California Environmental Protection Agency AIR RESOURCES BOARD	ISHIKAWAJIMA-SHIBAURA MACHINERY CO., LTD.	EXECUTIVE ORDER U-R-026-0073 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)
2003	3H3XL2.22L84	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 1	STD	N/A	N/A	9.5	5.5	0.80	20	15	50
		CERT	--	--	5.7	1.1	0.40	6	4	9

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 6TH day of January 2003.

Allen Lyons, Chief
Mobile Source Operations Division

ATTACHMENT 1 OF 1

Engine Model Summary Form

Manufacturer: **Ishikawajima-Shibaura Machinery Co., Ltd.**

Engine category: **Nonroad CI**

EPA Engine Family: **3H3XL2.22L84**

Mfr Family Name: **N/A**

Process Code: **New Submission**

U-R-026-0073

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
104--22	KR32/1700	31.5@1700	33.7+/-1.8	12.6+/-0.7	99.1@1500	34.3+/-2.4	11.3+/-0.8	IFI
104-22	KR33/1800	32.9@1800	31.6+/-1.8	12.5+/-0.7	99.1@1500	34.3+/-2.4	11.3+/-0.8	IFI
104-22	KR35/2200	34.7@2200	29.9+/-2.9	14.4+/-1.4	90.0@1900	30.4+/-1.5	12.7+/-0.6	IFI
104-22	KR39/2200	38.9@2200	32.2+/-1.7	15.6+/-0.8	102.5@1650	36.0+/-2.0	13.0+/-0.7	IFI
104-22	KR44/2300	44.3@2300	32.8+/-2.7	16.6+/-1.4	104.1@2000	34.9+/-1.8	15.3+/-0.8	IFI
104-22	KR46/2600	46.0@2600	33.1+/-1.8	18.9+/-1.0	104.1@2000	34.9+/-1.8	15.3+/-0.8	IFI
104-22	KR47/2500	46.9@2500	33.1+/-2.4	18.2+/-1.3	104.1@2000	34.9+/-1.8	15.3+/-0.8	IFI
104-22	KR48/2600	48.0@2600	34.0+/-1.8	19.4+/-1.0	104.1@2000	34.9+/-1.8	15.3+/-0.8	IFI
404C-22	HP32/1700	31.8@1700	35.0+/-2.3	13.1+/-0.9	99.1@1500	35.3+/-2.7	11.6+/-0.9	IFI
404C-22	HP33/1800	32.6@1800	34.4+/-2.0	13.6+/-0.8	99.1@1500	35.3+/-2.7	11.6+/-0.9	IFI
404C-22	HP42/2200	41.6@2200	35.3+/-3.1	17.1+/-1.5	105.5@1800	37.4+/-3.5	14.8+/-1.4	IFI
404C-22	HP46/2400	45.7@2400	36.5+/-3.3	19.2+/-1.7	105.5@1800	37.4+/-3.5	14.8+/-1.4	IFI
404C-22	HP48/2600	47.9@2600	35.6+/-3.2	20.3+/-1.8	105.5@1800	37.4+/-3.5	14.8+/-1.4	IFI
N843L-2	35/2700-CM	35.0@2700	31.0+/-1.5	13.8+/-0.7	78.0@2000	34.2+/-1.7	11.3+/-0.6	IFI
N843L-2	TC35/2600	35.0@2600	34.4+/-1.4	14.7+/-0.6	84.8@1800	40.4+/-2.2	12.0+/-0.6	IFI
N844L	47/2600-F3415	46.7@2600	34.3+/-1.8	19.6+/-1.0	101.2@2000	36.7+/-1.8	16.1+/-0.8	IFI
N844L-2	41/2500-F2120	43.3@2500	31.3+/-1.6	17.2+/-0.9	99.7@1800	34.4+/-1.7	13.6+/-0.7	IFI
N844L-2	TC45/2600	45.1@2600	32.7+/-1.0	18.7+/-0.6	109.9@1800	39.5+/-2.1	15.6+/-0.8	IFI