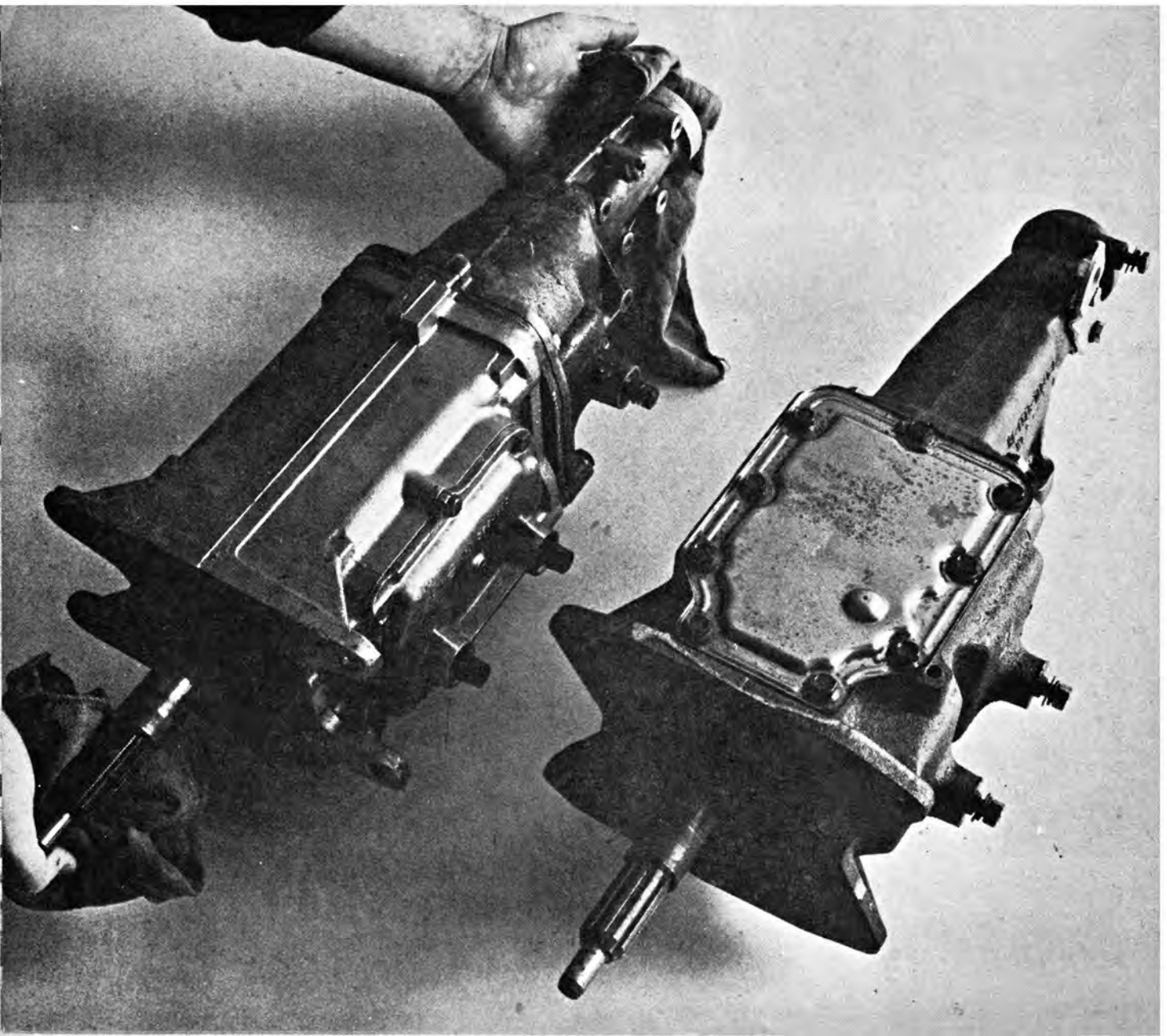


Thinking of swapping your three-speed in for four-on-the floor  
or going to a beefier box?

