

**MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT  
AIR QUALITY DIVISION**

April 5, 2010

**PERMIT TO INSTALL**  
No. 60-01E

**ISSUED TO**  
AVL Powertrain Engineering, Inc.

**LOCATED AT**  
47519 Halyard Drive  
Plymouth, Michigan 48170

**IN THE COUNTY OF**  
Wayne

**STATE REGISTRATION NUMBER**  
N7146

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Natural Resources and Environment. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203: <b>March 2, 2010</b>	
DATE PERMIT TO INSTALL APPROVED: <b>April 5, 2010</b>	SIGNATURE:
DATE PERMIT VOIDED:	SIGNATURE:
DATE PERMIT REVOKED:	SIGNATURE:

**PERMIT TO INSTALL**

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**Common Abbreviations / Acronyms**

<b>Common Acronyms</b>		<b>Pollutant/Measurement Abbreviations</b>	
AQD	Air Quality Division	BTU	British Thermal Unit
ANSI	American National Standards Institute	°C	Degrees Celsius
BACT	Best Available Control Technology	CO	Carbon Monoxide
CAA	Clean Air Act	dscf	Dry standard cubic foot
CEM	Continuous Emission Monitoring	dscm	Dry standard cubic meter
CFR	Code of Federal Regulations	°F	Degrees Fahrenheit
COM	Continuous Opacity Monitoring	gr	Grains
EPA	Environmental Protection Agency	Hg	Mercury
EU	Emission Unit	hr	Hour
FG	Flexible Group	H <sub>2</sub> S	Hydrogen Sulfide
GACS	Gallon of Applied Coating Solids	hp	Horsepower
GC	General Condition	lb	Pound
HAP	Hazardous Air Pollutant	m	Meter
HVLP	High Volume Low Pressure *	mg	Milligram
ID	Identification	mm	Millimeter
LAER	Lowest Achievable Emission Rate	MM	Million
MACT	Maximum Achievable Control Technology	MW	Megawatts
MAERS	Michigan Air Emissions Reporting System	ng	Nanogram
MAP	Malfunction Abatement Plan	NO <sub>x</sub>	Oxides of Nitrogen
MDNRE	Michigan Department of Natural Resources and Environment (Department)	PM	Particulate Matter
MIOSHA	Michigan Occupational Safety & Health Administration	PM10	PM less than 10 microns diameter
MSDS	Material Safety Data Sheet	PM2.5	PM less than 2.5 microns diameter
NESHAP	National Emission Standard for Hazardous Air Pollutants	pph	Pound per hour
NSPS	New Source Performance Standards	ppm	Parts per million
NSR	New Source Review	ppmv	Parts per million by volume
PS	Performance Specification	ppmw	Parts per million by weight
PSD	Prevention of Significant Deterioration	psia	Pounds per square inch absolute
PTE	Permanent Total Enclosure	psig	Pounds per square inch gauge
PTI	Permit to Install	scf	Standard cubic feet
RACT	Reasonably Available Control Technology	sec	Seconds
ROP	Renewable Operating Permit	SO <sub>2</sub>	Sulfur Dioxide
SC	Special Condition	THC	Total Hydrocarbons
SCR	Selective Catalytic Reduction	tpy	Tons per year
SRN	State Registration Number	µg	Microgram
TAC	Toxic Air Contaminant	VOC	Volatile Organic Compounds
TEQ	Toxicity Equivalence Quotient	yr	Year
VE	Visible Emissions		

\* For High Volume Low Pressure (HVLP) applicators, the pressure measured at the HVLP gun air cap shall not exceed ten (10) pounds per square inch gauge (psig).

### GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Natural Resources and Environment, P.O. Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R 336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to R 336.1219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of R 336.1219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Natural Resources and Environment. **(R 336.1219)**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R 336.1301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R 336.1303. **(R 336.1301)**
  - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
  - b) A visible emission limit specified by an applicable federal new source performance standard.
  - c) A visible emission limit specified as a condition of this Permit to Install.
  
