A TALK ON THE ORIGIN

AND DEVELOPMENT

OF THE HOLDEN

by

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A Talk on the Origin and Development of the Holden Car

Summary

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Development of the Holden Car

Introduction

Mr President and Gentlemen – good morning.

My talk this morning covers the development of the original Holden from its conception up to the Commodore models.

The Holden has become, to many of the older generation, something of an icon. This, I believe, is partly due to the fact that the car was produced immediately following the war years and together with the Snowy Hydro-Electric scheme were projects of national importance and which provided the economy with a tremendous boost. At this time, remember that Australia's population was little more than 7.5 million.

However, before we get too far into the story, I will explain to you my position in the whole scheme.

I was hired by the late Larrie Hartnett (later Sir Laurence) in Jan. 1936 as an Engineering Cadet. Not long after joining the co. I was made a Project Engineer on the construction of Fishermen's Bend Plant. This was followed by being sent to Perth to supervise the modification of the Perth plant. Later I was sent to Sydney for the construction of the Pagewood plant. Both the Melbourne and Sydney plants represented the latest technology of the time and became showplaces at that time.

During the building of the Pagewood plant I had joined the Army (RAE) but this did not last long, as I had to return to work on the plant. Soon after the plant was engaged wholly on Defence Department projects, one in which I became deeply involved, namely the building of the 25 lb. Howitzer Gun. This was a major and urgent task, as the Australian Army had none of these guns, they were still using the out of date 18 lbers ex World War 1. Our task was to involve manufacturers in NSW in the manufacture of the components. This was a massive task, as our manufacturers had no previous experience in making parts to Army Ordnance Standards on a volume basis. This involved reorganising many machine shops, redesigning and adapting machine tools, as nothing could be obtained from either USA OR UK. Whilst we were building the 25 lber our Adelaide plant built the 2 pound and 6 pound anti tank guns which like the 25 lber, was an excellent and efficient design. We managed with much hard work and long hours to get the 25 lber in production in 9 months and anti tank guns in 7 months. While we were building the 25 lber in NSW, Vickers Ruwolt were doing so in Melbourne

I mention these projects because these and other major projects during the war years developed the nation's manufacturing base which provided a starting point for the Holden project.

Following the war years, I was engaged entirely on design work and was sent to America where I worked with the American engineers on the design of the Holden car for approx. two (2) years. Later I became Chassis Engineer responsible for the suspension system (front and rear), the steering, the brakes and wheels and tyres. Later still I became Resident Engineer at the Opel works in Germany, co-ordinating among other problems, the design of the Gemini car.

The Holden Program

It is my opinion that the building of a car in Australia really started because of the wealth of experience built up, together with the advancement of technology during the war years. These events provided the initial stimulus and the motivation for Hartnett to pursue the task.

During the last few months of the war, the Government commenced the cancellation of war contracts and it was necessary to find other work for plants prior to the transition back to normal work. It was during this period that the Holden project started. Hartnett was fired up with the idea that GM should build the car. This was backed up by the Chifley Government as it was considered Australia should become more self sufficient in its manufacturing industries as a result of its wartime experiences of being inadequately equipped and organised to cope with the demands.

Hartnett's task, of course, was to convince the GM Corporation Directors that this was a feasible task for Australia to take on. To convince these people a series of comprehensive studies were prepared. These covered the political outlook for Australia, social and living standards, economic position, the education standards and the industrial capability.

The final result of this submission to the Corporation Directors, together with Larry Hartnett's enthusiasm and forceful character, enabled the scheme to be sold and the GM directors gave their approval to go ahead.

One problem following the Directors' approval was that the GM Finance Committee would not advance money for the project – which meant that Australia had to find the finance at home. The Australian government advanced £1,000,000 and the Bank of Adelaide £500,000.. Prior to the final submission, Engineering Department had established a broad specification for the vehicle we wished to build. Part of this analysis was the result of a questionnaire to a cross section of the public.

It is perhaps appropriate to mention here that the building of a car in Australia was not Hartnett's brain child. The seeds for a car were sown soon after the First World War when the government of the day was concerned with Australia's lack of independence in times of crisis. Succeeding governments continued to talk about the subject until the Menzies government in 1939 passed legislation which gave A.C.I. the rights to manufacture engines with a bounty on each engine produced. It also covered other components at reduced tariff rates. General Motors and Ford Co. protested as they claimed this was unfair and biased towards an Australian company. Like the previous governments, nothing further happened and later at the end of the Second World War, Hartnett grasped the nettle and with his energy and enthusiasm made it all happen. Hartnett must be given full credit for making the car a reality.

