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Contract # DE -FG01-96EE15649

Final Report DOE/EE/15649--T5

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Project Title: Develop the Dual Fuel Conversion System for High Output, Medium Speed Diesel Engines

Abstract:

The original plan for the project involved design modifications to an existing system to enhance its performance and increase the limit of power that was achieved by the original design and to apply the higher performance product to the full sized engine and test its performance. The new system would also be applied to a different engine model. The specific work would include the redesign of gas injectors, piston configurations and two types of igniters, Engine instrumentation, monitoring and testing.

Executive summary:

By the time the contract was awarded a number of the tasks indicated in the project had already been accomplished. Because of this there were several changes made in the plan. The contract then picked up on the project at the point we had previously achieved. The 16 cylinder 4300 horsepower full sized engine then underwent testing in its standard mode of diesel operation. Data was taken at all speed and load configurations. This now provides a frame of reference for the gas operation to compare to. New style gas injectors were designed and tested on number 5 cylinder of the 8 cylinder 1650 HP test engine. The new injectors were powered from a hydraulic system instead of the previous design compressed air system making them more accurate and more controllable. The new design greatly increased the level of air and fuel mixing and we saw spectacular results in emission reductions and apparent power limit increases. After these preliminary results we manufactured the necessary number to equip the entire engine for complete data acquisition. Along with the new injector we tested both a spark ignited prechamber and a diesel ignited prechamber. Both devices, after having gone through a number of configuration adjustments, performed very well on the single cylinder tests. The spark prechamber will allow the engine to operate on natural gas alone requiring only a single fuel source. The diesel prechamber produces higher levels of power with 1/10 the diesel fuel used by the preexisting dual fuel system. Both devices provide the benefits of electronic timing adjustments for greater performance and cleaner operation. The new gas injectors are installed and the full scale hydraulic system is manufactured and applied. The engine is then operated with these new devices to measure the incremental benefit of the better injectors alone. The results are that the engine is able to operate at higher loads, better efficiencies and lower exhaust emissions. The spark prechambers were acquired and the necessary changes were applied to the engine to make them operate. Testing the engine with all 8 cylinders spark ignited confirms some of the results from the single cylinder testing. However the spark system is not yet completed therefore final data is not available. Thus far the engine is able to operate at 80% power, cleaner exhaust and equal efficiencies. The extension of our product line to this area allows us to enter a new market category – Spark Ignited Gas Engines. The final task completed was to have a full set of diesel prechambers manufactured and they are ready for testing.

We have reached the end of an extended project time frame. It is not possible to complete all of the goals outlined in the original plan in this time frame, however the accomplishments achieved to date are enough to extend the product's marketability while further development continues. The remaining tasks will be under taken as time and resources permit. Out of the eleven basic task catagories we have 100% completion on 5 areas. One area has not yet been started and the remaining four areas are approximately 25 to 85% complete. In addition to these original task groups we identified seven more specific task areas. Of the additional seven task areas we have 100% completion on 4 of them. Of the remaining three we have 25% to 75% complete.

Substantive report:

710 Engine instrumentation:

In order to properly evaluate the operation of the high output 710 engine both in its standard configuration and in its converted configuration the engine is extensively instrumented. Sensors of various types must be applied to the appropriate areas. The sensors are connected to special circuit boards mounted inside personal computers. There are three PCs in use during most of the development testing. The first unit displays and records the basic engine variables such as power output, speed and fuel consumption. The second computer is used specifically for the emissions data. The third computer is used for recording high speed data, primary high speed data is the combustion pressure and crankshaft position. The combustion pressure data is recorded every two flywheel degrees. When the engine is at full speed we take a data sample every 45 micro seconds. The other two computers operate at relatively slow rates updating the screen information about twice a second. The computer runs a program to display the sensor's readings, create files and record the values. All in all there are 40 Temperatures, 9 Pressures, 17 measured voltages and 18 calculated values. The records taken with the system have been supplied in appendix A. Inspect the data sheets to see specifically what process variables are being instrumented.

We use two engines for testing. We have a 8 cylinder 645 (cubic inch per cylinder) turbocharged engine and the 16 cylinder 710. The 645 is rated at 1650 horsepower while the 710 is rated at 4500 horsepower. The 645 uses up to 80 gallons of fuel per hour and the 710 uses 200 gallons per hour. Many of the design aspects of these two engines are identical, in fact the connecting rods and cylinder heads are interchangeable. Because of the dramatic fuel use difference we use the 645 for much of our development work. Base line data, certain development and final testing is still required on the big engine. The 645 engine has been equipped with complete instrumentation prior to this contract. The 710 was approximately 95% instrumented before the start of the contract. Final instrumentation (within reasonable limits) was completed at the very beginning of the contract. 100% complete.

Base line:

After the engine was fully equipped with sensors we performed the base line test sets. The base line test generates a frame of reference for us to compare to. The first steps in base lining were to have everything operational and ensure the various sensors are calibrated. A number of test sets were run in order to achieve three data sets that showed consistently similar numbers. After taking the data we graphed a number of variables of particular interest such as the three emission concerns, CO, NOX and HC. The power curve and efficiency were likewise graphed. These are included in Appendix A 100% complete

Engine fuel gas supply:

None of the work or costs described in this gas fuel supply section were part of the contract but it certainly was essential to the project. In the past the 645 engine gas operation testing was fueled using a storage bank of high pressure cylinders. This storage was limited and full power operation would only last a few hours. We knew that the fuel system would not flow the necessary rate for the larger engine not to mention that the amount of fuel would be unacceptable. In previous discussions with the local utility they clearly indicated that we would have to pay for the extension and we couldn't afford to pay the 15,000 fee. Recently however there had been a housing development where the gas line was extended a

ways before turning away from the highway. After having contacted the gas company we finally arranged to have a gas supply line extended down the highway to our facility. The line pressure is limited to 15 PSI so in order to operate the engines it is necessary to compress it up to 115 PSI. We acquired a used compressor and rebuilt it. We are now able to run unlimited operating time. Because the gas is less expensive than the diesel we find that even the warm up of the 645 engine is done on gas instead of diesel. 100% complete.

Combustion pressure monitoring:

The monitoring of combustion pressure is not a new idea. The challenge always has been to make the results worth the costs. Previously it has been cost effective on very large ocean going vessels. If cost effective combustion pressure monitoring can be applied then the engine can be more accurately tuned and eventually through software algorithms able to tune itself. This would be the ultimate in engine design. The engine would always be most efficient, being able to produce the most possible power without engine damage. However we have always found in the past that the cost for sensors, considering they don't last very long is prohibitively high. At last we found a sensor made by NGK and marketed by Engine Monitoring Co. that has virtually infinite life and costs less than half of the next closest device. We thought this such a good thing that we had to try it. We purchased first only one sensor to evaluate its signal and to see how we could apply it to the EMD engine. The result of this was really pretty good so we ordered another 8 sensors. After applying the sensors to the engine we were very disappointed to find that the sensors all produced signals at different levels. We tried changing the mounting method and to mix and match them to be sure it wasn't something that we were doing but to no avail. The equipment wasn't extremely cheep but we feel it was worth every bit to evaluate them and what could have been. If we aren't able to go with affordable pressure monitoring then Knock detection can be used to protect the engine. Since that time we have now learned of another sensor that will be durable and they claim excellent signal repeatability. Their cost will be more than double but we expect to try the application of these. NGK sensor evaluation 100% complete. Engine monitoring with pressure sensors 25% complete

Knock detection:

The detection of combustion knock is commonplace today in the automotive industry. The benefits of this are multifaceted. For our project the ability to detect knock has several benefits as well. In order to achieve the maximum performance from the engine, ignition timing must be adjusted to the optimum point. During testing you can fine tune and map the timing to obtain the best performance. In real life however, the surroundings change and engine balance can also become an issue. In the past the lack of knock detection lead to some premature engine failures. The knock was caused by changes in the fuel content/quality. While this was never expected the result was that there was an unacceptable engine failure.

The development of a knock detection system started long before the contract was received. We have played with Delco sensors and finally acquired a Bosch automotive knock sensor. This particular sensor was selected because of its ungrounded electrical design, its availability and signal performance characteristics. We built a bread board version of a signal filter. In order to determine where to place the sensor and how many sensors would be needed we sampled signals on the operating engine. After finding the best location we mounted a couple of sensors and continued to make the electronic signal filter alterations. Testing the operation of the system and fine tuning was performed by running the engine and

forcing knock. Once we were convinced that the electronic component design performance was acceptable we moved ahead and had circuit boards made. The testing indicated that one sensor would be needed for every 2 cylinders, thus for a 20 cylinder engine, 10 sensors would be used. When installed the system is able to receive signals from up to 10 sensors and send a digital signal to the controller if knock is detected. The 10 channels are independently calibrated. The knock detection system work started about a year before the contract was received and approximately 30% of knock system was developed under the grant. The knock detection system is functional and available for application to existing and new products. We are still evaluating the package on our test engine and have identified some areas that may still need some improvements. As indicated above, new sensor technology for combustion monitoring may cause us to shift gears. The test knock system tends to drift and loose its ability to properly detect knock, additionally it can become more sensitive and indicate knock when it is not present. 100% functional 80% complete.

Spark prechamber:

Spark prechamber is a fairly common method used to create a powerful ignition source for large bore lean burn gas engines. It entails a fairly conventional industrial electronic distributorless ignition system and custom designed chamber that is connected to the main combustion chamber. Raw gas is supplied to the small prechamber through a check valve during the period of low pressure. During compression air is forced into the prechamber mixing with the gas in an attempt to create a perfect gas/air mixture that even under high compression pressures consistent and powerful ignition occurs. After ignition the expansion of the gases forces the flame into the main chamber and the flame sets off the lean mix main chamber charge. Lean burn engines have high power capacity, good emissions and good efficiency.

The spark ignition part of the project is another area that has been a long time coming. We first purchased the electronic controls and many of the components to do one cylinder testing in 1993. At that time we had a number of designs we intended to try. In the meantime we became acquainted with a company by the name of Diesel Supply Company that had been doing development of prechamber systems for gas engines in the power generation and gas pumping industries. They never did any work on the EMD because there aren't any gas EMD engines except for the dual fuel units that we have provided to industry. Instead of trying to duplicate the work that DSC had accomplished we decided to joint venture the application and DSC has supplied ECI with the prechambers for testing. DSC prechambers are water jacketed to keep the sparkplug from overheating. Over heated spark plugs are a primary cause for premature failure. The devices also utilize an inventive check valve that DSC has worked to optimize, going through many styles and designs prior to having such good success.

Early in the application of the prechamber we learned that the gas injection style and air mixing was critical to proper operation. Where the dual fuel system was very tolerant to poorly mixed gas and air the spark system would misbehave. This is a primary cause leading us to the next section involvement in new style gas injectors, specifically hydraulic port injector and jet caps. After we provided better mixed gas and air the preliminary results of one cylinder testing were very intriguing. We were recording numbers for power and emissions that appeared to indicate we were producing more power than the other system types and the emissions would be more than 50% below the existing levels of both CO and NOX. We do realize however that operating one cylinder cannot indicate what the fuel use or the efficiency of the whole engine will be. We took the prechamber design and made some

modifications to it so as to make it a custom fit for the EMD cylinder head. DSC received the plans and produced a full set of prechambers for the 645 test engine at no cost to ECI.

Complete engine operation with the prechambers has been established. The first step was to operate the engine still in the dual fuel mode to gather operational data in the areas of engine operation that have never before been covered. After several attempts at engine starting we learned what combination of settings would provide consistent and reliable start up. In order to identify the optimum parameters for engine operation regarding adjustments of air fuel ratio and ignition timing we performed a short series of tests sets. With the present prechamber configuration the engines operating efficiency is 8800 to 12000 BTU/HP-HR indicating a loss in thermal efficiency from baseline. The power limit is 85% of baseline and the emissions for NOx, and CO at equal power are reduced 49% and 57% respectively. We are not able to measure the non-methane hydrocarbons, however because diesel is no longer part of the incoming fuel, it is assured that they have been minimized to only the Lube oil and should be very much reduced. We have experienced some signal interference from the high tension of the spark system causing the electronic control of gas inlet valves to be interrupted and subsequent engine shutdown. The solution for this is still under investigation. Though more work is necessary, the results of the preliminary chambers are encouraging. The fuel consumption and power is not up to the level we intend to achieve. There are a number of chamber aspects that can be modified to optimize the ignition energy. The next step should be to reconfigure the delivery orifice at the tip of the prechamber and conduct more tests. Depending on the results we will ether do more tip configurations or increase the prechamber volume to increase the ignition energy. We are also seeking the advice of DSC and others that are knowledgeable about this type of ignition. When we have the final combination a full set of testing and mapping will be conducted. Only after final data is obtained will we be able to move forward with marketing efforts on this extension of our product line.

75% complete

Hydraulic port injector and Jet cap:

As mentioned above we confirmed what we thought we already knew about gas and air mixing. Previously we had done some testing with newly configured injector valve we call a jet cap. See Photo 7 and 8. The jet cap is a part we fit over the end of the standard gas injector that increases the velocity of the gas being injected into the cylinder. The increased velocity and directional jets aids the mixing of air and fuel. We saw measurable results on the emission side and less significant benefits in the power limits. By accident we first tested the spark prechamber with the jet cap injector and saw the spark system function fairly well. When we went back to the standard injector we saw the improper operation. The down side of the jet cap device is two fold. It increases the gas pressure required for the engine and it is located in the position where we wanted to place the diesel prechamber. We wanted to make a product that would accomplish both the quality of air fuel mixing required and work for all systems were planning to offer. In addition to this we have learned that the air powered gas injector is a maintenance issue that could be avoided if hydraulics were used. We designed an injector that would adapt to one of the 18 ports of the cylinder liner on cylinder number 5 of the 645 engine. We constructed a small hydraulic power unit from some used equipment we had in the warehouse. The single cylinder testing ended up going very well after a number of modifications were made. After the results of the one cylinder tests we decided to make up a full set of "port injectors" for the 8-645. We put together a bigger hydraulic power unit with mostly existing hardware, having to purchase only a pump and accumulator. The power unit is large enough to run the 710 engine when we get to applying hardware to it. The operational tests of the port injectors on the whole engine is again met with some new and different

challenges but after getting things worked out fairly well we were ready for tests. We met with mixed results. The engines power capacity increased 17%, the emissions NOX reduced 40% and the CO reduced 50%. The port injector's ability to better mix air and fuel is achieved and at a gas injector pressure of only 45 PSI, instead of the 70 PSI of the existing system the only drawback is that we are not able to sufficiently contain the gas in the combustion chamber. With repeated attempts of timing optimizations and flow adjustments the fuel consumption has increased by over 12%, nearly all of the increase going to gas slip into the exhaust. Our plan now is to shelve the design but not to scrap it. The benefits can't be ignored and there may be a solution to the problem in the future. The Jet cap will perform the same level of mixing and the hydraulic actuation benefits are still available for the through head injection. As for spark ignition, this will become the system design of choice. 100% complete.

Diesel prechamber:

The diesel prechamber is similar but unique from that of the spark system. It retains all of the benefits that the spark system has with the additional benefits of being virtually maintenance free and still allowing full diesel operation. The reason to provide a diesel prechamber system is to gain the performance of spark ignition with only small amounts of diesel and to offer a system to the applications that will require full power diesel operation such as off shore floating platforms and marine vessels. With the measured benefits of the spark prechamber and the available technical information on the performance of diesel prechambers they couldn't be ignored. The technical papers we have reviewed indicate the performance of the dual fuel prechamber is superior to the spark system in both power production and durability and the emissions are nearly identical.

The work under this contract was limited by time, however we were able to perform enough single cylinder testing to identify a number of the physical aspects and performance criteria necessary to take this project to the next step. The single cylinder tests provided data to support the theory that the engine would produce above the rated power using approximately 1% pilot fuel. The testing also produced results with 1/2 % on up to 3% fuel rates, three chamber volumes, two injector tips, four chamber orifice configurations and three injection control strategies. Ideally the prechamber system would be a collection of readily available production equipment and custom components. High pressure common rail injection systems have been in development from virtually all of the main fuel injection manufacturers. While our project is not able to support this type of development it is able to benefit from the availability of components from high volume manufacturing. As time has passed this technology is becoming available and will eventually fit into our product line.

We have manufactured enough chambers to equip the entire 645 engine. Software and electronic hardware has been completed to control the fuel injection timing and duration. There are still a number of components needed to finish the package and initiate testing of the entire system. Namely the injector tips and the controlling solenoid valves as mentioned above. 70% complete.

Skip fire:

Skip firing is a concept that has been tried on a number of production and prototype engines. Maybe the most well known is the Cadillac 468 engine that ran on first 4 then 6 then 8 cylinders depending on load. The fact is that an engine becomes more efficient when it is doing more work. To skip fire in our case means to inject fuel into one cylinder and then skip a number of cylinders in the firing order. You can rotate through the firing order the cylinder/s that are being fueled. The operation of skip

firing is purely in the software, there is no necessary modifications to the hardware. Skip fire is especially beneficial to this type of engine because of the difficulty of controlling excess air. Instead of reducing the air we can reduce the number of cylinders being used to produce power, in turn increasing the power of the cylinders being fired, increasing the necessary air and increasing efficiency. While there is still some testing left for refining the operational boundaries of skip fire, the preliminary programming work was completed under the contract and the initial tests confirm significant benefits. Skip fire will be used with both dual fuel system and spark ignition systems. All variable speed applications including locomotive and marine propulsion and stationary power (fixed speed) spark ignition products may also use it in conjunction with air throttling to control light load efficiency losses.

The tests we were able to perform under this contract were limited by the minimum fuel delivery flow rate of the gas flow control valve. Because of this minimum flow we were unable to gather zero load operating information. This would be significant for the idling of locomotives whereby they do this for over 50% of their operational life. This data will be acquired after some additional hardware is installed to limit available gas feed pressure. To gather relative data we set the engine speed and power low as would be expected on a locomotive application. Specifically the engine was set to 385 RPM and 125 horsepower. Data was recorded to indicate baseline, non-skip fire operation the fuel consumption was 10600 BTU per horsepower hour. We increased the ratio of skip cylinders one step at a time until we reached the optimum. With four skips and one fire we were able to reduce the fuel consumption to 8500 BTU/HP-HR. This reflects a 20% reduction of fuel consumption. Zero- load operation is expected to be even better because the fuel consumption rate gets increasingly worse with less load. Needless to say reducing the fuel consumption by over 20% should be considered very successful. Locomotives in freight service consume approx. 3.5 gallons of diesel per hour and they idle at 50% equating to 5.67 MMBTU per day and approx. 1.7 billion BTU per year per locomotive. 20% of this is 340MM BTU per year per locomotive, an equivalent savings of 2520 gallons of diesel. 100% complete.

Conclusions:

The results of the development and testing are gratifying. We are confident that the plans and decisions were good ones. The project continues to be worthwhile and the development work is producing exactly the desired results. Along with all of the positive's we recognize that the money didn't go as far as we projected and the time took longer than expected. In the past year we have delivered 12 proposals for conversion systems, some in the United States and also in other countries. The need for this product appears to be continually increasing. The optimizations of the development work are still very necessary if we are going to keep our hat in the ring with other engine builders. We are anxious to continue the development work and to be able to meet the needs of the marketplace.

Current market potential:

A recent report from Diesel Progress magazine October 98 indicates that in the past number of years the power generation market is continuously increasing in the categories of 1000KW and higher. The year from June to June recorded over 5000 generator set sold representing 9644 Mega Watts of power production internationally. In 1978 the number of units was at about 1000. Of the 5000 nearly 700 were gas or dual fuel. This is above the increase of last year but more importantly it also indicates continued growth that is expected to continue. The demand for power in the drilling and production of oil and gas are part of the above numbers. The interest for producing this power on natural gas is becoming more significant. The advent of Locomotive emission regulations in December of 1997 have sparked a

renewed interest with US railroads, and we have a number of interested parties for railroading off shore as well. The US maritime administration MARAD is proposing a number of alternative fueled marine vessel projects to the DOE. These projects would target vessels used for inland and coastal waterways, all of which could use the EMD engines for power. All indicators are that the market is growing and it is leaning more toward natural gas because of economy, emissions and domestic fuel source.

Recommendations:

We feel ECI should be directly involved in a new project whereby the DOE in collaboration with other government and private industries jointly fund a demonstration railroad project with the Burlington Northern Santa Fe in California. We think that because of emerging emission credit potential the BNSF would be interested in partnering in a project that would springboard off their past project (fn1). The project would have more than one phase, the first to finalize the development work that ECI has accomplished so much on already. The phases to follow would include finishing the design specifics necessary for 710 railroad application and ending up with the application / demonstration of a freight locomotive in revenue service. If the DOE has a vision for alternate fuel and reduced emissions on large fuel consumers in the United States they could never find a better more cost effective project than with BNSF and ECI. ECI is willing to supply a pre-proposal that would outline in specific detail how this project would pan out.

Fn1 BN and Air Products and Chemicals with ECI have already successfully demonstrated a 645 Liquid Natural Gas locomotive in freight service. The logistics surrounding the use of and the transportation of liquid natural gas has been addressed.

Planned activities: (dependent on resources)

Complete design specifics on spark ignition system

Test and map engine optimizations with spark ignition

Remove turbocharger and install roots blower and associated hardware

Test and map spark roots engine

Install diesel injectors and test dual fuel engine system roots blown configuration

Reconfigure piston type to reduce compression ratio

Retest dual fuel roots engine

Install spark system and retest with lower compression ratio

Remove roots blower and install turbocharger

Retest the engine turbocharged with present compression ratio

710 piston design testing and evaluation

710 piston manufacturing

710 conversion system install

710 engine testing and mapping

Planed concurrent activities:

Application, testing and development of combustion pressure sensor monitoring

Design, testing and application of micro pilot diesel injection system.

Information and Guide to photo pages:

#1 16 cylinder 710 engine with complete instrumentation applied

#2 710 data acquisition wire termination to PC's

#3 Yellow gas supply line and meter

#4 Yellow gas line after compressor and going into test building

#5 Port gas injector fitted to engine liner on the bench

#6 8 cylinder 645 engine operating on gas with standard system

#7 Gas inlet valve fitted with hydraulic actuation hardware

#8 Gas inlet valve Jet Caps ready for installation and engine testing

#9 A. Diesel prechamber components ready for engine testing

B Jet cap valve seats ready for installation and testing

#10 Prototype hydraulic testing pump (power unit) for development of hydraulic actuated gas injection

#11 Controls of testing power unit

#12 High pressure diesel pump for testing of diesel prechambers

#13 (A)Three HP pump, controls and (B) holding tank for complete engine testing of hydraulic gas injectors

#14 (A) engine monitoring system signal conditioner (B) sensors and wiring

#15 Knock detection sensor mounted on the side of engine block.

16 Knock detection electronic board with 4 of the 10 possible channels applied

#17 Side view of 8 cylinder test engine (A) hydraulic lines and control solenoid of port injector (B) Ignition coil of cylinder number 5 (C) Knock detection sensor on 8 cylinder engine block

#18 Right hand side of 8 cylinder test engine fitted with hydraulic driven port injection, ignition coils and controlling solenoid valve

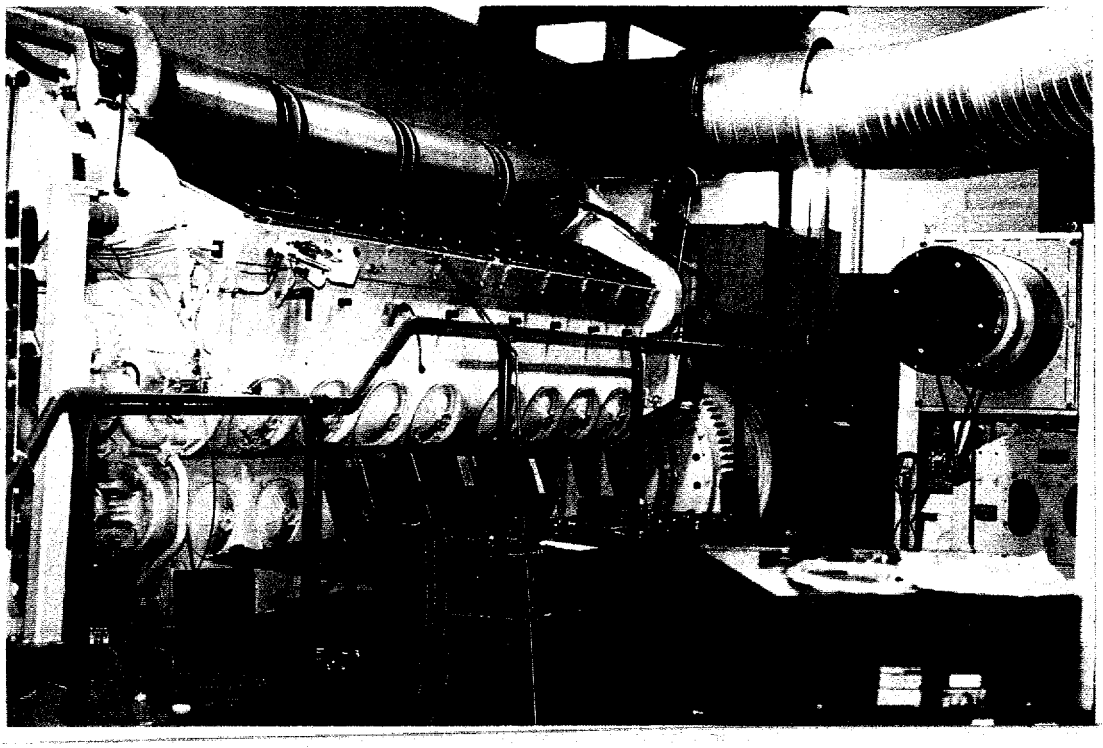
#19 Spark ignited prechambers after being removed from testing

#20 Prototype spark ignited prechamber

#21 Spark ignition control box mounted to the 8 cylinder

Explanation of appendix A "engine test data". There are two main sets of test data. One set for the 8-645 engine and one for the 16-710. At the start of each data set there is a log of each test date and some very brief information about the test day. In these two main sets you will find anywhere from one to four data groups recorded for each test day, recognized by its date. The data groups filed first by type and then date. The first data group for both 8 and 16 cylinder engines will have a hand filled in sheet indicating testing notes and parameters. If the testing was not very successful or problems were encountered this may be the only data group for that day. The second set on the 8 cylinder is more hand written notes that parallels other data. Both main sets have two spread sheet data. These we call snapshot data. This is data being displayed real time on our PC's and when all is stable we take a snapshot of all the data on one line of spreadsheet. We have two PC's one for engine data and one for emissions thus the two separate sheet styles. The data sheets have headings indicating what parameters are being measured. They are mostly self explanatory. The 16 cylinder we did a bunch of graphs to go with the baseline data for both power and emissions. We also have combustion pressure data that was recorded on the 16 with and combustion analysis print outs. The 8 cylinder engine too has combustion pressure data but the data was never entered into the combustion analysis program.

#1



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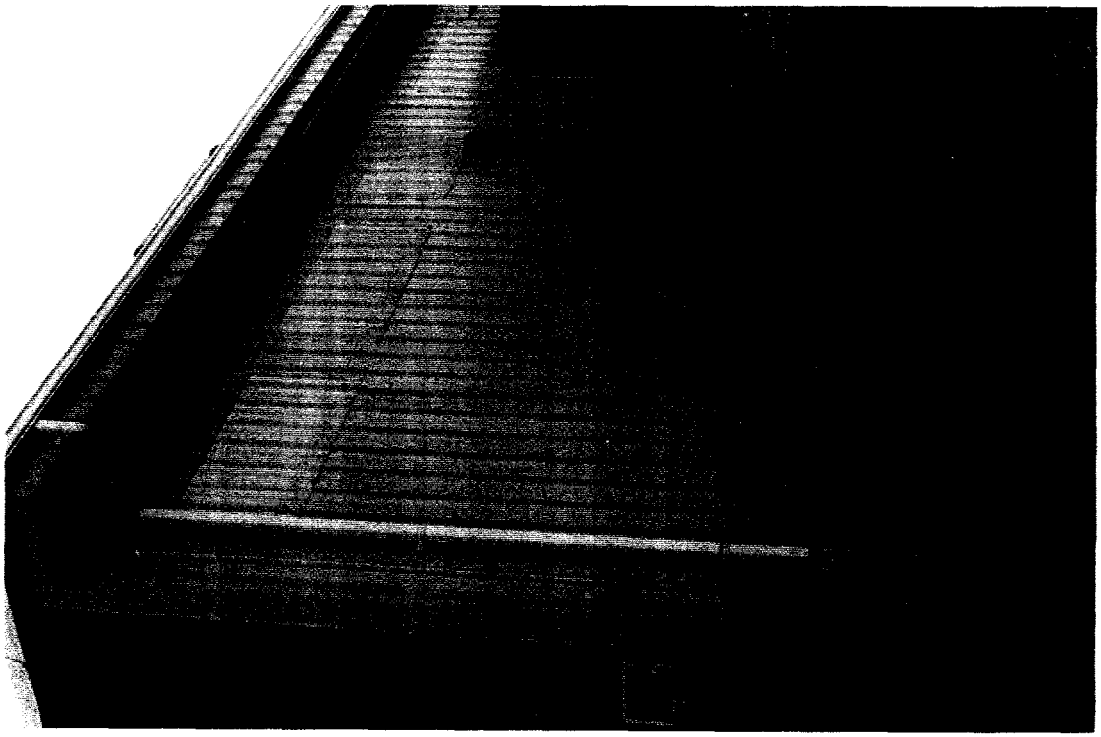

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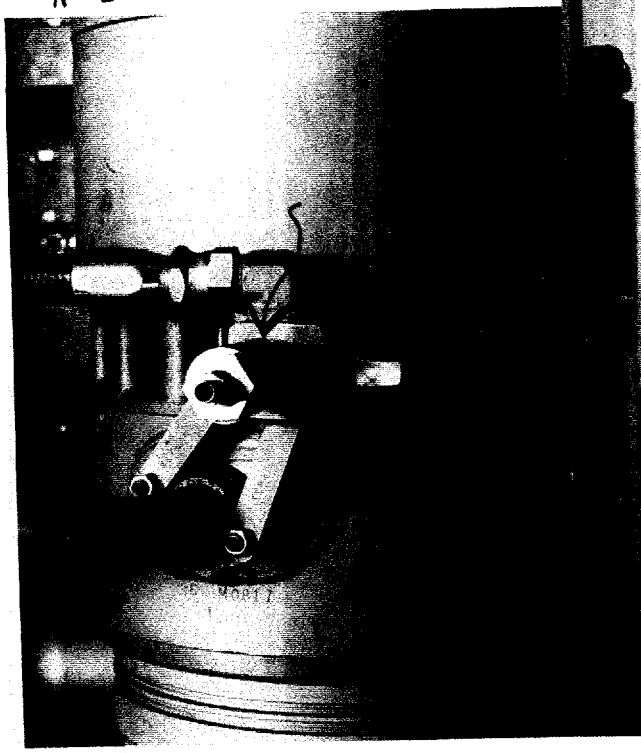

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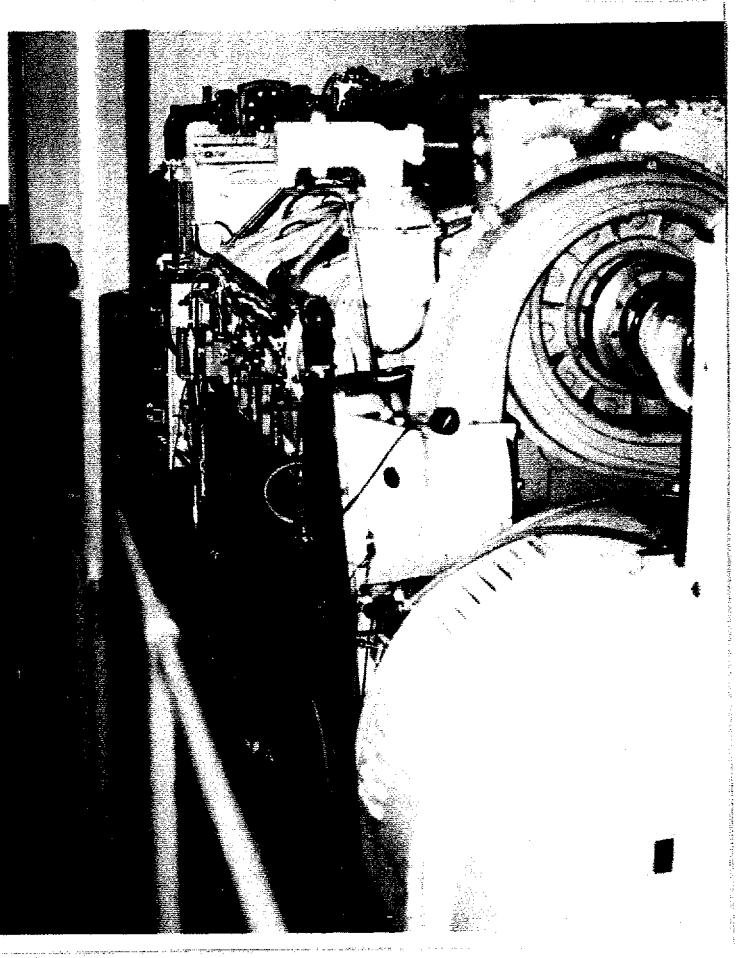

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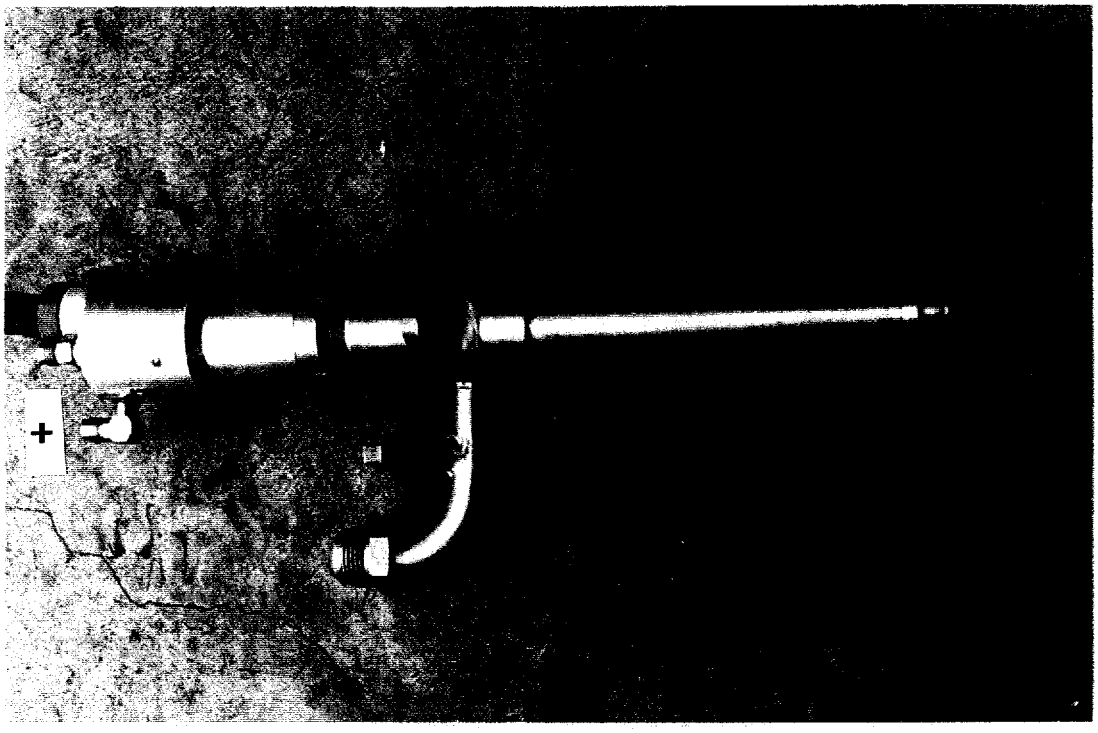

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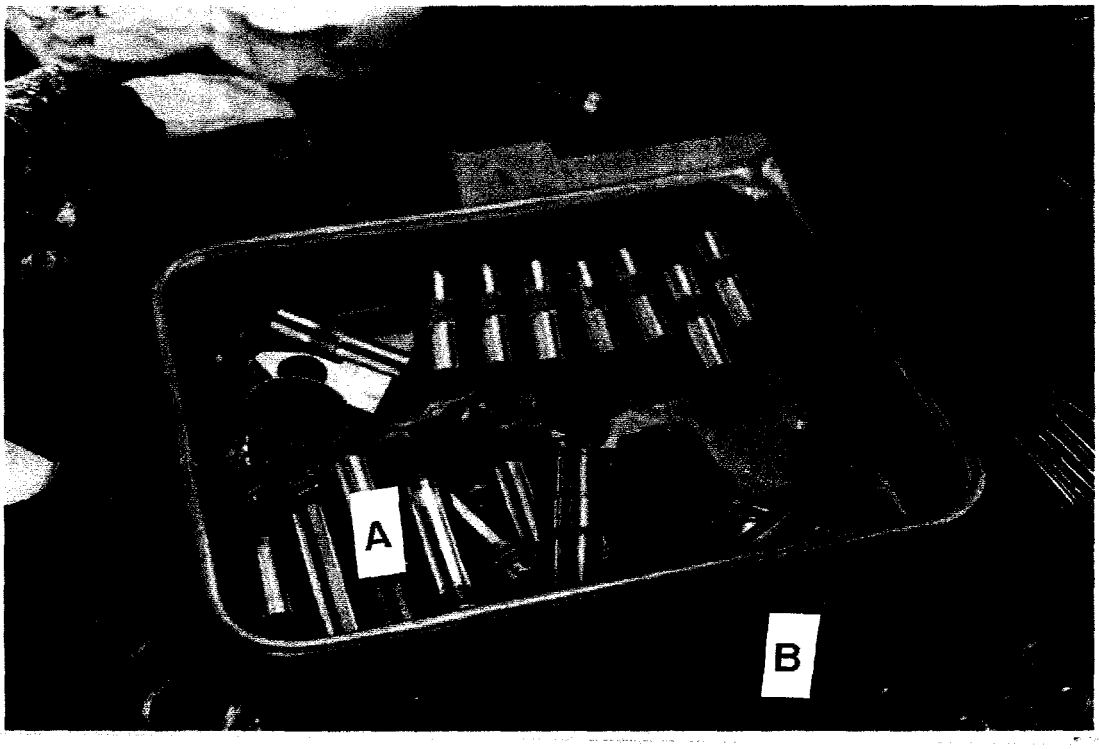

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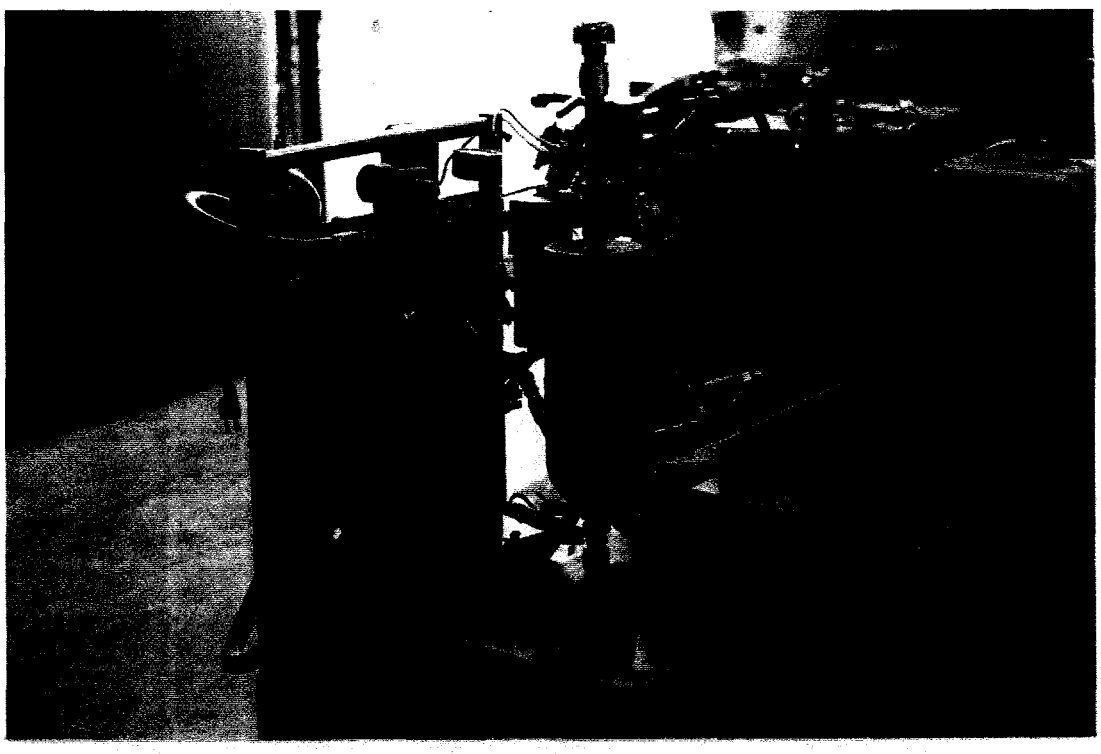

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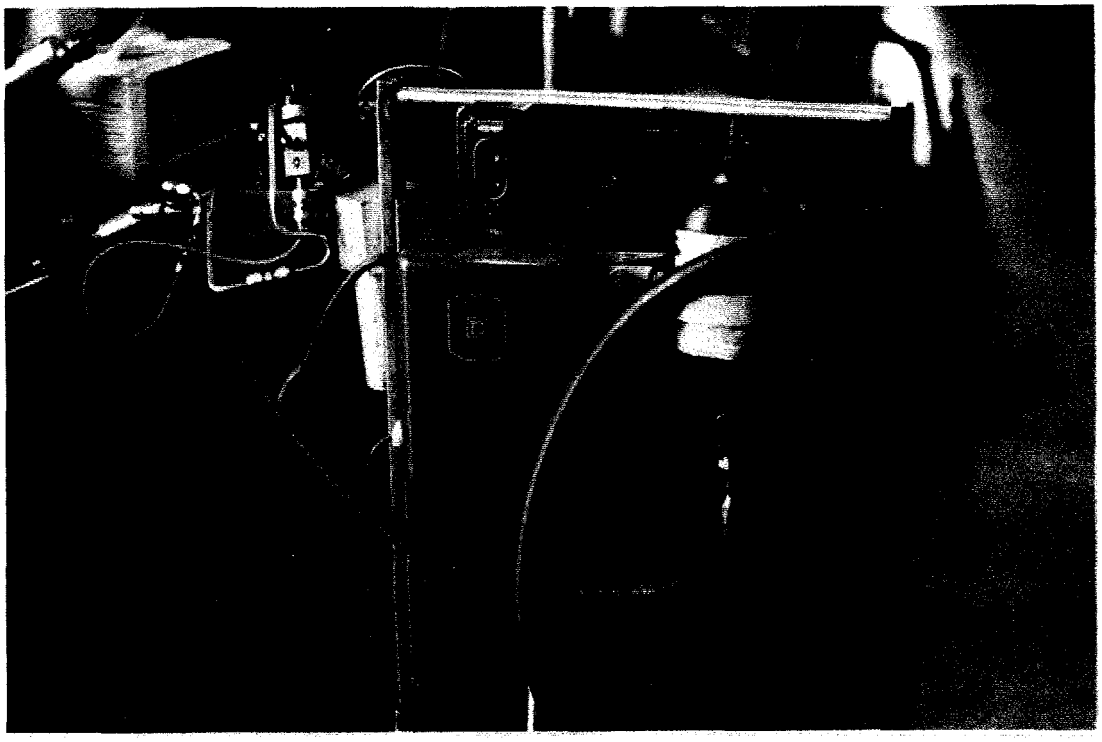

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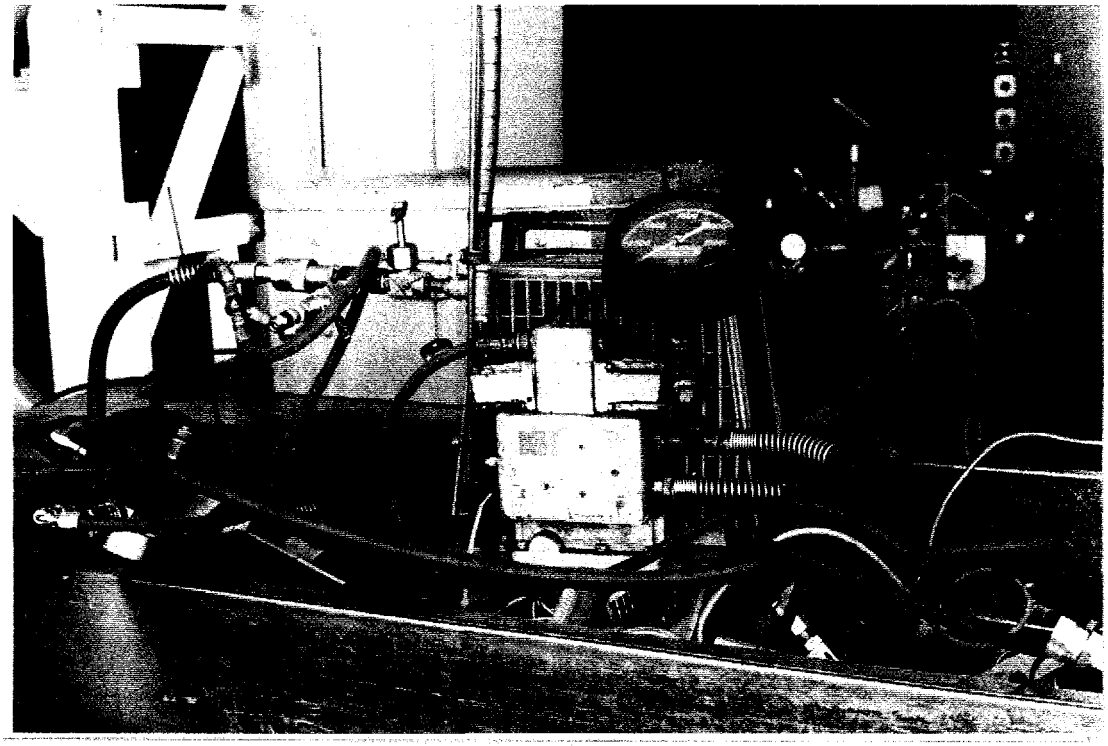

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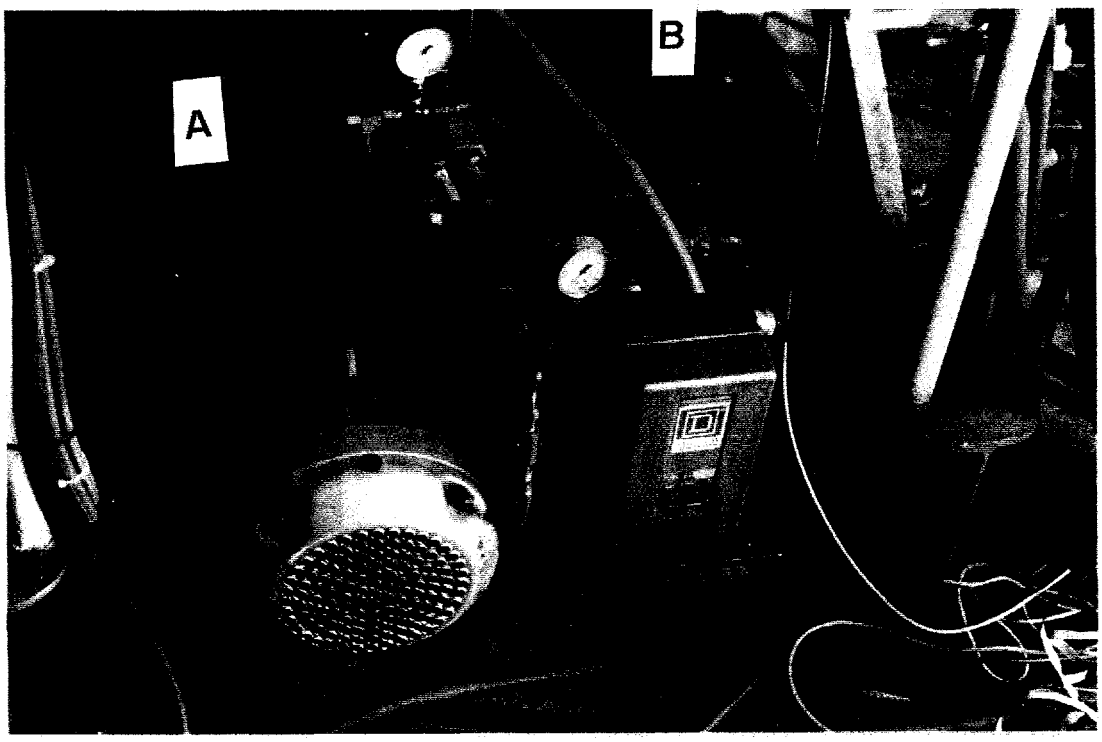

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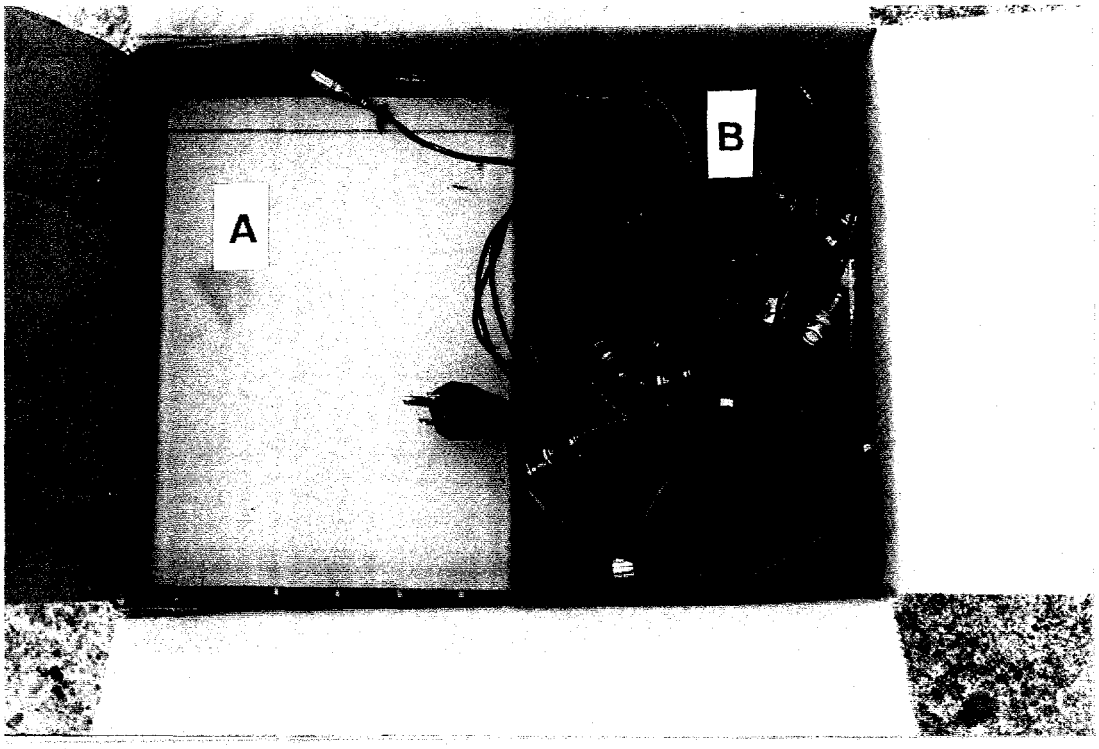

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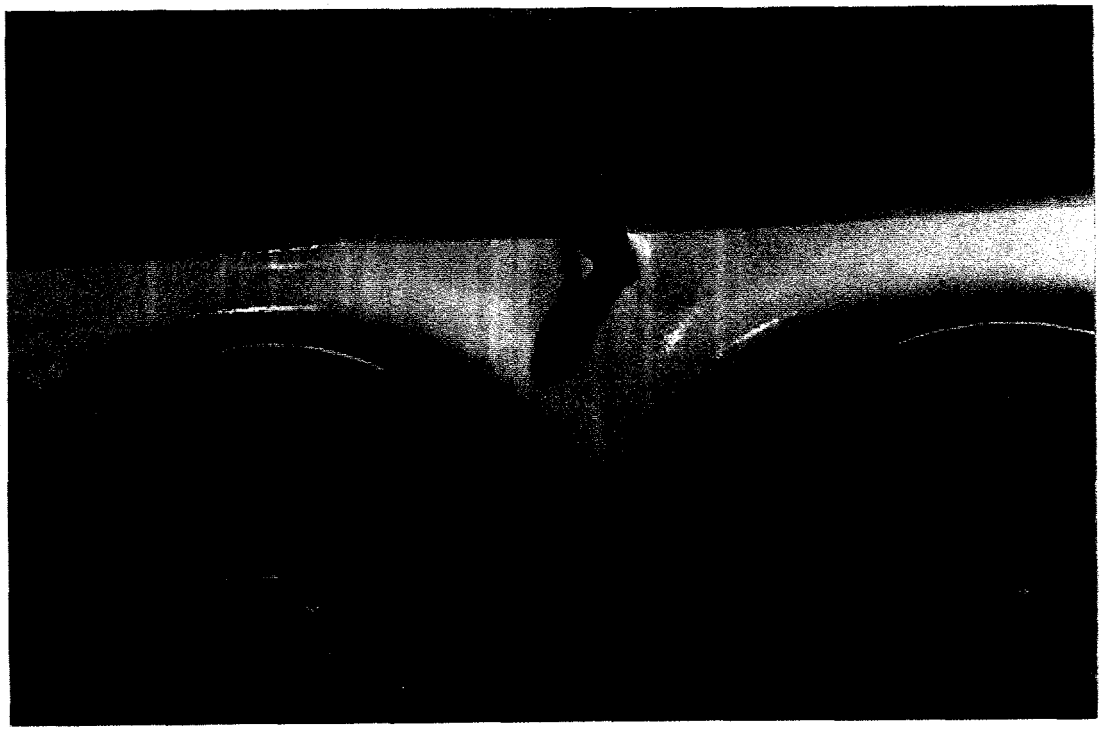

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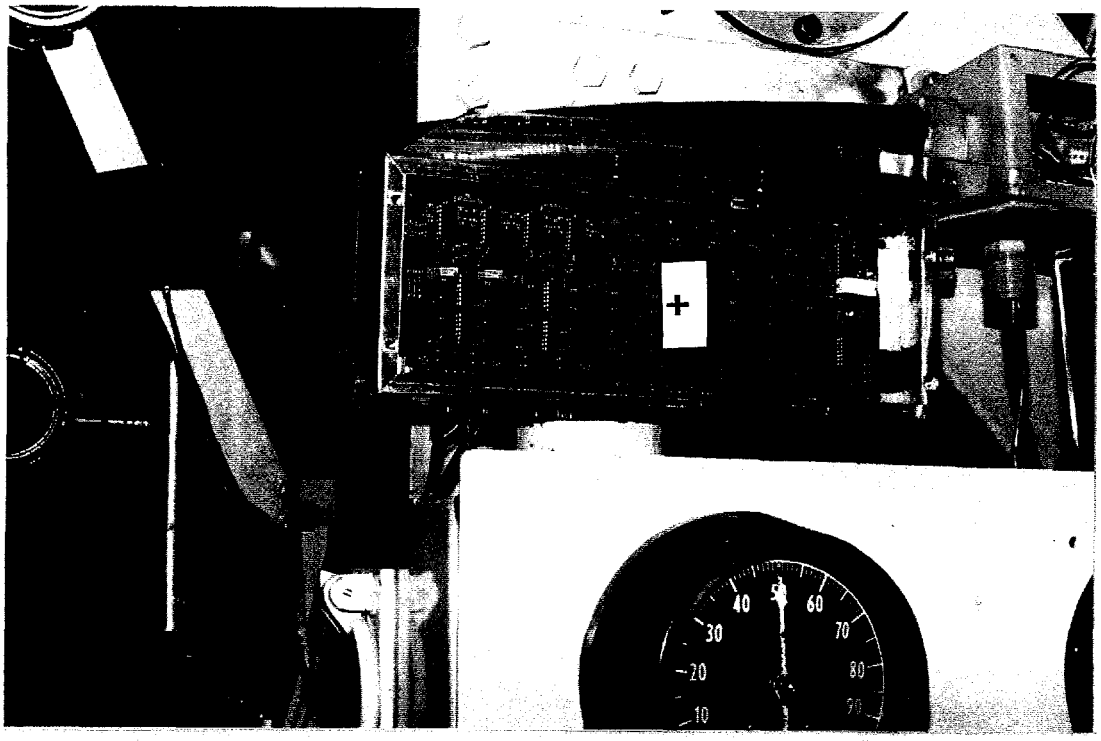

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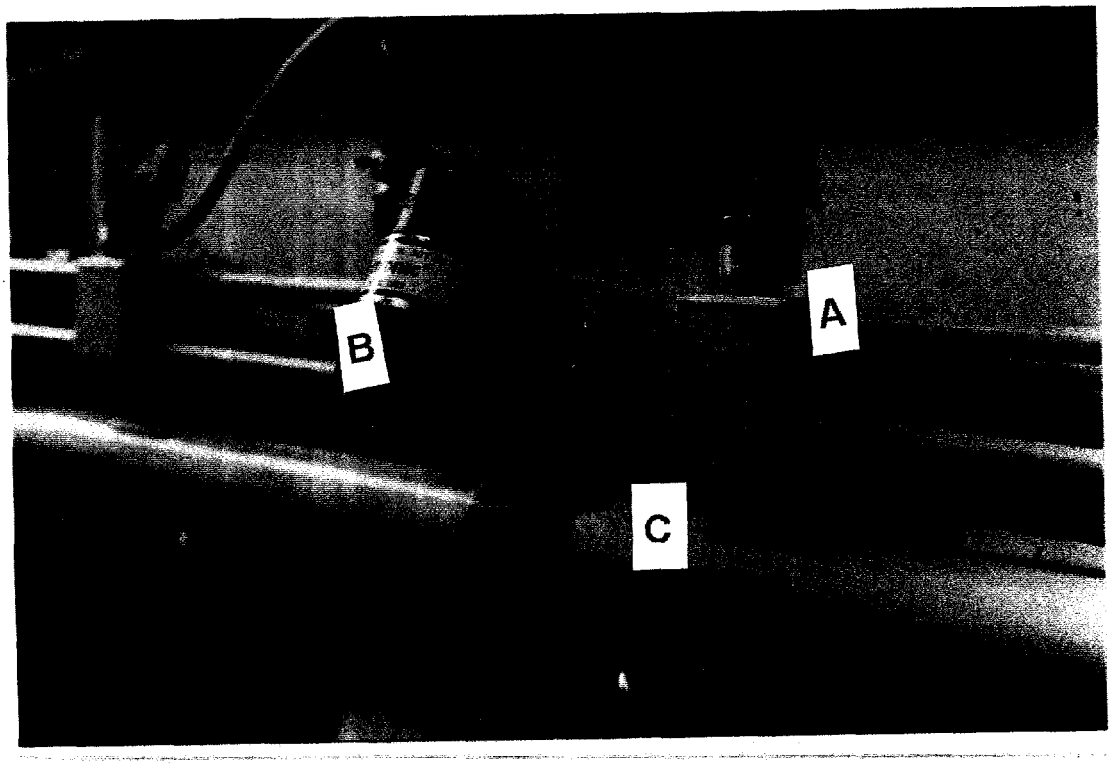
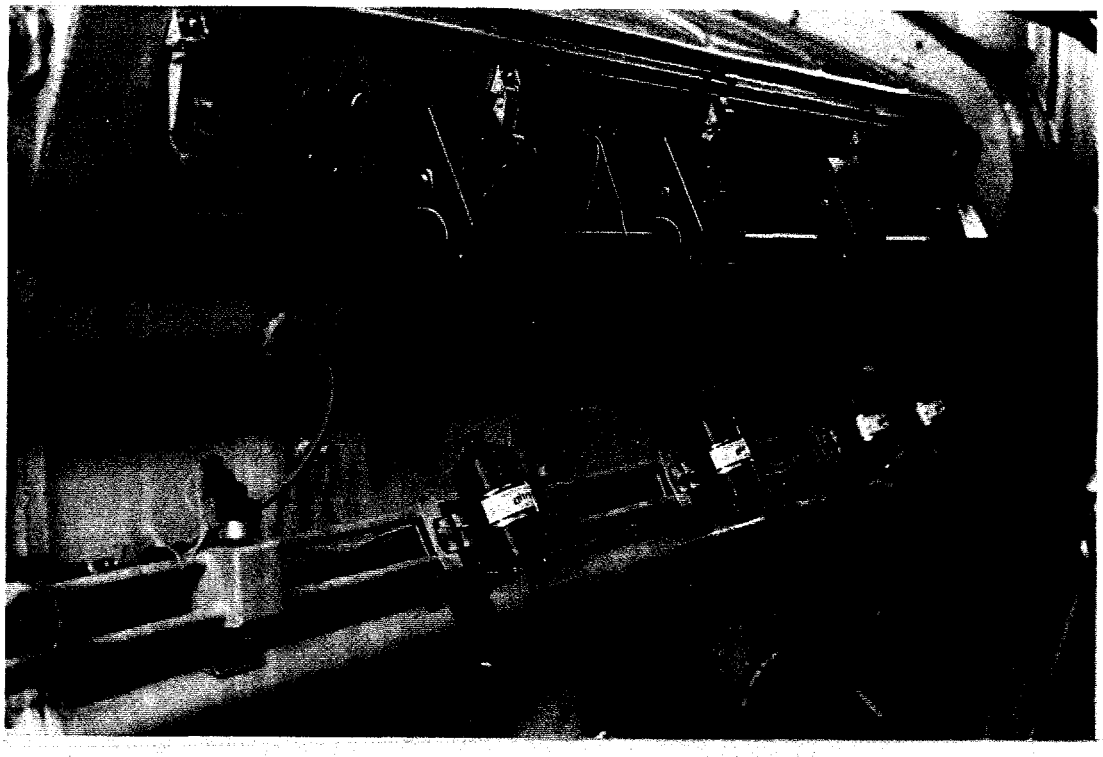
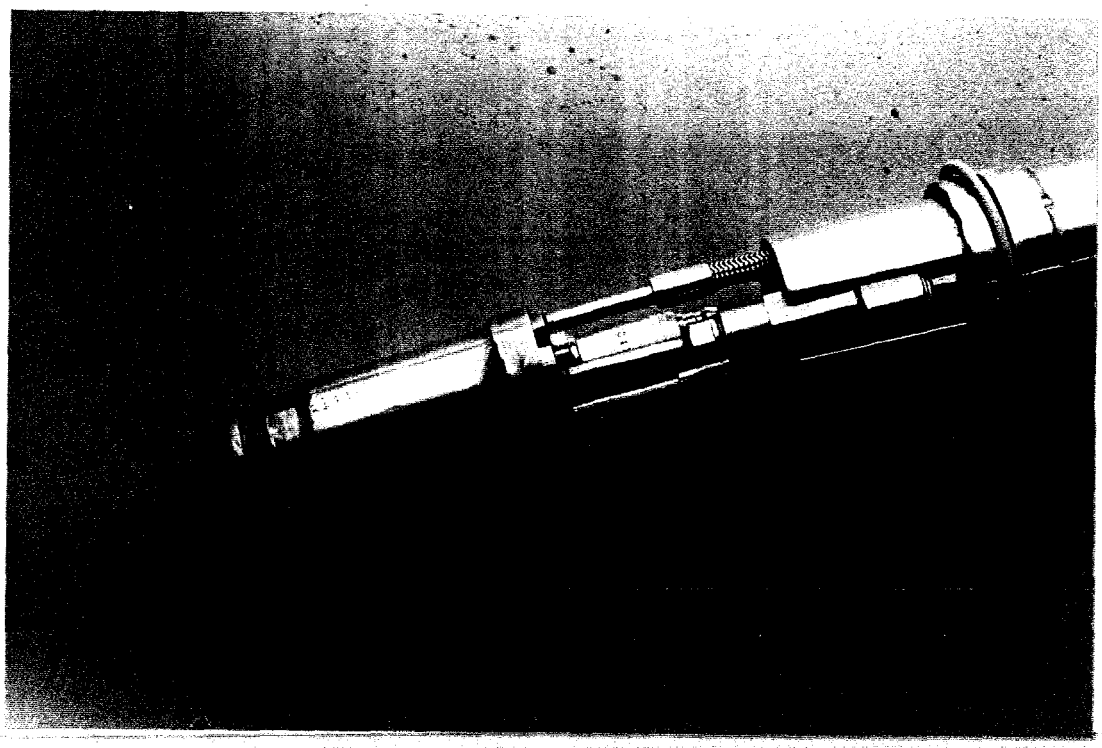


#18

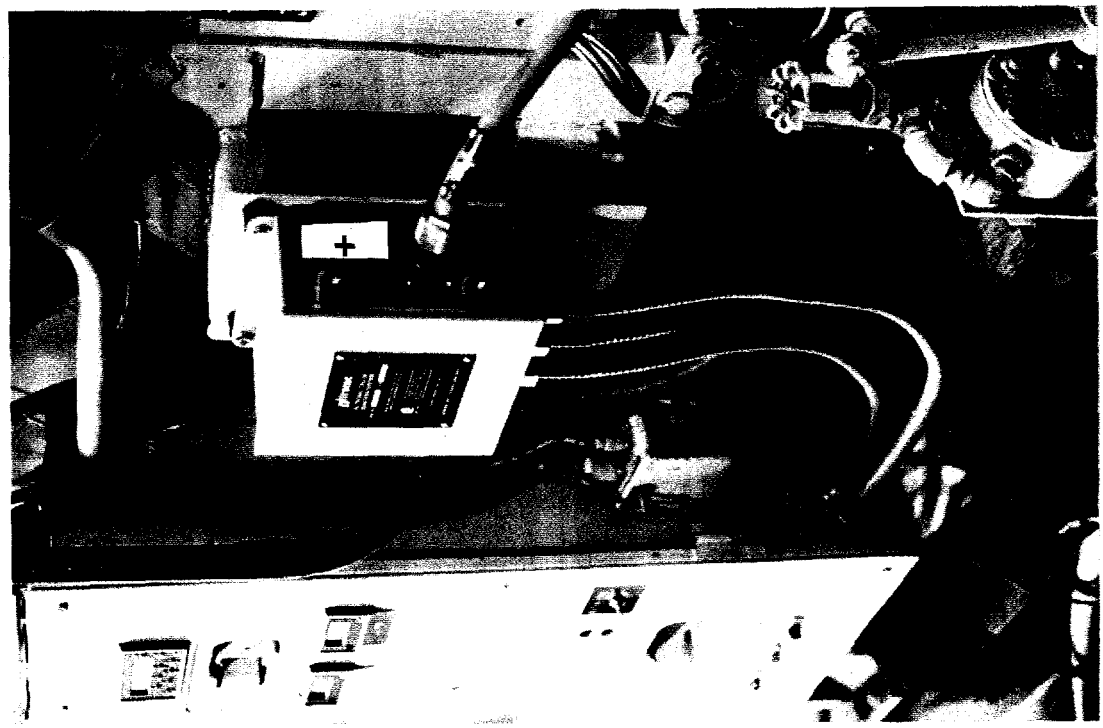


#19

#20



#21



8-645 testing log				
Date	G / D	Cyl.	ign.	wasup
10/21/96	D	8	DI	Baseline diesel for ER Gen II @ .020" 9200 injectors
10/22/96	G / D	8	DI	50 Hz gas data and diesel baseline variables
10/24/96	D	8	DI	ER installation and burn in
11/6/96	G	8	DI	Whole engine on gas w/stability problems
11/8/96	G	1	DI	Jet cap vs std GIV testing
11/12/96	G	1	SPC	First SPC testing HyGIV w/JC
11/14/96	G	1	SPC	
11/22/96	G	8	SPC	Demo run for leopoldo
12/12/96	G	1	SPC	Port GIV air act. 5 hp gas comp.
12/19/96	G	1	SPC	oil cooling and non spray testing - gotta have oil flow
1/2/97	G	1	SPC	Standard GIV test
1/9/97	G	1	SPC	Poppet check valve for the gas on SPC
1/24/97	G	1	DS	Direct spark ign.
1/30/97	G	1	SPC	Port vs JC GIV testing
2/3.4.5/97	G	1	DPC	Trying to get DPC to work
2/10,13/97	G	1	DPC	First decent DPC run w/ceramic liner
2/20/97	G	1	DPC	2.8 DPC w/o ceramic liner
2/25/97	G	1	DPC	vortex delivery on PGIV
2/28/97	G	1	DPC	reduced trap gas on PGIV
3/26/97	G	1	DPC	check valve on DPC @2.8X.17
4/14/97	G	1	DPC	HYPGIV drive pressure droops
4/18/97	G	1	DPC	@ 2.8xwide mouth cap
4/21/97	G	1	DPC	@1.8X.17 1% pilot base test
4/22/97	G	1	DPC	1.8xwide mouth cap
4/23/97	G	1	DPC	1.8x.12
4/24/97	G	1	DPC	2.8x.120 too small
4/25/97	G	1	DPC	2.8x.17 1% pilot std base operation "best operating"
4/25/97	G	1	DPC	3.3x.17
5/2/97	G	1	DPC	2.8x.125/.245 and baseline direct pilot test
6/16/97	D	8	DI	FPC-1 test and ER snapshot 9335 peg rack at 1000HP
6/20/97	G	1	DPC	Pressure Intensifier testing on DPC
7/10/97	G	8	DI	Baseline data, setup
7/11/97	G	8	DI	Baseline dual fuel tests Compressor works great
7/15/97	G	8	DI	Variable testing of Air temp, timing, Pilot fuel and Gas slip
7/22/97	G	8	DI	backup of 7/15 propane
7/23/97	G	8	DI	9335 injector @ TDC
7/24/97	D	8	DI	Diesel data w/9335 Inj.
7/25/97	G&D	8	DI	Gas and diesel w/9250 @ TDC timing
8/14/97	G&D	8	DI	9250 @ 4 restart and NGK sensor tests
8/15/97	G	8	DI	Dual fuel injectors and NGK sensor swap
11/7/97	G	8	DI	Port injector w/Hyd backpressure "first good runs"
11/11/97	G	8	DI	Port injector w/check valve
12/2/97	G	8	DI	Port injectors timing optimizations
12/3/97	G	8	DI	More of the same
12/4/97	G	8	DI	backup of 12/3 and accumulators
12/5/98	G	8	DI	Demonstration run, high power in tn6 and 8
4/23/98	G	8	DI	Check efficiency w/new gas meter and port Inj.

5/19/98	G	8	DI	same as above				
5/21/98	G	8	DI	Knock signals and injector timing				
5/28/98	D	8	DI	Testing HK baseline (Contract Work)				
7/2/98	D	8	DI	Testing HK baseline CW				
7/7/98	D	8	DI	Testing HK baseline CW				
7/10/98	D	8	DI	Testing HK baseline CW				
7/14/98	D	8	DI	Testing HK baseline CW				
7/17/98	D	8	DI	Test #1 crown CW				
7/20/98	D	8	DI	Test #2 crown CW				
7/21/98	D	8	DI	Test #3 crown CW				
7/22/98	D	8	DI	Test #4 crown CW				
7/23/98	D	8	DI	Test #5 crown CW				
7/31/98	D	8	DI	Test #6 crown CW				
8/3/98	D	8	DI	Test #7 crown CW				
8/4/98	D	8	DI	Test #8 crown CW				
8/5/98	D	8	DI	Test #9 crown 9250 Inj. CW				
8/10/98	D	8	DI	Test #10 9250 @4 later crown CW				
8/11/98	D	8	DI	Test #11 9H 5000 Inj crown CW				
8/12/98	D	8	DI	Test #12 4 crown w 6700 Inj CW				
8/13/98	D	8	DI	Test #13 4 crown w 7000 Inj CW				
8/18/98	G	8	DI	Dual fuel test prep for sparks, low speed PID				
8/23/98	G	8	SPC	Sparking full engine first run				
8/25/98	G	8	SPC	Sparking run 2				
8/26/98	G	8	SPC	Sparking run 3				
8/27/98	G	8	SPC	Sparking run 4				
9/1/98	G	8	SPC	Sparking run 5				
9/15/98	G	8	SPC	Sparking run 6				
9/18/98	G	8	SPC	Sparking run 7				
9/22/98	G	8	SPC	Sparking run 8				

Engine test sheet

Date 12/8/93	start time	
Baro pressure "Hg		Humidity
Ambiant temp.		Other

FILLED OUT THIS SHEET 12/21/94

Main reason for test: AIR THROTTLE TESTS BEFORE GOING TO GEN II +

Engine configuration basic description: GEN II PISTONS ALL ENGINE TESTING

injector timing setting	Injector part number 9200
Pilot timeing start of injection:	

Notes on what happened:

significant findings of the test: 1000 HP AT 6.5 PSI MBP, 1500 HP 16 PSI MBP AND 165 ABT, FUEL CONSUMPTION 210 SCFM GAS W/ 4% PILOT

Files recorded

710da	imep	indi	emmis	710da	imep	indi	emmis

Engine test sheet

645
GEN II +
FIRST TEST

Date 12/14/93	start time
Baro pressure "Hg	Humidity
Ambiant temp.	Other

Main reason for test: INVESTIGATE OPERATION OF PISTONS SET AT .080 SQUISH. LOOKING AT MANY DETAILS DIESEL POWER W/9200 INJ, DIESEL IDLE, GAS POWER

Engine configuration basic description: HIGHER COMP, THROTTLED & UN THROTTLED ALL ENGINE TESTING

injector timing setting 9 BTDC	Injector part number 9200
Pilot timeing start of injection:	

Notes on what happened:

significant findings of the test: MAX DIESEL PWR 1480, MAX GAS W/COOL AIR 1500, 1300 W/WARM AIR, DIESEL IDLE NO SMOKE, THROTTLE AIR TO .2 ABP & REDUCE RACK .015, 6 PSI ABP 900R 850 HP = ROOTS OPERATION

Files recorded

710da	imep	indi	emmis	710da	imep	indi	emmis

Engine test sheet

Date 12/15/94	start time	
Baro pressure "Hg		Humidity
Ambiant temp.		Other

FILLED OUT THIS SHEET 12/21/94

Main reason for test: AIR THROTTL TESTS

Engine configuration basic description: GEN II + PISTONS
ALL ENGINE TEST

injector timing setting	9 BTDC	Injector part number	9200
Pilot timeing start of injection:			

Notes on what happened:

significant findings of the test: 900 R NO LOAD STD GAS FLOW 95 CFM
THROTTLE TO 8 PSI ABP FLOW IS 65 CFM, 8 PSI STILL
HAD CRANK VACUUME

Files recorded

710da	imep	indi	emmis	710da	imep	indi	emmis

Engine test sheet

645 TEST

Date 12/8/94	start time
Baro pressure "Hg	Humidity
Ambiant temp. 52	Other

Main reason for test: LINER PORT INJECTION AND INCREASED HEAD INJECTOR PRESSURE

SINGLE CYLINDER TRIED EMISSION BUT NO RECORD

Engine configuration basic description: GEN II + PISTONS, 9200 INJ. TIMED AT 9 BTDC, NO AIR THROTTLE NOTCH 8 ONLY 1000 HP

injector timing setting	Injector part number
Pilot timeing start of injection:	

Notes on what happened: INJECTION PRESSURE NOT AS HIGH AS WE WANTED FOR HEAD INJECTOR

significant findings of the test:

Files recorded

~~710da~~	imep	indi	emmis	710da	imep	indi	emmis
120894.LOG	120844	—	—				

Engine test sheet 645

Date 12/9/94	start time 13:30
Baro pressure "Hg ?	Humidity ?
Ambiant temp. 52	Other

Main reason for test: CONFIRM PORT INJECTION AND TRY NEW RESTRICTED SEAT FOR HEAD INJECTION. EMISSION RECORDING

Engine configuration basic description: GEN II+ PISTONS #5 CYLINDER ONLY TESTING W/TRANSDUCER 1000 HP SETPOINT

injector timing setting 9	Injector part number 5229200
Pilot timeing start of injection:	

Notes on what happened: INJECTOR TOO RESTRICTIVE COULDNT INJECT ENOUGH FUEL THROUGH HEAD. IT DID INC. CO & NOx THOUGH.

significant findings of the test: MORE POWER SLIGHTLY W/PORT INJECTION CO & NOx RED, AND REPEATABLE AFTER 3+ MINUTES
CO < 50% BASELINE POWER NOT YET DETERMINED 1000 HP W/ MAIN RACK
AT 1.070 - 1.065 STD CONF. 1.060 - 1.055 W/ HOT AIR

Files recorded

710da	imep	indi	emmis	710da	imep	indi	emmis
120994		—	120994.EMI				
13:48	DIE 1,2	DIESEL 1000HP					
13:55	DIE 1A, 2A	REGG # 5 RACK					
14:01	GASSTD, 2	KNOCK LIM	STAND CONF.				
14:48	GASHP 1,	FUEL LIMIT					
14:54	GAS BOTH 1,2,3,4	TWO FUELING	KNO LIM.				
14:05/15:01	GASPORT 1, 2,3,4,5	PORT FUEL	KNO LIM				
15:11	GASPTAG, 1, 2	NOTCH 6 RECORDINGS					
15:13	GAS BAG/6	NOTCH 6 BOTH	INJ.				

645 TEST

Engine test sheet

Date 12/14/94		start time 13:30	
Baro pressure "Hg ?		Humidity ?	
Ambiant temp.		Other	

Main reason for test: NEW DESIGN. GIV SEAT FOR HIGHER INJECTION LINER PORT INJECTION AT 2 PLACES

Engine configuration basic description: 195 AMOTS, GEN II + PISTONS #5 ONLY GAS FUELED CYL, TESTED WITH HOT AIR ONLY, BASED ENGINE AT 1000 HP

injector timing setting	9°BTDC	Injector part number	5229200
Pilot timeing start of injection:			

Notes on what happened: HEAD INJECTOR STILL LOW INJECTION 75PS PORT INJECTION WORKED FAIRLY GOOD. SIGNAL NOISE ON COMB TRACE PLAGUED US.

significant findings of the test: NOT SURE ABOUT EMISSION INFO YET
PORT INJ ACHEIVED 168 CO & 751 NOX / REDUCING LOAD SLIGHTLY 208 CO & 486 NOX
HEAD INJ. ACHEIVED 207 CO & 1294 NOX

Files recorded

710da	imep	indi	emmis	710da	imep	indi	emmis
121494,LOG							
121494,RMI							
13:37	DIEBASE1,2	1000	HP	DIESEL			
13:41	DIEMAX1,2	PEGGED	RACK	DIESER		MAIN RACK TO	
13:52	GASHP1,2						
13:54	GAS HP4						207 1294
13 58	GASPORT1						
14:00/01	" 2,3						168 751
1404/07	" 4 5		SLIGHTLY	LESS POWER	LOW	NOX	CO 208 NOX 486
1415	GAS BOTH1,2		50 PSI LINER	39 PSI HEAD			

Engine test sheet

645 TEST

Date 12/21/94		start time 12:30	
Baro pressure "Hg		Humidity —	
Ambiant temp. 58		Other	

Main reason for test: CONFIRM PREVIOUS TEST DATA AND LOOK AT FUEL CONSUMPTION AS WELL AS HC WITH HIGH PRESSURE DIRECTED INJECTION IN HEAD AND PORT INJECTION IN TWO PLACES

Engine configuration basic description: GEN II + PISTONS, 1000 HP BASE MAIN RACK TARGETED 1.045 TO MACH #5 POWER = DIESEL MAX 1864 PILOT

injector timing setting	9 BTDC	Injector part number	5229200
Pilot timeing start of injection:			

Notes on what happened:

significant findings of the test:

Files recorded

.LOG	File/.prs	file indi	time	CO/HC/NOx	imep	M RACK		
122194	DIESEL 1		12:33 08			1045		
	DIESEL 2		12:33:55					
			1248 12 49 19 START ALL SET PORT INJ					ABOUT 82 PSI INJ PS
.EMI	GASPORT 1		1247:24			1045	2.67	
	GASPORT 2 3		1248 1252 25			1043		
	GASHP 1		1300	185, X,1100		1034		
	GASHO 2		1301	170 1300		1.032	2.34	
	GASHD 3		1307:22	704 574		1.018	2.171	LOWER LOAD
	GASHD 4		1308: 25	650 602		1.016		
	GASPORT 4		1316:			1.042		
	GASPORT 5		1316: 10	167 754		1.04	2.69	
			1318	REDUCE LOAD				
	GASPORT 6		13:22:20			1.032	2.64	
	GASPORT 7		13:23	180 560				
			1338:24				2.62	

NEXT PAGE

Engine test sheet

12/21 CONTINUED

Date	start time
Baro pressure "Hg	Humidity
Ambiant temp.	Other

Main reason for test:

Engine configuration basic description:

injector timing setting	Injector part number
Pilot timeing start of injection:	

Notes on what happened:

significant findings of the test:

Files recorded

.LOG	File/.prs	file indi	time	CO/HC/NOx	imep	RACK	CFM	
	DIESE 1		14:56			1.026		
	2		14:56			"		
	3		15:33:30			1.025		
.EMI	15:35	GAS HEAD START						
	GASSTD 1		15:37 40			1.010		KNOCK LIM
	GASSTD 2		15:38	722, X, 1134		1.011	2.23	
	GASSTD 3		15:40 45	603 X 1242		1.013		
			15:44 44	LOWER LOAD		1.000		
	GASSTD 4		15:46	921, 934		1.000	2.19	
	GASSTD 5		15:48:30					
			15:52	START PORT INJ		1.028	KNO	LIM
	GASPORT 8		15:54	187 592		1.022		
	GASPORT 9		16:00:16	174 572		1.019	2.52	
			16:02:00	REDUCE LOAD		1.000		
	GAS PORT 10		16:05:15	556 348		.990-	2.38	
	11		16 08:00			1.005		

Engine test sheet

Date 1/11/95		start time 1100	
Baro pressure "Hg	29.8	Humidity	
Ambiant temp.		Other	

Main reason for test: GATHER DATA ON RACK-HP RELATIONSHIP. REDUCED DURATION INJECTION TIME W/HIGH INJECTION PRESSURE. EMISSIONS 1 CYL VS WHOLE ENGINE

Engine configuration basic description: GEN II + PISTONS TURBO
ALMOST ALL TEST PERFORMED AT 900RPM & 1000 H.P.

injector timing setting	9 BTDC	Injector part number	5 22 9200
Pilot timeing start of injection:			

Notes on what happened: WE EXPECTED TO QUANTIFY HP GAIN W/HP INJECTION. BUT WE DIDNT SEE ANY GAIN TODAY. EMISSION #'s STILL CHANGED TO SOME EXTENT
AROUND 11:30 INFO REGARDING RACK-HP IS FOUND

significant findings of the test:

Files recorded

.LOG	File/.prs	file indi	time	CO/HC/NOx	M RACK RACK	FUEL R,		
122894				12 - 3000				BASE DIES
011195.LOG			11:43-11:44	400, -, 1450, 4.7, 12.6	1.044			GAS STD HOT A
				1232, -, 800, 4.5, 12.9	1.038			STD COLD AIR
.EMI			11:54	803, -, 1500, 5.7, 10.8	1.075			KNO LIM COL
011195.EMI			12:16	1047, -, 1013, 5, 12.1	1.041			COLD AIR STD PWR
			13:30	140, -, 1350, 4.9, 12.3	1.045			HP INJ HOT A
			13:39	730, -, 620, 4.8, 12.4	1.045			HP INJ COLD AIR
			13:44	162, -, 1363, 5.5, 11.2	1.068			KNO LIM HP IN COL
			13:54	800, -, 1000, 4.9, 12.2	1.045			HIGHER INJ, P
			14:00	380, -, 1400, 5.3, 11.6	1.0060			LIMIT
			14:47	153, -, 845, 5, 12.1	1.047			PORT INJ H
		←GAS PORT 1	14:49	380, -, 426, 4.9, 12.2	1.045			PORT INJ CO
		←GAS PORT 2	14:53	113, -, 1223,	1.075			LIMIT PORT
			14:56	371 814 5 12.2	1.044			HP AGAIN

Engine test sheet

645 ENG

Date	12/22/95	start time	14:00
Baro pressure "Hg	30.25	Humidity	37%
Ambiant temp.	COLD	Other	

Main reason for test: KNOCK SIGNALS ON TAPE FROM 2 LOCATION KNOCK SENSORS, LATER WE TRY 3 HOLE GIV CAP

Engine configuration basic description: GII + CR

injector timing setting	12° BTDC	Injector part number	5229200
Pilot timeing start of injection:			

Notes on what happened: MADE IT KNOCK AT 3 LEVELS AND AT NO KNOCK NO PT IN LOOP SO WE RAN 1.6" PILOT RACK ALSO LOOKED AT HP & MAIN RACK FOR NEXT TEST RESULTS ON GIV JET CAPS BASED EVERYTHING ON 1000 HP AND AT 1.035 MAIN RACK ACCEPTABLE KNOCK LIMIT 1.048 TO MUCH KNOCK

significant findings of the test: YES IT KNOCKS — W/GIV CHANGE SOME AMOUNT OF INCREASE MAY BE THERE HOWEVER IT SEEMS THAT THERE ARE HEAVER KELIEFS MIXED IN WITH LIGHT ONES AS IF FUELING IS DIFFERENT ON SOME CYCLES

Files recorded

.LOG	File/.prs	file indi	time	CO/HC/NOx	imep			
						1.065		HARD KNOCK
					SET 1	1.040		MED
						1.035		LIGHT
.EMI						1.019		NO KNOCK
					SET 2	1.070		HARD
						1.042		MED
						1.035		
			1.501		NEW GIV	1.037		LIGHT
						1.045		MED
						1.065		HARD

Engine test sheet

8 CYL

Date 10/15/96		start time 11:10	
Baro pressure "Hg	30.3	Humidity	60%
Ambient temp.	64	Other APPROX 1200 HRS ON METER WHEN INSTALLED	

Main reason for test: BASE LINE W/EMISSIONS STRAIT DIESEL

Engine configuration basic description: GEN II + PISTONS, ADV. INJ TIME, TURBO,

injector timing setting	9° BTDC	Injector part number	5229200
Pilot timing start of injection:			

Notes on what happened: RPM NOT WORKING, THERMO VERY NOISY. EMIS IS 3 MIN FAST, FA CALC OUT AT 1200 HP

Full speed RPM 8-10 low computer vs Digital Readout

significant findings of the test: KNOCK SENSORS ARE INDICATING

Files recorded

Time	TN	snapshot	File/.prs	file indi	CO/HC/NOx			imep	HP	
11:50	8									
11:51		1	NOBSE 1, 2		.26	.26	25.4		1450	
12:25		2	—		.25	.34	25.5		1200	
12:35		3	—		.24	.4	25		1000	
12:42		4			.34	.53	24.2		800	
12:51		5	—		.576	.759	23.3		600	
13:22		6							600	← CORR FUEL CONSU
13:38									400	
	7								1200	THINGS
14:22	6				.263	.286	28.3		1000	.84
									800	
14:42		5 & 7 Emiss			.312	.559	28.04		600	1.202
14:54		6 & 8			.750	.852	26.76		400	1.356
15:04	5	7 & 9			.229	.320	21.07		855	.898
15:13	4	8 & 10			.230	.422	32.11		604	1.066
15:20	3	9 & 11			.264	.471	32.		456	1.170
15:30	2	10 & 12			.451	.562	32.7		236	1.339
15:40	1	11 &			.741	.748	32.38		152	1.424
15:51	I	12 & 13							0	1.727
15:55	I	13 & 14								1.720

Engine test sheet

8 CYL

Date 10-18-96		start time 10:20	
Baro pressure "Hg 29.85		Humidity 55	
Ambient temp. 55.3		Other	

Main reason for test: DIAL IN FOR BASELINE RUN

Engine configuration basic description: Gen II pistons (9) .020" squish

injector timing setting 9° BTDC		Injector part number 522 9200	
Pilot timing start of injection:			

Notes on what happened: IMEP UP AND WORKING WE FOUND A BIG DIFFERENCE IN TIME CONSTANSE SO WE ARE STICKING W/ LONG WE CALIBRATED THE FUEL FLOW AND WHEN WE RUN IT GETS OFF I DIDN'T NOTICE UNTIL PART WAY THROUGH SO EMIS # ON BTU & FA ETC. ARE OFF & WE GOT NEW # ON LOG FILE 8CYL

significant findings of the test: THIS IS A PAIN IN THE ASS

Files recorded

Time TN	snapshot	File/.prs	file indi	CO/HC/NOx			imep	HP	RACK	
12:41 8	STARTING									
12:47 8	1	N862000,[illegible]		.278	.26	34.6	100/127	1450	.625	BAD FUEL #5
12:55	2	[illegible] 29		.24	.32	36.8	82/110	1200	.835	
13:06	3	5,6		.3	.4	37	75	1000	.984	
13:17	4	7,8		.4	.5	37.3	83	800	1.108	
13:38	5/1	9, 10		.6	.65	35	71	600	1.224	RECA FUEL FLOW
13 44	6/2	11 12		1	.975	36.7	58	400	1.350	
	1	13 14						1450		
								1200		
								1000		
13.58 9		13, 14								

11

Engine test sheet

8 CYL

Date	10/21/96	start time	
Baro pressure "Hg	30.4	Humidity	59% R.
Ambient temp.	54	Other	

Main reason for test: BASE LINE BEFORE ER APPLICATION

Engine configuration basic description: GEN II PISTONS W/.020 SQUISH

injector timing setting	9°	Injector part number	5229200
Pilot timing start of injection:			

Notes on what happened: FUEL # ARE GOOD ALL NUMBERS EXCEPT THE RACK WHO WE ADJ. .010 MORE FUEL MAIN RK ONLY TOOK DATA THROUGH ALL NOTCHES. TRIED GAS OP. & FIXED SOME READINGS. DID TNG GAS PRELIM. DATA

significant findings of the test: GOOD #'s CHANGED GIV UP RE WIRED GAS CFM AFTER THE DAYS TEST

Files recorded

Time	TN	snapshot	File/.prs	file indi	CO/HC/NOx			imep	HP	RK.
10:50	8	STARTUP								
11:42	8	1			.22	.29	33.6	126	1450	.656
11:48	8	2			.23	.29	33.7	109	1200	.856
11:53	8	3			.275	.34	34	95	1000	1.000
12:02	"	4			.36	.4	33.5	83	800	1.115
12:07	"	5			.57	.55	32.9	70	600	1.238
12:14	"	6			1	.85	34	58	400	1.361
12:21	7	7	N7G2000,1		.21	.25	35.2	114	1175	.808
12:29	6	8	N6G2000,1		.27	.27	35.1	104	1000	.865
12:36	6	9	N6G2002,3		.29	.4	34.2	87	800	1.046
12:42	6	10	4,5		.38	.45	33.8	72	600	1.214
12:50	6	11	6 7		.75	.67	31.5	55	400	1.365
13:01	5	12	N5G2000,1		.24	.29	36.5	101	855	.922
13:07	4	13	0 1		.26	.33	38.4	85	605	1.079
13:15	3	14	0 1		.3	.38	38.2	75	457	1.18
13:23	2	15	0 1		.5	.54	35	52	236	1.35
	1	16	0 1		.7	.83	37.5			

GAS RUNS NOT RECORDED

Engine test sheet

8 CYL

Date	10/22/96	start time	13:17
Baro pressure "Hg	30.3	Humidity	62
Ambient temp.	60	Other	

Main reason for test: BASELINE BEFORE FER & TN6

DATA FOR FUEL CONSUMPT

Engine configuration basic description: GEN II PIST. AT .020" 9200 INJ TURBO

injector timing setting	9°	Injector part number	5229200
Pilot timing start of injection:			

Notes on what happened: RACK WAS ADJUSTED YESTERDAY QUICK DIESEL DATA TAKING ONLY A FEW EMIS SPOTS. DIESEL CONSUMP. IS SLIGHTLY HIGHER.

significant findings of the test:

Files recorded

Time TN	snapshot	File/.prs	file indi	CO/HC/NOx			imep	HP	RK
13:17	GET	IT	HOT	XX	XX	XX			
	LOG EM								
13:28 8	1			.26	.27	32.8	—	1450	.625
13:31 8	2/			—	—	—	—	1200	—
13:32 8	3/			—	—	—	—	1000	—
13:38 8	4/2			.36	.45	33.4	—	800	1.11
13:40 8	5			—	—	—	—	600	1.238
13:42 8	6			—	—	—	—	400	1.354
13:45 7	7			.26	.28	33.58	—	1175	.790
13:52 6	8			.27	.28	33.96	—	1000	.856
13:53 6	9			—	—	—	—	800	1.040
13:55 6	10			—	—	—	—	600	1.214
13:58 6	11 / 3			.23	.23	34	—	400	1.365
1400 6	1 ON GAS							1000	1.816
1405	12 / 4								

MASS FLOW # CORRECT

GAS TESTS NEXT PAGE

Engine test sheet 8 CYL WHOLE ENGINE

CONT FROM PREV. PG. (THIS PAGE ALL GAS)

Date	10/22/96	start time	14:10
Baro pressure "Hg	30.3	Humidity	
Ambient temp.		Other	

Main reason for test: THIS SECTION OF TEST 50 HZ EFFICIENCY DATA W/TIMING & AIR TEMP CHANGES

Engine configuration basic description:

injector timing setting	Injector part number
Pilot timing start of injection:	

Notes on what happened: RUNNING BASE ON GAS AND RAN LOW W/½ CASCADES ON — COLD AIR RUN — 4 DEG TIMING BTDC HOT AIR — 4° BTDC COLD AIR

significant findings of the test:

Files recorded

	Time	TN	snapshot	File/.prs	file indi	CO/HC/NOx			imep HP	DIR #/min	RK	BSFC
	14:	6	13 / 5						1000	.47	1.814	6935
	14 15	6	1 1			4.5	.75	8.8	1000	.47	1.814	
	14:19	6	2 2			7.2	1.4	8.5	800	.47	1.814	7600
		6	OUT OF	GAS		12	3	8.8	600	.47	1.819	9100-89
	14:28	6	COLD	AIR							"	
	14:30	6	3 —						1000		"	7100
			4 3			5.6	.5	6.9	1200		"	7000
			4	BOGUS	EMIS				1250		"	6975
	14:36	6	5						1300	.47	"	
	1437	6	6						800			7900
HOT A												APJ TIM
	1456	6	7						1000	.47		7550
	1458	6	8 5						1200	.47		7250
	1459	6	9 6						800	.47	1.815	8200
	15	6	10						600	.47		9850
	15:03		11						400			13300
COLD AIR			12						1200			7420
	15:08		13						1400	.47		7100
			14 8						1000			7900
	15:12		15 8						800			8624
	15:13		16						600			10200

Engine test sheet

CONTINUED FROM PREV PG ALL DIESEL

Date	10/22/96	start time	
Baro pressure "Hg	30.3	Humidity	
Ambient temp.		Other	

Main reason for test: VARIABLES TO BASELINE

Engine configuration basic description: COLD AIR STD TIMING AT 4° BTDC

injector timing setting	Injector part number
Pilot timing start of injection:	

Notes on what happened:

significant findings of the test: HC WENT UP NOX WENT DOWN, 4 DEG. TIMING IS MORE EFFICIENT INDICATED BY BSFC AND RACK

Files recorded LOG / EM

Time	TN	snapshot		File/.prs	file indi	CO/HC/NOx			BSFC imep	HP	RK.
15:18	6	17	10			.4	.24	18.4	6850	1000	.867
15:23	6	18	11			.4	.3	18.9	6980	800	
15:27	6	19	12			.6	.4	17.1	7475	600	
15:32	8	20	13			.27	.2	18.5	6780	1450	.625
15:35	8	21	14			.28	.25	19	6900	1200	.862
15:38	8	22	15			.35	.3	19.6	7185	1000	1.000
15:40		23	16			~~.70~~	~~.5~~	~~18.5~~	7733	800	1.125
15:44		24	17			.70	.5	18.5	8690	600	1.241
15:49		25	18			1.4	.77	21.6	10733	400	1.351

Engine test sheet

8 C42

Date	10/24/96	start time	11:00 AM
Baro pressure "Hg	29.8	Humidity	51
Ambient temp.	56	Other	

Main reason for test: BACK UP DATA PREP FOR ER AND ER BREAKIN DIESEL ONLY RUNS

Engine configuration basic description: WARM AIR — STD TIMING GEN II PISTONS AT .020"

injector timing setting	4 BTDC	Injector part number	5229200
Pilot timing start of injection:			

Notes on what happened:

significant findings of the test: BSFC IS SAME AS W/ COLD AIR RUN ON 22ND

Files recorded

Time	TN	snapshot	File/.prs	file indi	CO/HC/NOx			imep	HP	RK	BSFC
1100	8	WARM UP						130	1450		
11:12	8	1	TEST001,2		.27	.35	19.5	130	1450	.658	6790
11:22	8	2	3,4		.24	.56	19.8	112.5	1200	.863	6920
11:27		3	5,6		.28	.7	19.5	97.5	1000	1.000	7211
11:33		4	7,8		.4	.85	19.9	84.7	800	1.118	7730
11:39		5	9,10		.6	1.14	19	72	600	1.24	8710
11:46		6	11 12		1.0	1.6	21	58.5	400	1.350	10660
11:54	7	7	~~13 14~~		.29	.46	20.6	116	1175	.806	6840
11:59	6	8 log 10	13, 14		.32	.53	20.9	107	1000	.864	6880
1206		9 11	15 16		.3	.77	20.8	89.4	800	1.042	7011
1210		10 12	17 18		.37	1.03	19.6	73.2	600	1.206	7500
1216		11 13	19 20		.78	1.36	20.1	57	400	1.360	8650
1222	5	12 14	21 22		.36	.52	22	102.6	855	.910	6980
1225	4	13 15	23 24		.36	.76	22.9	84	600	1.071	7070
1230	3	14 16	25 26		.44	.9	22.9	75.8	457	1.168	7175
1237	2	15 17	27 28		.65	1.2	22	52	237	1.345	7500
1244	1	16 18	29 30		.9	1.3	22.3	39.5	153	1.427	7835

Engine test sheet

8 CYL DIESEL

Date 10 24		start time 12:57	
Baro pressure "Hg	29.7	Humidity	
Ambient temp.		Other	

Main reason for test: INSTALLED FOR WITNESS EFFECT

Engine configuration basic description:

injector timing setting	Injector part number
Pilot timing start of injection:	

Notes on what happened: RAN FOR ABOUT 15 MIN. AIR IS HOTTER OIL IS HOTTER — OIL IS TOO HOT PUT GARDEN HOSE ON RADIATOR — SWITCH TO COLD AIR SYSTEM AFTER 13:20

significant findings of the test: WITH ALL VARIABLES CONSIDERED WE ARN'T SURE YET. THE BSFC IS WORSE BUT ABXP IS DOWN & AIR TEMP IS UP. IT ISN'T MAGIC — ABXP IS READING 14.8 BUT THE ECU & THE GAUGE SAYS 15.3

Files recorded

Time	snapshot		File/.prs	file indi	CO/HC/NOx			imep	HP RK	BSFC
	FMS	8CYL								
1254	19		31, 32					133.5	1450 610	7035
13:20	17	20	33, 34		.48	.32	20.4	127	1445 625	6880
13:40	18	21	35, 36		.34	.25	18.55	131	1450	6800
13:56	19	22	37 38		.37	.23	18.9	130	1448	6850 .635
14:17	20	23			.42	.24	20.1	129	1457	6875

ER Hours approx
10-24- 2 hrs
10-__ 3 hrs
10-31 - 4 hrs
11-1 - 4 hrs
11-5 - 2 hrs
11-6 - 4 hrs.

Engine test sheet

8 CYL, DIESEL

Date 10-31-96	start time 11:30		
Baro pressure "Hg		Humidity	
Ambient temp.		Other SHUT DOWN 3:30	

Main reason for test: Engine Flush

11-1-96 Attempting Engine clean out
start time 9:30
SHUT DOWN ABOUT 3:45
APPROX 4 hrs Run

Engine configuration basic description:

injector timing setting	Injector part number
Pilot timing start of injection:	

Notes on what happened:

significant findings of the test:

Files recorded

Time	snapshot	File/.prs	file indi	CO/HC/NOx	imep		

18 hrs. of Running Time with ER Before hr meter was installed with 1298.6 hrs. allready on it.

