

the compleat ANGLIA



F-head power for the Eleven-Seventy-Two English Ford Flat-head

by Dennis May

WELL over twenty years old in basic design, one of the last two surviving sidevalvers in the British auto industry, and with a bore/stroke ratio (1/1.46) that went out of fashion with dumbirons, the 1172 cc Ford engine wouldn't seem, *prima facie*, irresistible material for soupcraft. Nonetheless, following in the footsteps of its broad-shouldered uncle, the late-lamented flathead L-head V8, Dagenham's small four-in-hand does respond right nimbly to the tuning fork, power increases of 100 percent and over being recorded without using a blower. Cheap and simple to modify, and a worm that doesn't turn easily under malusage, the Eleven-Seventy-Two almost completely dominates the esoteric English sport of Trials. Also, such is its popularity among builders of elementary and inexpensive sports cars that a national racing formula has grown up around it in Britain.

The "well-nigh unburstable" 100E version of this powerplant, as fitted in the Anglia and Prefect sedans, is an egg-basket favored by several makers of proprietary conversion kits. Some of them retain a flat head, in either iron or alloy, and use dual carburetors, superior manifolding, high-compression ratios and sophisticated cams—though not necessarily all four on the same menu—to get their extra wallop;

others combine selections from the above list with an entirely original cylinder head containing vertical inlet valves operated by pushrods and rockers. One example of the latter setup has been successfully developed by Willment Speed Shop Ltd., and the resulting pack is now on sale in the U.S. through Genuine Foreign Parts, Scarsdale, N. Y.

SCI recently had an opportunity to roadtest a Willment-treated Anglia on its own ground; but before dissecting the results let's pause for a look at the four different deals these people offer.

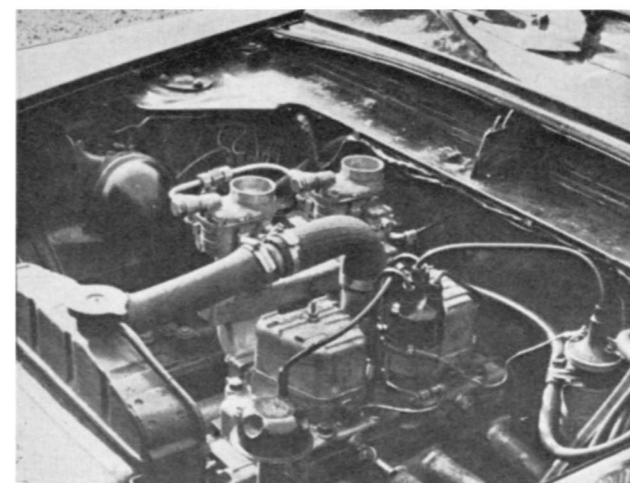
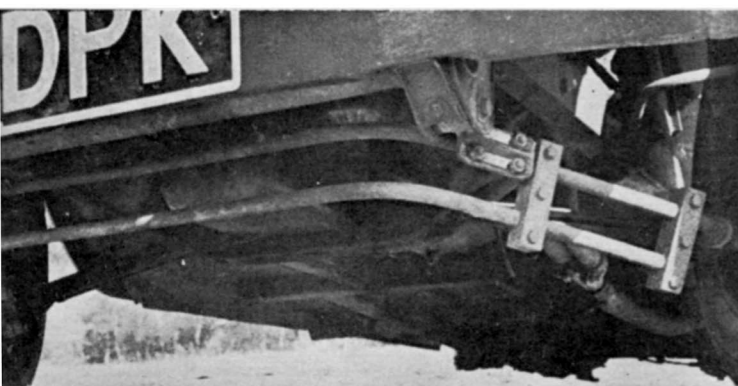
The cheapest and least-potent consists of the ohiv head, complete with pushrods, rockers, non-standard intake valves and springs, throttle linkage fittings, separate alloy inlet manifold, etc; this hamper doesn't include a carburetor, the original 26ZIC/2 Solex (23 mm choke) being switched to the Willment manifold. Output claimed is 50 bhp at 5200 rpm, compared with 36 at 4500 for the stock 100E. Torque goes up from 52 pound-feet at 2500 rpm to 64 at 2700.

