

# **CLUB INFORMATION PAGE**

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# NEETINGS

Club Neetings are held on the 1st Tuesday of each month except January at the Goodwood Scout Hall, Florence Street, Goodwood.

# Time: 7.30 p.m.

DATES-

6th
3rd
1st
5th
3rd

1990

**August AGN** – The Annual General meeting is held in August in leiu of the General Meeting for that month on a date to be decided.

	September	4th
	October	2nd
	November	6th
1.11	December	4th

Meetings may change if and when the committee feels necessary as appearing through this page.

The opinions expressed within this publication are not necessarily those of the committee except where indicated.

The committee accepts no responsibility for any damage of any form which may occur as the result of using information appearing in this publication.

This is the official publication of the "Leyland P76 Owners' Club of S.A. Inc." and is not for sale to the general public. Copies are included in a years Full Membership.

# **COMING EVENTS**

# JUNE

Sunday 17th Technical Day

10.30 a.m. on at Alan and Val Bakers home. BYO lunch, BBQ available.

This day will be like previous Technical Days where you can repair or find out how to repair anything you think relevant.

The recurring problem in Kyms car is presently okay so a major project on the day will be the fitting of a power steering unit to his car instead.

Any other problems you have or things you would like to see on the day, contact Alan 2611175 and let him know.

#### JULY

Sunday 15th Run to Woodhouse

This day is a general get-together and an opportunity for everyone to look over the venue for the Easter Meet next year.

Time, meet, map and other details to follow next month.

# EASTER 1992 ...

Some preliminary enqiries have been made into the situation of booking your passage on the boat to Tasmania for the '92 Easter Gettogether for those wanting to take their vehicle.

It is reported that the boat will be booked out within approximately eight weeks time for travel around Easter 1992. It is presently already fully booked until the end of 1991!

Hal Moloney has temporarily booked the thirty odd places left so if you are one wanting to have a space on the boat you must get in touch with Hal and let him know no later than the 31st of July.

You can contact Hal on (049) 661 763.

# WHERE'S STEVE?...

I know I get carried away and write too much causing David to restrict me to a certain amount of space but this is ridiculous! Actually, I've been a bit busy of late with SMASA, Distributor and the Rod Show but I'll be back next month. (Enter theme from the Twilight Zone.)

Steve and Hoto

# S.A. P76 CLUB NEWS

# **BITS N PIECES**

SUBS DUE...

June sees the end of another financial year and that includes the club's financial year also. Yes, which means your subs are due by June 30 for the coming 1990/91 club year. A renewal slip can be found within to make your payment, and the Treasurer's job of keeping track of them, easier.

# FILTERS 4 SALE ...

The club has a supply of Z86 oil filters for the P76 V8 for sale at the meetings. As a club we strive to make these available to you for under the normal retail price. Thanks to Richard again, we are able to offer these at a cost of \$8.00 each. Limited numbers.

#### DASH MAT DILEMMAS?...

The response with orders for Dash-mats has been somewhat disappointing considering a great interest was shown for these items. Unless you get your order in fast you'll either miss out or be stuck with whatever may be left over, perhaps even at a greater cost - if in fact we have the finances to go ahead at all!

Interest has been expressed in rear deck mats also but the same applies - unless we have FIRM orders nothing will eventuate.

Price \$39.50 (plus \$4.50 postage if required)

A deposit of \$20 per unit is requested or full payment can be made.

Orders with deposit (or payment), plus colour and pile required to :-

Kym Lindner 25 Maurice Road Murrary Bridge 5253 phone (H) (085) 324967 (W) 218 1384.

# MINUTES

General Meeting - 1st May, 1990. Held Goodwood Scout Hall

MEETING OPENED 7.53 P.M. .

PRESENT- 19 (as per Attendance Book) plus 1 visitor.

APOLOGIES- 7 (as per Attendance Book).

MINUTES of previous meeting were read and accepted.

BUSINESS ARISING- •Radiator Filters-Alan Schutz's is 1.5" size sleeved out to fit, generally doesn't consider worth it just for quick access. It seems to break down any flakes to dust which just sits in the bottom. Richard uses 'RadSok' [cheapsee past Club News) which works OK. Sway Bars-Kym found 22ml front and 19ml rear K-mac, \$49.50 ea. however availability now uncertain because K-mac has gone into recievership. Pedders can do for \$80, Lovells, \$90. Has order from Vic. for 7 front and 7 rear so will contact with developments and look elswhere. Nigel or lan will check with Industrial Springs. Ian has not made any progress with high volume oil pumps advertised. •Plastic pipes for heater-Kym suggested to see 'Auto Air'. •Oil filters-now available from meeting, cost \$8.00 each. Hot Rod Show-we are now not entered due to too many entrants. •Targa Caps-fair interest expressed at Get Together. Ian saw metal spinner-too difficult. David suggested with all parts manufacturing, Targa caps, Dashmats etc. we need money up front or at least a deposit to offset intitial costs. Decided to defer manufacture of Targa caps for a couple of months. Concentrate on Dash mats at this stage. •Kym's car (continuing saga)-Kym took the car back to Speedy for same problem, couldn't find anything except discs glazed up. Replaced pads with softer compound. •June technical day-Kym has no objection to Steve's proposal last month, but as the car is OK at the moment, would like to have the power steering unit fitted.

TREASURER'S REPORT- \$173.00 as end of April.

CORRESPONDENCE- IN- eNewsletters 1/NSW, Apr. 2/HV&NR, Apr. 3/Qld., Mar. W.A., Mar. eOther- 1/Travelaire Tours re US Drag Racing Tour. 2/FX-HZ Holden club re intro. new club. 3/Speedy mufflers acknowledging our letter. 4/L. Grosser, resignation. 5/Qld. club re committee and changes and address for club mail.

OUT- •Starter Kit 1/J. Polski, Parkside.

COMING EVENTS- as per newsletter.

May 20th - Obahn busway trip. June 17th - Tech day at Baker's. July 15th - Run to Woodhouse.

NATIONAL MEET- There is accommodation for 80 plus the 'Old House' and can feed 100. So far have deposits for 37 interstate people. Alan knows of approx. 92 wanting to come so far with still 12 months to go. May need two meal sittings if possible. Will look into catering. Will wait for a while until we have a better idea of number. Nigel suggested we have a run up to Woodhouse for anyone who wants to have a look. Alan suggested make it a July run. David suggested a letter to Birdwood to confirm our booking. Val to send it off. Rod Garnett now not attending the meeting.

