State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-228
Relating to Exemptions Under Section 27156
of the Vehicle Code

AUTOTHORITY PERFORMANCE ENGINEERING
PERFORMANCE CHIP

Pursuant to the authority vested in the Air Resources Board ("ARB") by Section 27156 of the Vehicle Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-45-5;

IT IS ORDERED AND RESOLVED: That the installation of the performance chip manufactured by AutoThority Performance Engineering ("performance chip") has been found not to reduce the effectiveness of required motor vehicle pollution control devices and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for those applications listed in Exhibit A, which is attached hereto and incorporated herein.

This Executive Order is valid provided that installation instructions for this performance chip will not recommend tuning the vehicle to specifications different from those submitted by the device manufacturer.

Changes made to the design or operating conditions of the device, as exempted by the ARB, that adversely affect the performance of a vehicle's pollution control system shall invalidate this Executive Order.

Marketing of this device using an identification other than that shown in this Executive Order or marketing of this device for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board. Exemption of a kit shall not be construed as an exemption to sell, offer for sale, or advertise any component of a kit as an individual device.

This Executive Order does not constitute any opinion as to the effect the use of this device may have on any warranty either expressed or implied by the vehicle manufacturer.

This Executive Order is granted based on results from emissions tests conducted in accordance with Cold-Start CVS-75 Federal Test Procedure. However, the ARB finds that reasonable grounds exist to believe that use of the performance chip may adversely affect emissions of motor vehicles when operating under conditions outside the parameters of the previously prescribed test procedures. Accordingly, the ARB reserves the right to conduct additional emission tests, in the future, as such tests are developed, that will more adequately measure emissions from all cycle phases. If such test results demonstrate that the performance chip adversely affects emissions during off-cycle conditions (defined as those conditions which are beyond the parameters of the Cold-Start CVS-75 Federal Test Procedure), this Executive Order shall be effectively rescinded as of the date the test results are validated. Further, if such test results or

other evidence provides the ARB with reason to suspect that the performance chip will affect the durability of the emission control system, AutoThority Performance Engineering shall be required to submit durability data to show that the durability of the vehicle emission control system is not, in fact, affected and/or that the add-on or modified part demonstrates adequate durability.

In addition to the foregoing, the ARB reserves the right in the future to review this Executive Order and the exemption provided herein to assure that the exempted add-on or modified part continues to meet the standards and procedures of Title 13, California Code of Regulations, Section 2222, et seq.

THIS EXECUTIVE ORDER DOES NOT CONSTITUTE A CERTIFICATION, ACCREDITATION, APPROVAL, OR ANY OTHER TYPE OF ENDORSEMENT BY THE AIR RESOURCES BOARD OF ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF AUTOTHORITY PERFORMANCE ENGINEERING'S PERFORMANCE CHIP.

No claim of any kind, such as "Approved by the Air Resources Board" may be made with respect to the action taken herein in any advertising or other oral or written communication.

Section 17500 of the Business and Professions Code makes untrue or misleading advertising unlawful, and Section 17534 makes violation punishable as a misdemeanor.

Section 43644 of the Health and Safety Code provides as follows:

> "43644, (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the state board for certification of a device, represent, any device as a motor vehicle pollution control device for use on any used motor vehicle unless that device has been certified by the state board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as a certified device which, in fact, is not a certified device. Any violation of this subdivision is a misdemeanor."

Any apparent violation of the conditions of this Executive Order may result in its rescission or submission to the Attorney General of California for such action as he deems advisable.

Executed at El Monte, California, this 25th day of July, 1991.

