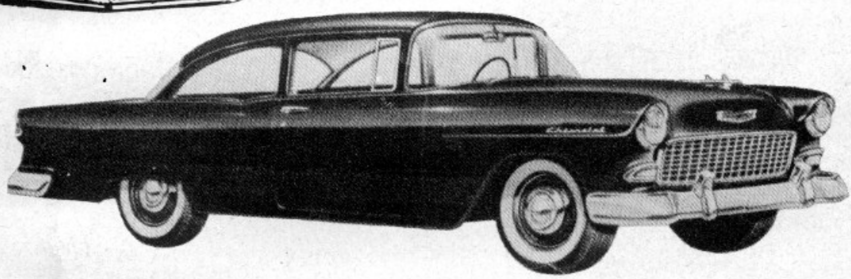
REWORKING THE LATE MODEL CHEVROLET AND CORVETTE ENGINES

6 CYLINDER



- POWER GLIDES, 1950-56
- STANDARD TRANSMISSION, 1953-56
- POPULAR '261' CONVERSIONS
- CORVETTE CONVERSIONS

By
FRANK McGURK

FOREWORD

In our manual on "Reworking the Chevrolet and GMC Engines" we discussed quite thoroughly a great deal of the theory and principles involved in engine modification work. Since these same principles apply also to the later models, with which we are now concerned, we will dispense with needless repetition. However, it is worth while to keep occasionally referring back to these sections in order to thoroughly understand the full impact of modifications recommended in these later models. When appropriate, we will expedite this by referring you to the actual pages.

A WORD ABOUT HORSEPOWER RATING

Before we discuss basic engine modifications that are directly responsible for raising H.P. rating it is appropriate to clarify some of the confusion that exists regarding 'Factory Advertised H.P. Rating' and actual 'Dynamometer-tested H.P. Rating.'

'Advertised' horsepower ratings, as released by the manufacturers, will actually fall short by about 20% from actual shop dynamometer tests. This is not a deliberate attempt by the manufacturer to misrepresent the potential performance of their engines, but attributed instead to the conditions under which the engines are tested. Factory tests are made under the most ideal, weather-controlled conditions in specially constructed rooms. In addition all engine accessories, such as generator, water pump, air filter, etc. are removed. And last, but not least, is the fact that the engine is built to exact factory specifications and is not subject to the allowable tolerances that production model engines are built to. These testing conditions apply to all cars of all makes and not merely to the Chevrolet engine.

As an example of the difference between 'advertised' and 'production model' horsepower ratings, the 1955 Power Glide is factory-rated at 136 H.P. but will only test out to 109 H.P. on our dynamometer. We mention this discrepancy, not to embarrass the manufacturer (who incidently publishes both types of HP ratings), but rather to point out that all results of modification work is based on computations taken from our dynamometer readings. All H.P. increases, therefore, must be computed from the stock shop rating and not from the factory advertised rating.

Modifying the 235 Chevrolet and Corvette Engine

All Chevrolet Power Glide engines 1950-56, Standard Transmissions 1953-56, and all Hi Torque truck engines 1950-52 use the same basic cylinder block which has a piston displacement of 235 cu. inches. Henceforth, when speaking of them as a group we will refer to them as the 235 engine.

Before analyzing the specific engine modifications that can be made on these engines it would be advisable to review some of the often ignored, but extremely important, theories behind successful modification work. Only then can you properly evaluate the significance of modifications made or recommended.

Very often modifications are made with no regard, whatsoever, to the relationship of the changes being made, to the existing equipment they must work in conjunction with. The result is either a very small gain . . . or no gain at all in engine performance. **We cannot stress too frequently the extreme necessity of making each equipment change work in close harmony with each other as well as with all existing stock equipment.** Always remember that the maximum performance that can be obtained from any engine is limited by the individual performance of its 'weakest' part.

Modifying an engine is similar to baking a good cake. In order to get a good finished product, it is not only necessary to use all of the proper ingredients, but also to use them in their correct proportions. With this in mind, therefore, we recommend the kit form of modification. A kit installation will not only assure the absolute tops in performance, but will also give the most value for your money spent.

Many of the modifications herein will be very similar in most respects. There are some exceptions, however, which will be pointed out. Also, the same performance level is not desired in all cases.

IGNITIONS and the VALVE ASSEMBLY

Since modification work in many cases is limited by a matter of economy we will review first those modifications which, in themselves, will not actually increase the H.P. rating but will materially aid in obtaining a smoother running, quieter and more efficient engine.

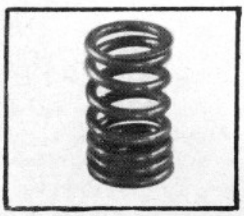
IGNITION:

While the stock Chevrolet ignition is satisfactory for the stock engine **it loses its efficiency and effectiveness** in a modified engine. For this reason we recommend the installation of either a Mallory or Bosch Coil and Condenser. This combination will assure your engine of positive performance at all times. (See pages 30 and 31 in our manual.)

