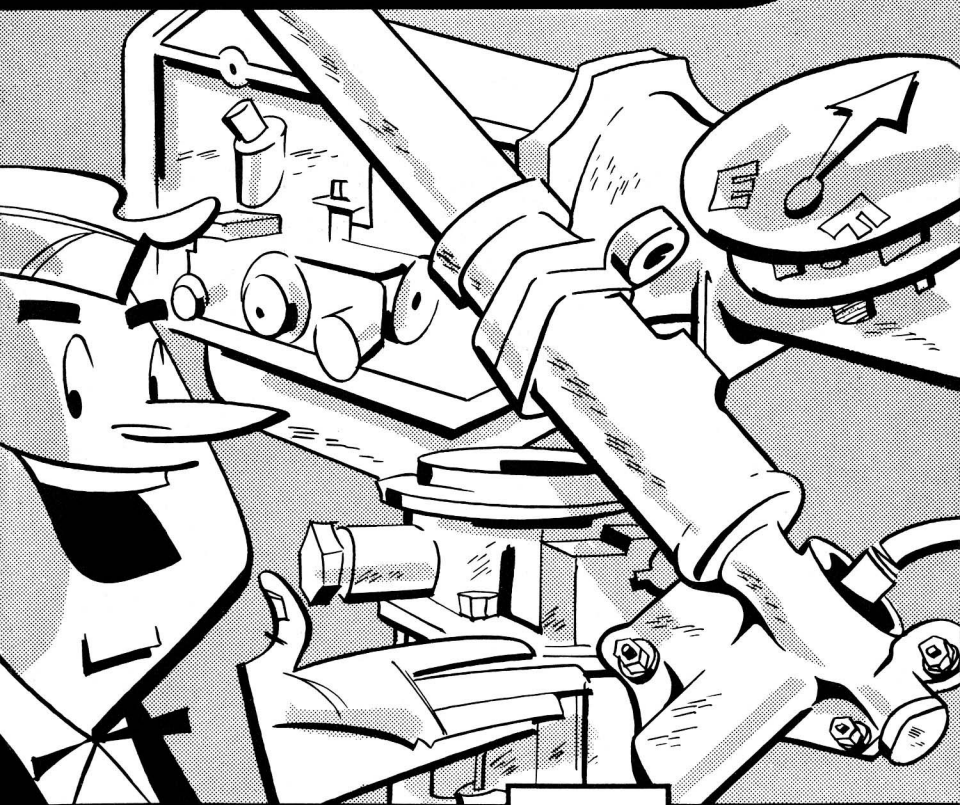


**"POWERFLITE, POWER STEERING,
CARBURETOR AND
FUEL GAUGE SERVICE"**



SESSION NO.

95

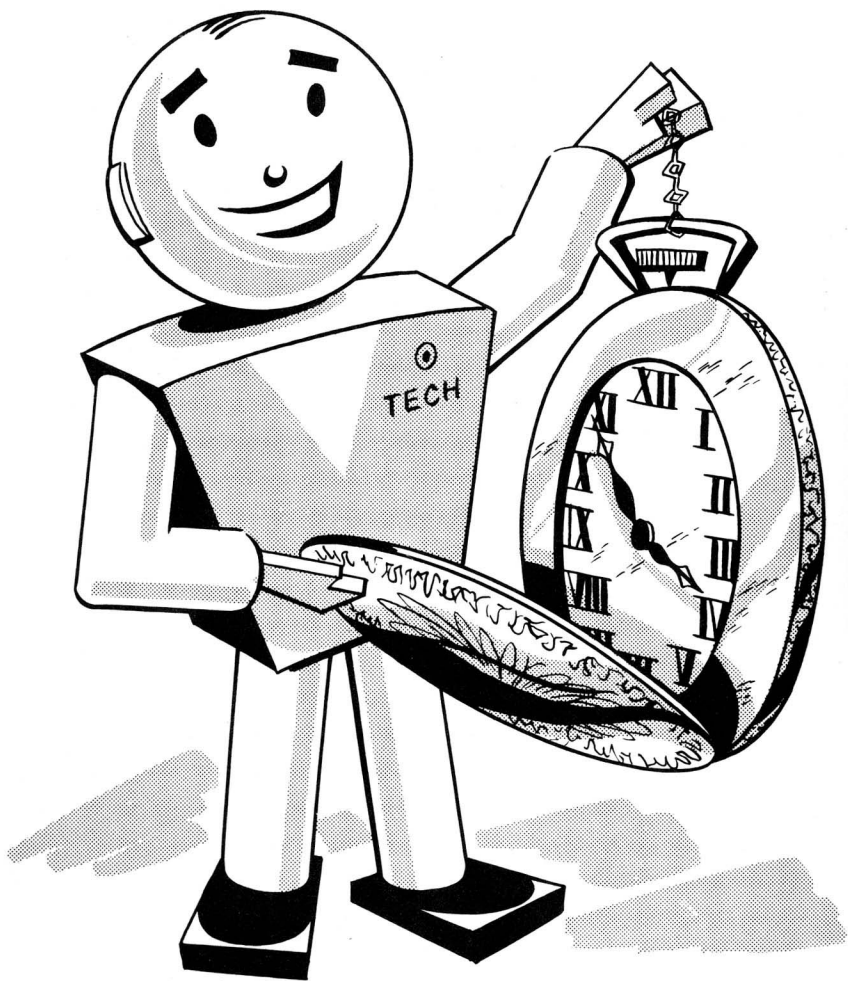
SERVICE REFERENCE BOOK

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Prepared by
CHRYSLER CORPORATION
PLYMOUTH · DODGE · DE SOTO
AND CHRYSLER DIVISIONS

**TECH
SEZ:**

"HERE ARE TIMELY



TIPS ON SEVERAL DIFFERENT CONDITIONS”

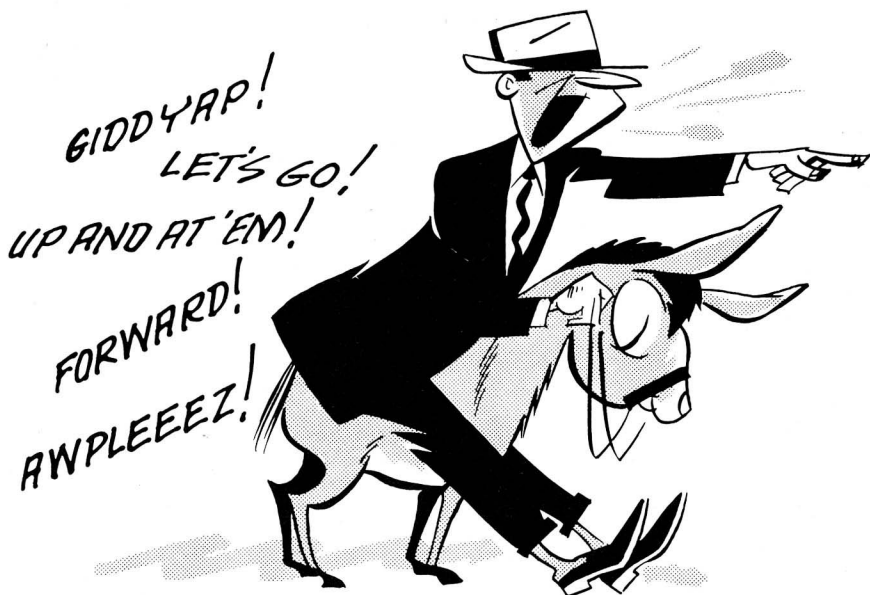
Occasionally, certain conditions pop up that are different from the usual maintenance attention that every car normally requires. If these conditions occur more than once, they get looked at in a hurry and the best service procedures are worked out fast. And that’s what this reference book is all about.

Spelled out on these pages, then, you’ll find the latest corrections for several once-in-a-while conditions. There are helpful service tips on the PowerFlite transmission, coaxial power steering, the Stromberg carburetor, and on both types of fuel gauges used on our cars.

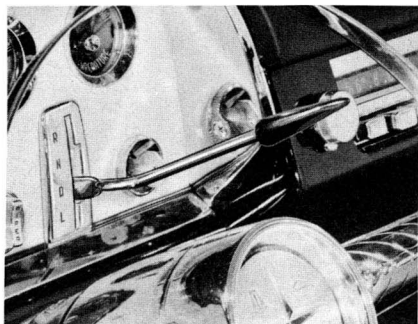
Here’s where to find the sections that tell you *what* to do, *when* and *how* to do it:

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POWERFLITE TRANSMISSION— “NO-DRIVE” CONDITION



Every now and then an owner might report a “no-drive” condition. What he means is that when he puts the selector lever into Drive, or

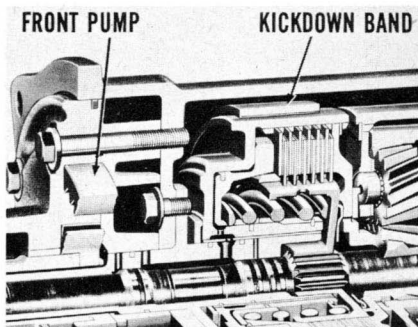


Reverse, the car won't move. He has to wait a few seconds or longer before the car gets under way. This doesn't happen all the time, of course. It seems to occur after the car has been standing for a while. Once the car gets going, the transmission works perfectly.

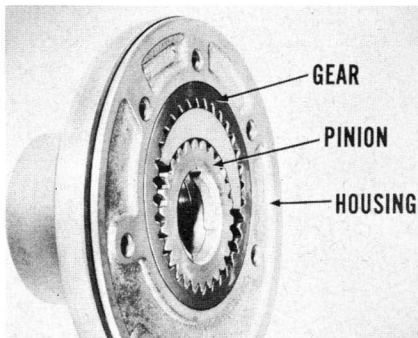
In a case like this, you'd make the usual PowerFlite transmission checks. For instance, you would check the fluid level, the linkage adjustment, the band adjustment, and you'd check line and throttle pressures. In addition, you'd check the regulator valve for sticking.

If the valve sticks or binds in the valve body as you slide it in and out, the body might be warped due to improper torque or uneven tightening of the pump housing attaching screws. Generally the bind can be relieved by tightening the screws evenly to 17 foot-pounds torque. If not, the body should be replaced.

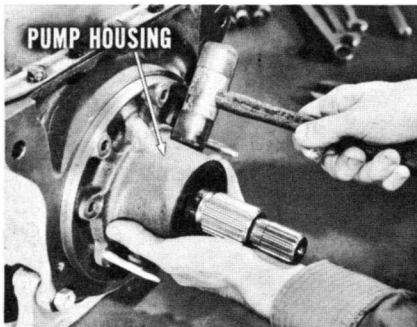
Now, if every one of those items checked out okay, you would then inspect the transmission front oil pump. Here's why this is important. You know that the front pump supplies the oil pressure necessary to operate the servo and apply the kickdown band. You also know that the car won't move until the kickdown band is applied.



So, naturally, if the band fails to apply instantly, it is probably because the front pump lost its prime while the car was standing still. This can happen if there's too much clearance between the face of the gear and pinion and the face of the housing.



Checking Clearance at the Front Pump—What you do, then, is remove the pump housing together with the gear and pinion. Always use the two housing guide studs (Tool C-3288) to do this so the housing will come out straight.



Use solvent to wash the lubricant off all the parts you remove. Be sure to get them all good and clean.



Now, once the parts are thoroughly clean, put the hub of the pump housing on a flat, even surface, with the gear and pinion facing up. Use the parallel bar (Tool C-3335) and feeler gauges—or a dial indicator—to check the clearance between the face of the

housing and the face of the gear and pinion. There should be only .0015" to about .0025" clearance (actually, specifications call for .0012" to .0022"). So, if you use feeler gauges, use a .002" gauge as a "go" measurement, and use a .003" gauge as a "no-go" gauge when checking this clearance.

If the .002" gauge is a little loose, but the .003" gauge is too tight, the actual clearance, then, is somewhere between .002" and .003", which is accurate enough for a service measurement.

Be sure to move the parallel bar around and make this clearance check in several places on the face of the housing.

