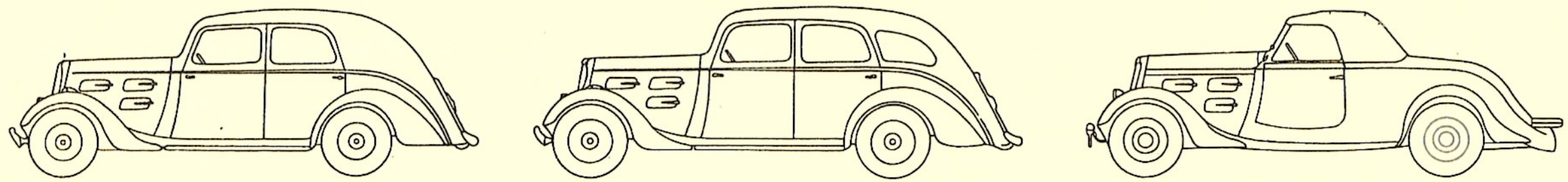

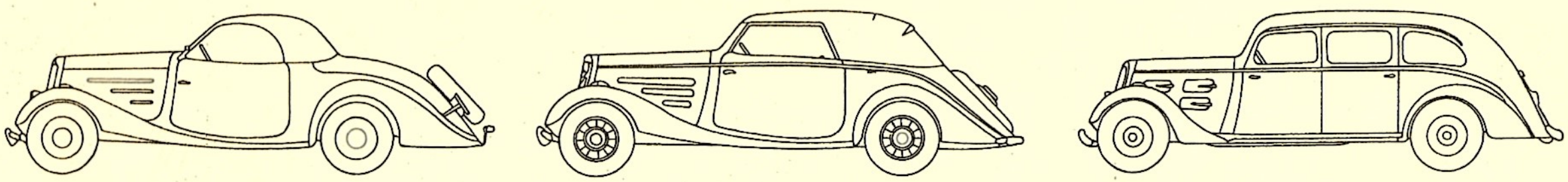

Autosiaste

VOL. 8
No. 2

été
summer – 1982

V E E A

Autosiaste

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Editors

Robert DesLauriers
Colin Tisshaw
Blair Tisshaw

All the same model, 1935 1.7-litre four-cylinder Peugeot 401s. Let's say the social equivalent of a Standard Twelve in England or a DU Dodge in the United States. Technical specifications are constant, though there is a choice of wheel-base lengths to allow the French to indulge their passion for *commerciales*, or seven-to-eight-passenger commercial sedans which came to be used to deliver goods during the working week.

a choice of three different types of orthodox soft-top convertible, including a traditional roadster with the refinement of wind-up windows. (Latterly, you could have a German-style cabrio-limousine as well, in the cheap 202 line made from 1938 onwards).

E.V.E.A. C.P. 332, V.M.R., H3P 3C6 - V.E.A.E. P.O. Box 332, T.M.R., H3P 3C6
MONTRÉAL, QC. CANADA

Le mot du président

LES AVANTAGES DE LA RÉCESSION!.....

Nous vivons tous actuellement une période difficile, faisant face à des taux records d'inflation, à des intérêts faramineux et nous n'y voyons que malheur. Il y a pourtant matière à réjouissance! Quoi, me direz-vous?

Nous nous débarassons lentement des spéculateurs avides qui ont littéralement envahi nos loisirs à la recherche d'un profit intéressant et surtout rapide, exportant souvent nos voitures à l'extérieur. Ils trouvent maintenant de meilleures possibilités de profits en mettant simplement leur argent en banque, rendant ainsi service aux vrais amateurs de voitures anciennes. Cette nouvelle vague freine les pressions à la hausse du marché et permet ainsi un retour à des prix plus réalistes. Dommage pour celui qui a manqué l'occasion de gros profits, mais bravo pour l'amateur sincère qui voyait de plus en plus la voiture de ses rêves glisser hors de sa portée. Tous nous avons actuellement la possibilité de profiter réellement de nos voitures sans tentation de céder au chantage d'un profit vite fait, qu'on regrette hélàs souvent! Et les nouveaux arrivants peuvent négocier de bonne foi, sans crainte de se faire souffler l'aubaine par un négociant qui n'y cherche que profit monétaire. Ajoutez à cela le taux de change intéressant de notre monnaie par rapport à celles de l'Europe et vous avez des pièces et des autos à des prix très abordables.

Sachons donc nous réjouir de ces faits et peut-être convoiter à juste titre cette fameuse décapotable qui nous fait tant envie!

Le président,

Pierre-André Ouimet

The president's adress

THE ADVANTAGES OF THE RECESSION!

We are all going through a difficult period, facing record high inflation, sky-high interest rates and pessimism is all around. But I maintain car enthousiasts should celebrate! You will say I am crazy, but not so.

We have a good reason to be happy and that is because the car hobby is finally neglected by those avid speculators who have put upward pressure on the price of most desirable cars over the last few years. They were buying many and even shipping a few out of the province too. Now that they can make a quicker profit by simply putting their money in the bank, the spiralling of prices seems to be coming to a halt. Sad for the one who missed the opportunity to sell at a huge profit, but good for the enthousiast who felt he could no longer reach the dream car he always wanted. Today, we can use our cars without being tempted by a possible quick profit, alas often regretted afterwards! Newcomers can also contemplate realistic negotiations, confident that there will be no shark around to take the deal away from them.

Another positive point is the position of our canadian dollar in comparison to the pound or the franc. This again means we can buy a whole car or the parts we need overseas at a bargain price.

So, now you see too that recession has a positive side.

You can now celebrate and may be reconsider the purchase of that lovely convertible you have long been dreaming of!

Pierre-André Ouimet

president.

6th May 1982.

P.O. Box 156,
Hudson Heights,
Quebec.
JOP 1JO

Dear Member,

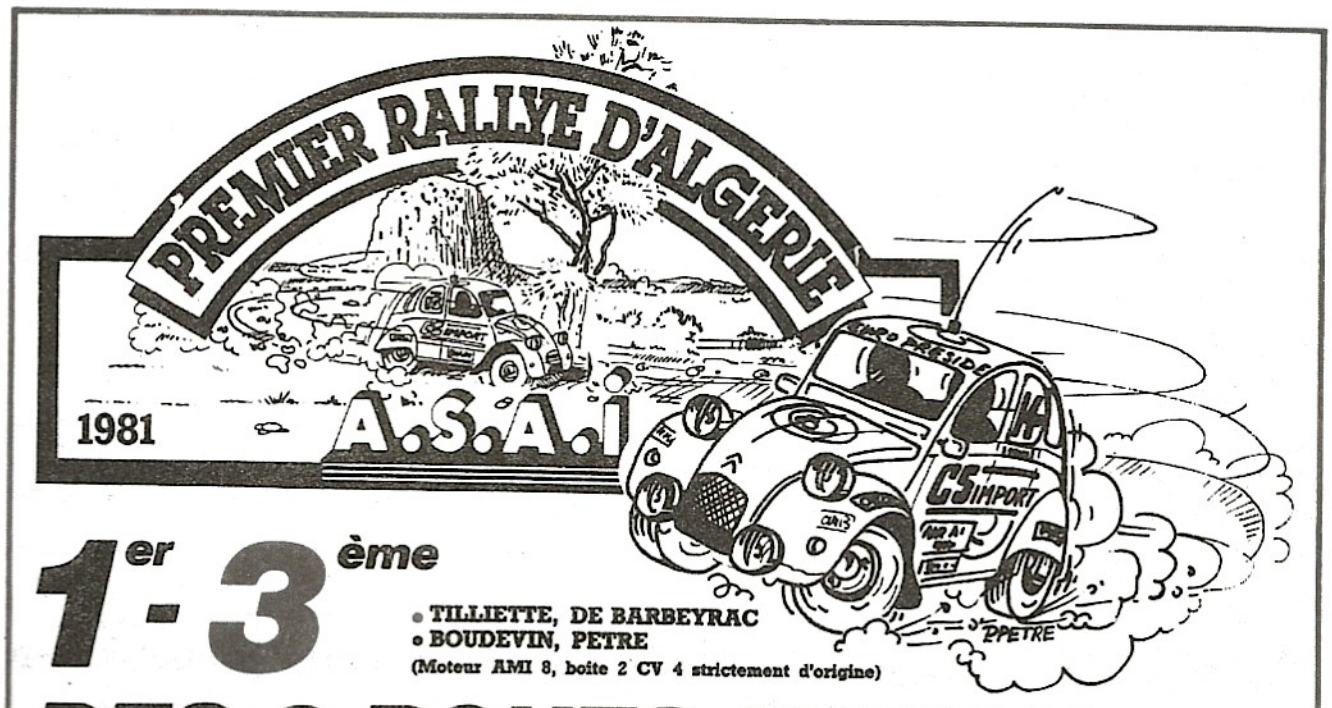
The complimentary words sent and spoken to me concerning the "Autosiaste" over several years have been greatly appreciated. It had been my hope as Editor that the magazine would be interesting and informative and that it would, in a suitable manner, carry to you the Club's spirit and ideas.

Having completed the composition of the Spring issue in mid-March I turned over the draft sheets, including a particularly nice cover which featured an MG TC in an appropriate setting, over to the new Executive for printing and distribution. Thus at that time I ceased to be the Editor. However, there is no doubt that forthcoming issues will adequately carry the spirit of the Club to the membership.

My association with the "Autosiaste" over several years has been personally satisfying and in turning over the Editor's chair to the 1982 Executive I extend with it my sincere good wishes, knowing that you will support the Club in the enjoyment of its activities.

Yours sincerely,

Hugh Jockel.



«Deux pattes sur le sable» c'est depuis 2, 3 ans le slogan de Gérard Tilliette, vétéran des 2CV Cross et auteur avec sa femme d'un long périple africain en 2CV. Il vient d'en démontrer à nouveau la valeur en s'attribuant avec Christian de Barbeyrac la première place des «deux roues motrices» (14e au scratch) dans le Rallye d'Algérie 1981: du 1er au 15 novembre, 5175km dont 2232 d'épreuves spéciales; sable, cailloux, tôle ondulée, on peut faire confiance à J.C. Bertrand quand il organise une épreuve, c'est rarement une simple partie de campagne.

Avec Tilliette et de Barbeyrac, cinq garçons pour l'assistance, tous d'anciens pilotes de 2CV Cross: dans une deuxième 2CV, J.P. Boudevin-Philippe Pétré (ex-participant au Raid Afrique 1973) qui bien que surchargés de pièces de rechanges (qui ne serviront jamais) termineront 3e des «2 roues motrices», et Bernard Hours avec un vieux camion et deux mécaniciens.

Les 2CV: moteur Ami 8 de série, boîte 2CV 4, plate-forme, pots de suspension et amortisseurs d'Ami8, bras de suspension bourrés de résine, réservoir 66 litres de DS, pneus Michelin RAA 8. La conduite : toujours à fond!

"2 CV on the sand" has, for the last 2 or 3 years, been the slogan of Gérard Tilliette, a 2 CV-Cross veteran and co-signer, with his wife, of a long trans-African trip in a 2 CV. He has once more demonstrated its capacities by taking, with Christian de Barbeyrac, first place among "two-wheel drives" (14th in the scratch classification) in the 1981 Algeria Rally: between 1st and 15 November, 3,216 miles, of which 1,387 on special stretches; sand, scree, corrugated tracks. To support Tilliette and Barbeyrac, the assistance of five young men, all of them ex-2 CV-Cross drivers: in a second 2 CV, J.P. Boudevin-Philippe Pétré (ex-participant in the Africa Long-Distance Run 1973) who, although the car was overloaded with spares (which were finally never used), finished 3rd among "two-wheel drives", and Bernard Hours with an old lorry and two mechanics.

The 2 CVs had standard Ami 8 engines, 2 CV 4 gearboxes, Ami 8 platforms, suspension dashpots and shock absorbers; their suspension arms were stuffed full of resin and they were fitted with 14 1/2 gallon DS petrol tanks and RAA Michelin 8-ply tyres. As for the driving: flat out at all times!

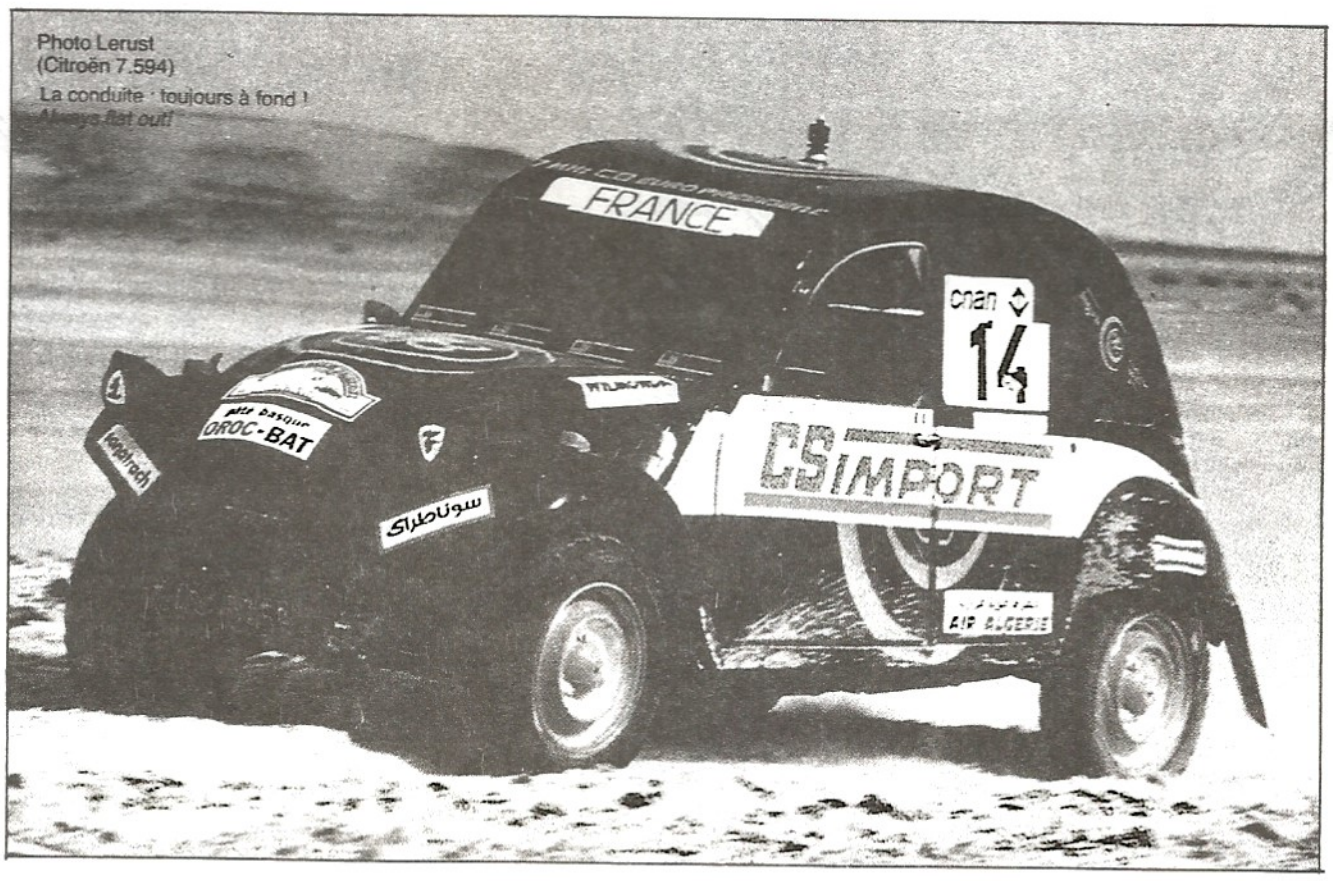
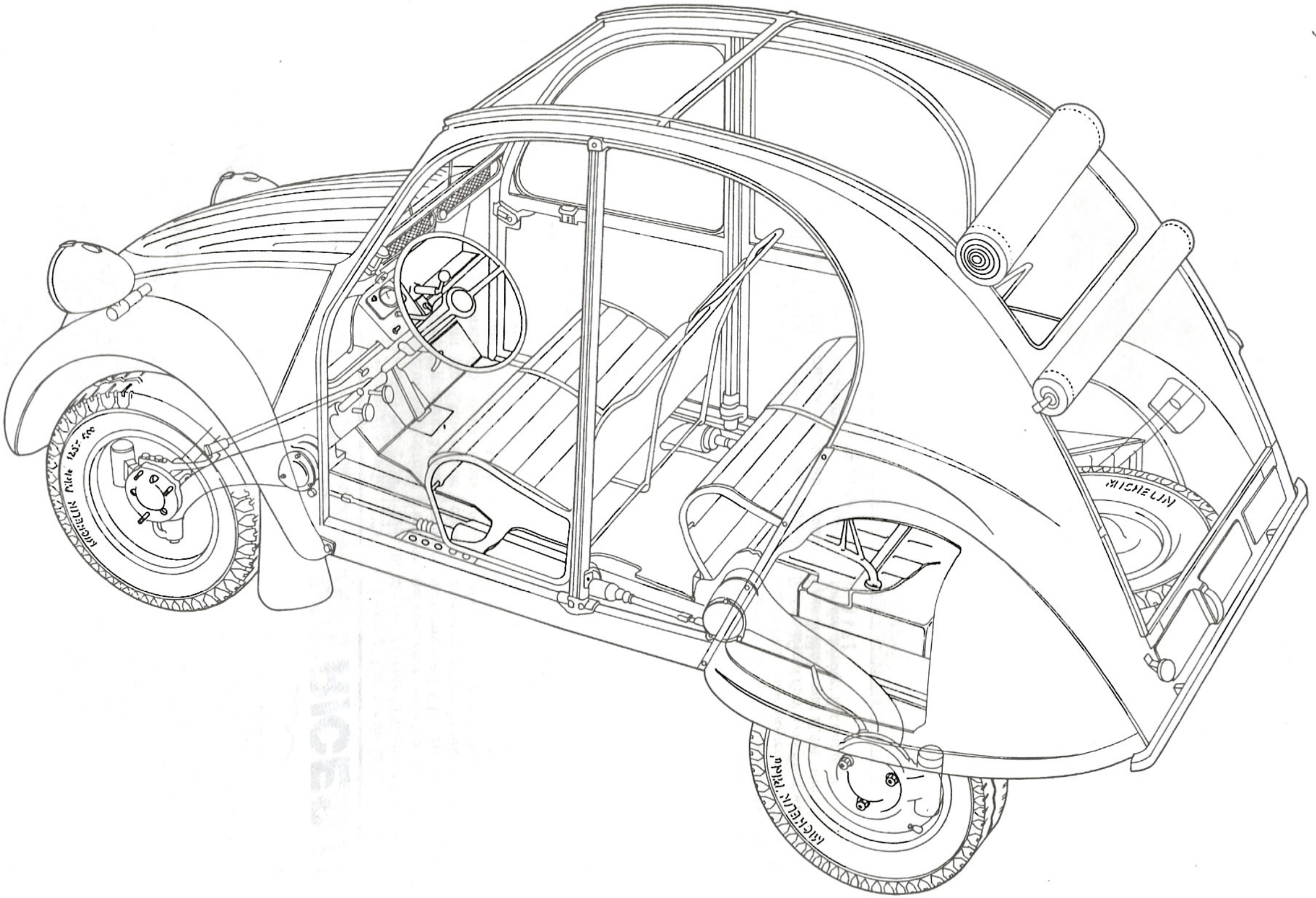


Photo Lerust
(Citroën 7.594)
La conduite : toujours à fond !
Always flat out!