Number two ensemble is generally similar, but the intake manifold is ported for dual 26ZIC/2 Solexes; you use the carb you've already got and harness it up to one that Twickenham sends. Performance now: 54 bhp at 5600 rpm;

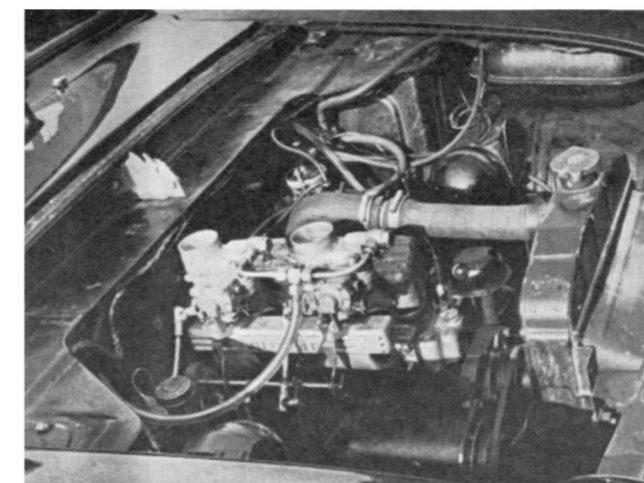
Another stability assist are these trailing radius rods that link the back axle to the side members. These rods control rear-axle dance, common to Anglias when cornering.



A Willment aid to roadability and cornering is an extra anti-roll bar for the front end. Stock models have only the single bar at the top. Car corners without any vices.



Willment Power Master head, with Rolls-fashion ohiv, is cast in aluminum alloy. Ribbed rocker boxes are anti-resonant and minimize mechanical noise. The four-branch-exhaust seen here is not a part of the Willment kit.



Seen from the starboard side, the conversion kit includes a special aluminum alloy inlet with balance pipe. Down-draft Solexes don't have clearance enough for air cleaners. The ignition coil has to be repositioned on the firewall.

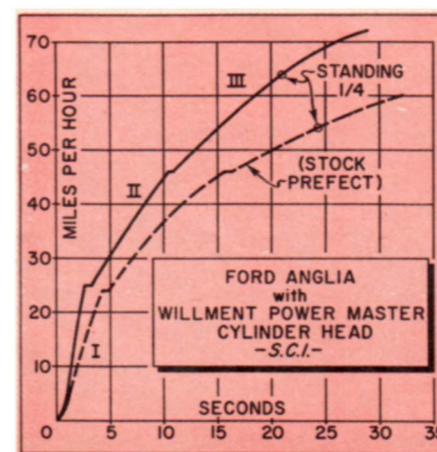
65 pound-feet of torque at 3500.

Number three repeats the main theme but uses a larger single carburetor (Solex 32PBI, 25 mm choke) in place of the two small ones; this, of course, puts the old carb out of work. Performance: 56 bhp at 5900 rpm; 66 pound-feet of torque at 3600.

The fourth and costliest dish comes with twin 32 PBI Solexes and a manifold to match. It gives you just over 63 horsepower at six thousand per minute and a torque figure of 66 lbs-ft at 3900.

But hold on—this isn't quite everything. Experimentally, by dint of a real wildfowl of a camshaft, Willment have pushed a 100E up to approximately 73 bhp, and this accessory may shortly be available on special order. More than doubling the makers' output naturally involves an appreciable loss of gentility in this long suffering engine, and such results are now only gotten with the aid of extra strong valve springs, enlarged exhaust ports, and so forth. None of the four regular stages of Willment tune entail any sculpture on the block, which has the advantage that when a converted engine reaches the evening of life you can clap the flat head back on and turn it in under Ford's exchange plan, reaping the appropriate economic benefits.