Engine test sheet

8 CYL RUN

Date 11-5-96	start time 12:15
Baro pressure "Hg 30.42	Humidity 53%
Ambient temp. 57°	Other

Main reason for test: GAS BASE LINE TO COMPARE W/HYGIV OPERATION

Engine configuration basic description: GEN II PISTONS AT .020" STD AIR TEMP 4°BTDC TIME

injector timing setting 4°	Injector part number 529200
Pilot timing start of injection:	

Notes on what happened: ABORTED TEST WE HAVE SIGNAL PROBLEMS W/ SPEED / GOVERNOR CONTROL

significant findings of the test: WE HAD PROBLEMS

Files recorded

Time TN	snapshot	File/.prs	file indi	CO/HC/NOx	imep	HP	
8							

Engine test sheet

8 CYL RUN, GAS, WHOLE ENG,

Date 11-6-96		start time 10:45	
Baro pressure "Hg	30.22	Humidity 55	
Ambient temp. 60		Other	

Main reason for test: Trouble shoot speed & GFCV Jumping AROUND BALANCE CYCS IN TN 8, GET IMEP DATA FOR HYGIV

Engine configuration basic description: GEN

injector timing setting	7½° BTDC	Injector part number	9200
Pilot timing start of injection:			

Notes on what happened: BAD ENGINE BALANCE ON GIV's WE BALANCED THEM & PULLED PILOT FUEL BACK TO 1.845"

JUMPING PROBLEM WAS CAUSED BY ALTRONIC BEING CONNECTED TO FLY SENSORS

significant findings of the test: 1100 HP MAX 1000 WAS MAINTAINABLE W/O KNOCK KNOCK SENSORS WERE TUNED IN AND ARE LOOKING PRETTY GOOD

AT THE LAST WE SET TIMING BACK TO 4 BEFORE & IT SEEMS THAT ENGINE BALANCE SUFFERED

Files recorded

Time	TN	snapshot	File/.prs	file indi	CO/HC/NOx	imep	HP	
14:50	8	4	G862000	1		108	1000	GAS
14:54	8	5	G862002,3			120	1100	
14:55	8	6					1000	
14:58	8	7	G862004,5			103	900	
1500		8	G862006,7			95.5	800	
1504		9	G862008,9		.57 27.7	131	1450	DIESEL
1515		10	10 11			105	1000	GAS
1553		11	12,13			111	1000	GAS

4° BTDC TIME

Engine test sheet

8 CYL TEST 1 CYL TEST

Date 11-7-96	start time 10:30 1298.6		
Baro pressure "Hg		Humidity	
Ambient temp.		Other SHUT DOWN 1302.4	

Main reason for test: comparing hydralic GIV TO 220 psi PNEUMATIC GIV FOR cycle to cycle deviation Imep & MAIN RACK PUSH BACK

Engine configuration basic description:

injector timing setting 8° BTDC		Injector part number 9200	
Pilot timing start of injection:			

Notes on what happened:

significant findings of the test: CYCLE TO CYCLE V IS ABOUT THE SAME ALSO HEADER PRESSURE IS ABOUT SAME

Files recorded

Time	snapshot	File/.prs	file indi	CO/HC/NOx	imep	HP	Pk
	1	2014 15				1.04	~~1.04~~
	2	16 17				1.00	~~1~~
	3	18 19				990	~~.98~~
	4	20 21				.980	1.025
	5	22 23				1.025	1.03
	6	24 25				1.03	1.00
	7	26 27				1.000	1.00
	8	28 29				1000	.99
	9	3031				1000	.98
	10	3233				1000	1.010

~~HP~~ HYGIV

Test sheet for 8 CYL HYGIV TEST 1 CYL

Date	11/8/96	Start time	11:00
Baro pressure	30.45	Humidity	53%90
Ambient temp.	64	Other	

Main reason for test HYDRAULIC GIV + EMISSIONS STD VALVE AND JET CAP

Engine Configuration description: GEN II AT .020 STD AIR

Injector timeing	8 BTDC	Injector part number	9200
Polot timing / start of injection			

Notes on what happened: RUNS FINE

Significant findings of the test: BACK UP DATA LOOKS GOOD. JET CAP APEARS TO REDUCE ALL EMISSIONS — DONT KNOW ABOUT EFFICIENCY. POWER LIMIT IS ABOUT THE SAME

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		
		1	GT86					1000	1.005	DIESEL	
11:52		2 3	34 35				125		1.035	GAS	HYGIV
		3 3	36 37				112				
1207		1 3	38 39				106				
1215		2 7	40 41				96				
1222		3 3	42 43				91				
1404		1 3	44 45				126			HYGIV	w/JC
1409		2 3	46 47				117				
1414		3 3	48 49				107				
1419		4 3	50 51				97				
1424		5 3	52 53				94				
		6									

Test sheet for 8 CYL SPARK 1 CYLINDER

Date 11/11,12/96	Start time
Baro pressure	Humidity
Ambient temp.	Other

Main reason for test FIRST TIME SPARK IGN TESTS ON #5 CYL

Engine Configuration description: GEN II AT .020" SQUISH, HVGIV W/JET CAP

Injector timeing 8 BTDC	Injector part number
Pilot timing / start of injection	

Notes on what happened: WE SEE THE UNIT LEAKS AT HIGH POWER OUTPUTS

Significant findings of the test: IT APEARS THAT FULL POWER CAN BE PRODUCED AT LIKE CONDITIONS OF DF. KNOCK SENSORS ARNT RIGHT CUZ NOT HAVING SHEILDS CONNECTED

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	ADV. °	HDPR
			SPARK								
11:23	6	1	607, 8				128	1000	.912		85.4
11:30	8	2 3	802,3,4	.8	1.6	5.4	128		1,045		89
11:34	8	4 5	805,6	1.1	4.6	2.5	100		1,000		80
11:39	8	6	7	1	3	4	116		1,025		83
11:49	8	7 8	8, 9	1.1	2.3	5.5	122		1.030	4°	83
11:54	6	9	6010,11,12	1	1.8	5.5	118		.850	4°	67

Test sheet for 8CYL SPARK ON #5 CYL

Date	11-14-96
Baro pressure	30.2
Ambient temp.	60

Start time	12:30 pm
Humidity	
Other	SHUT DOWN 1313.3 4:15 pm

Main reason for test CONFIRM INFO, GET EMISSION #S, LOWER SPEED & LOAD

Engine Configuration description: GEN I PRECHAMBER IN #5 HYGIV W/JETCAP

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test: TN 2 BETTER W FULL ADVANCE TIME & 25 PSI ON FEED IN TN6 MISFIRE WAS REDUCED AT LIGHTER LOADS W MORE FEED GAS > 55PSI

Files Recorded EMICS IS 3 MIN FAST

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	Dial Timing		
14:37	6	1	SP2	1.67	2.63	2.92		1000	.860	0		
14:44	6	2		1.54	1.78	13.4		1000	.875	5		
15:14	8	3		1.42	1.77	6.4		1000	1.043	0	23.3	SCFM GAS
15:22	8	4		1.42	1.73	9.2		1000	1.037	1.6	22.3	
15:30	8		SPT2005	3.1	13	2.8	42,48		.930	10		LIGHT LOAD
	8						12,16		.877	0		" "
15:40	8	5	10,11	2.2	5.8	4.6	91,5		.99	10		" "
15:48	8	6	12 13	2.43	7.76	3.7	85		.98	10		

Test sheet for

Date 11-22-96	Start time 11:00 1313.3
Baro pressure 30.22	Humidity 40%
Ambient temp. 46.9	Other

Main reason for test DEMO RUN FOR LEOPOLDO OF VENEZUELA

Engine Configuration description:

Injector timeing 80	Injector part number 9200
Polot timing / start of injection	

Notes on what happened: PROBLEMS W/CTC, GFCVT, ENG; SPEED, ENG BALANCE

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		

Test sheet for

Date 12-11-96	Start time 10:30 AM
Baro pressure 29.85	Humidity
Ambient temp. 50-55	Other SHUT DOWN 1323.0

Main reason for test Test port injection & GAS COMPRESSOR TEST

Engine Configuration description: GAS COMP DRAWS 42 AMPS @ 15psi inlet & 100 psi out let

Injector timeing 8°	Injector part number 9200
Polot timing / start of injection	

Notes on what happened: HC meter not working
EMISSION SAMPLE LINE STAYS HOT & DRY W/INSULATION & NO VACU

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		
15:31	8	2	PRT 000	NA	.94	9.0	130	1000	1.069		
15:40	8	3	003		.27	5.3	101	1000	1.023		
15:42	8	4	005		1.0	8.6	132		1.067		

SCFM 25.2

19-20
26

Test sheet for

Date 12-12-96	Start time 10:35 AM
Baro pressure 30.15	Humidity 51%
Ambient temp. 54	Other

Main reason for test 2ND Test Run FOR GAS COMPRESSOR AND PORT injector with HC meter WORKing. HEAD INJ. COMPARASON & EGR SNAPS HB

Engine Configuration description: GEN II AT .020"

Injector timeing 8° BTDC	Injector part number 9200
Polot timing / start of injection	

Notes on what happened: RAN SHORT OF GAS

Significant findings of the test: SHP AIR COMP WONT PUMP ENOUGH GAS. HC # HAVE BEEN GOING DOWN W/EARLIER GAS INJECTION

Files Recorded

Time	TN	Snapshot		.prs file	HC	CO	NOx	imep	HP	Rack	GAS SCFM / MTC Cont	DIESEL	GAS INJ
													180°
12 52	8	1	1		7.37	.85	8.23		1000	1060	26.2 / 25.6	5.39	180
12 57	8	2	2						"	"	—		-3°
13 02	8	3	3		7.2	1.8	7.7			1,040	24.7 /		-3
	8	4	4		10,124	1.75	3.4			1,040	26 /	5.49	+10
13 17	8	5	5		6.15	1.2	4.5			1,043	24.5 /	5.49	160°
13 20	8	6	6		6.9	1.5	3.8			1.040			-3
13 26	8	7	7		6	1.47	3.9			1,040			+5
13 41	8	8	8		5.8	1.15	4.6			1,040	24.5		175° & 8MS
13 4				HC WENT UP SOME									175 & 6.5
13:47	8	9	9		5.9	1.4	4.3			1042	24	5.52	170 & 6.0
14:02		10	10							1,040			
14:4		11	11										HEAD INJ.
1454	8	12	12		.272	.9	26		1450	.645	—	.368	
1456	8	13	13		.27	.9	25.6		1450	.644	—	.366	

ENGTST.XLS

Test sheet for

Date	Start time
Baro pressure	Humidity
Ambient temp.	Other

Main reason for test

Engine Configuration description:

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

Files Recorded

SPARK Timing @ TN 2

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	KNOB =	Fly°
									TURNS -	0	217
										1	215 3/4
										2	214
										3	212 3/4
										4	210 3/4
										5	209 1/4
										6	208
										7	206
										8	204 1/2
										9	203 1/4
										10	202

TN 8
+ 1½°

Test sheet for

Date 12-19-96	
Baro pressure	30.3
Ambient temp.	40°

Start time	1035
Humidity	35%
Other	1332.9

Main reason for test: To see if spark chamber's check valve could run in oil w/o oil feed or with oil feed

Engine Configuration description: spark chamber in cly #5 with reg old styld Giv.

Injector timeing	Injector part number: spark chamber
Polot timing / start of injection	

Notes on what happened: Ran in Tn 8 @ matched load of Engine ↓ oil Temp @ ✓ valve went from 200 – 400↑. shut down installed oil feed torque. Ran in Tn 8 @ matched load of Engine based off Ex. Temp oil Temp Ran about 5-10° above Engine oil out. Ran Tell man ✓ valve oil Temp. Topped out @ 258°

Significant findings of the test: Rack was @ 1.030 – 1.040

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	oil out	✓ valve Temp
w/o	8							1000	1.000		200
w/o	8							1000	1.010	205	400
w	8							1000	1.040	212	258
w	8							1000	1.000		230
w	6							800		210	232

Test sheet for

Date	1-2-97
Baro pressure	29.70
Ambient temp.	55

Start time	9:15AM	1335.1
Humidity	62%	
Other	SHUT DOWN	1337.4

Main reason for test: Back up Run to check out spark pre chamber AFT. Burnin Tip off Plug. Also Testing direct spark

Engine Configuration description: Spark chamber in cyl. #5 with Reg old style G.i.v

Injector timeing	Injector part number: Spark chamber
Polot timing / start of injection	

Notes on what happened: Spark chamber Didn't Run Real stable. Check Valve Hung up posibly From Debres stuck under it.

Significant findings of the test: We are considering Regular G.i.v's Might not work well with spark chamber

Files Recorded

Time	TN	Snapshot	.prs file (Spark Press)	HC	CO	NOx	imep	HP	Rack	Header Press / oil SC Temp	water SC Flow	
	3		12-13					375	21.8	180.2	[redacted]	22-5½ Less Than 16
	6		45-47					775	37.6	193.6	<1	32-9
	8										[redacted] Gpm <1	[redacted] 45.

Test sheet for

Date 1-3-97	Start time 10:15 AM
Baro pressure 30.05	Humidity 52%
Ambient temp. 51	Other

Main reason for test continuation of 1-2-97 Testing

Engine Configuration description: spark chamber in cyl #5 with Regular old style Q.i.v.

Injector timeing	Injector part number spark chamber
Polot timing / start of injection	

Notes on what happened: changed Q.i.v to Jet cup style and confirmed its necessity for spark pre chamber operation. check valve still

Significant findings of the test: seemed sticky

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		

TEST DATA & NOTES 1/2/97

SPARK PRECHAMBER GEN I

HP	NOTCH	P.C. GAS FEED	WTR FLOW	TEMP OIL	COMMENTS
371	3	15 PSI	<MIN	180	SAME TEMP AS NO COMB.
	(WATER FLOW D.P.	22 PSI IN	8.5 OUT)		GAS P.C. FEED 30 PSI MISFIRE FOR SURE 10 PSI SEEMS TO LIGHT
780	6	35/45	<MIN	193	

42 PSI IN 8 OUT ENG LO 188 OUT

6 ADVANCE 3 TURNS TO _____ AND SEE MUCH BETTER CONSISTANCY IN COMBUSTION LOAD IS STILL FAIRLY LOW HOWEVER AT _____ TIMING WHEN WE INCREASED LOAD THE INCONSISTANT COMBUSTION WAS CONCERNING.

1/3/97

TN6 P.C. PSI 50-65 GOOD 80 TO HIGH AGAIN 42 PSI H2O IN 9 PSI OUT NO MEASURED FLOW

TN 8 ONLY FOR A LITTLE WHILE UNTIL CHECK VALVE STUCK. W/JET CAP SPARKING COMB. W/O P.C. GAS FEED IS VERY DIFFICULT. TRIED IN BOTH 6 & 8 W/O JET CAP OPERATION IS VERY ERRADIC. SUSPECT OVER RICH MIXTURES IN P.C. CAUSE POOR CONSISTANCY HOWEVER IT MAY BE THAT IT IS TO LEAN STILL – CANT SAY FOR SURE. JET CAP WORKS MUCH BETTER

Test sheet for

Date	1-9-97
Baro pressure	30.45
Ambient temp.	53.5

Start time	900 AM
Humidity	64 %
Other	SHUT DOWN 1344.5

Main reason for test Testing SPARK CHAMBER with poppett type check valve. & set cap GIV

Engine Configuration description:

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

Files Recorded Emission Comp 4 min Fast

	Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	Dial Timing	GAS Flow
SPARK CHAMBER	9:44	6	1		5.1	2.1	19.8		1000	.920	4	19.6
	9:54	6	2		7.4	2.1	15.7		1000	.925	4	18.1
	10:02	6	3		8.7	2.3	5.4		1000	.914	0	18.6
	10:18	8	4		11.1	4.0	3.8		1000	1.042	0	22.9
	10:22	8	5		9.9	3.5	5.1		1000	1.052	1	22.6
	11:01	8	6		7.4	2.3	8.4		1000	1.058	0	23.9
	12:40	6	7		3.8	1.7	17.6		1000	.921	4	18.5
	13:44		AIR THROTTLE				TO	FULL	DIESEL	IDLE		

1/9/97

TESTING SPARK P.C. W/ JET CAP & OL INJECTOR CHECK VALVE

TN 3 PC PRESSURE 25 20 = NO GAS

32 + = MISFIRE, COULD SEE COMB W/O PRECHAMBER BUT VERY IRRADIC

> TN6 PC PRESS 28 = NO GAS 30 START

35 PSI GOOD 50 TO HIGH & MISFIRE

32 TO 35 LOOKS BEST 38 PROVIDED SOME MISFIRE

42 IS VERY PRONOUNCED.

RETARD 4° TO 0 ON KNOB MAIN RACK .920 TO .910

NOX DOWN PEAK PRESS DOWN EXT UP

TN8 PILOT PRESSURE - 45-60 FAIR

AT .92 HEADER PRESSURE & 0 TIMING WE HAVE LOW PEAK PRESSURE HIGH H.C. & HIGH VARI TO VARI

H2O DP 14 OUT 47 Δ 33 0 FLOW

OIL TEMP IN CHECK VALVE 213 RIGHT IN MIDDLE OF OIL OUT & IN 208-217

ON REDUCED LOAD PILOT PRESSURE FROM 45-60 MOVED MAIN RACK FROM .875 TO .915

BUT HAVING 45 P.P. W/ 5 TURN ADVANCE TOOK RACK .875-.950 NOW 60 PSI P.P. ONLY ADDED .005" TO RACK HEADER PRESSURE 70 PSI

Test sheet for

Date 1-24-97	Start time 8:45
Baro pressure 30.32	Humidity 47 %
Ambient temp. 46.8	Other

Main reason for test Check For Difference Between Jet Cap & STD OLP GIV with Direct SPARK

Engine Configuration description: Direct spark plug with STD OIP style GIV

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: Think We Burnt Tip on plug while Doing Knock STROBE Testing In TN 6

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	Dial	G Flow
9:51	6	1		87				1000	.927	9	[redacted]
9:57	6	2		102				1000	.924	6	18
	8	0		234				1000	1.035	7	20

17.4

1/24/97 DIRECT SPARK NO JET CAP

TN3 25-28 PSI HEADER WE HAVE COMB, WITH REGULAR MISFIRE

TN6 46-47 HEADER P. RACK .935
1000 HP PRETTY MUCH A MATCH W/S.P.C.
GAS FLOW 18.5 RANGE, HC IS IN 80's
ON THE BEAR. THIS IS W/9 ON TIME KNOB

GO TO 6 ON TIME KNOB INCREASE GAS
GET TO KNOCK AND BACK OUT SOME
48.5 HDPR GAINED ON FLOW & EXH HEAT
BUT RACK IS ABOUT SAME TRACE IS LESS
SABLE HC ON BEAR 120. THERMAL RUN
AWAY PLUG BURNT OFF FROM KNOCK - LOOKING AT STAO
TN8 NOT QUITE AS HIGH A LOAD AS
W/SPC. MED. MISFIRE. EVENTUALLY
THERMAL RUNAWAY I THINK IT RAN
NOT AS GOOD AS JC SPC W/PILOT
BETTER THAN SPC W/O PILOT OR W/PILOT
BETTER THAN DIRECT PLUG W/JC

Test sheet for

Date	1/30/97
Baro pressure	30.2
Ambient temp.	

Start time	10:30 WARM UP
Humidity	66
Other	SHUT DOWN 1355.1

Main reason for test: GEN I SPARK PRECHAMBER W/INJECTOR CHECK VALVE & PORT GAS INJECTION POWER LIMITS & BASIC OPERATION

Engine Configuration description: GEN II PISTON .020 SQUISH 1 CYLINDER TESTING

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: check valve Temp stayed from 3°-5° of Lube oil out 219.8 Being the peak

Significant findings of the test: WATER HOSES FOR SPARK CHAMBER WERE PLUGED. SPARK CHAMBER RUN'S good @ 26.823 GAS PRESSURE ON IT. IN TN3 45-58 IN TN8

Files Recorded

	Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	Pilot Timing	GAS P.	Pre chamber Pre
				HEADER				PORT Timing					
PORT INJ.	11:32	3	1		27.1	4.8	2.5	180	250	1.488	7 Turns	15.3	
	11:38	3	2	27	33.6	6.3	1.7	177	250	1.480	7	15.3	
	11:44	3	3		19.7	4.3	14.1	185	240	1.517	7	15.6	
	11:56	6	4	45.8	9.7	1.5	24	190	1000	.914	7	20.8	
10x 11.9	12:04	6	5	45.7	9.4	1.2	19	190	1000	.915	4	20.5	
	12:12	6	6	41.1	6.9	1.4	18.3	180	1000	.919	4	20.	
	12:23	6	7	42.8	6.6	1.6	17.1	170	1000	.919	4	20.8	
	12:37	8	8	47	7.6	1.6	5.2	175	1000	1.055	4	25	
	12:41	8	9	46	8.8	2.3	3.2	175	1000	1.048	4	28	
Jet cap	14:50	8	10	89.9	6.5	3.9	6.9	std	1000	1.048	1	25	5
	14:54	8	11	89.9	6.7	4.2	6.2	std	1000	1.047	1	25	5
	15:05	8	12	92	5.9	3.1	8.2	std	1000	1.054	1	25.8	5
	15:14	8	13	91.8	5.7	2.5	9.4	std	1000	1.055	1	24.8	4
	15:21	8	14	88	6.5	3.6	6.8	std	1000	1.047	2	22.5	4

1/30/97 1 CYL TEST 8 CYL SPC W PIG
SPC USING POPPET CHECK VALVE

TN3
PC PILOT GAS 26 PSI IS GOOD LIKE PREV. TEST
180° PORT INJ & 7K ON TIMING 3800-3900 HC PPM 7K TIME WAS THE LOWEST AT 180° PIG
177° PIG HC WENT UP TO 4500-4200
185° PIG HC LOWER SOME 3300-3600
190° PIG HC 3100-3300

TN6 7K TIMING 190° PIG 1000 HP RK .915
NOX HIGH AT 2741 PPM HC 3185
PCPILOT 31

TN6 4K TIMING 190 PIG 1000HP RK .920
W/ PCP AT 36 AVERAGE PEAK PRESSURE IS HIGHER

TN6 4K TIM 180 PIG 1000 HP RK .920
HAD TO TURN DOWN GAS FLOW WHEN PIG ADVANCED 10° HC 2450

TN8 PART LOAD 1000 HP .975 RACK
60 PCP BETTER THAN 50 FOR MISFIRE
DECENT TRACE AT 4K TIMING 4800 HC PPM
175 PIG
1060 MAIN RACK AT KNO LIMIT 2219 HC
HDPR 46 RK 1.050 NOX & CO BOTH LOW 304 & 391 PPM
HC 2400 PPM
TAKING PIG FROM 175 TO 180 YIELDED HIGHER HC & LOWER RACK-POWER GOING TO 170 SLIGHTLY LOWER HC

1/30/97 TEST CONTINUED

INSTALLED JET CAP IN ORDER TO DETERMINE IF P/G OR JC IS BETTER OVERALL

GENERAL OBSERVATION SOMEWHAT LESS CONSISTANT COMBUSTION TRACES — LOWER HC HIGHER CO & NOX AT EQUIL RACK & TIMING CO2 READING SEEMS HIGH.

INJECTION PRESSURE GOES FROM 47 TO 92 PSI

INCREASING PRECHAMBER FEED FROM 50 TO 58 REDUCED NOX INC. VARIABALITY

REDUCING TO 45 THE VARIABILITY IS BETTER BUT NOX GOES WAY UP CO DOWN SOME HC DOWN SOME

Test sheet for

Date 2-3-97	Start time 11:30
Baro pressure 30.37	Humidity 51%
Ambient temp. 52.3	Other

Main reason for test To Test Diesel pre chamber in cyl #5

Engine Configuration description: Diesel pre chamber, port injection

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: Turned on Diesel pre-chamber & couldn't get any sign of combustion on oscilliscope trace on Diesel OR gas in TN 2, 3 & 6. Shut down & disassembled Diese pre chamber. It had evidence of combustion, was fairly

Significant findings of the test: Sootty inside. some light colored ash on the inside of the exit. Decided to change angle a couple of degrees and make the hole bigger.

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		

Test sheet for

Date 2-4-97	Start time 10:15
Baro pressure 30.43	Humidity 40
Ambient temp. 47.2	Other SD 1361.4

Main reason for test 2ND Test on Diesel pre chamber

Engine Configuration description: Diesel pre chamber with port injection, Re Angled Tip ~~[illegible]~~ and increased Hole size on chamber.

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: Attained combustion in a mostly over fueled state ran from 1600-800 psi, from 4-6 ms dur seemed best timing 15°-near 0°

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		

Test sheet for

Date 2-5-97	Start time 10:35
Baro pressure 30.55	Humidity 37%
Ambient temp. 45.3	Other

Main reason for test 3RD Test on Diesel pre chamber

Engine Configuration description: Diesel pre chamber with port injection with Restrictor pin Removed

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: chamber actually Ran in TN 3 & TN 6 pump press dropped and we lost fire shut down & Disassembled on 2-10-97 looked good injector pop Between 1150-1200,

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		

Test sheet for

Date 2-10-97	Start time 11:15 am
Baro pressure 30.41	Humidity 47%
Ambient temp. 52.3°	Other SD 1370.1

Main reason for test 4th Test on Diesel chamber

Engine Configuration description: Diesel chamber with PORT injection

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: RAN in TN 3 & TN 6 as listed below
RAN BRIEFLY in TN 8 & diesel pump could not MAINTAIN PRESSURE

Significant findings of the test: in AREA'S of knock the injector APPEARS to get AIR TRAPED in it

Emision computer 1 min AHEAD

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	DUR	GAS SCFM
12:39	6	1						1000	.925-.930		
13:22	3	2						235	1.541		17
14:16	6	3 4		5.2	1.7	3.7		1000	.900	4	18.5
14:22	6	3 5		6.5	7.6	1.7		1000	.879	4	16.5
14:31	6	4 6		4.9	2.1	[illegible] ← 7.3		1000	.918	4	20.6
14:46	6	5 7		6.0	3.3	2.2		1000	.878	4	16.2

Test sheet for

Date 2-13-97	
Baro pressure 30.55	
Ambient temp. 51.5	

Start time 10:21	
Humidity 48%	
Other SP 1374.2	

Main reason for test 5th test on Diesel PRE chamber

Engine Configuration description: Diesel pre chamber with port injection

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

Files Recorded EMMIONS computer ABout 1 min FAST

Time	TN	Snapshot	.prs	HC	CO	NOx	[illegible]	HP	Rack	DURATION	GAS SCFM	Timing
11:49	8	1	1925	7.9	5.3	1.5		1000	1.025	4.5	22.8	35°
12:01	8	2	"	4.8	3.6	1.6	49	1000	1.050	4.8	23.6	38°
12:05	8	3	"	1150	499	172						
12:14	8	4	"	777	506	186	49	1000	1.050	5.6	24	32
12:27	8	5	"	2401	485	209	49	1000	1.052	5.6	23.9	32
12:34	8	6	"	2408 / 7.5	449 / 2.6	304 / 2.7	50	1000	1.055	5.6	24.5	
12:49	8	7	"	3550 / 13.1	1085 / 8.1	130 / 1.5	45	1000	1.010	4.5	21.5	32
	8		"	3000	780	1.5		1000	1.025	4.5	22.6	32
13:03	8	8	"	2580 / 9.0	489 / 2.9	193 / 1.9	48.5	1000	1.040	4.5	24	32
13:05	8	9	"	8.2	2.0	2.6	50	1000	1.050	4.5	25.5	32
	I	10	"	6830	260	2779	45	0	1.936	4.5	13.	39

Test sheet for

Date	2-20-97
Baro pressure	30.59
Ambient temp.	52.6

Start time	10:30
Humidity	51%
Other	SD 1378.8

Main reason for test: Test pre chamber w/o ceramic liner

Engine Configuration description: Diesel pre chamber

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: Achieved Good Power & noticed upon Entering knock you could back away from it quite easily

Significant findings of the test:

Files Recorded: EMMIS Comp 1½ Fast

Time	TN	Snapshot	.prs file/temp	HC	CO	NOx	~~imep~~BP	HP	Rack	PWR	GAS Flow	T-ing	Die Flo
	F		1925					0	1.758				
12:28	6	1	"	7.8 2980	1.9 417	17.8 2423	48	1000	.940	4.4	21.9	35	3.5
12:38	6	2	"	8.2 3553	1.8 366	4.9 616	44	1000	.915	4.4	19	35	3.5
12:53	6	3	"	8.5 2850	1.3 262	6.4 645	44	1000	.915	4	19.2	35	2.32
13:36	8	5	"	7.9 2681	1.5 282	4.5 557	52.5	1000	1.070	4.4	28.5	32.75	2.63
13:43	8	7	opch 000	8.1 2675	1.6 288	4.7 533	115	1000	1.065	4.4	28	32-25	
13:55	8	8	1900	8.4 2650	1.6 291	3.3 262	50	1000	1.054	4.4	26	32	
14:01	8	9	"	8.9 2821	3.2 585	1.6 164	47.5	1000	1.040	4.4	25	32	1.6%
14:08	8	10	"	11.9 2220	5.5 851	1.5 148	46	1000	1.025	4.4	24	32	approx
14:15	8	11	"	15.5 3840	7.7 1082	1.6 145	45	1000	1.010	4.5	22.5	32	
14:42	8	12	"	8.6 2770	1.7 24	5.1 598	51.5	1000	1.065	4.5	28.2	32	

Test sheet for

Date	2-25-97
Baro pressure	30.40
Ambient temp.	54.4

Start time	12:58 PM
Humidity	50%
Other	SD 1381.5

Main reason for test To compare STD. Port injection V.S. Vortex Deliver Tube

3E.R. SNAP SHOT

Engine Configuration description: Diesel pre chamber w/o ceramic & PORT injection

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

Files Recorded

	Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	Duration	Timing	Gas flow
STD. PORT INJECTION	13:57	6	1		9.0 2150	1.7 357	6.7 827		1000	.915	4.0	35	18.5
	14:01	8	2		7.6 2695	1.4 270	6.2 722		1000	1.070	4.2	35	26.5
	14:09	8	3		8.4 2646	1.5 273	2.7 242		1000	1.050	4.4	32	24.5
	14:18	8	4		14.4 3900	6.4 961	1.4 125		1000	1.013	4.4	32	21.9
PRE CHAMBER + PORT INJECTION	14:57	6	5		7.9 2660	2.4 408	8.8 1049		1000	.908	4.4	35	19
	15:03	8	6		6.3 2044	1.7 317	6.3 744		1000	1.070	4.4	32	27
	15:07	8	7		6.0 1988	1.4 268	6.1 712		1000	1.068	4.4	32	26.4
	15:14	8	8		6.5 1987	1.9 317	1.9 197		1000	1.050	4.4	32	24.1
	15:20	8	9		14.2 3400	8.2 1147	1.3 114		1000	1.010	4.4	32	22
STD PILOT	15:29	6	10		8.3 1956	2.0 344	7.6 813		1000	1.058			24.5
											BSFC/#		
	15:37	8	11		.31	1.9	32		1450	0.645	6735 .362		DIESEL
	15:42	8	12		.3	1.8	31		1450	.648	6690 .36		
ER SNAPS													

Test sheet for

Date 3-1-97	Start time 10:55
Baro pressure 30.20	Humidity 44%
Ambient temp. 52.4	Other SD 1383.9

Main reason for test To Compare Escentric Delivery Tube to Vortex & STD. on port GIV

Engine Configuration description: Diesel pre chamber port injection 125psi GIV

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: Dip Test on shortened Duration of port injector, not much change in Emisions injection pressure went to 80+psi then HC went up.

Significant findings of the test:

Files Recorded

	Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	Duration	Timing	Gas Flow
				Pump			OH						
SDT.	11:53	6	1	2000	5.8 1946	2.0 295	8.4 1018	42	1000	.915	4.4	35	19.5
	12:05	8	2	1920	4.6 1530	1.5 297	4.6 539	50.5	1000	1.070	4.4	35	24.6
	12:11	8	3	"	5.3 1590	1.9 323	2.0 213	46.7	1000	1.050	4.4	32	22.3
	12:16	8	4	"	13.0 3150	7.9 1091	1.3 115	43.0	1000	1.010	4.4	32	20.5
	13:19	6	5	1980	7.1 2222	2.1 275	19.9 2055	40.5	1000	.910	4.4	35	19
	13:26	8	6	1900	5.7 1893	1.6 298	5.5 621	49	1000	1.070	4.4	35	25
STD. PORT INJ.	13:31	8	7	"	7.1 1980	2.1 344	2.3 240	44.8	1000	1.050	4.4	32	23.5
	13:38	8	8	"	12.9 3164	8.3 1142	1.6 145	40.6	1000	1.010	4.4	32	20.8

Test sheet for

Date	3-26-97	Start time	10:25
Baro pressure	30.17	Humidity	40%
Ambient temp.	61.7	Other	SD 1388.0

Main reason for test: To try out port injection Hydraulically & Run pre chamber with A V valve & Test the pressure washer.

Engine Configuration description: Diesel pre chamber & Hyp Port injector

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: G.V needed 10.5 ms to operate Desently Header press ran about 55psi

Significant findings of the test: V valve worked well

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		

Test sheet for

Date	4-14-97	4-18-97
Baro pressure	30.22	30.07
Ambient temp.	55.2	55.5

Start time	11:30	12:05
Humidity	65%	55%
Other	SD 13:90.2	SD 13:93.2

Main reason for test: Testing SM Hyp GIV & WM Diesel prechamber

Engine Configuration description: Long Diesel prechamber with wider Rinner hole (First Tip change) & Hyp port injector with 30# pre load 15 ms duration with 8 ms signal.

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: Hydralic pump balanced out @ 1300 psi @ 125°

Significant findings of the test:

Files Recorded

	Time	TN	Snapshot	HYD .prs file	HC	CO	NOx	GH imep	HP	Rack	PWR	Timing	GF
4-14-97		6			1932	366	1529	46	HP	.910		35	17.5
	13:08	6	1		2436	375	812	27	1000	.923	3.9	35	18.5
	13:13	6	2	1500	2513	304	406	27	1000	.910	3.9	35	17.5
	13:20	6	3	800	4000	292	175	27	1000	.895	3.9	35	18
	13:30	8	4	1500	2852	504	343	35	1000	1.057	4.0	35	24
	13:38	8	5	1000	2632	389	503	49	1000	1.050	3.7	35	23.5
	13:53	8	6	1000	3190	903	134	32	1000	1.010	4.0	32	20.5
	14:16	8	7	1300	3871	1160	126	31	1000	1.010	3.9	32	20.5
	14:25	8	8	1300/125°	3725	1101	141	32	1000	1.010	3.9	32	21

Test sheet for

Date 4-21-97	
Baro pressure	
Ambient temp. 56.2	

Start time	12:00 pm
Humidity	53%
Other	SD

Main reason for test: Diesel chamber Test

Engine Configuration description: 1" shorter Diesel chamber w/ First Hole size & High Flow Hydraulic port Giv.

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: oscilations still Exist

Significant findings of the test: Made Good power in TN 8 But not in TN 6.

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	O4R	Tim	GF
			HYD.P.				GH					
13:30	8	1	1450	2261	299	402	42	1000	1.060	3.9	35	24.5
13:35	8	2		2205	304	245	40	1000	1.050	3.7	35	24
13:39	8	3		3360	1106	124	35	1000	1.010	3.7	35	21.5
13:56	6	4		3254	285	95	32	1000	.895	3.7	45	20
14:03	6	5		3302	781	145	25	1000	.835	3.7	45	15.5
14:19	8	6		2135	303	390	43	1000	1.055	3.7	41.5	25

Test sheet for

Date 4-22-97	Start time 11:45 AM
Baro pressure	Humidity 50%
Ambient temp. 60.9	Other S.D. 1398.0

Main reason for test Diesel chamber Test

Engine Configuration description: sing. cyl. SHORT Diesel chamber w/wide Mouth Nozzle & High Flow Hyd. Giv w/30# pre load

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test: MADE better power in TN 6 (compared to next previous Run) But HAD Higher cylee to cycle deviation in TN 8. NA

Files Recorded

Time	TN	Snapshot	.prs file (HYD PRES)	HC	CO	NOx	imep (GH)	HP	Rack	DUR	TIM	G.F.
12:56	6	1	1400	2240	323	1569	39	1000	.928	3.4	35	18.5
13:03	6	2	1400	2002	251	510	37.5	1000	.910	3.5	35	18
13:13	8	3	1350/132	2121	517	365	42.5	1000	1.047	3.9	32	

ENGTST.XLS

Test sheet for

Date 4-23-99	Start time 11:05 am
Baro pressure 30.1	Humidity 58%
Ambient temp. 58.8	Other S.P. 1400.2

Main reason for test Piesel chamber Test

Engine Configuration description: Sing. Cyl. Short Piesel chamber w/small Hole nozzle & High Flow Hyp. Giv 30# pre load

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	DUR	TMP	GF
12:07	6	1	1500	1645	538	1223	31.5	1000	.916	3.8	35°	19
12:16	6	2		1148	520	740	31	1000	.912	3.8	35°	19
NA	8	3	1400	680	489	350	41	1000	1.063	3.8	32°	24.5
12:47	8	3	1350 130	2282	479	408	40	1000	1.060	3.8	32°	24.5
12:51	8	4		2324	516	220	39	1000	1.050	3.8	32°	24
12:59	8	5	1325 121	3556	1154	122	35	1000	1.010	4.3	32°	21.5

Test sheet for

Date 4-24-97	
Baro pressure 30.4	
Ambient temp. 58.4	

Start time 10:35 AM	
Humidity 49%	
Other SD 1403.3	

Main reason for test Testing ORIGINAL size pre chamber w/ small Hole nozzle .120"

Engine Configuration description: Sing cyl Diesel chamber w/ port Giv Hyp. High Flow 30# pre load

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file (440)	HC	CO	NOx	imep (OH)	HP	Rack	PUR	Time	GF
11:29	6	1	1500	2029	782	1645	32	1000	.935	3.8	35	20
11:34	6	2		2128	673	592	30.5	1000	.920	3.8	35	19.5
11:46	8	3	1400	1911	583	331	49	1000	1.065	3.8	32	26
8	8	4	11	1932	597	208	47	1000	1.050	3.8	33	25
11:59	8	5		1946	591	211	47	1000	1.050	11	11	11
12:08	8	6	1400	1932	585	241	46.5	1000	1.050	3.8	27 7/8	25
12:15	8	7	1400						1.010	To much misfire		

Test sheet for

Date 4-25-97	
Baro pressure 30.37	
Ambient temp. 58.2°	

Start time 9:30 AM	1:12
Humidity 55 %	
Other SD 11:12	Round 1400.8

Main reason for test To Get Base line INFO ON ORIGINAL pre chamber & NOZZLE w/o CERAMIC liner.
chamber 2.8" 1.90
NOZZLE .120"

First Run

Engine Configuration description: Sing. cyl. Diesel chamber & port injection Hyp. H.F. 30# pre. load

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file (Hy.P.)	HC	CO	NOx	imep (GH)	HP	Rack	DUR	Timing	GF
10:21	6	12	1450	1953	368	1320	39	1000	.925	3.8	35	19.5
10:29	6	3	1400	2084	292	452	36.5	1000	.910	3.8	35	17.5
10:44	8	4	1400	2030	305	408	45	1000	1.060	3.8	32	24
10:55	8	5	1400	2142	458	189	42	1000	1.048	3.8	32	23
11:07	8	6	1400	3619	132	143	38.5	1000	1.010	3.8	32	20
13:36	6	7	1350,50	1988	489	1201	42	1000	.908	3.8	41	19
8	6	8	1350	2429	491	123	33.5	1000	.860	3.8	35	17.5
13:44	6	9	1350	2289	472	183	33.5	1000	.870	3.8	32	17.5
13:52	8	10	1400	1988	432	769	48.5	1000	1.062	3.8	32	25.5
13:57	8	11	1400	2177	393	386	48	1000	1.055	3.8	35	25.5

1024

Original chamber

Original nozzle

1.375 G/M 2.732 c/m .248 ci/i IN TUBE 317.625

Test sheet for

Date 4-29-97	Start time 10:15 AM
Baro pressure 30.23	Humidity 50%
Ambient temp. 59.4	Other SP 1409.5

Main reason for test

Engine Configuration description: LARGE Diesel chamber w/2 .120" Nozzle Holes w/ port injection 30# preload 15 ms app

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file (Hyp)	HC	CO	NOx	imep (G.H.)	HP	Rack	Dur	Time	G.F.
12:27	6	1	1450	2380	675	135	30	1000	.885	3.8ms	35°	18
12:35	6	2	1400	2275	643	403	32	1000	.910	3.8ms	32	19
	8	Cycle to Cycle Deviation To High										

Test sheet for

Date 5-2-97	Start time 10:00 AM
Baro pressure 30.11	Humidity 52%
Ambient temp. 53°	Other .OD 1413.6

Main reason for test: Diesel pre chamber test Cont.

Engine Configuration description: Sim. cyl. 2.8 diesel chamber w/ .125" x 2.45" Nozzle Hole. Hyd Giv w/ 30# pre load

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

Files Recorded — HP. Press. — G.H. Press.

	Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	Dur	Time	G.F.
2.8 x 125/245 Pre chamber	12:28	6	1	1450	2184	532	1984	33.5	1000	.923	4.0	40 1/8	20
	12:32	6	2	1400	2219	479	1187	32.5	1000	.913	4.0	37	19.5
	12:40	8	3	1400	2135	358	559	40.5	1000	1.068	4.0	35	?
	12:44	8	4	1400	2114	398	196	41	1000	1.050	4.0	32	24
	12:50	8	5	1400	3500	1250	111	39.5	1000	1.010	4.0	32	21.5
STD Pilot	12:56	8	N/A	1400	3486	1504	170	38	1000	1.005		9° BTDC	21.5
	13:00	8	6		2086	371	391	42	1000	1.050		11	23.5
	13:06	8	7		2037	340	823	44	1000	1.060			24.5
Pre chamber 3.3 x 125/245	14:26	6	8	1400	2191	628	1540	31.5	1000	.905	3.80	40	20.5
	14:33	8	9	1400	2171	570	699	39.5	1000	1.063	4.0	34	25.5
	14:38	8	10	1400	2184	552	228	38	1000	1.050	4.0	34	23.5
	14:42	8	11	1400	3451	1349	129	?	1000	1.010	4.0	34	21.5
	14:53	8	12	1400	2730	1211	154		1000	1.018	4.0	28	21

Test sheet for

Date	6-13-97
Baro pressure	30.23
Ambient temp.	69°

Start time	11:37
Humidity	54%
Other	SD 1415.7

Main reason for test: Fuel Catalyst Test #1

Engine Configuration description: 9335 @ 0° in cyl #5 All others are 9200 @ 8° BTDC

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test: Concluded that Fuel lines were to long for STP Pilot opp. Test Results are invalid for determining Firing press.

Files Recorded

	Time	TN	Snapshot	.prs file (\$001)	HC	CO	NOx	imep	HP	Rack	Fuel (Press)	
Reg	11:57:14	8	1	FPC 000	109	234	1546	108.5	1285	.800	56	
FPC1	12:06:07	8	2	002-003	112	278	1733	136/138	1310	.800	56	
		8		004				137.5	1315	.800		
Reg	12:11:	8	3	005-006	111	234	1449	110	1315	.773	56	
FPC1	12:19:53	8	4	007	112	269	1711	135	1285	.838	56	
			1									
PPC1	12:40	8		010	104	250	1649	108	1100	.953	56	

Test sheet for

Date 6-16-97	Start time 11:35 AM
Baro pressure 30.19	Humidity 56%
Ambient temp. 71.3	Other SD HOURS FINISH 1418 -

EVR START 1279

Main reason for test Fuel catalyst Test #2

Engine Configuration description: 9335 @ 0° in cyl #5 all others 9200 @ 8° BTDC.
GEN II PISTONS @ .020 SQUISH

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

STD mix.

Files Recorded

	Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack (MAIN)	Fuel Press	Peak Press
Reg	12:16	8	1	000-001	50	281	1725	141	1325	.800	50-52	737
FPC1	12:20	8	2	002 003	54	295	1684	146	1325	.800	50-	746
Reg	12:24.51	8	3	004 005	57	294	1676	147	1325	.800	50-	737
FPC1	12:29.34	8	4	006 007	56	288	1660	148	1325	.800	50-	749
				IDLE	w/ MIXING		4000:	1 FUEL				
Reg	NA	8	[illegible]	008 009	55	305	1661	141	1325	.780	50-	742
FPC1	13:04:59	8	5	010 011	57	303	1669	150	1325	.781	50	753
Reg	13:07:39	8	6	012 013	57	310	1675	149	1325	.783	50-	766
FPC1	13:10:24	8	7	014 015	57	311	1669	152	1325	.784	50-52	763
	13:17:26	8	8 SNAP	SHOT	FOR	9335	@	.800	VS	MAIN	RACK	1.045

5% over mix

Test sheet for

Date 6-20-97	Start time 8:45
Baro pressure 30.25	Humidity 53%
Ambient temp. 63°	Other 3D 1423.5

Main reason for test Testing Coated Diesel chamber Tip, Belville spring WASHER HOLD DOWN ABILITY & pressure INTENSIFIER.

Engine Configuration description: cyl #5 Diesel chamber 2.8 x .170 coated HYD. port injection

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

Files Recorded

	Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	D&R	TIME	GF
Direct pre chamber injection	10:48:00	8	1		1659	530	688		1000	1.060	3.8	35°	25
	10:51:44	8	2		1666	494	347		1000	1.050	3.8	32°	24
Press	12:28:48	6	3		1645	383	615		1000	.890	—	—	18
	12:41:14	6	4		1638	330	940		1000	.890	—	—	18
intens	12:50:39	8	5		1687	323	339		1000	1.025	—	—	22
	12:08:53	8	6		1694	385	277		1000	1.018	15	30°	21
	13:23:24	8	7		1771	312	342		1000	1.035	15	25°	24

Test sheet for

Date 7-3-97	Start time 12:30 pm
Baro pressure 30.25	Humidity 57%
Ambient temp. 71°	Other SD 1425.3

Main reason for test: Test FORD style Needle type injector in pre chamber

Engine Configuration description: Cyl. #5 port injector & Diesel pre chamber

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: with out the check valve in the system AIR WAS pumped in the injector line @ FULL LOAD.

Significant findings of the test: Ben thier Done that

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		

Test sheet for

Date 7-11-97	Start time 11
Baro pressure 30.18	Humidity 64%
Ambient temp. 66°	Other SD 1430.1

Main reason for test to check out gas compressor, Emissions 1 cyl vs All ~~3~~ air throttle.

Engine Configuration description: All cylinder opp. High press. Giv's. 9200's @ 8° BTDC

Injector timeing 8° BTDC	Injector part number 9200
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test: COMPRESSOR WORKS GREAT

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	~~imep~~	HP	Rack	ABP	Air Temp. GH	
1505	8	3						800	1838	10		
15:16	8	4		1190	859	855	284	800	11	10.1	45.8	133.4
15:43:14	8	5		2499	1334	443	283	800	11	10.8	46.5	134.0

Test sheet for

Date 7-11-97	Start time 10:00 AM
Baro pressure 30.26	Humidity 56 %
Ambient temp. 66.5	Other 50 1434.3

Main reason for test Base line Engine on Gas

Engine Configuration description: All cylinders STD. Dual Fuel High press. Gid's .020 squish Gen II style pistons

Injector timeing 8° BTDC	Injector part number 9200
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test: GOOD DATA — MOVING EMIS EQ. PROVED THAT THE NUMBERS FROM ONE CYL ARN'T THE SAME ON WHOLE ENGINE

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	GH	BSP	GF
11:49	8	1										
12:03	8	2	7453	2716	1323	540		1300	1840	60.6	15.7	171.7
12:08	8	3		2980	1362	457		1200	"	59.01	15.4	166.3
12:11	8	4		3423	1392	356		1000	"	56.5	15.2	156.0
12:18	8	5		2820	1393	472		1000	"	52.2	12.3	153.7
12:22	8	6		3290	1422	355		800	"	49.4	12.0	140.6
12:26	8	7	7620	3808	1372	271		600	"	46.6	11.6	128.2
12:30	8	8		3577	1446	308		600	"	43.5	9.9	124.2
12:37:31	7	9	7600	2611	1250	540		1200	"	52.5	12.6	159.8
12:45	6	10	7483	2296	1323	809		1200	"	46.2	9.5	156.3
12:53	6	11		2583	1140	580		1000	"	41.4	9.3	136.9
12:57:28	6	12		3082	1257	413		800	"	38.1	9.1	122.7
13:07	6	13	8252	2709	1250	534		8[illegible]00	"	35.5	7.1	121.5
13:14	6	14	9956	3185	1342	404		600	"	30.9	6.1	102.5
13:20	6	15	12300	3360	1446	309		400	"	23.8	4.0	83.5
12:29	5	16	7735	2478	972	722		855	"	34.6	7.2	117.2
13:35	4	17	8140	2350	928	710		604	1800	24.5	4.9	82.6
13:40	3	18	8072	2373	927	619		455	1800	19.6	3.6	63.5
13:44	2	19	9887	3100	1075	325		238	1800	14.56	2.0	39.5

Test sheet for

Date 7-15-97	
Baro pressure 30.32	
Ambient temp. 69	

Start time 9:20 am	
Humidity 67%	
Other SD 1440.0	

Main reason for test Back up Whole Eng Base line, 4° injector Timing, Air Temp. DeRate GAS slip stream, propane, High pilot Fuel.

Engine Configuration description: STD. Dual Fuel All cylinders High press Giv's & .020" squish Gen II pistons

Injector timeing 8° AND 4° BTOC	Injector part number 9200
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test: GAS SLIP ISN'T A CURE ALL HC GOES UP. AIR DERATE IS LINEAR. TIMING CHANGES EFFICIENCY & NOx

Files Recorded

	Time	TN	Snapshot	.prs file	HC	CO	NOx	imep (ABP)	HP	Rack	(GH)	BTU/HPHR (GF)	
			2					STD	1450	1840	KNOCK	7250	
	10:35	8	3					11	1400	1840		7300	
	10:42	8	4		2660	1301	487	11	1300	1840	60.4	7580	171.6
	10:49	6	5		2310	1296	735	11	1200	1840	45.3	7300	154
% slip	10:58	6	6		2650	1220	726	11	1200	1840	43.8	7400	156
12% slip	11:03	6	7		3073	1182	750	11	1200	1840	42.3	7520	
moved D	11:10	6	8		2450	1180	750	11	1200	1c	42.3		
ector	11:30	8	9		1967	925	704	11	1300	1652	53.8	7350	140.8
igh Pilot	11:41	8	10		1638	554	1146	11	1350	1.348	47	7100	96
higher Pilot													
				set Timing @ 4° BTDC									
	13:41	8	1/11		2471	1389	474	11	1375	1.840	61.3	7250	172.5
	13:46	8	2/12		2992	1381	351	11	1200	1.840	60.7	8090	167.9
	13:50	8	3/13		3514	1368	272	11	1000	1.840	58.4	9280	160
	13:53	8	4/14		4409	1301	211	11	800	1.840	56.2	10922	150
	13:59	8	5/15		3066	1486	306	10	800	1.840	47.4	10430	142
	14:06	6	6/16	AIR	2100	1150	528	12.4	1340	1.840	53.2	7115	168.7
	14:13	6	7/17	BOX	2212	1272	522	10.5	1200	1.840	42.9	7500	159
	14:16	6	8/18	Temp	2555	1216	395	9.4	1000	1.840	42.5	8063	140.8
	14:18	6	9/19	148 ↓	3178	1241	276	9.2	800	1.840	39	9020	125
HOT AIR	14:22	6	10/20		4053	1253	185	9.1	600	1.840	36.6	10930	112.8
	14:34		11	148					1350				
DeRATE	14:35		12	151					1300				
	14:39		13	154					1250				
	14:42		14	160					1200				
	14:47		15	168					1150				
	14:51		16	174					1100				

OVER

Test sheet for

Date 7-16-97	Start time 11:30 AM
Baro pressure	Humidity 54 %
Ambient temp. 73°	Other SD

Main reason for test Propane Testing & Full Diesel Test

Engine Configuration description: STD Dual Fuel with High PRESS. GIU's & .020" squish Gen II pistons

Injector timeing 4° BTDC	Injector part number 9200
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test: PROPANE

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		
	8							1650	1661		

Test sheet for

Date	7-22-97	Start time	9:15
Baro pressure		Humidity	56%
Ambient temp.	67.7	Other	SD 1449.2

Main reason for test: Back up Run on 9200 @ 4° BTDC Timing & propane Run

Engine Configuration description: STD. Pyl Fuel w High press 3/4" Bore GIV's & Gen II piston's @ .020" Squish.

Injector timeing	4° BTDC	Injector part number	9200
Polot timing / start of injection			

Notes on what happened:

Significant findings of the test:

Files Recorded PF GF #5

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	ABT	
MAY 27 Be 29 10:36	10:2?	8	1					1400	1840	132	7400
	10:2?	8	2					1350	"	137	7540
	[redacted]	8	3	2667	1350	437		1300	"	148	7760
	10:39	8	4	2839	1360	425		1250	"	[redacted] 135	7950
	10:52	8	5	2821	1355	392		1200	"	[redacted] 172	8090
11:02	11:0[redacted]	8	6	2716	1329	409		1150	"	184	8163
AIR DeRate	11:16	8	7	2639	1336	421		1100	"	197	8375
									"		
	11:21	8	8	2279	1326	393		1100	"	182	8460
		8	[redacted]		STRAIGHT		164	1200			
	?	8	[redacted] 1		Replace	to	154	1200	Knock limit		
		8	[redacted]		STRAIGHT	GAS	154	1100			
	14:40	8	[redacted] 2		Replace	to	135.5	1100	Knock limit		
		8	[redacted]		STRAIGHT	GAS	153.6	1000			
	14:44	8	[redacted] 3		Replace	to	121	1000	Knock limit		
					straight	GAS	149.[redacted]	900			
	14:49		4		Replace	to	99	900	Knock limit		
	14:53	8	5		straight		144	900			
watch BTU					Replace	to	90	800	Knock limit		
		8	[redacted]		straight		163	1200			
	14:57	8			Replace	to	160.4	1200	Knock limit		

switch to EMA Circuit

over FOR

Test sheet for

Date 7-23-97	Start time 1:35 pm 50 15:59
Baro pressure 30.29	Humidity 50%
Ambient temp. 78.8	Other SD 1451.5

Main reason for test Testing with 9335 injectors

Engine Configuration description: STO Dual Fuel w/ High Press. GIV's & Gen II pistons @ .020"

Injector timeing 0°	Injector part number 9335
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		
15:22	8	~~7~~ 8		2331	1245	537		1300	1.854	7464	164.4
15:25	8	9		2500	1217	466		1200	"	7834	159.2
15:28	8	10		3003	1395	369		1000	"	8833	148
15:31	8	11		3542	1330	296		800	"	10307	132
15:34	7	12		2303	1220	574		1200	"	7574	156
15:37	6	13		2114	1285	752		1200	"	7341	153.7
15:40	6	14		2380	1136	536		1000	"	7859	136.7
15:43	6	15		3010	1184	398		800	"	8822	120.5
15:47	6	~~25~~ 17		3332	1276	333		600	"	9980	96.5

Test sheet for

Date	7/24/97	Start time	9:30
Baro pressure	30.3	Humidity	48%
Ambient temp.	70.6	Other	

Main reason for test: DIESEL DATA W/9335 INJ.

Engine Configuration description: 9335 INJ GEN II PISTONS @ .020"

Injector timeing	0°	Injector part number	5229335
Polot timing / start of injection			

Notes on what happened: FA MEASUREMENTS DONT MATCH ON DIESEL SUSPECT CO2 INCORRECT

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	BTU/HP	
10:17	8	1		.228	3.4	14.3		1650	.665	7150	
10:20	8	2		.23	2.9	14.6		1600	.740	6970	
10:24	8	3		.27	2.5	16.8		1450	.895	6700	
10:26	8	4		.28	2.5	16.9		1400	.935	6700	
10:29	8	5		.33	2.7	19		1200	1.070	6780	
10:34	8	6		.31	2.2	15.4		1000	1.170	7100	
10:39	8	7		.40	2.5	15.7		800	1.275	7680	
10:44	8	8		.53	2.6	16.1		600	1.371	8600	
10:49	7	9		.22	2.0	14.1		1200	1.0	6752	
10:58	6	10		.19	2.2	12.6		1200	.88	6775	
11:04	6	11		.22	2.1	14.7		1000	1.05	6755	
11:08	6	12		.28	2.3	16.9		800	1.20	6900	
11:12	6	13		.38	2.4	16.6		600	1.350	7436	

Test sheet for

Date 7-25-97	Start time 10:00 AM
Baro pressure 30.36	Humidity 51%
Ambient temp. 72	Other SD 1457.4

Main reason for test: To compare Dual Fuel opp w/ 9250 injectors

Engine Configuration description: STD. Dual Fuel w/ High Press G.i.v's & Gen II pistons @ .020"

Injector timeing 0°	Injector part number 9250
Polot timing / start of injection	

Notes on what happened: BARRY FROM NABORS HERE TO WITNESS

Significant findings of the test:

Files Recorded

	Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	BTU/	GF	P.F.
	12:56	8	2		2114	1310	423		1100	1.800	7957	143.6	
	13:00	8	3		2429	1375	374		1000	1.800	8410	138.4	
	13:04	8	4		2961	1290	291		800	11	9820	127.2	
	13:07	8	5		3458	1185	230		602	11	12225	115.4	
	13:10	7	6		1981	1283	494		1050	11	7670	132.5	
	13:14	6	7		1365	1133	722		1100	11	7000	128.1	
	13:16	6	8		1540	1156	631		1000	4	7233	121.	
	13:18	6	9		2233	1253	461		800	11	7986	104	
	13:22	6	10		2175	1224	328		600	11	9570	91.5	
Diesel	13:33	8	11		89	771	785		1650	.679	7301		10.76
	13:36	8	12		89	692	809		1600	.760	7210		10.20
	13:42	8	13		87	428	880		1450	.921	6803		8.87
	13:45	8	14		91	374	892		1400	.953	6720		8.48
	13:47	8	15		92	281	885		1200	1.086	6730		7.28
	13:49	8	16		90	240	828		1000	1.175	6952		6.28
	13:52	7	17		89	318	897		1200	1.034	6700		7.27
	13:54	6	18		88	694	864		1200	.911	6950		7.48
	13:57	6	19		90	331	919		1000	1.091	6695		6.02
	14:00	6	20		90	250	906		800	1.222	6833		4.94
14:03	[illegible]	6	21		87	200	706		600	1.354	7265		3.92
				REBALANCE									
	1506	8	22	8ATDC					1200	1.802	8400		
	1518	8	23		2920	1407	231		1000		9580	160	

Test sheet for

Date	8-14-97	Start time	9:30 AM
Baro pressure	30.20	Humidity	63%
Ambient temp.	71.4	Other	SD 1460.2

Main reason for test To Run 9250 injectors, Rebalance & Test press washer sensors

Engine Configuration description: STD. DF with High press G.V's & .020 squish Gen II pistons

Injector timeing	4° ATDC	Injector part number	9250
Polot timing / start of injection			

Notes on what happened:

Significant findings of the test:

Files Recorded

	Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	BTU	°F	DF
	13:34	8	1										
	13:40	8	2		2247	1482	338		1200	1.800	7880	155	.91
	13:45	8	3		2842	1442	263		1000	"	8850	144	.94
	13:49	8	4		3458	1364	211		800	"	10260	133.5	.93
	13:53	8	5		4060	1251	166		600	"	12750	123	.92
AS	13:57	7	6		1740	1385	446		1200	"	7480	150	.83
	14:02	6	7		1302	1476	573		1200	"	7170	146	.68
	14:06	6	8		1736	1342	438		1000	"	7560	126	
	14:09	6	9		2445	1314	319		800	"	8420	110	
	14:14	6	10		3290	1308	233		600	"	9900	95	
	14:16	6	11		4150	1124	167		400	"	13600	85	
	14:21	6	12		1211	1450	630		1325	"	6980		
Diesel	1435	8	13		85	985	454		1650	.722	2390		10.98
	1441	8	14		84	668	471		1525	.855	2100		9.78

Test sheet for

Date	8-15-97	Start time	9:55 AM
Baro pressure	30.10"	Humidity	50%
Ambient temp.	71°	Other	SP

Main reason for test: Testing EMD Dual Fuel injectors & compair press washer readings after swapping sensor

Engine Configuration description: STP. DF with High press Giv's & .020 squish Gen II pistons

Injector timeing	4°BTDC & 0°	Injector part number	522 8360
Polot timing / start of injection			

Notes on what happened:

Significant findings of the test:

Files Recorded

	Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	OF	DF	BTU
	11:16	8	1						1270	1.766	161	.51	7240
	11:20	8	2		2275	1318	426		1200	"	157		7530
.0 BTDC	11:25	8	3		2807	1315	338		1000	"	146		8500
	11:28	8	4		3311	1284	268		800	"	137.5		9960
	11:32	6	5		134	1352	751		1200	"	145		6870
	11:35	6	6		1792	1203	543		1000	"	127	.38	7250
	11:39	6	7		2541	1231	379		800	"	113		8150
	11:42	6	8		3444	1208	256		600	"	102		9870
		8	8		1953	1462	485		1350	"	170		7250
	13:12	8	9		2030	1378	401		1290	"	169.5		7500
0°	13:16	8	10		2331	1392	346		1200	"	166		7932
	13:18	8	11		2989	1364	269		1000	"	156		9040
		6	RAN OUT OF SHOP AIR										

Test sheet for

Date	10-23-97	Start time	10:20 AM
Baro pressure	30.35	Humidity	64%
Ambient temp.	60°	Other	

Main reason for test First Run Attemp on Whole Engine port in Jection

Engine Configuration description: Gen II pistons @ .020 squish EMD DF injectors and Hyp port in Jectors

Injector timeing		Injector part number	[redacted] 8360
Polot timing / start of injection			

Notes on what happened: Balance Trouble & High Rack pressure

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		

Test sheet for

Date	11-7-97	Start time	9:30 AM
Baro pressure	30.30	Humidity	67%
Ambient temp.	55° approx	Other	SD

Main reason for test: 2nd Attempt at whole Eng. app with port injectors

Engine Configuration description: 1st production Run style port injector w/ 3/8 Round w/ ports and no stem seals with 70 psi Back pressure on the Return line. Gen II pistons @ .020 squish

Injector timeing		Injector part number	5229200
Polot timing / start of injection			

Notes on what happened:

Significant findings of the test: 150 HP HIGHER POWER LIMIT TUNEABLE BY COMPUTER, AT 1200 AP NOX IS 1.8 INSTEAD OF 5.6, PEAK EFF IS BETTER, EFF CURVE IS WORSE HC VERY HIGH MIN 4800 – >6000

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	HEADER	HP	Rack	GF	BTU	DF
	6	1					29.8	1076	1.815	138	7404	.45
	6						27.1	1000	1.815	137	7982	.45
	6	1					34+	1300	1.815	157	6950	
	6	2					32.	1250	1.815	154	7125	
13:16:45	6	3					31	1200	"	151.5	7235	
13:23	6	4					25.5	800	"	131	9455	
	8	4					36.5	1300	"	180	8040	DIESEL
13:55	8	5/1					38.	1500	1.811	186.4	7157	.64
	8	6					35	1200	1.811	176	8480	
1410	8	7					33	1000	1.811	170	10,000	
		LOAD	160°	GV	CODE							
	8							1200	1.811		8400	
		SHORTER	GV	SETTING				AVE	7 ms			
1446	8	8					42	1300	1.811	175	7620	
160°		TIMING	DURATION				FULL LOAD					
	1	7.3										
	5	7.8										
	3	6.7										
	7	8.5										
	4	9.5										
	8	7.9										
	2	6.8										
	6	7.6										

Test sheet for

Date	11-11-97	Start time	11:40 AM
Baro pressure	29.95	Humidity	50 - 60 %
Ambient temp.	59°	Other	SD

Main reason for test: Test Effects of Air Box PAM vs HC #

Engine Configuration description: Whole Engine opp. port injectors

Injector timeing	40° BTDC	Injector part number	522-9200
Polot timing / start of injection			

Notes on what happened: QUESTIONING GAS METER CAL

Significant findings of the test:

Files Recorded

	Time	TN	Snapshot	.prs file	HC (ppm)	CO	NOx	~~Inlet Air~~	HP	Rack	GF	BTU
160°	12:38	6	1 / 4939	584 / 333	140	2.8	2.7	31.5	1076	1.816	143.5	7200
	12:45	6	2 / 5509	470 / 681	13.0	1.9	4.8	35.5	1250	1.816	157	7150
	12:49	6	3 / 5530	460 / 485	13.7	2.0	3.6	31	1200	"	154	7330
170	12:56	6	4 / 4613	485 / 544	16.2	2.0	4.0	33.4	1200	"	147.5	7058
	13:08	8	5 / 4627	776 / 313	12.1	3.4	2.4	37.4	1450	1.815	178	7165
	13:12	8	6 / 4354	494 / 422	10.2	2.0	3.1	39.5	1550	"	182	6809
	13:18	8	7 / 4116	610 / 371	10.2	2.6	2.8	38.5	1500	"	177	6900
	13:25	8	8 / 4438	1050 / 235	13.6	5.6	2.2	37	1300	"	170.5	7636
select Diff Fuel FOR CO2 CALC	13:29	8	9 / 4508	1041 / 237	17.7	7.2	2.9	37	1300	"	170.5	7633
	13:36	8	10 / 5712	1387 / 122	21.2	13.3	3.1	35	1000	"	164	9580
									800	"		

Test sheet for

Date	12-2-97	Start time	10:20
Baro pressure	30.12	Humidity	50%
Ambient temp.	51°	Other	SP 1481

Main reason for test: Tune port + GIV's & opp.

Engine Configuration description: Gen II pistons @ .020 squish whole Engine port injection with Air Box window dams.

Injector timeing	40 BTDC	Injector part number	522 9200
Polot timing / start of injection			

Notes on what happened: Suffered Hydralic Troubles with a Hung up Regulation valve & plumbing pathway choices.

Significant findings of the test:

Eng Comp

Files Recorded

Time	TN	Snapshot	PPM	prs file		HC	CO	NOx	imep	HP	Rack	BTU	GF	DF
12:10	6	1	4390	1002	233	17.9	7.1	2.7		1000	1.810	7750	133	.45

Test sheet for

Date	12-3-97	Start time	11:30 AM
Baro pressure	30.17	Humidity	44%
Ambient temp.	51.5°	Other	SP 1485.0

Main reason for test: More Tuning of Hyd GIV app

Engine Configuration description: Gen II pistons @ .020 sq. with Hyd. GIVs.

Injector timeing	4° BTDC	Injector part number	522 9200
Polot timing / start of injection			

Notes on what happened: Played with Balance & timing of GIVs. & GFCV software for reasonable app. ADD'D Hoses to Hyd. Headers for accumulation effect

Significant findings of the test: Engine Ran very Efficient at High loads.

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	BTU	°F	DF
13:17	8	2	16	10.4	3.7	2.6	39	1500	1.815	6830	175	.68
13:22	8	3	15.6	27.9	12.6	2.1	34	1000	1.815	9350	162	.66
13:36	8	5	16	9.2	2.7	4.0	43	1650	1.815	6540	188	.66
13:42	8	6	16	11.5	4.4	3.5	40	1535	1.815	6900	181	.65
13:52	8	7	9.5	14.4	3.2	3.5	31	1200	1.815	7140	149	.48
14:09	6	8	9.6	12.1	2.6	7.1	35	1400	1.815	6600	166	.49
14:24	6	9	9.5	13.2	3.0	4.7	33	1300	1.815	6850	156	.48
14:40	6	10	9.5	11.2	2.8	4.6	32	1300	1.814	6590	150	.47
14:43	6	11	9.5	10.3	2.7	7.2	34	1400	1.813	6380	157	.47
14:51	8	12	15.8	9.8	3.5	2.8	44	1600	1.815	6600	182.5	.66

1010 AIR

#6 thermal couple

175°

Question GAS METER

Test sheet for

Date	12-4-97	Start time	11:40
Baro pressure	30.28	Humidity	50%
Ambient temp.	49°	Other	SD

Main reason for test: BACK up RUN FOR 12-3 & to Test the EFFects of ACCUMULATOR HOSES on HYD. HEADERS

Engine Configuration description: GEN II pistons @ .020 w/ HYD. GIVS & AIR RAMS

Injector timeing	4° BTDC	Injector part number	9200
Polot timing / start of injection			

Notes on what happened: changed GFCV linkage & P.D NUMBERS

Significant findings of the test: TORE Bellows on GAS meter

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		

Test sheet for

Date	12-5-97	Start time	8:45
Baro pressure	30.11	Humidity	43%
Ambient temp.	45	Other	SD

Main reason for test: Demo Run

Engine Configuration description: Gen II pistons @ .020 w/ Hyp GIV's & Air Box Dams

Injector timeing	4° BTDC	Injector part number	522 9200
Polot timing / start of injection			

Notes on what happened: Noticed no Difference in Balance By Exhaust Temps in Tn 6 @ 1200 hp w OR w/o Accumulator Hoses on Hyp. Headers.

Significant findings of the test: Finally turboed in Tn 6 @ 1500 hp w/ cold air 12 psi Boost

Files Recorded

Time	TN	Snapshot	.prs file (Header)	HC	CO	NOx	imep	HP	Rack		
12:14	6	1	35	628	592	1313		1445	1.817		
12:33	8	2	43	501	687	353		1685	"		
12:43	6	3	43	650	569	1148		1565	"		

Test sheet for

Date	4-23-98	Start time	1499.9
Baro pressure	29.92	Humidity	64%
Ambient temp.	56.5	Other	

Main reason for test: check Efficiency with port inj. & calibrated motor & prep. for Demo Run

Engine Configuration description: Gen II DF pistons @ .020" & port injection

Injector timeing	70 BTDC	Injector part number	9200
Polot timing / start of injection			

Notes on what happened:

Significant findings of the test: Efficiency looks Poor - Trouble shooting in progress.

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	BTU	DF	GF
12:76	8	1						1450	1.820	8250	.59	210

#2 ~~THERMA~~ ✓ & gaskets ✓

Test sheet for

Date	5-14-98	Start time	10:00 am
Baro pressure	30.25	Humidity	52%
Ambient temp.	60	Other	

Main reason for test: check EFFICIENCY OF port injection

Engine Configuration description: Gen II pistons @ .020" w/ port injection

Injector timeing	70 BTDC	Injector part number	9200
Polot timing / start of injection			

Notes on what happened:

Significant findings of the test: EFFiecency Looked poor enough that we didn't write it down

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		
	6			4200				1075	PF		

Test sheet for

Date	5-21-98		Start time	9:50	AM
Baro pressure	30.30		Humidity	53%	
Ambient temp.	64		Other		

Main reason for test: TO test new Knock signals & check EFFICIENCY vs timing & DURATION

Engine Configuration description: Gen II pistons @ .020 w/ port injection

Injector timeing	7 BTDC	Injector part number	9200
Polot timing / start of injection			

Notes on what happened: We were ABLE to move Timing & Duration around Quiet ABIT & still Run Fairly Balanced in TW, But we were only ABLE to AFFECT BTU/HOUR By 170-200 MAX & Notice HC CAME Down & CO went up. Attempted to Run in TW-8

Significant findings of the test: But AS soon AS we start to ADJUST DURATION engine Became un stable then VACUME pump stoped pumping — End OF Test.

Files Recorded

	Time	TN	Snapshot	.prs file	HC	CO	NOx	GH imep	HP	Rack	BTU	GF
80-5.7	11:43	6	1		3400	770		51	1075		8030	150.5
77-6.5	12:29	6	2		3600	730		35	1030		8200	146.5
84-6.0	12:37	6	34	3350	[redacted]	780		43	1030		8120	145.5

Test sheet for

Date	8-18-98	Start time	11:20 stop 15:12
Baro pressure	30.31	Humidity	49%
Ambient temp.	690	Other	

Main reason for test: PF Tune up For spark

Engine Configuration description:

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		
13:18	8	1						1400		8500	200
13:20	8	2						1300		8900	193
13:20	8	3						1200		9350	188
13:23	8	4						1100		10000	184
13:24	8	5						1000		10800	182
13:25	8	6						900		11800	178
13:26	8	7						800		13000	173
13:27	8	8						700		14600	170
13:28	8	9						600		16650	165
13:29	8	10						500		19500	160
13:30	8	11						400		23900	157
13:31	8	12						300		30800	152
13:32	8	13						0			118
Air Throttle 13:47	8	14						1000		9950	166
13:49	8	15						800		11500	152

Test sheet for

Date	8-23-98	Start time	
Baro pressure		Humidity	
Ambient temp.		Other	

Main reason for test: First Run on Dedicated gas

Engine Configuration description:

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: Open Throttle Spark Full Retard Duration 10.2-12

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	ABP ~~.prs file~~	HC	CO	NOx	Timing ~~imep~~	HP	chamber press Rack	GF	BTU
15:55	3		3.2				7.6	400		67.7	92.50
8-24											
2nd run	2						3.7	300	22 psi	49	
	3		3.8				3.7	450	43	78	
	4						6.4	600	45	98	
1530	6						0	1060		183	

L 220
R 203

ENGTST.XLS

Test sheet for

Date 8-25-98	Start time
Baro pressure	Humidity
Ambient temp.	Other

Main reason for test 3RD Dedicated Rew

Engine Configuration description:

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: #8 Falls off At [redacted] notch
8 under lighter load

Significant findings of the test: Full Retard with Cold Air = 1400 hp
Full Advanced " " " = 1200 hp

Timing light check
1 = 34
2 = 25
3 = 77
4 = 167
5 = 212 - 18
6 = 122
7 = 302
8 = 32

5 = 32
6 = 302
7 = 122
8 = 21

Files Recorded ABP Timing Pre Ress

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack	°F	BTU
12:50	8		.4					214	15	30	7626
13:12	8		15.9					1028	1	210	11083
14:29	8		15.5					1131	100	205	9875
14:32			19.5					1222	100	217	9627
14:33	8		15.5					1300	100	223	9250
14:35	8										
14:42											
14:43											

TDC ORDER	
1	0
5	45
3	90
7	135
4	180
8	225
2	270
6	315

Test sheet for

Date	8-26-98	Start time	
Baro pressure	30.26	Humidity	52%
Ambient temp.	70	Other	1567.1

Main reason for test: 4th Dedicated Run & Trouble Shoot

Engine Configuration description:

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: when #8 Pops out, advancing the timing brings it back to life.

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	ADP ~~prs file~~	HC	CO	MS ~~NOx~~	Time ~~imep~~	HP	PCP ~~Back~~	GF	BTU
13:39	6	2	5.5			11		781	50	141	9220
13:58	6	3	8.6			11	2.4	958	75	168	9550
	6	4	8.5	556		11	2.4	952	75	168	9589
14:26	6	4	8.5	495		9.5	2.0	950	75	164	9370
14:47	8	5	15.1	477		8-12	9.0	1000	107	186	10200

Test sheet for

Date	8-27-98	Start time	1569.5 - 1572.4
Baro pressure		Humidity	[redacted]
Ambient temp.	71°	Other	[redacted]

Main reason for test 5th pedicated Run to test Higher pcp in TN 8

Engine Configuration description: #5 cylinas Blown sylie Gen II OF piston @ .047 All other pistons are Gen II OF @ .0201

whole Engine spark pre chamber & port injection

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test: Efficentcy went Down A little At 1000 hp in notch 8 with cold Air

Files Recorded

Time	TN	Snapshot	ABP .pro file	HC	CO	NOx	Time imep	HP	PCP Rack	GF	BTU
13:30	3	1	2.2				4.0	500	20+	79	8540
14:07	3	2	3.1				6.0	393		66	9050
14:21	3	3	2.5	5400	388	819	6.0	456	35	73	8784
14:25	3	1	2.7	5250	378	981	6.0	456	35	74	8600
14:39	6	2	9.3	6503	252	1000	7.0	1000	75	171	9280
14:45	6	3	9.2	6265	336	463	7.0	900	75	157	[redacted] 9510
14:56	8	4	15.2	5768	661	174	10	1000	115	188	10200
14:58	8	5	15.3	5768	634	171	10	1000	115	187.5	10180
15:00	8	6	15.2	5750	609	158	10	1000	115	187	
y/#5 15:04	8	7	15.1	5020	503	325	10	1000	115	185	10071
OLD AIR 15:20	8	8	14.9	6286	815	96	10	1000	115	191.5	10380
15:43	6	9	9.0	5376	423	561	10	869	75	149	9270

Test sheet for

Date 9-1-98	Start time
Baro pressure	Humidity 47%
Ambient temp. 94°	Other

Main reason for test Testing .039 orifice on spark chambers

Engine Configuration description:

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test: yukyer than .031 ✓ valves

Files Recorded ABP Time PCP

Time	TN	Snapshot	.prs file	HC	CO	NOx	~~imep~~	HP	~~Rack~~	GF	BTU
14:36	3		1.6				10		18	39.6	9185

Test sheet for

Date 9-15-98	Start time 12:50
Baro pressure	Humidity
Ambient temp.	Other

Main reason for test to Test new style ✓ valves

Engine Configuration description: port injected w/spark chamber

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test: #1 wouldn't lite down low TN 3 & 4 unless timing was way advanced 7-8. #8 fell off as soon as we went to TN-6

Files Recorded

Time	TN	Snapshot	.prs file	HC	CO	NOx	imep	HP	Rack		

Test sheet for

Date 9-16-98	Start time 11:00
Baro pressure	Humidity
Ambient temp.	Other

Main reason for test Testing spark chambers w/ .250 nozzle holes & new plugs

Engine Configuration description:

Injector timeing	Injector part number
Polot timing / start of injection	

Notes on what happened: went to TN-6 & got stable RAN up to 950 hp & Lost Fire on #7 & Low Fire on #3

Significant findings of the test: #3 had a stuck ✓ valve Every thing looked good on #7

Files Recorded

Time	TN	Snapshot	.prs file (ABP)	HC	CO	NOx	imep	HP	Rack (TMC)	BTU	GF
11:10	3	1	2.7					456	5	9100	76.5

Test sheet for

Date 9-18-98	Start time
Baro pressure 30.07	Humidity 56%
Ambient temp. 67°	Other

Main reason for test Testing .250 holes in SPART chamber w/ .003" RADIAL CLEARANCE on new style valves

Engine Configuration description:

Injector timeing	injector part number
Polot timing / start of injection	

Notes on what happened:

Significant findings of the test: Every time to TN -8 Dies FIND OUT THAT VALVE SEQUENCER IS STUMBLING

Files Recorded

Time	TN	Snapshot	.prs file (ABP)	HC	CO	NOx	~~imep~~ (Torque)	HP	~~Rack~~ (PCR)	BTU	GF
14:37	8	1	9.6				0	1050	60	9100	180.5

Test sheet for

Date 9/22/98	Start time
Baro pressure	Humidity
Ambient temp.	Other

Main reason for test

Engine Configuration description: GEN II @ .020" PISTONS SPK PC W/ 0.250 JET HOLE & V.S. W/ DI CHECK VALVES

Injector timeing VARIED	Injector part number SPC
Polot timing / start of injection	

Notes on what happened: FIRST REASONABLE TN8 TESTS 9000 BTU/HRHR 1200 HP RAN OUT OF COOLANT ON PC'S & FAILED SPK. PLUGS

Significant findings of the test: VALVE SEQUENCER IS OK UNTIL THE FAILURE OF WONDERING OF MORE RETARD OF TIMING

Files Recorded

Time	TN	Snapshot	~~.bfs file~~	HC	CO	NOx	~~Imep~~ PCP	HP	~~Rack~~ Tim		
13:26	7		13.1				NA	1280	0	220	9250
13:32	8		16				60	1180	0	213	9750
13:45	8		15.5				80	1150	5	190	9000

Test sheet for

Date	9-23-98	Start time	11:45 - 2:15
Baro pressure	30.20	Humidity	52%
Ambient temp.	68°	Other	

Main reason for test: Finalize spark Testing

Engine Configuration description: .250 spark pre chamber, port inject with new style valves
Dedicated gas opp whole Engine
pistons are .020 squish PF 6CN II & #5 are .041

Injector timeing	ADJUSTABLE	Injector part number	
Polot timing / start of injection			

Notes on what happened: Ran near knock limit for Efficiency & #7 Fell out in TN 8.

Significant findings of the test:

Files Recorded

Time	TN	Snapshot	ABP ~~pas file~~	HC	CO	NOx	Time ~~imep~~	HP	PCP ~~Rack~~	GF	BTU
13:47	6	1	9.6				4	1000	60	159	8600
13:58	8	2	15.6				0	1200	60	215	9720
14:10	8	3	15.3				10	1100	75	186	9180
14:12	8	4	15.3				7	1200	75	195	NA

2/10/97

1.875 IN ONE

DIESEL PRE CHAMBER TESTING

TN 3 COLD FIRING WAS DIFFICULT OPERATION W/ 5.5mS FOR A PERIOD OF TIME COMBUSTION STARTED. EVEN WITH MAIN CHAMB. INJECTOR & COMB THE DPC DIDN'T LIGHT.

AT LIGHT LOAD THE DPC TIME @ 32° WAS GOOD AT 4.4mS AND 3.9mS WAS BAD HOWEVER WE WERE FOR SURE INJECTING DIESEL. ABOUT 1/4" PER 30SEC. W/HIGHER LOAD LESS DPC FUEL WORKED STILL MIN DPC TIME 3.7mS AT 4 mS THE COLUMN CHANGED 1.25" IN 6.5MIN W/1875 PSI ON IT = .309 IN³ = .0.96 G/HR

TN6 6" 2:50 W/1700 & 4.4

1.487 IN³ = 0.525/CYC/MIN

RK .930 - .928 W/ AS MUCH AS .935

SNAPSHOT 12:38

TIMING HERE 35 - 4mS

1.09

---

8 CYL TN8 FUEL 82 GPH X .02

2% FUEL FOR PILOT TN8 = 1.65 g/HR

TN3 PILOT MIN 2000 PSI 4 mS

.294 IN³/MIN = .613 G/HR ON 8 CYL

2/10/97

DPC TESTING

TN6 .880 RACK — LIGHT LOAD

CO & NOX LOW CO 600 NOX 175 PPM

HC 1890 PPM

— HIGHER LOAD RK .921

NOX 1150 CO 380 HC 1725 PPM

STARTS TO KNOCK DROP DOWN TO RK .917

NOX 865 CO 425 HC 1700

— TN6 SCREEN TIMING 30 + 4MS

4MS = 17.5 DEG

30 − 17.5 = 12.5 OR 32 BTDC

W/2MS SOLENOID DELAY

30 - 8.5 = 21.5 OR 23.5 BTDC

NOX 198 CO 557 HC 1780

PILOT FUEL 1.236 IN^3 / MINUTE

APPROX 1.8% OF 68 GPH

2/13/97 TESTING DPC ON #5 OF 8 CYLINDER W/ BETTER DIESEL PUMP

WE CAN RUN IN TN 8 USING 1925 PSI DIESEL SUPPLY. GOOD HP CAN BE REACHED NOX STAYS FAIRLY LOW TOO.

TN8 LIGHT LOAD 45 PSI GHP 32°

		HC	CO	NOX	PPMS
M RACK	1.010"	3815	1102	130	

MORE LOAD 32°

	HC	CO	NOX
MRK 1.030	3164	800	136

MORE LOAD GHP 48+ 32°

	HC	CO	NOX	PPM
MRACK 1.040	2600	489	181	

MORE LOAD NEAR LIMIT W/ 32° TIMING 50 GHP

	HC	CO	NOX
1.055	2513	340	400

SEEMS TO HAVE LESS DEFINED THERMAL RUNAWAY AS DID TN6 TO SHORT A PILOT PULSE WILL CAUSE THE UNIT TO QUIT ALTOGETHER

LOOKS PRETTY GOOD QUESTIONS THAT REMAIN — COATED PRECHAMBER TIP
PRECHAMBER W/O CERAMIC LINER
DELIVERY VALVE
DIFFERENT SIZE HOLE
DIFF SIZE CHAMB

2/20/97

TN 1 PRECHAMB NO TBC (CERAMIC LINER)

SKIP FIRE TEST

SKIP 2 AT 46 GHP LOOKS OK W/4.5 MS 35° DIESEL AT 4.0 IT DIED SKIP 3 RAN FOR A LITTLE WHILE THEN DIED OFF

AT 25° [redacted] AND 4.5 MS SKIP 3 KEPT RUNNING FOR LONGER THEN IT DIED OUT FOR GOOD.

THIS OPERATION ISNT MUCH DIFFERENT THAN WITH THE LINER IN IT. NOTE THAT SWITCHING THE TN CAUSES A SKIP FIRE

1850 PSI DIESEL

TN 6 HAD SOME PROBLEMS W/AIR IN LINES

HOPR 47.5 RK .938 PRETTY STABLE

CO 400 HC 2940 NOX 2385 35° & 4.4 MS

PILOT FUEL 3.5" PER MIN. = .868 IN³

= 1.8 GPH FOR ENGINE

FACTOR # 2.078 TO CONVERT IN³ TO GPH FOR WHOLE ENGINE

FACTOR # 0.515 FOR INCHES PER MINUTE TO GPH FOR WHOLE ENGINE

AT .92 RACK

HC 2930 CO 331 NOX 657 44.5 GHP

@ 4 MS 35° RK .915 44.5 GHP

HC 2900 CO 260 NOX 645

PILOT 2.325"/MIN = 1.19 GPH OR 1.8%

CO & NOX ARE LOWER TODAY

THE KNOCK SNOWBALL SEAMS LESS DRAMATIC

1900 TN 8 RK 1.060 52.7 GHP

13:19 SNAPSHOT

HC 2632 CO 302 NOX 319

TN 8 1.07 RK RANDOM KNOCK
4.4 mS @ 31 DEG 54 GHP

HC 2850 CO 295 NOX 600 PPM's

PILOT 2.63"/MIN 1.356 GPH 1.6%

TN8 HDPR 50 RK 1.050
4.4 mS 32°

HC 2618 CO 296 NOX 262 PPM's

TN8 47 HDPR RK 1.04 4.4 @ 32°
HC 284 CO 524 NOX 166

TN8 46.32 RK 1.027 4.4 @ 32°
HC 3200 CO 770 NOX 147 PPM's

TN8 RK 1.010 4.5 @ 32°
HC 3200 CO 1134 NOX 136

TN8 45 GHP RK 1.010 4.5 mS 26.7 DEG
HC 3514 CO 1300 NOX 146 PPM's MORE EFFICIEN FOR SURE

2/20/97 DPC W/O CER LINER
DIESEL ONLY RUNNING
TN 8 USING THE DPC INCREASED CO & NOX
BOTH. SLIGHT GAIN IN RACK

AT TN 1
DPC AT 4.5 mS @ 22° TAKES OUT
SOME OF THE DIESEL RPR KNOCK
HC 100 CO 132 NOX 1000 PPM'S
W/O DPC
HC 104 CO 141 NOX 860

TO DO ON TEST ENGINE
~~CHECK VALVE BLOCKS~~
~~NOISE IN VS - CTC SIGNALS~~
~~EMISSION LINE CLEAN OUT & CAL~~
~~FIX UP GIV MOUNT & SEAL~~

NEXT TESTS
BASE LINE AGAIN DPC
CHECK AGINST DIRECT PILOT
~~GIV TUBE/GAS DELIVERY TUBE~~

CALIBRATED BEAR UNIT

2/25/97 TESTING W/OPC & VDT

NO VDT BASELINE TODAY

KINDA HARD GETTING STARTED TN 5 W 6MS DUR.

TN 6

40 PSI GHP .925 RK .915" 35°T & 4mS

HC 3227 CO 351 NOX 821 PPMS (51)

TN8 4.2mS 35° RK 1.07 GHP 52

HC 2700 CO 268 NOX 680 PPM's 27.5 SCFM (52)

TN8 4.4 32° RK 1.052 GHP 47.5

HC2660 CO 274 NOX 238 PPM (53)

TN8 4.4 32° RK 1.012 GHP 44

HC 3900 CO 955 NOX 125 PPMS (54)

W/VDT

TN6 4.4 AT 35° RK .912 GHP 44

HC CO NOX

2660 442 1073 (55)

TN8 4.4 AT 32° RK 1.072 GHP 54.5

HC 2050 CO 324 NOX 750 27.5 SCFM (5

AT 1.068" RACK HC 2000 CO 280 NOX 680 JUST A BIT LESS POWER & NOX & CO LOOK WAS BEFORE (5

TN8 4.4 AT 32° RK 1.050" GHP 50 PSI

HC 1930 CO 325 NOX 197

TN8 4.4 AT 32 RK .910 GHP 45.5

HC 3470 CO 1147 NOX 112

CO IS DOWN 2-900 PPM

CO & NOX MAYBE A LITTLE HIGHER

ALSO TRIED DIRECT PILOT

AGAIN AS A BACKUP RK 1.058 MAX

2/28/97 TESTING PIG W/DPC DIESEL 192 PSI

TN6 EDT PIG DPC W/O LINER

4.4 mS 35° INJECTOR GHP 42 RK .915

HC 1920 CO 387 NOX 1025 ppm's

TN8 4.4mS 35° GHP 50.5 RK 1.070

HC 1520 CO 300 NOX 560 ppm's 26.5 CFM

8 4.4 32° GHP 46.5 RK 1.05

HC 1600 CO 326 NOX 213 ppm's

8 4.4 32° GHP 43 RK 1.012

HC 3100 CO 1095 NOX 114 ppm's

BASE LINE SEEMS LIKE POWER IN TN6 IS LOWER

STILL CATCHING TN 6 4.4 35° GHP 40 RK .912

AIR OCCASIONALLY IN PC. INJ. CAUSING DEAD CYLINDER

HC 2230 CO 375 NOX 2030 ppm

TN8 4.4 35° GHP 49 RK 1.072

HC 1859 CO 294 NOX 643

TN8 4.4 32° GHP RK 1.050

HC 1975 CO 348 NOX 239

TN8 4.4 32° GHP 41 RK 1.010

HC 3100 CO 1147 NOX 143

3/26/97

TESTING DPC W/CHECK VALVE ON DISCHARGE OF

DIESEL PRESSURE JUST UNDER 2000 PSI

TN8 5.375" DIESEL USED AT 4.0 mS & 40°

X 0.015 FACTOR = 2.76 GPH FOR ENGINE

80 GPH = FULL LOAD DIESEL

$\boxed{1.6}$ GPH = 2% GET DOWN TO .5% A 3.5 mS

RUNS OK 3.6 mS = <1% RUNS BETTER 3.4 MISFIRE

DIESEL FLOW CALCULATIONS

2% = 6.10 IN³ PER MIN PER ENGINE

0.77 PER CYC/MIN IN TN8

TO DO ~~MAP OUT~~ 2000 PSI

~~IN JECTORS~~ INTO PRESSURE

D.S 4/97

TN8 LOOKING AT EMISSIONS & PILOT CHANGES GOING FROM .5% TO 1.5% NO SIGNIFICANT CHANGE

3.5% MADE CO GO FROM 270 - 370 S1

MR 1.055" 5# HEADER P 25

HC 2500 CO 370 NOX 230

MR 1.010 53.5 HEADER 3.5% PILOT

HC 3143 CO 1025 NOX 126 S2

HC 3200 CO 1200 NOX 150 AT 1% PILOT & 25

4/14/97 DPC & PGIV TESTING
NEW HYPGIV & NEW WIDE MOUTH CAP
ON DPC

TN6 @ 35° & 3.7 mS 46 PSI HEADER
RK 0.910
HC 1925 CO 340 NOx 1450 ppm's (S1)
W/RETARD TIMING HIGHER POWER IS AVAILABLE
(LOOSE HYD PRESSURE DUE TO HEAT

4/18/97

TN6 @ 35° & 3.9 mS 28 PSI HEAD (S
HC 2408 CO 375 NOX 805 RK .930

RK .910 26.7 PSI HEAD 35° AT 3.9
HC2500 CO 306 NOX 413 (S2)

RK .890 3.8 mS & 35°
HC 3900 CO 276 NOX 175 (S3)

TN 8
RK 1.060 37 GHP 35° 4.0 mS
HC 3000 CO 509 NOx 349 (S4)

RK 1.050 51GHP 35° 3.7 (49GHP LOW HYD P)
HC 2618 CO 389 NOX 521 (S5)

RK 1.010 - 1014 33 GHP 32° 3.7
HC 3920 CO 1180 NOX 119 (S6)

4/21/97 SMALL DPC w/ ~~STOCK~~ .145 .170 TIP

TN 8 35° & 3.9 mS RK 1.063
GHP 43
HC 2270 CO 300 NOX 402 (S1)
SEEMS TO HAVE LOWER C-CV

TN8 RK 1.050 35° & 3.7 mS GHP 40 (S
HC 2261 CO 300 NOX 257

TN8 RK 1.010 32° & 3.7 GHP 36 (S
HC 3350 CO 1102 NOX 125

TN6 RK RUNS VERY DIFFERENT CANT GET
POWER EASY PRE IGN. FULL RETARD ON TIMING
MAX RK POWER 0.892 45° 3.7mS
AT 3.4 SOME MISFIRE (S4)
HC 2205 CO 286 NOX 970

CLEAN FILTER & TUBE ON EMISS

4/22
DPC 1/2 SIZE W/BIGMOUTH CAP

TN6 OPERATION/POWER IS MUCH BETTER
RK .918 LESS PILOT ALSO HOWEVER
RUN AT 3.4mS 35° FOR A WHILE
RK .922 HDP 40
HC 2130 CO 331 NOX 1600 (S1)
C-C IS PRETTY HIGH 5-6
YESTERDAY WAS A 4-5
C-C TO VARI RATING INFO
1 = DIESEL/GOOD LOW C-C (2)
10 = HIGH/BAD MISFIRE - KNOCK

RK .910 GHP 37 3.5ms 35°
HC 2030 CO 241 NOX 451

TN8 3.9mS 32° C-C 9 RK 1.048
TURNED UP PILOT & ADVANCET TO GET BETTER
COMB.
HC 2200 CO 533 NOX 321

STOP TESTING IT DOSENT
WORK VERY WELL

4/23

DPC w/.125 PORT HYGIV PORT SMALLER

TN6 RK .917 HDP 32

MORE RAGGED TRACE FROM BASELINE DPC

BETTER OPERATION THAN BIG MOUTH

HC 1610 CO 545 NOX 1313 (51)

PLUGGED → CO IS HIGH FOR THE LOAD

HC IS UNBELIEVEABLY LOW

TN6 RK .912 HDP 30.9 (52)

HC 1100 CO 522 NOX 761

TN8 RK 1,060 GHP 41 32° 3.8 m/s

HC 2230 CO 475 NOX 394 (53)

C-CV = 6-7

TN8 RK 1,050 GHP 39 32° 3.8 m

HC 2340 CO 512 NOX 239 (54)

TN8 RK 1,010 GHP 38 32° 4.3

TURN UP PILOT FOR BETTER COMB

HC 3500 CO 1145 NOX 123 (55)

4/24/97

DPC W/.120 PORT STD VOL CHAMBER

TN6 32 GHP RK .937 35° 3.8 mS

HC 2050 CO 789 NOX 1718

EXCELLENT POWER KINDA RAGGED COMB. (S1)

C-CV 5 HIGH CO & HIGH NOX W/O KNOCK

TN6 30.5 GHP RK .920 35° 3.8 mS

HC 2156 CO 677 NOX 602

CO & NOX DOWN C-CV 4 (S2)

SOMETHING IN GLV IS WEIRD

TN8 48 GHP RK 1.065 32° 3.8 mS

HC 1925 CO 580 NOX 327 (S3)

C-C 5-6,7 LOTSA POWER BUT COMB

LOOKS RETARDED & UNSTABLE HIGH EXT.

TN8 44 GHP RK 1.050 32 3.8

HC 1930 CO 595 NOX 204 (4)

PRETTY UNSTABLE (5)

TN8 GLV PRESS HUNTING RK 1.050 28° 3.8

HC 1932 CO 585 NOX 241

ITS BETTER ADVANCED BUT NOT GOOD ENOUGH.

C-CV 5-6

4/25/97

GEN II @ OP20" DPC @ 1.9 in³ VOL & 170 (147)

LEE CHECK VALVE NO LINER (STD OPERATION)

2000 PSI DIESEL HYPGIV

TN6 GHP 39 RK 0.920 35° 3.8 mS (S1)

HC 2000 CO 381 NOX 1332

TN6 GHP 37 RK .910 35° 3.8 mS

HC 2015 CO 291 NOx 430

REAL GOOD OPERATION C-CV 3-4 (S3)

1.375" FUEL USE IN 1 MIN

= .341 in³

TN8 GHP 42-46 RK 1.060 C-CV 4

HC 1995 CO 304 NOX 391 (S4)

GOOD OPERATION 32° 3.8 mS

TN8 RK 1.050 44 GHP 32° 3.8 mS

HC 2198 CO 425 NOX 181

C-CV 4.5

1.350" = .434 in³ = 1% PILOT FUEL

1.07 RUN W/SOME KNOCK

TN8 RK 1.010 GHP 40 C-CV 5.5 32° 3.8 mS

HC 3500 CO 1340 NOX 146

TIMING HAS LARGE IMPACT ON HC

WHAT TO DO. LARGER CHAMB, BELLEVILLS, CERAMIC COAT

4/25/97

TN6 DPC 3.3 LONG w/ 170 TIP

HC 1980 CO 490 NOX 1158 (57)

41° 3.8ms RK 0.908

C-CV 3-4

TN6 RK .872-.860 35° 3.8

C-CV 4-6

HC 2400 CO 489 NOX 172 58

32° 3.8ms 59

TN8 RK 1062 HOP 47 32° 3.8

2000 430 750 (510)

SMOTHE TRANSITION FROM COMP-PRESS RISE

C-CV 5-6

TN8 1.058 HOP 47-43 35° 3.8ms (511)

HIGHER C-CV 78

HC 2200 CO 395 NOX 386

TN8 RK 1.010 HDP 44

4/29 3.3" DPC w/2 .120 HOLES

TN6 RK .910 BHP 33 3.8 ms 32

HCO 2250 CO 657 NOX 396

C-C V8 SORTA HIGH WONDERING ABOUT HOT SPOTS - POWER LIMIT HERE IS LOW

TN8 4 ms 35.0 RK 1.06 PEAK 1.035

C-C V8 UNSTABLE DOSEN'T LIGHT A LOW MIX. .. HIGHER MIXES SHOW VERY LITTLE DELAY AND ALMOST NO COMPRESSION HUMP IN TRACE RETARD TO 45° CHANGES LITTLE CUT BACK DIESEL ? STILL SEE SOME COMBUSTION. HOT TIP FOR SURE

5/2

DPC W/ .120 x .240 HOLE 2.8 BODY HYPGIV

TN6 GHP 34 RK .921 C-CV 4-5

HC 2184 CO 536 NOX 2000 4 mS 40° (51)

TN6 GHP 32 RK .910 4 mS 37° C-CV 4-5

HC 2200 CO 478 NOX 1180

THIS CONFIG SEEMS TO LIGHT A LITTLE BETTER AND LIKES MORE RETARDET TIMING IT WONT DO .910 RACK AT 35° (52)

TN8 LITTLE IF ANY PREIGN.

GHP 37.10 RK 1.070 - 1.068 C-CV 5-6

HC 2170 CO 357 NOX 570 (53)

TN8 RK 1.050 GHP 43 32° 4 mS C-CV 6

HC 2125 CO 400 NOX 199 (54)

TN8 RK 1.010 GHP 39.5 32° 4 mS C-CV 7-8

HC 3400 CO 1250 NOX 112 (55)

DIRECT PILOT FUEL

TN8 RK 1.012 GHP 38 18 55 C-CV 7-8

HC 3800 CO OVER 1500 NOX 176

TN8 RK 1.050 GHP 41 C-CV 5-6 (56)

HC 2051 CO 373 NOX 388

TN8 RK 1.061 GHP 42 C-CV 78 (57)

HC 2023 CO 340 NOX 1020

5/2

DPC W/ 3.3 BODY .125 X 245 TIP HYPGIV

TN 6 RK 0.905 GHP 33

HC 2200 CO 636 NOX 1582 (S8)

MAX POWER IS LOWER ON BIG CHAMBER

TN 8 MAYBE A LITTLE LESS POWER

RK 1.063 GHP 38 34° 4 MS C-CV 7-8

HC 2135 CO 568 NOX 746 (S9)

NOX & CO BOTH ARE UP

TN8 RK 1.050 GHP 38 34° 4MS C-CV 5

HC 2170 CO 550 NOX 221 (S10)

TN8 RK 1.010 GHP 34 32° 4MS C-CV 7

HC 3500 CO 1375 NOX 131 (S11)

TN8 RK 1.010 GHP 33 28° 4MS C-CV 5

HC 2760 CO 1220 NOX 153

5000:1

FPC-1 TESTING ONE CYLINDER

6/10/97 STD DIESEL FPC 000, 001

1322 HP .8 MAIN RACK

IMEP 141/143 MAX PRESSURE 737/734

HC 52 CO 297 NOX 1724 CO2 6.1 (S1)

FPC 002

W/FPC1 MATCHED RACK

1325 .8 RACK

IMEP 146/146 747/744 (S2)

HC 55 CO 292 NOX 1683 CO2 6.1

FPC 004, 005

STD DIESEL

1325 HP .8 RACK

IMEP 147/149 PP 737/739 (S3)

HC 55 CO 293 NOX 1675 CO2 6.1

FPC 006 007

FPC1

1325 HP .8 RACK

IMEP 148/148 PP 739/742

(S4)

HC 57 CO 290 NOX 1658 CO2 6.0

FPC-1 AT 4000:1

6/16/97 STD DIESEL FPC 008 009

1325 HP .78

IMEP 141/143 PP 742/743 S5

57 305 1662 6.1

W/FPC1 @ 4000:1 S8

1325 HP RK .78 FPC 010.1 FPC 011.1

IMEP 150/150 PP 753/754

HC 57 CO 307 NOX 1666 CO2 6.1

STD DIESEL S6

1325 HP RK .784 FPC 012.PRS 013.PRS

IMEP 149/150 PP 766/763

HC 58 CO 310 NOx 1676 CO2 6.1

W/FPC1 FPC 014 015

1325HP RK. .784

152/153 763/766 S7

HC 57 CO 310 NOX 1670 CO2 6.1

PRESSURE INTENSIFIER

6/20/97 PI TESTING STARTING
W/ BASE CONFIG AND LEVEL I COATING ON TIP
2.8 W/170 DIESEL P = 2000

TN8 35° @ 3.8 RK 1,064 GHP 47

HC 1624 CO 530 NOX 712
C-CV 5-6 (51)

TN8 32 @ 3.8 RK 1,050 GHP 45

HC 1673 CO 496 NOX 349
C-CV 5-6 (52)

TN6 PI 1500 PSI HYD RK .890 (53)
20° 15mS > 1% MAYBE 3%-4%?
HC 1652 CO 380 NOX 601
GHP 38

TN6 17° 15MS 4.56 ML/MIN = < 1% RK .899
GHP 38.5 (54)
HC 1638 CO 332 NOX 920

TN8
40° 12mS RK 1.025 GHP 42
7.3 ML/MIN = 1% (55)
HC 1680 CO 324 NOX 350
* C-CV 6-7 BUT RAGGED TRACE
KNOCK BRO SIG BUT NOT AUDIABLE

TN8
30° RK 1,020
1834 371 280 (56)

RETARDING IN TN8 WONT PRODUCE
POWER LIKE WE HAVE SEEN
BEFORE

7/10/97 648 WHOLE ENGINE ON GAS PREP FOR BASELINE TESTING

TN8

180°F ABXT 1000 HP KNOCK LIM. W/ROT PERFECT BALANCE WENT TO 1100 + HP & #1 CYL KNOCK INDICATION

DIESEL FLOW 900RPM .64 #/min = 6%

GAS COMP IS CRUSING AT 150SCFM
150°F DISCHARG

9000 BTU/HPHR AT 1000 HP 900RPM
CO IS OVERANGE

TN 8 800 HP W/AIR THROT TO 11 PSI

EMISSIONS	#s ON	#5 CYL			
	1400	1156	50	710	12 O2
#5 ONLY	1210	895	5.3	827	11.5
	4.3	5.8		9.7	
	HC	CO	CO^2	NOx	O_2
WHOLE ENG	2470	1335	3.4	442	14.9
	13.5	13.8		7.5	

7/11/97 ON GAS

BASE LINE TESTING 9200's AT 8°
GEN II AT .020"

11:49 (S1) 1312 HP 7400 BTU/HPHR

AT 1.40 ABXT THIS IS KNOCK LIM
SEEMS LIKE 1450HP 115°F ABXT
DIESEL .64 #/MIN 1.840 RACK

50% AIR THROTTLE 12 PSI FROM 15.5

60% TOOK IT DOWN TO 9.9 PSI ABXP
AT 600HP 3900 SCFM AIR 4900 AT UNTHROTTLE
TURBO DISCHARGE TEMP GAINED 20°F FROM
15.5 TO 12 BUT DIDNT GAIN ANY MORE
12 TO 9.9

S9 12:37
TN7 1200 HP 7678 BTU/HP-HR
KNOCK LIMIT ABXT 138°F

TN6 1200 HP 7400 BTU/HP-HR KNOCK LIM
12:45 S 10
1000
800 ABXP 9.1
7.1 52% THROTTLE
130°F ABXT 6 65%

7/15/97 GAS BASELINE W/ALTERNATE CURVES

AIR TO DERATE, HIGH PILOT, 4° TIMING

STARTING OUT GEN II D 020 9200 INJ @ 8°

TN8

1300 HP — LOW ON GAS FLOW (S1)

NO KNOCK LOOKING GOOD

RAISE SUPPLY PRESS

1450 TO MUCH KNOCK (S2)

EMIS # NO GOOD 7150 BTU/HP-HR

1400 SOME RATTLE

ARXT 138 BTU/HPHR 7300 (S3)

1300 HP 1043 (S4)

DIESEL FLOW 6% 7580 BTU/HP-HR

.58 #/MIN

TN6

1200 HP 7350 BTU/HP-HR (S5)

GAS SLIP AT 400 SCFH = 9.3 SCFM

— OR 6%

HC > 300 PPM CO < 70 PPM

2674 1220 735

| 2% SLIP TN6 1200 HP (S6)

EJECTOR CONNECTED

HC 3082 CO 1180 NOX 750

TN 8 GAS SLIP

CO 1310 DOWN TO 1260

10% OR 18 SCFM

23% 42 SCFM VERY LITTLE CHANGE EIGHT

HIGH HC & LOWER EFFICIENCY CO PPM 1240

BASIC TEST RESULT THAT
GAS SLIP ISNT THAT BENIFICAL

TN8 1300 HP INC. PILOT
RACK 1.653 #/MIN 1.75 18% PILOT

	HC	CO	CO^2	NOx	O_2
PPM	1975	928	3.6	707	14.5
G	7.9	6.7		8.5	

S9

7350 BTU/HP-HR HP LIMIT AT
1350 HP 150 ABXT BOTH MODES
MORE PILOT DOESN'T INC. OR DEC. KNOCK
LIMIT

TN8 1.346 RACK = 3.83 #/MIN = 40.
SAME POW LIMIT NOX GOES UP CO DOWN
HC DOWN BTU/HP-HR = 7100

4° TIMING
TN8 1375 HP MAX GAS FLOW
BTU/HPHR 7250 1.836 RACK
.6 #/HR PILOT < 6%
ADXT 135
G FLOW 171
1200 HP G FLOW 167 8050 BTU/HPHR
1000 & 800 HP

BRINGS UNIT INTO 4 GRAM AREA THROUGHOUT LOAD RANGE

S11/1
S12
S13

TN6 1340 HP 7100 BTU/HPHR

~~ORDER~~
~~EMC SENSORS ✓~~
~~EMIS FILTERS ✓~~

7/22/97 9200's @ 4° RACK UP

TN8 1400 HP 133 ABXT 7400 .62 #/m
TOO KNOCKY S1

1350 SUSTAINED POW CIM

PROPANE IN TN8

	1200 HP	164 - 160		4%
	1200 HP	148	CFM GAS W/PROPANE	
1440	1100 HP	155 → 136	W/PROPANE	13%
	1000 HP	153 → 120		22%
	900	149 → 99		34
	800	144	90	38%

TN6 PROPANE

1190 @	154	NO PROPANE	0
1100 @	145 →	130	11%
1000 @	136 →	100	27%
900	128 →	73	43%

7/23/97 5229335 INJECTORS @ TDC
GEN II @ 020
TN 8 FUEL .85 #/MIN = 8.7% OF
1650 POW RATING
1200 HP KNO LIM W/ABXT >180
REDUCED PILOT TO .78 #/MIN = 8%

SNAPSHOTS

POWER LIMIT IS ABOUT THE SAME
1200 HP AT STANDARD AIR TEMPS
15:18 SWITCH ON COLD AIR READY FOR
DATA AQ.

