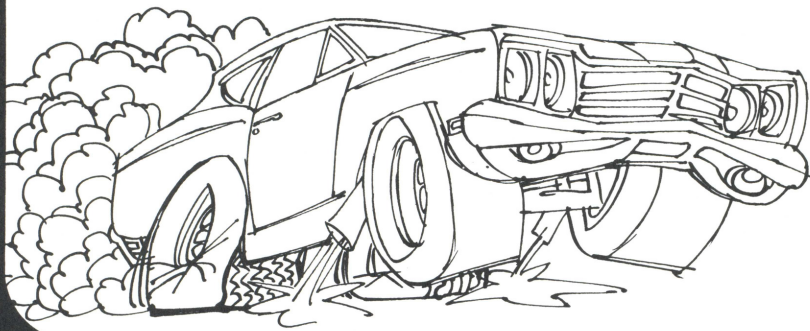


MASTER
TECHNICIANS
SERVICE
CONFERENCE
REFERENCE
BOOK

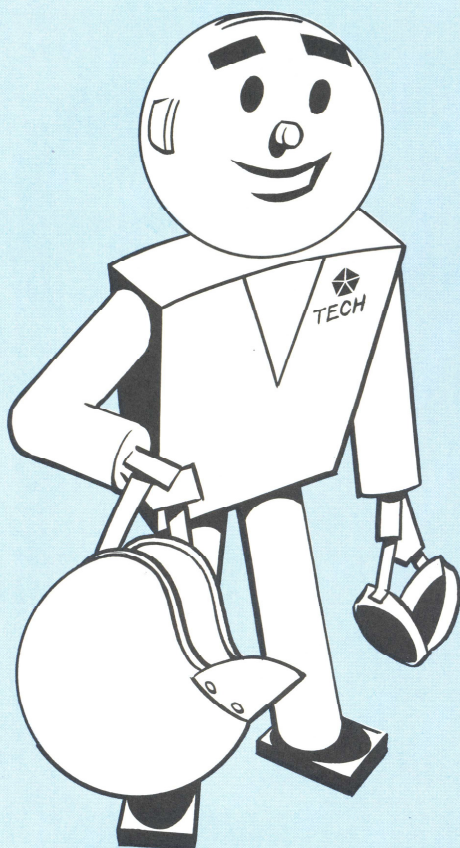
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**PERFORMANCE
IS THE
NAME OF THE GAME**



PLYMOUTH
DODGE
CHRYSLER
IMPERIAL
DODGE TRUCK





MOPAR TO YA' FROM TECH

And 'more power to ya' is the little ditty that Chrysler Corporation salesmen are singing to customers more and more every day. What I'm talking about is performance cars. As long as they're sold, you Master Technicians are going to have to service 'em.

Until just recently, servicing high-performance cars has been a broad, highly specialized and extremely technical subject. The reason was that very few factory-built performance cars were available; and most performance cars were modified and made into performance cars *after* they left the showroom. Naturally, these cars were serviced by the owners themselves or by the few mechanics around town who specialized in performance or 'hot-rod' type work. However, the performance car scene has changed quite a bit in the last couple of years. Chrysler Corporation has, for some time now, offered a wide variety of performance cars to the buying public. These buyers expect, demand, and should get the same service as other owners.

I hope this Reference Book will fill you Master Technicians in on what is happening to the performance market; why performance service is becoming big business; and most important, *how* to service performance-type cars. Some dealers appear to be reluctant, or not properly equipped to service and advise owners of performance-type cars. But at many dealerships the picture is changing. They are gearing themselves to the sale and service of performance cars as a routine matter. The performance push is on; and 1970 promises to be a bigger year than ever for performance sales.

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INTRODUCTION

Before we get into the meat of this Reference Book, I'm going to suggest that you might loan it to someone in the Sales or Parts Department when you're through with it. Sales of performance cars affect the entire dealership as much as the sale of any other car. It would be very helpful to them to know what is happening and to prepare themselves to discuss and understand performance lingo with prospective customers or owners.



Fig. 1—Performance affects both Sales and Service

SOME BASIC FACTS

Before discussing service procedures for performance cars, I think that a little orientation on the subject might be very helpful. There's a good reason behind the push for performance sales and it's a pretty good idea to acquaint yourselves with what are considered performance cars. Let's take a look at some basic facts.

THE YOUTH MARKET

The census bureau predicts that by 1970, half of the United States population will be under twenty-five years old. According to statistics, the new-car buyers under twenty-five now account for 12% of the new-car sales. If you are wondering why we're concerned with such a small percentage of the buying public, there's a good reason. The 1969 model year had the widest selection of youth appeal cars and the widest spread of performance cars yet. This



Fig. 2—Big year for youth appeal and performance cars

year's performance car sales are approaching 20% of *all* sales. Now that's a pretty healthy chunk of any market; and as we mentioned earlier, it promises to get bigger.

A QUICK MODEL RUNDOWN

The following is a quick model rundown of the performance cars that are easiest to spot. Generally, these models cannot be bought without a performance engine. In the Dodge line, the Charger R/T is probably the best known performance car. In the Coronet models, it's the R/T and the Super Bee. The little guys in the Dodge hive are the Dart GT Sport and the Dart Swinger 340. Plymouth offers the very popular Road Runner, the GTX, and the mighty mite, the Barracuda.

PERFORMANCE ENGINE LINEUP

The following is a lineup of what are considered performance engines.

- 340 4-bbl.
- 383 4-bbl.
- 426 Dual 4-bbl. HEMI
- 440 4-bbl. (High Performance)
- 440 6-bbl.

