1967

CHASSIS
SERVICE MANUAL

CHEVROLET · CHEVELLE
CAMARO · CHEVY II
CORVETTE

CHEVROLET

ST 130-67

QUICK REFERENCE INDEX. To use, move either the hand or selection tool directly over the section you desire to reference. Simply click once with the mouse button and the manual will automatically jump to that section.

1967 CHEVROLET, CHEVELLE, CAMARO, CHEVY II AND CORVETTE CHASSIS SERVICE MANUAL

AND CORVETTE BODY SERVICE MANUAL

FOREWORD

This manual includes procedures for maintenance and adjustments, minor service operations, removal and installation for components, except the body, of Chevrolet, Chevelle, Camaro, Chevy II and Corvette vehicles, and service information for Corvette bodies. Procedures involving disassembly and assembly of major components for these vehicles are contained in the 1967 Chassis Overhaul Manual. Service information for 1967 Chevrolet, Chevelle, Camaro and Chevy II body items is contained in the 1967 Body Service Manual.

The Section Index on this page enables the user to quickly locate any desired section. At the beginning of each section containing more than one major subject is a Table of Contents, which gives the page number on which each major subject begins. An Index is placed at the beginning of each major subject within the section.

Summaries of Special Tools, when required, are found at the end of major sections while specifications covering vehicle components are presented at the rear of the manual.

This manual should be kept in a handy place for ready reference. If properly used, it will enable the technician to better serve the owners of Chevrolet built vehicles.

All information, illustrations and specifications contained in this literature are based on the latest product information available at the time of publication approval. The right is reserved to make changes at any time without notice.

CHEVROLET MOTOR DIVISION
General Motors Corporation
DETROIT, MICHIGAN

Reprinted with Permission of
General Motors Corporation

Printed in U.S.A.

SECTION INDEX

SECTION O
GENERAL INFORMATION AND LUBRICATION

CONTENTS OF THIS SECTION

GENERAL INFORMATION

MODEL IDENTIFICATION—CHEVROLET

Series	Model Number		Description
	6-Cyl	V-8	
Biscayne	15311	15411	2-Door Sedan, 6-Passenger
	15369	15469	4-Door Sedan, 6-Passenger
	15335	15435	4-Door Station Wagon, 2-Seat
Bel Air	15511	15611	2-Door Sedan, 6-Passenger
	15569	15669	4-Door Sedan, 6-Passenger
	15535	15635	4-Door Station Wagon, 2-Seat
	15545	15645	4-Door Station Wagon, 3-Seat
Impala	16387	16487	2-Door Sport Coupe, 5-Passenger
	16367	16467	2-Door Convertible, 5-Passenger
	16369	16469	4-Door Sedan, 6-Passenger
	16339	16439	4-Door Sport Sedan, 6-Passenger
	16335	16435	4-Door Station Wagon, 2-Seat
	16345	16445	4-Door Station Wagon, 3-Seat
Impala Super Sport	16787	16887	2-Door Sport Coupe, 4-Passenger
	16767	16867	2-Door Convertible, 4-Passenger
Caprice	—	16647	2-Door Custom Coupe, 5-Passenger*
	—	16639	4-Door Custom Sedan, 6-Passenger
	—	16635	4-Door Custom Wagon, 2-Seat
	—	16645	4-Door Custom Wagon, 3-Seat

*4-Passenger when optional bucket front seats are specified.

VEHICLE DIMENSIONS—CHEVROLET

Pertinent dimensions for the different models are shown in the following chart.

Model	Sedan	2-Door Sport Coupe	Convertible Coupe	Station Wagon
Length Overall	213.2"	213.2"	213.2"	212.4"
Width Overall (Body)	79.6"	79.6"	79.6"	79.6"
Height Overall	55.4"	54.4"	55.3"	56.7"
Wheelbase	119.0"	119.0"	119.0"	119.0"
Tread-Front	62.5"	62.5"	62.5"	63.5"
Tread-Rear	62.4"	62.4"	62.4"	63.4"
Curb Weight: Approximately 3543 lbs. 4-Door Sedan with L-6 Engine; 3685 lbs. with V-8 Engine.				

MODEL IDENTIFICATION—CHEVELLE

Series	Model Number		Description
	6-Cyl	V-8	
Chevelle 300	13111 13169	13211 13269	2-Door Sedan, 6-Passenger 4-Door Sedan, 6-Passenger
Chevelle 300 Deluxe	13311 13369 13335	13411 13469 13435	2-Door Sedan, 6-Passenger 4-Door Sedan, 6-Passenger 4-Door Station Wagon, 2-Seat
Malibu	13569 13539 13517 13567 13535	13669 13639 13617 13667 13635	4-Door Sedan, 6-Passenger 4-Door Sport Sedan, 6-Passenger 2-Door Sport Coupe, 5-Passenger* 2-Door Convertible, 5-Passenger* 4-Door Station Wagon, 2-Seat
Super Sport 396	— —	13817 13867	2-Door Sport Coupe, 5-Passenger* 2-Door Convertible, 5-Passenger*
Concours	13735	13835	4-Door Station Wagon, 2-Seat

*4-Passenger when optional bucket seats are specified.

EL CAMINO	13380 13580	13480 13680	2-Door Sedan Pickup, 3-Passenger Reg. 2-Door Sedan Pickup, 3-Pass. Deluxe

VEHICLE DIMENSIONS—CHEVELLE

Pertinent dimensions for the different models are shown in the following chart.

Model	Sedan	2-Door Sport Coupe	Convertible Coupe	Station Wagon	Sedan Pickup
Length Overall	197.0"	197.0"	197.0"	199.9"	199.9"
Width Overall (Body)	75.0"	75.0"	75.0"	75.0"	75.0"
Height Overall	54.1"	53.2"	53.9"	56.7"	56.7"
Wheelbase	115.0"	115.0"	115.0"	115.0"	115.0"
Tread-Front	58.0"	58.0"	58.0"	58.0"	58.0"
Tread-Rear	58.0"	58.0"	58.0"	58.0"	58.0"
Curb Weight: Approximately 3104 lbs. 4-Door Sedan with L-6 Engine 3258 lbs. with V-8 Engine.					

MODEL IDENTIFICATION—CHEVY II

Series	Model Number			Description
	L-4	6 Cyl.	V-8	
100	11111 11169 —	11311 11369 11335	11411 11469 11435	2-Door Sedan, 6-Passenger 4-Door Sedan, 6-Passenger 4-Door Station Wagon, 2-Seat
NOVA	— — —	11569 11537 11535	11669 11637 11635	4-Door Sedan, 6-Passenger 2-Door Sport Coupe, 5-Passenger 4-Door Station Wagon, 2-Seat
NOVA SS	—	11737	11837	2-Door Sport Coupe, 4-Passenger

VEHICLE DIMENSIONS—CHEVY II

Model	Sedan	2-Door Sport Coupe	Station Wagon
Length Overall	183.0"	183.0"	187.4"
Width Overall (Body)	71.3"	71.3"	71.3"
Height Overall	56.7"	54.4"	57.6"
Wheelbase	110.0"	110.0"	110.0"
Tread-Front	56.8"	56.8"	56.3"
Tread-Rear	56.3"	56.3"	55.8"
Curb Weight: Approximately 2668 lbs. 4-Door Sedan with L-4 Engine; 2767 lbs. with L-6 Engine; 2959 lbs. with V-8 Engine.			

MODEL IDENTIFICATION—CAMARO

Model Number		Description
6-Cyl	V-8	
12337	12437	2-Door Sport Coupe, 4-Passenger
12367	12467	2-Door Convertible, 4-Passenger

VEHICLE DIMENSIONS—CAMARO

Model	Sport Coupe	Convertible
Length Overall	184.7"	
Width Overall (Body)	72.6"	
Height Overall	50.8"	
Wheelbase	108.0"	
Tread-Front	59.0"	
Tread-Rear	58.88"	
Weight: Sport Coupe with L6 Engine 2908 lbs.; with V-8 Engine 3063 lbs.		

MODEL IDENTIFICATION—CORVETTE

Model Number	Description
19437	2-Door Sport Coupe, 2-Passenger
19467	2-Door Convertible, 2-Passenger

UNIT AND SERIAL NUMBER LOCATIONS

For the convenience of servicemen when writing up certain business papers, such as L. & M.R.'s Product Information Reports, or reporting product failures in any way, we are showing below the location of various unit numbers. These unit numbers and their prefixes and suffixes are necessary on these papers for various reasons--such as accounting, follow-up on production, etc.

VEHICLE DIMENSIONS—CORVETTE

Model	Convertible	Sport Coupe
Length Overall	175.1"	
Width Overall (Body)	69.6"	
Height Overall	49.8"	49.6"
Wheelbase	98.0"	
Tread-Front	56.8"	
Tread-Rear	57.6"	
Curb Weight: 3145 lbs. Convertible 3135 lbs. Sport Coupe with Base V-8		

The prefixes on certain units identify the plant in which the unit was manufactured, and thereby permits proper follow-up of the plant involved to get corrections made when necessary.

Engine Unit Number

The engine unit number (figs. 3 and 4) shows manufacturing plant, month and day of manufacture, and transmission type. A typical engine number would be F1210FA, which would breakdown thus:

F--Manufacturing Plant (F--Flint, T--Tonawanda)
12--Month of manufacture (December)
10--Day of manufacture (tenth)
FA--Transmission and engine type

Vehicle Serial Number

A typical vehicle serial number tag (fig. 1) yields manufacturers identity, vehicle type, model year, assembly plant and production unit number when broken down as shown in the following chart.

