

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-13-2

Relating to Certification of New Heavy-Duty Off-Road Equipment Engines

DEUTZ MOTOR GmbH

Pursuant to the authority vested in the Air Resources Board by Sections 43000.5, 43013 and 43018 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-45-9;

IT IS ORDERED AND RESOLVED: That the following Deutz Motor GmbH 1996 model-year engine, with rated power between 175 and 750 horsepower, and exhaust emission control systems are certified as described below for use in heavy-duty off-road equipment:

Typical Equipment Usage: Gensets

Fuel Type: Diesel

<u>Engine Family</u>	<u>Liters (Cubic Inches)</u>	<u>Exhaust Emission Control Systems and Special Features</u>
TDZ7.1R6DARA	7.1 (436)	Turbocharger Charge Air Cooler Smoke Puff Limiter

Engine models and codes are listed on attachments. Production engines shall be in all material respects the same as those for which certification is granted.

The total hydrocarbons (THC), carbon monoxide (CO), nitrogen oxides (NOx), and particulate matters (PM) certification exhaust emission standards, in grams per brake horsepower-hour (g/bhp-hr), and the opacity of smoke emission standards, in percent (%), during acceleration (Accel), lugging (Lug), and peak (Peak) modes, for this engine family are (Title 13, California Code of Regulations, Section 2423):

<u>Exhaust Emissions (g/bhp-hr)</u>				<u>Smoke Opacity (%)</u>		
<u>THC</u>	<u>CO</u>	<u>NOx</u>	<u>PM</u>	<u>Accel</u>	<u>Lug</u>	<u>Peak</u>
1.0	8.5	6.9	0.4	20	15	50

The THC, CO, NOx and PM exhaust emission certification values, in g/bhp-hr, and the opacity of smoke emission certification values, in percent (%), for this engine family are:

<u>Engine Family</u>	<u>Exhaust Emission (g/bhp-hr)</u>				<u>Smoke Opacity (%)</u>		
	<u>THC</u>	<u>CO</u>	<u>NOx</u>	<u>PM</u>	<u>Accel</u>	<u>Lug</u>	<u>Peak</u>
TDZ7.1R6DARA	0.4	0.4	5.4	0.2	10	4	15

BE IT FURTHER RESOLVED: That the listed engine models comply with the "Exhaust Emission Standards and Test Procedures--Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2423) for the aforementioned model year.

BE IT FURTHER RESOLVED: That the listed engine models also comply with the "Emission Control Labels--1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2424) for the aforementioned model year.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the materials to demonstrate certification compliance with the Board's emission control system warranty provisions (Title 13, California Code of Regulations, Section 2425 et seq.).

Executive Order U-R-4-2 dated May 1, 1996, is hereby cancelled and replaced by Executive Order U-R-13-2.

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

Executed at El Monte, California this 27th day of June 1996.