VALVE ASSEMBLY PARTS:

A set of Tubular Push Rods for use in all stock or modified Chevrolets.

TUBULAR PUSH RODS: Highly recommended for **any stock or modified Chev. engine.** These rods have twice the strength of the stock rods but are only ⅔ the weight. They will not flex or bend and so eliminate the major cause of valve noise and help prevent valve floating.



A special 235, heavy tension, single outer spring. Recommended for use in all engines using ¾ camshafts.

HEAVY TENSION VALVE SPRINGS. Recommended for **all stock and modified ¾ Road Jobs.** These springs have 35 lbs. more tension than the heaviest PG stock spring and will insure better valve seating . . . which, in turn, means longer valve life and better heat dissipation. (See pages 24 and 25 in our manual.)

HEAVY DUTY VALVE RETAINER SET: A necessity in **all Chev. comp. engines** where anything more severe than a ¾ cam grind is used. (Pages 24 and 25 in our manual.)

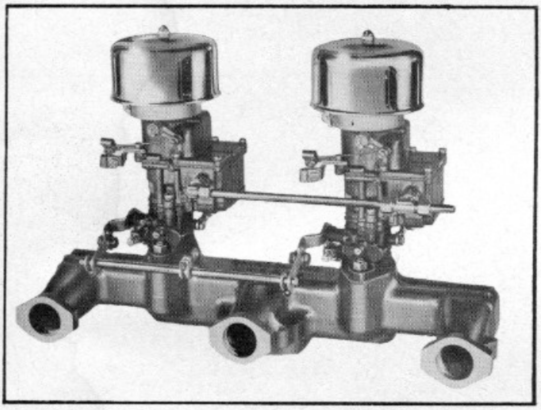
EXHAUST SYSTEM:

In any modified engine where carburetion has been substantially increased the resulting exhaust gases, if the exhaust system is left stock, will create a back pressure and hinder performance and efficiency. (See page 30 in the manual.) There are several ways of improving the exhaust system but we will discuss only the 3 most widely used methods.

1. **The simplest method is the installation of a single straight thru muffler to replace the stock tri-flow muffler.**
2. **Installation of a Corvette dual exhaust manifold which will operate very efficiently with the 235 or 261 series engines. This setup will also increase the power and torque available.**
3. **A conventional split manifold dual exhaust system such as featured by any of the muffler shops.**

CARBURETION

Since the stock Chev. engine is not only under carbureted but is inefficient in controlling fuel distribution to the cylinders, the greatest single improvement that can be made to increase engine performance and efficiency is to be had by improving the carburetion system. We have elaborated quite thoroughly on the importance of adequate carburetion on **Pages 12 and 13 in our manual,** so we will concern ourselves here only with the equipment developed and its role in providing greatly imoroved performance.



A McGurk Super Dual Manifold shown with two mounted Stromberg carburetors. Also shown is the exclusive McGurk unified linkage that assures uniform throttle opening resulting in equal fuel distribution.

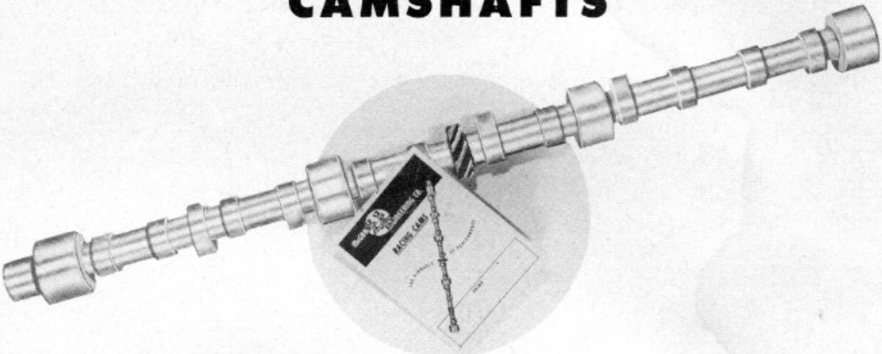
A Super Dual Intake Manifold and two *Stromberg #380269 Carburetors installed in a late model Chevrolet will not only substantially increase performance over the entire range of operating speeds, but will improve gasoline mileage as well. It is the one method of gaining a sizeable increase in H.P. without necessitating further equipment changes. At speeds of 40 mph in high gear the engine gains an additional 12 to 14% more in useable power. At higher speeds the gains are proportionate so that at 90 mph the power increases mount to about 20%. **The McGurk Super Dual Manifold is specifically designed to keep all fuel mixtures to each cylinder homogeneous in mixture and uniform in velocity over the complete range.** At low speeds this is accomplished by means of a very large area of exhaust heated surface below the carburetor to help vaporize the fuel and keep it in a gaseous state. At higher speeds the log type design provides sufficient turbulence to assure a homogenous fuel mixture and the velocity equalizing baffle plus the short length of travel assures equal volume of fuel to each cylinder.

