

### HIGH COMPRESSION ADVANTAGES GIVEN

#### Engineer Says Greater Efficiency Is Possible with Better Fuels

By Carl Bremer, Executive Engineer, Chrysler Corporation

The whole subject of high compression is a significant one to motor car owners. High compression increases the ratio of fuel that can be transformed into useful work. It gives greater power and performance from the same amount of fuel, thereby increasing engine efficiency.

How best to attain this greater efficiency is the engineers' problem. Two limiting factors govern

any increase in engine compression. These are the engine's structural strength, and knock or detonation.

As Chrysler pioneered high compression, it is perhaps needless to say that its engines are designed to operate smoothly and without overloading even at extremely high speeds. Their rigid crankcase and cylinder block construction, and the ample bearing areas provided, are assurance that their structure will not be overloaded by any conceivable compression that might be employed. They have been thoroughly tested over long periods under extreme loads and speeds, and also under conditions beyond those possible to encounter on the highways.

The second limiting factor presents an entirely different problem, variously known as carbon knock, spark knock, ping, fuel knock or detonation. Fuel knock is perhaps the most accurate of these expressions, all of which

really mean the same thing. **Overcoming Detonation** Many theories are advanced as to what detonation is. None of them has been universally accepted. We know that if properly mixed fuel is compressed above a certain pressure and temperature, and then ignited, there is a tremendously rapid rise in cylinder pressure and a sharp disagreeable ringing knock. It is this knock which has limited engine compression. Four important factors govern it. They are compression pressure, temperature of the compressed charge, design of the engine and type of fuel.

Compression pressure differs from compression ratio. One might design two engines with a 6 to 1 compression ratio—one that is efficient and gives full compression pressure, the other inefficient and not giving it. The result will be a marked difference in power and performance. Also, the cooler the fuel mixture can be kept, the higher the compression that can be used without detonation, and the greater the power.

The most important gain in engine design is the shape of the combustion chamber. By this alone, it is now possible to increase the compression ratio from 4.3 to 1 to 5 to 1 on ordinary fuels without detonation or objectionable roughness.

Though the three factors stated raising compression. More than a full compression ratio of difference exists between the best and poorest of present day commercially-marketed gasolines. In other words, if we have reached a 5 to 1 ratio by combustion chamber design, we can attain 6 to 1 by using a better fuel. Many anti-knock gasolines are available today. Some are the result of considerable expensive laboratory research, some are natural products and others, so far as anti-knock values are concerned, are accidental. There is no doubt, however, that by their proper further development we can utilize much higher compression and have much greater efficiency than now, even with our best engines. The "Silver Dome" and "Red-Head" engines, we believe, are the first step in a program of co-operative development between the petroleum and automotive industries toward a better fuel and a better engine to utilize that fuel most efficiently. Both these engines offer the advantages of high compression.

**Discusses Fuel** There is a wide variation in anti-knock fuels. This is partly due to the fact that until the Chrysler "Red-Head" made its advent no engine capable of taking full advantage of a good anti-knock fuel were available to the public. The "Red-Head" engine, in this way, serves also to focus the oil companies' attention on developing a uniform high grade fuel which will produce greater efficiency and greater power for the public.

Anti-knock fuels may be roughly divided into four classes. These are:

(1) Natural anti-knock gasolines. Certain crude petroleum products produce gasolines of good anti-knock properties, whereas certain other crudes produce gasolines of poor anti-knock properties. Due to this the compression ratio adopted by car manufacturers remains low, being penalized by the poorer gasolines of certain localities.

(2) Other fuels not gasoline, properly speaking, which have excellent anti-knock qualities. Of these benzol is the most familiar and toluol less familiar. Both are products of the distillation of coal in by-product coke ovens. These fuels frequently are blended with gasolines, producing good anti-knock fuels.

