



in the valley between the cam covers and offset 0.87 in. from each cylinder center, are the spark plugs. Valves are angled 27° from the vertical and their broad faces comprise much of the hemispherical chamber surface. Because the diameter of the combustion chamber across the face is 2.5 in., more than a quarter inch of overlap remains around the cylinder bore, which promotes combustion-enhancing squish. Tangential delivery of the fuel/air charge, moreover, adds to chamber turbulence to further improve performance.

The engine's exceptional breathing and the reduction in reciprocating mass inherent in the overhead camshafts mean this diminutive Street Hemi cranks up frightful revs as a matter of course. The tachometer is red-lined at 6500 and a 400-rpm safety factor was discovered in the test car's instrument, but inadvertent over-revs beyond such prudent limits are of little consequence.

While the engine's free-revving capacity insured sprightly performance, there

was some compromise evident in the choice of final gearing. The selected ratio provided a freeway cruising speed that kept the engine speed near 4000 rpm. Acceleration in that area was not quite up to expectation. Going up through the gears, however, was pure exhilaration; an engine which rips effortlessly and without strain up to 6000 before the shift, three times in quick succession, somehow stirs blood through the driver's veins at a similar velocity.

The engine has some difficulty in achieving a smooth idle, turning over quite roughly and tending to rapidly foul spark plugs. Blipping the foot throttle is the best technique for preventing plug failure. Warm-up is rapid and the car moves off from rest very smoothly, thanks to the hydraulic clutch operation. During the test period, maximum performance starts were hampered by excessive fuel loading, which reflects in the data panel times. Normal driving, however, revealed no such problem with

FORD CORTINA-LOTUS

Amazing Performance From a Demure Package

ONCE INDIANAPOLIS made Lotus-Ford into a household word, an appropriate climate to plant hybrid passenger cars bearing that hyphenated nameplate thereby was created. The car had been available before that, but word of its delights had seldom reached more than a handful of colonials. It was the exact converse of the race car, to be sure, being a Lotus engine in a Ford chassis, but an opportune marketing entrepreneur could ignore that so long as that name was there.

Among the domestic motorsporting minority, a great deal of interest existed in this sedan that dominated overseas "saloon" racing. Transplantation of the Cosworth-developed double overhead camshaft adaptation of the English Ford engine into a void under the English Ford Cortina hood had been a happy step. Unhappily, however, examples of the car were all too rare in this country—despite an expansion of production by

EnFoCo to meet homologation minimums.

Now Lotus-Ford Cortinas are reaching these shores, in the aftermath of the Lotus & Clark/Ford & dohc victory at Indianapolis. A subsequent reassignment of English Ford marketing programs to domestic Ford Division dealers helps their distribution. They arrive somewhat modified: The expected Chapmanesque coil-sprung rear suspension, radial ply tires and lightweight aluminum doors and hood and deck lid have been lost somewhere in shipment. What does arrive is virtually the Cortina GT variant fitted with the steel-blue Lotus dohc engine and a thoroughly instrumented, brushed aluminum dash panel.

Starting life as the 116E EnFoCo 4-cyl. block, the engine has undergone a transformation at the hands of a talented engineering team composed of Mike Costin and Keith Duckworth

(hence Cosworth Engineering). Both had been early architects in the burgeoning Lotus empire of Colin Chapman during the late '50s, but an extra moonlight engineering enterprise of their own soon became a prime supplier for Lotus. With the explosive popularity created in the wake of Lotus-Cortina competition successes, they have been forced to concentrate efforts on production of this engine.