You'll find one of these engines in the performance cars listed in the previous paragraph. Of course, if you run across one with anything smaller than a 340 it's not considered a performance model. But be careful, these engines are sometimes offered as options on standard models. It would be a good idea to acquaint yourself with these engines so that you can spot them in the family grocery wagon. The 440's are standard equipment on some full-size mod-

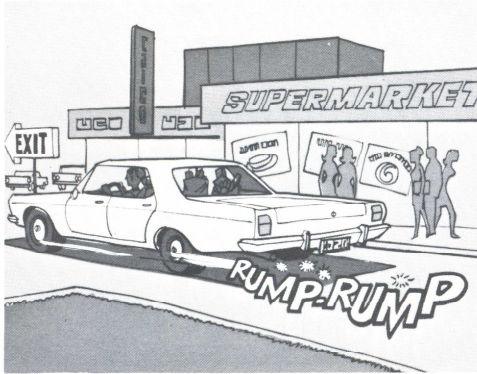


Fig. 3—Standard models may have performance engines

els to compensate for weight, power accessories, and air conditioning.

SERVING PERFORMANCE CUSTOMERS

Most sales forces have been well oriented in regards to performance models and optional performance engines. More and more performance cars are being sold every day; and these buyers are paying a premium price for their cars. They expect, and demand the same, if not more, service than other customers.



Fig. 4—Performance buyers are paying a premium

Usually, performance enthusiasts are more vocal and more influential than most other customers. Owners of performance models are also more exacting and discriminating in their demands than the average customer. It pays to satisfy their demands.

Some dealers have found that satisfied owners of performance cars *favorably influence* prospects for both performance and standard production models. Dissatisfied owners can cost sales of both types of cars.



Fig. 5—Satisfied owners favorably influence others

PRE-DELIVERY AND 'SUPER' TUNING

Every car owner wants good performance out of his car . . . that's only natural. However, the performance car owner usually wants that extra little something out of his machine. That little something is *maximum* performance. Every performance car sold should be carefully tuned before delivery. Don't get me wrong;

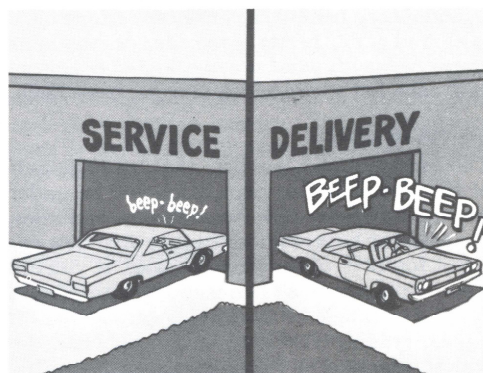


Fig. 6—Carefully tune cars before delivery

I'm not saying that the car as delivered from the factory will be running bad. It's just that assembly-line operations don't lend themselves to the critical tuning that every performance engine deserves.

STANDARD PROCEDURE (PRE-DELIVERY)

Nothing special is required to swing maximum performance out of any engine. It's simply a matter of making sure that all factory specs are *exactly* what they should be. If the following operations are checked and performed prior to delivery, the engine will deliver maximum performance for the factory specs.

CARBURETION

Starting with the carburetion, make sure that

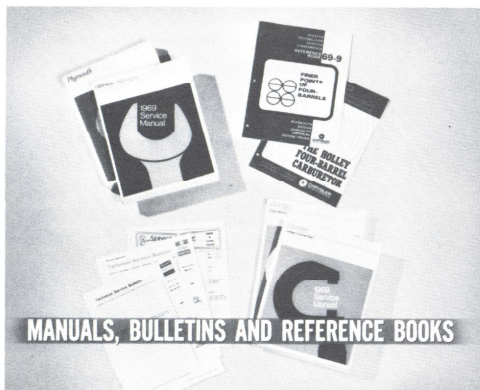


Fig. 7—Check Manuals, Bulletins and Reference Books

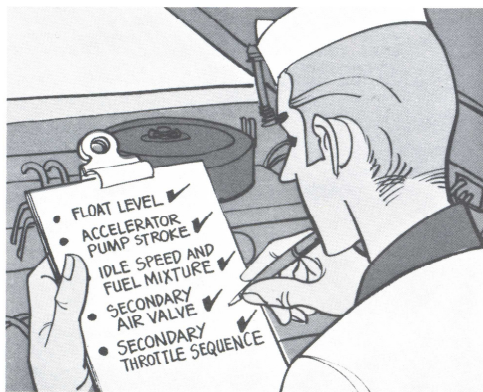


Fig. 8—Make these carburetor adjustments

all air/fuel adjustments are *precise*. Follow the manual for the specs and procedures. You might want to refer back to Master Tech Session No. 69-9. All the latest dope on four-barrel carbs is in that month's Reference Book.

Check the float level, accelerator pump stroke, idle speed, fuel mixture, and on the AVS, the secondary air valve operation and secondary throttle opening sequence. Of course there are other adjustments, but if you take care of these, the carburetor will be in pretty good shape.

IGNITION

When the fuel situation is right, make sure that there's spark there at the right time for proper combustion. Check the distributor dwell, and if necessary, set the contact gap. Check the ignition timing and make sure that the timing is dead right.

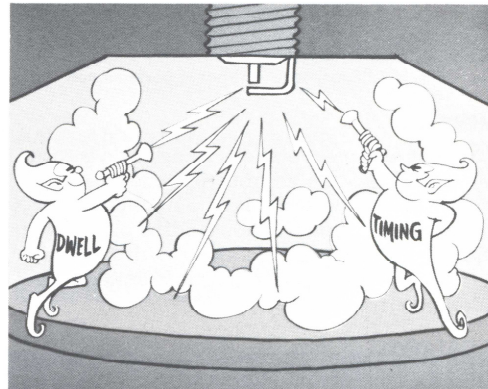


Fig. 9—Distributor dwell and timing are important

Just to be on the safe side, check the plugs to make sure they're the right type and heat range. The 383 and 440 take the same plug; but the 340 and 426 both require different plugs. Check the Service Manual for the proper plug.