R. B. Summerfield
Assistant Division Chief
Mobile Source Division

Exhibit A

PERFORMANCE SOFTWARE APPLICATION LISTING

PART NUMBER	DESCRIPTION
PORSCHE:	
911.020.100.20	'84 TO '87 911 PERF. SOFTWARE
911.020.200.20	'88 TO '89 911 PERF. SOFTWARE
928.020.100.20	'85 & '86 928S 32 VALVE PERF. SOFT
928.020.200.20	'87 TO '90 928S4 PERF. SOFTWARE
944.020.100.20	'83 TO '85 944 PERF. CONVERSION
944.020.150.20	EARLY '85 ONLY, W/PLUG IN CHIP
944.020.200.20	'85/2 TO '87 944 PERF SOFTWARE
944.020.300.20	'88 944 PERFORMANCE SOFTWARE
944.020.350.20	'89 944 PERFORMANCE SOFTWARE
944.020.400.20	'87-'88 944S PERF. SOFTWARE
944.020.500.20	'89-> 944S2 PERFORMANCE SOFTWARE
951.020.100.20	'86-'87 944T STAGE 1C CHIP
951.020.105.20	'86-'87 944T STAGE 1 KIT
951.020.110.20	1988 944T STAGE 1C CHIP
951.020.115.20	1988 944T STAGE 1 KIT
951.020.130.20	'88-'89 TURBO S STAGE 1C CHIP
951.020.135.20	'88-'89 TURBO S STAGE 1 KIT
951.020.300.20	'88-'89 TURBO S STAGE 2 KIT
964.020.100.20	'89-'90 CARRERA 2/4 SOFTWARE
BMW:	
12.14.1.250.100	'84-'87, 325e/528e PERF. SOFTWARE
12.14.1.240.100	'82-'84 "e" W/BRAIN CONVERSION
12.14.1.280.100	'88 325e/528e PERF. SOFTWARE
12.14.1.255.100	'87-'88, 325i,iS,iX PERF. SOFTWARE
12.14.1.259.100	'89-'90, 325i,iS,iX/525 PERF. SOFT
12.14.1.300.100	'87-'89 M3 PERFORMANCE SOFTWARE
12.14.1.330.100	'82-'84, 5/6/733i WITH PLUG-IN CHIP
12.14.1.335.100	'82-'84, 5/6/733i WITH CONVERSION
12.14.1.350.100	'85-'88 535i, '85-87 635CSi/735i
12.14.1.355.100	'89-'90 535i, '88-90 635CSi/735i
12.14.1.400.100	'85-'86, EUROPEAN M5/M6 PERF. SOFT.
12.14.1.500.100	'87-'89, M5/M6 PERFORMANCE SOFTWARE
12.14.1.550.100	'90 M5 PERFORMANCE SOFTWARE
VOLKSWAGEN:	
037.020.100	'90-'91 CORRADO STAGE 1 PERF. SOFT.

State of California
AIR RESOURCES BOARD

EVALUATION OF AUTOTHORITY PERFORMANCE ENGINEERING'S PERFORMANCE CHIP FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE CALIFORNIA CODE OF REGULATIONS

July 1991

State of California
AIR RESOURCES BOARD

EVALUATION OF AUTOTHORITY PERFORMANCE ENGINEERING'S PERFORMANCE CHIP FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE CALIFORNIA CODE OF REGULATIONS

by

Mobile Source Division
State of California
Air Resources Board
9528 Telstar Avenue
El Monte, CA 91731-2990

SUMMARY

AutoThority Performance Engineering has applied for an exemption from the prohibitions of Vehicle Code Section 27156 for their Performance Chip for installation on those model/model year BMWs, Porsches, and Volkswagens listed in Appendix A. AutoThority has submitted a completed application and all the required information, as well as exhaust emissions test data performed at Environmental Research & Development, Corp. and Milton Roy Company which show that the Performance Chip does not have any adverse effect on the exhaust emissions of the affected vehicles.

Based on the submitted information and the results of the emissions tests performed at Environmental Research & Development, Corp. and Milton Roy Company, the staff concludes that the installation of AutoThority Performance Chip will not adversely affect exhaust emissions on the specified vehicles.

The staff recommends AutoThority Performance Engineering be granted an exemption as requested and that Executive Order D-228 be issued.

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EVALUATION OF AUTOTHORITY PERFORMANCE ENGINEERING'S PERFORMANCE CHIP FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE CALIFORNIA CODE OF REGULATIONS

I. INTRODUCTION

AutoThority Performance Engineering of 3763 Pickett Rd., Fairfax, VA 22031, has applied for an exemption from the prohibitions of Vehicle Code Section 27156 for their Performance Chip for installation on those model/model year BMWs, Porsches, and Volkswagens listed in Appendix A.

