

LAMPIRAN

Lampiran 1

Pengujian performa dan emisi gas buang.

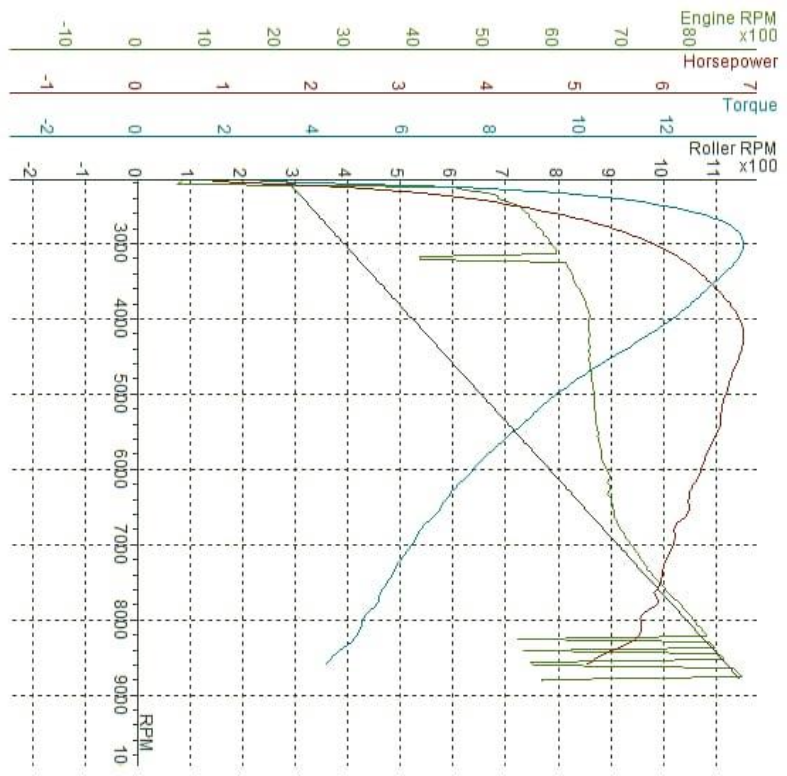




SPORINDYNO-Ver date: 16-AUG-2017 (3.8.44)
 DYNAMOMETER: SD_325
 ROLLER INERTIA: 6

Displacement Correction
 Correction Factor: ISO 1585
 NOTE: Load Cell Included.

Name	HP/rim	N*λ/rpm	KMH	Temp. (°C)	Humidity (%)	Pressure (mbar)	Date/Time
PENGUJIAN 1.10%	6.9 (6.9) / 4279	13.65 (13.65) / 3033	84.7	0.0	0	0.0	1/14/2022 8:51:23 AM



DATA FOR TEST: PENGUJIAN 1.10%

RPM	HP (HP)	TO (N*λ)	LAMBDA2 (Val)
2500	4.2	11.64	1.62
3000	5.8	13.64	2.00
3500	6.5	13.65	2.02
4000	6.8	12.15	2.42
4500	6.9	11.47	2.84
5000	6.7	10.79	3.10
5500	6.6	9.51	3.34
6000	6.4	8.52	3.88
6500	6.3	7.59	4.50
7000	6.1	6.85	5.18
7500	5.9	6.19	5.96
8000	5.7	5.64	6.80
8500	5.2	5.08	7.74
		4.38	8.76
			9.92
			10.05

WHEEL: 6.9 HP
 LOSSES: 0.0 HP
 TOTAL ENGINE: 6.9 HP

13.7 N*λM
 0.0 N*λM
 13.65 N*λM

Lampiran 2

Hasil pengujian performa.



