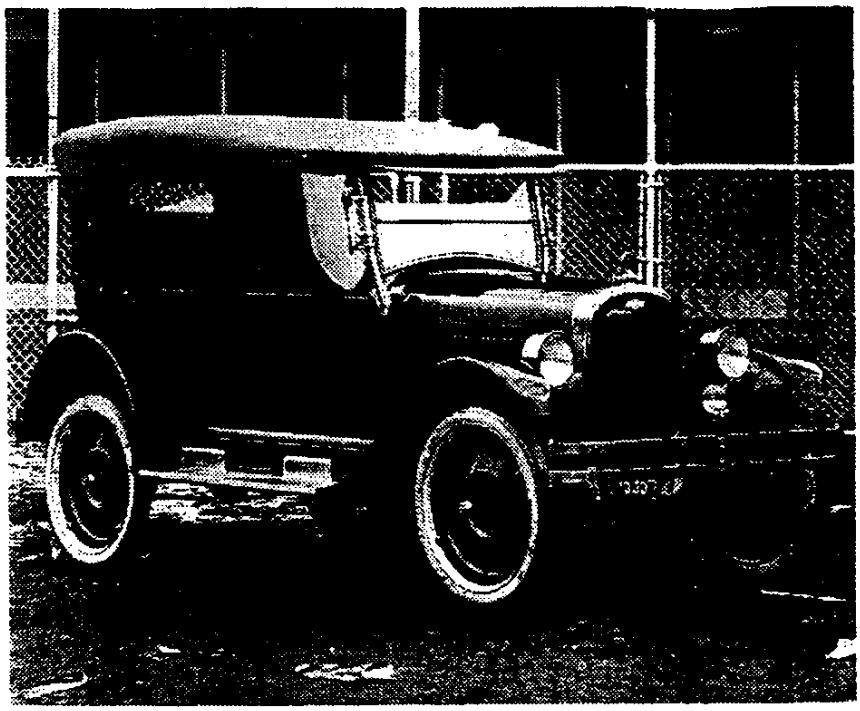
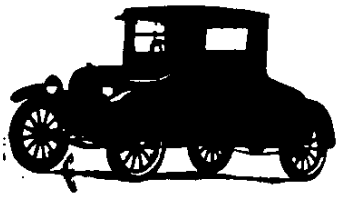
CHEVROLET



1922 Chevrolet, touring, JAC

1922



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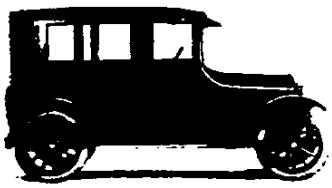

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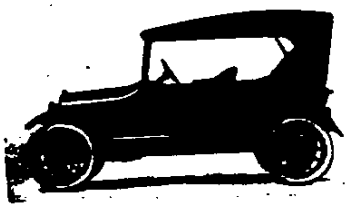


1922-490-TOURING-CHEVROLET.

It is Your Turn Now—

¶ We have employed the best engineering skill and used only first grade materials in building Chevrolet Cars.

¶ We have provided service facilities in every part of the world.

¶ But, unless the operator of a Chevrolet knows how to properly handle and care for his or her car, the maximum of satisfaction and enjoyment, which our painstaking efforts have provided, will not be realized.

¶ It is to give this desirable, if not entirely necessary, knowledge, that this Instruction Book has been prepared.

¶ It has been made simple, with technical terms eliminated, for the benefit of the Chevrolet operator who is without previous experience.

¶ The simplicity and accessibility of Chevrolet cars, combined with ease of operation, make it possible for one without previous mechanical experience, to secure entirely satisfactory results.

¶ At our factories and distributing branches we maintain a service organization that is at all times at your disposal and will be glad to give you any information you may desire.

CHEVROLET MOTOR COMPANY

Standard Warranty

Approved as to Form by National Automobile Chamber of Commerce, Inc.

We warrant each new motor vehicle manufactured by us to be free from defects in material and workmanship under normal use and service, our obligation under this warranty being limited to making good at our factory any part or parts thereof which shall within ninety (90) days after delivery of such vehicle to the original purchaser be returned to us with transportation charges prepaid, and which our examination shall disclose to our satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on our part, and we neither assume nor authorize any other person to assume for us any other liability in connection with the sale of our vehicles.

We do not make any guarantee against, and we assume no responsibility for, any defect in metal or other material that cannot be discovered by ordinary factory inspection, or in any part, device or trade accessory.

This warranty shall not apply to any vehicle which shall have been repaired or altered outside of our factory in any way so as, in our judgment, to affect its stability, nor which has been subjected to misuse, negligence or accident.

We make no warranty whatever in respect to tires, rims, ignition apparatus, horns or other signaling devices, starting devices, generators, batteries, speedometers or other trade accessories, inasmuch as they are usually warranted separately by their respective manufacturers.

CHEVROLET MOTOR COMPANY.

IMPORTANT NOTICE

It is understood and agreed that the Standard Warranty with this company is null and void on any Chevrolet Model where parts not made or sold by us are used in any replacement or otherwise. We do not sell batteries. See the nearest Willard Service Station for prices.

The following is a list of manufacturers supplying accessories for Chevrolet Cars, and as under the terms of our warranty these are guaranteed separately by the manufacturers, any questions as to the repair or replacement of the units should be taken up with them or their nearest service station.

Ammeter
Electric Auto-Lite Co., Toledo, Ohio.

Battery
Willard Storage Battery Co., Cleveland, Ohio.

Carburetor
Zenith Carburetor Co., Detroit, Mich.

Circuit Breaker
Electric Auto-Lite Co., Toledo, Ohio.

Coil
United Motors Service, Inc., Detroit, Mich.

Generator
Electric Auto-Lite Co., Toledo, Ohio.

Horn
Schwarze Electric Co., Adrian, Mich.
Klaxon, United Motors Service, Inc., Detroit, Mich.

Igniter
United Motors Service, Inc., Detroit, Mich.

Lighting and Ignition Switch
Electric Auto-Lite Co., Toledo, Ohio.

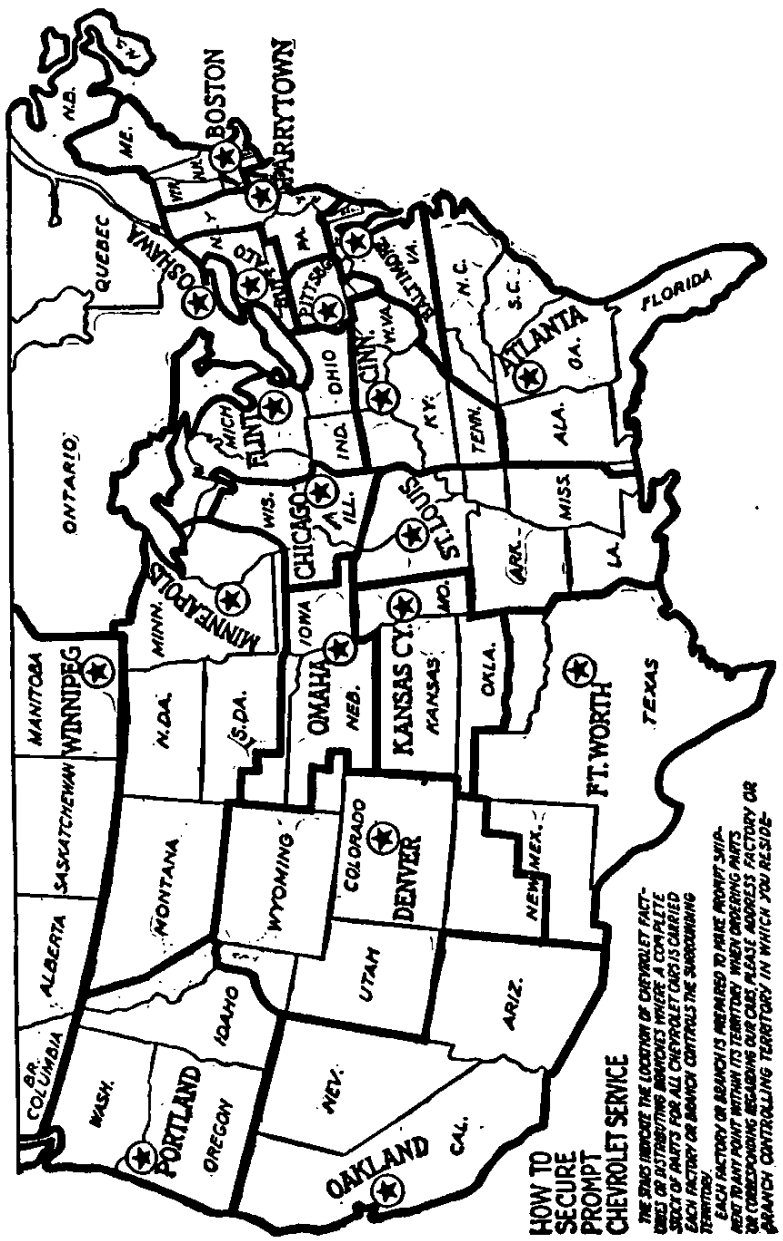
Oil Pressure Gauge
National Gauge & Equipment Co., La Crosse, Wis.

Rims
Jaxon Steel Products Co., Jackson, Mich.

Starting Motor and Switch
Electric Auto-Lite Co., Toledo, Ohio.

Speedometer
Stewart-Warner Corporation, Chicago, Ill.

Tires
Goodyear Tire & Rubber Co., Akron, Ohio.



WHAT TO DO UPON RECEIVING THE CAR

Every Chevrolet is thoroughly tested before it leaves the factory, and all places requiring oil or grease are supplied with it. It has been our purpose to deliver into your hands a perfectly balanced, well built automobile of honest and painstaking workmanship.

Your car, therefore, will be ready for use as soon as you have filled the cooling system with clean water and the fuel tank with a good grade of gasoline. After filling the tank with gasoline, tighten the tank cover securely to prevent evaporation.

As a precaution, however, and to avoid mistakes, examine your car: See that the tires are pumped up hard (air pressure

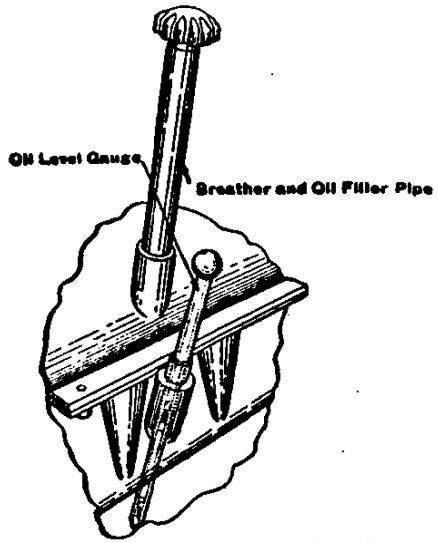


Fig. 1—Oil gauge and filler pipe.

should be about twenty pounds per inch of tire diameter), remove the caps on all grease cups and see that they are full. Raise the hood and examine the wiring—see that the terminals are tight upon the spark plugs, that no dirt or water covers the coil or ignition system, in short, see that all parts of the motor are clean and free from surplus oil or dirt. Make it your business thereafter, during the life of the car, to keep it in this condition and you will be sure of securing the maximum of service from your motor.

On the left side of the oil basin is an oil level gauge and filler pipe. (Fig. 1.)

To read the gauge pull up on the ball (Fig. 1), to which is fastened the gauge rod, and wipe the oil off the rod. By this time the oil in the reservoir will have become calm, and by inserting the gauge rod a true reading may be obtained. If the reading shows

the oil level to be below the "High" mark, remove the filler-pipe cap and pour in a good grade of cylinder oil until the "High level" is reached.

Do not put more oil into the basin than is required, as the level of oil is predetermined to give best results and any over-filling will simply mean increased consumption, smoking and carbonization.

Once a month, or every 1000 miles, the oil in the crank case should be drained off and a fresh supply poured in. The old oil may be drained by removing the drain plug on the bottom of oil pan. After draining, flush the oil pan with kerosene through the breather pipe, replace drain plug and refill with clean oil. Be absolutely sure that all kerosene is drained off, otherwise it will mix with the fresh oil and will cut down its lubricating qualities.

Fresh oil is cheaper than repair bills, so observe this point regularly.

Use light cylinder oil to lubricate the rocker arms and push-rod felts. Keep the felts saturated with oil.

STARTING THE MOTOR

These few details attended to, you are ready to start the motor.

Before you can do so, however—in fact, before you can start the motor at any time—you must make certain of *three* things.

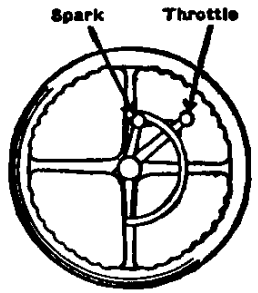


Fig. 2—Position of spark and throttle levers when starting motor.

First, that the gear shifting lever is in neutral position, that is, it should be free to move from right to left.

Second, that the spark and throttle levers are in the proper positions for starting. (Fig. 2.)

Third, that the ignition switch is turned on (Fig. 3). To do this insert key in slot through the lighting switch button and turn to the left as far as it will go. This performs the double operation of turning on the ignition and unlocking the lighting switch which can then be operated and any combination of lights turned on that may be desired.

Be absolutely sure that the spark lever is properly retarded, as shown. Failure to do this may result in a premature explosion or "back fire" which will cause serious damage to the

starting equipment and subject you to unnecessary trouble and expense.

We will not be responsible for such damage, so observe this point without fail.

After being absolutely sure that all *three* rules given above have been carefully observed, start the motor.

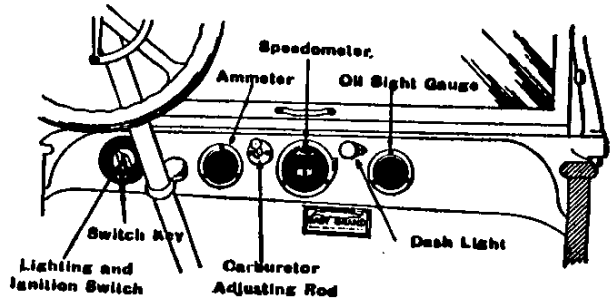


Fig. 3—Instrument Board.

Located on the floor boards (Fig. 4) within reach of the right foot is the starting button. Press this down as far as it will go and hold it until the engine starts under its own power. Remove your foot the moment the engine starts. Serious damage can be done to the starting motor unless this is watched very carefully.

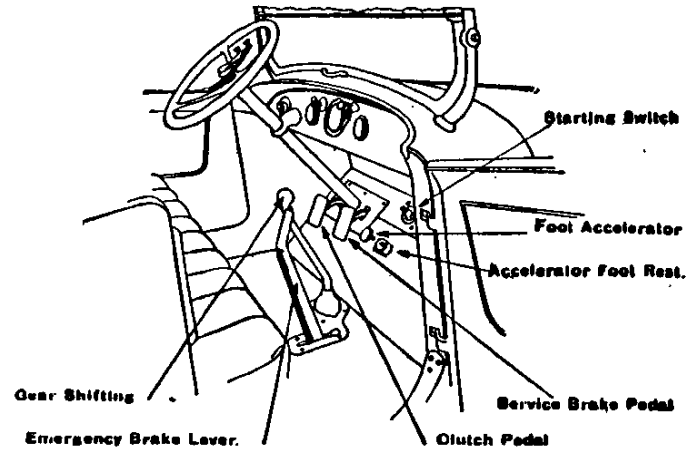


Fig. 4—Controlling devices.

Owing to the difference in specific gravity of gasoline obtainable in various localities, and also to difference in atmospheric conditions, it is sometimes necessary to feed the motor a fuel mixture rich in gasoline and poor in air. This is particularly true in cold weather when the motor has become thoroughly

After the car has gained sufficient momentum, prepare for changing to second speed.

Speed the car up just a little by opening the throttle.

Release the clutch by depressing the clutch pedal, the one under your left foot, and while the car retains its slightly increased speed, and while you keep the clutch released, move the gear-shifting lever forward to neutral, thence to the right and right-forward position. (Fig. 8.)

Now, let the clutch pedal come back easily as before, and at the same time advance both the spark and throttle levers slightly.

Allow the car to gain some speed (do not permit the motor to race), then prepare for changing to high or third speed.

Release the clutch as before and, while the clutch pedal is depressed, pull the gear-shifting lever straight back into the right rear position as indicated in Fig. 9. At the same time advance both the spark and throttle levers a little.

When you have become accustomed to changing gears, try using the accelerator pedal to "accelerate" the motor after making shifts from second to high or high to second. You will find it less awkward besides giving greater freedom of the hands.

It is possible to move the gear shifting lever from any one position to another, only be careful:

To keep the clutch released while moving the gear shifting lever.

To avoid the left forward or reverse position while the car is moving.

To avoid "clashing" when engaging the gears.

When the gears clash press down a little more upon the clutch pedal and wait a moment before trying again. Remember, clashing the gears burrs up the edges of the teeth, injuring them and in time making gear changes exceedingly hard, besides necessitating an early renewal of the gears.

Be deliberate: It is well to pause a moment or two after disengaging the gears before moving into the next speed. The fundamental requirements in every case are that the gears to be meshed shall be revolving at as nearly the same speed as possible. By waiting a moment, time is given for this to take place.

In changing to a higher gear, slow down the motor while the gears are disengaged. When changing to a lower speed, speed up the motor while the gears are disengaged.

STOPPING THE CAR

When you have decided that you want to make a stop, release the clutch and at the same time retard the throttle lever, or remove your foot on the accelerator pedal. Allow the car to coast for a moment or two on its own momentum, then gradually press downward upon the service brake pedal, the one under your right foot (Fig. 4) until you have reached its limit of downward movement, or until the car comes to a stop.

By applying the pressure on the brakes gradually, and by permitting the car to coast for a distance on its own momentum, you can gauge your stop to a nicety and come to a stop exactly at the desired spot.

You must keep the clutch pedal depressed while the car is

coming to rest, and never under any circumstances take pressure off the clutch pedal until after you have moved the gear shifting lever from the high speed position into the neutral position.

When the gear shifting lever is in neutral the transmission gears remain out of engagement, and although the pressure on

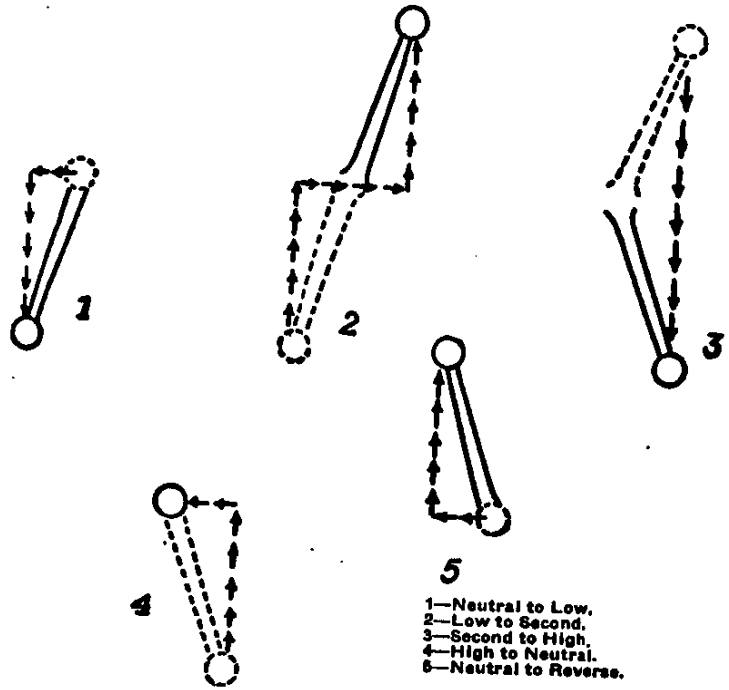


Fig. 10—Gear shifting table.

the clutch pedal be now removed, the car will remain motionless although the motor continues to run.

If the stop is to be of some duration, always before leaving the car set the emergency brake (Fig. 4) by pulling the emergency brake lever straight back towards you as far as it will go. Be sure that the plunger ratchet attached to the lever engages the toothed segment, otherwise the brake will not hold. To release the brake pull the lever towards you and at the same time press down upon the button extending through the top of the lever handle. This causes the plunger ratchet to disengage from the toothed segment and the lever can be pushed forward into its original position. Do not take your finger off the button until you are sure the lever has been pushed forward as far as it will go, otherwise your brake may be partially "set," using up power, besides wearing out the brake linings.

To stop the motor turn the ignition key to the right and remove. This locks the ignition, also the lighting switch, and prevents tampering or theft. Turning off the ignition does not affect the position of the lighting switch button, therefore it

is possible to leave your car with whatever combination of lamps burning you desire.

It is also good practice to turn the steering gear so that the wheels "turn in" towards the curb or side of the road. Should the brake, for any reason, be released, this will prevent the car from starting on a "wild plunge" should your stop be on a down grade.

MAKING AN EMERGENCY STOP

There are times when the ability to bring the car quickly to a stop is of the greatest importance. When this occurs, release the clutch by pressing the pedal under your left foot and at the same time press down hard on the service brake pedal, the one under your right foot. If this braking action is not sufficient to bring the car to a stop in the required time, "set" the emergency brake by pulling the emergency brake lever (Fig. 4) towards you as far as it will go. By applying both the service and emergency brakes you apply braking effect in opposite directions, which will have immediate results.

As soon as possible retard the throttle to prevent the motor "racing."

If a full stop is not desired, merely a temporary slackening of the speed, release the brakes first, then let the clutch pedal come up.

If the speed of the car has been decreased to any great extent, it is advisable to shift into a lower gear. Never allow the motor to pick up a slowly moving car on high gear. The strain placed upon it is very great, and the likelihood of "stalling" the motor easily offsets the small effort necessary to change speeds.

Be considerate; the manufacturers have placed three forward speeds at your disposal, each ratio of which is designed for certain loads and conditions. Don't overload the motor; the next lower gear, while a little slower, is in the end an insurance for longer life and more efficiency.

BRAKING EFFECTS

When the brakes are applied suddenly and with full force to the wheels of a car going at a considerable speed, the braking action will be so powerful as to immediately stop the rotation of the driving wheels. But the car will not come to an immediate standstill, its momentum will carry it forward, and the locked rear wheels will slide over the ground with most destructive effect on the tires.

The best method of using the brakes is that which applies pressure on them so gradually that the forward movement of the car and the rotation of the wheels come to a stop *together*.

Avoid spectacular stops; they are not only unnecessary, but indicate a desire to "show off" which is so disgusting to the average motorist. There may also come a time when through constant "showing off" the brakes will fail. The inevitable result will be a bad smash up, with its consequent danger to others.

The careful driver shuts his power off before he reaches the stopping point, and permits the car to carry him along on its momentum, bringing it, with a gradual application of the brakes, to a halt at the exact spot.

Never apply the brakes with the clutch in engagement. Release the clutch first, then, if necessary, apply the brakes. Applying the brakes first would destroy the braking effect, besides being very injurious both to the motor and clutch lining, with a liability of injuring the transmission.

STEERING

Steering is not a difficult task. Perfection comes from confidence, not from knowledge. Within a few minutes the novice will have learned just how much of a movement on the steering wheel is required to turn a corner, pass other vehicles or obstructions.

Turning the steering wheel to the left will cause the front wheels to turn in the same direction, and the car will travel to the left. Turning the steering wheel to the right causes the car to travel to the right. This applies when backing up as well as when going forward.

Proceed cautiously, preferably on a road that is little frequented, and wide enough to give plenty of room for your first attempt at automobile driving.

Don't forget that after turning a corner the front wheels should be "straightened" up, otherwise you will run off the road.

REVERSING OR BACKING THE CAR

Always bring your car to a "dead" stop before attempting to back up. Failure to observe this may result in serious damage to the transmission and cause unnecessary expense. With the car at rest and the gear shifting lever in neutral, release the clutch by depressing the clutch pedal and move the gear shifting lever forward into the left forward position (Fig. 11). Now let the clutch pedal come back easily and at the same time accelerate the motor speed by opening the throttle slightly.

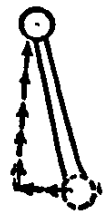


Fig. 11—Sketch showing gear shifting lever being moved from neutral to reverse.

Remember that in moving backward the same movement of the steering wheel will cause you to turn to the right or left as it would were you going forward.

Proceed cautiously. More accidents occur when backing up than when going forward, as you cannot see clearly; so take your time, look around, and make sure that you have your car under such control that a stop can be made instantly.

A FEW HINTS ON DRIVING

Never drive your car at high speed over any road, much less a rough or slippery one. The slight gain in time saved will not offset the liability of an accident nor the pounding and racking to which the car is subjected. Usually the time saved is unimportant when figured in dollars and cents. The resulting repair

bills, which in time are sure to follow are never unimportant.

It has been demonstrated that the car driver who drives at an average speed of from eighteen to twenty-five miles per hour over all sorts of roads pays much more per mile for gasoline, oil and tires than the one who is more conservative and averages from fifteen to eighteen miles per hour.

In addition, a car which is driven at high speeds all the time is in the repair shop at frequent intervals, which adds to the cost per mile of operation.

It is not the question of how many miles are covered in a given time that counts, but the number of miles of useful travel that can be obtained at the least cost for fuel, oil, tires and repairs.

In times of emergency, when to stop suddenly is absolutely necessary, remember the speed at which you are traveling combined with the road surface may spell safety or disaster for you, the occupants and your car. One cannot always observe closely road surfaces when traveling at high speed; the necessity of watching the road far ahead prevents. So, avoid excessive speed, is a rule to be observed.

Observe the "rules of the road." Have due respect for those who are using the same highway, remembering that courtesy and consideration to others will always win for you the same return.

When approaching a turn slow down. Some one else may be traveling in an opposite direction. Have your car under absolute control so that a stop may be made quickly and within a few feet.

When making a turn it is a good plan to release the clutch, at the same time retarding the throttle and allowing the car to coast under its own momentum. This releases the power from the driving wheels and lessens the liability of skidding.

Avoid, unless absolutely necessary, the application of the brakes when rounding a turn. Unless the road surface is very hard and dry, the liability of skidding is great. If it is necessary to apply the brakes, and the car "skids," release them at once. They can then be reapplied gradually.

When approaching a stretch of road covered with sharp, broken stones or ruts, it is advisable to speed your car a little before you reach it, and then, when passing over it, release the clutch and permit the car to coast over. This action not only saves the tires, but relieves the motor and driving mechanism of the strain.

During the first few days after you receive your car drive slowly; avoid "speeding," and watch carefully for any unusual noises. Every bearing and working part has been "set up" tight before leaving the factory to insure long life, consequently the liability of "heating" will be greater then than a little later when the parts have "run in."

FINALLY

In order that you may get the maximum service from your car you must be as considerate and thoughtful about it as you would of a fine horse that was as fine and as costly as your car is.

Therefore:

Do not race the motor unnecessarily.

Be warned by every abnormal noise; if it is a squeak, locate it and lubricate the part. If it is some other noise, locate the loose parts that cause it, and tighten the bolts.

Don't tinker. Half the ability to make an adjustment or repair is the ability to discover its necessity.

Some drivers are said to have "luck" with their cars. There never seems to be any trouble, everything is trim and neat, the motor always starts when wanted and runs as long as is needed, without any of the exasperating breakdowns on the road with which the unfortunate one thinks himself cursed through the carelessness of the manufacturer. With all adjustments carefully made when needed, every bearing and working part well lubricated, the whole car will work very sweetly and will continue to do so with only a very small fraction of the attention that would be absolutely necessary for the care of a horse.

By neglecting details you will save yourself some time and inconvenience in getting on your way, but the day of reckoning is sure to come. What you have saved will be spent in expensive roadside repairs.

COOLING SYSTEM

The cooling system as used on the Chevrolet is by means of a large cellular-type radiator and a belt-driven centrifugal pump. As the circulating pump is connected to the lower radiator outlet the water is drawn through the radiator before being delivered to the water jackets surrounding the cylinder walls, which insures a proper circulation of cool water at all times, regardless of engine speed. (Fig. 12.)

The circulating pump is readily accessible by removing the bolts holding it to the cylinder jackets. Should water leak through the stuffing box on the end of the pump shaft, tighten the nut. If this does not stop the leak, unscrew the stuffing box and wrap ordinary candle wicking around the shaft and tighten the nut again.

The radiator at all times should be kept full, or trouble is sure to follow. It is a good plan to form the habit of inspecting and filling the radiator before the car is taken from the garage. On long trips, especially when you have been traveling over hilly roads, or those with a loose top surface, examine the water supply quite frequently. Consider always that the proper amount of water is as important as your supply of gasoline and oil. It is well to examine the water supply every time a stop is made for oil or gasoline.

Always use clear water. If rain water can be had, use it, as less scale or deposit will result.

Keep the cellular openings clean. Never allow mud to remain in them, as it cuts down the radiation and prevents proper cooling. The entire circulating system should be thoroughly flushed out occasionally. This can be done in ordinary cases by disconnecting both the upper and lower hose connections and allowing fresh water to enter the filler neck and flow down

through the radiator and out the lower hose. The motor water jackets can be flushed out in the same way.

When hard water has been used, a scale or deposit will be

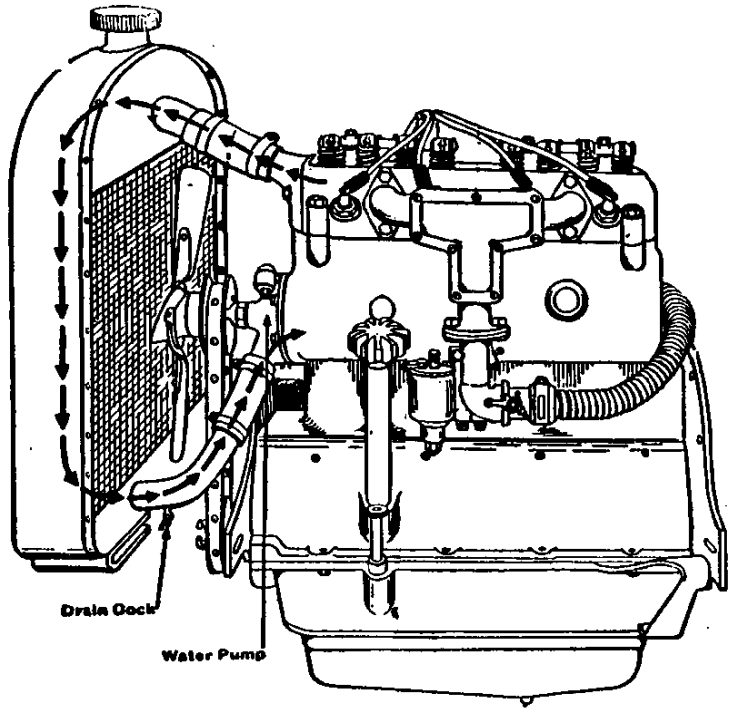


Fig. 12—Pump-driven cooling system.

formed, which, unless removed, will obstruct the circulation, causing unnecessary heating and frequent refilling. In this case a good way to clean out the scale is to dissolve a half pound of lye in about five gallons of water. Strain the liquid through a cloth and put in the radiator. Run the motor for about five minutes, then draw off the solution through the radiator drain cock. Fill the radiator with fresh water and run the motor again for several minutes, then drain off the solution and refill with fresh water. Never use a more powerful chemical.

Once a week it is a good plan to open the radiator drain cock and let all the water and accumulated dirt run out. If the water is very dirty, flush the radiator with fresh water.

