

# CAR LIFE ROAD TEST



SCOTT MALCOLM PHOTOS

## 10,000-MILE SPRINT

**A**FTER 10,000 miles in Pontiac's 1966 Tempest LeMans hardtop sedan with its belt-driven single overhead cam 6-cyl. engine, *CAR LIFE's* road testers believe themselves qualified to make certain suggestions to would-be owners of similarly equipped cars. The first suggestion is for the buyer to pay particular attention to the transmission and drive axle gearing as it has marked effects on the economy and performance of his car. The second suggestion is for him to strongly consider the lower-power sohc Six rather than the more

exotic, 4-barrel carbureted optional 6-cyl. for use with an automatic transmission. The third suggestion is that he not expect Volkswagen-type fuel economy or GTO-type performance; neither are possible with this car's restrictions of weight and engine size.

*CL* took on a 1966 Tempest several months ago for the specific purpose of living with and reporting on the new sohc Six. The extended, 10,000-mile road test is unusual in scope, but practical in capacity for proving the values of a new type of engine. Previous *CL*

tests involving this radical (for a domestic automaker) engine have outlined its mechanical attributes and expectations. In particular, *CL* was concerned about the reliability and performance of the cog-belt driven overhead cam system.

If anything, the sohc system is the most reliable and unnoticeable part of the whole car. Those people who bother to peer underhood certainly can't miss the large vaulted cast-aluminum housing that covers the workings, but those who merely drive can only note it is simply a rather "peaky" powerplant

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which makes some interesting growling noises at certain rpm.

The overhead cam Six proved remarkably free of clatters, ticks, wheezes or groans. For 10,000 miles the engine did nothing other than what it was supposed to do, power the car in fuss-free fashion. The engine turns willingly to 6500 rpm, yet it will lug along in traffic at 20 mph and 900 rpm with never a buck or a snort. Properly geared and equipped, it can be a highly satisfactory powerplant.

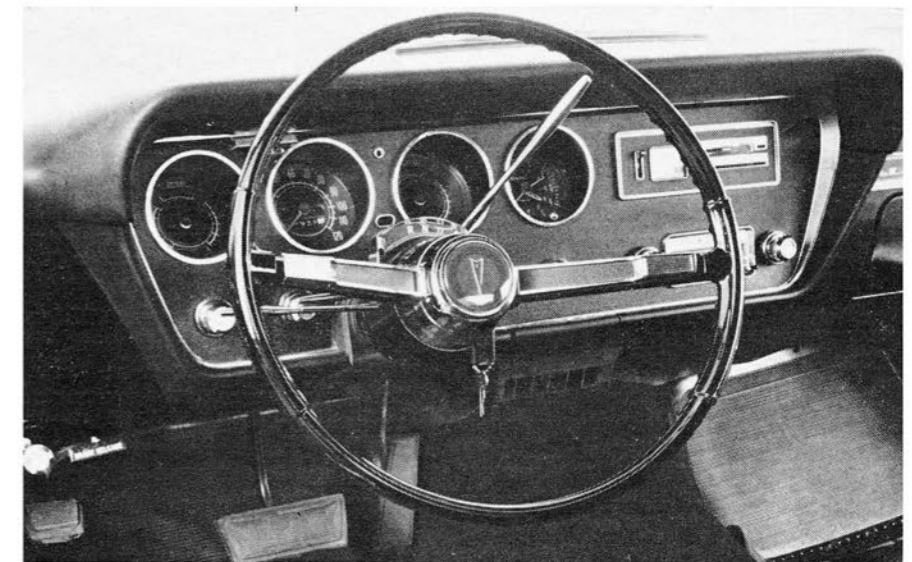
**T**HE 1000-MILE report (*CL*, June '66) pointed toward the transmission/axle combination as the major performance-limiting factor. The 10,000-mile report must confirm this. The single intermediate gear of the Tempest automatic transmission just isn't capable of providing the flexibility needed to utilize this particular engine's power characteristics without help from a high numerical axle ratio. With a torque peak at 3800 rpm and maximum horsepower at 5200 rpm, it is obvious that the hotter Pontiac sohc Six has to rev up fairly well before it begins to develop any sort of enthusiastic power. On the other hand, the lower-powered version of the same engine has its torque peak at 2600 rpm, which makes it far more compatible with the characteristics of this particular automatic transmission.

