Positive Traction Differentials

DANA/SPICER POWER-LOK

Ford Motor Co.
General Motors
International Harvester

NOTE – *Some models may use other units, refer to Contents page.*

DESCRIPTION

The Power-Lok differential uses clutch packs which are preloaded by Bellevue plates to provide limited slip action. The torque on 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 Dana/Spicer axles that have a two-piece differential case and four differential pinion gears.

AXLE RATIO & IDENTIFICATION

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

LUBRICATION

NOTE – *To insure proper operation of unit and to prevent differential chatter, manufacturers recommend that only the special lubricants listed be used.*

Ford Motor Co. – Hypoid Gear Lubricant Part Number C9AZ-19580-A and friction modifier that meets Ford Specification EST-M2C118-A.

General Motors Corp. – General Motors Positraction Lubricant.

International Harvester – SAE 90 or equivalent that meets specification MIL-L-2105B.

TESTING ON VEHICLE

With engine off and transmission in Neutral, raise one wheel off ground and block both front and rear of opposite wheel. Install suitable tool across two wheel studs and attach torque wrench to center of tool. Observe torque required to continuously turn wheel smoothly through several revolutions. NOTE – *Disregard breakaway torque.* Repeat test for opposite side. If differential is operating properly, torque should be 40-200 ft. lbs.

REMOVAL & INSTALLATION

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

OVERHAUL

DISASSEMBLY

CAUTION – *During disassembly note and record relationship of all parts, especially clutch discs and plates, to each other. Mark case halves and differential spiders for reassembly reference.*

Remove differential case bolts and separate case halves. Remove differential spider shafts, pinion gears, thrust washers, side gears and side gear rings from case halves. Remove clutch plates and discs, noting position of flat and concave discs. NOTE – *It is unnecessary to remove ring gear or differential side bearings unless they are to be replaced.*

INSPECTION

Inspect differential spider shafts for wear, scoring and pitting. If center land of either spider shaft shows signs of wear inspect end of axle shaft to determine if shaft is rubbing against spider. Examine clutch plates and discs for wear, cracks or distortion. Check side gear rings, side gears and differential case halves for wear, cracks and distortion.

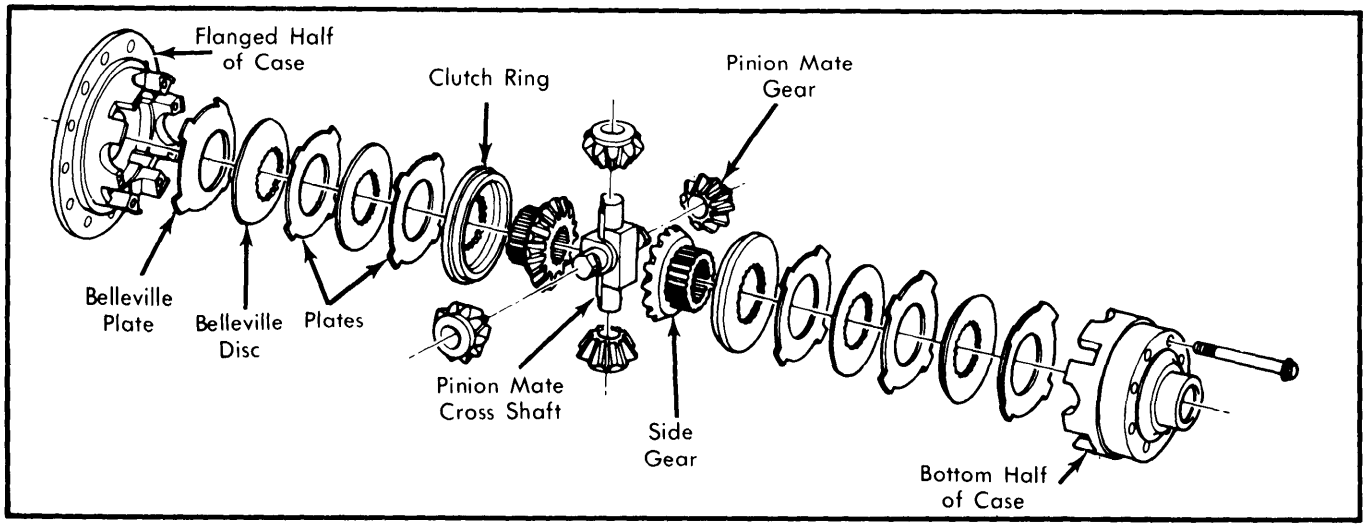

Fig. 1 Exploded View of Dana/Spicer Power-Lok Differential Assembly

DANA/SPICER POWER-LOK (Cont.)

REASSEMBLY

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

1) Assemble clutch plates and discs in exact order and direction of removal. Lightly coat each part with correct lubricant before assembly. Placed tabbed Belleville friction plate in flanged differential case with convex, (bulged) side toward side gear.

2) Place convex (bulged) side of Belleville disc toward side gear where it will nest into Belleville plate. Assemble remaining plates and discs to splines of side gear ring. Place assembled side gear ring with plates and discs in flanged half of differential case. Install side gear and cross shafts with pinions.

3) Install other side of assembly in order listed:

- Side gear and side gear ring.
- Flat plate with tabs.
- Flat disc with teeth.
- Flat plate with tabs.
- Belleville disc with convex side toward side gear.
- Belleville plate with convex side toward side gear.

4) Position plain half of differential case over assembled parts with scribe markings on halves of case in alignment. Install case bolts, but do not tighten. Use axle shafts to align splines of side gear and side gear ring on both sides. Tighten bolts evenly and alternately. Remove axle shafts. Be sure components have been assembled properly. Each pinion cross shaft can be tight on its ramp or if there is clearance, it should be equal at all four cross shaft ends.

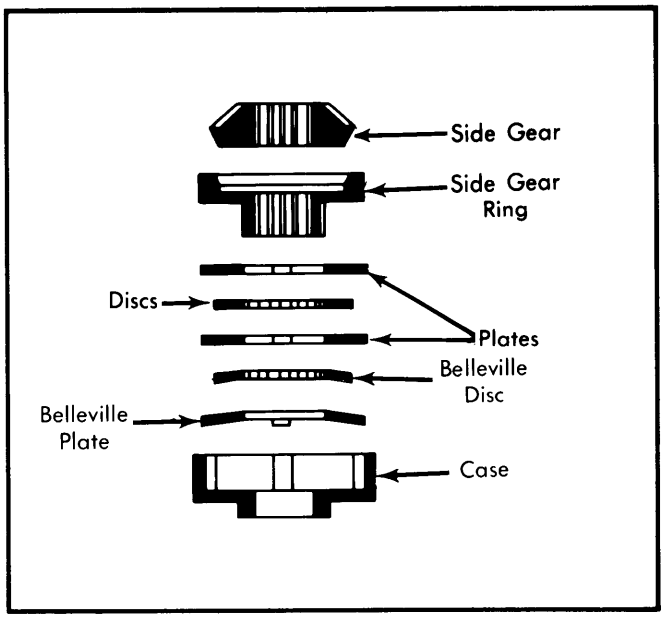

Fig. 2 Disc and Plate Arrangement for One Side of Power-Lok Differential (Model 70)