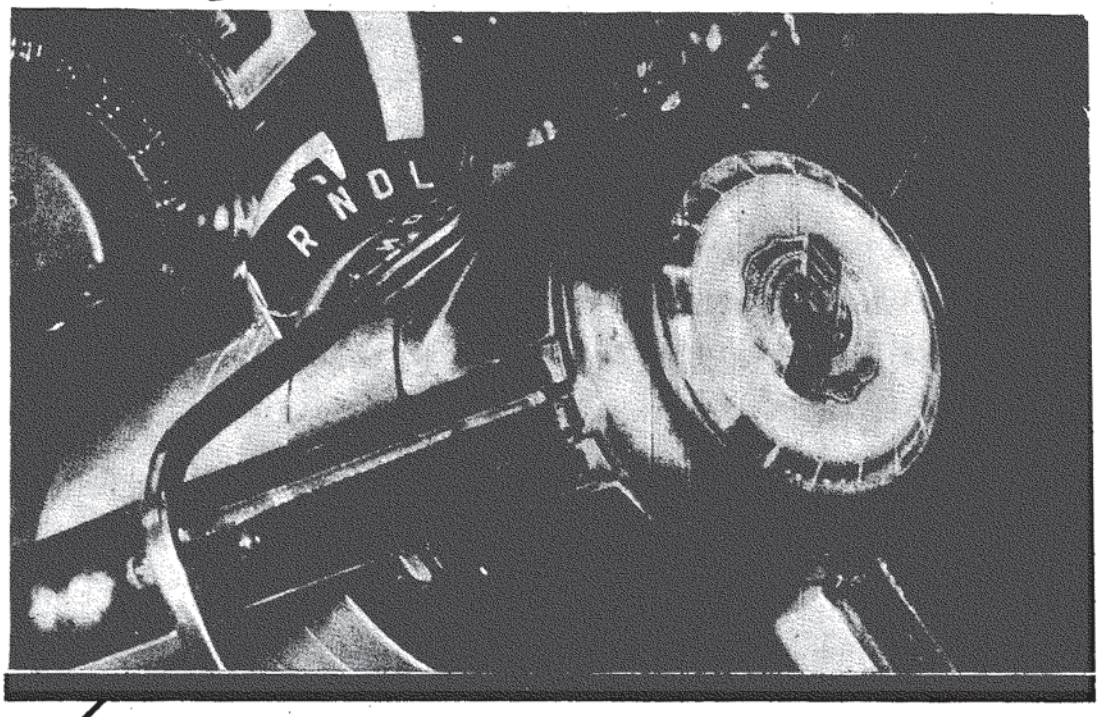
You Can Break Away Faster with

Chrysler's Newest

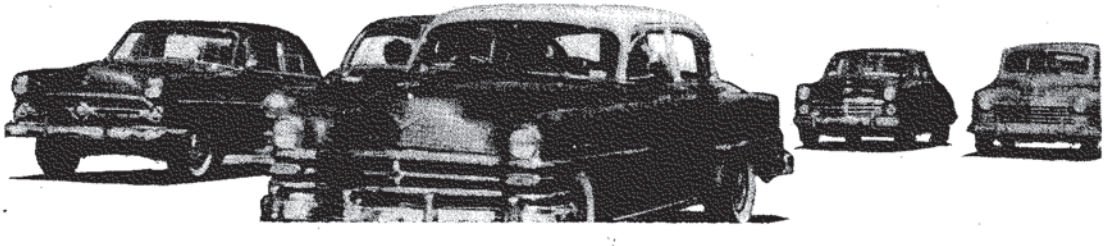


The PowerFlite is Chrysler's nomination in the Green Light Stakes. It looks good on the chart.

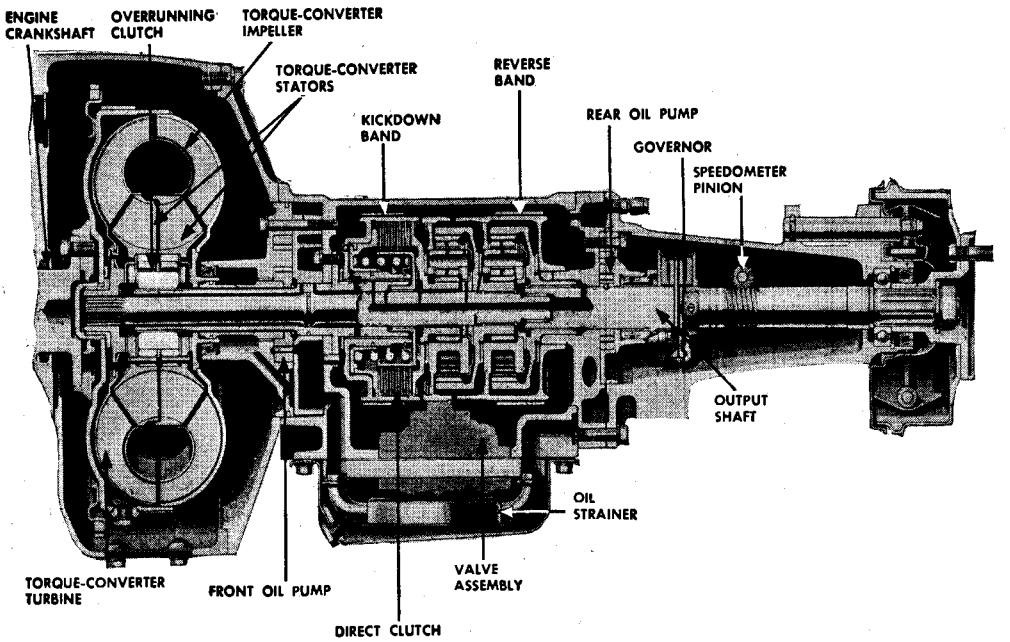
CHRYSLER has a new, fully automatic transmission. (Cries of "At last!" from friendly critics of the company will be temporarily ignored.) It is, in truth, a sweet basket of gears, with features that include:

- Sassy getaway, right in the running with the best U. S. entries in the Green Light Stakes;
- No clutch pedal, and upshift without accelerator ease-up—both for the first time in Chrysler-built cars—and
- Notably fewer parts and pounds than any other automatic now on the market.

