

Positive Traction Differentials

SPICER (DANA) POWER-LOK

Ford, General Motors
Front & Rear Axles

DESCRIPTION

The Power-Lok differential uses clutch packs, which are preloaded by Belleville spring plates to provide limited slip action.

The torque in the axle causes the pinion shafts to move up ramps on the differential case to increase preload on clutch packs. This varies the amount of torque directed to each wheel, and causes the wheel with the greatest traction to receive the greatest torque.

Power-Lok is used on Spicer (Dana) axles that have a 2-piece differential case and 4 differential pinion gears.

AXLE RATIO & IDENTIFICATION

To determine axle ratio, refer to *Drive Axle Ratio Identification* in this Section.

LUBRICATION

NOTE: To insure proper operation of unit and to prevent differential chatter, manufacturers recommend that only special Positraction lubricants be used.

TESTING ON VEHICLE

1) With engine not running and transmission in "N", raise 1 wheel off ground. Block both front and rear wheels of opposite side. Install adapter tool across 2 wheel studs, and attach torque wrench to center of tool.

2) Observe torque required to continuously turn wheel smoothly through several revolutions. Repeat test for opposite side. If differential is operating properly, torque should be 40-200 ft. lbs. (54-272 N.m). Disregard breakaway torque. Use rotating torque only.

REMOVAL & INSTALLATION

See Spicer (Dana) Semi-Floating or Full-Floating Axles in this Section.

OVERHAUL

DISASSEMBLY

1) During disassembly, note and record relationship of all parts to each other, especially clutch disc and plates.

2) Mark case halves, pinion mate shafts, and their corresponding ramps. Mark differential spiders for reassembly reference. For front axle shaft and bearing removal, see articles on Spicer (Dana) Full-Floating Axles or 4-Wheel Drive Steering Knuckles in this Section.

3) With axle assembly removed from vehicle, pull axle shafts out far enough to allow clearance for differential removal. Using a housing spreader, spread carrier.

4) Do not spread carrier over .020" (.51 mm). Remove bearing caps, and note letters stamped on caps and carrier. Remove differential. Mark bearing cups to indicate from which side of case they were removed.

5) If not previously done, scribe marks on both halves of differential case. Place case in vise. Remove case bolts and disassemble case. Keep stack of plates and discs exactly as they were removed.

INSPECTION

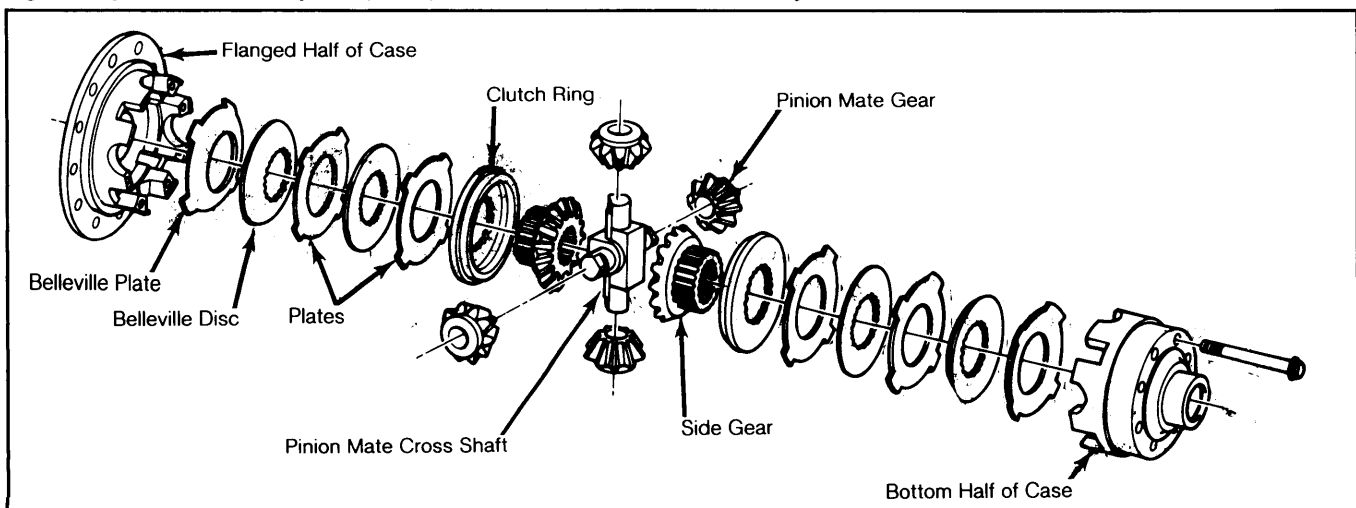
1) Inspect plates, discs, clutch rings, side gears, pinion mate gears, pinion mate shafts and spacer block for damage or wear.

