

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-180-10  
Relating to Exemptions Under Section 27156  
of the Vehicle Code

THE TURBO SHOP, INC.  
460 EFI HEADER SYSTEM

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 460 EFI Header System comprised of exhaust manifolds and pre-cat piping, manufactured by The Turbo Shop, Inc. of 940 W. Manchester Blvd., Inglewood, CA 90301, has been found not to reduce the effectiveness of the applicable vehicle pollution control system and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for 1987-1991 model-year Ford heavy-duty vehicles powered by a 7.5 liter (460 CID) fuel injected engine.

This Executive Order is valid provided that installation instructions for this supercharger kit will not recommend tuning the vehicle to specifications different from those submitted by The Turbo Shop, Inc.

Changes made to the design or operating conditions of the performance package, as exempt by the Air Resources Board, which adversely affect the performance of a vehicle's pollution control system shall invalidate this Executive Order.

Marketing of this performance package using any identification other than that shown in this Executive Order or marketing of this performance package 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 the performance package shall not be construed as exemption to sell, offer for sale, or advertise any component of the kit as an individual device.

This Executive Order does not constitute any opinion as to the effect the use of this performance package 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 CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF THE TURBO SHOP, INC.'S 460 EFI HEADER SYSTEM.

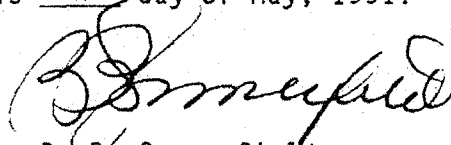
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No claim of any kind, such as "Approved by the Air Resources Board" may be made with respect to the action taken herein in any advertising or other oral or written communication.

Violation of any of the above conditions shall be grounds for revocation of this order. The order may be revoked only after ten day written notice of intention to revoke the order, in which period the holder of the order may request in writing a hearing to contest the proposed revocation. If a hearing is requested, it shall be held within ten days of receipt of the request and the order may not be revoked until a determination after hearing that grounds for revocation exist.

Executed at El Monte, California, this 24<sup>th</sup> day of May, 1991.



R. B. Summerfield  
Assistant Division Chief  
Mobile Source Division

State of California  
AIR RESOURCES BOARD

EVALUATION OF THE TURBO SHOP, INC.'S 460 EFI HEADER SYSTEM  
FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE  
CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE  
CALIFORNIA CODE OF REGULATIONS

May 1991

State of California  
AIR RESOURCES BOARD

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by

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

(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

The Turbo Shop, Inc., of 940 W. Manchester Blvd., Inglewood, California 90301 has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for the 460 EFI Header System. The 460 EFI Header System is designed for installation on 1987-91 heavy-duty Ford vehicles equipped with a 7.5 liter (460 CID) fuel injected engine.

Based on the results from comparative exhaust emission tests performed at an independent laboratory on a 1991 Ford F-250 pick-up truck, the staff concludes that The Turbo Shop, Inc.'s 460 EFI Header System will not adversely affect exhaust emission from vehicles for which an exemption is requested.

The staff recommends that The Turbo Shop, Inc. be granted an exemption as requested and that Executive Order D-180-10 be issued.

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I. INTRODUCTION

The Turbo Shop, Inc. of 940 W. Manchester Blvd., Inglewood, California 90301 has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code for the 460 EFI Header System. The 460 EFI Header System is designed for installation on 1987-91 heavy-duty Ford vehicles powered by a 7.5 liter (460 CID) fuel injected engine.

The Turbo Shop, Inc. has submitted data from comparative emission tests conducted on a 1991 Ford F-250 pick-up truck at Milton Roy Laboratory, Orange, California.

II. CONCLUSIONS

Based on the results from comparative exhaust emission tests performed at Milton Roy Laboratory on a 1991 Ford F-250 pick-up truck, the staff concludes that The Turbo Shop, Inc.'s 460 EFI Header System will not adversely affect exhaust emissions from vehicles for which an exemption is requested.

III. RECOMMENDATION

The staff recommends that The Turbo Shop, Inc. be granted an exemption for their 460 EFI Header System for installation on 1987-1991 model-year heavy-

V. 460 EFI HEADER SYSTEM EVALUATION AND DISCUSSION

A 1991 Ford F-250 pick-up truck with a 7.5 liter (460 CID) fuel injected gasoline engine was used for the evaluation of the 460 EFI Header System. The dynamometer inertia weight and loading used were 7000-lbs and 18.2-hp respectively.