Currently available on Crown and Custom Imperial models, the new drive has been christened the "PowerFlite" transmission by the salespeople. Around the



Basket of Gears



shop Chrysler engineers call it the "A323 job" and regard it with real pride. This reporter, having poked cautiously into its innards and having put some miles on it, is almost tempted to give up his long-time love affair with manual-plus-overdrive. If you like automatics, you'll find that PowerFlite is one of the best; if you dislike them, it may even change your mind.

What's inside? A323 uses a torque converter feeding into an automatic planetary gearbox, which is roughly the same as every other U. S. automatic except Hydra-Matic. What makes it good is that Chrysler has put a big chunk of engineering time and money into boosting torque-converter performance, and into smoothing out the valve, clutch, and servo actions into silken inconspicuousness. You start out without wallowing in wasted revs; once rolling you have to stay alert to detect the up- or downshift.

A323's converter has the highest starting torque ratio in the industry. This ratio, 2.6 to 1, means that at the moment of start the converter is doing more to help the engine get the car rolling than any other U. S. converter. Since Chrysler's big V-8 pours out a potent 312 foot-pounds of torque at comparatively low speed, she gets off like a gone goose.

There's Little Slip When It's Coupled

Up toward the other end of the range, when the converter is all through converting, the unit has remarkably little slip. Slip—the revs an engine delivers that never get through to the drive shaft—are reported to be a piddling 1.9 to 2 percent

when she's "coupled"—when the converter stators start to free-wheel and the gadget changes itself into a fluid coupling.

To fathom the niceties of torque-converter design you need to be a slide-rule guy with knobs on. It's possible, however, to follow Chrysler along certain of the paths by which this converter was achieved. There are at least four main elements that a development engineer must juggle:

1. Diameter. The smaller a converter is the less it costs and the less humpy the floor in front; the larger it is, the better are its performance characteristics.

2. Torque multiplication. This is what you are mainly after, so the more the better, if you don't have to pay in a falling-off somewhere else.

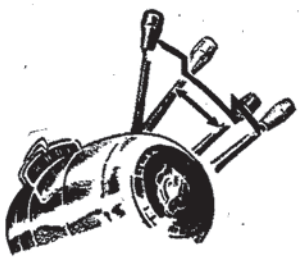
3. Stall speed. This reflects how high the engine winds up on starting, and wants to be kept as low as possible. (Weakness in this department was the big complaint directed at early Dynaflows.)

4. Efficiency. The less gasoline-fired heat thrown away in an oil radiator or in air-cooling vents, and the less engine energy spent in slip, the less a torque converter will cost to run.

Each of these elements is tied to the others. A designer can gain a lot on torque or efficiency, say, if he'll take a licking on stall speed or use a whopping big converter. To find a balance where all factors are nicely adjusted is a critical part of turning out a good design. Especially when the designer must also sweat over getting some engine braking, tailoring the converter to suit the engine's curves, and specifying turbine and impeller blading that can be built at competitive costs.

There is just one forward shift in the A323 gearbox. The upshift takes place at 15 to 65 m.p.h., depending on throttle position. ("Takes place" should not be interpreted to mean the leisurely kerplunk that Chrysler's old semiautomatic box delivered when your foot came off the gas. This job shifts quick and quiet, with no break in the power flow.) The downshift, also dead smooth, is governed by car speed rather than accelerator position, and always occurs as you drop down past 11 m.p.h.

When the planetary gears are at the lower speed they have a 1.72-to-1 torque ratio. Multiplied by the converter's 2.6, the whole basket of tricks socks out 4.47-to-1 torque multiplication at breakaway. This is more than any other U. S. automatic transmission with the lever in the Drive position, though others will give more if you start out in Low.

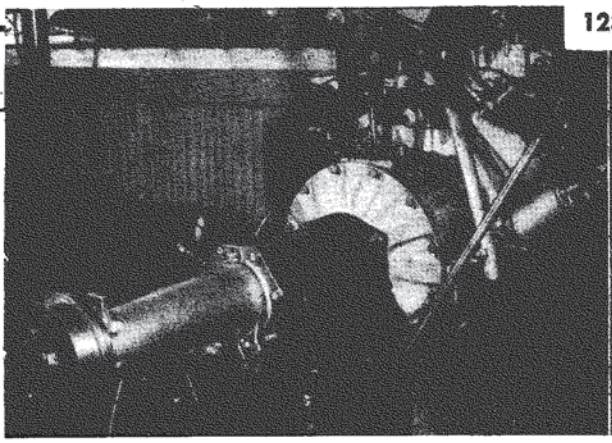


"NO-LOOKY" shift is fine for parking in tight quarters or rocking mired car: you just lift the lever a bit toward you and slap it up or down. If you don't lift, the gate restricts you to Neutral or Drive. As on other automatics, the starter works only in Neutral.

