

HOW TO INSTALL

A V-8 IN AN "A"



WANT EXCITING driving at low cost? Build yourself an AV-8—mating a Ford V-8 engine with the light-weight Model A chassis!

Flashy performance is the distinguishing feature of this hybrid, which boasts high horsepower to weight ratio, even with a stock engine. And by adding a few "goodies"—as described in past issues of *HOP UP & MOTOR LIFE*—this ratio can be made even more favorable.

Since the start of this series, inquiries have come in from all parts of the country from enthusiasts interested in performing this "marriage" but who are concerned with the mechanical difficulties.

It is obvious that the cheapest way to

gain more horsepower is to increase the cubic inch piston displacement. Thus, the addition of any V-8 engine to the Model A (except the Ford 60) will decidedly improve the surge and reliability to a far greater degree than is possible with a modified four-barrel engine.

Since both Model A chassis and V-8 engines are available almost anywhere in the country, construction of the AV-8 is suitable to those who have little or no experience in this type of project. Considering the high performance that can be obtained at a minimum cost, it is a worthwhile endeavor.

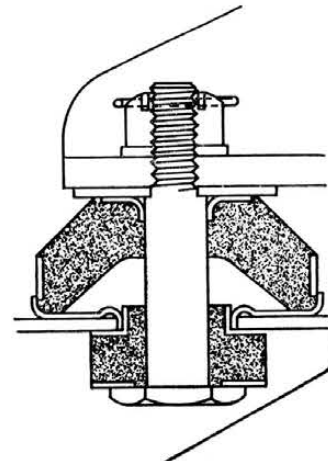
Because proper instruction will cut down most of the wasted effort, this arti-

cle will be complete and detailed, in order to save the reader's time and money and to forestall possible blunders.

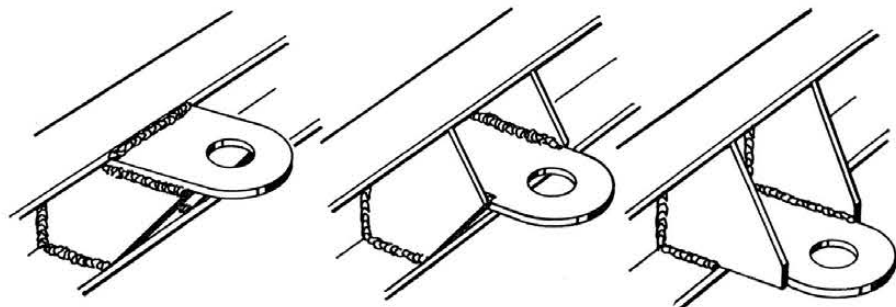
FIREWALL

At the lower edge of the firewall, make a recess approximately three inches deep by 11 inches wide to accommodate the rear engine housing. The recess can taper down to nothing toward the top where it meets the bottom of the cowl tank provided the breather pipe angle is changed so that it clears the firewall. On the inside of the firewall install a reworked V-8 throttle linkage. Drill a hole in the fire-

Cross-section of Ford motor-mount insulator and bolt assembly. Do not forget to finish with cotter pins for safety



Three types of front motor-mount supports. These are welded to frame rails and heights vary with conditions. Gusset plates reinforce and distribute the load



By Fred W. Fisher

wall so the linkage will enter in line with the carburetor.

STEERING

Since the left cylinder head and steering box interfere with each other, move the steering to the left so that it will clear, as the engine will be mounted in the center of the frame.

