

## SECTION : 5B

# FIVE-SPEED MANUAL TRANSAXLE

**CAUTION :** *Disconnect the negative battery cable before removing or installing any electrical unit or when a tool or equipment could easily come in contact with exposed electrical terminals. Disconnecting this cable will help prevent personal injury and damage to the vehicle. The ignition must also be in LOCK unless otherwise noted.*

## TABLE OF CONTENTS

<b>SPECIFICATIONS</b> .....	5B-2	GEARSHIFT TUBE, BOOT, BUSHING AND/OR BEARING RING .....	5B-18
FASTENER TIGHTENING SPECIFICATIONS .....	5B-2	CONTROL SHIFT ROD .....	5B-23
<b>SPECIAL TOOLS</b> .....	5B-3	LINKAGE LEVER AND/OR BUSHINGS .....	5B-24
SPECIAL TOOLS TABLE .....	5B-3	SPEEDOMETER DRIVEN GEAR .....	5B-30
<b>DIAGNOSIS</b> .....	5B-5	SHIFT LEVER COVER .....	5B-32
ISOLATE NOISE .....	5B-5	DRIVE AXLE SEAL .....	5B-34
SYMPTOM DIAGNOSIS .....	5B-6	TRANSAXLE ASSEMBLY .....	5B-34
<b>COMPONENT LOCATORS</b> .....	5B-9	UNIT REPAIR .....	5B-42
GEARS AND CASE .....	5B-9	MAJOR COMPONENT DISASSEMBLY .....	5B-42
DIFFERENTIAL AND CASE .....	5B-11	INPUT SHAFT AND CLUSTER GEAR .....	5B-53
SHIFT LINKAGE .....	5B-12	MAINSHAFT .....	5B-56
<b>MAINTENANCE AND REPAIR</b> .....	5B-15	HOUSING CASE .....	5B-71
ON-VEHICLE SERVICE .....	5B-15	DIFFERENTIAL .....	5B-74
CHECKING FLUID LEVEL .....	5B-15	MAJOR COMPONENT ASSEMBLY .....	5B-82
SHIFT LINKAGE ADJUSTMENT .....	5B-15	<b>GENERAL DESCRIPTION AND SYSTEM</b>	
GEARSHIFT LEVER .....	5B-17	<b>OPERATION</b> .....	5B-91
		FIVE-SPEED MANUAL TRANSAXLE .....	5B-91

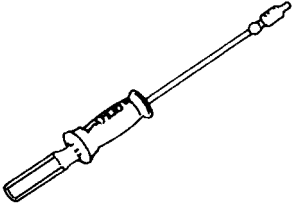
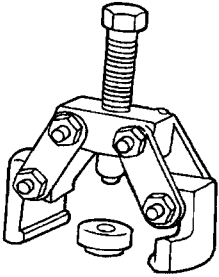
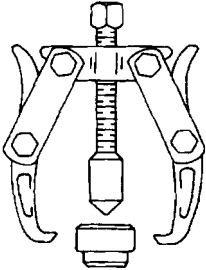
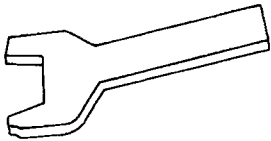
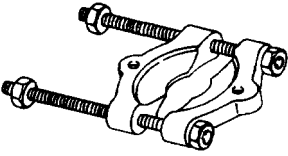
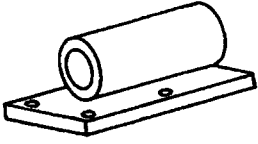
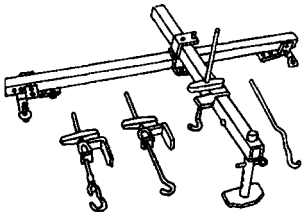
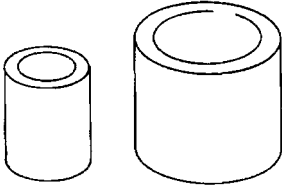
# SPECIFICATIONS