GENERAL BUSINESS- Nigel welcomed our visitor, Doug, who is looking for a starter motor for a V8. •Article in next month's news re starters. •From Ballina-it was decided that T-Shirts etc. left over from Easter meets can be sold at a reduced price except the current one which will remain full price until the next meet. There was talk of forming clubs into one body. Also one Magazine maybe bi-monthly with contributions from all clubs. Alan suggested that in future as clubs get smaller it may be necessary to do so then. Total membership Australasia wide is around 520. Suggested name kicked around Con/Federation of Leyland P76 Owners, to include NZ. After Nat. meet next year Hal Moloney is talking of organising a trip up North to Ayers Rock etc. and then across to the NSW border if anyone is interested. Attendance at Ballina 69 adults, 14 children, 83 total. 2 WA, 2 Tas., 11 SA, 5 Vic., 6 NSW, 37 HV&NR, 20 Qld. and 30 cars. It was a casual affair with no concours' etc. Nigel gave a report on the weekend. All had a good time. Most of those who went had some trouble getting back through the floods. •John Beattie still chasing front corners, has got fibreglass ones from Canberra, but would prefer metal. Also has info. on Slick 50 teflon coating and Oleon. Chap from Oleon has offered to do a demonstration for the club. Jilden recommends Penrite, but it needs to be changed regularly. Gordon gave a short report on the run to Bethany with the R & S Series Valiant Car Club. 1 P76 represented. See Club News for full report. •Tasmania, 1992. Good Friday, April 17th. Suggested that you should book soon for the boat if taking your car over.

FOR SALE- •6cyl P76, Level 1! [Fleet]. See Nigel for more info. •John Stretton has come across a lady in Vic. with two Workshop manuals, \$50 each. See John for ph. no. •V8 on Yorke Peninsular at Paskeville, wrecking only- \$1000. Good mechanically but body rusted. Nigel has ph. no.

MEETING CLOSED 9.26 P.M.

# EDITORIAL

hile this month sees the end of the financial year for the club, August, but two months away, will see the holding of the clubs Annual General Meeting, with its associated elections of club committee and office bearers. And it is with this in mind that I wish to focus my comments on this month.

For those more recent members, and to form a background; my association with the P76 club started with my joining in mid to late 1983 (August, I think) however it was not until my move to Adelaide from the country late in 1984 that I became directly involved. I offered assistance when at the end of 1984 help was needed in the production of the club newsletter. January 1985 saw me as an assistant to the Editor and February's was the first to carry signs of my input. By April I was left in charge. I carried on as Editor until duly elected as such at the AGM in August 1985.

And the rest is like the above - history. This coming August will see the end of five consecutive terms as Editor for me, and nearly five and a half years involved in its production. So, it's not the Sunday Mail or, more relevently, Modern Motor however it does lend some interesting statistics. Over that period, just in my monthly scrawls which I loving call an Editorial, I have written approximately 43,000 words. And that's not counting other articles. After 60 odd editions of typing all the bits and pieces that do into this publication it's amazing I have any teeth left! I hate to think of the figures Steve must have clocked up, as the amount of writing he does makes me look a rank amateur. It's even more startling to think that all of these words revolve around the one subject and that there could be anything left to say with regards to the P76. But there probably is.

The bottom line is this - I'd like a rest. Those who know me well will realise that that statement doesn't come lightly, in fact they'll probably marvel at it coming at all. Nonetheless, that's where it's at.

The rationale behind it is vast. There are large factors of a physical nature which enter the equation, and while I'd be pretty safe to say they are fairly large factors, the past renders them relatively irrelevent. I seem to always manage to get by with a lot more than a little help from my friends. So, a couple of other factors are emptiness, staleness and complacency.

Emptiness- ask me to write an article on anything P76 related and I would ask for a drink. I'm not so much dried up (there are things that could be written about) as wrung out.

Staleness- the reason for the above, with a bit of tiredness thrown in now and then.

Complacency- mix the above two and 'hey presto'. But let me explain this some more.

Last month I commented about getting information to the grass roots member. Now, as far as information exchange is concerned, as it stands, each clubs publication plays the part of a chain and therefore each Editor is a major link. (Backed up (I hope) by each committee, which is also a link in the chain.) As a major link, if I don't pass on the message the chain goes dead. I feel that having been constantly in the chain I do not want to become complacent whereby what seems new and exciting to others doesn't to me, and so not pass on what is relevent. Perhaps this is why some clubs have a maximum term of office written into their constitution.

The freshness that new blood can bring to a club is not just a myth bandied about out aloud at AGMs to encourage people to take active roles in the club. The new ideas new people bring with them may not always be new to everyone, but they don't need to be, old things can be new to them. The important thing is that they are fresh, and that inspires the new and old on alike.

I hope that there is someone to take up the ball and run with it, even if it is only a short way. I will then be able to take on something new to me and perhaps the stale will then be fresh.

Ed.

SHOCKING CONDITIONS SET THE SCENE FOR A TOUGH TEST TRYOUT ON THE FOUR CARS. DURING TWO DAYS OF HEAVY RAIN WE POUNDED THE CARS OVER THE WORST ROUGH-ROAD CONDITIONS WE COULD FIND – MUD, SLUSH, SLIPPERY BITUMEN AND CORRU-GATED DIRT NEWLY RIPPED TO SHREDS BY HEAVY WATER DRAINAG THEN WE FOLLOWED WITH OUR REGULAR TEST PROCEDURES TO BRING YOU THE MOST COMPRE HENSIVE FOUR-CAR COMPARISON POSSIBLE. ROB LUCK REPORTS ON THE FIRST FULL COMPARISON OF THE BIG FOUR ...

# F









THE ever-popular 302 CID Ford V8 returned between 12-14mpg under hard going and sat in the 18-20mpg range at 65mph. For routine maintenance, plugs, distributor, dipstick are quite accessible.



ECONOMY and performance. The P76's 4.4litre V8 is no sluggard, and returns impressive fuel consumption figures. Really pushed hard the car never drops below 18.5mpg, and with considerate use runs out to 22-24mpg. The massive amount of spare room under the bonnet has to be seen to be believed.

PERHAPS THE TOUGHEST task a manufacturer can be set is to enter a market area stocked with well-established competitors.

Because of the familiarity of the known products, the newcomer tends to be evaluated as a single unit in comparison with the combined force of the opposition.

