Ettore Bugatti

THE BUGATTI TRUST

NEWSLETTER 45

A Charitable Trust whose objectives
are to preserve and make available
for study the works of Ettore Bugatti

Founded by Hugh G. Conway, C.B.E. in 1987

For the advancement of education through the study of the works of Ettore Bugatti

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The Bugatti Trust is proud to display 'Bugatti Rendevous' a painting by Philip E West depicting Bugatti's 100P plane soaring over the heads of Ettore and De Monge and the famous Bugatti Atlantic

Foreword

At the last Prescott hill-climb meeting in October a number of visitors came to the Trust for the first time. In the current environment it is perhaps inevitable that many see Bugatti as no more than a maker of deco art automobiles commanding record values at auction.

So we are always happy to take the opportunity to explain the Trust's educational objectives and show examples of Ettore's engineering achievements. First time visitors too may be unaware that the talent extended over three generations – four if you include Carlo's father Giovanni Luigi, best known for his ornamental chimney pieces.

Casual visitors make a contribution to the Trust's running costs through a small entrance fee. Recent changes to Charitable Gift Aid provisions have made it easier to reclaim the tax on small donations. We have also reached an agreement with the BOC for the Club to contribute to the Trust's costs when it opens on certain hill-climb days. On these occasions entry for all visitors will be free of charge.

Of course the success of this will depend very much upon getting sufficient week-end volunteer assistance. If you can be available, even for limited periods, please get in touch. We would welcome your help as we would at any time.

Amongst the variety of items in the Trust we have several engines on display and have at last completed our 57. Our earliest example is the 16-cylinder aero engine produced under licence by Charles B King.

What we have been lacking however is an example of one of Bugatti's earlier models. It is very pleasing therefore to acknowledge our gratitude to Sarah Rheault and the American Friends of the Bugatti Trust for the gift of an early 8-valve crank-case. Delivery is expected shortly.

Our objective then will be to build it up as an interesting display to provide an example of Ettore's early work. Many ancillary parts are needed so if any of you know of the whereabouts of suitable engine parts – provenance and condition immaterial – please let us know.

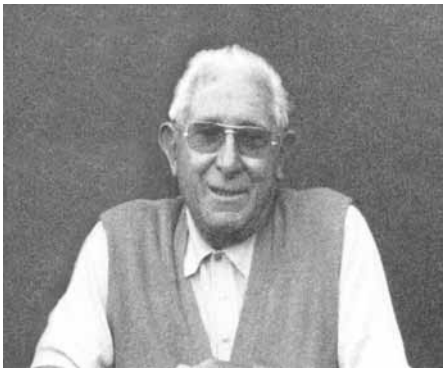
Two items have been received already as a result of our earlier appeal but there is still a long way to go.

We have recently written to advise that we have set up a Bugatti Trust Facebook Group. The aim is to improve our communication with members by providing regular updates and photographs, news items about research discoveries and publications, visitors to the Trust, new initiatives linked with engineering degree courses and schools. Trust members activities around the world, topical exhibitions, events and anniversaries and all things Bugatti that might be of interest to you will be included.

We hope you find the contents interesting and welcome your help and news clips to make it a success.

Noel Domboy on his time with Bugatti (part 1)

A.B. Price



Noel Domboy

Hugh Conway senior managed to discover the whereabouts of Noel Domboy, the chief engineer at Molsheim during the 30s and an energetic correspondence followed for several years. Some of this material appeared in Bugantics 25 years ago but a detailed study of more than 50 letters written in the 1970s and 80s now in the Bugatti Trust archives reveal further facts which are of interest from a social history point of view, in addition to information about works organisation and engineering matters.

We have not had the experience of occupation by a brutal regime and the disruption of the lives of Bugatti personnel during this period is to be noted. Now that those who worked with Bugatti, even in the final years are all dead, these letters by Noel Domboy are as close to the 'horses mouth' as we shall ever discover. I have translated the extracts 'verbatim' in order that we can better understand the personality of Noel Domboy, the professional mechanical engineer.

Noel Domboy joined Bugatti in May 1932 and retired in 1965. Some years later the Bugatti family asked him to write down recollections of working for Ettore. He begins by explaining that he joined after the 'glory years' of the Bugatti racing successes and thus knew little of the early days. He goes on to say that the personality of Ettore is already well known but recalls incidents which are not without interest.

His narrative is often duplicated but it is as he wrote.

"A personality like EB is very difficult to describe, his complex character is difficult to analyse". Domboy thinks that he is not perhaps the one to portray 'this genial creator'.

"Le Patron never neglected to go back to first principles. Many times I have heard speak of calculations «à la Bugatti» by those who did not know the care Le Patron took in his designs which he checked and then had them checked again by his staff to verify the dimensions and correctness for the stresses involved."

"By grace of vigorous methods, an intellectual discipline was acquired to a high degree including the art of the best use of materials. It also goes without saying that EB could conceive and machine himself the different pieces of an assembly. In this connection it is necessary to relate, contrary to opinions often repeated, that EB would design without thinking through the practical realisation, counting on his genius

and gift of improvisation. Nothing is more wrong, Le Patron never designed anything that he was not able to make with the means at his disposal or without intending to create such means. He had constantly in his head the dimensional capacities of the Bugatti machine tools as well as the combinations which were permitted. In certain cases he conceived new machines or adaptations of existing machines – always the object of a plan – for projects to be made as well as possible and never any place for improvisation. In all cases, he pursued the problem of manufacture to the point which he knew was within the operational range of the Molsheim Machine shop."

"The detail drawings carry, moreover, the indications of difficulties in the form of numbers of annotations relative to the different operations through which the parts passed before arriving at their finished state.

For the most part, Le Patron conceived the principal tooling and then passed the sketches down to a draughtsman charged with making drawings to be passed to the machine shop. The chief relied totally upon their competence. I have left until now to one side that which concerns inventions of EB. There are some 600 patents which he registered from 1904, which serve as witness to his activities in the world of research."

Domboy does not mention France in this list, "it would be fastidious to reproduce a complete list of his patents during the life of the constructor EB. He was constantly inventive because he believed there were two functions, construction and invention, which were inseparable since he had an enterprising natural tendency to invent."

"He well knew the state of automobile engineering and all the fields of activities which interested EB. One imagines it wasn't easy to leave dead ends. However Le Patron never failed to cover new ideas by patents in order to protect his rights. On the other hand he never would examine or simply retain documents relating to a third party's invention if the invention was not covered by one or more patents. He never departed from this line of action which witnessed a correction 'vis-à-vis' of others. Among these inventions the most remarkable are for cars or more generally for locomotion. I wasn't in his domain when his activity was most fruitful. He covered all aspects from the engines, gearboxes, clutches, brakes and even up to the wheels and tyres. On April 22nd 1929 he patented in France under the number 694279, the

List of Patents

Country	No of Patents	Country	No of Patents
Germany	121	Soviet Union	1 (further research needed)
UK	139	Spain	6
USA	91	Sweden	1
Belgium	81	Czechoslovakia	1
Italy	142	Holland	1
Switzerland	35	Denmark	1
Austria	17	Norway	1

principle of hydraulic brakes applied to four wheels of a car – a type of brake actually employed throughout the world. Firms which thus equip their cars in production have benefited greatly from the ideas of EB."

On rails…

"The project of Le Patron related to railways officially commenced in 1931. It gave birth to a number of patents which possessed great technical value and which had the advantage of being immediately realised in an industrial plan. Among them, I cite an example: elastic wheels for vehicles on rail.