## FASTENER TIGHTENING SPECIFICATIONS

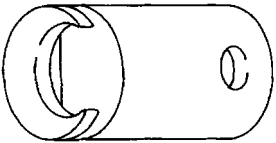
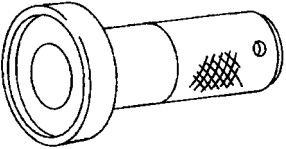
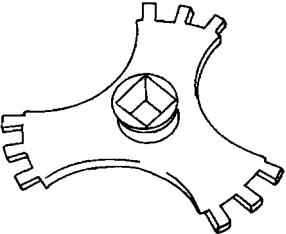
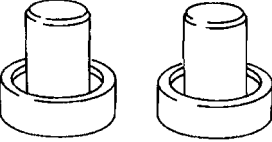
Application	N•m	Lb–Ft	Lb–In
Backup Lamp Switch	18	13	
Bearing Plate Bolts	22	16	
Bearing Retainer Bolts, Right Side	25	18	
Bearing–Adjusting Ring–Retainer Plate Bolt	25	18	
Center Rear Transaxle Support Bracket Bolts	93	69	
Clutch–Release Cylinder Bracket Bolts	75	55	
Differential Cover Bolts	40	30	
Fifth–Gear Fork Bolts	22	16	
Fifth–Gearshift Connector Bolts	7		62
Gearshift Lever Cover Bolts	22	16	
Input Driveshaft Detent Screw	15	11	
Left Front Transaxle Support Bracket Bolts	47	35	
Left Rear Transaxle Support Bracket Bolts	47	35	
Lower Transaxle–to–Engine Bolts	75	55	
Ring–Gear Bolts	70	52	
Rod Clamp Bolt	14		124
Speedometer Housing Retaining Bolt	4		35
Speedometer–Driven Gear Bolt	5		44
Support Bracket Bolt	7		62
Transaxle Cover Bolts, Bigger	20	15	
Transaxle Cover Bolts, Smaller	15	11	
Upper Transaxle–to–Engine Bolts	75	55	

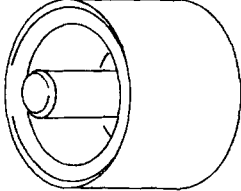
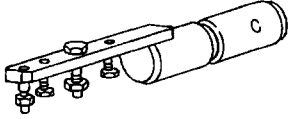
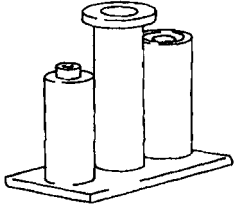
# SPECIAL TOOLS

## SPECIAL TOOLS TABLE

 <p>A103B110</p>	<p>J-6125-B Slide Hammer</p>	 <p>A103B163</p>	<p>KM-553-A Fifth-Gear Puller</p>
 <p>A103B003</p>	<p>J-22888-20-A Bearing Puller with J-22888-35 Puller Legs</p>	 <p>A103B028</p>	<p>J-36633 Snap Ring Retainer</p>
 <p>A103B112</p>	<p>J-22912-01 Universal Bearing Puller</p>	 <p>A103B002</p>	<p>KM-113-2 Base</p>
 <p>A102B152</p>	<p>J-28467-B Engine Support Fixture</p>	 <p>A103B025</p>	<p>KM-334 Installer Sleeve</p>

5B – 4 FIVE-SPEED MANUAL TRANSAXLE

 <p>A103B013</p>	<p>J-42469 Shift Rod Remover</p>
 <p>A103B007</p>	<p>KM-519 Ring Installer</p>
 <p>A103B008</p>	<p>KM-520 Remover/Installer</p>
 <p>A103B009</p>	<p>KM-522 Installer</p>

 <p>A103B017</p>	<p>KM-525 Installer</p>
 <p>A103B019</p>	<p>KM-552 Fixture</p>
 <p>A103B021</p>	<p>KM-554 Installer</p>

# DIAGNOSIS

## ISOLATE NOISE

Identify the cause of any noise before attempting to repair the clutch, the transaxle, or their related linkages.

Symptoms of trouble with the clutch or the manual transaxle include:

- A great effort required to shift gears.
- The sound of gears clashing and grinding.
- Gear blackout.

Any of these conditions requires a careful analysis. Make the following checks before disassembling the clutch or the transaxle for repairs.

## Road Travel Noise

Many noises that appear to come from the transaxle may actually originate with other sources such as the:

- Tires.
- Road surfaces.
- Wheel bearings.
- Engine.
- Exhaust system.

These noises may vary according to the:

- Size of the vehicle.
- Type of the vehicle.
- Amount of insulation used in the body of the vehicle.

## Transaxle Noise

Transaxle gears, like any mechanical device, are not absolutely quiet and will make some noise during normal operation.

