

Overview of EIS Installation

Thank you for purchasing an Electroair Ignition System for your aircraft. We are confident that you will be happy with the performance of your EIS on your aircraft. The next several pages will take you step-by-step through the process of installing your EIS on your aircraft. We hope you will enjoy the experience and that this manual will provide you with clear direction and guidance through this process. This manual will cover the following general installation steps:

1. General Overview and recommendations
2. Removal of old ignition components
3. Set-up and installation of the Mag Timing Housing – four-cylinder engines
4. Set-up and installation of the Crank Shaft Timing Wheel – six-cylinder engines
5. Installation of the EIS Controller and Coil Pack
6. Installation of the MAP Sensor & vacuum line
7. Spark Plug Harness
8. Wiring
9. Final installation steps
10. Options

We strongly recommend that you read through this entire installation procedure before installing your new EIS on your aircraft. Make sure that any questions you might have are answered before the actual installation. Also, make sure any extra components that you might need, e.g. cable ties, circuit breakers, switch terminations, etc., are all available. And above all else, use good common sense and judgment. An electronic ignition system is a high voltage device. If an EIS is improperly installed or miss-fired, you could cause severe damage to the EIS, your aircraft, or even yourself.

Please contact us if you have any questions during this installation process. Good luck and happy flying!!

Electroair

Installation of EIS

1. General overview and recommendations

- a. Read through the entire installation instructions before beginning the installation to make sure you understand each step. **CALL US** if you have any questions or there are items that are unclear.
- b. The installation of the EIS should take between 4-6 hours, depending on your skill set for working on the engine & ignition system.
- c. Review your own skill set. If this is the first time installing an ignition system of any kind, we recommend that you have some one available with some ignition experience in order to help you.
- d. If you are installing a Crank Shaft Timing Wheel (CSTW), we strongly recommend that you have help in this procedure. There are instances where two sets of hands are useful. And we also recommend that one of the installers be familiar with removing and installing components on engines.
- e. Always use good safety and work practices. Use appropriate safety equipment (glasses, etc.) and precautions. The EIS is a high voltage system and if installed or tested incorrectly can cause substantial damage to both the system and YOU.

2. Removal of old ignition components

- a. Remove cowling. Verify that Master Switch is off and battery is disconnected.
- b. Remove ignition harness from spark plugs associated with the right hand magneto. These are typically the right-hand lower and the left hand upper spark plugs
- c. Disconnect the P-Lead from the right hand magneto.
- d. Remove the right hand magneto and right hand ignition harness.
 - i. For 4-cylinder engines, retain mag holding clips if removing a Slick magneto (otherwise, obtain kit #EA-015 for mag holders needed when installing the Mag Timing Housing).
 - ii. For 6-cylinder engines, you may cover the accessory pad where the magneto was; be sure to fasten the cover in place securely. **CAUTION:** on some engines like the Lycoming 540 series, the magneto drive gear is not attached to the magneto and **MUST BE REMOVED** from the accessory housing or it will damage the engine.
- e. Remove the magneto drive gear/impulse coupling from the right hand magneto. Be careful not to damage the gear. We recommend using a standard gear puller. (Note: 6-cylinder installations do not require the magneto gear). Retain gear for installation on Mag Timing Housing.

3. Set-up & Installation of Mag Timing Housing (MTH); 4-cylinder ONLY

- a. Retrieve the MTH and remove nut, cotter pin and washer.
- b. Place the magneto gear (or impulse coupling) on the Mag Timing Housing shaft. Be sure to align the Woodruff (half-moon shape) key with the slot in the gear.
- c. Install the washer and nut and tighten. Install the cotter pin with the long end of the cotter pin facing you. Bend the long end of the cotter pin over the end of the shaft and the short end along the side of the nut.
- d. Holding the MTH, insert the alignment pin in the hole on the back cover (pin supplied with unit). Slowly turn the gear on the front of the unit until the alignment

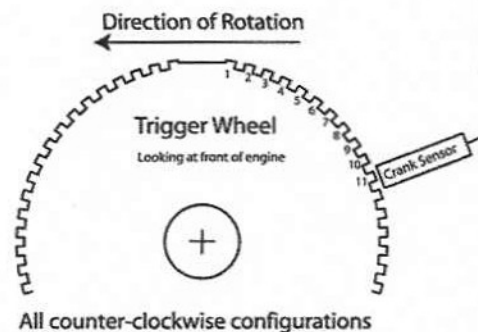
drops into a second hole inside the MTH. The MTH is now set to Top Dead Center (TDC). Leave the alignment pin in the MTH and ready the engine for the MTH installation (next steps).

- e. Clean magneto pad. Make sure new gasket is on MTH.
- f. VERIFY MASTER SWITCH IS OFF AND BATTERY DISCONNECTED.
- g. Rotate the engine to Top Dead Center (TDC). This done by rotating the prop in the direction of the engine rotation until TDC is reached. At TDC, the impulse coupler on the left magneto should click. Also, to verify TDC, there are two sets of timing marks found on the engine. The first set is on the fly wheel and the starter; they will line up at TDC. The second set is another mark on the back-side of fly wheel which lines up with the engine case seam at TDC. If any of these indications are not correct, repeat this step until they are. Always rotate the engine in the direction that it normally turns.
- h. Install the MTH into the right magneto hole. Secure the MTH using the mag holding clips talk about in step 1.d.i and secure to engine specifications.
- i. Remove the alignment pin. The MTH is now installed and timed properly.

4. **Set-up and installation of Crank-Shaft Timing Wheel (CSTW);**

- a. You will need access to the crankshaft between the block and the prop flange. Remove those components necessary to accomplish this. Note: Exploded view of CSTW installation on a Lycoming is at the bottom of this section - TCM installations are similar.
- b. Clean the crank area just in front of the crank shaft seal. **CAUTION:** the exposed portion of the crank shaft is tin plated. An abrasive (like sand paper or scotch brite) will remove the plating. We recommend using a liquid cleaner/degreaser.
- c. Temporarily fit the CSTW on the crank with the timing teeth toward the block. Slide the CSTW toward the prop flange.
- d. Temporarily install the pick-up bracket.
 - i. Lycoming installation is as follows:
 - 1. Remove the nuts from the two block through-bolts just behind the main seal (right hand side of engine).
 - 2. Replace the nuts removed with the coupling nuts in the CSTW kit and tighten these nuts to the recommended torque values found in your engine specifications.
 - 3. Temporarily bolt the pick-up bracket-holder assembly on these two coupling nuts using the enclosed allen head screws.
 - ii. TCM O-200 installation: remove the two nuts on the left hand side of the engine and install the bracket-holder assembly; replace the nuts to a finger tight fit.
 - iii. TCM 470 & 520 installation: remove the first two, top case nuts and install the bracket-holder assembly (verify that the crankcase center seam bisects the center of the large hole in the pick-up holder, adjust spacing with flat washers under the bracket if necessary); replace the nuts to a finger tight fit.
- e. Loosen the CSTW and rotate it on the crank shaft until the hole in the collar is aligned to the tip of the pick-up bracket.

