





# **Edelbrock E-Street Electronic Fuel Injection System**

Installation Instruction Manual for #3600, 3601, 3602 & 3606

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# **INTRODUCTION**

Thank you for selecting the Edelbrock E-Street Electronic Fuel Injection (EFI) System. This is a universal, throttle body style, electronic fuel injection system, intended for most V8 engines originally equipped with carburetors and intake manifolds with square-bore 4150 style flanges (*does not work on Point Type Ignition systems*). Engines with Q-jet or Thermoquad Style manifolds will require an adapter to run the E-Street EFI system. The E-Street EFI system features an easy-to-use software, which is pre-installed onto a supplied 7" touch screen Tablet PC. The E-Street E-Tuner software and tablet will enable real-time system performance monitoring and fine tuning adjustments. The use of a laptop PC is not required for tuning. E-Street EFI offers you the most bang for your buck, along with out-of-the-box performance from a name you can trust....Edelbrock!

If you have any questions, do not hesitate to call our EFI Technical Hotline at: (800) 416-8628, 7am-5pm PST, Monday-Friday.

# **E-STREET SOFTWARE UPDATES**

Edelbrock periodically releases improved versions of the E-Street software, pre-loaded on the touch screen tablet, included in this kit. These updates include improvements to pre-installed calibration maps, additional calibration maps and updates to the user interface to improve the overall functionality of the software. It is highly recommended that you visit the Edelbrock website (www.edelbrock.com) to verify that you have the latest firmware before starting this installation. Please see the Owner's Manual included with the Tablet for step by step instructions on updating your E-Street software.

It's also a good idea to visit the Edelbrock Tech Page to verify you have the latest E-Street EFI installation manual (www. edelbrock.com/automotive\_new/misc/tech\_center/install/index.php). Verify the latest release using the date on the lower left hand corner of the page.

# **IMPORTANT WARNINGS**

Before beginning the installation, use the enclosed checklist to verify that all components are present in the box. Then inspect each component for damage that may have occurred in transit. If any parts are missing or damaged, contact Edelbrock Technical Support (800-416-8628), not your parts distributor.

### WARNING: The Edelbrock E-Street EFI system will not work on Point Type Ignition systems.

#### CAREFULLY STUDY AND UNDERSTAND ALL INSTRUCTIONS BEFORE BEGINNING THIS INSTALLATION.

**NOTE**: The installation can be accomplished using common tools and procedures. However, it is highly recommended to have a solid understanding of automotive repairs and modifications, and be familiar with and comfortable working on your vehicle and your vehicle's fuel system. If you do not feel comfortable working on your vehicle, it is recommended to have the installation completed by a professional mechanic.

Proper installation is the responsibility of the installer. Improper installation will void all manufacturer's s standard warranties and may result in poor performance and/or engine or vehicle damage.

**WARNING**: The Edelbrock E-Tuner Tablet is intended as a hands free tuning display gauge and should only be used as such while driving. Any function that requires prolonged attention should only be performed after coming to a complete stop. Distracted driving is extremely dangerous and illegal in most states. If adjustments are to be made during driving, always stop the vehicle in a safe location before performing any adjustments, or have a passenger perform the necessary adjustments. Please check with your local laws for legal mounting locations in your vehicle.

#### **02 SENSOR INSTALLATION**

It is suggested that the 02 sensor threaded fitting be installed by a professional muffler shop prior to the installation of the Edelbrock E-Street EFI system. DO NOT drive the vehicle with the 02 sensor installed and not plugged in. An 02 sensor threaded fitting plug is provided for your convenience.

#### **EMISSION CONTROLS**

The Edelbrock E-Street EFI system will not accept stock emissions control systems. Check your local emissions laws for requirements before installing the E-Street EFI system. This system is not legal for use on pollution-controlled motor vehicles.

#### **FUEL REQUIREMENTS**

Because the E-Street EFI system uses a wideband oxygen sensor (02), unleaded fuel must be used at all times. **Using leaded fuels will damage the O2 sensor and void your warranty**. If leaded fuel is present in your fuel tank, the tank must be drained and filled with unleaded fuel. It is also recommended to have a full fuel tank before operating the vehicle (*after the installation*).

#### **AUTOMATIC TRANSMISSION CHECK**

For best performance, economy, and emissions, the transmission kick down and shift points must be checked before and after the E-street EFI installation.

#### **IGNITION SYSTEM CHECK**

Verify that all your ignition system components are operating properly. Verify ignition timing and spark advance curve have been properly set. High EMI suppression spark plug wires are necessary, do not use solid core spark plug wires. Resistor type spark plugs are necessary.

#### **COOLING SYSTEM**

The minimum requirement for the thermostat is 180°.





# **TOOLS AND SYSTEM REQUIREMENTS**

Use the following checklist for items needed.

- Wrench / Socket Set
- □ 7/8" Oxygen Sensor Socket or Equivalent
- $\hfill\square$  Pliers (channel locks and hose clamp)
- $\hfill \Box$  Screwdrivers (Phillips and Flathead)
- Gasket Scraper or Equivalent
- Timing light
- Shop Rags
- Edelbrock Gasgacinch #9300
- Loctite 598 OEM High Temperature Silicone Gasket (02 Sensor Compatible)
- □ Vehicle Wiring Diagram (if available)
- Thread Sealer
- High-Heat Anti-Seize Compound
- Throttle, Cruise Control & Trans. Kick-Down Mounting Bracket (See general Edelbrock catalog if necessary)

- □ 180° Thermostat
- Resistor Type Spark Plugs (Use correct heat range for your particular application)
- □ High EMI Suppression Spark Plug Wires (DO NOT use solid core spark plug wires)
- □ EFI Fuel System (*See fuel system recommendation on page 9*)
- Mechanical Fuel Pump Block Off Plate (Except for vehicles running a Fuel Sump System #3605, 3607)
- Fuel fittings (Additional fittings may be required depending on routing preferences. Visit www. russell.com)
- 30 AMP Automotive Relay (If using electric fans or A/C Kick up - One relay required for each accessory)

# **COMPONENT LAYOUT**

The Edelbrock E-Street EFI system delivers fuel and air to the engine via an induction system consisting primarily of a 4-barrel throttle body, dual fuel rails, and four fuel injectors. The induction system is fully assembled, tested, pressure checked, and flowed at the Edelbrock Factory. Avoid disassembling these components if possible.



