## Volvo 164

## the first modern Volvo prestige saloon...

ave you ever wondered why a certain car or model of a car is made and is successful on the market? Or perhaps, wondered why a certain automotive concept or design study never makes it to production? It's a tricky one, isn't? I'm not sure either, but as a guide to solving the riddle, take a look at Practical Classics magazine, the March 2007 issue, page 82 to 84, that should be just enough to get your imagination spinning.

After spending 25 years with Volvo Car Corporation at its Swedish HQ, the Torslanda Plant and at the Design and R&D Centre, I can safely say I've seen worse, at Volvo and elsewhere. But, and this is important, I have also seen elegant and glorious design studies; concept cars as they are called these days.

Some of these design studies and concept cars I've seen made it through to production with minor or final adjustments and changes to design or engineering, or both. The car that wins the market race has, in most cases, an instant appeal, says something to an individual, something that not everybody else emotionally or intellectually immediately realises or understands. It's about elegant architecture, art even, in some rare cases. It's all in the eyes of the beholder.

The following is my story of the Volvo 164 with some factual background to the project and its complexity. In fact all new car programmes are complex by nature. They are industrial development projects involving land usage, investment in production capacity, investment in R&D, investment in marketing and sales, investment in logistic structures, component and part supply chain and last but not least, investment in people, people with a multitude of skills on all levels working together. This applies to all automotive projects regardless of manufacturer, whether they are based in Europe, USA, Asia or South America.

So, let's look at the Volvo 164. Where did the ideas for this car come from? What was the thinking behind it?

During the mid to latter part of the 50s, the PV444/PV544, a small to medium sized two door "fastback" style saloon, had become well established and sold successfully on all traditional and new Volvo markets. The Volvo Amazon/120 had been introduced in 1957 and all indications pointed to another big success for Volvo. In other words, time to move on with planning for the future! New horizons to conquer! Let's get on with it!

A new saloon concept called Project 358 saw the light of day during the last

shivering days of 1957 through to the month of March 1958, get it? 3 = March, 58 = 1958; easy and logical for all to understand!

A closer look at the specification document told of a large luxury saloon with a 3.6 litre V8 engine and a 140bhp capability, a luxurious and well appointed interior, a choice of automatic or manual transmission, individual front suspension, disc brakes, live rear axle and pneumatic suspension, a wheelbase of 285cm and a total length of about 500cm to replace Volvo's large saloon ranges from the 40s and 50s, the PV800 with its design and engineering roots in the thirties, and the PV60 range from the 40s. The Company needed a large car for modern times, a car to do battle with Mercedes-Benz on the important American market.

The 358 project ran into trouble when further market research in the summer of 1959 showed that large car styling in North America was on the verge of moving towards something best described as "compacts", or down sizing of the traditional US car. A rethink of the project was vital to safeguard its commercial potential and capital investment.

At this point in time the PV444/PV544 was twelve years into its production run,



with the Amazon/120 series in the very early stages of its successful market penetration on all of Volvo's major markets.

The Company was now earning good money. Money needed to meet the expansion plans, investment in production capacity at home and abroad as well as new models to offer potentially new and established Volvo customers. Models for the future, for the late 60's, the 70s and beyond...

The specification for Project 358 partly merged with the P660 (6th June, 60th 1960) project into an up-to-date development programme, with a much greater economic potential. The P358 was quietly laid to rest in the misty history of great and glorious projects never to be realised, but never forgotten by people in some way involved with it.

The P660 project was intended as the replacement for the Amazon/120 range of cars at some time in the future. Deep down, buried you might say, in the specification notes for this project, Volvo had the embryo not only to the next standard range of cars, but also for a larger, more luxurious saloon, the car that later would be known as the 164, Volvo's first modern prestige saloon.

1956 marked the beginning of a new and expansive period for the Volvo Group, specially the PV operation (car operation). Mr. Gunnar Engellau, the newly appointed President, quickly implemented export and sales expansion plans for the car business with the aim of conquering the US market. Proceed with caution was the attitude of the Board at the time. Volvo had only the P444/P544 to offer the Americans; some said it would be like "selling ice-cream to Eskimos". Still, the Amazon/120 would soon be available to the Americans, the British, the Swedes and the rest of Volvo's new and established markets.

