



Williams Controls WCS-351571 Williams Customer Specification

Original Release: 03/25/09
Original Project:1429

FEATURES

- 45° ± 2° Pedal Angle
- 17° ± 2° Angular Rotation
- FMVSS 124 and 302 compliant
- -40°C to 85°C Operation
- +5V Operation
- Non-contact Sensor
- Ratiometric APS Output
- Interfaces with Metripak 150-series Connector
- Protected against Electrical Misconnection



APPLICATIONS

- Truck Throttle with Position Sensor
- Used with 2007/2010 Cummins engine application
- Meets Cummins Specification AEB 15.67

Connector Pin Configuration



DESCRIPTION

The Electronic Floor Pedal Assembly (EFPA) is designed to provide a signal to the engine fuel control system in response to the driver's request for engine power. A sensor is employed which provides a linear output voltage proportional to the angular displacement of the treadle.

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QEMS Representative	Mary Knight	Process Owner	Michael Cooper	Department Manager	Scott Thiel		



ABSOLUTE MAXIMUM ELECTRICAL/MECHANICAL RATINGS

Supply Voltage	+5.5VDC
Output Current	±10mA
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Static Load Limit	1500N normal to treadle at 200mm from pivot

Operation of this device beyond absolute maximum ratings may result in permanent damage.

VEHICLE SYSTEM SAFETY INFORMATION

During FMEA analysis (Failure Modes and Effects Analysis, a.k.a. Hazard Analysis), Williams Controls (WMCO) has identified the following potential failure mode of its Non Contact Sensors that can not be mitigated within the sensor assembly:

- Sensor output APS1 or APS2 (applicable for Dual APS Sensor only) or APS or IVS output (applicable for APS/IVS Sensors only) could get “electrically stuck” at an arbitrary output signal level (for APS only – IVS could get stuck at High or Low signal level) within the operating range of the sensor

This potential failure mode can not be detected and/or resolved within the sensor assembly itself and diagnostic information about this issue can not be transmitted and/or generated by the sensor assembly, but must be detected by the vehicle powertrain control system(s). To mitigate this potential failure mode, WMCO designed and released sensors feature a “Dual Redundant Output” concept. This sensor will produce two electrically independent output signals that are in direct correlation with each other. To mitigate the risk named above, Williams Controls strongly recommends using the sensor’s built-in redundancy feature. The first APS signal would be used as the source of accelerator position signal information, and the second APS signal (or IVS signal, depending on sensor type) would be used for diagnostic purposes only. The comparison of the second (diagnostic) signal with the first (accelerator position) signal enables the vehicle to fully detect the described “electrically stuck” output failure mode. Software algorithms specifically designed for this purpose (e.g. “stuck throttle routine”, “stuck pedal routine”...) are commonly used in the industry and known to mitigate this risk.

DESIGN VERIFICATION TESTING (REGULATORY, MECHANICAL, ENVIRONMENTAL)

Regulatory Validation	
FMVSS-124 RTI Certification	Per Federal regulations
FMVSS-302 Flammability	Per Federal regulations
Engine Manufacturer Specification	Per Cummins Standard AEB

Mechanical Validation	
Full Stroke Endurance/Durability	With periodically monitored electrical output
Ultimate Strength	With Force vs Displacement plots
Side Load Deflection	With Force vs Displacement Plots

