

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-369  
Relating to Exemptions Under Section 27156  
of the Vehicle Code

SUMMIT RACING EQUIPMENT  
TWISTED WEDGE 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 Twisted Wedge cylinder heads manufactured by Summit Racing Equipment of 565 Kennedy Road, Akron, Ohio 44305, as described in Table 1 of this Executive Order, 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 1995 and older General Motors vehicles equipped with a 262-400 c.i.d. V8 small block engine.

Table 1

| Application                     | P/N          | Chamber  |       | Valve Size |
|---------------------------------|--------------|----------|-------|------------|
|                                 |              | Material | Vol.  |            |
| 1986 & older                    | TFS-31400001 | Aluminum | 63 cc | 2.02"x1.6" |
| 1987 & newer -95 R              | TFS-31400002 | Aluminum | 63 cc | 2.02"x1.6" |
| 1986 & older Corvettes non LT-1 | TFS-31400003 | Aluminum | 63 cc | 2.02"x1.6" |
| 1992 & older Corvettes LT-1     | TFS-31400004 | Aluminum | 63 cc | 2.02"x1.6" |
| 1986 & older                    | TFS-31400005 | Aluminum | 63 cc | 2.02"x1.6" |
| 1987 & newer -95 R              | TFS-31400006 | Aluminum | 63 cc | 2.02"x1.6" |

This Executive Order is valid provided that the installation instructions for the Twisted Wedge cylinder heads will not recommend tuning the vehicle to specifications different from those of the vehicle manufacturer. A 160 degree Fahrenheit thermostat is required for installation on all 1994 & 1995 vehicle applications.

Changes made to the design or operating conditions of the Twisted Wedge 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 the Twisted Wedge cylinder heads using any identification other than that shown in this Executive Order or marketing of the Twisted Wedge 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.

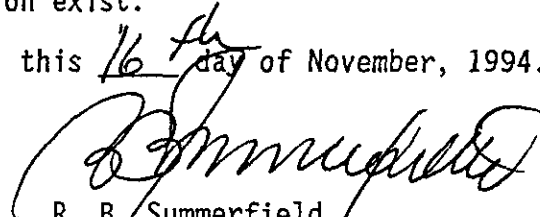
This Executive Order does not constitute any opinion as to the effect the use of the Twisted Wedge cylinder heads may have on any warranty either expressed or implied by the vehicle manufacturer.

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 SUMMIT RACING EQUIPMENT'S TWISTED WEDGE 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.

Violation of any of the above conditions shall be grounds for revocation of this Executive 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 16<sup>th</sup> day of November, 1994.



R. B. Summerfield  
Assistant Division Chief  
Mobile Source Division

State of California  
AIR RESOURCES BOARD

EVALUATION OF SUMMIT RACING EQUIPMENT'S TWISTED WEDGE 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

November 1994

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AIR RESOURCES BOARD

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by

Mobile Source Division  
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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

Summit Racing Equipment of 565 Kennedy Road, Akron, Ohio 44305, has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for their Twisted Wedge cylinder heads. The Twisted Wedge cylinder heads are designed for installation on applicable 1995 and older General Motors vehicles equipped with a 262-400 c.i.d. small block engine.

Summit Racing Equipment submitted a completed application and other required information, as well as emissions test data performed at the Edelbrock Corporation located in Torrance, California, demonstrating that their Twisted Wedge cylinder heads do not have any adverse effect on emissions.

Based on the submitted information, the staff concludes that the Twisted Wedge cylinder heads will not adversely affect exhaust emissions on those vehicles for which an exemption is requested.

The staff recommends that Summit Racing Equipment be granted an exemption as requested and that Executive Order D-369 be issued.

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I. INTRODUCTION

Summit Racing Equipment of 565 Kennedy Road, Akron, Ohio 44305, has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for their Twisted Wedge cylinder heads. The Twisted Wedge cylinder heads are designed for installation on applicable 1995 and older General Motors vehicles equipped with a small block V8 engine.