NOTE: ALL UNUSED VACUUM PORTS MUST BE CAPPED TO AVOID VACUUM LEAKS

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## **ELECTRONIC CONTROL UNIT / SYSTEM ECU**

The Electronic Control Unit (**ECU**) must be mounted away from moisture, excessive heat, and vibration. The fender well, or inner fender panel towards the front driver or passenger side near the battery are ideal locations.

If necessary, the ECU may also be moved inside the driver's compartment. Adjustments to the battery and ground leads may be required.

# MAIN HARNESS LAYOUT



# **ELECTRICAL CONNECTIONS**

The Edelbrock E-Street EFI system interprets overall engine operating conditions and fuel requirements based on readings from sensors that measure specific engine conditions. These sensors, with the exception of the 02 sensor and Coolant Temperature sensor, are designed as an integral part of the EFI system and require no installation. The 02 sensor must be installed in the exhaust system using an 02 sensor threaded fitting. The Coolant Temperature sensor must be installed onto the intake manifold in the coolant passage on the hot side of the thermostat.

The E-Street system includes eight electrical connections:

- 1) Manifold Air Temperature
- 2) Coolant Temperature
- 3) Throttle Position
- 4) Manifold Absolute Pressure

#### **MANIFOLD AIR TEMPERATURE SENSOR**





### **THROTTLE POSITION SENSOR**



This sensor connects to the Throttle Position Sensor (TPS) connector on the E-Street ECU main harness. DO NOT remove the TPS sensor as it is set from the factory.



This valve connects to the Idle Air Control (IAC) connector on the E-Street ECU main harness.

- 5) Idle Air Control
- 6) Fuel Rail Pressure
- 7) Exhaust Oxygen (02)
- 8) Fuel Injectors (4)

### **COOLANT TEMPERATURE SENSOR**



The Coolant Temperature sensor must be installed onto the intake manifold in the coolant passage on the hot side of the thermostat. Connect the sensor to the Coolant Temp (Cool T) connector on the E-Street ECU main harness.

#### **MANIFOLD ABSOLUTE PRESSURE SENSOR**



This sensor connects to the MAP sensor connector on the E-Street ECU main harness.

#### **FUEL PRESSURE SENSOR**



This sensor connects to the Fuel Pressure (Fuel PSI) sensor connector on the E-Street ECU main harness.

## WIDEBAND OXYGEN SENSOR (02) INSTALLATION

The 02 sensor must be installed in the exhaust system using the supplied 02 sensor threaded fitting from Bag #1. The 02 sensor is required as it measures the oxygen content of the exhaust gas, which is used by the ECU to manage fuel delivery under closed loop control.

**NOTE:** It is suggested that the 02 sensor threaded fitting be installed by a professional muffler shop prior to the installation of the Edelbrock E-Street EFI system. DO NOT drive the vehicle with the 02 sensor installed and not plugged into the E-Street main harness. An 02 sensor threaded fitting plug is provided for your convenience.

#### **INSTALLATION PROCEDURE**

**WARNING**: A properly sealed exhaust system is critical for the E-Street EFI to function properly. Any air leaks in the exhaust system upstream of the 02 sensor will skew 02 sensor outputs to the ECU resulting in improper calibration that may result in damage to your engine. Improper installation of the 02 sensor and any damage that may result is not covered by any Edelbrock Warranty.

**NOTE:** Because of harness length constraints, it is highly recommended to install the 02 sensor and the E-Street ECU on the same side of the vehicle. Ideally, this is on the passenger side of the vehicle.

- 1. Verify that the header and tailpipe gaskets are all in good condition. It is recommended to replace any worn or torn gaskets as they may cause exhaust leaks, which can lead to inaccurate Air Fuel Ratio (AFR) readings. Also, make sure to torque all fasteners to manufacturer's spec to avoid any possible exhaust leaks.
- The 02 sensor threaded fitting must be installed in the exhaust system, approximately 2-6" inches after the header collector and before the catalytic converter (*if equipped*). This location must be approximately 10° above horizontal and within reach of the 02 Sensor harness connector on the E-Street main harness.
- 3. Using a Sharpie marker, or equivalent, mark the drilling location on the exhaust system pipe. Check the proposed mounting location to ensure the clearance for the 02 sensor is adequate and that the 02 sensor connector on main harness will reach 02 sensor location. Make sure to take engine movement into consideration when checking for clearance.



- 4. Drill a 5/8" hole in the proposed mounting location. Deburr and clean the hole as needed.
- 5. Fit the provided 02 threaded fitting onto the hole opening. Secure the threaded fitting with a clamp and weld the threaded fitting into place.
- 6. Once the installation of the threaded fitting is complete, make sure to clean the threads of the threaded fitting to ensure it's free of debris.

**NOTE:** The 02 sensor threaded fitting uses an M18 x 1.5 thread pitch.

- 7. With the 02 sensor threaded fitting installed, the provided threaded fitting plug from Bag #1 can be temporally installed using a 7/8" wrench to enable the driveability of the vehicle.
- 8. When ready to begin the installation of the E-Street EFI system, the threaded fitting plug can be removed.
- 9. Apply a high-heat anti-seize compound (*not included*) to the threads of the 02 sensor and install into the threaded fitting using an 7/8" oxygen sensor socket or 7/8" wrench.
- 10. The 02 sensor will connect to the 02 sensor connector on the main E-Street ECU harness.

## **E-STREET INSTALLATION**

1. Remove fuel tank cap to help release fuel pressure from the fuel system.

**NOTE:** Skip Steps 2-4 if using an Edelbrock Fuel Sump System (#3605, 3606, 3607 or 36052).

Applications using Low Pressure Electric fuel pumps may already have a block off plate installed. The Edelbrock Fuel Sump is compatible with Low Pressure Electric fuel pumps (6 PSI Max). If using Returnless or Return Style fuel systems, the Low Pressure Electric fuel pump components must be removed. Please refer to the fuel system's installation manual for more details.