AutoThority has submitted a completed application and all the required information, as well as exhaust emissions test data performed at Environmental Research & Development, Corp. on a 1988 Porsche 928S4 and at Milton Roy Company on a 1986 BMW 325e.

II. CONCLUSIONS

Based on the submitted information and the results from exhaust emissions test performed at Environmental Research & Development Corp. and Milton Roy Company, the staff concludes that AutoThority's performance chips will not adversely affect exhaust emissions from vehicles for which the exemption is requested.

III. RECOMMENDATION

The staff recommends that AutoThority Performance Engineering be granted an exemption as requested and that Executive Order D-228 be issued.

IV. PERFORMANCE CHIP DESCRIPTION

Many computer controlled vehicles are equipped with an electronic control unit (ECU) which is programmed using a prom. Signals detected by the vehicle's sensors are fed directly into the ECU where they are analyzed and compared to the operational data programmed inside the prom. The prom

sends out appropriate adjustments in the engine operation in response to any changing conditions. For example, a prom will adjust timing and fuel delivery when a vehicle is subjected to additional load. Thus, by modifying data in the prom, spark timing, fuel delivery and rev-limit can be adjusted.

AutoThority Performance Chip modifies the ignition advances, fuel curves and rev-limit of the original equipment manufacturer's (OEM) prom under full throttle and part-throttle operation. Therefore, the performance chip monitors and modifies the vehicle's operation, both under closed-loop and open-loop modes. AutoThority claims these modifications increase torque and horsepower throughout the whole RPM range. By fine tuning the part-throttle operation, throttle response and driveability, under normal day-to-day driving conditions, are improved. The manufacturer also claims that modifications to the full-throttle operation offer end-users with maximum vehicle performance and acceleration. AutoThority recommends use of "premium fuel only" for optimum performance. Installation instructions, included with the chip, shows the installer how to properly install the chip. Appendix B shows the installation instructions.

V. DISCUSSION OF THE PERFORMANCE CHIP

Two test vehicles were used to evaluate the effect of the Performance Chip on tailpipe emissions. The first vehicle, a 1988 Porsche 928S4, was selected because it showed the greatest increase in rear wheel horsepower due to its large engine displacement. The second vehicle, a 1986 BMW 325e was chosen due to its California popularity. The test program consisted of one FTP CVS-75 (cold start) test on the test vehicles in the baseline configuration followed by another FTP CVS-75 test in the modified

configuration. The results of the exhaust emissions test performed at Environmental Research & Development, Corp. and Milton Roy Company are shown in Table 1.

Table 1

Exhaust Emissions Test Results from
Environmental Research & Development, Corp.
On The Porsche 928S4

	Exhaust Emissions (gm/mi)		
Test Mode	HC	CO	NOx
Baseline	0.408	3.711	0.402
Device	0.400	3.568	0.408
Difference	-0.008	-0.143	0.006

Exhaust Emissions Test Results from
Milton Roy Company On The BMW 325e

	Exhaust Emissions (gm/mi)		
Test Mode	HC	CO	NOx
Baseline	0.240	5.122	1.217
Device	0.289	5.880	1.246
Difference	0.049	0.758	0.029

The emissions test results at Environmental Research & Development, Corp. and Milton Roy Company indicate that exhaust emissions of the vehicles with the AutoThority Performance Chip installed are well below the allowable difference of .1 g/mi HC, 1.0 g/mi CO, and .1 g/mi NOx. This demonstrates that the installation of the AutoThority Performance Chip on the applicable vehicles will not adversely affect the exhaust emissions.

AutoThority submitted all the required information and fulfilled the requirements for an exemption.

APPENDIX A

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12.14.1.259.100	'89-'90, 325i,iS,iX/525 PERF. SOFT
12.14.1.300.100	'87-'89 M3 PERFORMANCE SOFTWARE
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12.14.1.500.100	'87-'89, M5/M6 PERFORMANCE SOFTWARE
12.14.1.550.100	'90 M5 PERFORMANCE SOFTWARE
VOLKSWAGEN:	
037.020.100	'90-'91 CORRADO STAGE 1 PERF. SOFT.