The Tempest Six automatic is the torque converter-plus-planetary gearbox type with a "loose" stall ratio of 2.8:1 to produce a more powerful "break-away" in first gear starts. Breakaway is the stall torque ratio (2.8:1) multiplied by the first gear ratio (1.76:1) and the axle ratio.

Properly gearing the drive axle can do much to improve the vehicle's over-the-road performance. As a general rule-of-thumb, it can be said that high numerical ratios produce best acceleration performance, low ratios yield the best fuel economy. Those ratios in between represent compromise to adapt the vehicle to the widest range of utility. The highest gear available in the Tempest model line is a 3.90:1, the lowest a 2.56:1. The accompanying table shows the relative characteristic of each available ratio, in terms of vehicle speed at torque and horsepower peaking speeds. Pontiac applies these ratios to the Tempest thus:

	auto. trans.	manual trans.	air cond.
Std. Tempest Six	2.56	3.08	3.08
Custom, LeMans	2.78	3.08	3.23
Optional 207-bhp Six	3.23	3.55	3.36

## Specific Recommendations For the Tempest Six Sedan



INSTRUMENTS IN round recesses proved glare-free and easily read, but optional tilting steering wheel was the feature most appreciated by *CL* testers.



Obviously, Pontiac engineers aim for the economy side of the compromise. Although the test car was delivered with the air conditioning ratio (to improve its performance—not because it was conditioner-equipped), it didn't perform to any notable degree in either fuel

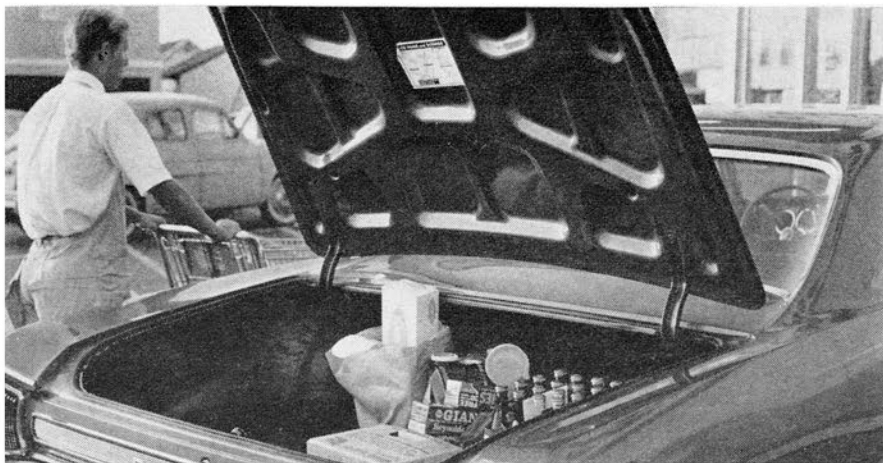
economy or acceleration. Such are the dangers of compromise.

Specific axle ratio recommendations by *CAR LIFE*, based on this test and that of a manual-transmission Sprint Coupe (*CL*, April '66), are: Standard Tempest Six (165 bhp), 3.23:1 for auto-

RELATIVE PERFORMANCE—TEMPEST GEAR RATIOS									
Ratios available	2.56	2.78	2.93	3.08	3.23	3.36	3.55	3.90:1	
rpm @ 60 mph*	1980	2150	2270	2390	2500	2590	2750	3020	
mph/1000 rpm*	30.3	27.9	26.4	25.1	24.0	23.1	21.8	19.9	
Mph @ bhp peak (4700 rpm), 230/165 sohc Six:	142	131	124	118	113	108	102	93	
Mph @ torque peak (2600 rpm), 230/165 sohc Six:	79	73	69	65	62	60	57	52	
Mph @ bhp peak (5200 rpm), 230/207 sohc Six:	157	148	137	131	125	120	113	103	
Mph @ torque peak (3800 rpm), 230/207 sohc Six:	97	89	100	95	91	88	83	76	
Total multiplication at breakaway**, automatic transmission:	12.6	13.7	14.4	15.2	15.9	16.6	17.5	19.2	
*Data based on 7.75-14 tires on test vehicle.									
**Converter stall torque ratio, 2.8:1, x transmission gear ratio, 1.78:1, x axle ratio.									



OPTIONAL rally wheels come with pierced-wheel, open-faced hubcaps.