- 2. Remove fuel feed line attached to the mechanical fuel pump and plug fuel line to prevent fuel leaks.
- 3. Remove the factory mechanical fuel pump and push rod, clean mating surface on engine block with scraper and lacquer thinner.

**NOTE:** A fuel pump block-off plate (not included) is required to block-off the factory fuel pump hole.

4. Install block-off plate using the appropriate gasket and bolts.



- 5. Remove air cleaner, throttle linkage, vacuum and fuel lines from the factory carburetor.
- 6. Unbolt carburetor and place shop rags inside the manifold plenum(s).
- 7. Clean all debris from the intake manifold.
- 8. Install the Coolant Temperature Sensor, from Bag #1, to the intake manifold coolant passage on the hot side of the thermostat. A 1/2" to 3/8" pipe reducer, in Bag #1, is supplied if needed.
- 9. Remove the shop rags from the intake manifold. Install the new E-Street EFI throttle body with the throttle linkage facing the driver side of the vehicle. Secure the throttle body using the supplied gasket and the factory studs and nuts.



10. Attach throttle linkage and verify it moves freely without interference.



11. Find a suitable mounting location for the ECU *(this should be on the same side of the vehicle as the 02 sensor)*. The fender well, or inner fender panel are ideal locations.

**NOTE**: It is recommended to mount the ECU in a location away from excess heat, vibration and possible water exposure.

- 12. Using the supplied rubber washers and sheet metal screws from Bag #1, mount the ECU to the desired mounting location. The rubber washers must be used in between the mounting surface and the ECU to help absorb excessive vibration.
- 13. Connect the E-Street main harness to the appropriate sensors and injectors on the throttle body *(refer to page #5 for harness diagram).*
- 14. Find a suitable harness route in the engine compartment which leads to the ECU location. The harness fits best if routed from the throttle body back towards the firewall, across the firewall, then forward towards the ECU location.

**NOTE**: Avoid routing the harness near any ignition related components (ignition coil, distributor, spark plug wires). Also avoid routing near the headers, sharp edges, or any tight radius corners that may damage the harness.

15. Route the power leads on the main harness to the battery. Connect the RED (+12V) POWER lead and the BLACK GROUND (-) lead to the appropriate battery terminals.

**NOTE**: If necessary, the power leads may be extended to reach the battery using only 12 gauge wire or larger.

- 16. Securely mount the Fuse and Relay in an accessible location.
- 17. Connect the Pink/Black 12 Volt switched wire on the main harness to a 12 Volt (+) switched power source that provides 12 Volts (+) when the key is both "ON" and "CRANKING".
- Secure the harness and leads with tie wraps from Bag #2. Avoid over tensioning wire ties as this may damage the harness.

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- 19. Remove the previously installed 02 sensor threaded fitting plug from the threaded fitting in the exhaust system and install the 02 sensor.
- 20. Connect the 02 Sensor to the main harness lead labeled 02 Sensor on the main ECU harness. Secure 02 sensor lead, avoiding contact with exhaust pipes. Make sure to leave plenty of air space between harness and headers to avoid overheating the harness.
- 21. Install the throttle return spring and bracket from Bag #1. Manifold bolt locations are ideal mounting points.



- 22. Install the fuel delivery system. Please refer to the fuel system's installation instructions for complete installation procedures.
- 23. Vehicles using the Returnless type fuel system #3601 or 3603, install the supplied fuel pump harness to the fuel pump using the diagram below. Proceed to Step 27.



24. If using a Return Type fuel system or a Fuel Sump, **the fuel pump relay harness supplied in those kits must be used.** Connect the fuel pump relay harness to the Fuel Pump connector on the E-Street EFI main harness and then to the fuel pump harness. The power lead on the relay harness must be connected to a Constant +12v source.

**NOTE**: DO NOT use a fuel pump relay harness with the Returnless style fuel system.



25. Using the Tach Input Notes to the right, assemble the Tach input harness from Bag #2, based on your specific application needs. Connect the assembled Tach input harness to the Tach Input connector on the Main Harness.

- 26. If using the Fan / AC Triggers refer to the Fan/AC Trigger Notes below.
- 27. Reinstall the air cleaner and verify that you have adequate hood clearance.
- 28. Proceed to the Tablet Initial Setup and Startup procedure on Page 12.

### TACH INPUT NOTES

The Tach Input harness needs to be configured using the provided harness and leads. Refer to the diagram and appropriate source options below to best configure the harness for your application. *Only one of the following source configuration is required.* Select the help received the system types.



**Source One** - If using the Negative Side of the coil or an HEI distributor as an RPM Trigger Input, use only the Tan/ Yel lead provided. This is the only wire used and connects to the negative side of the coil or the tach signal terminal on the HEI distributor. It may also be used if running a Tach Adapter Module.

**Source Two** - If using a Capacitive Ignition Box, remove the Tan/Yel wire and insert only the Wht/Blk wire into cavity B cavity. The Wht/Blk wire is the only wire used, it connects to the Tach Output lead of the Capacitive Ignition Box.

**Source Three** - If using a Mag or Hall Trigger Sensor, remove the Tan/Yel wire and insert the Wht/Blk wire into cavity B, and the Black wire into cavity C. The Wht/Blk wire connects to the Signal lead and the Black wire connects to the Signal Ground lead on the sensor.

#### FAN / AC TRIGGER NOTES

Three pigtail leads are provided in Bag #2 to trigger the electric fan(s) and AC kick up, if so equipped. The Fan and AC triggers are low current GROUNDS that require a 30 AMP Automotive Relay (not included) for each lead. Installation diagrams are provided on page 21. Pinout diagram is available on the Main Harness Schematic section, Page 22.

*NOTE: DO NOT connect E-Street ECU fan outputs directly to fan motors. DO NOT connect AC compressor clutch switch directly to the E-Street ECU.* 

WARNING: DO NOT START THE VEHICLE UNTIL PROMPTED TO DO SO. PROCEED WITH THE VEHICLE SETUP SECTION. A PROPER BASE MAP CALIBRATION MUST BE LOADED TO THE E-STREET ECU BEFORE STARTING THE VEHICLE.

