FY2016 Insp

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Self Initiated Inspection

N558236196

FACILITY: ROBERT BOSCH L.L.C.		**SRN / ID:** N5582
LOCATION: 38000 HILLS TECH DR, FARMINGTN HLS		**DISTRICT:** Southeast Michigan
CITY: FARMINGTN HLS		**COUNTY:** OAKLAND
CONTACT:		**ACTIVITY DATE:** 08/23/2016
STAFF: Iranna Konanahalli	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: FY 2016 SM CMS level-2 inspection of Robert Bosch Corporation ("Bosch")		
RESOLVED COMPLAINTS:		

N5582 - SAR - 2016 0823

Robert Bosch Corporation (N5582)
38000 Hills Tech Drive
(Between 11 & 12 Mile Roads)
Farmington Hills, Michigan 48331-3417

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PTI Mod: PTI No. 259-05 → PTI No. 259-05A (PTI No. 259-05 was revised [Tom Julien] to incorporate NSPS Dc standards due errors in the PTI as a result of an inaccurate application; the revision was recommended by SEMI District based upon FY2007 inspection)

ROP Opt-out Permit-to-Install No. 259-05A dated July 25, 2007

Void: Permit-to-Install No. 312-95 dated August 1, 1995 for ground water remediation (voided on August 3, 2005). PTI No. 259-05 (07/25/2007).

NSPS Dc: Subject to New Source Performance Standards for Small Industrial-Commercial-Institutional Steam Generating Units (40 CFR, Part 60, Subpart Dc or NSPS Dc).

May be subject to Area Source NESHAP / MACT ZZZZ or RICE MACT 4Z, 40 CFR Parts 60 and 63, National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines; New Source Performance Standards for Stationary Internal Combustion Engines; Final Rule (Page 6674 Federal Register / Vol. 78, No. 20 / Wednesday, January 30, 2013 / Rules and Regulations). In addition, Page 48072, Federal Register / Vol. 79, No. 158 / Friday, August 15, 2014 / Rules and Regulations / Notice of final decision on reconsideration. AQD has decided not to take delegation of these standards and therefore no attempt has been made to evaluate the Bosch's compliance with NESHAP / RICE MACT 4Z.

On August 23, 2016, I conducted a SM CMS level-2 inspection of Robert Bosch Corporation ("Bosch") located at 38000 Hills Tech Drive, Farmington Hills, Michigan 48331-1612. The inspection was conducted to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994, PA 451; Michigan Department of Environmental Quality, Air Quality Division (MDEQ-AQD) administrative rules; and ROP Opt-out Permit-to-Install No. 259-05A.

Mr. Mike Mansuetti (E-mail: Mike.Mansuetti@us.bosch.com) is responsible official.

During the inspection, Mr. Herbert Daumann (Phone: 248-876-1496; Cell: 248-881-2507; Fax: 248-876-1132; E-mail: Herbert.Daumann@us.bosch.com), Coordinator, Security and Environmental, Health & Safety, assisted me. Mr. Todd Brigmon (Cell: 248-408-5578: E-mail Todd.Brigmon@us.bosch.com) HSE Manager, was also present.

Ms. Jill Kupcak (Phone: 248-876-2135; Fax: 248-876-1132; Cell: 248-505-7163; E-mail: jill.kupcak@us.bosch.com)is no longer responsible for EHS responsibilities since May 2012. Mr. Benjamin J. Kroeger separated from Bosch in 2009

As a leading supplier in the automotive industry, Robert Bosch Corporation has made its Farmington Hills, Michigan, facility the headquarters for its North American automotive businesses. The facility houses more than 1,000 employees. The 410,000-square-foot facility contains outstanding research and development capabilities including a wiper lab, NVH (Noise, Vibration, Harshness) chambers and a software development lab, plus sales and administrative staff offices and meeting facilities. This building is an important cornerstone of the Farmington Hills campus, which also includes capabilities for vehicle test builds, hydraulics labs and a vehicle test instrumentation group along with gage tracking support. Bosch delivers a variety of electrical, electronic, powertrain, and chassis components and systems worldwide. Bosch also performs engineering and R&D at this facility for spark-plugs, fuel pumps, fuel injectors, oxygen sensors, occupancy sensors for air bags, door latches, windshield wipers, starters, etc.