To verify suspected transaxle noises:

1. Select a smooth, level asphalt road to reduce tire and resonant body noise.
2. Drive the vehicle far enough to warm up all the lubricants thoroughly.
3. Record the speed and the gear range of the transaxle when the noise occurs.
4. Check for noises with the vehicle stopped, but with the engine running.
5. Determine if the noise occurs while the vehicle operates in:
  - Drive – under a light acceleration or a heavy pull.
  - Float – maintaining a constant speed with a light throttle on a level road.
  - Coast – with the transaxle in gear and the throttle partly or fully closed.
  - All of the above.

## Bearing Noise

### Differential Side Bearing Noise

Differential side bearing noise and wheel bearing noise can be confused easily. Since side bearings are pre-loaded, a differential side bearing noise should not diminish much when the differential/transaxle is run with the wheels off the ground.

### Wheel Bearing Noise

Wheel bearings produce a rough growl or grating sound that will continue when the vehicle is coasting and the transaxle is in NEUTRAL. Since wheel bearings are not pre-loaded, a wheel bearing noise should diminish considerably when the wheels are off the ground.

## Other Noise

### Brinelling

A brinelled bearing causes a "knock" or "click" approximately every second revolution of the wheel because the bearing rollers do not travel at the same speed as the wheel. In operation, the effect is characterized by a low-pitched noise.

A brinelled bearing is caused by excessive thrust which pushes the balls up on the pathway and creates a triangular-shaped spot in the bearing race. A brinelled bearing can also be caused from pressing one race into position by applying pressure on the other race.

A false indication of a brinelled bearing occurs as a result of vibration near the area where the bearing is mounted. Brinelling is identified by slight indentations, resulting in a washboard effect in the bearing race.

### Lapping

Lapped bearing noise occurs when fine particles of abrasive materials such as scale, sand, or emery circulate through the oil in the vehicle, causing the surfaces of the roller and the race to wear away. Bearings that wear loose but remain smooth, without spalling or pitting, are the result of dirty oil.

### Locking

Large particles of foreign material wedged between the roller and the race usually causes one of the races to turn, creating noise from a locked bearing. Pre-loading regular taper roller bearings to a value higher than that specified also can result in locked bearings

### Pitting

Pitting on the rolling surface comes from normal wear and the introduction of foreign materials.

### Spalling

Spalled bearings have flaked or pitted rollers or races caused by an overload or an incorrect assembly that results in a misalignment, a cocking of bearings, or adjustments that are too tight.

After completing these checks, refer to the "Diagnosis Chart" in this section.

## SYMPTOM DIAGNOSIS

Checks	Action
Check for a knock at low speeds.	<ul style="list-style-type: none"> <li>• Replace any worn drive axle CV joints.</li> <li>• Replace any worn side gear hub.</li> </ul>
Check for a noise most pronounced on turns.	<ul style="list-style-type: none"> <li>• Correct any abnormalities in the differential gear.</li> </ul>
Check for a clunk upon acceleration or deceleration.	<ul style="list-style-type: none"> <li>• Tighten any loose engine mounts.</li> <li>• Replace any worn drive axle inboard joints.</li> <li>• Replace any worn differential pinion shaft in the case.</li> <li>• Replace any worn side gear hub in the case.</li> </ul>
Check for a clunking noise in turns.	<ul style="list-style-type: none"> <li>• Replace any worn outboard CV joint.</li> </ul>
Check for a vibration.	<ul style="list-style-type: none"> <li>• Replace any rough wheel bearing.</li> <li>• Replace any bent drive axle shaft.</li> <li>• Replace any out-of-round tires.</li> <li>• Balance any unbalanced tire.</li> <li>• Replace any worn CV joint in the drive axle shaft.</li> <li>• Correct an excessive drive axle angle by adjusting the trim height.</li> </ul>
Check for a noise in the NEUTRAL gear with the engine running.	<ul style="list-style-type: none"> <li>• Replace any worn cluster bearing shaft.</li> <li>• Replace any worn clutch–release bearing.</li> <li>• Replace any worn input shaft cluster gears.</li> <li>• Replace any worn first–gear/bearing.</li> <li>• Replace any worn second–gear/bearing.</li> <li>• Replace any worn third–gear/bearing.</li> <li>• Replace any worn fourth–gear/bearing.</li> <li>• Replace any worn fifth–gear/bearing.</li> <li>• Replace any worn mainshaft bearings.</li> </ul>
Check for a noise in the first gear (1) only.	<ul style="list-style-type: none"> <li>• Replace any chipped, scored, or worn first–gear constant mesh gears.</li> <li>• Replace any worn first–second gear synchronizer.</li> <li>• Replace any worn first–gear/bearing.</li> <li>• Replace any worn differential–gear/bearing.</li> <li>• Replace any worn–ring gear.</li> <li>• Adjust, repair, or replace the shift lever and the rods.</li> </ul>
Check for a noise in the second gear (2) only.	<ul style="list-style-type: none"> <li>• Replace any chipped, scored, or worn second–gear constant mesh gears.</li> <li>• Replace any worn first–second gear synchronizer.</li> <li>• Replace any worn second–gear/bearing.</li> <li>• Replace any worn differential–gear/bearing.</li> <li>• Replace any worn–ring gear.</li> <li>• Adjust, repair, or replace the shift lever and the rods.</li> </ul>
Check for a noise in the third gear (3) only.	<ul style="list-style-type: none"> <li>• Replace any chipped, scored, or worn third–gear constant mesh gears.</li> <li>• Replace any worn third–fourth gear synchronizer.</li> <li>• Replace any worn third–gear/bearing.</li> <li>• Replace any worn differential–gear/bearing.</li> <li>• Replace any worn–ring gear.</li> <li>• Adjust, repair, or replace the shift lever and the rods.</li> </ul>