# TABLET INITIAL SETUP AND STARTUP PROCEDURE

**WARNING:** The Edelbrock E-Tuner Tablet is intended as a hands free tuning display gauge and should only be used as such while driving. Any function that requires prolonged attention should only be performed after coming to a complete stop. Distracted driving is extremely dangerous and illegal in most states. If adjustments are to be made during driving, always stop the vehicle in a safe location before performing any adjustments, or have a passenger perform the necessary adjustments. Please check with your local laws for legal mounting locations in your vehicle.

Once the Edelbrock E-Street EFI system and the fuel system have been installed, use the checklist below to verify the following requirements are complete before proceeding. This will ensure the best results and optimal performance.

- □ Has the battery been reconnected?
- □ Have all linkages been reconnected?
- □ Have all wiring harness connectors been connected?
- □ Has the supplemental fuel system been installed?
- □ Has the fuel system been checked for leaks?
- □ Is the gas tank refilled with unleaded fuel?
- □ Is the gas tank full *(recommended for initial setup)*?
- □ Has the exhaust system been checked for leaks?
- □ Has the O2 sensor been installed and connected?
- □ Have resistor type spark plugs been installed?

Have High Suppression spark plug wires been installed?
Is the tablet fully charged?

**NOTE:** Before proceeding to the Tablet Initial Setup procedure, it is highly recommended to read the Tablet Owner's Manual to familiarize yourself with the basic functions and operations of the tablet.

# VEHICLE SETUP

 Power on the tablet by pressing and holding the power button for 3-4 seconds. Unlock the tablet to launch the Edelbrock E-Tuner Software. Please read the Important Warning screen before continuing to the E-Tuner Main Menu (Fig. 1).



**NOTE:** The **Engine Icon W** displays the status of the wireless connection between the tablet and the ECU. A Red X indicates "Not Connected", while a Green Check Mark indicates "Connected". An Hourglass indicates the tablet is communicating with the ECU. The Engine icon also functions as a manual connection toggle (on/off) switch. Touching the Engine icon while the Red X is present, when the ECU has "KEY ON" power, will connect the tablet and ECU wirelessly. If the wireless connection between the tablet and ECU is lost unexpectedly, the tablet will display a pop-up warning screen. Select "OK" to reconnect the tablet to the ECU. See image below.



2. On the Edelbrock E-Tuner Main Menu, select the **Vehicle Setup** icon to start the vehicle setup procedure.

**NOTE**: It's highly recommended to read the help menu on each screen as well as using the on screen directions and instructions outlined in this installation manual.

- 3. In the Vehicle Setup menu select the **Setup Wizard** icon to begin.
- 4. Set the Displacement of the engine, in cubic inches, using the "+" and "-" icons. Press accept to continue.

**NOTE**: Press and hold the icons to rapidly increase the variable.

5. Select the Camshaft Profile used in your application. Press accept 🖌 to continue.

**NOTE**: This information is available on the Cam Card that came with the Cam or on the manufacturer's specification sheet.

<b>Camshaft Selection</b>	Camshaft Duration @ 0.050 Lift
Stock	210° or Less
Mild	210° to 230°
Race	230° or Greater

Select the type of Ignition System used in your application (Fig. 2). Select the help ? icon for information regarding ignition system types. Press accept rest to continue.



 Select the type of Fuel System installed on your application. Turn the key to the "ON" position then press accept to continue.

**NOTE**: Key Must be Turned to the "ON" position Before Proceeding to the Next Screen.

8. The tablet will connect to the ECU as soon as the Writing Configurations screen appears. Once a successful connection has been made, the Engine Connection Icon will show a green check mark and the progress bar will show the calibration loading process. This process may take a few minutes. See Fig. 3.



**NOTE**: If a connection is not successful, press the Engine lcon; the tablet will attempt to connect to the ECU and load a calibration. If you are still experiencing difficulties connecting, please refer to the Troubleshooting section of the Tablet Owner's Manual.

Once a Calibration has been successfully loaded to the ECU, turn the key to the "OFF" position for 10 seconds and then back to the "ON" position. Press accept to continue. See Fig. 4.



10. Set the rev-limter to a desired maximum RPM value that will prevent damage to your engine and press accept

**NOTE:** This is a fuel based rev-limiter. It will allow a 200-300 RPM overshoot of the set RPM.

11. Start the engine and let it warm up to operating temperature. *Proceed with Steps 11-14 before driving vehicle.* The engine may not run smoothly at this time. Adjustments to the Throttle Body Idle Screw can be made as needed to keep the engine from stalling. In addition, throttle input may be needed to keep the engine running. DO NOT over-rev or drive the vehicle as damage to the engine may result.

**NOTE**: Warm the engine to operating temperature before proceeding (At least 160 °F)

12. With the engine at operating temperature, adjust the idle speed screw on throttle body to the desired idle speed. With the idle screw set, adjust the Target Idle RPM on the tablet to the desired idle RPM value, press accept it continue. (Fig. 5).



13. Verify that nothing is pressing the accelerator pedal then press accept 🔽 to calibrate the TPS.

**NOTE**: Vehicle may stumble and stall during this process. This will calibrate the Throttle Position sensor to 10° of throttle at idle.

- 14. Congratulations, the Setup Wizard is complete and a Base Map has been loaded successfully to the ECU.
- 15. Before driving your vehicle, it is highly recommended to read the Getting Familiar with the E-Street EFI section. Also note that it is recommended to drive cautiously and allow adequate time for the self learning feature to complete.

If you have any questions, please contact the Edelbrock Tech Hotline at **1-800-416-8628** Monday-Friday from 7:00AM to 5:00PM PST.

#### **<u>GETTING FAMILIAR WITH E-STREET EFI</u>**

The E-Street EFI system is equipped with a warning system to alert you of any sensor failures and/or if any of the preset parameters have been exceeded ie: temperatures, pressures, battery voltage, engine speed, etc. The tablet will display a popup Fault Warning Screen with a fault description and option to CANCEL or IGNORE the fault. Selecting CANCEL will disregard the fault for 20 seconds. If the fault still exists, the warning screen will display again. If IGNORE is selected, the fault will be ignored until the fault returns to its origin then exceeds the warning setpoint again.

