

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-278
Relating to Exemptions Under Section 27156
of the Vehicle Code

CHEVROLET RACESHOP
5.7L H.O. CAMARO PERFORMANCE PACKAGE

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 5.7L H.O. Camaro Performance Package manufactured by the Chevrolet Raceshop of 30007 Van Dyke Avenue, Warren, Michigan 48090-9065 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 1982 to 1987 Camaros originally equipped with an LG4 or L69 5.0L engine and a 700R4 automatic transmission.

The Chevrolet Raceshop's 5.7L H.O. Camaro Performance Package includes an engine block, camshaft, pistons, cylinder heads, intake and exhaust manifolds, an electronic control unit (ECU) with recalibrated PROM, new fuel, oil and water pumps, oil pan, valve covers, dual-snorkel air cleaner, dual catalyst, and a transmission shift kit. The Raceshop's 5.7L H.O. Camaro Performance Package does not utilize the use of an EGR valve or the carburetor heat stove.

This Executive Order is valid provided that installation instructions for the 5.7L H.O. Camaro Performance Package will not recommend tuning the vehicle to specifications different from those submitted by the Chevrolet Raceshop.

Changes made to the design or operating conditions of the 5.7L H.O. Camaro Performance Package, 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 5.7L H.O. Camaro Performance Package using any identification other than that shown in this Executive Order or marketing of these 5.7L H.O. Camaro Performance Package for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board.

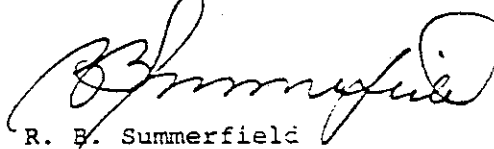
This Executive Order does not constitute any opinion as to the effect the use of the Performance Package may have on any warranty either expressed or implied by the vehicle manufacturer.

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 CHEVROLET RACESHOP'S 5.7L H.O. CAMARO PERFORMANCE PACKAGE.

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 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 2nd day of February, 1993.



R. B. Summerfield
Assistant Division Chief
Mobile Source Division

State of California
AIR RESOURCES BOARD

EVALUATION OF CHEVROLET RACESHOP'S
5.7L H.O. CAMARO PERFORMANCE PACKAGE FOR EXEMPTION FROM THE PROHIBITIONS OF
VEHICLE CODE SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE
CALIFORNIA CODE OF REGULATIONS

February 1993

State of California
AIR RESOURCES BOARD

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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

Chevrolet Raceshop (Raceshop) of 30007 Van Dyke Ave., Warren , Michigan 48090-9065, has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for the 5.7L H.O. Camaro Performance Package. The Performance Package is designed for installation on 1982-1987 Camaros originally equipped with an LG4 or L69 5.0L engine and a 700R4 automatic transmission.

The Raceshop submitted a completed application and all other required information, as well as emissions test data performed at Automotive Testing and Development Services (ATDS) in Huntington Beach, California which shows that their Performance Package does not have any adverse effect on emissions. Confirmatory testing performed by the Air Resources Board (ARB) showed similar results.

Based on the submitted information, the staff concludes that the Raceshop's Performance Package will not adversely affect exhaust emissions from vehicles for which an exemption is requested.

The staff recommends that the Chevrolet Raceshop be granted an exemption as requested and that Executive Order D-278 be issued.

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I. INTRODUCTION

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II. CONCLUSIONS

Based on the submitted information, the staff concludes that the Raceshop's Performance Package will not adversely affect exhaust emissions from vehicles for which an exemption is requested.

III. RECOMMENDATION

The staff recommends that the Chevrolet Raceshop be granted an exemption for their 5.7L H.O. Camaro Performance Package for installation on 1982-1987 Camaros equipped with a 5.0L V8 engine. The staff also recommends that Executive Order D-278 be issued.

IV. PERFORMANCE PACKAGE DESCRIPTION

The Raceshop's 5.7L H.O. Camaro Performance Package is a new engine that uses new internal and external components. The major components of the Performance Package are the engine block, camshaft, pistons, cylinder heads, intake and exhaust manifolds, and a electronic control unit (ECU). The Performance Package uses a 5.7L engine block which is a direct replacement to the stock 5.0L engine block. The new camshaft, when compared to OEM, is altered in lift by 32 percent on the intake lobe and 31 percent on the exhaust lobe. Inlet duration is also increased by 17.5 percent and exhaust duration increased by 14 percent. The stock flat tappet hydraulic lifters are replaced with hydraulic roller lifters, and the pistons are changed to a cast hypereutectic aluminum. The cylinder heads are changed from cast iron to aluminum construction, but retained similar valve dimensions. The intake and exhaust manifolds that are used as part of the Performance Package are similar to their stock counterparts through the use of similar casting materials and functional design. For example the intake manifold of the Performance Package is similar to the OEM intake manifold due to the aluminum construction and the dual plane 4 barrel setup. The exhaust manifolds are similar to the OEM in both material and design. Because the early ECU models had limited features, a new ECU is included as part of the Performance Package. The new ECU is a stock replacement for late model General Motors vehicles modified to adapt to earlier models. The stock PROM is also replaced by an updated PROM that has been calibrated for the new larger engine. Changes are made to the spark and fuel tables with the recommendation that the vehicle operates with premium octane fuel only. Other components of the Performance Package include new fuel, oil and water pumps, oil pan, valve covers, dual snorkel air cleaner,

replacement GM catalytic converters, and a transmission shift kit. Appendix A list all the components and their specifications while Appendix B shows the installation instructions. The Performance Package does not utilize the use of an EGR valve or the carburetor heat stove for proper vehicle operation.

V. DISCUSSION OF THE PERFORMANCE PACKAGE

Chevrolet Raceshop has requested that the 5.7L H.O. Camaro Performance Package be exempted for the 1982-1987 Camaros equipped with a 5.0L V8 engine. A 1987 Chevrolet Camaro using the 5.7L Performance Package engine was used as the test vehicle. The Raceshop performed testing at ATDS to be compared against the vehicle's emission standards.

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

Table 1

CVS-75 TEST RESULTS

(Automotive Testing and Development Services)

	<u>HC</u>	<u>CO</u>	<u>NOx</u>
	(grams/mile)		
Test 1	0.102	2.321	0.456
Test 2	0.259	2.859	0.481
Average	0.181	2.590	0.469
Standards	0.39	7.0	0.7

These results show that the modified vehicle emissions do not exceed those of the vehicle's emission standards.

The ARB also tested the vehicle with the 5.7L H.O. Camaro Performance Package installed. Test results showed comparable emission levels to that of ATDS.

Table 2

ARB CVS-75 Test Results

	<u>HC</u>	<u>CO</u>	<u>NOx</u>
	(grams/mile)		
Device	0.16	1.87	0.51
Standard	0.39	7.0	0.7

Raceshop submitted all of the required information and fulfilled the requirements for an exemption. The test results show that the Raceshop's Performance Package meets the requirements for exemption.

