

EPA - Kawasaki Emission Measurement Comparison
Test Program

by

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Abstract

Three Kawasaki motorcycles were emission tested at Kawasaki Heavy Industries in Japan, and at EPA. Emissions and fuel economy compared well with the exception of CO emissions, which were significantly higher at the EPA facility. It is believed ambient pressure differences between facilities account for some of the difference in CO emissions.

Introduction

A comparison emission test program between EPA and Kawasaki Heavy Industries, Ltd using three Kawasaki motorcycles was requested by Kawasaki in early 1975. The motorcycles were tested in Japan by Kawasaki, and then shipped to EPA for comparison testing. The motorcycles, described in more detail in Appendix I, are a 903 cc Z-1, a 247 cc F-11, and a 174 cc F-7.

Program Objective

The objective of this test program was to assess the comparability of the two test facilities. A complete correlation program, which would include precise preconditioning, hot start tests, and gas cylinder cross checks, was not attempted.

Test Facilities

The test equipment and instrumentation used is presented in Table I. Although the Kawasaki test report, reference 1, does not identify the manufacturer of their dynamometer, the layout drawing indicates it is very similar to the Shibaura being used by EPA. The power absorbers are identical Clayton ECE-50 models.

Figure 1 presents the total absorbed power of the EPA dynamometer for the two power settings used. The Kawasaki data presented in reference 1 is nearly identical, indicating the absorbed power characteristics for testing were the same for both facilities.

Test Procedure

Kawasaki performed its tests per the "Draft Emission Regulation for Motorcycles", dated January 17, 1974. The tests at EPA duplicated the Kawasaki test procedure as reported in reference 1. A summary of the test conditions is presented in Table II.

The dynamometer absorbed power used for this test program (and specified in the Draft Regulations) is considerably lower than the dynamometer absorbed power specified in the NPRM, reference 2. The values in the NPRM are based on coast down tests performed by EPA, and are the most recent data available. Thus the emission and fuel economy values determined in this test program should be used only for facility comparisons, and are not representative of the emissions and fuel economy to be expected from testing these motorcycles per the NPRM. A comparison of the dynamometer absorbed power specifications is presented below.

Dynamometer Absorbed Power at 65 kph

Motorcycle	Inertia Class, kg	Total Absorbed Power, kw	
		"Draft Regs" & as tested	NPRM
Z-1	330	2.24	3.54
F-11	210	1.75	2.83
F-7	200	1.72	2.70

A 1974 model F7, which was loaned to EPA by Kawasaki, was coast down tested at the Transportation Research Center of Ohio. The results of this test are presented in Figure 2 along with the dynamometer power characteristics. As the figure shows, the road power determined from coast down testing is much better represented on the dynamometer by the NPRM specified power. The power setting, as specified in the Draft Regulations and used for this test program, is much lower than the motorcycle's actual road load power.

Test Results

For each motorcycle, the tests used for comparison consisted of the 2 cold-hot tests performed by Kawasaki and the three FTPs performed by EPA. The test results are summarized in Table III. The individual test sheets for the EPA tests are presented in Appendix II. A summary of the Kawasaki data, taken from reference 1, is presented as Appendix III.

Table IV presents a statistical comparison of the test data. A t-statistic and corresponding confidence level is presented. Large confidence levels indicate the means between test facilities are significantly different. The results for each of the three motorcycles and possible causes for significant differences are discussed below.

Z-1: There is a significant difference between facilities for all parameters for this motorcycle. It is believed that the differences may be a result of a change in the motorcycle's operational performance. Upon receiving the motorcycle from Kawasaki, the Z-1 was driven over a preparation LA-4 followed by 2 FTPs. The emission results from these first two tests were radically different than the results reported by Kawasaki in reference 1. HC was more than 3 times higher (15 g/km), CO was 25 percent lower (27 g/km), and NOx was 3 times higher (0.6g/km) than reported by Kawasaki. The results from the third test were similar to the Kawasaki results, indicating a major shift in performance had taken place. The fourth and fifth tests were consistent with the third test. The emission results of the first two tests are believable since testing of other motorcycles at EPA was yielding expected results, and no analysis problems were detected during the routine maintenance of equipment. Thus the significant difference between facilities determined from the Z-1 testing is likely the result of a shift in the motorcycle's performance, and cannot be solely attributed to a facility difference.

F-11: All parameters except CO compare well between facilities. At a confidence level of 90 percent, the CO emissions between facilities are different. As Table IV shows, the average CO emissions at the EPA facility were 16 percent higher than at Kawasaki.

F-7: All parameters except CO and NOx compare well between facilities. The comparison of NOx emissions must be considered in light of the one significant figure reported for NOx in the Kawasaki report. The CO emissions are different at the 99.8 percent confidence level. The average CO emissions at the EPA facility were 30 percent higher than at Kawasaki.

In summary, the emissions and fuel economy compare well between facilities except for CO, which is different between facilities at the 90 percent confidence level.

An apparent difference between test conditions at the two facilities was the ambient pressure and temperature. On the average, the ambient pressure was 28 mm of mercury (1 inch Hg) higher and 6 degrees centigrade (10°F) lower at the Kawasaki facility. (The average ambient temperature at Kawasaki was 17°C, which is outside of the required test range of 20-30°C).

The effects of ambient conditions on motorcycle emissions have not yet been quantified. It is likely, however, that the ambient effects on motorcycle emissions will be similar to the ambient effects on light duty vehicle emissions, that is the trends may be expected to be the same. In an attempt to identify reasons for the differences in CO emission levels between facilities, the ambient correction factors determined in the 1975 EPA-U.S. MVMA correlation study (ref. 3) for light duty vehicles were applied to the F-7 and F-11 test data. With emissions corrected to the same ambient conditions, the confidence level that the CO emissions between facilities are different was reduced from 90 to 30 percent for the F-11 and from 99.85 to 99.8 percent for the F-7. The confidence level for HC emissions for the F-7 was increased from less than 20 percent to 95 percent; other confidence levels showed little change. These changes are due to ambient pressure only; correction factors for other ambient parameters were negligible (Ref. 3).

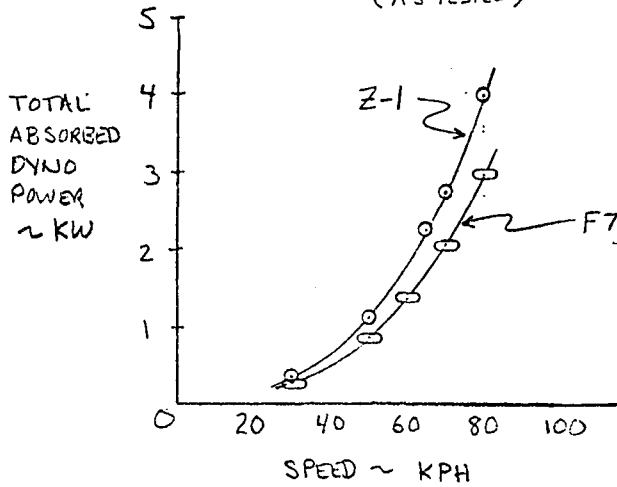
If these correction factors are applicable to motorcycles, then ambient pressure differences between facilities account for some of the differences in CO emissions. The quantitative use of these LDV correction factors for motorcycles is questionable, however the direction of the effect would seem applicable, and results in a reduction of the difference between facilities for CO emissions.

Summary and Conclusions

1. The facilities compared well with the exception of CO emissions.
2. CO emissions were significantly different between facilities, with EPA measuring higher CO emissions.
3. A large difference in test ambient pressure between facilities most likely accounts for some of the difference in CO emissions between facilities.
4. Because ambient correction factors for motorcycles are not available, the quantitative effect of the ambient pressure differences between facilities was not determined. Development of these factors for motorcycles is recommended.
5. The results of the Z-1 tests were not used due to a probable shift in engine performance which occurred during EPA testing.
6. It is recommended that additional correlation programs be performed as test facilities and procedures are changed and as low emission motorcycles become available.

FIGURE 1

DYNAMOMETER CHARACTERISTICS - EPA
(AS TESTED)



THE KAWASAKI DYNAMOMETER POWER CURVE AS PRESENTED IN REFERENCE 1 IS NEARLY IDENTICAL.

