State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-5-87
Relating to Certification of New Off-Road Compression-Ignition Equipment Engines

KOMATSU LTD.

Pursuant to the authority vested in the Air Resources Board (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-45-9;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engine and exhaust emission control system produced by the manufacturer are certified as described below for use in off-road equipment:

Model Year: 2001

Typical Equipment Usage: Generator and Other Industrial Equipment

Fuel Type: Diesel

Engine Family	Engine Displacement (liters)	Useful Life (hours)	Exhaust Emission Control Systems and Special Features
1KLXL060.AAA	60 and 45	8000	Direct Diesel Injection Turbocharger Charge Air Cooler Engine Control Module

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 exhaust emission certification standards and certification values for total hydrocarbons (THC), carbon monoxide (CO), oxides of nitrogen (NOx), and particulate matter (PM) (units are expressed in grams per kilowatt-hour (g/kw-hr)), and the opacity-of-smoke certification standards and certification values in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family are as follows (Title 13, California Code of Regulations, Section 2423(b)(1) and 2423(b)(3)(B), as amended by Board approval on January 28, 2000):

Engine Power Rating (kw)	Emission Standard Category		Exhaust Emissions (g/kw-hr)				Smoke Opacity (%)		
			THC	CO	NOx	PM	Accel	Lug	Peak
560<KW	Tier 1	Standard	1.3	11.4	9.2	0.54	20	15	50
		Certification	0.2	1.8	8.3	0.13	15	5	25

BE IT FURTHER RESOLVED: That, at the request of the manufacturer, the listed engine models are **conditionally certified** to, and shall be required to comply with, all amendments to Title 13, California Code of Regulations, Sections 2420 through 2427 adopted by the Board on January 28, 2000 at its hearing "TO CONSIDER AMENDMENTS TO OFF-ROAD COMPRESSION-IGNITION ENGINE REGULATIONS: 2000 AND LATER EMISSION STANDARDS, COMPLIANCE REQUIREMENTS AND TEST PROCEDURES." The listed engine models comply with all such amendments, including, but not limited to:

- the amended "Emission Control Labels—1996 and Later Off-Road Compression-Ignition Engines" (Title 13, California Code of Regulations, Section 2424) for the aforementioned model year;
- the Board's amended emission control system warranty provisions (Title 13, California Code of Regulations, Sections 2425 and 2426) for the listed engine models, as demonstrated by materials submitted by the manufacturer; and
- new California requirements for the Selective Enforcement Audit (SEA) for the listed engine models, as demonstrated by the manufacturer's submission of materials.

BE IT FURTHER RESOLVED: That the conditional certification described in the paragraph above is conditioned on the amendments being approved by the California Office of Administrative Law (OAL) pursuant to Government Code Section 11349.3, and where necessary, authorized by the Administrator of the U. S. Environmental Protection Agency (U.S. EPA) pursuant to Section 209(e)(2) of the Federal Clean Air Act. In the event that the OAL disapproves the amendments or the U.S. EPA decides not to authorize them, the ARB shall notify the manufacturer that the listed engine models must comply with the "California Exhaust Emission Standards and Test Procedures for 1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Sections 2420 through 2427) adopted on May 12, 1993, as applicable. Failure to demonstrate compliance within 45 days after notification by the Air Resources Board shall be cause for the Board to revoke the Executive Order and deem the listed engine models uncertified.

The conditional certification described herein is not conditioned on further U.S. EPA action on amendments determined by the Board to be within the scope of an existing U.S. EPA authorization.

Engines certified under this Executive Order must conform to the above requirements under Title 13, California Code of Regulations, Chapter 9, Article 4, and all other applicable California emission laws and regulations.

Executed at El Monte, California this 28th day of December 2000.

Raphael Susnowitz

for R. B. Summerfield, Chief
Mobile Source Operations Division

Engine Model Summary Form

Manufacturer: **Komatsu Limited**

Engine category: **Nonroad CI**

EPA Engine Family: **1KLXL060.AAA**

Mfr Family Name: **A593**

Process Code: **New Submission**

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
2850:FR6343	SSDA16V160	2750@1900	552	943	8050@1500	560	756	IDI, EC,TC,CAC, ECM
2850:FR6339	SSDA16V160	2700@1900	535	919	7840@1500	546	737	EC,TC,CAC
2850:FR6340	SSDA16V160	2500@1900	495	845	7257@1500	515	694	EC,TC,CAC
2851:FR6343	SSDA16V160	2750@1900	552	943	8050@1500	560	756	EC,TC,CAC
2851:FR6339	SSDA16V160	2700@1900	535	919	7840@1500	546	737	EC,TC,CAC
2851FR6340	SSDA16V160	2500@1900	495	845	7257@1500	515	694	EC,TC,CAC
2948:FR6284	SDA16V160	1782@1900	364	622	6274@1500	429	579	EC,TC,CAC
2855:FR6284	SDA16V160	1782@1900	364	622	6274@1500	429	579	EC,TC,CAC
2849:FR6329	SDA16V160	2500@1900	497	850	7257@1500	506	682	EC,TC,CAC
2849:FR6379	SDA16V160	1875@1800	398	645	6169@1500	436	588	EC,TC,CAC
2848:FR6329	SDA16V160	2500@1900	497	850	7257@1500	506	682	EC,TC,CAC
2848:FR6379	SDA16V160	1875@1800	398	645	6169@1500	436	588	EC,TC,CAC
2469:FR6288	SDA12V160	1487@1900	398	510	5042@1300	464	407	EC,TC,CAC
2853:FR6268	SDA12V160	1487@1900	398	510	5042@1300	464	407	EC,TC,CAC

ATTACHMENT

4-R-5-87