The Bugatti bogies were made in two different forms and according to the type of vehicle invariably carried four springs. The patents mentioned covered the invention which permitted the resolution of all the problems of stability inherent with vehicles on rails and brought considerable improvements to this mode of travel. These bogies ensured, at the time, an absolute rolling security: none of the four axles could derail. A uniform share of the loads on all axles of the same bogie: all of them a quarter of the weight suspended. The sideways stability was 'more than perfect' and in addition were while entering or leaving curves. The final test of the prototype, named much later 'Presidential', was put into service in 1933 on the track Paris-Chartres via Gallandon – an obsolete line only used for testing rolling stock. The speed limit was 95kph due to the poor state of the track. During the first test driven by Jean Bugatti the prototype passed 125kph. The engineers of the rail network (Réseau de l'etat – SNCF did not exist at the time) were aboard and were responsible for the recordings of the Flaman speed recorder. However after a short period of hesitation all felt justified in continuing the test up to 135kph.

Sometime later during a series of analogue tests carried out by colleagues on the PLM (Paris-Lyon-Mediterranean) network they were to experience a sensation when clearing the viaduct at Fontainebleau, which is on a curve and a speed of 175kph was reached. These demonstrations, followed by many others definitely established the superiority of the vehicle and in particular the safety of Bugatti bogies..

From memory, patents were also taken out in Austria, Italy, Switzerland, Brazil, Canada, Denmark, Spain, Hungary, Ireland, Japan, Norway and Sweden."

Noel Domboy's reflections on water and air are to be continued in part 2

Improvements for vehicles running on rails

Patent List

Country	Patent No	Date	Country	Patent No	Date
France	734348	23-3-32	Italian	913598	27-2-33
Germany	657707	30-3-33	France	753319	29-3-33
UK	403553	27-3-32	UK	416833	29-3-33
USA	1785146	18-12-34	Belgium	402221	26-3-34
Belgium	395244	23-3-33	Italian	330112	27-3-31

Repusseau-Silentbloc

A Trust member recently enquired about dashboard auto adjusters made by Repusseau. One of our contributors was able to supply a copy that the requester then kindly translated for us.

REPUSSEAU-SILENTBLOC

new constant friction disk model fitted
with Dufaux • Repusseau Auto-adjuster

BREVETÉ S.G.D.G.

The shock absorber is no longer an accessory. It is an integral part of the car's suspension mechanism; it is essential.

Until now, it was only once you had stopped that it was possible to modify, on a car, through successive operations, tightening of shock absorbers. Unfortunately, even by putting oneself in the most favourable conditions, could we merely obtain a compromise between the desirable values for a good suspension and correct road handling, regardless of the terrain, the speed, the weight carried, etc...

Consequently, the only rational way of using the shock absorbers whilst at the same time ensuring a comfortable suspension and impeccable road handling, is to adapt these shock absorbers to various road conditions, by adjusting them in motion.

The DUFAUX-REPUSSEAU auto-adjuster has solved this problem through a mechanical assemblage which ensures the exclusivity of the following rare qualities: surprising smoothness of the control, setting progressivity and stability, control of the tightening value, resistance to use.

Fig. 1

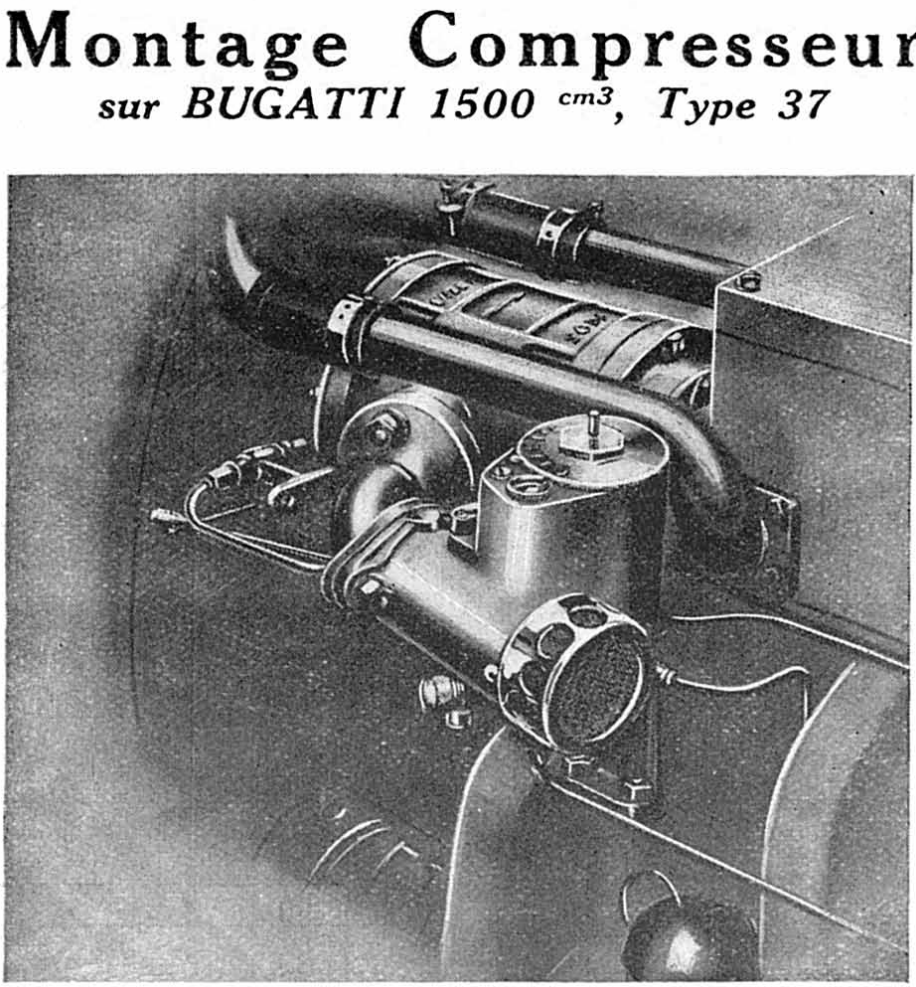
On each of the two control buttons (see fig. 1 on the left) a tightening controller indicates the value of the friction in the casing of each pair of shock absorbers (front or rear).

The DUFAUX-REPUSSEAU Auto-adjuster has proven to be in all circumstances, on all roads, at top speeds, an INCOMPARABLE comfort equalizer.

A period advertisement for the Repusseau auto-adjuster that enabled the stiffness of the friction damper to be altered from within the vehicle.

René Cozette, Engineer and Inventor

Hugh Price



Among the many curiosities held at the Trust is a Cozette supercharger sales brochure featuring several makes and appearing to include a Bugatti 37 equipped with Cozette. I use the word appearing as, to my eyes, the image has more of the look of an artist's impression than a photograph and the compressor position looks unlikely even given the natural space provided by the 1500cc four.

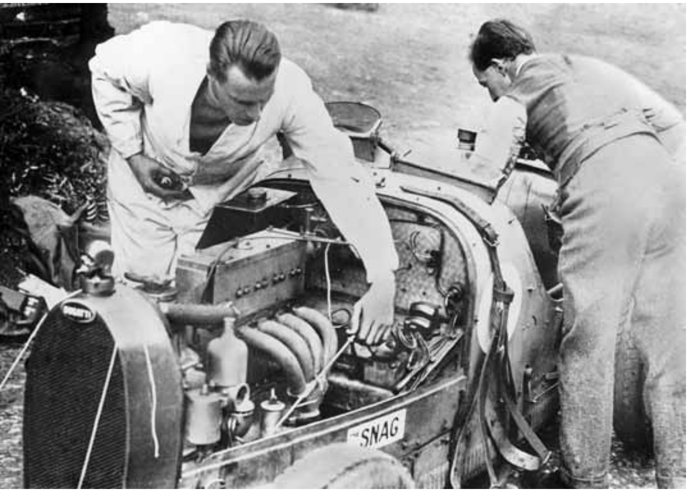
In trying to establish who was behind this quite well known concern the following has come to light. I would be delighted if others might be able to add to or indeed repudiate any of it.