Even in the coldest climate, you will very seldom find it necessary to use the choke. Normally, the manual choke on only one carburetor is used, being ample to provide quick starting.

TRIPLE CARBURETION: Triple carburetion will provide additional performance gains over that available with the dual carburetion only when used in conjunction with a Super ¾ or more radical grind camshaft. When a more conservative grind cam is installed the maximum volume of vaporized fuel available from dual carburetion is adequate.

***The standard 235 engine Rochester carburetor is unsuitable for efficient dual carburetion. This is due in main to the large throat and venturi size, which will not allow good fuel vaporization.**

CAMSHAFTS



The camshaft controls the 'breathing ability' of an engine and is the nerve center about which all internal combustion is concentrated, and so has been appropriately termed the 'heart of an engine.' All late model Chevrolet engines are equipped with a very mild and conservative cam. In contrast to this the majority of all other cars on the road today have substantially increased the severity of their stock cams and resulting valve action. Therefore, to get any degree of power increase it is necessary to use a camshaft with improved valve action.

All Power Glide camshafts are used in conjunction with hydraulic lifters. All other models, including the 235 passenger cars, 235 truck engine and the Corvette use conventional mechanical type lifters in conjunction with a cam that is an entirely different grind than used in the P.G. models. The Corvette employs the same grind as used in the 261 truck engine. This cam has proven to be unsatisfactory for modification work.

If the hydraulic lifters used with the P.G. cam are replaced with the conventional mechanical lifters, such as was used in the 1953 and earlier model engines, a cam can be ground that will give an amazing boost in over-all performance. The #45 ¾ cam, which we developed specifically for Power Glide model cars, provides a real healthy boost in power output where it is most needed with this type of transmission.

The DUAL-MASTER CAM: On Chev. engines, due to the valve arrangement and the type of combustion chamber used, we have proven after exhaustive tests, that an additional gain of 10% more low speed torque can be obtained by using an entirely difefrent lobe profile on the intake lobe than on the exhaust lobe. This grind gives the PG models the much needed extra power at lower engine speeds of up to 5000 rpm. The boost in power is almost 20% over the stock cam. We have other cam grinds that will produce a higher level of H.P. at one speed than the #45 grind but the latter has the most power available throughout the normal operating range. This grind is quiet in action and will only require the same periodic valve adjustments as any non-hydraulic lifter camshaft.

If the stock camshaft is to be retained in the 235 engine some measure of improved valve action and increased performance can be obtained by installing High Lift Rocker Arms on the intake valves. (See page 23 in the manual.)

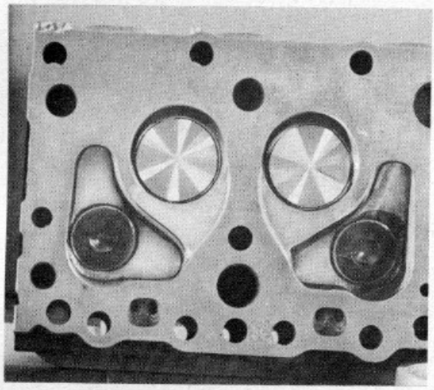
While on the subject of properly reground cams we wish to point out the common, but mistaken, practise of installing a 'hot' grind in conjunction with an otherwise mild engine modification using dual carburetion. The alleged purpose, of course, is to obtain greater engine power at higher speeds. However, instead of increased power this unbalanced modification will only result in rough performance at low speeds without any increased power at higher speeds.

In our manual we have stressed the extreme importance of the correlation of speed equipment. Installing radically modified equipment in conjunction with mildly modified or stock equipment will only result in obtaining all the undesirable effects of the former but with none of the intended improved performance. Thus, if your engine is equipped with only dual carburetion then don't install any cam more radical than a Super ¾. Any grind more severe than this will require triple carburetion.

CYLINDER HEAD MODIFICATION

Two basic improvements can be made on the cylinder head of the 1950-56 6-cylinder 235 engine that will contribute a great deal toward increasing the overall performance. First, by milling the cylinder head surface, the combustion chamber volume can be decreased . . . which in turn will increase the compression ratio. Secondly, by enlarging the intake side and valve ports and grinding the contours so as to reduce any resistance to the incoming flow, the breathing ability of the engine can be improved. The later models use a 1⅞" intake valve which is amply large enough for modification purposes. However, the intake side and valve ports must be enlarged to provide better breathing.

