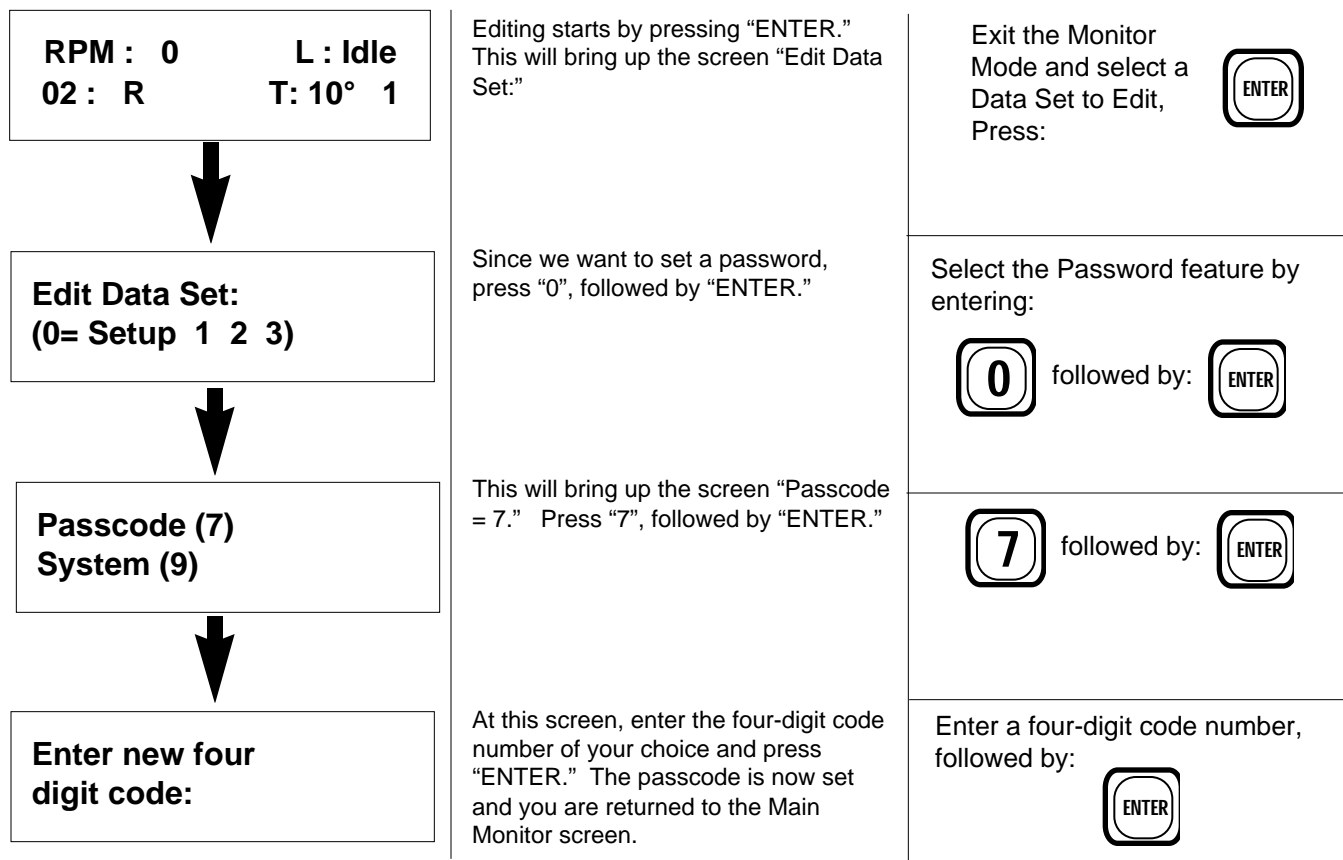


Appendix A - Using the Passcode Feature

The PMS incorporates a Passcode feature, for those who wish to use it, so that data sets cannot be edited or switched until after a four-digit Passcode, of your choosing, is entered.