Sport Devices
www.sportdevices.com

SPORTDYNO-Ver date: 16-AUG-2017 (3.8.44)

DYNAMOMETER: SD_325

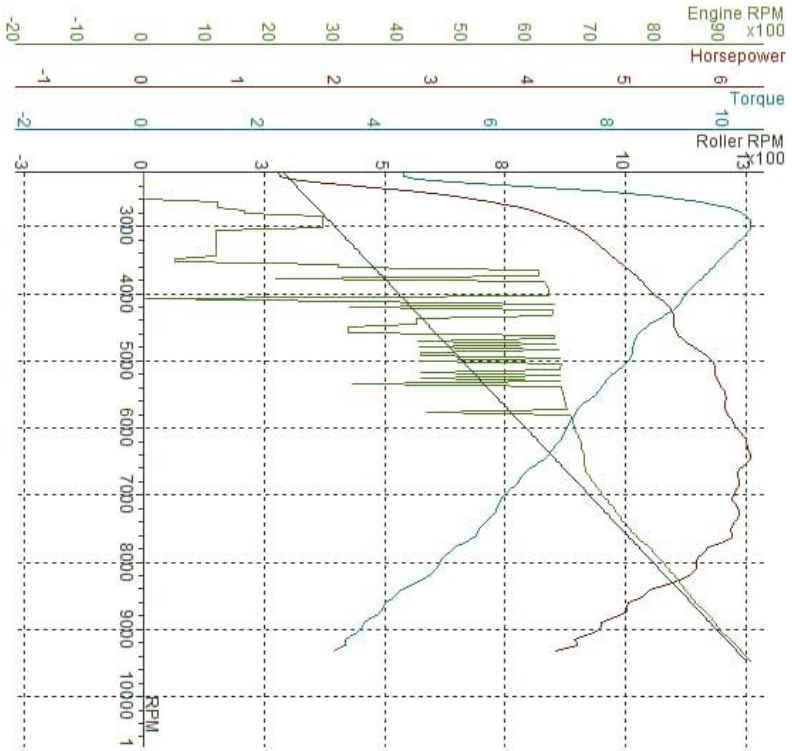
ROLLER INERTIA: 6

Displacement Correction
Correction Factor: ISO 1585
NOTE: Load Cell Included.

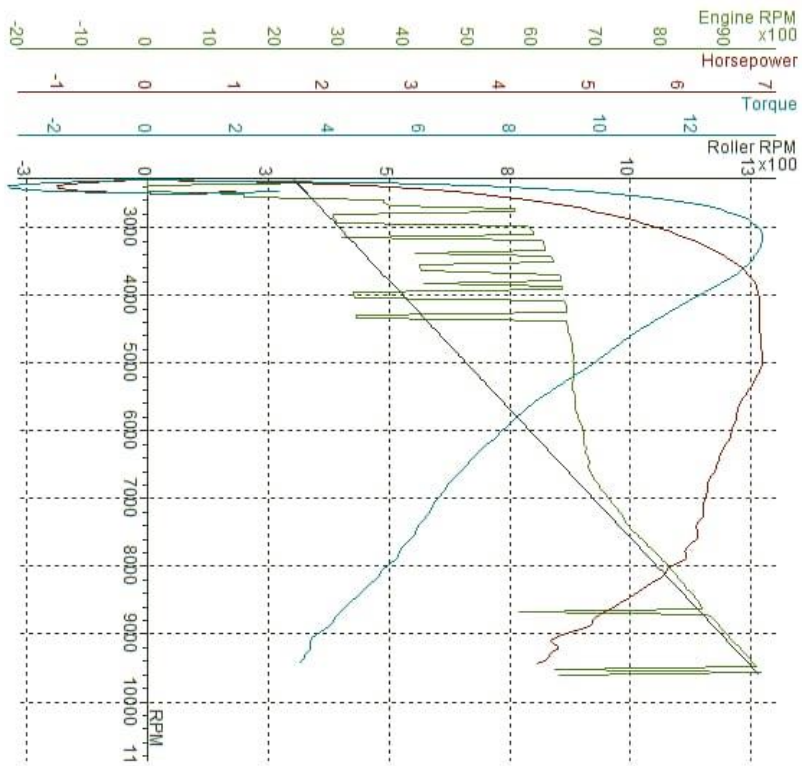
Name	HP/rpm	N*M/rpm	KMH	Temp. (°C)	Humidity (%)	Pressure (mbar)	Date/Time
PENGUJIAN 2.10%	6.3 (6.3) / 6453	10.43 (10.43) / 2991	92.7	0.0	0	0.0	1/14/2022 8:56:17 AM

