

APPENDIX F
WRAP OFFROAD DIESEL RETROFIT GUIDANCE DOCUMENT

APPENDIX F – EMISSIONS TESTING EQUIPMENT

Make/Model	Measurements	Limitations	Advantages	Cost	Comments
ATS Emission 5 Gas Analyzer	HC, CO, CO ₂ , O ₂ , NO _x , AFR & Lambda	Wired; 5 sensors	Certified to BAR-97; 1.5 to 2 second delay from sample to display	\$3,995	Includes software and technical support for 1 year
ECOM J2K	O ₂ , CO, NO, NO ₂ , SO ₂ (calculates CO ₂)	5 sensors	+2% accuracy; wireless	\$5,000-\$9,000	Price dependant on configuration and options
EMS Model 8000-5	HC, CO, CO ₂ , O ₂ , NO _x	Palm Pilot with Bluetooth required; no display	Wireless to 30 feet; no laptop required	\$3,995	1-3 year warranty
EMS Model 5001-4	HC, CO, CO ₂ & O ₂ (upgrade for NO _x avail)	Wired; 4 sensors; 9 second response	Certified to BAR-97	\$4,395	3 year warranty
EMS Model 5001-5	HC, CO, CO ₂ , O ₂ , NO _x	Wired; 5 sensors; 9 second response	Certified to BAR-97	\$4,995	3 year warranty
Horiba MEXA-324J	CO & HC	Wired; 10 second response	Warms up in 5 minutes		
Horiba MEXA-554J	CO, HC, CO ₂ , O ₂ , AFR & Lambda	Wired; 10 second response	Certified to BAR-97		Optional attached printer
testo 350	O ₂ , H ₂ , NO & NO ₂ (sensor upgrades avail)	Wired; 6 sensors	+2% accuracy; can link up to 8 analyzers to 1 controller	\$8,495	Comes as a kit (includes cases, extra filters, manuals); 1-2 year warranty
Sensors, Inc SEMTECH-D	HC, CO, CO ₂ , NO & NO ₂	70 lbs; +3-4% accuracy	Measures while vehicle is driven; data can be retrieved via cell or internet link		EPA's PEMS; can be installed in most light and heavy duty vehicles
Sensors, Inc SEMTECH PM-300	PM	0.3 to 2+ micron; 1 sec sampling rate	Measures while vehicle is driven; gasoline and diesel applications		Internal dilution tunnel

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Mustang "Dyno-to-go"	Engine characteristics	6,000 lbs max axle; 2,800 lbs	5 gas analyzer; opacity meter; AFR; OBD	\$55,660	80 psi air requirement
Mustang MD-SMK-DT	Opacity	1% accuracy; 0-100% opacity	Weather resistant		Integrated with Mustang dynamometers
Telonic Berkeley TBM300	Opacity (RPM, bar press, oil temp avail)	1% accuracy; 0-100% opacity	SAE J1667 compliant; includes pass/fail limits	\$4,995	Internal printer
AutoLogic Model 310-0322	Opacity	0-100% opacity	SAE J1667 compliant	\$5,395	Includes PC software and carrying case
Omitec PDA4GBD	HC, CO, CO2, O2, RPM, AFR (NOx avail)	Wired; 4 sensors; 4 second response	Certified to BAR-97; operates off of vehicle battery		Connects to other Omitec PDA equipment
Omitec PDA5GBD	HC, CO, CO2, O2, NOx, RPM, AFR	Wired; 5 sensors; 4 second response	Certified to BAR-97; operates off of vehicle battery		Connects to other Omitec PDA equipment
Omitec PDASM1100	Opacity, RPM	1% accuracy	Less than 4 minute warm-up		1 year warranty; software update capability
Wager 6500	Opacity, density	25' connecting cable	SAE J1667 compliant; stores 100 tests		Includes carrying case and printer interface
Wager 7500	Opacity, oil temp, RPM	Operating temp range 0-50C	SAE J1667 compliant		Replacement for the 6500; optional printer
Nova 7462	CO & HC	Wired; 2 sensors	Certified to BAR-97; plug-in smoke meter	\$3,170	Built-in printer
Nova 7463	CO, CO2 & HC	Wired; 3 sensors	Certified to BAR-97; plug-in smoke meter	\$3,850	Built-in printer
Nova 7464	O2, CO, CO2 & HC	Wired; 4 sensors	Certified to BAR-97; plug-in smoke meter	\$4,950	Built-in printer

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Nova 7465	O2, CO, CO2, HC, NOx	Wired; 5 sensors	Certified to BAR-97; plug-in smoke meter	\$6,220	Built-in printer
TSI Scanning Mobility Particle Sizer	PM	2.5-1000 nm; 50-300 second measuring time	60-600 second cycle time	\$50,000-\$90,000	Requires computer with 10Mb free space
Red Mountain Smoke Check 1667	Opacity		SAE J1667 compliant; no warm-up time; used by state governments		Weather does not affect test results
Argonne Real-Time Portable Exhaust Analyzer	PM, density		Real-time measurements; 1/20 second sampling	\$30,000-\$60,000	Uses Laser-Induced Incandescence (LII)
CE-CERT Mobile Heavy-Duty Diesel Emissions Laboratory	O2, CO, CO2, HC, NOx & PM	Currently used for Class 8 trucks only	Certification of trailer is higher than that of smog check	\$6,000/day; \$1,200/day travel + \$1.75/mile	Mobile, but based at the University of California - Riverside