

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-215-6
Relating to Exemptions Under Section 27156
of the Vehicle Code

EDELBROCK CORPORATION
PERFORMER ALUMINUM CYLINDER HEADS

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 Performer Aluminum Cylinder Heads, part nos. 6065, 6075, 6084, 6085, 6086, and 6087 manufactured by Edelbrock Corporation of 2700 California St., P.O. Box 2936, Torrance, California 90503, have been found not to reduce the effectiveness of the applicable vehicle pollution control system and, therefore, are exempt from the prohibitions of Section 27156 of the Vehicle Code for 1993 and older General Motors vehicles with a 262 to 400 CID V-8 gasoline engine.

This Executive Order is valid provided that installation instructions for the Performer Aluminum Cylinder Heads will not recommend tuning the vehicle to specifications different from those submitted by Edelbrock Corporation.

Changes made to the design or operating conditions of the cylinder heads, 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 these cylinder heads using any identification other than that shown in this Executive Order or marketing of the cylinder heads for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board. This Executive Order does not constitute any opinion as to the effect the use of this cylinder heads 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 EDELBROCK CORPORATION'S PERFORMER ALUMINUM CYLINDER HEADS.

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.

EDELBROCK CORPORATION
Performer Aluminum Cylinder Heads

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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 15th day of April, 1993.



R. E. Summerfield
Assistant Division Chief
Mobile Source Division

State of California
AIR RESOURCES BOARD

EVALUATION OF THE EDELBROCK CORPORATION
PERFORMER ALUMINUM CYLINDER HEADS FOR EXEMPTION FROM THE PROHIBITIONS OF
VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE
CALIFORNIA CODE OF REGULATIONS

April 1993

State of California
AIR RESOURCES BOARD

EVALUATION OF THE EDELBROCK CORPORATION
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CALIFORNIA CODE OF REGULATIONS

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 Edelbrock Corporation (Edelbrock) of 2700 California St., P.O. Box 2936, Torrance, California 90503, has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for the Performer Aluminum Cylinder Heads, part nos. 6065, 6075, 6084, 6085, 6086, and 6087. The cylinder heads are designed for installation on 1993 and older General Motors' vehicles equipped with a 262 to 400 CID V8 gasoline engine.

Edelbrock submitted a completed application and other required information, as well as emissions test data performed at the Milton Roy Company in Orange, California, demonstrating that their cylinder heads do not have any adverse effect on emissions.

Based on the submitted information, the staff concludes that the Edelbrock Performer Aluminum Cylinder Heads will not adversely affect exhaust emissions from vehicles for which an exemption is requested.

The staff recommends that Edelbrock be granted an exemption as requested and that Executive Order D-215-6 be issued.

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I. INTRODUCTION

The Edelbrock Corporation (Edelbrock) of 2700 California St., P.O. Box 2936, Torrance, California 90503, has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for their Performer Aluminum Cylinder Heads, part nos. 6065, 6075, 6084, 6085, 6086, and 6087. The cylinder heads are designed for installation on 1993 and older General Motors' vehicles equipped with a 262 to 400 CID V8 engine.

Edelbrock submitted a completed application and other required information, as well as emissions test data performed at the Milton Roy Company (Milton Roy) in Orange, California, demonstrating that their cylinder heads do not have any adverse effect on emissions.

II. CONCLUSIONS

Based on the submitted information, the staff concludes that the Edelbrock Performer Aluminum Cylinder Heads will not adversely affect exhaust emissions from vehicles for which an exemption is requested.

III. RECOMMENDATION

The staff recommends that Edelbrock be granted an exemption for their Performer Aluminum Cylinder Heads, part nos. 6065, 6075, 6084, 6085, 6086, and 6087 for installation on 1993 and older General Motors' vehicles equipped with a 262 to 400 CID V8 engine. The staff also recommends that Executive Order D-215-6 be issued.

IV. PERFORMER ALUMINUM CYLINDER HEAD DESCRIPTION

Edelbrock's Performer Aluminum Cylinder Heads are specifically designed for installation on 1993 and older General Motors' vehicles powered by a 262 to

400 CID V8 gasoline engine. The Performer Aluminum Cylinder Heads operate in conjunction with the original equipment manufacturer's (OEM) emission control systems already certified with the stock engine. The purpose of using the modified cylinder heads, according to the manufacturer, is to increase the overall engine performance which is accomplished through the use of the finest materials available along with labor intensive machining. The intake and exhaust ports are machined to match the gasket and manifold surfaces, thus eliminating reversion at those junctures. The interior surfaces of the ports have been machined in the critical areas to reduce backpressure and maintain laminar flow. The valve seats are machined to provide optimum sealing and increased flow. The combustion chambers are polished to eliminate hot spots which could cause detonation or pre-ignition.