FIGURE 2

DYNAMOMETER AND TRACK ABSORBED
POWER CHARACTERISTICS
F-7

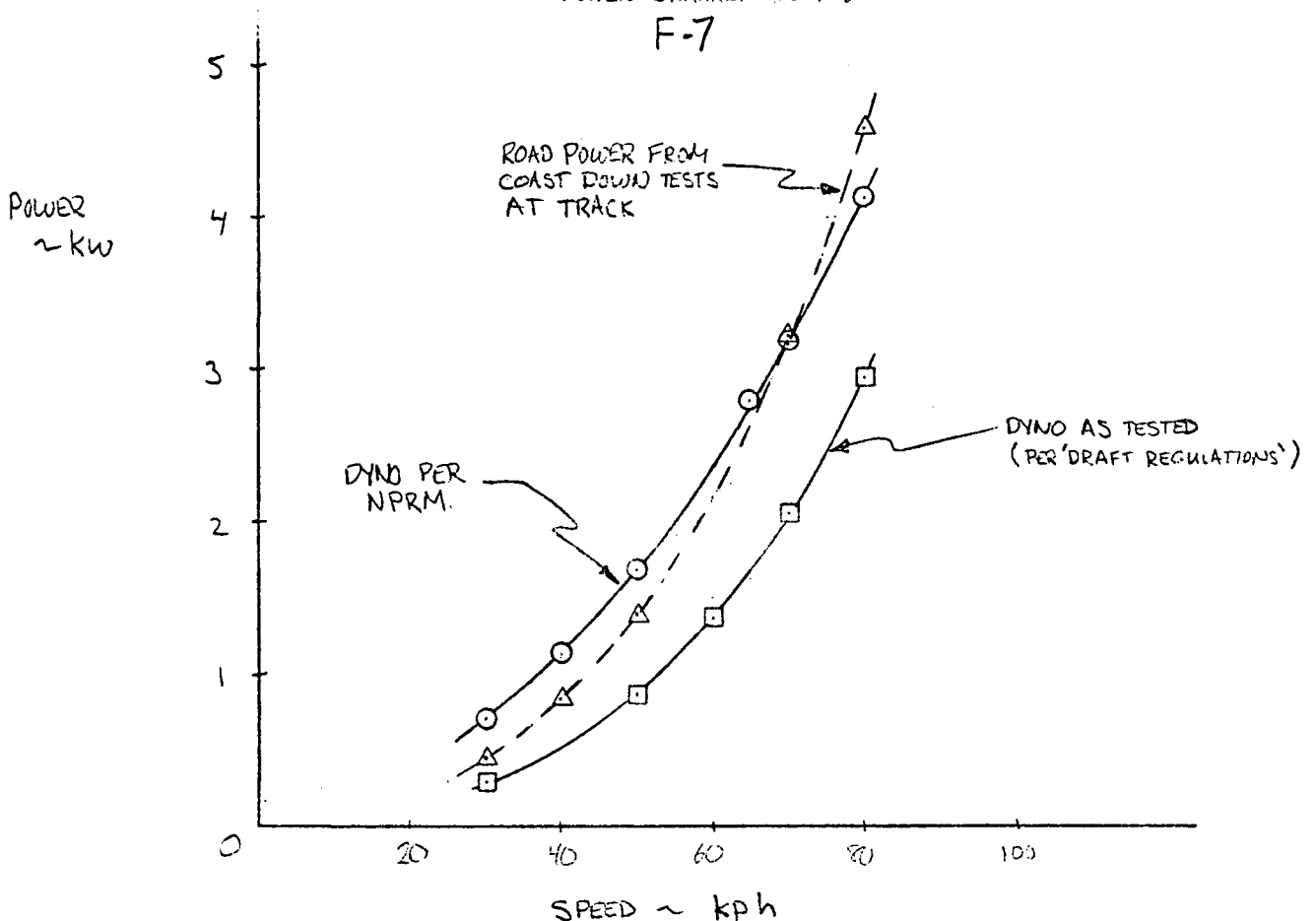


Table I

Equipment and Instrumentation Comparison

	EPA	Kawasaki
Dynamometer	Shibaura BS-30 Clayton ECE 50 Power Absorber, Belt Driven Inertia Wheels, 530.5 mm Roll Diameter	Manufacturer not specified, Clayton ECE 50 Power Absorber, Belt Driven Inertia Wheels, 530.5 mm Roll Diameter.
CVS	AMI Positive Displace- ment Pump.	Beckman Toshiba Convos - 3630 Positive Displacement Pump
Analyzers		
HC	Beckman 400 FID; 0-100, 0-1000 ppm Hexane	Beckman Toshiba FID; 0-4, 0-20, 0-40, 0-200, 0-400, 0-2000 ppm Hexane.
CO	Beckman 315 NDIR; 0-2500 ppm	Beckman Toshiba NDIR, 0-200, 0-500 ppm*
CO ₂	Beckman 315 NDIR; 0-1%	Beckman Toshiba NDIR, 0-4, 0-8, 0-16%.
NO _x	TECO CL; 0-25, 0-100 ppm	Beckman Toshiba CL; 0-10, 0-25, 0-100, 0-250, 0-1000, 0-2500, 0-10000 ppm.

Kawasaki Data from Reference 1

*The test data sheets and calibration curves indicate 0-2000 and 0-8000 ppm ranges were used.

Table II

Test Conditions

	<u>Z-1</u>	<u>F-11</u>	<u>F-7</u>
Inertia, kg	330	210	200
Absorbed Power @ 65 kph, kw	2.24 (3.0 hp)	1.75 (2.3 hp)	1.72 (2.3 hp)
Shift Points	Ref. 1	Ref. 1	Ref. 1
Choke Operation	Ref. 1	Ref. 1	Ref. 1
Rear Tire Pressure, kPa	214(31 psig)	214(31 psig)	193(28 psig)
Test Fuel	 Indolene 30		
Engine Oil	As Received	. . Kawasaki 2 Stroke . .	

Table III

Test Results

		HC	CO	CO ₂	NOx	Fuel Economy
<u>Z-1</u>						
Kawasaki	$\bar{x}$	4.36	37.28	91.28	.19	14.3
	S	.007	.028	4.42	.014	.38
	S%	.16	.08	4.8	7.4	2.7
EPA	$\bar{x}$	3.04	33.82	83.19	.22	16.1
	S	.15	.86	4.51	.006	.64
	S%	4.9	2.5	5.4	2.7	4.0
<u>F-11</u>						
Kawasaki	$\bar{x}$	7.99	19.54	45.50	.02	23.2
	S	.424	.665	5.54	0	1.80
	S%	5.3	3.4	12.2	0	7.8
EPA	$\bar{x}$	8.52	23.37	41.69	.019	22.3
	S	.60	1.98	2.51	.002	1.61
	S%	7.0	8.5	6.0	10.5	7.2
<u>F-7</u>						
Kawasaki	$\bar{x}$	4.31	7.02	42.61	.02	35.1
	S	.240	.290	6.66	0	4.10
	S%	5.6	4.1	15.6	0	11.7
EPA	$\bar{x}$	4.30	10.04	42.14	.027	32.8
	S	.11	.26	1.45	.002	.91
	S%	2.6	2.6	3.4	7.4	2.8

Note: Emissions in g/km
 Fuel Economy in km/l
 $S\% = s/\bar{x} * 100$

Table IV

Comparison of Test Results

	HC	CO	CO ₂	NOx	Fuel Economy
$\bar{X}_{KAW} - \bar{X}_{EPA}$					
Z1	1.32	3.46	8.09	-.03	-1.8
F11	-.53	-3.83	3.81	.001	0.9
F7	.01	-3.02	0.47	-.007	2.3
$(\bar{X}_{KAW} - \bar{X}_{EPA})/\bar{X}_{EPA}, \%$					
Z1	43.4	10.2	9.7	-13.6	-11.2
F11	-6.2	-16.4	9.1	5.3	4.0
F7	0.2	-30.1	1.1	-25.9	7.0
t statistic					
Z1	11.65	5.37	1.98	-3.10	-3.38
F11	-1.07	-2.53	1.10	.56	.56
F7	.07	-12.22	.13	-5.16	1.01
Confidence Level					
Z1	99.8	98	85	94	95
F11	60	90+	60	40	40
F7	<20	99.85	<20	98.5	60

References

1. 1st Engineering Dept. of Kawasaki Heavy Industries, CO, Ltd., "Test Data of Exhaust Emissions from Motorcycles, Kawasaki Z1, F11, F7" June 2, 1975.
2. Federal Register, Vol. 40, No. 205, October 22, 1975, pages 49496-49530.
3. Leiferman, M.W. and Wilson, G.M., "1975 EPA-U.S. MVMA Correlation Study", EPA, June, 1975.