Despite the caution displayed in some quarters of the Board, optimism and energy was running high through the veins of the Company from the mid 50's, when projects like the P358 were conceived. Other projects like the P1800, a 2+2 "sports/GT" car got underway with a planned market introduction 1961. The P1800 had flair and sexy styling with most of its underpinning from the Amazon/120 programme.

Only months after the introduction of the Amazon/120 in 1957, work started on new car projects and potential derivatives for the future. The future looked bright, very bright indeed!

Then, BANG! 1960 became the year when "dream & hope" clashed with reality. The dreams almost died...

Somehow, somewhere, there is always someone with a DREAM... But for now, the product planners, design engineers,



stylists and model-makers, the Company Board and management were suddenly facing a new world. The P358 with its V8 engine programme was abandoned and so were most of the grandiose ideas of a high end luxury car; out went the pneumatic/air suspension ideas, the long wheelbase and the overall dimensions of Volvo's intended luxury car for the 60's and 70's.

Nice try though, with the "358" I mean, but from now on, best foot forward, carefully, let's see what's "around the corner" before we jump. Let's scale back a bit guys, were words on everyone's lips.

But hey, stop for a minute; the concept of "compacts" was still very much a reality. Why don't we just go back to the P660 project for a second look at what's on the table? So they did!

The idea of the "compact" had taken hold in people's minds. Work got underway on the re-juvenated and respecified P660 project, now renamed the P1400 project, with high octane doses of enthusiasm; optimism was back!

The specification sheet for the P1400 project was quite strict with a four cylinder engine (B18), four speed manual gearbox (Volvo), with or without overdrive, or a three speed automatic (BW35) gearbox, rear wheel drive with a live rear axle, a wheelbase of 260cm (identical to the Amazon/120), track width to be 135cm front and rear, a two door, a four door and an estate version to be included in the development programme. The car was to be introduced around 1966 as a replacement for the Amazon/120 range.

A six year development programme from a blank sheet to a car on the road was now underway. Numerous full scale exterior and interior styling studies / models were created as part of the project development and its decision making process towards the final design. A number of full scale models of the P1400 were also produced by Italian design houses as a counter balance and a reference point to the work done in Gothenburg. Alongside the styling work, the design and test engineers were busy working on chassis, engines, transmissions, body structures, body panels and glass, electrics, steering and brake systems, interior design and "packaging" and most importantly, passive and active safety features to be included in the overall design of the car.

A "small boy" like Volvo in the automotive playground couldn't and can't afford to get it wrong. There are very few second chances in this business, not these days, not back in the 60's either!

Why do you keep on talking about the P1400 when you should be talking about the Volvo 164 you may ask? Parallel and within the development team of the P1400 project, a second team of design engineers were again working on the development of a larger, more luxurious saloon as proposed / indicated in the project specifications for the P1400 as a derivative project code named P1400/164. To make things still a bit more complex or confusing, within the overall P1400/164 project team, a separate third and yet smaller group of design engineers worked alongside Mr Jan Wilsgaard, the design chief, on an exotic 2+2 sports car cum GT with a straight 6 cylinder or V8 engine code named P172.

The DREAM was alive! The concept took its underpinning from the P1400/164 project but with a wheelbase identical to the P1400; 2600 mm. It was a low slung beauty with Italian styling cues and a certain Scandinavian substance to its overall exterior / interior styling impression. Think about it; a luxury saloon and a 2 door luxury GT from Volvo in late 60's! That would have been bold, brave and fantastic!

But finally, in the sharp light of reality, the Board pulled the rug under the feet of the P172 project team in 1967 caused by escalating cost in the industrial system (mainly production capacity) as well as soaring product development cost, with poor profitability analysis weighing heavily on everyone's mind. Reality caused pain in the organisation; we wanted the Dream project... The P172 had to go, but my God, we all wanted this one on the road!

The message was again loud and clear; focus on the potential big earners, not the exotics with slim profit margins! A serious bit of financial concern and caution had hit us, as it had in the past and certainly would in the future.