(3) The so-called "cracked" gasolines. These are the outcome of recent developments originally planned to obtain more gasoline from a barrel of crude through treatment at high temperatures

and pressures. There are many such processes, some better than others. But the significance here is that the petroleum industry has only started to scratch the surface in producing anti-knock gasolines from relatively poor crudes by means of cracking. The possibilities for improving our motor fuels by cracking are tremendous. The high anti-knock value of such gasoline shows that we may look forward to consistently better fuels as this cracking becomes more clearly understood. Several companies already are marketing fuels of good anti-knock properties by this process.

**Improved Fuels Coming** (4) Gasolines treated with various chemicals which reduce the fuel's tendency to knock. One of these, tetra ethyl lead, is widely known and widely marketed. Gasolines containing it form the majority of our best anti-knock fuels today. Other compounds, such as amiline and iron carbonyl, neither marketed in this country at present, have these same properties. Iron carbonyl is now marketed in parts of Europe, but in its present form contains certain properties not desirable. It seems quite possible, however, that further research will overcome these difficulties, and may also disclose other compounds that may even surpass anything now known.

### March Sales Of Nash Cars Show Heavy Increase

KENOSHA, Wis., Apr. 13—Factory shipments in March of 15,334 new Nash "400" Series cars brought an increase in Nash manufacturing and sales records of 44 per cent over the month a year ago, according to announcement made today by sales department officials of the Nash Motors company.

Following as it does a gain of 77 per cent in January shipments and 33 per cent in February, the March showing swells the increased business done by Nash so far in 1929 over the similar period last year to an average gain of 48 per cent for the entire three months, and indicates the increasing demand and continued popularity of these new "400" Nash cars.

"This gratifying increase, in the face of a late spring and bad weather conditions holds excellent promise for the entire Nash organization in the spring and summer months to come," C. H. Bliss, general sales manager, declared today. "The reports received weekly from leading market centers in the United States show that the Nash '400's' rose to the greatest sales level in the history of the company during the closing week of March, and that there is a decided upward trend in Nash sales all along the line."

"The March record may be taken as another proof of the lasting success won by these models and their leadership in this sales field."

### Northland Ready For Its Annual Arctic Cruise

The coast guard cutter Northland leaves shortly for Arctic waters on its fourth cruise. Four years ago the Northland succeeded the famous old cutter Bear, which for many years carried mail, supplies, etc., to the various inhabitants of the northern ports.

The Northland will be on patrol duty along the Alaskan coast and the islands of the Bering Sea until early October, at which time it returns to its home port in California.

Like the Bear, the Northland acts as a mail boat, holds federal court at the various ports of call along the coast, cares for smuggling violation of the game and fish laws, and the welfare of the Indians and Eskimos.

Life aboard the Northland is pleasant. The boys who make up the crew, all of them members of the regular navy, take their duties in the nature of adventure, and had many tales to tell a party of visitors in a Chevrolet six, of humorous incidents met with among the people of the ice and snow.

The Northland acts as the mother ship of the Alaskan patrol of five coast guard cutters. The other ships are Cheban, now at Unalaska, Unalga, Monomish and the Haida.

The first task of the patrol fleet will be to meet the northbound seal herd. The coast guard provides escort to the migrating sea animals in order to prevent poachers from wiping out the herd as they swim the long course to the Pribiloff and other seal islands in the Bering Sea. The wintering of the seal is a puzzle to the naturalists. Fact has them appearing off the coast of California the first of April and making their way to the breeding ground.

The most northern calls are made by the Northland, which reached Point Barrow, farthest north on the American continent, providing the ice permits passage that far. The rest of the fleet will patrol as far as Attu in the Aleutian group. Captain Claude S. Cochran, who will be remembered as the veteran captain of the Bear, is in charge of the vessel. This is his last voyage, as he is to retire at the end of the present season's work.

### THE RECORD BREAKING NEW NASH "400"



### Ask the Salesman this Question:

EVERY prospective motor car purchaser should ask every salesman he talks to, this question: "What is the price of this car, delivered to me, fully equipped with all the equipment?"