12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R 336.1370(2). **(R 336.1370)**
  
13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R 336.2001 and R 336.2003, under any of the conditions listed in R 336.2001. **(R 336.2001)**

**SPECIAL CONDITIONS**

**EMISSION UNIT SUMMARY TABLE**

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

<b>Emission Unit ID</b>	<b>Emission Unit Description (Process Equipment &amp; Control Devices)</b>	<b>Installation Date / Modification Date</b>	<b>Flexible Group ID</b>
EU-TESTCELL1	295 horsepower dynamometer test cell which has the capability to burn gasoline, diesel, natural gas, liquefied petroleum gas (LPG), propane, methane, and ethanol Stack ID: SV-TESTCELL1 and SV-TESTCELL1A*	1/1/1999	FG-TESTCELLS
EU-TESTCELL2	675 horsepower dynamometer test cell which has the capability to burn gasoline, diesel, natural gas, liquefied petroleum gas (LPG), propane, methane, and ethanol Stack ID: SV-TESTCELL2 and SV-TESTCELL2A*	5/1/2001	FG-TESTCELLS
EU-TESTCELL3	51 horsepower dynamometer test cell which has the capability to burn gasoline, diesel, natural gas, liquefied petroleum gas (LPG), propane, methane, and ethanol Stack ID: SV-TESTCELL3	5/1/2001	FG-TESTCELLS
EU-TESTCELL4	800 horsepower dynamometer test cell which has the capability to burn gasoline, diesel, natural gas, liquefied petroleum gas (LPG), propane, methane, and ethanol Stack ID: SV-TESTCELL4 and SV-TESTCELL4A*	7/14/2003	FG-TESTCELLS
EU-TESTCELL5	590 horsepower dynamometer test cell which has the capability to burn gasoline, diesel, natural gas, liquefied petroleum gas (LPG), propane, methane, and ethanol Stack ID: SV-TESTCELL5	8/1/2002	FG-TESTCELLS
EU-TESTCELL6	442 horsepower dynamometer test cell which has the capability to burn gasoline, diesel, natural gas, liquefied petroleum gas (LPG), propane, methane, and ethanol Stack ID: SV-TESTCELL6 and SV-TESTCELL6A*	8/1/2002	FG-TESTCELLS
EU-TESTCELL7	442 horsepower dynamometer test cell which has the capability to burn gasoline, diesel, natural gas, liquefied petroleum gas (LPG), propane, methane, and ethanol Stack ID: SV-TESTCELL7	5/1/2002	FG-TESTCELLS
EU-TESTCELL8	225 horsepower dynamometer test cell which has the capability to burn gasoline, diesel, natural gas, liquefied petroleum gas (LPG), propane, methane, and ethanol Stack ID: SV-TESTCELL8&9**	10/8/2007	FG-TESTCELLS

<b>Emission Unit ID</b>	<b>Emission Unit Description (Process Equipment &amp; Control Devices)</b>	<b>Installation Date / Modification Date</b>	<b>Flexible Group ID</b>
EU-TESTCELL9	225 horsepower dynamometer test cell which has the capability to burn gasoline, diesel, natural gas, liquefied petroleum gas (LPG), propane, methane, and ethanol Stack ID: SV-TESTCELL8&9**	10/8/2007	FG-TESTCELLS

\*Only one stack used at a time.

\*\*Test Cells 8 and 9 share a common stack.

Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.

