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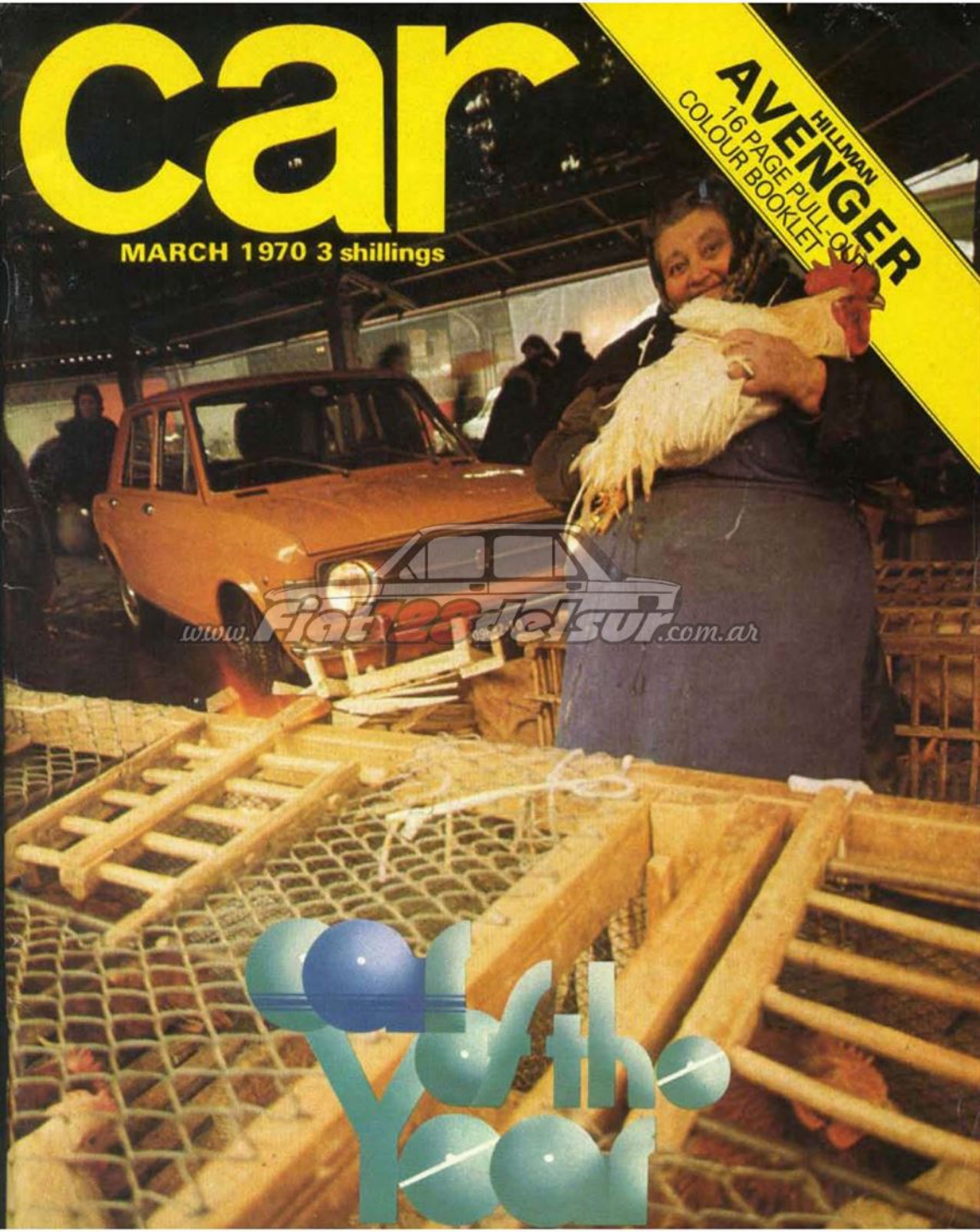

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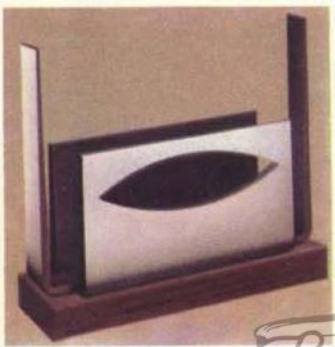
Youth Year

of the Year



As usual, we have commissioned a prominent British stylist to produce the trophy for our CAR of the Year Award. This year's choice fell on John Frayling, the independent consultant who became famous as the co-designer of the beautiful Lotus Elite. He has since been responsible for the elegant Europa for the same stable, and is working on other projects from his studio in Berkshire. Frayling's trophy is in stainless steel on a teak platform and is 12in by 10in. It becomes the permanent property of Fiat

CAR of the Year Jaguar photographed by John Perkins

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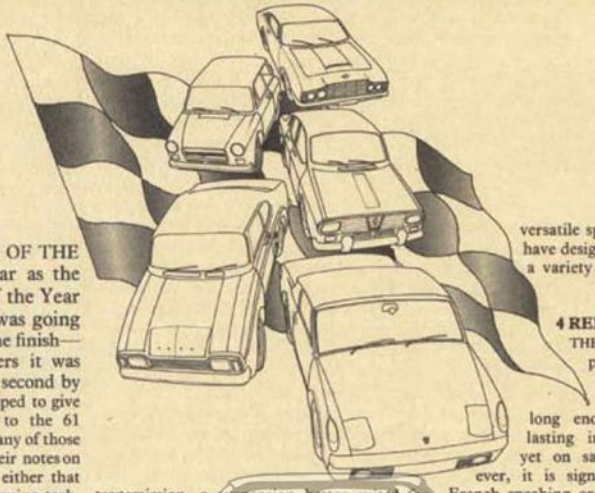
6th ASTON MARTIN DBSV8
5th AUTOBIANCHI A112
4th RENAULT 12
3rd FORD CAPRI
2nd VW PORSCHE
1st FIAT 128



1 FIAT 128/98.5 points

DESPITE THE CLOSENESS OF THE initial voting it became clear as the votes for this year's CAR of the Year Award poured in that there was going to be only one car left in at the finish—the Fiat 128. Among 21 voters it was placed first by 10 people and second by another six, which in the end helped to give the 128 a total of 98.5 points to the 61 gained by the second placed car. Many of those who voted for the Fiat prefaced their notes on the winning car by commenting either that several other cars were more intriguing technically but fell down on details, or that they found difficulty in listing four technically advanced cars introduced in 1969.

Said **Claude Savoye**, of *Sport Auto*:
The Fiat 128 may well be the car of the generation as was the first Fiat 1100. Apart from that it is a pretty car, a very clever design and it's fast, fun and cheap too.

In similar vein was the assessment of **James Ensor**, who felt in general that technical originality was notable by its absence in the new cars of 1969:
The Fiat 128 has more of the qualities of a robust family saloon than the Renault or Capri. It has neat styling, offers a good accommodation package, accelerates strikingly well for an 1100cc car and it is, of course, excellent value for money.

Others who voted the 128 into first spot were less grudging in their praise. Included among them was **Jan P Norbye**, who listed his reasons for placing the Fiat first shortly and succinctly:

- Low price, mass production capability; only car to shake up VW's management
- Excellent space utilisation
- Front wheel drive, combining good directional stability with high handling precision
- Advanced overhead camshaft engine with high rpm capability matched with reasonable fuel consumption
- Surprising ride comfort and low noise level.

Another judge, British engineer **Joe Lowrey**, would have come very close to winning that trip to Italy offered to CAR readers if he were eligible, for his six choices coincided remarkably closely with the final result—with one notable exception. He, too, chose the Fiat 128: This is a second generation to the Issigonis cars. To a proven layout it adds a simpler transmission, a suspension better suited for estate car loads and an overhead camshaft which works.

2 VW-PORSCHE/61 points

WHAT OF THE OTHERS? IN SECOND PLACE WITH 61 points on our 6, 5, 4, 3, 2, 1 points scale came the VW-Porsche. Five of our 21 judges placed this very exciting sports car first and we suspect many more would have voted for it but for a particularly inept press launch which upset many of those invited to try the car.

As **Philippe de Barsy** remarked: I vote for the VW-Porsche because I think it is really bringing new thinking into a category of car which was tending to lose ground.

Jack Yamaguchi did not attend the press presentation of the VW-Porsche so has no ill feeling on the subject:
My vote is cast for the VW-Porsche 914/4, which is the first reasonably priced and thoroughly practical mid-engined sports car, combining handling and performance.

3 FORD CAPRI/43.5 points

THE FORD CAPRI WAS MENTIONED BY MANY members of our panel. Most of them felt it was a triumph of marketing over design, but all agreed that the concept was absolutely right for the European market. Lack of technical merit prevented it from being placed first by more than three judges. Despite that, a number of lower placings brought it up to third spot in the overall judging.

Among those who plumped for the Capri was **Stirling Moss**, former racing driver, as if we need remind you, and erstwhile CAR contributor. Stirling commented:
I have chosen the Ford Capri as my number one car for 1969 because I feel that Ford have produced a good-looking, well mannered and very versatile sports coupé. The way they have designed the car to incorporate a variety of engines from different countries is commendable.

4 RENAULT 12/39.5 points

THE RENAULT 12 WAS possibly announced a little prematurely, for few people have driven it for long enough to have formed a lasting impression and it is not yet on sale outside France. However, it is significant that none of the French speaking or French domiciled judges placed it highly and they have had more opportunity to drive it than the rest of us. It did not rate a first place vote from anyone, but several judges put it second or third.

Said **James Ensor**:
The Fiat wins on points over the Renault by a narrow margin, mainly on styling grounds since I prefer the boxy Fiat lines to the more adventurous wedge shape of the Renault.

5 AUTOBIANCHI A112/30 points

THE FIAT EMPIRE, UNDER WHOSE MATERNAL wing the Autobianchi concern rests, launched the A112, we suspect, as a test marketing exercise for a future 600/850 range.

Alan Baker placed the A112 first with these remarks:
The qualities of the A112 are very similar to those of the Fiat 128—high grade production engineering, an up-to-the-minute concept, crisp styling, an eager performance in its class, good utilisation of space, and excellent value for money. I give my vote to the Autobianchi by a narrow margin because it is much more difficult to make a good small car than a good medium-small one.

6 ASTON MARTIN DBS V8/22.5 points

DESPITE THE FACT THAT NOT MORE THAN A couple of dozen people outside the Aston Martin works can have driven the DBS V8, its exotic specification and promise of a top speed of 170mph attracted a number of votes.

Voting it into first place, **Ian Fraser**, the well-known Australian writer, made the point:
The DBS V8 seems to be a very genuine attempt to get a British car back into the high performance GT field. History may well decide that this is the last of the meticulously designed and engineered cars to come from England. ●

Car of the Year

THE CAR OF THE YEAR IS SUPPOSED TO BE STIMULATING. WHAT IS THE STIMULUS IN THE FIAT 128? NOT ANY ONE FEATURE, SAYS L J K SETRIGHT, BUT AN EXEMPLARY COLLECTION OF DETAIL FELICITIES

I WISH I HAD MORE TIME AND space, I begged when writing of the Fiat 128 a couple of issues ago, *to expound the many virtues of its design.* The better intended of my prayers are often answered, but seldom so soon. Of course I could not know when writing for the January issue that the 128 would be CAR of the Year; I only knew that it should.

The 128's impressive roominess is the key to the design. Without it, most of the engineering features would be meaningless; with it, every single one of them plays an important part in making the whole thing workable and praiseworthy. It is the reason for the front-wheel drive, for the transverse engine, for the thin doors and the glued-in front and rear screens, for the strut suspension at all four corners. A lot of this we have heard and seen before, in some half-baked form or other. The thing about the 128 is the completeness, the rationality of the design. It results in a car for which it is at first difficult to work up any rabid enthusiasm; it is just a car that works well without ever drawing attention to itself. One does not find it necessary to make concessions or apologies for some inevitable and unwelcome consequence of an otherwise desirable specification; as a mere owner or user of the car, there is little or nothing one finds remarkable. One looks at the drawings of that neat and economical transmission and says '*Of course—how else?*' forgetting the unholy rabble of existing front-drive cars whose transmissions consume enough power to propel the 128 at 35mph. One notes the simplicity of tappet clearance adjustment beneath the overhead camshaft and says '*Perfectly obvious!*'—but we had to measure, strip, rebuild and remeasure our overhead camshaft apparata for more than half a century before Fiat came up with this system. Likewise with so many other features, everything seems perfectly reasonable; but how often does something become obvious only when it is demonstrated?

