California Environmental Protection Agency AIR RESOURCES BOARD	MOTORENFABRIK HATZ GMBH & CO. KG	EXECUTIVE ORDER U-R-034-0017 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-45-9;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control system 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)
2002	2HZXL.667C82	0.7	Diesel	3000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Direct Diesel Injection	Pump, Compressor, Generator

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
8≤ KW < 19	Tier 1	STD	N/A	N/A	9.5	6.6	0.80	N/A	N/A	N/A
		CERT	--	--	8.3	4.1	0.59	--	--	--

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 10th day of January 2002.

R. B. Summerfield, Chief
Mobile Source Operations Division

Model Year: 2002
Manufacturer: Motorenfabrik Hatz GmbH & Co. KG
Engine Family: 2HZXL.667C82

Issued:
Revised: 10/29/2001
E.O. Number: ~~EO#~~ U-R-034-0017

Small Off-Road Engine Model Summary Form

Units for Table: kw

Worst Case?	47. Model Designation	48. Sales Code	49. Displ (cc)	50. Bore/ Stroke	51. Ignition Timing	52. Max Power (KW)	53. Rated Speed (RPM)	54. Rated Torque	55. Torque Speed (RPM)	56. Emiss Control Sys
X	1D81S/Z/T/U	Calif. Only	667	100/85	13	14.7 11.0	3000	25.9	3000	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	13	14.6 10.9	2950	26.1	2950	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	13	14.3 10.7	2900	26.1	2900	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	13	14.2 10.6	2850	26.3	2850	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	13	14.1 10.5	2800	26.5	2800	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	13	13.9 10.4	2750	26.7	2750	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	13.7 10.2	2700	26.7	2700	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	13.5 10.1	2650	26.9	2650	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	13.3 9.9	2600	26.9	2600	DDI

Unit in [hp]

Additional engine model info. please see record 2 !

EPA# HZX-NR2-02-02

ATTACHMENT 185

Model Year:
Manufacturer:
Engine Family:

Issued:
Revised: 10/26/2001
E.O. Number: EO# U-R-034-0017

Small Off-Road Engine Model Summary Form

Units for Table:

orst ase?	47. Model Designation	48. Sales Code	49. Displ (cc)	50. Bore/ Stroke	51. Ignition Timing	52. Max Power (kW)	53. Rated Speed (RPM)	54. Rated Torque	55. Torque Speed (RPM)	56. Emiss Control Sys
	1D81S/Z/T/U	Calif. Only	667	100/85	13	14.1 10.5	3000	24.7	3000	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	13	13.9 10.4	2950	24.9	2950	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	13	13.7 10.2	2900	24.9	2900	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	13	13.5 10.1	2850	25.0	2850	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	13	13.4 10.0	2800	25.2	2800	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	13	13.3 9.9	2750	25.4	2750	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	13.1 9.8	2700	25.6	2700	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	13.0 9.7	2650	25.9	2650	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	12.7 9.5	2600	25.8	2600	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	12.6 9.4	2550	26.0	2550	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	12.3 9.2	2500	26.0	2500	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	11.9 8.9	2400	26.2	2400	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	11.4 8.5	2300	26.1	2300	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	11.1 8.3	2200	26.7	2200	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	10.7 8.0	2100	26.9	2100	DDI

Additional engine model info. please see record 3 !

ATTACHMENT 2 of 5

Model Year:
Manufacturer:
Engine Family:

Issued:
Revised: 10/26/2001
E.O. Number: EO# U-R-034-0017

Small Off-Road Engine Model Summary Form

Units for Table:

orst se?	47. Model Designation	48. Sales Code	49. Displ (cc)	50. Bore/ Stroke	51. Ignition Timing	52. Max Power (kw)	53. Rated Speed (RPM)	54. Rated Torque	55. Torque Speed (RPM)	56. Emiss Control Sys
	1D81S/Z/T/U	Calif. Only	667	100/85	13	12.7 9.5	3000	22.4	3000	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	13	12.3 9.2	2900	22.4	2900	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	13	12.1 9.0	2800	22.7	2800	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	11.8 8.8	2700	23.0	2700	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	11.5 8.6	2600	23.4	2600	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	11.0 8.2	2500	23.2	2500	DDI
	1D81S/Z/T/U	Calif. Only	667	100/85	10	10.7 8.0	2400	23.6	2400	DDI

Additional engine model info. please see record 4 !