Appendix I

Test Vehicle Description

Make	Kawasaki	Kawasaki	Kawasaki
Model Year	1975	1975	1975
Model	Z-1	F-11	F-7
Type	Street	Enduro	Enduro
Engine Type	4s dohc	2s	2s reed valve
# of Cylinders	4	1	1
Displacement	903 cc	247 cc	174 cc
Horsepower	82	22	18
Compression Ratio	8.5:1	6.4:1	7:1
Ignition	Bat. & Coil	Magneto	CDI
Transmission	5 Speed	5 Speed	5 Speed
Inertia (incl. rider)	330 kg	210 kg	200 kg

TEST # 18- 983

1976 MSPCP CONSTANT-VOLUME SAMPLER RESULTS MOTORCYCLE

PROCESSED: 11:22:14 NOV 3, 1975

MFG. CODE	MODEL	VEHICLE I.D.	MOD. YR	DISPL. CC	INERTIA MASS-KG	CURB MASS-KG	NO. CYL.	ACT. H.P.	DYNO HP @ 65 KPH	A C	UTL	TRANS	S.PAT.	TEST YEAR	TEST TYPE
335	F7 175 ENDURO	KAWASAKI 75	75	175.0	0	120	1	18	2.3	0	0	4	0	76	5

AXLF RATIO	N/V RATIO	RORE	STROKE	MANUFACTURE SPECS. C.R.	TIMING	RPM	% CO	GFAR	IDLE/ RPM	HC	CO	NOX	EVAP	TIRES SIZE	RIM	DRIVE CYCLE	SOURCE CODE
0.0	0.0	61.500	58.800	7.10	0.0	0.	0.0	0.0	0.	4.30	7.00	0.02	0.0			5	1

REQUESTOR INIT.	BRANCH	DATE	FUEL INJ. SHUT	#CAPR	#PRLS	CARB MODEL	EXHAUST TYPES	SYSTEM NAME	EVAP SYS.	EGN TYPE	CRANK CASE	FUEL TYPE	FUEL TANK	MAINT	ODOM	GVW
TC		7- 1-75	0	1			0	0	0	0	4	1	0	1	9	0

REQUESTOR COMMENTS : HP AT 65 KPH PER DRAFT REGS SPEC SHIFT PTS. KAWASAKI 75 F7
 LABORATORY COMMENTS : CHOKE FOR 50 SEC R61=2112531 R62=2259726 R63=2108526

ENGINE FAMILY :
 CVS HOURS : 1722.9

TEST DATE	ODOMETER	IND. H.P.	HAPO HPG	TEMP. OF DRY WFT	CVS	SPEC. GR.	UNITS	CVS PRES. IN	OUT	INITIALS	DRIVER	DYNO. NO.	CVS UNIT
7- 2-75	0.	1.7	29.20	72.5	58.0	100.0	1.75	IN	22.02	20.92	JSH KTC	MC	11C

CURIC FT PER REV.	CALCULATED RPM	NOX FACTOR	IGN TIMING	RPM	% CO	GEAR	IDLE RPM	EVAP. LOSS GRAMS	TIRE PRES.
0.27638	1443.	0.8924	00	0.	0.0		0.		0.0

BAG 1 5.864 KM 12128. COUNTS 2784.3 CU. FT. D/FACTOR=34.735

EXHAUST SAMPLE	RANGE	METER	CONC.	BACKGROUND SAMPLE	RANGE	METER	CONC.	CORRECTED CONCENTRATIONS	GMS	GMS/KM	KM/L
HC-FID	7	25.3	783.67	7	1.1	37.46	747.29 PPM	33.98	5.79		
CO	8	37.2	787.05	8	0.2	4.07	783.10 PPM	71.89	12.26		
CO2	1	26.3	0.229	1	4.8	0.041	0.188 %	272.00	46.39	27.9	
NOX CHEM	2	6.2	1.55	2	0.1	0.03	1.53 PPM	0.21	0.04		

BAG 2 6.273 KM 20741. COUNTS 4761.7 CU. FT. 1375.6 SECONDS D/FACTOR=67.230 ACT RPM= 1433.7 RPM RATIO(C/A)=0.9938

EXHAUST SAMPLE	RANGE	METER	CONC.	BACKGROUND SAMPLE	RANGE	METER	CONC.	CORRECTED CONCENTRATIONS	GMS	GMS/KM	KM/L
HC-FID	7	9.2	299.48	7	0.4	13.49	286.00 PPM	22.24	3.55		
CO	8	13.5	276.01	8	0.3	6.10	270.00 PPM	42.39	6.76		
CO2	1	16.4	0.142	1	4.0	0.035	0.108 %	265.89	42.39	36.5	
NOX CHEM	2	2.0	0.50	2	0.2	0.05	0.45 PPM	0.10	0.02		

BAG 3 5.853 KM 12345. COUNTS 2934.2 CU. FT. 516.3 SECONDS D/FACTOR=38.110 ACT RPM= 1434.6 RPM RATIO(C/A)=0.9945

EXHAUST SAMPLE	RANGE	METER	CONC.	BACKGROUND SAMPLE	RANGE	METER	CONC.	CORRECTED CONCENTRATIONS	GMS	GMS/KM	KM/L
HC-FID	7	20.6	644.55	7	0.2	6.85	637.47 PPM	29.52	5.04		
CO	8	41.1	876.63	8	0.0	0.0	876.63 PPM	81.91	14.00		
CO2	1	23.0	0.200	1	4.5	0.039	0.162 %	237.50	40.58	29.8	
NOX CHEM	2	5.6	1.40	2	0.2	0.05	1.35 PPM	0.19	0.03		

WEIGHTED VALUES(1)	HC	CO	CO2	NOX
GRAMS/KM	4.42	9.9	42.7	0.02
BEFORE ROUNDING	4.4247	9.8917	42.7199	0.02452

75 WEIGHTED1
 KM/L
 32.
 32.4197

FUEL-WEIGHT1
 KM/L
 0.0

TEST # 16-1029

1976 MSPCP CONSTANT-VOLUME SAMPLER RESULTS MOTORCYCLE

PROCESSED: 10:13:40 OCT 10, 1975

MFG. CODE	MODEL	VEHICLE I.D.	MOD. YR	DISPL. CC	INERTIA MASS-KG	CURB MASS-KG	NO. CYL.	H.P.	ACT. DYN. HP @ 65 KPH	A C	UTL	TRANS	S.PAT.	TEST YEAR	TEST TYPE
335	F7 175 ENDURO	KAWASAKI 75	75	175.0	0	120	1	18	2.3	0	0	4	0	76	5

AXLE RATIO	N/V RATIO	BORE	STROKE	MANUFACTURE C.R.	TIMING	RPM	% CO	GEAR	IDLE RPM	HC	CO	NOX	EVAP	TIRE SIZE	DRIVE CYCLE	SOURCE CODE
0.0	0.0	61.500	56.800	7.10	0.0	0.0	0.0	0.0	0.0	4.30	7.00	0.02	0.0		5	1

REQUESTOR INIT.	BRANCH	DATE	FUEL INJ.	SHUT.	#CARB	#ARLS	CARR	MODEL	EXHAUST SYSTEM TYPES	NAME	EVAP SYS.	EGN TYPE	CRANK CASE	FUEL TYPE	FUEL TANK	MAINT	ODOM	GVW
T C	ECT	7-11-75	0	0	1				0 0 0 0 0		4	1	0	1	9	0	0	0

REQUESTOR COMMENTS :