APPENDIX A

5.7L H.O. CAMARO CONVERSION #10185077 PARTS LIST

1983-86 L69 (VIN "G")
1982-84 LG4 (VIN "H")
1985-87 LG4 (VIN "H")

QTY	PART NAME	P/N			
1	5.7L HO ENGINE—ZZ3	10185072	X	X	X
1	INSTRUCTION MANUAL	24502463	X	X	X
INDUCTION SYSTEM					
1	LH DUCT	14070917		X	X
1	RH DUCT	14070918		X	X
4	SCREW	11513801		X	X
1	LH HOSE	14073299		X	X
1	RH HOSE	14083990		X	X
1	AIR CLEANER ASSY.	25043641		X	X
1	STUD	14048874		X	X
1	NUT, WING	25512090		X	X
1	HOT AIR TUBE	469506		X	X
1	FRESH AIR ELBOW	3970070	X	X	X
FUEL SYSTEM					
1	IN-TANK FUEL PUMP KIT	14085385		X	X
1	FUEL PUMP, IN-TANK	25116279	X	X	X
1	STRAINER	25055458	X	X	X
1	PRESSURE REGULATOR	10185094	X	X	X
1	BRACKET, PRESSURE REGULATOR	10185069	X	X	X
1	OUTLET FITTING 3/8 PIPE TO 3/8 INVERTED FLARE	9432267	X	X	X
1	RETURN FITTING	10185093	X	X	X
1	3/8 PIPE TO 3/8 HOSE FITTING	10185096	X	X	X
CALIBRATION					
1	CONTROLLER, ECM	1228079	X	X	X
1	CALIBRATOR, PROM 1982-84 LG4	24502457		X	
1	CALIBRATOR, PROM 1985-87 LG4, 83-86 L69	24502456	X		X
1	SENSOR, KNOCK	10456018	X		X
1	MODULE, ELEC. SPARK CONTROL	16128261	X		X
2	METERING RODS, SECONDARY (AH)	7033812	X	X	X

X= PART USED IN CONVERSION

5.7L H.O. CAMARO CONVERSION #10185077 PARTS LIST

1983-86 L69 (VIN "G")
1982-84 LG4 (VIN "H")
1985-87 LG4 (VIN "H")

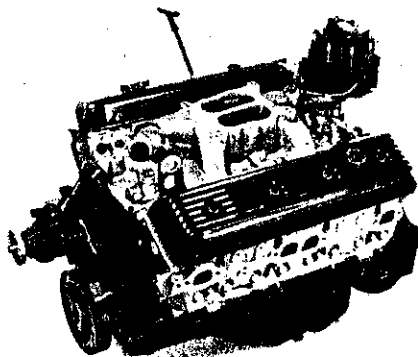
QTY	PART NAME	P/N			
CALIBRATION CONT'D					
1	COOLING FAN SWITCH (95C)	3053190	X		X
EXHAUST SYSTEM					
1	LH MANIFOLD	14094063	X	X	X
1	RH MANIFOLD	14094064	X	X	X
1	HEAT STOVE, PLATE	14101063	X	X	X
1	HEAT STOVE, COVER	14101064	X	X	X
2	STUD	14042051	X	X	X
2	STUD	12338075	X	X	X
4	NUT	14019305	X	X	X
1	SEAL, EXHAUST	10136863	X	X	X
1	TAKEDOWN, DUAL CAT	10185070	X	X	X
1	HEAT SHIELD, CATALYST	10164153	X	X	X
4	SCREW, M6.3-1.8x20	12337828	X	X	X
1	PIPE, AIR TO CONVERTER	10077542	X	X	X
1	CLAMP, AIR PIPE	22505116	X	X	X
1	BRACKET, CONVERTER HANGER	10081609	X	X	X
2	BOLT, CONVERTER TO BRACKET	11504596	X	X	X
1	INTERMEDIATE PIPE, MUFFLER, TAILPIPES*	24502461	X	X	X
TRANSMISSION					
1	SPRING, PRESSURE REGULATOR	8639164	X	X	X
1	VALVE, TV BOOST	8634940	X	X	X
1	SERVO, PISTON	8642079	X	X	X
1	SERVO, HOUSING	8642110	X	X	X
REAR SUSPENSION					
2	LOWER CONTROL ARM	10164151	X	X	X
DECALS					
1	DECAL, UNDERHOOD TUNE UP LABEL	24502462	X	X	X
1	"PREMIUM FUEL ONLY" DECAL	25602518	X	X	X

* For replacement exhaust system components, contact: Flowmaster Inc., 2975 Dutton Ave., Unit 3, Santa Rosa, CA 95407, 707-544-4761.



H.O. 350 ENGINE SPECIFICATIONS

Part Number: 10185072 (ZZ3)
Displacement: 5.7-liter (350ci)
Bore and Stroke: 4.00" x 3.48"
Compression Ratio: 9.8:1
Piston Material: Cast hypereutectic aluminum
Connecting Rod Material: 1053 forged steel
Camshaft: Hydraulic roller tappet (#10185071)
Valve Lift (Intake/Exhaust): .474"/.510"
Duration (Intake/Exhaust): 208/221 degrees @ .050" tappet lift
Valve Lash (Intake/Exhaust): Zero/zero
Cylinder Head Material: Cast aluminum
Valve Diameter (Intake/Exhaust): 1.94"/1.50"



Rocker Arm Ratio: 1.5:1
Oil Pressure (Normal): 40 psi @ 2000 rpm
Spark Plugs: AC FR5LS, 904 or MR43LTS
Maximum Recommended Engine Speed: 5800 rpm
Fuel Requirement: Unleaded premium 92 octane (R+M/2)

VEHICLE IDENTIFICATION

The H.O. 350 conversion kit is designed for installation in 1982-87 Camaros originally equipped with LG4 or L69 engines. Due to differences in original equipment in these vehicles, some of the components included in this conversion kit are not used with all year models and engines. The parts required to install the H.O. 350 conversion package on a specific model year and engine are noted in the chart above.

The factory-installed engine is identified by a letter code that appears in the eighth place of the Vehicle Identification Number (VIN). In the following example of a Vehicle Identification Number, the letter "H" is the engine code:

1G1FP3H0LL10001

The following are VIN engine codes for 1982-87 Camaros with LG4 and L69 engines:

Year	VIN	Engine
1983-86	"G"	L69
1982-87	"H"	LG4

APPENDIX B

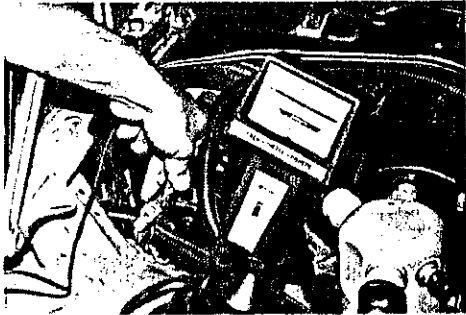


ENGINE INSTALLATION

CARBURETOR TEST

The H.O. 350 conversion retains the original equipment LG4 or L69 computer-controlled Quadrajets carburetor. Before removing the original engine, test the carburetor to make sure that it is operating properly.

This test requires a standard dwell meter set on its 6-cylinder scale. Open the underhood wiring harness cover near the heater blower motor and connect the dwell meter to the light blue wire with a green connector. When the engine is running at operating temperature, the dwell reading should be 30 degrees (plus-or-minus 10 degrees).



