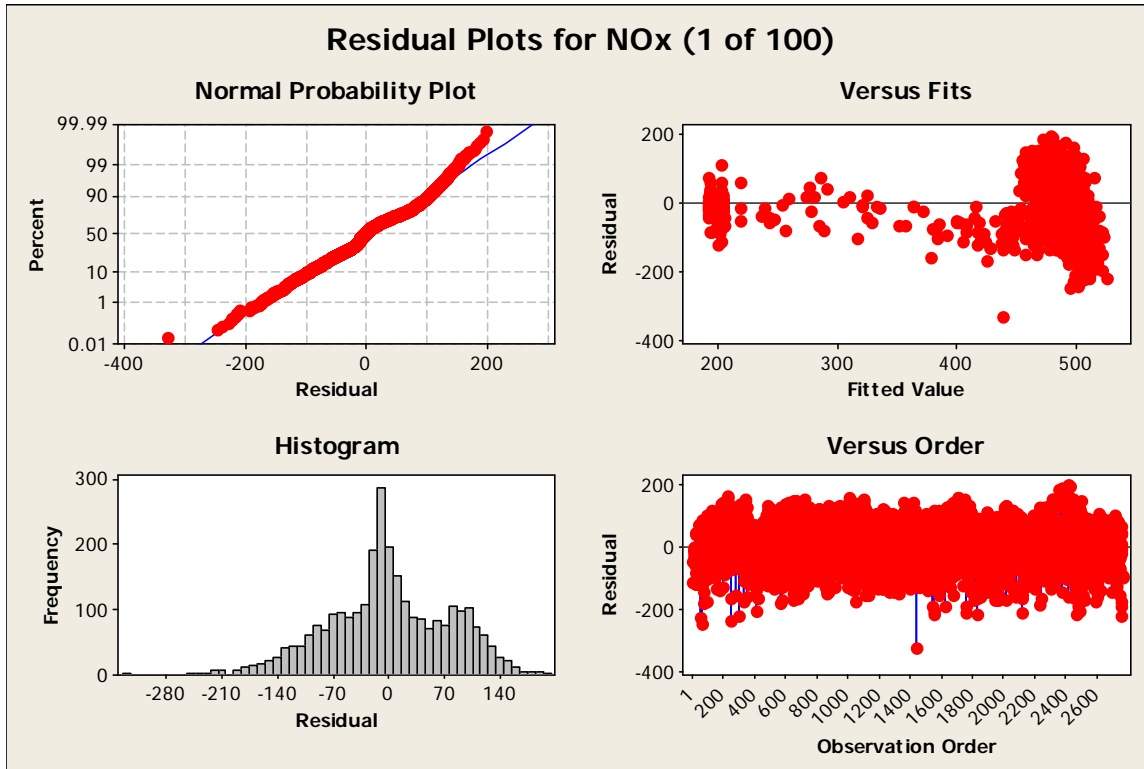


APPENDIX A: Fuel Analysis



Results for: 1 of 100 lag

General Linear Model: NOx versus Fuel Type

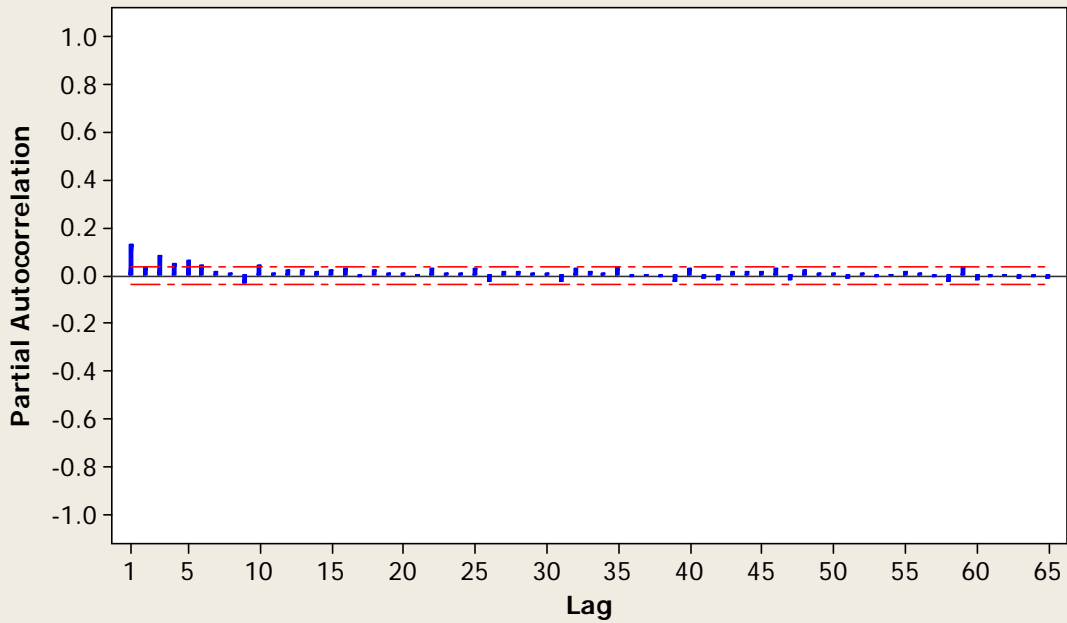
Factor Type Levels Values
 Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for NOx, using Adjusted SS for Tests

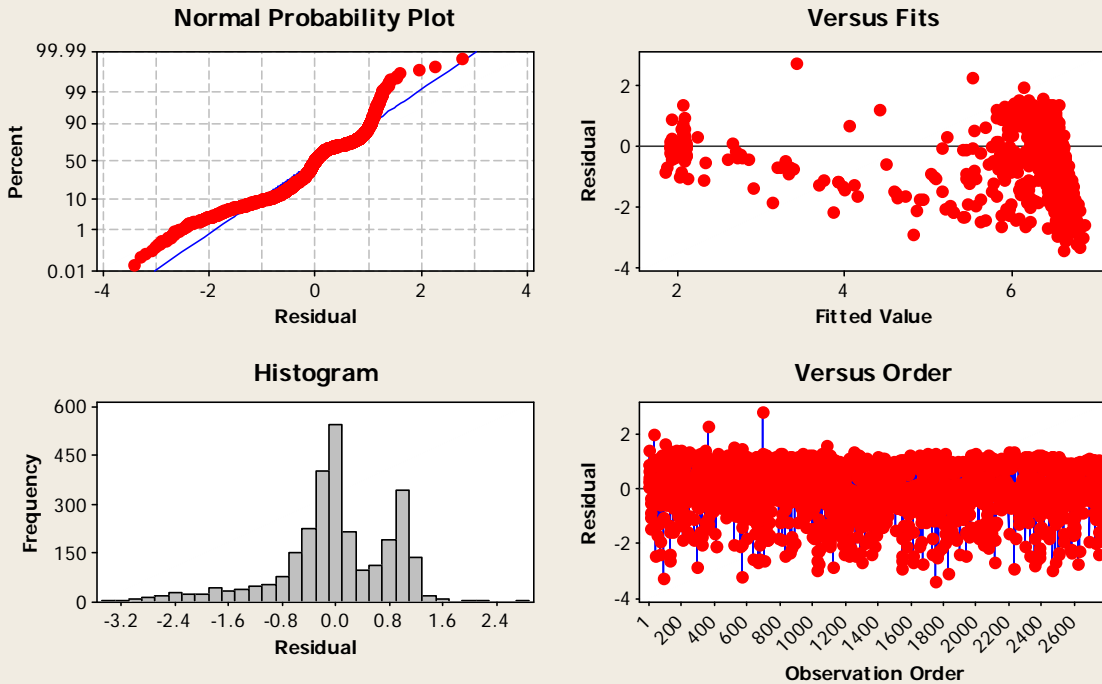
Source	DF	Seq SS	Adj SS	Adj MS	F	P
EngineSpeed	1	41678700	37568249	37568249	6836.03	0.000
Fuel Type	2	11673	61303	30652	5.58	0.004
Fuel Type*EngineSpeed	2	81234	81234	40617	7.39	0.001
Error	2760	15167925	15167925	5496		
Total	2765	56939531				

S = 74.1325 R-Sq = 73.36% R-Sq(adj) = 73.31%

Partial Autocorrelation Function for residuals from GLM (1 of 100) (with 5% significance limits for the partial autocorrelations)



Residual Plots for CO2 (1 of 100)



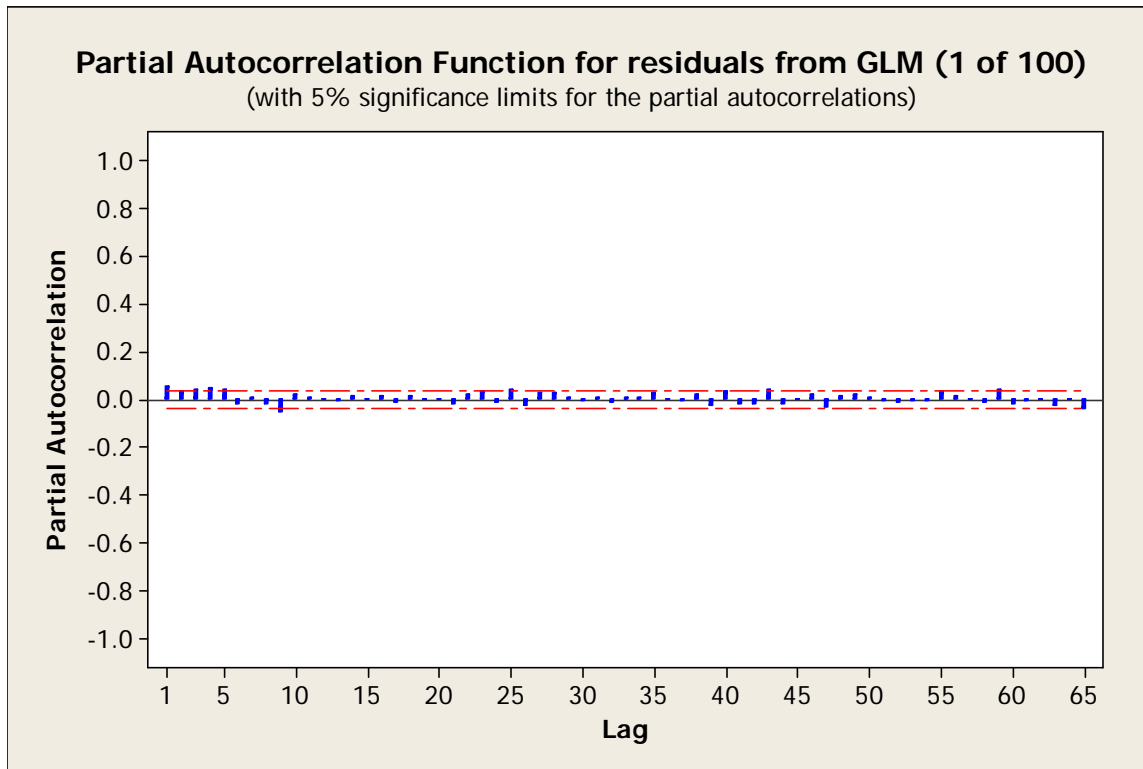
General Linear Model: CO2 versus Fuel Type

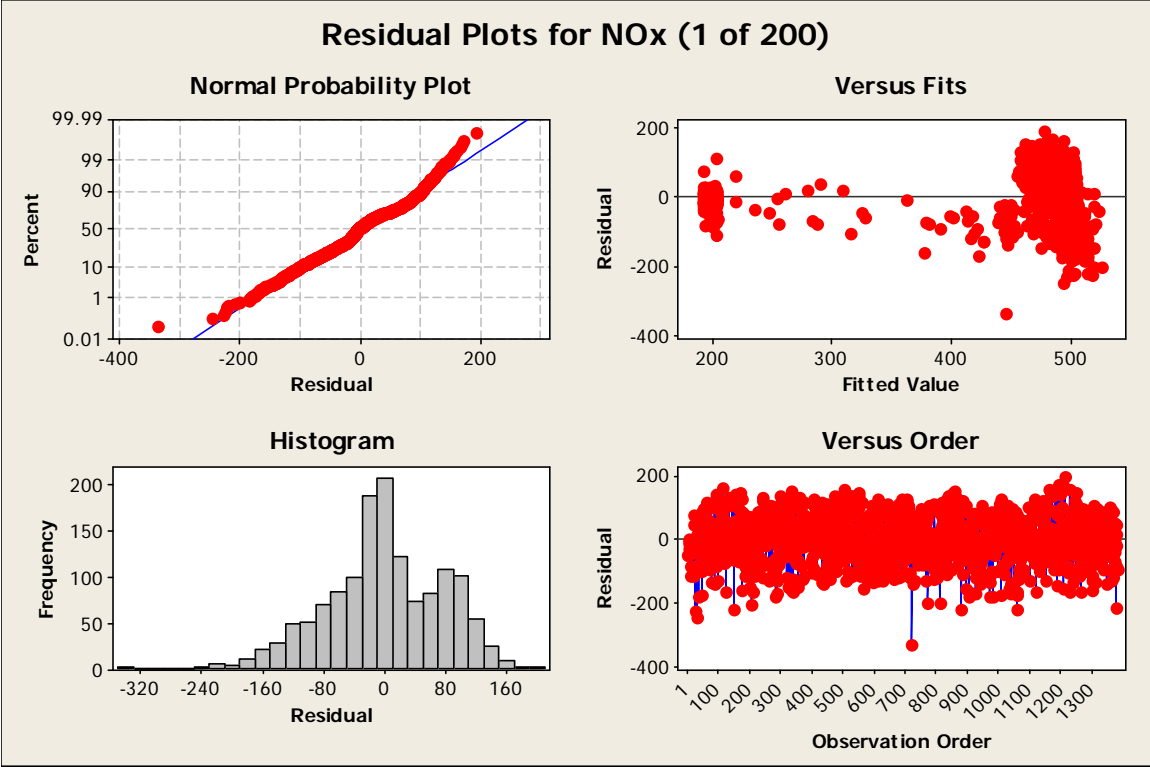
Factor Type Levels Values
Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for CO2, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
EngineSpeed	1	9612.6	8443.0	8443.0	12569.26	0.000
Fuel Type	2	39.3	5.8	2.9	4.32	0.013
Fuel Type*EngineSpeed	2	0.6	0.6	0.3	0.43	0.651
Error	2760	1853.9	1853.9	0.7		
Total	2765	11506.4				

