

TORSI DAN DAYA

No	Torsi									
	Putaran (rpm)	Pertamax Plus Murni	Putaran (rpm)	Premium Murni	Putaran (rpm)	Premium - Ethanol 5%	Putaran (rpm)	Premium - Ethanol 10%	Putaran (rpm)	Premium - Ethanol 15%
1	4000	6.19	4000		4000	9.78	4000		4000	
2	4250	11.03	4250		4250	13.07	4250	12.81	4250	5.63
3	4500	13.20	4500		4500	14.92	4500	13.28	4500	12.11
4	4750	14.08	4750		4750	14.01	4750	12.91	4750	12.67
5	5000	13.88	5000		5000	13.82	5000	12.93	5000	12.55
6	5250	13.85	5250	9.87	5250	13.78	5250	12.87	5250	12.66
7	5500	13.99	5500	11.13	5500	14.00	5500	13.10	5500	12.90
8	5750	14.42	5750	11.67	5750	14.50	5750	13.48	5750	13.26
9	6000	14.85	6000	11.99	6000	14.87	6000	13.83	6000	13.71
10	6250	15.19	6250	12.24	6250	15.22	6250	14.19	6250	13.97
11	6500	15.31	6500	12.51	6500	15.31	6500	14.29	6500	14.13
12	6750	15.33	6750	12.71	6750	15.32	6750	14.37	6750	14.18
13	7000	15.65	7000	12.82	7000	15.58	7000	14.63	7000	14.35
14	7250	15.83	7250	13.07	7250	15.75	7250	14.85	7250	14.71
15	7500	16.18	7500	13.26	7500	16.09	7500	15.19	7500	14.90
16	7584	16.35	7750	13.53	7635	16.24	7647	15.36	7704	15.21
17	7750	16.28	7983	13.84	7750	16.18	7687	15.17	7722	15.14

No	Torsi									
	Putaran (rpm)	Pertamax Plus Murni	Putaran (rpm)	Premium Murni	Putaran (rpm)	Premium - Ethanol 5%	Putaran (rpm)	Premium - Ethanol 10%	Putaran (rpm)	Premium - Ethanol 15%
18	7937	16.46	8000	13.69	7965	16.36	7750	15.27	7750	15.00
19	8000	16.37	8114	13.94	8000	16.22	7839	15.40	8000	14.93
20	8224	16.46	8222	13.47	8156	16.32	8000	15.18	8207	14.81
21	8250	16.31	8250	13.69	8250	16.20	8250	15.13	8250	15.00
22	8500	16.25	8500	13.62	8500	16.11	8500	15.03	8500	14.84
23	8750	16.07	8750	13.49	8750	15.86	8750	14.91	8750	14.62
24	8917	16.03	9000	13.30	9000	15.46	8858	14.92	9000	14.33
25	9000	15.79	9250	13.00	9047	15.60	9000	14.59	9037	14.17
26	9115	15.80	9500	12.78	9250	15.09	9235	14.20	9125	14.29
27	9250	15.35	9750	12.51	9333	15.15	9249	14.31	9250	13.85
28	9368	15.29	9908	11.97	9500	14.66	9250	14.17	9500	13.50
29	9500	14.87	10000	12.23	9605	14.49	9500	13.66	9750	13.22
30	9750	14.42	10250	11.86	9750	14.18	9750	13.28	9780	13.16
31	10000	14.00	10500	11.55	10000	13.79	10000	12.93	10000	12.77
32	10250	13.63	10750	11.26	10250	13.43	10250	12.58	10250	12.47
33	10500	13.25	11000	11.04	10500	13.08	10500	12.17	10500	12.11
34	10750	12.93	11250	10.89	10750	12.49	10750	11.88	10750	11.72
35	11000	12.55	11500	10.68	11000	12.31	11000	11.51	11000	11.43
36	11250	11.98	11529	11.02	11250	11.62	11250	10.97	11250	10.91
37	11500	11.61	11641	10.82	11500	11.23	11500	10.54	11500	10.44

