Test Plan for

J2VK Valvetronic Exhaust Control System

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Testing Overview

We have devised a test plan to ensure that the final product meets the requirements of our functional specifications. This test plan overviews a high level test plan for the J2VK Valvetronic Exhaust Control System. It consists of two phases – the first phase is to conduct tests on important individual components of our product. The second phase is that after assembly, we will perform post-integration testing on the final product.

Phase 1 Testing

1.1 Throttle-Position-Sensor

Throttle-Position-Sensor Testing Item: Accuracy and Detection Range
Testing Method:
Step on the pedal with TPS and get the full range of motion.
Expected Outcome:
Use Arduino Uno Microcontroller Board to read the output voltage from TPS.

RESULT: PASS / FAIL

COMMENT:

1.2 Wireless Transmitter Receiver

Wireless Transmitter Receiver Testing Item: Data communication with Arduino Board
Testing Method:
Press different buttons on the transmitter.
Expected Outcome:
Use Arduino Uno Microcontroller Board to read the output data from wireless transmitter receiver.

RESULT: PASS / FAIL

COMMENT:

Phase 2 Testing

2.1 Remote Control System

Remote Control System Testing Item: Functionality
Testing Method:
Connect the air control valve with a power generator (DC: 12V/5A). And use the two remote control buttons to test the open / close modes.
Expected Outcome:
When set in the open mode, the valve should be fully open.

When set in the close mode, the valve should be fully closed.

RESULT: PASS / FAIL

COMMENT:

2.2 Micro-programming Board Control System

Micro-programming Board Control System Testing Item: Functionality
Testing Method:
Connect the air control valve with a power generator (DC: 12V/5A). And use remote control to set to auto mode.
Repeatedly step on the accelerator pedal.
Expected Outcome:
When set in “Automatic” mode, the valve should be controlled by how the depth of pedal the driver steps on.

RESULT: PASS / FAIL

COMMENT:

2.3 Back Pressure Testing

Back Pressure Testing Item: Pressure
Testing Method:
Use pressure gauges with a scale that reads from 0 to 15 psi to record the back pressure from our exhaust system when the user steps on the accelerator pedal.
Expected Outcome:
Our system should induct our back pressure at low rpm by about 20%, when it is set in closed mode.

RESULT: PASS / FAIL

COMMENT:

2.4 Torque Testing

Torque Testing Item: Torque
Testing Method:
Use a dynamometer to place a load on the engine and measure the amount of power that the engine can produce against the load when the user steps on the accelerator pedal.

Expected Outcome:
Our system should increase the torque at low rpm by about 20%, when it is set in closed mode.

RESULT: PASS / FAIL

COMMENT:

2.5 Horsepower Testing

Horsepower Testing Item: Horsepower
Testing Method:
Use a dynamometer to place a load on the engine and measure the amount of power that the engine can produce against the load when the user steps on the accelerator pedal.
Expected Outcome:
Our system should increase the horsepower at high rpm by about 20%, when it is set in open mode.

RESULT: PASS / FAIL

COMMENT:
