

**SERVICE
TRAINING**

*Film
Supplement*



VOL. 3
FILM 1
SEPT. 1938

by the SERVICE PROMOTION DEPARTMENT
PACKARD MOTOR CAR COMPANY - DETROIT



NARRATOR: You boys have probably seen the new models, the sales department films, catalogues and--

BUTCH: Yeah, and we've heard all the sales ballyhoo.

NARRATOR: What's that?

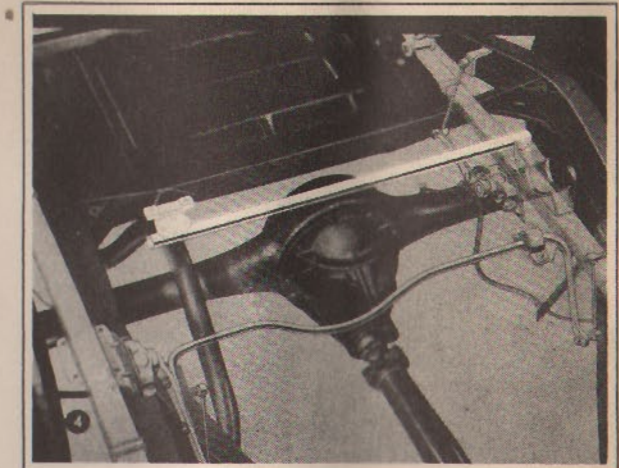


NARRATOR: Oh, so it's you, is it, Butch?

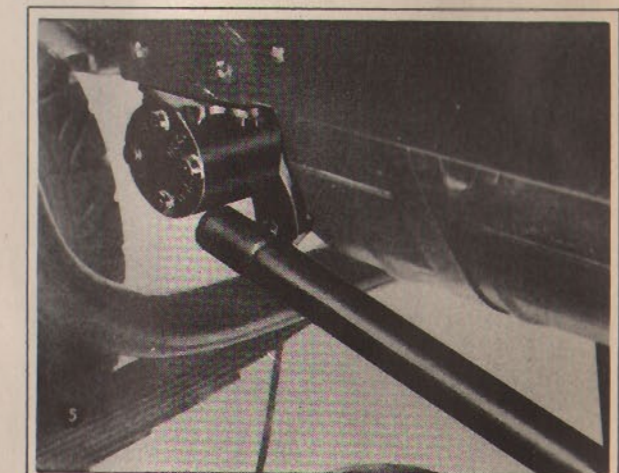
BUTCH: Yeah, it's me. I've heard enough of that sales stuff. What I want to know is how to service these new cars.

NARRATOR: Give me a chance. I was just going to tell you about the new stuff.

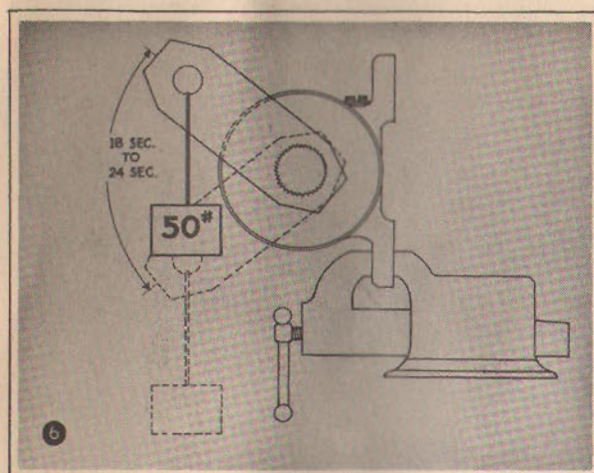
BUTCH: All right then, what's this gadget on the rear lateral stabilizer.



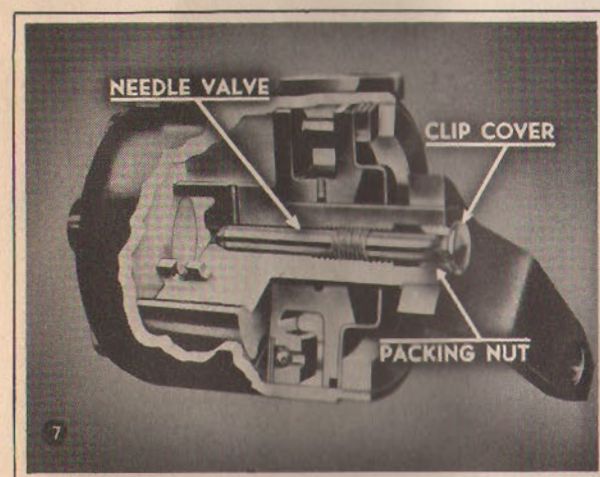
NARRATOR: That's the new fifth shock absorber.--The rear lateral stabilizer, on the six, eight and super-eight now has a shock absorber connecting the stabilizer bar and the frame, replacing the frame bracket.



NARRATOR: It resists and dampens sudden lateral movements, is self-centering, and requires no neutralizing. It's set to have much more resistance than the ride shock absorbers. It'll take a good twelve-inch wrench and plenty of pull to move it, too.



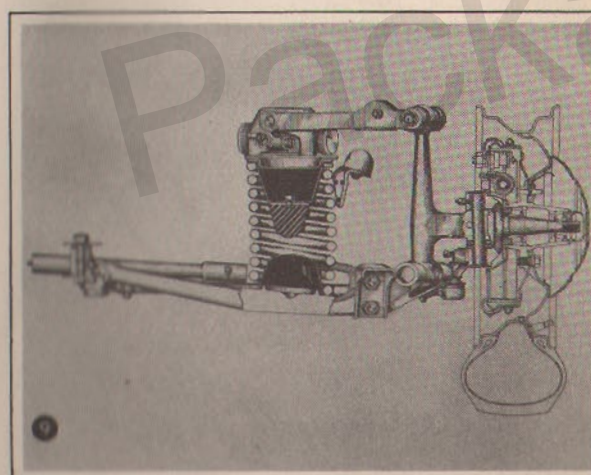
NARRATOR: If you want to check the resistance of the fifth shock absorber, mount it in a vise. Move the lever arm up to its top position and attach a fifty pound weight to the hole in the arm. If the shock absorber is in standard condition, it should require from eighteen to twenty-four seconds for it to move down to the bottom of its travel.



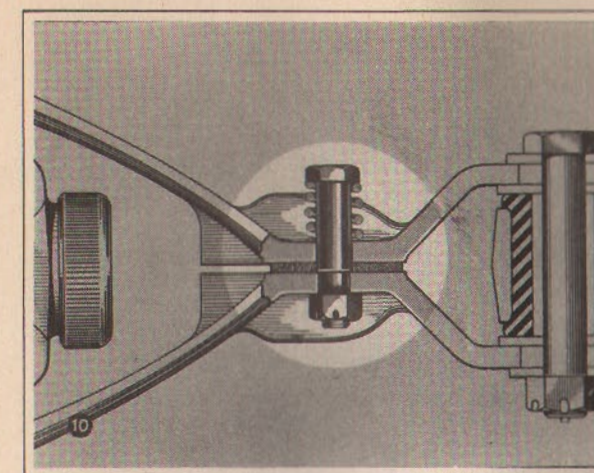
NARRATOR: You can adjust the resistance by turning the needle valve with a screw driver after taking out the clip cover. Turn the screw "in" to increase the resistance, and "out" to decrease. Any slight leak around the valve should be corrected by tightening the packing nut. Jerky, uneven movement indicates lack of fluid.



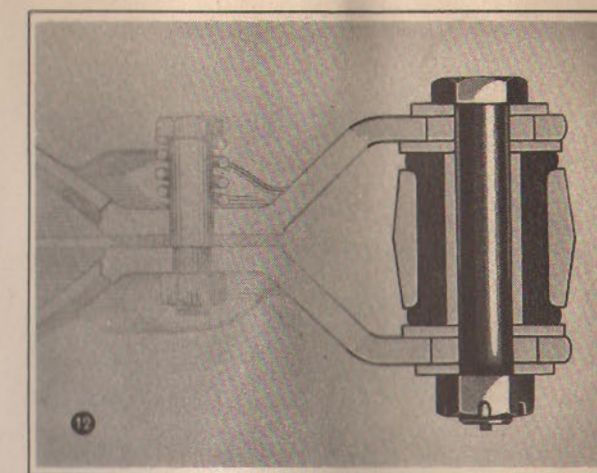
NARRATOR: When you add fluid the shock absorber should be in a horizontal position, just as it is on the car. After you've added fluid always be sure and work the arm back and forth at least two or three times to get all of the air out of the working chamber. Fill it only to the lower level of the filler hole and be sure to use only Packard Houdaille shock absorber fluid.



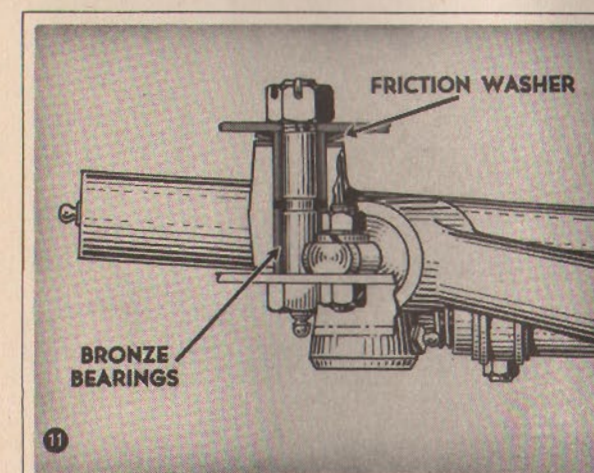
NARRATOR: Delco-Lovejoy piston type shock absorbers replace the Houdaille, vane type, on the 8. This new construction of the front shock absorber arms on the six, eight, and super-eight gives the same dampening of lateral vibration in the front of the car as the rear lateral stabilizer does in the rear.