An example of why you might want to use this feature would be where you are in a competition situation where some of the other competitors are also familiar with the PMS. Without passcode protection they could use your data terminal (or theirs!) to alter your Fuel and Timing tables to make you less competitive, or even damage your engine.

To activate and use the Passcode feature, start the engine and begin like you are going to edit a data set. **The engine must be running to activate or modify the passcode.** When the engine is started the PMS automatically enters the Main Monitoring mode. Then:



With the passcode set, whenever anyone tries to select from the "Edit Data Set" or "Toggle to Data Set:" menus, a screen will appear asking them to enter the four-digit passcode. If the correct passcode is entered, the PMS will allow the selected operation. But if the correct passcode is not entered, the PMS returns to the "Edit Data Set" or "Toggle to Data Set" screen and will not allow editing.

To cancel a previously-set password and disable the feature, enter passcode "0000."

Appendix B - Self Diagnostics

The PMS includes onboard diagnostics, not only for itself but for many of your vehicle's most important sensors and outputs. When the PMS detects a problem, it generates a Trouble Code which can be displayed on the terminal screen. Trouble Codes are accessed through the Accessory Monitor screen. Note: Trouble Codes are not stored, so they are erased when the ignition key is turned "OFF".

RPM : 0	L : Idle*
02 : L	T: 0° 1

An asterisk (*) in the upper right corner of the Main Monitor screen indicates a Trouble Code is present. To view the code, press Quick Key III to bring up the Accessory Monitor Mode screen.

Press Quick Key III:



MP : -21.3	N₂O: Off
ACC: 00	E: XXXX

The Trouble Code value, denoted here by "XXXX" will appear in the lower right of this screen. Write the code down, since it will be erased when the key is turned OFF. The Trouble Code may also be viewed on the "Select from menu" screen during editing.

Press Quick Key I:



To return to the Main Monitor Mode

Each of the four Trouble Code digits covers four possible problems, or faults, for a total of 16. However, each of the four problems for a given digit may or may not be present, or occur in any combination. Thus, each of the digits in the Trouble Code must allow for the 16 ways that the four faults may occur.

For Each Digit:	First Digit Problems:	Second Digit Problems:
1 = Problem #1 2 = Problem #2 3 = Problems #1 & #2 4 = Problem #3 5 = Problems #1 & #3 6 = Problem #2 & #3 7 = Problems #1, #2, & #3 8 = Problem #4 9 = Problems #1 & #4 A = Problems #2 & #4 B = Problems #1, #2, & #4 C = Problems #3 & #4 D = Problems #1, #3, & #4 E = Problems #2, #3, & #4 F = Problems #1, #2, #3, & #4	#1 = Missing MAP Signal #2 = Missing Mass Air Signal #3 = Missing Water Temp Signal #4 = Missing TPS Signal	#1 = Spark input fault #2 = Spark output fault #3 = Fuel injector input fault #4 = Fuel injector output fault
	Third Digit Problems:	Fourth Digit Problems:
	#1 = False interrupt #2 = False reset (or low voltage) #3 = High speed input problem #4 = High speed output problem	#1 = Stack overflow #2 = Invalid EPROM checksum #3 = Invalid EEPROM checksum #4 = RAM (memory) problem

For example, consider Trouble Code "0300". Since the first, third and fourth digits are zero, none of the problems associated with those digits is present (see table). Looking at the table, a "3" in the second position means that Problems # 1 and # 2 are present.

These problems are spark input fault and spark output fault. The most likely cause of this combination of faults is a loose or disconnected distributor harness connector. Remember, Trouble Codes are erased when the key is turned to "OFF".

Appendix C - Boost Set-Up Procedure

1. This procedure is used to help the Boost Control understand the different requirements that your turbo wastegate will have in controlling boost from the lowest to the highest setting. It is **very important that your wastegate be in good mechanical condition and able to maintain the minimum boost over the higher rpm band.**

2. Testing for Minimum Boost (to do this procedure, you need a clear stretch of road where you may perform the tests unimpeded and without danger):

After the PMS is installed test drive the car in third or fourth gear from 3000 to 7000 RPM; the boost should maintain a constant pressure within 2-3 psi. Record this pressure, as it will be used later in the boost test drive procedure. When you have finished and recorded this data, reconnect the boost control solenoid.

