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AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

INTRODUCTION

RENAULT MB1 - MJ3

The MB1 and MJ3 Transmissions are covered in detail along with teardown-assembly and trouble-shooting. The MB1 Transmission is found in the Alliance and Encore, the MJ3 Transmission is found in the Sportwagon and Fuego.

We thank American Motors and Renault for the illustrations and information that made this booklet possible.

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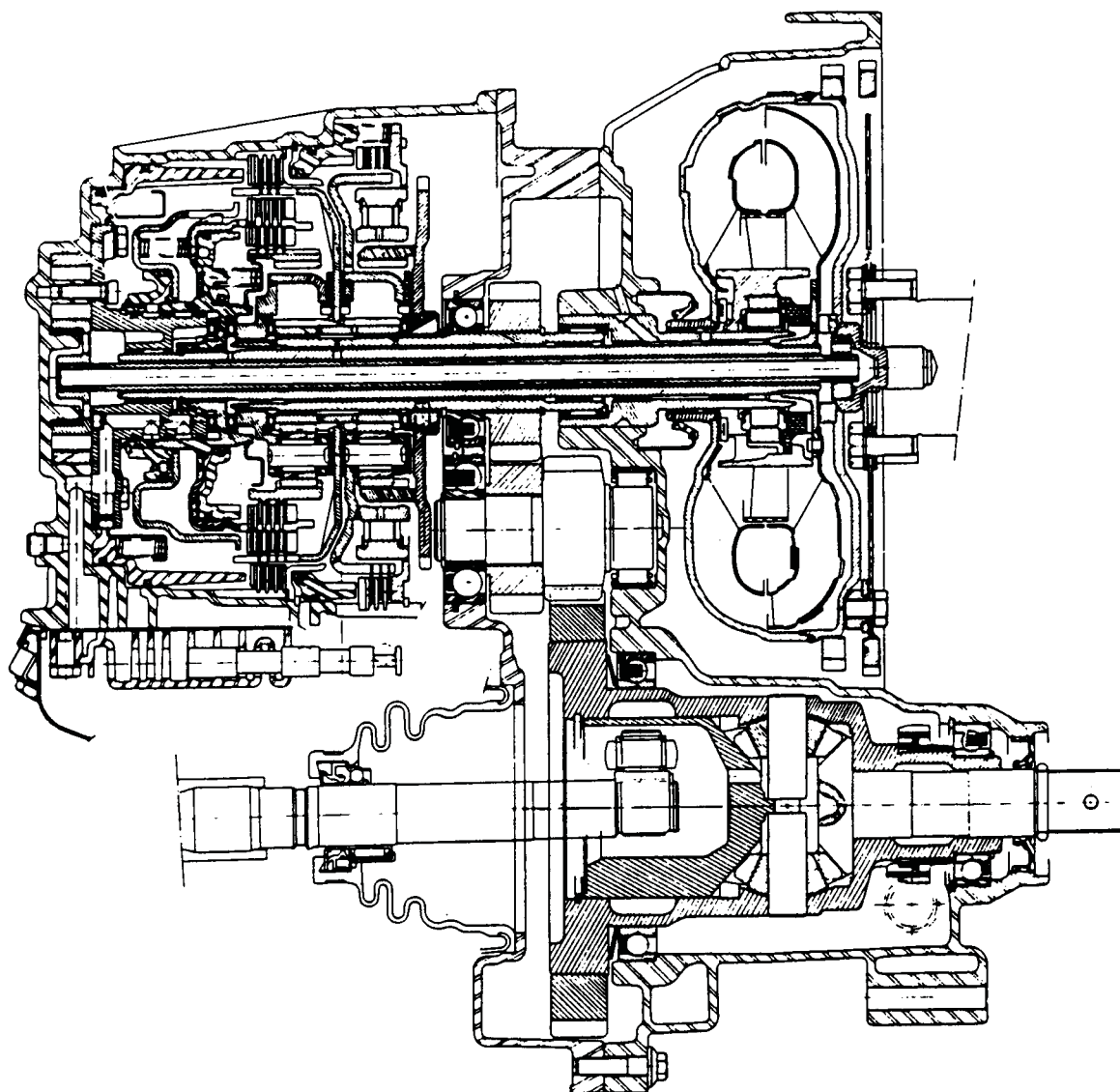
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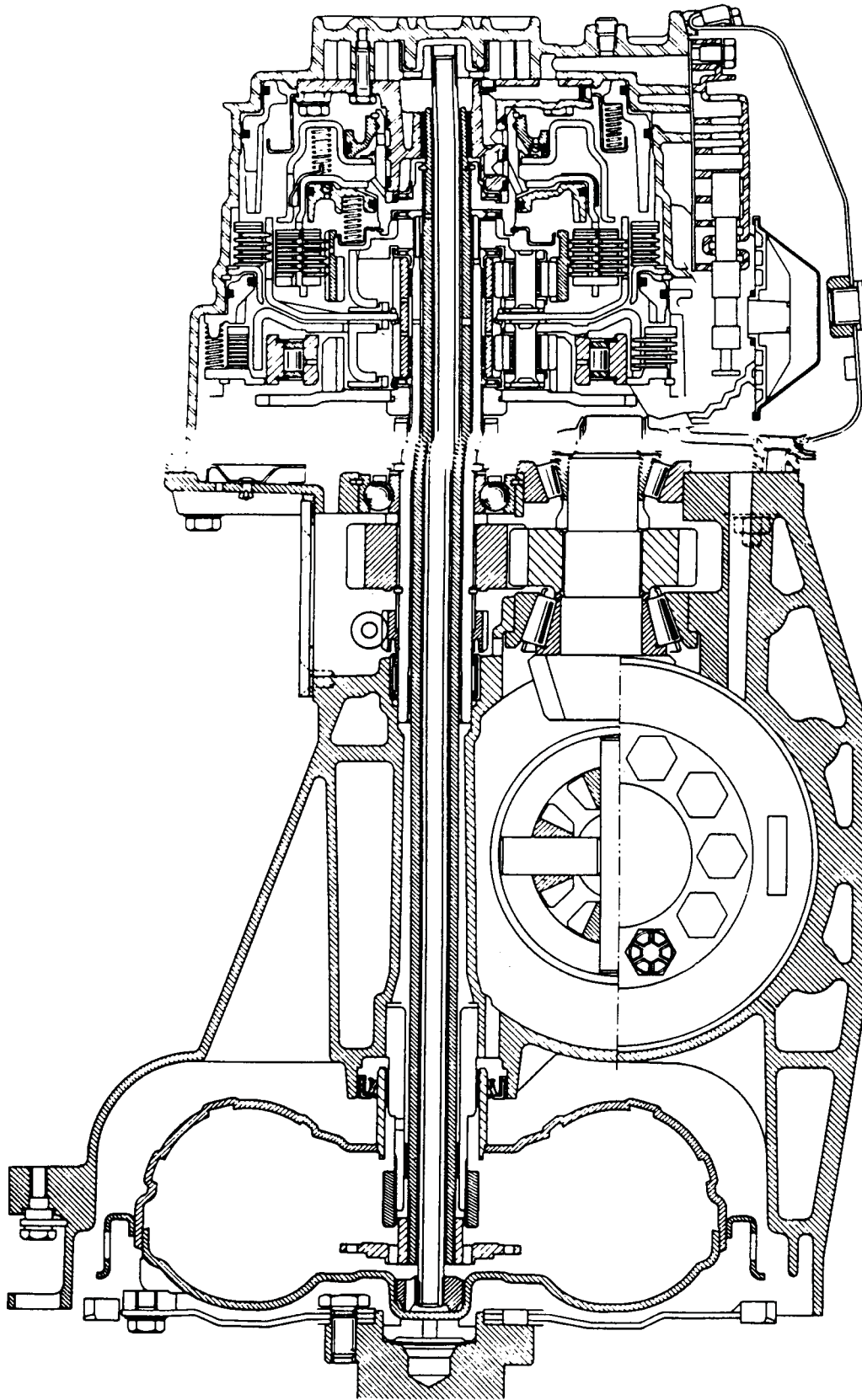
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MB TRANSAXLE (CUTAWAY VIEW)



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MJ TRANSAXLE (CUTAWAY VIEW)



AUTOMATIC TRANSMISSION SERVICE GROUP



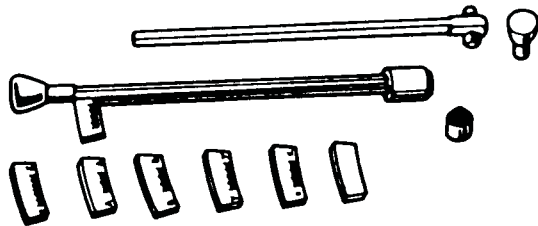
Technical Service Information

SPECIAL TOOLS

Tool Ref.	Description	Required	Recommended
B.Vi. 31-01	Set of 3 Roll Pin Drifts		■
B.Vi. 946	Planetary Snap Ring Installer		■
B.Vi. 952	Feed Hub Alignment Dowels and Front Piston Removing Tool		■
Mot. 50	Torque Wrench or Equivalent Beam Type Torque Wrench		■
Mot. 53	Drain Plug Wrench (98 mm square drive)	■	
B. Vi. 465	Converter Oil Seal Replacement Tool and Converter Holding Lug	■	
B. Vi. 466-04	Oil Pressure Gauge (or J-24027 with adapter 8981 320759)	■	
B. Vi. 466-06	Oil Pressure Gauge for B. Vi. 466-04	■	
B. Vi. 715	Tool From B. Vi. 710 Kit or use B. Vi. LM	■	
B. Vi. 883	Differential Outside Band Installer	■	
B. Vi. 905	Speedometer Shaft Seal Replacement Tool	■	
B. Vi. 945	Planetary Oil Seal Installing Mandrel	■	
B. Vi. 947	Intermediary Case Bearing Installer	■	
B. V. 951	Differential Oil Seal Installer	■	
B. Vi. 953	Step Down Driven Gear Holding Tool	■	
B. Vi. 955	Differential Pinion Bearing Preload Measuring Tool	■	
B. Vi. 958	Diagnostic Tester (or MS 1700 With Adapter)	■	
B. Vi. 959	Output Shaft Circlip Installing Tool	■	
B. Vi. 961	Differential Pinion Bearing Race Install- ing Tool	■	
B. Vi. 962	Converter Oil Seal Installing Tool	■	

SPECIAL TOOLS

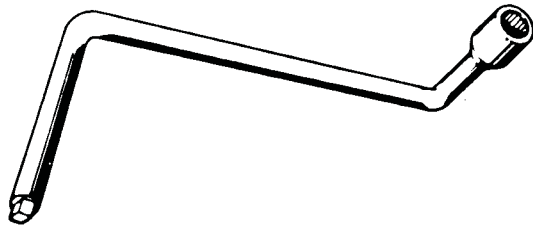
Mot. 50



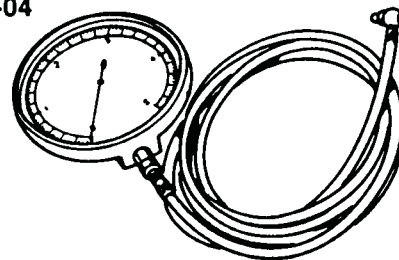
B.Vi. 715



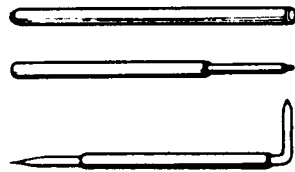
Mot. 593



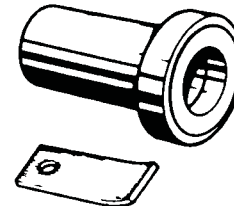
B.Vi. 466-04



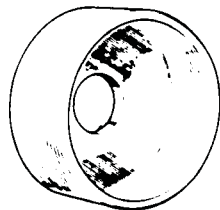
B.Vi. 31-01



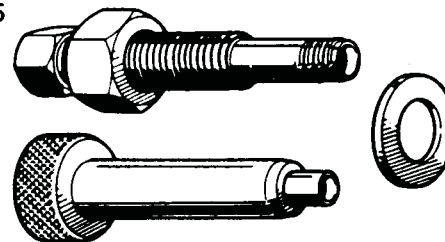
B.Vi. 465



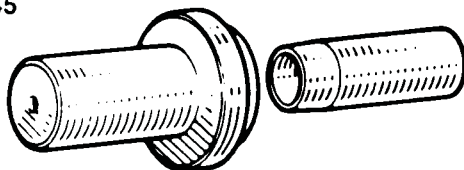
B.Vi. 883



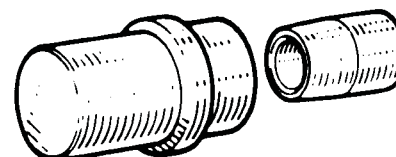
B.Vi. 905



B.Vi. 945



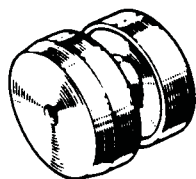
B.Vi. 946



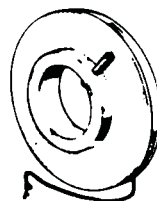
AUTOMATIC TRANSMISSION SERVICE GROUP

SPECIAL TOOLS

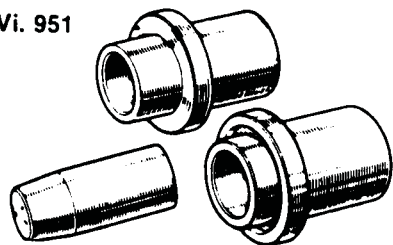
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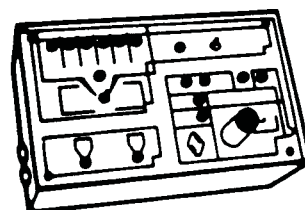
B.Vi. 955



