

General Information and Maintenance



HOW TO USE THIS BOOK

Chilton's Repair & Tune-Up Guide for the Corvette is intended to help you learn more about the inner workings of your vehicle and save you money on its upkeep and operation.

The first two chapters will be the most used, since they contain maintenance and tune-up information and procedures. Studies have shown that a properly tuned and maintained car can get at least 10% better gas mileage than an out-of-tune car. The other chapters deal with the more complex systems of your car. Operating systems from engine through brakes are covered to the extent that the average do-it-yourselfer becomes mechanically involved. This book will not explain such things as rebuilding the differential for the simple reason that the expertise required and the investment in special tools make this task uneconomical. It will give you detailed instructions to help you change your own brake pads and shoes, replace points and plugs, and do many more jobs that will save you money, give you personal satisfaction, and help you avoid expensive problems.

A secondary purpose of this book is a reference for owners who want to understand their car and/or their mechanics better. In this case, no tools at all are required.

Before removing any bolts, read through the entire procedure. This will give you the overall view of what tools and supplies will be required. There is nothing more frustrating than having to walk to the bus stop on Monday morning because you were short one bolt on Sunday afternoon. So read ahead and plan ahead. Each operation should be approached logically and all procedures thoroughly understood before attempting any work.

All chapters contain adjustments, maintenance, removal and installation procedures, and repair or overhaul procedures. When repair is not considered practical, we tell you how to remove the part and then how to install the new or rebuilt replacement. In this way, you at least save the labor costs. Backyard repair of such components as the alternator is just not practical.

Two basic mechanic's rules should be mentioned here. One, whenever the left side of the car or engine is referred to, it is meant to specify the driver's side of the car. Conversely, the right side of the car means the passenger's side. Secondly, most screws and bolts are removed by turning counterclockwise, and tightened by turning clockwise.

Safety is always the most important rule. Constantly be aware of the dangers involved in working on an automobile and take the proper precautions. (See the section in this chapter "Servicing Your Vehicle Safely" and the SAFETY NOTICE on the acknowledgment page.)

Pay attention to the instructions provided. There are 3 common mistakes in mechanical work:

1. Incorrect order of assembly, disassembly or adjustment. When taking something apart or putting it together, doing things in the wrong order usually just costs you extra time; however, it CAN break something. Read the entire procedure before beginning disassembly. Do everything in the order in which the instructions say you should do it, even if you can't immediately see a reason for it. When you're taking apart something that is very intricate (for example, a carburetor), you might want to draw a picture of how it looks when assembled at one point in order to make sure you get everything back in its

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proper position. (We will supply exploded view whenever possible). When making adjustments, especially tune-up adjustments, do them in order; often, one adjustment affects another, and you cannot expect even satisfactory results unless each adjustment is made only when it cannot be changed by any other.

2. Overtorquing (or undertorquing). While it is more common for overtorquing to cause damage, undertorquing can cause a fastener to vibrate loose causing serious damage. Especially when dealing with aluminum parts, pay attention to torque specifications and utilize a torque wrench in assembly. If a torque figure is not available, remember that if you are using the right tool to do the job, you will probably not have to strain yourself to get a fastener tight enough. The pitch of most threads is so slight that the tension you put on the wrench will be multiplied many, many times in actual force on what you are tightening. A good example of how critical torque is can be seen in the case of spark plug installation, especially where you are putting the plug into an aluminum cylinder head. Too little torque can fail to crush the gasket, causing leakage of combustion gases and consequent overheating of the plug and engine parts. Too much torque can damage the threads, or distort the plug, which changes the spark gap.

There are many commercial products available for ensuring that fasteners won't come loose, even if they are not torqued just right (a very common brand is "Loctite®"). If you're worried about getting something together tight enough to hold, but loose enough to avoid mechanical damage during assembly, one of these products might offer substantial insurance. Read the label on the package and make sure the product is compatible with the materials, fluids, etc. involved before choosing one.

3. Crossthreading. This occurs when a part such as a bolt is screwed into a nut or casting at the wrong angle and forced. Cross threading is more likely to occur if access is difficult. It helps to clean and lubricate fasteners, and to start threading with the part to be installed going straight in. Then, start the bolt, spark plug, etc. with your fingers. If you encounter resistance, unscrew the part and start over again at a different angle until it can be inserted and turned several turns without much effort. Keep in mind that many parts, especially spark plugs, use tapered threads so that gentle turning will automatically bring the part you're threading to the proper angle if

you don't force it or resist a change in angle. Don't put a wrench on the part until it's been turned a couple of turns by hand. If you suddenly encounter resistance, and the part has not been seated fully, don't force it. Pull it back out and make sure it's clean and threading properly.

Always take your time and be patient; once you have some experience, working on your car will become an enjoyable hobby.

TOOLS AND EQUIPMENT

Naturally, without the proper tools and equipment it is impossible to properly service your vehicle. It would be impossible to catalog each tool that you would need to perform each or any operation in this book. It would also be unwise for the amateur to rush out and buy an expensive set of tools on the theory that he may need one or more of them at sometime.

The best approach is to proceed slowly, gathering together a good quality set of those tools that are used most frequently. Don't be misled by the low cost of bargain tools. It is far better to spend a little more for better quality. Forged wrenches, 10 or 12 point sockets and fine tooth ratchets are by far preferable to their less expensive counterparts. As any good mechanic can tell you, there are few worse experiences than trying to work on a car or truck with bad tools. Your monetary savings will be far outweighed by frustration and mangled knuckles.

Begin accumulating those tools that are used most frequently; those associated with routine maintenance and tune-up.

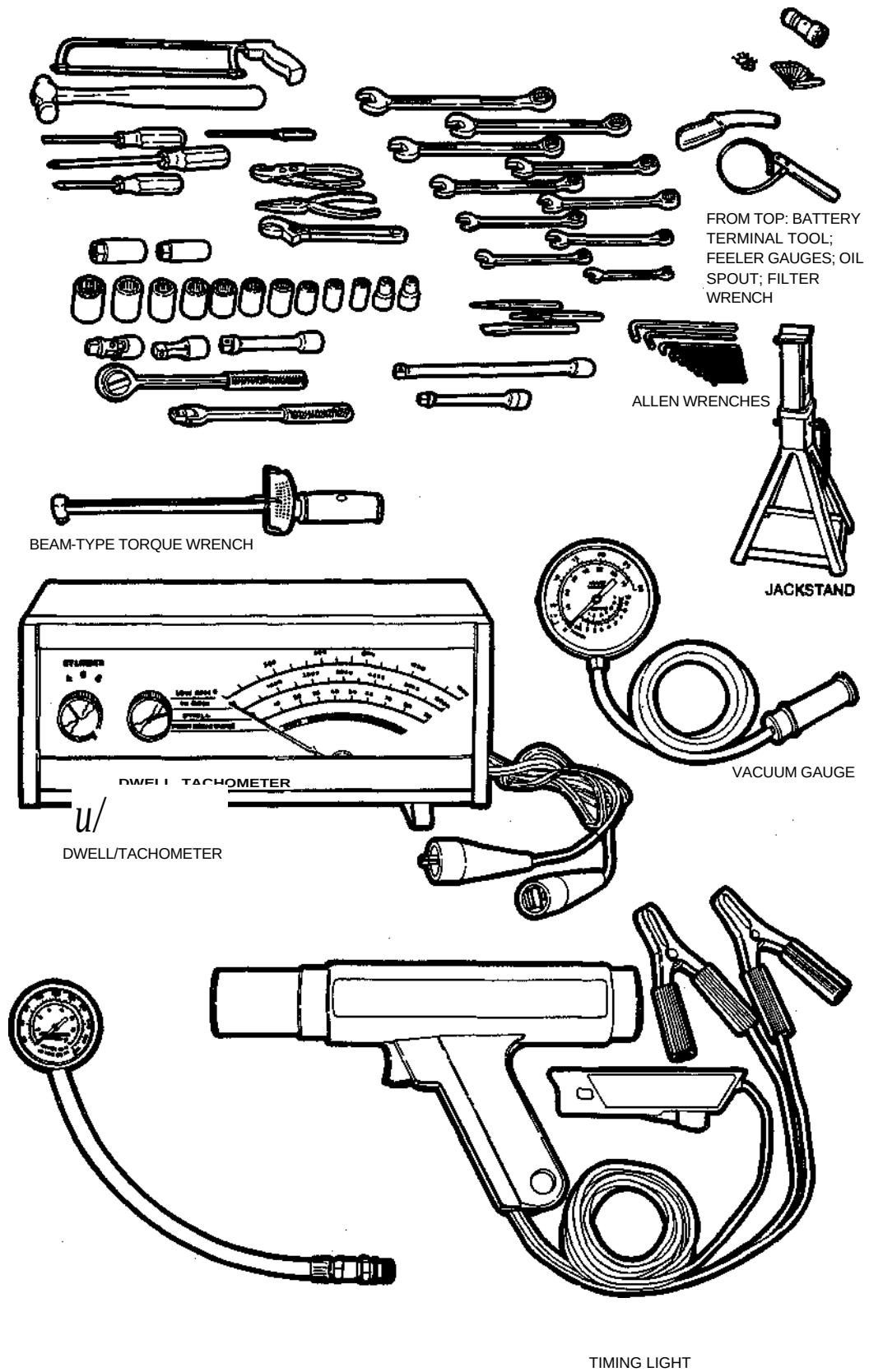
In addition to the normal assortment of screwdrivers and pliers you should have the following tools for routine maintenance jobs:

1. SAE (or Metric) or SAE/Metric wrenches—sockets and combination open end/box end wrenches in sizes from $\frac{1}{2}$ in. (13 mm) to $\frac{1}{2}$ in. (19 mm) and a spark plug socket ($\frac{13}{16}$ in. or $\frac{1}{2}$ in. depending on plug type).

If possible, buy various length socket drive extensions. One break in this department is that the metric sockets available in the U. S. will all fit the ratchet handles and extensions you may already have ($\frac{1}{2}$, $\frac{3}{4}$, and $\frac{1}{2}$ in. drive);

2. Jackstands—for support;
3. Oil filter wrench;
4. Oil filler spout—for pouring oil;
5. Grease gun—for chassis lubrication;
6. Hydrometer—for checking the battery;

COMPRESSION GAUGE



You need only a basic assortment of hand tools and test instruments for most maintenance and repair jobs

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7. A container for draining oil;
8. Many rags for wiping up the inevitable mess.

In addition to the above items there are several others that are not absolutely necessary, but handy to have around. These include oil drier, a transmission funnel and the usual supply of lubricants, antifreeze and fluids, although these can be purchased as needed. This is a basic list for routine maintenance, but only your personal needs and desire can accurately determine your list of tools. If you are serious about maintaining your own car, then a floor jack is as necessary as a spark plug socket. The greatly increased utility, strength, and safety of a hydraulic floor jack makes it pay for itself many times over through the years.

The second list of tools is for tune-ups. While the tools involved here are slightly more sophisticated, they need not be outrageously expensive. There are several inexpensive tach/dwell meters on the market that are every bit as good for the average mechanic as a \$100.00 professional model. Just be sure that it goes to at least 1,200-1,500 rpm on the tach scale and that it works on 4, 6 or 8 cylinder engines. A basic list of tune-up equipment could include:

1. Tach-dwell meter.
2. Spark plug wrench.
3. Timing light (a DC light that works from the car's battery is best, although an AC light that plugs into 110V house current will suffice at some sacrifice in brightness);
4. Wire spark plug gauge/adjusting tools.
5. Set of feeler blades.

Here again, be guided by your own needs. A feeler blade will set the points as easily as a dwell meter will read dwell, but slightly less accurately. And since you will need a tachometer anyway . . . well, make your own decision.

In addition to these basic tools, there are several other tools and gauges you may find useful. These include:

1. A compression gauge. The screw-in type is slower to use, but eliminates the possibility of a faulty reading due to escaping pressure.
2. A manifold vacuum gauge.
3. A test light, volt-ohm meter.
4. An induction meter. This is used for determining whether or not there is current in a wire. These are handy for use if a wire is broken somewhere in a wiring harness.

As a final note, you will probably find a torque wrench necessary for all but the most

basic work. The beam type models are perfectly adequate, although the newer click type are more precise.

Special Tools

Normally, the use of special factory tools is avoided for repair procedures, since these are not readily available for the do-it-yourself mechanic. When it is possible to perform the job with more commonly available tools, it will be pointed out, but occasionally, a special tool was designed to perform a specific function and should be used. Before substituting another tool, you should be convinced that neither your safety nor the performance of the vehicle will be compromised.

Some special tools are available commercially from major tool manufacturers. Others can be purchased from your car dealer. *NOTE: Chevrolet special tools referred to in this guide are available through the Service Tool Division, Kent-Moore Corporation, 29784 Little Mack, Roseville, MI 48066-2298. In Canada, contact Kent-Moore of Canada, Ltd., 2395 Cawthra Mississauga, Ontario, Canada L5A 3P2.*

SERVICING YOUR VEHICLE SAFELY

It is virtually impossible to anticipate all of the hazards involved with automotive maintenance and service but care and common sense will prevent most accidents.

The rules of safety for mechanics range from "don't smoke around gasoline," to "use the proper tool for the job." The trick to avoiding injuries is to develop safe work habits and take every possible precaution.

Do's

- Do keep a fire extinguisher and first aid kit within easy reach.
- Do wear safety glasses or goggles when cutting, drilling, grinding or prying, even if you have 20-20 vision. If you wear glasses for the sake of vision, then they should be made of hardened glass that can serve also as safety glasses, or wear safety goggles over your regular glasses.
- Do shield your eyes whenever you work around the battery. Batteries contain sulphuric acid; in case of contact with the eyes or skin, flush the area with water or a mixture

of water and baking soda and get medical attention immediately.

- Do use safety stands for any undercar service. Jacks are for raising vehicles; safety stands are for making sure the vehicle stays raised until you want it to come down. Whenever the vehicle is raised, block the wheels remaining on the ground and set the parking brake.

- Do use adequate ventilation when working with any chemicals. Like carbon monoxide, the asbestos dust resulting from brake lining wear can be poisonous in sufficient quantities.

- Do disconnect the negative battery cable when working on the electrical system. The primary ignition system can contain up to 40,000 volts.

- Do follow manufacturer's directions whenever working with potentially hazardous materials. Both brake fluid and antifreeze are poisonous if taken internally.

- Do properly maintain your tools. Loose hammerheads, mushroomed punches and chisels, frayed or poorly grounded electrical cords, excessively worn screwdrivers, spread wrenches (open end), cracked sockets, slipping ratchets, or faulty droplight sockets can cause accidents.

- Do use the proper size and type of tool for the job being done.

- Do when possible, pull on a wrench handle rather than push on it, and adjust your stance to prevent a fall.

- Do be sure that adjustable wrenches are tightly adjusted on the nut or bolt and pulled so that the face is on the side of the fixed jaw.

- Do select a wrench or socket that fits the nut or bolt. The wrench or socket should sit straight, not cocked.

- Do strike squarely with a hammer—avoid glancing blows.

- Do set the parking brake and block the drive wheels if the work requires that the engine be running.

Dont's

- Don't run an engine in a garage or any where else without proper ventilation—EVER! Carbon monoxide is poisonous; it takes a long time to leave the human body and you can build up a deadly supply of it in your system by simply breathing in a little every day. You may not realize you are slowly poisoning yourself. Always use power vents, windows, fans or open the garage doors.

- Don't work around moving parts while wearing a necktie or other loose clothing. Short sleeves are much safer than long, loose sleeves and hard-toed shoes with neoprene soles protect your toes and give a better grip on slippery surfaces. Jewelry such as watches, fancy belt buckles, beads or body adornment or any kind is not safe working around a car. Long hair should be hidden under a hat or cap.