Never—and be sure about this—put cold water into the radiator while the motor is hot. By "hot" we mean any temperature which is uncomfortable to the hand when held against the cylinder head.

When a motor gets "hot" the cylinder walls, and especially the cylinder head, around the exhaust ports, are thoroughly heated up. The danger of cracking these ports cannot be overestimated, so make it a point, should you stop for water after the motor has

been running for some time, to test the temperature of the motor by raising the hood and placing your hand on the cylinder head. If you can hold it there with comfort, water can be placed in the radiator; if not, wait until you can. It will only take a few minutes for the motor to cool off, and the repair bill saved will more than offset the slight loss of time and inconvenience.

Leaks in any system subjected to vibration are likely to occur, so don't be alarmed if you find your radiator has "sprung" a leak. As soon as possible it should be soldered, as a leaky radiator is not only a source of some annoyance by reason of frequent refilling, but a seam, once opened up, is likely to get larger, resulting in sudden loss of water, with disastrous results.

It is not a good plan to put corn meal, bran or other substances in a radiator to stop a leak. It clogs up the tubes, thereby decreasing the radiating efficiency. Make a permanent repair at the first opportunity.

WINTER DRIVING

As soon as the temperature begins to approach the freezing point an anti-freezing solution should be placed in the radiator. Wood alcohol or denatured alcohol is best for that purpose.

The capacity of a cooling system is 2⅞ gallons.

The following table may be used in estimating quantity of alcohol required for different temperatures:

Wood Alcohol	Denatured Alcohol
10 per cent.....18° F. above	10 per cent .....24° F. above
20 per cent..... 5° F. above	20 per cent.....16° F. above
30 per cent..... 9° F. below	30 per cent..... 7° F. above
40 per cent.....23° F. below	40 per cent..... 2° F. below
50 per cent.....36° F. below	50 per cent..... 8° F. below

Since alcohol evaporates more quickly than the water, it is well when filling the radiator to make up the loss by adding a solution of equal parts of alcohol and water.

The use of powerful chemicals, while sometimes cheaper in first cost, is very likely to cause damage later, costing more in repair bills than the amount saved, as they attack the metal system and rubber hose connections.

If the radiator should freeze, do not try to thaw it out by starting the motor, but thaw it by placing in a warm place.

It is a good plan, when making a stop in cold weather, to cover the radiator and hood with a blanket or other covering. This helps hold the heat, and in that way gives considerable protection from the liability of freezing, besides making the motor start easier.

VALVES AND VALVE SETTING

The valve mechanism used on Chevrolet cars is recognized as the highest type of engineering practice, not only from the standpoint of greatest efficiency, but of simplicity as well, allowing, as it does, absolute freedom in making adjustments and renewals.

To keep the valves in a state of continued efficiency, it is only necessary to give attention to a few simple rules.

Keep all rocker arms, push rods and tappets clean and free from dirt.

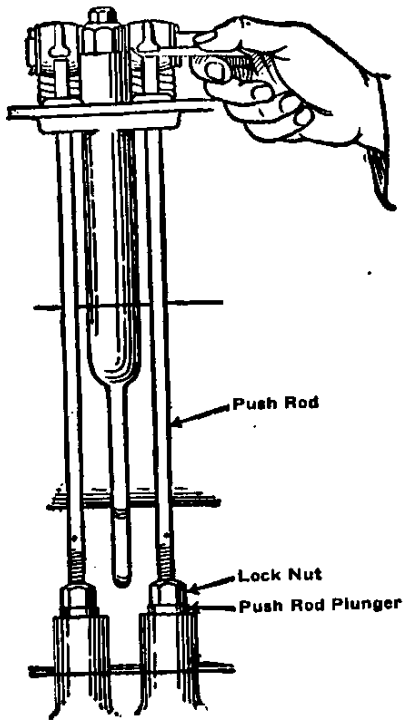


Fig. 13—Adjusting Push Rods.

Adjust, when needed, the clearance between ends of push rods and rocker arms.

Remove all pits and carbon deposits from valve seats when loss of compression or poor running indicates the necessity.

Too much stress cannot be laid upon the necessity of keeping the motor clean. The dust drawn through the radiator openings as the car travels ahead contains grit which, when wet with oil, forms a cutting compound that wears and scratches, leaving an irregular surface. This in time is sure to give trouble, so make it a rule to regularly clean all working parts. The slight inconvenience to yourself will be more than offset by the saving in repair bills later on.

HOW TO ADJUST PUSH RODS

The continual action of the push rod, opening and closing the valves, will in time produce wear which must be taken up.

To determine proper valve clearance, crank the motor by hand, turning the motor until the valve tappet has reached its lowest position.

The space between the top of the push rod and rocker arm (Fig. 13) should be about 0.005 inch, or the thickness of an ordinary sheet of letter paper. If more than this, loosen lock nut and turn push rod until proper clearance is had, after which—and be sure about this—tighten the lock nut to prevent the push rod working loose.

Caution: The necessity for valve adjustment will show itself first by excessive clicking of tappets, and second by poor running of motor. It is not necessary to make alterations under any other conditions.

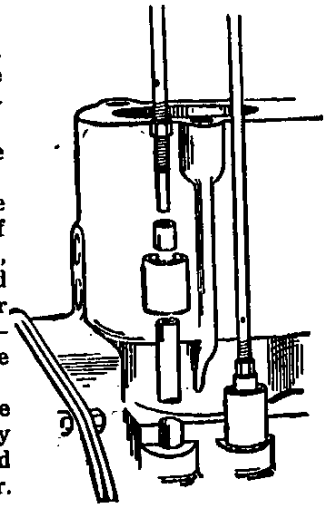


Fig. 14—Push rod and plunger removed.

In time the ends of the push rod plungers where they come in contact with the cams will become worn to such an extent as to require replacement.

Figure 14 shows one of the push rod plungers removed for inspection or replacement. The pressed metal guide is fitted into a slot cut in the top of the push rod plunger, and can be removed and installed in a new rod if needed.

CARBONIZED VALVES

As the motive power is obtained by burning or exploding a highly compressed gas mixture, it follows that a certain amount of carbon will be deposited on the valve seats, piston heads and combustion chamber. The amount of this deposit depends upon the severity of service and the quality and quantity of gasoline and lubricating oil used.

Small particles of burnt carbon will lodge under a valve, especially the exhaust, holding it open. As this exposes the valve seats to the heat generated by the explosion, small pits or burned spots will in time cause the surface to be so roughened as to prevent the proper seating of the valves. This will cause a leakage of gases resulting in loss of power and uneven running of the motor.

GRINDING VALVES

When this occurs, grinding the valves is the only remedy. To determine which valves need attention, turn the motor over slowly

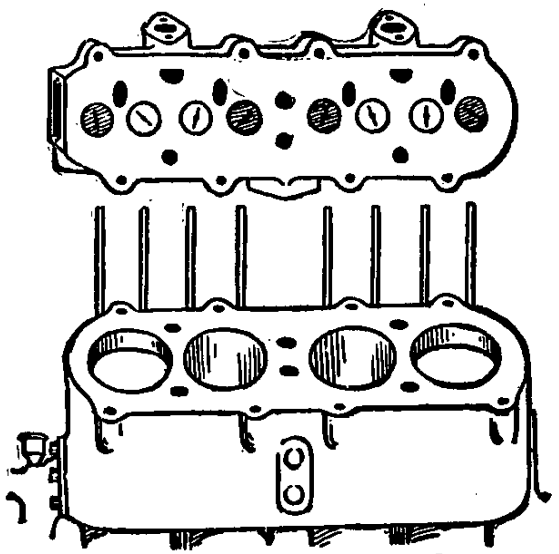


Fig. 15—Cylinder head removed.

by hand and note whether the same degree of resistance is met with in each cylinder. The ones offering the least resistance are those whose valves "leak". (Note: Except piston rings leaking. See page 23.)

The grinding of a valve is not a difficult operation when undertaken with patience. First, it is necessary to remove the valve from its seat.

Remove the cylinder head as follows: Disconnect the upper radiator hose connection. Remove each of the bolts holding the cylinder head to the cylinder casting and lift the head off (Fig.

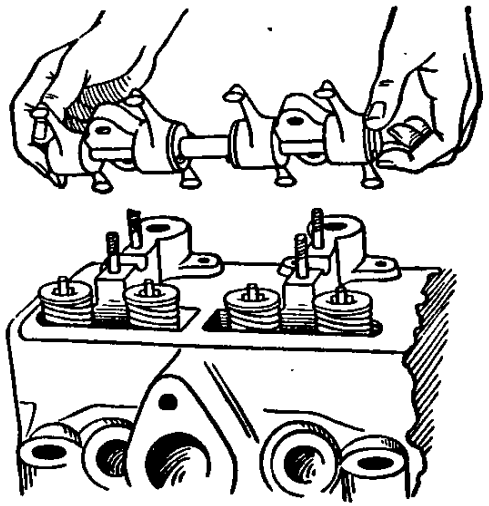


Fig. 16—Rocker arms and shaft removed.

15). The valves, rocker arms and bearings, being attached to the head, will remain with it.

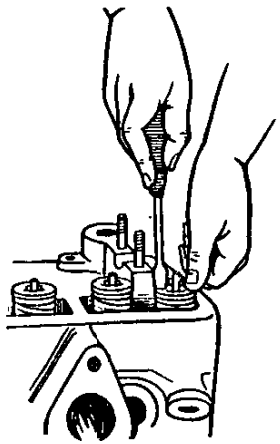


Fig. 17—Removing valve springs.

Remove the rocker arms and shafts as shown in Fig. 16. Do not mix the bearing caps; it is always a good plan to mark them before removing to insure putting back in exactly the same place when reassembling.

To remove the valves, proceed as follows: With a screw driver and your fingers press down upon the valve spring cap until the spring has been compressed enough to admit pulling out the valve spring cap pin (Fig. 17).

Remove each valve separately, using care not to mix them in any way, as they must go back into the same valve holes.

Secure a light coil spring and place it around the valve stem before replacing it for grinding. Use a good

grade of grinding material, the best being none too good if a satisfactory job is to be done. Smear the compound thinly on the beveled edge of the valve head and on the seat in the cylinder head. With a brace and a screw driver of good size rotate the valve back and forth (Fig. 18). **Do not turn the valve through a complete circle,** as this will cause the compound to cut ridges on the surfaces. After rotating the valve a few moments release the pressure on the brace. This will cause the coil spring to act, lifting the valve off its seat. Turn the valve slightly before again reseating for further grinding. Continue this method until the entire contact surfaces on both valve head and seat are polished and show no dark spots.

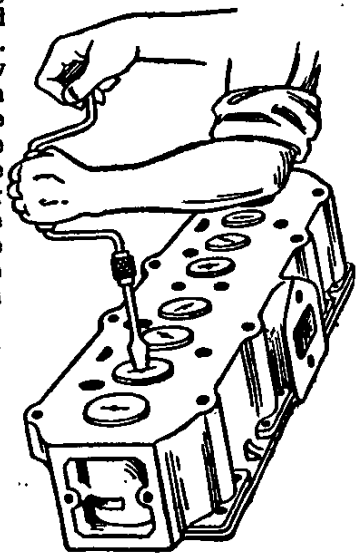


Fig. 18—Grinding valves.

After the surfaces have become apparently properly ground, test the seats for evenness as follows: With a pencil mark lines on the beveled edge of the valve head about ¼ inch apart and reseat the valve. Give it one-half turn to the right and then to the left, using a little extra pressure on the brace. If the valve has been ground accurately, each one of the pencil marks will be wiped away, but, on the other hand, if one line, or a part of one, remains untouched, there is an uneven spot and the valve must be reground until it seats accurately.

The secret of good valve grinding comes only with experience; however, if care is taken to properly rotate the valve back and forth with a reciprocating motion and at the same time turning the valve so that at the end of several such movements the valve has been turned through a complete circle a good job will result.

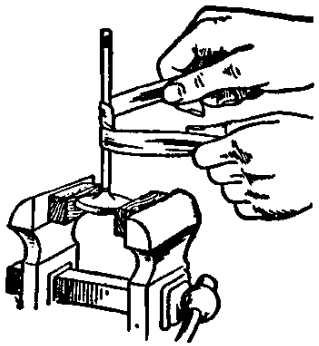


Fig. 19—Polishing valve stems.

Never grind a valve more than is required to secure a good accurate seat. Excessive grinding will lower the valve seat so that in time the valve head will fall below the top edge of the seat and cause trouble. When this occurs the only remedy is to have an expert reseat the valves with proper tools and replace the worn valve heads with new ones.

After having secured a good finish and accurate seat remove

with clean cotton waste every atom of grinding compound from the valve head, valve seat and combustion chamber. Wash with gasoline or kerosene and then flush the valve guides. Be sure about this, as it requires only a small particle of abrasive to cause trouble.

While you have the valve out, examine the stem, removing every particle of carbon and grit. Do not use a file for this purpose, but a fine grade of emery cloth. A good way to do this without the liability of getting the valve stem out of round is to clamp the valve head between wooden blocks or copper jaws (Fig. 19), then with a strip of emery cloth about ¼ inch wide wrap it around the stem one and one-half turns. Grasp the free ends of the cloth and pull back and forth at the same time causing it to slide up and down the stem.

REMOVING CARBON DEPOSITS

Before finally replacing the valves it is a good plan to scrape off all carbon deposit from the combustion chamber; however, care must be exercised not to scratch the surfaces of the valve seats. Do not leave any projections of carbon, as they will heat up and cause preignition

At the same time remove the carbon deposits from each piston head. Scrape clean, but use care not to scratch the surfaces, as this will provide a "pocket" to catch carbon more easily. Brush out all the particles of carbon, and finally wash with clean kerosene.

Before replacing the cylinder head examine carefully the copper asbestos gasket. If any weak spots appear, it is better to replace the gasket than to try to use the old one, as much depends upon a good fitting gasket. In replacing the cylinder head bolts run each one down until the head just touches the boss on the cylinder head, then—and be sure about this—**tighten each one evenly a little at a time until finally all are tight.** No one bolt should be drawn down tight until all are set snug.

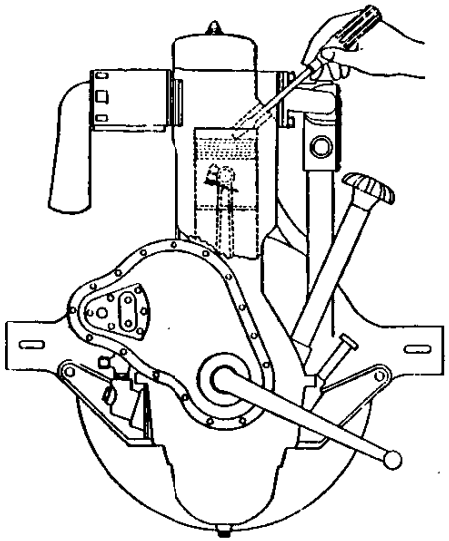


Fig. 20—Locating "Top Center" position of piston

VALVE TIMING

The retiming of motor valves is an operation requiring experience, and should be entrusted to a person thoroughly competent to do such work.

After having assembled the motor, with the exception of the cam shaft gear, insert the starting crank and turn until the piston in cylinder No. 1 is at its uppermost position. By removing the spark plug in that cylinder a screw driver or rod can be inserted (Fig. 20) and the position of the piston at its farthest upward movement can be determined. This is called the top center position of pistons 1 and 4.

Rotate the cam shaft so that the push rod operating No. 1 intake valve lightly touches the rocker arm. The opposite end of the rocker arm should be against the valve stem. The cam shaft gear then can be installed and properly secured.

Adjust the clearance between the end of the push rod and rocker arm so that it is 0.005 inch, or the thickness of an ordinary sheet of letter paper. The intake valve will then "open" at the proper position.

The exhaust valve should be set up in the same way, that is, it should "close" at the same time that the intake valve begins to open.

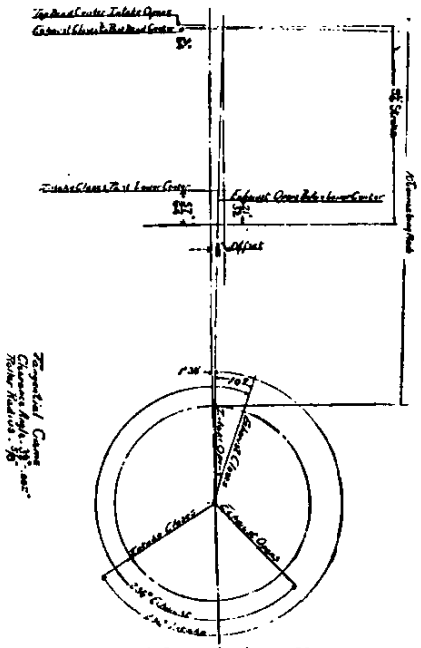


Fig. 21—Valve timing diagram.

As the cams are integral the opening and closing of the valves on cylinders 2, 3 and 4 will come at the proper time, so it is only necessary after having secured the settings for cylinder No. 1 to adjust the push rods for proper clearance.

In Fig. 21 is shown *a valve timing diagram*, from which the relative positions of the valves can be seen. The intake valve begins to open when the piston has traveled 1/32 inch below top center.

The motor cylinders are numbered from the front of the car, cylinder No. 1 being nearest the radiator, No. 2 next and No. 4 nearest the dash. Cylinder No. 1 fires first, No. 2 next, then No. 4, and next No. 3.

PISTON AND PISTON RINGS

The piston is a cylindrical drum having a closed end, sliding up and down inside the cylinder walls. On the downward stroke the suction of the piston draws the fresh gas from the carburetor, through the inlet pipe and valve, into the cylinder. The upward movement of the piston compresses the gas into a very small space between the top of the piston and

the depression in the cylinder head known as the combustion chamber. At this point the electric spark, produced by the igniter, explodes the gases—driving the piston downward—thus producing the power which turns the crank shaft. On the next stroke upward the piston drives the exploded gases out through the exhaust valve and pipe to the muffler.

As it would be impossible to fit the piston snug enough in the cylinders to prevent the gas from escaping during the compression stroke without causing undue friction and power loss, three spring-like rings are fitted into grooves around the top of the piston. The expansion of these rings reduces this friction to a minimum, and still prevents any loss of power through a leakage of gas.

As all friction is absorbed by the piston rings, it follows that they, in time, will become worn to such a point as to impair their efficiency. When grinding the valves does not make the resistance in each cylinder nearly equal, it is a pretty good indication that the rings need renewing. Before doing this, however, it is best to consult a good mechanic, preferably your Chevrolet dealer.

If it is necessary to do the work yourself, proceed as follows:

Remove the lower crank case and cylinder head, also the oil baffle plates in the cylinder. Withdraw the cotter pins holding the nuts on the connecting rods and remove the caps. Before doing this, however, mark both the upper and lower bearing so that, when reassembled, they can be put back again in exactly the same position. Push upward upon the connecting rod until the piston is far enough "out" of the cylinder so that it can be withdrawn.

The piston rings are sufficiently elastic so that they can be sprung out of the grooves and slipped over the end of the piston. New rings can then be installed. See that the "split" in each ring is about one quarter turn away from the next one to it so as to prevent gas from leaking through.

In sliding the piston back into the cylinder the rings should be "compressed" as they enter the bore. Don't crowd the piston —take your time—as much depends upon getting the rings into the cylinder without damaging them.

The cap can then be replaced upon the connecting rod and tightened. In replacing the cap be sure that the same number and size of liners or shims that were originally between the cap and upper bearing are replaced. Finally—and be sure about this —insert and properly spread the cotter pins in each nut.

Insert the oil baffle plates in their proper location in the crank case.

In replacing the lower crank case be careful to draw the flanges together evenly, being sure that no dirt or grit is allowed to remain between them.

BEARINGS

The main engine and connecting rod bearings are babbitt lined, the most efficient known. They are properly fitted before leaving the factory and, with proper lubrication, will require no attention for several thousand miles.

When a bearing becomes worn a peculiar knock or thump is heard, which must be located and remedied without loss of time. A motor which is "pounding" in its bearings is not only unpleasant to hear, but if not attended to will quickly become dangerous in that the probabilities of broken bearing studs and resulting breakage will be increased materially with time.

Unless you are an experienced mechanic, familiar with that class of work, it is best to take your car to the nearest Chevrolet dealer. Scraping in bearings is an art requiring time and patience, and is the only successful method of tightening loose bearings which have become worn.

To those who have not had previous experience in scraping bronze backed bearings, a word of caution will not be amiss. Tighten the bearing caps snugly and evenly, but have the "tension" on the shaft just snug enough so that it will turn freely with a slight "drag," but no end play or "shake". Be sure that the oil grooves and holes are clean so that the oil can spread over the entire bearing surface. Good mechanics always "spot" their bearings with Prussian blue and we recommend this practice as being superior to all others in securing a good even bearing surface, as it shows quickly and accurately the high spots on the bearing surface.

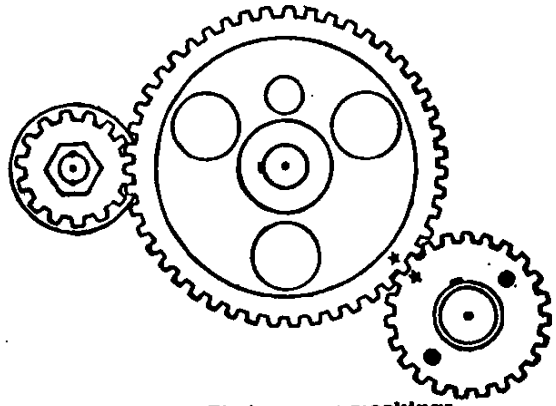


Fig. 22—Timing gear markings.

TIMING GEARS

These are housed in an oil-tight compartment at the forward end of the motor. They are the *crank shaft gear, cam shaft gear and generator shaft gear.* They are lubricated by the motor and will not require attention in themselves. However, should it be necessary to remove them, care should be exercised in replacing to see that the marks on the rims of the gears match, as shown in Fig. 22.

IGNITION

The ignition equipment used on Chevrolet cars is designed to give an even hot spark at all times regardless of engine speed.

It is, therefore, possible to run your car at slow speeds with an even flow of power, also to accelerate the motor without stalling.

Very little attention beyond keeping the terminals tight and the instrument clean is required.

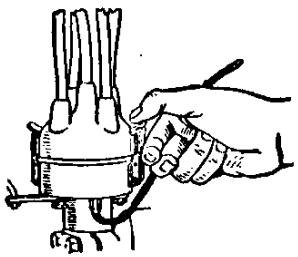


Fig. A.
Unclasp spring hinges on the sides of igniter

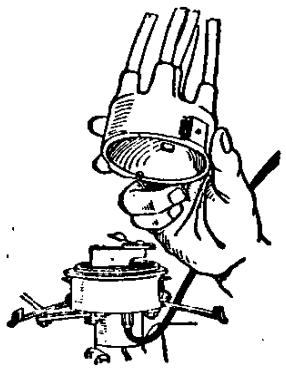


Fig. B.
Remove distributor case and wires

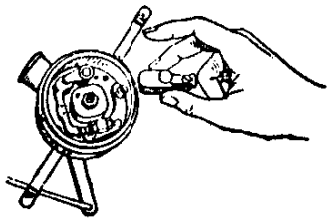


Fig. C.
Remove distributor arm

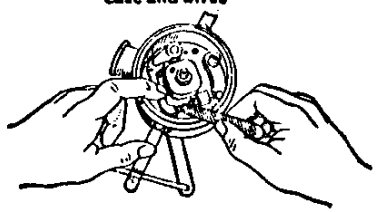


Fig. D.
Open arm and insert file between contact points

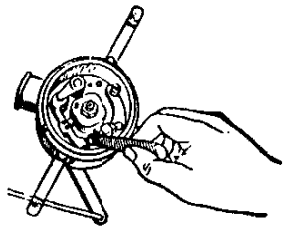


Fig. E.
Close contacts and square points by moving file up and down three or four times

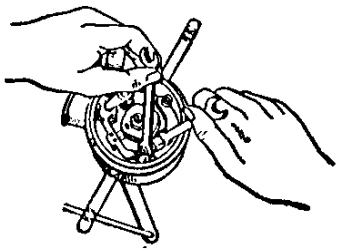


Fig. F.
Adjusting contact points

Fig. 23—Disassembling Igniter to clean points.

Contact Points

The contact points will require little attention or refiling, even though they may be very rough and irregular. When they become so badly burned as to cause missing, they should be "trued" so that their contact surfaces are exactly parallel. The best way to do this is to secure a thin Swiss or jeweler's file—insert the blade between the contact points, then press them together firmly with the fingers (Fig. 23), at the same time withdrawing

the file. Repeat this operation two or three times, then adjust the contact points so that when the cam holds them open the space between is 1/32 inch.

Caution—The contact points are made from thin discs of tungsten welded to alloy buttons, so care must be taken to remove only enough metal (when truing points) to get parallel surfaces. When the tungsten has been removed by reason of frequent refiling, a new adjustable point and contact arm can be secured by writing us or the maker of the instrument.

RETIMING IGNITER

Should it become necessary to remove the igniter assembly, loosen the two clamping bolts through the split collar on the generator housing and lift the entire assembly. In replacing

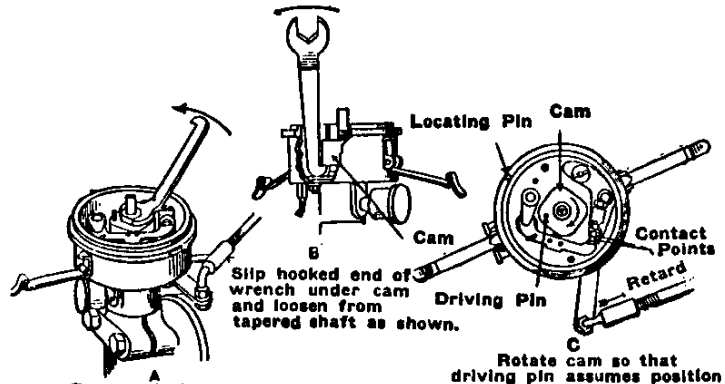


Fig. 24—Timing Igniter.

care should be taken to see that the shoulder on the machined end of the igniter comes in contact with the generator housing, otherwise the igniter gears will not be in proper engagement.

The clamping bolts can then be tightened securely and the advance rod connected. Remove the distributor cover and distributor arm as in Fig. 23, then with the special wrench supplied with each car remove the lock nut holding the igniter cam to the shaft (Fig. 24)—slip the hooked end of the wrench under the cam and pry it loose from the shaft (the igniter shaft is tapered and the cam is held to this taper by friction so that it should not require a great effort to loosen it).

Insert the starting crank and turn until the intake valve on No. 1 cylinder begins to open—remove the spark plug on that cylinder and insert a screw driver or rod (Fig. 20)—continue to turn the motor until the piston has traveled downward and again returned to its uppermost position. By holding the screw driver or rod firmly the position of the piston at which no further upward movement takes place can be readily determined.

The piston is then on "top dead center" of the compression stroke and the gases have been compressed ready for firing.

Next turn the cam on the igniter so that the driving pin assumes the position shown in Sketch C, Fig. 24, then turn the cam in the direction of the arrow until the two contact points begin to open—by the term "begin to open" we mean that point at which the two contact surfaces no longer touch each other.

The lock nut can then be slipped on the shaft and securely tightened against the cam; however, in doing this use care not to disturb the position of the cam. The distributor arm and cap can now be put in place and the car operated.

The sequence of firing is 1-2-4-3, the No. 1 wire being the one immediately above the small slot on the edge of the distributor case. This slot fits over the locating pin on the rim of the igniter body. The rotation of the igniter is called "clock wise", that is, it turns in the same direction as the hands of a clock, therefore, in the same direction will come the No. 2 wire, then No. 4 and lastly No. 3.

Remember that for every revolution of the motor the igniter shaft is revolving at the same speed, therefore, it is necessary to turn down the grease cup one-quarter turn every day to insure proper lubrication at this important point.

Keep the top of the igniter clean—examine the wires occasionally to see they are in good condition and that no oil or grease is allowed to remain on them—in short, make it your business to see that the entire ignition assembly is kept in a clean and healthy condition and you will have no cause to fear exasperating break-downs or delays on the road.

CARBURETOR

The carburetor used on the Chevrolet has been carefully tested and adjusted to the motor before leaving the factory. No adjustments should be made, as it has been found by experience that those made at the factory are proper for all changes in gravity and atmospheric conditions when the motor has been heated to the proper temperature. Too often adjustments to the carburetor are made when in reality something else is causing uneven running, or the motor has not thoroughly warmed up.

It is well to remember that any change in the carburetor's action will come gradually and not suddenly; therefore, if your car was operating properly when run last you may depend upon it that some other part of the motor is at fault and the trouble should be located and corrected before attempting alteration to the carburetor.

Carbureting Principle

On each suction stroke of the piston a partial vacuum is created which causes a fine spray of gasoline to flow from the carburetor jets. This spray is picked up by the air which is also drawn through the fixed air intake (Fig. 25), and as it passes through the choke or "venturi" a rotative action is produced (by the special shape of the choke) which breaks up the fine particles of gasoline and thoroughly mixing with the air passes

into the cylinder through the intake pipe in the form of a carburated gas.

The proper carburated mixture is composed of fifteen parts of air to one part of gasoline vapor, but since in the ordinary carburetor the flow of gasoline from the jets increases under suction faster than the flow of air, it is necessary to provide a means of regulating the flow for all motor speeds so as to maintain this ratio.

In reality this means the combining of two carburetors, one for low motor speeds and the other for higher speeds. By reference to Fig. 25 the following explanation will serve to give you a more clear understanding of your carburetor and its action.

The gasoline from the tank passes through the gasoline inlet, filter screen and needle valve into the float chamber, raising

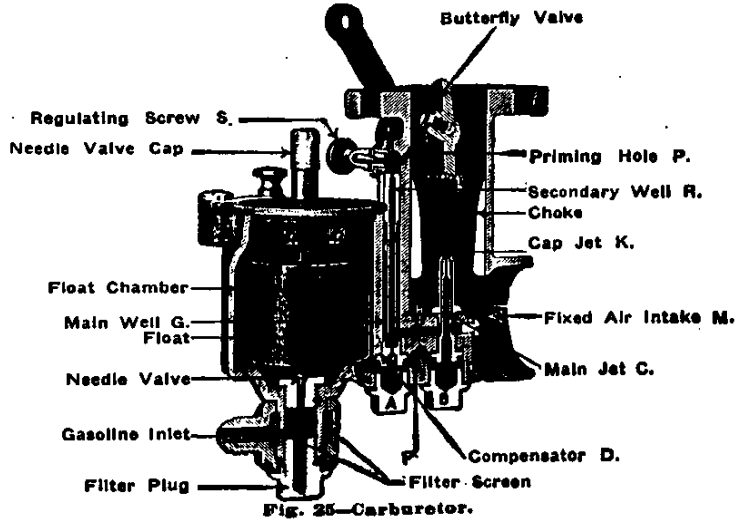


Fig. 25—Carburetor.

the float as the volume increases. Passing through the center of the float is a rod or needle valve having a pointed end. This rod is attached to fulcrums which are actuated by the float so that as it raises the needle valve moves downward and the conical end engages and closes the needle valve seat, thus shutting off the gasoline flow when the proper volume has been obtained.

All gasoline before being placed in the tank should be strained through chamois to remove water and dirt; however, in spite of care a certain amount of dirt or lint will get into the system and interfere with the best working of the carburetor. To remove as much as possible the liability of dirt getting into the instrument itself, a wire gauze strainer is inserted between the gasoline inlet pipe and the float chamber.