RALLYE


MICHELIN
MICHELIN

E D I T O R I A L

Montréal, le 24 août 1982

Chers lecteurs,

Nous voulons tous que notre club reflète au moins en partie nos intérêts particuliers sans quoi il serait difficile de s'enthousiasmer pour ses activités.

Permettez-moi donc de vous faire part de mes idées sur les futures orientations de notre club.

A priori, il me semble qu'un tel club devrait "faciliter" à ses membres l'accès au hobby de collectionneur de vieilles voitures. Ceci comprend l'achat, l'entretien, la restauration, l'exposition, l'entreposage et la vente ou l'échange de ces voitures.

Un aspect important d'une telle réalisation est la communication interne et externe. La preuve n'est pas à faire ici car nous connaissons tous le rôle essentiel de cet outil.

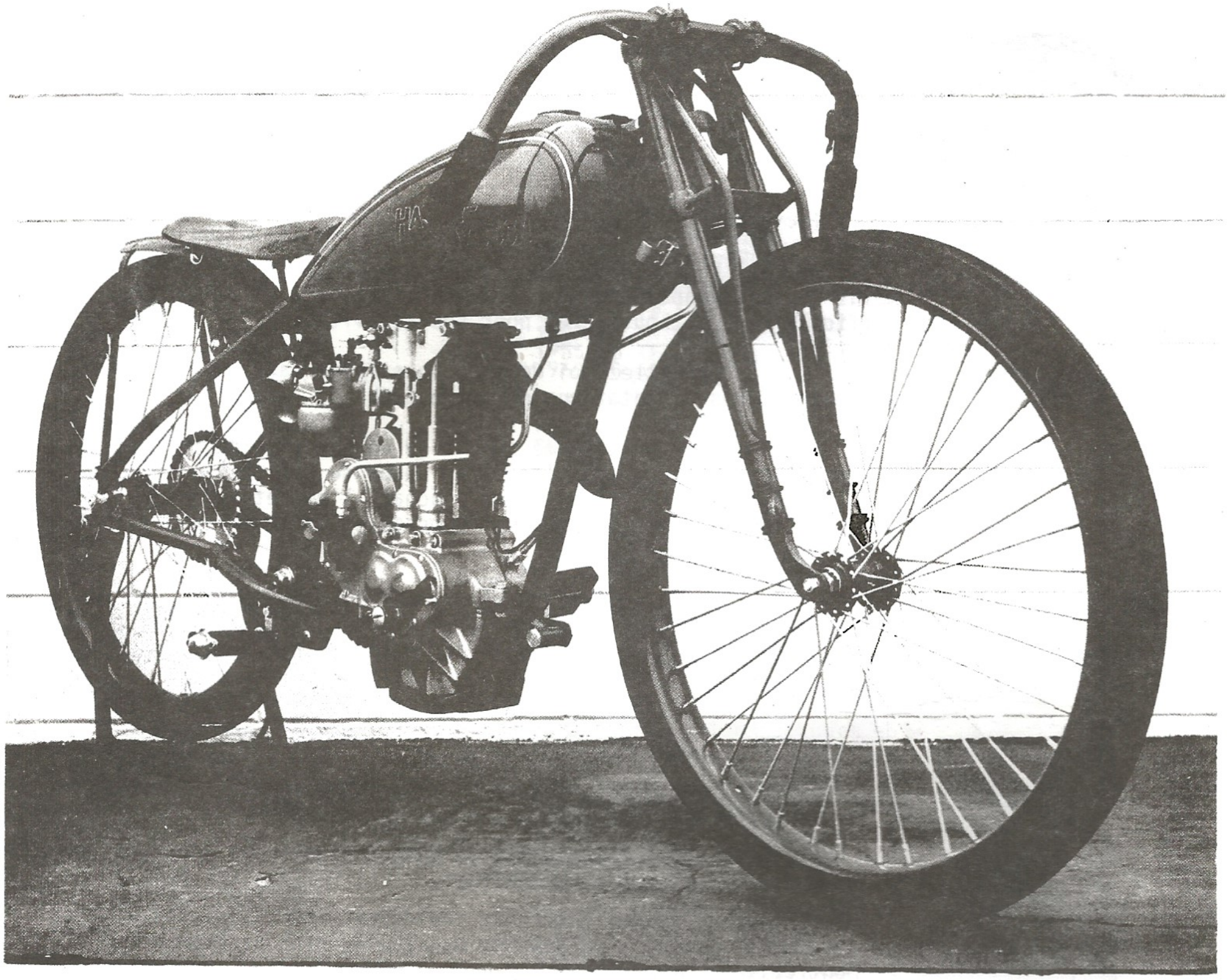
On pourrait faire un sondage auprès des membres afin de mieux connaître leurs intérêts et priorités sur les services que le club pourraient offrir tels que:

1) Affiliation avec des clubs semblables ailleurs au Canada et aux Etats-Unis; but: information, échanges, débouchés;
2) Lieu d'entreposage/restauration; but: partager les frais et avoir un endroit commun pour travailler;
3) Chaîne de téléphone; but: pour rapidement renseigner nos membres sur toutes sortes d'événements ayant lieu dans la région de Montréal;
4) Programmes d'activités: tels que conçus actuellement;
5) Inventaire auprès des garagistes/scrapper locaux sur la disponibilité de pièces neuves et usagées (incluant Ontario);
6) Inventaires de garagistes locaux aptes à faire de la restauration de carosserie et de mécanique (incluant Ontario);
7) Dates des expositions, concours, flea market au Québec, Ontario et à l'est des Etats-Unis.

Tout en reconnaissant que c'est un hobby "d'homme riche", il faudrait s'assurer que la grande majorité des membres se sentent à l'aise et libres de s'exprimer et de participer aux activités.

J'espère que ces idées, qui ne sont peut-être pas nouvelles, pourront néanmoins servir de réflexion sur les orientations futures du club.

Robert DesLauriers



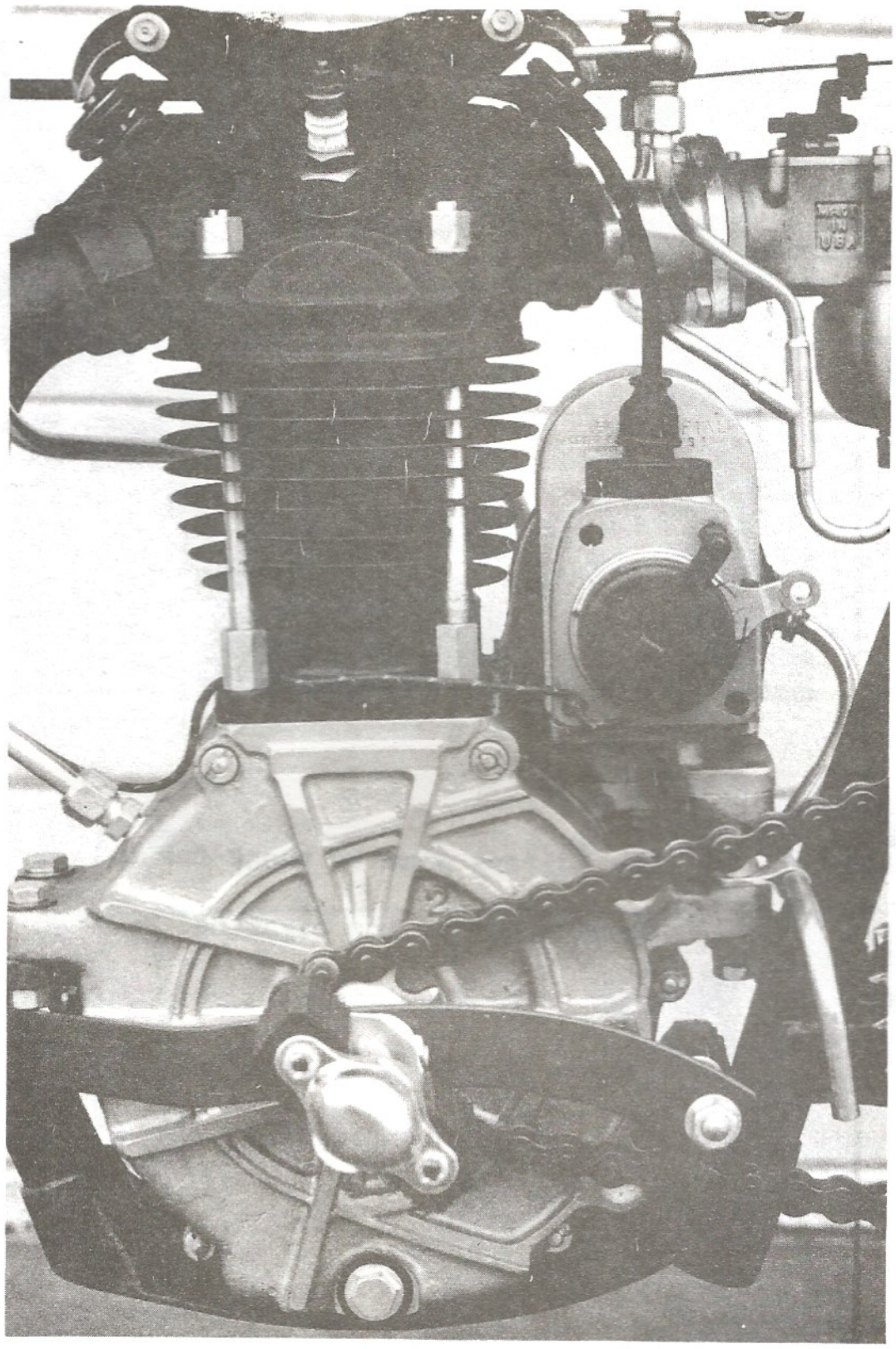
Speedway RACER

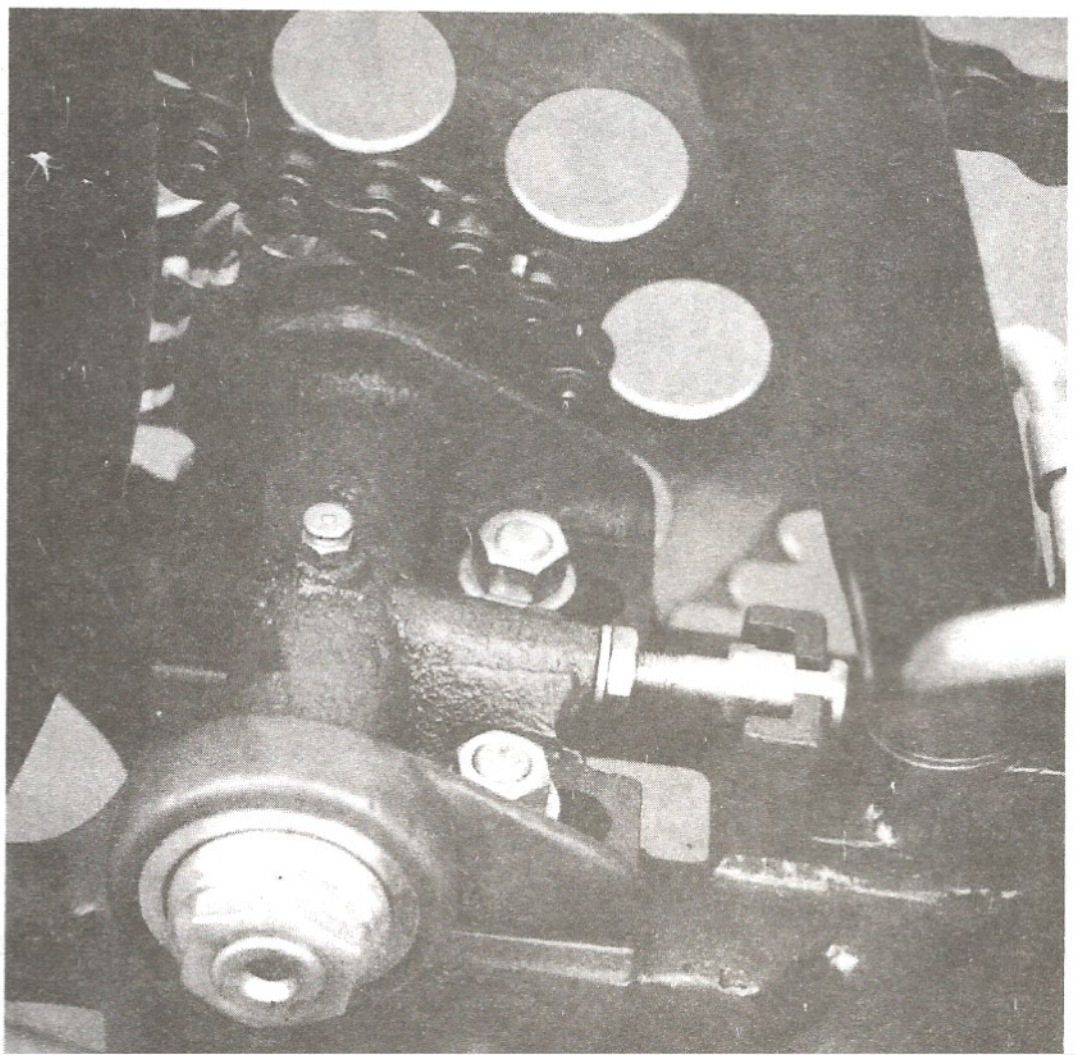
This motorcycle is an authentic restoration of a 1929 Class-A speedway racer, right down to the 23-inch Firestone racing tires. These bikes are nicknamed the Peashooters, undoubtly because of the sound that emits from the short exhaust pipes.

This motor is only 21 cu. in., or 350cc. It burns alcohol through a Schebler carburetor, which has no butterfly, but rather a drum in which the venturi rotates.

A Bosch magneto gives it the spark it needs to fire. The single head is of a hemispherical configuration and its solo piston has about a 12-to-1 compression ratio. The stock cases have extra-heavy webbing cast into them over the Harley-Davidson logo, which the earlier cases didn't have. These motorcycles were built only between 1926 and 1929. They weigh in the range of 175 to 185 lbs., and were sold only by Harley dealers. Their main competition on the racetrack came from Excelsiors and Indians.

It took Pete Smiley, the owner of this bike, ten long years to find all the parts necessary to complete this project. Ten years seems like a long time, but it was a labor of love to Pete.





This bike is a serious, no-nonsense piece of machinery. As you look at these pictures, you will notice that there isn't any clutch lever, brake pedal, or transmission. Where the trans would generally go is a jack-shaft, holding roller bearings and a sprocket. The top speed is determined by the number of teeth on the sprockets, which can be changed very quickly, depending on the size of the track. The small lever on the right case is a compression release. In the earlier days, there were no gates to hold the participants back. They would push-start the bikes, line them up according to the time trials on their individual heat laps, and let them go. Hence the term, "flying start." The Peashooters raced on the longer tracks the way you see the bike here. On the shorter tracks, an extra piece of tubing was bolted from the lower part of the front down-tubes around the engine to the rear part of the frame. This tubing was added to relieve the stress that the motor put on the frame.

This is the type of scoot that the legendary Californian Joe Petrali rode to take the number-one factory ride to so many American dirt-track championships from 1933 to 1938.

You will notice that the frame is rigid and the front end hasn't very much travel. This is so the rider can get the feel of the track and look for a good groove. I understand, from talking to some of the old-timers, that when Joe got his bike in a slide on the corners it was a thing of pure beauty, and he could race anywhere on the track—inside or outside grooves. As the saying goes, speedway racers do it sideways.