After the Setup Wizard has been completed, the idle speed has been set, and the throttle sensor calibrated, the use of the tablet is no longer required to operate the E-Street EFI. The tablet is only necessary to monitor system performance using the Tuning Gauge Displays and to make any desired modifications to the calibration. All modification made with the tablet after the completion of the Setup Wizard will require bluetooth connectivity with the E-Street ECU and will be applied in real time.

The E-Street EFI will constantly modify and apply fuel corrections to optimize your vehicles performance. Depending on your driving style and frequency of operation, this process will require adequate time to learn and adjust for inaccuracies during light acceleration, cruise, and some wide open throttle (WOT) conditions.

During the self learning process, the E-Street EFI system will constantly save Fuel Trim Modifications made and store them to the E-Street ECU automatically. Fuel Trim Modifications and setup information will be stored in the ECU until deleted or erased by the user. Power failures and lost of connectivity will not erase any stored data in the ECU.

The key to driving your vehicle initially with the E-Street EFI is to employ smooth slow throttle transitions and accelerations. Try to drive the vehicle in a manner that employs all conditions; light load, high RPM and low RPM.

If you experience a situation where the engine is not performing properly, it helps to observe the Air Fuel Ratio Setpoint (AFR SP), Actual Air Fuel Ratio (AFR), and the percentage of fuel corrections being applied (AFR Cor). The E-Tuner display screen is most useful for these observations. Try to hold a steady RPM and Vacuum level at the point that the vehicle is struggling, as the E-Street EFI makes adjustments, the AFR Cor should start to decrease and the AFR SP and AFR bars should become aligned. If running the E-Street EFI on a vehicle that is making close to the maximum horsepower rating of this system *(max HP rating will depend on fuel system used)*, be sure to monitor the Injector Duty Cycle (INJ Duty) on the display screen when running under wide open throttle conditions. If Injector Duty Cycle exceeds 100%, adjustments may be necessary or an incorrect setup may have been loaded. Please contact the Edelbrock Tech Support Line for assistance **(1-800-416-8628)**.

Depending on the Fuel System Type selected during the Setup procedure, your Fuel System Pressure will be either 50 PSI (+-2) or 58 PSI (+-2). Refer to the help file  $\bigcirc$  on the setup screen for Fuel Pressure information related to your system.

The E-Street EFI System is programmed with cold start tables. These tables function similar to a choke system on a carburetor. The Idle RPM will raise during initial cold start conditions, then decay out to the desired Idle Speed Setpoint as the water temperature increases to 150°F.

The fuel pump is programmed to run for 5 to 8 seconds prior to key "ON", then it shuts off automatically until "CRANKING" is sensed. A momentary Fuel Injector Prime event is active at key on to assist engine starts.

**FLOOD CLEAR:** In the event of fuel flooding during start up, a flood clear can be achieved by holding the throttle wide open for some duration during cranking. This shuts off all injectors and should assist in clearing the plenum of all raw fuel.

#### **ADVANCED SETUP MENU**

\*Requires bluetooth connectivity with the E-Street ECU

The Advanced Setup Menu section is provided to make modifications beyond the basic settings that were configured during the initial setup of your E-Street EFI (Fig. 6).



- 1. ON / OFF Menu In some scenarios it may be necessary to enable or disable such controls as the Idle Control, 02 Self Learn, or Multispark. This menu provides such actions without having to run through the Setup Wizard procedure.
- 2. Adjust 02 Setpoints O Use this function to set the parameters for the Idle air fuel ratio (AFR), Cruise AFR and WOT AFR (Fig. 7). The Adjust 02 Setpoints are a useful options for custom tuning your E-Street EFI System. These adjustments provide advantages over a carburetor by improving performance and increasing fuel economy. Refer to the help icon in this section for suggested AFR setpoint ranges.



a. The **Idle AFR Setpoint** is used to tune the vehicle for best idle quality and throttle response just off idle. The E-Street ECU will adjust fuel trims to meet this setpoint whenever the throttle is less than 12° and the Engine RPM is less than 1400 RPM. Engines with larger Camshaft Duration will generally require richer Air Fuel Ratios at Idle. *Suggested Idle AFR Range* 11.8 - 13.8.

- b. The Cruise AFR Setpoint is useful for improving fuel economy at moderate throttle openings and consistent RPMs. The E-Street ECU will adjust fuel trims to meet the cruise setpoint whenever the throttle is greater than 12° but not exceeding 50° and when the engine RPM is greater than 1400 RPM. The Cruise Air Fuel Ratio setpoint is usually the leanest of the three AFR Setpoints. Suggest Cruise AFR Range 13.0 14.0.
- c. The **Wide Open Throttle AFR Setpoint** is used to tune engine performance whenever the Throttle Position has exceeded 50° and Engine RPM is greater than 1400 RPM. This is usually the richest (*smaller AFR Setpoint value*) of the three setpoints and can be affected by engine displacement, camshaft grind, vehicle gearing, vehicle weight and vehicle aerodynamics. This number should be tuned for best performance with no regard for fuel economy. Be aware that too lean of an AFR Setpoint (*bigger setpoint value*) for WOT could damage your engine. *Suggested WOT AFR Range 12.0 – 12.8.*

**NOTE**: The AFR Setpoint (AFR SP) and Actual AFR (AFR) can be monitored as bar graphs on the bottom of the E-Tuner and Vitals Gauge Displays. On the E-Tuner Display, the amount of Fuel Correction (AFR COR) being applied can also be monitored. As the E-Street ECU makes the necessary Fuel Trim adjustments to meet the AFR Setpoint (AFR SP), it will store the adjustments to the Fuel Modifier Table. The amount of Fuel Correction (AFR COR) should become minimal and the Actual AFR (AFR) bar graph should become stable and aligned with the AFR Setpoint bar (AFR SP) during most driving conditions. Under certain conditions like hard acceleration and deceleration, it is normal to see excessive corrections (AFR COR) and erratic Actual AFR (AFR) readings.

