California Environmental Protection Agency	
AIR RESOURCES BOARD	ISHIKAWAJIMA-SHIBAURA
- AIN NESUURCES BUARD	MACHINERY CO., 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-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) 3000		
2004	4H3XL.451E2V	0.451	Diesel			
SPECIAL I	FEATURES & EMISSION	CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION			
	Indirect Diesel Inje	ction	Generator 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	EMISSION STANDARD		EXHAUST (g/kw-hr) OPACITY (
CLASS	CATEGORY		НС	NOx	NMHC+NOx	co	PM	ACCEL	LUG	PEAK
KW<8	Tier 1	STD	N/A	N/A	10.5	8.0	1.0	20	15	50
		CERT			6.6	2.5	0.6	<u> </u>	Q	10

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

_ day of January 2004.

Allen Kons, Chief Mobile Source Operations Division

Engine wodel Summary Form

۰,

ATTACHMENT 1 OF 1

Manufacturer: Ishikawajima-Shibaura Machinery Co., Ltd.

Engine category: Nonroad CI

EPA Engine Famly 4H3XL.451E2V

Mfr Family Name: N/A

Process Code: New Submission

W-R-026-0083

1192
9.Emission Control evice Per SAE J193 IFI IFI IFI IFI
De o
B.Fuel Rate: 9.Emission Control (Ibs/hr)@peak torque Device Per SAE J1930 N/A 1+/-0.2 IFI 3.5+/-0.2 IFI N/A IFI 3.2+/-0.2 IFI 3.2+/-0.2 IFI 3.2+/-0.2 IFI
8.Fuei Rate: bs/hr)@peak torque 1.1+/-0.2 3.5+/-0.2 N/A N/A 3.2+/-0.2 3.2+/-0.2
8.Fuel Rate: hr)@peak tor 1.1+/-0.2 3.5+(/_02 N/A 3.2+//02 3.2+/-0.2
8.FL 1.0 2. 3. 3.
(Ibs
7. Fuel Rate: 9. Emission C mm/stroke@peak 8. Fuel Rate: 9. Emission C torque (Ibs/hr)@peak torque 9. Emission C 15. 6+/-0.8 1.1+/-0.2 1F1 15. 6+/-0.8 3.5+/-0.2 1F1 15. 6+/-0.8 3.2+/-0.2 1F1
7.Fuel Rate: mm/stroke@peak torque 15.6+/-0.8 15.3+/-0.8 N/A N/A 15.3+/-0.8 15.5+/-0.8
7.Fuel Rate: wistroke@pe torque 15.3+/-0. N/A N/A 15.3+/-0. 15.5+/-0.
7.Fu to 15 15 15 15
7.Fuel Rate: 7.Fuel Rate: 9.Emission C 6. Torque @ RPM mm/stroke@peak 8.Fuel Rate: 9.Emission C (SEA Gross) torque (Ibs/hr)@peak torque 9.Emission C N/A an N N/A 1.1 1.1 18.8@2400 15.6+/-0.8 4.1+/-0.2 IFI 18.8@2400 15.6+/-0.8 4.1+/-0.2 IFI 18.4@2100 15.5+/-0.8 3.5+/-0.2 IFI N/A N/A N/A IFI 17.6@1800 14.9+/-0.1 2.9+/-0.1 IFI 17.6@1800 15.5+/-0.8 3.2+/-0.2 IFI 18.7@1900 15.5+/-0.8 3.2+/-0.2 IFI
Forque @ RP (SEA Gross) (SEA Gross) 18.8@240 18.4@210 18.4@210 18.7@180 18.7@190
5.Fuel Rate: (bs/h1) @ peak HP (for diesels only) (5.3‡/-0.3 5.7+/-0.3 4.4+/-0.3 4.4+/-0.3 3.3†/-0.2 3.7+/-0.2
Rate -0.0.0
5.Fuel Rate bs/hr) @ peak Hf (for diesels only) (5.3+/-0.3 5.7+/-0.3 4.4+/-0.3 4.4+/-0.2 3.3+/-0.2
.oooo ∠oo ≤a
4.Fuel Rate: mm/stroke @ peak H (for diesel only) (for diesel only) 14.5+/-0.7 14.2+/-1.0 13.5+/-0.8 13.5+/-0.8 14.2+/-0.9
4.2. 4.2. 4.2. 4.2.
3.BHP@RPM (SAE Gross) 9.8@3600 11.0@3600 9.4@2800 9.0@3000 7.2@2000 8.0@2400
600 000 000 000 000 000 000 000 000 000
3.ВНР@RPM (SAE Gross) 9.8@3600 9.4@2800 9.0@3000 9.0@3000 8.0@2400
3.BHP@RPM T (SAE Gross) (SAE Gross) (9,8@3600 9,4@2800 9,0@3000 9.0@3000 8.0@2400
0/36 9/2/ /24
4. Fuel Rate: 3. BHP@RPM 3. BHP@RPM mm/stroke @ peak H 3. BHP@RPM mm/stroke @ peak H (for diesel only) (for diese
~i 1
Engine Code 102-05 102-05 102-05 102-05 71PA04
ngine Co 102-05 102-05 102-05 102-05 7A1PA04