(Continued on page 60)



FORD ANGLIA with WILLMENT POWER MASTER HEAD

PERFORMANCE

TOP SPEED:

Two-way average 82.7 mph
Fastest one-way run 83.1 mph

ACCELERATION:

From zero to
30 mph 4.8 secs.
40 mph 8.3 secs.
50 mph 12.9 secs.
60 mph 18.5 secs.
70 mph 26.0 secs.
Standing 1/4 mile 21.0 secs.
Speed at end of quarter 64 mph

SPEED RANGES IN GEARS:

I 0 to 25 mph.
II 5 to 46 mph.
III 12 to top

SPEEDOMETER CORRECTION:

| Indicated | Actual |
|-----------|--------|
| 30 | 27 |
| 40 | 37 |
| 50 | 46 |
| 60 | 56 |
| 70 | 66 |
| 80 | 75 |

FUEL CONSUMPTION:

Hard driving 24.5 mpg
Average driving (under 60 mph) 29 to 32 mpg

POWER UNIT:

Type In-line 4.
Valve Arrangement F-head (Overhead intake, side exhaust)
Bore & Stroke (Engl. & Met.) 2.50 x 3.64 in (63.5 x 92.5 mm)
Stroke/Bore Ratio 1.46/1
Displacement (Eng. & Met.) 71.5 cu in (1172 cc)
Compression Ratio 8.5/1
Carburetion by Two downdraft Solex 32 PBI.
Max. Power 63 bhp @ 6000 rpm
Max. Torque 66 lb-ft @ 3500 rpm

DRIVE TRAIN:

Transmission ratios I 3.89
II 2.01
III 1.00
Final drive ratio 4.429/1
Axle torque taken by Willment Radius Arms
Weight, test car (Dry and unladen) 1618 pounds
Fuel capacity 8.4 U. S. gallons

RATING FACTORS:

Bhp per cu. in 0.88
Bhp per sq. in. piston area 3.20
Torque (lb-ft) per cu. in. 0.92
Pounds per bhp—test car (Dry and unladen) 25.6
Piston speed @ 60 mph 2440 fpm
Piston speed @ max bhp 3640 fpm

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(Continued from page 29)

The Anglia that SCI borrowed had treatment number 4, i.e., the Power Master head, as it is called, in conjunction with the larger paired Solexes. Engines in cars lent for press testing by conversion specialists, in England anyway, seldom seem to conform exactly to catalog specification, and this one, as usual, was a deviationist in one respect, namely, a fabricated four-branch exhaust system fitted in place of the normal Ford off-take. Willment experiments indicate, however, that the fancy bowels are only worth about two horsepower, and this gain—confined to the top end, they say—was probably offset in this case by slight but general deterioration throughout the engine; it had done over 20,000 miles, mostly under the penal rpm and load conditions that are the common lot of machinery used for development work and press testing.

Obviously, performance data on conversion jobs like this doesn't mean much unless you relate it to figures for the stock line. Regular Anglias and Prefects, then (these models are equal in power, the four-door Prefect being the heavier by around 56 pounds) have a timed maximum speed of between 70 and 71 miles per hour under neutral conditions, do the standing quarter mile in about 24.2 seconds, and go from forty to sixty in high in just over 21 secs. The Power Mastered Anglia, by comparison, averaged 82.7 mph in opposite direction runs for a flying quarter, a 17 percent improvement; lowered the standing quarter time by nearly 3½ sec to 21 flat; and almost halved the 40-60 push to a startling 11.5 secs.

Willment, speaking from knowledge of converted Anglias' paces in English club races, was mildly disappointed by the maximum speed we clocked. At SCI's best one-way speed over the quarter, 83.1 mph, the demonstrably overgeared Willment-Anglia's rpm is 5600, some 400 below peak, so the afore-mentioned deterioration really hurts. This is still 1200 revolutions per minute faster than the basic sidevalver's peak and probably quite fast enough for safety in the hands of the great anonymous public. More important is the fact that the converted car cruises at or even a bit above the stock Ford's maximum.