The Harley factory stopped their official sponsorship around 1936. Until that time, they ruled the tracks. Joe has some records that are still standing, one the ten-mile run at Laurel, Maryland. In 1925 he went 111.1mph. That same year in Altoona, Pennsylvania, he ran 100.3mph for 100 miles on a board track, at a time when the land speed record was only 119.3mph. These records of Joe's were probably set on a Harley V-twin with 45 cubic inches, or thereabouts.

In the late 1920s, some of these Peashooters found their way to Australia and New Zealand, where they gained great popularity. They were raced on greyhound dog tracks, cinder and horse tracks. Australia is looked on as the birthplace of the cinder speedways. From there, the popularity of these races spread throughout the world.

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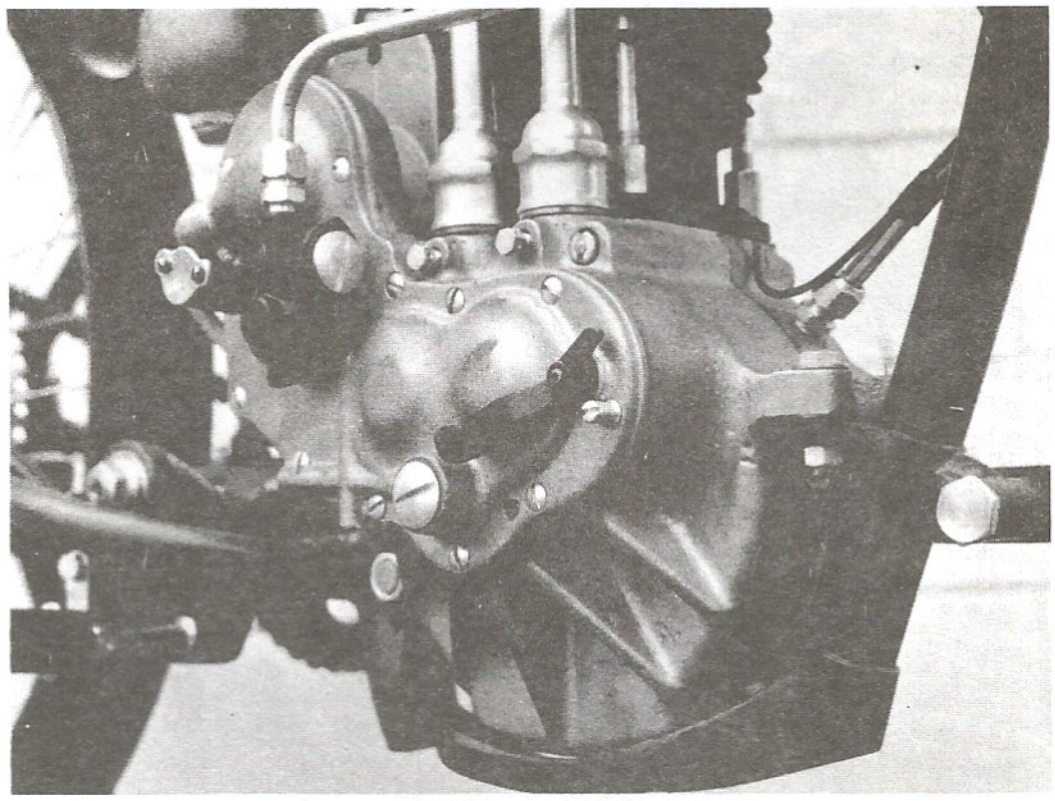
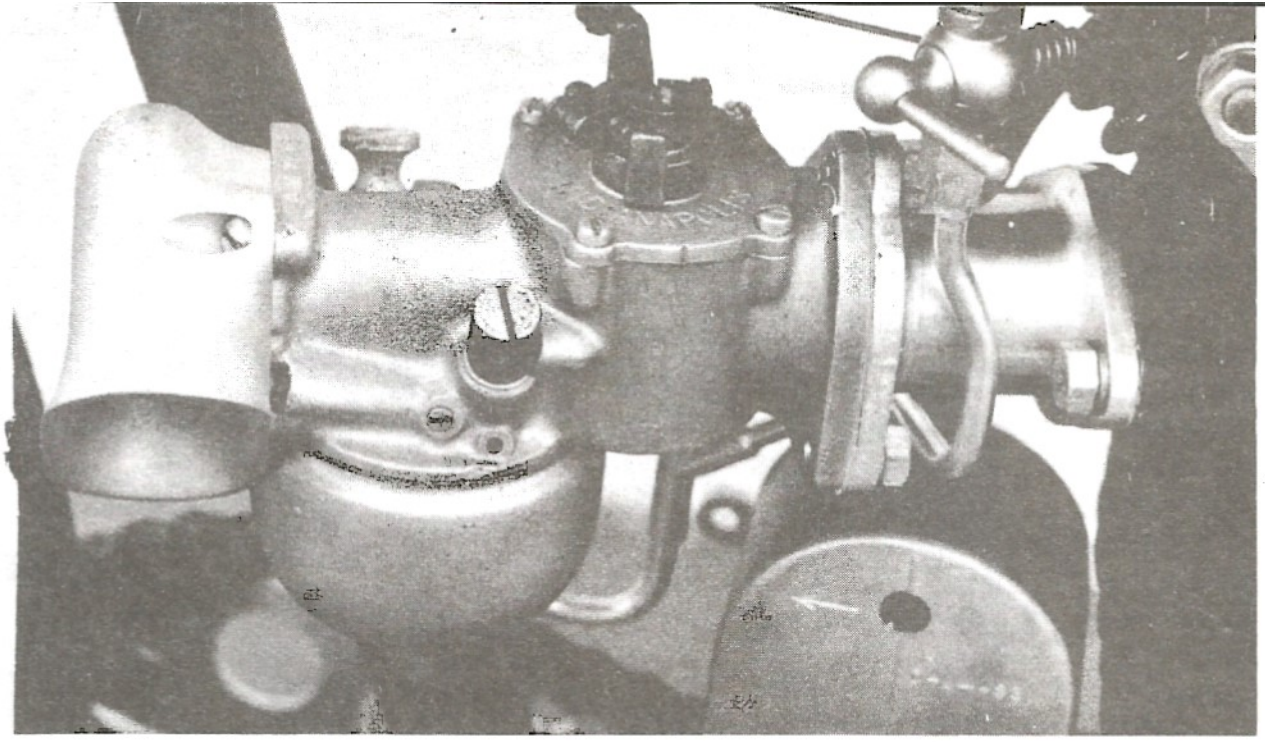
We understand that speedway racing is very popular over on the Continent and in the British Isles. The racers are supported by their hometown folks and looked up to as national heroes. It's on a par with the NFL over here.

No American had held the world speedway championship since 1939, when Jack Milne won it. That's 42 years ago. But in 1981, another young Californian, named Bruce Penhall, went to Wembly, England,



The Editors wish to thank the well known motorcycling magazine EASY RIDER for this well researched interesting article on one of the american all time classic motorcycles.



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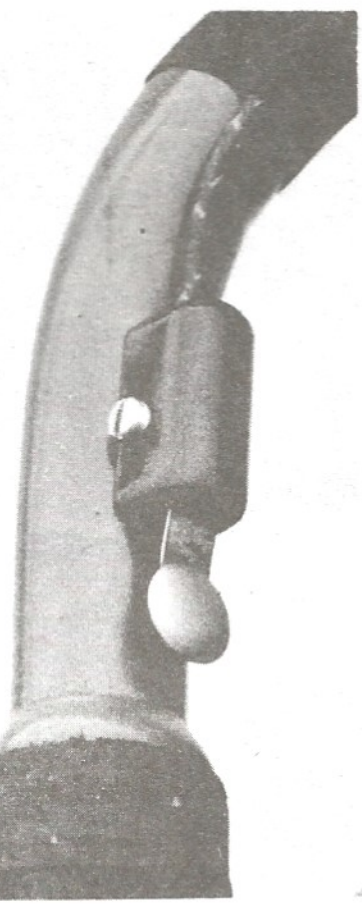
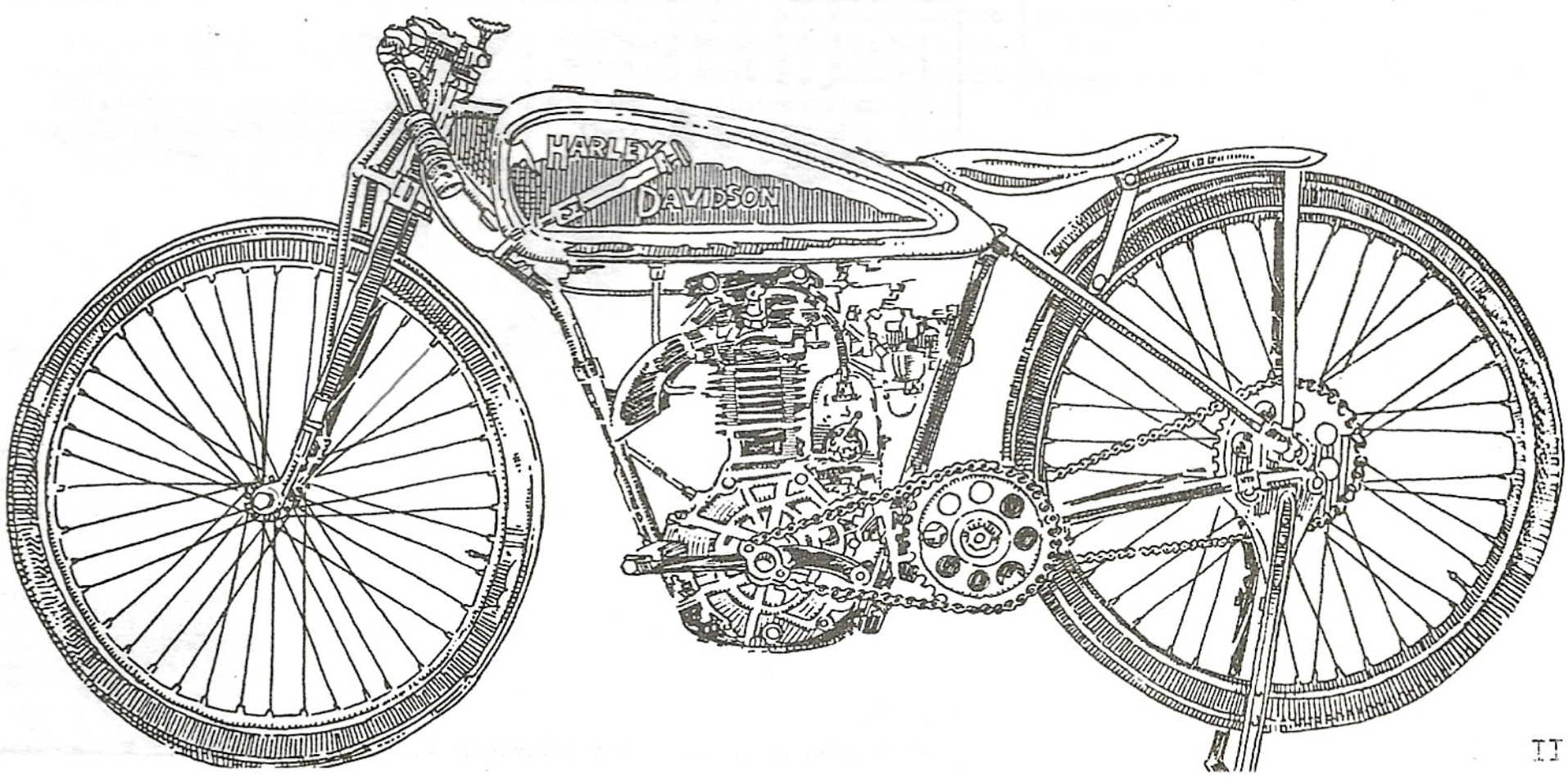
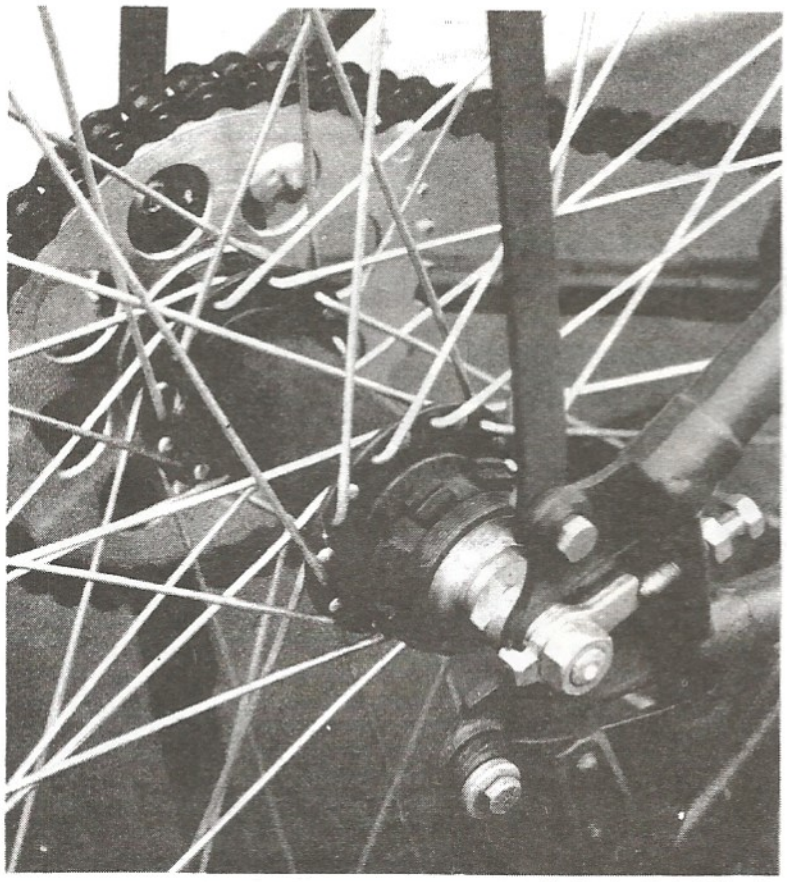


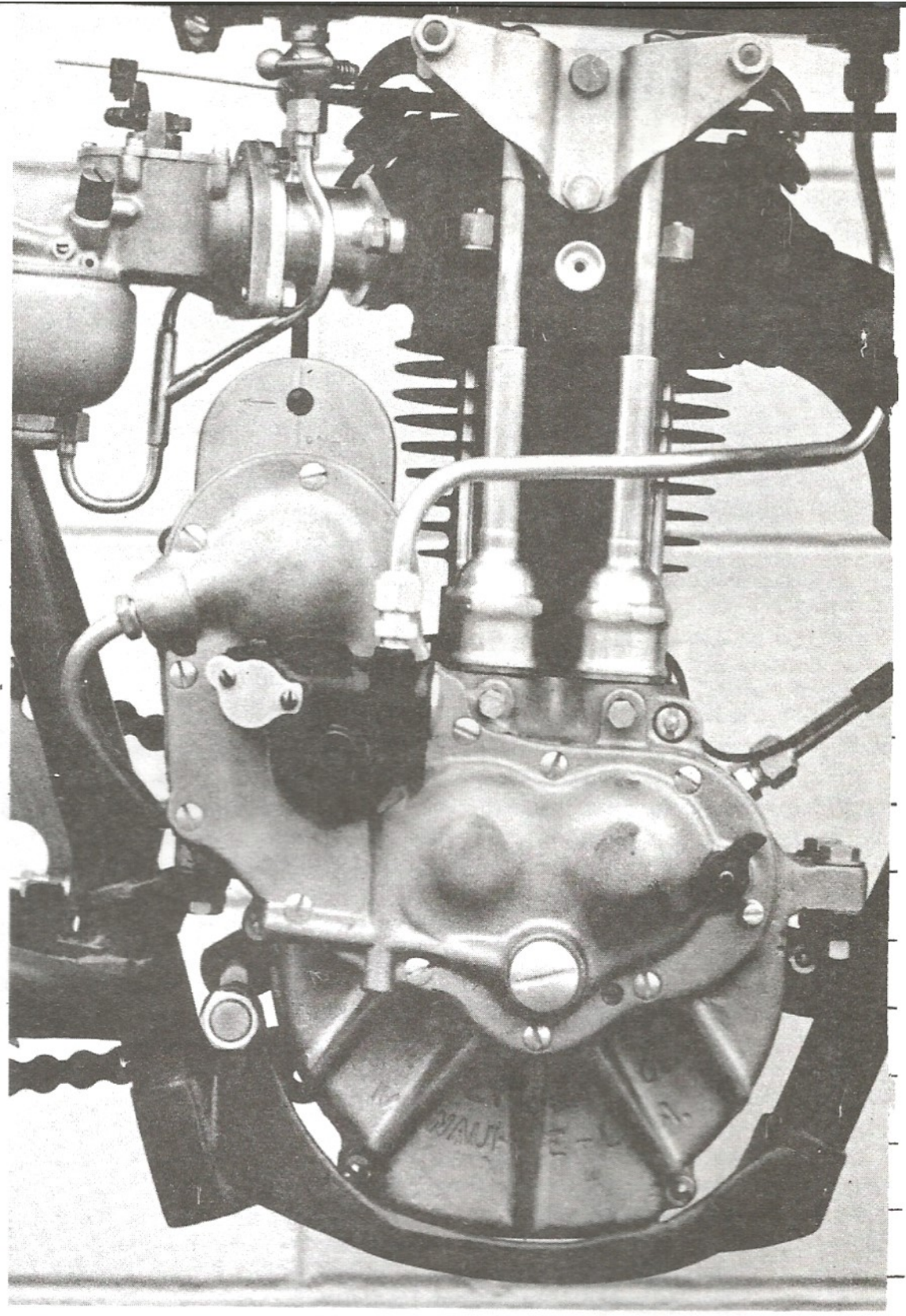


and shocked the racing world by bringing back the trophy and laurels for being the world's very best speedway rider. America is proud of you, Bruce. We love you—keep kicking ass!