And that's precisely what's happening to the P76. The big differences between this situation and others in the past, is that the latecomer stood up and demanded to be compared as an individual in competition with its common opposition.

A STATE

Leyland's claim for individuality is based on what they describe as a "European concept" in automobile engineering. However they also admit that they have followed the conventional packaging procedure in compiling the basic product "envelope."

In fact the degree of "originality" in the Leyland product manifests itself in only a few significant areas . . .

- A European-style body design.
- A European-concept of suspension engineering.
- A lighter overall body weight.

Any other differences really constitute "variations on a theme" since they could all be applied to any of the competitive packages without difficulty at the next model-change or facelift. However, it is worth noting that the major points listed above do have tangible side-benefits that relate to significant product advantages at the customer level. To take the most important point, the reduced weight reflects on the product in terms of improved fuel economy and competitive performance from a smaller, lighter powerplant.

The point of this preamble is primarily to demonstrate that innovation should not be the yardstick by which the quality or success of this product is accessed.

In fact, if innovation were applied to the task of evaluating the product, the new P76 would not fare well, for it is substantially non-new.

There is really only one fair standard of evaluation and that is by direct comparison with its competitors.

We propose to give you that direct comparison here and now in a carefully evaluated point-by-point analysis...

#### FIRST, THE CARS . . .

We put a solid five months of preparation into this comparison, knowing it is the most important comparison test ever performed in this country.

Months before release date, we approached Leyland and asked them to give us the specifications of at least two vehicles which we requested be made available to us immediately the car was released.

COLOR PAGE: (Top section). The four boot shots show the differing luggage capacities. Only the P76 accepted our entire Samsonite test pack – with room to spare. Clockwise from the top left corner they are Falcon, Chrysler, Holden and P76. (Bottom section). Interiors are distinctly individual, yet curiously the same. The order is the same as for the luggage shots.



Because Chrysler does not "market" its V8s, we were supplied with a 265 Hemi-six for the test. It matched the performance of the V8s in all respects and turned in about 14mpg under hard running. Gentle cruising lifted the figure to around 22mpg.



 $G\overline{M}$ -H's lusty 308 CID V8 was coupled with excellent gear ratios and outperformed all three competitors on the performance runs. Fuel consumption was in exactly the same category as the Ford. Unfortunately engine accessibility is not a high point with the Holden.

They readily agreed, supplying the mechanical details of two cars — an automatic V8 sedan optioned to the ultimate degree, and a stock-standard base-line manual six.

Armed with this information, we then approached the Big Three for cars with near-identical specification. GM-H and Ford readily agreed to build cars for us. Chrysler had just released the new VJ series and claimed they already had road test vehicles on strength of the specifications required.

GM-H and Ford, via the figureheads of NSW Public Relations Managers Marc MacInnes (The General) and Max Ward (Ford), bent over backwards to satisfy our demands and, by dint of working around the clock, they produced their test cars on time.

Unfortunately, when the Chrysler arrived, it had converted to a Ranger optioned up to Regal specification. However, although we used the Ranger for test and photographic purposes, we were able to secure a Regal for more direct comparisons of detail equipment.

Then Leyland postponed their release date — so that, after all this preparation, we didn't get to drive the P76 for quite as long as its rivals.

Leyland call their top model the Executive (a good name) and offer it in the Ford tradition — you can have any variation you like as long as it's complete!

The Executive is thus tagged at \$4525 but this price includes standard 4.4litre V8, three-speed T-bar autoshifter, power steering, push-button radio, power aerial,

# P76 v BIG 3

reclining bucket seats, radial ply tyres and 6in. rims.

We optioned all the rival cars to exactly this specification with the exception of the Chrysler in which we employed the biggest (265CID) six cylinder engine instead of the optional 318CID V8.

We did this because Chrysler does not seriously market the V8 engine (it accounts for only 10percent of total Valiant sales) and its six-cylinder engine is competitive in all respects with the rival V8s. By contrast, both Ford and GM fit in excess of 40percent V8s in their major sedan lines and the content is rising.

On test, the Chrysler Six matched the V8s in every area. However, if you wish to split hairs and claim the 318 V8 is the only truly competitive engine, please add an extra \$170 to the Valiant's price in the following comparative table below for cars of otherwise identical specification ...

P76 .....\$4525 Premier .....\$4344 crew headed by brilliant young US designed Jack Telnack and inspired by the then Managing Director, Bill Bourke. It has been a successful styling exercise from market acceptance viewpoint, but has been the subject of considerable criticism at a functional level.

The Chrysler is also locally styled, although it has the strongest allegiance to American models of the Big Three. Its somewhat cumbersome dimensions have reversed the substantially functional styling trend of the previous models, and the car has only achieved a fair degree of market acceptance.

The P76 strides in with a bold new European-styled body crafted by Michelotti. At the point of writing, two weeks after the press release, we've yet to get a single rave opinion on styling — and we've shown the car to hundreds of people. However that relates to aesthetics and we don't evaluate cars by that standard although you may feel free to as a consumer.

What concerns us more is functional design, and the P76 displays a mixture of good and bad. Certainly the

than its competitors, the space is entirely usable — quite unlike its competitors, in which spare wheels chew large chunks out of the usable area.

However, the major compartment of the P76 gets no special benefit from exterior body design and parallels the accommodation standard of its rivals almost too precisely. It is roughly identical from all considerations of interior dimensioning — hiproom, legroom, seat adjustment and shoulder room.

An overall assessment of design and styling on functional grounds must take into account the practical use of dimensions, provision of accommodation within the envelope, roadability and driveability affected by exterior dimensions (such as parkability, minimum garage requirement, capacity to negotiate rough or uneven terrain and turning circles) as well as standard of visibility and noise level produced from wind resistance.

From these viewpoints the Holden is clearly out front, and we put it at the head of this classification.

However, Leyland's serious attempts



FORD's Falcon/Fairmont range has always been popular with the enthusiast motorist because of its comfortable ride/handling combination. The car is not capable of handling rough roads exceptionally well, but the positive "optional oversteer" is an enthusiast's delight.

We consider this comparison of model topliners to be more important than a line-up of the base models. Its major advantage is that it gives us the opportunity to compare a wider range of the available equipment for you,

#### STYLING & DESIGN

The Big Three are all locally designed and styled but have undeniable origins or affiliations overseas. For example, the super-clean Holden was put together by the talented young styling team of GM-H Fishermen's Bend, yet it owes more than a passing family resemblance to the cars of West Germany's Opel company.

