

 <b>AIR RESOURCES BOARD</b>	<b>MTU DETROIT DIESEL, INC.</b>	<b>EXECUTIVE ORDER U-R-052-0012</b>
		New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-02-003;

**IT IS ORDERED AND RESOLVED:** That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2010	AMDDL31.8XRR	23.9, 31.8	Diesel	8,000
<b>SPECIAL FEATURES &amp; EMISSION CONTROL SYSTEMS</b>			<b>TYPICAL EQUIPMENT APPLICATION</b>	
Direct Diesel Injection, Turbocharger, Charge Air Cooler, Electronic Control Module			Crane, Loader, Tractor, Pump, Compressor, Generator Set	

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for hydrocarbon (HC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kW-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

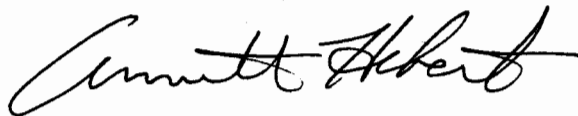
RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kW-hr)					OPACITY (%)		
			HC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
kW > 560	Tier 2	STD	N/A	N/A	6.4	3.5	0.20	20	15	50
		CERT	--	--	6.1	1.6	0.16	9	3	10

**BE IT FURTHER RESOLVED:** That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

**This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.**

Executed at El Monte, California on this 29 day of December 2009.



Annette Hebert, Chief  
 Mobile Source Operations Division

# Engine Model Summary Template

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1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm <sup>3</sup> /stroke @ peak HP (for diesels only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm <sup>3</sup> /stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torqueDevice	9.Emission Control
AMDDL31.8XRR	12V2000C11	760 @ 2100	207	288	2277 @ 1350	223	201	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000S11	760 @ 2100	207	288	2277 @ 1350	223	201	DFI, TC, CAC, ECM
AMDDL31.8XRR	16V2000S82	1500 @ 2100	295	547	4429 @ 1500	331	440	DFI, TC, CAC, ECM
AMDDL31.8XRR	16V2000S92	1500 @ 2100	295	547	4429 @ 1500	331	440	DFI, TC, CAC, ECM
AMDDL31.8XRR	16V2000C12	1050 @ 2100	219	407	3290 @ 1350	242	289	DFI, TC, CAC, ECM
AMDDL31.8XRR	16V2000S12	1050 @ 2100	219	407	3290 @ 1350	242	289	DFI, TC, CAC, ECM
AMDDL31.8XRR	16V2000C12	1050 @ 1800	237	407	3290 @ 1350	242	289	DFI, TC, CAC, ECM
AMDDL31.8XRR	16V2000S12	1050 @ 1800	237	407	3290 @ 1350	242	289	DFI, TC, CAC, ECM
AMDDL31.8XRR	16V2000C22	1205 @ 1800	270	428	3905 @ 1500	288	383	DFI, TC, CAC, ECM
AMDDL31.8XRR	16V2000S52	1205 @ 1800	270	428	3905 @ 1500	288	383	DFI, TC, CAC, ECM
AMDDL31.8XRR	16V2000C22	1205 @ 2100	249	461	3905 @ 1500	288	383	DFI, TC, CAC, ECM
AMDDL31.8XRR	16V2000S52	1205 @ 2100	249	461	3905 @ 1500	288	383	DFI, TC, CAC, ECM
AMDDL31.8XRR	16V2000C92R	1340 @ 2100	267	495	3905 @ 1500	288	383	DFI, TC, CAC, ECM
AMDDL31.8XRR	16V2000S92R	1340 @ 2100	267	495	3905 @ 1500	288	383	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000C12	760 @ 2100	210	293	2452 @ 1350	249	224	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000S12	760 @ 2100	210	293	2452 @ 1350	249	224	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000C22R	850 @ 2100	232	324	2762 @ 1500	278	277	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000S52R	850 @ 2100	232	324	2762 @ 1500	278	277	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000C22	905 @ 2100	247	345	2946 @ 1500	296	295	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000S62	905 @ 2100	247	345	2946 @ 1500	296	295	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000C92R	1005 @ 2100	273	381	3014 @ 1500	302	301	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000S92R	1005 @ 2100	273	381	3014 @ 1500	302	301	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000G84 3D	1120 @ 1800	330	374	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000G44 3D	986 @ 1800	300	341	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000G84 3B	1021 @ 1800	308	350	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000G44 3B	896 @ 1800	280	314	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000G84 3B	1021 @ 1800	308	350	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	12V2000G84 3D	1120 @ 1800	330	374	NA	NA	NA	DFI, TC, CAC, ECM

# Engine Model Summary Template

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12/10/09

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6. Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
AMDDL31.8XRR	5567	12V2000G84L	1234 @ 1800	367	417	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	5550	12V2000G44 3B	896 @ 1800	280	313	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	5551	12V-2000G44 3D	986 @ 1800	300	342	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	5556	16V2000G44 3D	1354 @ 1800	306	467	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	5557	16V2000G84 3D	1495 @ 1800	333	508	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	5558	16V2000G44 3B	1227 @ 1800	285	433	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	5559	16V2000G84 3B	1354 @ 1800	306	467	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	7047	12V2000P12	805 @ 1800	233	281	2348@1350	233	210	DFI, TC, CAC, ECM
AMDDL31.8XRR	7048	12V2000P92R	905 @ 1800	261	314	2739@1350	272	245	DFI, TC, CAC, ECM
AMDDL31.8XRR	7049	12V2000P92	1057 @ 2100	275	386	2935@1500	291	292	DFI, TC, CAC, ECM
AMDDL31.8XRR	7050	16V2000P12	1073 @ 1800	233	374	3026@1350	221	266	DFI, TC, CAC, ECM
AMDDL31.8XRR	7051	16V2000P92R	1207 @ 1800	262	421	3026@1350	222	267	DFI, TC, CAC, ECM
AMDDL31.8XRR	7052	16V2000P92	1408 @ 2100	272	509	3944@1500	285	381	DFI, TC, CAC, ECM
AMDDL31.8XRR	7077	12V2000P82 3A	805 @ 1800	250	283	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	7078	12V2000P82 3B/3C	932 @ 1800	287	327	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	7079	16V2000P82 3A	1073 @ 1800	247	377	NA	NA	NA	DFI, TC, CAC, ECM
AMDDL31.8XRR	7080	16V2000P82 3B/3C	1247 @ 1800	299	457	NA	NA	NA	DFI, TC, CAC, ECM