

Emission Regulations on JPN, EU and USA

Model Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018				
US EPA 40 CFR Part 1039 (June 29, 2004) Production Date () Note: (NOx or NOx+NMHC / CO / PM) or (NOx / HC / CO / PM) Unit: g/kWh																					
0 < P < 8	Tier 1 (10.5 / 8.0 / 1.0)			Tier 2 (7.5 / 8.0 / 0.80)			Tier 4 (7.5 / 8.0 / 0.40*)						Tier 4 (7.5 / 8.0 / 0.40*) NRTC/NTE Test mode effective								
8 ≤ P < 19	Tier 1 (9.5 / 6.6 / 0.80)			Tier 2 (7.5 / 6.6 / 0.80)			Tier 4 (7.5 / 6.6 / 0.40)						Tier 4 (7.5 / 6.6 / 0.40) NRTC/NTE Test mode effective								
19 ≤ P < 37	Tier 1 (9.5 / 5.5 / 0.80)			Tier 2 (7.5 / 5.5 / 0.60)			Interim Tier 4 (7.5 / 5.5 / 0.30)						Tier 4 (4.7 / 5.0 / 0.03)								
37 ≤ P < 56	Tier 1 (9.2 / --- / ---)			Tier 2 (7.5 / 5.0 / 0.40)			Interim Tier 4 (4.7 / 5.0 / 0.30) (Option #1)						Tier 4 (4.7 / 5.0 / 0.03)								
56 ≤ P < 75	Tier 1 (9.2 / --- / ---)			Tier 2 (7.5 / 5.0 / 0.40)			Tier 3 (4.7 / 5.0 / 0.40)						Interim Tier 4 (3.40 / 19 / 3.50 / 0.02)			Tier 4 (0.40 / 0.19 / 3.50 / 0.02)					
75 ≤ P < 130	Tier 1 (9.2 / --- / ---)			Tier 2 (6.6 / 5.0 / 0.30)			Tier 3 (4.0 / 5.0 / 0.30)						Interim Tier 4 (3.40 / 19 / 3.50 / 0.02)			Tier 4 (0.40 / 0.19 / 3.50 / 0.02)					
130 ≤ P < 225	Tier 1 (9.2 / 11.4 / 0.54)			Tier 2 (6.6 / 3.5 / 0.20)			Tier 3 (4.0 / 3.5 / 0.20)						Interim Tier 4 (2.00 / 19 / 3.50 / 0.02)			Tier 4 (0.40 / 0.19 / 3.50 / 0.02)					
225 ≤ P < 450	Tier 2 (6.4 / 3.5 / 0.20)						Tier 3 (4.0 / 3.5 / 0.20)						Interim Tier 4 (2.00 / 19 / 3.50 / 0.02)			Tier 4 (0.40 / 0.19 / 3.50 / 0.02)					
450 ≤ P < 560	Tier 2 (6.4 / 3.5 / 0.20)						Tier 3 (4.0 / 3.5 / 0.20)						Interim Tier 4 (2.00 / 19 / 3.50 / 0.02)			Tier 4 (0.40 / 0.19 / 3.50 / 0.02)					
Fuel Sulfur	500ppm						500ppm						15ppm								
* Interim Tier 4 (56kW-500kW) : Alt. NOx Phase-in Option																					

