

Blasted out of solid rock, this Butane storage cavern is located 432 feet straight down beneath Shell's refinery in Wood River, Illinois. Some 230,000 tons of limestone were removed to clear a

total area that's larger than two football fields—and holds 22 million gallons. Storage space consists of many corridors, each as high and wide as a good-sized suburban house, and many times as long.

# BULLETIN:

40 stories down, in caverns no tourist will ever see, lies the secret of the quicker starts you get with today's Super Shell—the gasoline for top performance

The 9 ingredients in today's Super Shell are specially blended every season to give you top performance in any weather.

While colder, harder-starting mornings are here, today's Super Shell is primed with extra Butane—an ingredient so volatile it has to be stored under pressure all summer to stop it from vaporizing by itself.

Think what this high volatility means on cold days. Faster firing. A big strain off your battery. And an even bigger one off your patience.

IT TAKES millions of gallons of Butane to give today's Super Shell its nationwide reputation for quick winter starts.

But you might wonder why Shell goes to so much trouble to store this quick-start ingredient underground. Here's why.

Butane is stored as a liquid. But it is so eager to vaporize that it has to be kept under pressure. This can be done in tanks of course. But Shell's refinery experts decided that a cavern would be safer and more economical. They didn't have a cavern handy. So they built one.

It was no mean task. For instance, the whole cavern had to be leakproof, airtight—and had to have the smallest possible opening (see cut) that could take men and machinery. This tiny entrance posed quite a



Only link to surface was pipe 42" wide, 40 stories deep. Heavy equipment was dismantled, lowered and reassembled on the cavern floor.

problem when it came to getting a bulldozer down. But our "spelunkers" simply cut up the bulldozer to fit the hole.

The very thing that makes Butane a problem to store makes it work wonders in stone cold engines.

Low temperatures make ordinary gasoline reluctant to fire. But when you add Butane, volatility increases dramatically and even the coldest engine finds it easier to start.

That's why an extra dose of Butane is added to today's Super Shell whenever the weather is likely to be wintry. It takes a strain off your engine, your battery and your patience.

**Butane has hot-weather benefits, too—an odd little paradox**

Shell's refining experts always add a certain amount of Butane to Super Shell—even in mid-summer. This may sound paradoxical. But it isn't.

Volatile Butane also happens to have an unusual anti-knock value at high temperatures. So this winter-start ingredient has a summer benefit, too. It helps to smooth out your car's performance just as much in June as it does in January.

Now that you know about Butane, why not take a couple of extra minutes and learn about the eight other ingredients in today's Super Shell? It's essential reading if you want to know the secrets of top performance.

**Ingredient #2 is TCP for power, mileage and longer plug-life**

Super Shell now contains an even better version of this famous additive. Its chemical name is cresyl-diphenyl-phosphate.

TCP\* additive can give your car up to 15 per cent more power; up to 17 extra miles per tankful; and can make plugs last up to twice as long.

New TCP does this by neutralizing certain harmful effects of combustion deposits. It is scientifically formulated to keep them from glowing when hot—a major cause of power loss. Also to keep them from diverting your spark—a major cause of "missing."

**Ingredient #3 is "cat-cracked" gasoline for power with a purr**

This is petroleum that has actually cracked under 900-degree heat and catalytic action. Its heavier molecules have been shattered into livelier, lighter ones.

The result is a super-octane ingredient that makes your engine purr with power the moment you put your foot down.

NOTE: "Cat-cracking" refers to the use of a catalyst—the mysterious substance that can alter molecules without changing itself.

**Ingredient #4 is Alkylate, noted for knock control in hot engines**

Jimmy Doolittle helped pioneer this outstanding high-octane ingredient for Shell aviation fuel.

Alkylate—the ingredient that took the dream of 100-octane gasoline out of the lab and put it into the skies—is now in Super Shell. It controls knocking in hot engines at high speeds better than anything else yet available.

NOTE: Speaking of controlling knocks at high speeds, remember that car engines frequently turn even faster than the engines of a DC-7.

**Ingredient #5 is anti-knock mix for extra resistance to knocks**

You might think that two high-octane ingredients are enough for knock-free performance. But Shell's scientists have ears like musicians.

They insist on adding a special anti-knock mix. A mix, so effective, one teaspoon per gallon can boost anti-knock rating by five points.

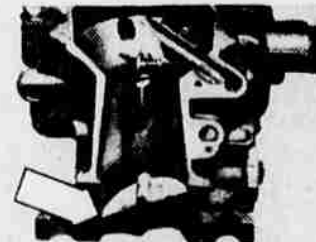
This mix has the tricky job of regulating combustion so that Super Shell gives each piston a firm, even push—rather than a sharp blow which would cause a knock.

**Ingredient #6 is Pentane mix for fast warm-ups on cold days**

Pentanes are made by tearing gasoline apart, much as you split kindling to start a log fire.

In this case, the "logs" are petroleum's heavier hydrocarbons. A special process transforms their molecules from slow-burning "logs" into the quicker-firing "kindling."

NET RESULT: Fast warm-up and top performance in a hurry.



Carburetor icing causes stalling. Arrow shows where ice can form on your throttle plate. Shell anticipates this problem. See below.

**Ingredient #7 is an "anti-icer" to check cold-weather stalling**

Super Shell's formula is adjusted as often as eight times a year to beat the weather. For example, whenever the temperature is likely to be less than forty-five degrees, a carburetor anti-icer is added.

Why add anti-icer at forty-five degrees? Because, even then, frost can form in your carburetor just as it does in your refrigerator. It can choke your engine dead.

**Ingredient #8 is gum preventive to keep carburetors clean inside**

Even the purest gasoline can form gum when stored. This can clog carburetors and foul automatic chokes. But, with Super Shell, you needn't worry. A special gum preventive does the trick.

It acts like a policeman controlling a mob. Regulates unstable elements to help keep them from clotting. Hence no gum problem.

**Ingredient #9 is Platformate for extra energy, more mileage**

It takes eight million dollars' worth of platinum catalyst for Shell to produce Platformate. But fortunately for you and for us, this precious stuff can be used over and over again.

The platinum re-forming process, which gives Platformate its odd name, converts petroleum into super-energy components—such as benzene, xylene and toluene.

These three alone release 11 per cent more energy per gallon than the finest 100-octane gasoline.

But make no mistake. This is not untamed energy. Far from it. The super-energy of Platformate is harnessed by the eight other ingredients in Super Shell, where it behaves so well you scarcely know it's there. That is until you note your extra mileage. After that, there is no doubt.

**Test Super Shell for yourself**

Try Super Shell next time you fill up. You'll soon feel and hear a difference in the way your engine runs.

That difference is top performance.



A BULLETIN FROM SHELL RESEARCH—where 1,007 scientists are working to make your car go better and better.