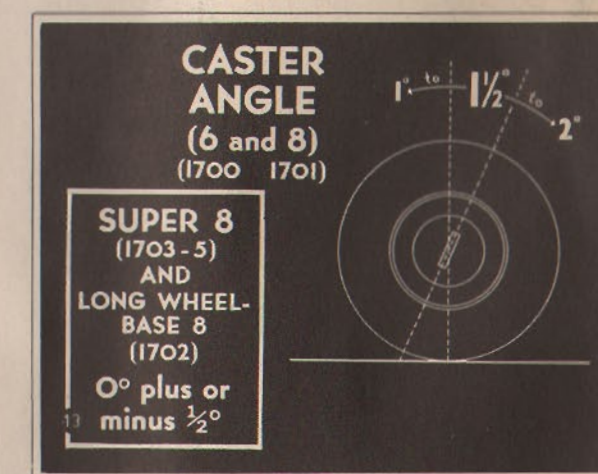
NARRATOR: The arms are in two pieces, separated by a special friction pad between the arms which dampens out vibration. The friction is controlled by the tension of the spring. No adjustment is necessary. The nut is tightened up until the shoulder on the bolt seats against the arm. The spring is calibrated to supply the proper tension.



NARRATOR: There's a new type self-flanging rubber bushing in the wheel support--and, you can use the new type for service replacements.--There also has been a slight change in the caster and camber angles.



NARRATOR: The steering crank ball-bearings have been replaced with steel backed bronze bushings and a spring friction washer. When the nut is taken up tight, the steering crank pin bottoms and the spring friction washer provide a definitely controlled dampening. It isn't necessary to adjust the preload.

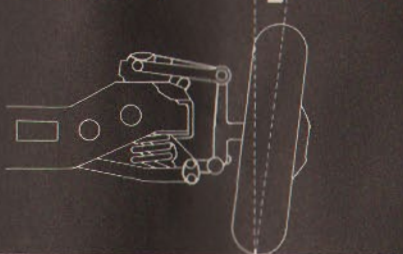


NARRATOR: The caster should be one-and-one-half degrees on the six and eight. It should be zero on the long wheel base eight and the super-eight. You can permit a variation of one-half degree plus or minus but not more than one-half degree between each side.

CAMBER ANGLE

6, 8, and Super 8
(1700-1, 2, 3, 4, 5)

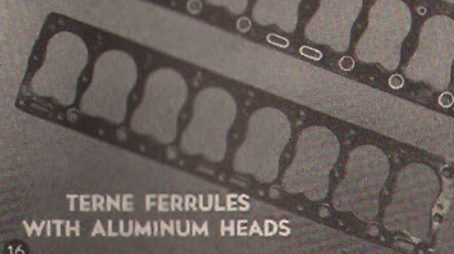
$\frac{1}{2}^{\circ}$ TO $1\frac{1}{4}^{\circ}$



14

NARRATOR: The camber angle is the same for the six, eight and super-eight--one-half degree--with an allowable variation of three-quarters degree plus. But both sides must be the same within one-half degree. Toe-in remains as before--one-sixteenth inch.--Now, for engines--

COPPER FERRULES WITH
CAST IRON HEADS

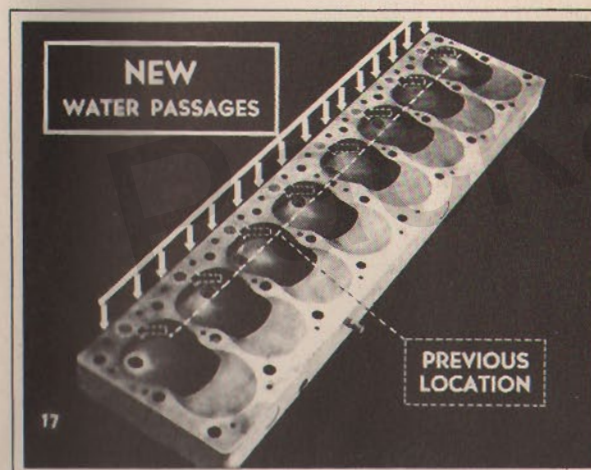


TERNE FERRULES
WITH ALUMINUM HEADS

16

NARRATOR: With the cast-iron head we use a new gasket, with copper ferrules. When you use aluminum heads you should use the former gasket with the Terne plated ferrules. Don't interchange gaskets because it might increase the tendency to corrode.

NEW
WATER PASSAGES



PREVIOUS
LOCATION

17

NARRATOR: Water passages in the block of the super-eight are rearranged to give more protection against gasket leakage and blow-out. The diameter of the holes near the bore is reduced to leave more bearing space between the hole and the cylinder bore. Additional holes are provided to maintain the same rate of water circulation.

BUTCH: Say--

HIGH COMPRESSION RATIO
SIX, EIGHT, SUPER EIGHT

6.85 to 1

15

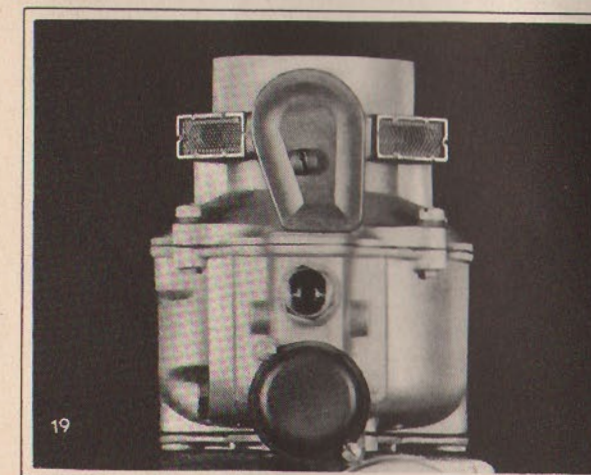
NARRATOR: Cast-iron cylinder heads, for both standard and high compression, are now used on the eight and super-eight as well as on the six. The high compression ratio is six point eighty-five to one. Aluminum cylinder heads are standard for the twelve.

DRILL
CYLINDER BLOCK

18

BUTCH:--it's all right to use the new heads on previous models, isn't it?

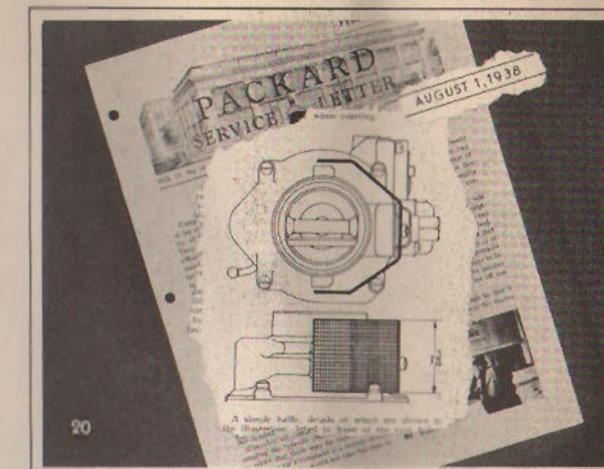
NARRATOR: Yes! But the cylinder block must be drilled so the new water holes line up. You can use the new gasket as a template for drilling. Here's some information about carburetors--



19

NARRATOR: On the six the carburetor has been improved in detail. The float chamber vents in the air horn have been fitted with screens to keep out bugs and dirt which might be drawn into the float chamber and obstruct the fuel passages.

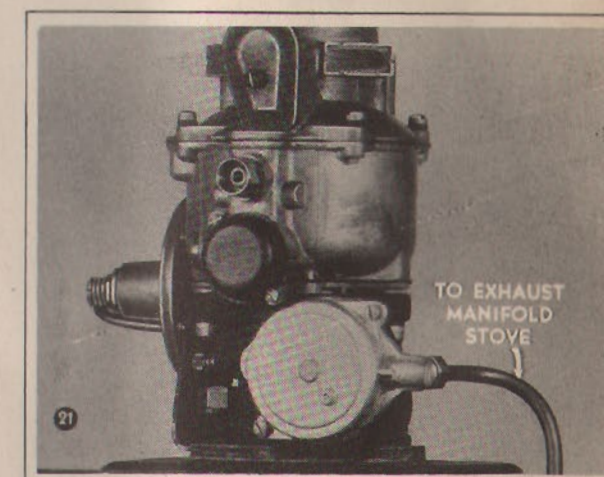
BUTCH: That's a good idea.



20

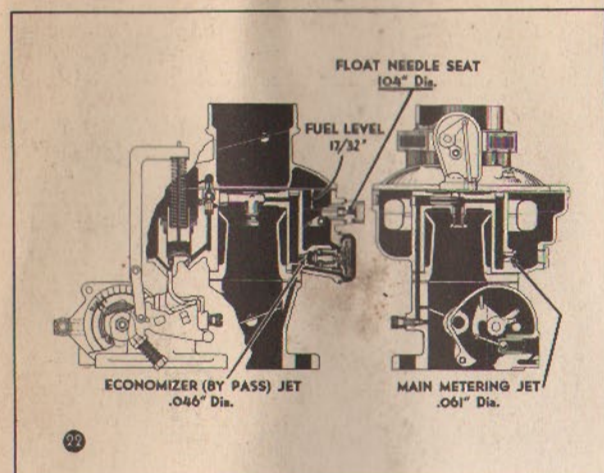
BUTCH: We had a Service Letter dated August first telling how to put screens on early carburetors.

NARRATOR: Here's a change--

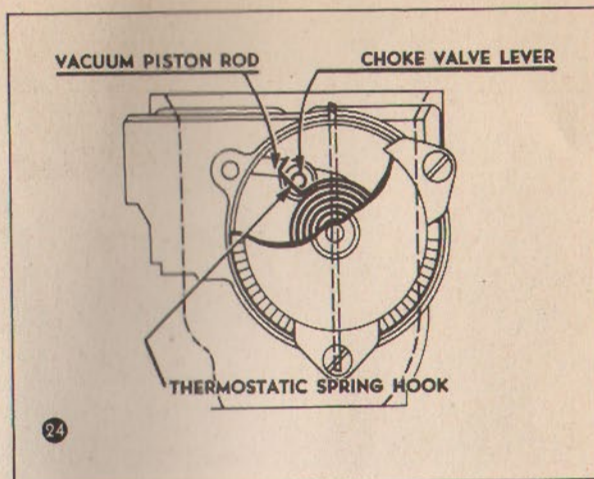


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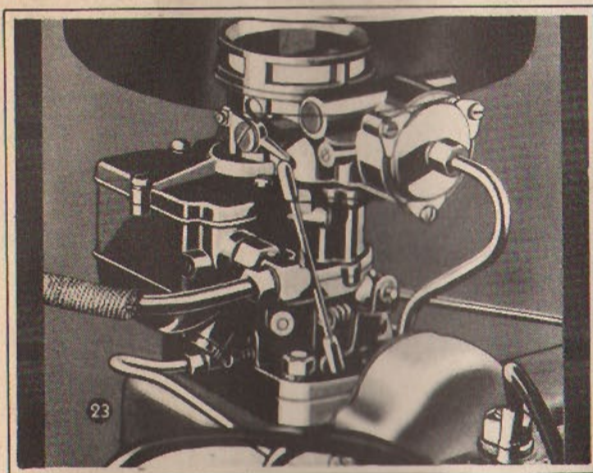
NARRATOR:--heat for the automatic choke thermostat is now taken from a stove, cast in the exhaust manifold. It goes through an external tube to a connection, cast in the thermostat cover. There's no change in adjustment of the thermostatic spring. And--



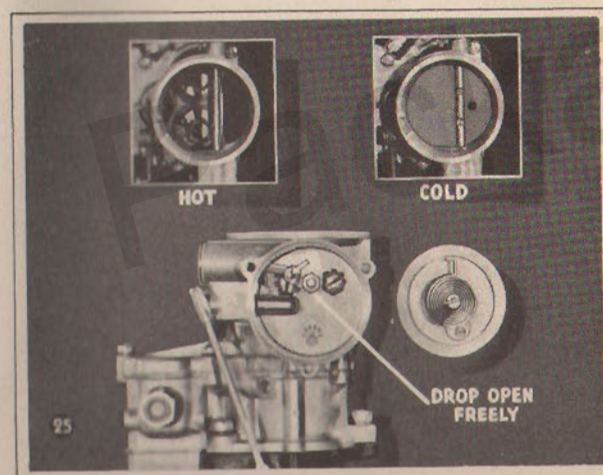
NARRATOR:--there is no change in the arrangement or size of the jets.



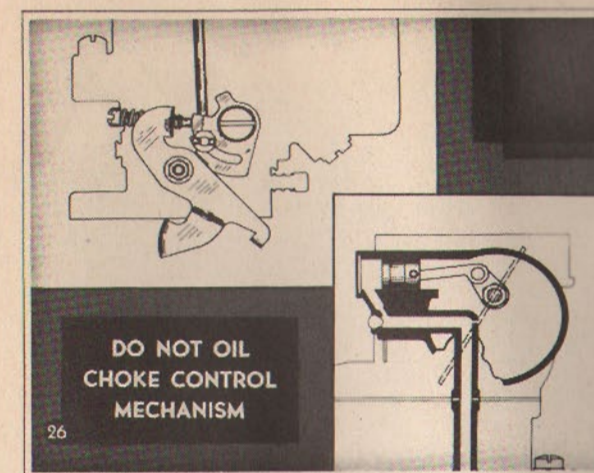
NARRATOR: A thermostatic spring, in the cover, hooks on to the lever attached to the choke valve shaft--and the vacuum piston is hooked on to the same lever. Before you attempt to adjust the thermostatic valve--



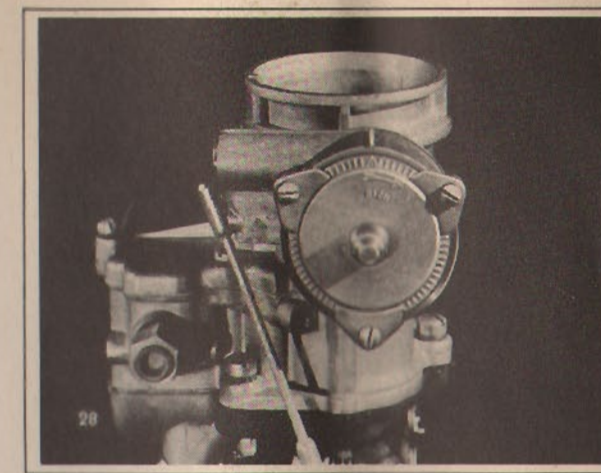
NARRATOR: The eight now has the automatic choke "built-in"--somewhat similar to the six. The thermostat is located on the engine side of the air horn. The heat for the automatic choke is taken from the stove in the exhaust through a tube to a connection, cast in the thermostat cover.



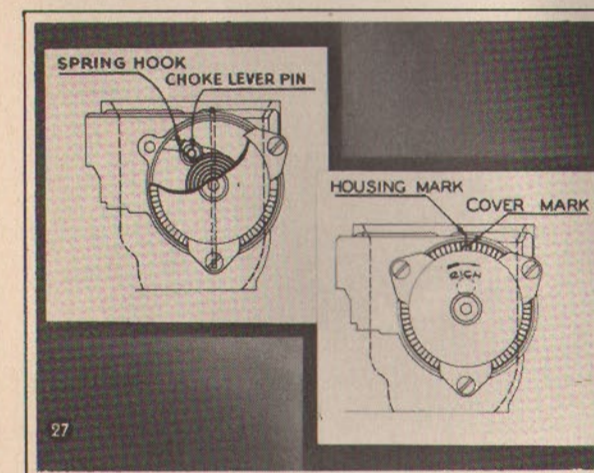
NARRATOR:--make sure that the choke valve and the entire linkage works freely--without the slightest drag. It should open fully when hot and close tight when cold. Now, if it does not drop open freely, when the thermostat cover is removed, examine the choke valve and shaft, the vacuum piston and the fast-idle mechanism--they've all got to be clean and work easily.



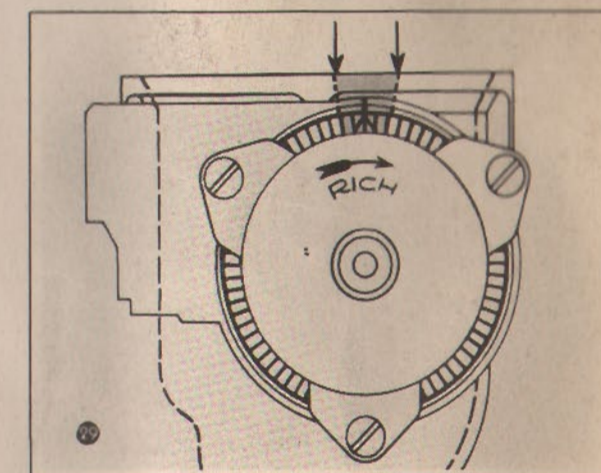
NARRATOR: If it is necessary to clean any of these parts, clean them with alcohol and a clean rag. Do not, under any circumstances, use oil on any parts of the automatic choke control mechanism.



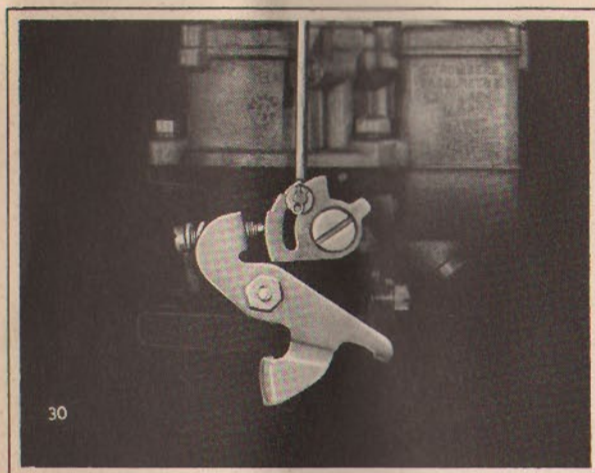
NARRATOR: If this standard adjustment is too rich or too lean during the warm-up period, it may be adjusted by rotating the cover clockwise for richer, counter-clockwise for leaner.



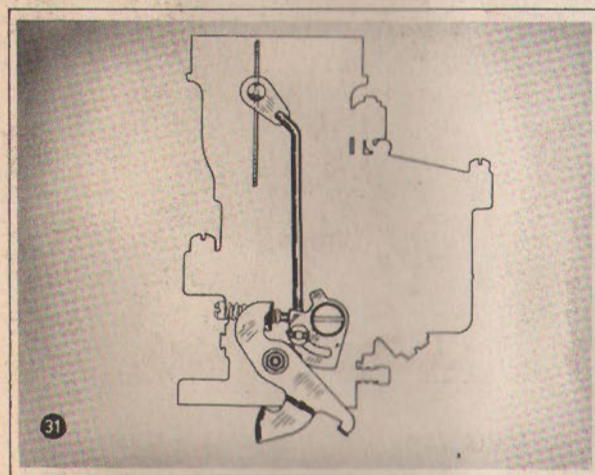
NARRATOR: When reassembling the thermostat in the housing be sure the hook on the end of the spring engages the pin in the choke lever and line up the "punch" mark on the outside of the cover with the line on the housing.