Model Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018				
EU Directive 2004/26/EC (April 21, 2004) Placing On the market																					
0 < P < 8	No Regulation																				
8 ≤ P < 18(19)	No Regulation																				
18(19) ≤ P < 37	Stage II (8.0 / 1.5 / 5.5 / 0.8)						Stage III A (7.5 / 5.5 / 0.0)														
	Constant speed →			Stage II (8.0 / 1.5 / 5.5 / 0.8)			Stage III A (4.7 / 5.0 / 0.4)						Stage III A (7.5 / 5.5 / 0.0)								
37 ≤ P < 56	Stage I (9.2 / 1.3 / 6.5 / 0.85)			Stage II (7.0 / 1.3 / 5.0 / 0.4)			Stage III A (4.7 / 5.0 / 0.4)						Stage III B (4.7 / 5.0 / 0.025)								
	Constant speed →			Stage II (7.0 / 1.3 / 5.0 / 0.4)			Stage III A (4.7 / 5.0 / 0.4)						Stage III A (4.7 / 5.0 / 0.4)								
56 ≤ P < 75	Stage I (9.2 / 1.3 / 6.5 / 0.85)			Stage II (7.0 / 1.3 / 5.0 / 0.4)			Stage III A (4.7 / 5.0 / 0.4)						Stage III B (3.3 / 0.19 / 5.00 / 0.025)			Stage IV (0.40 / 0.19 / 3.50 / 0.025)					
	Constant speed →			Stage II (7.0 / 1.3 / 5.0 / 0.4)			Stage III A (4.7 / 5.0 / 0.4)						Stage III A (4.7 / 5.0 / 0.4)								
75 ≤ P < 130	Stage I (9.2 / 1.3 / 6.5 / 0.7)			Stage II (6.0 / 1.0 / 5.0 / 0.3)			Stage III A (4.0 / 5.0 / 0.3)						Stage III B (3.3 / 0.19 / 5.00 / 0.025)			Stage IV (0.40 / 0.19 / 3.50 / 0.025)					
	Constant speed →			Stage II (6.0 / 1.0 / 5.0 / 0.3)			Stage III A (4.0 / 5.0 / 0.3)						Stage III A (4.0 / 5.0 / 0.3)								
130 ≤ P < 560	Stage II (6.0 / 1.0 / 3.5 / 0.2)						Stage III A (4.0 / 3.5 / 0.2)						Stage III B (2.0 / 0.19 / 3.50 / 0.025)			Stage IV (0.40 / 0.19 / 3.50 / 0.025)					
	Constant speed →			Stage II (6.0 / 1.0 / 3.5 / 0.2)			Stage III A (4.0 / 3.5 / 0.2)						Stage III A (4.0 / 3.5 / 0.2)								
Fuel Sulfur	2000ppm						1000ppm						1000ppm								
(Test Fuel Sulfur)							300ppm (Stage II A)						10ppm (Stage III B & IV)								