R. B. Summerfield
Assistant Division Chief
Mobile Source Division

Engine type	Engine code	Nominal Power $\pm 5\%$ kW	Nominal speed ± 50 rpm rpm	Mean effective pressure bar	Injection rate at nom. speed, $\pm 4\text{mm}^3$ mm ³ /stroke	Nominal torque $\pm 5\%$ Nm	Speed at nom. torque rpm	Low idle ± 50 rpm rpm	High idle (± 50 - ± 200 rpm, dep on engine applic.) rpm
BF 6M 1013 ECP	C195	195	2500	13.10	118	907	1500	700	2600
BF 6M 1013 ECP	C195/1	195	2300	14.24	125	954	1400	700	2400
BF 6M 1013 ECP	C195/2	195	2300	14.24	125	907	1400	700	2400
BF 6M 1013 ECP	C186	186	2300	13.58	120	897	1400	700	2400
BF 6M 1013 ECP	C176	176	2300	12.85	113	850	1400	700	2400
BF 6M 1013 ECP	C188	188	2200	14.35	125	954	1400	700	2300
BF 6M 1013 ECP	C188/1	188	2200	14.35	125	907	1400	700	2300
BF 6M 1013 ECP	C179	179	2200	13.66	119	897	1400	700	2300
BF 6M 1013 ECP	C170	170	2200	12.98	113	850	1400	700	2300
BF 6M 1013 ECP	C182	182	2100	14.55	125	954	1400	700	2180
BF 6M 1013 ECP	C182/1	182	2100	14.55	125	907	1400	700	2180
BF 6M 1013 ECP	C173	173	2100	13.83	119	897	1400	700	2180
BF 6M 1013 ECP	C165	165	2100	13.19	113	850	1400	700	2180
BF 6M 1013 ECP	C166	166	2000	13.94	118	897	1400	700	2080
BF 6M 1013 ECP	C158	158	2000	13.27	113	850	1400	700	2080
BF 6M 1013 CP	C190	190	2500		118	899	1500	700	2600
BF 6M 1013 CP	C190/1	190	2300		125	946	1400	700	2400
BF 6M 1013 CP	C190/2	190	2300		125	899	1400	700	2400
BF 6M 1013 CP	C181	181	2300		120	890	1400	700	2400
BF 6M 1013 CP	C171	171	2300		113	843	1400	700	2400
BF 6M 1013 CP	C184	184	2200		125	946	1400	700	2300
BF 6M 1013 CP	C184/1	184	2200		125	899	1400	700	2300
BF 6M 1013 CP	C175	175	2200		119	890	1400	700	2300
BF 6M 1013 CP	C166/1	166	2200		113	843	1400	700	2300
BF 6M 1013 CP	C178	178	2100		125	946	1400	700	2180
BF 6M 1013 CP	C178/1	178	2100		125	899	1400	700	2180
BF 6M 1013 CP	C169	169	2100		119	890	1400	700	2180
BF 6M 1013 CP	C161	161	2100		113	843	1400	700	2180
BF 6M 1013 CP	C163	163	2000		118	890	1400	700	2080
BF 6M 1013 CP	C155	155	2000		113	843	1400	700	2080
BF 6M 1013 EC	C174	174	2300	12.70	112	854	1400	700	2400
BF 6M 1013 EC	C165/1	165	2300	12.05	106	811	1400	700	2400
BF 6M 1013 EC	C157	157	2300	11.46	101	769	1400	700	2400
BF 6M 1013 EC	C169/1	169	2200	12.90	112	854	1400	700	2300
BF 6M 1013 EC	C160	160	2200	12.21	106	811	1400	700	2300
BF 6M 1013 EC	C152	152	2200	11.60	101	769	1400	700	2300
BF 6M 1013 EC	C162	162	2100	12.95	111	854	1400	700	2180
BF 6M 1013 EC	C154	154	2100	12.31	106	811	1400	700	2180
BF 6M 1013 EC	C146	146	2100	11.67	100	769	1400	700	2180
BF 6M 1013 EC	C149	149	2000	12.51	106	811	1400	700	2080
BF 6M 1013 EC	C142	142	2000	11.92	101	769	1400	700	2080
BF 6M 1013 C	C170/1	170	2300		112	847	1400	700	2400
BF 6M 1013 C	C161/1	161	2300		106	804	1400	700	2400
BF 6M 1013 C	C153	153	2300		101	762	1400	700	2400
BF 6M 1013 C	C165/2	165	2200		112	847	1400	700	2300
BF 6M 1013 C	C156	156	2200		106	804	1400	700	2300
BF 6M 1013 C	C148	148	2200		101	762	1400	700	2300
BF 6M 1013 C	C159	159	2100		111	847	1400	700	2180
BF 6M 1013 C	C151	151	2100		106	804	1400	700	2180
BF 6M 1013 C	C143	143	2100		100	762	1400	700	2180
BF 6M 1013 C	C146/1	146	2000		106	804	1400	700	2080
BF 6M 1013 C	C139	139	2000		101	762	1400	700	2080
BF 4M 1013 EC	C118	118	2500			577	1400	700	2600
BF 4M 1013 EC	C118/1	118	2300			577	1400	700	2400
BF 4M 1013 EC	C115	115	2300			548	1400	700	2400
BF 4M 1013 EC	C107	107	2300			520	1400	700	2400
BF 4M 1013 EC	C114	114	2200			577	1400	700	2300
BF 4M 1013 EC	C111	111	2200			548	1400	700	2300
BF 4M 1013 EC	C104	104	2200			520	1400	700	2300
BF 4M 1013 EC	C110	110	2100			577	1400	700	2180
BF 4M 1013 EC	C106	106	2100			548	1400	700	2180
BF 4M 1013 EC	C101	101	2100			520	1400	700	2180
BF 4M 1013 EC	C103	103	2000			548	1400	700	2080
BF 4M 1013 EC	C98	98	2000			520	1400	700	2080
BF 4M 1013 C	C115/1	115	2500			573	1400	700	2600
BF 4M 1013 C	C115/2	115	2300			573	1400	700	2400
BF 4M 1013 C	C112	112	2300			544	1400	700	2400
BF 4M 1013 C	C104/1	104	2300			516	1400	700	2400
BF 4M 1013 C	C111/1	111	2200			573	1400	700	2300
BF 4M 1013 C	C108	108	2200			544	1400	700	2300
BF 4M 1013 C	C101/1	101	2200			516	1400	700	2300