Rene Jean-Paul Emile Cozette was born in 1895. His early life and academic background remain obscure but it is said that he flew during WWI. Probably due to first hand experience of the charge density and mixture problems suffered by aero-engines he clearly became interested in carburation and forced induction. In or around 1919 he founded a business (in Courbevoie, Seine) to manufacture carburettors of his design, registering patents from 1920. By 1924-25 he had developed his efficient eccentric vane supercharger as well as apparently packing in a trip to America at the invitation of Albert Champion. Clearly this was a man with creative drive as by 1927 he had designed a 1,100cc opposing-piston two-stroke charged by his compressor and by July 1928 a car thus powered was setting records at Montlhéry at over 160kph. The driver at that time was Prince Ghika, descendant of the rulers of Wallachia and Moldavia and also a *Bugattist*. One wonders if Ghika was also helping Cozette financially? Cozette's productive life ended prematurely at Montlhéry the following year during further record breaking efforts. Among the many questions that one cannot help asking is whether or not the record-breaker's chassis was the work of or an adaptation by René, how many may have been built and what might remain?

Many French makes and models enjoyed the boost Cozette's supercharger gave them, some very local, such as Tracta, Salmson and BNC but possibly the first was the 1925 sleeve-valve Guyot. However, then as now, word spread quickly in the engineering community especially when it came to winning races. This side of the channel Cozette's supercharger was soon being fitted by the likes of Lea-Francis and Lagonda who were rapidly developing racing programmes following the SMMT ruling which prevented manufacturers from raising their profiles through endurance trials. This was undoubtedly spurred on by L.T. Delaney, who became British agent. However the sum of the sales to all of these firms plus units fitted to 'specials' may well still have fallen short of the inventor's ambitions. Therefore one may ask what the significance was in Cozette's inclusion of Bugatti in the brochure? Could he claim competitive advantage or squeezing some more out of an ageing model saw sufficient merit to realise such an installation? The Trust also holds a Bugatti drawing office sketch of the drive to a centrifugal supercharger. This may lead to speculation whether this option was being considered for original fitment or not.

One such was Dr.J.D.Jevons who we believe equipped his type 37, registered YN9370 'The Snag', in such a manner although not in the position recommended by the maker in his literature. This gentleman worked for Lucas becoming chief metallurgist with works published on metal forming and production engineering. One suspects his knowledge might well have been of significance in gas turbine development. In his spare time he was clearly a keen amateur competitor, appearing at least at Shelsley a number of times. Alas the Trust records do not identify the chassis number of this car.

In the late 1950s and early 60s Pat Carmichael competed at several vintage events in a 37 with Cozette supercharger in the same vertical configuration and enjoyed moderate success with it.

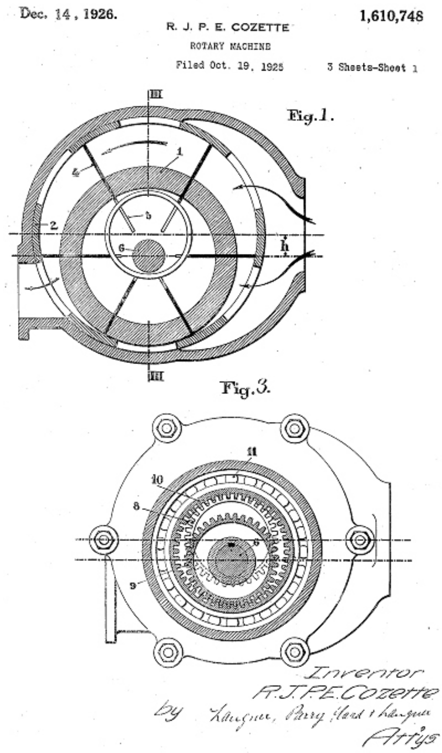


Jevons T3, showing supercharger

So what advantage did this type of compressor offer over, say, the Roots blower to which Bugatti always remained faithful? The answer is pressure, and as we know pressure at the inlet means horsepower. During its rotation the volume captured by the chambers of a Roots type pump alters but a little.

In contrast the eccentric vane type is designed to provide a considerably greater degree of compression, more akin to a reciprocating compressor. From the point of view of service life the two are in stark contrast. The Roots supercharger, certainly from the hand of Ettore is very low maintenance, highly reliable, quiet and low in friction. The vane type offers significantly higher pressures at a cost of somewhat greater friction and noise, while also being fussier about lubrication including carefully dosing the fuel. Straying relatively little from the optimum 2% dosage means fouled spark plugs or a seized unit. A well regulated external oil supply is also needed via a Best and Lloyd type pump and usually a throttle-controlled valve. The result was that within a very few years most of the cars originally fitted with Cozettes were motoring on without them, whereas practically all blown ‘Bugs’ retain their superchargers to this day. Indeed many an owner returned cars to Molsheim opting to add one.

Variations on the Cozette theme were offered by other makers whose names would subsequently ring round the paddocks and pits of racing venues such as Zoller, Centric and Shorrock.



Cozette cross-section

Standard Motor Oil Advertisment

Period motor oil advertisement from L'Illustration *24 June 1933*

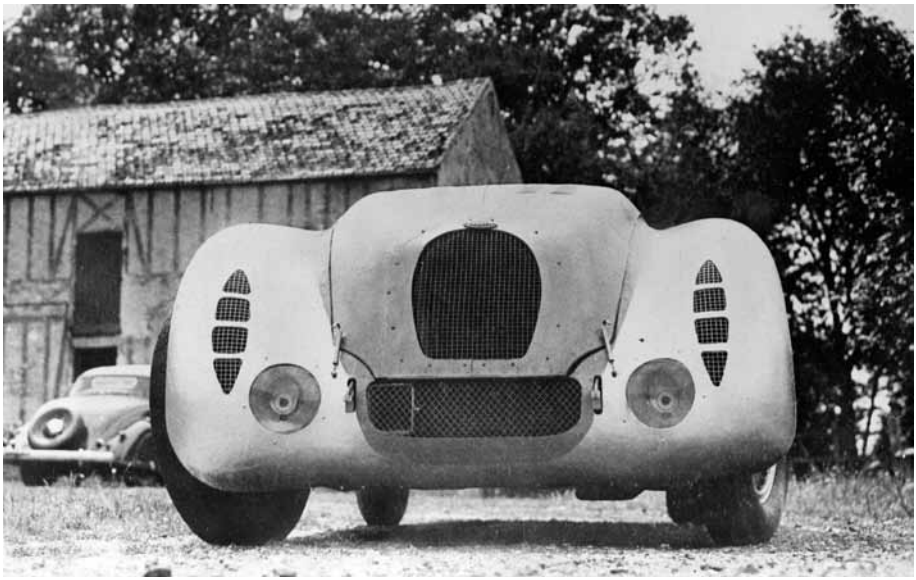
Bugatti T57G - Three Tanks or Four?