Checks	Action
Check for a noise in the fourth gear (4) only.	<ul style="list-style-type: none"> <li>• Replace any chipped, scored, or worn fourth gear or output gear.</li> <li>• Replace any worn third–fourth gear synchronizer.</li> <li>• Replace any worn fourth–gear/bearing.</li> <li>• Replace any worn differential–gear/bearing.</li> <li>• Replace any worn–ring gear.</li> <li>• Adjust, repair, or replace the shift lever and the rods.</li> </ul>
Check for a noise in the fifth gear (5) only.	<ul style="list-style-type: none"> <li>• Replace any chipped, scored, or worn fifth gear or output gear.</li> <li>• Repair any worn fifth–gear synchronizer.</li> <li>• Replace any worn fifth–gear/bearing.</li> <li>• Replace any worn differential–gear/bearing.</li> <li>• Replace any worn–ring gear.</li> <li>• Adjust, repair, or replace the shift lever and the rods.</li> </ul>
Check for a noise in the reverse (R) gear only.	<ul style="list-style-type: none"> <li>• Replace any chipped, scored, or worn reverse idler gear, idler–gear bushing, input gear, or output gear.</li> <li>• Replace any worn first–second gear synchronizer.</li> <li>• Replace any worn output gear.</li> <li>• Replace any worn differential–gear/bearing.</li> <li>• Replace any worn–ring gear.</li> </ul>
Check for a noise in all gears.	<ul style="list-style-type: none"> <li>• Add sufficient lubricant.</li> <li>• Replace any worn bearings.</li> <li>• Replace any chipped, scored, or worn input–gear shaft or output–gear shaft.</li> </ul>
Check for the transaxle slipping out of gear.	<ul style="list-style-type: none"> <li>• Adjust or replace the linkage, as needed.</li> <li>• Adjust, repair, or replace any binding shift linkage.</li> <li>• Tighten or replace the input–gear bearing retainer, as needed.</li> <li>• Repair or replace any worn or bent shift fork.</li> </ul>
Check for a leak in the area of the clutch.	<ul style="list-style-type: none"> <li>• Repair the transaxle casing.</li> <li>• Replace any damaged release bearing guide.</li> </ul>
Check for a leak at the center of the transaxle.	<ul style="list-style-type: none"> <li>• Repair the transaxle casing.</li> <li>• Repair the shift mechanism.</li> <li>• Replace the damaged backup lamp switch.</li> </ul>
Check for a leak at the differential.	<ul style="list-style-type: none"> <li>• Adjust or replace the bearing retainers.</li> <li>• Tighten or replace the differential cover.</li> <li>• Adjust or replace the drive axle shaft seals.</li> </ul>
Check for a hard shift.	<ul style="list-style-type: none"> <li>• Replace any damaged release–bearing guide.</li> <li>• Adjust, repair, or replace the shift mechanism.</li> <li>• Adjust, repair, or replace the clutch–release system.</li> <li>• Replace any chipped, scored, or worn fifth–gear synchronizer.</li> <li>• Replace any chipped, scored, or worn first–second gear synchronizer.</li> <li>• Replace any worn third–fourth gear synchronizer.</li> <li>• Adjust, repair, or replace the shift lever and the rods.</li> </ul>