LABORATORY COMMENTS : 175 CL BAG 1-2121048 BAG 2-2296778 BAG83 3-2129645

ENGINE FAMILY :

CVS HOURS : 1742.8

TEST DATE	ODOMETER	IND. H.P.	HAPO "HG	TEMP. DRY	WET	CVS	MANOMETER SPEC. GR.	UNITS	CVS PRES. IN	OUT	INITIALS OPER.	DRIVER	DYNO. NO.	CVS UNIT
7-11-75	0.	1.7	28.79	72.0	58.0	101.0	1.75	IN	22.20	20.40	DFF	KTC	MC	11C

CUBIC FT PER REV.	CALCULATED RPM	NOX FACTOR	IGN TIMING	RPM	% CO	GEAR	IDLE RPM	EVAP. LOSS GRAMS	TIRE PRES.
0.27621	1443.	0.8996	00	0.	0.0		0.	.	0.0

BAG 1	5.889 KM	12171. COUNTS	2741.8 CU. FT.	D/FACTOR=34.166						
HC-FID	7	25.0	750.01	7	0.3	9.00	741.27 PPM	33.19	5.64	
CO	7	85.7	843.40	7	0.0	0.0	843.40 PPM	76.24	12.95	
CO2	1	26.4	0.233	1	4.2	0.037	0.197 %	280.60	47.65	27.3
NOX CHEM	3	4.0	2.00	3	0.1	0.05	1.95 PPM	0.26	0.04	

BAG 2	6.377 KM	20768. COUNTS	4678.5 CU. FT.	1376.8 SECONDS	D/FACTOR=68.670	ACT RPM= 1435.5	RPM RATIO(C/A)=0.9947			
////////MEASURED DISTANCE DIFFERS FROM STANDARD DISTANCE BY 2.7 PERCENT////////										
HC-FID	4	88.3	267.44	4	2.6	8.78	258.79 PPM	19.77	3.10	
CO	6	56.6	273.68	6	0.0	0.0	273.68 PPM	42.21	6.62	
CO2	1	16.1	0.141	1	3.6	0.031	0.110 %	267.22	41.90	37.7
NOX CHEM	3	1.1	0.55	3	0.1	0.05	0.50 PPM	0.11	0.02	

BAG 3	5.912 KM	12269. COUNTS	2763.9 CU. FT.	513.1 SECONDS	D/FACTOR=35.500	ACT RPM= 1434.7	RPM RATIO(C/A)=0.9942			
////////MEASURED DISTANCE DIFFERS FROM STANDARD DISTANCE BY 2.3 PERCENT////////										
HC-FID	5	80.5	723.82	5	1.1	11.78	712.37 PPM	32.15	5.44	
CO	9	27.5	1000.27	9	0.0	0.0	1000.27 PPM	91.15	15.42	
CO2	1	23.3	0.205	1	3.6	0.031	0.175 %	250.24	42.33	28.0
NOX CHEM	3	3.7	1.85	3	0.2	0.10	1.75 PPM	0.24	0.04	

WEIGHTED VALUES(1)	HC	CO	CO2	NOX
GRAMS/KM	4.26	10.3	43.2	0.03
BEFORE ROUNDING	4.2649	10.3384	43.2058	0.02938

75 WEIGHTED1

KM/L

32.

32.1173

FUEL-WEIGHT1

KM/L

0.0

TEST # 1A-1110

1976 MSPCP CONSTANT-VOLUME SAMPLER RESULTS MOTORCYCLE

PROCESSED: 11:22:15 NOV 3, 1975

MFG. CODE	MODEL	VEHICLE I.D.	MOD. YR	DISPL. CC	INERTIA MASS-KG	CURB MASS-KG	NO. CYL.	H.P.	HP #	ACT. DYN A	UTL TRANS	S.PAT.	TEST YEAR	TEST TYPE
335	F7 175 ENDURO	KAWASAKI 75	75	175.0	0	120	1	18	2.3	0	0	4	0	76 5

AXLE RATIO	N/V RATIO	RORE	STROKE	MANUFACTURE C.R.	SPECS. TIMING	PPM	% CO	GEAR	IDLE RPM	HC	CO	NOX	EVAP	TIRES SIZE	DRIVE RIM	SOURCE CYCLE	CODE
0.0	0.0	61.500	58.800	7.10	0.0	0.	0.0		0.	4.30	7.00	0.02	0.0		5	1	

REQUESTOR INIT.	BRANCH	DATE	FUEL INJ. SHUT	#CARR	#BLS	CARR MODEL	EXHAUST SYSTEM TYPES	NAME	EVAP SYS.	EGN TYPE	CRANK CASE	FUEL TYPE	FUEL TANK	MAINT	ODOM	GVW
T C	ECT	7-10-75	0	0	1		0 0 0 0 0		4	1	0	1	9	0	0	0

REQUESTOR COMMENTS :

KAWASAKI 75 F7

ENGINE FAMILY :

LABORATORY COMMENTS : BAG 1-2053721 BAG 2-2246399 BAG-3-2097115 2 STALLS-BAG 1

CVS HOURS : 1750.0

TEST DATE	ODOMETER	IND. H.P.	BARO "HG	TEMP. DRY	WET	CVS	SPEC. GR.	UNITS	CVS PRES. IN	OUT	INITIALS OPER.	DRIVER	DYNO. NO.	CVS UNIT
7-1A-75	0.	1.7	29.12	71.5	59.0	100.0	1.75	IN	22.10	20.75	OFF	BGB	MC	11C

DILUTION AIR 0.0 0.0

CURIC FT PER REV.	CALCULATED RPM	NOX FACTOR	IGN TIMING	RPM	% CO	GEAR	IDLE RPM	EVAP. LOSS GRAMS	TIRE PRES.
0.27635	1443.	0.9164	00	0.	0.0		0.		0.0

BAG	KM	COUNTS	CU. FT.	SECONDS	D/FACTOR	ACT RPM	RPM RATIO(C/A)																																																												
BAG 1	5.702	12131	2775.3		35.463																																																														
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BAG 2	6.237	20645	4723.0	1374.3	70.252	1431.0	0.9919																																																												
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BAG 3	5.822	12281	2809.6	515.1	38.028	1430.5	0.9916																																																												
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TEST # 18- 981

1976 MSPCP CONSTANT-VOLUME SAMPLER RESULTS MOTORCYCLE

PROCESSED: 11:22:15 NOV 3, 1975

MFG. CODE	MODEL	VEHICLE I.D.	MOD. YR	DISPL. CC	INERTIA MASS-KG	CURB MASS-KG	NO. CYL.	H.P.	ACT. DYNO A HP @ 65 KPH C	UTL TRANS S.PAT.	TEST YEAR	TEST TYPE
335	F11 250 ENDURO	KAWASAKI 75	75	250.0	210	130	1	22	2.3	0 0 4 0	76	5

AXLE RATIO	N/V RATIO	BORE	STROKE	MANUFACTURE SPECS. C.P.	TIMING	RPM	% CO	GEAR	IDLE/ RPM	MANUFACTURE DATA HC	CO	NOX	EVAP	TIRES SIZE	DRIVE RIM	SOURCE CYCLF	TEST CODE
0.0	0.0	68.000	68.000	6.40	0.0	0.	0.0		0.	8.00	19.50	0.02	0.0		5	1	

REQUESTOR INIT.	BRANCH	DATE	FUEL INJ. SHUT	#CARR	#RBL	CARR MODEL	EXHAUST SYSTEM TYPES	NAME	EVAP SYS. TYPE	EGN CASE	CRANK TYPE	FUEL TANK	FUEL MAINT	ODOM	GVW
TC		0- 0- 0	0	0	1		0 0 0 0		4	1	0	1	9	0	0

REQUESTOR COMMENTS : HP AT 65KPH SPEC SHIFT PTS. CHOKE 50 SEC. KAWASAKI 75 F11
 LABORATORY COMMENTS : 1STALL RAG2 DIST=861=2103617 RAG2=2270881 RAG3=2114615 RAG3 1STALL