Manufacturer Identity[1]	Body Style[2]	Model Year[3]	Assembly Plant[4]	Unit Number[5]
1	5645	7	F	100025

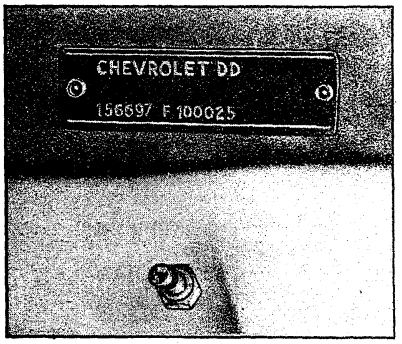

Fig. 1—Vehicle Serial Number Located on Left Front Hinge Pillar—Chevrolet Shown

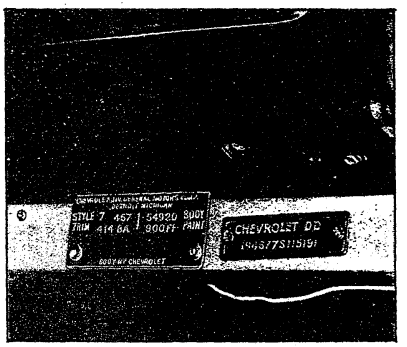

Fig. 2—Vehicle Serial Number and Body Style, Body Number Trim and Paint Combination Located on Instrument Panel Brace Under Glove Box—Corvette

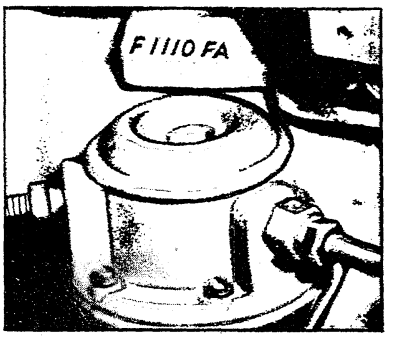

Fig. 3—Four and Six Cylinder Engine Unit Number Located on Pad at Right Hand Side of Cylinder Block at Rear of Distributor

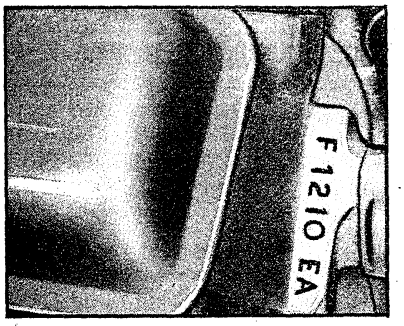

Fig. 4—Eight Cylinder Engine Unit Number Located on Pad at Front, Right Hand Side of Cylinder Block

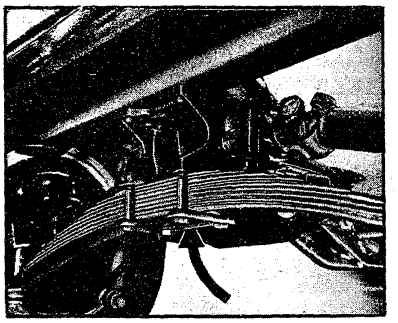

Fig. 5—Rear Axle Unit Number Located Bottom Surface of Carrier at Cover Mounting Flange—Corvette

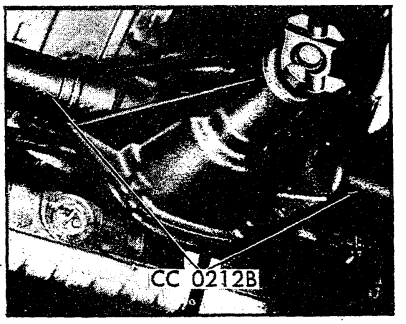

Fig. 6—Rear Axle Unit Number Located on Right or Left Axle Tube Adjacent to Carrier

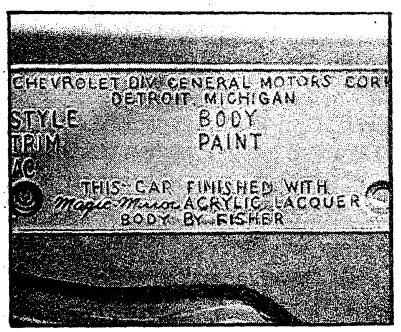

Fig. 7—Body Style, Body Number Trim Type and Paint Combination Located on Upper Right Hand Side of the Dash Panel—Chevrolet

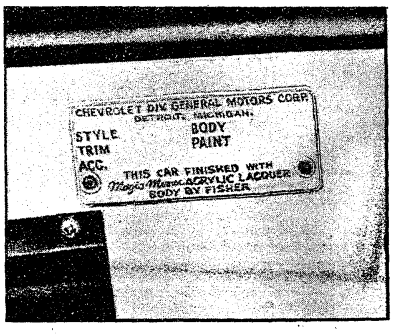

Fig. 8—Body Style, Body Number Trim Type and Paint Combination Located on the Upper Left Hand Side of the Dash Panel—Chevelle and Camaro

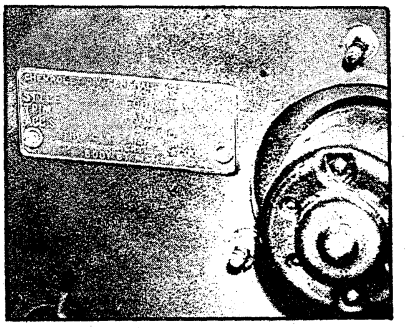

Fig. 9—Body Style, Body Number Trim Type and Paint Combination Located on the Upper Right Hand Part of the Dash Panel—Chevy II

1. Manufacturers identity number assigned to all Chevrolet built vehicles.
2. See Model Identification in this section.
3. Last number of model year (1967).
4. F-Flint
5. Unit numbering will start at 100,001 at all plants.

KEYS AND LOCKS

Four keys (two hexagonal head and two round head) are provided with each vehicle. The hexagonal-head key operates the ignition switch and front door locks. The round-head key operates the locks for the glove box and rear compartment lid.

Lock cylinders (except trunk) are furnished for service uncoded, this necessitates the coding of these replacement lock cylinders.

NOTE: In service, the trunk and glove box lock cylinders are provided together with the trunk lock cylinder coded and the glove box cylinder uncoded.

The side bar type lock (fig. 18) is used for the ignition, front doors and trunk. The glove box lock is of the wafer

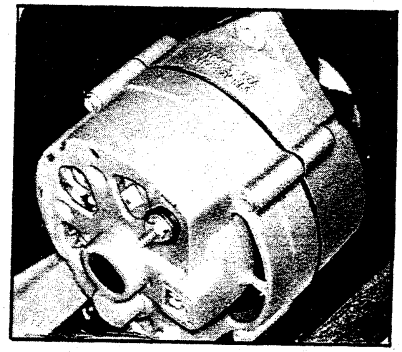

Fig. 10—Delcotron Unit Serial Number

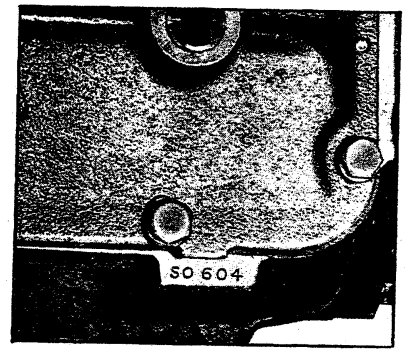

Fig. 11—3-4 Speed Transmission Unit Number Located on Lower Left Side of Case Adjacent to Rear of Cover (Saginaw)

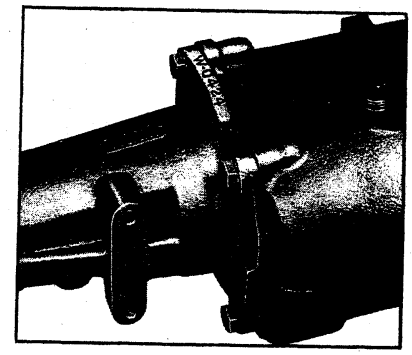

Fig. 12—3 Speed Borg-Warner Transmission Unit Number Located on Boss Right Rear Corner of Extension

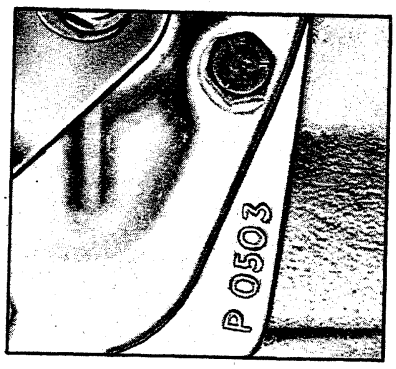

Fig. 13—4-Speed Transmission Source Data Code is Located on Left Side of Case at Lower Rear of Cover Flange (Muncie)

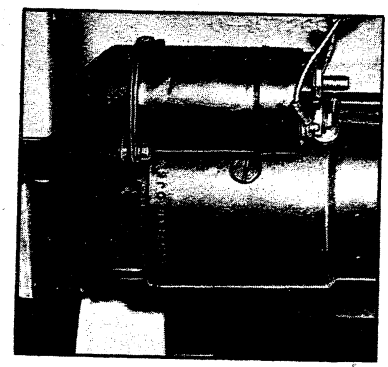

Fig. 14—Starter Serial Number and Production Date Stamped on Outer Case, Toward Rear

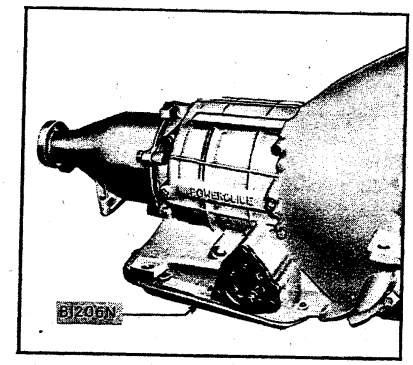

Fig. 15—Powerglide Transmission Unit Number Located on Right Rear Vertical Surface of Oil Pan

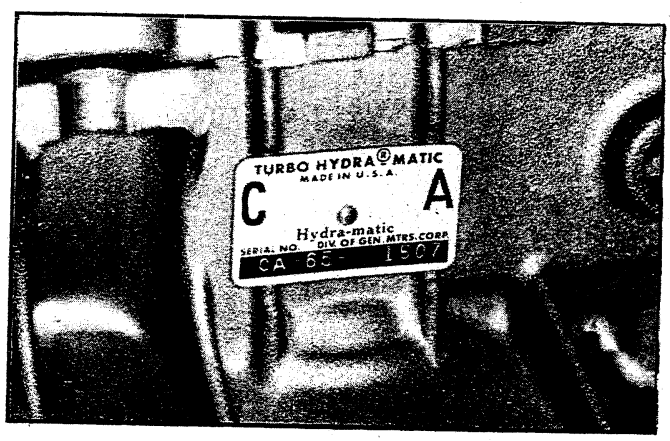

Fig. 16—The Turbo Hydra-Matic Transmission Serial Number is Located on the Light Blue Plate Location on the Right Side of the Transmission

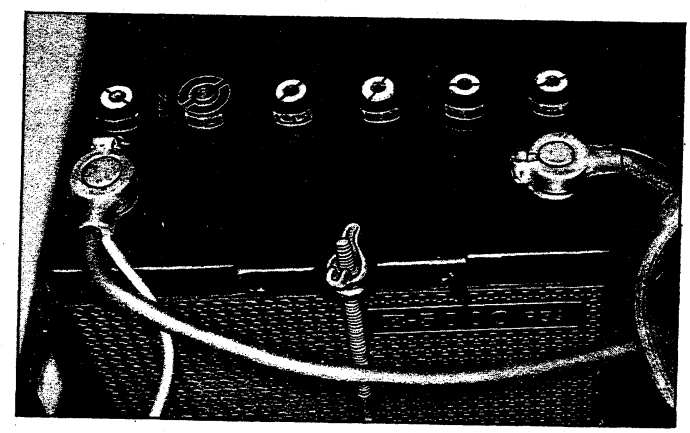

Fig. 17—Battery Code Number Located on Cell Cover Segment, Top of Battery

tumbler, single bitted type having four tumblers. To protect owners, automobile lock manufacturers stamp the lock numbers on the lock core, shaft, etc., where they will not show until lock is removed.