What if some motorcycle business heads got together and developed a bike over here that could compete with the Jawas? (They, incidentally, are made in a communist-bloc country.) How about a dual-overhead-cam 500cc motor? If the units were sold cheaply enough for the average racing family to afford one or two, would we see a resurgence of the so-called golden era of motorcycles?

—Rip





Photos by Pete Chiodo

Quiz: Name this car::

Is it an Austin?

Is it a Packard ?

Is it a Riley ?

Is it a replicar ?

Is it french ?

Is it quebecois ?

See p. for the answer.

LA POULE AUX OEUFS D'OR! PAS VU!

Nous ne l'avons pas trouvé lors de notre sortie du printemps, mais nous en avons sûrement vu plus que quiconque peut en manger dans toute une vie.

En effet, la tournée conjointe avec le V.A.C.M. nous a mené cette année à St-Félix de Valois, près de Joliette, pour visiter un couvoir. Un groupe d'enthousiastes des deux clubs ont profité d'une journée radieuse pour roder leurs favorites pour la saison qui s'amorçait. Pique-nique au soleil, visite rapide mais agréable et une ballade de cent milles aller-retour que ne devait qu'amorcer Bill Israel avec sa Austin Seven. Il a pourtant fait tout le circuit, dommage qu'un policier ait remarqué que son enthousiasme lui avait fait oublier son immatriculation 1982, mais tout s'est bien passé quand même.

Les photos que vous voyez ne sont qu'un mince aperçu du plaisir que cette promenade a fourni aux participants. La saison n'est pas encore terminée et nous préparons d'autres activités tout aussi agréables.

Soyez des nôtres et partagez ces moments de détente avec nous.

A bientôt.

Pierre-André.

LES RODEURS DE QUEBEC

Your intrepid President, Pierre Ouimet, and I found ourselves by chance to be holed up in the same motel (separate rooms) while in Quebec City on business in March. Craving aesthetic, intellectual, tactile and multifacetted stimulation and adventure, we tried to contact the headquarters of a group of car enthusiasts in the city. Rudimentary instructions of sufficient detail to put us in a rally mood, saw us venturing forth into the night to try to satiate some of the above basic human needs.

After some toing and froings, we gingerly approached a grungy quonset hut that was for sale * in an industrial area on the airport road, identified by a faded sign "Les Rodeurs" (* excuse - à vendre). Upon entering the unlit, unlocked door, we found ourselves in a cavernous, dark and deserted open area. After a gentle enquiry, delivered at the top of our lungs (one each), two forms descended from an upstairs section - Marc L'Abbé, the resident mechanic, body rebuilder and designer, and a pulchritudinous associate whose passion for cars was as great as ours. The appropriate introductions were made, libation was proferred, and graciously declined by your stalwart club representatives. (That line is for the benefit of our respective wives). Marc turned on the lights and under dust cloths, canvasses, and naked before our astonished eyes were more than 30 cars, all American, in all states of construction, assembly and finish. From bare carcasses, and emerging custom bodies to fully restored jewels - these chariots were resting peacefully with a light layer of dust cloaking all. Two rare Grahams (not Graham-Paiges), Pontiacs, Fords, Chevs, an Oldsmobile, a Buick, and many hybrids from big bore mopars to nitro-fuelled sleepers were assembled there. Marc works full time on members' cars, from frame and body restoration to motor rebuilds. The shop has an engine lift, a welding rig, and a makeshift plastic walled spray booth for small parts.

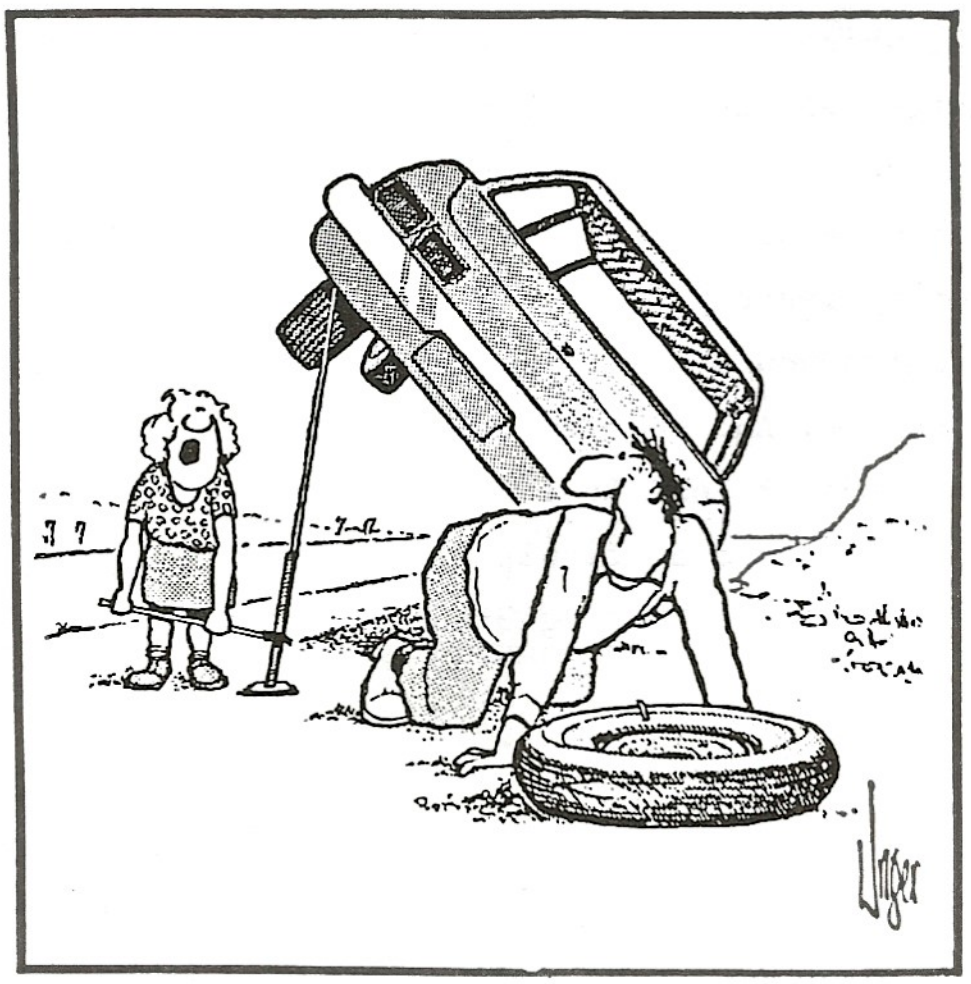
Because of rising costs, the building is to be sold and a move will be made to one of a few locations in which the club is interested. In the meanwhile, Marc, on behalf of the Rodeur members extends an invitation to any club members who are in Quebec

city with some time on their hands to visit. Call first to Marc L'Abbé - 872-1548 (club phone)
- 843-6915 (Marc's home number).

The concept of club members sharing shop facilities where their vehicles can be worked on is an idea that we should explore if members show sufficient interest in such a resource. The cost of the storage and share in the use of tools, facilities for the Rodeurs is approximately $30.-$40./month. Think it over, and if you wish to follow up on the idea, call Auriel or myself at 695-9689 and we'll start a list of interested members. If we get approximately a dozen enquiries, then the club can explore the possibilities of renting a location.

Colin E. Tisshaw

CET:ak



"Will that do?"

THE TECHNICAL ADVISOR'S CORNER.

With the next issue of the Autosiaste will start a new chronicle where you will be able to get an answer to technical difficulties. This corner will be the one of Chris Morgan, the one guy who can do the same thing you did the day before trying to fix it, but when He does it, it works ever.....after! Remember the XJ gas gauge Chris???

Anyhow, to prove that this will really be helpful, here are two useful informations for you. As I have said before, I also have to rely on Chris, so this time, to make sure the advise is worth something, I did not use personal experience but simply hints that appeared recently in specialized magazines. So next issue, send your requests to Chris at the Club's adress or at his residence.

ANTI-THEFT DEVISE: CHEAP, EFFECTIVE AND EASY.

All you really need is one length of wire tapped into the cable which runs from the coil to the distributor. If it's connected at the coil, which is generally easiest, it is not at all apparent as an anti-theft wire. The other end goes to chassis earth via a switch which you can either hide somewhere under the dash or leave plainly mounted for everyone to see, but labelled "fog" or "reverse" or something innocuous. When you close the switch, the engine won't start because you've put, in effect, a short across the contact breaker points. And because everything appears to be in order- and even a jumper lead from the battery to the coil won't start the engine- it is a difficult device to locate in a hurry.
(Taken from TIPS in Thoroughbred and Classic Cars, march 1982)

ENTHOUSIASTES DES VOITURES
EUROPÉENNES D'AUTREFOIS

VINTAGE EUROPEAN AUTOMOBILE ENTHUSIASTS

July 9, 1982

Dear Member,

Here's the Fall Program:

Sunday, August 8	-	Stowe (see attached)
Sunday, August 29*	-	Concours D'Elegance at St. Bruno with V.A.Q.
Sunday, September 12*	-	Rallye Coupe Hemmi
Sunday, October 3*	-	Fall Fun - Montreal Live Steamers
Friday, November 19*	-	Vin D'Honneur

* details to follow

Please jot these dates on your calendar!

Sincerely,

Pete

W. Peter Bigney
Membership Director

WPB/ts
atts.

ENTHOUSIASTES DES VOITURES
EUROPÉENNES D'AUTREFOIS

VINTAGE EUROPEAN AUTOMOBILE ENTHUSIASTS

le 9 juillet 1982

Cher membre,

Voici le programme d'automne:

Dimanche le 8 août	-	Stowe (voir ci-attachée)
Dimanche le 29 août*	-	Concours d'Elégance à St. Bruno avec V.A.Q.
Dimanche le 12 septembre*	-	Rallye Coupe Hemmi
Dimanche le 3 octobre*	-	Plaisirs d'automne - Montréal Live Steamers
Vendredi le 19 novembre*	-	Vin D'Honneur

* détail à suivre

S.V.P. veuillez noter ces dates dans votre calendrier.

Sincèrement,

W. Peter Bigney
Directeur du recrutement des membres

WPB/ts
att.

André Lapointe
399 Lemoyne
Beloeil, Qué.
J3G 2C1
(514) 467-9453

Charles Yale Knight

Un homme et son moteur

lère partie

André Lapointe

Un phénomène sans soupape

LE MOTEUR KNIGHT

· Écrire l'histoire des moteurs à manchon (sleeve valve) c'est écrire l'épopée du "moteur silencieux". C'est aussi toute une époque de l'évolution automobile. Les rois d'Angleterre et d'Espagne ont roulé avec leurs silencieuses limousines Daimler-Knight.

Plusieurs ont gardé en mémoire le trophée "Dewar" remporté par Cadillac en 1908 pour le fameux concours des pièces interchangeables mais qui se rappelle que ce même trophée fut remporté l'année suivante par un moteur Knight?

Peut être que l'explication réside dans le fait que l'auto en question était une Daimler sous la surveillance de son inventeur Charles Yale Knight.

Qui donc se souvient que l'histoire du moteur Knight vit ses débuts au début du siècle (1901) et se termina en 1939 en Europe tandis que l'Amérique l'abandonna en 1932.

Durant toutes ces années, plus de un demi-million de moteurs Knight furent installés dans près de 70 marques de voitures dont plus de 330,000 sur la seule marque Willys-Overland. Malgré la grande contreverse que suscita ce moteur, il fut un temps où ce moteur était le plus fiable et le plus efficace sur le marché.

Vous a-t-on dit qu'on avait coursé à Indianapolis avec un moteur Knight? Cela valut une cinquième place sans un seul arrêt ni bris mécanique.

C'est bien beau cela me direz-vous mais ce phénomène est enterré aujourd'hui et mis à l'oubliette. Je dois vous répondre que ce phénomène n'est pas mort car il y a plus de 400 voitures munies de moteurs Knight qui sont enregistrées au Club "Willys-Overland Knight Registry" et plus de 150 autres sont soupçonnés d'être encore en existance. Ce n'est qu'un petit groupe si on compare aux Ford, Chrysler, Cadillac, etc... mais c'est assez pour prouver que les moteurs Knight peuvent rouler et très longtemps. Comme on l'annoncait dans le temps. c'est "le moteur qui s'améliore en veillissant."

Et pour la jeune génération qui ne jure que par les têtes de moteur "Hemi", les moteurs Knight possédaient il y a plus de 60 ans des têtes "Hemi" parfaites, machinées en dome parfait non déformé par aucune soupape.

Ce moteur a-t-il des pistons? Mais oui et fonctionnant comme les moteurs conventionnels à partir du vilebrequin (crank shaft) par l'intermédiaire des bielles (connecting rod). Mais entre le piston et la paroi du cylindre il y a deux manchons parfaitement usinés qui glissent un en dedans de l'autre.

Ces manchons sont mus par un autre vilebrequin auquel sont attachés de courtes bielles, une pour chaque manchon pour leur donner un mouvement de haut en bas.

Dans chaque manchon on a fait une ouverture latérale de telle sorte que selon la position de chacun des manchons l'ouverture donne soit sur l'orifice d'admission des gaz carburés ou bien sur l'orifice d'échappement des gaz brûlés. Lors de la compression des gaz, ces deux orifices sont bouchées par les parois des manchons. Si on fait exception des soupapes, ce moteur fonctionne comme un moteur conventionnel. Les manchons jouent le rôle des soupapes.

On raconte que toute cette histoire a commencé parce que un certain Charles Y. Knight n'aimait pas son porc-épic. Je crois que je vous dois quelques explications.

Knight vit le jour en Indiana. N'étant pas né inventeur, il opta pour le métier d'imprimeur. Mais comme tout imprimeur de l'époque, il devait avoir de bonnes notions de mécanique pour mener à bien son ouvrage.

Au début du siècle on le retrouve comme éditeur à Chicago de la revue "Dairy Produce". À l'exposition d'auto de Chicago en 1901, Knight eut la piquûre du véhicule motorisé, en l'occurence un genre de voiture munie d'un moteur à un cylindre fabriqué par la maison Knox. C'était ça le "Porc-épic" de Charles Y. Knight. Ce surnom lui vint du fait que l'on avait disposé tout autour du cylindre des tiges droites qui servaient à refroidir le moteur. Ces tiges lui donnaient une allure de porc-épic.

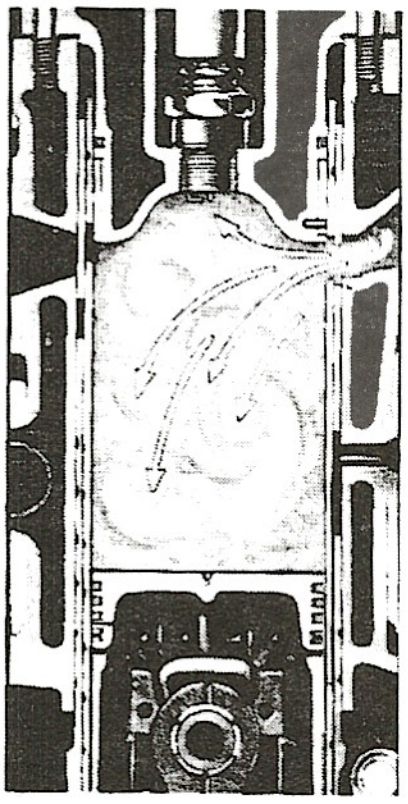
Ce qui embaraissait le plus Knight dans cette voiture et aussi dans une Searchmont 1903 qu'il acheta plus tard c'était le haut niveau de bruit ainsi que l'entretien continuel des soupapes. Knight se dit donc qu'il devait y avoir moyen de réduire le bruit et d'améliorer le système des soupapes.

Il se roula les manches, fit appel à ses connaissances de mécanique et inventa le moteur à manchons. En réalité si on s'en tient aux faits purs et simples il faut admettre que le premier moteur de Knight n'était pas vraiment un moteur à manchon. Il n'était même guère mieux que les moteurs conventionnels. Le mouvement de va-et-vient d'un cylindre additionnel servait à ouvrir et fermer l'entrée et la sortie des gaz. Le poids additionnel de ce cylindre était la source d'une trop grande vibration lorsque le régime du moteur augmentait. Ça laissait à désirer mais ce n'était qu'un début. C'était quand même la preuve que l'on pouvait faire fonctionner un moteur sans soupape à ressorts.