Then stay tuned as Motown's Roger Huntington gives the  
straight scoop on

# Swapping Sticks For More Dig

Two popular three and four-speed sticks for swapping. Left is a Chev Muncie four speed-right is a late Ford all-synchro three-speed.



**H**OT RODDERS talk about swapping engines all the time. It's a favorite hop-up trick. But how about swapping trany's? There are a lot of possibilities here, too. Maybe you want to change your present three-speed stick for a four-speed. Maybe your present trans isn't strong enough for the engine power you have, and you're busting gears all the time—you need a beefier basic tranny. Or maybe you want to switch an automatic for a stick. Or maybe you're just doing an oddball engine swap and you can't find a commercial adapter to mate the engine with the original trans.

We don't intend here to give detailed instructions on various tranny swaps. That would fill a book. We just want to clue you in on some of the interchange possibilities, so you'll be more familiar with *basic* trans models and how they can be swapped around between cars. Every backyard mechanic should be familiar with some of these relationships.

In the first place, I don't intend to spend a lot of space on older transmission design that are either too weak for modern high-performance engines or shift too hard and slow to satisfy today's drivers who have been weaned on all-synchro four-speeds. An example of a popular hot rod transmission that's not strong enough for modern demands is the old '32 through '48 Ford box. Those early Ford car models are still popular for engine swaps because they're light and the body styles are popular in the hot rod field. And adapters to mate the '32-'48 trans to any modern V-8 are widely available in any hot rod shop. These are simple swaps, and it's OK if you want to go this way. But we would never advise this basic transmission if you have any real *choice*. It's just not strong. The torque of a big-inch, free-breathing V-8, and a few hard shifts, will tear it to pieces. It's not worth fooling with.

Of course there are a lot of old

three-speed stick transmissions in junkyards that were designed for heavier cars, that have a lot more beef than the '32-'48 Ford box. Notable examples would be the early GM Buick-Olds trans, the Warner T-85 (Lincoln, T'bird, Studebaker, etc.), the '39-'54 Packard three-speed, and several others. These boxes were popular for engine swaps 10 or 12 years ago. But today even these early "heavy-duty" transmissions are marginal on strength for our latest high-torque V-8's especially shifting at 600+ rpm speeds, which is "bread-and-butter" today. An even more serious disadvantage is that these early three-speeds didn't have the constant-mesh synchronized low gear like our modern trannys have. This means that the big low gear wheel has to be slid back on the main shaft on the 1-2 shift. Not only does this take two or three times longer to complete than with constant-mesh gears, but it's easy to bust the gears when you slide them back and forth on hard speed-shifts.

I don't mean to discourage you guys too much on these old transmission, because I know you can buy loads of them in junkyards everywhere for \$10 or less. If you're building on minimum funds this could be a life-saver. But just don't expect too much is the idea. If you can possibly swing a more modern transmission, whether three or four-speed, by all means do it.