Once every three months, or oftener, should the motor miss firing and pop or sputter, the filter plug should be removed. This allows the gasoline inlet connection to slide off the boss on the end of the carburetor. Surrounding this boss is the filter

In very warm climates, and especially in the hot summer months, it may be necessary to disconnect the hot-air connection, as the heat, drawn through the intake, combined with the difficulty in keeping the motor parts cool, may become so intense as to vaporize the gasoline in the float chamber so that instead of the gasoline being drawn through the jets in its raw state—that is, as a moist spray—it will pass through in the form of a vapor which will not mix readily with air.

The necessity for disconnecting the hot-air tube will manifest itself by the action of the motor after it has been run for some distance and become thoroughly heated—the motor will start off beautifully, but after going for some distance becomes sluggish, and at the first grade shows a marked loss of power. As soon as the outside temperature becomes cooler the hot-air tube should again be connected.

GASOLINE TANK

The gasoline tank is mounted on the rear of the frame, and is made from heavy pressed steel, thoroughly lead-coated to prevent corrosion. A gasoline gauge in the top of the tank shows at all times the quantity of gasoline in the tank.

The copper tube running from the tank to the vacuum tank enters at the top and extends to the bottom, so that all the gasoline can be utilized. In new cars, in spite of our best efforts, a small amount of scale or sediment may remain in the tank. The action of the car in passing over the road will loosen this scale or sediment and deposit it at the bottom of the tank. A suitable drain plug located at the lowest point permits this to be

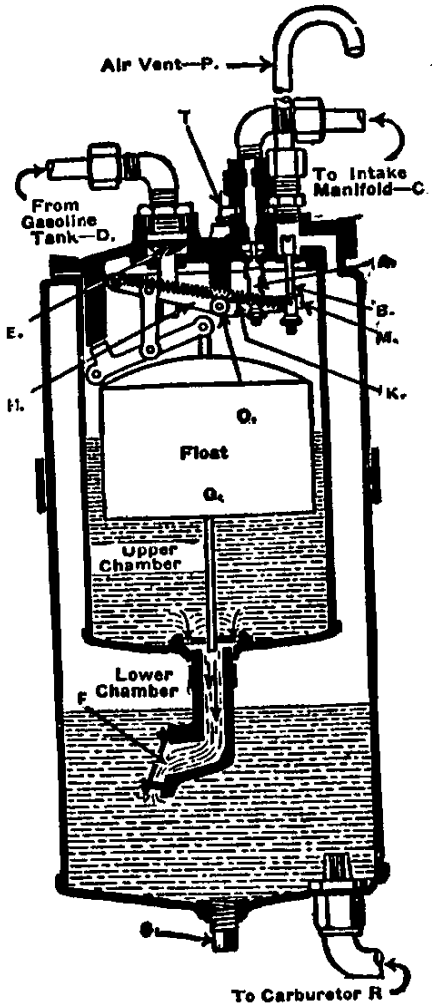


Fig. 27—Sectional view of vacuum tank.

drained off. After operating the car for a few weeks this should be done, after which, if proper precautions are taken to properly strain the gasoline through chamois as it is put into the tank, little if any trouble will result.

The small hole through the top of the filler cap should be kept open at all times, as this is absolutely essential to the proper flow of gasoline to the vacuum tank.

VACUUM TANK

As the gasoline tank is mounted on the rear of the car, some distance from the carburetor, it is necessary to provide a means of drawing the fuel from the tank into the carburetor.

This is accomplished by the use of a vacuum tank mounted on the dash under the hood, the construction of which is illustrated in Fig. 27.

Every motor draws its supply of gasoline through the carburetor by reason of the pumping action of the pistons, which on their downward or suction stroke create a partial vacuum in the intake pipe. It is this same pumping action which draws gasoline from the main supply tank into the vacuum tank.

The vacuum tank is composed of two chambers. The upper or smaller one is the filling chamber, and the lower one the emptying chamber. To the upper chamber is connected a *Copper Pipe C*, which is attached to the intake pipe at the center of the two branches. Gasoline enters this chamber from the main supply tank, through the *Connection D*, at the base of which a small *Wire Strainer E* is placed to catch any dirt or lint which may have gotten into the main tank. At the base of this chamber is placed a *Flapper Valve F*, which, when closed, prevents the gasoline from running into the lower chamber.

The suction of the pistons on the intake stroke exhausts the air in the upper chamber, creating a vacuum, and this vacuum closes the *Valve F*. As the main supply tank is open to atmospheric pressure (through the vent hole in the filler cap), the vacuum created in the upper chamber will cause the gasoline to flow from the main tank through the supply line and into the chamber through the *Connection D*. Mounted inside of this chamber is a *Metal Float G*, and as the gasoline rises in the chamber the *Lever H* moves upward until, when the proper quantity has been obtained, the direction of pull on the *Springs K* is reversed, which causes the *Lever M* to move upward. This action closes the *Valve A*, thus shutting off the suction from the motor, and opens the *Valve B*, which allows air to flow into the chamber through the *Vent Pipe P*.

The admission of outside air destroys the vacuum in the chamber, which automatically releases the suction on the *Valve F*, and at the same time stops the flow of gasoline through the *Pipe D*. The weight of the gasoline in the upper chamber then causes the *Valve F* to open, allowing the gasoline to flow into the lower chamber, from whence it flows by gravity to the carburetor, through the *Connection R*.

As the level of the gasoline in the upper chamber drops, the *Float G* moves downward, causing the *Lever H* to move, at its

free end, in the same direction. The *Levers H* and *M* are pivoted on the *Pin O*, and connected together at their free ends by *Springs K*; therefore, when the free end of *Lever H* has dropped below the center line of the *Pivot O* the direction of pull on the *Springs K* will reverse, and the *Lever M* will move downward at its free end. This action opens the *Valve A*, thus permitting the motor suction to create a vacuum in the upper chamber and start the flow of gasoline through the *Connection D*, and at the same time closes the *Valve B*, shutting off the admission of outside air. The process of filling the upper chamber is then repeated.

As all lint and dirt cannot be kept out of the system, it is necessary to drain the lower chamber every three months, and to do this a *Drain Plug, S*, is placed at the lowest point in the tank.

The manufacturers of the vacuum tank maintain a complete service repair organization in all principal cities, and we recommend that, should trouble be encountered with your system, you consult one of their experts, or write the factory direct.

Should this be impossible, the following instructions supplied by the manufacturers, if carefully followed, should give relief.

CARE AND REPAIR OF VACUUM SYSTEM

Before proceeding to repair vacuum tank make absolutely sure that the trouble is not due to some other cause.

Vent Tube Overflow

The *Air Vent P* allows an atmospheric condition to be maintained in the lower chamber, and also serves to prevent an overflow of gasoline in descending steep grades. If, once in a long while, a small amount of gasoline escapes, no harm will be done, and no adjustment is needed.

However, if the vent tube regularly overflows, the air hole in main gasoline tank filler cap may be too small, or may be stopped up. If the hole is too small, or if there is no hole at all, the system will not work. Enlarge hole to ⅛ in. diameter, or clean it out.

Failure to Feed Gasoline to Carburetor

Remember that this condition may be due to other causes than the vacuum system. Do not blame vacuum system until you are sure that the fault does not lie elsewhere. After flooding the carburetor, or "tickling the carburetor," as it is commonly called, if gasoline runs out of the carburetor float chamber you may be sure that the vacuum feed is performing its work of feeding the gasoline to carburetor.

Another test is to take out the inner vacuum tank, leaving only the outer shell. If you fill this shell with gasoline, and motor still refuses to run properly, then the fault clearly lies elsewhere, and not with the vacuum system—because you must certainly get gasoline feed from this open, elevated tank of gasoline, unless there is stoppage in the connection line to carburetor.

To Remove Top

In removing top of tank, after taking out screws, run the blade so as to separate gasket without damaging it. Gasket is shellacked to make an air-tight joint.

IF FAULTY FEED IS TRACED TO VACUUM SYSTEM, ONE OF THE FOLLOWING CONDITIONS MAY BE THE CAUSE

(A) The float, which should be air-tight, may have developed a leak, thus filling up float with gasoline, and making it too heavy to rise sufficiently to close vacuum valve. This allows gasoline to be drawn into manifold, which in turn will choke down the motor.

Proper operation depends upon the float being air-tight.

To Repair Float

Remove top of tank (to which float is attached) as above directed. Dip the float into a pan of HOT water, in order to find out definitely where the leak is. Bubbles will be seen at point where leak occurs. Mark this spot.

Next, punch two small holes, one in the top and the other in the bottom of the float, to permit discharge of the gasoline. Then solder up these holes and the leak. Test the float by dipping in HOT water. If no bubbles are seen, the float is air-tight.

In soldering float, be careful not to use more solder than required. Any unnecessary amount of solder will make the float too heavy.

In taking out float and repairing it, take care not to bend the float guide rod. If you do bend the rod it will strike against guide and retard float, producing the same effect as a leaky float, and allowing gasoline to enter manifold. Also note whether surface of rod is perfectly smooth, so that it cannot be retarded by guide.

To overcome the condition of a leaky float temporarily until you can reach a garage, remove *Plug T* at the top. In some cases the suction of the motor is sufficient to draw gasoline into tank even with this plug open, but not enough to continue to be drawn into manifold. If, however, you are not able to do this, close up *Plug T* with engine running. This will fill tank. After running engine until tank is full, remove *Plug T* until gasoline gives out. Repeat the same operations until a repair station or garage is reached, when the leaky float can be remedied.

(B) The *Flapper Valve F* may be out of commission.

A small particle of dirt getting under the flapper valve might prevent it from seating absolutely air-tight, and thereby render the tank inoperative.

In order to determine whether or not the flapper valve is out of commission, first plug up air vent; then detach tubing from bottom of tank to carburetor. Start motor, and apply finger to this opening. If suction is felt continuously then it is evident that there is a leak in the connection between the tank and the main gasoline supply, or else the flapper valve is being

held off its seat and is letting air into the tank instead of drawing gasoline.

In many cases this troublesome condition of the flapper valve can be remedied by merely tapping the side of the tank, thus shaking loose the particle of dirt or lint which has clogged the valve. If this does not prove effective, remove tank cover, as described on previous page. Then lift out the inner tank. The flapper valve will be found screwed into the bottom of this inner tank.

(C) *Manifold Connection C* may be loose, allowing air to be drawn into manifold.

(D) Tubing may have become stopped up, in *Lengths B* or *C*.

(E) *Gasoline Strainer E* is a screen located in the line from gasoline tank. This screen collects all foreign substances that might get in the rear tank and be carried through to the carburetor and clog it. If tank fails to work, it may be that this screen is clogged, preventing gasoline from getting into tank. Screen may be easily cleaned by unfastening connection at elbow. This cleaning should be done every three weeks. If tank should ever fail to operate, examine strainer FIRST.

Carburetor Trouble

(A) Carburetor trouble cannot possibly be attributed to vacuum system. If gasoline is delivered to carburetor, vacuum feed has done its work.

(B) If carburetor pops and spits, carburetor adjustment is needed.

(C) If car slows down, or if you cannot get usual speed out of car while running with open throttle, although the car still continues to run, you may be sure the trouble is not due to vacuum system. If all the gasoline in vacuum tank is exhausted the car will stop.

Filling Up Tank in Starting

To fill the tank, should it ever become entirely empty, with the engine throttle closed and the spark off, turn the engine over a few revolutions. This takes less than ten seconds, and will create sufficient vacuum in the tank to fill it. If the tank has been allowed to stand empty for a considerable time, and it does not easily fill when the engine is turned over, this may be caused by dirt or sediment being under the *Flapper Valve F*. Or, perhaps, the valves are dry. Removing the *Plug T* in the top and squirting a little gasoline into the tank will wash the dirt from this valve, and also wet the valves, and cause the tank to work immediately. The flapper valve sometimes gets a black carbon pitting on it, which may tend to hold it from being sucked tight on its seat. In this case the valve should be scraped with a knife.

Connections and Tubing

Look over the connections to see that they are absolutely tight. Coupling and elbow connections should be always kept screwed down tight. Care should be taken that tubing contains no sharp flat bends that might retard gasoline flow.

Suction Valve A, also *Atmospheric Valve B*, can be easily ground, if it ever becomes necessary. However, the fact that these two valves are not required to seat against a pressure, but are drawn on to their seat, eliminates any possibility of their needing to be ground.

Clean Tank Every Three Months

(To clean tank: Don't take tank off car; you may not be able to put it back in exactly same position.)

Unless gasoline is filtered through a screen or chamois when filling the main gasoline tank, from which the vacuum tank draws its supply, some dirt or sediment will accumulate in main tank. Part of this dirt or sediment may be drawn into the vacuum tank. This dirt should be removed from the vacuum tank at least once every three months. To clean the tank, remove the top of the tank and take out the inner shell or vacuum chamber. (Be careful to observe instructions "To Remove Top.") This will give access to the lower chamber, from which the dirt and sediment should be removed.

If you find it necessary to send the tank to us, then ship the COMPLETE TANK to our nearest branch or service station.

DETECTING TROUBLE

Defective Ignition

First of all ascertain whether the trouble is in the ignition instruments, the wiring, or the spark plugs. In most cases it will be found in the external wiring or the plugs when one cylinder continually misfires.

To determine the location of the trouble, go about the task systematically — don't jump from one thing to another, but satisfy yourself that each part examined is working and in its proper position.

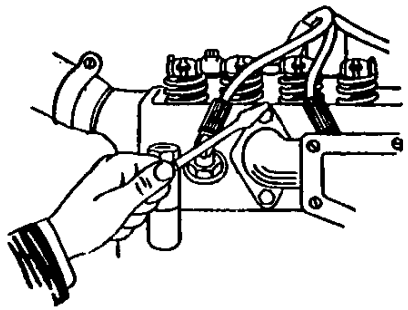


Fig. 28—Short-circuiting spark plugs.

When the engine misfires locate the particular cylinder at fault as follows: With a screw driver (having a wooden handle) touch the top or terminal end of the spark plug and at the same time allow the screw driver to come in contact with the cylinder head (Fig. 28). If a change in the motor running is noticed, that cylinder is working properly. Try each spark plug until one is found where "short circuiting" the plug causes no change in the motor running. You have then located the particular cylinder which is missing.

Examine carefully the wire running from the distributor cap on the igniter to the spark plug for a loose connection or broken insulation.

Should this be found in good condition, remove the spark plug.

Spark Plugs

The faults generally occurring in the spark plugs are as follows:

(1) Fouled or sooted plugs. These may be very easily cleaned with a brush dipped in gasoline.

(2) Broken insulation or porcelain. A close examination of the plug will determine if this is the cause of the trouble. Replacing the plug is the only remedy.

(3) Too wide gaps between the sparking points. The best width of spark gap is .020 inch or slightly less than 1/32 inch. Larger or smaller gaps are detrimental to the ignition.

(4) The sparking points or electrodes have become burned to such an extent as to increase their resistance. Replacement of the plug is the best remedy.

If after satisfying yourself that none of the things listed above is the cause of the trouble, find a cylinder that you know is working and put the assumed bad plug in that one and the good plug in the bad cylinder. If the trouble goes with the plug you are sure it is the plug; if not, look elsewhere.

Spark Plug Wires

To determine if the spark plug wire is at fault disconnect it from the spark plug and hold the end about one-quarter inch from the plug. If no spark jumps across the gap with the motor running, examine the terminals and insulation. Sometimes the copper wires break but do not damage the insulation. If no exterior damage can be found replace the wire on the plug, and, with motor running, slip the wire out of the socket on the distributor cap and hold it about one-quarter inch away from the brass ring on the socket. If a spark is given off you are sure the wire is at fault and should replace it with a new one. If no spark is obtained remove the distributor cap and examine the passing contact pins. If any are found burned or blackened on their points thoroughly clean and polish.

Motor Will Not Start

If for any reason the motor does not start immediately under its own power, remove your foot from the starting button at once. One of the following things may be causing the trouble:

(1) Gasoline supply exhausted.

(2) Shut-off cock under gasoline tank closed. When closed the valve handle should point downward, and when open, at right angles to the bottom of tank.

(3) The terminals are loose either on the spark plugs or distributor cap.

(4) The ignition switch has not been turned "on."

(5) The gasoline supply pipe may be clogged.

(6) There may be water in the gasoline system.

(7) The contact points in the igniter may be badly burned or some obstruction may have caused the contact arm to stick and remain open.

(8) The primary wires from coil to igniter, coil to switch and to battery may be loose, broken or making poor contact.

(9) The igniter may be "grounded."

(10) The coil may be "burned out."

(11) The switch may not be making proper contact.

(12) The storage battery may be exhausted.

Water in Gasoline System

If there is water in the gasoline it will not mix, but, being heavier than gasoline, will find its way to the bottom or lowest point in the system, which is at the carburetor. In cold weather it may freeze. By pouring hot water or applying hot cloths to the supply pipe and carburetor this can be loosened up. If poured on, be careful that none enters the carburetor.

Grounded Igniter

If trouble is suspected with the igniter, see if a spark is delivered to the plugs. Failing to get a spark at the plugs disconnect the high tension wire (running from the central terminal of the igniter to the coil) from the coil (Fig. 29) and hold it within one-quarter inch from the point from which it was removed, turning the motor over by hand with the ignition switch "turned on." If no spark occurs at this point, first examine the wire to see that it is in good condition and that it is properly secured to the distributor cap. After satisfying yourself that this is in proper shape, slip the distributor cap off the igniter and examine the small button-headed spring on the distributor arm. See that this is not broken, and that it is making good contact with the high-tension terminal. If this part of the assembly is in good condition some ground exists in the breaker box.

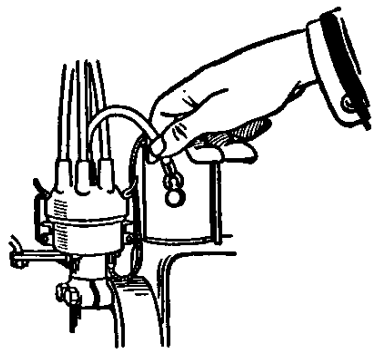


Fig. 29—Testing Igniter.

Examine the primary wire—see that the insulation is good and that it is properly fastened to the igniter. Occasionally oil or grease will get into the breaker box and form a connection between the case and the insulated contact point. Wipe out thoroughly.

Testing Coil

In order to determine if the coil is operating properly, secure a piece of wire and, holding one end to the frame of car, motor

casting, or other metallic "ground," bring the other end to within one-quarter inch from the point where the high tension wire (running from the coil to the central terminal of the igniter) leads from the coil, and turn the engine over by hand with the switch on. If a spark occurs at this point and not at the igniter, the trouble is in the high tension wire which leads from the coil to the igniter.

If, however, no spark occurs at either point and the primary circuit is intact, it is evident that the coil should be replaced or returned to the makers for repairs.

Test of Primary Circuit

When testing the primary circuit there are practically only two things to be taken into consideration, namely, the condition of the contact points in the breaker box and the wiring.

When tracing the primary circuit, first see if the fuse has "blown," then trace all the wiring following the diagram shown in this booklet.

Testing Ignition Switch

In order to test switch and determine if current flows through it, remove the wire from the terminal marked "Bat" on coil. Attach a wire to the negative terminal on the storage battery and bring its free end around so that it can be brought in contact with the free end of the wire which was removed from the coil. Then turn on the ignition switch and make and break the circuit with the two wires by touching their free ends together. If no spark occurs bring the free end of the wire attached to the negative terminal of the battery up to the switch and make and break the circuit by touching the screw on the back of the switch marked *IGN*. If a spark is given off then the wire from the switch to the coil is broken or faulty, and should be replaced. If no spark is given off there is doubtless an open circuit in the interior which can be reached by removing the four flat-head screws passing through the side of the switch and holding the fiber back.

Motor Misses at All Speeds

One or more spark plugs may be fouled. Thoroughly clean the sparking points and connecting chamber with a brush dipped in gasoline.

One or more valves are stuck. Remove and thoroughly polish stems.

The valves may require grinding.

A valve spring may be broken.

You may have a bad leak between the carburetor and motor.

One of the ignition wires may be loose and due to vibration of the machine makes and breaks contact.

One of the push rod plungers may be worn, and a valve may not open far enough.

The contact points in the breaker box may be badly worn and need cleaning.

The spark plug gaps are not adjusted properly.

Motor Misses at High Speed Only

You have a bad spark plug.

A valve may be sticking slightly and does not come to its seat in time.

You have a loose electrical connection.

A valve spring may be weak and does not bring the valve back to its seat properly.

The spark plug gaps are not set correctly.

Motor Misses at Low Speed Only

A weak exhaust spring.
A bad spark plug.
Exhaust valves need grinding.
A leak in the intake pipe or connection.

Weak Valve Springs

As the valve springs are subjected to considerable heat it follows that in time their "temper" will be affected.

By inserting a screw driver or other suitable tool between the coils of the spring (Fig. 30) and turning it (while the motor is running) the tension of the spring can be increased. If the motor picks up and runs properly, replace the spring. If you

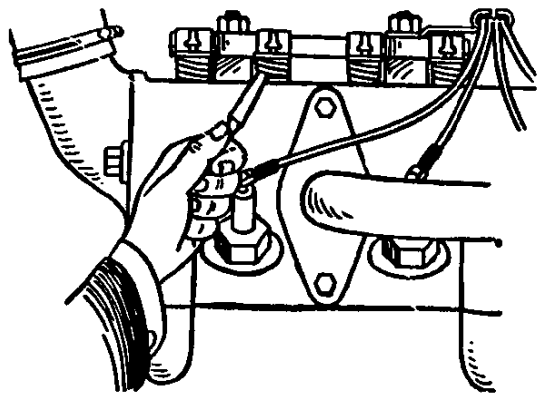


Fig. 30—Testing tension of valve springs.

have no new spring at hand remove the old one and stretch it about an inch. As soon as possible, however, a new spring should be secured and installed to insure a permanent repair.

Locating Leaks in Intake Pipe or Connections

This is a common cause of missing at low speeds and it is best detected by allowing the motor to run idle at the missing speed. Take a squirt can full of gasoline or oil and squirt around the intake pipe and connections. If any gasoline or oil is drawn in it indicates the leak, and the remedy is obvious.

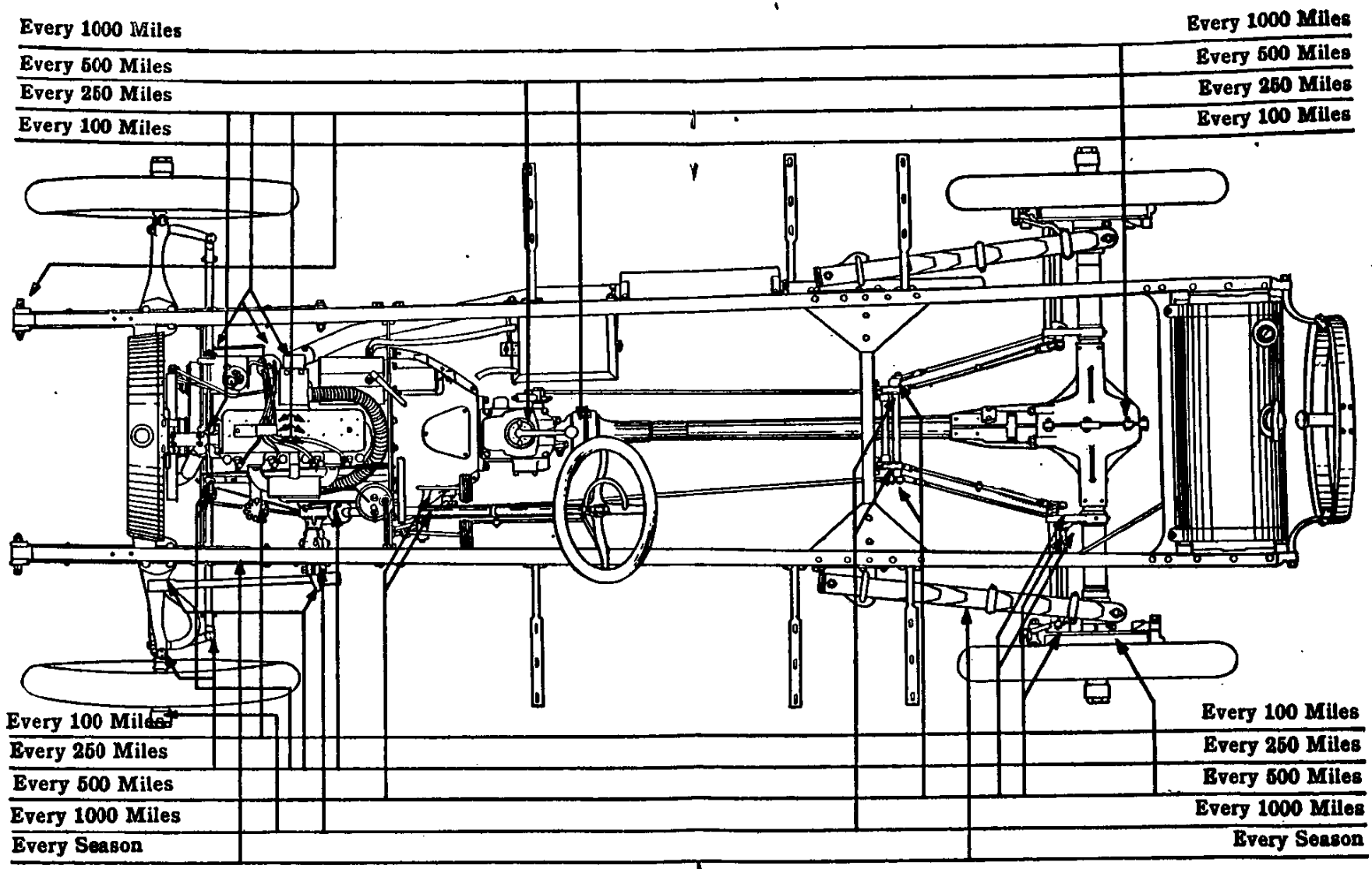


Fig. 31—Lubricating chart for Chevrolet "Model F-B" Chassis.

We have given above the principal causes of trouble, but it is not possible to cover all. So if the remedies suggested do not correct the trouble, you should consult an expert.

MOTOR LUBRICATION

The oiling system used on Chevrolet cars is known as the constant level splash system. The oil is carried in a reservoir located at the bottom of the crank case and is filled through a filler tube on the left side of the motor just back of the fan. (Fig. 32.)

The oil level in the reservoir is determined by removing the oil level gauge (Fig. 32). Keep oil reservoir filled so oil level will register between the two notches on this gauge.

Oil is drawn from the oil reservoir by a geared pump located on the end of the generator shaft and is then "fed" into a basin having four troughs or depressions into which the spoons or splashers on the ends of the connecting rods dip.

The rapid "splashing" of these spoons keeps the main bearings, connecting rods, piston pins and cylinder walls bathed in oil, from whence it drains back into the reservoir to be used over again.

Once every 1000 miles the oil pan should be drained by removing the drain plug, and thoroughly flushed with kerosene. This removes all "old" or "burned" oil and prevents clogging of oil holes and pockets.

Be absolutely sure that all the kerosene is drained off, otherwise it will mix with the fresh oil and will cut down its lubricating qualities.

Fresh oil is cheaper than repair bills, so observe this point regularly.

Use light cylinder oil to lubricate the rocker arms and push rod felts. Keep the felts saturated with oil.

Keep the oil pockets around the valve springs half filled with oil.

OIL PUMP

Upon the oil pump depends the successful lubrication of the motor. The pump used on Chevrolet cars has been simply designed to give a constant, even supply of oil with a minimum of parts and a consequent lessening of pump troubles. Under normal conditions you will not experience the slightest trouble and will need to give no thought to this important part, however, as a safeguard and to avoid accidents, a registering dial is mounted upon the instrument board (Fig. 32) so that the driver may observe the action of the pump.

Should this dial for any reason show that the pump has stopped working, the car should be stopped at once and the source of the trouble located and remedied. Usually this will be found to be due to air leaks in the suction pipe (Fig. 32) and can, in most cases, be corrected by tightening the connections at the upper and lower ends. Occasionally dirt and unburnt carbon will form a sediment and will be drawn into the suction and feed pipes,

obstructing them, in which case they should be taken off and blown out.

Get into the habit of noting the action of the registering dial regularly—not in the expectation of trouble, but to avoid its possibility and resulting large repair bill. Every few minutes,

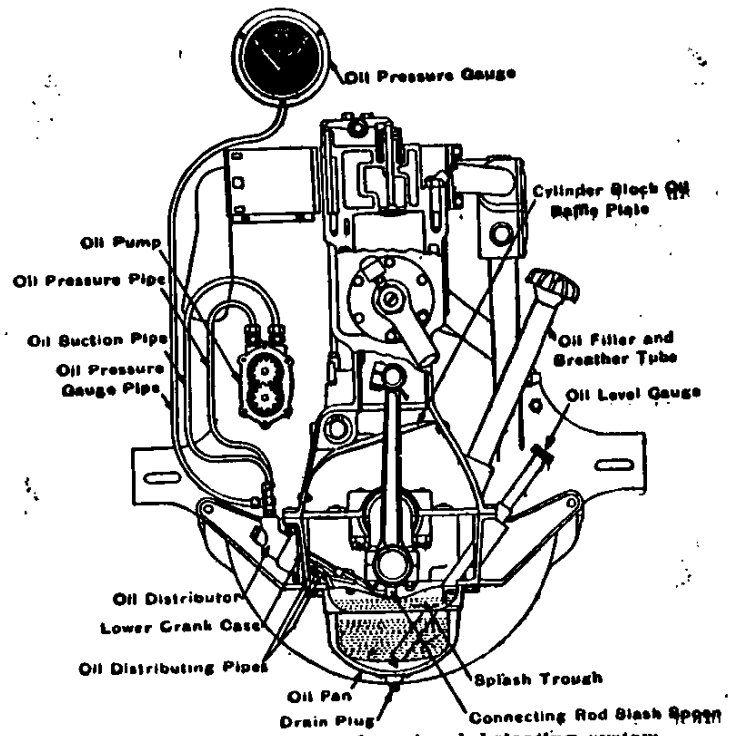


Fig. 32—Sectional view of engine lubricating system.

as you drive along, look at the dial—it only takes a second and requires no special effort. Failure to make proper observations may cost you in time and money several times this amount.

Oil Pressure Gauge

The needle or hand of the oil gauge is actuated by the pressure of oil against a column of air in the tube from the oil pump to the gauge. The instrument is self-contained and will require no attention in itself. Should the dial indicate that the pump has stopped working disconnect the *Oil Feed Pipe* (Fig. 32) at the pump. If the pump is working oil will be discharged and the trouble is in the air line or dial. Examine the air line, especially the connections, and see that they are tight. If tightening the connections does not remedy the trouble, take a squirt can full of oil and, with motor running slowly, squirt oil along the entire length of the air line. If the tubing has split bubbles

will appear at the leak. If the air line is in good condition then it is evident that the gauge is at fault and it should be returned to the makers for repair.

GENERAL LUBRICATION

The chart on lubrication (double page) shows where and when to lubricate the different units of a Chevrolet car. The thing to bear uppermost in mind is that oil and grease are much cheaper than repair bills, and that a slight inconvenience to yourself is necessary if you are to secure the maximum of useful service from your car.

Don't wait until you hear a "squeak" before oiling. A "squeak" means a rusted or dry bearing, and when once in that condition trouble soon follows.