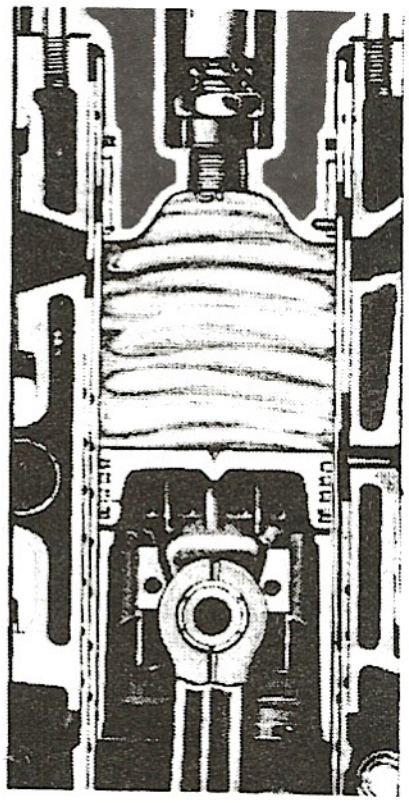
La prochaine étape fut donc de remplacer ce piston additionnel par deux manchons autour du cylindre. Il restait maintenant à corriger le bruit que faisaient les engrenages qui contrôlaient les manchons.

Préoccupé par sa nouvelle invention Knight commença à négliger son imprimerie qui était son seul gagne-pain. Il arriva ce qui est arrivé à beaucoup d'inventeurs, l'argent vint à manquer. Mais Knight n'était pas seulement imprimeur et inventeur mais on dit qu'il avait des pouvoirs de persuasion et c'est ce qui l'amena à convaincre L.B. Kilbourne à financer son projet de moteur à manchons.

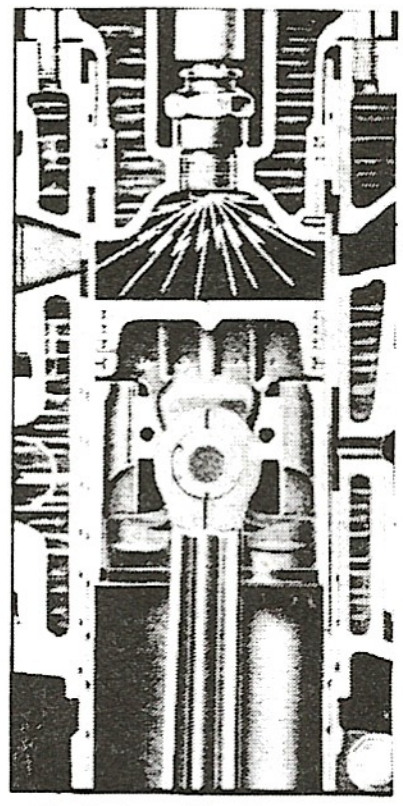
Dès 1905, Knight et Kilbourne purent mettre sur la route la première automobile munie d'un moteur Knight à manchon. Le moteur était évalué à plus de 35 H.P. et son rendement rencontrait toutes leurs espérances. Il ne restait qu'à trouver un manufacturier d'automobile qui voudrait incorporer le moteur Knight à sa voiture. Les problèmes commencèrent à ce moment. Personne n'en voulait. Chacun avait son moteur à soupapes et était satisfait de cela. On ne fournissait pas à vendre les autos; pourquoi, alors s'embarquer dans un moteur tellement différent.



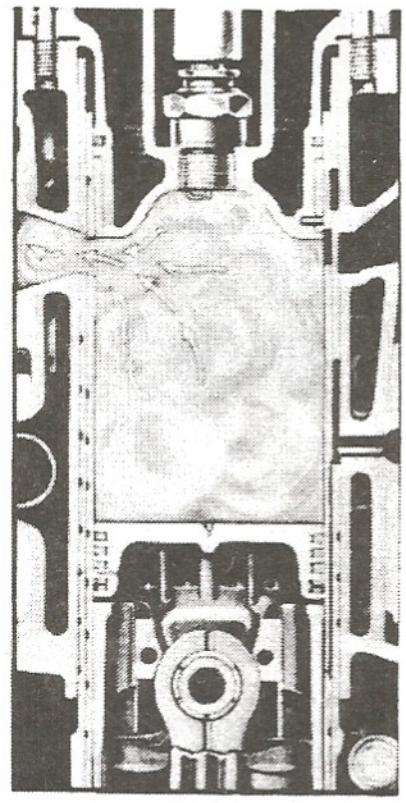
Entrée des gaz - Les gaz sont aspirés dans le cylindre par les ouvertures des deux manchons.



Compression - Les parois étant fermées, les gaz sont comprimés dans la chambre à combustion.



Explosion - L'explosion des gaz, comprimés dans la chambre à combustion, pousse le piston vers le bas avec force.



Sortie des gaz - Après l'explosion, les gaz brûlés sont évacués par les ouvertures à gauche dans les manchons.

Certains historiens avancent que Knight demandait trop cher pour ses droits d'invention. Certains manufacturiers eurent peur car le moteur n'était pas encore breveté. Knight avait fait sa demande de brevet le 4 avril 1904 mais on ne la lui accordera que le 23 août 1910. L'industrie automobile était aux aguets avec la bataille de droits d'invention que se livraient Henry Ford et Charles Seldon. À cette époque Ford ne semblait pas avoir le bon bout et les manufacturiers ne voulaient pas se retrouver avec une autre batailles de brevets sur les bras.

Ces six années d'attente, c'est long pour un inventeur impatient comme Charles Y. Knight. Donc après deux ans de vains efforts à la recherche d'un débouché aux États-Unis, il s'embarque sur un bateau vers l'Europe emportant avec lui un de ses moteurs. Il allait lui trouver un foyer.

La chance venait de frapper Knight. Quelques petits faits allaient redonner sourire et fortune à Charles Y. Knight. Tout d'abord, sur le bateau, en route vers l'Angleterre, il rencontra un des directeurs de la Firme Daimler Motor Co de Coventry, Angleterre. Daimler fabriquait des automobiles sous licence d'un brevet de la firme allemande Daimler. Ensuite par ironie du sort il se trouvait que le gérant de Daimler était un américain du nom de Percy G. Martin. Il était probablement plus enclin à écouter l'histoire d'un compatriote. Pour couronner tout cela il arriva que bien que Daimler fut une des compagnies prospères du temps, elle était à ce moment même dans une période creuse. Elle avait besoin de nouveauté pour attirer le public et redémarrer.

Au premier abord les ingénieurs de Daimler boudèrent ce bizarre de moteur qui leur arrivait d'Amérique. La réputation de Daimler était trop bien établie pour la risquer avec ce moteur bâtard qui n'avait pas fait ses preuves. Mais Knight, secondé par son nouvel allié, Monsieur Martin, supplia les ingénieurs de faire passer les essais les plus rigoureux à son moteur. Knight avajt confiance en son produit.

Il se plièrent à leur désirs et de ce fait firent la découverte de ce qui allait devenir la marque de commerce du moteur à manchons pour les années à venir. Plus le moteur fonctionnait, meilleur il devenait. Il s'améliorait donc avec le temps alors que le moteur conventionnel en perdait graduellement, les soupapes devenant moins étanches et les ressorts s'affaiblissant après des heures de marche. En plus pour conserver la compressionà son maximum il fallait souvent roder les soupapes (grind values). le moteur à manchon, sans soupape ni ressort mais avec des manchons à action positive avec bielles ne semblait pas se fagiguer avec le temps mais bien au contraire son rendement s'améliorait. Tout ceci était dû au fait que les dépots de carbonne qui s'accumulait à la surface des manchons avaient pour effet de rendre encore plus étanche le jeu entre les manchons et de ce fait augmenter la compression. Cette particularité permit à Knight de dire que son moteur: "Le moteur qui s'améliore en vieillissant".

Lorsque les ingénieurs de Daimler se rendirent compte que le dynamomètre enregistrait une augmentation de puissance du moteur après des semaines d'essais intenses ils n'en croyaient pas leurs yeux. Ils décidèrent donc d'adopter le moteur pour leurs voitures.

Un facteur qui influa la décision fut que la compagnie Daimler possédait à peu près les meilleurs machinistes et mécaniciens de l'industrie automobile. Les ingénieurs étaient certains de pouvoir améliorer la précision d'ajustement ce qu'ils firent. Le nouveau moteur Daimler-Knight s'avéra être le moteur le plus silencieux sur le marché, ce qui justifiait bien son surnom de "silent Knight".

C'était en 1908. Les directeurs de Daimler, compagnie très reconnue, venaient de mettre la réputation de leur compagnie en jeu en incorporant à toutes leurs voitures le nouveau moteur "Daimler-Knight".

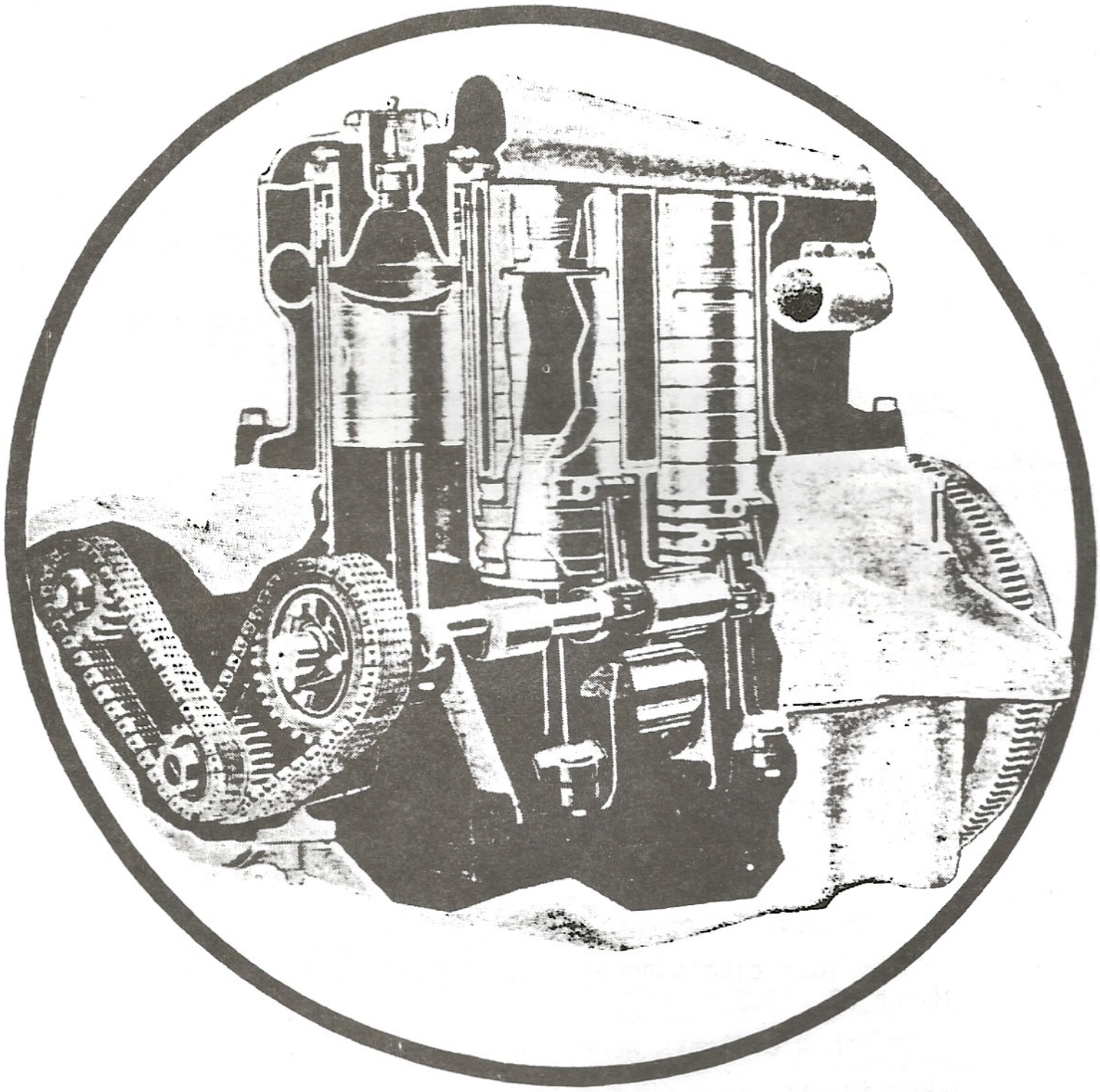
Mais lorsque, peu avant l'exposition automobile Olympia, l'on apprit au public cette décision, un orage de critique retomba sur Daimler.

C'était un peu le même scénario qui se présente lorsqu'une nouvelle invention fait surface. Peut-être qu'un manufacturier craignait la compétition de ce nouveau moteur et voulait le mettre en doute dès le départ. Comme le dit bien Eugène Ballau, un historien du moteur Knight, la propagande auto-Knight semblait venir de toutes parts.

Le point le plus vulnérable de Knight et sur lequel les critiques s'appuyaient était le fait qu'aucune compagnie américaine n'avait voulu du moteur Knight. Si ce moteur est si bon pourquoi les Américains ne l'ont pas adopté, demandèrent les critiques.

Cependant Knight et Daimler savaient qu'ils avaient un bon moteur. Ils avaient fait leurs propres essais mais lorsqu'ils mentionnaient que le rendement accroissait avec le temps, on ne voulait pas les croire. C'était un non-sens disait-on. Lorsqu'on leur disait que des essais avait été faits pour le prouver, on rétorquait en disant "Ce sont vos propres essais".

Knight et Daimler ignorèrent d'abord ces critiques mais comme ça ne semblait pas vouloir se calmer, ils décidèrent de soumettre



leur moteur au "Royal Automobile Club" pour lui faire subir des essais. Les sceptiques devraient croire le "Royal Automobile Club" qui était renommé pour son impartiale sévérité.

Le RAC acquiesça à leur demande pour soumettre leur moteur aux mêmes essais que ceux des autres compagnies anglaises. C'était un test très dur et très peu de manufacturiers avaient osé faire subir ce test à leur moteur. Les moteurs en sortaient souvent complètement ruinés.

C'était maintenant à Daimler d'étonner l'industrie automobile. Il n'acceptait pas les tests du RAC disant qu'ils n'étaient pas assez sévères. "Si nous soumettons nos moteurs à l'épreuve, dit Daimler, nous voulons que cela en vaille la peine en exigeant des conditions plus difficiles comme il ne s'en est jamais vu dans l'industrie automobile. Nous voulons éprouver nos moteurs et instituer des normes que personne d'autre n'essaiera d'atteindre".

Le RAC s'objecta d'abord, nous rapporte Ballau, prétextant que ce serait un suicide pour Daimler mais devant l'insistance de ce dernier, ils préparèrent des normes les plus strictes jamais établies pour un moteur à combustion interne.

Les nouvelles normes d'essai du Royal Automobile Club étaient plus exigeantes. Le moteur Knight devait fonctionner sans arrêt durant 132 heures sur un banc d'essai et à chaque heure une lecture est prise sur un dynamomètre. En aucun temps la puissance du moteur ne devait tomber sous celle établie par les ingénieurs du RAC pour cette cylindrée, soit 38.4 H.P. C'était là la clé de l'énigme car les ingénieurs de Daimler savaient que même si un moteur compétiteur pouvait passer le test des 132 heures, ils savaient très bien qu'aucun autre moteur que le Daimler-Knight ne pourrait conserver sa puissance initiale durant toute la durée de l'essai.

La deuxième phase consistait à monter ce même moteur sur une carrosserie automobile, sans ne faire aucune préparation puis le faire rouler sur une distance de 2,000 milles sur une piste de Brooklands et ce en dedans d'une limite de 60 heures. N'oubliez pas que nous sommes en 1909. Suite à cet essai sur piste, le moteur était de nouveau monté sur un banc d'essai et après 5 heures de marche, une lecteur était prise sur le dynamomètre. La puissance ne devait pas être sous les normes établies. Le moteur était ensuite démonté sous la surveillance des ingénieurs du RAC et mesuré pour déterminer l'usure. Il ne devait pas y avoir d'usure anormale.

Dès le début des essais, le moteur Daimler-Knight prit les ingénieurs du RAC par surprise. Bien qu'ils avaient calculé une puissance de 38.4 H.P. pour ce moteur, dès le début le dynamomètre leur indiquait une puissance de 54.3 H.P.

Le plus étonnant de tout, les ingénieurs voyaient grimper la puissance à mesure que l'essai se poursuivait. Au lieu de baisser la puissance indiquait un gain de 10%. Cela ne s'était jamais vu auparavant.

(À suivre)

LE CLUB SPORTIF MG-T QUEBEC INC

POUR NOS MEMBRES QUI SONT PROPRIETAIRES D'UNE DE CES MAGNIFIQUES PETITES VOITURES

Chers enthousiastes,

L'assemblée annuelle de votre Club avait le dimanche 21 mars dernier, à Sherbrooke.

De nouveaux officiers ont été élus pour gérer les destinés du Club au cours de l'année 1982:

-Président: Yvan L. Bureau
Tél.- travail (819) 562-3889
- résidence (819) 562-3374

-Vice-Président: Pierre P. Doyle (local 247)
Tél.- travail (418) 643-4881
- résidence (418) 832-0853

-Secrétaire-Trésorier: Pierre Danis
Tél.- travail (514) 873-5205

Trois nouveaux postes ont été créés dans la Corporation et les personnes suivantes ont été élues à ces fonctions:

-Responsable-adjoint au Secrétaire-Trésorier: Richard Jalbert

-Responsable des activités: Terry Ratycz

-Responsable de la publicité: Donald (Don) Leblanc

En souhaitant vous voir bientôt!

FOR ANY OF OUR MEMBERS WHO OWN T SERIES MG'S, A SUPERB LITTLE AUTOMOBILE

Dear Enthousiasts,

Your club's annual meeting was held in Sherbrooke, on March 21, 1982.

