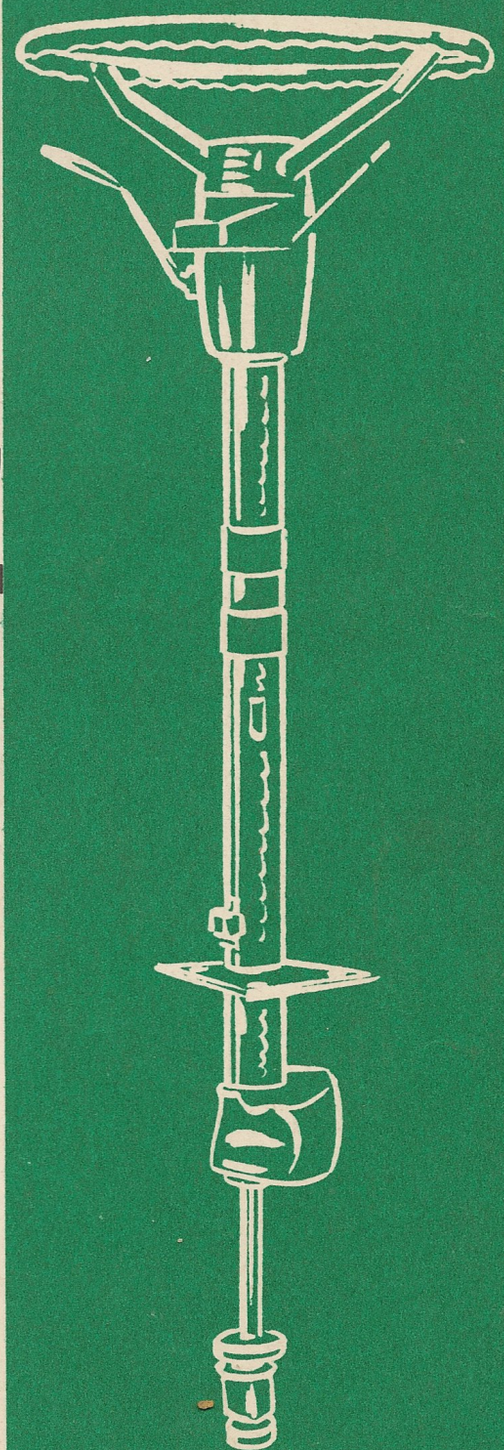
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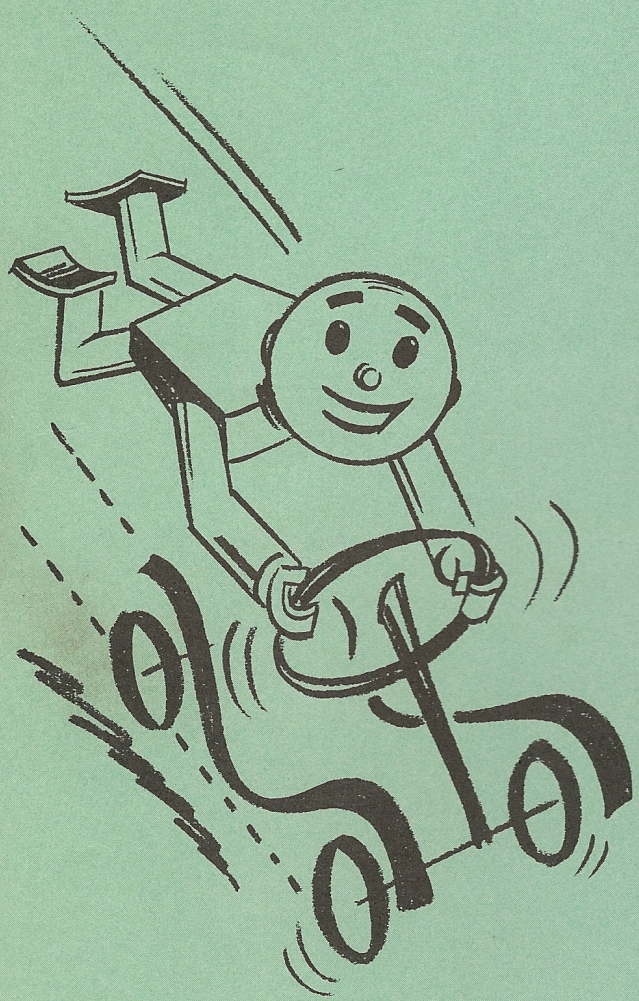
STEERING COLUMN SERVICE



CHRYSLER MOTORS CORPORATION

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Steering-column Comment



Right offhand we can't think of anything much more important in the operation of a car than gear selection and steering. The first two sections of this Reference Book deal with the new TorqueFlite steering-column shift linkage. The remaining section is devoted to steering-column alignment and other factors which affect steering ease and returnability.

When Tech reported that he was getting a lot of questions about the new TorqueFlite shift linkage, he suggested that it was time to review both shift cable and park-lock cable adjustments. As a matter of fact, this Reference Book covers just about everything connected with the shift linkage from the selector lever right down to the TorqueFlite manual shift valve and the park lock.

Of course steering-column alignment is very important since any interference or misalignment in the steering system affects both steering effort and returnability. The information on this important part of steering-column service will help you diagnose and correct steering problems traceable to the steering column. All in all, we are sure you'll find the information in this Reference Book both interesting and useful.

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TORQUEFLITE COLUMN-MOUNTED SHIFT CONTROL

If you understand exactly how a mechanism works, you'll find it easier to make the adjustments correctly and you'll do a lot better job of putting your finger on the cause of the trouble when it isn't working just right. Although there isn't anything particularly complicated about the new column-mounted TorqueFlite shift mechanism, it is a big change from the push-button control. You can get off on the right foot with the new column-mounted shift control by making sure you understand exactly how it works.

ONE SELECTOR LEVER FOR TWO CONTROL CABLES

The steering-column selector lever has to control two separate cables . . . the shift control cable and the park-lock cable. In other words, the selector lever has to do what five push buttons and a separate park-lock lever did on past models. Probably the easiest way to explain the shift linkage is to start at the manual shift valve in the transmission and trace the linkage back to the selector lever.

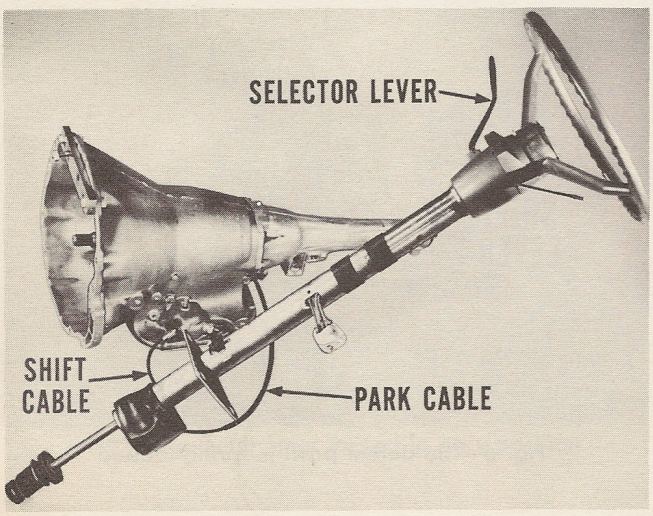


Fig. 1—The selector lever controls two cables

THE MANUAL VALVE LEVER HAS SIX DETENT POSITIONS

All 1965 models equipped with TorqueFlite, as well as all 1964 and 1965 TorqueFlite cars