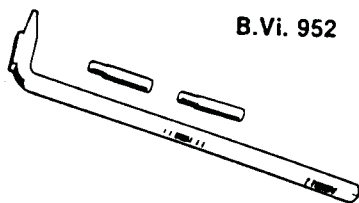
B.Vi. 951



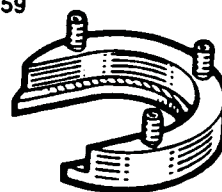
B.Vi. 958



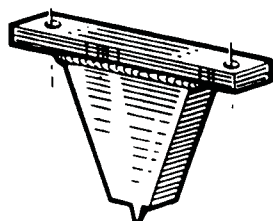
B.Vi. 952



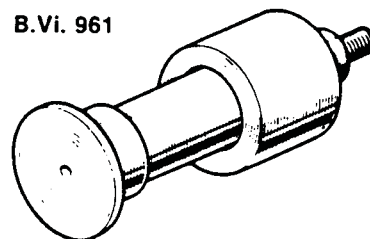
B.Vi. 959



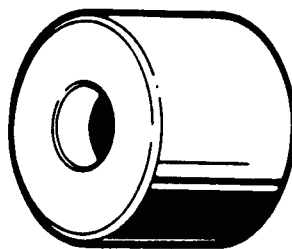
B.Vi. 953



B.Vi. 961



B.Vi. 962





TORQUE SPECIFICATIONS

Component	Service Set-to-Torque
Converter and Differential Casing-to-Intermediate Case Retaining Bolts (MB)	120 to 140 N·m (89 to 104 ft-lbs)
Converter-to-Drive Plate Bolts (MB)	20 N·m (15 ft-lbs)
Drive Plate-to-Crankshaft Bolts (MB)	25 N·m (18 ft-lbs)
Feed Hub Retaining Bolts (MB)	9 N·m (80 in-lbs)
Feed Hub Centering Bolt (MB)	15 N·m (132 in-lbs)
Transaxle Oil Pan Retaining Bolts (MB)	6 N·m (54 in-lbs)
Valve Body Retaining Bolts (MB)	6 N·m (54 in-lbs)
Differential Closure Plate Bolts (MJ)	25 N·m (18 ft-lbs)
Differential-to-Transmission Bolts (MJ)	30 N·m (22 ft-lbs)
Differential and Intermediary Housing Bolts (MJ)	70 N·m (52 ft-lbs)
Final Drive Pinion Bolts (MJ)	160 N·m (118 ft-lbs)
Ring Gear Bolts (MJ)	25 N·m (18 ft-lbs)

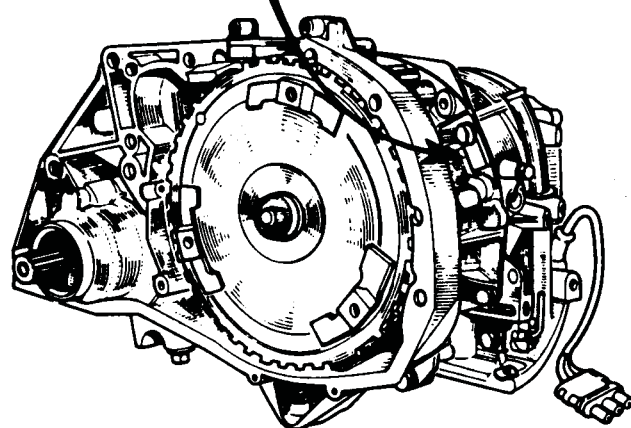
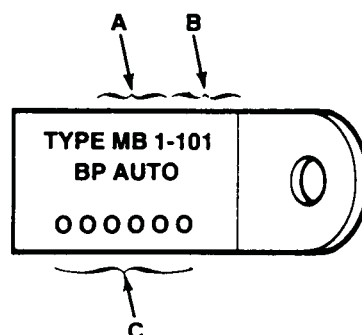
IDENTIFICATION PLATE

The identification plate on the **MB** or the **MJ** transaxle is stamped with the following data:

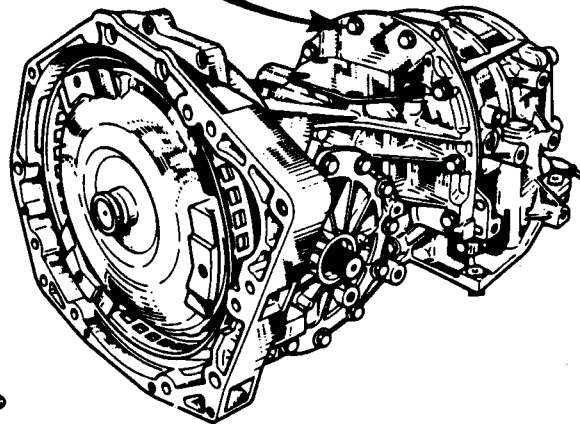
A-Automatic Transaxle Type

B-Type Suffix

C-Fabrication Number



MB



MJ

VEHICLE APPLICATION

Vehicle	Type of transaxle	Final drive ratio	Down Shift gear ratio	Speedometer gear ratio	Oil pressure in bars (psi)	Number of side gears
B42A C42A L42A M42A	MB 1	16/57	25/23	21/19	4.4 bars (64 psi)	2
135B 136B	MJ 3	9/32	25/22	7/20 7/19	4.6 bars (66.7 psi)	4

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MAJOR TRANSAXLE ASSEMBLIES

The automatic transaxle enables 3 forward speeds to be engaged one after the other with continuous torque action.

There are three main components:

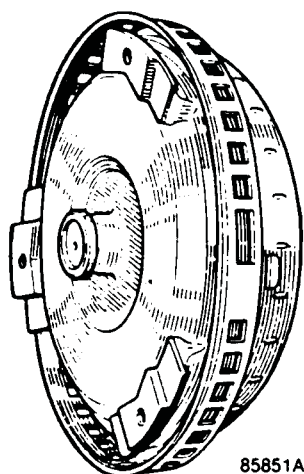
- the torque converter
- the differential
- the rear case

DESCRIPTION

Torque Converter

The torque converter provides a smooth coupling for transmitting engine torque to the rear case components with automatic clutch action.

Increased torque is provided for moving from a standing position.



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Differential

The differential transmits power from the rear case components to the wheels.

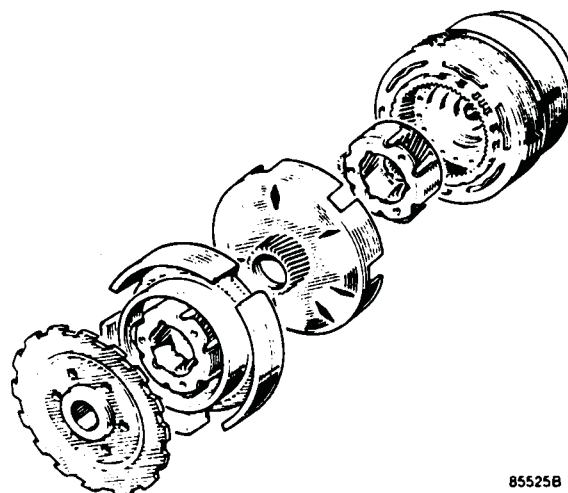
It consists of a step-down gear cluster that lowers the drive centerline, and a ring gear and pinion that drive the differential housing.

Rear Case

The rear case components provide 3 reduction ratios for forward movement and 1 for reverse movement.

The rear case components include an epicyclic gear train with 3 different control elements:

- mechanical
- hydraulic
- electric



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The epicyclic gear train is an assembly of helical gears that enable different ratios to be obtained (3 forward, 1 reverse) depending on hydraulic pressure to the receivers (E1 -E2 and F1 -F2).





GEAR SHIFT SPEEDS

The figures shown in the table give approximate speeds at which gear shifts occur.





The shift speeds may vary depending on the size of the tires on the vehicle.

- PL: foot removed from the accelerator pedal
- PF: accelerator pedal floored -full throttle

MB TRANSAXLE

Position of foot	Gear Shift Speeds			
	1↔2		2↔3	
				
PL	25 Km/h (16 mph)	15 Km/h (9 mph)	45 Km/h (28 mph)	25 Km/h (16 mph)
PF	70 Km/h (43 mph)	55 Km/h (34 mph)	110 Km/h (68 mph)	95 Km/h (59 mph)

MJ TRANSAXLE

Position of foot	Gear Shift Speeds			
	1↔2		2↔3	
				
PL	23 Km/h (14 mph)	15 Km/h (9 mph)	40 Km/h (25 mph)	27 Km/h (17 mph)
PF	71 Km/h (44 mph)	62 Km/h (39 mph)	117 Km/h (73 mph)	101 Km/h (63 mph)

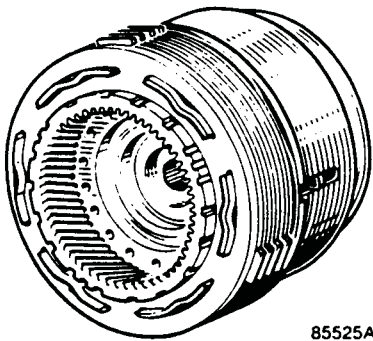
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OVERHAUL NOTES

The reaction shaft cannot be removed from the converter housing.

The speedometer drive gear and pinion shaft can be removed only after the final drive components have been disassembled.

The E1 and E2 clutch assembly cannot be disassembled.



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Parts that must be inspected during an overhaul:

- brakes and clutches (replace if damaged)
- torque converter (replace if the transaxle fluid contains metal chips or particles of brake or clutch material)
- final drive components (must be cleaned)
- valve body (must be cleaned)
- bearings (replace if worn or damaged)
- transaxle (if the transaxle is seriously damaged, replace it with an exchange unit)
- final drive gears (replace if noisy)

Parts that must be replaced during an overhaul:

- roll pins
- O-and square rings
- differential bearings if they have been removed
- oil seals
- differential outer band (MJ)
- speedometer pinion shaft
- oil filter



Technical Service Information

RECOMMENDED FLUID

The only recommended lubricants for the MB and MJ transaxles are AMC/Jeep/Renault Automatic Transmission Fluid, Mobil 220 ATF or equivalent Dexron II® ATF.

The fluid serves all the internal parts of the transaxle (converter, final drive components and the parts in the rear case).

FLUID CHANGE INTERVAL

Change the transaxle fluid and filter at 48,000 km (30,000 mi) intervals, or every 24 months.

NOTE: The initial fluid fill for a new replacement automatic transaxle must be with AMC/Jeep/Renault Automatic Transmission Fluid or MOBIL 220 ATF only.

Vehicle		Dry fill capacity	Refill capacity
Renault Encore	B42A C42A	4.3L (4.5 qts.)	2.45L (2.5 qts.)*
Renault Alliance	L42A M42A		
Renault Sportwagon	135B	6.0L (6.4 qts.)	2.5L (2.6 qts.)
Renault Fuego	136B		

*Combined transmission and differential drained

AUTOMATIC TRANSMISSION SERVICE GROUP



TRANSAXLE FLUID LEVEL

Check the fluid level at each engine oil change interval.

