



GENERAL DESCRIPTION

The Positraction unit used on the 1957-1962 Corvettes is a multi-plate, four pinion unit which provides controlled driving power to the wheel with best

traction. Two types of plate stack-up were used: 1957 through early 1960, four-plate; late 1960 through 1962, five-plate with Belleville.

SERVICE OPERATIONS

Removal

Refer to the 1961 Passenger Shop Manual, Section 5-7 for carrier removal.

Disassembly

Before disassembly, check the clearance between the pinion mate shaft "V" and the cam surface in the case. This must be done using shim stock or feeler gauges under both sides of the "V" on both ends of the pinion mate shaft at the same time. Note that this involves placing feeler gauges at four positions (Fig. 34). As closely as possible, the same thickness feeler gauge must be used at all four positions. The clearance of the maximum feeler thickness at each of the four positions on original 1957 to 1959 units without Belleville plate should not exceed .015" (Fig. 35). Both pinion mate shafts must be checked in this manner.

NOTE: On 1957 to 1959 units with Belleville conversion, and on all 1960 units, there should be no clearance (metal to metal).

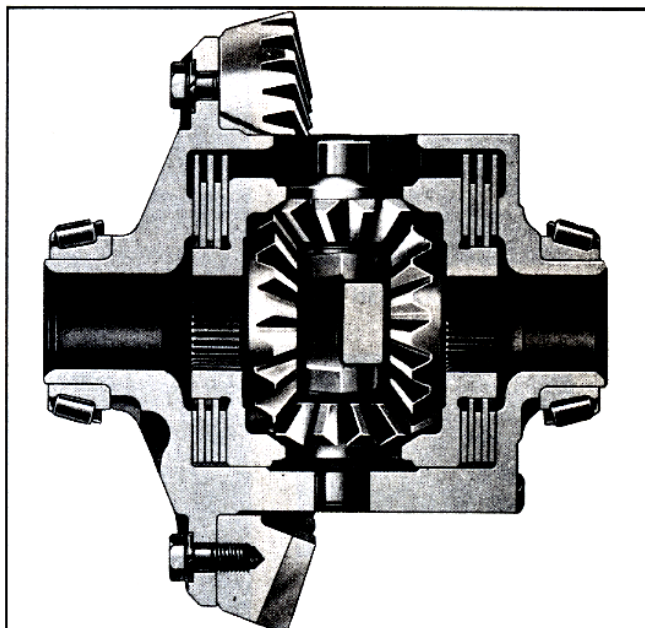


Fig. 33—Positraction Differential—Cross-Section—1960-1962

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Fig. 34—Checking Shaft and Ramp Clearance

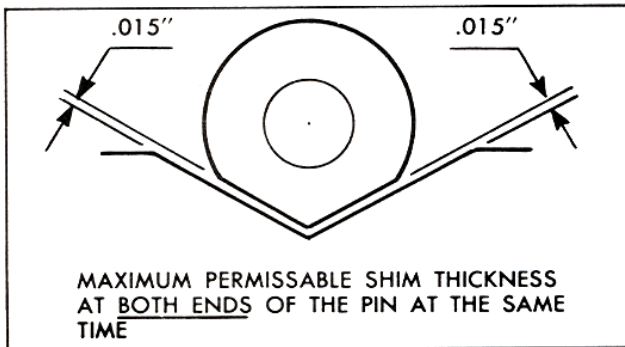


Fig. 35—Pinion Shaft Clearance

If a clearance of more than .015" on 1957, 1958 and 1959 units without Belleville (dished) plate, or zero on converted and 1960 units is found, the unit should be disassembled as follows:

NOTE: If clearance is found to be excessive on the 1957 to 1959 original units, installation of the Belleville plate conversion is suggested.

1. Check that the differential case halves are marked with a number or letter to aid aligning the case when assembling. If not, scribe an alignment mark as shown in Fig. 36.
2. With unit on bench, remove eight bolts securing the end case to the ring gear case.

NOTE: Bolts used to assemble 1960 units with the number 22159X or 22158X stamped on end case are left hand thread. All others are right hand.