No	Daya									
	Putaran (rpm)	Pertamax Plus Murni	Putaran (rpm)	Premium	Putaran (rpm)	Premium - Ethanol 5%	Putaran (rpm)	Premium - Ethanol 10%	Putaran (rpm)	Premium - Ethanol 15%
1	4000	2.6	4000		4000	4.2	4000		4000	
2	4250	4.9	4250		4250	5.8	4250	5.7	4250	2.5
3	4500	6.2	4500		4500	7.0	4500	6.3	4500	5.7
4	4750	7.0	4750		4750	7.0	4750	6.4	4750	6.3
5	5000	7.3	5000		5000	7.3	5000	6.8	5000	6.6
6	5250	7.6	5250	5.4	5250	7.6	5250	7.1	5250	7.0
7	5500	8.1	5500	6.4	5500	8.1	5500	7.5	5500	7.4
8	5750	8.7	5750	7.0	5750	8.7	5750	8.1	5750	8.0
9	6000	9.3	6000	7.5	6000	9.4	6000	8.7	6000	8.6
10	6250	10.0	6250	8.0	6250	10.0	6250	9.3	6250	9.2
11	6500	10.4	6500	8.5	6500	10.5	6500	9.7	6500	9.6
12	6750	10.9	6750	9.0	6750	10.9	6750	10.2	6750	10.0
13	7000	11.5	7000	9.4	7000	11.5	7000	10.8	7000	10.5
14	7250	12.1	7250	9.9	7250	12.0	7250	11.3	7250	11.2
15	7500	12.8	7500	10.4	7500	12.7	7500	12.0	7500	11.7
16	7584	13.0	7750	11.0	7635	13.0	7647	12.3	7704	12.3
17	7750	13.3	7983	11.6	7750	13.2	7687	12.2	7722	12.2
18	7937	13.7	8000	11.5	7965	13.6	7750	12.4	7750	12.2
No	Daya									
	Putara	Pertamax	Putaran	Premiu	Putaran	Prem	Putaran	Premium -	Putara	Premium

	n (rpm)	Plus Murni	(rpm)	m	(rpm)	ium - Ethanol 5%	(rpm)	Ethanol 10%	n (rpm)	- Ethanol 15%
19	8000	13.7	8114	11.9	8000	13.6	7839	12.7	8000	12.6
20	8224	14.2	8222	11.6	8156	13.9	8000	12.8	8207	12.8
21	8250	14.1	8250	11.9	8250	14.0	8250	13.1	8250	13.0
22	8500	14.5	8500	12.2	8500	14.4	8500	13.4	8500	13.2
23	8750	14.8	8750	12.4	8750	14.6	8750	13.7	8750	13.5
24	8917	15.0	9000	12.6	9000	14.7	8858	13.9	9000	13.6
25	9000	15.0	9250	12.7	9047	14.8	9000	13.8	9037	13.4
26	9115	15.1	9500	12.8	9250	14.7	9235	13.8	9125	13.7
27	9250	15.0	9750	12.8	9333	14.8	9249	13.9	9250	13.5
28	9368	15.1	9908	12.5	9500	14.7	9250	13.8	9500	13.5
29	9500	14.9	10000	12.9	9605	14.6	9500	13.6	9750	13.6
30	9750	14.8	10250	12.8	9750	14.6	9750	13.6	9780	13.9
31	10000	14.8	10500	12.8	10000	14.6	10000	13.6	10000	13.4
32	10250	14.7	10750	12.8	10250	14.5	10250	13.6	10250	13.5
33	10500	14.6	11000	12.8	10500	14.5	10500	13.5	10500	13.4
34	10750	14.7	11250	13.0	10750	14.3	10750	13.5	10750	13.3
35	11000	14.6	11500	13.0	11000	14.3	11000	13.3	11000	13.2
36	11250	14.2	11529	13.3	11250	13.8	11250	13.0	11250	13.0
37	11500	14.1	11641	13.3	11500	13.6	11500	12.8	11500	12.7

EMISI GAS BUANG

Emisi Gas Kadar CO					
No	Bahan Bakar	Kecepatan Putar (rpm)			
		4000	6000	8000	9000
1	Pertamax Plus Murni	2.817	0.339	0.158	0.128
2	Premium Murni	4.676	0.724	2.532	1.785
3	Premium - Ethanol 5%	1.920	0.316	0.150	0.116
4	Premium - Ethanol 10%	1.104	0.355	0.329	0.456
5	Premium - Ethanol 15%	2.003	0.335	0.674	0.430

Emisi Gas Buang Kadar CO ₂					
No	Bahan Bakar	Kecepatan Putar (rpm)			
		4000	6000	8000	9000
1	Pertamax Plus Murni	12.30	14.47	13.68	13.78
2	Premium Murni	8.73	13.33	12.97	13.81
3	Premium - Ethanol 5%	12.22	12.76	13.43	12.91
4	Premium - Ethanol 10%	12.72	13.16	13.30	13.23
5	Premium - Ethanol 15%	12.22	12.87	13.32	13.37

Emisi Gas Buang HC					
No	Bahan Bakar	Kecepatan Putar (rpm)			
		4000	6000	8000	9000
1	Pertamax Plus Murni	174	83	58	50
2	Premium Murni	364	265	211	154
3	Premium - Ethanol 5%	118	223	52	50