JPN Ministry of the Environment (6/30/03 Report) Registration of Equipment		() Note: (NO _x +NMHC / CO / PM / (smoke(%)) or (NO _x / HC / CO / PM / (smoke(%)) Unit: g/kWh HC for 2011 Regulation is Non-Methane hydrocarbons(NMHC) Smoke test for 2014 Regulation is measured by opacimeter Unit: m ³ ☆: Extended production period																
0 < P < 8		No Regulation																
8 ≦ P < 19		No Regulation																
19 ≦ P < 37		2003 Regulation (8.00 / 1.50 / 5.00 / 0.80 / 40) ~1/Oct	☆(~31/Aug) ~1/Oct	2007 Regulation (6.00 / 1.00 / 5.00 / 0.40 / 40) ~1/Oct	☆(~31/Aug) ~1/Oct	2013 Regulation (4.0 / 0.7 / 5.0 / 0.03 / 25) ~1/Oct	☆(~31/Aug) ~1/Oct	2014 Regulation (4.0 / 0.7 / 5.0 / 0.03 / 0.5) ~1/Oct										
37 ≦ P < 56		2003 Regulation (7.00 / 1.30 / 5.00 / 0.40 / 40) ~1/Oct	☆(~31/Aug) ~1/Oct	2008 Regulation (4.00 / 0.70 / 5.00 / 0.30 / 35) ~1/Oct	☆(~31/Oct) ~1/Oct	2013 Regulation (4.0 / 0.7 / 5.0 / 0.025 / 25) ~1/Oct	☆(~31/Aug) ~1/Oct	2014 Regulation (4.0 / 0.7 / 5.0 / 0.025 / 0.5) ~1/Oct										
56 ≦ P < 75		2003 Regulation (7.00 / 1.30 / 5.00 / 0.40 / 40) ~1/Oct	☆(~31/Aug) ~1/Oct	2008 Regulation (4.00 / 0.70 / 5.00 / 0.25 / 30) ~1/Oct	☆(~31/Mar) ~1/Oct	2012 Regulation (3.3 / 0.19 / 5.0 / 0.02 / 25) ~1/Oct	☆(~31/Aug) ~1/Oct	2014 Regulation (0.4 / 0.19 / 5.0 / 0.02 / 0.5) ~1/Oct										
75 ≦ P < 130		2003 Regulation (6.00 / 1.00 / 5.00 / 0.30 / 40) ~1/Oct	☆(~31/Aug) ~1/Oct	2007 Regulation (3.60 / 0.40 / 5.00 / 0.20 / 25) ~1/Oct	☆(~31/Oct) ~1/Oct	2012 Regulation (3.3 / 0.19 / 5.0 / 0.02 / 25) ~1/Oct	☆(~31/Aug) ~1/Oct	2014 Regulation (0.4 / 0.19 / 5.0 / 0.02 / 0.5) ~1/Oct										
130 ≦ P < 560		2003 Regulation (6.00 / 1.00 / 3.50 / 0.20 / 40) ~1/Oct	☆(~31/Aug) ~1/Oct	2006 Regulation (3.60 / 0.40 / 3.50 / 0.17 / 25) ~1/Oct	☆(~31/Mar) ~1/Oct	2011 Regulation (2.0 / 0.19 / 3.5 / 0.02 / 25) ~1/Oct	☆(~31/Aug) ~1/Oct	2014 Regulation (0.4 / 0.19 / 3.5 / 0.02 / 0.5) ~1/Oct										
Ministry of Land, Infrastructure and Transportation / Recognition system for construction machinery																		
(construction machinery not covered by off-road regulation's type approval)																		
0 < P < 7.5 (8)		No Regulation																
7.5 ≦ P < 15	1st Step (12.4/2.4/5.7/—/50)																	
8 ≦ P < 19		2nd Step (9.0 / 1.5 / 5.0 / 0.8 / 40)	3rd Step* (7.5 / 5.0 / 0.8 / 40)															
15 ≦ P < 30	1st Step (10.5/1.9/5.7/—/50)																	
19 ≦ P < 37		2nd Step (8.0 / 1.5 / 5.0 / 0.8 / 40)	3rd Step* (6.0 / 1.0 / 5.0 / 0.4 / 40)															
30 ≦ P < 272	1st Step (9.2/1.3/5.0/—/50)																	
37 ≦ P < 56		2nd Step (7.0 / 1.3 / 5.0 / 0.4 / 40)	3rd Step* (4.0 / 0.7 / 5.0 / 0.3 / 35)															
56 ≦ P < 75		2nd Step (7.0 / 1.3 / 5.0 / 0.4 / 40)	3rd Step* (4.0 / 0.7 / 5.0 / 0.25 / 30)															
75 ≦ P < 130		2nd Step (6.0 / 1.0 / 5.0 / 0.3 / 40)	3rd Step* (3.6 / 0.4 / 5.0 / 0.2 / 25)															
130 ≦ P < 560		2nd Step (6.0 / 1.0 / 3.5 / 0.2 / 40)	3rd Step* (3.6 / 0.4 / 3.5 / 0.17 / 25)															
Japan Land Engine Manufacturers Association (below 19kW) Voluntary Regulation																		
Note: (NO _x +NMHC / CO / PM) Unit: g/kWh																		
0 < P < 8		Tier 1 (7.5 / 8.0 / 0.80)																
8 ≦ P < 19		Tier 2 (7.5 / 8.0 / 0.40*)																
		Tier 1 (7.5 / 6.6 / 0.80)																
		Tier 2 (7.5 / 6.6 / 0.40)																
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018

注: 1. Entered into force 2. Drafting or studying 3. No limit/ no regulation

2 **Italic bold red character shows the limit requires aftertreatment for PM.**

3 **Italic bold red character shows the limit requires aftertreatment for NOx.**