

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-387  
Relating to Exemptions Under Section 27156  
of the Vehicle Code

BROWN RECYCLING & MFG., INC.  
"USED AFTERMARKET CATALYTIC CONVERTERS"

WHEREAS, Vehicle Code Section 27156 and Title 13 California Code of Regulations (hereafter "CCR") Section 2222(i), authorize the California Air Resources Board (ARB) and its Executive Officer to exempt used aftermarket catalytic converters from the prohibitions in Vehicle Code Sections 27156 and 38391.

WHEREAS, Brown Recycling & Mfg., Inc. of 1274 Gravel Ridge Road, Somerville, Alabama 35670, has applied to the ARB for exemption from the prohibitions in Vehicle Code Sections 27156 and 38391, and Title 13, CCR Section 2222(i), to market used original equipment manufacturer (OEM) two-way or oxidation converters (OC), three-way converters (TWC), three-way plus oxidation converters (TWC + OC), and precatalysts in California. Brown Recycling & Mfg., Inc. shall salvage, recondition (as necessary), and test the converters for installation on vehicles identical to the certification vehicles.

WHEREAS, pursuant to the authority vested in the Executive Officer by Health and Safety Code Section 39515 and in the Chief, Mobile Source Division by Health and Safety Code Section 39516 and Executive Order G-45-9, the ARB finds that the Brown Recycling & Mfg., Inc. used catalytic converters comply with the California Vehicle Code Sections 27156 and 38391, and Title 13, California Code of Regulations, Section 2222(i).

IT IS HEREBY RESOLVED that Brown Recycling & Mfg., Inc. used catalytic converters are exempt from the prohibitions in Vehicle Code Sections 27156 and 38391 for installation on applicable vehicles subject to the following conditions:

1. Used catalytic converters marketed in California must attain the minimum conversion efficiencies shown below within the specified time after the exhaust is switched to pass through the catalytic converter:

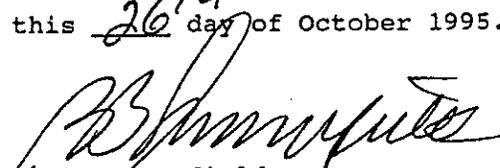
<u>Converter Type</u>	<u>Minimum Conversion Efficiency</u>			<u>Time</u>
	<u>HC</u>	<u>CO</u>	<u>NOx</u>	
OC	70%	70%	-	60 sec
TWC	70%	70%	60%	60 sec
TWC + OC	70%	70%	50%	60 sec
Precatalysts	40%	40%	-	60 sec

2. No changes are permitted to the catalytic converters as described in the application for exemption. Any changes to the catalytic converters or any of their components, applicable model year, or other factors addressed in this order must be evaluated and approved by the ARB prior to marketing in California.

3. Marketing of the converters using identifications other than those shown in the exemption application or marketing of the catalytic converters for vehicle applications other than those identical to the certification vehicles shall be prohibited unless prior approval is obtained from the ARB. Exemption of these products shall not be construed as an exemption to sell, offer for sale, or advertise any components of the catalytic converters as individual devices.
4. Any oral or written references to this Executive Order or its content by Brown Recycling & Mfg., Inc., its principals, agents, employees, distributors, dealers, or other representatives must include the disclaimer that the Executive Order or the exemption it provides is not an endorsement or approval of any emissions reduction claims for the catalytic converters and is only a finding that the catalytic converters are exempt from the prohibitions of Vehicle Code Sections 27156 and 38391.
5. Brown Recycling & Mfg., Inc. must submit their quality audit data or quality control procedures, as well as production quantity data for each converter type produced, to the ARB for review on a semi-annual basis no later than August 15 and February 15 for each production year. For the first production audit reporting period of February 15, 1996, production audit testing shall be conducted to demonstrate correlation between conversion efficiencies of two TWC and two TWC + OC determined using the procedures established by Brown Recycling & Mfg., Inc. and the cold-start CVS-75 Federal Test Procedure. The test parameters shall be specified by the ARB and will be sent to Brown Recycling & Mfg., Inc. not less than 30 days before the end of the reporting period. Failure to establish correlation between the conversion efficiency obtained using the CVS-75 and the conversion efficiency obtained using the procedures developed by Brown Recycling & Mfg., Inc. may cause the ARB to require Brown Recycling & Mfg., Inc. to review and modify its procedures.
6. Brown Recycling & Mfg. will be required to adopt a new bench test procedures should the ARB develop a bench test procedures for screening OEM catalytic converters which are more stringent than those used by Brown Recycling & Mfg., in the future.