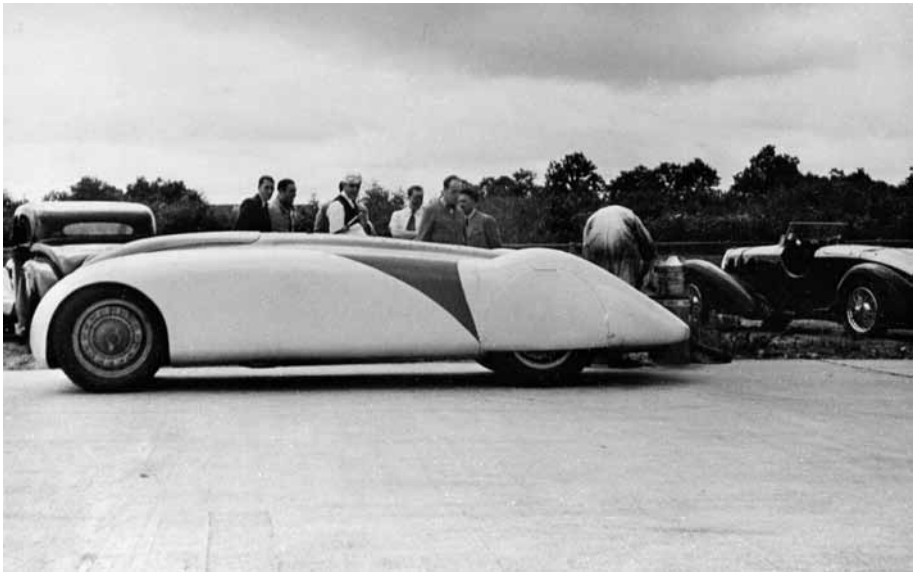
A Study in four parts by Max Tomlinson

Part Two

Referring back to the photograph of the up-turned Tank, the view is clearly the rear of the Montlhéry banked Autodrome, although more specifically the western end of the bowl identifiable as an area just off a sharp left-hand curve in the Road Circuit known as *Virage de la Ferme*. This bend is at the end of the fast straight on the return from the forested section after passing the water tower. Of particular interest though, note that the underbody of the car has a panel fitted over the rear axle. This cover was permanently removed during the ACF and Marne events to improve cooling when the rear brakes became too hot, which in turn, heat-expanded the rear hubs making the wheels difficult to remove. Notice too, the plain-sided rear wheel cover hanging open, and crucially, the absence of the unique rear quick-lift jacking bars. Compare these elements with the views of the pristine prototype Tank recorded at the Autodrome during testing on 8th and 9th June 1936, where clearly, the crashed car is a pre-ACF version of the Tank, if not the actual test car itself (see photos published in P.Y. Laugier's book, Bugatti Les 57 Sport).

Snother photo also provides clues, this time showing the crashed car turned back on to its wheels and badly damaged. As general observation, several people seen in the photos are in shirtsleeves, suggesting a warm period of the year, although one is wearing a raincoat as if there had been a recent shower of rain. The headlamp arrangement seen on the car is clearly an





early version; a June-July 1936 pattern as seen during performance testing at Montlhéry, and later at the ACF and Marne events. Note in particular, the high position of the front-wing cooling air intake. Additionally, take note of the concave quadrant in the bonnet lip, as well as the oil-cooler air intake shape; rounded at the bottom and flat at the top. As before, these are unique features of the test car, or more specifically what appears to be, the Wimille car, rather than those of the Benoist and de Rothschild car missing after the Paris Salon! Crucially for dating, note the absence of a small slot cut into the bonnet for the leather retaining-strap, and compare with later photographs. Therefore, given the noted detail features of all-three cars at the ACF, such as the removal of the rear under-tray, retaining-strap slots, louvred wheel covers and rear quick-lift jacking bars, it follows that the crashed Tank in the photos pre-date the ACF! However, the Tank's only known earlier visit to the Autodrome was on its premier outing for testing on the 8th and 9th of June! Consequently at this point, it may be reasonably concluded that the wrecked car appears to be the Wimille Tank, and that the crash occurred during its performance testing on Monday 8th June or Tuesday the 9th.

Having narrowed the crash down to this two-day period, can it be pinpointed further? From the photographs of the damage to the car at the Montlhéry crash site, the scenario suggests the car has spun-off anti-clockwise through 180º at *Virage de la Ferme*, struck the ditch sideways, turned over once before sliding through the grass upside down and coming to rest. Every portion of the bodywork has suffered some degree of damage and clearly appears to be a write-off. Obviously, it would have been impossible to continue with any further testing. Yet bizarrely, this is contrary to test-day publicity, where given that the contemporary news reports for both trial days were so detailed and positive about the car, it seems almost inconceivable to

believe that the incident did not become a special news item on its own accord! Therefore, this fact would suggest that the incident could only have occurred late into the summer evening of Tuesday the 9th of June, when all the official testing was over and everyone had more or less packed up for the day. For this reason too, it is the only realistic time window when Bugatti might have escaped an unpublicised accident.

Having focussed the crash to a specific date and time, and apparently identified the car, this situation now poses the question: Could the Wimille Tank have been perfectly repaired in the next nineteen days leading up to the ACF?

Ponder for example, that in order for repairs to be carried out, it would have been necessary for the panels to be cut into several pieces before re-work and welding back together. Obviously, it would have been easier and faster to completely rebuild the body! Yet, even assuming minimal damage to the chassis and running gear, repairs of this calibre today would take several months. Given that it appears so doubtful that the very thin alloy bodywork could have been restored to an immaculate finish in such a short time, it should be seriously considered that Jean Bugatti judged the crashed car to be beyond economical repair and wrote it off. This measured and informed reasoning reconciles much of the apparently conflicting evidence.

In combination with the photographic analysis discussed, as well as Benoist's revelation to the press that four cars were being built, and that four cars were registered for entry into the ACF, even though only three have ever been seen together, it may be concluded that in May 1936 there must have been four Bugatti Tanks originally constructed. That is, at least before one of them was wrecked. Furthermore, because the crashed Tank was written-off just two weeks before the ACF, it provides a cogent explanation as to why only three T57G cars actually qualified as

existing when Henri Pracht recorded his entries noted for 27th June 1936; the day before the ACF. This study not only shows there were four Tanks built, but significantly, that from the details identifying individual cars, the Wimille Tank must be one of identical twins! If this interpretation of the photos and records is accepted, it is possible to re-evaluate the cars and other events at that time in the light of this. For if there were originally two identical cars with high, front-wing cooling air intakes, as well as two with low air intakes, this would suggest two distinct build periods. Put another way, a pair of early prototypes as well as a pair of later models; but if so, which pairs were early and which late?

The more obvious visual disparity between the three remaining cars has prompted Bugatti historians to suggest early and late versions before; some interpreting the differences in the height of the front-wing cooling air intakes to imply chassis variations. Technically though, this approach seems to be rather tenuous, for the intakes are nothing more than very simple openings in the leading edges of the bodywork; their sole purpose being to admit cool air to the tyres and brakes. Logically, it could be argued that the lower opening version might admit slightly more airflow to the brake drum than the higher, simply because it is at a point of the greatest aerodynamic pressure when the car is in motion. In practice though, there is probably very little between the two variants.

Of much greater significance, the three dissimilar car weights verified at the Marne Grand Prix definitely appears to be evidence of the use of three unique chassis arrangements at that time. The weigh-in recorded the Wimille car as the heaviest at 1265kg; Veyron's was 1245kg; and Benoist's the lightest at 1225kg. This weight differential of exactly 20kg between cars, with 40kg between the heaviest and lightest appears to be noteworthy, so surely must be indicative of differences in chassis detail. Putting this into perspective, the weight saving in perforating a T59 GP chassis is estimated to be 7.7kg: enough to influence racing performance; so a difference of more than five times that has to be of major consequence! It is known that a great deal of effort went into making the cars lighter, although such changes took time.

The surviving Type 57G 'Tank' undoubtedly appears to be the Wimille car, and uses a lightened 'parallel' chassis frame, the sides of which have been perforated with holes to reduce weight. It also employs light-alloy crossbeams. A number of other components, including the gearbox and differential casing, are reportedly made from magnesium alloy, and some transmission parts have been made lighter by using stronger materials. Nevertheless, it is clear that its current form was not necessarily always so, where it now represents the culmination of the Type 57G Tank's evolution.

In summary at this point, weight differences would almost certainly suggest that the heaviest car was an early prototype, whereas the lightest would be a later and more technically advanced version. But is there any additional evidence to suggest early and later versions of the Tank?

The 'Three or Four Tanks' question continues in Part Three.

Petrol-Electric drawings

Sandy Skinner

Petrol-electric drive has a distinguished history and a bright future. The Lohner-Porsche with motors in its wheels drew the howitzers of the Austro-Hungarian empire. Tillings-Stevens provided reliable Edwardian bus transmissions. The Toyota Prius offers economy as well as impeccable green credentials. Bugatti's 1930s effort is typically elegant and probably just a little self-indulgent.

