IAN CALLUM

The Anatomy of Design

Ian Callum is the Director of Design responsible for both Aston Martin and Jaguar. His latest Aston Martin design is that for the V12 Vanquish which is making its world debut at this year's Geneva Salon.

Ian's design for the Aston Martin DB7, now the most popular and successful Aston Martin model of all time, continues to receive critical acclaim and gain international awards.

He has a unique talent for automobile design and his philosophy was outlined during a recent discussion with Aston Martin dealers visiting Newport Pagnell to see the start of V12 Vanquish production.

“My objective is always to create a shape that is interesting, spontaneous and hopefully a joy to its observers,” he said. “It is important to me that people looking at my work get as much pleasure from it as I do in creating it.

“When I think of how a car should look, I obviously have a clear understanding of what the brief is and more importantly a clear notion of what the car should be, in this case an expressive Aston. Not a gentle discreet Aston, but an expressive almost menacing Aston. One that reflects the passion of the DB4 Zagato from the early sixties. It also should be modern and dynamic, as that’s exactly the spirit of the Zagato. This is not to be a retro pastiche, but a new car in its own right. But there can often be a fine line between modern and retro.

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“The whole point of the initial sketch is not so much to impress upon others what the car might look like, but to capture a carefully considered thought from my mind. That’s why it appears so free. It actually leaves me space to remember what that original thought was. What I have found through the years of drawing cars is that it is easy to become so engrossed in the artwork that the drawing itself starts to

take over from the initial idea and the spontaneity of that idea becomes lost. I have seen this happen so many times. When I review the work of my designers, I try to encourage them to capture what they feel in their sketches. Their ability as artists allows them to produce wonderful pictures, but often the picture can become the end in itself and not the means to an end as it should be.

"How do we get this initial thought into a more comprehensive form? First we have to produce full size images and sections of the car, enough to give a complete impression of how the end result might look. This can be done manually by literally creating full size illustrations, or more commonly these days we would employ a computer using engineering and package information. It does not always come easily, as the original concept never complies neatly with the reality of what is required. This is where we have to manipulate the concept to fit into what is feasible, but without losing the character of the original idea. We can then project these images full size onto the studio wall to provide a greater understanding of how the car will look. This information is also used to begin the construction of a full size model.

"The three most important visual aspects of a car style are:

Proportion, Form and Stance.

The proportion is the architecture. It's the most important of all. Producing a style is like creating a painting or writing a song. If the

draughtsmanship of a painting is correct then chances are it will work, regardless of what you throw at it or what the detail is. If the composition of the notes of the song is correct then the song will be instinctively understood and enjoyed by most. If the proportions of a car are correct then it will be perceived as an object of beauty, or at least of interest. If, however the proportions are wrong, then no amount of detailing or beautiful form will produce a wonderful car. The proportion is the draughtsmanship of the car. It's what your eye sees first. It's what your mind absorbs most.

"Let's take the DB7, a car we are all familiar with. The amount of effort to gain the right proportions within the given package was considerable.

"For example. The windscreen pillar or A pillar was pushed as far forward as possible. As I believe the position and angle of the A pillar is crucial to the perceived modernity. But given the engine is where it is, the resulting windscreen is quite flat. But that's OK. It seems to be an obsession with some designers to create curved glass at all costs. But I always believe it is the pillar that we look at and not the glass. The glass is transparent, the metal is not. The roof line was designed to give the impression of a dramatic profile. Now admittedly this does not suit everyone as it slightly compromises the interior package, but that is the decision we made to protect the style. In this case style was the priority.

“It is all a matter of balance and for Aston Martin I believe that this has to err on the dramatic rather than the practical, but without too much compromise.

“So having established how the style will look in two dimensions, the next step in the process is to produce a full size clay model.

“To build this we have a team of sculpture modellers who create forms to my direction. I am privileged to work with some of the best modellers in the world. Their understanding of what is required of the form is paramount. We work together considering every millimetre of the surface and after a few weeks the clay car should evolve into the desired shape. This will then be taken outside so we can see for the first time exactly how the car actually looks.

“But we have been looking at it for weeks. Surely we know how it looks. No I am afraid not. We think we do but often there are surprises in store. So what is so special about looking at it outside? Well I believe the only way you can make true judgement of such a product is in its natural environment.

“And how will the car look for the first time in this unforgiving environment. I can be pretty sure it is going to look awful. I am so familiar with that feeling of disappointment and even despair, having worked with such enthusiasm and passion on something you just

know was going to look fantastic. But it seldom is. At this moment the secret is not to panic, but to absorb, listen to people's opinions and then think very hard. I have seen so many designers completely lose the plot at this point – I have done myself, so what is usually wrong? The proportions.

"It's a funny thing but even after all that hard work of defining the perfect proportions in two dimensions, the three dimensional models take on a life of their own. Although experience has taught me a few tricks to avoid this by some degree, it happens every time. I like to think that sculptor Henry Moore went through similar agonies.