Legislation was introduced to make it possible for Holden to build the car and also make it possible to all comers rather than to G.M. & Smith of A.C.I.

The basic specification established was: (refer to Chart No. 1)

1. A six cylinder sedan
2. Five seat capacity with six, using a front bench seat
3. Good ground clearance for use in the rough outback country
4. Boot capacity of 150 lbs.
5. Light weight to give a good power/weight ratio. Wt to be approx 2200 lbs.
6. Minimum cost

This broad specification was based on our own research in Australia and was submitted to the Corporation Directors.

The Corporation Directors appointed a Senior Staff Engineer as C.Eng. to head up a group to do the design work. This group was selected by the C.Eng. who selected engineers who were prepared to come to Australia for a period. Attracting good engineers to Australia was not easy and monetary incentives had to be made to persuade them (details later). Part of the design team in the USA was to include a small number of Australians to gain experience and I was one of those selected. This group was set up in an office of the GM building in the City of Detroit.

Contrary to what has been said and reported in articles in the past that the design incorporated a Chevrolet design engine, this is not so. It was all a fresh design as such. It is appropriate to mention here that most design work is of an evolutionary nature. There is very little in design that is truly original. Most design work evolves from a predecessor in some form. For instance, six cylinder side valve engines regardless of size are all based on a common concept. This applies to most other components. Somewhere in the design records there is one on which most future designs are based. There is, of course, a good reason for this which can be mentioned later.

The mechanical components of the car were all of conventional and proven design. This was part of the original design charter. This was sound common sense as in a new design project there is no time to test and prove original concepts. The risks are too great. The body structure did differ from the norm in that whilst not original, was of a monocoque construction, that is, it was a stressed structure, based on aircraft fuselage design. This type of design saved weight as it dispensed with the conventional channel section chassis used in most cars at that time. This concept was never used by the Americans but was used successfully in European auto design.

A sub frame for supporting the engine and attachment of the front suspension system was a bolted on attachment (refer to Chart Nos. 2 and 2A).

The group completed all design work and as designs were completed they were released to the manufacturing sources or purchasing sources. This work involved the build-up of three complete cars and the completion of three sets of components. The cars and the components were shipped to Australia. This work involved the best part of two (2) years.

On completion of this work it was necessary to transfer the staff and their families to Australia. The total number of people involved was approximately 95 (including the few Australians). To handle this task the Corp. arranged with the Canadian Pacific Railways to put on a special train to take the contingent from Detroit on the East Coast to Vancouver in the west. From here the group boarded the old Wanganella which had been converted back from hospital ship to passenger. The journey back to Australia took 3 ½ weeks (today 2 days at most).

The Program in Australia

The organisation of the Engineering Department in Australia was set up with the American team in charge of the various sections. These, of course, were backed up with the Australian staff existant. Later, or course, as the project developed, additional staff were hired. IN the set up of the overall company organisation, there were six groups: Finance, Supply, Sales, Personnel, Manufacturing and Engineering, each section having its own director in charge. The Managing Director had only six directors reporting to him. This kept the organisation simple and effective (refer to Chart 4).

Some reasons for the success of the Holden are covered in Chart 3.

The task of the Engineering Department was twofold –

1. To Build up the components into complete vehicles, and

2. To commence road test work on two of the complete vehicles shipped out to Australia

Concurrent with this process, Manufacturing Department had to commence tooling to produce production panels etc for the body and also for the mechanical components it was decided the company should make. Other components were those Supply Department determined could be procured from local suppliers or, if necessary, imported from overseas. It was a policy of the Corp. that we would not make any components, which are already produced in Australia, which were competitive and could meet our specifications. Some parts were imported but only until such time as the local part could be produced to the required standard. This policy worked well but it required much hard work in getting local manufacturers equipped adequately and educated to produce parts in sufficient volume and to the

Road testing of the vehicles presented some problems, as this had to be done on local roads. We first had a round trip through the Dandenongs. It was not long however before the local residents complained about the cars travelling constantly in the area. This demanded a constant change in the route. Later – in the late 50's – we had built our own Proving Ground which solved this problem

After two (2) years work, we were ready for production and at the end of November 1948, the first Holden came off the line at Fisherman's Bend.