TN 8

1300 HP	7460 BTU/HPHR		.76 #/MIN PILOT
1,853 RACK	1522	58	

1200 HP	7840 BTU/HPHR	6.8 G NOX
1000	8820 BTU/HPHR	
800	10300 "	6.8 G/NOX

TN7	1200 HP	7580 BTU/HPHR	
TN6	1200 HP	7320 "	.45 #/MIN PILOT
	1000	7875	
	800	8820	
	600	9980	

8/14/97

ECM RESULTS w/1/2" NF BOLTS

LOW LOAD. BAD LEAKS ON SOME

#1 INVERTED & SOME NOISE

#2 OK < FAIR LOW SIGNAL

#3 NOISE & HUMP BETWEEN EVENTS

#4 FAIR

#5 NOISY

#6 LOW SIGNAL

#7 NO SIGNAL

#8 OK < FAIR LOW SIGNAL

CLEANED & REINSTALLED SENSORS - SEALED WI

#1 STILL INVERTED - SWITCHED W/#2 & IT IS THE SENSO

NOT THE AMP

#2 3 & 4 ABOUS SAME AS ABOVE

#5 MUCH BETTER

#6, 7, 8 ALL ABOUT THE SAME LOW SIGNAL

SO #5 & 7 GOT A LOT BETTER 8 HAS

MORE NOISE & THE REST NO CHANGE

8/14/97 9250 AT 4° ATDC

TN 8 1290 HP CANT STAY HERE
13:34 S1 NOT EXACTLY
STABLE #'s ON EMIS .9 #/MIN DIESEL

TN 8 1200 HP 7880 S2 13:40
RACK 1802

8 1000 S3

8 800 S4 13:50

8 600 S5

7 1200 S6

6 1200 PEAKED AT 1280 DIESEL .68 #/MIN
6

9.77 #/MIN DIESEL ~~1600~~ 1525 HP

8 CYL TESTING DF INJECTORS AT 4°
8/15/97

TN8 KNOCK LIM W/COOL AIR 1275 HP
CANT STAY HERE
7250 BTU/HPHR .48 #/MIN DIESEL

HC	CO	NOX	
2072	1313	485	PPM
7.9	8.7	4.85	G/HPHR

(S1) H: 16

NGK SAY TN8 1200 (S2)
780
1400
1300
1090
1050
610
800
920

TN8 1000 8480 BTU/HPHR

IF THE ENERAC IS SET TO THE WRONG FUEL THE CO_2 WILL BE OFF ABOUT 1/2 % DIESEL EMITS MORE CO_2 CUZ IT HAS MORE C
LOOK FOR NOT MUCH OVER 4% WHEN ON GAS TO DETERMINE IF

CAT TEST

10/[illegible]/97 RUN W/LOWER C.R ON #8

BAD KNOCK ON DIESEL MAX LOAD 250HP

DUE TO BAD COMBUSTION

PILOT FUEL W/DDEC CONTROL LOOKED GOOD

WILL TRY DIFF INJECTOR

10/22/97 INJECTOR AMBACK. IT GETS

LOOSE AND OVERFUELED. RUINS TRANSDUCER WE STOP

10/27/97 RUN AGAIN. 50°F OUTSIDE T

COLD ENGINE SMOKES DURING IDLE

HITTING W/GLOW PLUG BUT TEMP STAYS LOWER

11/7/97 FIRST GOOD PORT GIV W/HYD DRIVE

11/11/97 SOME BACKUP RUNS ON

HY PGIV — WE HAVE 65 PSI BACK PRESSURE

ON RETURN LINES — INSIDE AIR BOX WINDOWS

PLUGGED TO SEE IF HC GOES DOWN

TN 6 BALANCED AT 1075 HP 7700 BTU/

2.9 CO 2.8 NOX

1	5	3	7	4	8	2	6	GIV #'s
7.3	8.1	7.5	8.0	7.9	7.4	7.1	7.5	162°

TN 6 1250 HP KNO ON 8 & 1 — REDUCED THEM

71 81 75 80 79 71 71 75 7330 BTU/HPH

CO 1.95 NOX 4.8 HC 5544 PPM 13 G/HP-HR

TN 6 1200 HP AT GIV TIMING 170°

HC 4550 PPM 11.0 G/HPHR BTU 7060

AT 160 IS BAD

CONTINUED 11/11/97 PORT HYD GIV

TN8 1540 HP 6790 BTU/HP-HR

CO = 2 NOX 3

4350 PPM 10.4 G/HP-HR AT 170 GIV

1	5	37		48		26	
6.7	8.0	7.0	8.5	8.7	7.1	6.8	7.5

TN8 1500 170 – 162 GIV T.

HC 4350 – 4180 BTU/HP-HR 6880

#4 WAS BROUGHT DOWN .6 mS CUZ KNOCK

BEST HC TIME WINDOW 162-164°

HC IS ALSO DOWN W/WINDOWS BLOCKED EFF IS BETTER

TN8 1300 HP

CO 5.6 NOX 2.8 HC 13.5 4500

1	5	3	7	4	8	2	6
67	80	74	81	75	71	68	75

TN8 1000 HP 9580 BTU

CO 13 NOX 3 HC 31 HC/PM 5700

12/2/97

EMD HYPGIV — GASKETS RESEALED ON THE BELLS, HYD SYSTEM HAS BY PASSES & NEW INJECTOR LINES

TN6 1000 HP GHP 25 BSFC 7325

			T	D
HC	4800 ppm	GIV	165	8.4
CO	4.6			9.9
NOX	3.1 G/HP-HR			9.0
CO2	3.7/3.6B			9.3
				9.2
				9.2
				9.1
				9.2

#2 HAS FALLEN DOWN A COUPLE OF TIMES BUT NOT ALL THE WAY.
PULLING ONE AT A TIME SHOWS A DIFFERENT CHANGE IN HDPR #8 25-38 BUT #3 25-45 ~~KNOCK~~
HC ARE INTERSTING TOO NOMINAL 4000 #8 1 DEC. A FAIR BIT BUT # 4 & 5 ARNT SO MUCH
#5 ALMOST NOT AT ALL

TN6 1300 KNOCK LIM GHP 26.5 BSFC 6800

HC	4325 ppm	13.4 G
CO	735	3.9
CO2	4.3	
NOX	793	6.7

SAME BAL # AT 1300 AS 750 HP
BUT 750 BALANCE ISNT TO GOOD
TN7 BALANCE ISNT THE SAME
BUT HAS SAME TREND BETTER BALANCE AT HIGHER LOAD W/ SAME #S

12/2 CONTINUED 8 645 HYPGIV

TN8 1248 HP PLAYING W/ BALANCE #s
CANT SEAM TO GET IT RIGHT THE
EXH # LOOK OK 7 ? 3 KINDA LOW
BUT STILL HAVE KNOCK

12/3 HYPGIV W/ ACCUM HOSES BETTER
TN8 BACK P. THAN YESTERDAY. SHORTER GIV
SIGNALS 165.5 (51)

1	68
5	79
3	75
7	81
4	80
8	75
2	74
6	7.7

1500 HP 6830 BTU/HPHR

HC	3360	10.7
CO	652	3.68
CO2	4.1 / 3.9-4.0	
NOX	296	2.66

#/MIN DIESEL .64

TN8 1000 9350 BTU/HP-HR

TN8 1200 8130 BTU/HP-HR

SAME TIMING BALANCE SUFFERS SOME

HC	4780	/ 21
CO	1270	/ 10
CO2	3.4	/
NOX	145	/ 1.8

36 GHP #6 EXH. REAL BOUNCY

1660 HP 6500 BTU/HPHR

HC	3304	9.2
CO	549	2.7
CO2	4.6	4.5 B
NOX	487	3.8

42.5 GHP 75-81 % ON GFCV
188 SCFM GAS (54-5)
— COLD AIR (125)

12/3 CONT.

TN8 1525 6850 BTU/HP-HR 40 GHP
6900

HC 3556 11.3
278 4.4
4.1
2.82 286

6.4 PILOT FUEL #/MIN
40 PSI GHP

#6 THERMO IS BAD

TN6 1450 MAX HP W/ COLD AIR
1400 SUSTAINABLE
1300 HP 6850 BTU/HPHR
32 PSI GHP

HC 4515 13.3
CO 578 3.04
CO_2 4.4
NOX 551 4.7

70
79
75
75
80
78
70
8.1

12-4 BEFORE ADJUSTMENTS

#1 167° 6.5
7.4
7.0
7.0
7.5
7.3
6.5
7.6

12-4 TUNING NOTES

	GAS	DIESEL	NEW GAS
TN3	498	508	508
TN4	568	572	575
TN5	664	666	668
	740	736	740
	835	834	835
	900	901	905

813
865
803
843
779
821
771
816
641

W/FLEX LINES (ACCUMULATORS) AT END OF HYD. SUPPLY LINES

REMOVE LINES

819
871
804
835
770
838
771
821
644

7.9	7
8	7.1
7.5	7.5
7.8	8

12/5/97 CONTINUED

TNG W/COLD AIR PRESS WASH/KNOCK/T BAL

1560 HP TURBOING 12 PSI BOOST

MAIN GAS METER INDICATES 85 PER MINUTE

170 CFM ?

6218 = 40.9 % BTE

BAD METER !!!

12/5/97

PRESSURE WASHER TESTING

#7 POOR SIG

2 STRONGEST

TN6 1450 PEAK

6, 13 NOT GOOD

~~4~~, ~~5~~, 8 OK

~~4~~ 5 BETTER BUT NOT SAME

BALANCED FOR KNOCK

6.9
7.7
7.3
8.1
8.3
7.2
7.3
7.8

EXHAUST WITHIN 100°

#1 IS DOWN FROM #2

TN8 1500 HP

6.6	7.8	6.6
7.8	7.6	7.1
7.3	7.9	7.3
7.9	7.2	7.6
7.8		
7.2		
7.1		
7.6		

W COLD AIR 1685 43 GHP

SAME #s AS ABOVE

1000 HP

HC 3500
CO 710
NOX 367

4/23/98 EMD TESTING

PORT HIGH

42.5

BUILDING METER 31:14 / 32:26 Δ 72

TIMES

(73 SECONDS TO MOVE 100 CFM 32:10 / 33:23 Δ 73

X2.02 ATMOS / 1.216 MINUTES

= 166 SCFM 33:23 34:37 Δ 74

DA = 128 34:37 35:50 Δ 73

CYL	MS
1	7.8
5	7.8
3	7.0
7	8.0
4	8.2
8	7.8
2	7.0
6	7.6

9/22/98

SPK PRECH W/INJECTOR CHECKS

TN8 1200 HP 9800 BTU TIME 0 = 5BTDC

HYGIV's 170° & 7mS 80 PSI PCP

100 - 70 PCP

RUNNING FAIRLY SMOOTH

ADVANCE TIME

B45 COMPUTER DATA

10/21/96 645 w/Gen II at .020 9200's baseline

date	time	TN	FAN A	FAN B	FAN C	1	2	3	4	5	6	7
10/21/96	11:42:28	0	0	0	0	789	826	887	829	801	778	822
10/21/96	11:48:04	0	0	0	0	669	722	764	707	709	688	695
10/21/96	11:53:48	0	0	0	0	612	657	678	647	602	628	625
10/21/96	12:01:30	0	0	0	0	544	589	597	562	527	560	599
10/21/96	12:07:26	0	0	0	0	473	531	529	498	462	478	473
10/21/96	12:13:00	0	0	0	0	417	464	458	434	401	415	424
10/21/96	12:21:05	0	0	0	0	712	784	798	741	719	753	762
10/21/96	12:28:08	0	0	0	0	710	774	786	726	675	729	738
10/21/96	12:35:57	0	0	0	0	596	659	671	622	563	632	623
10/21/96	12:42:52	0	0	0	0	492	532	560	511	471	501	522
10/21/96	12:50:41	0	0	0	0	423	431	450	418	384	444	435
10/21/96	13:01:23	0	0	0	0	685	740	757	681	620	687	724
10/21/96	13:07:47	0	0	0	0	606	635	651	609	553	581	610
10/21/96	13:15:21	0	0	0	0	551	536	555	528	484	511	536
10/21/96	13:23:03	0	0	0	0	385	384	399	391	356	373	394
10/21/96	13:35:54	0	0	0	0	323	322	330	326	305	315	337
date	time	TN	FAN A	FAN B	FAN C	1	2	3	4	5	6	7
10/21/96	16:21:19	0	0	0	0	761	736	746	805	723	767	794
10/21/96	16:31:22	0	0	0	0	725	704	725	781	697	764	775
10/21/96	16:29:49	0	0	0	0	634	581	635	697	628	668	659
10/21/96	16:25:38	0	0	0	0	580	531	545	614	544	624	624
10/21/96	16:28:06	0	0	0	0	484	425	438	539	419	500	512

10/21/96 645 w/Gen II at .020 9200's baseline

8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T
799	69	171	177	244	64	166	166	225	235	73	95	64
698	74	171	176	245	65	162	162	226	236	76	99	65
623	71	171	179	246	66	161	160	223	235	81	102	66
565	69	170	178	243	66	157	157	220	230	85	106	67
458	71	169	178	243	67	155	155	216	226	88	108	68
422	74	169	180	240	69	155	155	212	221	90	109	69
741	75	164	169	218	70	161	160	220	230	82	105	70
738	72	156	157	185	70	157	157	218	229	78	100	71
614	78	156	156	189	72	155	156	215	226	81	101	72
489	82	156	158	186	72	155	155	210	220	84	103	73
403	70	153	156	180	69	153	153	200	212	83	103	69
717	68	147	146	159	67	155	154	204	217	75	96	68
595	70	144	139	135	66	153	153	200	213	74	96	67
528	66	140	134	119	66	153	152	195	208	75	96	66
388	66	138	128	100	66	152	152	187	200	74	96	66
325	68	137	126	88	68	152	152	177	188	76	98	68
8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T
780	70	157	156	172	68	163	170	195	204	84	102	68
742	68	175	177	179	66	190	194	207	213	94	111	67
651	70	169	170	177	66	178	183	203	210	92	109	67
590	70	173	175	177	67	168	184	203	211	88	107	67
504	70	163	165	180	67	164	168	202	210	92	107	67

10/21/96 645 w/Gen II at .020 9200's baseline

GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMPS	EXC VOL	MAIN RA	PILOT RA	RPM	TURBO R
32	16.4	8.85	0.9	-1.99	0.19	773	1312	0	0.657	0.646	883.8	0
32	16	7.54	0.97	-1.45	0.19	702	1200	0	0.854	0.85	883	0
32	15.6	6.54	1.14	-1.36	0.18	642	1097	0	0.995	0.994	884.5	0
32	15.3	5.61	1.19	-1.25	0.18	568	983	0	1.118	1.125	886.7	0
32	14.9	4.74	1.22	-1.37	0.19	493	853	0	1.236	1.244	889.8	0
32	14.4	3.87	1.26	-1.44	0.18	402	696	0	1.354	1.362	892.5	0
32	12.7	7.24	1.22	-1.87	0.18	693	1187	0	0.814	0.809	822.9	0
32	9.4	6.21	1.33	-1.27	0.17	639	1096	0	0.866	0.865	728.9	0
32	9	5.09	1.32	-1.93	0.18	570	982	0	1.046	1.046	728.7	0
32	8.9	4.1	1.39	-2.05	0.15	492	852	0	1.214	1.216	729.6	0
32	8.8	3.15	1.28	-1.93	0.16	403	699	0	1.365	1.368	729.3	0
32	7.2	5.34	1.33	-1.4	0.16	590	1015	0	0.924	0.919	658.4	0
32	5	3.9	1.36	-1.96	0.12	496	857	0	1.075	1.065	562.2	0
32	3.7	2.94	1.31	-1.41	0.09	429	744	0	1.18	1.179	491.8	0
32	1.8	1.65	1.29	-1.55	0	310	537	0	1.35	1.346	367.8	0
32	1.2	1.05	1.19	120.58	0	249	433	0	1.431	1.421	307.2	0
GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMPS	EXC VOL	MAIN RA	PILOT RA	RPM	TURBO R
32	9.9	0.67	40.86	110.83	12.28	652	1123	0	1.785	1.784	739.6	0
32	9.8	0.75	39.2	110.75	12.1	637	1096	0	1.786	1.785	738.8	0
32	9.6	0.71	35.78	112.09	10.29	569	984	0	1.79	1.784	739.3	0
32	9.5	0.7	33.16	112.98	8.44	492	851	0	1.789	1.785	738.2	0
32	9.5	0.74	31.44	113.45	7.41	401	693	0	1.8	1.796	749.5	0

10/21/96 645 w/Gen II at .020 9200's baseline

REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS
4.96	0	0	0	0	0	1450	6784	0.366	0	0
4.96	0	0	0	0	0	1200	6957	0.376	0	0
4.96	0	0	0	0	0	1000	7216	0.39	0	0
4.96	0	0	0	0	0	800	7813	0.422	0	0
4.95	0	0	0	0	0	600	8769	0.474	0	0
4.96	0	0	0	0	0	400	10766	0.581	0	0
4.96	0	0	0	0	0	1175	6839	0.369	0	0
4.96	0	0	0	0	0	1000	6893	0.372	0	0
4.96	0	0	0	0	0	800	7071	0.382	0	0
4.96	0	0	0	0	0	600	7585	0.41	0	0
4.96	0	0	0	0	0	400	8697	0.47	0	0
4.96	0	0	0	0	0	850	6932	0.374	0	0
4.96	0	0	0	0	0	604	7155	0.386	0	0
4.96	0	0	0	0	0	450	7172	0.387	0	0
4.96	0	0	0	0	0	235	7727	0.417	0	0
4.97	0	0	0	0	0	155	7568	0.409	0	0
REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS
4.96	0	0	0	0	0	1050	6189	0.038	106	0
4.96	0	0	0	0	0	1000	6467	0.045	104	0
4.96	0	0	0	0	0	800	7068	0.053	90	0
4.96	0	0	0	0	0	600	8008	0.07	74	0
4.96	0	0	0	0	0	400	10937	0.112	65	0

10/22/97 645 data, Diesel, Gas timing changes W 9200's

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T	WATER I
2	Diesel operation																
3	10/22/96	13:28:18	8	808	845	917	854	831	798	866	856	78	172	178	245	69	151
4	10/22/96	13:30:47	8	703	739	784	735	713	692	717	719	75	174	180	246	69	150
5	10/22/96	13:32:44	8	611	670	698	657	627	640	637	635	75	173	182	246	69	147
6	10/22/96	13:38:21	8	540	605	618	581	538	585	553	551	74	172	181	245	70	160
7	10/22/96	13:40:34	8	482	543	539	508	465	493	489	485	73	172	182	245	70	159
8	10/22/96	13:42:24	8	428	463	465	440	408	425	416	417	72	171	180	245	70	156
9	10/22/96	13:45:24	7	720	788	814	745	727	760	789	747	73	165	170	220	70	162
10	10/22/96	13:52:03	6	716	781	790	733	677	734	746	752	72	158	159	186	70	159
11	10/22/96	13:54:00	6	598	656	682	623	569	626	635	602	71	157	158	186	70	157
12	10/22/96	13:55:53	6	499	541	560	526	478	511	517	521	72	156	157	184	70	155
13	10/22/96	13:58:34	6	415	438	462	427	388	410	423	417	72	155	156	183	70	152
14	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T	WATER I
15	Gas std. air at 9 Deg. timing																
16	10/22/96	14:04:57	6	743	715	750	811	725	786	795	766	72	154	154	186	70	157
17	10/22/96	14:15:26	6	756	721	748	809	721	768	787	786	71	156	158	188	70	159
18	10/22/96	14:19:05	6	676	593	652	723	658	694	701	695	75	155	159	189	71	156
19																	
20	Gas cold air temp at 9 Deg. timing																
21	10/22/96	14:35:55	6	916	910	882	986	870	947	949	935	74	104	95	188	71	158
22	10/22/96	14:32:39	6	846	847	824	913	809	881	890	876	74	104	98	184	73	156
23	10/22/96	14:30:10	6	730	661	690	775	707	749	802	740	73	105	102	180	73	153
24	10/22/96	14:37:21	6	682	600	632	721	656	676	705	699	83	104	106	188	71	154
25																	
26	Gas std. air temp. at 4 Deg. timing																
27	10/22/96	14:57:57	6	949	952	930	1012	882	997	996	992	72	150	151	178	70	159
28	10/22/96	14:56:16	6	819	779	801	877	775	874	848	853	72	149	152	175	70	158
29	10/22/96	15:00:34	6	748	658	714	809	741	749	770	774	72	152	154	184	70	157
30	10/22/96	15:02:24	6	637	534	594	704	621	659	668	663	74	151	153	185	70	153
31	10/22/96	15:03:19	6	545	461	487	612	488	559	560	564	74	151	155	185	70	152
32																	
33	Gas cold air at 4 deg. timing																
34	10/22/96	15:08:39	6	892	917	897	1007	866	943	975	978	77	113	110	216	72	157
35	10/22/96	15:07:14	6	938	937	904	1017	891	974	1018	1011	73	109	101	185	71	155
36	10/22/96	15:10:22	6	845	784	804	926	818	875	879	889	74	107	104	192	74	156
37	10/22/96	15:11:39	6	754	624	691	795	743	757	762	755	75	109	107	191	76	154
38	10/22/96	15:13:45	6	645	511	568	691	621	623	652	641	75	107	108	190	76	152
39																	
40	All diesel with cold air inlet at 4 Deg. BTDC																
41	10/22/96	15:32:32	8	775	816	875	800	806	792	818	806	75	123	127	242	71	158
42	10/22/96	15:35:33	8	673	703	755	696	693	669	684	685	75	125	133	244	71	158
43	10/22/96	15:37:45	8	596	637	662	625	605	638	622	607	75	127	138	245	71	156
44	10/22/96	15:40:22	8	520	574	586	555	527	550	537	524	75	129	141	245	72	154
45	10/22/96	15:43:21	8	458	501	517	491	451	549	547	458	75	131	143	244	72	152
46	10/22/96	15:49:30	8	411	446	447	418	404	414	398	400	75	131	145	245	71	153
47	10/22/96	15:53:25	8	401	440	449	417	392	408	410	400	74	132	147	242	71	153
48	10/22/96	15:19:13	6	678	728	741	688	646	694	697	700	72	106	107	183	71	155
49	10/22/96	15:23:08	6	556	613	625	577	539	579	609	602	71	106	108	184	71	153
50	10/22/96	15:26:55	6	473	493	528	480	450	470	476	475	71	107	110	182	71	153

	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
1	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMPS	EXC VOL	MAIN RA	PILOT RA
2																	
3	168	220	229	76	98	69	32	15.9	9	-0.16	127.52	0.05	774	1308	0	0.623	0.62
4	165	222	232	78	100	69	32	15.6	7.55	-0.18	127.6	0.07	703	1197	0	0.844	0.841
5	162	223	232	81	102	69	32	15.4	6.56	-0.16	127.68	0.06	639	1096	0	0.987	0.988
6	162	220	230	85	106	70	32	14.9	5.63	-0.21	127.65	0.06	570	980	0	1.115	1.124
7	158	218	229	88	106	70	32	14.6	4.74	-0.23	127.47	0.06	494	851	0	1.237	1.244
8	157	217	227	88	108	70	32	14.3	3.88	-0.24	127.41	0.06	403	697	0	1.356	1.364
9	165	218	228	84	106	70	32	12.5	7.36	-0.28	127.46	0.05	696	1185	0	0.793	0.791
10	145	219	230	79	102	70	32	9.3	6.23	-0.22	127.4	0.05	637	1095	0	0.856	0.855
11	156	218	230	81	102	70	32	9	5.1	-0.21	127.42	0.04	570	982	0	1.04	1.047
12	139	216	227	83	103	70	32	8.9	4.06	-0.17	127.51	0.05	494	851	0	1.214	1.221
13	147	212	222	86	104	70	32	8.7	3.13	-0.19	127.47	0.03	403	696	0	1.364	1.373
14	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMPS	EXC VOL	MAIN RA	PILOT RA
15																	
16	158	206	216	93	112	70	32	9.5	0.46	42.7	118.42	12.8	640	1098	0	1.815	1.816
17	147	209	218	97	113	71	32	9.6	0.45	42.29	117.94	13.03	637	1094	0	1.816	1.817
18	138	204	216	99	116	71	32	9.4	0.45	38.79	116.62	11.52	571	982	0	1.819	1.816
19																	
20																	
21	154	198	208	101	118	71	32	9.9	0.45	50.72	116.33	17.43	733	1248	0	1.817	1.817
22	156	195	205	101	117	71	32	9.7	0.47	48.03	117.25	16	702	1198	0	1.816	1.817
23	153	193	203	100	115	71	32	9.4	0.48	43.37	118.55	13.71	640	1095	0	1.814	1.816
24	154	199	208	102	119	71	32	9.3	0.44	39.58	119.4	11.62	569	981	0	1.82	1.817
25																	
26																	
27	159	192	202	92	107	70	32	10	0.48	49.55	116.42	16.74	702	1197	0	1.816	1.817
28	158	191	200	89	105	70	32	9.7	0.47	45.03	117.8	14.25	639	1097	0	1.819	1.815
29	157	195	204	94	110	70	32	9.6	0.43	40.91	119.05	12.17	569	980	0	1.819	1.818
30	153	194	203	96	111	70	32	9.4	0.45	37.86	119.71	10.71	492	850	0	1.82	1.817
31	151	194	203	97	112	70	32	9.1	0.5	34.99	120.4	9.49	403	698	0	1.821	1.817
32																	
33																	
34	158	193	203	95	114	71	32	14	0.51	60.51	114.63	19.63	765	1292	0	1.818	1.817
35	155	192	202	96	111	71	32	9.9	0.43	50.27	115.74	17.36	703	1198	0	1.82	1.816
36	155	195	204	97	114	71	32	9.7	0.43	45.11	117.59	15.03	638	1095	0	1.82	1.817
37	154	194	204	99	115	71	32	9.5	0.4	41.46	118.53	12.98	570	982	0	1.821	1.817
38	152	193	202	100	115	71	32	9.3	0.43	38.56	119.2	11.32	492	850	0	1.822	1.817
39																	
40																	
41	159	206	217	78	100	72	32	15.4	8.88	-0.23	127.39	0.03	776	1308	0	0.647	0.642
42	158	210	220	80	100	72	32	15	7.45	-0.27	127.29	0.06	701	1197	0	0.859	0.86
43	156	210	220	81	100	72	32	14.8	6.46	-0.29	127.56	0.07	638	1095	0	0.997	0.996
44	154	210	220	83	103	72	32	14.5	5.56	-0.36	127.71	0.03	571	981	0	1.12	1.127
45	152	208	218	86	105	72	32	14.1	4.69	-0.39	127.58	0.07	493	851	0	1.238	1.244
46	152	204	214	91	109	72	32	13.7	3.87	-0.34	127.68	0.06	403	695	0	1.353	1.359
47	153	203	213	92	110	71	32	13.7	3.87	-0.37	127.55	0.06	403	697	0	1.347	1.355
48	154	197	206	88	108	71	32	9.1	6.14	-0.27	127.18	0.02	639	1094	0	0.873	0.873
49	154	196	206	85	104	71	32	8.9	5.03	-0.24	127.4	0.06	571	981	0	1.053	1.054
50	150	195	205	85	103	71	32	8.7	4.04	-0.25	127.44	0.06	494	851	0	1.218	1.223

	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 G	TN
2														
3	893	0	4.95	0	0	0	0	0	1450	6908	0.373	0	0	8
4	893.3	0	4.95	0	0	0	0	0	1200	6983	0.377	0	0	8
5	893.6	0	4.96	0	0	0	0	0	1000	7267	0.392	0	0	8
6	892.9	0	4.96	0	0	0	0	0	800	7831	0.423	0	0	8
7	892.7	0	4.96	0	0	0	0	0	600	8769	0.474	0	0	8
8	892.7	0	4.96	0	0	0	0	0	400	10740	0.58	0	0	8
9	823.3	0	4.95	0	0	0	0	0	1175	6935	0.374	0	0	7
10	730.6	0	4.96	0	0	0	0	0	1000	6908	0.373	0	0	6
11	730	0	4.96	0	0	0	0	0	800	7085	0.382	0	0	6
12	730.5	0	4.96	0	0	0	0	0	600	7523	0.406	0	0	6
13	730.9	0	4.96	0	0	0	0	0	400	8685	0.469	0	0	6
14	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 G	TN
15														
16	738.5	0	4.96	0	0	0	0	0	1000	6842	0.027	117.6	0	6
17	738.9	0	4.96	0	0	0	0	0	1000	6949	0.027	119.3	0	6
18	738.8	0	4.96	0	0	0	0	0	800	7664	0.033	104.4	0	6
19														
20														
21	737.6	0	4.96	0	0	0	0	0	1300	6902	0.02	157.6	0	6
22	737.8	0	4.96	0	0	0	0	0	1200	6988	0.023	145.7	0	6
23	738.9	0	4.96	0	0	0	0	0	1000	7336	0.028	126.1	0	6
24	738.3	0	4.96	0	0	0	0	0	800	7901	0.033	107.5	0	6
25														
26														
27	738.5	0	4.96	0	0	0	0	0	1200	7263	0.023	151.5	0	6
28	739.3	0	4.96	0	0	0	0	0	1000	7553	0.028	130.3	0	6
29	738.6	0	4.96	0	0	0	0	0	800	8223	0.032	112.3	0	6
30	738.4	0	4.96	0	0	0	0	0	600	9826	0.045	99.3	0	6
31	739.9	0	4.96	0	0	0	0	0	400	13307	0.074	88.7	0	6
32														
33														
34	736.4	0	4.96	0	0	0	0	0	1400	7109	0.021	175.2	0	6
35	738.1	0	4.96	0	0	0	0	0	1200	7414	0.021	156.3	0	6
36	739.1	0	4.96	0	0	0	0	0	1000	7905	0.025	137.2	0	6
37	738.5	0	4.96	0	0	0	0	0	800	8624	0.03	119.3	0	6
38	738.6	0	4.96	0	0	0	0	0	600	10265	0.043	104.6	0	6
39														
40														
41	888.4	0	4.96	0	0	0	0	0	1450	6785	0.367	0	0	8
42	890.2	0	4.96	0	0	0	0	0	1200	6902	0.373	0	0	8
43	890	0	4.96	0	0	0	0	0	1000	7184	0.388	0	0	8
44	889	0	4.96	0	0	0	0	0	800	7733	0.417	0	0	8
45	889.1	0	4.96	0	0	0	0	0	600	8690	0.469	0	0	8
46	892.2	0	4.95	0	0	0	0	0	400	10739	0.58	0	0	8
47	892.3	0	4.96	0	0	0	0	0	400	10739	0.58	0	0	8
48	730.1	0	4.96	0	0	0	0	0	1000	6829	0.369	0	0	6
49	729.7	0	4.96	0	0	0	0	0	800	7005	0.378	0	0	6
50	730.9	0	4.96	0	0	0	0	0	600	7474	0.404	0	0	6

8 Cyl. 11/06/96 LOG data 9200 inj. Gen II pist. at 0.020" gas data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
2	900 RPM gas operation at 7.5 deg. timing of pilot															
3	11/6/96	14:36:54	8	742	829	824	774	802	817	782	753	69	165	170	240	68
4	11/6/96	14:38:05	8	732	817	820	768	795	778	775	753	69	168	172	241	68
5	11/6/96	14:40:02	8	750	792	793	749	780	753	763	736	70	166	174	241	68
6	Reduced pilot fuel															
7	11/6/96	14:50:28	8	733	722	720	739	755	709	718	703	70	168	172	243	68
8	11/6/96	14:53:05	8	780	778	775	761	795	738	818	725	69	168	174	241	68
9	11/6/96	14:54:54	8	758	744	732	737	771	700	710	687	70	168	174	240	68
10	11/6/96	14:57:46	8	737	694	669	708	725	678	651	641	71	168	176	241	69
11	11/6/96	15:00:31	8	714	675	634	679	690	600	622	610	69	168	176	242	70
12	Diesel snapshot															
13	11/6/96	15:07:42	8	820	835	908	847	837	806	831	829	70	170	174	242	70
14																
15	11/6/96	15:15:00	8	769	755	726	743	746	724	694	684	72	171	176	244	72
16																
17	11/6/96	15:51:00	8	834	829	746	784	824	740	725	718	67	158	164	229	64

WHOLE ENGINE ON GAS

8 Cyl. 11/06/96 LOG data 9200 inj. Gen II pist. at 0.020" gas data

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
2																
3	159	154	188	199	98	113	68	32	16	0.82	58.19	115.8	16.04	730	1251	0
4	159	157	190	201	98	114	69	32	16	0.9	57.24	115.74	15.68	714	1226	0
5	159	158	191	203	100	115	69	32	16.1	0.84	56.83	115.91	15.57	700	1203	0
6																
7	158	158	198	209	97	113	68	32	15.9	0.48	55.45	116.11	15.57	635	1102	0
8	159	158	197	209	101	117	69	32	16.2	0.48	57.92	115.45	16.58	671	1160	0
9	160	159	196	210	102	118	69	32	16	0.51	56.67	115.78	16.08	639	1109	0
10	158	158	198	209	105	120	69	32	15.7	0.55	54.85	116.61	15.31	598	1041	0
11	157	157	197	209	106	122	69	32	15.8	0.54	54.67	116.8	14.99	569	991	0
12																
13	164	164	206	217	90	111	70	32	15.8	8.98	-0.26	127.14	0.09	770	1313	0
14																
15	162	161	205	217	99	114	71	32	16	0.51	57.24	116.04	16.25	636	1103	0
16																
17	154	159	180	192	90	104	64	32	16.3	0.43	59.61	115.4	17.43	635	1103	0

8 Cyl. 11/06/96 LOG data 9200 inj. Gen II pist. at 0.020" gas data

	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
2																
3	1.786	1.795	895.7	0	4.96	0	0	0	0	0	1300	6689	0.037	144.6	0	
4	1.786	1.795	895.8	0	4.96	0	0	0	0	0	1250	6933	0.043	141.3	0	
5	1.788	1.796	898.8	0	4.96	0	0	0	0	0	1200	7084	0.041	140.5	0	
6																
7	1.839	1.839	893.5	0	4.96	0	0	0	0	0	1000	8142	0.028	140.7	0	
8	1.84	1.841	898.3	0	4.96	0	0	0	0	0	1100	7687	0.025	149	0	
9	1.842	1.841	898.9	0	4.96	0	0	0	0	0	1000	8297	0.03	145	0	
10	1.842	1.84	893.8	0	4.96	0	0	0	0	0	900	9126	0.037	138.9	0	
11	1.847	1.841	897.4	0	4.96	0	0	0	0	0	800	9861	0.04	136	0	
12																
13	0.617	0.615	889.1	0	4.96	0	0	0	0	0	1450	6902	0.373	0	0	
14																
15	1.842	1.842	896.8	0	4.96	0	0	0	0	0	1000	8469	0.03	146.6	0	
16																
17	1.845	1.842	902.1	0	4.96	0	0	0	0	0	1000	8940	0.025	156.7	0	

8cyl data one cylinder on gas. air GIV vs HyGIV and HyGIV w/Jet cap 11/08/96

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Air GIV vs the HyGIV one cylinder on gas															Air GIV vs
2	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
3	11/7/96	12:13:04	8	588	635	644	617	812	596	589	607	67	166	174	239	66
4	11/7/96	12:19:51	8	603	642	681	620	744	611	617	607	68	167	175	240	66
5	11/7/96	12:23:38	8	611	646	695	659	724	648	600	612	70	168	175	240	66
6	11/7/96	12:24:41	8	614	656	684	647	696	653	647	600	70	168	176	241	66
7	11/7/96	13:14:23	8	615	645	671	631	786	609	625	593	71	167	174	234	62
8																
9	HyGIV first run ever															HyGIV firs
10	11/7/96	13:17:00	8	596	636	668	622	811	605	591	581	72	167	176	241	62
11	11/7/96	13:23:47	8	614	649	685	646	755	622	640	642	72	168	175	245	64
12	11/7/96	13:27:57	8	608	656	694	645	735	636	618	623	73	168	176	246	65
13	11/7/96	13:29:08	8	622	656	668	648	702	647	628	600	76	168	176	244	65
14	11/7/96	13:49:37	8	613	656	679	637	770	637	656	607	71	168	175	244	64
15																
16	Diesel at 1000 hp															Diesel at
17	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
18	11/8/96	11:42:42	8	608	656	679	649	701	611	632	623	77	168	179	251	66
19																
20	HyGIV backup first line is diesel															HyGIV ba
21	11/8/96	11:49:53	8	604	643	675	623	815	621	621	604	78	171	181	253	68
22	11/8/96	11:59:32	8	615	654	688	643	794	654	639	623	79	173	181	251	70
23	11/8/96	12:08:11	8	624	658	686	650	760	634	635	621	77	174	182	251	70
24	11/8/96	12:15:29	8	623	663	700	659	748	645	641	651	78	174	182	251	70
25	11/8/96	12:22:08	8	628	664	708	666	711	651	653	618	80	175	182	251	71
26																
27	HyGIV w/Jet cap															HyGIV w/
28	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
29	11/8/96	14:04:08	8	618	651	685	643	803	630	625	611	79	171	179	249	73
30	11/8/96	14:09:29	8	623	653	694	649	790	637	635	623	80	172	180	251	73
31	11/8/96	14:14:03	8	620	656	697	653	762	649	653	623	81	174	181	252	73
32	11/8/96	14:19:31	8	631	674	703	666	740	679	628	649	83	174	182	253	74
33	11/8/96	14:24:21	8	631	676	716	661	713	673	683	644	82	174	180	250	75

8cyl data one cylinder on gas. air GIV vs HyGIV and HyGIV w/Jet cap 11/08/96

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1	he HyGIV	one cylinder on gas														
2	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
3	157	157	194	205	90	105	66	32	16	5.5	60.86	124.64	2.22	634	1102	0
4	158	157	197	208	91	108	66	32	16	5.74	59.01	124.43	2.15	635	1102	0
5	158	159	198	210	91	109	67	32	15.9	5.81	58.52	124.39	1.88	635	1102	0
6	159	159	199	211	92	109	67	32	16	5.86	57.17	124.5	1.8	637	1102	0
7	160	159	192	204	89	106	61	32	15.6	5.61	59.93	124.66	2.19	636	1103	0
8																
9	run ever															
10	158	157	194	206	90	108	62	32	15.6	5.55	59.43	124.37	2.32	634	1101	0
11	158	157	197	210	92	110	64	32	15.5	5.74	55.67	124.53	1.89	635	1102	0
12	158	158	198	211	93	110	65	32	15.5	5.78	54.51	124.64	2.15	636	1101	0
13	158	157	198	210	93	110	65	32	15.5	5.84	53.32	124.57	2.17	635	1101	0
14	157	156	201	214	93	110	64	32	15.3	5.68	55.88	124.04	2.02	635	1103	0
15																
16	00 hp															
17	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
18	161	162	188	198	78	94	67	32	15.6	6.71	69.23	126.23	0.07	639	1103	0
19																
20	kup	first line is diesel														
21	162	162	195	206	82	99	68	32	15.6	5.58	61.32	121.56	2.45	637	1102	0
22	164	164	200	213	89	103	70	32	15.5	5.71	56.46	122.94	2.24	638	1103	0
23	164	164	203	216	87	106	70	32	15.5	5.77	54.84	122.92	2.18	635	1102	0
24	164	164	204	217	87	106	70	32	15.3	5.81	54.41	122.77	2.19	638	1102	0
25	165	165	206	219	88	108	71	32	15.2	5.88	53.29	122.64	2.16	636	1101	0
26																
27	et cap															
28	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
29	162	162	196	209	87	105	73	32	15.1	5.62	83.17	122.78	1.96	636	1100	0
30	162	162	199	212	87	106	73	32	15.1	5.71	78.23	122.79	2.35	636	1102	0
31	163	163	202	214	88	107	74	32	15.1	5.78	75.2	122.63	2.16	636	1102	0
32	164	164	204	217	88	108	74	32	15	5.81	72.48	122.69	1.81	636	1100	0
33	164	163	205	218	89	108	75	32	15	5.88	70.83	122.66	2.1	637	1102	0

	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1	Air GIV vs the HyGIV one cylinder on gas															
2	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
3	1.039	1.845	898	0	4.96	0	0	0	0	0	1000	7277	0.33	21.4	0	
4	1	1.844	897.3	0	4.96	0	0	0	0	0	1000	7498	0.344	20.7	0	
5	0.987	1.843	895.3	0	4.96	0	0	0	0	0	1000	7435	0.348	18.1	0	
6	0.983	1.844	895.6	0	4.96	0	0	0	0	0	1000	7450	0.351	17.3	0	
7	1.02	1.844	894.2	0	4.96	0	0	0	0	0	1000	7355	0.335	21.1	0	
8																
9	HyGIV first run ever															
10	1.027	1.844	894.2	0	4.96	0	0	0	0	0	1000	7398	0.334	22.3	0	
11	0.998	1.842	892.8	0	4.96	0	0	0	0	0	1000	7349	0.344	18.2	0	
12	0.995	1.842	892.9	0	4.96	0	0	0	0	0	1000	7552	0.347	20.7	0	
13	0.982	1.842	892.5	0	4.96	0	0	0	0	0	1000	7629	0.351	20.9	0	
14	1.01	1.84	891.7	0	4.96	0	0	0	0	0	1000	7354	0.34	19.4	0	
15																
16	Diesel at 1000 hp															
17	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
18	1	1.96	901	0	4.96	0	0	0	0	0	1000	7403	0.4	0	0	
19																
20	HyGIV backup first line is diesel															
21	1.037	1.96	899.7	0	4.96	0	0	0	0	0	1000	7428	0.334	23.1	0	
22	1.011	1.96	897.5	0	4.96	0	0	0	0	0	1000	7453	0.34	21.3	0	
23	0.999	1.96	896.2	0	4.96	0	0	0	0	0	1000	7534	0.346	20.7	0	
24	0.989	1.96	895.3	0	4.96	0	0	0	0	0	1000	7582	0.348	20.8	0	
25	0.98	1.96	894.7	0	4.96	0	0	0	0	0	1000	7636	0.352	20.5	0	
26																
27	HyGIV w/Jet cap															
28	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
29	1.023	1.842	897.4	0	4.96	0	0	0	0	0	1000	7253	0.337	18.6	0	
30	1.011	1.841	893.6	0	4.96	0	0	0	0	0	1000	7538	0.342	22.3	0	
31	0.999	1.841	893.8	0	4.96	0	0	0	0	0	1000	7517	0.346	20.5	0	
32	0.991	1.84	891.3	0	4.96	0	0	0	0	0	1000	7386	0.348	17.2	0	
33	0.979	1.84	891	0	4.96	0	0	0	0	0	1000	7590	0.352	19.9	0	

8 Cyl [redacted] data from #5 cyl Spark prechamber 11/12/96

Spark Prechamber gas on cyl 5												
date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5
max power w/base timing												
11/12/96	11:30:34	8	611	638	672	631	836	607	611	595	71	159
11/12/96	11:32:08	8	612	638	668	625	863	602	646	601	72	162
Lighter load -- 1" rack at 1000 HP												
11/12/96	11:34:53	8	615	656	691	643	768	618	633	613	71	164
11/12/96	11:36:42	8	631	660	678	640	775	629	616	643	74	166
Stable-- slightly below max power												
11/12/96	11:39:11	8	612	634	682	638	823	629	622	609	75	167
Same as above with 4 Deg. advance												
11/12/96	11:45:11	8	605	651	680	636	803	611	615	595	77	168
11/12/96	11:49:22	8	608	648	680	652	805	614	624	605	77	169
11/12/96	11:23:40	6	690	736	755	696	824	694	700	672	68	148
4 deg advance												
11/12/96	11:54:03	6	723	775	801	742	702	731	761	748	75	158

8 Cyl [redacted] data from #5 cyl Spark prechamber 11/12/96

AIRBX 8	AIRT OUT	GAS T	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL
168	234	66	156	156	187	199	75	90	67	32	15.4	5.54
170	240	66	156	156	188	200	77	92	67	32	15.3	5.53
174	244	67	156	156	190	202	78	93	67	32	15.3	5.73
173	245	67	157	157	192	204	79	95	68	32	15.3	5.73
174	244	68	158	158	193	206	78	95	68	32	15.3	5.59
177	247	68	159	159	197	209	81	98	69	32	15.1	5.56
178	247	69	159	159	199	211	82	100	69	32	15	5.58
152	182	65	153	153	177	189	74	89	66	32	9.5	5.32
164	196	70	158	157	198	212	79	97	70	32	9.2	5.54

8 Cyl [redacted] data from #5 cyl Spark prechamber 11/12/96

HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMPS	EXC VOL	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR
											max power w/base ti	
89.15	122.28	2.35	635	1102	0	1.037	1.041	896.2	0	4.96		0
89.5	122.24	2.39	635	1102	0	1.044	1.045	895.4	0	4.96		0
											Lighter load -- 1" rack	
79.81	122.42	2.19	636	1102	0	1.007	1.003	895	0	4.96		0
80.67	122.4	2.32	634	1103	0	1.006	1.001	894.8	0	4.96	0	0
											Stable-- slightly below	
83.44	122.15	2.24	634	1102	0	1.027	1.026	894.1	0	4.96	0	0
											Same as above with 4	
83.22	121.09	2.44	636	1101	0	1.031	1.03	893.8	0	4.96	0	0
81.61	117.41	2.54	634	1102	0	1.029	1.028	893.6	0	4.96	0	0
85.45	122.8	2.38	635	1101	0	0.911	0.915	738.2	0	4.96	0	0
											4 deg advance	
65.05	108.38	2	635	1103	0	0.849	0.851	731.7	0	4.96	0	0

SPLY2 PRS			HORSE P	BTU/ HP-H	DIES #/ HP	SCFM GA	SCFM2 GAS	
ng								
0	0	0	1000	7361	0.332	22.3	0	
0	0	0	1000	7370	0.332	22.6	0	
t 1000 HP								
0	0	0	1000	7477	0.343	20.8	0	
0	0	0	1000	7558	0.344	22	0	
ax power								
0	0	0	1000	7367	0.336	21.2	0	
Deg. advance								
0	0	0	1000	7412	0.333	22.9	0	
0	0	0	1000	7461	0.335	23.1	0	
0	0	0	1000	7144	0.319	22.6	0	
0	0	0	1000	7067	0.332	16.9	0	

645 Data 11/14/96 Spark prechamber backup data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Second set of tests with spark ingnition															
2																
3	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
4	Notch 6 IMEP shots baseline level of power															
5	11/14/96	14:37:45	6	719	762	780	728	679	734	767	713	67	153	153	177	67
6	Same as above with timing set at 5 on the knob															
7	11/14/96	14:44:56	6	705	752	770	723	655	710	728	681	68	152	153	178	67
8																
9	Max load with 0 timing advance															
10	11/14/96	15:14:24	8	585	629	674	634	841	609	607	607	70	166	173	236	70
11	Max load with 1.6 on the knob for timing															
12	.11/14/96	15:22:38	8	599	634	669	626	800	609	628	596	70	167	174	239	70
13	Lighter load full advance Rack .99															
14	11/14/96	15:40:46	8	611	665	673	650	609	642	631	638	71	168	175	238	71
15	Lighter still load at full advance Rack .98															
16	11/14/96	15:48:44	8	614	673	699	659	586	666	665	656	71	168	175	239	71
17	Not sure on this shot															
18	11/14/96	15:55:15	8	606	661	688	641	641	645	638	625	71	169	174	240	71
19																
20																
21	Demo testing for Venezuela			Data taken for ER												
22	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
23	11/22/96	15:13:22	8	856	845	796	791	817	826	804	805	62	106	104	217	62
24	11/22/96	15:21:19	8	701	707	805	735	726	711	747	703	62	112	116	228	62
25																
26	Engine Hours since ER was added 38															

645 Data 11/14/96 Spark prechamber backup data

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1																
2																
3	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
4																
5	155	155	198	212	77	96	68	32	9.5	5.48	70.96	125.03	1.56	634	1100	0
6																
7	154	154	196	212	76	95	68	32	9.5	5.43	71.58	124.95	1.93	634	1104	0
8																
9																
10	157	157	201	213	82	100	70	32	15.2	5.44	92.59	123.73	2.29	637	1104	0
11																
12	157	157	203	215	83	102	70	32	15.2	5.44	89.72	123.85	2.56	633	1105	0
13																
14	158	158	206	218	85	103	71	32	15.1	5.74	72.91	125.55	2.14	635	1104	0
15																
16	157	157	206	219	84	103	71	32	15.2	5.81	70.4	125.34	1.73	633	1104	0
17																
18	157	157	206	218	84	103	71	32	15.1	5.7	75.08	125.07	1.85	635	1105	0
19																
20																
21																
22	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
23	154	154	175	186	86	100	62	32	16.7	0.77	61.28	115.24	18.5	743	1283	0
24	154	155	187	197	89	107	63	32	16.4	8.37	-0.33	128.6	0.09	739	1279	0
25																
26																

	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1																
2																
3	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
4																
5	0.866	0.869	732.6	0	4.96	0	0	0	0	0	996	6926	0.33	15.1	0	
6																
7	0.874	0.873	732.1	0	4.96	0	0	0	0	0	999	7043	0.326	18.6	0	
8																
9																
10	1.045	1.049	890.9	0	4.96	0	0	0	0	0	1004	7195	0.325	21.9	0	
11																
12	1.038	1.036	889.4	0	4.96	0	0	0	0	0	999	7372	0.326	24.5	0	
13																
14	0.993	0.991	888.8	0	4.96	0	0	0	0	0	1001	7486	0.344	20.7	0	
15																
16	0.981	0.978	888.7	0	4.96	0	0	0	0	0	998	7369	0.349	16.7	0	
17																
18	1.003	0.997	888.3	0	4.96	0	0	0	0	0	1002	7279	0.341	17.9	0	
19																
20																
21																
22	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
23	1.827	1.831	896.5	0	4.95	0	0	0	0	0	1361	7220	0.033	166.1	0	
24	0.732	0.733	895.1	0	4.95	0	0	0	0	0	1350	6882	0.372	0	0	
25																
26																

12/12/96 Data. Port injection gas on one cylinder

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T	WATER I
2	12/11/96	15:12:47	8	588	626	646	609	800	639	584	608	66	164	172	230	65	156
3	12/11/96	15:31:18	8	576	622	644	602	842	595	597	581	66	164	171	231	66	156
4	12/11/96	15:40:19	8	598	635	661	619	775	612	573	611	67	165	171	230	66	156
5	12/11/96	15:42:39	8	582	616	635	598	842	575	573	566	67	166	171	229	67	156
6	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T	WATER I
7	12/12/96	12:52:24	8	582	621	644	604	837	606	600	577	70	166	176	239	68	157
8	12/12/96	12:57:29	8	588	619	637	599	835	588	586	613	71	168	173	241	69	158
9	12/12/96	13:02:12	8	601	632	667	628	812	597	605	620	71	168	176	243	69	158
10	12/12/96	13:08:59	8	602	638	659	621	806	617	622	622	73	168	176	243	70	158
11	12/12/96	13:17:43	8	600	633	664	627	835	615	671	605	74	170	176	247	70	158
12	12/12/96	13:20:50	8	609	640	674	639	830	638	617	591	78	170	176	245	71	158
13	12/12/96	13:26:27	8	601	641	670	631	825	618	629	584	77	170	178	247	72	159
14	12/12/96	13:40:41	8	604	642	672	627	824	622	641	585	78	170	176	248	70	158
15	12/12/96	13:47:20	8	617	640	673	621	821	624	611	605	78	170	177	246	70	158
16	12/12/96	14:02:36	8	594	643	675	632	824	635	595	593	74	167	174	244	68	156
17																	
18	Head injection (Trying to get it at 1.040 rack but runing out of gas)																
19	12/12/96	14:40:18	8	595	635	668	621	781	604	622	585	71	165	172	238	65	154
20																	
21	ER data on diesel for comparison																
22	12/12/96	14:54:31	8	797	833	911	842	823	797	873	841	69	168	172	240	64	138
23	12/12/96	14:55:42	8	798	826	903	833	812	790	855	826	71	167	172	240	64	159
24	12/12/96	14:58:34	8	795	825	899	838	823	794	843	825	72	168	171	242	65	160

12/12/96 Data. Port injection gas on one cylinder

	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
1	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMPS	EXC VOL	MAIN RA	PILOT RA
2	156	201	213	86	105	66	32	15.8	5.48	48.65	124.7	2.63	632	1105	0	1.041	1.818
3	155	204	216	87	106	66	32	15.7	5.33	49.83	124.09	2.97	633	1105	0	1.069	1.819
4	156	205	218	88	107	66	32	15.8	5.6	44.11	124.4	2.08	634	1106	0	1.019	1.818
5	155	206	218	88	107	67	32	15.8	5.32	50.92	124.04	2.95	633	1106	0	1.067	1.818
6	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMPS	EXC VOL	MAIN RA	PILOT RA
7	157	197	208	84	102	68	32	15.9	5.38	53.24	125.36	2.53	634	1106	0	1.055	1.829
8	157	199	211	85	102	69	32	15.6	5.39	51.93	125.09	2.76	635	1106	0	1.057	1.828
9	157	201	213	84	103	69	32	15.5	5.53	47.7	124.95	2.53	634	1106	0	1.039	1.828
10	158	203	215	84	104	70	32	15.7	5.51	55.09	124.71	2.86	633	1106	0	1.041	1.827
11	158	204	216	87	105	71	32	15.4	5.5	46.43	124.66	2.65	633	1105	0	1.043	1.827
12	158	204	217	86	105	71	32	15.4	5.52	47.22	124.44	2.6	631	1106	0	1.037	1.827
13	158	205	217	87	105	72	32	15.3	5.51	46.85	124.54	2.59	633	1104	0	1.04	1.827
14	158	206	218	86	105	71	32	15.1	5.48	45.83	123.99	2.66	634	1105	0	1.046	1.826
15	158	206	218	86	105	70	32	15.1	5.47	46.15	124.06	2.56	633	1104	0	1.042	1.826
16	156	206	219	85	105	68	32	15.3	5.54	45.63	114.01	2.53	632	1106	0	1.035	1.825
17																	
18																	
19	154	199	212	82	101	65	32	15.4	5.57	60.56	89.6	2.75	633	1106	0	1.029	1.828
20																	
21																	
22	160	208	221	75	97	64	32	15.9	8.89	0.15	84.86	0.09	768	1324	0	0.641	0.637
23	160	209	223	75	96	65	32	15.9	8.84	0.16	84.42	0.06	767	1323	0	0.65	0.643
24	160	212	225	77	96	65	32	15.9	8.82	0.09	84.17	0.07	768	1321	0	0.652	0.645

12/12/96 Data. Port injection gas on one cylinder

	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS		
2	891.8	0	4.95	0	0	0	0	0	997	7477	0.329	25.4	0		
3	891	0	4.95	0	0	0	0	0	999	7467	0.32	28.5	0		
4	893.1	0	4.95	0	0	0	0	0	1001	7291	0.335	20	0		
5	890.6	0	4.95	0	0	0	0	0	1000	7437	0.319	28.3	0		
6	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS		
7	894.7	0	4.95	0	0	0	0	0	1001	7291	0.322	24.5	0	gas inj at 180	
8	894	0	4.95	0	0	0	0	0	1003	7419	0.323	26.7	0	gas inj at 177	
9	893.6	0	4.96	0	0	0	0	0	1001	7453	0.331	24.4	0	gas inj at 177	
10	892.6	0	4.95	0	0	0	0	0	1000	7599	0.33	27.6	0	gas inj at 190	
11	892	0	4.96	0	0	0	0	0	999	7493	0.33	25.5	0	gas inj at 160	
12	891.8	0	4.95	0	0	0	0	0	996	7510	0.332	25	0	gas inj at 157	
13	891.2	0	4.95	0	0	0	0	0	998	7479	0.331	24.9	0	gas inj at 165	
14	891.3	0	4.95	0	0	0	0	0	1000	7462	0.328	25.5	0	gas inj at 175 &8ms	
15	890.2	0	4.95	0	0	0	0	0	998	7416	0.328	24.6	0	gas inj at 170 & 8ms	
16	889.5	0	4.96	0	0	0	0	0	998	7357	0.332	22.5	0	gas inj at 180	
17															
18															
19	890.9	0	4.95	0	0	0	0	0	1000	7249	0.334	19.7	0	Head injection	
20															
21															
22	890.6	0	4.95	0	0	0	0	0	1452	6796	0.367	0	0	ER backups	
23	890	0	4.95	0	0	0	0	0	1449	6771	0.366	0	0		
24	890	0	4.95	0	0	0	0	0	1449	6756	0.365	0	0		

8 cyl 1/9/97 1 cyl test SPC jet cap gas backup test

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3																
4																
5																
6																
7	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
8	Spark Prechamber w/ Jet cap GIV Poppet check valve timeing 0 knob 1.042 rk															
9	1/9/97	10:05:41	8	583	615	652	615	815	602	582	571	68	168	176	235	67
10	Spark Prechamber w/ Jet cap GIV Poppet check valve timeing 1 knob 1.052 rk.															
11	1/9/97	10:22:49	8	583	615	652	615	815	602	582	571	68	168	176	233	68
12	Spark Prechamber w/ Jet cap GIV Poppet check valve timeing 0 knob 1.058 rk															
13	1/9/97	11:01:35	8	588	618	657	618	849	623	585	597	71	169	175	237	70
14	Spark Prechamber w/ Jet cap GIV Poppet check valve timeing 4 knob .921 rk															
15	1/9/97	12:40:29	6	671	704	761	694	778	715	700	696	70	149	151	174	70
16	Air throttle testing data															
17	1/9/97	13:29:08	1	240	239	238	240	160	223	249	248	74	155	153	142	73
18	1/9/97	13:44:17	1	228	216	227	230	144	215	237	233	75	153	147	100	74
19	1/9/97	13:50:01	1	195	193	196	195	147	186	203	201	72	148	135	84	72

8 cyl 1/9/97 1 cyl test SPC jet cap gas backup test

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1																
2																
3																
4																
5																
6																
7	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
8																
9	159	159	202	213	89	105	68	32	16.1	5.47	92.72	114.17	2.59	633	1113	0
10																
11	159	159	203	215	90	106	68	32	16.1	5.39	92.22	114.18	2.75	631	1110	0
12																
13	158	158	208	217	85	102	71	32	15.7	5.31	93.83	124.44	2.67	629	1108	0
14																
15	156	156	185	198	74	91	71	32	9.8	5.23	73.92	124	2.08	634	1107	0
16																
17	157	158	190	196	80	101	74	32	0.2	0.17	0.18	126.41	0	5	7	0
18	166	167	176	182	82	102	75	32	0.2	0.19	0.19	124.9	0	4	7	0
19	165	166	171	178	80	99	72	32	1.2	0.34	0.2	123.45	0	5	7	0

8 cyl 1/9/97 1 cyl test SPC jet cap gas backup test

	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1																
2																
3																
4																
5																
6																
7	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
8																
9	1.039	1.036	894.1	0	4.96	0	0	0	0	0	1006	7273	0.326	23	0	
10																
11	1.054	1.049	894.5	0	4.95	0	0	0	0	0	1000	7312	0.323	24.4	0	
12																
13	1.062	1.056	889.9	0	4.95	0	0	0	0	0	995	7276	0.318	25.7	0	
14																
15	0.922	0.926	734	0	4.96	0	0	0	0	0	1002	6870	0.313	19.9	0	
16																
17	1.728	1.731	308.1	0	4.96	0	0	0	0	0	0	0	0	0	0	
18	1.727	1.729	309.2	0	4.96	0	0	0	0	0	0	0	0	0	0	
19	1.714	1.717	309.4	0	4.96	0	0	0	0	0	0	0	0	0	0	

8 cyl log 1 cyl test 1/30/97 SPC w/ different gas injectors

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2	Direct spark plug no jet cap															
3	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
4	1/24/97	9:51:20	6	655	712	729	680	722	679	677	696	65	147	151	172	65
5	1/24/97	9:57:36	6	665	723	737	691	767	721	698	702	65	148	151	169	66
6																
7	Prechamber w/poppet check, port inj. gas															
8	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
9	1/30/97	11:32:43	3	364	353	365	341	479	340	348	337	71	140	135	113	70
10	1/30/97	11:38:12	3	366	354	358	341	448	338	354	348	71	139	135	113	71
11	1/30/97	11:44:43	3	357	338	345	329	518	314	374	326	71	139	133	113	71
12	Prechamber w/poppet check, port inj. gas 7 knob timing															
13	1/30/97	11:56:20	6	667	728	743	682	703	720	703	684	72	149	152	176	72
14	Prechamber w/poppet check, port inj. gas 4 knob timing															
15	1/30/97	12:04:10	6	667	750	749	701	729	732	696	684	71	149	152	181	71
16	1/30/97	12:12:22	6	670	736	757	703	750	746	710	700	71	152	154	184	70
17	1/30/97	12:23:04	6	690	743	748	693	775	770	698	693	73	151	155	187	69
18	Prechamber w/poppet check, port inj. gas 4 knob timing Rk 1.055															
19	1/30/97	12:37:09	8	600	640	664	633	771	637	592	608	76	169	176	246	69
20	Prechamber w/poppet check, port inj. gas 4 knob timing rack at 1.048															
21	1/30/97	12:41:20	8	598	645	678	632	768	633	612	631	75	169	176	246	69
22	Prechamber w/poppet check, Jet cap inj. gas 1 knob timing															
23	1/30/97	14:50:46	8	601	637	660	624	809	635	666	602	75	168	176	246	69
24	1/30/97	14:54:41	8	617	630	680	631	820	608	618	602	77	168	176	246	69
25	1/30/97	15:05:07	8	597	629	669	619	841	608	599	607	74	168	176	246	70
26	1/30/97	15:14:15	8	599	629	670	629	815	619	602	586	76	169	176	245	70
27	Prechamber w/poppet check, Jet cap inj. gas 2 knob timing															
28	1/30/97	15:21:41	8	584	645	671	615	780	655	615	600	76	169	174	248	70

8 cyl log 1 cyl test 1/30/97 SPC w/ different gas injectors

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1																
2		Direct spark plug no jet cap														
3	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
4	154	155	182	195	65	80	65	32	10.1	5.16	47.68	126.65	1.59	629	1109	0
5	155	155	188	199	66	82	66	32	10.1	5.2	48.11	125.57	1.86	627	1112	0
6																
7		Prechamber w/poppet check, port inj. gas														
8	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
9	153	153	172	182	76	91	71	32	3.8	1.49	26.46	124.17	1.81	314	559	0
10	152	152	171	180	76	91	71	32	3.8	1.49	26.79	124.58	1.63	314	558	0
11	152	152	172	180	77	92	72	32	3.7	1.36	27.9	124.1	1.5	308	548	0
12																
13	154	154	184	196	76	93	73	32	9.8	5.23	45.75	123.44	1.97	627	1106	0
14																
15	154	154	190	202	74	91	72	32	9.7	5.23	45.45	122.79	2.12	630	1110	0
16	154	154	192	206	73	90	70	32	9.5	5.2	41.06	122.44	2.19	629	1110	0
17	155	154	195	209	74	92	69	32	9.4	5.19	42.45	123.37	2.02	629	1110	0
18																
19	158	158	203	215	81	98	69	32	15.3	5.39	47.46	122.6	2.39	629	1109	0
20																
21	158	158	203	216	82	99	69	32	15.2	5.43	46.82	122.76	2.31	631	1109	0
22																
23	157	157	198	211	84	101	69	32	15.2	5.45	89.85	119.53	2.73	630	1111	0
24	158	158	200	212	85	102	69	32	15.3	5.46	89.8	119.51	2.87	629	1112	0
25	157	158	203	215	85	103	70	32	15.2	5.33	92.16	119.3	2.88	627	1109	0
26	158	158	204	217	86	104	70	32	15.2	5.37	91.39	120.13	2.8	628	1111	0
27																
28	157	157	204	217	85	104	70	32	15.1	5.41	88.56	120	2.6	629	1110	0

8 cyl log 1 cyl test 1/30/97 SPC w/ different gas injectors

	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1																
2		Direct spark plug no jet cap														
3	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
4	0.932	0.934	738.4	0	4.95	0	0	0	0	0	996	6595	0.31	15.5	0	
5	0.913	0.919	736.6	0	4.95	0	0	0	0	0	996	6762	0.312	18	0	
6																
7		Prechamber w/poppet check, port inj. gas														
8	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
9	1.493	1.491	502.4	0	4.96	0	0	0	0	0	250	10375	0.357	17.4	0	
10	1.481	1.479	501.7	0	4.96	0	0	0	0	0	250	10011	0.357	15.7	0	
11	1.517	1.51	497.9	0	4.96	0	0	0	0	0	241	9494	0.338	14.4	0	
12																
13	0.918	0.918	736.5	0	4.96	0	0	0	0	0	990	6891	0.316	18.8	0	
14																
15	0.918	0.914	735.8	0	4.96	0	0	0	0	0	999	6902	0.314	20.1	0	
16	0.923	0.921	734.8	0	4.95	0	0	0	0	0	997	6915	0.312	20.7	0	
17	0.922	0.92	732.4	0	4.95	0	0	0	0	0	997	6825	0.312	19.3	0	
18																
19	1.051	1.045	891.9	0	4.95	0	0	0	0	0	996	7240	0.324	22.7	0	
20																
21	1.045	1.036	892.4	0	4.96	0	0	0	0	0	999	7223	0.326	22	0	
22																
23	1.052	1.048	893.4	0	4.96	0	0	0	0	0	999	7424	0.327	25.3	0	
24	1.042	1.035	892.4	0	4.96	0	0	0	0	0	999	7475	0.326	26.6	0	
25	1.061	1.054	891.7	0	4.96	0	0	0	0	0	993	7406	0.321	26.6	0	
26	1.056	1.051	891.5	0	4.96	0	0	0	0	0	996	7402	0.323	26.1	0	
27																
28	1.047	1.043	891	0	4.96	0	0	0	0	0	997	7336	0.325	24.2	0	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3																
4	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
5	2/10/97	12:38:44	6	666	717	740	685	791	687	688	691	65	152	154	179	64
6	2/10/97	13:22:34	3	368	352	361	347	610	325	362	338	68	168	160	114	68
7	2/10/97	13:57:55	6	675	726	744	687	766	735	714	689	70	149	151	176	70
8	2/10/97	14:15:32	6	680	738	755	703	790	723	699	683	69	149	151	177	70
9	2/10/97	14:24:09	6	683	750	763	711	689	723	709	735	68	148	150	176	68
10	2/10/97	14:30:56	6	679	720	748	696	810	705	695	692	67	149	151	176	67
11	2/10/97	14:46:20	6	690	756	768	716	670	743	722	710	67	149	150	176	66

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1																
2																
3																
4	WATER IN	WATER OU	LUBE IN	LUBE OUT	FUEL IN	FUEL OUT	AMB T	GAS2 TMP	AIRBX PRS	DIESL FLO	HEADR PR	SUPLY PR	GAS CFM	MG VOLT	MG AMPS	EXC VOLT
5	155	154	191	203	79	98	64	32	9.9	5.11	41.88	124.83	2.31	627	1111	0
6	191	192	202	204	96	113	68	32	3.7	1.28	42.95	124.93	1.74	304	543	0
7	153	152	189	201	76	95	70	32	9.7	5.17	41.12	122.74	2.22	628	1109	0
8	152	152	192	206	71	90	70	32	9.6	5.22	40.31	121.17	1.86	625	1114	0
9	151	151	193	207	70	90	68	32	9.7	5.31	35.61	121.48	1.84	630	1113	0
10	152	152	194	207	71	92	68	32	9.6	5.12	43.35	120.54	2.01	616	1112	0
11	151	151	194	208	71	91	67	32	9.5	5.35	34.42	110.54	1.88	630	1114	0

	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1																
2																
3																
4	MAIN RACK	PILOT RAC	RPM	TURBO RP	REF V	FAN HP	DIFF2 PRS	SPLY2 PRS			HORSE PO	BTU/ HP-H	DIES #/ HP-	SCFM GAS	SCFM2 GAS	
5	0.933	1.96	736.5	0	4.95	0	0	0	0	0	995	6913	0.308	22.3	0	
6	1.54	1.96	496.3	0	4.96	0	0	0	0	0	235	9916	0.326	16.8	0	
7	0.917	1.96	732.6	0	4.96	0	0	0	0	0	994	6921	0.312	21.1	0	
8	0.9	1.96	731.4	0	4.96	0	0	0	0	0	994	6779	0.315	17.5	0	
9	0.885	1.96	731.1	0	4.95	0	0	0	0	0	1001	6825	0.318	17.3	0	
10	0.916	1.96	730.1	0	4.95	0	0	0	0	0	978	6851	0.314	18.8	0	
11	0.863	1.96	729.1	0	4.95	0	0	0	0	0	1002	6803	0.32	16.2	0	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Port gas w/diesel prechamber w/o ceramic liner															
2	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
3	2/28/97	11:57:08	6	677	733	753	702	766	707	715	698	69	149	152	181	67
4	2/28/97	12:05:21	8	589	637	656	612	854	610	601	586	73	163	174	242	68
5	2/28/97	12:11:21	8	601	647	666	623	812	623	614	597	75	166	174	245	69
6	2/28/97	12:16:26	8	614	669	687	647	701	643	634	619	71	167	174	246	70
7	2/28/97	13:19:43	6	677	738	748	703	771	701	714	698	67	147	150	178	66
8	2/28/97	13:26:45	8	589	633	652	615	858	611	600	587	71	163	170	241	68
9	2/28/97	13:31:12	8	599	646	666	626	811	625	611	601	71	165	173	242	69
10	2/28/97	13:38:22	8	612	665	690	648	720	645	632	619	74	167	174	245	70
11																
12	Prechamber w/check valve works much better															
13	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
14	3/26/97	13:47:13	8	599	656	659	625	786	627	609	600	78	171	178	248	71
15	3/26/97	13:52:03	8	618	678	680	649	723	648	632	624	78	172	178	247	73
16																
17	DPC, HyGIV	LARGE DELIVERY														
18	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
19	4/18/97	13:08:42	6	678	731	728	686	728	695	697	683	66	151	154	178	63
20	4/18/97	13:13:24	6	688	746	736	695	719	705	701	694	66	152	155	181	64
21	4/18/97	13:20:35	6	682	755	743	708	691	720	715	702	70	152	156	182	66
22	4/18/97	13:30:30	8	618	637	646	606	775	618	591	585	74	169	178	243	67
23	4/18/97	13:38:43	8	627	639	651	618	787	616	595	592	74	170	179	243	68
24	4/18/97	13:53:27	8	613	665	674	639	696	642	615	613	75	173	180	244	71
25	4/18/97	14:16:17	8	615	666	678	640	689	645	617	613	78	173	180	244	70
26	4/18/97	14:25:40	8	616	665	672	637	694	642	614	615	75	172	179	244	70
27																
28																
29	DPC w/smaller body & small delivery HyGIV in port															
30	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
31	4/21/97	13:30:06	8	591	636	648	611	784	614	586	586	71	172	180	243	70
32	4/21/97	13:35:50	8	595	640	656	618	772	620	593	590	72	172	181	244	71
33	4/21/97	13:39:37	8	610	663	672	638	669	640	612	609	75	173	182	245	71
34	4/21/97	13:56:50	6	698	766	762	711	740	710	713	704	76	159	161	186	74
35	4/21/97	14:03:45	6	705	803	793	746	638	749	748	739	77	159	161	189	75
36	4/21/97	14:19:17	8	614	651	666	622	851	623	601	597	78	174	182	249	73

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1		Port gas w/diesel prechamber w/o ceramic liner														
2	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
3	153	153	184	197	73	90	67	32	9.5	5.18	41.88	123.72	1.8	629	1114	0
4	155	155	192	203	76	95	68	32	15.3	5.27	51.71	123.08	2.82	629	1114	0
5	156	154	196	208	80	99	69	32	15.4	5.41	47.83	123.09	2.07	627	1115	0
6	156	156	199	210	80	100	70	32	15.5	5.63	42.7	123.64	2.26	631	1114	0
7	151	151	186	199	76	93	67	32	9.4	5.16	41.12	124.1	2.32	627	1112	0
8	154	154	193	204	80	98	69	32	15.3	5.26	48.98	123.54	2.92	629	1113	0
9	155	155	196	207	81	99	69	32	15.3	5.4	45.2	123.54	2.5	629	1114	0
10	156	156	200	212	82	101	71	32	15.1	5.6	40.14	123.53	2.37	629	1114	0
11																
12		Prechamber w/check valve works much better														
13	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
14	160	160	210	222	93	112	72	32	14.8	5.31	58.46	121.17	2.33	622	1104	0
15	159	159	210	222	93	112	72	32	14.8	5.57	50.52	121.64	2.52	624	1112	0
16																
17		DPC, HyGIV														
18	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
19	157	157	190	203	86	102	64	218	9.7	5.19	28.29	122.98	2.19	623	1111	0
20	157	157	193	204	86	103	64	206	9.8	5.27	28.22	123	2.12	629	1115	0
21	157	157	194	207	86	103	66	190	9.7	5.31	26.69	122.61	1.92	625	1113	0
22	162	162	201	212	95	112	68	199	15.5	5.35	38.71	121.98	2.56	626	1115	0
23	162	162	204	216	97	115	69	204	15.4	5.4	50.49	122.77	2.34	631	1113	0
24	164	163	208	220	99	117	71	210	15.2	5.59	31.72	123.29	2.4	627	1114	0
25	163	163	210	222	101	119	71	207	15.2	5.62	31.15	123.19	2.42	628	1116	0
26	162	162	210	222	93	114	70	203	15	5.58	32.51	123.06	2.13	628	1114	0
27																
28																
29		DPC w/smaller body & small delivery HyGIV in port														
30	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
31	163	164	204	216	91	110	71	32	15.7	5.36	41.38	121.28	2.83	626	1115	0
32	165	164	208	218	92	110	71	32	15.6	5.43	43.37	121.24	2.46	627	1115	0
33	164	164	209	219	93	112	72	32	15.5	5.64	36.05	121.49	2.12	626	1115	0
34	161	162	206	219	90	109	75	32	9.3	5.24	31.91	121.29	2.38	631	1112	0
35	162	162	206	219	88	108	76	32	9.3	5.58	25.79	121	1.81	630	1114	0
36	166	166	210	222	94	114	74	32	15.2	5.37	41.76	120	2.84	631	1116	0

	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1												Port gas w/diesel prechamber w/o ceramic liner				
2	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
3	0.923	1.96	734.7	0	4.95	0	0	0	0	0	1001	6675	0.31	17.2	0	
4	1.073	1.96	897.8	0	4.95	0	0	10.53	0	0	1001	7304	0.316	26.9	0	
5	1.05	1.96	894.9	0	4.95	0	0	10.72	0	0	998	7065	0.324	19.7	0	
6	1.014	1.96	894.6	0	4.95	0	0	11.17	0	0	996	7448	0.339	21.6	0	
7	0.919	1.96	732.2	0	4.95	0	0	0	0	0	996	6961	0.31	22.3	0	
8	1.066	1.96	896.2	0	4.95	0	0	10.95	0	0	1000	7349	0.315	27.9	0	
9	1.05	1.96	893.7	0	4.95	0	0	11.18	0	0	1001	7280	0.323	23.9	0	
10	1.015	1.96	892.1	0	4.95	0	0	11.95	0	0	1001	7433	0.335	22.6	0	
11																
12												Prechamber w/check valve works much better				
13	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
14	1.056	1.96	889.3	0	4.95	0	0	12.99	0	0	980	7222	0.325	21.9	0	
15	1.017	1.96	887.6	0	4.95	0	0	12.82	0	0	991	7535	0.337	23.7	0	
16																
17												DPC, HyGIV				
18	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
19	0.933	1.96	737.1	0	4.95	0	-0.03	0.49	0	0	988	6973	0.315	20.9	0	
20	0.914	1.96	736.5	0	4.95	0	-0.02	0.49	0	0	1001	6935	0.315	20.2	0	
21	0.889	1.96	734.7	0	4.95	0	-0.02	0.5	0	0	993	6929	0.32	18.2	0	
22	1.063	1.96	893.1	0	4.95	0	-0.02	0.53	0	0	997	7263	0.321	24.2	0	
23	1.049	1.96	891.8	0	4.95	0	-0.02	0.52	0	0	1003	7176	0.323	22.3	0	
24	1.012	1.96	890.1	0	4.95	0	-0.02	0.53	0	0	997	7465	0.336	22.9	0	
25	1.008	1.96	889	0	4.95	0	-0.02	0.52	0	0	1001	7478	0.336	23.1	0	
26	1.006	1.96	887.6	0	4.95	0	-0.02	0.51	0	0	999	7298	0.335	20.3	0	
27																
28																
29											DPC w/smaller body & small delivery HyGIV in port					
30	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
31	1.065	1.96	894	0	4.95	0	-0.02	0.54	0	0	997	7410	0.322	26.6	0	
32	1.048	1.96	893.9	0	4.95	0	-0.02	0.59	0	0	998	7299	0.326	23.1	0	
33	1.004	1.96	892.2	0	4.96	0	-0.02	0.6	0	0	997	7354	0.339	19.9	0	
34	0.898	1.96	728.2	0	4.96	0	-0.03	0.55	0	0	1002	7012	0.313	22.4	0	
35	0.827	1.96	728.2	0	4.96	0	-0.02	0.55	0	0	1002	7098	0.334	17	0	
36	1.055	1.96	891.1	0	4.95	0	-0.03	0.61	0	0	1005	7354	0.32	26.4	0	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	2.8" DPC w/170 tip SPI Pressure Intensifier															
2	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
3	Standard tests with direct solenoid control over pressurezed diesel															
4	6/20/97	10:48:05	8	618	664	646	599	762	610	578	583	78	174	183	247	91
5	6/20/97	10:51:36	8	602	666	652	606	751	623	583	588	77	174	183	247	92
6	Pressure intensifier w/servojet controlling the diesel															
7	6/20/97	12:28:40	6	701	776	769	713	766	711	713	712	81	160	163	192	95
8	6/20/97	12:41:12	6	707	786	770	715	740	715	713	714	83	161	164	193	96
9	6/20/97	12:50:35	8	605	673	671	637	691	635	611	612	86	176	182	253	97
10	6/20/97	13:08:51	8	616	707	674	644	693	643	614	621	83	176	184	253	97
11	6/20/97	13:23:20	8	611	669	666	627	748	630	602	606	87	178	186	254	98
12																
13	Whole engine on gas prep for baseline operation (Just some data)															
14	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
15	7/10/97	13:45:26	8	754	698	774	715	719	696	669	683	87	180	185	257	103
16	7/10/97	13:53:54	8	736	740	710	754	734	721	717	719	90	182	186	262	103
17	7/10/97	15:05:16	8	786	786	745	771	801	752	737	745	89	176	183	276	90
18	7/10/97	15:15:58	8	806	822	785	796	829	778	765	787	90	179	187	282	98
19	7/10/97	15:43:06	8	791	804	776	775	815	768	743	761	91	183	190	284	101

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1																
2	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMPS	EXC VOL
3																
4	166	166	206	216	95	114	77	32	15.4	5.85	47.11	119.17	3	626	1119	0
5	166	166	208	218	96	115	77	32	15.4	5.4	45.79	119.18	2.86	625	1119	0
6																
7	163	164	207	213	91	111	80	32	9	5.27	38.09	119.7	2	624	1116	0
8	163	163	208	222	93	112	81	32	9	5.26	38.14	119.51	1.89	624	1115	0
9	166	166	211	223	98	117	81	32	14.8	5.52	42.49	119.57	2.09	627	1119	0
10	148	166	213	223	100	119	81	32	14.8	5.58	42.13	119.81	2.49	626	1120	0
11	151	167	214	226	102	120	83	32	14.7	5.46	46.62	118.93	2.75	626	1119	0
12																
13																
14	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMPS	EXC VOL
15	170	170	204	216	129	143	80	32	15.2	0.64	55.98	102.53	19.01	620	1110	0
16	169	170	206	219	132	146	81	32	15.2	0.63	57.13	102.53	19.12	623	1116	0
17	169	168	196	207	124	137	84	32	11.3	0.68	47.39	103.33	16.49	560	1002	0
18	156	168	203	214	128	142	84	32	10.2	0.66	45.58	104.71	16.21	558	1001	0
19	154	168	211	222	148	160	85	32	10.9	0.67	46.66	103.49	16.47	562	1004	0

	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1																
2	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
3																
4	1.063	1.96	895.3	0	4.96	0	-0.02	0.54	0	0	1000	7988	0.351	27.6	0	
5	1.051	1.96	893	0	4.96	0	-0.03	0.54	0	0	999	7426	0.324	26.3	0	
6																
7	0.891	1.96	726.4	0	4.96	0	-0.03	0.51	0	0	994	6891	0.318	18.5	0	
8	0.893	1.96	726.4	0	4.96	0	-0.03	0.54	0	0	993	6830	0.317	17.4	0	
9	1.025	1.96	892.2	0	4.96	0	-0.02	0.56	0	0	1002	7157	0.33	19.3	0	
10	1.02	1.96	891.9	0	4.96	0	-0.03	0.53	0	0	1001	7432	0.334	23	0	
11	1.031	1.96	891	0	4.96	0	-0.03	0.56	0	0	1000	7450	0.328	25.3	0	
12																
13																
14	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
15	1.83	1.83	899	0	4.96	0	-0.02	0.6	0	0	983	9153	0.039	153.4	0	
16	1.833	1.83	899.7	0	4.96	0	-0.03	0.57	0	0	993	9098	0.038	154.3	0	
17	1.838	1.833	902.1	0	4.96	0	-0.02	0.55	0	0	801	9985	0.05	134.1	0	
18	1.838	1.832	899.7	0	4.96	0	-0.03	0.52	0	0	797	9957	0.049	133.4	0	
19	1.837	1.831	900.3	0	4.96	0	-0.02	0.54	0	0	806	9903	0.049	134	0	

7/11/97 8 cyl gas baseline w/gen II pistons @020, 9200's @ 8deg.

date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
7/11/97	11:50:16	8	824	869	829	823	863	818	815	816	84	128	131	243	84
7/11/97	12:03:12	8	818	855	825	823	839	814	803	810	85	142	146	258	101
7/11/97	12:08:48	8	791	813	793	793	824	785	773	773	89	145	150	263	103
7/11/97	12:11:48	8	741	712	692	727	759	703	683	704	88	147	155	263	103
Air throttled															
7/11/97	12:18:05	8	817	847	810	819	849	810	785	807	89	149	151	279	103
7/11/97	12:22:30	8	741	737	720	751	775	720	697	731	88	149	156	278	103
7/11/97	12:26:17	8	665	643	627	679	659	648	614	648	89	149	158	277	103
air throttled															
7/11/97	12:30:20	8	703	684	667	713	719	687	658	687	89	147	155	280	102
7/11/97	12:37:30	7	822	897	854	793	823	824	822	814	87	140	140	235	103
7/11/97	12:45:12	6	886	1002	959	865	847	892	921	905	87	131	126	206	104
7/11/97	12:53:02	6	781	865	840	745	764	778	804	785	89	129	127	205	104
7/11/97	12:57:20	6	700	738	737	640	686	681	707	678	91	130	130	204	104
air throttled															
7/11/97	13:07:00	6	805	850	829	746	779	792	805	794	90	128	126	217	99
7/11/97	13:14:03	6	711	736	735	650	698	705	714	695	90	128	128	219	97
7/11/97	13:20:26	6	700	677	671	614	664	651	671	647	89	126	120	220	95
7/11/97	13:29:33	5	769	856	827	709	727	762	778	746	90	156	159	184	91
7/11/97	13:35:11	4	678	715	702	590	609	631	660	605	89	150	150	159	90
7/11/97	13:40:31	3	618	607	603	528	546	556	577	562	87	147	145	143	90
7/11/97	13:44:34	2	488	431	471	371	408	412	455	413	86	147	142	125	89

7/11/97 8 cyl gas baseline w/gen II pistons @020, 9200's @ 8deg.

WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMPS	EXC VOL
159	159	184	194	109	122	81	32	15.4	0.64	60.19	100.88	21.48	722	1277	0
164	164	201	209	119	133	82	32	15.7	0.57	60.7	100.26	21.69	714	1273	0
162	164	203	213	122	136	82	32	15.4	0.53	59	100.6	20.9	686	1226	0
160	161	201	212	122	138	82	32	15.2	0.61	56.65	101.94	19.4	626	1121	0
163	163	204	214	125	139	82	32	12.3	0.51	52.24	102.41	19.08	625	1119	0
161	161	203	214	125	140	83	32	12	0.58	49.2	103.12	17.39	557	1003	0
158	157	201	213	126	140	83	32	11.5	0.63	46.35	104.5	15.55	484	870	0
158	158	201	212	125	140	84	32	9.8	0.59	43.56	104.36	15.15	482	870	0
164	164	202	214	125	140	84	32	12.7	0.51	52.63	101.7	19.98	685	1220	0
167	166	203	216	126	139	85	32	9.6	0.4	45.96	101.92	19.48	691	1228	0
162	162	200	213	124	140	86	32	9.3	0.46	41.37	103.79	16.79	624	1117	0
159	158	197	209	124	139	87	32	9.1	0.35	38.2	104.64	14.9	559	1005	0
159	159	194	205	124	136	87	32	7	0.45	35.43	105.39	14.67	560	1006	0
156	156	191	202	121	136	87	32	6.2	0.37	31.05	106.22	12.36	485	871	0
156	156	188	198	122	134	87	32	4.3	0.41	24.89	107.82	9.93	395	710	0
159	159	189	201	118	132	87	32	7.2	0.3	34.61	106	14	578	1037	0
156	156	185	198	115	130	86	32	4.9	0.39	24.6	108.05	9.85	484	872	0
156	156	182	195	113	129	86	32	3.6	0.31	19.63	109.42	7.15	425	759	0
156	155	180	190	110	127	86	32	1.9	0.22	14.59	110.17	4.58	303	550	0

7/11/97 8 cyl gas baseline w/gen ii pistons @020, 9200's @ 8deg.

MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS
1.836	1.817	893.2	0	4.96	0	-0.03	0.54	0	0	1317	7561	0.029	171.2	0
1.839	1.827	900.7	0	4.96	0	-0.04	0.54	0	0	1298	7625	0.026	171.7	0
1.841	1.823	900.1	0	4.96	0	-0.03	0.55	0	0	1201	7951	0.026	165.9	0
1.841	1.803	900.9	0	4.96	0	-0.03	0.52	0	0	1002	9073	0.036	155.8	0
1.841	1.831	898.8	0	4.96	0	-0.03	0.5	0	0	999	8884	0.03	153.8	0
1.841	1.831	900.5	0	4.96	0	-0.03	0.53	0	0	798	10354	0.043	141	0
1.841	1.83	899.8	0	4.96	0	-0.03	0.49	0	0	601	12632	0.062	127.6	0
1.841	1.813	899.4	0	4.96	0	-0.03	0.51	0	0	599	12291	0.059	124.2	0
1.841	1.831	832.1	0	4.96	0	-0.03	0.53	0	0	1193	7704	0.025	160.1	0
1.841	1.825	739	0	4.96	0	-0.03	0.5	0	0	1212	7336	0.019	156.4	0
1.842	1.822	737.8	0	4.96	0	-0.03	0.5	0	0	995	7948	0.027	137	0
1.843	1.827	737.9	0	4.96	0	-0.04	0.52	0	0	802	8773	0.026	122.4	0
1.843	1.824	738.1	0	4.96	0	-0.04	0.56	0	0	804	8775	0.033	121.4	0
1.844	1.832	738.2	0	4.96	0	-0.03	0.53	0	0	603	9905	0.036	103	0
1.844	1.832	738.2	0	4.96	0	-0.03	0.55	0	0	400	12457	0.061	83.8	0
1.844	1.832	665.9	0	4.96	0	-0.03	0.55	0	0	856	7735	0.021	116.4	0
1.805	1.802	570.4	0	4.96	0	-0.02	0.51	0	0	602	8193	0.038	83.3	0
1.807	1.803	498.9	0	4.97	0	-0.03	0.5	0	0	460	7927	0.04	61.1	0
1.809	1.805	386.6	0	4.97	0	-0.03	0.44	0	0	238	9976	0.055	39.4	0

7/11/97 8 cyl gas baseline w/gen II pistons @020, 9200's @ 8deg.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
3	7/11/97	11:50:16	8	824	869	829	823	863	818	815	816	84	128	131	243	84
4	7/11/97	12:03:12	8	818	855	825	823	839	814	803	810	85	142	146	258	101
5	7/11/97	12:08:48	8	791	813	793	793	824	785	773	773	89	145	150	263	103
6	7/11/97	12:11:48	8	741	712	692	727	759	703	683	704	88	147	155	263	103
7	Air throttled															
8	7/11/97	12:18:05	8	817	847	810	819	849	810	785	807	89	149	151	279	103
9	7/11/97	12:22:30	8	741	737	720	751	775	720	697	731	88	149	156	278	103
10	7/11/97	12:26:17	8	665	643	627	679	659	648	614	648	89	149	158	277	103
11	air throttled															
12	7/11/97	12:30:20	8	703	684	667	713	719	687	658	687	89	147	155	280	102
13	7/11/97	12:37:30	7	822	897	854	793	823	824	822	814	87	140	140	235	103
14	7/11/97	12:45:12	6	886	1002	959	865	847	892	921	905	87	131	126	206	104
15	7/11/97	12:53:02	6	781	865	840	745	764	778	804	785	89	129	127	205	104
16	7/11/97	12:57:20	6	700	738	737	640	686	681	707	678	91	130	130	204	104
17	air throttled															
18	7/11/97	13:07:00	6	805	850	829	746	779	792	805	794	90	128	126	217	99
19	7/11/97	13:14:03	6	711	736	735	650	698	705	714	695	90	128	128	219	97
20	7/11/97	13:20:26	6	700	677	671	614	664	651	671	647	89	126	120	220	95
21	7/11/97	13:29:33	5	769	856	827	709	727	762	778	746	90	156	159	184	91
22	7/11/97	13:35:11	4	678	715	702	590	609	631	660	605	89	150	150	159	90
23	7/11/97	13:40:31	3	618	607	603	528	546	556	577	562	87	147	145	143	90
24	7/11/97	13:44:34	2	488	431	471	371	408	412	455	413	86	147	142	125	89

8/14 data 9250 @ 4 ATDC and DF inj @ 4 BTDC

WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMPS	EXC VOL
152	145	197	206	116	127	67	32	15.1	0.93	53.59	105.74	19.4	705	1281	0
156	131	202	213	116	130	68	32	15	0.85	52.49	106.7	18.6	680	1237	0
153	139	202	214	119	132	69	32	14.8	0.87	50.56	107.52	17.17	614	1131	0
150	133	202	214	121	133	69	32	14.5	0.86	48.61	107.66	15.92	551	1016	0
159	131	200	212	120	133	69	32	14.2	0.86	46.67	108.53	14.52	476	880	0
153	166	202	215	121	134	70	32	12.3	0.78	46.32	106.75	17.93	679	1238	0
156	172	204	216	118	133	70	32	9.1	0.63	40.24	106.54	17.48	678	1241	0
153	165	204	215	119	133	70	32	9	0.6	36.14	108.27	14.95	613	1133	0
149	156	201	214	120	133	71	32	8.8	0.7	33.25	109.87	12.78	550	1016	0
158	157	196	208	119	132	71	32	8.6	0.72	30.87	110.36	11.05	477	880	0
155	155	194	205	118	132	71	32	8.3	0.66	28.72	111.48	9.89	387	712	0
154	159	198	210	117	132	71	32	10.5	0.69	44.56	105.29	19.03	715	1298	0
176	176	223	233	94	115	72	32	18.6	10.93	-0.13	15.65	0.06	811	1419	0
179	195	234	245	94	115	73	32	14.8	9.73	-0.13	15.56	0.05	771	1382	0
WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMPS	EXC VOL
160	160	203	215	125	143	63	32	15.4	0.48	55.15	104.99	19.45	696	1286	0
158	158	204	214	127	142	63	32	15.2	0.48	54.15	105.37	19.07	674	1254	0
157	157	203	215	128	141	63	32	15	0.48	51.9	106	17.63	608	1144	0
156	156	202	213	127	142	63	32	14.7	0.48	50.27	106.85	16.4	545	1025	0
161	161	201	213	124	142	64	32	9.4	0.45	40.3	106.67	17.13	671	1250	0
159	158	200	213	125	141	64	32	9.2	0.38	36.86	107.61	15.14	612	1143	0
155	154	197	209	122	140	64	32	9	0.38	34.4	108.56	13.29	547	1021	0
150	150	193	205	121	137	65	32	8.8	0.38	32.28	109.33	11.8	474	884	0
152	165	203	214	122	138	65	32	15.2	0.44	55.54	103.5	20.86	702	1286	0
147	160	203	215	125	141	66	32	15.1	0.54	55	103.79	20.35	671	1250	0
159	158	203	214	125	141	66	32	14.9	0.55	53.04	105.16	19	614	1145	0

8/14 data 9250 @ 4 ATDC and DF inj @ 4 BTDC

MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE PO	BTU/ HP-H	DIES #/ HP-	SCFM GA	SCFM2 GAS
1.801	1.799	900.1	0	4.95	0	0	0.51	0	0	1290	7582	0.043	160.9	0
1.802	1.797	898.9	0	4.95	0	0	0.51	0	0	1200	7880	0.042	155.4	0
1.801	1.796	899.2	0	4.95	0	0	0.51	0	0	1000	8850	0.052	144.5	0
1.8	1.791	900	0	4.95	0	0	0.51	0	0	8000	10260	0.064	134.1	0
1.798	1.796	899.2	0	4.95	0	0	0.54	0	0	6000	12750	0.086	123.2	0
1.801	1.793	832	0	4.95	0	0	0.54	0	0	1200	7480	0.039	149.9	0
1.802	1.792	738.1	0	4.95	0	0	0.54	0	0	1200	7162	0.031	145.9	0
1.803	1.796	738.3	0	4.95	0	0	0.51	0	0	1000	7560	0.036	126.5	0
1.802	1.794	737.5	0	4.95	0	0	0.52	0	0	800	8420	0.052	109.6	0
1.801	1.797	737.8	0	4.96	0	0	0.53	0	0	600	9913	0.072	95.1	0
1.8	1.798	737.7	0	4.96	0	0	0.52	0	0	400	13600	0.1	85.9	0
1.801	1.799	738	0	4.95	0	0	0.52	0	0	1325	6981	0.031	157.2	0
0.726	0.733	889.3	0	4.95	0	0	0.51	0	0	1650	7390	0.398	0	0
0.858	0.866	887.6	0	4.95	0	0	0.53	0	0	1525	7096	0.383	0	0
MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE PO	BTU/ HP-H	DIES #/ HP-	SCFM GA	SCFM2 GAS
1.766	1.626	899	0	4.95	0	0.01	0.38	0	0	1278	7233	0.023	160.4	0
1.767	1.771	899.2	0	4.95	0	0.01	0.44	0	0	1200	7539	0.023	157.8	0
1.766	1.739	899.7	0	4.95	0	0	0.39	0	0	1000	8500	0.028	146.6	0
1.765	1.7	899.2	0	4.95	0	0	0.41	0	0	800	9945	0.038	137.3	0
1.766	1.753	738.5	0	4.96	0	0.01	0.42	0	0	1200	6875	0.022	143.2	0
1.768	1.72	738.1	0	4.96	0	0.01	0.41	0	0	1000	7254	0.019	127.6	0
1.767	1.717	738.5	0	4.96	0	0	0.42	0	0	800	8150	0.027	112.8	0
1.766	1.771	739.1	0	4.96	0	0.01	0.43	0	0	600	9871	0.042	100.8	0
1.767	1.771	900	0	4.96	0	0.01	0.42	0	0	1290	7515	0.02	169.9	0
1.768	1.771	899.2	0	4.96	0	0.01	0.45	0	0	1200	7932	0.026	166	0
1.768	1.771	899.1	0	4.96	0	0.01	0.43	0	0	1000	9042	0.032	156.8	0

DF base and spark prechamber data 7-9,98

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
3	8/18/98	13:18:26	8	824	875	895	837	792	836	798	812	574	169	177	234	77
4	8/18/98	13:20:24	8	844	878	875	838	775	835	780	810	598	170	179	244	80
5	8/18/98	13:21:50	8	836	861	852	825	729	811	747	798	590	170	181	247	83
6	8/18/98	13:23:40	8	818	842	831	815	676	780	710	776	574	171	183	249	86
7	8/18/98	13:24:43	8	774	782	817	811	630	653	689	768	555	170	183	249	88
8	8/18/98	13:25:53	8	758	741	787	789	585	589	639	733	531	170	182	249	90
9	8/18/98	13:26:40	8	708	698	772	752	543	546	604	685	507	170	183	249	91
10	8/18/98	13:27:35	8	660	653	744	710	494	498	560	643	481	169	182	249	92
11	8/18/98	13:28:29	8	607	642	695	636	445	513	524	591	450	168	181	249	92
12	8/18/98	13:29:24	8	578	599	660	567	415	477	493	529	424	168	181	249	92
13	8/18/98	13:30:35	8	545	528	627	513	393	438	462	465	385	167	180	249	93
14	8/18/98	13:31:30	8	482	479	589	476	353	405	426	424	356	166	180	249	93
15	8/18/98	13:32:47	8	341	348	416	356	280	309	341	316	294	164	178	249	92
16	8/18/98	13:47:24	8	836	870	915	857	788	818	845	831	626	163	176	270	87
17	8/18/98	13:48:59	8	761	809	878	826	676	720	796	787	600	164	178	271	88
18	8/18/98	14:52:31	8	352	361	401	349	317	331	354	322	300	186	200	249	74
19	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
20	8/19/98	15:55:41	4	563	558	574	512	477	526	513	540	434	138	143	128	78
21	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
22	8/24/98	15:30:45	6	792	882	809	846	762	810	789	822	603	152	160	198	93
23																
24	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
25	8/25/98	12:50:36	2	555	542	542	532	574	536	558	546	383	104	117	104	77
26	8/25/98	13:12:16	8	775	799	687	708	780	786	715	740	502	155	174	245	88
27	8/25/98	14:29:46	8	752	775	726	737	770	780	719	737	192	158	172	248	78
28	8/25/98	14:32:22	8	773	796	730	729	785	796	731	749	182	129	141	249	85
29	8/25/98	14:33:25	8	786	825	770	771	805	819	762	776	183	125	139	249	89
30	8/25/98	14:35:06	8	851	900	854	866	884	894	848	860	224	123	135	249	92
31	8/25/98	14:35:14	8	851	897	853	869	881	892	848	862	240	123	135	250	92
32	8/25/98	14:42:56	8	771	813	769	778	801	819	766	786	557	131	145	251	100
33	8/25/98	14:43:28	8	771	819	783	789	804	819	771	789	568	132	147	252	100
34																
35	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
36	8/26/98	13:38:12	6	853	878	860	853	771	833	812	831	654	149	159	199	76
37	8/26/98	13:38:59	6	859	876	859	858	788	833	810	834	658	149	159	201	77
38	8/26/98	13:58:26	6	765	834	812	800	707	782	750	773	613	153	162	206	91
39	8/26/98	14:26:45	6	763	851	816	792	711	799	756	786	617	156	166	209	97
40	8/26/98	14:47:21	8	665	694	656	651	669	678	627	653	479	172	186	260	101
41	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
42	8/27/98	13:30:11	4	737	739	726	717	685	705	705	730	550	132	143	135	77
43	8/27/98	14:07:38	4	571	595	599	588	534	559	563	602	468	138	140	141	78

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
44	8/27/98	14:21:43	4	631	655	658	639	590	629	619	653	502	140	140	142	79
45	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
46	8/27/98	14:25:00	4	611	641	644	624	571	613	601	634	497	138	140	141	78
47	8/27/98	14:39:37	6	668	760	770	745	651	697	687	712	554	152	159	197	89
48	8/27/98	14:45:45	6	635	725	731	704	615	661	642	672	530	154	162	198	93
49	8/27/98	14:56:27	8	635	692	703	687	637	615	591	639	478	174	188	256	99
50	8/27/98	14:58:01	8	632	687	701	687	635	615	591	639	477	175	190	258	100
51	8/27/98	15:00:38	8	635	692	703	685	636	620	592	637	480	176	190	259	98
52	8/27/98	15:04:09	8	638	688	708	684	634	618	602	639	480	176	190	261	97
53	8/27/98	15:19:57	8	644	676	655	678	630	602	561	634	465	140	156	258	99
54	8/27/98	15:42:54	6	572	698	699	665	622	683	641	661	513	135	145	204	99
55																
56	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
57	9/1/98	14:36:18	4	639	622	606	611	561	615	587	635	482	129	140	140	78
58	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
59	9/16/98	11:18:46	4	591	661	635	635	561	613	607	635	486	124	132	128	67
60	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
61	9/18/98	14:37:23	6	833	905	902	876	827	872	836	873	680	154	161	194	90
62	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
63	9/22/98	13:26:39	7	849	953	919	917	831	878	851	866	662	158	170	223	91
64	9/22/98	13:32:16	8	844	929	845	838	832	862	779	827	624	172	186	253	98
65	9/22/98	13:45:19	8	732	771	798	728	722	740	725	712	549	179	191	257	99
66																
67	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT	GAS T
68	9/23/98	13:47:13	6	745	775	775	757	734	735	728	718	586	149	156	190	79
69	9/23/98	13:58:49	8	845	894	868	854	838	848	817	828	624	172	187	259	97
70	9/23/98	14:10:34	8	680	709	725	705	665	683	664	666	502	178	192	257	100
71	9/23/98	14:12:24	8	713	748	764	740	704	720	697	703	522	178	191	257	100

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1																
2	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
3	159	171	171	188	114	124	67	32	15.9	0.98	34.22	95.61	26.5	757	1297	0
4	158	170	171	189	115	126	67	32	15.8	0.85	32.76	97.33	25.46	728	1245	0
5	157	168	171	188	117	128	67	32	15.8	0.86	31.92	97.25	24.69	699	1199	0
6	158	168	170	189	119	129	67	32	15.7	0.9	31.15	97.59	24.02	671	1149	0
7	156	167	169	188	119	129	67	32	15.7	0.86	30.81	98.58	23.37	640	1095	0
8	155	166	168	187	120	130	67	32	15.5	0.89	30.25	98.12	22.98	606	1041	0
9	154	164	168	186	120	131	67	32	15.5	0.88	29.69	98.15	22.46	570	981	0
10	153	163	167	186	122	131	67	32	15.4	0.91	29.09	99.2	21.75	533	919	0
11	151	161	165	184	121	130	67	32	15.2	0.97	28.29	99.02	21.24	495	853	0
12	149	159	163	183	120	130	67	32	15.1	0.92	27.59	99.76	20.64	451	776	0
13	147	158	162	182	122	131	67	32	14.8	0.92	26.59	99.36	20.09	403	694	0
14	144	155	160	180	122	132	67	32	14.6	0.87	25.64	100.04	19.35	349	603	0
15	152	152	158	178	122	131	67	32	14	0.84	21.72	102.04	14.77	10	10	0
16	159	159	160	176	121	129	67	32	11.3	0.95	26.15	98.76	21.29	641	1099	0
17	159	159	161	178	121	129	67	32	11	0.92	23.89	99.81	19.3	572	982	0
18	189	190	188	192	119	130	69	32	13.7	2.27	13.02	110.6	-0.28	10	10	0
19	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
20	161	161	157	162	78	120	78	32	3.2	0.03	13.89	103.45	8.41	403	695	0
21	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
22	158	158	159	179	77	122	77	32	9.4	0.05	20.89	96.34	24.05	660	1126	0
23																
24	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
25	139	139	128	132	77	113	78	32	0.4	0.01	3.59	104.73	3.67	294	508	0
26	159	158	159	176	79	114	79	32	15.9	0.07	32.39	93.4	28.66	653	1111	0
27	159	159	159	176	78	122	79	32	15.4	0.05	31.17	101	25.75	681	1162	0
28	159	159	161	179	78	123	78	32	15.3	0.02	32.12	100.24	27.36	707	1203	0
29	160	161	162	181	78	124	78	32	15.5	0.04	33.07	99.44	28.49	733	1247	0
30	151	164	165	184	77	122	78	32	15.5	0.05	34.61	98.65	30.37	744	1266	0
31	150	163	164	183	77	122	78	32	15.6	0.04	34.63	98.73	30.39	746	1270	0
32	151	163	164	185	77	130	78	32	15.6	0.03	32.45	99.73	29.09	756	1284	0
33	152	163	165	186	77	132	78	32	15.6	0.02	32.48	99.95	29.03	760	1291	0
34																
35	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
36	148	159	159	177	66	126	66	32	5.5	0.04	14.53	106.11	16.91	564	974	0
37	146	158	159	177	66	126	67	32	5.5	0.04	14.58	106.66	16.88	565	974	0
38	158	158	160	181	67	138	67	32	8.5	0.04	19.04	105.12	20.42	625	1073	0
39	159	159	162	184	71	138	70	32	8.5	0.05	21.91	104.81	19.83	622	1069	0
40	155	167	170	190	71	147	71	32	15.1	0.07	26.2	110.56	21.72	639	1096	0
41	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
42	163	164	158	162	78	145	78	32	1.9	0.01	12.36	109.4	9.2	450	774	0
43	150	150	151	171	78	139	78	32	2.6	0.02	10.24	110.08	7.6	400	688	0