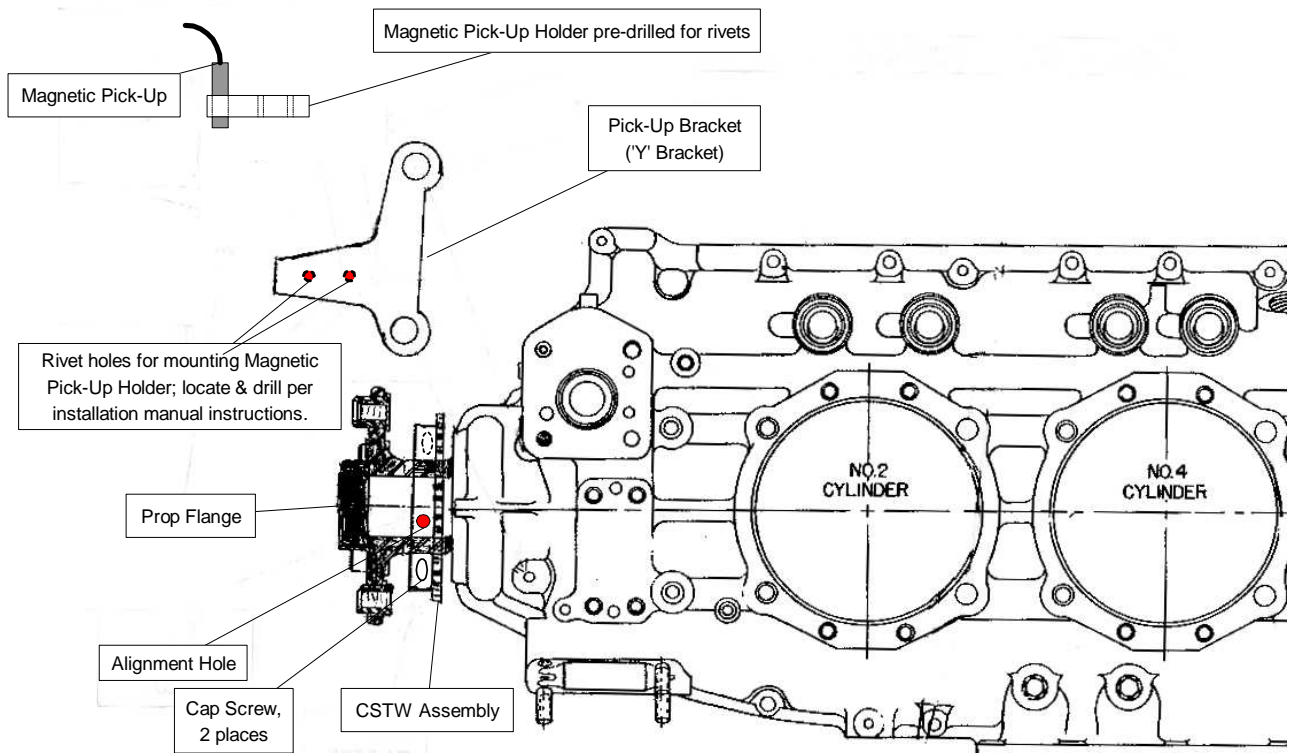
- f. Position the magnetic pick-up holder so that the magnetic pick-up would be oriented correctly on the timing teeth on the CSTW. Complete this by inserting the shaft of the pop rivet through the hole in the wood dowel (rivet and dowel provided). Place this assembly into the hole of the pick-up holder (dowel/pop rivet assembly simulates a magnetic pick-up and pop rivet will serve as an alignment pin).
- g. Rotate the CSTW to align the hole in the CSTW with the alignment pin (pop rivet). Hold it in place.
- h. While holding these pieces together, mark the position of the pick-up holder on to the pick-up bracket.
- i. After you have marked location of the pick-up holder, remove the pick-up bracket and holder assembly; tighten the fasteners so the pick-up holder is in the correct location on the bracket.
- j. Re-attach completed magnetic pick-up bracket/holder assembly to the engine using the previous through bolts or nuts and tighten to the recommend torque values found in your engine specifications.
- k. **Verify that the master switch is off and battery is disconnected.**
- l. Rotate the engine until number one cylinder is on Top Dead Center (TDC).
- m. Loosen the CSTW and rotate it until the alignment pin (remember the dowel/pop rivet assembly which is still in the pick-up holder) lines up with the hole in the CSTW. The alignment pin can be used to cage the CSTW. **This should place the trailing edge of the 11th tooth past the two missing teeth** (clockwise direction from the missing teeth) directly under the center of where the magnetic pick-up will go. Verify this or begin the procedure over.



- n. Remove CSTW and apply Loctite (Loctite # 242) to the crank shaft side of CSTW and to the two cap screws.
- o. Carefully replace the collar to the crank shaft and line up using the alignment pin as described in 4.m. The alignment pin will help hold the CSTW in position.
- p. Tighten the cap screws on the CSTW to a torque value of 20-25 inch-pounds. Be very careful that the gap between the two collar halves remains equal on both sides. If this gap is not held constant, the CSTW will not be concentric around the crank shaft and the timing pick-up will not function properly. **CAUTION:** Do not tighten the CSTW screws to the point that there is no gap between the collar halves. This means that you have over-torqued the screws, stretched the aluminum collar, and the CSTW now needs replacing.

- q. Remove the dowel/pop rivet assembly from the pick-up holder and install the magnetic pick-up. Using a feeler gage or equivalent, set the gap to minimum of 0.024" and tighten the set-screws. This is a temporary setting.
- r. Rotate the engine and check the gap at several points around the rotation.

