

AIR RESOURCES BOARD  
HAAGEN-SMIT LABORATORY  
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PHONE: (818) 575-6800

Reference No. A-93-551



OCT 7 1993.

TO: ALL INTERESTED PARTIES

SUBJECT: APPROVED ALTERNATIVE FUEL CONVERSION SYSTEMS

Attached is an updated list of "Approved Alternative Fuel Conversion Systems," revised on October 5, 1993.

Should you have any questions regarding this list, please contact the Public Information Office at (800) 242-4450.

*Rosalinda Castro*  
for Norman Kayne, Chief  
Certification Branch

Attachment

## PETROLEUM GAS CONVERSIONS

Advanced LP Systems, Inc.  
5327-U Jacuzzi St.  
Richmond, CA 94804

Holley Replacement Parts Division  
Colt Industries Operating Corp.  
11955 East Nine Mile Road  
Warren, MI 48090

Algas Carburetion  
16101 Vallen Drive  
Houston, TX 77041

Impco Carburetion, Inc.  
16916 Gridley Pl.  
Cerritos, CA 90701

Algas Industries, Inc.  
Box 20794  
2657 Andjon Drive  
Dallas, TX 75220

Landi-Hartog, U.S., Inc.  
3208 South Hutchinson Ave.  
Los Angeles, CA 90034

Automotive Natural Gas, Inc. (ANGI)  
265 North Janesville St.  
P.O. Box 39  
Milton, WI 53563

LPF Carburetion, Inc.  
P.O. Box 522  
Hutchinson, KA 67501

Beam Products, Manufacturing Company  
3040 Rosslyn St.  
Los Angeles, CA 90065

Marvel  
Division of Borg Warner Corp.  
2195 South Elwin Rd.  
Decatur, IL 62625

Carburetion Labs  
515 NE 190 Street  
Miami, FL 33179

OHG, Inc.  
10065A Greenleaf Ave.  
Santa Fe Springs, CA 90670

Eagle Propane  
1871 Lake Place  
Ontario, CA 91761

Toyo Red Cab LPG Conversion  
16609 South Halldale Ave.  
Gardena, CA 90247

Greenway Environmental Research  
40208 Industrial Park Circle  
Georgetown, TX 78626

Vialle U.S.A., Inc.  
(Formerly Vialle Autogas System)  
9101 Ely Rd.  
Pensacola, FL 32514

## LIST OF MANUFACTURERS OF ALTERNATIVE FUEL CONVERSION KITS

### COMPRESSED NATURAL GAS CONVERSIONS

Algas Carburetion  
16101 Vallen Drive  
Houston, TX 77041

Essex Cryogenics  
8007 Chivvis Drive  
St. Louis, MO 63123

Automotive Natural Gas, Inc. (ANGI)  
265 North Janesville St.  
P.O. Box 39  
Milton, WI 53563

Impco Carburetion, Inc.  
16916 Gridley Pl.  
CA 90701

Beam Products Manufacturing Company  
3040 Rosslyn Street  
Los Angeles, CA 90065

Mesa Environmental  
3125 West Bolt Street  
Fort Worth, TX 76110

Beacon Power Systems  
447 E. Elmwood  
Troy, MI 48083

NGV Development  
2250 Cherry Industrial Circle  
Long Beach, CA 90805

Carburetion Labs  
515 N.E. 190 Street  
Miami, FL 33179

PAS, Inc.  
570 Executive Dr.  
Troy, MI 48083

Century Products  
(Formerly Vialle Autogas Systemen)  
9101 Ely Road  
Pensacola, FL 32514

Stewart & Stevenson  
5840 Dahlia Street  
Commerce City, CO 80022

Dual Fuel Systems, Inc.  
Subsidiary of Pacific Lighting Corp.  
1120 Maple  
Montebello, CA 90640

Vialle U.S.A., Inc.  
(Formerly Vialle Autogas Systemen)  
9101 Ely Rd.  
Pensacola, FL 32514

