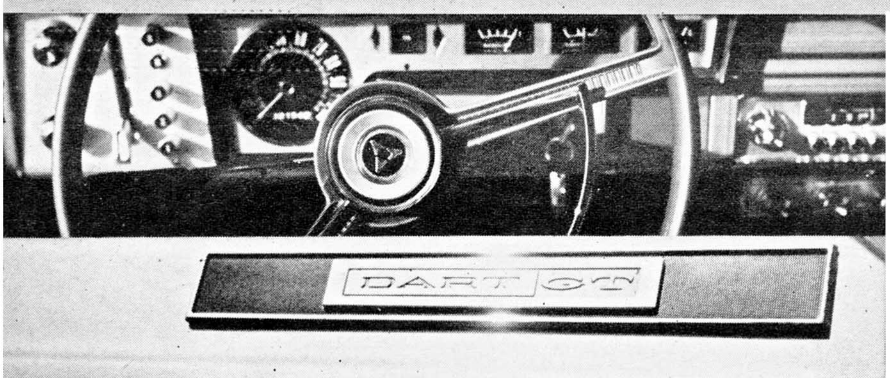
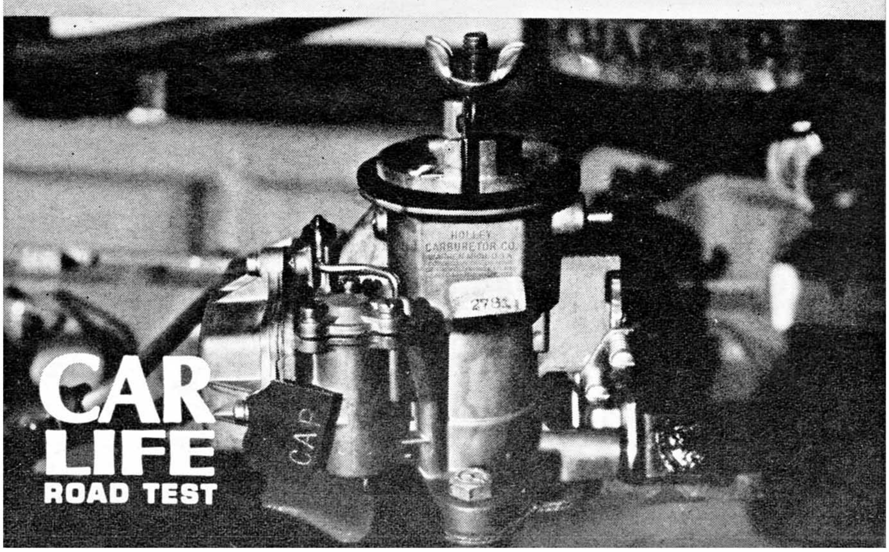
The thoughtful and concerned motorist who can approach the bureaucratically decreed anti-smog devices on new cars with anything approximating enthusiasm is a rarity, indeed. Crankcase ventilation devices are now legally mandatory on new cars in both California and New York, where they will be required within two years for all older cars still on the road. Car makers have carried them throughout their full production to insure that cars destined for such states have these devices installed.

While the crankcase devices do effectively reduce the amount of hydrocarbons spewed into the atmosphere from cars so equipped, the fact remains that they have drawbacks. They add to the cost of a car without improving its performance. They have inherent service problems in the necessity of cleaning or replacing their valves as mileage builds up. And, perhaps most galling, a large segment of

DODGE DART GT
225 Smogburner





MARVIN LYONS PHOTOS

the American car buying public has neither the need for them nor the conviction that they are beneficial.

A second area being explored (CL, Oct. 1962) is that of exhaust devices, either of the afterburner or the catalyst type, where a similar situation exists. So far, these devices have proved even more expensive and complicated, and without exhibiting the desired efficiency.

Now, however, all that may be changed. Chrysler Corporation has developed a smog control device for its cars which not only interests the California Motor Vehicle Control Board, but also may appeal to car owners. We tested a Dodge Dart GT hardtop equipped with this device and found a healthy increase in fuel economy as a pleasant, surprising by-product.

