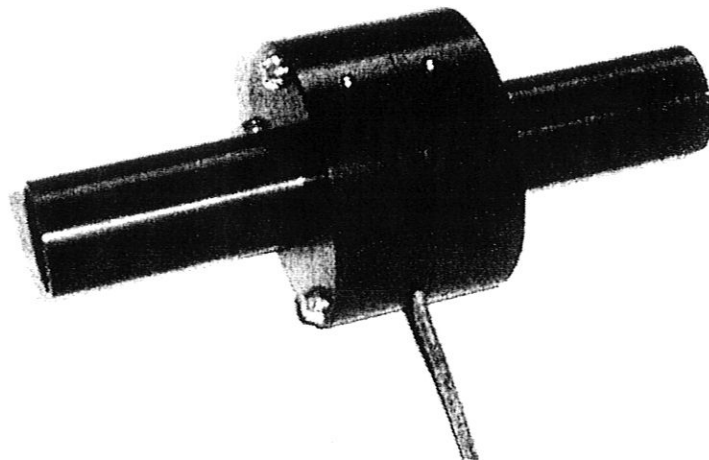


Blowby Sensor

*For
Engine
Testing*

By Performance Trends



The most common checks for piston ring sealing are cranking compression and leak down. Both of these can falsely indicate a problem if a small amount of debris is preventing a ring from setting in the ring lands correctly or holding open a valve. The next check you do could show everything is fine. You also do not get a real *measure* of how well this engine seals up compared to that last engine you built. Neither of these check ring sealing *while the engine is running*. Now with Performance Trends' affordable Blowby Sensor, you can actually measure CFM of blowby during your dyno tests.

Hook up the blowby sensor to your valve cover following the instructions on back of this sheet. Hook up the electrical lead to one of Performance Trends's DataMite data loggers. Pick the built in Blowby Sensor calibration for your range of sensor and you're ready to test measure the CFM of blowby from your engine at all engine RPMs. Now you can get a history of your engines' blowby levels. For example: last year you were running 3.3 CFM at 4000 and 3.7 CFM at 7000 RPM. This year with your new boring technique, you're down to 2.2 CFM at 4000 and 2.3 CFM at 7000. **Now you can really measure if you are going in the right direction.**

Other features include:

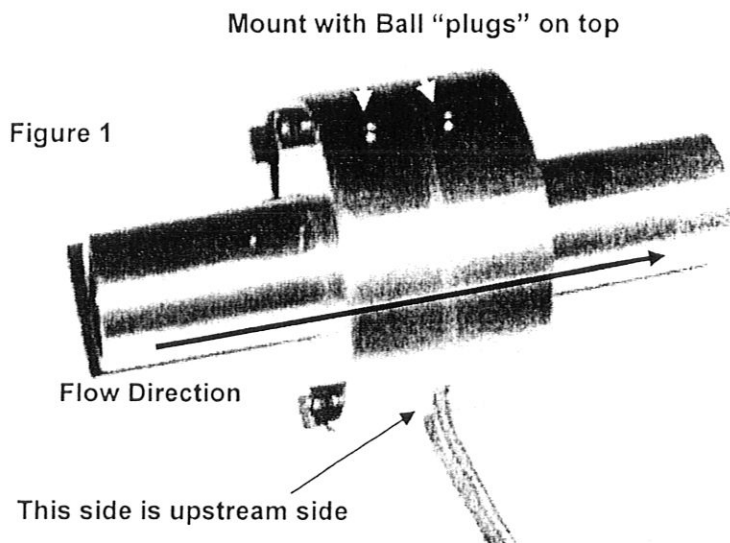
- Large 1" diameter inlet and outlet to be able to handle 1000+ HP engines.
- Rugged, all aluminum construction.
- Three (3) flow ranges available to handle most any size engine with good accuracy.
- Can measure small flows in the reverse direction. This is good for diagnostic work and is used by the Performance Trends' DataMite software to warn meter may be installed backward.
- Can be used in any dyno system which provides 5VDC power, can measure a 0-5 volt output and allows you to type in a calibration table of CFM for various voltage outputs.

Blow By Sensor Installation Tips

The Blow By Sensor lets you measure the CFM flow from your crankcase. To be accurate you should seal up the crankcase, valve covers, etc. You should eliminate any type of PCV valve, or routing of the crankcase vapors out of the engine. Typically you will have the breather of one rocker cover as being the only outlet of blow by gasses.

