EATON (TWO PIECE CASE) LOCKING DIFFERENTIAL

Chevrolet & GMC
C20/30
G, K & P30

DESCRIPTION

The Eaton two-piece locking differential is a three pinion type with clutch disc pack behind both side gears. Unit also utilizes a speed-sensitive device which automatically locks both rear wheels if either wheel should spin excessively during slow vehicle operation.

AXLE RATIO & IDENTIFICATION

See General Motors 10½" and 12¼" Ring Gear articles and Drive Axle Ratio Identification in this Section.

LUBRICATION

Check lubricant level every 7500 miles or 6 months. Drain and refill every 15,000 miles. Use standard differential lubricant, DO NOT use Positraction lubricant.

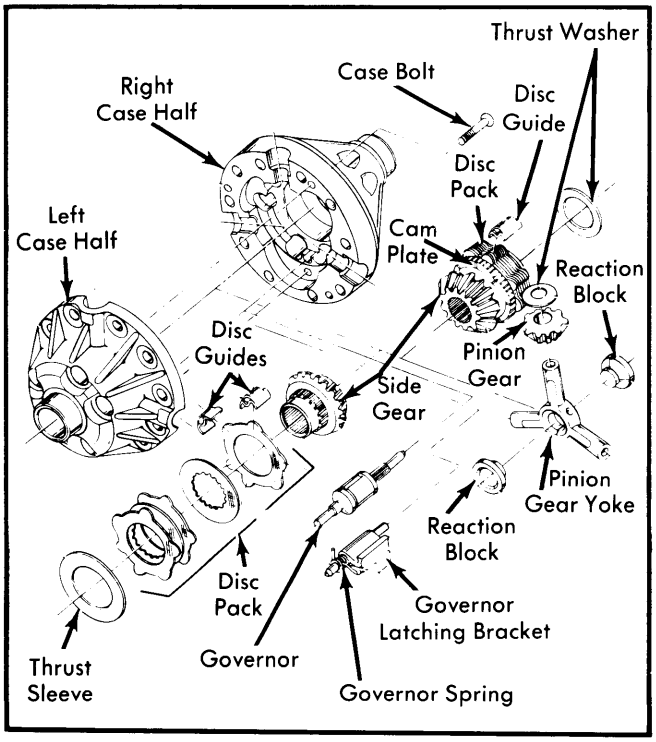

Fig. 1 Exploded View of Eaton Two Piece Case Locking Differential

TESTING ON VEHICLE

1) Raise vehicle so that both rear wheels can be rotated freely by hand. With one wheel held stationary, rotate other wheel approximately ½ turn every second. Wheel should rotate freely. If both wheels turn, or try to turn, differential is defective.

2) Raise vehicle as high as possible. Leave one technician in vehicle. Start engine and allow to idle at 600-800 RPM. If equipped with automatic transmission, place transmission in drive and apply brakes. If equipped with manual transmission, depress clutch and place transmission in first gear.

3) Pull on one parking brake cable from under vehicle to lock one rear wheel. With engine idling, slowly release brakes on automatic transmission models and slowly release clutch on manual transmission models. Locked rear wheel should remain stationary and free wheel should rotate slowly.

4) As free wheel speed increases, the differential should lock, causing both wheels to rotate or stop.

NOTE – *If equipped with manual transmission, engine may stall.*

5) It may be necessary to accelerate to 10 MPH to lock differential. If speed increases beyond 20 MPH without locking differential, unit is defective. Lock opposite wheel and repeat test.

REMOVAL & INSTALLATION

Same procedure is used to remove and install locking differential as conventional differential. *See General Motors 10½" and 12¼" Ring Gear articles in this Section.*

OVERHAUL

DISASSEMBLY

Differential – 1) With differential removed from housing, remove ring gear and side bearings. Remove 3 screws from front face of ring gear flange. Place differential on right side case half. Using a screwdriver, gently pry case halves apart at yoke hole locations.

2) Remove left side case half. Hold thumb against inside of gear hub when separating case halves. This will prevent side gear from falling out. If governor and latching bracket are only components being replaced, proceed to step 4) in Reassembly procedures. To further disassemble, pry under pinion gear yoke to remove from case half.

