



Williams Controls WCS-131032 Williams Customer Specification

Original Release: 01/18/08
Original Project: 328
Uses 133284 sensor

FEATURES

- 54° Shaft Rotation
- Knurled shaft interface
- Sealed for debris intrusion
- Contact Sensor
- IP66 Sealed Sensor
 - Ratiometric APS output (13% to 77%)
 - Form C IVS output
 - +5V DC Operation
 - Isolated APS/IVS functions

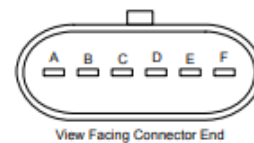


APPLICATIONS

- Used with the following engines:
 - Cummins (Prior to 2007)
 - Detroit Diesel III, IV, & V
 - International
 - Mack
 - MB NAFTA

Sensor Mating Connector Pin Configuration

- Connector A:
 - Packard Electric "Metri-Pack" Connector 12066317



Pin	Function	Pin	Function
A	APS SIG	D	IVS2 N.O.
B	APS GND	E	IVS1 N.C.
C	APS SUP (5V)	F	IVS SUP (5V)

DESCRIPTION

The remote sensor assembly is designed to provide an interface between an electronic sensor and mechanical input motion from the operator. A sensor is employed which provides a voltage proportional to the shafts angular displacement. The remote body provides holes for mounting the sensor to the remote and for mounting the remote to the host machine.

CURTISS - WRIGHT	PROCEDURE NAME:	DEPT:	030				
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DOCUMENT NUMBER:	WQF-030-021	Revision Level	A	Date Effective	11/13/07	DAF#	00396
QEMS Representative	Mary Knight	Process Owner	Michael Cooper	Department Manager	Scott Thiel		



ABSOLUTE MAXIMUM ELECTRICAL/MECHANICAL RATINGS

Supply Voltage (VCC1, VCC2)	+/-5.5V
Output Current (APS1, APS2 output)	+/- 10mA
Short Circuit Duration – to GND or VCC	Indefinite
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Static Load Limit	See Mechanical Specifications

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

ELECTRICAL SPECIFICATIONS: REMOTE ASSEMBLY

Over -40°C to +85°C temperature range, V_{CC}=5V unless noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V _{CC}	APS Supply Voltage		4.5	5	5.5	V
I _{CC}	APS Supply Current			7	10	mA
V _{CT}	CT Output, APS	$\theta < \theta_{CT}$	11	13	15	%VCC
V _{WOT}	WOT Output, APS	$\theta > \theta_{WOT}$	75	77	79	%VCC
V _{SPAN}	Voltage Span		60	64	68	%VCC
V _{IVS}	IVS Supply, Voltage		4.5	5	5.5	V
I _{IVS}	IVS Supply, Current				10	mA
V _{IVS}	IVS1, IVS2, Transition Voltage	For Rated Operation	3% of Span + V _{CT}	--	10% of Span + V _{CT}	%VCC

MECHANICAL SPECIFICATIONS: REMOTE ASSEMBLY

Parameter	Conditions	Min.	Typ.	Max.	Units
Tang angle at CT	For Mechanical Reference	--	-6	--	°
Shaft Angular Displacement	See Drawing	--	54	--	°
Actuation Force – without Sensor	No Sensor attached	--	--	3.3 (.373)	In*lb (N*m)
Maximum Input Torque	Applied to shaft	--	--	15 (1.70)	In*lb (N*m)
Maximum Torque for mounting bolts	For mounting to host machine	--	--	65 (7.34)	In*lb (N*m)
Maximum Axial Load	Away from Sensor	--	--	101 (450)	Lbs (N)
Life Expectancy, B10 life	No Axial Load	5x10 ⁸	--	--	Cycles
Life Expectancy, B10 life	Maximum Axial Load	0.25 x 10 ⁸	--	--	Cycles

Notes: 1- Mechanical reference is defined as line through center of sensor mounting bolt holes

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**DESIGN VERIFICATION TESTING (REGILATORY, MECHANICAL, ENVIRONMENTAL)**

REGULATORY VALIDATION	
FMVSS-302 Flammability	Per Federal regulations

MECHANICAL VALIDATION	
Full Stroke Endurance/Durability	With periodically electrical output
Ultimate Strength	Axial loading with force vs displacement plots