APPENDIX B

AUTOTHORITY PERFORMANCE ENGINEERING
PERFORMANCE SOFTWARE INSTALLATION INSTRUCTIONS:

I. LOCATION OF CONTROL UNIT(S)

A. PORSCHE

1. 911 - UNDER DRIVER'S SEAT
2. 924S - UNDER DASH, BELOW STEERING COLUMN
3. 944, '83 TO '85 - UNDER DASH, BELOW STEERING COLUMN
4. 944, '85/2 AND LATER, 944S, 944S2, 944 TURBO - PASSENGER SIDE FLOORBOARD
5. 964 (CARRERA 2/4) - UNDER DRIVER'S SEAT

B. BMW

1. 533i, 633CSi - ABOVE GLOVE BOX
2. 733i - BEHIND RIGHT HAND PASSENGER KICK PANEL
3. ALL 325e, 325i, 325iS, 325iX, '84 AND LATER - ABOVE GLOVE BOX
4. 525 - IN COMPARTMENT UNDER HOOD, PASSENGER SIDE AT FIREWALL
5. 535i,635CSi,735i, UP TO '88 - ABOVE GLOVE BOX
6. 535i, 635CSi, 735i, '89 AND LATER IN COMPARTMENT UNDER HOOD, PASSENGER SIDE AT FIREWALL
7. M3, M5, M6 - ABOVE GLOVE BOX

II. TYPE OF CONTROL UNIT(S)

A. PORSCHE

1. 911 - TYPE 2
2. 924S - TYPE 2
3. 944, '83 TO '85 - TYPE 1
4. 944, '85/2 AND LATER - TYPE 2
5. 944S, 944S2 - TYPE 3
6. 944 TURBO - TYPE 2 DME, TYPE 2A KLR
7. 964 (CARRERA 2/4) - TYPE 3

B. BMW

1. 533i, 633CSi, 733i - TYPE 1
2. 325e - TYPE 1
3. 325i, 325iS, 325iX - TYPE 2
4. 525 - TYPE 3
5. 535i,635CSi,735i, UP TO '88 - TYPE 2
6. 535i, 635CSi, 735i, '89 AND LATER - TYPE 3
7. M3, M5, M6 - TYPE 2

III. REMOVAL OF CONTROL UNIT(S)

A. PORSCHE

1. UNDER SEAT

Push the seat all the way back and lift up the hard plastic carpet that covers the Motronic control unit. The brain is held in place with four 10mm nuts and washers. Remove them with a small 10mm socket and ratchet. The wiring bundle is held in place with a heavy steel strap that is also held down with a 10mm washer and nut. Lift the Motronic control box up and off the studs.

2. UNDER DASH

Using a ratchet and 8MM socket, remove the brain from underneath the steering column. Note the position of the pieces attached to the brain for proper reinstallation.

3. FLOORBOARD

Peel the carpet back at the top edge. It is held up with Velcro. Underneath there is a plywood board held down with four Phillips head screws. Remove the board and note that the Velcro strips are on the top edge of the board. The frame that holds the Motronic control box is now exposed and is removed by unscrewing the lower two Phillips head screws and the upper two plastic straight blade screws. Three Phillips head screws hold the Motronic box to the frame. Note the exact location of the control box and any other control modules and unscrew the boxes. Remove the frame.

944 TURBO ONLY:

a. The KLR box, which controls boost, is the smaller box to the right of the Motronic(R) control unit. A 7 MM wrench is required to remove the hose connected to the brain.

b. Each A.P.E. Chip is designated "DME" or "KLR" at the end of the part number on the face of the chip. The "DME" chip goes in the larger control unit, the "KLR" in the smaller. Make sure the correct chip is installed in the correct control unit.

AUTOTHORITY PERFORMANCE ENGINEERING
PERFORMANCE SOFTWARE INSTALLATION INSTRUCTIONS:

B. BMW

1. ABOVE GLOVE BOX

Open the glove box. Remove the two Phillips head screws to the right and left of the screws holding the latch. The insulation and cover over the glove box should pull down and expose the control unit. Using a ratchet and 8 MM socket, remove the brain from the underside of the dash. Note the position of the bracket to the left of the box for reinstallation.

