

## Alternator

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#### Compact alternator with multifunction controller (MFR)

- The alternator with multifunction controller features only one threaded pin for the terminal connection B+ (terminal 30). The connection D+ (terminal 61 E) is located in the black connector (2-pin or 3-pin depending on version) at the alternator. The terminal 15 connection is also located in this connector for voltage supply of the controller. In some models the load status of the alternator is signalled to the engine management.

#### Compact alternator with multifunction controller (MFR) and start load response

- The alternator with multifunction controller (MFR) and start-load response does not differ externally from the alternator without the start-load response function. The difference only concerns the time limitation of the rated current during the start procedure.

#### Start load response function:

- This function is intended to shorten the engine starting procedure particularly at low ambient temperatures. The task of the function is to eliminate a braking torque acting on the engine as the result of full excitation and current output. As a result, during the first few seconds the load current is limited to 0 A in order to achieve the full power output in the following few seconds increasing at a rate of 10 A per second.

#### Multifunction controller:

- In the case of the multifunction controller, the battery charge indicator lamp is activated by means of an electronic switch integrated in the controller. The controller measures the voltage difference of terminal 30 and terminal 15 internally and switches terminated 61 E to ground in the case of fault. The indicator lamp lights up.

#### Fault detection with multifunction controller with/without start load response:

- Failure of the belt drive ( $U_{\text{alternator}} = U_{\text{terminal 15}}$  / no phase signal)
- no charge due to a fault ( $U_{\text{alternator}} = U_{\text{terminal 15}}$ )
- Interruption in excitation circuit
- Overvoltage by a defective, conductive controller output stage ( $U_{\text{alternator}} > U_{\text{setpoint}}$ )
- Break in charge line ( $U_{\text{alternator}} - U_{\text{terminal 15}} \geq 3 \text{ V } \pm 0.5 \text{ V}$ )