

© 1957—Divisional Motor Division,  
General Motors Corporation

# CHEVROLET - CENTRAL OFFICE

DIVISION OF GENERAL MOTORS CORPORATION



GENERAL MOTORS BUILDING  
DETROIT 2, MICHIGAN

April 19, 1957

To All Chevrolet Dealers:

Many Chevrolet dealers are actively engaged in the sport of stock car racing. Many others are aware of the tremendous interest in this challenging sport, which annually draws millions of spectators to observe automobile performance. To acquaint all dealers more fully with this sport, we have prepared the enclosed 1957 Chevrolet Stock Car Competition Guide.

The Stock Car Guide is the first publication of its type in the industry, and contains information that can be used to assist individuals who plan to participate in stock car racing. This valuable brochure is provided to acquaint dealers, as well as performance-minded individuals, with the techniques that permit greater safety and entertainment value for all who enjoy stock car competition in the highest traditions of the sport.

As you know, there are various racing associations that conduct stock car races. We are enclosing a map showing the geographical areas of activities of the five major associations. (Please note that SCCA sponsors sports car events only.) There are other racing associations well known in localized areas.

We hope the Competition Guide and the map will help you get a clear picture of stock car racing. We feel that the Competition Guide in particular, is a powerful aid in helping your dealership better service those individuals in your area, participating in stock car racing.

Very truly yours,  
*Robert D. Lund*  
Robert D. Lund  
National Sales Promotion Manager

RDL:hb  
Enc.

PLANTS IN ATLANTA, GEORGIA \* BALTIMORE, MARYLAND \* BAY CITY, MICHIGAN \* BLOOMFIELD, NEW JERSEY \* BUFFALO, NEW YORK \* CLEVELAND, OHIO \* DETROIT, MICHIGAN \* FLINT, MICHIGAN \* INDIANAPOLIS, INDIANA \* JANEVILLE, WISCONSIN \* KANSAS CITY, MISSOURI \* LIVONIA, MICHIGAN \* LOS ANGELES, CALIFORNIA \* MUNCIE, INDIANA \* NORWOOD, OHIO \* OAKLAND, CALIFORNIA \* SAGINAW, MICHIGAN \* ST. LOUIS, MISSOURI \* TARRYTOWN, NEW YORK \* TOLEDO, OHIO \* TONAWANDA, NEW YORK, \* WAUKEGAN, ILLINOIS \* YPSILANTI, MICHIGAN

SUPPLEMENTAL INFORMATION

As indicated on page 5 of the 1957 Chevrolet Stock Car Competition Guide, some sanctioned stock car races are restricted to cars equipped with conventional carburetion. Chevrolet stock cars with Ramjet Fuel Injection are not eligible to compete in these events. Always check the rules of the association in which competition is planned to be sure Ramjet Fuel Injection is permissible before ordering a car with this equipment.

As a specific example, NASCAR (National Stock Car Racing Association) has ruled, effective February 20, 1957, as follows:

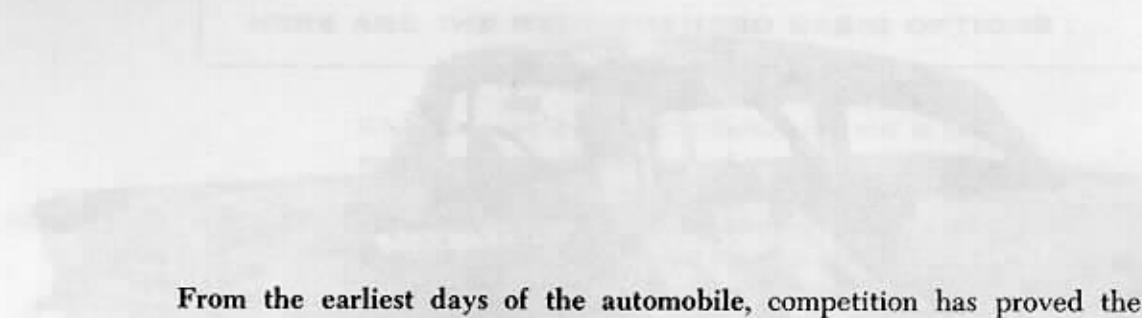
1. Late Model Convertible and Short Track races are limited to engines with one four-barrel carburetor.
2. Grand National Division races in the Pacific Coast Division are limited to engines with one four-barrel carburetor.

NASCAR will permit the following special performance parts in the Chevrolet V-8 engine with single four-barrel carburetion, and these parts are recommended for competition.

| <u>Part No.</u> | <u>Description</u>               | <u>Qty.</u> |
|-----------------|----------------------------------|-------------|
| 3736097         | Special Performance Camshaft     | 1           |
| 3749664         | Gear - Sprocket, Camshaft Timing | 1           |
| 3746289         | Notched Piston, with pin, L.H.   | 4           |
| 3746290         | Notched Piston, with pin, R.H.   | 4           |
| 3837002         | Valve Spring and Damper          | 16          |
| 5231585         | Valve Tappet (Mechanical type)   | 16          |
| *3749666        | Carburetor Assembly              | 1           |

\*Specially calibrated four-barrel carburetor required with the special performance camshaft.

For reference information, combustion chamber minimum volume is 59.1 cubic centimeters for cylinder head with single four-barrel carburetor.



**From the earliest days of the automobile, competition has proved the performance of both car and driver. Some of the first stock cars were prototype horseless carriages. By the turn of the century, automobile races were attracting large crowds of enthusiastic spectators.**

**There is no doubt that racing has contributed significantly to the growth and development of the automobile industry. Chevrolet's racing heritage began with the name itself — honoring a famous race driver of the era. Through the years, actual competition has helped develop the performance, durability and economy of the modern American automobile.**

**Recently revived from a long period of comparative dormancy, organized stock car competition has grown rapidly into one of the nation's leading spectator sports. Total attendance numbered several million in 1956, and 1957 offers even greater promise. More cars, more events and more spectators may result in the biggest year in competition history.**

**This Guide has been prepared for Chevrolet dealers, to assist individuals who plan to participate in this challenging American sport. It is advisory only, with material obtained from some of the top professional racing experts, performance engineers, and independent mechanics whose skill and dedicated effort have made Chevrolet a leader in open competition. The Competition Guide is not intended to encourage, but rather to inform the newcomer of techniques that promote greater safety and higher entertainment value for all who enjoy stock car competition in the highest traditions of the sport.**



### WHAT IS A STOCK CAR?

Simple as it seems, the term stock car is not always easy to define. In general, a stock car is a standard model of a type regularly produced for sale to the public. Special competition equipment is not permitted, except as authorized by the individual race sanctioning organizations. In most cases, these groups allow only modifications which promote greater safety and durability under the extreme stresses of competition.

A typical competition stock car is the 1957 Chevrolet "One-Fifty" Utility Sedan. It is rugged and dependable, low in cost, with no unnecessary weight to hamper performance; and conforms with all sanction requirements. Properly equipped with regular high-performance options and authorized modifications, this challenging Chevrolet is recognized from coast to coast as a performer of championship caliber.

### WHICH MODEL IS BEST FOR COMPETITION?

No Chevrolet model is designed specifically as a competition car. The versatile "One-Fifty" Utility Sedan Model 1512 is a popular choice, and is essentially a two-door sedan without rear seat. An alternate is the regular "One-Fifty" 2-door Sedan Model 1502. Either model is adaptable to regular stock car competition. In certain events where very long straightaways permit unusually high top speeds, the "Two-Ten" Sport Coupe Model 2154 may be preferred. Under these conditions, the superior Sport Coupe stream-

lining may more than compensate for the extra weight that could penalize this model on shorter tracks. Competition in the specialized convertible class requires the Bel Air Convertible Model 2434.

Regardless of model, a car intended for competition must be ordered in the same manner as a regular Chevrolet passenger car, with carefully specified optional equipment.

### CHOOSE THE RIGHT BASIC EQUIPMENT

If you decide to participate in the sport of stock car competition, you will naturally expect your share of success. Every competitor does. Obviously, you must have the proper basic equipment before you can reasonably expect to produce a car of championship stature.

Certain mechanical components, available as factory-installed regular production options (R.P.O.), are considered necessary for highly competitive stock car events. Winning performance is the sum of many skills — get off to a flying start with the proper basic equipment.

## HERE ARE THE RECOMMENDED BASIC OPTIONS . . .

While Chevrolet does not manufacture race cars as such, experience proves that a standard passenger car with the right options can be developed into a championship stock car. These options are recommended for 1957 Chevrolet passenger cars. With the choice of model and transmission, all of these regular production options should be specified when the new Chevrolet is ordered.

## BODY MODEL

Depending on the type of events you plan to enter, choose either the "One-Fifty" Utility Sedan Model 1512 (or "One-Fifty" 2-door Model 1502), Bel Air Convertible Model 2434, or "Two-Ten" Sport Coupe Model 2154. For general track competition, Model 1512 is a favorite. Almost any body color is satisfactory, but green is considered taboo in most American racing circles. Lighter tones tend to reduce interior temperatures on hot, sunny days.

## ENGINE



**"Corvette V8" with Ramjet Fuel Injection R.P.O. 578** — Here is one of the very finest high-performance engines ever offered on any production automobile. Produces 283 rated gross horsepower at 6200 r.p.m., with peak torque at high engine speeds. Ramjet Fuel Injection system produces instantaneous response unmatched by conventional carburetion. Compression ratio rated 10.5:1. Features competition-type camshaft, high-speed valve system with light alloy valves, high-tension valve springs, and mechanical valve lifters. Distributor has full centrifugal spark advance and dual breaker points. Special-alloy bearings, large oil sump, and full-flow oil filter contribute to the exceptional durability of this short-stroke, top-efficiency V8.

**Other V8 Engines** — Some sanctioning associations restrict certain events to stock cars equipped with either single or dual four-barrel carburetors. Be sure to check the regulations of the organization in which you intend to participate. For single 4-barrel carburetion, choose R.P.O.

410; specify R.P.O. 411 for dual 4-barrel carburetion. Since tuneup and adjustment of these engines is covered in the Chevrolet Shop Manual, all other references in this Guide concern the R.P.O. 578 engine.



## TRANSMISSION

Either of these transmissions will be satisfactory for stock car competition. Your choice must be determined by the gear ratios required for a specific course. Many experts favor the standard 3-speed; others prefer the more recently announced R.P.O. 303 with close-ratio gears. Axle ratio of the delivered car will be 3.55:1 with either transmission.

**Standard 3-Speed Synchro-Mesh** — Regular production Synchro-Mesh transmission is suitable for most stock car competition. Gear ratios: Low 2.94:1; Second 1.68:1; Third 1:1; Reverse 2.94:1.