If you discover more than the required clearance, you would have to dress down the face of the housing to reduce the clearance to about .0025". You can do this easily by rubbing the face of the housing on crocus cloth or very fine emery cloth placed on a piece of plate glass that is set on a surface plate or any surface you know is perfectly flat.



Check the face frequently to be sure the metal is being removed evenly and in just the right amount. Clean off all metal particles very carefully before you reassemble a dressed-off housing.



Besides too much clearance, a badly worn—or scored—regulator valve body can also cause the “no-drive” condition. So, you’d better check the front face of the valve body. Sometimes it will be scored by the endwise floating of the gear and pinion. If you see signs of scoring, install a new body.



Incidentally, some of these valve bodies use a gasket between the body and face of the transmission. If the valve body you disassemble has a gasket, use a new gasket before you reassemble it. If there is no gasket, reassemble the valve body without a gasket. Remember to tighten the attaching screws evenly to 17 foot-pounds when you reinstall the valve body and front pump assembly.



Next, reassemble the transmission unit, install it in the car, and add enough fluid to bring the level up as specified. Finally, test the transmission to check your work of elimination of this condition.

COAXIAL POWER STEERING CHUCKLE

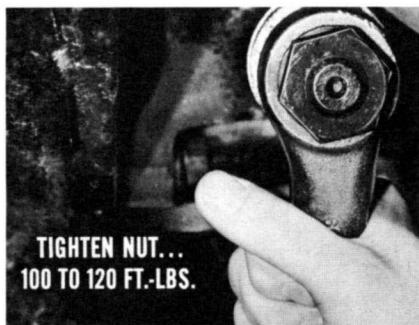


You may get occasional reports of a power steering unit that chuckles. Here are some possible causes:

Causes of Chuckle — Front wheel bearings can cause the power steering unit to chuckle. So check the bearings and adjust them if necessary. Chuckle can also be caused by a steering gear arm that's too loose on the gear shaft.



You can check for looseness by feel. Just try to move the arm on the splines of the gear shaft. If there's any movement, tighten the nut to 100 to 120 foot-pounds. Don't guess at this tightness, of course. Use a torque wrench and be sure.



Another cause of chuckle is a gear shaft adjustment that's too loose. In this case, remember that two types of gear shafts were used in 1955 production.

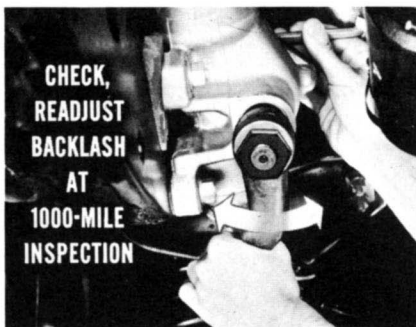




The earlier type gear shaft has a center tooth wider than the other four. The later type has teeth of equal width. The later shaft also has a letter "O" stenciled on the steering arm end of the shaft.

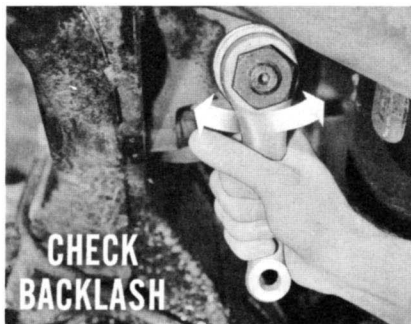


If you can't see that letter, you can still identify the late-type gear. The backlash on it remains the same at extreme turns as it is in the straight-ahead position. Backlash increases at extreme turns in the early-type gear.



Incidentally, the backlash adjustment should be checked and readjusted on *all new cars* at the *1000-mile inspection*. That's because a part of the original adjustment is lost after a few hundred miles, due to the normal "wearing-in" of the parts. When this occurs, backlash will show up.

Readjusting the Gear Shaft When Needed—If too much backlash is the cause of the power steering chuckle, here's how to take care of it. First, start the engine. Backlash adjustment is always made with the power on, the steering linkage and steering arm removed, and a spare arm installed on the gear shaft. In addition, the steering wheel should be turned in the straight-ahead position.



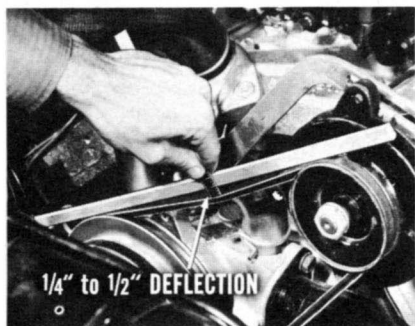
Loosen the adjusting screw lock nut and turn the adjusting screw *out* until there is some backlash.

Then, slowly turn the adjusting screw in until backlash is eliminated. Finally, slowly turn the adjusting screw *in* $\frac{3}{4}$ of a turn from the no-backlash position, and tighten the lock nut. This puts a slight preload on the teeth, so the adjustment will hold.

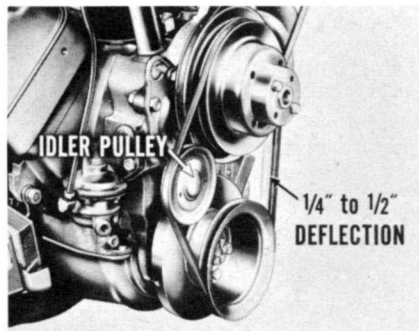
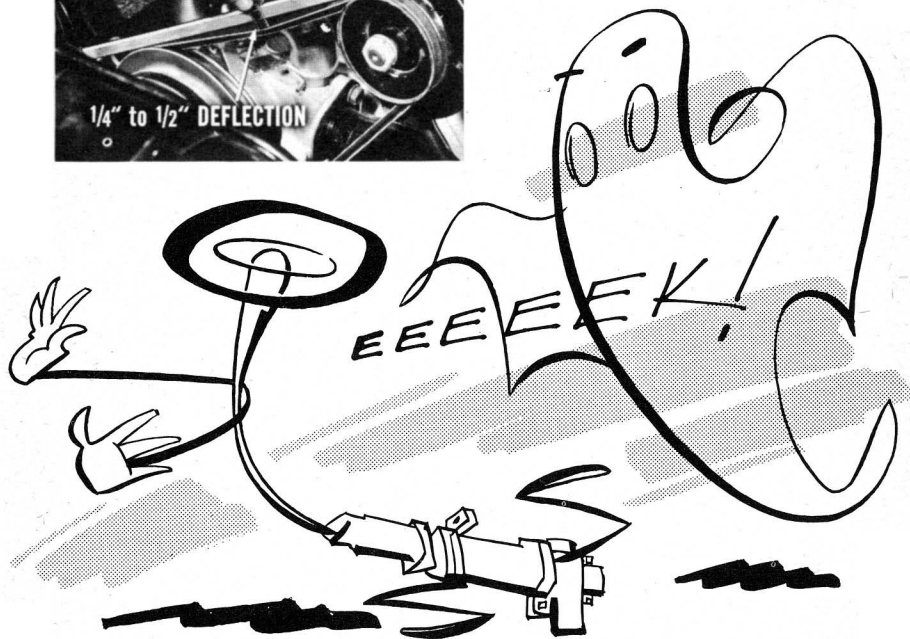


COAXIAL POWER STEERING SQUEAL

If an owner reports that he hears a squeal anytime when he turns the steering wheel, this usually means there's a slipping belt. In this case, check the generator drive belt first. It should have a $\frac{1}{4}$ " to $\frac{1}{2}$ " deflection when you press it with your fingers, midway between the water pump and generator pulleys. Move the generator in or out to



adjust the belt, if necessary. Be sure to use the generator belt adjusting tool (C-3379) and a torque wrench for making this adjustment accurately.



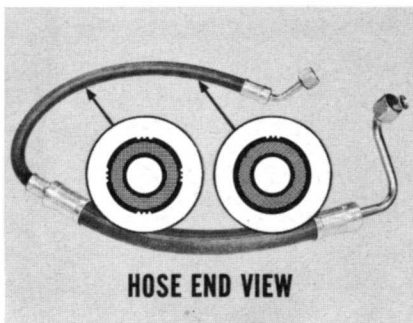
Next, check the fan belt between the crankshaft and water pump pulleys. It should deflect from $\frac{1}{4}$ " to $\frac{1}{2}$ ". You can loosen the idler pulley arm clamp bolt and adjust the arm to get the proper deflection.

Pump Seizure—You may even get an unusual case where the pump has seized. In a case of pump seizure, the only thing you can do is repair the pump or replace it if necessary. Whenever you repair a pump, tighten the pump cover screws to 17 foot-pounds torque. This is a change from the specifications shown in the Shop Manuals. It has been determined that the original specification of 30-35 foot-pounds is too tight, and may warp the pump body. If you install a new pump, always loosen the pump cover screws and then torque them to 17 foot-pounds.

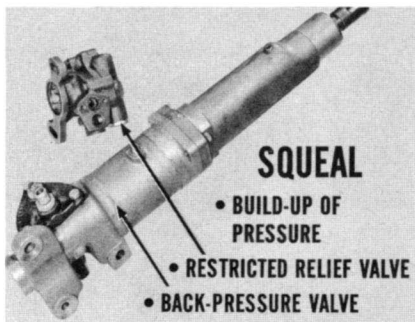


As soon as the pump is installed, check the pump pressure. If the reading is higher than 100 psi with the wheels in the straight-ahead position, there may be a restriction in the pressure hose. If so, install one of the latest type hoses.

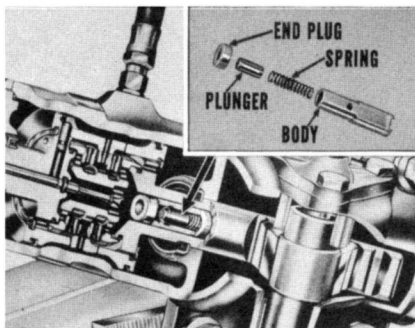
Use either the type of hose which has a smooth outer surface for the large and small diameter hoses, or a hose which has long ridges spaced by four flat surfaces around the circumference of the small-diameter hose.



In some cases of power steering pump squeal, the cause has been traced to a build-up of pressure within the power steering unit or the pump. If the build-up of pressure is in the pump, it's generally due to a restricted pressure relief valve. If the build-up isn't in the pump, it's usually due to some restriction in the power unit. The most likely place is in the back-pressure valve.



Checking the Back-Pressure Valve—You'll be able to check the back-pressure valve better if you know these details about it. First, this valve is in the centrally drilled hole in the lower piston rod to suppress squealing and to provide a better "feel" of the road. The



back-pressure valve is a four-piece unit consisting of a valve body, plunger spring, plunger, and end plug. The plug is a press fit in the rod and holds the valve parts in place. The plug is drilled and tapped with a 1/4" 28 NF thread so that it's easy to remove when necessary.

Checking the back-pressure valve must be done with the system under pressure. Your test will also show up faulty operation of either the pressure relief valve in the pump, or the back-pressure valve in the lower piston rod. Therefore, you'll have to rule out one valve or the other.

Disconnect the pressure hose at the pump and connect the shut-off valve and pressure gauge (Tool C-3309) between the pump and hose. Open the shut-off valve and start the engine.

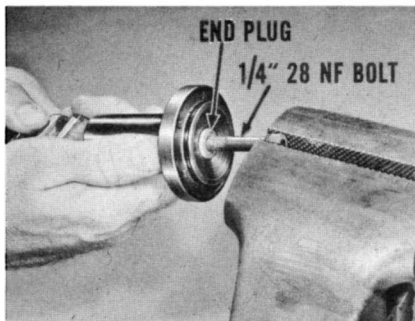
With the engine idling and the steering wheel in straight-ahead position, the gauge should read 100 psi. If the pressure is higher, there's a restriction in either the pressure relief or the back-pressure valve. If the pressure reading is lower, it means the relief valve may be stuck open.

If the pressure relief or back-pressure valve is restricted, pressure will build up beyond the maximum limit when the steering wheel is turned and engine speed is increased. Pressure may go as high as 1200 to 1300 psi.