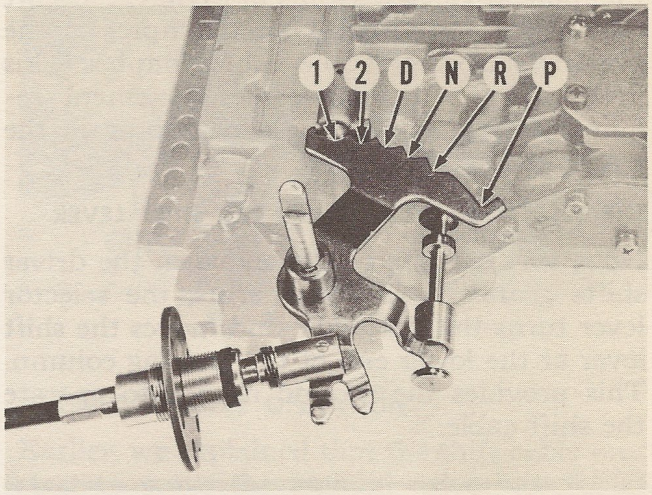


Fig. 2—Six-detent manual valve lever

equipped with console shift, have a six-detent manual valve lever instead of the five-detent lever used with push-button shift. The additional detent and manual valve position provided on column-shift cars is PARK.

SHIFT CABLE OVERTRAVEL SPRING

Because both the manual shift valve and the parking lock are controlled with a single selector lever, some means of moving the park lock after the shift valve reaches its limit of travel must be provided.

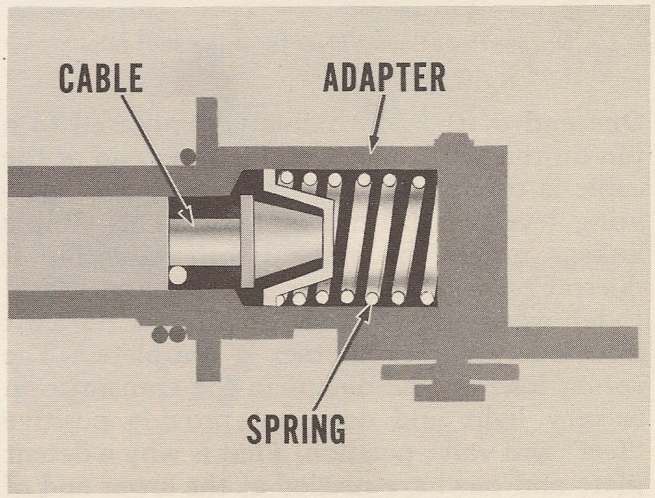


Fig. 3—Shift cable adapter with overtravel spring

The manual shift valve bottoms in the PARK position before the selector lever has moved the cables all the way into PARK. That is why the console models, as well as the column-shift models use a different shift cable and a cable adapter which has an overtravel spring. When the manual valve bottoms in PARK, the shift cable keeps on moving and compresses the overtravel spring in the cable adapter. This permits the park-lock cable movement required to control the park-lock sprag in the transmission.

THE SELECTOR LEVER MOVES THE SHIFT LEVER

Now, let's see what happens when the driver shifts gears. In simplest terms, the selector lever turns the shift tube and moves the shift lever at the lower end of the steering column. This provides the motion needed to operate the shift cable.

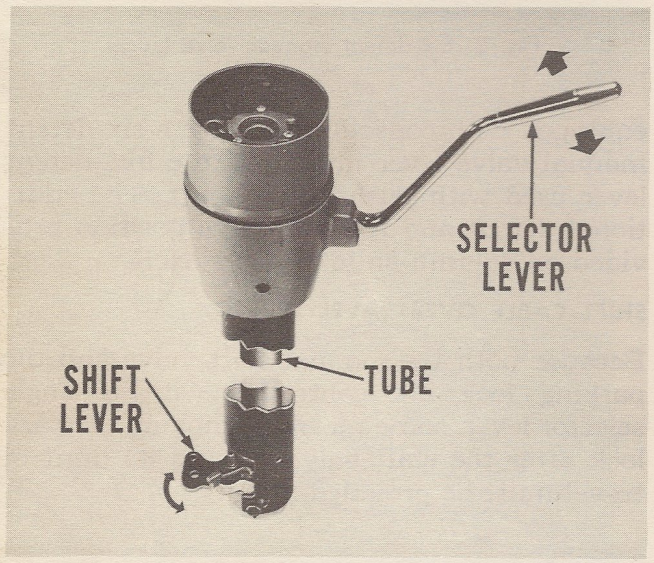


Fig. 4—The selector lever turns the shift tube

One end of the shift cable is connected to a pin on the shift lever and the other end of the cable is connected to the manual valve operating lever in the transmission. This simple linkage moves the manual shift valve but it doesn't provide the driver the necessary "feel" to tell what range he is in or whether the shift from one range to another is completed. The spring load on the detent in the transmission is very light and does not provide positive "feel" and valve position. That is why a detent plate and pawl are needed at the lower end of the steering column.

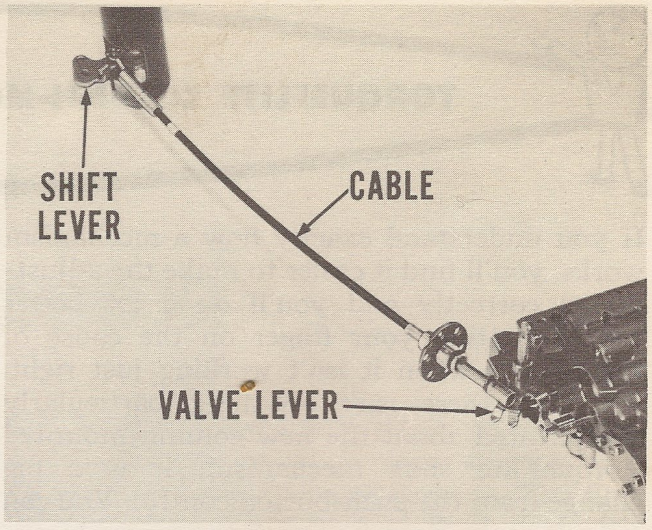


Fig. 5—The shift lever controls the manual valve lever

THE DETENT PLATE AND PAWL

The detent pawl is spring-loaded so that it drops into each of the notches in the detent plate as the shift lever is moved. The detent plate and pawl insure a positive positioning of the shift cable and manual shift valve for each driving range. It also lets the driver "feel" the completion of each gear selection.

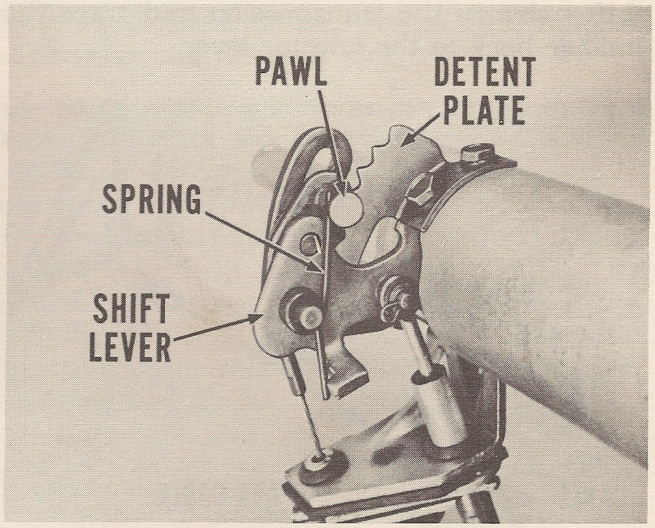


Fig. 6—The detent pawl is spring-loaded

THE SHIFT GATE MECHANISM

The gate mechanism at the upper end of the steering column minimizes the possibility of accidentally shifting into REVERSE or PARK. Since you have to lift the selector lever against spring force to shift into REVERSE, LOW or SECOND, there isn't much

chance of accidentally shifting into one of these ranges.

