

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-528

Relating to Exemptions Under Section 27156
of the Vehicle Code

Kleemann USA, Inc.
Kleemann Comfort Power Compressor Kit

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-45-9;

IT IS ORDERED AND RESOLVED: That the installation of the Kleemann Comfort Power Compressor Kit, manufactured and marketed by Kleemann USA, Inc., 29 West Cimarron Street, Colorado Springs, Colorado 80919 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 the following 1998 through 2001 Mercedes-Benz vehicles with either a 6 or 8-cylinder engine.

| <u>Part No.</u> | <u>Model Year</u> | <u>Models</u> |
|-----------------|-------------------|---|
| 1122083206 | 1998-2001 | C260, C280, C320, CLK320, SLK320 |
| | 1998-2000 | E320 |
| | 1998-1999 | ML320 |
| 1132085508 | 1998-2001 | E55, CLK430, CLK55, ML430, ML55, S430, S55, CL55, G500, ML500 |
| | 1998-2000 | E430, S500 |

Vehicles which have been certified to a Ultra-Low-Emission Vehicle (ULEV) and/or the Supplemental Federal Test Procedure (SFTP) standards are excluded from this Executive Order.

The Kleemann Comfort Power Compressor Kit consists of an Autorotor supercharger with a pulley diameter of 87mm for the 6 cylinder engine and 75mm for the 8 cylinder engine. The factory fuel system is modified with an additional fuel pressure regulator that raises fuel rail pressure in proportion to the positive manifold pressure. The factory intake manifold is replaced with a new manifold housing that contains the supercharger and intercooler assembly. The EGR tube inside the manifold is modified to ensure even distribution of gases into each cylinder. The factory electric air injection pump is relocated to the inside fender area. Maximum boost pressure is 7 psi. The C class models receive a voltage step up device for the fuel pump when in the boost mode. A 500 ohm resistor, designed to prevent a lean condition during high RPMs, is installed inline with the output signal of the mass air flow meter.

This Executive Order shall not apply to any Kleemann USA, Inc.'s Kleemann Comfort Power Compressor Kit advertised, offered for sale, sold with, or installed on a new motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

This Executive Order is valid provided that the installation instructions for the Kleemann Comfort Power Compressor Kit will not recommend tuning the vehicle to specifications different from those of the vehicle manufacturer.

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

Marketing of the Kleemann Comfort Power Compressor Kit using any identification other than that shown in this Executive Order or marketing of the Kleemann Comfort Power Compressor Kit 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 Kleemann Comfort Power Compressor Kit 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 the Kleemann Comfort Power Compressor Kit may have on any warranty either expressed or implied by the vehicle manufacturer.

This Executive Order is granted based on submitted emissions test data which showed that the Kleemann Comfort Power Compressor Kit did not adversely affect tailpipe emissions during a Cold Start CVS-75 Federal Test Procedure. A 2000 Mercedes-Benz E320 with a 3.2L engine, and certified to the low emission vehicle (LEV) emission standards was used as the test vehicle. Results of the emission testing with the Kleemann Comfort Power Compressor Kit installed are shown below.

| | NMOG | CO | NOx | HCHO |
|-------------|-------|-----|-----|-------|
| Standards | 0.075 | 3.4 | 0.2 | 0.015 |
| Device w/df | 0.026 | 0.4 | 0.1 | 0.001 |

Test results showed that the Kleemann Comfort Power Compressor Kit did not cause exhaust emissions to exceed the applicable emission standards with deterioration factors applied. This Executive Order is also based on an On-Board Diagnostic II (OBD II) test conducted on the same vehicle. Test data showed that the Kleemann Comfort Power Compressor Kit when installed on the vehicle did not affect the vehicle's ability to perform its OBD II monitoring.

The ARB finds that reasonable grounds exist to believe that use of the Kleemann Comfort Power Compressor Kit may adversely affect emissions of motor vehicles when operating under conditions outside the parameters of the Cold Start CVS-75 Federal Test Procedure.

Accordingly, the ARB reserves the right to conduct additional emission tests, in the future, as such tests are developed, that will more adequately measure emissions from all cycle phases. If such test results demonstrate that the Kleemann Comfort Power Compressor Kit adversely affects emissions during off-cycle conditions (defined as those conditions which are beyond the parameters of the Cold Start CVS-75 Federal Test Procedure), this Executive Order shall be effectively rescinded as of the date the test results are validated. Further, if such test results or other evidence provides the ARB with reason to suspect that the Kleemann Comfort Power Compressor Kit will affect the durability of the emission control system, Kleemann USA, Inc. shall be required to submit durability data to show that the durability of the vehicle emission control system is not, in fact, affected and/or that the add-on or modified part demonstrates adequate durability.

