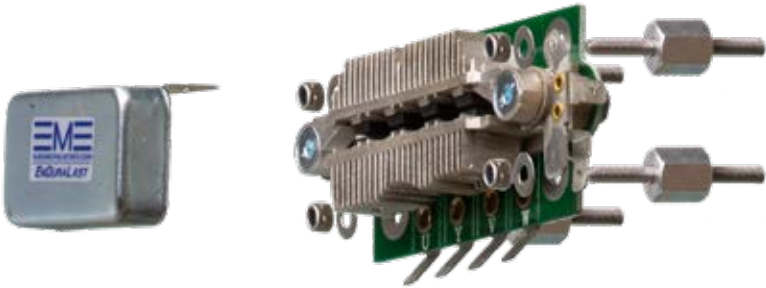


ENDURALAST

EDL3



**400w BOSCH Style Charging System
Installation Guide**

Confirm that you have the correct stator diameter:

Bosch Alternator #	EME Kit # & Stator Size	
0 120 340 001	105	
0 120 340 002	105	
0 120 340 003	105	
0 120 340 004		107
0 120 340 005		107
0 120 340 006	105	
0 120 340 008		107

There may be some cross-over on BMW applications.

BMW 1970-1976 ~ EME # Ending 105

BMW 1974-1975 ~ EME # Ending 105 or 107

BMW 1976-1995 ~ EME # Ending 107

Moto Guzzi – ALL: EME # Ending 105

Alternatively You can measure the stator with a caliper!

Measure the groove on the engine where the inner side of the stator frame fits into the timing chain cover. It will either be 105mm or 107mm.



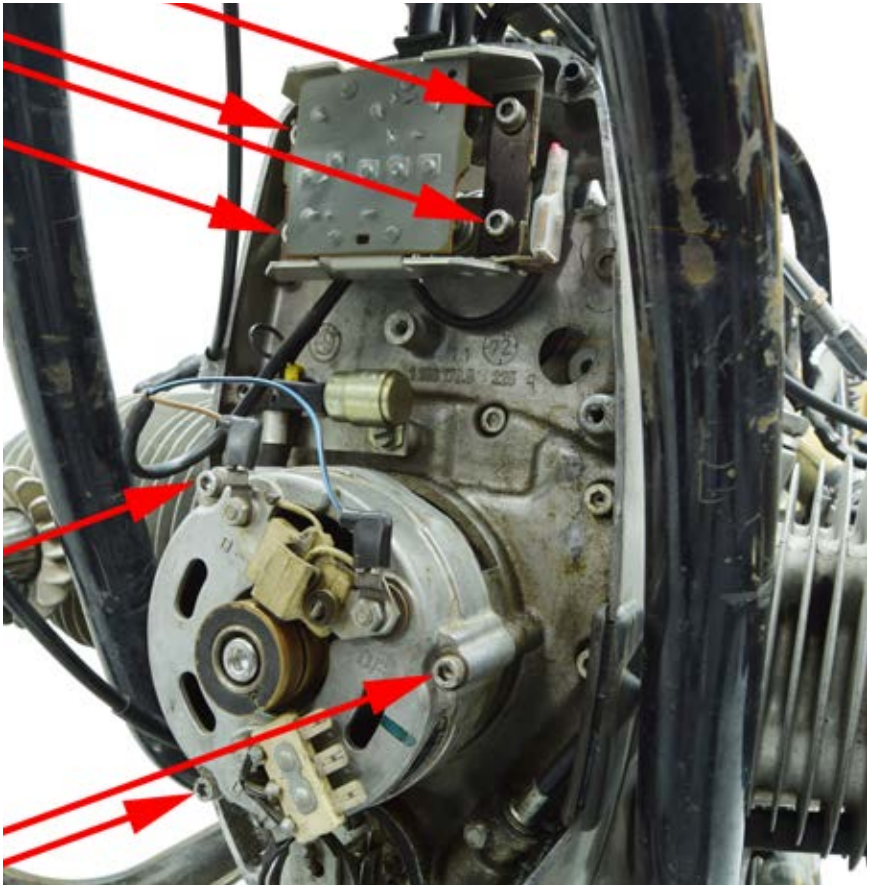
Note Regarding /5 Airheads

/5 Airheads have a Bosch alternator (part # 0 120 340 001) that lacked the additional AC circuit “Y” that later models have. The lack of the “Y” circuit capped peak output to only 180w. With /6 Airheads, the “Y” circuit was added and output increased to 240w. We advise that all /5 Airheads upgrade to the /6 style alternator with the Y post to optimize the alternator output by installing a new stator and stator frame cover, included in this kit.