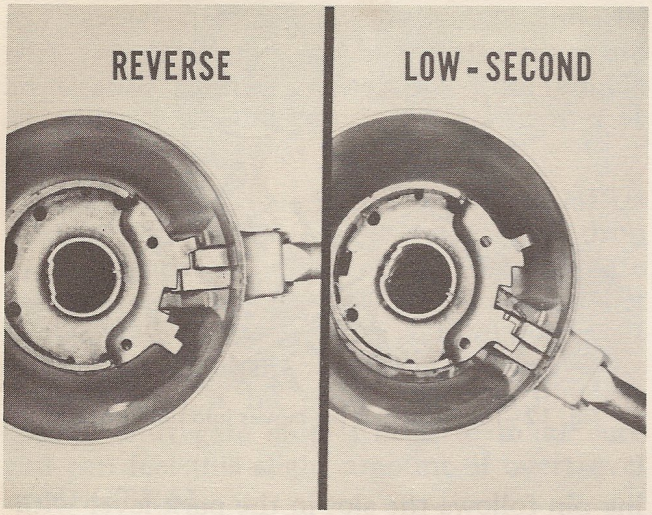


Fig. 7—Reverse, low and second gates

To get into PARK you have to lift the selector lever even more and against greater spring force. The stop between PARK and REVERSE keeps you from getting into or out of PARK accidentally.

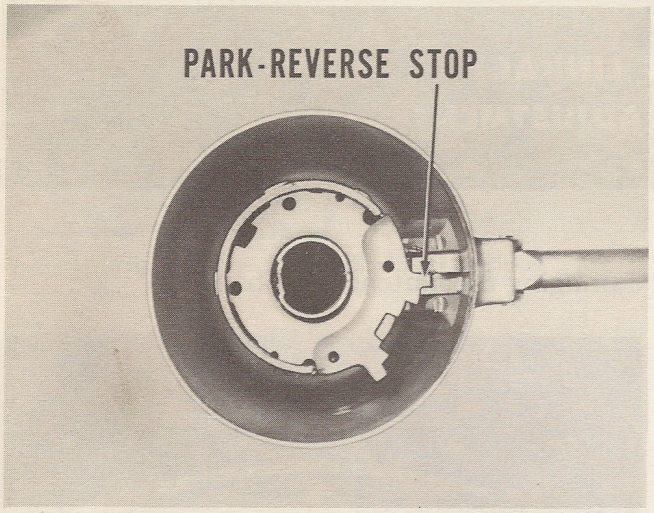


Fig. 8—Selector lever locked in park position

Of course the gate mechanism lets you shift between NEUTRAL and DRIVE by simply moving the selector lever up or down. After you have driven a car with the column-mounted selector lever a few times, the gate mechanism tells you what range you are in without even looking at the shift indicator. Next, let's consider the park-lock linkage.

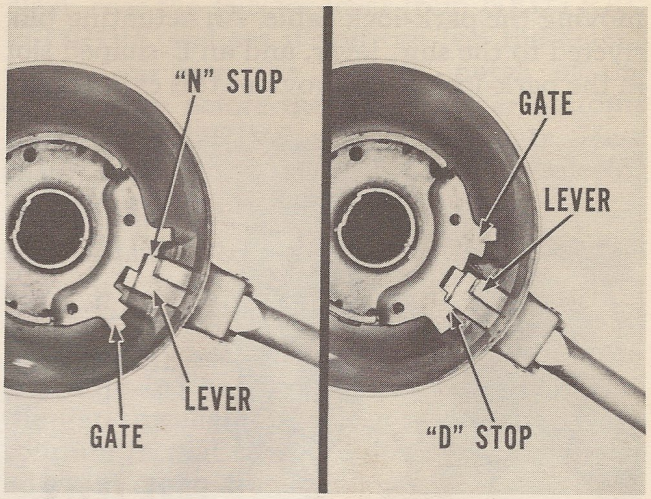


Fig. 9—Neutral and drive

PARK-LOCK LEVER OPERATION

Earlier, we explained that the shift cable must start to move the manual valve into PARK before the park-lock cable starts to move. That's because the manual shift valve must move past REVERSE and into PARK, shifting the transmission into neutral, before the park-lock sprag is engaged. In other words, the park-lock cable must not move until the manual shift valve is bottomed in the PARK position. The overtravel spring arrangement in the shift cable adapter allows the shift cable to keep moving after the shift valve has bottomed in the PARK position. Now, let's see how the park-lock cable is activated.

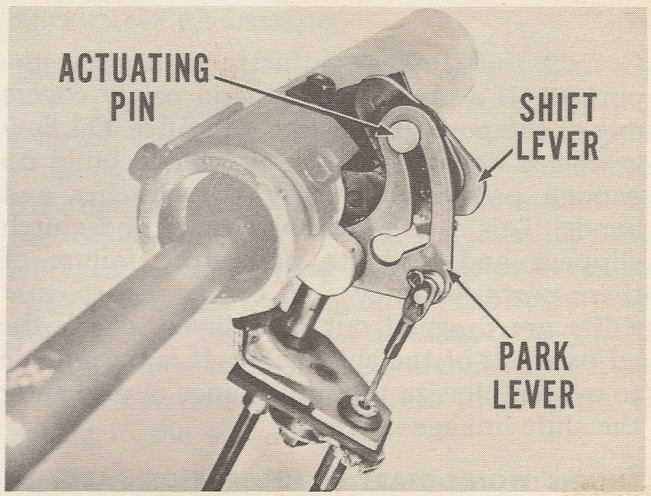


Fig. 10—The park-lock lever provides a cam action

The park-lock lever provides a cam action which allows the shift cable to move without

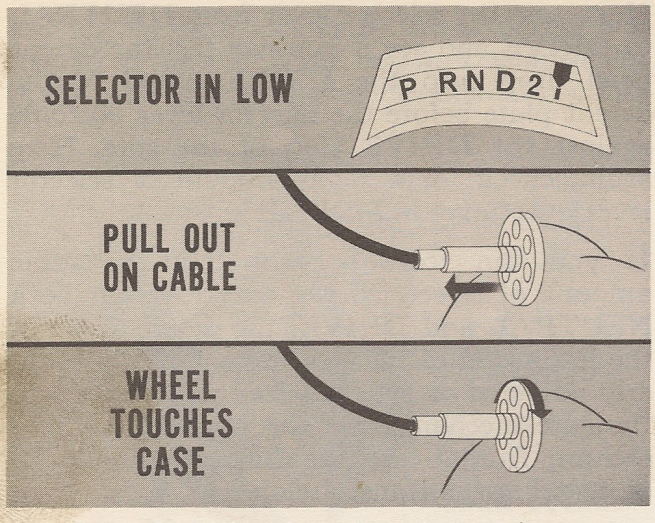


Fig. 17—Hold selector lever in low when adjusting shift cable

Turn the adjusting wheel clockwise until it just touches the transmission case. Be sure the cable is held at right angles to the machined surface on the transmission case so that the adjusting wheel contacts the case squarely.

Next, turn the adjusting wheel counterclockwise just enough to line up the first hole in the adjusting wheel with the screw hole in the case. Count the first hole that lines up with the screw hole as number one and turn the wheel counterclockwise until the fifth hole lines up with the screw hole in the case. Install the lock screw and tighten it to 75 inch-pounds.