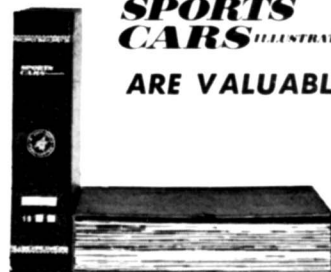
An incidental issue that the non-standard exhaust system tended to confuse was the assessment of under-hood noise. The Willment intake manifold repositions the Solexes at a level that leaves no room for air cleaners, but the gurgitations resulting from open intakes were blanketed by the fairly hearty exhaust note. Mechanically, the Power Master setup is just as quiet as a normal 100E; this is not unexpected, for the overhead inlet valves take a reduced clearance (0.008 instead of 0.015/.135) and the cast-alloy rocker-box covers are good and thick.

Compared with the phenomenal 40-to-60 time quoted above, the various gearbox-aided accelerations are good without being spectacular. The reason, of course,

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is no further to seek than a three-speed box with a jump of no less than 2.01 between second and top. This is a handicap that puts the Power Master in its least masterful light through no fault of Willment's. What can be said in extenuation of this Anglia/Prefect transmission is that the shift lever, unlike that of the larger Consul, Zephyr and Zodiac Fords, comes at you out of the floor instead of nesting on the column. In the nature of floor shifts, it has a positive and solid action.

For a four produced in a volume that is exceeded by very few British-built engines, the Eleven-Seventy-Two, in stock and Power Master forms both, is a smooth little proposition. In spite of the drastic elongation of the rev ladder that the Willment furniture entails, there is no noticeable roughness anywhere on the scale. Starting is not impaired and idling is steady. Due to slightly peculiar throttle linkage geometry on the test car, it was hard to sneak off the mark as gently as could be wished in city traffic. This, we are told, is being rectified.

The most striking single aspect of Power Master performance is its enormously-magnified punch around the middle of the range, for which credit is due to an increase in maximum torque from 52 to 66 pounds feet. This would be a real asset even if the Anglia had a four speed box with a close third ratio like the Morris Minor 1000; but the Ford box, with only three strings to fiddle on, makes it doubly valuable. Under typical English road conditions, with heavy traffic, minimum overtaking room and maximum blind-curves-per-mile, the Willment stuff radically reduces gearshifting frequencies and at the same time enables much improved averages to be maintained with less fatigue.

It isn't easy to make a fair comparison between stock Anglia and Willment Anglia fuel consumptions because the term "hard driving" means different things in the two contexts. In average use, it's probably fair to estimate that the untuned car goes three to four more miles per U.S. gallon. The Power Master's higher compression ratio—8.5/1 as against 7/1—obviously offsets to some extent the manlier thirst of the bigger and duplicated carbs. As applied to SCI's mileage, "hard driving" is certainly appropriate, for it included all the maximum speed and acceleration test timings.

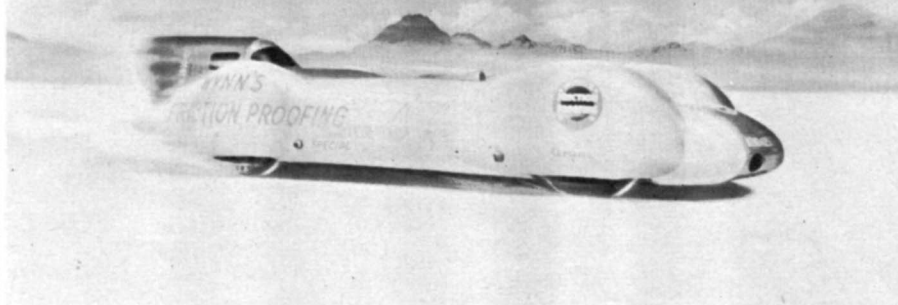
The conversion job, of course, involves stoppering the redundant inlet ports in the block, and blanks are supplied with the kit for this purpose. The printed instructions for the makeover seem clear and comprehensive as a whole.