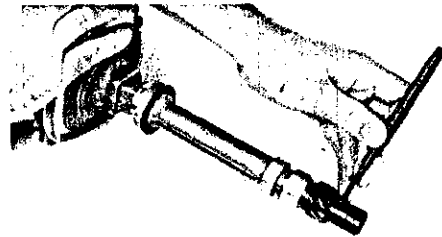
A dwell reading outside of this range indicates that the carburetor requires repair. See the Camaro service manual for cleaning and repair procedures.

DISTRIBUTOR GEAR REPLACEMENT

The H.O. 350 conversion retains the original LG4 or L69 electronic distributor. The H.O. 350 engine assembly includes an HEI distributor with mechanical and vacuum-spark advance mechanisms. This distributor cannot be used with the Camaro's EST (Electronic Spark Timing) system.

The drive gear from the H.O. 350 distributor must be transferred to the original LG4 or L69 distributor. The H.O. 350 engine has a steel roller tappet camshaft that requires a compatible distributor gear to prevent excessive wear. (NOTE: If you are installing an H.O. engine in a 1987 LG4 Camaro, the distributor already has the correct drive gear. If you are installing an H.O. engine in a 1983-86 L69 or 1982-1986 LG4, you must replace the distributor drive gear as shown.)

Remove the H.O. 350 distributor (after noting the position of the rotor) and drive out the distrib-



utor gear roll pin with a punch. Remove the original distributor gear from the LG4 or L69 EST distributor, and replace it with the gear from the H.O. 350 distributor. Align the dimple on the new distributor gear with the rotor point before inserting the gear retaining roll pin.

Install the EST distributor in the H.O. engine following the instructions for distributor installation in the Camaro service manual. Set the spark advance as specified on the tune-up label.

ENGINE INSTALLATION

The ZZ3 H.O. 350 engine is a direct replacement for LG4 and L69 305ci engines. Refer to the Camaro service manual for engine removal and installation instructions. Transfer all mounts, brackets, fittings, hoses, and accessories from the original engine to the H.O. 350.

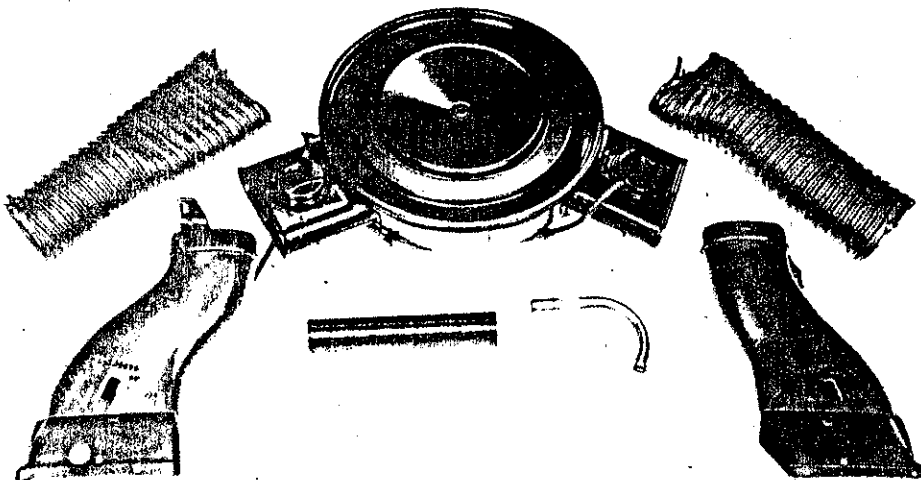
Plug all connections for the original LG4/L69 exhaust gas recirculation (EGR) system. These engines were equipped with EGR; however, the H.O. 350 conversion is certified to meet emission requirements without an EGR system.

Do not remove the EGR block-off plate or the choke heat stove block-off plate on the H.O. 350 intake manifold. The H.O. 350 conversion does not require an EGR valve or a carburetor heat stove.

Transfer the original LG4/L69 thermostat housing to the H.O. 350 intake manifold. Use the H.O. 350's 180-degree F thermostat.



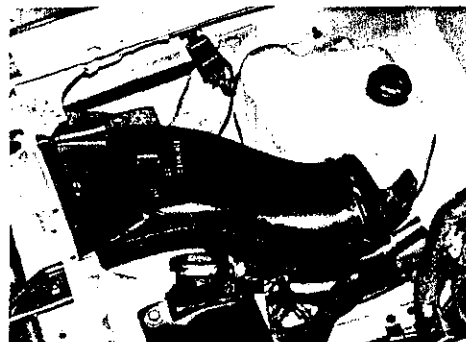
INDUCTION SYSTEM



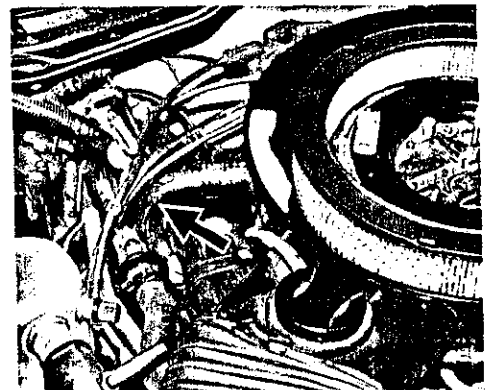
AIR CLEANER ASSEMBLY

The H.O. 350 Camaro conversion includes a dual-snorkel air cleaner with cold air ducts. This air cleaner assembly was original equipment on 1983-86 L69 Camaros; therefore these parts are not required when installing the H.O. 350 conversion in a 1983-86 L69 Camaro.

Connect the air ducts to the radiator crossmember with the supplied sheetmetal screws. Holes for the mounting screws are already drilled in the radiator mount. The passenger's side duct also attaches to a boss on the engine coolant reservoir tank.



The driver's side duct mounts to the radiator crossmember and to a boss on the windshield washer reservoir tank. Attach the ducts to the air cleaner snorkels with the flexible tubes supplied with the H.O. 350 conversion kit.



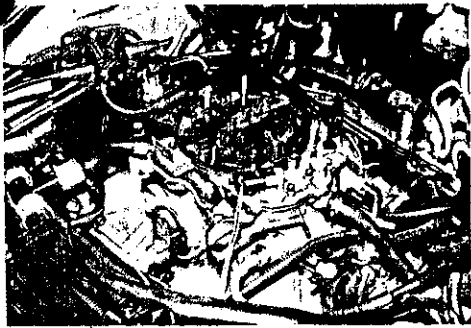
The H.O. 350 conversion kit includes a crankcase fresh air inlet tube. This tube is longer than the original part to compensate for the taller height of the H.O. 350 intake manifold. Install this tube from the passenger side rocker cover to the air cleaner base.

Connect the hot air tube from the driver's side exhaust manifold heat stove (see "Exhaust System") to the air cleaner snorkel as shown.

Connect the vacuum diaphragms on the air cleaner snorkels to the port fitting on the carburetor body above the fuel filter with a "Tee" fitting and vacuum hose.