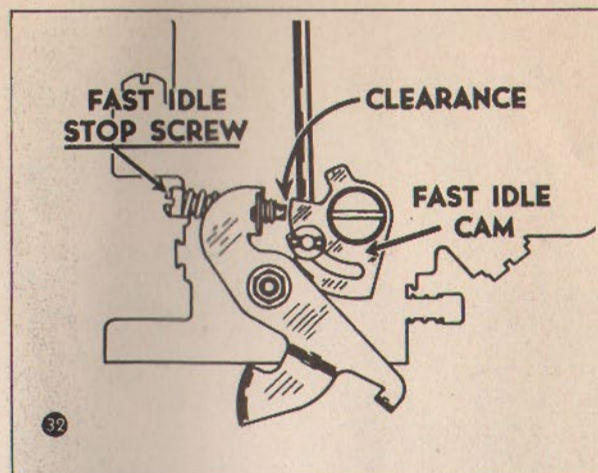
NARRATOR: The adjustment should be made one-half a graduation at a time. But the adjustment should never be varied more than two graduations richer or leaner than standard. If that much won't give satisfactory operation, replace the thermostat.



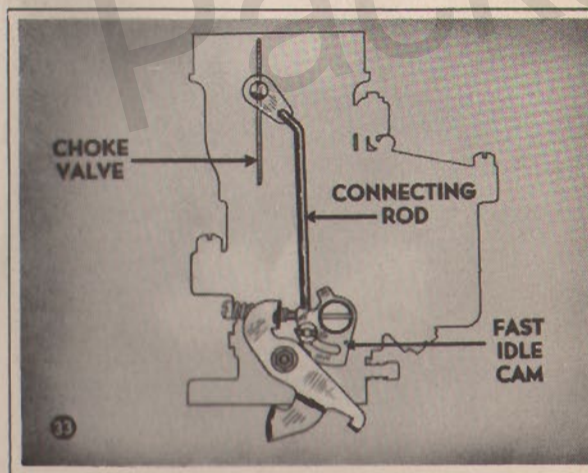
NARRATOR: The fast-idle is now accomplished by a four-step cam and throttle-stop on the right side of the carburetor, which is independent of the regular idle stop on the opposite side.



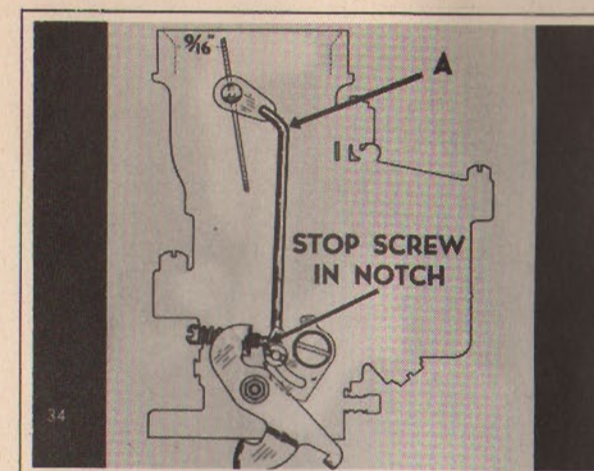
NARRATOR: To check the fast-idle speed, warm-up the engine so the choke valve is in the wide open position. Make sure the regular idle stop screw is against the stop and set so that the engine idles at about six miles per hour. Now, in this position--



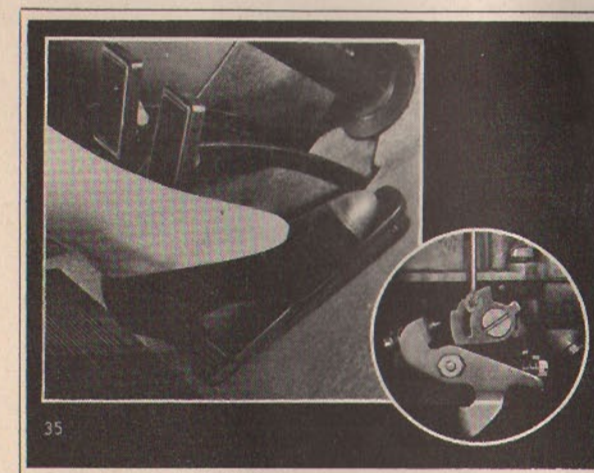
NARRATOR: Adjust the fast-idle stop screw so that there is only just enough clearance between the end of the screw and the cam to allow the cam to be moved by hand without any drag. The fast-idle speed is controlled by the steps on the cam. It cannot be increased except by increasing the regular idle speed.



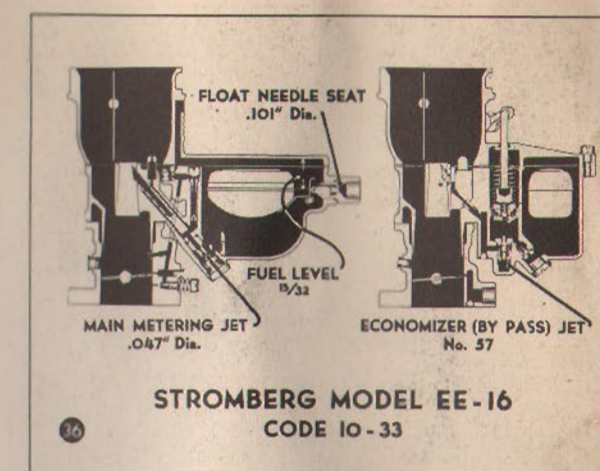
NARRATOR: The point of cutting in and out of the fast-idle is controlled by the length of the rod connecting the fast-idle cam and the choke-valve. This is the way to check the linkage.



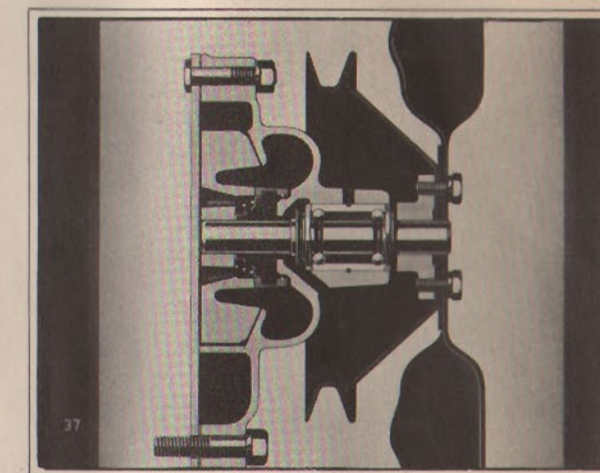
NARRATOR: Hold the fast-idle stop screw in the notch of the lowest step of the cam and pull up on the rod to take all of the slack out of the linkage. In this position, the top of the choke valve should be $\frac{9}{16}$ inch from the inside of the air horn. If it is not, it should be adjusted by bending the rod at A.



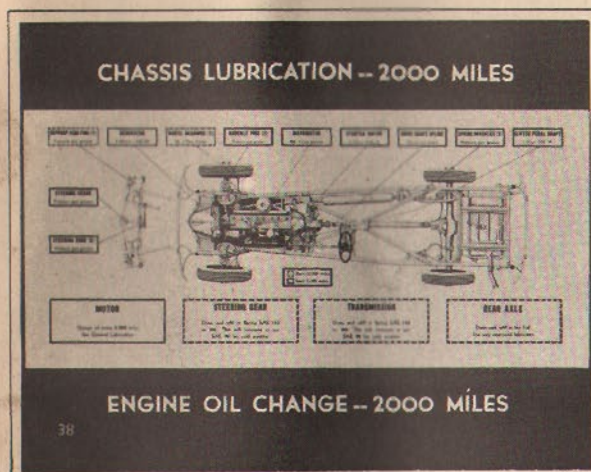
NARRATOR: Be sure to caution your owners about cold weather starting. To engage the choke the accelerator must be depressed to release the fast-idle cam and permit the choke to close. When it's especially cold, you may have to put the foot throttle all the way down to the floor to clear the high step of the cam.



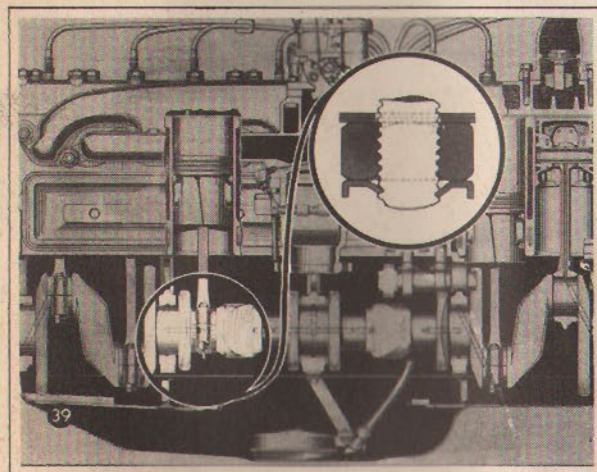
NARRATOR: You will notice that we don't use the fast-idle by-pass piston now. But otherwise the internal construction and jet sizes are the same. This carburetor is code number ten-dash-thirty-three. There's no change on the super-eight and twelve carburetor. About water pumps--



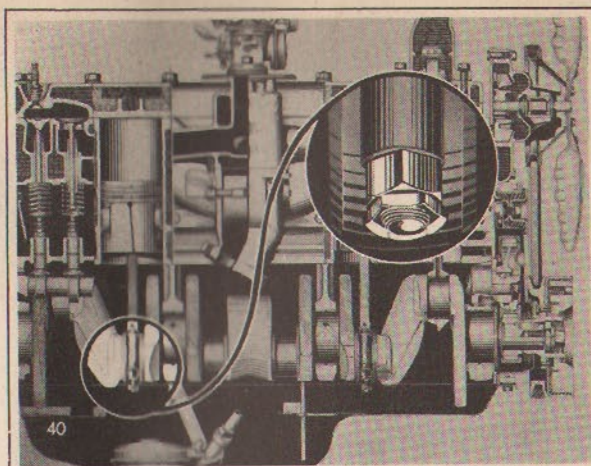
NARRATOR: We don't lubricate water pumps on the six, eight and super-eight any more. The impeller shaft ball-bearings are lubricated for life at assembly and need no further lubrication. There's a snap-ring to hold the bearings in place. On the super-eight we use the same design of pre-lubricated packless water pump as on the six and eight, but the impeller housing is cast into the cylinder block as formerly.