It was almost certainly the subject of some international collaboration in the GM Central Styling Studios in Detroit. However, it is also the most functionally styled and locally-suited product we've seen in this country and I'm excluding the controversial subject of aesthetic appeal from that suggestion.

The Falcon was designed and masterminded by a locally-based US

stow-away wipers offer the best forward visibility standard available, but the bulky tail treatment reduces rearward visibility to a level equivalent to the worst of its opposition. The car is as difficult to park as the worst of the Big Three, and the blind spots are among the biggest.

The longest overhangs in the business also cancel out any benefit gained by the extra inch of ground clearance. However, they are an inherent part of the car's long-nose wedge styling which may well contribute to presenting a superior aerodynamic profile to the wind — with resultant benefits of good performance (notably top speed) and fuel economy.

Certainly, the P76 encompasses larger compartment capacities within the overall envelope — although only at the extremities. The under-bonnet area is the biggest, widest and roomiest working space we've seen — and most mechanics will readily jump into the bay and sit on the guard to work on the car.

Similarly the boot is easily the largest in the business. And while its dimensions are up to  $1\frac{1}{2}$  times bigger



CHRYSLER's Regal has the usual Chrysler neutral handling characteristics with the sudden and sometimes viscious transition to wild oversteer. Ride comfort has been achieved at the expense of handling.

> at producing a functional body design has succeeded in pushing the marque ahead of two of its rivals — in our view very good for a first attempt! This is how we see the final scorecard... Design and Styling: Holden 1, Leyland 2, Ford 3, Chrysler 4.

# ENGINES ...

The P76 V8 engine is a development of the Rover V8 engine using an aluminium alloy cylinder block and cylinder heads, with shrunk-in, dry iron liners. Aluminium alloy is used extensively in other components. The engine dimensions are exactly square with bore and stroke of 3.5 in.

The resultant capacity is 4.4 litres which was achieved by increasing both bore and stroke on the original Rover engine. There are a long list of other modifications, chiefly designed for greater reliability and production economy, but the nett result is 192(gross) bhp at 4250 rpm and 285 lb.ft of torque at 2500 rpm from a twin-choke Stromberg carburettor on 9 to 1 compression ratio.

The V8 is a lusty performer, reasonably silent in operation for an

all-alloy unit, with very free-revving characteristics.

The 302 Ford engine needs little introduction. It's one of the best-known and most successful V8 designs in the world and it is showing no sign of ageing.

Like most of the Yankee-style V8s, it's oversquare in design at 4.00in. by 3.0in. for a cubic capacity of 302CID. Also overhead valve design with hydraulic lifters; it's menufactured purely from cast iron and yet is not considered a heavy engine for its power output of 220bhp at 4600rpm. A hefty 300 lb.ft of torque thumps in at 2600rpm.

The Ford engine is now manufactured and built in Australia at Geelong, Victoria, and local production has done nothing to detract from the reputation of this major component of Ford's sedan.

GM's 308 V8 should also be well-known to Australians by now. Designed and manufactured by Australians it was the first local V8 ever produced and replaced the imported 307 American unit. It's been a complete success in both this capacity and its smaller 253 derivative, all the engines – 2000rpm, and this enables the engine to give superior performance in areas where even shifting gears cannot compensate for lack of torgue.

Like the other engines, the Chrysler employs a two-barrel carb feeding the hemi head through 9 to 1 compression ratio with overhead valve arrangement. Bore and stroke is 3.91 in. x 3.68 in.

It's significant that all four cars employ mechanical fuel pumps. Other mechanical variations are minimal.

In terms of overall feel there's not a great deal of difference between the four powerplants. We placed several expert observers in the Valiant and most could not pick the six-cylinder without revving the engine right out (at which point the noise increases and the smoothness decreases, giving the game away).

The Holden and Falcon powerplants are so near identical in feel, performance and running operation that they can not be picked apart.

The Leyland V8 is slightly noisier than the other two V8s, but the noise is insulated from the passenger compartment, so the problem is not really noticeable. and tyre distortion at the limits.

The car has a smooth, firm ride on good surfaces and a very supple, forgiving ride on adverse surfaces. Control is always good, and the car handles its available power and gets more of it to the roadway than any other car.

The P76 makes a brave attempt at correcting what some "experts" consider to be a Holden "fault" body movement on the suspension. Variously described as jelly-action, float, and poor suspension location, Holden engineering has been the subject of probably unnecessarily hypercritical attention from many industry quarters.

Leyland, with a more positive suspension location, feel they have cured the problem — and they've certainly achieved a more positive contact between suspension and body, with a resultant reduction in the feeling of detachment between body and suspension.

But it is this highly rubber-impregnated GM approach that saves the car's ride on rough surfaces and conversely causes the Leyland vehicle to react more sharply to



THE Holden understeers (even in the wet) with moderate body roll, and final plough understeer. There is some evidence of front end kneel and a little tyre distortion, but generally handling is "safe".



THE P76 has virtually neutral handling characteristics with a touch of oversteer on call at its limits. Long suspension travel ensures excellent ride on smooth surfaces but the car is not at home in the rough.

#### adverse conditions.

On badly corrugated surfaces, ride is average (certainly below that of the Holden) and suspension control noticeably less. With the manual steering (4.7 turns lock to lock) control in fast going is quite poor, but with the power steering as fitted to these comparative test cars, it is significantly better.

However, bitumen surface road-holding is first class. Certainly the car rolls quite severely, but this is not particularly evident to the passengers, long-travel suspension and the characteristics are typical of European automotive engineering for which Leyland makes parallel claims. In fact a suspension engineer who examined the vehicle's specifications, described the shock absorber and spring travel as being very similar in dimensions to that of a BMW 3-litre. However he drew no further parallels to BMW ride or handling noting vastly different design approaches.

The Leyland vehicle displays good road manners when pushed hard, with a virtually neutral handling state that can be pushed into optional oversteer

although it's certainly not as popular with sportsmen as the Ford engine probably because of optional and modification equipment available for the latter.

From a near-identical bore/stroke specification to the Ford unit, 4.0in. x 3.06in.) GM's 308 with similar two-barrel carb, overhead hydraulically-operated valves and 9 to 1 compression ratio churns out the top-level 240bhp at 4800rpm. It's also got superior torque - 315lb.ft at 3000rpm, which accounts for the car's generally superior performance in most areas.

