U

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-167-4
Relating to Exemptions Under Section 27156
of the Vehicle Code

HEDMAN MANUFACTURING
TUBULAR EXHAUST MANIFOLD 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 Section 39515 and Section 39516 of the Health and Safety Code and Executive Order G-45-5;

IT IS ORDERED AND RESOLVED: That the installation of the Tubular Exhaust Manifold System (16 gauge), part nos. 69461, 69461-6, 69460, 69460-6, 68481, 68481-6, 68451, 68451-6, 69470, 69470-6, 69471, 69471-6, 69461 and 69461-6, manufactured by Hedman Manufacturing, 9599 Jefferson Blvd., Culver City, California 90232, 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 1982-1992 model-year General Motors vehicles equipped with 305 CID to 454 CID fuel-injected engines.

This exemption shall not apply to any device, apparatus, or mechanism advertised, offered for sale or sold with, or installed on, a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

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 system 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 system using an identification other than that shown in this Executive Order or marketing of this system 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 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.

IS 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 HEDMAN MANUFACTURING'S TUBULAR EXHAUST MANIFOLD SYSTEM.

No claims 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 violations 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.

Executed at El Monte, California, this 4th day of June, 1992.

R. B. Summerfield
Assistant Division Chief
Mobile Source Division

State of California
AIR RESOURCES BOARD

EVALUATION OF HEDMAN MANUFACTURING'S TUBULAR EXHAUST MANIFOLD SYSTEM FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE CALIFORNIA CODE OF REGULATIONS

June 1992

State of California
AIR RESOURCES BOARD

EVALUATION OF HEDMAN MANUFACTURING'S TUBULAR EXHAUST MANIFOLD SYSTEM FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE CALIFORNIA CODE OF REGULATIONS

by

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(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

Hedman Manufacturing, of 9599 Jefferson Blvd., Culver City, California 90232 has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for the Hedman Manufacturing's tubular exhaust manifold system, part nos. 69461, 69461-6, 69460, 69460-6, 68481, 68481-6, 68451, 68451-6, 69470, 69470-6, 69471, 69471-6, 69461 and 69461-6. The header is designed for installation on 1982-1992 model-year General Motors vehicles equipped with 305 CID to 454 CID fuel-injected engines.

Based on the results from emission tests performed at an independent laboratory on a 1991 GMC 3X3 1 Ton Crew-Cab pick-up truck, the staff concludes that Hedman Manufacturing's tubular exhaust manifold system will not adversely affect exhaust emissions from vehicles for which an exemption is requested.

The staff recommends that Hedman Manufacturing be granted an exemption as requested and that Executive Order D-167-4 be issued.

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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

Hedman Manufacturing of 9599 W. Jefferson Blvd., Culver City, California 90232 has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code for the Hedman Manufacturing's tubular exhaust manifold system, part nos. 69461, 69461-6, 69460, 69460-6, 68481, 68481-6, 68451, 68451-6, 69470, 69470-6, 69471, 69471-6, 69461 and 69461-6. The header is designed for installation on 1982-1992 model-year General Motors vehicles equipped with 305 CID to 454 CID fuel-injected engines.

Hedman Manufacturing has submitted data from testing on a 1991 GMC 3X3 1 Ton Crew-Cab pick-up truck equipped with a 7.4 liter engine at Milton Roy Company, Orange, California.

II. CONCLUSIONS

Based on the results from back-to-back emission tests performed at Milton Roy Company on a 1991 GMC 3X3 1 Ton Crew-Cab pick-up truck, the staff concludes that Hedman Manufacturing's tubular exhaust manifold system will not adversely affect exhaust emissions from vehicles for which an exemption is requested.

III. RECOMMENDATION

The staff recommends that Hedman Manufacturing be granted an exemption for their tubular exhaust manifold system for 1982-1992 model-year General Motors vehicles equipped with 305 CID to 454 CID fuel-injected engines. The staff also recommends that Executive Order D-167-4 be issued.

IV. DEVICE DESCRIPTION

The Hedman Manufacturing's tubular exhaust manifold system is designed for installation on 1982-1992 model-year General Motors vehicles equipped with 305 CID to 454 CID fuel-injected engines. As with the original equipment manufacturer's (OEM) exhaust system, the function of Hedman Manufacturing's tubular exhaust manifold system is to route exhaust gases through the header pipes from the two exhaust manifolds of the engine into the catalytic converters. Each cylinder has a 1-5/8 inch to 1-3/4 inch diameter pipe that combines with the four adjacent pipes into a 3.0 inch diameter collector pipe. This 3.0 inch collector pipe fits directly onto the catalytic converter. The header is manufactured using 16 gauge steel.

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 Hedman Manufacturing's tubular exhaust manifold system does not alter the OEM location of the oxygen sensor and the catalyst. The tune-up specifications also remain the same. Appendix A contains a sample of the installation instructions.

V. HEADER SYSTEM EVALUATION AND DISCUSSION

A 1991 GMC 3X3 Crew-Cab pick-up truck with a 454 CID (7.4 liter) fuel injected gasoline engine was used for the evaluation of the tubular exhaust manifold system. The dynamometer inertia weight and loading were 7000-lbs and 15.4-hp respectively.

