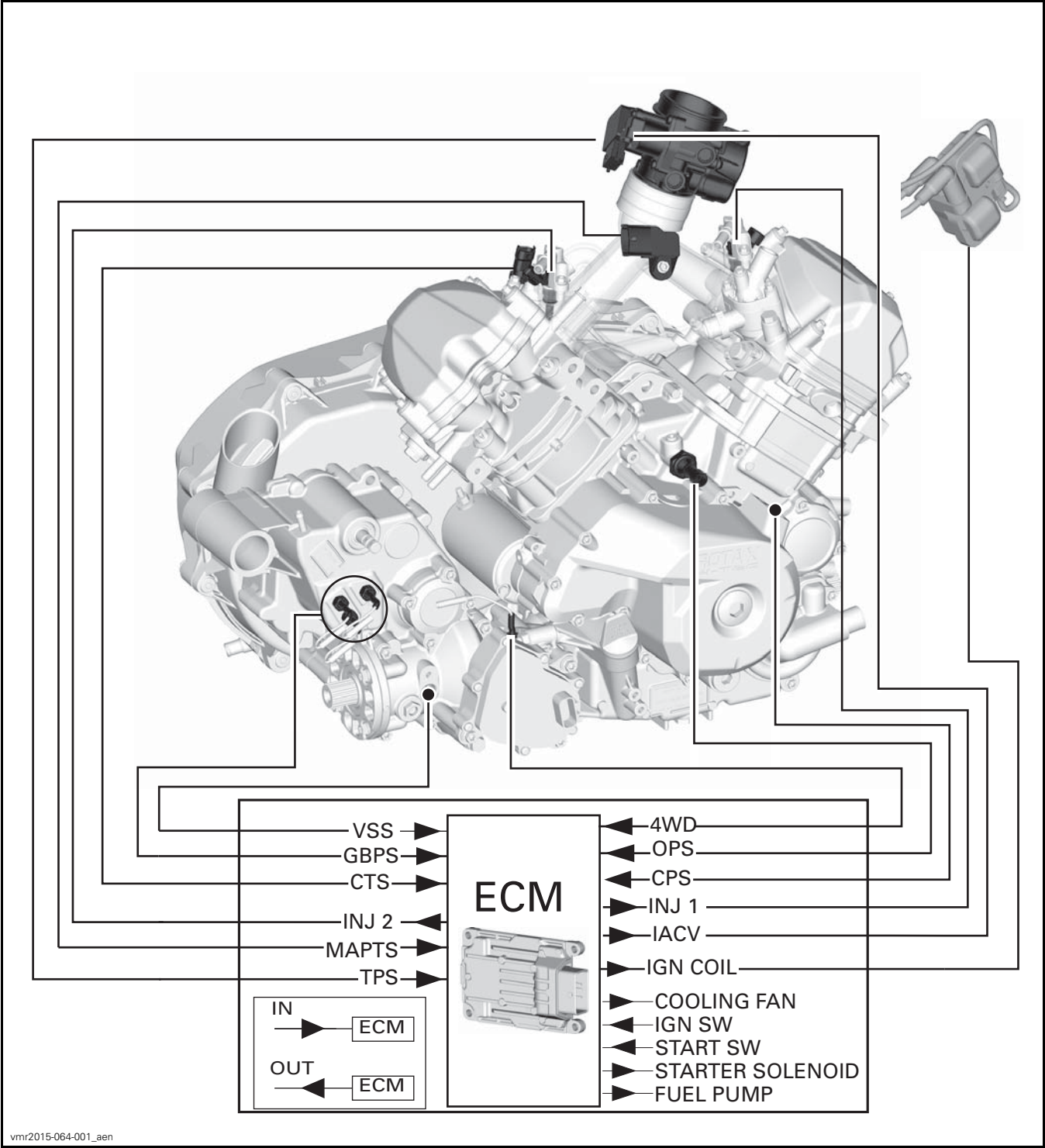