DATA FOR TEST: PENGUJIAN 2.10%

RPM	HP (HP)	TQ (N*M)	LAMBDA 2 (Vold)
2500	2.9	8.12	1.70
2991	4.4	10.43	2.22
3000	4.4	10.43	2.24
3500	4.9	9.91	2.80
4000	5.3	9.35	3.38
4500	5.5	8.68	4.00
5000	5.9	8.34	4.70
5500	6.0	7.78	5.38
6000	6.1	7.27	6.12
6453	6.3	6.93	6.86
6500	6.3	6.86	6.94
7000	6.1	6.20	7.82
7500	6.1	5.77	8.76
8000	5.7	5.09	9.78
8500	5.2	4.33	11.00
9000	4.7	3.74	12.40
9500	0.0	0.00	14.10
WHEEL LOSSES	6.3 HP	10.4 N*M	
TOTAL ENGINE	0.0 HP	0.0 N*M	
	6.3 HP	10.43 N*M	



Name	HP/rpm	N*M/rpm	KMH	Temp. (°C)	Humidity (%)	Pressure (mbar)	Date/Time
PENGUJIAN 3 10 %	6.9 (7.4) / 5004	13.51 (14.90) / 3217	93.7	0.0	0	0.0	1/14/2022 8:57:16 AM



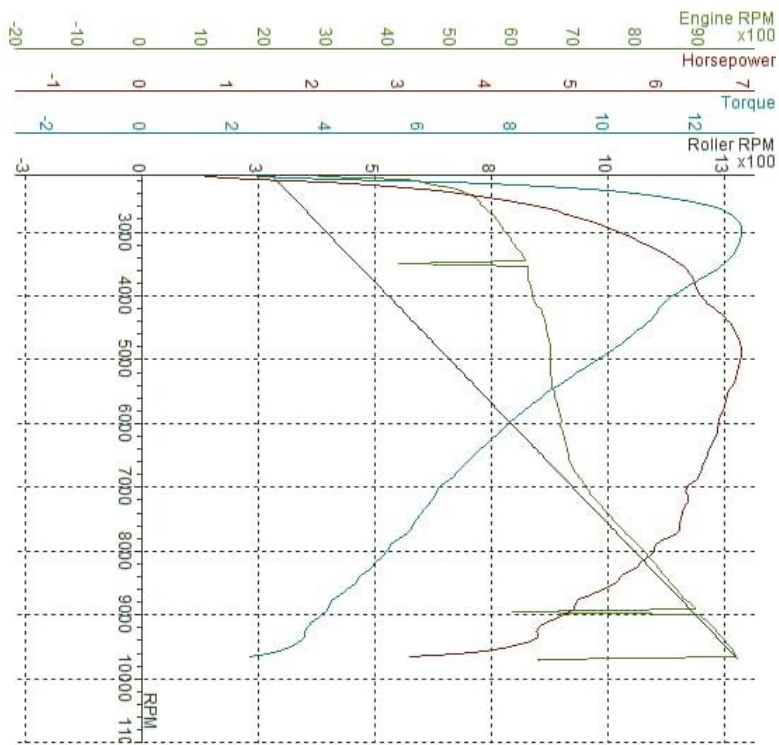
DATA FOR TEST: PENGUJIAN 3 10 %

RPM	HP (HP)	TQ (N*M)	LAMBDA ₂ (Vold)
2500	0.6	1.83	10.05
3000	3.6	13.34	10.05
3217	6.1	13.51	10.05
3500	6.6	13.28	10.05
4000	6.9	12.25	10.05
4500	6.9	10.91	10.05
5000	6.9	9.87	10.05
5004	6.9	9.87	10.05
5500	6.7	8.70	10.05
6000	6.6	7.82	10.05
6500	6.4	7.04	10.05
7000	6.3	6.39	10.05
7500	6.2	5.88	10.05
8000	5.9	5.27	10.05
8500	5.4	4.51	10.05
9000	4.7	3.73	10.05
9500	0.0	0.00	10.05

WHEEL: 6.9 HP
 LOSSES: -0.5 HP
 TOTAL ENGINE: 7.4 HP

13.5 N*M
 -1.4 N*M
 14.90 N*M

Name	HP/rpm	N*M/rpm	KMH	Temp. (°C)	Humidity (%)	Pressure (mbar)	Date/Time
PENGUJIAN 1 20%	7.0 (7.0) / 4911	12.94 (12.94) / 3016	94.6	0.0	0	0.0	1/14/2022 9:21:16 AM