S = 0.819583 R-Sq = 83.89% R-Sq(adj) = 83.86%





General Linear Model: NOx versus Fuel Type

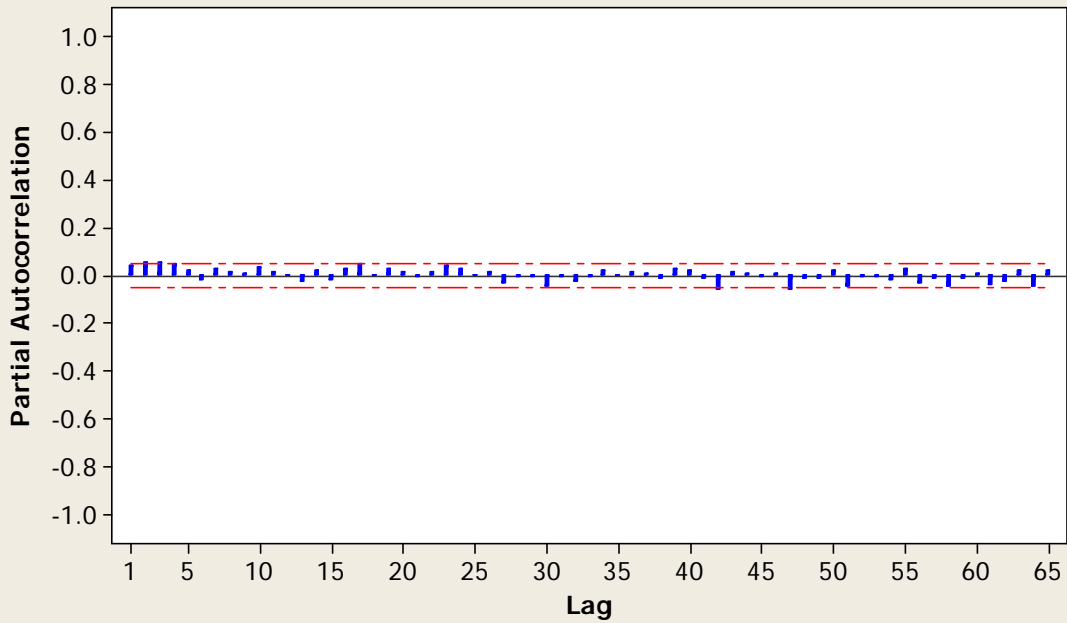
```
Factor      Type   Levels  Values
Fuel Type  fixed      3      B20, Diesel, ECD
```

Analysis of Variance for NOx, using Adjusted SS for Tests

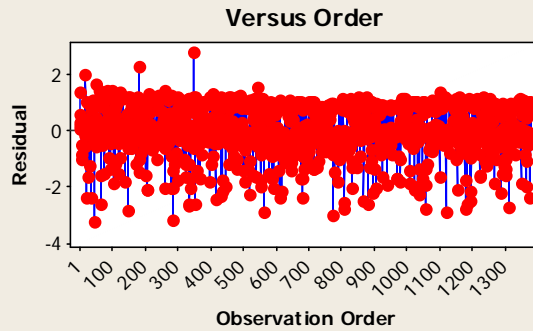
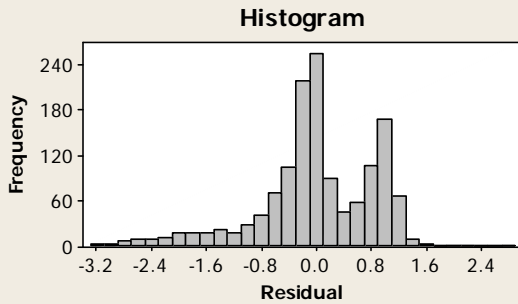
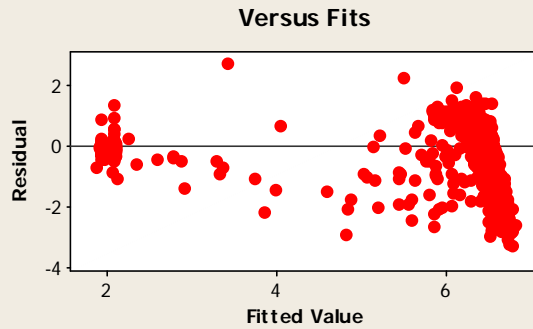
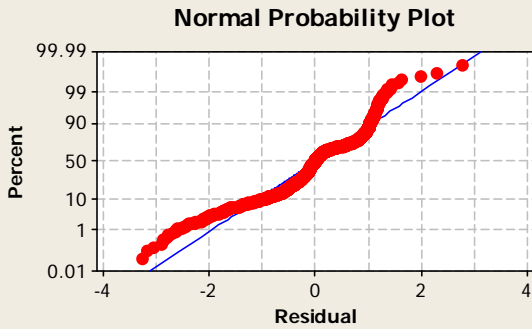
Source	DF	Seq SS	Adj SS	Adj MS	F	P
EngineSpeed	1	21196529	19086141	19086141	3374.99	0.000
Fuel Type	2	11322	34465	17233	3.05	0.048
Fuel Type*EngineSpeed	2	49577	49577	24788	4.38	0.013
Error	1377	7787164	7787164	5655		
Total	1382	29044592				

S = 75.2008 R-Sq = 73.19% R-Sq(adj) = 73.09%

Partial Autocorrelation Function for residuals from GLM (1 of 200)
(with 5% significance limits for the partial autocorrelations)



Residual Plots for CO2 (1 of 200)



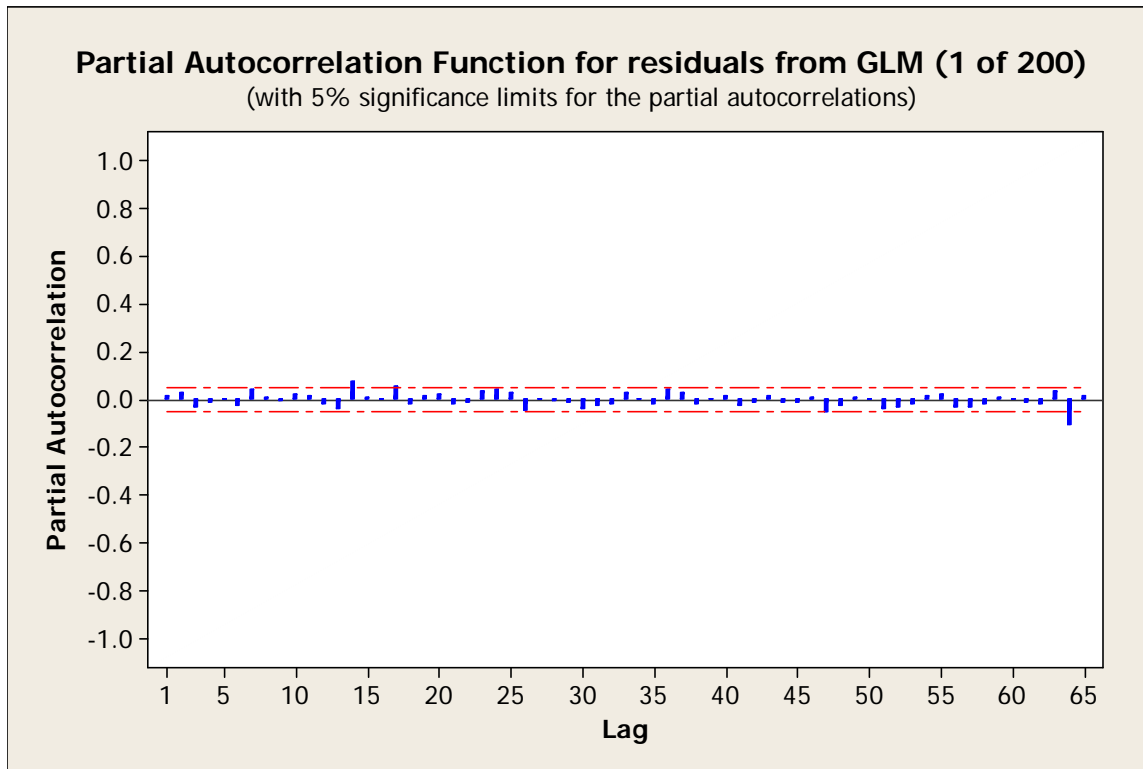
General Linear Model: CO2 versus Fuel Type

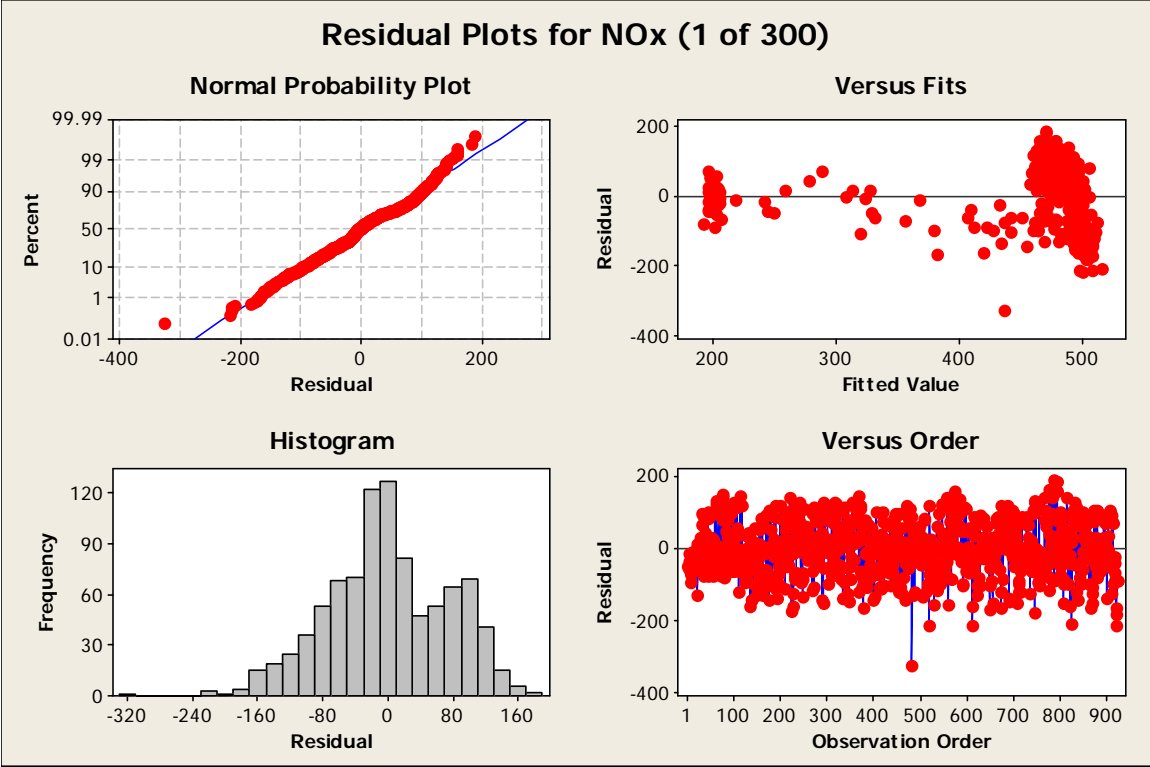
Factor Type Levels Values
Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for CO2, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
EngineSpeed	1	4809.86	4221.13	4221.13	5981.30	0.000
Fuel Type	2	15.10	4.05	2.03	2.87	0.057
Fuel Type*EngineSpeed	2	1.77	1.77	0.89	1.26	0.285
Error	1377	971.78	971.78	0.71		
Total	1382	5798.51				

S = 0.840073 R-Sq = 83.24% R-Sq(adj) = 83.18%





Results for: 1 of 300 lag

General Linear Model: NOx versus Fuel Type

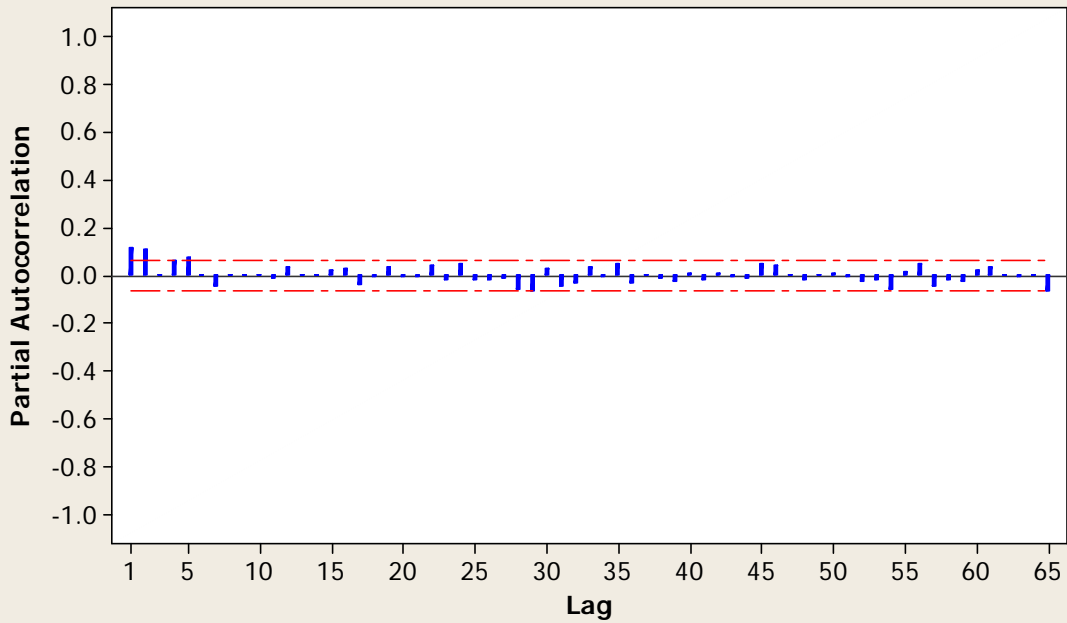
Factor Type Levels Values
 Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for NOx, using Adjusted SS for Tests