- Don't use pockets for toolboxes. A fall or bump can drive a screwdriver deep into your body. Even a wiping cloth hanging from the back pocket can wrap around a spinning shaft or fan.

- Don't smoke when working around gasoline, cleaning solvent or other flammable material.

- Don't smoke when working around the battery. When the battery is being charged, it gives off explosive hydrogen gas.

- Don't use gasoline to wash your hands; there are excellent soaps available. Gasoline may contain lead, and lead can enter the body through a cut, accumulating in the body until you are very ill. Gasoline also removes all the natural oils from the skin so that bone dry hands will suck up oil and grease.

- Don't service the air conditioning system unless you are equipped with the necessary tools and training. The refrigerant, R-12, is extremely cold and when exposed to the air, will instantly freeze any surface it comes in contact with, including your eyes. Although the refrigerant is normally non-toxic, R-12 becomes a deadly poisonous gas in the presence of an open flame. One good whiff of the vapors from burning refrigerant can be fatal.

HISTORY

The 1963 Corvette Stingray is a complete departure from the Corvettes which preceded it. The body, frame, and front and rear suspensions are all of new design. Engines and transmissions are the only components that were shared with the older models. Stingray body styling evolved from the original William Mitchell Stingray sports/racing car which competed in 1959-60. Fiberglass bodywork was retained, but included a steel, reinforcing framework around the passenger compartment. The convertible model, with or without hardtop, was retained and a new body style added, the fastback coupe. Retractable

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headlights, rotated by two electric motors, were also a new feature for the Corvette.

The frame is a ladder type with five cross-members. The wheelbase has been reduced from the 102 in. of previous models to a more compact 98 in., and the rear track shortened by 2 in. This, coupled with component relocation, resulted in a 48/52 percent front/rear weight distribution; a marked improvement over the 53 percent front weight bias of earlier model Corvettes. Overall body height was reduced by 2 in. Front and rear suspensions are both independent and newly designed for the Stingray. The short/long arm front suspension has the upper arm tilted at an angle of 9° for an anti-dive effect under braking. Steering knuckles pivot in ball joints, instead of the king pins and bushings of the early Corvettes. The fully independent rear suspension is sprung with a nine-leaf transverse spring. Universal-jointed axle driveshafts transmit power to the wheels. Steering gear is recirculating ball type and the linkage includes a hydraulic damper. Power steering and brakes both became optionally available for the first time on a Corvette. Brake drums were enlarged and the brakes were made self-adjusting. Air conditioning became optionally available in late 1963.

1964 saw detail body changes: functional passenger-compartment exhaust vents and elimination of the split rear window on the coupe, removal of the non-functional vents on the hood, and new wheel covers. The Muncie four-speed transmission, introduced in mid-year 1963 to replace the Borg-Warner T-10, became the optional four-speed. The solid lifter engines received larger intake and exhaust valves, and horsepower increased from 340 to 365 and from 360 to 375 for the carburetted and fuel-injected engines respectively. Transistorized, breakerless ignition became optionally available on high performance engines in 1964.

In 1965, the big change was the introduction of four-wheel disc brakes. Braking power and fade resistance were greatly increased over the drum brakes. A flat hood replaced the 1964 hood which had twin indentations and other body changes included restyled wheel covers and functional exhaust vents behind the front wheels. A new version of the 327 cubic inch engine was introduced, the 350 horsepower, hydraulic-cam option. In mid-year, a 396 cubic inch 425 horsepower engine was made available in the Corvette. 396 Corvettes were distinguished by the domed hood

required for carburetor clearance. Cars equipped with the 396 received a larger front stabilizer bar and the addition of a rear stabilizer bar. Side-mounted exhausts with chambered mufflers joined the option list in 1965.

The 250, 365, and 375 horsepower engines were dropped in 1966. The 300 horsepower, 327 cubic inch engine became the standard power plant and the standard three-speed transmission was synchronized in all forward gears. The 396 was bored out to 427 cubic inches and offered in two versions, a 425 horsepower and a milder 390 horsepower model. A heavy-duty, four-speed transmission was introduced for use with the high performance 427. Body changes included a new, egg-crate grille, restyled wheel covers, and the addition of backup lights.

1967 body styling changes included a hood scoop on 427 Stingrays, more subdued exhaust vents on the front fenders, and a center back-up light. Wheels were widened ½ inch to 6 inches and were slotted. The full wheel covers of former models were discarded for trim rings and center caps. The handbrake was changed to the pull-up type, and relocated to the center console. The 300, 350, and 390 horsepower engines remained the same for 1967. A triple-two barrel carburetor set-up was added to the 390 horsepower 427 engine which added an additional 10 horsepower. Also, the same carburetor arrangement was added to the former 425 horsepower engine along with large port aluminum cylinder heads and a matching large port intake manifold. The three-two barrel carburetion also added 10 horsepower to this engine.

For the 1968 Corvette, a completely redesigned body and interior were installed on a basically unchanged chassis. Many of the styling features of the new body had been previewed on the Mako Shark show car. Overall body width and height were reduced, while front and rear tread increased with the use of one inch wider wheels. The convertible model was retained and the fast-back coupe was replaced with a hardtop model featuring removable roof panels and rear window. Headlights on 1968 and later cars are raised automatically, with vacuum power when the lights are switched on. Wide oval F70-15 tires replaced the 7.75-15 tires of previous years. The two-speed, Powerglide automatic transmission was superseded by the three-speed Turbo Hydra-Matic, a significant improvement for general driving and

performance usage. Engines remained the same, except for the addition of the air-injection reactor pump to control exhaust emissions. Corvettes sold in California have been equipped with the A.I.R. system since 1966.

Body styling remained the same for 1969 except for the addition of a Stingray script above the engine exhaust vent. The doors were slightly reshaped, widening the cockpit by one inch at shoulder height. Wheel width was increased to 8 inches, which also increased front and rear tread. The anti-theft ignition, steering, and transmission lock were introduced in 1969, with the ignition switch mounted on the steering column. Side exhausts were offered for the first time on the new body in 1969. Headlight washers were now included in the standard equipment. The small block stroke was increased to give a displacement of 350 cubic inches; however, horsepower ratings remained the same. 427 engine options remained the same for 1969 with the exception of the redesigned L88 engine. The 2nd design L88 used a large-port aluminum intake manifold with a single 850 cfm Holley carburetor, aluminum large-port open chamber cylinder heads, special camshaft with solid lifters, and redesigned HD connecting rods with 7/8" rod bolts. Also, the rare ZL-1 427 engine was an option on models of this year. The ZL-1 had the same horsepower rating of the L88 (430 hp) and shared many internal components with the L88. The rarity of the ZL-1 engine comes with the fact that it used an aluminum cylinder block with cast iron cylinder liner sleeves.

A new grille, larger parabolic reflector turn signals, and wheel well flares were added to the Stingray body for 1970. Cast metal grilles were added over the engine compartment exhaust vents and the tailpipe exits were made rectangular. The seats were redesigned, lowering them one inch for more headroom and making the headrests integral. The 427 stroke was increased for 1970 to give a displacement of 454 cubic inches. Triple, two-barrel carburetion was dropped from the big blocks in 1970. A 370 horsepower 350 cubic inch engine, the LT-1, was introduced to answer the need for a solid lifter, high rpm small block engine. The three-speed, manual transmission was discontinued in 1970, and the four-speed transmission and Positraction rear axle were made standard equipment.

Horsepower was decreased in 1971 through an across-the-board compression reduction. The 350 horsepower, hydraulic-cam version

of the small block was deleted from the option list.

1972 saw very few changes made to the Corvette. Rated horsepower was again down, due mostly to a new rating system which utilizes net instead of gross power outputs. The audio alarm antitheft system is not a standard item, and the fiber optic light monitors have been discontinued. Only three engines are offered for 1972, two 350 cubic inch engines and one 454 cubic inch engine. There were no body changes, except for the addition of four new colors.

1973 saw the Corvette receive a new front end with a resilient body color bumper. The cool air induction hood covers the windshield wipers, allowing the wiper door and mechanism to be eliminated. New body mounts and extra soundproofing were also added for 1973. GR70-15 steel-belted radial tires are standard equipment. As far as the small-block engines are concerned, the LT-1 engine was discontinued for this model year. The successor to the LT-1 engine was the L82 high performance engine which used the same short block as the LT-1 but through the use of a hydraulic camshaft and a Quadrajet carburetor, the engine was again down on power. The 454 Turbo-jet was also available with a rating of 275 horsepower.

1974 was a year of very little change for the Corvette. A resilient rear section was added similar to the front system introduced in 1973. Three engines continued to be available, except in California where only the two 350s were available.

Changes to the 1975 Corvette include a catalytic reactor to reduce emissions, a fuel cell-type fuel tank, and the dropping of the 454 engine.

Only one Corvette body style was available for 1976, the convertible was dropped. The Turbo Hydra-Matic 350 replaced the 400 on the base engine. A partial steel underbody replaced the traditional fiberglass, which both improved body strength and heat protection from the exhaust system.

1977 was a year of refinements and a slight appearance change from the 1976 model.

The 1978 Corvette received its most extensive change since its introduction of the current series in 1968 with a new fastback roof line resulting in a new cockpit design and a larger cargo area. A larger 24 gallon fuel cell type fuel tank is used for greater fuel capacity. Increased horsepower and torque ratings

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are achieved for the special performance engine over the base engine as a result of improvements of the induction and exhaust systems. The base engine uses a Muncie 4-speed manual transmission while the special performance engine uses a Borg-Warner. Both engines use the same Turbo Hydra-Matic transmission.

1979 was a year of very little change with slight refinements of performance and appearance.

In 1980, the Corvette weight reduction plan was initiated. The following components were lightened to reduce the weight of the Corvette: front and rear bumper systems, hood, door panels, windshield and door glass (reduced thickness), selected frame members, and exhaust system. Appearance changes for 1980 include an integral front air dam, deeply recessed front grilles with integral parking lamps, cornering lamps, integral rear spoiler and functional black louvers on the front fenders. Transmission changes include the use of a locking torque convertor with the automatic transmission, and new gear ratios for the 4-speed manual transmission. Engine availability remains unchanged except for California models. California powertrain availability is limited to the new (to the Corvette) 305 engine with an automatic transmission. Miscellaneous components relating to drive train weight loss include the use of an aluminum intake manifold on the L82 engine, stainless steel exhaust manifolds on the 305 California engine, and a new aluminum differential mounting for all models.

The 1981 Corvette has only slight improvements in appearance and convenience items compared to the previous year. Both 350 engines (L48 and L82) and the 305 have been discontinued for 1981. A new L81 350-4 bbl. engine is the only engine available for 1981. The Corvette recorded an industry first this year through the introduction of an FRP (Fiberglass Reinforced Plastic) rear spring which replaces the previous mutli-leaf metal rear spring assembly.

In 1982, appearance and convenience item changes are again minimal. The 350 4-bbl. engine has been discontinued and a 350 engine with twin-throttle body fuel injection (TBI) was introduced. The twin TBI system, referred to as "Cross-fire Injection" by the Chevrolet marketing force, is said to improve both throttle response and fuel economy as compared to the previous 4-bbl. carburetion system. Also, a new 4-speed automatic overdrive transmission with a locking torque con-

vertor is the only transmission available in 1982.

There is no 1983 Corvette model, but the 1984 Corvette is the first completely new design in over fifteen years. A new uniframe design body structure incorporates high technology components such as forged aluminum suspension arms and fiberglass transverse leaf springs. The much-improved performance and handling characteristics of the 1984 Corvette continues the tradition of the ultimate American sport car. The L83 350 V8 with Cross Fire Fuel Injection is the only available engine in the 1984 Corvette, but two transmissions are offered. The THM 700 R4 automatic is standard, with an 83 mm 4 speed manual with automatic overdrive optional. The power rack and pinion steering and Z-51 suspension package combine to provide precision and predictability at all speeds, along with the highest lateral acceleration figure (.95G) ever recorded for a production model at the CM Proving Grounds.

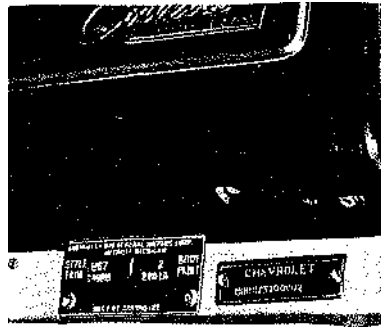
Corvettes have proven themselves in all types of automotive competition, and the Stingray has continued to bear the Corvette standard in many forms of racing. A Stingray coupe won the first race entered in October 1962 at Riverside Raceway. Since then, Corvettes have continued their winning ways in road racing in the SCCA A and B-Production classes. Corvettes have also taken numerous trophies in drag racing, in both the stock and modified classes. Sebring, Daytona, and Le Mans have witnessed many Corvette entries; Corvettes have placed well overall and succeeded in winning the GT class several times at these endurance races. The aerodynamic Stingray has also been utilized several times in setting Grand Touring class records during the Bonneville Speed Weeks. Just recently, a stock-bodied 1968 Corvette roadster equipped with a twin-turbocharged 430 cid big-block engine broke the stock-bodied record at Bonneville with two 240+ mph runs. That racing improves the breed has certainly proved to be true in the case of the Corvette, with many race-proven pieces having become standard equipment or options on production Corvettes.

SERIAL NUMBER IDENTIFICATION

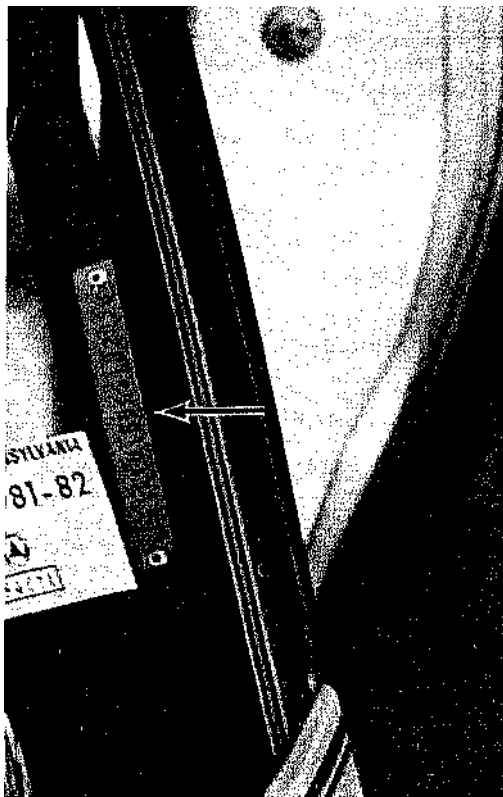
Vehicle

The 1963 through 1967 Corvette vehicle serial number, body style, body trim number,

and paint combination is located on the instrument panel reinforcing member directly under the glove compartment. The vehicle serial number plate is located on the top left of the instrument panel (1968—76) and on the inside left windshield pillar post (1977-82). The body, trim, and paint number plate is located on the upper left hand door hinge pillar (1968-78) and on the upper horizontal surface of the shroud (1979—84). The vehicle serial number identifies the body style, model year, assembly plant, engine usage (1976-84), and production number.