NARRATOR: Lubrication schedules are changed--the interval of lubrication of chassis and the engine oil change is two thousand miles. Say, here's a new idea--

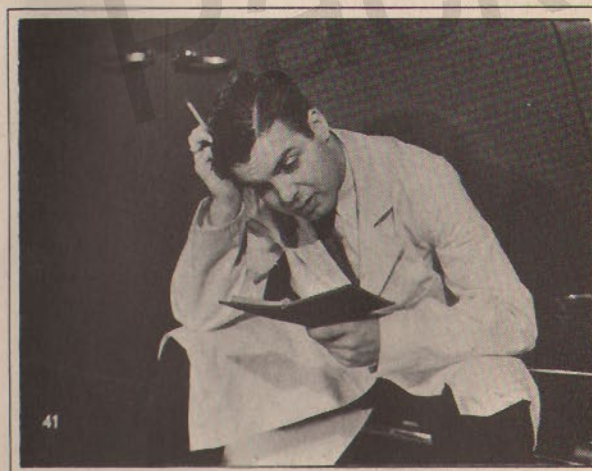


NARRATOR: --on the six and eight, Palnuts are used on the connecting rod bolts instead of the cotter pin and castellated nut. They're small stamped nuts which lock on the bolt threads when tightened and cannot be removed without a wrench.



NARRATOR: To install them you tighten the connecting rod nut in the usual way. Then, instead of putting in a cotter pin, you thread the Palnut on with your fingers--smooth face first--until it comes up snug against the nut. Then with a wrench tighten the Palnut another one-quarter turn only to lock it. Be careful that your wrench doesn't slip up over the regular nut, and be careful Not to tighten it more than a quarter turn. Now for--

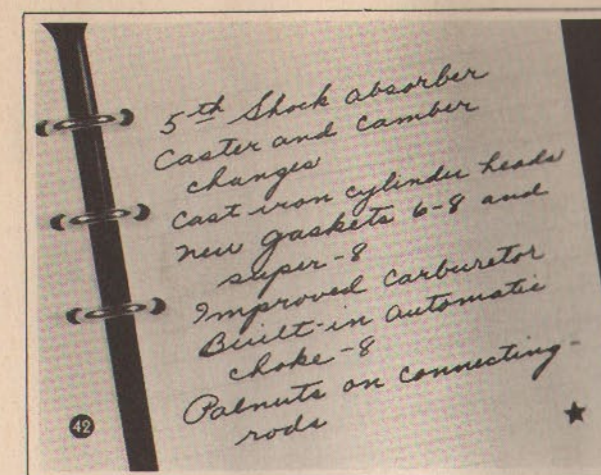
BUTCH: Hey, you go too fast for me.



BUTCH: Lemme go over my notes to be sure I didn't miss anything.

NARRATOR: YOU making notes?

BUTCH: Sure 'nuff! How'd you think I could remember everything the way you tear through it?

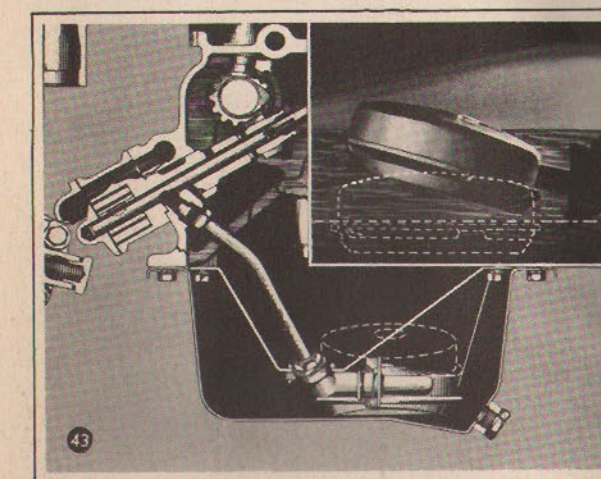


BUTCH: See, here's the whole list. Let's check it over to see that I've got everything.

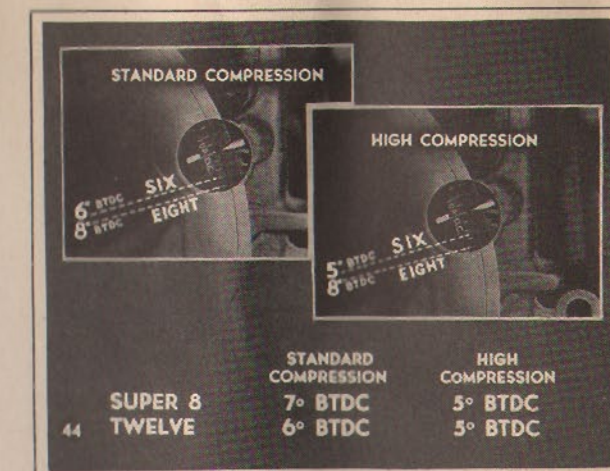
NARRATOR: Looks as though you got it all.

BUTCH: Well, let's get going then. That's not all, is it?

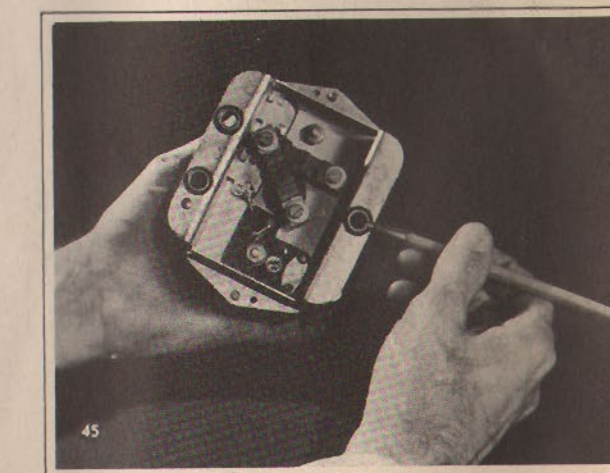
NARRATOR: No, there's lots more.



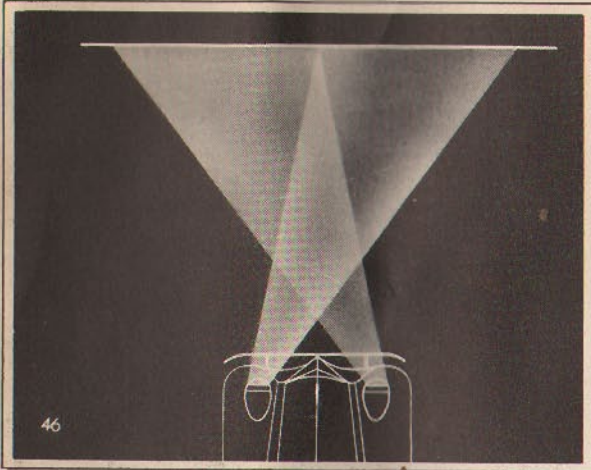
NARRATOR: Another big improvement is the floating type oil screen which is hinged on to the oil pump intake and floats on top of the oil. In that way the pump draws only fresh, clean oil from the top surface allowing the sediment to sink to the bottom of the pan. There aren't many changes in the electrical system.



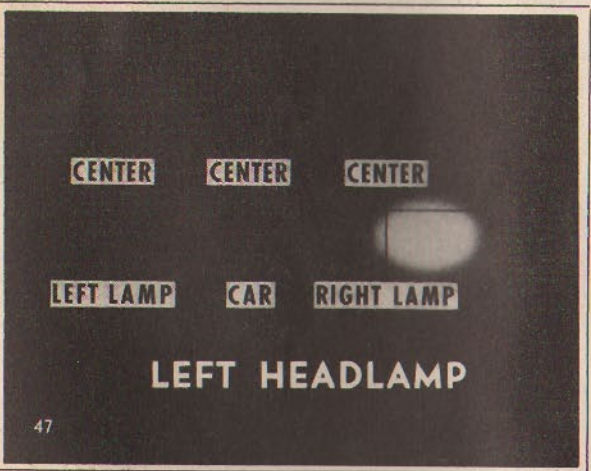
NARRATOR: Ignition timing for the six, eight, super-eight and the twelve with standard compression heads is six degrees, before top dead center for the six. The eight is eight degrees, the super-eight is seven degrees and the twelve is six degrees. With high compression heads the timing is five degrees for the six, eight degrees for the eight and five degrees for both the super-eight and the twelve.