Remove the Existing Charging Components

Disconnect the battery and place it on a charger so it is fully charged when the installation is complete. Remove any fairings, fuel tank, front engine cover, starter cover, and oil cooler to access the engine front and top.

- Remove the 4 fasteners that secure the diode board.
- Unplug all the electrical connections, taking note of the wire colors from the front engine harness, and their locations.
- Remove and discard the original diode board.
- Remove the 3 fasteners that secure the stator frame to the timing chain cover.
- Disconnect all the electrical connectors from the stator frame and remove the stator and stator frame as one unit and discard.

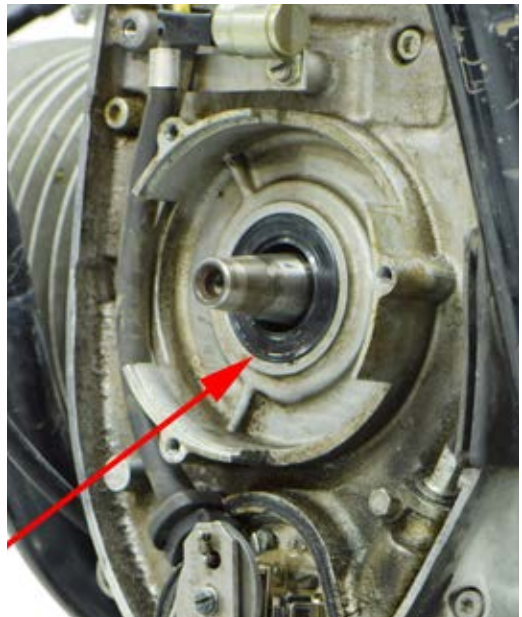


Put the transmission in gear to keep the engine from rotating. Remove the alternator rotor bolt. Place rotor removal tool into the rotor and tighten the tool.



Gently tapping the rotor with a rubber mallet after tightening the removal tool can assist in releasing the rotor from the crankshaft. The rotor can “pop” off the end of the crankshaft, so be prepared!

Once the rotor is removed it is time to inspect the oil seal on the crankshaft. A replacement is included in the kit as this is the best time to replace it. Take note of the orientation and depth so you do not drive it in too far.



Mount the Rotor

Inspect and clean the nose of the crankshaft. Remove all remaining oil with alcohol and a clean cloth. Clean the inside of the alternator rotor arbor of any remaining oil from the manufacturing process. Now that both surfaces are clean and prepared, slide the new rotor onto the crankshaft and seat it securely on the taper of the crankshaft. To confirm a clean interface, grasp the rotor and try turning it. If the rotor slips on the crankshaft, remove and clean it again.

Secure the rotor in place with the rotor bolt and lock washer with a torque setting of 14 foot pounds / 19 Newton meters.

Install the Stator into the New Stator Frame

Feed the stator wires through the new stator frame cover as shown, manipulating the wires so the ring terminal reaches the Y terminal post and the three wire bundle reaches the WVU terminal.

With an 8mm wrench or socket, bolt the Y wire ring terminal onto the Y post as shown.

Solder the three stator wires onto the WVU terminal, the sequence of these three wires is not important as they all do the same thing, (carry AC current.) Be sure to keep the insulation in place to prevent the wires from contacting the stator frame and shorting to ground. It is best to leave a little slack on these wires. No slack can be problematic if you intend to mount the EDL-Boigns ignition system down the road. A little slack will allow the re-soldering of the wires if necessary.



Install the Stator and Stator Frame Assembly

Slide the now combined stator and stator frame assembly over the rotor and secure the outer lip of the stator into the stator seat on the timing chain cover.

Take extra special care to protect the alternator brushes! We recommend you move the brush tension springs up and off to the side so they are hung up on the brush holder and not pressing on the brushes. You could also place a playing or business card over the rotor's copper commutator rings so the brushes will slide over the card and settle into place.