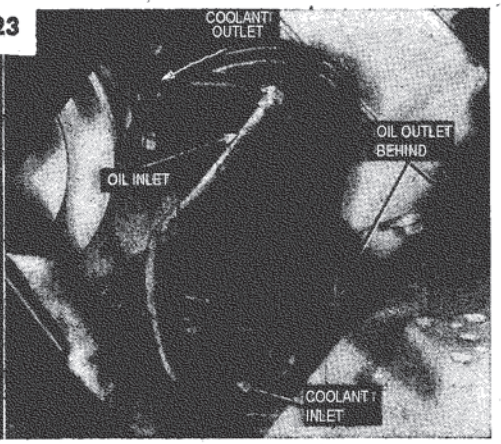
There is also a kickdown. If you floorboard the accelerator when she's upshifted, you drop back from 1-to-1 to 1.72-to-1 gearing, with correspondingly sharper response. This is one shift that is not dead smooth. You'll readily notice it, even though it isn't like the hiccough of an overdrive kickdown, where the poor engine has to be killed for a split second. Valving of the kickdown servo is set so you can't knock her down above 55 m.p.h. This wouldn't do any harm, but the revs at a high-speed kickdown would climb off the most useful part of the engine's power curve.

Chrysler is especially pleased with A323's shift pattern. As a drawing shows, a "gate" on the lever's movement lets you engage each range by feel, without checking the pointer. Fast changes for rocking or parking can be done without looking. Neutral is spotted between Reverse and Drive—you don't have to go through a forward gear to back up. It's an easy arrangement to drive with.

There is no Park on the quadrant, a fact that reflects Chrysler's affection for its mechanical hand brake, located just



SMALL BUT POTENT, the A323 transmission weighs only 214 pounds, 14 less than the lightest other automatic, which is built to handle 50 less horsepower. Housings and many other parts, including valve bodies, are made of pressure-cast light alloy.



OIL COOLER is a small heat exchanger mounted in front of the left cylinder bank. Thermostats governing coolant temperatures effectively control the temperature of oil in the transmission, which is entirely separate from the engine oil.

astern of the transmission. Thereby hangs a tale:

In the early days a car's emergency brake was a sort of panic lever to haul back on when the two-wheel mechanical brakes weren't doing the trick. With the coming of four-wheel hydraulics this panic function became less vital; the emergency gave way by imperceptible stages to the parking brake, a device supposed to hold the car put when you left it on a hill.

Pistol-grip levers and Bowden-wire controls—designed for easy release by women—tended to slacken up in time, and by the late Thirties most parking brakes were sorry sisters after they'd had some use. It didn't seem to matter much: when you parked on a hill you always left it in gear to backstop the brake.

This comfortably sloppy situation was upset when fluid couplings and torque converters appeared. Reason: with a liquid link in the power train, there isn't any absolute security in leaving a car in gear. As a result most makers went initially to the Park idea—a pawl or "sprag" that could be engaged to lock the drive shaft positively. This has drawbacks: it is hard to build a pawl that won't sometimes maliciously lock itself in under load; it is costly; and it may need an interlock to keep dimwits from engaging it while the car is rolling briskly, thus munching up the mechanism.

Chrysler was one company that elected to have none of this. Instead, they concentrated on the brake. The emergency brake on the A323 has, the company claims, the highest holding power in the industry. It will effectively hold the car on any grade where the rear wheels won't slide. It is an internal expanding mechanical brake mounted at the back of the transmission, where it benefits from the 3.36-to-1 torque multiplication of the rear-axle gears. Being physically separate from the service brakes, it won't be affected by any heating fade that might weaken them, a comfort going down a mountain. The company says it will genuinely function as an emergency brake.

No Extra-Low Gear Ratio

Despite the L on the quadrant, there is no heavy-pull, extra-low gear on A323. When you move the pointer to L you merely lock out the automatic upshift—you get no more torque than you'd have in Drive if you didn't let it upshift. Elimination of the extra planetary gearset and its control mechanisms saves Chrysler both weight and money. Whether there'll be enough moxie to lug an overloaded sedan in prolonged heavy going remains to be seen; Chrysler obviously thinks that its big engine needs no extra assist. The decision to omit this gearset may make more sense when you ponder the big horsepower boost for Chrysler in 1954.

L on the quadrant does give a lot more downhill braking than Drive, of course, and the lever can be popped over at any speed up to 65 m.p.h. (Nothing really hideous will happen if you move it over above that speed; it's just that the reversal forces set up are a bit rough on the works at very high speeds.)

You Can't Count on Engine Drag

There is some foot-off engine braking with the lever in Drive. But as on all torque-converter jobs, there is less than you'd like. You don't go gliding into trouble with the same carefree velocity that free-wheeling used to provide—but you can't count much on engine drag.

Unless you are a speed-shift wizard or drive non-stock equipment, the A323 Chryslers are going to get the jump on you at the light. About the only U. S. stock cars that will consistently stay with them are the Series 62 Caddies. If you tune these two cars with equal proficiency, put them side by side, and floorboard them, they'll stay remarkably close. The Hydra-Matic Caddy will generally lead by a few feet at 25 or 30 m.p.h., the A323 Chrysler by a few feet at 60 m.p.h. What this does to the gas and tire bills shouldn't happen to the U. S. Treasury, but getaway helps sell cars.