CARBURETOR CALIBRATION

The H.O. 350 conversion retains the original LG4/L69 electronically controlled Quadrajets carburetor. After you have tested the carburetor for proper operation (see "Carburetor Test," page

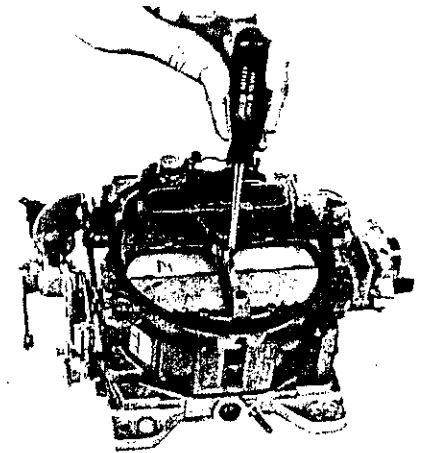


3), install the new secondary metering rods supplied with the conversion kit.

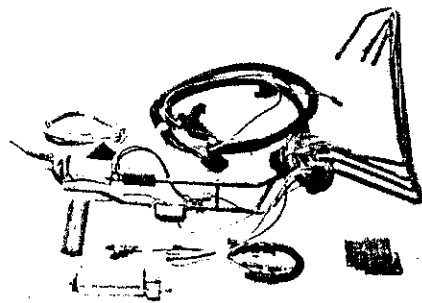
Use a T-8 Torx driver to remove the metering rod hanger retaining screw. Remove and discard the original secondary metering rods. Assemble



the replacement "AH" metering rods on the hanger as shown, and install the assembly in the carburetor. After tightening the retaining screw, make sure that the metering rods operate freely.



FUEL SYSTEM



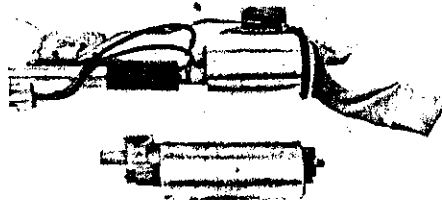
IN-TANK FUEL PUMP

All H.O. 350 Camaro conversions require a high-volume in-tank electric fuel pump. If you are converting a Camaro that was originally equipped with an in-tank fuel pump, it is only necessary to replace the original pump with the high-volume pump supplied with the H.O. conversion kit. If you are converting a Camaro that was originally equipped with a mechanical (engine-mounted) fuel pump, you must install the complete in-tank fuel pump kit and high-volume pump that are included with the H.O. 350 conversion kit. Refer to the instructions included with the in-tank conversion kit for installation procedures.

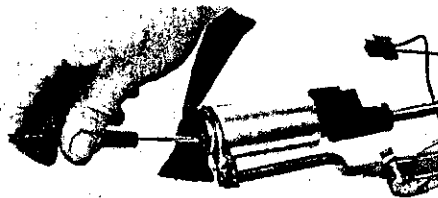
See the Camaro service manual for instructions on gas tank removal. Observe all safety precautions outlined in the service manual when working around flammable liquids. (NOTE: When installing an H.O. 350 conversion kit, remove the stock exhaust system before removing the gas tank. Reinstall the gas tank with the new fuel pump and then install the H.O. 350 exhaust system.)



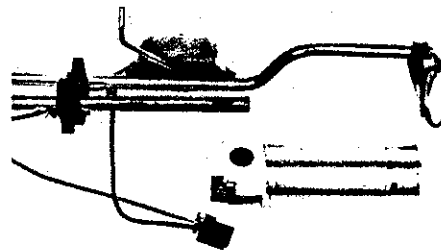
To remove the fuel pump and pickup assembly from the fuel tank, rotate the retaining ring with a punch.



Replace the standard in-tank fuel pump with the larger high-volume pump included with the H.O. 350 conversion kit.



To install the high-volume pump, first carefully pry off the strainer on the bottom of the pump. Remove the fuel pump from the sender assembly by pushing the pump toward the mounting ring and disengaging the connecting hose from the fuel pump outlet.



Trim the fuel pump pickup tube 1" to fit the longer high-volume fuel pump. Deburr and clean the pickup tube. Install the high-volume fuel pump and connect its outlet to the fuel line with the original hose. Install a new strainer on the fuel pump inlet. Connect the fuel pump wires, noting the location of the positive and negative terminals on the fuel pump. Reinstall the pickup and pump assembly in the gas tank, and secure it by rotating the retaining ring.



FUEL PRESSURE REGULATOR

The fuel pressure regulator included with the H.O. 350 conversion kit reduces the 14 psi fuel pressure produced by the in-tank electric fuel pump to 6 psi at the carburetor needle and seat.

Attach the regulator mounting bracket to the H.O. 350 engine's mechanical fuel pump block-off plate using the original fasteners. Mount the regulator beneath the bracket as shown with the screws supplied.

Install the $\frac{3}{8}$ " NPT x $\frac{3}{8}$ " hose fitting supplied with the H.O. 350 conversion kit in the regulator inlet (arrow A). Connect this fitting to the fuel tank line with $\frac{3}{8}$ " fuel hose included with the in tank electric fuel pump kit.

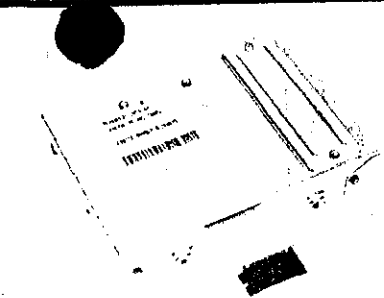
CAUTION: Use only hose approved for use with gasoline. Use only the worm-type hose clamps included with the H.O. 350 conversion kit. The use of other types of hose or clamps may cause a gasoline leak that could result in a fire. Apply pipe sealant (such as Loctite® PST) to a fitting threads to prevent fuel leaks.

Install the $\frac{3}{8}$ " NPT x $\frac{3}{8}$ " inverted flare fitting in the front regulator outlet (arrow B). Connect this fitting to the original steel fuel line that feeds the carburetor.

Install the $\frac{3}{8}$ " NPT x $\frac{1}{4}$ " hose fitting to the regulator outlet (arrow C). Connect this fitting to the fuel return line. **NOTE:** Use only the $\frac{3}{8}$ " NPT x $\frac{1}{4}$ " fitting supplied. It has a .042" restriction which is critical to the proper operation of the fuel system.

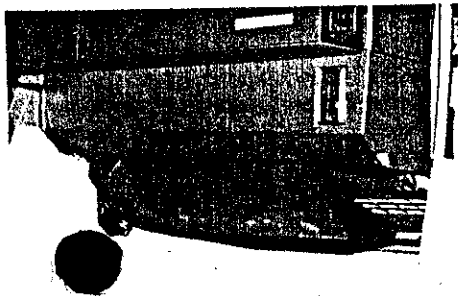
Refer to the instruction sheet included with the fuel pressure regulator for fuel pressure adjustment procedures. Set the fuel pressure with the engine hot and idling at 6 psi.