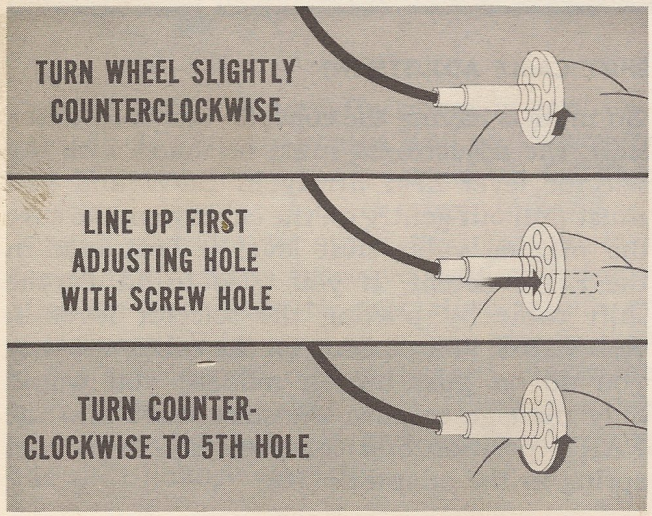


Fig. 18—Back off to hole number five

IT COULD BE THE VALVE BODY

If adjusting the shift cable doesn't correct the "won't start in PARK" problem, don't misadjust the shift cable so that it will start in PARK. Instead, drain the transmission, drop the pan and check to see what the neutral safety switch operating fingers on the manual shift lever are doing. Check to make sure the NEUTRAL finger contacts the center of the switch when the shift lever is in the NEUTRAL detent. Next, make sure the PARK finger contacts the center of the switch when the lever is in the PARK detent.

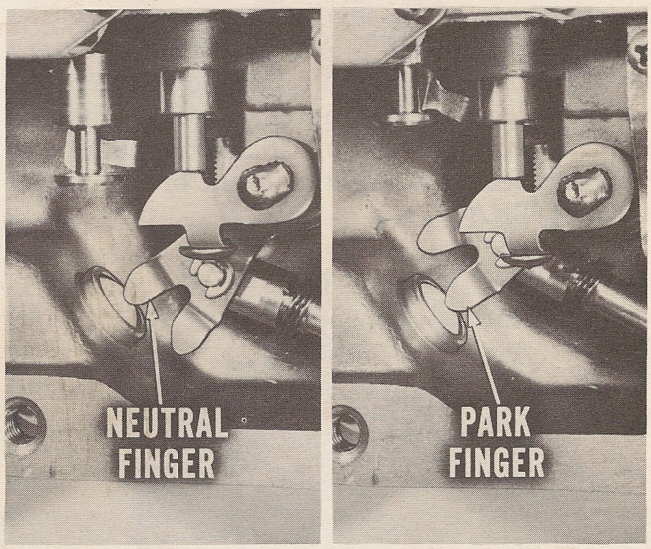


Fig. 19—Check neutral safety switch

If the NEUTRAL and PARK fingers do not center on the neutral safety switch, it will be necessary to reposition the valve body. To do this, loosen the ten valve body attaching bolts just enough to allow you to move the valve body. Be sure and readjust the shift cable after you align the valve body. Incidentally, any time you service a valve body you should make sure that it is properly positioned with respect to the neutral safety switch before you install the pan.

ADJUSTMENTS AT LOWER END OF COLUMN

There are two important adjustments at the lower end of the steering column . . . the park lever pivot adjustment and the detent plate adjustment. The park lever pivot should always be correctly adjusted before attempting to adjust the detent plate. Here's why.

If the park lever pivot is overadjusted, the actuating pin will bottom against the slot in the pivot lever before the shift lever bottoms

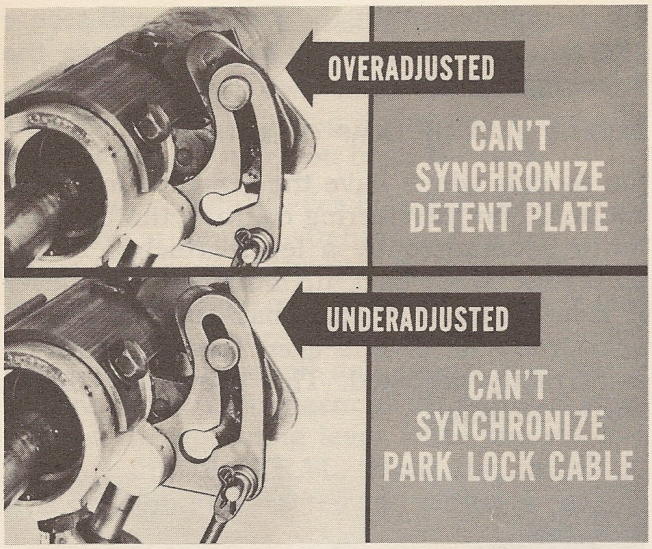


Fig. 20—Park lever pivot adjustment is important

against the LOW stop of the gate. If that happens, you won't be able to adjust the detent plate so that it is synchronized with the gate stops. If the pivot is underadjusted so that the actuating pin isn't tight against the end of the slot when the selector lever is in LOW, you won't be able to synchronize the park-lock cable and the detent plate adjustments.

PARK-LOCK CABLE ADJUSTMENT

Loosen the park-lock lever pivot screws. Have someone hold the selector lever *firmly* in LOW. This establishes the actuator pin position correctly with respect to the LOW stop of the gate mechanism.

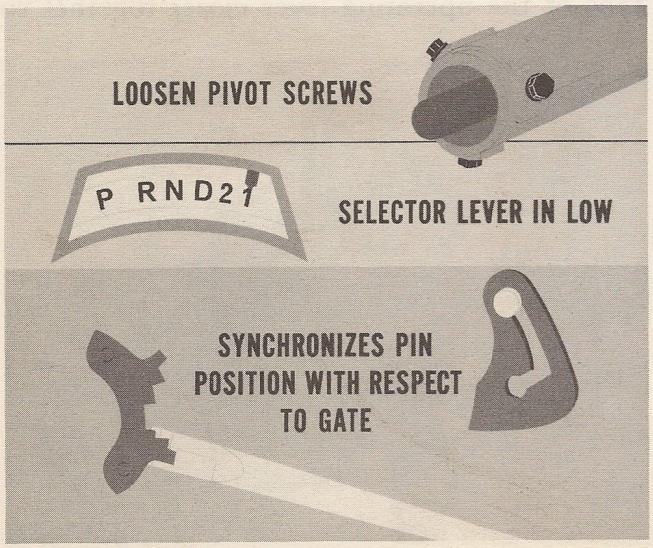


Fig. 21—Synchronize pin with respect to gate

While the selector lever is still held firmly in LOW, turn the park lever pivot until the end of the slot is tight against the actuating pin. Hold the pivot in this position and tighten the attaching screws.

DETENT PLATE ADJUSTMENT

First, make certain that the park-lock lever pivot is correctly adjusted. The only way to be absolutely sure it is correctly adjusted is to loosen the attaching screws and adjust it as described in the preceding paragraph. To adjust the detent plate, loosen the attaching screws and align the LOW detent notch in the detent plate with the spring-loaded detent pawl. When correctly adjusted, the pawl must be bottomed in the LOW detent notch when the selector lever is held firmly in LOW. A few cases have been reported where the elongated holes in the detent plate weren't quite long enough to allow correct adjustment. You can easily correct this condition by elongating the holes a bit more with a file.