SUPERMARKET SUPERCAR, the Tempest Sedan offers enough trunk space to swallow a month's groceries. High liftover height restricts access, however.

matic transmission and 3.36 for manual; optional Six (207 bhp), 3.55:1 for automatic, and manual. Reference to the ratio-performance table will show that these gear selections at least put the Tempest's power within usable, normal highway speeds.

Fuel consumption for the 10,723 test miles was 726.5 gal., or 14.8 miles per gal. This represented slight, but noteworthy improvement over the first 1000-mile report which showed only 13.8 mpg. At 4000 miles, consumption improved to

14.7 mpg, at 8000 it was at 15.1 mpg. The last 2000-mile period showed a leveling off at 15.1 mpg, indicating that this figure is what can be expected as minimum by an average driver. Although 15 mpg represents something of a median fuel mileage for the domestic automobile, drivers doubtlessly would be more encouraged to buy 6-cyl. cars if there was a greater potential for operating economy.

If mileage and performance improved slightly over the 10,000-mile test period,

the braking capability did not. Where *CL* recorded two 80-mph crash stops of 24 ft./sec./sec. deceleration rate after 1000 miles of driving, the same test after 10,000 miles gave only 20 and 19 ft./sec./sec. Noted, too, during the test period distance was a predilection of the rear brakes to lock up under hard usage. This could be attributed to excessive glazing of the front wheel linings, or simply fade. The Tempest, along with its General Motors A-body cousins F-85, Special and Chevelle, all suffer

## 1966 PONTIAC TEMPEST LE MANS 4-DOOR HARDTOP



### DIMENSIONS

Wheelbase, in.....	115.0
Track, f/r, in.....	58/59
Overall length, in.....	206.4
width.....	74.4
height.....	54.0
Front seat hip room, in.....	59.6
shoulder room.....	58.8
head room.....	38.1
pedal-seatback, max.....	40.3
Rear seat hip room, in.....	59.6
shoulder room.....	58.7
leg room.....	35.7
head room.....	37.1
Door opening width, in.....	31.5
Floor to ground height, in.....	12.2
Ground clearance, in.....	6.5

### PRICES

List, fob factory.....	\$2682
Equipped as tested.....	3316
Options included: Sprint pkg., auto. trans., rally wheels & 7.75-14 wsw tires, ride & handling pkg., radio group, power steering, tinted windshield, exhaust emission control.	

### CAPACITIES

No. of passengers.....	6
Luggage space, cu. ft.....	21.6
Fuel tank, gal.....	21.5
Crankcase, qt.....	5.0
Transmission/diff., pt.....	15/2.5
Radiator coolant, qt.....	13.5

### CHASSIS/SUSPENSION

Frame type.....	perimeter
Front suspension type: Independent by s.l.a., ball-joint steering knuckles, coil springs, telescopic shock absorbers.	
ride rate at wheel, lb./in.....	80.5
anti-roll bar dia., in.....	0.938
Rear suspension type: Live axle, 2 upper, 2 lower control arms; coil springs, telescopic shock absorbers.	
ride rate at wheel, lb./in.....	96.0
Steering system: Coaxial power-assisted, recirculating ball; parallelogram linkage, 2 tie rods.	
gear ratio.....	17.5
overall ratio.....	22.0
turns, lock to lock.....	4.2
turning circle, ft. curb-curb.....	40.9
Curb weight, lb.....	3470
Test weight.....	3860
Weight distribution, % f/r.....	55.4/44.6

### BRAKES

Type: Single-line hydraulic; self-adjusting duo-servo shoes in cast-iron drums.	
Front drum, dia. x width, in.....	9.5 x 2.5
Rear drum, dia. x width.....	9.5 x 2.0
total swept area, sq. in.....	269.2
Power assist.....	none
line psi @ 100 lb. pedal.....	700