ROP Opt-out Permit-to-Install No. 259-05A dated July 25, 2007, Emission Unit Identification

EU-EngDyn1 - 250 HP Engine Test Dynamometer for engines burning indolene with catalytic converter control - Permit Exemption: R336.1285(g). Engine calibration is tested. Two catalytic converters (one turbo, one muffler) are present.

EU-EngDyn2 - 350 HP Engine Test Dynamometer for engines burning indolene with catalytic converter control - Permit Exemption: R336.1285(g). Engine calibration is tested. The emissions (CO, NOx) are checked everyday.

Dyno1 and Dyno2 are used for calibration work. 99 percent of time Indolene, which is a high Octaine (94) fuel is used.

EU-EngDyn3 - 200 HP Engine Test Dynamometer for engines burning indolene - Permit Exemption: R336.1285(g). 4-stroke small (ATV / snowmobile) engine. No control is used.

EU-EngDyn5 - 260 HP Engine Test Dynamometer for engines burning gasoline with catalytic converter control - Permit Exemption: R336.1285(g). Two catalytic converters are present. O2 sensor tests are performed. Unleaded gasoline is used.

EU-EngDyn6 - 90 HP Engine Test Dynamometer for engines burning indolene - Permit Exemption: R336.1285(g). Lawn mower tractor engines are tested. Unleaded gasoline is used. No control is used.

EU-EngDyn7 - 260 HP Engine Test Dynamometer for engines burning gasoline- Permit Exemption: R336.1285(g). This is a flexible cell where a variety of tests are conducted. No control is used. Unleaded gasoline is used. According to Ms. Kupcak, Dyno No. 7 is converted to Diesel Dyno (FY 2012 inspection)

EU-EngDyn8dsl - 175 HP Engine Test Dynamometer for engines burning diesel - Permit

Exemption: R336.1285(g). Diesel fuel is used.

EU-EngDyn9 - 250 HP Engine Test Dynamometer for engines burning gasoline- Permit Exemption: R336.1285(g). O2 sensor tests are performed. Catalytic control was installed a couple of years ago although permitted as no control. Unleaded gasoline is used.

EU-EngDyn10 - 235 HP Engine Test Dynamometer for engines burning gasoline with catalytic converter control - Permit Exemption: R336.1285(g). O2 sensor tests are performed. Unleaded gasoline is used.

EU-111BoilCB - Clever Brooks 8.37 mmBtu/hr natural gas boiler - Permit Exemption: R336.1282(b)(i).

EU-113BoilPK - Penthouse - Kewanee 9.82 mmBtu/hr natural gas boiler - Permit Exemption: R336.1282(b)(i). This boiler is revised as 10.5 million BTU per hour capacity during PTI revision and is subject to NSPS Dc.

EU-121BoilF - Fulton 1.26 mmBtu/hr natural gas boiler - Permit Exemption: R336.1282(b)(i).
EU-105BoilCB1 - Clever Brooks 6.28 mmBtu/hr natural gas boiler - Permit Exemption: R336.1282(b)(i).

EU-105BoilCB2 - Clever Brooks 6.28 mmBtu/hr natural gas boiler - Permit Exemption: R336.1282(b)(i).

EU-105BoilPK - Kewanee 9.82 mmBtu/hr natural gas boiler - Permit Exemption: R336.1282 (b)(i). This boiler is revised as 10.5 million BTU per hour capacity during PTI revision and is subject to NSPS Dc.

EU-EmerGen1 - 350 HP Emergency Generator burning diesel - Permit Exemption: R336.1282(b)(ii).

EU-EmerGen2 - 350 HP Emergency Generator burning diesel - Permit Exemption: R336.1282(b)(ii).

The emergency generators are used only during power interruptions; however periodic test runs are performed.