Cylinder head material is the well-known DTD424 aluminium alloy, used in all modern Jaguar engines and in the Raymond Mays Ford Zephyr cylinder head (SCI, Aug. '57). The inlet valve seats are made of austenitic cast iron. Direct seating valves were tried during the development stage, but ferrous seats give longer life.

Willment's rockers are chill-cast steel and give one to one leverage. Stock Ford exhaust-valve springs are retained; but on each intake valve two springs register a combined strength of 115 pounds. On conversions that Willment does, the ex-

(Continued on page 62)

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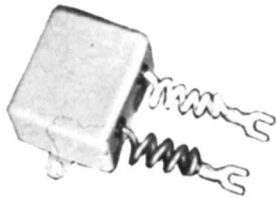
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(Continued from page 61)

haust valves and port shapes and sizes are left alone, but there isn't anything to prevent a customer with advanced ideas from gouging out these ports and fitting special valves. The inlet valves supplied with kits are of modified XK Jag origin, with 1 3/8 inch diameter heads and 5/16 inch stems.

Although Willment has experimented with several different compressions, ratios above the adopted level of 8.5 to 1 show no extra return. With the normal ignition timing, 5 deg. BTDC static, the test car was fully impervious to pinking on fuel of around 90 octane.

This wouldn't be the place for a general evaluation of the Anglia as a car, even if the particular one tested was a current model, which it wasn't. Nevertheless, prospective buyers of a conversion worth a 17 percent increase in maximum speed are entitled to know what hazards, if any, the full exploitation of such a bonus entails on the road. The short answer is None; and this verdict is borne out by the spectacle, common enough in club races around the British circuits any summer weekend, of hopped-up Anglias and Prefects being thrown through every variety of turn with impressive abandon and immunity from disaster. Over rippled surfaces the ride, naturally, isn't as flat as a Déesse's, nor does this small utilitarian automobile corner like a G.P. Maserati; but on the other hand it has no special vices and, both in a straight line and going around curves at speeds its designers probably never budgeted for, its safety factor is liable to surprise you. Sense of control would be better still if the steering wheel was about an inch lower; as it is, the driving position is slightly reminiscent of a beagle begging for biscuits.

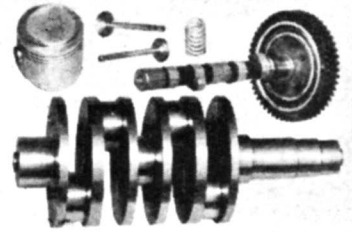
Good cornering properties of the test car no doubt owed something to two Willment specialties: an extra anti-roll torsion bar at the front and trailing radius rods linking the back axle to the frame sidemembers. When cornered brutally, stock Anglias are prone to some rear-axle dance, but the radius arms seem to cure it entirely. Both these Willment appendages will likely be available in the U.S., either with or without engine kits, before long.

Power Mastered Fords did well in a number of minor British events during 1957. One of their best scores—demonstrating ability to hold together under a prolonged ordeal—was third place in the annual six-hours team relay at Silverstone. Twenty-five teams competed. At a sterner level, a Lotus-Ford with P.M. embroideries pulled off Autosport's seasonal series production sports car championship, which now carries national kudos.

With its inlet valves inverted, the homely Eleven-Seventy-Two takes a step into Society, for Rolls, Bentley and Rover all favor this layout. But it's doubtful whether any of them equal the converted 100E in specific output.

Dennis May.

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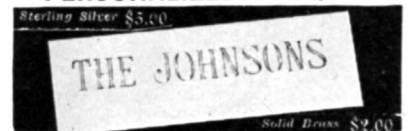
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