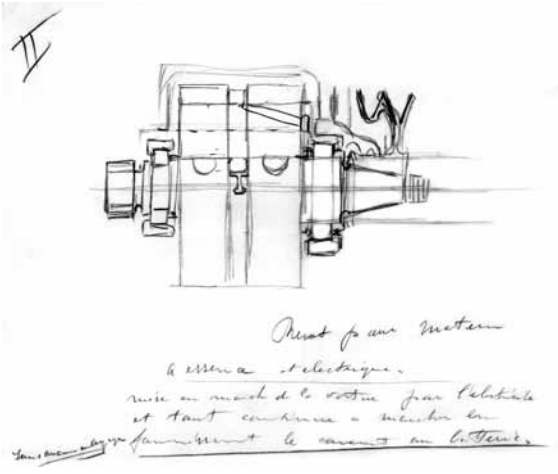
Two sketches by Bugatti illustrate a neat one horsepower single. Notes describe the engine as 'petrol and electric' and continue 'The vehicle is started by electricity and then continues to run by supplying current to the battery, with no clutch.'

The drawings show an engine whose bottom end is pure Grand Prix, with cotters retaining the bigend pin, a one piece connecting rod running on rollers, lipped roller main bearings and non-pressure lubrication. Uncharacteristically, valves are pushrod operated with conical springs. The integral block and head are bolted down with a generous flange and cooling fins are indicated between the inlet and exhaust ports. The combustion chamber is extended outwards to allow flow round the back of the valves, an attractive feature which has very little practical effect.

The crank carries a hefty double V-pulley, presumably driving a dynamo to charge the battery.

At this stage the exact method of operation planned by Bugatti can only be guessed at. The dynamo would almost certainly be wired as a dynamotor, capable of both starting the engine and charging a battery which feeds a traction motor. The result would be clutchless drive on the lines enjoyed by Bugatti in his Type 56 electric runabout used as personal transport around the factory with the extra benefit of on-board battery charging. Presumably the engine could be kept running to 'float' the battery, or stopped to give silent progress.

A refinement anticipating much later petrol-electric developments would be to use a single dynamotor connected through some form of fluid coupling to both the engine and wheels. This would combine weight saving with the ability to call on both petrol and electric power for added performance: but it is safe to assume that transmission and control complications would make this approach more trouble than it was worth.



French Number Plate System – 1930s to 1950s

Max Tomlinson

Many drivers are familiar with the British number plate system, where the registration district or town in which the vehicle was registered can be identified. In France, the system is similar, where the issuing authority is the area administration 'Department' in which the vehicle was first registered.

The French numbering system unitlizes one to four numerals, then a single, then later, double letter designation, followed with one or two numbers. Like Britain, it is the letters that identify the area 'Department'.

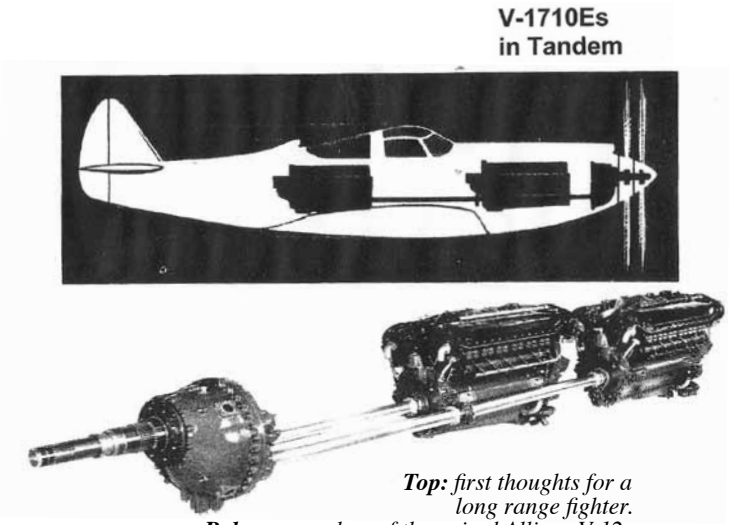
Vehicle Plate Letters Identifying Departments of France.

AB to AE	Ain	**FS to FX**	Haute-Garrone	**NA to NG**	Pas-de-Calais
AF to AM	Aisne	**FY to FZ**	Gers	**NH to NK**	Puy-de-Dome
AN to AQ	Allier	**GA to GN**	Gironde	**NM to NR**	Basses-Pyrenees
AR	Basses-Alpes	**GP to GU**	Herault	**NS**	Haute-Loire
AS	Hautes-Alpes	**GV to GZ**	Ille-et-Vilaine	**NT to NU**	Pyrenees-Orietales
AT to AU	Ardeche	**HA to HC**	Indre	**NV to NZ**	Bas-Rhin
AV to AY	Ardennes	**HD to HJ**	Indre-er-Loire	**PB to PD**	Haute-Rhin
AZ	Ariege	**HK to HQ**	Isere	**PF to PZ**	Rhone
BA to BM	Alles-Maritimes	**HR to HT**	Jura	**QA to QC**	Haute-Saone
BN to BS	Aube	**HU to HV**	Landes	**QD to QH**	Saone-et-Loire
BT to BV	Aude	**HX to Hz**	Loire-et-Cher	**QJ to QM**	Sarthe
BX to BY	Aveyon	**JA to JF**	Loire	**QN to QP**	Savoie
CA to CC	Bouches-du-Rhone	**JG**	Haure-Loire	**QR to QT**	Haute-Savoie
CD	Diplomatic Corps	**JH to JN**	Loire-Infereiure	**QU to QZ**	Seine-et-Marne
CE to CR	Bouches-du Rhone	**JP to JS**	Loiret	**RB to RZ**	Seine
CT to CY	Calvados	**JT to JU**	Lot	**TT**	Temp plates – imports
CZ	Cantal	**JV to JY**	Lot-et-Garonne	**TU**	Tunisie
DB to DF	Charente	**JZ**	Lozere	**W + WW**	Trade Plates
DG to DM	Charente-Maritime	**KA to KE**	Maine-et-Loire	**XA to XK**	Seine-Maritime
DN to DS	Correze	**KF to KH**	Manche	**XL to XN**	Deux-Sevres
DT	Corse (Corsica)	**KJ to KP**	Marne	**XP to XU**	Somme
DU to DZ	Cote-d'Or	**KQ to KR**	Haute-Marne	**XV to XZ**	Tarn
EA to EC	Cotes-du-Nord	**KS to KT**	Mayenne	**YS to YT**	Tarn-et-Garonne
ED to EF	Creuse	**KU to KZ**	Meurthe-et-Moselle	**YU to YZ**	Var
EG to EI	Dordogne	**LA to LD**	Meuse	**ZA to ZD**	Vaucluse
EK to ER	Doubs	**LE to LG**	Morbihan	**ZE to ZG**	Vendee
ES to EZ	Eure	**LM to LN**	Moselle	**ZH to ZG**	Vienne
FA to FD	Drome	**LP to LQ**	Nievre	**ZL to ZP**	Haute-Vienne
FE to FH	Eure-et-Loir	**LS to LZ**	Oise	**ZQ to ZT**	Vosges
FJ to FM	Finistere	**MB to MV**	Nord	**ZU to ZY**	Yonne
FN to FR	Gard	**MX to MZ**	Orne		

100P / Allison

Sandy Skinner

The 100P airframe is a triumph of packaging in which the innovative engine position plays an important part.
The nearest European approach was the Arsenal VB-10 with a 12 cylinder Hispano ahead of and behind the pilot, shown in Jaap Horst's book. Six were built but the concept was overtaken by the jet fighter.