Flexible Group Identification

FG-EngDynNCgas - Gasoline/indolene Engine Dynamometers with no CO controls that are exempt from the requirements of R336.1201, including: EU-EngDyn3, EU-EngDyn6, EU-EngDyn7, EU-EngDyn9, and any such emission units meeting these requirements added in the future. NC means "no control"

FG-EngDynCCgas - Gasoline/indolene Engine Dynamometers with catalytic converter CO controls that are exempt from the requirements of R336.1201, including: EU-EngDyn1, EU-EngDyn2, EU-EngDyn5, EU-EngDyn10, and any such emission units meeting these requirements added in the future. CC means "catalytic converter"

FG-Boiler - EU-111BoilCB, EU-113BoilPK, EU-121BoilF, EU-105BoilCB1, EU-105BoilCB2, and EU-105BoilK and any miscellaneous natural gas-fired equipment considered part of the stationary source including the Buildings at 38000 Hills Tech Drive.

FG-Diesel - Includes EU-EmerGen1, EU-EmerGen2, and EU-EngDyn8dsl.

FG-SpaceHeat - Miscellaneous space heating equipment considered part of the stationary source including the Building 38455 Hills Tech Drive.

FG-FACILITY - All process equipment at the stationary source (including the neighborhood buildings) including equipment covered by other permits, grandfathered equipment and exempt equipment. FG-FACILITY also includes process equipment located at other buildings in Farmington Hills that Bosch owns / leases / controls.

CO emission factors

Flexible Group or Emission Unit(s)	CO Emission Factor*
FG-EngDynCCgas and FG-EngDynNCgas	3,940 lbs./kgal gasoline/indolene
FG-Boiler	84 lbs./MMscf natural gas
FG-Diesel	130 lbs./kgal diesel
*kgal is defined as 1000 gallons and MMscf is defined as million standard cubic feet. A CO destruction efficiency of 96 percent (by weight) shall be applied for each of the catalytic converters when calculating emissions from FG-EngDynCCgas. CC = catalytic converter. NC = no catalytic converter.	

The PTI includes ten dynamometer test stands, six natural gas fired boilers (each less than 10 million BTU per hour capacity as written; see below) and two emergency diesel generators. PTI No. 259-05 listed two Penthouse Kewanee boilers as 9.82 million BTU per hour each. This was incorrect based upon the boilerplate information and January 29, 2007, inspection. Each of the two boilers has a maximum input capacity of 10.5 million BTU per hour. Hence, the two boilers are subject to federal New Source Performance Standards for Small Industrial-Commercial-Institutional Steam Generating Units (40 CFR, Part 60, Subpart Dc or NSPS Dc).

As a result of January 29, 2007, inspection and SEMI District recommendation to Mr. Tom Julien of AQD-Permits, PTI No. 259-05 was revised as PTI No. 259-05A dated July 25, 2007 to include NSPS Dc standards for two boilers in question. Bosch was previously in violation of federal NSPS Dc regulations but came into compliance upon PTI revision and upon starting natural gas usage recordkeeping.

NSPS Dc Notification

Ms. Jill Kupcak submitted an NSPS Dc Notification dated October 19, 2007 (AQD received on October 23). Each boiler (EU-105BoilPK & EU-113BoilPK) is 10.5 million BTU per hour design capacity natural gas fired boiler; no fuel oil back-up capability.

NSPS Dc natural gas usage records are as part of the ROP opt-out permit. 73 million standard cubic feet (MM SCF) of natural gas per year was used (PTI No. 259-05A SC

1.1:submit NSPS Dc notification, 1.2:monthly natural gas usage records, 4.3: fuel usage and emissions info).

PTI No. 259-05A Compliance

In Dynos (Nos. 1, 2, 5 & 10) with catalytic converters, 25,451 gallons of gasoline per year was used (PTI No. 259-05A, SC 2.1, no fuel usage limits because of catalytic converters providing 96% control for CO). In Dynos (Nos. 3, 6, 7 & 9) with no catalytic converters, 1,153 gallons of gasoline per year was used (PTI No. 259-05A, SC 3.1 limit: 41,000 gallons per yearcombined gasoline/indolene). Plant-wide carbon monoxide (CO) emissions were 11.99 tons per year (PTI No. 259-05A, SC 4.1 limit: 90 tpy CO). The emission calculations are done using Excel spreadsheets (PTI No. 259-05A, SC 4.2: the required monthly calculations & 4.3: emissions info and emissions factors). 23,598 gallons of diesel per year [253 gal NC [No Control] diesel & 23,345 gal CC [Catalytic Control] diesel) and 73.2 million standard cubic feet (MM SCF) of natural gas per year were used (PTI No. 259-05A SC 1.2:monthly natural gas usage records, 4.3: emissions info).