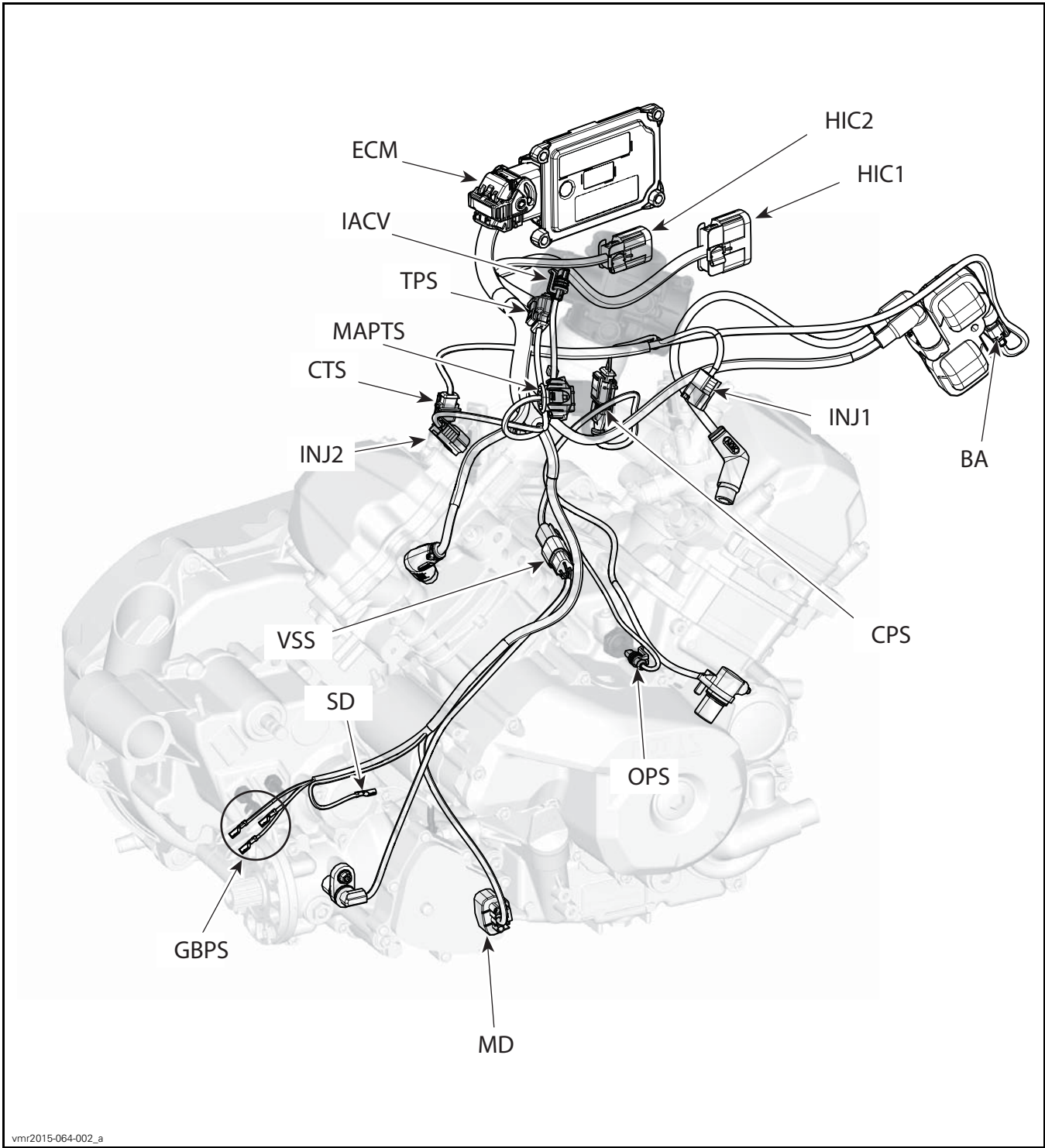