**FLEXIBLE GROUP SUMMARY TABLE**

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FG-TESTCELLS	Nine dynamometer engine test cells	EU-TESTCELL1 through EU-TESTCELL9
FG-FACILITY	All process equipment source-wide including equipment covered by other permits, grand-fathered equipment and exempt equipment.	EU-TESTCELL1 through EU-TESTCELL9

**The following conditions apply to: FG-TESTCELLS**

**DESCRIPTION:** Nine dynamometer test cells used to test various fuels at the facility.

**Emission Units:** EU-TESTCELL1 through EU-TESTCELL9

**POLLUTION CONTROL EQUIPMENT:** None

**I. EMISSION LIMITS**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. CO	4,056 lb/day	Daily	FG-TESTCELLS	SC VI.1 SC VI.5 And the "Emission Factors" below	R 336.2804 40 CFR 52.21 (d)
2. CO	63.9 tpy	12-month rolling time period as determined at the end of each calendar month	FG-TESTCELLS	SC VI.2 SC VI.5 And the "Emission Factors" below	R 336.1205(1)(a) & (3)
3. PM-10	39.1 lb/day	Daily	FG-TESTCELLS	SC VI.3 SC VI.5 And the "Emission Factors" below	R 336.2803 R 336.2804 40 CFR 52.21 (c) & (d)
Emission Factors		Emission Factors		Emission Factors	
<u>Gasoline and Ethanol</u> CO = 3.12 lb/gal PM-10 = 0.0127 lb/gal		<u>Diesel</u> CO = 0.13 lb/gal PM-10 = 0.017 lb/gal		<u>Natural Gas, LPG, Propane, and Methane</u> CO = 0.38 lb/MMBtu PM-10 = 0.0095 lb/MMBtu	

## **II. MATERIAL LIMITS**

1. The diesel fuel usage for FG-TESTCELLS shall not exceed 2,300 gallons per calendar day. **(R 336.1225, R 336.1702 (a), R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d))**
2. The combined gasoline and ethanol usage for FG-TESTCELLS shall not exceed 1,300 gallons per calendar day. **(R 336.1225, R 336.1702 (a), R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d))**
3. The combined gasoline and ethanol usage for the EU-TESTCELL8 and EU-TESTCELL9 portions of FG-TESTCELLS shall not exceed 581 gallons per calendar day. **(R 336.1225, R 336.1702 (a), R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d))**
4. The combined gasoline, ethanol and diesel fuel usage for FG-TESTCELLS shall not exceed 175,000 gallons per 12-month rolling time period as determined at the end of each calendar month. **(R 336.1205 (1)(a) & (3), R 336.1225, R 336.1702 (a), R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d))**
5. The gasoline and ethanol usage for FG-TESTCELLS shall not exceed 35,000 gallons per 12-month rolling time period as determined at the end of each calendar month. **(R 336.1205 (1)(a) & (3), R 336.1225, R 336.1702 (a), R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d))**
6. The combined usage of natural gas, LPG, propane, and methane for FG-TESTCELLS shall not exceed 6,300 MMBTU per 12-month rolling time period as determined at the end of each calendar month. **(R 336.1205 (1)(a) & (3), R 336.1225, R 336.1702 (a), R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d))**

## **III. PROCESS/OPERATIONAL RESTRICTIONS**

NA

## **IV. DESIGN/EQUIPMENT PARAMETERS**

NA

## **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. Within 180 days after commencement of burning new fuels, the permittee shall verify the CO emission factor for natural gas, LPG, methane, and propane from a representative test cell of FG-TESTCELLS by testing at owner's expense, in accordance with Department requirements. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD. The AQD must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test. **(R 336.1205, R 336.2001, R 336.2003, R 336.2004, R 336.2803, R 336.2804, 40 CFR 52.21(c) & (d))**

## **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall keep, in a satisfactory manner, monthly and previous 12-month CO emission calculation records for FG-TESTCELLS. All records shall be kept on file and made available to the department upon request. **(R 336.1205 (1)(a) & (3))**
2. The daily CO emissions shall be calculated based upon monthly records, prorated to a daily rate. Should the prorated emission rate exceed 90 percent of the limit, the permittee shall keep daily records for a

minimum of two months until the emission rate falls below 90 percent of the limit. All records shall be kept on file and made available to the department upon request. **(R 336.2804, 40 CFR 52.21 (d))**

