State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-22-9
Relating to Certification of New Off-Road Compression-Ignition Engines

PERKINS ENGINES COMPANY LTD.

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-45-9;

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

Model Year: 2001

Typical Equipment Usage: Other Industrial Equipment

Fuel Type: Diesel

Engine Family	Engine Displacement (liters)	Useful Life (hours)	Emission Control Systems and Special Features
1PKXL03.9AK1	3.99	8000	Direct Diesel Injection Turbocharger 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 exhaust emission certification standards and certification values for hydrocarbons (HC), oxides of nitrogen (NOx), or non-methane hydrocarbons plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), 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):

Engine Power Rating (kw)	Emission Standard Category		Exhaust Emissions (g/kw-hr)					Smoke Opacity (%)		
			HC	NOx	NMHC+NOx	CO	PM	Accel	Lug	Peak
37≤KW<130	Tier 1	Standard	N/A	9.2	N/A	N/A	N/A	20	15	50
		Certification	--	6.8	--	--	--	5	4	8

BE IT FURTHER RESOLVED: That the listed engine models also comply with "Emission Control Labels— 1996 and Later Off-Road Compression-Ignition 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, Sections 2425 and 2426).

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

Executed at El Monte, California this 22nd day of January 2001.

R. B. Summerfield, Chief
Mobile Source Operations Division

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Engine Model Su...nary Form

Manufacturer: **Perkins Engines Company Ltd**

Engine category: **Nonroad CI**

EPA Engine Famly: **1PKXL03.9AK1**

Mfr Family Name: **AS EPA**

Process Code: **New Submission**

U-R-22-9

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
	1932/2000	99.6 @ 2000	88.0	38.3	297 @ 1400	92.0	30.5	SPL, TC, DDI
	1932/2100	99.8 @ 2100	86.0	39.3	297 @ 1400	92.0	30.5	SPL, TC, DDI
	1932/2200	100.0 @ 2200	83.0	39.8	297 @ 1400	92.0	30.5	SPL, TC, DDI
	5586/2000	99.6 @ 2000	88.0	38.3	297 @ 1400	92.0	30.5	SPL, TC, DDI
	5586/2100	99.8 @ 2100	86.0	39.3	297 @ 1400	92.0	30.5	SPL, TC, DDI
	5586/2200	100.0 @ 2200	83.0	39.8	297 @ 1400	92.0	30.5	SPL, TC, DDI
	1958/2000	92.5 @ 2000	73.0	32.6	264 @ 1400	79.0	24.6	SPL, TC, DDI
	1958/2100	92.5 @ 2100	72.5	34.0	264 @ 1400	79.0	24.6	SPL, TC, DDI
	1958/2200	91.8 @ 2200	71.0	34.9	264 @ 1400	79.0	24.6	SPL, TC, DDI
	5632/2000	89.8 @ 2000	73.0	32.6	264 @ 1400	79.0	24.6	SPL, TC, DDI
	5632/2100	90.5 @ 2100	72.5	34.0	264 @ 1400	79.0	24.6	SPL, TC, DDI
	5632/2000	89.8 @ 2000	71.0	34.9	264 @ 1400	79.0	24.6	SPL, TC, DDI
	1985/2400	107.8 @ 2400	80.0	42.6	290.6 @ 1400	93.0	28.9	SPL, TC, DDI
	1985/2300	105.5 @ 2300	81.0	41.4	290.6 @ 1400	93.0	28.9	SPL, TC, DDI
	1985/2200	102.6 @ 2200	82.0	40.1	290.6 @ 1400	93.0	28.9	SPL, TC, DDI
	1985/2100	99.6 @ 2100	83.0	38.8	290.6 @ 1400	93.0	28.9	SPL, TC, DDI
	1985/2000	96.3 @ 2000	85.0	37.7	290.6 @ 1400	93.0	28.9	SPL, TC, DDI
	1935/2000	102.0 @ 2000	88.0	39.0	277.0 @ 1600	91.0	32.3	SPL, TC, DDI
	1935/2100	104.6 @ 2100	87.0	40.5	277.0 @ 1600	91.0	32.3	SPL, TC, DDI
	1935/2200	106.6@ 2200	86.0	42.0	277.0 @ 1600	91.0	32.3	SPL, TC, DDI
	1935/2300	107.6 @ 2300	85.0	43.5	277.0 @ 1600	91.0	32.3	SPL, TC, DDI
	1935/2400	107.9 @ 2400	84.0	44.8	277.0 @ 1600	91.0	32.3	SPL, TC, DDI
	Caterpillar	102.0 @ 2000	88.0	37.7	277.0 @ 1600	91.0	32.3	SPL, TC, DDI
	Caterpillar	104.6 @ 2100	87.0	40.5	277.0 @ 1600	91.0	32.3	SPL, TC, DDI
	Caterpillar	106.6@ 2200	86.0	42.0	277.0 @ 1600	91.0	32.3	SPL, TC, DDI
	Caterpillar	107.6 @ 2300	85.0	43.5	277.0 @ 1600	91.0	32.3	SPL, TC, DDI
	Caterpillar	107.9 @ 2400	84.0	44.8	277.0 @ 1600	91.0	32.3	SPL, TC, DDI
	1948/2200	85.8 @ 2200	68.2	33.3	258.1 @ 1400	77.6	24.0	SPL, TC, DDI
	1948/2100	86.0 @ 2100	68.9	32.1	258.1 @ 1400	77.6	24.0	SPL, TC, DDI
	1948/2000	83.7 @ 2000	70.4	31.2	258.1 @ 1400	77.6	24.0	SPL, TC, DDI