New officers were elected for the year 1982:

-President: Yvan L. Bureau

-Vice-President: Pierre P. Doyle

-Secretary-Treasurer: Pierre Danis

It was proposed and accepted that three new functions be created:

-Assistant Secretary-Treasurer: Richard Jalbert

-Director of activities: Terry Ratycz

-Director of publicity: Donald (Don) Leblanc

Hoping to see you all very soon.

OCTOGONNALLY YOURS,

for: Yvon L. Bureau

PARTS FOR CLASSIC SPORTS CARS

With the ever-increasing interest in the restoration of older mass-produced sports cars, it is encouraging to learn that British Leyland is authorizing the manufacture of replacement parts for most of the cars built through the years by its various constituent companies. Specifically, these companies are MG, Triumph, Austin-Healey and Jaguar and the models covered date from the end of world war II.

Admittedly, there are a variety of replacement parts on the market for these cars, but some of them are of doubtful origins so, if you drop a South Korean exhaust valve in your MGA, while turning 6 000 rpm, it may easily hole a Taiwanese piston, although I may be exaggerating somewhat because the shortage of parts for these older cars has resulted in certain manufacturers making replacements of excellent quality. Anyway, to legitimize the whole business, BL has set up a system whereby certain manufacturers are now authorized to use the BL trademark on parts that have been approved by BL.

The authorized suppliers are in Britain and the U.S. and the parts will bear the BL trademark and the word Heritage, because the scheme is being run by BL Heritage, which runs BL's museum and has responsibility to owners of the company's older cars.

At present, six authorized specialists have been appointed in the U.S. They are as follows: Abingdon Spares Ltd, South St, Walpole, N.H. 03608 (all MGs, all Austin-Healeys, Jaguars through the XK 150 and Triumph up to the TR4); Moss Motors Inc., 7 200 Hollister Ave, Goleta, Calif. 93117 (same parts as Abingdon Spares); The Roadster Factory, PO Box 332, Armagh, Pa. 15920 (TR2 through TR6); Scarborough Faire Inc., 1151 Main St, Pawtucket, R.I. 02860 (all MGAs and all Austin-Healeys); Start Your Engines Ltd, 6789 Mid Cities Ave, Beltsville, Md. 20705 (MGA, MGB and TR2 through TR6); M&G Vintage Auto Co, 154 Chestnut St, Ridgewood, N.J. 07450 (MG-T series).

If you are looking for components for your restoration job, one of these suppliers can probably help you.
(Road & Track ,april 1982)

You can probably ask Chris about some of them, or Bob Neapole, or Gilles Desroches or..... who have dealt with some of them in the last couple of years. Have you any other sources???? let your fellow members know about your experiences, good or bad.

Well, I have done my share for this year, now it is up to you to really puzzle your technical advisor.

It is all yours, Chris.

Pierre-André.

GIRLING...LOCKHEED....DUNLOP.... BRAKE AND CLUTCH PARTS

LUCAS.... SMITHS.....CARELLO ELECTRICALS

CROSSLAND FILTERS.....AND PROBABLY MORE

Not only will this adress let you save money but, more important, if there is the slightest chance to get it, Joe Lew will do all he can to find the part for you, to repair, adapt or else so that your classic will run. Many of our members have already benefited from the help of LEW'S DIESEL & ELECTRIC LTD and I personally hope that more will in the future. They have the catalogues for all the above components from the mid-thirties on, and Joe's father has the experience and memory to match as he was with Lucas for a number of years.

As if this was not enough , they will, upon request from any member, grant an additional 30 % DISCOUNT on all the parts purchased by a member of the V.E.A.E, a discount on a price which is frequently 30 to 50 % cheaper than the dealer's price. Anybody wants to gain?

Contact : Joe Lew
Lew's Diesel & Electrical Ltd
96 Leacock Drive
Pointe-Claire, Québec
(514) 694-1491

I personally recommend him and you can ask Gilles, Hans, René, David and probably others too. As you can see, it pays to be a part of a dynamic club that works for their members.

LES BONNES ADRESSES: ALIGNEMENT ET BALANCEMENT DE ROUES.

Il nous est souvent difficile, voir impossible de trouver un endroit spécialisé qui veuille bien a ligner nos voitures anciennes. De même, quand vient le temps de faire balancer nos roues de broche, le même défi se présente.

Eh bien, il existe une solution à ce problème. Il y a un endroit qui possède de l'équipement ultra-moderne et qui fait tout cela pour toute voiture construite après 1921... me dit-on. Chose certaine, ils ont fait ce travail sur ma XK-150 et j'en suis ravi, depuis le temps que je cherchais. Leur nom:

PNEUS ASTRO (QUE) LTEE
230 Michel Jasmin (voie de service Côte-de-Liesse)
Dorval, Québec.

Si vous voulez vous prévaloir de leur compétence, appelez

Gaétan Beaudin, au 636-9000 pour prendre rendez-vous.

Pierre-André Ouimet.

CHEZ L'ANTIQUAIRE

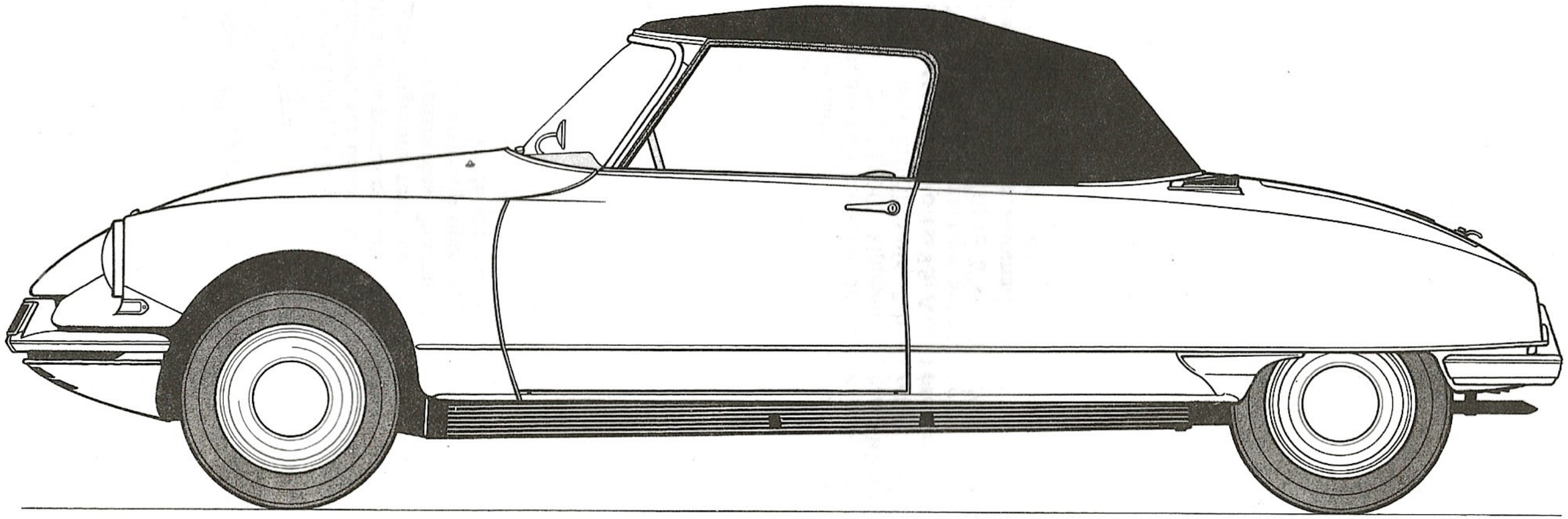
Citroën DS 19 cabriolet, 1961

Réalisé en 1960 par le carrossier français Chapron, sur dessins Citroën, ce modèle à deux portes et quatre places avait des longerons renforcés et ses ailes arrière échancrées. 76 combinaisons de teintes étaient proposées : 13 de carrosserie et 11 de garnitures en cuir. Capote en crylor noir.

FICHE TECHNIQUE : DS 19 décapotable. MOTEUR : 4 cylindres en ligne. Alésage 78 mm. Course 100 mm. Cylindrée 1911 cm^3. Rapport volumétrique 7,5. Puissance fiscale 11 CV. Puissance réelle 70,5 ch DIN à 4 500 tr/mn. Couple maxi 13,5 m.kg DIN à 3 000 tr/mn. Bloc moteur en fonte à chemises humides et amovibles. Vilebrequin à 3 paliers. Culasse en alliage léger à chambres de combustion hémisphériques. Carburateur double corps Weber 24/32 DDC. Allumeur à 2 rupteurs sans distributeur. 2 bobines. Batterie 6 volts 75 A/h. TRANSMISSION : traction avant. Embrayage monodisque à sec à commande hydraulique automatique. Boîte de vitesses à commande hydraulique par levier de sélection derrière le volant. 4 rapports avant dont 3 Synchronisés et une marche arrière. Transmissions homocinétiques des 2 côtés. SUSPENSION : hydropneumatique à hauteur constante à 4 roues indépendantes. FREINS : à disque à l'avant, à tambour à l'arrière, assistés, à double circuit, avec répartiteur de freinage agissant en fonction de la charge. DIRECTION : à crémaillère, assistée hydrauliquement. PNEUS : roue à fixation centrale. Pneumatiques Michelin avant 165-400, arrière 155-400. DIMENSIONS : empattement 3,125 m. Voie : avant 1,500 m, arrière 1,300 m. Longueur 4,81 m. Largeur 1,79 m. PERFORMANCES : vitesse 140 km/h. Consommation 10 l aux 100 km.

The convertible version of the DS was introduced at the 1960 Paris Motor Show. Built by French coachbuilder Chapron to Citroën specifications, this two-door, four-seater model had reinforced side members and cut-out rear wings. 76 colours: 13 for the body and 11 for leather seats and upholstery. Black crylon hood.

TECHNICAL SPECIFICATIONS: DS 19 Convertible. ENGINE: 4 in-line cylinders. Bore 3.071", stroke 3.937". Swept volume 116.62 cu.ins. Compression ratio 7.5: 1. French Treasury rating 11 CV. Effective horsepower 70.5 HP DIN at 4500 rpm. DIN torque 98 lb ft at 3000 rpm. Caststeel engine block with removable wet liners. 3-bearing crankshaft. Light-alloy cylinder head with hemispherical combustion chambers. Weber 24/32 DDC duplex carburetter. Ignition with two contact-breakers and no distributor. 2 coils. 6-volts, 65 Ah battery. TRANSMISSION: front-wheel drive. Single-plate dry clutch with automatic hydraulic control. Hydraulically operated gearbox controlled by a selection lever behind the steering wheel. 4 forward speeds, 3 of them synchromesh, and reverse. Homokinetic transmission on both sides. SUSPENSION: constant-height hydropneumatic, with 4 independent wheels. BRAKING: front-wheel discs, rear-wheel drums, power assisted, dual circuit with braking distributor acting according to load. STEERING: hydraulically assisted rack-and-pinion. TYRES: centre-fixed wheels. Michelin tyres: front 165 × 400, rear 155 × 400. DIMENSIONS: wheelbase 10' 3"; tracks: front 4' 11", rear 4' 3 1/4". Length 15' 9 1/4". Width 5' 12". PERFORMANCES FIGURES: speed 87 mph. Comsumption 28.2 mpg.



Dessin Dumont E.T.A.I.

Citroën. "DS 19" cabriolet, 1961

Realizing hydrogen's fuel potential could keep us on the roads and out of the cold

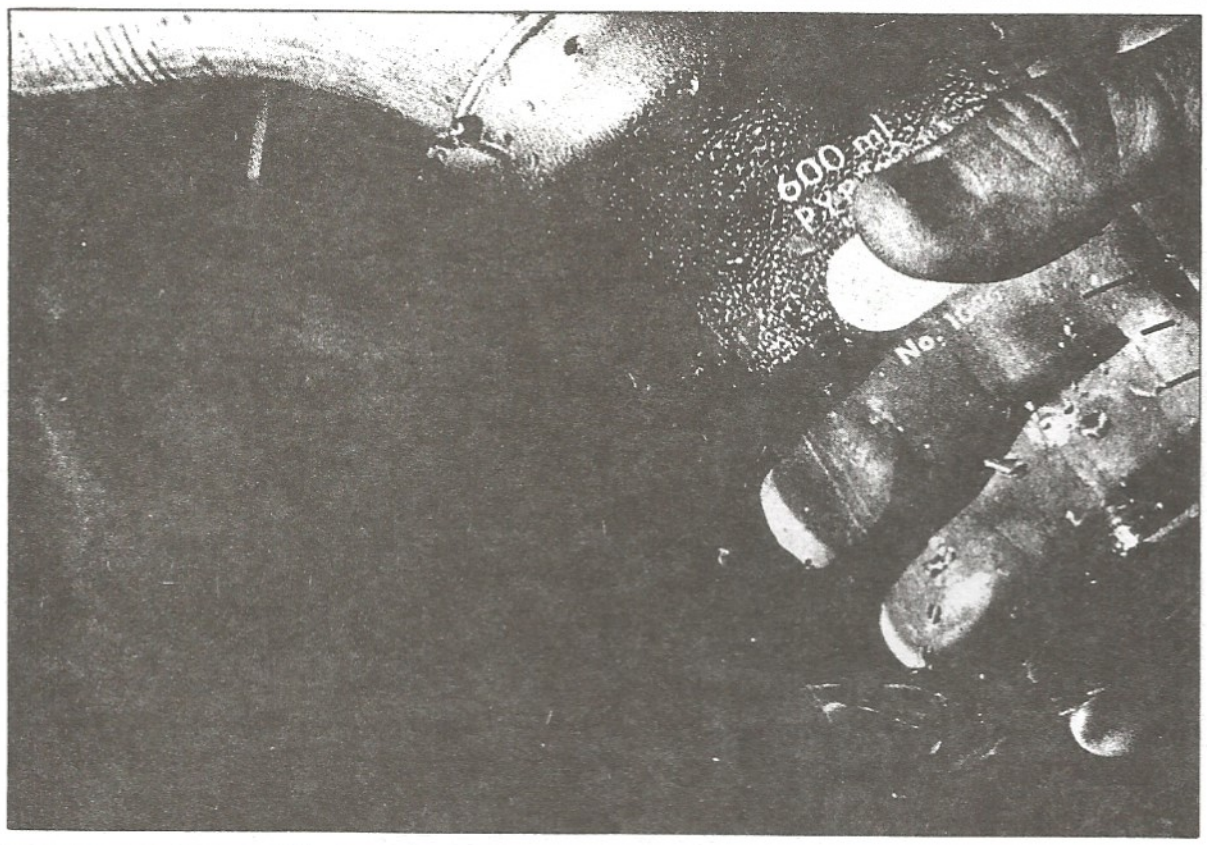
The fuel of the future

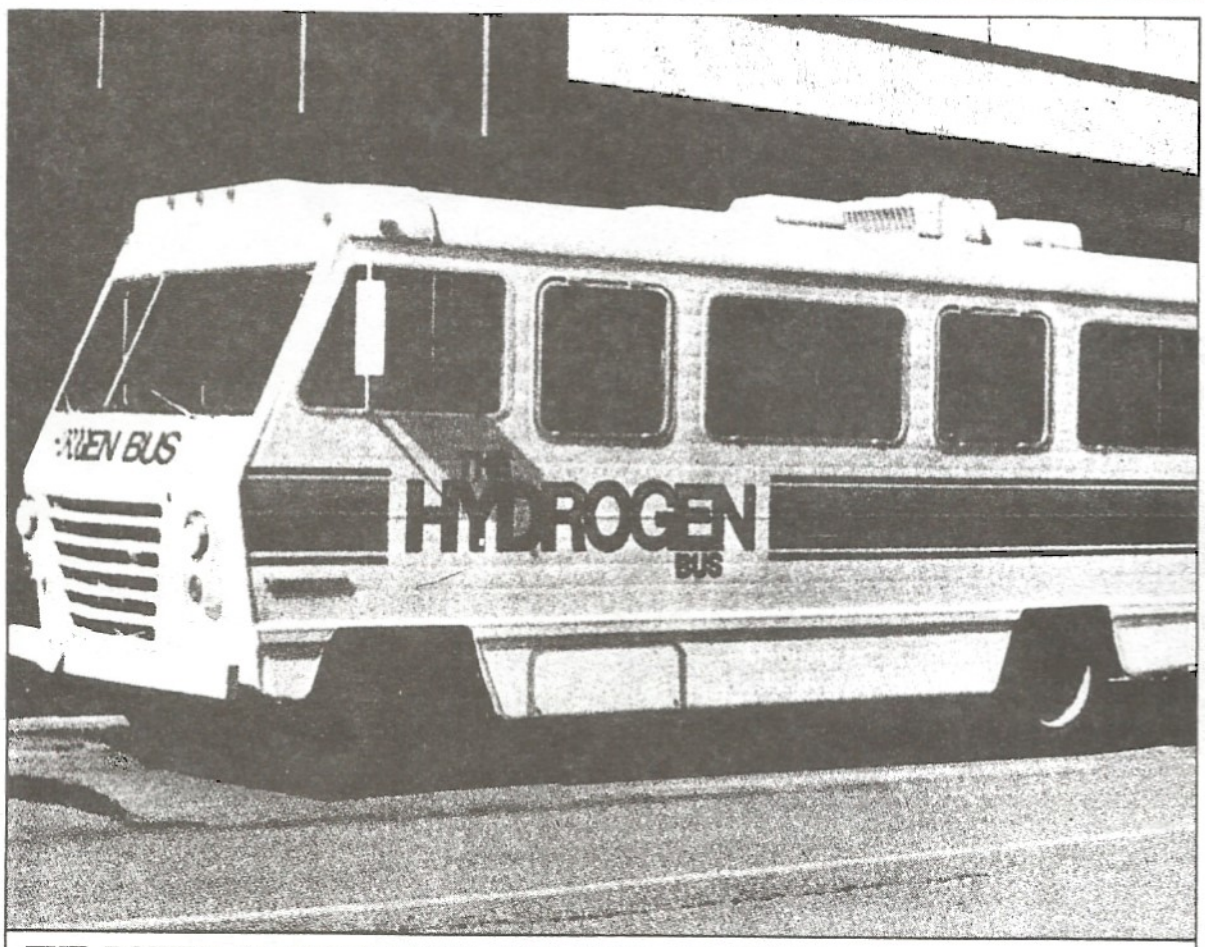
Since 1973 and the Arab oil embargo, Canadians and other oil-consuming nations of the world have been gripped by the energy crisis. The crisis has manifested itself by higher prices, higher taxes, seemingly endless federal-provincial wrangling and conflicting views. And even with the signing of the long-delayed Alberta-Ottawa oil-pricing agreement, general confusion remains about Canada's energy future. A quick review of the facts, however, shows exactly what the energy crisis is all about and, perhaps as important, exactly what we must do to resolve it.