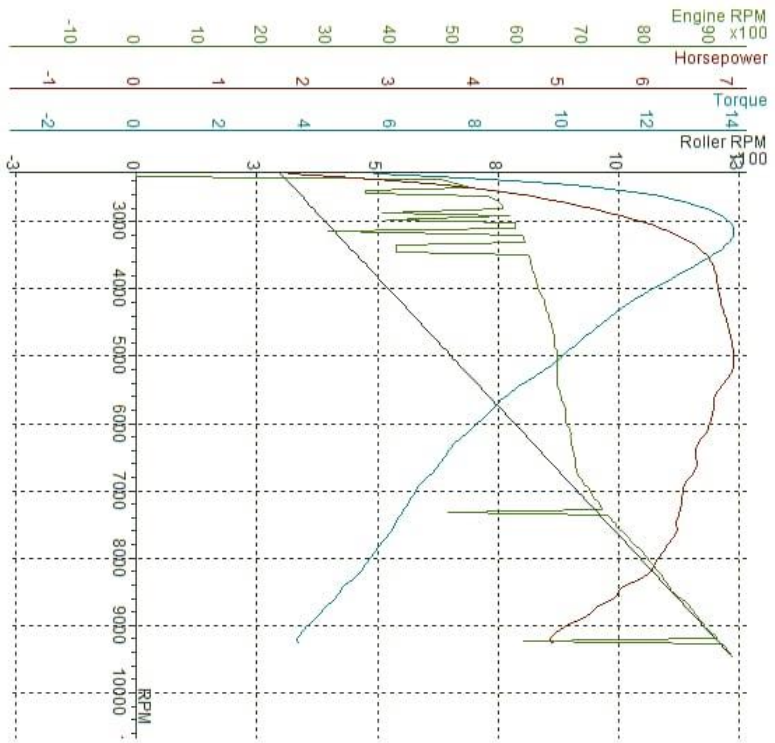


DATA FOR TEST: PENGUJIAN 1 20%

RPM	HP (HP)	TQ (N*M)	LAMBDA ² (Vold)
2500	4.0	11.33	1.74
3000	5.5	12.93	2.18
3500	5.5	12.93	2.18
4000	6.2	12.60	2.62
4500	6.9	11.49	3.08
5000	7.0	10.80	3.60
5500	6.9	10.10	4.02
6000	6.8	9.87	4.14
6500	6.7	9.87	4.14
7000	6.6	8.82	4.74
7500	6.3	7.93	5.42
8000	6.3	7.19	6.16
8500	5.9	6.42	7.02
9000	5.5	5.94	7.90
9500	4.9	5.28	8.92
10000	4.9	4.60	10.05
10500	4.3	3.87	10.05
11000	4.3	3.21	10.05

WHEEL: 7.0 HP
LOSSES: 0.0 N*M
TOTAL ENGINE: 7.0 HP 12.93 N*M

Name	HP/rpm	N*M/rpm	KMH	Temp. (°C)	Humidity (%)	Pressure (mbar)	Date/Time
PENGUJIAN 2 20 %	7.0 (7.0) / 5126	13.98 (13.98) - 3170	91.0	0.0	0	0.0	1/14/2022 9:22:14 AM