Full Stroke Cycles	3x10 ⁶
Cycle Rate	1Hz
Ultimate Load	100lb Axial Load

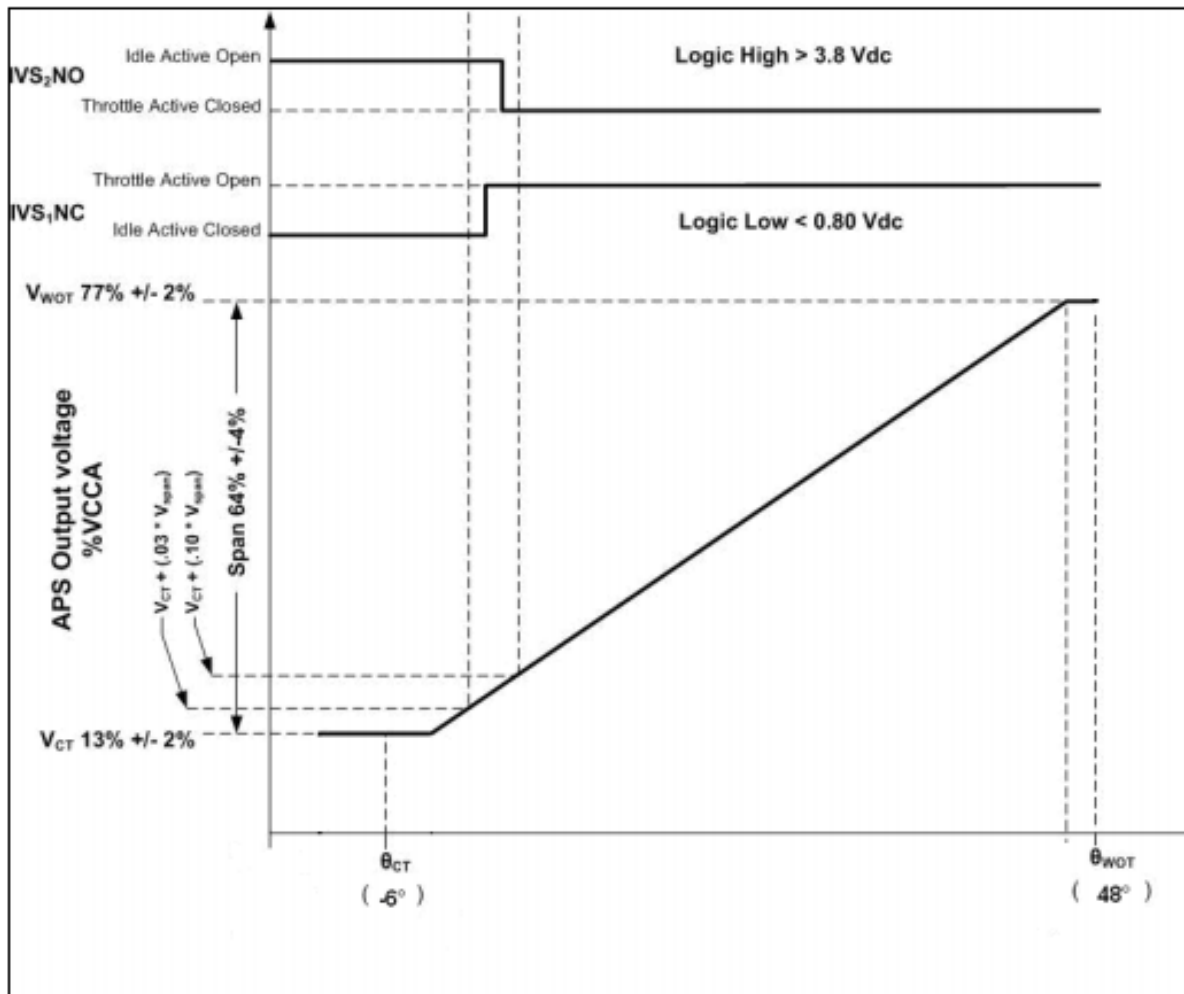
PEDAL ENVIRONMENTAL VALIDATION: (REFER TO WILLIAMS SPEC WDS-010)

Thermal cycle/stress	SAE J1455 -40°C to +85°C
Thermal shock	-40°C to +85°C
Humidity	120 hour exposure at 95% humidity from +27°C to +75°C
Salt spray exposure	ASTM B-117 96hr exposure
Dust exposure	24hr exposure, pedals cycled
Chemical exposure	Diesel fuel, brake fluid, antifreeze and plastic protectant exposure
Pressure wash	250 PSIG detergent at +75°C – 40 minute exposure, 0.05rpm 1000 PSIG water at +75°C – 40 minute, 0.05rpm
Mechanical shock	SAE J1455 one meter drop to concrete with additional harness drop test

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TYPICAL OUTPUT CHARACTERISTICS