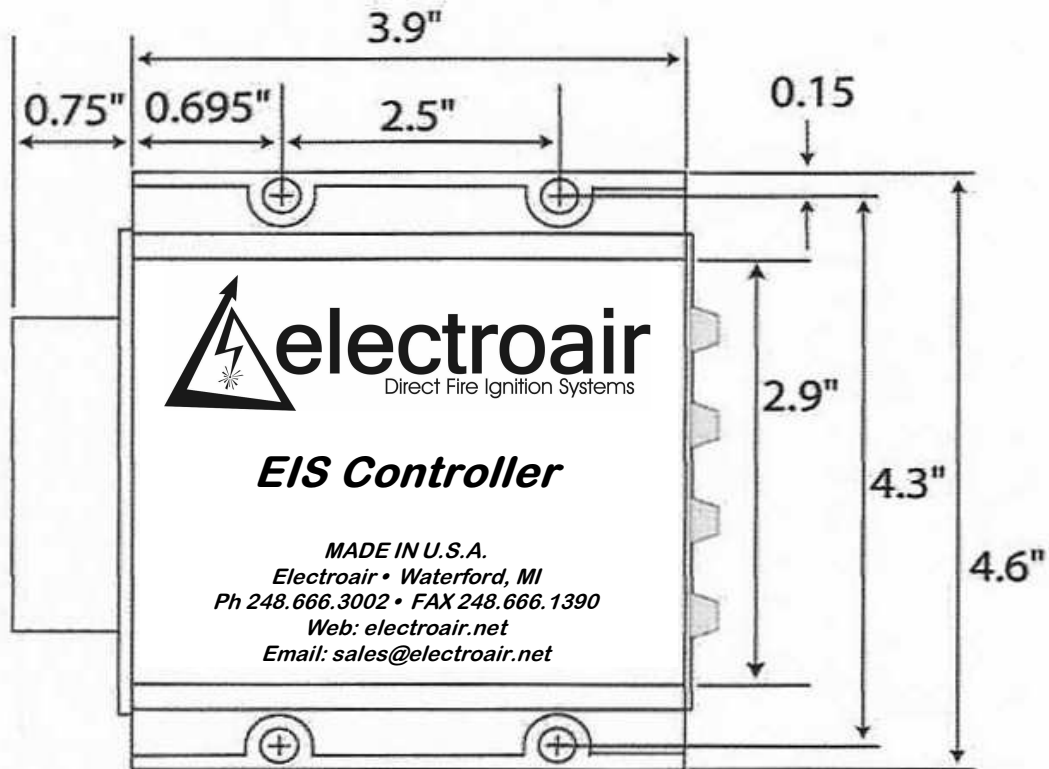
CAUTION: Do not leave the feeler gage between the CSTW and magnetic pick-up when rotating the engine – this could cause damage to the pick-up if it were to jam or wedge itself between the pick-up and timing wheel teeth. The gap should not vary more than +/- 0.005". If it does, mark those points. Verify that the CSTW gap around the crank is consistent and correct if necessary. High points on the CSTW can be corrected by filing the appropriate teeth. If this is done, only remove a small amount of material at a time and re-check the gap. Removing too much material will make the CSTW non-functional and will require you to purchase a replacement. Also, make sure any flashing on the teeth that are filed is also removed.
- s. Once the gap between the timing teeth and the magnetic pick-up is determined to be consistent, loosen the set-screws on the magnetic pick-up. Apply a thin coating of Loctite #242 to the sides of the pick-up and to the set-screws.
- t. Slide magnetic pick-up back in to the pick-up holder and set the gap between the pick-up and timing wheel to 0.024" using a feeler gage. Tighten the set-screws.
- u. Route the magnetic pick-up wire harness up the center of the block and then on top of the engine. Use cable ties as necessary to secure routing.



CSTW Installation - Exploded View; NOT TO SCALE

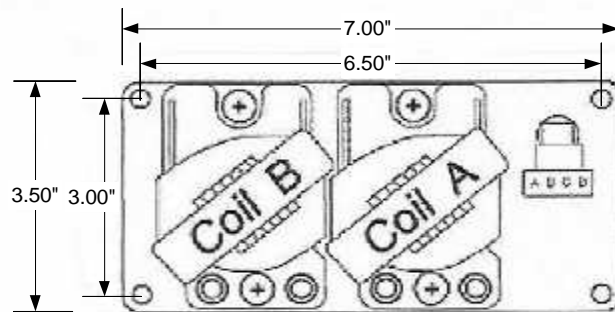
5. Installation of EIS Controller and Coil Pack

- a. Select appropriate locations for the EIS Controller and Coil Pack to be mounted.
 - i. Remove harness attached to EIS Controller and set aside for later installation.
 - ii. Install the EIS Controller where temperatures will not exceed 150F. Because of this, we recommend that the EIS Controller be mounted on the cockpit side of the firewall with the shortest practical distance from the coil pack for the wiring harness runs. Dimensions for the controller are laid out below:

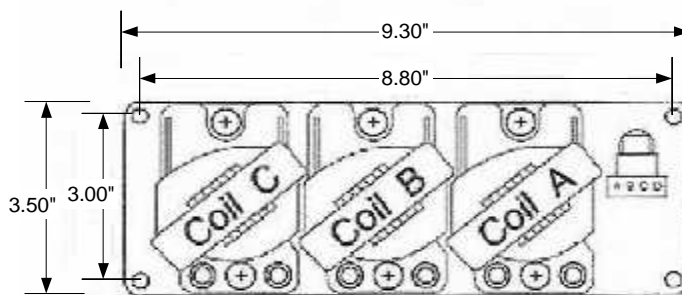


EIS Controller Dimensions

- iii. The most common place to mount the coil pack is on the engine side of the firewall. Try to locate the unit in a position to keep the spark plug wires as short as possible and not interfere with other components or create maintenance difficulties in the future. Additionally, the coil pack should be on a flat surface that is grounded. The unit also comes with a ground wire which will be installed in section 8. Coil Pack dimensions are below:



Four-Cylinder Coil Pack Dimensions



Six-Cylinder Coil Pack Dimensions

- iv. Also consider at this time the final location of the MAP Sensor (installation discussed in the next step).
- v. Prior to any drilling, verify that there is clearance from any components on the other side of the firewall.
- b. After all considerations have been made regarding the placement of the EIS Controller and Coil Pack, drill the mounting hole and install both units using standard AN hardware.