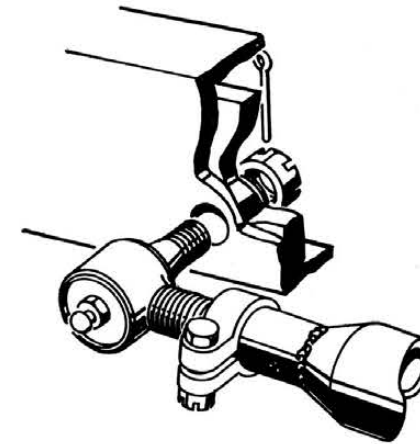
While this might appear to be a Trojan task, actually there is a simple solution. Most AV-8 builders have made a box on the side of the frame into which they have moved the steering gear. If done properly, this could be a neat installation. Others have used a Willys or other unit that sits atop the frame rails instead of inside the channel. Others have merely moved the stock unit back a few inches, just enough to clear the head. This, however, requires new mounting holes and lengthening the drag link.

Repositioning of the steering column should be done with the driver's individual requirements in mind. Special brackets can be obtained at most speed and custom shops.

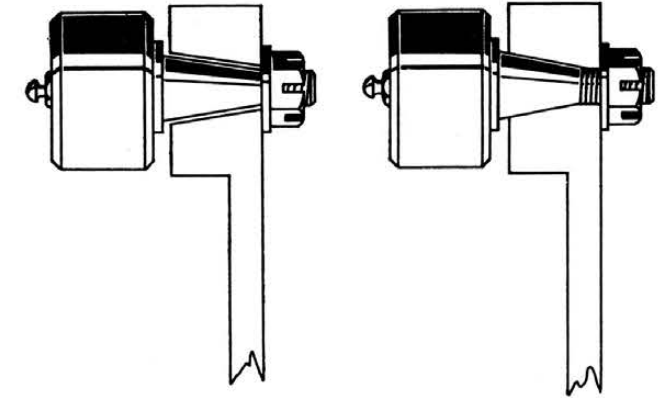
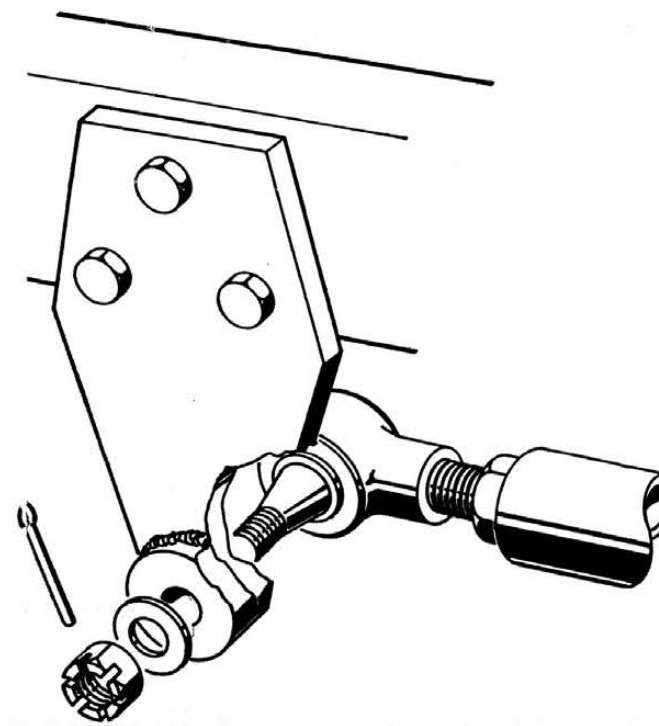
MOTOR MOUNTS

After making the recess in the firewall and relocating the steering, button together the engine, transmission and drive-line and suspend them on a chain hoist so the position for the front motor mounts can be spotted.

There are four ways to install the rear motor mounts. Most common calls for use of the '32 V-8 cross member which permits mounting '32 radius rods and pedals at the



Two methods of attaching radius rods to frame are shown here. Above: Extra plate is welded inside of frame rail. Below: Washer has been welded to bracket for thickness



Two radius rod ball joint stud installations. Sketch left is incorrect. Stud cannot be tightened further in bracket. Right view shows tightening nut correctly tightens taper

same time. Unfortunately the ease of initial installation is offset by the impossibility of removing the transmission—unless the engine comes out at the same time. This can be a serious drawback if the gear box needs reworking. If this installation is used, position the '32 cross member so that it bolts onto the top edge of the A frame. Lateral position will be determined by the radius rod ball.