**3.** Idle Tuning / Cal TPS - This function helps you readjust your Idle Settings, AC Idle Compensation and reset the TPS. If mechanical adjustments are made to the Idle Speed Screw on the Throttle Body, the Calibrate TPS procedure should be performed in this section. Throttle position at idle speed must be 10°.

4. Accel Fuel Tuning - The Accel Fuel Adjustments have the same functions as an accelerator pump on a carburetor. These adjustments add extra fuel in the event of a rapid throttle opening. The more rapidly you open the throttle the more fuel your engine requires to prevent hesitation. The numbers in these adjustments are only relative and have no units.



#### ACCEL FUEL TUNING TIPS

- a. Make changes in small increments to the **PUMP SHOT** and **SHOT DURATION** separately. Test how the throttle responds when revving the engine aggressively in neutral, then in gear from a dead stop. A lazy stumbling condition may be too much fuel. A delay in acceleration or pop back through the intake may indicate too little fuel. If the engine revs good initially then stumbles, try adjusting the **SHOT DURATION**. If the engine stumbles initially then accelerates, try adjusting the **PUMP SHOT**. Try to find an adjustment that works best in all conditions.
- b. The **PUMP SHOT** controls the amount of additional fuel added for the Accel Fuel event. The **PUMP SHOT** has a range of 0.000 to 2.000, 1.000 being the base setpoint that should perform adequately for most applications. Changes can be made in .020 increments.
- c. The **SHOT DURATION** controls the duration of the Accel Fuel event. The **SHOT DURATION** has a range of 0.0 to 10.0. For most applications, 5.0 is the default value. Changes can be made in increments of 1.0.
- 5. Rev Limiter Adjustment 💮 Use this function to adjust the rev limiter. An Engine RPM Rev Limiter has been provided to protect against over revs that may damage engine components. Default RPM on tablet is 6000 RPM. The Rev Limiter value may be adjusted in 50 RPM increments. When Engine RPM exceeds the set point the Fuel Injectors will be shut off until engine speed drops below the setpoint.

6. Fan Controls S - Two Cooling Fan Controls are provided. The default temperature for both controls is 172 degree Fahrenheit. When the E-Street EFI Coolant Temperature Sensor reads 172 degrees, both fan outputs will become active. The fan control outputs will shut off when Coolant Temperature drops approximately 10 degrees below the setpoint. The active setpoints can be set to any desired temperature. The active setpoints can be staged to reduce coolant temperature oscillation when fans are activated. Ex: Fan 1= 180 and Fan 2= 190. See Fig. 9.

The ECU Fan Control outputs are a low current ground signal. DO NOT connect low output signal directly to the Fan Motors. These outputs MUST be used to trigger a relay which will trigger the vehicle's Fan motors. Please refer to Page 21 of these installation instructions for diagrams and further information.



#### E-STREET MAIN MENU ICONS



- 1. Help Menu ? Is specific to each screen on the tablet and can be opened by touching the Question Mark icon on the upper right hand corner of Figure 10. Please read the Help Menu on each screen to familiarize yourself with the E-Tuner software.
- 2. Engine Icon 2. Displays the status of the wireless connection between the tablet and the ECU. A Red X indicates "Not Connected", while a Green Check Mark indicates "Connected". An Hourglass 2. icon indicates the tablet is communicating to the ECU. The Engine icon also functions as a manual connection toggle (on/off) switch. Touching the Engine icon while the Red X is present, when the key is on, will connect the tablet and ECU wirelessly. During the Vehicle Setup and Advanced Setup, some screens will attempt to Auto Connect if a connection is lost.
- **3. Vehicle Setup Icon C** Used to load a base map and perform advanced tuning. Selecting the Vehicle Setup icon will display the screen below (Fig. 11).



- a. The **Setup Wizard** lcon *P* Is the submenu used to load a base map into the ECU.
- b. The **Documentation** Icon **1** This submenu will contain supporting documentation such as, owner's and installation manuals, in PDF format.
- c. The **Advanced Setup** lcon **C** This submenu includes advanced tuning procedures that can be used once a base map has been loaded and the initial tune has been completed through the Setup Wizard.

d. The Custom Map / Settings lcon — Use this icon to load custom tune(s), reset default values as well as clear all the self learn values.

# **WARNING!** - Loading a custom map should only be done if directed by the Edelbrock Tech Support Team.

- e. The **Home Icon** A The Red House icon seen on the lower left corner of Figure 11 is the home key. The home key is present on all submenus and can be used to return to the E-Tuner's Main Menu screen at any time.
- f. The **Back Icon** The White Arrow icon on the lower left corner of Figure 11 is the back key. This icon is present on all submenus and can be used to go back to the previous screen at anytime.
- **4. Settings** The Settings submenu includes the connection settings and information regarding the version of the Edelbrock E-Tuner software. The information in this submenu could be helpful for troubleshooting.

SETTING	S Fig. 1	2	? 🏠	Edelbrock
	Connection Settings	i About		
19993999999	3929222222222222	182898989		333333

5. Tuning Gauge Displays 🕥 – This submenu includes the E-Tuner Display, Vitals Display, and Digital Display. These displays can be monitored to assist in advanced tuning once the base map has been loaded through the Setup Wizard. See Fig. 13.

**NOTE**: In order to observe the Gauge Displays, the ECU must be wirelessly connected with the tablet.



6. Exit to Android — This icon allows you to exit out of the Edelbrock E-Tuner software.

MAIN	ME	NU	Fig. 14		Edelbrock
	<b>२</b>	Veh	Warning! You are attempting to exit to the Android Platform. This action will terminate Edelbrock E-Tuner. To restart the application icon on the main Android	uge Disţ	blays
2525251 2525555	**	Set	screen.	biort	9629633
	5359 8359 8359		Exit to Android?		