One of the most obvious hazards that the 128 must risk in its assault on the world's markets is the assumption that it is merely a modernised Mini. However, a riffle through the patent files of 1947 or thereabouts shows that its gestation began about the time when Issigonis was working on the Morris Minor. The 128 is not a copy of anything that he has done, more an admission that BMC were right all along with their front-drivers and that Fiat have been wrong with their older-fashioned 124 and the like. It would not even be right to dismiss (as some are tempted to do) the 128 as a cleaned-up Primula, although the Autobianchi did some things that the Fiat does similarly. We know that Giacosa had schemed and evinced similar front-wheel-drive arrangements in the early post war years, and that the refined simplicity of the 128 design is not the result of improving some other firm's basic product (though Montabone has had a hand in the Simca 1100 as well) but rather of doing some original thinking about the same set of basic requirements and the means whereby they might be met with economy and ease.

What made Fiat converts to the front-drive faith after all those years worshipping *ιστερον προτερον*—the cart before the horse? They used to justify their little rear-engined cars by claiming that it was impossible to make a car of equivalent performance and accommodation as cheaply by any other means. But the old order changeth, yielding place to new, and Giacosa fulfils himself in many ways: it is now claimed that, having evolved some clever ideas in engine orientation and especially in transmission (where most of a front-driver's extra price is absorbed, as well as its power) Fiat can now get the results they wanted more acceptably and effectively by these means.

The result they sought was a car that would be a satisfactory and enduring replacement for the venerable Millecento. The old 1100 had been in circulation for practically two decades, and could even be traced back to the square-rigged Ballila—not the sporting beauty we like to remember from the '30s (that was really the Coppa d'Oro) but the 1927 saloon. The new car had to be everything the old one was, and a great deal more besides—as well as a great deal less, corporeally. It had to be shorter overall than the Fiat 1100, roomier inside, even roomier (albeit stretches narrower) than the bigger 124. Here then was immediate justification for the transverse engine. Bugatti (and Trojan?) had exploited the transverse engine before, in applications that were irrelevant; the Mini proved the virtue of a transverse engine in making use of the space discovered by front-wheel drive. The 128 is arranged in the same way for the same reasons.

For the same reasons the 128 is sure-footed in the tradition that Issigonis started. It has to be: standards in road-holding and handling have risen rapidly in the last few years, and in fact the 128 may find itself a little out of date in this respect, in less time than it has to run. For it can be expected to be around for a long time: not perhaps as long as its predecessor, but long enough for the tooling costs to be amortised very slowly, which helps to keep the cost down. Yet this alone cannot explain why the 128 is fit to be CAR of the Year—and Heaven forfend that it should, for the distinction is one that should only be earned by a very special combination of economic, aesthetic and engineering virtues. It is almost a relief that my brief extends only to the last of these.

There is plenty of clever engineering in

the 128, but not all of it can be enjoyed by peering under the bonnet or studying the drawings. Some of it can be appreciated only by driving the car—or at least by sitting in it, for its most striking feature remains the extraordinary roominess provided for all occupants. It is no more a five-seater than any other five-seater on the 1.5litre market: the rear seat width of 52.5inches forces three people to sit uncomfortably close together, though for a modest distance they could assuredly manage. But four really tall men can sit at ease within the 128, finding no fault with headroom, legroom, elbow room or each other. So much room in, so little out, so sprightly and small in size and appetite—how could it be done save by clever tailoring and fitting?

There is little that is noteworthy in the body structure. The roof and side panels are a one-piece pressing, with windscreen and rear window cemented in (as in the 124 Coupé) to reduce pillar thickness. The floor is another single sheet steel pressing running the whole length from tail to toeboard, set about with side and cross-members to increase strength and stiffness. The body sides are single pressings too, encompassing the door apertures. The 128 comes as a 2 or 4door saloon, the doors of the former being only 4.5inches wider than those of the latter. The pillar of the 2door version is not kept so far forward for aesthetic reasons, but because Fiat engineers were reluctant to sacrifice structural strength amidships; they have always expressed a very practical order of priorities. In fact the hull is the usual Fiat version of the triple-box fashion, with tolerably squashable front and rear (the 13cu ft boot is huge for such a car, despite the minimal overhang) sections protecting a non-creasing non-crumpling drip-dry travelweight suit of passenger armour.

This sort of safety can be taken for granted nowadays. Most customers do not really care, are not aware how much protection is built in, and are content to rely on the fact that it is always the other chap who is so incompetent as to have an accident. Instead they look for styling and gimmicks. In the 128 they will find precious little of either. This is not the first time (and I trust it will not be the last) that I have felt moved to commend Fiat for refusing to pander to the fashionable and irrational. They thus postpone the obsolescence and retard the depreciation of their cars, which in turn enables them to go on marketing each model that much longer and hence more cheaply. They are perhaps a little too reactionary sometimes, showing some reluctance to bring their cars up to date in terms of modern conveniences. Old-fashioned conveniences such as fully fuse-protected circuitry, a hand throttle, or a footrest alongside the clutch, are to be found almost throughout the range; but where are the tailgates, the folding rear seats, or—though it is asking rather a lot in a small car—the heated rear window?

Fiat do not have one single simple answer to this challenge; they have several. In the 128 they have made a start by providing more comprehensive ventilation, cool fresh air being nozzled independently of heated air from a newly simplified and effective exchanger. Complementing it is an extraction system which induces airflow over the rear window as the air finds its way out through vents beneath it, helping to keep mist dispelled. A tailgate body would of course enclose a greater volume of air, making it more difficult to heat and so aggravating the problem; but if you must indulge your illusions of being a second Pickford, you can always have the Familiare. Most compulsive argument is the effect of the rear window (together with the windscreen) on torsional stiffness: unglazed, the 128 demands 6100lb/in per degree of twist, a little more than the Maxi—but with those two glasses bonded in the figure soars to 11,700, which is almost as good as the BMC 1800.

Other sensible things include moving the heater fan motor out of the passenger compartment into the nose of the car where its full-blast operation will no longer drown the sound of everything else, as happens in, say, the 124. Fans can be too quiet (they tend to live perpetually turned-on lives if they are) so I dare say Fiat may be excused for allowing the sound of aerodynamic fungus or burbling at the nozzles to be heard when the engine is merely idling. Better still, they have developed an air-mixing system that makes the temperature control immediately responsive, and a two-tier distribution system that makes it possible to drive hotfoot and cool-headed, though not vice versa. Perhaps in this context it is not necessary that a hothead should be given cold feet . . . ?

That engine which fails to drown the fan when idling only just succeeds when pulling. It is probably the quietest engine Fiat have made, which is not saying much, and quite probably the quietest in its class, which is to say rather more. It should be: it is a brand new engine, owing nothing to the Primula or to anything else if we pardon the use of piston rings from the 125, thanks to the accident of their having 80mm bores in common. Nothing in the way of hardware but a lot of ideas have come from other Fiat engines, notably the tappet adjustment introduced in the overhead camshaft arrangements of the 125.

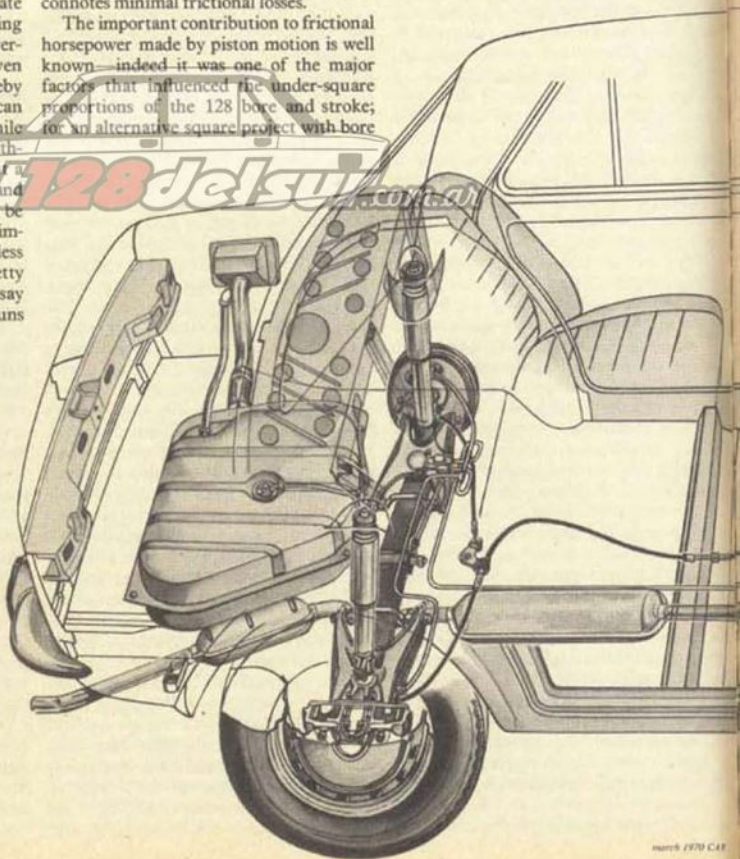
If any item is to become *de rigueur* in any self-respecting engine within the next few years, it will be the overhead camshaft. The 128 has only a single shaft, but in this case it matters little for the transverse installation of the engine discourages the crossflow porting without which a second camshaft is otiose. Without crossflow porting the combustion chamber must needs be somewhat lopsided, and Fiat ▸

▶have adopted a cuneiform shape for the combustion space. With so large a bore it is obviously necessary to confine the head recess to a small portion of the area of the piston crown, and it is usual in such circumstances to provide a squish effect from beneath the unrelieved portion of the cylinder head face as the piston rises to the upper limit of its travel. In the 128 this has been done with more sensitivity than is evident in other engines: the squish area itself is very slightly wedge-like in section, which should improve combustion by producing well-controlled and directed turbulence, and should reduce hydrocarbon emissions by diminishing the quenching effect of the squish band as the flame front passes beneath it. A little such quenching is sometimes necessary to ward off detonation, but the 128 engine has a modest compression ratio by current standards: only 8.8 to one. It and the light alloy of the head should allow all sorts of liberties to be taken without a pink or knock intruding. In fact the apparatus is at present in a pretty soft state of tune, not at all the screaming shouting rabid revver that short stroke and overhead cam suggest to the superficial. Given a headborne cam and direct attack thereby of the valve or tappet, an engine can usually be made to spin very fast while still enjoying the benefits of valves faithfully following their directions without a forest of pushrods getting tangled and mangled. Alternatively, the valves can be made heavier and therefore bigger, improving the breathing ability more or less in proportion. Here we have a pretty short stroke (55.5mm is a lot less than say the 70 of the Honda S800, which runs happily to 9000rpm, and is only 11percent longer than the stroke of the V12 Matra, which runs to 12,000) and generous valves. The exhaust is 1.2in in diameter, the inlet 18percent larger, and the latter acts as bung in a sensibly constant-section inlet tract so dimensioned that maximum mean air velocity is only about 0.27 Mach.

Sometimes it is not the valve gear but the pistons or the bottom end which may impose a rev limit. The 128 has been conceived with many more future revs in mind, the present limit being determined by the carburettor bore and cam contours that dictate asthma at 7000. All Fiat engines have a spare thousand or so safe rpm available beyond the peak of the power curve, just for safety's sake, and at present this means that although peak 55 net bhp comes at 6000 you can run the 128 up to 7000 without any qualms. Because of the very short stroke, the mean piston velocity is an utterly insignificant 2180ft/min at 6000—if you can treat as insignificant a figure whose modesty connotes minimal frictional losses.

The important contribution to frictional horsepower made by piston motion is well known—indeed it was one of the major factors that influenced the under-square proportions of the 128 bore and stroke; for an alternative square project with bore and stroke of about 71mm would have given piston speeds about 30percent higher to the detriment of relaxed cruising at maximum speed. There are, on the other hand, some engineers who consider high piston speed a lesser evil than the inertia loads that are magnified by extreme piston acceleration such as a short-stroke engine produces by doing what comes naturally, which is to spin at high speeds.

Turin get around this objection by making the connecting rods longer than usual—'usual' connoting a length between centres (the distance between the axis of the gudgeon pin and the axis of the crank pin) twice as great as the distance travelled by the gudgeon pin itself. Why this should be a convention I have no idea, but that is what it is. The rods on the Fiat are therefore unconventional, for their length/stroke ratio is not 2 but 2.18. So the maximum piston acceleration in the 128 at 6000rpm is a modest 44,000ft/sec/sec, or about 1360g. You think that immodest? Well, racing cars run beyond 4000g piston



Peter Griffin's exclusive cutaway drawing shows how the 128's mechanical loads are concentrated at the front of a sheet steel punt structure reinforced on all sides. Besides augmenting safety, this system saves money in tooling and production that can be spent on advanced engineering features

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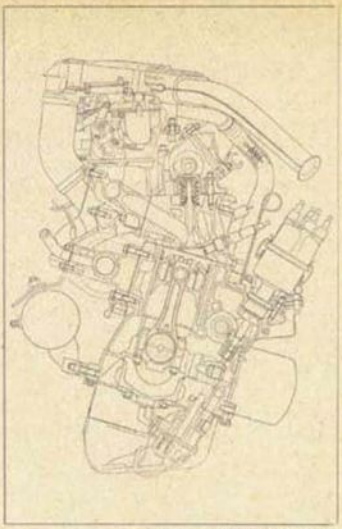
acceleration, motorcycles beyond 5000; and as for your good old slow-running long-stroke engine, there is always the example of British Leyland's Maxi, which has to have short rods in order to keep the height down and so does about 1700g.