**Close-Ratio 3-Speed Synchro-Mesh R.P.O. 303** — A heavy-duty competition type transmission with very close gear ratios: Low 2.2:1; Second 1.31:1; Third 1:1; Reverse 2.2:1.

## ELECTRIC WINDSHIELD WIPER R.P.O. 320

At the unusually high engine speeds sustained in competition, very little vacuum is available or desirable. Electric windshield wipers are a necessity. For the same reason, a foot-operated windshield washer (not an R.P.O.) should be ordered as a Chevrolet dealer-installed accessory.

\* \* \*

As delivered to the dealer, these options represent the proper basic equipment for a 1957 Chevrolet stock car. No other regular production options are required or recommended. Other necessary equipment and modifications for actual competition are described in the balance of this Guide . . .

## HEAVY-DUTY EQUIPMENT

A high-performance production car requires certain modifications to adapt it to the unusual stress of stock car competition. Heavy-duty parts, engineered for maximum durability and safety under extreme conditions, are available to all Chevrolet dealers for local installation — they are not offered as original production equipment. All of these heavy-duty parts are recommended, and are required by most stock car racing associations.

### ENGINE MOUNTINGS

Firmer rubber mountings offer more solid support at the rear of the engine.

| Group | Description                 | Part No. | Qty. |
|-------|-----------------------------|----------|------|
| 0.027 | Mounting, Engine Rear, L.H. | 3731803  | 1    |
| 0.027 | Mounting, Engine Rear, R.H. | 3731804  | 1    |

**Installation** — Use existing attachment parts and instructions in Shop Manual.

### RADIATOR

Special radiator has fewer fins to reduce clogging on dirt and loose top tracks. Hoses match special radiator inlet and outlet.

| Group | Description           | Part No. | Qty. |
|-------|-----------------------|----------|------|
| 1.159 | Hose, Radiator Inlet  | 3732482  | 1    |
| 1.173 | Hose, Radiator Outlet | 3732672  | 1    |
| 1.219 | Core, Radiator        | 3136551  | 1    |

**Installation** — Use existing mounting parts and install according to Shop Manual procedure. Clean fittings and hose mating surfaces **thoroughly**, and be sure parts are dry. Do not apply sealer. Use special aviation-type hose clamps.

For convenience, these heavy-duty parts are shown in Chevrolet Parts Book grouping and nomenclature. Items listed as "Unit" consist either of a complete assembly or a group of related parts supplied under a single part number. Order parts in this list for initial installation. For replacement see also separate list of component parts on page 9. Installation is as detailed in the applicable Chevrolet Shop Manual, except where specifically noted.

### FAN DRIVE

Very high competition engine speeds demand an exceptionally durable fan belt. This belt is  $\frac{3}{8}$ " wide, and  $\frac{1}{2}$ " wide pulley sheaves minimize belt jumping.

| Group | Description                 | Part No. | Qty. |
|-------|-----------------------------|----------|------|
| 0.659 | Balancer, Crankshaft        | 3743319  | 1    |
| 0.659 | Pulley, Crankshaft Balancer | 3742991  | 1    |
| 1.062 | Pulley, Water Pump          | 3713974  | 1    |
| 1.066 | Belt, Fan                   | 3738437  | 1    |
| 2.274 | Pulley, Generator           | 3711766  | 1    |

**Installation** — Balancer can be changed only with radiator removed or engine out of car. The water pump pulley bolts together with the fan to the fan hub. The crankshaft pulley and balancer are bolted together. Refer to Shop Manual for additional instructions. Adjust fan belt tighter than standard tension.

### FUEL TANK

Twenty-gallon tank has increased fuel capacity. Unit is complete with necessary filler neck, hoses, clamps and straps.

| Group | Description         | Part No. | Qty. |
|-------|---------------------|----------|------|
| 3.001 | Fuel Tank, Gasoline | 3744079  | 1    |

**Installation** — Mounts same as standard tank. Additional venting is permissible, but modification must not increase fuel capacity.

## HEAVY-DUTY EQUIPMENT

## BRAKES

Brake shoes with special cerametalix linings increase brake durability. Units include new heat resisting brake shoe springs 3740932.

| Group | Description            | Part No. | Qty. |
|-------|------------------------|----------|------|
| 5.017 | Brake Shoe Unit, Front | 3738424  | 2    |
| 5.017 | Brake Shoe Unit, Rear  | 3738425  | 2    |

**Installation**—Install according to *Shop Manual* procedure except adjustment: tighten to contact drum, then back off adjusting screw 35 to 40 notches.

## REAR AXLE

The exceptional demands of high-speed track competition necessitate a special rear axle. This axle unit includes axle shafts, brake drums, and a propeller shaft designed for very high speeds. The differential carrier is *not* included, and two different carriers are required to adapt all available Ring and Pinion Gear sets. Housing cover gasket also is used between the axle housing and differential carrier.

| Group | Description   | Part No. | Qty. |
|-------|---|----------|------|
| 5.386 | Axle Unit, Rear   | 3744020  | 1    |
| 5.399 | Gasket, Axle Housing Cover  | 3731305  | 2*   |
| 5.505 | Carrier Unit, Differential (includes 3.90:1 ring and pinion gear set) | 3731162  | 1    |
| 5.505 | Carrier Unit, Differential (includes 4.56:1 ring and pinion gear set) | 3744084  | 1    |

\*Order extra gaskets for use when changing ring and pinion gears.

**Installation**—Unit is interchangeable with standard rear axle. Existing attaching parts can be used. *Shop Manual* overhaul procedure for the  $\frac{1}{2}$ -Ton Truck axle is applicable. Be sure to use the special gasket 3731305 when installing differential carrier and axle housing cover.

## RING AND PINION GEAR SETS

Choice of proper axle ratio will vary according to individual car, track, and personal preference. Often the best combination can be established only by trial of the different units available.

| Group | Description                           | Part No.  | Qty.     |
|-------|---------------------------------------|-----------|----------|
| 5.529 | Gear Unit, Ring, With Pinion (3.55:1) | 3731179*  | 1        |
| 5.529 | Gear Unit, Ring, With Pinion (3.70:1) | 3731180*  | 1        |
| 5.529 | Gear Unit, Ring, With Pinion (3.90:1) | 3731168*  | 1        |
| 5.529 | Gear Unit, Ring, With Pinion (4.11:1) | 3731169*  | 1        |
| 5.529 | Gear Unit, Ring, With Pinion (4.56:1) | 3731170** | 1        |
| 5.529 | Gear Unit, Ring, With Pinion (4.89:1) | 3731171** | 1        |
| 5.529 | Gear Unit, Ring, With Pinion (5.14:1) | 3731172** | 1        |
| 5.529 | Gear Unit, Ring, With Pinion (5.57:1) | 3731178** | 1        |
| 5.529 | Gear Unit, Ring, With Pinion (5.83:1) | 3731173** | 1        |
| 5.529 | Gear Unit, Ring, With Pinion (6.33:1) | 3731066** | 1        |
| 5.535 | Lubricant, Hypoid Gear (2 quarts)     | 513379    | As req'd |

\*Fits 3731162 Carrier Unit

\*\*Fits 3744084 Carrier Unit

**Installation**—Proper ring and pinion gear adjustment is very important. *Shop Manual* procedure for  $\frac{1}{2}$ -Ton Truck axle should be followed carefully. Use new special gasket 3731305 each time differential carrier is installed. Special hypoid gear lubricant 513379 has been proved in heavy-duty service, and is recommended.

## HEAVY-DUTY EQUIPMENT

### WHEELS

This reinforced 15 x 6K wheel meets the special safety requirements of racing associations and must be used, together with the listed wheel nut.

| Group | Description                   | Part No. | Qty. |
|-------|-------------------------------|----------|------|
| 5.803 | Wheel, Front and Rear         | 3742676  | 4    |
| 5.813 | Nut, Hub Bolt, Front and Rear | 566537   | 24   |

**Installation**—These wheels are completely interchangeable with standard wheels. Proper tightness for wheel nuts is 45—65 foot-pounds torque. Hub caps or wheel covers are never used in competition.

### STEERING LINKAGE

Steering linkage parts made stronger by shot-peening are required for durability and safety. This Linkage Unit includes all necessary rods, sockets and arms.

| Group | Description            | Part No. | Qty. |
|-------|------------------------|----------|------|
| 6.230 | Linkage Unit, Steering | 3731270  | 1    |

**Installation**—The parts of this unit are completely interchangeable with comparable standard parts. Refer to instructions in the Shop Manual for detailed procedures.

### STEERING KNUCKLES

Stronger steering knuckles, wheel hubs, brake drums and associated parts offer greater durability and safety in competition. Most of these parts are shot-peened for extra strength. Steering Knuckle Unit includes special hub, brake drum, wheel bearings and other necessary related parts.

| Group | Description   | Part No. | Qty. |
|-------|---|----------|------|
| 6.020 | Knuckle Unit, Front Wheel                           | 3744426  | 2    |
| 6.164 | Shaft, Steering Knuckle, Upper Control Arm          | 3730721  | 2    |
| 6.164 | Stud Unit, Steering Knuckle, Upper Control Arm Ball | 3724848  | 2    |
| 6.169 | Shaft, Steering Knuckle, Lower Control Arm, L.H.    | 3731083  | 1    |
| 6.169 | Shaft, Steering Knuckle, Lower Control Arm, R.H.    | 3731084  | 1    |

**Installation**—Procedures in Shop Manual are applicable as these stronger parts are similar to standard. Enlargement of holes for new ball studs is necessary—instructions are included. Within standard limits, wheel bearing adjustment must be loose rather than tight. Other special front suspension modifications are described on page 13.

Naturally, no single publication can completely cover every situation that can develop in preparing a new Chevrolet for stock car competition. In most cases, experience and good judgment should be your guide, within the limits defined by the sanctioning organization in which you plan to participate. If you have a specific problem that cannot be solved locally, Chevrolet may be able to advise

you of practices that have proved successful for others. State the problem in full detail, and address your inquiry to:

Sales Promotion Department  
Chevrolet Motor Division  
General Motors Corporation  
General Motors Building  
Detroit 2, Michigan

## HEAVY-DUTY EQUIPMENT COMPONENT PARTS

These parts are listed for reference and replacement ordering. Most, but not all, are components of heavy-duty equipment units described in this Guide. Parts are available to all Chevrolet dealers. Refer to pages 6, 7 and 8 for heavy-duty complete unit replacements and individual parts not in this list.