In addition, when a lock cylinder requires replacement the lock code number may be obtained either from the key, if available, or from old lock cylinder which is being replaced.

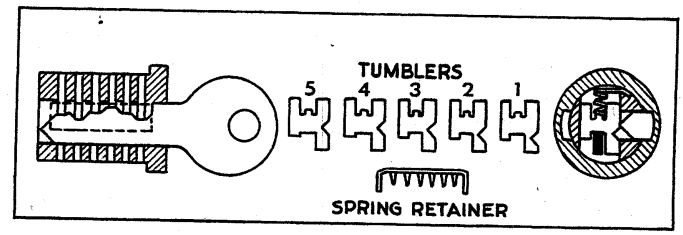

Fig. 18—Side Bar Lock

Once the code number of the lock is obtained look up this number in a key cutting book.

All side bar locks (except trunk) furnished to the field by the Parts Department are uncoded, that is, they are furnished without tumblers, springs or spring retainers, these parts are serviced separately. The tumblers come in five different depths, indicated by numbers.

The side bar locks have six tumbler positions, and in looking up the cutting code, the following may be used as an example. After key code number is determined, either from key or from number stamped on lock cylinder refer to your code book and record the key cutting information as follows:

Key of Lock Code Number	Key Cutting Code Numerical
0V11	545431
Cutting or Tumbler position from head of lock	123456

NOTE: Key blanks used for ignition and door locks are stamped with an "A" while rear compartment and glove box blanks are stamped with a "B".

The number that is written above the cutting or tumbler position indicates each different tumbler which is to be dropped into each tumbler slot of the lock.

In cases where a code book is not available, the diagram shown on Figure 19 may be used to determine the tumblers required to assemble an uncoded lock cylinder.

1. Lay the key on the diagram (fig. 19) with bottom of key flush with edge of the drawing, head and point carefully lined up.
2. Read the code in numbers 12345 from the head of the key to the end from positions 1 to 6 inclusive. As each depth is determined write that number in the blank space provided above the position numbers (1-2-3-4-5-6).
3. With key properly lined up on diagram, all cuts that show in the first section are marked "1".
4. Cuts that fall in the first black section, mark "2".
5. Cuts that fall in the first white section, mark "3".
6. Cuts that fall in second black section, mark "4".
7. Cuts that fall in the second white section, mark "5".

After the numbers have been determined and written above the cutting positions the lock cylinder should be assembled as follows.

Lock Cylinder Assembly—Refer to Figure 20

1. Hold cylinder with head of cylinder away and starting at the head of the cylinder, insert the tumblers in their proper slots in the order called for by the code, ribbed side toward you and long point down.
2. After all tumblers are in place, check for correctness with the code. Then press tumblers down with one finger.
3. Insert one tumbler spring in the space provided above each tumbler.

   CAUTION: If the springs are tangled, do not pull them apart--unscrew them.
4. Reverse the lock cylinder so that the head of the cylinder is now toward you. Insert the spring retainer so that one of its six prongs enters into each of the springs and the two large end prongs slide into the slots at either end of the cylinder. Press the retainer down with one finger.
5. To check, insert proper key and if tumblers are installed properly the side bar will be allowed to drop down. If bar does not drop down, remove the key, spring retainer, springs and tumblers and reassemble correctly.

   NOTE: If the tumblers have not been assembled correctly and not according to the code, the tumblers can be removed from the cylinder by holding it with the tumbler slots down, pulling the side bar out with the fingers and jarring the cylinder to shake the tumblers out. This procedure is necessary because after the tumblers have been pressed down into the cylinder they are held in their slots by the cross bar.
6. If after checking it is found that the lock is assembled properly, remove key and place cylinder in

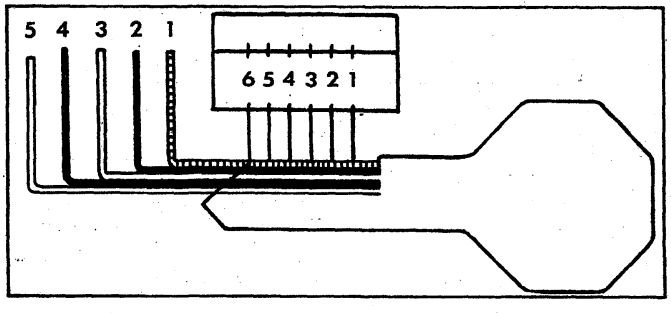

Fig. 19—Tumbler Requirement Diagram

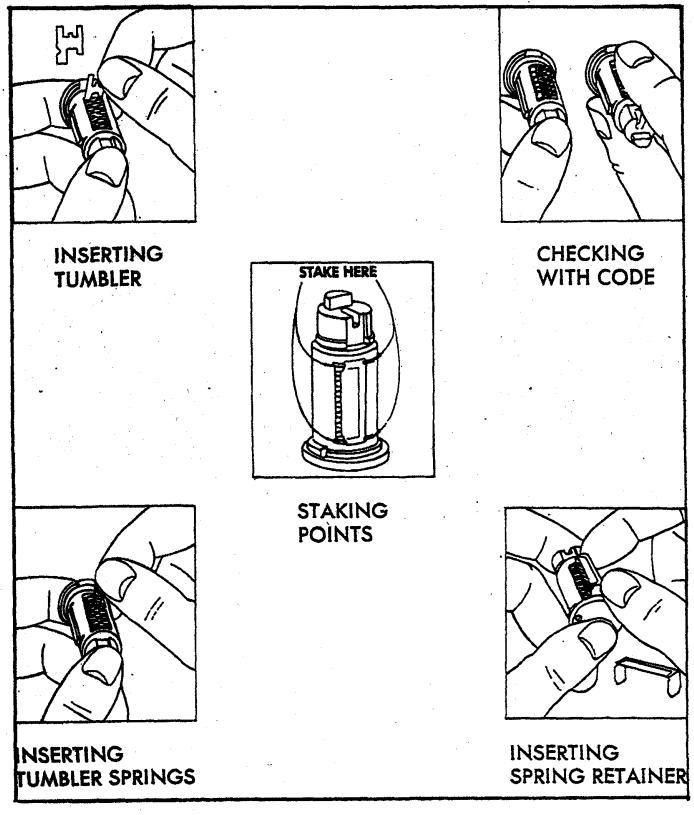

Fig. 20—Assembling Lock Cylinder

a vise using leather or wood on each side to prevent damage to the cylinder.

7. Stake the retainer securely in place by staking the cylinder metal over both edges of the retainer ends using a suitable staking tool at right angles to the top of the retainer and from the cast metal of the cylinder over the retainer at each corner.

PUSHING, TOWING AND LIFTING

Pushing

NOTE: Towing car to start is not recommended due to the possibility of the disabled car accelerating into tow car.

AUTOMATIC TRANSMISSION

Do not attempt to start the engine by pushing the car. Should the battery become discharged, it will be necessary to use an auxiliary battery with jumper cables to start the engine.

CAUTION: To prevent damage to electrical system, never connect booster batteries in excess of 12 volts and connect positive to positive and negative to negative.

Manual Transmission

When a push start is necessary turn off all electrical loads such as heater, radio, and if possible, lights, turn on the key, depress the clutch, and place the shift lever in high gear. Release the clutch when your speed reaches 10 to 15 miles per hour.

TOWING

The car may be towed safely on its rear wheels with the (selector lever in "N" (Neutral) position at speeds of 35 miles per hour or less under most conditions.

However, the drive shaft must be disconnected or the car towed on its front wheels if 1) Tow speeds in excess of 35 MPH are necessary, 2) Car must be towed for extended distances (over 50 miles) or, 3) Transmission is not operating properly. If car is towed on its front wheels, the steering wheel should be secured to maintain a straight ahead position.

