

- Ford V-8 - EXHAUST SYSTEMS

and why it's hard to restore them

by
DAVE COLE

The exhaust system is probably the part of a Ford V-8 about which we V-8'ers know the least. Of course, we know what it is and what it does. It's a string of steel tubing, 1½ to 2 inches in diameter, that runs from the exhaust manifolds on the V-8 engine to the rear of the car, where it dumps the engine exhaust gasses into the atmosphere so they don't asphyxiate us when we are riding in the car, and in the middle of that string of steel tubing is a muffler, about six inches in diameter and around 16" 2 inches long, which is designed to damp out as much of the noise made by the engine as possible. The V-8 engine, being of the conventional internal combustion type, generates its power by a rapid series of explosions within the cylinders, which produce both noxious fumes and a lot of noise, and it's the exhaust system that carries those fumes away and mitigates the noise to a tolerable rumble. In addition to the pipes and muffler, there are a number of clamps, supports and whatnot that hold the exhaust system to the bottom side of the car. Without them, the whole works would fall out onto the road.

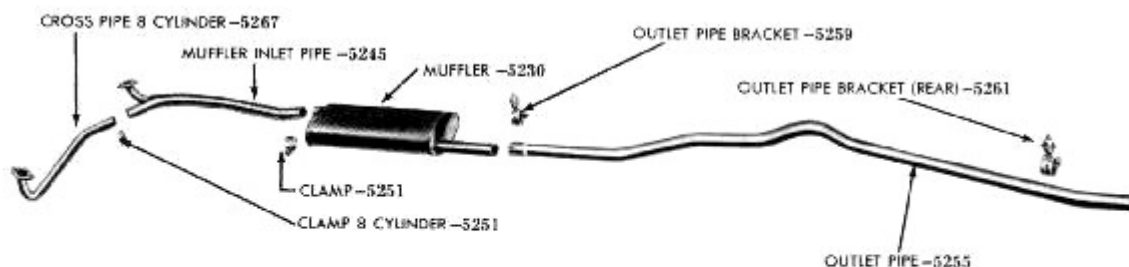
But specifically, how much do we know about the various parts of the exhaust systems that are in our own cars? Are we really sure that all the components are correct and authentic for the year and model of the car, or did we just put in whatever we could get that would fit and more or less do the job? How many of us would recognize an authentic factory-approved muffler inlet pipe or outlet pipe bracket if we saw one?

Probably not very many. Exhaust systems are fairly well hidden from view under the car, and as long as they work all right, we tend to ignore them. But if you are striving to restore your Ford V-8 to 1,000-point condition, you need to know just what is correct for your car, and then find and install it. Even if

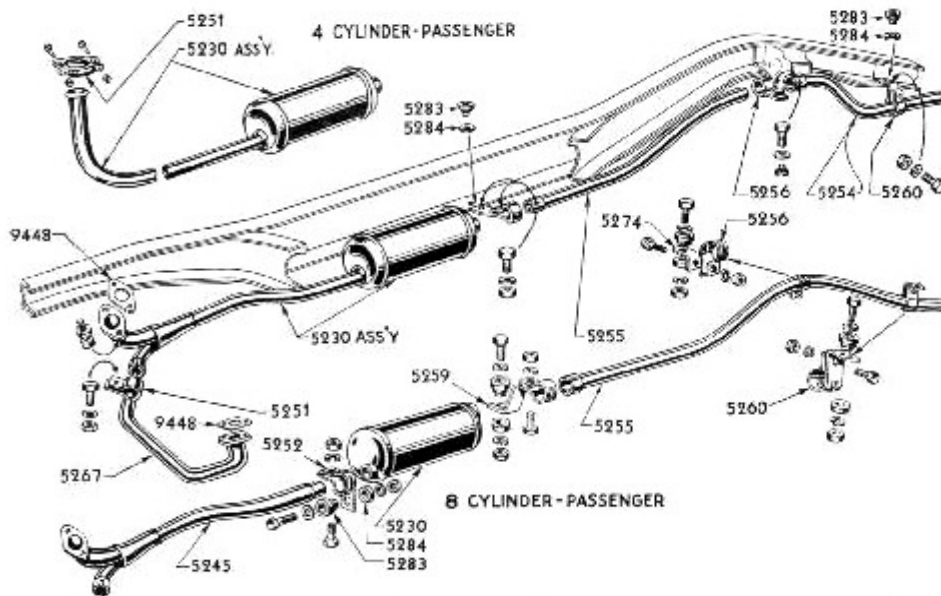
you're just building a nice driver, wouldn't you rather have a proper exhaust system? Well, if you fancy twin pipes and a pair of Smitties. Maybe not, but a lot of guys would like to put their Fords back into stock condition if they could figure out how to do it correctly.