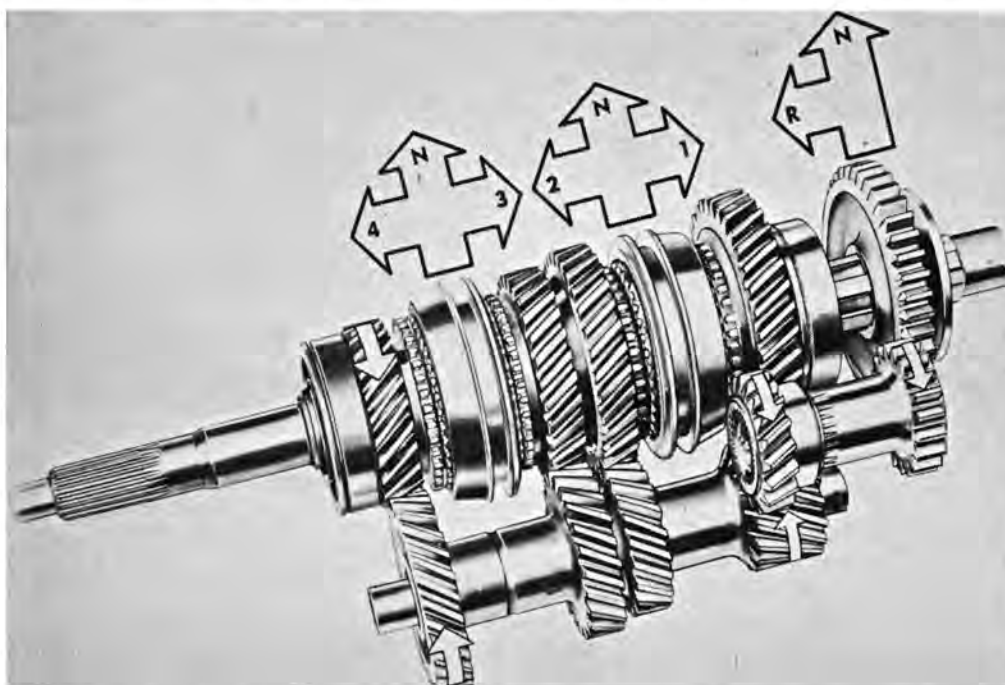
Which brings up the first important point in selecting a transmission: Look seriously at the modern all-synchromesh three-speed. These have been designed within the last five or six years, and they are very strong for their size and weight. All the gears are in constant mesh, so shifting is done by sliding dogs and synchro units, and you can shift them almost as fast as a close-ratio four-speed. Good, reliable floor shift linkages are available either through the factories or through the hot rod industry (Hurst, Drag-Fast, etc.). These are almost like having a four-speed, but with one gear missing. The only thing is the ratios are a little wider. But they shift beautifully, and it's neat to pull into low gear when rounding a corner, or when digging out from 15 or 20 mph. Just dump the gear and go. And, perhaps most important, these new all-synchro three-speeds have been in mass-volume production for several years, so they are quite widely available in the junkyards. Prices are generally under \$60 - which is maybe one-third of what you would have to pay for a four-speed of similar age and condition.



Ford cars ordered with overdrive get the T-86 unit. It's n.g. for HP machines.



Sectional view of GM Saginaw all-synchro three-speed. This trans is the base for GM's '66-'69 Saginaw Four.



Gearsets in famous Warner T-10 four-speed have been beefed and made with high-alloy steels.

You can save a lot of money by going the late three-speed all-synchro route. And yet get many of the advantages of a four-speed.

There are two of these basic transmissions available. Ford introduced their Model 3.03 on '63 Galaxies, Mercurys, Fairlanes and Comets. They were used on most of the big cars, but only with V-8 engines on the lighter cars. By now there are millions of Ford products on the road and in junkyards with them. Also Pontiac and Olds have bought the Ford 3.03 trans for certain lighter models in the '64-'67 period. The other late three-speed all-synchro is GM's "Saginaw" three-speed (made in Saginaw, Mich.), which was introduced on '65 Chevrolet lines (big cars, Chevelle, etc.) and is now used on most GM cars that offer the three-speed manual trans. They're widely available in junkyards.

The interchange possibilities on these two transmissions are great. Ford has

used the same trans front bolt pattern on practically all models since 1949 ('51 on Mercury). Notable exceptions would be the small Model 2.77 three-speed for Falcon and Comet six-cylinders, and Ford's new "T&C" four-speed (1965 and later models) has a different bolt pattern. This means that you could swap Ford's late all-synchro three-speed in any of these earlier Ford models using your original factory bell housing. In the case of the GM Saginaw three-speed, it uses the bolt pattern used on all Chevrolet passenger car three and four-speed transys since '55 - plus the GM compact cars since '61 (Tempest, F-85, Special). Some of these bell housings have two or more of the bolt holes threaded, so it might be necessary to remove the housing and tap the holes if you make this swap. But there are literally dozens of good swap possibilities here.