1. Total gasoline = 52,237 gallons per year
2. NC gasoline = 1,153 gallons per year
3. CC gasoline = 25,451 gallons per year
4. Vehicle testing (chassis) gasoline = 23,056 gallons per year
5. Start-stop gasoline = 2,577 gallons per year
6. CNG (Compressed Natural Gas) = 300,731,900 SCF per year
7. Diesel =23,598 gallons of diesel per year [253 gal NC [No Control] diesel & 23,345 gal CC [Catalytic Control] diesel)
8. NG = 73.199 million standard cubic feet (MM SCF) of natural gas per year
9. MAERS-2015: CO = 11.99, NOX = 6.5, VOC =2.4 tons per year.

All data is based on CY 2015 records.

Permit-to-Install No. 312-95 dated August 1, 1995 (Remediation)

Per the letter dated July 19, 2005, remediation system was shutdown because the hydrocarbon removal had stabilized. Therefore, Permit-to-Install No. 312-95 dated August 1, 1995 was voided on August 3, 2005. On April 12, 1996, soil vapor extraction (SVE) had switched from catalytic oxidation to carbon adsorption. The remediation project is in the process of permanent closure per MDEQ-RD procedures.

About July 2, 2002, Ms. Jill Kupcak submitted a closure report. RD Facility ID No. is 00017150. Ms. Terri Gola is Project Manager.

Ten dynamometers and violation notice

Bosh has ten dynamometers; refer to the Fred Fung's letter dated May 23, 2005, for description of ten dynamometers. As a result of the letter of violation dated July 18, 2005, for violation of Act 451 of 1994, as amended, § 324.5522 (2) (a) (Category I facility fee) and Rule 336.1210 (Renewable Operating Permit), Bosh obtained an opt-out PTI No. 259-05, which contained errors due to incorrect PTI application. Based upon SEMI District recommendation, AQD revised PTI No. 259-05 to PTI No. 259-05A to include NSPS Dc standards. In addition, AQD issued the typographical correction letter dated September 18, 2007: Special Condition No. 4.3a is deleted and 4.3c is corrected to read "natural gas".

While Dyno Nos. 1, 2, 5 & 10 are equipped with the catalytic converters providing 96% control for carbon monoxide, Dynos Nos. 3, 6, 7 & 9 have no control.

According to Ms. Kupcak, Dyno No. 7 is converted to Diesel Dyno (FY 2012 inspection).

Engine Test Cells Vs Dynos

According to Ms. Kupcak's July 11, 2011, letter Bosch would be installing ten new engine test cell for testing start-stop engines. AQD has at this time allowed installation of the test engines pursuant to Rule 336.1285 (g) subject to restrictions of Rue 278. AQD further added that the existing opt-out permit (PTI No. 259-05A) may not be used to satisfy Rule 278.

Since car / truck idling emissions factors are used to satisfy Rule 278, an equivalent or better control for the test cell engine emissions must be installed.

The engines are continuously (within a period such as one year) installed and removed depending upon customer requests. Diesel and gasoline engine mix is continuously changed within a given period, say a year.

As of February 2015, ten start-stop engines (10 engines = 3 gas + 7 diesel) were installed. During the FY 2016 inspection zero engine was running although all ten start-stop test stations are present; however, in the beginning of CY2016 start-stop engine tests were performed. Gasoline engine test had begun by March 2012. Diesel engine test began about June 2012. All start-stop engines are computer controlled; manual start-stop is not done. The engines were not equipped with catalytic converters in the beginning as it was assumed not effective due to cold exhaust. Based upon the FY 2016 inspection, Bosh installed catalytic converters for all ten stop-engines as it figured out proper catalyst.