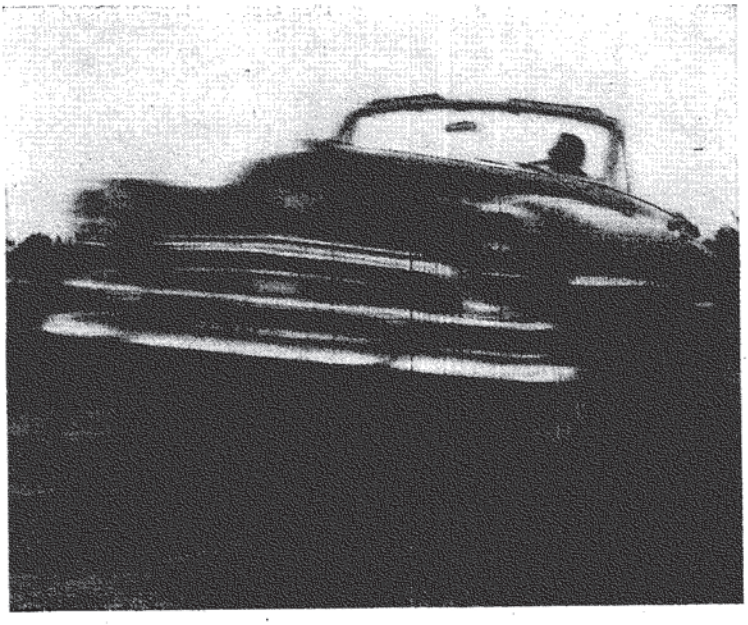
How It Compares with Other Automatics

A323 has some relatives on the road, in principles if not in details. Fordomatic and Mercomatic are perhaps the closest. They differ chiefly in offering a quadrant-selected low-to-second (Low) or second-to-high (Drive) range in place of A323's single medium-to-high range. Studebaker's and Packard's automatics are also similar, though they have a lock-up or direct-drive gizmo that Chrysler passed up. Powerglide and Dynaflow also have some similarities to A323. Only Hydra-Matic, an automatic four-speed box without converter, is fundamentally different.

Chrysler claims that it pondered long and experimented hard before it froze A323. Lock-up into direct drive, for example, was discarded only after considerable study, partly because it added weight, complexity and cost, partly because it "flattened out" car performance at medium speeds, where an unlocked converter can give extra perk to a car. In A323 the converter will "couple"—come within a few percentage points of being locked—at light throttle at 30 or 35 m.p.h. But when you feed the engine more gas, the converter will unbutton and multiply torque, the amount in proportion to what you demand. At 50 and above she couples even at full throttle.

A323 has been in development for eight years, and except for tooling and production headaches might have been in the salesrooms last winter. Chrysler says that the reason it has been slow to bring out a fully automatic drive is that the company wanted to make it a really good one. This is probably accurate; certainly A323 bears marks of intensive engineering.

Whatever the history, Chrysler's in business with an impressive new drive. —*Frank Rowsome Jr.*



1954 Chrysler's 235 Horsepower Makes It

America's Most Powerful Car

Its ability to spurt in cruising ranges pulls Wilbur Shaw out of a tight spot during preview run on lake highway.

By Wilbur Shaw

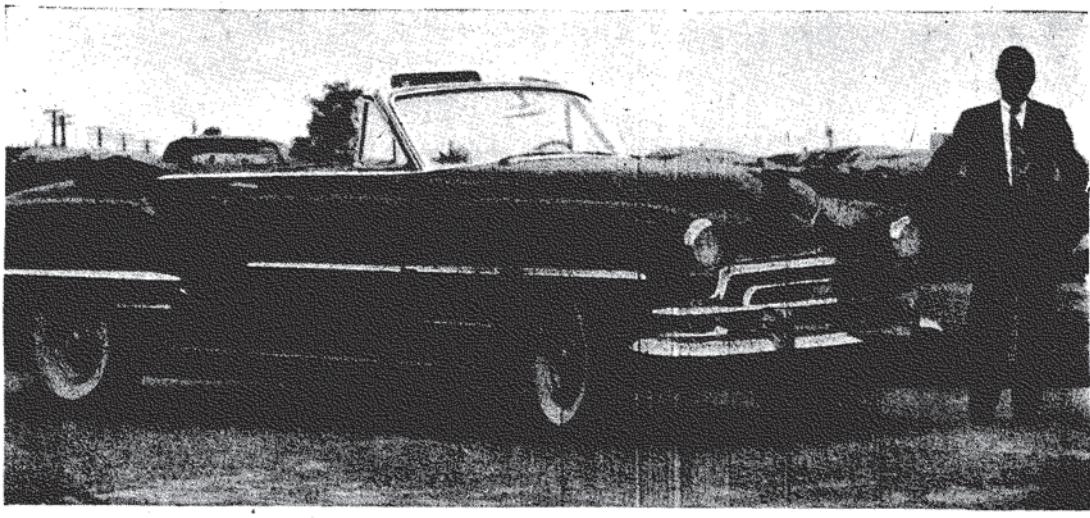
THREE years ago Chrysler brought out a sensational 180-horsepower hemispherical-head engine. All through 1952 and 1953, while other companies were boosting horsepowers, Chrysler coasted along on the same rating.

Now I've got news for you. For 1954 Chrysler is shooting up to a whopping 235 horsepower. That's exactly 100 hp. more than it had a mere four years ago. Announced in October, this car once again becomes the most powerful mass-production automobile in the world.

I paid a visit to the company's factory in Detroit tongue-in-cheek. These ever-increasing horsepowers, against a backdrop of ever-increasing accidents, have bothered me. Is there a good reason for so much moxie in a passenger car?

On a winding shore road by Michigan's Lake St. Clair I experienced one reason for it, and I'm going to pass it along to you. Then you can decide for yourself.

Chrysler's decision to advance its horsepower rating was purely arbitrary. The V-8 engine itself—described in some



quarters back in 1951 as the biggest improvement in design in a quarter of a century—is capable of a lot more. The basic engine, in fact, has produced 400-odd horsepower experimentally. For 1954 the engineers could have shifted a few more things around and come up with 250 or 275 hp. without any trouble.

