

DRD Exhaust Gas Fuel Consumption Test by Chassis Dynamo - 2014

Test Overview

The purpose of the test was to evaluate the impact of Engine Armour Tech™ on engine emissions and fuel economy through the following generalized steps:

1. **Establishment of a Baseline:** Determine engine emissions and fuel economy prior to adding Engine Armour Tech™.
2. **Engine Treatment:** Engine Armour Tech™ is added directly into the oil reservoir and emissions as well as fuel economy are monitored over a total of 1159 Km using the standard 10-15 Mode operating condition.
3. **Transmission & Differential Treatment:** Engine Armour Tech™ is then added to the transmission and differential oil, and emissions and fuel economy are monitored after 70, 110 and 260 km using the standard 10-15 Mode operating condition.
4. **Change oil:** Oil is changed at the end of the test, and a final set of readings taken after running the engine for an additional 30 km (oil break-in period).

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For more information, please contact Engine Armour Tech



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試験報告書
Trial report

シャシダイナモによる排ガス燃費確認試験
Exhaust gas fuel consumption confirmation test by chassis dynamo

試験車両：日産 PATROL
Test vehicle: Nissan PATROL

試験期間：2014年7月1日～7月4日
Examination period: 1 July - 4 July 2014

2014/07/05

株式会社DRD 実験部
DRD Experiment Department, Inc.



1) List of engine exhaust gas measurement results (before 1000 km break-in) **FE= Feul km/L** Start of the test Odometer distance 22,896 km
 Exhaust gas measurement result 10 · 15 mode The deficit is the rate of change (%) relative to the average value without Engine Armour Tech BASE End of this test Odometer distance 23,156 km
 Total km for page 1 - 260 km

Date / Time	Mode		CO (g/km)	THC (g/km)	NOX (g/km)	CO2 (g/km)	PM (g/km)	FE (km/L)	Odometer (km)	Conditions	
2014. 5. 8 16:20	10·15 Mode	Results	0.760	0.126	1.144	288.0	0.156	9.082	22960	Without Engine Armour Tech n=1	
2014. 5. 8 16:45	10·15 Mode	Results	0.720	0.111	1.141	285.1	0.134	9.179	22966	Without Engine Armour Tech n=2	
Test 1 and 2 average value for BASE point			Average	0.740	0.119	1.143	286.5	0.145	9.131	<< STARTING POINT BASE VALUE	
Exhaust gas test results 60 km / hr constant speed The deficit is the rate of change (%) without Engine Armour Tech											
Date / Time	Mode		CO (g/km)	THC (g/km)	NOX (g/km)	CO2 (g/km)	PM (g/km)	FE (km/L)	Odometer reading (km)	Conditions	
2014. 5. 8 17:52	60 km/hr 一定速	Results	0.433	0.031	0.373	161.7	0.078	16.230	22991	Without Engine Armour Tech (After 25km)	
2014. 5. 9 9:29	60 km/hr 一定速	Results	0.448	0.028	0.374	158.9	0.067	16.519	23021	Added Engine Armour Tech to engine (After 30 km)	
Test 1 and 2 average value for BASE point			Average	0.740	0.119	1.143	286.5	0.145	9.131	22966	<< STARTING POINT BASE VALUE
2014. 5. 9 9:42	10·15 Mode	Results	0.770	0.101	1.135	277.2	0.110	9.436	23051	With Engine Armour Tech (after 30 km) n=1	
		Change	4.05	-14.77	-0.66	-3.25	-24.14	3.35			
2014. 5. 9 11:12	10·15 Mode	Results	0.760	0.109	1.128	286.3	0.113	9.138	23058	With Engine Armour Tech (after 30 km) n=2	
		Change	2.70	-8.02	-1.27	-0.09	-22.07	0.08			
2014. 5. 9 13:27	10·15 Mode	Results	0.710	0.095	1.145	271.7	0.093	9.629	23093	With Engine Armour Tech (after 60 km)	
		Change	-4.05	-19.83	0.22	-5.16	-35.85	5.45			
2014. 5. 9 14:46	10·15 Mode	Results	0.740	0.101	1.154	268.6	0.101	9.739	23138	With Engine Armour Tech (after 100 km) n=1	
		Change	0.00	-14.77	1.01	-6.26	-30.34	6.65			
2014. 5. 9 15:37	10·15 Mode	Results	0.750	0.100	1.124	271.5	0.098	9.636	23144	With Engine Armour Tech (after 100 km) n=2	
		Change	1.35	-15.61	-1.62	-5.26	-32.41	5.54			
Average with Engine Armour Tech			Average	0.746	0.101	1.137	275.0	0.103	9.516		
Engine Armour Tech average vs BASE			Change	0.81	-14.60	-0.46	-4.01	-28.97	4.22		

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2) List of measurement results of engine exhaust gas (after 1000 km break in) **FE= Feul km/L** At the start of the test Odometer distance: 23458 km
 Exhaust gas measurement result 10-15 Mode deficit is the change rate (%) relative to the average value without Engine Armour Tech BASE At end of test Odometer distance: 24551 km
 Total from start P.1 to P.2 finish 1,655 km