Make sure the stator is seated all the way into all three sections of the timing chain cover. It must be square and true to the rotor and engine. If this is troublesome, inspect the groove on the timing chain cover for a bur or lip that is impeding the stator from seating.



Secure the stator frame to the timing chain cover with the three mounting screws. Take care not to over tighten them and strip the aluminum timing chain cover. Insert the brush springs back onto the brushes and verify that the brushes align to their respective commutator ring only, and do not bridge the gap.

Mount the Diode Board

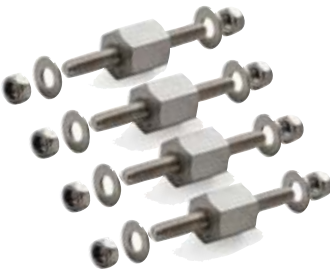
Depending on your model, you will either have solid posts built into the timing cover, or rubber mounts for the diode board.

Early models with a 105mm stator have no rubber mounts, but have solid studs on the timing chain cover as shown here. In this case you will not require the solid mounts.



Later models with a 107mm stator use rubber mounts for the diode board. They can crack, dry, and fail causing the diode board to move and short. Equally, the diode board uses the mounting holes as its ground connection. With the rubber mounts, the grounding is done with ground wires. These brown ground wires can be reused or omitted at your discretion.

Replace the rubber mounts with the solid mounts included in all 107mm kits. It is necessary to remove the starter to fit the lower solid mounts on the timing chain cover. This is an opportune time to install a new EnDuraLast starter!



Connect the BLUE DF wire from the front engine harness to the DF terminal located on the back of the diode board. With this connection made, secure the diode board in place at the 4 mounting points on each corner with the M5x16 screws for early versions, or over the solid mounts securing the washer and nylock nuts, depending on your model.



Remaining Electrical Connections

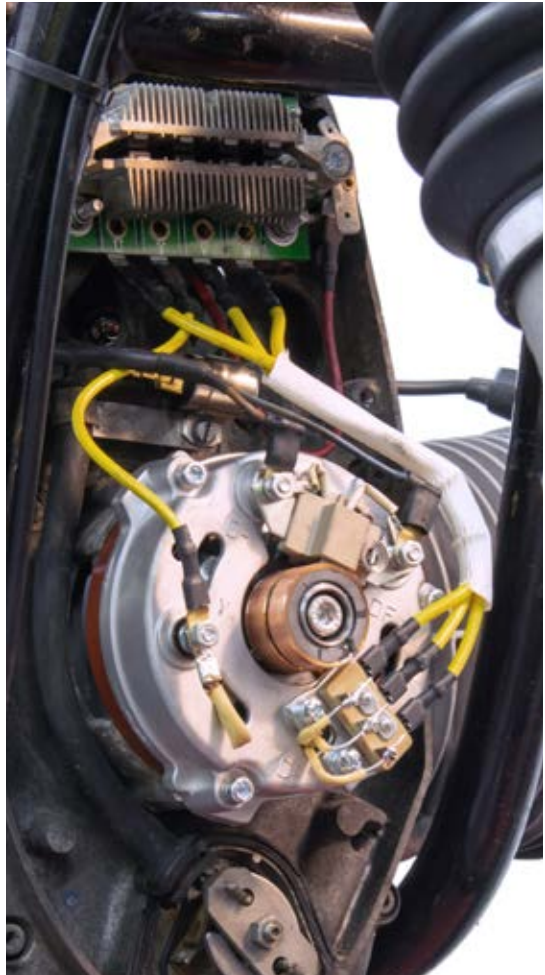
This is a direct replacement kit. All previous connections are to be maintained, or reconnected to the respective terminals.

There are a number of variations in the electrical wiring over the many years of the Airhead. Variations in the alternator wiring are with the /5, /6 models, and contact point ignition.

Airheads with a points plate and condenser have a black wire from the front engine harness that was, or may still be, connected to the contact point condenser located between the stator and diode board. This connection needs to be maintained for the contact points ignition to function.

/5 and /6 models have a red wire as part of the front engine harness that connects to the starter relay from the diode board B+ terminal. Reconnect this wire as originally configured to the new diode board. All other models use the included red wire which is connected between the starter solenoid B+ terminal (*where the battery positive cable is connected*) and the diode board B+ terminal on its side.