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
44	152	152	152	172	78	147	78	32	2.5	0.04	11.54	109.67	8.53	430	741	0
45	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
46	151	151	152	172	77	145	78	32	2.7	0.02	11.86	109.58	8.68	432	744	0
47	159	159	161	182	76	156	76	32	9.2	0.01	20.68	104.54	20.82	638	1091	0
48	160	160	162	184	75	147	76	32	9.2	0.02	18.88	104.61	19.24	607	1038	0
49	161	172	174	194	76	148	77	32	15.2	0.04	26.26	102.85	23.25	641	1094	0
50	163	173	176	195	77	149	77	32	15.1	0.04	26.31	103.16	23.07	639	1092	0
51	161	172	174	197	77	148	77	32	15	0.03	26.08	103.11	22.9	636	1090	0
52	160	171	174	197	76	148	77	32	15.1	0.04	26.05	103.12	22.86	640	1093	0
53	153	162	168	193	76	147	77	32	15	0.03	26.6	102.51	23.61	640	1092	0
54	146	158	163	188	91	177	76	32	8.9	0.02	20.4	104.76	18.07	595	1020	0
55																
56	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
57	156	156	152	157	70	134	70	32	1.7	0.01	9.22	105	7.13	375	648	0
58	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
59	149	149	145	150	67	125	68	32	2.7	0	14.24	95.9	10.08	430	743	0
60	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
61	162	162	162	183	67	119	67	32	9.6	0.02	32.01	103.39	22.2	664	1138	0
62	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
63	152	166	166	183	62	115	63	32	13.2	0.05	33.01	102.35	27.19	724	1243	0
64	164	174	174	192	63	113	64	32	16.1	0.05	41.43	103.12	26.09	694	1191	0
65	166	176	179	201	64	125	64	32	15.5	0.05	37.02	104.06	23.24	684	1174	0
66																
67	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT	MG AMP	EXC VOL
68	156	156	158	178	65	127	66	32	9.6	0.04	29.77	106.56	18.99	638	1096	0
69	162	173	173	192	65	116	65	32	15.7	0.04	36.77	101.37	27.11	702	1203	0
70	164	175	178	199	66	139	67	32	15.2	0.03	31.19	103.88	22.7	668	1148	0
71	165	176	178	200	66	138	67	32	15.4	0.02	33.01	103.14	24.11	700	1201	0

	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1																
2	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
3	1.815	0.61	902.4	0	4.95	0	-0.07	0.38	0	0	1402	8526	0.041	201.2	0	
4	1.82	0.61	902.4	0	4.95	0	-0.07	0.38	0	0	1294	8916	0.039	196.2	0	
5	1.82	0.61	902.7	0	4.95	0	-0.06	0.37	0	0	1197	9382	0.043	190.1	0	
6	1.821	0.61	903.4	0	4.95	0	-0.07	0.38	0	0	1101	10006	0.049	185.5	0	
7	1.821	0.61	903.6	0	4.95	0	-0.07	0.37	0	0	1001	10809	0.051	182.1	0	
8	1.82	0.61	902.1	0	4.95	0	-0.07	0.37	0	0	899	11810	0.059	178.3	0	
9	1.82	0.61	903.3	0	4.95	0	-0.07	0.38	0	0	798	13062	0.066	174.2	0	
10	1.819	0.61	903.7	0	4.96	0	-0.06	0.36	0	0	699	14600	0.078	170.2	0	
11	1.819	0.61	904.3	0	4.95	0	-0.07	0.37	0	0	603	16654	0.096	166	0	
12	1.818	0.61	905	0	4.96	0	-0.06	0.38	0	0	499	19619	0.11	162.3	0	
13	1.818	0.61	905.2	0	4.95	0	-0.07	0.36	0	0	399	23876	0.138	157.5	0	
14	1.817	0.61	905.3	0	4.95	0	-0.07	0.38	0	0	300	30760	0.174	153	0	
15	1.818	0.61	905.7	0	4.96	0	-0.07	0.36	0	0	0	0	0	118.8	0	
16	1.82	0.61	905.4	0	4.95	0	-0.07	0.29	0	0	1006	9967	0.056	166.1	0	
17	1.821	0.61	905	0	4.95	0	-0.07	0.29	0	0	802	11509	0.068	152	0	
18	1.654	0.61	897.8	0	4.96	0	-0.07	0.37	0	0	0	0	0	0	0	
19	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
20	1.789	0.61	505.4	0	4.96	0	-0.08	0.29	0	0	400	9343	0	68.6	0	
21	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
22	1.818	0.61	739.7	0	4.96	0	-0.08	0.33	0	0	1061	9395	0	183.5	0	
23																
24	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
25	1.79	0.61	385.6	0	4.96	0	-0.07	0.32	0	0	213	7722	0	30.2	0	
26	1.826	0.61	908.7	0	4.96	0	-0.07	0.38	0	0	1036	11183	0	213.1	0	
27	1.827	0.61	904.4	0	4.96	0	-0.07	0.28	0	0	1130	9878	0	205.6	0	
28	1.827	0.61	905.9	0	4.96	0	-0.07	0.26	0	0	1215	9659	0	216.9	0	
29	1.827	0.61	904.1	0	4.95	0	-0.08	0.28	0	0	1305	9289	0	223.6	0	
30	1.825	0.61	900.9	0	4.95	0	-0.08	0.26	0	0	1345	9541	0	236.6	0	
31	1.825	0.61	901.5	0	4.96	0	-0.07	0.28	0	0	1353	9490	0	236.9	0	
32	1.825	0.61	904.9	0	4.95	0	-0.08	0.31	0	0	1386	8932	0	228.6	0	
33	1.825	0.61	905	0	4.96	0	-0.08	0.32	0	0	1401	8827	0	228.6	0	
34																
35	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
36	1.84	0.61	739.6	0	4.95	0	-0.07	0.33	0	0	784	9770	0	141	0	
37	1.846	0.61	739.9	0	4.95	0	-0.07	0.36	0	0	786	9811	0	141.4	0	
38	1.827	0.61	739.9	0	4.95	0	-0.07	0.41	0	0	958	9550	0	168.6	0	
39	1.827	0.61	740	0	4.95	0	-0.07	0.38	0	0	949	9351	0	163.3	0	
40	1.825	0.61	905.2	0	4.95	0	-0.07	0.38	0	0	1000	10194	0	187.3	0	
41	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
42	1.788	0.61	506.2	0	4.96	0	-0.06	0.27	0	0	497	8534	0	78.8	0	
43	1.788	0.61	505.5	0	4.96	0	-0.07	0.31	0	0	393	9052	0	65.4	0	

	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
44	1.789	0.61	506.3	0	4.96	0	-0.07	0.29	0	0	455	8789	0	73.2	0	
45	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
46	1.791	0.61	506.9	0	4.96	0	-0.07	0.3	0	0	459	8809	0	74.4	0	
47	1.827	0.61	738.9	0	4.95	0	-0.07	0.3	0	0	994	9318	0	171	0	
48	1.828	0.61	739.5	0	4.95	0	-0.07	0.29	0	0	900	9516	0	158.2	0	
49	1.826	0.61	904.9	0	4.96	0	-0.08	0.3	0	0	1001	10197	0	188.2	0	
50	1.826	0.61	905.4	0	4.96	0	-0.07	0.28	0	0	996	10195	0	187.2	0	
51	1.827	0.61	904.9	0	4.96	0	-0.07	0.32	0	0	990	10174	0	185.9	0	
52	1.827	0.61	905	0	4.95	0	-0.08	0.32	0	0	999	10077	0	185.6	0	
53	1.827	0.61	905.4	0	4.95	0	-0.07	0.25	0	0	998	10352	0	190.7	0	
54	1.825	0.61	739.2	0	4.95	0	-0.07	0.3	0	0	867	9283	0	148.6	0	
55																
56	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
57	1.791	0.61	506.5	0	4.96	0	-0.07	0.31	0	0	347	9200	0	58.9	0	
58	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
59	1.792	0.61	506.8	0	4.95	0	-0.07	0.24	0	0	456	9094	0	76.8	0	
60	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
61	1.827	0.61	739.4	0	4.95	0	-0.08	0.3	0	0	1079	9062	0	180.6	0	
62	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
63	1.83	0.61	833.8	0	4.95	0	-0.07	0.35	0	0	1285	9260	0	219.3	0	
64	1.831	0.61	903.2	0	4.95	0	-0.07	0.31	0	0	1180	9766	0	211.8	0	
65	1.826	0.61	901.8	0	4.95	0	-0.07	0.34	0	0	1147	9003	0	190.2	0	
66																
67	MAIN RA	PILOT RA	RPM	TURBO R	REF V	FAN HP	DIFF2 PR	SPLY2 PRS			HORSE P	BTU/ HP-	DIES #/ H	SCFM GA	SCFM2 GAS	
68	1.829	0.61	739.6	0	4.95	0	-0.07	0.23	0	0	998	8646	0	158.9	0	
69	1.83	0.61	904.2	0	4.95	0	-0.07	0.25	0	0	1206	9746	0	216.8	0	
70	1.827	0.61	904.7	0	4.95	0	-0.08	0.29	0	0	1095	9171	0	185.3	0	
71	1.826	0.61	907.8	0	4.95	0	-0.07	0.27	0	0	1201	8815	0	195.6	0	

10/21/96 emis 645 Diesel only Gen II at .020 9200's

date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
10/21/96	11:42:31	0	0	0	0	773	1312	883.8	8.85	1.9	-1.99	64
10/21/96	11:48:05	0	0	0	0	702	1200	883	7.54	1.9	-1.45	65
10/21/96	11:53:49	0	0	0	0	642	1097	884.5	6.54	1.8	-1.36	66
10/21/96	12:01:29	0	0	0	0	571	982	886.6	5.63	1.9	-1.39	66
10/21/96	12:07:27	0	0	0	0	493	853	890.2	4.74	1.9	-1.4	67
10/21/96	12:13:03	0	0	0	0	402	696	892.5	3.87	1.8	-1.44	69
10/21/96	12:21:05	0	0	0	0	693	1187	822.9	7.24	1.8	-1.87	70
10/21/96	12:28:12	0	0	0	0	636	1097	729	6.2	1.8	-1.37	71
10/21/96	12:36:04	0	0	0	0	571	982	728.7	5.09	1.8	-1.93	72
10/21/96	12:42:53	0	0	0	0	492	852	729.6	4.1	1.5	-2.05	72
10/21/96	12:50:44	0	0	0	0	403	699	729.3	3.15	1.6	-1.93	69
10/21/96	13:01:26	0	0	0	0	589	1015	657.3	5.35	1.5	-1.27	68
10/21/96	13:07:52	0	0	0	0	496	857	562.2	3.9	1.2	-1.96	66
10/21/96	13:15:26	0	0	0	0	429	744	491.8	2.95	1.1	-1.43	66
10/21/96	13:23:02	0	0	0	0	310	537	367.8	1.65	0	-1.55	66
10/21/96	13:35:56	0	0	0	0	249	433	307.3	1.09	0	120.51	68

10/21/96 emis 645 Diesel only Gen II at .020 9200's

AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
69	30.4	2.97	0	0	55	72	34	5.3	3323	13.9	1450	0
74	30.3	3.09	0	0	55	74	29	4.4	2706	15.1	1200	0
71	30.4	3.22	0	0	55	71	28	3.7	2169	16	1000	0
69	30.4	3.31	0	0	55	66	29	3.1	1635	16.9	800	0
71	30.3	3.37	0	0	55	66	33	2.5	1164	17.6	600	0
74	30.3	3.42	0	0	55	65	39	2	782	18.3	400	0
75	30.4	2.34	0	0	55	73	29	4.8	3038	14.6	1175	0
74	30.3	1.65	0	0	55	79	35	4.8	3010	14.5	1000	0
78	30.3	1.71	0	0	55	90	33	3.9	2304	15.8	800	0
82	30.3	1.83	0	0	55	72	28	2.9	1551	17.1	600	0
70	30.3	1.93	0	0	55	66	36	2.1	938	18.2	400	0
68	30.3	1.28	0	0	55	77	29	4.7	3023	14.8	850	0
67	30.3	0.88	0	0	55	73	29	3.9	2601	15.7	604	0
66	30.3	0.67	0	0	55	73	29	3.4	2226	16.4	450	0
66	30.3	0.36	0	0	55	69	35	2.4	1400	17.7	235	0
68	30.3	0.23	0	0	55	65	40	1.9	1069	18.4	155	0

10/21/96 emis 645 Diesel only Gen II at .020 9200's

AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-	S.Hmid	CJCT
5074	531.5	0.02312	0.024	326	314	48757	0.226	0.217	33.719	6784	49.2	6.4
5147	451.8	0.01941	0.02009	334	274	40555	0.278	0.228	33.711	6957	51	6.5
5274	392.4	0.01646	0.01701	345	273	33986	0.347	0.274	34.156	7216	52.7	6.6
5357	337.7	0.01398	0.01434	325	290	26884	0.406	0.363	33.563	7801	54.6	6.7
5386	284.4	0.01169	0.01164	344	345	19972	0.573	0.575	33.287	8769	56.3	6.8
5420	232.2	0.00948	0.00936	335	415	13560	0.84	1.042	33.987	10766	58.2	6.9
4479	436.1	0.02157	0.02184	300	242	41650	0.254	0.206	35.357	6839	60	7
3765	372.5	0.0219	0.02184	277	250	35372	0.277	0.25	35.372	6909	62.3	7.1
3811	305.3	0.01766	0.01791	318	237	27158	0.398	0.297	33.99	7071	64.7	7.2
3954	247.7	0.01395	0.01344	274	220	20058	0.458	0.368	33.543	7585	67.2	7.3
4073	188.4	0.01023	0.00982	267	296	12775	0.668	0.741	31.939	8697	58.2	6.9
3334	320.3	0.0213	0.0214	234	182	30880	0.274	0.213	36.159	6953	54.6	6.8
2755	230.3	0.01844	0.0179	200	157	22799	0.331	0.26	37.685	7155	54.6	6.7
2413	176.3	0.01618	0.01568	171	138	17409	0.376	0.304	38.263	7196	52.7	6.6
1770	96.6	0.01207	0.01118	125	129	8559	0.529	0.546	36.115	7727	52.7	6.6
1411	63	0.00988	0.00891	97	121	5391	0.631	0.79	35.012	7856	56.3	6.8

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
2	Diesel std. air 9 deg. timing												
3	10/22/96	13:28:18	8	0	0	0	774	1308	893	9	0.05	127.52	69
4	10/22/96	13:38:26	8	0	0	0	570	980	892.9	5.64	0.07	127.56	70
5	10/22/96	13:52:03	6	0	0	0	637	1095	730.6	6.24	0.05	127.51	70
6													
7	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
8	Gas std. air 9 deg. timing												
9	10/22/96	14:05:00	6	0	0	0	640	1097	738.4	0.44	12.88	118.28	70
10	10/22/96	14:15:24	6	0	0	0	637	1094	739.1	0.44	13.14	118.14	72
11	10/22/96	14:19:05	6	0	0	0	571	982	738.8	0.45	11.52	116.62	71
12	Gas cold air 9 deg. timing												
13	10/22/96	14:32:43	6	0	0	0	703	1199	738.4	0.49	16.05	117.16	72
14	10/22/96	14:36:04	6	0	0	0	636	1086	749	0.47	14.22	118.6	71
15	Gas std. air 4 deg. timing												
16	10/22/96	14:58:40	6	0	0	0	703	1198	738.8	0.41	16.66	116.44	70
17	10/22/96	15:03:49	6	0	0	0	404	699	738.8	0.48	9.67	120.28	70
18	Gas cold air 4 deg. timing												
19	10/22/96	15:11:41	6	0	0	0	571	982	738.9	0.47	12.95	118.68	75
20	10/22/96	15:13:55	6	0	0	0	493	848	738.8	0.47	11.45	119.51	77
21													
22	Diesel cold air 4 deg. BTDC												
23	10/22/96	15:32:49	8	0	0	0	775	1308	888.3	8.85	0.06	127.43	71
24	10/22/96	15:35:38	8	0	0	0	701	1197	891.2	7.44	0.07	127.74	71
25	10/22/96	15:37:58	8	0	0	0	638	1094	889.1	6.47	0.06	127.72	71
26	10/22/96	15:40:35	8	0	0	0	571	981	889.3	5.59	0.07	127.78	72
27	10/22/96	15:43:27	8	0	0	0	494	851	889.3	4.7	0.07	127.47	72
28	10/22/96	15:49:33	8	0	0	0	403	695	892.2	3.84	0.13	127.6	71
29	10/22/96	15:19:12	6	0	0	0	637	1094	730	6.15	0.06	127.16	71
30	10/22/96	15:23:11	6	0	0	0	569	980	729.4	5.02	0.06	127.4	71
31	10/22/96	15:26:59	6	0	0	0	494	851	730.8	4.04	0.06	127.4	71

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
2													
3	78	30.3	2.86	0	0	55	86	41	5.4	3217	13.7	1450	0
4	74	30.2	3.25	0	0	55	72	29	3.1	1623	16.9	800	0
5	72	30.2	1.64	0	0	55	80	38	4.9	2951	14.5	1000	0
6													
7	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
8													
9	72	30.3	1.66	0	0	55	255	869	4.9	1027	14.5	1000	118.6
10	72	30.2	1.66	0	0	55	246	854	4.9	1020	14.5	1000	120.8
11	75	30.2	1.72	0	0	55	327	991	3.9	715	15.8	800	104.7
12													
13	73	30.2	1.62	0	0	55	229	1312	6	993	13	1200	146.5
14	77	30.2	1.72	0	0	55	221	1474	6.5	1042	12.3	1000	131.2
15													
16	74	30.3	1.64	0	0	55	209	1232	6.4	909	12.4	1200	151.3
17	73	30.2	1.86	0	0	55	664	1150	2.5	237	17.7	400	90.3
18													
19	73	30.2	1.69	0	0	55	446	1188	4.3	408	15.3	800	119.4
20	72	30.2	1.79	0	0	55	587	1223	3.3	261	16.6	600	106.2
21													
22													
23	75	30.2	2.9	0	0	55	66	41	5.2	1741	14	1450	0
24	75	30.2	2.99	0	0	55	62	34	4.2	1422	15.4	1200	0
25	76	30.2	3.15	0	0	55	63	36	3.5	1155	16.3	1000	0
26	76	30.2	3.23	0	0	55	61	39	2.9	875	17.1	800	0
27	75	30.2	3.32	0	0	55	56	42	2.4	627	17.9	600	0
28	76	30.2	3.4	0	0	55	55	50	1.9	445	18.5	400	0
29	71	30.2	1.69	0	0	55	67	48	4.6	1535	14.8	1000	0
30	73	30.2	1.78	0	0	55	63	41	3.6	1180	16.2	800	0
31	72	30.2	1.88	0	0	55	60	42	2.8	805	17.3	600	0

10/22/96 emis 645 gas and diesel

HC CO NOX

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1	AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-	S.Hmid	CJCT
2													
3	4929	539.4	0.02406	0.02444	388	377	47879	0.268	0.26	33.065	6889	58.2	6.9
4	5266	337.7	0.01424	0.01434	359	290	26547	0.45	0.364	33.226	7845	60	7
5	3747	373.8	0.02192	0.02228	279	267	33941	0.279	0.267	33.975	6954	60	7
6													
7	AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-	S.Hmid	CJCT
8													
9	3770	27.6	0.00162	0.02273	63	441	867	0.063	0.44	0.864	6872	60	7
10	3770	325.9	0.01906	0.02479	725	4462	8810	0.726	4.466	8.818	7051	62.3	7.1
11	3827	289.9	0.01668	0.02033	1063	5728	6796	1.33	7.17	8.506	7686	62.3	7.1
12													
13	3718	393.3	0.02342	0.02982	663	6735	8322	0.552	5.608	6.93	7025	62.3	7.1
14	3820	393.3	0.02288	0.03201	564	7002	8041	0.501	6.224	7.148	7338	62.3	7.1
15													
16	3740	406	0.02417	0.03148	576	6144	7343	0.481	5.124	6.124	7199	60	7
17	3987	249.5	0.01384	0.01389	2799	8596	2934	6.945	21.331	7.28	13434	62.3	7
18													
19	3801	322.7	0.01878	0.02233	1456	6900	3869	1.822	8.636	4.843	8705	62.3	7.1
20	3915	286.5	0.01618	0.01776	2195	8085	2831	3.683	13.565	4.751	10488	62.3	7.1
21													
22													
23	4968	532.1	0.02379	0.02357	291	386	26909	0.201	0.266	18.558	6821	64.7	7.2
24	5046	447	0.01955	0.01922	308	333	22986	0.257	0.278	19.187	6893	64.7	7.2
25	5174	388.1	0.01655	0.01612	296	357	19367	0.297	0.358	19.445	7203	64.7	7.2
26	5240	334.2	0.01412	0.01344	307	413	15312	0.384	0.517	19.14	7756	64.7	7.2
27	5326	282	0.01173	0.01118	302	453	11198	0.502	0.753	18.602	8695	64.7	7.2
28	5376	232.2	0.00962	0.0089	303	561	8198	0.759	1.406	20.547	10656	64.7	7.2
29	3808	366.6	0.02126	0.02097	237	352	18529	0.238	0.353	18.566	6860	62.3	7.1
30	3904	302.9	0.01711	0.01657	239	317	15147	0.3	0.397	18.957	7000	62.3	7.1
31	4012	242.9	0.01335	0.01299	235	335	10690	0.392	0.559	17.847	7486	62.3	7.1

8 cyl emis 11/06/96 900R's gas data w 9200 inj's

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
2	Gas Data w/9200 @ 7.5 BTDC													
3	11/6/96	14:52:20	8	0	0	0	635	1102	893.5	0.48	15.57	116.11	68	70
4	11/6/96	14:55:00	8	0	0	0	671	1160	898.3	0.48	16.58	115.45	68	69
5	11/6/96	14:56:45	8	0	0	0	639	1109	898.9	0.51	16.08	115.78	68	70
6	11/6/96	14:59:40	8	0	0	0	601	1042	893.1	0.57	15.2	116.33	69	71
7	11/6/96	15:02:27	8	0	0	0	569	991	897.4	0.58	14.95	116.6	70	70
8														
9	11/6/96	15:09:37	8	0	0	0	770	1313	889.1	8.98	0.09	127.14	70	70
10														
11	11/6/96	15:16:53	8	0	0	0	636	1103	896.8	0.51	16.25	116.04	72	72
12	11/6/96	15:52:50	8	0	0	0	636	1101	901	0.43	17.43	115.4	64	65

8 cyl emis 11/06/96 900R's gas data w 9200 inj's

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF	AIR SCFM	MasFlo #/
2														
3	30.3	3.03	0	0	36	422	1317	4	502	15.6	999	141	5117	383.1
4	30.3	3.01	0	0	36	370	1250	4.4	552	15.1	1111	149.3	5100	408.5
5	30.2	3.11	0	0	36	432	1292	4.1	486	15.5	1012	145.2	5184	394.2
6	30.3	3.11	0	0	36	494	1305	3.7	399	16	894	137.9	5174	383.3
7	30.2	3.17	0	0	36	553	1285	3.5	346	16.4	805	135.9	5225	372.2
8					Diesel shot									
9	30.3	2.86	0	0	36	85	92	5.4	2830	13.7	1444	0	4966	541.1
10														
11	30.2	3.07	0	0	36	432	1280	4.1	494	15.6	1002	147.1	5127	389
12	30.3	3.05	0	0	36	498	1246	4.3	397	15.2	1000	157	5143	422.1

	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
2											
3	0.0164	0.02233	11596	9154	5393	11.526	9.099	5.361	8157	37.9	6.8
4	0.01757	0.02394	10032	8566	5851	9.038	7.717	5.271	7701	37.9	6.9
5	0.017	0.02283	12036	9022	5229	11.87	8.897	5.156	8320	37.9	6.9
6	0.01633	0.0212	14449	9616	4544	16.126	10.732	5.072	9038	37.9	6.9
7	0.01575	0.02046	16249	9568	3982	20.185	11.886	4.947	9918	37.9	6.9
8											
9	0.02416	0.02446	389	848	40445	0.269	0.587	28.009	6902	39.2	7
10											
11	0.01674	0.02281	11779	8828	5274	11.767	8.819	5.269	8493	40.7	7.1
12	0.01806	0.02395	13984	8829	4334	14.026	8.855	4.347	8966	31.7	6.4

8 cyl emis single cylinder HyGIV vs HyGIV w/Jet cap 111/08/96

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2	Diesel back up at 1000 hp												
3	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
4	11/8/96	11:44:56	8	0	0	0	636	1103	900.7	6.71	0.06	125.8	66
5													
6	HyGIV single cyl. data												
7	11/8/96	11:52:09	8	0	0	0	637	1101	899.5	5.57	2.49	121.61	68
22 8	11/8/96	12:01:43	8	0	0	0	638	1103	897.5	5.71	2.24	122.94	70
9	11/8/96	12:10:20	8	0	0	0	635	1103	896.3	5.77	1.94	122.6	70
10	11/8/96	12:17:39	8	0	0	0	638	1102	895.3	5.81	2.19	122.77	70
11	11/8/96	12:24:22	8	0	0	0	636	1101	894.6	5.86	1.88	122.59	71
12													
13	HyGIV w/Jet cap												
14	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
15	11/8/96	14:06:21	8	0	0	0	636	1100	896.9	5.62	2.33	122.64	72
30 16	11/8/96	14:11:39	8	0	0	0	637	1102	894.4	5.7	2.33	122.84	73
17	11/8/96	14:16:10	8	0	0	0	636	1102	894	5.78	2.25	122.67	73
18	11/8/96	14:21:44	8	0	0	0	636	1100	891.3	5.81	1.81	122.69	74
19	11/8/96	14:26:31	8	0	0	0	637	1102	891	5.88	2.1	122.66	75

LINES 22/8, 30/16 } COMPARABEL DATA W & W/O JET CAP 1.011 RACK

23/9, 31/17 } AT 1"

24/10, 32/18 } AT .99

25/11, 33/19 } .98

GENERAL CONSENSUS: THE JET CAP REDUCED HC 70-80 PPM AT HIGH LOADS
HC >150 AT LIGHT LOADS

REDUCED CO 200-400 PPM

NOx 50-200 PPM

8 cyl emis single cylinder HyGIV vs HyGIV w/Jet cap 111/08/96

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1													
2													
3	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
4	77	30.5	3.23	0	0	36	39	76	5.5	2743	13.7	1000	0
5													
6													
7	79	30.5	3.17	0	0	36	301	307	6.6	1387	12.2	1000	23.5
8	79	30.4	3.16	0	0	36	308	967	6	792	13	1000	21.3
9	77	30.4	3.13	0	0	36	266	1311	5.6	643	13.5	1000	18.4
10	78	30.4	3.08	0	0	36	371	1482	5.4	568	13.8	1000	20.8
11	81	30.3	3.1	0	0	36	357	0	4.9	441	14.4	1000	17.8
12													
13													
14	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
15	80	30.3	3.13	0	0	36	238	383	6.3	1178	12.6	1000	22.1
16	81	30.4	3.08	0	0	36	217	610	5.9	796	13	1000	22.1
17	81	30.3	3.09	0	0	36	203	982	5.6	568	13.5	1000	21.4
18	83	30.4	3.04	0	0	36	203	1272	5.2	447	14	1000	17.2
19	82	30.4	3.06	0	0	36	182	1376	4.9	388	14.5	1000	19.9

8 cyl emis single cylinder HyGIV vs HyGIV w/Jet cap 111/08/96

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
1												
2												
3	AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-	S.Hmid
4	5261	402.5	0.01696	0.02486	125	512	27789	0.125	0.509	27.624	7433	35.4
5												
6												
7	5202	386	0.01638	0.03197	809	1429	9696	0.809	1.429	9.696	7444	36.7
8	5176	387.7	0.01663	0.02971	903	4918	6068	0.9	4.898	6.044	7453	39.2
9	5170	401.6	0.01732	0.02811	863	7344	5451	0.858	7.3	5.419	7400	39.2
10	5124	400.6	0.01732	0.02736	1207	8538	4937	1.208	8.547	4.942	7582	39.2
11	5131	405.5	0.0177	0	1356	0	4370	1.359	0	4.379	7469	40.7
12												
13												
14	AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-	S.Hmid
15	5161	383.8	0.01646	0.0307	651	1855	8718	0.651	1.857	8.727	7442	43.7
16	5123	393.3	0.01711	0.02907	647	3226	6364	0.645	3.22	6.351	7510	43.7
17	5110	400.2	0.01731	0.02793	644	5520	4871	0.641	5.498	4.851	7564	45.2
18	5067	396.2	0.01735	0.0263	682	7571	4046	0.684	7.593	4.058	7386	45.2
19	5088	403.7	0.01765	0.025	659	8826	3786	0.652	8.738	3.748	7589	45.2

8cyl emis cyl #5 spark prechamber 11/12/96

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
2													
3	Max power												
4	11/12/96	11:38:18	8	0	0	0	636	1102	895.8	5.54	2.88	122.12	66
5	11/12/96	11:34:51	8	0	0	0	636	1102	895.4	5.53	2.39	122.24	66
6	reduced power												
7	11/12/96	11:37:35	8	0	0	0	635	1102	895.1	5.76	2.74	122.34	67
8	11/12/96	11:36:21	8	0	0	0	634	1103	894.8	5.73	2.32	122.4	67
9	mid power												
10	11/12/96	11:41:54	8	0	0	0	634	1102	894.1	5.59	2.24	122.15	68
11	same as above with advanced timing												
12	11/12/96	11:47:48	8	0	0	0	635	1102	894.1	5.56	2.44	121.09	68
13	11/12/96	11:52:02	8	0	0	0	634	1102	893.6	5.58	2.54	117.41	69
14													
15	11/12/96	11:28:23	6	0	0	0	635	1101	738.2	5.32	2.38	122.8	65
16	11/12/96	11:56:45	6	0	0	0	635	1103	731.7	5.54	2	108.38	70

8cyl emis cyl #5 spark prechamber 11/12/96

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
2													
3													
4	71	30.1	3.11	0	0	36	350	725	6.6	376	12.3	1001	27.2
5	72	30.2	3.09	0	0	36	343	357	7.3	811	11.3	999	22.6
6													
7	73	30.2	3.08	0	0	36	350	865	5.9	311	13.2	999	26
8	74	30.2	3.09	0	0	36	357	869	5.9	316	13.1	999	22
9													
10	75	30.3	3.09	0	0	36	357	632	6.6	552	12.1	998	21.2
11													
12	77	30.2	3.06	0	0	36	364	467	6.6	714	12.1	999	22.9
13	77	30.2	3.06	0	0	36	385	480	6.5	777	12.2	998	23.2
14													
15	68	30.2	1.7	0	0	36	322	278	8.2	2422	10	998	22.6
16	75	30.2	1.63	0	0	36	392	399	6.4	796	12.4	1000	16.9

8cyl emis cyl #5 spar[illegible]echamber 11/12/96

HC CO NOx

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1	AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-	S.Hmid	CJCT
2													
3		Max power									NOT STABLE		
4	5157	404.1	0.01731	0.03218	956	3508	2783	0.957	~~3.511~~	~~2.786~~	7630	35.4	6.7
5	5144	399.7	0.01719	0.03452	855	1607	5445	0.857	1.61	5.456	7369	35.4	6.7
6		reduced power											
7	5131	401.3	0.01719	0.02925	1058	4636	2539	1.059	4.64	2.542	7805	35.4	6.8
8	5134	403.9	0.01744	0.02926	1086	4691	2589	1.08	4.668	2.576	7557	36.7	6.8
9		mid power											
10	5130	391	0.01684	0.03214	945	2972	3924	0.949	2.984	3.939	7365	36.7	6.8
11		same as above with advanced timing									LESS STABLE		
12	5095	390.9	0.01698	0.03207	965	2193	5073	0.965	2.193	5.073	7410	37.9	6.9
13	5095	385.9	0.01672	0.03167	1023	2268	5546	1.024	2.27	5.551	7463	37.9	6.9
14													
15	3836	377.4	0.02179	0.03852	667	1020	13704	0.668	1.022	13.732	7143	34.2	6.6
16	3719	370.7	0.02203	0.0312	999	1806	5599	0.997	1.803	5.588	7067	39.2	7

645 emis spark data 11/14/96

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
2	High power at min timing												
3	11/14/96	14:40:39	6	0	0	0	634	1100	732.6	5.48	1.56	125.03	67
4	Same power w/5 on the knob advanced timeing												
5	11/14/96	14:47:51	6	0	0	0	634	1104	733.3	5.42	1.79	125.05	67
6	Max power at std. timing												
7	11/14/96	15:17:19	8	0	0	0	635	1104	890.7	5.43	2.4	123.84	70
8	Max power w/1.6 on the knob advance												
9	11/14/96	15:25:28	8	0	0	0	633	1105	889.4	5.44	2.56	123.85	70
10	.99 rack w/10 on the knob advance (light power)												
11	11/14/96	15:43:42	8	0	0	0	635	1104	888.6	5.74	2.14	125.55	71
12	.98 rack w/10 on the knob advance (light power)												
13	11/14/96	15:51:38	8	0	0	0	634	1104	888.8	5.8	1.52	125.53	71
14	1.00 rack w/10 on the knob advance (light power)												
15	11/14/96	15:58:05	8	0	0	0	635	1105	888.3	5.7	1.85	125.07	71

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
2													
3	67	30.1	1.66	0	0	36	595	534	5.9	386	13.1	996	15
4													
5	68	30.1	1.66	0	0	36	518	371	6.1	1805	12.8	999	17.3
6													
7	71	30.1	3.1	0	0	36	574	395	6.9	1023	11.7	1001	23
8													
9	70	30.1	3.07	0	0	36	553	378	6.6	1268	12.2	999	24.5
10													
11	71	30.1	3.06	0	0	36	588	862	4.5	449	14.9	1001	20.7
12													
13	71	30.1	3.07	0	0	36	581	1038	4.1	324	15.5	999	14.7
14													
15	71	30.1	3.08	0	0	36	574	648	4.9	637	14.5	1002	17.9

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1	AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-	S.Hmid	CJCT
2		High power at min timing											
3	3776	371.7	0.02174	0.02923	1649	2651	2966	1.657	2.665	2.981	6925	36.7	6.8
4		Same power w/5 on the knob advanced timeing											
5	3778	373.7	0.02196	0.02998	1419	1799	13550	1.414	1.794	13.51	6958	36.7	6.8
6		Max power at std. timing											
7	5154	381.2	0.01637	0.0334	1418	1728	6944	1.412	1.721	6.916	7263	39.2	7
8		Max power w/1.6 on the knob advance											
9	5120	388.8	0.01677	0.03213	1475	1763	9147	1.479	1.768	9.174	7372	39.2	7
10		.93 rack w/10 on the knob advance (light power)											
11	5107	388.3	0.01688	0.02317	2229	5787	4681	2.229	5.787	4.681	7486	40.7	7.1
12		.99 rack w/10 on the knob advance (light power)											
13	5124	390.5	0.01692	0.02141	2414	7638	3702	2.419	7.654	3.71	7242	40.7	7.1
14		.98 rack w/10 on the knob advance (light power)											
15	5132	381.6	0.01649	0.02487	2002	3954	6037	1.998	3.946	6.025	7279	40.7	7.1

12/12/96 emis port gas injection on 1 cylinder

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
2	12/11/96	15:19:04	8	0	0	0	633	1104	892	5.47	2.3	124.6	65	66
3	Port injection for emissions													
4	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
5	12/12/96	12:52:33	8	0	0	0	634	1106	894.7	5.38	2.53	125.36	68	70
6	12/12/96	12:57:35	8	0	0	0	635	1106	894	5.39	2.76	125.09	69	71
7	12/12/96	13:02:18	8	0	0	0	634	1106	893.6	5.53	2.53	124.95	69	71
8	12/12/96	13:09:04	8	0	0	0	633	1106	892.6	5.51	2.86	124.71	70	73
9	12/12/96	13:17:50	8	0	0	0	634	1104	891.6	5.51	2.62	124.56	72	75
10	12/12/96	13:20:56	8	0	0	0	631	1106	891.8	5.52	2.6	124.44	71	78
11	12/12/96	13:26:39	8	0	0	0	633	1104	891.5	5.51	2.56	124.52	71	77
12	12/12/96	13:40:52	8	0	0	0	628	1105	891.1	5.51	2.54	124.09	70	78
13	12/12/96	13:47:25	8	0	0	0	632	1104	890.3	5.5	2.51	124.13	70	78
14	12/12/96	14:02:46	8	0	0	0	632	1106	889.5	5.54	2.27	113.9	68	74
15														
16														
17	Head injection (Trying to get it at 1.040 rack but runing out of gas)													
18	12/12/96	14:40:28	8	0	0	0	633	1106	890.9	5.57	2.75	89.6	65	71
19														
20	ER data on diesel for comparison													
21	12/12/96	14:54:40	8	0	0	0	768	1324	890.6	8.89	0.09	84.86	64	69
22	12/12/96	14:55:51	8	0	0	0	770	1323	890	8.84	0.07	84.57	64	72
23	12/12/96	14:58:40	8	0	0	0	765	1321	889.8	8.82	0.04	84.19	65	70

12/12/96 emis port gas injection on 1 cylinder

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF	AIR SCFM	MasFlo #/
2	29.7	3.19	0	0	36	91	504	6.4	515	12.4	998	22.1	5221	391.8
3														
4	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF	AIR SCFM	MasFlo #/
5	30.1	3.2	0	0	36	3129	211	7.3	1318	11.2	1001	24.5	5231	393.4
6	30.1	3.14	0	0	36	2905	208	7.3	1377	11.2	1001	26.7	5182	392.8
7	30.1	3.18	0	0	36	2912	402	6.6	531	12.1	1001	24.4	5215	381.2
8	30.1	3.16	0	0	36	3913	380	6.6	490	12.2	1000	27.6	5198	401.2
9	30.1	3.11	0	0	36	2555	275	6.9	690	11.8	999	25.2	5142	390.5
10	30.1	3.09	0	0	36	2716	361	6.8	565	12	996	25	5121	396.8
11	30.1	3.13	0	0	36	2331	320	6.8	593	11.9	998	24.6	5145	395.8
12	30	3.1	0	0	36	2555	258	6.8	711	11.9	991	24.4	5115	394.3
13	30	2.99	0	0	36	2338	307	6.7	634	12	996	24.1	5015	389.6
14	30.2	3.15	0	0	36	2618	399	6.6	546	12.2	998	20.2	5167	386.3
15														
16														
17														
18	30.1	3.13	0	0	36	1463	560	6.2	1209	12.6	1000	19.7	5174	379.8
19														
20														
21	30.2	2.87	0	0	36	116	185	6.9	3471	11.8	1452	0	4959	532.8
22	30.1	2.89	0	0	36	115	185	6.9	3476	11.7	1455	0	4967	530.3
23	30.1	2.85	0	0	36	112	185	6.9	3466	11.7	1443	0	4941	529.2

12/12/96 emis port gas injection on 1 cylinder

	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO
1	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-	S.Hmid	CJCT		
2	0.0167	0.0311	250	2460	3897	0.25	2.46	3.897	7284	34.2	6.6		
3													
4	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-	S.Hmid	CJCT		
5	0.01653	0.03628	7329	873	8400	7.307	0.87	8.375	7289	36.7	6.8	gas inj at 180	
6	0.01665	0.03616	6801	862	8795	6.794	0.861	8.786	7418	37.9	6.9	gas inj at 177	
7	0.01621	0.03333	7215	1772	3592	7.215	1.772	3.592	7452	37.9	6.9	gas inj at 177	
8	0.01709	0.03385	10164	1737	3451	10.154	1.735	3.447	7599	39.2	7	gas inj at 190	
9	0.01686	0.03436	6317	1205	4605	6.298	1.201	4.592	7487	40.7	7.1	gas inj at 160	
10	0.01717	0.03407	6930	1618	3873	6.944	1.621	3.881	7510	40.7	7.1	gas inj at 157	
11	0.0171	0.03385	5958	1448	4071	5.964	1.45	4.075	7463	42.2	7.2	gas inj at 165	
12	0.01709	0.03394	6470	1153	4832	6.49	1.157	4.846	7434	40.7	7.1	gas inj at 175 &8ms	
13	0.01719	0.03343	5933	1379	4311	5.945	1.382	4.319	7437	39.2	7	gas inj at 170 & 8ms	
14	0.01667	0.03319	6629	1793	3722	6.629	1.793	3.722	7255	36.7	6.8	gas inj at 180	
15													
16													
17													
18	0.01624	0.03098	3937	2668	8806	3.921	2.657	8.771	7248	33	6.5		
19													
20													
21	0.02376	0.03087	401	1313	37666	0.275	0.902	25.887	6796	33	6.4		
22	0.02366	0.03087	399	1307	37373	0.275	0.902	25.792	6771	33	6.5		
23	0.02379	0.03087	387	1304	37096	0.267	0.9	25.601	6756	33	6.5		

8 cyl emis 1/9/97 SPC w poppet check jet cap gas backup

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Spark Prechamber w/ Jet cap GIV Poppet check valve timeing 4 knob rk .920												
2	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
3	1/9/97	9:49:52	6	0	0	0	625	1107	738.7	5.15	2.24	113.74	64
4	Spark Prechamber w/ Jet cap GIV Poppet check valve timeing 4 knob .925 rk												
5	1/9/97	9:57:56	6	0	0	0	630	1111	738.1	5.18	2	115.18	65
6	Spark Prechamber w/ Jet cap GIV Poppet check valve timeing 0 knob .914 rk												
7	1/9/97	10:05:41	6	0	0	0	631	1109	736.7	5.23	2.18	115.01	66
8	Spark Prechamber w/ Jet cap GIV Poppet check valve timeing 0 knob 1.042 rk												
9	1/9/97	10:22:08	8	0	0	0	633	1113	894.1	5.47	2.59	114.17	67
10	Spark Prechamber w/ Jet cap GIV Poppet check valve timeing 1 knob 1.052 rk.												
11	1/9/97	10:26:31	8	0	0	0	631	1110	893.6	5.38	2.77	114.12	68
12	Spark Prechamber w/ Jet cap GIV Poppet check valve timeing 0 knob 1.058 rk												
13	1/9/97	11:05:12	8	0	0	0	629	1108	889.9	5.31	2.67	124.44	70
14	Spark Prechamber w/ Jet cap GIV Poppet check valve timeing 4 knob .921 rk												
15	1/9/97	12:44:07	6	0	0	0	634	1107	734	5.23	2.08	124	70
16	Air throttle testing data												
17	1/9/97	13:32:43	1	0	0	0	5	7	308.2	0.18	0	126.41	73
18	1/9/97	13:47:55	1	0	0	0	5	7	309	0.19	0	125	74
19	1/9/97	13:53:33	1	0	0	0	5	7	309.3	0.37	0	123.44	72

8 cyl emis 1/9/97 SPC w poppet check jet cap gas backup

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1													
2	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
3	64	30.5	1.79	0	0	40	1876	431	5.6	2605	11.1	988	19.9
4													
5	65	30.5	1.77	0	0	40	2597	430	5.4	2045	11.4	999	17.9
6													
7	67	30.5	1.75	0	0	40	3108	475	5.4	694	11.3	999	19.5
8													
9	68	30.4	3.29	0	0	40	3507	725	5.1	440	12	1006	23.1
10													
11	68	30.5	3.29	0	0	40	3199	627	5.1	588	11.9	1000	24.7
12													
13	71	30.4	3.18	0	0	40	2429	440	5.4	955	11.4	1001	25.7
14													
15	70	30.4	1.75	0	0	40	1596	329	5.3	2086	11.6	1002	19.9
16													
17	74	30.3	0.04	0	0	40	68	25	0	28	21.4	0	0
18	75	30.3	0.03	0	0	40	67	22	0	28	21.5	0	0
19	72	30.3	0.26	0	0	40	65	16	0	14	21.5	0	0

8 cyl emis 1/9/97 SPC w poppet check jet cap gas backup

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1													
2	AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-	S.Hmid	CJCT
3	3964	361.4	0.02018	0.02854	5274	2145	20246	5.322	2.165	20.43	6876	35.6	6.4
4													
5	3938	352.6	0.01982	0.02804	7285	2135	15939	7.263	2.129	15.892	6727	38.3	6.6
6													
7	3912	365.8	0.0207	0.02832	8957	2423	5560	8.975	2.428	5.571	6869	39.7	6.6
8													
9	5349	389.6	0.0162	0.02731	11201	4108	3916	11.123	4.08	3.888	7283	41.2	6.8
10													
11	5349	378	0.01572	0.02711	9962	3494	5065	9.972	3.498	5.07	7313	41.2	6.8
12													
13	5241	376.6	0.01591	0.02796	7317	2329	8004	7.332	2.334	8.02	7305	45.6	7.1
14													
15	3891	364.8	0.02081	0.02694	4275	1761	17618	4.292	1.768	17.688	6870	45.6	7.1
16													
17	585	10.2	0.00445	0.00004	3382	2531	4497	0	0	0	0	50.3	7.4
18	506	11.4	0.00498	0.00004	3892	2602	5257	0	0	0	0	52	7.5
19	1494	20.4	0.00302	0.00003	7425	3721	5156	0	0	0	0	47.2	7.2

8 cyl emis 1/30/97 SPC w/different gas injection

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2													
3													
4													
5													
6													
7	Prechamber w/poppet check , port injection gas												
8	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
9	1/30/97	11:32:38	4	0	0	0	314	559	502	1.49	1.62	124.19	70
10	1/30/97	11:38:08	4	0	0	0	314	558	501.7	1.49	1.63	124.58	71
11	1/30/97	11:44:32	3	0	0	0	308	548	497.9	1.36	1.5	124.1	71
12	Prechamber w/poppet check , port injection gas 7knob timing												
13	1/30/97	11:56:17	6	0	0	0	627	1106	736.5	5.23	1.97	123.44	72
14	Prechamber w/poppet check , port injection gas 4knob timing												
15	1/30/97	12:04:00	6	0	0	0	630	1110	735.7	5.23	1.87	122.95	71
16	1/30/97	12:12:17	6	0	0	0	630	1110	734.7	5.19	2.36	122.67	70
17	1/30/97	12:22:54	6	0	0	0	629	1110	732.4	5.19	2.02	123.37	69
18	Prechamber w/poppet check , port injection gas 4knob timing rk 1.055												
19	1/30/97	12:36:59	8	0	0	0	629	1109	892.7	5.4	2.42	122.82	69
20	Prechamber w/poppet check , port injection gas 4knob timing rk 1.058												
21	1/30/97	12:41:09	8	0	0	0	631	1109	892.4	5.43	2.31	122.76	69
22	Prechamber w/poppet check , Jet cap gas injection 1knob timing												
23	1/30/97	14:50:38	8	0	0	0	630	1111	893.4	5.45	2.73	119.53	69
24	1/30/97	14:54:31	8	0	0	0	629	1112	892.4	5.46	2.87	119.51	69
25	1/30/97	15:05:01	8	0	0	0	627	1109	891.4	5.33	2.92	119.25	70
26	1/30/97	15:14:03	8	0	0	0	628	1111	891.5	5.37	2.8	120.13	70
27	Prechamber w/poppet check , Jet cap gas injection 2 knob timing												
28	1/30/97	15:21:33	8	0	0	0	629	1110	891	5.41	2.6	120	70

8 cyl emis 1/30/97 SPC w/different gas injection

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1													
2													
3													
4													
5													
6													
7													
8	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
9	70	29.4	0.74	0	0	66	3871	404	2.9	116	15.9	250	15.5
10	71	29.4	0.73	0	0	66	4291	474	2.6	72	16.4	250	15.7
11	71	29.4	0.73	0	0	66	3283	381	3.2	426	15.2	241	14.4
12													
13	72	29.4	1.71	0	0	66	3171	297	5.2	2741	11.8	990	18.8
14													
15	72	29.4	1.71	0	0	66	3248	261	5.3	1487	11.7	999	17.8
16	71	29.5	1.67	0	0	66	2464	290	5.6	2243	11.1	999	22.4
17	73	29.5	1.66	0	0	66	2569	351	5.7	2191	10.8	997	19.3
18													
19	76	29.5	3.08	0	0	66	2317	331	4.9	408	12.4	996	23
20													
21	75	29.5	3.12	0	0	66	2450	385	4.8	315	12.5	999	21.9
22													
23	75	28.8	3.14	0	0	66	1988	667	5	686	12.1	999	25.3
24	77	28.8	3.09	0	0	66	2086	715	5	628	12.1	999	26.6
25	75	28.8	3.06	0	0	66	1911	535	5.3	933	11.7	993	27
26	76	28.8	3.08	0	0	66	1918	452	5.1	981	11.9	996	26.1
27													
28	76	28.8	3.13	0	0	66	1953	586	4.8	703	12.5	997	24.2

8 cyl emis 1/30/97 SPC w/different gas injection

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1													
2													
3													
4													
5													
6													
7													
8	AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-	S.Hmid	CJCT
9	2488	132.8	0.01182	0.01718	7011	1295	647	28.046	5.182	2.59	9981	74.1	7.1
10	2469	124.3	0.01114	0.01598	7865	1538	405	31.589	6.178	1.628	10051	74.1	7.1
11	2469	124.2	0.01121	0.01833	5287	1063	2085	21.938	4.414	8.653	9494	77	7.2
12													
13	3776	367.8	0.02156	0.0274	9599	1581	25262	9.676	1.594	25.466	6877	80	7.3
14													
15	3779	368.9	0.02164	0.02741	9753	1393	13661	9.782	1.397	13.702	6774	77	7.2
16	3741	363.9	0.02153	0.02878	6923	1442	18872	6.944	1.447	18.928	6980	71.2	7
17	3723	366.7	0.02192	0.02934	7337	1723	18024	7.322	1.719	17.988	6844	69.1	6.9
18													
19	5048	388.5	0.01698	0.02562	7884	2000	4101	7.916	2.008	4.117	7267	69.1	6.9
20													
21	5090	383.1	0.01666	0.02527	8375	2330	3172	8.426	2.344	3.191	7221	69.1	6.9
22													
23	5045	388.2	0.01709	0.02605	6581	3957	6760	6.588	3.961	6.766	7427	69.1	6.9
24	5000	378.3	0.01664	0.02613	6780	4115	6034	6.78	4.115	6.034	7478	69.1	6.9
25	4990	390.2	0.01719	0.02731	6229	3021	8849	6.236	3.024	8.858	7430	71.2	7
26	4997	389.6	0.01723	0.02639	6508	2624	9619	6.534	2.635	9.657	7379	71.2	7
27													
28	5037	379.5	0.01678	0.02509	6561	3524	7102	6.6	3.545	7.145	7336	71.2	7

8cyl emis 2/10,13,20,25/97 Gen II piston at 020, DPC w/port injects.

First DPC good run, low diesel pressure limited operation DPC has ceramic liner													
date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
2/10/97	13:59:03	6	0	0	0	628	1109	732.7	5.17	2.41	122.87	70	70
2/10/97	14:16:50	6	0	0	0	625	1114	731.4	5.22	1.86	121.17	70	69
2/10/97	14:25:27	6	0	0	0	629	1112	730.8	5.32	1.75	121.62	68	68
2/10/97	14:32:12	6	0	0	0	626	1112	730.4	5.13	2.55	120.52	67	67
2/10/97	14:47:37	6	0	0	0	630	1114	729.1	5.35	1.88	110.54	66	67
DPC has ceramic liner highter diesel inj pressure allows TN8													
date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
2/13/97	11:50:49	8	0	0	0	630	1116	893.1	5.51	2.39	123.1	64	66
2/13/97	12:02:46	8	0	0	0	625	1112	892	5.38	2.25	123	66	69
2/13/97	12:07:12	8	0	0	0	626	1107	891.5	5.34	2.66	123.32	66	70
2/13/97	12:15:38	8	0	0	0	631	1112	890.9	5.37	2.52	123.67	67	71
2/13/97	12:29:00	8	0	0	0	629	1110	889.5	5.34	2.7	123.46	68	72
2/13/97	12:35:43	8	0	0	0	629	1112	889.8	5.31	2.56	123.19	69	73
2/13/97	12:50:59	8	0	0	0	629	1111	888.9	5.6	2.38	123.95	70	73
2/13/97	13:05:07	8	0	0	0	629	1111	889.1	5.43	2.46	123.6	71	72
2/13/97	13:07:19	8	0	0	0	631	1113	888.7	5.34	2.56	123.78	71	72
2/13/97	13:30:55	0	0	0	0	4	5	262.4	-0.02	1.58	124.36	66	66
DPC has W/O ceramic liner better knock limit operation													
date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
2/20/97	12:31:14	6	0	0	0	631	1113	733.9	5.08	2.1	123.61	71	71
2/20/97	12:41:03	6	0	0	0	627	1110	732.9	5.14	2.21	123.61	71	71
2/20/97	12:55:34	6	0	0	0	629	1113	733.6	5.17	2.44	123.9	72	72
2/20/97	13:21:51	8	0	0	0	629	1113	892	5.31	2.67	123.09	74	74
2/20/97	13:27:31	8	0	0	0	626	1111	891.6	5.21	3.2	123.11	74	76
2/20/97	13:38:24	8	0	0	0	626	1115	890.8	5.25	2.58	123.03	70	73
2/20/97	13:45:53	8	0	0	0	628	1113	890.7	5.24	2.78	122.52	69	69
2/20/97	13:57:39	8	0	0	0	626	1113	890	5.32	2.79	122.29	68	69
2/20/97	14:04:05	8	0	0	0	628	1112	889.6	5.4	2.46	121.92	67	69
2/20/97	14:11:09	8	0	0	0	628	1112	889.8	5.49	2.81	121.63	67	71
2/20/97	14:17:44	8	0	0	0	629	1112	889.1	5.6	2.2	121.28	67	69
2/20/97	14:44:54	8	0	0	0	628	1113	889.2	5.25	3.19	122.55	67	70

8cyl emis 2/10,13,20,25/97 Gen II piston at 020, DPC w/port injects.

BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF	AIR SCFM	MasFlo #/
30.3	1.68	0	0	66	1813	360	5.4	750	11.5	994	22.9	3806	361.8
30.2	1.66	0	0	66	1771	335	5.3	391	11.7	994	17.5	3781	359.4
30.2	1.66	0	0	66	1841	564	4.4	170	13.2	999	16.5	3784	358.1
30.2	1.64	0	0	66	1701	430	5.6	871	11	994	23.8	3765	356.4
30.2	1.62	0	0	66	1827	589	4.3	184	13.5	1002	16.3	3742	358
BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF	AIR SCFM	MasFlo #/
30.5	3.18	0	0	48	1883	741	4.2	170	13.5	1004	22.8	5274	387.6
30.5	3.14	0	0	48	1232	511	4.6	193	12.9	992	21.4	5209	385.8
30.5	3.14	0	0	48	1162	501	4.6	173	12.9	989	25.4	5221	382.8
30.5	3.12	0	0	48	749	502	4.6	186	12.8	1002	24.1	5191	376.1
30.5	3.13	0	0	48	2464	494	4.9	223	12.3	997	25.8	5203	381
30.5	3.09	0	0	48	2415	458	5.1	302	11.9	999	24.4	5165	379.9
30.4	3.07	0	0	48	910	1103	4	135	13.9	998	22.8	5140	394.5
30.4	3.09	0	0	48	2646	485	4.7	204	12.6	998	23.5	5161	384.6
30.4	3.11	0	0	48	2478	342	5	319	12.2	1003	24.5	5178	381.7
30.4	0.15	0	0	48	6020	265	3	2783	15.7	0	15.2	1143	32.7
BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF	AIR SCFM	MasFlo #/
30.5	1.69	0	0	48	2968	419	5.9	2415	10.4	1003	20.1	3827	362.3
30.5	1.69	0	0	48	2891	360	5.4	621	11.4	989	21.1	3827	366.6
30.5	1.68	0	0	48	2863	256	5.3	629	11.5	1000	23.4	3812	359.5
30.4	3.1	0	0	48	2541	311	5.2	304	11.8	1000	25.4	5160	390.2
30.4	3.17	0	0	48	2646	283	5.4	449	11.5	996	30.5	5216	384.7
30.5	3.1	0	0	48	2646	277	5.5	553	11.2	997	24.6	5173	379.5
30.5	3.15	0	0	48	2667	287	5.5	539	11.3	998	26.4	5234	390.8
30.6	3.13	0	0	48	2646	294	5.1	255	12	998	26.4	5218	384.9
30.5	3.11	0	0	48	2863	521	4.7	169	12.6	997	23.2	5209	392.3
30.6	3.11	0	0	48	3262	816	4.4	148	13.2	997	26.5	5200	383
30.5	3.11	0	0	48	3906	1139	4	142	13.9	999	20.7	5201	396
30.6	3.1	0	0	48	2793	306	5.5	611	11.3	998	30.3	5183	388.2

8cyl emis 2/10,13,20,25/97 Gen II piston at 020, DPC w/port injects.

(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
0.02107	0.0276	5296	1882	6584	5.301	1.884	6.591	7020	71.2	7
0.02104	0.02711	5180	1750	3488	5.185	1.752	3.492	6725	71.2	7
0.02095	0.02323	6444	3508	1777	6.451	3.512	1.779	6804	67.1	6.8
0.02085	0.02845	4750	2117	7238	4.867	2.169	7.416	7025	67.1	6.8
0.02109	0.02277	6486	3731	1965	6.453	3.712	1.955	6805	65	6.7

(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
0.01624	0.02242	7419	5169	1890	7.389	5.149	1.883	7327	44	6.5
0.01639	0.0238	4565	3328	1985	4.574	3.335	1.989	7187	45.5	6.6
0.01632	0.02376	4258	3231	1765	4.309	3.27	1.786	7381	47	6.7
0.01605	0.02354	2704	3215	1896	2.728	3.244	1.913	7308	48.5	6.8
0.01633	0.02576	8107	2893	2084	8.124	2.899	2.088	7344	50	6.9
0.01631	0.02663	7747	2594	2713	7.74	2.591	2.71	7221	50	6.9
0.01708	0.02114	3789	8331	1622	3.789	8.331	1.622	7449	51.6	7
0.01649	0.02497	9209	2988	2035	9.236	2.997	2.041	7314	55.8	7.2
0.01632	0.02616	8122	1985	2998	8.098	1.979	2.989	7245	55.8	7.2
0.00633	0.01874	2461	191	3254	0	0	0	0	45.5	6.6

(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
0.02102	0.0304	7836	1954	18125	7.789	1.942	18.017	6684	53.7	7.1
0.02123	0.02816	8417	1851	5155	8.426	1.853	5.16	6855	55.8	7.2
0.02087	0.02765	8300	1317	5257	8.3	1.317	5.257	7003	57.9	7.3
0.01658	0.02709	8285	1787	2828	8.277	1.785	2.825	7269	60	7.4
0.01639	0.028	8132	1536	3982	8.165	1.542	3.998	7462	62.2	7.5
0.01618	0.02843	7864	1457	4698	7.904	1.465	4.722	7177	53.7	7
0.01666	0.02845	8157	1565	4660	8.223	1.577	4.697	7257	50	6.9
0.01633	0.02667	8542	1685	2338	8.56	1.688	2.343	7349	48.5	6.8
0.01673	0.02508	9973	3249	1697	9.993	3.255	1.701	7272	48.5	6.8
0.01631	0.02407	11647	5232	1511	11.717	5.264	1.52	7549	48.5	6.8
0.01694	0.02276	15707	8024	1602	15.723	8.032	1.604	7349	48.5	6.8
0.0167	0.02852	8445	1642	5205	8.445	1.642	5.205	7464	47	6.8

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2	DPC changing PIG setup from baseline to VDT													
3	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
4	2/25/97	13:57:02	6	0	0	0	628	1111	735.1	5.15	2.17	122.74	69	69
5	2/25/97	14:01:19	8	0	0	0	629	1111	898.4	5.24	2.79	122.3	70	69
6	2/25/97	14:09:01	8	0	0	0	629	1113	894.4	5.35	2.62	122.64	70	71
7	2/25/97	14:17:58	8	0	0	0	628	1112	893.3	5.6	2.46	122.62	71	71
8														
9	2/25/97	14:55:39	6	0	0	0	629	1112	733.8	5.21	2.12	122.8	68	68
10	2/25/97	15:03:38	8	0	0	0	627	1114	895.9	5.27	2.57	121.8	67	71
11	2/25/97	15:07:55	8	0	0	0	629	1115	893.6	5.29	2.81	121.58	67	69
12	2/25/97	15:14:52	8	0	0	0	622	1116	891.9	5.41	2.79	121.8	67	68
13	2/25/97	15:20:39	8	0	0	0	629	1112	891.4	5.65	2.3	122.03	68	71
14	2/25/97	15:29:42	8	0	0	0	629	1114	892.5	5.39	2.68	121.96	68	69
15														
16	Diesel backup ER run													
17	2/25/97	15:37:41	8	0	0	0	762	1327	892	8.76	0.07	126.01	68	70
18	2/25/97	15:42:41	8	0	0	0	764	1331	889.5	8.7	0.05	123.86	68	69

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1														
2														
3	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF	AIR SCFM	MasFlo #/
4	30.2	1.68	0	0	48	3129	359	5.4	852	11.4	996	20.6	3804	360.5
5	30.2	3.18	0	0	48	2660	266	5.7	677	10.9	998	26.4	5242	383.8
6	30.2	3.18	0	0	48	2660	272	5.2	242	11.8	1000	24.9	5223	387.4
7	30.2	3.12	0	0	48	3801	981	4.2	127	13.5	997	23.3	5174	398.5
8														
9	30.2	1.66	0	0	48	2674	411	5.3	1050	11.6	999	20.1	3791	365.8
10	30.2	3.14	0	0	48	2037	319	5.5	763	11.2	997	24.2	5190	381.5
11	30.1	3.15	0	0	48	1960	271	5.5	735	11.3	1001	26.5	5209	379.3
12	30.2	3.11	0	0	48	1988	311	4.9	196	12.2	991	26.3	5180	390.6
13	30.2	3.11	0	0	48	3297	1155	3.9	113	14.1	999	21.7	5166	392.3
14	30.2	3.13	0	0	48	1904	343	5	818	12	1001	25.3	5192	376.5
15														
16														
17	30.2	2.84	0	0	48	92	284	4.9	2950	12.4	1444	0	4941	525.5
18	30.2	2.86	0	0	48	92	278	4.9	2919	12.3	1445	0	4963	521.3

	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1											
2											
3	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-H	S.Hmid	CJCT
4	0.02098	0.02828	8902	1808	6875	8.938	1.815	6.902	6859	50	6.9
5	0.0162	0.02931	7748	1373	5604	7.771	1.377	5.621	7260	51.6	7
6	0.01642	0.02712	8509	1540	2212	8.544	1.547	2.221	7284	53.7	7.1
7	0.01706	0.02354	14738	6696	1406	14.752	6.703	1.407	7501	55.8	7.2
8											
9	0.02139	0.02763	7911	2142	8795	7.919	2.144	8.804	6880	48.5	6.8
10	0.01619	0.02814	6146	1704	6523	6.165	1.709	6.542	7183	48.5	6.8
11	0.01612	0.02763	5977	1468	6374	6.007	1.476	6.406	7282	48.5	6.8
12	0.01673	0.02544	6820	1902	1918	6.773	1.889	1.904	7444	48.5	6.8
13	0.01682	0.02198	13556	8395	1314	13.721	8.497	1.33	7500	48.5	6.8
14	0.01601	0.02587	6224	1985	7602	6.249	1.993	7.633	7345	48.5	6.8
15											
16											
17	0.02348	0.02239	453	2791	46359	0.313	1.93	32.06	6733	50	6.9
18	0.02336	0.02239	445	2711	45401	0.308	1.876	31.419	6675	50	6.9

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Port gas w/DPC w/o ceramic liner													
2	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
3	2/28/97	11:57:31	6	0	0	0	627	1114	734.6	5.19	1.85	123.89	67	68
4	2/28/97	12:05:46	8	0	0	0	629	1114	897.8	5.27	2.83	122.97	68	74
5	2/28/97	12:11:45	8	0	0	0	627	1115	894.8	5.4	2.63	123.02	69	72
6	2/28/97	12:16:51	8	0	0	0	631	1114	894.5	5.63	2.35	123.64	70	72
7	2/28/97	13:20:08	6	0	0	0	627	1112	732.6	5.17	1.81	124.09	66	68
8	2/28/97	13:27:06	8	0	0	0	627	1114	896	5.25	2.62	123.57	68	70
9	2/28/97	13:31:30	8	0	0	0	628	1114	893.7	5.39	2.64	123.51	69	71
10	2/28/97	13:38:46	8	0	0	0	630	1113	892.1	5.59	2.34	123.55	70	73
11														
12	Prechamber w/ check valve													
13	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
14	3/26/97	13:47:18	8	0	0	0	622	1104	889.3	5.31	2.33	121.17	71	78
15	3/26/97	13:52:06	8	0	0	0	624	1112	887.6	5.57	2.52	121.64	73	78
16														
17	DPC w/big delivery w/HyGIV													
18	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
19	4/18/97	13:09:20	6	0	0	0	623	1111	737.1	5.19	2.19	122.98	63	66
20	4/18/97	13:13:56	6	0	0	0	629	1115	736.5	5.27	2.12	123	64	66
21	4/18/97	13:21:08	6	0	0	0	625	1113	734.7	5.31	1.92	122.61	66	70
22	4/18/97	13:31:03	8	0	0	0	628	1115	892.9	5.33	2.88	122.04	67	74
23	4/18/97	13:39:14	8	0	0	0	630	1114	891.8	5.4	2.34	122.77	68	74
24	4/18/97	13:54:03	8	0	0	0	627	1114	890.1	5.59	2.4	123.29	71	75
25	4/18/97	14:16:49	8	0	0	0	629	1116	889	5.62	2.42	123.19	70	78
26	4/18/97	14:26:11	8	0	0	0	627	1115	888.3	5.58	2.13	123.06	70	75
27	DPC w/smaller body & small delivery hole HyGIV in port													
28	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
29	4/21/97	13:31:04	8	0	0	0	626	1115	894	5.36	2.83	121.28	70	71
30	4/21/97	13:36:46	8	0	0	0	627	1115	893.9	5.44	2.48	121.01	71	72
31	4/21/97	13:40:34	8	0	0	0	626	1115	892.2	5.64	2.12	121.49	71	75
32	4/21/97	13:57:51	6	0	0	0	625	1112	727.6	5.24	2.13	121.18	74	76
33	4/21/97	14:04:47	6	0	0	0	628	1114	728.1	5.56	1.55	121.27	75	78
34	4/21/97	14:20:13	8	0	0	0	631	1116	891.1	5.37	2.84	120	73	78

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1													
2	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE POW	GAS SCFM	AIR SCFM
3	30.1	1.67	0	0	48	1967	404	5.3	1021	11.6	997	17.7	3780
4	30.1	3.1	0	0	48	1533	302	5.5	599	11.2	1001	26.9	5139
5	30	3.13	0	0	48	1603	314	5	210	12.2	998	25	5146
6	30.1	3.08	0	0	48	3192	1082	3.9	115	14.1	1004	22.5	5127
7	30	1.65	0	0	48	2219	370	4.9	1803	12.2	996	17.3	3767
8	30	3.07	0	0	48	1876	297	5.4	646	11.4	997	25	5124
9	30	3.11	0	0	48	1960	350	4.8	245	12.4	999	25.2	5148
10	30	3.06	0	0	48	3066	1156	3.9	144	14	1001	22.4	5093
11													
12													
13	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE POW	GAS SCFM	AIR SCFM
14	29.9	3	0	0	48	2562	382	4.9	236	12.3	980	21.9	5020
15	29.9	2.99	0	0	48	3136	1037	4.1	126	13.7	991	23.7	4998
16													
17													
18	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE POW	GAS SCFM	AIR SCFM
19	29.9	1.71	0	0	48	2422	325	5	644	12.1	988	20.9	3836
20	29.9	1.7	0	0	48	2534	299	4.8	404	12.4	1001	20.2	3818
21	29.9	1.68	0	0	48	4074	296	4.5	170	13.1	993	18.2	3781
22	29.9	3.14	0	0	48	2849	498	5	438	12	1000	27.2	5150
23	29.8	3.1	0	0	48	2618	381	4.9	487	12.2	1003	22.2	5126
24	29.8	3.07	0	0	48	3787	1133	3.8	119	14.2	997	22.9	5079
25	29.8	3.04	0	0	48	3899	1152	3.8	136	14.3	1001	23.1	5040
26	29.8	3.03	0	0	48	3773	1097	3.8	143	14.3	998	20.3	5046
27													
28	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE POW	GAS SCFM	AIR SCFM
29	30.1	3.15	0	0	48	2205	298	4.9	393	12.4	997	26.6	5195
30	30.1	3.15	0	0	48	2261	299	4.7	264	12.7	998	23.3	5185
31	30.1	3.15	0	0	48	3318	1102	3.7	125	14.4	998	19.9	5171
32	30.1	1.61	0	0	48	2226	285	5.1	946	12	992	20	3693
33	30	1.6	0	0	48	3486	781	3.7	143	14.4	999	14.5	3669
34	30	3.04	0	0	48	2135	304	5.1	404	11.8	1005	26.4	5052

	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1												
2	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
3	360.5	0.02112	0.02725	5750	2113	8507	5.79	2.128	8.567	6712	47	6.7
4	371	0.0159	0.02786	4519	1567	4927	4.528	1.571	4.937	7299	48.5	6.8
5	373.9	0.01606	0.0257	5259	1816	1914	5.253	1.814	1.912	7341	50	6.9
6	384.2	0.01666	0.02185	12620	7727	1308	12.633	7.735	1.309	7435	51.6	7
7	360.2	0.0212	0.02559	7007	2075	16104	7.028	2.081	16.153	6704	47	6.7
8	385.4	0.01665	0.0276	5838	1636	5683	5.838	1.636	5.683	7203	50	6.9
9	375.3	0.01621	0.02501	6655	2097	2343	6.649	2.094	2.341	7340	50	6.9
10	392.6	0.01706	0.02185	12634	8434	1678	12.621	8.426	1.677	7407	53.7	7.1
11												
12												
13	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
14	373.3	0.01646	0.02578	8352	2205	2169	8.523	2.25	2.213	7222	55.8	7.2
15	394	0.01754	0.02276	12486	7248	1400	12.612	7.321	1.414	7535	55.8	7.2
16												
17												
18	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
19	363.8	0.02101	0.02613	7619	1799	5624	7.712	1.821	5.692	6973	42.4	6.4
20	365.3	0.02118	0.02528	8261	1726	3702	8.252	1.724	3.699	6935	44	6.4
21	362.3	0.02125	0.02473	13584	1744	1584	13.652	1.753	1.592	6928	45.5	6.6
22	381.5	0.01639	0.02643	9242	2860	3959	9.269	2.869	3.971	7411	48.5	6.8
23	378.7	0.01642	0.02581	8672	2228	4489	8.663	2.226	4.484	7175	50	6.9
24	398.3	0.01744	0.02176	15996	8442	1412	16.044	8.468	1.416	7450	53.7	7.1
25	395.5	0.01731	0.02187	16618	8480	1569	16.601	8.472	1.568	7493	51.6	7.1
26	383.5	0.01687	0.02173	15311	7882	1610	15.373	7.914	1.617	7298	51.6	7
27												
28	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
29	387.4	0.0165	0.02555	7523	1800	3845	7.523	1.8	3.845	7388	53.7	7.1
30	383.6	0.01645	0.02468	7938	1858	2640	7.962	1.864	2.648	7311	53.7	7.1
31	396.9	0.01703	0.02106	14702	8475	1544	14.688	8.467	1.542	7354	55.8	7.2
32	365.1	0.02175	0.02646	6931	1561	8421	6.952	1.566	8.446	6954	62.2	7.5
33	377.9	0.02294	0.02092	14214	5761	1711	14.271	5.785	1.718	6944	64.3	7.6
34	380.9	0.01669	0.02641	6904	1740	3706	6.869	1.732	3.688	7354	60	7.4

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	2.8" DPC w/170 tip SPI Pressure Intensifier												
2	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
3	Standard tests with direct solenoid control over pressurezed diesel												
4	6/20/97	10:48:03	8	0	0	0	626	1119	895.3	5.85	3	119.17	91
5	6/20/97	10:51:40	8	0	0	0	625	1119	893	5.4	2.86	119.18	92
6	DPC , pressure intensifier w/ SPI valve controlling the diesel												
7	6/20/97	12:28:43	6	0	0	0	624	1116	726.4	5.27	1.94	119.83	95
8	6/20/97	12:41:09	6	0	0	0	624	1115	726.4	5.26	1.89	119.51	96
9	6/20/97	12:50:33	8	0	0	0	627	1119	892.2	5.52	2.09	119.57	97
10	6/20/97	13:08:46	8	0	0	0	626	1120	891.9	5.58	2.49	119.81	97
11	6/20/97	13:23:18	8	0	0	0	626	1119	891	5.46	2.84	118.95	98
12													
13	Whole engine on gas prep for baseline operation (Just some data)												
14	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
15	7/10/97	13:54:05	8	0	0	0	623	1116	899.4	0.56	19.14	102.49	103
16	7/10/97	13:54:07	8	0	0	0	628	1116	900.1	0.61	19.15	102.43	103
17	7/10/97	15:05:14	8	0	0	0	559	1002	903.2	0.61	16.44	103.78	90
18	7/10/97	15:15:57	8	0	0	0	558	1001	899.7	0.66	16.21	104.71	98
19	7/10/97	15:43:05	8	0	0	0	560	1003	899.9	0.58	16.51	103.42	101

DPC w/intensifier and 8 cyl gas run prep for baseline

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1													
2	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
3													
4	78	29.9	-2.97	0	0	56	1645	531	5.1	710	11.9	1000	27.7
5	77	30	-2.97	0	0	56	1638	496	4.8	343	12.5	999	26.4
6													
7	84	30	-2.97	0	0	56	1638	385	5.2	623	11.8	994	18
8	83	29.9	-2.97	0	0	56	1631	328	5.1	917	12	993	17.5
9	86	29.9	-2.97	0	0	56	1673	326	4.2	349	13.6	1002	19.3
10	83	29.9	-2.97	0	0	56	1771	383	4.1	275	13.6	1001	23.1
11	87	30	-2.97	0	0	56	1764	318	4.7	592	12.6	1000	26.2
12													
13													
14	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
15	92	29.9	2.95	0	0	56	1953	0	4.2	476	13.5	993	154.4
16	93	29.8	2.96	0	0	56	1918	0	4.2	476	13.5	1001	154.4
17	88	29.8	2.01	0	0	56	1365	1149	5	729	12.1	800	134.2
18	90	29.9	1.77	0	0	56	1211	847	5.3	867	11.5	797	133.2
19	91	29.9	1.94	0	0	56	2499	1332	3.4	437	14.9	802	134.2

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1													
2	AIR SCF	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NO	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-	S.Hmid	CJCT
3													
4	0	408.1	0	0.02627	5750	3266	7563	5.75	3.266	7.563	7992	78.2	7.7
5	0	385.3	0	0.02491	5757	3060	3658	5.763	3.063	3.662	7430	78.2	7.7
6													
7	0	369.4	0	0.02664	5080	2114	5956	5.111	2.127	5.992	6863	85.5	8
8	0	366.9	0	0.02616	5126	1831	8995	5.162	1.844	9.058	6831	88.6	8.1
9	0	388.8	0	0.0221	6653	2314	4270	6.673	2.321	4.283	7194	88.6	8.1
10	0	391.1	0	0.02173	7280	2787	3488	7.258	2.779	3.477	7434	88.6	8.1
11	0	390.9	0	0.02443	6373	2034	6689	6.392	2.04	6.709	7475	94.7	8.3
12													
13													
14	AIR SCF	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NO	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-	S.Hmid	CJCT
15	4910	426.5	0.01924	0	8568	0	6234	8.602	0	6.259	9034	88.6	8.1
16	4914	420.1	0.01892	0	8323	0	6143	8.339	0	6.156	9036	88.6	8.1
17	4061	369.4	0.02024	0.02594	4269	6484	7139	5.322	8.085	8.902	9907	97.7	8.4
18	3810	372.3	0.02167	0.02706	3672	4612	8253	4.631	5.816	10.408	9950	100.7	8.4
19	3978	376.5	0.02098	0.01929	11281	10647	6050	14.084	13.292	7.553	9796	100.7	8.5

7/11/97 emis 8 cyl gas w/gen II @ 020" 9200 inj at 8 deg.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
3	7/11/97	11:50:24	8	0	0	0	723	1278	892.9	0.67	21.46	101.03	85
4	7/11/97	12:03:19	8	0	0	0	714	1273	900.7	0.57	21.69	100.26	101
5	7/11/97	12:08:56	8	0	0	0	685	1225	900.1	0.53	20.9	100.6	103
6	7/11/97	12:11:52	8	0	0	0	627	1120	900.9	0.61	19.4	101.94	103
7	air throttled												
8	7/11/97	12:18:08	8	0	0	0	625	1119	898.8	0.51	19.08	102.41	103
9	7/11/97	12:22:35	8	0	0	0	560	1003	899.8	0.53	17.41	103.03	103
10	7/11/97	12:26:22	8	0	0	0	481	869	899.8	0.55	15.6	104.55	103
11	air throttled												
12	7/11/97	12:30:29	8	0	0	0	482	870	899.4	0.59	15.15	104.36	102
13	7/11/97	12:37:32	7	0	0	0	685	1220	832.1	0.47	19.89	101.59	102
14	7/11/97	12:45:20	6	0	0	0	691	1228	739	0.4	19.48	101.92	104
15	7/11/97	12:53:06	6	0	0	0	622	1117	737.5	0.48	16.82	103.75	104
16	7/11/97	12:57:26	6	0	0	0	559	1005	739.1	0.35	15.01	104.82	103
17	air throttled												
18	7/11/97	13:07:03	6	0	0	0	559	1005	738.4	0.5	14.65	105.36	99
19	7/11/97	13:14:07	6	0	0	0	485	871	738.2	0.37	12.36	106.22	97
20	7/11/97	13:20:27	6	0	0	0	395	711	738.2	0.41	9.93	107.82	95
21	7/11/97	13:29:37	5	0	0	0	580	1037	665.9	0.29	14.01	105.99	92
22	7/11/97	13:35:15	4	0	0	0	484	872	570.4	0.39	9.85	108.05	90
23	7/11/97	13:40:39	3	0	0	0	420	758	498.4	0.32	7.7	109.43	90
24	7/11/97	13:44:40	2	0	0	0	304	549	386.1	0.24	4.54	110.14	89

7/11/97 emis 8 cyl gas w/gen II @ 020" 9200 inj at 8 deg.

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1													
2	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
3	83	29.9	2.8	0	0	56	2807	1335	4.1	544	13.8	1319	171.3
4	85	29.9	2.84	0	0	56	2730	1332	3.9	529	14	1298	171.7
5	89	29.9	2.87	0	0	56	2954	1366	3.7	458	14.4	1201	165.9
6	88	29.9	3.01	0	0	56	3409	1390	3.2	358	15.3	1002	155.8
7													
8	89	29.9	2.18	0	0	56	2835	1393	3.9	472	14.1	999	153.8
9	89	29.9	2.23	0	0	56	3304	1427	3.3	357	15.1	802	141.1
10	89	29.9	2.24	0	0	56	3815	1375	2.8	270	16	597	128.1
11													
12	89	30	1.85	0	0	56	3556	1412	3.1	308	15.5	599	124.2
13	86	29.9	2.22	0	0	56	2597	1248	4	582	13.8	1193	159.2
14	87	29.9	1.5	0	0	56	2324	1323	4.8	797	12.5	1212	156.3
15	89	29.9	1.59	0	0	56	1792	1137	3.9	581	14.1	992	137.1
16	90	29.9	1.69	0	0	56	3122	1254	3.2	412	15.3	802	123.5
17													
18	90	29.9	1.17	0	0	56	2688	1247	4	539	13.9	802	121.1
19	90	29.9	1.09	0	0	56	3178	1346	3.3	399	15.1	603	102.9
20	89	29.9	0.76	0	0	56	3514	1463	3.2	319	15.3	400	83.7
21	89	29.9	1.21	0	0	56	2471	974	3.8	716	14.3	859	116.5
22	89	29.9	0.87	0	0	56	2373	926	3.1	706	15.5	602	83.3
23	87	29.9	0.62	0	0	56	2373	928	2.8	624	16.1	454	65.8
24	87	29.9	0.35	0	0	56	3087	1073	2	326	17.5	238	39.1

7/11/97 emis 8 cyl gas w/gen II @ 020" 9200 inj at 8 deg.

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1								Hc	CO	NOx			
2	AIR SCF	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NO	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-	S.Hmid	CJCT
3	4826	461.6	0.02123	0.02272	12991	10967	7758	9.864	8.327	5.891	7588	91.6	8.1
4	4848	463	0.02103	0.02175	13317	11505	7885	10.259	8.863	6.075	7625	91.6	8.2
5	4856	450	0.02057	0.02096	14595	11950	6813	12.132	9.934	5.663	7937	91.6	8.2
6	4977	424.1	0.01881	0.01885	17788	12869	5693	17.842	12.908	5.71	9073	91.6	8.2
7													
8	4232	416.7	0.02178	0.02184	12395	10784	6285	12.408	10.795	6.291	8884	91.6	8.2
9	4284	387.2	0.02	0.01929	15380	11762	5082	19.273	14.739	6.368	10237	94.7	8.3
10	4290	356.6	0.0184	0.01714	18593	11866	4014	30.937	19.744	6.679	12610	94.7	8.3
11													
12	3905	349.4	0.01984	0.01847	15698	11016	4176	26.077	18.299	6.937	12291	97.7	8.4
13	4278	430.6	0.02228	0.02211	11569	9844	8014	9.673	8.231	6.701	7647	97.7	8.4
14	3517	418.6	0.02609	0.02564	8543	8631	9106	7.09	7.163	7.557	7379	100.7	8.5
15	3614	370.5	0.02269	0.0214	8858	7986	7211	8.948	8.067	7.284	8005	103.8	8.6
16	3723	326.6	0.01965	0.01864	12715	9043	5263	15.894	11.304	6.579	8802	106.8	8.7
17													
18	3097	328.2	0.02337	0.02216	9130	7480	5730	11.3	9.258	7.092	8847	106.8	8.7
19	2990	280	0.02071	0.01918	10757	8067	4273	17.84	13.379	7.087	9897	106.8	8.7
20	2499	239.7	0.0211	0.01893	10258	7633	2969	25.711	19.132	7.441	12448	106.8	8.7
21	3153	311	0.02174	0.02098	8388	5871	7633	9.811	6.867	8.928	7700	103.8	8.7
22	2673	223.7	0.01859	0.0176	7020	4851	6603	11.604	8.018	10.915	8153	103.8	8.6
23	2261	171.3	0.01664	0.01616	5893	4080	4909	12.81	8.87	10.673	8505	103.8	8.6
24	1700	111.9	0.01456	0.01267	6486	3991	2183	27.252	16.772	9.176	10005	103.8	8.6

7/15/97 8cyl emis gas baseline w/ gen II @ 020, 9200's at 8 and at 4 deg. , gas slip, inc. pilot, air temp derate

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	9200's @ 8 deg, Gen II at .020" cooled air "baseline data"												
2	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
3													
4	7/15/97	10:30:02	8	0	0	0	721	1275	902	0.53	19.79	108.83	81
5	1450 HP knock limit cant stay here 1400 still to high												
6	7/15/97	10:31:31	8	0	0	0	759	1338	895.8	0.56	21.41	106.91	85
7	7/15/97	10:36:22	8	0	0	0	748	1318	897.6	0.54	20.98	108.01	93
8	7/15/97	10:42:55	8	0	0	0	716	1274	897.3	0.54	20.2	108.78	97
9	7/15/97	10:49:46	6	0	0	0	683	1227	738.6	0.4	17.9	110.6	100
10	6% gas slip 9.3 SCFM gas in air inlet												
11	7/15/97	10:59:16	6	0	0	0	684	1227	738.5	0.37	18.14	110.11	99
12	12%slip 18.5 SCFM gas into airbox												
13	7/15/97	11:03:50	6	0	0	0	683	1226	738.7	0.36	18.59	109.32	100
14	Ejector line removed for reduced Hc in exhaust												
15	7/15/97	11:10:46	6	0	0	0	684	1227	738.4	0.37	18.59	109.12	101
16	Increased Pilot for knock and emissions review 18%												
17	7/15/97	11:31:14	8	0	0	0	714	1274	899.4	1.73	16.35	110.74	103
18	Higher still pilot for knock and emissions 40%												
19	7/15/97	11:41:56	8	0	0	0	723	1295	897	3.93	10.73	114.85	100
20	Timeing set to 4 Deg. BTDC 9200's w/air cooling												
21	7/15/97	13:41:31	8	0	0	0	736	1304	886.3	0.52	20.53	106.67	79
22	7/15/97	13:46:48	8	0	0	0	686	1224	900.2	0.55	19.87	107.88	91
23	7/15/97	13:51:00	8	0	0	0	625	1123	899.5	0.55	18.8	109.11	95
24	7/15/97	13:54:24	8	0	0	0	556	1003	899.6	0.56	17.49	110.08	97
25	Same as above w/less air												
26	7/15/97	14:00:03	8	0	0	0	556	1007	899.3	0.68	16.51	110.59	98
27	7/15/97	14:06:49	6	0	0	0	725	1295	728.7	0.45	20.01	107.89	101
28	7/15/97	14:13:46	6	0	0	0	684	1229	739.7	0.35	18.64	108.98	102
29	7/15/97	14:16:55	6	0	0	0	622	1120	737.3	0.39	16.23	111.32	101
30	7/15/97	14:19:20	6	0	0	0	556	1005	738.1	0.35	14.42	112.22	100

7/15/97 8cyl emis gas baseline w/ gen II @ 020, 9200's at 8 and at 4 deg. , gas slip, inc. pilot, air temp derate

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1														
2	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE POW	GAS SCF	AIR SCFM
3														
4	80	30.1	2.86	0	0	56	2723	1325	4	492	14	1313	168.6	4904
5														
6	79	30.1	2.76	0	0	56	2457	1256	4.3	571	13.3	1450	179.4	4813
7	84	30.1	2.81	0	0	56	2485	1231	4.2	574	13.5	1408	177.4	4853
8	82	30.1	2.86	0	0	56	2639	1286	3.9	488	14	1303	171.7	4895
9	84	30.1	1.49	0	0	56	2310	1294	4.8	738	12.4	1197	154.8	3523
10														
11	87	30	1.51	0	0	56	2660	1221	4.8	737	12.5	1198	156.2	3534
12														
13	87	30.1	1.5	0	0	56	3080	1158	4.8	748	12.5	1196	158.7	3529
14														
15	89	30	1.48	0	0	56	2443	1172	4.9	758	12.3	1198	158.5	3493
16														
17	90	30	2.93	0	0	56	1967	936	3.6	706	14.6	1299	141.5	4910
18														
19	86	30	2.92	0	0	56	1638	552	3.7	1149	14.5	1343	95.9	4928
20														
21	81	30.1	2.58	0	0	56	2457	1392	4.3	456	13.3	1371	171.8	4653
22	83	30.1	2.8	0	0	56	2968	1378	3.8	348	14.3	1199	167.8	4839
23	84	30	2.91	0	0	56	3535	1367	3.3	271	15.2	1001	160.2	4920
24	84	30	2.96	0	0	56	4109	1301	2.7	212	16.1	796	150.6	4971
25														
26	83	30	1.77	0	0	56	3066	1448	3.9	303	14.1	799	142.7	3841
27	86	30.1	2.01	0	0	56	2100	1157	4.6	624	12.7	1341	168.9	4088
28	85	30	1.6	0	0	56	2226	1295	4.8	518	12.5	1200	158.7	3645
29	86	30	1.54	0	0	56	2541	1217	4.1	396	13.7	995	141.1	3573
30	87	30	1.62	0	0	56	3192	1244	3.4	273	15	798	126.3	3661

7/15/97 8cyl emis gas baseline w/ gen II @ 020, 9200's at 8 and at 4 deg. , gas slip, inc. pilot, air temp derate

	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1												
2	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
3												
4	469.2	0.02103	0.02221	13188	11333	6922	10.029	8.618	5.263	7411	68.3	7.3
5												
6	486.4	0.02247	0.02342	11635	10526	7763	7.974	7.215	5.32	7096	68.3	7.3
7	478.3	0.02182	0.02296	11793	10344	7942	8.412	7.378	5.664	7230	70.8	7.4
8	461.4	0.02086	0.02168	12867	11103	6949	9.875	8.521	5.333	7578	73.2	7.5
9	407	0.02542	0.02562	8289	8197	7628	6.919	6.842	6.368	7349	73.2	7.5
10												
11	418.4	0.02612	0.02577	9756	7909	7789	8.164	6.618	6.518	7387	75.7	7.6
12												
13	417.2	0.02617	0.02596	11158	7428	7916	9.306	6.195	6.602	7502	78.2	7.7
14												
15	421.3	0.02669	0.02608	8875	7526	8079	7.414	6.287	6.749	7487	80.6	7.8
16												
17	455.7	0.02059	0.01977	10487	8805	11124	8.017	6.731	8.505	7335	85.5	8
18												
19	475.4	0.02154	0.01988	9013	5378	18805	6.706	4.001	13.992	7106	85.5	8
20												
21	461.2	0.02196	0.02348	10973	11008	6161	7.992	8.017	4.487	7190	85.5	8
22	454.8	0.02077	0.02144	14493	11886	5118	12.138	9.955	4.287	8103	85.5	8
23	429.6	0.01936	0.01939	18241	12441	4196	18.296	12.478	4.209	9256	85.5	8
24	408.6	0.01811	0.01727	22863	12784	3521	28.758	16.08	4.429	11029	85.5	8
25												
26	390.4	0.02269	0.02199	12478	10435	3718	15.501	12.963	4.618	10529	85.5	8
27	447.9	0.02422	0.02455	8663	8451	7819	6.45	6.292	5.822	7174	88.6	8.1
28	420.9	0.02551	0.02558	8250	8498	5735	6.881	7.088	4.783	7467	85.5	8
29	380.8	0.02357	0.02252	9806	8323	4620	9.866	8.373	4.648	8106	88.6	8.1
30	333.2	0.02015	0.01962	12552	8662	3232	15.75	10.868	4.056	9047	88.6	8.1

7/22/97 emis8 on gas air temp. derate

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	9200's @ 4 deg. Gen II pistons @ 020" air temp derate												
2	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL FLO	GAS CFM	GAS PRE	GAS TEM
3	7/22/97	10:29:48	8	0	0	0	743	1317	899.5	0.65	21.72	104.87	87
4	7/22/97	10:31:26	8	0	0	0	726	1293	897.8	0.52	21.36	104.99	90
5	7/22/97	10:36:52	8	0	0	0	711	1275	897.7	0.69	20.92	106.29	96
6	7/22/97	10:39:56	8	0	0	0	699	1252	897.8	0.7	20.5	106.81	98
7	7/22/97	10:52:59	8	0	0	0	683	1227	896.4	0.65	19.75	107.05	100
8	7/22/97	11:02:08	8	0	0	0	669	1203	897.9	0.56	19.3	107.15	99
9	7/22/97	11:16:55	8	0	0	0	653	1177	897.7	0.64	18.7	107.69	102
10	7/22/97	11:21:57	8	0	0	0	653	1178	897.6	0.6	18.98	107.44	103

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1													
2	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
3	83	30	2.74	0	0	56	2471	1357	4.3	491	13.4	1400	178.9
4	86	30	2.76	0	0	56	2548	1359	4.2	463	13.6	1350	176.1
5	85	29.9	2.79	0	0	56	2604	1344	4.1	440	13.7	1300	174.3
6	86	30.1	2.74	0	0	56	2709	1346	4	416	14	1250	171.5
7	86	30	2.76	0	0	56	2653	1331	3.8	427	14.3	1200	165.5
8	88	30	2.81	0	0	56	2653	1313	3.7	418	14.5	1150	161.9
9	89	29.8	2.8	0	0	56	2632	1338	3.5	424	14.7	1100	157.6
10	92	30	2.82	0	0	56	2758	1364	3.5	396	14.7	1100	159.6

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
1												
2	AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NO	BTU/ HP-	S.Hmid
3	4779	480	0.02217	0.02347	11488	11179	6905	8.159	7.94	4.904	7403	85.5
4	4804	474.8	0.02179	0.02305	11923	11291	6592	8.812	8.345	4.872	7503	85.5
5	4805	464.9	0.02146	0.02262	12281	11155	6285	9.432	8.567	4.827	7799	88.6
6	4766	459.5	0.02119	0.02221	12787	11271	5978	10.213	9.002	4.775	7974	88.6
7	4783	444.5	0.0205	0.02125	12711	11321	6310	10.636	9.474	5.28	8066	94.7
8	4817	446.5	0.02053	0.02078	13149	11510	6396	11.424	10	5.557	8159	97.7
9	4788	437.1	0.02003	0.01984	13391	12054	6765	12.152	10.938	6.139	8367	103.8
10	4809	437.7	0.02015	0.01992	13999	12259	6282	12.623	11.054	5.665	8373	103.8

7/23/97 8cyl emis on gas 9335 inj @ 0 deg.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	9335 inj @ 0 deg. baseline data w/ gen II @ 020"												
2	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
3	7/23/97	15:22:55	8	0	0	0	717	1272	897	0.76	20.1	104.24	104
4	7/23/97	15:25:55	8	0	0	0	684	1227	899	0.84	19.25	105.12	104
5	7/23/97	15:28:52	8	0	0	0	623	1124	899	0.76	17.82	105.74	104
6	7/23/97	15:31:29	8	0	0	0	561	1007	899.9	0.81	16.44	106.61	104
7	7/23/97	15:34:43	7	0	0	0	685	1225	832.6	0.62	18.84	105.71	105
8	7/23/97	15:37:37	6	0	0	0	685	1225	738.7	0.45	18.46	106.1	106
9	7/23/97	15:40:22	6	0	0	0	623	1122	738.7	0.42	16.27	107.26	106
10	7/23/97	15:43:11	6	0	0	0	556	1003	738	0.43	14.25	108.48	107
11	7/23/97	15:47:55	6	0	0	0	483	870	738.3	0.68	11.26	110.31	107

11/11/97 Port gas injection 9200 @ 4 and Gen II at 020" all 8 on gas

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Diesel only runs not sure of config at time of typing Maybe the Cat.														
2	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP	BAROM P
3	10/3/97	10:35:01	8	0	0	0	141	8701	1201.1	7.7	0.01	1.54	61	61	30
4	10/3/97	10:43:58	8	0	0	0	141	7706	1208.8	6.84	0.01	1.54	62	62	30
5	10/3/97	10:56:17	8	0	0	0	141	5989	1203.3	5.43	0.01	1.54	62	62	30
6	10/3/97	11:01:37	8	0	0	0	141	3988	1203.3	3.91	0.01	1.54	62	62	30
7	HYPGIV first good run only data problems were that the CO2 wasn't right and therfore the numbers are off.														
8	Engine balance is an issue corrected by adjusting duration from cylc to cyl vs speed and load														
9	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP	BAROM P
10	11/7/97	13:55:49	8	0	0	0	749	1404	899.3	0.65	22.32	106.2	94	82	30.4
11	11/7/97	14:05:39	8	0	0	0	658	1269	899.3	0.61	20.93	107.21	94	82	30.4
12	11/7/97	14:10:10	8	0	0	0	600	1161	899.3	0.64	20.17	108.45	93	82	30.4
13	11/7/97	14:45:48	8	0	0	0	698	1337	899.4	0.66	20.9	107.21	91	79	30.4
14	11/7/97	14:57:20	8	0	0	0	691	1320	899	0.66	20.66	107.9	90	81	30.5
15	second run on port giv. balance still an issue														
16	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP	BAROM P
17	11/11/97	12:38:38	6	0	0	0	626	1203	738.5	0.38	16.7	109.95	76	71	30.1
18	11/11/97	12:46:26	6	0	0	0	671	1306	738	0.5	18.56	108.5	84	72	30
19	11/11/97	12:50:24	6	0	0	0	653	1277	737.9	0.39	18.04	108.98	87	74	30
20	11/11/97	12:56:29	6	0	0	0	655	1277	738.6	0.42	17.14	109.85	87	73	30
21	11/11/97	13:08:55	8	0	0	0	729	1389	899.6	0.65	21.35	106.63	93	76	30
22	11/11/97	13:13:08	8	0	0	0	769	1418	896.5	0.68	21.99	105.52	95	76	30
23	11/11/97	13:18:35	8	0	0	0	744	1402	899.6	0.64	21.13	107.13	95	77	30.1
24	11/11/97	13:26:07	8	0	0	0	686	1327	898.5	0.6	20.42	107.05	96	75	30
25	11/11/97	13:30:06	8	0	0	0	683	1323	898.3	0.67	20.26	107.38	96	77	30.1
26	11/11/97	13:37:14	8	0	0	0	597	1171	899.1	0.66	19.6	107.37	97	73	30.1

11/11/97 Port gas injection 9200 @ 4 and Gen II at 020" all 8 on gas

	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
1														
2	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE POW	GAS SCF	AIR SCFM	MasFlo #/	(F/A) Mea
3	0.71	0	0	72	77	448	8	949	10.3	1226	0	2483	462.5	0.04123
4	0.61	0	0	72	79	398	7.6	917	10.8	1085	0	2299	407.9	0.0396
5	0.43	0	0	72	84	349	7	849	11.7	843	0	1931	325.7	0.03735
6	0.27	0	0	72	87	362	6	811	12.9	561	0	1530	233.4	0.03377
7														
8														
9	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE POW	GAS SCF	AIR SCFM	MasFlo #/	(F/A) Mea
10	-2.97	0	0	72	4795	578	5.5	304	13.6	1502	185.9	0	500.5	0
11	-2.97	0	0	72	5649	1134	4.6	154	14.9	1194	175.8	0	475.5	0
12	-2.97	0	0	72	6433	1361	4	120	15.7	995	171.1	0	464.5	0
13	-2.97	0	0	72	4375	942	4.9	180	14.5	1333	175.5	0	476.4	0
14	-2.97	0	0	72	4599	1031	4.7	170	14.7	1303	174.5	0	471.7	0
15														
16	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE POW	GAS SCF	AIR SCFM	MasFlo #/	(F/A) Mea
17	-2.97	0	0	72	4774	586	5.3	333	14	1075	143.5	0	387.8	0
18	-2.97	0	0	72	5572	470	5.9	674	13.1	1251	157.7	0	421.5	0
19	-2.97	0	0	72	5579	474	5.7	490	13.4	1191	153.7	0	407.5	0
20	-2.97	0	0	72	4571	492	5.6	547	13.5	1194	147.1	0	392.9	0
21	-2.97	0	0	72	4571	766	5.2	311	14	1446	178.5	0	488	0
22	-2.97	0	0	72	4354	490	5.6	422	13.6	1557	182	0	491.4	0
23	-2.97	0	0	72	4088	608	5.3	372	13.9	1490	177.2	0	481.1	0
24	-2.97	0	0	72	4501	1061	4.8	234	14.6	1300	171.2	0	463.6	0
25	-2.97	0	0	72	4508	1038	3.6	234	14.6	1290	170.3	0	463.9	0
26	-2.97	0	0	72	5719	1381	3	172	15.7	998	164.7	0	449.2	0

11/11/97 Port gas injection 9200 @ 4 and Gen II at 020" all 8 on gas

	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1										
2	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
3	0.03552	200	2376	8542	0.163	1.935	6.956	6987	84.6	0
4	0.03385	191	1960	7701	0.176	1.812	7.117	6975	84.6	0
5	0.03135	176	1490	6227	0.209	1.772	7.404	7136	84.6	0
6	0.02714	150	1290	5023	0.268	2.3	8.954	7643	84.6	0
7										
8										
9	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
10	0.02968	18031	3848	3467	11.988	2.558	2.305	7123	81.5	7.1
11	0.02639	23058	8206	1922	19.279	6.861	1.607	8520	84.6	7.2
12	0.02417	28307	10611	1625	28.507	10.686	1.636	10004	84.6	7.2
13	0.02698	17431	6635	2208	13.057	4.97	1.654	7651	81.5	7.1
14	0.02625	18777	7419	2068	14.522	5.738	1.599	7796	74	6.8
15										
16	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
17	0.0289	14971	3111	3031	13.952	2.899	2.825	7626	67.4	6.5
18	0.03176	16344	2447	6059	13.075	1.957	4.847	7217	69.6	6.6
19	0.0309	16338	2461	4344	13.684	2.061	3.638	7335	69.6	6.7
20	0.02997	13380	2537	4939	11.215	2.126	4.14	7044	74	6.8
21	0.02834	17672	5235	3665	12.255	3.63	2.541	7165	76.2	6.9
22	0.02985	15950	3178	4788	10.297	2.052	3.091	6798	78.4	7
23	0.02845	15465	4072	4414	10.379	2.733	2.962	6901	81.5	7.1
24	0.02665	17647	7377	2937	13.574	5.674	2.259	7623	84.6	7.2
25	0.02116	22867	9308	3744	17.617	7.171	2.884	7706	84.6	7.2
26	0.01912	31410	13430	3096	31.41	13.43	3.096	9620	87.8	7.3

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	HYPGIV first good run only data problems were that the CO2 wasn't right and therfore the numbers are off.														
2	Engine balance is an issue corrected by adjusting duration from cylc to cyl vs speed and load														
3	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT
4	11/7/97	13:05:08	6	857	883	874	881	870	881	865	884	697	149	154	193
5	11/7/97	13:10:13	6	850	871	861	865	846	864	848	870	688	149	154	193
6	11/7/97	13:16:37	6	837	855	851	850	837	856	842	860	678	150	155	194
7	11/7/97	13:23:00	6	747	639	657	718	747	747	707	750	577	151	158	195
8	11/7/97	13:55:45	8	827	920	908	892	875	890	889	891	660	170	179	259
9	11/7/97	14:05:32	8	683	859	819	847	815	824	824	858	608	169	176	258
10	11/7/97	14:10:07	8	750	766	713	786	763	753	709	804	559	169	179	258
11	11/7/97	14:45:43	8	830	909	879	848	836	872	846	822	632	168	177	256
12	11/7/97	14:57:20	8	809	911	860	824	844	876	812	817	627	167	176	254
13	second run on port giv. balance still an issue														
14	date	time	TN	1	2	3	4	5	6	7	8	9	AIRBX 5	AIRBX 8	AIRT OUT
15	11/11/97	12:38:07	6	832	827	809	815	780	800	795	811	638	147	156	185
16	11/11/97	12:45:56	6	853	886	856	870	828	848	850	842	678	150	158	188
17	11/11/97	12:49:51	6	844	861	846	863	820	810	846	835	672	151	158	189
18	11/11/97	12:55:59	6	818	883	854	851	804	851	831	842	669	151	160	190
19	11/11/97	13:08:22	8	828	887	878	870	833	845	844	862	636	168	182	248
20	11/11/97	13:12:41	8	837	907	901	879	854	874	857	864	650	170	182	251
21	11/11/97	13:18:02	8	847	908	847	878	862	871	841	865	645	173	186	252
22	11/11/97	13:25:35	8	731	871	826	855	837	817	807	848	615	173	185	251
23	11/11/97	13:29:38	8	829	868	811	847	849	814	787	834	616	172	185	252
24	11/11/97	13:36:41	8	740	759	728	792	789	679	673	775	553	172	185	250

11/11/97 Port gas whole engine, 9200 @ 4 deg Gen II @ 020"

	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1															
2															
3	GAS T	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT
4	83	157	157	185	198	107	120	74	5066	9.8	0.43	32.86	109.11	18.56	689
5	83	157	156	187	200	108	121	72	5103	9.8	0.46	31.93	109.76	17.96	672
6	84	156	156	188	200	111	124	72	4317	9.7	0.41	31.06	109.65	17.69	660
7	85	152	153	188	201	113	125	72	3117	9.4	0.44	25.93	112.16	14.92	538
8	95	164	166	206	219	126	139	71	32	15.8	0.59	37.91	106.66	22.35	754
9	94	161	162	205	218	129	141	72	32	15.6	0.61	35.4	107.21	20.93	659
10	93	159	160	204	216	129	142	72	32	15.5	0.64	34.12	108.45	20.17	600
11	91	163	162	203	217	129	142	71	32	15.9	0.61	42.1	107.3	20.91	699
12	90	161	161	204	218	130	143	68	32	15.8	0.64	42.5	107.97	20.59	691
13															
14	GAS T	WATER I	WATER O	LUBE IN	LUBE OU	FUEL IN	FUEL OU	AMB T	GAS2 TM	AIRBX PR	DIESL FL	HEADR P	SUPLY P	GAS CFM	MG VOLT
15	75	157	157	180	191	99	111	65	32	9.7	0.41	31.54	109.88	16.71	625
16	83	160	160	185	197	104	117	66	32	9.9	0.47	35.98	108.16	18.54	673
17	86	160	160	187	199	107	120	66	32	9.8	0.39	35.76	109	18.07	655
18	87	160	160	189	199	109	122	68	32	9.7	0.42	33.21	109.85	17.14	655
19	93	150	167	202	213	119	132	69	32	16.1	0.65	37.85	106.63	21.35	729
20	95	152	168	205	217	120	134	70	32	16	0.68	39.54	105.52	21.99	769
21	95	153	169	210	221	125	138	71	32	16	0.64	38.86	107.13	21.13	744
22	96	152	167	210	222	128	141	72	32	16	0.6	37.6	107.05	20.42	686
23	96	149	165	210	222	129	143	72	32	15.8	0.67	36.62	107.38	20.26	683
24	96	147	164	209	220	130	144	73	32	15.7	0.62	35.33	107.4	19.62	598

11/11/97 Port gas whole engine, 9200 @ 4 deg Gen II @ 020"

BAD #S

	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1													
2													
3	MG AMPS	EXC VOL	MAIN RA	PILOT RA	RPM	DIFF2 PR	SPLY2 PR	HORSE POW	BTU/ HP-HR	DIES #/ HP-H	SCFM GAS	SCFM2 GAS	
4	1321	0	1.813	1.804	737.7	0.03	0.35	1300	6951	0.019	158.5	0	
5	1292	0	1.815	1.751	737.9	0.03	0.39	1240	7126	0.022	154.1	0	
6	1272	0	1.814	1.764	738.1	0.03	0.35	1199	7225	0.02	151.7	0	
7	1039	0	1.815	1.806	737.9	0.03	0.34	798	9446	0.033	130.5	0	
8	1403	0	1.812	1.801	899.3	0.02	0.36	1511	7147	0.023	186.9	0	
9	1269	0	1.81	1.809	899.3	0.03	0.36	1194	8520	0.03	175.8	0	
10	1161	0	1.809	1.807	899.3	0.03	0.35	995	10004	0.038	171.1	0	
11	1337	0	1.814	1.814	899.7	0.03	0.38	1335	7601	0.027	175.8	0	
12	1320	0	1.814	1.813	899	0.03	0.36	1303	7789	0.029	174.2	0	
13													
14	MG AMPS	EXC VOL	MAIN RA	PILOT RA	RPM	DIFF2 PR	SPLY2 PR	HORSE POW	BTU/ HP-HR	DIES #/ HP-H	SCFM GAS	SCFM2 GAS	
15	1201	0	1.817	1.796	738.4	0.01	0.36	1072	7664	0.022	143.7	0	
16	1308	0	1.817	1.798	738.8	0.02	0.38	1257	7165	0.022	157.1	0	
17	1276	0	1.818	1.803	737.1	0.02	0.38	1193	7342	0.019	154.1	0	
18	1277	0	1.817	1.801	738.6	0.02	0.38	1194	7050	0.021	147.2	0	
19	1389	0	1.816	1.797	899.6	0.03	0.38	1446	7166	0.026	178.5	0	
20	1418	0	1.816	1.8	896.5	0.03	0.39	1557	6803	0.026	182.1	0	
21	1402	0	1.815	1.814	899.6	0.02	0.39	1490	6906	0.025	177.4	0	
22	1327	0	1.814	1.812	898.5	0.02	0.43	1300	7629	0.027	171.3	0	
23	1323	0	1.814	1.807	898.3	0.02	0.42	1290	7712	0.031	170.4	0	
24	1172	0	1.813	1.803	900.3	0.02	0.39	1001	9594	0.037	165.1	0	

7/23/97 8cyl emis on gas 9335 inj @ 0 deg.