And don't forget, that your hot rod shops have special adapters to mate

both of these transmissions to *any* late V-8. So if you want to put one, say, in a Mopar, or switch a GM trans into a Ford, you just need to spend an extra \$50 or \$60 for the necessary bell housing adapter. Nothing to it.

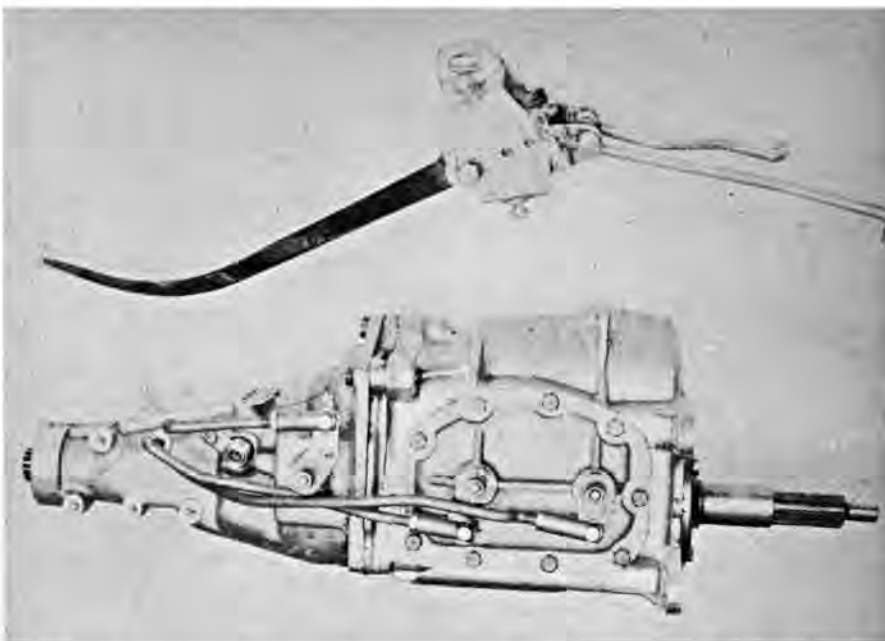
The only other three-speed worth talking about here would be Chrysler's new Model A-745 heavy-duty manual, brought out in 1961 for the corporation's heavier cars with medium to large V-8 engines. It has the sliding low gear and pin-type synchronizers, which doesn't make for the fastest shifting, but it's plenty strong and beefy for modern big-inch engines - so it would be a bolt-in swap on, say, a '57-'60 Plymouth Fury. And you can get adapters for other engines.

Now let's talk about four-speed.

As you know there are four basic American-made designs to choose from here. First is the famous Warner T-10. This was originally designed for the '57 'Vette (converted from a Warner T-85 three-speed by putting reverse gear in the tailshaft housing) and was quickly adopted by other GM divisions for passenger cars. Chev offered it in '58, Pontiac in '60, then Ford in '61, and so on. By the early '60's you could get the T-10 four-speed in Dodges and Plymouths, Buick Specials, Olds F-85's, Studebakers, as well as most models from Chev, Ford and Pontiac. Many thousands were built. As the transmission was used with larger engines it was necessary to beef up the gears and synchros, and in 1962 we saw an aluminum-case version that weighed only 66 pounds. It was a great transmission. But, frankly, the Chev and Warner engineers who designed it for the '57 Corvette never intended it would be used with 400-cubic inch, high-torque engines. It just didn't have the strength. And since the design was locked into the original Warner F-85 gearcase and tooling, it was not practical to expand it and make it a lot stronger. It would have cost too much for the limited market. This is why the other companies have tooled up their own four-speeds in the last few years.