The P1400/164 had a wheelbase of 2700mm, 10cm longer than the P1400 model, to accommodate an inline 6 cylinder engine. The engine would be around 3 litre with a capacity of about 140 to 150bhp. It should have a choice of manual or automatic gearbox, disc brakes, rear wheel drive

with a live rear axle and maintain the same interior space as the P1400 but with a more luxurious interior appointment and equipment, presented as a 4 or 5 seater saloon, colour coordinated leather or plush seating material with thick floor carpet.

The P1400 and the P1400/164 were to share all body panels, including windscreen and rear screen, doors and glass areas from the A pillar and backwards. The only area that differs on these two models is the front end, bonnet and front wings including headlights, indicators and bumpers, the P358 project turned up again on the P1400/164 as part of the new models' styling and design language. The time was now right for the grand, imposing front end of the '358' project to be transferred to a prestige saloon, later known as the Volvo 164.

The body of the Volvo 164 was an integral, all steel, welded construction

welded construction incorporating front and rear impact absorbing sections for passenger safety. The Volvo 164 was a 4 door saloon only.

The car had independent front suspension, coil springs, upper and lower suspension arms, incorporating a stabiliser bar and telescopic shock absorbers. The rear suspension was set up in conjunction with a rigid rear comprising axle, trailing arms, torque rod, coil springs and

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making the P1400/164 474cm long compared to the lengths of the P1400, 464cm with all other dimensions identical, interior and exterior. The two cars were to share, in principle, all or most mechanical and electrical

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Volvo's design & styling chief, Mr. Jan Wilsgaard, responsible for the Amazon design and all other cars to follow long into the mid 1990's had earlier been working on a dramatic and elegant, some would say a Wolseley 6-99 . Rover P5 Vanden Plas like styling for the front end; proud, upright and "aristocratic." Mr. Wilsgaard first tried this idea on an early styling study on an update of the Volvo 544, imagine that !!! It looked sensational, some would be kind and say "different", but that's another story.

So, the imposing front end design from

a Panard rod. Telescopic shock absorbers were fitted between the body frame and the trailing arms.

The steering gear was of the recirculating ball and nut type with a collapsible steering column for driver safety, related to any frontal impact accident. Turning circle for the early Volvo 164 was 10 metres with a 4.8 turn, from lock to lock. On the later models with power steering that was reduced to 3.7 turn, lock to lock.

The braking system was a dual front / rear triangle all wheel disc type, retaining 80% of its full braking capacity in the event of one brake circuit failure.

Wheels and tyres on early cars were 4.5 x 15" steel - 165 x 15". Later cars had 5.5 x 15" steel / alloys - 175R x 15".

The Volvo 164 was introduced in 1968, two years after the introduction of the Volvo 140 range of cars. The same year also saw the introduction of two new Volvo engines; the trusted, tried and tested B18 was replaced by the B20 for the Volvo 140 and Amazon/ 120 cars.

With the introduction of the Volvo 164, the B30 engine appeared on the scene. The B30 engine was basically a derivative of the four cylinder B20 engine. This gave great economic advantages to Volvo, with lower production costs, because most internal engine parts were interchangeable between the two engine types. The B30 engine and all other engines at that time were produced by Volvo's engine plant in Skövde, a 2 <sup>1</sup>/<sub>2</sub> hours drive north east of Gothenburg on a 'just in time' delivery basis. In today's international automotive language, this is called sequential parts and components deliveries to vehicle manufacturers' assembly plants.

This meant a delivery schedule to the Volvo Torslanda Vehicle Assembly Plant by way of road transport only 6 hours ahead of body/chassis and powertrain/driveline "marriage" on the assembly line. The automotive production phrase "marriage" refer to the point in the assembly process where body/chassis and powertrain, (engine, transmission) and driveline (propellershaft and rear axle) meet and are bolted together. I cannot remember, during my

time as a production manager that we ever lost a truck load of engines, summer or winter caused by road accidents. Steady drivers they were!

The B30 engine was a 6 cylinder in-line type with overhead valves operated by pushrods. The cylinder head and block was of cast -iron construction, with light pistons. The alloy engine had a seven bearing crankshaft while the camshaft ran in four bearings and timing gear comprised of a crankshaft sprocket which mated with a fibre gearwheel. The initial version of the 1330, 2978cc, had twin Zenith-Stromberg carburettors with an output of 145bhp SAE @ 5500rpm, 163 lb/ft @3000 rpm.