Overfilling the transaxle can cause:

- the fluid to foam
- a loss of fluid
- damage to the transaxle

A low fluid level can cause:

- slipping
- loss of drive
- damage to the transaxle

To check the fluid level:

- apply the parking brake
- place the transaxle in P (Park) and start the engine
- step on the brake pedal and move the selector lever through all the gear ranges and return to P.

A correct fluid level reading cannot be obtained if:

- the vehicle has been driven for a long time at high speed
- the vehicle has been driven in city traffic in hot weather
- the vehicle is stopped immediately after towing a trailer

Wait until the fluid cools down to normal temperature (about 30 minutes) if any of the above has occurred.

Fluid Level — MB Transaxle

The automatic transaxle fluid level dipstick is found on the left side of the vehicle, on the top of the transaxle.

The fluid level check should be made with the vehicle at rest on a level surface.

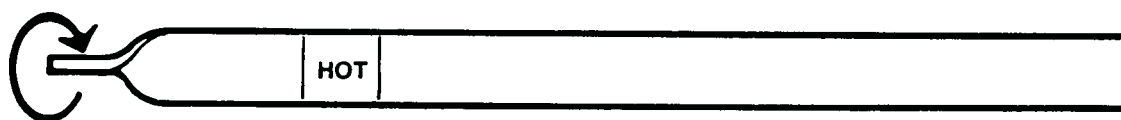
The transaxle should be at an ambient temperature of 16° to 38°C (60° to 100°F) to obtain a proper reading.

The engine should be at normal idle speed and the transmission should be in park. The transmission must be shifted through the five gear positions slowly and returned to the park position before checking the fluid level.

The fluid level should be between the add and full COLD marks (A). There is approximately one pint difference between the add and full marks.

Add just enough AMC/Jeep/Renault Automatic Transmission Fluid, Mobil 220 ATF or Dexron II® fluid to fill the transaxle to the proper level. It takes only 0.25 liters (0.5 U.S. pt. or 0.4 imp. pt.) of fluid to raise the level from ADD to FULL when the transaxle is at normal operating temperature, Do Not Overfill.

NOTE: The back side of the dipstick is marked with a hot fluid level range and is for reference only (fluid temperature approximately 71° to 80°C or 160° to 180°F).





Fluid Level — MJ Transaxle

The automatic transaxle fluid level dipstick is found on the right side of the vehicle, on the top of the transaxle.

Check the fluid level with the engine warm and running at curb idle (slow). The vehicle must be on a level surface.

The engine should be at normal idle speed and the transmission should be in park. The transmission must be shifted through the five gear positions slowly and returned to the park position before checking the fluid level.

Remove the dipstick and carefully touch the wet end to find out if the fluid is warm or at normal operating temperature.

Wipe the dipstick clean and seat it back in the dipstick tube. Pull out the dipstick and read the fluid level.

If the dipstick is too hot to hold, the transaxle is at a normal operating temperature of 71° to 77°C (160° to 170°F). The fluid level should be in range (A).

If the dipstick is warm, room temperature to 38°C (100°F), the fluid level should be in the range (B).

Add just enough AMC/Jeep/Renault Automatic Transmission Fluid, Mobil 220 ATF or Dexron II® fluid to fill the transaxle to the proper level. It takes only 0.25 liters (0.5 U.S. pt. or 0.4 imp. pt.) of fluid to raise the level from ADD to FULL when the transaxle is at normal operating temperature.



FLUID PRESSURE CHECK AND ADJUSTMENT

The test must be carried out when the transmission is hot during a road test. Fluid pressure varies with fluid temperature.

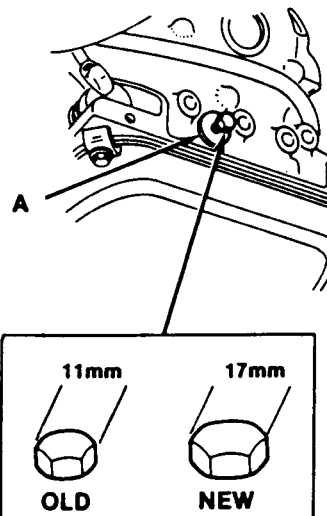
Low fluid pressure will cause excessive slip during gear shifting, overheating of the clutches and brakes, and eventual damage to the transaxle.

High fluid pressure will cause harsh gear shifting that is harmful to the transmission.

The Fluid Pressure Testing Gauge B.Vi. 466.04 must be handled carefully and calibrated regularly.

Conditions for checking fluid pressure:

- be sure that the accelerator cable is properly adjusted
- connect the pressure testing gauge to the plug orifice (A)
- drive a few miles to heat the fluid to normal operating temperature



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During the test:

- place the gear selector lever in 2nd
- press the accelerator pedal to the floor and apply the brakes at the same time to stabilize the speed at 80 km/h (50 mph)



VACUUM CAPSULE CHECK

Apply an extended vacuum of 524 mbar (400 mm Hg) to the capsule.

If the test gauge needle remains steady, check the fluid pressure.

If the needle falls, either the capsule or its pipe must be replaced.

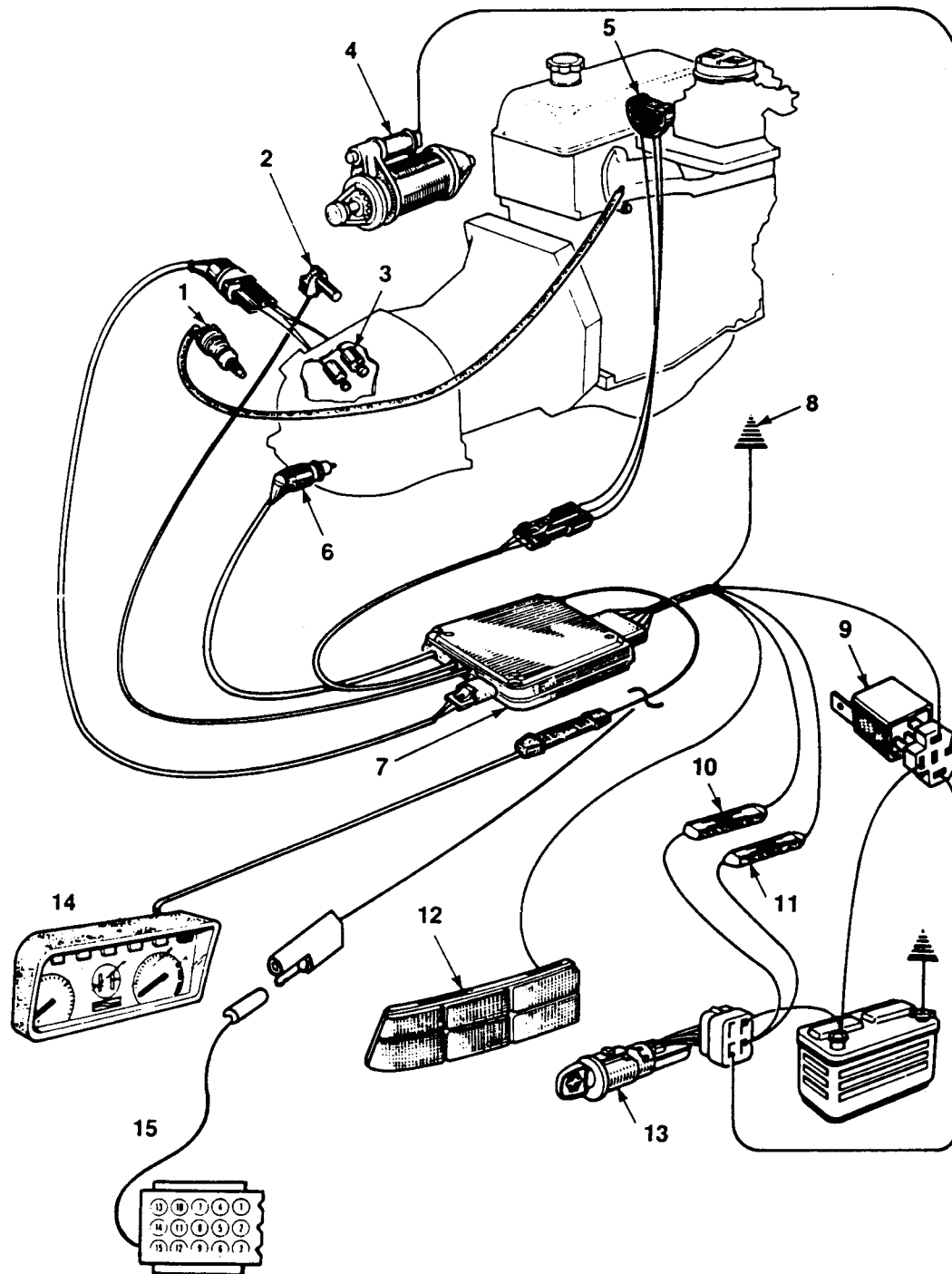
Make sure that the union on the inlet manifold is sound.

Check that the pipe is tight at both the capsule and union ends.

An air leak into the capsule or into its pipe will cause whistling, unsteady idling and rough gear shifting on light load.

NOTE: The vacuum capsule should be replaced if it is the cause of a fluid leak. The capsule cannot be repaired.

WIRE HARNESS AND ELECTRICAL COMPONENTS



- | | |
|-------------------------------|---|
| 1. Vacuum Capsule | 9. Starter Relay |
| 2. Road Speed Sensor | 10. 5 Amp Fuse for Backup Lights |
| 3. Solenoid Ball Valves | 11. 1.5 Amp Feed Circuit |
| 4. Starter | 12. Back up Lights |
| 5. Engine Load Potentiometer | 13. Starter Switch |
| 6. Multi-Function Switch | 14. Instrument Panel Indicator (Early Production) |
| 7. Computer | 15. Diagnostic Connector (Late Production) |
| 8. Automatic Transaxle Ground | |

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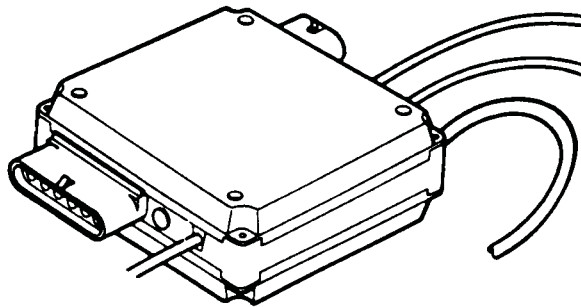
ELECTRICAL CONTROL UNITS

Computer

This is an electronic microprocessor that interprets information from:

- the road speed sensor
- the engine load potentiometer
- the multifunction switch

and converts it into electrical instructions to the solenoid valves to change gears.

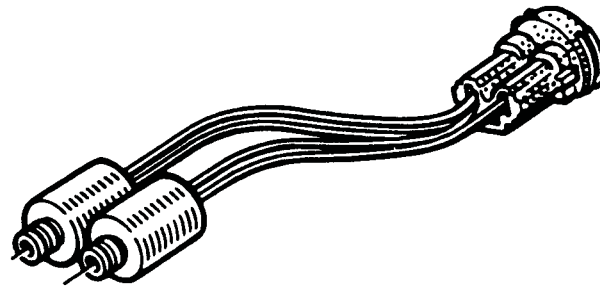


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Solenoid Ball Valves

The solenoid-operated ball valves open or close hydraulic channels to change gears.

They are controlled by the computer.



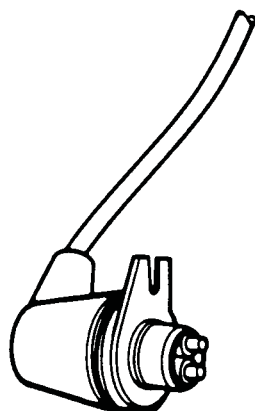
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Multifunction Switch

The switch cam opens or closes the following electrical circuits depending on the position of the gear selector lever:

- starter circuit,
- backup lights circuit (lever in R),
- solenoid ball valves EL1 and EL2

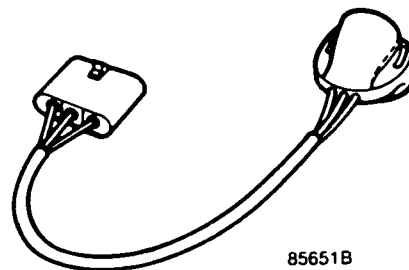
The starter is only activated when the lever is in positions N or P.



