

ACQUISITION AND ANALYSIS
OF EMISSIONS DATA FROM TESTS
ON IN-USE HEAVY-DUTY DIESEL TRUCKS

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1. INTRODUCTION

Emission factors for diesel powered heavy-duty trucks have been traditionally developed from engineering analysis as little actual data was available. Recently, the EPA has undertaken the testing of in-use heavy duty diesel trucks on the newly developed "chassis dynamometer" transient cycle to determine their emissions. These test results from in-use trucks are the only publicly available source of data on in-use emissions on the transient cycle, and was therefore of interest in verifying emission factor data previously developed by EPA. Under contract to the EPA, Energy and Environmental Analysis (EEA) obtained the data from the contractor responsible for conducting the tests, converted the data into machine readable form and analyzed the data to estimate emission and speed correction factors for diesel trucks. This report describes all phases of this work effort, and also provides a detailed listing of the data.

The first sub-task of the effort involved data acquisition, identification of useful data and entry of useful data into a database in machine readable form. As a result of resource and time constraints, only data generated from testing through the end of October, 1983 was obtained. The data encompasses test results from 30 heavy-duty vehicles. The testing of each vehicle generated large amounts of data and only data useful for the analysis was selected with EPA's guidance. These data were entered into a computer data base by EEA. Section 2 of this report describes the data selected and entered by EEA and details the format used. The data entered is summarized in Section 2, while Appendix A provides a detailed listing of the database.

Using this database, emission factors for heavy-duty vehicles were developed. Since data was available for only 30 vehicles that had accumulated mileage ranging from 8000 to 260,000 miles, it was difficult to derive statistically significant emission deterioration rates with mileage.

Moreover, tests conducted on the "chassis dynamometer" are not directly comparable to the certification procedure for heavy-duty diesel engines. In order to rate engines on a consistent basis, EEA had to derive a method to link emissions measured on the "chassis dynamometer" cycle with those measured according to the certification procedure on the engine dynamometer cycle. Section 3 of this report details this derivation, and describes the resulting emission factor analysis. As expected from the data, statistically significant deterioration rates could not be found for some pollutants, but the results of this analysis shows excellent agreement with the results of engine tests for low mileage emission rates.

In Section 4, the derivation of speed correction factors is discussed. The speed correction factor is a polynomial function of speed and it multiplies the basic emission factor to predict emissions at any speed. Each emission test utilizes three driving cycles that have these different average speed. The speed correction factor is determined from the emissions results from each cycle, and because the data is restricted to three speeds, the maximum order of the polynomial for the speed correction factor is 2. Based on a combination of statistical criteria and engineering requirements, the form of the equation selected was an exponential of first order for HC and CO, and an exponential of second order for NO_x . A secondary problem arises because of the non-linear nature of the speed correction factors, and the problem relates to the requirement of the speed correction factor being set equal to unity at a certain speed. The problem is discussed in Section 4, and two different alternatives are presented for EPA's decision.

Appendix A provides a detailed listing of data, and Appendix B provides plots of the emission index (or fuel specific emissions) against odometer.

2. EMISSIONS DATA DESCRIPTION

One of the sub-tasks of this project was to identify and access the data that was being generated by South-West Research Institute (SWRI) from their emission tests conducted on as-received heavy-duty diesel trucks. These tests were conducted for the EPA (under EPA Contract No. 68-02-3773) and characterized heavy-duty truck and bus emissions as measured under the EPA transient cycle using a programmable chassis dynamometer. Since the testing was still in progress during the period of performance of this contract, we had managed to obtain data generated until approximately the middle of October, 1983. The total number of trucks and buses tested included 4 under Task 2 and 22 under Task 3 of the SWRI effort. In December, we received the data from an earlier testing effort (Task 1) conducted in 1980/81 on four additional vehicles. The total emissions data available for this analysis, as well as the total number of data points entered in machine readable form into the data base is from the testing of these 30 vehicles.

The information available on these vehicles and the data entered into the data base is actually quite large, and the data base contains over 1000 lines of data. Accordingly, the data entered is explained in some detail below. The data can be subdivided into three types namely:

- data describing the vehicle and engine
- data describing the test variables such as fuel type, dynamometer settings and ambient conditions
- the emissions data

Each vehicle was subjected to two complete emission tests in Task 1 and 3 (a few vehicles were subjected to three tests) and each vehicle in Task 2 was subjected to five complete tests. In addition, buses tested in Task 3 were also tested on a separate transient cycle called the "bus" cycle. The data generated from all these tests were entered into the data base and the format is described below.

Each test was given a unique number and the number sequence followed in the data base is identical to the SWRI system. In this system, the first (leftmost) digit is the task number (1, 2 or 3), the second and third digit the vehicle number in that task, the fourth digit is a number for the fuel type and the final digit the test number on that particular vehicle. Thus number 20325 is the fifth test for vehicle number 3 in the second task, using fuel 2, while number 31121 is the first test on vehicle 11 in tasks 3, using fuel number 2.

All of the data records begin with the five digit identification number. Vehicle description records, which do not vary for each test on a vehicle utilize zeros in the fourth and fifth digit indicating fuel type and test numbers respectively. Data records on test description and emission data contain the information on fuel type and test number as well. Obviously, there is only one vehicle description record per vehicle for a total of 30 records labelled "VDES". For each vehicle and each test on the vehicle, there is one test description record, labelled "TDES". For each test, there are 10 emissions data records corresponding to the four different driving cycles in the test and the composite emissions for the entire test, conducted both from a hot and from a cold start. For buses, there is data on the "bus" cycle, which constitutes a single record.

Table 2-1 shows the format adopted for the vehicle description records. The record starts with the number (ending in 00), followed by the identifier labelled "VDES" for vehicle description. The manufacturer (for the truck body) name is abbreviated, if necessary, to a maximum of four characters. In general, most of the abbreviations are self-explanatory (GM for General Motors, WHIT for White Motors, KENW for Kenworth, PETE for Peterbilt, IHC for International Harvester Corporation and CHAN for Chane Motors). The truck type is documented as three letter code for single-axle truck dual axle truck or bus, as shown in Table 2-1. The transmission type is indicated by using M or A, for manual or automatic

TABLE 2-1
VEHICLE DESCRIPTION DATA FORMAT

<u>Data</u>	<u>Field Length (Bytes)</u>	<u>Comment</u>
● Test Number	0-00-0-0	SWRI System
● Data Type	4 Characters	VDES (Vehicle Description)
● Manufacturer Name	4 Characters	e.g., WHIT, MACK
● Truck Type	4 Characters	DAT - Dual axle trailer SAT - Single axle trailer RTS - City bus
● Transmission	4 Characters	e.g., M-10
● Year	4	e.g., 1980
● GVW	5	e.g., 78000
● Odometer	6	
● Engine Manufacturer	3 Characters	e.g., CUM, MAC, DDA
● Type	8 Characters	e.g., 8V-92TA
● Displacement (CID)	4	e.g., 855
● Turbocharger	1	T - Turbo N - Naturally aspirated
● Intercooled	1	Y - yes; N - no
● Federal/California	1	F - Federal; C - California
● HP (rated)	3	
● RPM (rated)	4	

transmission, respectively, followed by a hyphen and a number indicating the number of available gear ratios in the transmissions, e.g. M-8 would indicate an eight speed manual while A-4 would indicate a four speed automatic transmissions. This is followed by year of manufacture, the gross vehicle weight in pounds, and the odometer in miles. The engine manufacturer is listed as a three character abbreviation (CUM for Cummins, MAC for Mack, CAT for Caterpillar, DDA for Detroit Diesel Allison, and IHC for International Harvester Corporation) followed by engine model designation used by the manufacturer, and its development in cubic inches. Information on the presence or absence of a turbocharger and intercooler is provided in single character format, as well as engine certification (Federal or California). The engine's rated horsepower and rated RPM are also shown in this record.

Table 2-2 shows the format for the records containing the test description data. As with the vehicle description file, the test description record starts with the test number followed by the characters "TDES" to denote the type of records. All other entries in this table are self-explanatory, except for the fuel type designation. Once again, the SWRI system is utilized and the designations are:

- EM-329-F which is equivalent to national average No. 1 diesel. (Task 1)
- EM-528-F, equivalent to national average No. 2 diesel.
- EM-455-F equivalent to national average No. 1 diesel (Tasks 2 and 3)

All vehicles in Task 1 and all buses in Task 2 and 3 were tested in the equivalent of No. 1 diesel fuel.

Table 2-3 shows the format for the emission data records. The record is identified by the test number and "EDAT" for the data type. Each record indicates if the test is "cold start" (C) or "hot start" (H) data and specifies the driving cycle as per the EPA test procedure, namely:

TABLE 2-2
TEST DESCRIPTION DATA FORMAT

<u>Data</u>	<u>Field Length (Bytes)</u>	<u>Comment</u>
● Test Number	0-00-0-0	SWRI System
● Data Type	4 Characters	TDES (Test Description)
● Test Weight (lbs)	5	
● Dynamometer HP	5.1	
● Fuel Type	8 Characters	e.g., EM-528-F
● Barometer (Hg)	5.2	
● Humidity (%)	3	
● Dry Bulb Temperature	4.1	
● Absolute Humidity	4.1	
● NO _x Correction Factor	4.2	
● Filter Efficiency (%)	6.2	

TABLE 2-3
EMISSION DATA FORMAT

	Test Number	Data Type	Test	Cycle	Grams						Miles	Grams/Mile					MPG
					HC	CO	CO ₂	NO _x	Part.	Fuel	Dist.	HC	CO	CO ₂	NO _x	Part.	F/E
Field Length (Bytes)	8	4	1	5	5.2	6.2	6.1	5.2	6.3	6.1	4.2	5.2	6.2	6.1	5.2	5.2	5.2
	0-00-0-0	EDAT	C(cold) H(hot)	1NYNF	X	X	X	X	-	X	X	X	X	X	X	-	X
				2LANF	X	X	X	X	-	X	X	X	X	X	X	-	X
				3LAPR	X	X	X	X	-	X	X	X	X	X	X	-	X
				4NYNF	X	X	X	X	-	X	X	X	X	X	X	-	X
				5COMP	-	-	-	-	X	X*	X	X	X	X	X	X	X

Note: "-" indicates no data; will be coded as -1.

* Fuel in pounds for comp cycle only

- 1 NYNF for the initial (after-start) New York Non-freeway cycle
- 2 LANF for the Los Angeles non-freeway cycle
- 3 LAFR for the Los Angeles freeway driving cycle
- 4 NYNF for the final New York non-freeway cycle
- 5 COMP for the test cycle composite value across the four driving cycles.

Values for HC, CO, CO₂, NO_x, particulate and fuel consumption are provided in both total mass and rate (mass per unit distance). Distance traversed over each cycle is also recorded in miles. The total mass emissions and fuel consumed are in grams*, and all emissions rates are in gm/mile whereas fuel consumption is in miles per gallon. SWRI did not measure particulate emissions for each driving cycle but measured only the composite average over all cycles, and gaseous composite total emissions are derived from a straightforward addition of measured emissions over each driving cycles. Values not measured or missing from the data base are recorded as "-1" in the data file.

Data Summary

Table 2-4 through 2-6 provide summaries of all the data entered into the data base.

Table 2-4 lists most of the variables of interest in vehicle and test description data. For the 30 vehicles, the following variables are listed:

- the truck manufacturer (MAN)
- the truck type (TTYPE)
- the transmission type (TRANS)
- the model year of manufacture. (YEAR)
- the gross vehicle weight, in pounds (GVW)
- the odometer reading, in miles (ODOM)
- the engine manufacturer (EMAN)
- the engine model type (ETYPE)
- the engine displacement (DISP)

TABLE 2-4
VEHICLE AND TEST DESCRIPTION

1805 TUESDAY, DECEMBER 27, 1983													
OBS	MAN	TTYPE	TRANS	YEAR	GVW	ODOM	SAS		DISP	PVIN	TWEIGHT	DYNHP	FTYPE
							EMAN	ETYPE					
1	FORD	SAT	M-5	1979	27500	7199	CAT	3208	636	101	16000	60.4	EM-329-F
2	MACK	DAT	M-5	1979	80000	69332	MAC	ENDT676	676	102	49000	97.3	EM-329-F
3	FORD	DAT	M-8	1979	80000	26058	CUM	FOR-290	855	103	49000	96.6	EM-329-F
4	GMC	RTS	A-3	1977	36900	117982	DDA	8V-71	568	104	32000	37.0	EM-329-F
5	GMC	RTS	A-3	1980	36000	95000	DDA	6V-71N	426	201	28300	21.0	EM-400-F
6	WHIT	DAT	M-10	1980	78000	38000	CUM	FOR-350	855	202	54000	134.5	EM-528-F
7	IHC	DAT	M-8	1980	78000	32600	DDA	8V-92TA	736	203	54000	134.5	EM-528-F
8	IHC	SAT	M-5	1979	41500	104050	IHC	DT-466B	466	204	29000	104.6	EM-528-F
9	PETE	SAT	M-10	1970	41500	70455	CUM	FOR-350	855	301	29000	104.6	EM-528-F
10	IHC	SAT	M-6	1979	41500	59675	IHC	DT-466	466	302	29000	104.6	EM-528-F
11	IHC	SAT	M-6	1979	41500	215790	CUM	FOR-290	855	303	29000	104.6	EM-528-F
12	IHC	DAT	M-8	1980	78000	79616	DDA	8V-92TA	736	304	55000	135.0	EM-528-F
13	IHC	DAT	M-8	1979	78000	238577	DDA	8V-92TA	736	305	55000	135.0	EM-528-F
14	WHIT	DAT	M-8	1979	80000	261000	CUM	NTC-400	393	306	55000	135.0	EM-528-F
15	WHIT	DAT	M-8	1981	80000	78015	CUM	FOR-350	350	307	55000	135.0	EM-528-F
16	GMC	RTS	A-3	1980	36000	163732	DDA	6V-71N	426	308	28300	21.0	EM-455-F
17	GMC	RTS	A-3	1980	36000	182119	DDA	6V-71N	426	309	28300	21.0	EM-455-F
18	MACK	DAT	M-10	1981	78000	221936	MAC	EM6-285R	672	310	55000	135.0	EM-528-F
19	MACK	DAT	M-10	1980	78000	240732	MAC	EM6-285	672	311	55000	135.0	EM-528-F
20	KENW	DAT	M-10	1976	78000	100000	CAT	3406	893	312	55000	135.0	EM-528-F
21	KENW	DAT	M-3	1982	78000	180216	CAT	3406	893	313	55000	135.0	EM-528-F
22	WHIT	DAT	M-9	1982	78000	57755	CUM	FOR-350	855	314	55000	135.0	EM-528-F
23	IHC	DAT	M-8	1979	80000	176000	CUM	FOR-350	369	315	56800	135.0	EM-528-F
24	IHC	DAT	M-8	1979	78000	147867	CUM	FOR-290	855	316	55000	134.5	EM-528-F
25	KENW	DAT	M-8	1981	78000	150740	CUM	FOR-350	855	317	54000	134.5	EM-528-F
26	FORD	DAT	M-7	1981	80000	38000	CUM	NTC-300	855	318	57000	138.2	EM-528-F
27	GMC	DAT	M-9	1980	80000	81870	CUM	NTC-300	855	319	57000	138.2	EM-528-F
28	GMC	RTS	A-3	1980	36000	148285	DDA	6V-71N	426	320	28300	76.2	EM-455-F
29	CHAN	RTS	A-4	1970	20000	139173	CAT	3208	636	321	14000	62.3	EM-455-F
30	GMC	RTS	A-3	1970	36900	246988	DDA	8V-71N	568	322	28300	76.2	EM-455-F

- the vehicle identification number used by SWRI (PVIN)
- the test weight, in pounds (TWEIGHT)
- the dynamometer power absorption setting in horsepower (DYNOHP)
- the fuel type, as designated by SWRI

All of these variables do not vary for repeat tests on a vehicle.

Table 2-5 lists the weighted composite emissions rate and fuel consumption over the transient test, as well as the distance. The weighted composite emissions, in grams/mile, are arrived at by first averaging the "hot start" and "cold start" composite mass emissions over all tests for each vehicle, and then averaging the hot and cold emissions using the 6/7 and 1/7 for the hot and cold weight factors as required by EPA. This composite emissions data allowed a careful check against SWRI data to spot errors in data entry. Table 2-5 also shows the weighted mass of fuel consumed (WFUEL), in pounds, as well as the weighted distance traversed (WDIST) in miles. If required, the weighted fuel economy can be calculated using the formula:

$$\text{Fuel Economy (MPG)} = \frac{\text{WDIST} \times 7.072}{\text{WFUEL}}$$

where 7.072 is the density of diesel fuel in lb/gallon.

Table 2-6 shows the averages across respect test by vehicle and driving cycle for the mass emissions (GMC, GCO, GCO₂, GNO_x) and rate (RHC, RCO, RCO₂, RNO_x) as well as the mass of fuel consumed in grams and distance in miles. The only exception to this is that for the composite cycle, the mass of fuel consumed is expressed in pounds. The entire data record can be found in Appendix A of this report.

TABLE 2-5
COMPOSITE EMISSIONS AND FUEL CONSUMPTION

OBS	PVIN	WHC	WCO	SAS			WDIST
				WNOX	WPART	WFUEL	
1	101	1.76857	5.0793	19.4243	0.84514	5.1083	5.52714
2	102	1.51929	9.4729	29.7214	1.94571	8.1489	5.66000
3	103	2.33238	8.0319	27.3767	1.60762	8.4328	5.58000
4	104	2.12786	75.0636	35.5043	3.33143	10.0600	5.53929
5	201	2.79571	34.4160	17.4640	2.05743	8.0207	5.49857
6	202	3.30971	0.9429	23.0226	1.55457	8.3842	5.40257
7	203	2.76400	3.6037	21.5597	1.39714	8.6751	5.42657
8	204	1.84429	4.5466	14.3306	1.24914	6.3322	5.63971
9	301	3.50048	6.0400	14.4724	1.87000	7.4035	5.60000
10	302	1.73357	4.2657	17.4064	1.29357	6.3054	5.56357
11	303	3.50786	9.3743	14.7136	2.30643	6.5734	5.44214
12	304	2.64857	4.9371	23.5421	2.03000	9.2654	5.39286
13	305	2.77057	5.7014	26.0886	1.90786	10.0913	5.50071
14	306	4.99143	24.9200	22.4929	3.03000	9.4311	5.48214
15	307	3.44786	10.7364	24.5257	1.86714	8.0624	5.30000
16	308	2.50429	86.1957	16.3964	7.11143	7.7909	5.43857
17	309	2.91500	28.8700	22.2164	2.31143	7.6627	5.53071
18	310	1.85000	0.0829	20.1600	2.65143	7.6224	5.33857
19	311	1.52643	0.6779	23.6164	2.09500	8.4167	5.40429
20	312	2.60714	19.5771	29.9421	4.56786	9.0931	5.29000
21	313	1.97714	12.9086	39.5657	2.57143	9.8667	5.46071
22	314	2.92214	11.9493	24.3186	2.00500	8.3416	5.41143
23	315	3.29714	31.0579	23.7950	4.17071	9.8134	5.56429
24	316	2.07786	9.0586	35.1419	2.14714	9.8590	5.50048
25	317	2.06714	10.3757	24.6843	2.16571	7.9532	5.24929
26	318	2.52000	7.3386	26.6379	1.36357	8.4438	5.21643
27	319	3.32500	10.4729	27.5714	2.12286	8.8285	5.23500
28	320	2.85214	52.6364	16.3229	5.00357	7.0074	5.39500
29	321	1.09000	4.6686	17.6914	1.53643	4.6662	5.50071
30	322	2.69143	18.1864	27.3471	2.40000	8.0594	5.53214

12:29 FRIDAY, DECEMBER 23, 1983

TABLE 2-6
SAS

18:26 THURSDAY, DECEMBER 22, 1983

1

	P	T	C	T	F		G	G	G	G	F	D		R	R	R	R	R
O	V	E	Y	T	R		C	C	C	N	P	I		H	C	C	N	P
B	I	M	L	E	E		H	C	O	O	A	S		C	O	O	O	A
S	N	F	E	S	Q		C	O	Z	X	R	T		L	T		X	T
1	101	C	1NYNF	14	2	2.4800	10.605	1032.55	15.095	.	332.50	0.53000	4.6950	20.085	1955.85	28.5900	.	.
2	101	C	2LANF	14	2	3.6150	11.695	1693.15	23.335	.	541.90	1.15000	3.1450	10.180	1473.45	20.3050	.	.
3	101	C	3LAF	14	2	3.5150	10.005	4122.40	60.045	.	1305.05	3.29500	1.0650	3.030	1250.90	18.2200	.	.
4	101	C	4NYNF	14	2	1.9100	4.590	853.20	13.635	.	272.50	0.54000	3.5700	8.550	1590.35	25.4100	.	.
5	101	C	5COMP	14	2	.	.	.	.	5.2950	5.41	5.51000	2.0900	6.695	1397.93	20.3500	0.96000	.
6	101	H	1NYNF	14	2	1.6300	4.910	841.55	13.345	.	268.70	0.53000	3.0700	9.265	1588.20	25.1800	.	.
7	101	H	2LANF	14	2	2.8750	7.580	1442.15	20.450	.	460.20	1.15000	2.4900	6.570	1249.95	17.7200	.	.
8	101	H	3LAF	14	2	3.4200	10.225	4087.10	59.545	.	1293.90	3.31000	1.0300	3.090	1235.25	17.9950	.	.
9	101	H	4NYNF	14	2	1.5650	3.870	850.80	13.265	.	271.05	0.54000	2.9050	7.190	1579.00	24.6150	.	.
10	101	H	5COMP	14	2	.	.	.	.	4.5795	5.06	5.53000	1.7150	4.810	1305.59	19.2700	0.82600	.
11	102	C	1NYNF	14	2	1.4950	16.515	1737.55	23.870	.	556.10	0.54500	2.7500	30.455	3203.85	44.0200	.	.
12	102	C	2LANF	14	2	2.5450	13.815	2039.40	35.240	.	902.40	1.19500	2.1400	11.590	2381.65	29.5500	.	.
13	102	C	3LAF	14	2	3.5050	21.755	6593.05	100.285	.	2087.85	3.40000	1.0250	6.395	1937.05	29.4650	.	.
14	102	C	4NYNF	14	2	1.0550	8.565	1451.90	20.845	.	461.95	0.55000	1.9100	15.525	2633.70	37.8200	.	.
15	102	C	5COMP	14	2	.	.	.	.	10.8150	8.84	5.69000	1.5150	10.660	2218.36	31.6800	1.95000	.
16	102	H	1NYNF	14	2	1.2250	11.750	1454.00	20.065	.	464.35	0.54000	2.2700	21.780	2696.35	37.2100	.	.
17	102	H	2LANF	14	2	2.3650	10.460	2445.70	31.720	.	776.75	1.18500	2.0000	8.810	2062.70	26.7500	.	.
18	102	H	3LAF	14	2	3.5900	22.420	6292.00	95.135	.	1993.65	3.38000	1.0650	6.635	1862.75	28.1650	.	.
19	102	H	4NYNF	14	2	1.4150	7.820	1283.25	19.335	.	408.90	0.55500	2.5650	14.140	2320.10	34.9550	.	.
20	102	H	5COMP	14	2	.	.	.	.	10.7690	8.03	5.65500	1.5200	9.275	2028.91	29.3950	1.94500	.
21	103	C	1NYNF	14	3	2.9700	8.963	1853.43	14.880	.	590.33	0.51667	5.7367	17.297	3577.63	28.7033	.	.
22	103	C	2LANF	14	3	3.6167	9.567	2712.07	24.700	.	861.37	1.20000	3.0200	7.990	2266.50	20.6367	.	.
23	103	C	3LAF	14	3	4.6333	18.787	6427.03	91.900	.	2035.33	3.34667	1.3867	5.613	1920.87	27.4667	.	.
24	103	C	4NYNF	14	3	3.0933	6.653	1477.13	15.517	.	470.97	0.56000	5.5533	11.887	2646.77	27.7700	.	.
25	103	C	5COMP	14	3	.	.	.	.	9.9367	8.73	5.62000	2.5467	7.823	2219.46	26.1567	1.79333	.
26	103	H	1NYNF	14	3	2.8133	7.697	1523.00	15.247	.	485.63	0.53000	5.2933	14.527	2875.50	28.8133	.	.
27	103	H	2LANF	14	3	3.4967	8.590	2566.60	24.593	.	814.97	1.18667	2.9433	7.223	2158.50	20.6900	.	.
28	103	H	3LAF	14	3	3.7267	21.017	6343.70	97.250	.	2009.33	3.31667	1.1200	6.333	1912.60	29.3300	.	.
29	103	H	4NYNF	14	3	2.7567	7.670	1544.10	16.547	.	492.20	0.53667	5.1233	14.260	2869.83	30.7367	.	.
30	103	H	5COMP	14	3	.	.	.	.	8.7220	8.38	5.57333	2.2967	8.067	2149.06	27.5800	1.57667	.
31	104	C	1NYNF	14	2	1.5850	122.255	2590.30	32.325	.	876.70	0.50500	3.1450	242.300	5134.20	64.0900	.	.
32	104	C	2LANF	14	2	2.5900	123.900	3412.20	44.345	.	1137.00	1.16500	2.2150	106.125	2921.10	37.9550	.	.
33	104	C	3LAF	14	2	5.2750	146.215	7316.85	111.270	.	2378.00	3.29500	1.6000	44.365	2219.25	33.7400	.	.
34	104	C	4NYNF	14	2	1.8650	82.770	2030.70	24.820	.	681.45	0.54000	3.4750	153.765	3770.45	46.0650	.	.
35	104	C	5COMP	14	2	.	.	.	.	22.1650	11.19	5.50500	2.0550	86.305	2787.06	38.6200	4.00000	.
36	104	H	1NYNF	14	2	2.0400	87.095	2006.30	25.930	.	676.05	0.52000	3.9200	167.495	3857.95	49.8500	.	.
37	104	H	2LANF	14	2	2.8500	106.720	3051.95	39.480	.	1015.50	1.17000	2.4450	91.510	2617.00	33.6550	.	.
38	104	H	3LAF	14	2	5.2800	125.395	6618.80	104.835	.	2148.95	3.32500	1.5900	37.745	1992.40	31.5550	.	.
39	104	H	4NYNF	14	2	1.7000	86.585	1882.45	23.710	.	636.55	0.53500	3.1750	161.510	3511.65	44.2400	.	.
40	104	H	5COMP	14	2	.	.	.	.	17.8445	9.87	5.54500	2.1400	73.190	2445.65	34.9850	3.22000	.
41	201	C	1NYNF	14	5	1.7060	71.148	2127.88	19.906	.	709.38	0.51400	3.3080	137.758	4117.64	38.5480	.	.
42	201	C	2LANF	14	5	2.9640	48.684	2538.20	22.130	.	829.14	1.14400	2.6020	42.620	2222.98	19.3820	.	.
43	201	C	3LAF	14	5	8.6960	90.384	5968.18	48.500	.	1939.38	3.24400	2.6820	27.842	1838.90	14.9420	.	.
44	201	C	4NYNF	14	5	2.8940	34.252	1502.56	14.946	.	494.68	0.53000	5.5000	64.920	2849.52	28.3440	.	.
45	201	C	5COMP	14	5	.	.	.	.	13.3720	8.76	5.43000	2.9980	45.000	2234.46	19.4200	2.46200	.
46	201	H	1NYNF	14	5	2.2120	38.052	1529.88	15.340	.	504.50	0.52200	4.2240	72.608	2919.38	29.2780	.	.
47	201	H	2LANF	14	5	3.1980	37.796	2311.36	20.452	.	752.28	1.16000	2.7620	32.626	1995.32	17.6560	.	.
48	201	H	3LAF	14	5	7.5220	70.184	5724.16	44.288	.	1851.04	3.29200	2.2860	21.310	1738.18	13.4500	.	.
49	201	H	4NYNF	14	5	2.2880	33.914	1439.40	14.350	.	473.92	0.53400	4.2780	63.382	2690.00	26.8200	.	.
50	201	H	5COMP	14	5	.	.	.	.	10.9542	7.90	5.51000	2.7620	32.652	1996.98	17.1380	1.99000	.
51	202	C	1NYNF	14	5	11.8560	14.704	1763.84	11.324	.	573.88	0.44600	26.5080	32.918	3950.98	25.3200	.	.

O B S	P V I N	T E M P	C Y C L E	T E S T	T Y P E	F R E Q U E N C Y	G C O D	G C O D	G N O X	G P A R T	F U E L	D I S T	R H C	R C O D	R C O D	R N O X	R P A R T
52	202	C	2LANF	14	5	5.35000	11.5700	2970.98	22.07	.	945.5	1.16200	4.6000	9.9440	2554.66	19.0240	.
53	202	C	3LAF	14	5	4.11400	19.2580	6160.88	72.02	.	1951.3	3.23200	1.2720	5.9580	1905.96	22.2760	.
54	202	C	4NYNF	14	5	4.13200	8.3540	1627.18	14.16	.	520.0	0.50600	8.1680	16.5120	3217.12	27.9960	.
55	202	C	5COMP	14	5	.	.	.	.	11.8814	8.8	5.34600	4.7600	10.0760	2341.69	22.3660	1.84600
56	202	H	1NYNF	14	5	4.17800	8.9160	1621.92	13.58	.	518.7	0.49000	8.5440	18.2400	3316.64	27.7760	.
57	202	H	2LANF	14	5	4.57200	10.0380	2687.84	22.89	.	854.9	1.17400	3.9020	8.5680	2292.90	19.5260	.
58	202	H	3LAF	14	5	3.69400	19.5260	5891.24	73.51	.	1866.2	3.24200	1.1400	6.0280	1816.94	22.6720	.
59	202	H	4NYNF	14	5	4.14600	8.8860	1661.76	15.25	.	591.2	0.51000	8.1420	17.6520	3261.68	29.9360	.
60	202	H	5COMP	14	5	.	.	.	.	8.1458	8.3	5.41200	3.0680	8.7540	2191.55	23.1320	1.50600
61	203	C	1NYNF	14	5	3.28600	6.1380	2001.76	14.14	.	635.9	0.48000	6.8220	12.7480	4155.62	29.3460	.
62	203	C	2LANF	14	5	4.03200	5.4340	3073.76	22.91	.	973.5	1.16600	3.4620	4.6620	2637.86	19.6620	.
63	203	C	3LAF	14	5	5.34000	7.2340	6447.82	64.28	.	2036.9	3.22600	1.6520	2.2420	1997.74	19.9160	.
64	203	C	4NYNF	14	5	3.03600	3.4860	1770.56	16.16	.	561.6	0.52200	5.8360	6.6880	3397.38	31.0220	.
65	203	C	5COMP	14	5	.	.	.	.	8.1676	9.3	5.39400	2.9080	4.1300	2463.82	27.7740	1.51200
66	203	H	1NYNF	14	5	2.60800	2.7980	1177.48	9.36	.	374.3	0.50000	5.1880	5.5620	2345.66	18.6140	.
67	203	H	2LANF	14	5	3.91200	4.4760	2934.34	24.32	.	929.0	1.17000	3.3500	3.8320	2512.32	20.8200	.
68	203	H	3LAF	14	5	5.39000	8.2640	6389.04	66.28	.	2018.9	3.24800	1.6600	2.5460	1967.06	20.4100	.
69	203	H	4NYNF	14	5	2.98000	3.5600	1786.26	16.94	.	566.5	0.51200	5.8040	6.9480	3483.50	30.0380	.
70	203	H	5COMP	14	5	.	.	.	.	7.4894	8.6	5.43200	2.7400	3.5160	2262.31	21.5240	1.37800
71	204	C	1NYNF	14	5	2.60600	8.6580	1335.84	11.09	.	427.0	0.51600	5.0540	16.7980	2591.42	21.5200	.
72	204	C	2LANF	14	5	3.42800	7.7960	2169.22	18.11	.	689.5	1.19400	2.8720	6.5280	1816.58	15.1660	.
73	204	C	3LAF	14	5	3.65400	8.5320	5080.50	49.53	.	1605.8	3.34000	1.0940	2.5540	1521.58	14.8400	.
74	204	C	4NYNF	14	5	1.96400	4.6180	1085.74	9.51	.	345.8	0.56400	3.4980	8.1920	1928.48	16.8920	.
75	204	C	5COMP	14	5	.	.	.	.	7.1784	6.8	5.61400	2.0740	5.2700	1722.35	15.7140	1.28000
76	204	H	1NYNF	14	5	1.82600	5.0580	1101.96	9.42	.	350.9	0.52800	3.4620	9.5700	2088.40	17.8400	.
77	204	H	2LANF	14	5	3.08200	6.7380	1939.14	15.59	.	616.3	1.20800	2.5500	5.5680	1603.00	12.8820	.
78	204	H	3LAF	14	5	3.41800	8.4440	4823.50	45.45	.	1524.7	3.36800	1.0180	2.5060	1432.60	13.4960	.
79	204	H	4NYNF	14	5	1.86400	4.7600	1090.06	9.16	.	347.1	0.54200	3.4540	8.8140	2019.26	16.9580	.
80	204	H	5COMP	14	5	.	.	.	.	7.0254	6.3	5.64400	1.8060	4.4260	1586.49	14.1000	1.24400
81	301	C	1NYNF	14	3	8.34333	13.1933	1930.07	10.23	.	590.5	0.53333	15.6767	24.7867	3437.13	19.2067	.
82	301	C	2LANF	14	3	4.97000	8.8467	2578.77	14.92	.	820.4	1.17000	4.2633	7.5867	2210.90	12.7900	.
83	301	C	3LAF	14	3	5.20000	11.2600	5364.17	44.79	.	1697.9	3.33667	1.5600	3.3767	1607.53	13.4200	.
84	301	C	4NYNF	14	3	4.38333	6.5200	1472.27	10.34	.	470.7	0.54333	8.0633	11.9867	2704.70	18.9933	.
85	301	C	5COMP	14	3	.	.	.	.	11.5443	7.9	5.58000	4.1033	7.1400	2015.27	14.3867	2.07000
86	301	H	1NYNF	14	3	3.79000	8.2000	1552.90	10.19	.	496.3	0.53667	7.0500	15.2500	2887.37	18.9433	.
87	301	H	2LANF	14	3	5.07667	7.5233	2360.77	15.56	.	751.3	1.17667	4.3233	6.4100	2010.10	13.2500	.
88	301	H	3LAF	14	3	5.45000	11.1533	5046.67	44.89	.	1598.2	3.34667	1.6300	3.3333	1508.63	13.4200	.
89	301	H	4NYNF	14	3	4.75000	5.9633	1485.13	10.57	.	474.8	0.54667	8.6833	10.8967	2713.57	19.3133	.
90	301	H	5COMP	14	3	.	.	.	.	10.2797	7.3	5.60333	3.4000	5.8567	1863.66	14.4867	1.83667
91	302	C	1NYNF	14	2	2.21000	9.8550	1339.05	13.35	.	428.2	0.52500	4.2250	18.8350	2559.50	25.5250	.
92	302	C	2LANF	14	2	3.02500	8.0500	2068.05	20.16	.	657.4	1.16000	2.6100	6.9500	1785.85	17.4100	.
93	302	C	3LAF	14	2	3.09000	7.5700	5010.00	58.47	.	1582.5	3.33000	0.9300	2.2700	1503.10	17.5450	.
94	302	C	4NYNF	14	2	1.44000	4.5650	1097.45	11.50	.	348.8	0.53500	2.6700	8.4800	2038.45	21.3700	.
95	302	C	5COMP	14	2	.	.	.	.	7.6475	6.7	5.55500	1.7550	5.4100	1713.52	18.6450	1.37500
96	302	H	1NYNF	14	2	1.67000	5.6900	1061.55	10.61	.	338.3	0.53000	3.1650	10.7700	2010.30	20.1150	.
97	302	H	2LANF	14	2	3.04000	5.8700	1900.20	18.07	.	603.5	1.17000	2.5950	5.0150	1622.90	15.4350	.
98	302	H	3LAF	14	2	3.30500	7.1750	4882.10	55.60	.	1542.3	3.33000	0.9950	2.1500	1467.10	16.7100	.
99	302	H	4NYNF	14	2	1.60500	3.9300	1098.20	11.42	.	348.9	0.54000	2.9800	7.3350	2042.15	21.2200	.
100	302	H	5COMP	14	2	.	.	.	.	7.1270	6.2	5.56500	1.7300	4.0750	1606.99	17.2000	1.28000
101	303	C	1NYNF	14	2	3.27000	15.5850	1678.10	4685.69	.	28177.9	0.51000	6.4100	30.5100	3286.75	19.6200	.
102	303	C	2LANF	14	2	4.69300	13.6800	2379.85	15.77	.	759.9	1.13000	4.1450	12.0850	2102.15	13.9300	.