1963-67 vehicle serial number location



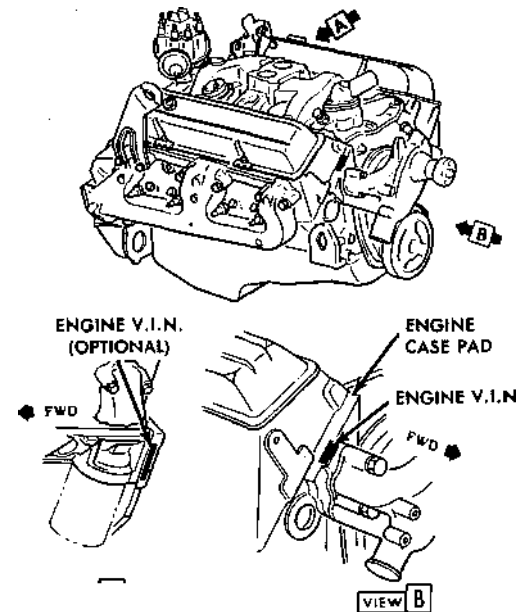
Serial number location on the drivers side windshield pillar—1977-82 models

INTERPRETING THE SERIAL NUMBER

A typical vehicle serial number tag yields manufacturer's identity, vehicle type, model year, engine type, assembly plant and production unit number when broken down as shown in the following charts.

Engine

All Corvette engine identification numbers are stamped on a pad of the engine block which is located at the lower front edge of the right side cylinder head. The first letter designates the plant in which the engine was manufactured and the numbers which follow identify the production date. The two or three letter suffix identifies the engine type and related equipment. On 1972 and later models, if the engine in the vehicle is known to be original, the fifth digit (1972-80) and the eighth digit (1981-84) of the serial number may also identify the engine used in the vehicle.



VIEW A Typical engine serial number location

V.I.N. Chart 1963-71

1

Mir Identity ¹	Body Style ²	Model Year ³	Assy Plant ⁴	Unit No. ⁵
	5645			100025

¹ Manufacturer's identity number assigned to all Chevrolet built vehicles

² Model identification

³ Last number of model year (1968)

⁴ F-Flint

⁵ Unit numbering will start at 100,001 at all plants

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V.I.N. Chart 1981-84

Restraint		Basic						
Mfr. Identity ¹	System Type ²	Car Model ³	Body Type ⁴	Engine Model ⁵	Check Digit ⁶	Model Year ⁷	Assy. Plant ⁸	Unit Number ⁹
		400.001	87		9			
¹ Manufacturers identity number assigned to all Chevrolet built		passenger cars						
² A—Non-passive restraint with manual seat belts								
³ Y—Corvette								
⁴ 87—Two door hardtop coupe								
⁵ Engine code : 6(1981), 8(1982-84)								
⁶ Manufacturers use only								
⁷ B—1981, C—1982, E—1984, etc.								
⁸ S—St. Louis, 5—Bowling Green								
⁹ Unit numbering varies depending upon model								

V.I.N. Chart 1972-80

Mfr. Identity ¹	Series Code ² Letter	Body Style ³	Engine Model ⁴	Model Year ⁵	Assem- bly Plant ⁶	Unit Num- ber ⁷
1	N	47				100025
¹ Manufacturer's identity number assigned to all Chevrolet built vehicles						
² Model identification						
³ Model identification						
⁴ Engine code						
⁵ Last number of model year (1974) ⁶ F-Flint						
⁷ Unit numbering will start at 000001 or 100,001 depending on the model						

Engine Identification

1963-64 327 cubic inch engine	
Manual transmission	RC
Manual transmission and high performance	RD
Special high performance	RE
Manual transmission and fuel injection	RF
Powerglide	SC
Powerglide and high performance	SD
1964 327 cubic inch engine	
Manual transmission and A/C	RP
Manual transmission, high performance, A/C	RQ
Manual transmission, special high performance, A/C	RR
Manual transmission and transistor ignition	RT
Fuel injection and transistor ignition	RX
Manual transmission, transistor ignition, A/C	RU
Powerglide and A/C	SK
Powerglide, high performance, A/C	SL
1965 327 cubic inch engine	
Manual transmission	HE
High performance	HF
Fuel injection	HG
Special high performance	HH
A/C	HI
High performance and A/C	HJ

Engine Identification (cont.)

1965 327 cubic inch engine	
Special high performance and A/C	HK
Transistor ignition	HL
Transistor ignition and A/C	HM
Fuel injection and transistor ignition	HN
Powerglide	HO
Powerglide and high performance	HP
Powerglide and A/C	HQ
Powerglide, high performance, A/C	HR
Special high performance and hydraulic lifters	HT
Special high performance, hydraulic lifters, A/C	HU
Special high performance, hydraulic lifters, transistor ignition	HV
Special high performance, hydraulic lifters, transistor ignition, A/C	HW
396 cubic inch engine	
Special high performance	IF
1966 327 cubic inch engine	
Manual transmission	HE
A.I.R.	HH
A.I.R. and Powerglide	HR
Special high performance and A.I.R.	HD
Powerglide	HO
Special high performance	HT
Power steering, special high performance, A.I.R.	HP
Special high performance, A/C, A.I.R.	KH
427 cubic inch engine	
Special high performance and hydraulic lifters	IK
High performance	IL
A.I.R.	IM
Special high performance	IP
Powerglide	IQ
Powerglide and A.I.R.	IR
1967 327 cubic inch engine	
Manual transmission	HE
A.I.R.	HH

Engine Identification (cont.)

1967 327 cubic Inch engine	
A.I.R. and Powerglide	HR
Special high performance and A.I.R.	HD
Powerglide	HO
Special high performance	HT
Power steering, special high performance, A/C	HP
Special high performance, A/C, A.I.R.	KH

427 cubic Inch engine	
4-speed or Powerglide	IL
Triple carburetion	JC
A.I.T., special high performance, triple carburetion	JE
Heavy duty	IT
Aluminum heads	ID
A.I.R.	IM
A.I.R. and triple carburetion	JF
A.I.R. and aluminum heads	JH
Powerglide	IQ
Powerglide and triple carburetion	JD
A.I.R. and Powerglide	IR
A.I.R., triple carburetion, Powerglide	JG
A.I.R., special high performance, triple carburetion	JA

1968 327 cubic inch engine	
Manual transmission	HE
Turbo Hydra-Matic	HO
Power steering and A/C	HP
Special high performance	HT

427 cubic inch engine	
High performance	IL
High performance and triple carburetion	IM
High performance, triple carburetion, Turbo Hydra-Matic	IO
Turbo Hydra-Matic	IQ
Special high performance and triple car- buretion	IR
High performance	IT
Special high performance, triple carbure- tion, aluminum heads	ID

1969 350 cubic inch engine	
High performance	HW
High performance and A/C	HX
Manual transmission	HY
Turbo Hydra-Matic	HZ

427 cubic inch engine	
High performance, Turbo Hydra-Matic	LL
High performance	LM
Triple carburetion, high performance, Turbo Hydra-Matic	LN
Heavy duty (L88)	LO
Aluminum heads	LP
Triple carburetion and high performance	LQ
Triple carburetion and special high perfor- mance	LR

Engine Identification (cont.)

427 cubic inch engine	
Triple carburetion, special high performance, heavy duty clutch Heavy duty and Turbo	LU
Hydra-Matic Triple carburetion, special high performance, Turbo Hydra-Matic	LV LX

1970 350 cubic inch engine	
Manual transmission	CTL
Turbo Hydra-Matic	CTM
High performance	CTN
High performance and A/C/	CTO
High performance and transistor ignition	CTP
High performance, transistor ignition, A/C	CTQ
Special high performance	CTR
Special high performance and transistor ig- nition	CTU
Special high performance, transistor ignition, 4-speed	CTV
High performance, 4-bbl carburetor, Turbo Hydra-Matic	CZN
High performance, 4-bbl carburetor, transistor ignition	CRI

454 cubic inch engine	
High performance, 4-bbl carburetor, Turbo Hydra-Matic	CGW
High performance and 4-bbl	
Heavy duty with 4-bbl	CZU
Heavy duty with 4-bbl and Turbo Hydra-Matic	CZL
High performance, 4-bbl, transistor ignition	CZN

1971 350 cubic inch engine	
270 hp, 4-speed 270 hp, THM 330 hp, 4- speed 330 hp, THM 330 hp, 4-speed (HD)	CJL CGT CGZ CJK

454 cubic inch engine	
365 hp, THM 365 hp, 4-speed 425 hp, 4- speed 425 hp, THM	CGY CPJ CPH CPW CPX

1972 350 cubic inch engine	
200 hp with 4-speed	CKW
200 hp with 4-speed and NOX control (Calif.)	CDH
200 hp with Turbo Hydra-Matic 200 hp with Turbo Hydra-Matic and NOX	CKX CDJ
control (Calif.) 255 hp with 4-speed 255 hp with Turbo Hydra-Matic 255 hp with 4-speed and A.I.R. 255 hp with Turbo Hydra-Matic and A.I.R.	CKY CKZ CRT CRS

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Engine Identification (cont.)

454 cubic Inch engine	
270 hp with 4-speed	CPH
270 hp with Turbo Hydra-Matic	CPJ
270 hp	CSR.C

1973 350 cubic inch engine	
190 hp with 4-speed	CKZ
190 hp with 4-speed (Calif.)	CLB
190 hp with Turbo Hydra-Matic	CLA
190 hp with Turbo Hydra-Matic (Calif.)	CLC
250 hp with 4-speed	CLR
250 hp with 4-speed (Calif.)	CIS
250 hp with Turbo Hydra-Matic	CLD
250 hp with Turbo Hydra-Matic (Calif.)	CLH

454 cubic inch engine	
275 hp with 4-speed	CWM
275 hp with 4-speed (Calif.)	CWT
275 hp with Turbo Hydra-Matic	CWR
275 hp with Turbo Hydra-Matic (Calif.)	CWS

1974 350 cubic inch engine	
195 hp with 4-speed	CKZ
195 hp with 4-speed (Calif.)	CLB
195 hp with Turbo Hydra-Matic	CLA
195 hp with Turbo Hydra-Matic (Calif.)	CLC
250 hp with 4-speed	CLR
250 hp with 4-speed (Calif.)	CLS
250 hp with Turbo Hydra-Matic	CLD
250 hp with Turbo Hydra-Matic (Calif.)	CLH

454 cubic inch engine	
270 hp with 4-speed	CWM
270 hp with 4-speed (Calif.)	CWT
270 hp with Turbo Hydra-Matic	CWR
270 hp with Turbo Hydra-Matic (Calif.)	CWS

1975 350 cubic inch engine	
195 hp with 4-speed	CRJ, CUA, CUB
195 hp with Turbo Hydra-Matic	CRK
250 hp with 4-speed	CRL, CUT, CUD
250 hp with Turbo Hydra-Matic	CRM

1976 350 cubic inch engine	
180 hp, 210 hp	CLM, CLR, CLS, CKW, CKX, CLS, CHC, CHR, CKC

1977 350 cubic inch engine	
180 hp, 210 hp	CKZ, CLA, CLB, CLC, CHD, CKD, CLD, CLF

1978 350 cubic inch engine	
185 hp (Calif.)	CLR
185 hp (high altitude)	CLS

Engine Identification (cont.)

1978 350 cubic inch engine	
185 hp AT. (Fed.) 185hpM.T. 225 hp M.T. 225hpA.T.	CUT CLM CMR CMS

1979	
195 hp (Calif.)	ZAC
195 hp with 4-speed	ZAA
195 hp with Turbo Hydra-Matic	ZAB
195 hp (High altitude)	ZAD
225 hp with 4-speed	ZBA
225 hp with Turbo Hydra-Matic	ZBB

1980	
305 engine	ZCA
Std. 350 eng. (L48) w/M.T. Std. 350 eng. (L48) W/A.T. Hi Pert. 350 eng. (L82) w/M.T. Hi pert. 350 eng. (L82) w/A.T.	ZAM ZAK ZBD ZBC

1981	
Federal models w/M.T. Calif, models w/M.T. Federal models w/AT. Calif, models w/A.T.	ZDA ZDC ZDD

1982	
Federal models Calif, models	ZDB ZBA ZBC

1984	
	ZFC, ZFD, ZFF, ZFN, ZFM

Transmission

350 (L83)
5.7L EFI

THREE-SPEED MANUAL

The Muncie 3-speed serial number is located on a boss above the filler plug. The Borg-Warner T-16, 3-speed serial number is located on a boss at the right rear corner of the transmission extension.

FOUR-SPEED MANUAL

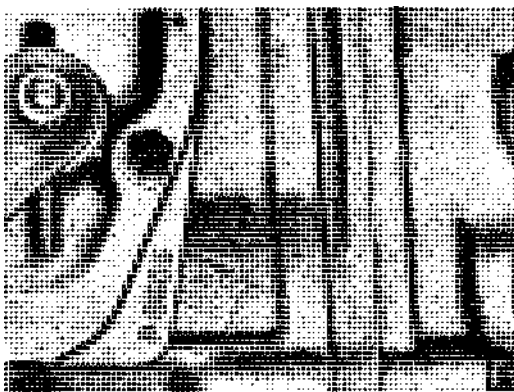
Serial numbers of 4-speed transmissions used in models prior to 1979 are located at one of the three following locations: left side cover flange; left side of the case to the rear of the cover; or the left side of the case below the side cover.

1979 and later transmission I.D. numbers are located on a flange at the right side top of the case.

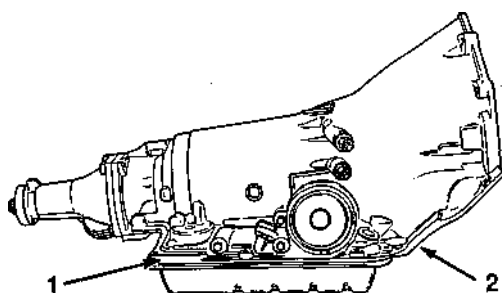
TURBO HYDRA-MATIC

1978 and prior THM 350 serial numbers are located on the right side vertical face of the transmission oil pan.

1979 and later 3-speed automatic transmissions are coded either on the right side of the case above the front of the oil pan or on the case above the left rear of the oil pan. The THM 400 and the THM 700-R4 4-speed automatic transmissions serial number is located on a tag attached to the transmission case above the right rear corner of the oil pan.



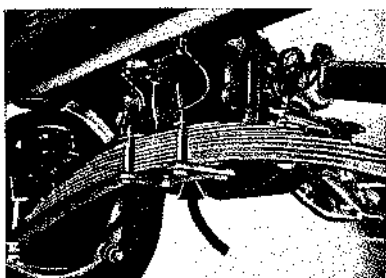
Muncie 4-speed serial number location



Typical automatic transmission stamped serial number location (1) and VIN number location (2)

Rear Axle

All Corvette Stingrays have the rear axle serial number located on the bottom surface of the carrier at the cover mounting flange. The two or three-letter prefix in the serial number identifies the rear-axle gear ratio.



Rear axle serial number

Rear Axle Ratio Identification

Year	Prefix	Axle Ratio and Type
1963-64	CA	3.36 with 3-speed
	CJ	3.08 Positraction
	CB	3.36 Positraction
	CC	3.55 Positraction
	CD	3.70 Positraction
	CE	4.11 Positraction
	CF	4.56 Positraction
	CZ	3.08 with 4-speed
	CX	3.70 with 4-speed
1965	AK	3.36
	AL	3.08 Positraction
	AM	3.36 Positraction
	AN	3.55 Positraction
	AO	3.70 Positraction
	AP	4.11 Positraction
	AQ	4.56 Positraction
	AR	3.08
	AS	3.70 with 4-speed 3.08
	AT	Positraction with 396 engine 3.36
	AU	Positraction with 396 engine 3.55
	AZ	Positraction with 396 engine 3.70
	FA	Positraction with 396 engine 4.11
	FB	Positraction with 396 engine 4.56
	FC	Positraction with 396 engine
1966	AK	3.36
	AL	3.08 Positraction
	AM	3.36 Positraction
	AN	3.55 Positraction
	AO	3.70 Positraction
	AP	4.11 Positraction
	AR	3.08 Positraction
	AS	3.70 with 4-speed 3.08
	AT	Positraction with 427 engine 3.36
	AU	Positraction with 427 engine 3.55
	AZ	Positraction with 427 engine 3.70
	FA	Positraction with 427 engine 4.1 1
	FB	Positraction with 427 engine 4.56
	FC	Positraction with 427 engine
1967	AK	3.36
	AL	3.08 Positraction
	AM	3.36 Positraction
	AN	3.55 Positraction
	AO	3.70 Positraction
	AP	4.11 Positraction
	AS	3.70 with 4-speed 3.08
	AT	Positraction with 427 engine 3.36
	AU	Positraction with 427 engine 3.55
	AZ	Positraction with 427 engine

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Rear Axle Ratio Identification (cont.)