You should also ask what the difference is between the factory (f. o. b.) price and the delivered price—and then ask what that difference buys.

Heretofore it has been customary for factory prices to cover only the bare car. This permits the dealer to sell you your bumpers and the other accessories, at retail prices.

Nash, in introducing the new "400"

10 Sedans from \$2071 to \$2451, delivered; 8 Coupes, Cabriolets, Victories from \$1666 to \$2923 delivered

### The New NASH '400'

Leads the World in Motor Car Value

IMPORTANT "400" FEATURES—NO OTHER CAR HAS THEM ALL

High compression motor	Aluminum alloy pistons (Insur-Strut)	7-bearing crankshaft	One-piece Salon fenders
High Turbulence	New double drop frame	Exterior metalware chrome plated over nickel	Clear vision front pillar posts
Lovejoy shock absorbers (Exclusive Nash mounting)	Torsional vibration damper	Short turning radius	Nash Special Design front and rear bumpers
Salon Bodies	World's easiest steering	Longer wheelbase	

McKennon Nash Motor Co.  
806 Adams Avenue. Main 650. (112)

LOOK OVER OUR WANT ADS FOR BARGAINS

### Personal Automobile Accident Policy Given Without Cost

To Purchasers Of Automobile Insurance

Between April 15th and May 31st

### IT PAYS

Loss of life	\$1500
Loss of both hands	1500
Loss of both feet	1500
Loss of both eyes	1500
Loss of hand and foot	1500
Loss of hand and eye	1500
Loss of foot and eye	1500
Loss of one arm	900
Loss of one leg	900
Loss of one hand	750
Loss of one foot	750
Loss of one eye	500
Loss of thumb and index finger	150
Weekly payments for total loss of time; limit 26 weeks	25
Weekly payments for partial loss of time; limit 4 weeks	12.50
Weekly payments for hospital or nurse; limit 4 weeks	15
Medical bills for non-disabling injury	5
For emergency expenses if injured away from home and unable to communicate with friends, not exceeding	100

This Service Can Be Had on Our Regular Monthly Payment Plan

### La Grande Insurance Agency

R. V. COPSEY, Mngr.

### PLAYLE OIL CO.

SUPER-SERVICE STATION  
Stalcup and Zimmerman

WASHING Phone Main 165. GAS & OIL	GREASING Phone Main 165. TIRE REPAIRS
---	---

COMPLETE CAR SERVICE

ALWAYS AS NEAR AS YOUR PHONE

### DUNLOP

TIRES

Corner Adams and Greenwood.



Let us inspect Your oil filter

As an Authorized AC Service Station, we make a regular practice of testing AC Oil Filters without charge. We suggest that you drive in and let us perform this service for you.

Dirt in oil means wear. That is why you should have the Oil Filter on your car tested regularly. An AC Renewal Cartridge makes it as good as new.

We are fully equipped to install the Renewal Cartridge if required.

DALE COX  
Battery and Electric Service



### Motor mastery in a Style Setting



COACH \$1045

Coupe \$1045 Sedan \$1145  
Touring \$1045 Roadster \$1045  
Motor wheels included. Prices  
F. O. B. Toledo, Ohio, and freight  
charges subject to change without  
notice. Equipment other than  
standard, extra.

### In the new

LOW-PRICED WILLYS-KNIGHT "70-B"

Grace of line and luxury of finish distinguish the new Willys-Knight "70-B" as the outstanding creation of modern style specialists.

Its big motor is the patented double sleeve-valve engine, so notable for smoothness, silence, economical operation and increased efficiency. A heavy seven-bearing crankshaft reduces vibration to a minimum, while the improved frame construction gives extra rigidity and greatest possible riding comfort.

### "FINGER-TIP CONTROL"

One button in center of steering wheel controls starter, lights and horn. Simple design, easy operation. No wires in steering post.



WILLYS-OVERLAND, INC. TOLEDO, OHIO

### NEW STYLE Willys-Knight

Gettings & Hanks

Jefferson Ave.