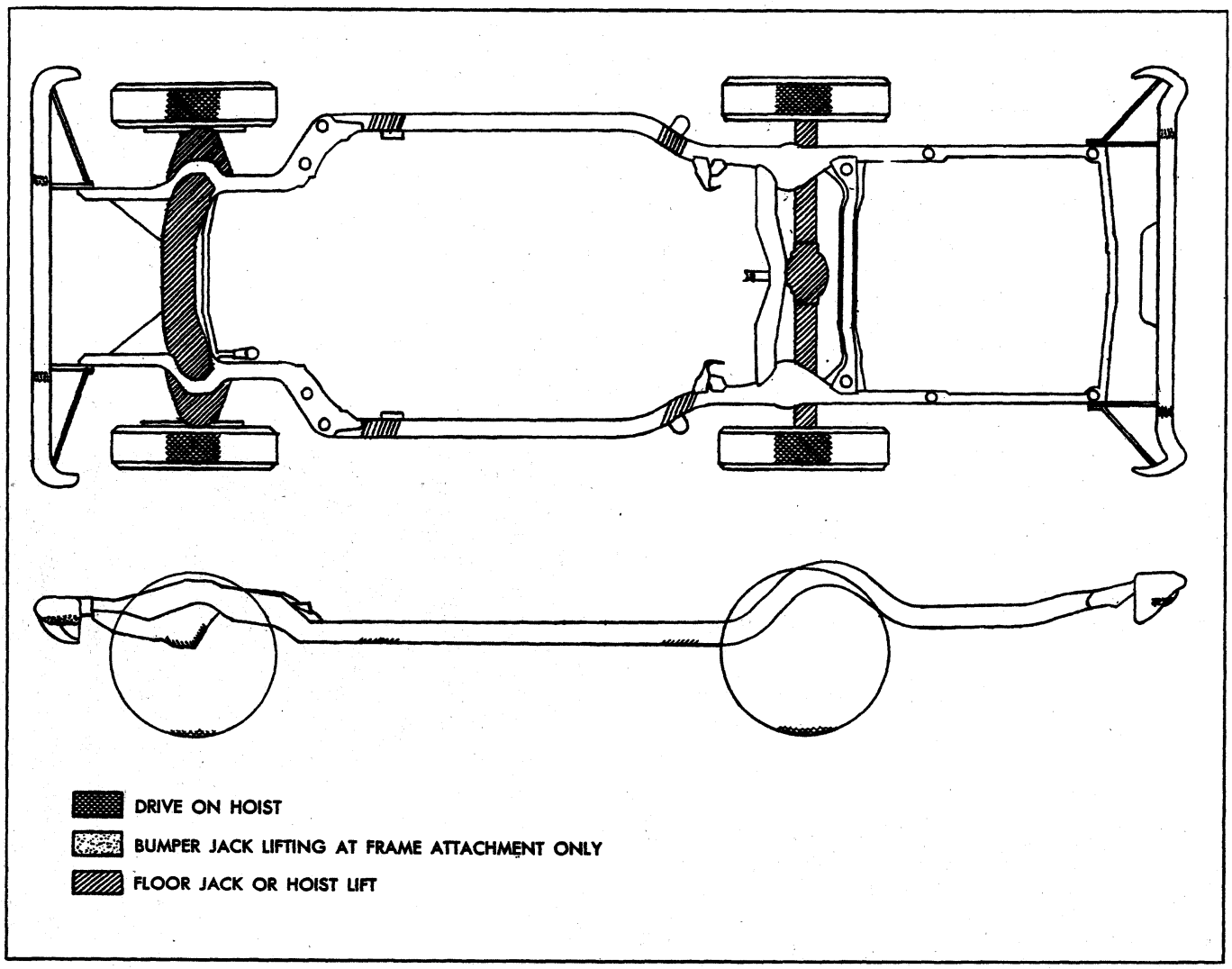

Fig. 21—Vehicle Lifting Points—Chevrolet

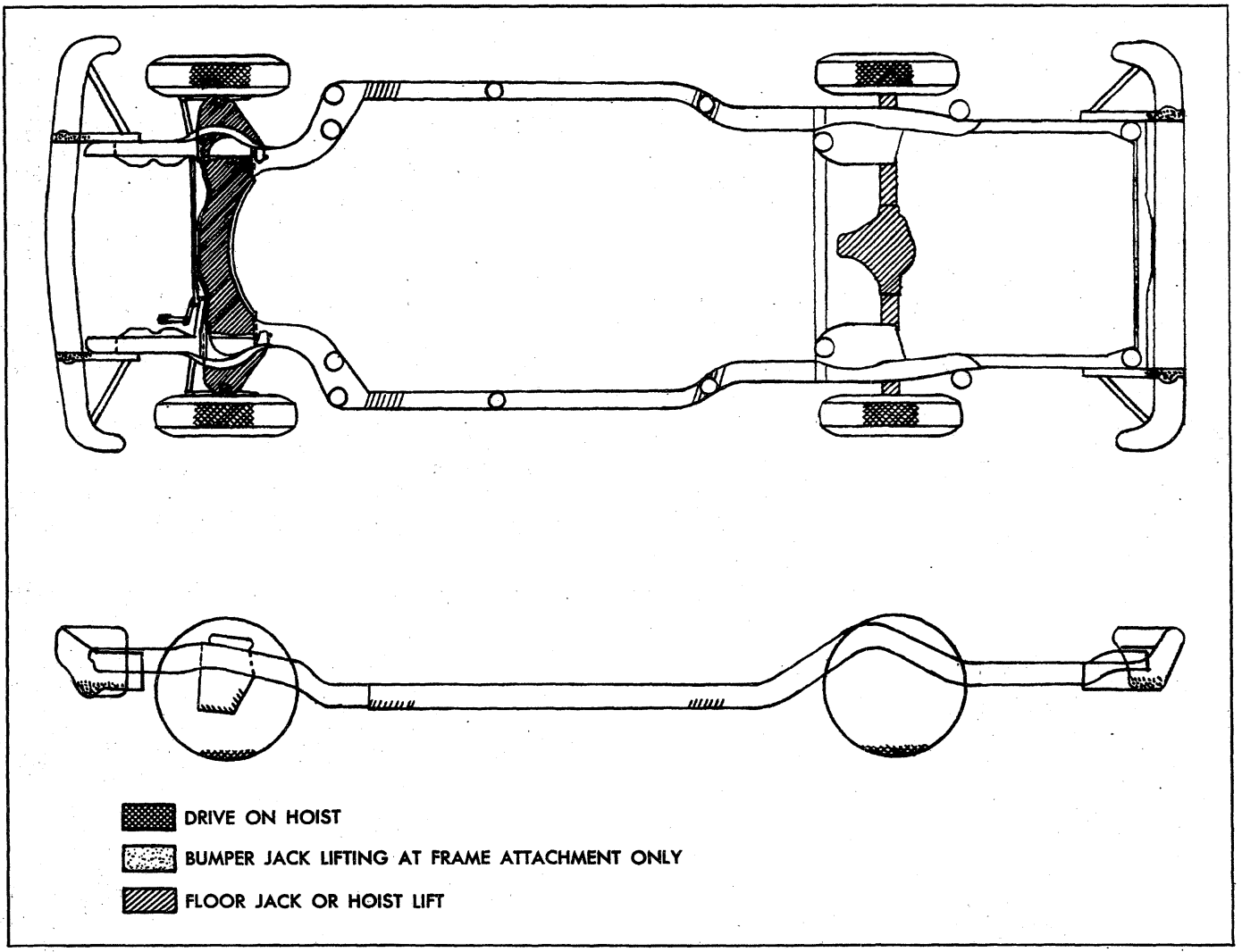

Fig. 22—Vehicle Lifting Points—Chevelle

TOWING THE CAMARO

The recommended method for towing the Camaro is as follows.

Front

Connect standard chain hooks near the outer ends of the front suspension lower control arms in between the coil springs and the stabilizer bar link bolt (fig. 23). The chains should be attached to the lower lifting sling bar so that when the vehicle is raised the rubber straps protect the front valance panel (fig. 24). Caution should be exercised when attaching the lower lifting bar that the upper lifting bar does not damage the hood header panel.

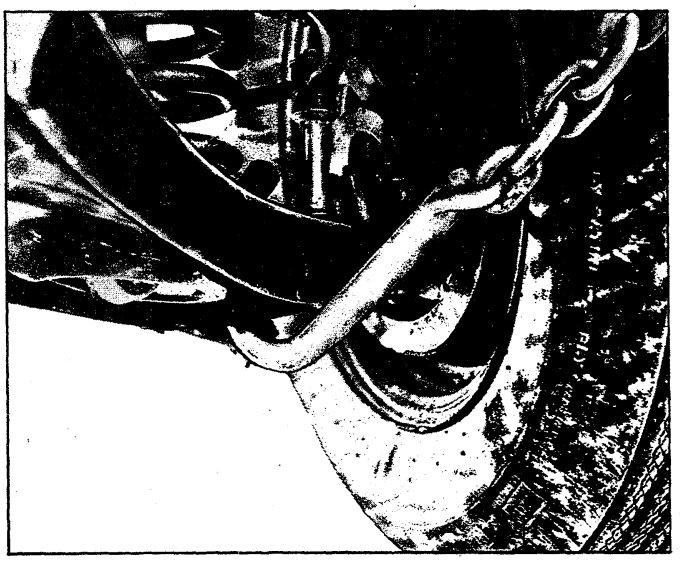

Fig. 23—Attachment of Towing Chain Hooks to Lower Control Arms

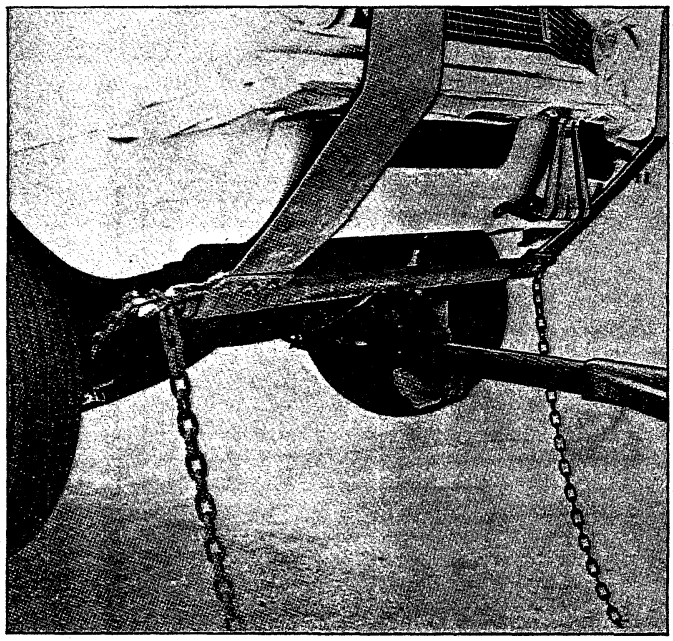

Fig. 24—Towing Sling Attachment—Front

Rear

Connect standard chain hooks around the axle tube from the underneath side between the axle rear spring pad and the brake flange plate (fig. 25). It is mandatory that the chain hook be positioned as stated above so that the brake lines are not damaged.

The lower lifting bar should be positioned in below the vehicle so that the rubber straps protect the rear valance panel. With the lower bar in this position, it is necessary that the bar be spaced down a minimum of 1 5/8" to prevent damage to the fuel tank. This can be accomplished by placing 6.0" section of 2x4' wood blocks below the rear section of each rear spring (fig. 26).

To facilitate towing without a helper it will be necessary to attach the 2x4's to the rear spring by a strap or tape. See Figure 27.

Also it will be necessary to lock the steering wheel in the straight ahead position prior to actually moving the vehicle.