If your boost starts out low and climbs with RPM (which is called boost creep) it indicates that you have a wastegate that is too small for the turbo; this needs to be corrected before the boost control setup can be continued. You can also use the manual boost setup procedure if you have boost creep. (See Manual Boost Setup, Menu Item 900, Performance Options, page 25)

3. Boost setup must be done in Data Set 3 because it is tuned for the highest boost pressure. If your car is running more than 18 psi boost make sure you have tuned the fuel and timing tables, including the fuel cut-off limit, for the higher boost. The boost control system will readjust the wastegate control as you drive; the purpose of this setup is to get the system close to the target for the different pressures.
4. With the car warmed up and in a safe place for test driving, setup the boost by doing the following procedure. Begin by starting the engine. Then:

RPM : 0 L : Idle
02 : R T: 0° 2



Edit data set:
(0=setup 1 2 3)



Select from
menu:





Press "ENTER".

This will bring up the "Edit Data Set" screen. Boost setup must be done in Data Set 3, so press "3-Enter."

The brings up the "Select from menu" screen. Enter "9-0-0" for the Performance Options menu.

Press: 

Press: 

Press:   
Followed by: 

Boost:
(0 = no 1 = yes) **Y**


We want Boost Control "On," so press "1" followed by "Enter."

Press: 

B Table Lmt
(1 - 31 psi) **17**

The next screen is "Boost Table Limit."
If not at 17 psi, press "1-7," followed by "Enter." If it is at 17psi, press "Enter" only.

Press:  

Followed by: 


OR



B Fuel Cut
(1 - 31 psi) **17**

"Boost Fuel Cut" is the next screen.
The value set here is a hard fuel cut, programmed to cut the fuel if the designated boost pressure is exceeded for more than 3 seconds. Set it at 22 psi.


Press:  

Followed by: 

Do Boost Control Setup? (1=Yes)

The next screen is "Do Boost Control?"
Answer "Yes" by entering "1" followed by "ENTER."


Press: 

Followed by: 

Test Drive...
12 PSI (Diagnostic info)

When "ENTER" is pressed, the next screen will be displayed; at this point enter the low boost pressure that was found during the test drive. For example assume the low boost attained was 12 psi. Press "1-2," followed by "ENTER." This will bring up the "High Boost" screen. Don't do anything with it yet.

Press:  

Followed by: 

At this point repeat the test drive, accelerating from 3000 to 7000 RPM in third or fourth gear at WOT, until the boost is close to 12 psi. This will usually take four to five runs of five seconds each. After the test drive return to idle (leave the engine running) and proceed:

High Boost
(14...18PSI)

After the test drive enter the high boost desired. (**Note:** This doesn't have to be the highest possible boost, just the maximum amount you can safely run. 15-17 psi works best in most applications.) Enter the High Boost. This will bring up the "OK to finish curve" screen.

Press:  

Followed by: 

OK to finish curve? (1=Yes)

Repeat the test drive; if boost holds within 2-3 psi, press "1," followed by "ENTER."

Press:  

If boost held during the test drive the boost profile is now setup and it will continue to refine the boost as you drive. If it **did not** hold within 2-3 psi, repeat the Boost Setup procedure or proceed with manual boost adjustment.