Since the pressure relief valve is located in the pump, it's the easier one to check. So, remove the valve from the pump after disconnecting the gauge and removing the adapter. Clean the relief valve thoroughly in solvent. Then, examine all parts for burrs or nicks which might cause sticking.

Reassemble the valve, or install a new one. Reconnect the gauge, start the engine, and recheck the pressure. If there is no reduction in pressure, then the back-pressure valve is restricted. In this case, remove the steering gear unit from the car and disassemble it.

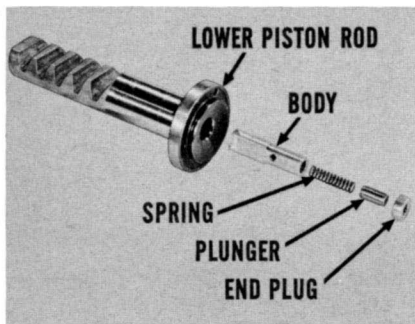
Servicing the Back-Pressure Valve—Thread a 1/4" 28 NF bolt into the threads of the back-pressure valve end plug in the upper end of the rod. Clamp the bolt head in a vise and pull the bolt and plug from the rod. **NOTE:** If the plug is seized in the rod, use a soft hammer to tap on the retaining flange of the piston rod to release the plug. Once the plug is out, you can remove the plunger, spring and valve body.



Check the valve body carefully for restrictions in the drilled holes in the small diameter section. If there's a build-up of foreign matter in these holes, or if there are fewer than four holes, replace the valve body.

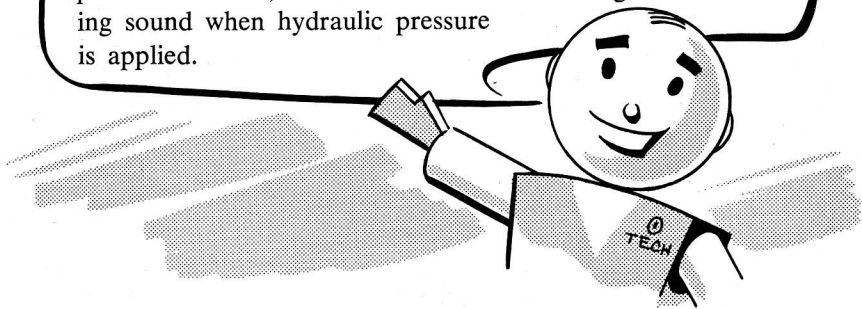
Now, if the holes are okay, check movement of the plunger in the valve body. Inspect the plunger for nicks or burrs which might cause sticking. If you cannot remove the rough spots with crocus cloth, replace both the plunger and body.

Installing the Back-Pressure Valve—When you reinstall the back-pressure valve, be extremely careful to avoid damaging the valve.



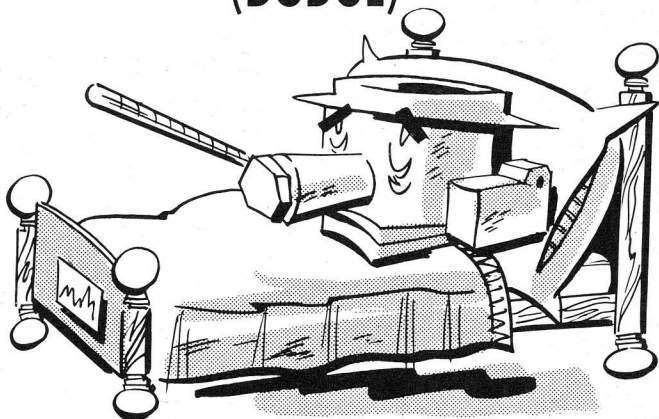
Insert the spring first, then the plunger, into the body. Then, put this assembly in the upper end of the piston rod, making sure that the milled end enters first. Next, place the end plug in the rod and press it into place, just enough to seat it against the valve body.

CAUTION: You'll need an adapter to press the plug into place. Otherwise, the valve will make a rattling or chattering sound when hydraulic pressure is applied.



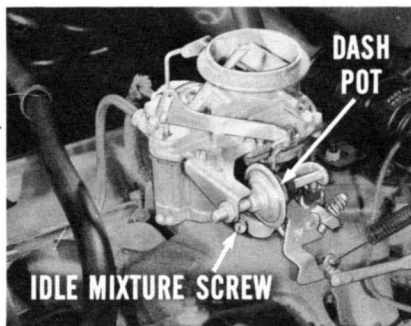
If the plug is pressed in too tightly, it will cause the valve body to collapse. This will restrict the plunger and cause a high-pressure condition. This, in turn, will cause a noticeable lack of steering assistance, damage the seals and "O" rings and cause oil leaks which may lead to pump seizure.

STROMBERG CARBURETOR CONDITIONS (DODGE)



If you ever come across a case where an owner of a 1955 Dodge reports that his car stalls when hot and is hard to start after the stall, here are some things to check.

If the car is equipped with PowerFlite, the condition might be caused by dirt in the carburetor, or an improper dash pot adjustment. In addition, an engine idle speed set too low could cause the stalling. Improper adjustment of the idle mixture screws contributes to this condition.



Besides those possibilities, a low vacuum on the intake side of the fuel pump might be responsible. Carburetor flooding due to too high a float level and a fuel mixture too rich are also points you'll want to look into.

Where to Begin your Carburetor Check—In general, you'll save time by checking the idle speed setting first. So, warm up the engine. Then, using a tachometer, set idle speed at 475 to 500 r.p.m. with the transmission in neutral. Adjust the idle mixture screws to get the highest engine r.p.m. you can, and still have a smooth idle.



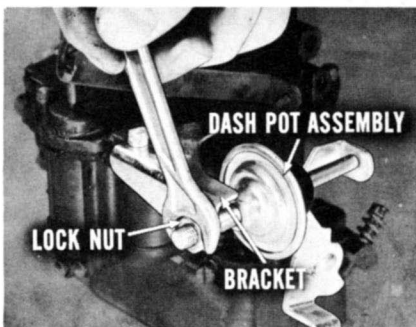
The idle mixture screws should be $\frac{3}{4}$ to $1\frac{1}{4}$ turns open. When you get the proper idle setting, back out the mixture screws an additional $\frac{1}{8}$ turn. This setting will compensate for higher road temperatures, and help to eliminate stalling.