ENGINE MANAGEMENT SYSTEM (EMS)

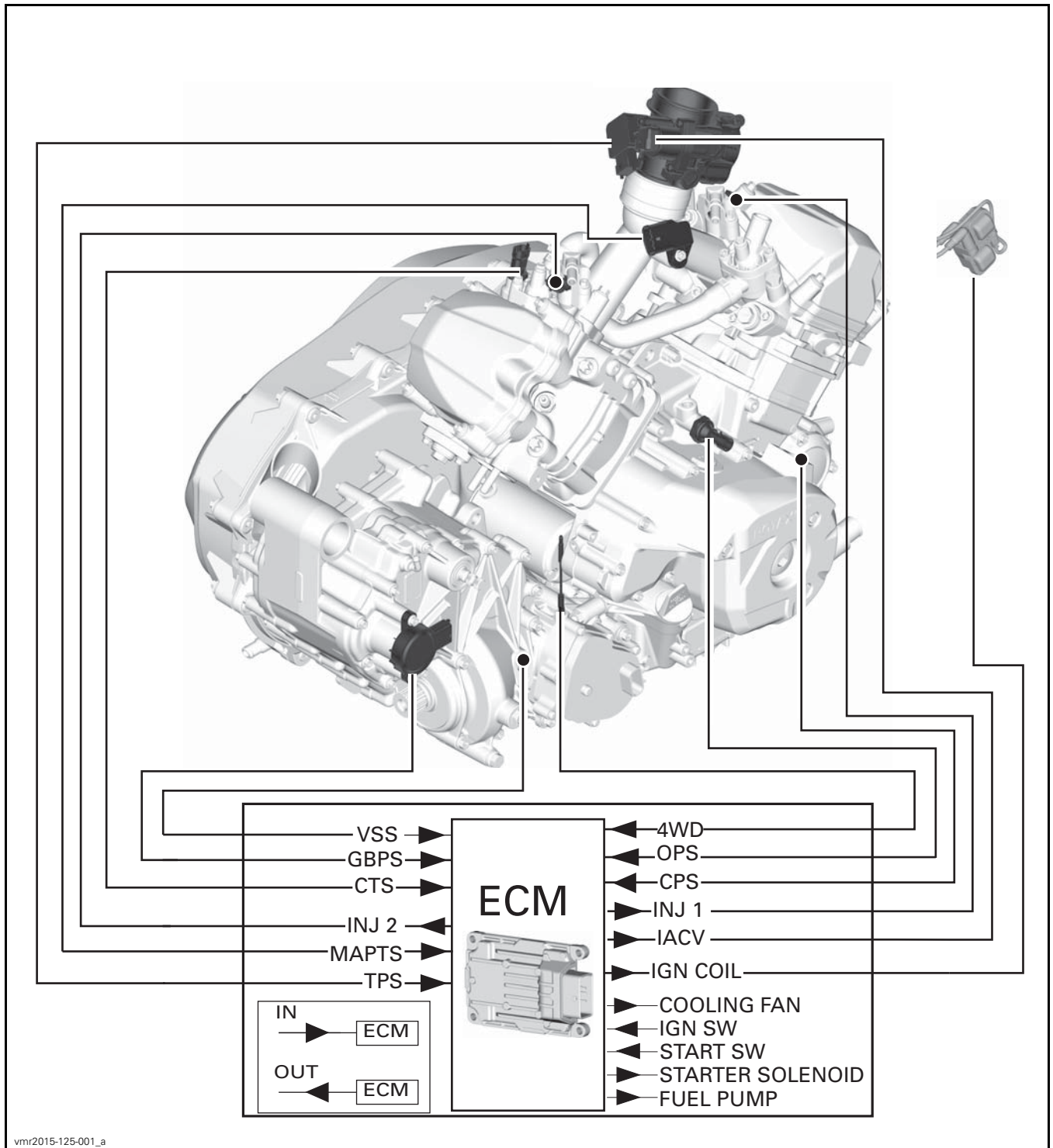
Engine with Gearbox using External Switches