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1													
2	AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
3	96	30	2.73	0	0	56	2324	1239	3.9	536	14	1300	164.6
4	99	29.9	2.79	0	0	56	2499	1313	3.6	463	14.5	1200	158.8
5	97	29.9	2.9	0	0	56	3003	1392	3.1	370	15.4	1000	147.7
6	97	29.9	3	0	0	56	3535	1331	2.7	293	16.3	800	137.3
7	97	29.9	2.16	0	0	56	2331	1222	4	583	13.8	1200	156
8	96	29.9	1.48	0	0	56	2107	1278	4.8	753	12.5	1200	153.4
9	97	29.9	1.57	0	0	56	2408	1138	4	532	13.9	1000	136.5
10	98	29.9	1.62	0	0	56	3017	1187	3.2	394	15.2	800	120.7
11	99	29.9	1.75	0	0	56	3325	1276	2.5	336	16.6	600	97

7/23/97 8cyl emis on gas 9335 inj @ 0 deg.

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
1												
2	AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR HC	G/HP-HR CO	G/HP-HR NO	BTU/ HP-	S.Hmid
3	4706	459.1	0.02151	0.02149	11305	10737	8731	8.676	8.24	6.701	7447	129.9
4	4745	446.6	0.02069	0.02022	12717	11831	7893	10.588	9.851	6.572	7918	134.5
5	4846	414.4	0.01901	0.01816	15882	13106	6622	15.93	13.146	6.642	8833	134.5
6	4933	386.8	0.01735	0.01648	19394	12981	5448	24.122	16.146	6.776	10368	134.5
7	4182	429.9	0.02266	0.02195	10407	9681	8942	8.658	8.054	7.439	7591	139.1
8	3465	411.1	0.02627	0.02551	7647	8213	9300	6.389	6.861	7.769	7339	139.1
9	3565	364.8	0.0228	0.02196	9152	7658	6902	9.179	7.681	6.923	7862	139.1
10	3619	326.2	0.01994	0.01854	12307	8593	5525	15.461	10.796	6.942	8804	139.1
11	3758	280.3	0.01644	0.01538	14284	9706	5025	23.807	16.177	8.375	9994	143.8

7/24 emis for 9335 and 9250 Injectors Gen II @ 020

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	9335 @ 0 time Diesel only														
2	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP	BAROM P
3	7/24/97	10:17:55	8	0	0	0	823	1400	893.6	10.53	0.04	8.02	89	84	30.3
4	7/24/97	10:21:03	8	0	0	0	806	1391	892.3	10.02	0.02	8.19	91	86	30.3
5	7/24/97	10:24:40	8	0	0	0	754	1346	892.2	8.76	0.03	8.31	94	90	30.3
6	7/24/97	10:26:35	8	0	0	0	741	1327	892.7	8.46	0.02	8.28	95	89	30.3
7	7/24/97	10:30:14	8	0	0	0	681	1235	892	7.32	0.04	8.31	97	91	30.3
8	7/24/97	10:34:33	8	0	0	0	619	1127	891.3	6.39	0.03	8.4	98	87	30.4
9	7/24/97	10:39:52	8	0	0	0	553	1008	890.8	5.51	0.05	8.29	99	87	30.3
10	7/24/97	10:44:50	8	0	0	0	482	878	890.4	4.7	0.04	8.22	99	88	30.2
11	7/24/97	10:49:55	7	0	0	0	683	1230	822	7.32	0.04	8.44	100	89	30.2
12	7/24/97	10:58:16	6	0	0	0	679	1227	724.8	7.26	0.03	8.33	100	88	30.2
13	7/24/97	11:04:42	6	0	0	0	622	1127	725.7	6.09	0.03	8.32	102	91	30.2
14	7/24/97	11:08:43	6	0	0	0	556	1010	726.2	4.99	0.1	8.4	101	90	30.2
15	7/24/97	11:12:35	6	0	0	0	480	874	727	4.01	0.03	8.35	101	90	30.2
16	9250 @ 0 time Gas														
17	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP	BAROM P
18	7/25/97	12:36:24	6	0	0	0	460	845	735.3	0.44	11.08	110.66	76	78	30.5
19	7/25/97	12:56:14	8	0	0	0	648	1185	898.7	0.92	17.22	106.27	91	83	30.4
20	7/25/97	13:00:47	8	0	0	0	620	1130	899.4	0.83	16.48	107.2	93	82	30.4
21	7/25/97	13:05:14	8	0	0	0	555	1014	899.2	0.83	15.08	108.61	93	80	30.5
22	7/25/97	13:08:15	8	0	0	0	479	877	899.4	0.94	13.47	109.24	94	81	30.4
23	7/25/97	13:11:03	7	0	0	0	638	1154	831.9	0.74	15.76	107.6	92	82	30.4
24	7/25/97	13:14:24	6	0	0	0	649	1181	737.8	0.66	15.18	108.15	92	82	30.5
25	7/25/97	13:16:42	6	0	0	0	620	1131	737.8	0.66	14.11	108.62	92	83	30.4
26	7/25/97	13:19:15	6	0	0	0	552	1010	737.9	0.64	12.13	110.26	93	85	30.4
27	7/25/97	13:22:19	6	0	0	0	479	877	737.8	0.66	10.64	110.77	93	84	30.4
28	9250 @ 0 time Diesel														
29	7/25/97	13:33:55	8	0	0	0	821	1408	889.9	10.89	0.04	22.75	95	86	30.4
30	7/25/97	13:36:28	8	0	0	0	803	1396	889.3	10.34	0.03	22.55	95	88	30.4
31	7/25/97	13:43:10	8	0	0	0	752	1354	884.7	8.86	0.04	22.43	100	88	30.4
32	7/25/97	13:45:52	8	0	0	0	734	1331	885.8	8.47	0.05	22.83	100	89	30.4
33	7/25/97	13:48:11	8	0	0	0	676	1240	885.8	7.26	0.03	22.84	101	91	30.3
34	7/25/97	13:50:15	8	0	0	0	617	1137	885.8	6.28	0.03	22.69	101	89	30.4
35	7/25/97	13:52:48	7	0	0	0	678	1243	817.5	7.26	0.04	22.87	101	84	30.3
36	7/25/97	13:54:56	6	0	0	0	677	1238	722.7	7.49	0.04	22.72	101	86	30.4
37	7/25/97	13:58:04	6	0	0	0	620	1133	723.1	6.06	0.03	22.64	101	87	30.4
38	7/25/97	14:01:00	6	0	0	0	552	1016	723.9	4.93	0.03	22.69	101	85	30.4
39	7/25/97	14:03:20	6	0	0	0	478	880	724	3.98	0.03	22.62	101	86	30.4
40	9250 @ 8 ATDC Gas														
41	7/25/97	15:07:22	8	0	0	0	678	1233	900.4	0.88	20.69	103.26	96	85	30.2
42	7/25/97	15:18:19	8	0	0	0	619	1131	901.3	0.78	19.55	104.49	103	90	30.4

7/24 emis for 9335 and 9250 Injectors Gen II @ 020

	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1															
2	AirFlo Dif	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF	AIR SCF	MasFlo #/	(F/A) Mea	(F/A) CAL
3	2.76	0	0	48	63	472	4.8	1198	12.4	1650	0	4816	631.1	0.02888	0.02203
4	2.61	0	0	48	65	409	4.7	1221	12.6	1600	0	4674	602.3	0.0285	0.02157
5	2.72	0	0	48	66	311	4	1228	13.8	1450	0	4754	525.5	0.02436	0.01846
6	2.77	0	0	48	67	300	3.9	1219	14.1	1400	0	4802	506.9	0.02343	0.01802
7	2.85	0	0	48	68	268	3.3	1127	15.2	1200	0	4862	439.2	0.01983	0.01534
8	2.97	0	0	48	67	234	3.7	966	16.1	1000	0	4990	381.6	0.01692	0.0171
9	3.05	0	0	48	67	196	3.1	757	16.8	800	0	5048	330.5	0.01447	0.01441
10	3.12	0	0	48	67	164	2.6	578	17.5	600	0	5101	282	0.0122	0.01215
11	2.18	0	0	48	67	299	4.9	1223	14.4	1200	0	4264	437.9	0.02273	0.02239
12	1.44	0	0	48	68	409	6	1322	12.9	1200	0	3460	435	0.02792	0.02716
13	1.51	0	0	48	66	313	4.9	1256	14.4	1000	0	3533	365.3	0.02274	0.02239
14	1.63	0	0	48	65	260	3.8	1086	15.9	800	0	3680	297.5	0.01789	0.01756
15	1.72	0	0	48	63	200	3	777	17	600	0	3771	241.1	0.01422	0.01396
16															
17	AirFlo Dif	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF	AIR SCF	MasFlo #/	(F/A) Mea	(F/A) CAL
18	1.68	0	0	48	28	0	0	0	0	555	96	3784	255	0.01486	0
19	2.9	0	0	48	2072	1312	4.3	423	15.3	1100	143.5	4949	411.9	0.01841	0.02324
20	2.94	0	0	48	2408	1316	4	372	15.7	1000	138.4	4978	397.8	0.01767	0.02204
21	3.04	0	0	48	2975	1286	3.4	291	16.4	800	128.1	5072	373.6	0.0163	0.01952
22	3.15	0	0	48	3437	1183	2.9	233	17.1	600	115	5167	340.6	0.01454	0.01734
23	2.27	0	0	48	1995	1285	4.5	489	15	1050	132.8	4378	379.9	0.0192	0.0241
24	1.58	0	0	48	1358	1129	5.4	718	13.8	1100	128.5	3662	355.7	0.02167	0.02772
25	1.59	0	0	48	1554	1153	5	628	14.3	1000	119.9	3664	338.2	0.02057	0.02606
26	1.66	0	0	48	2233	1259	4.1	455	15.6	800	104.7	3737	296	0.01744	0.02239
27	1.75	0	0	48	3024	1227	3.3	329	16.7	600	92.2	3841	277.9	0.01597	0.01905
28															
29	3.05	0	0	48	88	763	6.3	789	12.5	1650	0	5061	652.1	0.02855	0.02859
30	2.81	0	0	48	88	687	6.3	812	12.6	1600	0	4849	621.5	0.02842	0.02856
31	2.53	0	0	48	88	425	5.6	884	13.5	1450	0	4601	529.8	0.02531	0.02547
32	2.6	0	0	48	89	375	5.3	892	13.9	1400	0	4639	507.6	0.02413	0.02416
33	2.71	0	0	48	92	281	4.5	880	15	1200	0	4741	437.4	0.0204	0.02065
34	2.86	0	0	48	90	235	3.8	813	16	1000	0	4892	377.9	0.01718	0.01756
35	2.08	0	0	48	88	316	5	905	14.3	1200	0	4164	433.1	0.02292	0.02284
36	1.39	0	0	48	88	688	6.4	868	12.5	1200	0	3414	448.1	0.02903	0.02856
37	1.48	0	0	48	90	329	5	941	14.3	1000	0	3519	362.9	0.02289	0.02285
38	1.56	0	0	48	88	249	3.9	896	15.8	800	0	3620	297	0.018	0.018
39	1.65	0	0	48	86	198	3	694	17	600	0	3723	238.2	0.01416	0.01397
40															
41	2.71	0	0	48	2268	1490	3.9	307	14.1	1194	168	4760	466.9	0.02178	0.02159
42	2.75	0	0	48	2940	1410	3.4	231	15	1000	160.4	4776	447.5	0.02074	0.01956

7/24 emis for 9335 and 9250 Injectors Gen II @ 020

	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1									
2	G/HR HC	G/HR CO	G/HR NO	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
3	371	5668	23600	0.225	3.445	14.346	7105	72.7	8.1
4	374	4792	23532	0.234	2.998	14.725	6977	75.3	8.1
5	389	3738	24333	0.27	2.592	16.874	6719	78	8.2
6	391	3567	23711	0.279	2.548	16.936	6698	78	8.2
7	406	3260	22697	0.339	2.723	18.961	6833	80.5	8.3
8	310	2210	15275	0.312	2.219	15.336	7121	83.2	8.4
9	321	1913	12482	0.402	2.395	15.622	7683	85.7	8.5
10	326	1628	9779	0.54	2.691	16.165	8623	88.3	8.6
11	269	2449	16965	0.224	2.041	14.137	6771	88.3	8.6
12	225	2716	15054	0.188	2.277	12.619	6754	93.5	8.8
13	221	2138	14741	0.221	2.136	14.726	6739	96.2	8.9
14	228	1864	13436	0.285	2.324	16.754	6906	96.2	8.9
15	227	1471	9967	0.38	2.461	16.667	7381	98.7	9
16									
17	G/HR HC	G/HR CO	G/HR NO	G/HP-HR HC	G/HP-HR CO	G/HP-HR NOx	BTU/ HP-HR	S.Hmid	CJCT
18	115667	0	0	221.585	0	0	10264	42.4	6.4
19	8346	9358	4588	7.574	8.492	4.163	7939	47	6.7
20	9937	9624	4161	9.987	9.672	4.182	8406	48.5	6.8
21	13147	10094	3500	16.434	12.618	4.376	9814	48.5	6.8
22	15825	9625	2933	26.287	15.988	4.872	12094	48.5	6.8
23	7120	8121	4757	6.788	7.742	4.534	7621	50	6.9
24	3898	5709	5614	3.566	5.223	5.137	7019	50	6.9
25	4523	5942	4933	4.523	5.942	4.933	7208	50	6.9
26	6759	6727	3702	8.524	8.483	4.669	8028	50	6.9
27	10233	7352	3016	17.113	12.295	5.045	9555	50	6.9
28									
29	407	7196	11498	0.246	4.353	6.955	7312	51.6	7
30	389	6183	11268	0.243	3.871	7.056	7186	51.6	7
31	374	3679	11789	0.258	2.539	8.136	6777	53.7	7.1
32	387	3278	11944	0.278	2.355	8.58	6715	53.7	7.1
33	397	2501	11893	0.332	2.089	9.935	6754	53.7	7.1
34	407	2140	11286	0.407	2.14	11.286	6956	53.7	7.1
35	346	2523	11139	0.288	2.097	9.259	6698	53.7	7.1
36	280	4471	8767	0.233	3.726	7.306	6939	53.7	7.1
37	293	2193	9654	0.293	2.193	9.654	6726	53.7	7.1
38	304	1735	9646	0.38	2.167	12.043	6831	53.7	7.1
39	306	1438	7811	0.509	2.388	12.976	7338	53.7	7.1
40									
41	11235	13069	4185	9.409	10.946	3.505	8398	55.8	7.2
42	15561	13215	3335	15.608	13.254	3.345	9559	57.9	7.3

8/14 emis 9250's @ 4 ATDC DF inj. @ 4 BTDC

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	9250 @ 4 ATDC													
2	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
3	8/14/97	13:34:45	8	0	0	0	705	1281	900	0.93	19.4	105.74	102	85
4	8/14/97	13:40:02	8	0	0	0	680	1237	899.1	0.85	18.6	106.57	105	88
5	8/14/97	13:45:39	8	0	0	0	614	1131	899.2	0.87	17.17	107.52	107	88
6	8/14/97	13:49:49	8	0	0	0	551	1016	900	0.86	15.92	107.66	108	89
7	8/14/97	13:53:26	8	0	0	0	478	881	899.5	0.87	14.6	108.57	107	89
8	8/14/97	13:56:59	7	0	0	0	679	1238	832.3	0.77	17.84	106.87	108	88
9	8/14/97	14:02:29	6	0	0	0	678	1241	738	0.69	17.48	106.59	108	89
10	8/14/97	14:06:01	6	0	0	0	618	1133	738.4	0.65	14.9	108.11	109	89
11	8/14/97	14:09:20	6	0	0	0	550	1016	738	0.69	12.82	109.75	109	90
12	8/14/97	14:14:24	6	0	0	0	477	880	737.8	0.72	11.05	110.36	106	89
13	8/14/97	14:16:47	6	0	0	0	383	713	738	0.63	9.67	111.6	105	89
14	8/14/97	14:21:34	6	0	0	0	715	1298	738.4	0.66	18.98	105.4	104	89
15	8/14/97	14:34:53	8	0	0	0	811	1419	889.3	10.93	0.06	15.65	107	92
16	8/14/97	14:41:23	8	0	0	0	773	1383	887.5	9.73	0.05	15.72	110	93
17	DF Inj @ 4 BTDC													
18	date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM	AIR TEMP
19	8/15/97	11:16:31	8	0	0	0	696	1286	900.2	0.49	19.45	104.99	95	82
20	8/15/97	11:20:37	8	0	0	0	674	1254	899.2	0.46	19.07	105.37	96	80
21	8/15/97	11:25:29	8	0	0	0	610	1144	899.7	0.52	17.6	106.23	97	80
22	8/15/97	11:28:52	8	0	0	0	545	1025	899.2	0.52	16.4	106.85	97	81
23	8/15/97	11:32:46	6	0	0	0	671	1250	738.5	0.45	17.13	106.67	99	78
24	8/15/97	11:35:32	6	0	0	0	614	1143	738.1	0.32	15.14	107.61	98	82
25	8/15/97	11:39:09	6	0	0	0	547	1021	738.5	0.38	13.27	108.6	97	81
26	8/15/97	11:42:43	6	0	0	0	474	884	737.7	0.38	11.9	109.41	96	77
27	DF INj @ 0 time													
28	8/15/97	13:12:58	8	0	0	0	702	1286	900	0.44	20.86	103.5	97	87
29	8/15/97	13:16:04	8	0	0	0	671	1250	898.8	0.55	20.33	103.75	101	86
30	8/15/97	13:18:50	8	0	0	0	614	1145	899.1	0.55	19	105.16	104	85

8/14 emis 9250's @ 4 ATDC DF inj. @ 4 BTDC

	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1														
2	BAROM P	AirFlo Dif	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF	AIR SCF	MasFlo #/
3	30.2	2.74	0	0	48	1953	1435	4	359	13.8	1290	160.9	4778	453
4	30.1	2.77	0	0	48	2198	1442	3.8	335	14.3	1200	155.2	4790	442.8
5	30.2	2.84	0	0	48	2835	1446	3.3	264	15.1	1000	144.3	4847	417.6
6	30.1	2.95	0	0	48	3444	1370	2.8	211	16	8000	134	4940	387.5
7	30.2	3.02	0	0	48	4046	1247	2.4	167	16.8	600	123.8	4998	365.7
8	30.1	2.13	0	0	48	1750	1379	4.2	445	13.6	1200	149.2	4201	428.6
9	30.1	1.42	0	0	48	1302	1473	5	569	12.1	1200	145.8	3426	402
10	30.1	1.51	0	0	48	1722	1339	4.1	435	13.8	1000	125.9	3531	351.9
11	30.1	1.59	0	0	48	2401	1314	3.4	320	15	800	109.7	3623	311.5
12	30.1	1.68	0	0	48	3283	1306	2.7	234	16.3	600	95.3	3727	281.8
13	30.1	1.76	0	0	48	4137	1171	2.1	168	17.4	400	84.2	3812	250.6
14	30.1	1.66	0	0	48	1225	1467	5.1	631	11.9	1325	156.9	3705	434.1
15	30.1	3.22	0	0	48	85	983	6.3	456	12.6	1650	0	5155	655.7
16	30.1	2.48	0	0	48	83	668	6.4	471	12.4	1525	0	4512	585.5
17														
18	BAROM P	AirFlo Dif	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF	AIR SCF	MasFlo #/
19	30.1	2.84	0	0	48	2030	1306	3.7	484	14.4	1280	160.3	4878	427.9
20	30.2	2.87	0	0	48	2240	1321	3.5	426	14.7	1200	157.6	4921	421.4
21	30.1	2.94	0	0	48	2828	1316	3.1	338	15.5	1000	146.5	4980	394.2
22	30.2	3.03	0	0	48	3318	1289	2.7	267	16.2	800	137.2	5051	375.6
23	30.2	1.53	0	0	48	1344	1355	4.5	748	12.9	1200	143.1	3599	382.4
24	30.2	1.58	0	0	48	1820	1203	3.8	545	14.3	1000	127.5	3644	338
25	30.2	1.67	0	0	48	2541	1230	3.1	381	15.4	800	112.6	3750	303.9
26	30.3	1.73	0	0	48	3409	1208	2.6	255	16.5	600	101.7	3824	276.9
27														
28	30.2	2.81	0	0	48	2072	1367	3.9	409	14	1290	169.7	4838	451.1
29	30.2	2.81	0	0	48	2338	1388	3.7	348	14.3	1200	165.8	4833	447.1
30	30.2	2.86	0	0	48	2975	1357	3.3	273	15.2	1000	156.8	4876	421.5

11/8/96
HYGIV
1.025 RK

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2034.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	125.4	1181.2	67.3@-010°	1411.3
2	124.8	1184.8	150.3@-012°	1405.0
3	123.3	1098.0	46.8@-012°	1387.6
4	127.8	1121.2	57.5@-013°	1438.5
5	127.6	1043.8	55.3@-010°	1436.9
6	125.1	1077.8	44.0@-013°	1408.5
7	128.5	1094.6	38.3@-012°	1447.1
8	126.6	1088.1	35.4@-011°	1425.6
9	127.9	1169.6	52.5@-011°	1439.6
10	128.8	1099.8	44.7@-014°	1449.9
11	127.2	1012.5	26.9@-013°	1431.9
12	124.5	955.5	21.3@+018°	1401.8
13	125.2	905.7	24.8@-018°	1409.0
14	124.4	1060.7	34.0@-012°	1400.5
15	120.2	996.6	24.9@-015°	1353.6
16	129.4	1179.3	82.9@-010°	1456.7

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
126.0± 2.4	1079.3± 82.0	50.4± 31.4	1419.0± 26.9	Mean
129.4	1184.8	150.3	1456.7	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2035.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	125.0	1203.9	104.2@-012°	1407.2
2	125.9	1043.3	24.1@-014°	1417.9
3	125.6	1057.3	44.7@-016°	1413.6
4	122.5	884.9	21.2@+013°	1379.1
5	130.3	1079.0	34.7@-013°	1466.5
6	125.1	1045.6	32.6@-014°	1408.4
7	124.0	858.1	20.6@+013°	1396.2
8	125.8	1004.3	39.7@-016°	1416.6
9	120.1	954.6	22.7@+001°	1352.3
10	125.4	1085.6	31.9@-009°	1412.2
11	123.9	1080.2	40.4@-014°	1395.4
12	124.9	1141.4	64.5@-011°	1406.0
13	125.2	1229.6	103.5@-012°	1409.2
14	124.4	1143.8	66.6@-014°	1400.1
15	124.9	1011.5	30.4@-011°	1406.7
16	122.4	1175.1	90.7@-014°	1378.4

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
124.7± 2.1	1062.4±105.3	48.3± 28.8	1404.1± 23.9	Mean
130.3	1229.6	104.2	1466.5	Max

11/8/96
HYG-IV
1.01 RK

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2036.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	110.1	857.0	20.6@+013°	1239.2
2	112.3	905.7	21.3@+013°	1263.8
3	114.6	898.2	20.6@+013°	1290.0
4	107.9	801.9	19.9@+025°	1214.4
5	118.1	974.2	21.3@-004°	1329.3
6	116.1	922.4	20.6@+013°	1306.8
7	101.8	839.0	19.8@+021°	1146.1
8	119.2	936.7	19.8@+015°	1341.9
9	111.8	972.1	24.1@-004°	1258.5
10	115.4	965.5	26.9@-003°	1299.7
11	114.3	857.8	20.6@+013°	1286.4
12	111.8	837.4	20.6@+013°	1258.9
13	112.6	888.2	21.3@+013°	1267.2
14	116.1	925.6	20.6@+013°	1307.6
15	113.4	931.2	20.6@+013°	1276.2
16	108.9	853.3	19.8@+020°	1225.9

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
112.8± 4.3	897.9± 52.7	21.1± 1.9	1269.5± 48.1	Mean
119.2	974.2	26.9	1341.9	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2037.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	115.0	894.0	20.6@+025°	1295.2
2	111.3	823.9	19.9@+025°	1253.1
3	104.1	811.1	20.6@+013°	1171.5
4	110.0	859.8	21.3@+000°	1238.6
5	110.7	900.8	22.0@-004°	1246.6
6	117.1	901.3	21.3@+015°	1317.9
7	120.6	1023.8	24.1@-007°	1357.9
8	109.7	853.5	20.6@+013°	1235.1
9	105.2	835.3	20.6@+013°	1184.3
10	116.9	927.5	23.4@-005°	1316.4
11	111.6	856.6	21.3@+001°	1256.5
12	109.5	859.8	20.6@+013°	1232.3
13	114.1	855.8	20.6@-003°	1284.8
14	113.7	969.1	21.3@-012°	1280.1
15	109.7	864.5	20.6@+025°	1235.0
16	113.1	863.2	19.2@+013°	1273.5

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
112.0± 4.3	881.2± 54.8	21.1± 1.2	1261.2± 48.2	Mean
120.6	1023.8	24.1	1357.9	Max

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HYG-IV
1,000RK

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2038.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	98.6	795.8	19.8@+015°	1110.1
2	111.2	899.6	20.6@+013°	1252.2
3	100.3	834.7	20.6@+013°	1129.6
4	109.8	846.9	19.8@+013°	1235.8
5	106.6	883.1	19.8@+013°	1200.6
6	108.9	872.3	21.3@+013°	1225.9
7	103.3	848.2	19.1@+013°	1162.9
8	103.4	877.0	19.8@+013°	1164.4
9	107.1	904.0	23.4@-003°	1205.3
10	104.7	850.1	20.6@+013°	1178.8
11	111.1	893.0	20.6@-006°	1251.0
12	102.7	860.4	20.6@+013°	1156.6
13	108.8	875.7	21.3@+013°	1225.4
14	113.5	863.0	19.2@+015°	1278.2
15	99.3	863.3	20.6@+013°	1117.6
16	93.2	755.0	19.2@+025°	1049.4

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
105.2± 5.5	857.6± 38.2	20.4± 1.1	1184.0± 61.9	Mean
113.5	904.0	23.4	1278.2	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2039.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	104.9	842.7	19.9@+025°	1181.1
2	106.4	793.2	19.9@+025°	1198.3
3	109.0	894.8	19.2@+025°	1227.7
4	97.9	816.2	20.6@+013°	1102.6
5	110.0	935.6	22.7@-007°	1237.9
6	105.4	893.6	21.3@+013°	1186.9
7	102.2	805.1	19.9@+013°	1150.6
8	111.7	954.1	24.8@-003°	1257.3
9	106.9	875.0	19.9@+018°	1203.1
10	107.2	856.2	19.9@+025°	1207.1
11	112.2	905.2	22.7@-003°	1263.7
12	107.4	875.6	19.2@+025°	1209.3
13	109.1	852.7	19.8@+013°	1228.3
14	111.1	854.0	19.8@+025°	1250.8
15	107.9	903.1	22.0@+013°	1214.9
16	102.2	811.4	23.4@+000°	1150.6

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
107.0± 3.8	866.8± 46.7	20.9± 1.7	1204.4± 43.1	Mean
112.2	954.1	24.8	1263.7	Max

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HYGIV

.99 RK

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2040.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	102.2	832.0	21.3@+000°	1150.7
2	101.3	825.3	19.9@-003°	1140.9
3	101.8	853.0	20.6@+020°	1146.0
4	100.9	835.3	20.6@+012°	1136.1
5	101.7	829.9	20.6@+013°	1144.4
6	96.8	821.4	20.6@+013°	1090.2
7	92.2	848.4	20.6@+013°	1038.5
8	95.6	824.6	20.6@+013°	1076.0
9	105.3	881.7	20.6@+013°	1185.6
10	98.9	828.6	19.9@+013°	1113.9
11	90.1	796.9	20.6@+013°	1014.8
12	106.1	892.7	20.6@-008°	1194.6
13	102.3	840.6	20.6@+019°	1151.7
14	90.8	779.2	19.8@+013°	1022.8
15	95.0	878.1	22.6@-002°	1069.2
16	107.7	895.9	19.9@+025°	1213.0

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
99.3± 5.4	841.5± 32.6	20.6± 0.7	1118.0± 60.5	Mean
107.7	895.9	22.6	1213.0	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2041.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	102.7	814.1	19.9@+025°	1155.7
2	104.6	863.6	20.6@+025°	1177.1
3	100.2	796.7	21.3@+013°	1128.5
4	108.0	878.9	22.7@-002°	1215.9
5	97.6	822.9	22.0@+000°	1098.3
6	91.8	825.0	20.6@+013°	1033.7
7	109.2	873.9	21.3@+013°	1229.1
8	98.5	838.8	21.3@+013°	1108.6
9	100.1	836.4	20.6@+013°	1126.6
10	103.5	843.8	19.9@+015°	1164.9
11	102.0	860.1	20.6@+013°	1148.0
12	89.1	804.8	21.3@+013°	1002.7
13	100.4	828.2	26.3@+000°	1129.9
14	103.1	848.8	23.4@+000°	1160.3
15	101.2	827.5	21.3@+000°	1139.8
16	96.0	779.7	19.2@+018°	1080.8

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
100.5± 5.2	833.9± 27.5	21.4± 1.7	1131.2± 58.9	Mean
109.2	878.9	26.3	1229.1	Max

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Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2042.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	104.5	892.7	20.6@+015°	1176.9
2	80.4	786.3	21.3@+013°	905.6
3	99.5	872.8	19.2@+025°	1120.0
4	91.9	832.1	20.6@+015°	1034.7
5	93.3	816.4	20.6@+000°	1050.7
6	87.2	831.8	20.6@+013°	981.4
7	100.1	821.4	20.6@-001°	1127.1
8	93.6	843.8	22.0@-003°	1053.4
9	93.1	806.2	19.9@+015°	1047.7
10	82.1	782.0	19.1@+020°	924.4
11	84.5	800.8	19.9@+013°	951.5
12	102.7	834.6	19.9@+020°	1156.7
13	81.9	774.9	20.6@+013°	922.2
14	99.0	877.2	23.4@-003°	1114.5
15	94.8	847.0	19.2@+015°	1067.3
16	71.1	763.5	19.8@+020°	801.0

H4GIV

.98 RK

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
91.2± 9.3	824.0± 37.6	20.4± 1.1	1027.2±104.6	Mean
104.5	892.7	23.4	1176.9	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2043.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	95.1	833.9	20.6@+013°	1071.0
2	93.5	816.9	21.3@+013°	1052.6
3	94.2	822.5	20.6@-002°	1060.2
4	92.3	836.4	20.6@+013°	1038.6
5	99.9	851.6	21.3@+013°	1124.8
6	88.0	820.1	20.6@+013°	990.4
7	85.6	779.3	29.1@+036°	963.6
8	93.3	824.0	20.6@+020°	1050.4
9	97.8	875.0	21.3@+013°	1101.3
10	93.1	828.2	19.2@+013°	1048.1
11	88.8	800.2	20.6@+013°	999.6
12	80.7	818.2	20.6@+015°	909.1
13	90.8	848.7	20.6@+020°	1022.2
14	89.1	808.0	19.9@+015°	1003.3
15	90.0	815.0	21.3@+012°	1012.8
16	82.9	777.4	20.6@+013°	933.6

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
90.9± 5.1	822.2± 25.0	21.2± 2.2	1023.8± 57.3	Mean
99.9	875.0	29.1	1124.8	Max

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HYGIV w/J.C.

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2044.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	123.2	942.1	19.2@+025°	1387.2
2	127.7	1023.0	29.1@-016°	1437.3
3	123.3	956.9	19.8@+001°	1388.7
4	129.6	1212.7	90.1@-012°	1459.2
5	124.0	1126.0	46.1@-011°	1396.3
6	126.0	1086.6	44.0@-015°	1418.6
7	129.0	1150.8	97.9@-013°	1452.0
8	125.3	1185.5	66.0@-011°	1410.1
9	126.2	1101.2	97.8@-014°	1420.7
10	128.2	1105.0	48.2@-012°	1442.9
11	123.6	1033.8	34.8@-016°	1391.0
12	125.4	1041.7	24.9@-006°	1411.5
13	127.3	1039.9	36.9@-015°	1433.4
14	125.1	1203.2	112.7@-011°	1408.1
15	128.0	1245.0	84.3@-010°	1441.6
16	123.8	1123.1	57.4@-012°	1393.7

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
126.0± 2.1	1098.5± 88.9	56.8± 30.8	1418.3± 23.7	Mean
129.6	1245.0	112.7	1459.2	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2045.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	126.7	1146.8	51.7@-013°	1426.5
2	128.2	1172.4	63.8@-011°	1443.5
3	122.8	1035.7	46.8@-014°	1382.7
4	124.4	1030.9	31.2@-016°	1400.0
5	124.4	1006.9	23.4@+001°	1400.6
6	125.8	1144.0	48.2@-012°	1416.6
7	126.1	1230.1	160.9@-012°	1419.1
8	127.7	1030.3	44.7@-017°	1437.9
9	121.1	877.6	20.6@+025°	1363.8
10	126.7	1116.7	51.0@-014°	1426.2
11	123.9	1020.4	26.2@-015°	1395.1
12	127.7	1103.6	37.6@-013°	1437.8
13	128.2	1091.9	56.7@-014°	1443.9
14	124.4	1149.7	67.4@-012°	1400.4
15	125.1	1068.6	29.8@-006°	1408.5
16	126.8	1187.9	73.0@-013°	1427.5

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
125.6± 2.0	1088.3± 87.2	52.1± 33.1	1414.4± 22.9	Mean
128.2	1230.1	160.9	1443.9	Max

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HYGIV w/J.C.
1.01RK

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2046.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	116.6	852.4	21.3@+001°	1312.8
2	114.2	965.8	27.0@-002°	1285.4
3	118.4	1026.7	30.5@-011°	1333.2
4	117.7	922.2	22.7@+001°	1325.1
5	110.4	834.9	18.5@+018°	1242.7
6	116.9	922.6	22.0@+001°	1315.8
7	118.3	964.3	20.6@-011°	1331.3
8	115.3	919.0	21.3@-003°	1298.4
9	114.1	853.5	27.6@+001°	1284.9
10	117.3	961.9	24.8@-006°	1320.1
11	119.0	1082.0	41.2@-014°	1339.6
12	117.0	952.3	22.0@-003°	1316.9
13	115.0	877.8	20.6@+000°	1294.3
14	118.0	957.5	25.5@-011°	1328.9
15	118.7	930.3	22.7@+001°	1336.0
16	119.6	945.9	25.5@+000°	1346.6

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
116.6± 2.4	935.6± 63.7	24.6± 5.4	1313.3± 26.6	Mean
119.6	1082.0	41.2	1346.6	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2047.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	119.4	959.0	26.3@+000°	1344.6
2	119.8	1141.5	51.7@-009°	1349.0
3	118.4	972.9	22.7@+001°	1333.3
4	114.3	886.3	22.7@+001°	1286.7
5	115.7	966.4	26.9@-006°	1302.4
6	121.3	1007.6	22.0@-003°	1365.7
7	120.5	1023.9	29.1@-015°	1356.9
8	117.8	941.3	20.6@-017°	1326.7
9	116.9	956.9	23.4@+000°	1316.2
10	115.7	909.4	19.1@+026°	1302.1
11	120.5	1010.1	26.3@-007°	1356.8
12	118.2	962.6	27.0@-017°	1331.1
13	115.4	873.2	19.2@+025°	1299.1
14	118.8	1089.1	37.6@-004°	1336.9
15	114.1	1021.5	28.4@-004°	1285.0
16	119.4	932.8	26.9@-007°	1344.5

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
117.9± 2.3	978.4± 70.1	26.9± 8.0	1327.3± 25.9	Mean
121.3	1141.5	51.7	1365.7	Max

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HYGIV w/ J.C.
1,000 RK

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2048.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	103.6	885.6	19.9@+025°	1166.5
2	111.4	933.9	22.7@+001°	1254.0
3	106.4	815.5	19.8@+001°	1198.1
4	107.8	876.7	22.0@+001°	1213.4
5	108.3	841.7	21.3@+001°	1218.8
6	104.4	865.0	19.9@+019°	1175.2
7	106.6	879.7	26.3@-006°	1200.1
8	113.0	904.0	22.0@+000°	1272.0
9	106.0	840.3	19.8@+013°	1193.9
10	107.4	873.3	23.4@+000°	1209.3
11	110.4	851.0	20.6@+001°	1243.4
12	109.1	877.1	22.7@+001°	1227.9
13	109.8	871.9	19.1@+013°	1236.1
14	107.7	782.2	19.8@+025°	1212.0
15	112.1	878.2	23.4@-004°	1261.7
16	109.6	844.2	20.6@+000°	1233.6

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
108.3± 2.6	863.8± 35.2	21.5± 1.9	1219.8± 29.8	Mean
113.0	933.9	26.3	1272.0	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2049.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	105.1	845.6	19.8@+013°	1183.2
2	104.5	809.4	19.9@+000°	1176.6
3	110.9	876.8	21.3@+013°	1249.0
4	109.3	927.1	33.4@-004°	1230.8
5	104.7	842.4	19.2@+014°	1178.5
6	101.5	846.3	19.8@+021°	1143.0
7	107.0	871.1	21.3@+001°	1204.1
8	108.6	894.5	26.2@+001°	1223.1
9	100.1	797.4	19.8@+013°	1126.6
10	109.7	864.5	20.6@+001°	1234.7
11	101.4	757.3	22.0@+001°	1141.8
12	108.1	923.9	24.9@+000°	1217.2
13	111.7	925.0	21.3@-009°	1257.7
14	108.7	839.2	20.6@+025°	1223.7
15	111.2	867.9	26.9@+000°	1251.9

For 15 events:

IMEP	Max Press	Max RPR	8-645HP	
106.8± 3.8	859.2± 48.3	22.5± 3.9	1202.8± 42.4	Mean
111.7	927.1	33.4	1257.7	Max

11/8/96

HYGIV w/J.C.

.99 RK

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2050.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	97.2	850.2	21.3@+001°	1094.4
2	92.1	799.1	19.8@+013°	1037.0
3	98.2	827.9	19.2@+013°	1105.1
4	101.4	827.9	24.1@+000°	1141.7
5	94.1	765.8	22.0@+000°	1059.8
6	100.1	808.4	21.3@+001°	1126.8
7	91.4	770.4	19.2@+025°	1028.9
8	98.5	816.5	24.8@+001°	1108.6
9	98.5	814.3	18.4@+014°	1109.3
10	101.6	869.3	24.1@+000°	1143.8
11	98.3	823.6	19.8@+001°	1106.3
12	91.3	782.0	23.4@+001°	1028.1
13	94.6	820.4	22.0@+000°	1065.3
14	89.1	738.4	20.6@+013°	1003.0
15	101.8	803.5	24.1@+001°	1146.1

For 15 events:

IMEP	Max Press	Max RPR	8-645HP	
96.5± 4.2	807.8± 33.4	21.6± 2.1	1086.9± 46.8	Mean
101.8	869.3	24.8	1257.7	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2051.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	85.9	751.7	19.8@+013°	967.0
2	95.7	791.4	24.1@+001°	1077.3
3	104.5	899.1	29.1@-005°	1176.4
4	100.1	833.2	19.8@+001°	1127.2
5	91.1	747.0	21.3@+001°	1025.1
6	90.7	751.2	19.2@+025°	1021.5
7	98.7	885.6	20.6@+000°	1110.8
8	104.0	853.8	19.9@+013°	1170.8
9	101.2	886.4	20.6@+014°	1139.9
10	103.5	860.1	26.9@+001°	1165.2
11	106.2	874.3	20.6@-005°	1195.5
12	100.0	853.3	22.0@+000°	1126.3
13	103.5	883.1	26.3@-002°	1164.7
14	95.8	809.4	24.9@+000°	1078.8
15	105.4	862.9	20.6@+000°	1186.5
16	92.6	763.2	19.1@+016°	1042.9

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
98.7± 6.1	831.6± 54.5	22.2± 3.1	1111.0± 68.7	Mean
106.2	899.1	29.1	1257.7	Max

11/8/96

HYGIV w/JC

.98

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2052.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	98.7	845.3	20.6@+001°	1111.1
2	90.1	739.1	19.8@+013°	1014.1
3	88.3	780.7	19.2@+025°	994.5
4	100.7	895.9	27.7@+000°	1133.3
5	95.3	807.7	21.3@+000°	1073.4
6	84.4	741.9	20.6@+001°	950.0
7	96.0	807.7	19.9@+025°	1081.3
8	82.5	758.3	19.2@+000°	928.7
9	97.1	870.7	23.4@+000°	1093.5
10	94.2	857.9	22.0@+000°	1060.7
11	100.5	855.5	22.0@+000°	1132.0
12	90.5	773.6	19.9@+025°	1019.1
13	96.9	833.6	19.9@+025°	1090.4
14	96.1	794.5	20.6@+013°	1081.6
15	87.6	786.4	19.9@+025°	986.7
16	89.8	766.2	19.2@+013°	1011.4

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
93.1± 5.6	807.2± 47.9	20.9± 2.1	1047.6± 62.7	Mean
100.7	895.9	27.7	1133.3	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2053.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	98.4	887.7	28.4@-002°	1108.0
2	100.6	898.7	26.3@-004°	1132.2
3	101.5	854.0	21.3@+001°	1143.1
4	90.9	749.8	19.8@+001°	1023.0
5	90.4	764.0	24.1@+001°	1018.1
6	89.2	739.4	23.4@+001°	1004.0
7	93.5	817.2	24.9@+000°	1052.4
8	92.1	797.3	19.2@+025°	1036.9
9	91.4	813.6	23.4@-005°	1028.9
10	94.3	848.7	25.6@-002°	1061.6
11	89.4	810.5	20.6@+000°	1006.3
12	98.9	872.5	23.4@-007°	1113.6
13	94.3	864.4	19.8@+025°	1062.2
14	87.2	754.4	19.8@+001°	981.8
15	99.3	877.4	21.3@+000°	1118.2
16	98.1	853.4	19.9@-005°	1104.9

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
94.3± 4.6	825.2± 52.3	22.6± 2.8	1062.2± 51.3	Mean
101.5	898.7	28.4	1143.1	Max

11/12/96
SPARK STD TIME

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File spark607.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	131.0	1108.5	82.2@-011°	1212.5
2	130.2	918.6	41.2@-016°	1205.1
3	131.0	1080.0	99.9@-012°	1212.7
4	131.4	874.2	39.7@-003°	1216.2
5	128.5	932.2	43.3@-002°	1189.9
6	126.2	1000.6	54.6@-014°	1168.5
7	130.4	932.9	41.1@-004°	1207.4
8	129.2	959.5	43.3@-003°	1195.6
9	126.4	987.7	61.7@-014°	1169.8
10	130.6	1087.5	82.2@-012°	1208.7
11	129.1	1044.8	67.3@-013°	1195.5
12	130.2	880.4	39.0@-003°	1205.2
13	124.8	729.4	31.9@-008°	1154.9
14	127.0	795.4	32.6@-004°	1175.5
15	127.2	935.4	46.8@-003°	1177.3
16	126.7	1001.6	63.8@-014°	1172.7

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
128.7± 2.1	954.3±103.7	54.4± 20.0	1191.7± 19.3	Mean
131.4	1108.5	99.9	1531.1	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File spark608.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	127.4	775.0	26.9@-009°	1179.1
2	125.2	867.9	41.2@-004°	1159.0
3	129.5	849.8	36.1@-007°	1198.7
4	128.3	916.5	50.3@-006°	1187.7
5	129.7	1032.3	60.2@-009°	1200.3
6	129.5	1085.8	112.0@-013°	1199.1
7	128.6	1066.4	88.6@-013°	1190.4
8	125.7	851.7	32.6@-009°	1164.0
9	127.7	956.5	46.8@-012°	1182.1
10	126.5	878.6	30.5@-004°	1171.2
11	129.5	871.4	36.1@-003°	1198.4
12	127.3	1062.7	64.5@-013°	1177.9
13	126.7	930.4	72.3@-016°	1172.7
14	126.7	1081.0	115.6@-012°	1172.8
15	130.5	991.5	53.9@-016°	1207.5
16	131.5	957.1	43.9@-015°	1217.7

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
128.1± 1.8	948.4± 96.7	57.0± 27.6	1186.2± 16.5	Mean
131.5	1085.8	115.6	1217.7	Max

11/12/96
SPARK
ADVANCE TIME

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File spark609.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	120.3	850.9	39.7@-004°	1113.3
2	117.1	754.3	36.1@-007°	1084.4
3	120.7	918.3	51.1@-004°	1117.2
4	116.4	1080.7	82.9@-010°	1077.8
5	118.1	822.7	32.6@-004°	1093.4
6	118.8	936.7	47.5@-002°	1099.3
7	115.3	704.9	20.6@-005°	1067.3
8	119.9	913.0	41.1@-011°	1110.0
9	118.3	834.6	38.3@-009°	1094.8
10	117.1	743.1	26.2@-009°	1083.9
11	120.5	844.9	45.4@-002°	1115.4
12	120.2	820.5	42.5@-003°	1112.5
13	122.2	952.3	52.5@-001°	1130.8
14	111.6	655.2	19.8@-007°	1033.4
15	118.9	903.1	45.4@-001°	1100.5
16	117.9	786.1	29.8@-003°	1091.7

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
118.3± 2.5	845.1±105.8	40.7± 15.0	1095.4± 23.4	Mean
122.2	1080.7	82.9	1130.8	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File spark611.prs
Event run-on
Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File spark802.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	127.0	864.4	39.0@-003°	1429.7
2	122.1	828.6	21.3@-005°	1375.1
3	123.3	838.8	27.0@-003°	1387.6
4	126.9	892.4	31.9@-005°	1429.2
5	115.6	730.5	19.2@-008°	1301.9
6	128.2	878.3	22.0@-005°	1443.7
7	128.1	914.7	46.8@-002°	1441.7
8	124.3	884.9	34.7@-004°	1399.8
9	117.9	773.4	22.0@-004°	1326.8
10	129.1	875.8	26.3@-004°	1453.3
11	126.0	898.8	36.9@-009°	1418.5
12	127.4	879.3	53.9@-004°	1434.2
13	111.9	681.6	18.5@+019°	1260.0
14	121.8	681.6	20.6@+025°	1371.0
15	124.9	898.4	41.8@-004°	1405.7
16	129.7	926.8	36.9@-002°	1460.0

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
124.0± 5.1	840.5± 80.1	31.2± 10.8	1396.1± 57.3	Mean
129.7	926.8	53.9	1460.0	Max

11/12/96
MAX POWER
STD TIME

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File spark803.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	134.5	1016.4	49.0@-016°	1514.0
2	128.1	869.4	22.0@-006°	1442.4
3	129.8	952.0	46.1@-005°	1460.9
4	131.9	990.2	30.5@-005°	1485.0
5	127.4	863.0	19.1@+013°	1434.1
6	115.9	759.5	19.8@-012°	1304.8
7	116.4	698.9	19.2@+013°	1310.0
8	125.3	822.3	20.6@-004°	1410.2
9	133.6	988.8	47.5@-001°	1503.7
10	133.5	1131.6	51.7@-013°	1503.5
11	120.6	692.4	19.9@+013°	1357.6
12	133.5	1012.2	39.7@-008°	1503.3
13	128.0	881.4	30.5@-008°	1440.7
14	136.0	1102.3	61.0@-015°	1531.1
15	129.7	1039.9	49.7@-014°	1460.6
16	128.6	824.3	24.1@-007°	1448.2

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
128.3± 6.1	915.3±134.9	34.4± 14.5	1444.4± 69.0	Mean
136.0	1131.6	61.0	1531.1	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File spark804.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	131.7	1197.2	145.3@-012°	1482.5
2	127.9	804.2	33.4@-008°	1439.9
3	132.2	933.3	47.5@-007°	1488.4
4	130.5	855.6	24.8@-003°	1468.8
5	130.4	930.4	41.9@-002°	1467.7
6	131.4	1031.6	34.7@-005°	1479.7
7	128.4	906.9	36.1@-002°	1445.1
8	134.0	875.6	24.9@-005°	1509.1
9	128.0	840.3	22.0@-005°	1441.3
10	126.8	801.8	26.9@-006°	1427.7
11	124.5	833.6	32.6@-009°	1401.4
12	125.1	778.7	27.6@-012°	1408.0
13	127.7	881.4	24.1@-005°	1437.9
14	133.8	1054.7	39.7@-003°	1506.0
15	129.4	833.5	19.2@+013°	1456.9
16	128.3	905.9	26.9@-005°	1444.7

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
129.4± 2.8	904.0±109.6	38.0± 29.7	1456.6± 31.7	Mean
134.0	1197.2	145.3	1509.1	Max

11/12/96
1.000" RACK
SPARK - STD TIME

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File spark805.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	97.4	763.4	27.7@-005°	1097.1
2	100.1	741.4	19.8@+013°	1126.8
3	96.8	771.5	34.7@-006°	1090.2
4	110.2	864.8	36.1@-006°	1240.3
5	101.4	822.9	41.8@-009°	1141.5
6	98.5	756.9	24.8@-007°	1108.8
7	96.2	683.5	19.8@+013°	1083.4
8	103.1	864.4	39.7@-003°	1160.2
9	100.1	712.1	19.2@+013°	1127.3
10	104.9	842.1	51.0@-005°	1180.5
11	97.1	683.0	19.1@+018°	1093.0
12	100.7	841.7	37.6@-002°	1133.3
13	102.0	764.4	19.9@+025°	1148.9
14	87.9	679.5	19.2@+013°	990.0
15	102.2	755.2	27.0@-002°	1150.1
16	103.2	842.0	43.2@-005°	1162.2

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
100.1± 4.8	774.3± 65.2	30.1± 10.6	1127.1± 54.0	Mean
110.2	864.8	51.0	1240.3	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File spark806.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	98.3	812.6	22.0@-003°	1106.3
2	87.4	681.6	19.2@+019°	984.2
3	93.5	703.0	19.2@+013°	1052.5
4	99.6	793.5	28.4@-003°	1121.0
5	102.2	859.4	39.0@-004°	1150.5
6	108.9	832.1	26.2@-002°	1226.0
7	104.6	883.1	43.3@-003°	1178.1
8	100.3	715.3	19.1@+025°	1129.2
9	98.3	773.6	29.1@-009°	1106.8
10	92.5	709.0	19.1@+018°	1041.6
11	96.1	698.9	19.2@+013°	1081.9
12	101.8	803.4	34.1@-003°	1146.5
13	102.0	800.2	24.8@-002°	1148.3
14	90.0	686.6	19.9@+013°	1013.5
15	106.8	810.9	34.8@-005°	1202.2
16	98.6	809.0	31.9@-003°	1110.3

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
98.8± 5.9	773.3± 64.9	26.8± 7.9	1112.4± 66.0	Mean
108.9	883.1	43.3	1226.0	Max

11/12/96
SPARK
1.025" RACK

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File spark807.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	115.3	706.6	18.4@+015°	1298.2
2	112.9	810.5	22.7@-004°	1271.0
3	127.7	1005.8	41.8@-001°	1437.3
4	121.8	927.1	33.4@-006°	1371.0
5	113.2	839.6	25.6@-002°	1274.0
6	115.5	845.6	17.8@+025°	1300.8
7	108.9	817.9	32.6@-004°	1225.8
8	104.3	700.3	22.7@-009°	1173.9
9	120.0	866.9	43.3@-004°	1350.9
10	120.2	853.1	49.0@-004°	1353.5
11	113.9	804.9	37.6@-006°	1282.3
12	121.5	902.7	27.0@-002°	1367.7
13	106.3	746.7	34.0@-006°	1197.3
14	109.4	728.8	21.3@-006°	1231.9
15	114.3	840.0	26.2@-003°	1286.3

For 15 events:

IMEP	Max Press	Max RPR	8-645HP	
115.0± 6.4	826.4± 83.7	30.2± 9.5	1294.8± 71.8	Mean
127.7	1005.8	49.0	1437.3	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File spark808.prs

ADV. 40

Event	IMEP	Max Press	Max RPR	8-645HP
1	121.2	1056.1	37.6@+001°	1364.2
2	121.2	917.5	27.6@-006°	1364.9
3	120.9	930.2	33.4@+000°	1360.9
4	124.7	1012.5	39.0@+000°	1404.4
5	123.6	972.9	30.5@-001°	1391.1
6	120.1	886.3	31.9@-001°	1351.9
7	124.4	1054.6	58.1@+000°	1400.2
8	124.7	1190.0	163.1@-012°	1403.4
9	120.9	1009.0	46.1@-002°	1361.5
10	121.9	1021.4	49.7@-014°	1372.7
11	111.1	820.7	20.6@-003°	1251.3
12	114.4	848.1	22.7@-006°	1288.3
13	113.7	801.8	19.9@-004°	1280.2
14	126.9	1096.9	46.8@-003°	1428.2
15	123.5	1039.9	39.0@+000°	1390.0
16	123.9	1032.3	36.2@+000°	1394.5

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
121.1± 4.4	980.6±106.1	43.9± 33.5	1363.0± 49.4	Mean
126.9	1190.0	163.1	1437.3	Max

11/12/96
SPARK ADV. 4°
1.03"

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File spark809.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	115.9	798.1	18.5@+020°	1305.4
2	122.8	1080.2	55.3@-001°	1382.4
3	125.9	1179.0	76.6@-011°	1417.5
4	123.1	1034.6	51.0@-014°	1386.1
5	122.8	1023.8	44.7@+000°	1383.1
6	124.3	1121.7	87.2@-014°	1399.1
7	121.9	903.2	24.1@-015°	1372.0
8	126.8	1029.1	46.8@-003°	1427.5
9	115.8	771.9	18.4@+016°	1303.5
10	127.2	1136.6	49.6@-012°	1431.6
11	124.0	959.0	32.6@-001°	1396.1
12	123.9	947.2	46.8@-002°	1394.9
13	123.4	908.0	26.3@+000°	1389.1
14	117.7	849.1	23.4@+001°	1325.1
15	123.6	988.4	35.4@-002°	1392.0
16	123.3	985.2	36.1@-001°	1388.5

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
122.7± 3.4	982.2±117.7	42.1± 19.7	1380.9± 38.3	Mean
127.2	1179.0	87.2	1431.6	Max

710 MANUAL DATA

16-710 testing log								
Date	G / D	Cyl.	ign.	wasup				
1/12/95	D	16	DI	Will the engine do power? LEI benefits				
7/13/95	D	16	DI	Calibrtation work on meters				
7/14/95	D	16	DI	KW transducer work				
8/16/95	D	16	DI	Initial baseline and KW calibration				
8/17/95	D	16	DI	More baseline preperation				
8/18/95	D	16	DI	Baselining and final calibration work				
5/7/96	D	16	DI	Test new turbocharger, fan power data, cam going bad.				
5/17/96	D	16	DI	Good baseline run,				
5/24/96	D	16	DI	Baseline backup w/6700 injectors				
6/13/96	D	16	DI	third backup w/6700				
7/2/96	D	16	DI	Baseline on the 7000 injectors				
9/11/96	D	16	DI	7000 #2 backup baseline				
9/16/96	D	16	DI	#3 baseline w/7000 injectors				
9/19/96	D	16	DI	#4 baseline with humidity upgrade				

11/6/96

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2000.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	114.2	909.0	19.8@+015°	938.5
2	107.5	846.0	21.3@+012°	883.8
3	109.4	877.3	21.3@+020°	899.1
4	106.7	852.2	19.8@+018°	877.0
5	105.2	817.9	19.8@+014°	864.4
6	109.1	883.5	20.6@-004°	896.9
7	108.2	907.9	21.3@-004°	889.6
8	105.1	883.7	29.1@-001°	863.8
9	113.4	883.1	20.6@+020°	932.1
10	104.5	846.2	25.6@-003°	859.1
11	114.9	899.6	24.1@+000°	944.7
12	107.3	851.3	19.9@+018°	881.8
13	108.2	833.8	19.9@+020°	889.4
14	111.8	865.4	20.6@+013°	919.0
15	99.8	823.9	19.8@+024°	820.5
16	110.9	898.0	22.0@+000°	911.5

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
108.5± 4.0	867.4± 29.5	21.6± 2.6	891.9± 32.6	Mean
114.9	909.0	29.1	944.7	Max

1000 HP GAS

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2001.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	107.3	861.0	20.6@+020°	882.1
2	110.6	890.3	19.8@+012°	909.3
3	119.2	920.9	27.6@-003°	979.8
4	98.0	794.8	19.9@+018°	805.8
5	123.2	942.6	31.2@-001°	1012.7
6	121.7	946.2	29.1@-003°	1000.4
7	115.0	879.9	19.8@+024°	945.2
8	105.1	836.6	20.6@+018°	863.8
9	112.6	922.2	21.3@+022°	925.6
10	114.2	920.0	22.0@-006°	938.4
11	107.7	872.0	24.8@-003°	884.8
12	104.7	842.3	26.3@+000°	860.6
13	107.4	816.1	21.3@+000°	882.9
14	120.9	916.7	20.6@+015°	993.4
15	110.0	877.4	19.9@+012°	903.7
16	98.7	830.7	19.9@+012°	811.5

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
111.0± 7.7	879.4± 46.4	22.8± 3.8	912.5± 63.3	Mean
123.2	946.2	31.2	1012.7	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2002.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	128.8	938.2	20.6@+012°	1058.3
2	119.2	871.5	19.9@+017°	980.0
3	114.0	895.4	19.8@+020°	936.9
4	113.0	903.6	25.6@+000°	928.7
5	107.1	838.8	20.6@+012°	880.2
6	120.1	937.1	22.7@-008°	987.3
7	122.1	932.2	24.8@+000°	1003.3
8	125.8	910.2	19.9@+000°	1033.7
9	125.7	921.2	28.4@-003°	1032.8
10	128.2	1098.2	39.7@-005°	1053.6
11	114.2	902.8	24.8@-002°	938.8
12	126.7	904.6	20.6@+000°	1041.6
13	120.3	866.2	19.9@+018°	988.5
14	124.4	968.1	23.4@-004°	1022.1
15	126.7	974.2	27.6@-005°	1041.0
16	124.1	1033.3	28.4@-006°	1019.6

1100 HP GAS

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
121.3± 6.3	931.0± 64.3	24.2± 5.2	996.6± 51.9	Mean
128.8	1098.2	39.7	1058.3	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2003.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	126.3	1063.6	29.1@-003°	1037.9
2	102.6	837.6	20.6@+012°	843.6
3	118.2	851.5	20.6@+018°	971.0
4	109.7	837.3	22.0@+000°	901.7
5	128.8	1065.0	27.6@-007°	1058.7
6	119.6	881.0	20.6@+013°	983.0
7	121.2	963.9	34.0@-007°	995.9
8	131.5	1005.2	25.5@-005°	1080.8
9	120.8	917.3	21.3@-004°	992.6
10	123.0	920.6	19.9@+018°	1010.5
11	125.9	971.0	24.1@-006°	1034.9
12	122.7	889.0	20.6@+017°	1008.2
13	127.4	1023.0	26.9@-013°	1047.1
14	116.3	877.3	22.7@+000°	955.4
15	119.7	929.9	20.6@-007°	983.7
16	106.0	829.6	19.9@+017°	870.9

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
120.0± 8.1	928.9± 79.0	23.5± 4.1	986.0± 66.4	Mean
131.5	1065.0	34.0	1080.8	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2004.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	99.1	817.8	20.6@+018°	814.2
2	102.6	856.5	26.2@-003°	843.1
3	102.8	851.6	21.3@+014°	844.8
4	105.0	850.1	19.9@+020°	862.7
5	107.9	860.8	21.3@-003°	886.5
6	100.2	849.4	23.4@+000°	823.3
7	108.5	846.3	19.9@+018°	891.4
8	113.0	921.3	19.2@+018°	929.0
9	105.6	860.3	22.0@-003°	867.7
10	100.8	847.3	19.9@+020°	828.5
11	96.8	839.5	24.1@+000°	795.8
12	99.2	836.7	21.3@-001°	815.1
13	103.0	864.4	20.6@+020°	846.7
14	100.3	833.0	23.4@+000°	824.5
15	103.5	834.8	24.1@+000°	850.9
16	105.5	857.0	19.9@+012°	866.7

900 HP GAS

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
103.4± 4.1	851.7± 22.3	21.7± 2.0	849.4± 34.1	Mean
113.0	921.3	26.2	929.0	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2005.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	105.9	850.5	27.6@-002°	870.2
2	115.1	879.9	25.5@-001°	945.7
3	108.3	852.4	20.6@+017°	890.1
4	104.7	865.2	21.3@-006°	860.2
5	95.3	831.6	21.3@+000°	783.3
6	99.3	858.9	23.4@-001°	816.3
7	110.1	869.6	25.6@-006°	904.9
8	102.4	940.8	29.8@-005°	841.3
9	102.6	884.2	19.9@+017°	843.1
10	89.4	805.8	20.6@+019°	734.7
11	100.3	847.0	20.6@+017°	824.1
12	93.9	824.8	20.6@-003°	772.0
13	106.8	887.3	28.4@-003°	878.1
14	94.0	782.4	20.6@+014°	772.6
15	95.0	824.5	20.6@+017°	781.2
16	107.4	871.3	24.1@-001°	882.5

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
101.9± 7.0	854.8± 37.1	23.1± 3.3	837.5± 57.8	Mean
115.1	940.8	29.8	945.7	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2006.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	92.5	793.0	20.6@+019°	760.6
2	83.7	823.9	19.9@+019°	687.7
3	105.9	888.4	22.0@+000°	870.5
4	79.3	790.2	19.8@+017°	652.0
5	107.4	878.9	21.3@-001°	883.0
6	84.4	811.9	19.9@+020°	694.0
7	86.0	795.9	22.0@+000°	706.7
8	91.1	802.7	22.7@-001°	748.4
9	112.8	881.7	23.4@-004°	927.3
10	103.9	830.3	19.2@+020°	853.6
11	98.1	834.5	24.1@-001°	806.4
12	96.3	824.2	22.0@+000°	791.6
13	103.2	847.7	21.3@+019°	847.9
14	88.5	824.2	22.0@-001°	727.3
15	98.7	861.8	19.8@+017°	811.1
16	104.7	836.4	22.0@-001°	860.5

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
96.0± 9.9	832.8± 31.7	21.4± 1.4	789.3± 81.3	Mean
112.8	888.4	24.1	927.3	Max

800 HP GAS

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2007.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	88.7	826.4	20.6@+017°	728.8
2	90.8	813.2	21.3@+000°	746.1
3	95.1	852.6	19.9@+019°	781.9
4	91.8	808.3	27.6@-001°	754.2
5	103.3	850.1	20.6@+019°	849.1
6	104.2	882.7	22.0@-002°	856.7
7	103.5	887.3	20.6@-007°	850.5
8	87.5	805.0	22.7@+000°	719.5
9	109.4	849.7	20.6@+016°	899.1
10	76.4	776.0	19.8@+018°	627.9
11	85.3	788.7	27.6@+000°	701.1
12	93.6	810.5	19.2@+014°	769.0
13	99.3	854.0	25.5@-001°	816.0
14	89.2	815.7	23.4@-004°	733.2
15	105.9	855.5	20.6@+019°	870.7
16	90.8	826.0	26.3@+000°	746.1

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
94.7± 8.9	831.4± 31.8	22.4± 2.8	778.1± 73.1	Mean
109.4	887.3	27.6	899.1	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2008.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	-0.0	16.4	0.7@+168°	-0.3
2	-0.0	16.4	0.7@+137°	-0.2
3	-0.0	17.1	1.4@+013°	-0.4
4	-0.0	16.4	0.7@+176°	-0.3
5	-0.0	17.1	1.4@+013°	-0.2
6	134.2	1330.8	66.0@+009°	1103.2
7	129.6	1337.3	56.0@+005°	1065.2
8	132.9	1326.0	64.5@+006°	1092.5
9	132.5	1324.6	56.7@+016°	1089.2
10	131.9	1321.4	61.7@+011°	1083.9
11	131.0	1333.1	58.8@+010°	1076.4
12	129.6	1338.7	61.0@+017°	1065.2
13	128.2	1337.7	61.7@+017°	1053.5
14	132.3	1314.7	56.7@+008°	1087.5
15	130.8	1318.5	56.0@+005°	1074.6
16	129.9	1344.4	63.1@+010°	1067.5

1450 HP
DIESEL

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
90.2± 62.8	919.4±628.6	41.7± 28.5	741.1±516.4	Mean
134.2	1344.4	66.0	1103.2	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2009.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	134.2	1342.6	70.2@+006°	1103.0
2	132.9	1339.1	66.7@+016°	1092.3
3	130.8	1325.3	56.7@+009°	1075.1
4	129.8	1329.5	68.0@+011°	1066.6
5	128.3	1341.6	56.0@+010°	1054.4
6	134.3	1336.2	61.0@+013°	1104.1
7	134.0	1335.5	62.4@+008°	1101.2
8	131.8	1331.3	60.2@+008°	1083.6
9	131.5	1335.9	57.4@+011°	1080.4
10	130.7	1316.1	58.2@+013°	1074.5
11	130.6	1349.4	58.8@+011°	1073.5
12	127.9	1323.8	61.7@+011°	1050.8
13	133.3	1340.9	56.7@+008°	1095.9
14	131.3	1302.9	59.5@+018°	1078.7
15	131.6	1322.4	69.5@+011°	1081.1
16	130.7	1351.8	64.5@+007°	1074.4

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
131.5± 1.9	1332.8± 12.6	61.7± 4.7	1080.6± 15.9	Mean
134.3	1351.8	70.2	1104.1	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2010.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	94.4	882.7	21.3@+018°	775.8
2	104.9	893.8	22.7@-006°	861.9
3	109.3	917.9	19.9@+015°	898.1
4	86.9	812.1	23.4@-004°	714.1
5	98.1	823.6	19.9@+020°	806.2
6	109.9	915.4	24.8@-005°	903.6
7	104.5	848.8	28.4@-003°	859.0
8	105.7	899.4	20.6@+013°	868.9
9	96.0	799.1	19.8@+024°	788.8
10	110.3	878.9	20.6@+000°	906.4
11	99.1	814.3	21.3@-003°	814.1
12	106.9	856.9	19.9@+013°	878.7
13	90.8	791.4	20.6@+013°	746.4
14	101.0	840.3	19.9@+020°	830.2
15	109.9	862.2	21.3@+000°	903.6
16	99.7	851.2	23.4@+000°	819.0

1000 HP GAS
7.5 TIMING

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
101.7± 7.2	855.5± 40.3	21.7± 2.3	835.9± 59.2	Mean
110.3	917.9	28.4	906.4	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2011.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	110.7	879.6	19.1@+021°	909.5
2	109.6	871.8	19.2@+019°	900.4
3	107.0	843.8	29.1@-003°	879.5
4	94.2	820.3	19.9@+019°	773.9
5	97.6	838.8	19.2@+018°	802.0
6	114.4	888.8	20.6@-005°	940.4
7	107.5	865.1	19.1@+021°	883.2
8	106.3	876.8	21.3@+019°	873.4
9	106.7	878.5	19.9@+025°	877.3
10	100.3	858.6	22.7@+000°	824.2
11	110.4	945.3	25.5@-005°	907.3
12	107.9	890.8	20.6@+013°	887.0
13	108.6	823.9	19.8@+015°	892.3
14	93.3	792.7	24.1@+000°	766.8
15	97.2	817.2	24.9@+000°	798.7
16	107.9	855.1	22.7@+000°	887.1

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
105.0± 6.4	859.2± 36.7	21.7± 2.9	862.7± 52.3	Mean
114.4	945.3	29.1	940.4	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2012.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	91.5	772.8	20.6@+020°	752.3
2	116.6	825.8	21.3@+020°	958.2
3	120.3	830.3	21.3@+018°	988.5
4	111.7	791.3	20.6@+020°	918.0
5	130.8	939.9	26.9@-007°	1075.1
6	112.1	817.5	21.3@+017°	921.2
7	121.5	894.1	21.3@+020°	998.2
8	107.0	788.1	20.6@+020°	879.6
9	98.7	782.1	19.8@+017°	811.0
10	104.0	751.8	20.6@+017°	854.9
11	116.6	802.4	20.6@+014°	957.9
12	111.6	809.6	19.9@+020°	917.3
13	108.0	796.1	20.6@+018°	887.5
14	106.2	807.0	20.6@+018°	872.5
15	119.0	924.6	19.9@+020°	978.0
16	108.7	770.6	19.8@+020°	893.6

1000 HP GAS
4 DEG. TIMING

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
111.5± 9.5	819.0± 54.6	21.0± 1.7	916.5± 77.8	Mean
130.8	939.9	26.9	1075.1	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000

0File g8g2013.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	127.2	1013.7	35.5@-008°	1045.0
2	106.7	762.6	20.6@+018°	876.9
3	111.1	771.6	22.0@+018°	913.0
4	117.3	798.4	20.6@+020°	963.9
5	112.1	780.6	19.9@+021°	921.5
6	113.9	803.2	19.8@+021°	936.1
7	114.5	826.8	19.9@+018°	941.4
8	111.9	816.2	19.9@+018°	919.6
9	99.6	742.0	21.3@+018°	818.6
10	118.7	830.8	19.9@+020°	975.8
11	117.2	823.0	20.6@+018°	963.1
12	109.7	769.8	20.6@+020°	901.2
13	107.0	804.5	21.3@+018°	879.3
14	104.5	743.0	21.3@+020°	858.4
15	111.1	797.4	20.6@+020°	913.1
16	118.5	833.2	20.6@+018°	973.6

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
112.6± 6.6	807.3± 62.5	21.5± 3.8	925.0± 54.0	Mean
127.2	1013.7	35.5	1045.0	Max

11/7/96

FIRST TEST OF THE DAY

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2014.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	129.2	1011.1	21.3@+025°	1061.9
2	129.8	962.1	21.3@+000°	1066.7
3	130.0	1075.6	41.9@-011°	1068.4
4	134.0	1159.7	31.9@-002°	1101.0
5	133.8	1117.6	38.3@-013°	1099.8
6	129.1	938.4	21.3@-002°	1060.9
7	133.8	1138.4	45.4@-014°	1100.0
8	128.1	1020.7	22.0@-002°	1052.6
9	129.8	1038.5	24.1@-007°	1066.4
10	125.9	1096.6	36.9@-014°	1035.0
11	131.9	1191.7	47.5@-011°	1083.8
12	131.7	1182.5	56.7@-013°	1082.8
13	134.3	1087.8	42.5@-013°	1103.4
14	130.5	1100.1	41.1@-014°	1072.3
15	127.0	902.9	21.3@+000°	1043.5
16	138.5	1145.8	49.0@-011°	1138.5

1 CYL

1,040 RACK

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
131.1± 3.2	1073.1± 87.1	35.2± 11.9	1077.3± 26.4	Mean
138.5	1191.7	56.7	1138.5	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2015.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	136.8	1314.5	101.4@-013°	1123.9
2	130.1	975.1	22.7@-013°	1069.0
3	134.2	1137.1	53.2@-014°	1103.0
4	130.0	1134.9	47.5@-011°	1068.2
5	130.9	1153.4	60.3@-011°	1075.8
6	129.9	1115.1	35.4@-011°	1067.6
7	131.1	1051.4	22.0@-004°	1077.3
8	130.1	1077.4	29.8@-013°	1069.3
9	128.3	983.9	21.3@+013°	1054.5
10	127.3	883.9	21.3@+012°	1046.0
11	133.5	1069.5	26.9@-007°	1097.1
12	136.3	1214.9	128.3@-013°	1120.0
13	130.7	1103.2	35.5@-011°	1073.8
14	130.3	1128.3	46.1@-013°	1071.1
15	135.9	1071.8	24.1@-007°	1117.0
16	131.8	1134.7	31.2@-004°	1083.1

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
131.7± 2.8	1096.8± 99.0	44.2± 30.5	1082.3± 23.3	Mean
136.8	1314.5	128.3	1123.9	Max

11/7/96

1 CYL TEST
1" RACK

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2016.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	114.2	916.8	20.6@+001°	938.4
2	98.2	850.1	19.8@+020°	807.4
3	93.5	794.1	20.6@+015°	768.2
4	108.8	891.3	19.8@+012°	893.8
5	103.6	857.9	20.6@+018°	851.3
6	103.5	856.9	19.9@+013°	850.7
7	95.2	831.3	23.4@+000°	782.5
8	108.1	889.5	21.3@-003°	888.3
9	94.4	827.8	20.6@+013°	776.1
10	110.3	907.2	20.6@+017°	906.6
11	111.4	877.1	19.8@+021°	915.2
12	103.7	847.4	20.6@+020°	852.4
13	105.4	875.7	19.8@+017°	866.0
14	109.1	886.7	20.6@+020°	896.8
15	101.9	851.9	19.9@+020°	837.5
16	105.3	833.2	19.9@+020°	865.3

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
104.2± 6.2	862.2± 32.4	20.5± 0.9	856.0± 51.3	Mean
114.2	916.8	23.4	938.4	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2017.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	101.8	868.3	20.6@+020°	836.5
2	108.7	907.6	21.3@+020°	893.4
3	106.9	881.0	19.9@+020°	878.9
4	116.6	916.2	21.3@-003°	958.2
5	107.1	893.0	20.6@+012°	879.9
6	115.4	984.1	23.4@-004°	948.2
7	111.1	950.8	25.6@-002°	912.9
8	95.9	843.0	20.6@+020°	787.8
9	110.6	887.8	20.6@+020°	908.9
10	98.8	832.8	20.6@+020°	812.0
11	110.4	864.3	19.8@+018°	907.1
12	110.7	887.4	19.9@+012°	910.0
13	106.4	878.9	20.6@+020°	874.7
14	102.6	873.2	20.6@+020°	843.1
15	111.8	926.1	20.6@+018°	919.0
16	104.8	894.8	21.3@+013°	861.3

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
107.5± 5.7	893.1± 38.2	21.1± 1.5	883.2± 46.6	Mean
116.6	984.1	25.6	958.2	Max

11/7/96
1 CYL
.99 RACK

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2018.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	100.8	863.3	21.3@-002°	828.0
2	114.5	934.6	22.7@-005°	941.4
3	76.0	785.2	19.8@+018°	624.4
4	102.3	877.8	22.7@-005°	840.6
5	99.2	855.1	24.1@-004°	814.9
6	88.1	836.3	20.6@+013°	724.5
7	109.5	861.2	23.4@+000°	900.1
8	84.9	782.8	20.6@+013°	698.1
9	103.8	915.0	29.1@-002°	852.7
10	99.7	884.2	20.6@+018°	819.7
11	87.1	843.7	21.3@+000°	715.8
12	101.1	893.4	19.9@+020°	830.7
13	91.0	799.4	20.6@+020°	748.0
14	103.7	847.4	19.2@+020°	852.5
15	106.2	867.9	19.8@+020°	872.5
16	96.1	826.0	20.6@+024°	790.0

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
97.8± 10.0	854.6± 42.9	21.6± 2.4	803.4± 82.2	Mean
114.5	934.6	29.1	941.4	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2019.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	86.7	794.8	20.6@+020°	712.5
2	104.5	899.4	23.4@-002°	859.1
3	88.1	799.3	20.6@-003°	724.2
4	100.5	883.9	21.3@-005°	826.2
5	102.9	845.2	20.6@-002°	845.9
6	96.1	789.6	19.2@+020°	789.4
7	102.4	893.8	19.9@+017°	841.2
8	98.5	823.2	19.8@+013°	809.5
9	102.5	871.1	23.4@-003°	842.3
10	87.1	817.5	21.3@+001°	716.0
11	102.8	873.2	20.6@+001°	844.7
12	99.5	833.6	19.9@+024°	817.9
13	95.8	826.0	24.8@+000°	787.6
14	96.9	816.2	20.6@+018°	796.4
15	92.6	824.0	20.6@+017°	761.1
16	90.2	792.0	19.9@+020°	741.1

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
96.7± 6.1	836.4± 37.1	21.0± 1.5	794.7± 50.0	Mean
104.5	899.4	24.8	859.1	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2020.prs

11/7/96
1CYL

.98 RACK

Event	IMEP	Max Press	Max RPR	8-645HP
1	90.0	801.5	20.6@+018°	739.4
2	87.8	806.6	19.2@+020°	721.8
3	91.0	823.9	19.9@+020°	747.8
4	92.1	835.6	20.6@-003°	757.0
5	84.0	816.1	20.6@+017°	690.7
6	98.7	871.5	21.3@-004°	811.2
7	89.0	810.4	20.6@+020°	731.2
8	103.3	854.1	19.9@+018°	848.7
9	86.5	843.1	20.6@+000°	710.8
10	90.9	833.1	24.9@-003°	746.7
11	100.2	882.8	19.9@+020°	823.4
12	95.0	854.5	20.6@+020°	780.4
13	89.9	817.5	20.6@+017°	738.5
14	81.5	807.5	21.3@-001°	670.1
15	90.3	819.0	20.6@+020°	742.1
16	88.4	824.3	19.9@+020°	726.7

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
91.2± 5.7	831.3± 24.0	20.7± 1.2	749.2± 47.1	Mean
103.3	882.8	24.9	848.7	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2021.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	85.9	784.8	20.6@+020°	705.7
2	97.6	806.9	21.3@+019°	802.0
3	102.3	920.3	26.9@-005°	840.4
4	88.3	815.7	19.8@+018°	726.0
5	81.7	804.8	20.6@+020°	671.4
6	91.0	821.4	21.3@-001°	748.3
7	91.6	845.8	27.6@-001°	752.7
8	91.4	828.6	19.8@+017°	750.8
9	103.1	918.9	20.6@+017°	847.7
10	79.7	807.2	20.6@+020°	654.8
11	95.2	843.0	20.6@-002°	782.8
12	76.4	781.3	22.0@+001°	628.1
13	69.6	792.3	19.9@+020°	572.2
14	86.9	787.6	21.3@+000°	714.2
15	84.6	800.5	19.9@+014°	695.1
16	94.7	822.5	19.9@+020°	777.9

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
88.7± 9.1	823.9± 42.0	21.4± 2.4	729.4± 74.8	Mean
103.1	920.3	27.6	847.7	Max

**********new valve

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2022.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	116.7	846.5	24.1@+000°	959.1
2	127.2	1019.6	20.6@+013°	1045.7
3	121.5	1058.8	25.5@-004°	998.6
4	125.9	1028.9	31.9@-005°	1034.7
5	126.0	984.3	23.4@-016°	1035.7
6	124.2	986.9	26.3@-013°	1020.6
7	122.1	973.3	20.6@-004°	1003.2
8	123.8	939.8	20.6@+013°	1017.8
9	125.0	940.7	22.0@+013°	1027.6
10	125.5	1015.7	30.5@-015°	1031.1
11	125.5	923.5	22.0@-004°	1031.5
12	122.2	987.5	21.3@+013°	1004.6
13	125.5	1015.9	27.7@-016°	1031.5
14	123.5	992.8	22.0@-007°	1014.6
15	127.0	1023.1	23.4@-008°	1043.7
16	123.1	912.1	22.0@+013°	1012.0

NEW VALVE
HYGIV
1.025 RACK

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
124.0± 2.6	978.1± 53.9	24.0± 3.5	1019.5± 21.5	Mean
127.2	1058.8	31.9	1045.7	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2023.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	123.8	939.8	19.9@+013°	1017.4
2	126.7	990.3	22.0@-004°	1041.0
3	118.2	860.2	20.6@-002°	971.1
4	127.4	1015.0	26.9@-005°	1047.1
5	126.1	939.2	22.0@+000°	1036.4
6	110.7	810.0	19.1@+025°	909.6
7	126.2	1024.9	21.3@-003°	1037.0
8	125.7	1107.3	36.9@-011°	1033.0
9	123.8	1081.0	46.1@-013°	1017.2
10	127.8	1071.5	31.2@-009°	1050.4
11	120.0	948.1	19.9@+018°	986.4
12	128.5	1102.3	43.9@-013°	1056.3
13	123.3	960.8	21.3@-016°	1013.1
14	124.3	962.3	19.9@+017°	1021.3
15	120.4	945.4	19.8@+025°	989.6
16	124.7	930.0	22.0@+013°	1024.9

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
123.6± 4.5	980.5± 83.7	25.8± 8.9	1015.7± 37.0	Mean
128.5	1107.3	46.1	1056.3	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2024.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	127.5	1053.5	26.9@-011°	1048.0
2	130.7	1018.2	21.9@-004°	1073.7
3	130.1	1072.7	29.1@-011°	1069.1
4	127.1	942.5	19.9@+025°	1044.2
5	127.9	942.2	22.0@+025°	1051.3
6	131.1	1103.8	37.6@-013°	1077.4
7	128.3	1179.9	89.3@-010°	1054.4
8	124.3	941.9	21.3@+013°	1021.5
9	126.3	1105.8	44.0@-011°	1038.1
10	130.2	1144.3	53.9@-011°	1070.2
11	127.6	1027.7	30.5@-014°	1049.1
12	130.5	1101.4	33.3@-013°	1072.4
13	126.5	1038.9	29.1@-013°	1039.5
14	133.4	1198.0	48.9@-012°	1096.3
15	126.1	883.1	20.6@+014°	1035.9
16	127.9	1081.1	58.2@-015°	1051.1

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
128.5± 2.3	1052.2± 90.2	36.7± 18.6	1055.8± 19.2	Mean
133.4	1198.0	89.3	1096.3	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2025.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	129.4	1065.8	25.6@-002°	1063.9
2	126.4	1046.7	41.2@-015°	1038.9
3	127.7	952.2	23.4@-004°	1049.5
4	121.6	911.5	20.6@+013°	999.8
5	130.8	1091.8	37.6@-015°	1075.3
6	116.0	822.2	20.6@+025°	953.6
7	127.2	1099.1	31.9@-006°	1045.1
8	127.8	1090.9	32.6@-011°	1049.9
9	124.7	988.3	20.6@+013°	1025.0
10	123.7	1058.7	29.8@-013°	1016.9
11	133.2	1129.2	65.9@-014°	1094.6
12	125.4	1036.5	39.0@-011°	1030.4
13	130.9	1201.1	82.2@-012°	1075.6
14	131.2	1077.0	37.6@-013°	1078.0
15	130.9	1111.7	33.3@-010°	1075.8
16	128.1	1057.1	24.1@-005°	1053.2

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
127.2± 4.3	1046.2± 91.0	35.4± 16.9	1045.3± 35.3	Mean
133.2	1201.1	82.2	1094.6	Max

11/7/96
HYG-IV

1,033 RACK

SHORT T.C. ON AMP

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2026.prs

11/7/96

1.000 RACK

Event	IMEP	Max Press	Max RPR	8-645HP
1	84.7	857.5	19.2@+025°	695.8
2	81.5	859.9	21.3@+020°	669.7
3	83.8	892.6	20.6@+013°	688.6
4	87.5	933.7	26.9@-003°	719.5
5	86.3	925.5	23.4@-006°	709.6
6	80.3	856.3	19.9@+013°	660.2
7	81.9	855.7	19.9@+025°	673.5
8	83.7	839.4	22.7@+000°	687.7
9	84.7	879.9	20.6@-004°	696.3
10	81.9	847.5	19.2@+025°	673.1
11	75.5	821.2	19.2@+021°	620.3
12	78.0	808.4	20.6@+018°	641.2
13	87.6	852.1	19.9@+025°	720.0
14	89.1	959.4	20.6@+025°	732.5
15	86.8	871.7	20.6@+025°	713.7

For 15 events:

IMEP	Max Press	Max RPR	8-645HP	
83.6± 3.8	870.7± 41.7	21.0± 2.0	686.8± 31.1	Mean
89.1	959.4	26.9	732.5	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2027.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	84.7	948.2	23.4@-008°	695.8
2	73.1	844.6	19.9@+013°	600.5
3	81.3	849.7	22.7@+000°	668.1
4	88.6	914.0	19.9@+019°	728.3
5	82.1	877.3	20.6@+013°	674.4
6	77.2	820.2	20.6@+013°	634.5
7	82.1	848.9	20.6@+025°	674.7
8	78.4	823.0	20.6@+013°	644.3
9	84.0	866.0	19.9@+019°	690.5
10	84.6	846.5	21.3@+025°	695.1
11	78.8	833.4	20.6@+013°	648.0
12	79.2	866.7	19.9@+013°	650.7
13	81.2	855.3	20.6@+013°	667.4
14	78.4	868.5	19.9@+015°	644.3
15	83.5	910.3	20.6@+000°	686.1
16	60.1	767.1	19.2@+020°	494.2

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
79.8± 6.4	858.7± 42.1	20.6± 1.1	656.1± 52.6	Mean
88.6	948.2	23.4	732.5	Max

SHORT TC ON AMP

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2028.prs

11/7/96

.99 RACK

Event	IMEP	Max Press	Max RPR	8-645HP
1	98.2	844.8	21.3@+013°	807.2
2	93.6	801.1	20.6@+020°	769.2
3	103.2	844.2	20.6@+019°	848.2
4	96.6	836.5	24.8@-002°	794.3
5	89.9	817.5	20.6@+020°	738.8
6	98.9	865.4	20.6@+020°	812.6
7	102.8	840.0	20.6@+013°	845.1
8	101.8	881.2	24.1@-002°	837.0
9	100.6	868.2	20.6@+025°	826.5
10	106.6	852.9	19.9@+018°	876.4
11	102.4	912.1	20.6@+019°	841.8
12	92.8	873.5	21.3@+013°	762.7
13	88.8	829.5	19.8@+021°	729.5
14	110.6	903.3	22.7@-006°	909.3
15	93.8	791.3	21.3@+019°	771.0
16	99.7	878.9	21.3@-007°	819.4

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
98.8± 6.0	852.5± 33.9	21.3± 1.4	811.8± 49.2	Mean
110.6	912.1	24.8	909.3	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2029.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	104.7	887.8	21.3@-003°	860.6
2	101.0	816.2	20.6@+013°	830.3
3	103.0	873.2	21.3@+013°	846.2
4	101.6	847.0	21.3@+013°	834.6
5	103.1	866.8	21.3@+013°	847.7
6	101.2	852.3	22.0@+025°	831.3
7	103.4	928.1	20.6@+016°	849.9
8	86.2	792.3	20.6@+013°	708.1
9	92.2	838.1	22.0@+000°	758.1
10	117.1	949.8	20.6@+015°	962.2
11	89.6	790.2	21.3@+021°	736.4
12	101.8	873.3	20.6@+021°	837.0
13	107.2	892.7	19.8@+018°	881.2
14	99.5	861.5	21.3@+025°	817.4
15	90.2	813.3	19.2@+020°	741.5
16	89.5	809.0	21.3@+000°	735.5

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
99.5± 8.0	855.7± 45.8	20.9± 0.7	817.4± 65.9	Mean
117.1	949.8	22.0	962.2	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2030.prs

11/7/96

0.980

Event	IMEP	Max Press	Max RPR	8-645HP
1	87.5	777.1	19.9@+020°	718.8
2	90.2	830.7	20.6@+000°	741.3
3	94.4	823.9	19.9@+020°	775.5
4	103.4	874.3	24.1@+000°	850.0
5	87.2	834.9	19.9@+025°	716.8
6	92.5	846.6	20.6@+020°	760.1
7	90.9	826.0	20.6@+020°	747.4
8	89.9	798.8	19.9@+018°	738.6
9	94.7	854.1	20.6@+017°	778.7
10	90.6	797.3	19.8@+020°	744.7
11	95.4	807.3	19.9@+020°	784.2
12	88.0	828.5	19.9@+013°	723.4
13	101.7	886.4	20.6@+018°	835.7
14	93.0	819.6	21.3@+015°	764.5
15	90.1	837.8	20.6@+013°	740.7

For 15 events:

IMEP	Max Press	Max RPR	8-645HP	
92.6± 4.8	829.6± 28.8	20.5± 1.1	761.4± 39.2	Mean
103.4	886.4	24.1	850.0	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2031.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	88.8	792.0	21.3@+000°	729.9
2	92.6	814.0	19.9@+020°	761.2
3	94.8	866.8	20.6@+020°	778.8
4	87.9	814.3	21.3@+013°	722.1
5	84.9	808.3	19.9@+020°	698.1
6	86.7	792.6	20.6@+018°	712.8
7	93.0	821.1	19.8@+015°	764.6
8	92.4	883.1	27.6@-006°	759.5
9	96.5	883.1	26.9@-006°	793.3
10	83.1	818.9	20.6@+000°	683.1
11	96.5	860.9	20.6@+000°	792.9
12	85.4	808.7	20.6@+018°	702.2
13	86.9	804.4	19.2@+020°	714.2
14	93.6	815.1	20.6@+020°	768.9
15	76.1	784.8	19.9@+020°	625.8
16	95.7	869.3	19.9@+020°	786.7

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
89.7± 5.7	827.3± 33.4	21.2± 2.4	737.1± 46.7	Mean
96.5	883.1	27.6	850.0	Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2032.prs

11/7/96

1,010RACK

Event	IMEP	Max Press	Max RPR	8-645HP
1	111.2	830.4	20.6@+015°	914.1
2	114.1	856.6	19.2@+013°	937.5
3	117.2	922.3	26.2@-005°	963.5
4	115.5	959.4	22.7@-005°	948.9
5	110.2	830.3	19.2@+025°	906.0
6	117.1	925.0	22.0@-004°	962.7
7	103.6	834.2	18.5@+025°	851.5
8	108.9	835.8	19.9@+025°	895.4
9	103.6	778.8	20.6@+019°	851.6
10	111.2	836.9	19.9@+014°	914.3
11	106.3	816.7	21.3@+000°	873.5
12	120.9	964.9	19.8@+019°	993.3
13	108.1	862.5	21.3@+013°	888.4
14	108.2	847.7	19.9@+015°	888.8
15	109.8	884.3	19.8@+025°	902.1
16	114.4	909.3	19.9@+013°	940.1

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
111.3± 5.0	868.5± 53.6	20.7± 1.8	914.5± 40.7	Mean
120.9	964.9	26.2		

|158733540299699500000000000000000000000000000000000000000000000000000000000
00.0 | Max

Psi_Per_Int=0.044300 Int_Per_Psi=22.590000
0File gt8g2033.prs

Event	IMEP	Max Press	Max RPR	8-645HP
1	108.5	845.5	19.9@+025°	891.4
2	107.2	868.6	21.3@+013°	880.8
3	103.0	837.3	21.3@+013°	846.1
4	118.9	926.1	21.3@-007°	977.1
5	113.6	878.3	19.8@+013°	933.8
6	110.2	868.3	19.8@+021°	905.9
7	111.7	872.5	21.3@-002°	917.6
8	111.2	886.8	19.8@+019°	914.2
9	114.6	877.5	19.9@+013°	942.1
10	105.2	805.3	21.3@+001°	864.6
11	112.4	889.0	19.1@+019°	923.8
12	114.9	883.8	20.6@+013°	944.2
13	107.1	834.9	19.2@+019°	880.4
14	114.5	899.8	19.9@+025°	940.7
15	108.1	911.5	21.3@+013°	888.6
16	109.9	883.9	21.3@+001°	902.8

For 16 events:

IMEP	Max Press	Max RPR	8-645HP	
110.7± 4.1	873.1± 30.4	20.4± 0.8	909.6± 33.9	Mean
118.9	926.1	21.3	977.1	Max

Engine test sheet

Date 1/12/95		start time 11:00	
Baro pressure "Hg		Humidity 45	
Ambiant temp. 55		Other	

Main reason for test: DOES THE 710 DO POWER?

ALSO RUN LEI

Engine configuration basic description: BASE LINE

injector timing setting	Injector part number
Pilot timeing start of injection:	

Notes on what happened: WE FIND #4,5 AND 16 INJ. ARE SCREWING UP, TURBO DOES TURBO BUT WITH LOW FUEL POWER AND AIR ARE BOTH LOW

significant findings of the test:

Files recorded

.LOG	File/.prs	file indi	time TN	CO/HC/NOx	imep	RACK	HP	
			13:59 7			1945	2900	
.EMI						COUNTER	RPM	TEMP IN
			15:52	NORMAL IDLE	6 MIN	8.85	255	160
					10 MIN	15.12	"	
			16:05	LEI L.B.	6 MIN	10.40	256	TEMP IN 160
					10 MIN	17.29		
			16:22	NORMAL	6 MIN	9.80		
					10 MIN	16.32		
			16:50	NORMAL	16 MIN	11 70		110-118
				LEI L.B.	10	12 75		110-117
			17:12	LEI R.B.	10 MIN	12 58		108-114
			17:47	LOW IDLE	6 MIN	815	196	125-
			17:52	LOW LEI	6	836	196	128-129

Engine test sheet

Date 7-13-95		start time 10:15	
Baro pressure "Hg	30.4	Humidity	30?
Ambiant temp.	69	Other	

Main reason for test: Check Fuel meter & new Trans check, air horn & Fuel lines

Engine configuration basic description: STANDARD G3

injector timing setting	STD	Injector part number	6200
Pilot timeing start of injection:			

Notes on what happened: RAN FOR 5 hrs

significant findings of the test: Fuel meter on Engine panel is spot on at TN1 1.30 LBS/min and 24.53 at TN8 4200 hp

Files recorded

.LOG	File/.prs	file indi	time	CO/HC/NOx	imep		
.EMI							

Engine test sheet

Date 7-14	start time 12:30
Baro pressure "Hg	Humidity
Ambiant temp.	Other

Main reason for test: check KW TRANSDUCER

Engine configuration basic description: STPG3

injector timing setting	Injector part number
Pilot timeing start of injection:	

Notes on what happened: Ran 2 hrs. Almost have TRANSDUCER FIGURED OUT

significant findings of the test:

Files recorded

.LOG	File/.prs	file indi	time	CO/HC/NOx	imep		
.EMI							

TNS 4000 HP

3:18 8/16

EMISSION TEST DATA

CO	.10	%
HC	50	PPM
CO2	6.8	%
OXYGEN	11.0	%
ENGINE RPM	0	

Engine test sheet

Date 8/16/95		start time	
Baro pressure "Hg 30.21		Humidity 32 %	
Ambiant temp. 65 - 70		Other	

Main reason for test: INITIAL BASELINE WORK – FAN KWT SETTING PRESS TRANSD OPERATION

Engine configuration basic description: BASE LINE 4 PASS COOLERS TO THE ENGINE WATER

injector timing setting STD 0°		Injector part number 6700	
Pilot timeing start of injection:			

Notes on what happened: CANT SERM TO GET IT TO WORK RIGHT "FAN TRANSDUCER" OTHERS TO WORK ON AS LISTED ON OPPOSITE PAGE

significant findings of the test: ENERAC & BEAR UNITS ARE FAIRLY CLOSE IN CO, CO2, O2

Files recorded

.LOG	File/.prs	file indi	time	CO/HC/NOx	imep		
.EMI							

Engine test sheet

Date 8/17/95		start time 2:06	
Baro pressure "Hg		Humidity	
Ambiant temp.		Other	

Main reason for test: PREPARING FOR BASELINE COMPLEATION

Engine configuration basic description: BASELINE DIESEL

injector timing setting	0° STD	Injector part number	9700
Pilot timeing start of injection:	N/A		

Notes on what happened: RECORDED BASELINE EMISS & 7100A FOR NOTCHES 3-8, PLAYED WITH VARIOUS HP LEVELS CUTTING OUT CYL #9 TOOK SNAP SHOTS AT EACH SPOT PLUS FULL SPEED AND DECREASING LOAD AS BELOW, MOST SENSORS CALIBRATED INC, COMB PRESS. RECORDER INDI AT EACH NOTCH TOO.

significant findings of the test: CONSISTANT OPERATION W/POWER-FUEL RACK FROM PREVIOUS TESTS — MAYBE GETTING SLIGHTLY MORE EFF.