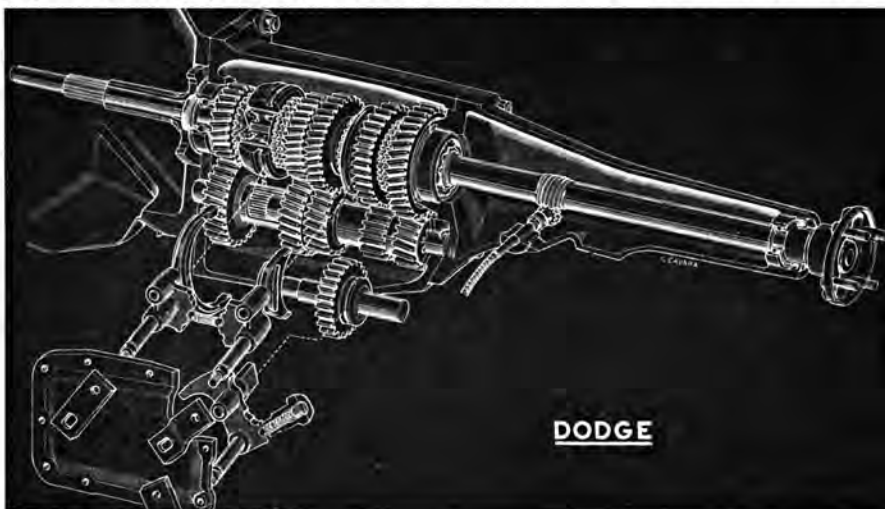
But there are thousands of T-10 transmissions around these days, and they are great swaps for high-performance home-built cars. Unfortunately some of the different companies that used it used their own bell housing bolt patterns of the front of the case - so you couldn't interchange, say, a Ford T-10 with a Chevy T-10. However, all the GM divisions used the same bolt pattern, and matched it with the

(Continued on Page 51)



Warner made all-aluminum version of the T-10 in early 1960's that weighed only 66-pounds.

Chrysler's latest four-speed is large and strong. Weighs 120 pounds and it'll take 500 horsepower.



**DODGE**

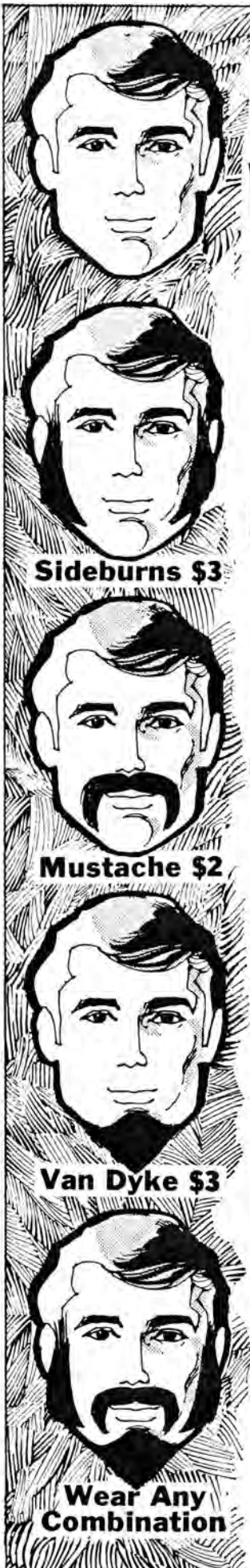
**SWAPPING STICKS** continued

GM medium-duty three-speed as used on all '55 and later Chevs, most '57 and later Pontiacs, and the '61 later Special, F-85 and Tempest compacts. So this means you could swap a T-10 four-speed in any of these above three-speed cars with the original bell housing. Dodge and Plymouth also used this bolt pattern but of course they needed special bell housings because this pattern didn't match their three-speeds. And since there were relatively few Mopars built with the T-10 trans (in 1963 only) you would undoubtedly have to buy an adapter to do this swap. In the case of Ford, they used their own bolt pattern on the T-10, but matched it with their '49 and later three-speed - so you have tremendous swap possibilities here. Practically any Ford or Mercury three-speed model from the early '50s will accept a Ford T-10 four-speed with the standard bell housing. This swap is very popular in '56 and '57 Fords.