Shown at right is a 235 cylinder head that has been milled and ported and the intake valve seat recessed to provide necessary operating clearance.

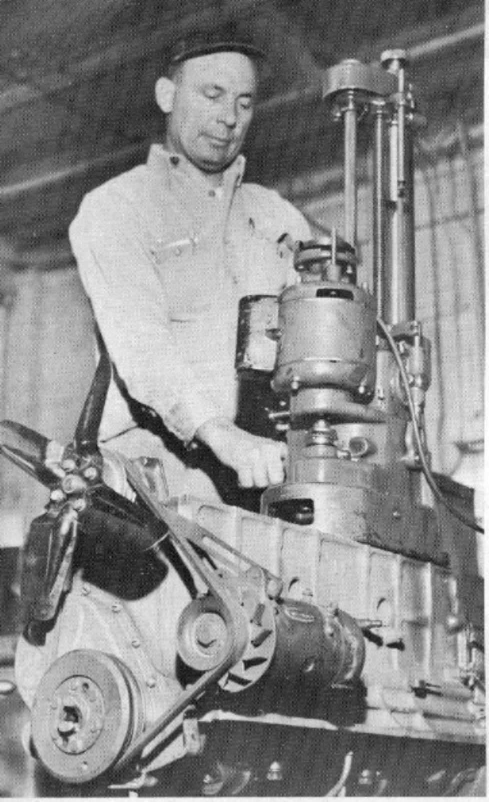


Increasing the compression ratio in an engine will add very close to 10 H.P. increase in engine performance for every full unit increase above the standard compression ratio. (For example, increasing comp. ratio from 7½ : 1 to 8½ : 1 will show a 10 H.P. increase.) We recommend a maximum compression ratio of 9 : 1 in any Road Job. Beyond this the ratio is too high to operate successfully on any premium grade pump gasoline. As a matter of fact compressions beyond this point will usually result in power loss rather than power gain.

A competition engine can, however, run extremely high compression to advantage, providing special high octane fuel, or alcohol fuel is used. A point to bear in mind when figuring final compression ratio is whether the engine bore is to be left stock or bored oversize. If the cylinders are bored to oversize this will also raise the compression ratio. In computing the amount of compression increase by bore alone add .2 for each 1/16" of oversize bore. This, added to compression ratio increase gained by milling cylinder head, will give you the overall increase in compression ratio.

On all of the Chevrolet cylinder heads, after the milling operation, it is necessary to use a formed cutter, and to recess the intake valve seats back into the cylinder head by the same amount that has been milled from the head surface. This allows for the necessary clearance between the intake valve and the piston head. When the above operation has been made it will similarly be necessary to shorten the intake valve stem the same amount or else the intake valve stem will protrude through the cylinder head too far. After shortening the intake valve the tip of the stem should be rehardened by heating with a torch and then quenched in oil. This will prevent the end of the valve stem from wearing and causing excessive valve noise.

When assembling the cylinder head, the valve spring length should be measured accurately on each valve. Special spacers should be used between the cylinder head and the bottom of the valve spring in order to space each valve spring to the proper length. **(For detailed installation instructions see Page 25 in the manual.)**



Above: Guy Allen shown in our machine shop applying a boring bar to the '261' engine.

CYLINDER BLOCK ASSEMBLY and PISTONS

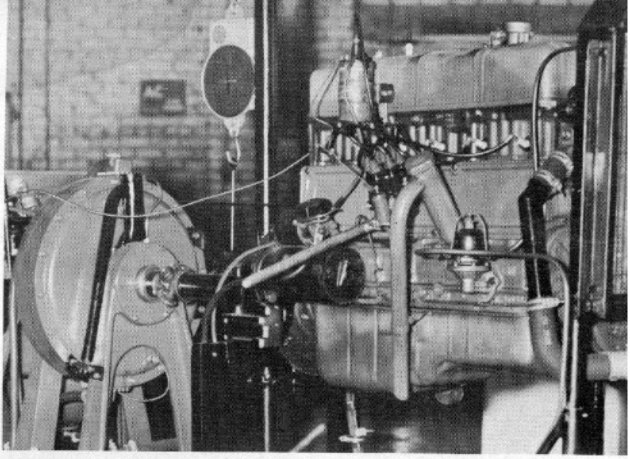
In order to modify a Chevrolet engine for greatly improved performance it is not necessary to make any changes in the cylinder block assembly. However, certain advantages can be gained in some models.

The Power Glide models 1950-52, Hi Torque engine 1950-53 and the 235 engine used in the 1953 standard transmission passenger car are all equipped with cast iron pistons as stock equipment. In making modifications for increased power it is not entirely necessary to replace these pistons to obtain a substantial increase in performance. However, by installing a set of lightweight aluminum alloy pistons the engine will be much more flexible in performance and have the added advantage of reducing loading on the connecting rod bearings by reducing the piston weight.