The following are the Performer Aluminum Cylinder Head specifications:

1. Head Casting ----- Aluminum

2. Valves

Exhaust ----- Stainless steel, 1.6" in diameter

Intake ----- Stainless steel, 2.02" in diameter

3. Chamber Volume .

P/N 6085 & 6084 ----- 64 cc

P/N 6075 & 6065 ----- 70 cc

P/N 6087 & 6086 ----- 60 cc

4. Valve seats ----- Cast ductile iron

Edelbrock has designed the Performer Aluminum Cylinder Heads with three different chamber volumes. These chamber volumes have been designed to match those that would be found in the OEM cylinder heads. A 64 cc chamber volume is designed for vehicles that use either tuned port or throttle body as a form of fuel injection. The 70 cc chamber volume is for vehicles that have a standard carburetor and a 60 cc chamber volume is used in high performance engines such as those found in a Corvette or a Camaro.

No changes are made to the vehicle's emission control system except for those applicable vehicles that use the Performer Aluminum Cylinder Head, part nos. 6085 and 6084. These applications require as part of the installation an 8° BTDC advance in timing, an increase of 4° when compared to OEM.

V. DISCUSSION OF THE PERFORMER ALUMINUM CYLINDER HEAD

The Edelbrock Corporation, has requested that the Performer Aluminum Cylinder Heads, part nos. 6065, 6075, 6084, 6085, 6086, and 6087, be exempted for 1993 and older General Motors' vehicles equipped with a 262 to 400 CID V8 engine. A modified 1993 General Motors' C1500 Suburban with a 350 CID V8 engine was used for testing (Performer Aluminum Cylinder Head, part no. 6085 installed). Edelbrock performed emissions testing at Milton Roy. Emission test results were compared against the vehicle's emission standards.

The results of the exhaust emissions test performed at the Milton Roy are shown in Table 1.

Table 1
CVS-75 TEST RESULTS
(Milton Roy Company)

	<u>HC</u>	<u>CO</u>	<u>NOx</u>
Standard	0.5	9.0	1.0
Cylinder Head	0.23	2.66	0.50

The CVS-75 emissions test results at Milton Roy indicate that the HC, CO and Nox emissions of the vehicle, with the Edelbrock Aluminum Cylinder Head installed, are below the emission standards set for that engine family.

The Air Resources Board did not conduct confirmatory testing to validate

the emission test results submitted by Edelbrock. The Edelbrock Aluminum Cylinder Heads are functionally identical to the original equipment manufacturer's cylinder head except for its valve sizes and casting material. A typical General Motors' cylinder head may have intake valves ranging in diameter from 1.72" to 1.94" and exhaust valves ranging in diameter from 1.5" to 1.6", with cast iron construction. Edelbrock consolidated these variations by designing their cylinder heads to be at the top end of the OEM scale, 2.02" on intake and 1.6" on exhaust with the cylinder head constructed out of aluminum. The exhaust valve diameter is still within acceptable OEM range while the intake valve diameter translates to a 5 percent increase over OEM. The test results confirmed that the minimal increase in the intake valve diameter does not cause any significant increase in emissions.

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

APPENDIX



PERFORMER STREET ALUMINUM CYLINDER HEADS
for Small-block Chevrolet V8s
CATALOG #6065, #6075, #6084, #6085, #6086, & #6087
GENERAL INSTRUCTIONS

- **PLEASE** study these instructions carefully before installing your new cylinder heads. If you have any questions or problems, do not hesitate to contact our **Technical Hotline** at: (310) 782-2900.

- **DESCRIPTION**

The Edelbrock Performer Street Cylinder Heads are designed for street high performance use, and are interchangeable with original equipment small-block Chevrolet cylinder heads. These new cylinder heads offer "out of the box" bolt-on performance with no additional porting required. The intake and exhaust ports are CNC machine "matched" and have been designed for maximum flow velocity when matched with Edelbrock Performer, Performer T.B.I., or High-Flo T.P.I. intake manifolds. These heads have an exhaust crossover passage and are street legal/stock replacement parts on any vehicle. If used on engines with a bore size less than 4.000" (305, 283, 265, & 262 c.i.d.), do not use a camshaft with more than .450" lift or the valves may hit the cylinder bores.

- **IDENTIFICATION:**

- **Performer Chevrolet Heads**

#6065 (bare) and #6075 (complete)

For 302, 327, 350, and 400 c.i.d. small-block engines with conventional valve covers (not centerbolt).

- **Performer Chevrolet Centerbolt Heads**

#6084 (bare) and #6085 (complete)

Designed as a stock replacement part for the cast iron heads on 1987 through 1992 5.7 Litre Chevrolet engines (except LT-1 or LT-5 Corvettes) using centerbolt valve covers and the '87 & later revised intake manifold bolt pattern. They accept either stock or Edelbrock centerbolt valve covers #4246 & #4247.