### WHEELS/TIRES

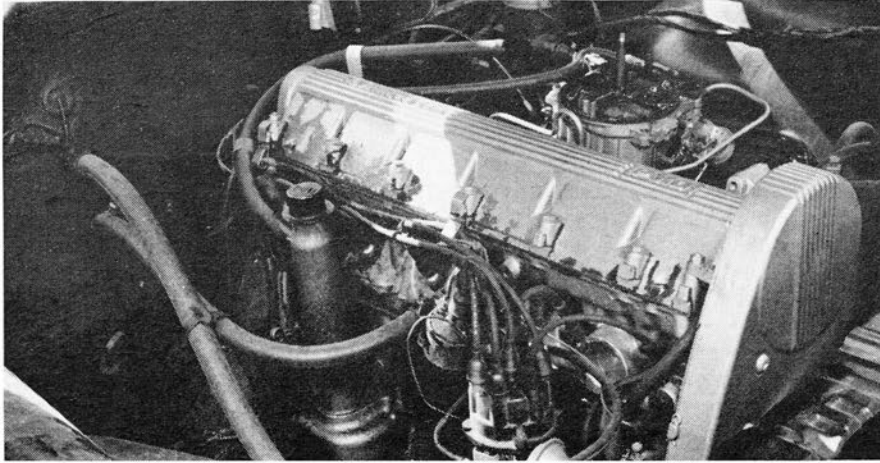
Wheel size.....	14 x 5J
optional size available.....	14 x 6JK
bolt no./circle dia., in.....	5/4.75
Tires: U.S. Royal Safety 800	
size.....	7.75-14
recommended inflation, psi.....	24/22
capacity rating, total lb.....	4480

### ENGINE

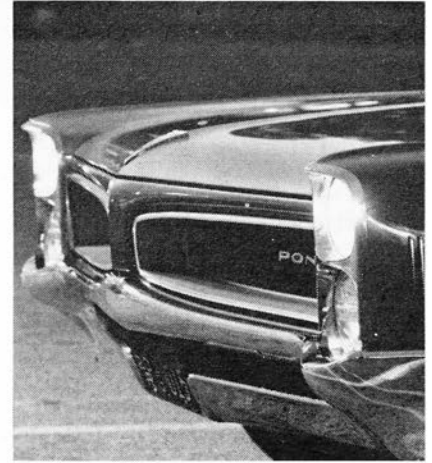
Type, no. cyl.....	IL-6, sohc
Bore x stroke, in.....	3.875 x 3.25
Displacement, cu. in.....	230
Compression ratio.....	10.5
Rated bhp @ rpm.....	207 @ 5200
equivalent mph.....	120
Rated torque @ rpm.....	228 @ 3800
equivalent mph.....	88
Carburetion.....	Rochester, 1x4 barrel dia., prl./sec.....
Valve operation: Belt-driven overhead camshaft, hydraulic lash adjusters, lever-type cam followers.	
valve dia., int./exh.....	1.92/1.60
lift, int./exh.....	0.438
timing, deg.....	20-44, 58-6
duration, int./exh.....	244
opening overlap.....	26
Exhaust system: Split manifold, dual branch, single muffler.	
pipe dia., exh./tail.....	2.25/2.00
Lubrication pump type.....	spur gear normal press. @ rpm.....
Electrical supply.....	alternator
ampere rating.....	37
Battery, plates/amp. rating.....	54/44

### DRIVE-TRAIN

Clutch type.....	
dia., in.....	
Transmission type: Automatic; torque converter and planetary gearbox.	
Gear ratio 4th ( ) overall.....	
3rd ( ).....	
2nd (1.00).....	3.36
1st (1.76).....	5.92
1st x t.c. stall (2.80).....	16.6
Shift lever location.....	column
Differential type: Hypoid, semi-floating axles.	
axle ratio.....	3.36



**SPRINT SIX** after 10,000 miles was beginning to show oil seepage at seams. Only thing to go wrong was transmission kickdown switch at 1500 miles.



**SHAPELY** front end announces Tempest; side ornamentation identifies Sprint Six.

from the same problem—too much weight for the size of the brake system. At 269.2 sq. in. of swept area in 9.5-in. drums, these brakes tend to be inadequate for anything but the most conservative sort of driving.

Without a power assist, the brakes were, if not overly effective, at least controllable. Drivers could stop the Tempest surely, if not swiftly. One slight problem developed, however, with the excessive height of the brake pedal in relation to the accelerator

