

::: Lancia Rally 037 - Heart, Design, Project :::

"We achieved our most outstanding results nearly ten years ago with the FULVIA HF, when we won the 1972 World Rally Championship. We went on to prove our superiority for three years on the trot from 1974 to 1976, again with the FULVIA, and then the Fiat 131 RALLY won us victories again in 1977, 1979 and 1980.

Three of our drivers have claimed the World Drivers Title: SANDRO MUNARI, MARKKU ALLEN AND WALTER ROEHL.

But in 1982 we will have to face a substantial rules change and, just for this, our programs have been revolutionised; we will race beginning from the month of April, as soon as it will be homologated, after the production of the two hundred samples prescribed by the rule with the LANCIA RALLY".

It is the 14th December 1981 and CESARE FIORIO, manager of the Fiat Group's Competitions Activities announced, with this short speech, the birth of the new weapon of the Fiat group for rallies: the LANCIA 037.



A new car, mechanically different from the victorious predecessors, built, conceived and projected according to the new GROUP B FISA RULES:

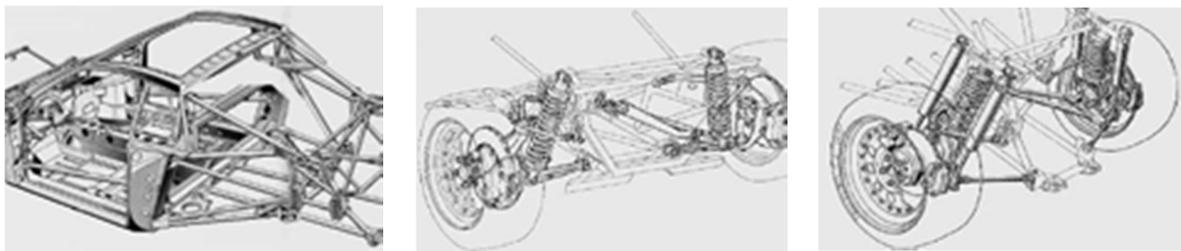
FIA		Appendix J - Art.256	
Article 256 - Specific Regulations for Grand Touring Cars (Group B)			
ARTICLE 1: DEFINITION		over 3500 cm ³	and up to 4000 cm ³ 1180 kg
Grand Touring Cars.		over 4000 cm ³	and up to 4500 cm ³ 1260 kg
		over 4500 cm ³	and up to 5000 cm ³ 1340 kg
		over 5000 cm ³	and up to 5500 cm ³ 1420 kg
		over 5500 cm ³	1500 kg
ARTICLE 2: HOMOLOGATION		ARTICLE 5: WHEELS AND TYRES	
At least 200 identical units (minimum 2 seats) of these cars must have been built in 12 consecutive months.		Same text as for Touring Cars (Group A - art. 5.4) except for the rim diameter and the maximum widths (in rallies only). In relation to the cubic capacity, the total of the widths of two rim-tyre assemblies on one and the same side of the car must be less than or equal to :	
ARTICLE 3: FITTINGS AND MODIFICATIONS ALLOWED		up to 1000 cm ³	13"
All those allowed for Touring Cars (Group A) with the following modifications.		over 1000 cm ³	and up to 1400 cm ³ 14"
However, article 255.5.1.B.3 (Restrictor) has not to be applied, but these cars will be accepted in rallies only on condition that their cylinder capacity, after correction if necessary (see article 252.3.1 to 3.5), is less than 1600 cm ³ .		over 1400 cm ³	and up to 1600 cm ³ 15"
		over 1600 cm ³	and up to 2000 cm ³ 17"
		over 2000 cm ³	and up to 2500 cm ³ 18"
		over 2500 cm ³	and up to 3000 cm ³ 18"
		over 3000 cm ³	and up to 3500 cm ³ 20"
		over 3500 cm ³	and up to 4000 cm ³ 20"
		over 4000 cm ³	and up to 4500 cm ³ 22"
		over 4500 cm ³	and up to 5000 cm ³ 22"
		over 5000 cm ³	24"
ARTICLE 4: WEIGHT		<i>In rallies :</i>	
Cars are subjected to the following minimum weight scale in relation to their cubic capacity.		The rim diameter cannot exceed 16" (or 415 mm for metric dimensions).	
up to 1000 cm ³	620 kg		
over 1000 cm ³	and up to 1400 cm ³ 700 kg		
over 1400 cm ³	and up to 1600 cm ³ 780 kg		
over 1600 cm ³	and up to 2000 cm ³ 860 kg		
over 2000 cm ³	and up to 2500 cm ³ 940 kg		
over 2500 cm ³	and up to 3000 cm ³ 1020 kg		
over 3000 cm ³	and up to 3500 cm ³ 1100 kg		
FIA Sport / Technical Department		15-10-2001	