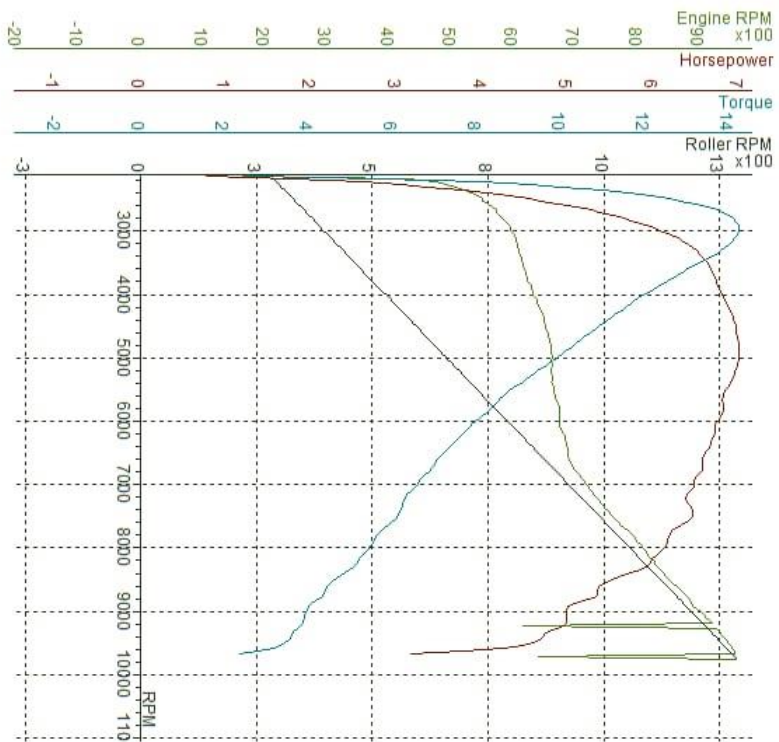


DATA FOR TEST PENGUJIAN 2 20 %

RPM	HP (HP)	TQ (N*M)	LAMBDA 2 (VAL)
2500	3.8	10.53	10.05
3000	5.9	13.82	10.05
3170	6.2	13.98	10.05
3500	6.7	13.60	10.05
4000	6.9	12.17	10.05
4500	7.0	10.98	10.05
5000	7.0	10.01	10.05
5500	6.9	9.78	10.05
6000	6.8	8.91	10.05
6500	6.6	7.22	10.05
7000	6.4	6.55	10.05
7500	6.4	6.04	10.05
8000	6.2	5.47	10.05
8500	5.7	4.76	10.05
9000	5.1	4.02	10.05

WHEEL: 7.0 HP 14.0 N*M
 LOSSES: 0.0 HP 0.0 N*M
 TOTAL ENGINE: 7.0 HP 13.98 N*M

Name	HP/rpm	N*M/rpm	KMH	Temp. (°C)	Humidity (%)	Pressure (atm)	Date/Time
PENGUJIAN 3 20 %	7.0 (7.0) / 4879	14.23 (14.23) / 3033	94.9	0.0	0	0.0	1/14/2022 9:23:48 AM



DATAFOR TEST: PENGUJIAN 3 20 %

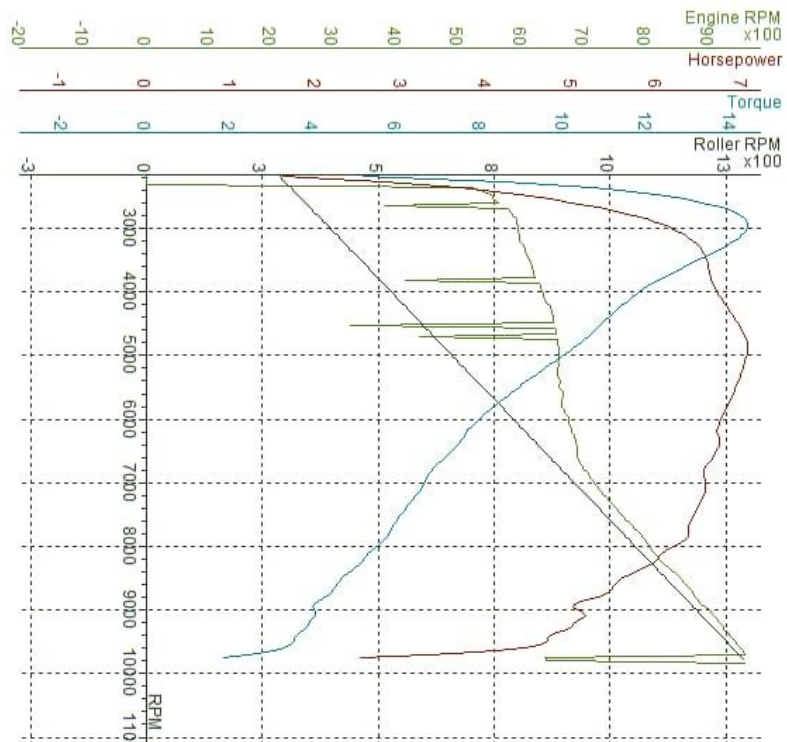
RPM	HP (HP)	TQ (N*M)	LAMBDA2 (Vol)
2500	4.4	12.38	1.66
3000	6.0	14.23	2.04
3033	6.1	14.23	2.06
3500	6.6	13.42	2.44
4000	6.8	12.08	2.88
4500	6.9	10.98	3.38
4879	7.0	10.21	3.78
5000	7.0	9.92	3.94
5500	6.8	8.84	4.54
6000	6.7	8.00	5.20
6500	6.6	7.22	5.96
7000	6.5	6.57	6.78
7500	6.4	6.12	7.66
8000	6.1	5.44	8.66
8500	5.5	4.61	9.78
9000	5.0	3.93	11.10
9500	4.6	3.42	12.62