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18:26 THURSDAY, DECEMBER 22, 1983 3

OBS	PVIN	TEMP	CYCLE	TEST	TYPE	FREQ	GHC	GCO	GCO2	GNOX	GPART	FUEL	DIST	RHC	RCO	RCO2	RNOX	RPART
103	303	C	3LAF	.	14	2	6.055	21.765	4837.65	46.630	.	1538.35	3.280	1.845	6.635	1474.30	14.210	.
104	303	C	4NYNF	.	14	2	4.055	9.075	1347.00	10.240	.	432.20	0.530	7.650	17.115	2539.95	19.310	.
105	303	C	5COMP	.	14	2	.	.	.	.	13.6340	7.21	5.455	3.315	11.020	1877.87	15.155	2.495
106	303	H	1NYNF	.	14	2	3.715	10.330	1347.75	9.535	.	432.70	0.515	7.180	19.955	2603.25	18.415	.
107	303	H	2LANF	.	14	2	5.535	10.460	2021.00	14.760	.	646.45	1.130	4.890	9.230	1784.45	13.025	.
108	303	H	3LAF	.	14	2	5.755	18.860	4502.50	45.015	.	1431.15	1.775	1.760	5.604	1376.15	13.755	.
109	303	H	4NYNF	.	14	2	4.255	9.870	2814.95	10.340	.	422.80	0.520	8.200	19.045	2534.85	19.945	.
110	303	H	5COMP	.	14	2	.	.	.	.	12.3685	6.47	5.440	3.540	9.100	1688.38	14.640	2.275
111	304	C	1NYNF	.	14	2	1.750	5.430	2027.25	15.565	.	642.05	0.480	3.655	11.365	4236.45	17.580	.
112	304	C	2LANF	.	14	2	3.505	6.490	3298.55	26.870	.	1044.20	1.150	3.050	5.655	2871.65	23.395	.
113	304	C	3LAF	.	14	2	5.520	9.625	6661.70	69.635	.	2105.50	3.225	1.710	2.980	2066.10	21.590	.
114	304	C	4NYNF	.	14	2	3.290	4.300	1800.75	17.670	.	571.75	0.535	6.200	8.075	3384.55	33.215	.
115	304	C	5COMP	.	14	2	.	.	.	.	11.5660	9.62	5.380	2.610	4.800	2561.30	24.095	2.150
116	304	H	1NYNF	.	14	2	2.555	4.815	1883.45	16.985	.	597.35	0.510	5.035	9.495	3705.85	33.450	.
117	304	H	2LANF	.	14	2	3.895	6.055	2998.80	25.725	.	950.10	1.145	3.405	5.295	2618.40	22.490	.
118	304	H	3LAF	.	14	2	5.325	11.165	6426.25	65.305	.	2032.00	3.215	1.660	3.475	2000.20	20.380	.
119	304	H	4NYNF	.	14	2	2.525	4.680	1878.55	18.220	.	595.65	0.530	4.795	8.885	3566.80	34.600	.
120	304	H	5COMP	.	14	2	.	.	.	.	10.8155	9.21	5.395	2.655	4.960	1345.13	23.450	2.010
121	305	C	1NYNF	.	14	2	2.315	8.830	2239.50	17.165	.	711.05	0.495	4.670	17.935	4531.75	34.730	.
122	305	C	2LANF	.	14	2	3.710	7.460	3469.85	27.925	.	1098.75	1.155	3.225	6.470	3004.70	24.180	.
123	305	C	3LAF	.	14	2	5.685	12.940	7362.10	75.975	.	2327.55	3.300	1.720	3.920	2231.05	23.020	.
124	305	C	4NYNF	.	14	2	2.535	5.815	1970.00	19.820	.	625.05	0.555	4.550	10.435	3561.25	35.845	.
125	305	C	5COMP	.	14	2	.	.	.	.	12.7520	10.50	5.505	2.590	6.370	2738.11	25.600	2.315
126	305	H	1NYNF	.	14	2	2.590	5.605	1947.80	18.780	.	617.95	0.500	5.135	11.155	3864.50	37.265	.
127	305	H	2LANF	.	14	2	4.060	6.070	3283.40	29.205	.	1039.75	1.145	3.555	5.320	2876.00	25.580	.
128	305	H	3LAF	.	14	2	5.900	13.860	7150.70	75.790	.	2261.75	3.290	1.790	4.210	2172.85	23.025	.
129	305	H	4NYNF	.	14	2	2.905	5.185	1972.70	20.110	.	625.90	0.565	5.205	9.300	3529.95	36.015	.
130	305	H	5COMP	.	14	2	.	.	.	.	10.1120	10.02	5.500	2.810	5.590	2610.66	26.170	1.840
131	306	C	1NYNF	.	14	2	5.650	39.525	2300.65	15.690	.	748.80	0.525	10.730	75.350	4381.85	29.880	.
132	306	C	2LANF	.	14	2	6.390	28.670	3545.70	25.090	.	1135.75	1.165	5.480	24.575	3040.30	21.515	.
133	306	C	3LAF	.	14	2	5.225	59.280	6823.80	69.630	.	2180.70	3.335	1.565	17.780	2047.60	20.890	.
134	306	C	4NYNF	.	14	2	7.230	28.045	1965.60	15.875	.	639.30	0.505	14.305	55.600	3897.10	31.485	.
135	306	C	5COMP	.	14	2	.	.	.	.	19.5615	10.37	5.525	4.430	28.130	2647.26	22.840	3.540
136	306	H	1NYNF	.	14	2	8.780	31.765	1972.65	15.210	.	644.95	0.495	17.675	63.660	3966.35	30.585	.
137	306	H	2LANF	.	14	2	7.900	28.105	3245.65	25.740	.	1042.55	1.150	6.855	24.405	2817.50	22.345	.
138	306	H	3LAF	.	14	2	5.030	50.130	6150.20	67.030	.	1964.10	3.305	1.520	15.180	1861.95	20.290	.
139	306	H	4NYNF	.	14	2	6.120	23.420	1705.80	14.780	.	554.20	0.520	11.785	45.105	3290.75	28.510	.
140	306	H	5COMP	.	14	2	.	.	.	.	16.1110	9.27	5.475	5.085	24.385	2389.81	22.435	2.945
141	307	C	1NYNF	.	14	2	4.930	12.830	1831.75	13.775	.	587.40	0.460	10.705	27.840	3973.65	29.885	.
142	307	C	2LANF	.	14	2	5.105	14.375	3064.95	24.460	.	976.15	1.130	4.510	12.700	2706.55	21.600	.
143	307	C	3LAF	.	14	2	4.695	26.010	5990.40	72.920	.	1901.60	3.210	1.460	8.105	1864.40	22.700	.
144	307	C	4NYNF	.	14	2	4.900	10.675	1742.15	16.465	.	558.10	0.495	9.935	21.645	3528.05	33.350	.
145	307	C	5COMP	.	14	2	.	.	.	.	11.3820	8.87	5.300	3.705	12.065	2382.69	24.080	2.150
146	307	H	1NYNF	.	14	2	4.280	10.590	1658.90	15.355	.	531.30	0.470	9.140	22.645	3550.80	32.865	.
147	307	H	2LANF	.	14	2	4.905	13.200	2722.70	25.420	.	867.80	1.135	4.300	11.640	2399.40	22.410	.
148	307	H	3LAF	.	14	2	4.470	22.370	5475.65	74.870	.	1737.70	3.205	1.400	6.980	1708.10	23.355	.
149	307	H	4NYNF	.	14	2	4.390	9.515	1428.40	14.660	.	458.35	0.490	8.995	19.510	2924.75	30.025	.
150	307	H	5COMP	.	14	2	.	.	.	.	9.6350	7.93	5.300	3.405	10.515	2130.70	24.600	1.820
151	308	B	BUS	.	14	2	10.785	380.855	7005.55	61.910	.	2413.45	2.975	3.625	128.060	2355.64	20.820	.
152	308	B	5COMP	.	14	2	.	.	.	.	29.7290	5.32	2.975	3.625	128.060	2355.64	20.820	10.000
153	308	C	1NYNF	.	14	2	2.100	120.385	1822.70	15.360	.	637.85	0.475	4.415	253.265	3833.55	32.310	.
154	308	C	2LANF	.	14	2	3.110	137.810	2572.40	21.190	.	884.30	1.145	2.710	119.980	2239.70	18.445	.
155	308	C	3LAF	.	14	2	7.600	231.945	6068.80	48.355	.	2040.35	2.970	2.580	78.585	2059.20	16.355	.
156	308	C	4NYNF	.	14	2	1.830	74.040	1416.55	12.945	.	486.15	0.535	3.420	138.470	2648.95	24.205	.
157	308	C	5COMP	.	14	2	.	.	.	.	44.8505	8.93	5.130	2.860	110.050	2321.08	19.075	8.770
158	308	H	1NYNF	.	14	2	1.965	81.455	1508.95	13.985	.	519.20	0.530	3.715	154.025	2852.80	26.445	.

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OBS	PVIN	TEMP	CYCLE	TEST	TYPE	FREQ	GHC	GCO	GCO2	GNOX	GPART	FUEL	DIST	RHC	RCO	RCO2	RNOX	RPART
159	308	H	2LANF	.	14	2	2.855	111.500	2295.60	19.835	.	783.60	1.170	2.435	95.105	1958.55	16.915	.
160	308	H	3LAF	.	14	2	6.800	195.445	5196.85	42.865	.	1745.90	3.255	2.090	60.080	1597.15	13.175	.
161	308	H	4NYNF	.	14	2	1.800	62.945	1157.25	10.880	.	398.75	0.535	3.350	117.775	2168.40	20.365	.
162	308	H	5COMP	.	14	2	.	.	.	.	37.5325	7.60	5.490	2.445	82.220	1850.65	15.950	6.835
163	309	B	BUS	.	14	2	12.075	154.535	7042.20	81.130	.	2313.95	3.005	4.020	51.450	2344.25	27.010	.
164	309	B	5COMP	.	14	2	.	.	.	.	9.8350	5.10	3.005	4.020	51.450	2344.22	27.010	3.270
165	309	C	1NYNF	.	14	2	2.525	43.520	1884.85	21.405	.	619.70	0.525	4.830	83.485	3614.45	41.075	.
166	309	C	2LANF	.	14	2	3.290	45.835	2527.65	27.275	.	824.70	1.140	2.885	40.190	2216.40	23.920	.
167	309	C	3LAF	.	14	2	7.460	78.375	6052.75	69.625	.	1958.90	3.275	2.280	23.940	1848.80	21.270	.
168	309	C	4NYNF	.	14	2	2.370	27.425	1427.35	17.090	.	467.00	0.540	4.375	50.605	2634.90	31.555	.
169	309	C	5COMP	.	14	2	.	.	.	.	15.5120	8.53	5.475	2.855	35.620	2170.86	24.715	2.830
170	309	H	1NYNF	.	14	2	2.385	31.745	1443.05	17.195	.	474.10	0.540	4.450	59.295	2695.15	32.110	.
171	309	H	2LANF	.	14	2	3.310	32.015	2247.75	24.790	.	729.45	1.170	2.815	27.280	1915.45	21.125	.
172	309	H	3LAF	.	14	2	7.720	63.550	5543.90	63.370	.	1791.00	3.300	2.340	19.290	1682.50	19.230	.
173	309	H	4NYNF	.	14	2	2.800	28.395	1262.05	15.425	.	414.70	0.540	5.225	49.220	2353.35	28.765	.
174	309	H	5COMP	.	14	2	.	.	.	.	12.3325	7.52	5.540	2.925	27.745	1894.63	21.800	2.225
175	310	C	1NYNF	.	14	2	2.060	9.525	1842.95	23.950	.	586.40	0.470	4.395	20.285	3925.50	51.015	.
176	310	C	2LANF	.	14	2	2.750	10.005	2780.05	35.180	.	882.05	1.140	2.410	8.765	2436.65	30.840	.
177	310	C	3LAF	.	14	2	3.365	24.150	5991.30	78.090	.	1899.65	3.130	1.075	7.740	1913.20	24.955	.
178	310	C	4NYNF	.	14	2	1.680	7.050	1584.35	22.995	.	503.50	0.500	3.365	14.145	3181.45	46.180	.
179	310	C	5COMP	.	14	2	.	.	.	.	23.3195	8.54	5.240	1.880	9.690	2328.00	30.590	4.490
180	310	H	1NYNF	.	14	2	1.545	7.350	1537.90	22.045	.	488.85	0.490	3.165	15.070	3151.50	45.230	.
181	310	H	2LANF	.	14	2	2.655	9.010	2445.60	33.695	.	776.30	1.155	2.300	7.795	2115.85	29.155	.
182	310	H	3LAF	.	14	2	3.785	19.710	5495.45	74.765	.	1741.95	3.220	1.175	6.120	1707.45	23.230	.
183	310	H	4NYNF	.	14	2	1.915	5.795	1195.15	18.170	.	380.65	0.495	3.865	11.745	2423.10	36.870	.
184	310	H	5COMP	.	14	2	.	.	.	.	12.5600	7.47	5.355	1.845	7.815	1992.43	27.755	2.345
185	311	C	1NYNF	.	14	2	1.810	12.940	1748.50	19.095	.	558.15	0.485	3.770	26.865	3624.10	39.635	.
186	311	C	2LANF	.	14	2	2.555	11.270	2814.90	28.620	.	893.45	1.135	2.210	9.745	2433.85	24.780	.
187	311	C	3LAF	.	14	2	2.960	16.905	6440.25	67.190	.	2036.90	3.265	0.905	5.175	1972.15	20.580	.
188	311	C	4NYNF	.	14	2	1.170	8.840	1587.15	18.620	.	504.75	0.525	2.240	16.880	3031.90	35.590	.
189	311	C	5COMP	.	14	2	.	.	.	.	15.8575	8.80	5.430	1.565	9.205	2319.54	24.615	2.925
190	311	H	1NYNF	.	14	2	1.500	9.430	1566.75	17.795	.	498.95	0.500	3.000	18.860	3132.30	35.585	.
191	311	H	2LANF	.	14	2	2.560	10.405	2689.10	28.465	.	853.45	1.160	2.210	8.970	2319.05	24.550	.
192	311	H	3LAF	.	14	2	2.755	17.600	6154.35	63.100	.	1947.10	3.235	0.850	5.450	1905.35	19.540	.
193	311	H	4NYNF	.	14	2	1.380	8.945	1533.85	17.200	.	488.20	0.510	2.720	17.625	3021.05	33.905	.
194	311	H	5COMP	.	14	2	.	.	.	.	15.5915	8.35	5.400	1.520	8.590	2212.76	23.450	2.890
195	312	C	1NYNF	.	14	2	5.570	35.235	2098.20	22.170	.	682.90	0.480	11.510	72.880	4340.00	45.850	.
196	312	C	2LANF	.	14	2	5.665	28.005	3145.85	35.645	.	1008.90	1.135	4.980	24.610	2764.80	31.325	.
197	312	C	3LAF	.	14	2	4.540	38.835	6618.80	77.385	.	2105.45	3.180	1.430	12.210	2080.90	24.330	.
198	312	C	4NYNF	.	14	2	2.260	16.935	1645.85	20.185	.	528.25	0.460	4.985	37.240	3638.90	44.570	.
199	312	C	5COMP	.	14	2	.	.	.	.	26.9665	9.54	5.260	3.430	22.620	2560.53	29.535	5.125
200	312	H	1NYNF	.	14	2	2.610	21.195	1747.65	22.220	.	562.80	0.480	5.435	44.165	3642.05	46.300	.
201	312	H	2LANF	.	14	2	4.075	27.000	2983.80	35.680	.	955.90	1.150	3.545	23.460	2592.30	31.000	.
202	312	H	3LAF	.	14	2	4.145	36.645	6357.15	78.260	.	2021.70	3.170	1.310	11.565	2006.65	24.700	.
203	312	H	4NYNF	.	14	2	2.265	16.140	1715.75	22.740	.	549.90	0.495	4.570	32.525	3457.90	45.855	.
204	312	H	5COMP	.	14	2	.	.	.	.	23.7055	9.02	5.295	2.470	19.070	2418.06	30.010	4.475
205	313	C	1NYNF	.	14	2	5.750	32.860	2291.45	27.510	.	742.70	0.515	11.275	64.415	4483.35	53.775	.
206	313	C	2LANF	.	14	2	4.255	23.950	3390.10	45.065	.	1082.30	1.160	3.670	20.620	2916.50	38.765	.
207	313	C	3LAF	.	14	2	2.955	24.330	7265.75	97.675	.	2300.20	3.245	0.910	7.500	2237.55	30.080	.
208	313	C	4NYNF	.	14	2	1.775	12.170	1836.50	28.290	.	585.40	0.520	3.405	23.360	3523.05	54.270	.
209	313	C	5COMP	.	14	2	.	.	.	.	17.1220	10.39	5.435	2.710	17.160	2716.59	36.480	3.150
210	313	H	1NYNF	.	14	2	2.040	15.720	1851.60	30.105	.	592.20	0.525	3.860	29.745	3506.75	57.015	.
211	313	H	2LANF	.	14	2	2.910	18.035	3140.50	50.550	.	998.60	1.170	2.495	13.735	2691.15	43.315	.
212	313	H	3LAF	.	14	2	3.375	23.160	7195.05	108.235	.	2277.80	3.255	1.040	7.115	2210.15	33.245	.
213	313	H	4NYNF	.	14	2	1.795	11.715	1778.00	30.070	.	566.80	0.510	3.500	22.880	3473.20	58.735	.
214	313	H	5COMP	.	14	2	.	.	.	.	13.5260	9.78	5.465	1.855	12.200	2556.53	40.080	2.475

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O B S	P V I N	T E M P	C Y C L E	T E S T	T Y P E	F R E Q U E N C Y	G C O D	G C O D	G N O X	G P A R T	F U E L	D I S T	R H C	R C O	R C O	R N O X	R P A R T
215	314	C	1NYNF	14	2	4.58500	12.0250	1738.00	11.890	.	557.15	0.45000	10.1500	26.650	3847.10	26.3050	.
216	314	C	2LANF	14	2	4.45500	13.0200	2896.40	22.070	.	921.85	1.14000	3.9000	11.400	2536.10	19.3300	.
217	314	C	3LAF	14	2	5.82000	31.6450	6043.65	70.465	.	1922.30	3.27000	1.7800	9.680	1847.70	21.5500	.
218	314	C	4NYNF	14	2	4.09500	9.8700	1615.30	13.445	.	517.00	0.49500	8.2950	19.975	3269.20	27.1700	.
219	314	C	5COMP	14	2	.	.	.	.	12.1975	8.64	5.36000	3.5350	12.425	2293.99	22.0000	2.27500
220	314	H	1NYNF	14	2	3.48000	10.8600	1650.10	15.680	.	527.80	0.51000	6.8100	21.240	3226.20	30.6650	.
221	314	H	2LANF	14	2	4.48000	12.0100	2625.70	25.160	.	836.20	1.16000	3.8650	10.360	2265.95	21.7100	.
222	314	H	3LAF	14	2	3.53000	30.3600	5881.65	76.620	.	1868.40	3.23000	1.0900	9.395	1820.70	23.7150	.
223	314	H	4NYNF	14	2	3.77500	11.0600	1649.15	16.355	.	527.95	0.51500	7.3200	21.440	3196.25	31.6950	.
224	314	H	5COMP	14	2	.	.	.	.	10.6000	8.29	5.42000	2.8200	11.870	2179.72	24.7050	1.96000
225	315	C	1NYNF	14	2	5.47000	55.1200	2778.20	13.775	.	749.25	0.51000	10.7650	108.435	4482.30	27.1100	.
226	315	C	2LANF	14	2	4.81000	37.8600	3511.85	23.815	.	1128.05	1.18000	4.0800	32.250	2980.00	20.1900	.
227	315	C	3LAF	14	2	5.19500	55.7150	6772.55	75.645	.	2162.80	3.33000	1.5600	16.720	2032.55	22.7050	.
228	315	C	4NYNF	14	2	3.66500	34.9650	1959.10	15.025	.	637.10	0.51000	7.1750	68.525	3842.00	34.4900	.
229	315	C	5COMP	14	2	.	.	.	.	23.5785	10.31	5.53000	3.4600	33.225	2626.49	23.1950	4.26500
230	315	H	1NYNF	14	2	4.12000	44.7000	1985.70	14.655	.	650.75	0.53500	7.6550	83.060	3690.15	27.2400	.
231	315	H	2LANF	14	2	4.82500	32.9400	3263.70	23.665	.	1047.60	1.19500	4.0400	27.580	2732.80	19.8150	.
232	315	H	3LAF	14	2	5.79500	61.6250	6535.80	79.380	.	2091.85	3.30000	1.7550	18.720	1981.65	24.0750	.
233	315	H	4NYNF	14	2	3.46000	36.8500	1910.35	15.395	.	622.55	0.54000	6.4000	68.215	3532.95	28.4700	.
234	315	H	5COMP	14	2	.	.	.	.	23.1430	9.73	5.57000	3.2700	31.630	2458.37	23.8950	4.15500
235	316	C	1NYNF	14	3	3.40000	13.6433	2168.87	19.007	.	690.73	0.47667	7.0600	28.647	4552.43	39.8900	.
236	316	C	2LANF	14	3	3.03500	9.8600	3503.43	35.577	.	1108.20	1.18333	2.5800	8.310	2951.93	29.9833	.
237	316	C	3LAF	14	3	2.87000	13.5267	7140.20	112.473	.	2253.83	3.24333	0.8950	4.170	2199.93	34.6200	.
238	316	C	4NYNF	14	3	2.47500	9.7000	1942.20	21.827	.	616.87	0.51333	4.8000	18.857	3773.73	42.4200	.
239	316	C	5COMP	14	3	.	.	.	.	14.0350	10.30	5.42333	2.1850	8.610	2720.53	34.8133	2.59000
240	316	H	1NYNF	14	3	2.74667	13.5300	1933.30	21.193	.	617.50	0.51333	5.3833	26.460	3776.70	41.4067	.
241	316	H	2LANF	14	3	3.07000	9.5867	3106.37	35.167	.	984.80	1.19000	2.5833	8.050	2610.67	29.5567	.
242	316	H	3LAF	14	3	2.90000	15.6833	6997.40	114.700	.	2211.43	3.28667	0.8833	4.770	2128.73	34.8900	.
243	316	H	4NYNF	14	3	2.62000	11.5667	1950.30	22.993	.	624.27	0.52667	5.0033	22.063	3731.33	43.8100	.
244	316	H	5COMP	14	3	.	.	.	.	11.4343	9.79	5.51333	2.0600	9.133	2538.22	35.1967	2.07333
245	317	C	1NYNF	14	2	4.21500	10.5700	1677.95	12.750	.	537.15	0.44000	9.5800	23.990	3809.25	28.9350	.
246	317	C	2LANF	14	2	5.07500	12.5450	2892.20	23.560	.	920.95	1.12000	4.5250	11.220	2585.90	21.0750	.
247	317	C	3LAF	14	2	4.47500	24.6100	5703.20	68.830	.	1810.40	3.10500	1.4400	7.920	1834.55	22.1250	.
248	317	C	4NYNF	14	2	4.03500	9.3750	1560.30	14.230	.	499.40	0.49000	8.2600	19.190	3193.40	29.1400	.
249	317	C	5COMP	14	2	.	.	.	.	13.4905	8.31	5.15500	3.4500	11.070	2295.12	23.1500	2.62000
250	317	H	1NYNF	14	2	3.56500	7.4400	1350.20	12.345	.	431.90	0.45000	7.9400	16.570	3007.40	27.4800	.
251	317	H	2LANF	14	2	3.89500	12.7600	2622.40	25.230	.	834.95	1.14500	3.4000	11.150	2291.05	22.0350	.
252	317	H	3LAF	14	2	3.37000	24.0050	5741.95	78.835	.	1821.55	3.19000	1.0550	7.760	1800.70	24.7300	.
253	317	H	4NYNF	14	2	3.76500	9.0100	1536.95	14.875	.	491.60	0.48500	7.8100	18.710	3189.50	30.8700	.
254	317	H	5COMP	14	2	.	.	.	.	10.9780	7.89	5.26500	2.7700	10.260	2136.91	24.9400	2.09000
255	318	C	1NYNF	14	2	3.27000	9.2000	1044.25	14.530	.	587.85	0.48000	6.8150	19.165	3844.70	30.3150	.
256	318	C	2LANF	14	2	4.32500	9.5550	2898.85	23.485	.	921.00	1.10000	3.9400	8.690	2637.70	21.3700	.
257	318	C	3LAF	14	2	6.03000	13.8100	6119.60	75.170	.	1937.55	3.14000	1.9200	4.400	1949.20	23.9400	.
258	318	C	4NYNF	14	2	3.00500	7.1450	1616.80	15.130	.	515.05	0.50500	5.9100	14.060	3180.70	29.7600	.
259	318	C	5COMP	14	2	.	.	.	.	6.6590	8.69	5.22500	3.1800	7.600	2387.79	24.5550	1.65500
260	318	H	1NYNF	14	2	2.85000	8.1600	1591.00	14.845	.	507.55	0.48500	5.8750	16.830	3282.05	30.6000	.
261	318	H	2LANF	14	2	3.79000	8.9700	2637.45	24.825	.	837.75	1.09000	3.4650	8.205	2410.75	22.6850	.
262	318	H	3LAF	14	2	3.44500	14.1050	6150.15	84.710	.	1944.75	3.13500	1.1000	4.505	1963.00	27.0350	.
263	318	H	4NYNF	14	2	2.47000	6.7850	1637.25	16.295	.	520.75	0.50000	4.9200	13.545	1819.64	32.5350	.
264	318	H	5COMP	14	2	.	.	.	.	6.8410	8.40	5.21500	2.4100	7.295	2305.21	26.9850	1.31500
265	319	C	1NYNF	14	2	4.02000	12.9250	1953.25	15.140	.	624.75	0.45000	8.9150	28.655	4331.50	33.5650	.

OBS	PVIN	TEMP	CYCLE	TEST	TYPE	FREQ	GHC	CCO	CCO2	GNQX	GPART	FUEL	DIST	RHC	RCO	RCO2	RNOX	RPART
266	319	C	2LANF	.	14	2	5.725	12.67	3297.10	26.005	.	1048.95	1.120	5.110	11.310	2943.30	25.005	.
267	319	C	3LAF	.	14	2	6.875	16.87	6427.85	81.270	.	2036.90	3.135	2.190	5.380	2049.10	25.915	.
268	319	C	4NYNF	.	14	2	4.265	10.42	1746.40	16.320	.	558.70	0.500	8.570	20.950	3511.75	32.810	.
269	319	C	5COMP	.	14	2	.	.	.	.	14.8745	9.41	5.205	4.015	10.160	2578.87	27.040	2.860
270	319	H	1NYNF	.	14	2	3.515	11.04	1698.80	16.205	.	543.25	0.460	7.595	23.880	3676.60	35.055	.
271	319	H	2LANF	.	14	2	4.415	12.60	2790.65	27.300	.	888.35	1.115	3.965	11.315	2505.85	24.510	.
272	319	H	3LAF	.	14	2	3.695	20.23	6240.25	84.270	.	1976.35	3.170	1.165	6.385	1969.05	26.590	.
273	319	H	4NYNF	.	14	2	5.170	11.22	1720.25	17.030	.	551.80	0.490	10.530	22.895	3507.90	34.730	.
274	319	H	5COMP	.	14	2	.	.	.	.	10.4870	8.73	5.240	3.210	10.525	2378.06	27.660	2.000
275	320	B	BUS	.	14	2	8.375	298.60	7136.50	57.940	.	2411.60	2.920	2.870	102.360	2446.30	19.860	.
276	320	B	5COMP	.	14	2	.	.	.	.	25.8340	5.32	2.920	2.870	102.360	2446.31	19.860	8.655
277	320	C	1NYNF	.	14	2	2.760	104.19	1920.50	16.015	.	661.30	0.470	5.870	221.710	4086.20	34.050	.
278	320	C	2LANF	.	14	2	3.510	102.53	2549.30	20.460	.	859.95	1.130	3.105	90.655	2254.30	18.090	.
279	320	C	3LAF	.	14	2	7.555	123.88	6054.20	46.995	.	1982.00	3.180	2.375	38.995	1904.85	14.795	.
280	320	C	4NYNF	.	14	2	2.320	50.19	1443.65	12.370	.	483.40	0.525	4.435	95.870	2758.60	23.650	.
281	320	C	5COMP	.	14	2	.	.	.	.	41.7305	8.79	5.305	3.045	71.815	2256.82	18.080	7.865
282	320	H	1NYNF	.	14	2	2.135	50.88	1400.00	12.195	.	469.75	0.505	4.225	100.655	2770.50	24.135	.
283	320	H	2LANF	.	14	2	3.420	63.82	2248.10	18.275	.	745.45	1.125	3.045	56.800	2001.10	16.270	.
284	320	H	3LAF	.	14	2	7.035	102.81	5482.85	44.845	.	1790.55	3.265	2.155	31.480	1679.00	13.730	.
285	320	H	4NYNF	.	14	2	2.650	50.08	1371.10	11.425	.	460.75	0.520	5.135	96.980	2653.00	22.115	.
286	320	H	5COMP	.	14	2	.	.	.	.	29.5375	7.64	5.410	2.820	49.440	1940.83	16.030	5.460
287	321	B	BUS	.	14	2	3.210	12.70	4275.45	74.570	.	1360.45	2.935	1.090	4.325	1455.10	25.395	.
288	321	B	5COMP	.	14	2	.	.	.	.	4.0670	3.00	2.935	1.090	4.325	1455.07	25.395	1.390
289	321	C	1NYNF	.	14	2	0.965	5.50	1113.95	18.855	.	355.65	0.525	1.850	10.535	2134.25	36.145	.
290	321	C	2LANF	.	14	2	1.305	6.12	1544.60	25.310	.	492.40	1.135	1.155	5.415	1365.95	22.385	.
291	321	C	3LAF	.	14	2	3.230	13.73	3630.60	44.305	.	1157.25	3.260	0.990	4.210	1112.80	13.575	.
292	321	C	4NYNF	.	14	2	0.930	2.78	845.45	16.075	.	269.45	0.525	1.755	5.265	1596.75	30.365	.
293	321	C	5COMP	.	14	2	.	.	.	.	9.0470	5.02	5.445	1.180	5.170	1310.33	19.200	1.665
294	321	H	1NYNF	.	14	2	0.665	3.14	861.50	15.390	.	274.40	0.530	1.260	5.930	1625.95	29.045	.
295	321	H	2LANF	.	14	2	1.030	4.35	1357.25	22.205	.	432.00	1.145	0.900	3.790	1181.85	19.335	.
296	321	H	3LAF	.	14	2	3.425	15.23	3503.90	42.640	.	1118.10	3.285	1.040	4.640	1067.50	12.990	.
297	321	H	4NYNF	.	14	2	0.810	2.56	833.15	15.880	.	265.35	0.550	1.475	4.655	1515.40	28.880	.
298	321	H	5COMP	.	14	2	.	.	.	.	8.3555	4.61	5.510	1.075	4.585	1189.71	17.440	1.515
299	322	B	BUS	.	14	2	11.250	80.56	7161.25	68.555	.	2314.00	2.950	3.820	27.335	2430.25	30.065	.
300	322	B	5COMP	.	14	2	.	.	.	.	8.5185	5.10	2.950	3.820	27.335	2430.25	30.065	2.890
301	322	C	1NYNF	.	14	2	2.375	55.95	2192.40	27.355	.	722.90	0.505	4.680	110.340	4326.10	53.950	.
302	322	C	2LANF	.	14	2	3.440	24.80	2869.75	34.690	.	922.50	1.155	2.975	21.480	2485.90	30.040	.
303	322	C	3LAF	.	14	2	6.935	38.25	5996.65	83.575	.	1920.70	3.320	2.090	11.530	1807.60	25.195	.
304	322	C	4NYNF	.	14	2	2.650	18.23	1582.10	19.990	.	511.60	0.535	4.950	34.060	2952.75	37.300	.
305	322	C	5COMP	.	14	2	.	.	.	.	18.4735	8.99	5.515	2.790	24.885	2292.24	30.030	3.350
306	322	H	1NYNF	.	14	2	2.790	24.70	1541.20	19.840	.	502.00	0.525	5.275	46.675	2913.25	37.500	.
307	322	H	2LANF	.	14	2	3.390	7195.69	2343.55	28.780	.	753.35	1.135	2.975	16.695	2057.30	25.265	.
308	322	H	3LAF	.	14	2	6.330	32.83	5711.65	80.470	.	1827.35	3.325	1.905	9.880	1718.70	24.215	.
309	322	H	4NYNF	.	14	2	2.285	17.93	1553.05	19.805	.	501.90	0.540	4.210	33.025	2861.80	36.490	.
310	322	H	5COMP	.	14	2	.	.	.	.	12.9250	7.90	5.535	2.675	17.070	2014.66	26.900	2.335

3. EMISSIONS FACTORS

3.1 Overview

The very limited data base available constrains the analysis of emission factors significantly. The entire data base consists of only 30 vehicles, 7 of which are buses. Since all buses and three additional trucks were tested on No. 1 diesel fuel, their test results are not completely comparable to the tests on other trucks. The twenty vehicles tested on No. 2 diesel fuel had odometers ranging from 8,000 miles to 260,000 miles. Moreover, the emissions test employed by SWRI to generate the data described in Section 2 of this report differs from the test procedure used to certify the emissions. Given the inherent random errors in emission measurement and the engine-to-engine variability, it is obvious that a statistically significant deterioration rate in emissions with respect to mileage is impossible to compute from a sample of 20 trucks. This analysis should, therefore, be viewed as one confirming or disproving trends in emission factors assumed previously by the EPA.

3.2 Methodology

Emissions regulations for HDT's are specified in grams per brake horsepower-hour, whereas the SWRI measurements are in gm/mile. In accordance with EPA's directive, it was decided to convert all gm/mile measurements to an equivalent gm/BHP-hr value. Since no established procedure exists to perform this conversion, we developed a procedure as follows.

Based on engineering considerations, a formula to link the dynamometer settings to the work done over the cycle can be derived. From the laws of motion, it is known that power consumed during acceleration and the power to overcome rolling resistance are both linear functions of the weight (or mass) of a truck. The power consumed in overcoming aerodynamic drag is a function of frontal area and the coefficient of drag. Since the

mass is equal to the inertia weight setting and the power consumed to overcome drag is proportional to the dynamometer power absorption setting, we can write:

$$\text{BHP-hr} = A(\text{IW}) + B(\text{DYNHP})$$

where BHP-hr is the total work over the cycle

IW is the inertia weight setting (in lbs)

DYNHP is the dynamometer power absorption unit
setting in horsepower

A, B are proportionality constants

For the tests conducted by SWRI, the inertia weight setting was equivalent in most cases to 70 percent of the truck's maximum GVW or GCW, while the dynamometer power absorption unit setting was obtained from truck coast down measurements. Note that both variables are related only to the truck's characteristics and are independent of the engine used in the truck.

In contrast, the engine emissions test procedure is specified in terms of the percentage of maximum (or rated) RPM and the percentage of maximum (or rated) torque. All though there is an approximate equivalence, on average, between truck size and engine power, there is also a good correlation with rated RPM and maximum speed. During the chassis transient cycle, all trucks are driven at the same speed, this test is not necessarily equivalent to engine transient cycle. Depending on the engine used, the chassis transient cycle can differ from the engine transient cycle in terms of both power and RPM. A strictly theoretical link between the two tests is, therefore, not possible. SWRI did test three engines on both the EPA engine and chassis test procedures. It was decided to derive the coefficients A and B from the results of the three tests, if the chassis test results and engine test results were comparable. Our assessment of comparability was based on the total mass of fuel consumed over the test.