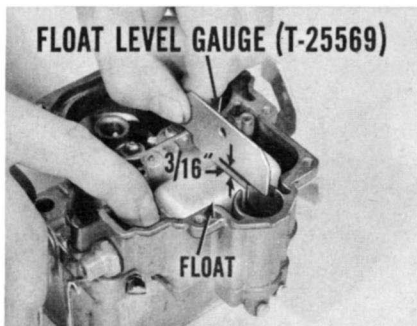
Once you know that the idle adjustment is okay, check the dash pot adjustment. There should be $\frac{1}{16}$ " to $\frac{3}{32}$ " clearance between the end of the dash pot plunger and the ear on the throttle lever, when the throttle is closed and the plunger is pushed in. In addition, you should be able to feel

some resistance when you push the plunger in. If there is no resistance, it means that the diaphragm is broken. While you're at this point, check the plunger for freedom of movement and for cocking. It should offer some resistance when pushed in, and should travel in a straight line with no noticeable side play.

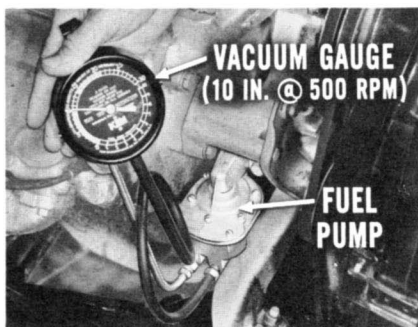
If you don't find the necessary clearance, loosen the nut. Then, turn the dash pot assembly in its bracket to get the necessary $\frac{1}{16}$ " clearance. After that, tighten the lock nut. But, don't stop here, a few other checks will prove to be worthwhile.



For instance, a high float level can also cause stalling, and hard hot starting after the stall. So, get out the Float Level Gauge (Tool T-25569) and see if you have the level set at $\frac{3}{16}$ " from the top of the main body casting. Use bending tool (T-24733) to bend the lip of the float toward or away from the float needle to get this adjustment. Finally, reassemble the carburetor and be sure to use a new gasket.



Another check you can make before road-testing the car is the vacuum draw of the fuel pump. Disconnect the fuel line at the inlet connection of the pump and connect a vacuum gauge to



the pump. Run the engine at 500 r.p.m. and see if you get a minimum of 10 inches of vacuum. It should be fairly steady with no blowback. If it is, you're okay. If your test shows *lower than 10 inches*, it may be necessary to replace the inlet valve or the pump assembly.

If all of these points check out, run the car out on the road and see if you've corrected the stalling and hard hot-starting condition. If the engine starts inside of three seconds whether the engine is hot or cold, you'll know you've done a good job. On your road test, also, you can tell whether or not the ignition timing, points, plugs, and engine compression are okay.

OTHER POSSIBLE CARBURETOR CONDITIONS

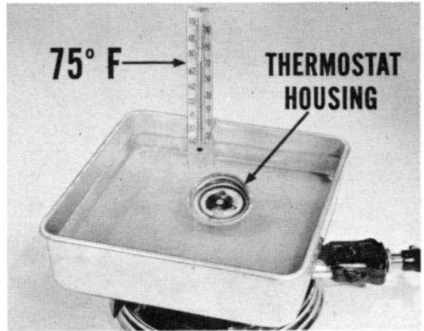


Vapor Lock—Because fuel vapors must be present for proper combustion, modern fuels are made up of blends which have a definite vaporization point. Engine temperatures are also affected by outside air temperatures. If the car is driven on extremely hot days, certain parts of the fuel having a lower boiling point will vaporize faster

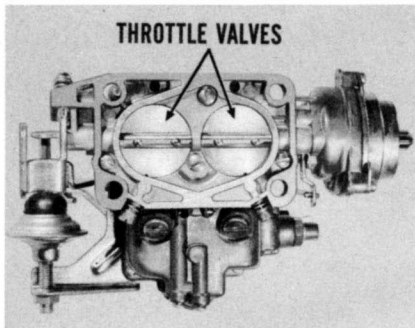
than normal. This causes vapor lock in the fuel pump and lines, and a collection of an over-rich fuel mixture in the intake manifold during idling or the times when the ignition is off.

Choke Housing Adjustment—Another contributing cause to stalling is an improper choke housing adjustment. And even if the choke adjustment appears to be correct, the calibration of the choke housing may be wrong. Here's how you can check it.

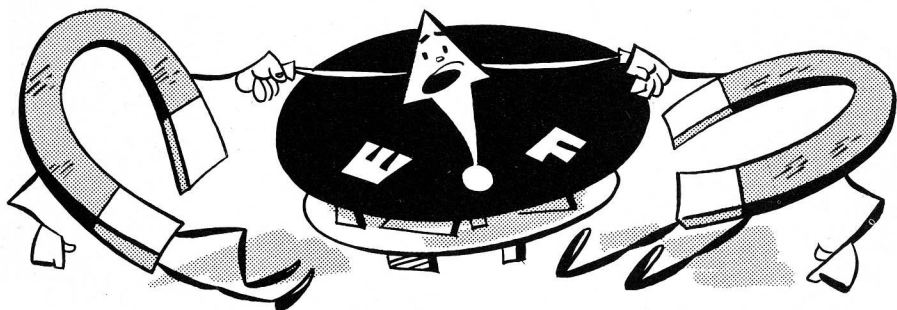
Put a thermometer in a container of non-inflammable spirits and bring up the temperature to 75°F. Hold that temperature for about 5 minutes. Block the carburetor throttle open halfway, so the choke valve can be moved freely from fully open to fully closed positions. Be sure there's no drag or excessive friction in the choke mechanism. Remove the thermostat housing and put it in the 75° liquid. Leave it there for about 5 minutes. Take it out and immediately place it on the carburetor. Rotate the housing until the choke valve is lightly closed. Check to see if the scribe mark on the choke housing lines up with the center mark on the carburetor throttle body. If it doesn't, file off the original mark and scribe a new one in line with the center mark on the throttle body. In its new position, a one-half notch movement of the choke housing should either close the choke valve firmly, or should permit the choke valve to open slightly.