Comparative emissions tests conducted by Milton Roy Laboratory for The Turbo Shop, Inc. consisted of one Cold-Start CVS-75 emission test in the unmodified (baseline) configuration, followed by one Cold-Start CVS-75 emission test in the modified (header system installed) configuration. The ARB did not perform tests to confirm the test results submitted by the applicant.

A summary of the test results is shown below:

Exhaust Emissions Test Results  
On A 1991 Ford F-250 pick-up truck

<u>Test Mode</u>	<u>Exhaust Emissions (gm/mi)</u>		<u>NOx</u>
	<u>HC</u>	<u>CO</u>	
Baseline	.803	9.551	6.291
Device	.906	10.612	6.471
Difference	+.103	+1.061	+.180
% Difference	+12.8%	+11.1%	+2.8%

The differences between the device emission test results and baseline emission test results submitted by the applicant were within the allowed limits of .1 gm/mile or 10 percent of baseline HC, 1.0 gm/mile or 15 percent of baseline CO and .1 gm/mile or 10 percent of baseline NOx as specified in the "Procedures for Exemption of Add-On and Modified Parts." Based on the test results, the staff concludes that the installation of the 460 EFI Header System did not have an adverse effect on exhaust emissions of the affected vehicles. The Turbo Shop, Inc. submitted all the required information and fulfilled the requirements for exemption.



duty Ford vehicles powered by a fuel-injected 7.5 liter (460 CID) engine. The staff also recommends that Executive Order D-180-10 be issued.

#### IV. DEVICE DESCRIPTION

The 460 EFI Header System is designed for installation on 1987-91 heavy-duty Ford vehicles powered by a 7.5 liter (460 CID) fuel injected engine. The 460 EFI Header System consists of exhaust manifolds and pre-catalyst piping. As with the original equipment manufacturer's (OEM) exhaust system, the function of Turbo Shop's 460 EFI header system is to route exhaust gases from the two exhaust manifolds of the engine into a common pipe which then feeds to the catalytic converter. Each cylinder has a 1.75" diameter tube that combines with the adjacent tube into a 2" diameter tube. On each side of the engine, these two 2" tubes combine into a 2.25" diameter tube. Finally all the exhaust gases are then routed into a 3" tube which feeds into the pre-catalyst piping. The installation instructions are shown in Appendix A.

The purpose of The Turbo Shop exhaust system is to enhance the exhaust flow through the use of steel tubing with mandrel type bending methods used. The manufacturer claims, use of mandrel-type bending method prevents the tubing from being crushed or reduced in size during the bending of the tubing, thereby allowing the engine to work more efficiently.

The system operates in conjunction with the OEM computer controlled electronic port fuel injection and emission control systems already certified with the stock engine. Installation of Turbo Shop's exhaust system does not alter the OEM location of the oxygen sensor and the catalyst. The tune-up specifications also remain the same.

Appendix

THE SUMO SHOP INC.  
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#### EGR SET HEADER SYSTEM

1. Remove ground cable from batteries.
2. Remove stock exhaust manifold and pre-cat pipe.
3. Install passenger side header from rear side of vehicle. Use bolts and gaskets provided with kit. on the third bolt from front of engine use original gasket with the spacer provided in this kit. Do not tighten mounting bolts.
4. Remove EGR fitting from rear of driver side manifold and install in same location on new header.
5. Install driver side header from underside of vehicle. Slide the Yank tube into the fitting in the rear of header then mount header with gasket and bolts provided. Do not tighten mounting bolts.
6. Install primer or connector pipe onto the end of the header and connect to the catalyst using the new mounting bracket and original nuts from catalyst.
7. Tighten all mounting bolts. First, then install 2 muffler clamps provided at connection between headers and pre-cat pipe. Using bolts provided secure necessary mounting brackets to the new system. Tighten EGR tube.
8. Remove oxygen sensor from old pre-cat pipe and install in same location in new pre-cat pipe.
9. Check all nuts, bolts, clamps and tube connections. Tighten as necessary. Reconnect the battery cables and start vehicle. Allow the vehicle to idle and check for leaks. Shut vehicle off, tighten all bolts and nuts installed with new system. Repair any leaks.