While Chrysler might appear to be at a disadvantage with only six cylinders, the locally designed and manufactured Hemi is a remarkably competitive engine and actually sends the heavier Chrysler sedan to better performance times than its rivals in some areas.

At 265CID it is a bare 4cu.in. under the Leyland V8 capacity and shoves out superior power at 203bhp (4800rpm). Even torque lags only slightly at 262lb.ft, but this high figure is produced at the lowest rev point of It's smooth and free-revving and it gives good performance from its light weight. Better still, it has less effect on handling than the other engines and produces better fuel economy. We can't wait to see it in 5-litre form, and it's not really surprising to see the powerplant score top marks with our test crew ...

Engines: Leyland 1, Chrysler 2, Ford and GM equal 3.

By way of an equaliser, we'd have to note that a V8-equipped Regal would see the Pentastar name displaced from second slot by the Big Two powerplants.

# RIDE, HANDLING & STEERING

There are notable differences in both the approach and end results of the products from all four manufacturers. Holden sticks conservatively to its predictable understeer set-up with a progressive handling processcharacterised by accurate steering, moderate body roll, good control under a wide variety of conditions, above-average suspension location for adverse conditions, and final plough understeer with some front end kneel

# P76 v BIG 3



THE bumper jack on the Fairmont is simple enough to use but is quite dangerous on anything but level ground. The tool kit - as with all four cars - is very basic, providing only the jack and a hubcap remover/wheelbrace.



SLIGHTLY more "comprehensive," the P76 tool kit had a hubcap remover, a wheelbrace and a ratchet-type jack handle. The wheeltrims were particularly hard to remove.

providing the terminal speed of the corner isn't too high for the power reserves available.

There is absolutely no sign of tyre squeal, and the front end of the vehicle is not thrown off line by unexpected adverse surfaces in the middle of a corner.

However, in our test experience, the rear end of the vehicle was most certainly prone to leaping off-line when an unexpected change in surfaces was encountered. In this respect, the more rigidly located, but supple rear suspension isn't as successful as the Holden's.

The Ford Fairmont is in a class and style all its own. Its smooth-surface capabilities are the best of the four. and it is a pleasure to drive round town for its complete ride silence.

However once the surface deteriorates is or interrupted intermittently, the Ford ride standard is noticeably reduced. On very rough surfaces, it is still better than its opposition, but because the vehicle can be readily thrown off-line, the ride is less comfortable.

Smooth, neutral handling with readily available optional oversteer endears the Ford to every enthusiast open road motorist and is generally accepted as the most desirable modern handling set-up. Certainly it is less progressive than the Holden which is a confirmed understeerer, but its steering loads are also lighter, and driving generally takes less effort.

Unfortunately, its dirt road handling is of a poor standard, with inadequate location of the rear axle. Even Leyland's rigidly-mounted coil-sprung rear end offers superior rough-road roadholding to the squishy, more compliant Ford.

Chrysler sits firmly in a position of soft ride and neutral handling with very definite (and sometimes sudden) transition to oversteer. However, although it is an extremely smooth car on smooth roads, its torsion bar suspension still seems unsuited to radial ply tyres and the slightest irregularity produces ride harshness.

Its handling is typically American, (unlike its competitors), and there is a noticeable presence of engineering for ride at the expense of handling. Combined with low-geared steering systems that are vague in manual form and over-boosted and indefinite in power-assisted form, the Chrysler offers the least control of the four.

However, it bears noting that the car is basically a good, safe handling car, and if treated with respect will gobble up any kind of mileage rapidly albeit with noticeable body roll and change in attitude, with the occasional presence of tyre noise.

way of almost inexplicable By contrast, the Valiant Regal found its way round Oran Park racing circuit faster than any of the others in an all-to-brief two-lap acquaintance before impending rain ruled-out continuation of the exercise. We hope to test four comparative cars on the circuit again.

A variety of steering systems are employed, although the variable ratio Ford and GM power systems are virtually identical.



CHRYSLER's jacking system is the same as that of the Ford. The test car did not have a base-plate for the jack, something which we trust was merely missing from that particular car. Without it the jack was useless on anything but a sealed surface.



THE Holden jack is the same as that of the P76. Both styles of jack are dangerous on anything but level ground and we would prefer to see either small hydraulic jacks, or the old "wind-up" style units supplied.

Both engines are extremely heavy and impose serious loadings on the front end. For the steering systems to for parking and light remain progressive for high speed cornering, a ratio system is in fact variable essential.

Leyland is in a completely different position, having slashed the engine weight by the use of alloy materials, and eliminated much of the front-end loadings. In view of this, the unnecessarily low-geared manual steering contradicts the very purpose of the lightweight mill, but in the power assisted version, a more accept?" compromise at 3.3 turns lock to is achieved.

Like the Falcon, it's still too and too unprogressive. However driver adapts, precise control abundantly available.

Our crew rated the Big Four in three separate categories. The findings make interesting comparison . . .

Pure ride: P76 - 1, Falcon 2, Holden 3, Valiant 4.

Ride handling compromise: Holden

1, P76 – 2, Falcon 3, Valiant 4. Pure handling: Falcon 1, P76 – 2, Holden 3, Valiant 4.

In drawing these conclusions, we have taken the perhaps controversial approach of evaluating the products for their most regular usage. Hence the Falcon is listed as having the best pure handling, because most mileage is completed on reasonably sealed roads. However, if handling on poorly sealed or unsurfaced roads is given Continued on page 96.

# P76 v BIG 3

Continued from page 14.

emphasis Falcon would be displaced at least two places and Holden accelerated to the lead, Similarly, P76 would not fare well on evaluations of ride over uneven or harsh surfaces.

#### PERFORMANCE

If you assess performance purely against-the-clock, switch to the comparative tables and you'll see the Holden edging out for a slight (and slightly surprising) lead.

The Chrysler is the most impressive straight-line performer in view of its straight-six mill and minimum capacity, and the Leyland V8 is certainly an impressive powerplant.

However, if Leyland engineering staff expected the car's 2001b weight advantage to yield any significant outright performance advantage, they should be interested in the figures comparative performance obtained on the same road, on the same day.

However we're talking measurable short-distance performance at this level and we prefer to evaluate the cars for their overall performance. This must include considerations of point-to-point capabilities, cornering potential under regular motoring conditions, round town responsiveness, and overall fuel economy

We'd like to be able to put down an impressive formula to compute all these factors, but it basically comes back to driver response, and practical experience.