Similar problems may beset the valves which also have to be accelerated—not at such high rates, it is true, but neither subjected to such efficient constraints. The valve springs have an awful job in a push-rod engine, returning not only the valves to their seats but the rockers, pushrods and tappets to their base positions after every lift of a valve. With an overhead camshaft the reciprocating mass is much less, entraining benefits we have already described. The idea makes particularly good sense in conjunction with an engine of large bore, for in this it is possible to install valves every bit as large as could be desired and yet have them in line and operated by a single camshaft, rather than having to incline them and employ two camshafts. What is more, the fairly low loadings in the valve gear make the cam profiles less critical, so the sophistication of computer design and the difficulty of manufacturing the cams with sufficient accuracy to justify the forbidding mathematical complexity in their generation becomes rather unnecessary, and the 128 with its mild 12-52-52-12deg timings makes do with a simple old-fashioned synusoidal cam. And it is still well nigh unburstable.

There are more things to engine design than sheer unburstability: thermal and volumetric efficiencies, for instance. The former is improved by long strokes and small bores, and the latter is strongly influenced by big bores to the extent that they make room for big valves and deep breathing, though they make difficult the achievement of a good combustion space shape for efficient burning. The brake mean effective pressure in the Fiat 128 is certainly not outstanding: the peak of the curve is at 126lb/sq in, which pales by comparison with the 140 of the Maxi or the 149 of the Imp. These are the peak figures at the speeds corresponding to maximum torque delivery, which is 3000 rpm in the case of the Fiat; but the story is different at higher speeds, when the free breathing of a big-bore engine grows more significant. At peak power the Fiat's bmep is down to 108lb/sq in, which represents a drop of only 14percent. I have ▶



Up-to-the-minute 128 engine design incorporates belt driven overhead camshaft working simple valvegear, with provision for a second cam in future sporting variant. Precision iron castings for block, crankshaft and conrods save money, while careful design keeps stresses low

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▸ noticed that this is a figure which recurs frequently when studying Fiat engines, and it probably reflects some particular favourite combination of valve timing and gas flow, but it is a good deal lower than the percentage drop suffered by most other engines in the same class. What is more to the point is that the Fiat is already delivering maximum torque at a mere 50percent of the speed at which it gives maximum power, and keeps it fairly well up thereafter, whereas other longer-stroke engines begin to run out of breath more quickly, torque falling away sharply towards the top of the rev range. Yet again the big bore, big valves and overhead camshaft justify themselves: indeed, the only modification necessary to enjoy sensibly more power from the engine is to substitute a larger carburettor.

The engine of the 128 is more than a set of vital statistics might suggest. Because the stroke is so short the crank throws have enormous overlap, so the crankshaft can be made long (necessary because of the big bores) without any fears of flexure. It might cost a bit more that way because material costs are higher—but more is saved by casting everything and forging nothing. Well, not quite nothing, for boltheads will presumably have been produced by upsetting which is technically a forging technique; but virtually everything else is cast, including the connecting rods. I have already explained how the stresses in these have been kept small by minimising accelerations; but I had misgivings about the idea for a long time, feeling that it might be necessary to make a cast conrod substantially bigger and heavier than a forged one in order that it might display the same strength. These fears were dispelled by the great Lampredi himself, who has been engines chief at Fiat since he left Ferrari many years ago. He pointed out that forged conrods are not only more likely to contain flaws, but also they are dimensionally less consistent than castings—especially in a really long production run during which the forging dies become worn away so that the rods get bigger and bigger. Engineer Cordiano pressed the matter further by pointing out that the consistent repeatable accuracy of casting allowed them to dispense with the heavy balancing lug which has to be incorporated in a forged rod (where forged rods vary greatly in weight, a little of this superfluous lug can be ground away so as to bring the weight down to standard).

It seems that with Fiat, as with the Americans, really precise iron foundry work has become part of the stock in trade. We saw this beginning with the 124 engine which, by European standards, is notably thin in the walls. The walls of the 128 block are no thinner, but the complete engine weighs only 235 lb (without transmission) which is half a hundredweight less than a Cortina engine, say. On the other hand it is no lighter than the bigger engine of the Renault 16 which makes extensive use of beautifully die-cast light alloys; and Fiat did experiment with alloy blocks before concluding that iron was much better and more reliable for really large production runs.

All things considered the 128 layout is very neat, and the only slightly untidy feature is that the water pump is at one end of the block and the thermostat at the other. This is because of the layout of the cooling system and involves no particular hazard. More interesting is that Fiat have applied to the 128 one of the minor lessons learned in the Dino, giving it an electric fan for the radiator, thermostatically controlled to work only when necessary. Aircraft techniques apart, there is no better system, though the old-fashioned engine-driven fan is basically cheaper. It is cheaper at any rate if the fan is driven off the end of the engine; but in a transverse installation this means that the radiator has to be set side-saddle, discharging into a wheel arch as in the Mini. This is not a particularly good place for it—amongst other things it causes accelerated wear of tyres and brake linings on that side due to the heat they suffer—and Fiat have preferred to keep the radiator in front of the engine in the conventional position. To combine this location with an engine-driven fan would demand some monstrous three-dimensional belt drive such as disfigures the Peugeot 204, and all the extra pulleys and belting must make an eloquent argument for the electric fan.

This insistence on doing the job properly, rather than the acceptance of the first rudimentary idea that comes along, shows up in the transmission of the Fiat. Indeed, it is more typical of their straight uncluttered conceptual thinking than perhaps anything else in the car. Front-wheel-drive transmission with a transverse engine ought to be easy: the crank is turning in the same plane as the driven wheels, after all. But look at what happens in most specimens. The gears mesh in the sump oil and there are far too many of them, wantonly wasting power and corrupting the oil. This would not do for Fiat: the gears had to have their own private supply of lubricant with no compromise for engine oil requirements, and the power lost in transmission had to be minimised. As a general rule one loses about 2percent in friction through every pair of meshing gears transmitting power, which is why bhp at the flywheel can sound so much more impressive than when measured at the road wheels. There is no front drive transmission more simple than that of the 128. The gearbox is stuck on the end of the crankcase because the Macpherson strut suspension leaves enough room for it. The box itself is all-indirect, so the step down from the line of the crankshaft can be made also the step down in the speed of any chosen ratio merely by sacrificing direct drive in top gear. A gear wheel on the end of the driven shaft meshes with another bolted to the differential and that is the lot—only two meshing points between clutch and differential.

A multitude of benefits accrues from this. First there is the sheer obvious economy: at least 5l of the engine's 55bhp gets to the tyres, even after deducting something for the losses in the driveshaft universals. Secondly all the synchronisers can be carried on the second shaft of the gearbox, so they are working at lower speeds and will last longer as well as allowing a really fast gearchange—just as a motorcycle gearchange is fast because the gearbox runs at only about half engine speed. There is every encouragement to make the shafts and gears fairly large in diameter so, thirdly, the synchronisers can be huge (some are nearly three inches in diameter) and therefore powerful and long-lasting; and fourthly, the stiffness that results because the shafts are relatively short guarantees a low noise level and freedom from misalignment as wear proceeds. It is perhaps unfortunate that the noise guarantee has been invalidated quite often in the car's youth, occasional gear noise being ascribed to insufficient accuracy in gear generation in the factory, and Fiat are working currently to improve general gearbox reliability.

The list of advantages continues. Accessibility to major assemblies is little less than fantastic, with the clutch and gearbox capable of quick and easy removal. Furthermore, as a sop to the cost accountants, the layout requires fewer expensive bearings than does that of a more conventional transmission. As a gratifying bonus, the quality of the gearchange is superb: this is probably the first front-wheel-drive car to offer a first-class change, a real high-speed lightweight precision butter-slicer.

This makes it all the more a pity that the gear ratios should be what they are, for they spoil the car in many ways. Fiat make a virtue of necessity by proclaiming the wide ratios a boon, and certainly they help to invigorate alpine pass-storming and to produce some impressive-sounding acceleration figures. Compared with top gear, third gives a multiplication of 1.51, second of 2.32, and bottom of 3.72. To be sure, the spread of torque is wide enough

to accommodate these big jumps; but more gears might have been a better answer and Fiat with their experience of five-speed boxes in Dino, 125S and 124C, must know it. In fact they postulated a five-speed gearbox for an alternative pushrod engine that they started when first working on the project, but the ability of the 128 design to attain really high revs encouraged them to pursue it and a four-speed box. For everything except really sporting driving they are probably right, for the engine could certainly survive the treatment that is bound to be given it in consequence of the gear spacing. Because of its spare revving capacity it seems under-geared in top for good acceleration and hill climbing, but although the neutral-conditions top speed can therefore be achieved with some promptness and even approximated in adverse conditions, the car is not limited in top gear by engine revs: even at 100mph there are still another 400rpm between the engine and its safe limit.

IF THERE IS A DISADVANTAGE in this two-shaft transmission it is one pointed out by one Bareham, chief designer of petrol engines for Austin and Morris, in a paper on transverse engine he presented recently to the Institute of Mechanical Engineers:

The application of an automatic transmission in place of a two-shaft mechanical gearbox would present a problem as the conventional epicyclic unit has coaxial input and output shafts. This could be corrected by using a chain in place of the two-pinion primary drive. Indeed BMC used a chain when automating their 1800. This is one only of several alternative solutions currently being studied by Fiat, who expect to have an automatic transmission option available early in 1971.

The transmission still has some delights in store even beyond its final drive gearing. The inboard universal joints are neither Hardy-Spicer nor Birfield-Rzeppa: they are pot joints, such as le Comte de Dion employed in the 1890s. And yet they are not quite such, for they have three lobes instead of the usual two, with advantages in smoothness and constant velocity characteristics that grow more and more obvious as you think about them. This is not an original Fiat idea, having already been employed by Simca among others; and the outboard joints are Rzeppas as is pretty well essential. Between the inner and outer universal joints are more surprises: the left half-shaft is much shorter than the right, so the latter is made much greater in diameter (being tubular) so that they should both have the same torsional stiffness. Both shafts have splined but not sliding joints which can be unclamped to allow removal and replacement of either universal. Mr Bareham had something to say about the differing driveshaft lengths too, maintaining that due to the asymetric differential mounting they would be a bad feature when obtaining maximum steering lock angles. Engineer Cordiano exploded this in a few seconds of paper and pencil work when I showed him Bareham's paper: full steering deflection is 35deg, which may have to be compounded with (not added to) full suspension deflection of 10deg. The resultant total angular deflection is well within the capacity of the joints and so there is really no problem at all. Bearing in mind the length of the wheelbase the turning circle is not at all bad for a front drive car at 33ft 10in.

Transmission refinement does not stop even here. In a sense the hubs, wheels and tyres all play parts in making the car run smoothly, but it is equally fair to treat them as suspension items. The tyres are radials, 145 by 13 Michelin ZX or Pirelli Cinturato CN54. Both these have steel-cord breakers, specified because the double duty of the front tyres in an fwd car can create a wear problem. Michelin were quite happy, of course, but Pirelli had to make a special tyre for the car: not to be confused with the fabric-belted CN53 although they look identical, with the latest opened-up tread pattern which is so much better in the wet (and especially in braking) than the now hoary old Cinturato 367. Other tyres are to follow as options in due course, and Ceat are already beginning to be seen in small numbers. Whatever they are, the 4.5in rims they sit on must run true, so the wheels are not located by their studs but by their centres, which are a close fit over machined hub bosses. The studs and nuts merely hold the things in place, doing little or nothing to affect their concentricity—in which case they ought to be flat-faced and not the conventional conical seated variety which Fiat have retained apparently as a concession to store-keeping.