Engine type	Engine code	Nominal Power $\pm 5\%$ kW	Nominal speed ± 50 rpm rpm	Mean effective pressure bar	Injection rate at nom. speed, $\pm 4\text{mm}^3$ mm ³ /stroke	Nominal torque $\pm 5\%$ Nm	Speed at nom. torque rpm	Low idle ± 50 rpm rpm	High idle (± 50 - ± 200 rpm, dep on engine applic.) rpm
BF 4M 1013 C	C108/1	108	2100			573	1400	700	2180
BF 4M 1013 C	C104/2	104	2100			544	1400	700	2180
BF 4M 1013 C	C99	99	2100			516	1400	700	2180
BF 4M 1013 C	C101/2	101	2000			544	1400	700	2080
BF 4M 1013 C	C96	96	2000			516	1400	700	2080
BF 6M 1013 ECP	D195	195	2400	13.64	121	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 ECP	D190	190	2400	13.29	118	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 ECP	D173	173	2400	12.10	108	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 ECP	D182	182	2000	15.28	130	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 ECP	D165	165	2000	13.85	118	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 ECP	D174	174	1846	15.83	133	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 ECP	D158	158	1846	14.37	121	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 CP	D190/1	190	2400		121	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 CP	D185	185	2400		118	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 CP	D167	167	2400		108	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 CP	D179	179	2000		130	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 CP	D162	162	2000		118	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 CP	D172	172	1846		133	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 CP	D156	156	1846		121	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 EC	D170	170	2400	11.8948	106	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 EC	D155	155	2400	10.8452	97	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 EC	D163/1	163	2000	13.686	116	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 EC	D148	148	2000	12.4265	106	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 EC	D156/1	156	1846	14.1909	119	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 EC	D142	142	1846	12.9174	109	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 EC	D163	163	1800	15.2066	128	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 EC	D155/1	155	1800	14.4603	121	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 C	D165/1	165	2400		106	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 C	D150	150	2400		97	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 C	D160/1	160	2000		116	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 C	D146	146	2000		106	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 C	D154	154	1846		119	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 C	D140	140	1846		109	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 C	D160	160	1800		128	n.a.	n.a.	n.a.	n.a.
BF 6M 1013 C	D152	152	1800		121	n.a.	n.a.	n.a.	n.a.
BF 4M 1013 EC	D113	113	2400			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 EC	D103	103	2400			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 EC	D108	108	2000			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 EC	D98	98	2000			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 EC	D104	104	1846			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 EC	D95	95	1846			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 EC	D110	110	1800			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 EC	D105	105	1800			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 C	D110/1	110	2400			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 C	D100	100	2400			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 C	D106	106	2000			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 C	D96	96	2000			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 C	D103/1	103	1846			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 C	D93	93	1846			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 C	D97	97	1800			n.a.	n.a.	n.a.	n.a.
BF 4M 1013 C	D92	92	1800			n.a.	n.a.	n.a.	n.a.