

D-Motor International bvba

Houtekiestraat 11

B-8540 Deerlijk, Belgium

Tel. +32 56 49 81 49

Info@d-motor.eu**Information BULLETIN D-MOTOR**

Information Bulletin NO. 2019-015

SUBJECT : Mounting Voltage regulator – Alternator Coil**MODELS :** All models

The D-Motor engine needs continue power to the ECU to run, it is important that current is available at any moment. We strongly advise to use a good battery and to monitor the voltage. Also install a warning system to warn the pilot if the voltage drops below 12 VDC. When the alternator fails, you are able to fly another 40-45 minutes with a good and full charged battery. Note: while starting the engine in cold weather, the voltage can drop temporal under 12V and generate a warning signal. When the alternator works properly, the warning signal must disappear after 10-20 sec while running at 1500 Rpm or higher. Do not install unnecessary protective devices for the alternator and the regulator rectifier.

The D-Motor engines have a permanent magnet alternator integrated at the back of the engine. It provides current to all connected electrical consumers and/or charges the battery. The AC output from the alternator is converted and regulated into approximately 14.3V DC by an external regulator/rectifier that is provided with the engine.

Rectifier :



The rectifier has 3 notches, (see figure left).

The two wires from the alternator are NOT connected when delivered. Builders can guide the wires as they planned when mounting the engine.

BEWARE !

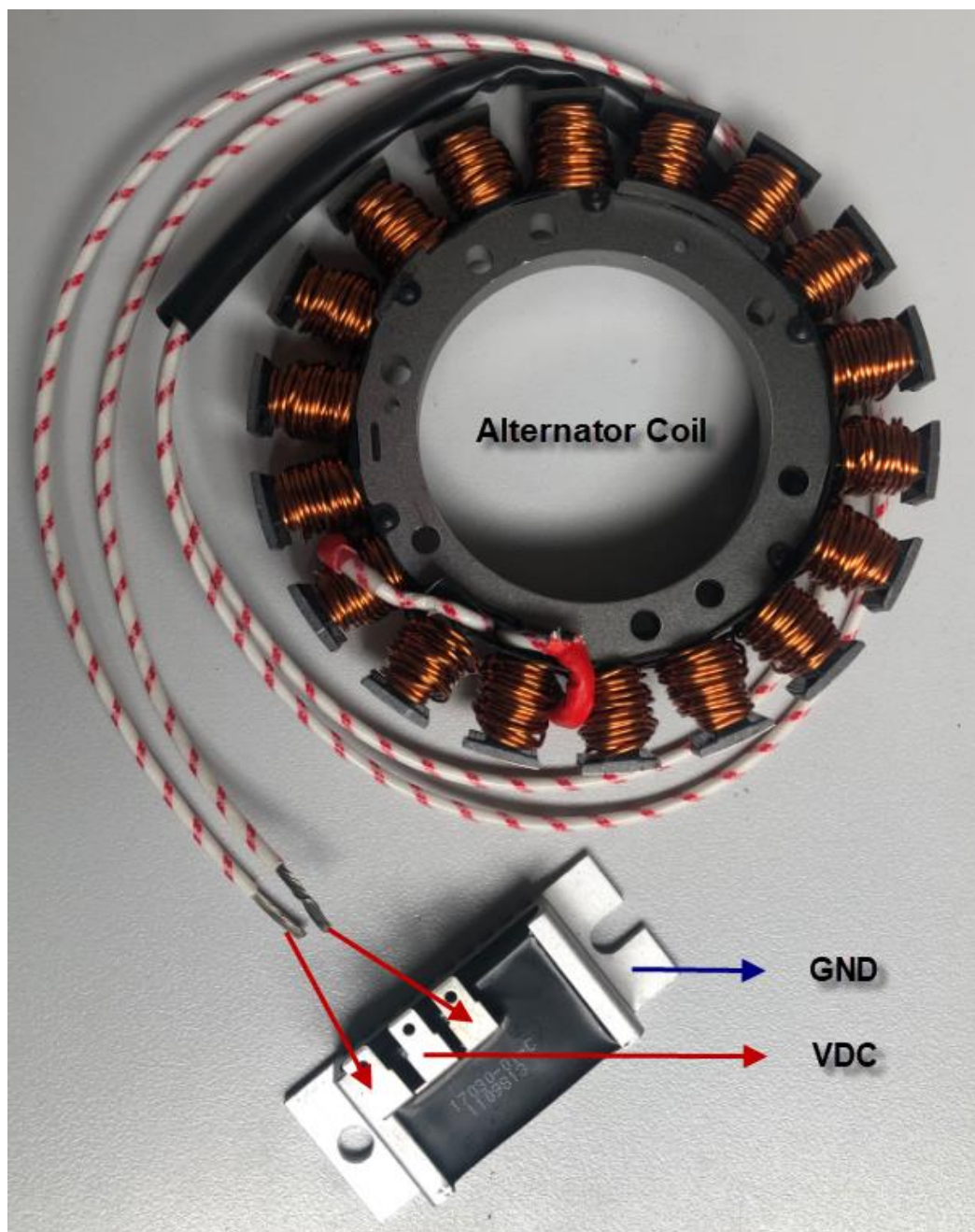
The two wires of the alternator have to be connected to Pin 1 and Pin 3. Pin 2 and 3 are the same voltage level. DO NOT Connect the two wires of the alternator to Pins 2 and 3.