Since the Leyland P76 will hurry round any corner as fast as the other three, accelerate as easily, cruise as effortlessly, provide safe overtaking reserves, keep you abreast of the traffic flow without conscious effort and still pack more miles into the gallon than its competitors, we feel it rates the thin edge of the vote.

The top mark is not given lightly any manufacturer can easily build-in superior outright performance with a or spunked-up bigger engine suspension, but it takes a little extra engineering effort to go down in cubic capacity, achieve near-identical significantly performance. and improve conventional fuel on consumption.

Because the other rate them identically ... P76 - 1, Holden, Because the others are so similar, we

Falcon, Valiant - 2.

#### INTERIORS' COMFORT

If there is any substantial difference between the four cars, we failed to identify it. Selection of a car on its interior must essentially reside in the area of personal choice. For one thing our interior measurements prove that conclusively.

The basic cockpit is identical on all four cars. This is hardly surprising when you consider all four sit on an identical 111in. wheelbase, astride tracks varying in width only between 58in. and 60.5in. – these are the two major dimensions affecting interior

THE interiors need no explanation. They all have basically the same equipment, although

the "sports pack" Chrysler we used for photography has a tachometer. Clockwise from the top left corner they are Falcon, Chrysler, Holden and P76.

#### space of any car.

Claims for interior space advantages by any manufacturer would have to rate as a complete waste of time otherwise we'll have our tape measure melted down the made into a booby prize for ourselves.

If you want to go nit-picking, you will find the P76 offers 2in. more rearseat headroom than its best competitor and the Valiant offers 0.75in, more headroom in the front than the P76. And so on.

And so what!

Every goddam one of them has completely identical people-accommodation in an absolutely identical package. In fact the manufacturers could do everyone a a favor, get together and build a common compartment and save everyone a bundle on repair bills.

Certainly there would be no loss of individuality.

Every car now utilises the self-contained wrap-around instrument console placed directly in front of the driver. They employ two-spoke wheels to a man (the Chrysler photographed had the optional sports pack which offers three-spoke wheel just like The Other Two in similar trim).

There are variations in switchgear and slight variation in instrumentation and warning lights but it's all basically similar. The promise of a European feel in the P76 pales in the face of an obviously US-oriented steering wheel layout, instrument design and even foot-operated dipswitch.

All cars now have a high standard of seating with cushy buckets offering good location and fatigue-free driving. If we were asked to nominate the smartest cockpit we'd opt for the Ford, and its seats still rate tops for our money. However the P76 is very comfortable, the Holden seats are vastly improved to a now completely acceptable standard and the Chrysler seats are completely accommodating.

We rate driving positions highly for both comfort and safety, and to our way of thinking the commanding, relaxed Holden driving position is superior. However, the P76 is good, and the Falcon's slightly low seating position only limits control in the area of visibility. But our crew agreed universally that the Chrysler seating position is just too low and the driver relationship to the controls too disiointed.

Our rating is a photo-finish . . .

Interiors and Comfort: Falcon 1, P76 2, Holden 3, Valiant 4.

#### BRAKES

We'd like to think braking is an area of major competition amongst the various manufacturers, but the competition has now levelled-out, fortunately at a peak. Flip to our test chart, and you'll find there's only a hair-splitting difference between the cars.

From 60mph, the cars all screamed to a halt within 10ft of each other on a variety of bitumen surfaces and gradients. The recorded g-ratings were similar, the pedal pressures close and the overall time required to stop, near-identical.

The Valiant test car refused to slew sideways unlike the cars we mentioned last month, and only kicked the tail out slightly when the surface became slippery from a fresh drizzle.

The Holden displayed badly-adjusted rear brakes at first, but the car was dreadfully new and soon settled into painfully hard, consistent stops. The Holden brakes were the only ones that showed no sign of fade, and the P76, despite its lighter weight was the worst

There was little to pick between the various systems in open road use, except that the P76 and Valiant consistently required less effort than the other cars, and also produced less progressive feel.



The Holden was the most consistent and the Ford the most pleasant to use. We don't rate the differences in performance or feel highly, and the final decision was close .

Brakes: Holden 1, Ford 2, P76 3, Chrysler 4.

That brings us to the tail-pieces. We'd like to consider the minor categories conjointly.

Luggage-carrying capacity has been promoted as a major selling point by Leyland, and a casual observer could be forgiven for assuming it was the focal point of the styling. Certainly the boot is huge - gigantic in fact, and easily capable absorbing our entire Samsonite luggage pack plus a couple of spare people!

The rival manufacturers maintain that the boot is normally fully used once a year for annual holidays and occasionally for extended weekends. But with bigger families, more travel and more household and personal chattels, a useful and usable boot capacity is increasingly important.

Certainly Leyland is the only manufacturer who can rightfully make claims to either. At 36cu ft., the P76 makes Holden's 26 cu ft. look pitiful. Worse still, the Holden loses a large portion of that because of poor spare wheel location, while the Leyland capacity is fully usable.

It is impossible to squeeze even a moderate amount of luggage into either of the Big Three boots without striking the inevitable curse of the poorly located spare wheel. However, shifting the wheel to another location (usually the floor) provides good luggage space for most occasions.

On top of that, most of the jacking systems are hopeless. The Leyland and Holden vehicles share the common concertina jack, operating on body contacts, while the other two use bumper jacks.

Operating every one of them on uneven terrain is a nightmare, but the body jacks on the Holden and P76 are certainly the most reliable. The bumper jacks are slow and awkward to adjust and fit although they are generally easier to pump up and down once fitted. The P76 unit is the easiest to extract from the boot.

No car has even a basically acceptable toolkit — at best you score a hubcap/wheeInut remover and jack lever. When it comes to roadside breakdowns, it pays to improvise, or perhaps you use the meagre equipment to club the nearest individual into surrendering his toolkit. Really, we had hoped Leyland would have proved an innovator on this important point.

Fuel systems have raised our wrath for various reasons on every product produced by the Big Three. The P76 overcomes the major complaint - slow and inefficient filling with shocking spitback. The Leyland device accepts full-power fast fills right to the top of the neck, while the other three provide poor filling down to the all-time low standard offered by the Holden.

The Holden fuel system is further disgraced by a gauge that seems to be constantly in search of new magnetic fields, and which is totally unreliable. average fuel Fortunately the consumption is more predictable so owner can gauge observant the diminishing supplies.