- a. Selecting this icon will prompt a warning message seen in Figure 14. Selecting "NO" on the popup warning screen will cancel the action. Selecting "Yes" will close the Edelbrock E-Tuner application and the tablet will go to the general operating system (Android) home screen. It is NOT recommended that this action be preformed until you have become proficient at using the Edelbrock E-Tuner Application.
- b. To restart the Edelbrock E-Tuner application, select the EdelbrockTabletBT icon in the Android APP menu. Please see Tablet Owner's Manual for more details.

#### TROUBLESHOOTING

#### **VEHICLE DOES NOT START**

- Is the Tach Input Connector configured properly?
  - Refer to TACH INPUT NOTES on Page 11 of this instruction sheet for details.
- Does the E-Street system have adequate fuel pressure?
  - Check the Display Screens on the tablet to verify the fuel system is operating at 50-60 PSI (depending on fuel system used).
- Does the Fuel Pump run for 5-8 seconds with Key in the "ON" position?
  - Verify that the pink /black switched power wire on the E-Street harness has +12 volts in the key "ON" and "CRANKING" positions.
  - Check the 30 amp fuse on the E-Street harness and replace if necessary.
- Has the Setup Wizard procedure been completed?
  - The Setup Wizard needs to be completed before the vehicle will start.

#### **ENGINE STALLS UNEXPLAINABLY**

- Is the fuel level below 1/4 tank?
  - Older vehicles have fuel tanks with poor fuel pickup locations which may have difficulty "picking up" fuel especially when the fuel level is below 1/4 tank. This issue is enhanced when fuel levels are low and fuel sloshing is present. Try adding fuel to the tank to verify that this is not the issue.
- Is the idle speed screw on the throttle body properly set?
  - Refer to Page 13, Step 12 of this instruction sheet or the idle Tuning/Cal TPS section in Advanced Tuning on the tablet to properly adjust the idle speed screw.

- Has the E-Street system had sufficient driving time for the self learning feature to apply the necessary fuel trim corrections?
  - In most cases, the vehicle just needs additional driving time to adequately correct the fuel trims. Refer to the Getting Familiar w/ E-Street EFI section on Page 14 of this instruction manual.

#### **IDLE HUNT OR SURGING**

- Is the idle speed screw on the throttle body properly set?
  - Refer to Page 13, Step 12 of this instruction sheet or the idle Tuning/Cal TPS section in Advanced Tuning on the tablet to properly adjust the idle speed screw.
- Has the Throttle Position Sensor (TPS) been properly calibrated? Does the TPS read 10° at Idle on the tablet display screen?
  - Refer to Page 13, Step 13 of this instruction manual, or the idle Tuning/Cal TPS section in Advanced Tuning on the tablet to properly calibrate the TPS.
  - If the idle speed screw is properly set, and the TPS is still not at 10° when the engine is idling, you may have a faulty TPS sensor. Please contact the Edelbrock Tech Support team at 1-800-416-8628 for further assistance.
- Does the fuel correction exceed 25% at idle when engine is warm?
  - Verify that the correct camshaft profile and cubic inch displacement were chosen during the Setup Wizard procedure. Refer to Page 12, the Tablet Initial Setup section of this instruction manual.
- Is the ignition timing properly set?
  - Verify ignition timing with timing light.
- Verify there are no vacuum leaks present.
- Verify exhaust system is properly sealed.

#### **VEHICLE HAS POOR ACCELERATION**

- Has the E-Street system had sufficient driving time for the self learning feature to apply the necessary fuel trim corrections?
  - In most cases, the vehicle just needs additional driving time to adequately correct the fuel trims. Refer to the Getting Familiar w/ E-Street EFI section on Page 14 of this instruction manual.
  - To aid the self learning feature, apply soft and slow throttle in the area of hesitation. This will allow the system to correct the Fuel Trims.

- Is the ignition timing properly set?
  - Verify ignition timing with timing light.
- If the vehicle continues to accelerate poorly, adjustments to the Accelerator Pump tune may be necessary.
  - Refer to the Accel Fuel Tuning section on Page 16, Step 4 of this instruction manual or in the Advanced Setup section of the tablet.

### POOR PERFORMANCE AT WIDE OPEN THROTTLE

- Has the E-Street system had sufficient driving time for the self learning feature to apply the necessary fuel trim corrections?
  - In most cases, the vehicle just needs additional driving time to adequately correct the fuel trims. Refer to the Getting Familiar w/ E-Street EFI section on Page 14 of this instruction manual.
- The WOT Setpoints may be set too lean or too rich.
  - Refer to the Adjust 02 Setpoints section on Page 15, Step 2 of this instruction manual, or in the Advanced Setup section of the tablet.
- Is the fuel level below 1/4 tank?
  - Older vehicles have fuel tanks with poor fuel pickup locations which may have difficulty "picking up" fuel especially when the fuel level is below 1/4 tank. This issue is enhanced when fuel levels are low and fuel sloshing is present. Try adding fuel to the tank to verify that this is not the issue.
- Inadequate fuel supply.
  - Check the display screens on the tablet to verify the fuel system is operating at 50-60 PSI (depending on fuel system used).
- Does Injector Duty Cycle exceed 100% on E-Tuner display of tablet at Wide Open Throttle.
  - If yes, the fuel pressure will have to increase or the fuel system will have to be upgraded.
- Verify exhaust system is properly sealed.

## ENGINE SURGES DURING STEADY THROTTLE CRUISE

- Has the E-Street system had sufficient driving time for the self learning feature to apply the necessary fuel trim corrections?
  - In most cases, the vehicle just needs additional driving time to adequately correct the fuel trims. Refer to the Getting Familiar w/ E-Street EFI section on Page 14 of this instruction manual.

- The Cruise Setpoints may be set too lean.
  - Refer to the Adjust 02 Setpoints section on Page 15, Step 2 of this instruction manual, or in the Advanced Setup section of the tablet.
- Verify exhaust system is properly sealed.

# LIGHT THROTTLE HESITATION DURING ACCELERATION

- Has the E-Street system had sufficient driving time for the self learning feature to apply the necessary fuel trim corrections?
  - In most cases, the vehicles just needs additional driving time to adequately correct the fuel trims. Refer to the Getting Familiar w/ E-Street EFI section on Page 14 of this instruction manual.
  - To aid the self learning feature, apply soft and slow throttle in the area of hesitation. This will allow the system to correct the Fuel Trims.
- The Idle or Cruise Setpoints may be set too lean.
  - Refer to the Adjust 02 Setpoints section on Page 15, Step 2 of this instruction manual or in the Advanced Setup section of the tablet.