The total mass of fuel consumed is an indicator of the total energy output (BHP-hr) of the engine, and tests were rated as comparable if the fuel consumption measured over the chassis test was within 5 percent of the fuel consumption measured over the engine test. We used the 5 percent figure as it is equivalent to 2 standard deviations of typical test-to-test differences. A second reason for adopting this comparability criterion is that brake-specific fuel consumption (BSFC) is a non-linear function of power output. The assumption that energy produced by the engine is linearly proportional to the fuel consumed (i.e. BSFC is constant) is valid only for small changes in power output per unit time.

Data utilized to derive the coefficients A and B are shown in Table 3-1. The derivation is from composite emissions data, rather than the individual driving cycles, since the emission factors are for the composite driving cycle. Both hot and cold composite cycle data was used, and the HP-HR and fuel consumption from the engine test (FC_E) is compared to distance and fuel consumption from the chassis test. As can be seen in Table 3-1, Engines (vehicles) No. 202 and 204 are acceptable for the analysis since the fuel consumption varies by less than 5 percent. Values shown are four test averages and their standard deviations. Fuel consumed over the tests for both engine/vehicle 202 and 204 are within two standard deviations (of test-to-test variability). Engine 203, on the other hand, shows substantial differences in fuel consumption between the chassis and engine tests. This can be easily explained, since engine 203 is rated at 435 HP, but is loaded in the chassis test at the same level as engine 202, which is rated at 300HP. In the engine test, engines are loaded in proportion to their rated power, and thus, agreement between engine and chassis tests is likely only when the loads are approximately matched.

Using the data from engines 202 and 204, the BHP-hr values were adjusted for fuel consumption differences between chassis and engine tests using the proportional relationship described below.

TABLE 3-1
COMPARISON OF CHASSIS AND ENGINE DYNAMOMETER TEST RESULTS
(Average of 5 tests)*

<u>Chassis/Engine</u>	<u>Cycle</u>	<u>Engine</u>		<u>Chassis</u>	
		<u>HP-HR</u>	<u>FC_E</u>	<u>Distance</u>	<u>FC_C</u>
202	Cold Composite	20.66(0.08)	8.96(0.11)	5.35(0.06)	8.80(0.167)
	Hot Composite	21.12(0.036)	8.65(0.08)	5.41(0.08)	8.32(0.159)
203	Cold Composite	22.93(0.20)	10.57(0.08)	5.40(0.02)	9.28(0.16)
	Hot Composite	23.10(0.08)	10.30(0.06)	5.43(0.03)	8.57(0.16)
204	Cold Composite	12.88(0.03)	6.50(0.16)	5.61(0.03)	6.76(0.15)
	Hot Composite	12.80(0.04)	6.25(0.08)	5.65(0.04)	6.28(0.15)

<u>Engine</u>	<u>HP</u>	<u>Test Weight</u> (lb)	<u>Dyno.HP</u>
202	350	54,000	134.5
203	435	54,000	134.5
204	210	29,000	104.6

*Std. Derivation in parantheses.

$$\frac{(\text{BHP-hr}) \text{ engine test}}{(\text{BHP-hr}) \text{ chassis test}} = \frac{\text{FC engine test}}{\text{FC chassis test}}$$

Where the FC over the chassis test is renormalized to 5.54 miles (the test distance). This is equivalent to assuming a constant BSFC, and is approximately correct for small variations in fuel consumption. Two equations are thus obtained from the hot cycle composite results namely:

$$\begin{aligned} 29,000A + 104.6B &= 12.61 \\ 54,000A + 134.5B &= 20.80 \end{aligned}$$

which can be solved to give $A = 0.2744 \times 10^{-3}$, $B = 0.0445$

The cold cycle composite values result in

$$\begin{aligned} 29,000A + 104.6B &= 12.23 \\ 54,000A + 134.5B &= 21.01 \end{aligned}$$

which can be solved to give $A = 0.2390 \times 10^{-3}$, $B = 0.0602$

Using the same weight factors used to weight hot and cold emissions over the EPA transient cycle, the weighted values of A and B are:

$$\begin{aligned} A &= 0.2693 \times 10^{-3} \text{ BHP-hr/lb} \\ B &= 0.0467 \text{ BHP-hr/Dyno HP} \end{aligned}$$

These values were used to convert inertia weight and dynamometer horsepower settings to BHP-hr.

3.3 Emission Factors Derivation

In this analysis, emission factors were derived on two bases, namely:

- A gm/BHP-hr basis, using the method detailed in Section 3.2 to convert inertia weight and dynamometer settings to BHP-hr.
- a gm/lb fuel basis, where mass emissions are normalized by fuel consumption in pounds.

Although the results of both methods are presented in this report, only the emissions in gm/GHP-hr are discussed below, since they are far more useful to the EPA and consistent with emission standards.

At the outset, it was immediately obvious that the emissions (in gm/BHP-hr) were radically different for buses in comparison to trucks, and were typically 2 to 3 times higher on average. Therefore, it was decided to treat the two emissions separately. On the remaining 23 trucks, inspection revealed that there was a strong tradeoff between HC and NO_x emissions. This tradeoff is well known in engineering circles, and since the emissions requirements specifies only a HC + NO_x standard, manufacturer often set different goals for HC and NO_x . Figure 3-1 shows a plot of HC emissions versus NO_x emissions and the relationship appears to confirm the HC/ NO_x tradeoff - all high NO_x emitters ($\text{NO}_x > 9$ gm/BHP-hr) have low HC emissions and all high HC emitters ($\text{HC} > 1$ gm/BHP-hr) have low NO_x emissions. Only one vehicle, No. 101, had both very high NO_x and very high HC emissions. (This data is not shown in Figure 3-1). As a result of this uncharacteristic behavior, and the fact that it was the very first vehicle tested by SWRI on the chassis procedure, EEA believes that the data is erroneous and has discarded this data for the remainder of the analysis.

The remaining data on 22 trucks were then analyzed to provide emission factors in the form

$$\text{Brake-Specific Emissions} = C + D \times \text{ODOMETER}$$

The results for HC, CO, NO_x , particulate and HC + NO_x are summarized in Table 3-2. Using data on the 22 trucks, it can be seen the slope of the emission factor (or deterioration rate) is not statistically significant at the 0.05 level (T-statistic less than 1.96) for HC, NO_x and HC + NO_x emissions.

PLOT OF HCHP*NOXHP

LEGEND: A = 1 OBS, B = 2 OBS, ETC.

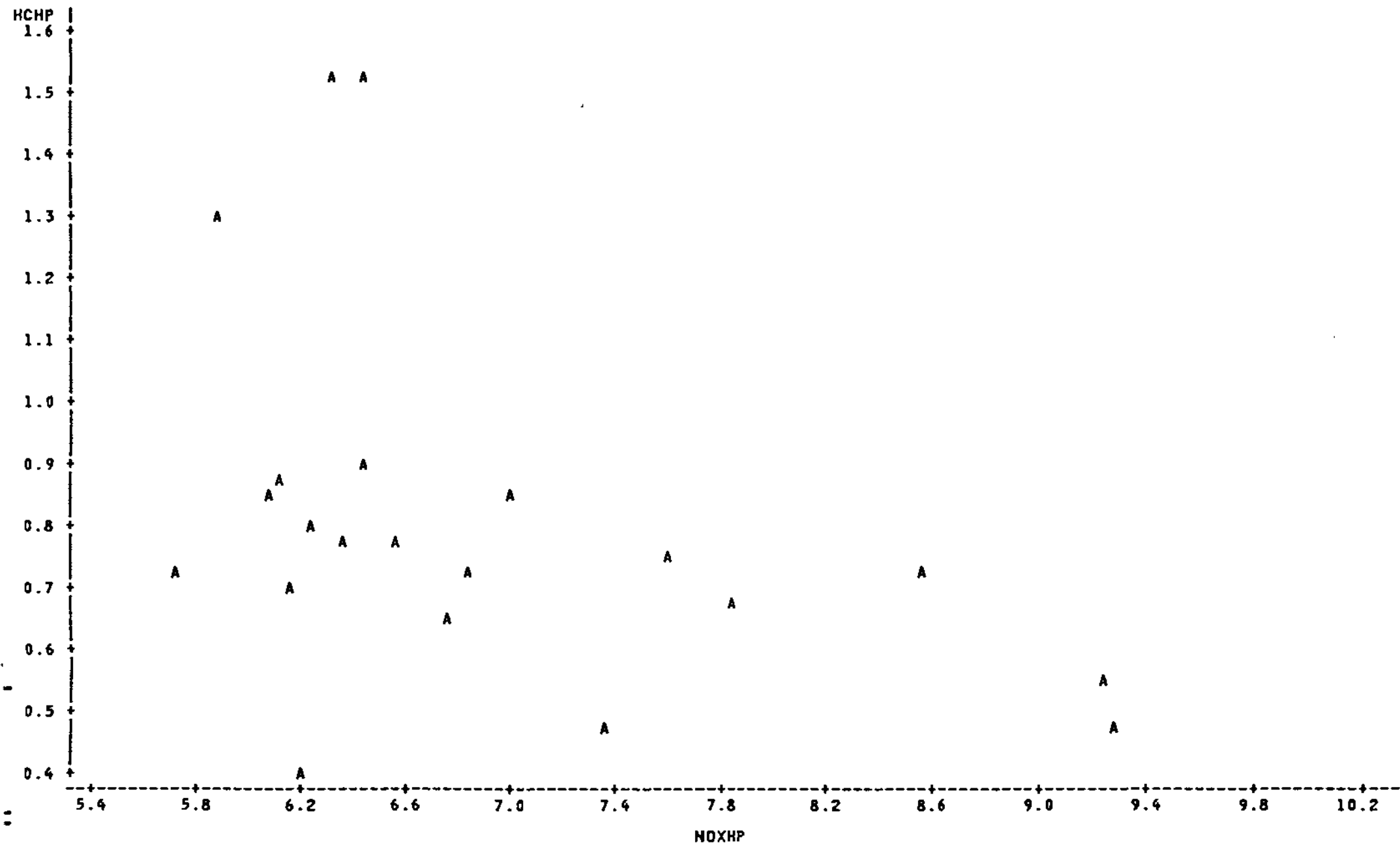


Figure 3-1

HC vs NO_x Emissions

On the other hand, the slope of the CO emission factor has a T-statistic of 1.83 while the slope of the particulate emissions factor has a T-statistic of 2.40, which are slightly below and above the 1.96 value. (In comparison, T-statistics for HC and NO_x are less than 0.3). Figures 3-2 through 3-6 show the individual truck data plotted against odometer. In each case, emissions appear to be clustered about the mean with the exception of three "outliers". Because of the inverse relationships between HC and NO_x , and a direct relationship between HC emissions and particulate and (to some extent) CO emissions, the "outliers" are different for NO_x emissions, and similar (but not identical) for CO and particulate emissions in comparison to the "outliers" for HC emissions.

The number of Cummins engines tested were the largest of any manufacturer, and were all of the same displacement (855 CID) but had different horsepower ratings. Because of the physical similarity of the engines, EEA was of the opinion that a regression of emissions from these engines against odometer might provide a better indicator of the deterioration factors. Regression analysis of the data from 12 Cummins engines showed large improvements in the T-statistics for intercept and slope value for all pollutants except the slope for NO_x . The values of the intercept for emissions from Cummins engines did not show any significant differences from those for all trucks; however the deterioration rate for HC emissions was significant at the 0.10 level, while the deterioration rate for CO was significant at the 0.05 level. The T-statistic for particulates increased from 2.40 for all trucks to 3.23 for Cummins engines, in spite of the smaller sample size. As expected, regression analysis of the data from all "non-Cummins" engines resulted in loss of significance for all of the deterioration rate estimates. This is because of the wide range of manufacturers and engine sizes in the sample of 10 trucks. The results of the analysis of Cummins and non-Cummins powered vehicles are also shown in Table 3-2.

PLOT OF HCHP*ODOM LEGEND: A = 1 OBS, B = 2 OBS, ETC.

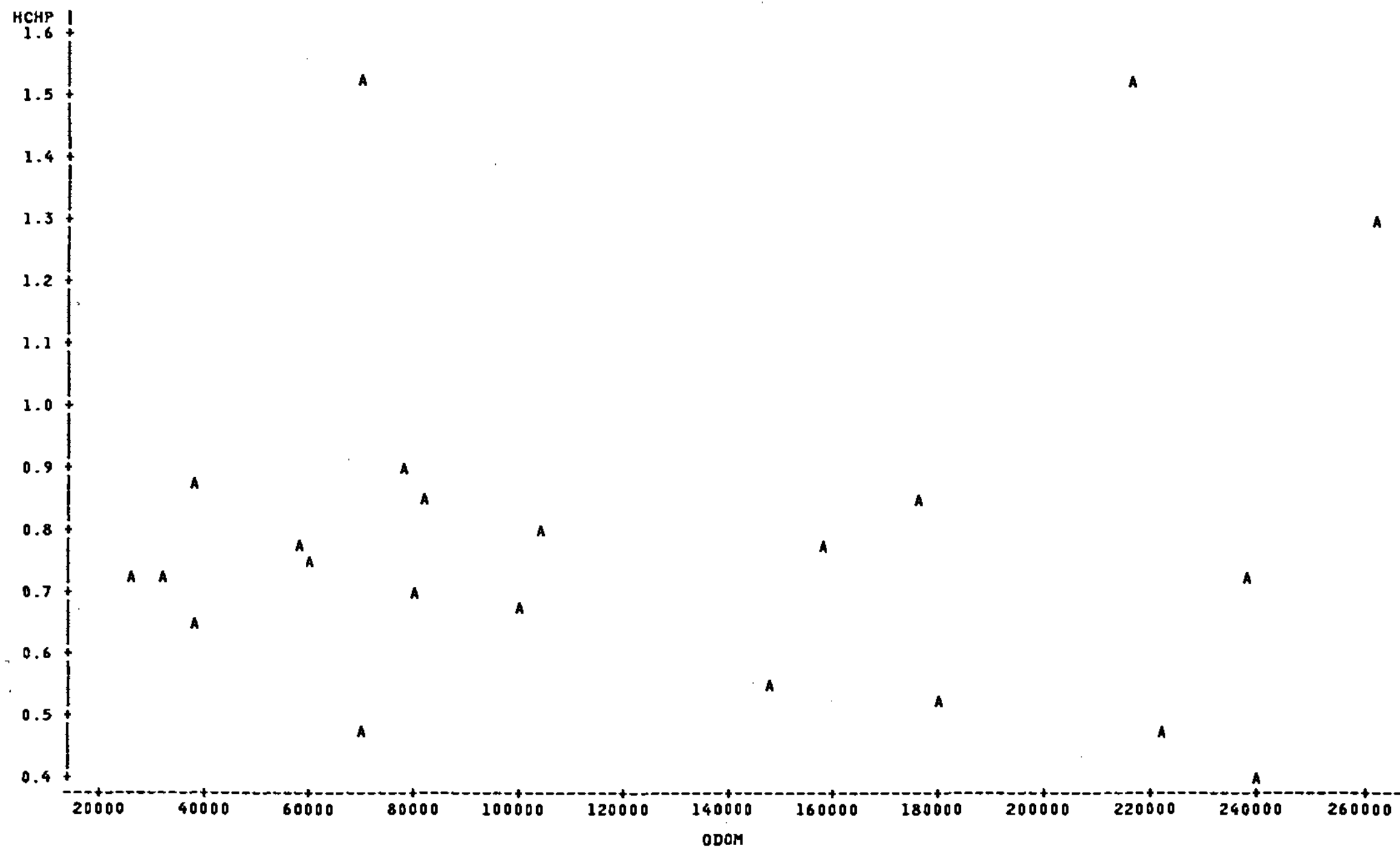


Figure 3-2

Brake Specific Emissions vs. Odometer

PLOT OF COHPXODOM

LEGEND: A = .1 OBS, B = 2 OBS, ETC.

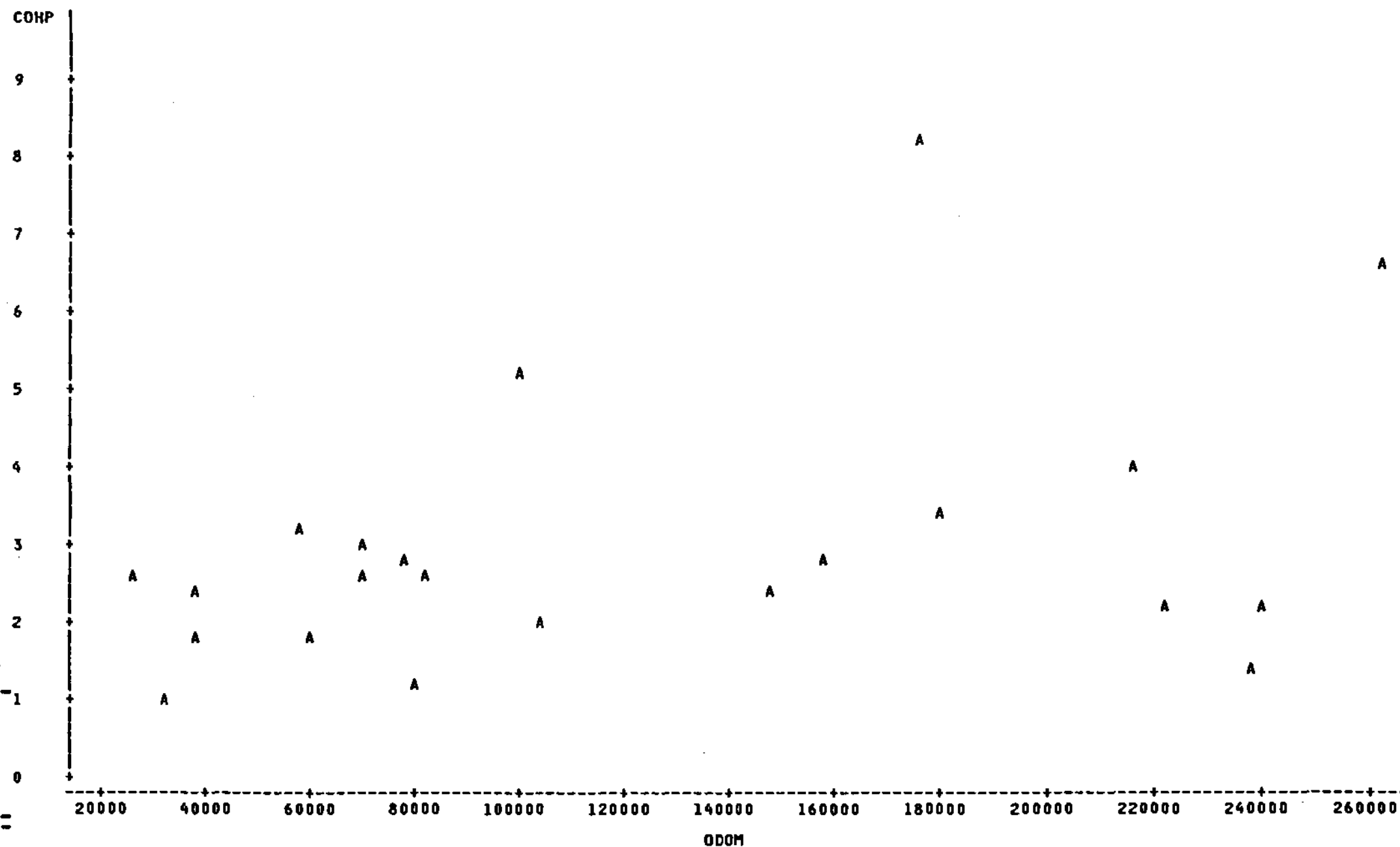


Figure 3-3
Brake Specific CO Emissions vs Odometer

PLOT OF NOXHP*ODOM

LEGEND: A = 1 OBS, B = 2 OBS, ETC.

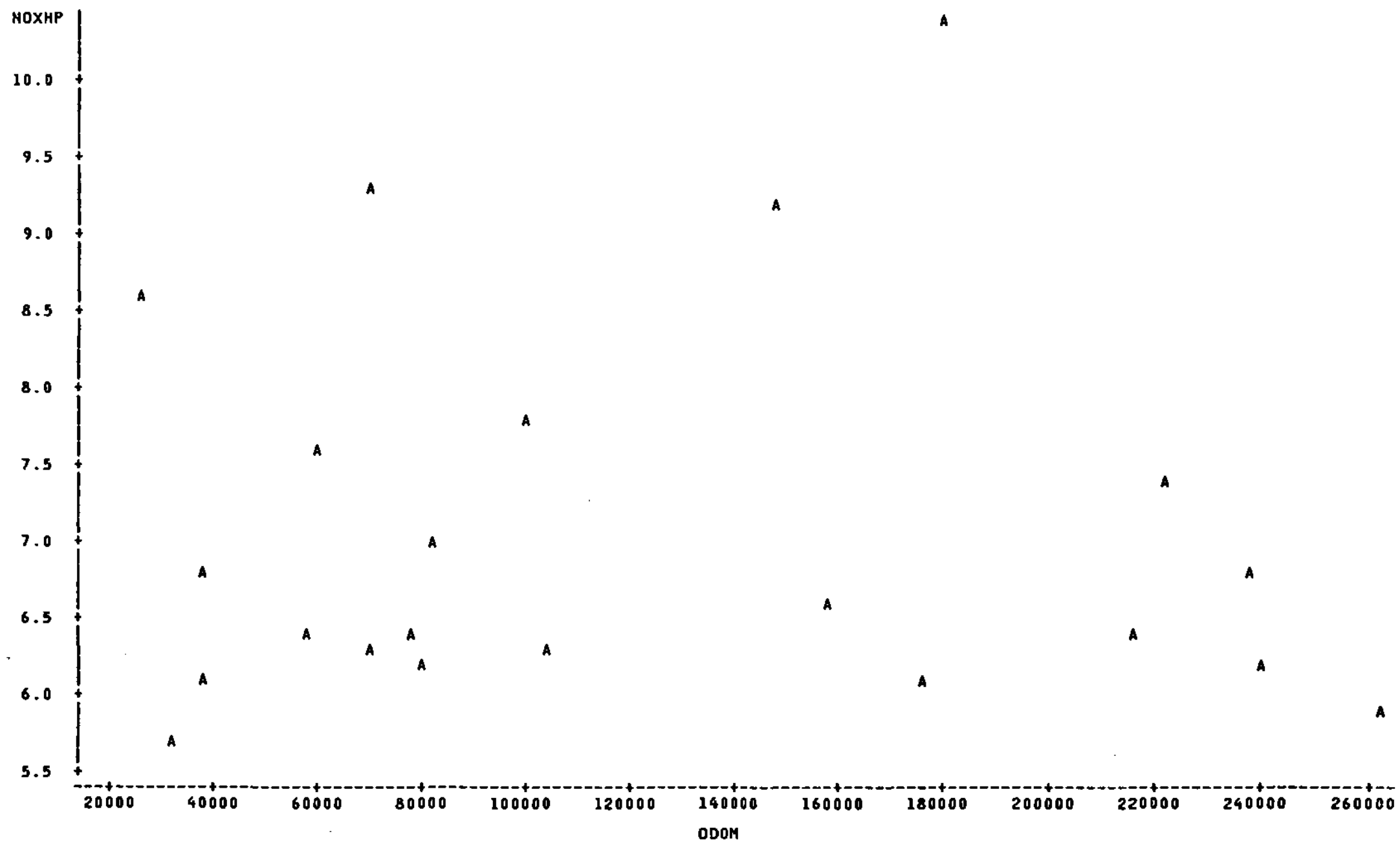


Figure 3-4

Brake Specific NO Emissions vs. Odometer

x

PLOT OF PARTHP*ODOM

LEGEND: A = 1 OBS, B = 2 OBS, ETC.

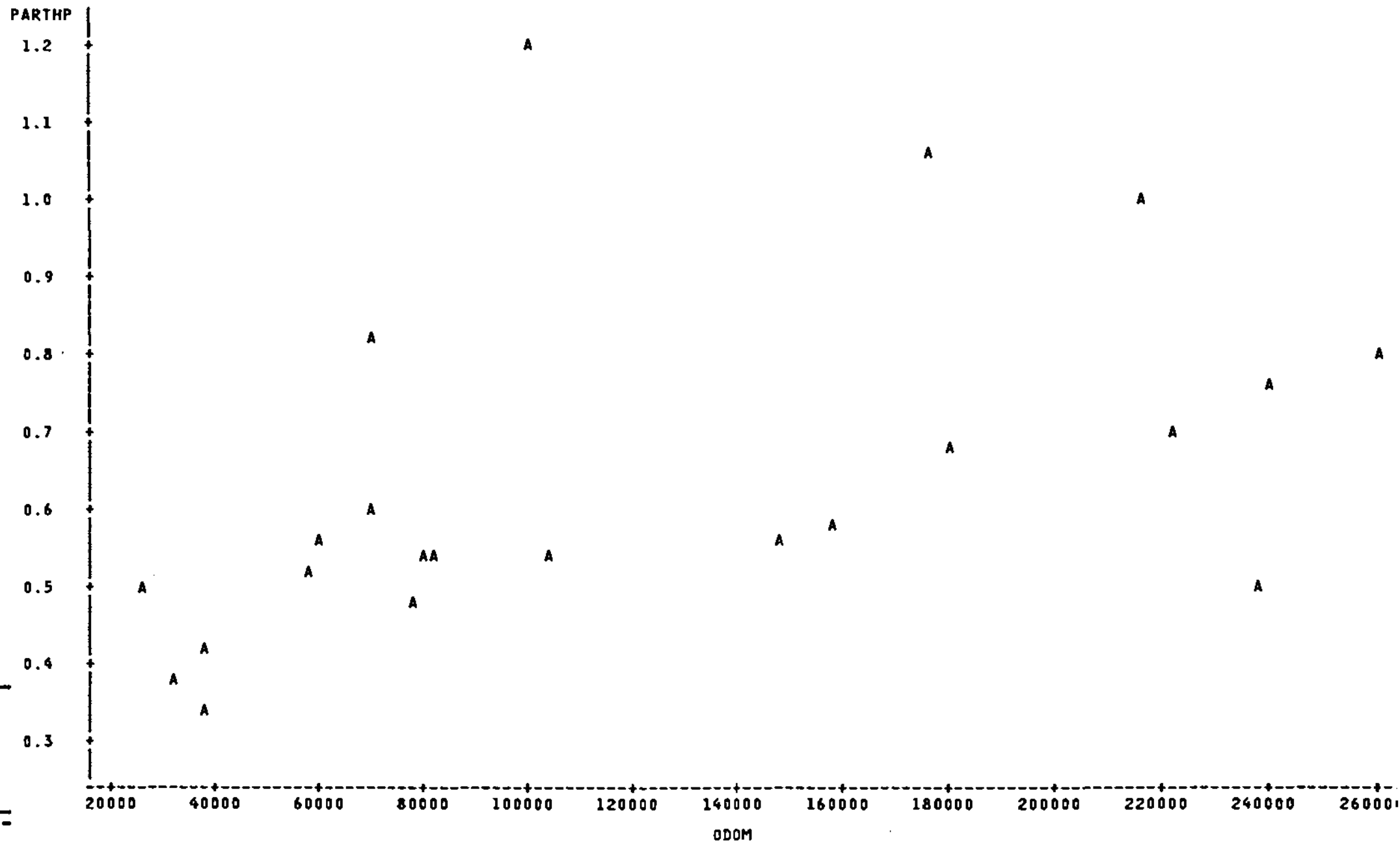


Figure 3-5
Brake Specific Particulate Emissions vs. Odometer

PLOT OF HNP*ODOM LEGEND: A = 1 OBS, B = 2 OBS, ETC.

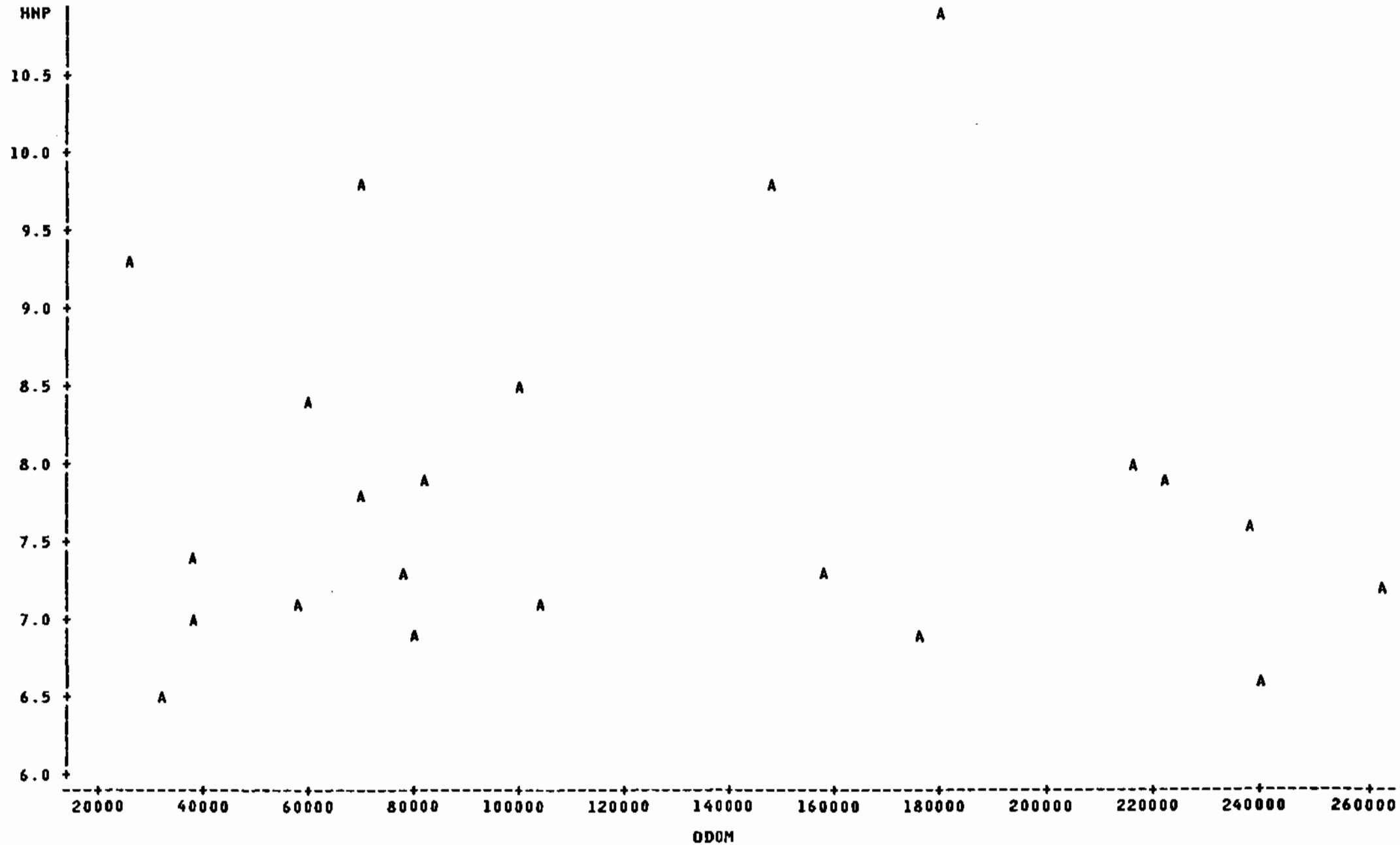


Figure 3-6

Brake Specific HC + NO_x Emissions vs. Odometer

The analysis was repeated for fuel specific emissions, sometimes called the emission index. Since the brake-specific fuel consumption of most diesel engines are approximately similar, the results of this analysis exhibits the same general trends as the analysis in terms of gm/BHP-hr. The results are detailed in Table 3-3. However, the plots of the individual data points vs. odometer (shown in Appendix B) show greater dispersion than those for brake specific emissions. The results of the fuel specific emissions could be used to convert on-road emissions to fuel economy directly.

The emission estimates from the brake specific emission analysis was compared with the only other source of equivalent data on heavy-duty diesel emissions. SWRI had previously tested 19 new engines on engine dynamometer tests to provide a 1979 baseline emissions value. The results of those tests is compared with the estimated emission intercepts (as those engines were new) from the chassis test data, in Table 3-4. The comparison shows remarkable agreement between the values for all pollutants, especially considering the differences in test procedure.

Finally, the test data for the buses was analyzed. The data is presented in Table 3-5, and shows that the emissions intercept for all pollutants is considerably higher. Because of the small sample, none of the deterioration rates are statistically significant.

TABLE 3-2
RESULTS OF EMISSION FACTOR ANALYSIS
(Emissions in gm/BHP-hr)

	Intercept	Std. Error	Slope*	Std. Error	Mean
<u>All 22 Trucks</u>					
HC	0.765	0.125	2.73×10^{-3} a/	8.7×10^{-3}	0.798
CO	1.954	0.652	8.35×10^{-2} b/	4.55×10^{-2}	2.971
NO _x	7.131	0.521	-5.59×10^{-3} a/	3.64×10^{-2}	7.064
Particulate	0.475	0.081	1.36×10^{-2}	5.70×10^{-3}	0.640
HC + NO _x	7.897	0.477	-2.86×10^{-3} a/	3.33×10^{-3}	7.862
<u>Cummins Only(12)</u>					
HC	0.732	0.081	1.850×10^{-2} b/	1.22×10^{-6}	0.940
CO	1.555	0.753	1.721×10^{-1}	5.60×10^{-2}	3.492
NO _x	7.146	0.552	-2.950×10^{-2} a/	4.10×10^{-2}	6.814
Particulate	0.397	0.089	2.133×10^{-2}	6.60×10^{-3}	0.637
HC + NO _x	7.878	0.494	-1.102×10^{-2} a/	3.67×10^{-2}	7.754
<u>All Other Trucks(10)</u>					
HC	0.750	0.083	-9.232×10^{-3} a/	5.50×10^{-3}	0.628
CO	2.249	0.825	7.171×10^{-3} a/	5.40×10^{-2}	2.345
NO _x	7.216	1.007	1.106×10^{-2} a/	6.59×10^{-2}	7.363
Particulate	0.577	0.148	5.071×10^{-3} a/	9.70×10^{-3}	0.644
HC + NO _x	7.966	0.972	1.828×10^{-3} a/	6.36×10^{-2}	7.991

* Slope in gm/BHP-hr/10⁴ miles

a/ Not significant at the 0.10 level

b/ Significant at the 0.10 level

TABLE 3-3
RESULTS OF EMISSION FACTOR ANALYSIS
(Emission in gm/lb-fuel)

	Intercept	Std. Error	Slope*	Std. Error	Mean
<u>All 22 Trucks</u>					
HC	1.710	0.228	$3.795 \times 10^{-3} \text{a/}$	1.59×10^{-2}	1.756
CO	4.427	1.442	$1.808 \times 10^{-1} \text{b/}$	1.01×10^{-1}	6.627
NO _x	15.932	1.187	$-1.079 \times 10^{-2} \text{a/}$	8.29×10^{-2}	15.801
Particulate	1.042	0.166	3.115×10^{-2}	1.16×10^{-2}	1.421
HC + NO _x	17.643	1.045	$-6.996 \times 10^{-3} \text{a/}$	7.30×10^{-2}	17.557
<u>Cummins Only(12)</u>					
HC	1.689	0.264	$3.313 \times 10^{-2} \text{b/}$	1.96×10^{-2}	2.062
CO	3.799	1.750	3.541×10^{-1}	1.30×10^{-1}	7.784
NO _x	16.587	1.276	$-1.167 \times 10^{-1} \text{a/}$	9.48×10^{-2}	15.270
Particulate	0.922	0.152	4.226×10^{-2}	1.13×10^{-2}	1.397
HC + NO _x	18.276	1.063	$-8.385 \times 10^{-2} \text{a/}$	7.90×10^{-2}	11.662
<u>All Others(10)</u>					
HC	1.612	0.155	$-1.675 \times 10^{-2} \text{b/}$	1.01×10^{-2}	1.390
CO	4.734	1.826	$3.809 \times 10^{-2} \text{a/}$	1.196×10^{-1}	5.239
NO _x	15.268	2.170	$8.810 \times 10^{-2} \text{a/}$	1.420×10^{-1}	16.438
Particulate	1.202	0.349	$1.862 \times 10^{-2} \text{a/}$	2.280×10^{-2}	1.450
HC + NO _x	16.880	2.064	$7.135 \times 10^{-2} \text{a/}$	1.351×10^{-1}	17.828

* Slope in gm/lb-fuel/10⁴ miles

a/ Not significant at the 0.10

b/ Significant at the 0.10 level

TABLE 3-4
COMPARISON OF 1979 BASELINE EMISSIONS
WITH INTERCEPT OF EMISSION FACTORS
(gm/BHP-hr)

	<u>Baseline</u>	<u>Intercept</u>
HC	0.83	0.765 $\pm$ 0.125
CO	2.28	1.954 $\pm$ 0.652
NO _x	7.04	7.131 $\pm$ 0.521
Particulate	0.49	0.475 $\pm$ 0.081

TABLE 3-5
EMISSION FACTORS FOR BUSES

	Brake Specific Emissions (gm/BHP-hr)				
	<u>Intercept</u>	<u>Std. Error</u>	<u>Slope</u>	<u>Std. Error</u>	<u>Mean</u>
HC	1.421	0.519	$1.201 \times 10^{-3} \text{a/}$	3.19×10^{-2}	1.440
CO	40.583 ^{b/}	25.400	$-9.937 \times 10^{-1} \text{a/}$	1.56	25.062
NO _x	13.563	5.190	$-3.202 \times 10^{-2} \text{a/}$	3.19×10^{-1}	13.063
Particulate	2.174 ^{a/}	1.837	$-6.076 \times 10^{-3} \text{a/}$	1.13×10^{-2}	2.079
HC + NO _x	14.985	4.994	$-3.082 \times 10^{-2} \text{a/}$	3.07×10^{-1}	14.503

Fuel Specific Emissions (gm/lb-fuel)					
HC	1.332	0.493	$2.483 \times 10^{-2} \text{a/}$	3.03×10^{-2}	1.720
CO	42.319 ^{b/}	26.898	$-8.775 \times 10^{-1} \text{a/}$	1.65	28.610
NO _x	12.651	5.943	$1.953 \times 10^{-1} \text{a/}$	3.65×10^{-1}	15.701
Particulate	2.309 ^{a/}	2.070	$1.134 \times 10^{-2} \text{a/}$	1.223×10^{-1}	2.486
HC + NO _x	13.984	5.552	$2.201 \times 10^{-1} \text{a/}$	3.41×10^{-1}	17.422

a/ Not significant at the 0.10 level

b/ Significant at the 0.10 level

4. SPEED CORRECTION FACTORS

4.1 Overview

Speed correction factors for emissions are specified in EPA's MOBILE 2 and MOBILE 3 models as multipliers to basic emission rates, so that they predict emissions at speeds other than the speed for which the basic emission rate is derived. This can be expressed as

Emissions at speed, S = Correction Factors (S) X Basic Emission Rate.