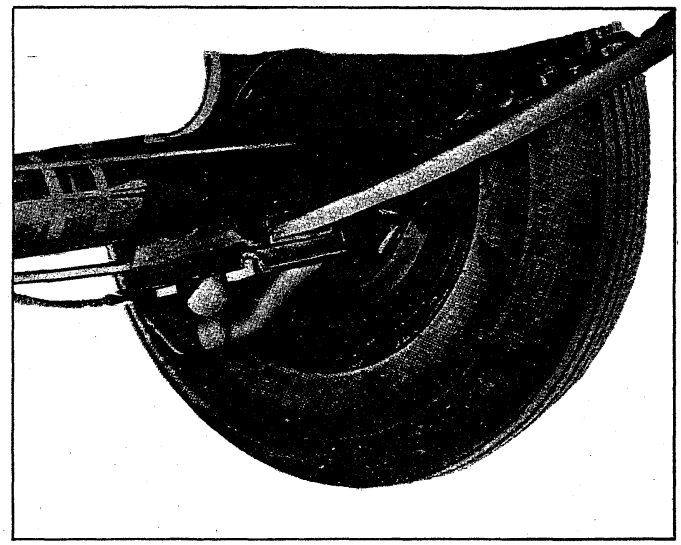

Fig. 25—Attachment of Towing Chain Hooks to Axle Tube

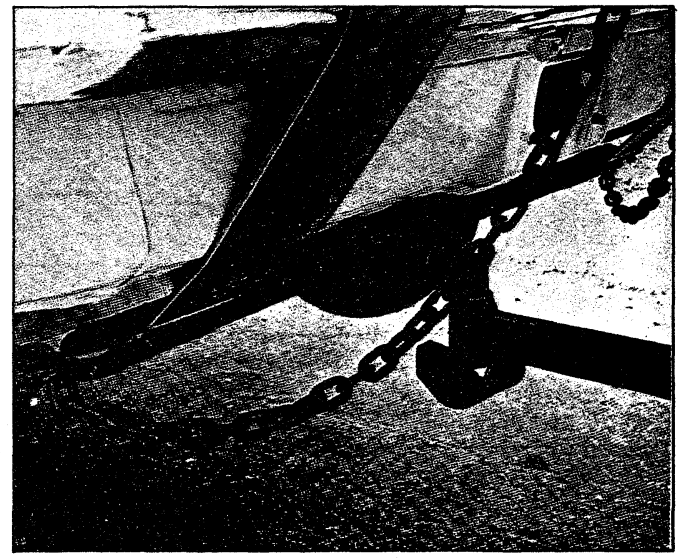

Fig. 26—Towing Sling Attachment—Rear

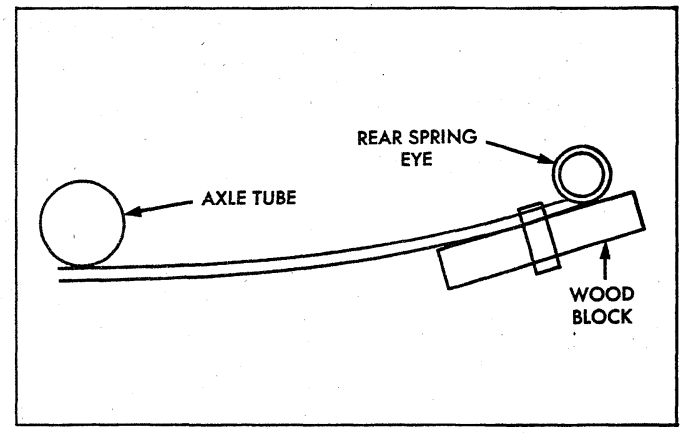

Fig. 27—Strapping Wood Block to Rear Spring

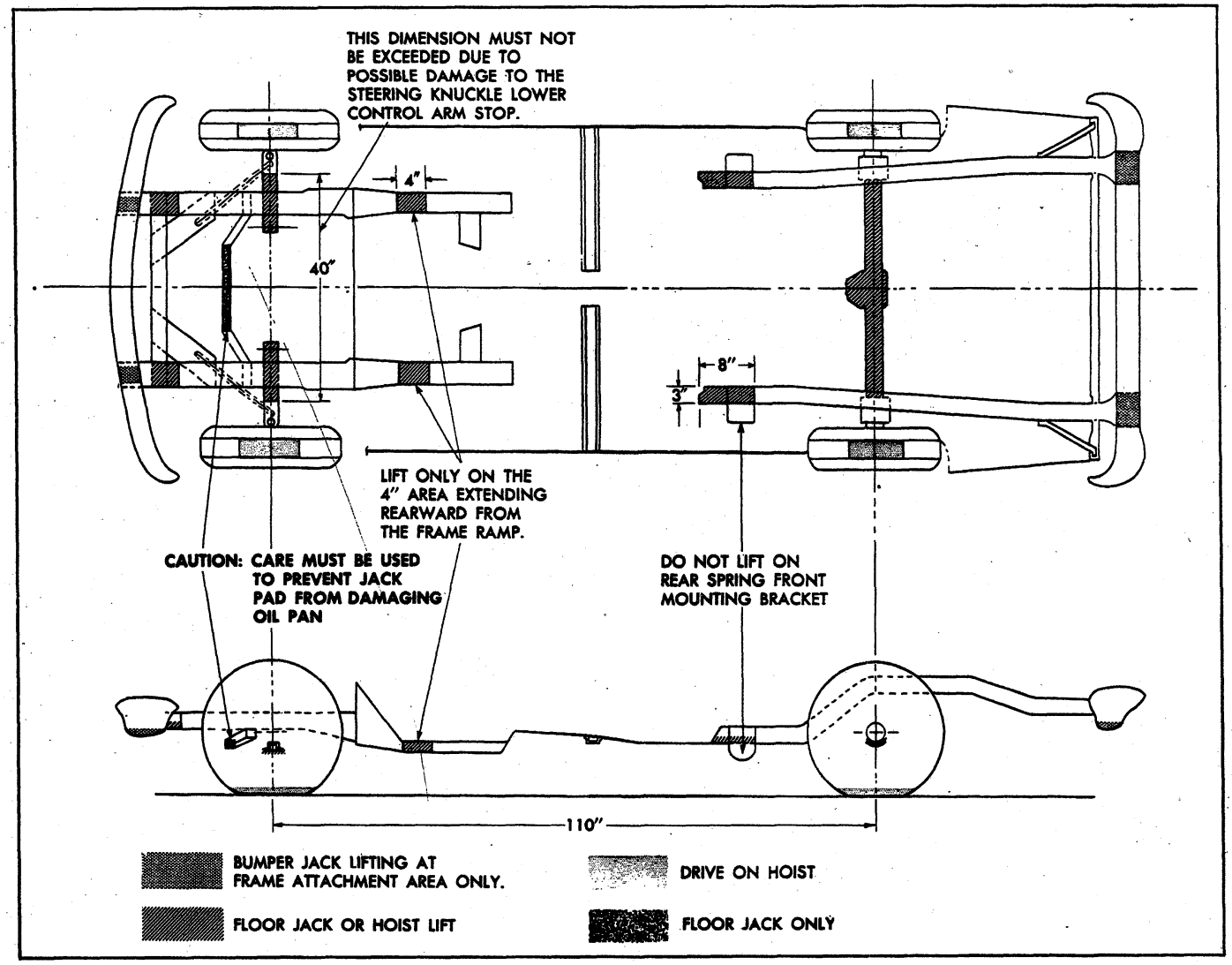

Fig. 28—Vehicle Lifting Points—Chevy II

Lifting With Auto Jack

The shaded areas on both the front and the rear bumpers, as shown in Figures 21, 22, 28, 29 are recommended auto jack lifting points. The jack load rest must locate under the bumper at these points. Be sure the load rest is positioned properly on the jack before raising the vehicle. On Corvettes, position jack on shaded areas indicated on Figure 30. Be sure jack load rest properly contacts frame before raising vehicle.

Lifting Car With Drive-on Hoist

Many dealer service facilities and service stations are now equipped with a type of automotive hoist which must bear upon some part of the frame in order to lift the vehicle. In Figures 21, 22, 28, 29, 30 the shaded areas indicate areas recommended for hoist contact.

LIFTING THE CORVETTE

Shaded areas in Figure 30 indicate recommended points for hoist or jack contact. When using a single post hoist place hoist on frame side rail behind kickup at front and forward of #3 body mount at rear. When using a twin-post hoist, two methods are recommended.

a. If no rear axle or suspension work is contemplated, use either suspension adapters or drive-on adapters at the front, and drive-on adapters at the rear. If a need for axle work develops, use jack stands beneath the frame side rails on each side and lower rear post.

b. If rear axle work is contemplated, use either suspension adapters or drive-on adapters at the front and frame lift adapters as shown in Figure 31. If frame lift adapters are not available, use jack stands.

NOTE: Wooden blocks, bolted to steel beam shown in Figure 31 are necessary to allow beam to clear exhaust system.