The first of the "modern" four-speeds was the famous Chevrolet Muncie design, which replaced the Warner T-10 in all GM lines in 1964. This new trans was similar to the T-10 in shape, size and weight (and it still retained reverse gear in the tail-shaft housing) but it was a lot stronger for big-inch engines, the bearings were bigger, gear teeth heavier, and the synchronizers were stronger and worked easier. Today it's one of the finest four-speed transmissions in the world. And certainly one of the strongest. If you're looking for a four-speed that will take a lot of abuse, and has a good selection of gear ratios, consider the Chev Muncie. They call it "Muncie" because it's made in Muncie, Indiana.

The reason we have to designate this is because GM brought out another distinct four-speed in '66, for small V-8's and six-cylinder cars with lower horsepower. Not very many cars fans realize this. This is the "Saginaw" four-speed you hear about. It was made by converting the new Saginaw all-synchro three-speed that was brought out in '65, which we talked about earlier. The four-speed version was made by squeezing the four gearsets into the original case, and pushing reverse gear back into the tailshaft housing (like they converted the Warner T-85 to make the Corvette T-10 four-speed in '57). The case is considerably shorter than the Muncie. Today this transmission is used on all Chevrolet lines using the small V-8 (307 cubic inch) or 6-cylinder engine, plus 6-cylinder Tempest and

(Continued on Page 56)



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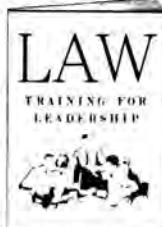
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(Continued from Page 51)

Firebirds. They are pretty rare in the junkyards, however.

But let's face some facts on swapping this one: *Don't bother.* It's not strong enough to stand the gaff. With four gearsets squeezed into the area designed for three, you have very narrow gear teeth, and they can't handle much torque. Chevrolet engineers tooled the thing up because it was a quick, cheap way of getting a four-speed trans out of existing three-speed tooling. But note that they only use it with small, low-torque engines. It's not a trans for the hot rod business.

On the other hand the Muncie four-speed can answer a lot of problems with high-performance cars. It has the same front bolt pattern as all the other '55 and later Chev passenger cars (and '61 and later GM compacts), so it will interchange on these standard bell housing. And of course it has the same pattern as the Warner T-10 four-speed for GM and Chrysler lines - so you could replace the T-10 with a Muncie on any of these models. A lot of fellows have, especially where you have a big-inch, high-torque engine that occasionally shucks gears out of the T-10.

Chrysler brought out their "New Process" four-speed for '64 Dodge and Plymouth models (including a wide-ratio version for the Dart and Valiant compacts). This is a very large, beefy transmission that weighs 120 pounds, and is strong enough to handle truck engines. In standard form it doesn't shift as easy as the Muncie; but you can now buy a "Slick-Shift" kit through Mopar Parts that has modified synchro parts to convert the trans for drag racing. They're designed to let you slam-shift through the gears by brute force, with or without the clutch, so you can make very quick shifts. However the trans is then not suitable for street driving. You can't have it both ways. This, plus the fact that the trans is relatively bulky and heavy, has not made it very popular in the hot rod field.

Incidentally, the front bolt pattern on the Chrysler four-speed is different from their three-speeds, so you need a special bell housing. These are available through Mopar Parts for Chrysler engines, or through the hot rod industry for any popular V-8 block. It might be mentioned also that these transmissions are not at all widely available through used parts sources. As a matter of fact relatively few Chrysler products have been built with them, since the heavy-

duty TorqueFlite has been so popular on Mopar high-performance cars for years. They sell ten TorqueFlites for every four-speed.