6. Installation of MAP Sensor and connection of vacuum line

- a. Verify that a vacuum line exists for a Manifold Pressure gauge.
- b. If a vacuum line exists (should exist for all engines with, or potential for, a constant speed prop installation) for a Manifold Pressure gauge, skip to step 6.d.
- c. If a vacuum line does not exist (typically engines where there is not a provision for a constant speed prop) for a Manifold Pressure gauge, a vacuum line must be installed for the MAP Sensor. (Now is a good opportunity to install a Manifold Pressure gauge too!). There are four common ways to install a manifold pressure line. For steps ii, iii, and iv, we recommend you consult an engine professional with your plan before proceeding.
- d.

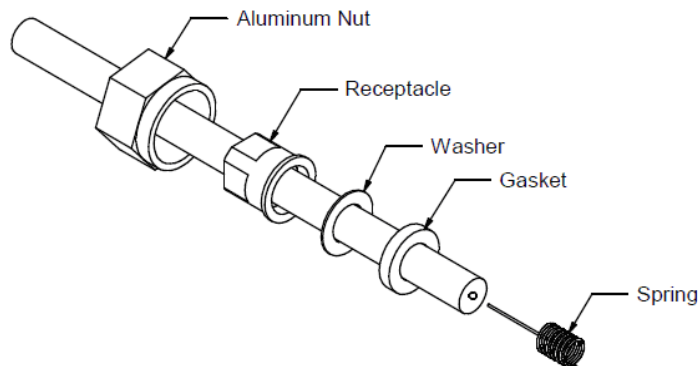
- i. First, a manifold pressure line can be attached to the intake of one of the cylinders. We suggest that you use either #3 or #4 cylinder since they will be the closest to the firewall and most convenient for the MAP Sensor. Remove the plug in the selected cylinder. Verify the thread (should be 1/8" NPT). Go to step 6.c.v.
 - ii. Second, use a primer line from either #3 or #4 (closest to firewall and most convenient for the MAP Sensor location). Disconnect the primer line from the engine and blow out any residual fuel. Leave the primer line fitting attached to the cylinder. Cap or plug the primer fuel source as required. Determine the best routing for the copper line from the cylinder primer fitting and cut the primer line to an appropriate length. Go to step 6.c.v.
 - iii. Third, drill and tap a new hole for 1/8" NPT in to #3 or #4 cylinder manifold (closest to firewall and most convenient for the MAP Sensor location). Go to step 6.c.v.
 - iv. Fourth, in some instances you can pick-up manifold pressure from the 'manifold take-off port' found on some model of carburetors. Consult your engine manual for this information.
 - v. Now plumb in a vacuum line. This vacuum line can be either 1/8"ID or 3/16"ID (Aeroquip p/n 306 or Stratoflex p/n 193 w/ appropriate end fittings) or aluminum tubing with AN818 and AN819 end fittings. The MAP Sensor is supplied with a 3/16"ID hose to connect to the MAP line (we use the Aeroquip or Stratoflex type hose mentioned above). We recommend using AN fittings at the engine for best results. If you are threading into a 1/8"NPT hole, use a p/n AN816 type fitting to provide a flared tube nipple that can be attached to with either a rubber vacuum line or aluminum tubing with appropriate end fittings. Determine if you are going to install a Manifold Pressure gauge but do not connect to the MAP sensor yet (that will happen in step 6.g.)
- d. Locate an appropriate location for the MAP Sensor on the engine side of the firewall. Keep in mind all of the considerations that were mentioned in Step 5. The manifold pressure hose that will go to the MAP Sensor should be as short as practical.
 - e. Mount the MAP Sensor using standard hardware.
 - i. Mounting holes are sized for #6 fasteners.
 - ii. Connect secondary ground to MAP Sensor.
 1. If MAP Sensor is mounted on Firewall and the Firewall is set-up to be a ground plane, simply mounting the MAP Sensor will complete the secondary ground path (make sure firewall location is clean so good contact can be made).
 2. Alternatively, a ground wire can be connected to the MAP Sensor where indicated (observe that paint has been removed from the MAP Sensor case, showing the connection point).
 - f. Verify electrical continuity between the middle (#2) pin of the MAP Sensor connector and your ground.
 - g. Now connect the vacuum line to the MAP Sensor.

- i. If a Manifold Pressure gauge is installed, you will 'tee' into the vacuum line feeding the Manifold Pressure gauge.
 1. The hose coming from the MAP Sensor is a MIL-H-5593 type hose commonly used in vacuum line installation (either Aeroquip 306 or Stratoflex 193). This size is -3 or 3/16"ID.
 2. You may connect to your manifold pressure line with either standard fittings or other appropriate fittings for this application.
 3. Verify that all connections and lines are tight and secure.
- ii. If a Manifold Pressure gauge is not installed and you have created a new vacuum line as described above, use the following procedure:
 1. If the new vacuum line is rubber vacuum hose (like Aeroquip p/n 306 or Stratoflex p/n 193), bring your new vacuum line directly to the MAP Sensor and connect to the vacuum pick-up line using either standard fittings or other appropriate fittings for this application. The hose coming from the MAP Sensor is a MIL-H-5593 type hose commonly used in vacuum line installation (either Aeroquip 306 or Stratoflex 193). This size is -3 or 3/16"ID. Verify that all connections are secure.
 2. If you are using an existing copper primer line,
 - a. Remove fittings on copper tube at the end that will attach to the MAP Sensor (do not remove end fittings that attach to the primer fitting in the engine). Use a tube cutter behind the fittings to complete this. Make sure the end of the copper tube has not been closed over.
 - b. Cut a length of 1/8" ID rubber vacuum hose (like Aeroquip p/n 306-2 or Stratoflex p/n 193-2) to join the copper tube with the vacuum pick-up line on the MAP Sensor.
 - c. Attach the new rubber vacuum hose to the copper line with two hose clamps. Make sure the copper line is inserted into the rubber hose at least 1-1/2". Connect the other end of the new rubber vacuum hose to the vacuum pick-up line using either brass or nylon barbed fitting and hose clamps.
 - d. Verify that all connections are secure.
 3. If you are using a new, aluminum vacuum line,
 - a. Terminate the ends of the new line with AN818 nuts and AN819 sleeves and connect to the AN816 nipple installed previously.
 - b. Install a hose fitting on the vacuum pick-up line on the MAP Sensor. The hose coming from the MAP Sensor is a MIL-H-5593 type hose commonly used in vacuum line installation (either Aeroquip 306 or Stratoflex 193). This size is -3 or 3/16"ID. You may use Aeroquip p/n 471-3D or Stratoflex p/n 311-3D.
 - c. Attach the aluminum line to the vacuum pick-up line using an appropriate AN union. Verify that all connections are secure.
- iii. If a Manifold Pressure gauge is going to be installed,