One major improvement that can be made in the cylinder block assembly is to enlarge the cylinder bore size which will increase the volume of piston displacment of the engine. An important point to remember is that the power output of an engine is directly proportional to the piston displacement or size of the engine. A mildly modified engine of the 235 series develops about .7 Horsepower for each cubic inch of piston displacement . . . or about 164½ Horsepower. This same engine bored from the stock 3 9/16" will increase the displacement to 252 cubic inches. Accordingly, based on this formula, the HP rating will be increased to 176½ horsepower without making a single other change in the engine. The torque or pulling power at low speeds will also be greatly improved. The 1950 and later 235 cylinder blocks can all be bored safely to 3 21/32" . . . at no risk at all, giving a total of 248 cubic inches of displacement. However, if the cylinder block casting is anywhere near uniform in thickness it can be bored to the full 3 11/16".

In any of the 1950 and later model 235 engines it is not necessary or advisable to make any change or alteration in the lubrication, bearings or cankshaft assembly. This applys to the 1950-52 models and the 1953 standard transmision models, which employ the spray type lubrication to the connecting rods, as well as the full pressure lubrication system employed in the 1953-56 models.

THE NEW '261' TRUCK ENGINE CONVERSIONS



A 261 conversion is shown in our shop being installed in a 1954 Corvette. This conversion will develop a healthy boost to 210 Horsepower.

In 1954 Chevrolet came out with the new '261' truck engine in the larger model trucks. The '261' refers to the number of cubic inches of piston displacement. **Since this represents an increase of 10% in piston displacement over the 235 engine series the possibilities of exploiting the larger engine has been used to the utmost by most of the fastest Chev. conversion jobs on the road today.**

An important feature of the 261 engine is its **interchangeability with all 6-cylinder engines from 1937-56, including the Corvette.** The 261 employs full pressure lubrication and flat head aluminum pistons. The 261 cylinder block is identical in all external measurements to all engines from 1937-56 inclusive, including Powerglide and Standard Transmission Engines and will readily fit all chassis in this group. This makes conversion installations relatively simple.

All 261 engines can be safely bored to 3⅞" which gives it a piston displacement of 278 cu. inches. Based on the previously discussed formula of .7 HP per cu. in. of displacement this gives the 278 cubic inch engine modification a whopping HP rating of 194 HP. No wonder the performance of these popular 261 conversion installations is so outstanding.

To supplement the 261 conversion kit we have designed the Power Master Aluminum Alloy Piston. This piston is extremely rugged and very carefully machined. It will perform equally as well in a slightly modified engine as in the fastest full competition conversion.

In conjunction with the installation of a '261' engine it will also be necessary to consider the basic modifications which follow.

IGNITION SYSTEM:

Install a higher voltage output coil and condenser. This will insure positive ignition at higher engine speeds as well as overcoming missing at high speeds due to insufficient spark to the plugs.

VALVE ASSEMBLY PARTS:

The standard Chev. push rods are not adequate for modified engines. The installation of the special McGurk Tubular Push Rods will eliminate the flexing and bending so characteristic of stock push rods. Tubular Push Rods have not only twice the structural strength of stock push rods, but are only ⅔ the weight of the stock push rods. Tubular Push Rods assure positive valve action, and cut down considerably on annoying valve noise.

With the ¾ Road Grind cam installation use the single heavy tension single valve springs.

With the #68 Super ¾ or full race grind cams use the standard 216 Chevrolet outer valve springs in conjunction with the special McGurk Inner Springs.

EXHAUST SYSTEM:

Re-work exhaust system to reduce exhaust back pressure. We recommend either a conventional split dual exhaust manifold (available from your local muffler shop) . . . or, even more preferable, a Corvette dual exhaust manifold in conjunction with a dual exhaust system and mufflers (the pipes will have to be built on the automobile as no kits are available for the Corvette exhaust manifold installations).

CARBURETION:

Installation is the same as recommended for the 235 series. (See Page 5.)

CAMSHAFTS

The #68 grind camshaft is recommended. This cam will perform very smoothly and efficiently in this engine with its extra large piston displacement. Highly recommended for all Road Jobs. For competitive events we recommend the more radical and hotter #82 grind. For straight competition the #56 cam is recommended.

CYLINDER HEAD REWORKING

Recommended procedure for various models is as follows:

Any 1953 or later 235 cylinder head can be used with this engine. By milling head .060" the compression ratio will be raised to 8½ : 1. If a standard 261 head is used it will be necessary to mill head .125" to obtain the 8½ : 1 ratio. (These ratios are based on the 261 engine bored to 3⅞".)