Full Stroke Cycles	3x10 ⁶ Cycles
Cycle Rate	1 Hz

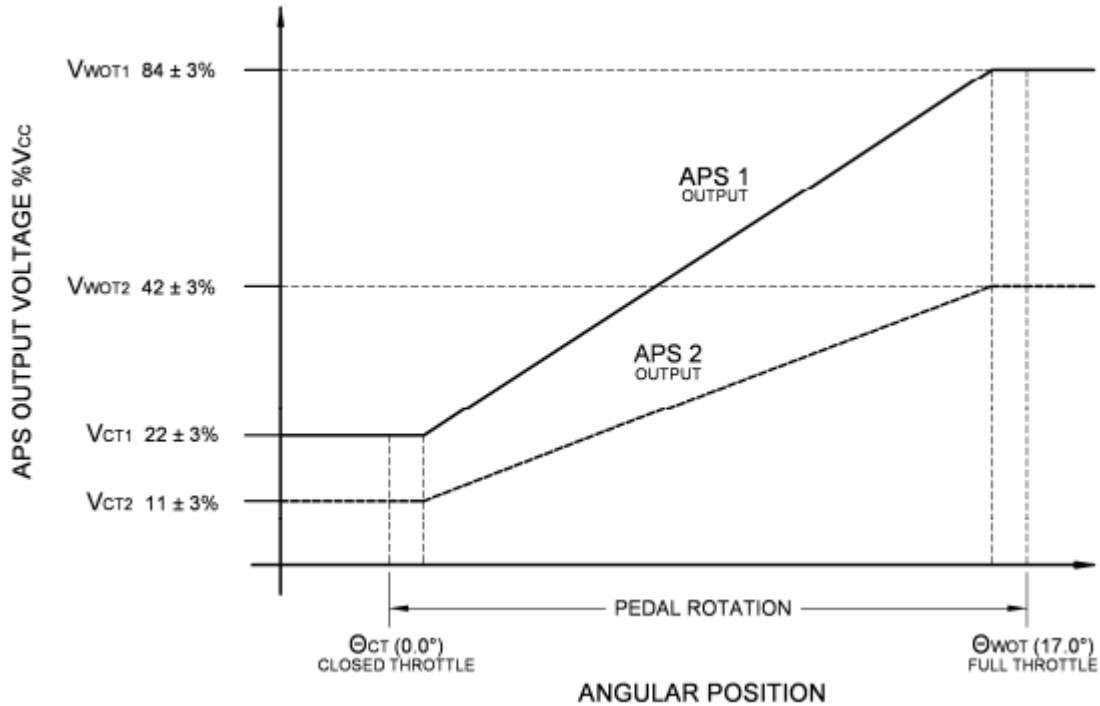
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ENVIRONMENTAL VALIDATION

Thermal Cycle	Refer to Williams Spec WDS-010
Thermal Stress	
Thermal Shock	
Humidity	
Vibration	
Salt Fog	
Dust Exposure	
Chemical Immersion	
Pressure Wash	
Mechanical Shock	