ENGINE FAMILY :
 CVS HOURS : 1611.4

TEST DATE	ODOMETER	IND. H.P.	HARD WGT	TEMP. OF DRY	WET	CVS	SPEC. GR.	UNITS	CVS PRES. IN	OUT	INITIALS OPER.	DRIVER	DYNO. NO.	CVS UNIT
7- 2-75	0.	1.7	29.20	74.5	59.5	100.0	1.75	IN	21.99	20.93	JSH	KTC	MC	11C

CURIC FT PER REV.	CALCULATED RPM	NOX FACTOR	IGN TIMING	RPM	% CO	GEAR	IDLE RPM	EVAP. LOSS GRAMS	TIRE PRES.
0.27639	1443.	0.9047	00	0.	0.0		0.	.	0.0

RAG 1	5.840 KM	12223. COUNTS	2804.7 CU. FT.	D/Factor=22.714
		EXHAUST SAMPLE	BACKGROUND SAMPLE	CORRECTED
		RANGE METER CONC.	RANGE METER CONC.	MASS EMISSIONS
HC-FID	7	49.2 1499.38	7	1.1 37.46
CO	8	88.0 2139.75	8	0.0 0.0
CO2	1	24.0 0.226	1	4.8 0.041
NOX CHEM	2	3.6 0.90	2	0.2 0.05
				CONCENTRATIONS GMS GMS/KM KM/L
				1463.57 PPM 67.08 11.49
				2139.75 PPM 198.01 33.91
				0.185 % 271.23 46.44
				0.85 PPM 0.12 0.02

RAG 2	6.304 KM	20842. COUNTS	4785.8 CU. FT.	1383.2 SECONDS	D/Factor=53.192	ACT RPM= 1434.3	RPM RATIO(C/A)=0.9943
		EXHAUST SAMPLE	BACKGROUND SAMPLE	CORRECTED	MASS EMISSIONS		
		RANGE METER CONC.	RANGE METER CONC.	CONCENTRATIONS	GMS GMS/KM KM/L		
HC-FID	7	17.4 549.21	7	0.3 10.27	539.13 PPM 42.13 6.68		
CO	8	28.6 595.75	8	0.0 0.0	595.75 PPM 94.00 14.91		
CO2	1	15.9 0.137	1	4.2 0.036	0.102 % 252.59 40.07		27.7
NOX CHEM	2	2.3 0.58	2	0.2 0.05	0.53 PPM 0.12 0.02		

RAG 3	5.870 KM	12362. COUNTS	2838.6 CU. FT.	517.2 SECONDS	D/Factor=24.314	ACT RPM= 1434.1	RPM RATIO(C/A)=0.9941
		EXHAUST SAMPLE	BACKGROUND SAMPLE	CORRECTED	MASS EMISSIONS		
		RANGE METER CONC.	RANGE METER CONC.	CONCENTRATIONS	GMS GMS/KM KM/L		
HC-FID	7	43.9 1338.10	7	0.8 27.30	1311.92 PPM 60.81 10.36		
CO	8	86.1 2041.12	8	0.0 0.0	2081.12 PPM 194.77 33.18		
CO2	1	24.1 0.209	1	4.1 0.035	0.175 % 257.49 43.93		18.2
NOX CHEM	2	3.7 0.92	2	0.2 0.05	0.88 PPM 0.12 0.02		

WEIGHTED VALUES(1)	HC	CO	CO2	NOX
GRAMS/KM	8.69	23.9	42.4	0.02
BEFORE ROUNDING	8.6872	23.8601	42.4488	0.02000

75 WEIGHTED1
 KM/L
 22.
 21.8047

FUEL-WEIGHT1
 KM/L
 0.0

TEST # 18-1030

1976 MSPCP CONSTANT-VOLUME SAMPLER RESULTS MOTORCYCLE

PROCESSED: 10:13:40 OCT 10, 1975

MFG. CODE	MODEL	VEHICLE I.D.	MOD. YR	DISPL. CC	INERTIA MASS-KG	CUPH MASS-KG	NO. CYL.	H.P.	ACT. DYNO HP @ 45 KPH	A C	UTL	TRANS	S.PAT.	TEST YEAR	TEST TYPE
335	F11 250 ENDURO	KAWASAKI 75	75	250.0	210	130	1	22	2.3	0	0	4	0	76	5

AXLE RATIO	N/V RATIO	BORE	STROKE	MANUFACTURE SPECS.				IDLE/-----MANUFACTURE DATA-----/ TIRES				DRIVE CYCLE	SOURCE CODE	
0.0	0.0	68.000	68.000	C.R.	TIMING	RPM	% CO	GEAR	RPM	HC	CO	NOX	EVAP	SIZE, RIM
0.0	0.0	68.000	68.000	6.40	0.0	0.0	0.0	0.0	0.0	8.00	19.50	0.02	0.0	5

REQUESTOR INIT.	BRANCH	DATE	FUEL INJ.	SHUT.	#CARR	#RBL	CARR MODEL	EXHAUST SYSTEM TYPES	NAME	EVAP SYS.	EGN TYPE	CRANK CASE	FUEL TYPE	FUEL TANK	MAINT	ODOM	GVW
TC		0-0-0	0	0	1			0 0 0 0 0		4	1	0	1	9	0	0	0

REQUESTOR COMMENTS :
LABORATORY COMMENTS : BG1=2100978BG2=22605148G3=2108233

KAWASAKI 75 F11

ENGINE FAMILY :
CVS HOURS : 1724.5

TEST DATE	ODOMETER	IND. H.P.	BARO "HG	TEMP. OF			MANOMETER		CVS PRES.		INITIALS		DYNO. NO.	CVS UNIT
7-3-75	0.	1.7	28.98	DRY	WET	CVS	SPEC. GR.	UNITS	IN	OUT	OPER.	DRIVER	MC	11C
				DILUTION AIR	0.0	0.0		IN	21.68	20.55	JSH	KTC		

CUBIC FT PER REV.	CALCULATED RPM	NOX FACTOR	IGN TIMING	RPM	% CO	GEAR	IDLE RPM	EVAP. LOSS GRAMS	TIRE PRES.
0.27662	1444.	0.9273	00	0.	0.0		0.	.	0.0

BAG 1 5.832 KM 12311. COUNTS 2804.9 CU. FT. D/FACTOR=22.512

EXHAUST SAMPLE			BACKGROUND SAMPLE			CORRECTED CONCENTRATIONS		MASS EMISSIONS		KM/L
RANGE	METER	CONC.	RANGE	METER	CONC.	GMS	GMS/KM			
HC-FID	7	51.5	1569.84	7	0.9	30.69	1540.51 PPM	70.56	12.10	
CO	8	91.4	2246.22	8	0.0	0.0	2246.22 PPM	207.73	35.62	
CO2	1	24.6	0.214	1	4.3	0.037	0.174 %	259.03	44.41	16.9
NOX CHEM	2	3.7	0.92	2	0.2	0.05	0.88 PPM	0.12	0.02	

BAG 2 6.275 KM 20601. COUNTS 4693.7 CU. FT. 1381.1 SECONDS D/FACTOR=49.034 ACT RPM= 1429.8 RPM RATIO(C/A)=0.9904

EXHAUST SAMPLE			BACKGROUND SAMPLE			CORRECTED CONCENTRATIONS		MASS EMISSIONS		KM/L
RANGE	METER	CONC.	RANGE	METER	CONC.	GMS	GMS/KM			
HC-FID	7	19.0	596.97	7	0.7	23.90	573.55 PPM	43.96	7.01	
CO	8	31.8	666.00	8	0.0	0.0	666.00 PPM	103.06	16.42	
CO2	1	17.0	0.147	1	4.1	0.035	0.112 %	273.20	43.54	25.6
NOX CHEM	2	2.4	0.60	2	0.3	0.07	0.53 PPM	0.12	0.02	

BAG 3 5.853 KM 12083. COUNTS 2753.0 CU. FT. 506.6 SECONDS D/FACTOR=23.774 ACT RPM= 1431.1 RPM RATIO(C/A)=0.9913

EXHAUST SAMPLE			BACKGROUND SAMPLE			CORRECTED CONCENTRATIONS		MASS EMISSIONS		KM/L
RANGE	METER	CONC.	RANGE	METER	CONC.	GMS	GMS/KM			
HC-FID	7	45.1	1374.47	7	0.2	6.85	1367.91 PPM	61.50	10.51	
CO	8	88.4	2152.17	8	0.0	0.0	2152.17 PPM	195.34	33.37	
CO2	1	24.3	0.211	1	3.9	0.034	0.179 %	255.04	43.57	18.1
NOX CHEM	2	3.9	0.97	2	0.2	0.05	0.93 PPM	0.13	0.02	