The compact construction of a Chevrolet car makes necessary the placing of oil holes and grease cups under the floor boards of the car. Don't because it might cause you a little extra trouble forget to remove them and lubricate as directed.

We guarantee that, when adjusted and lubricated, following the instructions contained in this booklet, your car will give you a maximum of service at a minimum of upkeep cost.

For those who wish we have prepared an enlarged cut of the oiling chart which can be tacked on the garage wall for handy reference. Write us for this chart.

CLUTCH

The clutch used is the conventional cone engaging with a beveled edge of the fly wheel. The "face" of the cone is covered with a leather band firmly riveted to it. To prevent "grabbing," expanders are placed under the clutch leather so as to present slightly raised points of contact. If the clutch takes hold too quickly and causes the car to start with a jerk, it is an indication that the clutch leather expanders need adjusting. To do this, turn each of the expander nuts to the right, until they lightly touch the clips, and then give them a half turn to the left. This unscrewing a half turn allows the expander to act properly under the clutch leather.

The clutch leather will in time "dry" out, resulting in "grabbing," or slipping. Once a month rub a little neat's-foot or castor oil on the leather to soften it. Should the clutch leather become greasy apply a little Fuller's earth to it. Do not use sand or other gritty substances to make a slipping clutch hold. If you do you simply are inviting a large repair bill.

Should the clutch leather become worn because of continued slipping, it should be replaced. We carry in stock clutch bands ready for installation and recommend ordering from us or your nearest dealer when this becomes necessary.

To renew the clutch leather it is necessary to disconnect and remove the rear axle, propeller shaft, brake-pull rods and transmission. Then remove the pressed metal pan under the fly-wheel,

also the hand hole cover on top of clutch housing, as well as both clutch collar equalizer springs. (Fig. 33.)

Remove clamp screws holding the two clutch collar equalizing levers to the shaft and slide them to the sides, free from the collar. This exposes the clutch release flange lock.

Unscrew the clutch release flange (turn opposite to the direction of the hands of a clock, left to right) from the clutch drive

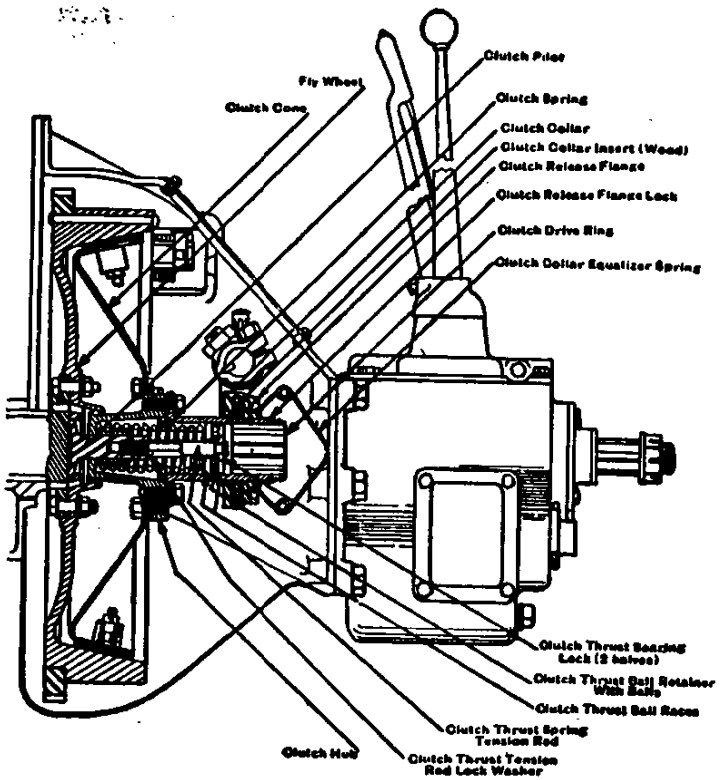


Fig. 33—Clutch and operating mechanism.

ring. The clutch collar and the clutch collar insert (wood) may then be taken off.

Remove the six screws which fasten the clutch drive ring to the clutch hub, and take off the drive ring. The clutch spring ball bearing and locking device will then be exposed.

To Remove Clutch Spring

Drill two ⅜-in. holes, 3 in. between centers, in a piece of flat steel 5/16 in. thick, 1 in. wide, and 4 in. long. Fig. 34.

Secure two screw studs ⅜—16 x 6 in. long, and two ⅜—16 hexagon nuts.

Obtain a U-shaped steel spacer ⅛ in. thick, 1 in. wide, 1 in. between the ends and 1 in. deep. Fig. 34.

Insert the two studs through the holes in the steel bar and screw them into the clutch hub.

Hold the U-shaped spacer between the steel bar and thrust ball bearing, so that the thrust tension rod and thrust bearing lock will pass between its ends.

Alternately tighten the nuts on the long studs until the spring is compressed. When the spring pressure is relieved from the

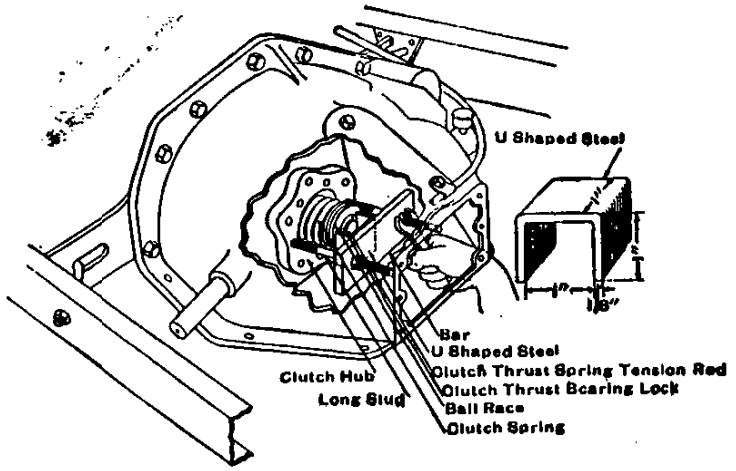


Fig. 34—Removing Clutch Spring.

thrust ball bearing lock, the lock, being in two halves, will fall out of place. Fig. 34.

The operations are reversed when the spring is to be installed. Be sure to place the thrust ball bearing and its two races between the spring and the U spacer. Compress the spring sufficiently to permit the thrust bearing lock to be installed, which may be put in place between the ends of the U spacer, after the hub and spring have been guided over the clutch pilot and thrust tension rod. Fig. 34.

Unlock and remove the clutch spring tension rod.

The clutch cone and hub may then be removed by dropping it out under the car. The clutch housing need not be removed.

INSTALLING CLUTCH LEATHER

Fig. 35 illustrates the best method for installing the clutch leather on the cone.

Soak the clutch leather in water for a short time so that it will stretch slightly.

Then place the leather so that the smaller diameter lies upon a perfectly flat surface (Sketch 1). And guide the cone into the leather evenly all around and press it down as far as possible with the hand, then tap the cone lightly with a hammer around its circumference until it is completely inside the leather.

Punch or drill holes in the leather corresponding to those in the face of the cone, and insert rivets, Sketch 2. Sink the heads below the surface of the leather by holding the divided prongs of the split rivet, which passes through the clutch cone, over a chisel, and hitting the rivet head with a ball-headed hammer.

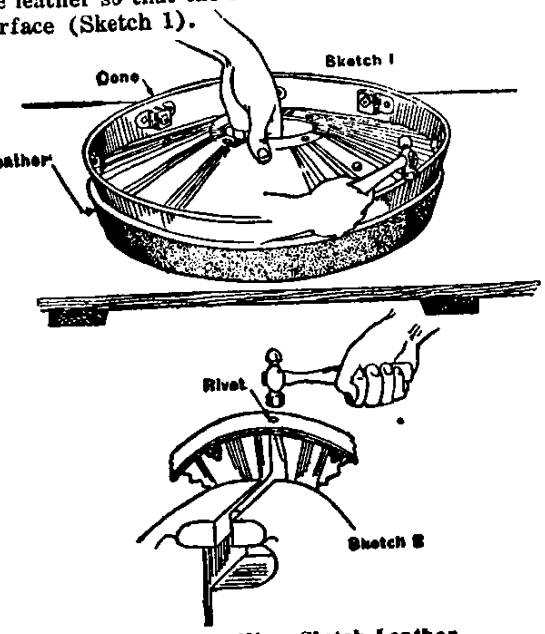


Fig. 35—Installing Clutch Leather.

ADJUSTMENT OF CLUTCH

There are ten clutch leather expanders. These expanders are placed under the clutch leather (Fig. 36) and present a slightly raised point of contact. Their function is to prevent the clutch from "grabbing," or taking hold too quickly, thus causing the car to start with a jerk. If this condition exists, the expanders should be adjusted. To adjust the expanders, turn each of the expander nuts in the same direction as the hands of a clock, right to left, until they lightly touch the clip, then give them a half turn in the opposite direction.

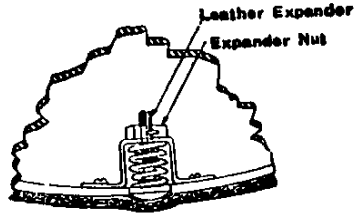


Fig. 36—Adjustment of Clutch.

This unscrewing a half turn allows the expanders to act properly under the clutch leather.

TRANSMISSION

The transmission is of the selective type, having three speeds forward and one reverse. Stripped of technicalities it is com-

posed of a countershaft on which are keyed three gears and a main or splined shaft on which slide two gears, which by a lengthwise movement can be made to engage the gears on the countershaft. (Fig. 37.)

The fundamental requirement is in every case to first engage

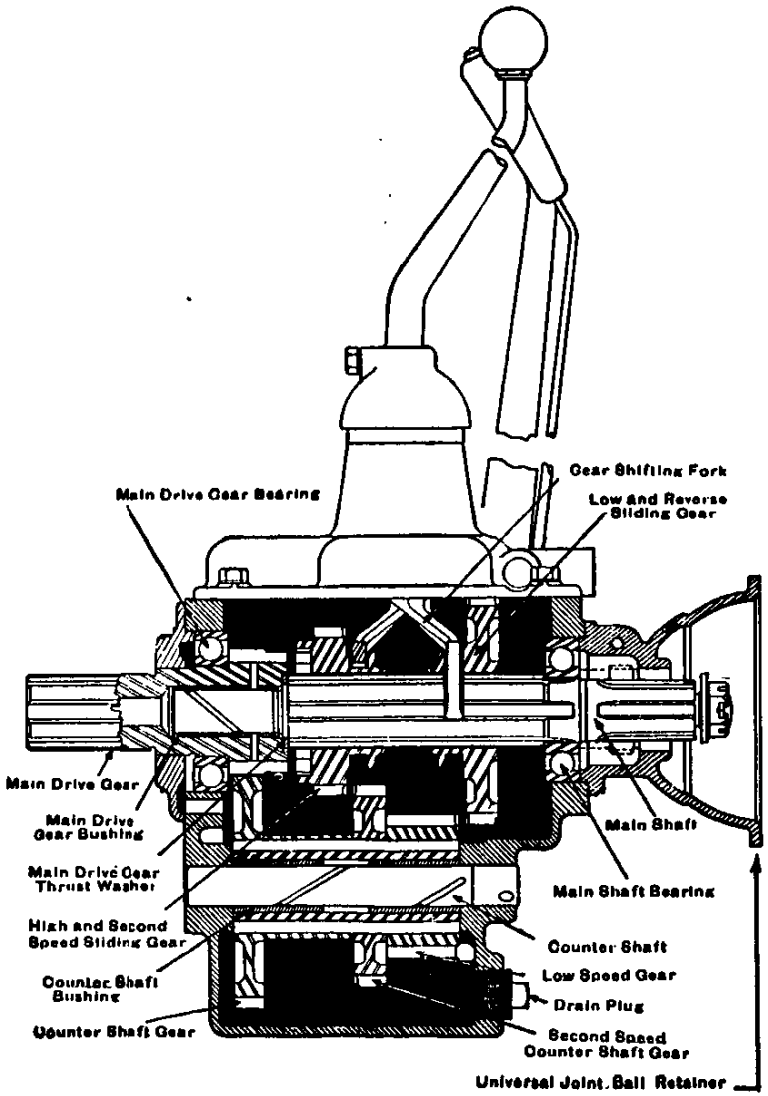


Fig. 37—Transmission.

the gears so that the entire tooth "face" of the sliding gears mesh with those on the countershaft, and second, to properly lubricate all working parts. Proper engagement can be had by

being sure, when shifting gears, that the gear shift lever travels as far forward, or backward, as it will go without straining before re-engaging the clutch.

To lubricate the transmission fill every 1000 miles with No. 600W steam cylinder oil, not grease, so that the oil level stands at the bottom of the upper or splined shaft.

Once every 2000 miles it is a good plan to wash out the transmission with kerosene to remove any chips of metal knocked off the gears or other foreign substances. To do this remove the drain plug at the bottom of the transmission case and allow the oil to drain off, after which flush out thoroughly and refill with oil.

REAR AXLE

The rear axle used on Chevrolet cars is the floating type, in which the load is carried by the axle housings instead of the main axle shafts, their only function being to rotate the rear or driving wheels. The manner of supporting the load between the hub and the axle housing is a patented device, controlled only by this company.

A glance at the illustration (Fig. 38) shows the construction, the different units being so marked as to show their relation to each other. That you may be familiar with its general construction, we will describe briefly the different units.

The driving torque is transmitted from the motor crank shaft, through the clutch and transmission to the propeller shaft. On the end of the shaft is mounted a bevel pinion, called the *Drive Pinion*, which meshes with a large ring gear called the *Differential Drive Gear*. This in turn is securely bolted to a housing called the Differential Gear Case.

Inside the differential gear case are mounted five gears. Two of these, called the *Differential Main Shaft Gears*, are fastened to the ends of the axle shafts. The other three gears, called *Differential Pinions*, are mounted on the *Differential Spider*, and mesh with the two Differential Main Shaft Gears.

The function of a *differential* is to permit one rear wheel of the car to travel faster than the other, or independent of the other when required. If such a device were not used turning corners would be almost an impossibility, as without it both wheels would have to move at the same speed, whereas a turn demands that one wheel travel faster than the other.

When the car is traveling over uneven road surfaces, turning corners or on the side of the roadway, considerable end play or "thrust" is transmitted to the differential. To prevent injury and to reduce the power loss due to friction, a suitable bearing called a *Differential Thrust Bearing* is used.

The weight of the differential and the drive shafts is carried by a roller bearing on each side, through which the main axle shafts pass.

The propeller shaft is housed inside the *Propeller Shaft Housing*, and is supported at its lower end by a ball bearing and at the upper end by a bronze bushing. A ball bearing called the *Pinion Shaft Thrust Bearing* absorbs the end play of the shaft and driving thrust.

One end of the Propeller Shaft Housing is flanged and bolted to the axle housings. The opposite end is supported by a *Ball*

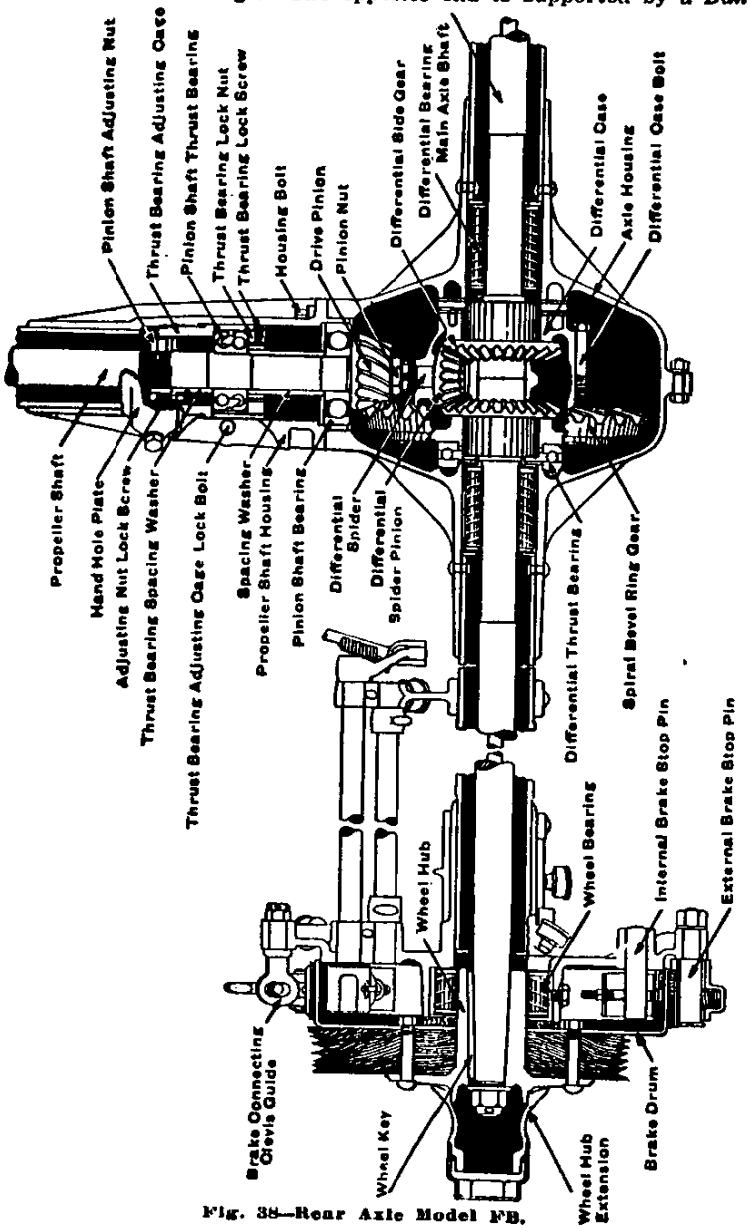


Fig. 38—Rear Axle Model FB.

and Socket Joint (Fig. 41), inside of which works a *Universal Joint* connecting the propeller shaft with the main or splined transmission shaft.

How to Remove the Rear Axle Assembly

Jack up the car and remove bolts and clips holding springs to axle housing. Disconnect the *brake pull rods* from the operating *levers* on the *rear axle housing* by removing the *yoke pins*, and slide the *axle* assembly from under the car.

Removing the Propeller Shaft Housing Assembly

Slide the *axle* assembly from under the car, then remove the four *propeller shaft housing bolts*, clamping the *housing* to the *axle housings*, and lift the assembly off (Fig. 39).

Remove the *hand hole plate* (Fig. 39).

Clamp the *housing* in a vise with the *hand hole* on top, and remove the *thrust bearing adjusting cage lock bolt*.

Turn the *propeller shaft* so that the hole in the *pinion shaft adjusting nut* is in line with the milled slots in the end of the *thrust bearing adjusting cage*.

Then secure a small steel pin ⅜ in. square, 1 in. long, and place it through the slots into the hole in the shaft.

With a large adjustable wrench gripping the splined end of the *propeller shaft*, turn in the opposite direction to the hands of a clock, left to right.

This will cause the *thrust bearing adjusting cage* to turn with the *propeller shaft*. Continue to turn until the cage is free, permitting the entire assembly to be removed through the ***drive gear*** end of the ***housing***.

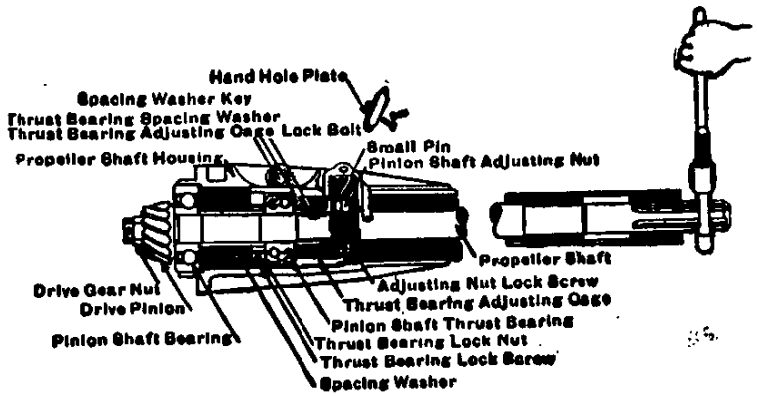


Fig. 39—Propeller Shaft.

Should there be any difficulty in unscrewing the *cage*, insert a large screw driver into the split clamp at the point where the *thrust bearing adjusting cage lock bolt* was removed, and open the jaws of the clamp slightly.

Removing Propeller Shaft

Remove the small wire passing through the head of the *adjusting nut lock screw*, and remove the *lock screw*.

Unscrew the *pinion shaft adjusting nut* as far as it will go, then pull out the *cotter pin* holding the *drive gear nut* and remove the *nut*. (Fig. 39.)

Slip a flat piece of steel between the back of the *drive* pinion and the lower end of the *propeller shaft housing.*

With a lead hammer or piece of wood held against the end of the *propeller shaft,* drive the *pinion* off the *shaft.* The *bearings* and *spacing washers* can then be taken off the *shaft.*

Removing Pinion Shaft Thrust Bearing

Remove the *thrust bearing lock screw* and unscrew the *thrust bearing lock nut.*

Assembling Propeller Shaft in Housing

In reassembling the *propeller shaft assembly,* the above operations are reversed. Be absolutely sure to set the various parts up tight. Also, do not forget to install the *spacing washer key.*

Lock the *pinion shaft adjusting nut lock screw* with a wire.

Replace and draw tight the *thrust bearing adjusting cage lock bolt.*

Replacing Drive Pinions

Should it become necessary to replace the drive pinion, extreme care should be exercised to see that the tapered hole of the gear fits the taper on the shaft snugly and at all points. Always, before putting the new pinion on the shaft, remove the cotter pin holding the adjusting nut and turn the nut back two or three turns. As it is impossible to machine two tapered holes exactly alike, one gear may "go on" a little farther than the other, so if the adjustment were not changed the gear would "shoulder" against the bearing before obtaining a good seat on the shaft.

Before fitting the gear examine the key. If this is loose in the shaft, or worn, replace it with a new one.

It is a good plan to "try" the fit of the gear on the shaft before finally assembling. The best way is to secure a little *Prussian Blue* and spread it thinly around the bore of the gear. Press the gear on the shaft, then remove, and note the marks made on the shaft. If the "bearing" is uneven, smear a little valve grinding compound on the shaft and with a reciprocating motion "grind" the gear to its seat. Much depends upon securing a good snug fit, so take your time, as it is a good insurance against roadside repairs.

After having secured a good fit, securely lock the nut and spread the cotter pin.

The adjusting nut should then be set up and securely locked with a cotter pin. Care must be used not to get the adjustment too tight; however, it should be snug. If the holes for cotter pin will not "line up" without getting the bearing too tight or too loose, make a washer of tin or brass and insert between the nut and center thrust bearing washer.

How to Remove the Differential Assembly

Remove the propeller shaft housing assembly and rear wheels. The axle housing is in two parts, right and left, bolted together in the center. Remove the bolts and slide the housings off the shafts.

The differential gear case is in two halves and can be separated

by removing the clamping bolts, after which the axle shafts with the main shaft gears can be withdrawn.

The main shaft gears are keyed to the axle shaft, and can be removed by pressing the gear off in the direction of the tapered end of the shaft.

After the axle is assembled remove the drain plug and pour oil into the housing until it runs out the drain plug hole. No. 600W steam cylinder oil is the best for summer use and light cylinder oil for freezing weather.

Before connecting the axle with the transmission, pack the universal joint with cup grease.

REMOVING REAR WHEELS

The *rear wheels* are keyed on the tapered ends of the *axle shafts* and held in place by a *castle nut* and *cotter pin.*

Lift the *rear wheel* from the ground, with the jack placed under the *axle, not* under the *truss rod.*

Then remove the *hub cap,* also remove the *hub extension* by using the *hub cap* wrench and turning in the opposite direction to the hands of the clock, left to right.

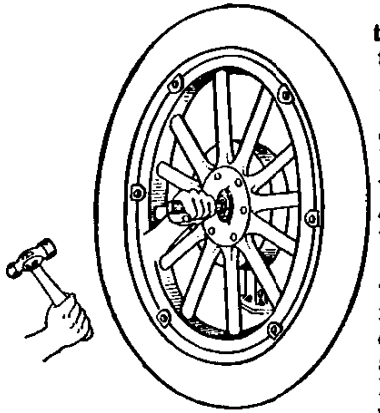


Fig. 40—Removing Rear Wheel.

Remove the *cotter pin* holding the *nut* on the shaft, and loosen the *castle nut.* (Do not entirely remove.)

With a bar held against the *castle nut,* deliver several sharp blows on the bar, Fig. 40, and when the *wheel* is free on its *key* remove the *castle nut,* and the *wheel* may be pulled off.

When installing the *rear wheel,* thoroughly clean all oil from the tapered end of the *axle shaft,* as this will insure a good tight fit, and the key is less likely to shear off on a hard pull.

Rear Wheel Bearings

Large roller bearings carry the car load and are mounted on special one-piece drop-forged hubs, hardened and ground. The method of mounting is covered by patents controlled by this company, and insures to the owner a minimum of power loss and upkeep cost. Suitable felt washers are provided to prevent grease leaking from the differential, and can easily be renewed by removing the wheels.

Lubrication

Grease cups have been provided at different points to insure proper lubrication. Make it your business to regularly "turn down" the grease cup caps and you will prolong the life of your car and avoid trouble.

HOW TO REMOVE THE UNIVERSAL JOINT

With the axle removed from under the car, take out the five cap screws holding the *Joint Ball Retainer Collar* and pull the ball joint from the socket. Remove the four clamp screws holding the two universal joint rings together (Fig. 41) and separate the rings. The nut holding the universal joint yoke to the

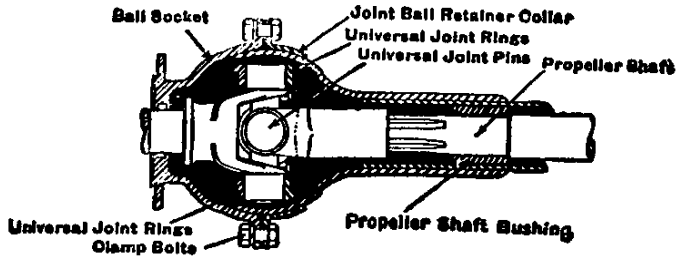


Fig. 41—Sectional view of ball and socket.

transmission shaft can then be removed and the yoke pulled off the shaft.

BRAKES

As will be shown by reference to illustration Fig. 42, the service brake is the outside or external, and the emergency the

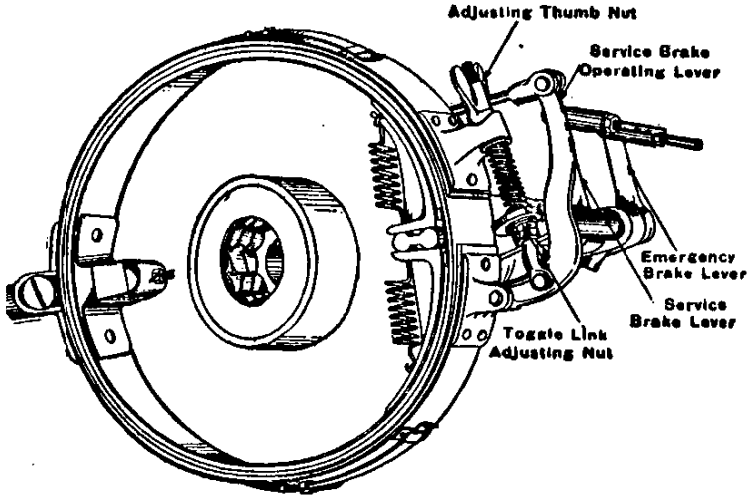


Fig. 42—Brake Bands.

inside or internal. One, the service, contracts on the outside of the brake drum, and the other, the emergency, expands against the inside of the drum.

No part of an automobile is more neglected by the average user than the brakes. They are of the utmost importance, however, and there should be no disregard for the precautions necessary to insure their dependable condition at all times.

How to Adjust Brakes

It is important that the brakes be adjusted evenly, that is, that when applied both grip the brake drums with the same pressure and at the same time.

Adjustment of Brakes

As the brakes are used the *brake linings* become worn.

When the *brake pedal* is pressed down as far as it will go without stopping the forward movement of the car, shorten the

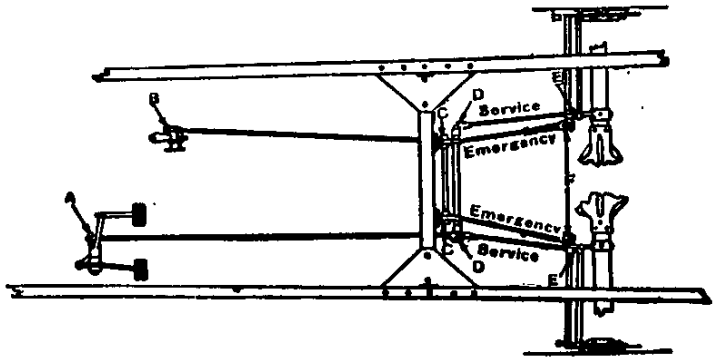


Fig. 43—Brake Adjustment.

rod between the *pedal* and *brake shaft* by raising the *hood* on the left side and turning the *thumb nut* (*A*), Fig. 43, in the same direction as the hands of a clock, right to left. When the *hand brake lever* is pulled back as far as it will go without stopping the forward movement of the car, shorten the rod between the *hand lever* and the lever on the *brake shaft* by screwing the *thumb nut B*, Fig. 43, to the right.

After making these adjustments note the position of levers C and D (with the brakes released). To give proper pull, these *levers* should point downward and about an inch to the rear of a vertical position.

If the levers stand in a vertical or forward of vertical position, unscrew the *thumb nuts* (*A*) and (*B*).

Remove the *yoke pins* (*E*) from the *brake band* and shorten the *service* or *emergency brake pull rods* by screwing the *yoke ends F* to the right.

Caution.—Be sure to turn each *yoke* end an equal number of turns, otherwise one *brake* will take hold before the other.

Should one *brake* "grab"—that is, take hold too quickly—remove the *yoke pin E* and lengthen the rod by unscrewing slightly the *yoke end F*.

Whenever the *service* or *emergency brake levers* stand in a vertical or forward of vertical position (with the brakes applied) it indicates that the *brake linings* have become worn to the point where they should be replaced.

Additional use may be obtained on the service *brake* by screwing the *adjusting thumb nut*, Fig. 42, to the right.

Adjustment of Brake Bands

To secure proper braking action, the brake bands must be adjusted so that when applied they grip the brake drums evenly and at all points. Should the *service brake band* touch the drum at the top and not at the bottom (with the brakes applied), screw up on the *toggle link adjusting nut* (Fig. 42) until the lower half grips the drum properly.

Should the *service brake band* touch the drum at the bottom and not at the top (with the brakes applied), screw down on the *adjusting thumb nut* (Fig. 42) until the upper half grips the drum properly.