Year	Prefix	Axle Ratio and Type
	FA	3.70 Positraction with 427 engine
	FB	4.1 1 Positraction with 427 engine
	FC	4.36 Positraction with 427 engine
1968	AK	3.36"
	AL	3.08 Positraction
	AM	3.36 Positraction
	AN	3.55 Positraction
	AO	3.70 Positraction
	AP	4.11 Positraction
	AS	3.70
	AT	3.08 Heavy duty Positraction
	AU	3.36 Heavy duty Positraction
	AV	3.08 Positraction
	AW	3.08 Heavy duty Positraction
1969	AK	3.36
	AL	3.08 Positraction
	AM	3.36 Positraction
	AN	3.55 Positraction
	AO	3.70 Positraction
	AP	4.11 Positraction
	AS	3.70
	AT	3.08 Heavy duty Positraction
	AU	3.36 Heavy duty Positraction
	AV	3.08
	AW	3.08 Heavy duty Positraction
	AY	2.73 Heavy duty Positraction
	AZ	3.55 Heavy duty Positraction
	FA	3.70 Heavy duty Positraction
	FB	4.11 Heavy duty Positraction
	FC	4.56 Positraction
1970	CAK	3.36
	CAL	3.08 Positraction
	CAM	3.36 Positraction
	CAN,	3.55 Positraction
	CAO,	3.70 Positraction with
	CAS	high performance 350 and close-ratio 4-speed
	CAP	4.11 Positraction
	CAT	3.08 Positraction
	CAU	3.36 Positraction
	CAV	3.08 Positraction
	CAW	3.08 Positraction with Turbo Hydra-Matic
	CAY	2.73 Positraction
	CAX	3.36 Positraction with Turbo Hydra-Matic
	CAZ	3.55 Positraction
	CFA	3.70 Positraction
	CFB	4.11 Positraction
	CFC	4.56 Positraction
	CLR	3.36 Positraction
1971	AA	3.55 Positraction
	AB	3.70 Positraction
	AC	4.11 Positraction
	AD	4.56 Positraction
	AW	3.08 Positraction
	AX, LR	3.36 Positraction

Rear Axle Ratio Identification (cont.)

Year	Prefix	Axle Ratio and Type
1972-75	AX, LR	3.36 Positraction
	AC AB	4.11 Positraction
	AA AW	3.70 Positraction
	AV	3.55 Positraction
		3.08 Positraction
		2.73 Positraction
1976-77	OA LR,	3.08 Positraction
	OD OB	3.36 Positraction
	OC	3.55 Positraction
		3.70 Positraction
1978	OK	3.08 Positraction
	OM	3.36 Positraction
	OH	3.55 Positraction
	OJ	3.70 Positraction
1979	OM	3.36 Positraction
	OH	3.55 Positraction
	OJ	3.70 Positraction
1980	DANA	3.07 Positraction
1981	OJ	2.87 Positraction w/A.T.
	OK	2.72 Positraction w/M.T.
1982	DANA	2.87 Positraction
1984	DANA	3.07 Positraction
		3.31 Positraction

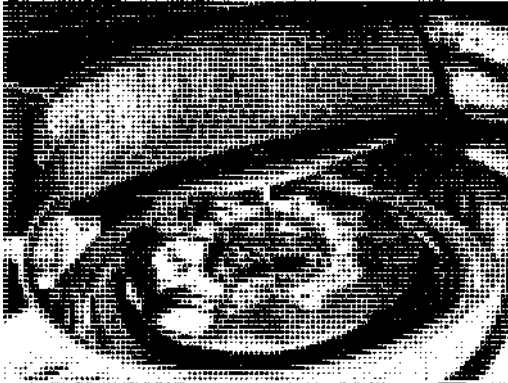
ROUTINE MAINTENANCE Air

Cleaner

The air cleaner consists of a metal housing for a replaceable paper filter or permanent polyurethane element and the necessary hoses connecting it to the crankcase ventilation system. The air cleaner cover is held by a wing nut on all models. If your Corvette is equipped with a paper element, the factory recommends it should be replaced once every 12,000 miles (1963-72), every 24,000 miles (1973-74), every 30,000 miles (1975-84). Inspection and replacement should come more often when the car is operated under dusty conditions. To check the effectiveness of your paper element, remove the air cleaner assembly and, if the idle speed increases noticeably, the element is restricting airflow and should be replaced. Some high-performance models or cars equipped with optional air cleaners use a polyurethane element that must be removed, cleaned, and reoiled at 12,000 mile or 12 month intervals. Remove the filter and clean it in kerosene. Do not use paint thinner or similar solvent and then squeeze it dry. Allow it to soak in SAE 30 oil



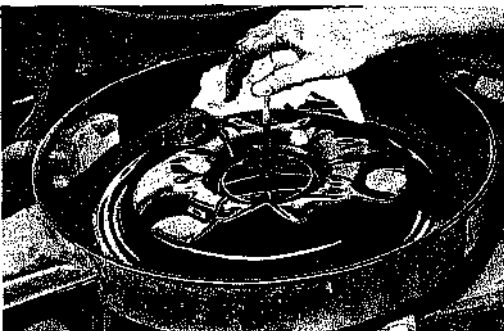
Unscrew the wing nut and remove the cover



Remove and discard the old filter

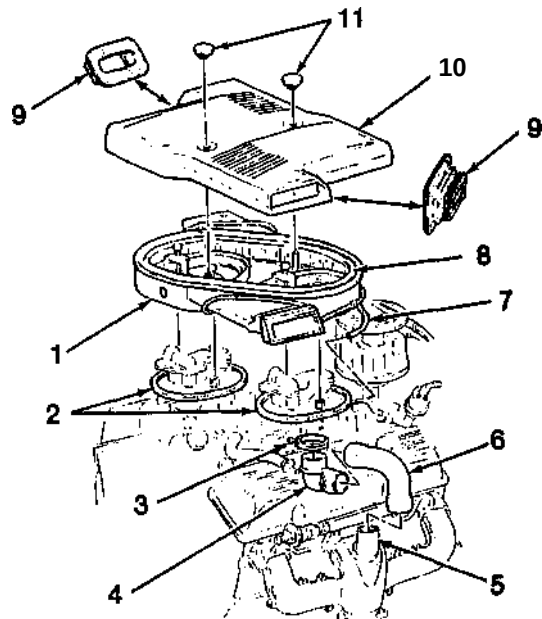


Check the small crankcase breather



Using a clean rag or a paper towel, wipe out the inside of the air cleaner

and again squeeze it dry using a clean cloth to remove excess oil. Clean the inside of the air cleaner housing before reinstalling either type of filter.

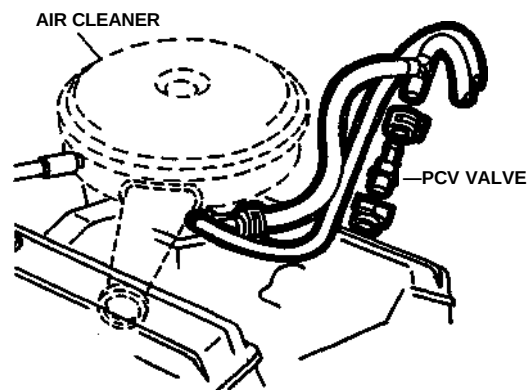


- | | |
|-------------------------|-------------------------|
| 1. Air cleaner assembly | 7. Manifold vacuum hose |
| 2. Gasket | 8. Air filter element |
| 3. Hose clamp | 9. Hood seal |
| 4. Heat stove adapter | 10. Air cleaner cover |
| 5. Heat stove | 11. Knurl nuts |
| 6. Heat stove tube | |

Air cleaner assembly—1984 TBI shown

Positive Crankcase Ventilation (PCV)

The PCV valve is screwed into the carburetor or located in the ventilation hose on 1963 models. 1964 and 1965 models are not equipped with a PCV valve, but use a metered orifice fitting instead. This is not replaced, as it is a permanent part of the system, but it should be cleaned with solvent as a part of regular maintenance. The PCV valve



The PCV valve is located in the rocker arm cover on later models

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is located in the hose or in the rocker cover on later models. Replace the PCV valve and if so equipped the PCV filter, located in the air cleaner, every 12,000 miles (1963-71), every 24,000 miles (1972-74), every 30,000 miles (1975-84).

Evaporative Emissions Control System

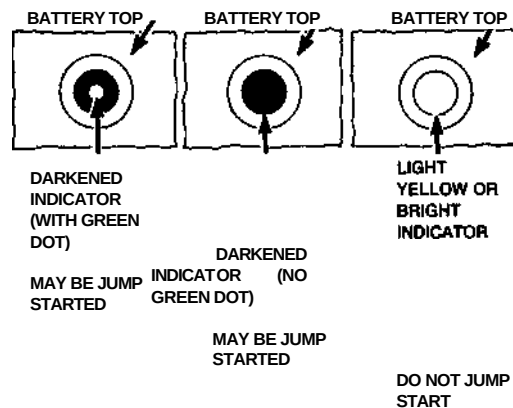
This system, standard since 1970, eliminates the release of unburned fuel vapors into the atmosphere. The only periodic maintenance required is an occasional check of the connecting lines of the system for kinks or other damage and deterioration. Lines should be replaced only with quality fuel line or special hose marked "evap." Every 12,000 miles or 12 months (1970-71), every 24,000 miles or 24 months (1972-74), every 30,000 miles or 24 months (1975-81), the filter in the bottom of the carbon canister which is located in the engine compartment should be removed and replaced. This service is not required on 1982 and later models.

Battery

The major cause of slow engine cranking or a "no-start" condition is battery terminals which are loose, dirty, or corroded. Every 3 months or so, disconnect the battery and clean the terminals of both the battery and the cables. Cleaning tools for this purpose are available at most any auto parts store. When you buy a cleaning tool, be sure to specify whether you have a top terminal or side terminal battery, as the type of tool differs depending upon the style of battery. After you clean the terminals and reconnect the battery, apply a corrosion inhibitor to the terminals. Stay away from using any substance which is not meant specifically for this purpose. Do not apply the corrosion inhibitor to the mating surfaces of the terminals unless specified by the chemical manufacturer.

Batteries themselves can be cleaned using a solution of baking soda and water. Surface coatings on battery cases can actually conduct electricity which will cause a slight voltage drain, so make sure the battery case is clean.

Unless you have a "maintenance-free" battery, check the electrolyte level in the battery (see Battery under Fluid Level Checks in this chapter). Be sure that the vent holes in the caps and the vent tubes are not blocked with grease or dirt. The vent system allows



Maintenance-free batteries contain their own built-in hydrometer

hydrogen gas, formed by the chemical reaction in the battery, to escape freely. If your vehicle is equipped with a Delco Freedom® or Freedom II® battery, check the color of the battery condition indicator (which is actually a built-in hydrometer). If the indicator is green, the battery is sufficiently charged and in good condition. If the indicator is darkened, the battery is discharged. In this case, the reason for the discharge should be determined (e.g.—low alternator output, voltage draw, etc.) then the battery itself should be tested and recharged. If the indicator is light without a green dot visible or if it is yellow in color, the battery must be replaced—DO NOT attempt to test or recharge a battery with this indicator condition. Test the electrical system after the battery has been replaced. **CAUTION:** *On later models with electronic engine controls, the electrical system and control unit can be quickly damaged by improper connections, high-output battery chargers or incorrect service procedures.*

Check the battery cables for signs of wear or chafing. If corrosion is present on the cable or if the cable is visible through the cable jacket, the cable assembly should be replaced. If cable replacement is necessary, it is best to purchase a high-quality cable that has the cable jacket sealed to the terminal ends. See "Jump Starting" for more information.

REPLACEMENT BATTERIES

The cold power rating of a battery measures battery starting performance and provides an approximate relationship between battery size and engine size. The cold power rating of a replacement battery should match or exceed your engine size in cubic inches. Replace the battery tray, if corroded excessively.

Heat Riser

The heat riser is a thermostatically or vacuum operated valve in the exhaust manifold. Not all engines have one. It closes when the engine is warming up, to direct hot exhaust gases to the intake manifold, in order to preheat the incoming fuel/air mixture. If it sticks shut, the result will be frequent stalling during warmup, especially in cold and damp weather. If it sticks open, the result will be a rough idle after the engine is warm. There is only one heat riser on a V8. The heat riser should move freely. If it sticks, apply GM Manifold Heat Control Solvent or something similar (engine cool) to the ends of the shaft. Sometimes rapping the end of the shaft sharply with a hammer (engine hot) will break it loose. If this fails, components must be removed for further repairs. See "Exhaust Manifold" for removal procedures.

Drive Belts

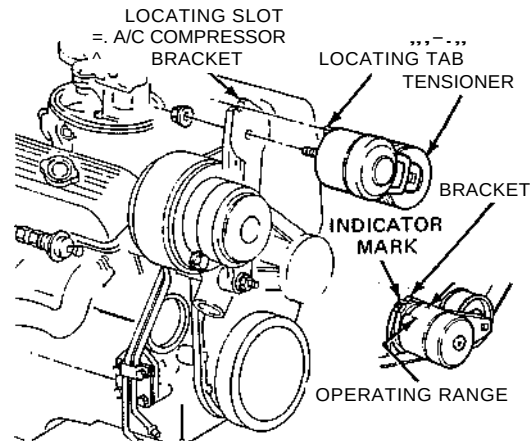
CHECKING AND ADJUSTING TENSION

Check the drive belts every 6,000 miles for evidence of wear such as cracking, fraying, and incorrect tension. Determine the belt tension at a point halfway between the pulleys by pressing on the belt with moderate thumb pressure. The belt should deflect about $\frac{1}{2}$ inch at this point. If the deflection is found to be too much or too little, loosen the mounting bolts and make the adjustments.

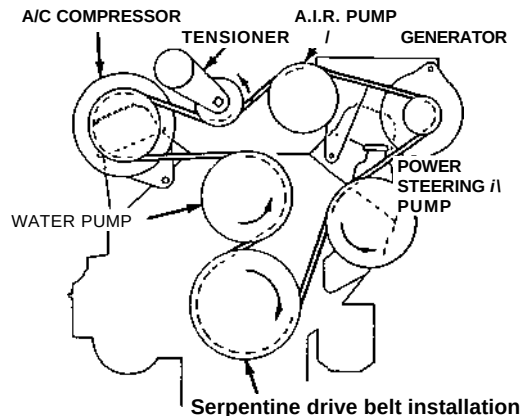
On all 1984 and later engines, a single serpentine belt is used to drive all accessories formerly driven with V-belts. Belt tension is maintained by a spring loaded tensioner which has the ability to maintain belt tension over a broad range of belt lengths. There is an indicator to make sure the tensioner is adjusted to within its operating range. The belt tension is adjusted with a $\frac{1}{2}$ inch breaker bar inserted into the square hole in the tensioner arm and a belt tension gauge (BT 7825 or equivalent) to 120—140 lbs, as read on the



Measuring fan belt tension



Serpentine drive belt tensioner—1984 and later
CRANKSHAFT



Serpentine drive belt installation

tension gauge installed between the alternator and the A.I.R. pump.

Cooling System

CAUTION: Do not perform any coolant system services on a hot engine.