To anyone who has strong feelings about an automobile engine and its proper operation, the sight inside the car's exhaust pipe can sometimes be soul stirring. On our test Dart, the deposit was just that—a beautiful pinkish-gray powder which all but shouted that combustion in this engine was perfect. In view of the fuel mileage figures we recorded, we could only conclude that this car was burning everything combustible, including fumes.

It is usually axiomatic that great fuel economy and top performance are virtually incompatible. Yet the increased mileage we recorded had little effect on the performance of the Dart, a fact attested to by our data panel. The acceleration figures and Tapley readings were comparable to those of the Dart 4-door sedan we tested in March; for an "economy" car, the Smogburner was surprisingly strong.

One obvious factor affecting fuel mileage was the Great Plains axle ratio of 2.93:1, which reduced the rpm/mile from the earlier test car's 2740 with its 3.23:1 rear axle. What does that do to the performance? With a mere 20-lb. difference in test weights, the earlier 4-door had only a 0.7-sec. advantage in the quarter mile and a 3 mph greater terminal speed. And where the estimated top speed for the 4-door was 95 mph (at 4300 rpm), our Smogburner should top out at 100 mph with only 4150 rpm.

Another consideration must lie in the different transmissions; Dodge's excellent 3-speed automatic on the Smogburner against the 3-speed manual (column controlled) on the 4-door. The latter, it will be recalled, was the feature we were most critical of in the previous road test because of its balkiness; results of this test bear out our suggestion at that time that the automatic was the better transmission.

This curious state of affairs leads only to the conclusion that the greater efficiency of the engine made possible in the smog kit modification contributes to the development of optimum output. Turning this around and stating it in another way, an engine that is operating at top efficiency contributes substantially less contamination to the smog basin than the average automobile's powerplant.

This is the direction which Dodge engineers have explored in the development of the anti-smog kit, technically known as the Cleaner Air Package. Tests conducted by Chrysler Corporation as well as by 21 separate independent laboratories have borne out this theory. Proper engine maintenance is the key, unlocking as much of the major reduction in air pollution as the relatively minor engine modifications specified. In fact, Charles M. Heinen, Chrysler chemical laboratories assistant chief engineer, declares unequivocally that "major reductions in exhaust emissions would be accomplished by maintaining proper operation of the electrical components and carburetor according to present factory recommendations"—this on any automobile.

Emission levels 60% below those reported for California vehicles have been recorded on test fleets of well-tuned cars. The anti-smog kit modifications bring exhaust emissions below the standards established by the state, according to all present test data.

That there is no adverse effect on either economy or performance is verified by our road test of the Smogburner. For the actual effect of the kit on exhaust emissions, we must rely on the more elaborately instrumented tests and measurements performed by the independent laboratories. These results are contained in Heinen's paper presented to the Society of Automotive Engineers, "Using the Engine for Exhaust Control."

A modified carburetor, a slightly altered distributor and a sensing valve which controls the spark adjustment during deceleration are the main components in the kit. While prices haven't been determined pending the successful completion of tests by the company and by the State of California, we doubt that the complete kit would add more than $10 to the cost of a new car.

Experimental Chrysler Cleaner Air Package Ups Engine Efficiency To Cut Hydrocarbons For Smog Control . . .

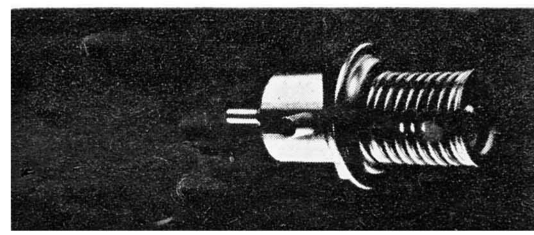
The carburetor is modified simply by installing leaner fuel jets, which lower the carbon monoxide emission at cruising speeds, and a choke restriction to limit the emission of carbon monoxide during warm-up periods. Idle adjustment is set at the very lean end of the scale, providing not only low CO output but also effectively limiting hydrocarbon (HC) emission in the 0-25 mph cycle (California standard) and during deceleration. This altered carburetion attempts to eliminate the CO, caused by partially burned fuel, and the emission of hydrocarbons, which is unburned fuel. When the fuel burns properly, CO changes chemically into carbon dioxide (harmless CO_2).