The Prime Minister, Mr. Chifley, had this pleasure. The car was identified as 48/215 – 48 Year of Release 215(Wt.abr.2200). Production at this time was 10 per day which was slowly built up to 100 per day and ~~it~~ in its later stages (in the 70's), it had reached 400/day in 2 shifts. (As a matter of interest, in November 1994, 10,000 Holden Commodores were produced at the Elizabeth Plant, S.A.).

The first major changes to the car were made in 1954 when we produced the FJ model. Later came the first major change with the FE and subsequently a change about every 2-3 years with a face-lift on a new model. Before introduction of the FJ model, we had designed the highly successful Holden Utility and Panel Van.

The building of the proving ground was a major project and proved to be an outstanding success for the company and a leader for the automotive industry. This project commenced in 1955 when we commenced looking for a suitable block of land within reasonable distance from Melbourne. We found 837 hectares of land at Lang Lang, on which we built a variety of roads – rough, smooth, water crossings, mud patches and a speed loop representing all types of travel in Australia.

Later we added a sophisticated laboratory specially designed for accident and crash test work.

In the intervening years, we have now produced many models and by the 70's, we were building Holdens 98% Australian and for a number of years, had over 50% of the market.

Holdens were exported to N.Z., South Africa, the Middle East, Pacific Islands and a number of other smaller countries (40,000/year max).

As time went by, the demand for Holden cars increased and plant expansions were necessary to increase production. In the meantime, most of the original American team had returned home to the U.S.A. and Australian personnel had taken their places. It is also appropriate to mention that the engineering skills of the personnel in Design and Manufacturing had developed considerably and we had become a highly sophisticated group equal to our American and European counterparts.

In the 70's, I was sent to the Opel works in Germany as resident engineer responsible for the original Gemini Vehicle Program.

CONCLUSION

It is now 51 years since the Holden car was launched in Australia. During this time much has changed, particularly so in the last decade. From being a car built in Australia with its own design team, it is now basically of German design and has quite a large content of foreign material. Originally it was approximately 98% local content. These changes have been brought about by economics, government tariff policy and the Senator John Button's plans on design.

Finally, on looking back after years of hard work, one ponders on the question of what it all means. On reflection, one recalls that we are all builders for eternity in some small way. This, in turn, reminds one of that old verse which I quote –

Isn't it strange
That princes and kings,
And clowns that caper in sawdust rings
And common people,
Like you and me
Are builders for eternity

Each is given a bag of tools
A shapeless mass
A book of rules
And each must make –
Ere life is flown –
A stumbling block
Or a stepping stone

THE ORIGINAL SPECIFICATION

1. A SEDAN BODY
2. A 6 CYLINDER MOTOR
3. SEATING CAPACITY FOR 6 PASSENGERS (Front Bench Seat)
4. GOOD GROUND CLEARANCE – 9 INCHES
5. LIGHT WEIGHT TO GIVE GOOD POWER TO WEIGHT RATIO
6. LOWEST POSSIBLE COST

CHART NO. 1

Chart 1

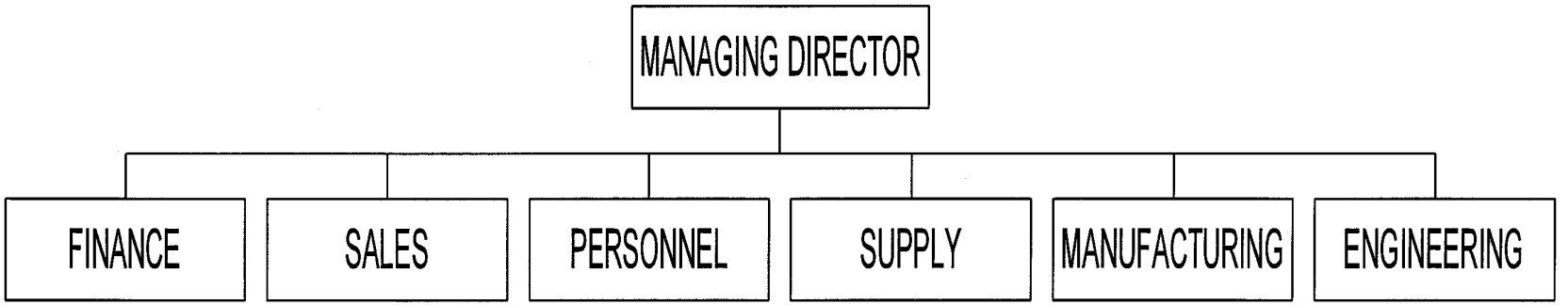
The original Engine Spec.
6 cyl. Side valve
132.5 cub. In. capacity (2171 c.c – 2.1 litres)
Pistons 3" | x 3 1/8" stroke
HP Rating 21.6 (SAE + RAC) Tax Rating
BHP @ 3800 RPM – 60
Wheel Base – 103 inches
Tread Width – 54 in F. 53 in. R.
Weight – 2230 lbs