Almost as intriguing as the motive package, the suspension of the 128 is full of niceties and refinement. Struts at front and rear make good sense in many ways, not the least of which is the amount of space they liberate for other uses. At the front the Macphersons are girt about with coiled springs and have dampers within them, which is normal enough; but all the stiction and binding which commonly affect the type are eliminated by copious applications of ptfe and sundry other polymers of assorted resiliences. And big Vulkalan rubber bushes in the lower links (which form part of a virtual bottom wishbone, consorted by the anti-roll torsion bar) allow the longitudinal compliance that is usually desirable when radials are worn and are largely responsible for the isolation of road noise. Another thing to remark in the front suspension is the geometry: the steering axis, defined by the top swivel of the strut and by the lower ball joint on the hub carrier, is inclined so as to give virtually centre-point steering—that is, the axis when produced passes more or less through the centre of the tyre contact area. This is tremendously important in eliminating kick-back through the fully reversible rack-and-pinion steering and in eliminating the spurious steering effects so common in front-wheel-drive cars when the accelerator is moved while cornering. The object of the design was to achieve more or less constant self-aligning torque except in the most extreme circumstances, and the consistency of the 128's behaviour is largely explained by this geometrical solution—shared with Renault's 12.

At the rear a similar tale may be told of struts and bottom wishbones, but there you will see no coils, just a wide two-leaf spring anchored to the wishbones and to nothing else. This is clever: the spring acts as an anti-roll bar, the whole length of it from clamp to clamp does useful work, restrained only partially by the trunnions, and the movement of the centre section of the spring as the wheels go respectively down and up is translated by a simple linkage into a load-sensing control of the pressure-limiting valve for the rear brakes. If the car merely rolls the centre of the spring constitutes a node and therefore does not move, having no effect on the braking distribution.

Cordiano insisted that they had not had to prejudice the ride in arriving at suitable rear spring rates to deal with load variation, presumably because unsprung weight is very low, 50lb at the rear and 55 at the front. Nevertheless, when braking hard, forward weight transfer can introduce some difficulties which are typical of front-drive cars, and the panic mitigator in the hydraulics makes a vital contribution to safety, as it has in the majority of Fiats since the 124. It is rare for the rear brakes to lock prematurely: they are drums from the 850, whereas the discs at the front come from the 850 coupé, and I am bound to wonder whether they are good enough. Indeed I am inclined to think that this would be as good an occasion as any to direct your attention now to our road test over the page, where you may find out . . . ●

GIANT TEST

Basically, there are two approaches to producing a vehicle so outstanding that it can become CAR of the Year. One is to design something that is totally new, truly revolutionary in concept a car which extends the frontiers of automotive technology. The other approach is to stay within the realms of established practice, but to improve and develop each facet of design, major and minor alike, so that the final result is a car standing head and shoulders above its rivals yet superficially of similar specification to them.▶

www.FlatOut.com.ar

www.Fiat128Delsur.com.ar

▶ CARS of the year have in the past come from both categories. This year's clearly belongs to the latter one and is already bringing deserved rewards to Fiat in the market place. No one should blame a manufacturer for sticking to the beaten track. Pioneering may collect pats on the back but it does not necessarily bring in the orders and sales which, after all, are the object of any motor firm's existence.

So first let's see how the 128 stands up on a price basis. Because we Giant Tested a four-door version it is this one that we have chosen for comparison against other European four-door 1100s. The Fiat costs £861 in Britain and that figure, obviously, includes shipping costs and import duty. Well, British Leyland's 1100 is £69 less at £792; or a mere £43 less at £818 when equipped with the 1300 engine to give a fairer basis of comparison, on performance at least, with the Fiat. The lowest-priced four-door Escort is £736, or £778 in de luxe form. Again, the 1300 comes closer to the Fiat and, at £838, is £23 less. Vauxhall's Viva undercuts by £69 and the Hillman Avenger is £811. Among the imports, the Renault 10 is a useful £85 lower at £776 and the cheapest comparable Simca 1100 is £12 under at £849.

On a price basis, then, the Fiat has most though not all of its immediate rivals beaten by a large margin after one has deducted the 15percent import duty imposed by Great Britain on cars coming in from European Economic Community countries. And many of its Continental competitors are beginning to look somewhat long in the tooth. The Renault 10, for example, may find its days numbered once production of the much more expensive 12 gets into full swing.

So the Fiat impresses enormously on a value for money basis. It is equally excellent in performance, a characteristic that it shares with the more outstanding of Fiat's other introductions in recent years. The 124, for instance, is nominally a 1200 yet it has the legs of just about any other 1200 saloon in the business and should be compared more closely with the run-of-the-mill 1500/1600. Similarly the 1.6litre 125 goes as though it had getting on for 2000cc beneath the bonnet. And now comes the 128 which, almost predictably, makes a mockery of established concepts of performance for an 1100.

This is done, as we have seen, not by breaking fresh technological ground of any note but by skilful, painstaking development of the conventional.

It was basically the same initial approach that enabled the Fiat 1100, the 128's immediate predecessor, to remain in production for so long.

STYLE AND ENGINEERING

When the 128 was announced nearly a year ago its reception was something less than overwhelming in Britain for the simple reason that it all but coincided with the introduction of the Maxi. Naturally, the British Leyland car and its attendant publicity tended to swamp anything else new to the motoring world at that time. And added to this must be the fact that the Fiat fanfare in Britain was further muted by the knowledge that it would be a while before the 128 could go on sale here. In fact, the first right-hand-drive examples are due to reach dealers in quantity by the end of this month.

The engineering side of the 128 is covered exhaustively elsewhere in this issue by Learned Setright so we'll omit it from this test except in so far as it actually has a bearing on the car's behaviour in everyday use.

Styling, though, is another matter. Fiat's people, under the direction of Boano, have come up with a shape for the shell that unmistakably echoes the family line laid down with the 124, enlarged with the 125 and carried on into the 130. The appearance is attractive, yet almost anonymous, and gives little clue to the whereabouts of the engine/transmission package. The windscreen and side windows are deep, giving plenty of glass area, and the smooth lines are broken by remarkably few projections. Most of the lights are neatly faired in, the front grille is a simple matt mesh and the flanks are marked only by a single 'sculptured' ridge at waist level that serves to stiffen the panels. The door handles are notably non-protrusive, yet are still large and robust enough to present no difficulties even to the meatiest of hands.

Overall, the 128's appearance emphasises the thorough-going competence that is the hallmark of the entire car.

USE OF SPACE

On strictly utilitarian grounds the 128 could become a recipient of criticism here. It clearly isn't making the best possible use of space, having turned the engine sideways and shoved it out ahead of the front wheels. The answer, as Peugeot and Simca have realised for themselves and other transverse-engine gospellers have found out the hard way, is that the majority of motorists do not want an unbalanced looking car. They will accept brevity of bonnet down at the bottom of the

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price scale but for anything over 1000cc or so the engine compartment must have reasonable length, or at least appear to have.

Having accepted this requirement Fiat has gone on to utilise the excess room under the bonnet by moving the spare wheel up there from the boot. It also means that the battery, the air cleaner and the voluminous heater and fan can all be contained therein and still leave plenty of room for maintenance access.

Keeping the spare wheel and battery out of the boot means that every cubic inch can be used for luggage. Just how many of these cubic inches there are comes as something of a surprise since the compartment doesn't look all that big from outside. The explanation lies primarily in the rear suspension, which is of a notably space-saving design, while the low-slung position of the fuel tank also helps. In practice the luggage capacity is on a par with that of many a 1300 saloon and even matches some 1600 and 2000 models. Its only drawback is that cases have to be humped over an unusually high sill.

Despite styling that makes it look both higher and shorter than is actually the case, the 128 is pretty typical of current 1100s where overall dimensions are concerned. So it has been something of an achievement to provide very nearly as much space in the passenger compartment as exists in the 124. Unavoidably, internal width is less—three inches less than in a 124, to be exact—but the car is still a comfortable four-seater and can manage a third adult in the rear seat at the cost of some cramping. Headroom is maintained fore and aft by the high, flat roof line. Rear legroom is better than in almost any other 1100, due in part to fairly thin squabs to the front seats.

From an ergonomic standpoint the arrangements are much more acceptable to British drivers than in some Italian cars. Fiat, it seems, is adopting human dummies for dimensioning purposes that more accurately reflect European average physical proportions rather than those of Italian man alone.

There isn't the same obsession with making every spare cubic inch into a cubby hole for something or other that exists in some smaller cars. The 128 pays too much attention to the svelte appearance of the interior trim for that. There are, however, shallowish shelves beneath the facia.

COMFORT AND SAFETY

Soft springing and mild damping provide a truly excellent ride for so small a car, swallowing up all but the very worst potholes and bumps with aplomb. Body roll is kept within highly acceptable limits by a stout torsion bar at the front and by the rear transverse leaf spring's resistance to deformation at two points simultaneously. Early cars suffered from rather pronounced nose-dive under braking and although this characteristic has been reduced it has not been eliminated. Perhaps this is a wise move, for 100percent effective anti-dive suspension robs the driver of much important 'feel' under braking.

With the partial cure of nose-dive has come a reduction in the general tendency to pitch, particularly over an elongated series of bumps. This has now disappeared almost entirely. Taken all round the 128 ranks even above Peugeot's 204 as one of the best riding of all small-to-medium saloons.

It is also one of the quietest, if not *the* quietest. The designers have succeeded in producing an impressively silent engine, thanks partially to the flexible belt drive to the camshaft and to a remote, thermostatic cooling fan. And, because the power passes through so (relatively) few gears on its way to the wheels, there is negligible transmission noise. There was, admittedly, a faint whine but this declined to a barely detectable whistle and finally disappeared almost altogether as our test progressed and the car neared that optimum point where running-in has finished and running-out is still to begin. One sound that persisted throughout was a highly audible rustle of tappets.

We said that the engine is near-silent and this is so—during normal use. But remember that it has a practical limit of 6000rpm and can happily be run another 1000rpm and more beyond that. Over the final third of the speed range it begins to make its presence heard in no uncertain fashion, with a hum that builds into a hard, loud snarl as peak revs are approached. Unless driving extremely hard it is a noise that will seldom be encountered and when it is its note—redolent of efficient machinery at full stretch—will not come as an unwelcome sound. Wind and road noise, especially the latter, are both quite low.

The seats both front and rear are fairly firm which, as we have observed before, makes for a much more comfortable ride in the long run than yielding squashiness. At the rear the ends of the seat back are curved around to give a modicum of lateral support to the occupants. The squabs of the front seats provide a much higher degree of sideways location against cornering forces and there is useful lumbar support. They also have a very clever system of adjustment: a knob projecting beyond the base of the cushion in front is lifted to recline the back quickly and in large increments; fine adjustment is then obtained by turning the knob to operate a screw mechanism.

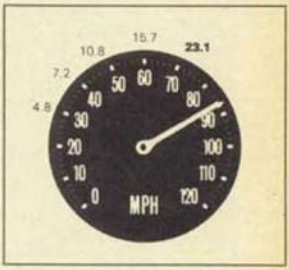
All four doors carry armrests. The steering wheel, with two downward-slanted spokes and a shiny, none-too-grippy surface, is angled nicely between the equally reprehensible extremes of the near vertical and the buslike near horizontal. With so much backrest adjustment and plenty of longitudinal travel available from the seat most people can locate a satisfactory driving position. They will find themselves sitting rather high in what is fast becoming a Fiat mannerism with fine all-round visibility. The pedals and wheel are offset by a slight, barely noticeable amount and the accelerator is just too high to encourage heel and toeing.