- **Performer Corvette Centerbolt Heads**

#6086 (bare) and #6087 (complete)

Designed as a stock replacement part for the OE aluminum heads on 1987 through 1991 5.7 Litre Corvette engines (except LT-1 or LT-5 Corvettes) using centerbolt valve covers and ear style "straight" intake manifold bolt pattern. They also fit 1986 Corvette convertibles originally equipped with aluminum heads. They feature 60 cc combustion chambers and angled spark plugs. When used with Fel-Pro head gaskets #1003, they will produce the same compression ratio as the stock 57cc heads. They accept either stock or Edelbrock centerbolt valve covers #4246 & #4247.

These heads are available in pairs, either bare or assembled. Complete cylinder heads are assembled with the following components: Stainless steel, one-piece, swirl-polished intake and exhaust valves with under-cut stems for increased flow; 2-ring positive oil control seals; 3/8" rocker studs and 5/16" guideplates; Edelbrock Sure-Seat Valve Springs #5767, retainers #9724, and valve keepers #9611. Complete cylinder heads are assembled and prepared for installation right out of the box. Bare cylinder heads will have valve guide and seats installed, but will require final sizing and a valve job to match the valves you will be using.

- **ACCESSORIES**

Although Edelbrock Street Cylinder Heads will accept OEM components (rocker arms, valve covers, intake manifold, head bolts, etc.) we highly recommend that premium quality hardware be used with your new heads.

HEAD BOLTS or STUDS: High quality head studs or head bolts with hardened washers must be used to prevent galling of the aluminum bolt bosses.

ROCKER ARMS: The valve springs supplied will accommodate valve lifts up to .600", which is much higher than stock rocker arms will allow. Roller rocker arms will be required if your camshaft has more than .480" lift. Stock rockers will require .100" longer-than-stock pushrods to clear the valve springs. Non-stock rockers may not be legal; check local laws.

VALVE COVERS: Edelbrock Performer heads accept stock valve covers for the year and model for which they are listed. #6075 will also accept Edelbrock Signature Series chrome valve covers #4449 or Elite Series polished aluminum valve covers

#4248. #6085 & #6087 will accept Edelbrock centerbolt valve covers #4246 or #4247. **NOTE:** Most taller than stock valve covers will interfere with the EGR valve and are not legal on emission controlled vehicles.

INTAKE MANIFOLD: Although stock intake manifolds will fit, the Edelbrock Street Cylinder Heads are matched in size and operating range with Edelbrock Performer, Performer T.B.I., or High-Flo T.P.I. intake manifolds. For best results, use stock or Edelbrock intake manifolds listed as stock replacement parts for the year and model of your vehicle. Fel-Pro intake manifold gaskets #1204 are recommended.

EXHAUST HEADERS: Any header or manifold designed for original equipment heads will fit the Edelbrock Street Cylinder Heads. Exhaust ports are CNC profiled for compatibility with Fel-Pro #1404 exhaust gaskets which are recommended for this application. Edelbrock makes emissions-legal Tubular Exhaust Systems for many applications. Check the Edelbrock catalog complete listing, or call our Technical Hotline.

SPARK PLUGS: Use 14mm x 3/4" reach gasketed spark plugs. Heat range may vary by application, but we recommend Champion RC-12YC (or equivalent) for most applications. Use a drop or two of oil or anti-seize on the plug threads to prevent galling in the cylinder head, and torque to manufacturers specification for aluminum heads.

IGNITION TIMING: To meet required emission levels, the following timing specifications should be used:

- #6075 & #6087 - original timing specifications
- #6085 - 8° B.T.D.C.

Follow factory procedures to change ignition timing. Note that the computer must be disconnected to set timing.

INSTALLATION

Installation is the same as for original equipment cylinder heads. Consult service manual for specific procedures, if necessary. For 350 and smaller engines use Fel-Pro head gasket #1003. For 400 c.i.d. small-blocks, use Fel-Pro #1034. **YOU MUST DRILL "STEAM HOLES" IN CYLINDER HEADS FOR 400 ENGINES** (see Figure 2). Be sure that the surface of the block and the surface of the head is thoroughly cleaned to remove any oily film before installation. Use alcohol or lacquer thinner on a lint-free rag to clean. Apply Edelbrock Gasga-cinch or suitable thread sealer to head bolt threads. Torque to 65 ft./lbs. in three steps (40-55-65) following the factory tightening sequence (see Figure 1). A re-torque is recommended after initial start-up and cool-down (allow 2-3 hours for adequate cooling).