## 5B – 8 FIVE–SPEED MANUAL TRANSAXLE

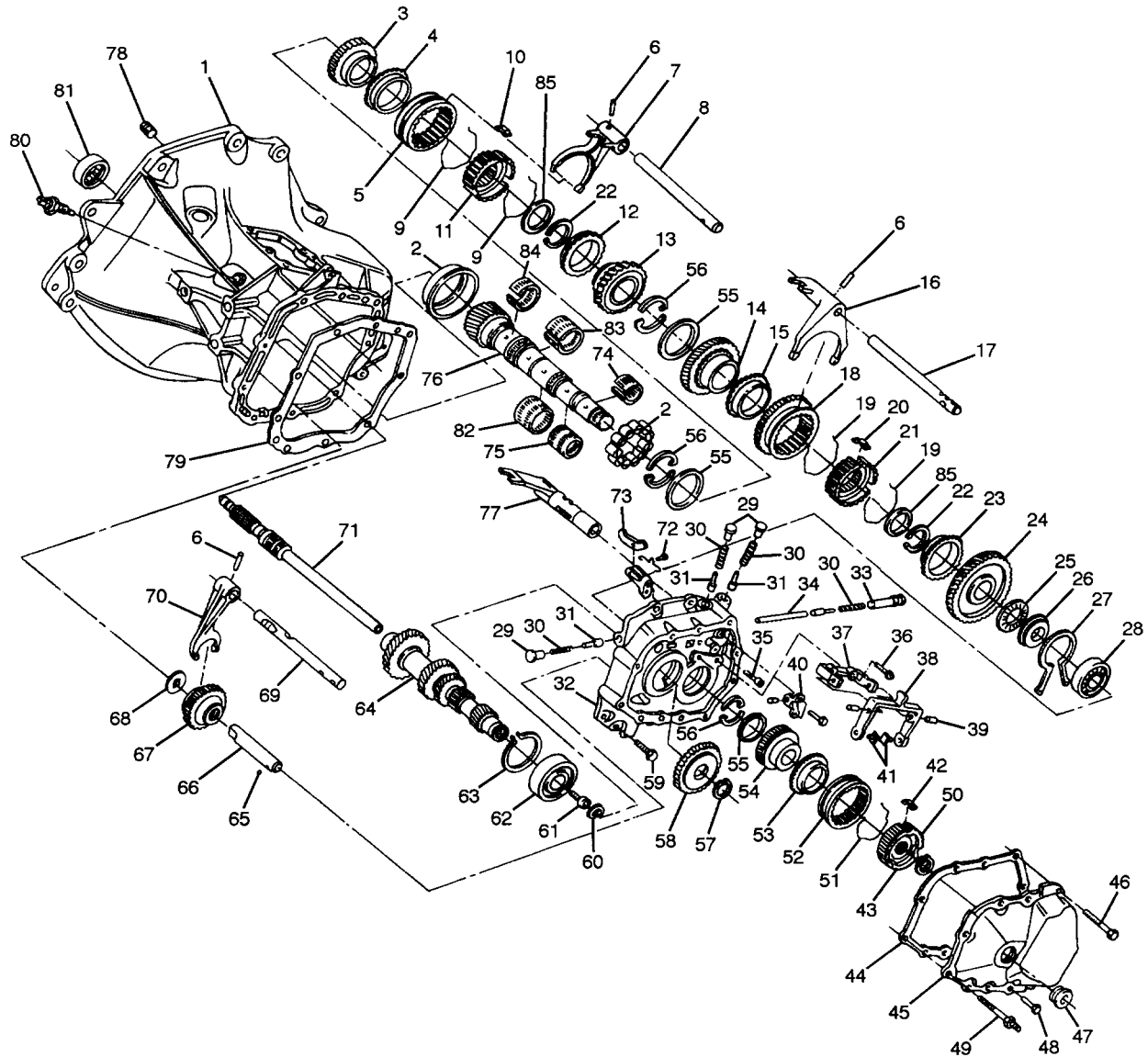
---

<b>Checks</b>	<b>Action</b>
Check for a clashing of gears.	<ul style="list-style-type: none"><li>• Replace any damaged release–bearing guide.</li><li>• Adjust, repair, or replace the clutch–release system.</li><li>• Replace the chipped, scored, or worn input shaft/gear–cluster gears.</li><li>• Replace any worn fifth–gear synchronizer.</li><li>• Replace any worn fifth–gear/bearing.</li><li>• Replace any worn first–gear/bearing.</li><li>• Replace any worn first–second gear synchronizer.</li><li>• Replace any worn second–gear/bearing.</li><li>• Replace any worn third–gear/bearing.</li><li>• Replace any worn third–fourth synchronizer.</li><li>• Replace any worn fourth–gear/bearing.</li><li>• Replace any worn reverse–idler gear.</li></ul>