The other fuel systems are not much better, and none offer lockable caps except on the options lists - Leyland haven't reversed this trend either.

Breaking this section into three areas we find the following . . . Luggage capacity: P76 1, (easily),

Chrysler 2, Ford 3, Holden 4.

Jack system: P76 1, Holden 2, Chrysler and Ford 3.

Fuel systems: P76 1, Chrysler 2, Ford 3, Holden 4.

# FINISH AND ASSEMBLY

A surprising aspect of this test was that a detailed inspection of the four vehicles showed that standards of finish and assembly were remarkably close. We find that Holden has yet to be displaced from its position of ultimate quality, and Leyland fits in close behind - although it has some rough edges to clear up. Chrysler offers a vastly improved standard of trim 'and finish, and Ford is showing noticeable improvement in assembly standard.

We couldn't help leaving the cars with the impression that the very close standard of assembly might be due to the ultimate specifications of these luxury models - in other words, you pay for what you get.

Reliable as ever, Holden heads the class .

Finish and Assembly: Holden 1, P76 2, Chrysler 3, Ford 4.

#### UNDER-BONNET

There's little to fight about in this area, but the two prime points of consideration are accessibility to the mechanicals, and safety.

We note with satisfaction that one manufacturer has finally heard our pleas for properly protected fans unfortunately it's not the one we've been criticising. Leyland fits a fan shroud and it's efficient. Will the others please follow suit! (Or supply a finger-bin below).

The Leyland undoubtedly has the roomiest under-bonnet area, though we couldn't find a mechanic who liked the forward-hinged safety bonnet. That's probably a case of inflexible ideas, as most mechanics also leaped readily into the engine bay feet-first and commenced fiddling in relative comfort. Leyland provide a powerful under-bonnet light to make sure the fiddling can be done at night just as easily.

There is little to choose between the cars for access to the major ancillaries so we nominate one winner and three also-rans.

Under bonnet: Leyland 1, Ford, GM & Chrysler 2.

## VALUE-FOR-MONEY

To offer an outright assessment in this category is almost to declare an outright winner - since a majority of buyers in the regular sedan market are guided solely by fiscal influences in

their ultimate choice. For this reason, Leyland starts from behind with a \$200 penalty and nothing to show for it apart from vague, nebulous phrases such as "European ride and comfort standards."

by reference to our Again, check-chart, you'll find there is no significant variation in specifications of any kind and the four cars could quite easily have had their design parameters stamped with the same neat little cheese-cutter.

But while our test crew failed to find any serious evidence of genuine design innovation or radical approach in the P76 product, they all returned the same verdict on economy - and the P76 on test invariably recorded 5mpg better fuel consumption than its competitors (including, most times, the Chrysler Six).

On this basis alone, a simple calculation will prove that the initial pricetag differential can be relatively quickly offset by mileage.

At five more miles for every gallon, it doesn't take very long to buy back your original price disadvantage and get out front of your next door neighbour's motoring budget.

And that weekend jaunt or special long-distance holiday trip doesn't seem to hurt nearly as much. Thus our clearcut finding . . .

Value for money: P76 1, Chrysler 2, Holden 3, Falcon 4.

#### SUMMARY

Our test crew spent many miles and many hours behind the wheels of these four near-identical cars to bring you this test. After a particularly hard test gruelling wet-weather dav in conditions, two staffers were heard to comment quite separately on the similarity of the products. "It's really a matter of personal preference," they later agreed.

Although the Leyland vehicle sets itself aside in styling origins, and V8 engine design, it is identical with its competitors in every other major respect.

Our crew failed to establish a European concept of ride, and the car certainly failed to make a similar impression to the Peugeot 504 or BMW 520, which drew unanimously enthusiastic reactions from a wide variety of drivers.

Certainly, the P76 is dimensionally identical to its competitors, both inside and out, and it follows their exact design parameters in terms of performance, braking, equipment and general design layout.

There are minor divergences such as the big boot, the excellent stow-away the lighter, more wipers and economical body. Apart from that, it's another

"variation on a popular theme." In that respect alone, Leyland should consider they have hit the mark squarely.

From the consumer point of view, the choice is now fourfold and the variation available just slightly, almost imperceptibly, enlarged. 0 FOUR CAR COMPARISON - P76 VHOLDEN VALON VALIANT OUCK REFERENCE INSTANT CHECK-CHART

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1 1

# ROAD TEST DATA - SPECIFICATIONS

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# INSURANCE WARRANTY MAINTENANCE COSTS

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\$10.80	\$10.13 \$10.13	\$23.92 (strut) \$15.17	Shock absorbers (front): (reer):
\$10.00	\$47.25	\$40.00	Windscreen:
\$24.00	\$20.25	\$18.67	SPARE PARTS - recommended cost breakdown Disc pads (set of 2):
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Ford Fairmont	Holden Premier	<b>P76</b> Executive	

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	sed gravel	13degC	OOpercent	-2 knots	Wet/cold		

	P76 Executive	Holden Premier	Ford Fairmont	Chrysler Regal
Tap speed: Average:	102mph	103mph	102mph	108mph
Best run:	ndwcni	IUbmph	IU4mpn	IUSmpn
Standing Quarter Mile:		ii I		•
Average. Best run:	18.4secs	17.6secs	17.9secs	18.0secs
Speed at and of Standing O'tr:	73mph	77mph	75mph	76 mph
Acceleration, standing Start:				
0-30mph:	4.2secs	3.6secs	3.9secs	4.0secs
0-40mph:	6.1 secs	5.3secs	5.7secs	5.8secs
0-50mpn:	8.5secs	1.2903	11 Desce	0.2900
0-sompri. 0-70mph:	16.55605	13 Asecs	15 figers	14.6secs
0-80mph:	22.5secs	19.8secs	21.8secs	21.5secs
0-90mph:	31.2secs	,25.1secs	30.6secs	29.2secs
0-100mph:		30.8secs	36.3secs	34.5secs
Speeds in gears: (Held/Drive)			•	
Gut			•	
18	60/40	66/48	60/43	60/46
2nd	90/60	100/69	93/68	95/68
APM in gears: (Heid/Unive)				
π j	6000/3800	6100/4000	6000/4300	5800/5300
2nd	5600/3400	6100/3600	5700/3900	5100/4550
Acceleration in drive:				
20-40	3.3secs	3.2secs	3.3secs	3.4 secs
30-50 40-60	4.3secs	3.bsecs	4.058453	3.8secs
50-70	7.8secs	5.9secs	7.1903	6.9secs
50-80	9.8secs	8.6secs	9.4secs	11.5secs
10.90	13.0sec3	11.USECS	13.1903	. Data
Braking				
Stop				
3000	3.9 50 53	5 019001	4 8672	3 7mm
2	4.6secs	4.8secs	4. Steets	3.6sect
• ω	4.3secs	3.8secs	3.9secs	3.6secs
σ, <b>4</b>	4.2secs 4.8secs	3.9secs	3.9secs	3.5secs
0.60				
Time/distance:	3.9secs/158ft	3.8secs/153ft	3.8secs/149ft	3.3secs/146ft
g-force/pedal pressure:	.85g/60psj	.89g/55psi	.91g/59psi	.85g/40psi
0.30				
Time/distance: g-force/pedal pressure:	1.9secs/34tt .87g/75psi	1.9secs/34ft .85g/65psi	1.8secs/32ft .89g/70psi	1.5secs/33ft .92g/45psi
Speedo corrections				
Speedo corrections Actual:		•		
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51	38.5	88	88	£ 8
38	48.5	8	8	8
28	58.5 58.5	\$ ¥	88	58
88	8	នេ	121	8:
8	88	88	8	. 8