The new Chevrolet Parts and Accessories catalog issued March 1, 1957 contains complete parts information for 1957 Chevrolet passenger cars. You may order heavy-duty equipment from information in this Guide, but only the new catalog contains the parts information for ordering all other replacement parts.

| Group   | Description  | Part No. | Qty. |
|---------|--|----------|------|
| 0.459   | Tappet, Valve (mechanical type)                              | 5231585  | 16   |
| 0.519   | Camshaft (special performance)                               | 3736097  | 1    |
| 2.170   | Coil, Ignition (for 1110905 distributor)                     | 1115091  | 1    |
| 2.173   | Resistor, Ignition Coil, primary (for use with 1115091 coil) | 1931385  | 1    |
| 2.361   | Distributor, Ignition  | 1110905  | 1    |
| 2.384   | Point Unit, Distributor (for 1110905 distributor)            | 1918148  | 1    |
| 4.003*  | Transmission Assy. (ratios 2.94:1; 1.68:1; 1:1)              | 3737857  | 1    |
| 4.003** | Transmission Assy. (ratios: 2.2:1; 1.31:1; 1:1)              | 3731937  | 1    |
| 5.026   | Spring, Brake Shoe Pull Back                                 | 3740932  | 8    |
| 5.398** | Bolt, Rear Axle Housing Cover                                | 3731306  | 10   |
| 5.420** | Axle Shaft Assy., L.R. with drum                             | 3731303  | 1    |
| 5.420** | Axle Shaft Assy., R.R. with drum                             | 3725817  | 1    |
| 5.420** | Axle Shaft, L.R. (without drum)                              | 3731363  | 1    |
| 5.441** | Shaft, Propeller, with "U" joint                             | 3724491  | 1    |
| 5.809   | Hub and Drum Assy., Front wheel                              | 3725816  | 2    |
| 5.858   | Cap, Front Wheel Bearing Grease                              | 3725823  | 2    |
| 6.020   | Knuckle, Steering, with nut                                  | 3725025  | 2    |

\*For replacement of entire transmission assembly.

\*\*All other rear axle parts, except those on page 7, are as listed in the Parts Catalog for the 1/2-Ton Truck.

| Group | Description  | Part No. | Qty. |
|-------|--|----------|------|
| 6.103 | Arm, Steering Knuckle, L.H.                                | 3729295  | 1    |
| 6.103 | Arm, Steering Knuckle, R.H.                                | 3729296  | 1    |
| 6.232 | Sleeve, Front Axle Tie Rod                                 | 3729294  | 2    |
| 6.233 | Socket Assy., Tie Rod (long) L.H.                          | 3729407  | 1    |
| 6.233 | Socket Assy., Tie Rod (long) R.H.                          | 3729408  | 1    |
| 6.233 | Socket Assy., Tie Rod, L.H.                                | 3729405  | 1    |
| 6.233 | Socket Assy., Tie Rod, R.H.                                | 3729406  | 1    |
| 6.234 | Clamp, Tie Rod   | 5661926  | 4    |
| 6.307 | Hub, Front Wheel   | 3744428  | 2    |
| 6.314 | Cone, Front Wheel Inner Bearing (with separator and balls) | 457050   | 2    |
| 6.315 | Cone, Front Wheel Outer Bearing (with separator and balls) | 457047   | 2    |
| 6.316 | Cup, Front Wheel Inner Bearing                             | 457051   | 2    |
| 6.317 | Cup, Front Wheel Outer Bearing                             | 457048   | 2    |
| 6.859 | Arm, Pitman  | 3731271  | 1    |
| 6.870 | Rod, Steering Relay  | 3729293  | 1    |
| 6.895 | Lever Assy., Steering Idler                                | 3731274  | 1    |
| 6.896 | Support, Steering Idler                                    | 3731273  | 1    |

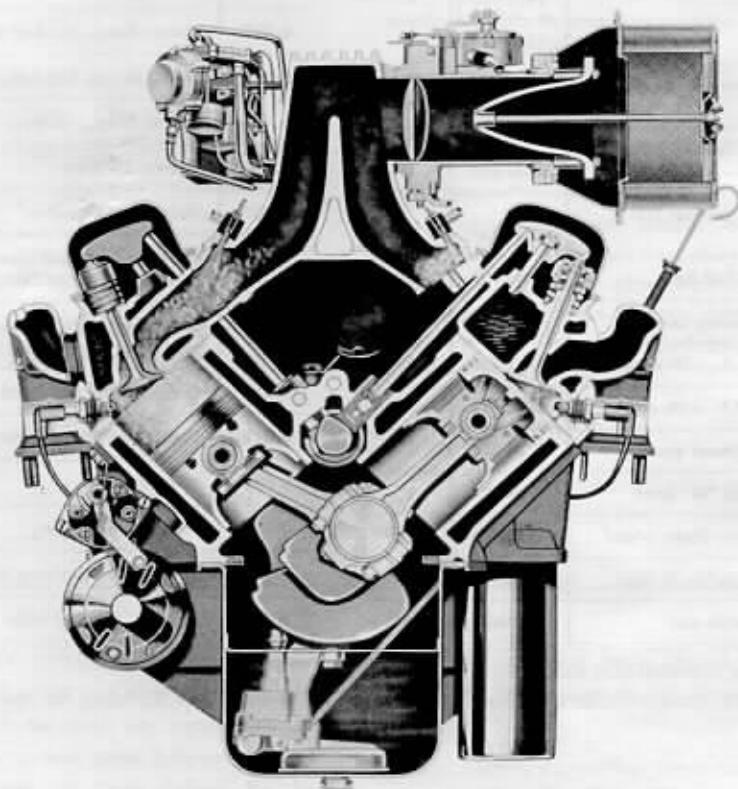
## SPECIAL MODIFICATIONS FOR COMPETITION

In addition to the heavy-duty parts, special modifications and thorough tuning are necessary to prepare your high-performance Chevrolet for actual stock car competition. This section describes some of the techniques suggested by leading professional race mechanics. Many of these operations are required by racing regulations, others are methods of improving over-all performance. Improper modification may disqualify your car — be sure to check the regulations of the organization in which you intend to participate. Naturally, any modifications to manufactured components may nullify the standard manufacturer's warranty, regardless of mileage or date of production.

Be sure to plan your work carefully. Craftsmanship is a necessity, not a luxury. Top racing mechanics take nothing for granted — every part must pass critical inspection. And while there certainly is no substitute for experience, the right combination of ingenuity, planning, and skill can produce a first-class competition car for a newcomer to the sport.

The best way to begin preparing a new car for competition is to strip it down completely. Remove the body and sheet metal, engine, transmission, drive train, and suspension. Now you're ready to start building for competition.

## SPECIAL MODIFICATIONS: ENGINE



The engine is the heart of a competition car. It must be capable of delivering full power for prolonged periods, at engine speeds far in excess of those encountered in normal driving. Every part of a competition engine must be as nearly perfect as possible — the slightest failure can put you out of the running or even out of the race.

While some racing engine specialists advocate complete

rebuilding for competition, actual experience has proved the 1957 Chevrolet "Corvette V8" engine capable of producing championship performance without modification of any type. The exceptional performance of the unmodified R.P.O. 578 Chevrolet V8 engine is a tribute to the high standards of precision to which this fine power plant is engineered and built.

**SPECIAL MODIFICATIONS: ENGINE**

Although Chevrolet V8 engine modification is neither required nor recommended, certain facts must be recognized. Manufacturing tolerances are absolutely necessary in any volume-produced engine, and while Chevrolet inspection is unusually thorough, you may wish to completely disassemble the engine and carefully check each part. To some, this procedure is reassuring, and adds the personal satisfaction that each part is absolutely right.

For the perfectionist who simply *must* perform additional modifications, here are some suggestions:

- *Make no modification unless you are absolutely certain it will improve performance and is authorized by the sanctioning organization in which you plan to participate.*
- *Try to concentrate on improvements in sealing, fits, and surface finish — preferably on the exterior of the engine.*
- *Avoid lightening or other structural changes that could affect the strength of any engine part.*
- *Above all, do not attempt to re-design an engine that has proved to be one of the finest high-performance engines ever manufactured.*

If — in spite of the fact that costly disassembly may not result in significantly improved performance — you do prefer to dismantle the engine, here are some helpful hints and important cautions . . .

Observe standard Chevrolet Shop Manual procedures wherever possible.

During disassembly, be sure to identify the original position of every piston and connecting rod, or the precision balance of the engine may be impaired.

Keep every part as clean as possible. A tiny chip or piece of grit can be very costly. Be sure all lubricant passages are free, but do not revise them. The oil pump pickup screen is not essential in competition, and may be removed. Make certain that the full-flow oil filter is operating properly.

Check the fit and alignment of every bearing, as well as pistons, rings, and pins. If greater clearances are required, selectively fit the special inserts in this engine. Increase piston clearance only when necessary, and then by honing the bore — never by reducing or replacing the piston.

If magnetic flux, X-ray, or similar special equipment is available, you may want to check all moving parts for concealed interior flaws. Such conditions are rare, but always possible.

Valve spring tension should be equal on all valves. If adjustment is necessary, use shims. The umbrella-type valve spring caps may be replaced with special shims or washers of identical thickness.

Because some racing organizations rigidly govern combustion chamber size, it may be advisable to double-check the liquid volume of each chamber. Use an accurate graduate calibrated in cubic centimeters. All eight combustion chambers should be alike, within the specified limits. If an important variation exists, the head may be either surface ground or replaced. Most racing associations restrict grinding or polishing the combustion chamber proper.

Do not alter the camshaft or specified valve timing of the R.P.O. 578 engine. Serious trouble can result from experimenting with this carefully engineered system.

Do not attempt to improve engine balance by individual weight-matching and costly dynamic balancing. Chevrolet V8 engines are precision-balanced after assembly with the finest equipment available. No perceptible imbalance should exist unless the engine has been modified unnecessarily.

During reassembly, check all gaskets and mating surfaces carefully. Any kind of a leak — oil, water, air, or gasoline — can cause trouble in competition. Be sure every gasket forms a tight, *dry* seal. One good technique is the use of special aluminum paint that has a heat rating of at least 1600 degrees F. This paint can be used on any gasket in the engine — just brush on a good coat at the time the gasket is installed.

All manifolds must be accurately aligned. Intake manifold, engine top cover, and intake ports in the cylinder head must match. The same is true of the exhaust manifold. Where locating dowels are permissible, they may be installed in both ends of the manifold.

**ENGINE ACCESSORIES**

Regardless of whether or not you intend to modify the Chevrolet engine, some modifications to the engine accessories and related systems are recommended for stock car competition. Some of these are very important; others are subject to professional preference.