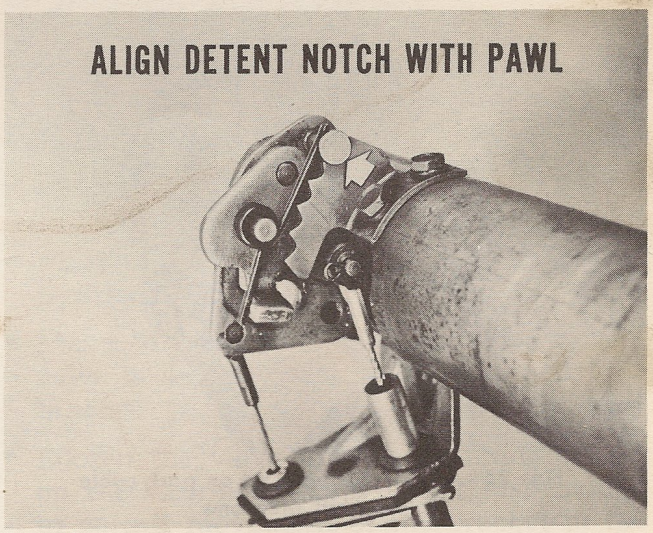


Fig. 22—The pawl must bottom in the low detent notch

PARK-LOCK CABLE ADJUSTMENT

Put the selector lever in NEUTRAL. Loosen the cable clamp bolt and pull out *gently* on the park-lock cable housing . . . just enough to take all of the slack out of the cable. Release the cable housing and tighten the clamp bolt.

CAUTION: Don't tighten the clamp bolt while you are pulling outward on the cable housing. If you do, you'll put a compression load on the cable and the park-lock lever at the

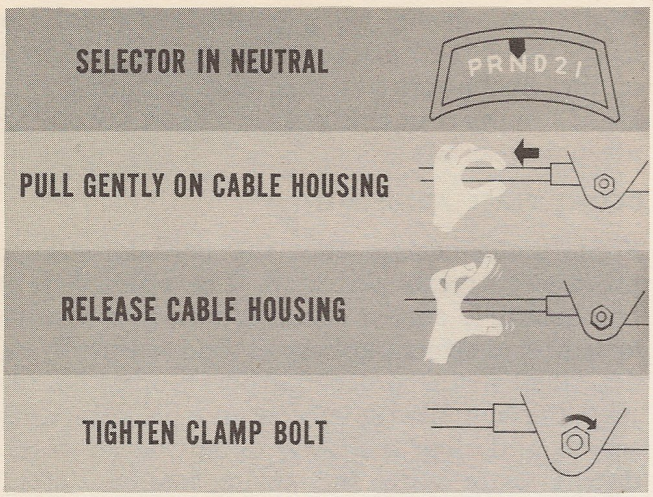


Fig. 23—Park-lock cable adjustment

lower end of the steering column. This will push the pivot lever slot against the actuating pin and cause roughness and binding in the shift linkage.

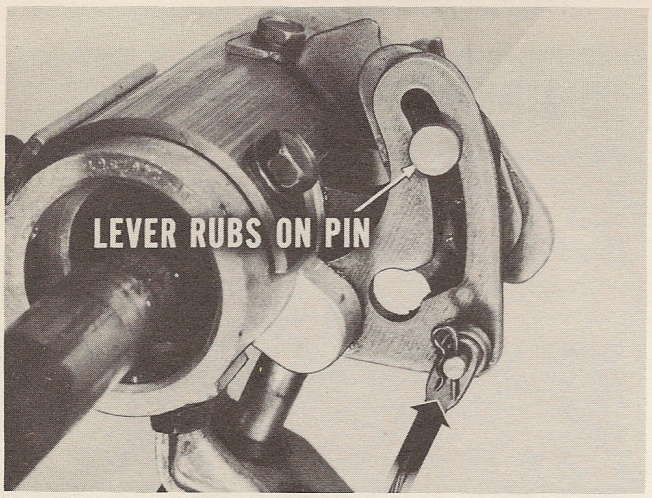


Fig. 24—A compression load on park cable causes shift problems

"LOSS OF GATES" CONDITION

If for any reason the selector lever housing is loose on the shift tube, the gate mechanism will not function properly. That's because the loose housing drops down so that the end of the selector lever does not engage the stops in the gate plate. If the condition cannot be corrected by tightening or replacing the Allen-type lock bolt in the housing, remove the steering-column assembly and inspect the tube and the housing. The steering tube must not fit too loosely in the housing. It must be tight enough so that the lock bolt will secure the housing to the tube by cutting into the tube slightly when it is installed and tightened.

ERRATIC BACK-UP LAMP OPERATION

On models which have the gearshift indicator mounted on the steering column, the back-up lamp is actuated by a lever attached to the shift tube. If the back-up lamp operating lever is loose on the shift tube, back-up lamp operation may be erratic even when the switch is correctly adjusted. This condition can be easily corrected.

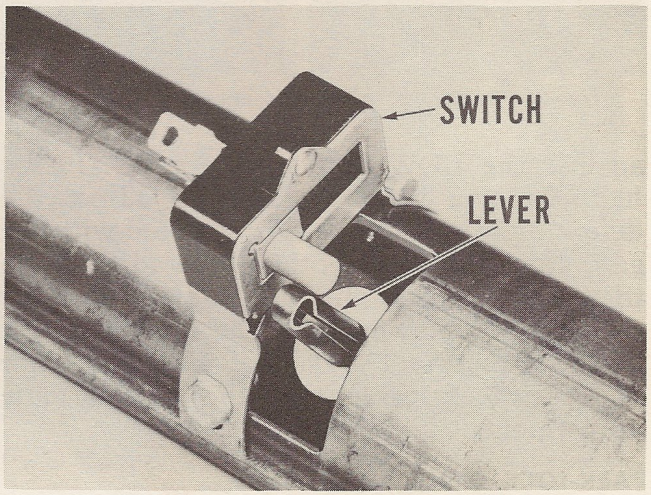


Fig. 25—Backup lamp switch and operating lever

Remove the back-up lamp switch. Lift the retaining washer from the switch operating lever, then unsnap the lever from the gearshift tube. Use a vise to squeeze the two retaining tabs of the operating lever closer together so

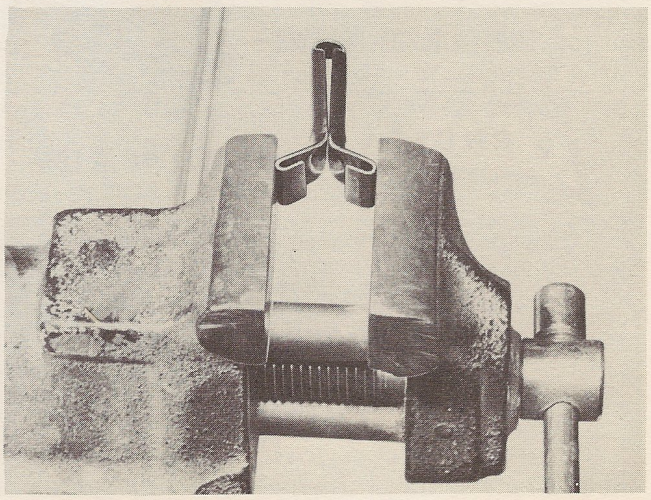


Fig. 26—Bend the switch operating lever retaining tabs

they will grip the gearshift tube tightly. Do not attempt to bend the operating lever tabs with pliers or you may bend them too far and ruin the lever. By using a vise you can easily control the amount you bend the tabs.

Place the gearshift lever in NEUTRAL. Snap the back-up lamp switch operating lever into place on the gearshift tube. Slide the retaining washer into place on the operating lever and check to make sure the lever is tight on the gearshift tube. Install and adjust the switch so that the actuating arm of the switch is snug against the operating lever when the selector lever is in NEUTRAL. Hold the switch in this position and tighten the retaining screws.