Top: *first thoughts for a long range fighter.*
Below*, a mockup of the paired Allison V-12s with shaft drive to a reduction gearbox and contrarotating propellers on lines almost identical to the Bugatti record aircraft.*

The US also showed interest in connection with the XP-75 project to build a heavy long range fighter to complement the P-51 Mustang. The prototype used a mid-mounted Allison V-3420 24 cylinder engine, effectively a paired version of their successful 28 litre V-1710, driving two three-bladed contra-rotating propellers through a long shaft and a nose mounted gearbox.

Asked for a slimmer version of the XP-75 Allison used its considerable experience in shaft drive systems to come up with E-24, a concept close to the 100P. The first general arrangement drawing showed something similar to the French Arsenal, with one V-1710 ahead of the pilot and the second behind driving to the well proven Allison reduction gearbox and contraprops. Second thoughts produced a layout almost identical to the Bugatti.

A pair of V-1710s was placed in line behind the pilot, driving through parallel shafts to the usual reduction gearbox and contraprops. As in the 100P the forward engine was offset to starboard and the rear engine to port. The angled engine layout of the P100 produced the slimmest possible profile for a record aircraft, but the parallel Allison engines were probably a better engineering and production proposition. No universal joints were needed and the longer rear shaft had an intermediate bearing solidly supported on the crankcase of the front engine. Parallel final driveshafts greatly simplified gearbox design and allowed an off the shelf unit to be used.

The twin engined E-24 reached design and mockup stage before cancellation. Development of the P51 as the Merlin engined Mustang provided the long range cover needed to protect the bomber force and removed the need for the larger and heavier fighter

The Bugatti Trust is grateful to the Rolls-Royce Heritage Trust for permission to use these illustrations.

Mystery Photograph from India

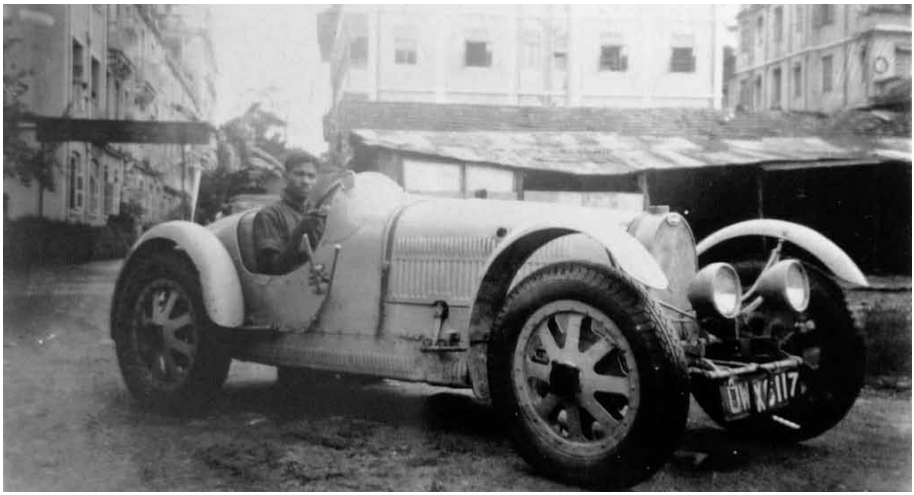
Hugh Conway

John Fasal has sent us two fascinating photographs of Bugattis in India which he found whilst undertaking research for a new book. One of the photographs is new to us and shows a supercharged Grand Prix Bugatti in Bombay many years ago apparently on its way to be scrapped. The number plate appears to be obscuring an earlier one. We have photographs of Homi Batlivala in the UK with his GP at Shelsley and Southport. It would seem that the two cars have the same registration number. Could this be the mystery solved? Any further information to assist in solving the puzzle would be welcomed.

The other photograph is of 44733 and has been well known for many years. This photograph was taken in 1967 when owned by Roni Kahn. It has been re-bodied and is now in the hands of VJ Mallya.

Compared with other luxury makes not many Bugattis were delivered to India. One source suggests there were 21 although this seems unlikely. It is well known that Elizabeth Junek went to India in 1929 with two Type 44s, one of which may have been 44733. We have also written extensively on JRD Tata's ownership of an un-supercharged Type 35.

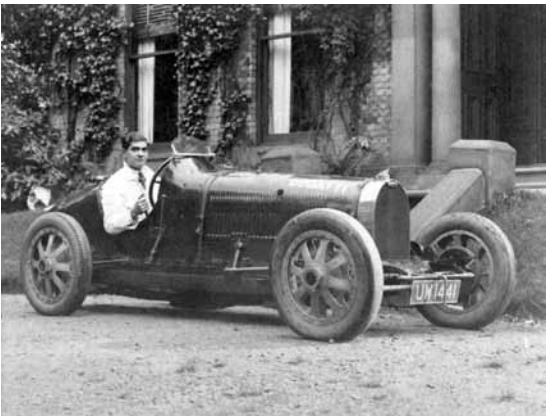
We have also seen a photograph of a 37 belonging to the Maharaja of Kapurthala and as far as we know Type 23 chassis number 2883 is still in India. Maharaja Jam Sahib Ranjitsinhji Vibhaji Jadeja of Nawanagar was known to favour Lanchesters, but according to H. H. Rana Manvendra Singh Barwani he also bought several sporting models for himself, including a 5-litre, 8-cylinder Bugatti. Described as having a boat-tail body with flashes of lightning depicted on its mouldings we wonder whether this is indeed the Corsica bodied car depicted and said to have been exported to India.



Grand Prix Bugatti 4807 en route to scrapyard in Bombay

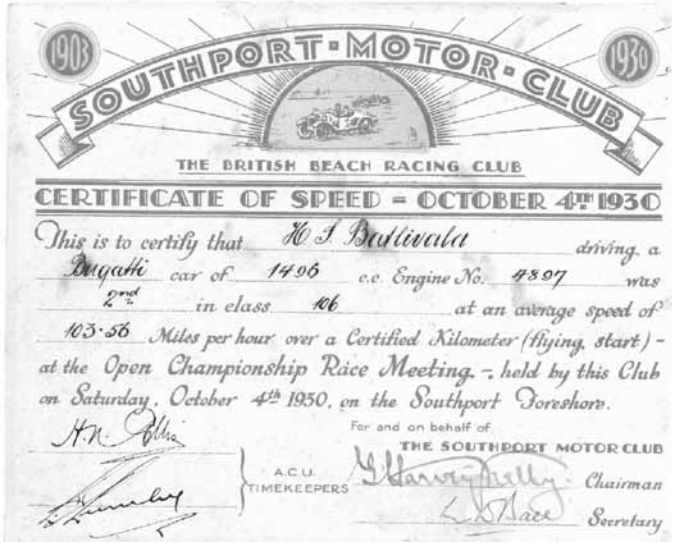
Many of you will know John Fasal from his authoritative works on Rolls-Royce cars. He has travelled the length and breadth of the country. He has met many of the Maharajas and studied their collections of luxury cars. His two-volume work on the extensive princely collections is eagerly awaited and should be published shortly. Whilst it will primarily focus on Rolls-Royce and Bentley, he will be including a chapter on 'competition and other great marques' so Bugatti will be included in a small way.

Type 46 Bugatti on Wimbledon Common with dramatic paint scheme



Homi Batlivala in his Grand Prix Bugatti

Type 44 when owned by Roni Kahn in 1967


1903 SOUTHPORT · MOTOR · CLUB 1930

THE BRITISH BEACH RACING CLUB

CERTIFICATE OF SPEED - OCTOBER 4th 1930

This is to certify that H. I. Batlivala driving a Bugatti car of 1496 c.c. Engine No. 48307 was 2nd in class 106 at an average speed of 103·56 Miles per hour over a Certified Kilometer (flying start) - at the Open Championship Race Meeting - held by this Club on Saturday, October 4th 1930, on the Southport Foreshore.

For and on behalf of THE SOUTHPORT MOTOR CLUB

A.C.U. TIMEKEEPERS

Chairman

Secretary

Certificate of Speed presented to Homi Batlivala 04 October 1930 by the Southport Motor Club

SCHD, Sammy Davis

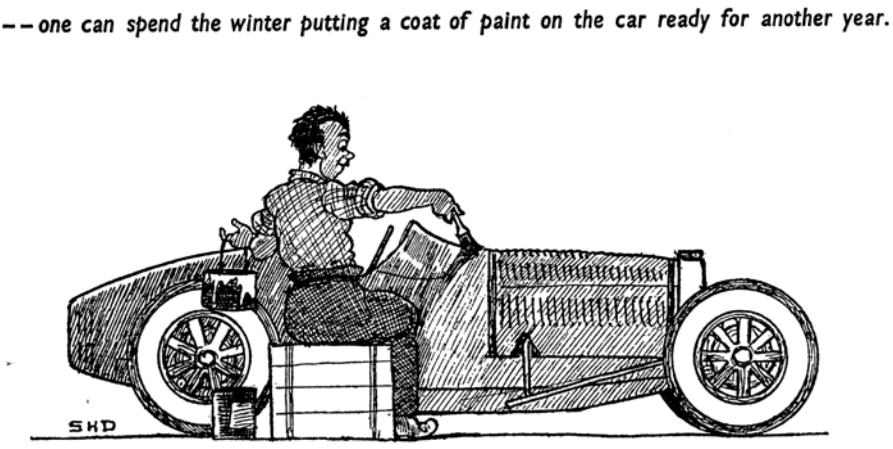
Sandy Skinner

SCHD, Sammy Davis was one of the most versatile and entertaining characters on the British motoring scene. Daimler apprentice, RN Air Service officer in WW1 and Army in WW2, Le Mans winner and later team manager for Bentley, author, cartoonist, BRDC committee member – – one could go on. His Leon Bollee tricycle, imported and (economically) declared at Customs as 'agricultural machinery', was known as Beelzebub and flew a flag string. Decoded, this read 'I am manoeuvring with difficulty'. He wrote and drew for Automobile Engineer where his friendship with Jarrott and Letts, Bugatti concessionaires, may explain the laudatory 1917 test of an 8 valve car but is best known as sports editor of The Autocar under the pen name of Casque.

He was a competent artist in oils and late in life would turn out work in his characteristic style more or less to order. A surprising number of Bentley owners own an original Sammy Davis painting of the White House crash at le Mans in 1927 from which Sammy extricated a rather battered Old Number Seven to win.

Sammy's cartoons decorated several of his books as well as appearing in collections such as 'Casque's Sketch Book' and 'More Sketches by Casque'. A consistent theme was the problems of designers, mechanics, officials and drivers, often involving a small dragon-like animal which must be the ancestor of the Gremlin which so troubled RAF pilots and fitters. British cars were his staple subject, unsurprisingly considering his close links with the industry, with excitable Italians making guest appearances.

Bugattis appear occasionally, drawn with care, respect and humour. These come from a pre-war sketchbook: the subtle layout of one caption is Sammy's.



The Bugatti GP Compressor

David Morys

During the course of our time researching component drawings necessary for the refurbishment or making of replacement parts a recurring theme emerges for specific items and their various applications.

For those in the know the conundrum that is a Bugatti parts list holds no fear or contradiction. However mere mortals who might rightly assume that "C" follows "B" follows "A" etcetera would regrettably, in this instance, be woefully wide off the mark.

Let us take one example that has cropped up on numerous occasions over previous years, the Bugatti compressor, supercharger or blower if you prefer.

If we start at the beginning, scanning the aforementioned parts lists for the Type 35, one would expect to find a section titled "COMP" devoted to the compressor yet there is nothing in the parts list we hold at the Trust*. This in itself confuses matters and then when one looks in the T37 parts list the "COMP" section though containing a number of associated ancillary components has but a single line entry for the compressor, "1 Compresseur Petit Complet" and another line for the compressor drive.

This is all rather baffling until taking another step forward chronologically by combing the Type 51 Parts Lists. At last light begins to emerge from the end of the tunnel.

The first line in the "COMP" section lists 51 COMP 3 "Corps du compresseur", the casing that contains the two rotors. More interestingly there follow countless entries over five pages listing Type 39 "COMP" numbers. Most illuminating are those for the end plates, 39 COMP 20 and 39 COMP 21 "Flasque avant" and "Flasque arriere" and the end covers, 39 COMP 23 and 24 "Couvercle avant" and Couvercle arriere".

From this we begin to understand why there are no Type 35 or Type 37 compressor drawings in the Parts lists for the core components. If we divert our attention away from the topic for a moment and delve into the history of the various derivatives of T35 chassis it doesn't take long to find the Type 39 in blown form preceded all of the other versions that we have discussed above. We are then drawn to the Type 39 parts list that embraces all of these major components (with a few exceptions) and from this we can see clearly that blown Types 35, 37 and 51 are the recipients of the same.

The Table below shows the seven key part numbers in detail for each of these types. However the five major components shared between types are the main casing and corresponding rotors, the end plates and end covers. One other point worth noting is the length of the casing and rotors that could be either 135mm or 185mmm in length. Typically the Types 35 and Types 51 utilised the long case described as the "Grand Compresseur" and the Type 37 the short case "Petit Compresseur".

It is also relevant to mention that the blower drive at the front of the engine is also shared across these types.

Of course these findings are eminently appropriate to blown Types 40, 43 and 55.

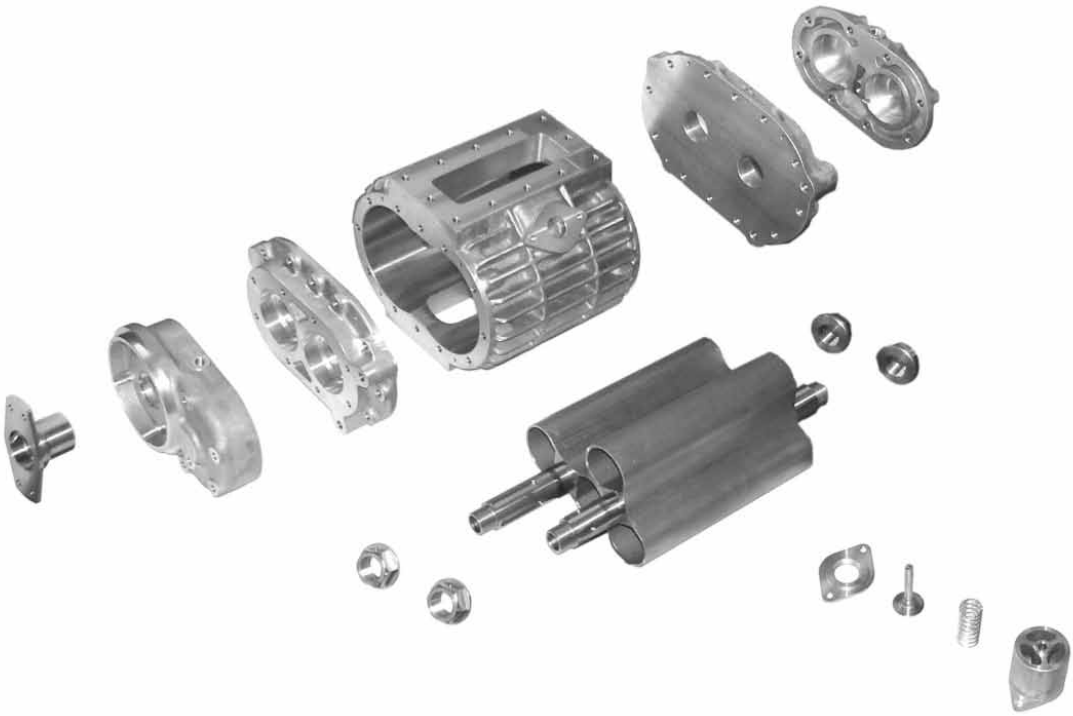
Bugatti Type Number	39	35	51	37
Bugatti Part & Description				
Blower Case	39 COMP 58	39 COMP 103	51 COMP 3 & 36	39 COMP 58
Blower End Plate Front	39 COMP 20	39 COMP 20	39 COMP 20	39 COMP 20
Blower End Plate Rear	39 COMP 21	39 COMP 21	39 COMP 21	39 COMP 21
Blower End Cover Front	39 COMP 23	39 COMP 23	39 COMP 23	39 COMP 23
Blower End Cover Front	39 COMP 24	39 COMP 24	39 COMP 24	39 COMP 24
Blower Rotor “Entraine”	39 COMP 16	39 COMP 139	39 COMP 139	39 MOT 16
Blower Rotor “Primaire”	39 COMP 17	39 COMP 140	39 COMP 140	39 MOT 17
Blower Drive Casing Front	39 COMP 120	39 COMP 120	39 COMP 120	39 COMP 120
Blower Drive Casing Rear	39 COMP 109	39 COMP 109	39 COMP 109	39 COMP 109