**CYLINDER HEAD TORQUE**

Because of the higher combustion chamber pressures developed at competition speeds, some racing mechanics torque cylinder heads to 85 foot-pounds. Tighten in increments of 5 lbs., using the proper sequence shown in the Chevrolet Shop Manual.

**ELECTRICAL SYSTEM**

The full centrifugal advance distributor with dual breaker points and special coil and resistor is specifically engineered for this engine and must not be altered from production specifications. High tension cables are another

## SPECIAL MODIFICATIONS: ENGINE

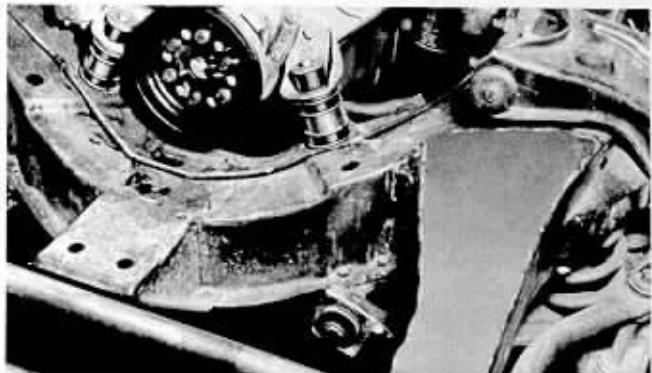
matter — some experts prefer to install 7-strand stainless steel high tension plug wires of top-quality brand. High tension wires should be properly isolated, not touching the engine, and be sure to retain the standard heat shields above the spark plugs.

Spark plug gaps, point settings, and distributor advance are described in the Competition Tuning section of this Guide.

The Chevrolet starter is entirely satisfactory. So is the generator, but some experts recommend that the adjustable upper support arm be reinforced by welding two of them together. Tighter drive belt tension is recommended.

### ENGINE MOUNTS

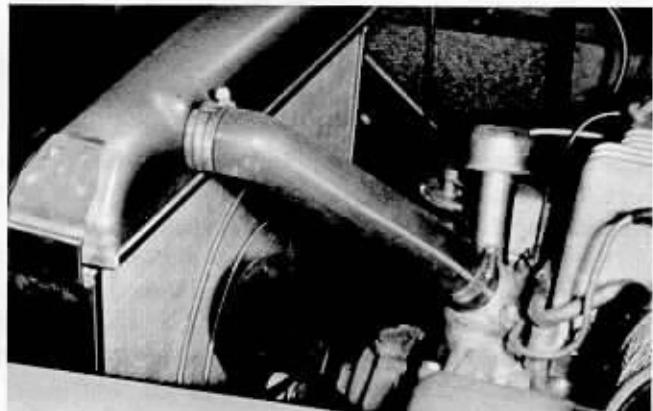
Be sure to install the firmer rear engine mounts listed in the heavy-duty parts on page 6. Front mounts usually are modified for greater rigidity by the addition of a special spacer that fits between the rubber biscuits. These should be tailored to the particular installation, using aluminum or any hard, light metal.



*Special spacer makes front mounts as solid as possible and helps prevent undue rocking of the powerplant.*

### COOLING SYSTEM

The heavy-duty radiator listed on page 6 of this Guide is designed for dirt track competition, and can be used satisfactorily in most stock car events. However, many experts prefer to custom build special radiators for different track conditions. In general, these radiators are of two types — those for asphalt tracks, with as many as 11 or 12 fins per inch for maximum cooling, and those for dirt tracks, which may have as few as 5½ or 6 fins per inch to allow dirt to pass through instead of plugging the core. A fan shroud is not necessary, but may be advantageous under certain conditions. It must be either specially made or modified to fit the Chevrolet radiator. High speed coolant flow may be improved by removing three blades from the water pump impeller and polishing all over.

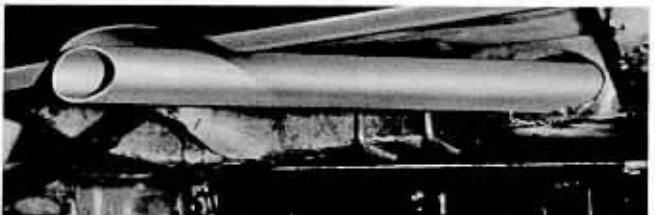


*Special radiator, upper hose and clamps installed on 1957 Chevrolet stock car. Fan rings reduce possible damage to core.*

Hose connections are very important: sand and clean them with thinner until every fitting is absolutely clean and dry. Aviation-type stainless steel hose clamps are recommended. Lock these clamps as tight as possible, warm up the engine and then lock the clamps again.

### EXHAUST SYSTEM

Most racing associations require considerable exhaust system modification. Mufflers are not required or recommended, but the exhaust pipes usually must be standard diameter, and extend beyond the driver. From this point they may turn out to the side of the car. Omit gaskets between exhaust manifold and cylinder head, and between exhaust manifold and exhaust pipes. It's a good idea to lock all bolts in the exhaust system — pull them up tight, drill a small hole, and run mechanic's wire through two or three bolts wherever possible.



*Special exhaust pipe passes through sleeve in frame member (upper photo) and extends past body sill (lower photo) at rear edge of door.*

**SPECIAL MODIFICATIONS: CHASSIS**

A highly competitive stock car requires many chassis modifications. All experts do not agree on this subject, and no brief summary can completely cover the varied conditions encountered in different racing events. Some modifications that are recommended for asphalt track competition are not advisable for dirt track competition, and vice versa. Others will be highly satisfactory for one car and not for another nearly identical car. In general, the chassis modifications described in this Guide will serve as a basic outline subject to experimentation and testing for individual cases.

**FRAME**

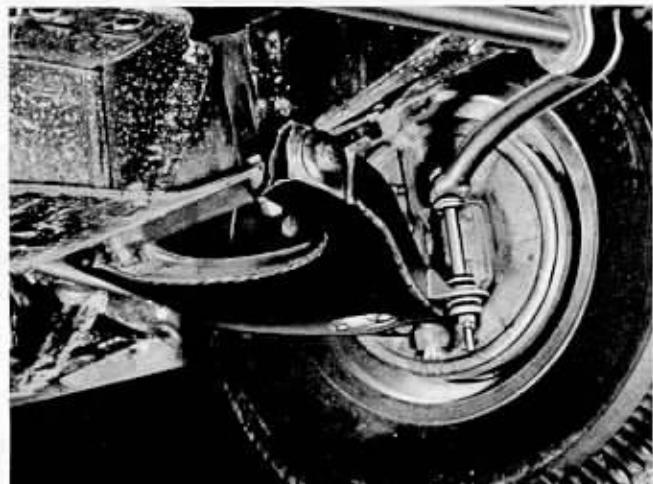
With the car completely dismantled, check the bare frame carefully. Be sure all welds are tight and secure. Additional gussets or reinforcements may be added at cross-member junctions. One example is shown in the engine mount photo on page 12. And while the standard 1957 Chevrolet frame is an exceptionally rigid structure, some experts install tubular crossmembers over the rear axle and between the front frame horns, plus an additional crossmember behind the rear engine mounts on a car that will be run on asphalt. The crossmember behind the engine is attached to the bolts that hold the rear engine mounts.

**FRONT SUSPENSION**

In addition to the heavy-duty components listed on page 8, certain front suspension modifications are recommended for stock car competition. The lower control arms should be reinforced by welding an extra plate across the bottom of the stamping, thus forming a box section. The balance of the suspension should then be assembled from heavy-duty and standard production parts. Take great care in selecting springs, shock absorbers, and stabilizer bar. The latter two items are discussed separately in this section, and springs are covered along with front end alignment in the Track Setup section on pages 18 and 19 of this Guide.

Springs and shock absorbers are two of the most controversial items in stock car competition. Few professionals agree on a specific combination of springs and shocks for a given car on a specific track. The best advice seems to be: work out the combination that's best for your car.

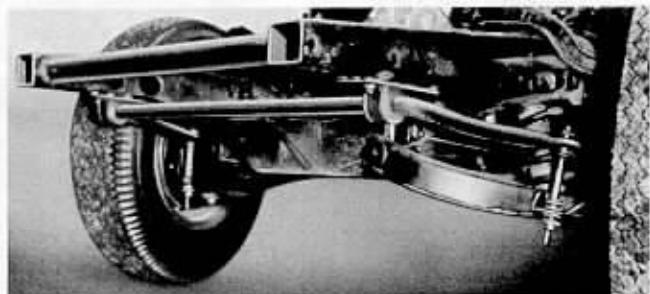
While this takes time, it's one of the most important phases of competition buildup. The principles outlined later in this Guide should help you get started right.



*Steel plate welded to bottom and forward edge of lower control arm adds extra strength and rigidity.*

**FRONT STABILIZER**

A front stabilizer bar definitely is recommended for stock car competition. Stabilizers are listed in the Chevrolet Parts Catalog. However, as in the case of springs and shock absorbers, most racing experts prefer to tailor a special stabilizer which differs mainly in the diameter of the bar itself. Here again, only experience will prove the combination that's best for you.



*Special front stabilizer has rubber-bushed mounting and linkage. Note tubular crossmember between frame horns.*

## SPECIAL MODIFICATIONS: CHASSIS



*Dual shock absorbers are installed on each front wheel. The second shock can be mounted on either side of the lower control arm, with the top end attached securely to the frame. Special brackets for this installation must be designed to prevent shock bottoming in either direction. Be sure to allow sufficient wheel turning angle.*

### SHOCK ABSORBERS

In general, stock car competition requires very stiff shock absorber action. Dual shocks must be installed on each wheel. Handling on circular tracks is sometimes improved by using shocks with stiffer valving on the right side of a car. Rambling road courses require balanced shock action on both sides. One solution to the shock absorber problem is a three-way adjustable unit available throughout the industry that can be set for soft, normal, or hard valve action. While this arrangement may not be perfect, it does give the newcomer an excellent opportunity to study the effects of different shock absorber valving on varied track conditions.