In addition to the foregoing, the ARB reserves the right in the future to review this Executive Order and the exemption provided herein to assure that the exempted add-on or modified part continues to meet the standards and procedures of Title 13, California Code of Regulations, Section 2222, et seq.

THIS 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 KLEEMANN USA, INC.'S KLEEMANN COMFORT POWER COMPRESSOR KIT.

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 a 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 is made after the hearing that grounds for revocation exist.

Executed at El Monte, California, this 18th day of December 2001.



R. B. Summerfield, Chief
Mobile Source Operations Division

EVALUATION SUMMARY

Manufacturer Name: Kleemann USA, Inc.

Name of Device: Kleemann Comfort Power Compressor Kit

Background:

Kleemann USA, Inc., 29 West Cimarron Street, Colorado Springs, Colorado 80919, has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for the Kleemann Comfort Power Compressor Kit designed for selected 1998 through 2001 Mercedes-Benz vehicles with either a 6 or 8-cylinder engine, excluding those which have been certified to the Ultra-Low-Emission Vehicle (ULEV) and/or the Supplemental Federal Test Procedure (SFTP) emission standards.

Recommendation:

Grant exemption to Kleemann USA, Inc. as requested and issue Executive Order D-528.

Device Description:

The Kleemann Comfort Power Compressor Kit consists of an Autorotor supercharger with a pulley diameter of 87mm for the 6 cylinder engine and 75mm for the 8 cylinder engine. The factory fuel system is modified with an additional fuel pressure regulator that raises fuel rail pressure in proportion to the positive manifold pressure. The factory intake manifold is replaced with a new manifold housing that contains the supercharger and intercooler assembly. The EGR tube inside the manifold is modified to ensure even distribution of gases into each cylinder. The factory electric air injection pump is relocated to the inside fender area. Maximum boost pressure is 7 psi. The C class models receive a voltage step up device for the fuel pump when in the boost mode. A 500 ohm resistor, designed to prevent a lean condition during high RPMs, is installed inline with the output signal of the mass air flow meter.

Discussion/Basis for the Recommendation:

Kleemann USA requested an exemption for their Kleemann Comfort Power Compressor Kit which is applicable to selected 1998 through 2001 Mercedes-Benz vehicles. Kleemann submitted emissions test data which showed that the Kleemann Comfort Power Compressor Kit did not adversely affect tailpipe emissions during a Cold Start CVS-75 Federal Test Procedure. A 2000 Mercedes-Benz E320 with a 3.2L engine, and certified to the low emission vehicle (LEV) emission standards was used as the test vehicle. Results of the emission testing with the Kleemann Comfort Power Compressor Kit installed are shown below. Testing parameters used were: 3875 lbs. and 6.5 hp. The deterioration factors used for the calculations were: NMOG 1.0, CO 1.0, NOx 1.56, and HCHO 1.435. The conversion factors used were: NMOG/NMHC=1.0679 and HCHO/NMHC=0.025, NMHC was measured at 0.024.

| | NMOG | CO | NOx | HCHO |
|-------------|-------|-----|-----|-------|
| Standards | 0.075 | 3.4 | 0.2 | 0.015 |
| Device w/df | 0.026 | 0.4 | 0.1 | 0.001 |
| Margin | 0.049 | 3.0 | 0.1 | 0.014 |

Test results showed that the Kleemann Comfort Power Compressor Kit did not cause exhaust emissions to exceed the applicable emission standards with deterioration factors applied. This Executive Order is also based on an On-Board Diagnostic II (OBD II) test conducted on the same vehicle. Test data showed that the Kleemann Comfort Power Compressor Kit when installed on the vehicle did not affect the vehicle's ability to perform its OBD II monitoring.

Based on the submitted emissions and OBD II test data, the staff concludes that the Kleemann Comfort Power Compressor Kit meets the requirements for a VC 27156 exemption.

This Executive Order does not constitute any opinion as to the effect the use of the Volant Performance Air Intake System may have on any warranty either expressed or implied by the vehicle manufacturer.