IMPERIAL PARKING BRAKE VACUUM RELEASE VALVE

The Imperial parking brake vacuum release device is designed to open the vacuum valve and release the parking brake when the engine is running and the transmission is shifted into any forward or reverse gear. When the transmission is in NEUTRAL or PARK, the vacuum valve is closed so that the parking brake is *not* automatically released when the engine is started.

The opening and closing of the vacuum release valve is controlled by a lever which is attached to the shift tube. This valve actuating lever has two cams; one closes the valve in NEUTRAL, the other closes the valve in PARK. If the vacuum valve is not correctly adjusted or if the actuating lever becomes bent, one or more of the following conditions may result:

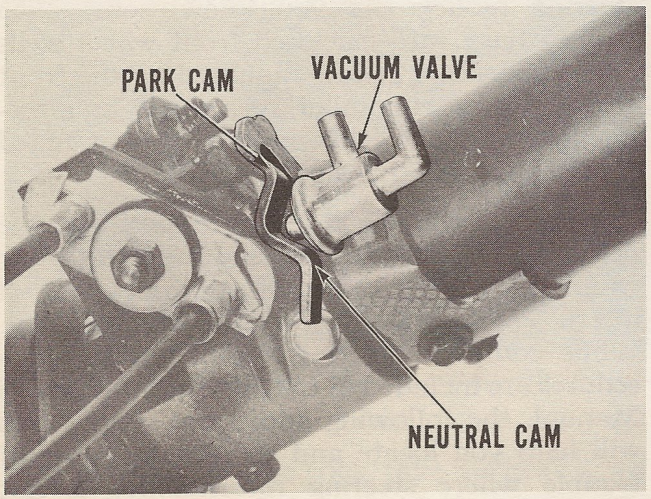


Fig. 27—Parking brake vacuum release valve

- An annoying continuous vacuum leak hissing noise in drive or reverse shift positions.
- The parking brake will not remain applied when the selector lever is in the PARK position and the engine is running.
- The parking brake will not remain applied when the selector lever is in the NEUTRAL position with the engine running.

Vacuum Release Valve Adjustment: If any of the above conditions exist, the following adjustment procedure should be followed:

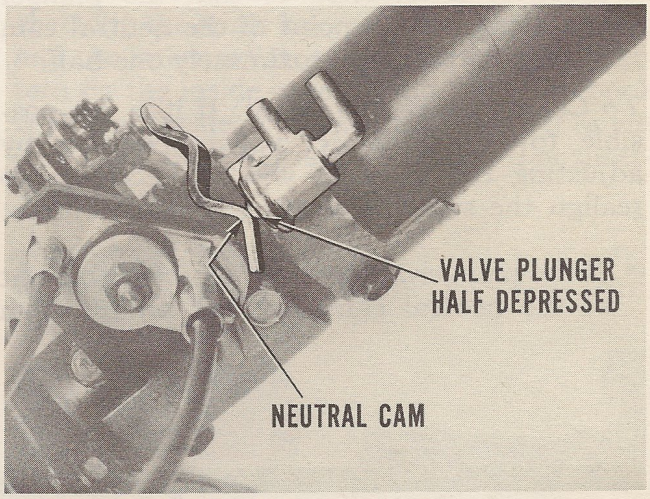


Fig. 28—Check the vacuum valve adjustment

- Place the gearshift lever in the NEUTRAL position.
- Make sure the vacuum park brake release valve is securely fastened to its mounting bracket.
- Loosen the valve bracket retaining screws on the steering-column jacket just enough to permit movement of the bracket in the oversized holes. Position the bracket and valve assembly on the steering-column jacket so that the valve plunger is visibly on the high point of the neutral cam and about half depressed.
- Tighten the bracket retaining screws, making sure the vacuum valve assembly does not shift as the screws are tightened. The plunger should remain halfway depressed when the screws are tightened.

Check The Vacuum Valve Adjustment: After adjusting the vacuum valve, check for correct

operation as follows:

- Shift the hand lever through all shift positions. The valve plunger must be depressed on the high points of the cam in NEUTRAL and PARK, but must not touch the neutral cam in either DRIVE or REVERSE.
- If the plunger touches the neutral cam in either drive or reverse with the engine running, a continuous hissing noise will be evident.
- In order to correct this condition, the valve must be re-adjusted so that the plunger contacts the high point of the neutral cam and is depressed approximately one-half.

To Correct Cam Alignment: If it is not possible to obtain correct valve operation by adjusting the valve, it will be necessary to realign the switch operating cam as follows:

- If the plunger is depressed on the high point of the neutral cam, but not on the high point of the park cam, then the cam is out of plane and the foot lever will not latch in the park shift position with the engine running.
- To correct this condition, the cam may be carefully bent with pliers away from the plunger so that the plunger depresses equally on the high points of the neutral and park cams.

  CAUTION: Extreme care must be taken in bending the cam. Should the cam be damaged, the entire shift tube must be replaced.
- On the other hand, if the cam is out of plane so that the plunger contacts the park high point, but not neutral, then the foot lever will not latch in the neutral shift position with the engine running.
- Again the cam must be bent, but toward the plunger under these conditions.
- After final adjustment is made, it is important to recheck the valve operation.



STEERING-COLUMN ASSEMBLY ALIGNMENT

Any interference or misalignment in the steering system will reduce steering returnability.

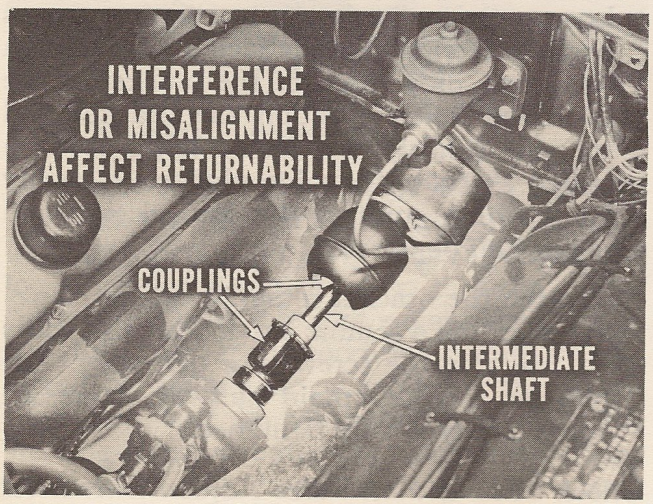


Fig. 29—Freedom from binding is very important

Good alignment and complete freedom from binding is particularly important on power steering models. As you know, some 1965 models have fully enclosed front wheel wells and the steering gear is mounted on the front suspension crossmember. As a result, an intermediate shaft and a second coupling was added between the steering shaft and the gear.

In order to insure good returnability, the angle between the intermediate shaft and the lower coupling must be held to a minimum and all interference or binding must be eliminated. While complete steering system service procedures are included in the appropriate Service Manual, the following additional service tips will help you locate and correct the cause of trouble where steering returnability is not satisfactory.

STEERING SHAFT BINDING AND BEARING PRELOAD

Steering shaft friction or binding is a possible cause of poor returnability. Although such a binding condition is not common, it is important to avoid building in such a condition when servicing the steering-column assembly. Excessive friction may possibly be caused by bearing preload or misalignment, an improperly installed upper bearing snap ring, a displaced bearing insulator, or interference between the steering shaft and the column-mounted shift components. For example, a park-lock lever pivot screw that is too long will rub on the steering shaft and contribute to steering problems.