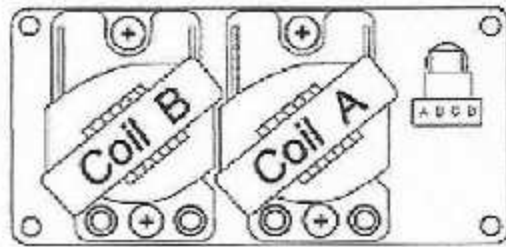
1. Follow the installation procedure for installing the new gauge from the manufacturer.
2. Tee in to the vacuum line using the same procedure in step 6.g.i.

7. Spark Plugs and Spark Plug Wire Harness

- a. You can now install the spark plugs that will be connected to Electronic Ignition System.
 - i. We recommend that you use new, aircraft spark plugs with the massive electrodes. If you are re-using the old spark plugs, make sure that they are clean.
 - ii. Gap the spark plugs to 0.030"-0.035". We suggest using the REM37BY (or UREM37BY) spark plug because they are the easiest to gap. Check the engine application data to verify that these plugs can be used in your engine. **CAUTION:** Be careful when not using an REM37BY (UREM37BY) plug when gapping because the outer electrode can become over-stressed and break. If you have any problems with plug selection, please give us a call.
- b. Your kit came with spark plug wire assemblies (two assemblies for a 4-cylinder engine & three assemblies for a 6-cylinder engine). Each assembly will make two spark plug wires. **CAUTION:** Since each assembly makes two spark plug wires, be careful when determining spark plug wire length.
 - i. Route the spark plug wire from the coil pack to the correct cylinder (see chart below for correct firing order) to determine the spark plug wire length. Make sure to keep spark plug wire routings away from exhaust pipes and do not run two wires parallel to each other without a minimum of 1/4" of separation between the wires.
 - ii. Cut the spark plug wire leaving enough length to go three inches beyond the spark plug.
 - iii. Slide the aluminum nut, receptacle and gasket (o-ring) on the wire approximately one inch on to the wire.
 - iv. The wire supplied is a spiral core wire with a non-conductive center. Insert the spark plug spring to the side of the center core so that the spring 'tail' is between the spiral wrap (black) and white rubber insulation. Optional: you may strip ~1/4" of the ignition wire insulation to expose the spiral core wire to make installing the spring easier.
 - v. See drawing below for example:

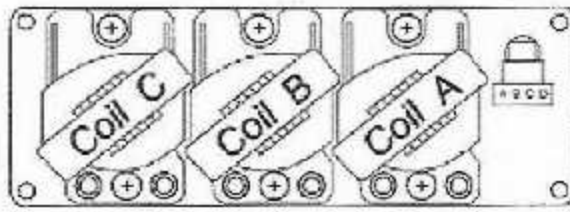


- vi. To finish the connection, install the spark plug end first. This prevents the spark plug wire from twisting as the spark plug nut is tightened.
CAUTION: Do not over-tighten the spark plug nut as this may cause separation of the core of the wire. Hand-tighten and then turn an additional one-half turn with a wrench.
- vii. Attach the other end of the spark plug wires to the coil pack at their appropriate coil tower. The drawing below shows the Coil Tower ID numbers. Use the Spark Plug Wire Hook-Up Chart (on next page) for the correct firing order. Note: specific cylinders need to be connected to specific coil towers.



B2 B1 A2 A1

Coil Tower ID's for 4-cylinder



C2 C1 B2 B1 A2 A1

Coil Tower ID's for 6-cylinder

Spark Plug Wire Hook-Up Chart

Engine Type	Coil A	Coil B	Coil C	Coil D
Lycoming 4cyl	Cyl 1 to A1 Cyl 2 to A2	Cyl 3 to B1 Cyl 4 to B2		
TCM 4cyl	Cyl 1 to A1 Cyl 2 to A2	Cyl 3 to B1 Cyl 4 to B2		
Rotorway 4cyl	Cyl 1 to A1 Cyl 2 to A2	Cyl 3 to B1 Cyl 4 to B2		
VW 4cyl	Cyl 1 to A1 Cyl 2 to A2	Cyl 3 to B1 Cyl 4 to B2		
Franklin 6cyl	Cyl 1 to A1 Cyl 2 to A2	Cyl 4 to B1 Cyl 3 to B2	Cyl 5 to C1 Cyl 6 to C2	
Lycoming 6cyl	Cyl 1 to A1 Cyl 2 to A2	Cyl 4 to B1 Cyl 3 to B2	Cyl 5 to C1 Cyl 6 to C2	
TCM 6cyl	Cyl 1 to A1 Cyl 2 to A2	Cyl 5 to B1 Cyl 6 to B2	Cyl 3 to C1 Cyl 4 to C2	
Chevy 2.8	Cyl 1 to A1 Cyl 4 to A2	Cyl 2 to B1 Cyl 5 to B2	Cyl 3 to C1 Cyl 6 to C2	
Buick 3.0/3.8	Cyl 1 to A1 Cyl 4 to A2	Cyl 3 to B1 Cyl 6 to B2	Cyl 2 to C1 Cyl 5 to C2	
Ford 2.8	Cyl 1 to A1 Cyl 5 to A2	Cyl 3 to B1 Cyl 4 to B2	Cyl 2 to C1 Cyl 6 to C2	
Lycoming 8cyl	Cyl 1 to A1 Cyl 2 to A2	Cyl 7 to B1 Cyl 8 to B2	Cyl 5 to C1 Cyl 6 to C2	Cyl 3 to D1 Cyl 4 to D2