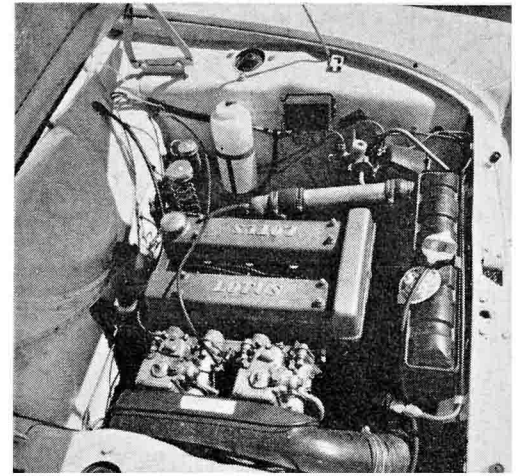
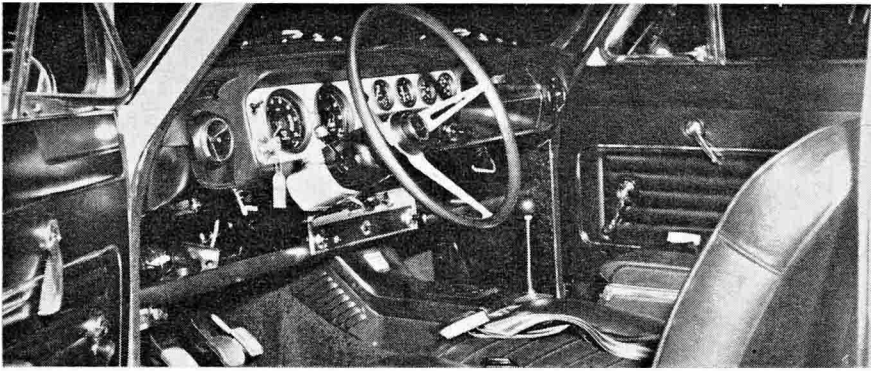
An initial slight overbore from the stock 3.1875 in. increases displacement from 90.1 to 95.1 cu. in. (1558 cc). Special lightweight high-crown pistons are carefully fitted into the larger bore. Together with the special dohc cylinder head, this brings compression ratio up to 9.5:1. The light alloy head casting, subcontracted to the highly-regard J. A. Prestwich firm of JAP motorcycle engine fame, carries the twin camshafts in four bearings each. The cams are driven by a roller chain, which also operates

the distributor and oil pump drives located lower in the block. Sufficient sturdiness to handle increased engine operating stresses is provided by the standard 5-main bearing lower end, although a carefully counterbalanced crankshaft is substituted during assembly.

Carburetion is by a brace of dual-throat Weber 40-DCOE-18 units, drawing through a silencer box over inlet horns. On the opposite side, an extractor-like manifold collects and routes the exhaust down and out through a low restriction resonator and muffler. When the engine was first applied to the Cortina, it had a rating of 105 bhp at 5500 rpm. However, something—perhaps better grade fuels—has increased that rating on imported versions to 115 bhp at 5700 rpm. In any event, premium grade fuel is necessary.

Ports in this head are short, direct and generous. Centered between them,





FORD CORTINA-LOTUS

MATCHED PAIR of Weber twin-choke carburetors and steel-blue cam covers are inspiring sight.

the fuel metering abilities of the Webers.

As a setting for this engine, the Cortina makes obvious those virtues that first attracted sedan class racers to the car. It is a solid unitized body structure that could well have been designed for racing sedan service and later adapted to passenger car use. Suspension modifications in the Cortina-Lotus have lowered the riding height slightly and, while one feels disappointed at getting the regular steel doors, there certainly is no loss of struc-

tural integrity with their retention.

Few production automobiles place the driver so thoroughly in command as does the Cortina-Lotus. Seats are chair high (front) with good back support, providing the average-size driver with exceptional visibility—as close as 6 ft. over the short, downswept hood and exact position of all four corners. Switches, knobs and minor controls all are less than an arm-reach away. Foot pedals are well placed and can be operated with deft dabs of the toe. The

remote control shift lever is faultlessly linked to the 4-speed transmission. Instruments are highly readable and arrayed in good order, though test drivers tended to confuse the tachometer with the speedometer (a reading of 40, we constantly cautioned ourselves, meant 70 mph road speed because it was indicating 4000 rpm). It was a thoroughly inviting car to drive, to drive briskly.

The pity of it all was that there is so little opportunity left in this country to

1966 FORD CORTINA-LOTUS SEDAN



DIMENSIONS

Wheelbase, in.....	98.0
Track, f/r, in.....	51.5/50.5
Overall length, in.....	168.3
width.....	62.5
height.....	53.4
Front seat hip room, in.....	2 x 21
shoulder room.....	n. a.
head room.....	37.7
pedal-seatback, max.....	42.0
Rear seat hip room, in.....	52.0
shoulder room.....	n. a.
leg room.....	35.0
head room.....	37.4
Door opening width, in.....	40.5
Floor to ground height, in.....	10.25
Ground clearance, in.....	5.3

PRICES

List, fob factory.....	\$3481
Equipped as tested.....	3528
Options included: Floor carpets, seat belts, outside mirror, emergency flashers.	