### REAR SUSPENSION

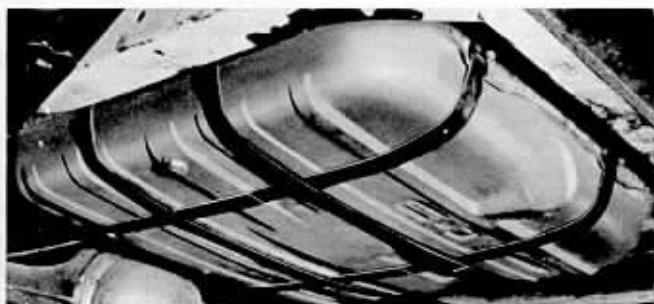
Stock car competition demands an unusually rugged rear axle, which is included in the list of heavy-duty equipment on page 7 of this Guide. This axle should be installed the same as a conventional Chevrolet rear axle, except that dual shock absorbers are required on each rear wheel. If you have installed an additional cross-member under the rear axle, attach both shocks to this point. Springs will vary according to track conditions and individual preference, as described on page 13 of this Guide. Sometimes it is advantageous to use spacer blocks between the axle and spring to lower the rear of the car.



*Underside view shows dual shocks mounted at rear wheel. Transverse rod reinforces heavy-duty rear axle.*

### FUEL SYSTEM

Racing regulations govern the type and capacity of fuel tank that may be used for stock car competition. The heavy-duty tank listed on page 6 complies with all regulations. The tank should be vented from the right front corner with a  $\frac{1}{2}$ " line up to the filler neck or any place high enough to prevent spilling. Some experts prefer to replace the standard fuel line with a  $\frac{3}{8}$ " neoprene hose from tank to fuel pump. Make sure such a line is properly supported, and keep it as far away from the exhaust system as practical.



*Heavy-duty fuel tank must be securely mounted. Double straps increase support.*

### BRAKES

In addition to the special brake facings listed on page 7 of this Guide, most racing organizations encourage special modifications that extend the life and durability of brakes. Air ducts, vents, and similar cooling devices sometimes are allowed, but be sure to check association regulations. Generally, the principal requirement is that such special installations are thoroughly engineered and professional appearing.

### CLUTCH, TRANSMISSION AND DRIVE LINE

R.P.O. 303 transmission needs no modification. The standard 3-speed may prove satisfactory, but extreme duty requires a special 3737857 transmission, or major modification.

Adjust transmission linkage carefully, and reinforce brackets wherever possible. The Chevrolet clutch is well suited to stock car competition, and so is the heavy-duty propeller shaft described on page 7 of this Guide.

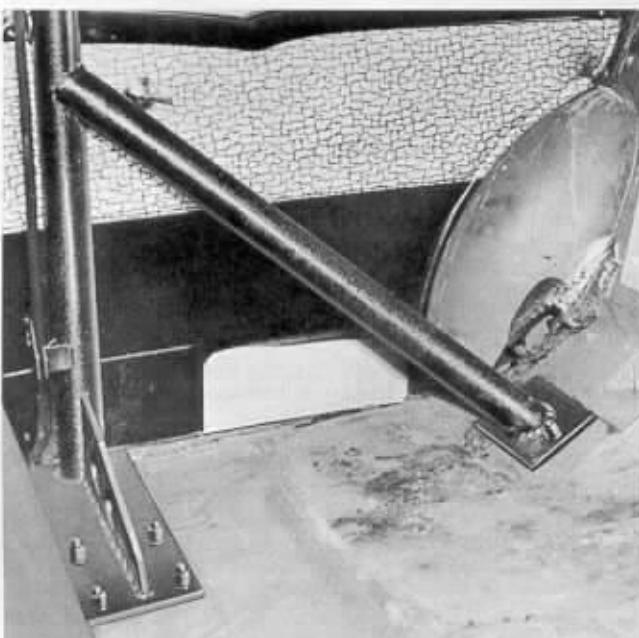
## SPECIAL MODIFICATIONS: BODY

Nearly all of the body modifications required for stock car competition are designed to increase safety. In most cases, they are subject to strict regulation by the individual sanctioning organizations.

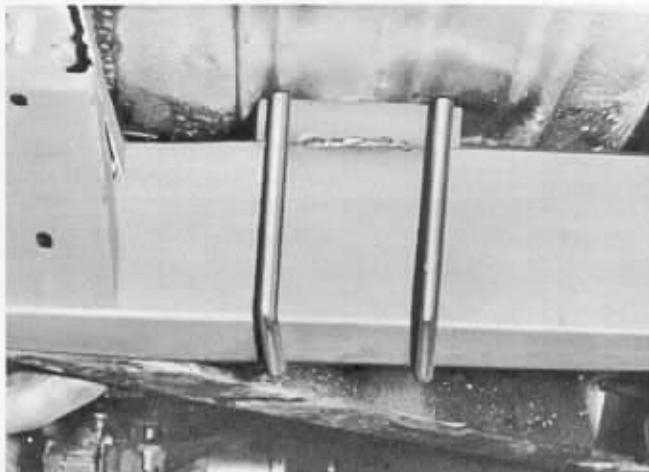
Naturally, these modifications require careful preparation, since these are the features that often are directly responsible for minimizing the possibility of injury to drivers and spectators as well. All body glass must be in place, and many drivers prefer to keep windows closed during actual competition.

## ROLL BAR

Most racing associations require that the roll bar be of a certain design, and must pass rigid inspection before a car is allowed to compete. Detailed plans and specifications are available from some of these associations. In general, the roll bar should be carefully fabricated from chrome-alloy steel tubing of .080" to .090" wall thickness, approximately 2" in diameter. It must be carefully formed, and bolted securely to the chassis frame. Two arches are usually required, with tie bars between. Bolts should be used wherever possible. Keep it completely independent of the body shell, but with very little clearance. The roll bar should be carefully padded at any point where the driver may come in contact with it.



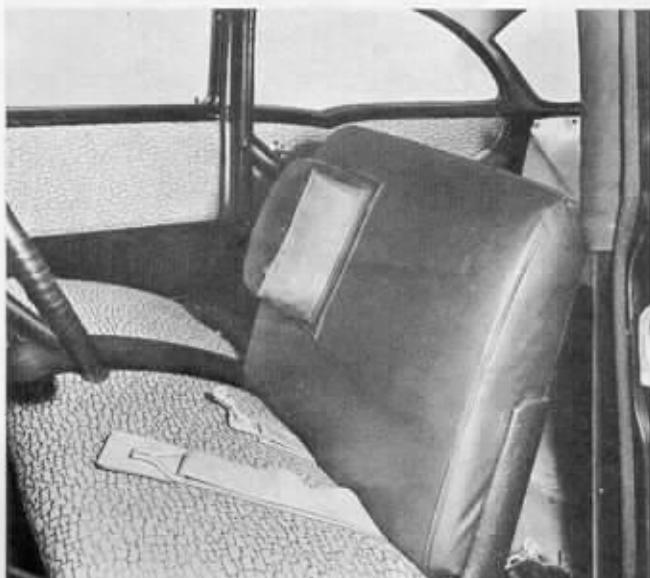
Roll bar must be well braced and properly mounted. Large stanchion feet permit bolting directly to chassis frame.



Roll bar is secured to frame by heavy U-bolts around side member. Shim under floor adds rigidity.

## SEAT MOUNTING

Determine the proper seat position for the driver, then remove the seat and run bolts through the adjustment mechanism so the seat is securely locked in the proper position. Remount the seat carefully — reinforce the body floor with heavy gauge steel plates. The right hand seat backrest is not necessary, and must be removed. The driver's backrest must be made stationary — a 5/16" bolt through each seat arm will immobilize it.



Driver's seat is securely locked in preferred driving position. Special shoulder pad on backrest helps keep driver in position during turns.

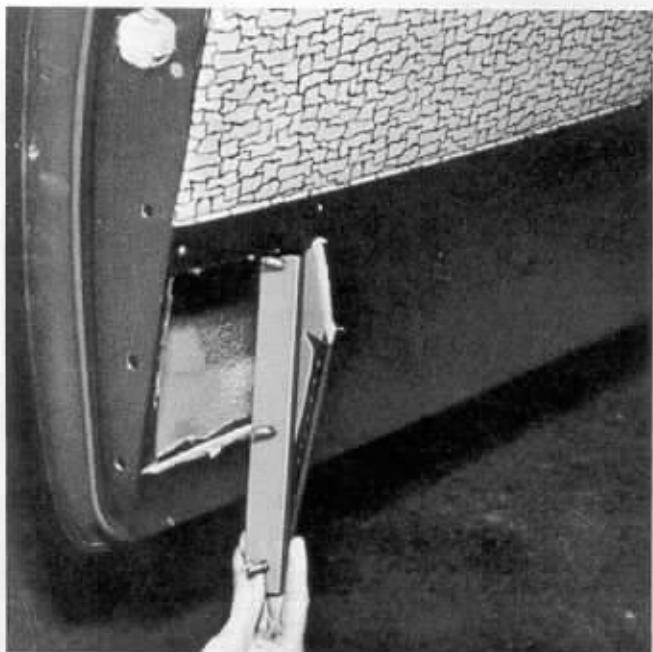
## SPECIAL MODIFICATIONS: BODY



Seat belt should be attached to frame similar to roll bar.  
Tubular member shown here strengthens Convertible body.

### SEAT BELT

A seat belt is mandatory, but shoulder harness is often a matter of individual preference. Both of these items are rigidly governed, and individual racing organizations will specify satisfactory equipment. Approved racing belts and shoulder harnesses are generally wider and heavier than those available in regular automotive production.



Steel plates and heavy bolts lock driver's door to center pillar of body. Similar method may be used for front pillar.

### DOORS

The driver's door *must* be closed and immobilized during competition. Take great care in securing the door — steel plates, attached to both door interior shell and body pillar, bolted tightly together, are an important safety modification. These are often spaced well apart — one at the belt line, and one at the bottom on *both* hinge pillar and lock pillar. The right-hand door is important, too — and often is secured by at least one or two pairs of steel plates attached to the door and the roll bar. Special clamps pass through glass cutouts near the top of both doors.



Steel plates and bolts hold right-hand door firmly. Driver enters car through window.

### WINDSHIELD PROTECTION

Some tracks are very hard on windshields — dirt tracks in particular. Tiny stones, dirt, and other abrasives are thrown against the windshield with terrific velocity, and can severely abrade or even break the glass. Windshields are considered expendable — a common track saying is: one race; one windshield.

Several systems have been devised for preserving the windshield — at least for the duration of a race. One technique is to edge-trim a second windshield and clamp it firmly over the one permanently installed in the body. Attachment by masking tape is not satisfactory, and may allow the auxiliary windshield to fall off. Other techniques range from sheets of plastic film, sometimes applied in several layers that can be removed at various stages of a race, all the way down to a simple piece of cardboard that the driver holds in place until the mud stops flying.

