

N2915
TMNA
Manu
Washt.

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection**

N291545855

FACILITY: TOYOTA MOTOR NORTH AMERICA R&D		SRN / ID: N2915
LOCATION: 1555 WOODRIDGE, ANN ARBOR		DISTRICT: Jackson
CITY: ANN ARBOR		COUNTY: WASHTENAW
CONTACT: Terryl Blackmore , Sr. Engineering Manager, M&O		ACTIVITY DATE: 08/30/2018
STAFF: Diane Kavanaugh-Vetort	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Complete scheduled compliance inspection at Title V Facility. PCE/FCE		
RESOLVED COMPLAINTS:		

N2915 Toyota Motor North America (TMNA) 1555 and 1588 Woodridge, Ann Arbor referred to as " Ann Arbor Campus".

TMNA Contacts: Terryl Blackmore, Senior Engineering Manager, terryl.blackmore@toyota.com (734)695-5893, Josh Strapec, Engineer, Briggs Hamilton, and Casel Burnett. All accompanied AQD during the inspection.

On August 30, 2018 the MDEQ AQD conducted a complete scheduled compliance inspection at the Toyota Motor North America (TMNA) facility located at 1555 and 1588 Woodridge, Ann Arbor, MI. The purpose of the inspection is to determine TMNA's compliance status with applicable federal and state Air Pollution Control Regulations, particularly Michigan Act 451, Part 55 Air Pollution Control, the administrative rules and the conditions of their Title V Renewable Operating Permit (ROP) MI-ROP-N2915-2017a. TMNA has a ROP Modification (b) currently Proposed. They also have an AQD New Source Review Permit to Install (PTI) Revision in-house, application 186-13E with Catherine Asselin (CJ) Permit Engineer. This is primarily to simplify EU/FG and consolidate facility wide emission and fuel usage limitations.

During the FCE period, TMNA was issued a Violation Notice dated 11-6-2017 for EU-EG-6 that was subsequently resolved 12-11-17. TMNA reported deviation in 1st Semi-annual, test pattern identified (fuel-rich, high air) intermittently resulted in catalytic converter not meeting ULEV standard efficiency resulting in excess CO emissions on short term basis. Reported period as Jan to May 23, 2017 when ceased operating this pattern. Submitted PTI application revision to account for this test pattern which was approved/issued.

This facility also has an installed permit exempt natural gas fired Emergency Generator subject to federal National Emission Standard for Hazardous Air Pollutant (HAP) for Reciprocating Internal Combustion Engines (RICE) 40 CFR Part 63, Subpart ZZZZ also referred to as Maximum Achievable Control Technology (MACT) standard or RICE MACT. The facility is also subject to the Gasoline Dispensing Facilities MACT Subpart CCCCCC for dispensing fuel to engine testing dynamometers and fleet vehicles.

TMNA operates what they call two "campuses". The Ann Arbor site is a Major Stationary Source ROP subject facility (N2915) and the York Twp. site, Platt Rd. has a HAP Opt Out Permit (P0615). Both TMNA facilities are Minor (Area) Sources of HAPs. TMNA's N2915 2017 Michigan Air Emissions Report shows 46 tons CO, 7 tons NOx, and 2 tons VOC was emitted during the calendar year. During this review period ROP Certifications and Deviation Reports were all received timely and reviewed. TMNA does not have any outstanding non-compliance issues.

TMNA operates vehicle and engine research and developmental testing for their automobile manufacturing company at the Ann Arbor location. The site contains two buildings referred to as Evaluation and Powertrain. On this day I initially met the TMNA contacts at the York Twp. facility. Following that inspection (see Separate Report) TMNA contacts and I drove separately to the Woodridge Road facility for this inspection. The prior AQD inspection of both facilities was August 11, 2016.

PRE-INSPECTION CONFERENCE

AQD explained the purpose of the inspection and requested general facility information and updates. Terryl provided me with two (Ann Arbor & York) one-page color site photos and building drawings with some information about each site's acreage and square feet. The Ann Arbor site is 15 acres and was built in 1987. It is located in an industrial park on the east side of highway US 23.