Bearing preload is easily relieved by tapping the upper end of the steering shaft with a soft-faced hammer *before* you install the steering-column assembly. You can accomplish the same thing on the car by using a hammer and a brass drift.

RUBBER COUPLING HEAT SHIELD INTERFERENCE

A heat shield that is bent or positioned so that it rubs on the rubber coupling at the lower end of the steering column can cause returnability problems. Heat shield interference can also damage the horn ground wire. You can usually correct this condition by simply lifting up on the heat shield to eliminate the interference between the heat shield and the coupling.

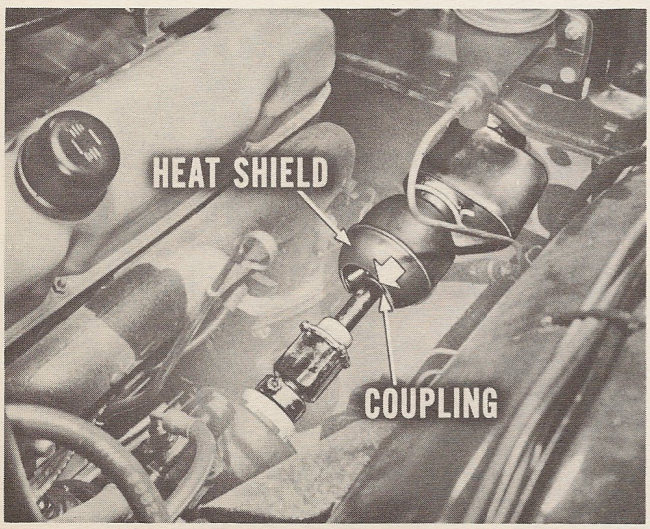


Fig. 30—Make sure the heat shield is correctly positioned

If this doesn't do the trick, take the heat shield off and reshape the neck of the shield just enough so that it will not rub when reinstalled. When installing the heat shield, make sure it is positioned correctly and attached securely. Whatever you do, do not leave the heat shield off. If the rubber coupling is not shielded from the manifold heat, it will become excessively hard and its service life will be greatly reduced.

INTERMEDIATE SHAFT ANGULARITY

Excessive angularity between the intermediate shaft and the lower coupling greatly increases friction and affects steering effort and returnability. The angle should be as close to zero as possible. You can easily make a template for checking the angle between the lower coupling and the intermediate shaft. The template pattern on the inside cover of this reference book is to exact scale. You can either trace it or cut it out and use it to make a hardboard or sheet-metal template.

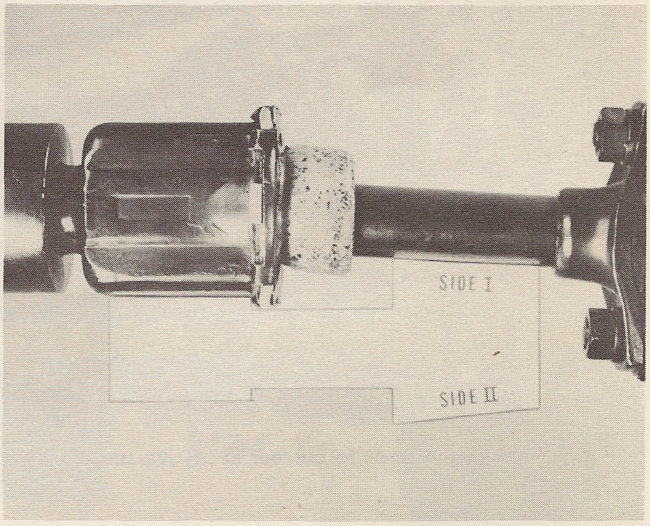


Fig. 31—Use template to test shaft angularity

Ideally, the angle between the coupling and the shaft should be no greater than the template angle marked "SIDE 1". Under no circumstances should the angle be any greater than SIDE 2 of the template.

CORRECTING INTERMEDIATE SHAFT ANGULARITY

If the angle between the lower coupling and the intermediate shaft is excessive, perform the following corrective operations:

- Loosen the steering gear mounting bolts and add .090" shim under the upper inboard mounting lug. *Do not* add more than

.090". If you find that a shim has already been installed in this position, *do not* add a second shim.

- Loosen the toe-board column support plate screws. Move the lower end of the column assembly to minimize the coupling angle and retighten the support plate screws.

- On Chrysler models, adjust the cowl to upper column attaching brace in order to match the upper column jacket to the instrument panel. This requires loosening of the 4 bolts on the cowl to upper column attaching brace, adjusting the upper end of the column assembly as required, and retightening the 4 bolts.

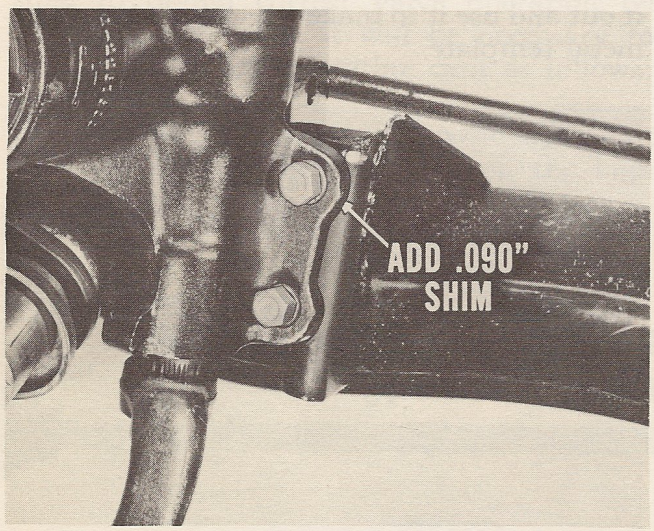


Fig. 32—Shim the gear to correct excessive angularity

POSITION OF INTERMEDIATE SHAFT IN LOWER COUPLING

The intermediate shaft must be positioned in the lower coupling so that it won't bottom and cause a binding condition when the steering wheel is turned. When correctly positioned, the gauge hole in the intermediate shaft should be 13/16 of an inch above the upper face of the coupling.

If the intermediate shaft is not correctly located in the coupling, loosen the steering column attachments so you can move it up or down to obtain the required 13/16" dimension. Be sure and use angularity template to check the intermediate shaft alignment any time you loosen and retighten the steering-column assembly.

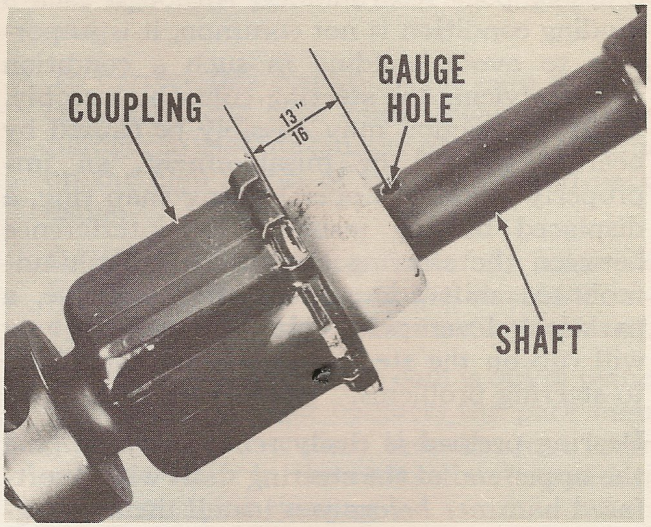


Fig. 33—Measure from coupling to gauge hole

VALIANT-DART STEERING COUPLING

Valiant and Dart models do not have an intermediate steering shaft. On these models, as well as Dodge Coronet and Plymouth Belvedere, the steering shaft is coupled to the steering-gear worm shaft. On Valiant and Dart models equipped with power steering and either TorqueFlite or manual transmission with column-mounted shift, the gauge hole in the steering shaft is concealed by the seal at the lower end of the steering column. Therefore, the gauge hole cannot be used as a reference for centering the steering shaft in the lower coupling.