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 it, during 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 is made, after the hearing, that grounds for revocation exist.

Executed at El Monte, California, this 26<sup>th</sup> day of October 1995.

  
R.B. Summerfield  
Assistant Division Chief  
Mobile Source Division

State of California  
AIR RESOURCES BOARD

EVALUATION OF BROWN RECYCLING & MFG., INC. SALVAGED OR USED ORIGINAL  
EQUIPMENT CATALYTIC CONVERTERS FOR EXEMPTION FROM THE PROHIBITIONS  
IN VEHICLE CODE SECTION 27156 AND TITLE 13, CALIFORNIA  
CODE OF REGULATIONS, SECTION 2222(i)

October 1995

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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

Brown Recycling & Mfg., Inc. (Brown Recycling) of 1274 Gravel Ridge Road, Somerville, Alabama 35670, has applied for an exemption to salvage and test used original equipment manufacturer (OEM) catalytic converters for sale in California under California regulations on used aftermarket catalytic converters. Brown Recycling has developed a bench test for screening used catalytic converters, which is a modification of the Environmental Protection Agency (EPA) approved light-off and stabilized efficiency test. The test set-up will bench test two-way, three-way, and three-way plus oxidation used OEM converters.

Brown Recycling proposes to screen the used OEM converters for the minimum conversion efficiencies of 70 percent for HC and CO, and NOx efficiencies of 60 and 50 percent for three-way and three-way plus oxidation converters respectively. These are the same conversion efficiencies required by California regulations for new aftermarket non-OEM converters. The ARB is also allowing Brown Recycling to market used precatalysts that show a minimum conversion efficiency of 40 percent for HC and CO. At the present time, the Air Resources Board (ARB) has not adopted a test procedure for recycling used OEM three-way type converters. However, the staff believes that there is a significant need to allow the sale of recycled three-way converters in California, and that the test procedure proposed by Brown Recycling is more stringent than that currently accepted by the EPA. As part of their production audit testing, Brown Recycling will test a total of four used OEM converters, with known conversion efficiencies, using cold-start CVS-75, for the purpose of correlating their bench test efficiency with the efficiency obtained from the cold-start CVS-75.

Information submitted by Brown Recycling show that they meet the requirements of Vehicle Code Section 27156 and Title 13, California Code of Regulations, Section 2222(i) to advertise and market used OEM catalytic converters in California. Staff recommends that the exemption be granted as requested and that Executive Order D-387 be issued.

CONTENTS

	<u>Page Number</u>
<u>SUMMARY</u>	i
<u>CONTENTS</u>	ii
I. <u>INTRODUCTION</u>	1
II. <u>CONCLUSION</u>	1
III. <u>RECOMMENDATIONS</u>	1
IV. <u>PROCEDURE DESCRIPTION</u>	2

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I. INTRODUCTION

Brown Recycling & Mfg., Inc. (Brown Recycling) of 1274 Gravel Ridge Road, Somerville, Alabama 35670, has applied for an exemption to salvage and test used original equipment manufacturer (OEM) catalytic converters for sale in California under California Vehicle Code Section 27156 and Title 13, California Code of Regulations, Section 2222(i). Brown Recycling has developed a bench test for screening three-way converter (TWC) and three-way plus oxidation converter (TWC + OC). Their test procedure is a modification of the Environmental Protection Agency (EPA) approved GM's "Cell 102" or Light-off and Stabilized Efficiency Tests which enables Brown Recycling to determine the conversion efficiency for NOx as well as HC and CO. Brown Recycling also uses the unmodified EPA approved GM's "Cell 102" test procedures to screen oxidation converters and precatalysts.