When installing the plugs, make sure the gasket, if required, is properly seated and always torque the plugs to the correct specs. Use a torque wrench with a proper plug socket to eliminate the possibility of cracking the insulator. As a final precaution, check all ignition cables at both the plugs and distributor cap. Make sure the connectors are on properly and on tight when you connect them.

"SUPER TUNING"

There's always the owner who wants his car to run a little bit better than the rest and still be as streetable as Aunt Martha's station wagon. He can do this with a bare minimum of part changes and at very little cost. This operation is generally referred to as "Super Tuning".

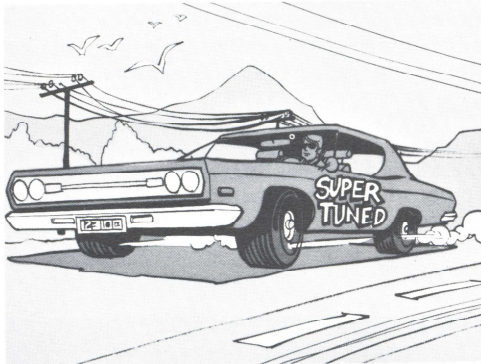


Fig. 10—"Super-tune" for better performance

MORE FUEL

The first and most obvious thing to do is to get more gas into the combustion chambers. Install primary and secondary main metering jets which are a couple of thousandths bigger than the original ones. To go along with the bigger jets, change the accelerator pump linkage to get a longer stroke.

FLOAT LEVEL

The bigger jets and long accelerator pump

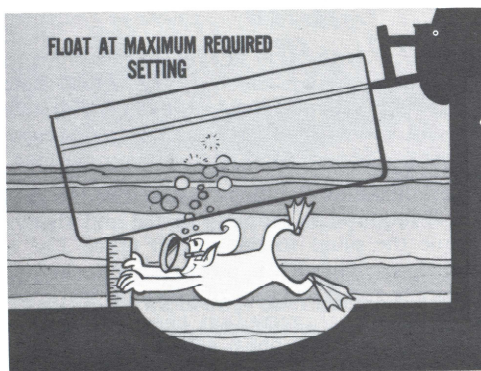


Fig. 11—Set float level at maximum setting

stroke are going to require more fuel. To allow storage of the extra fuel, adjust the float level to the maximum setting. Check the manual for the correct procedure for each carburetor. The Holleys can be set while on the car, but the Carter AVS and AFB have to be removed.

MORE SPARK

You'll need more spark advance with the richer mixture that will result from the bigger jets and long pump stroke. The reason is that a rich mixture burns slower and must be ignited sooner. In addition to the extra advance, low-speed torque and throttle response can be improved by 'reworking' or 'decreasing' the slope of the distributor advance curve.

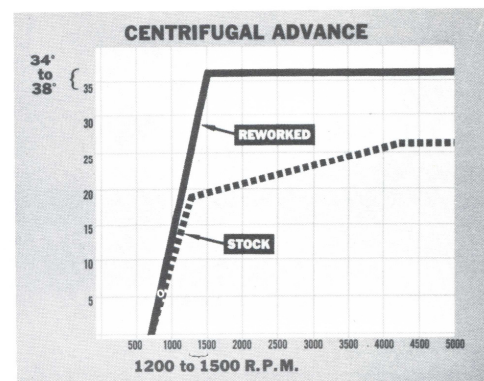


Fig. 12—Rework distributor advance curve

REWORK ADVANCE CURVE



Fig. 13—Remove heavy spring and stretch the other

To rework the advance curve, remove the heavier governor spring and stretch the other spring to give the desired advance curve. Be sure to leave enough spring tension to retard the advance while starting. In most cases, full advance should be completed by twelve- to fifteen-hundred r.p.m. crankshaft speed. Limit total advance to thirty-four to thirty-eight degrees.

DUAL-POINT DISTRIBUTOR

In the event a distributor tester is not available or if you're not exactly sure about how to change the curve, the easiest thing to do is replace the single-point distributor with a dual-point system.

POINTS 'N' PLUGS

Whether you change the advance curve or install a dual-point distributor, make sure you always use the best Chrysler points available. They'll throw a more consistent spark and last a lot longer when subjected to high-r.p.m. running. In the plug department, a slight change may be necessary. Normally, recommended heat ranges will be adequate; but if the owner plans on extensive high-r.p.m. operation, it is advisable to go one or two steps colder.

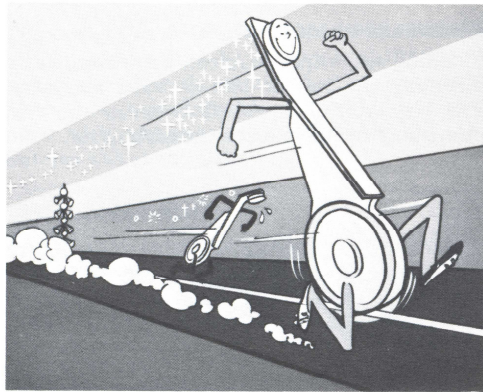


Fig. 14—Use the best Chrysler points available

SOLID-WIRE IGNITION CABLES

To make sure that the spark reaches the plug at full power, the best thing is to install solid-wire ignition cables from the distributor to the plugs. Stock cables are adequate for all uses providing they are kept away from sources of

high heat. But solid-wire ignition cables are more positive and more durable.