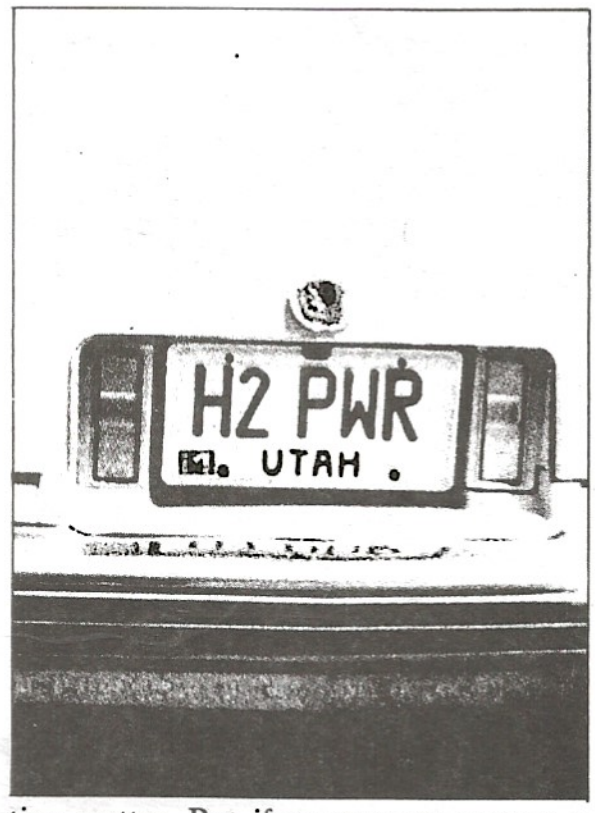
The key facts are these:

- Canada imports 20 percent of its oil and may reach 30 percent by 1985.
- Canadians are the highest per capita users of oil in the world.
- Our increasing dependence on foreign oil is largely from unstable sources, which may or may not be available to us within five years.
- *The Scientific American* has said that world oil supply will fail to meet demand within 20 years.
- Canada has abundant electrical supplies. In some markets we are quickly approaching the electrical saturation point, and we are a net exporter of electricity. The first step, then, to the resolution of the crisis is to realize that we do not have an energy crisis; we have instead an oil crisis.

By David Onley







THE POWER OF HYDROGEN: THE FUEL OF THE FUTURE IS SAFER AND MORE POWERFUL THAN GASOLINE AND PRODUCES ONLY WATER (TOP) AND NO WASTE PRODUCTS. CARS SUCH AS ROGER BILLINGS'S CADILLAC (TOP RIGHT) CAN EASILY BE CONVERTED AND ALREADY SOME CITIES IN THE U.S. ARE EXPERIMENTING WITH HYDROGEN IN TRANSIT SYSTEMS

BUS & TRUCK TRANSPORT/JOHN BATES

The difference between the two is far greater than mere terminology, especially in light of the popularly touted "solutions," the avante-garde "new sources of energy." The new sources are a natural result of a technological society turning to technology for a technological answer. On a regular basis we are greeted with all manner of exciting stories on the future of solar power, the future of tidal power, the future of biomass and the future of wind power. Yet somehow the stories ring hollow. Despite the optimistic pronouncements, we come away with a vague feeling of unease because all of these solutions *are* in the future. Intuitively (and financially) we realize the problem is today.

Our sense of unease is articulated by Dr. Bryan Taylor of the National Research Council of Canada (NRC), who points out that while the crisis is oil, "these new energy sources including wind and solar enter the system as electricity," the one form of energy we have in abundance. Dr. David Scott of the University of Toronto clarifies the situation in specific terms: "It is not the shortage of electricity that troubles our nation. It is a shortage of fuel — a chemical energy currency. Even if these new sources produce electric power, *that* is not what is needed. But the ability to make a *fuel* energy currency from these sources is needed."

This leads to a simple conclusion with staggering implications: since the crisis is oil and since we are running out, the only solution to the oil crisis is a replacement for oil itself. Even with the most advanced technology in the world, such a task makes putting a man on the moon seem a routine matter. But if we were to pursue a replacement for oil, and thus a replacement for gasoline, if we were to indulge in what-if-you-won-the-lottery? type of speculation, what kind of replacement fuel would we come up with?

First, the ideal fuel would be manufactured from an inexhaustible Canadian supply. Second, the ideal fuel would power existing cars, buses, trucks and transit vehicles with minor technical adjustments. Third, the new fuel would even be safer and more powerful than gasoline and have the added benefit of being nonpolluting. Fourth, existing Canadian corporations would be world leaders in the technical expertise to manufacture this new fuel. Fifth and finally, one of Canada's key university departments of mechanical engineering would already have made a formal academic commitment to the training of engineering students who would be, in effect, the technical vanguard of the new era.

Now, *that* would be an ideal replacement for oil and gasoline. So consider if you will the implications, because the preceding five points are not fiction, they are fact. The replacement for oil and gasoline has been found and is ready to go. It must be beheld to be believed.

It was first isolated in the laboratory of English scientist Henry Cavendish in 1766

THERE IS NO ENERGY CRISIS, THERE IS AN OIL CRISIS; THE ONLY SOLUTION IS TO REPLACE OIL ITSELF

as a highly flammable but unnamed gas. It was left to the father of modern chemistry, Antoine-Laurent Lavoisier, to take the Greek word for "maker of water", *hydrogenès*, and call it *hydrogen*.

Behold, hydrogen.

It is the most abundant element in the universe. Unlike oil or gas, however, hydrogen rarely exists in an independent or free state and is usually bound up with other molecules to form the traditional hydrocarbon fuels of wood, coal and oil. When we use the hydrocarbon fuel, gasoline, in our cars, it is actually the hydrogen that burns and provides the power, while it is the carbon that pollutes.

Pollution is another difference between hydrogen and gasoline. Because hydrogen has no carbon molecules in its chemical makeup, it does not produce any carbon pollutants, no carbon monoxide, no sulphur dioxide, no particulates nor photochemical oxidants. When air enters a hydrogen flame, a small amount of nitrous oxide can be produced but the level is quite controllable and far below even the most stringent future auto-pollution standards. The only byproduct of burning hydrogen is water.

Almost any internal combustion engine that runs on gasoline can be converted economically to run on hydrogen. Present-day automobiles carry costly pollution controls that significantly decrease fuel consumption in order to reduce pollution; in other words, the full power potential of gasoline is not utilized. Even at full potential, gasoline has 16,000 BTUs of power per pound while hydrogen checks in at 51,000. And hydrogen is not only much more powerful than gasoline, but most automobiles can be converted to run on hydrogen for about the same price as the present pollution controls, which, when the conversion is completed, are no longer needed.

Hundreds of vehicles the world over have been converted to run on hydrogen, ranging from tractor lawnmowers to compact Dodge Omnis to a Cadillac Seville. With no hydrocarbon pollutants to foul spark plugs or clog the carburetor, general engine wear is dramatically cut to the point where tests indicate the standard automobile engine running on hydrogen should be able to drive more than 250,000 miles before an engine overhaul is required.

The leading expert in hydrogen automobiles is Roger Billings of Independence, Missouri, founder and president of the Billings Corporation, the world's largest private research and development hydrogen company, with more than 300 employees and $9.8 million in annual sales. It was Billings's Seville that rode in U.S. President Jimmy Carter's 1976 inaugural parade, a hybrid auto that carries both gasoline and hydrogen in separate tanks. With the flip of a switch on the dashboard, the Seville's fuel supply is diverted from gasoline to hydrogen and the engine becomes strangely quieter, its vibrations far lower. The engine itself seems to know that this is the fuel it should be running on.

Billings has sold converted hybrid Dodge Omnis from his Independence facilities and is now converting vehicles for government and industry on a contract basis and plans to make kits available to convert private cars. He sees one of the problems of hydrogen cars as being the oil in the crankcase. With no hydrocarbon pollutants, the oil does not turn black. Billings worries with a smile whether people will even remember to change the oil.

There is, however, a real worry: safety. Mention hydrogen and many people of an earlier generation think of the spectacular 1937 crash of the hydrogen-filled German zeppelin the *Hindenberg*. Hydrogen proponents call it the Hindenberg syndrome: a fear of a firey hydrogen explosion. Often overlooked is the fact that of the 97 people on board, 61 survived and many of the 36 victims died not from the hydrogen, but from the pools of burning diesel fuel on the ground. Why? Because hydrogen's lighter-than-air quality means that unlike gasoline, which spills and sticks and burns with furious intensity, hydrogen burns straight up and away, and because of its higher flammability, burns off in split seconds.

Even though we are used to driving at highway speeds, lugging about 16 gallons of explosive gasoline, the notion of hydrogen and the Hindenberg syndrome cause concern. If hydrogen is more than three times more powerful than gasoline, what would happen if a hydrogen car's tank ruptured in an accident? Another technical innovation assures that little would happen, certainly not a small *Hindenberg*. Behold, the "miracle sponge."

Iron titanium is a crushed pebblelike substance with unusual properties. Once a typical hydrogen tank is filled with iron titanium to the two-thirds level and hydrogen gas is pumped in, an immediate chemical transformation takes place. A new material, iron-titanium hydride, is formed as the titanium soaks up the hydrogen the way a sponge soaks up water. At that point, the hydride is about as dangerous as a wet sponge. An iron-titanium hydride tank filled with hydrogen chemically cannot explode.

Well aware of public disbelief, Roger Billings graphically recorded a unique experiment on film. U.S. Army sharpshooters fired incendiary bullets into separate gasoline- and iron-titanium-hydride-filled tanks. In the government-certified test, the first bullet hit the gasoline tank; the resultant fire-bomb type of explosion scattered the tank in bits of shrapnel in all directions and the blaze raged out of control. When the second incendiary bullet was fired into the hydrogen tank, a popping sound was heard and there appeared a hole the size of the bullet. For two or three seconds a jet of hydrogen flame whooshed from the hole, then flickered back down to limp pilot light, then simply blinked out. In an interview, Billings said that "if a hydrogen tank were ruptured, you could shovel the titanium hydride back in, weld it shut, and still have enough hydrogen to drive home."

The problem right now with iron-titanium hydride is its weight: 600 pounds' worth are required to achieve a 200-mile range in a typically converted Dodge Omni. But iron-titanium is not the only "miracle sponge" material. Worldwide research into and development of lighter hydrides is leapfrogging ahead and hydrogen-powered cars are a present-day reality.

So it is easy to think of hydrogen just in terms of cars and buses and trains. We know that the transportation sector uses 25 percent of our fuel. We know hydrogen is safer than gasoline. We know about hydrogen's nonpolluting nature. And when we recall that 20 percent of our oil is imported, the percentages start to tease us: *Convert the transportation sector to hydrogen and Canada is oil independent.* Quite true. But that alone is to miss the point, for hydrogen is much more than a fuel for safe, clean cars. It represents a power that

THE REALITY IS SIMPLE: CONVERT THE TRANSPORTATION SECTOR TO HYDROGEN AND CANADA IS OIL INDEPENDENT

can transform the entire economy.

Recall that the problem of the fuel crisis is our dependence on foreign supply and our own dwindling resources. And recall that hydrogen's only combustion byproduct is water. Water is the answer to our supply problem, for it is from water that hydrogen is manufactured. How? By the one power Canada has in abundance: electricity.

The hydrogen manufacturing process is called electrolysis, the splitting of water's one oxygen and two hydrogen molecules into hydrogen and oxygen. It is with electrolysis that the Canadian odyssey to a clean chemical fuel begins. Others had discovered it and named it, but in 1905 it was Canadian pathfinder A. T. Stuart who took hydrogen out of the lab and into the market. From his work at various electrochemical plants in the Niagara Falls, New York, area, Stuart considered the great waste of electricity in off-peak conditions. Stations are built for peak use and when the peak is passed, electricity is wasted. He then recorded the advantages of taking excess electricity and using it to manufacture hydrogen and oxygen.

For the next 25 years, Stuart was to discover that being on the leading edge of technology is a lonely place, a constant battle to convince the unbelievers. But by 1930, General Motors had begun hydrogen research and development. In 1933 German scientist Rudolph Erren, working in the U.K. on the development of hydrogen-powered engines, also proposed using off-peak electricity for widescale hydrogen production. Ironically, Erren's concern centred on automobile pollution and Great Britain's dependence on foreign oil. By 1934, the chairman of Ontario Hydro was quoted in the *Globe* as saying that the utility intended to exploit the use of electrolysis to manufacture hydrogen and oxygen, stressing "the vast new market for hydro power. There is no question but that an assured and plentiful supply of cheap hydrogen and oxygen would result in attraction of many industries to Ontario." After three decades of letter writing, report preparation and convincing, Stuart's dedication paid off and in 1935 Ontario Hydro opened an experimental electrolysis plant in Toronto, which in short order demonstrated the efficient production of hydrogen and oxygen by electrolysis. The plant shifted from pure research into development and Hydro calculated practical market sales could begin within five years.

It appeared that Canada was on the verge of something great. We seemed to be experiencing the heady euphoria of Victor Hugo's aphorism that nothing is as powerful as an idea whose time has come. But history has more often than not proven Hugo wrong. Had he said, "Nothing is as irresistible as an idea whose price is right," he would have been proven correct, because just as hydrogen emerged from the labs, just as public officials began informing the public of its potential, the bottom fell out. The huge pools of Middle East crude oil came on line at pennies per gallon. It was an offer the world could not refuse. With the crunch of the Depression squeezing all economies and with the problem of cheap energy "solved," Ontario's experimental hydroelectrolysis plant was shut down. Work in hydrogen ground to a halt and as an alternative fuel it became academic, an interesting answer to a problem that apparently did not exist. Oil was cheap and so was gasoline. Years later, there appeared a paper entitled "The Need in Canada for a National Energy Policy." Its argument was familiar: "There exists in Canada the anomaly of having at the one and same time both too much energy in the refined form of electricity and too little energy in the form of crude fuel." This prohydrogen paper was not the federal government's 1980 NEP. The author was A. T. Stuart and the year was 1938. Few listened, and soon World War II preoccupied everyone.

The victorious oil-powered allies rolled into the fifties and sixties on a cheap oil economy and in more and more cars consuming more and more gasoline. Early warnings about supply were dismissed because we still had "hundreds of years left."

October 1973: the Arab oil embargo. The oil pools that had built our economy were turned against us. The price of oil began to skyrocket, economies faltered and, worst of all, it became clear for the first time that we were actually running out of the stuff. After a 35-year sabbatical in the laboratories, alternative fuels were no longer of only academic interest.

Fortunately, in 1955, David Scott, a Queen's University electrical engineering undergraduate, attended a Queen's football game and, as engineering students are wont to do at football games, had a few beers: "For reasons I can't possibly remember now, I changed my mind at half time, went over and changed my registration from electrical to mechanical engineering."

Of lesser reasons is history made, for the centrality of mechanical engineering is energy conversion, the essence of our economic machine. A quick study, Scott finished off his bachelor of science and master's degrees at Queen's and received a PhD from Chicago's Northwestern University. In 1976, the University of Toronto made a propitious decision: Scott was appointed chairman of the Department of Mechanical Engineering. Things really began to happen.

In far more analytical and traditional analysis than that which had prompted his reregistering in mechanical engineering, Scott began his chairmanship with a back-to-the-basics approach. Since energy conversion is basic to mechanical engineering, what were his students actually being taught? Moreover, what was going to be important in energy conversion in the future? In the aftermath of the oil embargo, surely the key lay in alternative fuel. "That is when I began to go to Ottawa and ask people at the NRC just what was needed. It's interesting that the first leads to hydrogen were not from me, but from people in Ottawa." There was clearly a need for Scott's first big step: the creation of the department's Laboratory for Advanced Concepts in Energy Conversion.

Brains, money and research into fundamentals often discovered patterns, clues to be pursued. In short order the lab began hitting on such a pattern: with the entire gamut of alternative fuels under scrutiny, hydrogen kept popping up again and again. "For a long time I just thought hydrogen was very attractive for technological and environmental reasons and therefore was highly probable to be something that would happen in the future."