## SPECIAL MODIFICATIONS: BODY

## WINDSHIELD WIPER AND WASHER

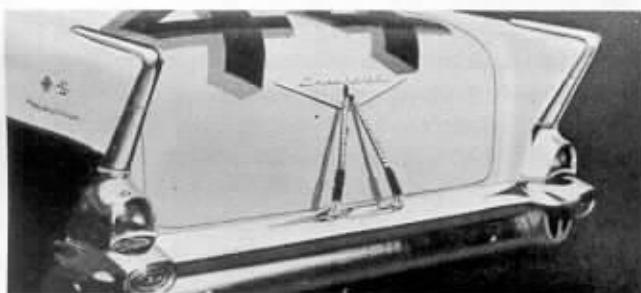
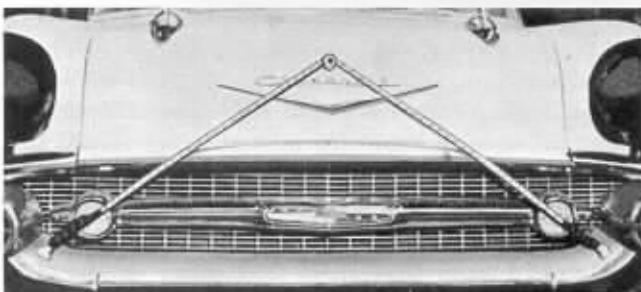
Windshield wipers are seldom used in competition, and this applies to windshield washers as well. Usually, the wiper or washer merely smudges the windshield and impairs visibility. Nevertheless, these units should always be ready for use at the driver's discretion.

## HOOD AND TRUNK LID

Both hood and deck lid should be tightly held down to prevent accidental opening. The hood may be secured in several different ways. One of the best methods is to attach hooks to hood and bumper, with aviation-type shock cord in between. Locate hooks so they are not likely to be snapped off in the event of a minor collision. The same system is satisfactory for the trunk lid. Straps or belts waste precious time, and are not recommended.

## RADIATOR DIRT SCREEN

Competition on dirt tracks presents special problems. Perhaps the greatest is dirt clogging the radiator, which is the beginning of the end for a competition car. Special deflector screens are regularly used on dirt tracks, and vary in design according to individual ingenuity. It's a good plan to study the devices used on cars that have been successful on specific dirt tracks.



Hood and deck lid may be secured as shown here. Heavy rubber shock cord permits quick opening and positive hold-down.

## TIRE INSPECTION CUTOUTS

Tire wear has always been one of the most critical problems of competition driving. You must expect heavy tread wear in almost any event of any duration. Treads generally wear more rapidly at first than after the tread has worn half way down. The heaviest wear usually occurs on the right front, and many cars have an inspection hole cut through the toe board and dash to enable the driver to determine tread wear at all times. Another inspection hole is sometimes cut in the right rear wheel house, with a mirror mounted on the instrument panel for convenient observation.

## HEADLIGHTS

Headlights *must* be removed for every event. The sealed beam unit is removed, and the opening may be covered with masking tape or any suitable cover to keep out the dirt. For cars that will be used solely in competition, it is preferable to remove the entire headlamp assembly, fill the opening with sheet metal, and paint to match. Check the regulations of the association in which you plan to participate.

## CHROME TRIM

Sometimes it is desirable to mask the exterior chrome moldings for protection against high-velocity sand and other abrasives. Ordinarily this is not required — and most competitors prefer to keep the car's appearance as standard as possible.



Preferred headlamp closure for 1957 Chevrolet stock cars. Cover fits inside regular headlamp bezel.

## TRACK SETUP

No matter how carefully a car is prepared, much of the success in stock car competition depends on proper setup for a specific competition event. There are no hard and fast rules — in fact, seldom if ever are any two cars identical. Proper setup for a competition car requires skill, ingenuity, and good judgment — factors that are developed considerably through competition experience. While the tips in this Guide necessarily must be general, they at least indicate some of the situations you will encounter in setting up your Chevrolet for successful stock car competition.

### GEAR RATIO

There is probably no more controversial subject in stock car competition than rear axle gear ratio. Your choice of ratio must be governed by the nature of the event, the driver of your car, engine performance, tire size, and other factors of equal importance. Short track competition is obviously different than a standing start acceleration run and will require a different axle ratio. The higher numerical ratios are generally preferred for short track events. Lower numerical ratios are more suited to very high, sustained car speeds such as flying mile events or road courses with long, open straightaways. The best general rule is: experiment. Try the ratio that seems best, then switch to the next higher and the next lower ratios. With a few trial runs on each, a stop watch can tell you which ratio is best for that particular track on that particular day.

Be very careful to avoid over-speeding the engine — the "Corvette V8" with Ramjet Fuel Injection has a net installed maximum rating of 240 horsepower at 5600 r.p.m. While this engine is capable of much higher speeds, most experts prefer to stay under 6000 r.p.m., and 6500 r.p.m. is considered tops. Consequently, you should choose an axle ratio that will not over-speed the engine on the straightaway, yet still permit whiplash acceleration out of a turn. These formulas will help you calculate the right gear ratio:

$$(A) M.P.H. = \frac{60 \times \text{engine r.p.m.}}{\text{trans. ratio} \times \text{axle ratio} \times \text{wheel rev per mile}}$$

$$(B) \text{Axle ratio} = \frac{60 \times \text{engine r.p.m.}}{M.P.H. \times \text{trans. ratio} \times \text{wheel rev per mile}}$$

Wheel Revolutions Per Mile

(Based on standard 4-ply tires, disregarding  
slip and expansion)

| Tire/Wheel          | Rev. Per Mile |
|---------------------|---------------|
| 6.70 X 15-5K.....   | 755           |
| 7.10 X 15-5K.....   | 741           |
| 7.60 X 15-5.5K..... | 727           |

Special racing tires may vary slightly from these figures. To compute the actual wheel revolutions per mile of any tire on a normally loaded

car, mark both tire and floor with chalk, then roll the tire one revolution in a straight line. Make another mark on the floor, and measure distance between marks. Divide this distance in inches into 63360 (the number of inches in a mile) for wheel revolutions per mile. For example, if you measure 87" between marks, you would get 727 revolutions per mile using this formula:

$$\text{Wheel rev. per mile} = \frac{63360}{\text{rolling circumference of wheel in inches}}$$

Properly used, these formulas can simplify gear ratio selection. Here's one example, based on a 1957 Chevrolet stock car equipped with 7.60 x 15 tires and 4.11:1 axle ratio, running in high:

Coming out of a turn, engine speed drops to 3000 r.p.m., and acceleration is too sluggish. To maintain the same speed out of the turn, but keep engine speed up to at least 4000 r.p.m. to improve acceleration, what axle ratio should be used?

Using formula (A) compute the actual speed coming out of a turn:

$$M.P.H. = \frac{60 \times 3000}{1 \times 4.11 \times 727} = 60 \text{ m.p.h. out of the turn}$$

Now, to figure out what axle ratio will allow 4000 r.p.m. at 60 m.p.h., use formula (B).

$$\text{Axle ratio} = \frac{60 \times 4000}{60 \times 1 \times 727} = 5.51 \text{ (theoretical)}$$

The available ratio closest to 5.51 is 5.57, so this would be the logical one to try. Compare times with a stop watch, and check engine and car speed on straightaway carefully.

Most track events are run in third gear, although an occasional race has been won by a car using second gear and a ring and pinion gear chosen for the proper over-all ratio. This combination sometimes is preferred by those who drive the competition car to and from an event. But it's a good idea to treat a fine competition car the same as a thoroughbred race horse — transport it by trailer or tow bar.

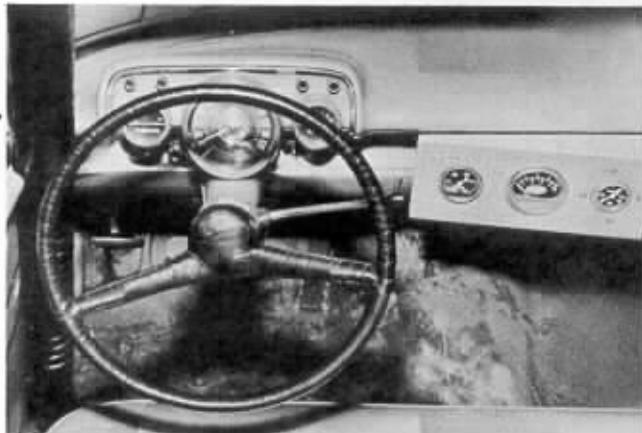
### SPRINGS AND SHOCK ABSORBERS

You must experiment in practice runs before you can determine the proper springs and shock absorbers for any particular event. Left-hand circular tracks usually require stiffer springs and harder shocks on both the right front and right rear wheels. The left front can be somewhat softer. The left rear wheel sometimes takes a softer spring but slightly stiffer shock absorber action. Road races require a balanced suspension system that is equal for both right and left turns. In these events, it's common to make the suspension as firm as possible. Occasionally you may not need more than one heavy-duty shock absorber per wheel — but the accepted practice is two shocks for every wheel.

## TRACK SETUP

## TACHOMETER AND INSTRUMENTS

In actual competition, the only instruments necessary are the oil pressure gauge and temperature gauge. The standard oil pressure warning light is entirely adequate, but some drivers prefer a conventional gauge that can indicate variations in oil pressure during the race. The tachometer can be invaluable, and frequently can help determine the proper rear axle gear ratio during practice runs. The speedometer is of little use in a competition car and usually is removed or covered. Some cars are fitted with oil temperature gauges and similar instruments, but it is best to avoid any instrument that is not absolutely necessary.



Supplementary instruments may be placed in any convenient location. This installation has oil pressure gauge, tachometer, and water temperature gauge mounted on auxiliary panel. Notice that steering wheel is completely covered with rubber tape to improve grip.

## FRONT END ALIGNMENT

Front end settings will vary according to the track, and must be determined by practice runs. Because circular tracks impose a very high load on the right front wheel bearings, this wheel may require as much as  $3^{\circ}$  negative camber, with  $\frac{1}{2}^{\circ}$  to  $1^{\circ}$  positive camber on the left front wheel. Caster should be about  $2\frac{1}{2}^{\circ}$  positive on the right front wheel, with  $\frac{1}{2}^{\circ}$  to  $1^{\circ}$  less positive caster on the left front wheel. Front wheels are generally toed out to reduce steering effort on a circular track. The amount of toe-out will vary according to the sharpness of the curves. Fast asphalt tracks may require as much as  $\frac{1}{4}^{\prime\prime}$  to  $5/16^{\prime\prime}$  toe-out, slightly less on dirt tracks. The desired effect is to lead the right front wheel in a turn.