WHEEL 7.0 HP 14.2 N*M
LOSSES 0.0 HP 0.0 N*M
TOTAL ENGINE: 7.0 HP 14.23 N*M

SPORIDYNO-Ver date: 16-AUG-2017 (3.8.44)
DYNAMOMETER: SD_325
ROLLER INERTIA: 6

Displacement Correction
Correction Factor: ISO 1585
NOTE: Load Cell Included.

Name	HP/gpm	N*M/gpm	KMH	Temp. (°C)	Humidity (%)	Pressure (mbar)	Date/Time
PENGUJIAN 1.30%	7.1 (7.1) / 4912	14.39 (14.39) / 2986	95.4	0.0	0	0.0	1/14/2022 9:34:34 AM



DATA FOR TEST: PENGUJIAN 1.30%

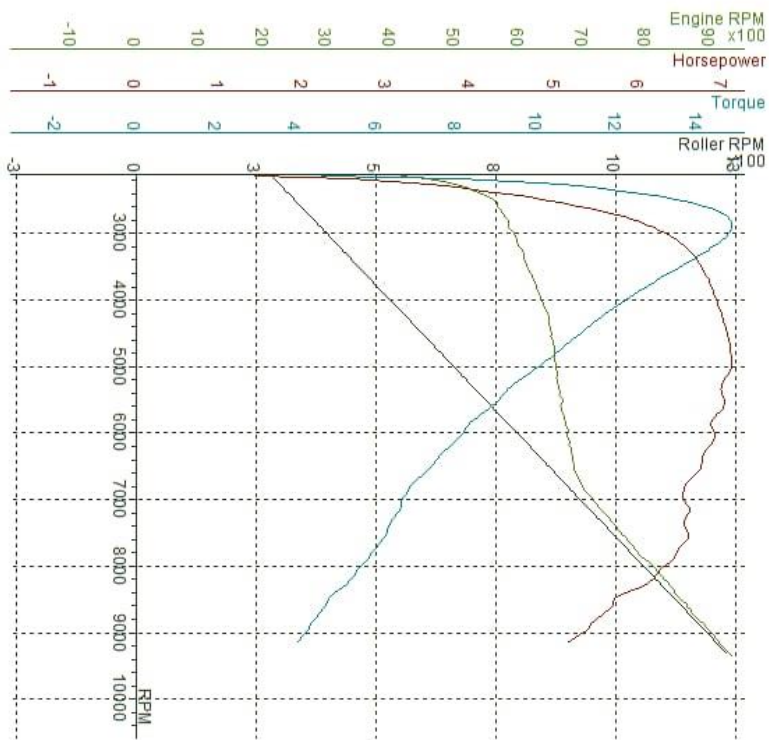
RPM	HP (HP)	TQ (N*M)	LAMBDA 2 (Yield)
2500	4.4	12.18	1.50
3000	6.0	14.39	1.86
3500	6.1	14.38	1.88
4000	6.6	13.32	2.28
4500	6.9	11.90	2.72
5000	7.1	10.95	3.22
5500	7.0	10.22	3.66
6000	6.9	9.99	3.78
6500	6.9	8.91	4.38
7000	6.8	8.01	5.02
7500	6.7	7.31	5.78
8000	6.6	6.67	6.58
8500	6.4	6.09	7.48
9000	6.2	5.53	8.42
9500	5.6	4.68	9.54
10000	5.0	3.99	10.84
10500	4.7	3.52	12.32