## ALTERNATIVE FUEL CONVERSION SYSTEMS

MANUFACTURER	MODEL YEAR	MIXER #	REGULATOR	ENGINE SIZE (CID)	FUEL COEFF. TYPE	APPLICATIONS	OTHER COMPONENTS	REMARKS/ MODIFICATIONS ALLOWED
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Advanced LP Systems # B-7	E.O. 1979 & Older		63		LPG DF	Toyota PC and LDT equipped a 4 cyl. carbureted engine		
# B-3-1A	(LPG) E.O. 1981 & Older	M500	250	> 250	LPG DF	All MDV and HDV. for LDT with VV		
a B-3	1974	PCA 500C	C250A-4	< 140	LPG	PC, LDT, MDV, HDV.		
	&	PCA 500C	C-250A-4	200-300	LPG	PC, LDT, MDV, HDV.		
	Older	PCA 500C	C250A-3	251.300	LPG DF			
Algas Carburetion Also known Piccision General, Inc. E.O. # B-14-1	1993 & Older	ECOTRIM LPG	C250ALRS-200	250.460	LPG, LPG DF	LDT, MDV, HDV	VSS-1 switch, EPC-1 controller, AIV-1 control valve, MSH-2 modu relay (dual fuel Mixer M500LP, FI Chrysler use Autotronic P/N 8789 8	

E.O. # 014-7

## ALTERNATIVE FUEL CONVERSION SYSTEMS

MANUFACTURER	MODEL YEAR	MIXER#	REGULATOR#	ENGINE SIZE (CID)	FUEL CONV. TYPE	APPLICATIONS	OTHER COMPONENTS	REMARKS/ MODIFICATIONS ALLOWED
'Algas Carburation Also known as Precision General, Inc. E.O. # B-14-6	1993 & Older	ECOTRIM M500CPCL	C250AC-225	250-460	CNG, CNG DF	LDT, MDV, HDV	EPC-1 controller, AIV-1 control valve, MSR-2 mode selector relay (dual fuel FI Chrysler use Auto-tronic P/N 8789-8	
E.O. # B-14-5	1993 & Older	ECOTRIM MSOOLPCL	C250ALRS-240	250-460	LPG, CNG DF	LDT, MDV, HDV	EPC-1 controller, AIV-1 control valve, MSR-2 mode (dual fuel only), FI Chrysler use Auto-tronic PIN 8789-1	
E.O. # B-14-4	1987 & Older	M500CP	C250AC-225	250-460	CNG, CNG	LDT, MDV, HDV with loop catalyst or non-	VSS-1 vacuum safety switch.	
E.O. # B-14-3	1987 & Older	M500CP	C250AC-225					
E.O. # B-14	1987 &	M500	250					

ALTERNATIVE FUEL CONVERSION SYSTEMS

MANUFACTURER	MODEL YEAR	MIXER#	REGULATOR	ENGINE SIZE (CID)	FUEL CONV. TYPE	APPLICATIONS	OTHER COMPONENTS	REMARKS/ MODIFICATIONS ALLOWED
<b>Automotive Inc. (ANGI)</b> E.O. # B-10-22	1993 & Older	D-5		ALL	CNG, CNG DF	PC, LDT, MDV, HDV. Also approved for vehicles with TWC-CL and FI systems.	1) GM Vehicles use ANGI trouble code micro computer except with flow system.	
				ALL	LPG, LPG DF	PC, LDT, MDV, HDV Also with TWC CL and FI	2) Ford and Chrysler vehicles with OBD systems 02 sensor fix. 3) FI Chrysler vehicles use injector fix.	
E.O. # B-10-21	1993 & Older	ANGI-LEVS Electronic Feedback		ALL	CNG, CNG DF	PC, LDT, MOV, HDV With closed loop system.	GM Vehicles use trouble code micro computer FI Chrysler vehicles use injector fix.	
<b>Beacon Power Systems</b> B-18-1	1993 & Older	-		153-350	CNG, CNG DF	General Motors LDT, MDV, HDV with TBI		
<b>Beam Products Mfg. Co.</b> E.O. # B-1-2	1974 & Older	5C-60N	JOOAV	201-300	CNG DF			
E.O. # B-1-1	1973 & Older	51CN	400AV	> 200	CNG OF	PC, LDT, HDV		
E.O. B-1-2	1974 & Older	5C-60	450	201-301	LPG DF	PC, LDT, MDV, HDV		
E.O. # B-1-1	1973 & Older	51C	450		LPG DF	PC, LDT, MDV, HDV		