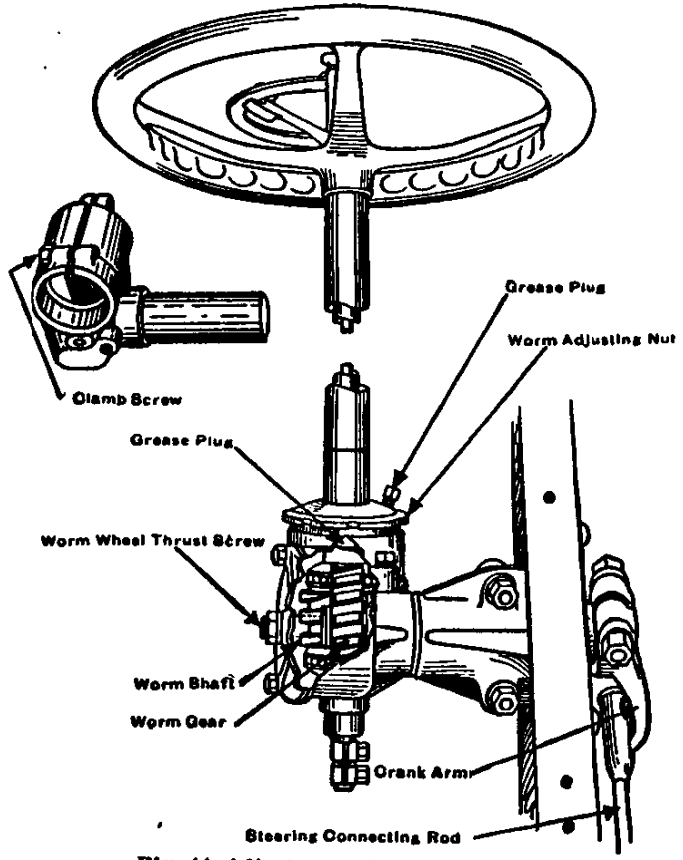


Fig. 44—Adjustment of Steering Gear.

Examine your brakes regularly, and make absolutely sure that they are in good dependable condition, as your safety may depend upon them. Grease cups have been provided on the bearings of all operating shafts. Turn down the grease cup caps regularly,

otherwise the brakes will not operate freely, wearing out the linings besides using up power.

STEERING GEAR

The steering mechanism used on Chevrolet cars has been designed to give the greatest ease of handling with the least amount of wear and consequent adjustment. No part of the car is so vital, therefore it is absolutely essential that it be well lubricated and any looseness immediately corrected. Go over all the connections regularly and tighten any bolts or nuts which are loose, supplying grease where needed, as this is the only safe insurance against a costly accident.

The steering gear is of the worm and worm wheel type, in which the worm on the steering gear shaft meshes with a worm wheel to which the crank arm is attached. To take up end play in the worm shaft loosen the adjusting nut clamp bolt (Fig. 44) and screw down the worm adjusting nut until all play is removed without binding the steering gear. Be sure to tighten the adjusting nut clamp bolt after securing the proper adjustment. To adjust end play in the worm wheel tighten the worm wheel thrust screw.

Should neither of these adjustments take up the play in the steering gear, remove the *steering crank arm* from the worm wheel shaft and turn the steering gear hand wheel one-quarter turn. In time the worm and wheel gear teeth become worn and the turning one-quarter turn brings new teeth into action.

Grease should be put into the gear case every 250 miles. This is quite important, as your safety depends upon a well-lubricated gear.

Every 500 miles the ball and socket connection on the *drag link* (connection between steering crank arm and front axle) should be packed with grease—any looseness in the connection can be removed by tightening the screws in the end of the drag link tube. Be sure to replace the cotter pin after making this adjustment.

FRONT WHEEL BEARINGS

The front wheel bearings used on Chevrolet Cars are of the

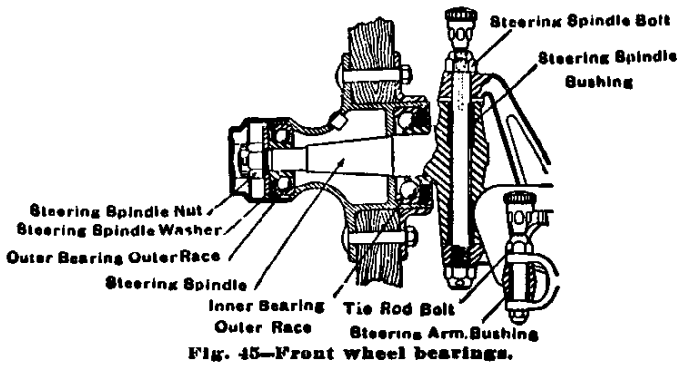


Fig. 45—Front wheel bearings.

cup and cone type on which the radial and lateral load is carried

on ball bearings working between hardened cups and cones, and are very durable and easily adjusted.

To keep the bearings clean and well lubricated is an absolute necessity if you are to secure maximum efficiency. Once a month the front wheels should be removed and the bearings thoroughly washed in gasoline or kerosene.

To remove the wheel lift the wheel from the ground with a jack and then unscrew the hub cap, spindle nut and spindle washer. The wheel can then be slid off the spindle.

The front wheels should fit the steering spindle snugly without end play. To adjust the bearings spin the wheel and at the same time screw the spindle nut up until it is tight enough to stop the rotation of the wheel, then unscrew the spindle nut just enough to allow the wheel to spin.

Be sure to draw the spindle nut up against the spindle washer, insert the cotter pin and spread it.

To lubricate the bearings, remove wheel and pack the wheel hub and ball races with a good grade of grease.

Front Wheel Alignment

To make steering easy it is required that the front wheels should "toe" in—that is, the distance between the inside faces of the wheel felloes, measured at the height of the wheel hubs, should be 3/8 in. more at the rear than at the front. This causes the wheels to grip the road better and allows the car to hold its course without undue action on the steering mechanism. (Fig. 46.)

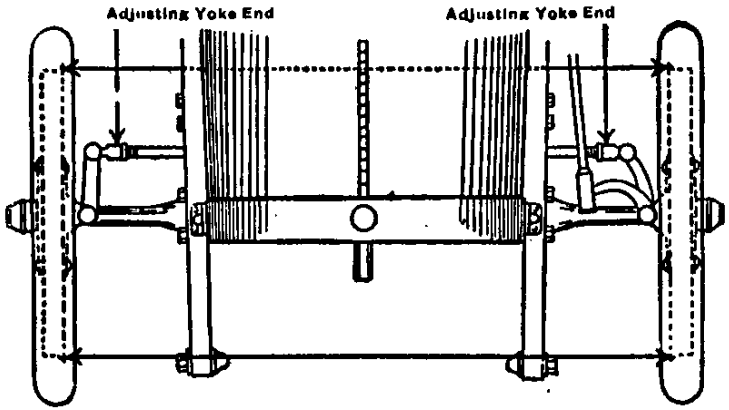


Fig. 46—Front wheel alignment.

As the car passes over uneven road surfaces the front wheels are subjected to considerable strain, therefore, about once every 2,500 miles their alignment should be checked to make sure that none of the connecting links have changed their adjustment, otherwise there is the possibility that the front tires will become unduly worn, necessitating early renewal.

To adjust the front wheels loosen the tie rod connecting the two wheels and screw in or out upon the *adjusting yoke end.*

After securing the proper alignment be sure to draw the check nut up against the yoke end, otherwise there is danger that the yoke will wear the threads on the rod, finally allowing the yoke to slip off the rod, with bad results.

The lubrication of the *Spindle Bolts* and *Tie Rod Bolts* is very important, so make it your business to follow the instructions contained on the oiling chart regularly.

SPRINGS

It is of the utmost importance that regular attention be given to the springs on your car if you are to realize their fullest riding qualities. Even the best designed spring will become squeaky as soon as moisture enters between the leaves and causes rust. The fullest action and resiliency of the springs is obtained only when the different leaves are free to slide on each other. A spring which is "rusted up" cannot do this, causing unequal strains to be placed on each leaf, especially the larger or main one. It follows, therefore, that to lubricate the springs as soon

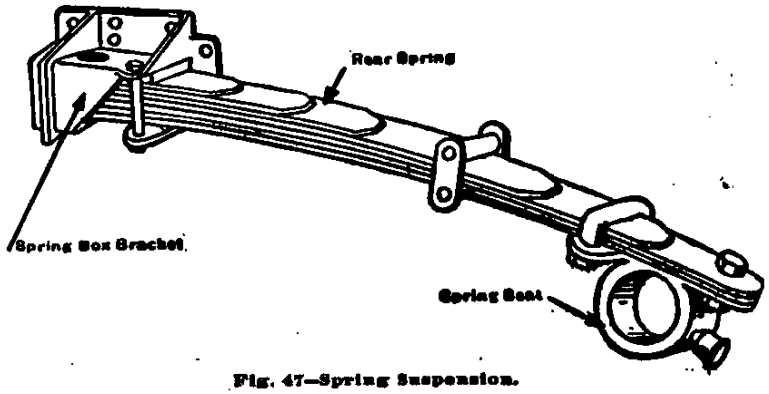


Fig. 47—Spring Suspension.

as they begin to squeak is the surest way to secure easy riding and prevent spring breakage.

The best way to lubricate the springs is to place a jack under the frame or body and raise the car (not the wheels) until the spring leaves separate far enough so that graphite grease can be spread between them.

Once a week examine the clamping bolts and spring clips holding both front and rear springs to the axles and see that they are absolutely tight. (Fig. 47.) No matter how "tight" they were drawn up at the last examination, the action of the spring will cause them to "stretch" or loosen up. Nearly all spring breakage can be traced to loose spring clips and bolts, so observe this rule carefully.

TIRES

Tires represent one of the principal items of your upkeep expense. By following the suggestions and simple precautions offered here you can keep your tire upkeep expense very low.

Inflation.

First and foremost, keep the tires fully inflated. Remember the car rides on air—not on the side walls of the tires. To insure long life and protection against stone bruises and blowouts, tires must contain enough air to support the car's weight.

The best average pressure is given in the following table. These figures are based upon regular passenger and equipment load. If extra weight, in the form of passengers or equipment, is added, the tire pressure should be raised accordingly (about 5 pounds pressure for each 50 pounds increase in car weight per wheel). However, the maximum pressure should in no case be greater than the carrying load of the tire, which is plainly marked on the side of each casing.

INFLATION SCHEDULE

Model	Total weight with passengers average 155 lb. each	Size 33" x 4" Weight on 2 front wheels with passengers	Weight on 2 rear wheels with passengers	Inflation Front	Inflation Rear
FB-50	3,500	1,365	2,135	55	85
FB-20	2,950	1,405	1,545	60	60
FB-40	3,736	1,459	2,277	55	85
FB-30	3,263	1,535	1,728	60	60

(To find actual load on each tire, weigh front and rear of fully loaded car separately and divide each by two.)

Tires should be tested about twice a week, or every morning when touring. If the pressure has fallen 10 pounds or more, reinflate at once. This, more than any other one thing, will help prolong the tire's life and prevent trouble.

Do not let out any of the air on account of hot weather. Heat has comparatively little effect on air pressure, and will never cause trouble from undue expansion. By diminishing the air pressure because of hot weather you encourage new tire troubles.

Fill Small Cuts in Tread

In a few minutes at night you can clean out any small cuts with gasoline; apply some of the cement from the repair kit and squeeze in a little tire putty. This putty hardens over night and effectually closes the cuts.

Vulcanize Big Cuts or Snags

Long cuts, tears or mud blisters that start before you notice them should be vulcanized at once by a competent repairman.

Unusual Wear on Tread

A common trouble especially hard to account for is sudden wearing down of the tread, either unevenly or around the entire circumference. This may be caused on the rear tires by quick starting or stopping, or on the front by improper alignment of the wheels.

Chains

If you find it necessary to use chains, apply them loosely enough so they can slip around the tire. Chains that are too tight quickly cut and tear the tire tread. If too loose they will fold under and produce the same result.

Oil

Keep tires out of grease and oil. Oil rots the rubber quickly and causes the tire to peel off. If necessary to drive over oiled roads, it is a good plan on returning to wipe the tires with a piece of waste soaked in gasoline. This cuts the oil and leaves the tires clean.

Removing Tires

When it becomes necessary to remove a tire, place a jack under the axle and raise the car high enough so that the wheel clears the ground. Turn the wheel so that the valve stem is at the top, then if removing a tire from the rear wheel, set the emergency brake. This will prevent the wheel from turning and make the work easier. Unscrew the dust cap and lock nut on the valve stem and push the valve back into the casing as

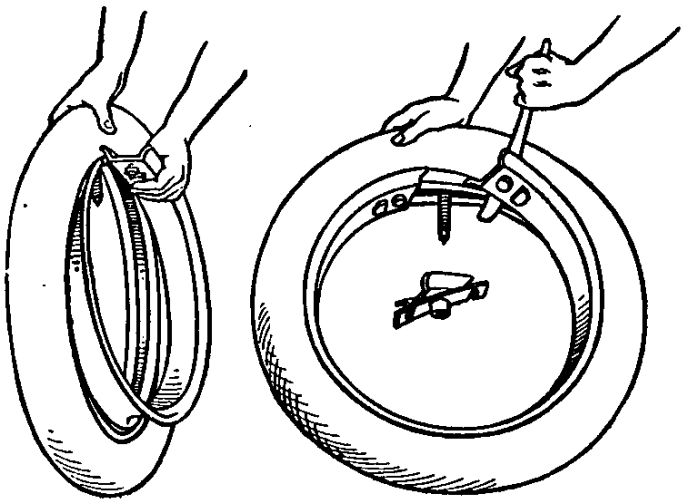


Fig. 48—Removing Casings.

far as it will go. With the special rim wrench provided with each car loosen the nuts holding the clamping lugs enough so that the lugs can be pulled away from the rim.

Grasp the tire and rim at the bottom and pull outward until the rim clears the felloe band, after which move upward and lift the valve out of its hole.

Removing Casings

If the tire is to be removed from the rim, release the rim segment by turning the pivoted lever far enough to disengage the round lugs. Then lift the rim segment off the valve stem. (Fig. 48.)

Insert the tire iron supplied with each car between the casing and rim (see sketch), and pry the casing from the rim, at the same time pulling inward and upward on the free end of the rim. By sliding the tire iron around the rim during this operation the rim can be removed very readily. Care should be taken in inserting the tire iron not to injure the tube in any way.

Removing Tubes

Lay the casing on the ground, then slip your fingers under the tube and around the valve. With the other hand spread the casing and lift the tube out. Keep repeating this until the tube is free from the casing. **Do not attempt to pull the tube out, as you run a great risk of tearing the tube, spoiling it beyond repair; so take your time, as the extra precautions will easily repay you.**

Inserting Tubes

Before inserting a new tube in a casing, inflate the tube enough to make it hold out round. This makes it much easier to slip into the casing, besides will prevent the tube from folding under or being pinched between the bead and rim.

Leaky Valves

After inflating the tube, wet the end of the valve stem to make sure that the valve does not leak. If a bubble forms, insert the slotted end of the valve cap and tighten the valve core. If this is not sufficient, unscrew the core and examine the rubber seat, as occasionally a small obstruction is preventing a perfect "seat." If the core is too badly damaged, or fails to hold, insert a new one, a supply of which is provided with each tire kit. Leaky valves are a frequent source of trouble, and are usually apparent by a gradual loss of air, and unless it is corrected will lead to trouble.

Examine Inside of Casing

Always examine carefully the inside of the casing before inserting a new tube, and remove any foreign substance, as this will surely cause trouble if allowed to remain. In the case of nail or glass punctures it often happens that the offending object is driven into the casing with considerable force and imbeds itself in the fabric in such a manner that it cannot be seen from the outside. Locate and remove this before inserting a new tube.

In applying tubes, always be sure to dust the inside of the casing thoroughly with French talcum furnished in the tire repair kit. This acts as a lubricant and prevents the tube from heating in the case and sticking to the sides.

Keep Rims Free From Rust

Before applying a new tire or tube, examine the rim carefully,

and if rusty have it sand-papered smooth and treated with a coat of rim paint or graphite.

Replacing Tire on Rim

Lay the casing (with tube inserted) on the ground. Grasp the rim by its free ends and compress it enough to slip inside the casing. Be sure that the beads on the casing are inside the rim flanges, then slip the loose rim segment over the valve and securely lock it with the pivoted lever. It may be necessary to pry the casing over the rim flanges with the tire iron; however, use care not to injure the tube in any way.

The tire can now be pumped up to its proper pressure.

Replacing Rim on Wheel

Grasp the tire and rim at the sides, lift and insert the valve stem into its hole through the felloe. The tire can then be pressed into position. Turn each of the lugs so that their wedge edges slip under the rim, after which tighten each nut a little at a time until all are tight and snug. Be careful about this, as the rim must stand away from the felloe band an equal distance all around. Rim squeaks, which are so annoying, are usually the result of improperly tightening the lugs.

The dust cap over the valve can now be replaced, jack removed, and the car operated.

Punctures and Blow-Outs

The most common tire troubles encountered are nail or glass punctures, tube pinches and blow-outs.

Punctures

These are the result of running over nails, tacks, sharp pieces of metal, broken glass, and sometimes by sharp stones or gravel. If the "puncture" through the casing is not large, repairs need only be made to the tube. If, on the other hand, the hole is pronounced, stick a small blow-out patch (a supply is in each repair kit) over the opening, on the inside of the casing, and press down firmly.

Tube Pinches

There are two kinds of tube pinches, one caused by fabric breaks and the other by rim pinches.

Fabric breaks, or what tire experts call stone bruises, are the direct result of underinflation. The accompanying drawings illustrate this injury and show how it is caused. When the tires are not properly inflated, any obstruction which strikes the tire squarely may rupture the fabric in this way. Generally the rupture is on the inside fabric next to the tube, and cannot be noticed from the outside, but as the smooth surface on the inside of the casing is broken the tube will be forced into the fracture. The action of the tire passing over the road will cause this fracture to open and close, pinching the tube until it breaks.

If this should happen to you on the road, remove the casing and stick over the break a small blow-out patch which you will

find in the repair kit. This will keep the new tube from being pinched until you get home.

As soon as possible have a repairman cut out the injured section and insert a permanent repair; otherwise the break is likely to grow bigger and eventually cause a blow-out.

A rim pinch may be caused by using an oversized casing; by not properly inflating the tube before inserting in the casing; or by running the car with tires not properly inflated. The remedy in this case is obvious.

Blow-Outs

A blow-out occurs when the tube is forced through the fabric of the casing, and is usually accompanied by a loud report like a gun shot. Stone bruises, tread cuts and sand blisters, when not promptly repaired, will usually lead to a blow-out. When this occurs the casing should be sent to a competent repairman for vulcanizing. Casings on which the tread has become badly worn will, of course, blow out in time.

Repairing Tubes

In each tire repair kit are complete instructions for the repair of tubes. Large breaks or cuts should be vulcanized, as this is the only safe method.

Care of Spare Tubes

The wise driver always provides himself with one or more spare tubes, but few take the necessary precautions to keep these in good condition, usually throwing them under the rear seat, along with tools and accessories; also there is seldom any way of distinguishing between a "punctured" and a "good" tube.

Each driver should provide himself with one or more small cloth bags, made with a draw string at one end, and keep spare tubes in these.

A good way to distinguish between a "good" tube and a "punctured" one is to have one of the bags specially marked, and put all punctured tubes into that bag. Another way is to employ different methods of folding.

Folding Tubes

Remove the valve core by unscrewing with the slotted end of the valve cap. This allows all the air to escape and makes the following operations easier. Twist the tube so that the valve

Fig. 49.

projects outward, as shown in Fig. 49, then, beginning at the opposite end, roll the tube up tightly.

Still holding the tube as tightly as possible, insert the valve core and screw on the cap. Screw it on tightly with fingers only.

If the tube is a "punctured" one it may be bound securely with elastic bands or tape to distinguish it from a good one.

The tube can then be unrolled and folded, as shown in Fig. 50, into a flat package.

Fig. 50.

Before placing the folded tube into its bag, dust it with French Talcum or Soapstone and then close the end of the bag tightly.

The following are a few Don'ts it will pay you to observe:

Don't drive fast around corners. Aside from danger of skidding, this throws terrific strain on the tread and carcass of the tire.

Don't let the clutch in with a jerk, or jam on the brakes, when stopping. Spinning or sliding the wheels will quickly wear thousands of miles of service off the treads.

Don't scrape the side-walls against curbstones. This wears off the rubber and exposes the fabric to air and dirt and moisture, which soon starts to rot.

Don't drive fast across car tracks or other irregularities in the road surface. A sharp blow that hits the tire squarely may break the inner fabric and later pinch a tube or cause a blow-out.

Don't leave the car standing on the tires for a long period of time.

Don't store car where tires are exposed to bright light or allow it to rest on an oily, greasy floor.

Don't carry spare tires or tubes unprotected.

Don't drive on car tracks.

Don't overload either the car or the tires.

Don't drive on a flat tire for even a hundred yards. It will not only injure the casing, but will also tear the tube.

Don't drive with the front wheels out of alignment. Examine the casings every few days, and if you notice any undue wear have the wheel line-up checked at once.

ELECTRIC STARTING AND LIGHTING SYSTEM

The system used on Chevrolet cars is known as the two-unit type; that is, with a separate generator and motor, each performing its function independently of the other.

The system as a whole comprises three principal units:

The *Generator*, which produces an electric current and delivers it to the Storage Battery.

The *Storage Battery*, which receives and accumulates the current thus generated and delivers it to the igniter and lighting system or the starting motor when needed.

The *Starting Motor*, which receives current from the storage battery and cranks the automobile motor whenever it is to be set in motion.

In addition there are four auxiliary systems for the regulation and control of the different units, as follows:

A *Circuit Breaker* whose function is to "break" the charging circuit when the automobile engine is standing still or when the speed drops below the point where the generator will produce a charging voltage.

An *Ammeter* which registers on a dial the charging or discharging rate of current flowing through the system. When the car is at rest and no lights burning, the indicating needle or pointer should stand at "zero." When the lights are turned "on" the pointer will move to the right and indicate the amount of discharge or current flowing from the storage battery. With the automobile motor running at a fair speed, and no lights burning, the pointer will move to the left of zero and indicate the amount of current flowing into the storage battery, or "charging rate." Should the pointer indicate "discharge" when the car is at rest and no lights burning, the system is not working properly, and you should consult a competent electrician as quickly as possible.

A *Starting Switch* whose function is to make the necessary electrical connection from the storage battery to the starting motor when the automobile motor is to be set in motion. This switch is self-contained in an insulated steel box and requires no attention.

An *Ignition and Lighting Switch* by which the ignition and lighting systems are controlled.

THE GENERATOR

The construction of the generator is of the utmost simplicity, and beyond a few drops of oil every 500 miles requires no attention. The machine is enclosed in a dust and moisture proof shell which effectually protects it from oil and dirt. The generator is driven by a gear meshing with the cam shaft gear housed in the gear case at the forward end of the automobile motor.

The voltage output is controlled by a third brush, which increases or decreases the field strength in proportion to the motor speed, this doing away with mechanical governors and clutches, which are liable to get out of adjustment.

The generator begins to produce a charging current of sufficient voltage at a car speed of about six miles per hour. At twenty-five miles per hour the generator is producing nearly its maximum output, or about fifteen amperes.

Care of the Generator

The generator should be examined occasionally to see that all connections are tight and that there is no undue wear on the moving parts. The commutator end of the generator can be reached by removing the steel band around the *commutator head.* (Fig. 51.)

If the commutator should be found blackened or rough it may be smoothed down with No. 00 sandpaper, while the generator is running. **Never use emery cloth for this purpose.** After

smoothing down the commutator examine it carefully and remove all particles of metal which may bridge across from one

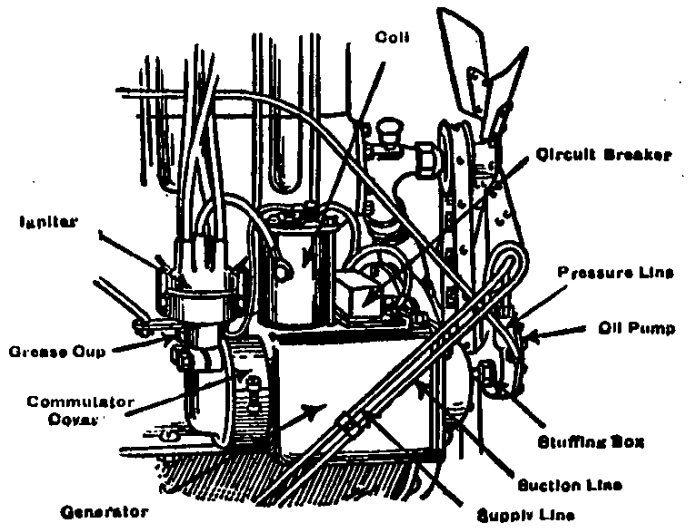


Fig. 51—Generator and ignition set.

copper segment to another. Blow out every particle of carbon dust which may have accumulated in the generator case.

See that there is just enough spring tension on the carbon brushes to insure good contact on the commutator. Too much tension will cause heating and unnecessary wear to brushes and commutator segments.

See that the brushes are making even contact with the commutator. When they become worn to such an extent as to need replacement, order new ones from your dealer or direct from the factory. **Do not use cheap carbon brushes or substitutes.**

The brush holders must be entirely insulated from the generator case. Should any of the insulating plates or bushings become torn or broken they must be replaced with new ones.

Should the battery be disconnected for any reason **do not operate the engine until it is again connected. Should it be necessary to operate the car under such conditions, be sure to connect a short piece of copper wire between the terminal posts of the generator.** Remove this when again connecting up the battery.

In case of any trouble with the generator windings or serious damage to an important part, the generator should be returned to the manufacturer for adjustment and repairs. **Do not use the starting motor while the generator is undergoing repairs, as serious damage will be done to the storage battery.** When necessary to set the automobile motor in motion, crank it by hand, using the hand crank provided for such purpose.

Once every 500 miles lubricate the bearings with a few drops of good machine oil through the oilers provided. Do not use too much oil, as only enough to soften the grease in the bearings

is necessary. **Do not, under any circumstances, get oil or grease on the commutator or brushes.**

STARTING MOTOR

The starting motor is mounted on the rear motor supporting arm, having a pinion, which automatically engages the toothed edge of the fly wheel when the motor armature is rotated rapidly, as in starting. The armature shaft of the starting motor has an extension or sleeve provided with square threads. The pinion is also threaded, and, in addition, carries an eccentric weight which holds the pinion in the position shown in Fig. 52, with the weight underneath. Because of the weight, the pinion is too heavy to turn on the threaded extension, and because the pinion does not turn, it must move along the screw sleeve. After the pinion has moved along the threaded sleeve it engages the teeth on the fly wheel and keeps on moving along until it reaches a stop at the end of the threaded sleeve. The pinion and the fly wheel gear are then fully meshed. Fitted over the end of the armature shaft is a second sleeve, held securely to the shaft by a clamping bolt. A heavy coiled spring connects the outer sleeve with the threaded sleeve. After the pinion has reached the stop it now must turn with the threaded sleeve, but since it is engaged with the fly wheel gear the shock of starting the engine would be very great were it not that the armature shaft is connected to the threaded sleeve through the coiled spring. Instead of picking up the load immediately, this spring keeps coiling until the torque of the starting motor overcomes the resistance of the engine and starts to revolve the fly wheel.

As soon as the gasoline engine starts under its own power, the fly wheel revolves at a much higher speed than it did when

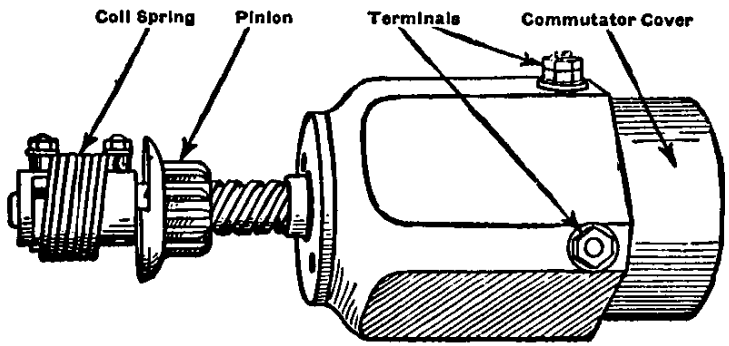


Fig. 52—Starting motor.

the starting motor was cranking the engine. This increases the speed of the pinion, but because it is running faster than the threaded sleeve, it will be screwed on the threads of the sleeve like a nut on a bolt until it has been screwed out of mesh with the fly wheel gear. Should the operator of the car, through error, not immediately remove his foot from the starting button, the unbalanced weight of the pinion causes it to twist on the threaded sleeve and clutch the threads, preventing it from again

meshing with the fly wheel gear. This demeshing movement and clutching action is entirely automatic.

The coiled spring should be examined occasionally to see that it is clamped tightly, and that no distortion has taken place. Should this occur, replace the spring, as this must be in good working order to prevent damage to the teeth on the fly wheel gear.

While the coiled spring absorbs much of the starting torque, the vibration of the car, coupled with the shock of starting, may cause the clamping bolts holding the starting motor to the motor support to loosen, and possibly shift the starting motor slightly, throwing the pinion out of proper alignment with the fly wheel gear.

Whenever, when starting the engine, the pinion goes into mesh with a "bang," accompanied with considerable noise while cranking, take your car to a garage and have the bolts examined and the starting motor lined up properly. By turning the threaded sleeve with the fingers the pinion can be moved into mesh with the fly wheel gear, and any disalignment observed and corrected.

In general, the instructions given for the care of the generator will apply as well to the starting motor. The brushes and commutator are easily accessible for examination by removing the sheet metal cover on the commutator end of the machine.

CIRCUIT BREAKER

The circuit breaker is entirely automatic and requires no lubrication or attention. If for any reason the instrument should fail to operate properly, it should be returned to the manufacturer for adjustment. If the circuit breaker is removed, the car must not be operated until a short piece of copper wire is connected between the two terminal posts on the generator.

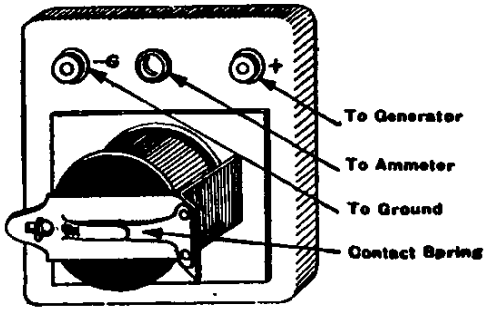


Fig. 53—Circuit breaker cover removed.

AMMETER

The ammeter is self-contained, and requires no lubrication or attention. The accuracy of its reading should be checked up occasionally to make certain that no short circuit has bent the pointer or otherwise injured its internal parts. To test for accuracy, remove the wires from the ammeter terminals or the positive (+) wire from the storage battery. The ammeter pointer should now stand at "zero," and any difference between where it actually stands and "zero" is the degree of error, and should be allowed for when observing ammeter readings.

When for any cause it is necessary to remove the ammeter and

operate the car without it, the two wires which were attached to the ammeter terminals should be firmly fastened together and the bare spots covered with electrician's tape.

LIGHTING AND IGNITION SWITCH

The lighting and ignition switch is contained in an insulated metal case, and needs no attention or adjustment. The ignition key performs the double operation of turning "on" or "off" the ignition and "unlocking" or "locking" the lighting switch. To protect the switch from short circuits a small fuse is mounted on the back side. Should both lights and ignition fail to work, examine the fuse first. It will usually be found "blown." If one or more lamps fail to burn, examine the bulbs. If these are in good condition probably the switch contact springs have weakened. Remove the switch from the instrument board and take out the four flat-headed screws holding the fiber back to the barrel of the switch. This will permit necessary repairs.

LOCATING TROUBLES

When the electric system gives trouble do not jump at conclusions. Only when you have made sure that the wiring is in perfect condition, all terminals tight and connected up according to the wiring diagram (Fig. 54), should trouble be looked for in the electrical instruments themselves.