## ACTUAL AFR WON'T MEET AFR SETPOINT

- Does the fuel correction exceed 25% at idle when engine is warm?
  - Verify that the correct camshaft profile and cubic inch displacement were chosen during the Setup Wizard procedure. Refer to Page 12, the Tablet Initial Setup section of this instruction manual.
  - Verify Fuel Pressure.
  - Is coolant temp above 150F°, self learn not enabled below 150F°.

## **IDLE SPEED WON'T MATCH IDLE SPEED SETPOINT**

- Is the Idle Speed Screw on the throttle body properly set?
  - Refer to Page 13, Step 12 of this instruction sheet or the idle Tuning/Cal TPS section in Advanced Tuning on the tablet to properly adjust the idle speed screw.
- Has the Throttle Position Sensor (TPS) been properly calibrated? Does the TPS read 10° at Idle on Tablet Display Screen?
  - Refer to Page 13, Step 13 of this instruction sheet, or the idle Tuning/Cal TPS section in Advanced Tuning on the tablet to properly calibrate the TPS.
  - If the idle speed screw is properly set, and the TPS is not at 10° when the engine is idling, you may have a faulty TPS sensor. Please contact the Edelbrock Tech Support team at 1-800-416-8628 for further assistance.

#### **POOR VACUUM AT IDLE**

- Is the ignition timing properly set?
  - Verify ignition timing with timing light. Refer to your vehicle's service manual for proper ignition timing setting.
- Does the fuel correction exceed 25% at idle when engine is warm?
  - Verify that the correct camshaft profile and cubic inch displacement was chosen during the Setup Wizard procedure. Refer to Page 12, the Tablet Initial Setup section of this instruction manual.
- Verify there are no vacuum leaks present.

#### **FUEL CORRECTION OVER 25% AT IDLE**

• Verify that the correct camshaft profile and cubic inch displacement were chosen during the Setup Wizard procedure. Refer to Page 12, the Tablet Initial Setup section of this instruction sheet.

# COLD START REQUIRES EXCESSIVE CRANKING ON STARTER.

- Cycle key a few times to build up fuel pressure.
- Try to intermittently crank the engine over.

# ENGINE PERFORMS POORLY WHEN ACTUAL AFR AND AFR SETPOINT ARE ALIGNED.

- Check the exhaust system for any leaks, this will cause improper 02 readings which will throw off the 02 setpoints.
- Is the ignition timing properly set?
  - Verify ignition timing with timing light.
- Verify AFR setpoints are properly set.
  - Refer to the Adjust 02 Setpoints section on Page 15, Step 2 of this instruction manual, or in the Advanced Setup section of the tablet.

# FAN / AC TRIGGER INSTALLATION

The diagrams provided on Page 21 are to assist in the installation of switch triggers for electric fans and AC kick up using the provide pigtails (*not pre-installed*). The E-Street EFI uses low voltage switched ground outputs for electric fan triggers and a low voltage switched ground AC kick up input. These triggers are controlled by the ECU using parameters defined in the E-Tuner software. The pinouts for the fan outputs are: Pinout 29 - Fan #1 and Pinout 30 - Fan #2 (*See Pinout Diagram on Main Harness Schematic*). The AC kick up trigger, Pinout 7, is a ground input used to bump the idle when the AC is switched on. The Fan trigger(s) and AC kick up trigger must be used in conjunction with a 30 AMP automotive relay (*not included*). Each accessory trigger will require its own 30 AMP automotive relay.

**NOTE**: Auxiliary Outputs are rated at 1.5 AMP max and must be configured to activate with a relay (not included). DO NOT connect ECU fan outputs directly to the fans. DO NOT connect AC compressor clutch switch directly to the E-Street ECU.

#### **PIGTAIL INSTALLATION**

To install the provided pigtails, use a small flathead screwdriver to push in the large locking tab (Image A). Insert the pigtail(s) to the appropriate pinout(s), on the harness side of the connector, until the pigtail is fully seated. When complete, push down on the two small tabs to re-lock the locking tab (Image B).

## **TO UNLOCK**

**IMAGE A** 



IMAGE B

# FAN / AC TRIGGER DIAGRAM



## **MAIN HARNESS SCHEMATIC**



Part #3600, 3601, 3602, 3606 Rev. 1 03/05/13 - QT/mc 22 E-Street EFI Installation Instructions

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## WARRANTY

In the best interest of Edelbrock LLC to provide our customers with the highest quality performance products. Edelbrock warrants the Edelbrock E-Street EFI System to be free from defects in both workmanship and materials for a period of one year from date of purchase, provided that the product is properly installed and subjected to normal use and service, is not used for racing or competition purposes and that the product is not modified or altered in any way unless specified by our instructions. Our warranty service and repair facility is located at 2700 California Street, Torrance, CA 90503. Customers requiring warranty assistance should contact the dealer from whom they purchased the product. In turn, the dealer will contact Edelbrock, and we will determine the method of satisfying the warranty. Should Edelbrock determine that the product needs to be returned to the factory, it should be accompanied by proof of purchase and a clear description of the exact problem. The product must be returned freight pre-paid. If a thorough inspection of the product by the factory indicates defects in workmanship or material, our sole obligation shall be to repair or replace the product. This warranty covers only the product itself and not the cost of installation or removal.

## EDELBROCK LLC SHALL NOT BE LIABLE FOR ANY AND ALL CONSEQUENTIAL DAMAGES OCCASIONED BY THE BREACH OF ANY WRITTEN OR IMPLIED WARRANTY PERTAINING TO THIS SALE, IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT SOLD.

If you have any questions regarding this product or installation, please contact our Technical Department from 7:00 am - 5:00 pm, Pacific Standard Time, Monday through Friday at: 800-416-8628.



Edelbrock LLC 2700 California Street, Torrance, CA 90503 1-(800)-416-8628