If the basic emission rate is valid for a particular speed, S_1 , it is obvious that

$$\text{Correction Factor } (S_1) = 1.$$

Speed correction factors are decoupled from the effects of cold start by considering only hot start data. Thus all of the data used to derive speed correction factors are from the "hot" cycles only.

As described in Section 2, the EPA transient cycle for heavy-duty trucks is comprised of four segments, two of which are identical. They are the Los Angeles Freeway and Los Angeles Non-Freeway (2 LANF and 3 LANF) as well as two New York Non-Freeway segments, one from a hot start (1NYNF) and one following the 3 LAF segment (4NYNF). Since the first New York Non Freeway (1NYNF) cycle includes emissions from the "hot start" phase, only the 4NYNF cycle was considered for the speed correction factor derivation. Each of the three cycles used to derive the speed correction factors have unique speeds and they are as follows:

- 2 LANF has a speed of 16.82 MPH
- 3 LAF has a speed of 46.91 MPH
- 4 NYNF has a speed of 7.31 MPH

Data for HC, CO and NO_x are available on a cycle specific basis, but such data is not available for particulate emissions.

Importantly, the composite cycle which has an average speed of 18.79 MPH is not a separate cycle but an average of the cycles described above. Emissions for the composite cycle, which are used to derive the basic emission rate represents a distance weighted average of the four cycles described above. In comparison, the basic emission rate for light duty vehicles is derived from an actual cycle whose speed corresponds to the speed for the basic emission rate. This has important ramifications for the speed correction for heavy-duty vehicles, as discussed in this section.

4.2 Methodology

The speed correction factor for emissions is generally expressed as a polynomial of speed in MPH. Since there are only three speeds at which emission data is available, a maximum of three constants can be solved for, restricting the polynomial in speed to a second-order polynomial. It is well known that emissions per unit distance rise steeply at low speeds - in fact, it is infinite at idle, but the speed correction factor is not used at idle - and therefore, exponential forms of the equations are generally used. The two forms tried

$$E/E_o = \exp (A_1 + B_1 S)$$

$$E/E_o = \exp (A_2 + B_2 S + C_2 S^2)$$

where E is the emission rate of HC, CO, or NO_x at speed, S
 E_o is the basic emission rate for the pollutant
 A, B and C are regression constants.

This form of the equation allows the speed correction factor to be used as a multiplier to the base emission rate. An advantage of this form is that emission rates for each speed are normalized by the composite emission rate, and hence vehicle specific effects are removed. A non-exponential form was also tried of the form

$$E/E_o = A_3 + B_3 S + C_3/S$$

This form uses the $1/S$ term to model the rapid increase in emission rates at low speeds.

4.3 Results

The approach used to determine the regression constants was by fitting the equations, by pollutant, for each vehicle and then averaging the constants over all vehicles. As for the emission factor analysis, the buses were removed from consideration because of their unique behavior. Models were selected for each pollutant depending on their relative accuracy as measured by the variance of the estimated values for each coefficient, as well as their ability to behave correctly outside the range of speeds for which there is data. Correct behavior is defined based on engineering analysis of directional trends for emissions at speeds higher than the range encountered in the data.

The following values* were determined for the speed correction factors, using the first model $E/E_o = \exp(A_1 + B_1 S)$ or conversely,

$$\ln E/E_o = A_1 + B_1 S$$

$$\ln HC/HC_o = 0.9450 (\pm 0.2134) - 0.0351 (\pm 0.0096)S$$

$$\ln CO/CO_o = 0.6594 (\pm 0.1403) - 0.0244 (\pm 0.0056)S$$

$$\ln NO_x/NO_{xo} = 0.1859 (\pm 0.1247) - 0.0063 (\pm 0.0039)S$$

The second for $\ln E/E_o = A_2 + B_2 S + C_2 S^2$ were found to give

$$\ln HC/HC_o = 1.1709 (\pm 0.4226) - 0.0610 (\pm 0.0358) S + 4.585 \times 10^{-4} (\pm 5.21 \times 10^{-4}) S^2$$

$$\ln CO/CO_o = 1.2023 (\pm 0.3128) - 0.0867 (\pm 0.0337) S + 0.0011 (\pm 0.0006) S^2$$

$$\ln NO_x/NO_{xo} = 0.6426 (\pm 0.1215) - 0.0586 (\pm 0.0119) S + 9.269 \times 10^{-4} (\pm 2.417 \times 10^{-4}) S^2$$

Examination of the equations show that the S^2 term is not significant in the HC Equation at 0.10 level, but is significant for the CO and NO_x equations. The positive sign of the S^2 term in the equations indicate that emissions begin to increase beyond a certain speed, and the speed at which this occurs (i.e., the speed of minimum emissions) was calculated from the above

*Std. errors in parantheses.

data to be 66.52 mph for HC, 39.40 mph for CO and 31.61 for NO_x. Engineering considerations show that both HC and CO should decrease at higher speeds and the available data confirms this hypotheses, showing that the significant coefficient found for the S² term is simply an artifact of the model used. On the other hand, engineering analysis shows that NO_x emissions should rise at higher speeds due to the higher engine loads experienced at higher speed, and hence the S² term is required.

Analysis of this equation for NO_x emissions shows that the speed correction factor increases rapidly beyond 50 mph. At 50 mph its value is 1.03, but at 70 mph the factor rises to 2.95. In order to determine if such an increase is realistic, EEA examined records of steady-state test data for HD diesel engines. If we assume that the intermediate RPM, 75 percent load point corresponds to 50 MPH and rated speed, rated load point corresponds to 70 MPH (these assumptions are approximately correct), then we found that, on a gm/BHP-hr basis, NO_x emissions decrease between the 50 mph and 70 MPH points. Engineering analysis shows that BHP-hr, or work, should increase at approximately the square of the speeds, indicating that the correction factor should increase by $(\frac{70}{50})^2$, or 1.96. Emissions should increase by less than this factor, indicating that the exponential model with an S² term may be overestimating NO_x emissions at higher speeds. Accordingly, the alternative model using a polynomial in S (1/S, S⁰, S

$$\begin{aligned} \text{NO}_x/\text{NO}_{x0} = & 0.4437 (+ 0.2297) + \frac{5.8851 (+ 1.3309)}{S} \\ & + 0.00778 (+ 0.00567)S \end{aligned}$$

This model however, predicts hardly any increase in NO_x emissions between 50 and 70 MPH, giving values of 0.9504 and 1.072 for the two speeds respectively. The coefficients are also less significant (i.e. they have large variance) than these for the exponential equations. Accordingly, EEA recommends the following equations for speed correction factor:

$$\begin{aligned}
\ln (\text{HC}/\text{HC}_0) &= 0.945 - 0.0351 \underline{+} S \\
\ln (\text{CO}/\text{CO}_0) &= 0.659 - 0.0244 \underline{+} S \\
\ln (\text{NO}_x/\text{NO}_{x0}) &= 0.6426 - 0.0587 \underline{+} S + 0.000927 \underline{+} S^2
\end{aligned}$$

It must be recognized that engineering analysis show that NO_x may be over-predicted for speeds above 50 MPH, with the form of exponential employed. Figure 4-1 to 4-3 shows the plot of predicted vs. actual correction factors for HC, CO and NO_x .

A problem with the form of the equation is that the correction factor is not equal to 1 at the composite cycle average speed, 18.79 MPH. That is because the composite cycle takes a linear distance weighted average whereas all of the equations used for the correction factors are non-linear. Thus, there can be no correspondence between average speed and average emissions. Note that there is no actual data at 18.79 MPH for heavy duty trucks that is derived independently from the other data. As a result, the values of the correction factor at 18.79 MPH are 1.33 for HC, 1.22 for CO and 0.875 for NO_x . Two alternatives are possible.

- Accept the fact that transient cycle emissions are average of highway and city cycles, and therefore not representative of emissions at 18.79 MPH. Actual emissions for a cycle at 18.79 MPH would be represented by the values predicted by the speed correction factor.
- Modify the factors to make them predict a correction factor of one at 18.79 MPH.

If the second approach is followed, it can be accomplished as an "offset" to the existing factors. The resulting equations are:

$$\begin{aligned}
\ln \text{HC}/\text{HC}_0 &= 0.6595 - 0.0351 S \\
\ln \text{CO}/\text{CO}_0 &= 0.4585 - 0.0244 S \\
\ln \text{NO}_x/\text{NO}_{x0} &= 0.7756 - 0.0587 S + 0.000927 S^2
\end{aligned}$$

PLOT OF PRHCN*RHCHN LEGEND: A = 1 OBS, B = 2 OBS, ETC.

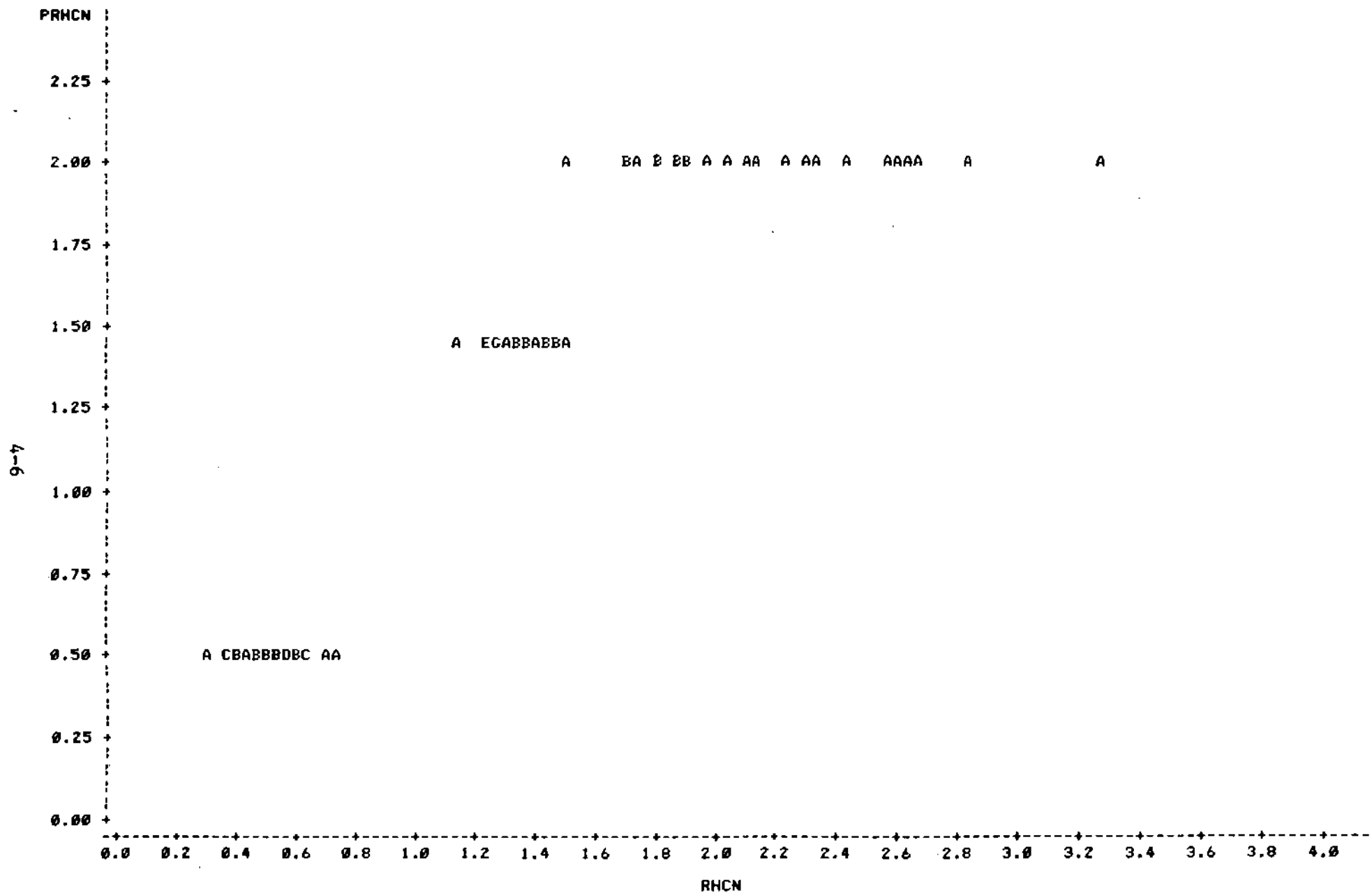


Figure 4-1

Predicted vs. Actual HC Speed Correction Factor

A2

14:19 THURSDAY, APRIL 19, 1984 11

PLOT OF PRCON=RCON LEGEND: A = 1 OBS, B = 2 OBS, ETC.

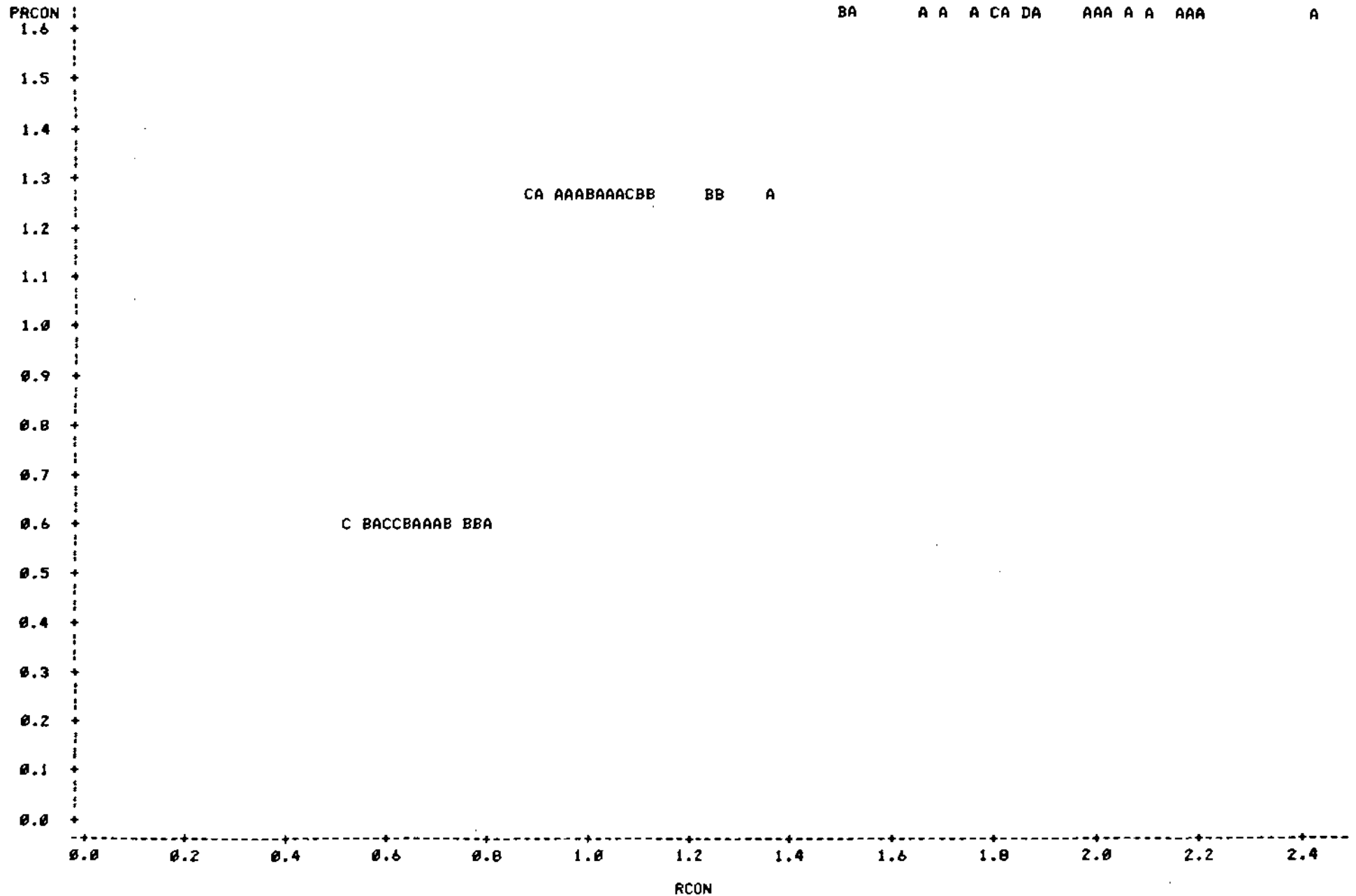


Figure 4-2
Predicted vs Actual CO Speed Correction Factor

B3

14:19 THURSDAY, APRIL 19, 1984 15

PLOT OF PRNOXN*RN0XN LEGEND: A = 1 OBS, B = 2 OBS, ETC.

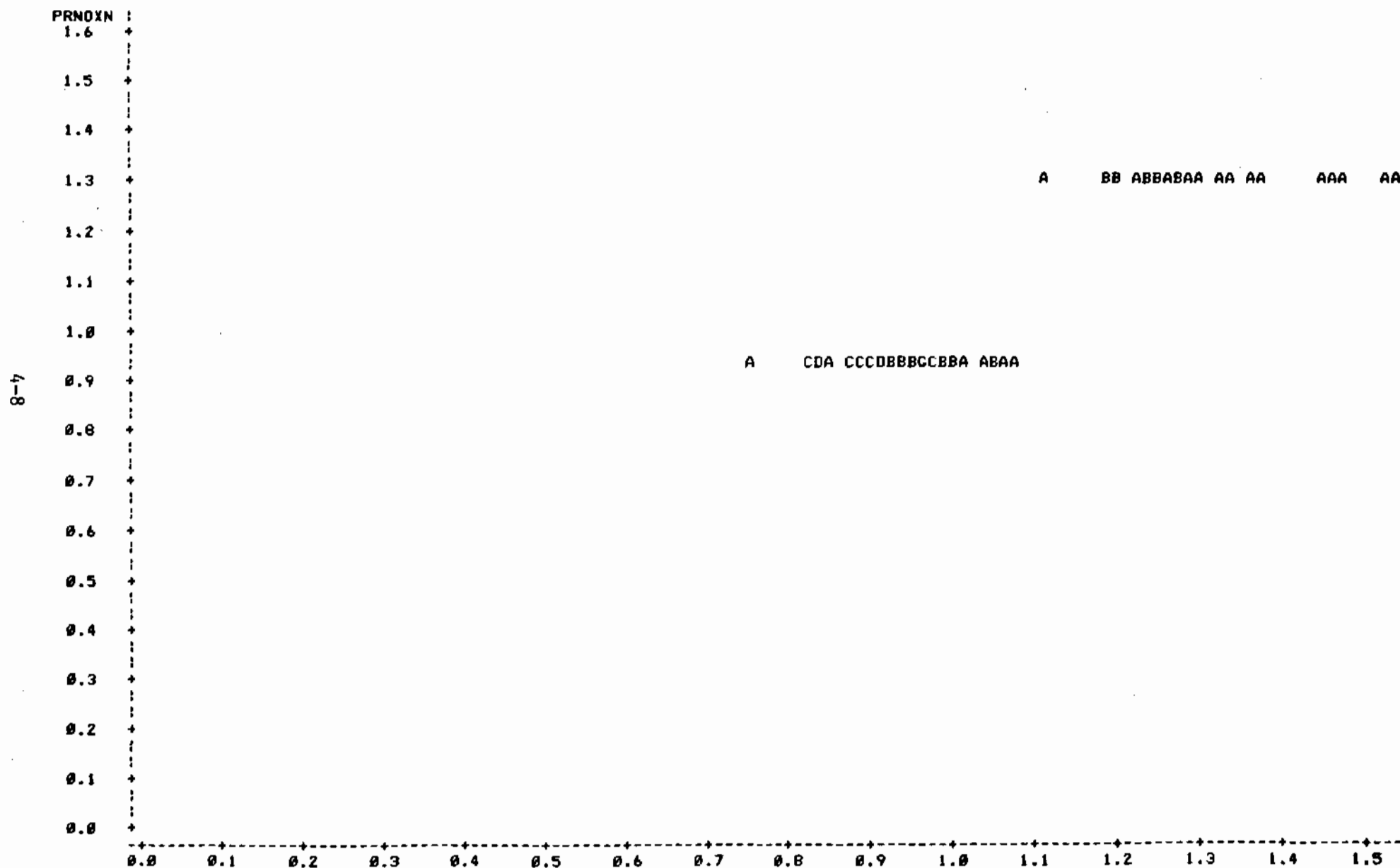


Figure 4-3
Predicted vs. Actual NO_x Speed Correction Factor

This, of course, changes the values of the factor at the observed cycle speeds, and provides a poorer fit of the data. Yet another approach to the normalization problem is to attempt to fit the regressions through 18.79 as an additional data point, but this introduces an unnatural shape to the speed correction curve. EEA did not attempt, nor does it recommend, such an approach.

APPENDIX A
DETAILED LISTING OF EMISSIONS DATA BASE

65.	10312	EDAT	C	1NYNF	3.85	8.58	1968.2	14.24	-1	624.6	.51	7.51	16.75	3826.0	27.79	-1	2.62
66.	10312	EDAT	C	2LANF	3.29	8.78	2825.1	23.51	-1	876.2	1.19	2.77	7.39	2377.2	19.78	-1	4.23
67.	10312	EDAT	C	3LAF	4.68	17.71	6518.2	83.96	-1	2063.5	3.32	1.41	5.34	1963.9	25.30	-1	5.14
68.	10312	EDAT	C	4NYNF	3.45	5.88	1476.4	14.10	-1	478.7	.54	6.48	10.91	2737.8	26.14	-1	3.66
69.	10312	EDAT	C	5COMP	-1	-1	-1	-1	10.32	8.941	5.56	2.74	7.37	2298.92	24.43	1.86	4.38
70.	10312	TDES	49000	96.6	EM-329-F	29.15	52	70.0	8.3	.93	-1	-1	-1	-1	-1	-1	-1
71.	10312	EDAT	H	1NYNF	3.42	6.42	1617.7	15.55	-1	516.4	.55	6.26	15.43	2964.4	28.50	-1	3.37
72.	10312	EDAT	H	2LANF	3.54	8.50	2511.6	22.32	-1	797.7	1.18	3.01	7.22	2131.0	18.94	-1	4.72
73.	10312	EDAT	H	3LAF	3.26	21.46	6402.5	90.19	-1	2027.6	3.32	.98	6.47	1929.5	27.18	-1	5.23
74.	10312	EDAT	H	4NYNF	2.36	8.57	1573.3	15.02	-1	501.4	.53	4.43	16.09	2955.0	28.22	-1	3.39
75.	10312	EDAT	H	5COMP	-1	-1	-1	-1	8.633	8.474	5.57	2.26	8.42	2171.36	25.67	1.56	4.63
76.	10313	TDES	49000	96.6	EM-329-F	29.38	65	74.0	11.9	1.04	-1	-1	-1	-1	-1	-1	-1
77.	10313	EDAT	C	1NYNF	2.37	8.44	1889.2	15.97	-1	600.7	.52	4.51	16.09	3603.2	30.46	-1	2.79
78.	10313	EDAT	C	2LANF	3.70	9.03	2697.5	27.04	-1	856.6	1.20	3.09	7.55	2254.3	22.60	-1	4.46
79.	10313	EDAT	C	3LAF	4.81	17.10	6298.0	101.99	-1	1994.1	3.34	1.44	5.12	1866.6	30.55	-1	5.35
80.	10313	EDAT	C	4NYNF	2.81	6.31	1441.3	16.57	-1	459.3	.56	5.02	11.28	2578.7	29.65	-1	3.89
81.	10313	EDAT	C	5COMP	-1	-1	-1	-1	9.52	8.623	5.62	2.44	7.28	2193.97	28.76	1.72	4.59
82.	10313	TDES	49000	96.6	EM-329-F	29.38	65	74.0	11.9	1.04	-1	-1	-1	-1	-1	-1	-1
83.	10313	EDAT	H	1NYNF	2.29	6.95	1390.3	15.58	-1	443.0	.52	4.42	13.41	2682.3	30.05	-1	3.74
84.	10313	EDAT	H	2LANF	3.21	7.70	2475.8	26.05	-1	785.7	1.17	2.74	6.57	2111.3	22.21	-1	4.77
85.	10313	EDAT	H	3LAF	3.84	18.40	6120.1	104.81	-1	1937.8	3.29	1.16	5.58	1857.6	31.81	-1	5.43
86.	10313	EDAT	H	4NYNF	2.70	6.57	1498.3	17.67	-1	477.2	.54	5.00	12.15	2771.8	32.69	-1	3.62
87.	10313	EDAT	H	5COMP	-1	-1	-1	-1	8.455	8.034	5.53	2.18	7.17	2078.2	29.70	1.53	4.84
88.	10400	VDES	GMC	RTS	A-3	1977	36900	117982	DDA	8V-71	568	-1	-1	-1	-1	-1	-1
89.	10414	TDES	32000	37.0	EM-329-F	28.75	59	72.0	10.3	.99	-1	-1	-1	-1	-1	-1	-1
90.	10414	EDAT	C	1NYNF	1.62	134.93	2755.4	31.37	-1	934.9	.51	3.21	266.71	5446.3	62.00	-1	1.73
91.	10414	EDAT	C	2LANF	2.92	133.25	3276.9	41.57	-1	1099.4	1.16	2.51	114.60	2818.1	35.75	-1	3.38
92.	10414	EDAT	C	3LAF	5.87	148.30	7153.0	103.88	-1	2326.9	3.27	1.79	45.33	2186.1	31.75	-1	4.49
93.	10414	EDAT	C	4NYNF	2.20	82.72	1959.9	23.07	-1	659.5	.53	4.15	156.12	3698.9	43.55	-1	2.57
94.	10414	EDAT	C	5COMP	-1	-1	-1	-1	21.72	11.075	5.47	2.30	91.25	2768.49	36.54	3.92	3.48
95.	10414	TDES	32000	37.0	EM-329-F	28.75	59	72.0	10.3	.99	-1	-1	-1	-1	-1	-1	-1
96.	10414	EDAT	H	1NYNF	2.06	86.97	1981.8	24.21	-1	669.3	.52	3.97	171.51	3820.4	46.67	-1	2.47
97.	10414	EDAT	H	2LANF	2.59	116.77	3213.8	36.68	-1	1071.1	1.17	2.22	100.13	2755.8	31.45	-1	3.48
98.	10414	EDAT	H	3LAF	5.12	122.68	6569.0	98.73	-1	2131.8	3.32	1.54	36.96	1979.2	29.75	-1	4.97
99.	10414	EDAT	H	4NYNF	1.71	88.17	1855.7	22.00	-1	628.9	.54	3.19	164.15	3454.8	40.96	-1	2.73
100.	10414	EDAT	H	5COMP	-1	-1	-1	-1	18.334	9.925	5.54	2.07	75.18	2458.04	32.78	3.31	3.93
101.	10415	TDES	32000	37.0	EM-329-F	28.95	59	79.0	13.0	1.08	-1	-1	-1	-1	-1	-1	-1
102.	10415	EDAT	C	1NYNF	1.55	109.58	2425.2	33.28	-1	818.5	.50	3.08	217.89	4822.1	66.18	-1	1.96
103.	10415	EDAT	C	2LANF	2.26	114.55	3547.5	47.12	-1	1174.6	1.17	1.92	97.65	3024.1	40.16	-1	3.19
104.	10415	EDAT	C	3LAF	4.68	144.13	7480.7	118.66	-1	2428.7	3.32	1.41	43.40	2252.4	35.73	-1	4.37
105.	10415	EDAT	C	4NYNF	1.53	82.82	2101.5	26.57	-1	703.4	.55	2.80	151.41	3842.0	48.58	-1	2.48
106.	10415	EDAT	C	5COMP	-1	-1	-1	-1	22.61	11.301	5.54	1.81	81.36	2805.63	40.70	4.08	3.45
107.	10415	TDES	32000	37.0	EM-329-F	28.95	59	79.0	13.0	1.08	-1	-1	-1	-1	-1	-1	-1
108.	10415	EDAT	H	1NYNF	2.02	85.22	2030.8	27.65	-1	682.8	.52	3.87	163.48	3895.5	53.03	-1	2.44
109.	10415	EDAT	H	2LANF	3.11	96.67	2890.1	42.28	-1	959.9	1.17	2.67	82.89	2478.2	36.26	-1	3.88
110.	10415	EDAT	H	3LAF	5.44	128.11	6668.6	110.94	-1	2166.1	3.33	1.64	38.53	2005.6	33.36	-1	4.90
111.	10415	EDAT	H	4NYNF	1.69	85.00	1907.2	25.42	-1	644.2	.53	3.16	158.87	3568.5	47.52	-1	2.65
112.	10415	EDAT	H	5COMP	-1	-1	-1	-1	17.355	9.819	5.55	2.21	71.20	2433.26	37.19	3.13	3.98
113.	20100	VDES	GMC	RTS	A-3	1980	36000	95000	DDA	8V-71M	426	-1	-1	-1	-1	-1	-1
114.	20111	TDES	28300	21.0	EM-400-F	29.01	65	72.0	11.3	1.02	98.14	-1	-1	-1	-1	-1	-1
115.	20111	EDAT	C	1NYNF	1.00	73.39	2565.4	19.39	-1	848.0	.52	1.91	140.21	4900.9	37.05	-1	1.90
116.	20111	EDAT	C	2LANF	1.91	59.23	2724.2	23.39	-1	892.1	1.16	1.65	51.18	2354.0	20.21	-1	3.99
117.	20111	EDAT	C	3LAF	6.87	97.81	6071.8	49.55	-1	1974.0	3.29	2.09	29.73	1845.8	15.06	-1	5.13
118.	20111	EDAT	C	4NYNF	1.20	40.15	1525.5	15.30	-1	503.2	.53	2.25	75.11	2853.7	28.63	-1	3.27
119.	20111	EDAT	C	5COMP	-1	-1	-1	-1	15.044	9.299	5.50	2.00	49.15	2341.03	19.55	2.73	4.01
120.	20111	TDES	28300	21.0	EM-400-F	29.01	65	74.0	10.1	.98	96.89	-1	-1	-1	-1	-1	-1
121.	20111	EDAT	H	1NYNF	1.99	38.60	1533.5	15.23	-1	505.7	.53	3.78	73.20	2908.3	28.89	-1	3.21
122.	20111	EDAT	H	2LANF	3.15	38.22	2268.8	20.08	-1	739.0	1.17	2.70	32.79	1946.1	17.23	-1	4.85
123.	20111	EDAT	H	3LAF	7.58	80.35	5735.7	45.10	-1	1859.8	3.31	2.29	24.24	1730.6	13.61	-1	5.48
124.	20111	EDAT	H	4NYNF	2.46	33.26	1424.9	13.96	-1	469.2	.54	4.58	61.77	2646.5	25.93	-1	3.53
125.	20111	EDAT	H	5COMP	-1	-1	-1	-1	11.518	7.880	5.55	2.74	34.34	1976.79	17.02	2.08	4.77
126.	20112	TDES	28300	21.0	EM-400-F	29.06	77	70.0	12.4	1.06	96.35	-1	-1	-1	-1	-1	-1
127.	20112	EDAT	C	1NYNF	1.60	64.57	2050.9	20.27	-1	681.7	.51	3.11	125.51	3986.4	39.39	-1	2.32
128.	20112	EDAT	C	2LANF	2.76	54.09	2706.1	23.06	-1	884.7	1.14	2.43	47.57	2379.8	20.98	-1	3.95
129.	20112	EDAT	C	3LAF	7.55	88.12	5982.6	47.83	-1	1941.7	3.23	2.34	27.26	1850.7	14.80	-1	5.12
130.	20112	EDAT	C	4NYNF	3.00	35.97	1534.3	14.63	-1	505.7	.53	5.71	68.48	2921.6	27.85	-1	3.19
131.	20112	EDAT	C	5COMP	-1	-1	-1	-1	13.019	8.850	5.41	2.76	44.87	2269.01	19.70	2.41	4.14
132.	20112	TDES	28300	21.0	EM-400-F	29.06	77	70.0	12.4	1.06	99.01	-1	-1	-1	-1	-1	-1