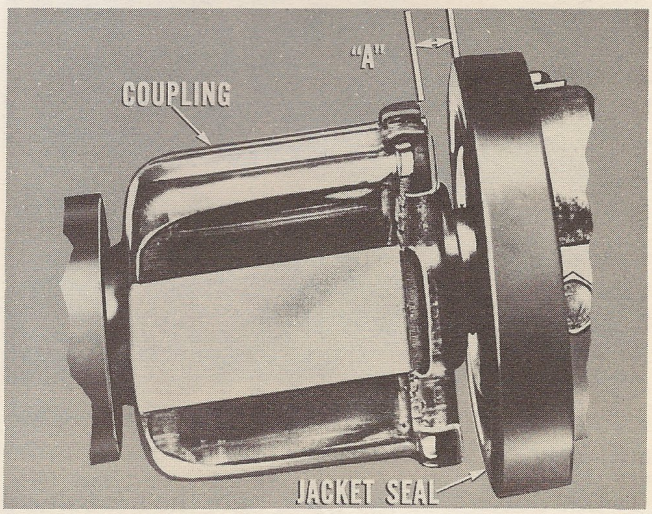


Fig. 34—Valiant and Dart with power steering

TorqueFlite Models With Power Steering: On these Valiant and Dart models, the steering column should be positioned so that upper face of the coupling is 1/2-inch below the lower face of the column jacket seal. This is designated as "DIMENSION A" in the accompanying illustration.

Three-Speed Manual With Power Steering: On these Valiant and Dart models, the correct spacing from the upper face of the coupling to the lower face of the column jacket seal is 3/16 inch.

CAUTION: If the bolts which attach the floor plate to the toeboard are too long, it may not be possible to move the column assembly up enough to obtain the 3/16- or the 1/2-inch dimension required on the models discussed above.

Manual Steering Models: Valiants and Darts equipped with manual steering, and those equipped with power steering and four-speed transmission, have the gauge hole readily visible. On these models the steering column should be located so that the gauge hole is 13/16 inch above the upper face of the coupling.

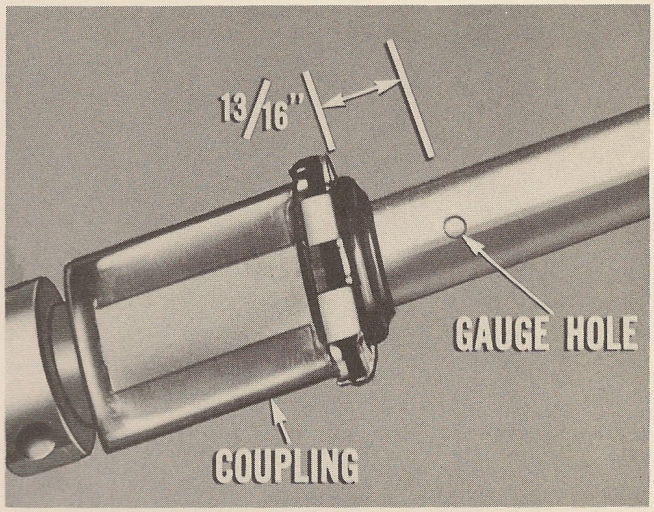
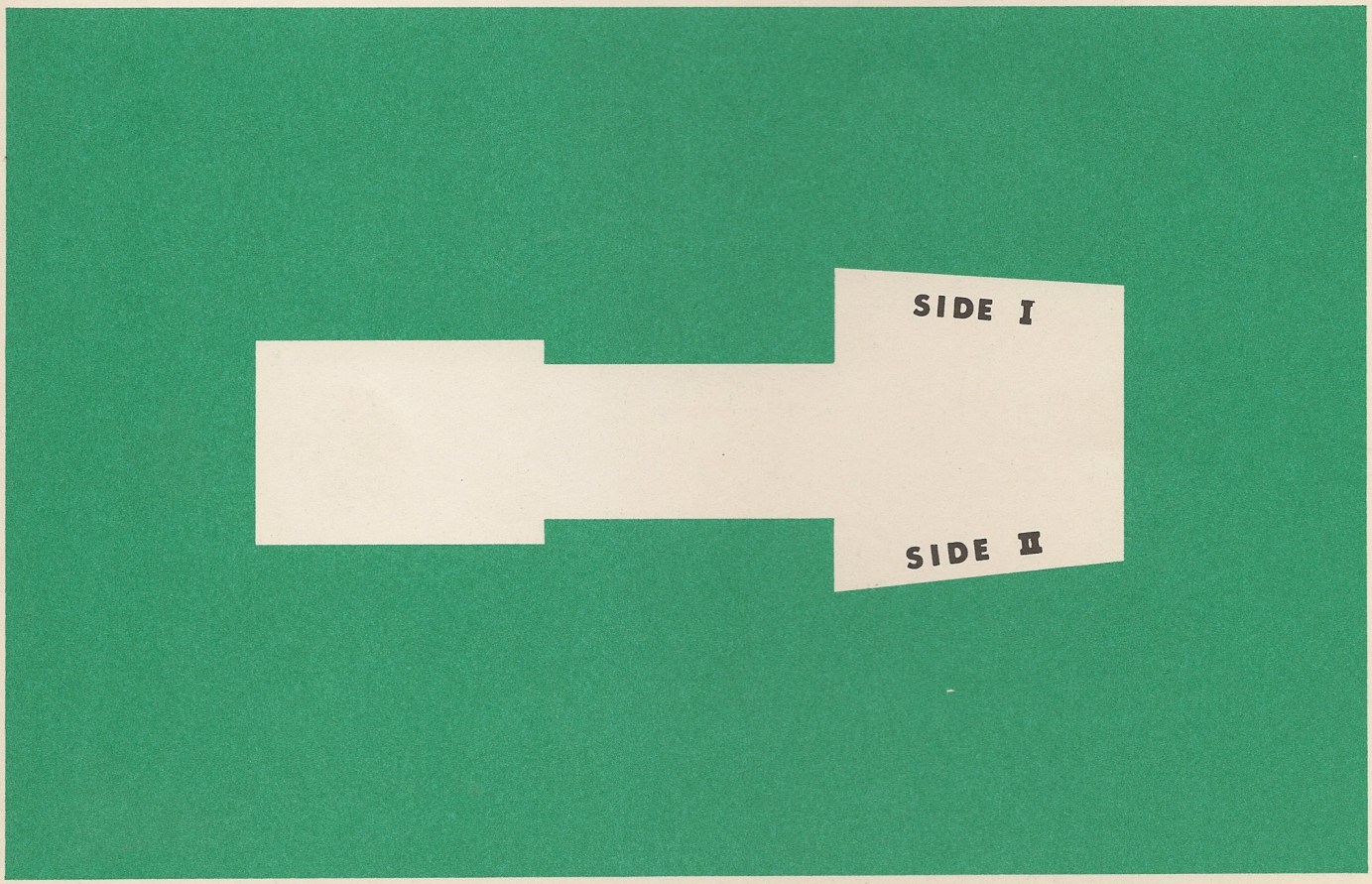


Fig. 35—Valiant and Dart with manual steering



PATTERN FOR INTERMEDIATE SHAFT ALIGNMENT TEMPLATE