5616/2200	83.4 @ 2200	68.2	33.3	252.2 @ 1400	77.6	24.0	SPL, TC, DDI
5616/2100	83.7 @ 2100	68.9	32.1	252.2 @ 1400	77.6	24.0	SPL, [illegible] DDI
5616/2000	81.7 @ 2000	70.4	31.2	252.2 @ 1400	77.6	24.0	SPL, TC, DDI
1957/2200	80.6 @ 2200	66.0	30.0	246.3 @ 1400	75.0	23.2	SPL, TC, DDI
1957/2100	81.9 @ 2100	67.0	31.1	246.3 @ 1400	75.0	23.2	SPL, TC, DDI
1957/2000	79.4 @ 2000	70.0	30.9	246.3 @ 1400	75.0	23.2	SPL, TC, DDI
5629/2200	78.2 @ 2200	66.0	30.0	240.4 @ 1400	75.0	23.2	SPL, TC, DDI
5629/2100	80.1 @ 2100	67.0	31.1	240.4 @ 1400	75.0	23.2	SPL, TC, DDI
5629/2000	77.4 @ 2000	70.0	30.9	240.4 @ 1400	75.0	23.2	SPL, TC, DDI
1907/2200	81.8 @ 2200	67.8	33.1	244.9 @ 1400	76.3	23.8	SPL, TC, DDI
1907/2100	82.5 @ 2100	68.9	32.1	244.9 @ 1400	76.3	23.8	SPL, TC, DDI
1907/2000	83.1 @ 2000	69.3	31.9	244.9 @ 1400	76.3	23.8	SPL, TC, DDI
Caterpillar	81.8 @ 2200	67.8	33.1	244.9 @ 1400	76.3	23.8	SPL, TC, DDI
Caterpillar	82.5 @ 2100	68.9	32.1	244.9 @ 1400	76.3	23.8	SPL, TC, DDI
Caterpillar	83.1 @ 2000	69.3	31.9	244.9 @ 1400	76.3	23.8	SPL, TC, DDI
1977/2200	76.4 @ 2200	63.3	31.0	231.6 @ 1400	72.0	22.6	SPL, TC, DDI
1977/2100	78.2 @ 2100	64.7	30.2	231.6 @ 1400	72.0	22.6	SPL, TC, DDI
1977/2000	77.8 @ 2000	66.0	29.0	231.6 @ 1400	72.0	22.6	SPL, TC, DDI
Caterpillar	76.4 @ 2200	63.3	31.0	231.6 @ 1400	72.0	22.6	SPL, TC, DDI
Caterpillar	78.2 @ 2100	64.7	30.2	231.6 @ 1400	72.0	22.6	SPL, TC, DDI