CYLINDER BLOCK ASSEMBLY

Installation of the '261' engine in a Chevrolet varies according to the specific model into which it is to be installed.

Recommended procedure for the various models is as follows:

On all these engines it is recommended that they be bored to 3⅞" and a set of McGurk Power Master pistons installed. The large 3⅞" bore, used in conjunction with stock clinder head will give a piston displacement volume of 278 cubic inches. This modified 261 engine will develop not only a great deal more horsepower in the high speed range but due to its greatly increased size will provide substantially more torque and pulling power in the lower speed ranges.

Standard Transmission Models 1937-52 and **Power Glide Models, 1950-52.** These models require so many parts replaced that the most economical conversion is to buy and install a complete new 261 engine.

Power Glide Models (1953 and later), Standard Transmission Model Automobiles and Trucks, 1954 and later), and **6 cylinder Corvettes.** With these models the majority of your stock engine parts can be used and installation of a 261 truck engine is rather easy. Since all the above model engines employ the full pressure lubrication system, have the same late model sylinder head as the 261 truck engine, and use the same crankshaft as the 261, the only parts necessary to replace for conversion to this extra large piston displacement engine will be the bare 261 cylinder block and a set of the 261 connecting rods. The balance of the existing stock equipment can be transferred over to the new assembly.

All the cylinder head parts and external accessories on these models can be transferred directly to the '261' conversion.

The 1953 Standard Transmission Passenger Car: These models are almost identical with the later model Power Glide engines with the exception that it has the spray type lubrication instead of the full pressure lubrication. With these models the most economical 261 conversion is to install the complete 261 block assembly.

SOUP THAT CHEV!

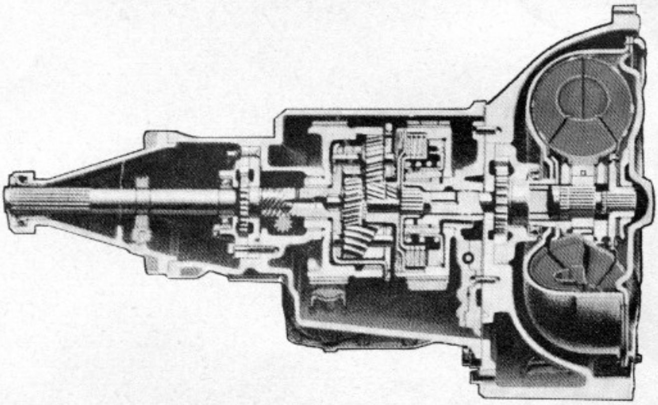
By Racer Brown

For months, loyal Chevrolet ... have laid siege to our editorial off... demanding information on their favorite cars and engines. While we realize that the Chevs are very popular (the most, in fact), the big news was the late V8 engines, with emphasis being placed on a rival Dearborn, Michigan, product whose name is unmentionable in the same paragraph. But the Chevrolet sixes have not been forsaken by any means.

Possibly the best thing that has happened in years for the Chev six-in-a-row boys was the introduction of the "Jobmaster 261" truck engine in 1954. This engine retains many of the attributes of ... illustrious predecessors, yet there are ...al features that ... stand out ... and shoulders— ...ck—above

Note: The terrific power boost and all-around performance of the McGurk 261 Conversion was featured in an article written by the technical staff of Hot Rod Magazine and published in the May, 1955, issue. If not available this back issue may be had by enclosing 25c and forwarding to Trend, Inc., 5959 Hollywood Blvd., Hollywood, Calif.

1950-55 POWERGLIDE MODELS



The late model Chevrolet automobiles, using the Powerglide transmission, have a definite advantage over the Standard transmission models, when it comes to leisure driving. They take a great deal of the effort out of driving by automatically taking care of most of the gear shifting and clutching operations required in the Standard Transmission models. There is however, a very definite sacrifice in performance that is inherent, to some extent, in most of the automatic transmission equipped automobiles.