Individual interior lamps are fitted to either door pillar. The facia is fully up to American Federal safety requirements with crushable surfaces and copious padding, although the little panel of imitation veneer ▶

FIAT 128

PRICES At £861 for the 4door model, as tested, the 128 is much closer in price to the 124, the next Fiat up in size, than to the 850, the next one down. There is only £64 in it with the 124, against £212 for the 850. The 128 also comes as a 2door at £818, and there is an estate version

ACCELERATION from standstill in seconds



FUEL SPEEDS IN GEARS

27 mpg overall

★★★

33mpg driven carefully

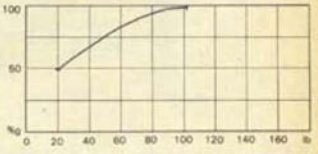
210–270 miles range

8.25gallons capacity

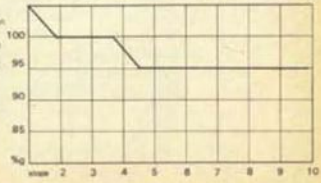
HANDLING Understeer all the way on Cinturatos, with very high cornering power and gentle breakaway. Less trailing throttle-induced oversteer than most rival front-wheel-drive designs. Steering light, accurate but lacking in feel. Wet weather handling basically similar, but rear end has comparatively less grip. Still a very stable car

LUGGAGE CAPACITY cubic feet

BRAKES RESPONSE in normal use. Deceleration (percent g) vs pedal load (lb)



FADE peak deceleration achieved in 10 crash stops from 60mph at one minute intervals



DIMENSIONS	inches
wheelbase	98.85
front track	51.2
rear track	51.4
length	151.8
width	62.5
height	55.55
ground clearance	6.3
front headroom	35
front legroom	44
rear headroom	35
rear legroom	29

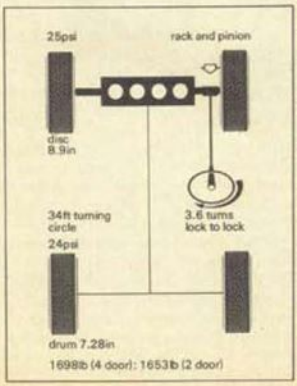
ENGINE	
material	iron/alloy
bearings	5
cooling	water
valve gear	single ohc
carburettor	1 Weber 32 ICEV
capacity cc	1116
bore mm	80
stroke mm	55.5
compression to 1	8.8
net power bhp	55
rpm	6000
net torque lb ft	57.1
rpm	3400

TRANSMISSION	
control	floor lever
synchromesh	1-2-3-4
ratios to 1 1	3.58
2	2.23
3	1.45
4	1.00
final drive ratio	4.11
tyre size	5.20
rim size	13

SUSPENSION	
front	Macpherson strut, coil spring, telescopic damper, anti-roll bar
rear	strut type by lower wishbone, telescopic damper and transverse leaf spring

LUBRICANT	
engine oil type	20/40
sump pints	7½
change period	6000
other lube points	
lube intervals	

NB: transmission oil change every 1800 miles



facing the passenger may not comply. Switches are kept to a bare minimum (Fiat, in common with many other Continental manufacturers, has never shared the British enthusiasm for a plethora of minor controls) and are of the safety rocker type. One is a master switch for the lights and the other brings on the facia illumination. Both are marked with clear symbols. A total of three stalks on the steering column handle lights, winkers and wipers respectively. The wipers offer a choice of a single speed, and none too high a one at that, or intermittent operation with single sweeps coming automatically at five-second intervals. For rhd cars a proper conversion is made with the blade pivots moved over to the offside, leaving unswept only a small vertical section of screen near the pillar. Like the heater blower, the silent wipers will continue after the ignition has been switched off. The washers are operated by an ineffectual rubber button at the foot of the dash panel. In the middle of the facia, and clearly symbolised, are the pull-out knobs for the choke and hand throttle . . . that's right: hand throttle. It only works over the first stage of accelerator movement and might be useful for warming up, or even for motorway cruising if you were sure of being able to close it the instant a hazard loomed up. Since one's instinctive reactions in an emergency do not include reaching down for a hand throttle we think this is best left alone.

Instrumentation is confined to the bare minimum required by the majority of motorists—speedometer (with non-trip odometer), fuel level and water temperature gauges. The speedo is a straightforward circular dial with white numerals on a black ground. Maximum gear speeds at 6000rpm are marked with red dots. The other two instruments are contained in a matching bezel and both dials are cowled to prevent reflections in the windscreen. A generous selection of warning lights covers winkers, main beam, sidelights (rather too bright, these two), oil pressure, ignition and low fuel level. Each circuit has its own fuse, mounted in a long panel in the right-hand facia shelf. The dipping rearview mirror is of the knock-out safety type; ours gave a double image.

Heating and ventilation have commendably simple controls. Two levers look after temperature and air intake flow respectively. A flap directs air either out at floor level or up to large vaned nozzles above the facia. These in turn can be rotated to guide air on to the windscreen or back at face level. Stale air exits through extractors beneath the rear window. The whole system is readily grasped without reference to the instruction manual —which is more than can be said for a lot of Fiat's rivals in this respect—and gives rapid, progressive temperature control with efficient air blending. The heater blower switch is not master-controlled by the ignition.

For ventilation alone there are eyeball-outlets at either end of the facia delivering cold air. And this is one new car in which the designers haven't been afraid to stick to good old-fashioned opening quarterlights. There's nothing like them for ventilation at city traffic speeds, or for scooping in cooling gales of air on a scorching day. On the 128 they are secured by little triggers built into the curve of the catches.

Interior trim is neat, simple and unexciting. Moulded rubber mats are fitted in both front and rear compartments. The seats and most other areas are trimmed in plastic of mattish finish, and there is a perforated plastic headlining.

Turning to matters of structural safety, the 128 is up to date with current European trends. As is now virtually standard practice in automotive design—at least on the level practised by Fiat—the ends of the body shell are made comparatively soft to absorb impact. The passenger compartment itself has the further protection of what is in effect a perimeter frame formed by the sills and by box sections around the engine bay.

The steering wheel is designed to collapse under impact, though it is not dished at all and in fact the horn button—in the form of a Fiat badge—actually projects. The column will also telescope in a crash and the facia, as we have seen, is to US Federal standards. Taken all round the 128 is at worst level with, and in most cases ahead of, the competition on the safety front. As a final touch, Fiat has put a third set of belt mounts in the back.

PERFORMANCE, HANDLING, BRAKES

With such a sporting specification—notably the short stroke and big bore that permit large-diameter valves—the 128 engine is an exceptionally deep breather. So it can be run well over the peak of the power curve at 6000rpm and for performance measuring purposes there is some point in doing this.

Hanging on to the intermediates up to 7000rpm is accepted, if not exactly officially recommended, by Fiat as being necessary to get the full potential out of the 128. And the results, as you can see from the accompanying table, are remarkable for an 1100. In fact for one that is just at the start of its development life they're downright extraordinary. Up to around 60mph the 128 can hold most 1600s and only thereafter do power to weight and frontal area ratios begin to restrain it.

Similarly, the gear speeds are astronomical for anyone mechanically cruel enough just to keep on right up to the valve bounce point. Fiat has marked the speedo with red dots equating to 6000rpm in the intermediates. They equate to 29mph in first, 41 in second and 70 in third. Our own figures were obtained using 7000rpm.

What all this means in practical terms is that the Fiat has a dual personality. It can be a quiet, refined small car with a flexible, smooth-running engine; or it can be a real boy-racer's delight with (momentarily) wheel-spinning starts, brilliant acceleration and a loud, hard-snarling power unit.

As to maximum speed, Fiat exemplifies the refreshing trend among European makers to numerical honesty and only lays claim to 84mph. The car we tested, clearly one in which all the manufacturing tolerances erred on the right side, easily surpassed this and

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Instruments: 1 Speedo 2 Fuel 3 Battery 4 Rev counter. **Warnings:** 5 Winkers 6 Oil pressure 7 Water temperature 8 Ignition 9 Fuel level 10 Lights **Controls:** 11 Handbrake 12 Heating/ventilation 13 Headlights 14 Ignition 15 Bonnet catch 16 Windscreen washers 17 Choke 18 Winkers 19 Wipers 20 Heater blower 21 Lights 22 Starter (where separate from ignition) 23 Horn 24 Face level vent **Item:** Cigarette lighter.

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eventually crept up to a mean velocity some 3mph higher.

The fact that it proved very nearly as fast in third emphasises the rather odd collection of gear ratios. They are widely spaced and top is distinctly on the low side at less than 1 to 1, but the engine's broad spread of torque combined with the ability to rev serves to mask any deficiencies here. As it is, a higher fourth gear or better still a fifth ratio would have given quieter, more economical rapid cruising without upsetting the acceleration since this is amply looked after by third.

The gearchange itself, with a long, thickish lever sticking straight up out of the floor, is good as transverse transmissions go, though only medium judged by overall standards. Even Fiat has yet to put the lightness and precision of the best 'conventional' setups into a sideways-sited gearbox. In the 128 the lever is strongly spring-loaded towards third and fourth, and can baulk going into first.

If the intricacies of a really efficient gear linkage in this location have still to be mastered in Turin, the problems of front wheel drive have been solved with apparent ease. Sheer cornering power is very high indeed, provided one sticks to the basic fwd technique of using plenty of throttle all the way round. Understeer is, predictably, the dominating characteristic of handling—right up to the limit on a dry road, when the front eventually ploughs gently out. The test car came on Pirelli Cinturatos which proved happy to run at remarkable slip angles before losing all grip on the situation. To overcome the understeer the trick is to throw the car hard into the corner on the approach, keeping the throttle right down the while, and catch and control it entirely on the steering. The lift off/tail out syndrome so well known to Mini-istes hardly applies to the 128; backing off in a corner brings the attitude closer to neutrality but never actually provokes the tail far enough out to be of any use.

So that is how the 128 behaves *in extremis*. For more normal driving, it remains a car with the reassuring stability of front wheel drive and no nasty tricks up its sleeve if you inadvertently do the wrong thing.

At least on the Cinturatos (Michelins are also fitted as original equipment) there are few basic differences in the wet. The understeer, barely noticeable in the dry unless you are trying hard, becomes more pronounced, of course. And the tail unsticks relatively earlier in the process. But, again, it is hard to see how the Fiat's handling could bring anyone to grief.

The steering, on the other hand, is not such a strong point. Ours was light and accurate enough, and reasonably high geared. But it felt disappointingly dead, especially for a rack and pinion system. This complete lack of sensitivity does damp out all road reaction at the rim but we would willingly sacrifice some of that to get more feel of the road.

An early 128 we tried last summer had no self-centring. There is some now, though not very much. On the brighter side, the steering is happily free of varying heaviness and/or artificially induced castor related to the amount of power being fed through the front tyres. But taken *in toto* its steering is not the 128's high spot.

The brakes—disc front and drum rear—have improved since the first cars and are now quite light, progressive and, in conjunction with the adhesive qualities of the Cinturato, reasonably efficient.

IN CONCLUSION

The 128, as we observed at the beginning of this Test, breaks no ground of any note in automotive design. But everything that it does it does well and a lot of it is actually brilliant. It is far and away the best 1100 saloon yet to come from any manufacturer, matching the competition point for point and outstripping most of it at every turn.

Fiat has over the last few years been developing an extraordinary facility for making saloons that behave quite out of character. The 125 and 124 both perform as if they had 25percent more cubic capacity than is the case. The 128 follows in their footsteps; offering most (though not quite all) the attractions of a 1300/1500 yet still with an 1100-sized price tag. ●

HOW TWO AUSTRALIAN ABORIGINALS, A WOOLF AND A DOG, WENT TO TURIN IN A BEAUTIFUL PEA BLUE FIAT. THEY TOOK A TAPE RECORDER AND WHAT IS KNOWN AS A HEALTHY CURIOSITY WRAPPED UP IN A 5 MILLION LIRA NOTE . . .

TUESDAY 13 JANUARY

ITEM ONE IN CAR OPERATION, MOTORING MASOCHISTS TAKE TIN BOX TO Turin, is for Howler Woolf and Yap-Yap Barker to fly this evening to Brussels rendezvous with Big Ed Blain. Last-minute instruction bids us keep an eye open at LAP for female Blain cousin. Henrietta (we like that) will be modelling a mid-length green overcoat; so armed with protective Campari soda we appraise the talent with a sort of love-hate excitement.

Heavens! Not *her*, says Woolf. Her buys modest cup of coffee, and is soon pretending not to look at us looking at her but pretending not to.

Suddenly Barker spies another candidate, much more promising. His glasses begin to mist up; when they clear he has already leapt up and started making in her direction, which rapidly changes as she strides away with stunning self-assurance—straight thro' the Customs barrier the wrong way. Then, just as flight is called, we see coming through the barrier mid-length coat it would be very nice to go to Turin with; she has an unmistakably Blain face and looks completely human, and when we say *Emma Chisett*? she understands perfectly.

Your Captain tells us reassuring things we've heard so often before, just to let us know he's not yet a computer although maybe they've got him taped? Thinks: why don't BR do it. *Evenin' Lidies and Gents, this is your trine driver Alf Bloggs speakin to you from Diesel loco No 49683. We are jus passinover Watford Junction and 'eading norf at zero orltitude, proximitly ityfree moilsprar. Spec torive Beerminam Central 17 minutes after ETA . . .*

Taxi to Hotel Albert I, message from Blain to say he'll be with us for big eats at 9.30, time for a wash down and brush up. At 9.35 Blain takes revolving doors with a trace of over-correction at exit and the auguries are good (why *do* they call him the late Mr Blain?). Miniature Italian rocket called Massimo Colombo, who should have joined us, is diverted into a different orbit but will call to refuel around 11.30. Messrs Blain and Woolf know a fish plaice and we all like fish. The gastro-gnomes take off *à pied*, noses sensitive to good nosh as pigs after Périgord truffles. Steady Barker and Miss Strine lose faith after half a mile and countless right-angle bends, but suddenly strong pong of Ostend fills the night air . . .

WEDNESDAY 14 JANUARY

HENRIETTA GOOD DINNER, SHE said. Back well after midnight so must apologise later this morning to Italian rocket. We wanted to leave for Turin around 9–9.30 but there's nothing to leave in. Blain will work, Henrietta will shop gaze, Woolf and Barker will hunt the 128. 'It's at Waterloo,' says Woolf. 'Which platform?' says Barker. Well, how was he to know? It's the original Waterloo, see, about 25 km out, so we hop into a Toyota taxi and zoom out to Waterloo like a pair of Wellingtons. The Toyota is quiet and smooth but has the Japanese Roll, very sexy. Woolf unresponsive. Mr Napoleon is out, they say, and the 128 is not at Waterloo. It is at Brussels. It is at the Motor Show. (Actually it wasn't there either, but how are we to know?) It has been brought specially from Turin, has studded snow tyres (no snow in sight) and insufficient paperwork. Would we like a coffee?