All models, will have brush holder connections as part of the front engine harness. Reconnect the brown to D- and blue to DF as marked on the stator frame cover.



The short yellow wire included connects the Y terminal. The bundled 3 yellow wires connect between the WVY terminals. *The sequence is not important on the WVU as they are all AC current.*

Lastly, included in your kit are brown ground straps that can be installed from any one of the corner diode board mounting studs to a case ground if desired.

Replace the Voltage Regulator

Early BMW models have the voltage regulator mounted as shown here. The new adjustable regulator is a direct fit with the two original bolts that secured the original regulator. Reconnect the engine harness to the new regulator.



Later BMW models have the voltage regulator mounted as shown here. The new adjustable regulator is a direct fit with the two original bolts that secured the original regulator. Reconnect the engine harness to the new regulator.



Final Reassembly

With the ignition switch still off and transmission in gear turn the rear wheel while you watch the rotor to ensure that it runs true and straight in-line with the stator without touching. Ensure that all components are mounted correctly and securely. Check all wiring to make sure that the components are connected properly and that wires are routed appropriately to avoid pinching, binding, rubbing and are secured.

Reinstall the front engine cover, starter cover, fuel tank, and all remaining components removed to restore the bike to operating condition. Reinstall the battery, and clean the terminals to ensure a solid connection to the battery cables.

After confirming correct operation of your new charging system, verify everything is reassembled properly and it is safe to ride.

Verify workmanship

Review the above and inspect work. Twice. Maybe three times.

- Ensure that all wiring is connected to the proper locations!
Check the wire colors.
- Check that all connections are clean and snug.
- Check wire routing to ensure that wires are not pinched, have no sharp bends, and are not in danger of chafing.
- Ensure that any remaining unused electrical wiring and connectors from the original charging system are properly secured out of the way and insulated against shorting.
- Use tie wraps to hold any loose wires in place and to prevent rubbing from vibrations.

GEN Lamp Bypass Modification - *Optional*

NOT included in the kit.

The GEN lamp is required for the Bosch style alternator to function. If the GEN lamp bulb happens to burn out or is removed because the bike has been modified or customized, it will interrupt the current to the rotor and not allow your alternator to charge your battery. To bypass the GEN lamp you will need a resistor with a resistance value of 330 to 440 Ohms to mimic the function of the bulb. You can make your own or purchase one **EME Part # BOALT-ResWire**

If you are building your own, Blue and Green colored wire will match the factory colors. GREEN is KEY ON battery voltage, and BLUE is the DF circuit.



Solder your resistor between the two wires, and heat shrink it to seal the connections. Connect the Green end to the coil positive terminal, there should already be a Green wire connected there. Tap into the Blue wire from between the diode board and voltage regulator (part of the front engine harness.) With this modification, the charging system will not begin charging at as low of an RPM as when the original Gen lamp is maintained.

Adjusting the Voltage Regulator - *Optional*

The voltage regulator is already preset to 14.1 volts. Often this is an acceptable setting. However you can fine tune the maximum voltage output with this solid state voltage regulator.

If most of your riding is done in urban Stop-&-Go, you may need to set your voltage as high as 14.4 volts. Never set the voltage **over 14.4 volts!** Doing so will eventually damage the battery, and probably damage other electrical components as well.

If most of your riding is done with long durations where higher RPM engine speeds are being used, you may be able to maintain healthy battery voltage with as low as 14.1 volts.

It is important to note, NO alternator will produce sufficient output at low RPM's (at idle). The output of any alternator is RPM dependent. Always evaluate alternator output at an engine RPM of at least 3,500 RPM's.

To adjust, the battery MUST be fully charged. Remove the gas tank once the carburetor bowls are full, and bike ready to run, gain access to the voltage regulator. Locate the adjusting screw, (*the white dial inside the blue square.*)

Start the engine with the headlamp off or bulb removed. Increase engine speed to ~ 2500 RPM. Measure the voltage at the battery terminals. The voltage should increase and stabilize. When the voltage has stabilized, use a small screwdriver to adjust the maximum voltage output.

TURN THE SCREW ON REGULATOR
CLOCKWISE TO INCREASE VOLTAGE AND
COUNTER CLOCKWISE TO DECREASE VOLTAGE.





ENDURALAST

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