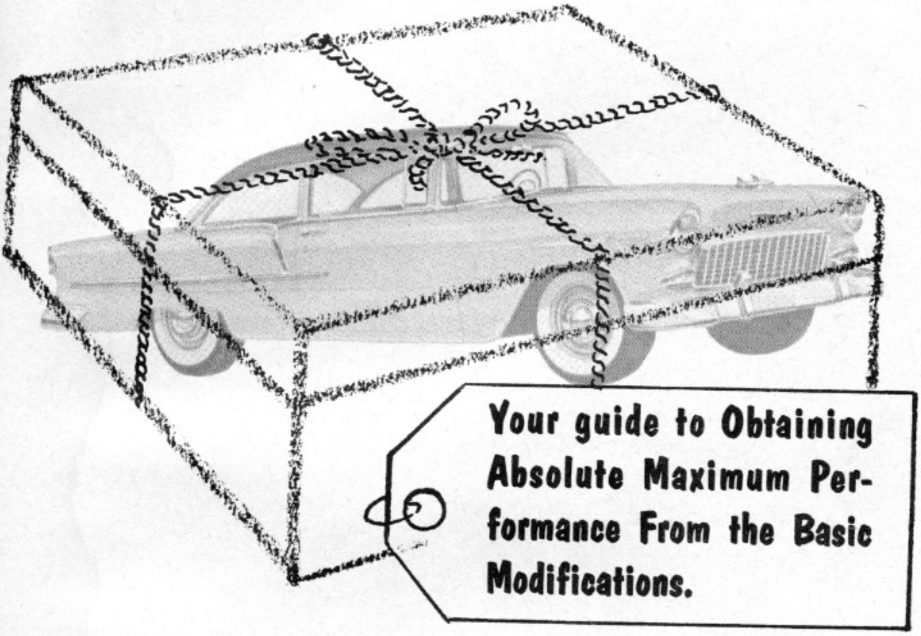
The Power Glide Model has several features which contribute to retarding performance. The first and most logical reason is insufficient power potential. Secondly, the Powerglide unit itself will absorb and lose a decided portion of generated engine power to operate the unit. The power lost through this unit is higher than the small amount lost in the conventional transmission. There is also the problem of gear ratios. The Powerglide unit uses only two forward speeds to cover the entire operating range of speeds, from a standing start to top sped. This definitely hampers the accelerating characteristics of the automobile.

The factory, realizing that these problems did exist, equipped the PG model with an engine of slightly higher HP. However, to obtain any great degree of performance, the engine power was not increased to a high enough level. In order to convert a PG model Chevrolet to a high performance automobile it is first necessary to encrease the engine power by at least 35 HP above its stock rating.

Since the Power Glide models were first introduced McGurk Engineering has done a great deal of research, designing, testing, and equipment modification on these engines for greatly improved performance. The results have been more than gratifying and we are indeed proud of the fact that these **McGurk equipped Power Glide Models are performing as well as, or better, than most of the newer highly publicized V8 automobiles of other makes. And what is more important is the fact that they lose none of their desirable low speed characteristics.** Idle is smooth and quiet, and gasoline mileage on open road driving is improved over stock, when driven under the same conditions. Performance, throughout the entire operating range is vastly improved. Another very important factor in Chev. PG modification work is the fact that even after the HP rating has been raised an additional 70 HP over stock the engine still retains ample safety margin due to its simple design and extreme ruggedness. And to further erase any doubts the PG unit has proven that it can safely handle all power increases of a Road Job Modification.

In keeping with our recommended policy of advocating an engineered kit for modification work on the specific engine you might have in mind we shall take the various groups separately and list the necessary equipment and modification work needed.

POWER PACKAGE KITS



Generally speaking, modification work is based on 3 major improvements, sometimes referred to as the 3 "C's" . . Carburetion, Camshaft, and Compression (Cylinder head and piston displacement). Each change must work harmoniously with each other or with existing stock equipment. For this reason we find it most helpful in making recommendations for engine modifications to suggest the kit that provides the maximum amount of performance increase for any one particular type of modification.

Recommendations in this section will not include those changes mentioned earlier on page 4 in regard to Ignitions, Valve Assembly Parts, Exhaust System and on Page 8 in regard to Cylinder Block Assembly and volume of piston displacement. When you have determined the kit necessary to modify your engine to the type you have in mind, refer back to these sections to re-orient yourself with these further recommended changes.

CARBURETION:

ALL MODELS.

For all conservative modifications where the automobile is intended for road use, where a maximum increase in performance is desired without sacrificing any of the desirable low speed characteristics, we recommend the McGurk Super Dual Manifold and Stromberg Carburetors. On any modification in conjunction with a cam more radical than the Super ¾, we recommend the Triple Carburetor Manifold and Stromberg Carburetors.

POWER PACKAGE KITS (continued)

CAMSHAFTS:

Power Glide Models, 1950-56. We recommend the #45 cam for use with dual carburetion.

Standard Transmission, Passenger Cars and **Hi Torque Truck Engines.** (1953 and later)

#45 Cam grind for road use where good low speed characteristics are retained. This is a power grind for those not interested in extreme top speed performance.

#15 Cam grind is for those interested in extreme top speed performance but with a slight sacrifice in low speed performance.

#68 Cam grind for competitive use as well as road use. This grind is recommended for use with triple carburetion and in large piston displacement engines such as the 261 engine, Corvette, or the 235 engine bored out to 3 11/16".

#82 Cam grind for all out competition engines, all models. Must be used in conjunction with triple carburetion, heavy duty valve spring combination and only in engines with an increased piston displacement volume.