Information Bulletin 2019 - 015						
ISSUED			REVISED			Pages
Day	Month	Year	Day	Month	Year	Rev.
01	08	2019	05	08	2019	4

Illustrated :

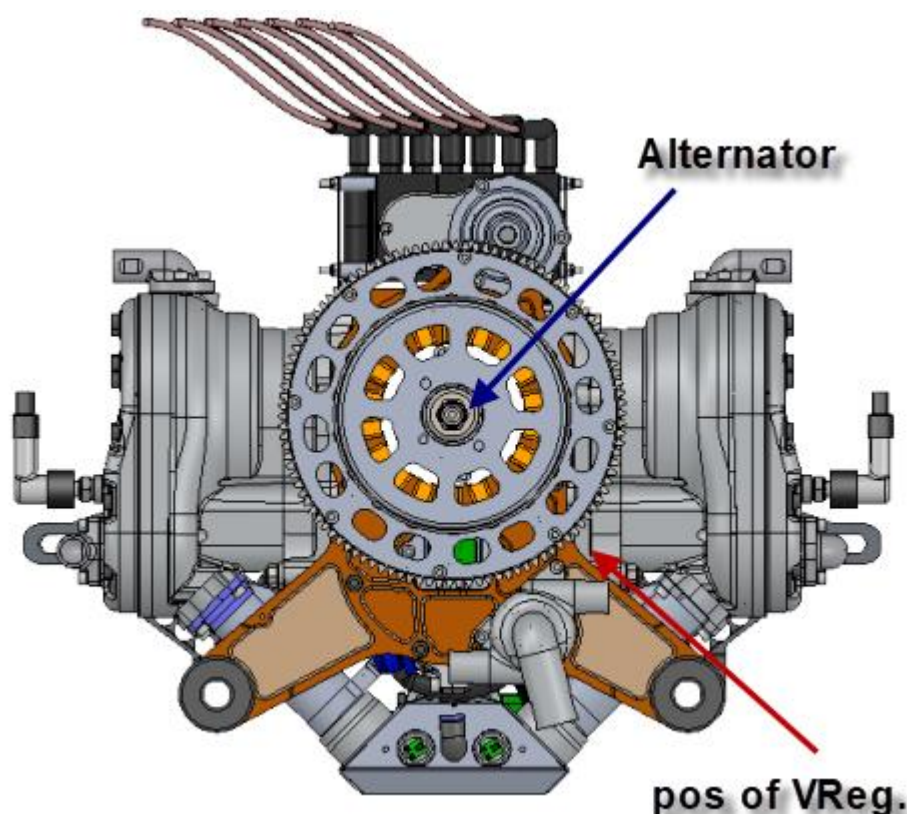
Ping 2 is connected to +VDC of the battery. Ground (GND) is the housing of the voltage regulator.