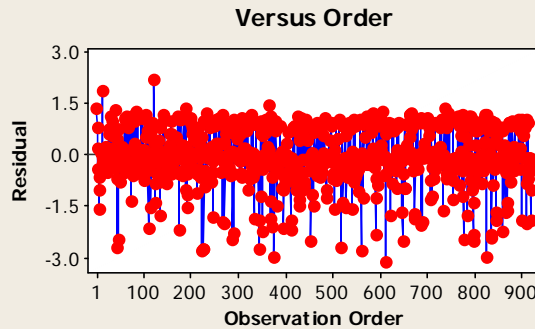
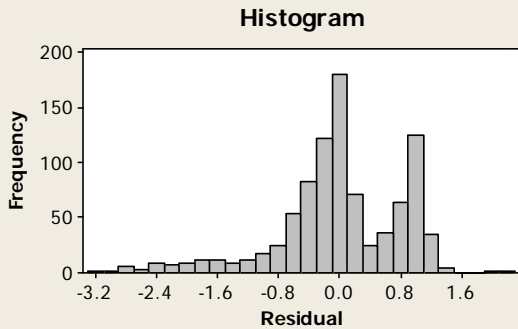
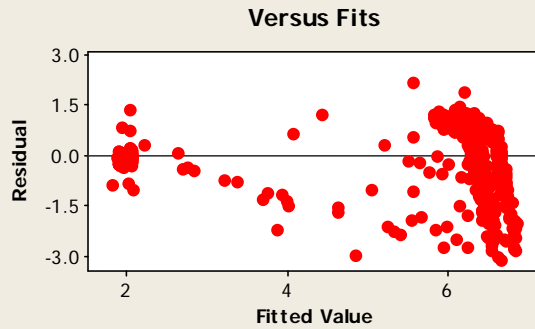
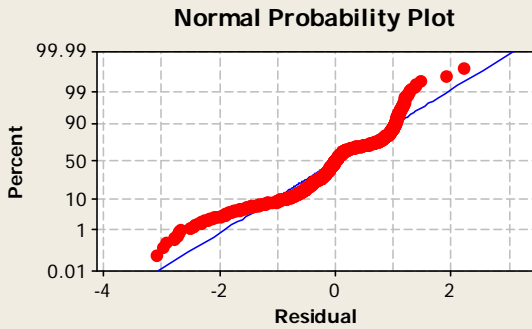
Source	DF	Seq SS	Adj SS	Adj MS	F	P
EngineSpeed	1	13824523	12038636	12038636	2156.71	0.000
Fuel Type	2	10984	9458	4729	0.85	0.429
Fuel Type*EngineSpeed	2	5085	5085	2542	0.46	0.634
Error	917	5118640	5118640	5582		
Total	922	18959232				

S = 74.7124 R-Sq = 73.00% R-Sq(adj) = 72.85%

Partial Autocorrelation Function for residuals from GLM (1 of 300)
(with 5% significance limits for the partial autocorrelations)



Residual Plots for CO2 (1 of 300)



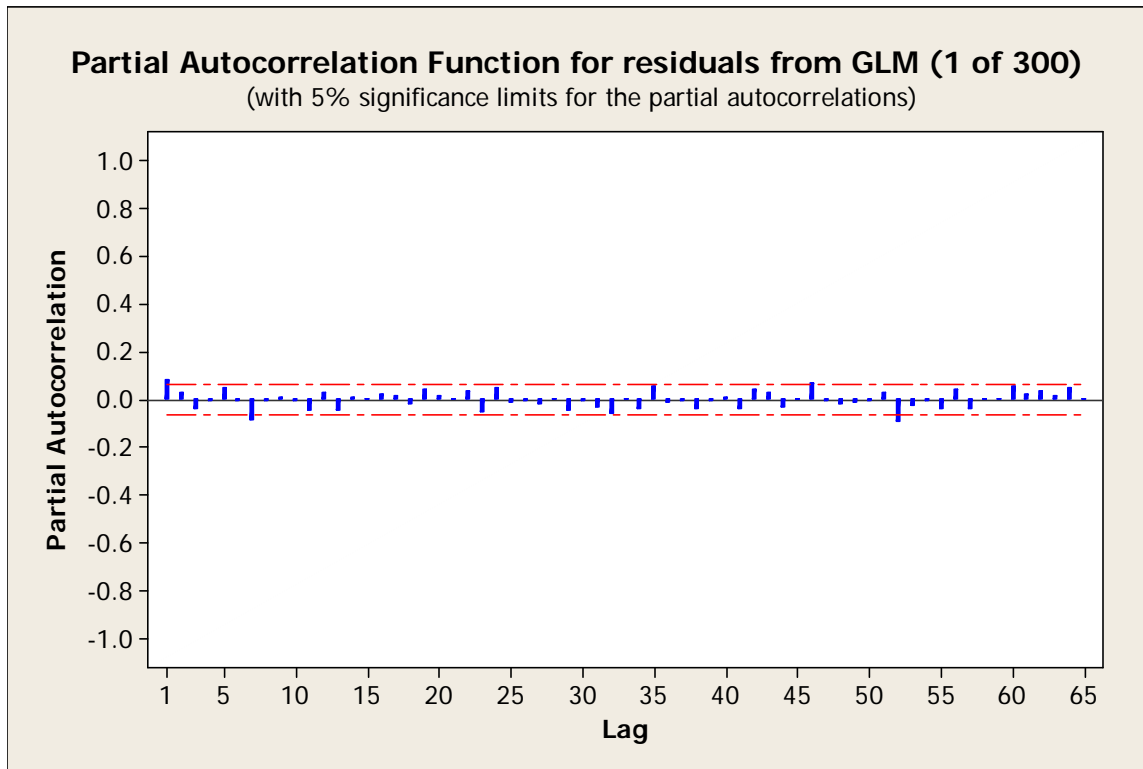
General Linear Model: CO2 versus Fuel Type

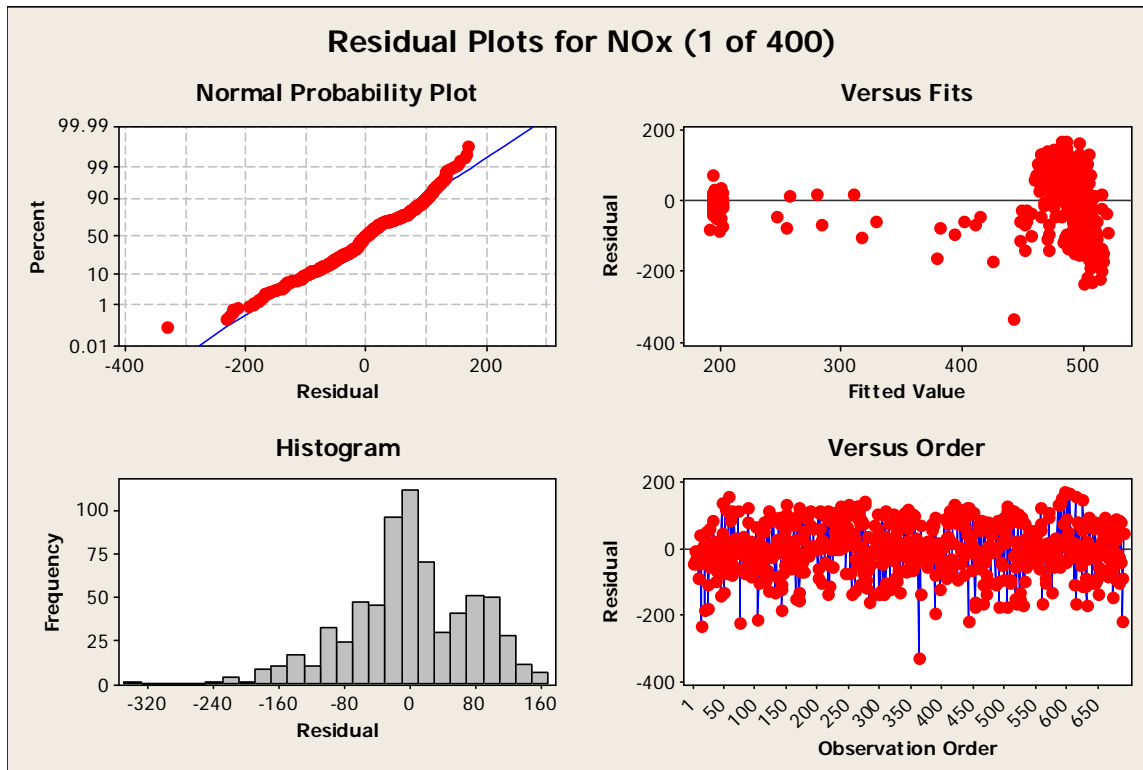
Factor Type Levels Values
Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for CO2, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
EngineSpeed	1	3230.79	2763.17	2763.17	4049.45	0.000
Fuel Type	2	20.36	1.13	0.57	0.83	0.437
Fuel Type*EngineSpeed	2	0.49	0.49	0.25	0.36	0.697
Error	917	625.72	625.72	0.68		
Total	922	3877.37				