On the drive along the lake a fast panel truck was streaking ahead of me in the lane to my right. I had three people, besides myself, aboard a 1954 Chrysler New Yorker. I decided to pass.

Truck Creeps Over

Up to that moment the driver of the panel truck was behaving as any good driver should. He was keeping strictly to his lane. Behind me, another car intent on passing the truck, was riding my bumper.

Then things began happening. I had covered about a third of the truck's length on the left side when his front wheels began creeping into my lane. This was a perfect set of circumstances for a nasty highway accident. If I jammed on the brake, I stood a good chance of being rammed by the car behind. If I went on trying to pass, I could get sideswiped by the truck.

But if the car had the oomph, I might get out of the jam.

I mashed the accelerator. We fairly leaped ahead. My right rear fender cleared the truck's left front fender with only inches to spare.

"That," said one of the Chrysler engineers, "is where our high torque pays off."

I agreed.

As the horsepower has gone up, the torque has gone up with it. It was torque—the sudden added push at the rear wheels—that came to my rescue.

The 1953 New Yorker model required 20.7 seconds to accelerate from 40 to 80 miles an hour. The 1954 New Yorker requires only 13.7 seconds. And, as a matter of interest, the 1950 New Yorker, with 135 horsepower, required 24.4 seconds.

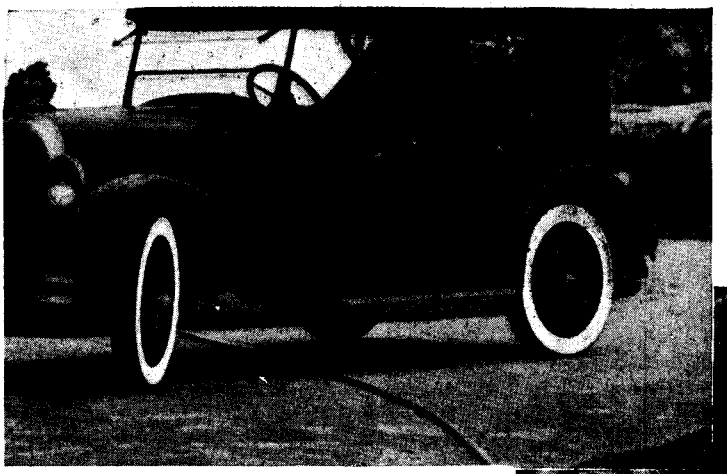
The torque produced has gone up from 270 foot-pounds in 1950 to 330 in 1954.

James C. Zeder, Chrysler's vice-president and director of engineering, sums it up this way: "We want to cut down the time that you're on the wrong side of the road when you're passing another car."

Whether or not you approve of the boost in horsepower, I'd like to credit Chrysler with a sensible suggestion that it has made to those guests who were privileged to drive the new car prior to its appearance in the salesrooms.

"We'd rather," I was told, "that you didn't mention the top speed. It could only lead to somebody's getting himself in trouble trying to see how good his car was by comparison."

I opened the car up—but I'm not telling how fast I went.



THE '54 JOB on the left can pull out and pass a car going 40 m.p.h. and get back in the right-hand lane—all in 310 feet. On the right is a 68-hp. 1924 Chrysler.

The fact is, the new Chrysler isn't a great deal faster than the 1951 job. It wasn't speed that the engineers were after. It was acceleration performance in the cruising range and—let's not forget—added power to run today's accessories. Power steering, automatic transmissions and air conditioning don't require a vast amount of power, but it would be pointless to penalize performance for them.

It takes a sharp eye to discover what has been done to improve the Chrysler's performance. There's a new four-barrel carburetor. There's new intake and exhaust manifolding and there are bigger valves to improve breathing. Waste gases are tunneled out through two tailpipes, one for each bank of cylinders, to reduce back pressure in the system. And there's a new camshaft that increases both the duration of valve lift and the overlap between the opening of the intake and exhaust valves.

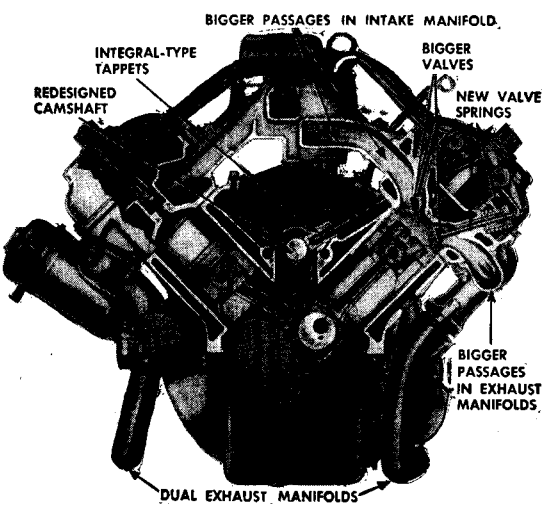
Increased Stability on Turns

The important engine changes are pretty subtle. Look under the hoods of the '53 and '54 Chryslers, and you can't tell the differences in the engines.

Other improvements have been made in the car. There's a new transmission, described by its champions as the best of its kind. (It is described in the preceding article, pages 120-124, and is a torque converter with a planetary gear box.) This transmission contrib-

THE ENGINE still runs on nonpremium gas. The intake-valve diameters are 1.93 inches, compared to 1.81 in '53, and the exhaust valves are 1.75 inches compared to 1.50.

THIS CUTAWAY shows the changes. The compression ratio is the same at 7.5:1. The torque effort is 330 foot-pounds at 2,600 r.p.m., compared with 312 at 2,000.