Appendix D - Frequently Asked Questions About the PMS

- Q.** How do I check the air/fuel ratio to see if it is rich or lean?
- A.** The O₂ voltage displayed on Monitor Screen 2 is a good general indication of mixture. A value between .62 and .82 at WOT is about right. However, if the engine has a misfire the O₂ numbers will not be accurate because of the unburned fuel.
- Q.** At idle or part throttle the O₂ voltage varies; why is this happening?
- A.** This is a result of the system operating in the closed loop mode. The ECU is trying to maintain a 14.7:1 air/fuel ratio. It adjusts the mixture 30 times a second, and what you are seeing is the result of this mixture change as reflected in the O₂ voltage readings.
- Q.** If I add fuel during idle or part throttle it just seems to relearn it; why?
- A.** This again is closed loop in operation. The stock computer has a window of about $\pm 20\%$ fuel that it can adjust in. Any adjustment you make that falls within this window will be changed by the stock computer in an effort to maintain the 14.7:1 ratio. Adjustments made here should be in an attempt to cause the computer to go closed loop for optimum fuel mileage and emissions.
- Q.** Will it relearn at WOT too?
- A.** No. Any adjustments made at high load or WOT will be added to the total. This is what's known as open loop. You will notice the O₂ voltage fluctuates more slowly under these conditions.
- Q.** Will the settings be lost if I disconnect the battery?
- A.** No, the PMS stores your program in a special chip that doesn't lose its memory when the power is removed.
- Q.** I moved the battery from its original location. Now I get error code 0020 at startup.
- A.** When you moved your battery you changed the power and ground paths; sometimes this causes a voltage drop. That's what the 0020 code is indicating. You can help this by adding a 12# wire from the positive battery terminal to the ECU relay's 12V source. This code doesn't cause any problems except during starting.
- Q.** Sometimes I get 0200 code but my car runs fine. What should I do?
- A.** In an effort to check all systems the PMS ECU counts incoming sparks versus outgoing sparks and sometimes, either because of multi - spark ignition or leaky plug wires, it counts an extra spark. This usually doesn't cause a problem.
- Q.** The PMS permits adjustments at 2000, 4000, 6000, and 7800 rpm. What happens in between these points?
- A.** The PMS software averages the difference between adjacent set points. Example: 2000 rpm = 10%, 4000 rpm = 20%. At 3000 rpm it would be half way between 2000 and 4000, so the adjustment would be 15%. The same averaging is used between LLoad, MLoad, HLoad.

Appendix E - Data Table Worksheets

These worksheets are for your convenience in modifying the PMS data tables and keeping a record of what you have done.

Data Set No. 1 -

Idle Fuel Adjustment ($\pm 2\%$ Steps)

Part Throttle Fuel Adjustment ($\pm 2\%$ Steps)				
RPM	2000	4000	6000	7800
Light Load				
Med. Load				
High Load				

Part Throttle Timing Adjustment ($\pm 1^\circ$ Steps)				
RPM	2000	4000	6000	7800
Light Load				
Med. Load				
High Load				

Wide-Open Throttle (WOT) Fuel Adjustment ($\pm 2\%$ Steps)				
RPM	2000	4000	6000	7800
High Load				

Wide-Open Throttle (WOT) Timing Adjustment ($\pm 1^\circ$ Steps)				
RPM	2000	4000	6000	7800
High Load				

Boost Fuel Adjustment ($\pm 2\%$ Steps)				
RPM	2000	4000	6000	7800
1 psi Boost				
Boost Table Limit				

Boost Timing Adjustment ($\pm 1^\circ$ Steps)				
RPM	2000	4000	6000	7800
1 psi Boost				
Boost Table Limit				

Nitrous Oxide Fuel Adjustment ($\pm 2\%$ Steps)				
RPM	2000	4000	6000	7800
N ₂ O On				

Nitrous Oxide Timing Adjustment ($\pm 1^\circ$ Steps)				
RPM	2000	4000	6000	7800
N ₂ O On				

Boost Feature	
ON <input type="checkbox"/>	Maximum Boost psig
OFF <input type="checkbox"/>	

Rev Limiter Feature	
ON <input type="checkbox"/>	Maximum RPM rpm
OFF <input type="checkbox"/>	

N ₂ O Feature	
ON <input type="checkbox"/>	Maximum Boost psig
OFF <input type="checkbox"/>	