A better method is to use a '33 or later X-type cross member. This is recommended since it adds rigidity to the frame and body assembly and still permits easy removal of the transmission. Since the "X" is wider than the A-frame, it must be trimmed on all four sides before being arc-welded onto the Model A-frame.

A third method is used on competition cars. A special tubular cross member is fabricated and welded onto the frame at each side, or onto pads, which are then bolted to the frame. A platform or ears are then welded onto the cross member to provide a mounting for a Lincoln Zephyr type rubber-insulated transmission mount.

Disadvantage of this installation is the fact that stock radius rods cannot be used without splitting them or unless a "belly band" is solidly built under the frame to allow for the radius rod ball socket.

When installing the front motor mounts, it is best to check carefully to see that they are placed at such an angle that the engine and drive shaft are in line as nearly as possible with a normal load on the car. A good rule-of-thumb: Keep the center of the crankshaft pulley 1½ inches above the center of the U-joint housing. At the same time, make certain that the joint is operating on a straight line. This added precaution, often overlooked by hop-up builders, will insure longer life for your car's U-joint and drive train.

Finally, there's the "quick and dirty" method. This consists of welding ¾-inch steel straps onto the stock Model A cross member so that they drop down and then extend forward to provide mounts for the V-8 transmission pads. Fabrication of new pedal mounts will be necessary as well as cutting away a small section in the center of the cross member to allow for the torque tube.

Any steel stock, from ¼ to ½-inch thickness, can be used for the front motor mounts but these should be gusseted for added strength. For information on this process, consult a good welder. Also see detailed sketch.

Do not use '32 engine mounting brackets on the front of your AV-8. Instead, install the 1933-36 combination water inlet and motor mounting brackets. These will also mount on a '32 block. If the engine to be installed is '37-48, those brackets, which are part of the water pump castings, can be used. If a '49-53 Ford or Mercury engine is to be put in, use truck water pumps, generator and crankshaft pulley.

Drill a ¼-inch hole in each front motor mount bracket to align with the holes in the engine brackets. Use Ford front mounting pads; these are superior to all others.

With a cutting torch, trim enough from the rear part of the front cross member to allow for easy operation of the crank pulley. The amount to be removed will vary with different V-8 engines.

RADIUS RODS

It is best to use stock radius rods in their stock location. However, since some fans prefer an extremely low car and particularly want to bring the frame ends of the radius rods out to the sides, here are the details.

First, a word of caution: This job requires careful workmanship. If you're not too confident about your own ability, get a competent person to do the job.

Caster angle of the front axle depends solely on the relationship of the frame height of the radius rods to the axle height. If the wishbone is split to bring the radius rods to the sides, careful measurement is necessary to be certain that the proper caster value is kept. For that reason it is recommended that the positioning be done at a front end shop, where the work can be checked.

With the wishbone split, new mountings are needed for the frame end of each radius rod. Generally, a Ford tie rod and two tie rod ends are used. The threaded ends of the tie rod are cut off and carefully welded into the radius rod ends. The tie rods are then installed into the threads to provide a positive means of adjustment.

A slight taper must be cut into the mounting bracket to provide secure mounting of the tie rod ends. Location of the holes in the brackets (or on the frame, depending on the installation) is governed by the front axle height. Bearing in mind the type of tire that will be used, since this will vary caster, obtain a reamer from a machine shop that will cut a taper approximating as closely as possible the one on the tie rod ends. This taper must be fitted so its small end does not protrude, nor should it even reach the small end of the tapered hole in the bracket. Test the taper. If it slides

all the way into the bracket, or appears too loose, replace the bracket.

EXHAUST SYSTEM

No ready-made headers are available for this installation, so special ones must be made or else a special dual-set type left exhaust manifold installed.