WHEEL: 7.1 HP 14.4 N*M
LOSSES: 0.0 HP 0.0 N*M
TOTAL ENGINE: 7.1 HP 14.39 N*M

SPORTDYNO-Ver date: 16-AUG-2017 (3.8.44)
 DYNAMOMETER: SD_325
 ROLLER INERTIA: 6

Displacement Correction
 Correction Factor: ISO 1585
 NOTE: Load Cell Included

Name	HP/gpm	N•M/rpm	KMH	Temp. (°C)	Humidity (%)	Pressure (mbar)	Date/Time
PENGUJIAN 2.30%	7.1 (7.1) / 4962	14.84 (14.84) / 2916	91.2	0.0	0	0.0	1/14/2022 9:38:05 AM



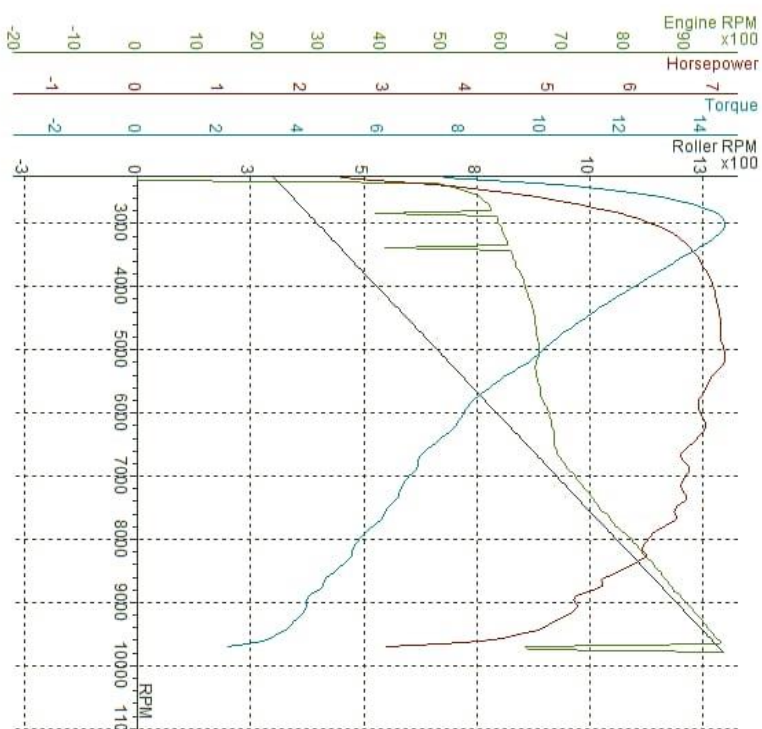
DATA FOR TEST: PENGUJIAN 2.30%

RPM	HP (HP)	TQ (N•M)	LAMBDA: (Vald)
2500	4.7	13.18	1.48
3000	6.1	14.84	1.78
3500	6.3	14.79	1.86
4000	6.7	13.61	2.26
4500	6.9	12.29	2.68
5000	7.0	11.11	3.18
5500	7.1	10.19	3.66
6000	7.1	10.08	3.72
6500	7.0	9.07	4.30
7000	6.9	8.17	4.96
7500	6.7	7.36	5.72
8000	6.5	6.64	6.50
8500	6.6	6.23	7.40
9000	6.3	5.61	8.36
9500	5.7	4.78	9.42
10000	5.3	4.23	10.70

WHEEL: 7.1 HP 14.8 N•M
 LOSSES: 0.0 HP 0.0 N•M
 TOTAL ENGINE: 7.1 HP 14.84 N•M

SPORTDYNO-Ver date: 16-AUG-2017 (3.8.44)
 DYNAMOMETER: SD_325
 ROLLER INERTIA: 6
 Displacement Correction
 Correction Factor: ISO 1585
 NOTE: Load Cell Included