FACILITY SITE INSPECTION and ROP MI-ROP-N2915-2017a REVIEW

Today's inspection included both the Evaluation Building (EV, 1555) and Powertrain Building (PT, 1588). Emission Units and Flexible Groups (EU/FG) are located in both buildings and are identified mostly by EV or PT. TMNA operates both Chassis dynamometers (CHY) and Engine Test Stands/Cells dynamometers (EG). Gasoline is the primary fuel used and the facility has multiple above ground and underground storage tanks (FG-TANKS, FG-GDFMACT).

TMNA informed me that the new Regenerative Thermal Oxidizer (RTO) and Engine Dynamometer flexible group FG-EG789 are mostly installed and operational. EG-7 is still undergoing some construction, the rest are completed. The RTO was observed to be operating during the inspection even with no EG operating. This is primarily because RTO units are not easily started up and shut down, as it takes awhile to get to required operating temperature. It is large and appeared to be in excellent (new) condition. AQD received and approved TMNA's RTO Malfunction Abatement Plan (MAP) on 4-19-18. I observed the control panel and the temperature was being recorded; required minimum is 1425 degrees F. TMNA set a Temperature automatic shut-off at 1440 degrees F. I observed the current temperature reading was 1509 degrees F. RTO appears to be operating in compliance.

TMNA's Proposed ROP Modification incorporates updates to the federal CAM conditions and plan. CAM was updated for EU: EG1, 2, 5, TM1, 4, 5 all for Catalyst Control Systems (CCS). A Programmable Logic Controller (PLC) is proposed to be used to monitor fuel throughput in lieu of reaching a minimum temperature in certain Engine Types and Testing scenarios. Temporary monitoring devices showed the temperature in/out and fuel throughput. I observed these were installed & sitting on top of the Control panels at each of the subject Test Cells pending receipt of permanent PLCs. Per Terryl PLCs have been ordered. During the inspection I observed most of the Test Cell areas. TM6 is electric, TM1, 4, and 5 were not operating and EG-5 was not operating. All Cells required to have installed CCS appear to, which could be observed through the Cell windows.

I observed RG-GENSETS, these are the two new natural gas fired stationary generators, 1,573 bhp (1,141 kW). One was operating and I was told one will be used as standby, or backup. The Units appeared to be in excellent condition, brand new and large units with individual exhaust stacks. Each Unit is equipped with a Catalyst and LEANOX air-to-fuel controllers. I was able to see the catalyst section located in stack. Units are non-certified Generators subject to NSPS JJJJ with NOx, CO and VOC limits. Per TMNA they are scheduled to have performance testing on October 11th. Per Josh protocol will be submitted soon. I requested records of fuel usage and hours of operation be submitted to me following the inspection.

FG-GDFMACT records require gasoline throughput of less than 100,000 gallons on an annual average determined monthly. TMNA stated they are in compliance with this. I requested these records be submitted to me following the inspection.

EUEMERGEN – TMNA said they run weekly tests and do annual maintenance. I observed it was not operating and appeared to be in good condition. The Unit is Rule 201 permit exempt emergency generator subject to the RICE MACT. The Unit was reviewed previously and AQD does not have delegation of authority for this Area Source MACT. Per Terryl they did experience some outages requiring its use over the past year.

EG-6 was observed and it was not operating today. This Unit underwent performance testing earlier this year (AQD observed) and was compliant with permit emission limits.

During the inspection I observed two new Above Ground Gasoline Storage Tanks were installed during the new construction/expansion. We observed the tanks from beyond a fenced location. The plates appeared to show each tanks was 4000 gallon capacity. This was later found to be inaccurate. The tanks are fenced in together and are located next to the new RG-GENSETS. TMNA was advised to review whether the Tanks themselves and the fuel throughput was provided to AQD Permits Section with the current PTI Revision application in-house. I told TMNA they are also required to demonstrate exemption from Rule 201 if applicable. I sent an email to CJ, Permit Engineer following the inspection. TMNA followed up by submitting all required information to Permits Section:

- The **West tank** consists of 3 compartments at 4,000 gallons each. = 12,000 gallon capacity
- The **East tank** consists of 4 compartments at 3,000 gallons each. = 12,000 gallon capacity

- Each compartment has a vent with an **outside diameter of 3.5 Inches**. I would guess the **inside diameter at 3.25 Inches**.
- Each **vent height** is approximately **34.25 ft** (411 Inches) from the concrete pad.