S = 0.826049 R-Sq = 83.86% R-Sq(adj) = 83.77%





Results for: 1 of 400 lag

General Linear Model: NOx versus Fuel Type

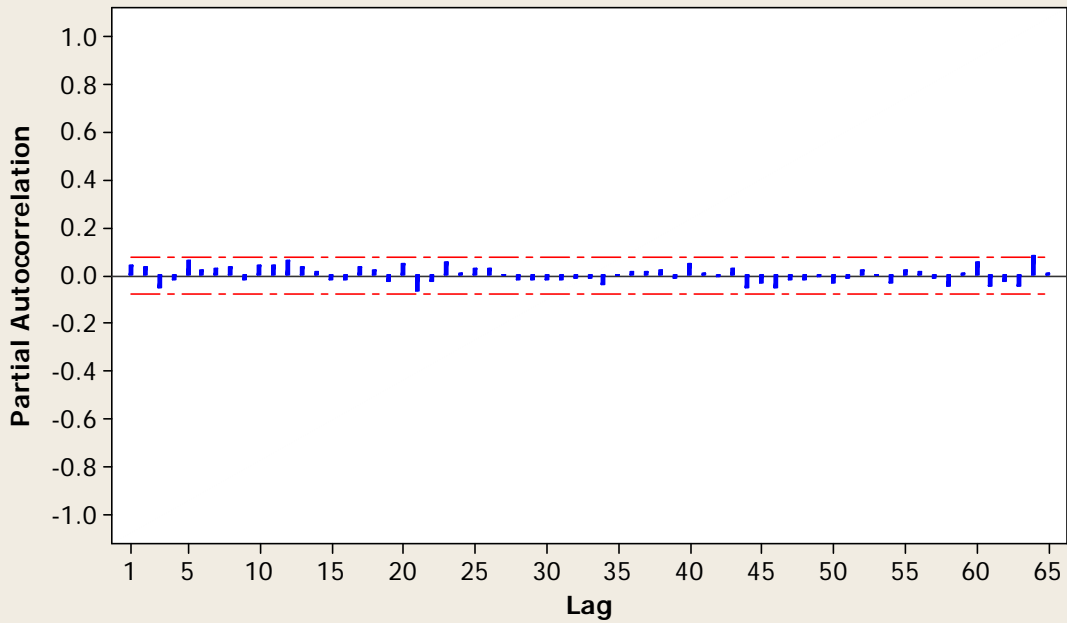
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Factor      Type  Levels  Values
Fuel Type  fixed      3      B20, Diesel, ECD
```

Analysis of Variance for NOx, using Adjusted SS for Tests

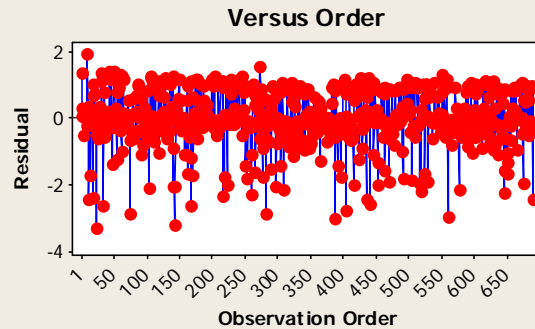
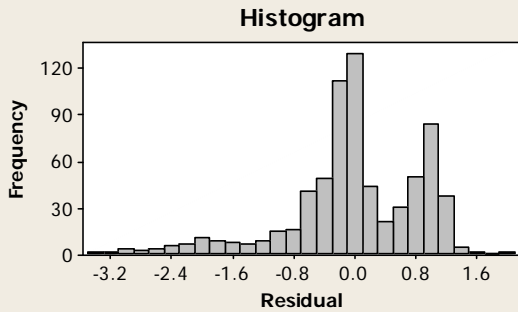
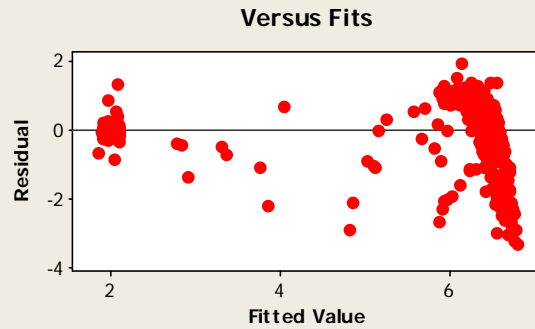
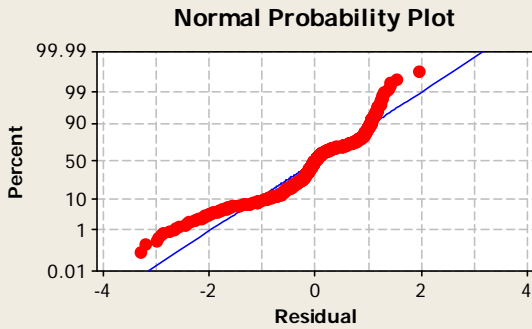
Source	DF	Seq SS	Adj SS	Adj MS	F	P
EngineSpeed	1	11100481	9792619	9792619	1714.57	0.000
Fuel Type	2	565	12859	6430	1.13	0.325
Fuel Type*EngineSpeed	2	15203	15203	7602	1.33	0.265
Error	686	3918029	3918029	5711		
Total	691	15034279				

S = 75.5739 R-Sq = 73.94% R-Sq(adj) = 73.75%

Partial Autocorrelation Function for residuals from GLM (1 of 400) (with 5% significance limits for the partial autocorrelations)



Residual Plots for CO2 (1 of 400)



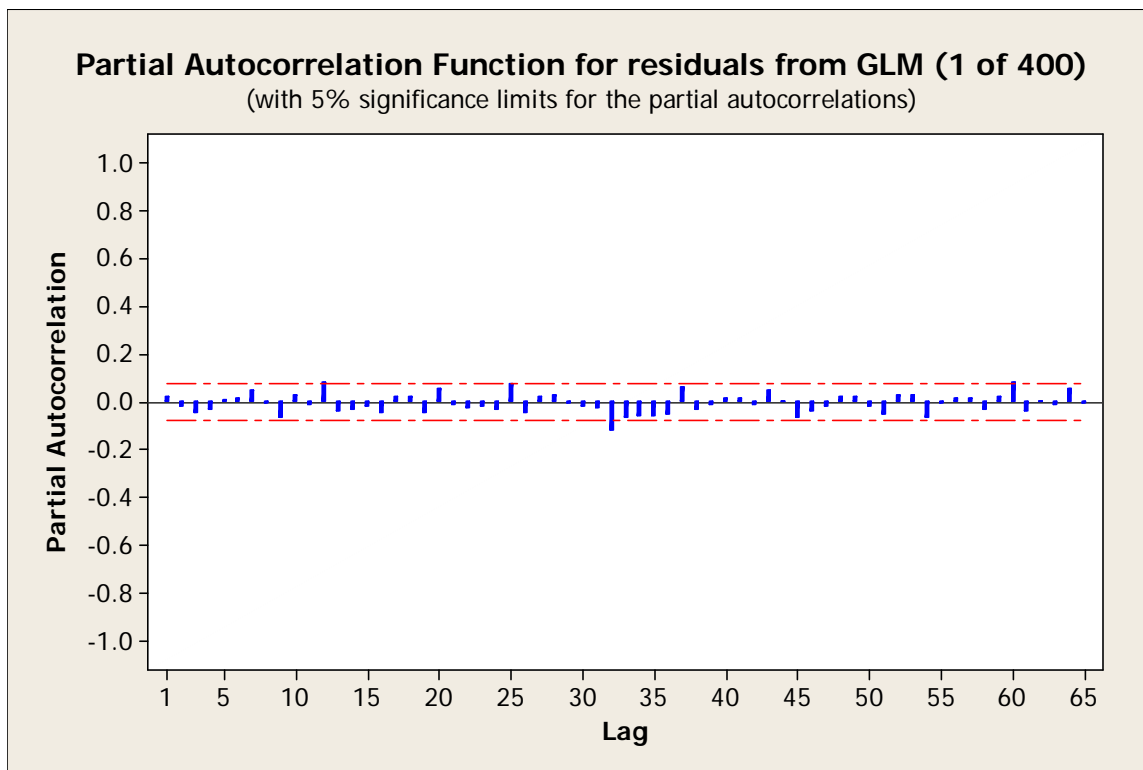
General Linear Model: CO2 versus Fuel Type

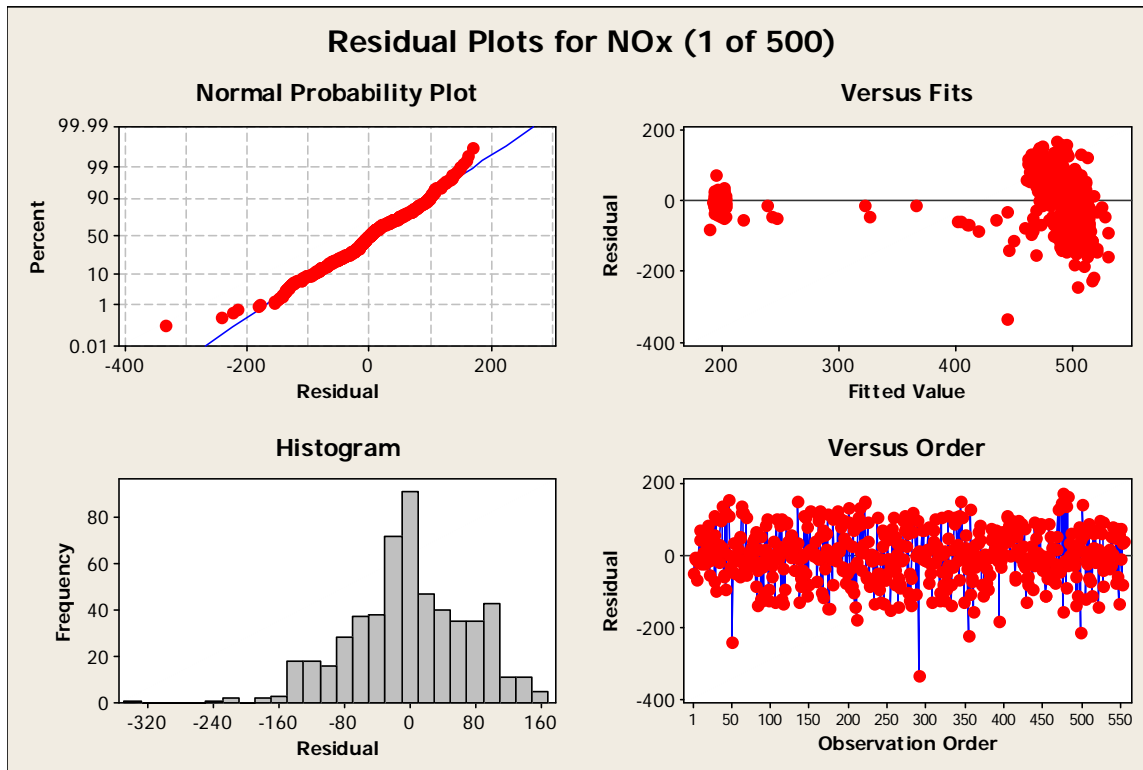
Factor Type Levels Values
Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for CO2, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
EngineSpeed	1	2482.98	2149.67	2149.67	2950.62	0.000
Fuel Type	2	7.54	1.87	0.93	1.28	0.279
Fuel Type*EngineSpeed	2	0.52	0.52	0.26	0.36	0.700
Error	686	499.79	499.79	0.73		
Total	691	2990.83				

S = 0.853552 R-Sq = 83.29% R-Sq(adj) = 83.17%





General Linear Model: NOx versus Fuel Type

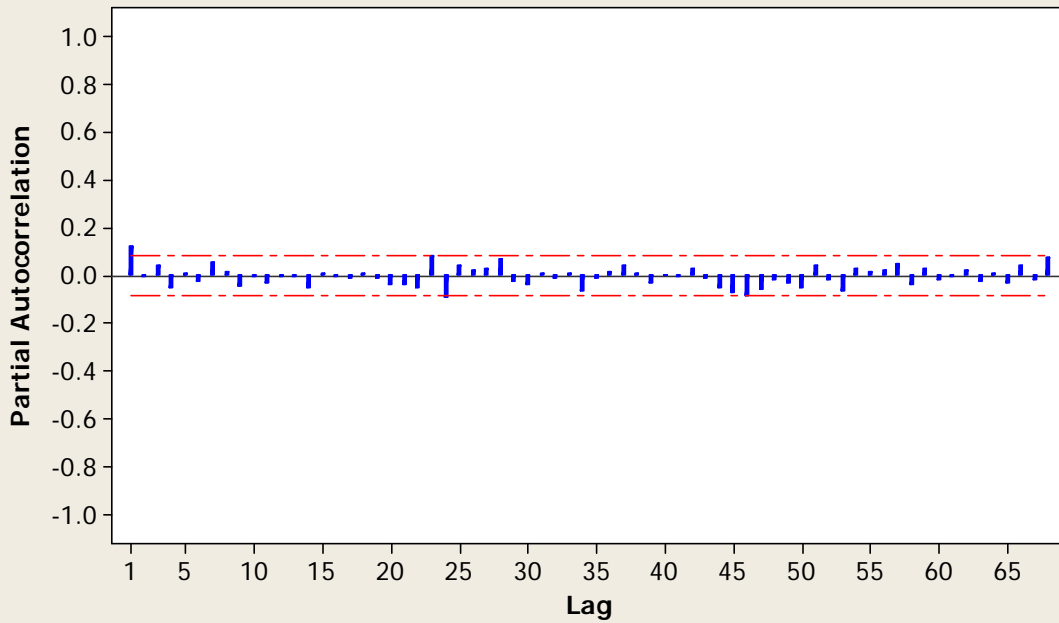
Factor	Type	Levels	Values
Fuel Type	fixed	3	B20, Diesel, ECD

Analysis of Variance for NOx, using Adjusted SS for Tests

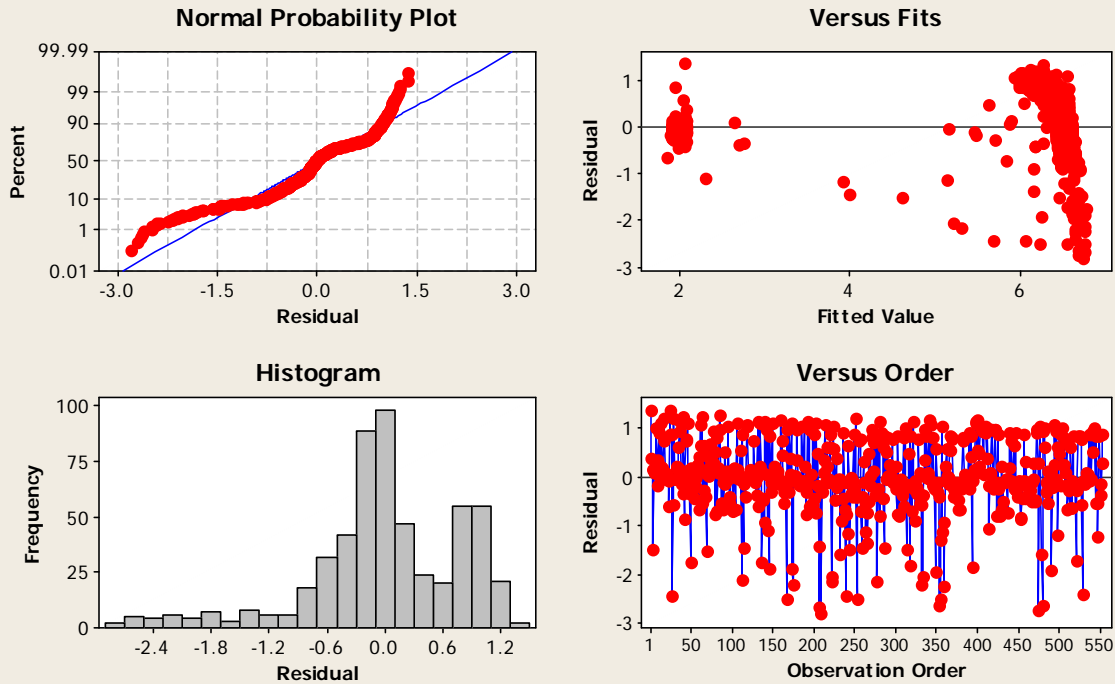
Source	DF	Seq SS	Adj SS	Adj MS	F	P
Fuel Type	2	3693	14384	7192	1.34	0.262
EngineSpeed	1	8812595	7976444	7976444	1490.10	0.000
Fuel Type*EngineSpeed	2	21295	21295	10648	1.99	0.138
Error	548	2933421	2933421	5353		
Total	553	11771004				

S = 73.1639 R-Sq = 75.08% R-Sq(adj) = 74.85%

Partial Autocorrelation Function for residuals from GLM (1 of 500) (with 5% significance limits for the partial autocorrelations)



Residual Plots for CO2 (1 of 500)



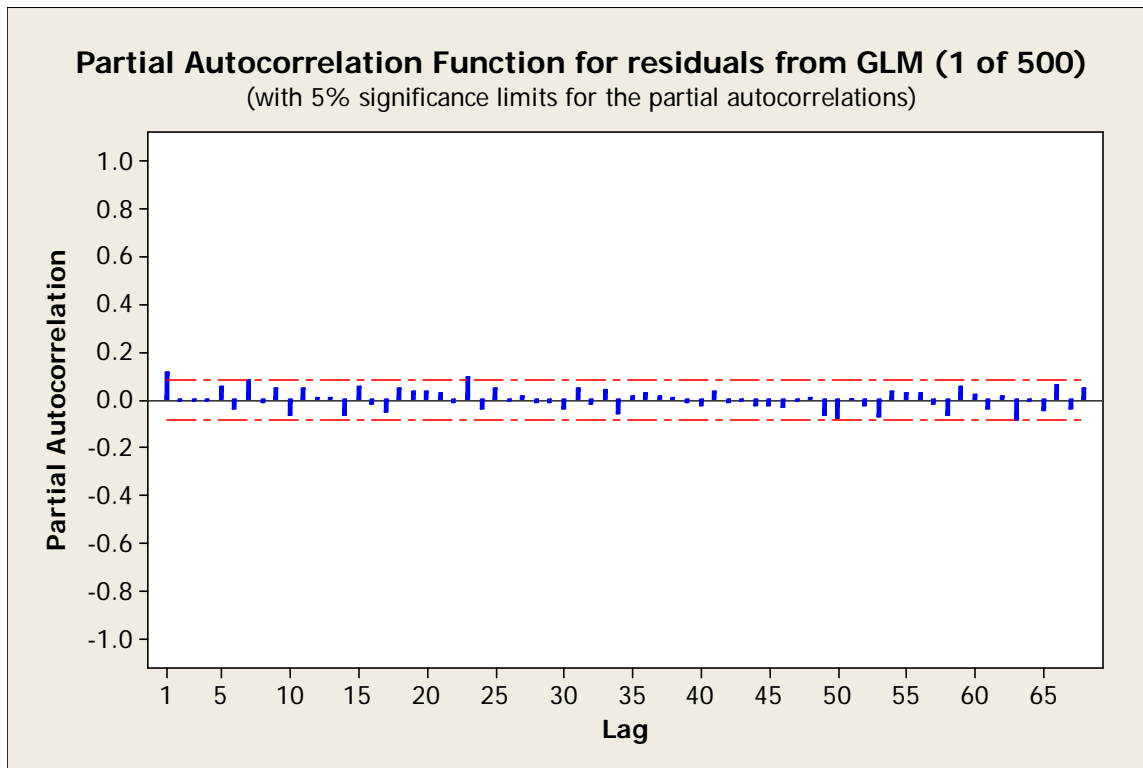
General Linear Model: CO2 versus Fuel Type

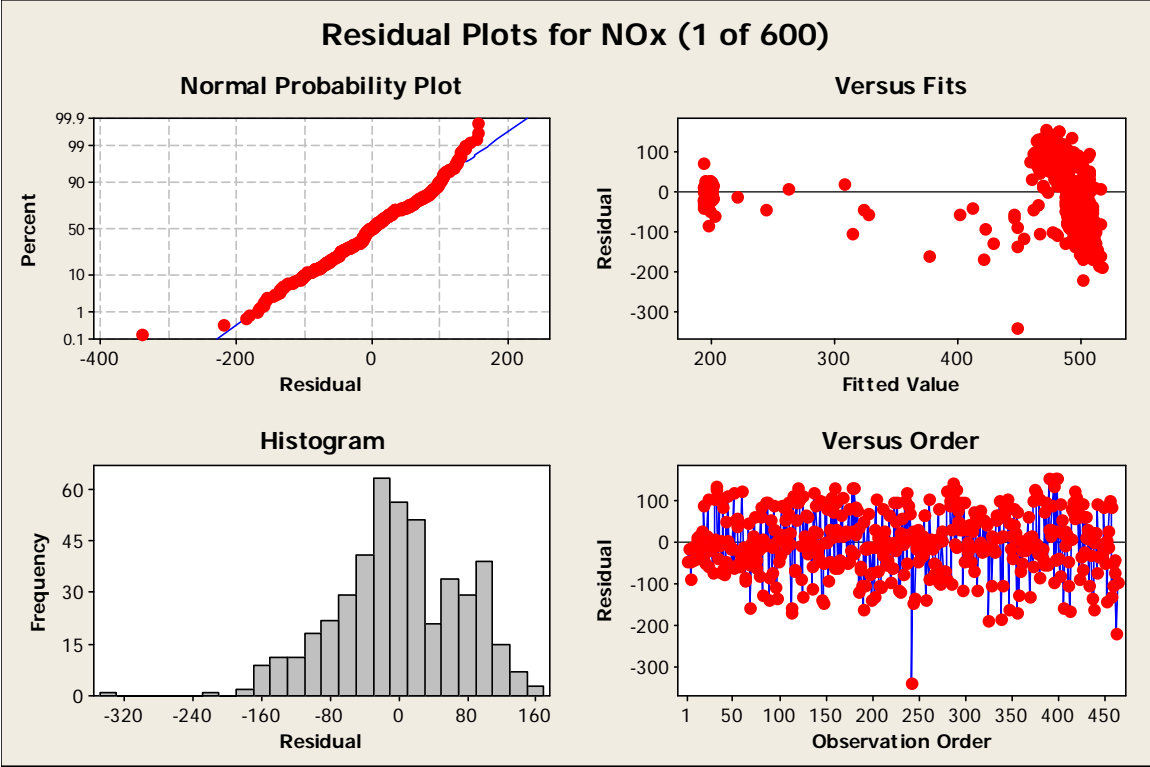
Factor Type Levels Values
Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for CO2, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
Fuel Type	2	6.74	1.34	0.67	1.06	0.346
EngineSpeed	1	1980.68	1744.50	1744.50	2763.53	0.000
Fuel Type*EngineSpeed	2	0.42	0.42	0.21	0.33	0.719
Error	548	345.93	345.93	0.63		
Total	553	2333.77				

S = 0.794518 R-Sq = 85.18% R-Sq(adj) = 85.04%





General Linear Model: NOx versus Fuel Type

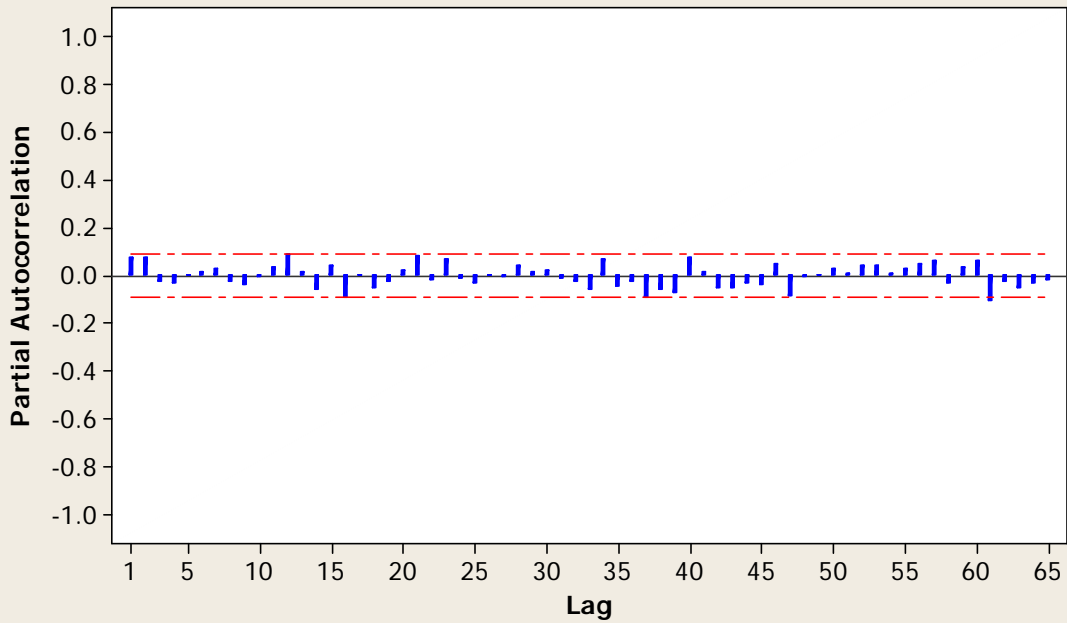
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Factor      Type  Levels  Values
Fuel Type  fixed      3  B20, Diesel, ECD
```