4	Premium - Ethanol 10%	286	180	102	106
5	Premium - Ethanol 15%	477	200	149	111

Emisi Gas Buang Kadar O ₂					
No	Bahan Bakar	Kecepatan Putar (rpm)			
		4000	6000	8000	9000
1	Pertamax Plus Murni	0.45	0.63	1.86	1.70
2	Premium Murni	1.78	1.11	0.42	0.47
3	Premium - Ethanol 5%	1.20	2.32	1.58	2.12
4	Premium - Ethanol 10%	1.48	1.35	0.94	1.20
5	Premium - Ethanol 15%	1.38	1.84	1.16	1.04

Emisi Gas Kadar λ					
No	Bahan Bakar	Kecepatan Putar (rpm)			
		4000	6000	8000	9000
1	Pertamax Plus Murni	0.945	1.015	1.084	1.077
2	Premium Murni	0.957	1.038	0.936	0.963
3	Premium - Ethanol 5%	0.998	1.100	1.077	1.105
4	Premium - Ethanol 10%	1.025	1.050	1.027	1.068
5	Premium - Ethanol 15%	0.982	1.022	1.029	1.032

PENGUJIAN JALAN “TEST RUN”

Pertamax Plus Murni								
No	Bahan Bakar	Bahan Bakar awal (ml)	Bahan Bakar akhir (ml)	Kecepatan (km/jam)	Time (t)	Jarak (KM)	Penggunaan Bahan Bakar (ml)	Ket
1	Pertamax Plus	1000	861	60	366,84	5,7	139	
2	Pertamax Plus	1000	857	60	358,61	5,7	143	
3	Pertamax Plus	1000	850	60	361,94	5,7	150	

PremiumMurni								
No	Bahan Bakar	Bahan Bakar awal (ml)	Bahan Bakar akhir (ml)	Kecepatan (km/jam)	Time (t)	Jarak (KM)	Penggunaan Bahan Bakar (ml)	Ke t
1	Premium	1000	837	60	371.19	5,7	163	
2	Premium	1000	841	60	369.87	5,7	159	
3	Premium	1000	838	60	362.75	5,7	162	

Campuran Premium - Etanol 5%								
No	Bahan Bakar	Bahan Bakar awal (ml)	Bahan Bakar akhir (ml)	Kecepatan (km/jam)	Time (t)	Jarak (KM)	Penggunaan Bahan Bakar (ml)	Ket
1	Pre - Eth 5%	1000	852	60	371,13	5,7	148	
2	Pre - Eth 5%	1000	849	60	369,58	5,7	151	
3	Pre - Eth 5%	1000	857	60	348,47	5,7	143	

Campuran Premium - Etanol 10%								
No	Bahan Bakar	Bahan Bakar awal (ml)	Bahan Bakar akhir (ml)	Kecepatan (km/jam)	Time (t)	Jarak (KM)	Penggunaan Bahan Bakar (ml)	Ket
1	Pre - Eth 10 %	1000	851	60	361,52	5,7	149	
2	Pre - Eth 10 %	1000	856	60	368,25	5,7	144	
3	Pre - Eth 10 %	1000	854	60	377,63	5,7	146	

Campuran Premium - Etanol 15%								
No	Bahan Bakar	Bahan Bakar awal (ml)	Bahan Bakar akhir (ml)	Kecepatan (km/jam)	Time (t)	Jarak (KM)	Penggunaan Bahan Bakar (ml)	Ket
1	Pre - Eth 15 %	1000	853	60	369,69	5,7	147	
2	Pre - Eth 15 %	1000	850	60	361,39	5,7	150	
3	Pre - Eth 15 %	1000	859	60	362,43	5,7	141	

KONSUMSI BAHAN BAKAR

Pertamax Plus Murni									
No	Volume (ml)	Rpm	Torsi (N.m)	Daya (HP)	Waktu	Temperatur Ruang (°C)	Daya (kW)	<i>mf</i>	SF C
					Konsumsi Bahan Bakar 20 ml (s)				
1	20	5000	13.88	9.8	69.03	34.2	7.3	0.779	0.107
2	20	6000	14.85	12.5	64.52	34.2	9.3	0.834	0.089
3	20	7000	15.65	15.4	60.03	34.2	11.5	0.896	0.078
4	20	8000	16.37	18.4	56.01	34.2	13.7	0.960	0.070
5	20	9000	15.79	20.1	51.51	34.2	15.0	1.044	0.070
6	20	10000	14.00	19.8	48.52	34.2	14.8	1.109	0.075

Bahan Bakar Premium Murni									
No	Volume (ml)	Putaran (Rpm)	Torsi (N.m)	Daya (HP)	Waktu	Temperatur Ruang (°C)	Daya (kW)	<i>mf</i>	SF C
					Konsumsi Bahan Bakar 20 ml (s)				
1	20	5000			62.33	30.1		0.863	
2	20	6000	11.99	9.9	56.23	30.1	7.4	0.957	0.130