SHORT CIRCUITS

A short circuit occurs when any two wires of opposite polarity come in contact at exposed places or with any metallic conductor. This will discharge the storage battery in a very short time, therefore, **the greatest care should be taken to see that all connections remain tight and that the insulation of all wires is not broken or cut.**

To prevent a short circuit from damaging the lights a fuse is inserted on the lighting switch box. When this "blows" it can be easily replaced; however, before doing so be sure everything else in the wiring system is in good order.

If the ammeter hand shows a discharge when the lights are turned off and engine idle, disconnect the positive (+) wire from the battery, and if the hand goes back to zero it shows that there is a leak or short circuit, which should be remedied at once. If the hand does not go back to zero, the needle is bent. (See care of ammeter.)

After satisfying yourself that the wiring is in good working order test each of the electrical instruments.

Examine the generator brushes, see that they work freely, and that the commutator is clean.

Examine the circuit breaker; see that the points make contact. If not, close them with your fingers, then if the ammeter registers "charge" with the engine running at fair speed, remove the circuit breaker and send to the makers for repairs as instructed.

Examine the ammeter: With the lights turned on and engine idle the ammeter hand should register "discharge." If it stands

at zero, remove the ammeter and return to the manufacturers as instructed.

Examine the storage battery: **See that the solution in each cell covers the plates, and add distilled water if it does not. See**

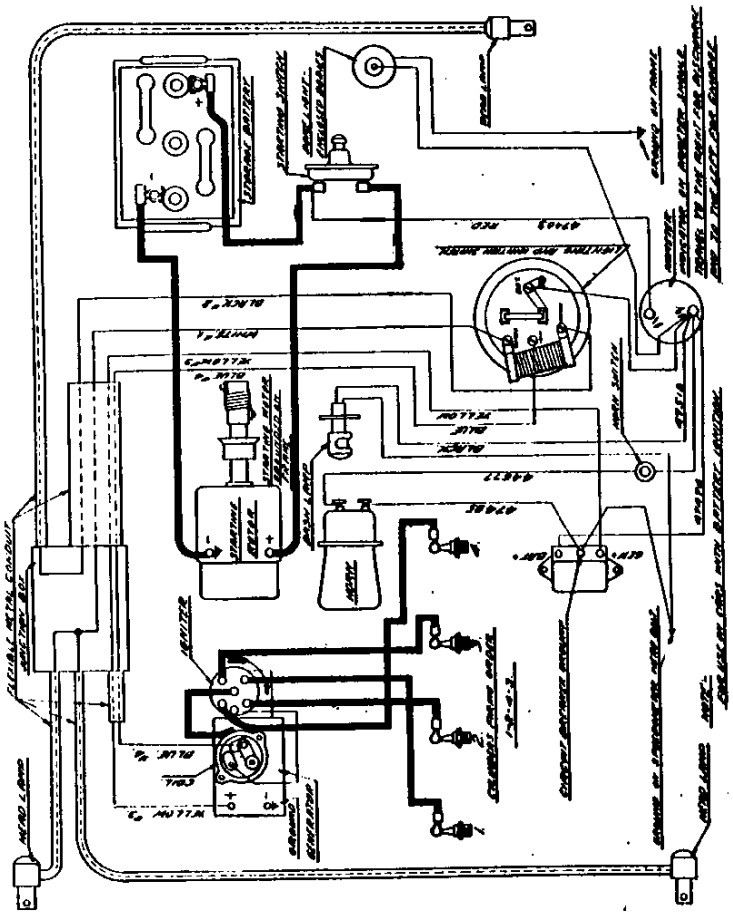


Fig. 54—Wiring diagram.

that the top of the battery is clean and terminals tight. In case of leakage of the electrolyte in one or more cells, take your battery to the nearest service station maintained by the battery manufacturers for examination and replacements.

It should be remembered that the efficiency of any storage battery decreases with a drop in temperature, and for that reason the starting motor and lights should be used sparingly in cold weather, and the engine run for several minutes at good speed after each start.

STORAGE BATTERY

The Storage Battery on this car is the Willard type SJRN-4 manufactured by the Willard Storage Battery Company, Cleveland, Ohio.

The Storage Battery is the heart of the electric system. It is a reservoir into which the electrical energy made by the generator is stored for ignition, lighting and cranking the motor.

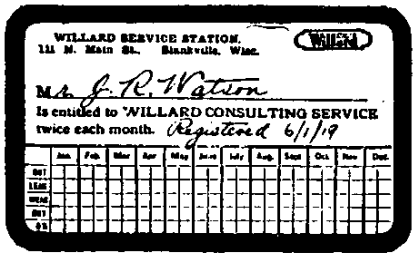
A Storage Battery is an electro-chemical apparatus entirely different from the mechanical parts of the car. Its life depends on the care which it receives and the kind of service demanded from it.

PROPER BATTERY CARE

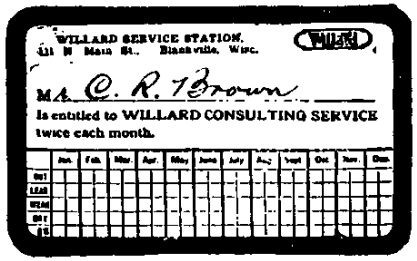
1. When a new car is purchased, the owner should go to the nearest Willard Service Station immediately and have the battery registered in order to take advantage of the Willard 90-day insurance policy. Also ask for a Service Card on which the registration date will be written.

If you buy a Willard battery to replace the one you now have, it will be registered when sold.

2. If your car is not new, call at a Willard Service Station and get a Consulting Service Card which will entitle you, without charge, to testing and filling service twice a month. At the same time you will be given advice which will help you to get the best possible service from your battery.



Registration Service Card



Consulting Service Card

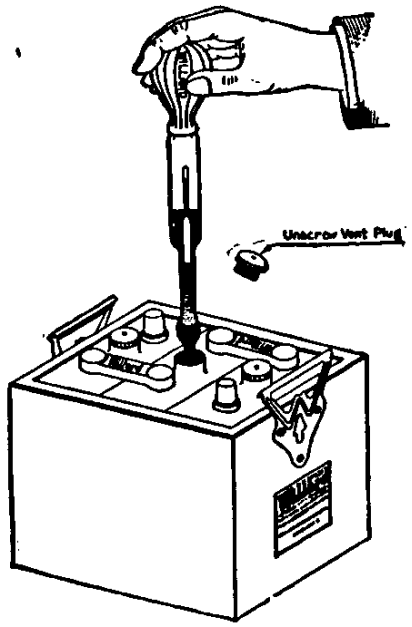
3. Test all cells with a Willard hydrometer on the first and fifteenth of every month. If any cells are below 1.275 on two successive testing dates, take the battery to the Willard Service Station and have it fully charged. In taking these readings, care should be exercised to return the electrolyte from the hydrometer syringe to the same battery cell from which it was taken.

4. Keep all cells filled with distilled water to a level ½ in. above the top of the plates. Never fill ABOVE this level.

5. Keep the battery and the battery compartment clean and dry.

6. Keep the terminals clean and tight and well covered with vaseline to prevent corrosion.

7. Never allow the battery to become heated in service above 100° F. Watch the battery for heating one or more times every day in warm weather. If the top connectors feel more than blood-warm to the touch, take the temperature with a dairy thermometer. If the temperature registers over 100° F., burn all the lamps while driving, until you can consult a Willard Service Station, who will prescribe what is necessary. If the temperature reaches 120° F., the battery may be ruined.

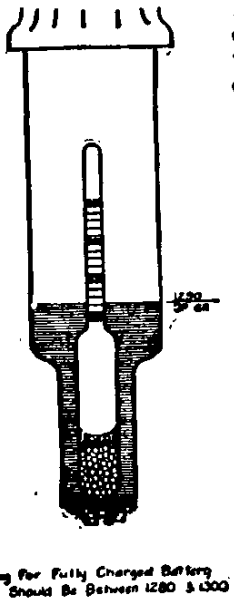


8. In order to prevent freezing in cold weather, test your battery frequently and see that the gravity is kept up to at least 1.275. A discharged battery will freeze at a little below the freezing point.

9. When filling, if one cell takes considerable more water than the others, this indicates a leaky jar, and the battery should be taken or sent to a Willard Service Station. Unless repaired immediately, the battery may be ruined.

10. If you lay up your car, the battery should be removed and placed in storage with a Willard Service Station, who will issue a receipt for it.

A battery will slowly discharge when standing idle. Serious injury will result if it is not kept charged, and it is not practical to do this by running the engine when the car is not in use.



Reading For Fully Charged Battery Should Be Between 1280 & 1300

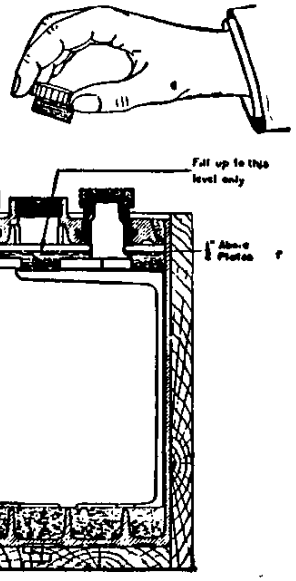
WILLARD SERVICE AND ADJUSTMENT POLICIES

1. We insure every new Willard Battery for 90 days from the date of purchase, provided the battery is registered immediately at the nearest Willard Service Station. If any repairs are necessary during this period, the same will be made without charge to the owner. Recharging is not considered repairs, and the owner is expected to pay for any recharging that may be necessary.

2. During the fourth, fifth and sixth months of ownership, if a battery needs any repairs, the same will be made on a basis satisfactory to the customer.

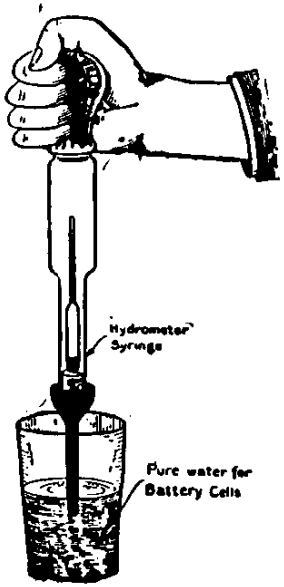
3. During the seventh, eighth, ninth,

tenth, eleventh and twelfth months of ownership, if repairs are necessary, the owner will be given the option of paying the regular charge for the same, or he may exchange the old battery for a new one by paying a fractional part of the retail price, based on the number of months of service received from the old battery. For example: If the battery has given eight months' service, the adjustment price for the new battery would be eight-twelfths (8-12) of the retail price.



4. Willard Service Stations will keep dealers' stock batteries fully charged at a minimum cost to the dealer, and will register and accept responsibility for them under our service policy, provided they are not over six months old at the end of the storage period.

5. All questions concerning batteries which have not been registered, or which may have attained some age at the time the car is delivered are to be settled in the customer's interest between the car dealer and the Willard Service Station dealer.



6. Batteries shipped bone dry with cars and prepared by the Willard Service Station at destination will be registered by them at the same time. Bone-dry batteries prepared by the dealer himself are to be registered at the nearest Willard Service Station in the regular way.

7. With motor car dealers located in places where there is no Willard Service Station, the nearest service station will make arrangements with the dealer whereby all Willard Service and Adjustment Policies will be handled through the dealer.

WILLARD SERVICE STATIONS

The Willard Storage Battery Company has the most complete and extensive storage battery service organization in the world.

The benefits of the above Service and Adjustment Policies, can be had only through authorized Willard Service Stations. If there is none as yet in your City, consult your dealer.

We strongly recommend that you take advantage of the service which we have provided for you by equipping our cars with Willard batteries.

DON'TS FOR THE STORAGE BATTERY

Don't allow your storage battery to stand in a discharged condition for any length of time. Should the battery for any reason become discharged, have it fully charged at once at the nearest garage or charging station. A battery, when in a discharged condition, sulphates rapidly, making charging extremely hard, and in time entirely destroying the elements.

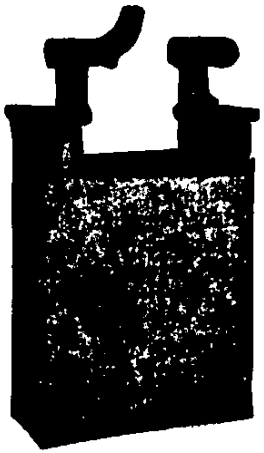


Fig. 55—Battery plates sulphated.

Don't allow dirt, water, or any pieces of metal to come in contact with or remain on the top of your battery. Inspect regularly and keep clean.

Don't continue to crank your engine with the starting motor if it does not start after a few revolutions. Something is wrong with your ignition system or carburetor. Locate and remedy the trouble before again cranking the engine. Just turning the engine over will not help you start, but it will exhaust your battery, if continued for any length of time.

Don't forget to turn "on" the ignition switch before attempting to start the motor.

Don't forget that you must restore in the battery whatever current has been withdrawn for starting. It requires about twenty times as long to restore current to the battery as it takes to start the engine.

Don't turn on all the lights of your car and leave it standing for several hours. Conserve the battery supply by using only such lamps as are absolutely needed to prevent accident.

Don't allow the battery to become loose on the brackets.

Don't allow the battery terminals to become coated with a greenish deposit. Wipe off with diluted ammonia water and thoroughly coat the terminals with vaseline or petroleum jelly.

Don't forget to examine your storage battery once every week in warm weather and every two weeks in cold weather, and make certain that the electrolyte covers the tops of the plates in each cell.

Don't forget that the proper treatment of a storage battery is absolutely necessary to secure uniformly good results from the entire electrical system.

Fig. 55 tells a story more graphically than a hundred pages of text. Here you see what happens to the interior parts or plates when the battery is neglected. The center and upper portions of the plate, as shown by the white coating, are sulphated. This white coating, or sulphate, is an obstruction to the free passage of the electric current; in fact, when it has reached the stage that this one has it is almost impossible to recharge it. A new set of elements is usually the only resource.

Don't let this happen to your battery. Examine your battery regularly every week and follow faithfully the instructions we have given above, and always keep the plates covered with solution by adding distilled water when needed, and your battery will not sulphate, but will continue to give you good service day after day.

Winter Storage of Cars

When it is found necessary to store the car during the winter months, the water should be thoroughly drained from the radiator and motor, after which the engine should be run under its own power until it becomes thoroughly heated. Do not run the motor too fast, but keep it going long enough to evaporate every particle of water that may be "pocketed," to prevent the water freezing and possibly bursting the water jackets.

It is desirable to remove the tires and place them in a room where they are not subjected to extreme temperature changes. The casings should be thoroughly cleaned to remove all oil which may have adhered to them. After removing the tires, thoroughly clean the inside of the wheel rims and apply a coat of enamel to prevent rust, which is very injurious to the fabric of the tire.

If the tires are not removed, jack up the car so that the wheels clear the floor at least two inches, and let the air out of the tubes.

Under no circumstances should the car be stored in a barn or other building in which horses or cattle are kept at the same time. The ammonia fumes given off will quickly discolor the paint and enamel. Select a building having a good roof, and preferably a wooden floor raised several inches from the ground.

All bright metal parts should be thoroughly coated with slab oil, vaseline, cosmic or gun grease to prevent rusting.

CARE OF TOP

The top of the car should be thoroughly cleaned and all dust brushed out. Never attempt to clean the top or curtains with gasoline or kerosene—use a good brush or broom.

If possible, the top should be kept open, which will keep it well stretched and smooth. If this cannot be done, use care in folding it—see that the folds are straight and that none of the fabric is pinched between the bows or supports.

Do not fold the top until it is thoroughly dry, because any moisture remaining in the fabric will likely cause mildew, resulting in an unsightly and leaky top.

CURTAIN FASTENERS

"Lift the Dot"

When a curtain fastener is snapped together it becomes locked on three sides. To release a fastener it must be lifted on the side which is not locked. This side is indicated by a small projection on the fastener.

Curtain fasteners cannot be released by lifting them at any other side.

CARE OF CLOTH UPHOLSTERY

To clean the cloth upholstery on Sedan Bodies, use warm water and Ivory Soap only. Gasoline has a tendency to spread the grease and leave a discolored spot.

After cleaning, wipe dry with a clean cloth.

Directions for Ordering Parts

When ordering parts be sure to give the model, year produced, and car number for which parts are desired.

The model and car number will be found on the name plate attached to the dash under the instrument board.

If in doubt as to the name of the part needed, send the broken part to your dealer or the nearest factory or distributing branch, attention of Parts and Service Department, by prepaid express. Write your name and address plainly on the package, so that it can be identified upon arrival. Write a letter the same day shipment goes forward, stating the purpose for which it is returned, regardless of any previous correspondence.

In ordering from the factory or branch, if possible, always send cash with your order, because we cannot open accounts except with our regularly appointed dealers, who maintain a deposit sufficient to cover their accounts. Orders not accompanied by cash will be sent C.O.D.

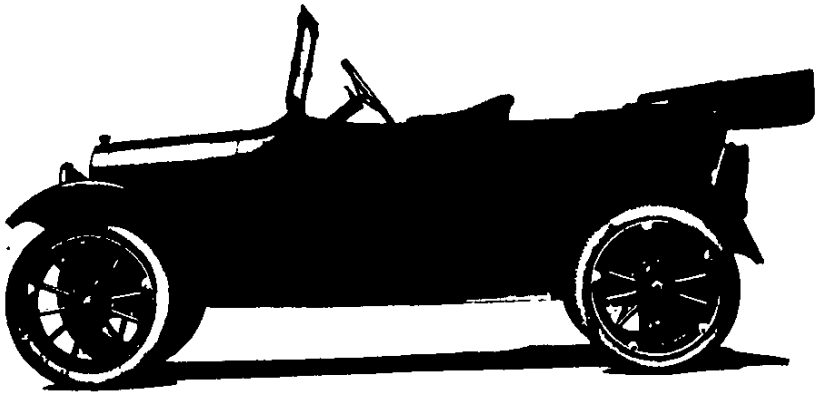
In ordering parts by telegram, be sure the message is prepaid. Collect messages will not be accepted by this company. Always confirm the telegram by a regular order, marked "confirmation of telegram," through the mail.

All Chevrolet dealers carry a stock of such parts as are needed most frequently; therefore, delays can be avoided by ordering from your nearest dealer.

INDEX

Chevrolet "Four-Ninety" Touring Car

$820
f.o.b. Flint, Mich.



Here is a car whose proven economy, dependability, endurance and complete equipment make it a sound and satisfactory investment.

Specifications MODEL "FOUR-NINETY" TOURING CAR

Motor. Four-cylinder, valve-in-head type, 3 ¼" bore, 4" stroke.

Cylinders: Cast in block (including upper half of crank case). Head detachable.

Valves: 1½" diameter.

Connecting Rod Bearings: 1⅜" diameter, 1⅞" long.

Crankshaft Bearings: Front, 1⅜" diameter, 2 ⅛" long; Center, 1 ¼" diameter, 1½" long; Rear, 1¾" diameter, 2 ¼" long.

Camshaft Bearings: Front, 1 ⅛" diameter, 2⅜" long; Center, 1 ⅛" diameter, 2" long; Rear, 1¼" diameter, 1 ⅛" long.

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge.

Carburetor: Zenith improved double jet.

Ignition: New improved Remy.

Clutch: Cone type with adjustable compensating springs.

Transmission: Selective type, sliding gear; three speeds forward and reverse.

Cooling: Water pump and fan; radiator extra size.

Front Axle: Drop-forged I-beam.

Rear Axle: Three-quarter floating type, wheel bearing carried on the wheel-hub and in axle housing, not on axle shaft. Hyatt roller bearings.

Brakes: Emergency, internal expanding type; service, external contracting type; 10" brake drums. Foot control.

Wheels: Wood, artillery type, demountable rims, large hub flanges.

Tires: 30" x 3½", non-skid front and rear.

Drive: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

Steering Gear: Spur and gear, adjustable for wear 15" steering wheel.

Springs: Cantilever type, front and rear.

Body: Five-passenger Touring Car.

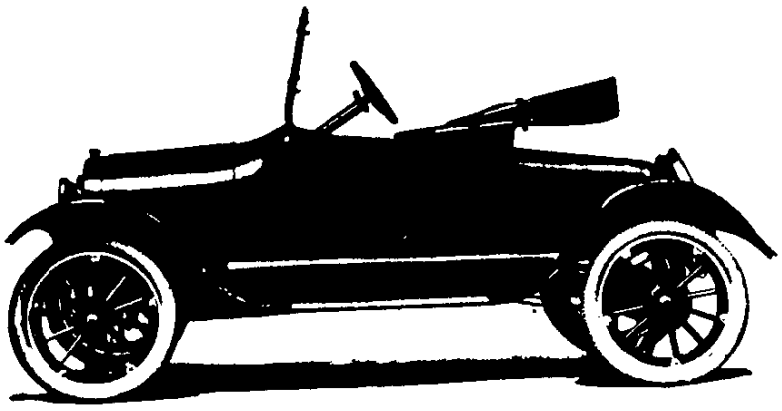
Wheelbase: 102".

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment. Universal adjustment on head lamps; top, top cover and side curtains; tilted windshield; speedometer; electric horn extra rim and carrier on rear; complete tool equipment, including pump and jack. Foot-rest, robe rail.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.

Chevrolet "Four-Ninety" Roadster

$795
f.o.b. Flint, Mich.



This car is convenient, comfortable and efficient for every day travel at minimum expense.

Specifications MODEL "FOUR-NINETY" ROADSTER

Motor: Four-cylinder, valve-in-head type, 3 ¼" bore, 4" stroke.

Cylinders: Cast in block (including upper half of crank case). Head detachable.

Valves: 1½" diameter.

Connecting Rod Bearings: 1⅜" diameter, 1⅞" long.

Crankshaft Bearings: Front, 1⅜" diameter, 2 ⅛" long; Center, 1 ¼" diameter, 1½" long; Rear, 1¾" diameter, 2 ¼" long.

Camshaft Bearings: Front, 1 ⅛" diameter, 2⅜" long; Center, 1 ⅛" diameter, 2" long; Rear, 1¼" diameter, 1 ⅛" long.

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge.

Carburetor: Zenith improved double jet.

Ignition: New improved Remy.

Clutch: Cone type with adjustable compensating springs.

Transmission: Selective type, sliding gear; three speeds forward and reverse.

Cooling: Water pump and fan; radiator extra size.

Front Axle: Drop-forged I-beam.

Rear Axle: Three-quarter floating type, wheel bearing carried on the wheel-hub and in axle housing, not on axle shaft. Hyatt roller bearings.

Brakes: Emergency, internal expanding type; service, external contracting type; 10" brake drums. Foot control.

Wheels: Wood, artillery type, demountable rims, large hub flanges.

Tires: 30" x 3½", non-skid front and rear.

Drive: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

Steering Gear: Spur and gear, adjustable for wear. 15" steering wheel.

Springs: Cantilever type, front and rear.

Body: Two-passenger Roadster.

Wheelbase: 102".

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment; universal adjustment on head lamps; top, top cover and side curtains; tilted windshield; speedometer; electric horn; extra rim and carrier on rear; complete tool equipment, including pump and jack.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.

Chevrolet "Four-Ninety" Sedan

$1375
f.o.b. Flint, Mich.

The year 'round comfort of this model combines with Chevrolet reliability under all road and weather conditions to make it fill every transportation requirement.

Specifications MODEL "FOUR-NINETY" SEDAN

Motor: Four-cylinder, valve-in-head type, 3 11/16" bore, 4" stroke.

Cylinders: Cast in block (including upper half of crank case). Head detachable.

Valves: 1 1/2" diameter.

Connecting Rod Bearings: 1 3/4" diameter, 1 3/8" long.

Crankshaft Bearings: Front, 1 1/2" diameter, 2 1/16" long; Center, 1 11/16" diameter, 1 1/2" long; Rear, 1 3/4" diameter, 2 1/16" long.

Camshaft Bearings: Front, 1 1/16" diameter, 2 1/2" long; Center, 1 1/16" diameter, 2" long; Rear, 1 1/4" diameter, 1 1/8" long.

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge.

Carburetor: Zenith improved double jet.

Ignition: New improved Remy.

Clutch: Cone type, with adjustable compensating springs.

Transmission: Selective type, sliding gear; three speeds forward and reverse.

Cooling: Water pump and fan; radiator extra size.

Front Axle: Drop-forged I-beam.

Rear Axle: Three-quarter floating type, wheel bearing carried on the wheel-hub and in axle housing, not on axle shaft. Hyatt roller bearings.

Brakes: Emergency, internal expanding type; service, external contracting type; 10" brake drums. Foot control.

Wheels: Wood, artillery type, demountable rims, large hub flanges.

Tires: 31" x 4", moulded type, ribbed tread front and rear.

Fenders: Front and rear fender skirts extended to meet the radiator splash guard and rear splash guard on body.

Drive: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

Steering Gear: Spur and gear, adjustable for wear. 15" steering wheel.

Gasoline Supply: 12-gallon tank, hung on rear, with gauge; Stewart vacuum system.

Springs: Cantilever type, front and rear.

Body: Five-passenger Sedan solid post construction, with divided front seats; right hand seat reversible.

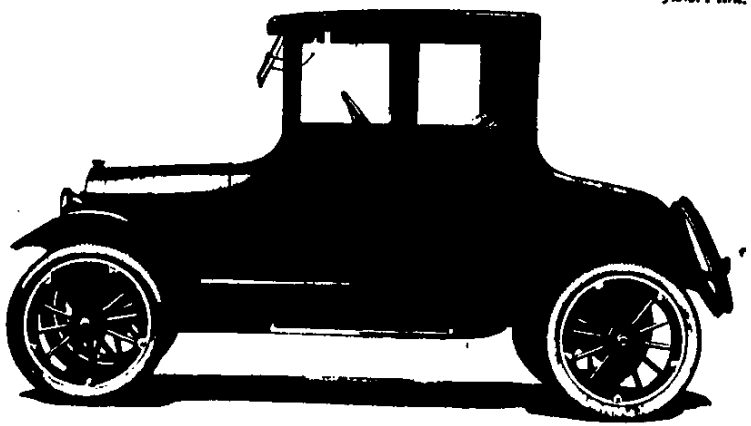
Wheelbase: 102".

Equipment: Electric lights and starter; highest type 2-unit system, double wiring used. Complete lamp equipment, including headlight dimmer; universal adjustment on head lamps; speedometer; electric horn; extra rim and carrier on rear; complete tool equipment, including pump and jack.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.

Chevrolet "Four-Ninety" Coupe

$1325
f.o.b. Flint, Mich.



The smart design and mechanical efficiency of this Chevrolet model suit it to the individual who wishes dependable performance at low cost.

Specifications MODEL "FOUR-NINETY" COUPE

Motor: Four-cylinder, valve-in-head type, 3 11/16" bore, 4" stroke.

Cylinders: Cast in block (including upper half of crank case). Head detachable.

Valves: 1 1/2" diameter.

Connecting Rod Bearings: 1 3/4" diameter, 1 3/8" long.

Crankshaft Bearings: Front, 1 1/2" diameter, 2 1/16" long; Center, 1 11/16" diameter, 1 1/2" long; Rear, 1 3/4" diameter, 2 1/16" long.

Camshaft Bearings: Front, 1 1/16" diameter, 2 1/2" long; Center, 1 1/16" diameter, 2" long; Rear, 1 1/4" diameter, 1 1/8" long.

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge.

Carburetor: Zenith improved double jet.

Ignition: New improved Remy.

Clutch: Cone type, with adjustable compensating springs.

Transmission: Selective type, sliding gear; three speeds forward and reverse.

Cooling: Water pump and fan; radiator extra size.

Front Axle: Drop-forged I-beam.

Rear Axle: Three-quarter floating type, wheel bearing carried on the wheel-hub and in axle housing, not on axle shaft. Hyatt roller bearings.

Brakes: Emergency, internal expanding type; service, external contracting type; 10" brake drums. Foot control.

Wheels: Wood, artillery type, demountable rims, large hub flanges.

Tires: 31" x 4", moulded type, ribbed tread front and rear.

Fenders: Front and rear fender skirts extended to meet the radiator splash guard and rear splash guard on body.

Drive: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

Steering Gear: Spur and gear, adjustable for wear. 15" steering wheel.

Gasoline Supply: 10-gallon tank.

Springs: Cantilever type, front and rear.

Body: Two-passenger Coupe, solid post construction.

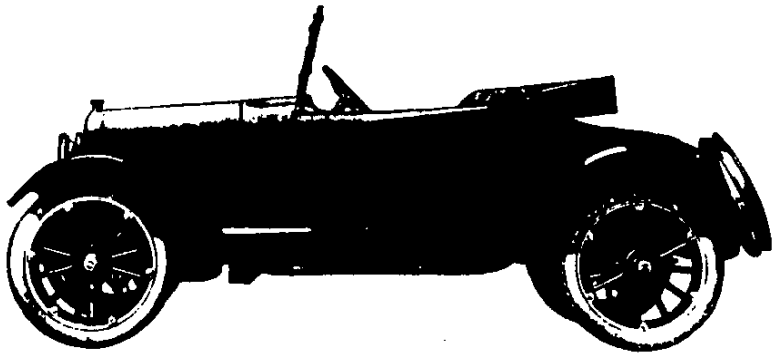
Wheelbase: 102".

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment, including headlight dimmers; adjustable head lamps; speedometer; electric horn; extra rim and carrier on rear; complete tool equipment, including pump and jack.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice

Chevrolet "FB 20" Roadster

$1320
f.o.b. Flint, Mich.



Here is the stream-line design at its best, both for comfort and appearance.

Specifications MODEL "FB 20" ROADSTER

Motor: Four-cylinder, valve-in-head type, 3 1/8" bore, 5 1/4" stroke.

Cylinders: Cast in block with upper half of crank case. Head detachable.

Valves: 1 1/2", enclosed.

Connecting Rod Bearings: 1 1/2" x 2 1/8".

Crankshaft Bearings: Front, 1 1/2" x 2 1/8"; Center, 1 1/8" x 2"; Rear, 2" x 3 1/2".

Center Main Bearing: Doehler bronze back.

Camshaft Bearings: Front, 1 1/8" x 2 1/4"; Center, 1 1/2" x 2"; Rear, 1 1/8" x 2".

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge on dash.

Carburetor: Zenith improved double jet.

Electric System: Auto-Lite generator, starting motor, and lighting system. Two-unit type.

Ignition: New improved Remy system.

Clutch: Cone, leather faced, with adjustable compensating springs.

Transmission: Selective type, three speeds forward and reverse.

Front Axle: Drop-forged I-beam with integral yokes. Wheels fitted with New Departure ball bearings.

Rear Axle: Three-quarter floating type. Shafts run on Hyatt roller bearings.

Cooling: Water pump and fan; radiator extra size.

Brakes: Service, external contracting; emergency, internal expanding (hand-controlled); 12" brake drums.

Springs: Front, semi-elliptic; rear, semi-cantilever.

Tires: 33" x 4", non-skid on rear. Plain tread on front.

Drive: Left side, center control.

Body: Two-passenger Roadster.

Steering Gear: Worm and gear wheel, 18" steering wheel with inserted spider.

Gasoline Supply: Seventeen-gallon tank hung on rear, with gauge. Stewart vacuum system.