CALIBRATION

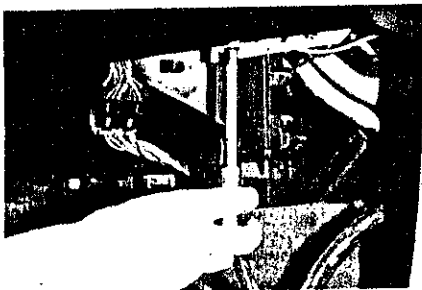


ENGINE CONTROL MODULE (ECM)

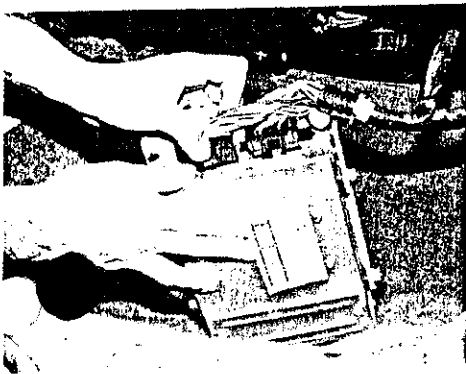
A replacement Engine Control Module (ECM) is required for all H.O. 350 conversions. The ECM controls spark timing and part-throttle fuel mixture. A specially programmed PROM (chip) calibrates the ECM to a specific application. Two PROMs are included with the H.O. conversion kit. Use #24502456 with a 1983-86 L69 or 1985-87 LG4 Camaro; use #24502457 with a 1982-84 LG4 Camaro.



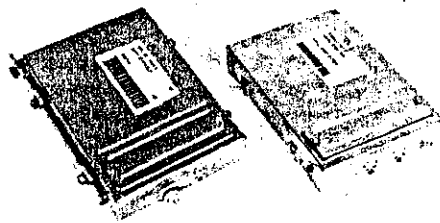
The ECM is located underneath the passenger side dashboard. On some models, a trim panel must be removed to access the ECM.



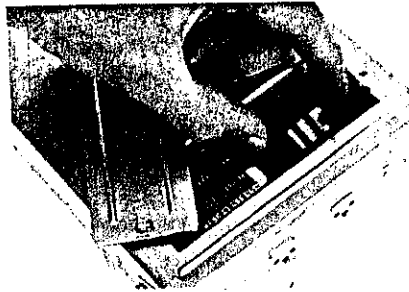
Remove the ECM mounting screws with a $\frac{1}{32}$ " socket and lower the ECM from beneath the dashboard.



Disconnect the wiring harness from the ECM by depressing the clips on the plug-in connectors.

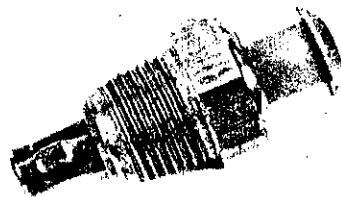


Transfer the mounting brackets and hardware from the original ECM to the replacement ECM.



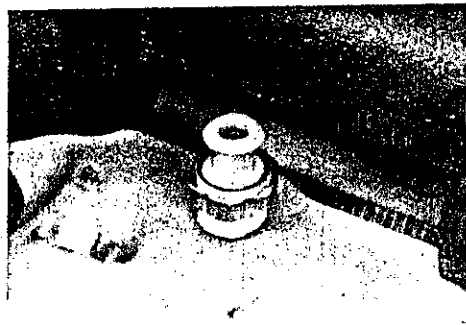
Install the PROM calibration chip included with the H.O. 350 conversion kit in the replacement ECM by removing the PROM cover with a $\frac{1}{4}$ " socket. Carefully align the PROM's indexing notches in the socket; the PROM can only be installed one way.

After installing the PROM, replace the cover and reinstall the ECM in the vehicle.



COOLANT FAN SWITCH

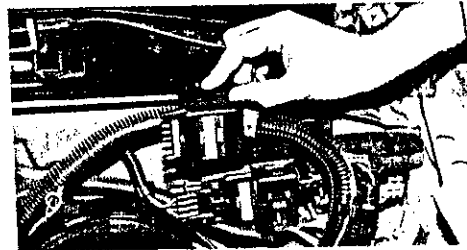
A coolant fan switch is included with H.O. 350 conversion kits for vehicles equipped with electric fans (1983-86 L69 and 1985-87 LG4). This switch turns on the radiator fan when the coolant temperature reaches 95 degrees C.



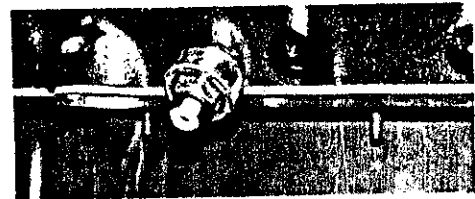
Install the coolant fan switch in the threaded hole in the passenger side cylinder head, using thread sealant to prevent coolant leaks. Connect the fan switch to the wiring harness with the original connector.

ELECTRONIC SPARK CONTROL

Electronic Spark Control (ESC) automatically retards the spark timing when a block-mounted sensor detects engine knock. The H.O. 350 conversion kit utilizes this system for models originally equipped with ESC (1983-86 L69 and 1985-87 LG4 Camaro). 1982-84 LG4 Camaros do not have ESC; the ESC module and knock sensor included with the H.O. 350 conversion kit are not used with these models.

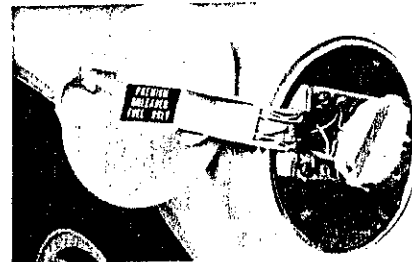


If your Camaro has ESC, you must replace the original ESC module with the module supplied with the H.O. 350 conversion kit. The module is located on the underhood wiring harness behind the brake master cylinder. Unplug and discard the original ESC module; plug the wiring harness connector into the new ESC module.



Remove the coolant drain plug on the passenger side of the H.O. 350 block. Install the ESC knock sensor in the threaded hole and tighten to 15 ft./lbs. torque. **NOTE:** Do not overtighten the ESC sensor; damage will result!

Apply pipe sealant to the threads to prevent a coolant leak. Connect the ESC sensor to the wiring harness with the original connector.

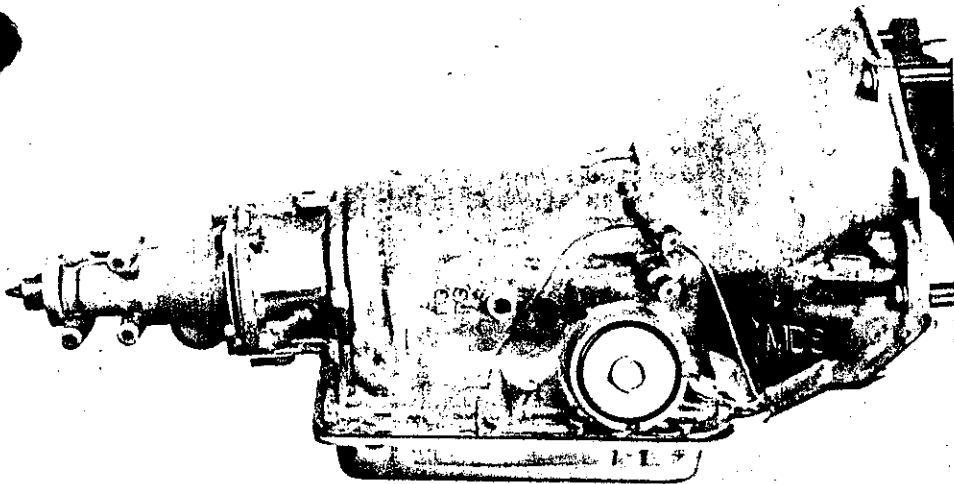


PREMIUM FUEL DECAL

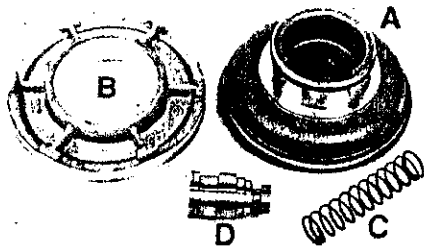
Apply the "Premium Unleaded Fuel Only" decal to the inside of the fuel tank filler door as shown.

