Positive Traction Differentials

SPICER TRAC-LOCK DIFFERENTIAL

American Motors (Twin-Grip 8 7/8" Axle)

DESCRIPTION & OPERATION

The Trac-Lock differential is similar to the conventional differential except that part of the torque from ring gear is transmitted through clutch packs between side gears and differential case. Multiple disc clutches are engaged by a preload from Belleville springs. This construction permits differential action when required for turning corners, and transmits equal torque to both wheels when driving straight ahead. When one wheel tries to spin, the clutch packs automatically provide more torque to wheel with more traction.

AXLE RATIO & IDENTIFICATION

See American Motors Rear Axles in this section.

LUBRICATION

Use American Motors "Twin Grip" lubricant to insure proper operation and to prevent chatter.

TESTING ON CAR

With transmission in Neutral and engine off, raise one wheel and install a torque wrench on axle shaft nut. Rotate wheel with a torque wrench and note torque at which axle begins to slip. Break-away torque reading should be 70-200 ft. lbs.

OVERHAUL

NOTE – *These procedures are for "Trac-Lock" differentials only. For other axle components, see American Motors Rear Axles in this section.*

DISASSEMBLY

1) Place an axle shaft, which was removed from the assembly, into a vise so that 2¾" extends above the jaws. Tighten vise firmly on shaft. Axle shaft will serve as a holding devise to remove drive gear and to disassemble interior parts of case.

2) Remove drive gear screws. Place shop towels over vise jaws to protect gear teeth from becoming nicked after it is free from

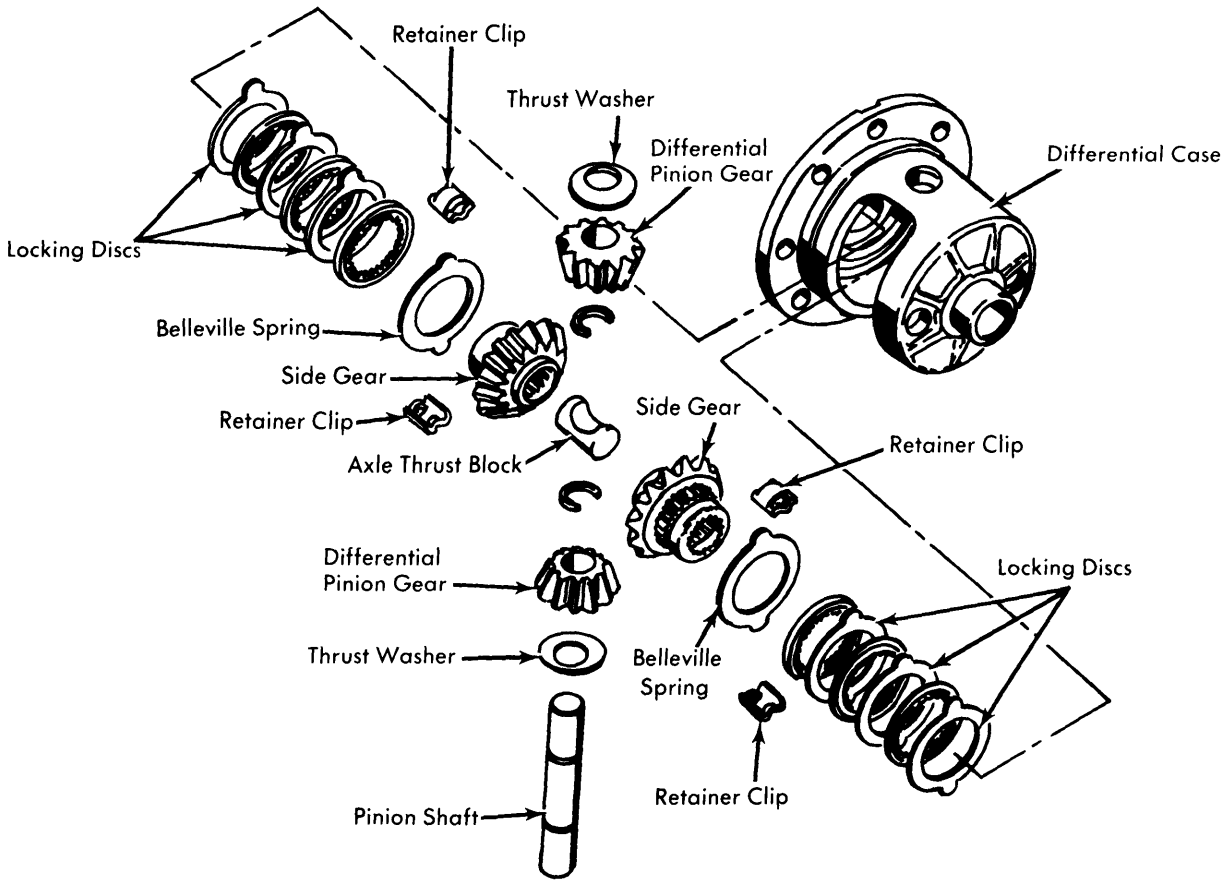

Fig. 1 American Motors Spicer Trac-Lock Differential Assembly for 8 7/8" Axles

SPICER TRAC-LOCK DIFFERENTIAL (Cont.)

case. Tap drive gear with a brass drift and hammer to free it from case. Remove differential case from axle shaft, and remove drive gear.