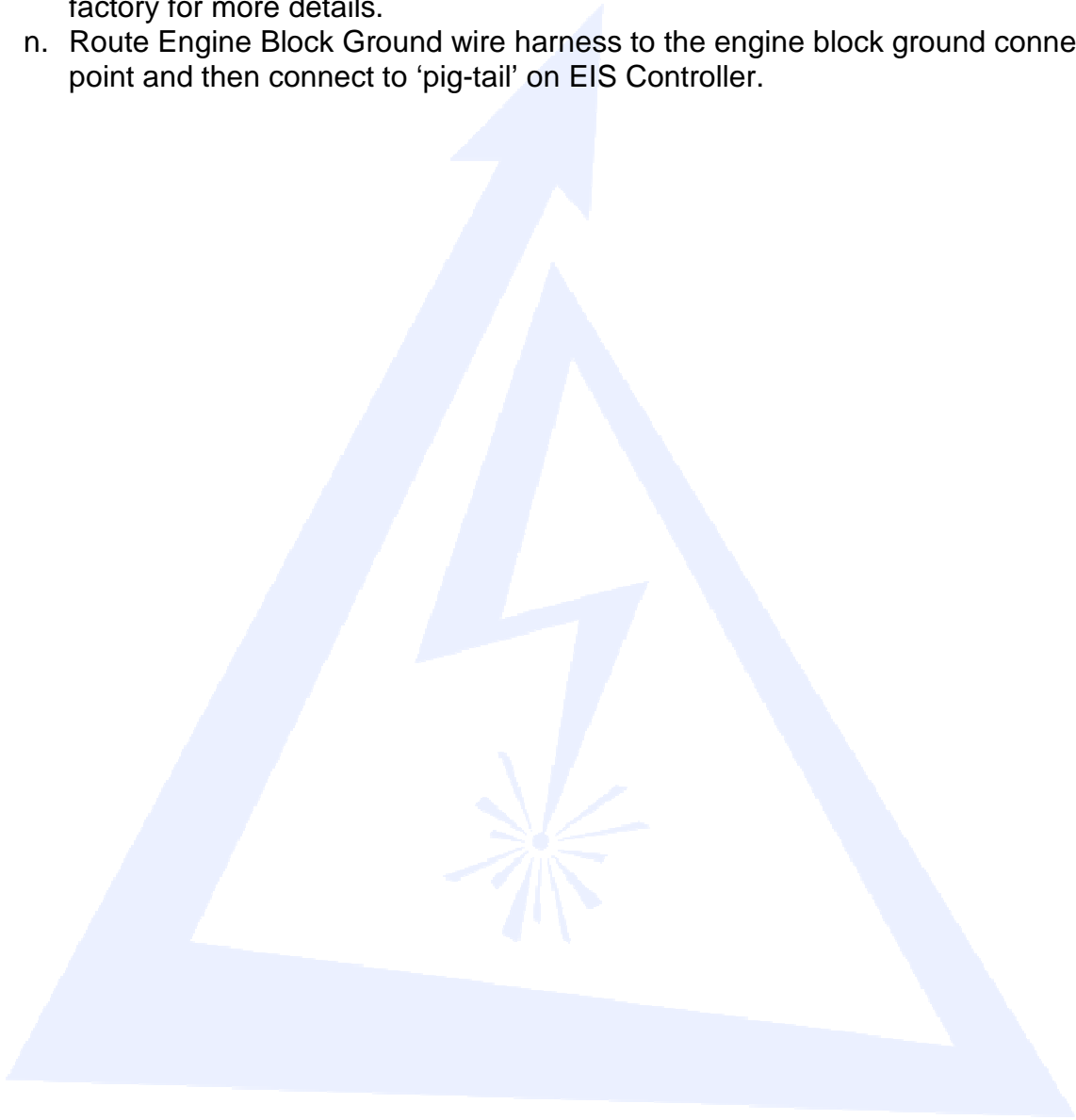
8. **Wiring Hook-Up**

- a. **Verify that the master switch is off and battery is disconnected.**
- b. The electrical connections that will be made are as follows:
 - i. Ground for Coil Pack
 - ii. Spark Plugs
 - iii. Timing sensor (either from the MTH or the CSTW).
 - iv. Coil Pack
 - v. Switched (or keyed) Power for EIS Controller
- c. **NOTE:** Determine whether or not you are going to use a key switch or toggle switch for operating the EIS. If you are going to use a toggle switch, proceed with installation. If you are going to use a key switch, CONTACT US so we can determine if your harness has been modified to work with a key switch. In order to use a key switch with an Electroair ignition, a Key Switch Lead must be added to this harness at the factory. This Key Switch Lead will replace the P-Lead for the right hand magneto at the key switch. Also, verify that your key switch is