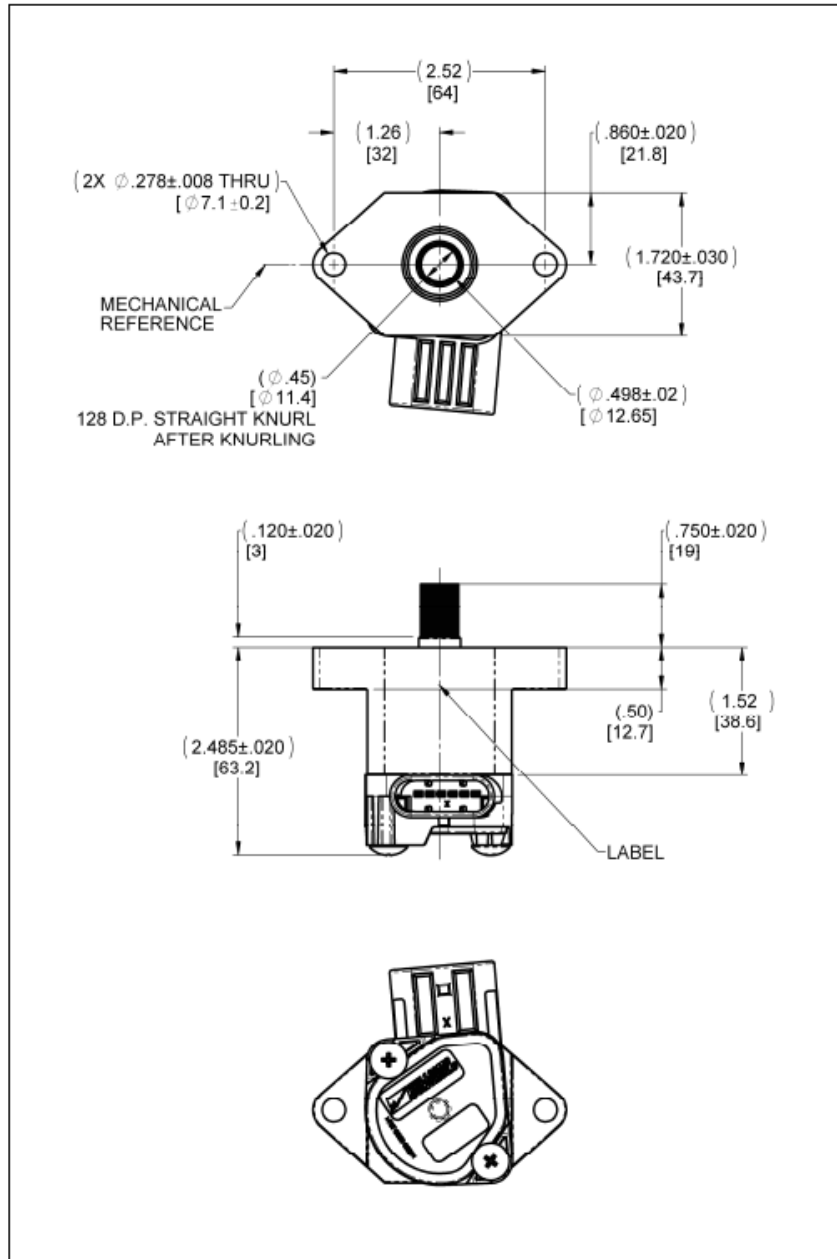


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MECHANICAL DIMENSIONS AND CHARACTERISTICS (FOR REFERENCE ONLY)

Measurements in mm

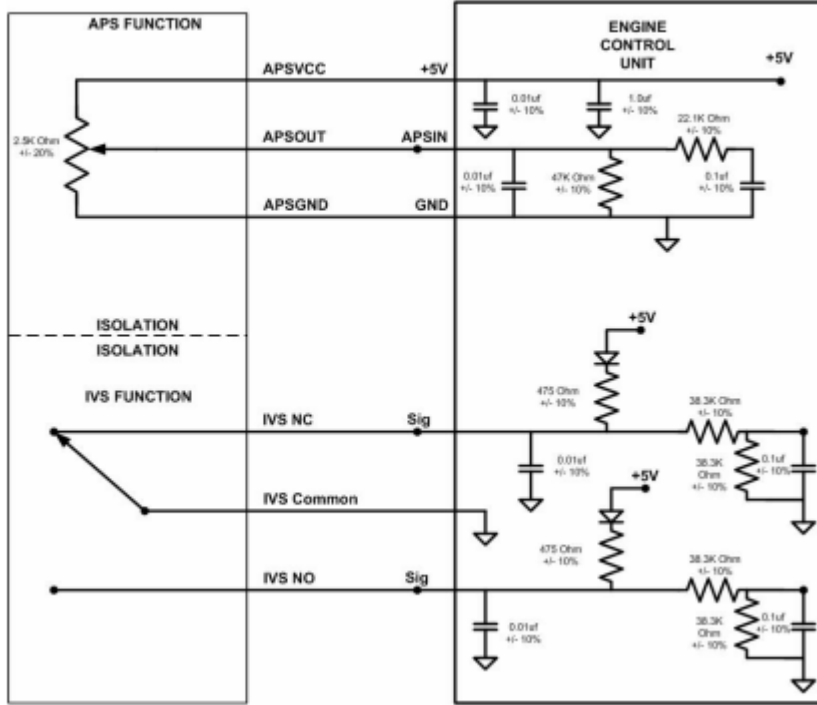


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APPLICATIONS INFORMATION:

Load Circuit



REFERENCED DOCUMENTS

- Williams Controls DWG #131032
- Williams Controls Specification #WCS-133284
- Williams Controls Specification #WDS-010

REVISION HISTORY

Rev	Date	ECN#	Checked	Approved	Changes/Comments
A	01/18/08	41818	SCN	SCN	New Release

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