132.	20112	EDAT	H	1NYNF	2.44	39.23	1531.8	15.66	-1	505.9	.52	4.66	74.83	2921.6	29.87	-1	3.19
134.	20112	EDAT	H	2LANF	3.71	37.80	2312.6	20.59	-1	753.2	1.16	3.20	32.62	1996.1	17.78	-1	4.73
135.	20112	EDAT	H	3LAF	7.93	66.13	6139.2	45.25	-1	1980.6	3.29	2.41	20.08	1863.9	13.74	-1	5.11
136.	20112	EDAT	H	4NYNF	3.14	31.53	1474.2	14.61	-1	484.6	.54	5.86	58.89	2753.4	27.29	-1	3.40
137.	20112	EDAT	H	5COMP	-1	-1	-1	-1	-1	10.813	8.212	5.51	3.12	31.69	2078.68	17.44	1.96 4.55
138.	20113	TDES	20300	21.0 EM-400-F	29.17	77.72	0	13.4	1.10	97.39							
139.	20113	EDAT	C	1NYNF	2.61	75.28	2009.7	19.79	-1	675.0	.51	5.07	146.32	3986.3	38.47	-1	2.34
140.	20113	EDAT	C	2LANF	4.86	52.46	2757.9	23.94	-1	902.3	1.14	4.27	46.12	2424.4	21.05	-1	3.88
141.	20113	EDAT	C	3LAF	10.34	89.94	5993.1	48.61	-1	1948.7	3.23	3.20	27.81	1853.2	15.03	-1	5.10
142.	20113	EDAT	C	4NYNF	5.54	32.28	1533.8	15.34	-1	506.2	.53	10.53	61.42	2918.2	29.19	-1	3.19
143.	20113	EDAT	C	5COMP	-1	-1	-1	-1	-1	13.510	8.891	5.41	4.31	46.19	2271.89	19.90	2.50 4.13
144.	20113	TDES	20300	21.0 EM-400-F	29.18	73.72	0	12.6	1.07	96.94							
145.	20113	EDAT	H	1NYNF	2.12	34.53	1536.6	15.28	-1	504.8	.52	4.06	66.12	2942.7	29.27	-1	3.18
146.	20113	EDAT	H	2LANF	2.62	41.37	2307.9	20.21	-1	752.4	1.15	2.27	35.83	1998.8	17.50	-1	4.72
147.	20113	EDAT	H	3LAF	6.75	68.19	5602.0	43.85	-1	1810.7	3.28	2.06	20.78	1706.7	13.36	-1	5.57
148.	20113	EDAT	H	4NYNF	1.18	34.19	1440.6	14.40	-1	473.4	.53	2.21	64.11	2701.5	27.01	-1	3.46
149.	20113	EDAT	H	5COMP	-1	-1	-1	-1	-1	10.907	7.808	5.49	2.31	32.46	1982.22	17.07	1.99 4.77
150.	20114	TDES	20300	21.0 EM-400-F	29.21	77.70	0	12.4	1.06	98.15							
151.	20114	EDAT	C	1NYNF	2.60	71.66	1978.2	19.32	-1	663.2	.51	5.05	139.28	3845.2	37.55	-1	2.39
152.	20114	EDAT	C	2LANF	3.27	46.13	2599.8	22.22	-1	847.6	1.14	2.88	40.57	2286.3	19.54	-1	4.13
153.	20114	EDAT	C	3LAF	7.58	89.04	5902.5	47.25	-1	1916.8	3.23	2.34	27.54	1825.6	14.61	-1	5.19
154.	20114	EDAT	C	4NYNF	2.34	30.92	1443.9	14.34	-1	473.9	.53	4.46	58.87	2749.5	27.31	-1	3.41
155.	20114	EDAT	C	5COMP	-1	-1	-1	-1	-1	13.490	8.603	5.41	2.92	43.95	2204.21	19.06	2.49 4.26
156.	20114	TDES	20300	21.0 EM-400-F	29.22	77.70	0	12.4	1.06	96.12							
157.	20114	EDAT	H	1NYNF	2.13	38.03	1545.5	15.41	-1	509.3	.52	4.06	72.65	2952.5	29.44	-1	3.16
158.	20114	EDAT	H	2LANF	3.29	36.33	2297.1	20.35	-1	747.1	1.16	2.85	31.39	1985.0	17.58	-1	4.76
159.	20114	EDAT	H	3LAF	7.72	67.59	5598.5	43.58	-1	1807.7	3.29	2.35	20.55	1699.5	13.25	-1	5.60
160.	20114	EDAT	H	4NYNF	2.35	36.22	1409.9	14.20	-1	465.7	.53	4.40	67.75	2636.6	26.56	-1	3.53
161.	20114	EDAT	H	5COMP	-1	-1	-1	-1	-1	10.503	7.783	5.50	2.81	32.37	1969.66	16.99	1.91 4.80
162.	20115	TDES	20300	21.0 EM-400-F	29.27	78.73	0	13.9	1.12	97.92							
163.	20115	EDAT	C	1NYNF	.72	70.84	2035.2	20.76	-1	679.0	.52	1.40	137.47	3949.4	40.28	-1	2.33
164.	20115	EDAT	C	2LANF	2.02	31.51	1903.0	17.24	-1	619.0	1.14	1.78	27.66	1670.4	15.13	-1	5.66
165.	20115	EDAT	C	3LAF	11.14	87.01	5890.9	49.26	-1	1915.7	3.24	3.44	26.87	1819.2	15.21	-1	5.20
166.	20115	EDAT	C	4NYNF	2.39	31.94	1475.3	15.12	-1	484.4	.53	4.55	60.72	2804.6	28.74	-1	3.34
167.	20115	EDAT	C	5COMP	-1	-1	-1	-1	-1	11.797	8.154	5.42	3.00	40.84	2886.14	18.89	2.10 4.51
168.	20115	TDES	20300	21.0 EM-400-F	29.27	78.74	0	12.9	1.08	97.34							
169.	20115	EDAT	H	1NYNF	2.38	39.87	1502.0	15.12	-1	496.8	.52	4.56	76.24	2871.8	28.92	-1	3.24
170.	20115	EDAT	H	2LANF	3.22	35.26	2370.4	21.03	-1	769.7	1.16	2.79	30.50	2050.6	18.19	-1	4.62
171.	20115	EDAT	H	3LAF	7.63	68.66	5553.4	43.66	-1	1796.4	3.29	2.32	20.90	1690.2	13.29	-1	5.62
172.	20115	EDAT	H	4NYNF	2.31	34.37	1447.4	14.50	-1	476.7	.53	4.34	64.39	2712.0	27.31	-1	3.44
173.	20115	EDAT	H	5COMP	-1	-1	-1	-1	-1	11.030	7.805	5.50	2.83	32.40	1977.55	17.17	2.01 4.78
174.	20200	VDES	WHIT	DAT	M10	1980	78000	30000	CUM	F0R-350	855						
175.	20221	TDES	54000	134.5 EM-528-F	29.69	23.67	0	3.2	.80	93.29							
176.	20221	EDAT	C	1NYNF	15.14	14.94	1782.0	11.61	-1	583.0	.44	34.71	34.25	4085.3	26.62	-1	2.39
177.	20221	EDAT	C	2LANF	5.69	11.92	3022.5	22.39	-1	962.2	1.16	4.92	10.31	2614.7	19.37	-1	3.84
178.	20221	EDAT	C	3LAF	4.51	18.26	6326.0	73.86	-1	2003.2	3.23	1.39	5.65	1957.4	22.05	-1	5.16
179.	20221	EDAT	C	4NYNF	3.83	7.52	1616.7	12.78	-1	516.0	.50	7.60	14.91	3206.4	25.34	-1	3.12
180.	20221	EDAT	C	5COMP	-1	-1	-1	-1	-1	19.829	8.962	5.33	5.47	9.88	2392.43	22.64	1.84 4.19
181.	20221	TDES	54000	134.5 EM-528-F	29.68	29.66	0	4.0	.82	94.93							
182.	20221	EDAT	H	1NYNF	4.19	8.74	1508.0	13.43	-1	482.8	.49	8.61	17.96	3090.5	27.60	-1	3.22
183.	20221	EDAT	H	2LANF	4.59	10.11	2848.4	24.17	-1	905.5	1.20	3.83	8.43	2376.2	20.17	-1	4.23
184.	20221	EDAT	H	3LAF	3.71	17.67	6083.6	75.20	-1	1925.8	3.31	1.12	5.33	1835.8	22.69	-1	5.50
185.	20221	EDAT	H	4NYNF	4.15	8.33	1704.7	15.69	-1	544.4	.52	7.97	16.01	3278.0	30.17	-1	3.05
186.	20221	EDAT	H	5COMP	-1	-1	-1	-1	-1	7.725	8.508	5.52	3.02	8.13	2200.40	23.20	1.40 4.57
187.	20222	TDES	54000	134.5 EM-528-F	29.36	44.70	0	7.0	.89	91.65							
188.	20222	EDAT	C	1NYNF	14.70	14.42	1788.5	10.80	-1	559.2	.44	33.15	32.53	3052.5	24.34	-1	2.54
189.	20222	EDAT	C	2LANF	6.01	11.22	3087.7	22.25	-1	982.7	1.16	5.19	9.68	2664.2	19.46	-1	3.77
190.	20222	EDAT	C	3LAF	4.74	18.54	6207.6	71.02	-1	1966.3	3.24	1.46	5.72	1915.5	21.91	-1	5.27
191.	20222	EDAT	C	4NYNF	4.89	7.99	1618.1	14.49	-1	517.7	.51	9.59	15.68	3174.1	28.43	-1	3.15
192.	20222	EDAT	C	5COMP	-1	-1	-1	-1	-1	10.390	8.877	5.35	5.67	9.75	2357.93	22.20	1.94 4.25
193.	20222	TDES	54000	134.5 EM-528-F	29.37	47.69	0	7.3	.90	95.57							
194.	20222	EDAT	H	1NYNF	4.31	8.05	1710.2	14.15	-1	546.6	.49	8.00	10.07	3489.5	28.87	-1	2.87
195.	20222	EDAT	H	2LANF	4.54	9.43	2650.3	22.83	-1	842.8	1.18	3.86	8.02	2253.5	19.41	-1	4.46
196.	20222	EDAT	H	3LAF	3.78	19.32	5803.1	72.78	-1	1838.5	3.25	1.16	5.95	1786.9	22.41	-1	5.65
197.	20222	EDAT	H	4NYNF	3.97	8.41	1687.3	15.29	-1	538.8	.51	7.71	16.33	3277.1	29.70	-1	3.06
198.	20222	EDAT	H	5COMP	-1	-1	-1	-1	-1	7.843	8.305	5.43	3.06	8.48	2183.03	23.03	1.44 4.61
199.	20223	TDES	54000	134.5 EM-528-F	29.71	24.65	0	3.2	.80	95.38							
200.	20223	EDAT	C	1NYNF	5.72	13.22	1682.1	9.57	-1	541.3	.43	13.34	30.83	3921.6	22.30	-1	2.53

201.	20223	EDAT	C	2LANF	4.65	10.59	2859.3	20.82	-1	909.2	1.15	4.03	9.19	2400.0	18.05	-1	4.06
202.	20223	EDAT	C	3LAF	3.66	17.53	6056.3	69.48	-1	1917.1	3.22	1.14	5.44	1879.5	21.56	-1	5.30
203.	20223	EDAT	C	4NYNF	3.91	8.17	1647.5	14.37	-1	526.1	.50	7.85	16.39	3303.9	28.81	-1	3.03
204.	20223	EDAT	C	5COMP	-1	-1	-1	-1	8.963	8.566	5.30	3.30	9.34	2309.15	21.54	1.69	4.36
205.	20223	TDES	54000	134.5	EM-528-F	29.71	30.	67.0	4.2	.82	92.54						
206.	20223	EDAT	H	1NYNF	4.35	8.30	1617.9	13.27	-1	517.3	.50	8.77	16.75	3264.2	26.77	-1	3.06
207.	20223	EDAT	H	2LANF	4.77	9.60	2633.4	22.54	-1	637.8	1.16	4.06	8.16	2230.4	19.16	-1	4.49
208.	20223	EDAT	H	3LAF	4.24	20.06	5779.8	71.67	-1	1832.0	3.20	1.33	6.27	1806.1	22.40	-1	5.59
209.	20223	EDAT	H	4NYNF	4.87	9.10	1643.1	15.00	-1	526.1	.51	9.54	17.83	3217.8	29.38	-1	3.10
210.	20223	EDAT	H	5COMP	-1	-1	-1	-1	8.109	8.188	5.30	3.39	8.74	2168.76	22.75	1.51	4.64
211.	20224	TDES	54000	134.5	EM-528-F	29.28	43.	68.0	6.3	.87	94.50						
212.	20224	EDAT	C	1NYNF	6.82	15.17	1862.8	12.94	-1	600.2	.46	14.78	32.88	4037.0	28.03	-1	2.46
213.	20224	EDAT	C	2LANF	4.68	11.96	3025.3	23.17	-1	962.1	1.17	3.98	10.18	2576.2	19.73	-1	3.90
214.	20224	EDAT	C	3LAF	3.46	20.31	6166.8	74.36	-1	1953.1	3.26	1.06	6.23	1893.1	22.83	-1	5.33
215.	20224	EDAT	C	4NYNF	3.73	9.25	1651.3	15.02	-1	527.7	.51	7.31	18.13	3236.7	29.44	-1	3.09
216.	20224	EDAT	C	5COMP	-1	-1	-1	-1	10.094	8.915	5.40	3.46	10.49	2351.52	23.22	1.87	4.27
217.	20224	TDES	54000	134.5	EM-528-F	29.27	36.	69.0	5.5	.85	93.46						
218.	20224	EDAT	H	1NYNF	3.94	10.14	1684.3	13.83	-1	538.7	.49	8.04	20.69	3436.6	28.21	-1	2.91
219.	20224	EDAT	H	2LANF	4.25	10.78	2678.0	22.57	-1	851.9	1.17	3.64	9.23	2293.0	19.33	-1	4.36
220.	20224	EDAT	H	3LAF	2.94	20.24	6001.6	75.54	-1	1900.6	3.26	.90	6.22	1843.6	23.21	-1	5.48
221.	20224	EDAT	H	4NYNF	3.60	9.79	1677.9	15.61	-1	836.2	.52	6.97	19.97	3250.6	30.24	-1	3.00
222.	20224	EDAT	H	5COMP	-1	-1	-1	-1	8.560	8.439	5.43	2.71	9.38	2217.85	23.49	1.56	4.54
223.	20225	TDES	54000	134.5	EM-528-F	29.19	45.	71.0	7.5	.90	92.87						
224.	20225	EDAT	C	1NYNF	16.90	15.77	1783.8	11.70	-1	585.7	.46	36.56	34.10	3858.5	25.31	-1	2.52
225.	20225	EDAT	C	2LANF	5.72	12.16	2860.1	21.71	-1	911.3	1.17	4.38	10.36	2438.2	18.51	-1	4.12
226.	20225	EDAT	C	3LAF	4.20	21.65	6047.7	71.36	-1	1917.0	3.21	1.31	6.75	1864.3	22.23	-1	5.35
227.	20225	EDAT	C	4NYNF	4.30	8.84	1602.3	14.16	-1	512.6	.51	8.49	17.45	3164.5	27.96	-1	3.16
228.	20225	EDAT	C	5COMP	-1	-1	-1	-1	10.131	8.658	5.35	5.82	10.92	2297.40	22.23	1.89	4.36
229.	20225	TDES	54000	134.5	EM-528-F	29.18	48.	70.0	7.7	.91	93.78						
230.	20225	EDAT	H	1NYNF	4.10	8.55	1589.2	13.23	-1	508.2	.48	8.50	17.73	3294.4	27.43	-1	3.04
231.	20225	EDAT	H	2LANF	4.71	10.27	2629.1	22.33	-1	836.7	1.14	4.12	9.00	2303.4	19.56	-1	4.36
232.	20225	EDAT	H	3LAF	3.80	20.34	5788.1	72.34	-1	1834.3	3.19	1.19	6.37	1812.3	22.65	-1	5.57
233.	20225	EDAT	H	4NYNF	4.14	8.80	1595.8	14.67	-1	510.4	.49	8.52	18.12	3284.9	30.19	-1	3.04
234.	20225	EDAT	H	5COMP	-1	-1	-1	-1	8.472	8.135	5.30	3.16	9.04	2187.72	23.11	1.60	4.60
235.	20300	VDES	1HCT	DAT	H-8	1980	78000	32600	DDA	8V-92TA	736						
236.	20321	TDES	54000	134.5	EM-528-F	29.17	31.	71.0	5.1	.84	91.89						
237.	20321	EDAT	C	1NYNF	3.47	5.62	1841.9	13.33	-1	585.5	.48	7.20	11.67	3824.9	27.67	-1	2.63
238.	20321	EDAT	C	2LANF	4.40	5.03	3144.5	21.74	-1	995.9	1.17	3.78	4.32	2698.3	18.65	-1	3.74
239.	20321	EDAT	C	3LAF	5.63	6.79	6273.3	60.54	-1	1982.0	3.21	1.75	2.11	1954.0	18.86	-1	5.18
240.	20321	EDAT	C	4NYNF	3.15	3.28	1661.0	14.53	-1	527.2	.53	5.97	6.23	3152.5	27.57	-1	3.20
241.	20321	EDAT	C	5COMP	-1	-1	-1	-1	8.156	9.020	5.38	3.09	3.85	2399.73	20.45	1.51	4.21
242.	20321	TDES	54000	134.5	EM-528-F	29.17	35.	68.0	5.2	.85	91.08						
243.	20321	EDAT	H	1NYNF	2.94	2.92	1302.7	12.24	-1	414.1	.50	5.82	5.79	2581.6	24.26	-1	3.90
244.	20321	EDAT	H	2LANF	4.41	3.95	2815.7	23.40	-1	891.9	1.17	3.78	3.39	2415.3	20.07	-1	4.18
245.	20321	EDAT	H	3LAF	5.68	7.93	6278.8	65.91	-1	1984.4	3.25	1.75	2.44	1930.6	20.27	-1	5.24
246.	20321	EDAT	H	4NYNF	3.43	3.26	1750.4	16.41	-1	555.6	.51	6.69	6.37	3413.6	32.01	-1	2.95
247.	20321	EDAT	H	5COMP	-1	-1	-1	-1	6.923	8.480	5.44	3.03	3.32	2234.87	21.70	1.27	4.52
248.	20322	TDES	54000	134.5	EM-528-F	29.11	28.	71.0	4.6	.83	94.03						
249.	20322	EDAT	C	1NYNF	3.71	6.91	2043.8	14.13	-1	649.9	.48	7.70	14.34	4244.2	29.35	-1	2.37
250.	20322	EDAT	C	2LANF	4.36	6.00	3132.5	22.66	-1	992.6	1.16	3.74	5.15	2689.0	19.45	-1	3.75
251.	20322	EDAT	C	3LAF	5.67	7.88	6436.6	63.15	-1	2034.0	3.23	1.75	2.44	1991.1	19.53	-1	5.08
252.	20322	EDAT	C	4NYNF	3.29	4.05	1742.2	15.57	-1	553.3	.52	6.33	7.79	3350.3	29.94	-1	3.01
253.	20322	EDAT	C	5COMP	-1	-1	-1	-1	7.848	9.326	5.40	3.15	4.60	2473.56	21.39	1.45	4.08
254.	20322	TDES	54000	134.5	EM-528-F	29.12	34.	67.0	4.9	.84	92.00						
255.	20322	EDAT	H	1NYNF	2.22	3.61	1157.0	10.93	-1	367.9	.50	4.43	7.19	2302.5	21.76	-1	4.37
256.	20322	EDAT	H	2LANF	3.21	4.92	2979.8	23.79	-1	942.8	1.17	2.75	4.21	2551.3	20.37	-1	3.96
257.	20322	EDAT	H	3LAF	4.75	9.21	6400.3	66.44	-1	2022.3	3.25	1.46	2.84	1970.8	20.46	-1	5.14
258.	20322	EDAT	H	4NYNF	2.52	3.70	1747.9	16.14	-1	554.1	.51	4.91	7.23	3408.8	31.47	-1	2.96
259.	20322	EDAT	H	5COMP	-1	-1	-1	-1	7.272	8.571	5.43	2.34	3.95	2262.09	21.60	1.34	4.47
260.	20323	TDES	54000	134.5	EM-528-F	29.46	34.	67.0	4.8	.84	91.60						
261.	20323	EDAT	C	1NYNF	3.26	5.95	2032.7	14.17	-1	645.5	.48	6.70	12.35	4221.2	29.43	-1	2.39
262.	20323	EDAT	C	2LANF	4.30	5.19	2872.6	21.04	-1	910.3	1.16	3.69	4.46	2465.9	18.06	-1	4.09
263.	20323	EDAT	C	3LAF	5.57	6.87	6754.2	66.12	-1	2133.3	3.23	1.72	2.13	2089.4	20.45	-1	4.85
264.	20323	EDAT	C	4NYNF	3.44	3.49	1837.1	16.32	-1	583.0	.52	6.61	6.71	3532.7	31.39	-1	2.85
265.	20323	EDAT	C	5COMP	-1	-1	-1	-1	7.923	9.420	5.40	3.07	3.98	2499.75	21.79	1.47	4.04
266.	20323	TDES	54000	134.5	EM-528-F	29.47	33.	70.0	5.2	.85	92.04						

267.	20323	EDAT	H	1NYNF	2.55	1.75	1261.5	6.94	-1	400.2	.50	5.07	3.47	2510.4	13.82	-1	4.02
268.	20323	EDAT	H	2LANF	4.06	4.20	3081.1	24.72	-1	975.2	1.17	3.48	3.59	2638.1	21.16	-1	3.83
269.	20323	EDAT	H	3LAF	5.17	7.66	6288.6	63.61	-1	1986.8	3.25	1.59	2.36	1936.4	19.59	-1	5.23
270.	20323	EDAT	H	4NYNF	2.65	3.48	1816.5	16.73	-1	575.9	.51	5.55	6.79	3542.6	32.63	-1	2.85
271.	20323	EDAT	H	5COMP	-1	-1	-1	-1	7.463	8.683	5.43	2.69	3.15	2292.05	20.62	1.37	4.41
272.	20324	TDES	54000	134.5	EM-528-F	29.44	42.67	0.6.0	.86	92.35							
273.	20324	EDAT	C	1NYNF	2.96	5.87	2120.9	13.29	-1	672.9	.49	6.00	11.91	4305.0	31.04	-1	2.34
274.	20324	EDAT	C	2LANF	3.60	5.31	3107.8	24.78	-1	983.7	1.16	3.12	4.59	2690.5	21.45	-1	3.76
275.	20324	EDAT	C	3LAF	5.22	7.45	6463.6	67.31	-1	2041.8	3.20	1.63	2.33	2019.0	21.03	-1	5.01
276.	20324	EDAT	C	4NYNF	3.13	2.97	1746.3	16.68	-1	553.8	.51	6.21	5.89	3457.6	33.03	-1	2.92
277.	20324	EDAT	C	5COMP	-1	-1	-1	-1	8.093	9.376	5.35	2.78	4.03	2509.90	23.17	1.51	4.03
278.	20324	TDES	54000	134.5	EM-528-F	29.43	46.67	0.6.5	.88	91.78							
279.	20324	EDAT	H	1NYNF	2.69	3.21	922.9	9.16	-1	294.5	.51	5.26	6.28	1805.8	17.93	-1	5.55
280.	20324	EDAT	H	2LANF	3.88	4.57	2923.0	24.50	-1	925.5	1.19	3.27	3.86	2463.9	20.65	-1	4.10
281.	20324	EDAT	H	3LAF	5.94	8.27	6871.9	68.16	-1	2171.3	3.26	1.82	2.53	2105.2	20.88	-1	4.81
282.	20324	EDAT	H	4NYNF	3.32	3.73	1841.5	17.47	-1	584.3	.52	6.42	7.22	3564.6	33.81	-1	2.83
283.	20324	EDAT	H	5COMP	-1	-1	-1	-1	8.016	8.766	5.48	2.89	3.61	2292.56	21.78	1.46	4.41
284.	20325	TDES	54000	134.5	EM-528-F	29.53	62.67	0.8.9	.94	91.58							
285.	20325	EDAT	C	1NYNF	3.03	6.34	1969.5	13.77	-1	625.6	.47	6.43	13.47	4182.8	29.24	-1	2.41
286.	20325	EDAT	C	2LANF	3.50	5.64	3111.4	24.34	-1	984.9	1.18	2.98	4.79	2645.6	20.70	-1	3.82
287.	20325	EDAT	C	3LAF	4.61	7.18	6311.4	64.30	-1	1993.2	3.26	1.41	2.20	1935.2	19.71	-1	5.23
288.	20325	EDAT	C	4NYNF	2.17	3.64	1866.2	17.72	-1	590.9	.53	4.06	6.82	3493.8	33.18	-1	2.89
289.	20325	EDAT	C	5COMP	-1	-1	-1	-1	8.818	9.249	5.44	2.45	4.19	2436.15	22.07	1.62	4.15
290.	20325	TDES	54000	134.5	EM-528-F	29.55	59.68	0.8.7	.94	92.89							
291.	20325	EDAT	H	1NYNF	2.64	2.50	1243.3	7.52	-1	394.9	.49	5.36	5.08	2528.0	15.30	-1	3.98
292.	20325	EDAT	H	2LANF	4.00	4.74	2872.1	25.17	-1	909.7	1.15	3.47	4.11	2493.0	21.85	-1	4.05
293.	20325	EDAT	H	3LAF	5.41	8.25	6105.6	67.28	-1	1929.8	3.23	1.68	2.56	1892.3	20.85	-1	5.35
294.	20325	EDAT	H	4NYNF	2.78	3.63	1775.0	17.95	-1	562.8	.51	5.45	7.13	3487.9	35.27	-1	2.87
295.	20325	EDAT	H	5COMP	-1	-1	-1	-1	7.773	8.373	5.38	2.75	3.55	2229.98	21.92	1.45	4.53
296.	20400	VDES	IHCS	SAT	M-5	1979	41500	104650	IH	DT-466B	466						
297.	20421	TDES	29000	104.6	EM-528-F	29.22	43.73	0.7.6	.91	93.11							
298.	20421	EDAT	C	1NYNF	2.43	8.38	1265.5	11.00	-1	404.6	.51	4.72	16.28	2459.8	21.39	-1	4.07
299.	20421	EDAT	C	2LANF	3.38	8.29	2145.1	18.08	-1	682.1	1.21	2.80	6.88	1779.3	15.00	-1	5.65
300.	20421	EDAT	C	3LAF	3.46	8.36	5049.4	50.67	-1	1595.7	3.37	1.03	2.48	1499.3	15.05	-1	6.75
301.	20421	EDAT	C	4NYNF	1.82	4.50	1070.6	10.01	-1	340.8	.54	3.35	8.26	1968.1	18.40	-1	5.10
302.	20421	EDAT	C	5COMP	-1	-1	-1	-1	7.585	6.666	5.63	1.97	5.24	1692.28	15.94	1.35	5.96
303.	20421	TDES	29000	104.6	EM-528-F	29.22	38.75	0.7.1	.89	87.87							
304.	20421	EDAT	H	1NYNF	1.76	4.75	1069.0	10.44	-1	340.3	.53	3.34	9.01	2025.7	19.78	-1	4.96
305.	20421	EDAT	H	2LANF	3.02	7.00	1911.2	16.24	-1	607.6	1.20	2.52	5.83	1592.7	13.53	-1	6.32
306.	20421	EDAT	H	3LAF	3.28	8.68	5076.2	49.23	-1	1604.1	3.35	.98	2.59	1515.0	14.69	-1	6.68
307.	20421	EDAT	H	4NYNF	1.75	4.78	1070.4	9.32	-1	340.8	.54	3.24	8.85	1980.2	17.24	-1	5.07
308.	20421	EDAT	H	5COMP	-1	-1	-1	-1	7.388	6.379	5.62	1.75	4.49	1624.29	15.17	1.31	6.21
309.	20422	TDES	29000	104.6	EM-528-F	29.52	19.72	0.3.1	.80	97.24							
310.	20422	EDAT	C	1NYNF	2.61	8.14	1366.3	11.22	-1	436.3	.52	5.06	15.79	2649.1	21.75	-1	3.78
311.	20422	EDAT	C	2LANF	3.27	8.36	2028.9	17.03	-1	645.5	1.18	2.76	7.06	1714.0	14.39	-1	5.86
312.	20422	EDAT	C	3LAF	3.70	8.43	5163.6	50.29	-1	1631.9	3.33	1.11	2.53	1548.8	15.09	-1	6.53
313.	20422	EDAT	C	4NYNF	1.87	4.53	1066.0	9.24	-1	339.4	.54	3.46	8.37	1972.1	17.09	-1	5.09
314.	20422	EDAT	C	5COMP	-1	-1	-1	-1	6.668	6.732	5.57	2.05	5.28	1726.70	15.75	1.20	5.84
315.	20422	TDES	29000	104.6	EM-528-F	29.53	21.74	0.3.7	.81	96.29							
316.	20422	EDAT	H	1NYNF	1.60	4.96	1093.7	9.34	-1	348.0	.53	3.05	9.44	2082.6	17.78	-1	4.83
317.	20422	EDAT	H	2LANF	2.87	6.55	1977.4	15.88	-1	628.0	1.20	2.39	5.45	1466.1	13.22	-1	6.12
318.	20422	EDAT	H	3LAF	3.26	8.54	4934.4	47.22	-1	1559.4	3.36	.97	2.54	1466.5	14.03	-1	6.90
319.	20422	EDAT	H	4NYNF	1.77	4.66	1181.2	9.76	-1	375.6	.54	3.30	8.68	2200.8	18.18	-1	4.57
320.	20422	EDAT	H	5COMP	-1	-1	-1	-1	6.525	6.419	5.63	1.69	4.39	1632.33	14.60	1.16	6.10
321.	20423	TDES	29000	104.6	EM-528-F	29.38	20.73	0.3.5	.81	95.54							
322.	20423	EDAT	C	1NYNF	2.70	8.22	1361.1	10.79	-1	434.9	.52	5.23	15.92	2634.7	20.89	-1	3.80
323.	20423	EDAT	C	2LANF	3.50	7.63	2006.5	15.95	-1	638.3	1.19	2.95	6.41	1687.7	13.41	-1	5.96
324.	20423	EDAT	C	3LAF	3.65	7.86	4990.5	45.48	-1	1577.1	3.36	1.09	2.34	1486.6	13.55	-1	6.81
325.	20423	EDAT	C	4NYNF	1.98	4.30	1056.7	8.87	-1	336.5	.53	3.70	8.04	1975.1	16.58	-1	5.08
326.	20423	EDAT	C	5COMP	-1	-1	-1	-1	6.755	6.586	5.60	2.11	5.00	1681.94	14.49	1.21	5.99
327.	20423	TDES	29000	104.6	EM-528-F	29.39	18.74	0.3.2	.80	95.80							
328.	20423	EDAT	H	1NYNF	1.95	4.88	1076.2	8.53	-1	342.9	.51	3.80	9.50	2095.4	16.60	-1	4.79
329.	20423	EDAT	H	2LANF	3.31	6.40	1926.8	14.84	-1	612.5	1.21	2.73	5.28	1588.7	12.23	-1	6.33
330.	20423	EDAT	H	3LAF	3.66	7.52	4644.5	41.09	-1	1468.2	3.34	1.10	2.25	1392.4	12.32	-1	7.27
331.	20423	EDAT	H	4NYNF	1.98	4.46	1036.2	8.52	-1	330.1	.53	3.74	8.45	1960.4	16.13	-1	5.12

332.	20423	EDAT	H	5COMP	-1	-1	-1	-1	6.417	6.072	5.59	1.95	4.16	1553.25	13.05	1.15	6.49
333.	20424	TDES	29000	104.6	EM-528-F	29.23	46.72	0.78	.91	95.49							
334.	20424	EDAT	C	1NYNF	2.59	9.29	1306.7	10.88	-1	418.2	.52	5.01	17.95	2525.2	21.03	-1	3.96
335.	20424	EDAT	C	2LANF	3.41	6.78	2608.2	22.12	-1	827.1	1.19	2.86	5.69	2186.8	18.55	-1	4.61
336.	20424	EDAT	C	3LAF	3.51	8.81	4920.9	49.46	-1	1555.6	3.25	1.08	2.71	1516.0	15.24	-1	6.67
337.	20424	EDAT	C	4NYNF	1.94	4.82	1125.1	9.77	-1	358.2	.67	2.88	7.15	1671.5	14.52	-1	6.01
338.	20424	EDAT	C	5COMP	-1	-1	-1	-1	7.352	6.966	5.63	2.03	5.28	1769.51	16.38	1.31	5.70
339.	20424	TDES	29000	104.6	EM-528-F	29.24	40.74	0.74	.90	96.36							
340.	20424	EDAT	H	1NYNF	1.92	5.55	1151.1	9.62	-1	366.7	.53	3.60	10.42	2160.3	18.05	-1	4.65
341.	20424	EDAT	H	2LANF	3.14	7.04	1968.7	15.99	-1	625.8	1.23	2.55	5.71	1596.7	12.97	-1	6.30
342.	20424	EDAT	H	3LAF	3.35	8.94	4757.8	45.96	-1	1504.2	3.40	.99	2.63	1400.3	13.53	-1	7.22
343.	20424	EDAT	H	4NYNF	1.78	4.99	1088.9	9.19	-1	346.7	.56	3.18	8.93	1949.7	16.46	-1	5.15
344.	20424	EDAT	H	5COMP	-1	-1	-1	-1	7.001	6.270	5.72	1.78	4.63	1567.02	14.11	1.22	6.44
345.	20425	TDES	29000	104.6	EM-528-F	29.12	50.72	0.85	.93	96.34							
346.	20425	EDAT	C	1NYNF	2.70	9.26	1379.6	11.57	-1	441.2	.51	5.25	13.05	2686.3	22.54	-1	3.72
347.	20425	EDAT	C	2LANF	3.58	7.92	2057.4	17.36	-1	654.6	1.20	2.99	6.60	1715.1	14.48	-1	5.86
348.	20425	EDAT	C	3LAF	3.95	9.20	5278.1	51.75	-1	1668.6	3.39	1.16	2.71	1557.2	15.27	-1	6.50
349.	20425	EDAT	C	4NYNF	2.21	4.94	1110.3	9.65	-1	353.9	.54	4.10	9.14	2055.6	17.87	-1	4.88
350.	20425	EDAT	C	5COMP	-1	-1	-1	-1	7.532	6.876	5.64	2.21	5.55	1741.33	16.01	1.33	5.79
351.	20425	TDES	29000	-1	-1	-1	-1	-1	-1	-1							
352.	20425	EDAT	H	1NYNF	1.90	5.11	1119.8	9.16	-1	356.6	.54	3.52	9.48	2078.02	16.99	-1	4.83
353.	20425	EDAT	H	2LANF	3.07	6.70	1911.6	14.98	-1	607.6	1.20	2.56	5.57	1590.8	12.46	-1	6.32
354.	20425	EDAT	H	3LAF	3.54	8.54	4704.6	43.73	-1	1487.4	3.39	1.05	2.52	1388.8	12.91	-1	7.28
355.	20425	EDAT	H	4NYNF	2.04	4.91	1073.6	8.99	-1	342.1	.54	3.81	9.16	2005.2	16.78	-1	5.00
356.	20425	EDAT	H	5COMP	-1	-1	-1	-1	7.796	6.160	5.66	1.86	4.46	1555.54	13.57	1.38	6.48
357.	30100	VDES	PETE SAT	M-10	1978	41500	70455	CUM FOR-350	855								
358.	30121	TDES	29000	104.6	EM-528-F	29.25	34.75	0.65	.88	94.84							
359.	30121	EDAT	C	1NYNF	9.19	14.14	1861.7	10.38	-1	608.0	.53	17.42	26.79	3565.6	19.67	-1	2.78
360.	30121	EDAT	C	2LANF	5.33	9.49	2590.0	15.04	-1	824.6	1.16	4.61	8.20	2239.8	13.00	-1	4.48
361.	30121	EDAT	C	3LAF	5.21	11.64	5390.8	44.74	-1	1706.4	3.32	1.57	3.50	1622.3	13.46	-1	6.23
362.	30121	EDAT	C	4NYNF	4.21	7.99	1428.6	10.27	-1	457.5	.54	7.77	14.73	2632.4	18.93	-1	3.79
363.	30121	EDAT	C	5COMP	-1	-1	-1	-1	12.641	7.930	5.55	4.31	7.79	2034.53	14.49	2.28	4.93
364.	30121	TDES	29000	104.6	EM-528-F	29.26	40.74	0.73	.90	92.61							
365.	30121	EDAT	H	1NYNF	3.69	7.82	1570.0	10.51	-1	501.3	.54	6.86	14.53	2915.9	19.52	-1	3.43
366.	30121	EDAT	H	2LANF	5.44	7.55	2373.8	15.93	-1	755.8	1.18	4.61	6.41	2014.1	13.52	-1	4.99
367.	30121	EDAT	H	3LAF	5.80	11.39	5009.4	47.07	-1	1587.0	3.36	1.73	3.39	1492.8	14.03	-1	6.76
368.	30121	EDAT	H	4NYNF	5.11	5.71	1506.0	11.04	-1	481.6	.55	9.29	10.38	2736.3	20.06	-1	3.65
369.	30121	EDAT	H	5COMP	-1	-1	-1	-1	10.520	7.333	5.62	3.56	5.77	1860.00	15.04	1.87	5.41
370.	30122	TDES	29000	104.6	EM-528-F	29.36	35.68	0.52	.85	93.29							
371.	30122	EDAT	C	1NYNF	8.06	13.15	1813.9	10.26	-1	585.1	.53	15.19	24.80	3420.6	19.35	-1	2.90
372.	30122	EDAT	C	2LANF	5.02	9.04	2593.1	15.05	-1	825.1	1.17	4.30	7.74	2220.3	12.89	-1	4.53
373.	30122	EDAT	C	3LAF	5.29	10.90	5155.2	42.97	-1	1632.1	3.33	1.59	3.28	1549.8	12.92	-1	6.52
374.	30122	EDAT	C	4NYNF	4.86	5.80	1451.9	10.19	-1	464.4	.54	8.97	10.70	2677.4	18.79	-1	3.73
375.	30122	EDAT	C	5COMP	-1	-1	-1	-1	11.232	7.732	5.57	4.17	6.99	1978.55	14.10	2.02	5.08
376.	30122	TDES	29000	104.6	EM-528-F	29.32	27.71	0.45	.83	94.97							
377.	30122	EDAT	H	1NYNF	4.04	8.45	1547.6	9.88	-1	495.0	.53	7.57	15.84	2899.7	18.52	-1	3.45
378.	30122	EDAT	H	2LANF	5.23	7.48	2293.3	15.03	-1	730.2	1.16	4.53	6.48	1985.4	13.01	-1	5.06
379.	30122	EDAT	H	3LAF	5.52	10.81	4978.5	42.91	-1	1576.7	3.31	1.67	3.26	1502.1	12.95	-1	6.72
380.	30122	EDAT	H	4NYNF	4.80	5.83	1440.2	10.12	-1	460.6	.54	8.85	10.74	2653.7	18.66	-1	3.77
381.	30122	EDAT	H	5COMP	-1	-1	-1	-1	10.071	7.194	5.55	3.53	5.87	1849.96	14.05	1.82	5.44
382.	30123	TDES	29000	104.6	EM-528-F	29.25	24.74	0.44	.83	95.27							
383.	30123	EDAT	C	1NYNF	7.78	12.29	1794.6	10.04	-1	578.3	.54	14.42	22.77	3325.2	18.60	-1	2.98
384.	30123	EDAT	C	2LANF	4.56	8.01	2553.2	14.66	-1	811.6	1.18	3.88	6.82	2172.6	12.48	-1	4.63
385.	30123	EDAT	C	3LAF	5.10	11.24	5546.5	46.65	-1	1755.1	3.36	1.52	3.35	1650.5	13.86	-1	6.12
386.	30123	EDAT	C	4NYNF	4.08	5.77	1536.3	10.55	-1	490.1	.55	7.45	10.53	2804.3	19.26	-1	3.57
387.	30123	EDAT	C	5COMP	-1	-1	-1	-1	10.760	8.015	5.62	3.83	6.64	2032.74	14.57	1.91	
388.	30123	TDES	29000	104.6	EM-528-F	29.25	23.73	0.40	.82	94.68							
389.	30123	EDAT	H	1NYNF	3.64	8.33	1541.1	10.18	-1	492.5	.54	6.72	15.38	2846.5	18.79	-1	3.52
390.	30123	EDAT	H	2LANF	4.56	7.54	2415.2	15.72	-1	767.9	1.19	3.83	6.34	2030.0	13.22	-1	4.95
391.	30123	EDAT	H	3LAF	5.03	11.26	5152.1	44.69	-1	1631.0	3.37	1.49	3.35	1531.0	13.28	-1	6.60
392.	30123	EDAT	H	4NYNF	4.34	6.35	1509.2	10.55	-1	482.2	.55	7.91	11.57	2750.7	19.22	-1	3.64
393.	30123	EDAT	H	5COMP	-1	-1	-1	-1	10.248	7.439	5.64	3.11	5.93	1881.02	14.37	1.82	5.35
394.	30200	VDES	1H SAT	M-16	1979	41500	59675	1H DT-466	466								
395.	30221	TDES	29000	104.6	EM-528-F	29.11	19.72	0.32	.80	95.55							
396.	30221	EDAT	C	1NYNF	2.18	10.38	1384.9	13.76	-1	442.9	.54	4.06	19.38	2584.4	25.60	-1	3.87
397.	30221	EDAT	C	2LANF	3.13	7.94	2116.8	20.26	-1	672.8	1.18	2.66	6.75	1800.6	17.23	-1	5.59