## ALTERNATIVE FUEL CONVERSION SYSTEMS

MANUFACTURER	MODEL SEAR	MIXER#	REGULATOR#	ENGINE SIZE	FUEL CONV. TYPE	APPLICATIONS	OTHER COMPONENTS	REMARKS/ MODIFICATIONS ALLOWED
Carburetion Lubs International, Inc. B-17-2	1993 & Older	KG5000D	PEV-1		LNG Fum	4-Stroke HD Diesel those with self compensating fuel	Hold Relay, Throttle Position Sensor, 3-Way solenoid valve, needle valve, ECU, ECAT-6000, first stage 49 p.s.i. low pressure sensor.	Diesel fuel flow restricted to 20% of capacity.
E.O. # B-17-1	1993 & Older	KG5000D	PEV-1 IIPR 501		CNG Fum		Hold Relay, Throttle Sensor, 3-Way solenoid valve, needle valve, ECU, ECAT-6000, pressure regulator, 49 p s.i. low pressure sensor	Diesel fuel flow restricted to 20% of normal capacity.
Century Products E.O. # B-10-12	1987 & Older	3C705-L 3C705 DTL	M 6 M 6	< 300 > 200	CNG	LDT, MDV, HDV, with FI		
E.O. # B-10-12	1987 & Older	3C705 L 3C705 DTL	M 6 M 6	< 300 > 200	LPG LPG	LDT, MDV, HDV, with FI		

ALTERNATIVE FUEL CONVERSION SYSTEMS

	MODEL YEAR	MIXER#	REGULATOR#	ENGINE SIZE (CID)	FUEL CONV. TYPE	APPLICATIONS	OTHER COMPONENTS	REMARKS/ MODIFICATIONS ALLOWED
Fuel Systems, Inc. Subsidiary of Pacific Lighting E.O. B-6-17	1986 & Older	1.25	8400	All	CNG DF	PC, LDT, MDV, HDV with engines. LDT and MDV with 140-200 CID injected engines. Also, vehicles 1wc-CL and VV		
E.O. # B-6-18	1986 & Older	2.25	8401	> 300	CNG DF	Also approved for TWC-CL and VV		
Propane Service # B-15-1	1993 & Older		OHG					
Cryogenics, E.O. IB-2	1974 &	300AN	615000 1					



ALTERNATIVE FUEL

SYSTEMS

MANUFACTURER	MODEL YEAR	MIXER#	REGULATOR#	ENGINE SIZE (CID)	FUEL CONTIV. TYPE	APPLICATIONS	OTHER COMPONENTS	REMARKS/ MODIFICATIONS ALLOWED
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Greanway Environmental  
E.O. # 8-31

1993 &  
Older

4176

8400

300-375  
LPG

HDV with Cummins "B" series or Navistar DTA-360 engines  
A5 listed in executive order. Catalytic convertar required (P/N GER CAT LP)