CYLINDER HEADS AND PISTONS

1950-52 POWER GLIDES. (Two choices)

1. Install a set of Power Dome Pistons. This will increase compression ratio to 8¼ : 1, as well as providing all the advantages of a light weight piston. When the pistons are installed no head milling will be necessary.
2. If standard flat top pistons are used (either cast iron or aluminum) the cylinder head should be milled .125" and ported to obtain increased compression ratio and to improve the breathing ability of the engine.

1953-56, POWER GLIDES and STANDARD TRANSMISSION MODELS

Cylinder head should be milled .090" and valve ports enlarged and cleaned to provide necessary increased compression ratio and breathing ability.

CORVETTE

The cylinder head when used in conjunction with the standard bore should be milled to .060". The intake valve ports and the side ports should also be enlarged and grooved. If the bore size is increased milling of cylinder head normally will not be required. However, porting will definitely be advantageous. It should always be remembered that in all modification work the final result of power increase will be in direct proportion to the size of the engine (the volume of piston displacement.)

THE CORVETTE ENGINE

No other Chevrolet engine in recent times has raised so much controversy and yet is so little understood as the Corvette engine. **For all its vaunted power the Corvette must still undergo modification work to give it the performance expected from it.** The Corvette employs an engine of 235 cu. in. displacement, which is similar in size to all the late model Power Glide and Standard Transmission automobiles. Also like the late model Power Glide engines it has full pressure lubrication. The Corvette camshaft is the same grind as used in the 261 Truck engine and can be greatly improved upon by regrinding.

By using the 261 cylinder block in the Corvette engine and boring it to 3⅞" full advantage can be taken of the extra piston displacement volume to bring the engine up to full 194 Horsepower. Installation of a set of Power Master Pistons will give top performance throughout the entire operating range and under all driving conditions. When used in conjunction with a #68 cam grind your Corvette will really jump to life.

If it is desired to retain the stock cylinder block a substantial increase in over-all performance can be obtained by boring out the block to 3 11/16", which will give a piston displacement of 252 Cu. Inches. In conjunction with this the hot #68 cam grind should be used and the cylinder head ported to increase the breathing ability of the engine. Also standard Corvette outer valve springs should be replaced with the standard Chev. 216 valve springs. The inner springs should also be replaced with the McGurk special inner springs.

On the Corvette engines it is necessary to retain the stock carburetion system due to the fact that the low hood line prohibits any use of further modification improvements.

We wish to point out at this time that, although the modifications outlined in conjunction with the stock cylinder block will give a very substantial improvement in performance, **the most popular hot Corvette conversions employ the 261 cylinder block with its extra large piston displacement volume of 278 cu. inches.** The 261 conversion installed in a Corvette will provide power increases of better than 70 H.P. over the stock engine. With this power plant under your Corvette hood it is capable of competing with any of the production Sports Cars running on the road today.

HELPFUL HINTS

As a final aid in obtaining minimum success with your modification work there are several points of interest we felt worth mentioning where efficiency may be retarded if not properly checked.

1. **Spark Plugs:**

   When any kind of modification work is done on an engine the type of spark plug used is generally dependent on the type of driving the automobile will be subjected to. Ordinarily the spark plug should be one range colder than the factory recommendation. However, due to the many variables involved, the first set of spark plugs installed in a modified engine will tend to serve as a guide to the proper heat range to be used in subsequent spark plug changes.

2. **Carburetion Mixture.**

   When installing multiple carburetion the main two items that will influence carburetion mixture to the cylinders is (1) the back pressure in the exhaust system and (2) the longer duration of valve timing. They will both tend to lean out the mixture. A good general rule to follow, if dual exhaust system is used in conjunction with a reground cam, is to enlarge main jet size by .001" for each change . . . or a total of .002" for both.

3. **Ignition**

   On any engine running compression ratios from 8 : 1 up to 9 : 1, the use of the 1954 and later Power Glide or Corvette ignition distributor is recommended. This is due to the shorter ignition advance range in these distributors. Stock ignition timing will usually give the best results.

4. **Head Gaskets:**

   In a modified engine the stock type of head gasket will not cause any trouble if the cylinder head is properly installed. Use standard Chev. head gasket or any first line head gasket. Clean both cylinder head and cylinder block thoroughly and wipe with lacquer thinner to remove all oil. Paint both contact surfaces of cylinder head and cylinder block with a light coating of high temperature aluminum stove paint. Allow paint to dry at least 15 minutes. Install cylinder head and tighten all bolts to 90 foot/pounds torque.

5. **Shim or High Compression Type Gasket.**

   Due to the wide head bolt spacing we have found it impossible to use this type of gasket with any success whatsoever. There is invariably some leakage of both compression and water.