California Environmental Protection Agency AIR RESOURCES BOARD	IHI SHIBAURA MACHINERY CORPORATION	EXECUTIVE ORDER U-R-026-0298 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-02-003;

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. 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)
2011	BH3XL2.22L84	1.662 and 2.216	Diesel	5000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Indirect Diesel Injection	Loader, Tractor and Industrial Equipment

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
19≤KW<37	Tier 4 Interim	STD	N/A	N/A	7.5	5.5	0.30	20	15	50
		CERT	--	--	4.4	1.1	0.22	6	4	6

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 27TH day of December 2010.

M. Tuente FOR AGM

Annette Hebert, Chief
Mobile Source Operations Division

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Engine Model Summary Template

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12/20/2010

Engine Family	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
BH3XL2.22L84	403D-17	GS32/2400	31.6@2400	33.4+/-2.2	13.2+/-0.9	77.4@1800	35.8+/-2.2	10.6+/-0.7	IFI
BH3XL2.22L84	403D-17	GS35/2600	35.0@2600	35.0+/-1.9	15.0+/-0.8	78.2@1800	36.4+/-2.4	10.8+/-0.7	IFI
BH3XL2.22L84	404D-22	GN28/1500	27.6@1500	34.0+/-2.4	11.2+/-0.8	95.9@1400	33.6+/-2.2	10.3+/-0.7	IFI
BH3XL2.22L84	404D-22	GN33/1770	32.6@1770	35.5+/-2.4	13.8+/-0.9	99.1@1500	35.3+/-2.7	11.6+/-0.9	IFI
BH3XL2.22L84	404D-22	GN33/1800	32.6@1800	34.4+/-2.0	13.6+/-0.8	99.1@1500	35.3+/-2.7	11.6+/-0.9	IFI
BH3XL2.22L84	404D-22	GN42/2200	41.6@2200	35.2+/-3.3	17.0+/-1.6	105.5@1800	36.2+/-2.4	14.3+/-0.9	IFI
BH3XL2.22L84	404D-22	GN42/2600	42.1@2600	30.5+/-1.7	17.4+/-1.0	95.9@1800	31.8+/-1.8	12.6+/-0.7	IFI
BH3XL2.22L84	404D-22	GN44/2800	44.0@2800	29.6+/-1.7	18.2+/-1.0	95.9@1800	31.8+/-1.8	12.6+/-0.7	IFI
BH3XL2.22L84	404D-22	GN46/2400	45.7@2400	36.2+/-2.2	19.1+/-1.2	105.5@1800	36.9+/-2.6	14.6+/-1.0	IFI
BH3XL2.22L84	404D-22	GN46/3000	45.6@3000	30.5+/-1.6	20.1+/-1.1	95.9@1800	31.8+/-1.8	12.6+/-0.7	IFI
BH3XL2.22L84	404D-22	GN47/2600	47.5@2600	34.9+/-2.1	19.9+/-1.2	105.5@1800	36.3+/-2.6	14.3+/-1.0	IFI
BH3XL2.22L84	404D-22	GN48/2600	47.9@2600	35.3+/-3.2	20.2+/-1.8	105.5@1800	36.3+/-2.6	14.3+/-1.0	IFI
BH3XL2.22L84	404D-22	GN49/2800	48.7@2800	34.7+/-2.6	21.3+/-1.6	103.3@1800	36.0+/-2.6	14.2+/-1.0	IFI
BH3XL2.22L84	C1.7	GS32/2400	31.6@2400	33.4+/-2.2	13.2+/-0.9	77.4@1800	35.8+/-2.2	10.6+/-0.7	IFI
BH3XL2.22L84	C1.7	GS35/2600	35.0@2600	35.0+/-1.9	15.0+/-0.8	78.2@1800	36.4+/-2.4	10.8+/-0.7	IFI
BH3XL2.22L84	C2.2	GN28/1500	27.6@1500	34.0+/-2.4	11.2+/-0.8	95.9@1400	33.6+/-2.2	10.3+/-0.7	IFI
BH3XL2.22L84	C2.2	GN33/1770	32.6@1770	35.5+/-2.4	13.8+/-0.9	99.1@1500	35.3+/-2.7	11.6+/-0.9	IFI
BH3XL2.22L84	C2.2	GN33/1800	32.6@1800	34.4+/-2.0	13.6+/-0.8	99.1@1500	35.3+/-2.7	11.6+/-0.9	IFI
BH3XL2.22L84	C2.2	GN42/2200	41.6@2200	35.2+/-3.3	17.0+/-1.6	105.5@1800	36.2+/-2.4	14.3+/-0.9	IFI
BH3XL2.22L84	C2.2	GN42/2600	42.1@2600	30.5+/-1.7	17.4+/-1.0	95.9@1800	31.8+/-1.8	12.6+/-0.7	IFI
BH3XL2.22L84	C2.2	GN44/2800	44.0@2800	29.6+/-1.7	18.2+/-1.0	95.9@1800	31.8+/-1.8	12.6+/-0.7	IFI
BH3XL2.22L84	C2.2	GN46/2400	45.7@2400	36.2+/-2.2	19.1+/-1.2	105.5@1800	36.9+/-2.6	14.6+/-1.0	IFI
BH3XL2.22L84	C2.2	GN46/3000	45.6@3000	30.5+/-1.6	20.1+/-1.1	95.9@1800	31.8+/-1.8	12.6+/-0.7	IFI
BH3XL2.22L84	C2.2	GN47/2600	47.5@2600	34.9+/-2.1	19.9+/-1.2	105.5@1800	36.3+/-2.6	14.3+/-1.0	IFI
BH3XL2.22L84	C2.2	GN48/2600	47.9@2600	35.3+/-3.2	20.2+/-1.8	105.5@1800	36.3+/-2.6	14.3+/-1.0	IFI
BH3XL2.22L84	C2.2	GN49/2800	48.7@2800	34.7+/-2.6	21.3+/-1.6	103.3@1800	36.0+/-2.6	14.2+/-1.0	IFI
BH3XL2.22L84	N843L-D	34D/2600	35.0@2600	34.5+/-1.4	14.8+/-0.6	79.2@1800	37.0+/-2.4	11.0+/-0.7	IFI
BH3XL2.22L84	N843L-D-8801	38/2925	38.1@2925	34.8+/-1.7	16.8+/-0.8	78.2@2200	35.9+/-1.8	13.0+/-0.7	IFI

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Engine Model Summary Template

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Engine Family	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
BH3XL2.22L84	N843L-D-MC36	36D/2700	36.0@2700	34.7+/-2.1	15.4+/-0.9	77.1@1700	35.5+/-2.7	9.9+/-0.8	IFI
BH3XL2.22L84	N844L-D	45D/2600	45.0@2600	32.8+/-1.4	18.7+/-0.8	104.4@1800	37.2+/-2.4	14.7+/-0.9	IFI
BH3XL2.22L84	N844L-D	48D/2800	48.0@2800	34.9+/-2.5	21.5+/-1.5	101.3@1800	36.7+/-2.2	14.5+/-0.9	IFI
BH3XL2.22L84	N844L-D	TT45A	45.0@2700	34.2+/-1.7	20.3+/-1.0	103.3@1800	36.7+/-1.8	14.5+/-0.7	IFI
BH3XL2.22L84	S3L3L	S3L3L-Y311R	34.5@2600	34.6+/-1.9	14.8+/-0.8	78.2@1800	36.4+/-2.4	10.8+/-0.7	IFI