When installing solid-wire ignition cables, always install resistor plugs along with them. If you don't, your customer may be unhappy because of radio interference from the cables.

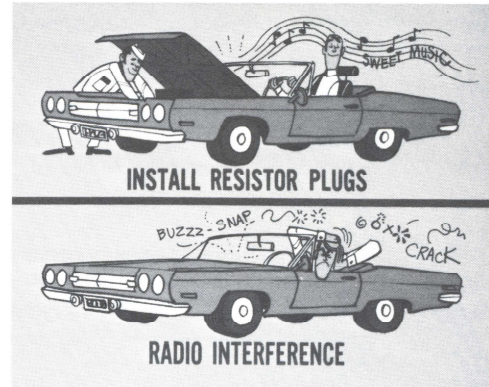


Fig. 15—Resistor plugs eliminate radio interference

MANIFOLD HEAT CONTROL VALVE

For the final touch, wire open or eliminate the manifold heat control valve. Again, ask the customer if this is acceptable to him. Remind him that the warmup performance will be a little rougher and complete warmup will take a little longer than usual.

DRAG STRIP OR MAXIMUM STREET PERFORMANCE

Because modification for drag strip or maximum street performance is such a large topic, we will limit ourselves to modifications that do not include cylinder head or internal block modifications. In the case of exhaust systems and drive-line components, the assortment of different components and combinations available are too numerous to cover.

WARRANTY RESTRICTIONS

Before we discuss modifications for drag strip any further, I'd like to clear up the subject of

warranty restrictions connected with racing or unauthorized modifications. These restrictions are something that every performance car owner should be informed of.

RACING

In regards to racing, you better tell your customers like it is. For all practical purposes, racing or participation in other competitive speed events voids the warranty.

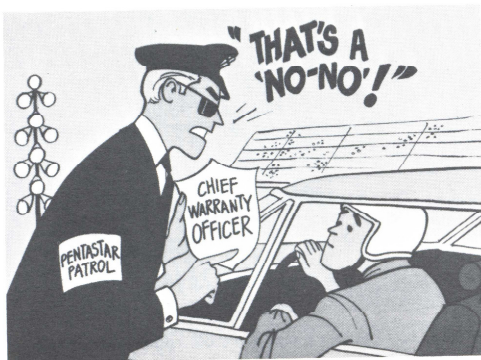


Fig. 16—Racing participation will void the warranty

UNAUTHORIZED MODIFICATIONS

Here's the story in regards to modifications. *Unauthorized* alterations or the use of parts or material *not approved* by Chrysler Corporation will also void the warranty. But that doesn't mean there aren't plenty of *authorized* adjustments and approved parts goodies available for the customer that wants some customized performance service.

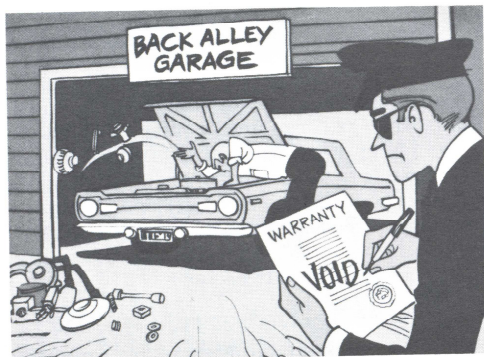


Fig. 17—Modification and parts must be approved

FUEL INDUCTION

First of all, if they haven't been done before, all of the procedures for 'super tuning' must be done along with the 'strip' modifications.

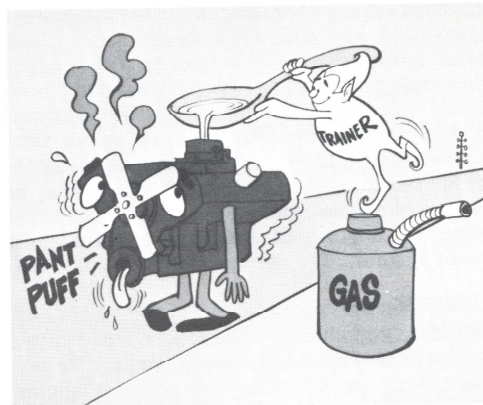


Fig. 18—Improve fuel induction for proper feeding

Just like any hard-playing athlete needs his Wheaties, a performance engine must be fed right if it's going to run hard. Let's take a look at what can be done to the fuel induction system to improve it.

PRESSURE REGULATOR AND FILTER

Flooding and vapor lock can be prevented by installing the *correct* fuel pressure regulator. The regulator is installed between the fuel pump and the fuel inlet on the carburetor.



Fig. 19—Install between fuel pump and carb inlet

FILL 'ER UP

Also important, but sometimes overlooked, is the necessity of maintaining adequate fuel pressure to the carburetor at all times. Over-size fuel lines, fittings and an electric fuel pump can be installed for this purpose.

A WORD ABOUT FUEL FILTERS

When you install the pressure regulator and electric pump, you may have to reposition the fuel filter. Here's a little reminder in regards to location and position of the filter. Make sure that the fuel filter is kept away from engine "hot-spots" and always position the filter tipped at a 45-degree angle or more. You may even go as far as to install it in an upright position. Just make sure that the inlet is at the lower end when you install the filter.

WHY THE ANGLE'S IMPORTANT

If it is extremely hot, *if* the engine has been driven hard so it is very hot, and *if* the engine is stopped, heat will cause fuel in the filter and lines to heat up abnormally and expand. If the filter is in a horizontal position, fuel expansion and vaporization in the filter and lines may push a solid stream of fuel past the float and into the carburetor and intake manifold.

