State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-28-43
Relating to Certification of New Off-Road Compression-Ignition Equipment Engines

YANMAR DIESEL ENGINE CO., 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: Crane, Loader, Tractor, Dozer, Pump, Compressor Generator and Other Industrial Equipment

Fuel Type: Diesel

Engine Family	Engine Displacement (liters)	Useful Life (hours)	Exhaust Emission Control Systems and Special Features
1YDXL4.41D4N	4.412	8000	Direct Diesel Injection

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, 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
37≤KW<75	Tier 1	Standard	N/A	N/A	9.2	N/A	20	15	50
		Certification	--	--	6.8	--	9	13	16

BE IT FURTHER RESOLVED: That the listed engine models with rated power equal to or greater than 19 KW but less than 130 KW 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 conditional certification herein of the listed engine models with rated power equal to or greater than 19 KW but less than 130 KW shall be deemed null and void.

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 19th day of December 2000.

R. B. Summerfield, Chief
Mobile Source Operations Division

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Engine Model S nmary Form

U-R-28-43

Manufacturer: **Yanmar Diesel Engine Co.,Ltd.**

Engine category: **Nonroad CI**

EPA Engine Family: **1YDXL4.41D4N**

Mfr Family Name: **N/A**

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
N/A	4TNE106-DMA	94.9/2500	65.2	35.8	236.4/1600	73.6	25.9	EM
N/A	4D106-1FA	84.8/2200	58.9	28.9	228.5/1500	69.8	23.1	EM
N/A	4D106E-1HC	72.7/2500	47.2	25.9	177.7/1500	50.0	16.5	EM
N/A	4D106E-2HC	77.7/2500	49.4	27.1	187.6/1500	53.6	17.8	EM
N/A	4D106-1FB	84.8/2200	58.9	28.9	228.5/1500	69.8	23.1	D DI EM
N/A	4TNE106-AMM	88.1/2300	59.1	29.9	228.5/1600	69.3	24.6	EM
N/A	4TNE106-SA	94.9/2500	65.2	35.8	225.7/1600	65.6	23.1	EM
N/A	4D106-1FAA	84.8/2200	58.9	28.9	228.5/1500	69.8	23.1	EM
N/A	4TNE106-TB	94.9/2500	65.2	35.8	225.7/1600	65.6	23.1	EM