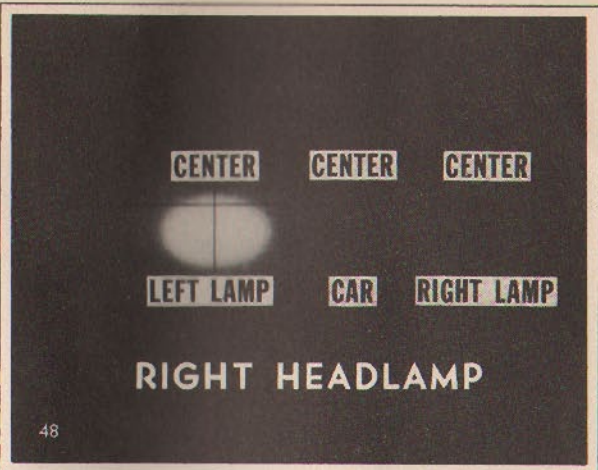
NARRATOR: The current and voltage regulator on the super-eight is the same unit and the adjustments are the same, but it has a different mounting bracket.



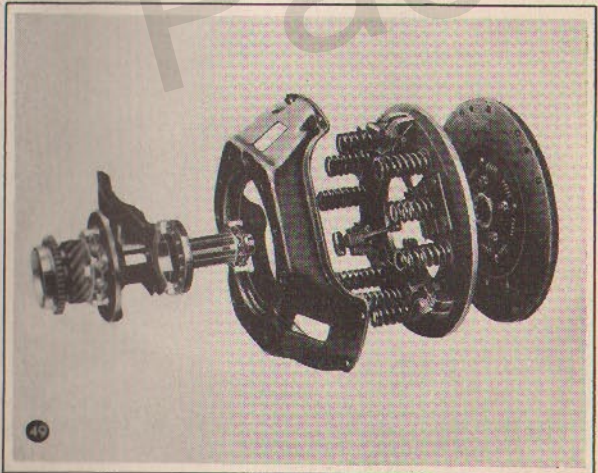
NARRATOR: The aiming of the Multi-beam headlamps used on the super-eight differs from the Flex-beam of the other cars. On the super-eight the beams are crossed.



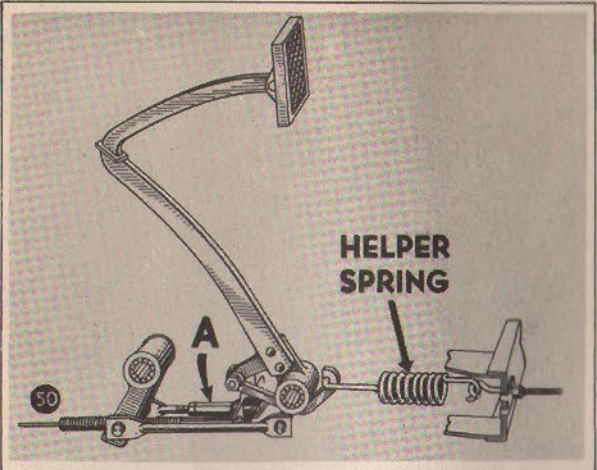
NARRATOR: Aim the left headlamp at the screen marker directly in front of the right lamp. Locate the hot spot flush with the horizontal and vertical markers.



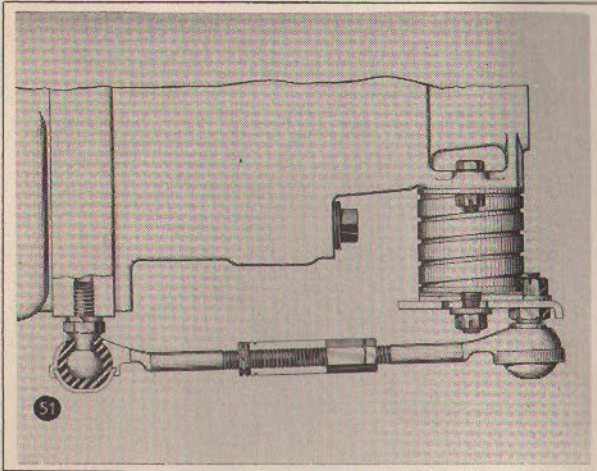
NARRATOR: Then aim the right headlamp on the screen marker directly in front of the left lamp. Center the hot spot on the vertical marker and bring the top flush with the horizontal marker.



NARRATOR: The super-eight is equipped with an eleven inch semi-centrifugal clutch of a similar design to those used in the six and eight.

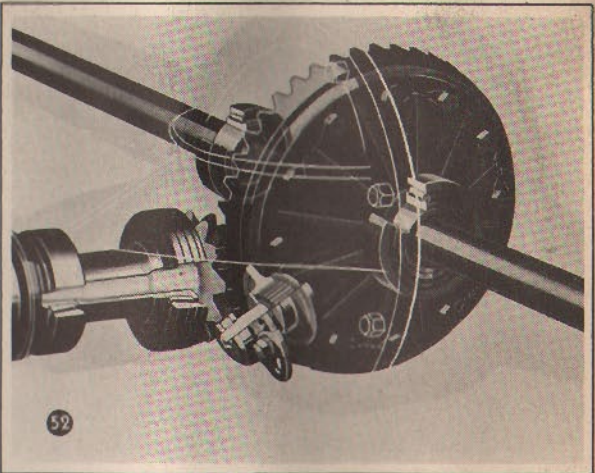


NARRATOR: The clutch pedal of the super-eight is mounted on roller bearings, and the leverage on the pedal is stepped up by a helper spring. The spring is attached to the pedal so that when the pedal is depressed the spring is thrown off center and helps depress the clutch pedal. Free travel of the pedal should be one-and-three-quarters inch to two-and-one-quarter inch--and is adjusted by nut "A".

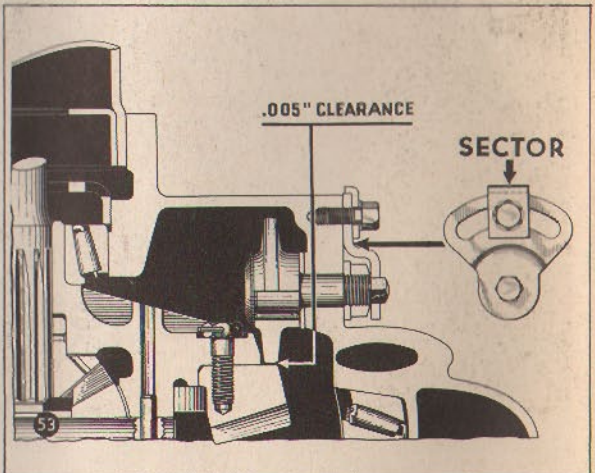


NARRATOR: This year the six, eight and super-eight have an adjustable rubber bushed link between the rear of the engine and the cross member of the frame--to prevent the longitudinal movement which might cause chatter on a pull in low or reverse. The link is fitted with a turn-buckle for adjustment. When installing it, attach the front end first. Then lengthen or shorten the link so that

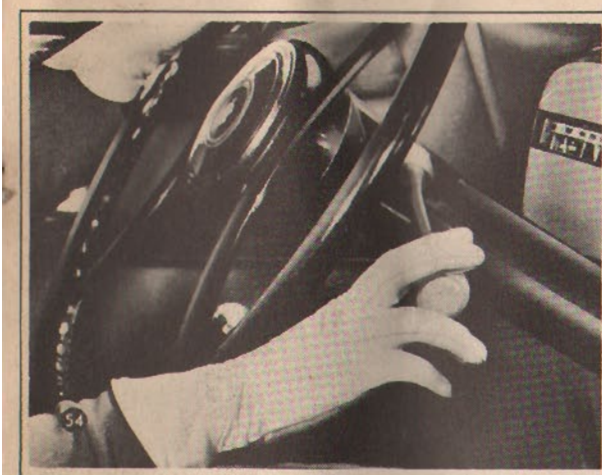
the rear connection enters the hole in the frame freely and seats squarely. Then install and tighten the nut.



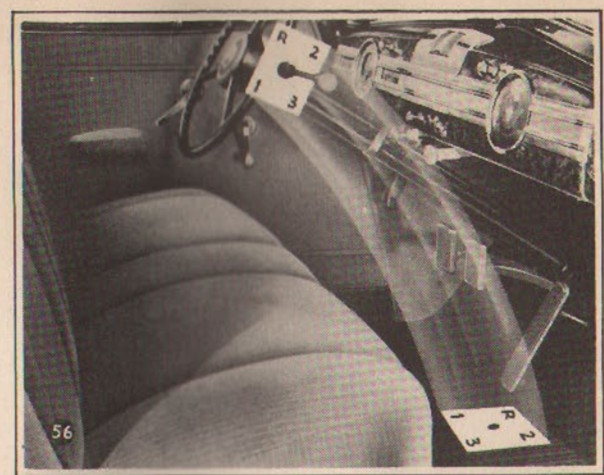
NARRATOR: The super-eight has the same design of differential as the six and eight, with the addition of a roller support behind the ring gear, to prevent deflection under the greater power of the super-eight engine. The roller support is carried on roller bearings on an adjustable eccentric mounting in the differential case and the adjustment is made by rotating the eccentric.



NARRATOR: There should be five thousandths clearance between the back of the ring gear and the roller. To adjust it, you loosen the lock nut and move the sector to rotate the eccentric.