Holley Replacement Parts Industries  
Operating Corp.  
E.O. B 12-2

1982 &  
Older

4176

8400

300-375  
LPG

MDV, HDV.  
Approved only for  
2 Barrel or 4-  
Barrel

E.O. # B-12-1

1980 &  
Older

2301

8400

300-375  
LPG

MDV, HDV.  
Approved only for  
2 Barrel or 4-  
Barrel

E.O. # B-12-3A

1982 &  
Older

1976

8401

300-375  
LPG

MDV, HDV.  
Approved only for  
2 Barrel or 4-  
Barrel

E.O. # B-12-4

1983

1977

8400

300-375  
LPG

MDV, HDV.  
Approved only for  
2 Barrel or 4-  
Barrel

## FUEL CONVERSION SYSTEMS

MANUFACTURER	MODEL YEAR	MIXER#	REGULATOR#	ENGINE SIZE (CID)	FUEL CONV. TYPE	APPLICA	OTHER COMPONENTS	REMARKS/ MODIFICATIONS ALLOWED
Impco Carburetion, Inc. E.O.# 8-4-41	1993 & Older	CA100	HPR-501 or HPR3000 plus	0-360				
		CA125	PEV or PJ	0-360				
		CA175			50-360			
		CA200			>180			
		CA225			>180			
		CA300A	HPR-501 or HPR-3000 plus	ALL				
		(1, 20, 50, 70)	PEV					
	CA425			>300				
E.O.# 8-4-42	1993 & Older	AFE-92-G-CNG System	-			CNG, CNG LDT, MDV HDV DF		
E.O.# B-4-43	1993 & Older	AFE-92 G LPG SYSTEM						



ALTERNATIVE FUEL CONVERSION SYSTEMS

MANUFACTURER	MODEL YEAR	MIXER #	REGULATOR #	ENGINE SIZE (CID) CONV. TYPE	FUEL	APPLICATIONS	OTHER COMPONENTS	REMARKS/ MODIFICATIONS ALLOWED
Impco Carburetion, Inc. E.O. # B-4-5	1979 & Older	CA425	E	LPG	LPG	PC, MDV, HDV with eng. size > 200 CID MDV, HDV with eng. size > 250 CID		
E.O. # B-4-1	1976 & Older	CA425	E	> 200	LPG, LPG DF	LDT, MDV, HDV		EGR Valve may be disconnected if the EC-1 valve is used.
Landi-Hartog, U.S., Inc. E.O. # B-8	1980 & Older	1000 U.S.	JHdelth	> 300	LPG DF	PC, LDT, HDV		
LPF Carburetion E.O. B-11-1	1981 & Older	L-50	T	> 250	LPG DF	LDT, MDV, HDV		
Marvel Schebler/Tillotson Division of Borg Warner E.O. # B-5-3	1981 & Older	M S/T2569	M S/TM-4 or M-6	> 300	LPG DF	PC, LDT, MDV, HDV		Marvel-Schebler/Tillotson mixer aka "Century"
E.O. # B-5-1	1976 & Older	3C-705 LE 3C-706 LE 3C or 3CG 705 DTLE 3C OR 3CG 06 DTLE		0-250 201-300 > 250 > 300	LPG LPG LPG	PC, LDT, MDV, HDV PC, LDT, MDV, HDV PC, LDT, MDV, HDV PC, LDT, MDV, HDV	On Chrysler and Ford 6 cyl. engines the vacuum diaphragm on engines amplifier for EGR valve may be replaced by a Century delay control valve.	Vacuum advance using single diaphragm distributors may be disconnected. Marvel Schebler/Tillotson mixer aka "Century"

ALTERNATIVE FUEL CONVERSION SYSTEMS

MANUFACTURER	MODEL YEAR	MIXER#	REGULATOR#	ENGINE SIZE (CID) CONV. TYPE	FUEL	APPLICATIONS	OTHER COMPONENTS	REMARKS/ MODIFICATIONS ALLOWED
Mesa Environmental E.O. # B-34	1993 & Older	GEM		CNG 2.5, or 2.2 liter engines	CNG CNG DF	GM LDT with 5.7, 2.5, or 2.2 liter engines	ECM, gas mixer nozzle, regulator, metering valve assembly, PROM.	
Mogas Sales, Inc. B-19	1993 & Older	ECOLO CNG conversion		CNG, CNG PC, LDT, MDV, HDV	DF		Injector Fix for Chrysler, Signal Fix for Ford, Autotronics #8690 for GM, heated oxygen sensor for open loop vehicles.	
NGV Technologies Company, Inc. E.O. # B-28-2	1993 & Older	NGV CNG Conversion Kit		CNG, CNG General Motors LDT, MDV, HDV	DF			Modification allowed to OEM air cleaner
PAS, Inc. B-32	1992- 1993		P/N 90210	350	CNG	General Motors C1500 or C2500 Pick Ups with 350 CID engines.	90018 low-pressure shut off valve, 10096129 heated oxygen sensor, 16192816 PROM, 90053 fuel pressure sending unit, 90612 natural gas injectors, 90402 manual shut off valve, 90415 fuel injector plate.	