Analysis of Variance for NOx, using Adjusted SS for Tests

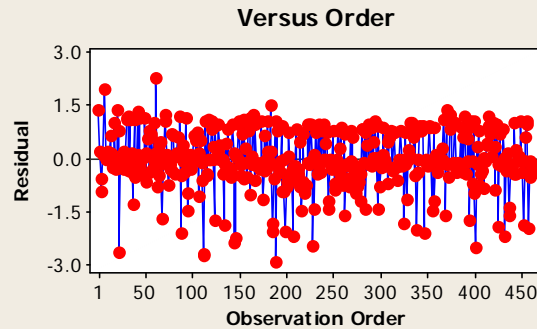
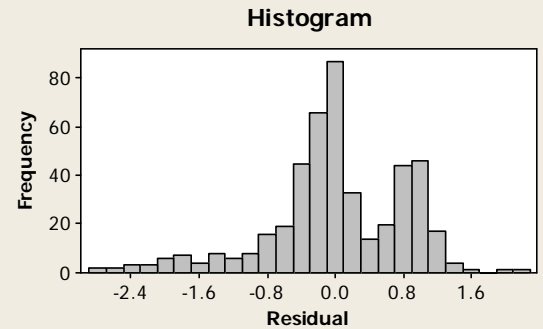
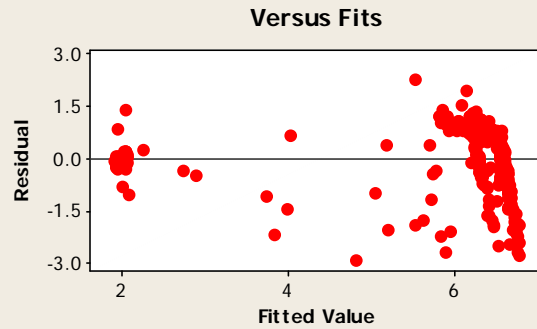
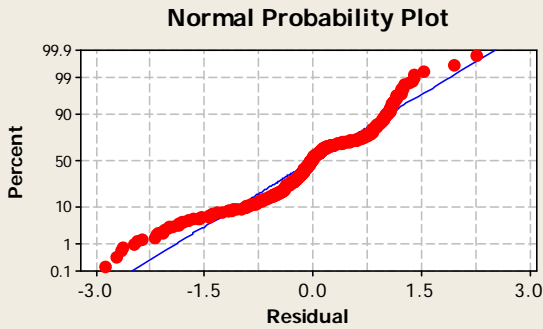
Source	DF	Seq SS	Adj SS	Adj MS	F	P
EngineSpeed	1	7233331	6394569	6394569	1152.22	0.000
Fuel Type	2	5532	7068	3534	0.64	0.529
Fuel Type*EngineSpeed	2	10686	10686	5343	0.96	0.383
Error	457	2536259	2536259	5550		
Total	462	9785808				

S = 74.4970 R-Sq = 74.08% R-Sq(adj) = 73.80%

Partial Autocorrelation Function for residuals from GLM (1 of 600)
(with 5% significance limits for the partial autocorrelations)



Residual Plots for CO2 (1 of 600)



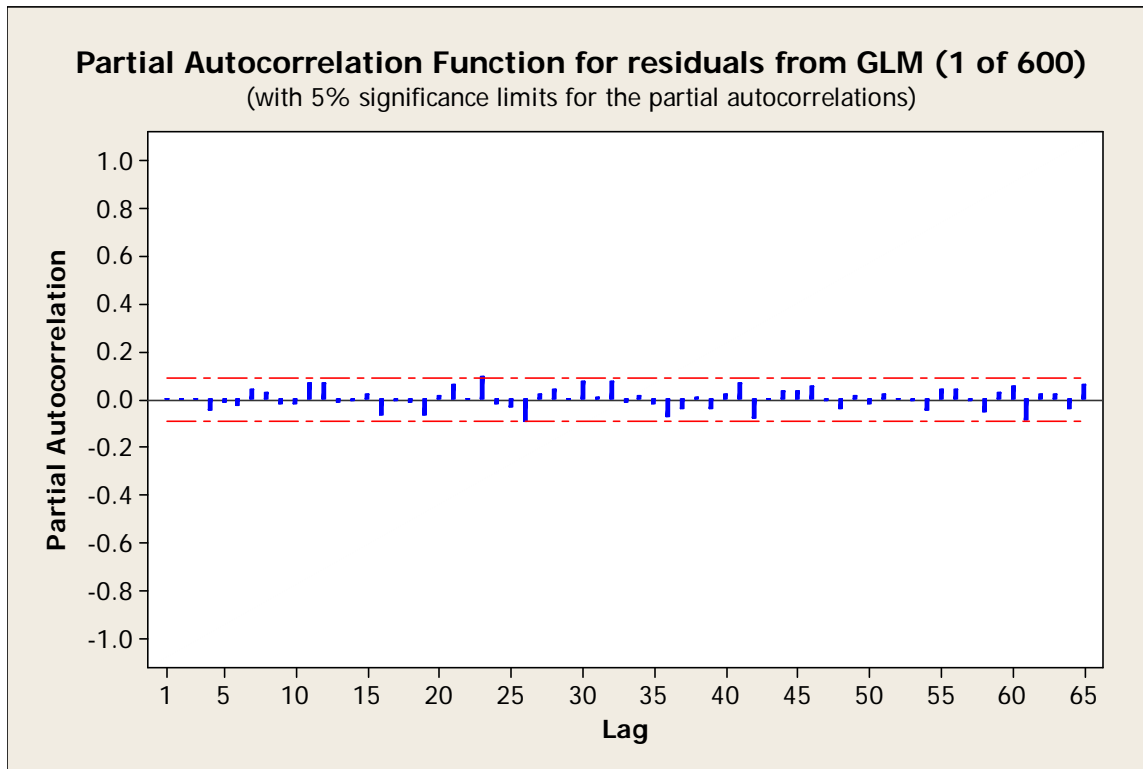
General Linear Model: CO2 versus Fuel Type