The upright or 45-degree-angle position of the fuel filter provides a vapor spacer at the outlet side of the filter. Expanding fuel pushes vapor instead of solid fuel into the carburetor and most of it escapes without flooding the carburetor and manifold.

DON'T REMOVE FILTERS

The fuel filters are installed for very good reasons so *do not* remove them. The carburetors are quite sensitive to dirt. The filter size is more than adequate and will not cause a restriction in the fuel flow.

IMPROVED BREATHING

If the car doesn't already have one, installing an unsilenced air cleaner will improve the breathing. The other alternative is to install a smaller "hot-rod" or "bonnet" type air cleaner approved by Chrysler. The extra air coming in is going to affect the air/fuel mixture. Always reset the idle speed and fuel mixture after installing a different air cleaner.

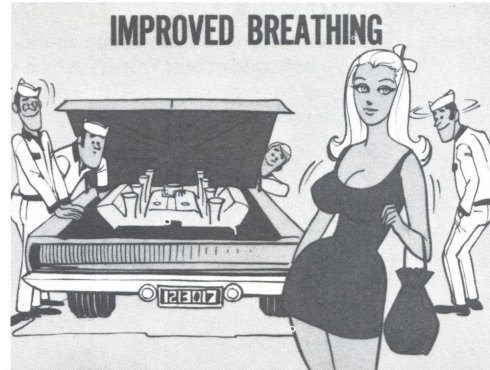


Fig. 20—Use unsilenced or smaller air cleaner

MANIFOLD AND CARBURETOR CHANGES

Several intake manifold and carburetor combinations are readily available that can substantially increase performance; depending on which system the particular engine is equipped with. For now we will restrict the conversation to those carburetor changes that do not require a camshaft or cylinder head modification.



Fig. 21—Several carburetion systems are available

HI-RISE MANIFOLD

The easiest and most noticeable improvement in fuel induction can be had by changing to a special-design, high-rise intake manifold. The extra height of these manifolds allows more gentle turns and smoother surfaces to make the mixture flow easier. For best results over the entire r.p.m. range, use the Edelbrock single-quad high-rise manifold.

USE THE RIGHT CARBURETOR

Although just changing to the high-rise manifold will improve breathing, best results are obtained by changing to a carburetor with a higher c.f.m., or cubic feet per minute, capacity.

A Holley 700 c.f.m. carburetor is the best for the "A" engines or engines up to 383 cubic inches. For "B" engines, or engines over 383 cubes use the Holley 780 c.f.m. carb. Bigger carburetors are available but are effective only when used with an appropriate high-lift, long-duration camshaft.

FOUR-FORTIES CAN BE IMPROVED, TOO

If a four-forty cubic incher is equipped with a Carter AVS, increased performance can be easily obtained. For engine speeds up to five thousand r.p.m., use the Carter AFB or Holley 850 c.f.m. job. For maximum performance above the four thousand r.p.m. range, use the factory dual-quad intake manifold mounting the Carter AFB carburetors.



Fig. 22—These carbs are good for the 440

BEAT THE HEAT

If the dual-quad carburetor system is used, Bakelite spacers should be used between the carburetors and the manifold to eliminate heat build-up in the float bowls. If the spacers are not available, use a commercial heat dissipator available at auto parts outlets or a stack of five or six carburetor mounting gaskets.

TRANSISTORIZED IGNITION

Once the fuel situation is taken care of, the next logical thing is to make sure you have the spark

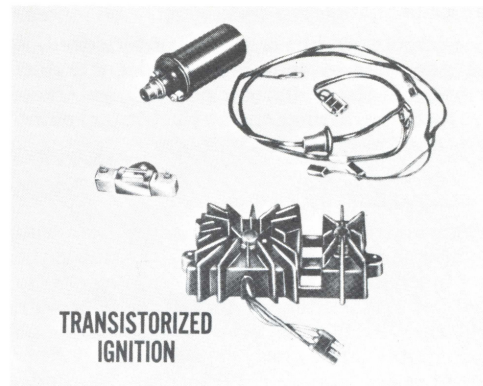


Fig. 23—Super stock transistorized ignition

to ignite the fuel charge. If the car is to be used primarily for drag racing, the super stock transistorized ignition should be used. Although any distributor can be converted to the transistorized type, best results are obtained when the dual-point distributor is used.

IT'S A KIT

You probably noticed that in the previous paragraph I said that any ignition system could be converted to the transistorized type. The transistorized ignition system is not a completely new unit. It is a modification kit which is easily installed. The transistorized ignition kit consists of a transistor amplifier and heat sink, special ignition coil, ballast resistor, and necessary wiring to complete the installation.

GET THE POINT?

If the transistorized ignition system is used, the Hemi super stock points should be installed also. These points are shorter, lighter, and will run at much higher speeds without encountering point bounce. But be careful, these points are designed for the transistorized ignition, so don't install them in a standard ignition system.

ONE STEP FURTHER

You all know by now that regardless what type distributor is used that the advance curve should be reworked. However, if the car is to be used primarily for racing, you should go one step further. It is best to disconnect the vacuum advance and run mechanical advance only. Then set the distributor up so it provides full

mechanical advance at 1000 to 1200 r.p.m. engine speed. Details on reworking the advance curve were covered under "Super Tuning".

STREET OR STRIP?

For street use with the transistorized ignition, the standard recommended plugs should be used. But if you plan on extensive high-r.p.m. operation or drag racing, you should use plugs that are one or two steps colder.