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Engine Load Potentiometer

The potentiometer provides variable voltage based on the throttle position.



85651B

Road Speed Sensor

The sensor is a winding located opposite the PARK ring that senses vehicle speed.



85651C

HYDRAULIC CONTROL UNITS

Oil Pump

The involute gear oil pump (1) is located in the back of the rear case.

The pump is driven directly by the engine via the converter drive plate and supplies pressurized fluid for the following:

- converter
- gear lubrication
- brakes and clutches

Vacuum Capsule

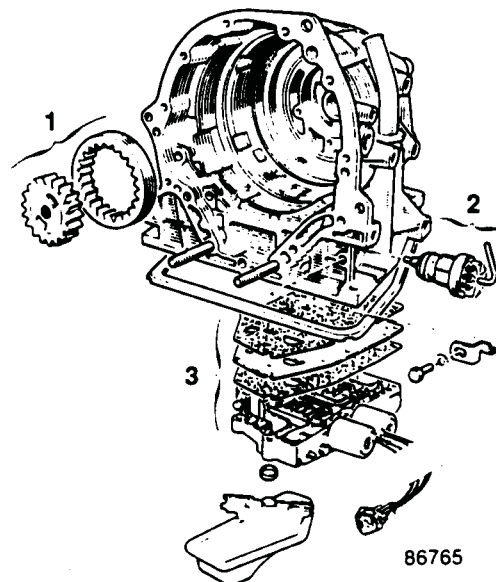
The vacuum capsule (2) provides pressure that, depending on the engine load, determines the fluid pressure to the receivers and, as a result, controls the gear change quality.

Valve Body

The valve body (3) ensures:

- the fluid pressure regulation taking into account the engine load (vacuum capsule).
- pressurized fluid supply or release to or from the clutches and brakes

Ratio changes are determined by the operation of the 2 solenoid ball valves EL1 and EL2. They receive electrical instructions from the computer.



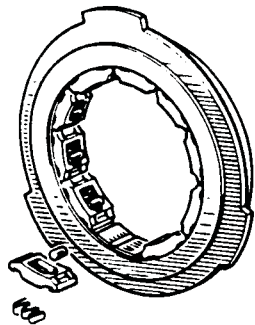
MECHANICAL CONTROL UNITS**Freewheel**

The freewheel allows torque to be transmitted from the engine to the front wheels but does not provide engine braking.

Clutches and Brakes

Clutches E1 and E2 and brakes F1 and F2 are of the multi-disc oil bath type.

They are hydraulic receivers that, depending on their feed, lock or release units in the epicyclic gear train to engage the various forward gear ratios.



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Technical Service Information

FUNCTION CHART

Selector lever position		RL	E1	E2	F1	F2	EL1	EL2
P								
R								
N								
A	1							
	2							
	3							
2nd HOLD								
1st HOLD								

RL = Freewheel
E1 = Clutch 1
E2 = Clutch 2
F1 = Brake 1
F2 = Brake 2
EL1 = Solenoid valve 1
EL2 = Solenoid valve 2

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Technical Service Information

TROUBLESHOOTING CHART

COMPLAINTS	transaxle component causes	electrical causes	hydraulic causes	mechanical causes
Engine stalls, uneven idling	2 - 3 - 4 - 5 - 12			
Creep in N	9			23
Excessive creep in D	2 - 4		22	
Slip when starting off in D or R			1 - 11 - 16 - 22	
Slip when starting off in D only				23 - 26
Slip during gear shifting			11 - 16 - 30	23 - 25
Surge when starting off	2 - 4		1	
Surge during gear shifting			11 - 12 - 16	
Incorrect gear shift speeds	4 - 8	7 - 14 - 13 - 28		
No drive	9		1 - 16 - 17 - 30	18 - 19 - 20 - 21 22 - 23
No drive in D or in 1st gear Hold			16	23 - 26
No drive in R or 3rd			16	23
No reverse or engine braking in 1st gear Hold		29	16	24
No 1st gear in D		7 - 15	15	26
No 2nd gear in D		7	16	25
No 3rd gear in D		7 - 13 - 15 - 29	16	
No 1st gear Hold	9	7 - 13 - 29	16	
No 2nd gear Hold	9	7 - 13 - 29		
Remains in 1st in D		7 - 13 - 15 - 28	16	
Remains in 3rd		6 - 7 - 13 - 17	16	
Some ratios unobtainable and selector lever position abnormal	9 - 10			27
Park position not functional	9			27
Starter not operating	9 - 10	7 - 13 - 29		
Backup lights not working	9 - 10	7 - 13 - 29		

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Technical Service Information

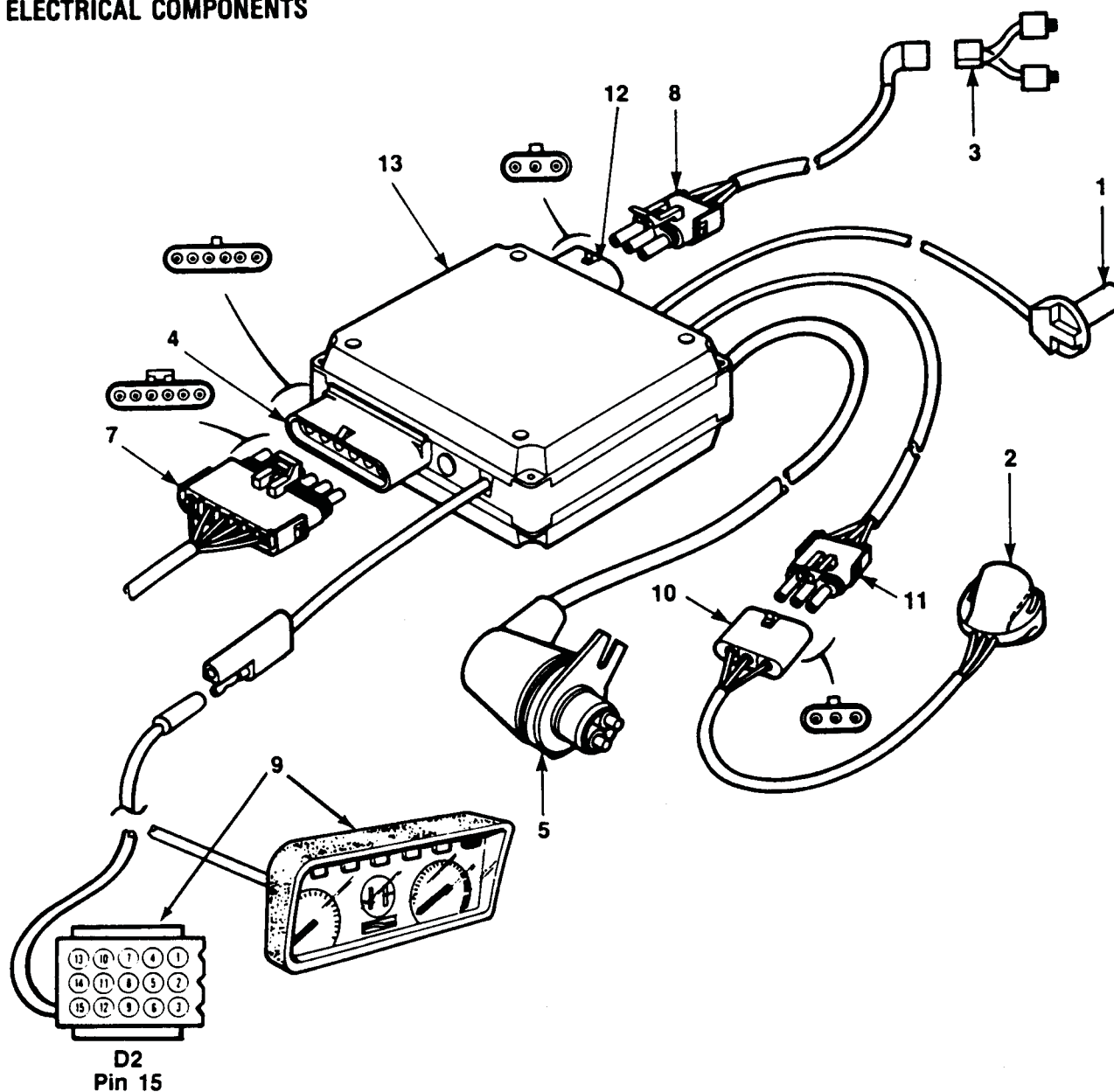
1	●	FLUID LEVEL
2	●	IDLING
3	●	IGNITION: SPARK PLUGS, DISTRIBUTOR
4	●	ACCELERATOR CONTROL
5	●	VACUUM CAPSULE TUBE
6	●	FUSES
7	●	HARNESSES, PLUGS, GROUNDS
8	●	LOAD POTENTIOMETER ADJUSTMENT
9	●	GEAR SELECTOR LEVER ADJUSTMENT
10	●	SELECTOR CONTROL
11	●	FLUID PRESSURE SETTING (CAPSULE)
12	■	VACUUM CAPSULE OR HOSE
13	■	COMPUTER
14	■	KICK-DOWN SWITCH
15	■	SOLENOID VALVES
16	■	VALVE BODY
17	▲	OIL PUMP
18	▲	OIL PUMP SHAFT
19	▲	TURBINE SHAFT
20	▲	FINAL DRIVE
21	▲	CONVERTER DRIVE PLATE
22	▲	CONVERTER
23	▲	E1 - E2 CLUTCH
24	▲	F1 BRAKE
25	▲	F2 BRAKE
26	▲	FREEWHEEL
27	▲	MANUAL VALVE MECHANICAL CONTROL
28	▲	ROAD SPEED SENSOR
29	▲	MULTIFUNCTION SWITCH
30	■	OIL PUMP SCREEN

- Adjustment on installed transmission
■ Overhaul on installed transmission
▲ Overhaul on removed or disassembled transmission

86768

AUTOMATIC TRANSMISSION SERVICE GROUP

ELECTRICAL COMPONENTS



1. Road Speed Sensor
2. Engine Lead Potentiometer
3. Solenoid Ball Valves
4. Computer 6-way connector
5. Multi-Function Switch
6. 6-Way Connector

8. 3-Way Connector
9. Diagnostic Connector or Warning Light (Early Models)
10. Potentiometer Connector
11. 3-Way Connector
12. Computer 3-Way Connector
13. Computer

86769



Technical Service Information

DIAGNOSTIC TESTER MS 1700

Components that can be tested	Road speed sensor Solenoid valves Load potentiometer Multifunction switch
Adjustment	Load potentiometer

86770

NOTE: Refer to the manual supplied with the MS 1700 Tester for information on usage and testing.



DIAGNOSTIC TESTER B.Vi. 958

Components that can be tested	Road speed sensor Solenoid valves Load potentiometer Multifunction switch
Measurement	Load potentiometer
Readings	Supply voltage Continuity of the solenoid valve winding

86771

ZONE A is used to test **MB** and **MJ** transaxles.