..on tests conducted by Milton Roy Company for Hedman Manufacturing consisted of one Cold-Start CVS-75 emission test in the baseline configuration and once 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 GMC 1 Ton Crew-Cab pick-up truck

Test Mode	Exhaust Emissions (gm/mi) HC	CO	NOx
Baseline	.685	10.273	3.625
Device	.668	10.002	3.533
Difference	-.017	-0.271	-.092
% Difference	-2.5%	-2.6%	-2.5%

Results from the emission test conducted at Milton Roy Company show the vehicle emissions with the Hedman Manufacturing's tubular exhaust manifold system installed are within the allowable increase of 10 percent or 0.1 gm/mile HC, 15 percent or 1.0 gm/mile CO and 10 percent or 0.1 gm/mile NOx above the baseline as specified under the "Procedures for Exemption of Add-On or Modified Parts." Staff concluded that the GMC 454 CID (7.4 liter) engine represented the worst case vehicle in Hedman Manufacturing's range of General Motors vehicle application. Therefore, based on the test results, the staff concludes that the installation of the Hedman Manufacturing's tubular exhaust manifold system, part nos. 69461, 69461-6, 69460, 69460-6, 68481, 68481-6, 68451, 68451-6, 69470, 69470-6, 69471, 69471-6, 69461 and 69461-6, did not have an adverse effect on exhaust emissions of 1982-1992 model-year General Motors vehicles equipped with 305 CID to 454 CID fuel-injected engines. Hedman Manufacturing submitted all the required information and fulfilled the requirements for exemption.

Appendix

PART #69461
CHEVY GMC ½-1 TON P/U 2 & 4 WD 88-92
7.4 LITER T.B.I. W/ A.I.R.

C A U T I O N !!

THIS IS A CUSTOM DESIGNED EXHAUST HEADER SYSTEM DESIGNED FOR THIS PARTICULAR APPLICATION(S). DO NOT BEND, CUT, DENT, DRILL, OR HEAT ANY PORTION OF THIS HEADER! ANY ALTERATION OTHER THAN THOSE SUGGESTED IN THIS INSTRUCTION SHEET WILL VOID THE HEDMAN LIFETIME WARRANTY!

TO PREVENT LEAKS, INSTALL YOUR HEADERS WITH HEDMAN FLANGE GASKETS ONLY!

This Tubular Exhaust Manifold System is designed as a system to improve the exhaust efficiency of the GM T.B.I. (Throttle Body Injection) 7.4 Liter V8 engine. A performance gain can be expected by the installation of the system. This system requires no welding for installation and retains all O.E.M. emissions equipment.

SUGGESTED TOOLS FOR INSTALLATION

3/8" ratchet socket set with extensions and universal 13mm and 15mm swivel sockets
Combination set of open-end wrenches
Jackstands, screwdrivers, pliers, crescent wrench, etc.
Liquid penetrant (GM #1052627), anti-seize compound (GM #5613695).

DISASSEMBLY

1. Disconnect battery negative cable from battery.
2. Raise the vehicle and support with jackstands.
3. Use penetrating oil on all nuts and bolts to be removed. This will prevent the possibility of broken or stripped nuts and bolts.
4. Making sure the converter is cool, remove the exhaust crossover pipe.
5. Lower vehicle to the ground.

DISASSEMBLY - LEFT SIDE

6. Remove fresh air duct to air cleaner.
7. Disconnect A.I.R. (air injection reactor) tube from exhaust manifold.
8. Remove power steering pump support bracket (if power steering is applicable
9. Disconnect spark plug wires and remove spark plugs.
10. Remove O2 sensor, being careful not to rupture or destroy the unit. **WARNING** DO NOT CLEAN THIS UNIT IN ANY CLEANING SOLVENT AND DO NOT RUPTURE WIRE.
11. Disconnect temperature sensor wire.
12. Remove bolts and exhaust manifold from top side.

DISASSEMBLY - RIGHT SIDE

13. Disconnect A.I.R. injection tube from exhaust manifold.
14. Disconnect spark plug wires and remove spark plugs.
15. Remove bolts and exhaust manifold from top side.
16. Clean exhaust flange surfaces on cylinder heads at this time.

___ - LEFT SIDE

1. Install left side T.E.M.S. from bottom side.
2. Install all but the front two bolts and washers in left side. Do not tighten at this time.
3. Re-install rear power steering support bracket with bolts, lock washers and spacers supplied.
4. Align all parts and tighten left side bolts and nuts at this time.
5. Re-install spark plugs and re-connect wires on left side.
6. Re-install temperature sensor wire to temperature sensor.
7. Re-install O2 sensor. Use anti-seize on threads of sensor and torque to 30 ft./lbs. Re-route O2 sensor wire from wire loom to O2 sensor making sure all wires are clear of exhaust system. (O2 sensor extension wire is included in kit).

ASSEMBLY - RIGHT SIDE

1. Install right side T.E.M.S. from top side.
2. Install remaining bolts, lock washers, and spacer tube for dipstick to clear exhaust flange.
3. Align all parts and tighten all right side bolts at this time.
4. Re-install spark plugs and re-connect wires.
5. Remove A.I.R. check valves from original manifolds and re-install them on T.E.M.S. With hose supplied in kit, re-connect all A.I.R. injection hoses at this time.
6. Raise vehicle and support with jackstands.

CROSSOVER PIPE ASSEMBLY

1. Carefully align and tap pipe into converter using a piece of wood.
2. Install crossover pipe assembly on vehicle using 3/8" bolts and nuts provided.
3. Install u-clamps and tighten all nuts and bolts.

Start engine and allow to run long enough to gain normal operating temperature. Check for new or unusual noises or leaks. Turn off engine and re-tighten all bolts.

WARNING:	REMOVAL OF CATALYTIC CONVERTERS AND OTHER FACTORY AIR POLLUTION CONTROL DEVICES IS ILLEGAL. WE RECOMMEND YOU ABIDE BY THE LAW. OUR TESTING INDICATES PERFORMANCE IS NOT SIGNIFICANTLY AFFECTED BY THESE DEVICES.