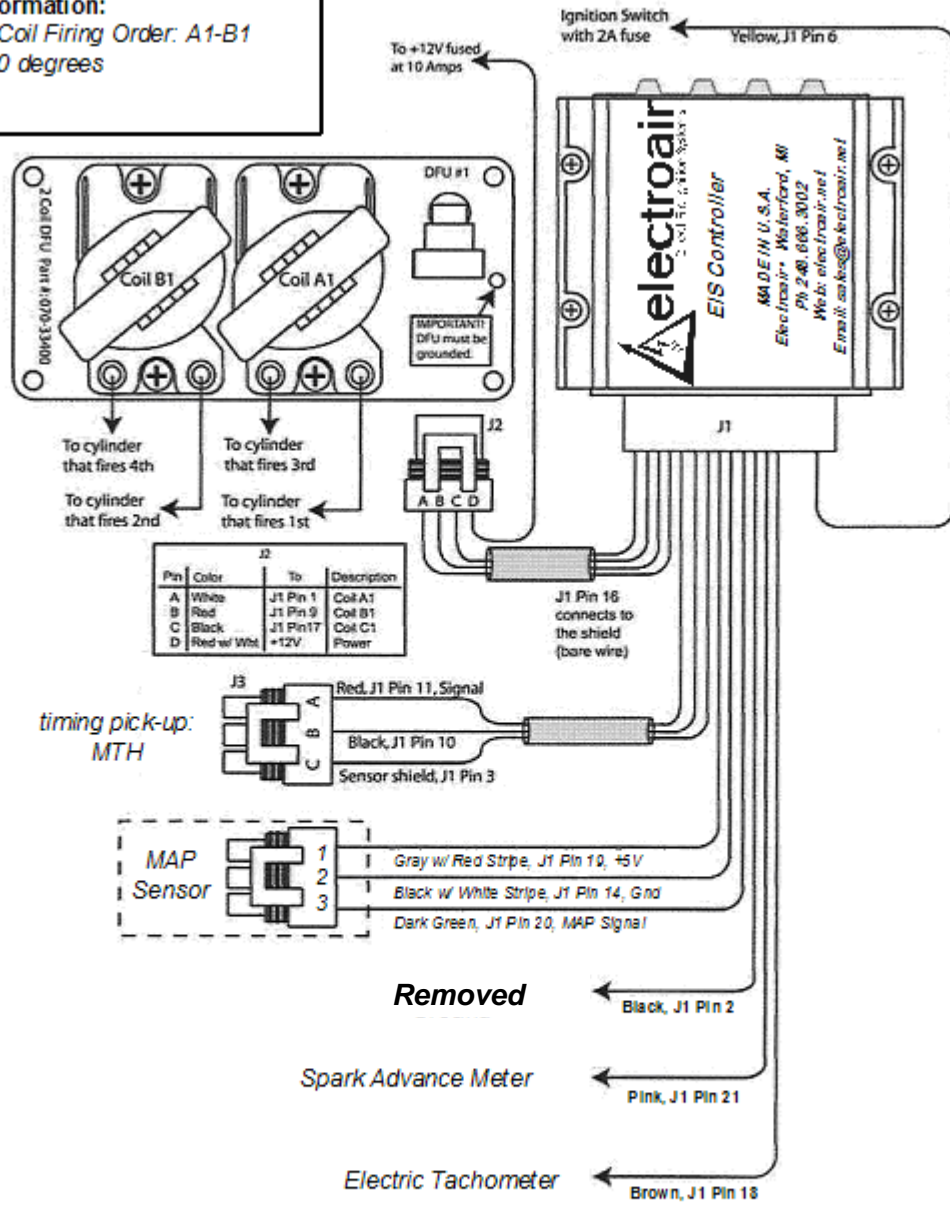
- functioning properly. A worn or old key switch will arc internally and cause the EIS to malfunction. If in doubt, replace the key switch.
- d. Notes: The main harness is not completely assembled so it can be installed through tight clearances such as a hole in the fire wall. Terminal ends for the MAP Sensor and Timing Pick-up have been supplied. You will need to supply terminations for switches, circuit breakers, and the bus bar. The main harness has been tied off into five separate bundles. Each bundle is labeled 1,2,3,4, & 5. We will work with each harness bundle separately. A wiring diagram with pin-out information has been supplied on the pages 15 & 16 of this section for reference. **CAUTION:** Follow these wiring instructions very carefully to insure a correct hook-up of your EIS. Skipping ahead or taking short cuts increases the risk of an incorrect installation and either a poor performing EIS or the possibility of damaging equipment. Please call us if you have any questions.
 - e. Connect the Coil Pack ground wire to an airframe or battery (preferred) ground. The Coil Pack ground wire is the black wire that is fastened on the Coil Pack base plate. This wire will need to be appropriately terminated at the ground connection (a connector is not provided for this). **CAUTION: The Coil Pack MUST be grounded. Failure to ground the Coil Pack may result in SEVERE ELECTRICAL SHOCK! Also, a poorly grounded Coil Pack may result in poor engine performance and can cause ENGINE DAMAGE.**
 - f. Verify that the screws holding the coils and ground wire in place are tightened and securely in place.
 - g. Connect the EIS Controller harness assembly to the EIS Controller. You will begin routing the various harness bundles from here.
 - h. Route harness bundle #1 to the MAP Sensor from the controller.
 - i. Route harness to MAP Sensor.
 - ii. Trim and terminate the bundle #1 with the enclosed Molex pins and connector. The connections are as follows: Gray w/ Red Stripe (PWR) in Cavity 1, Black w/ White Stripe (GND) in Cavity 2, and Green (MAP Signal) to Cavity 3 (Note: connector cavities are marked with one line for Cavity 1, two lines for Cavity 2 & three lines for Cavity 3).
 1. **NOTE:** We recommend installing a toggle switch for the MAP Signal (GREEN wire). This will allow for easier troubleshooting of the MAP Sensor in flight or on the ground if a suspected failure has occurred. *Toggle switch installation is required for all dual systems using a single MAP Sensor.*
 2. For Toggle Switch Installation, route the GREEN wire to the switch, and then route a GREEN wire from the switch to the MAP Sensor. Terminate and install GREEN wire to Cavity 3 on the MAP Sensor connector as discussed above.
 - iii. Connect now-terminated bundle #1 to MAP Sensor and secure bundle with cable ties.
 - i. Route harness bundle #2 to the Timing Sensor (either the MTH for 4-cylinders or the CSTW for 6-cylinders).

- i. If the Timing Sensor has been installed and/or routed correctly, you will have a black, three-way connector coming from the magnetic pick-up. Route bundle #2 to that three-way connector.
- ii. Bundle #2 has already been terminated to go into the appropriate mating connector body that will attach to the magnetic pick-up harness. Once bundle #2 has been routed past any tight clearances (such as a hole in the fire wall), install the supplied connector body to the terminated wires. The wires go into the following connector cavities:
 - 1. Red wire goes into cavity 'A'
 - 2. Black wire goes into cavity 'B'
 - 3. Bare wire goes into cavity 'C'
- iii. You will hear an audible 'click' when the terminated wires have been properly installed into the connector body and the wire should not be able to be pulled out.
- iv. Loop any excess wire and cable tie or clamp the loop to a convenient location that does not interfere with any components (a location on the inside of the firewall is suggested).
- v. Connect bundle #2 (now terminated with a connector body) to the connector from the magnetic pick-up. Verify that the connection is secure.
- j. Route harness bundle #3 to the Coil Pack.
 - i. Separate the 'Red w/ White Stripe' wire from the other wires that are bundled (gray wrap) and terminated with a four-way connector (this wire is for power).
 - ii. Loop any excess wire of the gray bundle and cable tie or clamp the loop to a convenient location that does not interfere with any components (a location on the inside of the firewall is suggested).
 - iii. Connect the four-way connector to the mating connector on the Coil Pack.
 - iv. Route the 'Red w/ White Stripe' wire through a 10 amp breaker to the Essential Bus Bar. Trim and terminate as required.
- k. Toggle Switch Set-Up: Route harness bundle #4 to Essential Bus Bar for switch termination. (For Key Switch set-up, see step 8.I.).
 - i. Trim & Terminate the 'Yellow' wire to a panel mounted switch that is protected with a 2 amp breaker. Label panel mounted switch "Electronic Ignition System", and proper "ON/OFF" orientation. This switch should be a SPST switch.
 - ii. Connect the 2-amp breaker to Essential Bus Bar.
- l. Key Switch Set-Up: Route harness bundle #4 to Essential Bus Bar for circuit breaker termination. Note: EIS Controller harness must have factory installed Key Switch Lead (white wire) in bundle #4; this insures proper operation of the Key Switch – call us if you have any questions.
 - i. Terminate the 'Yellow' wire to a 2 amp circuit breaker.
 - ii. Connect 2-amp circuit breaker to Essential Bus Bar.
 - iii. Remove right hand magneto P-Lead wire from Key Switch.
 - iv. Connect white, shielded wire to key switch where right hand magneto P-Lead would connect. Connect shield to ground terminal.