399.	30221	EDAT	C	3LAF	3.40	7.52	5097.6	50.60	-1	1610.4	3.38	1.01	2.22	1506.9	17.32	-1	6.72
399.	30221	EDAT	C	4NYNF	1.04	4.71	1101.3	11.50	-1	350.5	.54	3.38	8.66	2024.6	21.15	-1	4.96
400.	30221	EDAT	C	5COMP	-1	-1	-1	-1	7.893	6.784	5.64	1.87	5.42	1720.50	18.47	1.40	5.86
401.	30221	TDES	29000	104.6	EM-520-F	29.14	17.76	0.34	.81	94.39							
402.	30221	EDAT	H	1NYNF	1.71	6.00	1090.5	10.85	-1	347.6	.55	3.14	11.00	1990.3	19.89	-1	5.02
403.	30221	EDAT	H	2LANF	3.25	6.03	1924.6	18.20	-1	611.5	1.20	2.72	5.04	1606.7	15.26	-1	6.26
404.	30221	EDAT	H	3LAF	3.62	7.02	4994.6	56.70	-1	1578.4	3.40	1.07	2.30	1470.9	16.70	-1	6.88
405.	30221	EDAT	H	4NYNF	1.07	3.17	1098.8	11.81	-1	349.0	.55	3.41	5.77	2001.1	21.51	-1	5.03
406.	30221	EDAT	H	5COMP	-1	-1	-1	-1	7.327	6.365	5.69	1.84	4.05	1601.26	17.16	1.29	6.30
407.	30222	TDES	29000	104.6	EM-520-F	29.34	29.66	0.40	.82	95.71							
408.	30222	EDAT	C	1NYNF	2.24	9.33	1293.2	12.95	-1	413.6	.51	4.39	18.29	2534.6	25.37	-1	3.95
409.	30222	EDAT	C	2LANF	2.92	8.16	2019.3	20.06	-1	642.1	1.14	2.56	7.15	1771.1	17.59	-1	5.68
410.	30222	EDAT	C	3LAF	2.78	7.62	4922.4	58.35	-1	1554.7	3.28	.85	2.32	1499.3	17.77	-1	6.75
411.	30222	EDAT	C	4NYNF	1.04	4.42	1093.6	11.51	-1	347.2	.53	1.96	8.30	2052.3	21.59	-1	4.91
412.	30222	EDAT	C	5COMP	-1	-1	-1	-1	7.402	6.521	5.47	1.64	5.40	1706.55	18.82	1.35	5.91
413.	30222	TDES	29000	104.6	EM-520-F	29.36	26.63	0.32	.80	94.08							
414.	30222	EDAT	H	1NYNF	1.63	5.38	1032.6	10.38	-1	329.1	.51	3.19	10.54	2022.3	20.34	-1	4.96
415.	30222	EDAT	H	2LANF	2.83	5.71	1875.0	17.86	-1	595.6	1.14	2.47	4.99	1639.1	15.61	-1	6.14
416.	30222	EDAT	H	3LAF	2.99	6.53	4769.6	54.51	-1	1506.3	3.26	.92	2.00	1463.3	16.72	-1	6.92
417.	30222	EDAT	H	4NYNF	1.34	4.69	1097.6	11.03	-1	348.9	.53	2.35	8.90	2003.2	20.93	-1	4.83
418.	30222	EDAT	H	5COMP	-1	-1	-1	-1	6.927	6.130	5.44	1.62	4.10	1612.73	17.24	1.27	6.26
419.	30300	VDES	1M	SAT	M-16	1979	41500	215790	CUM	FOR-290	855						
420.	30321	TDES	29000	104.6	EM-520-F	29.18	24.77	0.40	.84	96.98							
421.	30321	EDAT	C	1NYNF	3.41	16.53	1739.5	9361	-1	55837	.52	6.53	31.66	3331.3	18.40	-1	2.99
422.	30321	EDAT	C	2LANF	4.766	13.84	2424.9	16.17	-1	774.3	1.14	4.17	12.11	2121.3	14.15	-1	4.72
423.	30321	EDAT	C	3LAF	6.16	23.04	4968.1	47.93	-1	1580.1	3.32	1.86	6.95	1497.4	14.45	-1	6.71
424.	30321	EDAT	C	4NYNF	3.79	9.60	1300.1	10.56	-1	442.6	.53	7.13	10.05	2594.2	19.85	-1	3.84
425.	30321	EDAT	C	5COMP	-1	-1	-1	-1	14.741	7.399	5.52	3.29	11.43	1906.18	15.28	2.67	5.26
426.	30321	TDES	29000	104.6	EM-520-F	29.17	25.75	0.47	.84	93.90							
427.	30321	EDAT	H	1NYNF	3.02	10.89	1371.9	9.60	-1	439.9	.52	5.78	20.88	2629.4	18.40	-1	3.79
428.	30321	EDAT	H	2LANF	5.49	11.00	2055.7	14.89	-1	657.5	1.14	4.80	9.62	1796.9	13.01	-1	5.56
429.	30321	EDAT	H	3LAF	5.81	19.27	4607.4	45.01	-1	1464.4	3.30	1.76	5.84	1397.5	13.64	-1	7.20
430.	30321	EDAT	H	4NYNF	4.31	9.65	1342.3	10.31	-1	431.5	.53	8.14	10.23	2535.4	19.47	-1	3.93
431.	30321	EDAT	H	5COMP	-1	-1	-1	-1	12.528	6.600	5.49	3.39	9.25	1707.45	14.53	2.20	5.87
432.	30322	TDES	29000	104.6	EM-520-F	29.19	31.75	0.59	.86	96.00							
433.	30322	EDAT	C	1NYNF	3.13	14.64	1616.7	10.39	-1	510.9	.50	6.29	29.36	3242.2	20.84	-1	3.07
434.	30322	EDAT	C	2LANF	4.62	13.52	2334.8	15.37	-1	745.6	1.12	4.12	12.06	2003.0	13.71	-1	4.81
435.	30322	EDAT	C	3LAF	5.95	20.49	4707.2	45.33	-1	1496.6	3.24	1.83	6.32	1451.2	13.97	-1	6.93
436.	30322	EDAT	C	4NYNF	4.32	8.55	1313.9	9.92	-1	421.8	.53	8.17	16.18	2405.7	18.77	-1	4.01
437.	30322	EDAT	C	5COMP	-1	-1	-1	-1	12.527	7.018	5.39	3.34	10.61	1849.57	15.03	2.32	5.42
438.	30322	TDES	29000	104.6	EM-520-F	29.20	30.77	0.60	.87	94.49							
439.	30322	EDAT	H	1NYNF	4.41	9.77	1323.6	9.47	-1	425.5	.51	8.58	19.03	2577.1	18.43	-1	3.86
440.	30322	EDAT	H	2LANF	5.58	9.92	1986.9	14.63	-1	635.4	1.12	4.98	8.84	1772.0	13.04	-1	5.64
441.	30322	EDAT	H	3LAF	5.70	18.45	4397.6	45.02	-1	1397.9	.25	1.76	5.360	1354.8	13.87	-1	7.43
442.	30322	EDAT	H	4NYNF	4.20	10.09	4207.6	10.37	-1	414.1	.51	8.26	19.86	2534.3	20.42	-1	3.92
443.	30322	EDAT	H	5COMP	-1	-1	-1	-1	12.209	6.335	5.39	3.69	8.95	1669.32	14.75	2.27	6.00
444.	30400	VDES	1MCT	DAT	M-8	1980	70000	79616	DDA	8V-92TA	736						
445.	30421	TDES	55000	135.8	EM-520-F	28.82	60.70	0.12	1.08	91.46							
446.	30421	EDAT	C	1NYNF	1.58	5.67	1903.3	15.02	-1	603.0	.47	3.37	12.10	4064.4	3.78	-1	2.48
447.	30421	EDAT	C	2LANF	3.72	7.266	3302.1	27.25	-1	1045.9	1.15	3.23	6.31	2868.3	23.67	-1	3.52
448.	30421	EDAT	C	3LAF	6.14	10.66	6699.7	73.89	-1	2118.6	3.25	1.89	3.28	2064.3	22.77	-1	4.90
449.	30421	EDAT	C	4NYNF	4.15	4.68	1861.1	18.71	-1	591.0	.53	7.86	8.85	3523.9	35.42	-1	2.85
450.	30421	EDAT	C	5COMP	-1	-1	-1	-1	11.860	9.612	5.39	2.89	5.24	2552.54	25.15	2.20	3.96
451.	30421	TDES	55000	135.8	EM-520-F	28.82	60.70	0.12	1.08	80.96							
452.	30421	EDAT	H	1NYNF	2.74	5.19	1841.7	17.30	-1	584.6	.50	5.53	10.47	3715.7	34.90	-1	2.71
453.	30421	EDAT	H	2LANF	4.01	6.22	2910.7	26.83	-1	922.6	1.13	3.57	5.53	2585.9	23.04	-1	3.90
454.	30421	EDAT	H	3LAF	5.52	11.09	6421.1	73.57	-1	2030.5	3.10	1.74	3.49	2020.0	23.20	-1	5.01
455.	30421	EDAT	H	4NYNF	2.57	5.01	1039.2	19.05	-1	583.5	.53	4.89	9.53	3499.3	36.25	-1	2.88
456.	30421	EDAT	H	5COMP	-1	-1	-1	-1	10.999	9.087	5.33	2.79	5.17	243.44	25.71	2.07	4.13
457.	30423	TDES	55000	135.8	EM-520-F	28.97	24.77	0.49	.84	87.06							
458.	30423	EDAT	C	1NYNF	1.92	5.19	2151.2	15.31	-1	601.1	.49	3.94	10.63	4400.5	31.38	-1	2.29
459.	30423	EDAT	C	2LANF	3.29	5.73	3295.0	26.49	-1	1042.5	1.15	2.87	5.00	2875.0	23.12	-1	3.52
460.	30423	EDAT	C	3LAF	4.90	8.59	6623.7	65.30	-1	2092.4	3.20	1.53	2.68	2067.9	20.41	-1	4.90
461.	30423	EDAT	C	4NYNF	2.43	3.92	1740.4	16.63	-1	551.7	.54	4.54	7.30	3245.2	31.01	-1	3.11
462.	30423	EDAT	C	5COMP	-1	-1	-1	-1	11.272	9.631	5.37	2.33	4.36	2570.07	23.04	2.10	3.93
463.	30423	TDES	55000	135.8	EM-520-F	29.00	23.76	0.44	.83	87.20							

464.	30423	EDAT	H	1NYNF	2.37	4.44	1925.2	16.67	-1	610.1	.52	4.54	8.52	3696.0	32.00	-1	2.73
465.	30423	EDAT	H	2LANF	3.78	5.89	3086.9	24.62	-1	977.6	1.16	3.24	5.06	2650.9	21.14	-1	3.81
466.	30423	EDAT	H	3LAF	5.13	11.24	6431.4	57.04	-1	2033.5	3.25	1.58	3.46	1980.4	17.56	-1	5.11
467.	30423	EDAT	H	4NYNF	2.48	4.35	1917.9	17.39	-1	607.8	.53	4.70	8.24	3634.3	32.95	-1	2.78
468.	30423	EDAT	H	5COMP	-1	-1	-1	-1	-1	10.632	9.325	5.46	2.52	4.75	2446.83	21.19	1.95 4.13
469.	30500	VDES	INCT	DAT	M-8	1979	78000	238577	DDA	8V-92TA	736						
470.	30521	TDES	55000	135.8	EM-528-F	29.35	21.77	0.42	.82	87.62							
471.	30521	EDAT	C	1NYNF	1.98	6.67	2200.0	17.57	-1	722.4	.50	3.94	13.32	4552.9	35.08	-1	2.22
472.	30521	EDAT	C	2LANF	3.17	7.17	3500.7	26.63	-1	1110.3	1.17	2.71	6.12	2991.1	24.41	-1	3.38
473.	30521	EDAT	C	3LAF	5.24	12.75	7448.3	78.25	-1	2354.1	3.31	1.58	3.85	2250.5	23.64	-1	4.50
474.	30521	EDAT	C	4NYNF	2.22	4.82	2006.1	20.44	-1	635.6	.53	4.16	9.05	3767.8	38.38	-1	2.68
475.	30521	EDAT	C	5COMP	-1	-1	-1	-1	-1	12.739	10.633	5.52	2.29	5.70	2763.48	26.27	2.31 3.66
476.	30521	TDES	55000	135.8	EM-528-F	29.35	21.74	0.38	.81	88.28							
477.	30521	EDAT	H	1NYNF	2.61	4.70	1989.1	19.19	-1	630.5	.51	5.09	9.16	3875.9	37.40	-1	2.60
478.	30521	EDAT	H	2LANF	4.05	5.99	3321.7	29.62	-1	1051.7	1.15	3.53	5.22	2895.0	25.82	-1	3.49
479.	30521	EDAT	H	3LAF	5.85	14.24	7242.5	77.65	-1	2290.8	3.30	1.77	4.31	2192.3	23.50	-1	4.61
480.	30521	EDAT	H	4NYNF	3.07	5.54	2030.6	20.95	-1	644.5	.53	5.83	10.52	3857.2	39.80	-1	2.61
481.	30521	EDAT	H	5COMP	-1	-1	-1	-1	-1	10.166	10.182	5.49	2.84	5.55	2656.12	26.85	1.85 3.80
482.	30522	TDES	55000	135.8	EM-528-F	29.47	13.70	0.21	.78	89.47							
483.	30522	EDAT	C	1NYNF	2.65	10.99	2199.0	16.76	-1	699.7	.49	5.44	22.55	4510.6	34.38	-1	2.23
484.	30522	EDAT	C	2LANF	4.25	7.75	3431.0	27.22	-1	1087.2	1.14	3.74	6.82	3018.3	23.95	-1	3.34
485.	30522	EDAT	C	3LAF	6.13	13.13	7275.9	73.70	-1	2301.0	3.29	1.86	3.99	2211.6	22.40	-1	4.57
486.	30522	EDAT	C	4NYNF	2.85	6.81	1933.9	19.20	-1	614.5	.58	4.94	11.82	3354.7	33.31	-1	3.00
487.	30522	EDAT	C	5COMP	-1	-1	-1	-1	-1	12.765	10.369	5.49	2.89	7.04	2702.75	24.93	2.32 3.73
488.	30522	TDES	55000	135.8	EM-528-F	29.40	11.71	0.10	.77	88.29							
489.	30522	EDAT	H	1NYNF	2.57	6.51	1906.5	18.37	-1	605.4	.49	5.18	13.15	3853.1	37.13	-1	2.61
490.	30522	EDAT	H	2LANF	4.07	6.15	3245.1	28.79	-1	1027.0	1.14	3.50	5.42	2857.0	25.34	-1	3.53
491.	30522	EDAT	H	3LAF	5.95	13.48	7058.9	73.93	-1	2232.7	3.26	1.81	4.11	2153.4	22.55	-1	4.69
492.	30522	EDAT	H	4NYNF	2.74	4.83	1914.8	19.27	-1	607.3	.60	4.56	8.08	3202.7	32.23	-1	3.15
493.	30522	EDAT	H	5COMP	-1	-1	-1	-1	-1	10.058	9.864	5.51	2.78	5.63	2565.20	25.49	1.63 3.94
494.	30600	VDES	WHIT	DAT	M-8	1979	80000	261000	CUM	NTC-400	393						
495.	30621	TDES	55000	135.8	EM-528-F	28.90	27.77	0.55	.85	94.67							
496.	30621	EDAT	C	1NYNF	6.87	38.90	2422.7	16.46	-1	788.1	.53	12.89	72.99	4546.6	30.89	-1	2.16
497.	30621	EDAT	C	2LANF	6.61	25.16	3536.0	25.36	-1	1131.2	1.16	5.69	21.64	3040.9	21.81	-1	3.29
498.	30621	EDAT	C	3LAF	5.30	62.28	6899.6	70.08	-1	2206.1	3.35	1.58	18.60	2061.0	20.93	-1	4.85
499.	30621	EDAT	C	4NYNF	6.83	28.55	2010.8	16.33	-1	653.4	.49	13.89	58.11	4092.2	33.24	-1	2.41
500.	30621	EDAT	C	5COMP	-1	-1	-1	-1	-1	21.367	10.537	5.53	4.63	27.99	2686.51	23.17	3.86 3.70
501.	30621	TDES	55000	135.8	EM-528-F	28.89	27.77	0.55	.85	96.97							
502.	30621	EDAT	H	1NYNF	8.70	36.49	2023.8	15.59	-1	663.3	.51	17.04	71.46	3963.5	30.53	-1	2.46
503.	30621	EDAT	H	2LANF	8.22	27.70	3296.6	26.21	-1	1058.7	1.16	7.08	23.85	2838.2	22.56	-1	3.51
504.	30621	EDAT	H	3LAF	5.53	48.35	6147.3	67.52	-1	1962.8	3.33	1.66	14.54	1848.3	20.30	-1	5.42
505.	30621	EDAT	H	4NYNF	6.62	23.40	1704.5	14.86	-1	554.3	.53	12.55	44.38	3232.6	28.18	-1	3.04
506.	30621	EDAT	H	5COMP	-1	-1	-1	-1	-1	16.689	9.347	5.53	5.26	24.60	2383.98	22.47	3.02 4.17
507.	30622	TDES	55000	135.8	EM-528-F	29.11	28.75	0.53	.85	96.75							
508.	30622	EDAT	C	1NYNF	4.43	40.15	2178.6	14.92	-1	709.5	.52	8.57	77.71	4217.1	28.07	-1	2.33
509.	30622	EDAT	C	2LANF	6.17	32.18	3555.4	24.82	-1	1140.3	1.17	5.27	27.51	3039.7	21.22	-1	3.28
510.	30622	EDAT	C	3LAF	5.15	56.28	6748.0	69.18	-1	2155.3	3.32	1.55	16.96	2034.2	20.85	-1	4.92
511.	30622	EDAT	C	4NYNF	7.63	27.54	1920.4	15.42	-1	625.2	.52	14.72	53.09	3702.0	29.73	-1	2.65
512.	30622	EDAT	C	5COMP	-1	-1	-1	-1	-1	17.756	10.210	5.52	4.23	28.27	2608.02	22.51	3.22 3.81
513.	30622	TDES	55000	135.8	EM-528-F	29.05	58.73	0.10	.99	93.64							
514.	30622	EDAT	H	1NYNF	8.86	27.04	1921.5	14.83	-1	626.6	.48	18.31	55.86	3969.2	30.64	-1	2.47
515.	30622	EDAT	H	2LANF	7.58	28.51	3194.7	25.27	-1	1026.4	1.14	6.63	24.96	2796.8	22.13	-1	3.56
516.	30622	EDAT	H	3LAF	4.53	51.91	6153.1	66.54	-1	1965.4	3.28	1.38	15.82	1875.6	20.28	-1	5.34
517.	30622	EDAT	H	4NYNF	5.62	23.44	1707.1	14.70	-1	554.1	.51	11.02	45.99	3348.9	28.84	-1	2.94
518.	30622	EDAT	H	5COMP	-1	-1	-1	-1	-1	15.533	9.201	5.42	4.91	24.17	2395.64	22.40	2.87 4.15
519.	30700	VDES	WHIT	DAT	M-8	1981	80000	78815	CUM	FOR-350	350						
520.	30721	TDES	55000	135.8	EM-528-F	28.95	74.75	0.14	1.13	92.53							
521.	30721	EDAT	C	1NYNF	5.03	12.75	1790.2	13.37	-1	574.4	.45	11.20	28.39	3986.7	29.79	-1	2.50
522.	30721	EDAT	C	2LANF	5.17	14.60	3012.8	24.11	-1	959.9	1.11	4.69	13.13	2709.5	21.60	-1	3.70
523.	30721	EDAT	C	3LAF	5.04	28.29	5937.4	72.74	-1	1886.4	3.16	1.59	8.94	1876.9	23.00	-1	5.36
524.	30721	EDAT	C	4NYNF	5.07	11.10	1741.6	16.46	-1	558.3	.48	10.56	23.10	3623.1	34.25	-1	2.75
525.	30721	EDAT	C	5COMP	-1	-1	-1	-1	-1	11.324	8.774	5.20	3.90	12.82	2398.05	24.34	2.18 4.18
526.	30721	TDES	55000	135.8	EM-528-F	28.96	67.77	0.13	1.11	91.86							
527.	30721	EDAT	H	1NYNF	4.04	10.34	1667.1	15.37	-1	533.5	.45	9.00	23.04	3712.7	34.23	-1	2.69
528.	30721	EDAT	H	2LANF	3.71	13.94	2734.5	25.90	-1	870.7	1.11	3.34	12.55	2463.1	23.33	-1	4.08
529.	30721	EDAT	H	3LAF	5.07	22.14	5285.6	71.38	-1	1678.4	3.14	1.11	1.89	1672.2	22.44	-1	4.02

530.	30721	EDAT	H	4NYNF	4.22	9.54	1336.8	13.81	-1	429.4	.48	8.83	19.96	2795.9	28.89	-1	3.56
531.	30721	EDAT	H	5COMP	-1	-1	-1	-1	9.472	7.744	5.20	3.28	10.76	2121.47	24.34	1.82	4.73
532.	30722	TDES	55000	135.8	EM-528-F	28.98	67.	76.0	13.3	1.07	88.46						
533.	30722	EDAT	C	1NYNF	4.83	12.91	1873.3	14.18	-1	600.4	.47	10.21	27.29	3960.6	29.98	-1	2.52
534.	30722	EDAT	C	2LANF	5.04	14.15	3117.1	24.61	-1	992.4	1.15	4.37	12.27	2703.6	21.52	-1	3.72
535.	30722	EDAT	C	3LAF	4.35	23.73	6043.4	73.10	-1	1916.8	3.26	1.33	7.27	1851.9	22.40	-1	5.44
536.	30722	EDAT	C	4NYNF	4.73	10.25	1742.7	16.47	-1	557.9	.51	9.31	20.19	3433.0	32.45	-1	2.91
537.	30722	EDAT	C	5COMP	-1	-1	-1	-1	11.440	8.969	5.40	3.51	11.31	2367.33	23.82	2.12	4.24
538.	30722	TDES	55000	135.8	EM-528-F	28.99	67.	77.0	13.8	1.11	87.81						
539.	30722	EDAT	H	1NYNF	4.52	10.84	1650.7	15.34	-1	529.1	.49	9.28	22.25	3388.9	31.50	-1	2.94
540.	30722	EDAT	H	2LANF	6.10	12.46	2710.9	24.94	-1	864.9	1.16	5.26	10.73	2335.7	21.49	-1	4.29
541.	30722	EDAT	H	3LAF	3.87	22.64	5665.7	78.36	-1	1797.0	3.25	1.19	6.97	1743.0	24.11	-1	5.78
542.	30722	EDAT	H	4NYNF	4.56	9.49	1520.0	15.51	-1	487.3	.50	9.16	19.06	3053.6	31.16	-1	3.27
543.	30722	EDAT	H	5COMP	-1	-1	-1	-1	9.798	6.111	5.40	3.53	10.27	2139.93	24.86	1.82	4.69
544.	30800	VDES	GMC	RTS	A-3	1980	36000	163732	DDA	6V-71N	426						
545.	30831	TDES	28300	21.0	EM-455-F	29.06	45.	76.0	8.9	.94	96.63						
546.	30831	EDAT	C	1NYNF	1.90	108.14	1761.7	14.10	-1	612.3	.48	3.98	226.38	3686.0	29.52	-1	2.39
547.	30831	EDAT	C	2LANF	3.02	132.98	2521.4	19.08	-1	865.7	1.14	2.64	116.20	2203.2	17.37	-1	4.05
548.	30831	EDAT	C	3LAF	7.55	227.52	6054.3	46.63	-1	2033.5	2.71	2.79	83.99	2235.1	17.21	-1	4.08
549.	30831	EDAT	C	4NYNF	1.74	69.95	1379.1	11.97	-1	472.2	.54	3.24	130.54	2573.6	22.33	-1	3.47
550.	30831	EDAT	C	5COMP	-1	-1	-1	-1	45.223	8.784	4.87	2.92	110.67	2407.47	19.02	9.29	3.74
551.	30831	TDES	28300	21.0	EM-455-F	29.05	49.	77.0	10.0	.98	97.72						
552.	30831	EDAT	H	1NYNF	1.95	80.52	1513.8	13.53	-1	520.3	.54	3.64	150.27	2825.1	25.24	-1	3.15
553.	30831	EDAT	H	2LANF	2.73	100.21	2297.7	16.85	-1	782.5	1.16	2.35	93.13	1977.5	16.22	-1	4.55
554.	30831	EDAT	H	3LAF	6.60	196.64	5047.1	41.82	-1	1699.0	3.24	2.04	60.75	1559.2	12.92	-1	5.83
555.	30831	EDAT	H	4NYNF	1.50	64.53	1302.1	11.44	-1	445.0	.53	2.84	122.48	2471.3	21.71	-1	3.63
556.	30831	EDAT	H	5COMP	-1	-1	-1	-1	36.988	7.600	5.46	2.34	82.37	1860.40	15.68	6.77	4.85
557.	30831	TDES	28300	21.0	EM-455-F	29.02	52.	76.0	10.3	.99	98.07						
558.	30831	EDAT	B	BUS	11.10	373.90	6823.9	57.89	-1	2353.0	2.99	3.74	125.17	2284.4	19.38	-1	3.89
559.	30831	EDAT	B	5COMP	-1	-1	-1	-1	29.261	5.188	2.99	3.74	125.17	2284.41	19.38	9.80	3.89
560.	30832	TDES	28300	21.0	EM-455-F	28.96	67.	76.0	13.3	1.09	99.54						
561.	30832	EDAT	C	1INTNF	2.30	132.63	1883.7	16.62	-1	663.4	.47	4.85	280.15	3979.1	35.10	-1	2.19
562.	30832	EDAT	C	2LANF	3.20	142.64	2623.4	22.50	-1	902.9	1.15	2.78	123.76	2276.2	19.52	-1	3.91
563.	30832	EDAT	C	3LAF	7.65	236.37	6083.3	50.08	-1	2047.2	3.23	2.37	73.18	1883.3	15.50	-1	4.83
564.	30832	EDAT	C	4NYNF	1.92	76.13	1454.0	13.92	-1	500.1	.53	3.60	146.40	2724.3	26.08	-1	3.27
565.	30832	EDAT	C	5COMP	-1	-1	-1	-1	44.478	9.071	5.39	2.60	109.43	2234.69	19.13	8.25	4.01
566.	30832	TDES	28300	21.0	EM-455-F	28.94	70.	75.0	13.5	1.10	96.30						
567.	30832	EDAT	H	1NYNF	1.98	82.39	1504.1	14.44	-1	518.1	.52	3.79	157.78	2880.5	27.65	-1	3.09
568.	30832	EDAT	H	2LANF	2.98	114.79	2293.5	20.82	-1	784.7	1.18	2.52	97.08	1939.6	17.61	-1	4.61
569.	30832	EDAT	H	3LAF	7.00	194.25	5346.6	43.91	-1	1792.8	3.27	2.14	59.41	1635.1	13.43	-1	5.59
570.	30832	EDAT	H	4NYNF	2.10	61.36	1012.4	10.32	-1	352.5	.54	3.86	113.07	1865.5	19.02	-1	4.72
571.	30832	EDAT	H	5COMP	-1	-1	-1	-1	38.077	7.603	5.52	2.55	82.07	1840.91	16.22	6.90	4.90
572.	30832	TDES	28300	21.0	EM-455-F	28.88	74.	75.0	14.4	1.14	98.76						
573.	30832	EDAT	B	BUS	10.39	387.81	7187.2	65.93	-1	2473.9	2.96	3.51	130.95	2426.9	22.26	-1	3.67
574.	30832	EDAT	B	5COMP	-1	-1	-1	-1	30.197	5.455	2.96	3.51	130.95	2426.88	22.26	10.20	3.67
575.	30900	VDES	GMC	RTS	A-3	1980	36000	182119	DDA	6V-71N	426						
576.	30931	TDES	28300	21.0	EM-455-F	29.06	56.	77.0	11.5	1.03	95.58						
577.	30931	EDAT	C	1NYNF	2.75	43.62	1916.0	21.15	-1	629.8	.54	5.11	81.01	3558.6	39.27	-1	2.62
578.	30931	EDAT	C	2LANF	3.56	47.42	2611.3	27.74	-1	852.2	1.13	3.14	41.89	2306.8	24.51	-1	4.07
579.	30931	EDAT	C	3LAF	7.60	79.64	6150.4	70.30	-1	1990.5	3.29	2.31	24.23	1871.1	21.39	-1	5.06
580.	30931	EDAT	C	4NYNF	2.43	30.09	1471.0	17.42	-1	482.2	.54	4.46	55.26	2702.0	32.01	-1	3.46
581.	30931	EDAT	C	5COMP	-1	-1	-1	-1	16.183	8.720	5.50	2.97	36.49	2208.13	24.83	2.94	4.26
582.	30931	TDES	28300	21.0	EM-455-F	29.04	53.	78.0	11.3	1.02	24.67						
583.	30931	EDAT	H	1NYNF	2.18	33.67	1479.7	17.14	-1	486.4	.54	4.07	62.89	2763.5	32.01	-1	3.37
584.	30931	EDAT	H	2LANF	3.34	34.00	2303.6	25.10	-1	748.1	1.17	2.84	28.97	1963.1	21.39	-1	4.80
585.	30931	EDAT	H	3LAF	7.89	67.27	5584.8	64.73	-1	1805.9	3.30	2.39	20.42	1694.9	19.64	-1	5.59
586.	30931	EDAT	H	4NYNF	3.13	28.92	1265.6	15.64	-1	417.4	.54	5.84	53.93	2359.9	29.16	-1	3.93
587.	30931	EDAT	H	5COMP	-1	-1	-1	-1	13.448	7.625	5.54	2.98	29.58	1919.34	22.13	2.43	4.91
588.	30931	TDES	28300	21.0	EM-455-F	28.99	50.	84.0	12.9	1.08	95.84						
589.	30931	EDAT	B	BUS	12.57	163.88	7019.4	81.93	-1	2311.9	3.00	4.19	54.67	2341.5	27.33	-1	3.97
590.	30931	EDAT	B	5COMP	-1	-1	-1	-1	10.265	5.098	3.00	4.19	54.67	2341.46	27.33	3.42	3.97
591.	30932	TDES	28300	21.0	EM-455-F	29.12	59.	75.0	11.2	1.02	96.74						
592.	30932	EDAT	C	1NYNF	2.30	43.42	1853.7	21.66	-1	609.6	.51	4.55	85.96	3670.3	42.88	-1	2.54
593.	30932	EDAT	C	2LANF	3.02	44.25	2444.0	26.81	-1	797.2	1.15	2.63	38.49	2126.0	23.33	-1	4.42