Ford's new "T&C" four-speed was introduced on the '65 models, and is now used with various gear ratios on Fairlanes, Mustangs, Comets, Cougars, and full-size Fords and Mercurys. (It should be mentioned, however, that some of the lighter '65 models - Fairlanes, Comets and Mustangs - came through with Warner T-10 four-speeds, before production was built up on the T&C design. By late '65 the T-10's were phased out entirely. But check to see which one you have.) The Ford T&C trans is a medium-size unit, around 100 pounds, plenty strong, good-shifting, and quite reliable and longlasting. It has been quite widely used in the hot rod field.

Unfortunately swapping is complicated by the fact that the T&C has its own separate front bolt pattern. This means you will need to change the bell housing when making a swap. A factory bell could be used for any Ford engine, or the hot rod suppliers have adapters for any of the other late V-8's. There are quite a few of these late Ford T&C transmissions in junkyards around, from wrecked cars. Not as many as there are GM Muncies; but they're not hard to find. And prices are a little lower than the Muncie - between \$100 and \$150 for a decent one. This might be a good possibility, though you might need to buy the bell housing, too. The beauty of the Muncie is that it has the same bolt patterns as all '55 and later Chevs - so can be bolted on dozens and dozens of models that go 'way back.

A lot of fellows have asked how much of a job it is to swap an automatic transmission for a three and four-speed manual. It's a pretty big one, actually. You need to replace a lot of parts. Like the engine flywheel, clutch, bell housing, plus the manual transmission - then you have to go ahead and rig up the clutch operating linkage. It's a big job. If you bought new factory parts the price for the whole job would be prohibitive. The only practical way to tackle it would be to buy a complete junk car chassis, and pull the necessary parts off that. Or, maybe better still, trade the car off and buy a similar model with the stick trans you want. If the difference is only \$100 or so it might cost you more than that to make the swap, even using junk parts.

Certain particular transmission swaps are hot right now. For instance putting

a four-speed in a '55-'57 Chevrolet. It's a bolt-in swap with either the T-10 or Muncie, as both have the same bolt pattern as your original '55 '57 stick bell housing. A specialty floor gearshift linkage tops it off. Another popular one is a four-speed in a '56 or '57 Ford, especially models with the 312 cubic inch Thunderbird engine. Here you would have to use a T-10 four-speed to fit the original bell housing bolt pattern. The new Ford T&C would require changing the bell, too, or using a special adapter. And, of course, the T-10 would need to be a Ford version of this one, as GM and Chrysler versions have a different bolt pattern. There are quite a few of these around in the junkyards, however, as Ford used the T-10 from '61 through '64. This is also a bolt-in swap if you can find the Ford T-10.

Quite a few fellows are interested in putting four-speeds in Dodge and Plymouth stick-shift models of the early '60s. This is a bit more complicated because Chrysler didn't use the same bell housing bolt pattern for four-speed and three-speeds. You will need to swap the bell housing, too. But otherwise the job is straight forward, and only requires a special bracket to adapt the rear trans mount to the four-speed. The best way to go on this one is to look for a GM or Chrysler-version T-10 in the junkyards, and then use a '63 factory bell housing for the A or B block. You can buy a used T-10 for \$150 or so, where there is very little chance of finding a junk Chrysler four-speed.

And so it goes. Lots of trans swap possibilities. And here's a good way to hop up your performance and fun with a minimum of expense and complication. A trans swap is many times easier than an engine swap. Good luck!

#### 25 HP BOLT-ON continued

good cleaner such as the open top Stellings setup and there should be at least 1-inch clearance between the top of the air cleaner and the hood. On many Chevilles there is enough room for a Ram Air setup which can do wonders at high speeds for the 396/427.

To finish off the bolt-on hop up the timing should be corrected to anywhere from 38 to 42 degrees total with a suitable curve and Sunoco 260 in the tank. Then you should be able to reap the benefits of the newly-found 25 horsepower.

#### FORD continued

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