- 1-Solenoid valves
- 2-Road speed sensor
- 3-Potentiometer
- 4-2nd gear hold switch
- 4&5-1st gear hold switch
- 6-Multifunction switch
- 15-Diagnostic socket
- 14-Control box feed

gear selector
lever position

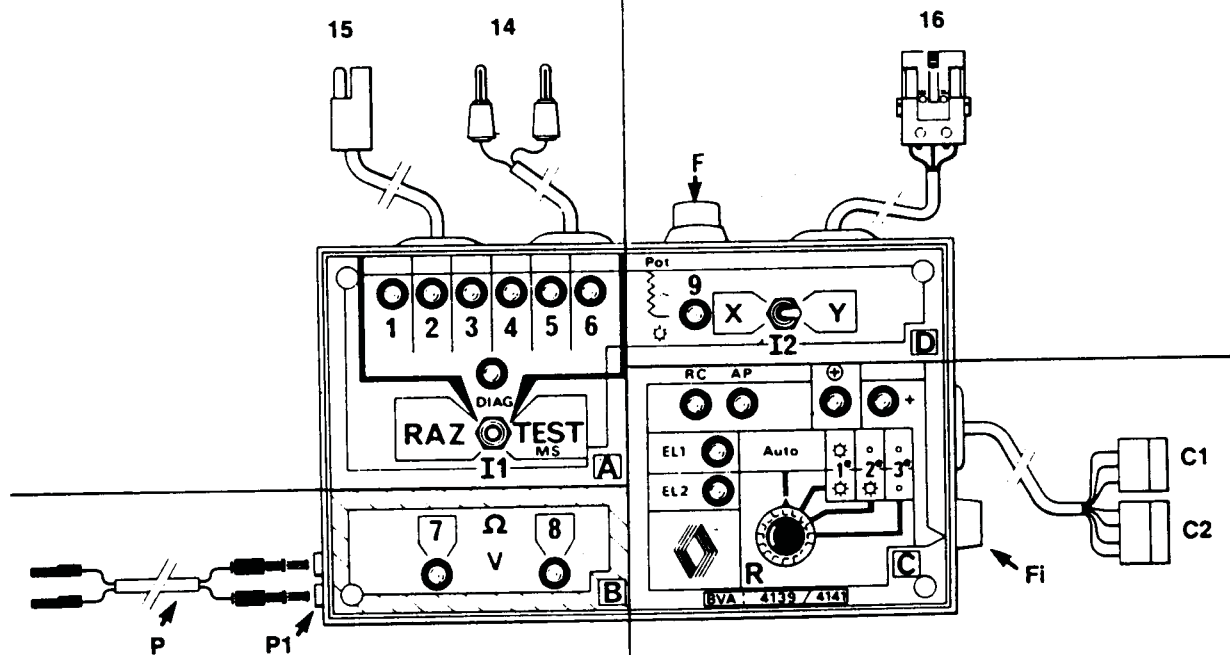
RAZ-Return to zero for check lights 1 to 6.

TEST-B.Vi. 958 check

DIAG-Instrument panel check light

ZONE D is used to check and adjust the load potentiometer on **MB** and **MJ** transaxles.

- I2-Inverter
- 9-Adjustment check light
- ⊕-Feed light (**MB-MJ**)
- F-Fuse (3.15A)
- 16-Test harness connectors



ZONE B is used to measure the solenoid valve windings and voltage and to test the multifunction switch on all **Renault** automatic transaxles.

- 7-8-Reading control lights
- P-Control harnesses
- P1-Control input sockets

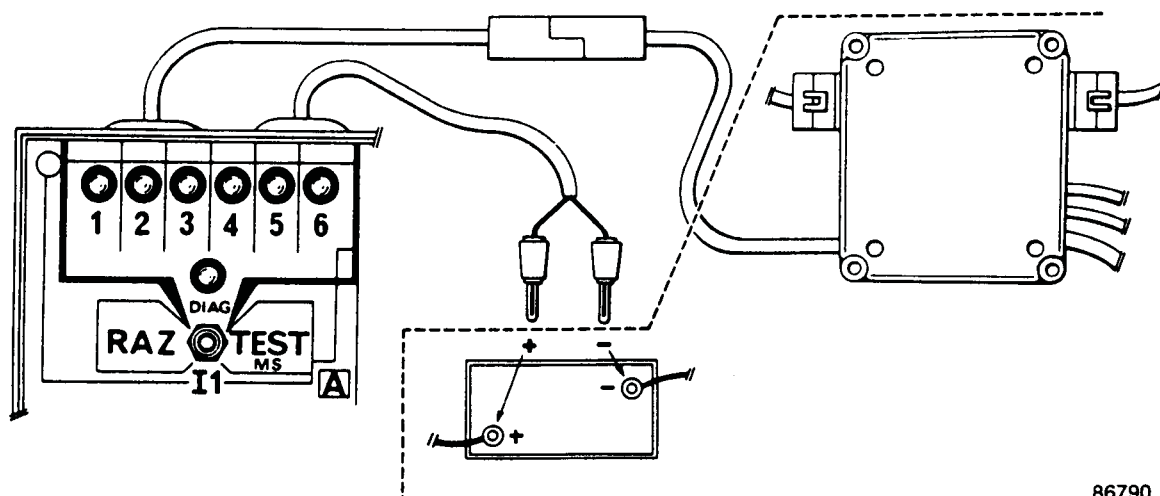
ZONE C is used to check 4139 and 4141 transaxles. Additional wiring is required.

86789

Equipment Test

The B.Vi. 958 tester has a self checking feature. Check the instrument by connecting terminal 14 to the battery and switching I1 to the test position.

Test lights 1, 2, 3, 4, 5, 6, 7, 8, and the (+) red zone should illuminate. If they do not illuminate, the tester is defective.



86790

Test Results

Road test the vehicle, but do not shut the engine off after the test.



Technical Service Information

VEHICLE STOPPED (ENGINE RUNNING)					
Checks	Check light(s)	Good	Bad	Faulty components	Operation
Solenoid Valves	1	○	⊕	Solenoid valves Harness	VII-IX-X
Road Speed Sensor	2	○	⊕	Faulty road speed sensor	
Potentiometer	3	○	⊕	Load potentiometer harness	XI - XIV
ENGINE NOT RUNNING - IGNITION SWITCH ON					
Position of the control lever	Check light 2 is on - (do not take it into consideration)				
	Check light(s)	Good		Faulty components	Operation
2nd hold	4	4 ⊕ 5 ○		If bad, multifunction switch and harness	V - XIII
1st hold	4 and 5	4 ⊕ 5 ⊕		If bad, check multifunction switch and harness	V - XIII
P R N D	4 and 5	4 ○ 5 ○		If bad, check multifunction switch and harness	III - IV XII- XIII
P - N	6	⊕		If bad, check selector lever adjustment and multifunction switch operation and harness	II

⊕ Light 'ON' ○ Light 'OFF'

86788

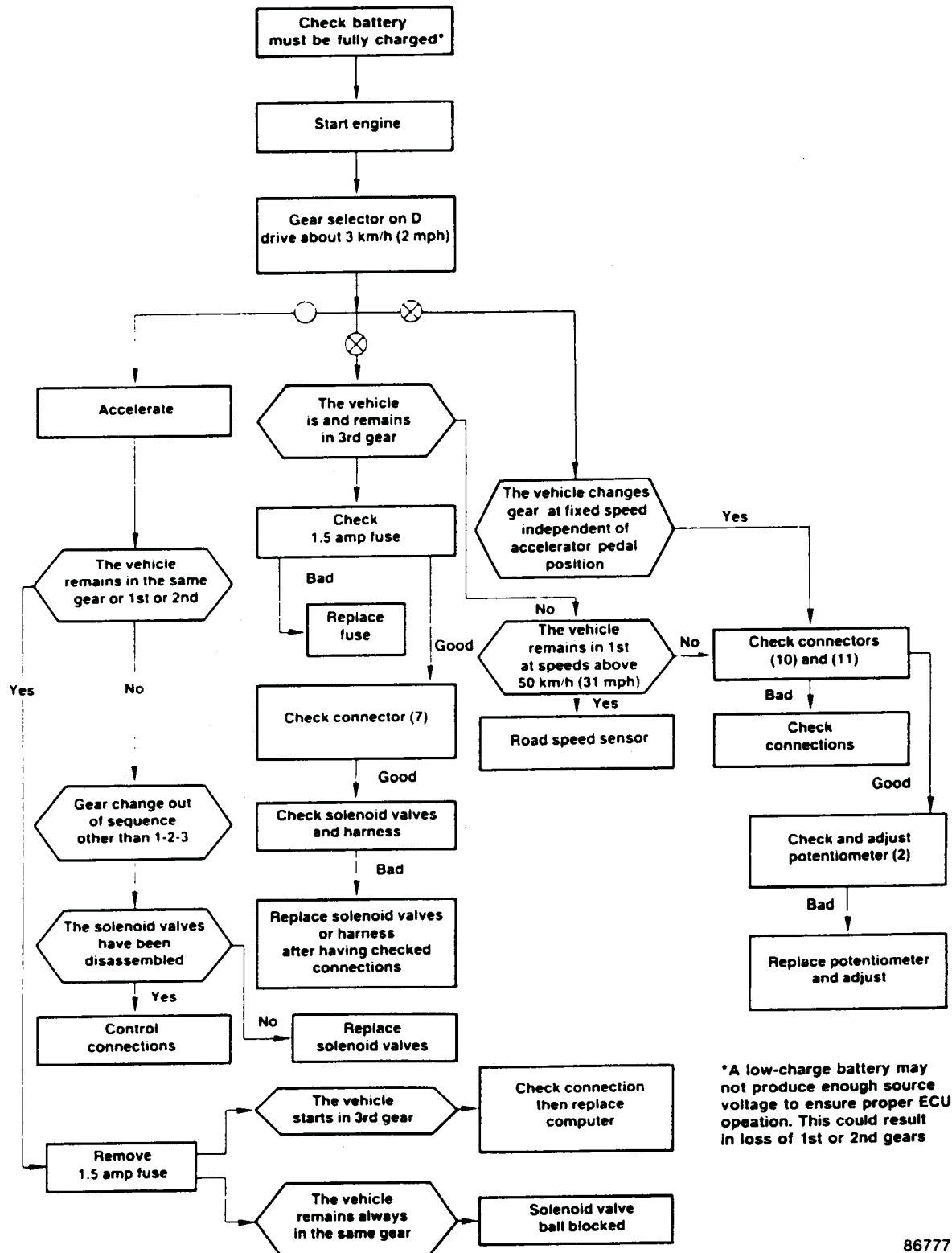
DIAGNOSTIC TESTING

The following diagnostic procedure will help locate and solve several electrical problems.

A volt/ohmmeter is required. For rapid, accurate diagnosis use Diagnostic Tester B.Vi. 958.