CAPACITIES

No. of passengers.....	5
Luggage space, cu. ft.....	11.6
Fuel tank, gal.....	9.6
Crankcase, qt.....	4.2
Transmission/diff., pt.....	2.15/2.4
Radiator coolant, qt.....	9.3

CHASSIS/SUSPENSION

Frame type.....	unitized
Front suspension type: Independent A-arm, coil springs; telescopic shock absorbers; anti-roll bar.	
ride rate at wheel, lb./in.....	n. a.
anti-roll bar dia., in.....	n. a.
Rear suspension type: Hotchkiss drive with longitudinal semi-elliptic leaf springs; longitudinal radius arms; telescopic shock absorbers.	
ride rate at wheel, lb./in.....	n. a.
Steering system: Recirculating ball-nut, transverse tie rods.	
gear ratio.....	n. a.
overall ratio.....	15.1
turns, lock to lock.....	3.5
turning circle, ft. curb-curb.....	37.25
Curb weight, lb.....	2060
Test weight.....	2450
Weight distribution, % f/r.....	51.1/48.9

BRAKES

Type: Single-line hydraulic with front calliper discs and rear duo-servo shoes in cast-iron drums.	
Front disc, dia. x width, in.....	9.625 x n. a.
Rear drum, dia. x width.....	9.0 x 1.75
total swept area, sq. in.....	281.6
Power assist.....	vacuum servo
line psi @ 100 lb. pedal.....	n. a.

WHEELS/TIRES

Wheel size.....	13 x 5.5J
optional size available.....	none
bolt no./circle dia., in.....	n. a.
Tire brand.....	Dunlop Gold Seal C-41
size.....	6.00-13
recommended inflation, psi.....	24
capacity rating, total lb.....	2920

ENGINE

Type, no. cyl.....	IL-4, dohc
Bore x stroke, in.....	3.25 x 2.86
Displacement, cu. in.....	95.06
Compression ratio.....	9.5
Rated bhp @ rpm.....	115 @ 5700
equivalent mph.....	100
Rated torque @ rpm.....	108 @ 4000
equivalent mph.....	70
Carburetion.....	Weber, 2x2
barrel dia., pri./sec.....	1.60
Valve operation: Chain-driven camshafts, inverted cup followers.	
valve dia., int./exh.....	n. a.
lift, int./exh.....	n. a.
timing, deg.....	n. a.
duration, int./exh.....	n. a.
opening overlap.....	n. a.
Exhaust system: Single, reverse flow muffler.	
pipe dia., exh./tail.....	n. a.
Lubrication pump type.....	n. a.
normal press. @ rpm.....	n. a.
Electrical supply.....	generator
ampere rating.....	22
Battery, plates/amp. rating.....	n. a./51

DRIVE-TRAIN

Clutch type.....	single dry plate hydraulic
dia., in.....	n. a.
Transmission type: 4-speed manual shift.	
Gear ratio 4th (1.00) overall.....	4.125
3rd (1.39).....	5.763
2nd (2.02).....	8.29
1st (2.97).....	12.26
synchronous meshing?.....	all
Shift lever location.....	console
Differential type: Hypoid.	
axle ratio.....	4.125



GREEN FLASH along sides distinguishes those Cortinas which have received Chapman touch.



INSIDE TRUNK, which is of ample capacity. Cortina-Lotus carries relocated battery to improve weight distribution.