"This is where that original sketch comes back into play. How do we recapture the expression of that sketch, that character? It takes hours, maybe days of absorbing and analysing what has to be done. This requires an enormous amount of self-discipline, listening and often courage. The courage to tear up weeks of work. This is the defining moment. At this point the car could become brilliant – or just another car.

"If one analyses the design of the V12 Vanquish – starting at the front, a powerful face. The Aston Martin face is the most wonderful graphic you could ask for. It is a mouth with a sort of contented grin. A very knowing smile. A bit like James Bond I suppose. However to get that

mouth to do all the right things often takes many iterations and like a face it's a fine line between handsome and just plain.

"The bonnet surface sweeping up to the windscreen runs with an accelerating line, but much of the profile is developed almost by default This is one of those situations that can be the source of great frustration for designers but we try to work around it best we can.

"There is one European law that states the bonnet cannot be higher than four degrees down from the driver's eye. This eye location is determined from a position we call the H point – a position that we nominate on our package drawing. There is another law, only for the USA, that determines the position of the top of the screen, and this is calculated from the same nominated H point. It is actually to do with unbelted occupants not hitting the roof. So as you can see if we lift the bonnet line we have to lift the driver due to the European law and so therefore by a totally unrelated law from another continent we would have to lift the top of the screen. As the proportion of the car is more sensitive to the top of the screen the bonnet line is squeezed in to fit where it can, between the two laws.

"The form on top of the bonnet is produced to give the impression that the surface is under tension. Almost as if something is trying to burst through the surface – something very powerful.

“The phrase “surface tension” is one of my favourites. It is about creating the feeling of just that. Almost as if the surface is like a skin pulled taught by muscle – an impression of controlled power and even sensuality.

“One of the features of this bonnet I particularly like are the set of light-lines that converge just inside of the wing half way up the bonnet, but due to the complexity and sophistication of the surface they don’t actually meet. This is difficult to explain without seeing the real car, but believe me there are many days work in that area alone.

“Light-lines are another phrase we designers use. These are the lines created if you shine strip lights over the body surface and act as a visual indicator to the purity and integrity of the form. The easiest way to describe this is the effect you see on a car when you go through a tunnel with overhead lighting. You will see the light lines run like liquid over the metal and you should see exactly what the surface is doing. This image is created by using a computer to simulate the same effect.

“The side profile of the car. Simple – this is created from a series of lines designed to give the car drama. Some are working in harmony with each other and some in discord.

“Let’s look at the main architecture. A dramatic wing that looks like it’s ready to snap – it’s under tension. This is complemented by the rear wing driving up from the ground and driving forcefully towards the back. The two lines are then bridged by the strong but simple third line, the profile of the roof. This visual bridge runs in sympathy with these two elements amounting to a powerful and effective statement. In designing a car I always try to create something that can be recognised by three or four simple lines.

“Now if this was meant to be a more relaxed car such as the DB7 then I would have left it at that, but to create drama it was necessary to capture a more aggressive and powerful aesthetic, so the angle of the side glass is line increased and the resulting line almost behaves in discord. This has the effect of setting all the other controlled lines into a state of discomfort and unease. This creates tension and recaptures some of the drama of the original sketch. And then to throw even more power towards the front, the dramatic sill line unleashes like a knife cut towards the rear.

“Now looking toward the back of the car, we see the proportions of the cabin tucking in towards the rear emphasising the power of the rear wings. This is where the power reaches the road.

“The relationship of the masses over the rear wheels is crucial to the stance of the vehicle. What really makes a car sit right on its wheels is

not just the closeness of the wheels to the body, but also how the masses sit above the wheels. For instance if the cabin were further out over the body then the car would not look as powerful. If you look at the DB7 on the road it does tend to sit better than most cars. In fact I think this is one of its most endearing characteristics. We worked very hard on it to achieve the right proportion and stance, making sure the relationship of the body masses to the wheels were nothing short of perfect and of course making sure the ride height was right to make the most of it. However this isn't new. I had a good look at the DB2 first.

"And so to the finished model of V12 Vanquish. From initial concept sketch to concept design, complete with proportion, form, light lines and stance. A car structured visually from three simple lines and a car that absorbs all the character and heritage of its inspiration, the DB4 GT Zagato , but resulting in what I like to think of as a thoroughly modern Aston Martin.

"Now I have only touched on a brief over view of designing a car shape. Believe me there is much more involved, such as how we integrate with all the aspects of engineering, how we study the packaging and how we have to design shapes that can be manufactured. And also how we have to convince manufacturers to produce shapes they say they can't make! This all requires much tenacity to reach a final product that relates a sense of beauty and

perception of quality. Every area is important, but in the case of sports cars in particular, it is the exterior style that evokes more discussion and emotion than any other. However the most valuable contribution to achieving a successful design is something that I find difficult to explain and certainly something a committee would be unable to come up with – **Intuition**."