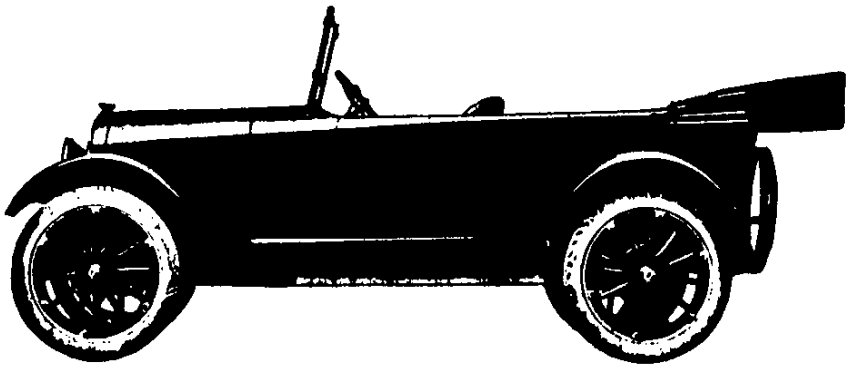
Wheelbase: 110".

Equipment: Electric lights and starter; highest type two-unit system, double wiring used. Complete lamp equipment, including headlight dimmers; top, top cover and side curtains; electric horn, speedometer; demountable rims, with extra rim; tire carrier; license holder; complete tool equipment including pump and jack.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.

Chevrolet "FB 50" Touring Car

$1345
f.o.b. Flint, Mich.



Here is a car which has distinguished itself by performance fully equal to the promise of its splendid design.

Specifications MODEL "FB 50" TOURING CAR

Motor: Four-cylinder, valve-in-head type, 3 1/8" bore, 5 1/4" stroke.

Cylinders: Cast in block with upper half of crank case. Head detachable.

Valves: 1 1/2", enclosed.

Connecting Rod Bearings: 1 1/2" x 2 1/8".

Crankshaft Bearings: Front, 1 1/2" x 2 1/8"; Center, 1 1/8" x 2"; Rear, 2" x 3 1/2".

Center Main Bearing: Doehler bronze back.

Camshaft Bearings: Front, 1 1/8" x 2 1/4"; Center, 1 1/2" x 2"; Rear, 1 1/8" x 2".

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge on dash.

Carburetor: Zenith improved double jet.

Electric System: Auto-Lite generator, starting motor, and lighting system. Two-unit type.

Ignition: New improved Remy system.

Clutch: Cone, leather faced, with adjustable compensating springs.

Transmission: Selective type, three speeds forward and reverse.

Front Axle: Drop-forged I-beam, with integral yokes. Wheels fitted with New Departure ball bearings.

Rear Axle: Three-quarter floating type. Shafts run on Hyatt roller bearings.

Cooling: Water pump and fan; radiator extra size.

Brakes: Service, external contracting; emergency, internal expanding (hand-controlled); 12" brake drums.

Springs: Front, semi-elliptic; rear, semi-cantilever.

Tires: 33" x 4", non-skid on rear Plain tread on front.

Drive: Left side, center control.

Body: Five-passenger Touring car.

Steering Gear: Worm and gear wheel, 18" steering wheel with inserted spider.

Gasoline Supply: Seventeen-gallon tank hung on rear, with gauge. Stewart vacuum system.

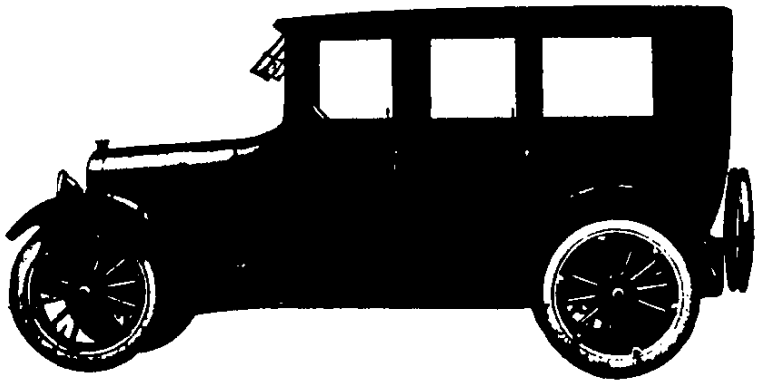
Wheelbase: 110".

Equipment: Electric lights and starter; highest type two-unit system, double wiring used. Complete lamp equipment, including headlight dimmers; top, top cover and side curtains; electric horn; speedometer; demountable rims, with extra rim tire carrier; license holder; complete tool equipment including pump and jack.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.

Chevrolet "FB 40" Sedan

$2075
f.o.b. Flint, Mich.



Dignity of design, every refinement of comfort and convenience, and certainty of service in all seasons are cause for pride in this model.

Specifications MODEL "FB 40" SEDAN

Motor: Four-cylinder, valve-in-head type, 3 11/16" bore, 5¼" stroke.

Cylinders: Cast in block with upper half of crank case. Head detachable.

Valves: 1½", enclosed.

Connecting Rod Bearings: 1½" x 2⅛".

Crankshaft Bearings: Front, 1½" x 2 11/16", Center, 1 11/16" x 2"; Rear, 2" x 3½".

Center Main Bearing: Doehler bronze back.

Camshaft Bearings: Front, 1 5/16" x 2¼"; Center, 1½" x 2"; Rear, 1 11/16" x 2".

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge on dash.

Carburetor: Zenith improved double jet.

Electric System: Auto-Lite generator, starting motor, and lighting system. Two-unit type.

Ignition: New improved Remy system.

Clutch: Cone, leather faced, with adjustable compensating springs.

Transmission: Selective type, three speeds forward and reverse.

Front Axle: Drop-forged I-beam, with integral yokes. Wheels fitted with New Departure ball bearings.

Rear Axle: Three-quarter floating type. Shafts run on Hyatt roller bearings.

Cooling: Water pump and fan; radiator extra size.

Brakes: Service, external contracting; emergency, internal expanding (hand-controlled); 12" brake drums.

Springs: Front, semi-elliptic; rear, semi-cantilever.

Tires: 33" x 4", non-skid on rear. Plain tread on front.

Drive: Left side, center control.

Body: Five-passenger Sedan, solid post construction. Front seats undivided.

Steering Gear: Worm and gear wheel, 18" steering wheel, with inserted spider.

Gasoline Supply: Seventeen-gallon tank hung on rear, with gauge. Stewart vacuum system.

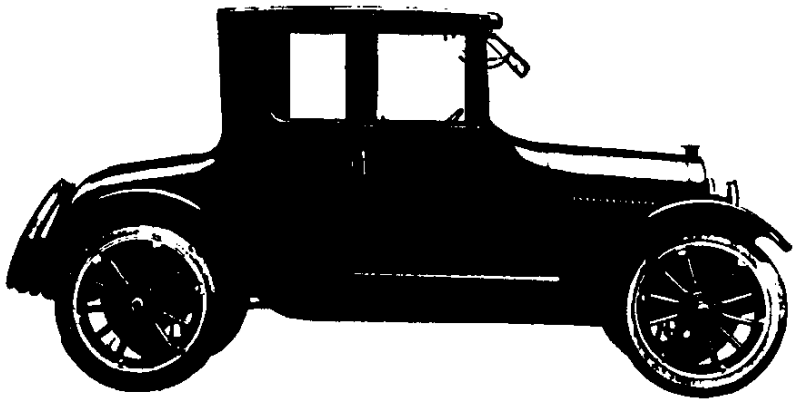
Wheelbase: 110".

Equipment: Electric lights and starter; highest type two-unit system, double wiring used. Complete lamp equipment, including headlight dimmers; electric horn; speedometer; demountable rims, with extra rim; tire carrier; license holder; complete tool equipment including pump and jack.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.

Chevrolet "FB 30" Coupe

$2075
f.o.b. Flint, Mich.



The smart design of this model combines all the comfort and equipment of the sedan with the convenience of the roadster type.

Specifications MODEL "FB 30" COUPE

Motor: Four-cylinder, valve-in-head type, 3 11/16" bore, 5¼" stroke.

Cylinders: Cast in block with upper half of crank case. Head detachable.

Valves: 1½", enclosed.

Connecting Rod Bearings: 1½" x 2⅛".

Crankshaft Bearings: Front, 1½" x 2 11/16"; Center, 1 11/16" x 2"; Rear, 2" x 3½".

Center Main Bearing: Doehler bronze back.

Camshaft Bearings: Front, 1 5/16" x 2¼"; Center, 1½" x 2"; Rear, 1 11/16" x 2".

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge on dash.

Carburetor: Zenith improved double jet.

Electric System: Auto-Lite generator, starting motor, and lighting system. Two-unit type.

Ignition. New improved Remy system.

Clutch: Cone, leather faced, with adjustable compensating springs.

Transmission: Selective type, three speeds forward and reverse.

Front Axle: Drop-forged I-beam, with integral yokes. Wheels fitted with New Departure ball bearings.

Rear Axle: Three-quarter floating type. Shafts run on Hyatt roller bearings.

Cooling: Water pump and fan; radiator extra size.

Brakes: Service, external contracting; emergency, internal expanding (hand-controlled); 12" brake drums.

Springs: Front, semi-elliptic; rear, semi-cantilever.

Tires: 33" x 4", non-skid on rear. Plain tread on front.

Drive: Left side, center control.

Body: Four-passenger Coupe; solid post construction.

Steering Gear: Worm and gear wheel, 18" steering wheel with inserted spider.

Gasoline Supply: Seventeen-gallon tank hung on rear, with gauge. Stewart vacuum system.

Wheelbase: 110".

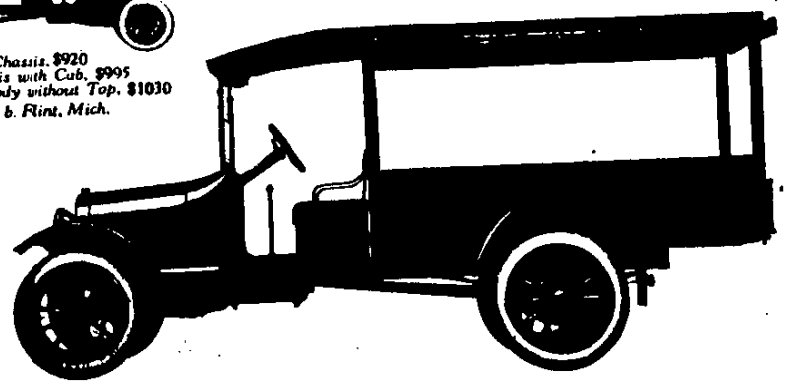
Equipment: Electric lights and starter; highest type two-unit system, double wiring used. Complete lamp equipment, including headlight dimmers; electric horn; speedometer; demountable rims, with extra rim; tire carrier; license holder; complete tool equipment including pump and jack.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.

Chevrolet "G" Light Truck

Express Body and Top, $1095
f. o. b. Flint, Mich.

Chassis, $920
Chassis with Cab, $995
Express Body without Top, $1030
f. o. b. Flint, Mich.



Here is a sturdy new model especially designed for reliable and economical service in light hauling and delivery work.

Specifications MODEL "G" LIGHT TRUCK

Motor: Four-cylinder, valve-in-head type, 3 11/16" bore, 4" stroke.

Cylinders: Cast in block with upper half of crank case. Head detachable.

Valves: 1½" diameter.

Connecting Rod Bearings: 1⅜" x 1⅜".

Crankshaft Bearings: Front, 1⅝" x 2 5/16"; Center, 1 21/32" x 1½"; Rear, 1¾" x 2 11/16".

Camshaft Bearings: Front, 1 5/16" x 2⅜"; Center, 1 9/32" x 2"; Rear, 1¼" x 1 7/16".

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge.

Carburetor: Zenith improved double jet.

Ignition: New improved Remy.

Clutch: Cone type with adjustable compensating springs.

Frame: 5"; width, rear 37"; front 28". Length back of driver's seat, 76". Height, 23½" loaded.

Transmission: Selective type; 3 speeds forward and reverse.

Cooling: Water pump and fan. Radiator extra size.

Front Axle: Drop-forged I-beam. The steering knuckles and knuckle arms are ample in size, drop-forged and heat-treated.

Rear Axle: Semi-floating type, made of nickel steel, heat-treated.

Control: Hand throttle; foot accelerator.

Springs: Cantilever front, one-half elliptic rear. Front springs are 21⅛ inches long and 1¾ inches wide. The rear springs are 43¼ inches long and 2½ inches wide.

Tires: All pneumatic. Demountable type, non-skid wrapped tread. Front 31" x 4". Rear, 34" x 4½". All weather tread.

Wheels: Artillery type, standard dimensions, twelve hickory spokes each; front wheels equipped with Timken tapered roller bearings of extra large size.

Steering Gear: Spur and gear type, 15" steering wheel. Steering arm of drop-forged steel, heat-treated.

Gasoline Tank: Capacity 10 gallons. It is located under the driver's seat.

Wheelbase: 120".

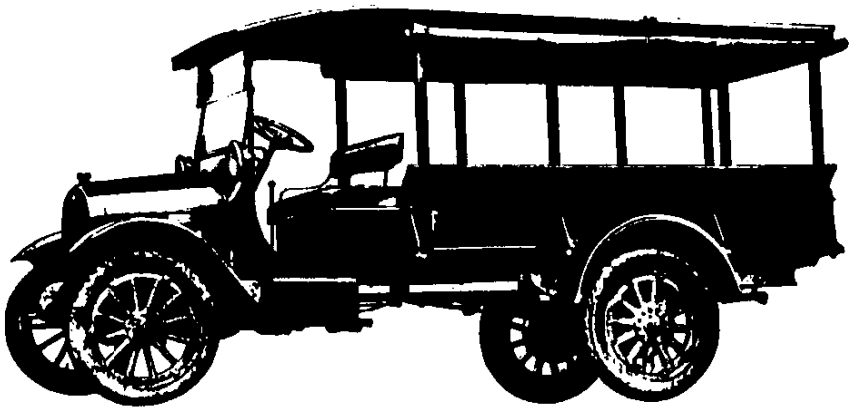
Carrying Capacity: 1500 pounds.

Body: Length of the body from inside of tail board to inside of head board is 97⅛". Width inside of boards 46".

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment, side curtains; adjustable windshield; speedometer; demountable rims; electric horn; complete tool equipment, including pump and jack.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.

Chevrolet One-Ton Truck, Express Body and Top $1545 *f.o.b. Flint, Mich.*



This one-ton worm-drive truck has made a reputation for dependable performance.

Specifications MODEL "T" ONE-TON TRUCK

Motor: Four-cylinder, valve-in-head type, 3⅜" bore, 5¼" stroke.

Cylinders: Cast in block with upper half of crank case. Head detachable.

Valves: 1½" enclosed.

Connecting Rod Bearings: 1⅝" x 2⅛"; Doehler bronze back.

Crankshaft Bearings: Front, 1⅝" x 2⅜". Center, 1⅜" x 2"; Rear, 2" x 3½".

Center Main Bearing: Doehler bronze back.

Camshaft Bearings: Front, 1⅜" x 2½"; Center, 1⅛" x 2"; Rear, 1⅜" x 2".

Oiling System: Pressure and splash system. Gear driven oil pump. Oil pressure gauge.

Carburetor: Zenith improved double jet.

Ignition: New improved Remy System.

Governor: Governor is provided and set for 25 miles maximum. It is locked.

Clutch: Cone, leather-faced, with adjustable compensating springs.

Frame: 4"; width, rear 35½"; front, 30½". Length back of driver's seat, 109". Height, 25" loaded.

Transmission: Selective type; 3 speeds forward and reverse.

Cooling: Water pump and fan. Radiator extra size.

Front Axle: Drop-forged I-beam. The steering knuckles and knuckle arms are ample in size, drop-forged and heat-treated.

Rear Axle: Semi-floating type, made of high carbon steel, heat-treated.

Control: Hand throttle; foot accelerator.

Springs: Semi-elliptic front and rear. Front springs are 38 inches long and 2½ inches wide. The rear springs are 54 inches long and 2½ inches wide.

Worm Gear Drive: The steel worm is cut, hardened, and then finished by grinding. No adjustment is required at any time.

Tires: Front, pneumatic 33" x 4", demountable type, non-skid, wrapped tread. Rear, 35" x 5", pneumatic cord type.

Wheels: Artillery type, standard dimensions, twelve hickory spokes each; front wheels equipped with Timken tapered roller bearings of extra large size. Demountable rims.

Steering Gear: Worm and gear type, 17" steering wheel. Steering arm of drop-forged steel, heat-treated.

Gasoline Tank: Capacity 13 gallons, tank non-leakable. It is located under the driver's seat.

Wheelbase: 125".

Carrying Capacity: 2000 pounds.

Body: Length of the body from inside of tail board to inside of head board is 114½". Width inside of boards, 44".

Prices: Truck chassis, $1325; truck with express body $1460; truck with express body and eight-post top, $1545, F. O. B. Flint, Mich.

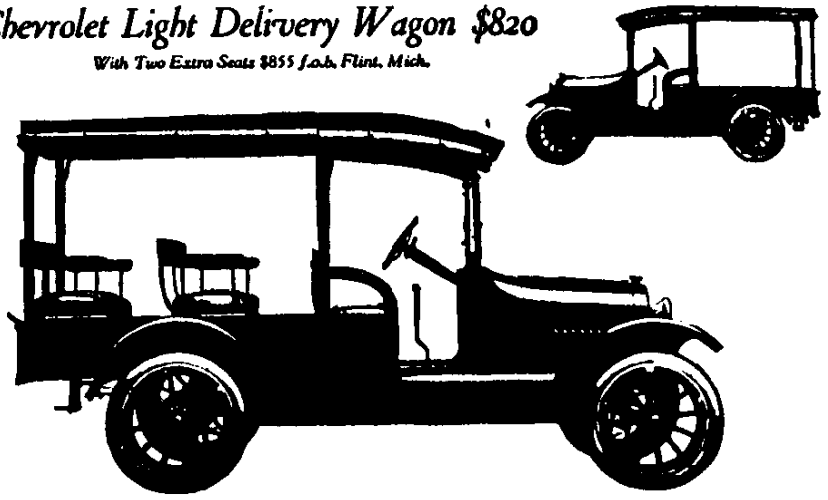
We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.

CHEVROLET

For Economical Transportation

Chevrolet Light Delivery Wagon $820

With Two Extra Seats $855 f.o.b. Flint, Mich.



A light utility car with strength and power for innumerable commercial uses.

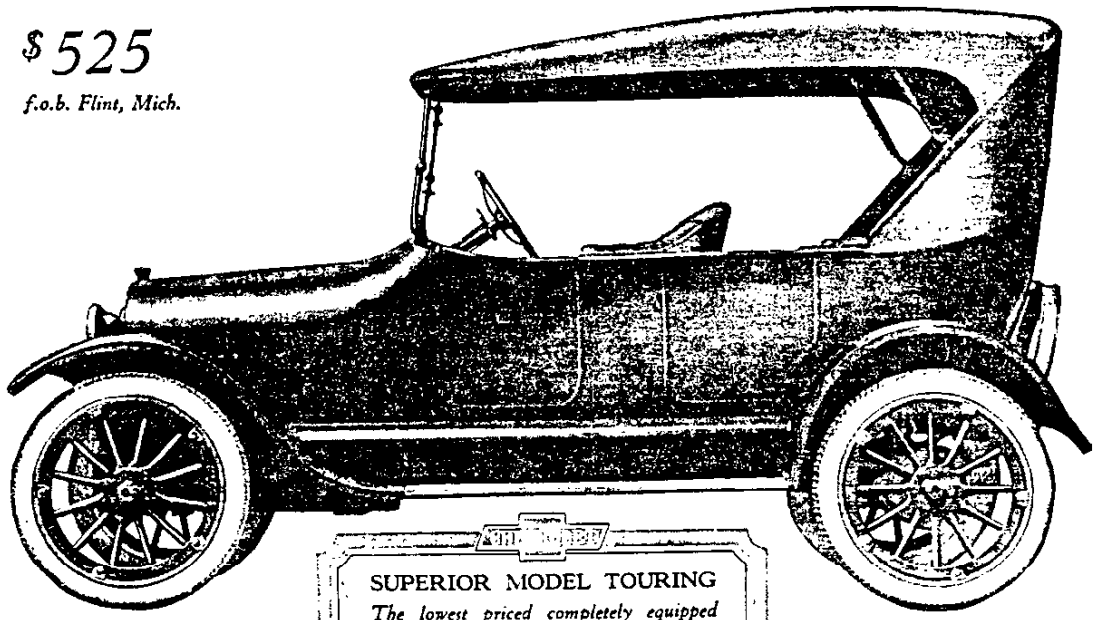
ORIGINAL

CHEVROLET

For Economical Transportation

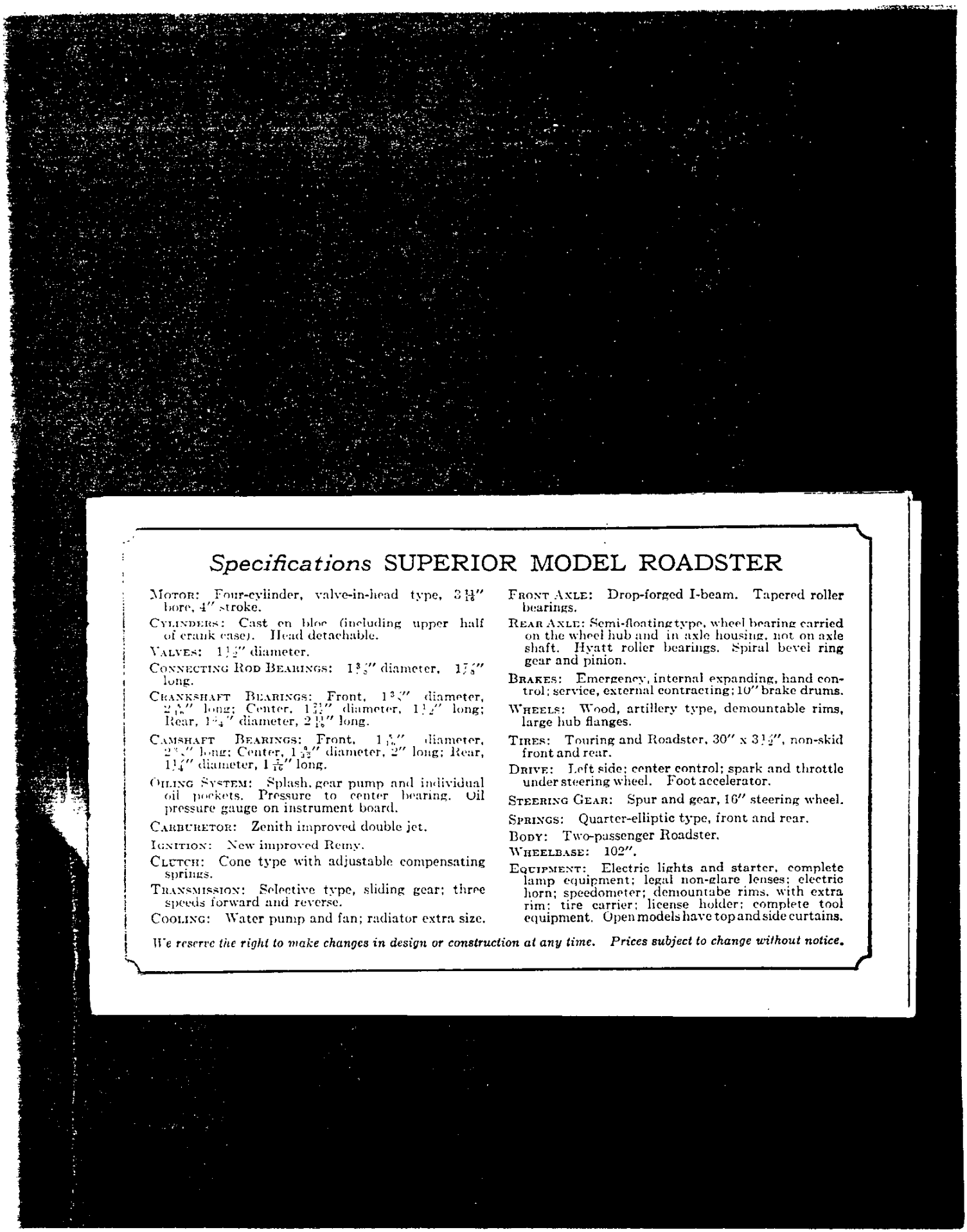
$525

f.o.b. Flint, Mich.



SUPERIOR MODEL TOURING

The lowest priced completely equipped quality car on the market



Specifications SUPERIOR MODEL ROADSTER

MOTOR: Four-cylinder, valve-in-head type, $3\frac{11}{16}$" bore, 4" stroke.

CYLINDERS: Cast en bloc (including upper half of crank case). Head detachable.

VALVES: $1\frac{1}{2}$" diameter.

CONNECTING ROD BEARINGS: $1\frac{3}{8}$" diameter, $1\frac{7}{8}$" long.

CRANKSHAFT BEARINGS: Front, $1\frac{3}{8}$" diameter, $2\frac{5}{16}$" long; Center, $1\frac{31}{32}$" diameter, $1\frac{1}{2}$" long; Rear, $1\frac{3}{4}$" diameter, $2\frac{13}{16}$" long.

CAMSHAFT BEARINGS: Front, $1\frac{5}{16}$" diameter, $2\frac{3}{4}$" long; Center, $1\frac{9}{32}$" diameter, 2" long; Rear, $1\frac{1}{4}$" diameter, $1\frac{7}{16}$" long.

OILING SYSTEM: Splash, gear pump and individual oil pockets. Pressure to center bearing. Oil pressure gauge on instrument board.

CARBURETOR: Zenith improved double jet.

IGNITION: New improved Remy.

CLUTCH: Cone type with adjustable compensating springs.

TRANSMISSION: Selective type, sliding gear; three speeds forward and reverse.

COOLING: Water pump and fan; radiator extra size.

FRONT AXLE: Drop-forged I-beam. Tapered roller bearings.

REAR AXLE: Semi-floating type, wheel bearing carried on the wheel hub and in axle housing, not on axle shaft. Hyatt roller bearings. Spiral bevel ring gear and pinion.

BRAKES: Emergency, internal expanding, hand control; service, external contracting; 10" brake drums.

WHEELS: Wood, artillery type, demountable rims, large hub flanges.

TIRES: Touring and Roadster, 30" x $3\frac{1}{2}$", non-skid front and rear.

DRIVE: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

STEERING GEAR: Spur and gear, 16" steering wheel.

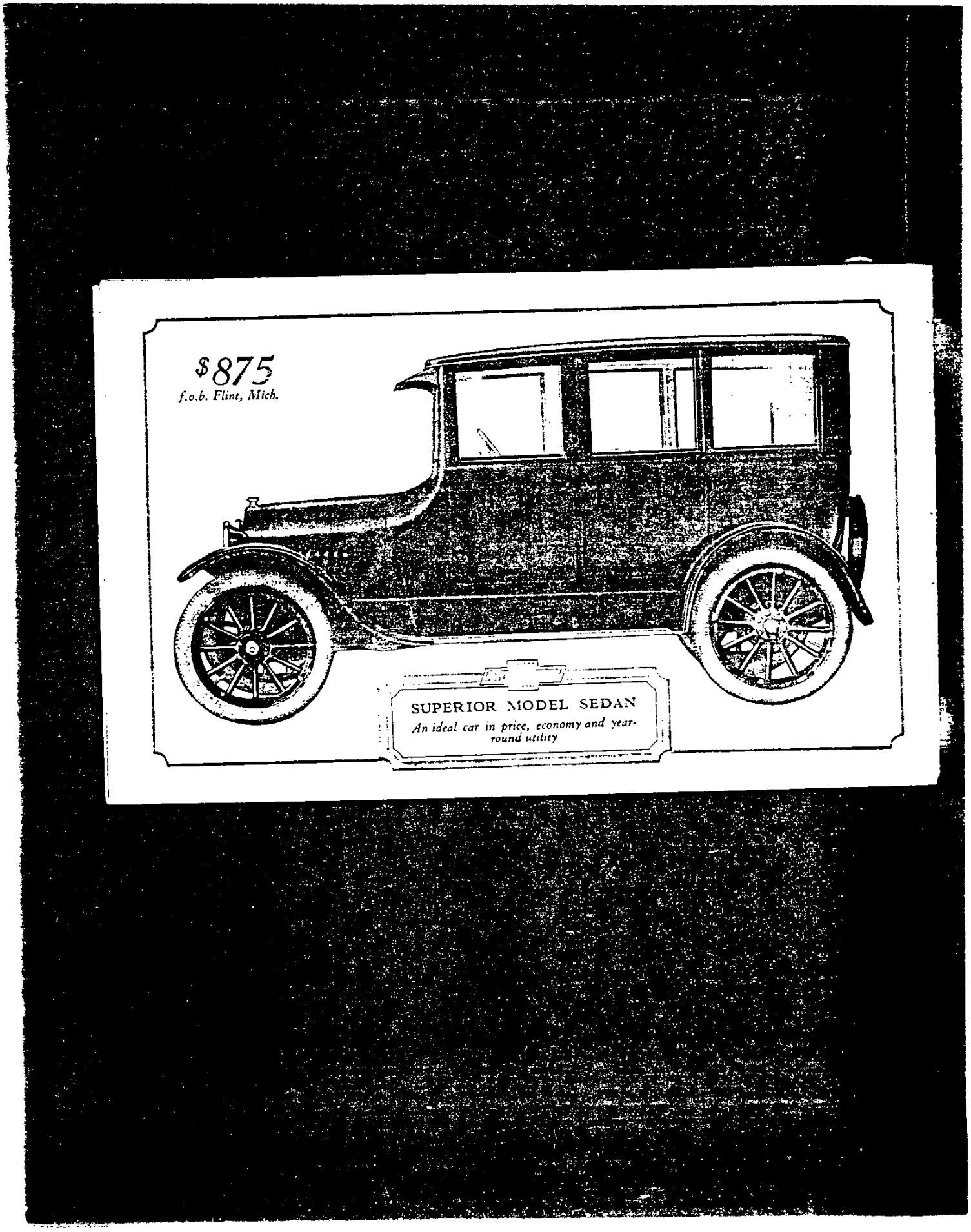
SPRINGS: Quarter-elliptic type, front and rear.

BODY: Two-passenger Roadster.

WHEELBASE: 102".

EQUIPMENT: Electric lights and starter, complete lamp equipment; legal non-glare lenses; electric horn; speedometer; demountabe rims, with extra rim; tire carrier; license holder; complete tool equipment. Open models have top and side curtains.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.


$875
f.o.b. Flint, Mich.
SUPERIOR MODEL SEDAN
An ideal car in price, economy and year-round utility

Specifications SUPERIOR MODEL SEDAN

MOTOR: Four-cylinder, valve-in-head type, 3 1/8" bore, 4" stroke.

CYLINDERS: Cast en bloc (including upper half of crank case). Head detachable.

VALVES: 1 1/2" diameter.

CONNECTING ROD BEARINGS: 1 3/8" diameter, 1 7/8" long.

CRANKSHAFT BEARINGS: Front, 1 7/8" diameter, 2 1/8" long; Center, 1 7/8" diameter, 1 1/2" long; Rear, 1 3/4" diameter, 2 1/16" long.

CAMSHAFT BEARINGS: Front, 1 5/8" diameter, 2 3/8" long; Center, 1 5/8" diameter, 2" long; Rear, 1 1/4" diameter, 1 5/8" long.

OILING SYSTEM: Splash, gear pump and individual oil pockets. Oil pressure gauge.

CARBURETOR: Zenith improved double jet.

IGNITION: New improved Remy.

