

Uses 134143 Sensor

Features:

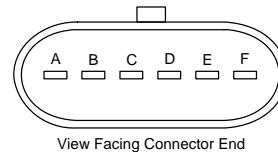
- -40°C to + 85°C Operation
- FMVSS 124 and 302 compliant
- +5V Operation
- Dual Ratiometric APS output
- Independent, Isolated APS circuits
- IP66 Sealed
- Highly EMI resistant (SAE J1113)
- Kick-Down Force in pedal actuation
- Kick-Down Switch



Applications:

- **Cummins '07 Engine ECU Applications with Kick Down**

Sensor Connector Pin Configuration



Pin	Function	Pin	Function
A	APS1 SIG	D	APS2 VCC2
B	APS1 GND1	E	APS2 GND2
C	APS1 VCC1	F	APS2 SIG

Sensor Mating Connector:

- P Packard Electric "Metri-Pack"
- Housing p/n: 12066317
- Terminal p/n: 12103881
- Kick-Down Switch Connector Pins

Description:

The ESPA 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 voltage proportional to the angular displacement of the treadle.

Mechanical Requirements:

- Treadle Angle = $20^{\circ} \pm 2^{\circ}$

Absolute Maximum Ratings

APS Circuits

Supply Voltage (VCC1, VCC2)	-15V to +15V
Output Current (APS1, APS2 output)	+/-10 mA
APS1,2 short circuit duration to ground	20 Minutes max.
APS1,2 short circuit duration to VCC	20 Minutes max.

Whole Sensor

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +125°C

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

Pedal Validation:

- **FMVSS-124 RTI Certification**
Per Federal regulations
- **FMVSS-302 Flammability**
Per Federal regulations
- **Ultimate Strength**
With force vs displacement plots
- **Side Load Deflection**
- **Full Stroke Endurance/Durability**
With continuously monitored electrical output
- **Thermal cycle**
SAE J1455 85C to -40C
- **Thermal Shock**
-40C to 85C
- **Humidity**
95% humidity and 27C to 75C 120 hour exposure
- **Mechanical Vibration**
Swept sine resonant frequency search
- **Mechanical Vibration**
Random broadband 5-500 Hz, 4.0 G's
- **Salt Spray Exposure**
ASTM B-117 96 hr exposure
- **Dust Exposure**
24 Hr exposure, pedals cycled
- **Chemical Exposure**
Diesel, brake fluid, antifreeze, and plastic protectant exposure.
- **Pressure Wash**
250 psig detergent, 1000 psig water at 140F- 40 minute exposure, 0.05 rpm
- **Mechanical Shock**
SAE J1455 One meter drop to concrete with additional harness drop test.

Sensor Validation:

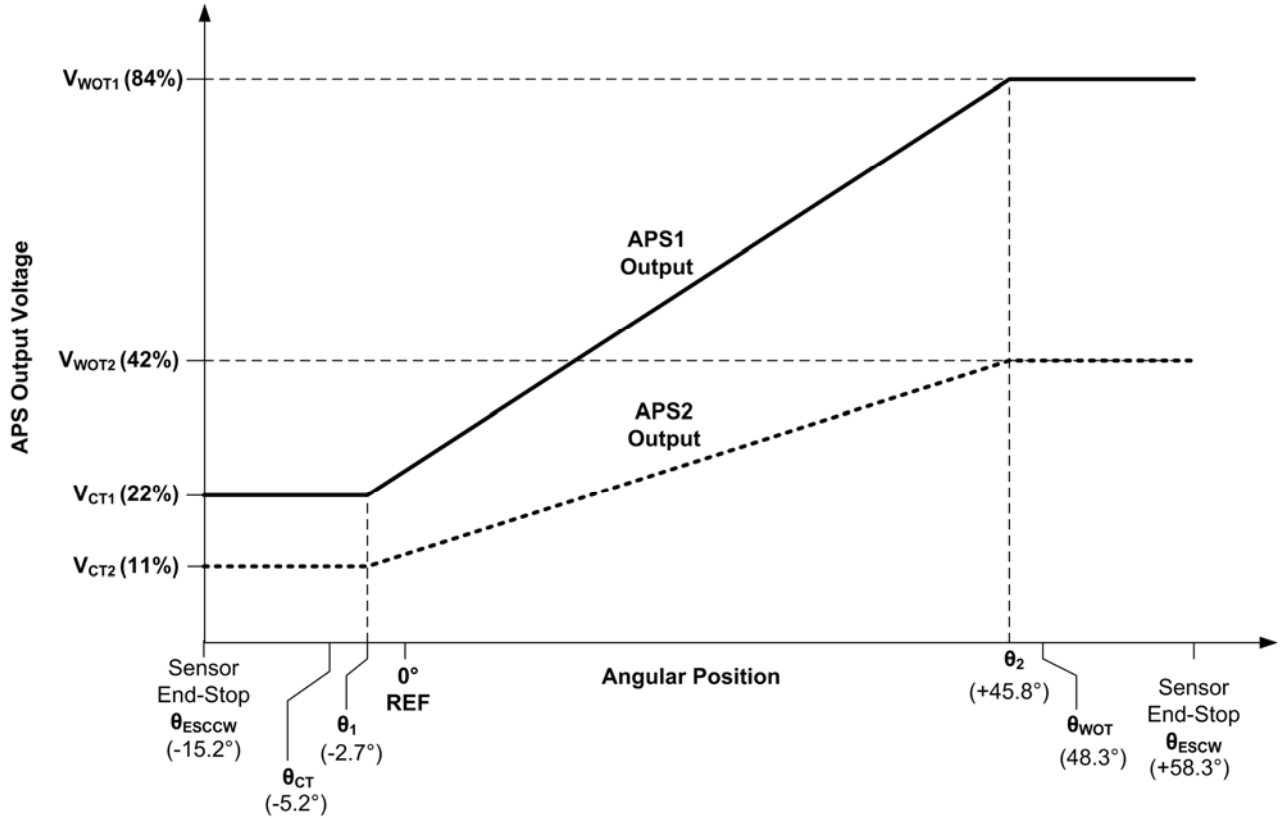
- **Endurance Cycling to 10 Million Cycles**
 - Sensor cycled over temperature, -40C to 85C, with continuously monitored electrical output.

- **Dither Testing**
 - Sensors cycled to 80 million cycles at 28 Hz with periodic monitoring

- **Electrical Performance**
 - Williams warrants its products to perform within +/-2.4% of listed values electrically over the life of the product.

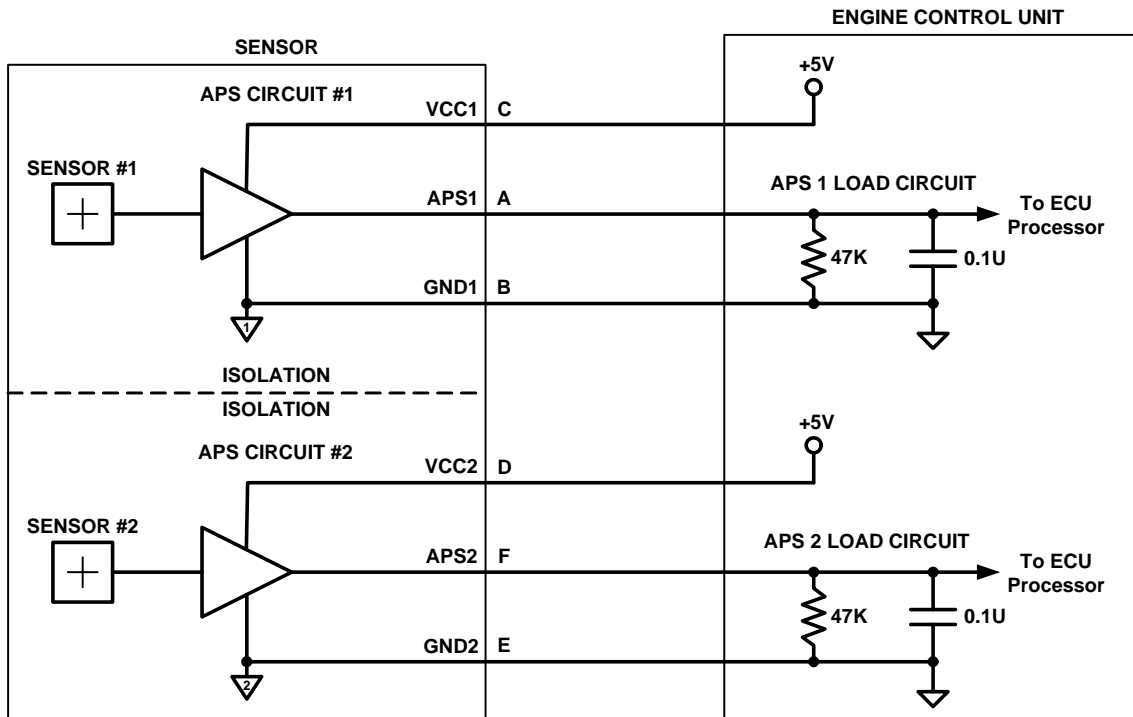
- **EMC Testing**
 - Sensors tested per SAE J1113 Class C for EMI