Files recorded

	.LOG	File/.prs	file indi	time	CO/HC/NOx	imep		
	S2,3 ✓	TN3 BASE	IND 1234 IND 5 MOT	14.02				
	S4,5 ✓	TN4 BASE	IND6	15.08				
	S6,7 ✓	TN5 BASE	IND7	15:27				
	.EMI							
	S789 ✓	TN6 BASE	IND8	15:37				
	10 11 ✓	TN7 BASE	IND9	15:44,45				
	1213 ✓	TN8 BASE	IND 10	15:5				
3000HP	S14,15,16				#9 in, out, in			
3500HP	S17,18			16:15-21	~~#9 out, in~~			
	19,20			16:22				
				16:27	#9 out, in			
	S 21 22	4000		16:37?	FULL SPEED/CHANG LOAD			
	23 24	3800		16 36				
	25 26	3600		16,37.30				
	27 28	3400		16.39				
	29 30	3000		16:40:47				
	31 32	2600		16.43	FANS JUST CAME ON			
	33 34	2200		16:44:41	ONE FAN ON			
	35 36	1800		16:46				
	37 38	1200		16:48				
	39 40	600		16:50 - 50:30				

MAXIMUM TEMPERATURE: 3797
ANGLE OF THE BEG.OF COMBUSTION: -6
MAXIMUM PRESSURE: 967
AVERAGE INDICATOR PRESSURE: 66.2
INDICATOR EFFICIENCY: 0.39
MAXIMUM VALUE OF X: 0.96
MAXIMUM SPEED OF PRESSURE INCREASE: 71
ANGLE OF MAXIMUM PRESSURE: 7
ANGLE OF MAXIMUM X: 40
ANGLE OF MAXIMUM SPEED OF COMBUSTION: 16
INDICATOR POWER: 777.4
FUEL CONSUMPTION PER HOUR: 330.000 #/HR
ANGLE OF THE BEGINNING OF COMBUSTION: -7.000
THE LOWEST HEAT OF COMBUSTION: 18498.600 BTU/#
CRANKSHAFT SPEED: 488.000 rev/min
GAS CONSUMTION PER HOUR: 0.000 #/HR
NUMBER OF DISEL CYLINDERS: 16.000
HEATING VALUE OF GAS: 20349.000 BTU/#
ADIOBATTIC EXPONENT: 1.390
DIAMETR OF CYLINDER: 2.300 dm
STROKE OF PISTON: 2.790 dm
RADIUS OF CRANK: 1.390 dm
LENGTH OF CONNECTING ROD: 5.840 dm
COMPRESSION RATIO: 16.000
PRESSURE OF SUPERCHARGING: 3.000 PSI
TEMPERATURE OF AIR AT INPUT INTO DIESEL: 85.000 DEG F
ATMOSPHERIC PRESSURE: 1.033 kg/cm^2
EFFICIENCY OF COMPRESSOR: 0.750
NUMBER OF STROKES OF DIESEL: 2.000
TEMP. DROUP OF AIR IN COOLER FOR AIR SUPERCHARGING: 0.000 DEG F
TEMP. RISE OF AIR AFTER TRANSFORM. OF KINETIC ENERGY: 0.000 DEG F
TEMPERATURE OF RESIDUAL GASES: 440.600 DEG F
COEFFICIENT OF RESIDUAL GASES: 0.030
TEMP. RISE OF AIR AS A RESULT OF HEAT FROM CYLINDER WALL: 4.000 DEG F
ANGLE OF CLOSING OF EXHAUST VALVES: -130.000 grade PKV
COEFFICIENT OF MOLECULAR CHANGE: 1.030
POWER OF DIESEL: 920.000 HP
EFFICIENCY OF DIESEL: 0.810

TN3
BASELINE

EL CONSUMPTION PER HOUR: 468.000 #/HR
GLE OF THE BEGINNING OF COMBUSTION: -5.000
THE LOWEST HEAT OF COMBUSTION: 18498.600 BTU/#
CRANKSHAFT SPEED: 562.000 rev/min
GAS CONSUMTION PER HOUR: 0.000 #/HR
NUMBER OF DISEL CYLINDERS: 16.000
HEATING VALUE OF GAS: 20349.000 BTU/#
ADIOBATTIC EXPONENT: 1.390
DIAMETR OF CYLINDER: 2.300 dm
STROKE OF PISTON: 2.790 dm
RADIUS OF CRANK: 1.390 dm
LENGTH OF CONNECTING ROD: 5.840 dm
COMPRESSION RATIO: 16.000
PRESSURE OF SUPERCHARGING: 4.000 PSI
TEMPERATURE OF AIR AT INPUT INTO DIESEL: 85.000 DEG F
ATMOSPHERIC PRESSURE: 1.033 kg/cm^2
EFFICIENCY OF COMPRESSOR: 0.750
NUMBER OF STROKES OF DIESEL: 2.000
TEMP. DROUP OF AIR IN COOLER FOR AIR SUPERCHARGING: -10.000 DEG F
TEMP. RISE OF AIR AFTER TRANSFORM. OF KINETIC ENERGY: 5.000 DEG F
TEMPERATURE OF RESIDUAL GASES: 440.600 DEG F
COEFFICIENT OF RESIDUAL GASES: 0.030
TEMP. RISE OF AIR AS A RESULT OF HEAT FROM CYLINDER WALL: 4.000 DEG F
ANGLE OF CLOSING OF EXHAUST VALVES: -130.000 grade PKV
COEFFICIENT OF MOLECULAR CHANGE: 1.030
POWER OF DIESEL: 1290.000 HP
FICIENCY OF DIESEL: 0.810

MAXIMUM TEMPERATURE: 4123
ANGLE OF THE BEG.OF COMBUSTION: -5 NOT RIGHT
MAXIMUM PRESSURE: 981
AVERAGE INDICATOR PRESSURE: 72.2
INDICATOR EFFICIENCY: 0.35
MAXIMUM VALUE OF X: 0.59
MAXIMUM SPEED OF PRESSURE INCREASE: 71
ANGLE OF MAXIMUM PRESSURE: 6
ANGLE OF MAXIMUM X: 20
ANGLE OF MAXIMUM SPEED OF COMBUSTION: -6
INDICATOR POWER: 986.9

MAXIMUM TEMPERATURE: 4125
ANGLE OF THE BEG.OF COMBUSTION: -8 MORE LIKE IT
MAXIMUM PRESSURE: 981
AVERAGE INDICATOR PRESSURE: 72.2
INDICATOR EFFICIENCY: 0.35
MAXIMUM VALUE OF X: 0.63
MAXIMUM SPEED OF PRESSURE INCREASE: 71
ANGLE OF MAXIMUM PRESSURE: 6
ANGLE OF MAXIMUM X: 19
ANGLE OF MAXIMUM SPEED OF COMBUSTION: -9
DICATOR POWER: 986.9

TN4 BASE

EL CONSUMPTION PER HOUR: 622.000 #/HR
ANGLE OF THE BEGINNING OF COMBUSTION: -14.000
THE LOWEST HEAT OF COMBUSTION: 18498.600 BTU/#
CRANKSHAFT SPEED: 647.000 rev/min
GAS CONSUMTION PER HOUR: 0.000 #/HR
NUMBER OF DISEL CYLINDERS: 16.000
HEATING VALUE OF GAS: 20349.000 BTU/#
ADIOBATTIC EXPONENT: 1.390
DIAMETR OF CYLINDER: 2.300 dm
STROKE OF PISTON: 2.790 dm
RADIUS OF CRANK: 1.390 dm
LENGTH OF CONNECTING ROD: 5.840 dm
COMPRESSION RATIO: 16.000
PRESSURE OF SUPERCHARGING: 5.800 PSI
TEMPERATURE OF AIR AT INPUT INTO DIESEL: 85.000 DEG F
ATMOSPHERIC PRESSURE: 1.033 kg/cm^2
EFFICIENCY OF COMPRESSOR: 0.750
NUMBER OF STROKES OF DIESEL: 2.000
TEMP. DROUP OF AIR IN COOLER FOR AIR SUPERCHARGING: 15.000 DEG F
TEMP. RISE OF AIR AFTER TRANSFORM. OF KINETIC ENERGY: 3.000 DEG F
TEMPERATURE OF RESIDUAL GASES: 440.600 DEG F
COEFFICIENT OF RESIDUAL GASES: 0.030
TEMP. RISE OF AIR AS A RESULT OF HEAT FROM CYLINDER WALL: 4.000 DEG F
ANGLE OF CLOSING OF EXHAUST VALVES: -130.000 grade PKV
COEFFICIENT OF MOLECULAR CHANGE: 1.030
WER OF DIESEL: 1700.000 HP
FICIENCY OF DIESEL: 0.810

MAXIMUM TEMPERATURE: 4938
ANGLE OF THE BEG.OF COMBUSTION: -14
MAXIMUM PRESSURE: 1109
AVERAGE INDICATOR PRESSURE: 79.2
INDICATOR EFFICIENCY: 0.33
MAXIMUM VALUE OF X: 0.71
MAXIMUM SPEED OF PRESSURE INCREASE: 85
ANGLE OF MAXIMUM PRESSURE: 6
ANGLE OF MAXIMUM X: 31
ANGLE OF MAXIMUM SPEED OF COMBUSTION: 8
INDICATOR POWER: 1243.3

TN5 BASE

FUEL CONSUMPTION PER HOUR: 933.000 #/HR
ANGLE OF THE BEGINNING OF COMBUSTION: -12.000
THE LOWEST HEAT OF COMBUSTION: 18498.600 BTU/#
CRANKSHAFT SPEED: 726.000 rev/min
GAS CONSUMTION PER HOUR: 0.000 #/HR
NUMBER OF DISEL CYLINDERS: 16.000
HEATING VALUE OF GAS: 20349.000 BTU/#
ADIOBATTIC EXPONENT: 1.390
DIAMETR OF CYLINDER: 2.300 dm
STROKE OF PISTON: 2.790 dm
RADIUS OF CRANK: 1.390 dm
LENGTH OF CONNECTING ROD: 5.840 dm
COMPRESSION RATIO: 16.000
PRESSURE OF SUPERCHARGING: 7.800 PSI
TEMPERATURE OF AIR AT INPUT INTO DIESEL: 85.000 DEG F
ATMOSPHERIC PRESSURE: 1.033 kg/cm^2
EFFICIENCY OF COMPRESSOR: 0.750
NUMBER OF STROKES OF DIESEL: 2.000
TEMP. DROUP OF AIR IN COOLER FOR AIR SUPERCHARGING: 30.000 DEG F
TEMP. RISE OF AIR AFTER TRANSFORM. OF KINETIC ENERGY: 3.000 DEG F
TEMPERATURE OF RESIDUAL GASES: 440.600 DEG F
COEFFICIENT OF RESIDUAL GASES: 0.030
TEMP. RISE OF AIR AS A RESULT OF HEAT FROM CYLINDER WALL: 4.000 DEG F
ANGLE OF CLOSING OF EXHAUST VALVES: -130.000 grade PKV
COEFFICIENT OF MOLECULAR CHANGE: 1.030
POWER OF DIESEL: 2500.000 HP
EFFICIENCY OF DIESEL: 0.810

MAXIMUM TEMPERATURE: 5567
ANGLE OF THE BEG.OF COMBUSTION: -12
MAXIMUM PRESSURE: 1237
AVERAGE INDICATOR PRESSURE: 99.1
INDICATOR EFFICIENCY: 0.31
MAXIMUM VALUE OF X: 0.64
MAXIMUM SPEED OF PRESSURE INCREASE: 71
ANGLE OF MAXIMUM PRESSURE: 7
ANGLE OF MAXIMUM X: 30
ANGLE OF MAXIMUM SPEED OF COMBUSTION: 6
INDICATOR POWER: 1786.0

TN6 BASE

FUEL CONSUMPTION PER HOUR: 1189.000 #/HR
ANGLE OF THE BEGINNING OF COMBUSTION: -13.000
THE LOWEST HEAT OF COMBUSTION: 18498.600 BTU/#
CRANKSHAFT SPEED: 821.000 rev/min
[illegible] CONSUMTION PER HOUR: 0.000 #/HR
[illegible]MBER OF DISEL CYLINDERS: 16.000
HEATING VALUE OF GAS: 20349.000 BTU/#
ADIOBATTIC EXPONENT: 1.390
DIAMETR OF CYLINDER: 2.300 dm
STROKE OF PISTON: 2.790 dm
RADIUS OF CRANK: 1.390 dm
LENGTH OF CONNECTING ROD: 5.840 dm
COMPRESSION RATIO: 16.000
PRESSURE OF SUPERCHARGING: 13.600 PSI
TEMPERATURE OF AIR AT INPUT INTO DIESEL: 100.000 DEG F
ATMOSPHERIC PRESSURE: 1.033 kg/cm^2
EFFICIENCY OF COMPRESSOR: 0.750
NUMBER OF STROKES OF DIESEL: 2.000
TEMP. DROUP OF AIR IN COOLER FOR AIR SUPERCHARGING: 95.000 DEG F
TEMP. RISE OF AIR AFTER TRANSFORM. OF KINETIC ENERGY: 3.000 DEG F
TEMPERATURE OF RESIDUAL GASES: 440.600 DEG F
COEFFICIENT OF RESIDUAL GASES: 0.030
TEMP. RISE OF AIR AS A RESULT OF HEAT FROM CYLINDER WALL: 4.000 DEG F
ANGLE OF CLOSING OF EXHAUST VALVES: -130.000 grade PKV
COEFFICIENT OF MOLECULAR CHANGE: 1.030
POWER OF DIESEL: 3300.000 HP
EFFICIENCY OF DIESEL: 0.810

[illegible]XIMUM TEMPERATURE: 5757
[illegible]GLE OF THE BEG.OF COMBUSTION: -13
MAXIMUM PRESSURE: 1379
AVERAGE INDICATOR PRESSURE: 122.4
INDICATOR EFFICIENCY: 0.34
MAXIMUM VALUE OF X: 0.63
MAXIMUM SPEED OF PRESSURE INCREASE: 85
ANGLE OF MAXIMUM PRESSURE: 6
ANGLE OF MAXIMUM X: 22
ANGLE OF MAXIMUM SPEED OF COMBUSTION: 0
INDICATOR POWER: 2529.7

TN7 BASE

FUEL CONSUMPTION PER HOUR: 1410.000 #/HR
ANGLE OF THE BEGINNING OF COMBUSTION: -15.000
THE LOWEST HEAT OF COMBUSTION: 18498.600 BTU/#
CRANKSHAFT SPEED: 902.000 rev/min
[illegible] CONSUMTION PER HOUR: 0.000 #/HR
NUMBER OF DISEL CYLINDERS: 16.000
HEATING VALUE OF GAS: 20349.000 BTU/#
ADIOBATTIC EXPONENT: 1.390
DIAMETR OF CYLINDER: 2.300 dm
STROKE OF PISTON: 2.790 dm
RADIUS OF CRANK: 1.390 dm
LENGTH OF CONNECTING ROD: 5.840 dm
COMPRESSION RATIO: 16.000
PRESSURE OF SUPERCHARGING: 19.100 PSI
TEMPERATURE OF AIR AT INPUT INTO DIESEL: 105.000 DEG F
ATMOSPHERIC PRESSURE: 1.033 kg/cm^2
EFFICIENCY OF COMPRESSOR: 0.750
NUMBER OF STROKES OF DIESEL: 2.000
TEMP. DROUP OF AIR IN COOLER FOR AIR SUPERCHARGING: 130.000 DEG F
TEMP. RISE OF AIR AFTER TRANSFORM. OF KINETIC ENERGY: 3.000 DEG F
TEMPERATURE OF RESIDUAL GASES: 440.600 DEG F
COEFFICIENT OF RESIDUAL GASES: 0.030
TEMP. RISE OF AIR AS A RESULT OF HEAT FROM CYLINDER WALL: 8.000 DEG F
ANGLE OF CLOSING OF EXHAUST VALVES: -130.000 grade PKV
COEFFICIENT OF MOLECULAR CHANGE: 1.030
POWER OF DIESEL: 4000.000 HP
EFFICIENCY OF DIESEL: 0.810

[illegible]IMUM TEMPERATURE: 5682
[illegible]LE OF THE BEG.OF COMBUSTION: -15
MAXIMUM PRESSURE: 1479
AVERAGE INDICATOR PRESSURE: 127.0
INDICATOR EFFICIENCY: 0.33
MAXIMUM VALUE OF X: 0.59
MAXIMUM SPEED OF PRESSURE INCREASE: 85
ANGLE OF MAXIMUM PRESSURE: 6
ANGLE OF MAXIMUM X: 18
ANGLE OF MAXIMUM SPEED OF COMBUSTION: -16 ← wrong
INDICATOR POWER: 2855.3

TN8 BASE

Engine test sheet

Date	8/18/95	start time	15:00
Baro pressure "Hg	30.6	Humidity	24
Ambiant temp.	70	Other	

Main reason for test: BASELINING, FAN HP DATA

GETTING SNAPSHOTS, LOGGING PRESSURE & INDICATOR FILES

Engine configuration basic description: STD BASELINE

injector timing setting	0°	Injector part number	9700
Pilot timeing start of injection:			

Notes on what happened: FAN POWER NOT RIGHT MAYBE ITS THE P.F.

significant findings of the test:

Files recorded

.LOG	File/.prs	file indi	time	CO/HC/NOx	imep		
S1, 2	N2BASE+A	IND1	15:03				
S3, 4	N3,A BASE	IND2	15:10 53				
S5, 6	N4,A BASE	IND3	15:15:10				
.EMI 7, 8	N5,A BASE	IND4	15:19:0				
9 10	N6,A BASE	IND5	15:22:00	CO OVER			
11 12	N7,A BASE3	IND6	15:27	B = 3300	-2A ARNT	CO	BACK IN
13 14	N8,A BASE	IND7	15:32				
			15:39	OVER HEATING			
			15:42	SHUTTING DOWN			
			15:37	FAN POWER	GOES	OFF	

File n8base.prs

ent	IMEP	Max Press	Max RPR
1	122.6	1709.6	83.3@+43°
2	123.1	1690.9	51.5@+00°
3	101.4	1710.7	70.8@+133°
4	118.3	1667.2	63.8@+13°
5	117.8	1693.6	53.2@+02°
6	99.9	1702.1	51.3@+05°
7	113.3	1690.2	54.9@+01°
8	117.7	1677.1	81.6@+118°
9	114.2	1695.4	53.2@+65°
10	134.8	1693.3	74.5@+06°
11	115.3	1699.8	58.5@-99°
12	120.1	1689.3	49.7@+03°
13	127.1	1698.2	93.9@+134°
14	122.0	1679.8	56.7@-46°
15	132.0	1696.9	53.3@+08°
16	146.2	1708.0	55.1@-153°

For 16 events:

	IMEP	Max Press	Max RPR
Mean	120.4± 11.5	1693.9± 11.8	62.8± 13.7
Max	146.2	1710.7	93.9

FUEL CONSUMPTION PER HOUR: 1387.000 #/HR
ANGLE OF THE BEGINNING OF COMBUSTION: -15.000
THE LOWEST HEAT OF COMBUSTION: 18498.000 BTU/#
CRANKSHAFT SPEED: 900.000 rev/min
GAS CONSUMTION PER HOUR: 0.000 #/HR
NUMBER OF DISEL CYLINDERS: 16.000
HEATING VALUE OF GAS: 20349.000 BTU/#
ADIOBATTIC EXPONENT: 1.390
DIAMETR OF CYLINDER: 2.300 dm
STROKE OF PISTON: 2.790 dm
RADIUS OF CRANK: 1.390 dm
LENGTH OF CONNECTING ROD: 5.840 dm
COMPRESSION RATIO: 16.000
PRESSURE OF SUPERCHARGING: 20.000 PSI
TEMPERATURE OF AIR AT INPUT INTO DIESEL: 103.000 DEG F
ATMOSPHERIC PRESSURE: 1.033 kg/cm^2
EFFICIENCY OF COMPRESSOR: 0.750
NUMBER OF STROKES OF DIESEL: 2.000
TEMP. DROUP OF AIR IN COOLER FOR AIR SUPERCHARGING: 130.000 DEG F
TEMP. RISE OF AIR AFTER TRANSFORM. OF KINETIC ENERGY: 5.400 DEG F
TEMPERATURE OF RESIDUAL GASES: 440.000 DEG F
COEFFICIENT OF RESIDUAL GASES: 0.040
TEMP. RISE OF AIR AS A RESULT OF HEAT FROM CYLINDER WALL: 9.000 DEG F
ANGLE OF CLOSING OF EXHAUST VALVES: -130.000 grade PKV
COEFFICIENT OF MOLECULAR CHANGE: 1.030
POWER OF DIESEL: 4033.000 HP
EFFICIENCY OF DIESEL: 0.890

MAXIMUM TEMPERATURE: 7397
ANGLE OF THE BEG.OF COMBUSTION: -15
MAXIMUM PRESSURE: 1664
AVERAGE INDICATOR PRESSURE: 159.0
INDICATOR EFFICIENCY: 0.41
MAXIMUM VALUE OF X: 0.115
MAXIMUM SPEED OF PRESSURE INCREASE: 99
ANGLE OF MAXIMUM PRESSURE: 8
ANGLE OF MAXIMUM X: 45
ANGLE OF MAXIMUM SPEED OF COMBUSTION: 12
INDICATOR POWER: 3667.7

8/18/95

Engine test sheet

DALE PROPP WAS SAYING THAT THEIR NOX TESTING AT SWRI INDICATED .37 #/HP BSFC & 13+ G/HPHR NOX W/ 4° RETARD THEY GOT DOWN TO 9. W/ 1.5% PENELT ON FUEL

Date	start time		
Baro pressure "Hg		Humidity	
Ambiant temp.		Other	

Main reason for test: BN DEMO 1 CYLINDER — COMPARING 1 CYL EMISSION INFO W ENTIRE ENGINE. HC IS SAMPLED ON WHOLE ENG.

Engine configuration basic description: BASELINE

injector timing setting	0	Injector part number	9700
Pilot timeing start of injection:			

Notes on what happened:

significant findings of the test:

Files recorded

.LOG	File/.prs	file indi	time	CO/HC/NOx	imep		
S1, S2	—	—	11:40	TN3 BASE			
S3, S4			11:44	TN4 BASE			
.EMI							
S5, S6			11:49	TN5 BASE			
7 8			11:53	TN6 BASE	CO OVERANGED		
9 10	N7BASE, A		11:58	TN7 BASE			
11 12	N8BASE, A		12:02	TN8 BASE			
13					PULL PROBE		
S 14			12:13		CO READING		
S1			14:38		TN6	#9 GA	
S2		9	14:48		TN6 #9 GAS		2500 HP
		10			TN8 #9 GAS		3800 HP
S3			14:54:36				
S4			15:00:4				

Engine test sheet

710 ENGINE

Date 5/7/96	start time
Baro pressure "Hg 30	Humidity 38%
Ambiant temp. 60 APPROX	Other HR # 47 START 51.3 STOP

Main reason for test: TEST NEW TURBO FIRST TIME, COLLECT FAN POWER DATA — BREAK IN TURBO

Engine configuration basic description: BASE STANDARD — NEW ASSYS IN #'S 9 & 16 CAM LOBE GOING BAD ON #16

injector timing setting 0	Injector part number 522 0700
Pilot timeing start of injection: ?	

Notes on what happened: GOT FAN DATA. FILTERS NOT SETUP CORRECT ON EMISSIONS SO ~~#~~ ARNT REALLY VERY GOOD

significant findings of the test: NEW TURBO HAS SLIGHTLY HIGHER AIR BUT NOT WHAT WE EXPECTED. TN7 HAS 16 PSI TN8 HAS 22.

Files recorded

.LOG	File/.prs	file indi	time	CO/HC/NOx	imep		
.EMI							
1602	BASE LE1						
1607	LE1 RUNNING		R. BANK	55/-/230			

Engine test sheet

Date	5/17/96	start time	12:52
Baro pressure "Hg	29.55	Humidity	64%
Ambient temp.	64	Other	

Main reason for test: FINISH TESTING W/ 6700 INJ, CHECK FAN HP #, CHECK MAX METER CAL., RECORD #9 POWER LEVELS, LEI EMISSION & FUEL #

Engine configuration basic description: BASELINE

injector timing setting	0	Injector part number	522 6700
Pilot timing start of injection:			

Notes on what happened: INLET DEP NOT ZEROED, MAX METER LOOKS VERY GOOD

significant findings of the test: WE HAVE LEI #s NO SIGNIFICANT CHANGE IN FUEL FLOW MAYBE SLIGHTLY WORSE AT LOW IDLE HOWEVER NOX GOES UP SOME & CO GOES DOWN, STD IDLE

Files recorded

Time TN	snapshot	File/.prs	file indi	CO/HC/NOx	imep		
14:00						7000	
15:25	1			15,54,200		BASE LOW IDLE	
15:28	START CHARGE						
15:33	2			2,51,205		LEI	
15:40	3			15,50,202		RE BASE LOW IDLE	
15:48	4			18,50,191	.38-.39	STD IDLE	
15:54	5			2,46,227	.39-.41	LEI	STD SPEED

Engine test sheet

710 BASE #1

Date 5/24/96	start time 11:45		
Baro pressure "Hg 30.4		Humidity 58%	
Ambient temp. 64		Other ENG HRS 55.1	

Main reason for test: BASELINE ENGINE BEFORE CHANGING TO E03A INJECTORS

Engine configuration basic description: FULL INSTRUMENTS EXCEPT COMB. PRESSURE NEED TO CHECK RACK CALIBRATION.

injector timing setting 0°	Injector part number 5226700
Pilot timing start of injection:	

Notes on what happened: 25.5 ABXP AT 4500 HP, EXBACK P. 6" AT 4200 HP & 23.5 ABXP

significant findings of the test: 4500 HP

Files recorded

Time	snapshot	File/.prs	file indi	CO/HC/NOx	imep	TN, HP	RACK
13:27	1					8, 4250	.740
13:29:30	2			3.32/.31/13.96		8, 4500	.65
13:31	3					8, 4500	.65
13:38	4					8, 4250	.73
13:43:09	5					8, 4000	
13:49:10	6					8, 3800	
13:55	7					8, 3600	.918
13:59:50	8			2.85/.264/11.6		8, 3400	
14:05:	9			1.75/.305/11.8		8, 3000	
14:10:00	10			.469/.351/13.28		8, 2500	1.240
14:16:20	11			.355 .427 13.62		8 2000	1.304
14:20:59	12			.514/.571/14.3		8 1500	1.488
14:30 ?	13			.45/.248 12.25		7 3500	.86
14:36:00	14					7 3300	
14:43:	15			7.6/.248/12.5		6 3200	.826
14:48	16			7.51/.253 12.94		6 3000	.884
14:	17			8.66/.236/10.80		6 2500	1.028

AIR DP MAY BE OFF .2" TO HIGH
#12 EXT. BOUNCY
BERRY ON WEST GRID
WATER IN EXHAUST

Engine test sheet

CONTINUED 710 BASELINE

Date	5/24/	start time	
Baro pressure "Hg		Humidity	
Ambient temp.		Other	

Main reason for test:

Engine configuration basic description:

injector timing setting	Injector part number
Pilot timing start of injection:	

Notes on what happened:

significant findings of the test:

Files recorded

Time	snapshot	File/.prs	file indi	CO/HC/NOx	imep	TN HP	RACK
14:58	18			.94/.291/14		6 2000	1.246
15:53	19			.275/.368/15.72		6 1500	1.410
15:08:56	20			.45 .558 15.3		6 1000	1.574
15:13	21			1.23/1.05/19.04		6 500	1.723
15:20	22			.93/.27/15.3		5 1725	1.260
15:23:30	23			.41/.3/16.8		4 1290	1.360
15:26:30	24			.3/.36/18.13		3 935	1.45
15:30:00	25			.33/.5/21.5		2 420	1.56
15:35:28	26					1 190	1.060
15:39:05	27					1 0	1.824
1544	28					LOW IDLE	1.801

Engine test sheet

710

Date 6-13 — 96		start time 10:15 AM	
Baro pressure "Hg 30.2		Humidity 50 %	
Ambiant temp. 66		Other 51.3ST — 64	

Main reason for test: CONFIRM Baseline #s'

Engine configuration basic description: STD.

injector timing setting 0°		Injector part number 522 6700	
Pilot timeing start of injection:			

Notes on what happened: CO2 ON BEAR 6.4% & ENERAC 4.72
11.4 BEAR O2 12.5 ENERAC O2

significant findings of the test: NOTCH TO MEASURE 10°F DIFF ON JACKET WATER BEFORE & AFTER LUBE OIL COOLER
DATA IS FAIRLY REPEATABLE FROM PREVIOUS TEST

Files recorded

	.LOG	File/.prs	file indi	time	CO/HC/NOx	imep		
	SMAPSHOT	HP	IN					
11:55	1.2	4490	8		3.X/ /13			
	3	4250			3/.24/13.2			
1206	4	4000			3/.23/13			
	5	3800			2.9/.23/12.2			
1217	6	3600			3.3/.2/11.8			
1223	7	3400			3.4/.23/11.3			
1234	8	3000			1.8/.22/11.4			
1240	9	2500			.45/.26/12.8			
1245	10	2000			.35/.34/13.8			
1250	11	1500			.46/.51/14.3			
1259	12	3500	7		5.2/.2/12			
1305	13	3200	6		8.66/.23/12.2			
1309	14	3000			7.9/.22/12.5			
1315	15	2500			9.0/.21/10.5			
1322	16	2000			.9/.26/13.5			

PROJ 9 HP?
12 THERMO COUPLE

Engine test sheet

CONTINUATION OF PREVIOUS TEST

Date 6/13/96	start time
Baro pressure "Hg	Humidity
Ambiant temp.	Other

Main reason for test:

Engine configuration basic description:

injector timing setting	Injector part number
Pilot timeing start of injection:	

Notes on what happened:

significant findings of the test:

Files recorded

.LOG	File/pre	file fuel	time	CO/HC/NOx			imep		
TIME	SWAP	HP	NOTCH						
1328	17	1500	6	.26	.36	14.8			
1334	18	1000		.45	.55	16			
~~EM~~ 1340	19	500		1.26	1.72	18.8			
1348	20	1725	5	.19	.28	15.1			
1353	21	1290	4	.39	.32	16.4			
1401	22	935	3	.27	.37	17.5			
1407	23	420	2	.26	.53	20.6			
1413	24	190	1	.36	.9	23			
1420	25	0	1	.15	45	192	— PPM		
1427	26	0	LOW	.16	42	187	— "		

710

Engine test sheet

Date 7-2-96		start time 9:20 AM	
Baro pressure "Hg 29.9		Humidity 67 %	
Ambiant temp. 76°		Other HRS 64	

Main reason for test: Base line on 5227000 injectors

Engine configuration basic description: 63

injector timing setting 0		Injector part number 5227000	
Pilot timeing start of injection:			

Notes on what happened: 13:11 TN8 WARMUP,

significant findings of the test: DEFINATELY MORE FUEL IN THESE INJECTORS AIR FUEL CALC WENT ASTREY AT TN6. SWITCHING OFF SAMPLE PUMP CAUSED ENERAC & BEAR UNITS TO GET VERY CLOSE READINGS.
SPECULATING THE AIR DP # ARE BAD

Files recorded

.LOG	File/.prs	file indi	time	CO/HC/NOx			imep		
TIME	SNAPSHOT	HP	TN				RACK		
1317	1	4500	8	4.33	.144	11.4	.73	RACK	
	2	4250	8	3.59	.132	11.06	.808	RACK	
13:26	3	4000	8	3.4	.152	11.7	.882		
13:30	4	3800	8	3.4	.153	11.5	.930		DOUPLED IN SNAPSHOT ON EMCS COMPUTER
13:36	5	3600	8	3.5	.150	10.9	.976		
13:40	6	3400	8	4.4	.150	10.2	1.010		
13:45	7	3000	8	3.03	.163	10.1	1.117		
13:51	8	2500	8	.67	.203	11.5	1.025		
13:55	9	2000	8	.391	.265	12.8	1.365		
14:01	10	1500	8	.55	.306	13.65	1.475		
14:07	11	3500	7	6.8	.179	9.8	.903		
14:16	12	3200	6	7.3	.161	9.13			
14:26	13	3000	6	9.32	.141	11.06	.934		
14:30	14	2500	6	10	.14	9.928		CO OFF LIMITS >200PP	
14:36	15	2000	6	1.169	.16	11.96	1.026		
14:39	16	1500	6	.23	.26	13.21	1.415		

Engine test sheet

Date 7/2/96		start time	
Baro pressure "Hg		Humidity	
Ambiant temp.		Other	

Main reason for test: CONTINUED FROM OTHER PAGE

Engine configuration basic description:

injector timing setting	Injector part number
Pilot timeing start of injection:	

Notes on what happened:

significant findings of the test:

Files recorded

~~.EOG~~	File/.prs	file indi	time	CO/HC/NOx			imep		
TIME	SNAPSHOT	HP	TN				RACK		
14:43	17	1000	6	.38	.35	13.3	1.560		
14:47	18	500	6	1.1	.67	15.0	1.687		
~~.EOT~~									
14:54	19	1725	5	1.15	.174	13.6	1.770		
14:58	20	1290	4	.45	.18	14.3	1.360		
15:04	21	935	3	.26	.22	15.8	1.457		
15:08	22	420	2	.27	.34	18	1.555		
15:18	23	191	1	.38	.42	21	1.633		
15	~~24~~	0	1	13	17	18.3	1.783		PPM'S
15 32	24	0	0	13	15	17.6	1.768		
	25								

Engine test sheet

Date	9/11/96	start time	12:20
Baro pressure "Hg	29.99	Humidity	50%
Ambient temp.	77.6	Other	ENG HRS START 88.1

Main reason for test: #2 BASELINE W/7000 INJ, IMEP, EMIS

PRESSURE SPIKES FIXED, NEW EMIS SENSORS & CAL, CALIBRATED AIR FLOW

Engine configuration basic description: SSD.

injector timing setting	0°	Injector part number	5227000
Pilot timing start of injection:			

Notes on what happened: AT 4250 UE HAD A PROTECTION SHUTDOWN
EMIS LOG FILES ARE 2 MIN. LATER THAN 7100 DA

significant findings of the test:

Files recorded

Time	snapshot	File/.prs	file indi	CO/HC/NOx			imep	HP	HP	RK
12:40	1	N88SE1, 2		3.1	.168	9.04	224	281	4500	.725
12:46	2	3, 4		2.55	.164	9.5	213	265	4250	.795
13:04	3	5, 6		2.56	.164	9.44	196	250	4000	.865
13:13	4	7, 8, 9		2.4	.160	9.49	185	237	3800	.912
13:20	5	10, 11		2.8	.150	9.16	178	225	3600	.962
13:28	6	12, 13		3.25	.145	8.6	167	212	3400	1.008
13:37	7	14, 15		1.74	.155	8.9	155	187	3000	1.115
13:43	8	16, 17		.645	.190	10	138	158	2500	1.245
13:51	9	18, 19		.357	.243	10.76	120	125	2000	1.361
13:59	10	20, 21		.33	.54	11	100		1500	1.472
14:10	11	N7BSE 001, 2		4.5	.15	9.26	187		3500	.912
14:18	12	N6BSE 001, 2		6.8	.16	9.86	191		3200	.866
14:25	13	3, 4		.69	.15	9.63	179		3000	.935
14:34	14	4, 5		—	.149	8.7	151		2500	1.070
14:42	15	6, 7		.77	.18	10.84	127		2000	1.257
14:48	16	8 9		.35	.32	12.2	104		1500	1.410
14:58	17	10 11		.62	.5	12.1	82		1000	1.550
15:06	18	12 13					58		500	1.680

↑ 8 7 6

.875

11

Engine test sheet

CONTINUED FROM PREV. PAGE

Date 9/11/96	start time
Baro pressure "Hg	Humidity
Ambient temp.	Other

Main reason for test: BASELINE

Engine configuration basic description:

injector timing setting	Injector part number
Pilot timing start of injection:	

Notes on what happened: EMIS NUMBERS ARE 2 MIN LATER ~~[illegible]~~ THAN THESE STAMPS

significant findings of the test:

Files recorded

TN	Time	snapshot	File/.prs	file indi	CO/HC/NOx			imep HP	HP	RK
5	15:14	19	N5BSE001,2		.79	.25	12.1	120	1728	1.273
4	15:20	20	N4BSE001,2		.43	.28	13.1	100	1290	1.361
3	15:26	21	N3 1 2		.34	.31	14.2	85	935	1.445
2	15:35	22	N2 1 2		.4	.46	16.4	50	420	1.544
1	15:41	23	N1 1 2				1	29	190	1.625
I	15:48	24	ND 1 2					5.8		
LI	15:55	25								
	MOT IDLE							-5.6		

Engine test sheet

Date	9/16/96	start time	11:30
Baro pressure "Hg	30.1	Humidity	53%
Ambient temp.	68	Other	

Main reason for test: #3 BASELINE

Engine configuration basic description: STD CONDITIONS

injector timing setting	0°	Injector part number	5227000
Pilot timing start of injection:			

Notes on what happened: INLET DEP. WAS ZEROED BEFORE RUN

significant findings of the test: IMEP WAS HIGHER THAN PREV TEST FUEL CONS. WAS LOWER AND EMISSIONS HIGHER

Files recorded

12:23

Time	snapshot	NOTCH	File/.prs	file indi	CO/HC/NOx			imep		HP	RACK
12:24	1	8	N8BSE022,23		2.74	.17	10.2	235	283	4500	.742
12:31	2		24,25		1.97	.167	10.85	219	259	4200	.810
12:40	3		26,27		1.95	.173	10.8	209	245	4000	.886
12:46	4		28,29		2.0	.176	10.4	200		3800	.93
12:56	5		30,31		2.2	.175	10.12	189		3600	.981
13:03	6		32,33		2.3	.173	9.6	180		3400	1.026
13:12	7		34,35		1.1	.19	10.3	165		3000	1.132
13:21	8		36,37		.4	.23	11.3	148		2500	1.256
13:28	9		38,39		.48	.28	11.8	128		2000	1.370
13:38	10		40,41		.75	.4	12.4	109		1500	1.486
13:51	11	7	N7BSE 3,4		3.29	.177	10.5	192		3500	.931
14:02	12	6	N6BSE 14 15		5.52	.182	11.3	192		3200	.885
14:11	13		16 17		5.5	.178	11.1	183		3000	.942
14:39	14		18,19		5.4	.2	9.54	153		2500	1.076
14:50	15		20,21		.57	.235	12.27	129		2000	1.264
14:57	16		22,23		.32	.30	12.6	106		1500	1.418
15:06	17		24 25		.63	.4	12.01	83		1000	1.554
15:13	18		26 27		.5	.84	13	59		500	1.685

START FILES N8BSE 022
N7BSE 003
N6BSE 014
N BSE 5-1 003

Engine test sheet

CONTINUED FROM OTHER PAGE

Date	9/16/96	start time	
Baro pressure "Hg		Humidity	
Ambient temp.		Other	

Main reason for test:

Engine configuration basic description:

injector timing setting	Injector part number
Pilot timing start of injection:	

Notes on what happened:

significant findings of the test:

Files recorded

Time	snapshot	TN	File/.prs	file indi	CO/HC/NOx			imep	HP	RACK
15:22	19	5	N5BSE 003		.55	.23	13.43	121	1725	1.278
15:29	20	4	03,4		.33	.25	14.8	102	1290	1.371
15:39	21	3	034				15.6	84	935	1.451
15:49	22	2	34		.46	.407	17.4	50	420	1.550
15:58	23	1	03, 04		.52	.67	20	27	190	1.630
16:10	24	1						5.4	0	1.794
	25	OLI								
		1	MOT003					-5		

Engine test sheet

710

Date 9/19/96	start time
Baro pressure "Hg 30.29	Humidity 82 % REL 77
Ambient temp. 60	Other ENG HRS 98.9

Main reason for test: #4 BASELINE, ADDITIONAL CALC. CHANGE FOR NOx W/ HUMIDITY SHOULD BRING READINGS UP SOME. NEW STYLE OF SAMPLE PUMP ON EMISSION LINE TOO.

Engine configuration basic description: STD. BASE

injector timing setting 0°	Injector part number 522 7000
Pilot timing start of injection:	

Notes on what happened: CO^2 WITH BEAR & ENERAC VERY CLOSE. I FEEL BETTER W/THOSE NUMBERS

significant findings of the test:

Files recorded

1652

Time	snapshot	TN	File/.prs	file indi	CO/HC/NOx			imep	HP	RK
11:59	1	8	42 43		2.15	.163	11.7	225	4500	.750
12:05	2	8	44 45		1.82	.158	11.22	215	4250	.82
12:14	3	8	46 47		1.9	.153	11.66	204	4000	.880 -.878
12:22	4	8	48 49		1.9	.147	11.5	189	3800	.93
12:29	5	8	50 51		2	.151	11.1	183	3600	.974
12:37	6	8	52 53		2.1	.150	10.7	175	3400	1.024
12:45	7	8	54 55		1	.160	11.5	158	3000	1.130
12:53	8	8	56 57		.38	.197	13.2	140	2500	1.259
13:02	9	8	58 59		.36	.26	14	123	2000	1.366
1311	10	8	60 61		.65	.34	15.9	104	1500	1.475
1322	11	7	5 6		2.8	.164	12.4	192	3500	.928
1330	12	6	28 29		4.84	.179	12.8	196	3200	.894
13:34	13	6	30 31		4.9	.164	12.6	184	3000	.946
13:43	14	6	32 33		5.2	.158	11.2	155	2500	1.088
13:50	15	6	34 35		.55	.196	14.6	130	2000	1.2
1358	16	6	36 37		.36	.262	16.5	107	1500	1.420
14:05	17	6	38 39		.66	.42	18.4	84	1000	1.551
14:14	18	6	40 41		1.88	.87	23.2	60	500	1.683

Engine test sheet

CONTINUED FROM OTHER PG.

Date 9/19/96	start time
Baro pressure "Hg	Humidity
Ambient temp.	Other

Main reason for test:

Engine configuration basic description:

injector timing setting	Injector part number
Pilot timing start of injection:	

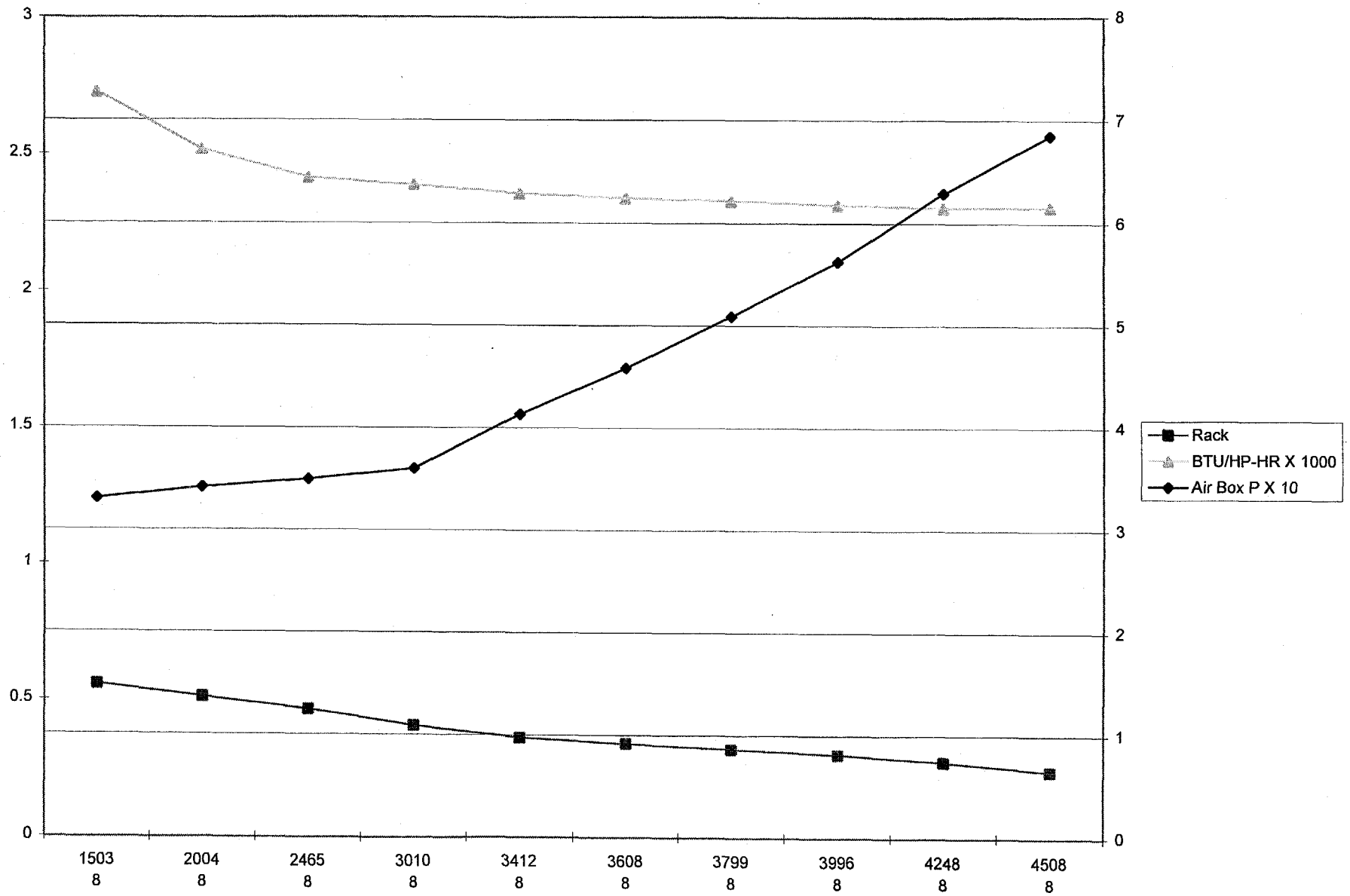
Notes on what happened:

significant findings of the test:

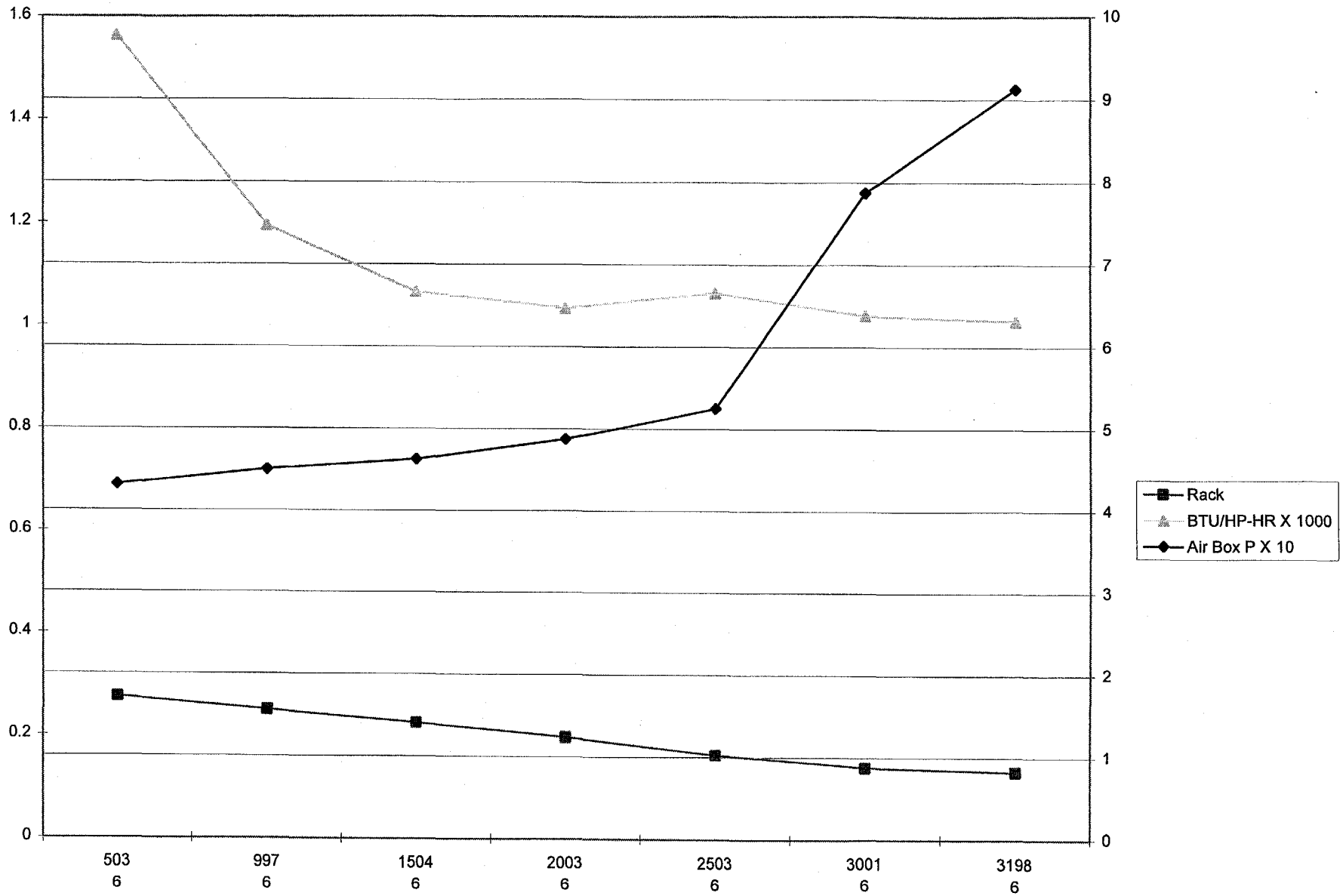
Files recorded

Time	snapshot TN		File/.prs	file indi	CO/HC/NOx			imep	HP	RK
14:23	19	5	5 6		.52	.2	16.4	122	1725	1.290
14:28	20	4	5.4		.35	.22	18.1	105	1290	1.372
14:37	21	3	5 6		.29	.28	20.3	87	935	1.452
14:48	22	2	5 6		.37	.4	24.4	51.2	420	1.550
14:56	23	1	5 6		.52	.66	28.6	29	190	1.628
15:08	24	I	NO 5 6							
	25	LI								
		M	MOT004 5							

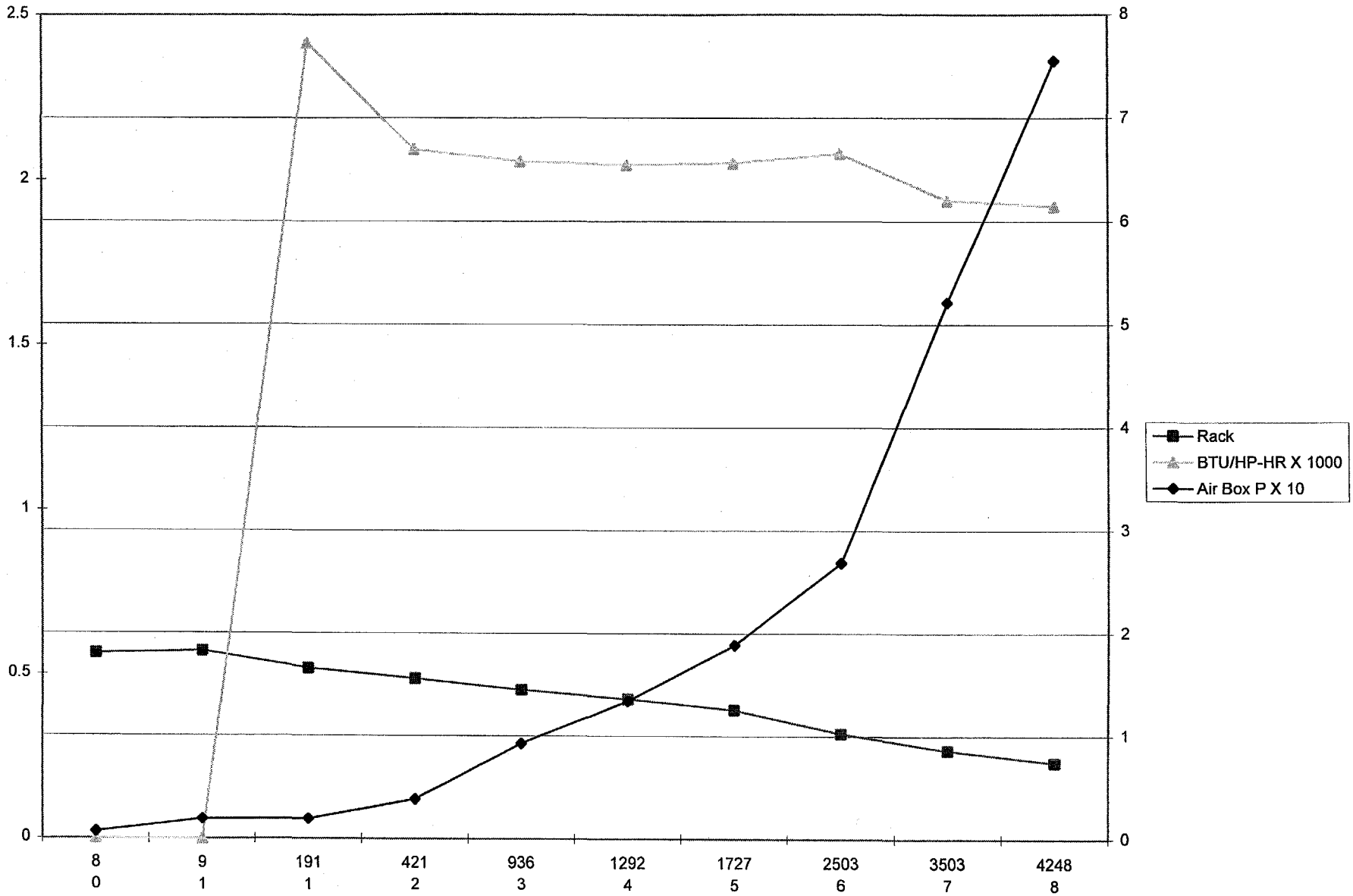
710DA 900R's #1 baseline w/6700 inj's 5/24/96



710DA 750R's #1 baseline w/6700 inj's 5/24/96



710DA notches #1 baseline w/6700 inj's 5/24/96



710DA 5/24/96 #1 baseline w/6700 inj's

date	time	TN	FAN A	FAN B	FAN C	1	2	3	4	5	6	7
5/24/96	0:08:44	8	1	1	1	1021	993	1025	1054	1002	986	993
5/24/96	0:05:40	8	1	1	1	1005	981	1000	1041	988	975	987
5/24/96	13:43:08	8	1	1	1	994	968	1005	1026	978	962	971
5/24/96	0:11:14	8	1	1	1	991	964	1006	1026	974	958	964
5/24/96	0:16:22	8	1	1	1	990	966	999	1025	975	964	965
5/24/96	13:59:38	8	1	1	1	984	961	992	1016	970	955	959
5/24/96	0:23:32	8	1	1	1	935	912	941	958	919	913	906
5/24/96	0:30:34	8	1	1	0	779	770	790	793	771	777	755
5/24/96	0:33:54	8	1	1	0	671	650	671	669	660	666	648
5/24/96	0:25:08	8	1	1	0	570	550	568	558	554	567	540
5/24/96	36:03:02	6	1	1	1	973	932	985	972	963	929	949
5/24/96	14:48:06	6	1	1	1	975	937	992	973	970	930	950
5/24/96	36:20:28	6	1	1	0	1017	964	1024	1003	996	972	967
5/24/96	0:13:24	6	1	1	0	814	770	812	800	780	773	765
5/24/96	0:22:42	6	1	1	0	631	611	627	618	608	616	591
5/24/96	0:09:58	6	1	1	0	498	483	491	478	480	487	470
5/24/96	36:22:04	6	1	0	0	391	374	374	364	371	377	364
5/24/96	0:05:40	8	1	1	1	1005	981	1000	1041	988	975	987
5/24/96	14:30:23	7	1	1	1	986	956	1010	1006	972	965	960
5/24/96	36:20:28	6	1	1	0	1017	964	1024	1003	996	972	967
5/24/96	0:06:44	5	1	1	0	755	715	752	736	727	722	706
5/24/96	0:08:30	4	1	1	0	660	636	660	644	635	637	622
5/24/96	0:03:54	3	1	0	0	564	547	555	548	544	549	532
5/24/96	36:13:52	2	1	0	0	431	418	411	412	413	419	408
5/24/96	36:09:02	1	1	0	0	344	327	326	324	326	331	318
5/24/96	36:07:24	1	1	0	0	235	220	221	213	224	233	199
5/24/96	36:07:02	0	1	1	0	213	200	202	194	206	211	181

710DA 5/24/96 #1 baseline w/6700 inj's

8	9	10	11	12	13	14	15	16	TBin	TBou	AIR IN	RB OUT
964	1010	1042	1002	1027	994	973	1005	959	912	652	90	334
960	991	1022	978	928	976	955	989	950	902	653	93	326
945	978	1004	966	947	962	946	974	937	885	655	97	311
944	978	1006	968	995	961	946	975	938	886	665	101	298
939	974	1004	964	974	961	944	980	938	882	673	98	285
939	971	997	959	935	956	946	974	932	876	679	97	270
889	921	941	907	850	905	898	924	884	831	655	98	258
747	767	779	756	735	756	764	773	742	700	558	98	252
649	658	668	651	662	652	660	663	646	603	485	96	249
556	557	565	550	540	552	560	558	557	514	417	95	246
931	937	974	961	962	960	907	957	903	876	683	99	257
930	948	979	966	971	969	914	964	911	878	690	95	243
962	987	1005	989	1011	997	954	1003	946	903	716	97	210
770	789	806	783	805	782	754	792	752	724	622	95	199
604	619	624	609	628	609	589	615	595	576	499	98	196
478	485	493	479	497	480	478	484	472	455	400	94	194
372	376	382	366	382	370	371	371	363	355	319	91	189
960	991	1022	978	928	976	955	989	950	902	653	93	326
934	975	989	973	984	974	930	973	933	882	672	96	270
962	987	1005	989	1011	997	954	1003	946	903	716	97	210
721	734	746	728	739	723	703	738	706	666	543	93	175
633	642	646	634	645	632	620	640	616	587	515	89	156
538	557	554	534	552	534	534	548	528	510	471	89	142
412	412	425	394	422	410	407	415	407	400	397	84	119
326	320	331	304	330	320	325	326	317	312	327	84	110
231	213	229	186	224	216	222	228	226	220	258	83	106
211	194	205	169	205	201	203	206	206	204	219	80	99

710DA 5/24/96 #1 baseline w/6700 inj's

LB OUT	RB REAR	LB REAR	RB MID	LB MID	RB FRNT	LB FRNT	ACR IN	ACR OUT	AC IN	AC OUT	ENG IN	ENG OUT
339	188	177	195	208	192	204	65	65	174	194	173	182
332	188	181	195	208	191	205	66	66	175	194	175	183
312	183	177	191	203	187	200	67	67	173	186	174	178
304	177	170	187	201	185	196	67	67	169	184	168	177
288	171	166	182	191	181	190	68	68	167	176	166	173
278	167	165	177	184	177	186	68	68	164	174	163	170
262	170	159	178	185	174	184	68	68	166	176	166	173
258	163	157	171	177	167	179	68	68	159	169	159	163
256	165	154	172	178	167	178	68	68	162	171	162	166
253	163	154	169	176	163	175	69	69	159	166	158	162
263	170	160	177	183	174	183	70	70	167	177	166	174
248	166	158	173	181	172	179	70	70	164	173	164	171
211	163	155	172	174	170	174	71	71	167	174	167	173
207	159	147	166	169	163	169	71	71	161	166	161	167
202	155	144	162	166	157	166	71	71	157	162	157	162
197	155	143	161	165	156	166	71	71	158	161	156	161
194	156	142	161	164	155	164	71	71	159	163	159	162
332	188	181	195	208	191	205	66	66	175	194	175	183
275	172	159	181	188	175	186	69	69	167	178	167	174
211	163	155	172	174	170	174	71	71	167	174	167	173
179	154	140	160	161	154	162	71	71	159	163	158	164
159	151	139	156	158	150	158	71	71	156	156	157	161
145	149	136	154	155	147	156	71	71	158	156	157	161
124	150	134	156	154	144	155	71	71	162	159	162	166
114	148	133	155	154	142	155	72	72	162	157	162	164
110	148	131	156	153	141	154	72	72	163	158	163	164
103	147	128	156	152	140	153	72	72	164	159	164	165

710DA 5/24/96 #1 baseline w/6700 inj's

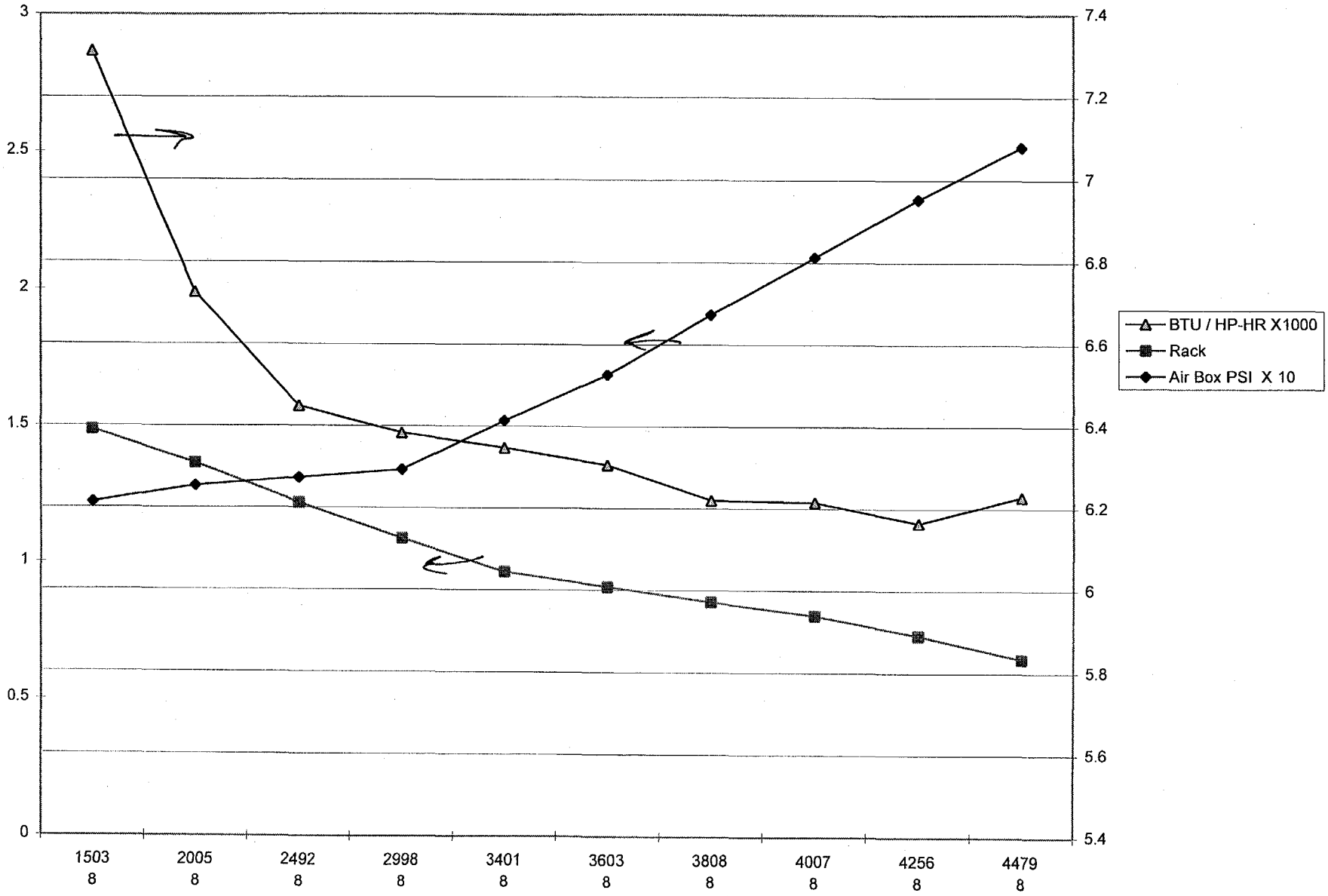
OIL IN	OIL OUT	FUEL IN	FUEL OU	GAS TMP	INLT DEP	TRBO DC	AIR BOX	GAS SPL	GAS HDR	EXH MAN	MG VOLT	MG AMP
199	203	116	144	65	-3.8	27.4	25.7	2.7	-62.4	22.1	944	3171
201	205	123	153	66	-8.4	25.1	23.6	3	-62.4	20.1	914	3076
200	206	118	147	67	-7.3	22.5	21.1	2.6	-62.4	17.9	884	2981
197	205	110	142	69	-5.9	20.4	19.1	2.8	-62.4	16.2	860	2904
194	202	110	140	68	-5.9	18.3	17.2	2.4	-62.4	14.4	836	2827
191	201	107	138	68	-5.2	16.6	15.5	2.6	-62.4	12.8	811	2745
192	198	102	131	68	-5	14.4	13.5	2.6	-62.4	11.1	757	2569
186	194	105	133	69	-5.9	14.1	13.1	2.5	-62.5	10.6	684	2331
186	193	106	133	69	-5.4	13.7	12.8	3.1	-62.5	10.1	610	2084
183	186	114	135	69	-5.5	13.4	12.4	2.8	-62.5	9.6	518	1777
189	194	110	129	70	-4.9	15.6	14.6	2.9	-62.5	12	799	2706
187	195	112	136	78	-1.1	13.5	12.6	2.9	-62.5	10.4	773	2619
187	193	102	124	71	-2.6	9	8.4	2.8	-62.5	6.7	707	2403
183	190	103	124	71	-2.6	8.4	7.8	2.9	-62.5	6	629	2144
178	183	107	125	71	-3	8.1	7.4	3	-62.5	5.6	540	1850
176	177	109	126	77	-3.4	7.8	7.2	3	-62.5	5.2	432	1492
174	175	113	130	71	-3.7	7.5	6.9	3	-62.5	4.7	296	1028
201	205	123	153	66	-8.4	25.1	23.6	3	-62.4	20.1	914	3076
190	197	112	135	74	-5.4	17.5	16.3	2.8	-62.5	13.6	829	2804
187	193	102	124	71	-2.6	9	8.4	2.8	-62.5	6.7	707	2403
176	179	107	125	71	-2.5	6.4	5.9	3	-62.5	4.5	586	2005
172	176	107	122	71	-1.1	4.6	4.2	3.1	-62.5	3	506	1735
171	174	107	121	71	-1.5	3.3	2.9	3.2	-62.4	2	431	1484
172	172	108	119	72	0.5	1.3	1.2	3.3	-62.4	0.6	287	994
170	170	110	119	72	0.4	0.7	0.6	3.3	-62.4	0.2	191	665
171	168	111	120	72	0.6	0.7	0.6	3.2	-62.4	0.2	4	15
170	166	112	120	72	0.9	0.3	0.2	3.3	-62.4	0	3	11

710DA 5/24/96 #1 baseline w/6700 inj's

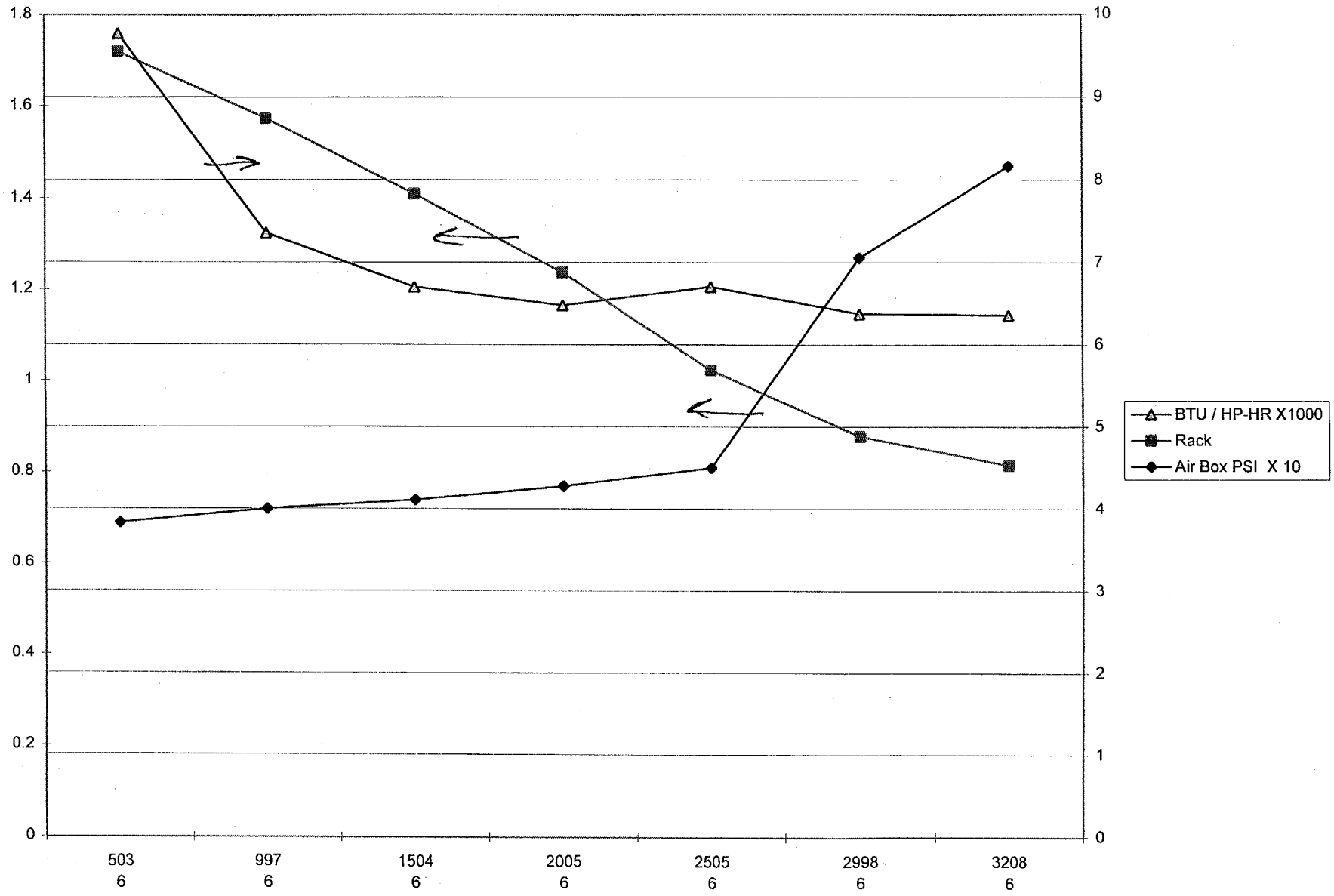
EXC VOL	CJC	RPM	TRBO RP	GAS CFM	RACK MAI	RACK #9	DIES FLO	VALV PO	FAN HP	DIGITL	HORSE P	BTU/ HP-
39.1	66.3	899.3	214	0	0.65	0.629	25.08	0	231.8	-232	4508	6160
38.5	67.1	900	66	0	0.742	0.727	23.53	0	232	-232	4248	6150
37.3	67.4	900.6	74	0	0.812	0.8	22.23	0	232.2	-232	3996	6180
36.4	67.8	900.2	69	0	0.866	0.856	21.27	0.1	232.1	-232	3799	6217
35.4	68.3	900	70	0	0.917	0.909	20.32	1.2	232	-232	3608	6245
34.3	68.5	900.4	71	0	0.973	0.967	19.32	2.4	232.2	-232	3412	6288
31.7	68.9	900.3	59	0	1.087	1.084	17.28	4.9	232.1	-232	3010	6372
28.4	69.2	900.1	69	0	1.245	1.245	14.31	8	188.1	-104	2465	6443
25	69.4	900.2	67	0	1.363	1.366	12.1	10.5	188.1	-104	2004	6713
21	69.6	900.2	65	0	1.485	1.491	9.87	13.2	188.1	-104	1503	7274
37.6	70.7	723.5	61	0	0.823	0.816	18.21	0	109.6	-240	3198	6317
36	70.8	722.7	56	0.1	0.878	0.871	17.3	0.2	109	-240	3001	6380
32.1	71.2	723.1	56	0.1	1.029	1.023	15	3.3	76.8	-112	2503	6656
27.8	71.6	723.2	61	0.1	1.24	1.24	11.69	7.9	76.9	-112	2003	6469
23.2	71.7	722.7	58	0.1	1.41	1.414	9.04	11.6	76.9	-112	1504	6664
18.3	71.9	722.5	52	0.1	1.567	1.575	6.65	15.1	77	-112	997	7470
12.4	72.1	722.4	54	0.2	1.718	1.729	4.42	18.2	68.8	-48	503	9775
38.5	67.1	900	66	0	0.742	0.727	23.53	0	232	-232	4248	6150
36.5	70.1	818.6	68	0	0.863	0.857	19.58	0	184	-231	3503	6207
32.1	71.2	723.1	56	0.1	1.029	1.023	15	3.3	76.8	-112	2503	6656
26.1	72.3	645.5	53	0.1	1.259	1.263	10.19	8.4	48.7	-111	1727	6568
23.4	72.5	559.4	42	0.3	1.362	1.366	7.64	10.6	38.7	-102	1292	6546
20.5	72.5	485.9	26	0.4	1.45	1.458	5.55	12.5	23.1	-37	936	6581
15.6	72.5	331.1	2	0.7	1.559	1.57	2.62	14.8	13.8	-34	421	6696
11.6	72.6	252.1	2	0.7	1.659	1.671	1.41	17	10	-33	191	7729
0	72.6	259.8	0	0.7	1.825	1.836	0.45	20.4	9.4	-33	9	0
0	72.8	194.1	0	0.7	1.803	1.816	0.24	20	8.8	-106	8	0

DIES # HP	SCFM	PROJ #9
0.333	0	26.2
0.332	0	17
0.333	0	2469.4
0.335	0	33.7
0.337	0	49.1
0.339	0	2518.9
0.344	0	70.6
0.348	0	91.7
0.362	0	101.7
0.394	0	75.4
0.341	0	-64.5
0.345	0	2664.3
0.359	0	-12.2
0.35	0	40.2
0.36	0	68.1
0.4	0	29.9
0.527	0	-7.4
0.332	0	17
0.335	0	0.1
0.359	0	-12.2
0.354	0	20.2
0.354	0	25.5
0.355	0	11.7
0.373	0	-32
0.442	0	-46.5
0	0	-51.4
0	0	-52.5

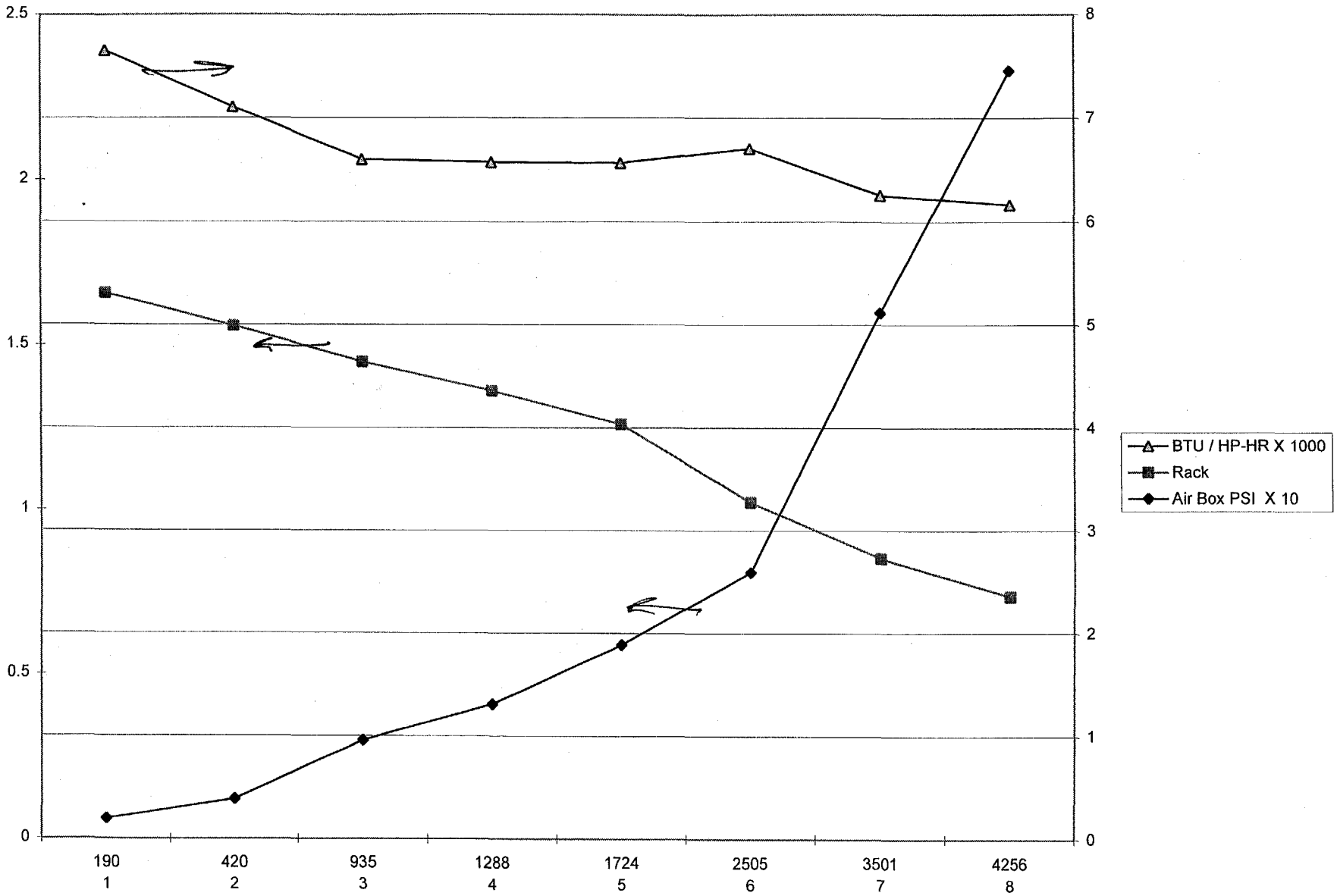
710DA 900R's #2 baseline w/6700's 6/13/96



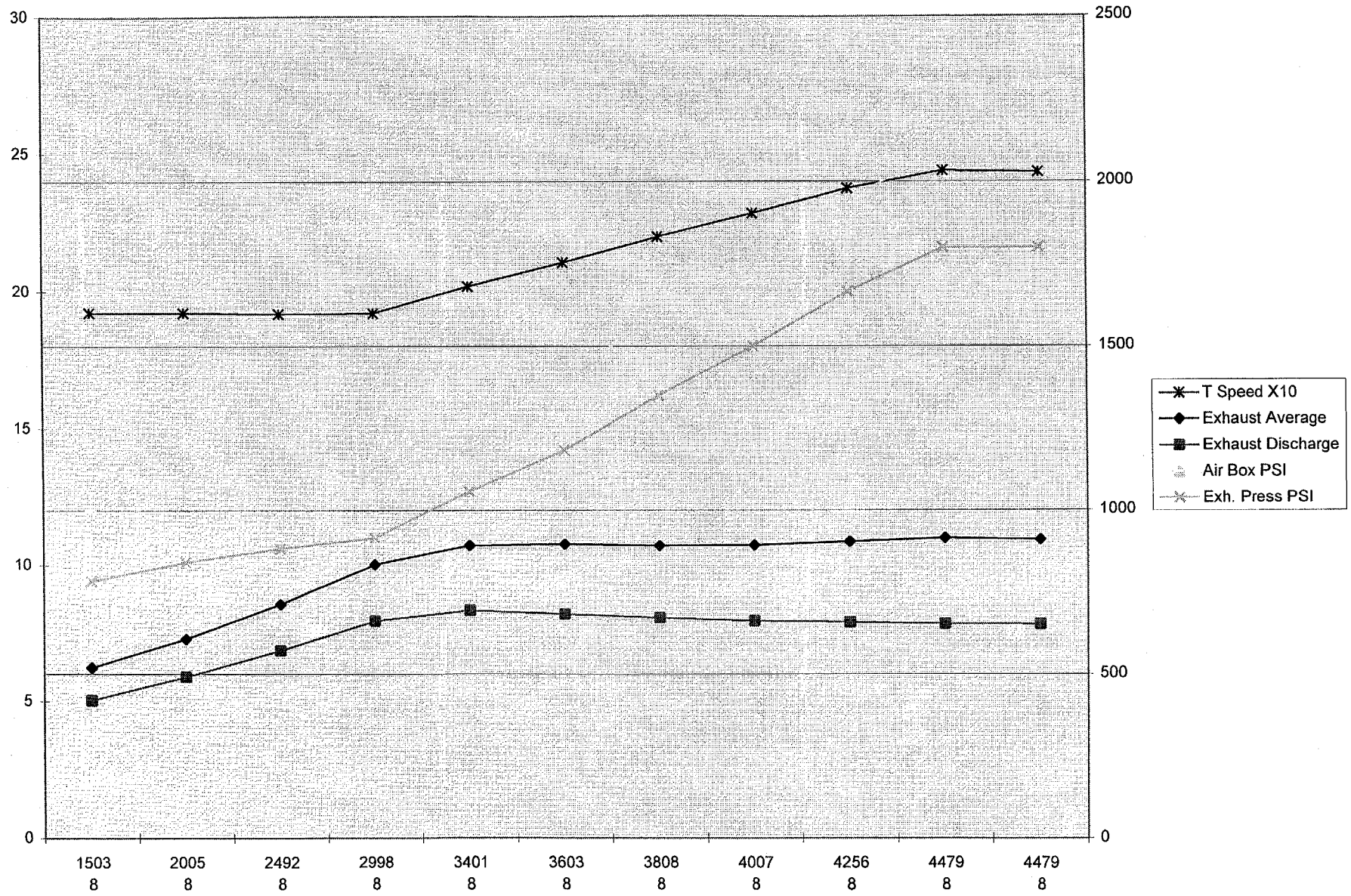
710DA 750R's #2 baseline w/6700's 6/13/96



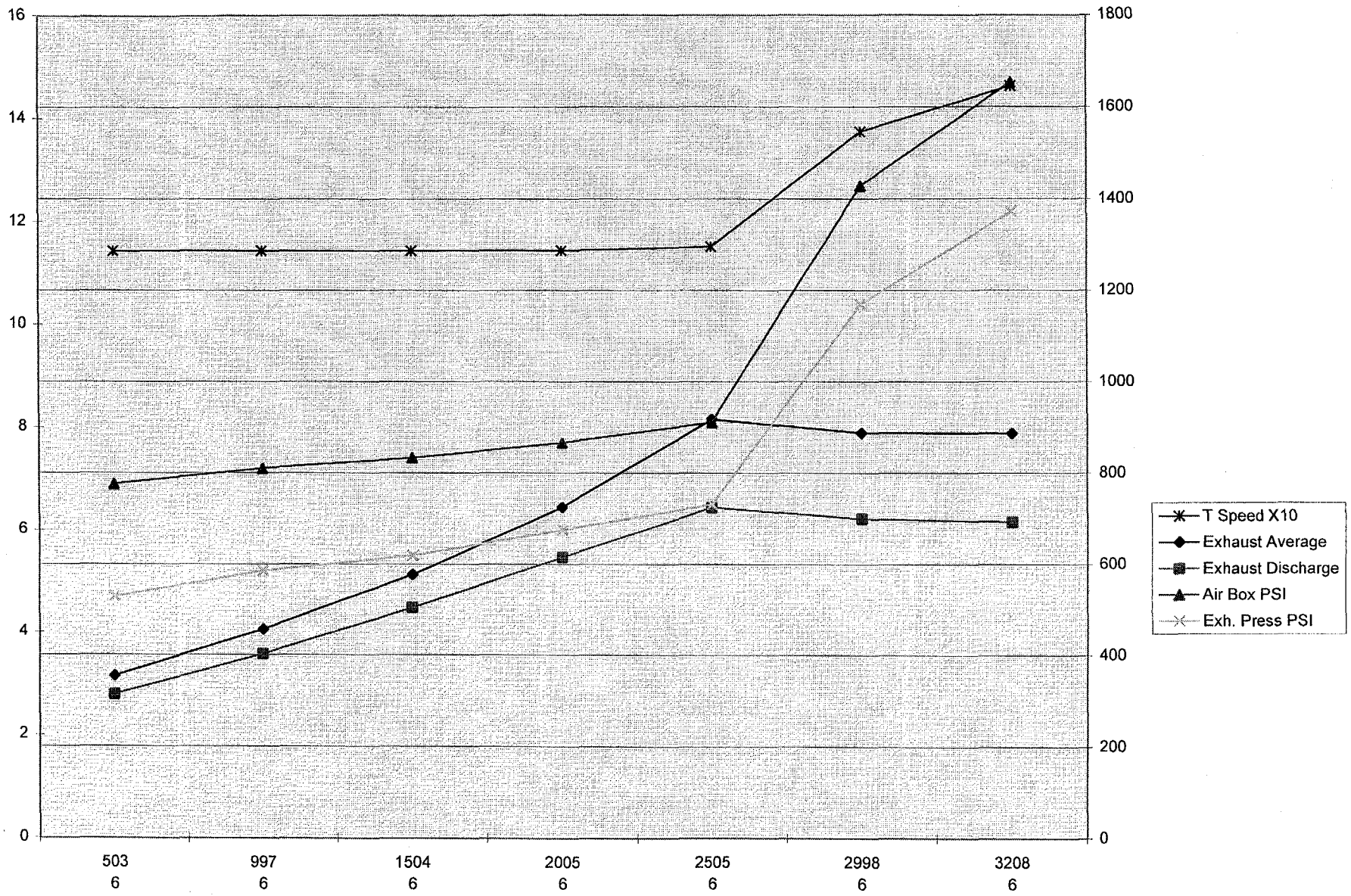
710DA Notches #2 baseline w/6700's 6/13/96



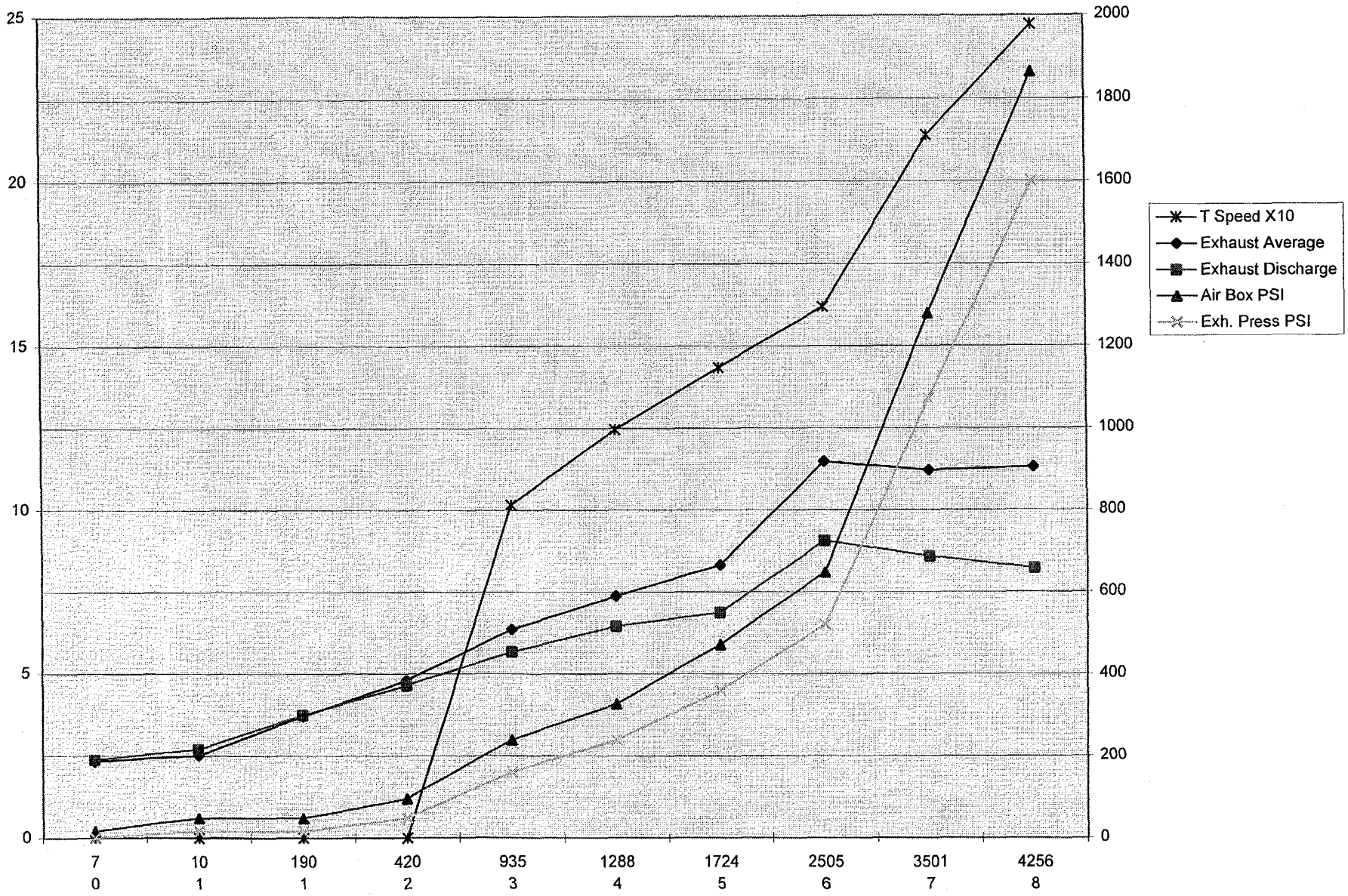
710DA 6/13/96 run #2 baseline w/6700 inj's air exhaust



710DA 750R's airexhaust baseline w/6700 inj's 6/13/96



710DA notches air/exhaust baseline w/6700 inj's 6/13/96



6/13/96 710 DA baseline w 6700 Inj's #2 run

date	time	TN	FAN A	FAN B	FAN C	1	2	3	4	5	6	7
6/13/96	11:53:52	8	1	1	1	1021	992	1022	1055	1004	993	999
6/13/96	11:54:54	8	1	1	1	1023	998	1026	1060	1009	996	1004
6/13/96	12:00:03	8	1	1	1	1012	986	1012	1047	998	984	991
6/13/96	12:06:28	8	1	1	1	999	979	1014	1035	984	976	980
6/13/96	12:11:53	8	1	1	1	997	973	1009	1027	981	967	973
6/13/96	12:17:01	8	1	1	1	997	975	1011	1030	988	964	973
6/13/96	12:23:11	8	1	1	1	998	978	1008	1029	983	970	973
6/13/96	12:34:46	8	1	1	1	934	917	944	959	919	915	906
6/13/96	12:40:10	8	1	1	1	790	775	795	798	784	778	766
6/13/96	12:45:19	8	1	1	0	676	656	676	670	662	670	649
6/13/96	12:50:27	8	1	1	0	575	554	569	557	557	570	544
6/13/96	13:04:52	6	1	1	1	983	950	1004	981	979	944	961
6/13/96	13:09:15	6	1	1	1	983	947	1000	977	976	946	958
6/13/96	13:15:56	6	1	1	1	1032	978	1041	1014	1010	986	980
6/13/96	13:22:52	6	1	1	0	812	775	810	793	783	775	766
6/13/96	13:28:16	6	1	1	0	635	617	632	623	610	620	599
6/13/96	13:33:56	6	1	0	0	498	482	491	478	479	488	469
6/13/96	13:40:06	6	1	0	0	389	373	374	365	369	376	361
6/13/96	12:00:03	8	1	1	1	1012	986	1012	1047	998	984	991
6/13/96	12:59:27	7	1	1	1	996	970	1019	1017	983	975	976
6/13/96	13:15:56	6	1	1	1	1032	978	1041	1014	1010	986	980
6/13/96	13:48:20	5	1	1	0	758	720	757	741	731	726	709
6/13/96	13:52:58	4	1	1	0	657	635	658	643	639	634	622
6/13/96	14:01:12	3	1	1	0	559	544	551	544	544	546	529
6/13/96	14:06:51	2	1	0	0	414	405	396	398	399	402	392
6/13/96	14:13:18	1	1	0	0	328	311	314	309	310	315	303
6/13/96	14:20:30	1	1	0	0	211	197	198	192	201	211	177
6/13/96	14:27:11	0	1	0	0	195	181	183	177	189	194	163

6/13/96 710 DA baseline w 6700 Inj's #2 run

8	9	10	11	12	13	14	15	16	TBin	TBou	AIR IN	RB OUT
963	1008	1041	1002	848	994	973	1008	954	911	652	92	330
968	1014	1051	1010	884	996	981	1013	959	916	653	91	332
968	1000	1034	991	817	986	965	1000	958	905	658	93	324
954	988	1011	979	591	975	958	991	951	894	662	96	313
948	984	1009	974	681	969	955	983	951	892	671	103	300
950	989	1014	977	1007	974	961	989	952	897	683	108	292
950	989	1012	973	1011	974	960	990	948	894	694	102	278
892	923	940	909	860	912	911	925	888	835	662	103	263
758	784	796	771	722	770	781	786	751	713	571	98	256
653	664	672	655	691	657	666	667	649	606	491	98	252
561	565	568	554	590	559	567	561	559	519	420	99	252
942	954	984	978	975	979	925	972	919	887	693	98	264
937	958	984	973	975	978	924	969	919	888	700	99	248
979	1006	1018	1007	1023	1015	972	1021	962	918	725	104	213
771	792	809	786	809	787	761	798	756	725	615	99	204
609	626	629	613	617	615	598	622	600	577	504	98	201
474	485	491	478	479	482	483	487	473	456	402	93	196
368	376	382	364	383	370	373	374	364	354	314	90	191
968	1000	1034	991	817	986	965	1000	958	905	658	93	324
949	991	1004	986	953	990	945	988	948	897	687	102	279
979	1006	1018	1007	1023	1015	972	1021	962	918	725	104	213
726	740	751	732	733	729	708	742	712	666	550	94	176
637	642	643	635	606	633	621	637	615	590	517	94	159
538	555	548	533	539	532	531	548	527	509	454	91	143
399	399	408	380	406	395	393	397	392	384	372	86	119
312	307	318	292	315	305	311	311	304	297	300	87	110
212	190	205	168	203	197	201	206	207	201	217	85	106
196	179	190	156	192	187	186	190	193	186	190	81	98

6/13/96 710 DA baseline w 6700 Inj's #2 run

LB OUT	RB REAR	LB REAR	RB MID	LB MID	RB FRNT	LB FRNT	ACR IN	ACR OUT	AC IN	AC OUT	ENG IN	ENG OUT
332	183	173	187	199	67	196	67	67	168	186	169	177
336	183	174	188	203	67	199	67	67	167	191	169	177
329	184	179	193	205	67	203	67	67	170	190	169	179
315	182	175	188	201	68	201	68	68	170	185	169	178
305	177	172	186	196	183	194	68	68	167	181	168	175
294	174	169	181	191	180	192	68	68	166	179	165	172
281	171	165	178	187	177	186	69	69	165	174	163	170
267	167	161	175	182	174	182	70	70	163	173	160	169
259	171	159	175	183	172	182	70	70	168	176	168	173
257	165	157	171	177	167	178	70	70	160	167	161	165
257	165	158	169	177	163	177	71	71	159	168	157	163
267	172	162	177	186	174	186	71	71	167	177	166	175
252	169	162	174	182	173	181	71	71	164	175	164	171
217	162	152	168	170	168	172	72	72	161	166	160	167
208	162	148	167	171	164	171	72	72	164	168	164	170
205	159	148	165	168	160	169	72	72	159	165	159	164
199	160	145	164	167	158	168	73	73	163	167	163	166
196	156	143	162	164	155	165	73	73	159	163	159	162
329	184	179	193	205	67	203	67	67	170	190	169	179
283	174	166	180	188	178	186	71	71	167	177	166	174
217	162	152	168	170	168	172	72	72	161	166	160	167
180	155	142	162	163	156	163	73	73	160	162	160	166
164	152	140	158	158	153	159	73	73	158	157	156	163
144	155	138	159	158	150	159	74	74	165	162	162	168
122	146	134	151	150	143	152	74	74	155	152	155	158
112	146	131	151	150	142	151	74	74	156	152	156	159
107	144	129	150	148	140	149	74	74	155	150	155	157
101	142	127	149	145	136	147	74	74	155	150	155	156

6/13/96 710 DA baseline w 6700 Inj's #2 run

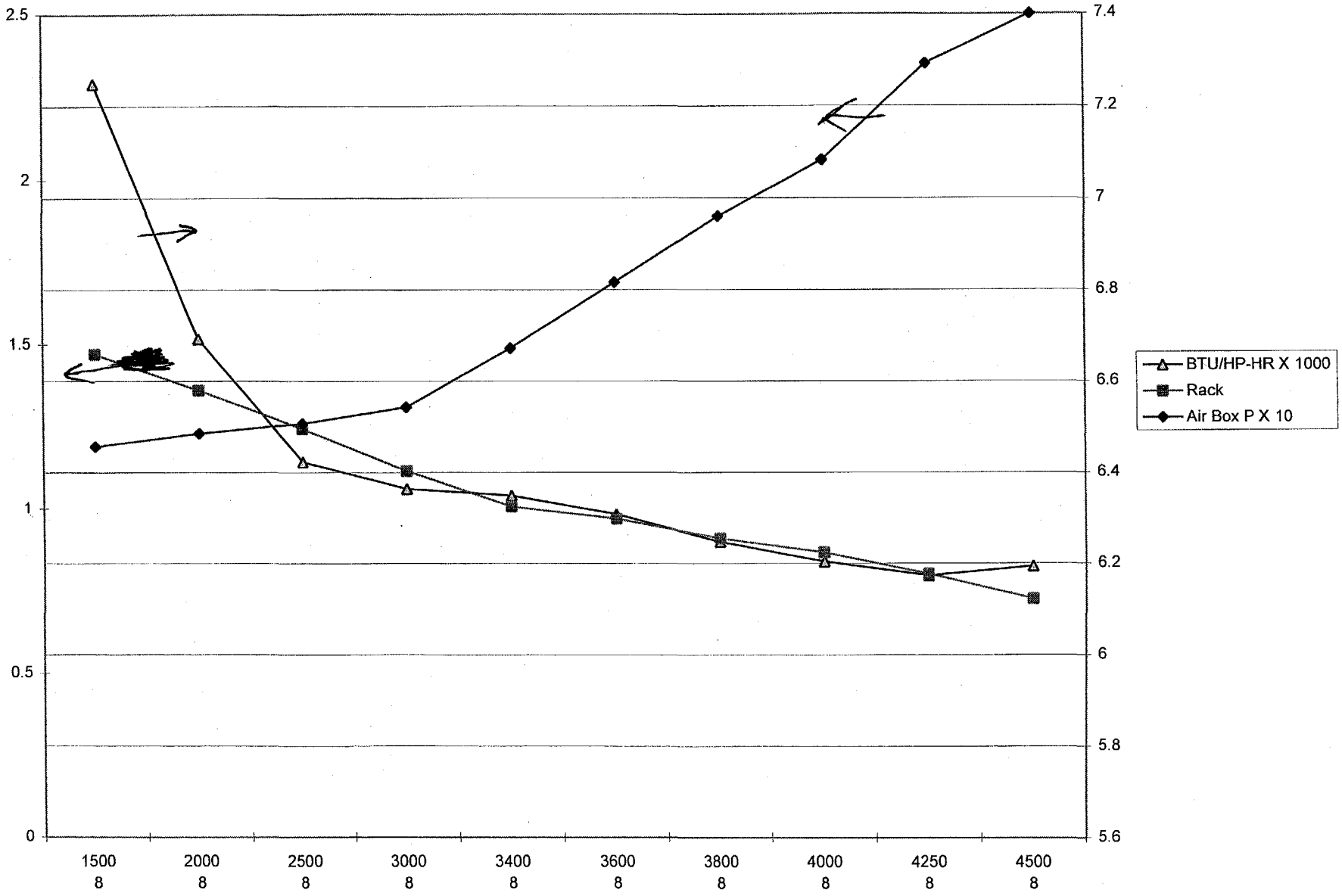
OIL IN	OIL OUT	FUEL IN	FUEL OU	GAS TMP	INLT DEP	TRBO DC	AIR BOX	GAS SPL	GAS HDR	EXH MAN	MG VOLT	MG AMP
194	197	118	143	69	-7.2	26.8	25.1	7.7	-62.4	21.6	939	3166
194	198	118	143	67	-10.4	26.8	25.2	7.5	-62.4	21.6	939	3166
197	203	118	145	75	-10.1	24.9	23.3	7.5	-62.4	20	914	3082
198	203	117	146	68	-8.8	22.5	21.2	7.5	-62.4	18	884	2989
196	202	116	146	71	-7.6	20.4	19.1	7.6	-62.4	16.2	860	2911
194	201	104	138	69	-6.9	18.1	16.9	7.6	-62.4	14.2	834	2829
192	199	107	135	69	-6.7	16.3	15.2	7.5	-62.4	12.7	809	2742
190	197	101	133	70	-5.2	14.4	13.4	7.5	-62.4	11	754	2568
191	194	103	133	75	-6.2	14.1	13.1	7.5	-62.3	10.6	687	2347
186	188	110	132	70	-7.1	13.7	12.8	7.6	-62.5	10.1	609	2088
181	186	110	138	71	-6.6	13.1	12.2	7.6	-62.5	9.4	517	1780
189	196	109	132	73	-5.7	15.7	14.7	7.6	-62.5	12.2	800	2713
189	194	110	131	71	-4.8	13.6	12.7	7.7	-62.5	10.4	772	2621
185	191	103	131	73	-3.4	8.7	8.1	7.5	-62.5	6.5	701	2391
185	189	103	128	72	-3.8	8.3	7.7	7.6	-62.5	6	628	2149
181	184	107	126	72	-3.8	8.1	7.4	6.9	-62.5	5.5	539	1853
181	180	109	129	73	-4.2	7.8	7.2	7.1	-62.5	5.2	434	1498
175	175	113	131	73	-5	7.6	6.9	7	-62.5	4.7	296	1029
197	203	118	145	75	-10.1	24.9	23.3	7.5	-62.4	20	914	3082
190	197	114	138	71	-6.5	17.1	16	7.6	-62.5	13.4	828	2805
185	191	103	131	73	-3.4	8.7	8.1	7.5	-62.5	6.5	701	2391
178	180	107	126	75	-4.7	6.4	5.9	7	-62.5	4.5	585	2006
175	177	105	122	73	-3.1	4.5	4.1	7.1	-62.5	3	504	1736
176	175	106	121	74	-2.6	3.3	3	7.1	-62.5	2	428	1479
167	169	107	118	74	-1.4	1.3	1.2	7.9	-62.4	0.6	286	995
166	166	108	118	74	-1.5	0.7	0.6	7.8	-62.4	0.2	190	664
164	160	110	119	74	-1.5	0.7	0.6	7.8	-62.4	0.2	4	15
163	158	110	118	74	-1.6	0.3	0.2	7.8	-62.4	0	3	11

6/13/96 710 DA baseline w 6700 Inj's #2 run

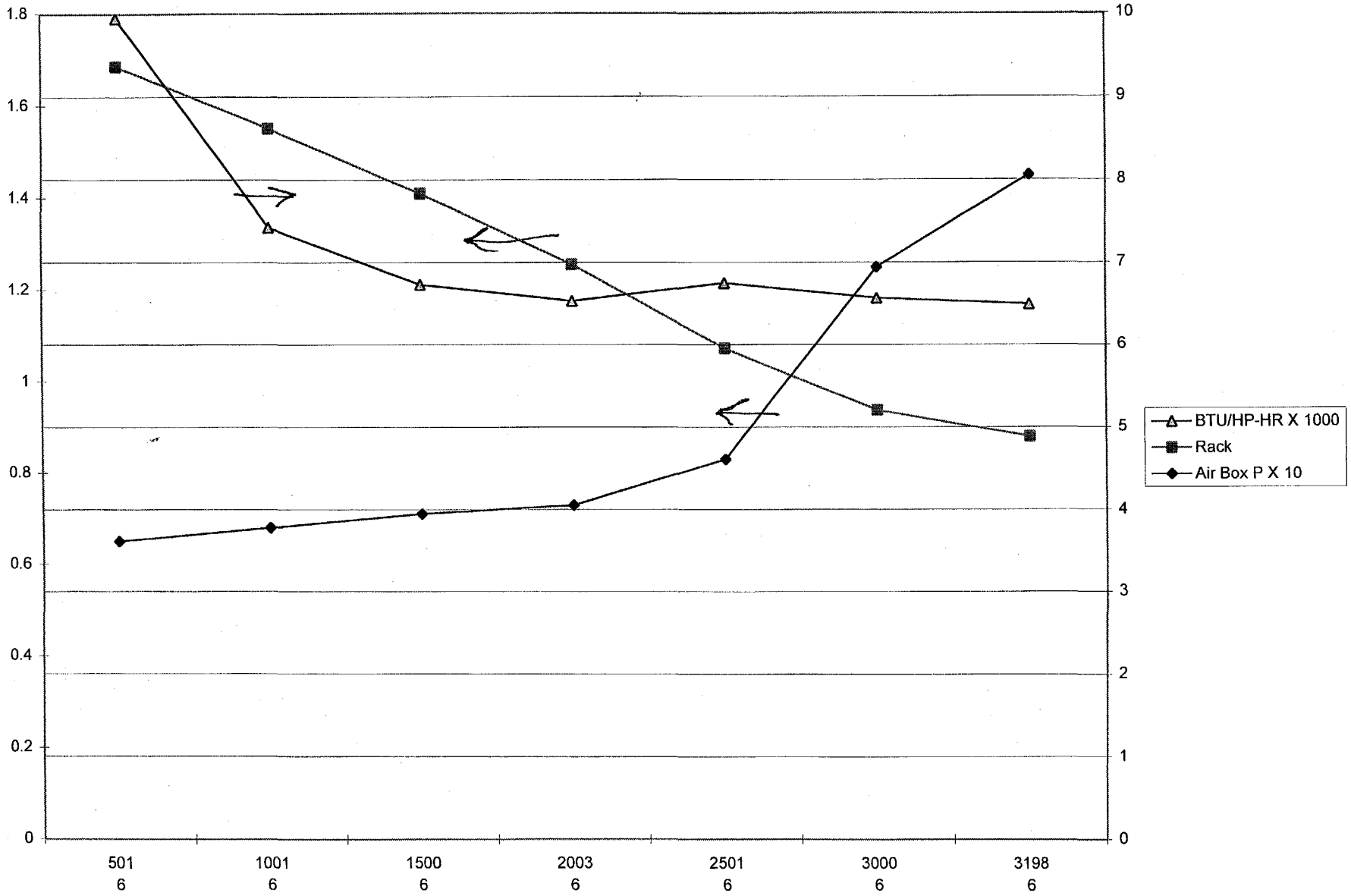
EXC VOL	CJC	RPM	TRBO RP	GAS CFM	RACK MAI	RACK #9	DIES FLO	VALV PO	FAN HP	DIGITL	HORSE P	BTU/ HP-
37.5	67.6	901.6	20280	0	0.657	0.641	25.08	0	232.5	-232	4479	6203
37.7	67.6	901.3	20323	-0.1	0.652	0.636	25.1	0	232.4	-232	4479	6229
37.2	68	901.6	19783	-0.1	0.737	0.723	23.63	0	232.5	-232	4256	6165
36.5	68.5	902.1	19038	0	0.81	0.799	22.45	0	232.7	-232	4007	6216
35.8	68.7	902	18331	-0.1	0.858	0.848	21.32	0	232.6	-232	3808	6220
34.9	69	902.1	17557	0	0.912	0.903	20.51	0.9	232.6	-232	3603	6306
33.9	69.6	901.9	16829	0	0.966	0.96	19.46	2.1	232.6	-232	3401	6347
31.6	70.3	901.9	16012	0	1.088	1.084	17.27	4.8	232.6	-232	2998	6383
28.5	70.8	900.8	15992	0	1.218	1.218	14.47	8	232.3	-232	2492	6449
25	71	901.6	16029	-0.1	1.363	1.368	12.14	10.4	188.5	-104	2005	6726
21	71.4	901.7	16023	0	1.485	1.492	9.87	13.1	188.6	-104	1503	7311
37.5	72.3	724.2	16450	-0.2	0.815	0.805	18.36	0	107.1	-240	3208	6356
35.9	72.5	724.6	15461	-0.2	0.879	0.871	17.21	0.1	107.8	-240	2998	6375
31.7	72.8	724.7	12959	-0.1	1.024	1.02	15.15	3.3	109.7	-240	2505	6704
27.7	73.2	724.4	12876	-0.2	1.238	1.238	11.74	7.7	77.1	-112	2005	6477
23.2	73.4	724.6	12869	-0.2	1.41	1.415	9.08	11.5	77.2	-112	1504	6701
18.3	73.5	724.1	12869	-0.2	1.574	1.582	6.66	14.9	68.3	-48	997	7359
12.4	73.7	724.2	12863	-0.2	1.72	1.729	4.47	18.1	68.5	-48	503	9775
37.2	68	901.6	19783	-0.1	0.737	0.723	23.63	0	232.5	-232	4256	6165
36.6	71.9	820.6	17111	-0.1	0.854	0.846	19.75	0	183.6	-231	3501	6258
31.7	72.8	724.7	12959	-0.1	1.024	1.02	15.15	3.3	109.7	-240	2505	6704
25.9	74.1	646.3	11480	-0.2	1.261	1.265	10.17	8.3	48.5	-111	1724	6567
23.2	74.1	561.5	9965	-0.3	1.362	1.367	7.65	10.5	38.5	-102	1288	6575
20.2	74.4	486.7	8137	-0.5	1.45	1.457	5.56	12.4	31.6	-101	935	6600
15.3	74.4	331.5	0	-0.7	1.559	1.57	2.69	14.7	13.6	-34	420	7109
11.1	74.4	255.2	-2	-0.7	1.659	1.67	1.29	16.8	10.1	-33	190	7653
0	74.6	254	-2	-0.7	1.823	1.834	0.5	20.3	10.1	-33	10	0
0	74.8	195.9	-2	-0.7	1.803	1.815	0.35	19.8	7.7	-42	7	0