The new Tanks have been added to the Permit application and are currently under evaluation for applicable requirements.

RECORD KEEPING REVIEW

ROP EU/FG are listed below by Building location. Chassis or Engine Dynamometers reference a Control System if applicable. EG-6 is identified with CAT AGING and Catalyst meets or exceeds LEVII -ULEV. Individual Catalytic Converter (CC) is integral to the engine and meets ULEV or LEV standards. CCS is stand alone Catalyst Control System and (RTO) Regenerative Thermal Oxidizer. Some may also be identified as "Uncontrolled/Dummy Catalyst" or "Uncontrolled/High Speed".

EV BUILDING (1555):

FG-EVCHDYNOS (EU-CHDY7, 8, 9, 10) the Chassis Dynos as of the date of the inspection have not yet been commissioned into operation. They will operate with CC LEV or UNCONTROLLED/DUMMY CAT. Have CO and fuel usage combined limits.

EU-ANECHOIC (CC): Fuel only limit. TMNA records received show 12 month rolling gasoline throughput for month ending August 2018 = 172 gallons < 2000 gallon limit.

EU-ENVIRON (CC): Fuel only limit. TMNA records show 12 month rolling gasoline throughput for month ending August 2018 = 849 gallons < 2245 gallons limit.

EU-COLD: Permit description says fully assembled vehicles and stand along engines. Uncontrolled Emission Factor (EF) 5,090 lb CO/1000 gallons fuel is used to calculate emissions. CO emission limit = 6.93 pounds per hour (test) and 0.35 tons per 12 month rolling time period as determined at the end of the month. Fuel usage limit = 100 gallons per 12 month rolling period as determined at end of the month.

TMNA Report states no emissions/fuel usage and that Cell doesn't involve combustion of fuel. I verified this is correct with TMNA. They have chosen to keep the current description & limits in new PTI for future use and operational flexibility.

FG-TANKS (TANK 1, TANK 2, TANK 5): TANK1 serves Fleet vehicles and has GDF MACT limit of 100,000 gallons annual average monthly throughput. Monthly report indicates @ 4000 gallons per month is average.

TANK 2 reported 12 month rolling fuel usage as of August 2018 = 460.7 gallons; and is compliant with GDF MACT (same limit).

TANK 5 reported 12 month rolling fuel usage as of August 2018 = 3,616.1 gallons; and compliant with GDF MACT (same limit).

NEW ABOVEGROUND TANKS: Records refer to Tanks as West and East, in new PTI will be #6 and #7. Received first fuel delivery in January 2018. At this time they will be permitted.

West and East Tanks are also subject to the GDF MACT. West received gasoline fuel (gal): 9,000 in January, 3,000 in each of May, July, and August. East received gasoline fuel (gal): 12,000 in January, 3,000 in May and July, and 6,000 in August.

Combined GDF Category Annual Average Monthly throughput was 21,000 in January. It decreased to 10,500 in February, 7,000 in March, 5250 April, 4800 May, 4000 June, 3857.1 July, and 4125 in August. Compliant with <100,000 limit.

FG-EG789 (RTO): It is noted these Dynamometers and RTO commenced operation as of February 2018. EG -7 is still being commissioned.

EF 509 lb CO/ 1000 gal fuel. Combined CO emission limit = 13.2 tons per 12 month rolling time period as determined at the end of the month. Report CO emissions 0.3 tons as of August 2018. Combined Fuel usage limit = 52,000 gal per 12 month rolling period as determined at end of the month. Report Fuel usage 1,277 gallons as of August 2018.

EU-EMERGEN: Emergency Generator subject to RICE MACT (applicable requirement under FG-RICEMACT). Recordkeeping indicates well below 100 hours per year maintenance and testing, and non emergency use was less than 50 hours per year. Emergency use 2018 occurred in March, April, and June, very low hours.