# COMPONENT LOCATORS

## GEARS AND CASE

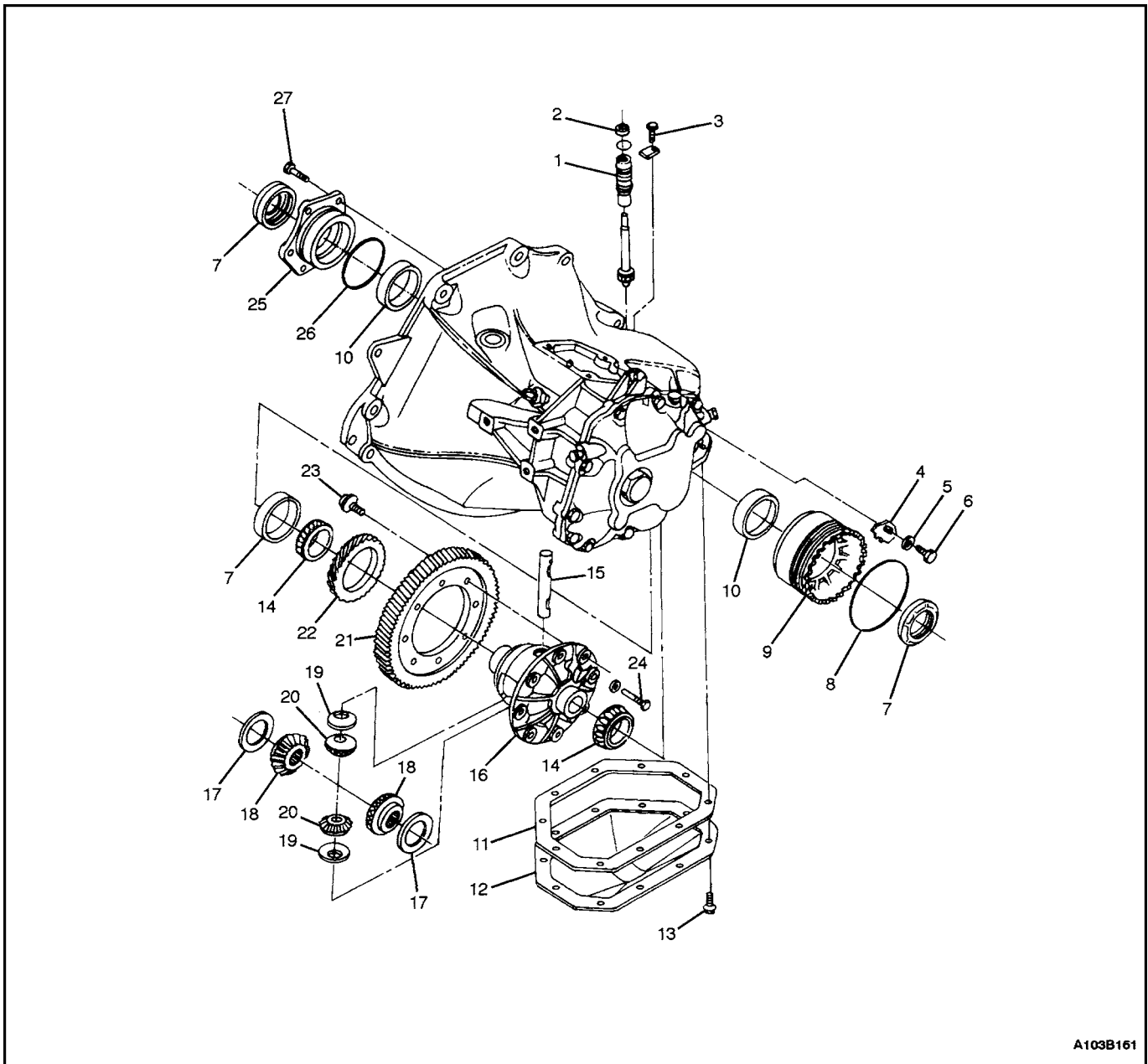


## 5B – 10 FIVE–SPEED MANUAL TRANSAXLE

---

1. Case
2. Mainshaft Bearing
3. Fourth Gear
4. Synchronizer Blocking Ring
5. Synchronizer Sleeve
6. Pin
7. Third–Fourth Gearshift Fork
8. Third–Fourth Gearshift Shaft
9. Spring
10. Key
11. Third–Fourth Synchronizer Gear
12. Synchronizer Blocking Ring
13. Third Gear
14. Second Gear
15. First–Second Gear Blocking Ring
16. First–Second Gearshift Fork
17. First–Second Gearshift Shaft
18. Synchronizer Hub Sleeve
19. Synchronizer Spring
20. Key
21. First–Second Synchronizer Gear
22. Snap Ring
23. Outer Blocking Ring
24. First Gear
25. First Gear Needle Bearing
26. Mainshaft Wear Plate
27. Snap Ring
28. Mainshaft Bearing
29. Shift Rod Plug (21.5 mm)
30. Spring
31. Shift Rod Lock Pin
32. Bearing Plate
33. Shift Rod Plug (50.4 mm)
34. Detent Rod Bolt
35. Bolt
36. Bolt
37. Support
