

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-6-1

Relating to Certification of New Heavy-Duty Off-Road Equipment Engines

ISUZU MOTORS LIMITED

Pursuant to the authority vested in the Air Resources Board by Sections 43000.5, 43013 and 43018 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 Isuzu Motors Limited 1996 model-year engine, with rated power between 175 and 750 horsepower, and exhaust emission control systems are certified as described below for use in heavy-duty off-road equipment:

Typical Equipment Usage: Hydraulic Excavators

Fuel Type: Diesel

<u>Engine Family</u>	<u>Liters (Cubic Inches)</u>		<u>Exhaust Emission Control Systems and Special Features</u>
TSZ9.8R6DARA	9.8	(600)	Turbocharger

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 total hydrocarbons (THC), carbon monoxide (CO), nitrogen oxides (NOx), and particulate matters (PM) certification exhaust emission standards, in grams per brake horsepower-hour (g/bhp-hr), and the opacity of smoke emission standards, in percent (%), during acceleration (Accel), lugging (Lug), and peak (Peak) modes, for this engine family are (Title 13, California Code of Regulations, Section 2423):

<u>Exhaust Emissions (g/bhp-hr)</u>				<u>Smoke Opacity ( % )</u>		
<u>THC</u>	<u>CO</u>	<u>NOx</u>	<u>PM</u>	<u>Accel</u>	<u>Lug</u>	<u>Peak</u>
1.0	8.5	6.9	0.4	20	15	50

The THC, CO, NOx and PM exhaust emission certification values, in g/bhp-hr, and the opacity of smoke emission certification values, in percent (%), for this engine family are:

<u>Engine Family</u>	<u>Exhaust Emission (g/bhp-hr)</u>				<u>Smoke Opacity ( % )</u>		
	<u>THC</u>	<u>CO</u>	<u>NOx</u>	<u>PM</u>	<u>Accel</u>	<u>Lug</u>	<u>Peak</u>
TSZ9.8R6DARA	0.4	1.1	6.4	0.3	15	10	23

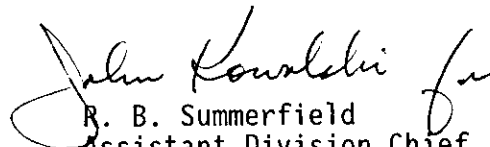
BE IT FURTHER RESOLVED: That the listed engine models comply with the "Exhaust Emission Standards and Test Procedures--Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2423) for the aforementioned model year.

BE IT FURTHER RESOLVED: That the listed engine models also comply with the "Emission Control Labels--1996 and Later Heavy-Duty Off-Road Diesel Cycle 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, Section 2425 et seq.).

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

Executed at El Monte, California this 18<sup>th</sup> day of January 1996.

  
R. B. Summerfield  
Assistant Division Chief  
Mobile Source Division

E.O.# U-R-6-1

199 6 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET  
 HEAVY-DUTY OFF-ROAD-DIESEL ENGINES

Page \_\_\_ of \_\_\_

Manufacturer Isuzu Motors Limited Engine Family TSZ9.8R6DARA  
 Displacement: 9.8 / 600 Liters/Cubic Inches Eng Config: L6/OHC  
 All Codes in Eng Fam: CA 49S 50S X Cert Test Procedures: ARB     EPA X  
 Valves/Ports per Cylinder 2 Strokes per Combustion Cycle 4  
 Maximum Rated Power: 249.6 HP ( 186.1 KW) @ 2200 RPM  
 Ignition: Compression     Compression with Glow Plug X Spark      
 Fuel Type(s): Dedicated X Flex-Fuel     Dual-Fuel     Diesel X M100     M85      
 CNG     LNG     LPG     Other (specify)      
 Diesel Cert Fuel: 40 CFR 86.1313-94 X Other (specify)      
 Primary Service Equipment: Hydraulic Excavator  
 Exhaust ECS (e.g., MFI, TC, CAC): EM, TC  
 (use abbreviations per SAE J1930 JUN93)

Engine Model (Eng Code)	Rated HP @ RPM	Fuel Rate @ Rated HP mm <sup>3</sup> / stroke (lbs/hr)	Fuel Pump & Injector Part No.	ECM/PCM Part No.	EGR Valve Part No.	PTOX / Catalytic Converter Part No.
9.8RD-A	250/2200	130.6 (95.9)	Pump 115602975(X)	N/A	N/A	N/A
9.8RD-B	241/2000	132.3 (88.4)	115603074(X)			
9.8RD-C	174/2200	92.2 (67.7)	or 115603075(X)			
9.8RD-D	170/2000	94.1 (62.8)	Injector 115300289(X)			

(X): Suffix any figure from 0 to 9.

Date Issued:

Revisions: Nov. 27, 95