

SECTION F

43-44-45000 POSITIVE TRACTION DIFFERENTIAL

CONTENTS

Division	Subject	Paragraph
I	SPECIFICATIONS AND ADJUSTMENTS: Lubrication of Positive Traction Differential.....	40-27
II	DESCRIPTION AND OPERATION: Description of Positive Traction Differential..... Operation of Positive Traction Differential.....	40-28 40-29
III	SERVICE PROCEDURES: Positive Traction Differential Service Procedures..... Positive Traction Flushing Procedure	40-30 40-31
IV	TROUBLE DIAGNOSIS: Testing Positive Traction Differential.....	40-32

DIVISION I

SPECIFICATIONS AND ADJUSTMENTS

NOTE: All specifications and adjustments for the Positive Traction Differential are the same as are listed in Section E for standard differential. The only exception to this is the lubricant used in the Positive Traction Differential.

40-27 LUBRICATION OF POSITIVE TRACTION DIFFERENTIAL

The lubricant level should be checked every 6,000 miles. Maintain level between the bottom of the filler plug opening and 1/4 inch below the opening by adding Special Positive Traction Lubricant (SAE 90 gear lube meeting specification for GM Part No. 1050081) or equivalent available through the Buick Parts Department. Never use any lubricant other than this special lubricant, even for adding.

Positive Traction Differentials can

be easily identified either by a stainless steel plate attached by a rear cover bolt or by an X in a circle stamped on the bottom of the left axle tube. For flushing procedure, see paragraph 40-31.

Capacity of the differential assembly is 3 pints.

DIVISION II

DESCRIPTION AND OPERATION

40-28 DESCRIPTION OF POSITIVE TRACTION DIFFERENTIAL

Buick Positive Traction Differential is optional equipment on all Buicks. It is designed to perform all the desirable functions of a conventional differential and at the same time overcome its limitations. With a conventional differential, when one wheel is on a slippery surface, its pulling power is limited by the wheel with the lowest traction. Un-

like the conventional differential, with the Positive Traction device, the anti-spinning action is limited by the wheel having the best traction thus limiting the possibility of becoming stuck.

Buick Positive Traction Differential is not a fully locking type and will release before excessive driving force can be directed to one rear wheel. The safety value of this feature eliminates the possibility of dangerous steering reaction. When the rear wheels are under extremely unbalanced tractive conditions, such as having one wheel on ice and the other on dry pavement, wheel spin can occur if over-acceleration is attempted. However, even when wheel spin does occur, the major driving force is directed to the non-spinning wheel.

Another advantage of the Positive Traction Differential is that on uneven surfaces such as railroad tracks, check holes, etc., wheel action is not adversely affected. During power application on a conventional differ-

ential, when one wheel hits a bump and bounces clear of the road, it spins momentarily. When this rapidly spinning wheel again contacts the road, the sudden shock may cause the car to swerve. This action is also hard on tires and the entire drive train. With a Positive Traction Differential the free wheel rotates at the same speed as the wheel on the road, thereby minimizing adverse effects.

40-29 OPERATION OF POSITIVE TRACTION DIFFERENTIAL

The design of the Positive Traction Differential is basic and simple and is completely interchangeable with a conventional differential. The Positive Traction unit has coarse, spiral-threaded cone brakes installed behind the side gears. These brakes are statically spring preloaded to provide an internal resistance to the differential action within the case itself. This preload assures an adequate amount of pull when extremely low tractive conditions such as wet ice, mud or snow are encountered at one rear wheel. It also provides smooth transfer of torque when traveling over alternating tractive to non-tractive conditions at either rear wheel.

During application of torque to the axle, the initial spring loading of the cone brakes is supplemented by the gear separating forces between the side and spider gears which progressively increases the resistance in the differential. This unit is therefore an automatic throttle-sensitive device that provides greater resistance under greater torque loads. It should be

remembered however, that this is not a positive lock differential and it will release before excessive driving force can be applied to one wheel.

CAUTION: When working on a car with Positive Traction Differential, never raise one rear wheel and run the engine with the transmission in gear. The driving force to the wheel on the floor could cause the car to move.

DIVISION III

SERVICE PROCEDURES

40-30 POSITIVE TRACTION DIFFERENTIAL SERVICE PROCEDURES

All differential service procedures are the same in the Positive Traction differential as in a conventional differential, except for servicing the case and case internal parts. The case and case internal parts are serviced as an assembly only.

40-31 POSITIVE TRACTION FLUSHING PROCEDURE

The following procedure is established for flushing the Positive Traction Differential in the event the wrong lubricant is accidentally added.

1. Drain original lubricant from differential housing.
2. Fill axle with a light, non-detergent engine oil.
3. Raise both rear wheels off floor.

4. With car properly supported, run car in "Drive" range for three to four minutes. Do not exceed 30 MPH on speedometer or accelerate or decelerate rapidly.

5. Remove oil from axle.

6. Repeat Steps 2, 3, 4 and 5. It is important that the axle be flushed *two* times to ensure complete removal of the original lubricant.

7. Fill differential housing with positive traction lubricant, GM Part No. 1050081 or equivalent.

DIVISION IV

TROUBLE DIAGNOSIS

40-32 TESTING POSITIVE TRACTION DIFFERENTIAL

If there is a doubt that a Buick is equipped with a Positive Traction Differential, or to determine if this option is performing satisfactorily, a simple test can be performed.

1. Place transmission in neutral.
2. Raise one wheel off floor and place a block of wood in front and rear of opposite wheel.
3. Remove wheel cover and install torque wrench with extension on lug nut.
4. Disregard breakaway torque and observe only torque required to continuously turn wheel smoothly. If differential assembly is equipped with Positive Traction, the rotating torque will be at least 30 lb.ft.