2) Any part showing extreme wear or scoring should be replaced. The pinion mate shafts are unlike the shafts of a conventional differential, and therefore are not locked to differential case.

REASSEMBLY

NOTE: During assembly, keep all parts clean, and lubricate with limited slip gear lubricant just prior to installation.

Fig. 1: Exploded View of Spicer (Dana) Power-Lok Differential Assembly



SPICER (DANA) POWER-LOK (Cont.)

NOTE: All front axles have 3 friction surfaces; rear axles have 5 friction surfaces.

1) Replace plates and disc in exactly the same order as they were removed. Apply proper lubricant on each part. With plates and disc now assembled to clutch ring, line up ears of plates so they will enter easily into ring gear case half.

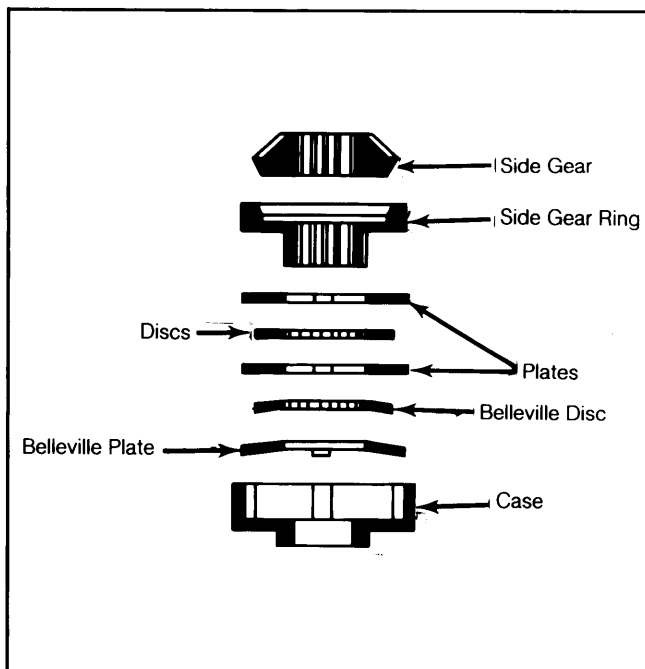
2) Install side gear, plates and disc on other clutch ring, exactly as removed. Apply proper lubricant on each part. Line up ears of plate for case assembly. Assemble bottom half of case, making sure scribe marks are lined up.

3) Assemble case bolts finger tight only. Put axle in vise, splined end pointing up, and set differential on end of axle. Insert second axle making sure that splines of side gear and clutch ring are lined up.

4) Also make sure shafts are entered the full depth. Leave shafts in this position, and tighten case bolts evenly to 30-40 ft. lbs. (41-54 N.m). Remove shafts. Spread carrier housing to .020" (.51 mm) to receive differential assembly.

5) Assemble bearing cups to their correct sides, and install differential into housing. Install bearing caps exactly as removed, and torque to 70-90 ft. lbs. (95-122 N.m). After axle assembly is completed, refill axle housing with limited slip lubricant.

Fig. 2: Disc and Plate Arrangement for One Side of Power-Lok Differential



Apply lubricant on each part, and line up ears of plates for assembly.