At least once every 2 years, the engine cooling system should be inspected, flushed, and refilled with fresh coolant. If the coolant is left in the system too long, it loses its ability to prevent rust and corrosion. If the coolant has too much water, it won't protect against freezing.

The pressure cap should be looked at for signs of age or deterioration. Fan belt and other drive belts should be inspected and adjusted to the proper tension. (See checking belt tension).

Hose clamps should be tightened, and soft or cracked hoses replaced. Damp spots, or accumulations of rust or dye near hoses, water

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HOW TO SPOT WORN V-BELTS

V-Belts are vital to efficient engine operation—they drive the fan, water pump and other accessories. They require little maintenance (occasional tightening) but they will not last forever. Slipping or failure of the V-belt will lead to overheating. If your V-belt looks like any of these, it should be replaced.



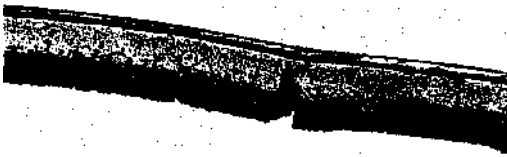
This belt has deep cracks, which cause it to flex. Too much flexing leads to heat build-up and premature failure. These cracks can be caused by using the belt on a pulley that is too small. Notched belts are available for small diameter pulleys.

Cracking or weathering



Softening (grease and oil)

Oil and grease on a belt can cause the belt's rubber compounds to soften and separate from the reinforcing cords that hold the belt together. The belt will first slip, then finally fail altogether.



Glazing

Glazing is caused by a belt that is slipping. A slipping belt can cause a run-down battery, erratic power steering, overheating or poor accessory performance. The more the belt slips, the more glazing will be built up on the surface of the belt. The more the belt is glazed, the more it will slip. If the glazing is light, tighten the belt.



Worn cover

The cover of this belt is worn off and is peeling away. The reinforcing cords will begin to wear and the belt will shortly break. When the belt cover wears in spots or has a rough jagged appearance, check the pulley grooves for roughness.

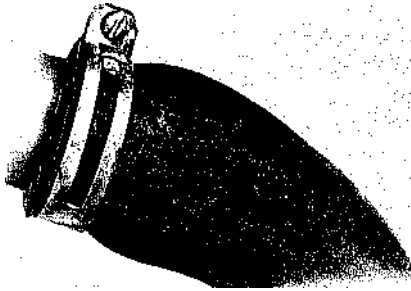


Separation

This belt is on the verge of breaking and leaving you stranded. The layers of the belt are separating and the reinforcing cords are exposed. It's just a matter of time before it breaks completely.

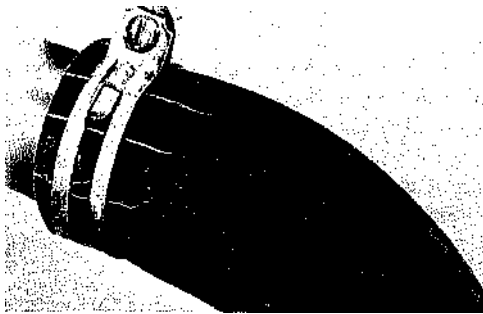
HOW TO SPOT BAD HOSES

Both the upper and lower radiator hoses are called upon to perform difficult jobs in an inhospitable environment. They are subject to nearly 18 psi at under hood temperatures often over 280°F., and must circulate nearly 7500 gallons of coolant an hour—3 good reasons to have good hoses.



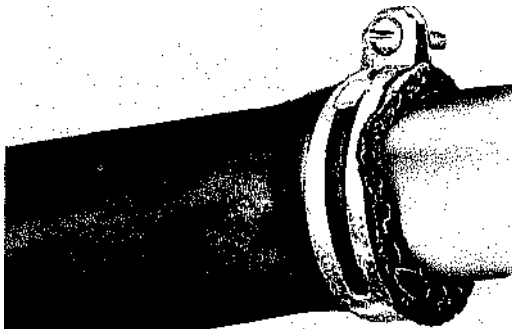
Swollen hose

A good test for any hose is to feel it for soft or spongy spots. Frequently these will appear as swollen areas of the hose. The most likely cause is oil soaking. This hose could burst at any time, when hot or under pressure.



Cracked hose

Cracked hoses can usually be seen but feel the hoses to be sure they have not hardened; a prime cause of cracking. This hose has cracked down to the reinforcing cords and could split at any of the cracks.



Frayed hose end (due to weak clamp)

Weakened clamps frequently are the cause of hose and cooling system failure. The connection between the pipe and hose has deteriorated enough to allow coolant to escape when the engine is hot.



Debris In cooling system

Debris, rust and scale in the cooling system can cause the inside of a hose to weaken. This can usually be felt on the outside of the hose as soft or thinner areas.

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pump or other areas, indicate possible leakage, which must be corrected before filling the system with fresh coolant.

CHECK THE RADIATOR CAP

While you are checking the coolant level, also check the condition of the radiator cap gasket and the seal inside of the cap (if your vehicle uses a coolant recovery system). The radiator cap is designed to seal the cooling system under normal operating conditions which allows the system to build-up a certain amount of pressure (this pressure rating is stamped or printed on the cap). The pressure in the system raises the boiling point of the coolant to help prevent overheating. If the radiator cap does not seal, the boiling point of the coolant is lowered and overheating will occur. If the cap must be replaced, purchase the new cap according to the type of system you have (with or without a coolant recovery tank) and the pressure rating which is specified for your vehicle.

CLEAN RADIATOR OF DEBRIS

Periodically clean any debris—leaves, paper, insects, etc.—from the radiator fins. Pick the large pieces off by hand. The smaller pieces can be washed away with water pressure from a hose.

Carefully straighten any bent radiator fins with a pair of needle nose pliers. Be careful—the fins are very soft. Don't wiggle the fins back and forth too much. Straighten them once and try not to move them again.

DRAIN AND REFILL THE COOLING SYSTEM

Completely draining and refilling the cooling system every two years at least will remove accumulated rust, scale and other deposits. Coolant in late model cars is a 50-50 mixture of ethylene glycol and water for year round

use. Use a good quality antifreeze with water pump lubricants, rust inhibitors and other corrosion inhibitors along with acid neutralizers.

1. Drain the existing antifreeze and coolant. Open the radiator and engine drain petcocks, or disconnect the bottom radiator hose, at the radiator outlet.

NOTE: *Before opening the radiator petcock, spray it with some penetrating lubricant.*

2. Close the petcock or re-connect the lower hose and fill the system with water.

3. **Add a can of quality radiator flush.**

4. Idle the engine until the upper radiator hose gets hot.

5. Drain the system again.

6. Repeat this process until the drained water is clear and free of scale.

7. Close all petcocks and connect all the hoses.

8. If equipped with a coolant recovery system, flush the reservoir with water and leave empty.

9. Determine the capacity of your cooling system (see capacities specifications). Add a 50/50 mix of quality antifreeze (ethylene glycol) and water to provide the desired protection.

10. Run the engine to operating temperature.

11. Stop the engine and check the coolant level.

12. Check the level of protection with an anti-freeze tester, replace the cap and check for leaks.

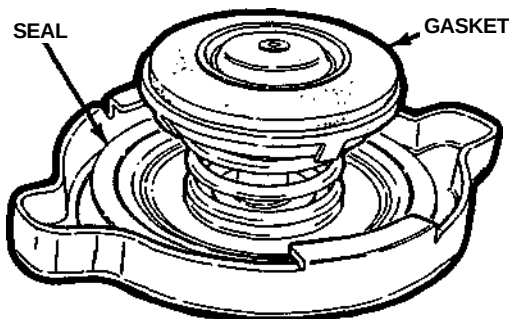
Air Conditioning

SAFETY PRECAUTIONS

There are two particular hazards associated with air conditioning systems and they both relate to the refrigerant gas.

First, the refrigerant gas is an extremely cold substance. When exposed to air, it will instantly freeze any surface it comes in contact with, including your eyes. The other hazard relates to fire. Although normally non-toxic, refrigerant gas becomes highly poisonous in the presence of an open flame. Inhalation of the vapor formed by burning refrigerant can be fatal. Keep all forms of fire (including cigarettes) well clear of the air-conditioning system.

Any repair work to an air conditioning system should be left to a professional. Do not, under any circumstances, attempt to loosen



Check the radiator cap's rubber gasket and metal seal for deterioration at least once a year

or tighten any fittings or perform any work other than that outlined here.

CHECKING FOR OIL LEAKS

Refrigerant leaks show up as oily areas on the various components because the compressor oil is transported around the entire system along with the refrigerant. Look for oily spots on all the hoses and lines, and especially on the hose and tubing connections. If there are oily deposits, the system may have a leak, and you should have it checked by a qualified repairman.

NOTE: A small area of oil on the front of the compressor is normal and no cause for alarm.

CHECK THE COMPRESSOR BELT

Refer to the section in this chapter on "Drive Belts."

KEEP THE CONDENSER CLEAR

Periodically inspect the front of the condenser for bent fins or foreign material (dirt, butts, leaves, etc.) If any cooling fins are bent, straighten them carefully with needlenosed pliers. You can remove any debris with a stiff bristle brush or hose.

OPERATE THE A/C SYSTEM PERIODICALLY

A lot of A/C problems can be avoided by simply running the air conditioner at least once a week, regardless of the season. Simply let the system run for at least 5 minutes a week (even in the winter), and you'll keep the internal parts lubricated as well as preventing the hoses from hardening.

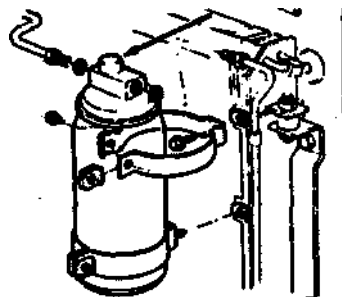
REFRIGERANT LEVEL CHECK

There are two ways to check refrigerant level, depending on how your model is equipped.

With Sight Glass

The first order of business when checking the sight glass is to find the sight glass. It will either be in the head of the receiver/drier, or in one of the metal lines leading from the top of the receiver/drier. Once you've found it, wipe it clean and proceed as follows:

1. With the engine and the air conditioning system running, look for the flow of refrigerant through the sight glass. If the air conditioner is working properly, you'll be able to see a continuous flow of clear refrigerant through the sight glass, with perhaps an occasional bubble at very high temperatures.



Air conditioning sight glass

2. Cycle the air conditioner on and off to make sure what you are seeing is clear refrigerant. Since the refrigerant is clear, it is possible to mistake a completely discharged system for one that is fully charged. Turn the system off and watch the sight glass. If there is refrigerant in the system, you'll see bubbles during the off cycle. If you observe no bubbles when the system is running, and the air flow from the unit in the car is delivering cold air, everything is OK.

3. If you observe bubbles in the sight glass while the system is operating, the system is low on refrigerant. Have it checked by a professional.

4. Oil streaks in the sight glass are an indication of trouble. Most of the time, if you see oil in the sight glass, it will appear as a series of streaks, although occasionally it may be a solid stream of oil. In either case, it means that part of the charge has been lost.

Without Sight Glass

On vehicles that are not equipped with sight glasses, it is necessary to feel the temperature difference in the inlet and outlet lines at the receiver/drier to gauge the refrigerant level. Use the following procedure:

1. Locate the receiver/drier. It will generally be up front near the condenser. It is shaped like a small fire extinguisher and will always have two lines connected to it. One line goes to the expansion valve and the other goes to the condenser.

2. With the engine and the air conditioner running, hold a line in each hand and gauge their relative temperatures. If they are both the same approximate temperature, the system is correctly charged.

3. If the line from the expansion valve to the receiver/drier is a lot colder than the line from the receiver/drier to the condenser, then the system is overcharged. It should be noted that this is an extremely rare condition.

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4. If the line that leads from the receiver/drier to the condenser is a lot colder than the other line, the system is undercharged.

5. If the system is undercharged or overcharged, have it checked by a professional air conditioning mechanic.

Windshield Wipers

Intense heat from the sun, snow and ice, road oils and the chemicals used in windshield washer solvents combine to deteriorate the rubber wiper refills. The refills should be replaced about twice a year or whenever the blades begin to streak or chatter.

WIPER REFILL REPLACEMENT

Normally, if the wipers are not cleaning the windshield properly, only the refill has to be replaced. The blade and arm usually require replacement only in the event of damage. It is not necessary (except on new Tridon refills) to remove the arm or the blade to replace the refill (rubber part), though you may have to position the arm higher on the glass. You can do this turning the ignition switch on and operating the wipers. When they are positioned where they are accessible, turn the ignition switch off.

There are several types of refills available and your vehicle could have any kind, since aftermarket blades do not necessarily use the same refill as original equipment blades. The two most popular original equipment types are what we refer to as the first and the third types. The remaining styles are used mainly as aftermarket replacements.

The first type of blade uses a release button that is pushed down to allow the refill to slide out of the yoke jaws. The new refill slides in and locks in place.

The second type of refill is removed by locating where the metal backing strip (or where the refill) is wider and inserting a small screwdriver between the frame and the metal backing strip. Press down to release the refill from the retaining tab.

The third type of refill is replaced by squeezing the two metal tabs located at the end of the refill and sliding the refill out of the frame jaws. When the new refill is installed, the tabs will click into place and lock the refill.

The fourth type of refill is termed the "poly-carbonate type." The refill of this type is held into place by a locking lever which is pushed

downward out of the groove in the arm to free the refill. The new refill will lock into place automatically as it is installed.

The fifth type of refill is used with the Tridon blade. The Tridon refill has a plastic backing strip with a notch about an inch from the end. Hold the blade (frame) on a hard surface so that it is tightly bowed. Grip the tip of the backing strip and pull upward while twisting counterclockwise. The backing strip will snap out of the retaining tab. Do this for the remaining tabs until the refill is free of the arm. The refills must be replaced with identical new refills.

No matter what type of refill is used, be sure that all of the frame claws engage the refill. Before operating the wipers, be sure that no part of the metal frame contacts the windshield glass.

Fluid Level Checks

ENGINE OIL

The engine oil level is checked with the dipstick, which is located either on the left side of the engine (small-blocks) or the right side of the engine (big-blocks).

NOTE: The oil should be checked before the engine is started or five minutes after the engine has been shut off. This gives the oil time to drain back to the oil pan and prevents an inaccurate oil level reading.

Remove the dipstick from its tube, wipe it clean, and insert it back into the tube. Remove it again and observe the oil level. It should be maintained between the "full" and "add" marks without going above "full" or below "add."

CAUTION: Do not overfill the crankcase. It may result in oil-fouled spark plugs, oil leaks caused by oil seal failure, or engine damage due to foaming of the oil.

MANUAL TRANSMISSION FLUID

Remove the filler plug from the side of the transmission (the upper plug if the transmission has two plugs). The oil should be level with the bottom edge of the filler hole. This should be checked at least once every 6,000 miles and more often if any leakage or seepage is observed. Fill with SAE 80 or 90 multipurpose gear lubricant.

NOTE: The 4 speed overdrive transmission uses two types of fluid. See "Lubrication" for details.

AUTOMATIC TRANSMISSION FLUID

Run the engine until it reaches normal operating temperature. Park the car on a level surface. With the transmission in Park and the engine idling, the fluid level on the dipstick should be between the "foil" mark and $\frac{1}{2}$ inch below "foil" mark. Repkce the dipstick making sure that it is pushed folly into the filler tube.