D-Motor Voltage regulator (VReg.) part number : 500101



Information Bulletin 2019 - 015						
ISSUED			REVISED			Pages
Day	Month	Year	Day	Month	Year	Rev.
01	08	2019	05	08	2019	4

Mounting situation :



The regulator/rectifier or VReg should be placed on the firewall (or elsewhere) in such a manner that the rear metal surface makes good contact over the entire surface with the metal firewall in order to help dissipating the heat coming from the VReg. Special thermal interface material or “thermal pads” between the bottom (shiny surface) of the VReg and the metal fire wall can help to increase heat transfer.

Make sure all wires, pins and connectors are properly connected and make good contact. Use electrical conductors with a cross section of at least 12AWG to connect to battery. Fasten wires to engine mount/firewall in such as way to minimise vibration. Vibration is a major cause of connection and wire failure. Keep them well away and shielded from the exhaust.

Attention: Output regulator must always be connected to the battery! Do not run the engine when regulator is disconnected from the battery, this should destroy the regulator. If you want, for any reason, run the engine without charging the battery, you may to disconnect (or install a switch) the 2 wires from the alternator!

Since the permanent magnet 2-phase alternator provides a constant current, which is only depending on engine rpm, a “shunt’ regulator/rectifier is used. As the overall power usage for the engine and accessories used in recreational aircraft or helicopter is usually relatively low, the use of a shunt type is the simplest and most reliable type of regulator with fail safe characteristics.

Information Bulletin 2019 - 015						
ISSUED			REVISED			Pages
Day	Month	Year	Day	Month	Year	Rev.
01	08	2019	05	08	2019	4

A disadvantage of a permanent magnet alternator is that it is always providing the electrical current associated with the rpm which is independent of the actual current needed at any particular moment, making it run hotter than it would actually need to be.

After the engine's starting and once the battery is again fully charged and its voltage reaches a certain fixed value, the thyristors in the shunt regulator actually short the generator windings to ground (dump the load) in a pulsating like fashion which generates heat in the regulators components and which must be dissipated by its outside surfaces to the surrounding environment to prevent the regulator/rectifier from overheating and malfunctioning.

Although the cooling fins of the VReg are presumably large enough to ensure proper cooling on their own, the VReg manufacturer would undoubtedly expect that the VReg is placed in a well ventilated and relatively cool environment. If the firewall is made of wood or other non heat conducting material with the fire proofing obtained by use of special coatings, metal foil etc. it is possible that this type of surface does little or nothing to aid in heat transfer.

Placing the VReg in the cabin against a surface covered with carpet for example, could create serious troubles. As with most electrical components, overheating will cause failure! Therefore the VReg must be situated in a relatively cool area of the engine compartment with sufficient cool air ventilation. Ideally the VReg should be placed in a constant stream of cool air to make sure heat dissipation is always at its maximum. The pictures on the right show an example of cooling air being ducted from the cylinder head baffles directly on top of the VReg.



D-Motor has provided (see mounting situation figure) two tapped holes to fix the VReg (right to the Alternator, above the Engine Cable loom connector) !

The D-Motor ECU stops working (and engines stops) below 12 VDC !

The Lambda sensors, water sensors and MAP sensors stop working below 12 VDC !

Information Bulletin 2019 - 015						
ISSUED			REVISED			Pages
Day	Month	Year	Day	Month	Year	Rev.
01	08	2019	05	08	2019	4