If it isn't actually Jacky Ickx who drives us back to Brussels Centrum in a Fiat 124S it is someone who knows the circuit and the ropes. View out of back window is best for the nerves. The someone, says pseudo-Ickx, who has to sign our papers is at the Show and not one to be kept waiting. Like us. At the Show they ask would we like a coffee? Anyhow, there is time to go and say sorry to Italian rocket on Pininfarina stand. We chorus hello to him in Italian (hello) and are just about to say sorry (sorry, we don't know the Italian for that either) when he says it first, because he couldn't make it last night. So we just murmur about only missing one course of our dinner to get back by 11.30 and sitting up not more than two or three hours waiting for him. This makes him say sorry again. Bastards!

It's now 12.30—have tin box, will travel. It's a vivid, groovy blue. Back to the Albert where Blain and cousin are taking coffee and sandwiches. Would we like a coffee?

No, we mustn't say tin box any more. After all, if jury and gentle readers hadn't picked Italian car *and* a four-seater we wouldn't be here all packed in complete with luggage and still room to fidget, setting off towards Turin four hours later than intended. Even with over two yards of Blain kinked into a civilised driving position there's just room for knees behind him. After establishing this, though, and being a civilised sort of chap, he does slide the seat forward a notch. Agreed, no time for lunch.

We are not happy about the studded snow-shoes. Looks like there'll be no snow at least until within spitting distance of the St Bernard Tunnel, and we're concerned about noise and stability and what speed we can hold on German autobahnen. But only the outer tread pattern is studded, and the studs have been ground short by the journey from Turin, so it may be okay after all.

Easiest route out of Brussels is west, to Ostend—no good for Turin. One can go south towards France and Reims, but the quickest way is the longest—east to Liège, start autobahning at Aachen, follow the groove NNE to Cologne, then south past Frankfurt, Karlsruhe and Freiburg to Basle in Switzerland. Then over to the St Bernard, tunnel through to Italy and descend via Aosta.

Brussels to Liège (to the phlegmish English) or Luik (to the Flemish Belgians) is one of Europe's most hazardous roads and has been so for years. Always crammed with trucks, and particularly at high-pressure commuting times, middle lane is frantic with kamikaze desperados daring opposition at Last to Give Way. Blain is at the wheel, and his passengers are reassured to find him strictly non-competitive; nothing contributes more to passengers' equanimity than discovering companions have similar driving habits and reactions (thinks—hope others share this view about oneself).

Relieved that tyres, which hum rather loudly at town speeds, are not too noisy on the open road and scarcely affect car's directional stability and handling. Resolve to forget all about them. Bearing in mind how a full complement of passengers plus luggage can cause a rear-drive conventional to swing about with delayed response to the helm, we marvel at modern fwd small car which maintains decorum when trimmed stern down. New fashion for Manx tail with minimal overhang is obviously Very Good Thing from this viewpoint.

No radio on board, but we do have tape recorder with, it happens, a cassette of conversazione with motoring pop star Sir Alec Issigonis. Serious content is liberally spiced with hilarious anecdote, which keeps us in fits. We suddenly realise he is a born comic on the Bob Hope/Tony Hancock level, having gifts of timing for effect even in private conversation, and *ad lib* entertaining self-expression plus a mellifluous voice to put it over. Even the Fiat-orientated Woolf enjoys this, and it makes a break in the expressed thoughts of Chairman Dante Giacosa.

LUNCH AT 80MPH IS BOILED sweets and assorted chocolate bought at a German filling station: we are putting over 60 miles into most hours, including fuel stops, and in one 3hour 10min stint cover 213 miles—67.5mph. This is mostly (by now) in darkness and much of it in fog of varying density. Many German cars and trucks now carry an extra, very powerful rear lamp presumably sharing the fog lamp circuit; we wait for some fearless Teuton in a well-illuminated Mercedes dreadnought to flash by, then tuck in at a discreet distance and simply follow his guiding light at 70–75mph with ample space for an emergency stop. Meanwhile fuel is disappearing at almost exactly a gallon per 30 miles—very little per head, considering.

Darkness brings to light, so to speak, our one embarrassment—the need to stop and adjust headlamps to suit tail-down trim. Alfredo the tame Woolf knows where to find twiddler behind each lamp for this job (for which you need only fingers) and it's soon done. But it would be nice to have those two-way triggers beneath lamp rims featured on most French cars: British lamp manufacturers, please note. This is a real problem, for most

The handsome young man on the right is Fiat's chief stylist, Paolo Boano. The distinguished looking gentleman in the other picture is Dr Dante Giacosa, retiring chief engineer. Giacosa is a contemporary of Issigonis and was actually the first to revive the idea of a transverse engine after the pioneer attempts of prewar years. He has strong views on the function of styling, and Boano's job was simply to make the 128 look like what it is—a compact, practical family saloon that fits into its surroundings in the same way as it fits into people's lives

www.Fiat128delsur.com.ar


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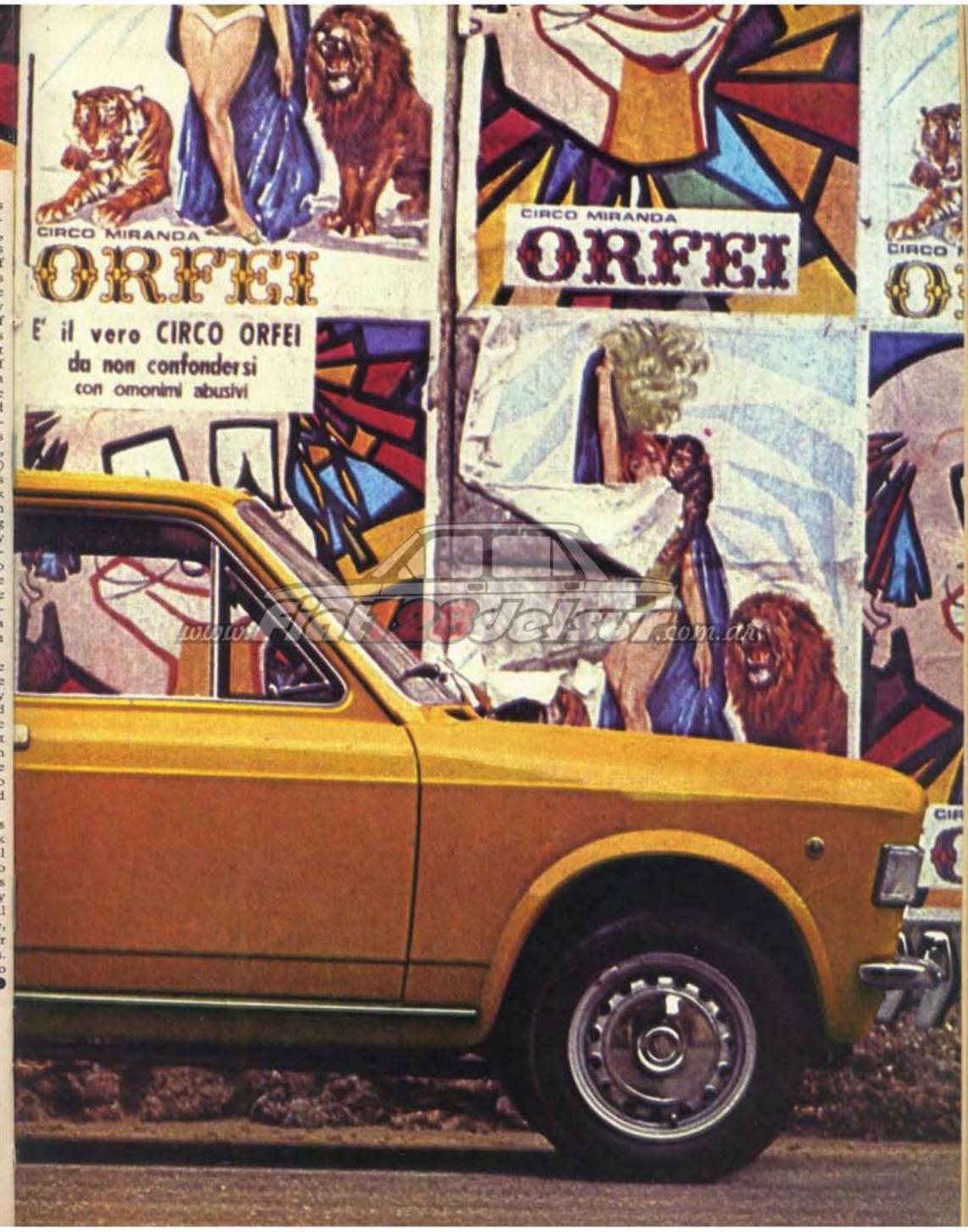
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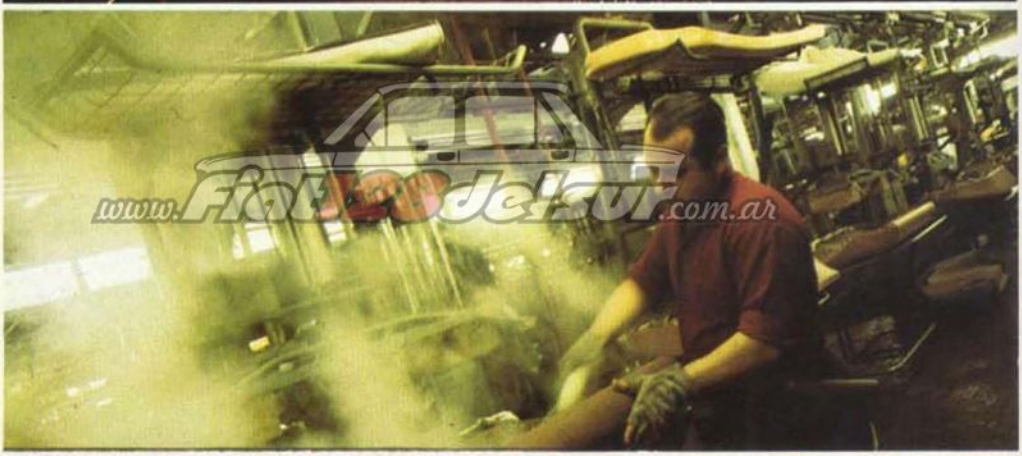

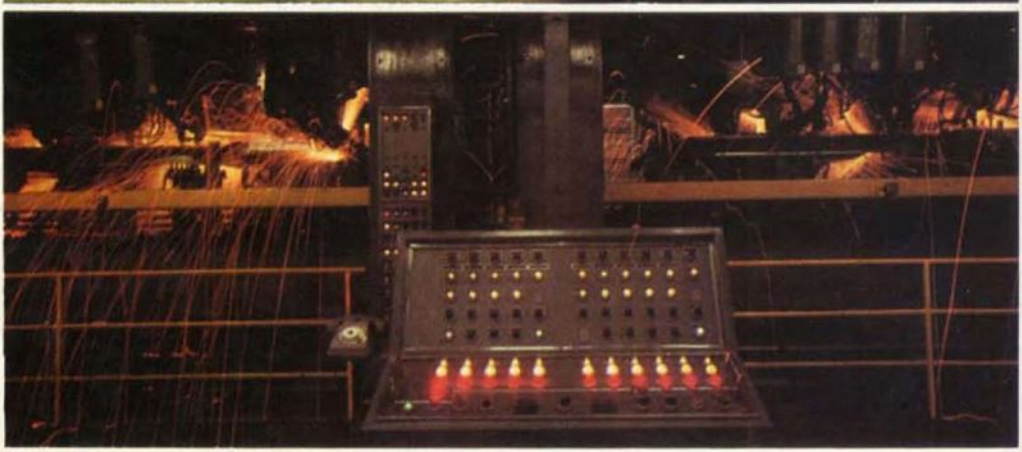

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Only at Volkswagen in Wolfsburg is automation carried further than in Fiat's new car plant at Rivalta, just outside Turin. The lines move swiftly but the pace of life is comparatively slow for the few skilled workers whose job is to assist and supervise rather than to sweat and push and hammer as in older factories. Even the seating and upholstery line incorporates its share of sophistication, while the computer-controlled transfer machines in the main welding bay, pouncing on individual panels like a flock of pterodactyls and bonding them into a single shell, are a marvel of complexity

drivers are unwilling to upset normal lamp settings every time they carry a big load, preferring to put up with reduced vision as well as dazzling other traffic.