Alterations to the distributor provide a substantial spark retard (5° ATC) at idle rpm, resulting in low hydrocarbon emission. But, by far more important, such a setup means that the throttle has to be opened to a greater extent (than for a normal spark setting) to maintain the same engine rpm at idle. It therefore follows that closed throttle decelerations will have greater air flow, meaning lower vacuum.

Normally, under this latter condition the port to the vacuum advance would be closed, giving a retarded spark which would increase hydrocarbon emissions. This is avoided by activating the vacuum advance during deceleration by means of a special spring-loaded control valve.

This vacuum-operated valve, mounted atop the rocker cover and on the vacuum tube between carburetor and distributor, instantly senses the change in vacuum created during the engine's operation of providing fuel to the cylinders, thereby avoiding the build-up of CO and HC that normally would result. The fuel is burned in the cylinders rather than being partially consumed and then transferred to the atmosphere.

There, as it now stands, is the Dodge anti-smog kit. An interesting sidelight is that dynamometer test results showed that a higher idle rpm (630 rather than 460) resulted in lower emissions over the full rpm range because of the lower vacuum which resulted from greater air flow at idle.



CONTROL VALVE is heart of system.

One other piece of equipment was used in earlier tests but was not fitted to our test car. It was a steel shroud around the fan behind the radiator, as used in air conditioned cars, to insure the better cooling required at idle by virtue of the spark being retarded during those periods. We were unable to detect any hint of a problem from its absence, although the temperature gauge developed a sizable flicker during one 4-hour stretch of desert driving at 70–75 mph—a distraction we finally concluded was caused by either a sticky thermostat or an erratic (when warm) thermocouple.

Because of the nature of the Smogburner alterations, there is some lack of engine braking effect during deceleration and consequently slightly increased deceleration times. However, the only instances where this free wheeling feel was evident was upon downshifting the pushbutton transmission, particularly into second. Heinan reports only two of the outside laboratories noticed any free wheeling, but felt that it was not objectionable. But ▶

Smogburner

a third laboratory test reported idle stalling during cold starts and stumble during low-speed, low-acceleration operation. A different mechanism to reduce idle air bleed while the choke is on, subsequently specified for the kits, has completely eliminated the idle stall complaints. Alterations to the accelerator pump were undertaken to correct the latter.

There is one interesting factor which continually pops up as the testing program is studied: Presently recommended engine maintenance procedures, if adhered to, will keep the car's average emission levels below 500 parts per million of HC and between 2 and 2.5% CO. By adding one step—a stop at the service department every 5000 miles or so—the owner could maintain a level of 350–400 ppm HC and below 2% CO. This extra "tune-up" would merely involve idle adjustment to the specified rpm and leanest possible (somewhere between 1.5 and 2.0%) idle for good operation and a timing check. With the Smogburner kit, levels below 275 ppm HC and 1.5% CO (the California Standards maximum) are maintained with this recommended service schedule, although an annual check of the deceleration timing valve is included during one of the stops.

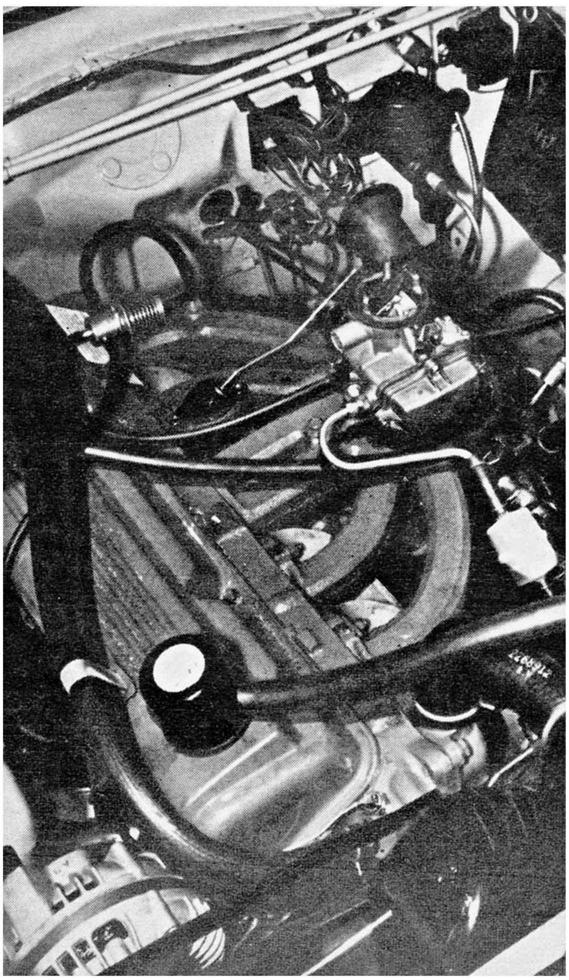
Heinan concludes that readjustment to and maintenance at factory specifications for all cars in use is an almost essential step for whatever type of control, whether devices or engine modifications, is finally decreed.