594.	30932	EDAT	C	3LAF	7.32	77.11	5955.1	68.95	-1	1927.3	3.26	2.25	23.65	1626.5	21.15	-1	3.18
595.	30932	EDAT	C	4NYNF	2.31	24.76	1383.7	16.76	-1	451.8	.54	4.29	45.95	2567.8	31.10	-1	3.65
596.	30932	EDAT	C	5COMP	-1	-1	-1	-1	14.841	8.348	5.45	2.74	34.75	2133.60	24.60	2.72	4.41
597.	30932	TDES	28300	21.0	EM-455-F	29.12	55.75	10.5	.99	96.21							
598.	30932	EDAT	H	1NYNF	2.59	29.82	1406.4	17.25	-1	461.8	.54	4.83	55.70	2626.8	32.21	-1	3.55
599.	30932	EDAT	H	2LANF	3.28	30.03	2191.9	24.48	-1	710.8	1.17	2.79	25.59	1867.8	20.86	-1	5.06
600.	30932	EDAT	H	3LAF	7.55	59.83	5503.0	62.01	-1	1776.1	3.30	2.29	18.16	1670.1	18.82	-1	5.68
601.	30932	EDAT	H	4NYNF	2.47	23.87	1258.5	15.21	-1	412.0	.54	4.61	44.51	2346.8	28.37	-1	3.99
602.	30932	EDAT	H	5COMP	-1	-1	-1	-1	11.217	7.410	5.94	2.87	25.91	1869.92	21.47	2.02	5.05
603.	30932	TDES	28300	21.0	EM-455-F	29.13	52.76	10.3	.98	96.31							
604.	30932	EDAT	B	BUS	11.58	145.19	7065.0	80.33	-1	2316.0	3.01	3.85	48.23	2347.0	26.69	-1	3.98
605.	30932	EDAT	B	5COMP	-1	-1	-1	-1	9.405	5.107	3.01	3.85	48.23	2346.98	26.69	3.12	3.98
606.	31000	VDES	MACK	DAT	M-10	1981	78000	221936	MAC	EM6-285R	672						
607.	31021	TDES	55000	135.8	EM-528-F	29.16	61.73	10.1	1.01	89.29							
608.	31021	EDAT	C	1NYNF	2.23	9.22	1840.4	24.07	-1	585.6	.46	4.81	19.91	3973.6	51.97	-1	2.53
609.	31021	EDAT	C	2LANF	2.88	9.40	2708.6	35.10	-1	859.4	1.13	2.54	8.29	2389.1	30.96	-1	4.22
610.	31021	EDAT	C	3LAF	3.13	26.41	5816.1	77.68	-1	1845.4	3.04	1.03	8.68	1911.2	25.53	-1	5.27
611.	31021	EDAT	C	4NYNF	1.56	6.01	1575.2	23.30	-1	500.0	.50	3.14	12.13	3180.8	47.05	-1	3.17
612.	31021	EDAT	C	5COMP	-1	-1	-1	-1	33.657	8.358	5.14	1.91	9.94	2325.14	31.19	6.55	4.33
613.	31021	TDES	55000	135.8	EM-528-F	29.17	55.75	10.5	.99	93.94							
614.	31021	EDAT	H	1NYNF	1.53	7.14	1546.1	20.75	-1	491.3	.50	3.06	14.32	3100.6	41.61	-1	3.25
615.	31021	EDAT	H	2LANF	2.59	9.55	2640.0	34.13	-1	837.6	1.16	2.24	8.25	2281.3	29.49	-1	4.42
616.	31021	EDAT	H	3LAF	3.76	21.61	5826.2	74.79	-1	1846.9	3.21	1.17	6.73	1815.5	23.31	-1	5.56
617.	31021	EDAT	H	4NYNF	2.11	5.24	1065.8	14.71	-1	339.9	.50	4.21	10.48	2131.8	29.42	-1	4.70
618.	31021	EDAT	H	5COMP	-1	-1	-1	-1	13.725	7.752	5.36	1.86	8.12	2064.90	26.91	2.56	4.88
619.	31022	TDES	55000	135.8	EM-528-F	29.13	69.72	11.9	1.04	96.17							
620.	31022	EDAT	C	1NYNF	1.89	9.83	1845.5	23.83	-1	567.2	.48	3.98	20.66	3877.4	50.06	-1	2.59
621.	31022	EDAT	C	2LANF	2.62	10.61	2851.5	35.26	-1	904.7	1.15	2.28	9.24	2484.2	30.72	-1	4.06
622.	31022	EDAT	C	3LAF	3.60	21.89	6166.5	78.50	-1	1953.9	3.22	1.12	6.80	1915.2	24.38	-1	5.27
623.	31022	EDAT	C	4NYNF	1.80	8.09	1593.5	22.69	-1	507.0	.50	3.59	16.16	3182.1	45.31	-1	3.16
624.	31022	EDAT	C	5COMP	-1	-1	-1	-1	12.982	8.716	5.34	1.85	9.44	2330.86	29.99	2.43	4.32
625.	31022	TDES	55000	135.8	EM-528-F	29.14	74.75	14.2	1.13	92.19							
626.	31022	EDAT	H	1NYNF	1.56	7.56	1529.7	23.34	-1	486.4	.48	3.27	15.82	3202.4	48.85	-1	3.14
627.	31022	EDAT	H	2LANF	2.72	8.47	2251.2	33.26	-1	715.0	1.15	2.36	7.34	1950.4	28.82	-1	5.16
628.	31022	EDAT	H	3LAF	3.81	17.81	5164.7	74.74	-1	1637.0	3.23	1.18	5.51	1599.4	23.15	-1	6.31
629.	31022	EDAT	H	4NYNF	1.72	6.35	1324.5	21.63	-1	421.4	.49	3.52	13.01	2714.4	44.32	-1	3.70
630.	31022	EDAT	H	5COMP	-1	-1	-1	-1	11.395	7.188	5.35	1.83	7.51	1919.97	28.60	2.13	5.25
631.	31100	VDES	MACK	DAT	M-10	1980	78000	240732	MAC	EM6-285	672						
632.	31121	TDES	55000	135.8	EM-528-F	29.05	58.73	10.3	.99	93.64							
633.	31121	EDAT	C	1NYNF	1.64	12.24	1752.4	18.18	-1	558.9	.50	3.31	24.66	3529.5	36.62	-1	2.84
634.	31121	EDAT	C	2LANF	2.65	11.49	2917.7	27.68	-1	926.0	1.18	2.25	9.75	2476.4	23.50	-1	4.07
635.	31121	EDAT	C	3LAF	2.97	16.75	6426.8	63.51	-1	2032.6	3.28	.90	5.10	1958.1	19.35	-1	5.16
636.	31121	EDAT	C	4NYNF	1.20	9.39	1617.5	18.00	-1	514.6	.53	2.27	17.74	3055.2	34.00	-1	3.29
637.	31121	EDAT	C	5COMP	-1	-1	-1	-1	16.432	8.891	5.49	1.54	9.09	2317.46	23.22	3.00	4.35
638.	31121	TDES	55000	135.8	EM-528-F	29.00	58.74	10.8	1.00	93.60							
639.	31121	EDAT	H	1NYNF	1.52	9.41	1603.1	17.30	-1	510.4	.50	3.03	18.72	3187.6	34.39	-1	3.15
640.	31121	EDAT	H	2LANF	2.70	9.79	2677.8	27.53	-1	849.7	1.16	2.33	8.43	2308.0	23.73	-1	4.37
641.	31121	EDAT	H	3LAF	2.94	16.71	6087.1	62.00	-1	1925.7	3.26	.90	5.13	1869.9	19.05	-1	5.41
642.	31121	EDAT	H	4NYNF	1.36	8.36	1506.2	16.25	-1	479.2	.52	2.63	16.16	2913.2	31.43	-1	3.45
643.	31121	EDAT	H	5COMP	-1	-1	-1	-1	15.306	8.302	5.44	1.57	8.14	2184.58	22.64	2.82	4.62
644.	31122	TDES	55000	135.8	EM-528-F	29.00	70.75	13.5	1.10	95.65							
645.	31122	EDAT	C	1NYNF	1.98	13.64	1744.6	20.01	-1	557.4	.47	4.23	29.07	3718.7	42.65	-1	2.69
646.	31122	EDAT	C	2LANF	2.46	11.05	2712.1	29.56	-1	860.9	1.13	2.17	9.74	2391.3	26.06	-1	4.21
647.	31122	EDAT	C	3LAF	2.95	17.06	6453.7	70.87	-1	2041.2	3.25	.91	5.25	1986.2	21.81	-1	5.09
648.	31122	EDAT	C	4NYNF	1.14	8.29	1556.8	19.24	-1	494.9	.52	2.21	16.02	3008.6	37.18	-1	3.34
649.	31122	EDAT	C	5COMP	-1	-1	-1	-1	15.283	8.719	5.37	1.59	9.32	2321.62	26.01	2.85	4.34
650.	31122	TDES	55000	135.8	EM-528-F	29.01	70.75	13.5	1.10	94.59							
651.	31122	EDAT	H	1NYNF	1.48	9.45	1530.4	18.29	-1	487.5	.50	2.97	19.00	3077.0	36.78	-1	3.26
652.	31122	EDAT	H	2LANF	2.42	11.02	2700.4	29.40	-1	857.2	1.16	2.09	9.51	2330.1	25.37	-1	4.32
653.	31122	EDAT	H	3LAF	2.57	10.49	6221.6	64.20	-1	1968.5	3.21	.80	5.77	1940.8	20.03	-1	5.21
654.	31122	EDAT	H	4NYNF	1.40	9.53	1561.5	18.15	-1	497.2	.50	2.81	19.09	3128.9	36.38	-1	3.21
655.	31122	EDAT	H	5COMP	-1	-1	-1	-1	15.877	8.402	5.36	1.47	9.04	2240.95	24.26	2.96	4.50
656.	31200	VDES	KENW	DAT	M-10	1976	78000	100000	CAT	3406	893						
657.	31221	TDES	55000	135.8	EM-528-F	29.11	70.75	13.5	1.10	96.11							
658.	31221	EDAT	C	1NYNF	5.62	32.97	2106.3	21.43	-1	684.4	.48	11.61	68.17	4354.8	44.30	-1	2.26
659.	31221	EDAT	C	2LANF	5.73	26.45	3100.4	35.00	-1	993.9	1.13	5.05	23.33	2734.7	30.87	-1	3.65
660.	31221	EDAT	C	3LAF	4.60	39.25	6620.2	75.07	-1	2108.7	3.20	1.44	12.26	2070.7	23.45	-1	4.85

661.	31221	EDAT	C	4NYNF	2.14	15.43	1566.1	19.02	-1	502.3	.40	5.37	30.78	3937.6	47.82	-1	2.53
662.	31221	EDAT	C	5COMP	-1	-1	-1	-1	25.992	9.450	5.22	3.47	21.87	2569.14	20.85	4.98	3.89
663.	31221	TDES	55000	135.8	EM-528-F	29.12	83.76	16.5	1.23	95.09							
664.	31221	EDAT	H	1NYNF	2.59	20.60	1710.5	21.72	-1	550.8	.47	5.49	43.71	3629.5	46.09	-1	2.74
665.	31221	EDAT	H	2LANF	3.04	27.75	2992.3	36.10	-1	958.7	1.15	3.34	24.10	2598.2	31.35	-1	3.04
666.	31221	EDAT	H	3LAF	4.06	35.94	6280.7	77.60	-1	1997.2	3.17	1.28	11.35	1983.6	24.53	-1	5.07
667.	31221	EDAT	H	4NYNF	2.30	15.01	1714.5	23.57	-1	549.4	.49	4.71	32.35	3507.6	48.21	-1	2.85
668.	31221	EDAT	H	5COMP	-1	-1	-1	-1	22.389	8.944	5.28	2.42	18.97	2405.79	30.14	4.24	4.16
669.	31222	TDES	55000	135.8	EM-528-F	29.11	82.74	15.3	1.10	95.88							
670.	31222	EDAT	C	1NYNF	5.52	37.50	2090.1	22.91	-1	681.4	.48	11.41	77.59	4325.2	47.40	-1	2.27
671.	31222	EDAT	C	2LANF	5.60	29.56	3191.3	36.29	-1	1023.9	1.14	4.91	25.89	2794.9	31.78	-1	3.57
672.	31222	EDAT	C	3LAF	4.40	38.42	6609.4	79.70	-1	2102.2	3.16	1.42	12.16	2091.1	25.21	-1	4.81
673.	31222	EDAT	C	4NYNF	2.38	18.44	1725.6	21.35	-1	554.2	.52	4.60	35.70	3340.2	41.32	-1	2.98
674.	31222	EDAT	C	5COMP	-1	-1	-1	-1	27.941	9.610	5.30	3.39	23.37	2567.92	30.22	5.27	3.89
675.	31222	TDES	55000	135.8	EM-528-F	29.12	78.75	15.0	1.17	94.50							
676.	31222	EDAT	H	1NYNF	2.63	21.79	1784.0	22.72	-1	574.0	.49	5.38	44.62	3694.6	46.51	-1	2.72
677.	31222	EDAT	H	2LANF	4.31	26.25	2975.3	35.26	-1	953.1	1.15	3.75	22.82	2586.4	30.65	-1	3.86
678.	31222	EDAT	H	3LAF	4.23	37.35	6433.6	78.84	-1	2046.2	3.17	1.34	11.70	2029.7	24.87	-1	4.95
679.	31222	EDAT	H	4NYNF	2.23	16.47	1717.0	21.91	-1	550.4	.50	4.43	32.70	3408.2	43.50	-1	2.93
680.	31222	EDAT	H	5COMP	-1	-1	-1	-1	25.022	9.094	5.31	2.52	19.17	2430.33	29.88	4.71	4.12
681.	31300	VDES	KENW	DAT	M-13	1982	78000	180216	CAT	3406	093						
682.	31321	TDES	55000	135.8	EM-528-F	29.11	58.74	10.7	1.00	91.16							
683.	31321	EDAT	C	1NYNF	5.95	33.77	2215.6	25.67	-1	719.5	.50	12.01	68.14	4470.0	51.00	-1	2.20
684.	31321	EDAT	C	2LANF	4.50	23.72	3226.7	42.64	-1	1031.1	1.14	4.02	20.82	2032.2	37.43	-1	3.53
685.	31321	EDAT	C	3LAF	3.12	23.09	6771.9	90.51	-1	2144.0	3.20	.97	7.46	2115.0	28.27	-1	4.77
686.	31321	EDAT	C	4NYNF	1.82	11.48	1790.6	27.51	-1	570.7	.53	3.44	21.74	3390.3	52.08	-1	2.96
687.	31321	EDAT	C	5COMP	-1	-1	-1	-1	16.766	9.848	5.36	2.88	17.31	2610.43	34.73	3.13	3.84
688.	31321	TDES	55000	135.8	EM-528-F	29.10	64.79	14.1	1.12	92.72							
689.	31321	EDAT	H	1NYNF	2.03	12.97	1803.2	29.25	-1	575.6	.52	3.88	24.79	3444.9	55.88	-1	2.91
690.	31321	EDAT	H	2LANF	2.92	15.56	3002.4	40.60	-1	980.1	1.16	2.52	13.43	2660.6	41.95	-1	3.78
691.	31321	EDAT	H	3LAF	3.37	23.08	6760.5	101.72	-1	2141.1	3.24	1.04	7.11	2083.6	31.35	-1	4.85
692.	31321	EDAT	H	4NYNF	1.89	11.33	1679.7	28.34	-1	535.0	.51	3.69	22.15	3284.1	55.40	-1	3.05
693.	31321	EDAT	H	5COMP	-1	-1	-1	-1	12.252	9.333	5.44	1.88	11.58	2450.48	30.23	2.25	4.11
694.	31322	TDES	55000	135.8	EM-528-F	29.12	70.74	12.9	1.08	96.24							
695.	31322	EDAT	C	1NYNF	5.55	31.95	2367.3	29.35	-1	765.9	.53	10.54	60.69	4496.7	55.75	-1	2.20
696.	31322	EDAT	C	2LANF	3.93	24.18	3553.5	47.49	-1	1133.5	1.18	3.32	20.42	3000.0	40.10	-1	3.34
697.	31322	EDAT	C	3LAF	2.79	24.77	7759.6	104.84	-1	2455.6	3.29	.85	7.54	2360.1	31.89	-1	4.28
698.	31322	EDAT	C	4NYNF	1.73	12.86	1882.4	29.07	-1	600.1	.51	3.37	24.98	3655.0	56.46	-1	2.74
699.	31322	EDAT	C	5COMP	-1	-1	-1	-1	17.478	10.926	5.51	2.54	17.01	2822.75	30.23	3.17	3.56
700.	31322	TDES	55000	135.8	EM-528-F	29.14	79.77	16.2	1.22	94.09							
701.	31322	EDAT	H	1NYNF	2.05	18.47	1900.0	30.96	-1	608.0	.53	3.84	34.70	3568.6	50.15	-1	2.80
702.	31322	EDAT	H	2LANF	2.90	16.51	3198.6	52.50	-1	1017.1	1.18	2.47	14.04	2721.7	44.68	-1	3.70
703.	31322	EDAT	H	3LAF	3.30	23.24	7629.6	114.75	-1	2414.5	3.27	1.04	7.12	2336.7	35.14	-1	4.32
704.	31322	EDAT	H	4NYNF	1.70	12.10	1876.3	31.80	-1	597.8	.51	3.31	23.61	3662.3	62.07	-1	2.74
705.	31322	EDAT	H	5COMP	-1	-1	-1	-1	14.800	10.227	5.49	1.83	12.82	2662.58	41.93	2.70	3.78
706.	31400	VDES	WHIT	DAT	M-9	1982	78000	57755	CUM	FOR-350	855						
707.	31421	TDES	55000	135.8	EM-528-F	29.36	56.77	11.3	1.02	93.33							
708.	31421	EDAT	C	1NYNF	4.54	12.32	1707.0	11.28	-1	547.5	.44	10.28	27.90	3064.1	25.54	-1	2.50
709.	31421	EDAT	C	2LANF	4.44	13.70	2933.4	21.91	-1	933.8	1.14	3.08	11.99	2567.1	19.10	-1	3.91
710.	31421	EDAT	C	3LAF	5.73	32.39	6110.1	69.22	-1	1946.0	3.22	1.78	10.05	1897.6	21.47	-1	5.30
711.	31421	EDAT	C	4NYNF	4.12	9.45	1545.5	12.26	-1	494.9	.48	8.63	19.81	3241.1	25.71	-1	3.08
712.	31421	EDAT	C	5COMP	-1	-1	-1	-1	11.619	8.648	5.29	3.56	12.84	2327.91	21.70	2.20	4.31
713.	31421	TDES	55000	135.8	EM-528-F	29.34	61.81	14.3	1.13	91.97							
714.	31421	EDAT	H	1NYNF	3.46	10.57	1630.9	15.83	-1	521.6	.51	6.77	20.67	3180.7	30.96	-1	3.14
715.	31421	EDAT	H	2LANF	4.72	12.66	2653.5	25.91	-1	845.5	1.16	4.06	10.89	2202.8	22.29	-1	4.40
716.	31421	EDAT	H	3LAF	3.35	31.40	5960.9	79.12	-1	1893.7	3.25	1.03	9.70	1836.4	24.37	-1	5.48
717.	31421	EDAT	H	4NYNF	3.00	11.38	1649.0	17.17	-1	528.1	.52	7.34	22.00	3186.7	33.19	-1	3.13
718.	31421	EDAT	H	5COMP	-1	-1	-1	-1	10.309	8.355	5.44	2.82	12.16	2107.50	25.39	1.90	4.59
719.	31422	TDES	55000	135.8	EM-528-F	29.33	74.74	13.6	1.10	92.17							
720.	31422	EDAT	C	1NYNF	4.63	11.73	1769.0	12.50	-1	566.8	.46	10.02	25.40	3030.1	27.07	-1	2.61
721.	31422	EDAT	C	2LANF	4.47	12.34	2059.4	22.23	-1	909.9	1.14	3.92	10.81	2505.1	19.40	-1	4.01
722.	31422	EDAT	C	3LAF	5.91	30.90	5969.2	71.71	-1	1898.6	3.32	1.78	9.31	1797.0	21.63	-1	5.59
723.	31422	EDAT	C	4NYNF	4.07	10.29	1685.1	14.63	-1	539.1	.51	7.96	20.14	3297.3	28.63	-1	3.03
724.	31422	EDAT	C	5COMP	-1	-1	-1	-1	12.776	8.631	5.43	3.51	12.01	2260.07	22.30	2.35	4.44
725.	31422	TDES	55000	135.8	EM-528-F	29.34	65.80	14.5	1.14	92.65							
726.	31422	EDAT	H	1NYNF	3.50	11.15	1669.3	15.53	-1	534.0	.51	6.85	21.01	3263.7	30.37	-1	3.06

727.	31422	EDAT	H	2LANF	4.24	11.36	2597.9	24.41	-1	826.9	1.16	3.67	9.83	2249.1	21.13	-1	4.47	
728.	31422	EDAT	H	3LAF	3.71	29.24	5882.4	74.12	-1	1843.1	3.21	1.15	9.89	1885.8	29.86	-1	5.58	
729.	31422	EDAT	H	4NYNF	3.75	10.74	1649.3	15.54	-1	527.8	.51	7.38	28.88	3285.8	38.28	-1	3.12	
730.	31422	EDAT	H	5COMP	-1	-1	-1	-1	-1	10.987	8.229	5.48	2.82	11.58	2171.87	24.82	2.82	4.62
731.	31500	VDES	IMCT	DAT	M-8	1979	88888	176888	CUM	FOR-358	369							
732.	31521	TDES	56888	135.8	EM-528-F	29.24	63.77	12.9	1.88	95.83								
733.	31521	EDAT	C	1NYNF	5.53	62.82	2288.6	13.26	-1	756.4	.51	10.88	123.45	4497.1	26.86	-1	2.15	
734.	31521	EDAT	C	2LANF	4.47	46.38	3443.2	21.94	-1	1110.3	1.16	3.86	39.99	2968.8	18.92	-1	3.34	
735.	31521	EDAT	C	3LAF	5.49	57.68	6878.2	71.28	-1	2197.3	3.33	1.65	17.32	2865.2	21.38	-1	4.85	
736.	31521	EDAT	C	4NYNF	3.96	35.83	1958.8	14.45	-1	635.2	.52	7.68	68.72	3742.8	37.72	-1	2.62	
737.	31521	EDAT	C	5COMP	-1	-1	-1	-1	-1	25.826	18.362	5.52	3.52	36.72	2637.53	21.89	4.53	3.76
738.	31521	TDES	56888	138.8	EM-528-F	29.24	63.77	12.9	1.88	95.83								
739.	31521	EDAT	H	1NYNF	4.85	44.64	2881.7	15.89	-1	655.7	.53	7.59	83.71	3753.6	28.38	-1	2.68	
740.	31521	EDAT	H	2LANF	4.77	31.87	3353.2	24.48	-1	1875.2	1.28	3.99	26.65	2884.3	28.47	-1	3.56	
741.	31521	EDAT	H	3LAF	5.96	74.17	6447.4	81.28	-1	2878.4	3.27	1.82	22.69	1972.6	24.87	-1	5.85	
742.	31521	EDAT	H	4NYNF	3.58	41.38	1971.8	16.87	-1	644.2	.53	6.78	77.28	3685.6	38.83	-1	2.66	
743.	31521	EDAT	H	5COMP	-1	-1	-1	-1	-1	24.196	9.882	5.53	3.32	34.78	2489.65	24.75	4.37	3.98
744.	31522	TDES	56888	138.8	EM-528-F	29.19	78.736	15.6	1.19	96.71								
745.	31522	EDAT	C	1NYNF	5.41	47.42	2267.8	14.29	-1	742.1	.51	10.65	93.42	4467.5	28.16	-1	2.19	
746.	31522	EDAT	C	2LANF	5.15	29.34	3588.5	25.69	-1	1145.8	1.28	4.38	24.51	2991.2	21.46	-1	3.34	
747.	31522	EDAT	C	3LAF	4.98	53.75	6666.9	88.89	-1	2128.3	3.33	1.47	16.12	1999.9	24.83	-1	5.81	
748.	31522	EDAT	C	4NYNF	3.37	34.18	1967.4	15.68	-1	639.8	.58	6.75	68.33	3942.8	31.26	-1	2.58	
749.	31522	EDAT	C	5COMP	-1	-1	-1	-1	-1	22.131	18.265	5.54	3.48	29.73	2615.46	24.58	4.88	3.88
750.	31522	TDES	56888	138.8	EM-528-F	29.19	71.78	15.1	1.17	95.89								
751.	31522	EDAT	H	1NYNF	4.19	44.76	1969.7	14.22	-1	645.8	.54	7.72	82.41	3626.7	26.18	-1	2.69	
752.	31522	EDAT	H	2LANF	4.88	34.81	3174.2	22.85	-1	1828.8	1.19	4.89	28.51	2661.3	19.16	-1	3.74	
753.	31522	EDAT	H	3LAF	5.63	49.88	6624.2	77.48	-1	2113.3	3.33	1.69	14.75	1998.7	23.28	-1	5.84	
754.	31522	EDAT	H	4NYNF	3.34	32.48	1848.9	14.72	-1	688.9	.55	6.18	59.23	3388.3	26.91	-1	2.91	
755.	31522	EDAT	H	5COMP	-1	-1	-1	-1	-1	22.898	9.658	5.61	3.22	28.56	2427.18	23.84	3.94	4.18
756.	31600	VDES	IMCT	DAT	M-8	1979	78888	147887	CUM	FOR-298	855							
757.	31621	TDES	55888	134.5	EM-528-F	29.38	91.76	18.1	1.32	98.41								
758.	31621	EDAT	C	1NYNF	3.38	15.88	2247.4	28.84	-1	717.7	.48	7.88	31.18	4658.9	43.28	-1	2.15	
759.	31621	EDAT	C	2LANF	3.17	18.87	3386.4	35.68	-1	1873.2	1.16	2.73	8.67	2916.6	38.73	-1	3.46	
760.	31621	EDAT	C	3LAF	2.95	13.72	7227.8	118.99	-1	2282.7	3.29	.98	4.17	2196.7	36.17	-1	4.61	
761.	31621	EDAT	C	4NYNF	2.49	9.28	1976.8	22.64	-1	628.8	.51	4.86	17.94	3855.1	44.16	-1	2.61	
762.	31621	EDAT	C	5COMP	-1	-1	-1	-1	-1	15.734	18.369	5.45	2.28	8.81	2724.39	36.39	2.89	3.78
763.	31621	TDES	55888	134.5	EM-528-F	29.32	95.75	18.3	1.33	92.22								
764.	31621	EDAT	H	1NYNF	3.86	14.14	1848.9	28.38	-1	589.8	.58	6.16	28.42	3781.3	48.97	-1	2.78	
765.	31621	EDAT	H	2LANF	3.39	9.55	3832.8	34.75	-1	961.7	1.17	2.89	8.16	2589.4	29.68	-1	3.89	
766.	31621	EDAT	H	3LAF	3.13	15.96	6931.8	114.42	-1	2198.9	3.24	.96	4.92	2138.1	35.38	-1	4.73	
767.	31621	EDAT	H	4NYNF	2.82	12.99	1939.3	22.86	-1	619.2	.52	5.47	25.17	3757.8	44.28	-1	2.67	
768.	31621	EDAT	H	5COMP	-1	-1	-1	-1	-1	11.554	9.616	5.43	2.29	9.78	2532.78	35.46	2.13	3.98
769.	31622	TDES	55888	134.5	EM-528-F	29.31	83.76	16.3	1.23	88.73								
770.	31622	EDAT	C	1NYNF	-1	13.87	2123.1	18.58	-1	673.3	.47	-1	29.73	4558.5	39.82	-1	2.22	
771.	31622	EDAT	C	2LANF	-1	11.28	3645.1	37.51	-1	1158.3	1.28	-1	9.37	3825.7	31.13	-1	3.35	
772.	31622	EDAT	C	3LAF	-1	13.48	3788.6	118.33	-1	2325.9	3.38	-1	4.85	2232.6	35.81	-1	4.54	
773.	31622	EDAT	C	4NYNF	-1	11.51	1994.8	22.84	-1	631.5	.51	-1	22.45	3888.7	44.55	-1	2.68	
774.	31622	EDAT	C	5COMP	-1	-1	-1	-1	-1	13.812	18.542	5.49	-1	9.12	2758.48	35.94	2.52	3.67
775.	31622	TDES	55888	134.5	EM-528-F	29.33	83.77	16.9	1.26	87.97								
776.	31622	EDAT	H	1NYNF	2.48	15.64	2818.8	21.75	-1	642.4	.52	4.78	38.14	3874.7	41.93	-1	2.58	
777.	31622	EDAT	H	2LANF	2.81	11.11	3286.2	36.47	-1	1816.9	1.22	2.31	9.13	2635.2	29.98	-1	3.83	
778.	31622	EDAT	H	3LAF	2.45	15.78	7155.7	119.25	-1	2268.8	3.35	.73	4.71	2135.9	35.59	-1	4.74	
779.	31622	EDAT	H	4NYNF	2.23	11.69	2844.7	24.82	-1	651.1	.54	4.16	21.84	3818.8	44.86	-1	2.63	
780.	31622	EDAT	H	5COMP	-1	-1	-1	-1	-1	11.983	18.879	5.62	1.77	9.65	2564.71	35.85	2.12	3.93
781.	31623	TDES	55888	134.5	EM-528-F	29.18	68.77	12.2	1.85	89.28								
782.	31623	EDAT	C	1NYNF	3.42	12.86	2136.1	17.68	-1	681.2	.48	7.12	25.11	4447.9	36.65	-1	2.25	
783.	31623	EDAT	C	2LANF	2.98	8.23	3478.8	33.54	-1	1181.1	1.19	2.43	6.89	2913.5	28.89	-1	3.47	
784.	31623	EDAT	C	3LAF	2.79	13.46	6815.8	188.18	-1	2152.9	3.14	.89	4.29	2178.5	31.88	-1	4.66	
785.	31623	EDAT	C	4NYNF	2.46	8.39	1855.8	28.88	-1	598.3	.52	4.74	16.18	3577.4	38.55	-1	2.81	
786.	31623	EDAT	C	5COMP	-1	-1	-1	-1	-1	12.559	9.979	5.33	2.17	7.98	2678.88	32.11	2.36	3.77
787.	31623	TDES	55888	134.5	EM-528-F	29.18	65.88	14.6	1.15	91.54								
788.	31623	EDAT	H	1NYNF	2.78	18.81	1949.8	21.45	-1	621.1	.52	5.21	28.82	3754.1	41.32	-1	2.67	
789.	31623	EDAT	H	2LANF	3.81	8.18	3888.9	34.28	-1	976.8	1.18	2.55	6.86	2687.4	29.81	-1	3.87	
790.	31623	EDAT	H	3LAF	3.12	15.31	6985.5	118.43	-1	2182.6	3.27	.96	4.68	2112.2	39.78	-1	4.79	
791.	31623	EDAT	H	4NYNF	2.81	18.82	1898.9	22.18	-1	682.5	.52	5.38	19.18	3618.2	42.29	-1	2.77	
792.	31623	EDAT	H	5COMP	-1	-1	-1	-1	-1	18.846	9.663	5.49	2.12	8.85	2517.18	34.28	1.97	4.81

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793. 31700 VDES KENW DAT M-8 1981 78000 158740 CUM FOR-350 855
794. 31721 TDES 54000 134.5 EM-528-F 29.37 60. 78.0 12.6 1.07 92.93
795. 31721 EDAT C 1NYNF 4.50 10.36 1652.1 12.02 -1 529.2 .44 10.24 23.54 3754.2 27.31 -1 2.66
796. 31721 EDAT C 2LANF 5.65 12.50 2934.8 23.17 -1 934.9 1.14 4.96 10.98 2578.0 20.35 -1 3.89
797. 31721 EDAT C 3LAF 4.49 24.51 5600.3 64.54 -1 1778.0 3.06 1.47 8.00 1828.0 21.06 -1 5.51
798. 31721 EDAT C 4NYNF 4.20 9.79 1626.3 14.47 -1 520.5 .50 8.40 19.58 3253.0 28.95 -1 3.07
799. 31721 EDAT C 5COMP -1 -1 -1 -1 14.331 8.297 5.14 3.66 11.11 2297.39 22.21 2.79 4.37
800. 31721 TDES 54000 134.5 EM-528-F 29.39 58. 81.0 13.4 1.10 98.73
801. 31721 EDAT H 1NTNF 4.00 7.87 1436.6 12.51 -1 459.7 .44 9.03 17.77 3242.6 28.24 -1 3.08
802. 31721 EDAT H 2LANF 4.55 12.77 2619.8 25.54 -1 834.8 1.16 3.93 11.01 2258.9 22.02 -1 4.44
803. 31721 EDAT H 3LAF 3.63 24.05 5706.1 77.30 -1 1810.2 3.22 1.13 7.47 1772.2 24.01 -1 5.69
804. 31721 EDAT H 4NYNF 3.82 8.78 1535.6 14.70 -1 491.1 .49 7.81 17.97 3141.4 30.07 -1 3.10
805. 31721 EDAT H 5COMP -1 -1 -1 -1 10.389 7.929 5.31 3.01 10.07 2127.12 24.49 1.96 4.72
806. 31722 TDES 54000 134.5 EM-528-F 29.27 78. 76.0 15.5 1.19 95.78
807. 31722 EDAT C 1NYNF 3.93 10.78 1703.0 13.40 -1 545.1 .44 8.92 24.44 3864.3 30.56 -1 2.59
808. 31722 EDAT C 2LANF 4.50 12.59 2849.6 23.95 -1 907.0 1.10 4.09 11.46 2593.8 21.80 -1 3.87
809. 31722 EDAT C 3LAF 4.46 24.71 5806.1 73.12 -1 1842.8 3.15 1.41 7.84 1841.1 23.19 -1 5.47
810. 31722 EDAT C 4NYNF 3.87 8.96 1494.3 13.99 -1 476.3 .48 8.12 18.80 3133.8 29.33 -1 3.19
811. 31722 EDAT C 5COMP -1 -1 -1 -1 12.650 8.320 5.17 3.24 11.03 2292.86 24.09 2.45 4.38
812. 31722 TDES 54000 134.5 EM-528-F 29.28 74. 75.0 14.1 1.13 94.58
813. 31722 EDAT H 1NYNF 3.13 7.01 1263.8 12.18 -1 404.1 .46 6.85 15.37 2772.2 26.72 -1 3.61
814. 31722 EDAT H 2LANF 3.24 12.75 2625.0 24.92 -1 835.1 1.13 2.87 11.29 2323.2 22.05 -1 4.33
815. 31722 EDAT H 3LAF 3.11 25.56 5777.8 80.37 -1 1832.9 3.16 .98 8.09 1829.2 25.45 -1 5.51
816. 31722 EDAT H 4NYNF 3.71 9.24 1538.3 15.05 -1 492.1 .48 7.81 19.45 3237.6 31.67 -1 3.09
817. 31722 EDAT H 5COMP -1 -1 -1 -1 11.567 7.859 5.22 2.53 10.45 2146.70 25.39 2.22 4.60
818. 31800 VDES FORD DAT M-7 1981 80000 38000 CUM NTC-300 855
819. 31821 TDES 57000 138.2 EM-528-F 29.63 32. 73.0 5.6 .86 90.27
820. 31821 EDAT C 1NYNF 3.29 9.48 1848.1 14.05 -1 589.2 .49 6.74 19.41 3784.2 28.78 -1 2.65
821. 31821 EDAT C 2LANF 4.04 9.81 2850.8 22.49 -1 905.9 1.10 3.67 8.90 2587.8 20.41 -1 3.89
822. 31821 EDAT C 3LAF 5.22 13.84 5979.9 71.70 -1 1892.8 3.12 1.67 4.43 1914.9 22.96 -1 5.28
823. 31821 EDAT C 4NYNF 2.73 6.95 1532.8 13.95 -1 488.3 .50 5.44 13.87 3058.2 27.04 -1 3.28
824. 31821 EDAT C 5COMP -1 -1 -1 -1 8.885 8.454 5.21 2.93 7.69 2342.09 23.44 1.70 4.30
825. 31821 TDES 57000 138.2 EM-528-F 29.64 30. 74.0 5.4 .85 89.69
826. 31821 EDAT H 1NYNF 2.74 8.23 1554.6 14.46 -1 495.8 .48 5.76 17.29 3266.2 30.37 -1 3.07
827. 31821 EDAT H 2LANF 3.67 8.99 2550.4 23.66 -1 810.3 1.07 3.42 8.38 2376.9 22.05 -1 4.23
828. 31821 EDAT H 3LAF 3.00 14.40 5997.8 81.97 -1 1896.5 3.09 .97 4.66 1942.8 26.55 -1 5.21
829. 31821 EDAT H 4NYNF 2.21 6.53 1613.6 15.88 -1 512.9 .49 4.49 13.29 383.00 32.31 -1 3.06
830. 31821 EDAT H 5COMP -1 -1 -1 -1 6.592 8.193 5.13 2.27 7.44 2284.98 26.52 1.29 4.41
831. 31822 TDES 57000 138.2 EM-528-F 29.56 40. 70.0 6.4 .87 89.26
832. 31822 EDAT C 1NYNF 3.25 8.92 1840.4 15.01 -1 586.5 .47 6.89 16.92 3905.2 31.05 -1 2.93
833. 31822 EDAT C 2LANF 4.61 9.30 2946.9 24.40 -1 936.1 1.10 4.21 8.48 2687.6 22.33 -1 4.28
834. 31822 EDAT C 3LAF 6.84 13.78 6259.3 78.64 -1 1982.3 3.16 2.17 4.37 1983.5 24.92 -1 5.81
835. 31822 EDAT C 4NYNF 3.28 7.34 1700.8 16.31 -1 541.8 .51 6.38 14.25 3303.2 31.60 -1 3.47
836. 31822 EDAT C 5COMP -1 -1 -1 -1 8.433 8.923 5.24 3.43 7.51 2433.49 25.67 1.61 4.73
837. 31822 TDES 57000 138.2 EM-528-F 29.57 30. 77.0 5.9 .86 87.90
838. 31822 EDAT H 1NYNF 2.96 8.09 1629.0 15.23 -1 519.3 .49 5.99 16.37 3297.9 30.03 -1 3.04
839. 31822 EDAT H 2LANF 3.91 8.95 2724.5 25.99 -1 865.2 1.11 3.51 8.03 2444.6 23.32 -1 4.12
840. 31822 EDAT H 3LAF 3.89 13.81 6302.5 87.45 -1 1993.0 3.18 1.23 4.35 1983.2 27.52 -1 5.10
841. 31822 EDAT H 4NYNF 2.73 7.04 1660.9 16.71 -1 528.6 .51 5.35 13.80 3255.4 32.76 -1 3.09
842. 31822 EDAT H 5COMP -1 -1 -1 -1 7.090 8.613 5.30 2.55 7.15 2325.45 27.45 1.34 4.34
843. 31900 VDES GNC DAT M-9 1980 80000 81878 CUM NTC-300 855
844. 31921 TDES 57000 138.2 EM-528-F 29.30 71. 77.0 14.4 1.14 90.20
845. 31921 EDAT C 1NYNF 3.77 12.54 1928.8 15.45 -1 616.6 .45 8.34 27.73 4267.0 34.10 -1 2.34
846. 31921 EDAT C 2LANF 5.90 12.67 3287.8 29.14 -1 1046.2 1.11 5.31 11.40 2958.0 26.21 -1 3.40
847. 31921 EDAT C 3LAF 6.91 17.81 6478.4 85.35 -1 2053.3 3.12 2.21 5.70 2073.7 27.32 -1 4.87
848. 31921 EDAT C 4NYNF 4.46 10.28 1694.9 15.85 -1 542.6 .50 8.93 20.60 3396.1 31.75 -1 2.94
849. 31921 EDAT C 5COMP -1 -1 -1 -1 17.300 9.390 5.19 4.06 10.28 2581.63 28.11 3.34 3.89
850. 31921 TDES 57000 138.2 EM-528-F 29.30 71. 77.0 14.4 1.14 93.29
851. 31921 EDAT H 1NYNF 3.59 11.07 1668.6 16.44 -1 533.8 .47 7.57 23.38 3524.5 34.74 -1 2.84
852. 31921 EDAT H 2LANF 4.39 12.40 2641.0 26.79 -1 841.4 1.12 3.93 11.10 2365.0 23.98 -1 4.25
853. 31921 EDAT H 3LAF 3.50 20.60 6002.0 83.04 -1 1901.4 3.17 1.10 6.50 1894.3 26.21 -1 5.33
854. 31921 EDAT H 4NYNF 4.21 11.45 1653.3 16.54 -1 529.9 .49 8.63 23.48 3391.3 33.93 -1 2.94
855. 31921 EDAT H 5COMP -1 -1 -1 -1 11.141 8.393 5.25 2.99 10.58 2280.72 27.22 2.12 4.41
856. 31923 TDES 57000 138.2 EM-528-F 29.36 69. 72.0 11.8 1.04 93.14
857. 31923 EDAT C 1NYNF 4.27 13.31 1977.7 14.83 -1 632.9 .45 9.49 29.58 4396.0 32.95 -1 2.27
858. 31923 EDAT C 2LANF 5.55 12.67 3306.4 26.87 -1 1051.7 1.13 4.91 11.22 2928.6 23.80 -1 3.43
859. 31923 EDAT C 3LAF 6.84 15.94 6377.3 77.19 -1 2020.5 3.15 2.17 5.06 2024.5 24.51 -1 4.99