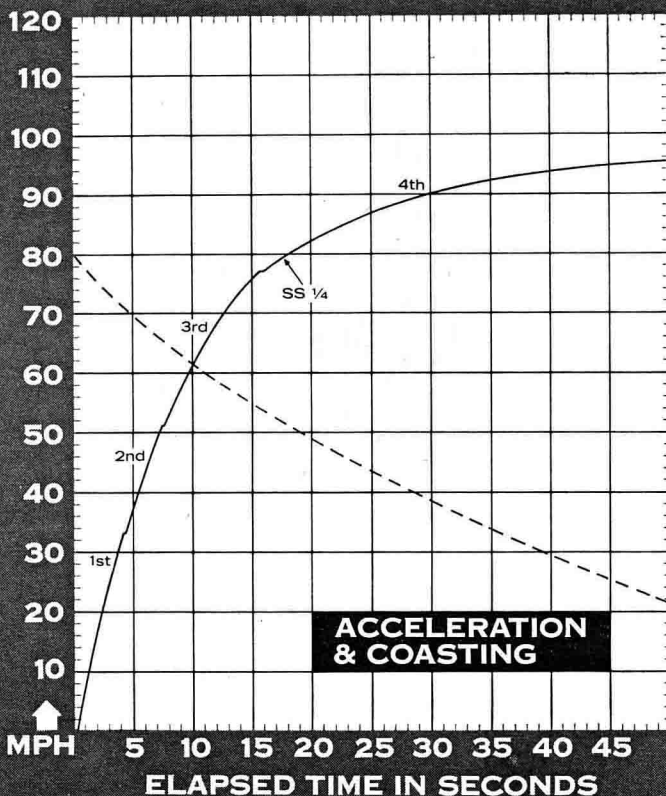
take advantage of a car designed for bashing down meandering, narrow British roads. Even in such near-stock form, the suspension could cope with any strained situation which opportunity did present. Its modification includes a slight lowering of riding height and the inclusion of wide-footprint tires which help considerably in cornering precision. Steering, though slightly heavy at lower speeds, is so positive and precise at higher speeds that one could overlook any other problem

which the car could conceivably develop. In like manner, the brakes are near perfect in operation (though somewhat under expectation in effectiveness) without any bad manners to anticipate. Only the ride, which tends to be a bit choppy, and the noise level, which is somewhat high, even though of a delightfully melodious, happily mechanical variety, would be considered drawbacks by most American buyers.

It is remarkable that Ford, a name so synonymous with the masses, and

Lotus, most often coupled with the Elite, have combined to produce such a delightful and desirable automobile. Its price, obviously, is a bit steep for a car of its size, but its value can be measured by more than dollars. Undoubtedly the Cosworth 'cammer will share some of the maintenance bothers so characteristic of highly tuned small engines. Yet, it's all worth it to have that teenie yellow polka dot with the green guitar pick on it, mounted on the grille and flank.

CAR LIFE ROAD TEST



CALCULATED DATA

Lb./bhp (test weight)	21.3
Cu.ft./ton mile	78.4
Mph/1000 rpm (high gear)	17.5
Engine revs/mile (60 mph)	2610
Piston travel, ft./mile	1720
Car Life wear index	62.1
Frontal area, sq. ft.	18.5
Box volume, cu. ft.	324.4

SPEEDOMETER ERROR

30 mph, actual	29.5
40 mph	37.2
50 mph	48.7
60 mph	59.2
70 mph	69.1
80 mph	79.3
90 mph	87.4

MAINTENANCE INTERVALS

Oil change, engine, miles	n. a.
transmission/differential	n. a.
Oil filter change	n. a.
Air cleaner service, mo.	n. a.
Chassis lubrication	n. a.
Wheelbearing re-packing	n. a.
Universal joint service	n. a.
Coolant change, mo.	n. a.

TUNE-UP DATA

Spark plugs	n. a.
gap, in.	n. a.
Spark setting, deg./idle rpm	n. a.
cent. max. advance, deg./rpm	n. a.
vac. max. adv., deg./in. Hg.	n. a.
Breaker gap, in.	n. a.
cam dwell angle	n. a.
arm tension, oz.	n. a.
Tappet clearance, int./exh.	n. a.
Fuel pump pressure, psi	n. a.
Radiator cap relief press., psi	n. a.

PERFORMANCE

Top speed (5700), mph	100
Shifts (rpm) @ mph	
3rd to 4th (6100)	77
2nd to 3rd (6100)	51
1st to 2nd (6100)	33

ACCELERATION

0-30 mph, sec.	3.8
0-40 mph	5.3
0-50 mph	7.2
0-60 mph	9.7
0-70 mph	12.9
0-80 mph	17.8
0-90 mph	29.9
0-100 mph	
Standing 1/4-mile, sec.	17.6
speed at end, mph	80
Passing, 30-70 mph, sec.	9.1

BRAKING

(Maximum deceleration rate achieved from 80 mph)	
1st stop, ft./sec./sec.	24
fade evident?	none
2nd stop, ft./sec./sec.	26
fade evident?	slight

FUEL CONSUMPTION

Test conditions, mpg	17.7
Normal range, mpg	16.5-18.5
Cruising range, miles	158-177

GRADABILITY

4th, % grade @ mph	7 @ 62
3rd	14 @ 55
2nd	23 @ 48
1st	29 @ 33

DRAG FACTOR

Total drag @ 60 mph, lb.	100
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