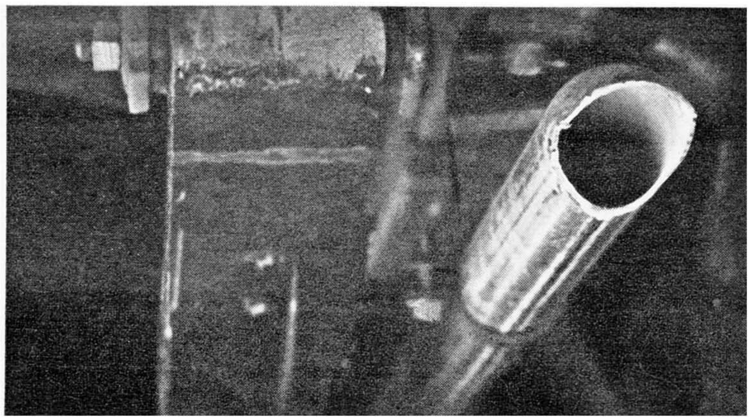
In conducting our test of the GT Smogburner, we put it through a 1000-mile test trip from the Pacific coast to Tucson, Ariz., from the moisture-laden smog basin over mountains and through dry, hot desert. On an early 318-mile portion of this run, with the engine hardly broken in and at speeds between 60–75 mph, we recorded 21.8 mpg. At a higher average speed and bucking a definite headwind on the return trip, a 19.17-mpg average was recorded. The overall average was 19.91 mpg, lower than it might have been because we avoided any particularly economical driving practices once we discovered the increased mpg potential. During normal around-town driving, with some mountain mileage, we averaged 19.36 mpg but this dropped to 17.6—our worst—during 200 miles of deliberate attempts to gulp gas (jack-rabbit starts, jerky throttle operation, brake riding, etc.).

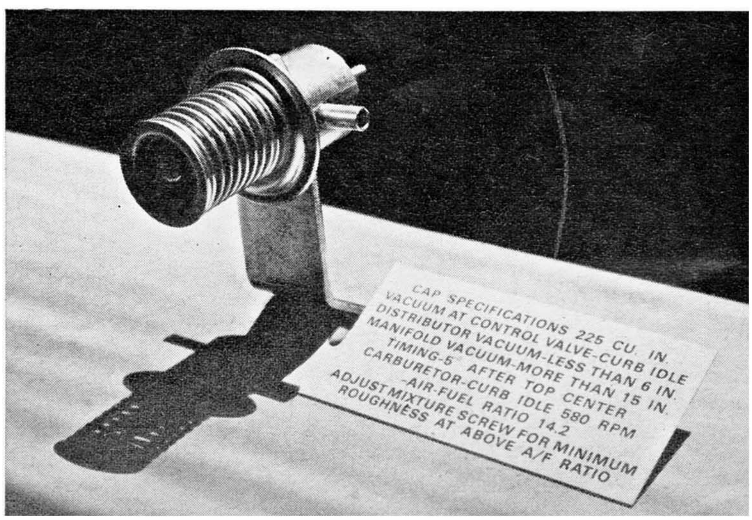
In view of the performance level of the car and the comparable Dart tested earlier, such figures are worth noting. Cars which perform as well seldom maintain such mileage figures.