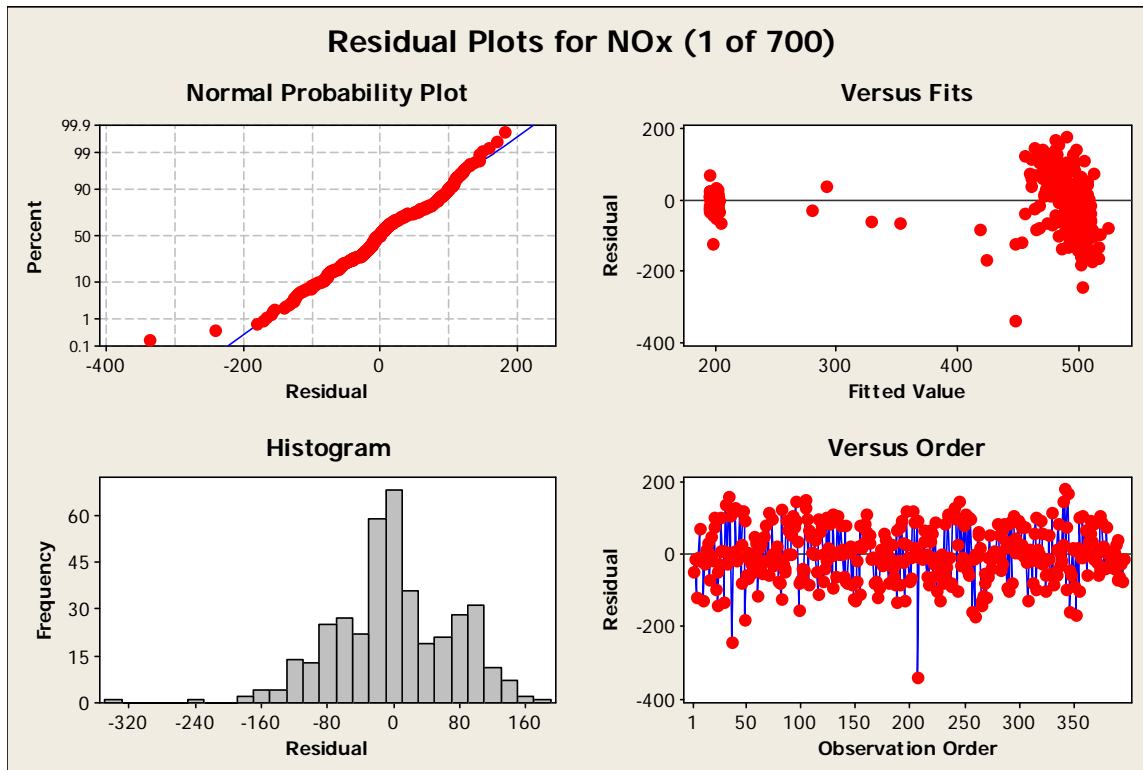
Factor Type Levels Values
Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for CO2, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
EngineSpeed	1	1648.66	1423.48	1423.48	2115.98	0.000
Fuel Type	2	6.39	0.91	0.46	0.68	0.509
Fuel Type*EngineSpeed	2	0.99	0.99	0.50	0.74	0.479
Error	457	307.44	307.44	0.67		
Total	462	1963.48				

S = 0.820199 R-Sq = 84.34% R-Sq(adj) = 84.17%





Results for: 1 of 700

General Linear Model: NOx versus Fuel Type

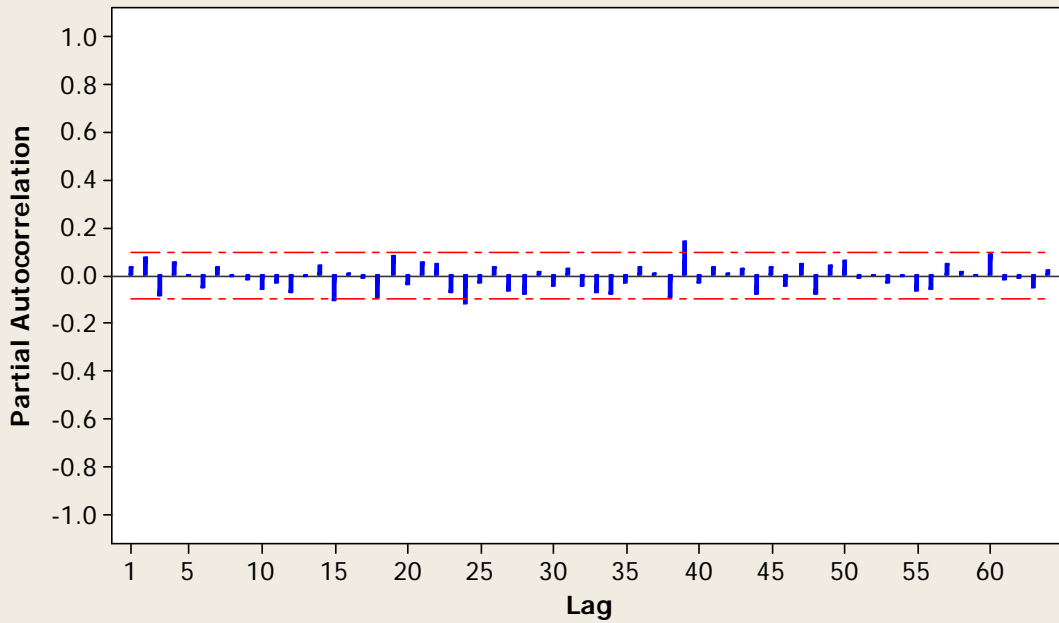
Factor Type Levels Values
 Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for NOx, using Adjusted SS for Tests

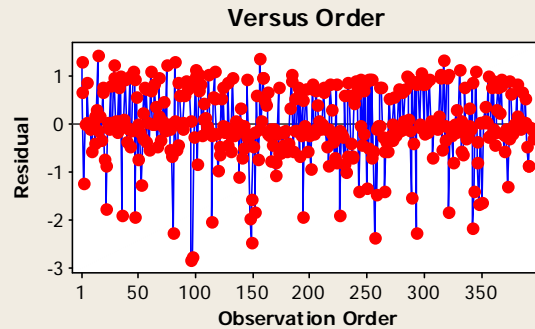
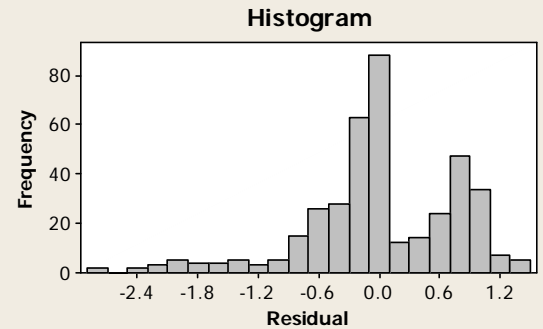
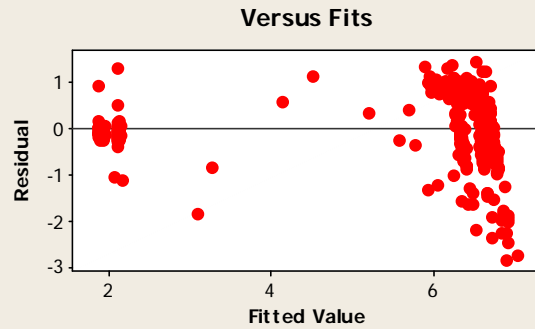
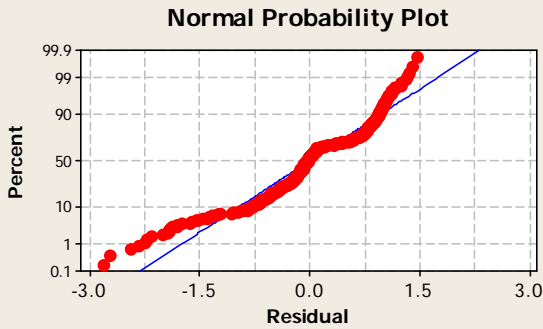
Source	DF	Seq SS	Adj SS	Adj MS	F	P
Fuel Type	2	32594	8510	4255	0.80	0.448
EngineSpeed	1	6752312	5896630	5896630	1115.24	0.000
Fuel Type*EngineSpeed	2	12151	12151	6075	1.15	0.318
Error	390	2062049	2062049	5287		
Total	395	8859105				

S = 72.7139 R-Sq = 76.72% R-Sq(adj) = 76.43%

Partial Autocorrelation Function for residuals from GLM (1 of 700) (with 5% significance limits for the partial autocorrelations)



Residual Plots for CO2 (1 of 700)



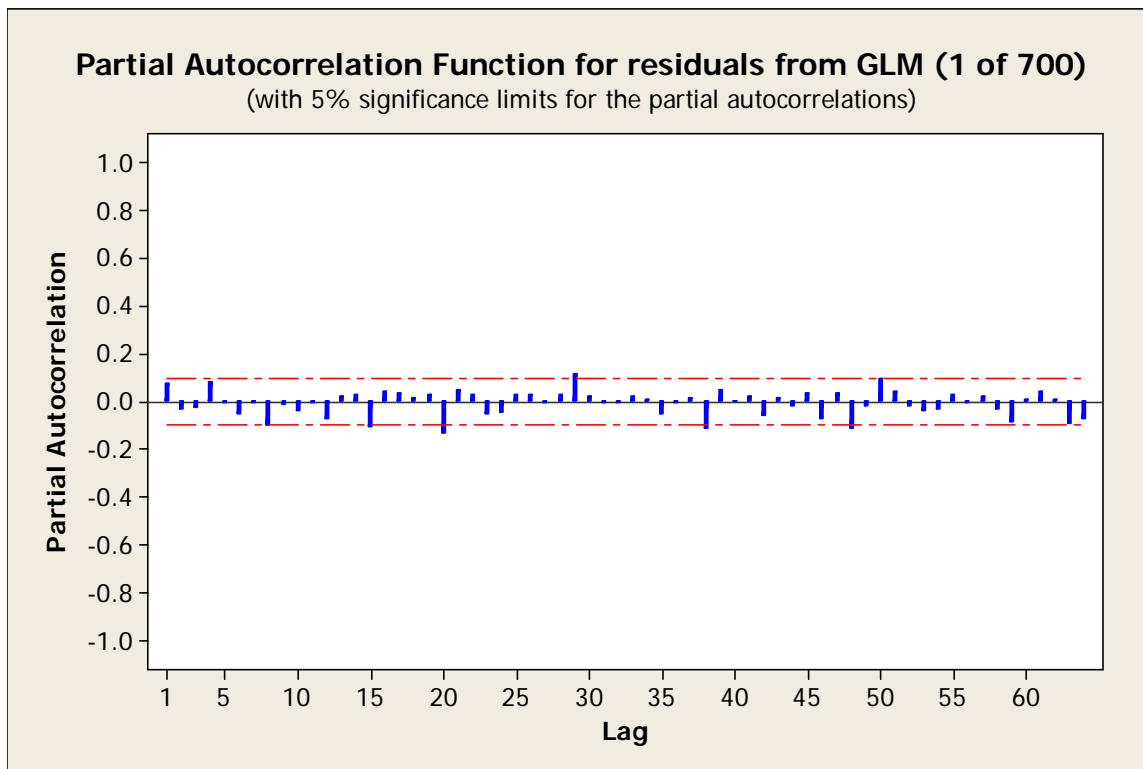
General Linear Model: CO2 versus Fuel Type

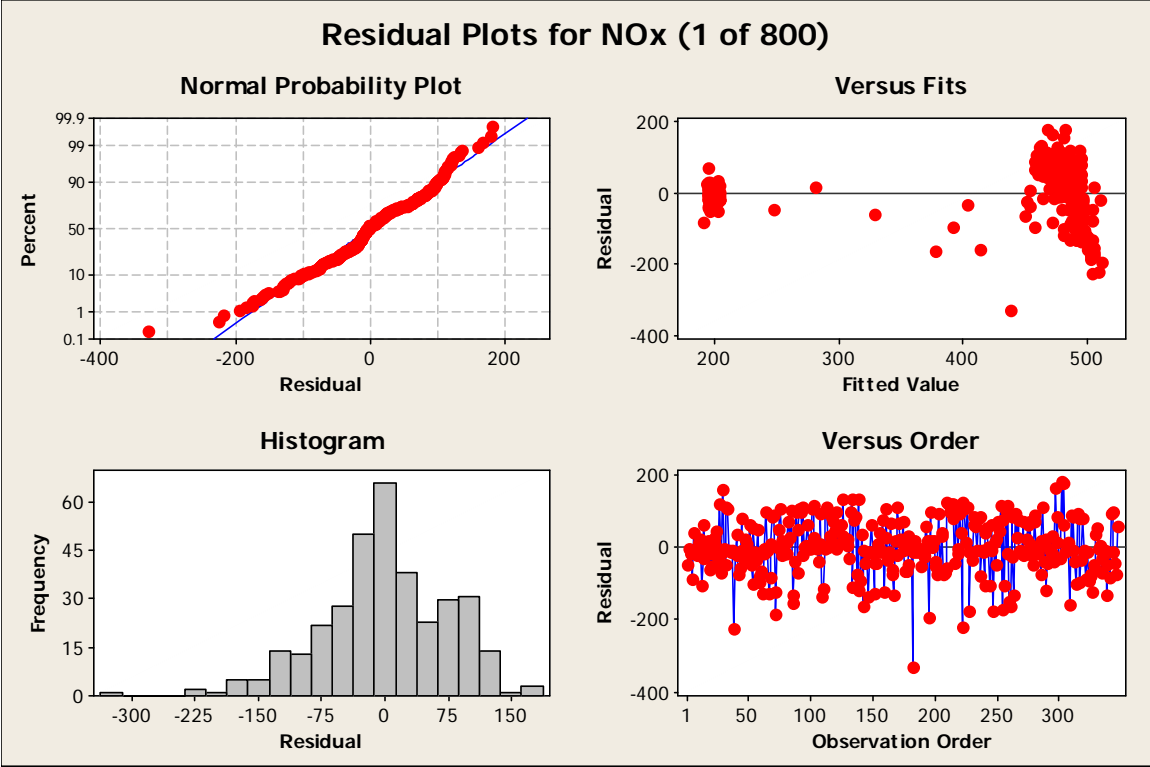
Factor Type Levels Values
Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for CO2, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
Fuel Type	2	8.61	1.43	0.72	1.25	0.286
EngineSpeed	1	1587.95	1344.74	1344.74	2355.09	0.000
Fuel Type*EngineSpeed	2	0.37	0.37	0.19	0.33	0.723
Error	390	222.69	222.69	0.57		
Total	395	1819.61				