Name	HP/rpm	N°M/rpm	KMH	Temp. (°C)	Humidity (%)	Pressure (mbar)	Date/Time
PENGUJIAN 3 30 %	7.1 (7.1) / 5148	14.55 (14.55) / 2034	95.4	0	0.0		1/14/2022 9:39:09 AM



DATA FOR TEST: PENGUJIAN 3 30 %

RPM	HP (HP)	TQ (N°M)	LAMBDA 2 (Void)
2500	4.2	11.71	1.34
3000	6.1	14.53	1.72
3034	6.2	14.55	1.74
3500	6.8	13.70	2.12
4000	7.0	12.37	2.56
4500	7.1	11.15	3.04
5000	7.1	10.09	3.58
5148	7.1	9.85	3.74
5500	6.9	8.96	4.18
6000	6.8	8.09	4.84
6500	6.7	7.33	5.60
7000	6.6	6.74	6.40
7500	6.5	6.18	7.28
8000	6.2	5.52	8.22
8500	5.9	4.91	9.32
9000	5.3	4.19	10.56
9500	4.6	3.47	12.02

WHEEL: 7.1 HP
 LOSSES: 0.0 HP
 TOTAL ENGINE: 7.1 HP

14.5 N°M
 0.0 N°M
 14.55 N°M

Lampiran 3

Hasil pengujian emisi gas buang.

Kadar emisi CP10

Rpm	Uji	HC	CO
3000	1	173 ppm	2.70%
	2	104 ppm	2.74%
	3	88 ppm	2.38%
Rata-rata		121 ppm	2.60%

Rpm	Uji	HC	CO
5500	1	105 ppm	1.91%
	2	69 ppm	1.23%
	3	69 ppm	1.93%
Rata-rata		81 ppm	1.69%

Rpm	Uji	HC	CO
8500	1	83 ppm	3.08%
	2	104 ppm	3.57%
	3	100 ppm	3.61%
Rata-rata		95 ppm	3.42%

Kadar emisi CP20

Rpm	Uji	HC	CO
3000	1	140 ppm	3.24%
	2	217 ppm	3.22%
	3	176 ppm	3.56%
Rata-rata		177 ppm	3.34%

Rpm	Uji	HC	CO
5500	1	215 ppm	2.21%
	2	202 ppm	2.06%
	3	190 ppm	2.01%
Rata-rata		202 ppm	2.09%

Rpm	Uji	HC	CO
8500	1	201 ppm	4.40%
	2	141 ppm	4.64%
	3	134 ppm	4.67%
Rata-rata		158 ppm	4.57%

Kadar emisi CP30

Rpm	Uji	HC	CO
3000	1	108 ppm	3.01%
	2	146 ppm	4.88%
	3	138 ppm	3.74%
Rata-rata		130 ppm	3.8%

Rpm	Uji	HC	CO
5500	1	234 ppm	2.75%
	2	238 ppm	2.56%
	3	260 ppm	2.79%
Rata-rata		236 ppm	2.7%

Rpm	Uji	HC	CO
8500	1	118 ppm	3.36%
	2	195 ppm	4.86%
	3	99 ppm	3.28%
Rata-rata		137 ppm	3.8%

Sample ID	Analyzer	CO (%)	HC (ppm)	CO2 (%)	O2 (%)	A/F Ratio	H/C Ratio	D-C Ratio
①	CP30 3000	3.01%	177.12	6.6%	15.3%	1.90	16.7	1.0500
②	CP30 3000	4.00%	177.12	7.8%	5.20%	1.547	16.7	1.0500
③	CP30 3000	3.79%	177.12	7.8%	5.81%	1.199	12.8	1.0500
①	CP30 5500	2.75%	177.12	8.2%	5.77%	1.159	12.5	1.0500
②	CP30 5500	2.54%	177.12	7.8%	5.28%	1.231	18.1	1.0500
③	CP30 5500	2.74%	177.12	7.7%	5.35%	2.000	8.0	1.0500
④	CP30 8500	3.36%	177.12	7.8%	6.15%	1.230	18.0	1.0500
②	CP30 8500	4.06%	177.12	7.8%	3.20%	1.011	14.8	1.0500
③	CP30 8500	3.79%	177.12	9.0%	4.74%	1.066	15.6	1.0500