CAUTION: Do not overfill the automatic transmission. Use Dexron® or Type A automatic transmission fluid or any other equivalent fluid. One pint raises the level from 'add'to "full"

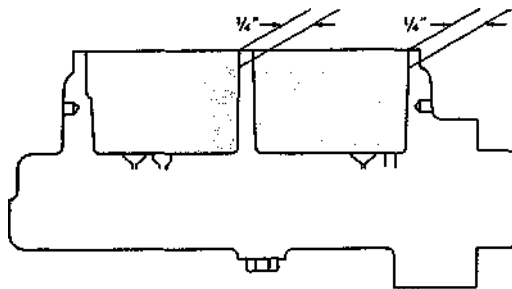
(65 -85°F.) (18 -29 C.)
COOL HOT
ADD $\frac{1}{2}$ PT. — J° — FULL HOT

NOTE: DO NOT OVERFILL. It takes only one pint to raise level from ADD to FULL with a hot transmission.

Automatic transmission dipstick

BRAKE MASTER CYLINDER

Once every 6,000 miles or four months, check the brake fluid level in the master cylinder. The master cylinder is mounted on the fire-wall and is divided into two reservoirs and the fluid level in each reservoir must be maintained at $\frac{1}{4}$ inch below the top edge. Use only heavy-duty brake fluid (DOT 3 or 4), which is recommended for disc brake applications. See "Brakes" for details.



LEVEL CYLINDER

Checking the master cylinder fluid level

COOLANT

Check the coolant level when the engine is cold. The level of coolant should be maintained 2 in. below the bottom of the filler

neck, or the line on expansion tank-equipped models.

CAUTION: Allow the engine to cool considerably and then add water while the engine is running.

STANDARD REAR AXLE

The rear axle oil level should be checked when the chassis is lubricated. Remove the plug from the side of the housing. The lubricant level should be maintained at the bottom of the filler plug hole. When repkcing oil, use SAE 80 or 90 multipurpose hypoid gear lubricant.

POSITRACTION REAR AXLE

Lubricant level should be checked at each chassis lubrication and maintained at the bottom of the filler plug hole. Special Positraction oil must be used in this differential.

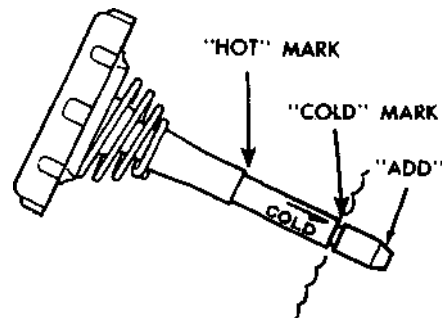
CAUTION: Never use standard differential lubricant in a Positraction differential.

MANUAL STEERING GEAR

Check the lubricant by removing the center bolt on the side cover of the steering gear. Grease must be up to the level of this bolt hole.

POWER STEERING RESERVOIR

Maintain the proper fluid level as indicated on the cap of the reservoir. Check this level with the engine off and warm. Use GM power steering fluid or its equivalent. Note: Avoid using automatic transmission fluid in power steering units except in an emergency.



Power steering dipstick

Tires

INFLATION PRESSURE

Tire inflation is the most ignored item of auto maintenance. Gasoline mileage can drop as

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Capacities & Pressure

Year	Model (cu In.) ©	Engine Crankcase Add 101 for New Filter	Transmission Pts to Refill after Draining				Fuel Tank (gal)	Cooling System (qts)	Max Coolant Pressure (psi)
			Manual		Automatic	Differential (pts)			
			3-spd	4-spd					
1963	327 (hyd. lifters)	4	2	2.5	18	3.7	20	17	13
	327 HP (solid lifters)	5	—	2.5	—	3.7	20	17	13
1964	327 (hyd. lifters)	4	2	2.5	18	3.7	20	17	13
	327 HP (solid lifters)	5	—	2.5	—	3.7	20	17	13
1965	327 (hyd. lifters)	4	2	2.5	18	3.7	20	17	13
	327 (solid lifters)	5	2	2.5	18	3.7	20	17	13
1966	327 (300 hp)	4	3	3.0	18	3.7	20	19	15
	327 HP (350 hp)	5	—	3.0	—	3.7	20	19	15
	427	5	—	3.0	—	3.7	20	22	15
1967	327 (300 hp)	4	3	3.0	19	3.7	20	19	15
	327 HP (350 hp)	5	—	3.0	—	3.7	20	19	15
	427	5	—	3.0	19	3.7	20	22	15
	427 HP	5	—	3.0	—	3.7	20	22	15
1968	327 (300 hp)	4	3	3.0	22	3.7	20	15	15
	327 HP (350 hp)	4	—	3.0	—	3.7	20	15	15
	427	5	—	3.0	22	3.7	20	22	15
	427 HP	5	—	3.0	—	3.7	20	22	15
1969	350 (all)	4	—	3.0	8®	4.0	20	15	15
	427	5	—	3.0	8©	4.0	20	22	15
	427 HP	5	—	3.0	8©	4.0	20	22	15
1970	350 (all)	4	—	3.0	8®	4.0	20	®	15
	454 (all)	5	—	3.0	22	4.0	20	22	15
1971	350 (270 hp)	4	—	3.0	22	4.0	18	15	15
	350 HP (330 hp)	4	—	3.0	—	4.0	18	18	15
	454	5	—	3.0	22	4.0	18	22	15
	454 HP	5	—	3.0	22	4.0	18	20	15
	454					4.0		22	
	350					4.0		IF	
					22				
					8©				
1972	350 (all)	4	—	3.0	22	4.0	18	®	15

		-	3.0			18	15
1973						T ¹⁸	
454 -	3.0			8©	4.0	18	24
							15

Capacities & Pressure (cont.)

			Transmission Pts to Refill after Draining						
Year	Model (cu.in.)©	Engine Crankcase Add 1 qt at far New Filler	Manual		Automatic	Differential (pts)	Fuel Tank (gal)	Cooling System (qts)	Max Coolant Pressure (psi)
			3-spd	4-spd					
1974	350	4	—	3.0	8®	4.0	18	17	17
	454	5	—	3.0	8®	4.0	18	22	23
1975-76	350	4	—	3.0	8©	4.0	18	17	17
1977	350	4	—	3.0	8©	3.75	17	21	15
1978	350	4	—	3.0	6©	3.75	24	21.6	15
1979	350.	4	—	3.0®	6©	3.75	24	21.6	15
1980	305, 350	4	—	3.0®	6®	4.0	24	21®	15
1981	350	4	—	3.0®	6®	4.0	24	21®	15
1982	350	4	—	—	10©	4.0	24	21®	15
1984®	350 —				10®	4.0	20	15	15

4.0

® "HP" denotes high performance engine; "hp" denotes horsepower

© For pan removal and filter change only

© 15 qts. for standard engine, 18 qts. with special high performance (L82) engine

® With automatic transmission and air conditioning add 1 qt.

© With optional close-ratio transmission, subtract 1A qt.

® See "Manual Transmission" for details on 4 speed overdrive

much as .8% for every 1 pound per square inch (psi) of under inflation.

Two items should be a permanent fixture in every glove compartment; a tire pressure gauge and a tread depth gauge. Check the tire air pressure (including the spare) regularly with a pocket type gauge. Kicking the tires won't tell you a thing, and the gauge on the service station air hose is notoriously inaccurate.

The tire pressures recommended for your car are usually found on the glove-box door or in the owner's manual. Ideally, inflation pressure should be checked when the tires are cool. When the air becomes heated it expands and the pressure increases. Every 10° rise (or drop) in temperature means a difference of 1 psi, which also explains why the tire appears to lose air on a very cold night. When it is impossible to check the tires "cold," allow for pressure build-up due to heat. If the "hot" pressure exceeds the "cold" pressure by more than 15 psi, reduce, your speed, load or both. Otherwise internal heat is created in the tire. When the heat approaches the temperature at which the tire was cured, during manufacture, the tread can separate from the body.

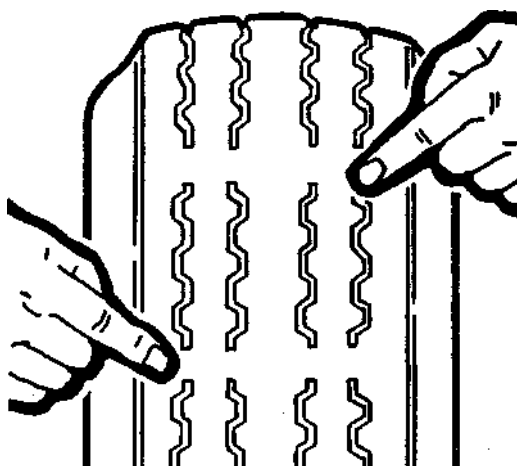
CAUTION: *Never counteract excessive pressure build-up by bleeding affair pressure (letting some air out.) This will only*

further raise the tire operating temperature.

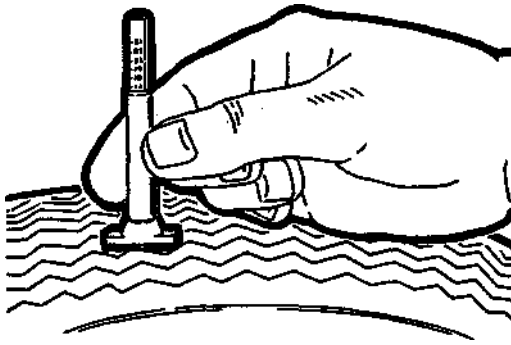
Before starting a long trip with lots of luggage, you can add about 2—4 psi to the tires to make them run cooler, but never exceed the maximum inflation pressure on the side of the tire.

TREAD DEPTH

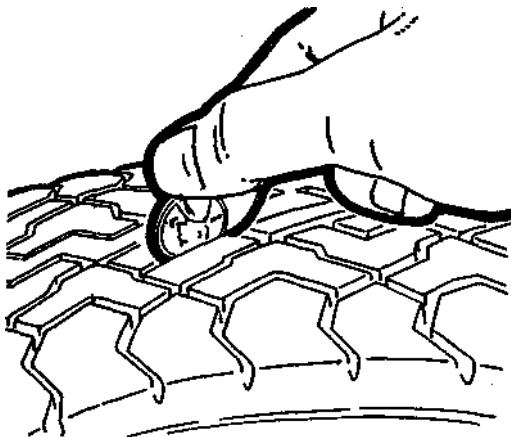
All tires made since 1968, have 8 built-in tread wear indicator bars that show up at W wide smooth bands across the tire when Vie" of



Tread wear Indicators will appear when the tire is worn out



Tread depth can be checked with an inexpensive gauge



A penny works as well as anything for checking tread depth; If the top of Lincoln's head is visible in two or more adjacent grooves, the tires should be replaced

tread remains. The appearance of tread wear indicators means that the tires should be replaced. In fact, many states have laws prohibiting the use of tires with less than 1/16" tread. You can check your own tread depth with an inexpensive gauge or by using a Lincoln head penny. Slip the Lincoln penny into several tread grooves. If you can see the top of Lincoln's head in 2 adjacent grooves, the tires have less than 1/16" tread left and should be replaced. You can measure snow tires in the same manner by using the "tails" side of the Lincoln penny. If you can see the top of the Lincoln memorial, it's time to replace the snow tires.

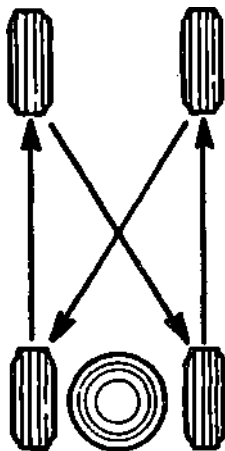
TIRE ROTATION

Tire wear can be equalized by switching the position of the tires about every 6000 miles. Including a conventional spare in the rotation pattern can give up to 20% more tire life. **CAUTION:** Do not include the new "Space-Saver®" or temporary spare tires in the rotation pattern.

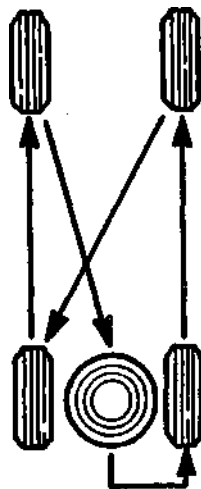
There are certain exceptions to tire rotation, however. Studded snow tires should not be rotated, and radials should be kept on the same side of the car (maintain the same direction of rotation). The belts on radial tires get set in a pattern. If the direction of rotation is reversed, it can cause rough ride and vibration.

NOTE: When radials or studded snows are taken off the car, mark them, so you can maintain the same direction of rotation.

BIAS PLY TIRE 4-WHEEL ROTATION



BIAS PLY TIRE 5-WHEEL ROTATION



RADIAL PLY TIRES 4-WHEEL ROTATION



RADIAL PLY TIRES 5-WHEEL ROTATION



Tire rotation diagrams; note that radials should not be cross-switched

TIRE STORAGE

Store the tires at proper inflation pressures if they are mounted on wheels. All tires should be kept in a cool, dry place. If they are stored in the garage or basement, do not let them stand on a concrete floor; set them on strips of wood.

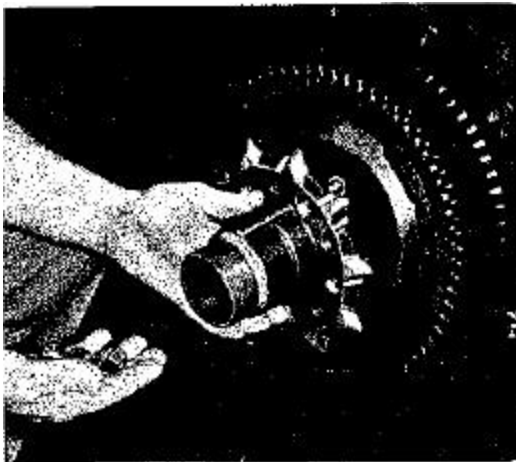
ALUMINUM WHEELS

CAUTION: *If your vehicle has aluminum wheels, whether they are the early "turbine" style or the late (76 and up) slotted style, be VERY careful when using any type of cleaner on either the wheels or the tires. Read the label on the package of the cleaner to make sure that it will not damage aluminum.*

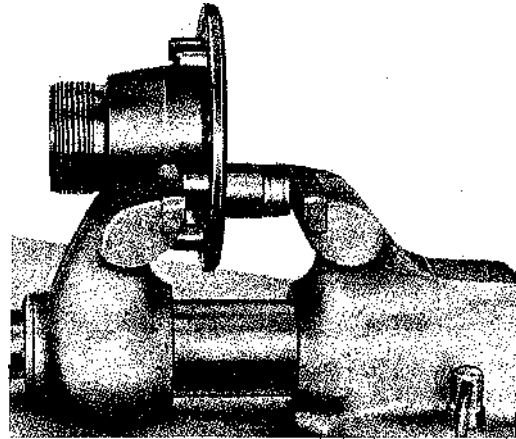
An optional knock-off wheel was introduced with the 1963 Stingray. This wheel option consisted of 15 x 6L cast aluminum wheels, knock-off locking nuts, and wheel adapters. The latter bolt to the hub, using the existing wheel hub bolts. The flange of the adapter had five pins that fitted into corresponding holes in the optional wheels and located the wheel to the hub. The securing device was the single, center, knock-off nut.

Each Corvette delivered with the optional, knock-off aluminum wheels, was equipped with a special knock-off hammer. Owners of these cars were urged to tighten the knock-off nut every 100 miles for the first 500 miles. The suggested method was to strike the ears of the nut eight hard blows.

Should adapter pin replacement become necessary, remove the wheel and tire assembly and remove the adapter from the wheel hub. Select a socket of suitable size that will



Knock-off wheel adapter



Removing adapter pin

slip over the adapter pin. Position the socket over the back of the pin and clamp the entire assembly in a vise so that the socket acts as a spacer to receive the damaged pin. Tighten the vise and press the pin from the adapter. Position the replacement pin and start it into the hole by tapping lightly. Position the spacer socket on the opposite side and again clamp the assembly in the vise. Press the replacement pin into the adapter. Check to see that it seats firmly against its bore. Install the adapter and wheel.