S = 0.755640 R-Sq = 87.76% R-Sq(adj) = 87.60%





Results for: 1 of 800

General Linear Model: NOx versus Fuel Type

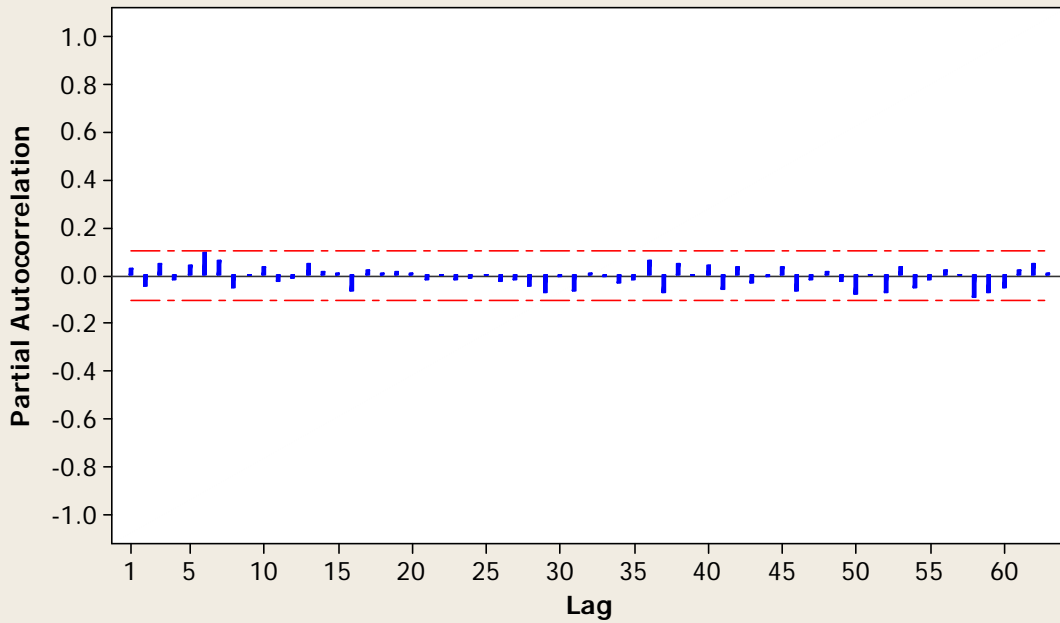
Factor Type Levels Values
 Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for NOx, using Adjusted SS for Tests

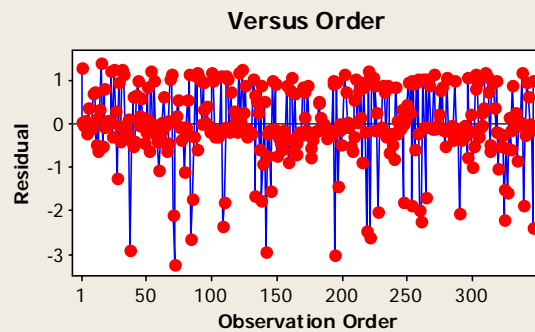
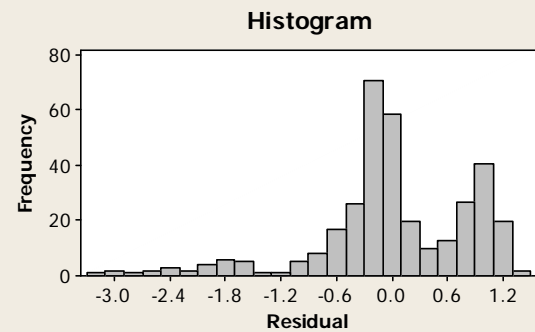
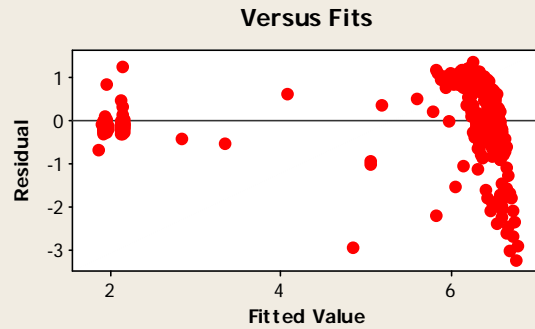
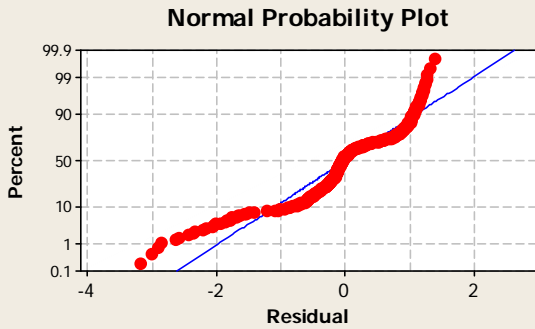
Source	DF	Seq SS	Adj SS	Adj MS	F	P
Fuel Type	2	28293	5995	2998	0.52	0.595
EngineSpeed	1	5489489	4752988	4752988	824.72	0.000
Fuel Type*EngineSpeed	2	5063	5063	2531	0.44	0.645
Error	341	1965230	1965230	5763		
Total	346	7488075				

S = 75.9153 R-Sq = 73.76% R-Sq(adj) = 73.37%

Partial Autocorrelation Function for residuals from GLM (1 of 800) (with 5% significance limits for the partial autocorrelations)



Residual Plots for CO2 (1 of 800)



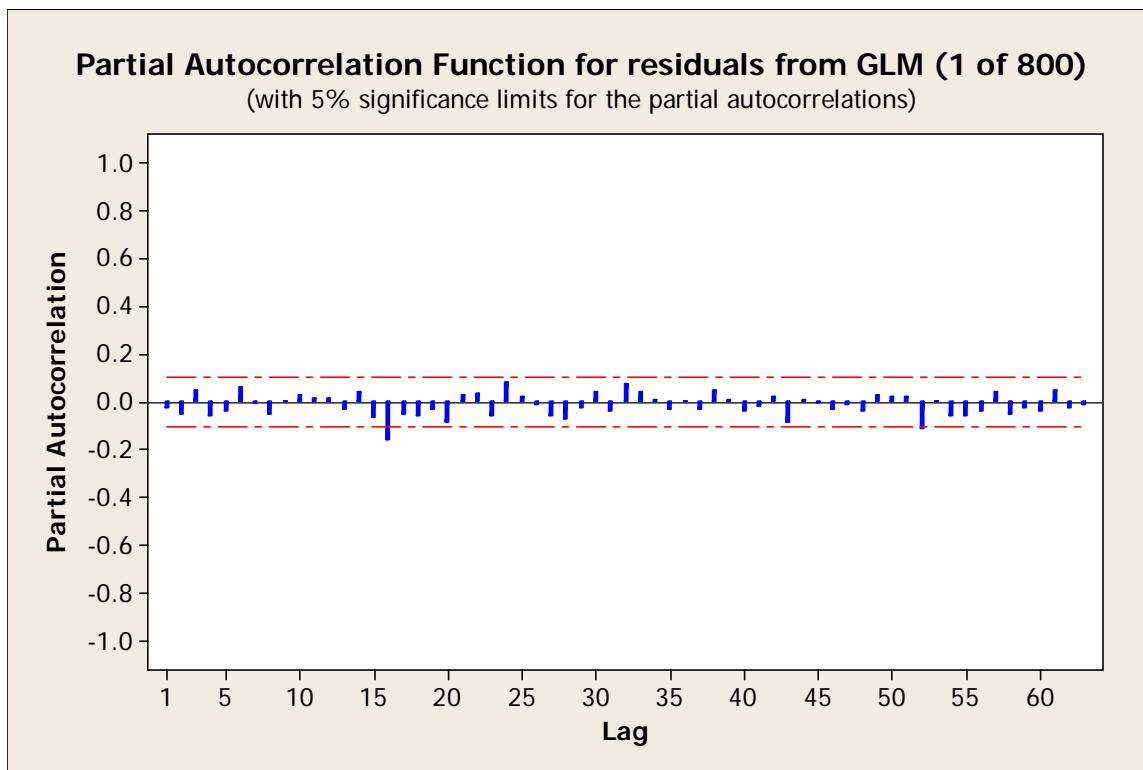
General Linear Model: CO2 versus Fuel Type

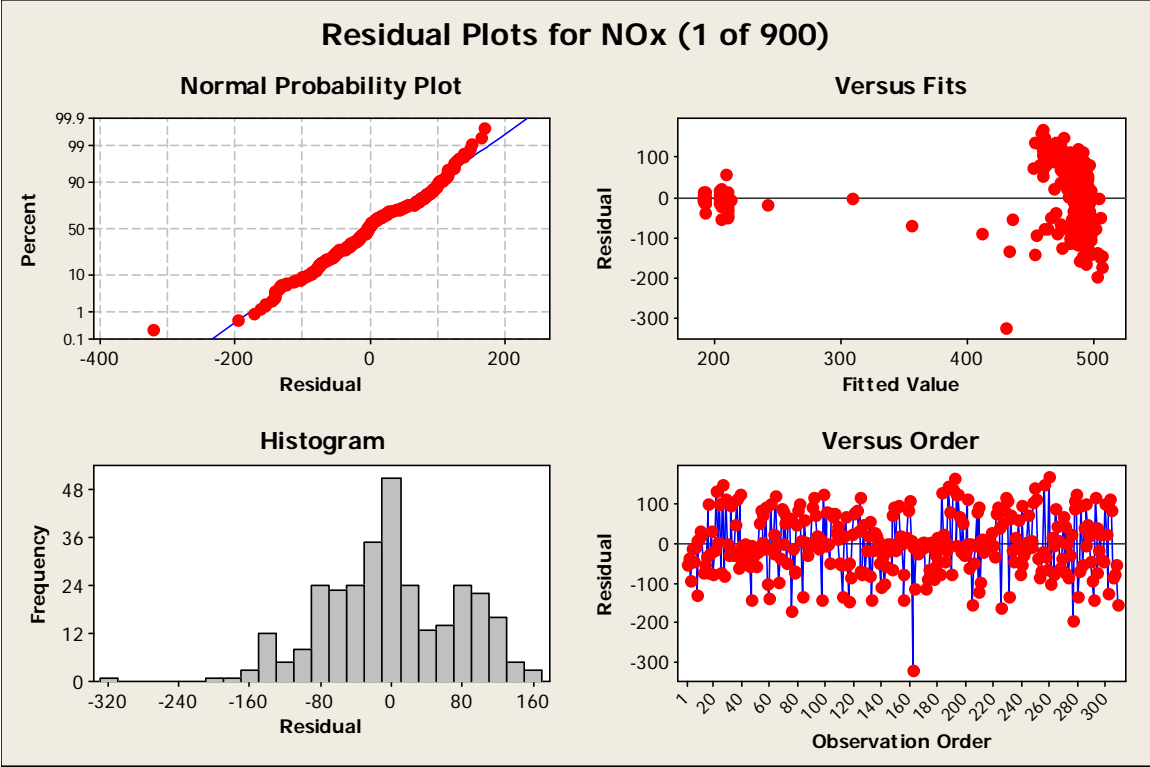
Factor Type Levels Values
Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for CO2, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
Fuel Type	2	6.92	1.39	0.69	0.95	0.389
EngineSpeed	1	1248.25	1066.55	1066.55	1454.71	0.000
Fuel Type*EngineSpeed	2	0.49	0.49	0.25	0.34	0.714
Error	341	250.01	250.01	0.73		
Total	346	1505.68				

S = 0.856255 R-Sq = 83.40% R-Sq(adj) = 83.15%





Results for: 1 of 900

General Linear Model: NOx versus Fuel Type

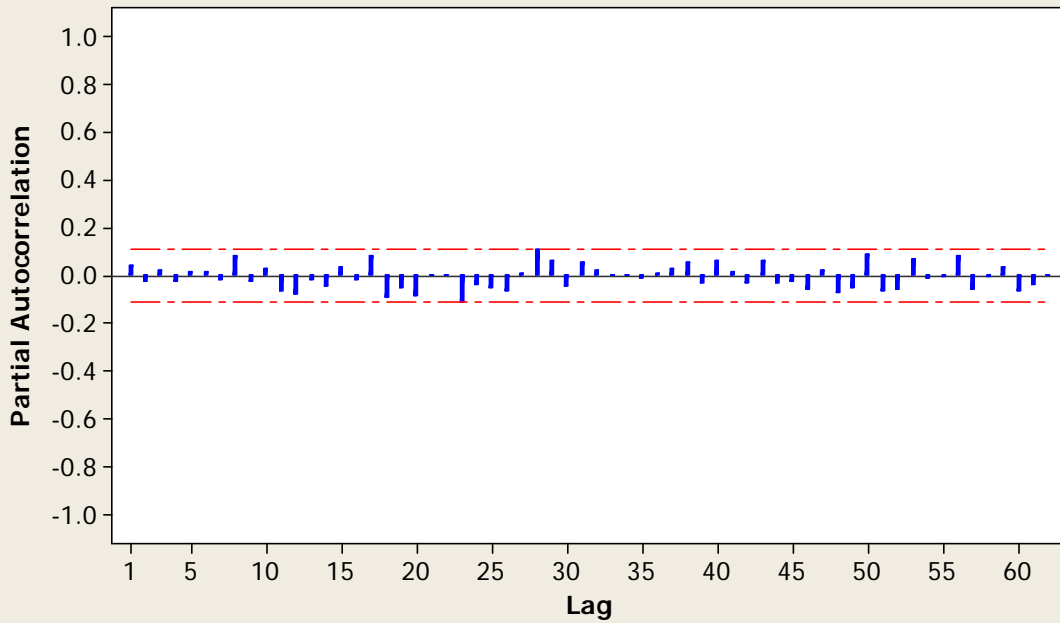
Factor Type Levels Values
 Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for NOx, using Adjusted SS for Tests

