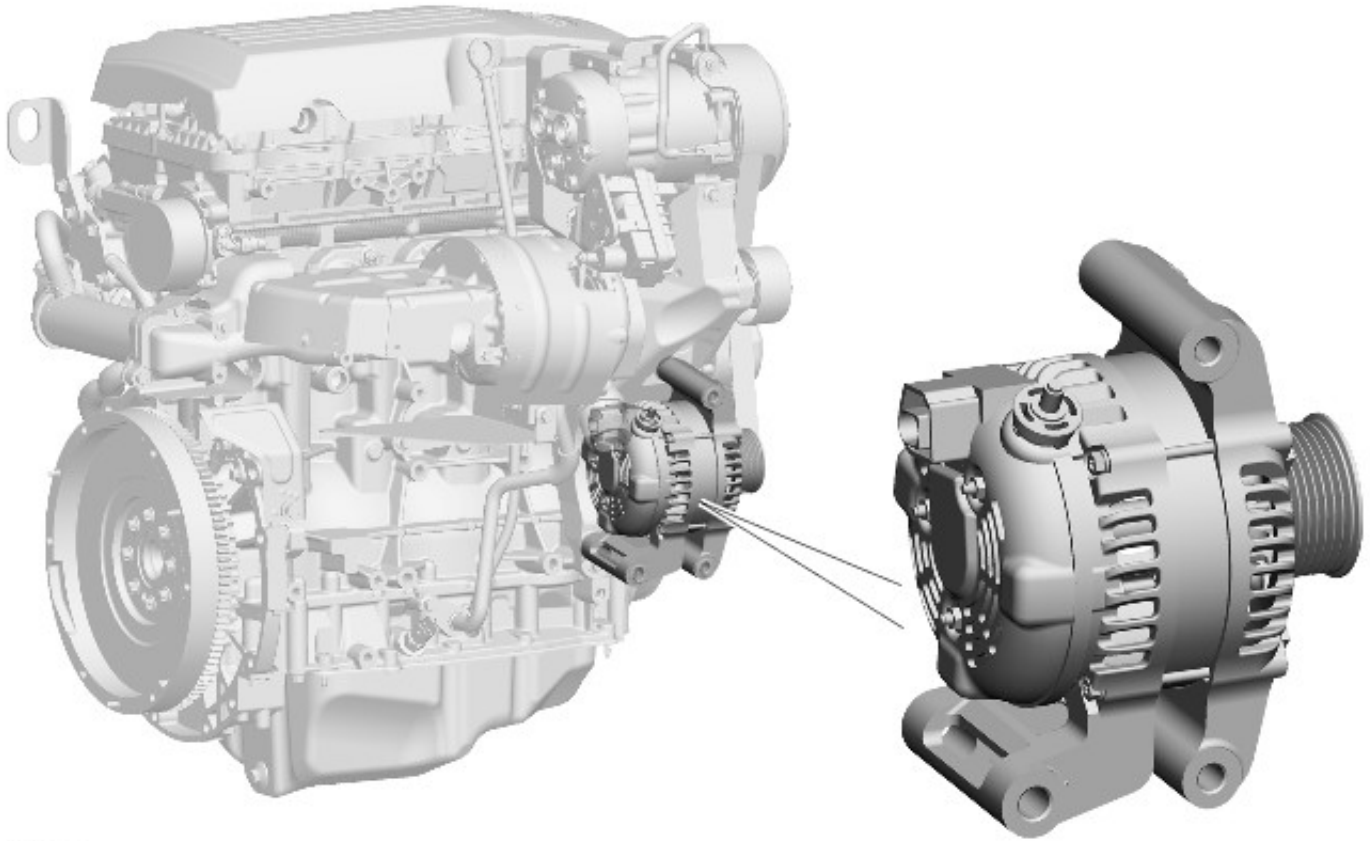# Generator and Regulator - ID4 2.2L Diesel - GeneratorID4 2.2L Diesel
Description and Operation

COMPONENT LOCATION

E139192

OVERVIEW

The generator is a self exciting type located at the front RH (right-hand) side of the engine and driven by the accessory drive belt. The generator is rated at 85/150 amps.

The generator pulley incorporates a one-way clutch that reduces NVH (noise, vibration and harshness) and improves the life of the accessory drive belt. The one-way clutch prevents the generator from driving the belt (causing 'belt whip'), due to the high rotational inertia of the generator internal components, during transients in engine speed.

A rectifier and a regulator are incorporated into the generator. The rectifier converts the AC (alternating current) produced in the stator coils of the generator into the DC (direct current) required by the vehicle electrical system. The regulator controls the output voltage from the generator and provides feedback of various parameters, including fault information, to the ECM (engine control module).

Generator output is supplied to the battery, via the starter motor, from a threaded copper post on the generator casing. A single pin electrical connector on the rear of the casing provides a LIN (local interconnect network) bus interface for communication between the regulator and the ECM. The generator mountings provide the electrical ground for the generator.

Generator output is controlled by the ECM, which sends information regarding charging voltage to the generator on the LIN bus. The ECM calculates the charging voltage using a software based battery temperature model, which uses the intake air temperature, road speed, coolant temperature and engine running timers to estimate the electrolyte temperature. This value is then used to select the appropriate charging voltage based upon the charging characteristic of the battery.

The LIN bus is also used to communicate fault messages from the generator to the ECM. If a fault occurs, a DTC (diagnostic trouble code) is stored in the ECM and, if necessary, after a short delay the ECM sends a high speed CAN (controller area network) bus message to the instrument cluster to illuminate the ignition/no charge warning indicator.

During engine starting, the ignition/no charge warning indicator is illuminated when the ignition is energized, and is extinguished when the engine starts and the ECM detects a generator output voltage.