Acc.Switches No. 1 No. 2	
ON <input type="checkbox"/>	ON <input type="checkbox"/>
OFF <input type="checkbox"/>	OFF <input type="checkbox"/>

Appendix E - Data Table Worksheets

Data Set No. 2 -

Idle Fuel Adjustment (± 2% Steps)

Part Throttle Fuel Adjustment (± 2% Steps)				
RPM	2000	4000	6000	7800
Light Load				
Med. Load				
High Load				

Part Throttle Timing Adjustment (± 1° Steps)				
RPM	2000	4000	6000	7800
Light Load				
Med. Load				
High Load				

Wide-Open Throttle (WOT) Fuel Adjustment (± 2% Steps)				
RPM	2000	4000	6000	7800
High Load				

Wide-Open Throttle (WOT) Timing Adjustment (± 1° Steps)				
RPM	2000	4000	6000	7800
High Load				

Boost Fuel Adjustment (± 2% Steps)				
RPM	2000	4000	6000	7800
1 psi Boost				
Boost Table Limit				

Boost Timing Adjustment (± 1° Steps)				
RPM	2000	4000	6000	7800
1 psi Boost				
Boost Table Limit				

Nitrous Oxide Fuel Adjustment (± 2% Steps)				
RPM	2000	4000	6000	7800
N ₂ O On				

Nitrous Oxide Timing Adjustment (± 1° Steps)				
RPM	2000	4000	6000	7800
N ₂ O On				

Boost Feature	
ON <input type="checkbox"/>	Maximum Boost
OFF <input type="checkbox"/>	psig

Rev Limiter Feature	
ON <input type="checkbox"/>	Maximum RPM
OFF <input type="checkbox"/>	rpm

N ₂ O Feature	
ON <input type="checkbox"/>	Maximum Boost
OFF <input type="checkbox"/>	psig

Acc.Switches No. 1 No. 2	
ON <input type="checkbox"/>	ON <input type="checkbox"/>
OFF <input type="checkbox"/>	OFF <input type="checkbox"/>

Appendix E - Data Table Worksheets

Data Set No. 3 -

Idle Fuel Adjustment ($\pm 2\%$ Steps)

Part Throttle Fuel Adjustment ($\pm 2\%$ Steps)				
RPM	2000	4000	6000	7800
Light Load				
Med. Load				
High Load				

Part Throttle Timing Adjustment ($\pm 1^\circ$ Steps)				
RPM	2000	4000	6000	7800
Light Load				
Med. Load				
High Load				

Wide-Open Throttle (WOT) Fuel Adjustment ($\pm 2\%$ Steps)				
RPM	2000	4000	6000	7800
High Load				

Wide-Open Throttle (WOT) Timing Adjustment ($\pm 1^\circ$ Steps)				
RPM	2000	4000	6000	7800
High Load				

Boost Fuel Adjustment ($\pm 2\%$ Steps)				
RPM	2000	4000	6000	7800
1 psi Boost				
Boost Table Limit				

Boost Timing Adjustment ($\pm 1^\circ$ Steps)				
RPM	2000	4000	6000	7800
1 psi Boost				
Boost Table Limit				

Nitrous Oxide Fuel Adjustment ($\pm 2\%$ Steps)				
RPM	2000	4000	6000	7800
N ₂ O On				

Nitrous Oxide Timing Adjustment ($\pm 1^\circ$ Steps)				
RPM	2000	4000	6000	7800
N ₂ O On				

Boost Feature	
ON <input type="checkbox"/>	Maximum Boost
OFF <input type="checkbox"/>	psig

Rev Limiter Feature	
ON <input type="checkbox"/>	Maximum RPM
OFF <input type="checkbox"/>	rpm

N ₂ O Feature	
ON <input type="checkbox"/>	Maximum Boost
OFF <input type="checkbox"/>	psig

Acc.Switches No. 1 No. 2	
ON <input type="checkbox"/>	ON <input type="checkbox"/>
OFF <input type="checkbox"/>	OFF <input type="checkbox"/>