SPECIFICATIONS

Head bolt torque:	65 ft./lbs. (in steps of 40-55-65)
Rocker stud torque:	45 ft./lbs.
Combustion chamber volume:	#6075 - 70 cc
	#6085 - 64 cc
	#6087 - 60 cc
Deck thickness:	9/16"
Valve Seats:	Hardened, interlocking, compatible with unleaded fuels
Valve Size:	Intake- 2.02", Exhaust- 1.60"
Valve Spring Diameter:	1.45"
Valve Spring Installed Height:	1.800"
Valve Spring Seat Pressure:	120 lbs.
Max. Valve Lift:	.600"

PLEASE complete and mail your warranty card. Be sure to write the model number of this product in the "Part # _____" space.

THANK YOU.

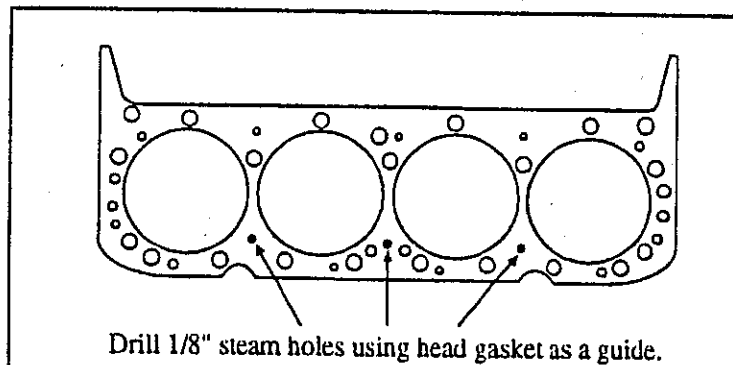
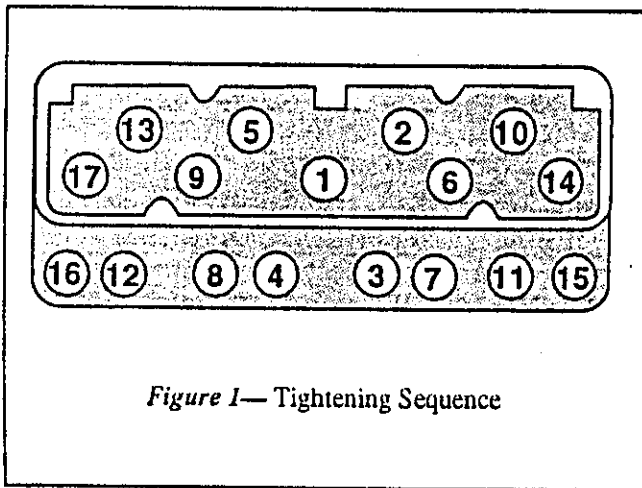


Figure 2— STEAM HOLE LOCATION FOR 400 C.I.D. ENGINES ONLY

Drill three .125" holes in each head using 400 c.i.d. head gasket as a guide. **DRILL ONLY THE THREE LOWER STEAM HOLES** (closest to the spark plugs) as indicated. Drill straight into the head (90° from the deck) until the drill breaks through into the water jacket (about 9/16"). **COOLANT HOLES ABSOLUTELY MUST NOT OVERLAP INTO THE HEAD GASKET SEALING RING AREA.**

Edelbrock

**SPECIAL INSTRUCTIONS FOR PERFORMER
STREET ALUMINUM CYLINDER HEADS #6075, #6085, & #6087**

Complete cylinder heads #6075, #6085 and 6087 are sold with the pushrod guide plates and rocker studs installed, but they will require checking for proper valve train alignment and pushrod clearance before operating engine.

PUSHROD GUIDE PLATE ALIGNMENT

The pushrod guide plates are attached to the cylinder heads with two (each) rocker studs. There is enough clearance around the stud holes to adjust the guide plates for optimum alignment of your valve train components (see Figure 3).

1. After the heads have been bolted on your engine and torqued to specs, install your pushrods, rocker arms, and rocker arm adjusting nuts.
2. Check pushrod-to-cylinder head clearance. **YOU MUST CHECK TO ENSURE THAT THERE IS CLEARANCE BETWEEN THE PUSHRODS AND THE CYLINDER HEADS (.005" min.).** See Note "A".
3. If adequate clearance exists between pushrod and head, slowly turn engine over through at least two revolutions while watching pushrod. Make sure that pushrod doesn't rub on the head either at full lift or when the valve is seated.
4. If pushrod rubs on the cylinder head, remove rocker arms, loosen the rocker studs and move the guide plate as needed to provide clearance.
5. After checking all pushrods for proper clearance, ensure that the tip of the rocker arm is making adequate contact with the top of the valve stem.
6. Carefully re-torque to 45 ft./lbs. any rocker studs that were loosened. Check alignment again to be sure that the guide plates did not move while torquing the studs.