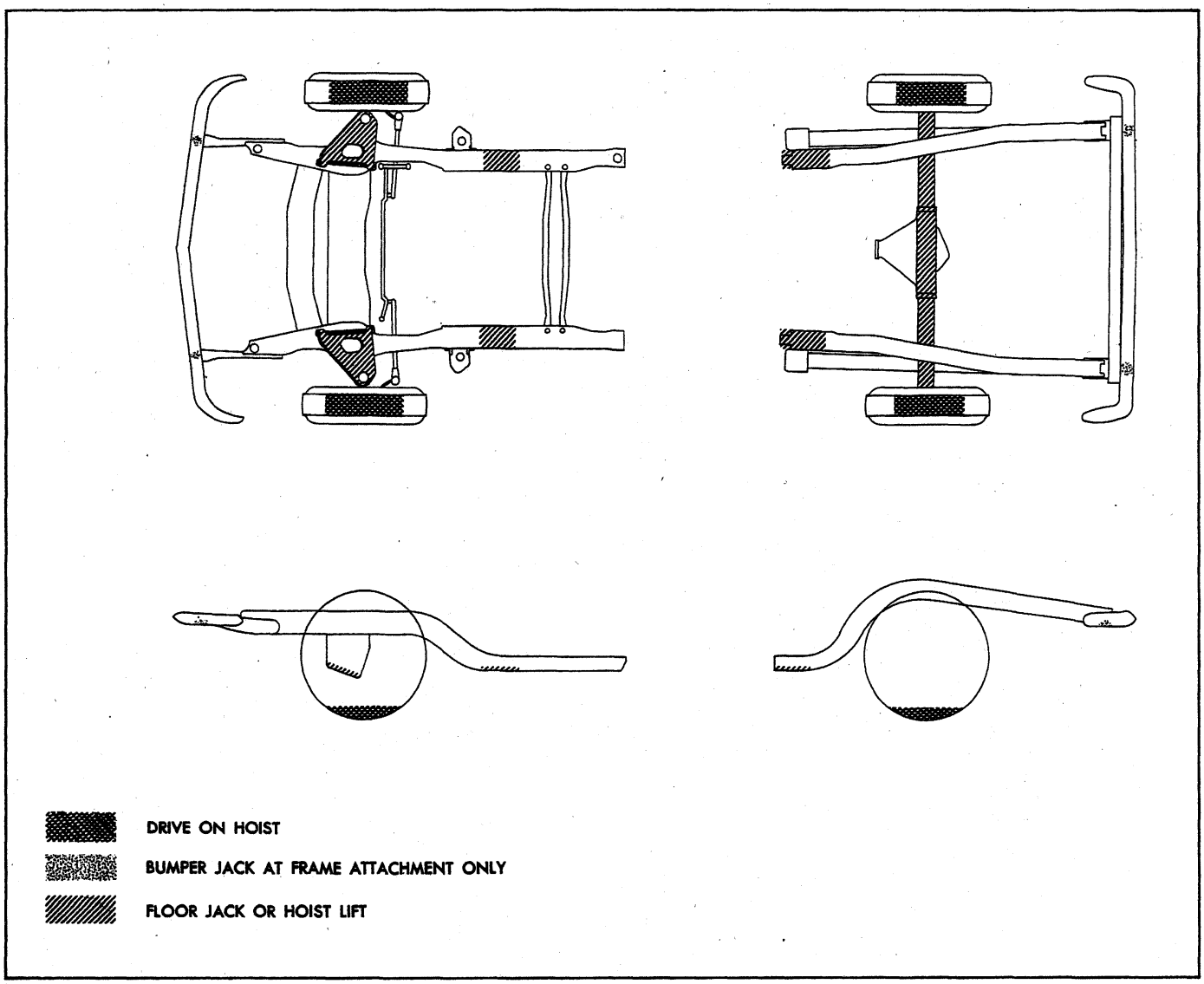

Fig. 29—Vehicle Lifting Points—Camaro

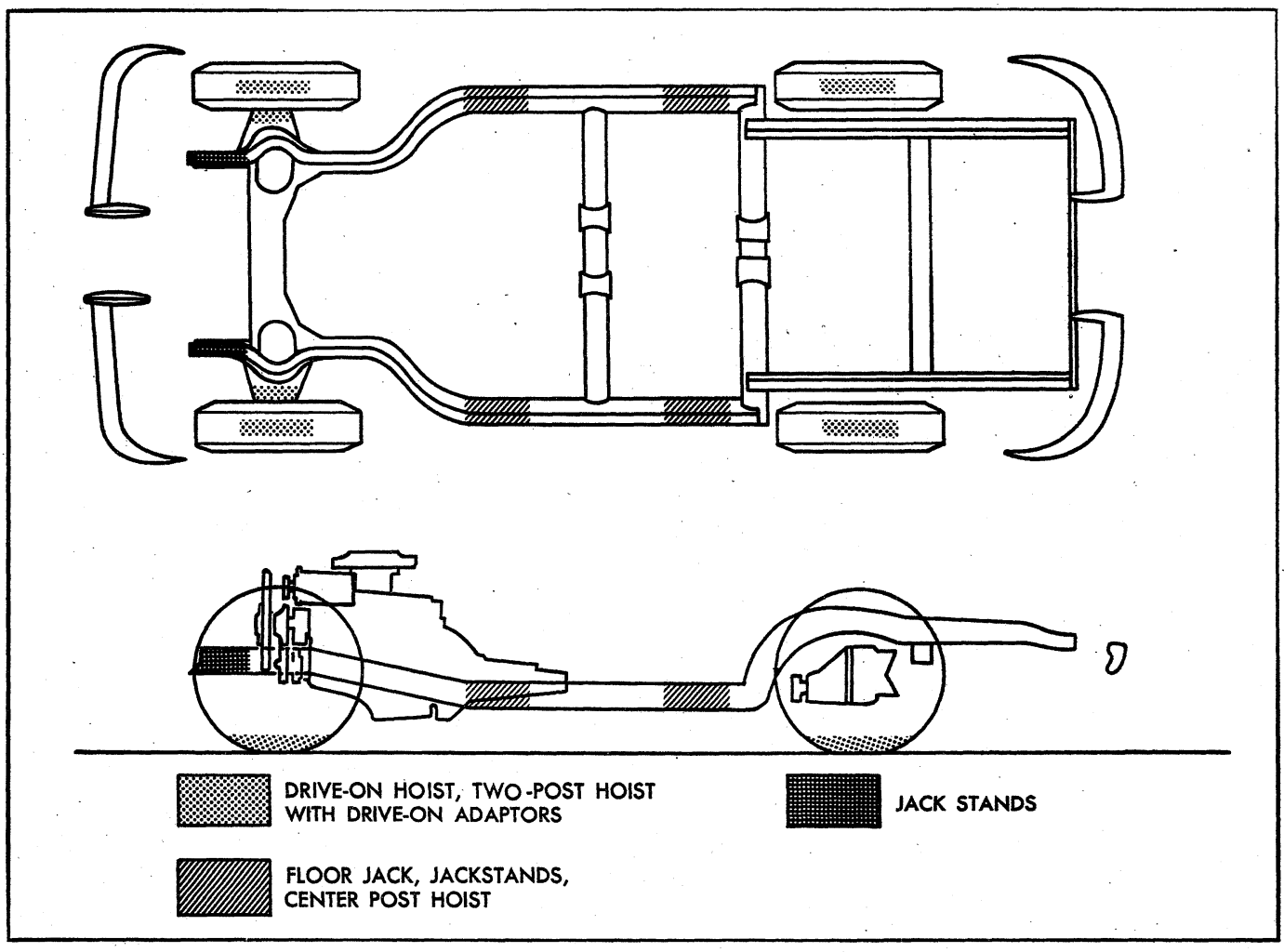

Fig. 30—Vehicle Lifting Points—Corvette

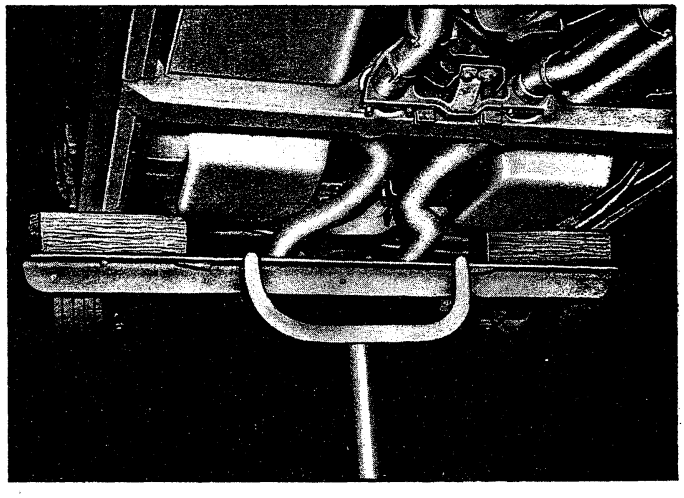

Fig. 31—Frame Lift Adapters—Corvette

LUBRICATION

INDEX

The selection of the proper lubricant and its correct application at regular intervals does much to increase the life and operation of all moving parts of the vehicle. Consequently, it is important that the correct grade of oil or grease, as noted in the following pages, be used.

ENGINE CRANKCASE OIL

Crankcase Capacity

4 Cylinder	4 qt.
6 Cylinder	4 qt.
8 Cylinder (283)	4 qt.
8 Cylinder (327)	4 qt.
8 Cylinder (350)	4 qt.
8 Cylinder (396)	4 qt.
8 Cylinder (427) Chevrolet	4 qt.
8 Cylinder (427) Corvette	5 qt.

For 4 Cyl. Add .5 qt. with filter change; 1 qt. for 6 and 8 Cyl. engines.

Lubrication

Crankcase oil should be selected to give the best performance under the climatic and driving conditions in the territory in which the vehicle is driven.

During warm or hot weather, an oil which will provide adequate lubrication under high operating temperatures is required.

During the colder months of the year, an oil which will permit easy starting at the lowest atmospheric temperature likely to be encountered, should be used.

When the crankcase is drained and refilled, the crankcase oil should be selected, not on the basis of the existing temperature at the time of the change, but on the lowest temperature anticipated for the period during which the oil is to be used.

Unless the crankcase oil is selected on the basis of viscosity or fluidity of the anticipated temperature, difficulty in starting will be experienced at each sudden drop in temperature.

SAE Viscosity Oils

SAE Viscosity Numbers indicate only the viscosity or body of the oil, that is, whether an oil is a light or a heavy body oil, and do not consider or include other properties or quality factors.

The lower SAE Viscosity Numbers, such as SAE 5W and SAE 10W which represent the light body oils, are recommended for use during cold weather to provide easy starting and instant lubrication. The higher SAE Viscosity Numbers such as SAE 20 and SAE 20W, which represents heavier body oils, are recommended for use during warm or hot weather to provide improved oil economy and adequate lubrication under high operating temperatures.

Oils are available which are designed to combine the easy starting characteristics of the lower SAE Viscosity Number with the warm weather operating characteristics of the higher SAE Viscosity Number. These are termed "multi-viscosity oils," SAE 5-10W, SAE 5W-20, SAE 10W-20W, and SAE 10W-30.

The following chart will serve as a guide for the selection of the correct SAE Viscosity Number for use under different atmospheric temperature ranges, and suggests the appropriate SAE Viscosity Numbers when multi-viscosity oils are used.

Lowest Anticipated Temperature During Time Oil Will Be in Crankcase	Recommended SAE Viscosity Oils	Recommended SAE Multi-Viscosity Oils
32°F.	SAE 20 or 20W	SAE 10W-30
0°F.	SAE 10W	SAE 10W-30
Below 0°F.	SAE 5W	SAE 5W-20

SAE 30 or 10W-30 is recommended when most of the driving is at high speeds and/or at temperatures above 90°F.