ALTERNATIVE FUEL CONVERSION SYSTEMS

MANUFACTURER	MODEL YEAR	MIXER #	REGULATOR#	ENGINE SIZE (CID) CONV. TYPE	FUEL	APPLICATIONS	OTHER COMPONENTS	REMARKS/ MODIFICATIONS ALLOWED
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OHG, Inc. E.O. # B-13-4 E.O. # B-13-7	1993 & Older	X-450	X-1	300-460	LPG	Non-Feedback LDT, Autotronics computer MDV, HDV	Autotronics computer fix (part # 8690)	
		X-450FB	X-1	300-460	LPG	Feedback LDT, MDV, HDV	required on all GM vehicles with OBD systems, except those with mass flow fuel system.	
		X-450FB	X-2	230-350	LPG	Feedback LDT, MDV, HDV		

Stewart & Stevenson Power, Inc. B-16.1	1993 & Older	GFI Conv. system	P/N 10999-621-000D	All	CNG, CNG PC, LDT, MDV, DF	CNG, CNG PC, LDT, MDV, HDV	Primary Fuel Filter (A00093)	
							Fuel metering valve/computer (A00125)	
							Fuel Nozzle (10999-D-B A00074 or 10999 D-40 009 B Ortech 70)	

Toyo Red Cab LPG Conversion E.O. # B-9	1979 & Older	1000	V-3	0-300	LPG DF	PC, LDT, HDV		
		2000	V-3	301-360	LPG DF	PC, LDT, HDV		
		3000	V-3	>360	LPG DF	PC, LDT, HDV		

ALTERNATIVE FUEL CONVERSION SYSTEMS

MANUFACTURER      MODEL      MIXER#      REGULATOR#      ENGINE      FUEL      APPLICATIONS      OTHER COMPONENTS      REMARKS/  
 YEAR      CONV.      TYPE

Vialle U. S. A., Inc. E.O. # B-10-19	1992 & Older	D-5		ALL	CNG, CNG LDT, MDV, HDV. DF	Also approved for vehicles with TWC- CL and FI systems. fuel system.	GM Vehicles use ANGI part #D35A44441 except with mass flow	
		C-5		ALL	LPG, LPG DF	PC, LDT, MDV, HDV	Ford and Chrysler vehicles with OBD systems use O2 sensor fix. FI Chrysler vehicles use injector fix.	
Vialle U. S. A., Inc. E.O. # B-10-20	1992 & Older	D-5		ALL	CNG, CNG PC with carb. or FI. DF		GM Vehicles use ANGI part #D35A44441 except with mass flow fuel system. Ford and Chrysler vehicles with OBD systems use O2 sensor fix. FI Chrysler vehicles use injector fix.	

ALTERNATIVE FUEL CONVERSION SYSTEMS

MANUFACTURER      MODEL      MIXER#      REGULATOR#      ENGINE      FUEL      APPLICATIONS      OTHER COMPONENTS      REMARKS/  
 YEAR      TYPE

CNG = Compressed Natural Gas  
 DF = Dual Fuel  
 LPG = Liquefied Petroleum Gas  
 LNG = Liquefied Natural Gas  
 FUM = Fumigation System  
 PC = Passenger Car  
 LDT = Light Duty Truck  
 MDV = Medium Duty Vehicles  
 HDV = Heavy Duty Vehicles  
 VV = Variable Venturi Carburetor  
 FI = Fuel Injected  
 TBI = Throttle Body Injected  
 TWC-CL = Three-way catalyst closed loop