DIES # HP	SCFM	PROJ #9
0.335	0	258.4
0.336	0	251.3
0.333	0	237.9
0.336	0	254
0.336	0	217
0.341	0	202.9
0.343	0	179.2
0.345	0	179.3
0.348	0	93.7
0.363	0	126.2
0.394	0	93.9
0.343	0	183
0.344	0	187.6
0.362	0	142.9
0.351	0	386.5
0.362	0	94
0.4	0	83.7
0.533	0	34.7
0.333	0	237.9
0.338	0	218.8
0.362	0	142.9
0.353	0	107.7
0.356	0	80.5
0.356	0	58.4
0.382	0	26.2
0.407	0	11.8
3	0	0.6
0	0	0

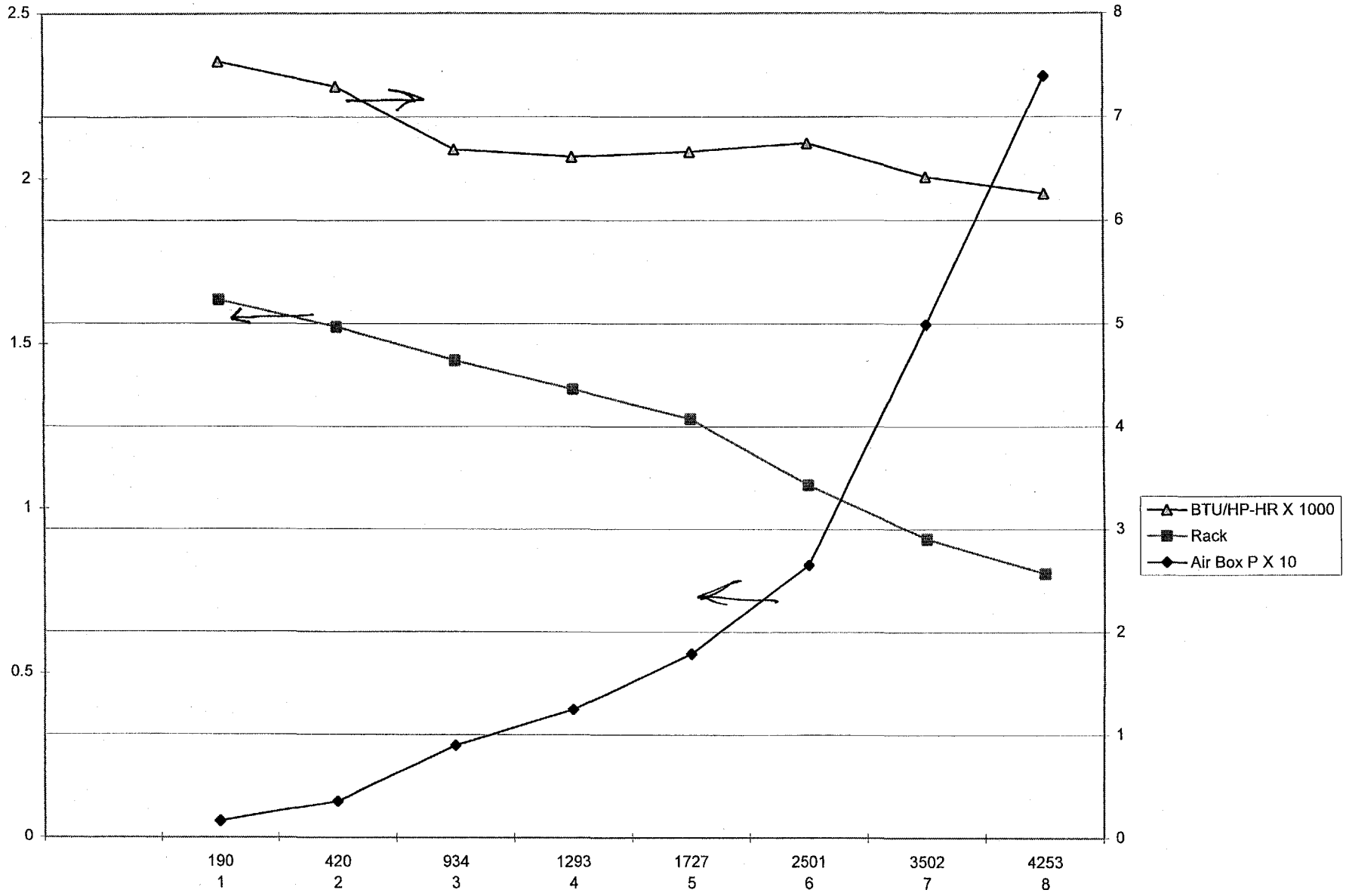
710DA 900R's #1 baseline w/7000's ~~9/11/06~~ 7 2 96



710DA 750R's #1 baseline w/7000's 7/2/96



710DA Notches #1 baseline w/7000's 7/2/96



7/2/96 710DA baseline

#1 with 7000 injectors

date	time	TN	FAN A	FAN B	FAN C	1	2	3	4	5	6	7
7/2/96	13:17:20	8	1	1	1	1040	1014	1027	1093	1040	1018	1026
7/2/96	13:21:42	8	1	1	1	1032	1009	1021	1084	1029	1001	1007
7/2/96	13:26:04	8	1	1	1	1021	1004	1040	1077	1024	997	999
7/2/96	13:30:12	8	1	1	1	1018	1005	1045	1071	1023	999	992
7/2/96	13:36:06	8	1	1	1	1018	1006	1045	1074	1024	998	994
7/2/96	13:40:14	8	1	1	1	1018	1009	1050	1075	1028	1001	991
7/2/96	13:45:23	8	1	1	1	967	965	999	1026	979	955	940
7/2/96	13:51:17	8	1	1	1	803	804	834	848	823	809	775
7/2/96	13:55:39	8	1	1	0	689	680	705	713	703	692	658
7/2/96	14:01:04	8	1	1	0	582	568	591	587	583	577	544
7/2/96	14:15:59	6	1	1	1	987	970	1025	1017	1010	965	969
7/2/96	14:26:16	6	1	1	1	997	978	1031	1023	1017	968	971
7/2/96	14:31:41	6	1	1	1	1030	1002	1061	1050	1043	1004	981
7/2/96	14:36:03	6	1	1	1	840	817	857	852	830	817	785
7/2/96	14:39:39	6	1	1	0	652	641	663	664	642	645	604
7/2/96	14:43:15	6	1	1	0	520	512	527	520	510	516	479
7/2/96	14:46:51	6	1	1	0	405	393	402	396	388	395	357
7/2/96	13:21:42	8	1	1	1	1032	1009	1021	1084	1029	1001	1007
7/2/96	14:07:45	7	1	1	1	1019	1005	1059	1064	1031	999	995
7/2/96	14:31:41	6	1	1	1	1030	1002	1061	1050	1043	1004	981
7/2/96	14:54:03	5	1	1	0	783	754	802	788	765	758	723
7/2/96	14:58:10	4	1	1	0	682	669	701	686	667	667	630
7/2/96	15:04:05	3	1	1	0	569	564	580	575	561	567	528
7/2/96	15:08:43	2	1	1	0	433	427	428	431	419	427	395
7/2/96	15:18:30	1	1	0	0	321	313	321	314	312	324	278
7/2/96	15:31:06	0	1	0	0	195	195	201	191	189	205	159

8	9	10	11	12	13	14	15	16	TBin	TBou	AIR IN	RB OUT
984	1029	1064	1039	362	1033	999	1038	983	934	663	97	341
975	1018	1050	1025	254	1024	991	1030	970	928	673	103	338
962	1009	1033	1016	283	1015	986	1018	962	919	685	106	327
964	1009	1036	1013	198	1010	981	1016	962	918	693	110	317
963	1010	1040	1014	118	1013	989	1018	968	921	703	118	307
964	1009	1032	1017	633	1016	997	1021	969	918	722	113	295
918	960	984	962	270	971	955	973	922	878	701	125	277
761	794	808	804	78	812	808	809	776	732	597	111	271
646	682	688	690	78	693	689	687	668	629	514	116	268
551	576	574	581	79	581	583	574	572	532	435	111	268
944	966	992	1006	415	1007	947	985	930	911	712	116	288
949	979	1007	1014	185	1018	957	991	937	918	723	114	273
967	1011	1025	1036	83	1045	994	1021	964	932	745	114	233
781	824	834	834	83	836	804	826	785	757	656	115	225
606	647	646	650	83	647	623	637	621	601	544	111	222
480	510	510	512	84	516	509	504	496	484	448	111	218
362	393	393	388	84	395	394	384	384	377	354	109	212
975	1018	1050	1025	254	1024	991	1030	970	928	673	103	338
959	1019	1033	1035	109	1040	976	1024	968	930	703	117	295
967	1011	1025	1036	83	1045	994	1021	964	932	745	114	233
727	768	772	778	84	771	749	768	736	701	578	108	197
627	672	665	677	371	669	663	665	640	617	544	109	179
519	572	561	568	85	556	559	563	540	524	478	103	159
386	416	428	413	85	421	416	418	409	404	398	99	136
292	312	316	311	85	313	317	312	308	297	295	96	121
155	185	193	190	85	197	194	193	190	187	197	93	109

LB OUT	RB REAR	LB REAR	RB MID	LB MID	RB FRNT	LB FRNT	ACR IN	ACR OUT	AC IN	AC OUT	ENG IN	ENG OUT
344	188	179	195	210	186	203	74	74	176	199	176	186
341	192	186	199	213	191	208	75	75	180	199	180	190
333	191	187	201	211	193	208	75	75	183	198	182	191
320	190	186	198	211	194	207	75	75	182	198	183	190
310	189	183	197	204	195	206	76	76	182	195	181	189
299	184	179	194	201	191	201	77	77	181	190	179	187
281	177	174	185	192	185	194	78	78	173	183	172	179
276	169	167	178	186	177	186	78	78	164	175	164	169
271	173	159	178	185	175	185	78	78	172	178	167	172
267	174	159	173	181	169	182	79	79	163	173	163	166
286	190	173	190	199	186	194	81	81	180	191	178	186
273	187	172	190	198	187	197	82	82	182	190	180	188
231	180	166	183	186	182	188	83	83	176	181	175	182
225	174	161	176	180	174	182	83	83	168	173	169	174
219	167	155	167	172	167	174	83	83	159	166	160	164
217	166	154	167	172	164	173	84	84	160	166	161	164
212	162	151	162	167	159	169	84	84	155	161	154	158
341	192	186	199	213	191	208	75	75	180	199	180	190
295	186	168	187	195	183	193	80	80	173	187	172	180
231	180	166	183	186	182	188	83	83	176	181	175	182
193	168	150	169	171	163	171	84	84	168	169	167	172
176	166	150	167	168	160	169	84	84	167	168	167	172
158	160	147	163	163	156	164	85	85	163	163	163	167
136	154	143	157	157	150	159	85	85	159	157	158	163
121	150	137	153	151	144	153	85	85	156	153	156	159
112	144	133	150	148	141	150	85	85	155	151	155	157

OIL IN	OIL OUT	FUEL IN	FUEL OU	GAS TMP	INLT DEP	TRBO DC	AIR BOX	GAS SPL	GAS HDR	EXH MAN	MG VOLT	MG AMP
197	197	114	142	74	-15	26.8	25.2	8.3	-62.4	21.6	943	3171
204	207	117	146	75	-14	24.6	23.1	8.3	-62.4	19.7	914	3080
206	210	104	136	75	-14.1	22.2	20.8	8.2	-62.4	17.7	884	2983
209	212	100	136	77	-12	20.2	18.9	8.2	-62.4	15.9	860	2904
208	213	103	140	78	-13.1	18	16.8	8.4	-62.4	14.1	834	2828
206	214	103	139	78	-9.8	16.3	15.2	8.3	-62.4	12.7	809	2743
201	208	108	142	78	-9.5	13.6	12.7	8.2	-62.4	10.4	755	2570
193	197	113	143	79	-9.5	13.5	12.5	8.3	-62.4	10.1	683	2330
191	194	118	146	78	-10.6	13	12	8.2	-62.5	9.5	609	2086
186	188	122	147	79	-11.5	12.6	11.7	8.1	-62.5	8.9	517	1779
200	205	102	133	81	-10.3	15.5	14.5	8.3	-62.5	12	800	2706
202	209	104	132	82	-9	13.5	12.5	8.3	-62.5	10.3	773	2621
199	205	107	133	83	-8.1	8.9	8.3	8.3	-62.5	6.7	702	2388
193	199	112	136	83	-9.3	7.9	7.3	8.4	-62.5	5.7	623	2130
185	190	116	135	85	-8.2	7.7	7.1	8.4	-62.5	5.4	539	1848
182	185	121	139	84	-8.4	7.5	6.8	8.3	-62.5	5	433	1494
176	178	126	140	84	-8.6	7.1	6.5	8.3	-62.5	4.5	292	1016
204	207	117	146	75	-14	24.6	23.1	8.3	-62.4	19.7	914	3080
195	198	106	138	80	-10.9	16.7	15.6	8.3	-62.5	13	829	2805
199	205	107	133	83	-8.1	8.9	8.3	8.3	-62.5	6.7	702	2388
184	186	118	136	84	-7.3	6.2	5.6	8.3	-62.5	4.3	586	2007
183	186	121	134	84	-5.2	4.3	3.9	8.4	-62.5	2.9	506	1737
178	181	119	132	85	-6	3.1	2.8	8.4	-62.5	1.9	428	1477
171	174	120	130	85	-5.6	1.2	1.1	8.4	-62.4	0.6	285	991
167	165	122	131	85	-5.7	0.6	0.5	8.5	-62.5	0.2	190	663
164	159	125	131	85	-5.9	0.2	0.2	8.4	-62.5	0	3	12

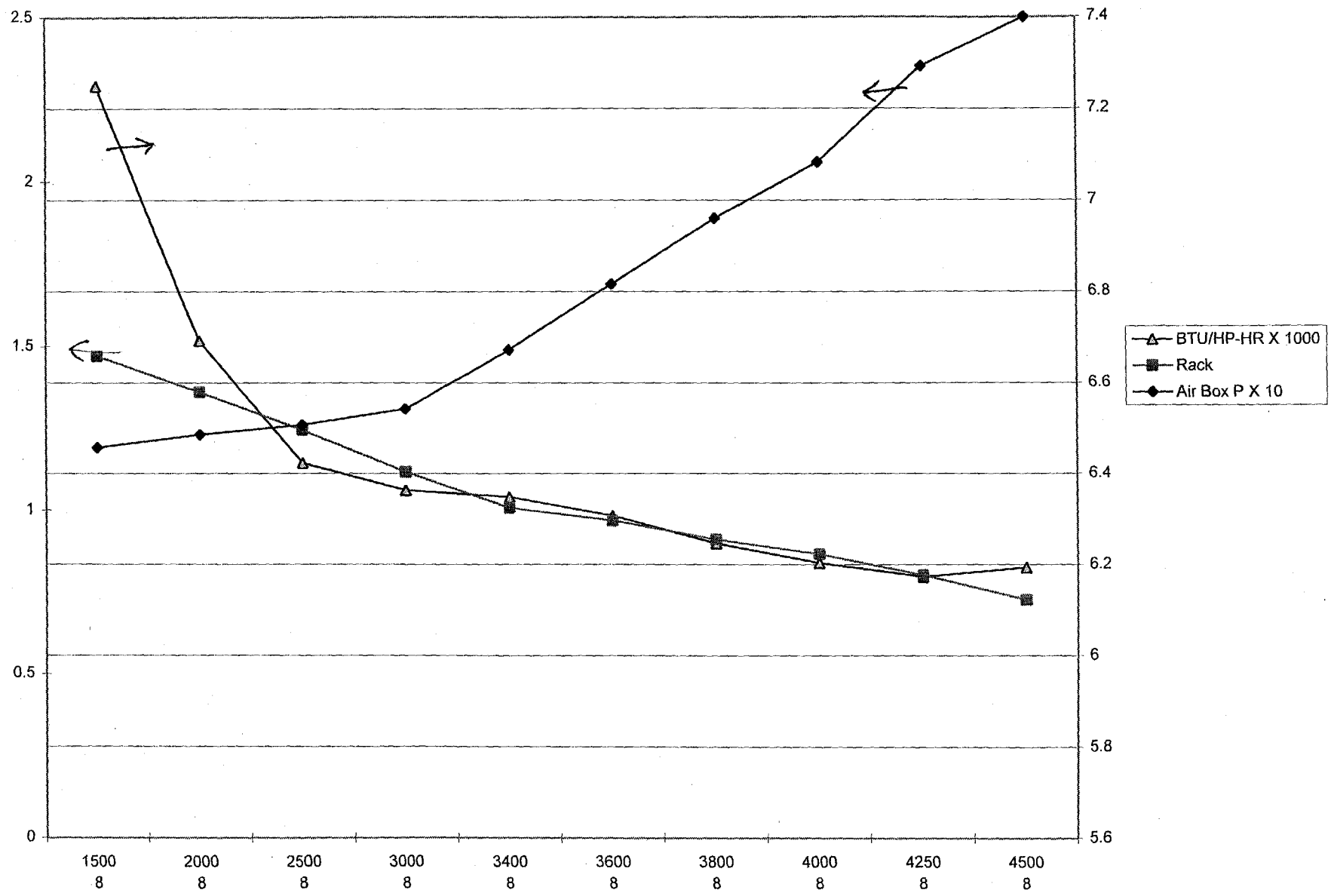
7/2/96 710DA baseline

#1 with 7000 injectors

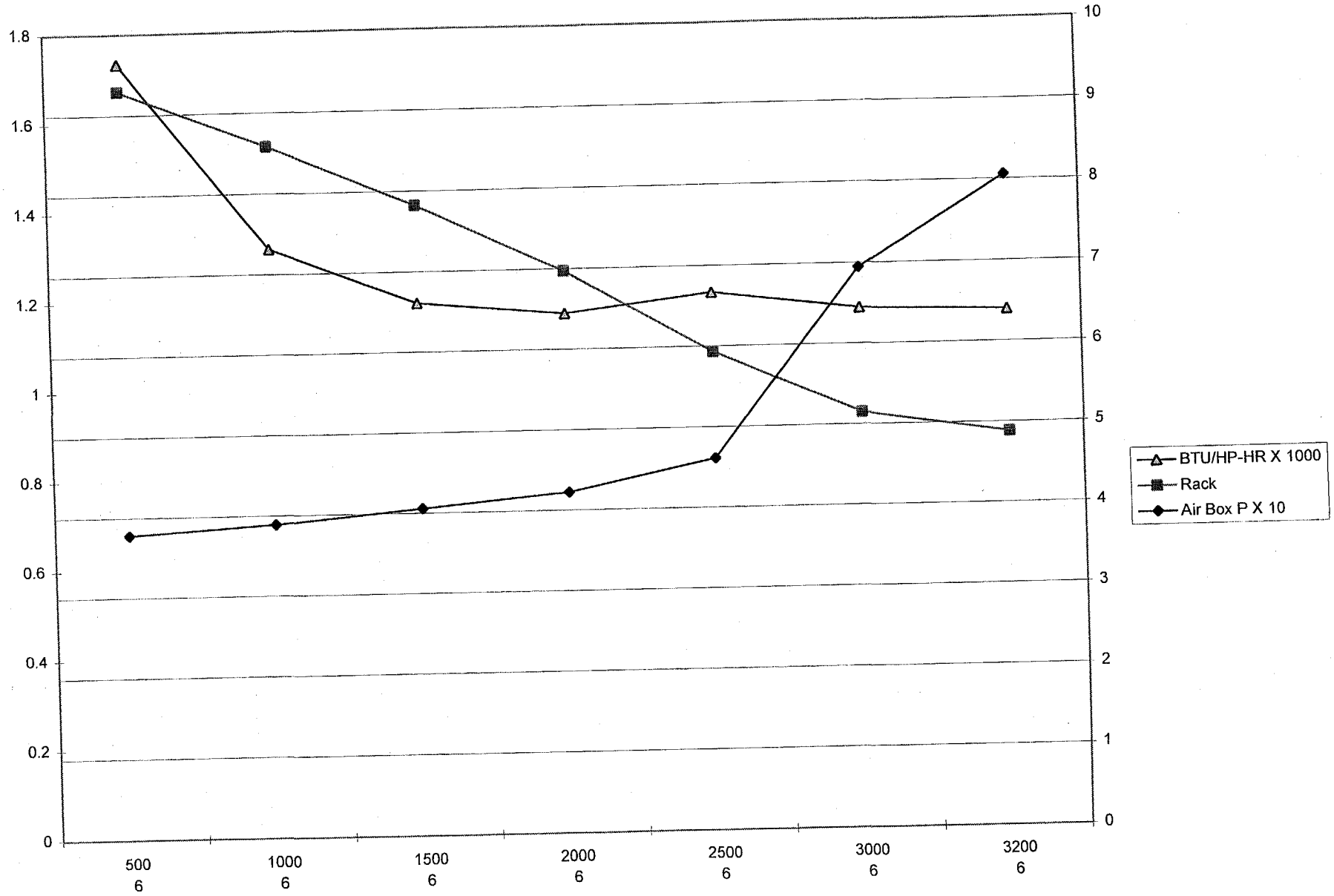
EXC VOL	CJC	RPM	TRBO RP	GAS CFM	RACK MAI	RACK #9	DIES FLO	VALV PO	FAN HP	DIGITL	HORSE P	BTU/ HP-
37.6	74.6	902.5	20578	-0.1	0.735	0.718	25.46	0	232.8	-232	4504	6281
37	75.2	902.2	19964	-0.1	0.804	0.788	23.98	0	232	-232	4253	6263
36.1	75.7	902.9	19263	0	0.886	0.868	22.72	0.4	232.4	-232	3999	6306
35.4	76.2	903	18595	0	0.933	0.919	21.61	1.5	231.8	-232	3799	6308
34.8	77	902.7	17843	0	0.969	0.957	20.69	2.4	231.1	-232	3600	6370
33.8	77.5	902.5	17137	0	1.017	1.008	19.58	3.5	230.6	-232	3400	6392
31.5	78.2	902.6	16039	0	1.114	1.11	17.56	5.7	231.3	-232	3003	6498
28.3	79.1	901.4	15979	0	1.247	1.25	14.62	8.7	231.1	-232	2504	6480
25	79.5	901.4	16034	0	1.364	1.367	12.2	10.9	186.2	-104	2000	6771
21	80.2	901.8	16042	0	1.474	1.483	9.94	13.4	186.8	-104	1500	7348
37.7	82	726.5	16745	0	0.88	0.87	18.67	0.5	106	-240	3198	6490
36.5	83.1	726.7	15844	0	0.937	0.927	17.76	1.7	107	-240	3000	6567
32.1	83.6	726	13341	0	1.072	1.067	15.21	4.7	106.7	-240	2501	6750
27.8	83.8	726	12925	0	1.256	1.258	11.77	8.8	107.5	-240	2003	6533
23.6	84.2	726.6	12896	0	1.411	1.417	9.08	12	77.6	-112	1500	6734
18.6	84.5	726.2	12896	0	1.552	1.562	6.68	15.2	77.4	-112	1001	7429
12.5	84.7	725.7	12899	0	1.686	1.7	4.48	18.1	77.4	-112	501	9947
37	75.2	902.2	19964	-0.1	0.804	0.788	23.98	0	232	-232	4253	6263
36.5	81.1	822.6	17291	0	0.908	0.899	20.29	1.1	180.2	-231	3502	6421
32.1	83.6	726	13341	0	1.072	1.067	15.21	4.7	106.7	-240	2501	6750
26.7	84.9	649.3	11519	-0.1	1.273	1.279	10.37	9	47.6	-111	1727	6665
23.8	85.1	563.7	10000	-0.6	1.364	1.371	7.7	11	38.1	-102	1293	6618
20.8	85.2	489.6	8661	-0.9	1.451	1.461	5.61	13	31.2	-101	934	6690
15.7	85.2	334.7	11	-1.2	1.553	1.566	2.58	15.2	16.8	-98	420	7294
11.8	85.6	256.5	8	-1.1	1.635	1.649	1.41	16.9	10.1	-33	190	7536
0	85.6	197.3	4	-1.2	1.769	1.786	0.23	19.7	7.7	-42	7	0

DIES # HP	SCFM	PROJ #9
0.339	0	480.8
0.338	0	479.7
0.34	0	507.6
0.341	0	469
0.344	0	388.1
0.345	0	346.7
0.35	0	268.4
0.35	0	200.3
0.366	0	125
0.397	0	48.5
0.35	0	390.7
0.355	0	368.9
0.364	0	681.3
0.352	0	406.3
0.363	0	93
0.4	0	20.9
0.536	0	-68.7
0.338	0	479.7
0.347	0	218.8
0.364	0	681.3
0.36	0	107.9
0.357	0	80.8
0.36	0	58.3
0.368	0	26.2
0.445	0	11.8
0	0	0

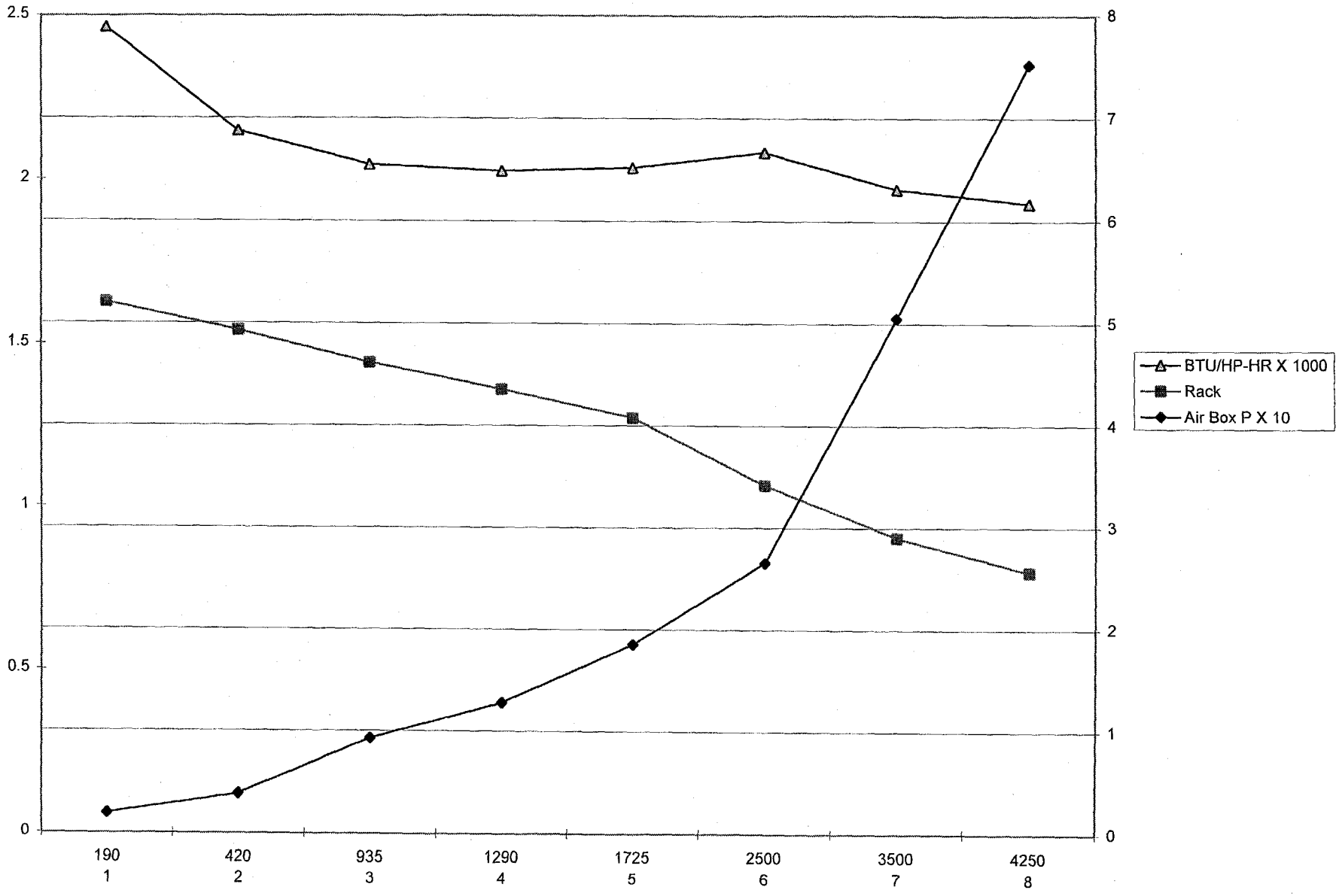
710DA 900R's #2 bas[illegible]e w/7000's 9/11/96



710DA 750R's #2 baseline w/7000's 9/11/96



710DA Notches #2 baseline w/7000's 9/11/96



710DA baseline # 2 09/11/96

date	time	TN	FAN A	FAN B	FAN C	1	2	3	4	5	6	7	8
9/11/96	12:39:38	8	1	1	1	1047	1028	997	1088	1040	1017	1026	986
9/11/96	12:45:49	8	1	1	1	1030	1015	1014	1070	1021	1002	1000	966
9/11/96	13:03:49	8	1	1	1	1029	1015	1009	1072	1021	997	998	960
9/11/96	13:12:50	8	1	1	1	1020	1010	1009	1066	1013	994	991	954
9/11/96	13:20:17	8	1	1	1	1015	1009	1029	1064	1010	998	986	951
9/11/96	13:28:46	8	1	1	1	1020	1015	1034	1072	1018	996	993	953
9/11/96	13:37:00	8	1	1	1	941	946	968	996	946	930	915	886
9/11/96	13:43:26	8	1	1	0	797	794	817	832	802	795	764	747
9/11/96	13:51:24	8	1	1	0	682	672	691	696	689	682	647	640
9/11/96	13:59:08	8	1	1	0	578	563	583	576	571	575	539	544
9/11/96	14:18:10	6	1	1	1	989	977	1016	1014	1002	958	966	932
9/11/96	14:25:53	6	1	1	1	1002	987	1029	1028	1014	974	973	945
9/11/96	14:34:07	6	1	1	1	1027	1007	1056	1057	1034	1008	982	962
9/11/96	14:42:20	6	1	1	0	812	792	825	829	799	794	756	747
9/11/96	14:48:46	6	1	1	0	632	626	640	650	619	630	586	584
9/11/96	14:58:02	6	1	1	0	498	489	504	497	485	497	455	458
9/11/96	15:06:01	6	1	1	0	396	384	396	388	377	386	351	356
9/11/96	12:45:49	8	1	1	1	1030	1015	1014	1070	1021	1002	1000	966
9/11/96	14:09:56	7	1	1	1	1020	1009	1051	1064	1026	997	992	952
9/11/96	14:34:07	6	1	1	1	1027	1007	1056	1057	1034	1008	982	962
9/11/96	15:14:43	5	1	1	0	755	730	774	764	737	743	696	698
9/11/96	15:19:38	4	1	1	0	667	657	684	678	651	664	616	612
9/11/96	15:26:36	3	1	1	0	561	555	570	564	549	563	519	510
9/11/96	15:34:49	2	1	0	0	420	411	409	412	403	412	379	371
9/11/96	15:41:00	1	1	0	0	330	323	326	320	319	331	285	298
9/11/96	15:48:43	1	1	0	0	213	211	211	204	202	217	168	164
9/11/96	15:55:08	0	1	0	0	196	196	197	192	188	201	159	161

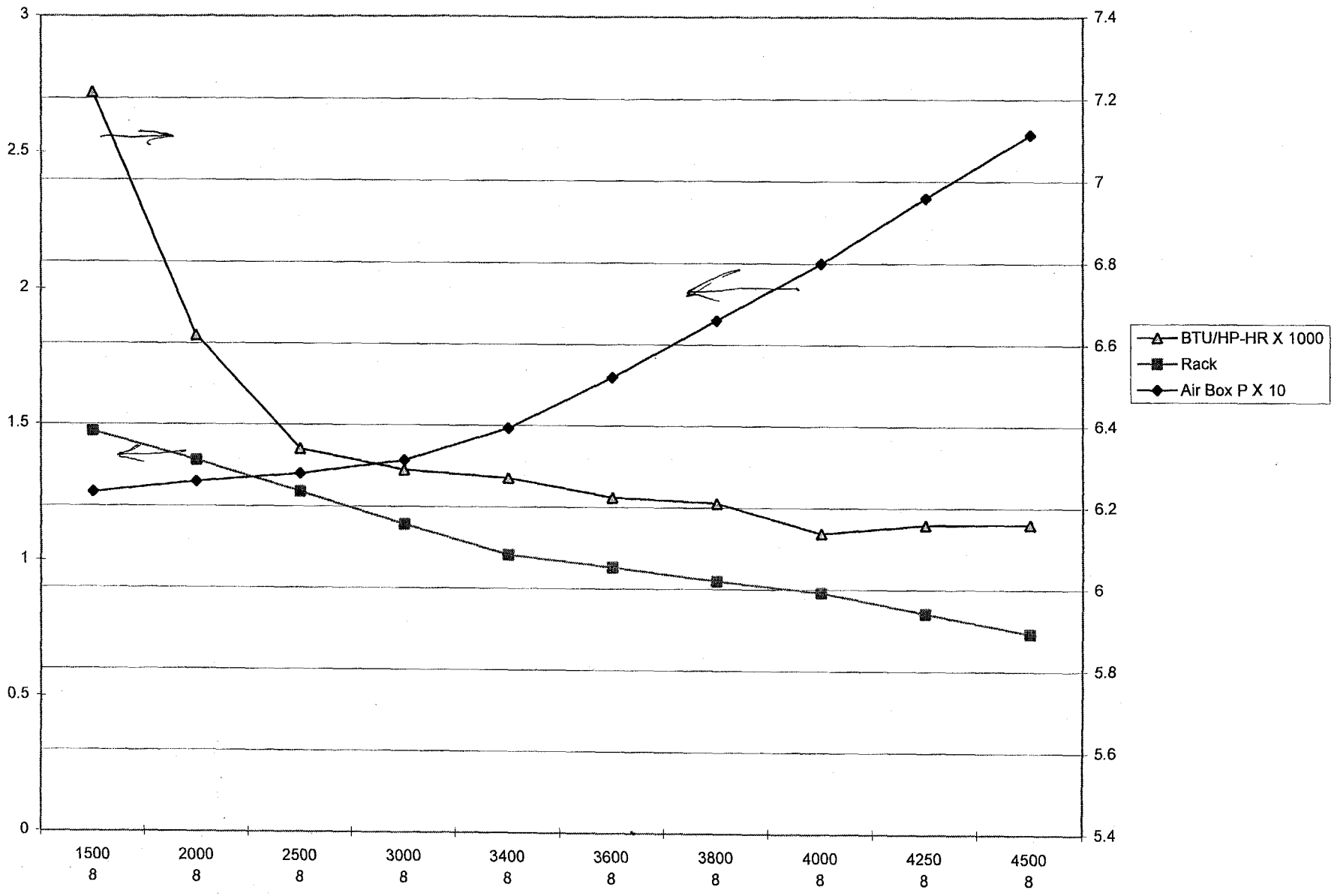
9	10	11	12	13	14	15	16	TBin	TBou	AIR IN	RB OUT	LB OUT	RB REAR
1039	1079	1031	1051	1040	1010	1044	989	938	675	99	348	345	194
1019	1053	1012	1027	1020	990	1020	969	922	677	98	339	337	199
1017	1050	1009	1029	1020	997	1024	968	920	684	109	327	326	194
1008	1036	1008	1023	1016	992	1016	959	917	693	112	316	315	191
1009	1038	1005	1018	1015	991	1014	964	914	704	114	305	303	189
1017	1042	1006	1030	1021	1004	1022	969	921	721	113	293	291	185
933	959	931	962	945	942	947	901	855	679	115	276	276	176
788	805	788	816	798	804	796	768	726	581	112	272	272	175
672	679	676	697	682	690	677	666	620	498	111	268	268	177
571	572	569	590	575	583	565	570	524	421	109	267	264	175
973	996	998	986	1006	950	983	929	907	708	107	279	278	186
987	1008	1010	1004	1018	971	996	945	917	722	111	267	267	183
1015	1025	1031	1035	1044	1003	1024	965	931	749	108	226	223	174
805	807	806	811	812	786	800	762	737	623	108	220	217	170
632	631	630	639	628	615	617	609	581	503	110	215	214	167
489	488	494	499	495	492	484	482	458	395	105	211	211	165
388	387	381	392	386	390	377	380	362	312	102	205	203	166
1019	1053	1012	1027	1020	990	1020	969	922	677	98	339	337	199
1018	1030	1023	1020	1037	980	1018	966	926	707	114	293	292	186
1015	1025	1031	1035	1044	1003	1024	965	931	749	108	226	223	174
748	751	749	750	746	726	739	715	675	550	105	191	187	166
665	655	659	656	656	644	651	632	605	526	109	177	172	164
564	554	552	546	548	550	552	538	516	468	101	159	155	160
406	414	397	410	408	397	404	394	388	368	97	133	128	158
321	323	315	326	322	325	320	315	304	309	95	124	118	157
204	209	196	211	208	209	212	206	202	219	94	119	114	154
191	193	186	199	198	196	196	192	190	196	90	112	107	153

LB REAR	RB MID	LB MID	RB FRNT	LB FRNT	ACR IN	ACR OUT	AC IN	AC OUT	ENG IN	ENG OUT	OIL IN	OIL OUT	FUEL IN
181	197	210	188	205	70	70	176	197	177	187	200	203	118
187	201	213	194	209	71	71	184	201	182	191	208	212	122
184	197	208	193	206	72	72	179	196	180	188	205	212	116
180	195	205	192	204	73	73	178	194	178	186	206	213	116
177	193	202	189	200	74	74	176	190	177	186	205	212	99
173	188	197	186	197	75	75	174	185	173	181	202	209	114
167	178	186	179	187	75	75	166	176	166	173	195	201	100
162	177	183	174	184	75	75	167	179	167	172	191	197	103
164	177	185	171	183	76	76	167	177	168	173	190	193	106
162	173	181	167	180	77	77	162	172	162	167	185	187	113
170	186	195	183	193	78	78	175	187	175	184	198	203	101
169	184	192	180	190	78	78	174	185	174	183	198	204	105
159	174	178	173	180	78	78	169	172	168	176	192	200	100
154	170	174	166	174	78	78	166	171	166	171	187	191	103
152	166	170	163	171	79	78	161	165	160	165	181	184	106
151	163	168	158	168	79	79	158	163	158	163	177	179	112
148	163	167	157	167	79	79	159	164	159	163	176	175	115
187	201	213	194	209	71	71	184	201	182	191	208	212	122
172	186	194	181	192	77	77	172	184	172	181	196	201	109
159	174	178	173	180	78	78	169	172	168	176	192	200	100
146	163	164	157	166	80	80	163	165	163	168	180	183	107
146	161	163	155	163	80	80	162	163	162	167	178	181	106
143	157	159	151	159	80	80	158	156	158	163	174	175	106
138	154	153	146	154	80	80	158	155	159	162	169	169	109
136	155	154	144	154	80	80	160	156	160	163	170	168	110
135	151	150	141	150	80	80	155	151	155	157	164	162	111
132	151	149	139	150	80	80	158	153	158	159	165	160	112

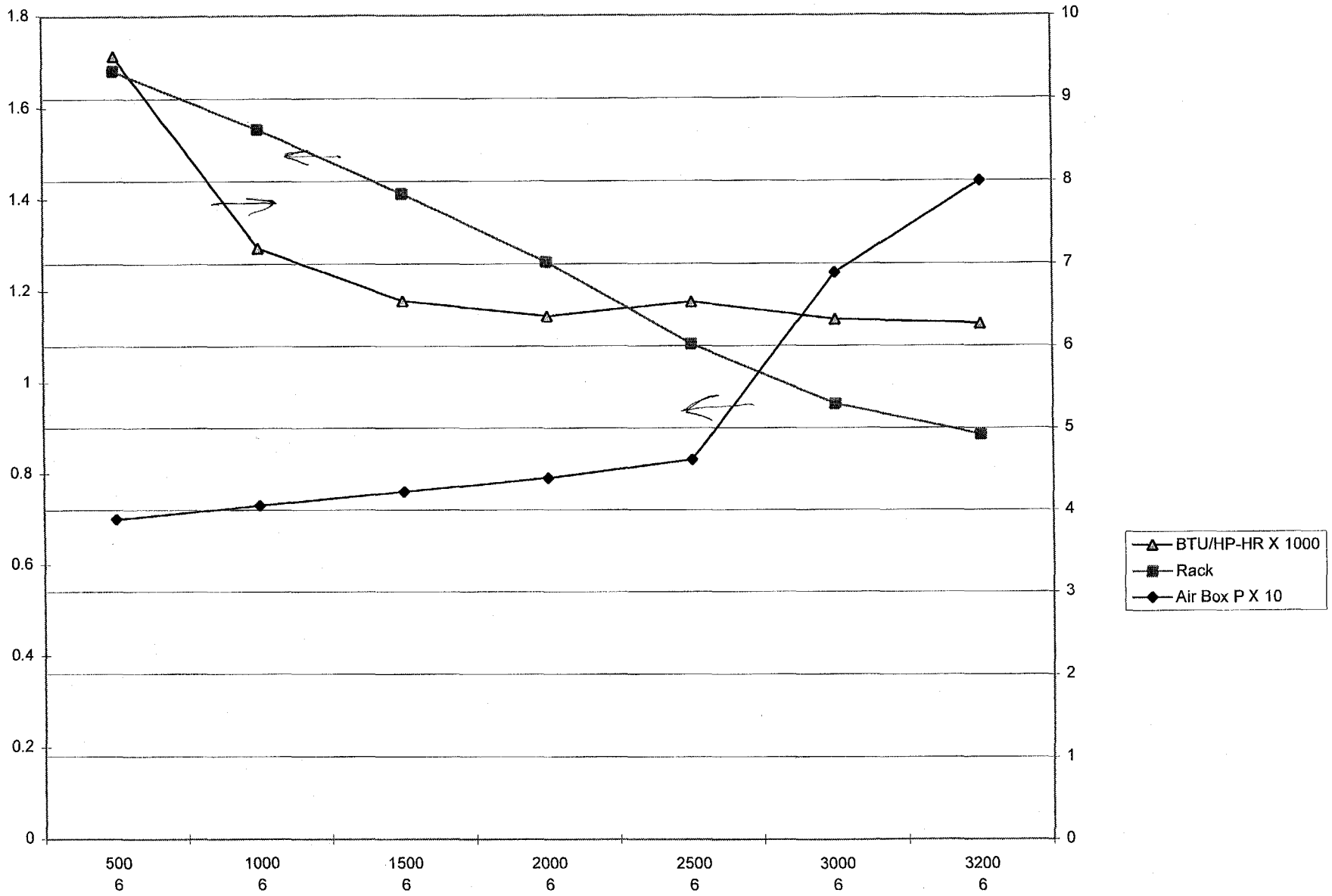
FUEL OU	GAS TMP	INLT DEP	TRBO DC	AIR BOX	GAS SPL	GAS HDR	EXH MAN	MG VOLT	MG AMP	EXC VOL	CJC	RPM	TRBO RP
152	75	-13.1	26.7	25	7	-62.1	21.5	944	3169	38.7	70.7	898.8	20377
159	71	-11.9	25.1	23.5	7.2	-62.2	20	915	3079	38.2	71.4	898.7	19841
155	73	-11.1	21.9	20.6	7.3	-62.1	17.4	885	2984	37.6	73	899.5	18950
158	73	-9.6	20.1	18.9	7.4	-62.1	16	861	2907	37.1	73.9	899.2	18327
147	74	-8.8	17.9	16.9	7.1	-62.2	14.2	836	2824	36.1	74.4	899.2	17574
151	75	-8.1	15.9	14.9	7.2	-62.2	12.4	809	2740	35	75.2	899.1	16753
143	77	-7.6	14	13.1	7.3	-62.2	10.7	756	2567	32.5	75.9	899.5	15951
145	75	-8.3	13.6	12.6	7.2	-62.2	10.2	691	2354	29.4	76.2	899.2	15949
145	76	-8.7	13.3	12.3	7.3	-62.2	9.7	612	2089	25.7	76.8	899	15946
147	82	-8.8	12.9	11.9	7.3	-62.2	9.2	520	1784	21.5	77.3	899.2	15960
138	78	-8.7	15.5	14.5	7.3	-62.2	12	802	2712	38.3	78.4	723.6	16475
137	78	-8	13.3	12.5	7.3	-62.2	10.2	775	2623	36.8	78.6	723.4	15536
134	78	-6.5	8.9	8.3	6.9	-62.2	6.6	704	2393	32.5	78.9	723.2	13059
136	78	-7.2	8.2	7.6	7.5	-62.2	5.9	629	2145	28.2	79.3	723.3	12826
136	78	-7	7.9	7.3	7.2	-62.2	5.5	540	1850	23.7	79.7	723.4	12823
138	79	-7.1	7.6	7	7.1	-62.2	5.1	435	1496	18.6	80	723.5	12819
140	80	-8.4	7.3	6.8	7.2	-62.2	4.6	301	1042	12.7	80.2	723.5	12827
159	71	-11.9	25.1	23.5	7.2	-62.2	20	915	3079	38.2	71.4	898.7	19841
139	77	-8.5	16.9	15.8	7.3	-62.2	13.2	831	2807	37.4	77.9	818	17118
134	78	-6.5	8.9	8.3	6.9	-62.2	6.6	704	2393	32.5	78.9	723.2	13059
134	80	-7	6.3	5.8	7.1	-62.2	4.4	587	2007	26.1	80.4	645.6	11443
130	80	-6.2	4.4	4	7.3	-62.2	2.9	507	1739	23.4	80.4	558.3	9888
127	80	-5.9	3.2	2.9	7.2	-62.2	2	431	1482	20.5	80.6	486.3	8592
126	80	-5.3	1.3	1.2	7.2	-62.2	0.6	288	999	15.6	80.7	331	-37
126	80	-5.4	0.7	0.6	7.1	-62.2	0.2	191	664	11.3	80.6	254	-37
127	80	-5.5	0.6	0.6	7.1	-62.2	0.2	5	17	0.1	80.7	254.1	-39
126	80	-5.5	0.3	0.2	7.2	-62.2	0.1	4	13	0.1	80.7	193.3	-38

GAS CFM	RACK MA	RACK #9	DIES FLO	VALV PO	FAN HP	DIGITL	HORSE P	BTU/ HP-	DIES # H	SCFM	PROJ #9
-1.4	0.726	0.721	25.18	0	228.5	-232	4500	6194	0.335	0	273.6
-1.4	0.801	0.797	23.64	0	227.5	-232	4250	6173	0.333	0	287.4
-1.4	0.866	0.866	22.36	0.3	227.6	-232	4000	6204	0.335	0	239.3
-1.4	0.91	0.912	21.4	1.3	227.1	-232	3800	6247	0.337	0	199.4
-1.4	0.969	0.972	20.46	2.6	227.3	-232	3600	6308	0.341	0	246.1
-1.4	1.007	1.012	19.38	3.5	226.9	-232	3400	6349	0.342	0	186.6
-1.3	1.116	1.127	17.23	5.9	228.1	-232	3000	6364	0.344	0	190.6
-1.4	1.244	1.26	14.47	8.4	178.7	-104	2500	6423	0.347	0	152.7
-1.4	1.361	1.379	12.07	11	178.6	-104	2000	6693	0.361	0	107.4
-1.4	1.471	1.493	9.84	13.4	179.9	-104	1500	7250	0.392	0	97.5
-1.4	0.879	0.88	18.46	0.5	94.6	-240	3200	6401	0.346	0	446.1
-1.4	0.927	0.93	17.42	1.6	94.2	-240	3000	6445	0.348	0	890
-1.4	1.068	1.075	15.01	4.7	95.1	-240	2500	6670	0.36	0	1230.5
-1.4	1.255	1.271	11.6	8.7	73.9	-112	2000	6445	0.347	0	821.1
-1.4	1.408	1.427	8.97	12	74.1	-112	1500	6611	0.358	0	506.6
-1.4	1.545	1.568	6.61	15.1	74.2	-112	1000	7315	0.395	0	317.9
-1.4	1.673	1.697	4.54	17.9	74.3	-112	500	9632	0.521	0	228.6
-1.4	0.801	0.797	23.64	0	227.5	-232	4250	6173	0.333	0	287.4
-1.4	0.908	0.912	19.93	1.2	168.3	-231	3500	6312	0.341	0	218.8
-1.4	1.068	1.075	15.01	4.7	95.1	-240	2500	6670	0.36	0	1230.5
-1.3	1.274	1.289	10.15	9.1	43.6	-111	1725	6521	0.352	0	107.8
-1.3	1.361	1.378	7.55	11	34.4	-102	1290	6490	0.35	0	80.8
-1.4	1.443	1.462	5.55	12.8	27.3	-101	935	6548	0.354	0	58.6
-1.3	1.541	1.563	2.63	14.9	12.3	-34	420	6875	0.373	0	26.4
-1.3	1.626	1.648	1.32	16.7	9.6	-33	190	7886	0.416	0	11.8
-1.3	1.774	1.798	0.39	19.9	9.6	-33	0	0	0	0	0
-1.3	1.757	1.781	0.3	19.4	7.6	-42	0	0	0	0	0

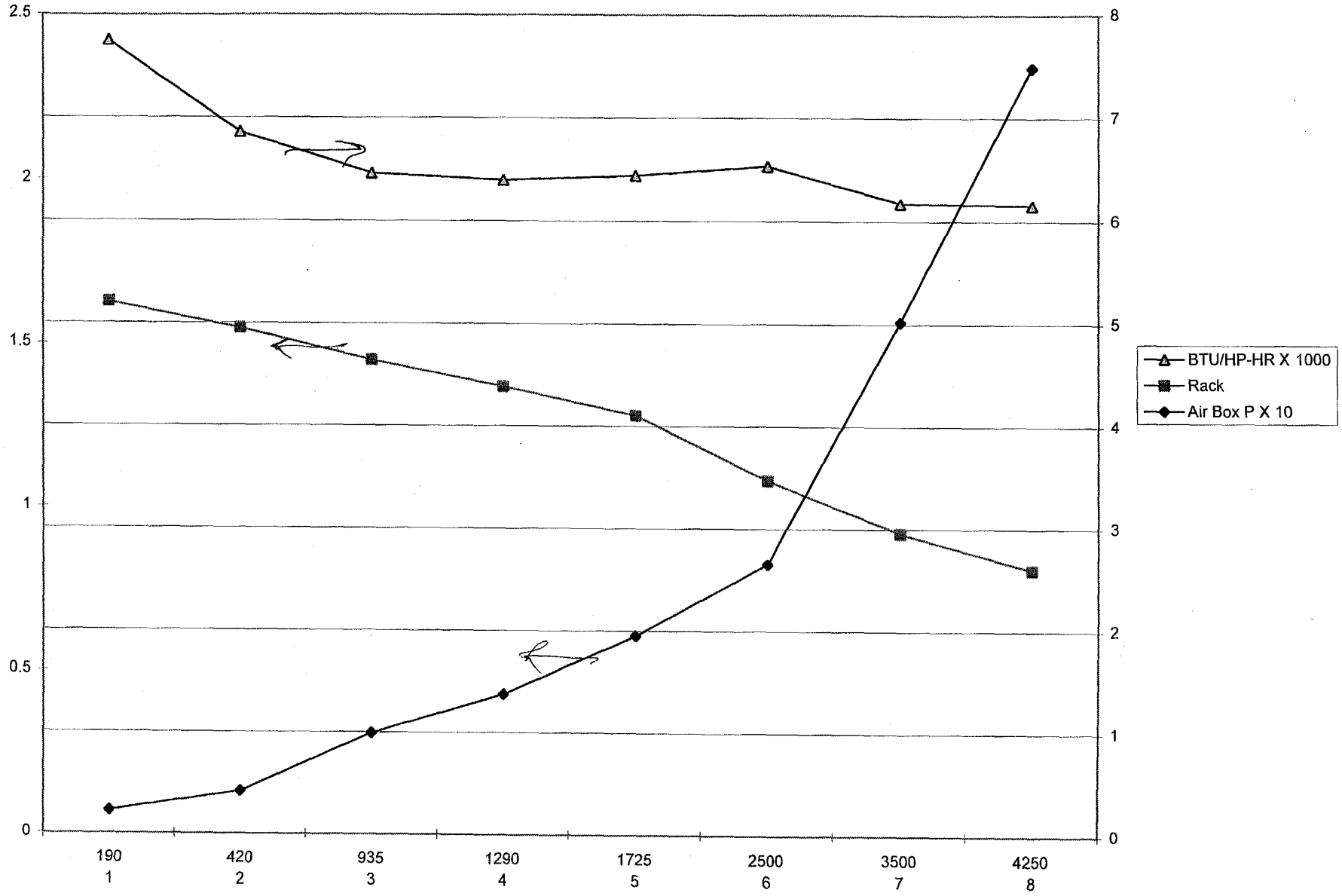
710DA 900R's # 3 baseline w/7000's 9/16/96



710DA 750R's # 3 baseline w/7000's 9/16/96



710DA Notches # 3 baseline w/7000's 9/16/96



date	time	TN	FAN A	FAN B	FAN C	1	2	3	4	5	6	7	8
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9/16/96	12:30:51	8	1	1	1	1009	1001	1025	1063	1007	989	988	950
9/16/96	12:39:35	8	1	1	1	988	984	1007	1044	992	974	969	928
9/16/96	12:46:48	8	1	1	1	982	982	1005	1044	986	972	963	927
9/16/96	12:56:04	8	1	1	1	983	979	1003	1049	983	972	959	925
9/16/96	13:03:16	8	1	1	1	973	974	996	1041	983	966	957	916
9/16/96	13:12:00	8	1	1	1	897	904	930	956	907	898	878	848
9/16/96	13:21:01	8	1	1	0	762	764	787	793	771	766	734	715
9/16/96	13:28:13	8	1	1	0	660	650	670	672	663	661	624	614
9/16/96	13:38:46	8	1	1	0	558	544	554	557	549	557	519	525
9/16/96	14:02:10	6	1	1	1	974	949	990	985	975	939	935	910
9/16/96	14:11:26	6	1	1	1	979	950	996	991	978	946	935	908
9/16/96	14:39:59	6	1	1	0	997	976	1024	1023	1001	982	953	929
9/16/96	14:50:01	6	1	1	0	784	770	794	798	771	766	730	722
9/16/96	14:57:13	6	1	1	0	614	609	622	626	598	613	564	566
9/16/96	15:05:59	6	1	0	0	484	477	488	479	470	488	442	444
9/16/96	15:13:57	6	1	0	0	384	372	380	374	367	377	339	345
9/16/96	12:30:51	8	1	1	1	1009	1001	1025	1063	1007	989	988	950
9/16/96	13:50:20	7	1	1	1	987	973	1005	1023	989	967	957	919
9/16/96	14:39:59	6	1	1	0	997	976	1024	1023	1001	982	953	929
9/16/96	15:20:53	5	1	1	0	725	706	743	733	712	714	669	670
9/16/96	15:29:38	4	1	1	0	638	628	653	648	623	634	588	583
9/16/96	15:39:09	3	1	1	0	542	537	550	548	529	544	501	496
9/16/96	15:48:56	2	1	0	0	406	397	397	397	390	399	370	357
9/16/96	15:58:27	1	1	0	0	312	305	311	304	301	312	272	277
9/16/96	16:11:03	1	0	0	0	198	196	199	191	188	203	155	155
9/16/96	16:24:41	0	0	0	0	184	188	186	183	177	193	147	155

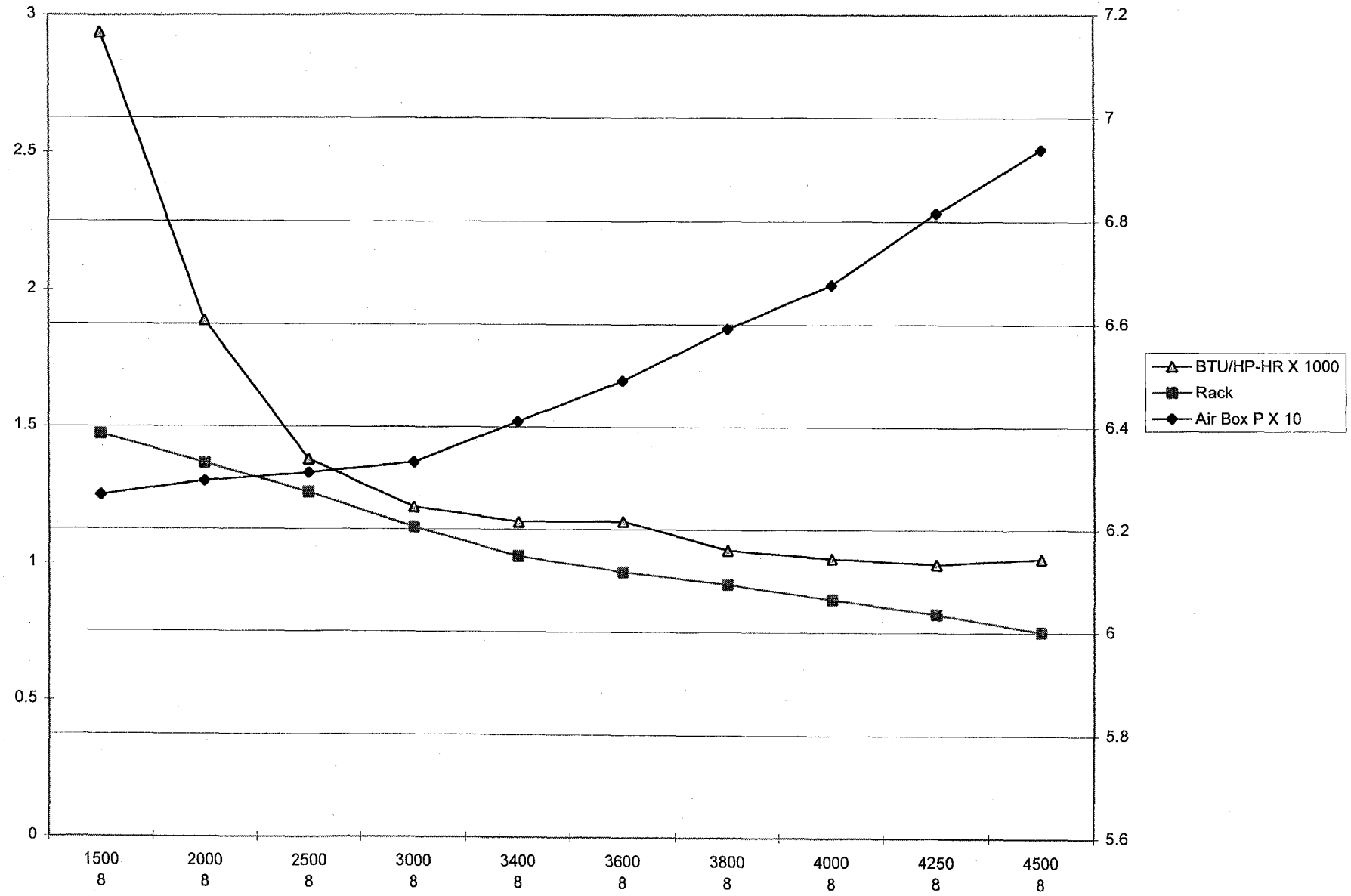
9	10	11	12	13	14	15	16	TBin	TBou	AIR IN	RB OUT	LB OUT	RB REAR
1023	1056	1020	1031	1018	968	1024	974	930	670	92	345	342	200
1002	1032	1003	1016	1000	969	1007	956	911	666	92	331	332	195
979	1008	985	996	985	972	993	942	896	669	91	312	309	189
980	1005	979	998	982	974	991	940	892	675	97	300	307	183
979	1008	980	995	984	977	989	938	902	684	98	285	285	177
970	996	973	993	978	974	983	930	892	691	98	269	268	170
892	914	899	919	905	892	906	863	820	647	95	259	254	175
755	771	765	787	766	778	768	738	698	554	96	255	253	170
651	656	661	675	658	678	656	643	598	478	95	253	251	171
550	552	550	567	547	561	546	550	506	399	92	246	247	167
949	971	975	966	979	932	958	906	876	691	92	258	259	174
956	977	980	971	986	939	968	910	882	700	93	242	240	168
985	996	1001	1010	1013	976	995	934	904	723	94	206	201	167
776	780	776	788	778	757	771	733	710	596	93	201	198	166
612	607	612	620	609	597	601	588	563	486	96	198	196	158
476	478	482	484	480	482	469	465	446	382	89	193	193	162
374	374	371	377	372	380	362	365	350	303	88	190	190	161
1002	1032	1003	1016	1000	969	1007	956	911	666	92	331	332	195
985	1000	986	984	992	951	983	930	894	683	95	272	269	173
985	996	1001	1010	1013	976	995	934	904	723	94	206	201	167
716	721	721	723	713	698	710	688	647	525	89	174	171	158
634	626	633	627	626	617	622	601	579	501	87	157	151	160
540	533	535	532	528	527	534	518	498	443	84	139	134	159
388	397	382	394	393	384	390	377	374	348	81	115	110	152
303	307	298	309	303	306	303	296	285	279	80	106	100	150
189	194	184	195	192	196	197	188	185	188	78	101	96	147
177	181	174	187	185	184	184	178	174	169	75	93	88	146

LB REAR	RB MID	LB MID	RB FRNT	LB FRNT	ACR IN	ACR OUT	AC IN	AC OUT	ENG IN	ENG OUT	OIL IN	OIL OUT	FUEL IN
188	201	215	192	212	68	68	177	200	178	187	205	208	120
183	200	211	193	209	68	68	179	197	178	185	205	211	118
177	191	203	188	201	69	69	174	189	173	181	201	208	100
174	185	195	182	196	70	70	170	183	169	175	198	205	110
167	180	189	178	188	71	71	165	177	166	170	194	200	106
159	174	182	174	182	71	71	161	171	162	166	190	196	98
160	177	182	172	183	71	71	166	174	165	170	191	196	102
158	171	178	166	178	71	71	163	170	162	166	187	191	103
159	170	177	165	177	72	72	161	170	161	164	185	186	106
155	166	174	159	173	72	72	159	165	156	159	180	183	113
161	174	185	171	182	73	73	164	174	163	171	188	195	108
157	169	176	165	176	73	73	161	168	161	167	185	191	96
148	167	169	163	170	74	74	164	167	164	170	186	190	99
148	165	169	160	172	74	74	163	165	162	169	184	187	104
147	159	163	153	163	75	75	154	158	155	158	176	180	104
144	161	165	153	164	75	75	160	166	161	163	177	177	110
140	159	162	151	162	75	75	158	161	157	159	173	172	114
183	200	211	193	209	68	68	179	197	178	185	205	211	118
162	173	182	168	182	72	72	161	173	161	167	187	193	110
148	167	169	163	170	74	74	164	167	164	170	186	190	99
141	157	159	150	159	75	75	156	157	155	161	175	177	108
138	158	159	150	159	75	75	161	160	160	165	176	177	105
136	156	156	146	156	75	75	160	159	160	165	174	174	106
132	150	149	140	150	75	75	157	152	157	160	168	167	108
129	149	147	136	148	75	75	155	150	155	159	166	163	110
125	145	142	132	143	75	75	152	147	152	153	161	155	112
123	145	142	129	142	75	75	154	147	153	155	161	154	112

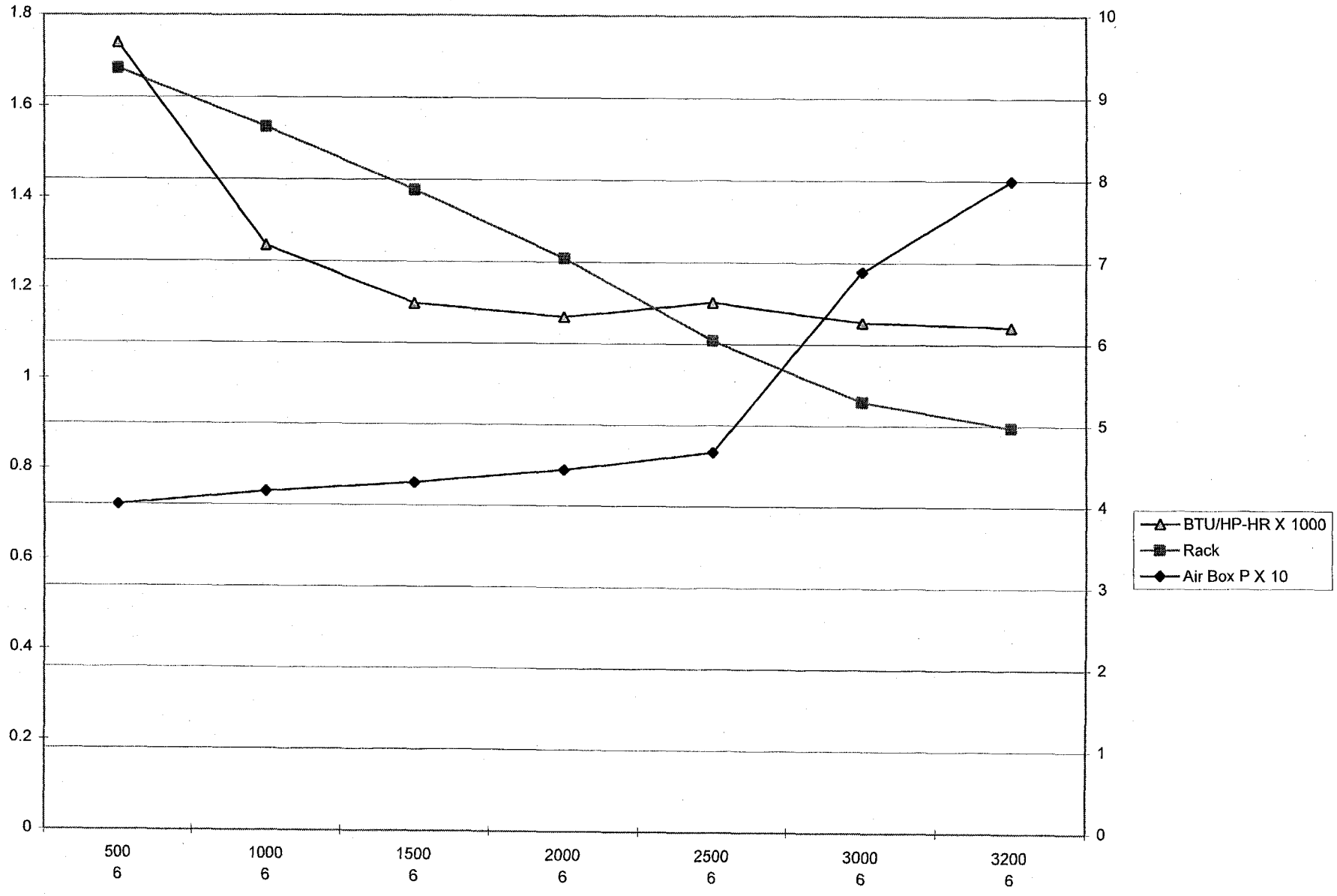
FUEL OU	GAS TMP	INLT DEP	TRBO DC	AIR BOX	GAS SPL	GAS HDR	EXH MAN	MG VOLT	MG AMP	EXC VOL	CJC	RPM	TRBO RP
154	69	-10.3	27.3	25.7	8.4	-62.1	22	944	3171	40.4	68.9	899.4	20710
155	68	-11.3	24.8	23.4	8.5	-62.2	19.9	914	3075	39.3	69.4	899.1	19959
141	72	-4.8	22.4	21	8.5	-62.1	17.8	884	2984	38.2	70.1	899	19089
148	70	-4.6	20.3	18.9	8.6	-62.2	15.9	861	2904	37.1	70.5	899.4	18346
143	71	-4	18	16.8	8.5	-62.2	14.1	835	2822	36	71	899	17526
137	71	-2	16	14.9	8.6	-62.2	12.4	810	2745	35	71.6	898.9	16719
137	71	-2.9	14.6	13.7	8.6	-62.2	11.2	755	2565	32.2	71.9	898.2	16164
136	71	-3.5	14.2	13.2	8.5	-62.2	10.6	690	2350	29	72.5	898	16170
142	73	-3.2	13.9	12.9	8.5	-62.2	10.2	610	2086	25.3	72.8	898	16163
142	72	-4.2	13.5	12.5	8.5	-62.2	9.6	518	1779	21.1	73.2	897.9	16165
133	74	-3.3	15.4	14.4	8.4	-62.2	11.8	800	2707	37.9	73.7	721.8	16392
127	73	-1.7	13.3	12.4	8.4	-62.2	10.2	773	2618	36.3	74.1	722.5	15406
128	74	-2.4	8.8	8.3	8.1	-62.2	6.6	706	2403	32.2	74.6	722.6	13011
130	74	-1	8.5	7.9	8.4	-62.2	6.2	629	2147	27.8	75	722.2	12992
130	75	-2.9	8.3	7.6	8.4	-62.2	5.7	540	1852	23.3	75.2	722.4	13001
134	75	-1.7	8	7.3	8.3	-62.2	5.3	436	1503	18.4	75.3	722.5	12994
139	75	-2.4	7.7	7	8.3	-62.2	4.8	297	1030	12.4	75.3	722.4	12982
155	68	-11.3	24.8	23.4	8.5	-62.2	19.9	914	3075	39.3	69.4	899.1	19959
139	72	-6.7	16.8	15.7	8.6	-62.2	13.1	828	2799	36.7	73.4	817.2	17027
128	74	-2.4	8.8	8.3	8.1	-62.2	6.6	706	2403	32.2	74.6	722.6	13011
131	75	-1.4	6.6	6.1	8.1	-62.2	4.6	585	2003	25.7	75.3	644.4	11590
126	80	-0.9	4.7	4.3	8.3	-62.2	3.1	505	1734	23	75.3	559.3	10059
125	75	-0.8	3.4	3.1	8.3	-62.2	2.1	429	1477	20	75.3	484.1	8730
124	75	-0.3	1.4	1.3	8.3	-62.2	0.7	286	993	15.1	75.5	331.1	-39
125	75	-0.2	0.7	0.7	8.3	-62.2	0.3	190	663	11.1	75.5	253.7	-39
126	75	-0.1	0.7	0.6	8.3	-62.2	0.3	5	17	0.1	75.5	253.9	-39
125	75	-0.1	0.4	0.3	8.3	-62.2	0.1	4	14	0.1	75.5	194.6	-41

GAS CFM	RACK MA	RACK #9	DIES FLO	VALV PO	FAN HP	DIGITL	HORSE P	BTU/ HP-	DIES # H	SCFM	PROJ #9 HP
-1.3	0.739	0.737	25.03	0	231.8	-232	4500	6160	0.333	0	261.3
-1.3	0.813	0.814	23.57	0	231.5	-232	4250	6159	0.333	0	258.8
-1.4	0.889	0.889	22.12	0.7	231.8	-232	4000	6138	0.331	0	247
-1.3	0.93	0.933	21.27	1.6	231.8	-232	3800	6211	0.335	0	242.1
-1.3	0.98	0.986	20.18	2.8	231.7	-232	3600	6224	0.336	0	206.8
-1.3	1.024	1.033	19.25	3.8	231.6	-232	3400	6271	0.339	0	231.2
-1.3	1.135	1.146	16.87	6.2	231.3	-232	3000	6290	0.337	0	202.5
-1.3	1.254	1.269	14.29	8.5	187	-104	2500	6341	0.342	0	132.6
-1.3	1.369	1.358	11.96	10.4	187.3	-104	2000	6621	0.357	0	128.4
-1.3	1.475	1.476	9.76	12.9	187.4	-104	1500	7215	0.389	0	57.1
-1.3	0.886	0.885	18.09	0.5	107.5	-240	3200	6271	0.338	0	899.8
-1.3	0.953	0.954	17.09	2	108.7	-240	3000	6321	0.341	0	969.1
-1.3	1.085	1.039	14.71	4.4	76.5	-112	2500	6538	0.353	0	786.6
-1.3	1.264	1.208	11.5	7	76.5	-112	2000	6361	0.344	0	566.7
-1.3	1.413	1.352	8.88	10.2	76.6	-112	1500	6549	0.354	0	525
-1.3	1.553	1.492	6.54	13.1	67.6	-48	1000	7193	0.391	0	360.7
-1.3	1.681	1.66	4.37	16.7	68	-48	500	9517	0.519	0	419
-1.3	0.813	0.814	23.57	0	231.5	-232	4250	6159	0.333	0	258.8
-1.4	0.925	0.929	19.48	1.4	182.2	-231	3500	6177	0.334	0	218.4
-1.3	1.085	1.039	14.71	4.4	76.5	-112	2500	6538	0.353	0	786.6
-1.3	1.283	1.291	10	9	48.6	-111	1725	6445	0.348	0	107.6
-1.3	1.371	1.382	7.43	10.9	38.6	-102	1290	6398	0.345	0	80.5
-1.3	1.451	1.44	5.47	12.1	31.7	-101	935	6463	0.35	0	58.5
-1.3	1.547	1.515	2.58	13.8	13.7	-34	420	6861	0.369	0	26.1
-1.3	1.628	1.637	1.34	16.3	10	-33	190	7752	0.425	0	11.8
-1.3	1.774	1.793	0.4	19.5	6.7	-1	0	0	0	0	0
-1.3	1.759	1.773	0.3	19.1	5	-10	0	0	0	0	0

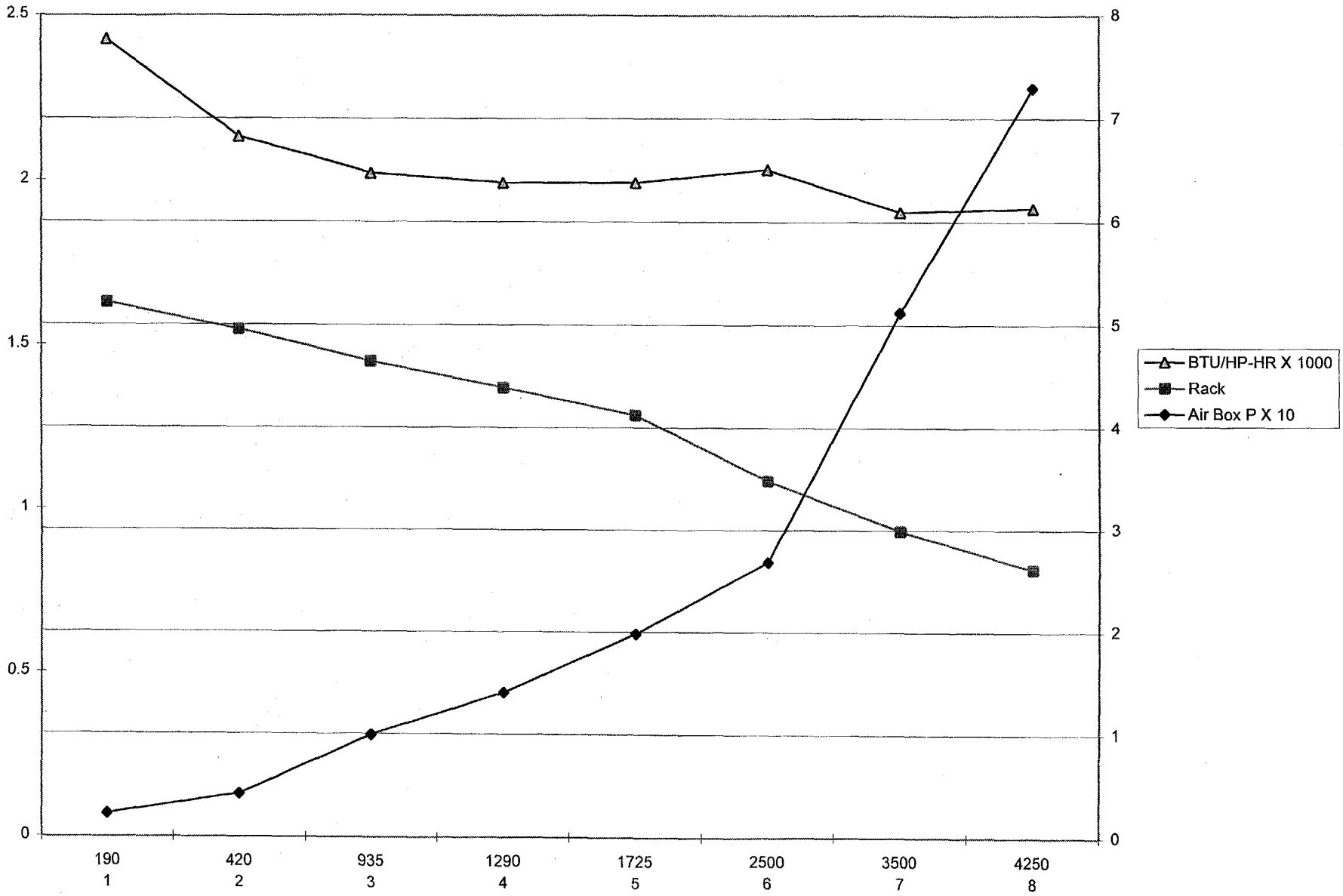
710DA 900R's # 4 baseline w/7000's 9/19/96



710DA 750R's # 4 baseline w/7000's9/19/96



710DA Notch's # 4 baseline w/7000's9/19/96



710DA baseline # 4 w/7000's 9/19/96

date	time	TN	FAN A	FAN B	FAN C	1	2	3	4	5	6	7	8
9/19/96	11:59:36	8	1	1	1	1020	1004	1023	1070	1013	1001	996	957
9/19/96	12:05:30	8	1	1	1	1003	991	1017	1054	998	987	974	938
9/19/96	12:14:27	8	1	1	1	986	983	1007	1050	991	979	964	930
9/19/96	12:22:55	8	1	1	1	980	977	1005	1045	990	972	962	924
9/19/96	12:29:50	8	1	1	1	985	983	1006	1045	992	978	963	927
9/19/96	12:37:46	8	1	1	0	978	980	1000	1041	987	968	957	922
9/19/96	12:43:55	8	1	1	0	896	903	925	951	906	893	872	846
9/19/96	12:52:54	8	1	1	0	760	763	783	793	771	764	732	713
9/19/96	13:02:38	8	1	0	0	650	641	663	665	656	653	619	611
9/19/96	13:11:21	8	1	0	0	556	541	555	556	551	556	519	522
9/19/96	13:29:33	6	1	1	1	957	932	977	974	962	924	922	894
9/19/96	13:34:40	6	1	1	1	964	934	980	979	969	931	924	896
9/19/96	13:43:22	6	1	1	0	987	961	1005	1013	988	963	937	912
9/19/96	13:50:48	6	1	1	0	778	761	786	793	763	758	722	712
9/19/96	13:58:14	6	1	0	0	607	602	610	619	592	602	560	557
9/19/96	14:05:56	6	1	0	0	484	476	487	482	469	481	443	443
9/19/96	14:14:23	6	1	0	0	381	369	377	369	362	373	335	341
9/19/96	12:05:30	8	1	1	1	1003	991	1017	1054	998	987	974	938
9/19/96	13:22:22	7	1	1	1	972	958	993	1005	972	957	942	905
9/19/96	13:43:22	6	1	1	0	987	961	1005	1013	988	963	937	912
9/19/96	14:23:06	5	1	0	0	721	704	733	731	702	706	666	663
9/19/96	14:28:13	4	1	0	0	633	623	645	643	614	629	582	578
9/19/96	14:37:11	3	1	0	0	537	531	542	542	520	536	493	488
9/19/96	14:47:57	2	1	0	0	408	400	398	399	391	399	370	357
9/19/96	14:56:09	1	1	0	0	316	308	313	304	304	314	274	283
9/19/96	15:08:11	1	0	0	0	200	198	199	194	189	202	155	159
9/19/96	15:23:03	0	0	0	0	186	187	188	184	178	190	147	159

710DA baseline # 4 w/7000's 9/19/96

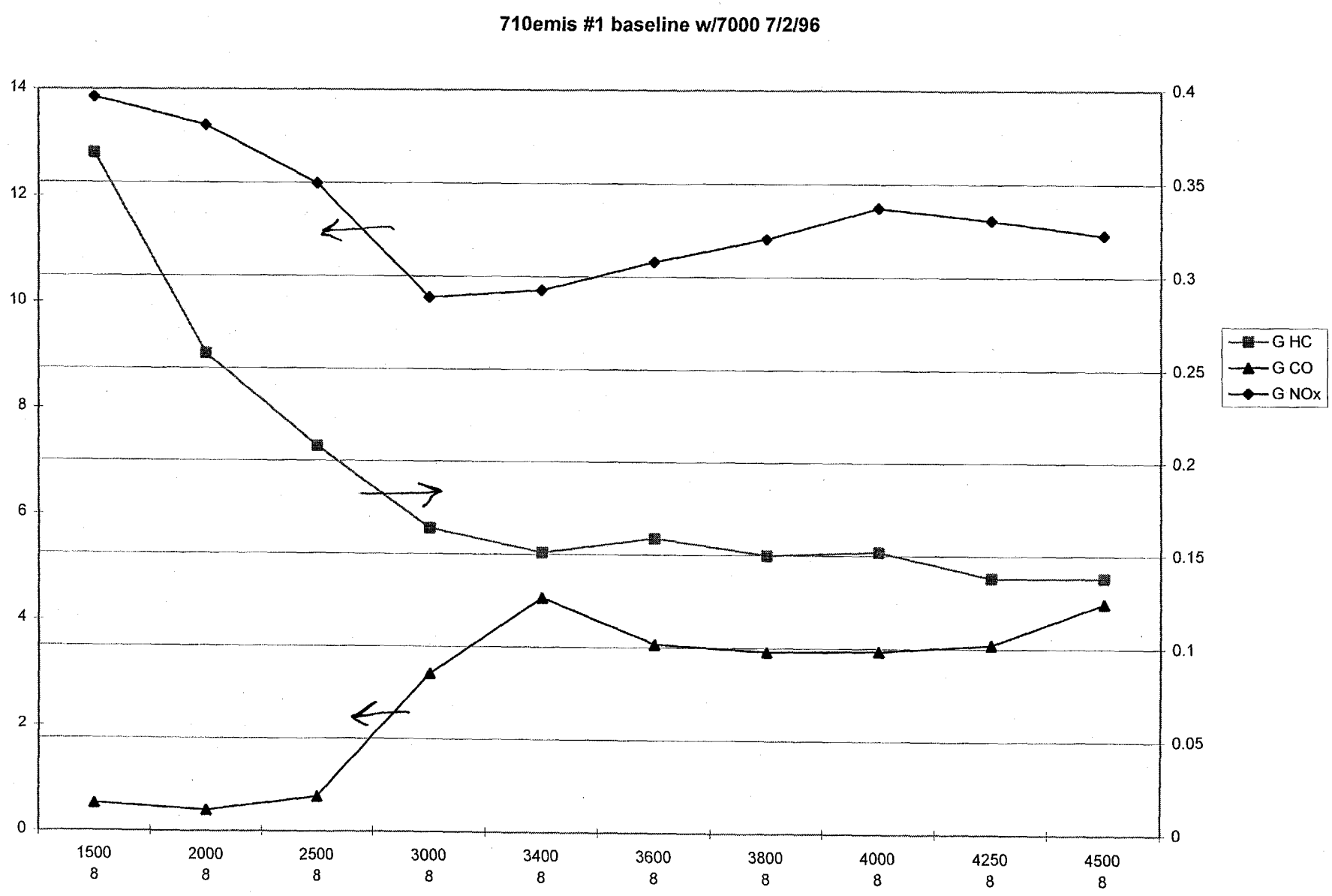
9	10	11	12	13	14	15	16	TBin	TBou	AIR IN	RB OUT	LB OUT	RB REAR
1007	1039	1009	1024	1006	971	1013	964	919	658	90	334	334	190
992	1021	994	1002	989	951	998	951	904	662	89	325	322	187
981	1011	984	1003	982	974	993	941	902	669	96	310	308	182
975	1004	980	998	977	971	988	936	895	678	95	296	295	181
980	1009	981	998	982	979	994	936	900	689	106	284	282	177
973	1005	977	996	980	980	993	930	889	697	95	271	265	178
886	908	901	920	898	901	901	860	820	651	94	258	255	176
752	769	765	785	762	745	762	736	694	553	97	252	251	171
642	647	651	665	653	665	649	636	592	469	89	251	246	171
549	546	549	563	546	538	543	544	502	396	85	243	242	169
932	956	960	951	964	909	944	892	865	680	84	250	247	172
941	957	962	957	970	917	952	899	872	689	86	235	233	171
972	981	981	989	995	957	981	919	890	715	89	200	196	167
767	770	763	778	770	745	761	722	701	599	87	199	190	162
603	603	604	612	602	587	588	580	557	478	84	192	189	164
475	474	479	484	479	478	465	462	449	383	87	191	186	165
369	368	368	373	369	376	359	360	345	300	80	183	180	160
992	1021	994	1002	989	951	998	951	904	662	89	325	322	187
966	980	969	964	977	934	968	920	881	674	89	264	263	176
972	981	981	989	995	957	981	919	890	715	89	200	196	167
709	718	713	718	709	693	707	681	645	533	80	168	163	158
626	619	628	621	618	612	615	596	574	502	81	151	146	158
534	529	529	526	522	519	525	511	492	441	78	135	129	155
390	399	381	396	394	384	391	377	375	349	77	112	105	155
305	308	300	310	305	305	305	296	288	284	72	100	94	152
189	194	183	195	191	194	196	188	186	190	71	95	89	147
178	181	174	188	185	183	184	178	174	170	71	88	83	145

710DA baseline # 4 w/7000's 9/19/96

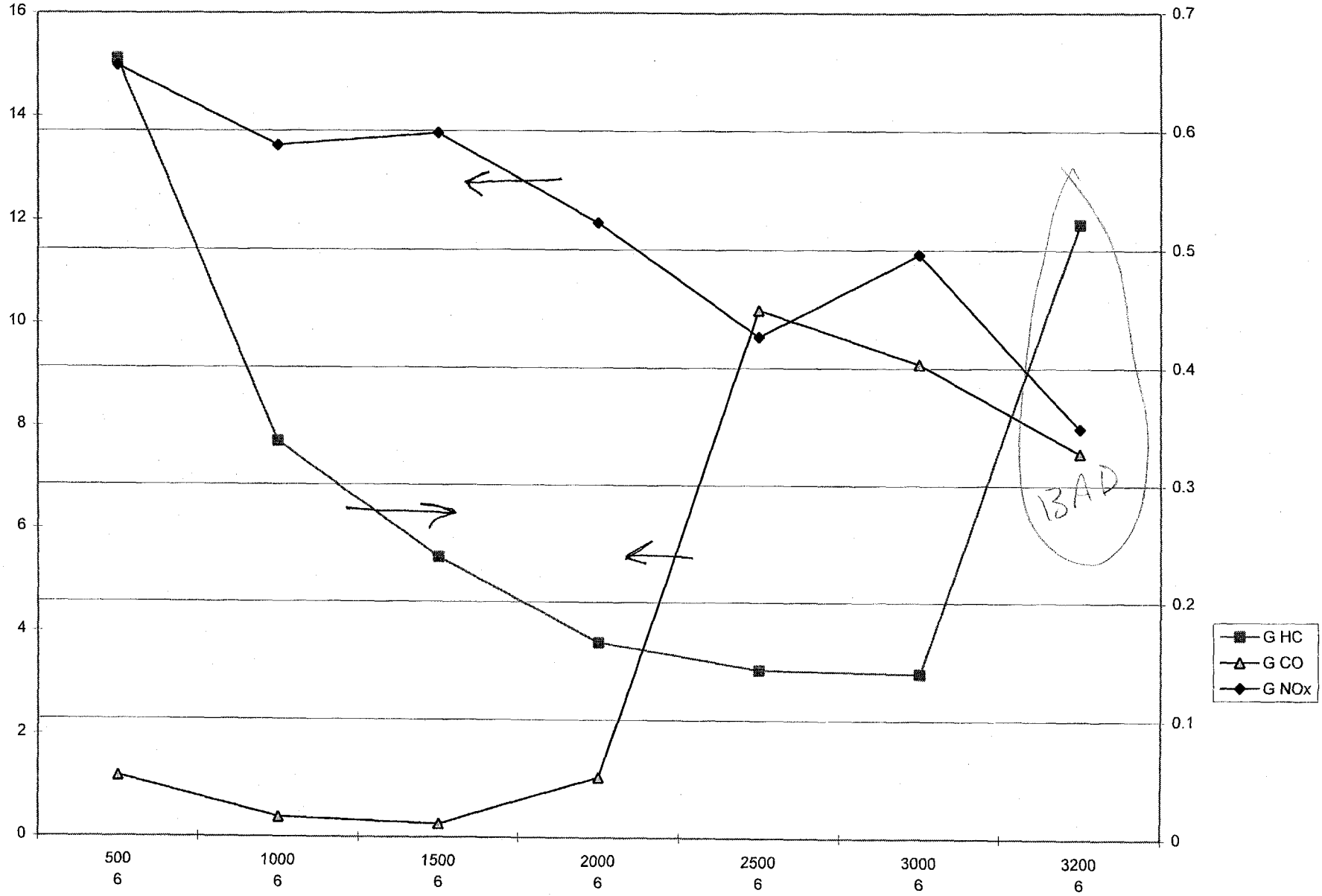
LB REAR	RB MID	LB MID	RB FRNT	LB FRNT	ACR IN	ACR OUT	AC IN	AC OUT	ENG IN	ENG OUT	OIL IN	OIL OUT	FUEL IN
180	191	206	186	201	67	67	169	189	169	179	198	201	116
184	188	200	184	199	68	68	168	187	168	176	198	202	115
168	182	194	181	193	68	68	164	180	164	171	195	199	113
164	181	192	179	190	69	69	167	179	165	173	194	198	113
163	179	190	176	188	70	70	163	174	163	170	193	198	109
159	178	186	176	185	71	71	169	177	169	174	195	197	101
159	176	183	170	182	71	71	167	176	167	173	193	196	101
153	173	177	167	178	71	71	163	170	162	167	189	191	101
152	169	176	162	174	72	72	163	170	163	165	185	186	104
148	166	173	160	172	72	72	157	166	159	161	182	182	109
155	170	179	166	178	72	72	159	170	160	166	184	191	108
154	169	177	163	176	72	72	160	169	160	167	186	192	108
146	167	170	163	170	72	72	164	167	165	170	187	190	97
142	161	166	158	167	72	72	159	162	159	164	183	186	101
143	162	165	155	165	72	72	162	165	161	165	181	181	103
139	161	165	154	165	72	72	161	164	162	163	179	179	106
138	157	159	150	160	72	72	156	157	155	157	173	171	111
184	188	200	184	199	68	68	168	187	168	176	198	202	115
157	174	183	170	182	72	72	163	174	162	170	189	194	113
146	167	170	163	170	72	72	164	167	165	170	187	190	97
136	155	156	147	157	72	72	158	158	158	161	176	175	102
134	154	155	147	155	72	72	159	157	159	162	175	175	103
133	153	153	143	153	72	72	158	155	158	161	174	173	102
130	152	150	140	151	71	71	160	155	159	163	172	170	103
127	149	147	136	148	71	71	156	150	155	159	167	166	105
123	144	141	131	142	71	71	152	146	151	153	162	155	106
122	145	141	129	142	71	71	154	147	154	155	163	155	107

FUEL OU	GAS TMP	INLT DEP	TRBO DC	AIR BOX	GAS SPL	GAS HDR	EXH MAN	MG VOLT	MG AMP	EXC VOL	CJC	RPM	TRBO RP
150	69	-4.9	26.7	25.1	8.1	-62.1	21.6	942	3169	38.7	67.6	898.9	20448
150	68	-6.6	24.4	22.8	8	-62.1	19.6	915	3081	37.9	68.1	898.9	19739
148	68	-6	21.6	20.2	7.7	-62.1	17.1	886	2990	37.1	69	899	18862
149	70	-6.5	19.9	18.6	8.1	-62.1	15.7	860	2905	36.2	69.8	898.5	18203
146	72	-4.4	17.9	16.7	7.9	-62.1	14.1	836	2827	35.2	70.5	898.4	17454
138	71	-3.9	16.3	15.2	8.1	-62.1	12.7	815	2763	34.4	71.2	898.4	16819
143	71	-3.1	14.7	13.7	8.1	-62.2	11.2	762	2588	31.8	71.6	898.3	16157
137	71	-3.7	14.4	13.3	8.1	-62.2	10.8	689	2348	28.4	72.3	898.9	16166
137	72	-4.2	14	13	8	-62.2	10.2	618	2112	25.1	72.8	897.9	16132
139	74	-4.7	13.7	12.5	8	-62.2	9.8	528	1811	21.1	73.2	897.8	16138
137	73	-4.4	15.4	14.4	8	-62.2	11.9	799	2708	36.8	73.4	721.9	16254
136	76	-3.6	13.3	12.4	8	-62.2	10.2	772	2619	35.2	73.4	721.7	15316
127	72	-2.2	9	8.4	8	-62.2	6.7	706	2405	31.4	73.4	721.9	12981
127	72	-2.3	8.7	8	8.1	-62.2	6.2	628	2146	27.2	73.4	721.2	12968
129	72	-2.6	8.4	7.7	8	-62.2	5.8	541	1856	22.9	73.4	722.1	12967
131	72	-2.9	8.1	7.5	8.1	-62.2	5.4	436	1501	17.9	73.2	721.4	12960
134	72	-3.2	7.9	7.2	8.1	-62.2	5	296	1028	12	73	721.9	12955
150	68	-6.6	24.4	22.8	8	-62.1	19.6	915	3081	37.9	68.1	898.9	19739
142	72	-4.8	17.2	16	8	-62.2	13.4	828	2802	36	73.4	817.2	17004
127	72	-2.2	9	8.4	8	-62.2	6.7	706	2405	31.4	73.4	721.9	12981
127	72	-2.3	6.7	6.2	8.1	-62.2	4.8	588	2013	25.3	72.8	643.1	11557
123	72	-1.3	4.8	4.4	8.2	-62.2	3.2	508	1744	22.5	72.8	559.2	10038
122	72	-1.2	3.5	3.1	8.1	-62.2	2.2	431	1484	19.8	72.6	485.1	8713
121	71	-0.6	1.4	1.3	8.1	-62.2	0.8	287	994	14.9	72.3	330.7	-38
121	71	-0.6	0.8	0.7	8.1	-62.2	0.3	190	664	11.2	72.1	253.1	-41
121	71	-0.7	0.8	0.7	8.2	-62.2	0.3	5	17	0.1	71.9	253.7	-41
122	71	-0.8	0.4	0.3	8.1	-62.2	0.1	4	14	0.1	71.7	194.6	-43

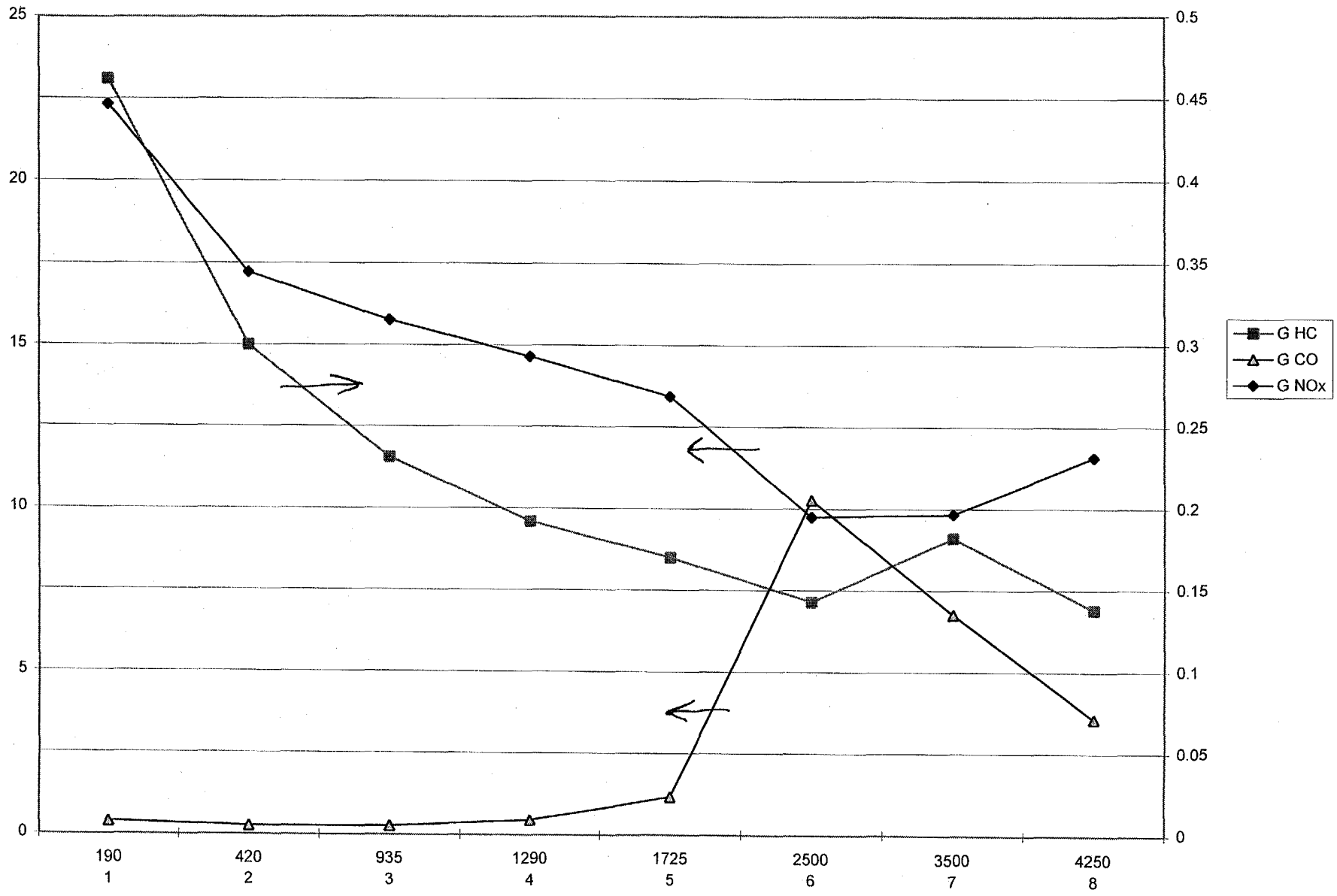
GAS CFM	RACK MA	RACK #9	DIES FLO	VALV PO	FAN HP	DIGITL	HORSE P	BTU/ HP-	DIES # H	SCFM	PROJ #9
-1.4	0.752	0.743	24.88	0	231.7	-232	4500	6144	0.332	0	247
-1.4	0.817	0.814	23.5	0	231.7	-232	4250	6133	0.331	0	219.7
-1.3	0.87	0.87	22.27	0.3	231.7	-232	4000	6144	0.332	0	215.3
-1.3	0.925	0.919	21.12	1.4	231.6	-232	3800	6160	0.333	0	210.6
-1.4	0.97	0.971	20.2	2.5	231.5	-232	3600	6216	0.336	0	206.4
-1.3	1.027	1.002	19.08	2.9	187.5	-104	3400	6215	0.336	0	223.9
-1.3	1.133	1.107	16.89	5	187.5	-104	3000	6244	0.337	0	186.8
-1.3	1.259	1.218	14.26	7.6	187.7	-104	2500	6336	0.342	0	150.6
-1.3	1.366	1.372	11.97	10.4	144.4	-40	2000	6608	0.357	0	109.3
-1.3	1.473	1.486	9.75	12.8	144.4	-40	1500	7167	0.387	0	92.1
-1.3	0.896	0.9	17.94	0.8	110.8	-240	3200	6214	0.336	0	204.2
-1.3	0.953	0.959	16.94	2	110.9	-240	3000	6268	0.339	0	210
-1.3	1.088	1.096	14.66	4.8	76.4	-112	2500	6512	0.351	0	146.6
-1.2	1.268	1.276	11.41	8.6	76.4	-112	2000	6329	0.342	0	110.3
-1.2	1.418	1.401	8.78	11	67.9	-48	1500	6488	0.35	0	74.3
-1.3	1.555	1.493	6.48	13	68	-48	1000	7193	0.387	0	56.8
-1.3	1.683	1.661	4.38	16.7	68.7	-48	500	9662	0.523	0	29.4
-1.4	0.817	0.814	23.5	0	231.7	-232	4250	6133	0.331	0	219.7
-1.3	0.935	0.938	19.25	1.7	185.5	-231	3500	6098	0.33	0	218.7
-1.3	1.088	1.096	14.66	4.8	76.4	-112	2500	6512	0.351	0	146.6
-1.3	1.288	1.3	9.91	8.9	32.5	-47	1725	6384	0.345	0	107.6
-1.3	1.372	1.384	7.42	10.8	27.3	-38	1290	6383	0.344	0	80.7
-1.3	1.452	1.467	5.46	12.6	23.1	-37	935	6475	0.35	0	58.5
-1.3	1.549	1.564	2.59	14.6	13.7	-34	420	6828	0.369	0	26.3
-1.3	1.629	1.646	1.31	16.4	10	-33	190	7770	0.413	0	11.8
-1.3	1.774	1.794	0.42	19.4	6.7	-1	0	0	0	0	0
-1.3	1.759	1.779	0.28	19.1	5	-10	0	0	0	0	0


710emis #1 baseline w/7000 7/2/96
14
12
10
8
6
4
2
0
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1500 8
2000 8
2500 8
3000 8
3400 8
3600 8
3800 8
4000 8
4250 8
4500 8
G HC
G CO
G NOx

710emis 750R's #1 baseline w/7000 inj's 7/2/96



710emis notches #1 baseline w/7000 7/2/96



710emis 7/2/96 #1 baseline w/7000 inj's

date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
7/2/96	13:17:17	8	1	1	1	943	3171	902.5	25.46	0.1	8.3	74
7/2/96	13:21:39	8	1	1	1	914	3081	902.5	23.93	0	8.3	75
7/2/96	13:26:03	8	1	1	1	883	2983	902.8	22.7	0	8.1	75
7/2/96	13:30:18	8	1	1	1	860	2904	903	21.61	0	8.2	77
7/2/96	13:36:06	8	1	1	1	834	2828	902.7	20.69	0	8.1	78
7/2/96	13:40:10	8	1	1	1	809	2743	902.5	19.58	0	8.3	78
7/2/96	13:45:32	8	1	1	1	755	2570	902.6	17.56	0	8.2	78
7/2/96	13:51:25	8	1	1	1	683	2330	901.4	14.62	0	8.3	79
7/2/96	13:55:35	8	1	1	0	609	2086	901.4	12.2	0	8.2	78
7/2/96	14:00:59	8	1	1	0	517	1779	901.8	9.94	0	8.1	79
7/2/96	14:15:57	6	1	1	1	800	2706	726.5	18.67	0	8.4	81
7/2/96	14:26:15	6	1	1	1	773	2621	726.7	17.76	0	8.3	82
7/2/96	14:31:39	6	1	1	1	702	2388	726	15.19	0	8.3	83
7/2/96	14:36:07	6	1	1	1	623	2130	726	11.77	0	8.4	83
7/2/96	14:39:36	6	1	1	0	539	1848	726.6	9.8	0	8.4	85
7/2/96	14:43:17	6	1	1	0	434	1494	726.2	6.68	0	8.1	84
7/2/96	14:46:47	6	1	1	0	292	1016	726.1	4.49	0	8.2	84
7/2/96	13:21:39	8	1	1	1	914	3081	902.5	23.93	0	8.3	75
7/2/96	14:07:42	7	1	1	1	829	2805	822.6	20.29	0	8.3	80
7/2/96	14:31:39	6	1	1	1	702	2388	726	15.19	0	8.3	83
7/2/96	14:54:00	5	1	1	0	586	2005	649.1	10.35	0.2	8.3	84
7/2/96	14:58:18	4	1	1	0	506	1737	563.7	7.7	0.6	8.4	84
7/2/96	15:04:06	3	1	1	0	428	1477	489.6	5.61	0.9	8.4	85
7/2/96	15:08:49	2	1	1	0	285	991	333.9	2.74	-1.2	8.4	85
7/2/96	15:18:33	1	1	0	0	191	666	256.4	1.3	-1	8.4	85
7/2/96	15:31:13	0	1	0	0	3	12	197.3	0.23	-1.2	8.4	85