NOTE: *The optional 16 in. cast aluminum wheels on 1984 models are designated for right, left, front or rear installation depending on the cooling fins. Rear wheels are one inch wider than the front.*

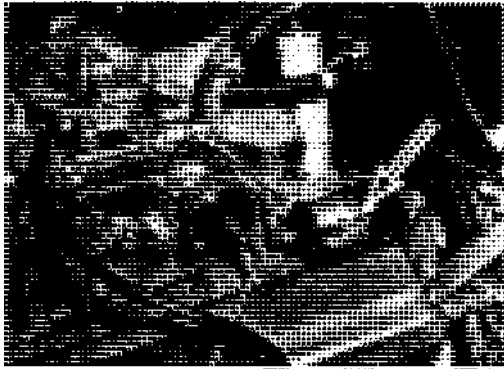
Fuel Filter

The filter in Carter WCFB, Rochester Quadrajets, Holley 2300, and Holley 4150 carburetors is located in the fuel inlet connection and should be replaced at least every 12,000 miles or sooner if engine flooding occurs. The Carter AFB uses an in-line filter, which should be replaced every 24,000 miles. The Rochester and Throttle Body fuel injection uses an in-line filter, which should be replaced every 15,000 miles.

To replace an in-line filter, disconnect the fitting at each end of the filter canister, discard the old filter, and install the replacement in the reverse order of removal.

To replace a fuel inlet filter:

1. Using an open-end wrench (preferably a line wrench), disconnect the fuel line connection from the larger fuel filter nut.
2. Remove the larger nut from the carburetor.



Inline fuel filter

3. Remove the filter element and spring from the carburetor.

4. Check the bronze element for dirt blockage by blowing on the cone end. If the element is good, air should pass through easily.

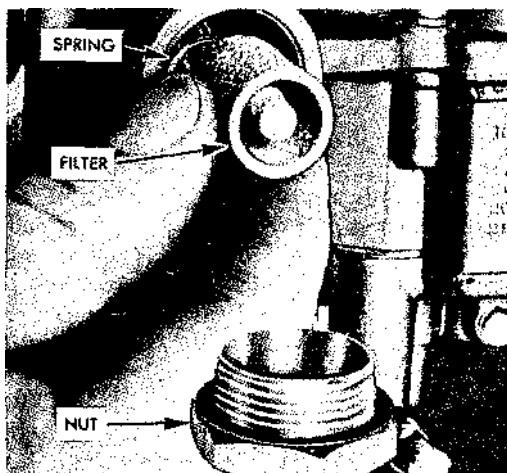
5. If the car has a paper element instead of a bronze element, check by blowing into the fuel inlet end. If air does not pass through easily replace the element. Do not attempt to clean these elements.

6. Install the spring and then the element into the carburetor, making sure that the small end of the bronze cone is facing outward.

7. Install a new gasket on the large nut and tighten securely.

8. Insert the fuel line and tighten the nut with a line wrench.

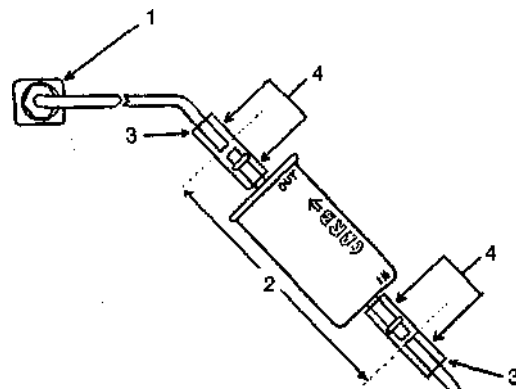
If your vehicle is equipped with a small filter mounted in the carburetor fuel inlet, it may be wise to consider replacing this filter with a larger "in-line" filter. Although Chev-



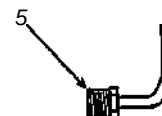
Most late models have this bronze fuel filter located behind the fuel fitting

rolet recommends doing this for vehicles which see severe usage (racing, etc.), it is also a wise move for street-driven vehicles. The small, carburetor mounted filter clogs more easily than a large in-line filter. The clogged filter can cause a drastic drop in fuel pressure which will generally cause the engine to run leaner; engine damage can result from an excessively lean fuel mixture. Another negative view of a carburetor mounted filter is that if a fuel pressure problem is encountered, a clogged carburetor mounted filter would not show a pressure loss during a fuel pressure test since the filter is mounted after the fuel pressure test connection. In-line fuel filters are relatively inexpensive and easy to install. The added filtering protection and longer filter life offered by the in-line filter more than make up for its slight additional cost.

NOTE: Do not perform this operation on 1976 and later models, as special fuel filters with anti-spillage valves are used. If you decide to install an in-line fuel filter, first remove and discard the carburetor mounted filter. Position the in-line fuel filter against the fuel line to judge where the fuel line has to be cut. Do not mount the in-line filter straight up as this could allow fuel vapors to block the filter outlet (vapor-lock). Preferably, the filter should be mounted on a 45° angle and be positioned an inch away from surrounding engine components. Mark where the fuel line must be cut, disconnect the line from the fuel pump and remove the fuel line. Using either a "mini" tubing cutter or a hack-



1. Carburetor fitting
2. Cut fuel line here
3. Fuel-resistant connecting hoses
4. Install clamps here
5. Fuel pump fitting



Typical in-line fuel filter installation

Maintenance Intervals

Maintenance	1963-67	1968-71	1972-74	1975-79	1980-84
Cleaner (Check and Clean) Oil bath Paper element ©	12,000 mi 1 2,000 mi (replace)	12,000 mi (replace)	24,000 mi (replace)	30,000 mi (replace)	30,000 mi (replace)
PCV Valve (Replace)	12 mo/1 2,000 mi	12 mo/1 2,000 mi	12 mo/1 2,000 mi	15,000 mi	30,000 mi.
Vaporative Canister Replace filter	—	12 mo/1 2,000 mi. (1970-71)	12 mo/1 2,000 mi	24 mo/30,000 mi	24 mo/30,000 mi.
Engine Oil Check Replace	Each fuel stop 4 mo/6,000 mi	each fuel stop 4 mo/6,000 mi	each fuel stop 4 mo/6,000 mi	each fuel stop 6 mo/7,500 mi	each fuel stop 12 mo/7500 mi.®
Engine Oil Filter (Replace)	every oil change	every oil change	every oil change	every oil change	every oil change
Oil Filter Replace	12,000 mi	12,000 mi	12,000 mi	15,000 mi	15,000 mi.
Powerglide Transmission Fluid Check Replace	6,000 mi 24,000 mi	6,000 mi 24,000 mi	—	—	—
—					
Turbo Hydra-Matic Fluid & Filter Check fluid Change fluid Replace		6,000 mi 24,000 mi 24,000 mi	6,000 mi 24,000 mi 24,000 mi	6,000 mi 30,000 mi 30,000 mi	each eng. oil change 100,000 mi.® 100,000 mi.®
Manual Transmissions (All) Check lubricant Add lubricant	6,000 mi as necessary	6,000 mi as necessary	6,000 mi as necessary	7,500 mi as necessary	7500 mi. as necessary
Battery Lubricate terminal felt washer Clean terminals Check electrolyte level	6,000© 6,000 mi Twice monthly	6,000© 6,000 mi twice monthly	as necessary twice monthly	as necessary twice monthly ®	as necessary not necessary
Coolant level	Each fuel stop	each fuel stop	each fuel stop	each fuel stop	each fuel stop
Front Wheel Bearings Lubricate	24,000 mi	24,000 mi	24,000 mi	30,000 mi	30,000 mi

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Drive Belts
Check and adjust
(as necessary)

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saw with a fine-toothed blade, cut the fuel line and make sure to clear the line of metal particles left from the cutting. Reinstall the line but do not yet tighten the fittings. Install the in-line filter (if the filter is marked "in" and "out," install the "out" side towards the carburetor), fuel-resistant connecting hoses, and the clamps. Tighten the hose clamps and the fuel line fittings at the fuel pump and carburetor. Start the engine and check for leaks.

LUBRICATION

Oil and Fuel Recommendations

For 1980 and earlier vehicles, oils having one of the following service ratings **MUST** be used: SE, SE/CC, or SF. For 1981 and later vehicles, use **ONLY** SF rated oils; it is O.K. to use an SF oil with a combination rating, such as SF/CC. Under the classification system developed by the American Petroleum Institute, the SF rating designates the highest quality oil for use in passenger cars. In view of this, it is recommended that you use an SF rated oil on ANY Corvette. In addition, Chevrolet recommends the use of an SF/Energy Conserving oil. Oils labeled "Energy Conserving (or Saving)," "Fuel (Gas or Gasoline) Saving," etc. are recommended due to their superior lubricating qualities (less friction = easier engine operation) and fuel saving characteristics. Pick your oil viscosity with regard to the anticipated temperatures during the period before your next oil change. Using the accompanying chart, choose the oil viscosity for the lowest expected temperature. You will be assured of easy cold starting and sufficient engine protection.

NOTE: Some fuel additives contain chemicals that can damage the catalytic converter and/or oxygen sensor on late model engines. Read all labels carefully before using any additive in the engine or fuel system.

Fuel should be selected for the brand and octane which performs best with your engine. Judge a gasoline by its ability to prevent "pinging," its engine starting capabilities (cold and hot), and general all-weather performance. As far as octane rating is concerned, refer to the "General Engine Specifications" chart in Chapter 3 to find your engine and its compression ratio. If the compression ratio is 9.0:1 or lower, in most cases a regular grade of gasoline can be used.

Oil Viscosity Selection Chart

	Anticipated Temperature Range	SAE Viscosity
Multi-grade	Above 32°F	10W-40
		10W-50
		20W-40
		20W-50
		10W-30
	May be used as low as -10°F	10W-30
		10W-40
	Consistently below 10°F	5W-20
		5W-30
Single-grade	Above 32°F	30
	Temperature between +32°F and -10°F	10W

If the compression ratio is 9.0:1-10.0:1, use a premium grade of fuel. Vehicles with a compression ratio higher than 10.0:1 (1970 and prior—check the engine chart) should use a premium leaded fuel, if it is available. Most oil companies have discontinued leaded premium gasoline; if you cannot find leaded premium, it has been recommended by several enthusiast publications to mix regular leaded and unleaded premium in a 1:3 proportion (1 part regular leaded to 3 parts unleaded premium). This mixture will give you the lubricating properties of lead and the added performance of a premium gasoline. Also, mixing leaded and unleaded fuels will increase the total octane rating by 1 or more points, depending on the ratings of the gas which is actually used. **DO NOT** use straight unleaded gas in a vehicle designed to use leaded; excessive valve and valve seat wear will result.

CAUTION: Unleaded fuel MUST be used in 1975 and later vehicles equipped with catalytic converters. Use of leaded fuel in these vehicles will render the catalytic converter ineffective and damage the oxygen sensor, if equipped.

Fluid Changes

ENGINE OIL AND FILTER

The mileage figures given in your owner's manual are the Chevrolet recommended intervals for oil and filter changes assuming average driving. If your Corvette is being used under dusty, polluted, or off-road conditions, change the oil and filter sooner than specified. The same thing goes for cars driven in stop-and-go traffic or only for short distances. Always drain the oil after the engine has

been running long enough to bring it to operating temperature. Hot oil will flow easier and more contaminants will be removed along with the oil than if it were drained cold. You will need a large capacity drain pan, which you can purchase at any store which sells automotive parts. Another necessity is containers for the used oil. You will find that plastic bottles, such as those used for bleach or fabric softener, make excellent storage jugs. One ecologically desirable solution to the used oil disposal problem is to find a cooperative gas station owner who will allow you to dump your used oil into his tank. Another is to keep the oil for use around the house as a preservative on fences, railroad tie borders, etc.

Chevrolet recommends changing both the oil and filter during the first oil change and the filter every other oil change thereafter. For the small price of an oil filter, it's cheap insurance to replace the filter at every oil change. One of the larger filter manufacturers points out in its advertisements that not changing the filter leaves one quart of dirty oil in the engine. This claim is true and should be kept in mind when changing your oil.

CHANGING YOUR OIL

1. Run the engine until it reaches normal operating temperature.
2. Jack up the front of the car and support it on safety stands.
3. Slide a drain pan of at least 6 quarts capacity under the oil pan.
4. Loosen the drain plug. Turn the plug out by hand. By keeping an inward pressure on the plug as you unscrew it, oil won't escape past the threads and you can remove it without being burned by hot oil.

NOTE: Dispose of waste oil properly; don't pollute the environment. Avoid prolonged skin contact with used oil either directly or from oil-saturated clothing.

5. Allow the oil to drain completely and then install the drain plug. Don't overtighten the plug, or you'll be buying a new pan or a trick replacement plug for damaged threads.
6. Using a strap wrench, remove the oil filter. Keep in mind that it's holding about one quart of dirty, hot oil.

1963-67 Corvettes use a cartridge type oil filter. On these models, loosen the center bolt on the filter housing and remove the housing along with the filter. If possible, replace the housing-to-block seal during installation and do not overtighten the housing bolt. After-market adaptors are available to adapt the new

style spin-on filters to earlier engines. Some prefer the convenience of a spin-on filter, though the cartridge type filter actually offers a greater filtering area.

7. Empty the old filter into the drain pan and dispose of the filter.

8. Using a clean rag, wipe off the filter adapter on the engine block. Be sure that the rag doesn't leave any lint which could clog an oil passage.

9. Coat the rubber gasket on the filter with fresh oil. Spin it onto the engine *by hand*; when the gasket touches the adapter surface give it another $\frac{1}{2}$ -turn. No more, or you'll squash the gasket and it will leak.

10. Refill the engine with the correct amount of fresh oil. See the "Capacities" chart.

11. Crank the engine over several times and then start it. If the oil pressure gauge shows zero, shut the engine down and find out what's wrong.

12. If the oil pressure is OK and there are no leaks, shut the engine off and lower the car.

13. Wait a few minutes and check the oil level. Add oil, as necessary, to bring the level up to Full.

MANUAL TRANSMISSION

No intervals are specified for changing the transmission lubricant, but after extended heavy duty operation it may be a good idea. The vehicle should be on a level surface and the lubricant should be at operating temperature.

1. Position the vehicle on a level surface.
2. Place a pan of sufficient capacity under the transmission drain plug.
3. Remove the upper (fill) plug to provide a vent opening.
4. Remove the lower (drain) plug and let the lubricant drain out.
5. Replace the drain plug.
6. Add lubricant with a suction gun or squeeze bulb. The correct lubricant is SAE 80W-90 GL-5 Gear Lubricant, or SAE SOW GL-5 for cold climates. Refer to the Capacities and Pressures Chart for the correct quantity.

AUTOMATIC TRANSMISSION

NOTE: The fluid should be drained while the transmission is warm.

1. Using a jack, raise the front of the vehicle and support it safely with jackstands. If the transmission pan has no drain plug, visu-

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ally check that you can gain access to all of the transmission pan bolts. If you can, proceed to step 8; if not, proceed to step 2.

2. Place a jack under the transmission with a block of wood (a piece of a 2x4 will do) between the jack and the transmission pan.

3. Raise the jack until the wood block contacts the transmission pan.

4. Remove the crossmember-to-transmission mount bolts and the crossmember-to-frame bolts.

5. Raise the transmission SLIGHTLY—just enough to take the weight of the transmission off of the crossmember.

6. Turn the crossmember sideways and remove it.

7. Place a jackstand close to the transmission tailshaft. Lower the jack until the transmission rests on the stand. Remove the jack and the wood block.

8. Place a drain pan under the transmission pan. If the pan has a drain plug, remove it and allow the fluid to drain.

9. If the pan does not have a drain plug, remove the pan bolts from one side of the pan and loosen the rest of the bolts. This will allow the pan to partially drain. Remove the remaining pan bolts and carefully lower the pan away from the transmission.