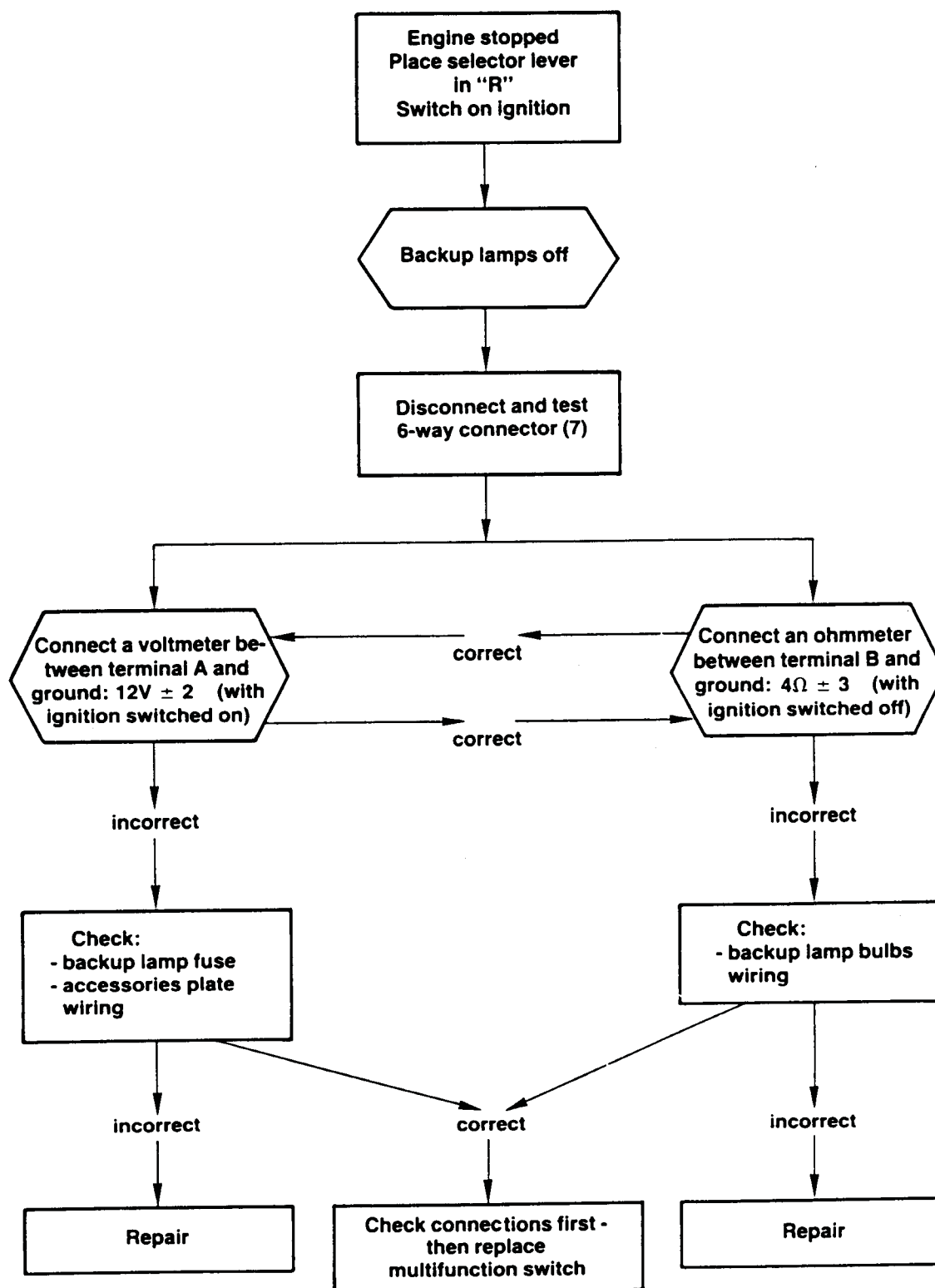
AUTOMATIC TRANSMISSION SERVICE GROUP

II ELECTRICAL CHECK SEQUENCE

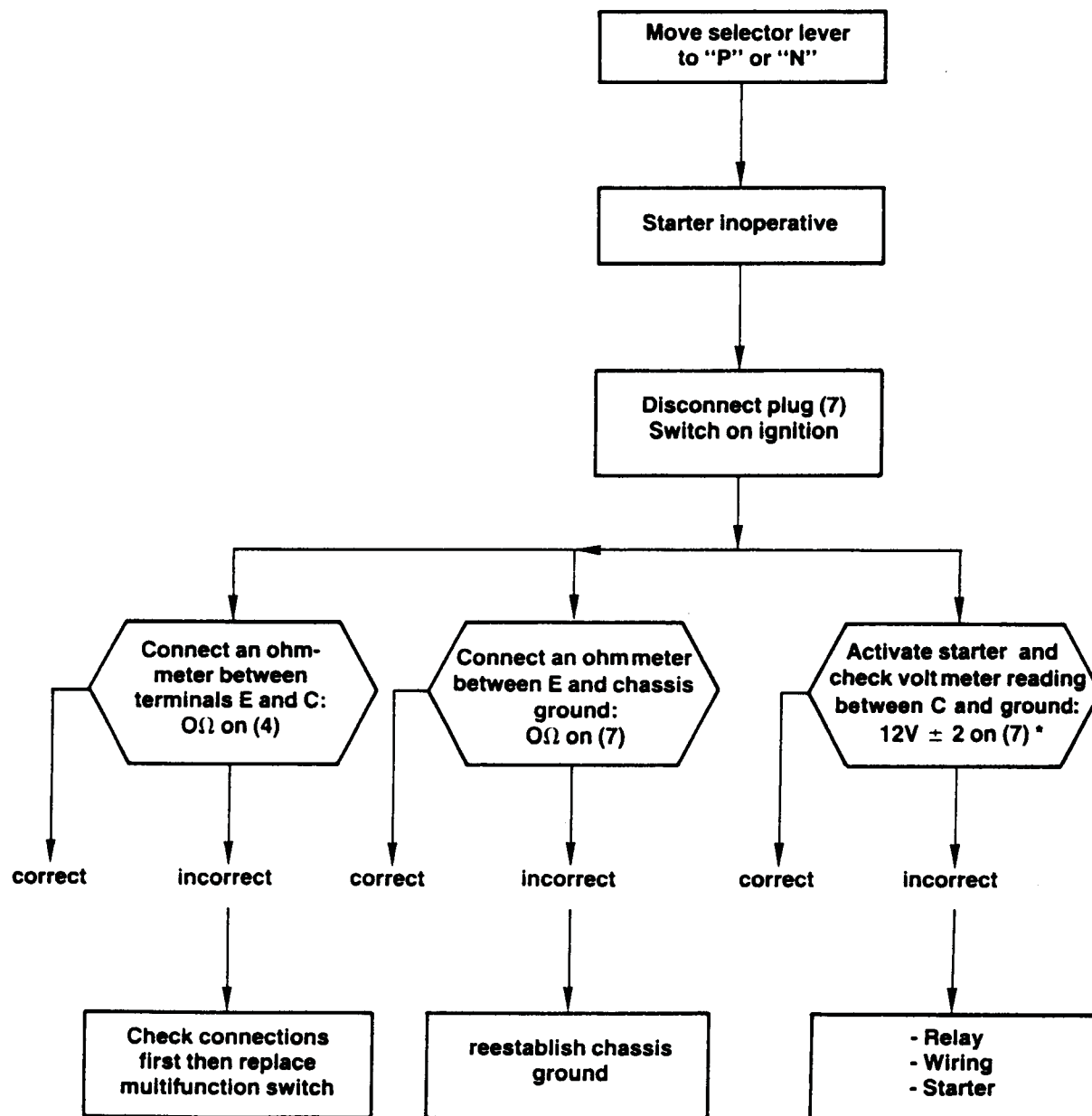


86777

III CHECKING OPERATION OF BACKUP LAMPS

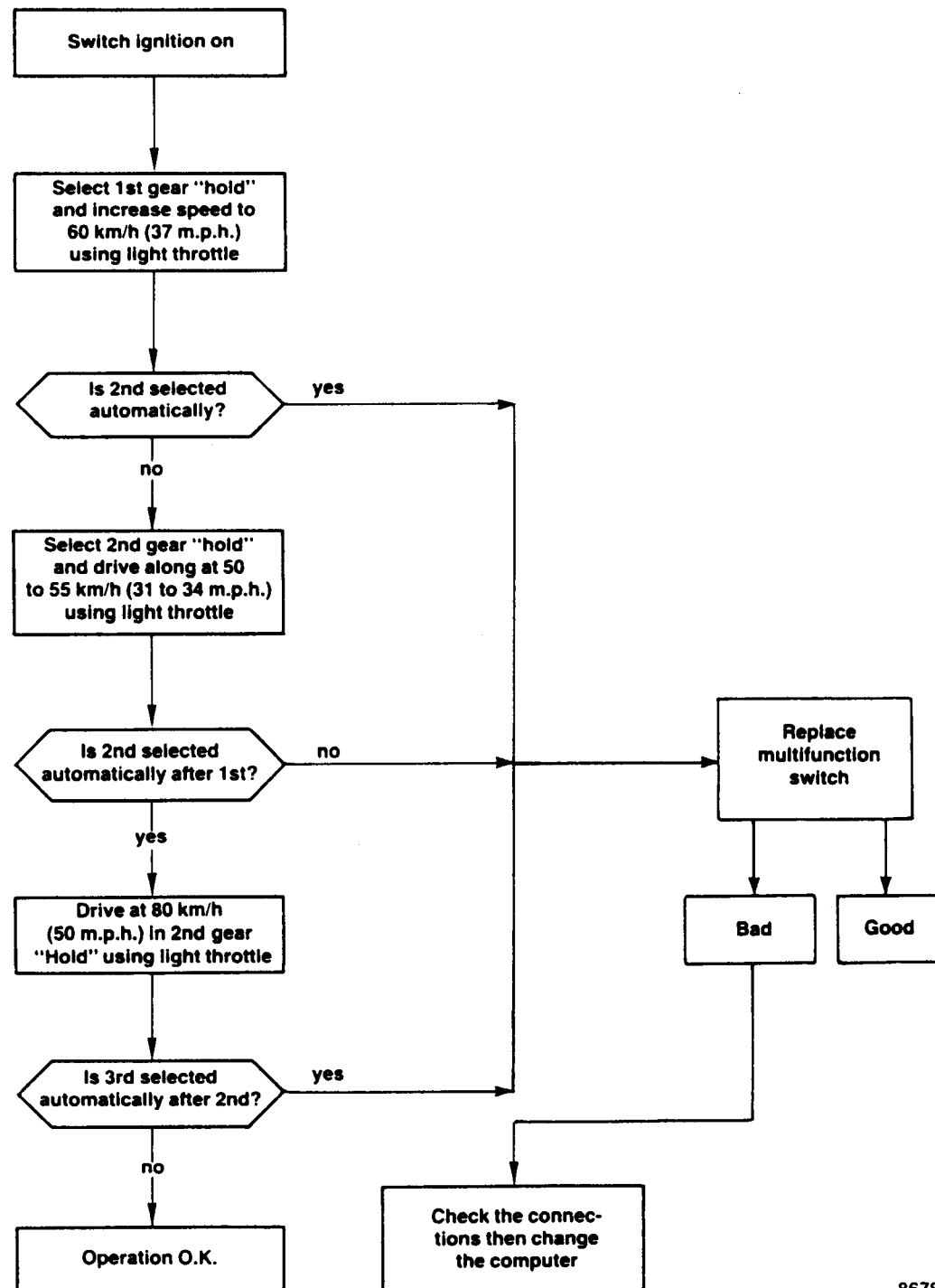


IV STARTER OPERATION



V CHECKING GEAR SHIFTING PHASES

NOTE: Be sure the selector cable is functioning correctly before proceeding with this test.

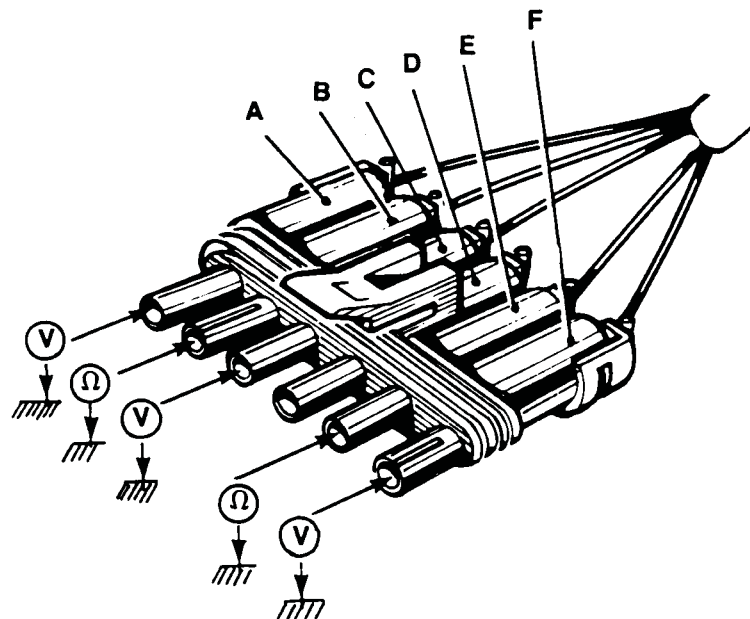


86780

VI CHECKING THE 6-WAY CONNECTOR

Unplug connector from the computer and make the following checks.

Action on vehicle	Check	Diagnosis
Ignition switched 'off'	B - Ground = $4\Omega \pm 3$	Backup lamps
Ignition switched 'on'	A - Ground = $12V \pm 2$	Backup lamps
Ignition switched 'off'	E - Ground = 0Ω	Ground
Ignition switched 'on'	F - Ground = $12V \pm 2$	Current feed to module
Operate starter	C - Ground = $12V \pm 2$	Starter
	D - Not Used	

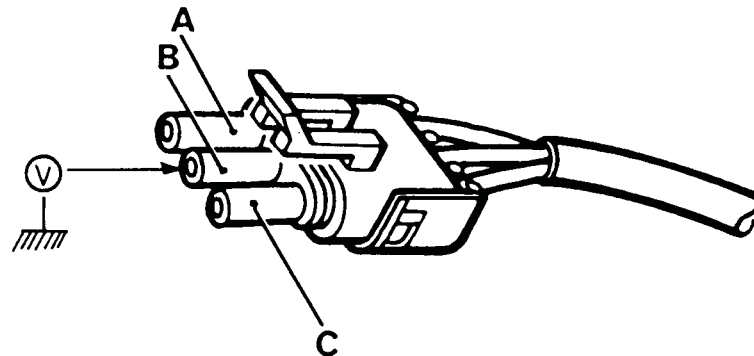


86781

AUTOMATIC TRANSMISSION SERVICE GROUP

VII CHECKING THE 3-WAY CONNECTOR

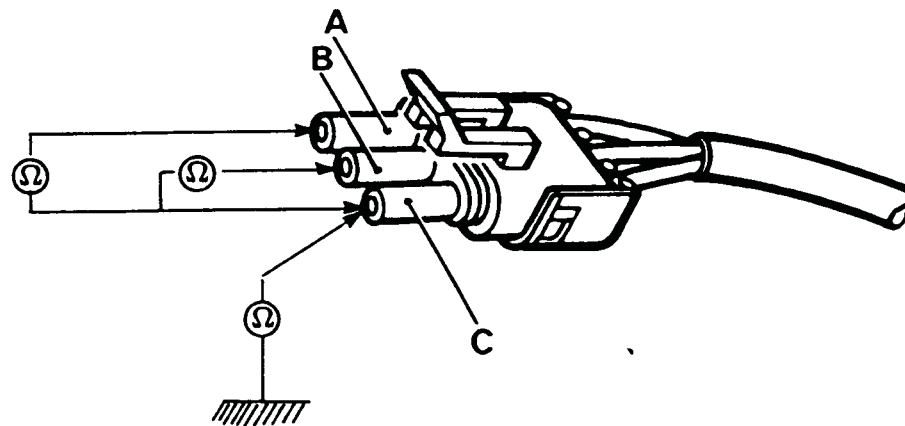
Action on vehicle	Check	Diagnosis
Ignition switched on	B - Ground = $4.3\text{ V} \pm 0.5$	If this check proves a problem exists, check connector 7. Replace the computer if connector 7 is satisfactory. Replace computer.