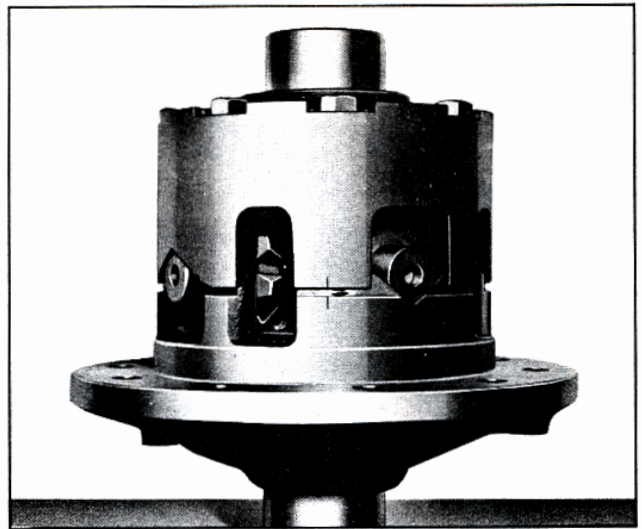


Fig. 36—Differential Case Alignment Marks

3. Remove end case.
4. Remove clutch plates from side gear retainer and note the relation of these clutch plates.
5. Remove side gear retainer and side gear.
6. Remove pinion mate shafts and gears.
7. Remove remaining side gear, side gear retainer and clutch plates.

Cleaning and Inspection

All parts, before reassembly, must be clean and free from all foreign substance. All parts must be inspected. See that there are no worn, cracked or distorted clutch plates. All parts must be free of nicks, burrs, or any imperfections that will reduce of this unit. Lubricate all the special lubricant.

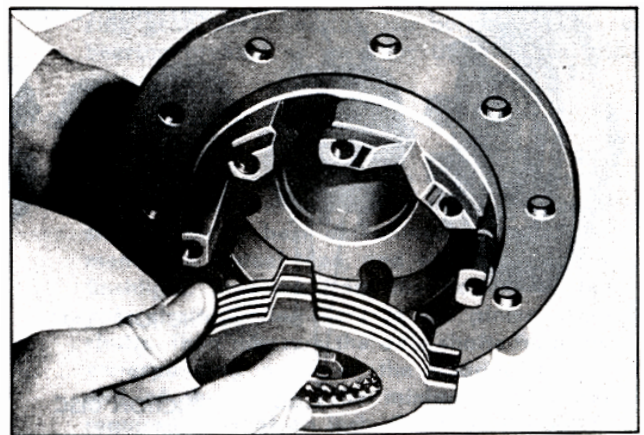


Fig. 37—Installing Clutch Plates

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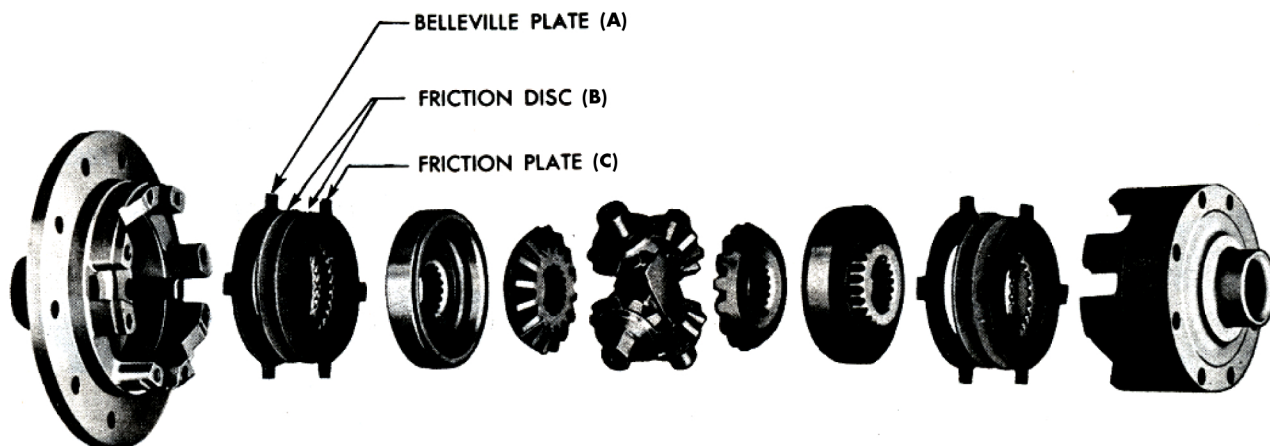


Fig. 38—Four Stack Plate Arrangement

Assembly

1. Hold ring gear half of case on its side, Fig. 37. Install side gear retainer and clutch plates as follows.

NOTE: Clutch stack may be varied for certain driving conditions. See "Clutch Stack Arrangement."