PT BUILDING (1588):

FG-EG125 (CCS): EF 509 lb CO/ 1000 gallons fuel. CO Emission limit = 79.4 pph, 37.1 tons per 12 month rolling period as determined at the end of the month. Report CO Emissions 1.8 tons as of August 2018. Fuel usage limit = 145,846 gallons. Report 7,043.7 gallons as of August 2018.

FG-EG34 (CC and UNCONTROLLED/HIGH SPEED): EF 187.4 lb CO/ 1000 gal fuel ULEV and EF 6930 lb CO/ 1000 gal fuel UNCONTROLLED/HIGH SPEED. CO Emission limit is combined = 721 pph, 76.8 tons per 12 month rolling time period as determined at the end of the month.

ULEV: Report 3098.6 gallons fuel used as of August 2018 < Limit 80,000 gallons. UNCONTROLLED/HIGH SPEED: Report 8,208.9 gallons fuel used as of August 2018 < Limit 20,000 gallons.

EU-EG6 (CAT AGING; meets or exceeds LEVII or ULEV): EF 502.67 lb CO /1000 gal fuel. CO limit = 10.1 pph, 5.62 tons per 12 month rolling time period as determined at the end of month. Report 1.2 tons as of August 2018.

Fuel Limit = 22,360 gallons per 12 month rolling time period as determined at the end of month. Report 13,017.9 gallons as of August 2018.

FG-TM145 (CC): EF 509 lb/ 1000 gal fuel. CO emission limit is combined = 30.54 pph, 52.2 tons per 12 month rolling time period as determined at the end of the month. Report CO 5.2 tons as of August 2018. Fuel limit is combined = 205,000 gallons per 12 month period as determined at the end of month. Report combined fuel usage 20,456.7 as of August 2018.

FG-PTCHDYNOS consists of Chassis Dynos 1-6 (CC meets or exceeds LEV or UNCONTROLLED/DUMMY CAT). Combined CO Emission Limit and separate Fuel usage limits. EF 234 lb CO/1000 gal fuel for LEV and EF 6930 lb CO/1000 gal fuel UNCONTROLLED/DUMMY CAT. CO emission limit = 144.5 pph, 3.14 tons per 12 month rolling time period as determined at the end of the month.

Combined CO Emissions (LEV only) report 0.5 tons per 12 month rolling period as determined at end of the month < Limit of 3.14 tons.

LEV Report 4075.8 gallons fuel used as of August 2018 < Limit 15,000 gallons per 12 month rolling period as determined at the end of the month. UNCONTROLLED/DUMMY CAT was not operated during the prior 12 month rolling period. Limit is 400 gallons.

EU-UPDOWN (CC): CO emission limit = 0.7 pph and 5.66 tons CO per 12 month rolling period as determined at the end of each month. Records are kept by specific type of catalyst: ULEV EF 187.4 lb CO/1000 gallons fuel and LEV EF 234 lb CO/1000 gallons fuel. Fuel usage limits are different. ULEV = 21,879 and LEV = 30,879 gallons per 12 month rolling period.

NOTE: Only ULEV Catalyst type was operated in the previous 12 months. CO Emissions report 0.3 tons as of August 2018. Report Fuel usage 2874.46 gallons as of August 2018.

TMNA submitted a summary of the CO pph emission limits for EU/FG with limits which are based on maximum hourly fuel usage (gal/hr) and CO EF (lb/1000gal). I contacted CJ, Permits Section and she confirmed the limits were based on testing and they have been removed from the proposed PTI. Now any permit mandatory testing specifies EF verification. AQD can request future testing at any time as well.

COMPLIANCE SUMMARY

I requested and received all necessary recordkeeping following the inspection in approximately two email/hard copy submittals for this facility. All required and requested records were received timely and are attached to this report for the files.

AQD determined TMNA is in substantial compliance with the conditions of their ROP, MI-ROP-N2915-2017a and with the applicable federal and state administrative rules.

The new Tanks will be added to FG-TANKS during the current permit review. It appears they are subject to Rule 703. They will also need to be added to FG-GDF MACT likely upon renewal. TMNA will need to update and maintain sufficient records related to the Tanks.

Compliance testing is pending for FG-GENSETS in October 2018.

NAME



DATE

10/8/18

SUPERVISOR