This Executive Order is granted based on an examination of the On-Board Diagnostic II (OBD-II) system of a 2002 model-year Chrysler PT Cruiser (engine family 2CRXV0148V40, ULEV, PC) in the modified configuration, and an engineering evaluation of the emissions impact of the device if measured using the Cold-Start CVS-75 Federal Test Procedure. However, the ARB finds that reasonable grounds exist to believe that use of the Volant Performance Air Intake System may adversely affect emissions of motor vehicles when operating under conditions outside the parameters of the CVS-75 Federal Test Procedure. Accordingly, the ARB reserves the right to conduct additional emission tests, in the future, as such tests are developed, that will more adequately measure emissions from all cycle phases. If such test results demonstrate that the Volant Performance Air Intake System adversely affect emissions during off-cycle conditions (defined as those conditions which are beyond the parameters of the Cold-Start CVS-75 Federal Test Procedure), this Executive Order shall be effectively rescinded as of the date the test results are validated. Further, if such test results or other evidence provides the ARB with reason to suspect that the Volant Performance Air Intake System will affect the durability of emission control systems, Volant Air Intake Systems shall be required to submit durability data to show that the durability of vehicle emission control systems are not, in fact, affected and/or that the add-on or modified part demonstrates adequate durability.

The ARB reserves the right in the future to review this Executive Order and the exemption provided herein to assure that the exempted add-on or modified part continues to meet the standards and procedures of Title 13, California Code of Regulations, Section 2222, et seq.

THIS 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 VOLANT AIR INTAKE SYSTEMS' VOLANT PERFORMANCE AIR INTAKE SYSTEM.

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 a 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 is made after the hearing that grounds for revocation exist.

Executed at El Monte, California, this 15th day of October, 2001.



R. B. Summerfield, Chief
Mobile Source Operations Division

Exhibit A

| MY | Make | Model | Disp. | P/N |
|-----------|----------|------------------------|-----------------|-------|
| 1994-1995 | GM | S-10 pick-up, Blazer | 4.3 L | 15543 |
| 1996-2001 | GM | S-10 pick-up, Blazer | 4.3 L | 15643 |
| 1994-1995 | GM | S-10 pick-up, Blazer | 2.2 L | 25543 |
| 1996-2001 | GM | S-10 pick-up, Blazer | 2.2 L | 25643 |
| 1999-2001 | GM | Silverado, Sierra | 4.3 L | 15743 |
| 1999-2001 | GM | Silverado, Sierra | 4.8, 5.3, 6.0 L | 15853 |
| 2000-2001 | GM | Suburban, Yukon | 5.3, 6.0 L | 15953 |
| 1988-1995 | GM | Silverado, Suburban | 5.7 L | 15857 |
| 1996-1998 | GM | Silverado, Suburban | 5.7 L | 15957 |
| 2001 | GM | Silverado HD, Suburban | 8.1 L | 15881 |
| 1994-1997 | GM | Sonoma, S-10 | 2.2 L | 25422 |
| 1998-2000 | GM | Sonoma, S-10 | 2.2 L | 25522 |
| 1996-2000 | GM | Astro van | 4.3 L | 25743 |
| 1994-2000 | Dodge | Ram | 5.9 L | 16859 |
| 2001 | Dodge | Ram | 3.9, 5.9 L | 16959 |
| 1999-2001 | Dodge | Dakota crew cab | 4.7 L | 26847 |
| 2000-2001 | Dodge | Dakota, Durango | 5.2 L | 26952 |
| 2001-2002 | Chrysler | PT Cruiser | 2.4 L | 13424 |
| 1997-2001 | Jeep | Wrangler | 4.0 L | 27640 |
| 1998-2000 | Ford | Ranger | 3.0 L | 29630 |
| 1996-2001 | Ford | F150, Expedition | 4.6, 5.4 L | 19854 |
| 1999-2001 | Ford | Lincoln Navigator | 32 valve | 19054 |
| 1996-2000 | Ford | F150 | 4.2 L | 29642 |
| 1996-2001 | Ford | F150, Expedition | 4.6, 5.4 L | 29854 |
| 1999-2001 | Ford | F250, Expedition | 6.8 L | 29068 |
| 1999-2001 | Ford | F250, Expedition | 5.4 L | 29954 |

EVALUATION SUMMARY

Manufacturer Name: Volant Air Intake Systems

Name of Device: Volant Performance Air Intake System

Background:

Volant Air Intake Systems of 10700 Jersey Blvd. Suite 670, Rancho Cucamonga, California 91730, has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for the Volant Performance Air Intake Systems designed for the vehicles listed in Exhibit A. The vehicle application includes those certified to the Ultra Low Emission Vehicle (ULEV) standards.

Recommendation:

Grant exemption to Volant Air Intake Systems as requested and issue Executive Order D-526.

Device Description:

Volant Air Intake Systems' Volant Performance Air Intake Systems are air intake systems specifically designed for installation on the vehicles listed in Exhibit A. The installation of the kit does not require any major modifications to the stock motor, except for the modification of the factory air intake system to accommodate the Volant Performance Air Intake Systems air filter and plumbing. On some models, relocation of the crankcase ventilation hose is required. In these cases, the Volant Performance Air Intake Systems are supplied with crankcase ventilation hoses (which may be silicone, and a color other than black). The filter element used in the Volant Performance Air Intake Systems is an open-element, reusable cotton gauze unit, designed to be less restrictive than the stock air filter.