NOTE: The spark advance and fuel mixture calibrations for the H.O. 350 conversion are based on a minimum fuel octane rating of 92 (R+M/2). It is extremely important on non-ESC equipped models (1982-84 LG4) to use only gasoline which meets this minimum octane requirement. Engine damage may result if lower octane fuel is used because these vehicles do not have detonation-sensing capabilities.

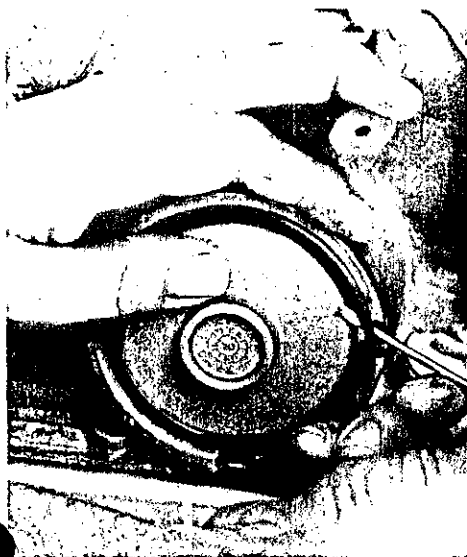
TRANSMISSION



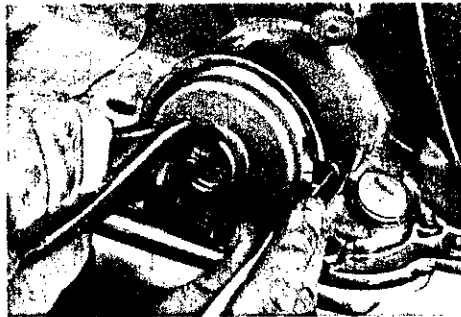
These modifications will increase the shift firmness and improve the durability of the Hydra-matic 700R4 four-speed automatic transmission in heavy-duty applications. See the Camaro service manual for transmission removal and installation instructions.



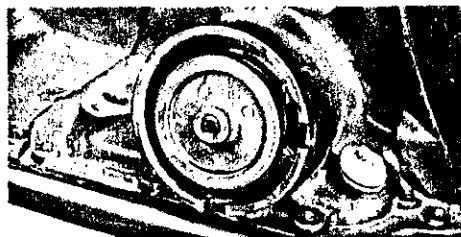
The transmission components supplied with the H.O. 350 conversion include the following: servo piston (A); servo housing (B); pressure regulator spring (C); and boost valve (D).



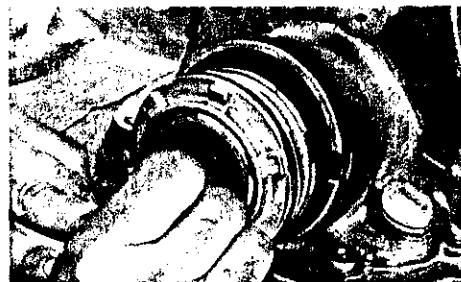
To remove the intermediate servo cover, depress the cover and remove the retaining snap ring with a small screwdriver.



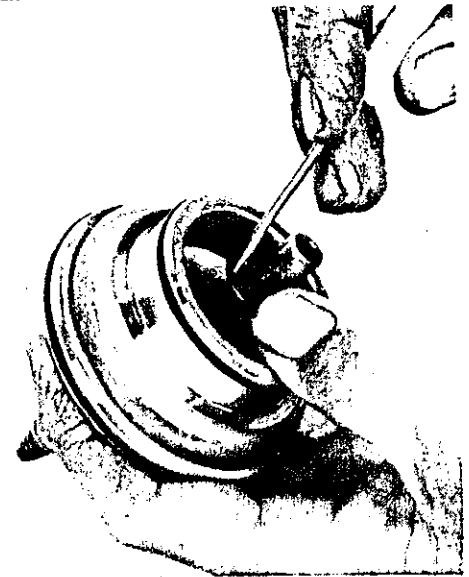
Pull out the servo cover with a pair of pliers until its O-ring seal stops its movement. Carefully work the O-ring seal out of the groove in the servo cover with a small screwdriver as shown. Use caution to prevent damaging the O-ring.



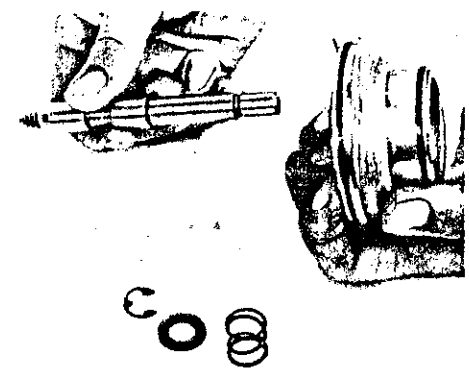
Note the direction of the fourth gear apply piston. Remove the piston from the transmission case.



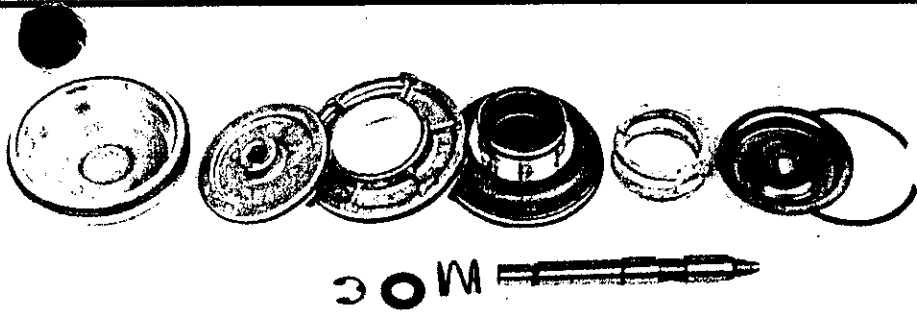
Remove the servo assembly, holding it by the center shaft. Install the supplied seals on the new inner servo. Remove the seal from the original outer servo and install it on the replacement servo.



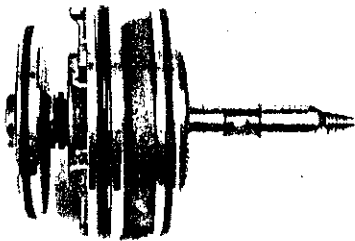
Disassemble the servo by removing the snap ring retainer from the shaft with a small screwdriver.



Carefully compress the servo assembly in a vise and remove the outer snap ring. Insert a socket between the vise jaw and the servo as shown when compressing the servo; protect the servo against damage by the vise jaws with a soft cloth.