But it's not easy to find out what is correct. Your old Ford probably had lost its original muffler and tail pipe long before you got it. Those components don't last long in use. They rust away and have to be replaced, and before Ford V-8's became collectible and worthy of restoration, the replacement mufflers and pipes might have been anything that the owner could find at the time that would work. The original brackets had to be replaced, too, when the rubber insulator rotted away or broke loose from the clamp, and for years, all anyone ever thought of using was a universal-type replacement from the closest auto supply store. Thus, there is hardly a chance that the exhaust system that was in your car when you got it is even close to being correct.

Ideally, you should be able to learn what you need to know about the exhaust system from the Ford service literature published when the car was new. Unfortunately, you won't find very much in any of it. The series of *Ford Service Bulletins* published from 1932 to 1937 offers practically no information on the exhaust system, and the big seven-ring binder titled *Service Bulletins - Mechanical* that replaced the earlier series in 1938 never had one bulletin picturing or describing any exhaust pipes or parts there of. *The Ford, Lincoln & Mercury Service Manual for 1946*, one of the most helpful of all early postwar service manuals, devotes six lines on page 190 to the subject of "Exhaust Systems," but also has four illustrations that show various systems, although not in great detail.



■ The *Ford, Lincoln & Mercury Service Manual [for] 1946 Cars and Trucks* shows exhaust systems in this fashion. Like most Ford publications, it shows little detail concerning the brackets and where to attach them to the car. This illustration shows the 6- and 8-cylinder passenger car exhaust system. Note the oval muffler.



■ In the 1935 Ford Chassis Parts List, one illustration shows the Model B exhaust system (less tail pipe), the 1933-34 system below it, and the 1935 system at the bottom. The muffler is welded to the inlet pipe in the first two, and clamped on in the '35.

About the only books in which you'll find any information at all are the parts manuals. They list the components of the exhaust system, and many of them are illustrated, but the line drawings show only the pipes and mufflers in a general way, and the bracketry is rendered in so small a scale that you might have trouble identifying parts correctly. Add to this the fact that few exhaust pipe brackets have part numbers on them, and you can see that sorting all this stuff out is pretty difficult and subject to error. The parts books for 1932, 1933 and 1938 don't show any exhaust pipe parts; in fact, the latter two books have no illustrations at all.

So the factory literature doesn't tell you all you would need to know in order to assure yourself that your exhaust system is restored properly. What about the books being published by the Early Ford V-8 Club? They are supposed to describe the cars in detail as they were when they were built, and the V-8'ers who compiled the books were all long-time owners of the models they wrote about, so they knew the cars intimately.

The entire series of these books has not yet been published, but those that are in print do offer more information than the factory ever did. David Rehor's treatise on 1932 Ford judging standards, written some twenty-five years ago, offers some insights into the '32 exhaust plumbing and brackets that cannot be found elsewhere, but the work is entirely without illustrations that would help clarify things. There is as yet no book for the 1933-34 Fords, but *The 1935-36 Ford Book* came out five years ago. It has two pages on the exhaust system, giving in narrative form the same information as is given in the parts lists, and using the same illustrations, with enlargements of the parts showing the brackets and clamps, but little else.

The 1937 Ford Book has not been published, but if the section on exhaust systems remains as it is in draft form, it will be as brief as the 1935-'36 book.