You will route this outlet to the inlet of the Blow By Sensor with a long (6 ft, 2 meters or more), large diameter (5/8", 14 mm or larger), non restrictive hose. This helps protect the sensor from engine heat and helps isolate it from engine vibration. After the sensor, vent these gases with a large diameter, non-restrictive hoses to a safe, well ventilated area. **Blow by gases are exhaust which has passed by the piston rings and should not be breathed.**

The Blow By sensor should be mounted approximately level, with the side with the 2 ball plugs on top. The round section with the notch for the sensor lead is the upstream side of the sensor. See Figure 1.. The label will show this also.



Because the sensor is very sensitive, you want to isolate the sensor from engine vibration. This is accomplished by keeping the hose between engine and sensor long (6 ft or more) to keep space between the engine and sensor

The sensor may collect liquid from condensation and oil vapors. You should periodically check by removing hoses and letting hoses drain, and tipping condensation out of both sides of sensor. When moving sensor which has accumulated liquid, be careful to keep the ball "plugs" up, so liquid can not get to this top side of the channel inside the meter.

In the DataMite software, pick Blowby Sensor for your range of sensor as the Type (Fig 2). Figure 2 also shows the calibration for older DataMite software or for other dyno computers. The output is non-linear and requires you to select the Type as "Custom (user supplies table)" as shown. This will open up the right side of the screen called "Sensor Calibration Table".

You can choose any Data Name you want. Then set the "Signal Based On" to "0-5 Volts". Fill in the table with the 10 pairs of values shown.

The Blow By Sensor **does** put a small restriction on the blowby flow, and therefore does put a small pressure on the crankcase. For 12 CFM sensor, a signal of 2 volts will produce 0.15 psi pressure. At full scale of 5 Volts (about 17 CFM), the pressure will be about 0.6 psi.

For non-DataMite wiring to customer's connector:

- Black is ground (bare shield wire can be connected to ground, or cut off)
- Red is 4.75 to 5.25 V power
- White is signal (A 47uF cap can be connected between black and white to stabilize signal. If blue cap supplied with black bar, black bar end goes to ground, indented end to white.)

Analog Sensor Specs
Revised 4/25/13

Calib: Cstm Table (5v) 1.15/0 1.4/4.34

Analog Sensor Specs

Type: Custom (user supplies table) Details

Data Name: blowby

Signal Based On: 0-5 Volts

Correction:

Notes:

Buttons: Keep Specs | Help | Cancel | Print

Sensor Calibration Table

	Volts	Data		Volts	Data
A	1.15	0	F	3.15	12.29
B	1.4	4.34	G	3.65	13.73
C	1.65	6.14	H	4.15	15.04
D	2.15	8.68	I	4.65	16.25
E	2.65	10.63	J	5	17.03

Figure 2

Resort Rows	Read DataMite
Clear Row	Insert Row
Delete Row	Clear All Rows

Equation for above curve is:
 $CFM = 8.67 \times \text{SqRt}(\text{Volts} - 1.15)$
 For DTS (6 volt power)
 $CFM = 10.4 \times \text{SqRt}(\text{Volts} - 1.4)$

Later versions of software *may* list Blowby Sensor in the list of "Types". Be sure to pick the correct range for your particular Blowby Sensor.

Later versions of software will let you "rezero" the sensor with this "Correction" (which must be first turned on in Preferences to see it).

the Calibration in factory sensor). The adjustment after example, after for a shock adjust this to read eight.

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 Performance Trends reserves the right to change or discontinue any product at any time

Blow By Sensor pub

Calibration For 3 CFM Meter

Analog Sensor Specs
✕

Calib

Analog Sensor Specs

Type

Data Name Details

Analog Sensor Specs

1st Value, Engineering Units

1st Value, volts Read

2nd Value, Engineering Units

2nd Value, volts Read

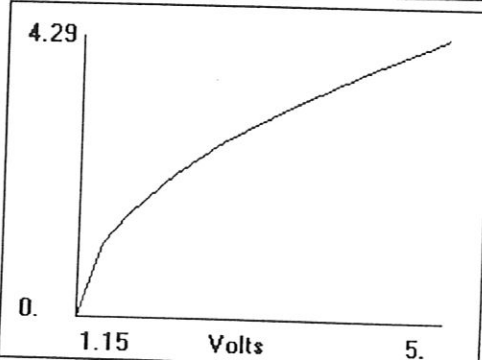
Signal Based On

Correction Read

Note:
Pick the type of sensor and fill in the Calibration Specs as necessary (or fill in from factory calibration table provided with sensor). The 'Correction' factor is meant for an adjustment after

Sensor Calibration Table

	Volts	Data		Volts	Data
A	1.15	0	F	3.15	3.07
B	1.4	1.09	G	3.65	3.44
C	1.65	1.54	H	4.15	3.77
D	2.15	2.17	I	4.65	4.07
E	2.65	2.66	J	5	4.29