FACTS ON '54 CHRYSLER

Model: New Yorker DeLuxe convertible.

Engine: V-8 with overhead lateral valves; 235 hp. at 4,400 r.p.m.; compression ratio, 7.5:1; piston displacement, 331.1 cu. in.; bore and stroke, 3 13/16" by 3⅝"; piston travel (in feet per car mile at 30 m.p.h.), 1,437; crankshaft bearing surface, 43.8 sq. in.; torque, 330 lb.-ft. at 2,600 r.p.m.

Weight: 4,595 lb. (approx.); per hp., 19.5 lb.

Transmission: torque converter with planetary gearbox; rear-axle ratio: 3.36:1.

Steering ratio: 16.2:1 (with power steering); radius of turning circle, 21′ 9″.

Effective brake-lining area: 201.1 sq. in.

Springs: front, coil; rear, semi-elliptic.

Outside dimensions: height (to top of windshield) 59 9/16"; over-all length with bumpers and guards, 215⅝"; width, 76¾"; wheelbase, 125½"; overhang, front 37⅜", rear 52¾"; tread, front 56 5/16", rear 59⅜".

Inside dimensions: seat-cushion width, front 58", rear 49¼"; leg room, front 43¾", rear 39⅜"; seat height, front 14⅝", rear 14½"; vertical distance, steering wheel to seat cushion with seat in mid-position, 5⅜"; front-seat adjustment, horizontal 5", vertical 1⅛".

Tire size: 8.00 by 15.

FACTS ON '54 PLYMOUTH

Model: Belvedere four-door sedan.

Engine: 6-cyl. L-head; 100 hp. at 3,600 r.p.m.; compression ratio, 7.1:1; piston displacement, 217.8 cu. in.; piston travel (in feet per car mile at 20 m.p.h.), 2,040; bore and stroke, 3¼" by 4⅜"; torque, 177 lb.-ft. at 1,200 r.p.m.

Weight: 3,185 lb. (approx.); per hp., 31.85.

Transmission: 3-speed manual shift, with or without overdrive; or torque converter with 3-speed transmission. Rear-axle ratio, 3.73:1 (standard); 4.41:1 (overdrive).

Steering ratio: manual, 21.1:1 over-all; power, 19.7:1 over-all. Radius of turning circle: 19½′.

Effective brake-lining area: 158 sq. in.

Springs: front, coil; rear, semi-elliptic.

Outside dimensions: height, 61¾"; over-all length with bumpers and guards, 193½"; width, 74¼"; wheelbase, 114"; overhang, front 32", rear 47½"; tread, front 55⅝", rear 58½".

Inside dimensions: seat-cushion width, front 59¾", rear 58¾"; leg room, front 43¾", rear 43⅜"; headroom, front 36⅜", rear 35⅜"; seat height, front 14⅜", rear 15"; front-seat adjustment, horizontal 5", vertical 1⅛".

Tire size: 6.70 by 15.

FACTS ON '54 DODGE

Model: Royal V-8 four-door sedan.

Engine: 8-cyl. inclined lateral valve-in-head; 150 hp. at 4,400 r.p.m.; compression ratio, 7.5:1; piston displacement, 241.3 cu. in.; piston travel (in feet per car mile at 20 m.p.h.), 1,408; bore and stroke, 3 7/16" by 3¼"; torque, 222 lb.-ft. at 2,400 r.p.m.

Weight: 3,585 lb.; per hp., 23.9.

Transmission: torque converter and automatic transmission; or 3-speed manual shift with or without overdrive.

Steering ratio: manual, 22.2:1 over-all; power, 20.4:1 over-all. Radius of turning circle, 20′ 8″.

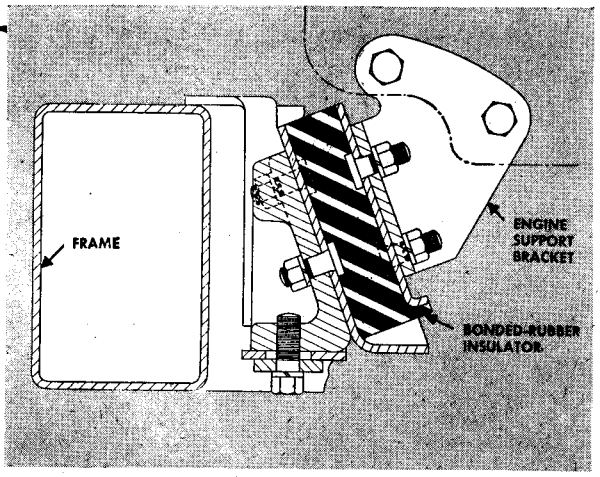
Effective brake-lining area: 173½ sq. in.

Springs: front, coil; rear, semi-elliptic.

Outside dimensions: height (loaded), 62"; over-all length with bumpers and guards, 205½"; width, 74¼"; wheelbase, 119"; overhang, front 34⅝", rear 51⅞"; tread, front 55 15/16", rear 58¾".

Inside dimensions: seat-cushion width, front 60", rear 60½"; leg room, front 43¾", rear 39"; headroom, front 36¼", rear 36"; seat height, front 14¾", rear 14½"; vertical distance, steering wheel to seat cushion with seat in mid-position, 5¾"; front-seat adjustment, horizontal 5", vertical 1⅛".

Tire size: 7.10 by 15.



NEW SLANTING engine mountings insulate engine vibration from the frame better. Moreover, the rubber retains its elasticity. The car's roll center has been raised so that the body will lean toward the outside of a hard turn by 15 degrees less.

utes a lot, of course, to the car's performance.