During the 7 year production run, the engine was upgraded step by step, year by year. The final B30 versions, introduced in 1972, were the B30E and B30F; both fuel

injection specification with a capacity of 2978cc, 175bhp SAE @ 5800rpm, 178 lb/ft @ 2500. Back in the early 70's, this type of engine was seen as a real "power house", a "muscle car" if you like that term better. It was an engine first and foremost aimed at pleasing the discerning American market without losing sight of the emerging and increasingly important executive car market segment in Europe.

The 3 speed automatic gearboxes were supplied by Borg Warner, the BW35. The manual gearboxes, M400 (four speed) and M410 (four speed with overdrive); rear axle, propeller shafts and brake components were supplied in house by Volvo subsidiaries. A well defined and implemented component and parts logistics operation embedded in the production system is a key element in keeping production costs down, as it was then and still is today.

The interiors were to a large extent produced by Volvo owned subsidiaries. Body panels and structures were produced at the Torslanda Plant in Gothenburg and at the Olofström Body Pressing Plant, later to become a wholly owned Volvo subsidiary, in southern Sweden some 225 miles away and



brought to the Torslanda Body Assembly Plant by train.

By the time of the Volvo 164 introduction, Volvo had a high value and volume parts and component content imported from the UK. Producing cars "the Volvo way" meant buying parts and components, on Volvo specification, from quality manufacturers around the world. Logistics and transport was and still is a key element in successful Volvo car manufacturing.

From the early 60's Volvo accelerated its PKD and CKD operations around the

world, PKD "partly knocked down", CKD "completely knocked down" car bodies or body panels and parts for local build, one such operation being based in South Africa. Volvo 164's build in South Africa had part locally built interiors. One example is the rear seat or bench, looking distinctly different, but still familiar to the cars produced in Sweden. Even the exterior paint and body treatment programme could slightly differ from the Swedish standard, depending on local market conditions. This as an example of Volvo's manufacturing and commercial flexibility in establishing itself in far flung markets.

Power steering became standard equipment from the autumn of 1970. At the same time the wheelbase was extended by 2cm without extending the overall length of the car, resulting in improved ride quality. A stereo radio became standard equipment and other goodies like head restraints were included in the annual upgrade of the model this year for increased driver and passenger comfort and safety. By now you could order most automotive luxuries worth mentioning, like air conditioning, cruise control, electric window winders, a choice of manual or electric sun roof or moon roof as the Americans say, heated rear screen. heated seats, the list goes on with bits and pieces we today take for granted on our cars, but at that time was the exception rather than the rule.

Autumn 1972, the Volvo 164 was given its first major facelift. The

changes included a redesigned exterior front end with a shallow grill area compared to the car's original taller grill styling. The car was given a straight, horizontal, slim line rubber clad bumper treatment and new "flush" door handles. One item stayed as originally designed, the front indicators were fixed to the front bumpers throughout the production run. The car's interior was redesigned, including a new instrument panel with analogue round dials for the instrument cluster instead of the original horizontal "thermometer" style instrument. Interior and exterior colour schemes were part of the annual upgrade.

Then, in the autumn of 1973 the car had its final "facelift", a redesigned rear end including light clusters and body structures around the rear axle to accommodate a repositioning of the fuel tank for rear end impact safety reasons. This again included a new design of the bumpers, front and rear, ungainly looking big lumps of aluminium bars with a wide strip of rubber across the full length of the bumpers. These bumpers, with design and engineering roots from the 1972 VESC (Volvo Experimental Safety Car) project, indicated what was to come on the Volvo 240/260, the replacement of the 140/164, to be introduced in 1975. The large heavy looking bumpers were to adorn the Volvo saloons and estates for the next five years. The bumpers increased the length of the car from 472 cm to 487 cm. Volvo 140/164 and 240/260 owners either loved them or hated the sight of them, most people got used to them, accepted them even, because Volvo said they were "good for you" if you had a crash, these bumpers were an integral part of the car's "passenger safety cage" structure.