38. Fifth Gearshift Fork
39. Pin
40. Fifth Gear Connector
41. Shoe
42. Key
43. Snap Ring
44. Gasket
45. Cover
46. Bolt
47. Plug
48. Bolt
49. Screw
50. Synchronizer Gear
51. Spring
52. Synchronizer Sleeve
53. Synchronizer Blocking Ring
54. Mainshaft Driven Fifth Gear
55. Ring
56. Thrust Washer
57. Ring
58. Input Drive Fifth Gear
59. Bolt
60. Cluster Gear Snap Ring
61. Screw
62. Cluster Shaft Bearing
63. Ring
64. Input Shaft Cluster Gear
65. Ball
66. Reverse Idler Gear Shaft
67. Reverse Idler Gear
68. Washer
69. Reverse Gear Fork Shaft
70. Reverse Gearshift Fork
71. Input Drive Shaft
72. Bolt
73. Fifth–Gear Pawl
74. Fifth–Gear Needle Bearing
75. First–Gear Needle Bearing
76. Main Driven Shaft
77. Fifth Gearshift Lever
78. Hex Plug
79. Gasket
80. Reverse Lamp Switch
81. Input Shaft Bearing
82. Second–Gear Needle Bearing
83. Third–Gear Needle Bearing
84. Fourth–Gear Needle Bearing
85. Washer