Well, yes, we do get a bit fidgety on the back seat after a few hours. The backrest is maybe a little upright for long journeys (whereas the front backrests are adjustable for rape), yet it's much more than adequate and far more habitable than cramped rear perch in certain direct competitors. Perhaps you will say I build sybaritic perfection of Pullman travel into mass-market utilitarian transport? As with any small saloon, though, one chap in the back sitting diagonally can ride for hours without discomfort. At waist level back seat is over 52in across, so there's room enough for three abreast with the advantage of an almost flat floor.

We are to discover later how the 128 is almost free from transmitted road noises on standard tyres, and at most rpm its little 1116cc ohc engine is unobtrusive. At certain points one is aware of slight resonant periods, and it cannot quite match Beetle's low-revving easy gait at Beetle cruising speeds of 70-75. Above this, however, with engine spinning at over 5000rpm (equivalent to 75.5mph) it gets out of range of such disturbances. Final drive gearing is high enough to make over-speeding impossible in top, and Fiat say you can cruise flat-out all day without incurring their displeasure or risking Henry Moore job on crankcase. On return run with more sporting footwear we are to find just what the little motor will take when pressed to limit.

And so to Basle, arriving just after 9pm.

THURSDAY 15 JANUARY

DEPART BASLE 12.05AM, THE DIARY says, and arrive Lausanne 3.10am. No one likes driving in Switzerland, but it's not too bad in the small hours when natives are all half-smothered under those thickly eidered downs. Tame Woolf now at wheel, lupine ferocity damped by the nice things floating around in belly; truly he is a brother who will chauffeur fellows in the small hours after a good meal.

Phone call to Turin next morning tells us we are not expected until 4pm, so we shop for a while, then motor gently round lake (Lucerne, alias Léman) and south towards St Bernard.

Morning is damp and misty, light rain falling; are we really surprised when motor begins to misfire quite badly? The Woolf says no, must be foreign bodies in carburettor, but it *is* a misfire. Stop, open bonnet, and everything looks dry on the outside. Perhaps burst of speed will clear it, for plugs look difficult to reach with narrow space between them and grille made more inaccessible by forward hinged bonnet. Sure enough, after few miles we are back on four full-time.

Coffee is taken in small village, mostly rough hewn timbers secured by pegs, wedges and things, but some buildings have plaster façades and ancient iron balconies. Air is rich with manure and sweeter aroma of newly sawn wood, and only motor van blocking narrow street lifts it out of previous century.

Although they do have snowing and skiing Darn Under, only snow Henrietta has seen in 22 years is dirty slush by roadside in England this winter. Frosted fairy forests bordering *autobahnen* yesterday had entranced her, and now at last we have very light fall to prove how snow really does come *down* from nowhere just like on Christmas cards. But going is very easy, and where there is ice and packed snow our spiked, treaded covers keep us sporting footin.

We are in Italy, hungry again, lose altitude fast in Piedmont, and thinking Aosta would be good for a *colazione*.

Enter the suburbs of Turin about 4pm: coming from land where history began 200 years ago—on 20 April 1770—Henrietta marvels at omnipresent architectural evidence of past glories of Piedmont, great pink palazzos, cathedral and churches, and colonnaded streets where pedestrians stroll safe from motor-cars between perilous intersections. 128's distance recorder has clocked 732 miles since Brussels and total running time of around 17 hours gives overall average better than 45mph including three refuelling stops. Apart from resetting headlamps and misfiring after Lausanne we've had no troubles, and busy little motor has needed no extra oil or water.

Home for next two nights is famous Excelsior Grand Hotel Principe de Piemonte, right in city centre. There are grander and more excelsior hotels elsewhere, but surely none with grander name, and Piemonte's luxury is real, without pomposity or pretension. And it has a darned good restaurant. CAR's ambassador extraordinary has already arrived by air from London, sheltering under Leonard Setright's bowler hat and protected by his armed umbrella. Although a seasoned Piemonte guest he continues to command the startled attention of the staff there, of whom only the older members can recall such sartorial distinctions enveloping inscrutable monolinguists from the heart of the British Empire.

Giorgio Burnous the PR man from Fiat is waiting to welcome us, but no professional duties this evening so arrange to dine informally with him in hotel. Our huge cameras are on the eighth piano, where traffic noises are diffused into regular hum broken now and again by brief passionate screams of Maranello V12 echoing between the colonnades as dolce vita Lothario spurs it between mistresses.

FRIDAY 16 JANUARY

SIGNORINA MARIA RUBIOLO arrives just before 9am, officially as Fiat's Director of Publicity, less formally as friend of almost every pressman who has visited Mirafiore for many years past. It isn't every press chief who greets you with a kiss on each cheek! She is that rare phenomenon, woman heading vital department in vast organisation; formidable in stature and personality, but mercifully still very feminine. As she speaks little English we chatter in sort of *Français cassé*. The signorina in good form, conversation veering to Fiat's activities in Russia where huge factory is rising to build the 124. She tells us about life for Fiat reps out there, and of friendly relationships with Russian emissaries to Turin. Reluctantly, have to cut this short, being already late for first of three sessions with engineering and commercial chiefs. Considering Fiat's automobile activities give employment, directly or indirectly, to some 2,300,000 people, these men shoulder tremendous responsibilities, so good to find them accessible, informal in approach and reasonably uninhibited in responses to our sly questions.

First we meet DR CORDIANO, Chief Project Engineer, who can understand and speak English very adequately without an interpreter. We speak thus:

The justification for conventionality in other people's engineering has always been that cars for production in very high volume at very low cost must be simple. The 128 seems to us to be exactly the opposite. It is full of originality and it incorporates many features that so far have been restricted to lower volume, higher cost competitors. How do you justify this economically?

Our design brief specified a car which must be convenient and comfortable for city traffic. But of course it could not be a proper city car; it had to be a compromise for traffic and for the open road. Therefore the 128 had to have maximum cargo space for passengers and luggage with minimum external dimensions. To achieve this result the best layout, in our considered view, was front wheel drive with a transverse engine. Our problem was to decide whether we could do it without coming up against a cost barrier. Of course if a car is longer it costs more, so that compactness is an advantage. It was for this reason, just as much as for reasons of practicality, that we placed the spare wheel in the front so as to get more space in the luggage boot and to shorten the car. Provided one seeks solutions such as this it is not more expensive to build a car like the 128 than a conventional design. Of course there are many individual features which are more expensive: for instance the cost of constant velocity joints, and of the electric

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fan. But there are simplifications elsewhere which reduce the cost by comparison with the normal car. For instance in a conventional scheme there are many more ballraces in the driveline, and more castings for the clutch housing, gearbox, gearbox extension and final drive housing. Then there is the propellor shaft, which may have to be divided and will need an intermediate support plus the universal couplings. With our simplified transverse engine installation we have only two main castings to house clutch, gearbox and differential.

What about the engine itself? Another thing we are told by more conventional engineers is that an overhead camshaft design always costs more.

We started with this conception of engine because it was important that the car should be able to maintain high cruising speeds without strain or excessive wear. We thought we must have a maximum speed of 140km/h. But how could we achieve it? We had two ways open to us. One was to use a normal engine, probably less expensive than the one we chose, but with five gears so that we could get a high cruising speed and have good acceleration, too. The other way was to have an engine which could run really fast so that a driver in a hurry could take it to very high rpm in the indirects without building up excessive piston speeds. To achieve this objective we chose a short stroke of 55.5mm. In the third year of development we considered building a 'square' engine with equal bore and stroke of 70.8mm. If we had chosen this solution with the gearing we are using now the piston velocity at maximum speed in top would have been up to 2750ft/min, and over 3000 in the lower gears. As for the overhead camshaft, it is definitely more expensive but it gives such advantages that we decided it was better to go for this solution because we were trying to make a car which could last us for many, many years. We felt it should have all the modern features and be capable of tremendous development. It's more expensive because, although the number or pieces is smaller, there are some which are expensive in themselves. For instance we have a long driving belt and it is necessary of course to have a tensioner, which costs a good deal. With one camshaft like this, I should say it costs between three and five percent extra to put it on top than to use pushrods.

Now how do you save money on the body? You've got four big major pressings. Ostensibly this is cheap, but when you have big pressings you have troubles. What governed the decision to have a few big ones rather than a lot of little ones?

It's true that for mass production it's better and cheaper to have large pieces than many small parts. A single large pressing by comparison with a composite of various smaller pieces is always more precise, and there is a saving in labour costs. The frame is stronger and can therefore be made simpler. But to go back to your question about saving money. An important reason why it is cheaper to make the body for a car like ours is that the front wheel drive unit is a single assembly, attached at one end, so that all the major stresses are concentrated there. Our new rear suspension—which is in itself quite cheap to make—attaches to the structure very simply, too, so that we can economise particularly on the floor pan. Not that we want to overdo it. If you try and save too much money you have rigidity problems, because of the lack of a tunnel for example, and the spinal tunnel can be a help when it comes to distribution of accidental shocks through the structure. To compensate for the lack of it we make a sort of perimeter frame of the floor pan, which is something that's not possible with the conventional layout. We make a crossmember under the feet of the front passengers and spread the loads that result from frontal impact to the sill members, which in themselves are a useful barrier against side impact. You will find that, although it has far fewer pressings, the 128 body has almost 50percent more torsional rigidity than an average conventional structure—than a 125, for example. This is all part of our theory that it is possible to make a car that is not only cheaper but better than a conventional one of similar capacity by balancing the extra mechanical costs against savings which accrue elsewhere.

You mentioned the American safety standards. Does this mean that you intend selling the 128 in the States?

We do, but not just yet. We are able to match the present requirements for safety and pollution, and we are working to keep abreast of the more stringent standards laid down for the future. We are also working hard on an automatic transmission, which we think is essential for America and which we believe can be achieved without complication. Naturally we have tried to adapt existing transmissions made by the European specialists, but we are now considering making our own and sharing it perhaps with the 124 and our other small models.

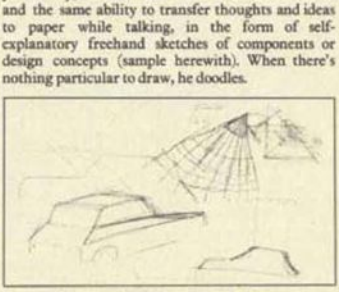
We've been concerned about your attitude to accessibility of mechanical components. The 128 can be criticised on the grounds that accessibility to the front of the engine compartment is hampered by the forward opening bonnet.

Our service people have found that on the 128 the routine operations require 30percent less in time and number of operations than in the 124.

We were talking about changing the plugs, changing the distributor points, that sort of thing.

We are eliminating small detail problems and gradually we will increase the accessibility . . .

Next we see DR DANTE GIACOSA, Director of Engineering. One of the all time greats in his profession, he has been with Fiat since 1926. Having transferred to cars from liquid-cooled aero engines when his design for the original Fiat 500 Mouse was accepted for production in the mid-1930s, he has been responsible for just about every new model since but, having now reached the retiring age of 65, will be shedding his main responsibilities to concentrate on forward thinking in an advisory capacity; it would be unthinkable for Fiat not to continue using his intellect and abilities while he is still willing to offer them. He is reticent, but colours his remarks with an almost whimsical sense of humour. One compares him inevitably with Sir Alec Issigonis; outwardly more academic and with a less forceful personality, he has the same aristocratic charm and the same ability to transfer thoughts and ideas to paper while talking, in the form of self-explanatory freehand sketches of components or design concepts (sample herewith). When there's nothing particular to draw, he doodles.



Giacosa doodle shows 128 rear end as conceived

First he showed us a model of a special five-door derivative of the 128 planned for Yugoslavia.

Was the 128 conceived fundamentally for the Italian market, or in terms of world-wide sales?

The car was conceived a long time ago, almost informally, by my department, not by the commercial organisation of Fiat. When I began to study it I had in mind to make a car which should be the same weight as a Volkswagen Beetle but with four doors, better performance and cheaper production. This was way back in 1954. We made many prototypes, some with rear engine. The reason we finally chose a transverse front one was that it made the car even more compact and allowed us to turn it very simply into a station wagon or to put in a fifth door at the back, which is the way I designed it. The market research people had other ideas, but we're building it like this in Yugoslavia and the idea may spread. To get back to the conception, we also played about with many different kinds of power unit, and at one time our ideas were so advanced that they were too advanced, if you can see what I mean. Then we substituted more traditional solutions until finally with the Primula we made a sort of commercial prototype—a front wheel drive saloon with transverse engine. This was the big test for Fiat, and it was because of the Primula's success that we decided to replace the 1100 model with the 128.

Did Fiat share your idea that the 128 should be a direct challenge to the Beetle?