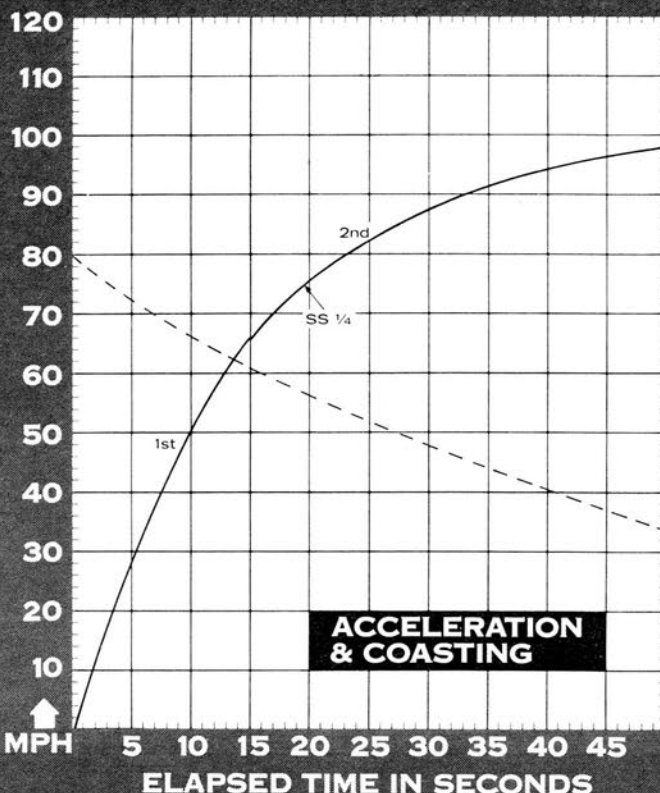
pedal. This disparity forced the driver to lift his foot nearly 4 in. off the throttle to step on the brake; it was possible, in the haste of an emergency, to slide that foot *under* the pedal rather than over it. Power brakes, which do not require long pedal travel, are in closer alignment and do not have that problem.

After 10,000 miles, everything mechanical about the Tempest was functioning normally and properly. The only real sign of wear appeared in the front

seat where a sag in the springs developed at the driver's position.

In summary, despite certain reservations for inadequate braking and limited performance, *CL* must rate the Tempest LeMans sedan quite highly among the 1966 model cars it has tested. It is quiet and comfortable, handsome and drivable. It is ideal for supermarket and schoolyard stop-and-go uses, yet it can offer pleasant highway touring without excessive fuel consumption. Reliability and utility are its strongest suits. ■

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### CALCULATED DATA

Lb./bhp (test weight)	18.7
Cu. ft./ton mile	89.3
Mph/1000 rpm (high gear)	23.1
Engine revs/mile (60 mph)	2590
Piston travel ft./mile	1410
Car Life wear index	36.3
Frontal area, sq. ft.	22.3
Box volume, cu. ft.	480

### SPEEDOMETER ERROR

30 mph, actual	29.6
40 mph	39.1
50 mph	50.8
60 mph	60.0
70 mph	71.8
80 mph	82.5
90 mph	93.0

### MAINTENANCE INTERVALS

Oil change, engine, miles	6000
trans./diff.	12,000/as req.
Oil filter change	6000
Air cleaner service, mo.	12
Chassis lubrication	12,000
Wheelbearing re-packing	as req.
Universal joint service	none
Coolant change, mo.	24

### TUNE-UP DATA

Spark plugs	AC 44-S
gap, in.	0.033-0.038
Spark setting, deg./idle rpm	5/500
cent./max. adv., deg./rpm	24/4800
vac. max. adv., deg./in. Hg.	20/12
Breaker gap, in.	0.016
cam dwell angle	31-34
arm tension, oz.	19-23
Tappet clearance, int./exh.	0/0
Fuel pump pressure, psi	4.0-5.5
Radiator cap relief press., psi	14-17

### PERFORMANCE

Top speed (4300), mph	100
Shifts (rpm) @ mph	
3rd to 4th ( )	
2nd to 3rd ( )	
1st to 2nd (5000)	66

### ACCELERATION

0-30 mph, sec.	5.3
0-40 mph	7.4
0-50 mph	9.8
0-60 mph	12.7
0-70 mph	16.7
0-80 mph	23.0
0-90 mph	32.8
0-100 mph	
Standing 1/4-mile, sec.	19.7
speed at end, mph	75
Passing, 30-70 mph, sec.	11.4

### BRAKING

(Maximum deceleration rate achieved from 80 mph)	
1st stop, ft./sec./sec.	19
fade evident?	yes
2nd stop, ft./sec./sec.	20
fade evident?	yes

### FUEL CONSUMPTION

Test conditions, mpg	14.8
Normal cond., mpg	14-16
Cruising range, miles	301-344

### GRADABILITY

4th, % grade @ mph	
3rd	
2nd	12 @ 65
1st	21 @ 40

### DRAG FACTOR

Total drag @ 60 mph, lb.	120
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