Typical Sensor Output Characteristics

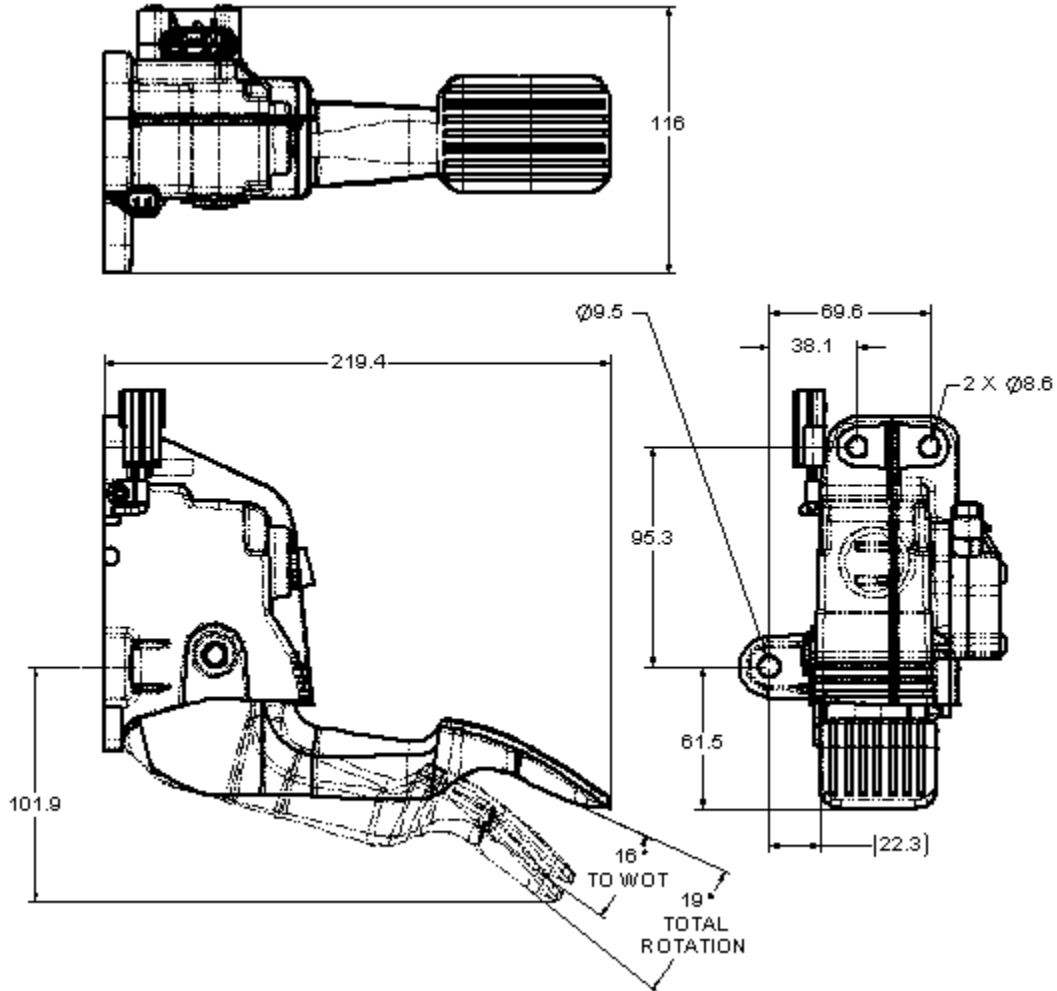


Load Circuit:

The following figure shows suggested interconnection and typical compatible ECU internal load circuits. Note that to maintain maximally redundant operation, separate power and ground signals need to be provided to each sensor.



Mechanical Dimensions and Characteristics (for reference only)



Referenced Documents:

- Williams Controls DWG # 134798
- WCS- 134143 (Sensor specification)
- Williams Controls Specification # WDS-010
- FMVSS-124
- FMVSS-302
- SAE J1843
- IP66

Revision History

Rev	Date	By	ECN	Changes/Comments
A	09/04/07	DNF		Initial Release