The project, developed thanks to the close collaboration among LANCIA, ABARTH and PININFARINA, finalized in its definitive version on 2nd May 1982 at the 59th Turin International Motorshow.

The LANCIA 037, in road version, was introduced in fact to the public during the Italian kermesse, immediately receiving a great success among the specialized press and the numerous fans that crowded the pavillions of TORINO ESPOSIZIONI.

Beautiful, aggressive, red, refined: a sport thoroughbred with a "heart" of 2 litres, 16 valves, four cylinders, supercharged volumex compressor and view mounted engine, characteristic this used only for few cars. Powerful, decidedly powerful: the maximum for a road car of that time. With its 205 Bhp, it was able to easily overcome the 220 Km/h and to accelerate from 0 to 100 Km/h in less than seven seconds. A true bomb.

The decisions that brought to the 037 outcome were not easy. The final objective was that to replace the FIAT 131 that collected so many victories, from the 1976 RALLY dell'ELBA to the success at the World Championship in 1980. Inside the FIAT group there were someone who wanted to maintain the image of the FIAT 131: the one of a rally car coming from the great production series. Parallely others wanted to plan a real race car, made on purpose for the races as it was for the glorious LANCIA STRATOS.



Anyway it was necessary to build shortly a worthy heir of the FIAT 131, following the new group B rules, that required a road car produced in 200 samples with technical-stylistic characteristics very near to the race version. It was necessary therefore to conceive a winning car trying to use, if necessary, also revolutionary technical solutions.

The decision to adopt a turbo engine, for Eng. SERGIO LIMONE project manager, was initially took into consideration but immediately rejected.

LANCIA was not able in short time to make an engine with such characteristics, as instead the German technicians of the rival AUDI were studying, with many difficulties. Also the solution of the four wheel-drive engine, winning in the following years but still lacking in that period, was refused. It was better, according to Eng. LIMONE, not to test too complicate technical solutions, risking a sure failure. It was decided therefore for a conventional car, with a two wheel-drive engine, with all the

good qualities of the Fiat 131 and something more above all concerning the chassis. This one had to be conceived in the simplest possible way and able to allow easy reparations and mechanical substitutions during the races.

A chassis predisposed for a new suspensions system, no more McPherson as on the 131, but with quadrilateral layout like on racing cars. This solution was able to give different set-up and camber regulations and to use both radial than not radial tires.



Concerning the car, because of time reasons, they thought to use the frame cell chassis of an already existing model. Three cars were taken into consideration: the FIAT RITMO, the LANCIA DELTA and the LANCIA BETA MONTECARLO, appraising the advantages and the handicaps of each of them.

The hypothesis RITMO was immediately discarded. The frame cell of the FIAT economical car was useful but the image that they wanted to give to the new Rally weapon had to show more the LANCIA style. Furthermore, many technical-building doubts rose after the decision to mount the engine in rear position.

Also the hypothesis DELTA was discarded, being this car very similar to the RITMO. All the attentions, therefore, were concentrated on the BETA MONTECARLO.