The Volant Performance Air Intake Systems are intended to increase the vehicles' volumetric efficiency and power output at particular engine loads and throttle openings. At heavy engine loads and increased throttle openings, the airflow into the engine is increased because the Volant Performance Air Intake Systems are less restrictive than stock air filters. This allows more air to enter the engine, which is compensated by the vehicle engine control module with an increase in fuel flow, resulting in a higher power output. However, the fuel enrichment is limited and the typical net effect is an overall leaning effect of the fuel mixture. The leaning effect is manifested in a marginal, but measurable, NO_x increase. Worst-case vehicles are examined for their certification emissions. In cases where certification emissions have values low enough to accommodate any small increase in emissions (in this case NO_x), emission testing is deemed not required.

Discussion/Basis for the Recommendation:

A 2002 Chrysler PT Cruiser with a 2.0 liter four cylinder engine (engine family 2CRXV0148V40) was used for the evaluation of the Volant Performance Air Intake System. The test vehicle was certified to the Passenger Car Ultra Low-Emission Vehicle (PC ULEV) standards and was equipped with an enhanced evaporative system. Testing consisted of one CVS-75 Federal Test Procedure (FTP) in the modified configuration (Volant Cool Air Intake installed) to set all On-Board Diagnostics (OBD) II readiness indicators. Testing was conducted at Automotive Testing and Development Services. No emissions measurement was required since similar systems have been

tested previously and have shown to marginally increase the NOx when tested in accordance with the CVS-75 FTP. This marginal increase in NOx is due to a leaning effect of the less restrictive intake system. Since the affected vehicles have certification values that are considerably below the standards, they can accommodate any small increase in NOx emissions.

Based on engineering evaluation and the OBD-II test results, the staff concludes that the Volant Air Intake Systems' Volant Performance Air Intake System meets the requirements for a VC 27156 exemption for the vehicles listed in Exhibit A.

Exhibit A

| MY | Make | Model | Disp. | P/N |
|-----------|----------|------------------------|-----------------|-------|
| 1994-1995 | GM | S-10 pick-up, Blazer | 4.3 L | 15543 |
| 1996-2001 | GM | S-10 pick-up, Blazer | 4.3 L | 15643 |
| 1994-1995 | GM | S-10 pick-up, Blazer | 2.2 L | 25543 |
| 1996-2001 | GM | S-10 pick-up, Blazer | 2.2 L | 25643 |
| 1999-2001 | GM | Silverado, Sierra | 4.3 L | 15743 |
| 1999-2001 | GM | Silverado, Sierra | 4.8, 5.3, 6.0 L | 15853 |
| 2000-2001 | GM | Suburban, Yukon | 5.3, 6.0 L | 15953 |
| 1988-1995 | GM | Silverado, Suburban | 5.7 L | 15857 |
| 1996-1998 | GM | Silverado, Suburban | 5.7 L | 15957 |
| 2001 | GM | Silverado HD, Suburban | 8.1 L | 15881 |
| 1994-1997 | GM | Sonoma, S-10 | 2.2 L | 25422 |
| 1998-2000 | GM | Sonoma, S-10 | 2.2 L | 25522 |
| 1996-2000 | GM | Astro van | 4.3 L | 25743 |
| 1994-2000 | Dodge | Ram | 5.9 L | 16859 |
| 2001 | Dodge | Ram | 3.9, 5.9 L | 16959 |
| 1999-2001 | Dodge | Dakota crew cab | 4.7 L | 26847 |
| 2000-2001 | Dodge | Dakota, Durango | 5.2 L | 26952 |
| 2001-2002 | Chrysler | PT Cruiser | 2.4 L | 13424 |
| 1997-2001 | Jeep | Wrangler | 4.0 L | 27640 |
| 1998-2000 | Ford | Ranger | 3.0 L | 29630 |
| 1996-2001 | Ford | F150, Expedition | 4.6, 5.4 L | 19854 |
| 1999-2001 | Ford | Lincoln Navigator | 32 valve | 19054 |
| 1996-2000 | Ford | F150 | 4.2 L | 29642 |
| 1996-2001 | Ford | F150, Expedition | 4.6, 5.4 L | 29854 |
| 1999-2001 | Ford | F250, Expedition | 6.8 L | 29068 |
| 1999-2001 | Ford | F250, Expedition | 5.4 L | 29954 |