SAE 5W-30 oils may be used during periods when temperatures of 32° and below are to be expected.

Types of Oils

In service, crankcase oils may form sludge and varnish and under some conditions, corrosive acids unless protected against oxidation.

To minimize the formation of these harmful products and to assure the use of oil best suited for present day operating conditions, automobile manufacturers have developed a series of sequence tests designed to evaluate the ability of any oil to properly lubricate automobile engines.

It is recommended that only those oils which are certified by their suppliers as meeting or exceeding the maximum severity requirements of these sequence tests (or GM Standard 4745-M) be used in Chevrolet engines. Certified sequence tested oils will be described as such on their containers.

Maintaining Oil Level

The oil gauge rod is marked "Full" and "Add Oil." These notations have broad arrows pointing to the level lines. The oil level should be maintained between the two lines, neither going above the "Full" line nor under the "Add Oil" line. DO NOT OVERFILL. After operating vehicle allow a few minutes for oil to return to crankcase before checking oil level.

Check the oil level frequently and add oil when necessary.

Oil and Filter Change Intervals

NOTE: Under prolonged dusty driving conditions, it is recommended that these operations be performed more often.

OIL

To insure continuation of best performance, low maintenance cost and long engine life, it is necessary to change the crankcase oil whenever it becomes contaminated with harmful foreign materials. Under normal driving conditions draining the crankcase and refilling with fresh oil every 60 days or every 6000 miles whichever occurs first, is recommended.

It is always advisable to drain the crankcase only after the engine has become thoroughly warmed up or reached normal operating temperature. The benefit of draining is, to a large extent, lost if the crankcase is drained when the engine is cold, as some of the suspended foreign material will cling to the sides of the oil pan and will not drain out readily with the cold, slower moving oil.

OIL FILTER

Change engine oil filter every 6000 miles or every 6 months, whichever occurs first.

NOTE: For Vehicles in heavy duty operation involving continuous start-stop or prolonged idling, engine oil should be changed after 2500-3000 miles of operation. The filter should be changed after 5000-6000 miles of operation.

Crankcase Dilution

Probably the most serious phase of engine oil deterioration is that of crankcase dilution which is the thinning of the oil by fuel vapor leaking by pistons and rings and mixing with the oil and by condensation of water on the cylinder walls and crankcase.

Leakage of fuel, or fuel vapors, into the oil pan occurs mostly during the "warming up" period when the fuel is not thoroughly vaporized and burned. Water vapor enters the crankcase through normal engine ventilation and through exhaust gas blow-by. When the engine is not completely warmed up, these vapors condense, combine with the condensed fuel and exhaust gases and form acid compounds in the crankcase.

As long as the gases and internal walls of the crankcase are hot enough to keep water vapor from condensing, no harm will result. However, when the engine is run in low temperatures moisture will collect and unite with the gases formed by combustion resulting in an acid formation. The acid thus formed is likely to cause serious etching or pitting which will manifest itself in excessively rapid wear on piston pins, camshaft bearings and other moving parts of the engine, oftentimes causing the owner to blame the car manufacturer or the lubricating oil when in reality the trouble may be traced back to the character of fuel used, or a condition of the engine such as excessive blowby or improper carburetor adjustment.

Automatic Control Devices to Minimize Crankcase Dilution

All engines are equipped with automatic devices which aid greatly in minimizing the danger of crankcase dilution.

The thermostat, mounted in the cylinder head water outlet, restricts the flow of water to the radiator until a predetermined temperature is reached, thus minimizing the length of time required to reach efficient operating temperature, reducing the time that engine temperatures are conducive to vapor condensation.

A water by-pass is included in the cooling system, utilizing a hole in the front of the cylinder block. This allows a limited circulation of coolant, bypassing the thermostat until thermostat opening temperatures are reached. This system provides a uniform coolant temperature throughout the engine, eliminating localized hot-spots, improving exhaust valve life, provides fast warm-up of lubricating oil and fast temperature rise in the coolant which provides fast heater operation in cold weather.

A thermostatic heat control on the exhaust manifold during the warming up period, automatically directs the hot exhaust gases against the center of the intake manifold, greatly aids in proper vaporization of the fuel.

An automatic choke reduces the danger of raw or unvaporized fuel entering the combustion chamber and leaking into the oil reservoir.

An efficient crankcase ventilating system drives off fuel vapors and aids in the evaporation of the raw fuel and water which may find its way into the oil pan.

CRANKCASE BREATHER CAP

Clean and re-oil at every oil change.

CRANKCASE VENTILATION VALVE

VALVE TYPE

NOTE: Under prolonged dusty driving conditions, it is recommended that these operations be performed more often. Every 12,000 miles or 12 months the valve should be replaced. Connecting hoses, fittings, flame arrestor and crankcase breather cap (where used) should be cleaned. At every oil change the system should be tested for proper function and serviced, if necessary.

FUEL FILTER

Replace filter element located in carburetor inlet if flooding occurs, if engine surges during constant speed operation (pulsating effect) or if poor performance is experienced during acceleration or at higher speeds.

AIR CLEANER

NOTE: Under prolonged dusty driving conditions, it is recommended that these operations be performed more often.

POLYURETHANE TYPE—

Every 12,000 miles clean element in solvent, squeeze out solvent, then soak in engine oil and squeeze out excess.

OIL WETTED PAPER ELEMENT TYPE—

First 12,000 miles inspect or test element; if satisfactory, re-use element but recheck every 6,000 miles until replaced. Element must not be washed, oiled, tapped or cleaned with an air hose.

BATTERY TERMINAL WASHERS

Battery terminals have felt washers between top of case and cable connections to minimize corrosive action of battery acid. These felt washers should be saturated with engine oil every 6,000 miles.

DISTRIBUTOR

4 and 6-Cylinder Engine--Remove distributor cap and rotate lubricator 1/2 turn at 12,000 mile intervals. Replace at 24,000 mile intervals.

8-Cylinder Engine--Change cam lubricator end for end at 12,000 mile intervals. Replace at 24,000 mile intervals.

REAR AXLE AND 3-SPEED AND OVERDRIVE, 4-SPEED TRANSMISSIONS

The passenger car operates under the most severe lubrication conditions at high speed and requires a hypoid lubricant which will meet this condition.

Recommended Lubricants

Standard Rear Axles--SAE 90 "Multi-Purpose" gear lubricant.

Positraction Rear Axles--Use special Positraction lubricant.

CAUTION: Straight Mineral Oil gear lubricants must not be used in hypoid rear axles.

Transmissions--SAE 90 "Multi-Purpose" gear lubricant.

The SAE 90 viscosity grade is recommended for year round use. However, when extremely low temperatures are encountered for protracted periods during the winter months, the SAE 80 viscosity grade may be used.

"Multi-Purpose" Gear Lubricants

Gear lubricants that will satisfactorily lubricate hypoid rear axles have been developed and are commonly referred to as "Multi-Purpose" gear lubricants meeting U.S. Army Ord. Spec. MIL-L-2105B.

These lubricants can also be satisfactorily used in manual transmissions.

CAUTION: With Positraction rear axles use special Positraction lubricant.

"Multi-Purpose" gear lubricants must be manufactured under carefully controlled conditions and the lubricant manufacturer must be responsible for the satisfactory performance of his product. His reputation is the best indication of quality.

Lubricant Additions

The lubricant level in the axle and transmission housings should be checked periodically. (Every 6,000 miles.)

It is recommended that any additions required to bring up the lubricant level be made using the same type lubricant already in the housing.

When checking lubricant level in transmission or rear axle the unit being checked should be at operating temperature. With unit at operating temperature the lubricant should be level with bottom of the filler plug hole. If the lubricant level is checked with the unit cold the lubricant level should be 1/2 inch below the filler plug hole.

Lubricant Changes

The rear axle lubricant does not require changing for the life of the vehicle. If additions are needed, or when refilling the axle after service procedures, use lubricants described above.

POWERGLIDE TRANSMISSION

NOTE: Every 12,000 miles, it is recommended that the Powerglide low band be adjusted as specified in Section 7 of this manual.

Every 6,000 miles--Check fluid level on dipstick with engine idling, selector lever in neutral position, parking brake set and transmission at operating temperature. If fluid level is below full mark on dip stick, adding a small amount of Automatic Transmission Fluid, General Motors Automatic Transmission Fluid (Part Numbers 1050568-69, 70) is recommended. If this fluid is not obtainable, use Automatic Transmission Fluid Type 'A' bearing the mark AQ-ATF followed by a number and the suffix letter 'A'. Recheck fluid level on dip stick and again add a small amount of fluid if needed to bring level to full mark. DO NOT OVERFILL.

Every 12,000 miles (more frequently*, depending on severity of service, if vehicle is used to pull trailers, carry full loads during high ambient temperatures, operate in mountainous terrain or operate under other severe conditions--Remove fluid from the transmission sump and add one and a half quarts of fresh fluid for Camaro and Chevy II and two quarts for Chevrolet, Chevelle, and Corvette. Operate transmission through all ranges and check fluid level as described above.

*Except if vehicle is equipped with transmission provided in heavy duty service options. If so equipped, drain converter and pump every 12,000 miles and add approximately seven and a half quarts of fresh fluid for Chevy II and nine quarts for Chevrolet and Chevelle.

TURBO HYDRA-MATIC

Lubrication recommendations for the Turbo Hydra-Matic are the same as outlined for the Powerglide transmission except for fluid capacity and filter change listed below.

After checking transmission fluid level it is important that the dip stick be pushed all the way into the fill tube.

Every 12,000 miles -- after removing fluid from the transmission sump, approximately 7 1/2 pints of fresh fluid will be required to return level to proper mark on the dip stick.

Every 24,000 miles, or at every other fluid change--the transmission sump strainer should be replaced.

FRONT WHEEL BEARINGS

It is necessary to remove the wheel and hub assembly to lubricate the bearings. The bearing assemblies should be cleaned before repacking with lubricant. Do not pack the hub between the inner and outer bearing assemblies or the hub caps, as this excessive lubrication results in the lubricant working out into the brake drums and linings.

Front wheels of all passenger car models are equipped with tapered roller bearings and should be packed with a high melting point water resistant front wheel bearing lubricant whenever wheel and hub are removed.