3	20	7000	12.82	12.4	53.98	30.1	9.2	0.997	0 . 1 0 8
4	20	8000	13.69	15.0	50.96	30.1	11.2	1.056	0 . 0 9 4
5	20	9000	13.30	16.4	45.04	30.1	12.2	1.194	0 . 0 9 8
6	20	10000	12.23	16.6	40.19	30.1	12.4	1.338	0 . 1 0 8

Bahan bakar Campuran Premium - Ethanol 5%									
No	Volume (ml)	Putaran (Rpm)	Torsi (N.m)	Daya (HP)	Waktu Konsumsi	Temperatur Ruang (°C)	Daya (kW)	<i>mf</i>	SFC
					Bahan Bakar 20ml (s)				
1	20	5000	13.93	9.8	86.35	33.7	7.3	0.623	0 . 0 8 5
2	20	6000	14.96	12.6	78.98	33.7	9.4	0.681	0 . 0 7 2

3	20	7000	15.57	15.4	68.22	33.7	11.5	0.788	0 . 0 6 9
4	20	8000	16.61	18.2	56.27	33.7	13.6	0.956	0 . 0 7 0
5	20	9000	15.51	19.7	52.43	33.7	14.7	1.026	0 . 0 7 0
6	20	10000	13.9	19.7	46.82	33.7	14.7	1.149	0 . 0 7 8

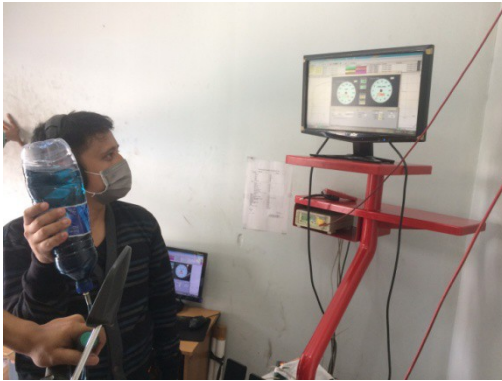
Bahan Bakar Campuran Premium - Ethanol 10%									
No	Volume (ml)	Putaran (Rpm)	Torsi (N.m)	Daya (HP)	Waktu Konsumsi	Temperatur Ruang (°C)	Daya (kW)	<i>mf</i>	SFC
					Bahan Bakar 20ml (s)				
1	20	5000	12.94	9.1	88.87	33.7	6.8	0.605	0. 08 9
2	20	6000	13.64	11.5	79.44	33.7	8.6	0.677	0. 07 9
3	20	7000	14.57	14.4	73.54	33.7	10.7	0.731	0. 06 8
4	20	8000	15.14	17.1	61.22	33.7	12.8	0.879	0. 06 9
5	20	9000	14.46	18.2	55.70	33.7	13.6	0.966	0.

									07 1
6	20	10000	12.89	18.4	47.19	33.7	13.7	1.140	0. 08 3

Bahan Bakar Capuran Premium - Ethanol 15%									
No	Volume (ml)	Putaran (Rpm)	Torsi (N.m)	Daya (HP)	Waktu Konsumsi	Temperatur Ruang (°C)	Daya (kW)	<i>mf</i>	S F C
					Bahan Bakar 20ml (s)				
1	20	5000	12.5	8.8	90.23	33.7	6.6	0.596	0. 09 1
2	20	6000	13.81	11.7	81.43	33.7	8.7	0.661	0. 07 6
3	20	7000	14.64	14.4	70.68	33.7	10.7	0.761	0. 07 1
4	20	8000	15.08	17.0	60.81	33.7	12.7	0.885	0. 07 0
5	20	9000	14.43	18.4	52.97	33.7	13.7	1.016	0. 07 4
6	20	10000	12.9	18.2	46.19	33.7	13.6	1.165	0. 08 6

FOTO PENGUJIAN

1. Torsi dan Daya



2. Emisi Gas Buang



3. Uji Jalan



FOTO STANDAR EMISI GAS BUANG

PT. TOYOTA - ASTRA MOTOR

INFORMASI AMBANG BATAS
GAS BUANG KENDARAAN BERMOTOR
(Kep. No. 05/MenLH/08/2006)
Tgl. 1 Agustus 2006

BENSIN	CO Maks. (%)	< 2007	4.5
		≥ 2007	1.5
	HC Maks. (ppm)	< 2007	1200
		≥ 2007	200
DIESEL	Kepekatan asap maksimum (% H ₂ SU)		
	< 2010	-	70
	≥ 2010	GVW ≤ 3.5 ton	40
		GVW > 3.5 ton	50