# **TECH TALK**

#### FLICKERING LIGHTS

Hands up those P76 owners who have tried to fix their headlight switch in an attempt to stop their headlights flickering.

The immediate cure is to replace the offending unit with a new switch, however new switches are not always available and repairing the old switch is not a major problem.

The main problem is wear in the contact plate and plug plate contact pins.

My first attempt at fixing this problem was to rotate the contact plate 180°, and found the cure was short lived. On further investigation I found that the contact plate sits at a slight angle to the slide block and rotating the contact plate 180° only increased the problem.

Looking at the contact plate, the slotted holes which clip over the slide block are slightly offset. I then decided to file the slots a fraction more so that they are even in length, put the switch back together and try it. Success at last!

Step 1: Remove plug plate.

Step 2: File contact plate at points indicated on drawing.

Step 3: Rotate contact plate 180°.

Step 4: Solder (to raise) worn plug plate pins. NB: This is not necessarily required at this stage but can be done also in addition if required.

If you follow this procedure, this allows the spring to push the contact plate closer to the plug plate contact pins.

#### **G.** Cutting.



#### Post Script Note:

As an adjunct to Geoff's piece above, he has asked that I include the following.

When removing the light switch, providing certain conditions exist, it is not necessary to remove the instrument surround assembly which holds the switch, only the instrument panel.

The switch is held to the surround by four plastic pins, similar to those which are used for securing the rear parcel shelf cover. There are two pins at the top and two at the bottom of the switch. If the two top pins are inserted with the points directed inwards towards the switch assembly and the two lower pins have their points directed outwards – away from the switch assembly – then you should be able to prise the top pins out working through the instrument panel hole and the lower pins by working from beneath the dash. This method enables relatively swift removal of the switch assembly when compared to the alternative of complete surround removal.

If the pins are not in these positions to begin with it may be necessary to remove, or partly remove, the surround initially, making sure to refit the pins in the way so as to make access easter in the future. Ed.

# S.A. P76 CLUB NEWS

# **TECH TALK**

# Starter Motors and Ring Gears/Drive Plates

There appears to be confusion on ring gear and starter motor compatibility for P76 V8 and six cylinder vehicles.

Basicaly there are two different ring gear/drive plate diameters and two different types of starter motors. For acceptable service they should be used in the correct combinations.

Technical service bulletin C9-74, outlines the problem and starting points of the changes. This does not mean much to us now as over the years ring gears, drive plates and starters have been changed from motor to motor and the direct combinations have been separated.



To avoid the confusion the following will help.

The early ring gear/drive plate of 1' 1 1/16" diameter uses the starter with the triangle etched on the soleniod end braket (eccentric starter).

The late ring gear/drive plate of 1' 1 1/8" diameter uses the starter with the unmarked solenoid end bracket (concentric starter).

The correct combinations ensure suitable starter ring gear/drive plate service with acceptable noise level. However, the unmatched combinations will still operate.

## **Tony DeLuca**

(Thanks to NSW Club Newsletter March'90)

In the above problem by Tony, the noise refered to is the incorrect meshing of the teeth on the starter motor pinion and the ring gear/drive plate, usually due to the teeth being too deeply in mesh.

Another method of rectifying the problem is to slightly elongate the top hole of the starter motor to enable it to come out of mesh a little.

Ed.

# **PICKLES, PIES & PASTRIES**

# Crusty Chicken Casserole

- Serves 6 3 rashers bacon 1 onion 435g cream of chicken soup 2 shallots 1/4 cup grated cheese 1 stick celery 1/4 cup water 30g butter or marg. Optional - 60g mushrooms, 300g sour cream

Cheese batter:

- 1 cup SR flour
- 2 eggs
- 1/2 red pepper
- 1/2 green pepper
- 1 cup grated cheese
- 1/2 cup milk



Remove chicken meat from bones, chop meat roughly. Place peeled and chopped onion, chopped shallots, chopped celery and water in saucepan, bring to boil, reduce heat, simmer covered for 15 minutes.

Melt butter in pan, add chopped bacon and sliced mushrooms, cook for 3 minutes.

Combine soup, sour cream and chicken in bowl, add vegetables and bacon mixture. Pour mixture into greased 2 litre (8 cup) capacity oven proof dish. Spread batter mixture over top.

Bake, uncovered, in moderate oven 40 mins. Sprinkle with cheese, return to oven for further 5 mins.

# Cheese batter:-

Sift flour into bowl, add diced peppers, lightly beaten eggs, cheese and milk; mix until just blended.

# FOR THE YOUNGER P76 GENERATION

The fish game.



Trace the fish opposite onto cardboard. Cut out and colour in 6 fish. Numbering them from 1-6.

# How to play

Take turns rolling a dice. If you roll a 2, you take fish number 2, a 3, fish number 3 and so on. Play until no more fish are left. Who ever caught the most fish is the winner. Have fun!

How many candy sticks can you count in this jar? Colour it in. Jokes Attow do you count cows? ans :- on a cow - culator Q-why don't canarics cost a Lot of money A- because they are always going cheep. a worm is it's head. A-Tickle it in the middle and see which end Laughs.