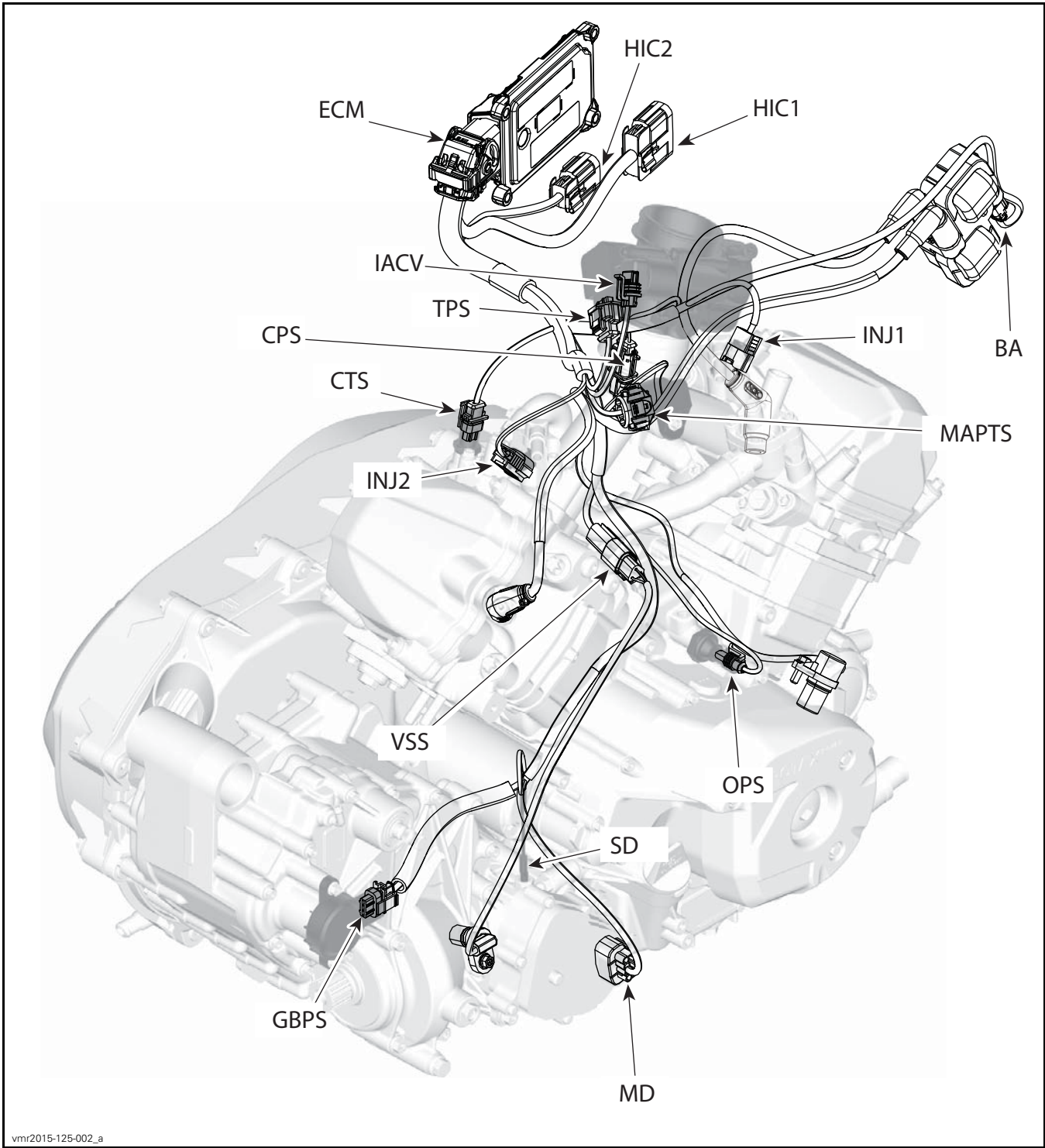
Engine with Gearbox using External Switches



Engine with Gearbox using GBPS



Engine with Gearbox using GBPS



vmr2015-125-002_a

ABBREVIATION	DEFINITION
BA	Ignition coil
CPS	Crankshaft position sensor
CTS	Coolant temperature sensor
ECM	Electronic control module
GBPS	Gear box position sensor
HIC1‡	Harness interconnect 1
HIC2‡	Harness interconnect 2
IACV	Idle air control valve
INJ1	Injector 1 (front)
INJ2	Injector 2 (rear)
MAPTS	Manifold absolute pressure and temperature sensor
MD	4WD Actuator
OPS	Oil pressure switch
SD	4WD Signal
TPS	Throttle position sensor
VSS	Vehicle speed sensor
‡Refer to applicable <i>WIRING HARNESS AND CONNECTORS</i> subsection for the vehicle harness.	

GENERAL

SYSTEM DESCRIPTION

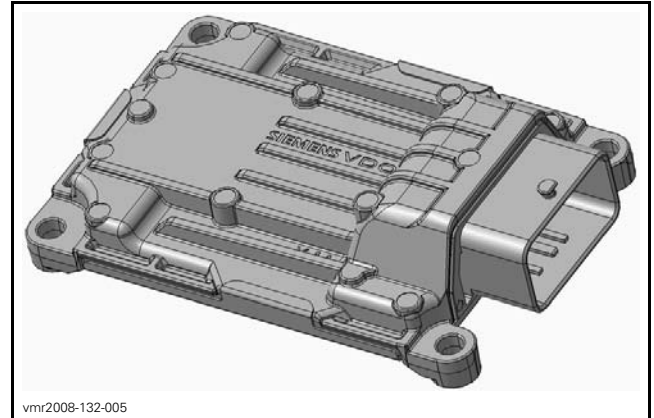
The HIC# connectors connect the vehicle harness to the powertrain harness.