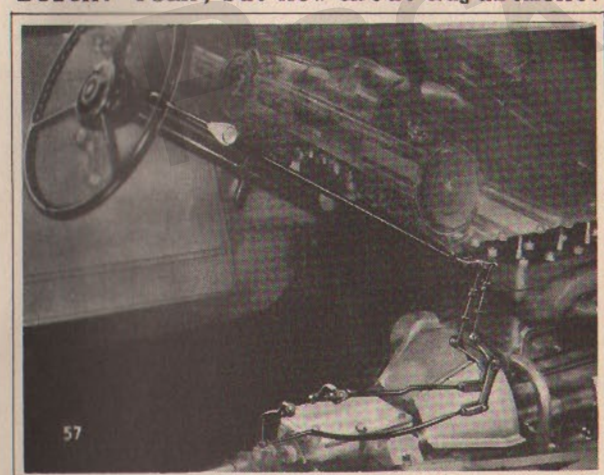


NARRATOR: Probably the biggest changes, from the customer's viewpoint are: one, the location of the gear shift on the steering column. It's standard equipment on the six, eight, super-eight and twelve.



NARRATOR: The twelve has a vacuum assisted shift with the control on the column. It's a straight mechanical shift on the six, eight and super-eight. You don't have to learn any new shifting habits. The angle of shifting is the only change. Just think of the "H" as being picked up, from its old position on the floor, and set up on its edge--right under the steering wheel. The low and reverse slot are on top. The second and high slot on the bottom.

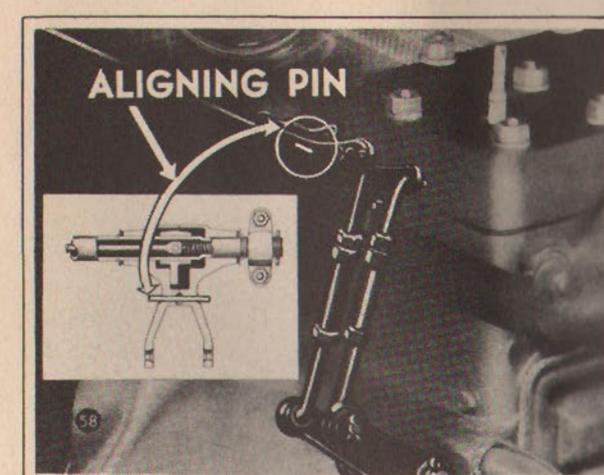
BUTCH: Yeah, but how about adjustment?



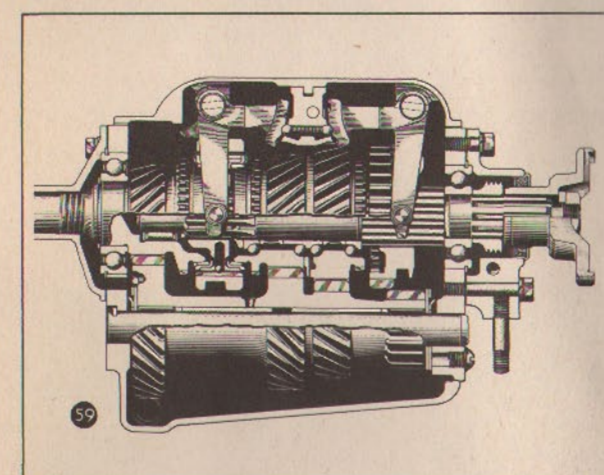
NARRATOR: It's an easy one. The levers on the steering column--under the bonnet--are connected through rods to the shifter levers on the side of the transmission. There's only one adjustment and that is to adjust the length of the rods. To do that, disconnect the rods at the transmission.



NARRATOR: And, too, the over-drive is optional equipment on the six, eight and super-eight.--First we'll take the steering column gear shift.

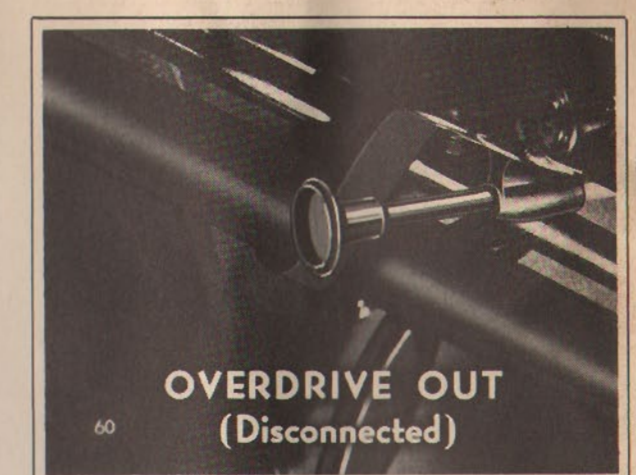


NARRATOR: Put a three-sixteenths inch rod through the holes in the column levers. That holds them parallel and in the neutral position. Then place both transmission shifter levers in neutral position, and adjust the length of the rods by means of turnbuckles--until the clevis pins slip through the yoke and shifter rods freely.



NARRATOR: The six, eight and super-eight have entirely new transmissions. They are constant mesh in all forward speeds with dog clutches for engagement. It's a similar design to the twelve and former super-eight except the synchronizers require no adjustment.

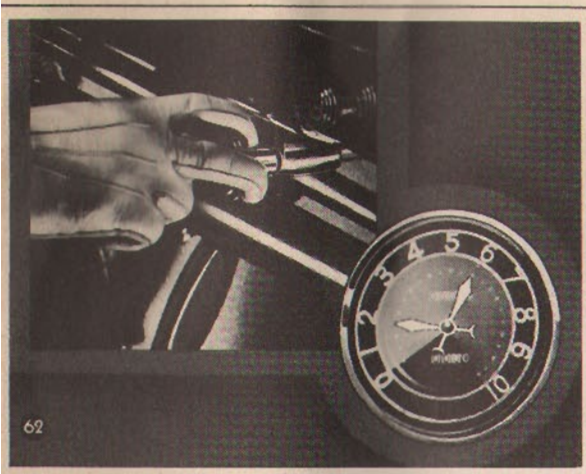
BUTCH: Well--what about the over-drive.



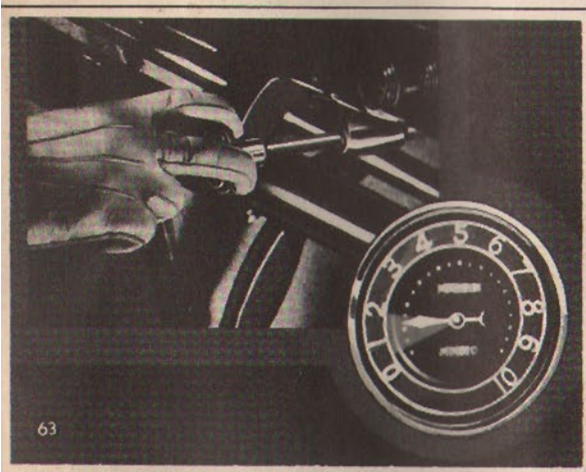
NARRATOR: We're just coming to that. The OVER-DRIVE is automatic in operation, the only manual control being the knob on the instrument board. When the knob is "out" the over-drive unit is locked out and the car operates in the conventional high gear.



NARRATOR: With the control knob "in," the over-drive is engaged and cuts in automatically at any speed above thirty miles an hour when the accelerator is released momentarily. It will remain in operation through all speeds above twenty miles an hour. At speeds below twenty miles an hour it becomes a free wheeling unit.



NARRATOR: To engage the over-drive you can push the control knob in at any time--or at any speed. But the car speed must reach thirty miles per hour--and the accelerator be released momentarily to have the over-drive become operative.



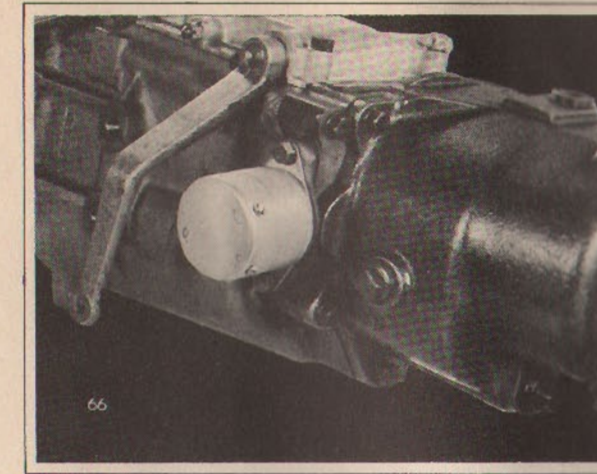
NARRATOR: However, there are definite conditions about disengaging it. First, the car speed must be below twenty miles per hour. Say, somewhere between fifteen and eighteen. Then bring the engine speed up to the car speed and accelerate slightly while pulling out the control knob. Don't attempt to lock out the over-drive unit at speeds in excess of twenty miles per hour or when the car is decelerating. To do so may wreck the unit.



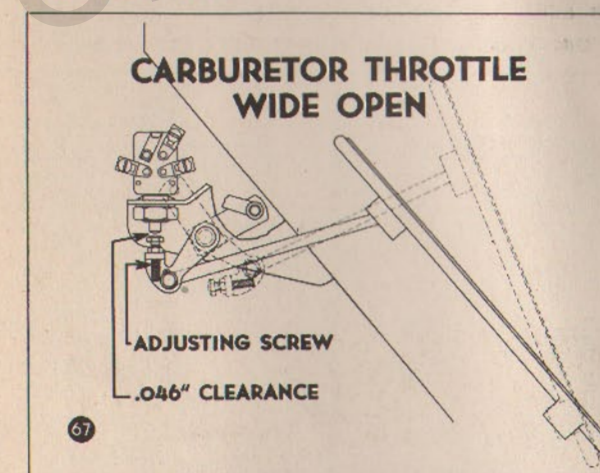
NARRATOR: An added feature of this over-drive is the ease with which it can be put into third gear for quick acceleration or pulling. Put the accelerator pedal clear down to the floor. This automatically engages third speed and keeps it engaged as long as the accelerator is held down. The moment the pedal is released it automatically goes back into over-drive.