710emis 7/2/96 #1 baseline w/7000 inj's

AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	Humid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
97	29.6	6.62	232.8	0	67	43	678	4.8	1261	12.4	4503	0
103	29.6	6.1	232.3	0	67	44	556	4.8	1311	12.5	4254	0
106	29.6	5.26	232.5	0	67	47	533	4.8	1331	12.5	3994	0
110	29.6	4.67	231.8	0	67	47	540	4.9	1308	12.4	3798	0
115	29.5	4.19	231.1	0	67	49	562	4.9	1272	12.3	3600	0
113	29.5	3.7	230.6	0	67	50	704	5	1212	12	3400	0
118	29.5	3.8	231.3	0	67	49	438	4.7	1130	12.6	3002	0
111	29.5	3.24	231.1	0	67	48	77	3.8	1076	14.2	2503	0
116	29.5	3.4	186.2	0	67	47	35	3	905	15.6	2000	0
111	29.5	3.57	186.8	0	67	48	34	2.4	700	16.8	1499	0
116	29.6	3.52	106	0	67	56	387	1.6	298	18.2	3198	0
114	29.6	2.85	107	0	67	47	1478	5.1	1351	11.8	3001	0
114	29.6	1.73	107.3	0	67	50	1762	5.6	1228	11	2501	0
115	29.6	1.73	107.5	0	67	46	159	4.4	1221	13.2	2002	0
111	29.6	1.88	77.6	0	67	45	24	3.1	968	15.4	1499	0
111	29.6	1.98	77.4	0	67	44	24	2.3	656	17	1001	0
109	29.6	2.1	77.5	0	67	41	32	1.5	354	18.4	500	0
103	29.6	6.1	232.3	0	67	44	556	4.8	1311	12.5	4254	0
117	29.5	3.83	180.2	0	67	57	1035	4.8	1127	12.5	3501	0
114	29.6	1.73	107.3	0	67	50	1762	5.6	1228	11	2501	0
109	29.6	1.36	47.6	0	67	44	148	4.2	1280	13.5	1725	0
109	29.6	0.99	38.1	0	67	44	51	3.7	1237	14.5	1293	0
103	29.7	0.75	31.2	0	67	44	24	3.1	1097	15.6	934	0
99	29.7	0.34	16.8	0	67	39	17	2.2	842	17.2	419	0
96	29.7	0.2	10.2	0	67	33	13	1.4	566	18.5	191	0
93	29.8	0.13	7.7	0	67	15	13	0.4	176	20.3	7	0

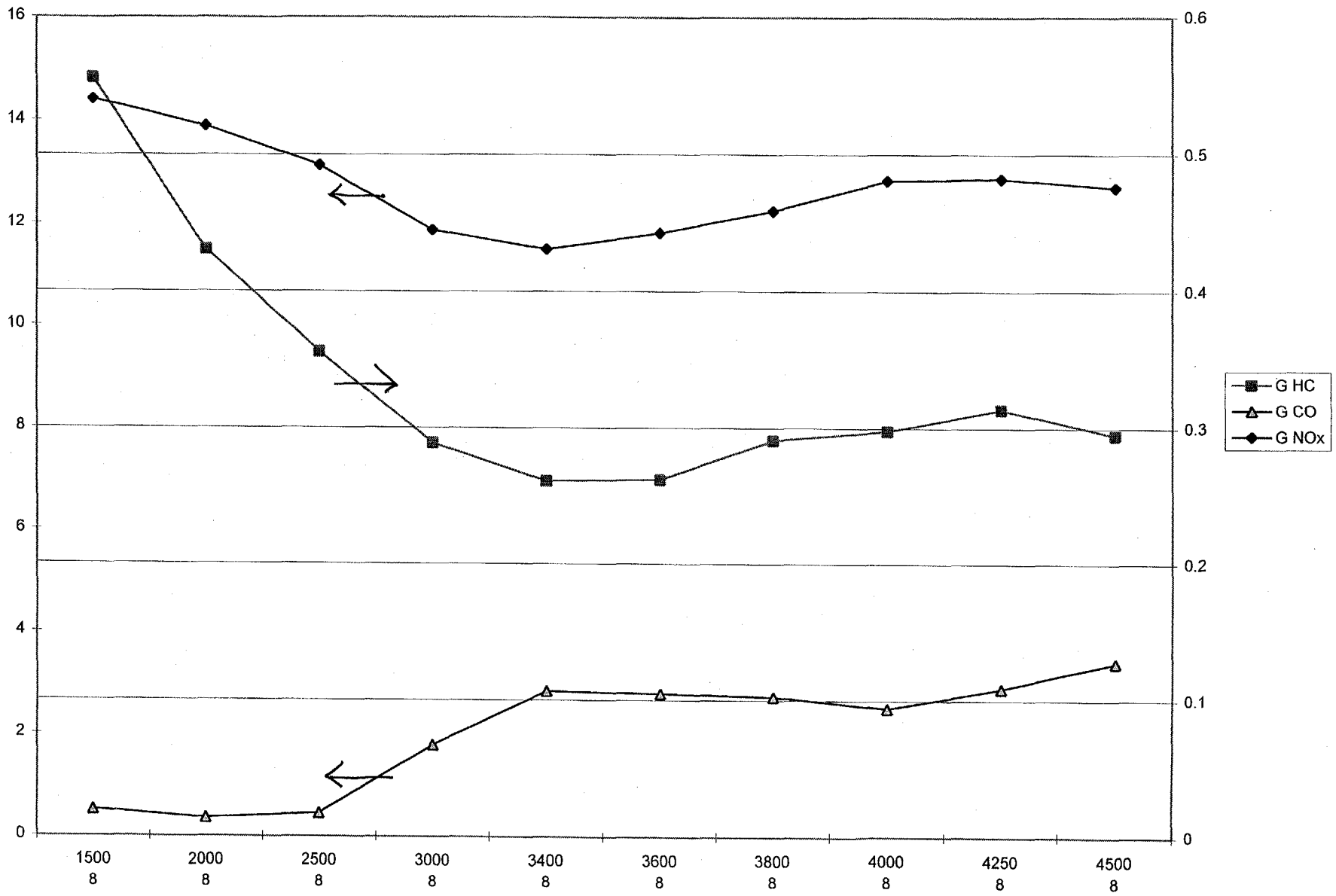
710emis 7/2/96 #1 baseline w/7000 inj's

HC CO NOX

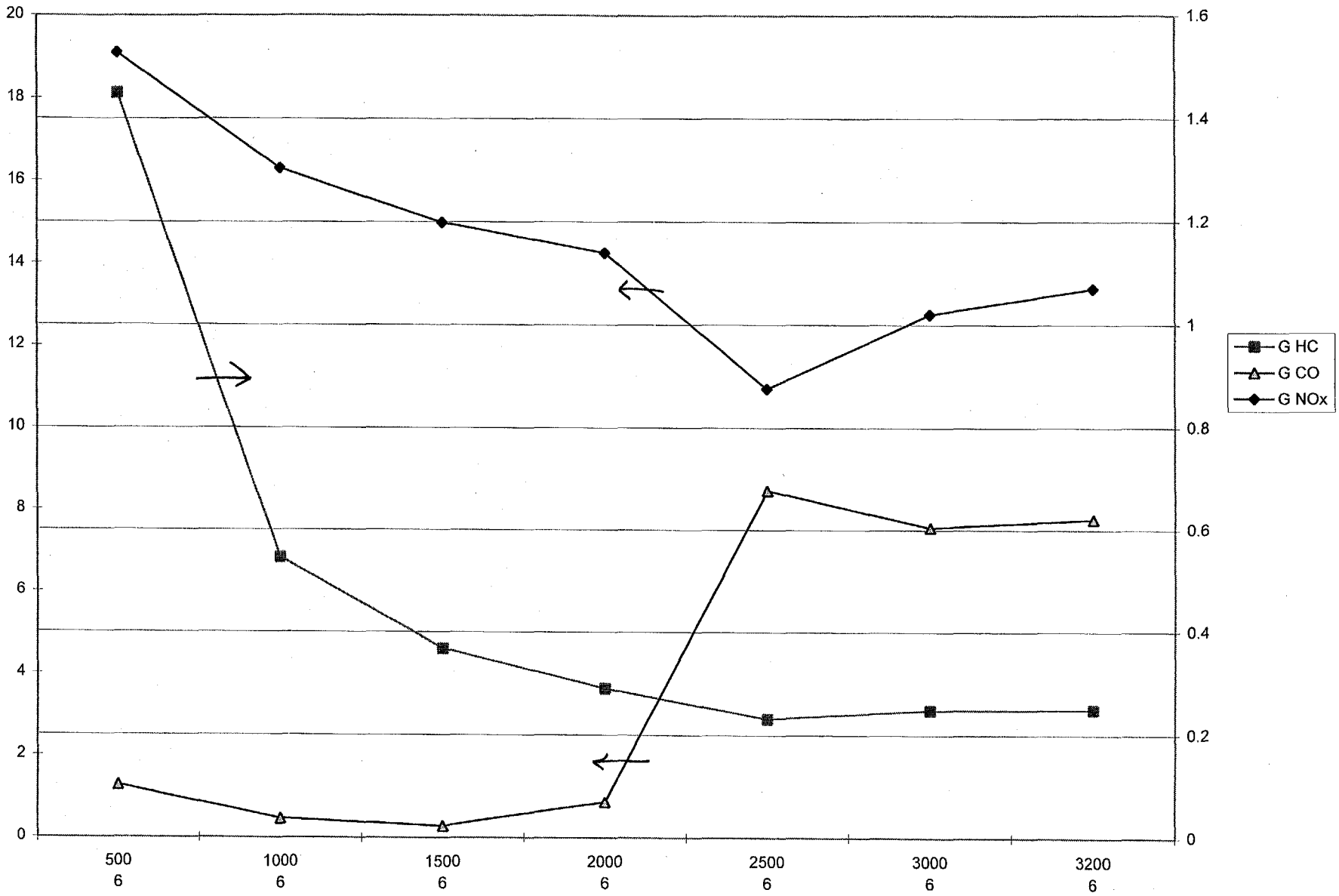
AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-HR		Notch
16240	1526.4	0.2066	0.2211	625	19614	50950	0.138	4.348	11.294	6274		
15391	1438.8	0.2069	0.2206	590	15199	49211	0.138	3.573	11.571	6258		8
14360	1364.3	0.2101	0.2205	611	13797	47226	0.152	3.448	11.803	6314		8
13484	1297.7	0.2136	0.2249	569	13026	42604	0.15	3.431	11.223	6316		8
12662	1234.2	0.2159	0.225	575	12819	38800	0.159	3.563	10.786	6377		8
11950	1174.7	0.2172	0.2299	514	15068	34810	0.151	4.434	10.244	6396		8
10790	1053.5	0.2161	0.2157	493	8973	30332	0.164	2.989	10.104	6491		8
11202	879	0.1729	0.1747	522	1639	30658	0.208	0.654	12.243	6483		8
11425	731.3	0.1411	0.1388	518	785	26698	0.258	0.392	13.329	6764		8
11759	595.7	0.1122	0.1117	549	776	20767	0.366	0.518	13.854	7353		8
												Notch
11645	1120.7	0.2117	0.768	1670	23931	25450	0.522	7.487	7.963	6498		6
10496	1065	0.2248	0.2376	423	27673	34032	0.14	9.221	11.34	6565		6
8178	912.6	0.247	0.2604	358	25684	24383	0.143	10.269	9.749	6750		6
8171	707.3	0.1915	0.2014	333	2349	23964	0.166	1.171	11.952	6533		6
8547	545.9	0.1414	0.1432	358	389	20582	0.238	0.258	13.676	6711		6
8772	400.7	0.1013	0.1071	338	385	13477	0.337	0.383	13.437	7414		6
9050	268.1	0.654	0.705	330	509	7493	0.661	1.18	14.987	9945		6
												Notch
15391	1438.8	0.2069	0.2206	590	15199	49211	0.138	3.573	11.571	6258		8
12116	1215.6	0.2218	0.2228	640	23688	34467	0.182	6.76	9.836	6417		7
8178	912.6	0.247	0.2604	358	25684	24383	0.143	10.269	9.749	6750		6
7289	620.9	0.1899	0.1926	293	2011	23206	0.17	1.164	13.437	6665		5
6213	462.5	0.1648	0.1701	248	587	18951	0.192	0.454	14.657	6618		4
5446	337.7	0.1373	0.1432	217	240	14755	0.231	0.257	15.764	6676		3
3680	152.9	0.92	0.1025	125	108	7210	0.3	0.259	17.209	6834		2
2830	84.5	0.66	0.658	87	72	4221	0.462	0.382	22.336	8821		1
2291	14.3	0.139	0.19	25	42	777	0	0	0	0		0

Horsepow	G HC	G CO	G NOx
4254	0.138	3.573	11.571
3994	0.152	3.448	11.803
3798	0.15	3.431	11.223
3600	0.159	3.563	10.786
3400	0.151	4.434	10.244
3002	0.164	2.989	10.104
2503	0.208	0.654	12.243
2000	0.258	0.392	13.329
1499	0.366	0.518	13.854
Horsepow	G HC	G CO	G NOx
3198	0.522	7.487	7.963
3001	0.14	9.221	11.34
2501	0.143	10.269	9.749
2002	0.166	1.171	11.952
1499	0.238	0.258	13.676
1001	0.337	0.383	13.437
500	0.661	1.18	14.987
Horsepow	G HC	G CO	G NOx
4254	0.138	3.573	11.571
3501	0.182	6.76	9.836
2501	0.143	10.269	9.749
1725	0.17	1.164	13.437
1293	0.192	0.454	14.657
934	0.231	0.257	15.764
419	0.3	0.259	17.209
191	0.462	0.382	22.336
7	0	0	0

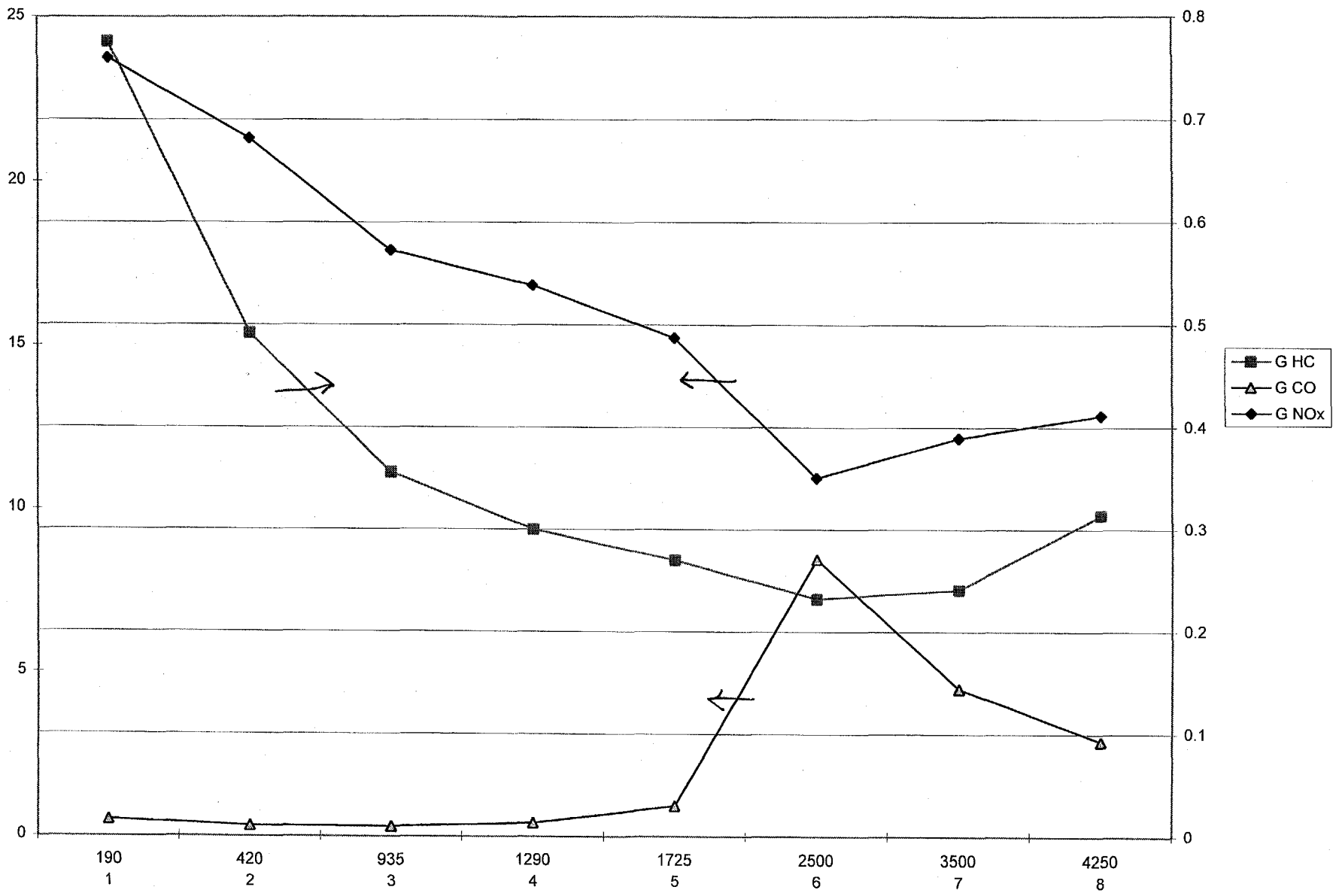
710emis TN8 #1 baseline w/6700's 5/24/96



710emis 750R's #1 baseline w/6700's 5/24/96



710emis Notches #1 baseline w/6700's 5/24/96



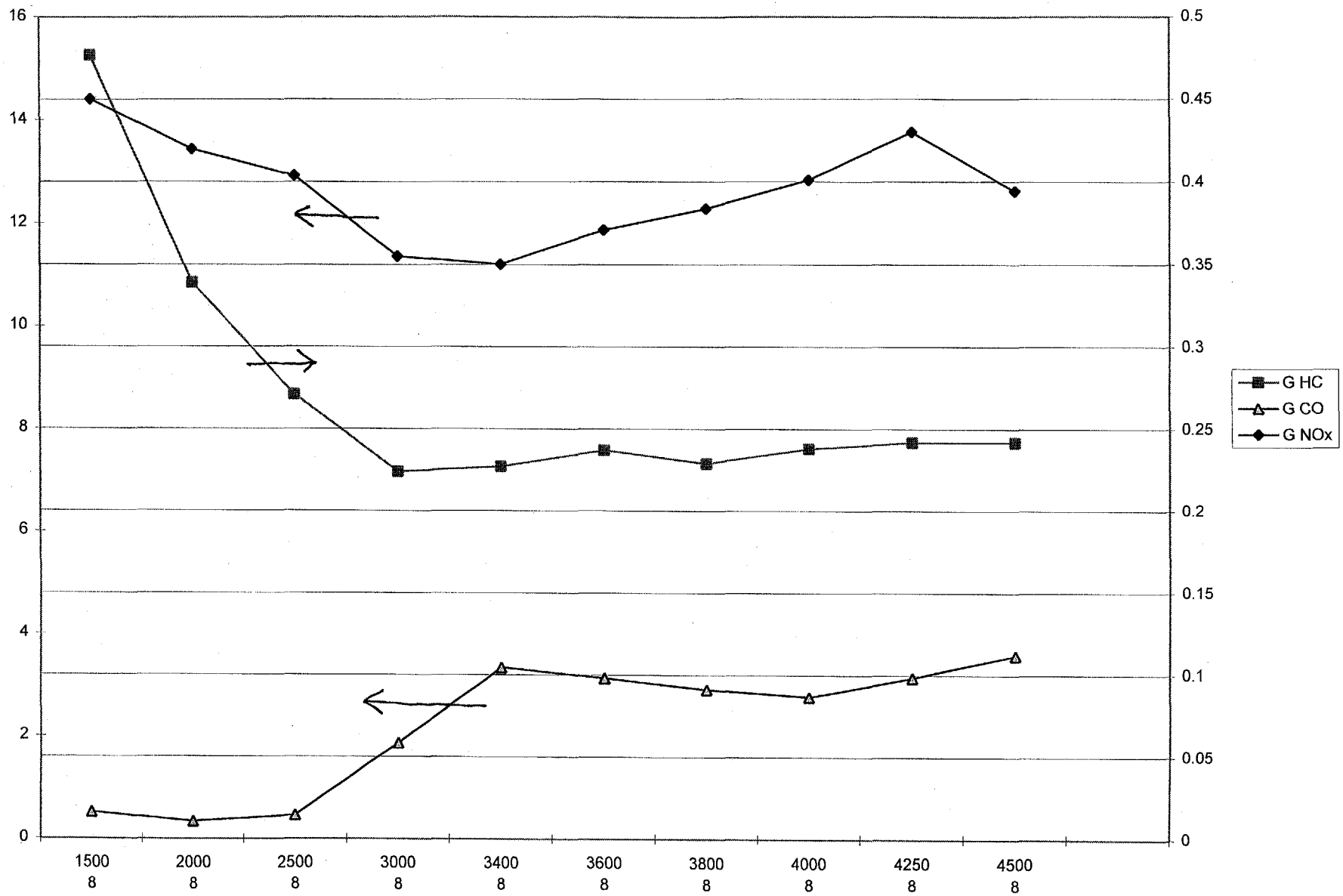
710emis #1 baseline 5/24/96

date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
5/24/96	13:28:20	8	1	1	1	944	3170	899.9	25.3	0	3.1	68
5/24/96	13:38:02	8	1	1	1	914	3076	900.1	23.56	0.1	2.7	71
5/24/96	13:42:14	8	1	1	1	886	2987	900.4	22.3	0	2.7	68
5/24/96	13:48:10	8	1	1	1	860	2905	900.1	21.32	0	2.7	69
5/24/96	13:55:02	8	1	1	1	836	2828	900.6	20.35	0	2.6	69
5/24/96	13:58:50	8	1	1	1	810	2741	900	19.25	0	2.9	68
5/24/96	14:04:06	8	1	1	1	756	2567	900.4	17.22	0	2.8	68
5/24/96	14:10:04	8	1	1	0	684	2330	900.1	14.24	0	2.7	69
5/24/96	14:15:16	8	1	1	0	611	2084	900.1	12.8	0	2.8	70
5/24/96	14:20:15	8	1	1	0	518	1776	900.5	9.86	0.1	2.6	69
5/24/96	14:42:06	6	1	1	1	799	2705	723	18.21	0.1	2.9	70
5/24/96	14:47:06	6	1	1	1	773	2618	722.6	17.29	0.1	2.8	72
5/24/96	14:52:14	6	1	1	0	707	2403	723.1	14.98	0.1	2.9	74
5/24/96	14:57:04	6	1	1	0	629	2145	723	11.68	0.1	2.9	71
5/24/96	15:02:46	6	1	1	0	540	1849	722.9	9.1	0.2	3.1	71
5/24/96	15:07:58	6	1	1	0	433	1492	723.2	6.66	0.1	3	77
5/24/96	15:12:18	6	1	0	0	296	1028	722.5	4.43	0.1	3.1	72
5/24/96	13:38:02	8	1	1	1	914	3076	900.1	23.56	0.1	2.7	71
5/24/96	14:29:30	7	1	1	1	829	2805	818.9	19.6	0	2.8	70
5/24/96	14:52:14	6	1	1	0	707	2403	723.1	14.98	0.1	2.9	74
5/24/96	15:19:12	5	1	1	0	586	2004	645.1	10.19	0.1	3	71
5/24/96	15:22:34	4	1	1	0	505	1735	560.3	7.62	0.2	3.1	71
5/24/96	15:26:02	3	1	0	0	431	1484	486.1	5.58	0.4	3.1	72
5/24/96	15:29:50	2	1	0	0	287	995	332.1	2.54	0.7	3.3	72
5/24/96	15:34:08	1	1	0	0	190	663	262.5	1.29	0.7	3.4	72
5/24/96	15:37:56	1	1	0	0	4	15	258	0.35	0.7	3.2	72
5/24/96	15:42:50	0	1	1	0	3	11	196	0.24	0.7	3.3	72

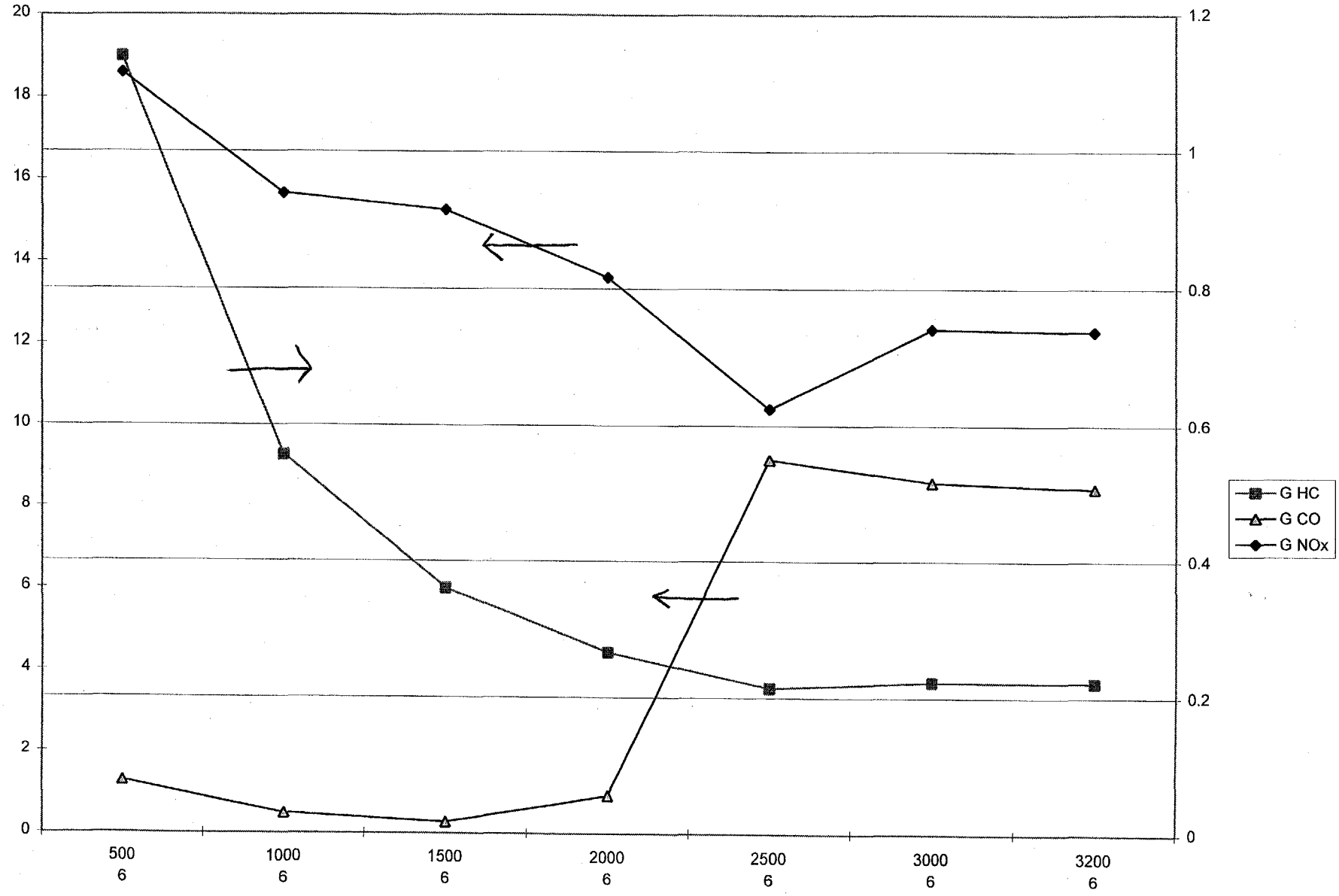
AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	Humid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
92	30.1	7.1	232	0	54	96	538	4.8	1427	12.5	4500	0
94	30.1	6.5	232.1	0	54	97	450	4.7	1447	12.7	4250	0
96	30	5.6	232.2	0	54	96	391	4.7	1429	12.6	4000	0
96	30	5	232.1	0	54	94	427	4.8	1377	12.5	3800	0
100	30	4.4	232.2	0	54	84	445	4.9	1356	12.4	3600	0
97	30	4	232	0	54	85	450	4.9	1310	12.3	3400	0
100	30	3.4	232.2	0	54	86	260	4.6	1258	12.7	3000	0
97	30	3.7	188.1	0	54	84	52	3.7	1108	14.4	2500	0
95	30	3.9	188.1	0	54	78	32	3	916	15.7	2000	0
95	30	4	188.2	0	54	75	34	2.4	702	16.8	1500	0.1
95	30	3.6	109.4	0	54	76	1187	4.7	1421	12.6	3200	0
95	30	3	108.8	0	54	78	1191	4.9	1433	12.3	3000	0
98	30	1.9	76.8	0	54	78	1409	5.4	1305	11.5	2500	0
96	30	2	77	0	54	72	109	4	1265	13.9	2000	0
97	30	2.2	76.9	0	54	68	26	3	998	15.8	1500	0
94	30	2.3	77.1	0	54	64	26	2.1	676	17.3	1000	0
91	30	2.4	68.8	0	54	58	34	1.3	375	18.7	500	0
94	30.1	6.5	232.1	0	54	97	450	4.7	1447	12.7	4250	0
93	30	4.2	184	0	54	77	698	4.7	1347	12.6	3500	0
98	30	1.9	76.8	0	54	78	1409	5.4	1305	11.5	2500	0
93	30	1.5	48.6	0	54	65	111	3.9	1318	14	1725	0
89	30.1	1.1	38.7	0	54	64	43	3.4	1254	14.9	1290	0
90	30.1	0.9	23.1	0	54	62	26	2.8	1096	15.9	935	0
85	30.2	0.4	13.8	0	54	59	19	2	876	17.5	420	0
84	30.2	0.2	10.3	0	54	53	17	1.3	568	18.7	190	0
82	30.2	0.2	9.4	0	54	36	15	0.3	190	20.4	0	0
80	30.2	0.1	8.9	0	54	35	14	0.3	197	20.4	0	0

AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-HR
17037	1500.6	0.195	0.2207	1329	15328	57181	0.295	3.404	12.701	6181
16272	1413.5	0.1919	0.216	1335	12353	54671	0.314	2.908	12.869	6156
15076	1334.3	0.1947	0.2157	1198	10094	51478	0.298	2.516	12.834	6155
14222	1275	0.1984	0.2202	1108	10409	46553	0.291	2.738	12.247	6217
13293	1220.3	0.2007	0.2246	950	10102	42694	0.262	2.796	11.816	6254
12709	1156.8	0.2044	0.2246	889	9682	39139	0.261	2.844	11.498	6286
11685	1033.1	0.1957	0.2108	869	5352	35687	0.289	1.781	11.879	6360
12223	854.4	0.1568	0.1703	876	1104	32306	0.356	0.449	13.132	6425
12571	727.1	0.1281	0.139	865	713	27884	0.431	0.355	13.893	6703
12732	592.1	0.1029	0.1119	835	771	21651	0.556	0.513	14.415	7294
12078	1094.3	0.1975	0.2192	802	24874	41762	0.25	7.765	13.38	6300
11026	1038	0.2084	0.2279	749	22689	38275	0.249	7.56	12.754	6401
8751	901.1	0.2279	0.2504	581	21160	27383	0.232	8.467	10.957	6651
8994	699	0.172	0.1837	583	1734	28093	0.291	0.866	14.25	6466
9425	540.5	0.1269	0.1389	554	431	22518	0.368	0.287	14.992	6646
9663	402.5	0.921	0.981	545	458	16269	0.546	0.459	16.301	7403
9897	265.7	0.594	0.613	524	637	9590	1.45	1.269	19.104	9773
16272	1413.5	0.1919	0.216	1335	12353	54671	0.314	2.908	12.869	6156
13070	1174.7	0.2019	0.217	847	15849	42660	0.241	4.523	12.174	6202
8751	901.1	0.2279	0.2504	581	21160	27383	0.232	8.467	10.957	6651
7810	611.9	0.1739	0.1793	467	1601	26299	0.27	0.927	15.237	6559
6713	456.6	0.1503	0.1568	388	531	21749	0.3	0.411	16.833	6542
6076	333.5	0.1214	0.1299	334	285	16754	0.356	0.304	17.9	6593
4076	157.7	0.856	0.935	206	137	8952	0.492	0.328	21.316	6977
2885	79.8	0.612	0.612	146	95	4489	0.776	0.507	23.756	7576
2890	26.4	0.202	0.144	145	111	2131	0	0	0	0
2047	15.6	0.168	0.144	83	61	1317	0	0	0	0

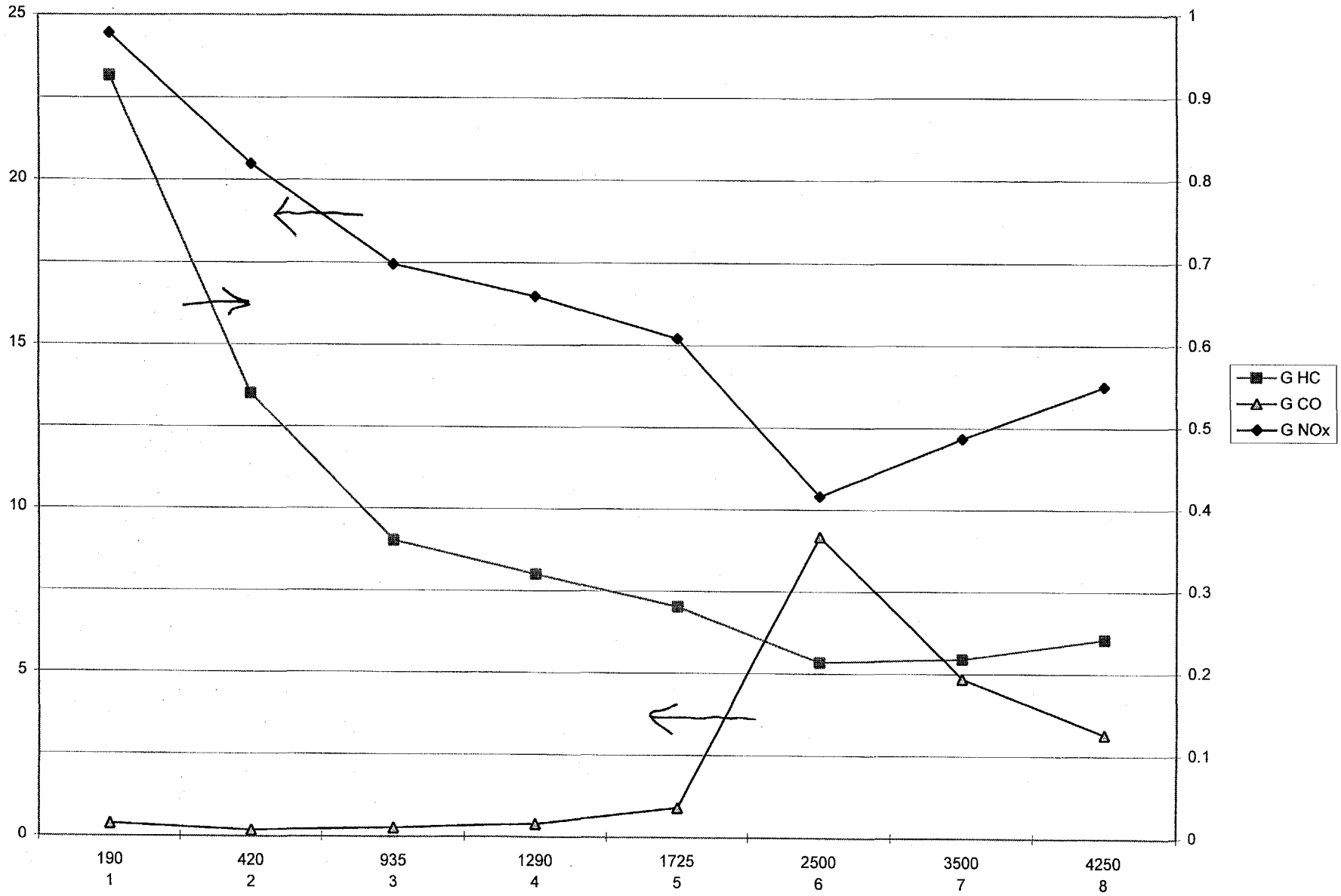
710emis TN 8 #2 baseline w/6700's 6/13/96



710emis 750R's #2 baseline w/6700's 6/13/96



710emis Notches #2 baseline w/6700's 6/13/96



6/13/96 710emis baseline w/6700 inj's

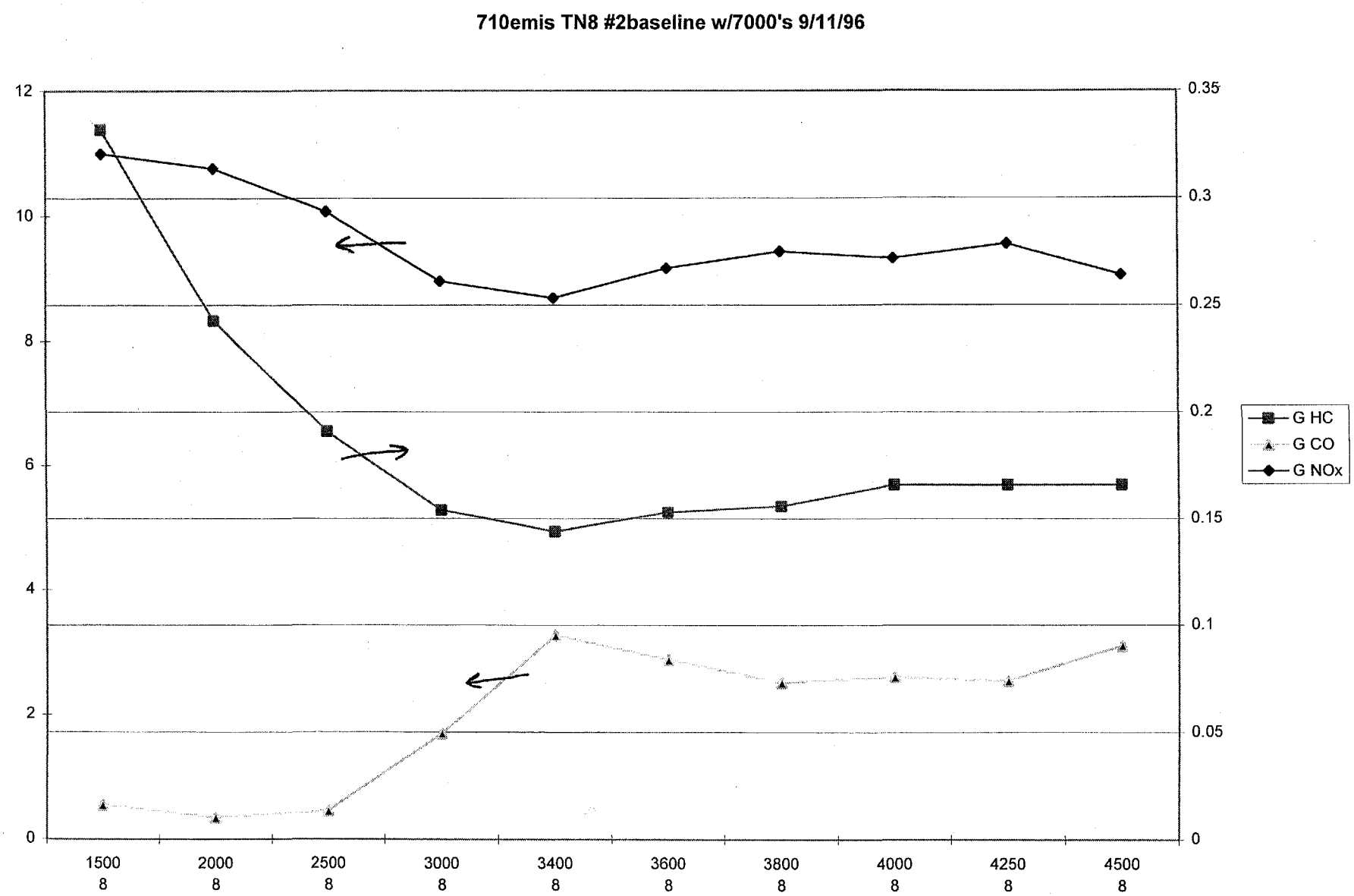
date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
6/13/96	11:56:18	8	1	1	1	939	3166	901.3	25.1	0.1	7.5	67
6/13/96	12:01:30	8	1	1	1	914	3082	901.5	23.65	0.1	7.6	67
6/13/96	12:08:00	8	1	1	1	883	2989	901.7	22.46	0.1	7.6	68
6/13/96	12:13:16	8	1	1	1	860	2911	901.9	21.41	0	7.6	71
6/13/96	12:18:27	8	1	1	1	834	2829	902.1	20.51	0	7.6	69
6/13/96	12:24:39	8	1	1	1	809	2742	901.9	19.46	0	7.5	69
6/13/96	12:36:11	8	1	1	1	754	2568	901.9	17.27	0	7.5	70
6/13/96	12:41:41	8	1	1	1	687	2347	900.8	14.47	0	7.5	75
6/13/96	12:46:42	8	1	1	0	609	2087	902.1	12.14	0.1	7.6	70
6/13/96	12:51:52	8	1	1	0	517	1780	901.7	9.87	0	7.6	71
6/13/96	13:06:28	6	1	1	1	800	2712	724.5	18.35	0.1	7.5	72
6/13/96	13:10:49	6	1	1	1	772	2621	724.6	17.21	0.2	7.7	71
6/13/96	13:17:20	6	1	1	1	701	2391	724.7	15.15	0.1	7.5	73
6/13/96	13:24:16	6	1	1	0	628	2149	724.4	11.74	0.2	7.6	72
6/13/96	13:29:38	6	1	1	0	539	1853	724.6	9.8	0.2	6.9	72
6/13/96	13:35:24	6	1	0	0	434	1498	724.1	6.66	0.2	7.1	73
6/13/96	13:41:29	6	1	0	0	296	1029	724.2	4.47	0.2	7	73
6/13/96	12:01:30	8	1	1	1	914	3082	901.5	23.65	0.1	7.6	67
6/13/96	13:00:56	7	1	1	1	828	2805	820.6	19.75	0.1	7.6	71
6/13/96	13:17:20	6	1	1	1	701	2391	724.7	15.15	0.1	7.5	73
6/13/96	13:49:44	5	1	1	0	585	2006	646.3	10.17	0.2	7	75
6/13/96	13:54:30	4	1	1	0	505	1737	561.5	7.64	0.4	7.1	73
6/13/96	14:02:35	3	1	1	0	428	1479	486.7	5.56	0.5	7.1	74
6/13/96	14:08:25	2	1	0	0	286	995	331.5	2.59	0.7	7.9	74
6/13/96	14:15:04	1	1	0	0	191	667	254.6	1.27	0.7	7.8	74
6/13/96	14:21:52	1	1	0	0	4	15	254.5	0.49	0.7	7.9	74
6/13/96	14:28:34	0	1	0	0	3	11	195.9	0.35	0.7	7.8	74
6/13/96	14:42:38	0	1	0	0	0	0	1.2	0.3	0.7	7.9	74

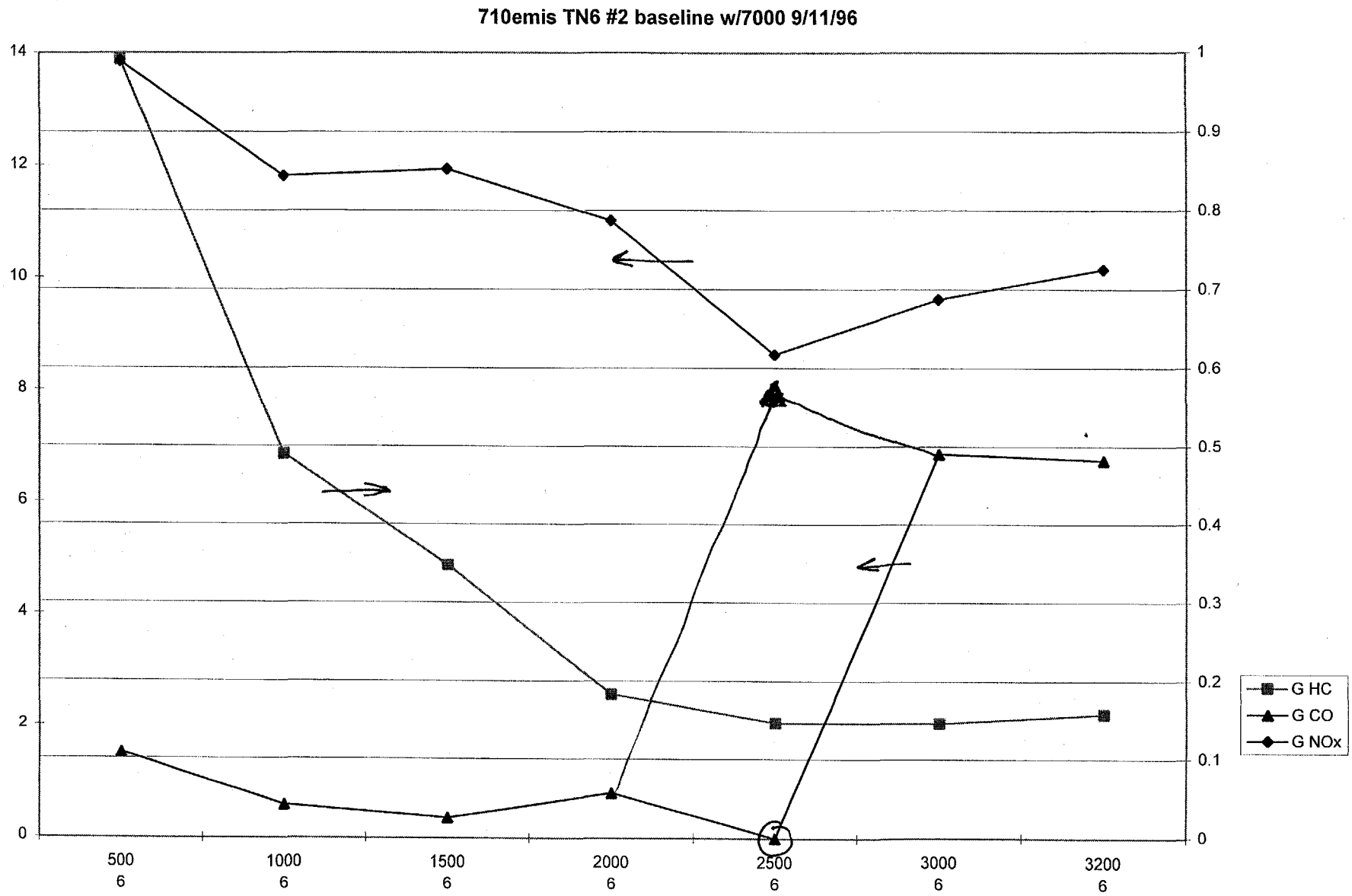
6/13/96 710emis baseline w/6700 inj's

AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	Humid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
91	30	7.34	232.4	0	50	78	561	4.8	1428	12.5	4476	0
93	30	6.64	232.5	0	50	76	489	4.7	1438	12.6	4256	0
96	30	5.8	232.6	0	50	76	437	4.8	1445	12.6	4002	0
103	29.9	5.21	232.6	0	50	73	457	4.8	1401	12.5	3808	0
108	29.9	4.47	232.6	0	50	76	494	4.9	1363	12.3	3602	0
102	29.9	3.88	232.6	0	50	73	534	5	1313	12.2	3400	0
105	29.9	3.47	232.6	0	50	68	278	4.7	1242	12.7	2998	0
98	29.9	3.61	232.3	0	50	67	56	3.8	1124	14.3	2535	0
98	29.9	3.84	188.5	0	50	63	32	3.1	915	15.6	2004	0
99	30	3.99	188.6	0	50	63	34	2.4	707	16.7	1502	0
98	29.9	3.68	108.1	0	50	72	1345	4.9	1410	12.3	3207	0
99	29.9	2.99	107.8	0	50	71	1275	4.9	1410	12.2	2997	0
104	29.9	1.83	109.7	0	50	73	1525	5.5	1272	11.3	2503	0
99	29.9	1.97	77.1	0	50	69	118	4.1	1260	13.8	2004	0
98	29.9	2.9	77.2	0	50	67	24	3	996	15.7	1503	0
93	29.9	2.25	68.3	0	50	64	28	2.1	659	17.3	996	0
90	29.9	2.33	68.5	0	50	62	34	1.3	367	18.6	503	0
93	30	6.64	232.5	0	50	76	489	4.7	1438	12.6	4256	0
102	29.9	4.4	183.6	0	50	70	776	4.9	1412	12.2	3500	0
104	29.9	1.83	109.7	0	50	73	1525	5.5	1272	11.3	2503	0
94	29.9	1.48	48.5	0	50	68	107	3.9	1307	14	1724	0
94	30	1.7	38.4	0	50	68	41	3.4	1237	15	1291	0
91	30	0.81	31.6	0	50	65	24	2.9	1111	15.9	935	0
86	30.1	0.34	13.6	0	50	63	13	2	853	17.5	419	0
87	30.1	0.22	10.1	0	50	58	12	1.3	561	18.7	191	0
85	30.1	0.22	10.1	0	50	45	15	0.4	191	20.3	10	0
81	30.1	0.13	7.7	0	50	44	15	0.4	187	20.4	7	0
82	30.1	0.1	2.6	0	50	11	0	11.9	5	0	2	0

6/13/96 710emis baseline w/6700 inj's

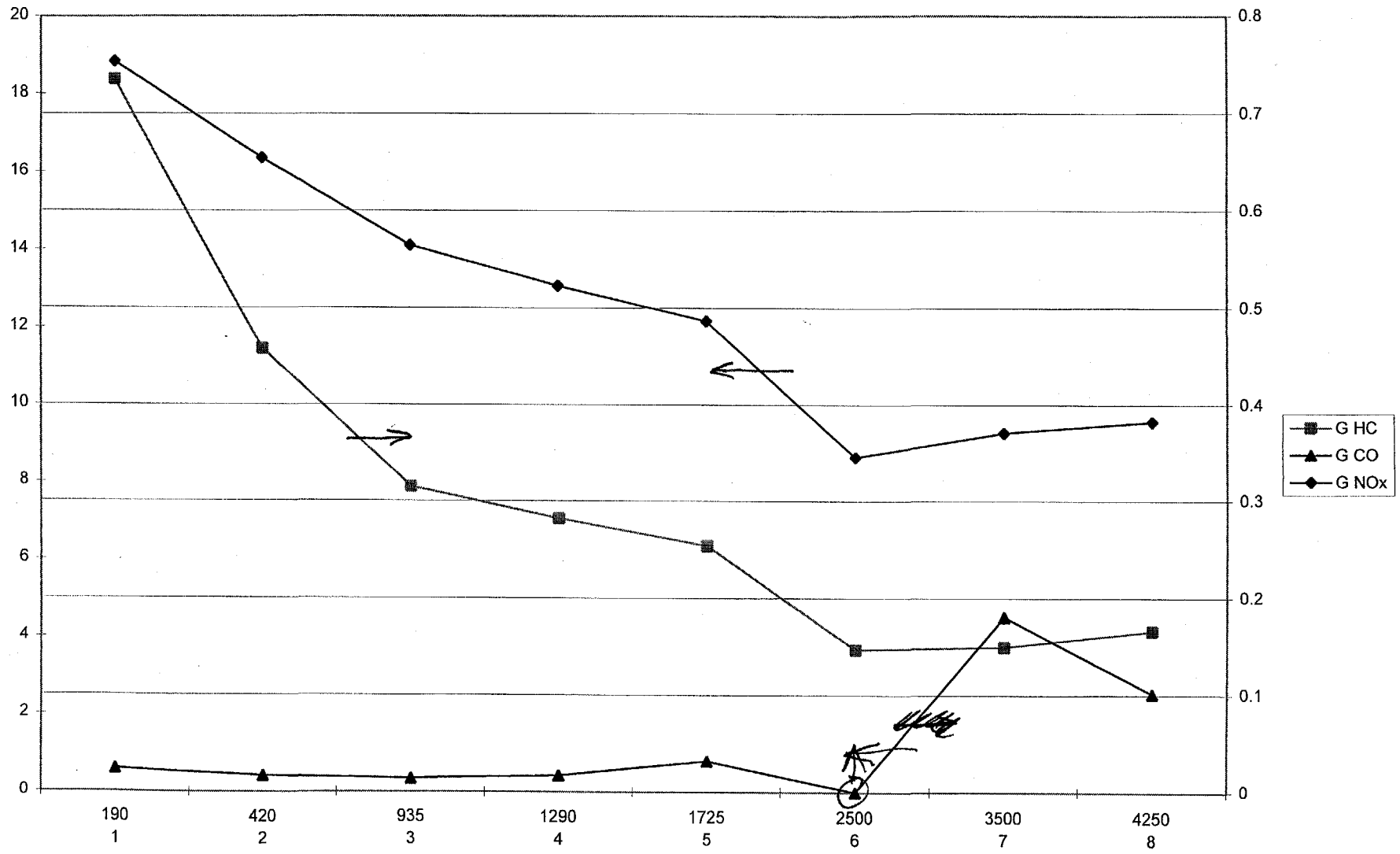
AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-
17309	1507.2	0.194	0.2207	1082	16024	56423	0.242	3.584	12.619	6236
16433	1420.2	0.1911	0.2161	1029	13400	55561	0.242	3.153	13.76	6162
15317	1345.7	0.1946	0.2202	956	11118	51387	0.238	2.778	12.84	6220
14403	1279.7	0.1967	0.2203	873	11128	46674	0.229	2.927	12.279	6219
13329	1230.6	0.2044	0.2248	855	11324	42760	0.237	3.143	11.871	6320
12440	1165.7	0.2072	0.2293	773	11380	38168	0.227	3.342	11.209	6342
11754	1034.3	0.1948	0.2151	673	5608	34085	0.224	1.87	11.365	6383
12042	865.7	0.157	0.1746	679	1153	32354	0.271	0.46	12.921	6416
12420	727.1	0.129	0.1434	678	669	26894	0.339	0.334	13.433	6729
12649	595.1	0.1039	0.1118	717	775	21638	0.477	0.516	14.406	7316
12179	1101.5	0.2002	0.2285	713	27137	39459	0.222	8.461	12.304	6354
10950	1033.1	0.2075	0.2282	670	24161	37054	0.223	8.61	12.363	6377
8528	907.1	0.2348	0.2552	538	22571	26055	0.214	9.17	10.409	6704
8888	701.9	0.1751	0.1882	533	1857	27291	0.266	0.926	13.618	6467
9154	544.2	0.1314	0.1389	541	400	22585	0.36	0.266	15.26	6705
9550	396.6	0.919	0.981	554	486	15619	0.556	0.487	15.666	7359
9745	266.4	0.608	0.614	572	638	9335	1.139	1.272	18.596	9795
16433	1420.2	0.1911	0.2161	1029	13400	55561	0.242	3.153	13.76	6162
12694	1183.1	0.2071	0.226	764	17008	42602	0.218	4.859	12.172	6260
8528	907.1	0.2348	0.2552	538	22571	26055	0.214	9.17	10.409	6704
7738	608.4	0.1734	0.1793	486	1534	26213	0.281	0.89	15.205	6567
6591	457.7	0.1543	0.1568	413	508	21274	0.32	0.393	16.478	6597
5750	333.5	0.1284	0.1344	338	254	16319	0.361	0.271	17.454	6600
3748	157.2	0.929	0.935	227	79	8603	0.541	0.189	20.484	7092
3012	84.5	0.621	0.613	176	71	4646	0.927	0.377	24.457	7828
3018	30	0.22	0.192	150	102	1806	0	0	0	0
2328	19.2	0.182	0.191	92	65	1151	0	0	0	0
645	2.4	0.82	0	0	0	0	0	0	0	0


710emis TN8 #2baseline w/7000's 9/11/96
12
10
8
6
4
2
0
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1500 8
2000 8
2500 8
3000 8
3400 8
3600 8
3800 8
4000 8
4250 8
4500 8
G HC
G CO
G NOx



OVER RANGED >1900PPM

710emis #2 baseline w/7000's 9/11/96



OVER RANGED > 1900PPM

710emis 9/11/96 #2 baseline w/7000 inj's

	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
9/11/96	12:41:41	8	1	1	1	944	3169	898.5	25.16	-1.4	7.3	78
9/11/96	12:47:48	8	1	1	1	915	3080	899	23.65	-1.4	7.2	71
9/11/96	13:05:49	8	1	1	1	885	2984	899.3	22.37	-1.4	7.3	73
9/11/96	13:14:59	8	1	1	1	861	2908	899.1	21.39	-1.4	7.3	73
9/11/96	13:22:16	8	1	1	1	836	2824	899.2	20.46	-1.4	7.1	74
9/11/96	13:30:42	8	1	1	1	809	2740	899.1	19.38	-1.4	7.2	75
9/11/96	13:39:10	8	1	1	1	756	2567	899.5	17.23	-1.3	7.3	77
9/11/96	13:45:34	8	1	1	0	691	2354	899.2	14.47	-1.4	7.2	75
9/11/96	13:53:30	8	1	1	0	612	2091	899.1	12.09	-1.3	7	76
9/11/96	14:01:16	8	1	1	0	520	1784	899.2	9.84	-1.4	7.3	82
9/11/96	14:20:13	6	1	1	1	801	2711	723.2	18.45	-1.4	7.2	78
9/11/96	14:28:02	6	1	1	1	775	2623	722.9	17.43	-1.4	7.7	78
9/11/96	14:36:13	6	1	1	1	704	2393	723.2	15.01	-1.4	6.9	78
9/11/96	14:44:26	6	1	1	0	629	2145	723.6	11.61	-1.4	7.3	78
9/11/96	14:50:50	6	1	1	0	540	1850	723.4	8.97	-1.4	7.2	78
9/11/96	15:00:10	6	1	1	0	435	1496	723.5	6.61	-1.4	7.1	79
9/11/96	15:08:08	6	1	1	0	301	1042	723.5	4.54	-1.4	7.2	80
9/11/96	12:47:48	8	1	1	1	915	3080	899	23.65	-1.4	7.2	71
9/11/96	14:11:57	7	1	1	1	831	2807	817.7	19.93	-1.4	7.3	77
9/11/96	14:36:13	6	1	1	1	704	2393	723.2	15.01	-1.4	6.9	78
9/11/96	15:16:38	5	1	1	0	587	2007	646.5	10.14	-1.3	7.2	80
9/11/96	15:21:45	4	1	1	0	507	1739	558.3	7.55	-1.3	7.3	80
9/11/96	15:28:37	3	1	1	0	431	1482	486.3	5.55	-1.4	7.2	80
9/11/96	15:36:55	2	1	0	0	288	999	331	2.63	-1.3	7.2	80
9/11/96	15:42:54	1	1	0	0	191	664	254	1.32	-1.3	7.1	80
9/11/96	15:50:39	1	1	0	0	5	17	254.1	0.39	-1.3	7.1	80
9/11/96	15:57:02	0	1	0	0	4	13	193.3	0.3	-1.3	7.2	80

710emis 9/11/96 #2 baseline w/7000 inj's

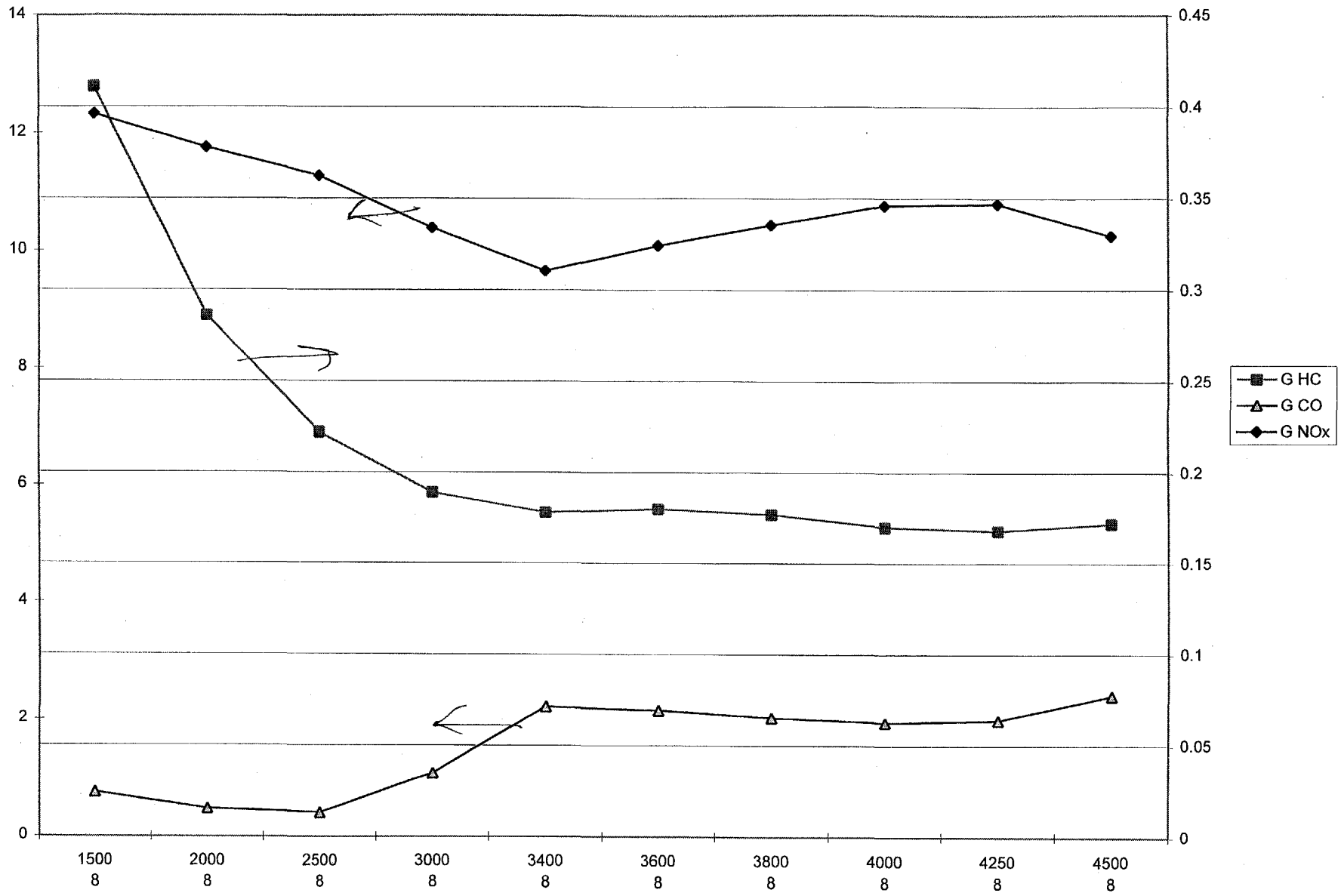
TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	Humid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
101	29.9	7.41	227.9	0	50	75	666	6.6	1375	12.2	4500	0
98	29.9	6.86	227.9	0	50	72	541	6.5	1435	12.3	4250	0
109	29.9	5.95	227.5	0	50	72	560	6.6	1440	12.2	4000	0
112	29.9	5.33	227	0	50	68	539	6.6	1455	12.2	3800	0
114	29.9	4.74	227.3	0	50	68	616	6.7	1415	12	3600	0
113	29.9	4.08	226.9	0	50	64	708	6.8	1357	11.8	3400	0
115	29.9	3.68	228.1	0	50	65	339	6.3	1299	12.5	3000	0
112	29.9	3.92	178.7	0	50	62	72	5.1	1187	14.2	2500	0
111	29.9	4.03	178.7	0	50	61	43	4.1	990	15.5	2000	0
109	29.8	4.35	179.9	0	50	60	49	3.2	740	16.7	1500	0
107	29.8	3.92	93.7	0	50	65	1378	6.4	1483	12.4	3200	0
111	29.8	3.34	94.3	0	50	64	1464	6.7	1475	12.1	3000	0
108	29.8	2.1	95.1	0	50	67	X 0	7.3	1341	11.2	2500	0
108	29.8	2.2	74	0	50	62	135	5.4	1359	13.7	2000	0
110	29.8	2.38	74.1	0	50	82	42	3.9	1062	15.7	1500	0
105	29.8	2.49	74.2	0	50	75	45	2.8	685	17.3	1000	0
102	29.8	2.64	74.3	0	50	71	53	1.7	374	18.7	500	0
98	29.9	6.86	227.9	0	50	72	541	6.5	1435	12.3	4250	0
114	29.8	4.37	168	0	50	67	977	6.7	1435	12	3500	0
108	29.8	2.1	95.1	0	50	67	X 0	7.3	1341	11.2	2500	0
103	29.8	1.71	43.7	0	50	85	127	5.2	1404	14	1725	0
109	29.8	1.25	34.4	0	50	81	60	4.6	1371	14.9	1290	0
101	29.8	0.95	27.3	0	50	75	40	3.8	1207	15.9	935	0
97	29.8	0.43	12.3	0	50	72	32	2.6	917	17.5	420	0
95	29.8	0.27	9.6	0	50	67	26	1.7	613	18.8	190	0
94	29.8	0.28	9.6	0	50	47	25	0.4	200	20.5	0	0
90	29.9	0.17	7.6	0	50	45	25	0.3	193	20.6	0	0

X OVERRANGED

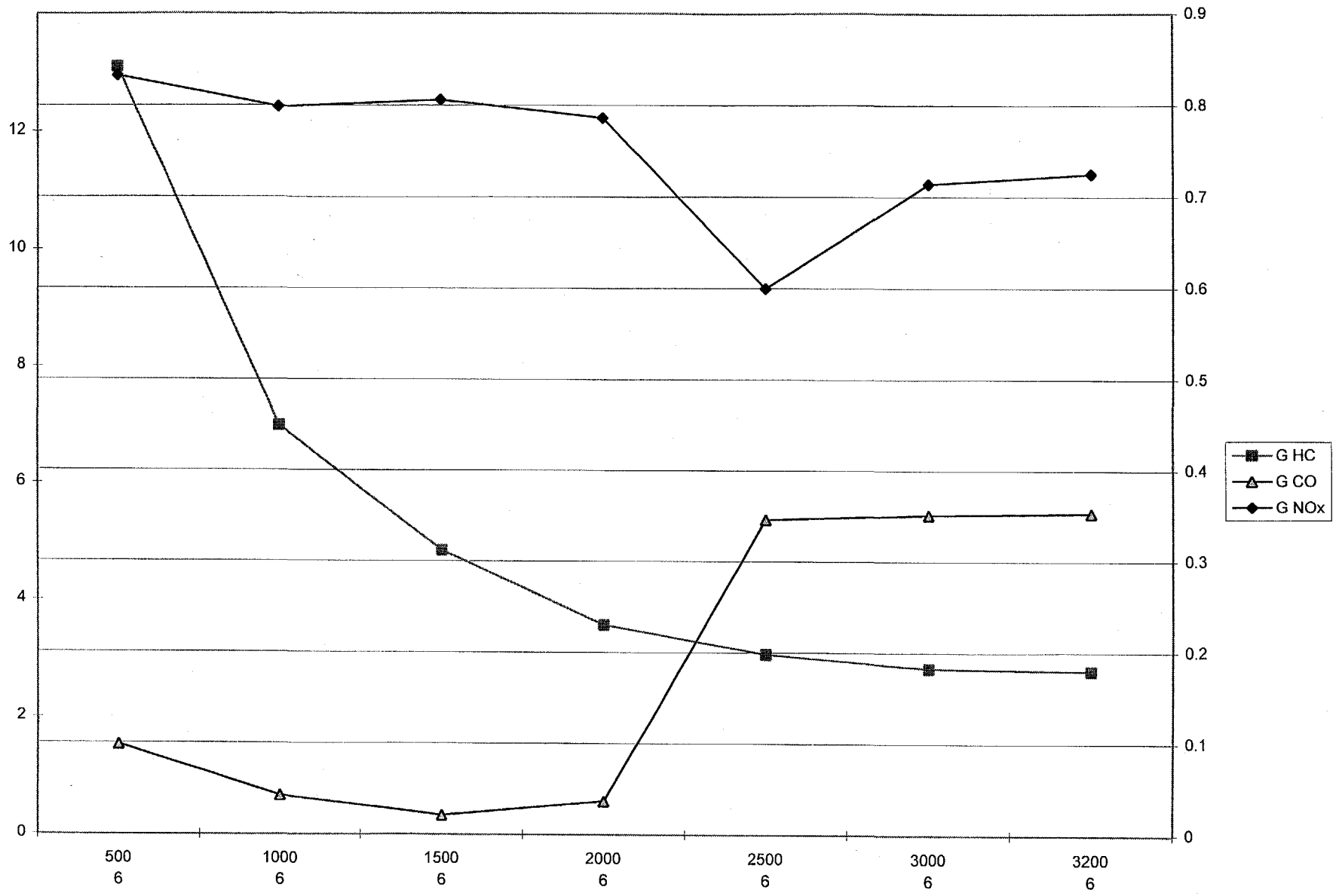
710emis 9/11/96 #2 baseline w/7000 inj's

AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	HC G/HP-HR	CO G/HP-HR	NOx G/HP-HR	BTU/ HP-
12059	1510.7	0.02772	0.0298	749	13963	40776	0.166	3.102	9.059	6206
11634	1418.9	0.027	0.02933	706	10804	40636	0.166	2.542	9.561	6172
10730	1341.5	0.02768	0.02976	666	10411	37305	0.166	2.603	9.328	6206
10128	1282.7	0.02811	0.02974	594	9550	35874	0.156	2.513	9.44	6247
9535	1225.2	0.02849	0.0302	550	10346	32957	0.153	2.878	9.17	6308
8838	1165.2	0.02918	0.03066	491	11076	29483	0.144	3.264	8.689	6353
8394	1031.9	0.02715	0.02839	465	5095	26900	0.154	1.697	8.963	6364
8686	869.4	0.02213	0.02315	478	1130	25202	0.191	0.452	10.08	6429
8815	724.2	0.01814	0.01878	487	699	21573	0.243	0.349	10.765	6685
9159	589.8	0.01425	0.01479	499	831	16550	0.332	0.552	10.997	7250
8710	1105.7	0.02801	0.02927	505	21577	32453	0.158	6.753	10.157	6401
7990	1044.6	0.02907	0.03056	442	20593	28864	0.147	6.866	9.624	6449
6369	901.7	0.03127	0	369	0	21655	0.147	0	8.644	6660
6496	697.8	0.02395	0.02447	367	1605	22117	0.183	0.8	11.025	6438
6768	536.3	0.01758	0.01791	522	531	17919	0.348	0.354	11.938	6611
6954	396.6	0.01253	0.013	492	586	11864	0.49	0.583	11.816	7307
7179	271.8	0.00836	0.008	518	791	7232	0.992	1.516	13.855	9632
11634	1418.9	0.027	0.02933	706	10804	40636	0.166	2.542	9.561	6172
9164	1193.9	0.02884	0.03035	525	15831	32452	0.15	4.523	9.272	6318
6369	901.7	0.03127	0	369	0	21655	0.147	0	8.644	6660
5773	609	0.02319	0.02362	439	1367	20999	0.254	0.792	12.166	6527
4909	453.5	0.02041	0.02098	365	544	16906	0.282	0.421	13.075	6490
4310	332.4	0.01707	0.01746	296	322	13248	0.315	0.343	14.108	6548
2910	157.2	0.01195	0.01209	193	177	6921	0.458	0.42	16.362	6875
2310	79.8	0.00763	0.00798	139	112	3580	0.735	0.589	18.843	7886
2355	23.4	0.00219	0.00192	122	132	1417	0	0	0	0
1844	17.3	0.00209	0.00145	113	130	1371	0	0	0	0

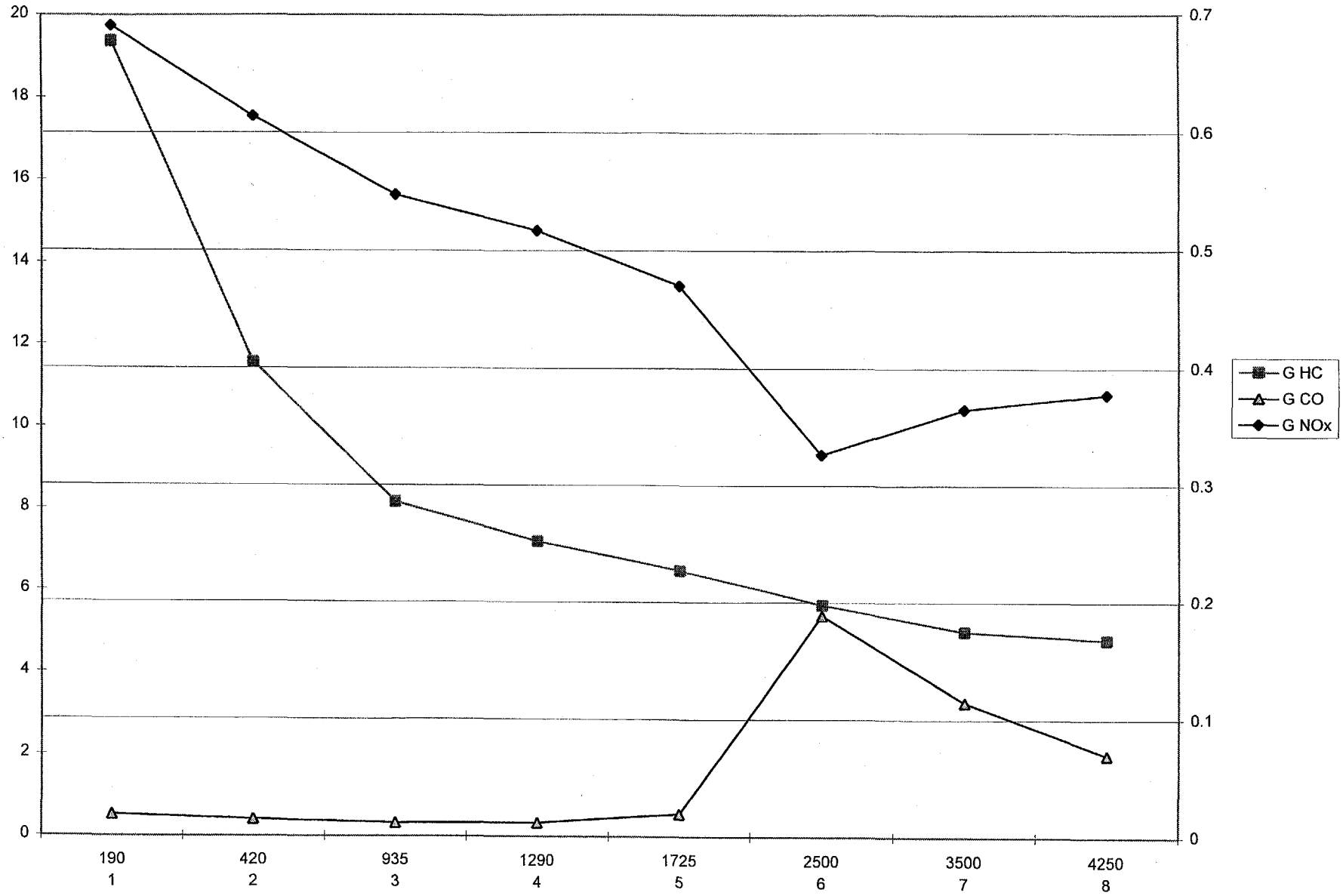
710 EMIS 900R's # 3 baseline w/ 7000's 9/16/96



710 EMIS 750R's # 3 baseline w/ 7000's 9/16/96



710 EMIS Notches # 3 baseline w/ 7000's 9/16/96



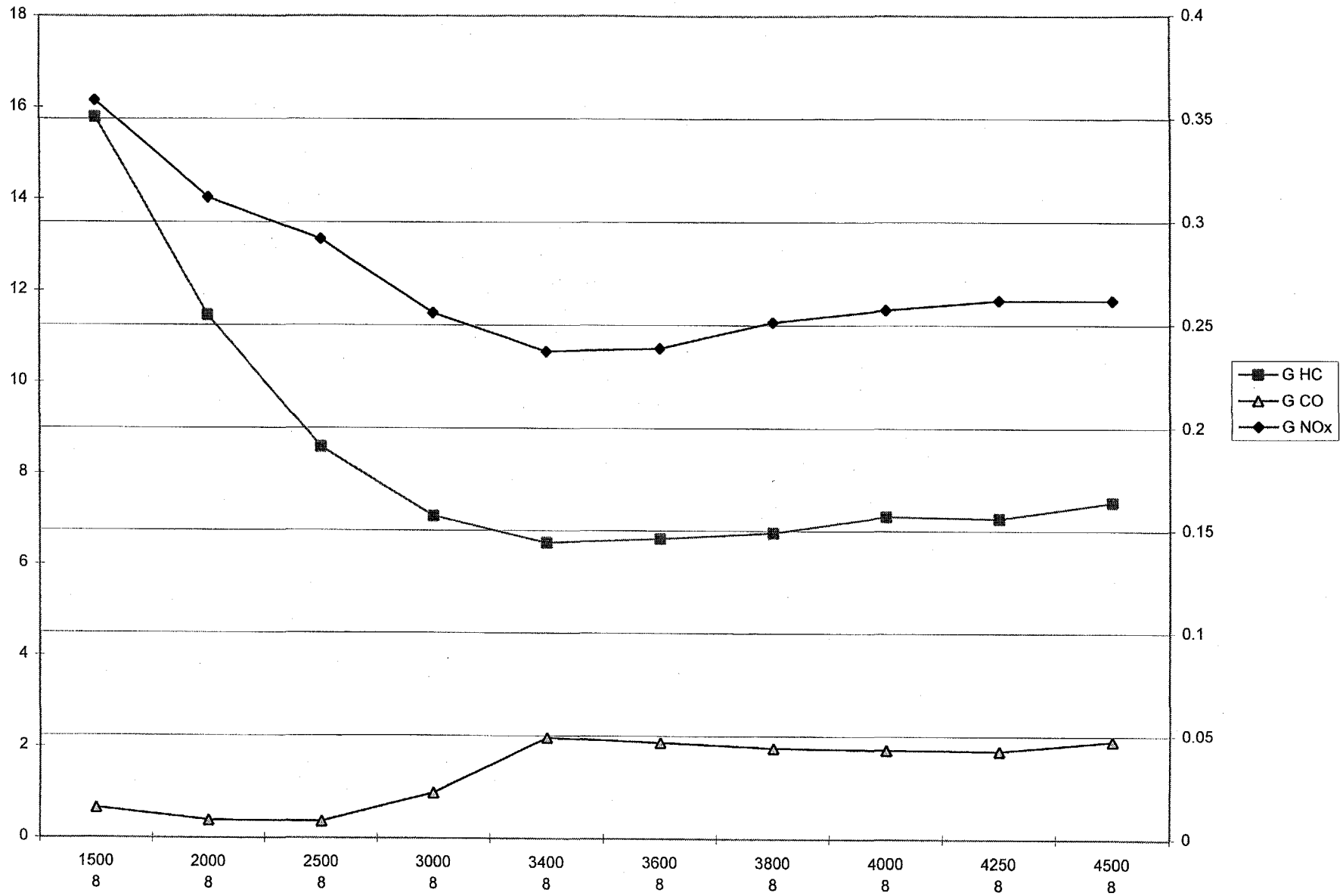
	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
9/16/96	12:24:34	8	1	1	1	944	3171	899.4	25.03	-1.3	8.4	69
9/16/96	12:31:02	8	1	1	1	914	3075	899.1	23.57	-1.3	8.5	68
9/16/96	12:39:42	8	1	1	1	884	2984	899	22.12	-1.4	8.5	72
9/16/96	12:46:49	8	1	1	1	861	2904	899.4	21.27	-1.3	8.6	70
9/16/96	12:56:10	8	1	1	1	835	2822	899	20.18	-1.3	8.5	71
9/16/96	13:03:23	8	1	1	1	810	2745	898.9	19.25	-1.3	8.6	71
9/16/96	13:12:01	8	1	1	1	755	2565	898.2	16.87	-1.3	8.6	71
9/16/96	13:21:01	8	1	1	0	690	2350	898	14.29	-1.3	8.5	71
9/16/96	13:28:12	8	1	1	0	610	2085	898.1	11.96	-1.3	8.4	73
9/16/96	13:38:52	8	1	1	0	518	1779	897.9	9.76	-1.3	8.5	72
9/16/96	14:02:15	6	1	1	1	800	2707	721.8	18.09	-1.3	8.4	74
9/16/96	14:11:29	6	1	1	1	773	2618	722.5	17.09	-1.3	8.4	73
9/16/96	14:40:12	6	1	1	0	706	2403	722	14.71	-1.3	8.4	78
9/16/96	14:50:05	6	1	1	0	629	2147	722.2	11.5	-1.3	8.4	74
9/16/96	14:57:13	6	1	1	0	540	1852	722.4	8.88	-1.3	8.4	75
9/16/96	15:06:06	6	1	0	0	436	1503	722.5	6.54	-1.3	8.3	75
9/16/96	15:13:58	6	1	0	0	297	1030	722.4	4.37	-1.3	8.3	75
9/16/96	12:31:02	8	1	1	1	914	3075	899.1	23.57	-1.3	8.5	68
9/16/96	13:50:30	7	1	1	1	828	2799	817.2	19.48	-1.4	8.6	72
9/16/96	14:40:12	6	1	1	0	706	2403	722	14.71	-1.3	8.4	78
9/16/96	15:21:04	5	1	1	0	585	2003	644.6	10	-1.3	8.1	75
9/16/96	15:29:42	4	1	1	0	505	1734	559.3	7.44	-1.3	8.4	80
9/16/96	15:39:18	3	1	1	0	429	1477	484.1	5.47	-1.3	8.3	75
9/16/96	15:49:03	2	1	0	0	286	993	331.1	2.58	-1.3	8.3	75
9/16/96	15:58:26	1	1	0	0	190	663	254.5	1.32	-1.3	8.3	75
9/16/96	16:15:11	1	0	0	0	5	17	253.8	0.4	-1.3	8.3	75
9/16/96	16:24:36	0	0	0	0	4	14	194.6	0.3	-1.3	8.3	75

AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	Humid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
92	30.1	7.54	231.8	0	50	74	507	6.4	1506	12.5	4500	0
92	30.2	6.81	231.7	0	50	73	414	6.3	1552	12.6	4250	0
91	30.1	5.78	231.8	0	50	72	405	6.3	1552	12.6	4000	0
97	30.2	5.27	231.8	0	50	74	423	6.4	1523	12.5	3800	0
98	30.2	4.62	231.7	0	50	73	450	6.4	1473	12.4	3600	0
98	30.1	3.95	231.6	0	50	76	465	6.5	1415	12.3	3400	0
95	30.2	3.79	231.3	0	50	72	205	5.9	1381	13.1	3000	0
96	30.1	4.01	187	0	50	69	62	4.8	1220	14.6	2500	0
95	30.1	4.2	187.3	0	50	70	56	3.9	1002	15.8	2000	0
92	30.1	4.37	187.4	0	50	69	63	3	739	17	1500	0
92	30.1	3.86	107.5	0	50	74	1107	6.2	1585	12.7	3200	0
93	30.1	3.24	108.7	0	50	76	1114	6.3	1571	12.5	3000	0
97	30.1	2.05	76.5	0	50	87	1160	6.9	1392	11.7	2500	0
93	30.1	2.26	76.5	0	50	77	93	5.2	1421	14	2000	0
96	30.1	2.41	76.6	0	50	77	39	3.9	1083	15.8	1500	0
89	30.1	2.54	67.6	0	50	71	50	2.7	672	17.3	1000	0
88	30.1	2.63	68	0	50	64	58	1.8	354	18.6	500	0
92	30.2	6.81	231.7	0	50	73	414	6.3	1552	12.6	4250	0
95	30.1	4.2	182.2	0	50	74	691	6.4	1538	12.5	3500	0
97	30.1	2.05	76.5	0	50	87	1160	6.9	1392	11.7	2500	0
89	30.2	1.73	48.6	0	50	72	86	5	1467	14.2	1725	0
87	30.1	1.27	38.6	0	50	71	46	4.4	1431	15.1	1290	0
84	30.2	0.93	31.7	0	50	67	37	3.7	1257	16	935	0
81	30.2	0.4	13.7	0	50	63	31	2.6	935	17.5	420	0
80	30.2	0.23	10	0	50	61	23	1.7	608	18.7	190	0
76	30.2	0.24	6.7	0	50	45	19	0.6	181	20.3	0	0
75	30.2	0.12	5	0	50	49	17	0.5	171	20.3		0

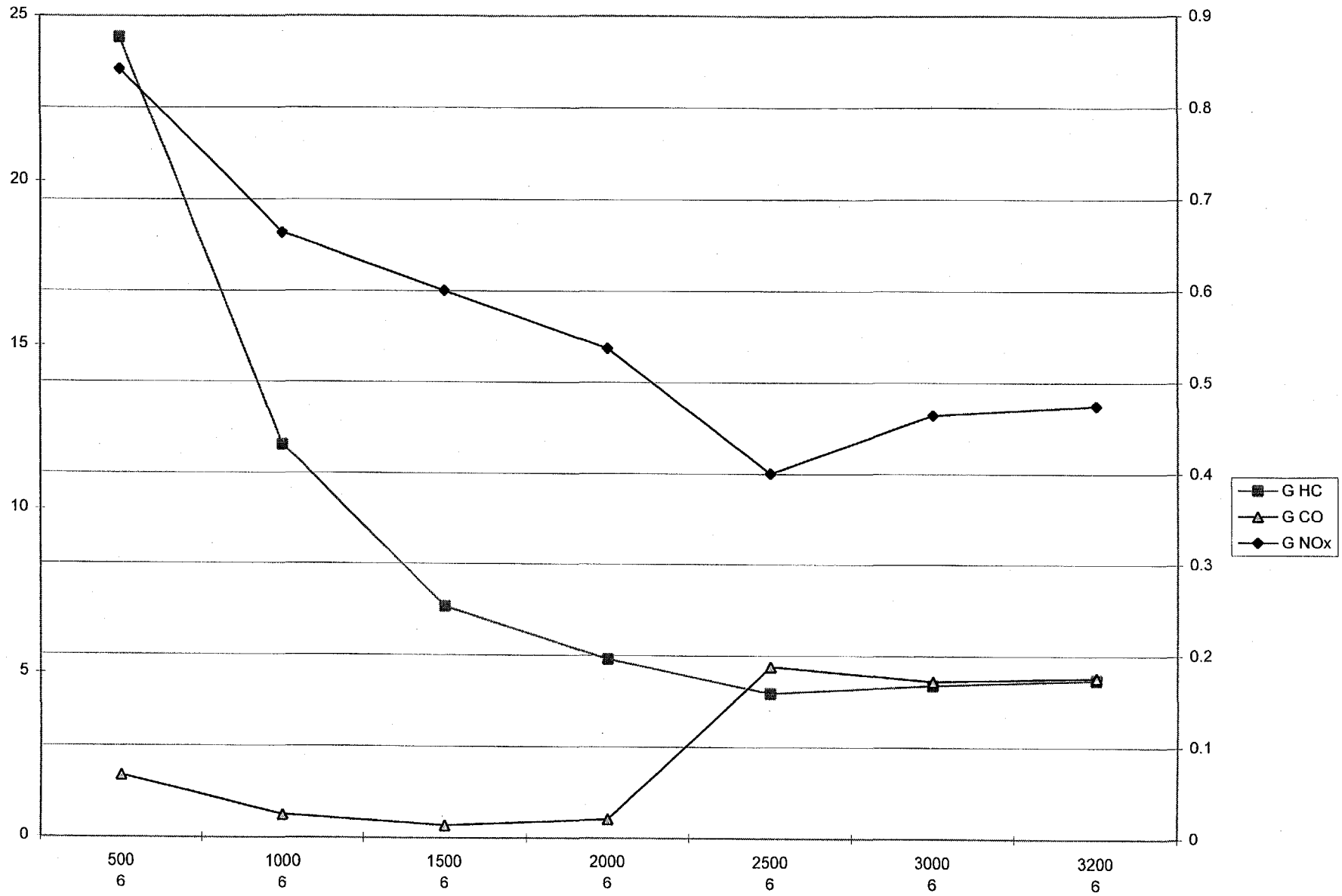
HC CO NOK

AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR	G/HP-HR	G/HP-HR	BTU/ HP-
12304	1501.1	0.02699	0.02889	780	10882	46271	0.172	2.412	10.257	6156
11713	1411.1	0.02672	0.02843	715	8477	45829	0.168	1.997	10.798	6163
10800	1327.2	0.0272	0.02843	682	7819	43075	0.17	1.955	10.771	6139
10257	1276.8	0.02753	0.02886	673	7732	39616	0.177	2.037	10.439	6216
9595	1211.9	0.02809	0.02887	647	7787	36291	0.18	2.165	10.092	6229
8872	1156.8	0.02886	0.0293	608	7578	32898	0.178	2.225	9.661	6275
8714	1019.3	0.02628	0.02664	569	3255	31206	0.189	1.084	10.395	6282
8940	857.3	0.02124	0.02185	557	1019	28213	0.222	0.407	11.276	6341
9158	717.6	0.01745	0.01791	574	948	23544	0.286	0.473	11.754	6624
9367	586.1	0.01382	0.01391	617	1131	18516	0.411	0.753	12.327	7200
8803	1086.5	0.0275	0.02831	577	17611	36144	0.18	5.495	11.277	6271
8058	1026.5	0.02829	0.02873	551	16408	33328	0.183	5.467	11.105	6319
6404	883.2	0.0306	0.03128	496	13467	23326	0.198	5.386	9.33	6533
6730	689.4	0.02267	0.0236	461	1134	24530	0.23	0.565	12.228	6357
6931	534	0.01698	0.0179	470	491	18863	0.312	0.326	12.542	6549
7161	390	0.01203	0.01255	450	663	12435	0.449	0.663	12.423	7186
7293	261.6	0.00797	0.00845	425	773	6539	0.842	1.53	12.949	9517
11713	1411.1	0.02672	0.02843	715	8477	45829	0.168	1.997	10.798	6163
9158	1165.2	0.02802	0.02897	612	11496	36479	0.175	3.288	10.434	6173
6404	883.2	0.0306	0.03128	496	13467	23326	0.198	5.386	9.33	6533
5919	600	0.02243	0.02273	390	949	23124	0.227	0.551	13.436	6449
5072	445.7	0.01945	0.0201	325	429	19024	0.252	0.333	14.77	6403
4360	327.5	0.01672	0.01701	268	301	14645	0.286	0.322	15.646	6463
2867	154.8	0.0121	0.01209	169	169	7332	0.405	0.406	17.541	6877
2176	79.2	0.00823	0.00798	128	98	3732	0.678	0.52	19.748	7869
2229	24.5	0.00249	0.00286	84	71	973	0	0	0	0
1579	17.9	0.00252	0.00239	78	55	812	0	0	0	0

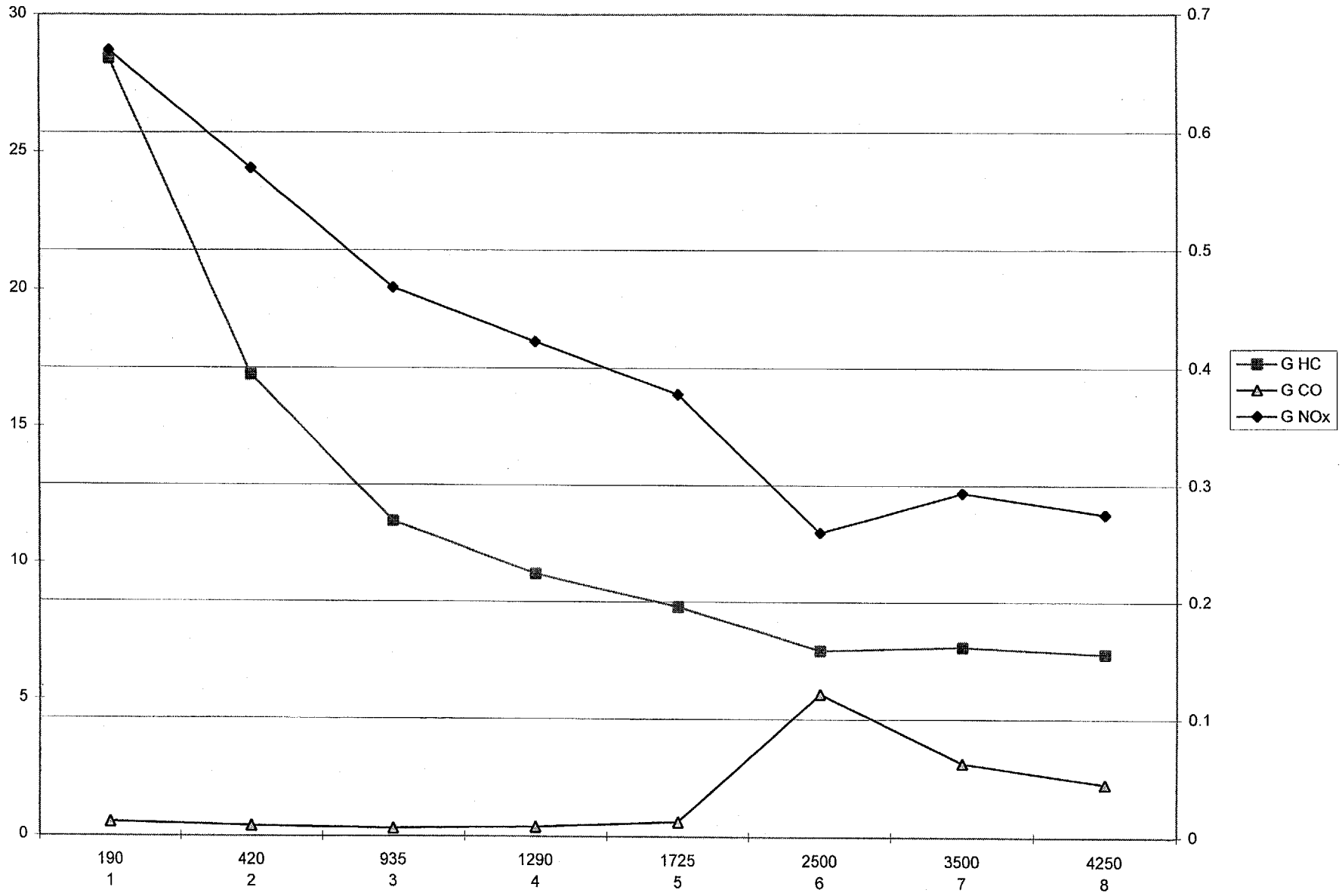
710 EMIS 900R's # 4 baseline w/ 7000's 9/19/96



710 EMIS 750R's # 4 baseline w/ 7000's 9/19/96



710 EMIS Notch's # 4 baseline w/ 7000's 9/19/96



710emis baseline # 4 9/19/96

date	time	TN	FAN A	FAN B	FAN C	MG VOLT	MG AMPS	RPM	DIESEL F	GAS CFM	GAS PRE	GAS TEM
9/19/96	12:00:03	8	1	1	1	942	3169	898.9	24.88	-1.4	8.1	69
9/19/96	12:05:57	8	1	1	1	915	3081	898.9	23.5	-1.4	8	68
9/19/96	12:14:52	8	1	1	1	886	2990	899	22.27	-1.3	7.7	68
9/19/96	12:23:16	8	1	1	1	860	2905	898.5	21.12	-1.3	8.1	70
9/19/96	12:30:12	8	1	1	1	836	2827	898.4	20.2	-1.4	7.9	72
9/19/96	12:38:10	8	1	1	0	815	2762	898.4	19.11	-1.3	8	71
9/19/96	12:44:22	8	1	1	0	762	2588	898.3	16.89	-1.3	8.1	71
9/19/96	12:53:20	8	1	1	0	689	2347	898.6	14.25	-1.3	8.1	71
9/19/96	13:03:04	8	1	0	0	618	2112	897.9	11.97	-1.3	8	72
9/19/96	13:11:48	8	1	0	0	528	1811	897.8	9.75	-1.3	8	74
9/19/96	13:29:52	6	1	1	1	799	2708	721.9	17.94	-1.3	8	73
9/19/96	13:35:06	6	1	1	1	772	2619	721.7	16.94	-1.3	8	73
9/19/96	13:43:55	6	1	1	0	706	2405	722.1	14.67	-1.3	8	72
9/19/96	13:51:06	6	1	1	0	628	2146	721.2	11.41	-1.2	8.1	72
9/19/96	13:58:45	6	1	0	0	541	1856	722.1	8.78	-1.2	8	72
9/19/96	14:06:12	6	1	0	0	436	1501	721.4	6.48	-1.3	8.1	72
9/19/96	14:14:43	6	1	0	0	296	1027	721.4	4.37	-1.3	8.1	72
9/19/96	12:05:57	8	1	1	1	915	3081	898.9	23.5	-1.4	8	68
9/19/96	13:22:40	7	1	1	1	828	2802	817.2	19.25	-1.3	8	72
9/19/96	13:43:55	6	1	1	0	706	2405	722.1	14.67	-1.3	8	72
9/19/96	14:23:29	5	1	0	0	588	2013	643.2	9.91	-1.3	8.1	72
9/19/96	14:28:33	4	1	0	0	508	1744	559.2	7.42	-1.3	8.2	72
9/19/96	14:37:34	3	1	0	0	431	1484	485.6	5.46	-1.3	8.1	72
9/19/96	14:48:26	2	1	0	0	287	994	330.7	2.59	-1.3	8.1	71
9/19/96	14:56:26	1	1	0	0	190	664	253.1	1.31	-1.3	8.1	71
9/19/96	15:08:40	1	0	0	0	5	17	253.9	0.4	-1.3	8.1	71
9/19/96	15:23:31	0	0	0	0	4	14	194.6	0.28	-1.3	8.1	71

AIR TEMP	BAROM P	AirFlo DifP	Fan HP	Digital	R.Hmid	HC PPM	CO PPM	CO2 %	NOxPPM	O2%	HORSE P	GAS SCF
90	30.4	7.32	231.7	0	82	68	435	6.2	1447	12.6	4500	0
89	30.4	6.51	231.7	0	82	65	393	6.2	1452	12.7	4250	0
96	30.4	5.71	231.7	0	82	64	399	6.2	1423	12.6	4000	0
95	30.4	5.18	231.6	0	82	63	410	6.3	1408	12.6	3800	0
98	30.4	4.55	231.5	0	82	62	438	6.4	1369	12.4	3600	0
95	30.4	4.05	187.5	0	82	61	459	6.4	1317	12.5	3400	0
94	30.4	3.79	187.5	0	82	60	186	5.8	1276	13.3	3000	0
90	30.4	4.02	187.6	0	82	58	55	4.7	1139	14.8	2500	0
89	30.4	4.16	144.4	0	82	59	45	3.8	938	16	2000	0
86	30.4	4.38	144.4	0	82	58	53	2.9	734	17.1	1500	0
84	30.4	3.77	110.8	0	82	71	953	6	1470	13	3200	0
86	30.4	3.19	110.9	0	82	67	950	6.1	1461	12.8	3000	0
89	30.4	2.03	76.5	0	82	67	1077	6.6	1333	12.1	2500	0
87	30.4	2.23	76.4	0	82	61	87	4.8	1295	14.5	2000	0
84	30.4	2.41	67.9	0	82	58	40	3.5	1016	16.3	1500	0
87	30.4	2.57	68	0	82	58	46	2.4	686	17.7	1000	0
80	30.4	2.6	68.4	0	82	57	59	1.5	396	19	500	0
89	30.4	6.51	231.7	0	82	65	393	6.2	1452	12.7	4250	0
89	30.4	4.26	185.5	0	82	70	543	6.1	1463	12.8	3500	0
89	30.4	2.03	76.5	0	82	67	1077	6.6	1333	12.1	2500	0
80	30.4	1.73	32.5	0	82	59	79	4.7	1368	14.7	1725	0
81	30.4	1.28	27.3	0	82	59	45	4.1	1315	15.5	1290	0
78	30.4	0.93	23.1	0	82	60	32	3.4	1176	16.4	935	0
77	30.4	0.38	13.7	0	82	54	25	2.3	899	17.9	420	0
72	30.4	0.21	10	0	82	53	20	1.5	600	19	190	0
71	30.4	0.22	6.7	0	82	34	19	0.3	217	20.6	0	0
71	30.4	0.1	5	0	82	34	16	0.3	209	20.7	0	0

AIR SCFM	MasFlo #/	(F/A) Mea	(F/A) CAL	G/HR HC	G/HR CO	G/HR NOx	G/HP-HR (HC)	G/HP-HR (CO)	G/HP-HR (NOx)	BTU/ HP-	S.Hmid	CJCT
12226	1494.6	0.02691	0.02801	737	9605	53023	0.164	2.136	11.796	6144	82	67.6
11540	1410.6	0.02717	0.02799	665	8196	50231	0.156	1.924	11.794	6142	84.4	68.1
10722	1331.4	0.02756	0.028	628	7814	46353	0.157	1.954	11.591	6159	86.7	69
10221	1263.5	0.02753	0.02842	568	7537	43017	0.149	1.982	11.317	6158	86.7	69.8
9486	1211.9	0.02834	0.02886	528	7600	38779	0.146	2.106	10.748	6214	89	70.5
9038	1144.7	0.02783	0.02887	490	7520	36358	0.144	2.209	10.684	6223	92.6	71.2
8751	1013.9	0.02565	0.0262	473	2990	34615	0.157	0.995	11.523	6244	92.6	71.6
8988	854.4	0.02093	0.02141	477	921	32792	0.191	0.369	13.138	6336	96.3	72.3
9210	718.2	0.01725	0.01746	512	783	28191	0.255	0.39	14.046	6608	96.3	72.8
9485	585	0.01362	0.01345	528	983	24330	0.351	0.653	16.166	7186	100	73.2
8783	1073.9	0.02675	0.0274	558	15664	42205	0.174	4.896	13.193	6217	100	73.4
8087	1014.6	0.02804	0.02782	504	14351	38671	0.168	4.788	12.903	6270	100	73.4
6410	879.6	0.03037	0.02998	398	13064	27815	0.159	5.225	11.126	6506	100	73.4
6755	684.6	0.02243	0.02186	393	1142	29881	0.196	0.57	14.933	6329	100	73.4
7042	526.1	0.01673	0.01612	380	553	25033	0.253	0.368	16.678	6488	100	73.4
7252	389.4	0.01189	0.01118	432	686	18475	0.431	0.685	18.456	7200	100	73.2
7341	262.2	0.00794	0.00707	440	945	11746	0.877	1.882	23.399	9684	100	73.2
11540	1410.6	0.02717	0.02799	665	8196	50231	0.156	1.924	11.794	6142	84.4	68.1
9320	1153.1	0.02755	0.02764	568	9385	44032	0.162	2.682	12.584	6103	100	73.4
6410	879.6	0.03037	0.02998	398	13064	27815	0.159	5.225	11.126	6506	100	73.4
5988	594.6	0.02208	0.02142	337	920	27866	0.196	0.534	16.182	6387	96.3	73
5146	445.1	0.01922	0.01878	289	450	23372	0.224	0.348	18.104	6388	96.3	72.8
4399	327	0.01636	0.01567	252	274	18800	0.269	0.293	20.086	6475	96.3	72.6
2814	156	0.01211	0.01072	165	156	10255	0.394	0.371	24.417	6845	96.3	72.3
2102	78.6	0.00849	0.00705	125	96	5425	0.663	0.509	28.705	7729	96.3	72.1
2153	24.5	0.00252	0.00144	124	141	3068	0	0	0	0	92.6	71.9
1451	17.9	0.00274	0.00144	91	87	2163	0	0	0	0	92.6	71.7