The 1938-39 Ford Book, by Gary Mallast, was released just last year, and is by far the most comprehensive work of the whole series, yet in its 266 pages of small type and countless photos and illustrations, only two pages of text and two illustrations are devoted to the exhaust system. One picture shows the muffler with domed ends made by Ford for the 1935 to '38 Ford V-8's; the other is a small copy of the blueprint showing another type of muffler used on 85-h.p. V-8 cars beginning in the spring of 1937, made by Oldberg, a portion of Associated Parts, or AP Parts, of Toledo, Ohio. The Oldberg muffler, part number 48-5-0-A2, could be identified by its end plates, which are recessed into the shell, flanged outward, and welded to the end of the shell, giving a rather ragged look in practice. This type of muffler was never pictured in Ford literature and is thus little known among V-8'ers, but apparently many of them were used in production. In this book, there is considerable descriptive text concerning the mufflers and their supports and hangers, but that's all. There is no corresponding description of the pipes and their bracketry.

And so it goes. *The 1949-50-51 Ford Book* is the most abbreviated of all regarding the exhaust system, with just four lines of text and no illustrations.

Thus, with a few noteworthy exceptions, the club's *Ford Book* series does not add very much to the meager information given in the factory literature. For the most part, a serious restorer has to rely on suppliers of reproduction parts who say their components are made to factory specifications, and trust his own mechanical sense to install them in the car correctly.

But the Ford Motor Company, by virtue of the way it made some of its parts in the 1930's, unwittingly thwarted the good intentions of present-day muffler and pipe reproducers. Consider the peculiarities of the original parts:

- **WELDED, SEAMED STEEL TUBING** was the standard product used in making exhaust pipes at the time the 1932 Ford V-8 was introduced, and thus original 3' pipes have a straight narrow seam alone, one side, about 1/8 inch wide, the full length of the pipe. This type of tubing was continued for a number of years. But it is no longer available, so pipe Benders today use regular seamless tubing.

field
Boys
Gives
ect

NEW REPLACEMENT
MUFFLER ANNOUNCED

Fits all Ford V-8s and Model
Bs, practically all Ford
Trucks from 1932 to 1939

The answer to a serviceman's and stock man's muffler problem is now available. Two muffler assemblies with adapters to make them applicable to all Ford V-8 cars, Model Bs and nearly all Ford Trucks have been placed on the market by the Ford Motor Company, and can be obtained from authorized Ford Parts Distributors and dealers. The muffler assemblies lack the drain holes which must be added at time of installation. These two mufflers with adapters replace 21 previous muffler types and therefore greatly reduce stock requirements.

A chart has been compiled showing parts needed for replacing previous type mufflers. These charts can be obtained from Ford Parts Distributors at the same time that an order is placed for the new service mufflers, and adapting parts.

The present complete assemblies for specific models will be maintained until further notice.

THE ADAPTERS, REPLACING THE USUAL WELDED INLET PIPE.

THE NEW MUFFLER ASSEMBLY

Help Proposed | Bombay Enforces | Kennedy's Children Find Fashioned

Mass
was de
to close
operated
the three
Two of
Bender B
closed for
their world
Body crowd
Robert T
from Detro
provoking
asserted th
after the
brick thro
nonstriker

One-
Nabb
who all
had a st
irons.
DeLong
record ar
from the
He was
a curio
kidn

■ This introduction of the replacement muffler program was made in the September, 1939, *Ford Service Merchandising Bulletin*. The muffler shown is of the typical domed-end Ford construction.

• **LONG RADIUS BENDS** were commonly specified for Ford exhaust pipes in the '30's. As a rule, the longest radii possible were specified, consistent with making the pipe fit in the allowable space. How long? Would you believe a 53-inch-radius bend was called for on the blueprint of the long muffler outlet pipe for the 1932 Ford? The pipe starts to curve upward in that long sweeping bend just a couple of inches behind the muffler, and it continues for nearly two feet before it straightens out and reverses the direction of the bend—on a 17~4 inch radius—for about nine more inches. It appears that such long radii were not uncommon for Ford exhaust pipes, but the likelihood of anyone bending pipe to such specs at the present time is very remote. The pipe benders now in use have only a very limited assortment of radii they can produce, and crazy figures like 17~4 and 53 inches are not among them! To produce a '32 muffler outlet pipe that will fit properly, a present-day manufacturer will probably make a few short kinks with the usual 6-inch radius or whatever his machine makes, thus approximating the long radius bend called for by Ford in the original drawing. It can be made to fit. And it will work—but it will not look right.