There are 6 main systems that are controlled by the engine management system (EMS):

1. Electronic Fuel Injection (EFI)
2. Cooling system (cooling fan)
3. Ignition system
4. Starting system
5. Fuel pump system
6. D.E.S.S. system.

NOTE: For further information related to these systems, refer to the applicable subsection.

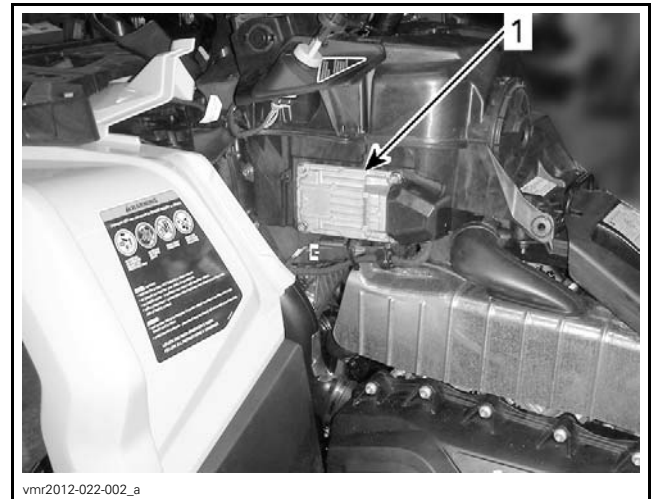
The ECM (Engine Control Module) is the central point of the engine management system.



vmr2008-132-005

TYPICAL - ECM

The ECM is located behind the LH panel.



vmr2012-022-002_a

LH PANEL REMOVED

1. ECM location

The ECM reads input signals from various switches, controls, and sensors, that it compares to pre-determined parameters, makes computations, and provides control signal outputs required for proper engine management.

The ECM also interacts through CAN bus with the gauge module for various functions, information exchange and display of messages. Refer to *CONTROLLER AREA NETWORK (CAN)* and *LIGHTS, GAUGE AND ACCESSORIES* subsections.

The ECM also features a permanent memory that will store the information on the various ignition keys programmed to the vehicle, fault codes, customer information, and other engine information, even when the battery is removed from the vehicle.

Subsection 01 (ENGINE MANAGEMENT SYSTEM (EMS))

Engine RPM Limiter

The ECM limits the maximum engine speed with the shifter selected to any position. It uses the CPS and the GBPS for this function.

An override switch, on the handlebar, allows the engine to be run at a higher speed than the RPM limiter when more power is needed in reverse operation. Refer to *LIGHTS, GAUGE AND ACCESSORIES*.

that they can be monitored. Some problems will turn on a warning lamp or will set the engine in limp home mode. Refer to *DIAGNOSTIC AND FAULT CODES* section for more information.

Vehicle Speed Limiter

The ECM will limit the maximum vehicle speed. For this purpose, the ECM uses the VSS and the GBPS.

Drowned Mode (Flooded Engine)

If the engine is fuel-flooded and does not start, this special mode can be activated to prevent fuel injection and ignition while cranking. Proceed as follows to activate it.

With the ignition key set to ON and the engine stopped, press and HOLD the throttle lever to WOT position (wide open throttle).

Press the start button. Drowned mode is now on.

Releasing the throttle lever will bring back the normal mode.

Monitoring System

The ECM monitors the electronic components of the fuel injection system and also parts of the electrical system.

For more information, refer to *DIAGNOSTIC AND FAULT CODES*.

Limp Home Mode

The ECM may automatically set default parameters to the engine management to ensure the adequate operation of the engine if a component of the fuel injection system is not operating properly. The engine will operate with reduced performance to protect the engine. In more severe cases, the engine RPM will be limited, also to protect the engine.

These performance-reduced modes allow the rider to go back home which would not be otherwise possible. Refer to the *DIAGNOSTIC AND FAULT CODES* subsection.

Diagnostic Mode

The ECM features a self-diagnostic mode when the ignition key is turned on. However, some components need the engine to be running so