WEIGHTED VALUES(1)	HC	CO	CO2	NOX
GRAMS/KM	9.02	25.1	43.7	0.02
BEFORE ROUNDING	9.0238	25.0629	43.7295	0.02065

75 WEIGHTED1
KM/L
21.
20.9776

FUEL-WEIGHT1
KM/L
0.0

TEST # 18-1072

1976 MSPCP CONSTANT-VOLUME SAMPLER RESULTS MOTORCYCLE

PROCESSED: 10:13:40 OCT 10, 1975

MFG. CODE	MODEL	VEHICLE I.D.	MOD. YR	DISPL. CC	INERTIA MASS-KG	CURB MASS-KG	NO. CYL.	ACT. HP @ 5 KPH	DYNO A C	UTL	TRANS	S.PAT.	TEST YEAR	TEST TYPE
335	F11 250 ENDURO	KAWASAKI 75	75	250.0	210	130	1	22	2.3	0	0	4	0	76 5

AXLE RATIO	N/V RATIO	BORE	STROKE	MANUFACTURE C.R.	SPECS. TIMING	PPM	% CO	GEAR	IDLE RPM	HC	CO	NOX	EVAP	TIRES SIZE	RIM	DRIVE CYCLE	SOURCE CODE
0.0	0.0	68.000	68.000	6.40	0.0	0.	0.0	0.	8.00	19.50	0.02	0.0	0.0	5	1		

REQUESTOR INIT.	BRANCH	DATE	FUEL INJ.	SHUT.	#CARR	#RRLS	CARR MODEL	EXHAUST TYPES	SYSTEM NAME	EVAP SYS.	EGN TYPE	CRANK CASE	FUEL TYPE	FUEL TANK	MAINT	ODOM	GVW
TC	0-0-0	0	0	0	1			0	0	0	0	4	1	0	1	9	0

REQUESTOR COMMENTS : HP AT 65KPH SPEC SHIFT PTS. CHOKE 50 SEC. KAWASAKI 75 F11
 LABORATORY COMMENTS : 250 CC -TIRE PRESS 31 PSI-RG#1-2118906RG#2-2270817RG#3-2111585

ENGINE FAMILY :
 CVS HOURS : 1736.8

TEST DATE	ODOMETER	IND. H.P.	BARO	TEMP. OF DRY WET	CVS	MANOMETER SPEC. GR. UNITS	CVS PRES. IN OUT	INITIALS OPER. DRIVER	DYNO. NO. UNIT
7-8-75	0.	1.7	28.75	74.0 60.5	100.0	1.75	IN 21.73 20.48	LRH JAS	MC 11C

CUBIC FT PER REV.	CALCULATED RPM	NOX FACTOR	IGN TIMING	RPM	% CO	GEAR	IDLE RPM	EVAP. LOSS GRAMS	TIRE PRES.
0.27644	1444.	0.9308	00	0.	0.0		0.	.	31.0

BAG 1 5.883 KM 12211. COUNTS 2760.2 CU. FT. D/FACTOR=23.763

EXHAUST SAMPLE RANGE METER CONC.	BACKGROUND SAMPLE RANGE METER CONC.	CORRECTED CONCENTRATIONS	MASS EMISSIONS GMS	GMS/KM	KM/L
HC-FID 7 48.6 1481.05	7 0.5 17.10	1464.67 PPM	66.02	11.22	
CO 8 85.6 2065.79	8 0.3 6.10	2059.95 PPM	187.46	31.87	
CO2 1 24.1 0.209	1 4.4 0.038	0.173 %	247.26	42.03	18.4
NOX CHEM 2 3.4 0.85	2 0.2 0.05	0.80 PPM	0.11	0.02	

BAG 2 6.304 KM 20751. COUNTS 4690.6 CU. FT. 1379.3 SECONDS D/FACTOR=57.904 ACT RPM= 1433.9 RPM RATIO(C/A)=0.9932

EXHAUST SAMPLE RANGE METER CONC.	BACKGROUND SAMPLE RANGE METER CONC.	CORRECTED CONCENTRATIONS	MASS EMISSIONS GMS	GMS/KM	KM/L
HC-FID 7 15.7 498.21	7 0.2 6.85	491.48 PPM	37.65	5.97	
CO 8 25.9 537.25	8 0.1 2.03	535.25 PPM	82.78	13.13	
CO2 1 14.8 0.128	1 3.6 0.031	0.097 %	236.59	37.53	30.4
NOX CHEM 2 1.8 0.45	2 0.2 0.05	0.40 PPM	0.09	0.02	

BAG 3 5.862 KM 12152. COUNTS 2746.8 CU. FT. 508.8 SECONDS D/FACTOR=27.248 ACT RPM= 1433.0 RPM RATIO(C/A)=0.9926

EXHAUST SAMPLE RANGE METER CONC.	BACKGROUND SAMPLE RANGE METER CONC.	CORRECTED CONCENTRATIONS	MASS EMISSIONS GMS	GMS/KM	KM/L
HC-FID 7 38.4 1172.48	7 0.4 13.69	1159.29 PPM	52.00	8.87	
CO 8 78.0 1838.37	8 0.2 4.07	1834.46 PPM	166.13	28.34	
CO2 1 22.0 0.191	1 3.6 0.031	0.161 %	228.89	39.05	21.0
NOX CHEM 2 3.6 0.90	2 0.3 0.07	0.83 PPM	0.11	0.02	

WEIGHTED VALUES(1) GRAMS/KM	HC	CO	CO2	NOX
BEFORE ROUNDING	7.86	21.2	38.9	0.02
	7.8577	21.1968	38.8804	0.01709

75 WEIGHTED1 KM/L	FUEL-WEIGHT1 KM/L
24.	0.0
24.1363	

TEST # 18-1189

1974 MSPCP CONSTANT-VOLUME SAMPLER RESULTS MOTORCYCLE

PROCESSED: 10:13:39 OCT 10, 1974

MFG. CODE	MODEL	VEHICLE I.D.	MOD. YP	DISPL. CC	INERTIA MASS-KG	CURB MASS-KG	NO. CYL.	H.P.	ACT. HP @ 65 KPH	DYNO A	UTL	TRANS	S.PAT.	TEST YEAR	TEST TYPE
335	Z1 900	KAWASAKI 75	75	900.0	330	250	4	82	3.0	0	0	4	0	76	5

AXLE RATIO	N/V RATIO	BORE	STROKE	MANUFACTURE C.P.	SPECS. TIMING	RPM	% CO	GEAR	IDLE RPM	HC	CO	NOX	EVAP	TIRES SIZE	RIM	DRIVE CYCLE	SOURCE CODE
0.0	0.0	66.000	66.000	8.50	0.0	0.	0.0		0.	0.0	0.0	0.0	0.0			5	1

REQUESTOR INIT.	BRANCH	DATE	FUEL INJ.	SHUT.	#CARB	#GBLS	CARB MODEL	EXHAUST TYPES	SYSTEM NAME	EVAP SYS.	EGN TYPE	CRANK CASE	FUEL TYPE	FUEL TANK	MAINT	ODOM	GVW
TC	ECT	7-15-75	0	0	4			0 0 0 0 0		4	1	0	1	16	0	0	0

REQUESTOR COMMENTS : HP AT 65 KPH SPECIAL SHIFT PTS KAWASAKI 75 Z1 ENGINE FAMILY :
 LABORATORY COMMENTS : DIST-BAG1=2104384 BAG2=2262251 BAG3=2107682 TWO STALLS-BAG3 CVS HOURS : 1744.5

TEST DATE	ODOMETER	IND. H.P.	BARO	TEMP.	OF	MANOMETER	CVS PRES.	INITIALS	DYNO. NO.	CVS UNIT
7-15-75	0.	2.4	29.30	73.5	58.1	101.0	1.75	IN	22.05	20.75