Four Slack Units

- A. Belleville type (dished) plate, positioned so concave side rests against case.
- B. Two internally splined plates.
- C. Eared clutch plate (flat plate) against side gear ring.

Five Stack Units (Fig. 39)

- A. .096/.094 Belleville friction plate.
- B. Two internally splined plates.
- C. .096/.094 friction plate.
- D. .061/.059 friction plate against case.

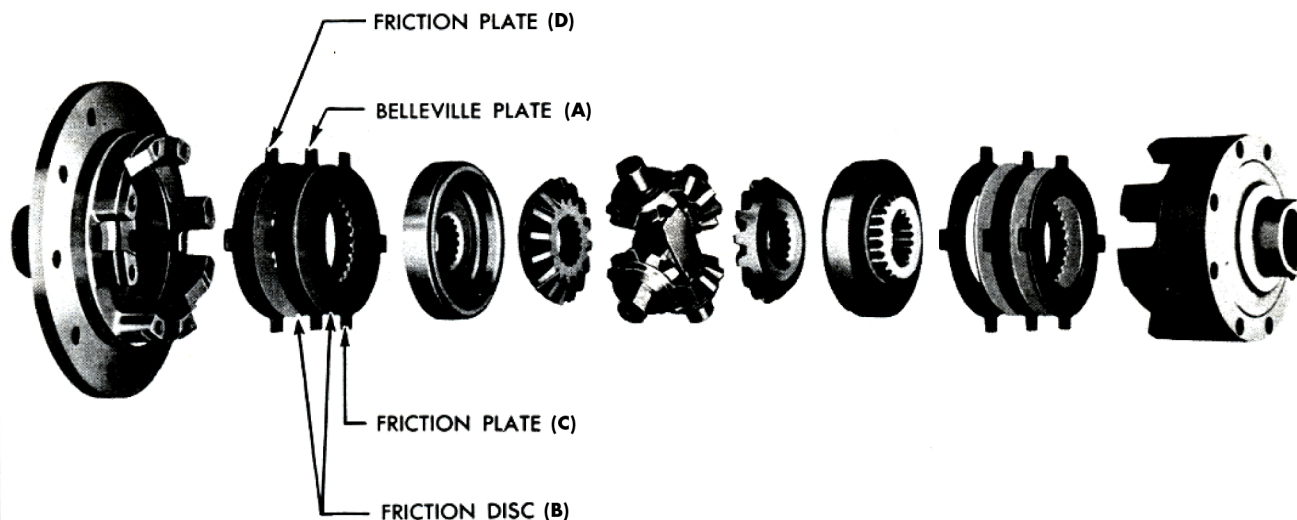


Fig. 39—Five Stack Plate Arrangement

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Make sure the side gear retainer will rotate with a slight drag when in the case. Repeat for opposite side.

2. Install side gear on ring gear case half.
3. With the ring gear case half of the differential case in a vertical position, install one mate shaft and gears as shown in Fig. 40. Make certain that notch in shaft is up, and shaft is 90° from "V" notches in case.

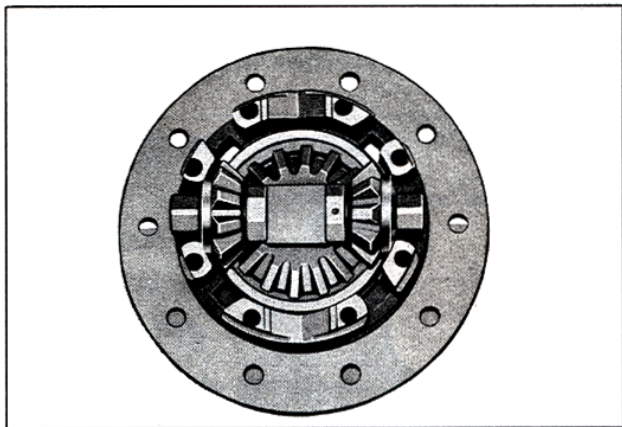


Fig. 40—Installing Male Shaft

4. Install remaining shaft and gears over the first with the center notch down, as shown in Fig. 41.
5. Install side gear in other half of case.
6. Hold the remaining end case through the bearing trunnion and install it on the ring gear flange half as shown in Fig. 42. Make certain that identification marks are in alignment.
7. Tighten eight attaching bolts evenly to 35-45 foot-pounds torque to avoid di
On some units, it will be necessary to turn bolts until bolt head flats are tangent to O.D. of case (Fig. 34) in order to install ring gear.
8. Check the clearance between each pinion mate shaft and the "V" of the case as follows:

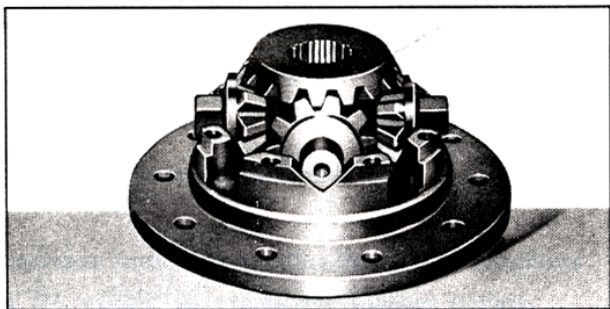


Fig. 41—Pinion and Side Gear Installation

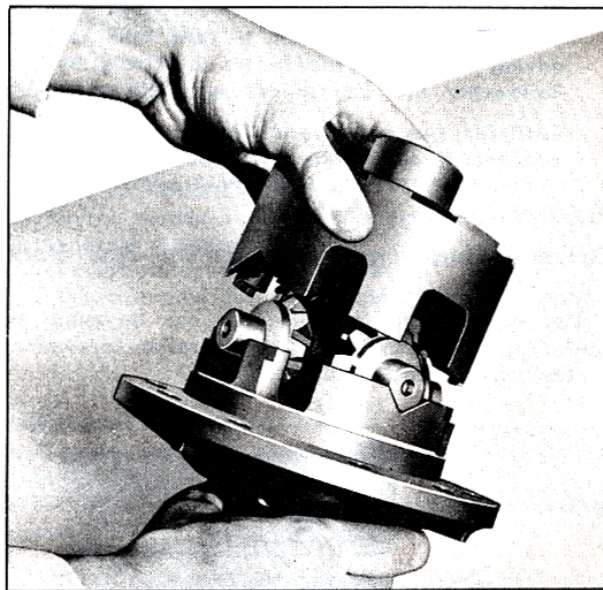


Fig. 42—Installing Differential Case Cover

Converted units and 1960 production units require a "no clearance" metal to metal contact between mate shafts and case "V" notches.

If clearance exists in these units, disassemble and check friction plates and discs for correct thickness and position. Also examine cases and internally splined drums for excessive wear.

9. Check for clutch plate freedom on each side by using a discarded and cut-off axle shaft. The shaft should turn firmly but should not lock.

Installation

1. Install the Positraction differential with the ring gear and bearings assembled as outlined in Section 5 of the 1961 Manual.
2. Use the same instructions and specifications for ring gear bolts, bearing cap bolts, backlash, and bearing preload as used for the standard differential.
3. Install axle shafts.

NOTE: Make sure the spline end of the axle shaft does not interfere with the pinion mate shafts. This is best determined by measurement. Use a steel tape, and with the aid of a flashlight, measure from the bottom of the axle shaft bearing bore to the pinion mate shafts. Then measure the axle shafts from the corresponding point of the bearing to the end of the spline. The minimum clearance required is $\frac{1}{8}$ of an inch. Grind off the

the other axle shaft in the same manner.

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WARNING: Do not spin wheels with one elevated as it is possible to have sufficient driving load due to friction, etc. to actuate the Positraction unit and cause the car to move.

CAUTION: Use only Special Hypoid gear lube available through parts stock under *GM Part Number 3758797* for filling Positraction Rear Axles.

Optional Clutch Stack Arrangement—Four Stack Units Only

Two clutch stack arrangements can be made as shown in Fig. 43 to tailor axle operation to owner's preference in four stack units.