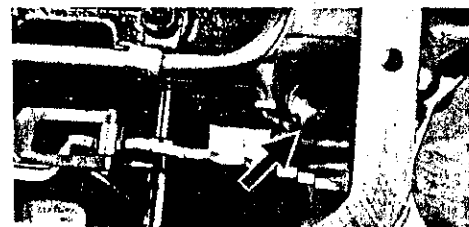
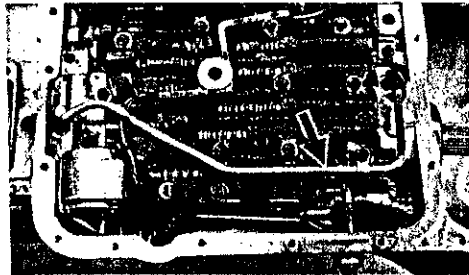


Reassemble the servo components in the order shown above, using the new servo housing and servo piston supplied with the H.O. 350 conversion kit.

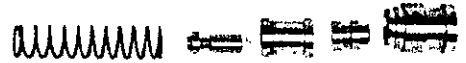


Reinstall the servo assembly in the transmission case. Then reinstall the fourth gear apply piston, the servo cover and O-ring seal, and the servo retaining ring.

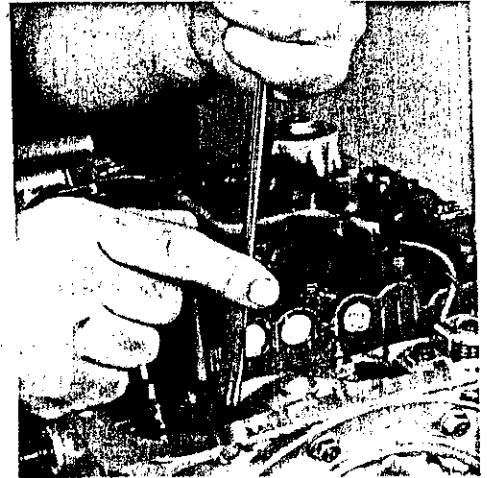
The H.O. 350 conversion kit includes a new regulator spring and valve. These components raise the main line pressure in the 700R4 transmission to improve durability in heavy-duty applications. To install the new spring and valve, you must remove the transmission pan and drain the transmission fluid.



Remove the fluid transfer tube to provide access to the boost valve. Remove the snap ring that retains the valve with internal snap ring pliers while pushing down on the valve with a screwdriver.

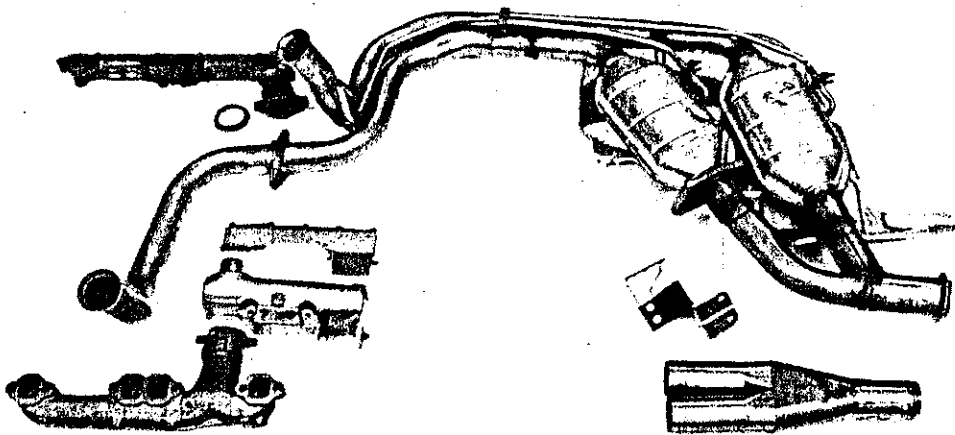


Remove and discard the original valve and regulator spring. Assemble the replacement valve and spring with the other components in the order shown. (NOTE: Use white grease to hold the small parts in place during reassembly.)



Install the valve and spring assembly in the transmission. Push down on the valve with a screwdriver and install the retaining ring with internal snap ring pliers. Reinstall the transmission pan. See the Camaro service manual for transmission installation instructions.

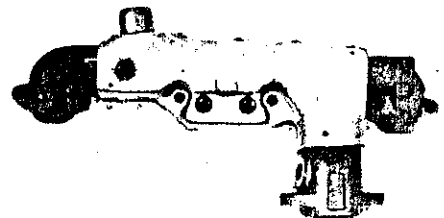
EXHAUST SYSTEM



The H.O. 350 Camaro exhaust system improves vehicle performance by reducing exhaust restrictions with high-flow manifolds, two catalytic converters, a specially designed Y-shaped intermediate pipe, a large diameter tailpipe, and a low-restriction muffler.

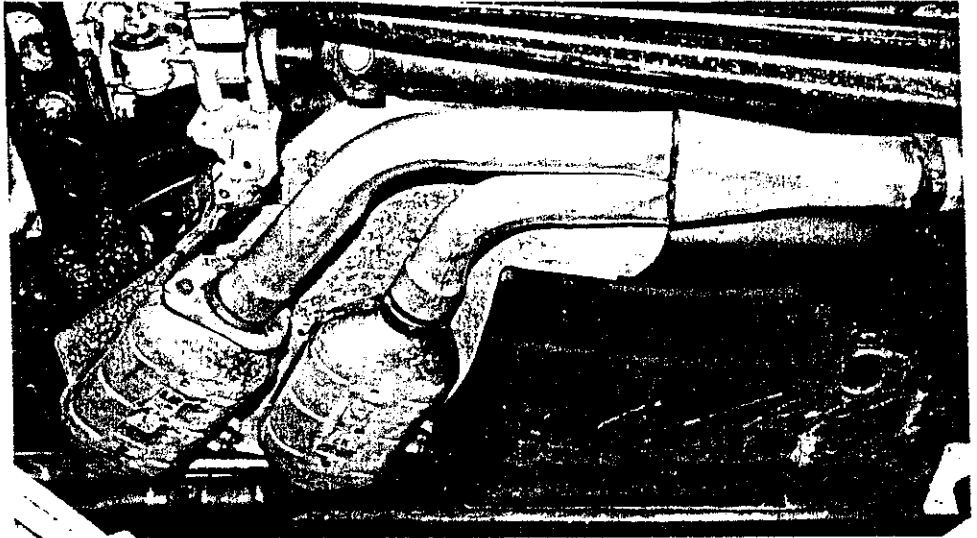
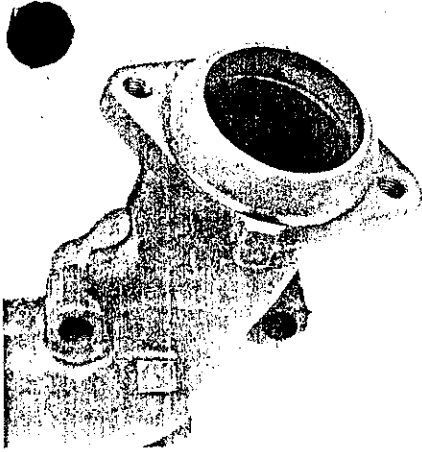
Remove the original L69/LG4 exhaust system, muffler, and catalytic converter heat shield. Save all fasteners and brackets for reuse. (NOTE: Remove the gas tank and install the high-volume in-tank electric fuel pump before installing the H.O. 350 exhaust system; see "Fuel System," page 4.)