CLUTCH: Cone type, with adjustable compensating springs.

TRANSMISSION: Selective type, sliding gear; three speeds forward and reverse.

COOLING: Water pump and fan; radiator extra size.

FRONT AXLE: Drop-forged I-beam.

REAR AXLE: Semi-floating type, wheel bearing carried on the wheel hub and in axle housing, not on axle shaft. Hyatt roller bearings.

BRAKES: Emergency, internal expanding type; service, external contracting type; 10" brake drums.

WHEELS: Wood, artillery type, demountable rims, large hub flanges.

TIRES: 30" x 3 1/2", straight-side Cord, non-skid tread.

FENDERS: Front and rear fender skirts extended to meet the radiator splash guard and rear splash guard on body.

DRIVE: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

STEERING GEAR: Spur and gear, 16" steering wheel.

GASOLINE SUPPLY: 10 1/2-gallon tank, hung on rear, Stewart vacuum system.

SPRINGS: Semi-cantilever, front and rear.

BODY: Five-passenger Sedan solid post construction, with solid front seat.

WHEELBASE: 102".

EQUIPMENT: Electric lights and starter; highest type two-unit system, double wiring used. Complete lamp equipment, including headlight dimmer and legal non-glare lenses; universal adjustment on head lamps; speedometer; electric horn; robe rail; extra rim and carrier on rear; complete tool equipment, including pump and jack.

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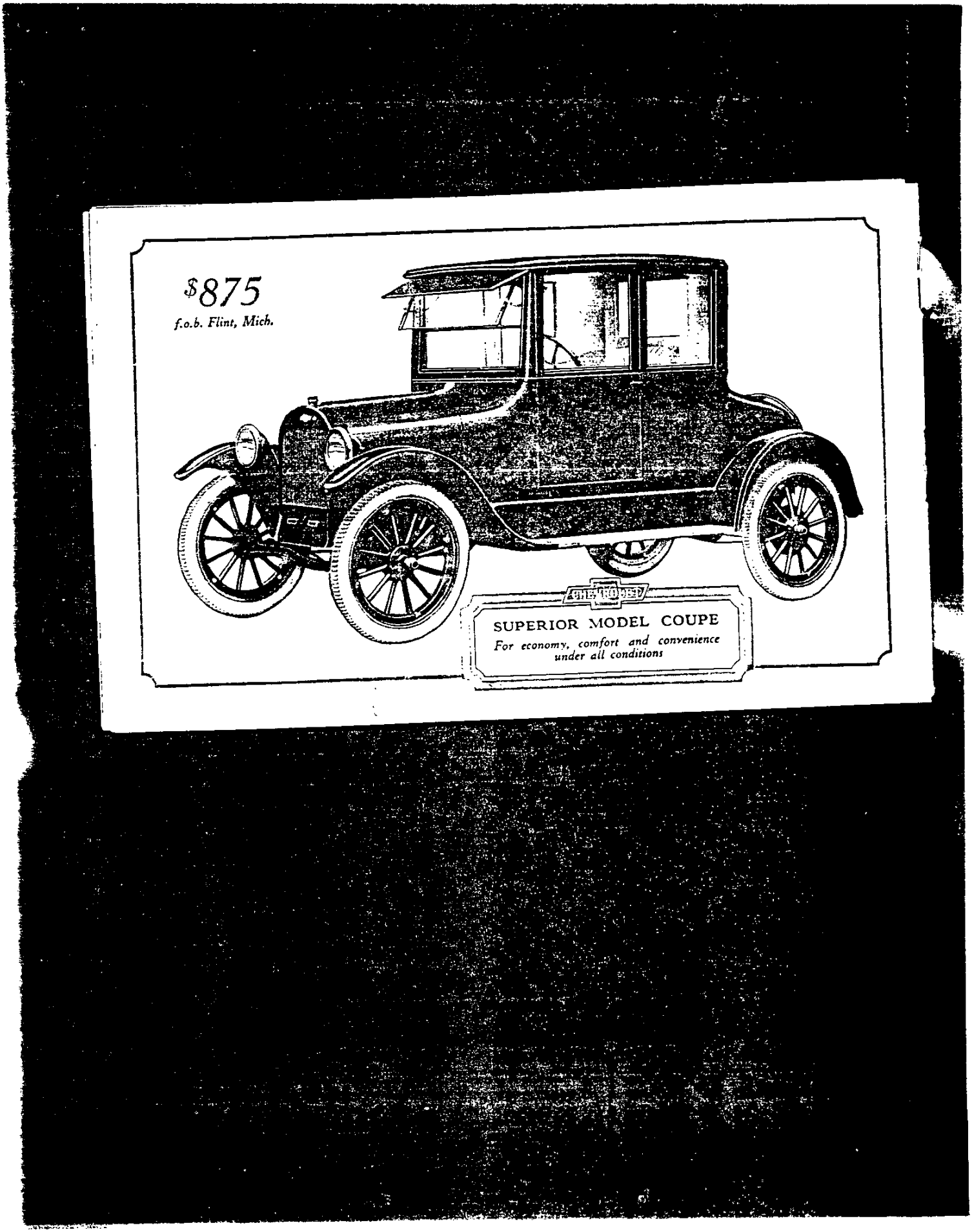

$875
f.o.b. Flint, Mich.
SUPERIOR MODEL COUPE
For economy, comfort and convenience
under all conditions

Specifications SUPERIOR MODEL COUPE

MOTOR: Four-cylinder, valve-in-head type, 3 11/16" bore, 4" stroke.

CYLINDERS: Cast en bloc (including upper half of crank case). Head detachable.

VALVES: 1 1/2" diameter.

CONNECTING ROD BEARINGS: 1 3/8" diameter, 1 7/8" long.

CRANKSHAFT BEARINGS: Front, 1 3/8" diameter, 2 5/16" long; Center, 1 11/32" diameter, 1 1/2" long; Rear, 1 3/4" diameter, 2 1/16" long.

CAMSHAFT BEARINGS: Front, 1 5/16" diameter, 2 3/8" long; Center, 1 5/32" diameter, 2" long; Rear, 1 1/4" diameter, 1 7/16" long.

OILING SYSTEM: Splash, gear pump and individual oil pockets. Oil pressure gauge.

CARBURETOR: Zenith improved double jet.

IGNITION: New improved Remy.

CLUTCH: Cone type, with adjustable compensating springs.

TRANSMISSION: Selective type, sliding gear; three speeds forward and reverse.

COOLING: Water pump and fan; radiator extra size.

FRONT AXLE: Drop-forged I-beam.

REAR AXLE: Semi-floating type, wheel bearing carried on the wheel hub and in axle housing, not on axle shaft. Hyatt roller bearings.

BRAKES: Emergency, internal expanding type; service, external contracting type; 10" brake drums.

WHEELS: Wood, artillery type, demountable rims, large hub flanges.

TIRES: 30" x 3 1/2", straight-side Cord, non-skid tread front and rear.

FENDERS: Front and rear fender skirts extended to meet the radiator splash guard and rear splash guard on body.

DRIVE: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

STEERING GEAR: Spur and gear, 16" steering wheel.

GASOLINE SUPPLY: 10 1/2-gallon tank.

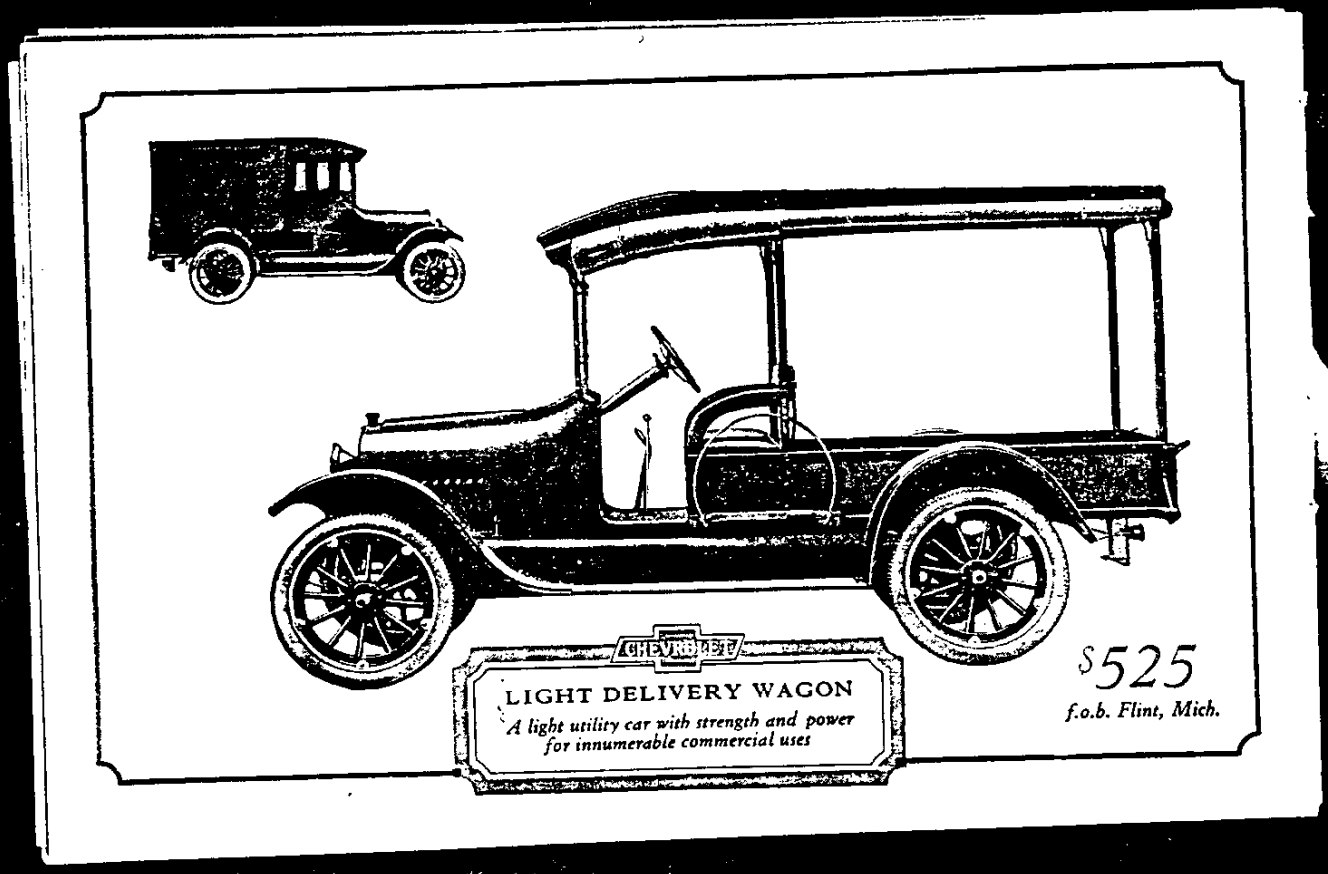
SPRINGS: Semi-cantilever, front and rear.

BODY: Four-passenger Coupe, solid post construction.

WHEELBASE: 102".

EQUIPMENT: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment, including headlight dimmers and legal non-glare lenses; adjustable head lamps; speedometer; electric horn; extra rim and carrier on rear; complete tool equipment, including pump and jack.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.


CHEVROLET
LIGHT DELIVERY WAGON
A light utility car with strength and power for innumerable commercial uses
$525
f.o.b. Flint, Mich.

Specifications

SUPERIOR MODEL LIGHT DELIVERY WAGON

MOTOR: Four-cylinder, valve-in-head type, $3\frac{13}{16}$" bore, 4" stroke.

CYLINDERS: Cast en bloc (including upper half of crank case). Head detachable.

VALVES: $1\frac{1}{2}$" diameter.

CONNECTING ROD BEARINGS: $1\frac{3}{8}$" diameter, $1\frac{7}{8}$" long.

CRANKSHAFT BEARINGS: Front, $1\frac{3}{4}$" diameter, $2\frac{5}{16}$" long; Center, $1\frac{21}{32}$" diameter, $1\frac{1}{2}$" long; Rear, $1\frac{3}{4}$" diameter, $2\frac{11}{16}$" long.

CAMSHAFT BEARINGS: Front, $1\frac{5}{8}$" diameter, $2\frac{3}{8}$" long; Center, $1\frac{5}{32}$" diameter, 2" long; Rear, $1\frac{1}{4}$" diameter, $1\frac{7}{16}$" long.

OILING SYSTEM: Splash, gear pump and individual oil pockets. Oil pressure gauge.

CARBURETOR: Zenith improved double jet.

IGNITION: New improved Remy.

CLUTCH: Cone type with adjustable compensating springs.

TRANSMISSION: Selective type, sliding gear; three speeds forward and reverse.

COOLING: Water pump and fan; radiator extra size.

FRONT AXLE: Drop-forged *I*-beam. Tapered roller bearings.

REAR AXLE: Semi-floating type, wheel bearing carried on the wheel hub and in axle housing, not on axle shaft. Hyatt roller bearings. Spiral bevel ring gear and pinion.

BRAKES: Emergency, internal expanding type; service, external contracting type; 10" brake drums. Foot control.

WHEELS: Wood, artillery type, demountable rims, large hub flanges.

TIRES: 30" x 3½", non-skid front and rear.

DRIVE: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

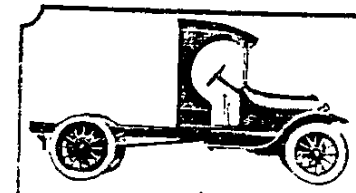
STEERING GEAR: Spur and gear, 16" steering wheel.

SPRINGS: Semi-cantilever, front and rear.

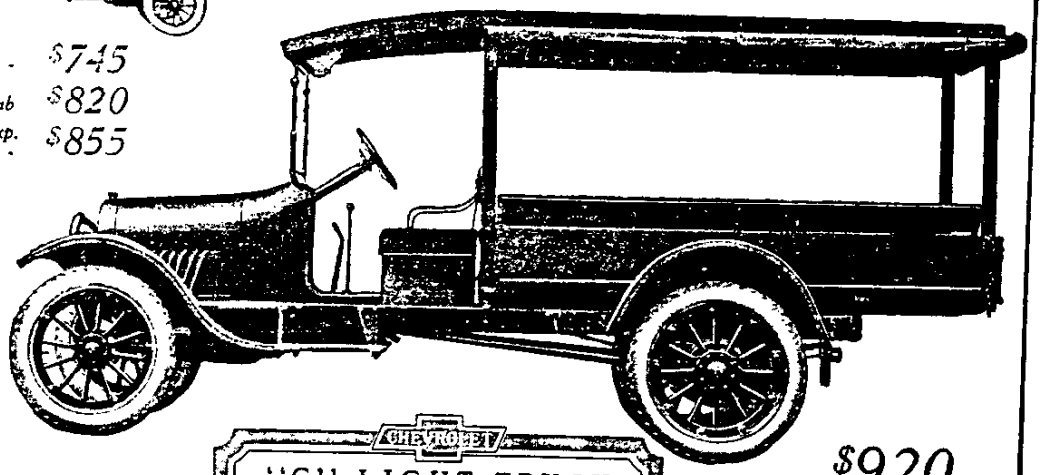
WHEELBASE: 102".

EQUIPMENT: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment, universal adjustment on head lamps; four-post top, side curtains; adjustable windshield; speedometer; electric horn; complete tool equipment, including pump and jack.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.



Chassis - $745
With Cab $820
With Exp. Body - - $855



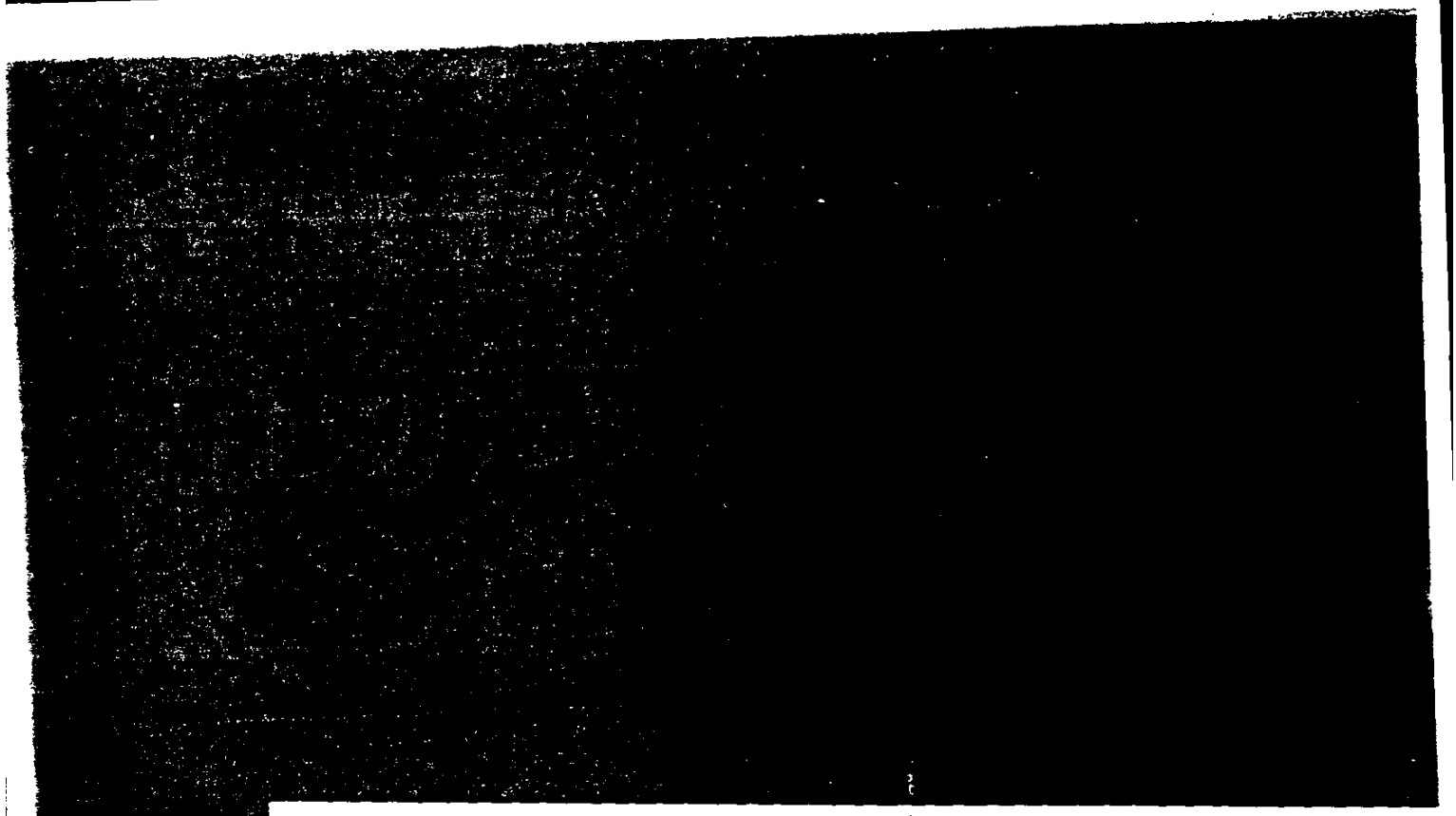
CHEVROLET

"G" LIGHT TRUCK

A sturdy new model especially designed for reliable and economical service for all light hauling requirements

$920

Express Body and Top f.o.b. Flint, Mich.



Specifications MODEL "G" LIGHT TRUCK

MOTOR: Four-cylinder, valve-in-head type, $3\frac{11}{16}$" bore, 4" stroke.

CYLINDERS: Cast en bloc with upper half of crank case. Head detachable.

VALVES: $1\frac{1}{2}$" diameter.

CONNECTING ROD BEARINGS: $1\frac{3}{8}$" x $1\frac{7}{8}$".

CRANKSHAFT BEARINGS: Front, $1\frac{3}{8}$" x $2\frac{4}{16}$"; Center, $1\frac{21}{32}$" x $1\frac{1}{2}$"; Rear, $1\frac{3}{4}$" x $2\frac{11}{16}$".

CAMSHAFT BEARINGS: Front, $1\frac{5}{16}$" x $2\frac{3}{8}$"; Center, $1\frac{9}{32}$" x 2"; Rear, $1\frac{1}{4}$" x $1\frac{5}{16}$".

OILING SYSTEM: Splash, gear pump and individual oil pockets. Oil pressure gauge.

CARBURETOR: Zenith improved double jet.

IGNITION: New improved Remy.

CLUTCH: Cone type with adjustable compensating springs.

FRAME: 5"; width, rear 37"; front 28". Length back of driver's seat, $81\frac{7}{16}$". Height, $25\frac{1}{2}$" loaded.

TRANSMISSION: Selective type; three speeds forward and reverse.

COOLING: Water pump and fan. Radiator extra size.

FRONT AXLE: Drop-forged I-beam. The steering knuckles and knuckle arms are ample in size, drop-forged and heat-treated.

REAR AXLE: Semi-floating type, made of nickel steel, heat-treated.

CONTROL: Hand throttle, foot accelerator.

SPRINGS: Quarter-elliptic front, semi-elliptic rear. Front springs are $21\frac{7}{8}$ inches long and $1\frac{3}{4}$ inches wide. The rear springs are $43\frac{1}{4}$ inches long and $2\frac{1}{2}$ inches wide.

TIRES: All pneumatic. Demountable rims. Front 31" x 4" clincher. Rear, 34" x $4\frac{1}{2}$" straight-side.

WHEELS: Artillery type, standard dimensions, twelve hickory spokes each; front wheels equipped with Timken tapered roller bearings of extra large size.

STEERING GEAR: Spur and gear type, 16" steering wheel. Steering arm of drop-forged steel, heat-treated.

GASOLINE TANK: Capacity 10 gallons. It is located under the driver's seat.

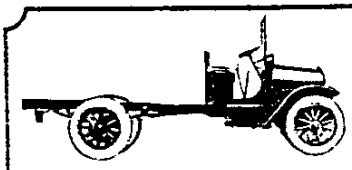
WHEELBASE: 120".

CARRYING CAPACITY: 1500 pounds.

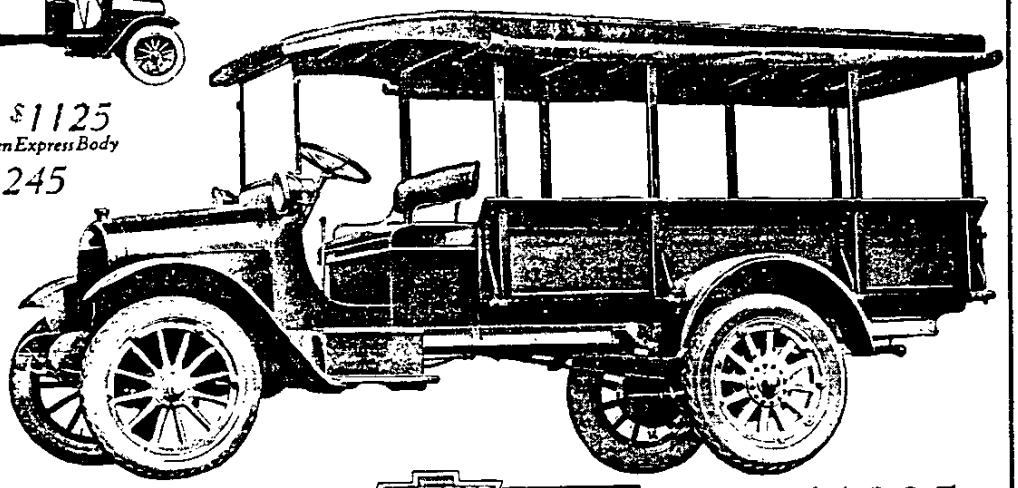
BODY: Length of the body from inside of tail board to inside of head board is 99". Width inside of boards $44\frac{1}{2}$".

EQUIPMENT: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment; side curtains; adjustable windshield; speedometer; demountable rims; electric horn; complete tool equipment, including pump and jack.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.



Chassis $1125
With Open Express Body
$1245



CHEVROLET

ONE-TON TRUCK WITH EXPRESS BODY AND TOP

This worm-drive truck has made a reputation for dependable performance

$1325
Express Body and Top f.o.b. Flint, Mich.

Specifications MODEL "T" ONE-TON TRUCK

MOTOR: Four-cylinder, valve-in-head type, 3 3/4" bore, 5 1/4" stroke.

CYLINDERS: Cast en bloc with upper half of crank case. Head detachable.

VALVES: 1 1/2", enclosed.

CONNECTING ROD BEARINGS: 1 1/2" x 2 1/8"; Doehler bronze back.

CRANKSHAFT BEARINGS: Front, 1 1/2" x 2 11/16"; Center, 1 11/16" x 2"; Rear, 2" x 3 1/2".

CENTER MAIN BEARING: Doehler bronze back.

CAMSHAFT BEARINGS: Front, 1 5/16" x 2 1/4"; Center, 1 1/2" x 2"; Rear, 1 1/2" x 2".

OILING SYSTEM: Pressure and splash system. Gear driven oil pump. Oil pressure gauge.

CARBURETOR: Zenith improved double jet.

IGNITION: New improved Remy System.

GOVERNOR: Governor is provided and set for 25 miles maximum. It is locked.

CLUTCH: Cone, leather-faced, with adjustable compensating springs.

FRAME: 4"; width, rear 35 1/8"; front, 30 1/2". Length back of driver's seat, 109". Height, 25" loaded.

TRANSMISSION: Selective type; three speeds forward and reverse.

COOLING: Water pump and fan. Radiator extra size.

FRONT AXLE: Drop-forged I-beam. The steering knuckles and knuckle arms are ample in size, drop-forged and heat-treated.

REAR AXLE: Semi-floating type, made of high carbon steel, heat-treated.

CONTROL: Hand throttle; foot accelerator.

SPRINGS: Semi-elliptic front and rear. Front springs are 38" long and 2 1/4" wide. The rear springs are 54" long and 2 1/2" wide.

WORM GEAR DRIVE: The steel worm is cut, hardened, and then finished by grinding. No adjustment is required at any time.

TIRES: Front, pneumatic 33" x 4", demountable type, non-skid, wrapped tread. Rear, 35" x 5", pneumatic cord type.

WHEELS: Artillery type, standard dimensions, twelve hickory spokes each; front wheels equipped with Timken tapered roller bearings of extra large size. Demountable rims.

STEERING GEAR: Worm and gear type, 16" steering wheel. Steering arm of drop-forged steel, heat-treated.

GASOLINE TANK: Capacity 13 gallons, tank non-leakable. It is located under the driver's seat.

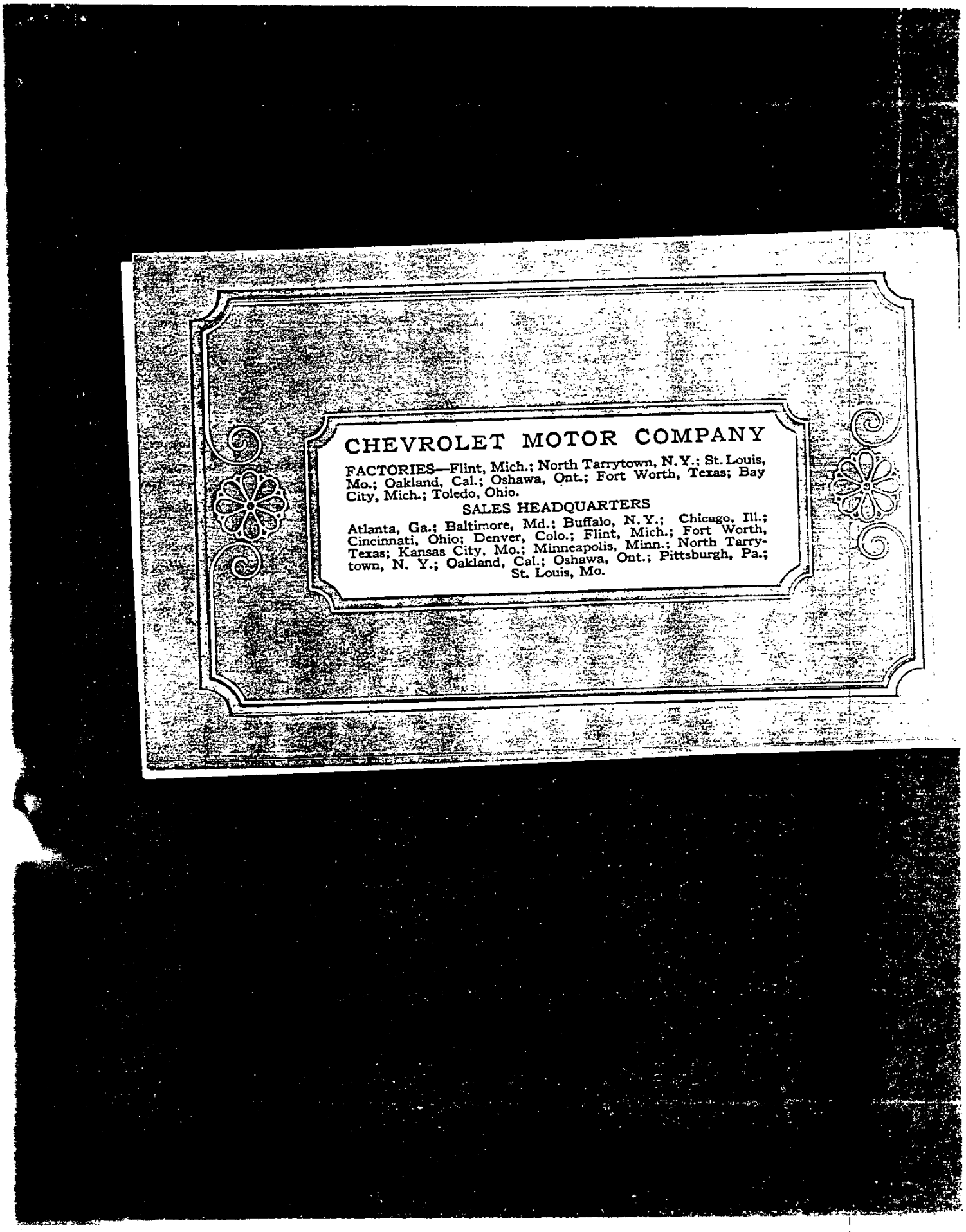
WHEELBASE: 125".

CARRYING CAPACITY: 2,000 pounds. Weight of chassis, 2,840 pounds; with body, 3,420 pounds.

BODY: Length of the body from inside of tail board to inside of head board is 114 1/2". Width inside of boards, 44".

EQUIPMENT: Electric lights and starter, highest type two-unit system; complete lamp equipment, including headlight dimmers; electric horn; speedometer; ammeter; side curtains for driver's seat; windshield; complete tool equipment.

We reserve the right to make changes in design or construction at any time. Prices subject to change without notice.


CHEVROLET MOTOR COMPANY
FACTORIES—Flint, Mich.; North Tarrytown, N.Y.; St. Louis, Mo.; Oakland, Cal.; Oshawa, Ont.; Fort Worth, Texas; Bay City, Mich.; Toledo, Ohio.
SALES HEADQUARTERS
Atlanta, Ga.; Baltimore, Md.; Buffalo, N.Y.; Chicago, Ill.; Cincinnati, Ohio; Denver, Colo.; Flint, Mich.; Fort Worth, Texas; Kansas City, Mo.; Minneapolis, Minn.; North Tarrytown, N. Y.; Oakland, Cal.; Oshawa, Ont.; Pittsburgh, Pa.; St. Louis, Mo.