Fig. 2 Driving Off Ring Gear

3) Reposition case on axle. Place a shop towel behind case to prevent snap rings from flying out of case during removal. Use two screwdrivers and push rings free from cross shaft. Use hammer and drift to remove cross shaft from case. Remove spacer block.

4) Position step plate tool J-23781-7, or equivalent in the bottom of differential gear. Position gear rotating tool J-23781-3 and -6, or equivalent, in the top of differential gear. Insert the forcing screw J-8626-2, or equivalent, down through the top of case and thread into the gear rotating tool. **NOTE** — *Before using forcing screw, lubricate threads with a fine coat of oil, also apply a small spot of grease to centering hole in step plate.*

5) Thread forcing screw so that it becomes centered in step plate. Tighten forcing screw until differential gears move away from pinion gears. This relieves load between gears and allows pinions to be loose. Use shim stock of .030" thickness and remove spherical washers. Loosen forcing screw and retighten until a very slight movement of pinions is detected.

6) Insert gear rotating pawl between two of the differential gear teeth. Pull on handle so top of differential gear will rotate and force pinions to rotate. Continue pulling on tool until handle hits case. Remove pawl from between gear teeth and repeat the above until pinions can be removed through large opening in case. **NOTE** — *When rotating differential gear, adjust forcing screw until required load is applied to allow gear and pinions to rotate.*

7) Retain top differential gear and clutch pack in case by holding hand on bottom of rotating tool while removing forcing screw. Remove rotating tool, step plate, top differential gear, and clutch pack. Remove case from axle shaft. Turn case with flange on drive gear side up. Remove gear and clutch pack from case.

8) Remove retainer clips from both clutch packs to allow separation of plates and discs. **NOTE** — *During inspection of plates, discs, and retainer clips, keep parts in the same order that they were removed, so that they can be installed in their original position.*

CLEANING & INSPECTION

Clean and dry all parts. Inspect plates, discs, and clips. If any component shows evidence of excessive wear or scoring, it should be replaced. Inspect gears for extreme wear or cracks. Inspect case for scoring, wear, or metal pickup on machined surfaces.

REASSEMBLY

1) Prelubricate thrust face of differential gears and assemble plates and discs to differential gear splines, prelubing each part with "Twin-Grip" lubricant. Assemble retainer clips to ears of plates. Make sure both clips are completely seated onto the ears of plates. Assemble clutch pack and differential gear into case. Make sure clutch pack stays assembled to differential gear splines, and that retainer clips are completely seated into pockets of case.

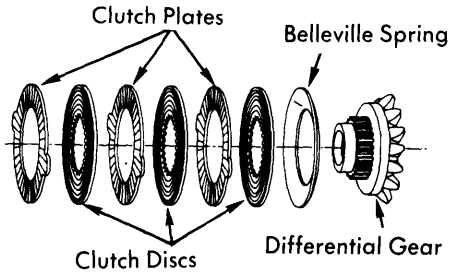

Fig. 3 Clutch Plate Assembly Sequence

2) Assemble step plate into differential gear. Apply a small daub of grease into centering hole of step plate. Position gear rotating tool into top of differential gear. Hold gear and tool in position by hand. Insert forcing screw down through top of case and thread into rotating tool. Position pinions in case with holes lined up with each other. Hold gears in place by hand.

3) Tighten forcing screw so that belleville springs will compress and allow clearance between teeth of differential pinion and gear. While holding pinions in place, insert pawl of rotating tool between two of the differential gear teeth. Pull on tool so that the top of the differential gear will rotate and allow pinions to rotate into case. Pull on tool until handle hits gear. Remove pawl from between the gear teeth and reposition handle and pawl. Repeat operation until holes of both pinions are lined up exactly with those of case.

4) Tighten forcing screw enough to allow for clearance of spherical washers. Prelubricate both sides of pinion washers. Use a small screwdriver and push washers into place. **NOTE** — *Be sure holes of washers and gears are lined up exactly with those of case.* Remove forcing screw, rotating tool, and step plate. Prelubricate cross shaft. Position spacer block, and install cross shaft into case. Be sure snap ring grooves of cross shaft are exposed enough to allow assembly of snap rings. Install snap rings.

5) Remove case from axle shaft. Assemble drive gear to case. Install drive gear screws finger tight. Reposition case onto axle shaft, and torque screws evenly to 105 ft. lbs.