2. KICK PANEL

Remove the trim panel located under the dash and in front of the door on the passenger side to gain access to the control unit.

3. UNDER HOOD

Open the hood. The control units are in a compartment in front of the firewall on the passenger side. On some models there will be a plastic cover over the entire compartment. Remove the four screws securing the cover and lift off. Use a ratchet with a 10 MM socket and an extension to remove the two nuts securing the control unit. Lift straight up.

IV. CONNECTOR REMOVAL

A. EARLY STYLE MOTRONIC(R) UNITS - TYPE 1 & TYPE 2

Hold the control unit in one hand and press on the spring steel retaining tab that holds in the electrical connector. Remove the plug by rotating out from the box. When reinstalling, remember that this hook must be inserted first.

B. LATER STYLE MOTRONIC(R) UNITS - TYPE 3

Pull the thin metal retainer out and away from the connector. The metal piece will push the connector away from the control unit at one end. Pivot the connector out and disconnect it from the control unit.

V. OPENING THE CONTROL UNIT

A. TYPE 1 CONTROL UNITS

Remove the four Phillips screws holding the flat metal cover on the bottom of the box (the side away from the label) to gain access to the circuit boards. Remove the four screws which hold the board down and "unfold" it. On the board you have just moved you will see either five twenty-four pin chips or only two twenty-four pin chips. The five chip style requires modification, the two chip style utilizes a replaceable EPROM.

NOTE: EVEN SOME EARLY EPROM STYLE CONTROL UNITS DID NOT COME WITH A PLUG IN SOCKET FOR THEIR MEMORY CHIPS. PLEASE CONTACT A.P.E. IF YOU DO NOT HAVE A SOCKETED CHIP.

Before removing the chip, note the orientation by locating the end that has a notch in it. To remove the chip, slide a small screwdriver under the chip and carefully lift upwards, changing ends often so chip lifts out of its socket evenly.

To install your A.P.E. chip, gently press into the socket while checking that no pins are mis-aligned or bent. If you bend a pin, simply remove the chip, straighten the bent pin(s) with needle nose pliers and carefully reinstall the chip. BE SURE CHIP IS INSTALLED WITH THE NOTCHED END CORRECTLY ORIENTED.

B. TYPE 2 CONTROL UNITS

Straighten the metal tabs on the bottom of the box. Remove the cover.

EXTREME CARE IS REQUIRED TO SEPARATE THE TWO CIRCUIT BOARDS! At the front of the board is the wiring harness connector block. At the rear is a wire ribbon. The boards are held together at the wire ribbon end by two plastic posts which are snapped together in the middle. The best way to separate these posts is to place a small screwdriver in the slit on the post and twist while gently pulling the boards apart. You will have to use some force to separate the boards, but be careful not to pull the board too far once it comes apart or you may rip out the ribbon cable. It's best to pull at the connector, not the board itself.

After both posts are separated, lift the board up at the rear and slide it back away from the wiring harness connector block. If it is glued to the block, carefully pry the glue away from the plastic and wiggle the board

to release it. DO NOT USE A KNIFE OR RAZOR BLADE. It is possible to damage the traces on the board. Some of the boards are glued, some are not.

Open up the two boards like a book and lay them flat. Locate the memory chip on the board you have unfolded. On some vehicles, it will be held to the socket by a plastic cover which must be unsnapped first.

NOTE: SOME EARLY CONTROL UNITS DID NOT COME WITH A PLUG IN SOCKET FOR THEIR MEMORY CHIPS. PLEASE CONTACT A.P.E. IF YOU DO NOT HAVE A SOCKETED CHIP.

Before removing the chip, note the orientation by locating the end that has a notch in it. To remove the chip, slide a small screwdriver under the chip and carefully lift upwards, changing ends often so chip lifts out of its socket evenly.

To install your AutoThority chip, gently press into the socket while checking that no pins are mis-aligned or bent. If you bend a pin, simply remove the chip, straighten the bent pin(s) with needle nose pliers and carefully reinstall the chip. BE SURE CHIP IS INSTALLED WITH THE NOTCHED END CORRECTLY ORIENTED.