Exhaust and tail pipes also will have to be fabricated, but these usually can be converted from stock components.

All types of mufflers are available.

Since installation of an exhaust system is a complicated job for a novice, it is recommended that the completed car be taken to a competent mechanic. Consult the advertisements in this issue for the location of a mechanic near you.

FUEL LINE

A flexible fuel line should be used to connect the Model A strainer with the V-8 fuel pump.

While the cowl tank is often used, many prefer to add a tank in the turtle deck—they don't like to be too close to all that volatile fuel!

RADIATOR

DON'T—we repeat—DON'T use the stock Model A radiator! You'll be asking for trouble . . . Instead, install a '32 Ford V-8 radiator, preferably one that has been properly overhauled.

Frequently a '32 radiator shell is also included since it can easily be adapted to fit the Model A shell. Most builders, too, prefer to move the filler neck from its stock location and onto the rear of the top tank. Solder the stock filler hole and smooth off the shell where the old filler cap was installed.

If the car will be driven for long periods in heavy traffic, a fan is advised.

OIL GAUGE

The Model A's "spit and miss" oiling system didn't need a gauge—but the modern V-8 definitely needs one. Replacements are easy to obtain and mount.

Either an electrical or direct-fed type gauge may be used. If the latter is installed, insert a short length of flexible line between the engine and gauge line to eliminate any possibility of oil loss through a fracture of the tubing because of engine vibration.

Also recommended is a water temperature gauge and some means of lighting both instruments for nighttime driving.

WIRING

It would be advisable to rewire completely the entire electrical assembly, bearing in mind the age of a Model A and the undoubtedly ragged condition of the well-used insulation.

Include a Ford resistor unit to drop the coil current to a safe flow during slow speed operation and to protect the coil from burning out should the ignition switch be left on inadvertently. The resistor must be inserted between the ignition switch and the coil primary terminal.

Although a stock Model A ignition switch can be used, it usually is discarded in favor of a universal replacement, key-actuated part, readily available at auto parts shops. If the stock part is used, strip off the protective cabling so the wire can reach the V-8 coil.

A two-brush type generator is recommended over the older three-brush model because of its greater output and reliability. To this generator attach a voltage regulator unit and wire with No. 10 or 12 wire as follows:

Rear generator terminal to armature; side generator terminal to field; battery terminal of regulator to positive side of ammeter. (Ford products are wired with a positive ground.)

From the *negative* side of the ammeter couple a lead to the "hot" side of starter solenoid, which in turn is coupled to the *negative* of the battery.

A lead from the small terminal on the solenoid coil should be terminated in a V-8 starter switch of the push-button type located on the dash. These units require only a single wire and the switch will ground on the car body.

Ground the *positive* side of battery to body and frame.

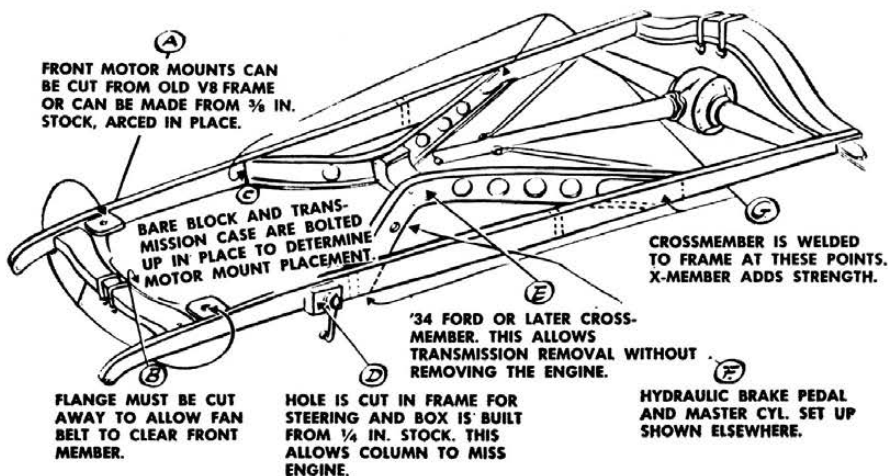
Recommended also are sealed beam headlights such as the popular "King Bee" replacement units.

