

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-140-14
Relating to Exemptions under Section 27156
of the Vehicle Code

SPEARCO PERFORMANCE PRODUCTS, INC.
"TURBOCHARGER KIT
(INCLUDING AN OPTIONAL INTERCOOLER)
FOR 2.8 LITER TOYOTA SUPRA AND CRESSIDA VEHICLES"

Pursuant to the authority vested in the Air Resources Board 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 add-on turbocharger kit (using a 0.98 A/R ratio Ishikawajima-Harima Heavy Industries turbocharger), with an optional intercooler, manufactured by Spearco Performance Products, Inc., of 7541 Woodman Place, Van Nuys, California 91405, 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 the following Toyota vehicles with a 2.8 liter (168 CID) fuel injected six-cylinder engine:

<u>Turbo Kit No.</u>	<u>Vehicle Models</u>
9898	1982 Supra
9899	1983 Supra
9900	1983 Cressida
9909 (intercooled)	1982-1984 Supra
9910 (intercooled)	1983-1984 Cressida
9909-A (intercooled)	1985 Supra and Cressida
9909-B (intercooled)	1986 Supra and Cressida

This Executive Order is valid provided that installation instructions for this device 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 Air Resources Board, 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 that the use of this device may have on any warranty either expressed or implied by the vehicle manufacturer.

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 THE SPEARCO ADD-ON TURBOCHARGER KIT FOR 2.8 LITER TOYOTA SUPRA AND CRESSIDA VEHICLES.

No claim of any kind, such as "Approved by 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 will be submitted to the Attorney General of California for such action as he deems advisable.

Executive Order D-140-4, dated November 14, 1984, is superseded and of no further force and effect.

Executed at El Monte, California, this 20th day of December, 1985.


K. D. Drachand, Chief
Mobile Source Division

STATE OF CALIFORNIA
AIR RESOURCES BOARD

EVALUATION OF SPEARCO PERFORMANCE PRODUCTS, INC.'S ADD-ON TURBOCHARGER KIT
WITH AN OPTIONAL INTERCOOLER FOR 2.8 LITER TOYOTA SUPRA AND CRESSIDA VEHICLES
FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156 IN
ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE CALIFORNIA ADMINISTRATIVE CODE.

DECEMBER, 1985

Date of Issue: December, 1985

EVALUATION OF SPEARCO PERFORMANCE PRODUCTS, INC.'S ADD-ON TURBOCHARGER KIT WITH AN OPTIONAL INTERCOOLER FOR 2.8 LITER TOYOTA SUPRA AND CRESSIDA VEHICLES FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE CALIFORNIA ADMINISTRATIVE CODE.

by

Mobile Source Division

State of California
Air Resources Board
9528 Telstar Avenue
El Monte, CA 91731

(This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.)

SUMMARY

Spearco Performance Products, Inc. of 7541 Woodman Place, Van Nuys, California 91405, has requested an update to the existing Air Resources Board's Executive Order (E.O.) No. D-140-4 which exempted six (6) Spearco turbo kits (including optional intercoolers) from the prohibitions of California Vehicle Code Section 27156 for installation on 1982 through 1985 Toyota Supra and Cressida vehicles. The applicant requested an update of the above E.O. to include fuel-injected 1986 model-year Toyotas.

Based on test data from previous comparative exhaust emissions tests performed on a 1984 Toyota Supra and the fact that the engine and emission control systems of 1986 fuel-injected Toyota Supras and Cressidas are carry-overs (identical) from the 1985 model-year, the staff concludes that the Spearco's turbocharger kits (with and without the optional intercooler) will not adversely affect exhaust emission from 1986 and older model-year Toyota Supras and Cressidas equipped with 168 CID fuel-injected six-cylinder engines.

The staff recommends that Spearco Performance Products, Inc. be granted an update exemption for their add-on turbocharger kits to include 1986 Toyota Supras and Cressidas and that Executive Order D-140-14 be issued.

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EVALUATION OF SPEARCO PERFORMANCE PRODUCTS, INC.'S ADD-ON TURBOCHARGER KIT WITH AN OPTIONAL INTERCOOLER FOR 2.8 LITER TOYOTA SUPRA AND CRESSIDA VEHICLES FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE CALIFORNIA ADMINISTRATIVE CODE.