There's a new front suspension to increase the stability on turns. And the "roll center" has been raised so the car won't lean away from a hard turn.

When you get behind the wheel of one of the world's really fine motor cars, automatically you begin looking around for the spots where the designers have goofed off. I thought I had found one when I began examining the height of the power-brake pedal. Braking, I had to lift my foot from the accelerator and bring it clear back to the point where the calf of my leg touched the seat cushion.

"Ah-hah," I said to myself, "what's this?"

The answer to that one lay in long-established Chrysler engineering policy. If you tell one of their engineers that the sun comes up in the east, he'll wait until sunrise and check it before he concedes, "It's a possibility."

A Reason for Long Brake-Pedal Travel

Chrysler was all set to install a power-brake pedal just the same height as the accelerator pedal when somebody said whoa! Reducing the pedal travel is the same thing as increasing the size of the master brake cylinder—when the power goes off, it's incredibly hard to brake the car with the leg muscles alone.

"Let's suppose," preached the man who called the halt, "that some guy is starting down a hill in heavy traffic and his engine dies. The torque converter won't let his rear wheels turn his engine over fast enough to maintain sufficient vacuum for his power brakes. With short pedal travel, where does that leave him?"

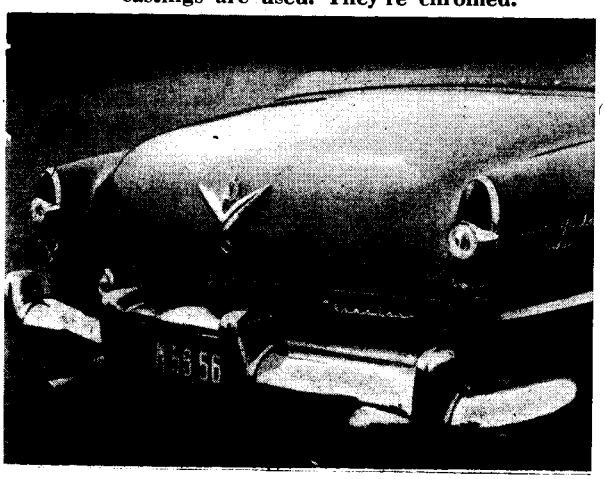
So Chrysler is going to study that one for a spell before it makes any change in its brake pedal—if, indeed, it does at all.

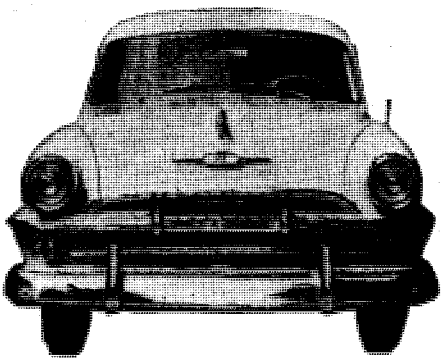
There's Headroom to Spare

But I did find something to squawk about. The Chrysler Corporation has got a lot of six-foot men in it, topside. They like to get into a car with their Homburgs on. Me, I'm average. The roof of the sedan is too high. The Chrysler seats are too big for anyone except men six feet tall with posteriors to match. One of these days I hope that Chrysler will discover that all potential car buyers aren't brothers of the center on the University of Michigan basketball team.

Power, the new Chrysler has—aplenty. I may regret these words, come next year, but I'm beginning to suspect that we're about reaching tops in engine power for ordinary driving, even in the most *chichi* of America's quality automobiles. Personally, I think it's time we did.

TWIN EXHAUST PIPES tattletale the fact that it's a '54 Chrysler. Styling has been sharpened with stainless-steel trim except where castings are used. They're chromed.





'54 Plymouth Is Longer, Offers Power Steering

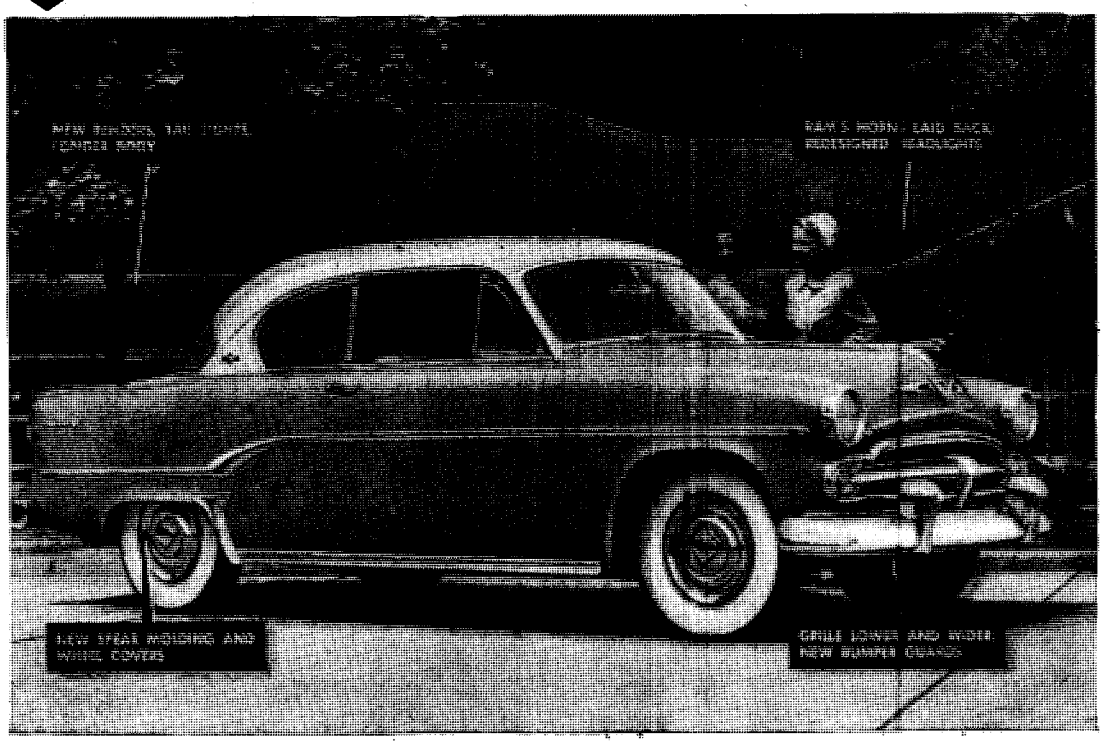
OPTIONAL linkage-type power steering, a 3⅝-inch increase in over-all length and a variety of small style and engineering changes mark the new and restyled 1954 Plymouths.