HYDRAULIC BRAKES

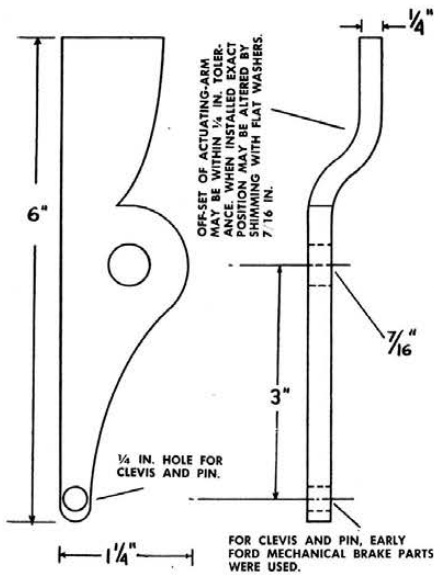
When a V-8 engine is mated to an A-bone, the added "go-power" must be matched by additional braking. Install a set of Ford hydraulic brakes, '39 or later. See drawing for details of installation. Only special work necessary is to cut a quarter-inch from the rear axle housing flange to allow for the backing plate to be placed closer toward the center of the car, thus eliminating the possibility of its rubbing against the brake drums.

Incidentally, make certain proper size brake drums are installed. Otherwise

Overall view of Model A chassis with essential modifications for installing V-8



there will be the danger of "cracking



Clutch actuating arm fits on left frame rail, insures efficient clutch operation

out" the wheels around the lug bolts.

At the front spindles, use spacer rings to properly position both the backing plate and inner wheel bearing. These are available at speed shops for \$3 per pair.

Holes in the front hydraulic backing plate must be slotted to properly align with the stock mounting holes. A special steering arm will be required for the left spindle after the hydraulic backing plate is installed if '37 or later front spindles are used (for dropped axles).

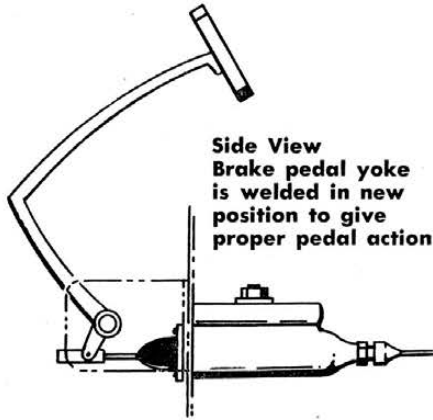
See accompanying diagram for details on positioning a hydraulic master cylinder

Installation of '39 Ford or later backing plates to "A" for hydraulic brakes

der as used with a '32 cross member and pedal assembly. If a complete '39 brake and clutch pedal assembly is installed, special fitting and cutting will be necessary, but the task won't be too difficult. In either case, an outboard clutch socket will have to be placed on the left frame rail to insure efficient clutch actuation.

A final tip: Hydraulic brakes will make it necessary to change over tail lights so they will operate from the master cylinder, instead of the mechanical system.

Does all the foregoing sound like a lot of labor? To tell the truth, it is. But



since you have decided to build an AV-8, why not build it the right way? The performance of the car and your personal safety are vitally involved in doing this job properly and when you follow the step-by-step instructions we have laid out in this article, the project becomes a group of logical tasks that suddenly integrate themselves into a complete unit. Remember that thousands of these conversions have been accomplished by beginners in the hop-up sport with relatively little difficulty.



We hope that this article answers fully the questions we have been receiving from readers across the country on this subject and we feel sure that aside from the valuable experience you will have gained, the finished product will be ample reward for the toil invested.

Detail drawing shows how to attach late model rear cross-member to frame rail