AQD allowed installation of engine test cells pursuant to Rule 336.1285(g) subject to Rule 278 restrictions. The opt-out permit may not be used to satisfy Rule 278 restrictions. Further, AQD may be developing General Permit-to-Install for engine test cells.

Bosch is using car / truck idling vehicle emission factors to calculate emissions pursuant to Emission Facts EPA-420-F-98-014 dated April 1998. Hence, equivalent or better than motor vehicle controls must be installed for engine test cells for US EPA factors to be valid. It may be noted that US EPA tests may include warm catalysts and cars equipped with catalytic converters. However, Bosch does not control start-stop engine emissions.

The start-stop test cell engines do not have any load. All dyno (dynamometer) engines have load.

Mr. Victor Calles (248-876-2569) is supervisor of the test labs.

Right to unfettered access

On September 19, 2012, Mr. Brigmon stated that the start-stop engines are exempt and therefore records were not necessary. This is incorrect. Bosch is required to keep separate records of emissions to satisfy Rule 278. In addition, Bosch must keep description, installation and removal dates of the engines. Mr. Brigmon also stated that all inspections must be done with prior appointment and seemed suggest restrictions on facility access. I explained to him that an inspection with an appointment or any restriction to facility access is against US EPA and MDEQ-AQD policy. As a matter of fact US EPA requires states to perform unannounced

inspections.

August 16, 2010, Hyundai letter

In connection with Hyundai America Technical Center, Inc., AQD sought US EPA determination, via December 10, 2008, letter, regarding potential-to-emit (PTE) calculations and permitting of engine and chassis dynamometers. EPA communicated to AQD, via August 16, 2010, letter, its determination that chassis dynamometers were regulated as stationary sources since the vehicles were not put into commerce. AQD Chief Hellwig wrote a letter dated September 1, 2010, to each known affected source with a copy of US EPA's determination (August 16, 2010, letter to Mr. Hellwig from Ms. Cheryl L. Newton of Region V).

Therefore, the emissions from chassis dynamometers (fully-assembled vehicles) must be included as part of PTI No. 259-05A record-keeping. Bosch decided not to modify PTI No. 259-05A to incorporate the Hyundai determination. However, it must include chassis dyno emissions (PTI No. 259-05A, FG-Facility, SC 4.1 limit: 90 tpy CO). All calculations must be performed by 15th day of the calendar month (PTI No. 259-05A, FG-Facility, SC 4.2).

The emergency generators (2)

The two diesel fired emergency generators (350 HP Spectrum Detroit Diesel 400) are used only during power interruptions; however periodic test runs are performed.

1. Engine Model: John Deere 5030; Engine Serial No. 5030I119550; Generator Model: MTU 60; Generator Serial No. 359047-1-10413; 60 kW (480 volts)

2. Engine Model: 6063HK35; Engine Serial No. 06R0540227; Generator Model: 400DSE; Generator Serial No. 0659723; 405 kW (480 volts)

May be subject to Area Source NESHAP / MACT ZZZZ or 4 Z, 40 CFR Parts 60 and 63, National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines; New Source Performance Standards for Stationary Internal Combustion Engines; Final Rule (Page 6674 Federal Register / Vol. 78, No. 20 / Wednesday, January 30, 2013 / Rules and Regulations). In addition, Page 48072, Federal Register / Vol. 79, No. 158 / Friday, August 15, 2014 / Rules and Regulations / Notice of final decision on reconsideration. AQD has decided not to take delegation of these standards and therefore no attempt has been made to evaluate the Bosch's compliance with NESHAP / MACT 4 Z.

Diesel Emergency Generator - Existing RICE engines

Change oil/filter & inspect hoses/belts every 500 hours or annually; inspect air cleaner (CI) or spark plugs (SI) every 1,000 hours or annually. No emission standards.

These activities appear to be performed as part of preventive maintenance.

Conclusion

Robert Bosch Corporation is now in compliance with NSPS Dc standards for two boilers and PTI No. 259-05A. The start-stop engines are subject to Rule 278 limits and attendant record-keeping.

NAME J Allen Marshall DATE 08/29/2016 SUPERVISOR Joyce Zhou