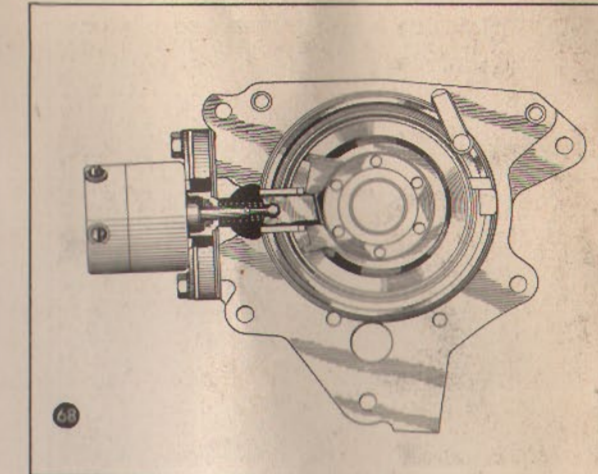
BUTCH: But, what I want to know is what makes it do all that?



NARRATOR: All of this is accomplished by a solenoid on the side of the over-drive unit which disengages the unit and locks it out. Y'see the solenoid is energized by a switch and relay mounted on the front of the dash. When the accelerator pedal is put all the way down it closes the switch and through the relay, operates the solenoid.



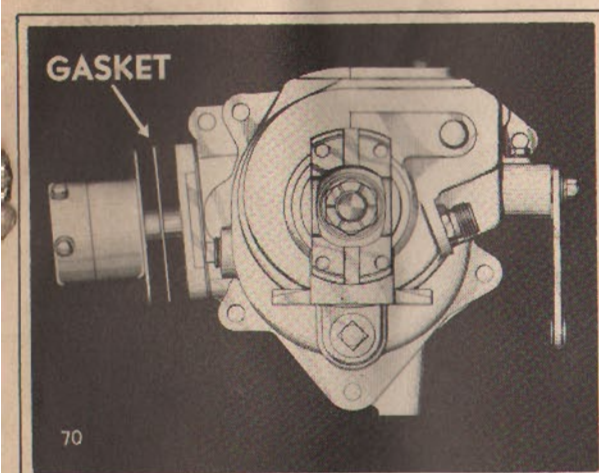
NARRATOR: The accelerator linkage is arranged so that the carburetor throttle valve is fully open before the accelerator contacts the switch. That makes it possible to operate at full throttle without disengaging the over-drive. With the accelerator depressed so that the throttle is wide open, there should be forty-six thousandths inch clearance between the accelerator lever and the switch. This clearance is adjusted by the adjusting screw in the lever.



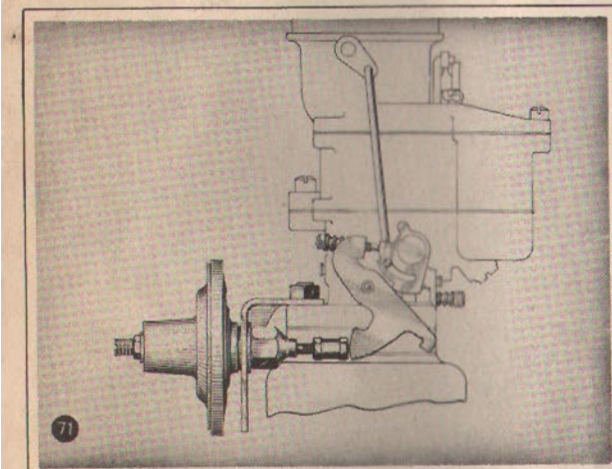
NARRATOR: In order for the locking device to engage and disengage--without damage to the unit--the ignition is cut off momentarily with the tripping of the accelerator pedal switch.



NARRATOR: Pay particular attention to the installation of the solenoid unit if you ever change one. The electrical connections must face the rear of the car. Watch this, because it will wreck the unit to put it in with the connections facing the front.

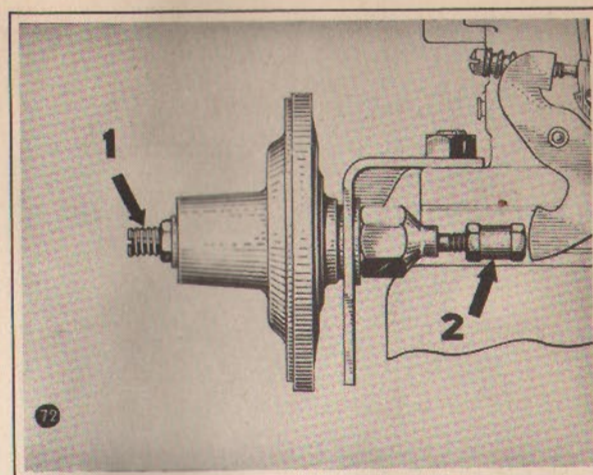


NARRATOR: Thickness of the gasket regulates the clearance of the disengaging unit. So, put the same solenoid gasket back or another of exactly the same thickness. If it's too thin it won't let the engaging dog clear and would tear it out. Too thick wouldn't let it engage deep enough.

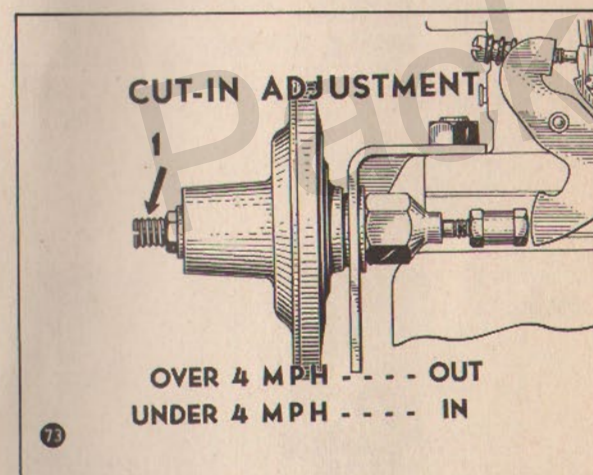


NARRATOR: As a precaution against the possibility of the engine stalling, when in free wheeling, a throttle guard is fitted to the carburetor. When idling, if engine speed and manifold vacuum fall off, a vacuum controlled plunger works against a finger on the carburetor throttle lever, and opens the throttle momentarily to increase the engine speed to prevent stalling.

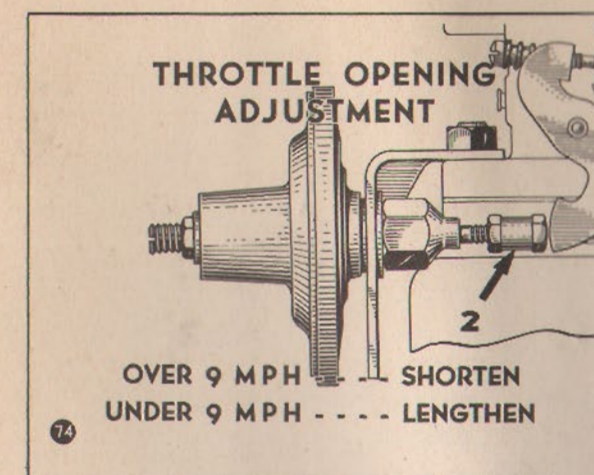
BUTCH: Say--how many adjustments on that?



NARRATOR: There are two adjustments. First, there is a screw in the diaphragm housing which regulates the tension of the diaphragm spring, and the car speed at which the throttle guard comes into operation. Second, an adjustable knob on the end of the plunger regulates the amount the throttle is opened by the throttle guard.



NARRATOR: If the throttle guard starts to cut in above a speed of four miles per hour it indicates too much diaphragm spring pressure--and it should be decreased by turning the adjusting screw "out." Should it engage at less than four miles per hour--or even fail to operate--then you have too little spring pressure. So, turn the screw "in." Now--

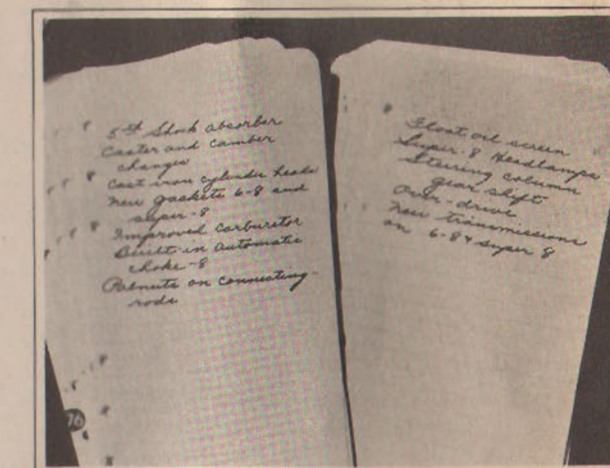


NARRATOR: --the amount of throttle opening with the throttle guard in operation, is controlled by the length of the plunger. If it produces a car speed in excess of nine miles per hour, it should be decreased by turning the adjusting knob on the plunger in toward the diaphragm to decrease the amount of throttle opening. If less than nine miles per hour, increase the length of the plunger by turning the adjusting knob out toward the throttle lever.



NARRATOR: Here is a very important point--a caution card comes with every car and that card must be left in the car--attached to the over-drive control--or handed to the owner at the same time you give him his Owner's Manual and Service Card. It tells how to engage and disengage the over-drive. It is important that

every owner should know how to do it. Failure to follow the proper procedure may wreck the over-drive unit.



NARRATOR: That's the whole ball of wax on servicing the 17th series Packards. With that kind of service information, we can give Packard owners real service.



BUTCH: Yes, sir! And I'm going to start right now by servicing these demonstrators right.

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