In terms of Volvo design and styling language, it is interesting to see that the broad "shoulders" of the 140/160 cars, carried over to the 240/260 models in 1975. Stretching from the point where the A pillar meets the top of the front wing, runs all the way back to the C pillar and out on top of the rear wings. The "broad shoulders," the so called "cat walk" has made a return in the design of modern Volvos like the S80 from 1998 and on to subsequent Volvo models like the S60, right up to today's C30, S40, V50, C70, V70 and CX90 models.

In my mind, Mr. Jan Wilsgaard, the then design director, introduced the "cat walk" on the Amazon/120 range of cars back in 1957, although less pronounced than today's cars. Mr. Wilsgaard in turn was inspired by earlier Volvo models like the PV444, Italian and American auto design when he was looking to the future.

Mr. Peter Horbury, Ford's now (2006) Corporate Group Design Director, the man responsible for the Volvo S80 design during his tenure at Volvo, took a long hard look at Volvo's styling and design heritage and realised and understood the history and tradition of what was in front of him and brought styling elements of old back into the modern shape of today's Volvos.

Volvo produced 1,351,119 cars of the 140/164 range of which 146,008 (the numbers differ depending on source) was of the Volvo 164 model during the

seven year production run. The 164 sales figures for the UK are uncertain and have not been confirmed by Volvo. I estimate some 1000 or so were sold in the UK annually between 1968 and 1975. Most of the Volvo 164 was sold in the US. The Volvo 164 became the most sold 6 cylinder car in Sweden back in the early 70's, beating the competition by a wide margin.

So, how was or should I say is, this car to drive? The Volvo 164 evolved and was upgraded and refined year by year during its time in production. The car was set up to please Americans more than the Europeans. The purists would say that the first couple of years were the golden period, possibly a bit parsimonious unless you added goodies from the Options List, like an air conditioning system perhaps or why not a cruise control for your comfort on those long journeys down to the French Riviera.

The car was understandably heavy up front with the weight of a massive 6 cylinder engine and its heavy duty front independent suspension design. Pronounced under steering was a fact of life with the Volvo 164. There was and still is a remedy for the problem. Fit a 1 inch stabiliser bar instead of the standard kit and you suddenly have a much more modern feel to the driving experience.

The large glass area gave the passenger compartment a light and airy feel. The car would run out of steam at around 105mph, but was pulling strongly at lower speed with high torque at low engine revs. You could drive all day in a large and comfortable seat, "sailing" around town in 3rd or 4th gear, no need to pump the clutch pedal at every corner. With an auto box, the car was Mr. Smoothy himself. Just up my street! That's what I like, lazy, massive low down pulling power on a slow revving engine, hardly audible. What better way to travel?! Open the driver's or passenger front or rear doors; you and your passengers step in/up ever so slightly, just like my late father's black 1949 Plymouth Special De Lux; sweet childhood memories.

The seating arrangements gave you an elevated seating position, front and back. The view over the broad muscular bonnet is most satisfactory and enjoyable, pleasing and massaging your ego and soul. It gives you confidence about the car's capacity and capability. The passengers in the back and your companion up front will enjoy a travel experience you only have in large comfortable, whisper quiet cars, as you enjoy the world passing by on the highways and byways of Britain and Europe.

I had a 1973 model, manual gearbox, burgundy red metallic with black leather seats, ox blood red thick carpet, manual operated sunroof, and electric window winders. The car was for gliding, preferably straight ahead at a gentle, sensible and comfortable speed. It was not for hurried runs on Britain's minor and bendy B roads.

The car talked to me; "don't rush me", it whispered as I enjoyed the landscape passing by. Progress along the road was near silent, almost like my dad's Plymouth from 49, or a Jaguar, XJ6, 4.2 engine from the 60's and 70's.

Volvo 164; M-M-M-A-A-A-G-G-G-I-I-I-C-C-C!!!

## March 2007 Asbjörn Stragnefors

Thanks to: Vin Perry French and Kelly Day of Volvo Car UK Ltd, Customer Relations, Roger Sampson and Robert Isaac of Volvo Owners Club Ltd, Claes Rydhoim of Volvo Car Corporation, Heritage & Archives in Sweden for all help and assistance with this story. Reference literature: Bjorn Lindh's Volvo The Cars from the 20's to the 80's as well as public Volvo literature and brochures.



- Volvo Driver Summer 2007

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