• **MANDREL-BENT CURVES**, or at least, bends that were not out of round by more than 1/8 inch, were commonly specified by Ford. This requirement was to assure that the pipe would not restrict the flow of exhaust gasses too much. If you look at an original Ford V-8 exhaust pipe or tail pipe, you will see that this requirement was observed very well. The bends are not caved inward on the inside radius, and there is no wrinkling of the steel, either, that would exceed a 1/8-inch reduction in the diameter of the pipe. You are not likely to get replacement pipes made to such strict specifications today. Modern pipe benders do the job quickly and efficiently, but seldom leave a bend that looks as smooth and free of distortion as the original.

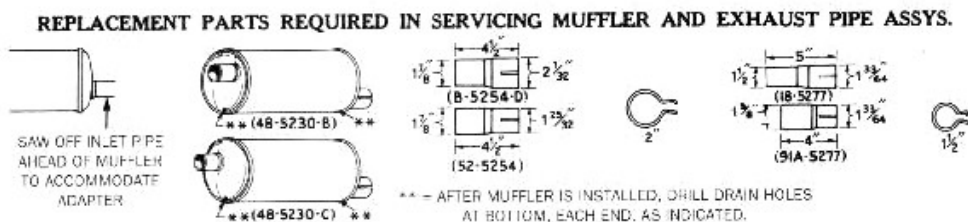
These three characteristics of original Ford exhaust pipes make it very difficult for a reproducer to duplicate original pipes exactly. Generally, you have to settle for replacement parts that are as close to original specifications as modern materials and methods will allow. We accept this because it's the best we can do, and if we have never seen an original exhaust pipe to compare with the reproduction (which is all too often the case, then we don't realize how much they differ. What we would really like to

find is a new~ old stock pipe, but the likelihood of that is very remote nowadays.

And so it is with the muffler, too. In fact, it's even worse. Ford still offered some early V-8 exhaust pipes into the 1950's, so there might be a few left even now, but original mufflers of the '30's started to disappear from dealers' stock by September, 1939! In that month, Ford announced a new replacement muffler program, in which just two different mufflers, with one of four different adapters at each end, would be used to replace any Ford passenger car muffler, and practically every truck muffler, from 1932 to 1939! In the eight years the V-8 had been in production, muffler designs had proliferated to such a degree that there were six of them for passenger cars and sixteen for trucks. This meant that every Ford dealer's parts department had to stock an ever-increasing number of items, thus creating a storage problem. With the new program, only two mufflers and four adapters would service any Ford back to 1932. In replacing a muffler, the mechanic would saw off the inlet pipe, slip on the proper adapter, the new muffler, and another adapter to join the outlet pipe, clamp 'em all together, and be done.

But what was easy for stockmen and mechanics from 1939 onward makes it impossible for us to find Ford V-S mufflers of the 1930's today. Once the dealers stocks were used up, no more were made; only the two replacements were available. Even the drawings of exhaust systems in the parts books were altered to show the replacement mufflers and adapters. Up to 1934, the Ford muffler was welded to the end of the inlet pipe, but after 1939, if a parts book illustrates the 1933-34 exhaust system, it is not shown in its original configuration: it has the adapters, clamps and substitute muffler shown instead.

All of this makes it a real challenge for a V-8'er to restore a Ford with an authentic-looking exhaust system. NOS parts cannot be found: the old original system is long gone: we're not entirely sure what it looked like: and it's not economically feasible to reproduce the various parts in their original specifications even if we do know what they were! Add to this the fact that the exhaust system lives under the car where it's hard to see it, and it's easy to understand why most V-8'ers just go with the most likely components they can find, and let it go at that. Strict authenticity thus remains an elusive goal.



■ The May 1, 1940, *Ford Chassis Parts List* explained how to service exhaust systems of 1932-'39 Fords with the two new mufflers, part numbers 48-5230-B and -C. If your Ford of those years uses the adapters pictured here at the inlet or outlet of your muffler, the installation is not per original specs.