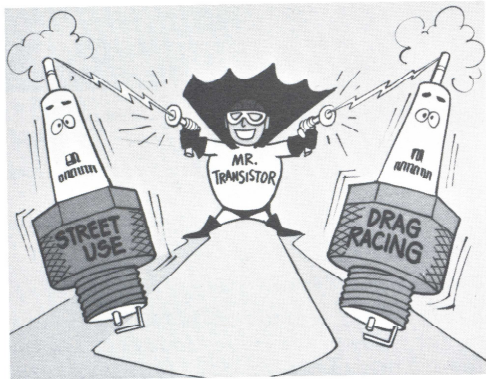


Fig. 24—Make sure you have the right heat range

COOLING SYSTEM

There are a few more minor changes that can be made under the hood to improve performance. The stock cooling system is adequate to keep operating temperatures to accepted levels. However, some components may be changed to reduce power losses in the system.

PART-TIME WORKER

The torque control drive fan can be installed in place of the stock fan. The silicone fluid drive unit allows the fan to be driven in a normal manner at low engine speeds while limiting the top speed of the fan at higher engine speeds. This means simply that the fan is not using horsepower that is normally required to turn it at high speeds.

The water pump impeller can also be changed to gain a few extra horses. Replace the stock water pump impeller or water pump assembly with the type used on air-conditioned cars. This water pump impeller has a smaller diameter which effectively reduces drag and offers less resistance.

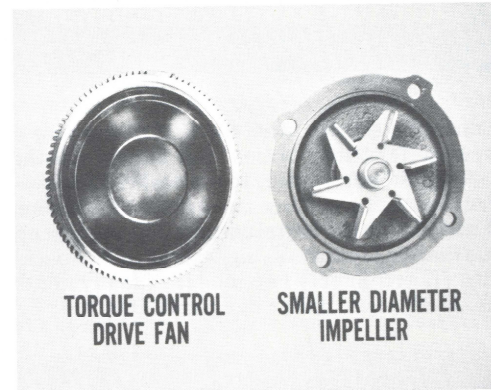


Fig. 25—These parts can increase horsepower

KEEP IT COOL!

To make sure the engine stays cool enough after extensive high-r.p.m. running, there are two items that can be installed. If the car is not so equipped, a maximum cooling, high-performance radiator and seven-blade torque-drive fan can be installed.

JUST A REMINDER

Whenever you are reassembling parts or installing new ones, make sure that the parts have been thoroughly cleaned and are kept as clean as possible while you're installing them. Another thing to always do is to observe *all* factory torque specs for all fasteners. Also follow the factory tightening sequence if one is given in the Service Manual.

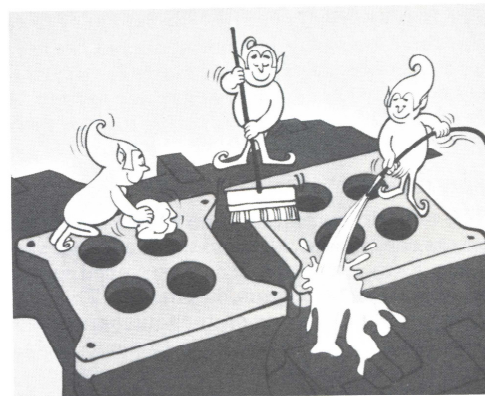


Fig. 26—Clean parts thoroughly before installing

THREE TWO-BARREL CARBURETION

Sometime shortly after the first of the year a new performance option was offered for the 440-cubic-inch engine. It is a carburetion system consisting of three two-barrel carburetors. The 440 with six-barrel carburetion, at present, is a limited production, high-performance package offered on only two models: the Plymouth Road Runner, and Dodge Super Bee.

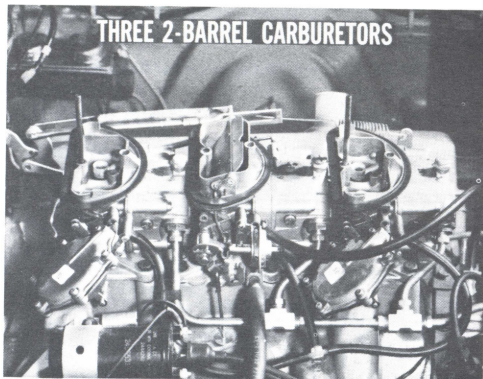


Fig. 27—Be on the lookout for this system

GET READY FOR 'EM

The six-barrel setup is one you should be on the lookout for. You may not have seen one yet, but they're selling like hot cakes and it may not be too long before you see one in for service. The Service Manuals were printed long before the three two-barrels were available, so they won't have any service procedures for the Holley two-barrels that are used in the system. A Service Bulletin has been issued for the three two-barrel setup, but let's review it.

HOW IT WORKS

The two end carburetors don't have the choke, power enrichment, idle, and spark advance systems. Each end carburetor is equipped with a throttle control vacuum diaphragm. This diaphragm is the same as on the four-barrels and does not require service. The two end carburetors are connected to the center carburetor's slotted throttle lever by two adjustable connector rods. The slotted throttle lever of the

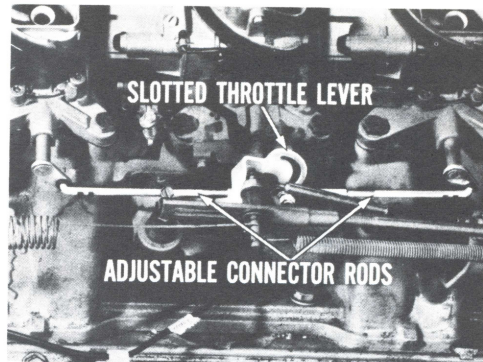


Fig. 28—Center carburetor controls end carburetors

center carb allows the throttle valves to open on the end carburetors as the vacuum requires, and close mechanically with the controlling center carburetor.