II. CONCLUSION

The applicant has submitted all the required information, and based on the submitted catalyst test data, the staff concludes that Brown Recycling laboratory has demonstrated that their procedures are adequate for determination of the conversion efficiency of used OC, TWC, TWC + OC, and precatalysts in accordance with California regulations on aftermarket catalytic converters.

III. RECOMMENDATION

Staff recommends that the exemption be granted as requested and that Executive Order No. D-387 be issued, permitting the advertisement, sale and installation of the used OEM catalytic converters tested by Brown Recycling.

IV. PROCEDURE DESCRIPTION

Brown Recycling previously screened used catalytic converters in accordance with procedures described in Federal Registrar Vol.51, No.150, dated August 5, 1986, the light-off and stabilized conversion efficiency test. The following are the test equipment and parameters:

Test Engine - 350 CID (5.7L) GM V-8 2 bbl TBI equipped

Engine speed - 1800 +/- 20 RPM

Engine load - 31 ft-lb (10.6 hp)

Converter inlet CO - 2% +/- 0.05%

Converter inlet temperature - 730 +/- 30 degrees F

Air Injection Pump - 20 CID (maximum)

Air Injection Drive Ratio - 1.5:1 (maximum)

Location of converter - 2 feet (min) from merging point of the two  
exhaust banks

Converter pre-test temperature - 100 degrees F

Exhaust Gas Analyzers for HC, CO, and NOx

Computer for data reduction

Since the above test parameters cannot generate NOx, some adjustments to the existing test procedure were necessary to evaluate the NOx efficiency of a catalytic converter. In order to generate enough NOx in the exhaust for conversion efficiency measurement, Brown Recycling leaned the inlet CO from 2% +/- 0.05% to 0.6% +/- 0.10%. The converter inlet temperature was increased to 800 +/- 30 degrees F by increasing the load on the dynamometer to 75 ft-lb +/- 5 ft-lb. Inlet HC was adjusted to 500 +/- 100 ppm, inlet NOx was 2000 +/- 100 ppm, air/fuel ratio was maintained at 14.7:1, backpressure was maintained at between 1-3 psi, ignition timing was set 0 degree TDC, and air pump flow rate was maintained at 5-10 scfm. Air injection was not used except when testing three-way plus oxidation

converters when air was introduced between the reducing and oxidizing substrates for oxidation reaction. All other parameters remained unchanged. Brown Recycling submitted data from tests conducted with 10 used OEM three-way converters and 10 used OEM three-way plus oxidation converters using the modified procedures described above. The time to obtain conversion efficiencies of 50, 70, and 90 percent after the exhaust gas was switched to pass through the catalytic converter were measured. Based on these test data, staff recommends that the ARB allow the sale and installation of used OEM three-way, three-way plus oxidation, and precatalysts which attain the following conversion efficiencies within 60 seconds after the exhaust is switched to pass through the catalyst.

Conversion Efficiencies

<u>Converter Type</u>	<u>HC</u>	<u>CO</u>	<u>NOx</u>
TWC + OC	70%	70%	50%
TWC	70%	70%	60%
Precatalyst	40%	40%	-

As part of their production audit testing Brown Recycling shall conduct cold-start CVS-75 conversion efficiency tests on two three-way converters and two three-way plus oxidation converters in order to correlate the efficiencies obtained using their procedures with the cold-start CVS-75 conversion efficiencies. The tests shall be conducted by the next production audit reporting period ending February 15, 1996. The cold-start CVS-75 tests are to be conducted at an independent laboratory. The ARB will provide Brown Recycling with all pertinent information for the audit testing. All used catalytic converters sold in California by Brown Recycling must be tested using the procedures described above, and must attain the required conversion efficiencies.