SOME REASONS FOR HOLDEN'S SUCCESS

1. RELATIVELY LOW INITIAL COST
2. GENERAL RELIABILITY OF PERFORMANCE
3. SUITABILITY OF DESIGN
4. LOW COST OF MAINTENANCE
5. ACCESSIBILITY OF REPLACEMENT PARTS
6. GOOD RIDE AND HANDLING FOR MOST NEEDS

CHART NO. 3

THE ORIGINAL ORGANIZATION CHART



ALL DEPARTMENT HEADS ARE DIRECTORS

CHART NO. 4

SEPARATE NOTES

SOME RANDOM NOTES

"The engineer typifies the twentieth century" said Alfred P. Sloan Jr.

"Without his genius and the vast contributions he has made in design, engineering and production on the material side of our existence, our contemporary life could never have reached its present standard"'"

Engineers try to design a car like the Poets "Wonderful One Hoss Shay" which worked perfectly until one day (100 years = a day) every single part wore out at the same time.

Car engineers aim at a reliable life of 100,000 miles for all of the 12 – 14,000 parts in a car.

The modern engineer fits no single mould. He is part scientist, part inventor, part technician, part cost accountant – and almost always a specialist in a narrow field. A metallurgical engineer may spend years improving industrial means for making tougher metal machine parts. A chemical engineer may do nothing but study better ways to manufacture quick drying paints. Other engineers may focus on the design of highway interchanges or work assembly-line operations.

Car Panels

Outer	0.5mm.	26 gauge	.0186
Inner	1.5mm.	18 gauge	.059
Floor Pan	2.0mm	14 gauge	.078

Some of the highlights of my original stay in the USA

1. During my stay, the Automotive Industry celebrates its 50th anniversary. For this occasion, the main avenue in the City of Detroit was sprayed gold for a mile. During the celebrations I saw at close range many of the greats in the industry, namely Henry Ford Snr, Ransom Olds of Oldsmobile and Nash fame. Barney Oldfield, the first man to break the 100mph barrier in a specially built Ford vehicle

2. Met and talked on a number of occasions to Alfred P. Sloan, Chairman of GM Corp. and great leader in industry and commerce at that time.

3. Had the pleasure of meeting the great Benny Goodman in New York.

4. Saw many of the great entertainers of the day – Fats Waller, Lionel Hampden, Duke Ellington, Nat King Cole, The Inkpots, The Andrews Sisters, Sonja Heeney and many others.

5. The great post war strike in the automotive industry, running from the fall of 1945 thru March 1946.

6. On the return journey home across Canada, I was on friendly terms with the train conductor who is the man in charge of the train. He took me through the train to the engine driver's cab and I sat in the driver's seat and had control (under instructions of course) of the giant Pacific loco for some 100 miles.

3.0 The Work in Australia

3.1 The build-up and test work prior to production

3.2 The release of the first Holden in October 1948 48/215 Model – 48 year 2150 Wt. Target.Act 2200 lb.

3.3 The build- up of volume from 10/day to approx. 100/day to the first model change – the FJ in 1954

3.4 The build- up of staff, departure of Americans and sophistication of the Eng. Organisation and skill of the staff

3.5 The construction of the Lang Lang Proving Ground

3.6 The outstanding success of the Holden in Australia – over 50% of the market

3.7 The export markets – N.Z., South Africa, Middle East, Asia and Pacific Islands

3.8 The advent of the Japanese in the late 60's

3.9 The change in philosophy with the Button Plan and Government policy on tariffs

4.0 Post Original Holden to Commodore Models

4.1 Change in Eng. Policy on design. The original design work carried out at the Opel Works in Germany

4.2 Experiences as Resident Engineer at Opel in Germany for two (2) years

5.0 Summary