## TIRES AND TIRE PRESSURE

Tire size is an important factor in over-all gearing. A general tire rule is: the bigger, the better. 7.60 x 15 is a very popular size for Chevrolet stock cars, and tubes

should always be used. Most racing associations require that all four tires be the same size, and certain designs such as smooth tread types may not be permitted. Tire suppliers are often present at major events, but you should always arrange to have enough tires on hand, including spares.

Tire pressures also vary according to the track, and every tire may require a different pressure. A change in tire pressure may make the difference of two or three miles per hour. A typical cold pressure range is 55 lbs. right front, 50 right rear, 45 left rear, 38 left front. Nitrogen gas is often used instead of air to reduce pressure buildup.



Portable wheel alignment equipment helps determine the proper settings for a specific track.

## COOLING ADDITIVE

While pure water is quite satisfactory for the cooling system of a competition car, coolant additives are sometimes used to increase heat absorption. Ethylene glycol or special solutions used in high-speed wet grinders should be satisfactory.



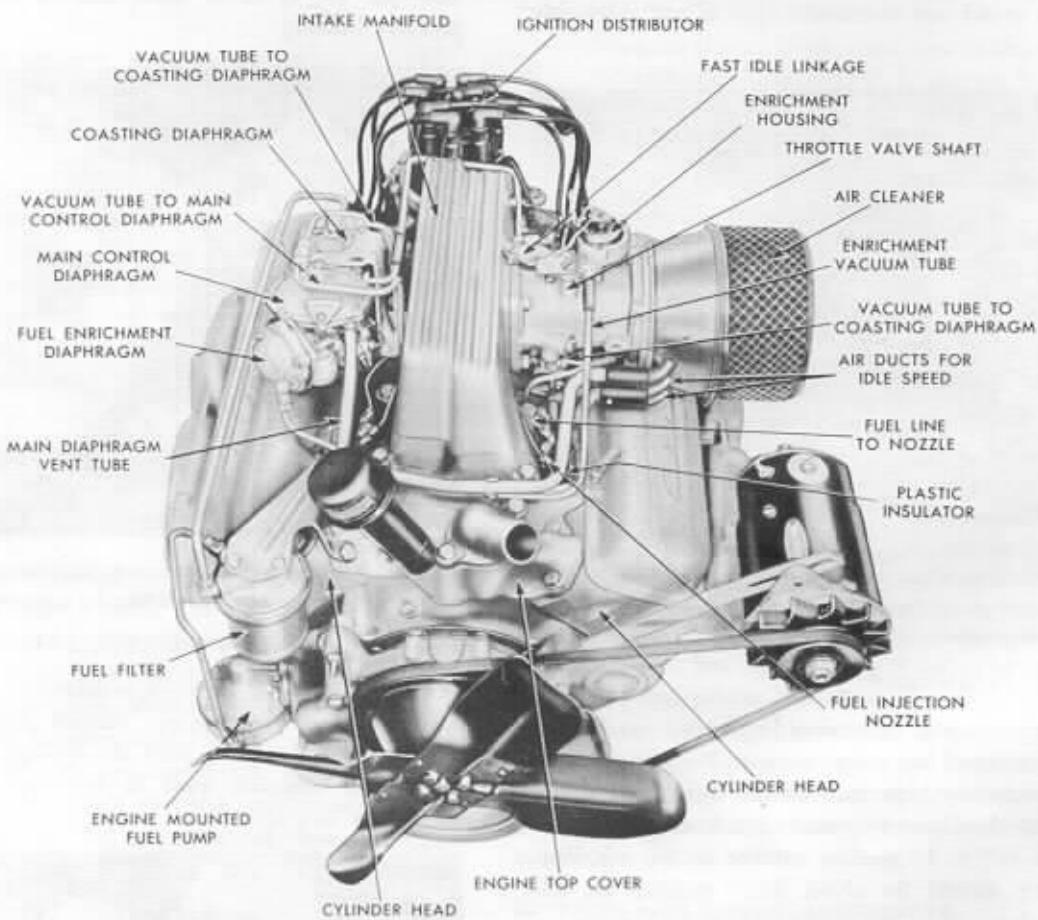
Nitrogen gas minimizes tire pressure buildup. It is available at many tracks, as well as local welding supply houses.

## COMPETITION TUNING

Only through careful tuning can you expect to produce the best possible performance from your Chevrolet stock car. Races are won or lost by the skill and judgment used in tuning for competition. While there are far more tuning secrets than there will ever be race cars, remember that it is possible to over-tune an engine. Never deviate from

specified Chevrolet settings unless you are certain that you can improve performance. This is particularly true of the R.P.O. 578 "Corvette V8" with Ramjet Fuel Injection. There are no tuning "secrets" contained in this section other than some helpful hints and important cautions that should be carefully observed.

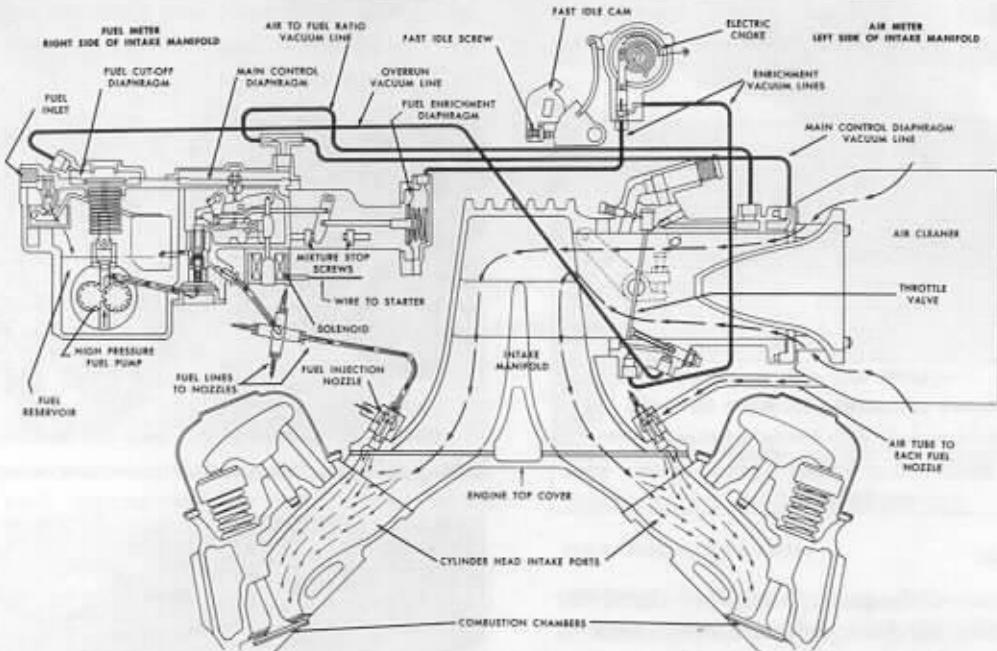
### "CORVETTE V8" WITH RAMJET FUEL INJECTION



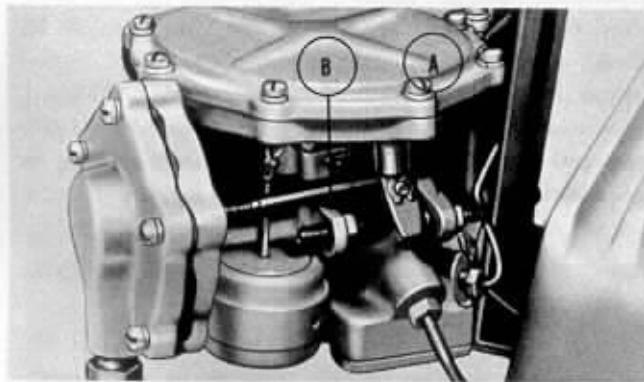
Chevrolet's revolutionary Ramjet Fuel Injection system is one of the principal reasons for the outstanding performance of the R.P.O. 578 "Corvette V8" engine. Carefully engineered and built to unusually high standards of precision, this unit is designed to produce peak power and instantaneous throttle response as originally manufactured. There is no known modification that will measurably improve the maximum performance of a properly calibrated Ramjet Fuel Injection system. However, the production unit includes some auxiliary systems that are

not absolutely necessary on a specialized competition car. Purely for the sake of simplicity, it is possible to remove the fuel cutoff system, the automatic choke and enrichment system, and the cold start solenoid in the fuel metering system. Where regulations permit, the air cleaner sometimes is removed unless dust is a hazard. If you remove any of these control systems, be sure to block completely the balance ports in the air meter venturi, and seal all other openings that occur.

## COMPETITION TUNING



Proper adjustment and maintenance are essential to best performance with Ramjet Fuel Injection. Study the system until you know the exact function of each related part. Do not experiment — make only necessary adjustments and perform these with great care, in strict accordance with the Chevrolet Fuel Injection Shop Manual S&M 14 which is available to all Chevrolet dealers. The system must be kept meticulously clean, but never use tools to clean the tiny fuel injection nozzle orifices — use only air and solvent. Avoid unnecessary disassembly — the air meter is one example. Do not adjust the fast idle screw on the automatic choke, and never move the exposed mixture stop screws on the fuel meter. These stops are preset during manufacture, under carefully calibrated flow conditions that cannot be approximated.



Mixture control stop screws are preset at factory and must not be adjusted. Stop "A" is Rich, stop "B" is Lean.

## FUEL REQUIREMENT

Fuel is very important in stock car competition, and must be carefully matched to a highly tuned engine. At most events, fuel is controlled by the sanctioning organization. Be sure to determine in advance the type and rating of fuel available. With 10.5:1 compression ratio, best performance requires 100+ octane gasoline, but the R.P.O. 578 engine as manufactured will perform satisfactorily in competition on 97 octane fuel. In rare cases where lower octane fuel must be used, it may be necessary to lower compression slightly by doubling cylinder head gaskets.

## VALVE LASH AND TIMING

Strict adherence to production valve lash and valve timing will avert serious trouble. Adjust lash at idle speed, with engine at stabilized normal operating temperature. Recommended settings are .012" inlet, .018" exhaust. Check valve timing carefully: inlet opens 35° B.T.C. and closes 72° A.B.C.; exhaust opens 76° B.B.C. and closes 31° A.T.C.