Date / Time	Operation Condition		CO (g/km)	THC (g/km)	NOX (g/km)	CO2 (g/km)	PM (g/km)	FE (km/L)	Odometer (km)	Conditions	
Test 1 and 2 average value for BASE point			Average	0.740	0.119	1.143	286.5	0.145	9.131	22966	<< STARTING POINT BASE VALUE
2014.07.01 14:14	10-15Mode	Results	0.770	0.101	1.135	277.2	0.110	9.436	23458	"Coating Agent" 1000 km before break-in (300 km from the base)	
		Change	4.05	-14.77	-0.66	-3.25	-24.14	3.35	23464		
2014.07.01~2014.07.02	100km/h 一定速	1000 km break-in driving with Engine Armour Tech in Engine only							23156~24158		
2014.07.02 14:47	10-15Mode	Results	0.710	0.074	1.070	251.6	0.082	10.339	24158	With Engine Armour Tech during 1000 km breaking km n=1	
		Change	-4.05	-37.55	-6.35	-12.20	-43.45	13.24	24164		
2014.07.02 15:39	10-15Mode	Results	0.710	0.078	1.095	256.4	0.080	10.204	24167	With Engine Armour Tech during 1000 km breaking km n=2	
		Change	-4.05	-34.18	-4.16	-10.52	-44.83	11.76	24173		
2014.07.02 16:12	10-15Mode	Results	0.720	0.081	1.125	255.1	0.082	10.255	24173	With Engine Armour Tech during 1000 km breaking km n=3	
		Change	-2.70	-31.65	-1.53	-10.97	-43.45	12.32	24180		
1000km Average Results with Engine Armour Tech			0.713	0.078	1.097	254.343	0.081	10.266		With Engine Armour Tech during 1000 km breaking km Average	
Engine with Engine Armour Tech value vs BASE Average			-3.60	-34.46	-4.01	-11.23	-43.91	12.44			
2014.07.03	60km/h 一定速	Transmission, differential oil Added "Engine Armour Tech"							24180	Transmission and differential oil Added "Engine Armour Tech"	
		70 km break-in driving							24253		
2014.07.03 13:48	10-15Mode	Results	0.740	0.093	1.131	260.1	0.097	10.057	23253	Engine Armour Tech in Engine, Transmission, differential 70 km After break-in n=1	
		Change	0.00	-21.52	-1.01	-9.24	-33.10	10.15	24260		
2014.07.03 14:17	10-15Mode	Results	0.700	0.089	1.140	263.7	0.096	9.922	24260	Engine Armour Tech in Engine, Transmission, differential 70 km After break-in n=2	
		Change	-5.41	-24.89	-0.22	-7.97	-33.79	8.07	24268		
2014.07.03	100km/h 一定速	+ 40 km break-in driving							24266~24306	110 km break-in (mode mileage excluded)	
2014.07.03 15:21	10-15Mode	Results	0.690	0.073	1.105	256.9	0.078	10.185	24306	Engine Armour Tech in Engine, Transmission, differential 110 km After break-in n=1	
		Change	-6.76	-38.40	-3.28	-10.34	-46.21	11.55	24312		
2014.07.03 15:52	10-15Mode	Results	0.690	0.083	1.107	258.6	0.086	10.120	24312	Engine Armour Tech in Engine, Transmission, differential 110 km After break-in n=2	
		Change	-6.76	-29.96	-3.11	-9.76	-40.69	10.84	24318		
2014.07.03	100km/h 一定速	+ 150 km break-in driving							24318~24471	260 km break-in (mode mileage excluded)	
2014.07.04 09:22	10-15Mode	Results	0.720	0.082	1.109	262.1	0.083	9.982	24471	Engine Armour Tech in Engine, Transmission, differential 260 km After break-in	
		Change	-2.70	-30.80	-2.93	-8.54	-42.76	9.33	24477		
Engien, Trans, differential with "Engine Armour Tech" average			0.708	0.084	1.118	260.252	0.088	10.053		Engine, Transmission, differential average value with Engine Armour Tech	
Engine Armour Tech absent average value BASE rate change			-4.32	-29.11	-2.11	-9.17	-39.31	10.11			
2014.07.04	100km/h 一定速	Replace engine oil with new oil only							24477	Replace engine oil with new oil only	
		30 km break-in driving							24516		
Date / Time	Operation Condition		CO (g/km)	THC (g/km)	NOX (g/km)	CO2 (g/km)	PM (g/km)	FE (km/L)	Odometer (km)	Conditions	
Test 1 and 2 average value for BASE point			Average	0.740	0.119	1.143	286.5	0.145	9.131	22966	<< STARTING POINT BASE VALUE
2014.07.04 11:58	10-15Mode	Results	0.680	0.074	1.134	263.0	0.079	9.953	24516	Changed engine oil with new oil After breaking 30 km n=1	
		Change	-8.11	-37.55	-0.74	-8.23	-45.52	9.01	24522		
2014.07.04 13:39	10-15Mode	Results	0.690	0.076	1.116	261.7	0.080	10.000	24539	Changed engine oil with new oil After breaking 30 km n=2	
		Change	-6.76	-35.86	-2.32	-8.67	-44.83	9.52	24545		
2014.07.04 14:10	10-15Mode	Results	0.700	0.082	1.116	260.4	0.082	10.048	24545	Changed engine oil with new oil After breaking 30 km n=3	
		Change	-5.41	-30.80	-2.32	-9.12	-43.45	10.05	24551		
New Engine oil Engine Armour Tech absent average value			0.690	0.077	1.122	261.670	0.080	10.000	< Results	Changed engine oil	
Engine Armour Tech absent average value BASE change rate			-6.76	-34.74	-1.79	-8.67	-44.60	9.53	< Percentage	after oil change average v BASE after 30 km	