VIII CHECKING THE SOLENOID VALVES AND HARNESS

Unplug the connector 3 terminal from the computer.

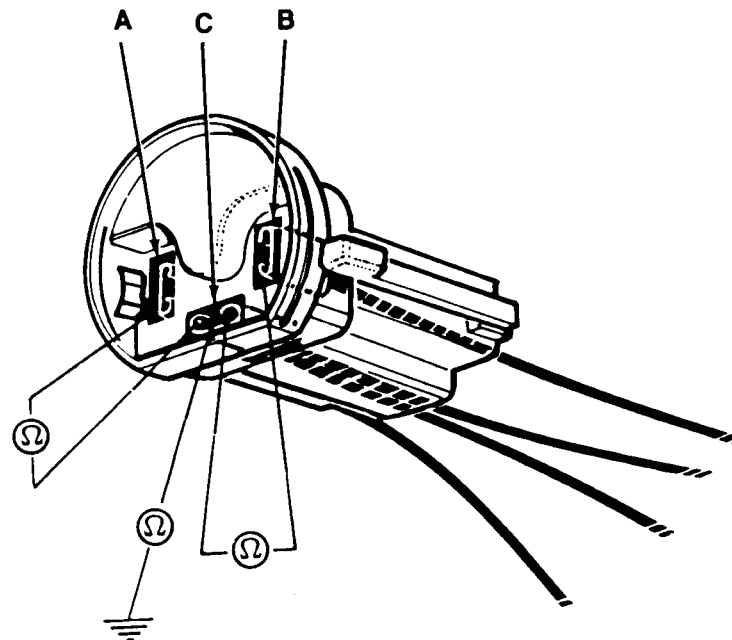
Check	Diagnosis
A to C = $30\Omega \pm 10$	If 0Ω : Replace wiring or solenoid valves If $60\Omega \pm 20$: Poor connection If not ∞ : Replace wiring or solenoid valves
B to C = $30\Omega \pm 10$	
C to Ground = ∞	
	There is a short circuit between the solenoid valve windings and ground: Replace the wiring or solenoid valves



86782

IX CHECKING THE SOLENOID VALVES

Test points	Diagnosis
A - C = $30 \Omega \pm 10$	If 0Ω : Replace the Solenoid Valves $60 \Omega \pm 20$: Bad connection ∞ : Replace the Solenoid Valves
B - C = $30 \Omega \pm 10$	
C - Ground = ∞	: If different from ∞ — Solenoid valves short between ground and windings. Replace the solenoid valves.



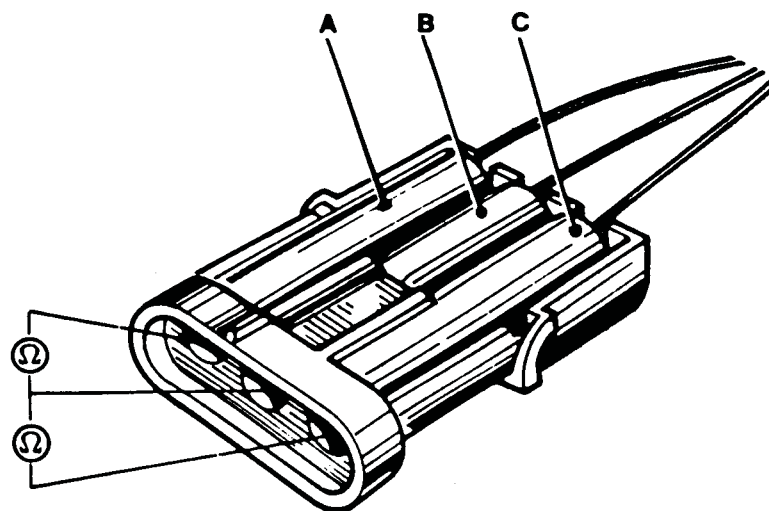
X BLOCKAGE OF THE SOLENOID VALVES BALL

- Only 2nd gear operates when transaxle is in D-EL1 remains closed
- No 2nd gear when transaxle is in D. Transaxle shifts 1 → 3 - EL1 remains open.
- No 3rd gear when transaxle is in D. Transaxle shifts 1 → 2 → 1 - EL2 remains closed.
- No 1st gear in D. Transaxle shifts 3 → 2 → 3 - EL2 remains closed.
- During 2 → 1 → 3 operation, solenoid valves are reversed.

XI CHECKING ENGINE LOAD POTENTIOMETER

Unplug connector from potentiometer

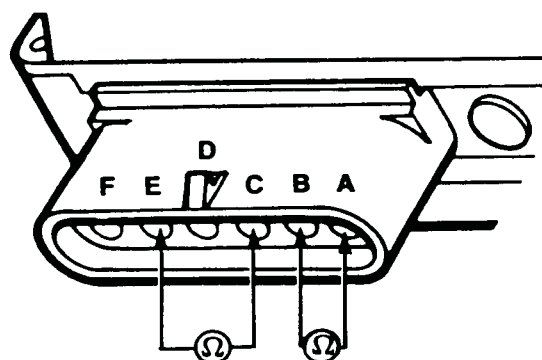
Check	Diagnosis
C to B = $4k\Omega \pm 1$	If the readings are different, the potentiometer is faulty or incorrectly adjusted. (See Diagnostic Tester B.VI. 958)
A to B = $2,5k\Omega \pm 1$	
A to B: open throttle slowly; the ohmmeter should never show infinite resistance (∞)	



XII PARTIAL CHECK OF MULTI-FUNCTION SWITCH

Unplug the 6-way connector from the computer and check the computer socket.

Check	Diagnosis
A to B = 0Ω (selector in R)	Replace multifunction switch
E to C = 0Ω (selector in P or N)	



86784

XIII-CONTROL OF THE MULTIFUNCTION SWITCH (ZONE B)

Backup Lights Not Working

NOTE: Make sure that the gear shift lever is properly adjusted.

Observe the following test information:

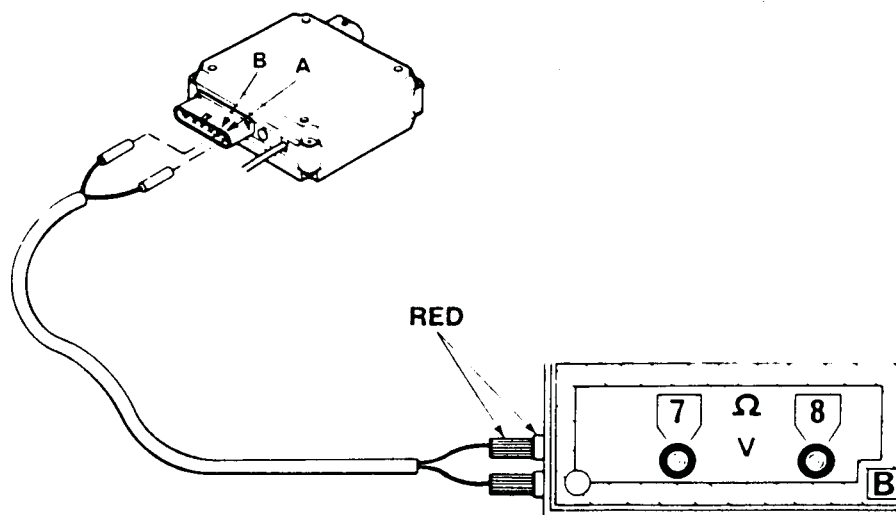
- vehicle stopped
- ignition switch off
- B.Vi. 958 connected to the battery
- disconnect 6-wire connector from the automatic transmission computer
- connect the control harness to B.Vi. 958 (male red connector to red terminal)

BACKUP LIGHT NOT WORKING READINGS TO BE TAKEN BETWEEN A AND B

GEAR SELECTOR	CHECK LIGHTS	
	7	8
D/1/2/N/P	OFF	OFF
R	OFF	ON

86785

NOTE: If the check lights 7 and 8 do not give the exact results as shown, refer to Multi-function Switch Replacement.



86786

XIV-CONTROL/ADJUSTMENT OF THE LOAD POTENTIOMETER (ZONE D)

NOTE: Be sure to check that accelerator cable is correctly adjusted.

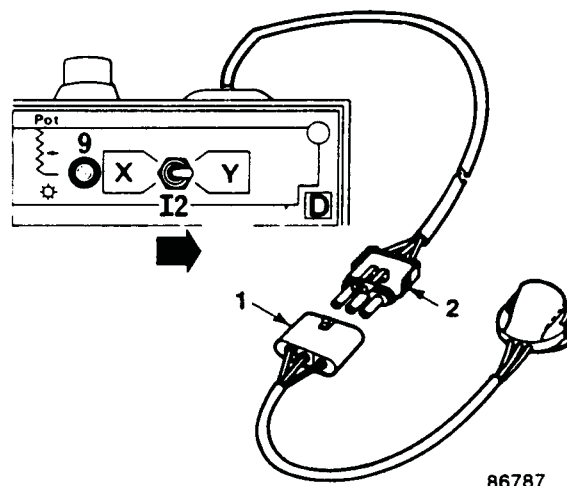
Observe the following test information:

- vehicle stopped
- ignition switch off
- disconnect the 3-wire connector (1) from the harness connecting the computer to the throttle plate
- connect the 3-wire connector (1) from the potentiometer to connector (2) on the B.Vi. 958 Tester
- connect Tester power feed terminals to the battery

Control Of The Potentiometer

Place switch I2 in the Y position.

Press accelerator to floor	Check light 9
Good	ON
Bad or badly adjusted	OFF



Adjustment Of The Potentiometer

Partially unscrew the two screws attaching the potentiometer (on the throttle plate housing) Keep the throttle plate fully open and slowly rotate the potentiometer until check light 9 comes on.

Tighten the two screws in position when light 9 is on.

If the check light does not come on, check the potentiometer wiring or replace the potentiometer.

Each time the potentiometer is removed or replaced, it has to be adjusted.

MULTIFUNCTION SWITCH REPLACEMENT

This operation consists of replacing the multifunction switch by cutting the wire harness connecting the computer and the multifunction switch.

NOTE: Always test the multifunction switch to be certain it is faulty before replacing the switch.

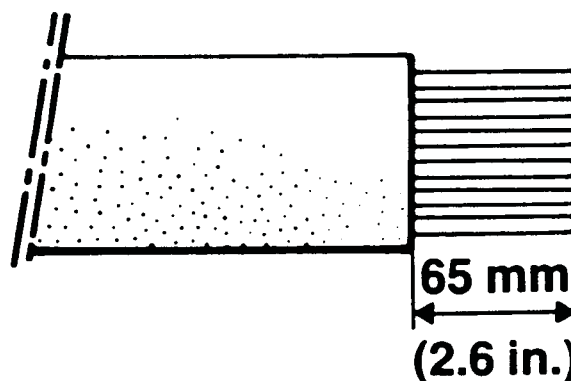
Contents of the Multifunction Switch Repair Kit:

- one multifunction switch with a wire harness and male connector
- one female connector
- six male terminals
- six seals

Remove the multifunction switch from the transaxle.