Throttle Valve Alignment—If the engine appears to idle rather roughly, and the ignition timing, points, plugs and compression are up to standard, be sure to check the throttle valves for proper alignment. Rough handling, or improper assembly may put the valves slightly out of alignment. If you find this condition, replace the throttle valves and shaft.

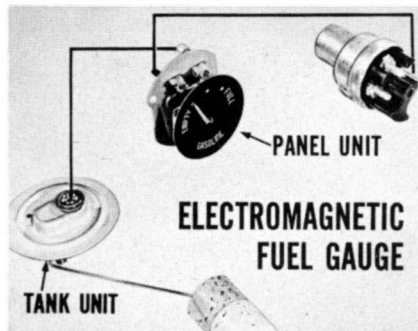


FUEL GAUGES

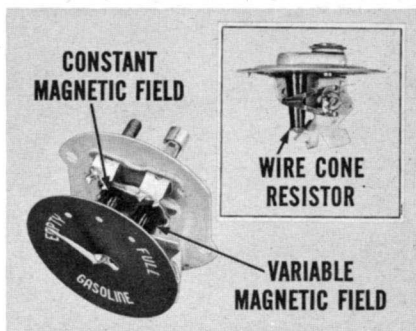


The Electromagnetic Fuel Gauge—Every now and then you might hear of an owner who feels that the fuel gauge isn't telling a true story of his fuel supply.

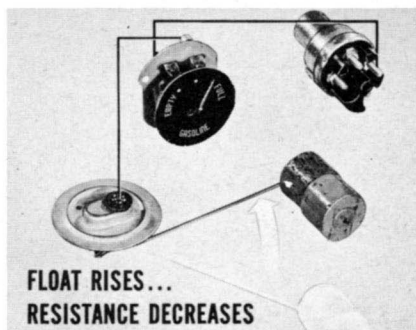
An electromagnetic fuel gauge is used on all models except the suburbans. It is made up of a panel unit and a tank unit connected by a single wire. The panel unit has two magnetic circuits, each of which has windings.



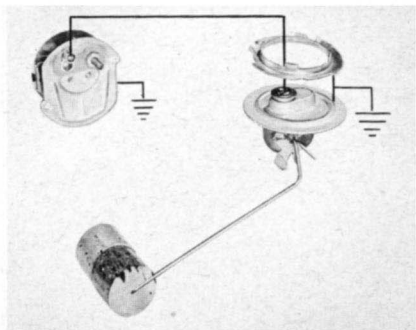
One of the windings is internally grounded. It sets up a constant magnetic field which pulls the needle toward “empty” when the ignition switch is turned on. The other winding, a variable magnetic field, is grounded through the tank unit. Inside the tank unit, is a wire cone resistor with a sliding contact finger controlled by a float.



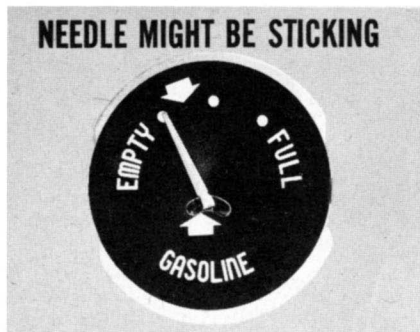
The resistor in the tank unit is connected to the variable coil winding in the panel unit. The tank unit case is grounded, which completes the fuel gauge circuit. So, when the float rises, the resistance decreases. That makes the variable magnetic field stronger than the constant field. So the pointer is pulled over to the “full” mark.



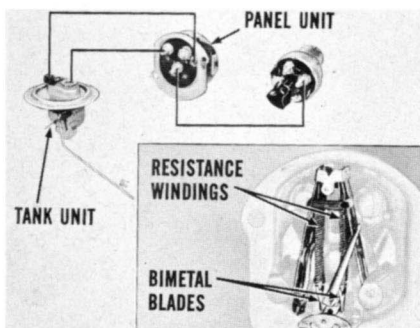
Testing the gauge, then, is mainly a matter of checking the circuit from ignition switch to the tank unit. In fact, one common cause of fuel gauge trouble is a poor ground at either unit, or inside the tank unit itself. So, check out the circuit to be sure it's okay.



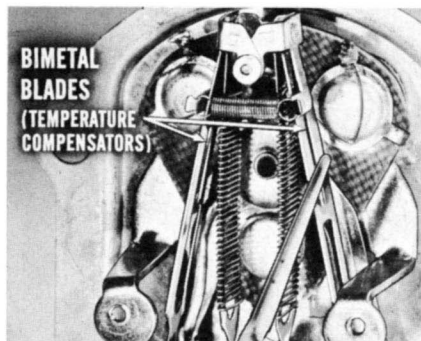
Now, suppose the circuit is all right, and the system works correctly most of the time, but at other times it doesn't. Well, in this case, the gauge needle might be sticking on the face or on the back of the dial.



So, you'd remove the gauge and straighten the needle carefully so it could move freely in either direction. Check the stops behind the dial, too. If the stops are bent, they'll prevent the needle from traveling the correct distance. You can bend them, if you have to, to properly control movement of the needle.



The Thermostatic Fuel Gauge
Suburban models use a two-wire, thermostatic fuel gauge. It has two wires connecting the panel and tank units. These wires connect with resistance windings designed to heat two thermostatic bimetal blades inside the panel unit.

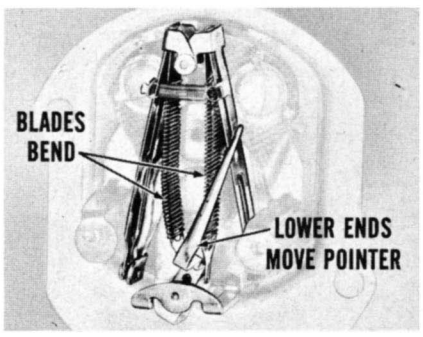


Next to the resistance-wound blades are bimetal blades that act as temperature compensators and adjust for variations in temperature of the resistance windings.