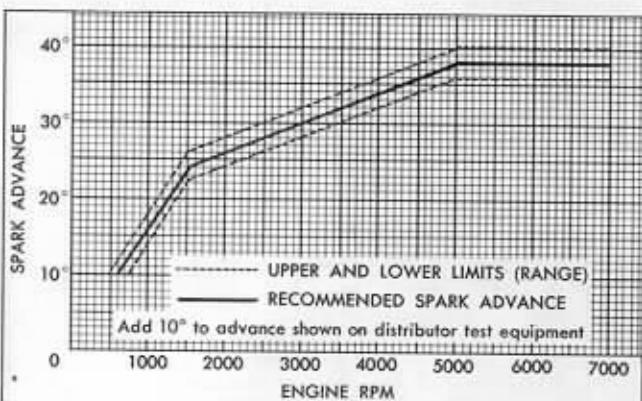
## DISTRIBUTOR

Be sure the distributor is operating according to specification. Shaft, rotor, and cam lobes must run straight and true. Check alignment of the dual breaker points, dwell, and breaker arm spring tension, which should be 19-23 ounces. Recommended breaker point gap is .018". Cap must seat properly and high tension cables fit firmly.

## COMPETITION TUNING

### SPARK PLUGS

Plugs are a traditional subject of discussion in racing circles. While many mechanics have strong personal preferences, the AC 42 plug is recommended, unless you are certain another model is better suited to your requirements. Torque plugs to 20-25 foot-pounds. Normal gap is .033"-.038", but a closer setting may prove better for certain events.

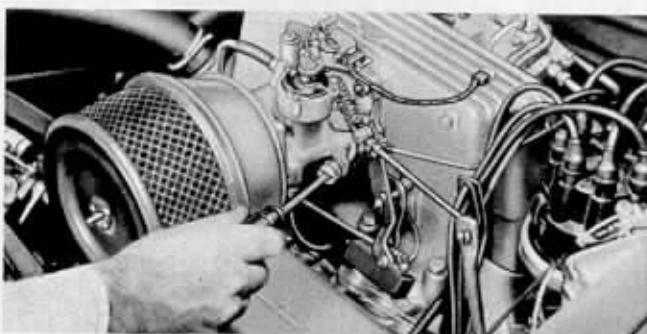


### SPARK ADVANCE

Check spark advance of the properly adjusted distributor on a first-class testing machine. Advance curve must be within tolerance band indicated on the above chart. Initial setting is 10° at 700 r.p.m. idle, or 16° at 1000 r.p.m. Never try to road-check spark advance by luggering the engine at low speeds — the R.P.O. 578 Chevrolet V8 will not develop pre-ignition "ping." Check distributor setting very thoroughly — excessive advance can produce serious detonation and total failure at competition speeds.

### IDLE ADJUSTMENT

Recommended idle is 700 r.p.m. with the engine at normal operating temperature, and the engine is designed to operate smoothly at this speed. Adjustment screws are shown below. Before starting the engine, open both screws two turns. Start and warm up engine, then turn first the air screw then the fuel screw as necessary for final adjustment.



With warm engine, air adjustment screw determines best idle speed.



Fuel adjustment screw smooths out idle at proper speed.

## SPARE PARTS AND EQUIPMENT

Only experience and good judgment can help you determine the proper spare parts to have on hand for stock car competition. If you intend to participate regularly in events throughout the country, you should plan to have a complete set of parts and other necessary equipment with the car at all times. Some competitors transport cars and spares in huge vans that include a complete machine shop — others drive to the track with everything in the car.

An important point to consider is that few repairs will be possible during an actual race — pit stop time is limited and usually permits only tire changes or addition of fuel, oil or coolant. In a long race it may be necessary to replace all four tires, and a minimum of six mounted spares should be on hand. During trial runs, it is a good plan to have points, plugs, possibly a coil, several primary resistors, a fuel pump, radiator pressure cap and engine gaskets on hand. Include other parts through experience.

Since rear axle ratio differs from track to track, it's best to have a complete set of gears. Eventually you may need

only three gear sets for a certain track — the calculated one plus the next higher and lower ratios in case of weather or track surface changes. Be sure to have several axle housing gaskets and the special lubricant along. Experience alone can indicate what springs you will need. After the race, the engine may be disassembled for official inspection, requiring a complete set of engine gaskets. If you drive or tow the car home from the track, a spare rear axle with shafts, one front wheel knuckle unit, and a steering linkage unit are useful in case an accident requires replacement before the car can be moved. An extra set of brake shoes is good insurance.

In addition to spare parts, certain other equipment will be required for competition. Properly fitting helmets are required for every driver, and must be of approved design. Optional items include uniforms for crew members and other things that contribute to the traditional color of the sport.



## REGISTRATION

Numerous associations now sponsor or sanction stock car competition events. All have rules and requirements by which drivers, car owners, and mechanics must be guided. In addition, each organization has specifications which stock cars must meet to qualify for competition.

Registration and/or licensing of personnel as well as cars entering competition also is required. Formal entry for each event usually is necessary. For complete information, contact the association sanctioning events in which you plan to enter.

### SANCTIONING ORGANIZATIONS

Four of the largest associations that sanction stock car races are listed below. Several others are well known in more localized areas throughout the country.

#### NASCAR • National Association for Stock Car Auto Racing

42 S. Peninsula Drive, Daytona Beach, Florida  
Mr. William France, President, or Mr. Pat Purcell

#### USAC • United States Auto Club

P.O. Box 6201, Speedway City 24, Indiana  
Mr. Duane Carter, Director of Competition

#### IMCA • International Motor Contest Association

2815 W. Locust St., Davenport, Iowa  
Mr. Frank Harris, Secretary

#### MARC • Midwest Association for Race Cars, Inc.

3201 Glenwood Ave., Toledo 10, Ohio  
Mr. John Marcum

### LICENSING

A typical association requires that all drivers, car owners, and mechanics be licensed, for which there is a nominal fee. Usual requirements for licensing of a driver call for proof of age (21 years minimum), driving ability and

good physical condition. Licenses are usually granted only after a driving test and physical examination. Associations may not permit a licensed driver to compete in races sanctioned by another organization.

### CAR REGISTRATION

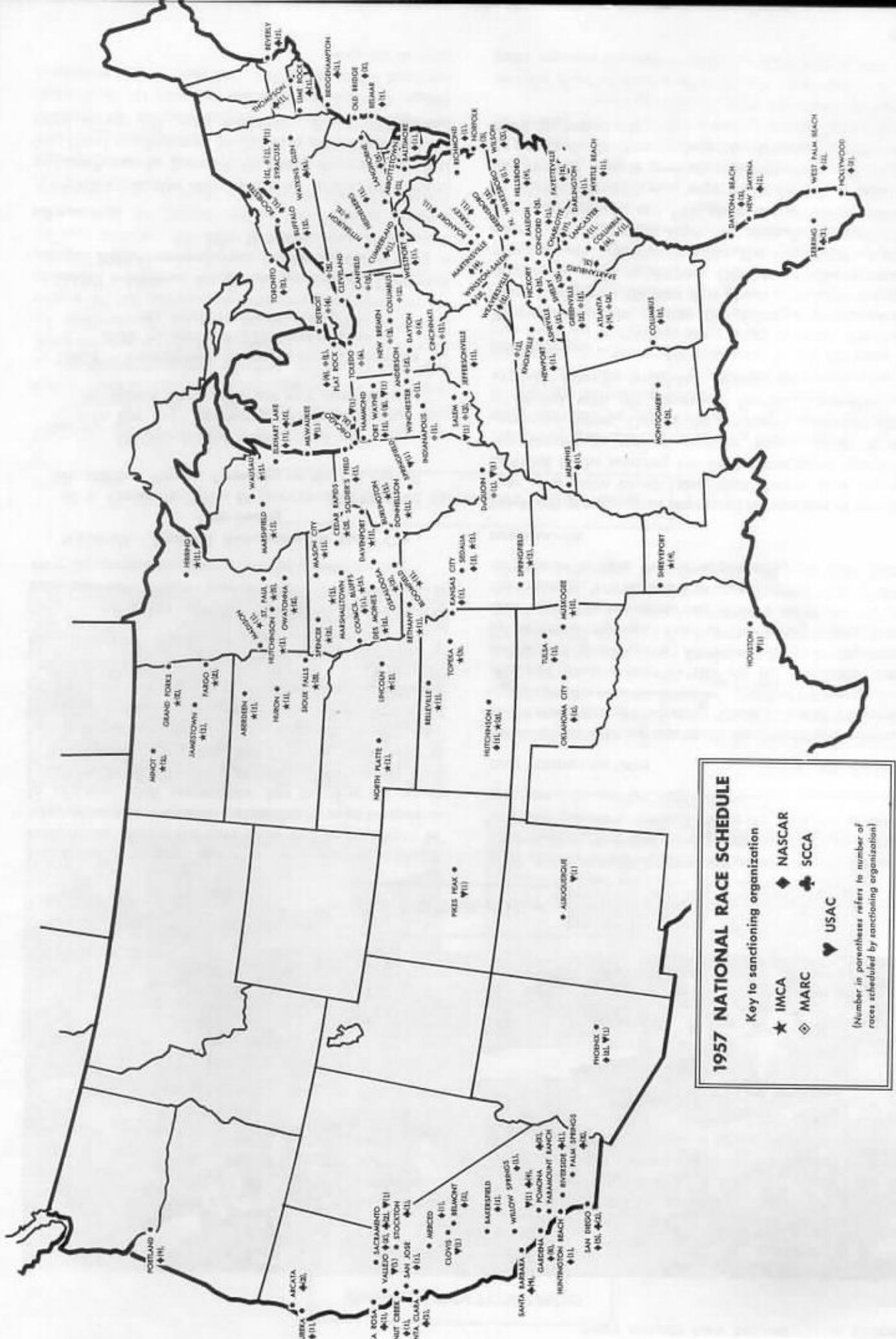
All stock cars entering sanctioned races must be registered and licensed before competing. There is usually a nominal registration fee. Car numbers are assigned by the association and must appear on the car in accordance with established specifications. All cars must pass inspection by technical representatives of the racing organization after signing in before a race. When a car is entered for the first time, it is advisable to appear at the track as soon as possible to have the car approved before time trials.

### INSURANCE

Most racing associations require all competitors to participate in a group benefit plan. Cost may or may not be included in the licensing fee. Such plans are designed to pay benefits in case of damage, injury, or death by accidental means. Usually the association-sponsored plan is funded with life insurance. Specific information is available from the individual associations.

### INSPECTION

Racing associations require that winning cars — usually those finishing in the first five places — be inspected for compliance with regulations. Officials usually impound winning cars immediately after the race, with careful examination of the first three cars normally required and checking of fourth and fifth place cars at the discretion of officials. The entrant is expected to furnish mechanics and suitable tools to perform whatever disassembly may be required. Be sure to have the necessary gaskets on hand for reassembly.



### 1957 NATIONAL RACE SCHEDULE

CHEVROLET