DON'T LET THEM THROW YOU

Basically, the center carb is the same as the primary side of the Holley four-barrel carburetor. The end carbs are the same as the secondary portion of the Holley four-barrel. So, don't let them throw you when you have to service them. The basic adjustments are the same as the four-barrel with the exception of the specifications. Check the Service Bulletin when making any adjustments.



IT MAY BE STRANGE TO YOU

End carburetor throttle rod adjustment to synchronize the end throttle valves with the center, or control carb is one adjustment that may be a little strange to you. If the adjustment is to be done on the vehicle, be sure the ignition switch is off. This de-energizes the fast-idle solenoid so that clearance is obtained between the plunger and fast-idle adjusting screw. Remove the air cleaner; then remove the end carburetor throttle connector rod clips and disengage the front and rear connector rods from the throttle levers.

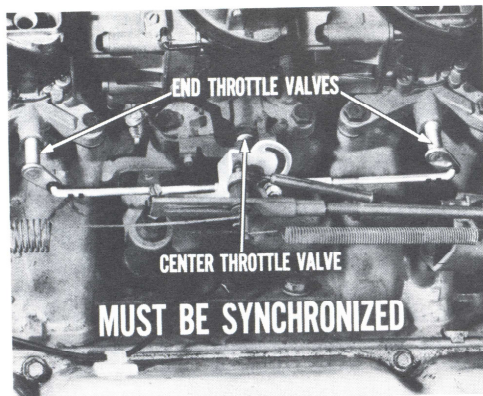


Fig. 29— This adjustment may be a little strange

NOW YOU'RE READY TO ADJUST

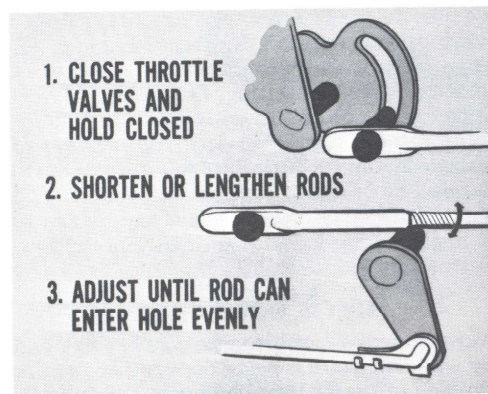


Fig. 30— Follow these three easy steps

Close the throttle valves on all three carbs and hold in the closed position. Shorten or lengthen the front and rear connector rods by turning in or out in the threaded sleeve. Adjust until the rod can enter the hole in the throttle lever evenly. Install the throttle connector rods in the end carburetor throttle levers and secure with spring clips.

SETTING FAST CURB IDLE SPEED

After adjusting the throttle rods, you'll have to readjust the fast curb idle speed. The fast curb idle speed adjusting screw is above the fast curb idle speed solenoid. For automatic transmissions, adjust to nine hundred r.p.m., and one thousand r.p.m. for manual transmissions.

WHAT THE SOLENOID DOES

The fast curb idle solenoid is something you may not be familiar with at this time. The solenoid plunger is extended when energized to contact the fast curb idle adjusting screw on the throttle lever. This prevents the throttle from closing completely. When the ignition is turned off and the solenoid is de-energized, the plunger retracts to allow the throttle valves to close all the way.

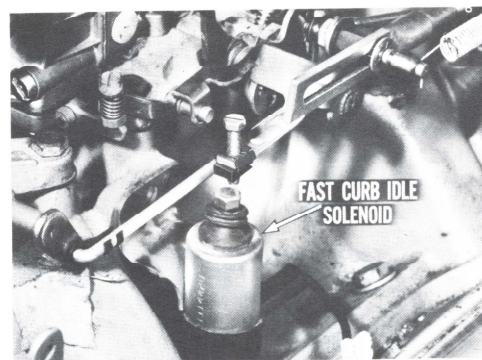


Fig. 31— It does two jobs

IT PREVENTS DIESELING

The relatively high r.p.m. of 900 or 1000 is required for the high-performance 440 with the three two-barrel setup. The extended solenoid plunger accomplishes this. However, when the engine is turned off it would after-run or "diesel" if the throttles could not close farther. The retracted plunger, when the solenoid is de-energized, allows this.

ONE MORE CURB IDLE ADJUSTMENT

After setting the fast curb idle speed, there is one more adjustment that must be made. Turn off the ignition to de-energize the solenoid and retract the plunger. Turn the curb idle screw alongside the slotted throttle lever until it just touches the throttle lever shaft. Then back the screw out one full turn. The purpose is to keep the throttle valves from slamming shut and possible nicking or misalignment.

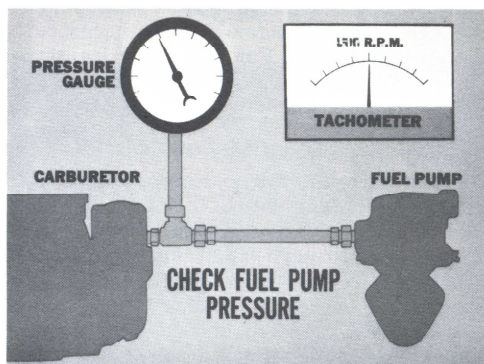


Fig. 32—Do this before checking fuel level

FUEL LEVEL CHECK

Checking the wet fuel level on the Holley two-barrel is also a little different than the four barrel. But before checking the wet fuel level, check the fuel pump pressure. A reading of five pounds pressure must be obtained and remain constant or return to zero very slowly when the engine is stopped.