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Engine Model Summary Form

Manufacturer: **Perkins Engines (Peterborough) Ltd**

Engine category: **Nonroad CI**

EPA Engine Famly: **1PKXL03.9AK1**

Mfr Family Name: **AS EPA**

Process Code: **New Sub - continued**

U-R-22-9

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
	Caterpillar	77.8@ 2200	66.0	29.4	231.6 @ 1400	72.0	22.6	SPL, TC, DDI
	1908/2000	85.8 @ 2000	73.9	33.0	258.1 @ 1400	78.0	24.3	SPL, TC, DDI
	1908/2100	86.5 @ 2100	73.0	34.2	258.1 @ 1400	78.0	24.3	SPL, TC, DDI
	1908/2200	85.8 @ 2200	71.3	34.9	258.1 @ 1400	78.0	24.3	SPL, TC, DDI
	Caterpillar	85.8 @ 2000	73.9	33.0	258.1 @ 1400	78.0	24.3	SPL, TC, DDI
	Caterpillar	86.5 @ 2100	73.0	34.2	258.1 @ 1400	78.0	24.3	SPL, TC, DDI
	Caterpillar	85.8 @ 2200	71.3	34.9	258.1 @ 1400	78.0	24.3	SPL, TC, DDI
	1909/1900	90.5 @ 1900	81.9	34.5	276.6 @ 1400	88.3	27.5	SPL, TC, DDI
	1909/2000	92.5 @ 2000	81.1	36.1	276.6 @ 1400	88.3	27.5	SPL, TC, DDI
	1909/2100	93.2 @ 2100	80.6	37.6	276.6 @ 1400	88.3	27.5	SPL, TC, DDI
	1909/2200	95.2 @ 2200	79.8	39.0	276.6 @ 1400	88.3	27.5	SPL, TC, DDI
	Caterpillar	90.5 @ 1900	81.9	34.5	276.6 @ 1400	88.3	27.5	SPL, TC, DDI
	Caterpillar	92.5 @ 2000	81.1	36.1	276.6 @ 1400	88.3	27.5	SPL, TC, DDI
	Caterpillar	93.9 @ 2100	80.6	37.6	276.6 @ 1400	88.3	27.5	SPL, TC, DDI
	Caterpillar	95.2 @ 2200	79.8	39.0	276.6 @ 1400	88.3	27.5	SPL, TC, DDI
	5700/2400	105.3 @ 2400	80.0	42.6	284.7 @ 1400	93.0	28.9	SPL, TC, DDI
	1998/2200	95.8 @ 2200	77.5	38.0	280.3 @ 1400	85.0	28.9	SPL, TC, DDI
	5783/2200	93.9 @ 2200	77.5	38.0	274.4@ 1400	85.0	28.9	SPL, TC, DDI
	5588/2400	105.3 @ 2400	84.0	44.8	271 Lbf ft @ 1600	91.0	32.3	SPL, TC, DDI
	5588/2300	105.3 @ 2300	85.0	43.5	271 Lbf ft @ 1600	91.0	32.3	SPL, TC, DDI
	5588/2200	104.0 @ 2200	86.0	42.0	271 Lbf ft @ 1600	91.0	32.3	SPL, TC, DDI
	5588/2100	102.0 @ 2100	87.0	40.5	271 Lbf ft @ 1600	91.0	32.3	SPL, TC, DDI
	5588/2000	100.0 @ 2000	88.0	39.0	271 Lbf ft @ 1600	91.0	32.3	SPL, TC, DDI
	Caterpillar 3054	105.3 @ 2400	84.0	44.8	271 Lbf ft @ 1600	91.0	32.3	SPL, TC, DDI
	Caterpillar 3054	105.3 @ 2300	85.0	43.5	271 Lbf ft @ 1600	91.0	32.3	SPL, TC, DDI
	Caterpillar 3054	104.0 @ 2200	86.0	42.0	271 Lbf ft @ 1600	91.0	32.3	SPL, TC, DDI
	Caterpillar 3054	102.0 @ 2100	87.0	40.5	271 Lbf ft @ 1600	91.0	32.3	SPL, TC, DDI
	Caterpillar 3054	100.0 @ 2000	88.0	39.0	271 Lbf ft @ 1600	91.0	32.3	SPL, TC, DDI
	1817/2200	95.9 @ 2200	80.0	37.7	258.5 @ 1400	90.0	27.4	SPL, TC, DDI
	Caterpillar 3054	95.9 @ 2200	80.0	37.7	258.5 @ 1400	90.0	27.4	SPL, TC, DDI

2048/1800	95 bhp @ 1800	86.0	34.	277.8 lbf ft @	86.0	34.5	SF C, DDI
2074/2200	102 @ 2200	80.0	38.7	277 @ 1600	86.0	30.1	SPL, TC, DDI
1930/1950	99 bhp @ 1950	83.0	35.7	297 @ 1400	92.0	28.3	SPL, TC, DDI
Caterpillar 3054	99 bhp @ 1950	83.0	35.7	297 @ 1400	92.0	28.3	SPL, TC, DDI

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