Eng. LIMONE was a great supporter of the little sportcar. He thought that it could be a correct point of departure, thanks to the best mechanical solutions and to the frame cell stiffness. A real sportcar that had been successful both on the European and on the severe and demanding American market where it was sold with the name of SCORPION.

After many studies and many afterthoughts, on July 1980 the sketches of the project named "SE037" were realized and only six months later, on December 1980, the first working prototype was already racing along the runway of the ex-airfield in Corso Marche in Turin.

The job to study the 037 design was given to PININFARINA, a leader company in the car design, that already in the previous years had studied the line of the LANCIA AURELIA B20, B24 and of the GAMMA COUPE'.

The final result was really excellent, despite of the hard work. The new car had many dimension constrains, due above all to the supporting structure, to the engine layout, to the wheels dimensions, to the suspensions layout and to the possibility of their regulation.

Then we don't have to forget the aerodynamics problems, considering the MONTECARLO frame cell base layout.

The first prototype was realized in fact modifying one of these cars. The result was not fantastic. Although widened on the front and on the rear sides, the 037 continued to be the rough draft of the MONTECARLO, so that it was completely rejected by Eng. FIORAVANTI, responsible of the study-centre. This episode was the turning point of the project and gave new ideas to the PININFARINA technicians. In short time, in fact, with a study aimed to the carrying out of a sporting and aggressive car, but elegant at the same time, they were able to realize what we today can appreciate. The aerodynamics was developed with many tests inside the wind tunnel.

The result was that of a aggressive body-lines car but soft at the same time, able to confer an aerodynamic load to create an effective aerodynamic lift, so avoiding set-up variations at the high speeds. The front and boot spoiler, this last on purpose conceived for an more rally use, allow the first to avoid to the fore-carriage a dangerous lightening while the second to increase the dynamic load, allowing the air to flow out discharging under the car body.

A great importance besides, always from the aerodynamic point of view, has the 037 central part composed by the full-vision windscreen that is joined with the top, then to end with the rear window that consents to see the engine. This stylistically appreciable layout allows the air to flow out on the boot spoiler creating a pressure zone. The PININFARINA technicians studied this good system to allow the car to unload the horsepower high quantity, as well as to have a good lateral roadability, important thing for a strongly sporting car.

Large and aerodynamic spoilers, swelling bonnet, widened track and view-mounted engine are therefore the important elements for an aggressive car with a strong personality; we can affirm without any doubt that the LANCIA 037 still today is one among the more beautiful sporting cars in the world.



Parallely to the lines study, magistrally cared by PININFARINA designers, the ABARTH technicians attended to the chassis and engine project. These two elements, fundamental for the good result in the building of a sporting car, have been studied thinking to an use to the limits of the exasperation. In substance the car for road use has the same tipology of the rally one composed by central position engine, rear wheel-drive, indipendent suspensions and tubular frame. In the carrying out of this last element the ABARTH staff, headed by Eng. LIMONE, tried to shorten the project times avoiding great innovations and concentrating the efforts using elements already known and experimented in the precedent years.

The adopted solution, although simple from a mechanical point of view, revealed optimal indeed. The central frame cell anteriorly ends to the pedals and posteriorly behind the crew. The central frame cell holds up the two frameworks (front and rear), in round cross section steel pipes with diameter of 25-30 mms, connected to others square cross section tubes and high resistance metallic supports. The front tubular frame serve to water and oil radiators and suspensions linkage, the rear one for suspensions and two fuel tanks linkage and of course for the engine linkage.

Also the choice to adopt a frame system has also been made for constructive simplicity needs and has been made possible by the weldings experience obtained in the carrying out of the precedent rally cars.

A rugged structure decidedly able to resist to high-stress conditions, normal thing speaking about a rally car also able to race on uneven and low grip roads. The safety factor has not been neglected, rather a lot of care has been put in the building of a rugged roll-bar cage, homologated by FISA and in conformity with the severe rules expressed in the enclosure J in subject of crush, dimensions and assembly. The roll-bar cage has been made with 35 mms diameter pipes, cage moulding, with four lateral pillars connected to the hard top and to the chassis base with joint points.