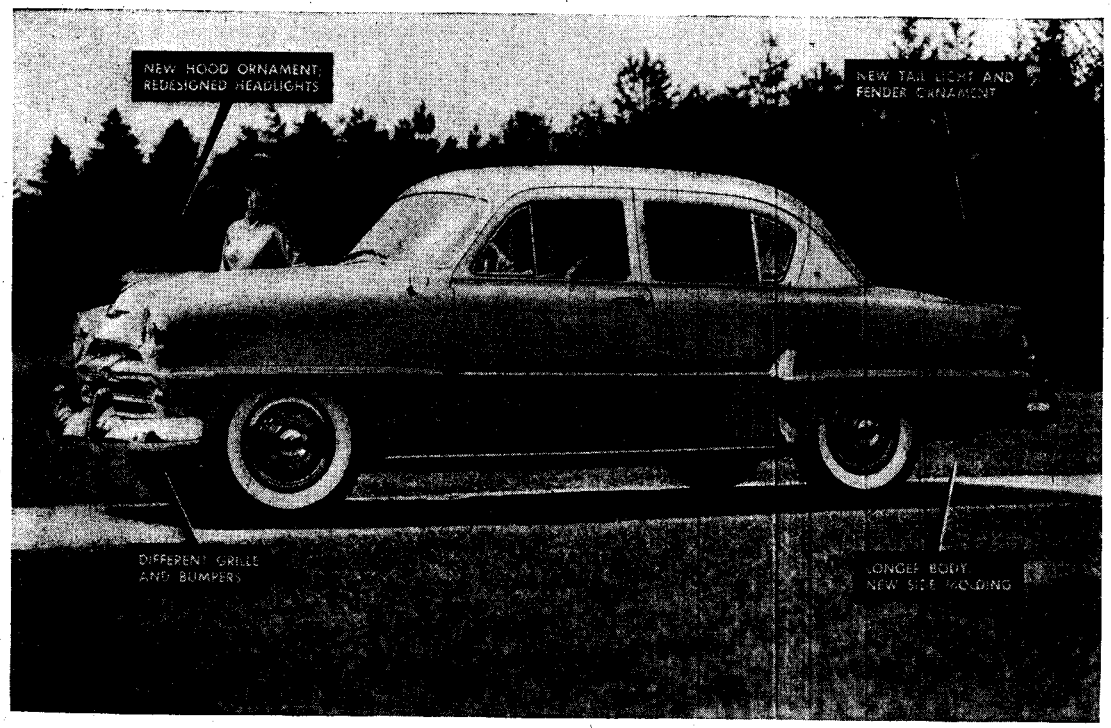
Plymouth's power-steering unit, manufactured by Monroe, comes into play when one pound of steering effort is applied to the rim of the 17½-inch wheel. The hydraulic-assist mechanism reduces steering effort up to 80 percent.

Styling changes are highlighted in the recognition features listed at right. Interiors have been dressed up with new vinyl fabrics. Springs in the seat cushions have been modified to give softer riding on smooth roads but greater resistance to bottoming on rough ones.

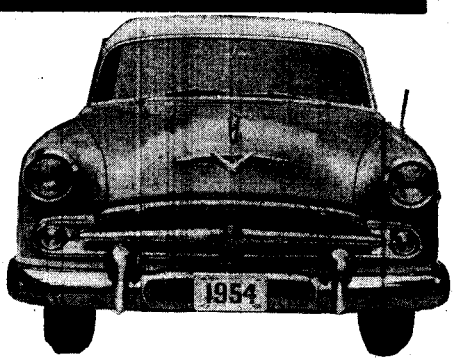
Mechanical changes include a new alloy steel for intake valves, an improved clutch and more capacity for the oil pump.

HOW TO TELL THE NEW MODELS





Dodge Gets New Transmission, 10 More Horsepower



TEN more horsepower on the V-8—achieved by boosting compression from 7.2 to 7.5—a new fully automatic transmission, and power steering are highlights of the 1954 Dodge. The cars also sport some styling changes.

The compression rise is the principal change on the V-8 engine, which has a distributor with a slightly different advance curve. Meadowbrook models of the V-8 continue at 140 hp. Power of the L-head six has been raised to 110 hp. and compression to 7.25.

The new PowerFlite transmission is identical with the one announced this year by Chrysler (see pages 120 to 124). It combines a high-multiplication torque converter with a fully automatic two-speed gearbox. There is no clutch pedal.

Power steering on Dodge is of the linkage type, with assist occurring as soon as one pound of effort is put on the wheel.

A new super de luxe series, the Royal V-8, heads the line. Models come in 11 body colors and 14 two-tone combinations, with restyled interiors and Jacquard fabrics. If you really want to shoot the wad, you can get air conditioning.