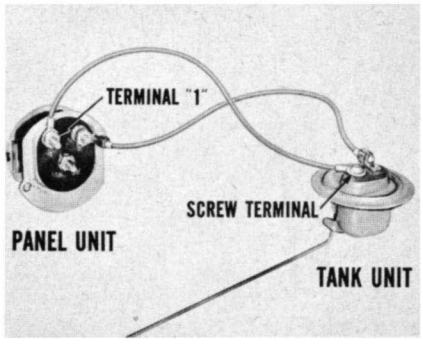


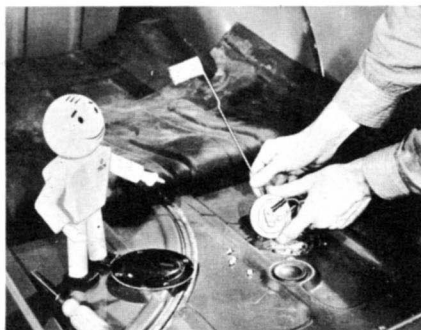
As the tank unit float rides the fuel level, the float arm moves a contact finger across a cone-shaped resistance winding in the tank unit. This varies resistance and heat in the windings around the bimetal blades.

The resistance-wound bimetal blades bend according to the amount of heat they receive. The lower ends of the bimetal blades move the gauge pointer.



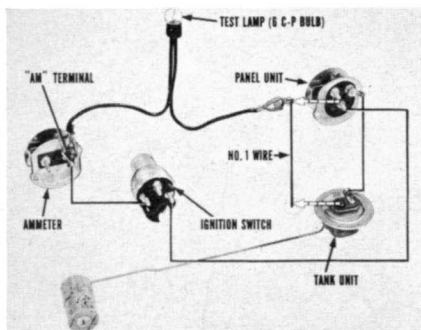
The wire from the screw-type terminal of the tank unit is wired to terminal "1" on the panel unit. The bullet-type terminals of both units are connected by a separate wire. If the bullet-type connection on the number two terminal of the panel unit is ever installed on the number one terminal, the gauge will register "full" when empty, and "empty" when the tank is full. So, make sure the panel unit connections are at the proper terminals.



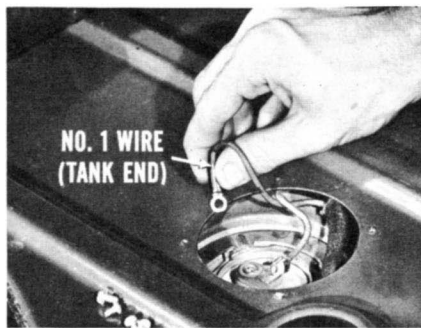


You can connect a new tank unit to the wires and test the panel gauge like you check a single-wire gauge. Just turn the ignition "on" and work the float arm of the new tank unit.

Allow about a minute or so after you turn the ignition on. That's needed to give the resistance windings time to warm up. If the panel unit registers all right with the new tank unit, check the original tank unit or the wiring.



To test the wiring, disconnect the number "1" wire from the panel and tank terminals. Connect a test lamp, with a 6-candlepower bulb, between the panel end of the wire and the "AM" (hot) terminal of the ammeter. If the bulb lights, the wire is grounded, and you'll have to correct it.



If the bulb doesn't light, ground the tank end of the number "1" wire. The test lamp should light and show that the circuit is okay. If it doesn't light, the circuit is open and the wire should be repaired or replaced.

You would test the number two wire the same way. If both wires are okay, replace the tank unit. Be sure to clean the tank and the tank unit mounting surfaces, and install the screws tightly for a good, electrical ground.

There may be cases where the gauge registers, but not quite accurately. In that case, you can remove and adjust the float arm stops to give the correct readings.

Adjusting the Panel Unit—Remove the panel unit and position it on the bench the same way it is mounted in the instrument panel. Clean the panel unit contact points by drawing a piece of bond paper between them while you hold the points together.

Connect the “SW” terminal of the panel unit to a 6-volt battery. Then, hook up a tank unit to the panel unit, making sure the No. 1 and No. 2 wires are connected to their respective terminals. Now, connect the tank unit case to the other battery terminal.

Allow a minute for the unit to warm up. It’s wise to shelter the unit from air currents during this test. Move the float to its “empty” position and allow time for the pointer to reach the “empty” mark on the gauge. If the pointer doesn’t quite make it, you can adjust it by loosening the two nuts on the “SW” terminal and moving the left-hand calibrating arm to the right. Move it to the left if the pointer goes beyond “empty”.

Now move the float to “full” position. Move the right-hand calibrating arm to the right to raise the indication, or to the left to lower it. Next, check the pointer setting by moving the float arm to “empty” again. You may have to readjust “empty” and “full” positions a couple of times until the gauge registers both indications correctly.

RECORD YOUR ANSWERS TO THESE QUESTIONS ON QUESTIONNAIRE NO. 95

If all the usual PowerFlite transmission checks are made and found to be okay, remove and inspect the front pump when a "no-drive" condition is reported.

1
RIGHT WRONG

There should be .0015" to about .0025" clearance between the face of the front pump housing and the faces of the gear and the pinion.

2
RIGHT WRONG

Besides excessive front pump clearance, a badly worn regulator valve body face can cause a "no-drive" condition.

3
RIGHT WRONG

Tighten pump housing screws to 17 foot-pounds so you will avoid warping a regulator valve body.

4
RIGHT WRONG

Backlash adjustment of the coaxial power steering should be checked and readjusted on all new cars at the 1000-mile inspection due to normal "wearing-in" of the parts.

5
RIGHT WRONG

Always make backlash adjustment with the power on and the steering linkage disconnected.

6
RIGHT WRONG

Low vacuum on the intake side of the fuel pump can cause stalling and hard hot-starting.

7
RIGHT WRONG

A high float level can cause stalling and hard hot-starting after the stall.

8
RIGHT WRONG

Testing the fuel gauge is mainly a matter of checking the circuit from ignition switch to the tank unit.

9
RIGHT WRONG

If the connections on a thermostatic fuel gauge panel unit are ever reversed, the gauge will register full when empty, and empty when full.

10
RIGHT WRONG