There was a pattern all right, but the picture of the future was still fuzzy. In September 1979, at a symposium on hydrogen in Stuttgart, Germany, Scott's picture snapped into focus. Dr. Cesare Marchetti, a leading scientist in global energy systems, propounded his theory of energy penetration rates: that every form of en-

ergy penetrates the market to a maximum saturation rate to then be replaced by a more efficient form of energy. Marchetti demonstrated that historically man has shifted energy sources not because the original source was running out but because the market had been saturated and another form of energy was more efficient. We shifted from wood to coal in the 1800s because wood had saturated the market and coal was more efficient. Coal in turn saturated the market to be replaced by oil because oil was more efficient, and electrical power stations as evidenced in Ontario, Manitoba and Quebec are quickly saturating the market today. At no point did we shift from wood to coal to oil because we were running out of wood or coal, but because a more efficient fuel came along. Says Scott: "The thing really didn't click at the time, but when I listened to Marchetti talk, I could see these penetration rates and see the ultimate, unequivocal reality of it. I just took the obvious next step, which is the implication for hydrogen." The implication? Surplus electricity and further electrical plants can be used to manufacture what we need, a chemical fuel.

Scott emphasizes, "The important thing in this evolution is that it is not somebody whose work on his little pet research project has convinced him this thing's time has come. We have come to hydrogen by a systematic evaluation of what the future holds and the position Canada is in." With Marchetti's theories and with history and proven technologies on his side, there are, in Scott's estimation, six simple points making hydrogen inevitable:

"Number one is that we don't have an energy crisis, we have an oil crisis. Number two, the only way to solve the oil crisis in the long shot is that you allow our nonhydrocarbon energy sources and indigenous technologies to penetrate that market solely in the domain of oil right now. Number three, the only way you can do that is to have our nonhydrocarbon sources [electricity] make a chemical energy currency or, in layman's terms, a fuel. Number four, the only realistic fuel you can *make* is hydrogen. Number five, that makes hydrogen inevitable. Number six, if you know something's inevitable, you should exploit that knowledge and get on with it. These are simplistic arguments — except that you can't find fault with any of them."

Dr. Bryan Taylor, who heads the NRC's hydrogen research, says, "The technical feasibility of hydrogen is beyond doubt." Sandy Stuart, son of A. T. Stuart and chairman of the Electrolyser Corporation, confirms that there are enough technical developments to say yes, it can be done. Ontario Hydro spokesman David Mosey adds, "We really could eliminate foreign fuel" — but the only way to prove it is to do it.

Which brings us to the most important economic and political decision in Canada's history. Do we go hydrogen? Do we seize the initiative? Before answering, we need to consider the brutal lesson the Japanese impressed upon the North American car industry: technology respects no nationality, only the marketplace. As Scott warns, "Canada has only a small window in time to act." The time window is crucial, because there is a worldwide race underway to be the first to develop hydrogen technology to be exported to the rest of the world.

In Japan there are plans to electrolyze hydrogen directly from the sun's effect on water; if the successful results of initial tests prove out, the Japanese could well become the "hydrogen Arabs" of the future. Iceland is converting the basis of its economy, its entire fishing fleet, to hydrogen, using the country's vast geothermal and hydroelectric facilities for hydrogen production. The metal hydrides that trans-

"How could I have been doing 70 miles an hour when I've only been driving for ten minutes?"

form hydrogen to a safe chemical state will be the ballast in the keels of the boats. Daimler-Benz AG in West Germany will deliver hydrogen-powered buses to the City of West Berlin this year, and the West German government is pouring millions of deutsche marks into hydrogen research and development. Overshadowed in the massive commitment the French have made to nuclear power is the startling fact that up to 50 percent of that power is for the production of hydrogen through electrolysis. In the United States, the first plant to gasify hydrogen from coal will begin construction in two years at Forest City, Iowa. The U.S. Energy Department has said that 50 large gasification plants could produce enough hydrogen to do away entirely with imported oil. Overall, in terms of potential exports of both hydrogen and hydrogen technology, the stakes are beyond financial calculation.

While our competition is definitely big league, we do have that brief time window where we can beat them all. For it is Canada *and only Canada* that has the most attractive set of components available to begin the systematic implementation of an entire hydrogen economy. The Electrolyser Corporation has constructed more than 400 electrolysis plants in 85 countries. Electrolyser and the Noranda Research Centre, funded by the Department of Industry, Trade and Commerce, are at work in a cost-sharing program on research and development to improve the electrolysis process. Inco's work is keyed to lighter metal hydrides. Ontario Hydro is studying the cost of electrolytic hydrogen production.

Which brings us to cost and "cost." Today the price of a barrel of Canadian oil is $22.50. While the world price is $38 Canadian, the recent federal-provincial pricing agreement means we will move ever closer to the world price. It is not a matter of if, it is purely a matter of when.

Because hydrogen is an immature technology, not a full-time, on-line operation, the costs of producing hydrogen can only be based on laboratory and existing industrial conditions. On that basis, the present experimental costs of producing hydrogen electrolytically using Canadian power rates are equivalent to an energy cost 1.5 times the present world price of oil. In the words of the NRC's Taylor, "The world price of oil would have to reach $54 [U.S.] a barrel to be competitive with hydrogen right now." However, this presumes the existence of a full-fledged hydrogen economy, the entire country running on hydrogen using peak electricity. But initially the development of a hydrogen economy would feature the use of cheaper off-peak electricity and at those rates, under present conditions, hydrogen can be manufactured for the energy equivalent of $1.25 per gallon of gasoline.

In other words, we do not have to wait for hydrogen production to become economically feasible, or the price of world oil to hit $54, before we begin. Off-peak hydrogen production is economically competitive today. And as oil prices rise and as innovations in electrolysis reduce hydrogen production costs, hydrogen will remain competitive. Taylor emphasizes, therefore, "What we are missing is sufficient R and D engineering work [into hydrogen production]. We can't wait until it is economically justifiable because by that time it may be too late to research and develop."

"Too late" is being caught in a frightening foreign oil squeeze play, like the baseball player trapped between third base and home plate, unable to reach either safely. It is all too easy to visualize Canada being caught between another embargo and the point where our own oil supply is so low that we couldn't make up the difference even with a crash hydrogen program.

Insofar as overall costs are concerned, Ontario and Quebec Hydro studies indicate that with a minimum of $84 billion invested over the next 20 years, Canada could be making enough hydrogen to meet all of its transportation needs. If the figure seems large, consider a recent study that suggested Canadian oil-related development will amount to more than $200 billion in the next 10 years alone and when the $200 billion is spent, where will the oil be? Gone. All of it.

A Canadian oil company official acknowledged hydrogen's inevitable role and volunteered his company's noninvolvement with hydrogen: "Why should we? There's still 20 years' oil left." Indeed, why invest one cent in hydrogen when you know you will soon be able to sell gasoline at $2 a gallon and then $3 and then $4 and so on, reaping future profits that even by today's standards are unimaginable. No ogres, just prudent businessmen.

What would be required to go hydrogen? "The factors," says Bryan Taylor, "are not technological or economic, but political." It comes down to the question of political leadership, the willingness of the federal government to seize the initiative.

A first step in that direction was taken last spring when an all-party House of Commons committee recommended that Canada commit itself to a total energy system based on hydrogen and electricity. It suggested the government spend $1 billion over the next five years "to establish Canada as a world leader in hydrogen technology."

But given Canada's history in handling new technology, doubts remain.

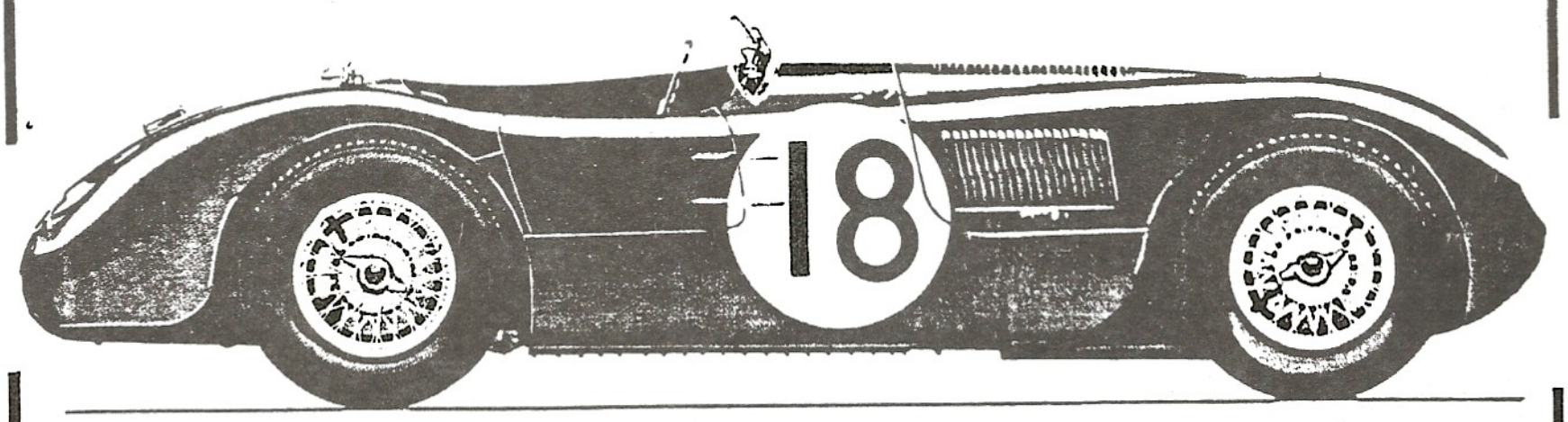
The Canadian Avro Jetliner was the second commercial jet ever to fly. Comparable to the DC-9, it could have made the world's short-route markets ours before the DC-9 even got off the drawing board. The Jetliner ended up on the scrapheap, physically cut in half. In 1959 the Avro Arrow was so technically advanced that assuming the unlikely situation of no technological improvements over 21 years, the Arrow would still have been a strong competitor in our new fighter acquisition (won by the F-18). The Arrow too ended up on the scrapheap. The International Energy Agency's 1980 analysis impartially describes the federal government's energy research and development efforts. In relating the amount of research to the amount of energy consumed by the agency's 20 member nations, only two countries did not spend more on research than the year before. One was Great Britain, the other was Canada. In fact, the entire federal budget for hydrogen R and D last year was only $3 million. This year it was chopped to $1 million.

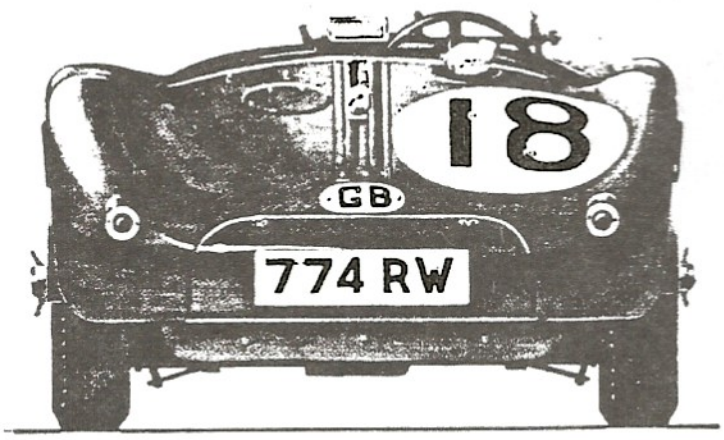
But as of May this year the parliamentary task force examining alternative fuels tabled its report and recommended no less than a full-scale commitment to the "only" alternative: hydrogen. If Ottawa fails to move, it will leave the field clear for Ontario's energy minister, Bob Welch, whose own task force issued a voluminous report in the fall. Welch's establishment of an institute for hydrogen systems may well make Ontario the self-powered, independent industrial machine of the nation.

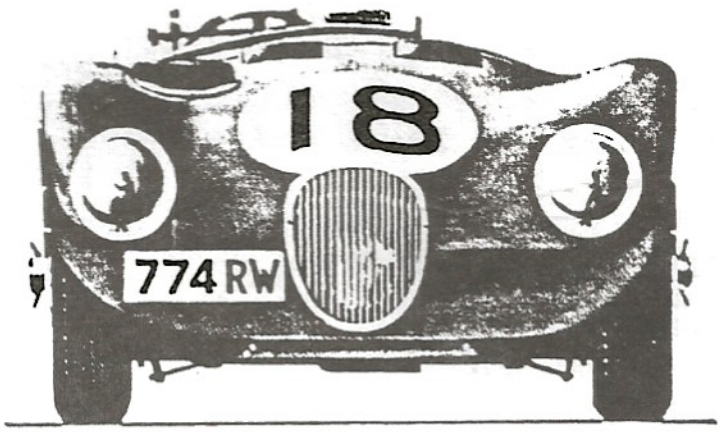
Clearly we are at a crossroads. The decisions made in the next few months will truly determine our fate. If we move now, Sir Wilfrid Laurier may actually be proven correct — this century *really* could belong to Canada. On the other hand, if we remain immobilized, Canada could end up like Antarctic explorer Robert Scott, scant miles from supplies and frozen in the dark. Q

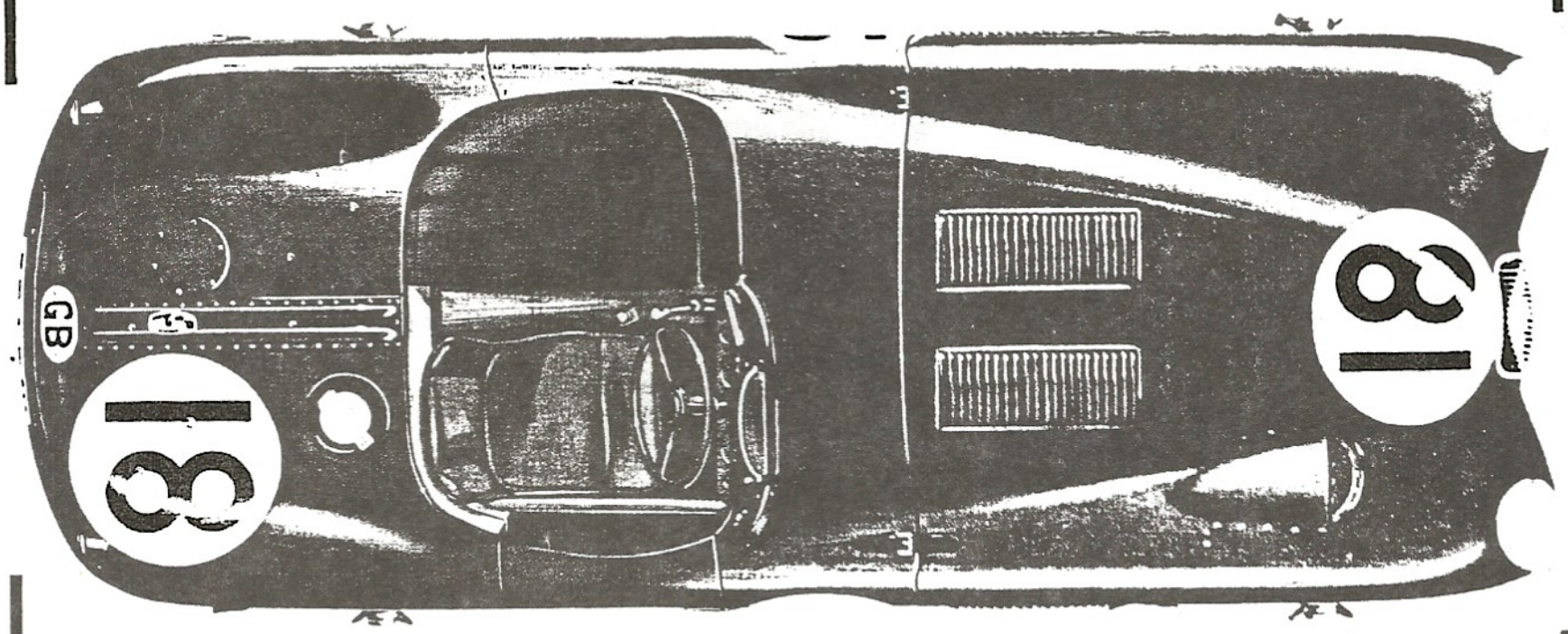
David Onley, an energy and technology writer, is author of the novel Shuttle, *published in Canada last August.*

A tribute to Ed's toy !









THE JAGUAR C-TYPE: winner of the Le Mans 24-hours race, 1953. Drivers: Duncan Hamilton and A. P. R. Rolt. Record average speed: 105·85 m.p.h. (The 1953 Le Mans winner was not fitted with a badge.)

ACTIVITÉS POUR 1982 - ACTIVITIES FOR 1982

	Responsable responsibility	Date
Vin et Fromage Spring Wine & Cheese	R. Neapole	Vendredi, 23 avril Friday, April 23
Tour d'Essai /Trial Run	P. Bigney	Dimanche, 2 mai Sunday, May 2
Economy Run	P.A. Ouimet	Jeudi, 18 mai Tuesday, May 18
Gymkhana	B. Neapole / W. Smith	Dimanche, 6 juin Sunday, June 6
Concours d'Elégance		Dimanche, 29 août Sunday, August 29
Rallye Coupe Hemmi	W. Smith	Dimanche, 12 septembre Sunday, September 12
Steamers Fall Run	G. Desroches	Dimanche, 3 octobre Sunday, October 3
Vin d'honneur	P. Ouimet	Vendredi, 19 novembre Friday, November 19