The function of this important element is obviously that to protect the crew in case of accidents, somersaults or lateral impacts. Many crash-tests have been performed in the FIAT safety centre to confirm the goodness of the product. The results have been excellent indeed. The chassis impact absorption power revealed so elevated that, after the crash, it has still been possible to open the doors. Besides the steering column shortening was only of 20 mms against the 127 admissible, imposed by the rule. The LANCIA RALLY 037 is made by a ruggedness structure that unites lightness and sturdiness, giving really exceptional safety level, with each detail studied to resist to the highest stress conditions.



Concerning the engine, the ABARTH technicians didn't leave anything to the case. The classical FIAT engine has four cylinders in line of 1995 ccs. and four valves for each cylinder. These technical solutions, although singly, had already been adopted previously by the FIAT-ABARTH RACING DIVISION with good success.

The four valves head had already been tested on the pluri-victorious FIAT 131 ABARTH and derived from an evolution of the 1800 cc engine used by the FIAT 124 ABARTH. This engine choice, whose power was increased by the volumetric compressor, was supported by Eng. AURELIO LAMPREDI, good ABARTH technician and strong supporter of the different supercharging system.

In that period, the car companies had contrary opinions about the use of the turbo in the rallies. Even inside the ABARTH there were opposite opinions and doubts, above all after the experience made in the carrying out of the LANCIA STRATOS TURBO, strongly wanted by CESARE FIORIO and by the Eng. TONTI for the "queen" use in track.

LAMPREDI had good reasons to sustain the adoption of the VOLUMEX. Before all he remembered the good results gotten in track by the BETA MONTECARLO, arrived at the second place end at the Tour of Italy, and from the 035 prototype, a FIAT 131 ABARTH modified in the engine and in the aerodynamics to race in the 24 Hours of LE MANS.

Then the fact to use the turbo on a rally car could be a good promotional vehicle for the sale of the LANCIA TREVI and BETA HPE, road cars that adopted such system. Finally, important thing, the Turbo engines, even giving high performances, had a big defect to the low rates, the so-named "TURBO-LAG".

For a rally car that often races on tortuous roads and narrow curves, an immediate acceleration is fundamental, therefore the turbocharged engine would have caused to the Turinese car only a great handicap.

Clearly, to get a good engine-chassis-performances combination, other aspects were taken into consideration. The dry oil sump, like on racing cars, the ZF gearbox, already used on cars like the MASERATI BORA and the DE TOMASO PANTERA, the self-ventilated brake discs and the adjustable suspensions are only some details present on the 037, clearly already tested in the races world that, improved on the Turinese rally car, were able to make it win.

All the components, exactly as projected, were sent in the LANCIA establishment of BORGO SAN PAOLO near Turin and built in a little car assembly line. Each sample of the 222 built was mounted by hand, then sent out for the painting and finally re-assembled. Each single piece was submitted to particular tests, inconceivable for a great production but fundamental for a small number of cars ready for the rally use. Only the experienced eye was able to appraise and to appreciate each small detail of a car built with maniacal care.

At the end of this phase, each 037 was tried and duly set up from GIORGIO PIANTA, ABARTH "quality" manager, and only after his approval the car could reach the car-shop.

On 21st April 1982 the LANCIA RALLY 037 in red-race livery, colour belonging only to the true MADE IN ITALY sport cars, debuts to the 59th Turin International Motorshow "parade" immediately getting a great victory: that of the critics that nominated it "queen" of the Expo.

So finishes a great project made by great men and starts an extraordinary career that brought the rear traction car to dominate the roads.

::: "SE037" Project Managers :::



CLAUDIO
LOMBARDI
Technical
Manager

SERGIO
LIMONE
Development
Engineer

CESARE
FIORIO
Martini Racing
Team Manager

GIORGIO
PIANTA
Quality
Manager

NINNI
RUSSO
Logistics
Manager