CAUTION: "Long fibre" or "viscous" type lubricant should not be used. Do not mix wheel bearing lubricants. Be sure to thoroughly clean bearings and hubs of all old lubricant before repacking.

The proper adjustment of front wheel bearings is one of the important service operations that has a definite bearing on safety. A car with improperly adjusted front wheel bearings lacks steering stability, has a tendency to wander or shimmy and may have increased tire wear. The adjustment of these bearings is very critical. The procedure is covered in Section 3 of this manual under Front Wheel Bearings--Adjust.

MANUAL STEERING GEAR

Check lubricant level every 36,000 miles. If required, add EP Chassis Lubricant.

POWER STEERING

On models equipped with power steering gear, check fluid at operating temperature in pump reservoir. Add GM Power Steering Fluid, or, if this is not available, use Automatic Transmission Fluid "Type A" bearing the mark AQ-ATF followed by a number and the suffix letter 'A' to bring level to full mark on dip stick.

AIR CONDITIONING

After the first 6,000 miles, check all hose clamp connections for proper tightness.

Every 6,000 miles check sight glass under the hood, after the system has been in operation for several minutes. Sight glass should be clear but may, during milder weather, show traces of bubbles. Foam or dirt indicate a leak which should be repaired immediately.

BRAKE MASTER CYLINDER

Check level every 6,000 miles and maintain 1/4" below lowest edge of each filler opening with GM Hydraulic Brake Fluid Supreme No. 11.

PARKING BRAKE

Every 6,000 miles, apply water resistant lube to parking brake cable, cable guides and at all operating links and levers.

CLUTCH CROSS-SHAFT

Periodic lubrication of the clutch cross shaft is not required. At 36,000 miles or sooner, if necessary; remove plug, install lube fitting and apply CHASSIS LUBRICANT.

CHASSIS LUBRICATION

For chassis lubrication, consult the lubrication chart. It shows the points to be lubricated and how often the lubricant should be applied.

The term "chassis lubricant" as used in this manual, describes a water resistant EP chassis grease designed for application by commercial pressure gun equipment.

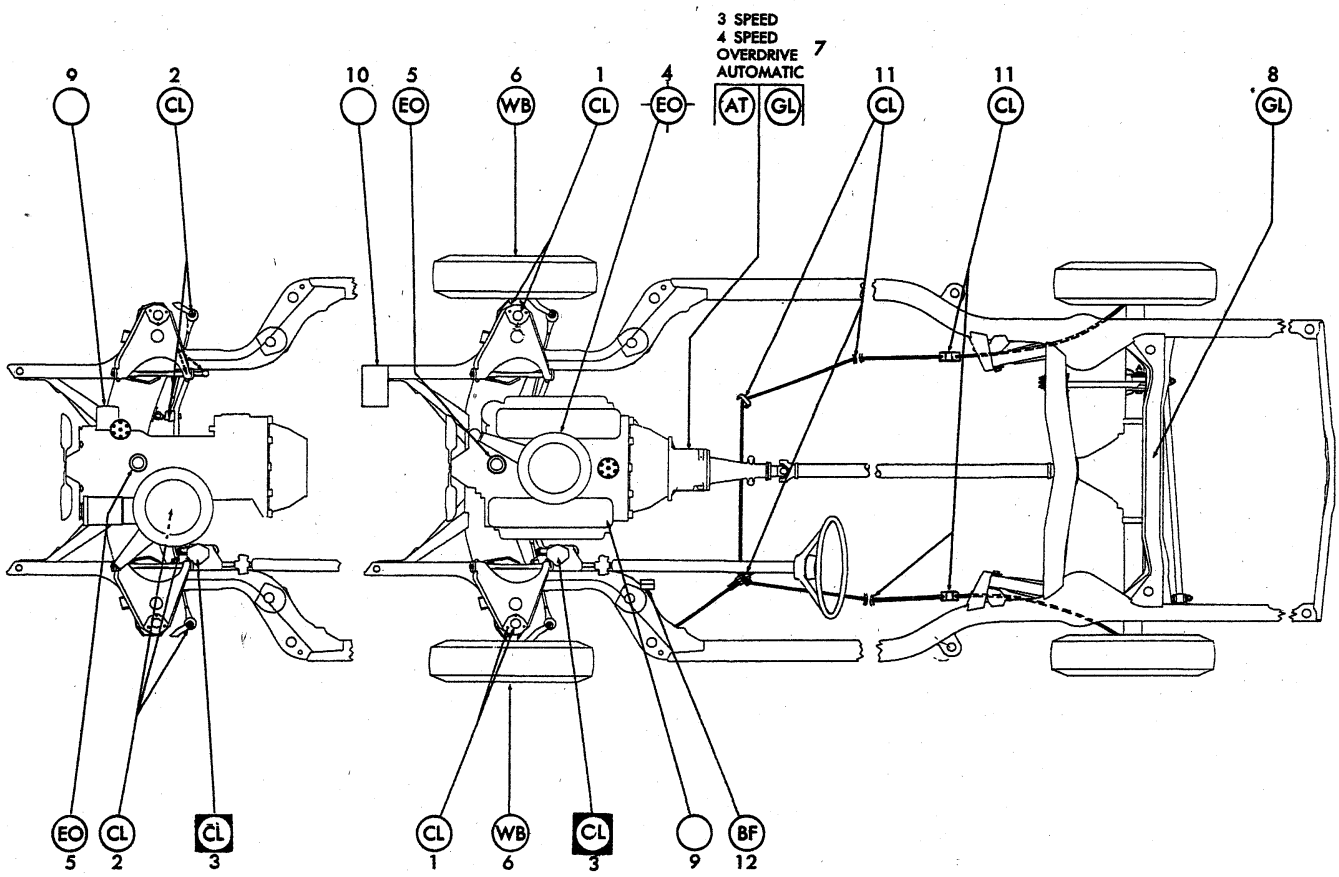

Fig. 32—Lubrication Diagram—Chevrolet

1. Front Suspension
2. Steering Linkage
3. Steering Gear
4. Air Cleaner
5. Crankcase Breather Cap
6. Front Wheel Bearings
7. Transmission
8. Rear Axle
9. Oil Filter
10. Battery
11. Parking Brake
12. Brake Master Cylinder

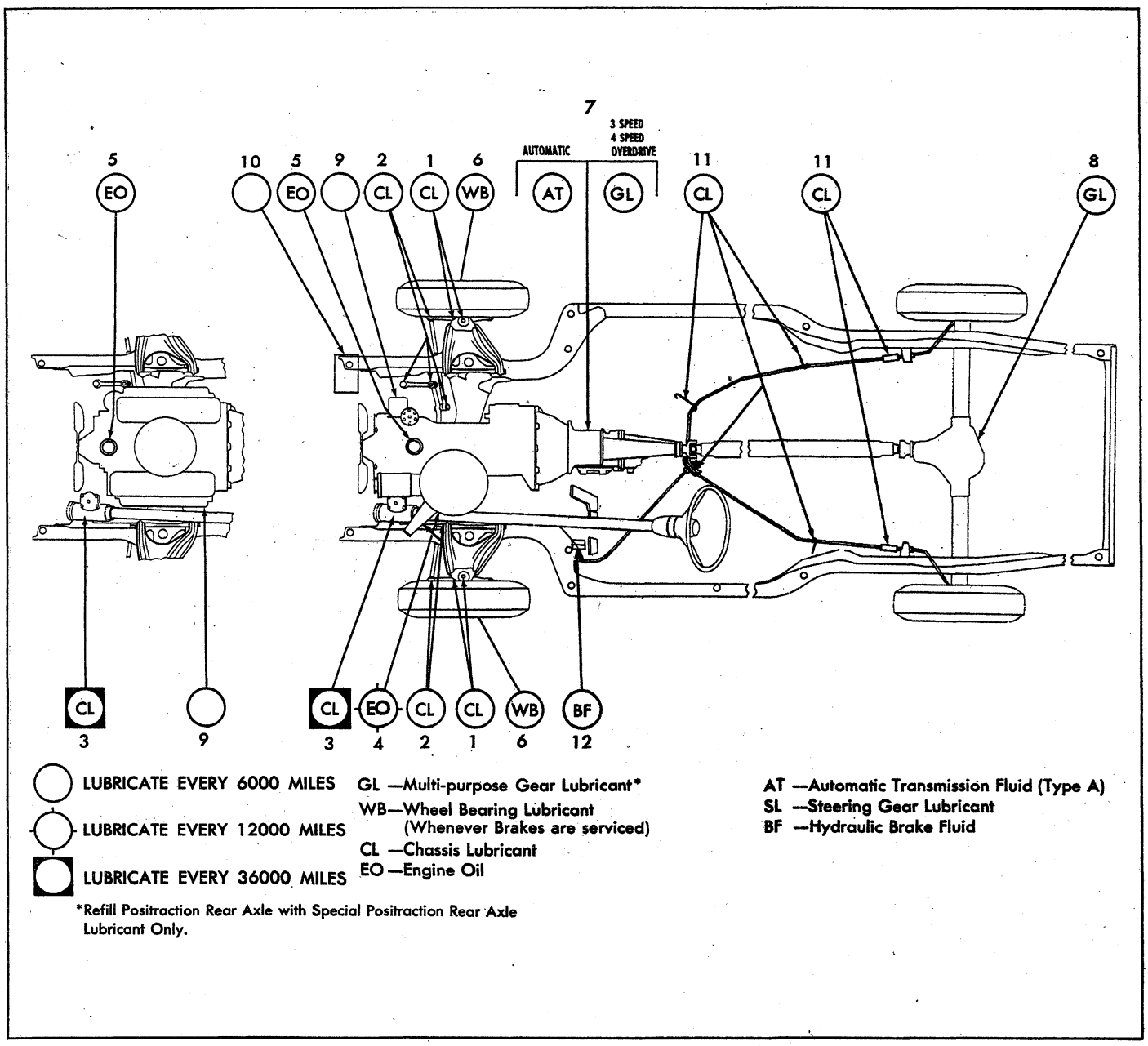

Fig. 33—Lubrication Diagram—Chevelle

1. Front Suspension
2. Steering Linkage
3. Steering Gear
4. Air Cleaner
5. Crankcase Breather Cap
6. Front Wheel Bearings
7. Transmission
8. Rear Axle
9. Oil Filter
10. Battery
11. Parking Brake
12. Brake Master Cylinder