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860.	31923	EDAT	C	4NYNF	4.07	10.56	1797.9	16.79	-1	574.8	.50	8.21	21.30	3627.4	33.87	-1	2.76
861.	31923	EDAT	C	5COMP	-1	-1	-1	-1	12.449	9.437	5.22	3.97	10.04	2576.12	25.97	2.38	3.90
862.	31923	TDES	57000	138.2	EM-520-F	29.37	65.73	0	11.6	1.03	95.12						
863.	31923	EDAT	H	1NYNF	3.44	11.01	1729.0	15.97	-1	552.7	.45	7.62	24.38	3828.7	35.37	-1	2.61
864.	31923	EDAT	H	2LANF	4.44	12.81	2939.5	27.81	-1	935.3	1.11	4.00	11.53	2646.7	25.04	-1	3.80
865.	31923	EDAT	H	3LAF	3.89	19.87	6478.5	85.50	-1	2051.3	3.17	1.23	6.27	2043.8	26.97	-1	4.94
866.	31923	EDAT	H	4NTNF	6.13	11.00	1707.2	17.52	-1	573.7	.49	12.43	22.31	3624.5	35.53	-1	2.75
867.	31923	EDAT	H	5COMP	-1	-1	-1	-1	9.833	9.069	5.23	3.43	10.47	2475.40	28.10	1.88	4.06
868.	32000	VDES	CHC	RTS	A-3	1900	36000	148285	DDA	6V-71N	426						
869.	32031	TDES	28300	76.2	EM-455-F	29.34	63.77	0	12.8	1.08	97.40						
870.	32031	EDAT	C	1NTNF	2.69	105.54	1904.1	15.02	-1	656.7	.47	5.77	226.19	4081.1	32.18	-1	2.18
871.	32031	EDAT	C	2LANF	3.58	97.92	2598.8	19.53	-1	873.4	1.13	3.18	86.73	2301.9	17.30	-1	3.96
872.	32031	EDAT	C	3LAF	7.73	119.00	6067.1	44.91	-1	1983.8	3.22	2.40	36.94	1883.5	13.94	-1	4.97
873.	32031	EDAT	C	4NYNF	2.23	51.25	1426.0	11.69	-1	478.3	.53	4.21	96.96	2697.9	22.12	-1	3.38
874.	32031	EDAT	C	5COMP	-1	-1	-1	-1	45.997	8.803	5.35	3.04	69.91	2244.24	17.05	8.61	4.10
875.	32031	TDES	28300	76.2	EM-455-F	29.36	61.81	0	14.2	1.13	98.37						
876.	32031	EDAT	H	1NYNF	1.76	47.99	1368.3	11.83	-1	457.9	.50	3.52	95.91	2734.7	23.65	-1	3.35
877.	32031	EDAT	H	2LANF	3.36	58.31	2251.7	18.19	-1	743.8	1.12	3.00	52.06	2010.4	16.24	-1	4.61
878.	32031	EDAT	H	3LAF	7.64	100.05	5570.0	44.65	-1	1817.3	3.25	2.35	30.75	1711.9	13.72	-1	5.48
879.	32031	EDAT	H	4NYNF	2.82	51.99	1391.0	11.70	-1	468.2	.51	5.57	102.67	2747.2	23.11	-1	3.31
880.	32031	EDAT	H	5COMP	-1	-1	-1	-1	33.437	7.689	5.38	2.90	48.01	1966.62	16.05	6.21	4.72
881.	32031	TDES	28300	76.2	EM-455-F	29.33	56.84	0	14.4	1.14	94.61						
882.	32031	EDAT	B	BUS	7.40	280.20	7127.8	55.20	-1	2402.7	2.92	2.53	98.76	2442.4	18.94	-1	3.72
883.	32031	EDAT	B	5COMP	-1	-1	-1	-1	26.151	5.298	2.92	2.53	98.76	2442.42	18.94	8.96	3.72
884.	32032	TDES	28300	76.2	EM-455-F	29.25	83.78	0	17.6	1.29	96.66						
885.	32032	EDAT	C	1NYNF	2.83	102.84	1936.9	17.01	-1	665.9	.47	5.97	217.23	4091.3	35.92	-1	2.18
886.	32032	EDAT	C	2LANF	3.44	107.15	2499.8	21.39	-1	846.5	1.13	3.03	94.58	2206.7	18.00	-1	4.10
887.	32032	EDAT	C	3LAF	7.38	128.75	6041.3	49.08	-1	1980.2	3.14	2.35	41.05	1926.2	15.65	-1	4.85
888.	32032	EDAT	C	4NYNF	2.41	49.13	1461.3	13.05	-1	488.5	.52	4.66	94.78	2019.3	25.18	-1	3.25
889.	32032	EDAT	C	5COMP	-1	-1	-1	-1	37.464	8.778	5.26	3.05	73.72	2269.40	19.11	7.12	4.05
890.	32032	TDES	28300	76.2	EM-455-F	29.26	72.80	0	16.2	1.22	98.18						
891.	32032	EDAT	H	1NTNF	2.51	53.78	1431.7	12.56	-1	481.6	.51	4.93	105.40	2806.3	24.62	-1	3.24
892.	32032	EDAT	H	2LANF	3.48	69.34	2244.5	18.36	-1	747.1	1.13	3.09	61.54	1991.8	16.30	-1	4.62
893.	32032	EDAT	H	3LAF	6.43	105.58	5395.7	45.04	-1	1763.8	3.28	1.96	32.21	1646.1	13.74	-1	5.69
894.	32032	EDAT	H	4NYNF	2.48	48.18	1351.2	11.15	-1	453.3	.53	4.70	91.29	2560.4	21.12	-1	3.56
895.	32032	EDAT	H	5COMP	-1	-1	-1	-1	25.638	7.598	5.44	2.74	50.87	1915.04	16.01	4.71	4.84
896.	32032	TDES	28300	76.2	EM-455-F	29.26	79.79	0	17.4	1.28	97.56						
897.	32032	EDAT	B	BUS	9.35	309.01	7145.2	60.60	-1	2420.5	2.92	3.21	105.96	2450.2	20.78	-1	3.69
898.	32032	EDAT	B	5COMP	-1	-1	-1	-1	25.517	5.337	2.92	3.21	105.96	2450.20	20.78	8.75	3.69
899.	32100	VDES	CHAM	RTS	A-4	1970	20000	139173	CAT	3200	636						
900.	32131	TDES	14000	62.3	EM-455-F	29.40	41.75	0	7.7	.91	86.47						
901.	32131	EDAT	C	1NYNF	.81	5.77	1141.7	10.94	-1	364.4	.54	1.51	10.77	2132.3	35.38	-1	4.50
902.	32131	EDAT	C	2LANF	1.02	6.38	1572.9	25.31	-1	501.2	1.15	.89	5.57	1372.4	22.08	-1	7.00
903.	32131	EDAT	C	3LAF	3.18	13.65	3607.4	47.87	-1	1175.1	3.27	.97	4.17	1126.5	14.62	-1	8.53
904.	32131	EDAT	C	4NYNF	.93	2.80	866.3	16.11	-1	276.0	.53	1.73	5.25	1621.9	30.16	-1	5.93
905.	32131	EDAT	C	5COMP	-1	-1	-1	-1	8.830	5.108	5.49	1.08	5.21	1324.17	19.72	1.61	7.26
906.	32131	TDES	14000	62.3	EM-455-F	29.41	38.76	0	7.4	.90	90.70						
907.	32131	EDAT	H	1NYNF	.65	3.12	878.7	15.89	-1	279.8	.53	1.24	5.90	1662.3	30.06	-1	5.78
908.	32131	EDAT	H	2LANF	.81	4.37	1362.3	22.52	-1	433.4	1.14	.71	3.82	1190.0	19.67	-1	8.09
909.	32131	EDAT	H	3LAF	3.33	15.77	3546.4	44.30	-1	1131.7	3.29	1.01	4.80	1079.1	13.48	-1	8.89
910.	32131	EDAT	H	4NYNF	.73	2.73	850.2	16.59	-1	270.7	.56	1.31	4.91	1528.1	29.03	-1	6.29
911.	32131	EDAT	H	5COMP	-1	-1	-1	-1	7.961	4.665	5.52	1.00	4.71	1203.27	18.00	1.44	7.98
912.	32131	TDES	14000	62.3	EM-455-F	29.40	29.80	0	6.5	.88	71.34						
913.	32131	EDAT	B	BUS	2.88	12.79	4393.7	72.58	-1	1397.5	2.98	.96	4.29	1472.6	24.32	-1	6.54
914.	32131	EDAT	B	5COMP	-1	-1	-1	-1	3.810	3.082	2.98	.96	4.29	1472.55	24.32	1.28	6.54
915.	32132	TDES	14000	62.3	EM-455-F	29.29	45.76	0	8.0	.94	89.47						
916.	32132	EDAT	C	1NTNF	1.12	5.24	1086.2	18.77	-1	346.9	.51	2.19	10.30	2136.2	36.91	-1	4.49
917.	32132	EDAT	C	2LANF	1.59	5.87	1516.3	25.31	-1	483.6	1.12	1.42	5.26	1359.5	22.69	-1	7.06
918.	32132	EDAT	C	3LAF	3.28	13.81	3573.8	40.74	-1	1139.4	3.25	1.01	4.25	1099.1	12.53	-1	8.74
919.	32132	EDAT	C	4NYNF	.93	2.77	824.6	16.04	-1	262.9	.52	1.70	5.28	1571.6	30.57	-1	6.11
920.	32132	EDAT	C	5COMP	-1	-1	-1	-1	9.264	4.923	5.40	1.28	5.13	1296.49	18.60	1.72	7.41
921.	32132	TDES	14000	62.3	EM-455-F	29.31	50.73	0	8.9	.94	91.17						
922.	32132	EDAT	H	1NTNF	.68	3.17	844.3	14.89	-1	269.0	.53	1.28	5.96	1589.6	28.03	-1	6.05

923.	32132	EDAT	H	2LANF	1.25	4.33	1352.2	21.89	-1	430.6	1.15	1.09	3.76	1173.7	19.00	-1	0.19
924.	32132	EDAT	H	3LAF	3.52	14.69	3461.4	40.98	-1	1104.5	3.28	1.07	4.48	1055.9	12.50	-1	9.09
925.	32132	EDAT	H	4NYNF	.89	2.39	816.1	15.17	-1	260.0	.50	1.64	4.40	1502.7	27.93	-1	6.40
926.	32132	EDAT	H	SCOMP	-1	-1	-1	-1	8.750	4.551	5.50	1.15	4.46	1176.16	16.88	1.59	8.17
927.	32132	TDES	14000	62.3	EM-455-F	29.33	51.75	0.97	.97	81.08							
928.	32132	EDAT	B	BUS	3.54	12.62	4157.2	76.56	-1	1323.4	2.89	1.22	4.36	1437.6	26.47	-1	6.69
929.	32132	EDAT	B	SCOMP	-1	-1	-1	-1	4.324	2.910	2.89	1.22	4.36	1437.59	26.47	1.50	6.69
930.	32200	VDES	GMC	RTS A-3	1978	36900	246988	DDA 8V-71N	560								
931.	32231	TDES	28300	76.2	EM-455-F	29.26	73.73	0.13	1.09	95.90							
932.	32231	EDAT	C	1NYNF	2.29	59.16	2227.4	28.92	-1	735.5	.51	4.45	115.18	4336.7	56.30	-1	2.14
933.	32231	EDAT	C	2LANF	3.61	25.37	2081.3	36.38	-1	926.6	1.16	3.10	21.80	2476.1	31.26	-1	3.85
934.	32231	EDAT	C	3LAF	7.29	42.15	6031.2	86.87	-1	1933.9	3.31	2.20	12.74	1823.3	26.26	-1	5.24
935.	32231	EDAT	C	4NYNF	2.85	16.88	1576.8	20.46	-1	509.5	.54	5.28	31.26	2919.3	37.88	-1	3.25
936.	32231	EDAT	C	SCOMP	-1	-1	-1	-1	18.254	9.053	5.53	2.90	25.98	2301.54	31.24	3.30	4.12
937.	32231	TDES	28300	76.2	EM-455-F	29.27	62.75	0.11	1.04	92.38							
938.	32231	EDAT	H	1NYNF	2.82	23.74	1517.3	19.60	-1	494.0	.52	5.39	45.39	2901.1	37.48	-1	3.24
939.	32231	EDAT	H	2LANF	3.46	14368	2285.7	20.09	-1	733.0	1.13	3.05	12.94	2015.4	24.77	-1	4.74
940.	32231	EDAT	H	3LAF	6.43	36.93	5685.1	80.04	-1	1821.1	3.32	1.94	11.12	1711.0	24.10	-1	5.58
941.	32231	EDAT	H	4NYNF	2.09	16.27	1535.7	19.41	-1	495.4	.54	3.85	29.99	2832.1	35.00	-1	3.35
942.	32231	EDAT	H	SCOMP	-1	-1	-1	-1	13.411	7.813	5.52	2.68	16.59	1996.86	26.65	2.43	4.77
943.	32231	TDES	28300	76.2	EM-455-F	29.23	53.77	0.10	1.00	88.86							
944.	32231	EDAT	B	BUS	10.99	80.72	7047.6	84.42	-1	2277.9	2.99	3.68	27.03	2360.0	28.27	-1	4.01
945.	32231	EDAT	B	SCOMP	-1	-1	-1	-1	8.626	5.023	2.99	3.68	27.03	2359.98	28.27	2.89	4.01
946.	32232	TDES	28300	76.2	EM-455-F	29.53	54.73	0.94	.96	93.52							
947.	32232	EDAT	C	1NYNF	2.46	52.74	2157.4	25.79	-1	710.3	.50	4.91	105.50	4315.5	51.60	-1	2.16
948.	32232	EDAT	C	2LANF	3.27	24.24	2058.2	33.00	-1	918.4	1.15	2.85	21.16	2495.7	28.82	-1	3.82
949.	32232	EDAT	C	3LAF	6.58	34.35	5962.1	80.20	-1	1907.5	3.33	1.98	10.32	1791.9	24.13	-1	5.34
950.	32232	EDAT	C	4NYNF	2.45	19.59	1587.4	19.52	-1	513.7	.53	4.62	36.86	2986.2	36.72	-1	3.17
951.	32232	EDAT	C	SCOMP	-1	-1	-1	-1	18.693	8.930	5.50	2.68	23.79	2282.94	28.82	3.40	4.16
952.	32232	TDES	28300	76.2	EM-455-F	29.56	58.74	0.10	.99	93.52							
953.	32232	EDAT	H	1NYNF	2.76	25.66	1565.1	20.00	-1	510.0	.53	5.16	47.96	2925.4	37.52	-1	3.21
954.	32232	EDAT	H	2LANF	3.32	23.39	2401.4	29.47	-1	773.7	1.14	2.90	20.45	2099.2	25.76	-1	4.53
955.	32232	EDAT	H	3LAF	6.23	28.73	5738.2	80.90	-1	1833.6	3.33	1.87	8.64	1725.6	24.33	-1	5.55
956.	32232	EDAT	H	4NYNF	2.48	19.59	1570.4	20.20	-1	508.4	.54	4.57	36.06	2891.5	37.18	-1	3.27
957.	32232	EDAT	H	SCOMP	-1	-1	-1	-1	12.439	7.995	5.55	2.67	17.55	2032.46	27.15	2.24	4.69
958.	32232	TDES	28300	76.2	EM-455-F	29.58	77.70	0.12	1.05	92.74							
959.	32232	EDAT	B	BUS	11.51	80.41	7274.9	92.69	-1	2350.1	2.91	3.96	27.64	2500.5	31.86	-1	3.79
960.	32232	EDAT	B	SCOMP	-1	-1	-1	-1	8.411	5.182	2.91	3.96	27.64	2500.53	31.86	2.89	3.79

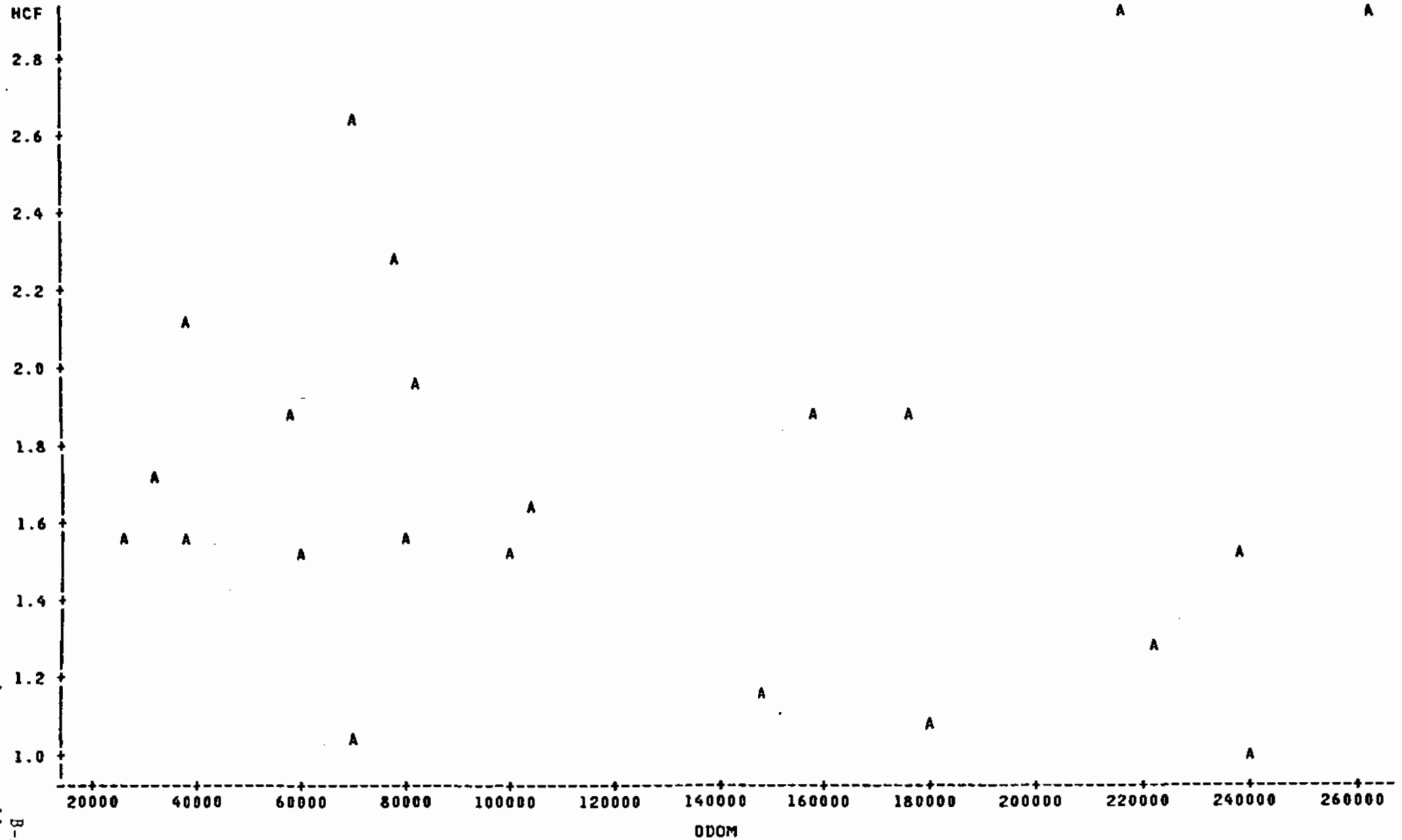
APPENDIX B
PLOTS OF FUEL SPECIFIC EMISSIONS (gm/lb - fuel)
VERSUS ODOMETER (miles)

SAS

12:25 THURSDAY, APRIL 12, 1984 11

PLOT OF HCF*ODOM

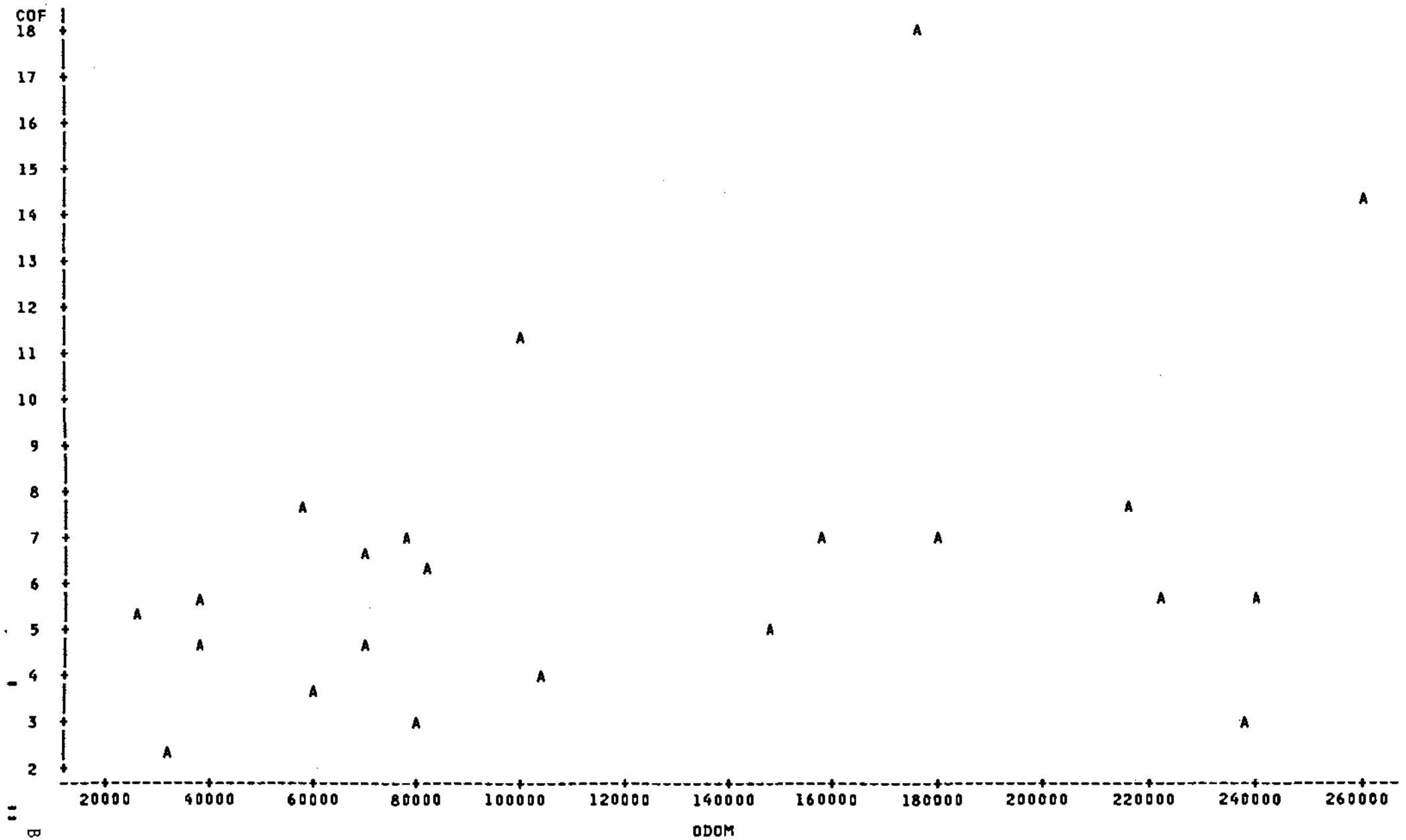
LEGEND: A = 1 OBS, B = 2 OBS, ETC.



SAS

12:25 THURSDAY, APRIL 12, 1984 12

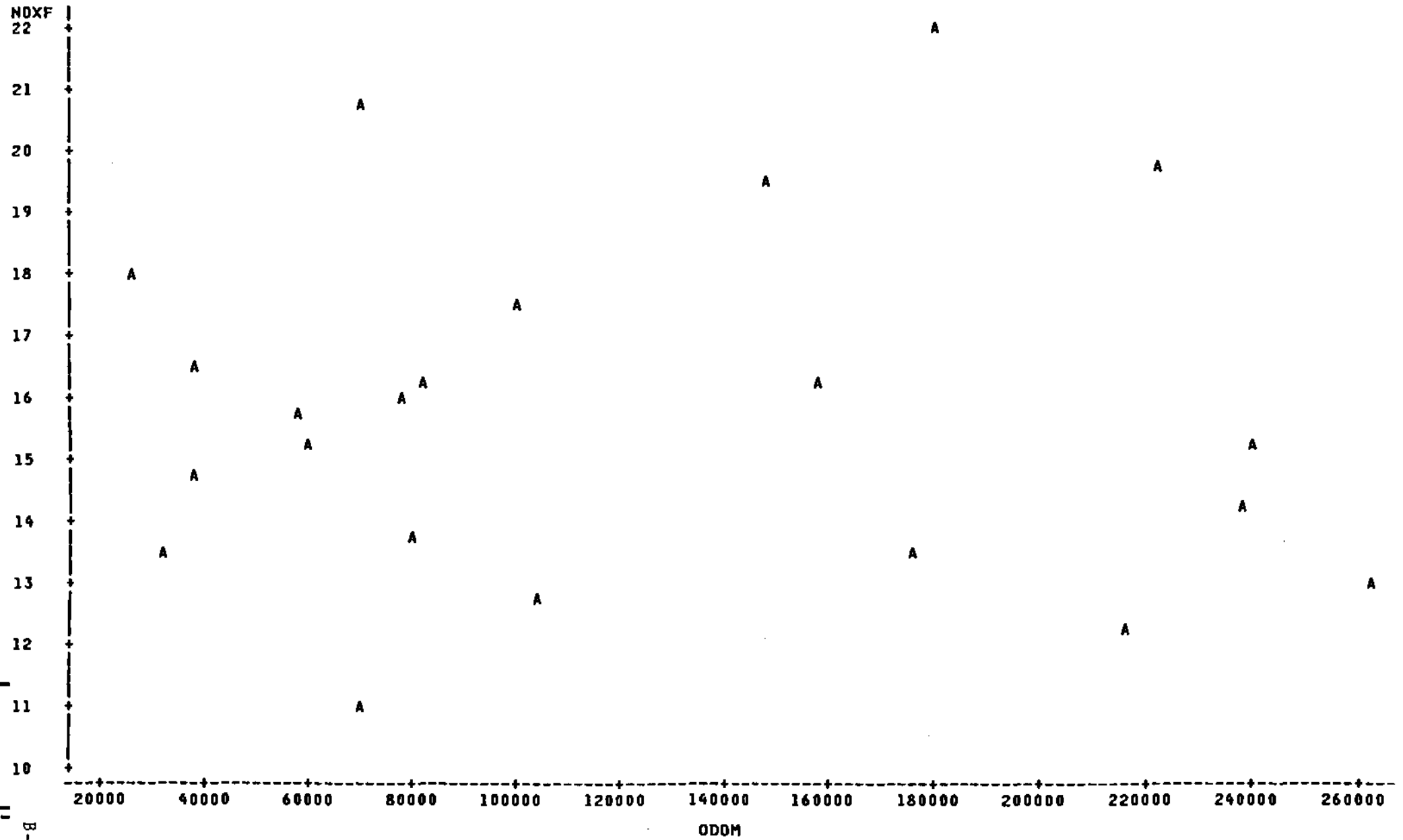
PLOT OF COF*ODOM LEGEND: A = 1 OBS, B = 2 OBS, ETC.



SAS

12:25 THURSDAY, APRIL 12, 1984 13

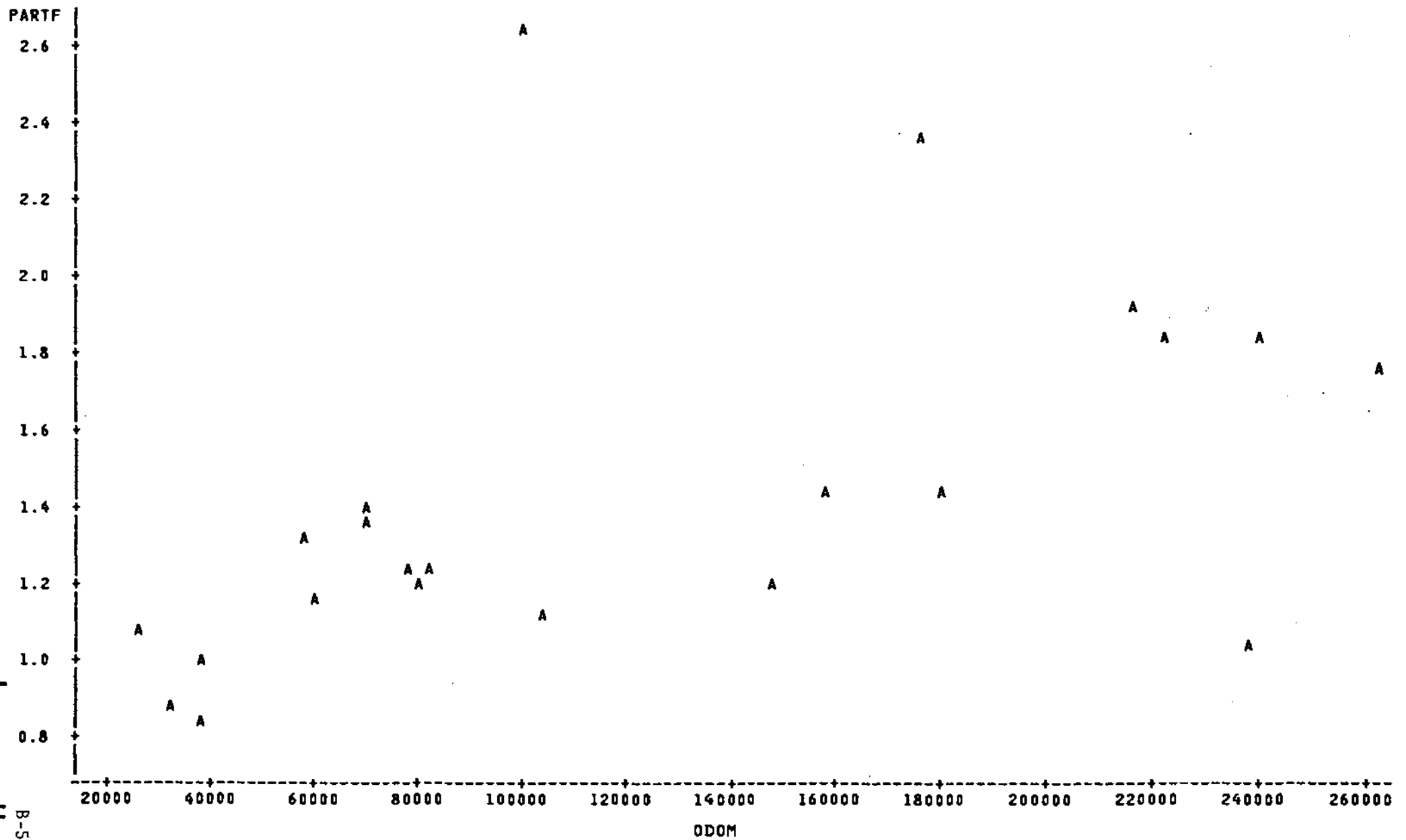
PLOT OF NOXF*ODOM LEGEND: A = 1 OBS, B = 2 OBS, ETC.



SAS

12:25 THURSDAY, APRIL 12, 1984 14

PLOT OF PARTF*ODOM LEGEND: A = 1 OBS, B = 2 OBS, ETC.



SAS

12:25 THURSDAY, APRIL 12, 1984 15

PLOT OF HNF*ODOM LEGEND: A = 1 OBS, B = 2 OBS, ETC.