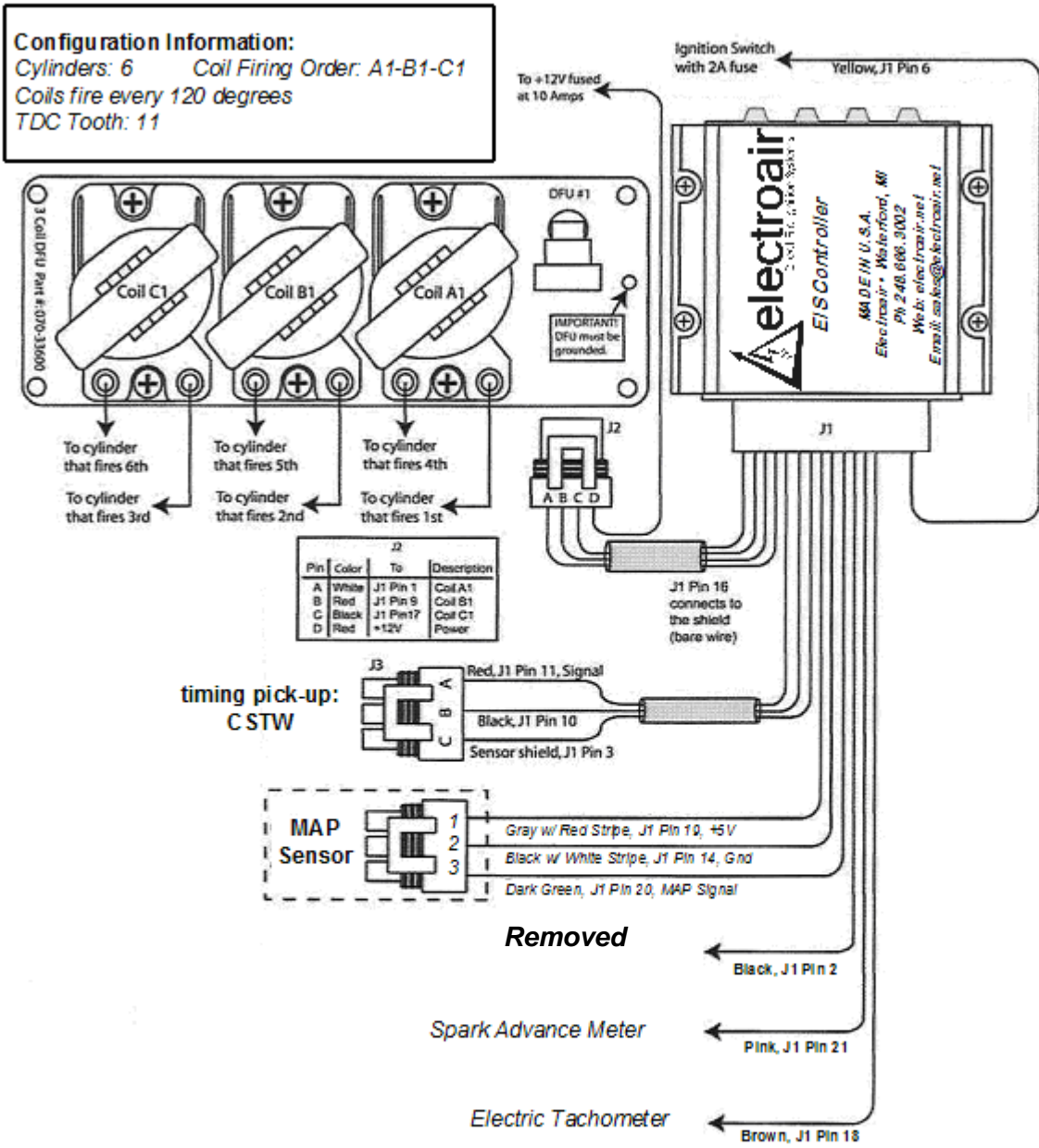
- m. Bundle #5 contains two extra outputs for an electric tach and a spark advance meter (make sure to connect the ground wire from the spark advance meter to a common ground). This bundle should be looped and tied to an appropriate place inside the cockpit for later use. Alternatively, bundle #5 can be trimmed out of the harness connector if those options will not be used. Wiring diagrams for the electric tach and/or spark advance meter are supplied with our option kits #EA-009, Electric Tach and #EA-010, Spark Advance Meter. Please contact the factory for more details.
- n. Route Engine Block Ground wire harness to the engine block ground connection point and then connect to 'pig-tail' on EIS Controller.



Configuration Information:
 Cylinders: 4 Coil Firing Order: A1-B1
 Coils fire every 180 degrees
 TDC Tooth: 11



4-Cylinder Electrical Overview



6-Cylinder Electrical Overview

9. Final Installation Steps

- a. Calibration and Timing settings: Your unit has been pre-set at the factory based on the information you gave when you placed your order and should not need any adjustment in the field. Please contact us if you feel that your unit is not performing optimally.
- b. Re-attach and reinstall any connections or components that were removed or loosened during this installation.
- c. Secure all new wires, harness, connections and lines to prevent failures due to vibration.
- d. Connect battery connections and close any open circuit breakers.
- e. Recover all tools that may have been used (you don't want any tools 'floating' around inside the airplane).
- f. Proceed to the operational section and perform a test run-up before flying.

10. Installation Options available from Electroair

- a. MAP Sensor connection parts: kit p/n EA-013.
- b. Key Switch Harness Upgrade: kit p/n EA-014
- c. MTH Holders: kit p/n EA-015
- d. Other options will be announced when available.