TYPICAL OUTPUT CHARACTERISTICS

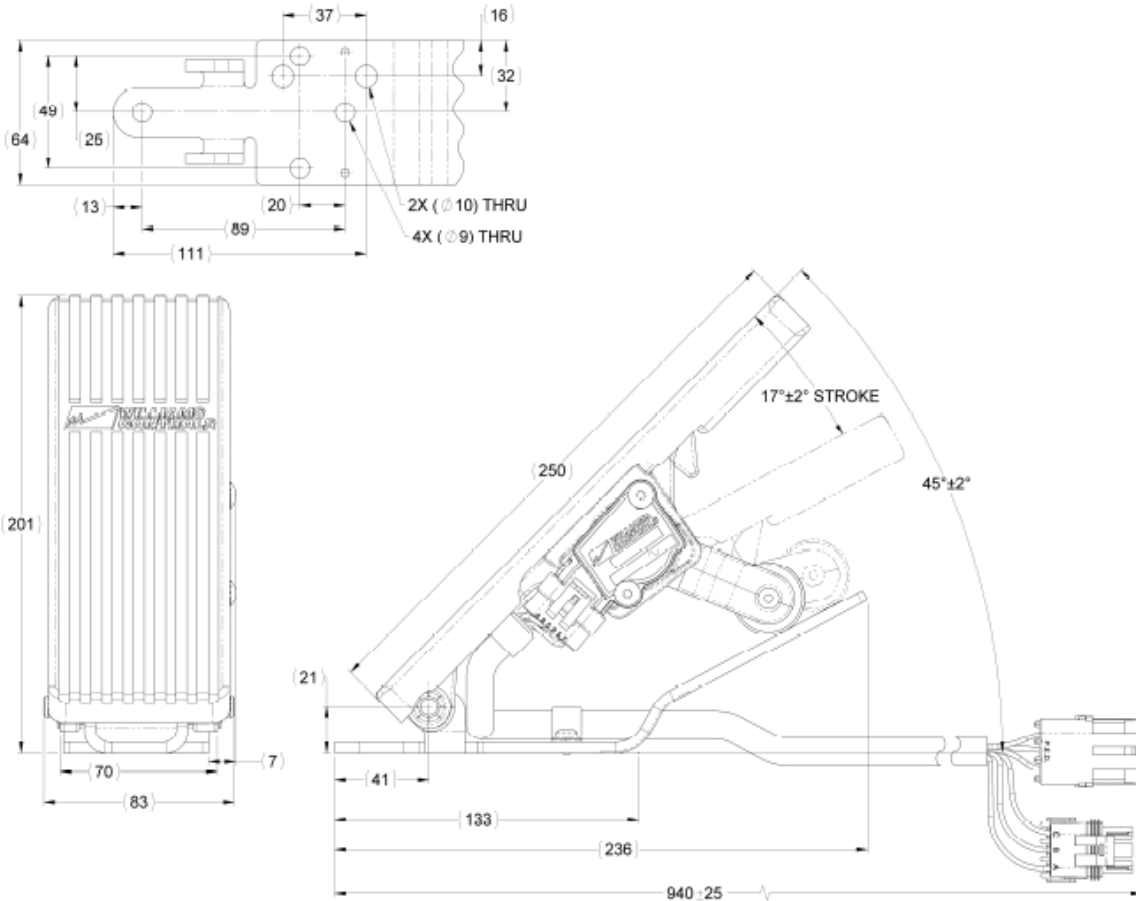


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MECHANICAL DIMENSIONS AND CHARACTERISTICS (FOR REFERENCE ONLY)

Measurements in mm

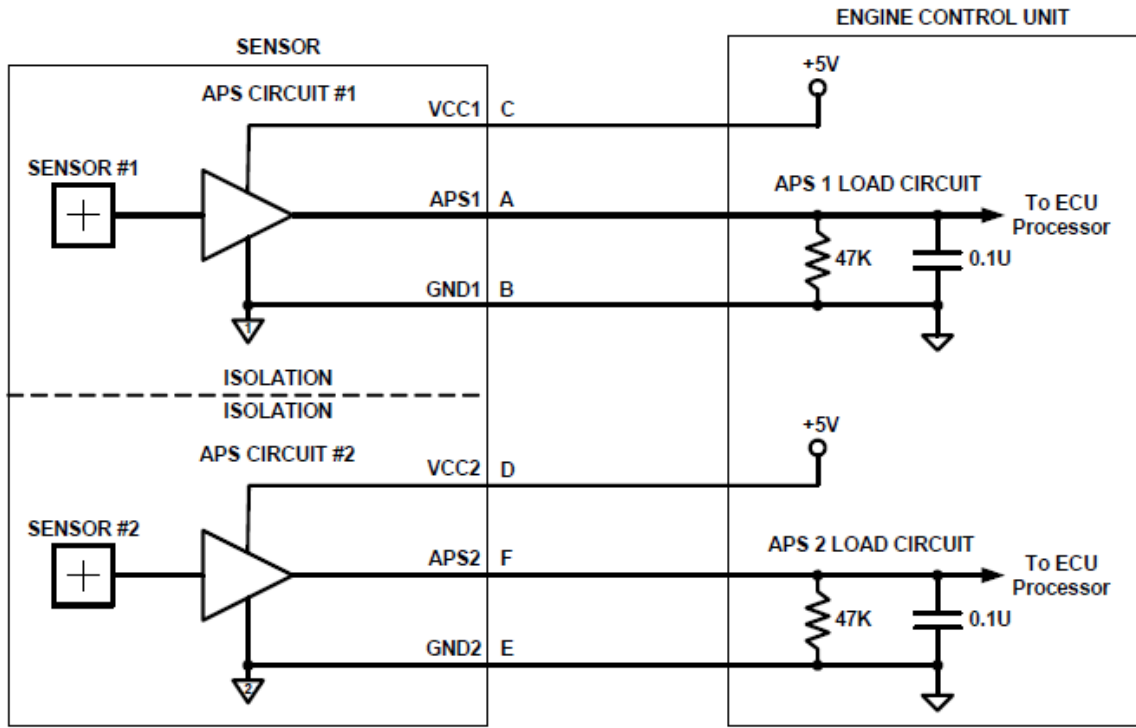


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APPLICATIONS INFORMATION:

Load Circuit



REFERENCED DOCUMENTS

- Williams Controls DWG #351571
- Williams Controls Specification #WDS-010
- FMVS-124 & FMVSS-302
- SAE J1455
- ASTM B-117
- Cummins Specification AEB 15.67

REVISION HISTORY

Rev	Date	ECN#	Checked	Approved	Changes/Comments
A	08/04/08	000384			Initial Release
B	03/25/09	000682			Updated/ Revise Load Circuit
C	10/15/09	001203			Cummins 2010 Compliant

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