Note: Changes did arise partially for the blower casing and several revisions are listed. In fact there are three drawings in the archive for the “Petit” short blower, numbers 39 COMP 38, 55 and 58 and two for the “Grand” long blower, 39 COMP 22 and 39 COMP 103. You will also see that the Type 51 has drawings for the casing specific to this model, 51 COMP 3 and 36.

Though there may be exceptions or modifications to particular cars the “Petit” blower was predominantly used on Types 39, 37 and 40 though some early Type 35’s may have had them. The “Grand” blower was found on Types 35, 43 and 51.

Merely as an aside we have very few enquiries for the Type 57C and Type 57SC. However on searching through the “COMP” drawings it does not take long before we see something of a similar pattern emerging.

Though both were fitted with basically the same engine, the latter with dry sump lubrication, the Type 57SC came after the Type 57 but before the Type 57C. So it is therefore no surprise in the parts list to see that the seven major components for compressor on the Type 57C are T57 SC COMP drawings.



Type 57 blower components – Photograph: Courtesy of Crosthwaite and Gardiner

All of this makes sense of course and one finds it throughout the parts lists for all of the Bugatti Types. Here the commonality of shared parts is rife but so it was with nearly all of the car manufacturers. The monetary savings are enormous and why redesign when an existing component that serves the same purpose already exists and be procured from the parts bin without further cost.

From time to time members are surprised when confronted with drawings of Type 30 or Type 46 parts for their Type 57's yet this clearly demonstrates not only the cleverness of Ettore's parts structure but of his frugality.

** Though the Bugatti Trust holds no record for the parts list for the blown T35 it would surely confirm that what we already know.*

Bugatti 100p Replica Project

Report by John Lawson

Since our last report, we have made steady progress. John Lawson travelled out to Tulsa in May and installed the gearbox and oil supply system. Since then we have "run" the gearbox using electric motors to turn the shafts and can report that the box ran beautifully with no drop in oil pressure or levels and a stable temperature well within limits.

Concurrently with the installation, we finished the complex curved wing-fuselage fairings and they are currently being painted to match the rest of the aircraft. Before sending the panels off to the paint shop. we officially" rolled out" the aircraft on her own wheels in late October 2013, this is always a major milestone in aviation circles.

Scotty Wilson is now working on the flying control actuation system, a long and tedious task of measuring, cutting, checking and fitting the myriad of linkages, cranks, levers and rose joints required for the unique flying controls.

If everything goes according to plan, we hope to install the first engine toward the beginning of December 2013 at which point we can apply engine power to the gearbox and check that the long driveline functions as designed.

All things being equal, we will then install the second engine and start limited power runs and small taxi trials before disassembling the aircraft and moving it down to Muskogee airport. At Muskogee we have a much longer and wider runway, and this will enable us to carry out full power runs and high speed taxi trails before we finally look forward to that all elusive first flight in the early part of 2014.

Images below are from the "Roll-out"

Correspondence

Dear Hugh,

During the closing work for the Nordic Bugatti register we have discovered that there had been industrial cooperation between the lorry car manufacturer Tidaholm in Sweden and Bugatti. This took place sometime between 1909 and 1912. Snippets have been found from several sources:

1. The Georgano Encyclopedia provides a brief description of Tidaholm cars.

2. In Jaap Horst's Bugatti web, a Type 12 is mentioned as "reserved for Tidaholm"

3. A local Swedish club magazine, called Västgötabladet 2012-2 p8 has provided the following detail:

Four cars were built in 1911 and 1912. One of the passenger cars was said to have been exported to Russia to a Grand Duke in St. Petersburg. The engines were often German, but one of the cars, sold to Stockholm Södra Spårvägs AB (Stockholm South Tramways Ltd), had a Bugatti engine.

4. There is a Swedish book on all 151 manufacturers of Swedish built cars and provides a description of each. It confirms that only 4 Tidaholm passenger cars were built and none of them still exist.

Our preliminary conclusion, so far, is that the Bugatti works actually delivered one engine to Tidaholm and that this most likely occurred in 1910 or 1911. It was put into one of the four passenger cars and ended up with Stockholm Södra Spårvägs AB, which closed its operations in 1926. The Tidaholm passenger cars were heavy, probably because the company's usual production was for lorries and buses and the 4-cylinder Type 12 engine could have been too small for the intended car.

Noone seems to know of a Type 12, although Norbert Steinhauser in his book on L'Artisan de Molsheim refers to "The Old Engine" or "Type 12?" (his question mark). He states:

This four-cylinder engine unit was a continuation of the Deutz engine line, most particularly of the type 11, but was distinguished from it by the existence of three vertical valves per cylinder. It is not unlikely that the original engine, intended for aviation use, was given the type-number 12.

If an engine was delivered it must have been made according to drawings marked "Type 12" or similar. As it was a prototype engine and not well suited for its planned use, the project was closed after the prototype (my guess).

I am continuing my researches with the assistance of a local person who has an interest in Tidaholm cars.

I ask: can you or any of your readers provide me with information on the Type 12 and come up with leads to possible sources for the reference of a Bugatti engine delivered to Stockholm South Tramways Ltd. to which I refer above?

Bo Söderberg,
Västerås, Sweden

Correspondence

The last issue of your Newsletter was excellent as usual and I wait for the next one with relish. The feature on Wimille testing an Alfa Romeo at Luxembourg in 1939 was of highest interest, the more that it shows a rare picture of his T59/50B sports car. Alfa Romeo having entered blown cars, it is possible that for that race the Bugatti was fitted with a blower which it could not have in French races.

As an evidence, I have the copy of a note hand-written in French, undated and not signed, which came from Uwe Hucke via the late lamented Les Matthews. It lists various test carried on T50B engines and hereunder are two mentions translated into English:

A – "5) Test no 1013 – Type front plane – Mot no 7 – Luxembourg GP 320ch (20 April 1939) – 368ch (26 May 1939) – 404ch (27 July 1939)"

This mention infers that Bugatti intended to race a 'plane type' T50B engine, i.e. 4.7 litre blown. Curiously, the last of the three tests took place 23 days after the 4 June race!

The note offers another piece of interesting information:

B – "Mot no 5 – Plane/preparation Comminges (without blowers) 27/07/39"

It seems that at Comminges, Bugatti intended to fit another 'plane-type' engine, this time unblown in conformity to the French sports Car regulations in the 4 August race.

Interestingly, Mot no 7 was the front engine removed from the plane in the sixties. It showed traces of wear and Jaap Horst considers it should have been tested at Molsheim, a fact this note confirms. Jaap also mentions (page 53) that Mot no 5 was earmarked for the plane's inaugural flight, Therefore, Type 50B engines should have had quite a versatile career. (unquote).

With my best regards

Yves Kaltenbach,
Lyon, France

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on 18 January 2009

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