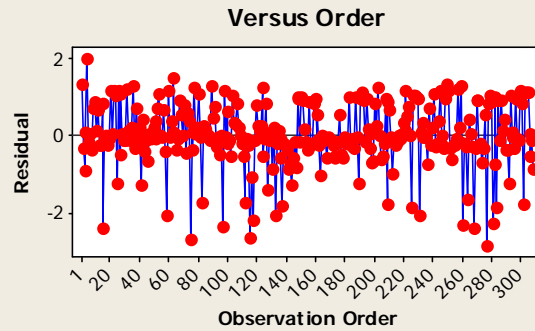
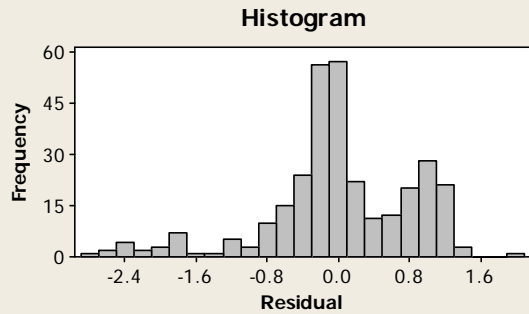
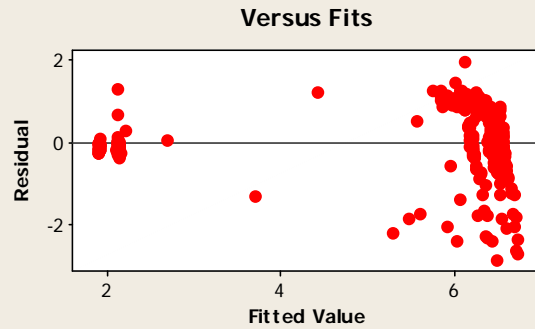
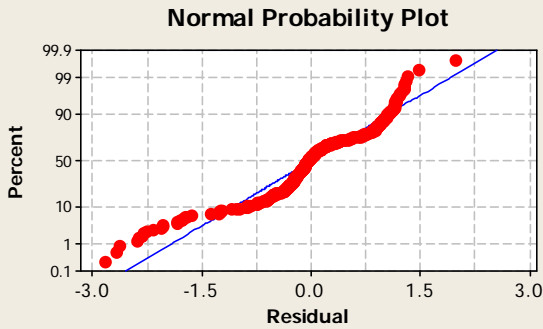
Source	DF	Seq SS	Adj SS	Adj MS	F	P
Fuel Type	2	19958	4054	2027	0.35	0.708
EngineSpeed	1	4104430	3384041	3384041	577.37	0.000
Fuel Type*EngineSpeed	2	2467	2467	1233	0.21	0.810
Error	303	1775911	1775911	5861		
Total	308	5902765				

S = 76.5578 R-Sq = 69.91% R-Sq(adj) = 69.42%

Partial Autocorrelation Function for residuals from GLM (1 of 900) (with 5% significance limits for the partial autocorrelations)



Residual Plots for CO2 (1 of 900)



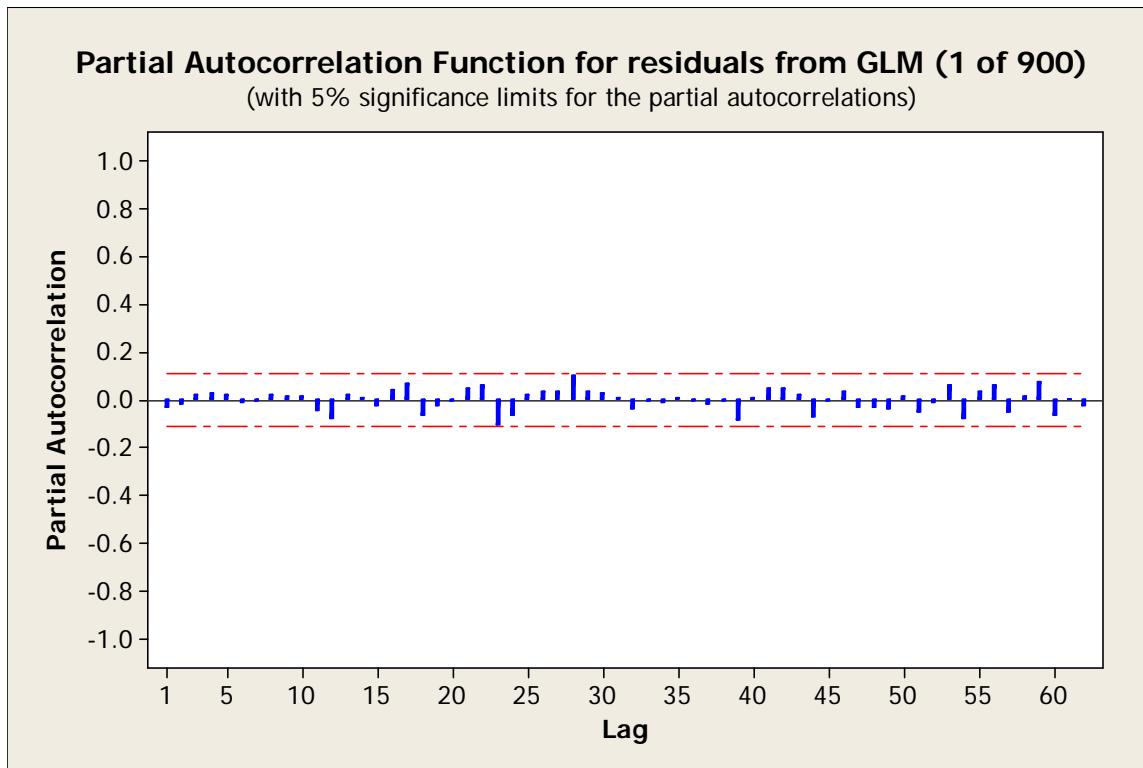
General Linear Model: CO2 versus Fuel Type

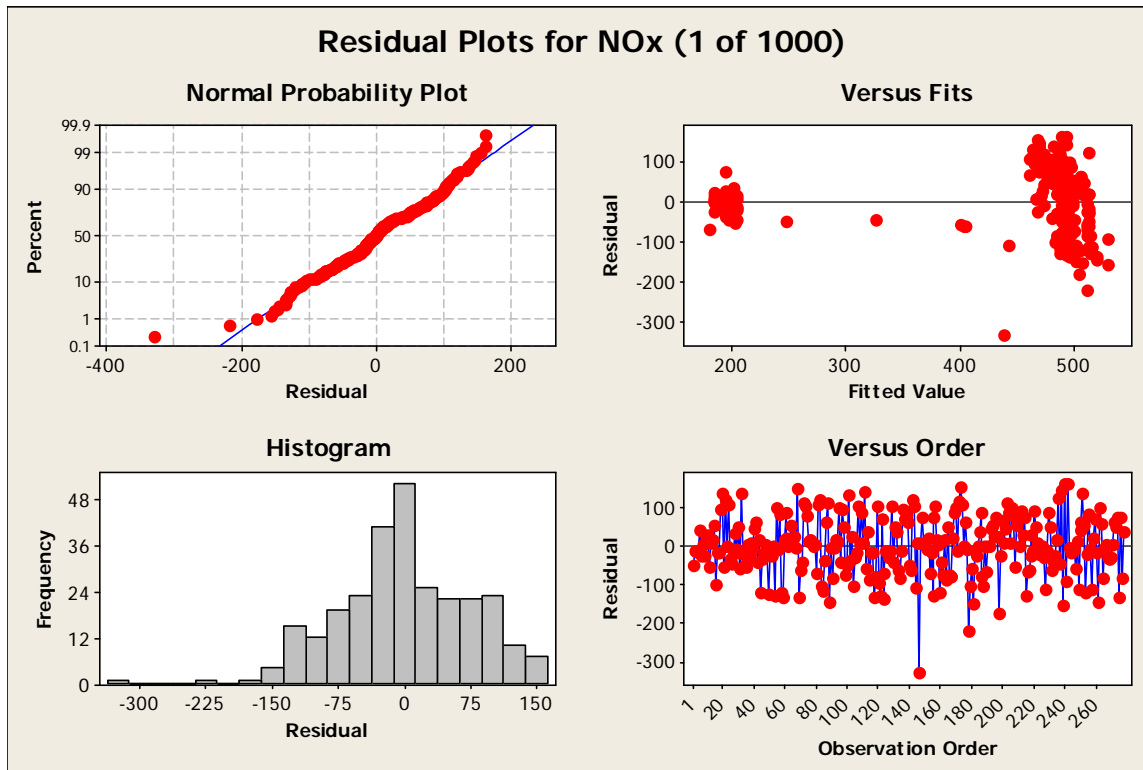
Factor Type Levels Values
Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for CO2, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
Fuel Type	2	2.22	1.15	0.57	0.83	0.437
EngineSpeed	1	947.83	776.83	776.83	1123.31	0.000
Fuel Type*EngineSpeed	2	1.23	1.23	0.61	0.89	0.413
Error	303	209.54	209.54	0.69		
Total	308	1160.82				

S = 0.831601 R-Sq = 81.95% R-Sq(adj) = 81.65%





Results for: 1 of 1000

General Linear Model: NOx versus Fuel Type

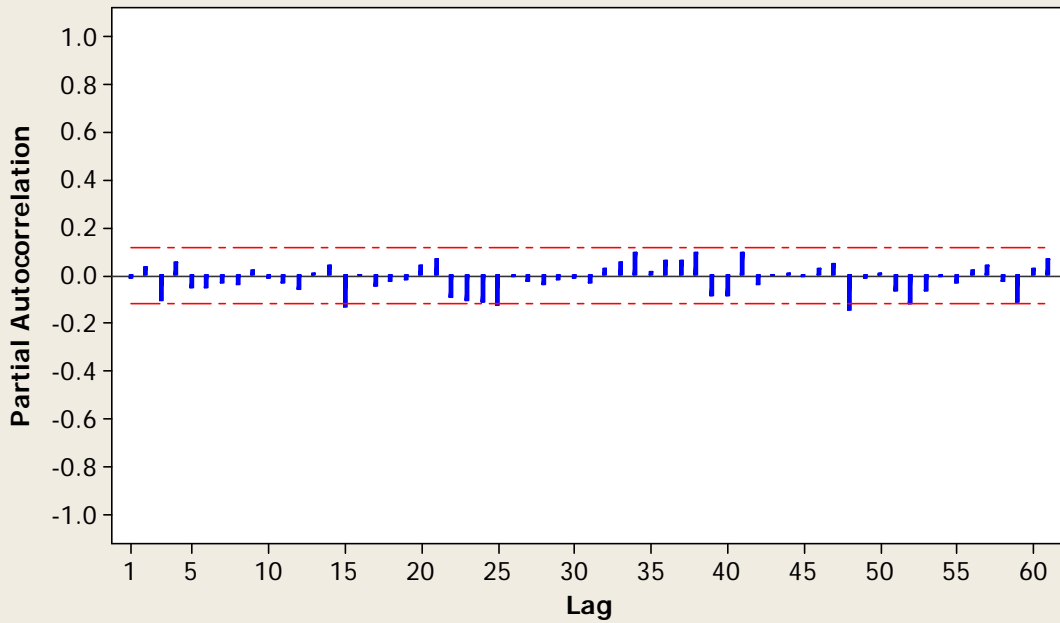
Factor	Type	Levels	Values
Fuel Type	fixed	3	B20, Diesel, ECD

Analysis of Variance for NOx, using Adjusted SS for Tests

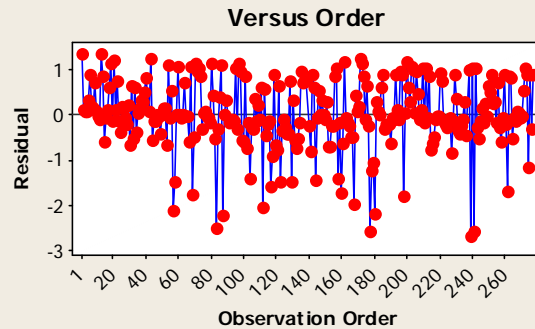
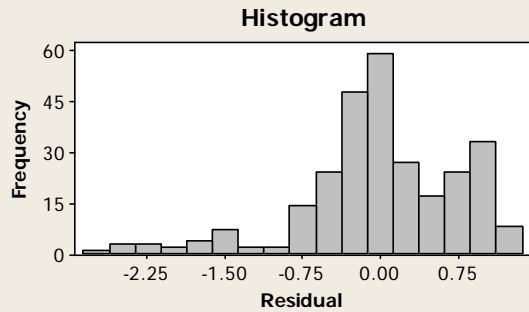
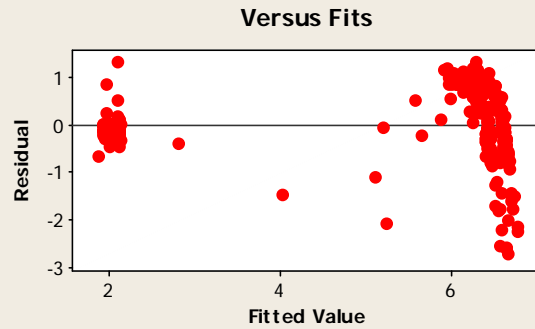
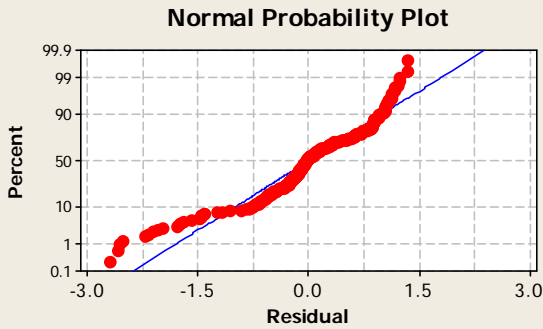
Source	DF	Seq SS	Adj SS	Adj MS	F	P
Fuel Type	2	21153	11283	5641	0.97	0.380
EngineSpeed	1	4532826	3967746	3967746	682.75	0.000
Fuel Type*EngineSpeed	2	14223	14223	7111	1.22	0.296
Error	272	1580710	1580710	5811		
Total	277	6148912				

S = 76.2328 R-Sq = 74.29% R-Sq(adj) = 73.82%

Partial Autocorrelation Function for residuals from GLM (1 of 1000)
(with 5% significance limits for the partial autocorrelations)



Residual Plots for CO2 (1 of 1000)



General Linear Model: CO2 versus Fuel Type

Factor Type Levels Values
Fuel Type fixed 3 B20, Diesel, ECD

Analysis of Variance for CO2, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
Fuel Type	2	12.21	0.66	0.33	0.55	0.580
EngineSpeed	1	1007.66	850.36	850.36	1398.27	0.000
Fuel Type*EngineSpeed	2	0.09	0.09	0.05	0.08	0.927
Error	272	165.42	165.42	0.61		
Total	277	1185.38				

S = 0.779838 R-Sq = 86.05% R-Sq(adj) = 85.79%