Slide the top board back into the wiring harness connector block. While making sure the boards line up, press the top board down until it snaps.

We do not recommend bending the tabs back on the cover. Simply place the top in place and secure with two rubber bands.

C. TYPE 2A CONTROL UNITS

These units are identical to the Type 2 units detailed above, with the exception of a plastic pin which must be pulled out of the bottom center of the box before separating the boards. Also, if you have an '86 or '87 944 Turbo where the two chips are identical in configuration, mark each chip or record their part numbers so you will know which is which.

D. TYPE 3 CONTROL UNITS

Straighten the metal tabs on the bottom of the box. Remove the cover.

NOTE: SOME LATE STYLE BRAINS ARE OF A SINGLE BOARD DESIGN. IF YOU HAVE THIS TYPE, CONTINUE WITH STEP "VI".

One or two small screwdrivers are needed to release the top board for access to the Chip. First, you will separate the boards at the end away from the connector, and then you will unhook the top board from the connector block.

EXTREME CARE IS REQUIRED TO SEPARATE THE TWO CIRCUIT BOARDS! At the front of the board is the wiring harness connector block. At the rear is a wire ribbon. The boards are held together at the wire ribbon end by two plastic posts which are snapped together in the middle. The best way to separate these posts is to place a small screwdriver in the slit on the post and twist while gently pulling the boards apart. You will have to use some force to separate the boards, but be careful not to pull the board too far once it comes apart or you may rip out the ribbon cable. Apply force to the plastic strip attached to the cable, not the circuit board.

Looking at the connector on the control unit, you will see two locking tabs on either side of the top row of pins. While gently spreading the boards apart, (lifting at the rear) unclip the locking tabs. With the boards pulled apart at the opposite end, the tabs should stay unlocked. Carefully pry the plastic lip above the row of pins down, and, when clear, pull the board back and away from the connector block.

Open up the two boards like a book and lay them flat. Locate the memory chip on the board you have unfolded. On some vehicles, it will be held to the socket by a plastic cover which must be unsnapped first.

VI. CHIP REMOVAL AND INSTALLATION

A. LOCATING THE MEMORY CHIP

On all units discussed here, the chip will be on the circuit board that has been unfolded from the control unit. On some vehicles, the chip will be held to the socket with a plastic cover which must first be unsnapped. There will only be one socketed chip per unit, and it will have a silver/gray label with black numbers, usually starting with "126735____". If you have any questions, do not hesitate to call for assistance.

NOTE: SOME EARLY CONTROL UNITS DID NOT COME WITH A PLUG IN SOCKET FOR THEIR MEMORY CHIPS. PLEASE CONTACT A.P.E. IF YOU DO NOT HAVE A SOCKETED CHIP.

B. CHIP REMOVAL

EPROMS are static sensitive devices. Although ground straps and other protective devices are not a necessity to perform your chip installation, do try to avoid high static conditions and touching the chip by the pins.

Before removing the chip, note the orientation by locating the end that has a notch in it. To remove the chip, slide a small screwdriver under the chip and carefully lift upwards, changing ends often so chip lifts out of its socket evenly.

C. CHIP INSTALLATION

To install your A.P.E. chip, gently press it into the socket while checking that no pins are mis-aligned or bent. If you bend a pin, simply remove the chip, straighten the bent pin(s) with needle nose pliers and carefully reinstall the chip. **BE SURE CHIP IS INSTALLED WITH THE NOTCHED END CORRECTLY ORIENTED.**

D. CLOSING AND SECURING THE CONTROL UNIT

Reverse the opening instructions above, making sure that all circuit boards are snapped firmly into place. We do not recommend bending the tabs back on the cover (Style 2/3 units). Simply place the top in place and secure with rubber bands.

VI. AFTER INSTALLATION

A. CHIP STORAGE

Store your original chip in a safe place using the anti-static foam that came with your A.P.E. chip.

B. ENGINE SET-UP

Basic idle and fuel mixtures should be checked to make sure they are within factory specifications. Also make sure oxygen sensor is connected. The A.P.E. chip is designed to work with all emissions controls in place, and in conjunction with normal engine settings.