I. INTRODUCTION

Spearco Performance Products, Inc., of 7541 Woodman Place, Van Nuys, California 91405, has requested an update to the existing Air Resources Board's Executive Order (E.O.) No. D-140-4 which exempted six (6) Spearco turbo kits (including optional intercoolers) from the prohibitions in Vehicle Code Section 27156 for 1982 through 1985 Toyota Supra and Cressida vehicles. The applicant requested an update of the above E.O. to include 1986 model-year Toyotas. The list of kits and their applications is shown below:

<u>Turbo Kit No.</u>	<u>Vehicle Models</u>
9898	1982 Supra
9899	1983 Supra
9900	1983 Cressida
9909 (intercooled)	1982-1984 Supra
9910 (intercooled)	1983-1984 Cressida
9909-A (intercooled)	1985 Supra and Cressida
9909-B (intercooled)	1986 Supra and Cressida

II. CONCLUSION

Based on test data from previous comparative exhaust emission tests performed on a 1984 Toyota Supra and the fact that the engines and emission control systems of the 1986 fuel-injected Toyota Supras and Cressidas are carry-overs (identical) from the 1985 model-year, 168 CID, Toyotas, the staff

concludes that Spearco's turbocharger kits (with and without the optional intercooler) will not adversely affect exhaust emissions from 1986 and older model-year Toyota Supras and Cressidas equipped with fuel-injected 168 CID six-cylinder engines.

III. RECOMMENDATIONS

The staff recommends that Spearco be granted an update exemption for their add-on turbocharger kits to include 1986 Toyota Supras and Cressidas and that Executive Order D-140-14 be issued.

IV. TURBOCHARGER KIT DESCRIPTION AND OPERATION

The original equipment manufacturer (OEM) exhaust manifold is replaced by a Spearco manifold. The turbine inlet mounts directly to the replacement exhaust manifold. The turbine, driven by exhaust gases, is linked to the compressor by a solid shaft. Intake air is routed from the air flow meter to the compressor by the compressor inlet pipe. It is then compressed and routed into the intake plenum through the discharge pipe. Exhaust gases from the turbine is routed to the catalytic converter via the exhaust pipe.

Lubrication and cooling of the turbocharger is provided by a steel braided line from a tap into the main oil galley. Oil from the turbocharger is returned to the oil pan.

Maximum positive pressure (boost) is limited to 5 psig by a wastegate internally mounted in the housing of the turbocharger. The wastegate is preset so that boost pressure cannot exceed 5 psi. In addition to the internal wastegate, a separate intake blow-off valve is included to relieve pressure at 7 psi in the event that the wastegate malfunctioned.

The kit also includes a fuel enrichment device. The device connects to the intake manifold and coolant temperature sensor. When boost pressure

reaches 4 psig, the device increases the electrical resistance of the temperature sensor. This increase in electrical resistance dictates the vehicle's computer to increase the fuel flow through the injector nozzles, thus enriching the fuel charge during boost conditions above 4 psig.

An electronic spark retard module is employed to suppress detonation during boost conditions or heavy load operations. The module utilizes a sensor, mounted on the intake manifold or cylinder head, to detect detonation. When detonation is detected, the module electronically retards the spark until detonation is eliminated.

An optional air/liquid intercooler system is also available from Spearco for installation on these vehicles. An intercooler core casting replaces the compressor discharge cross-over casting pipe in the standard turbocharger kit. Liquid is circulated through this core by a separate pump actuated by boost pressure. When the pump is triggered, the circulation goes through the intercooler core and through a coil mounted in front of the vehicle which is exposed to ambient air flow. This ambient air flow cools the fluid which is then circulated to the intercooler core, thereby cooling the compressed air before it enters the engine.

No modifications to the OEM tune-up specifications are required when the turbocharger kit is installed. All OEM emission controls are left intact.

V. DISCUSSION

Spearco Performance Products, Inc.'s turbocharger kits applicable for 1982 Toyota Supra and 1983-1985 Toyota Supra and Cressida having a 168 CID, fuel-injected engine were granted an exemption (E.O. No. D-140-4) on November 14, 1984. The exemption was granted on the basis that the effectiveness of the vehicle's pollution control system was not reduced.

Evaluation consisted of comparative (baseline versus turbocharged/not intercooled and baseline versus turbocharged/intercooled) CVS-75 and HFE tests at normal certification dynamometer road loading.

The applicant requested that the exemption be updated to include 1986 Toyota Supra and Cressida, fuel-injected, six-cylinder, 168 CID engine.

In response to the request, the staff compared the engine design of 1985 to 1986 model-year Toyota Supra and Cressida vehicles with a 168 CID engine and found that the engines and emission control systems on these 1986 model-year vehicles are carry-overs from 1985 models. The 1986 models will have the same degree of performance/emission impact as the previous model-year vehicles. Since the data from a 1984 Toyota Supra test vehicle showed that the vehicle's emissions were not adversely affected when the turbocharger kit (with and without the intercooler) was installed, the Spearco kit will have no adverse effect on the 1985 vehicles. No additional testing was required or performed for updating this exemption.