NOTE: If the transmission fluid is dark or has a burnt smell, transmission damage is indicated. Have the transmission checked professionally.

CAUTION: If the pan sticks, carefully tap sideways on the pan with a rubber mallet or a plastic hammer to break the pan loose. DO NOT dent the pan. Avoid prying the pan off with a screwdriver—this can bend the pan or crack the transmission case.

10. Empty the pan, remove the gasket material, and clean the pan with solvent (carburetor cleaner works well).

11. Remove any gasket material which may remain on the transmission case.

12. Remove the transmission filter from the valve body. The filter may have either a fibrous or screen filtering element and is retained by one or two fasteners.

13. Install a new filter using a new gasket or O-ring (TH400's).

NOTE: If the transmission uses a filter having a fully exposed screen, it may be cleaned and re-used.

14. Install the pan using a new gasket. Tighten the bolts to 12-14 ft. lbs. in a criss cross pattern. Recheck the bolt torque after all of the bolts have been tightened once.

15. Add either Dexron or Dexron II transmission fluid through the filler tube. See the Capacities Chart to determine the proper amount of fluid to be added.

CAUTION: DO NOT OVERFILL the transmission; foaming of the fluid and subsequent transmission damage due to slippage will result.

16. With the gearshift lever in PARK, start die engine and let it idle. Do not race the engine.

17. Move the gearshift lever through each position, holding the brakes. Return the lever to PARK, and check the fluid level with the engine idling. The level should be between the two dimples on the dipstick, about $\frac{1}{2}$ in. below the ADD mark. Add fluid, if necessary.

18. Check the fluid level after the vehicle has been driven enough to thoroughly warm up the transmission. Details are given under Fluid Level Checks earlier in the Chapter. If the transmission is overfilled, the excess must be drained off-

REAR AXLE

Refer to the Maintenance Intervals chart for information on when to change the fluid.

1. Run the vehicle so the lubricant reaches operating temperature.

2. Position a drain pan under the rear axle.

3. Remove the axle housing cover and gasket and drain the lubricant.

4. Clean the gasket sealing surfaces and install the cover with a new gasket.

5. Torque the cover bolts in a crosswise pattern to 20 ft. lbs.

6. Add 4 oz. of rear axle lubricant additive (GM 1052358).

7. Use a suction gun or a squeeze bulb and refill the differential housing to a level within $\frac{1}{2}$ " of the filler plug with rear axle lubricant (GM 1052271) or equivalent. (See the Capacities Chart),

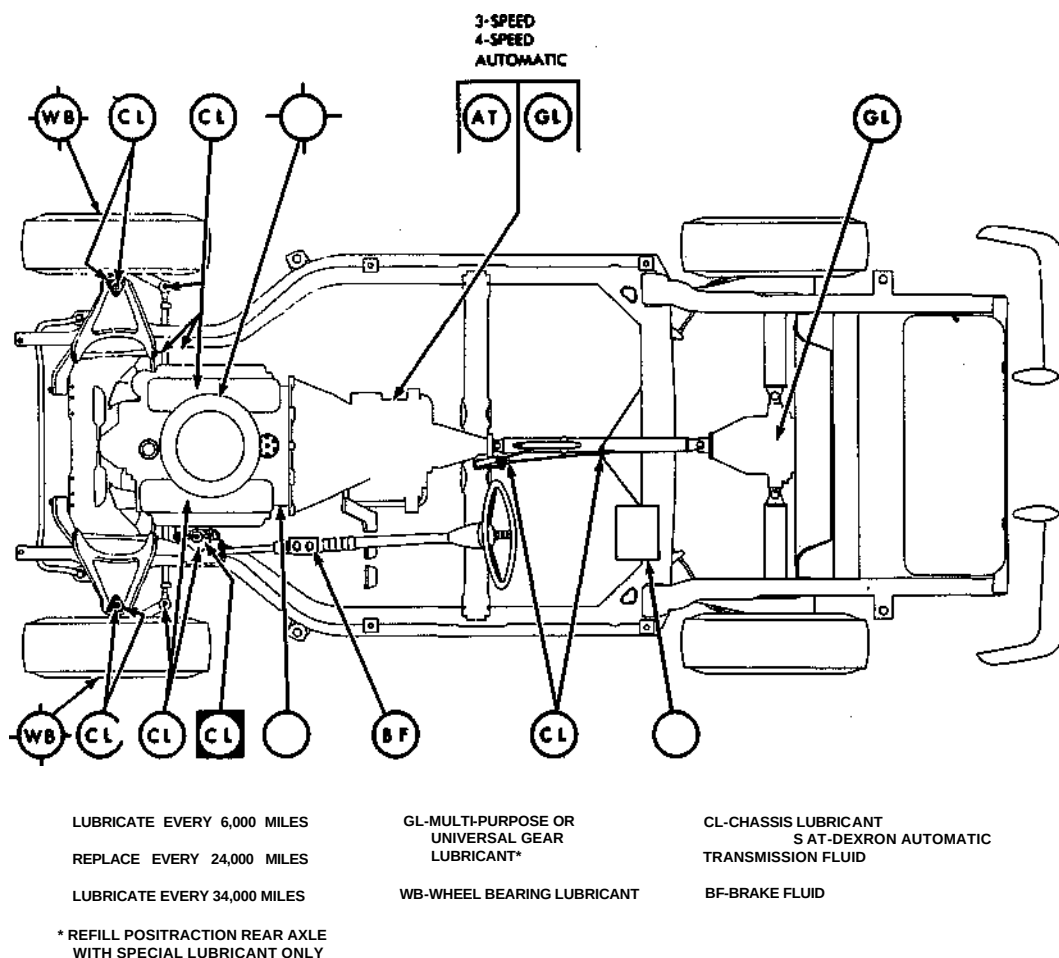
8. Install the filler plug.

COOLANT

Refer to the Cooling System Section under Routine Maintenance. Observe the recommended specifications for aluminum, if necessary.

Chassis Greasing

Chassis greasing can be performed with a pressurized grease gun or it can be performed at home by using a hand-operated



Lubrication points—1963-74

grease gun. Wipe the grease fittings clean before greasing in order to prevent the possibility of forcing any dirt into the component.

Wheel Bearings

Once every 24,000 miles, clean and repack wheel bearings with a wheel bearing grease. Use only enough grease to completely coat the rollers. Remove any excess grease from the exposed surface of the hub and seal.

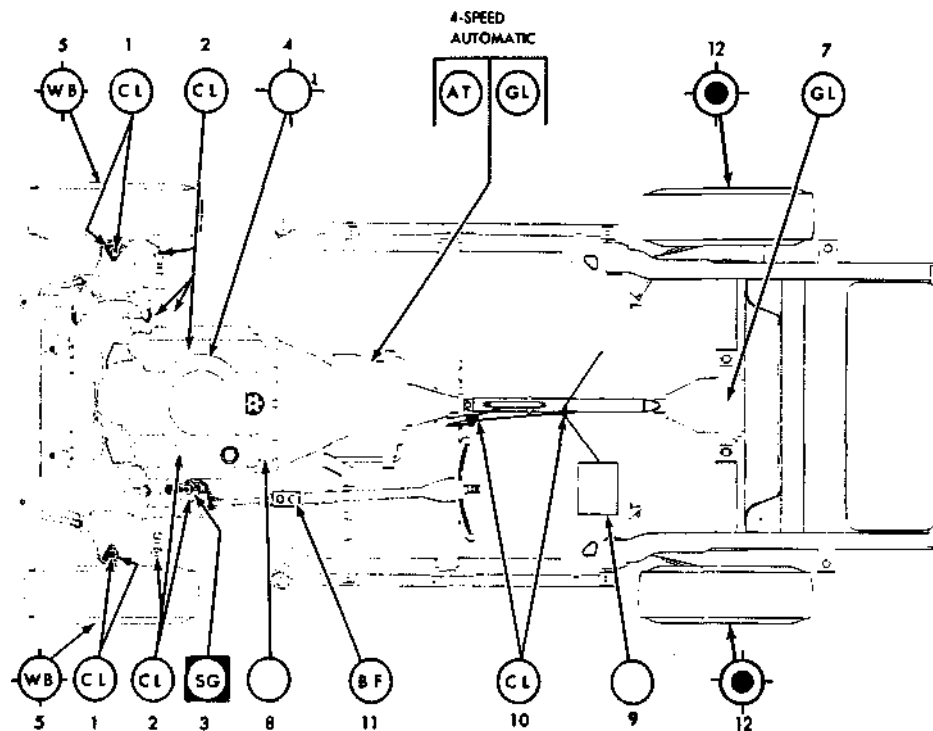
It is important that wheel bearings be properly adjusted after installation. Improperly adjusted wheel bearings can cause steering instability, front-end shimmy and wander, and increased tire wear. For complete adjustment procedures, see the "Wheel Bearing" section in Chapter 8.

PUSHING AND TOWING

Corvettes equipped with either the Powerglide or Turbo Hydra-Matic automatic transmissions cannot be push-started. To push-start a Corvette that has either a three-speed or four-speed manual transmission, switch on the ignition, select the highest forward gear and keep the clutch pedal depressed until suitable speed has been provided by the pushing vehicle. When this speed, approximately 15 mph, is reached, slowly release the clutch to start the engine.

Corvettes may be towed at speeds up to 35 mph and distances not over 50 miles with the driveshaft in place, if no engine/drive-line damage is present. If engine/drive-line damage is known or suspected, the driveshaft should be disconnected before towing. Towing connections should not be made on

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LUBRICATE EVERY 7,500 MILES

LUBRICATE FIRST 12,000 MILES

REPLACE EVERY 30,000 MILES
CHECK FOR GREASE LEAKAGE
EVERY 30,000 MILES

REFILL POSITRACTION REAR AXLE
WITH SPECIAL LUBRICANT ONLY

GL-MULTI-PURPOSE OR
UNIVERSAL GEAR
LUBRICANT

WB-WHEEL BEARING LUBRICANT

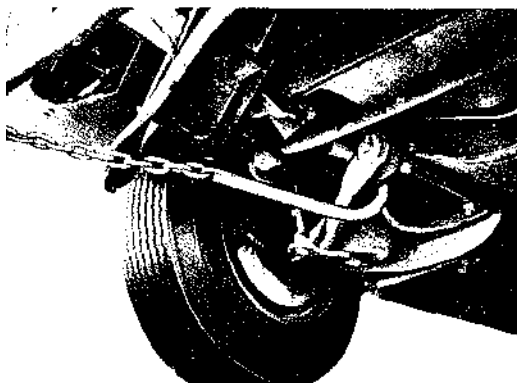
CL-CHASSIS LUBRICANT

AT-DEXRON-H® AUTOMATIC TRANSMISSION FLUID

BF-BRAKE FLUID SG-STEERING
GEAR LUBRICANT

- | | |
|-------------------------|------------------------------|
| 1. Front suspension | 7. Rear axle |
| 2. Steering linkage | 8. Oil filter |
| 3. Steering gear | 9. Battery |
| 4. Air cleaner | 10. Parking brake |
| 5. Front wheel bearings | 11. Brake master cylinder |
| 6. Transmission | 12. Rear wheel inner bearing |

Lubrication points—1975-82 typical



Front towing point



Rear towing point

bumpers, only on the spindle struts at the rear and the frame crossmember or lower control arm at the front.

JUMP STARTING

The following procedure is recommended by the manufacturer. Be sure that the booster battery is 12 volt with negative ground. **CAUTION:** *Do not attempt this procedure on a frozen battery; it will probably explode. Do not attempt it on a sealed Delco Freedom battery showing a light color in the charge indicator. Be certain to observe correct polarity connections. Failure to do so will result in almost immediate alternator and regulator destruction. Never allow the jumper cable ends to touch each other.*

1. Position the 2 vehicles so that they are not touching. Set the parking brake and place automatic transmissions in Park and manual transmissions in Neutral. Turn off the lights, heater and other electrical loads.

2. Remove the vent caps from both the booster and discharged battery. Lay a cloth over the open vent cells of each battery. This isn't necessary on batteries equipped with sponge type flame arrestor caps, and it isn't possible on sealed Freedom batteries.

3. Attach one cable to the positive (+) terminal of the booster battery and the other end to the positive terminal of the discharged battery.

4. Attach one end of the remaining cable to the negative (—) terminal of the booster battery and the other end to the alternator bracket. Do not attach to the negative terminal of discharged batteries.

5. Start the engine of the vehicle with the booster battery. Start the engine of the vehicle with the discharged battery. If the engine will not start, disconnect the batteries as soon as possible. If this is not done, the two batteries will soon reach a state of equilibrium, with both too weak to start an engine. This will not be a problem if the engine of the booster vehicle is kept running fast enough. Lengthy cranking can also overheat and damage the starter.

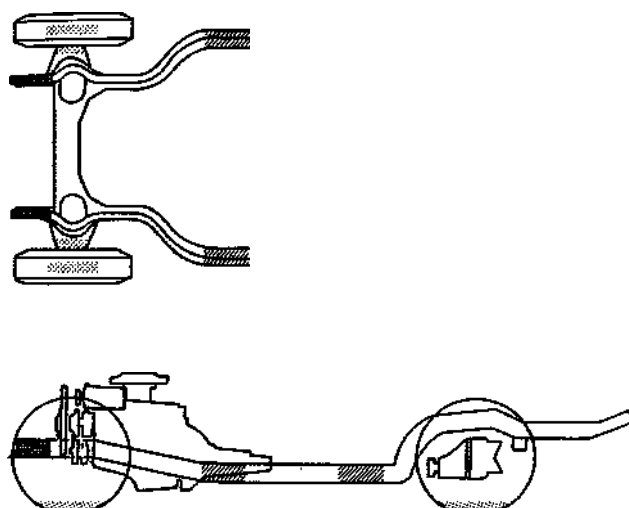
6. Reverse the above steps to disconnect the booster and discharged batteries. Be certain to remove negative connections first.

7. Reinstall the vent caps. Dispose of the cloths; they may have battery acid on them.

CAUTION: *The use of any "hot shot" type of jumper system in excess of 12 volts can damage the electronic control units on late model engines with computer controls.*

JACKING AND HOISTING

The jack supplied with the Corvette was meant for changing tires. It was not meant to support a vehicle while you crawl under it and work. Whenever it is necessary to get under a vehicle to perform service opera-



DRIVE-ON HOIST, TWO-POST HOIST
WITH DRIVE-ON ADAPTORS

JACK STANDS

FLOOR JACK, JACKSTANDS,
CENTER POST HOIST

Jacking and hoisting points

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tions, always be sure that it is adequately supported, preferably by jackstands at the proper points. Always block the wheels when changing tires.

Since the Corvette is equipped with a Positraction rear axle, do not run the engine for any reason with one rear wheel off the ground. Power will be transmitted through the rear wheel remaining on the ground, possibly causing the vehicle to drive itself off the jack.

Some of the service operations in this book require that one or both ends of the vehicle be raised and supported safely. The best arrangement for this, of course, is a grease pit or a vehicle lift, but these items are seldom found in the home garage. However, small hydraulic, screw, or scissors jacks are satisfactory for raising the vehicle.

Heavy wooden blocks or adjustable jackstands should be used to support the vehicle while it is being worked on. Drive-on trestles, or ramps, are also a handy and a safe way to raise the vehicle, assuming their capacity is adequate. These can be bought or constructed from suitable heavy timbers or steel.

In any case, it is always best to spend a little extra time to make sure that your Corvette is lifted and supported safely.

CAUTION: Concrete blocks are not recommended. They may crumble if the load is not evenly distributed. Boxes and milk crates of any description must not be used. Shake the vehicle a few times to make sure the jack stands are securely supporting the weight before crawling under.