DILUTION AIR 0.0 0.0

CUBIC FT PER REV.	CALCULATED RPM	NOX FACTOR	IGN TIMING	RPM	% CO	GEAR	IDLE RPM	EVAP. LOSS GRAMS	TIRE PRES.
0.27653	1443.	0.8869	00	0.	0.0		0.		0.0

BAG 1 5.842 KM 12115. COUNTS 2789.0 CU. FT. D/FACTOR=22.136

EXHAUST SAMPLE	BACKGROUN SAMPLE	CORRECTED	MASS EMISSIONS	
RANGE METER CONC.	RANGE METER CONC.	CONCENTRATIONS	GMS	GMS/KM
HC-FID 7 18.1 570.13	7 0.5 17.10	553.81 PPM	25.21	4.32
CO 8 65.9 1497.80	8 0.4 8.13	1490.04 PPM	136.97	23.45
CO2 1 44.8 0.399	1 5.7 0.049	0.352 %	508.17	86.99
NOX CHEM 2 59.7 14.92	2 0.7 0.17	14.76 PPM	1.98	0.34

KM/L 17.0

BAG 2 6.281 KM 20746. COUNTS 4774.3 CU. FT. 1373.6 SECONDS D/FACTOR=31.370 ACT RPM= 1435.4 RPM RATIO(C/A)=0.9949

EXHAUST SAMPLE	BACKGROUN SAMPLE	CORRECTED	MASS EMISSIONS	
RANGE METER CONC.	RANGE METER CONC.	CONCENTRATIONS	GMS	GMS/KM
HC-FID 4 82.9 251.21	4 3.1 11.53	240.05 PPM	18.72	2.98
CO 8 68.0 1555.03	8 0.7 14.23	1541.25 PPM	242.61	38.63
CO2 1 28.3 0.247	1 5.2 0.045	0.203 %	502.59	80.02
NOX CHEM 2 12.2 3.05	2 0.7 0.17	2.88 PPM	0.66	0.11

KM/L 15.6

BAG 3 5.852 KM 12056. COUNTS 2774.5 CU. FT. 505.1 SECONDS D/FACTOR=24.737 ACT RPM= 1432.1 RPM RATIO(C/A)=0.9926

EXHAUST SAMPLE	BACKGROUN SAMPLE	CORRECTED	MASS EMISSIONS	
RANGE METER CONC.	RANGE METER CONC.	CONCENTRATIONS	GMS	GMS/KM
HC-FID 4 89.6 270.32	4 3.6 13.35	257.51 PPM	11.67	1.99
CO 8 79.5 1882.43	8 0.8 16.26	1866.83 PPM	170.77	29.18
CO2 1 37.1 0.326	1 6.3 0.054	0.274 %	394.43	67.40
NOX CHEM 2 52.6 13.15	2 0.7 0.17	12.98 PPM	1.73	0.30

KM/L 19.6

WEIGHTED VALUES(1)	HC	CO	CO2	NOX
GRAMS/KM	3.0	32.9	78.0	0.21
BEFORE ROUNDING	2.9854	32.8832	77.9928	0.20585

75 WEIGHTED1	FUEL-WEIGHT1
KM/L	KM/L
17.	0.0
16.8464	

TEST # 18-1237

1976 MSPCP CONSTANT-VOLUME SAMPLER RESULTS MOTORCYCLE

PROCESSED: 10:13:39 OCT 10, 1975

MFG. CODE	MODEL	VEHICLE I.D.	MOD. YR	DISPL. CC	INERTIA MASS-KG	CURR. MASS-KG	NO. CYL.	ACT. HP	DYNO 65 KPH	UTL TRANS	S.PAT.	TEST YEAR	TEST TYPE
335	Z1 900	KAWASAKI 75	75	900.0	330	250	4	82	3.0	0	4	76	5

AXLE RATIO	N/V RATIO	BORE	STROKE	MANUFACTURE C.R.	TIMING	RPM	% CO	GEAR	IDLE RPM	HC	CO	NOX	EVAP	TIRES SIZE	RIM	DRIVE CYCLE	SOURCE CODE
0.0	0.0	66.000	66.000	8.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			5	1

REQUESTOR INIT.	BRANCH	DATE	FUEL INJ. SHUT.	#CARB	#BRLS	CARB MODEL	EXHAUST SYSTEM TYPES	NAME	EVAP SYS.	EGN TYPE	CRANK CASE	FUEL TYPE	FUEL TANK	MAINT	ODOM	GVW
T C	ECT	7-18-75	0	0	4		0 0 0 0		4	1	0	1	16	0	0	0

REQUESTOR COMMENTS : HP AT 65KPH SPECIAL SHIFT PTS.

KAWASAKI 75 Z1

ENGINE FAMILY :

LABORATORY COMMENTS : BAG1-2,104,498 BAG2-2,256627 BAG3-2,108,737

CVS HOURS : 1762.1

TEST DATE	ODOMETER	IND. H.P.	BARO MMHG	TEMP. DRY	WET	CVS	MANOMETER SPEC. GR.	UNITS	CVS PRES. IN	OUT	INITIALS OPER.	DRIVER	DYNO NO.	CVS UNIT
9-9-75	0.	2.4	29.51	70.5	59.2	100.0	1.75	IN	22.46	20.98	CFJ	DCS	MC	11C

CUBIC FT PER REV.	CALCULATED RPM	NOX FACTOR	IGN TIMING	RPM	% CO	GEAR	IDLE RPM	EVAP. LOSS GRAMS	TIRE PRES.
0.27631	1442.	0.9224	00	0.	0.0		0.	.	0.0

BAG	KM	COUNTS	CU. FT.	D/FACTOR	ACT RPM	RPM RATIO(C/A)
BAG 1	5.843	12131	2811.1	21.280		
		EXHAUST SAMPLE	BACKGROUND SAMPLE	CORRECTED	MASS EMISSIONS	
		RANGE METER CONC.	RANGE METER CONC.	CONCENTRATIONS	GMS GMS/KM	KM/L
HC-FID	7	18.1 570.13	7	0.4 13.69	557.09 PPM 25.57	4.38
CO	8	63.9 1444.01	8	0.2 4.07	1440.14 PPM 133.47	22.84
CO2	1	47.9 0.428	1	4.3 0.037	0.393 % 572.61	98.00
NOX CHEM	2	62.6 15.65	2	1.4 0.35	15.32 PPM 2.15	0.37

BAG	KM	COUNTS	CU. FT.	SECONDS	D/FACTOR	ACT RPM	RPM RATIO(C/A)
BAG 2	6.265	20719	4800.9	1375.6	30.612	1432.8	0.9938
		EXHAUST SAMPLE	BACKGROUND SAMPLE	CORRECTED	MASS EMISSIONS		
		RANGE METER CONC.	RANGE METER CONC.	CONCENTRATIONS	GMS GMS/KM	KM/L	
HC-FID	4	90.4 270.63	4	3.7 10.42	260.75 PPM 20.44	3.26	
CO	8	69.5 1590.38	8	0.3 6.10	1590.48 PPM 251.75	40.18	
CO2	1	28.8 0.251	1	4.2 0.035	0.216 % 537.40	85.78	14.7
NOX CHEM	2	12.0 2.90	2	0.4 0.10	2.90 PPM 0.70	0.11	

BAG	KM	COUNTS	CU. FT.	SECONDS	D/FACTOR	ACT RPM	RPM RATIO(C/A)
BAG 3	5.854	12131	2812.7	508.8	23.708	1431.4	0.9928
		EXHAUST SAMPLE	BACKGROUND SAMPLE	CORRECTED	MASS EMISSIONS		
		RANGE METER CONC.	RANGE METER CONC.	CONCENTRATIONS	GMS GMS/KM	KM/L	
HC-FID	4	97.2 292.16	4	3.5 9.85	282.73 PPM 12.99	2.22	
CO	8	81.7 1947.79	8	0.2 4.07	1943.90 PPM 180.27	30.79	
CO2	1	38.7 0.341	1	3.6 0.031	0.311 % 454.14	77.58	17.6
NOX CHEM	2	52.3 13.68	2	0.4 0.10	12.98 PPM 1.82	0.31	

WEIGHTED VALUES(1)	HC	CO	CO2	NOX
GRAMS/KM	3.2	34.0	86.1	0.22
BEFORE ROUNDING	3.2064	34.0003	86.0565	0.21964

75 WEIGHTED1

FUEL-WEIGHT1

KM/L

KM/L

16.