For general service, the arrangement used in production, with the two internally splined plates placed between the externally tapered plate and the Belleville plate (Belleville plate against case), provides ample traction. In cases where the owner desires maximum traction for off-highway operation or heavy duty operation, the clutch plates should be stacked alternately starting with an internally splined friction disc against the differential case, followed by the Belleville plate. However, owners should be cautioned that in order to obtain the benefits of the maximum traction arrangement, tire squeal on turns and a tendency toward oversteer is to be expected.

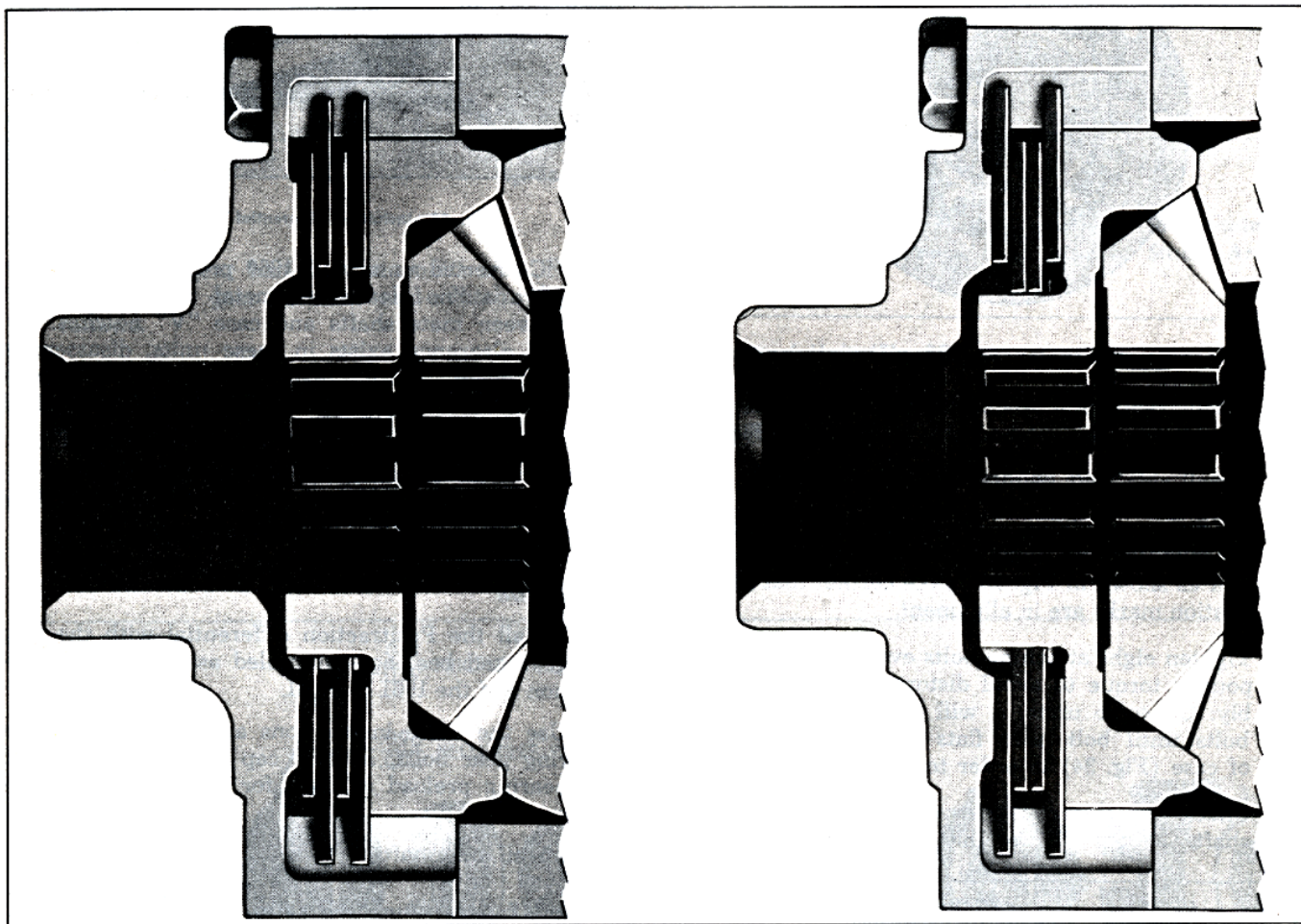


Fig. 43—Clutch Stack Arrangement

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