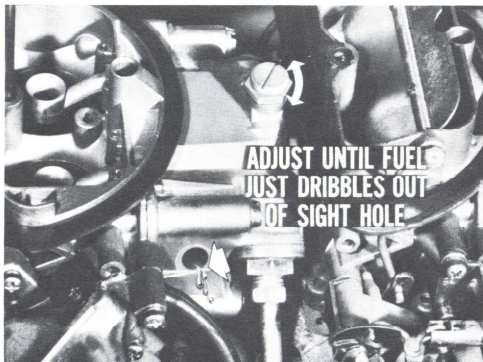


Fig. 33—You'll need a wrench and screwdriver

IT'S EASY AS 1-2-3

Once you've checked the fuel pump pressure, start the engine and remove the sight plug from each carburetor. Using a wrench and screwdriver, turn the adjusting nut either up or down until fuel just dribbles out of the sight hole. Reinstall the sight plugs and gaskets and tighten securely. It's a good idea to place a container under the bowl before removing the sight plug. This will catch any fuel that might run out due to a high or improper previous setting.

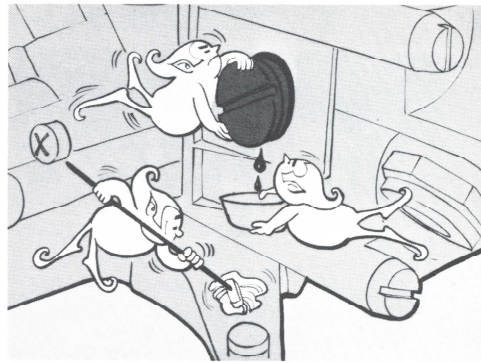


Fig. 34—Safety precautions are a good idea

THERE'S MORE TO IT THAN SERVICE

I'd like to make a few closing comments to wrap up this month's Reference Book. A lot of people just aren't aware of how big performance car sales are getting. Don't let performance cars be a hangup with you. All they require to be correctly serviced is a little bit of knowledge and a little bit more attention to detail. Sometimes it requires more than good service to satisfy a performance car owner, so it might be a good idea to brush up on your customer relations skill.

THEY'RE NOT LOUNGERS

Most owners of performance cars like to stand by while the work is being done rather than be shuffled off to the waiting lounge to drink coffee and read old magazines. They seem to have a little bit more interest in and concern for their

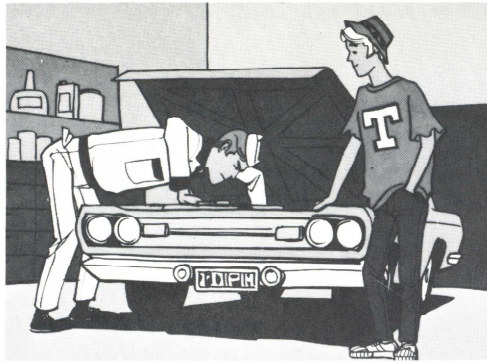


Fig. 35—Owners like to stand and watch

car than other owners. Just make sure that they do not endanger themselves by walking under the hoist or get close enough to be accidentally sprayed with oil or gas.

GRIN AND BEAR IT

Whether they are or not, most performance car owners like to think they are pretty knowledgeable when it comes to performance. At any rate, most of them talk a pretty good game. So, you may have to suffer through a little extra conversation and possibly some volunteered diagnosis. But grin and bear it; in turn you'll have a steady customer and maybe some referrals to other performance car owners.



Fig. 36—You may get some volunteered diagnosis

DON'T BE AFRAID TO ASK

As I mentioned earlier, performance is a broad subject. I know there's a lot more to it than



Fig. 37—He can be a big help

what we've covered; but don't let that stop you. Don't be afraid to ask your factory Service Rep any questions you may have regarding performance. The factory Service Rep is there to help you with your problems as well as the owner. They are well-informed and very cooperative; so if it's at all possible, he'll help answering your questions.

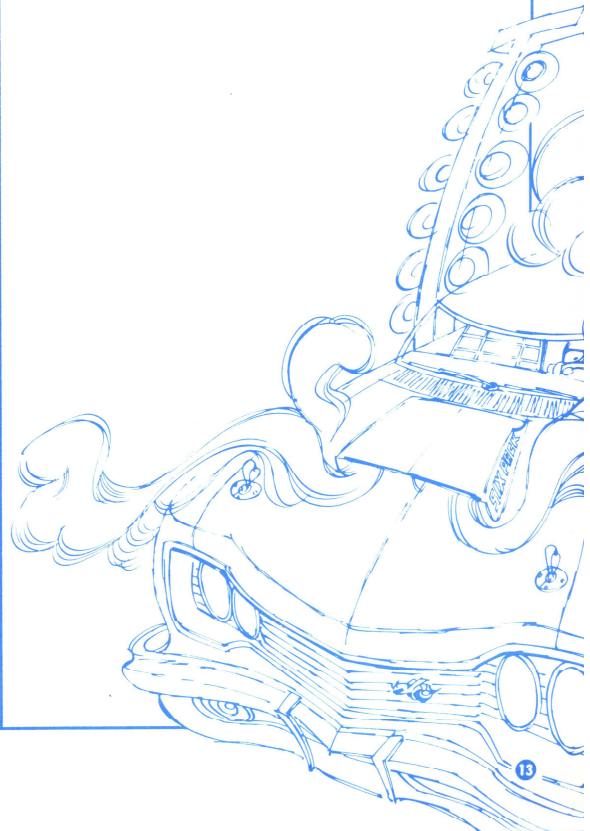


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