3. The daily PM-10 emissions shall be calculated based upon monthly records, prorated to a daily rate. Should the prorated emission rate exceed 90 percent of the limit, the permittee shall keep daily records for a minimum of two months until the emission rate falls below 90 percent of the limit. All records shall be kept on file and made available to the department upon request. **(R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d))**
4. The permittee shall keep, in a satisfactory manner, monthly gasoline and ethanol, diesel, natural gas, LPG, methane, and propane fuel use records for FG-TESTCELLS. All records shall be kept on file and made available to the Department upon request. **(R 336.1205 (1)(a) & (3), R 336.1225, R 336.1702, R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d))**
5. The permittee shall calculate the daily gasoline and ethanol and daily diesel fuel usage rates based upon monthly recordkeeping prorated to a daily rate. Should the prorated daily rate exceed 90 percent of the daily limit, the permittee shall keep daily records for a minimum of two months until the daily rate falls below 90 percent of the daily limit. All records shall be kept on file and made available to the department upon request. **(R 336.1225, R 336.1702 (a), R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d))**

**VII. REPORTING**

NA

**VIII. STACK/VENT RESTRICTIONS**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SV-TESTCELL1	8	34.3	R 336.1225, R 336.2803 R 336.2804, 40 CFR 52.21 (c) & (d)
2. SV-TESTCELL1A	8	34.3	R 336.1225, R 336.2803 R 336.2804, 40 CFR 52.21 (c) & (d)
3. SV-TESTCELL2	14	33.2	R 336.1225, R 336.2803 R 336.2804, 40 CFR 52.21 (c) & (d)
4. SV-TESTCELL2A	14	33.2	R 336.1225, R 336.2803 R 336.2804, 40 CFR 52.21 (c) & (d)
5. SV-TESTCELL3	6	36	R 336.1225, R 336.2803 R 336.2804, 40 CFR 52.21 (c) & (d)
6. SV-TESTCELL4	12	41	R 336.1225, R 336.2803 R 336.2804, 40 CFR 52.21 (c) & (d)
7. SV-TESTCELL4A	12	41	R 336.1225, R 336.2803 R 336.2804, 40 CFR 52.21 (c) & (d)
8. SV-TESTCELL5	12	41	R 336.1225, R 336.2803 R 336.2804, 40 CFR 52.21 (c) & (d)

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
9. SV-TESTCELL6	12	41	R 336.1225, R 336.2803 R 336.2804, 40 CFR 52.21 (c) & (d)
10. SV-TESTCELL6A	12	41	R 336.1225, R 336.2803 R 336.2804, 40 CFR 52.21 (c) & (d)
11. SV-TESTCELL7	12	41	R 336.1225, R 336.2803 R 336.2804, 40 CFR 52.21 (c) & (d)
12. SV-TESTCELL8&9	12	32	R 336.1225, R 336.2803 R 336.2804, 40 CFR 52.21 (c) & (d)

**IX. OTHER REQUIREMENTS**

NA

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

**The following conditions apply Source-Wide to: FGFACILITY**

**POLLUTION CONTROL EQUIPMENT:** None

**I. EMISSION LIMITS**

NA

**II. MATERIAL LIMITS**

1. The natural gas usage for FG-FACILITY shall not exceed 50 million cubic feet per 12-month rolling time period as determined at the end of each calendar month. **(R 336.1205 (1)(a) & (3))**

**III. PROCESS/OPERATIONAL RESTRICTIONS**

NA

**IV. DESIGN/EQUIPMENT PARAMETERS**

NA

**V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

NA

**VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall keep, in a satisfactory manner, monthly and previous 12-month natural gas use records for FG-FACILITY. All records shall be kept on file and made available to the Department upon request. **(R 336.1205 (1)(a) & (3))**

**VII. REPORTING**

NA

**VIII. STACK/VENT RESTRICTIONS**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

NA

**IX. OTHER REQUIREMENTS**

NA