The cast iron exhaust manifolds used with the H.O. 350 conversion have 2¼" outlets. These manifolds have higher airflow potential than the manifolds with 1⅞" diameter outlets originally installed on LG4 engines. The exhaust manifolds included with the H.O. 350 conversion kit will also clear the raised rocker cover rails on H.O. 350 cylinder heads.

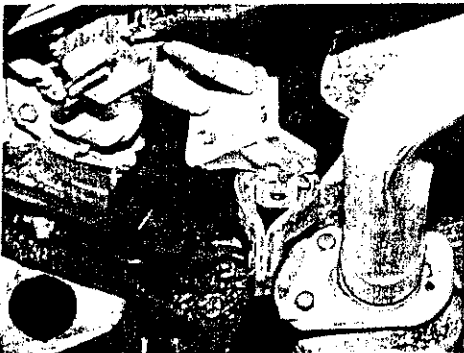


Assemble the two-piece air cleaner heat stove on the driver's side exhaust manifold. The two halves of the stove can be spot-welded together or joined with .125" blind steel rivets ("pop" rivets) after drilling out the locating holes in the two parts.

Install the supplied studs in the exhaust manifold flanges. Use the two longer studs in the passenger side exhaust manifold.



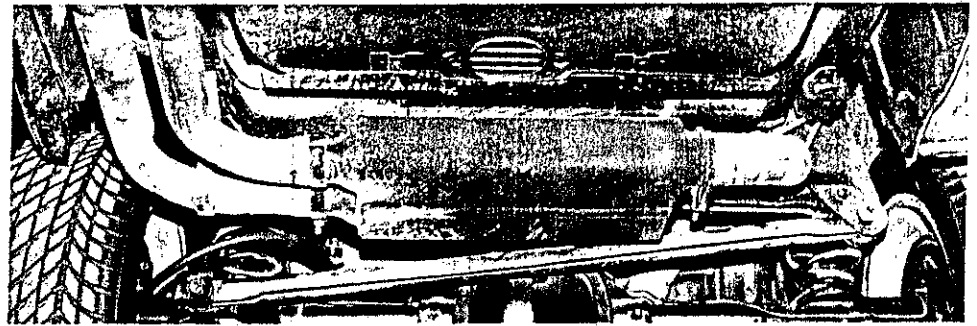
Insert the supplied spacer ring between the passenger side exhaust manifold and the take-down pipe.



Install the catalytic converter heat shield with four M6.3-1.8x20 screws. Attach the catalytic converter to the mounting bracket with the supplied bolts. Weld the two intermediate pipes to the catalytic converter outlets. Clamp and tack-weld the tailpipe to the "Y"-shaped intermediate pipe.

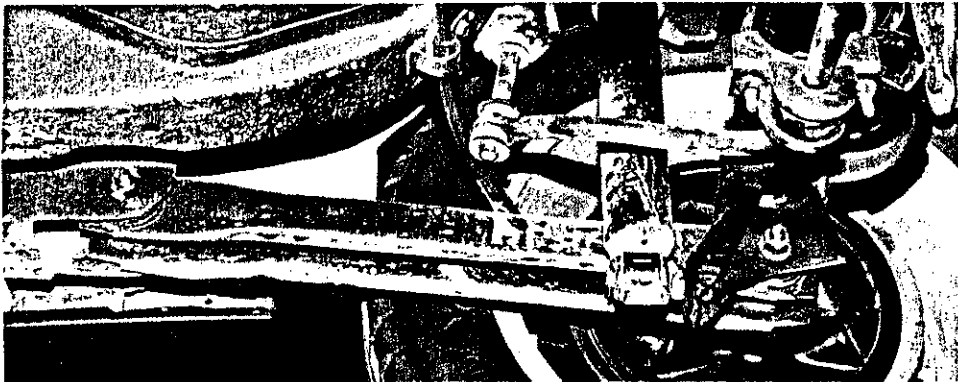
CAUTION: If you do not have the equipment and training to complete this procedure safely, this work must be done by a professional.

Connect the catalytic converter air pipe to the check valve on the passenger side AIR manifold with the supplied air pipe. Secure the connection with the supplied clamp.



Attach the replacement catalytic converter bracket to the transmission tailshaft using the original fasteners.

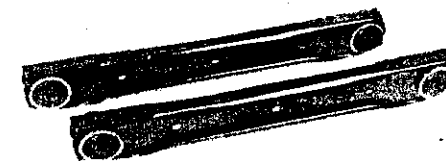
MISCELLANEOUS



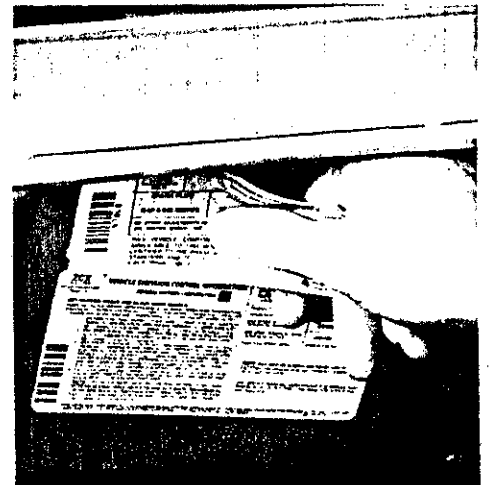
REAR SUSPENSION

The rear control arms included with the H.O. 350 conversion kit have high-durometer (50K) bushings. These harder bushings reduce wheel hop under hard acceleration. (For comparison, original bushings are 11K.)

The heavy-duty rear control arms are direct replacements for the original control arms. Support the vehicle securely with jackstands. Remove and replace one rear control arm at a time, reusing the original bolts. Tighten the bolts to 80



ft. lbs. with the rear axle supported at curb height position.



TUNE-UP SPECIFICATION LABEL

Apply the H.O. 350 tune-up specification label to the underside of the hood directly above the original Vehicle Emission Control Information label.

Remove the "Special Parts Notice" label from the H.O. 350 rocker cover.

JAN 30, 1995

TO: RICH MURPHY LAW

FAX: (818) 575-6818

THIS VEHICLE EQUIPPED WITH A CAMARO PERFORMANCE PACKAGE

P/N 10185077

ARB E. O. NO. D-278

DEVIATIONS FROM ORIGINAL TUNE-UP LABEL:

- 1. IDLE SPEED SETTING: 650 RPM (DRIVE)
- 2. THIS VEHICLE DOES NOT USE THE EFE AND EGR SYSTEMS INDICATED ON THE ORIGINAL TUNE-UP LABEL AND/OR VACUUM HOSE ROUTING DIAGRAM.

P/N 24502462

GENERAL MOTORS CORPORATION

THIS VEHICLE EQUIPPED WITH A CAMARO PERFORMANCE PACKAGE

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P/N 24502462

GENERAL MOTORS CORPORATION

FROM: MARK MCPHAIL