ATTACHMENT 3 of 5

Model Year:
Manufacturer:
Engine Family:

Issued:
Revised: 10/29/2001
E.O. Number: EO # U-R-034-0017

Small Off-Road Engine Model Summary Form

Units for Table:

orst ase?	47. Model Designation	48. Sales Code	49. Displ (cc)	50. Bore/ Stroke	51. Ignition Timing	52. Max Power	(kW)	53. Rated Speed (RPM)	54. Rated Torque	55. Torque Speed (RPM)	56. Emiss Control Sys
	1D81C	Calif. Only	667	100/85	13	13.4	10.0	3000	23.6	3000	DDI
	1D81C	Calif. Only	667	100/85	13	13.3	9.9	2950	23.7	2950	DDI
	1D81C	Calif. Only	667	100/85	13	13.1	9.8	2950	23.9	2950	DDI
	1D81C	Calif. Only	667	100/85	13	13.0	9.7	2850	24.1	2850	DDI
	1D81C	Calif. Only	667	100/85	13	12.7	9.5	2800	24.0	2800	DDI
	1D81C	Calif. Only	667	100/85	13	12.6	9.4	2750	24.2	2750	DDI
	1D81C	Calif. Only	667	100/85	10	12.3	9.2	2700	24.1	2700	DDI
	1D81C	Calif. Only	667	100/85	10	12.2	9.1	2650	24.3	2650	DDI
	1D81C	Calif. Only	667	100/85	10	12.1	9.0	2600	24.5	2600	DDI
	1D81C	Calif. Only	667	100/85	10	11.9	8.9	2550	24.7	2550	DDI
	1D81C	Calif. Only	667	100/85	10	11.8	8.8	2500	24.9	2500	DDI
	1D81C	Calif. Only	667	100/85	10	11.7	8.7	2450	25.1	2450	DDI
	1D81C	Calif. Only	667	100/85	10	11.4	8.5	2400	25.0	2400	DDI
	1D81C	Calif. Only	667	100/85	10	11.3	8.4	2350	25.3	2350	DDI
	1D81C	Calif. Only	667	100/85	10	11.0	8.2	2300	25.2	2300	DDI

Additional engine model info. please see record 5!

ATTACHMENT 4 of 5

Model Year:
Manufacturer:
Engine Family:

Issued:
Revised: 10/29/2001
E.O. Number: EO# U-R-034-0017

Small Off-Road Engine Model Summary Form

Units for Table:

Worst Case?	47. Model Designation	48. Sales Code	49. Displ (cc)	50. Bore/ Stroke	51. Ignition Timing	52. Max Power (Kw)	53. Rated Speed (RPM)	54. Rated Torque	55. Torque Speed (RPM)	56. Emiss Control Sys
	1D81C	Calif. Only	667	100/85	13	12.2 9.1	3000	21.4	3000	DDI
	1D81C	Calif. Only	667	100/85	13	11.9 8.9	2950	21.3	2950	DDI
	1D81C	Calif. Only	667	100/85	13	11.8 8.8	2900	21.4	2900	DDI
	1D81C	Calif. Only	667	100/85	13	11.7 8.7	2850	21.6	2850	DDI
	1D81C	Calif. Only	667	100/85	13	11.7 8.7	2800	22.0	2800	DDI
	1D81C	Calif. Only	667	100/85	13	11.4 8.5	2750	21.8	2750	DDI
	1D81C	Calif. Only	667	100/85	10	11.3 8.4	2700	22.0	2700	DDI
	1D81C	Calif. Only	667	100/85	10	11.1 8.3	2650	22.1	2650	DDI
	1D81C	Calif. Only	667	100/85	10	11.0 8.2	2600	22.3	2600	DDI
	1D81C	Calif. Only	667	100/85	10	10.7 8.0	2550	22.2	2550	DDI

ATTACHMENT 5 of 5