NOTE – *If cam gear or clutch discs must be replaced, the cam gear assembly must be disassembled as follows:*

Cam Gear Assembly – 1) Measure and record overall length of gear assembly. Measure from face of gear to back side of thrust ring and include shim. This dimension will be required for reassembly if thrust ring is replaced.

NOTE – *Thrust ring should be replaced only if it is absolutely necessary.*

2) If thrust ring is replaced, check thrust ring bore in case for wear. If bore is scored excessively, replace complete differential.

3) Position gear with hub end up. Compress disc pack and place suitable bearing removal tool (J-22912) between thrust

EATON (TWO PIECE CASE) LOCKING DIFFERENTIAL (Cont.)

ring and top disc. Beveled side of tool should be toward thrust ring. Position cam gear and tool in press with tool supported on both sides. Place a 1½- 1¾" plug on gear hub. Press against plug with press to remove thrust ring. Make sure all components are in correct order.

INSPECTION

Clean all components in a suitable solvent. Inspect all bearings and gear teeth for chipping or wear. Replace as necessary. Inspect clutch plates and discs for signs of wear or overheating. If reaction blocks or flanges must be replaced, measure thickness of original components and replace with components of comparable size.

REASSEMBLY

NOTE – *If cam gear assembly was disassembled, reassemble as follows:*

Cam Gear Assembly – 1) Place gear on bench with hub end up. Place cam plate on gear so that cam form on plate is against cam form on gear. Install 2 eared discs on cam plate, 1 splined disc and 1 wave spring alternately in that order. Install on gear hub 4 eared discs and 3 splined discs alternately, starting and ending with an eared disc.

2) Place cam gear in a press with hub end up. Install thrust ring on gear hub with press. Make sure thrust ring is square with hub. Press thrust ring on until it is flush with shoulder. When installing ring, press down on discs to make sure splined disc does not wedge between thrust ring and gear shoulder. When unit is assembled, check for correct disc sequence. Make sure that the first splined disc (large spline) is correctly located on cam plate.

Differential – 1) Install disc pack guide clips on disc ears of cam gear disc pack. Use grease to retain clips in ears. Install cam gear assembly and original shim in right case half. If a new thrust ring was installed on cam gear, it may be necessary to reshim. Measure overall length of cam gear assembly, including shim. Compare this measurement with one previously recorded. If measurement variation is more than .003" either way, install a new shim that will obtain a reading within .003" of original measurement.

2) Position right reaction block on gear face with buttonside of block facing up. Replace reaction block only if it is absolutely necessary. If a new block is being installed, measure face-to-face thickness of old block and obtain a new block of same thickness. Install pinion gears and thrust washers on pinion yoke. Place yoke in correct position in housing. Make sure center of yoke is correctly positioned over reaction block button. Tap on yoke lightly to correctly seat it in position.

3) Position left reaction block on yoke with flange end up. Replace block only if it is absolutely necessary. If a new block is being installed, measure face-to-face thickness of old block and obtain a new block of same thickness.

NOTE – *The right and left reaction blocks are not necessarily the same thickness. If the blocks are broke or it is impossible to measure thickness, complete differential must be replaced.*

4) Install governor and latching bracket assemblies in correct position. Place straight end of latching bracket spring over and to the outside of governor shaft. This will preload the latching bracket against the governor assembly. Install the original three eared discs and two splined discs on left side gear alternately, starting and ending with an eared disc.

NOTE – *Original discs must be used to maintain correct operating clearance in differential.*

5) Install the six disc pack guide clips. Use grease to retain clips in place. Install original shim in left case half. Remove disc pack from side gear and place in position in case half. Make sure guides are in correct position. Install side gear in case, rotating gear to engage splines with splines on discs. Hold thumb on right case half. Make sure governor and latching bracket assembly holes are aligned in case halves. Install three screws.

6) Place one axle shaft in a vise in a vertical position. Install differential on axle shaft, making sure splines on axle are engaged in splines in side gear. Slowly rotate differential. This can be easily done by inserting a short shaft or punch in a pinion yoke hole and pulling on shaft. Differential should turn smoothly without locking up or binding. Differential is now ready to be installed in housing.

NOTE – *Differential will lock up if turned rapidly.*