0.0

15.6621

TEST # 18-2224

1974 MSPCP CONSTANT-VOL SAMPLER RESULTS MOTORCYCLE

PROCESSED: 10:13:40 OCT 10, 1975

MFG. CODE	MODEL	VEHICLE I.D.	MOD. YR	DISPL. CC	INERTIA MASS-KG	CURB MASS-KG	NO. CYL.	ACT. DYN. HP @ 65 KPH	A	UTL TRANS	S.PAT.	TEST YEAR	TEST TYPE
335	Z1 900	KAWASAKI 75	75	900.0	330	250	4	82	3.0	0	0	76	5

AXLE RATIO	N/V RATIO	BORE	STROKE	MANUFACTURE C.R.	SPECS. TIMING	RPM	% CO	GEAR	IDLE RPM	HC	CO	NOX	EVAP	TIRES SIZE	RIM	DRIVE CYCLE	SOURCE CODE
0.0	0.0	66.000	66.000	A.50	0.0	0.	0.0	0.0	0.	4.40	37.30	0.19	0.0			5	1

REQUESTOR INIT.	BRANCH	DATE	FUEL INJ. SHUT.	#CARR	#BLS	CARR MODEL	EXHAUST TYPES	SYSTEM NAME	EVAP SYS.	EGN TYPE	CRANK CASE	FUEL TYPE	FUEL TANK	MAINT	ODOM	GVW
TC	ECT	9-11-75	0	4			0 0 0 0		4	1	0	1	16	0	0	0

REQUESTOR COMMENTS : HP AT 65 KPH SPECIAL SHIFT POINTS
LABORATORY COMMENTS : B1=2130118 B2=2278418 B3=2123A57

KAWASAKI 75 Z1

ENGINE FAMILY :
CVS HOURS : 1775.7

TEST DATE	ODOMETER	IND. H.P.	BAPO "HG	TEMP. OF DRY WFT	CVS SPEC. GR.	UNITS	CVS PRES. IN	OUT	INITIALS OPER.	DRIVER	DYNO. NO.	CVS UNIT
9-10-75	50.	2.4	28.88	70.5	61.5	100.0	1.75	IN 22.11	20.58	DCS	CFJ	MC 11C

CUBIC FT PER REV.	CALCULATED PPM	NOX FACTOR	IGN TIMING	RPM	% CO	GEAR	IDLE RPM	EVAP. LOSS GRAMS	TIRE PRES.
0.27625	1443.	0.9739	00	0.	0.0		0.		30.0

BAG 1 5.914 KM 12127. COUNTS 2747.8 CU. FT. D/FACTOR=21.014
 MEASURED DISTANCE DIFFERS FROM STANDARD DISTANCE BY 2.3 PERCENT
 EXHAUST SAMPLE BACKGROUND SAMPLE CORRECTED MASS EMISSIONS

RANGE	METER	CONC.	RANGE	METER	CONC.	CONCENTRATIONS	GMS	GMS/KM	KM/L
HC-FID	4	96.4	289.60	4	3.5	9.85	280.23 PPM	12.57	2.13
CO	8	63.9	1444.01	8	0.1	2.03	1442.08 PPM	130.65	22.09
CO2	1	51.6	0.464	1	5.4	0.047	0.420 %	598.20	101.15
NOX CHEM	2	64.3	16.07	2	1.1	0.28	15.81 PPM	2.29	0.39

BAG 2 6.326 KM 20764. COUNTS 4704.8 CU. FT. 1375.4 SECONDS D/FACTOR=28.755 ACT RPM= 1434.8 RPM RATIO(C/A)=0.9944
 MEASURED DISTANCE DIFFERS FROM STANDARD DISTANCE BY 2.0 PERCENT
 EXHAUST SAMPLE BACKGROUND SAMPLE CORRECTED MASS EMISSIONS

RANGE	METER	CONC.	RANGE	METER	CONC.	CONCENTRATIONS	GMS	GMS/KM	KM/L
HC-FID	4	102.5	309.53	4	3.7	10.42	299.47 PPM	23.01	3.64
CO	8	73.4	1705.79	8	0.5	10.17	1695.98 PPM	263.08	41.59
CO2	1	30.3	0.264	1	5.1	0.044	0.272 %	541.40	85.58
NOX CHEM	2	12.5	3.13	2	0.6	0.15	2.98 PPM	0.74	0.12

BAG 3 5.896 KM 12132. COUNTS 2748.9 CU. FT. 507.3 SECONDS D/FACTOR=23.047 ACT RPM= 1434.9 RPM RATIO(C/A)=0.9944
 MEASURED DISTANCE DIFFERS FROM STANDARD DISTANCE BY 2.0 PERCENT
 EXHAUST SAMPLE BACKGROUND SAMPLE CORRECTED MASS EMISSIONS

RANGE	METER	CONC.	RANGE	METER	CONC.	CONCENTRATIONS	GMS	GMS/KM	KM/L
HC-FID	4	99.0	297.98	4	3.9	10.99	287.47 PPM	12.90	2.19
CO	8	83.8	2011.00	8	0.3	6.10	2005.16 PPM	181.73	30.82
CO2	1	39.7	0.351	1	5.6	0.048	0.304 %	433.63	73.55
NOX CHEM	2	49.5	12.38	2	1.1	0.23	12.11 PPM	1.76	0.30

WEIGHTED VALUES(1)	HC	CO	CO2	NOX
GRAMS/KM	2.9	34.6	85.5	0.22
BEFORE ROUNDING	2.9249	34.5765	85.5072	0.22288

75 WEIGHTED1	FUEL-WEIGHT1
KM/L	KM/L
16.	0.0
15.7186	

TABLE 1 SUMMARIZED EMISSION RESULTS

MODEL	TEST NO.	CARB.	DRIVING SCHEDULE	MASS EMISSIONS GMS/KM				FUEL ECONOMY KM/L	
				HC	CO	CO ₂	NO _x	DRAFT	DATA
Z1	18-1	#1	LA-4 HOT	4.31	56.6	77.3	0.1	13.0	13.8
	18-2	#2	LA-4 HOT	3.63	39.4	87.6	0.19	14.6	15.5
	22-4	#2 *	LA-4 COLD HOT	4.35	37.26	94.40	0.20	14.06	13.86
	23-3	#2 *	LA-4 COLD HOT	4.36	37.30	88.15	0.18	14.60	13.59
F11	22-1	#1	LA-4 HOT	7.73	18.83	48.42	0.02	22.86	24.37
	22-2	#2	LA-4 HOT	8.27	20.22	49.03	0.02	21.90	23.49
	22-3	#3 *	LA-4 HOT	7.94	18.68	49.19	0.02	22.61	24.38
	22-6	#3 *	LA-4 COLD HOT	8.29	20.01	49.42	0.02	21.88	22.12
	23-2	#3 *	LA-4 COLD HOT	7.69	19.07	41.58	0.02	24.43	22.58
F7	18-5	#1 *	LA-4 HOT	4.91	12.46	39.96	0.02	31.21	32.41
	18-4	#2	LA-4 HOT	4.76	11.34	40.95	0.02	31.73	32.97
	18-3	#3	LA-4 HOT	4.04	7.42	43.64	0.02	34.42	35.30
	23-1	#1 *	LA-4 COLD HOT	4.48	7.23	47.32	0.02	32.16	32.72
	23-4	#1 *	LA-4 COLD HOT	4.14	6.82	37.90	0.02	37.96	33.93

Remarks: (1) The vehicles shipped have carburetors with asterisk.

(2) "DRAFT" means fuel economy obtained from the calculation in accordance with the paragraph S.85.476-27(pp.61) of the January 17, 1974 EPA draft test procedure. (Added July 20, 1975)

(3) "DATA" means fuel economy derived from readings of fuel-consumption meter. (Added July 20, 1975)