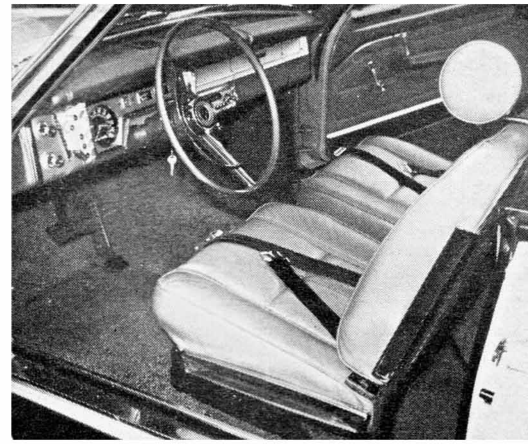
Familiarity, it is sometimes said, breeds contempt, but this is untrue in the case of the Dart. We probably have been exposed to more variations of this make than any other brand during the past year and our appreciation for it has increased each time. Interior appointments, which we termed utilitarian in the 4-door, are tastefully indulgent in the GT. The vinyl bucket seats, which improve the driving position as much as they add sporting flair, were a pleasant beige to complement the pinkish-tan exterior color.

ALTERED ENGINE uses leanest carburetor jets, with vacuum lines connecting carburetor, distributor and control valve. Powdery exhaust pipe indicates combustion is complete inside engine. Tune-up specifications mounted on plate beside valve insure proper settings.









The GT was our first 1963 Dart to have power steering which, while it had a disconcerting lack of self-centering action, reduced overall ratio from the manual 28.7:1 and cut 2 full turns off the lock-to-lock.

As we have continually pointed out, the Dart's handling and roadability are—with standard suspension components—as precise as any domestic car. Heavy-duty shock absorbers and traction bars, as fitted to our sharpened Dart convertible (May CL), raise the handling level to sports car standards. Riding comfort and interior roominess, packaged in such a reasonable overall size, place the Dart in some sort of ideal middleground among domestic cars. With the Cleaner Air Package, the car moves one up on its competitors. ■

CAR LIFE ROAD TEST

1963 DODGE DART
GT 225/Smogburner

SPECIFICATIONS

List price	$2289
Price, as tested	2844
Curb weight, lb.	2810
Test weight	3140
distribution, %	57/43
Tire size	6.50-13
Tire capacity, lb.	3600
Brake swept area	255
Engine type	6-cyl, ohv
Bore & stroke	3.40 x 4.13
Displacement, cu in	225
Compression ratio	8.20
Carburetion	1 x 1
Bhp @ rpm	145 @ 4000
equivalent mph	96.3
Torque, lb-ft	215 @ 2400
equivalent mph	57.8

EXTRA-COST OPTIONS

Radio, heater, 225-cu. in. engine, wsw tires, automatic transmission, tinted windshield, outside mirror, smog control kit.

DIMENSIONS

Wheelbase, in	111.0
Tread, f and r	55.9/55.6
Over-all length, in	195.9
width	69.8
height	54.0
equivalent vol, cu ft	420
Frontal area, sq ft	21.0
Ground clearance, in	5.7
Steering ratio, o/a	18.8
turns, lock to lock	3.5
turning circle, ft	38.7
Hip room, front	2 x 22
Hip room, rear	55.5
Pedal to seat back, max	42.0
Floor to ground	12.7
Luggage vol, cu ft	17.3
Fuel tank capacity, gal	18.0

GEAR RATIOS

3rd (1.00), overall	2.93
2nd (1.45)	4.25
1st (2.45)	7.16
1st (2.45 x 2.2)	15.8

PERFORMANCE

Top speed (4150), mph	100
Shifts, rpm-mph (automatic)	
3rd ( )	
2nd (4100)	68
1st (3750)	37

ACCELERATION

0-30 mph, sec	4.2
0-40	6.6
0-50	10.0
0-60	14.4
0-70	20.5
0-80	28.5
0-100	
Standing ¼ mile	20.0
speed at end	69

FUEL CONSUMPTION

Normal range, mpg	18-22

SPEEDOMETER ERROR

30 mph, actual	31.8
60 mph	60.7
80 mph	79.0

CALCULATED DATA

Lb/hp (test wt)	21.6
Cu ft/ton mile	103
Mph/1000 rpm	24.1
Engine revs/mile	2490
Piston travel, ft/mile	1710
Car Life wear index	42.5

PULLING POWER

70 mph, max. gradient, %	10.3
50	15.4
30	25.6
Total drag at 60 mph, lb	162