II. CONCLUSIONS

Based on the submitted information, the staff concludes that the Twisted Wedge cylinder heads will not adversely affect exhaust emissions from the applicable vehicles for which an exemption is requested.

III. RECOMMENDATION

The staff recommends that Summit Racing Equipment be granted an exemption for their Twisted Wedge cylinder heads for installation on applicable 1995 and older General Motors vehicles equipped with a 262-400 c.i.d. small block engine. The staff also recommends that Executive Order D-369 be issued.

IV. TWISTED WEDGE CYLINDER HEAD DESCRIPTION

The Twisted Wedge cylinder heads have been specifically designed for installation on applicable 1995 and older General Motors vehicles equipped with a 262-400 c.i.d. small block engine. The Twisted Wedge cylinder heads are sold as a set and operate in conjunction with the original equipment manufacturer's (OEM) emissions control system already certified with the stock engine. A 160 degree Fahrenheit thermostat is required for installation on all 1994 & 1995 vehicle applications.

The purpose of using Twisted Wedge cylinder heads, according to

the manufacturer, is to increase the engine's overall performance which is accomplished by designing the cylinder head's valves to be at an angle rather than the typical valve that is linear to the piston. The manufacturer also claims that the cylinder heads are manufactured using 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 Twisted Wedge cylinder head's specifications:

| Application                     | P/N          | Material | Chamber |            |
|---------------------------------|--------------|----------|---------|------------|
|                                 |              |          | Vol.    | Valve Size |
| 1986 & older                    | TFS-31400001 | Aluminum | 63 cc   | 2.02"x1.6" |
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| 1986 & older                    | TFS-31400005 | Aluminum | 63 cc   | 2.02"x1.6" |
| 1987 & newer                    | TFS-31400006 | Aluminum | 63 cc   | 2.02"x1.6" |

V. DISCUSSION OF THE TWISTED WEDGE CYLINDER HEADS

Summit Racing Equipment, has requested that the Twisted Wedge cylinder heads be exempted for 1995 and older General Motors vehicles equipped with the applicable small block V8 engine. A 1994 Chevrolet truck equipped with a 5.7L



engine, certified to Tier 1 emission standards, was used as the test vehicle. One CVS-75 Federal Test Procedures was performed on the vehicle with the Twisted Wedge cylinder heads, part no. TFS-31400002, and a 160 degree Fahrenheit thermostat installed. Summit Racing Equipment performed emissions testing at the Edelbrock Corporation's emissions test facility.

Results of the exhaust emissions test performed at Edelbrock are shown in Table 1.

Table 1  
CVS-75 TEST RESULTS

|                       | <u>NMHC</u> | <u>CO</u> | <u>NOx</u> |
|-----------------------|-------------|-----------|------------|
| Device w/ applied DFs | 0.31        | 3.4       | 0.93       |
| Standards             | 0.32        | 4.4       | 1.0        |
| Difference            | -0.01       | -1.0      | -0.07      |

The CVS-75 emissions test results at Edelbrock indicate that the HC, CO and NOx emissions of the vehicle, with the cylinder heads and thermostat 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 Summit Racing Equipment

Summit Racing Equipment's Twisted Wedge cylinder heads are functionally identical to the original equipment manufacturer's Twisted Wedge cylinder heads except for its valve size and chamber volume. A typical General Motors vehicle uses a 1.94" intake valve and a 1.5" exhaust valve and stock chamber volumes in the range of 67 to 76cc. Summit Racing Equipment consolidated these variations by designing their Twisted Wedge cylinder heads to be at the top end of the OEM scale at 2.02" on the intake and 1.6" on the exhaust with the chamber volume at 63cc. Test results confirmed that the change in Twisted Wedge cylinder head's specifications do not cause any significant change in vehicle emissions.

Summit Racing Equipment submitted all of the required information fulfilled the requirements for an exemption.