In the beginning it was our own personal idea. When Fiat decided to make the 128 they didn't think of competition with the Beetle, merely of the necessity to replace an existing model. The wider conception was mine, and I don't think it is fully shared by my fellow directors even now. We are certainly not equipped to make as many 128s as Volkswagen make Beetles—not in the first year, at any rate! Half a million might be a realistic annual target so long as the commercial people still think they are selling an 1100. Remember, though, that Fiat have experience in increasing production very quickly. When we began with the 500 model we planned a maximum of 500 cars a day. Now we make 1500, and we're trying to make 2000.

You say the conception of the 128 was wholly your own. Your personal influence is obviously strong, and yet Fiat is very successful in competition with companies in which individual engineering is very much played down. How does this come about?

I don't know how to answer you. This is even more of a personal thing than you imagine. I think that when a company is organised like Ford or General Motors the consequence is that the models have no character. If Fiat changes the system it will have the same results as at Ford, and my view is that sales will suffer. My detailed opinions on the whole question were expressed in a paper I delivered years ago in London to the Council of Industrial Design—it wasn't a technical paper, it was my own philosophy. I was much younger then than I am now, but my view has not completely changed. Fundamentally I am a believer in individual design, but I feel strongly that companies must adapt to the men they have in positions of responsibility. They must be flexible. If there is a man who is capable of leading the way, then they should give him free range. If not, they should have a formula ready. Whether people are more inclined to buy a car that's the work of one man than the work of a team depends on his ability and on the details of the system. The success of the Volkswagen in the United States is a good example because it has happened on the doorstep of those who deny that ▶

individualism can work; the Beetle was very much the work of one man in its styling as well as in its engineering. I'm not happy when Fiat make cars with styling which is not so personal as it used to be.

It seems from all you've said that the 128 is very much your kind of car and that the 124 is not. Obviously the two models overlap to some extent. Can you tell us why Fiat introduced the 124 at all?

We didn't win our battle, that's all. Obviously an engineer's influence must be tempered by the influence of commercial people. My job, more and more, is to have ideas and to do advanced research. Not all of my theories are shared by the company as a whole, although they are very keen on research. We have a big department and we do a lot of work on alternative power units, for example. The gas turbine is one alternative that still interests us very much, particularly when it concerns trucks. With cars it is much more distant. It depends on materials. We are doing a lot of work, too, on electric cars, but batteries are the problem. And of course we are keeping a close eye on the Wankel engine. There are lots of drawbacks there, but I am less worried about pollution than I used to be.

What about different kinds of car, different concepts altogether? For instance, there's a popular (if crazy) theory that the future lies with very small cars for town and very large ones for the open road?

The theory is my own! I was the one who suggested it, and I still believe that small cars for cities are the answer. One does see a few of them around already, and one or two are made by us here at Fiat . . .

Afterwards, the usually serene Blain countenance suddenly loses its composure as we pull into a filling station with adjacent ristorante called the Roccie Bianche at Orbassano between Mirafiore and the new plant at Rivalta where the 128 is made. Plaintive rumbles from deep in his personal engine room indicate: *Swine! You promised me better than spaghetti and Barbera!* But one must never judge Italian eating places by their façades, and the first glance inside reassures him; he sniffs the spicy air appreciatively and . . .

While these things are digested we're chauffeured to Rivalta, deposited in a soporific see-through Multipla and subjected to the mobile brain-washing hypnosis of mass-production. Almost a relief to note isolated clots in ever-moving system where human beings must exercise individual talents to sort it out.

Our last discussion, with styling chief PAOLO BOANO and commercial man PETALUGA takes place in Fiat's Centro Storico, in Turin, where the whole enterprise was hatched 70 years ago . . .

Can we ask Mr Petaluga at whom the 128 is aimed?

Yes, of course. I'd like to give you a very exact answer because then it would mean that I would know how many to sell and where to sell them! I think that the size of the car itself, the power of the engine and the overall performance indicate that we aim at the middle type of consumer who has accepted the Volkswagen or who is attracted by the Opel Rekord. The comparison with Volkswagen comes naturally because we are both producing automobiles which have the same characteristics. But I don't think we can consider the 128 as a challenger to the VW. They have a different home market, and a domestic market always determines the choice the company makes. We rely heavily still on our own consumption, so we have to produce primarily for Italian needs.

How can you talk in terms of a home market that is not the Common Market?

Well, the home market has been for us, traditionally, Italy. Since we have come into the Common Market, obviously it is expanding. The two will eventually become one, but it takes time. At the moment our penetration here is much greater than in the rest of Europe. We are concentrating on the Common Market initially, and on EFTA which of course includes Britain. America will come when we have perfected an automatic transmission, which we hope will be by the beginning of '71. By then we might be able to think in terms of a larger production than our present target of 1800 128s a day.

Can we bring Mr Boano into the discussion? We've formed the opinion that the 128's body design is the work more of engineers than of stylists. What's your view of that as a salesman and what's Mr Boano's view as a stylist?

I as a salesman consider the car very acceptable from the point of view of styling. It has the trend of the future in it, it has lines which I think will not become unfashionable in too short a time, and therefore as a mass seller I have the items I need to sell the cars. There's even a positive element of fashion in it. If you look at the short back and the slightly elongated hood, then there is a reference to the trend started by the Mustang but in a very different dimension.

Mr Boano, through an interpreter: Owing to the fact that a stylist has to follow certain strict rules and fixed dimensions, it was rather difficult for me to go haywire and design a car which from the design point of view could have been a very pleasant vehicle. Because of the engineering conception I was forbidden to exceed the existing exterior dimensions, and at the same time I had to seek the largest possible interior dimensions. This is what came up. It's comparable in these respects with the Mini, in that the dimensions dictated the shape. One interesting point I would like to make is that for the first time we have studied the problem of designing a car with the same shape and producing a two door and a four door version, maintaining maximum interior space and good proportions and using the highest possible number of common pressings to keep costs down. As for the shape itself, we did consider having a semi-fastback as Opel and now Renault and Rootes have. But this produced problems, the main one being an adequate luggage boot door, because if you have a semi-fastback it reduces the depth available for inserting baggage into the boot. If you make it a proper fastback you have to have a door which opens all the way up, like a Renault 16 or a Maxi, and market research showed that this solution was not acceptable in Italy. It would have been much easier to make the car bigger and longer, but the real point of the 128 is the way the interior space has been exploited to an extent that makes it quite a different car from its conventional rivals. The short tail is really dictated by price and the engineering conception, stressing visually that the car has front wheel drive. Fashion apart, it has little to do with aerodynamics although it does lend the 128 a bit of a sporting image because everyone knows that in sports cars a cut-off tail is specified for very strict technical reasons. In fact the 128 is quite good aerodynamically, with a drag coefficient of 0.43. In its first prototype form the body was taken to Stuttgart, where there is the only wind tunnel of the right characteristics in Europe. It was tested for 10 days and then the original form was modified to take care of the points that came up. For example the rear of the roof was raised to improve the air flow over the tail.

Giacosa and Cordiano: key figures in the 128 story

Can we ask both of you gentlemen how you go about choosing colours for your cars? It occurs to us that if the 128 can be CAR of the Year then Positano Yellow, which has become so very much a Fiat trade mark, should be Colour of the Year . . .

The first choice of colour is made by the styling department, which submits its choices in turn to the commercial department to see how they react before and after market research. One of Mr Boano's ideas is to have more vivid colours in the range. I, too, have been advocating this for a number of years. The first red we ever had at Fiat came out in America when I was there and it was very successful; so did the yellow. These are colours which are fashionable not only for cars but in art and in graphic and interior design, and Mr Boano feels they ought to be available. So it is something which we consider to be not only important, but of growing importance. The combination of exterior and interior colour is also very important. We are not yet in a position to offer as many choices as Americans have in their interior trims, but the tendency is to offer more.

With such brightness outside, why are so many of your interiors black?

I have learnt that my own personal likings in automobiles are not what everybody wants. I give them what they ask for, and what people ask for with very sharp colours is black interiors.

SATURDAY 17 JANUARY

TODAY MUST START FOR home, but Setright has coned Fiat friends into conjuring up 1.6litre 124 coupé and 2.4 V6 Dino, as we've only played with these previously on autostrade. Blain suggests making south-east to Alba, beyond which wonderful motoring can be enjoyed snaking through hills in direction of Savona. We set off in convoy, agreeing to rendezvous at Hotel Savona in Alba if separated. This happens. Each crew waits impatiently for other to arrive, thinking terrible thoughts about mates not sticking to agreements, not realising hotel has façades in adjacent squares. Situation relieved when worried Italian test driver strolls round block and finds other car. We concentrate into next hour or two some very vigorous and entertaining motoring, challenge accentuated by indifferent road surfaces with wet patches which occasionally become ice at last moment.

Blain, Setright and Barker take turns at each car, and all agree that Dino is a masterpiece in balance of qualities a driver enjoys. Must be one of most desirable motoring properties on market, but unfortunately not made with rhd or sold in England. Adequate performance matched by responsive and sensitive control, superb road- ▶

Serving as everyday transport for CAR's team of investigators en route from Brussels to Turin and Paris, 128 surpassed expectations

continued from p53

holding complemented by comfortable ride and excellent cloth trimmed seats, engine silky smooth, tractable and excitingly noisy. Barker would like quicker steering but Blain says he's come to terms with Italian low gearing and is content with *status quo*.

Perhaps unfortunate to step out of this into revamped 124, which seems soft and sloppy compared with predecessors. Exhibits Lotus Elan-style elastic caterpillar transmission surges however hard one tries to quell them, and in this territory embarrasses with wide gap between second and third; keep reaching max revs (6200) in second before next hairpin comes up, and third at that point in rev range lacks bite. Brakes over-sensitive, with too much servo; quickly overheat and fade. Handling on Michelin XAS tyres bedevilled by understeer entering corners preceding disconcerting oversteer. Happens with so many good cars. 'In response to public demand' they are emasculated, their muscles relaxed.

Back to Alba for lunch, and take bets on when the Woolf will arrive with 128 after morning's business at factory. Estimates vary; he confounds us all by turning up just after 2.30.

After lunch, Setright scrambles again into Dino with Fiat test driver headed for Milan airport; 128 crew discover still room for augmented store of luggage. Blain now obsessed by dreams of home gastronomy buys Grappa, white wine, olive oil, local sausage. At 3.50pm depart by cross-country roads towards Bardonecchia and train tunnelling under Pointe de Fréjus to Modane in France. In yellow evening light countryside, flat at first, looks like film set against silhouetted mountains. In every village focal point towering red brick church, architectural masterpieces so abundant in Italy that locals probably don't notice them. At Avigliana we join main drag up valley of River Riparia towards Susa, where you can almost count castles at so many per kilometre; Fellow-Strines darn under will never believe Henrietta when she tells them.

Last few miles on packed snow and ice, but now on standard steel braced Pirelli radials Fiat proves extraordinarily manageable on treacherous surfaces. Blain and Barker remember eating place in St Michel de Maurienne reached soon after 8pm. Disappointing, appropriate entry made in Blain's Bad Food Guide for Tourists. On to Chambéry, where we find brand new hotel only one-third completed, comfortable and well worth remembering. It is called, oddly, the Residence du [sic] France.

SUNDAY 18 JANUARY

PARIS BEING ONLY 330 miles, make leisurely start at 10.30 after which gastronomes concentrate on planning next meal; decide on Bourg en Bresse, which appears far too early just after midday. Blain insists aromas of good food will soon whet appetites. Navigational exercise to find Hotel? stimulates excitement. One of those places you see several times before getting the *sens unique* sorted out.

Feasting takes its course, after course, after course, after course until 2.50pm, when head north again with just over 250 miles to Orly airport. Plan to keep clear of N6 as far as possible fails, and gravitate on to it at Tournus. Some way north of Avallon *autoroute* appears and from this point make very good time. Fiat soon cruising mile after mile well above advertised maximum of 84mph. Needle often poised around 150km/h (93mph) and running high as 163 (just over 101mph). Assuming it 10-percent fast, still very good going, especially with such a load, and last 154 miles covered in 2hr 5min (74mph). Fuel consumption for return journey on standard tyres lowered to around 33mpg—darned good going, all things considered. Must remember, though, lower drag with these tyres and reduced rolling radius affecting mileage and speed readings.

At Orly (7pm) find Air France ladies more anxious than BEA staff to aid distressed gentlefolk seeking passage to UK. Settle for first class seats at extortionate cost, 10pm flight. Deposit baggage, then hare off to Champs Elysées to deposit Fiat at company showrooms. Wave farewell to Henrietta with appropriate admonitions and lounge in brand-new Citroën D Special taxi back to Orly. Over bubbling glasses in 727 reflect how Napoleon could have retreated far more quickly and comfortably from Waterloo if he'd waited . . . ●

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Liability for sports or modified cars

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