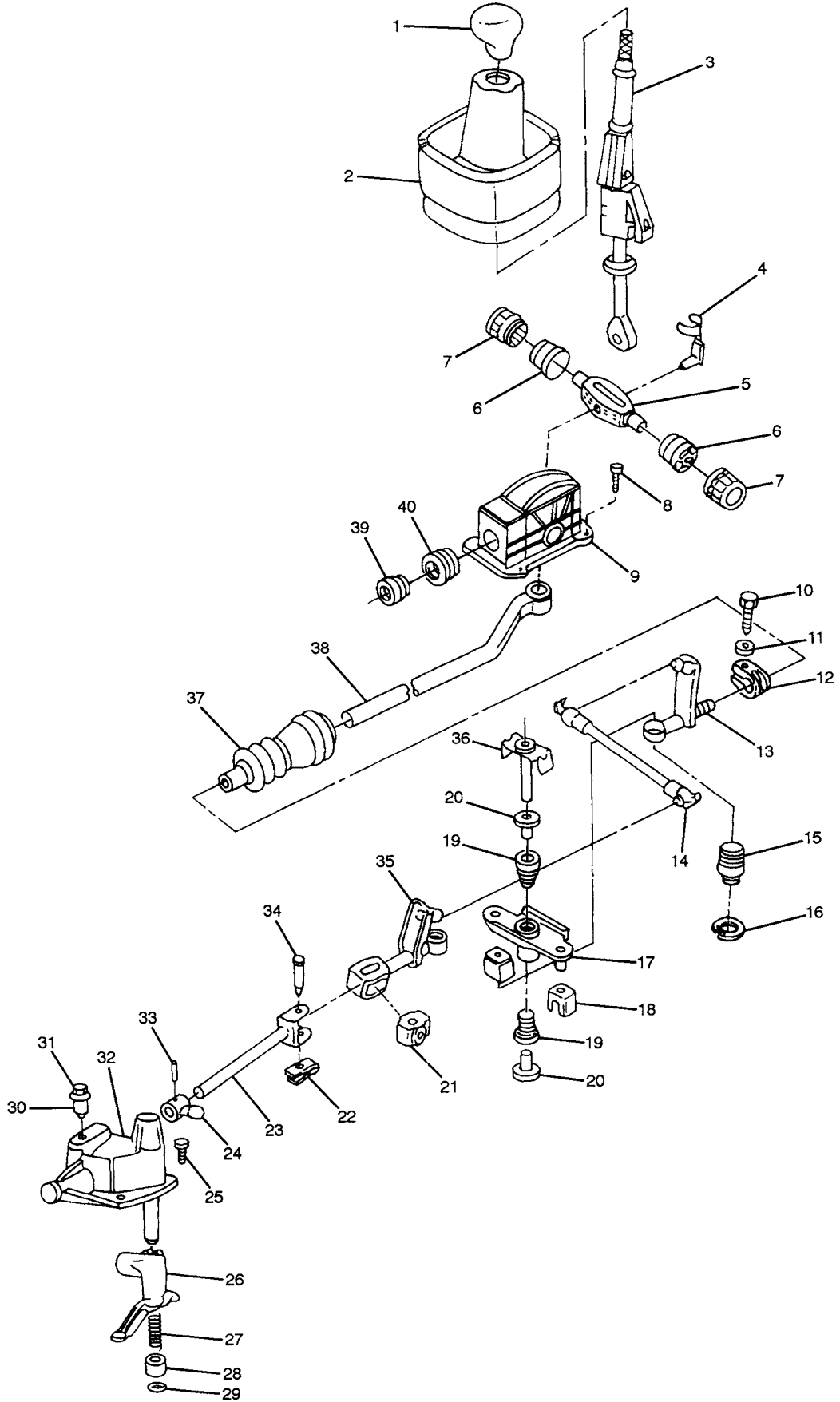
## DIFFERENTIAL AND CASE



A103B161

- |                            |                                 |
|----------------------------|---------------------------------|
| 1. Speedometer-Driven Gear | 15. Pinion Gear Shaft           |
| 2. Seal                    | 16. Differential Housing        |
| 3. Hex Bolt                | 17. Thrust Washer               |
| 4. Bearing Plate           | 18. Side Gear                   |
| 5. Washer                  | 19. Washer                      |
| 6. Bolt                    | 20. Pinion Gear                 |
| 7. Seal                    | 21. Ring Gear                   |
| 8. Seal                    | 22. Speedometer Drive Gear      |
| 9. Bearing Adjusting Ring  | 23. Bolt                        |
| 10. Side Bearing Race      | 24. Pinion Shaft Lock Pin       |
| 11. Housing Cover Gasket   | 25. Right Side Bearing Retainer |
| 12. Differential Cover     | 26. Seal                        |
| 13. Bolt                   | 27. Retainer Bolt               |
| 14. Differential Bearing   |                                 |

# SHIFT LINKAGE



1. Gearshift Lever Knob
2. Gearshift Lever Boot
3. Gearshift Lever
4. Gearshift Lever Stop Clamp
5. Gearshift Lever Shaft
6. Gearshift Lever Stop Bushing
7. Gearshift Lever Stop Bushing
8. Bolt
9. Gearshift Housing
10. Shift Rod Clamp Bolt
11. Washer
12. Clamp
13. Linkage Adjuster Bolt
14. Gearshift Control Rod
15. Linkage Ball Socket
16. Circlip Ring
17. Linkage Reverse Lever
18. Gearshift Boot
19. Bushing
20. Bushing
21. Rod U-Joint Bushing
22. Clip
23. Gearshift Rod
24. Shift Finger Lever
25. Cover Bolt
26. Intermediate Lever
27. Shift Lever Thrust Spring
28. Bushing
29. Snap Ring
30. Oil Filler Plug
31. Oil Plug Cap
32. Gearshift Lever Cover
33. Pin
34. Bolt
35. Gearshift Adjuster Linkage
36. Shift Reverse Pivot Bolt
37. Boot
38. Gearshift Tube
39. Bushing
40. Gearshift Tube Bearing