Equation for above curve is:
 CFM = 2.17 x SqRt (Volts - 1.15)
 For DTS (6 volt power)
 CFM = 2.6 x SqRt (Volts - 1.4)

Calibration For 6 CFM Meter

Analog Sensor Specs
✕

Calib

Analog Sensor Specs

Type

Data Name Details

Analog Sensor Specs

1st Value, Engineering Units

1st Value, volts Read

2nd Value, Engineering Units

2nd Value, volts Read

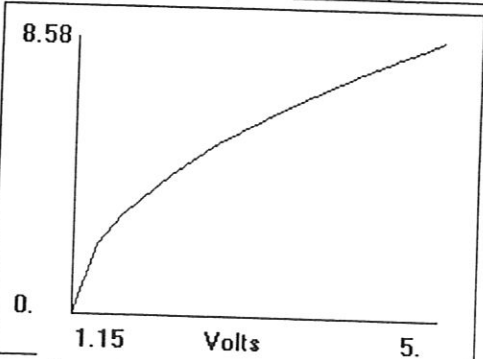
Signal Based On

Correction Read

Note:
Pick the type of sensor and fill in the Calibration Specs as necessary (or fill in from factory

Sensor Calibration Table

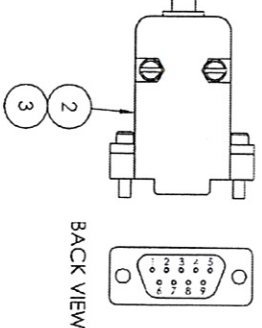
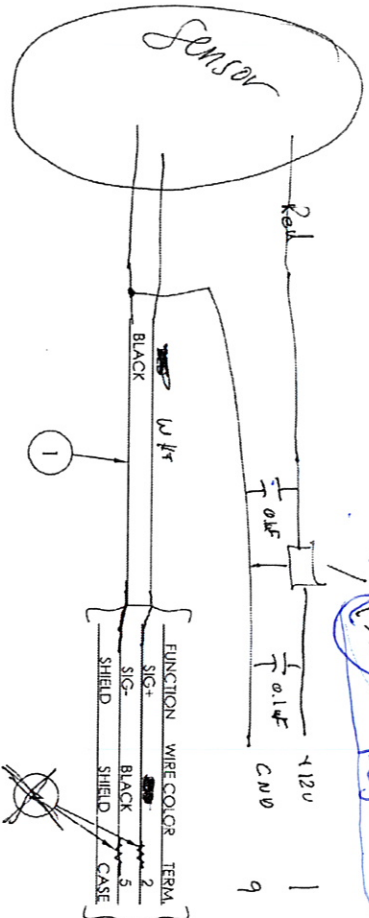
	Volts	Data		Volts	Data
A	1.15	0	F	3.15	6.15
B	1.4	2.17	G	3.65	6.87
C	1.65	3.07	H	4.15	7.53
D	2.15	4.34	I	4.65	8.13
E	2.65	5.32	J	5	8.58



Equation for above curve is:
 CFM = 4.34 x SqRt (Volts - 1.15)
 For DTS (6 volt power)
 CFM = 5.2 x SqRt (Volts - 1.4)

\$20278(+2) caps

13376 101 Volt Reg. Station 5V



ITEM NO.	QTY	CUT LG.	PART NO.	DESCRIPTION
1	1		12210	WIRE 22 AWG; 2 COND W/SHIELD GREY /FT
2	1		12209	SUB D SOCKET - 9 POSITION
3	1		X008	SHIELDED HOOD - 9 POSITION
4	1		28239	RES CAR FLM 1/4W 5% 1.0K OHM
5	1			CALIBRATOR-AIR FLOW - 3-POINT

NOTE:
 1. COMPLETE THE DRAWING NUMBER AND ITEM 1 CUT LG. BY ADDING THE LAST THREE DIGITS OF THE ASSEMBLY NO. TO BE PRODUCED. TO THE BLANKS PROVIDED.
 EXAMPLE: TO PRODUCE ASSEMBLY NUMBER 48109.003, THE DRAWING NUMBER WOULD BE 48109.003 AND ITEM 1 CUT LG. WOULD BE 3 FT.

REMOVED X-303

REV	DATE	ECN	DO NOT TEAR DRAWING	DESCRIPTION
2	2/18/10	5054		POWER TEST INC. UNIVERSAL AUXILIARY INPUT CABLE
1	2/20/06	3379		SID-BOX

Tim's Automotive

APPROVED 02/23/10

NAME: Tamm, Zornes
 DATE: 8-1-14
 UNITS COMPLETED: 1
 SIGN OFF: TZ
 50-15946/1
 7-30-2014
 Qty (1)
 Rgd 7-31-2014
 DLF