There are, however, some interesting observations concerning Ford V-8 exhaust systems that have never received much attention. A few of them follow:

- **FORD V-8's USED THREE-PASS MUFFLERS.** When it was finally understood, in the 1920's, that a muffler full of baffles created a lot of back pressure that took power from the engine to push out, the **straight-thru** muffler was developed to solve that problem. A perforated pipe ran straight through the center of the muffler shell so you could look right through it, and baffles centered the pipe in the shell. A certain amount of exhaust gas escaped through the holes, hit the baffles, and was forced back into the main pipe a fraction of a second after the rest of the charge had gone by, thus evening out the pulsations of the exhaust and damping out the noise to an acceptable degree. The so-called **two-shell** and **three-shell** designs were variants on this same theme. In order to be effective, such mufflers had to be rather long, as a rule.

Many cars with fairly short wheelbases did not have enough room under the car for long straight-through mufflers: among them, the Ford. For them, the **three-pass** muffler was developed. In this, the basic layout of the **straight-thru** was chopped into three parts arranged side by side in the shell, which could be fairly short. The exhaust gas entered the muffler and went through a perforated tube surrounded by a solid one, much as in the straight-through design, but it exited into a chamber at the end of the muffler, from which the only way out was a similar set of tubes leading forward to the front of the muffler and another chamber. Leading out of that was -the third set of tubes, the "third pass," which led to the outlet and the tail pipe. The exhaust thus changed direction twice on its way through the muffler.

Almost all Ford V-8 three-pass mufflers, 1932 to 1941, were 6 inches in diameter and 16-1/2 inches long, the differences among them being mainly in the sizes of the tubes inside and the lengths and positions of the pipes stubbed out each end. In 1942, Ford switched to an oval muffler with the three sets of tubes side by side within it, and the length grew to 24 inches. These three-pass mufflers usually had -drain holes in the ends to allow condensation to escape, which would otherwise rust out the muffler from the inside. The drain holes, about 1/8 inch, did not go into the chambers that contained the exhaust gas; they drained the space in the shell not occupied by the tubes.

- **FORD V-8's HAD RUBBER INSULATED EXHAUST SYSTEM BRACKETRY.** at least in passenger cars from 1933 onward. The 1932 cars were the last to bolt the steel brackets directly to the chassis without benefit of insulation, but if we can believe the drawings in the parts books, Ford trucks used uninsulated brackets all through the 1930's and '40's. From 1933 to about 1938, the rubber insulators were separate items; then Ford began with supports



The STRAIGHTTHRU type is a late design. Mufflers of this design are used as original equipment on Buick, Pontiac, Oldsmobile.



The THREE-SHELL type muffler is specified for many cars including Hudson, Studebaker and others.

The TWO-SHELL type muffler is specifically designed for certain models of Buick Oldsmobile and other popular vehicles.



The THREE-PASS type muffler is widely used as original equipment by Packard, Ford, Chevrolet, LaSalle and others.



The Double-Shell Three-Pass OVAL type muffler design is used as original equipment on Plymouth, Dodge, DeSoto and others.



■ The AP Parts Mufflers catalogue of 1949 shows the main types of mufflers in use at that time. Fords used the THREE-PASS type; so did Chevy, LaSalle, Packard and others.

that had the rubber vulcanized to the steel part of the bracket. Around 1947 or '48, it was found that heavy fabric impregnated with rubber made much longer-lived exhaust system hangers, and that type soon superseded the vulcanized rubber type. But Ford always minimized the number of exhaust system supports, regardless of insulation, to minimize the amount of noise and vibration the pipe might transmit into the body of the car to annoy the passengers. The earliest V-8's had only a support behind the muffler and one at the rear of the car, in addition to the bolts that secured the exhaust pipe to the engine.

- **FORD V-8's HAD SQUARE-CUT TAIL PIPE ENDS,** as a rule. That is, the end of the pipe is cut off at right angles to the pipe, not angled, as in the so-called "bologna" cut used by other makes. Another characteristic typical of Ford V-8's is that the tail pipe ends much shorter than you might think it should. Some end just below the rear of the body, some even shorter. If you see a Ford V-8 with the tail pipe sticking out past the bumper, you can be sure its owner is more interested in keeping the residue from the exhaust from corroding the chrome on his bumper than he is in strict authenticity.

Next time we visit this subject, we'll take a closer look at the 1932 Ford V-8 exhaust system, which the parts books and other Ford literature have never covered thoroughly. V8