Cut the harness the same length as the replacement harness.

On the computer side, remove 65 mm (2.6 in) of outer insulation from the cable end.



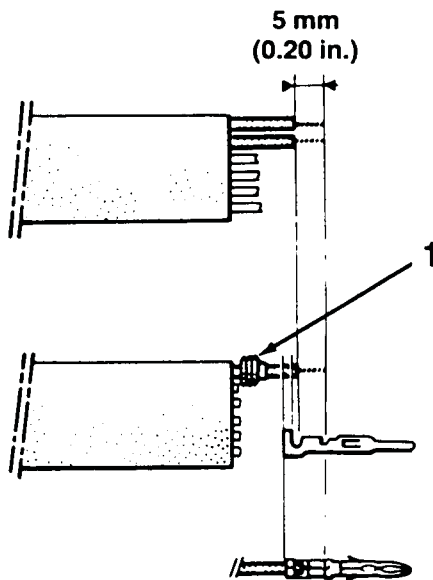
86332B

Remove 5 mm (0.20 in) of insulation from each wire.

Install a seal (1) on each wire.

Install and crimp the six male terminals on the wire ends.

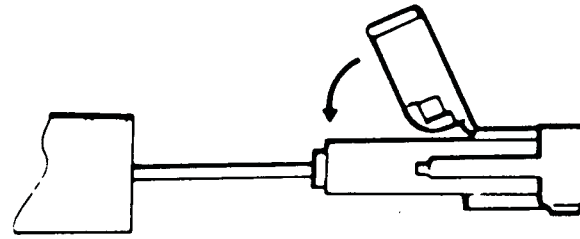
NOTE: Some computers are connected to the multifunction switch with seven wires. If this is the case, cut the yellow or white wire on the computer side of the harness flush with the protective sleeve.



86791

NOTE: When installing the wires in the connector, be sure the wire color codes are not mismatched.

Install the connector locking device.

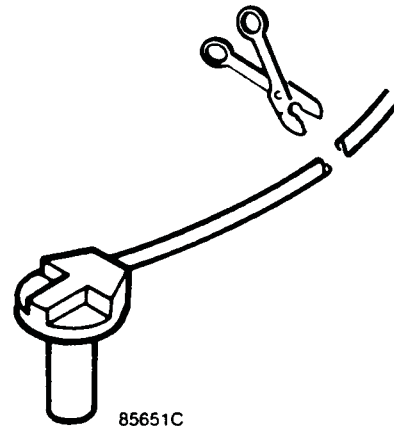


86332E

ROAD SPEED SENSOR REPLACEMENT

This operation consists of replacing the road speed sensor by cutting the harness connecting the computer and the road speed sensor.

NOTE: Always test the road speed sensor to be certain it is faulty before replacing the sensor.



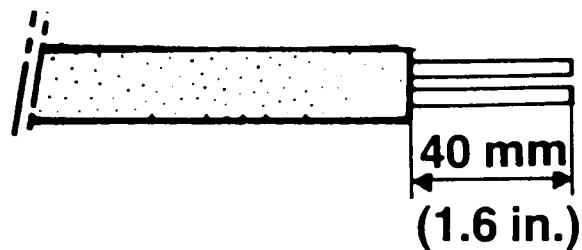
85651C

Contents of the Road Speed Sensor Repair Kit:

- one road speed sensor with a wire harness and male connector
- one female connector
- two male terminals
- two seals

Remove the road speed sensor from the trans-axle. Cut the harness the same length as the replacement harness.

On the computer side, remove 40 mm (1.6 in) of outer insulation from the cable end.

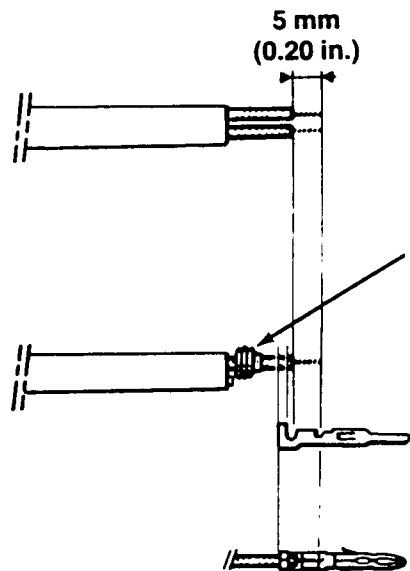


86332G

Remove 5 mm (0.20 in) of insulation from each wire.

Install a seal (1) on each wire.

Install and crimp the two male terminals on the wire ends.



86792

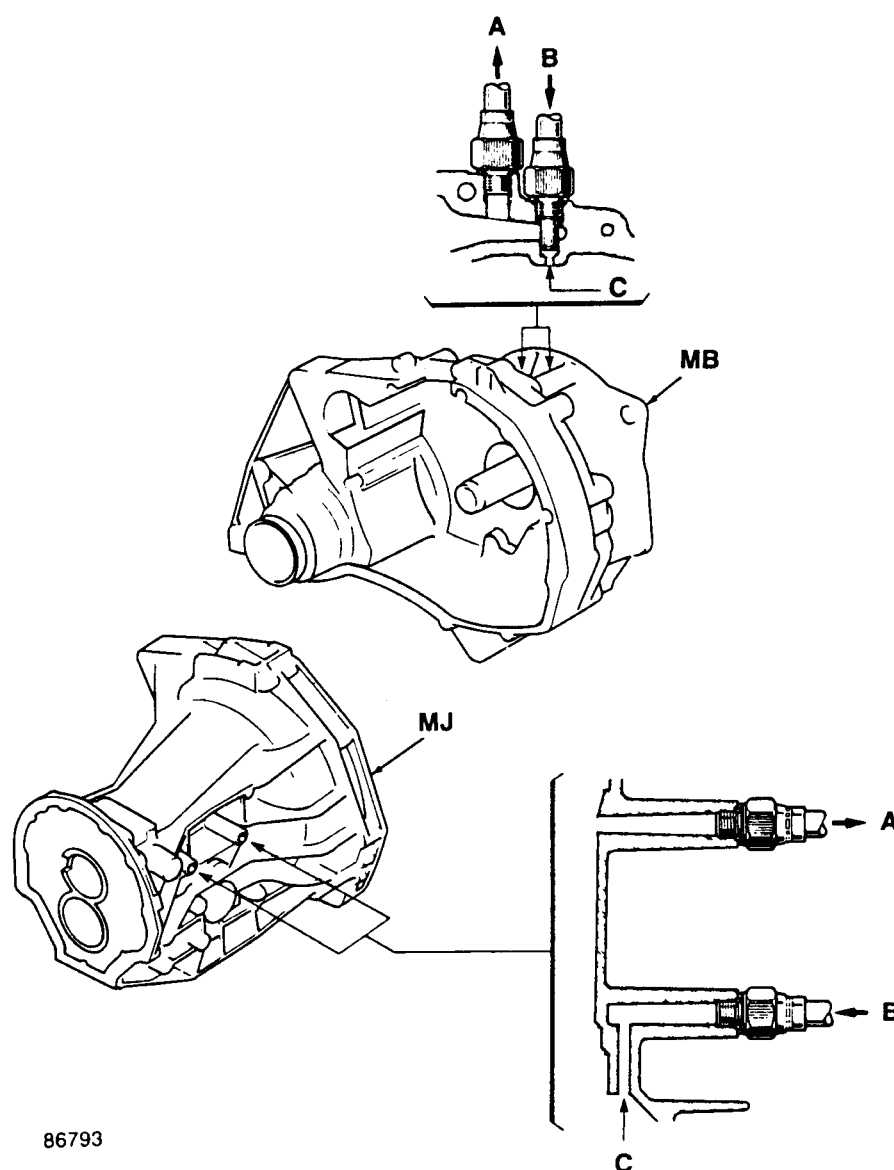
NOTE: When installing the wires in the connector, be sure the wire color codes are not mismatched.

Install the connector locking device.

OIL COOLER PASSAGES

Using compressed air, blow out the oil cooler galleries (A), (B) and (C).

After cleaning, coat the parts with automatic transmission fluid.



86793

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

REAR CASE

Check the condition of the oil pump gears, housing and oil pump drive.

The differential case assembly has matched components. The assembly must be replaced if one part is damaged.

Check the sealed junction box joint faces, the input shaft seal surface and all other joint faces.

CLUTCHES AND BRAKES

Check the condition of the intermediate discs. Any that show traces of overheating (blueing, yellowing, etc.) or surface blemishes must be replaced.

Replace all worn, burned (black), or torn linings.

Replace plates with signs of overheating, surface damage, runout or taper.

VALVE BODY

Cleaning

Use mineral spirits and lint free shop towels to clean the valve body.

Use compressed air to blow out the passages and dry the valve body.

Inspection

If any of the valves in the valve body are scratched or worn, the valve body must be replaced as a unit.

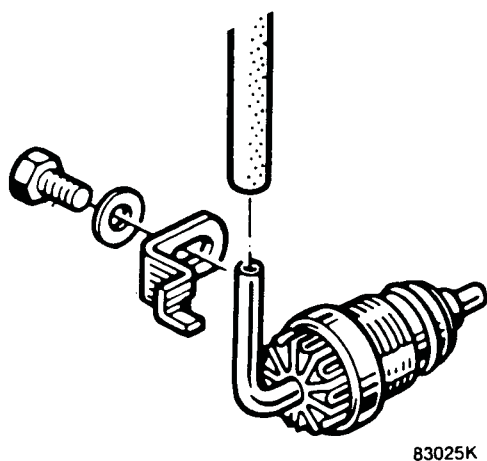
Be sure that all valves slide freely in the valve body bores. Valves should not stick or bind in the bores.

DISASSEMBLY

Vacuum Capsule Removal

Place a block under the transaxle and remove the front transaxle mount. Remove the capsule retaining bolt and bracket.

Remove the vacuum hose and remove the capsule.



Valve Body Removal

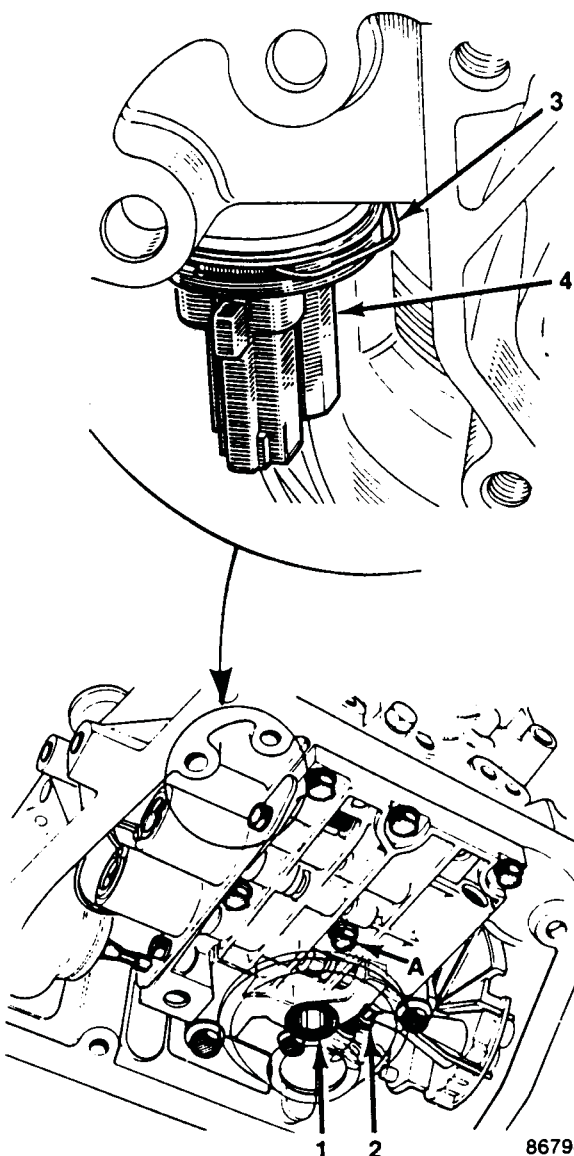
Drain the automatic transaxle using Wrench Mot. 593 and remove the following components:

- the oil pan (sump plate)
- the filter and seal (1)
- all the valve body bolts EXCEPT bolt (A)

When removing bolt (A), take care not to let the following drop:

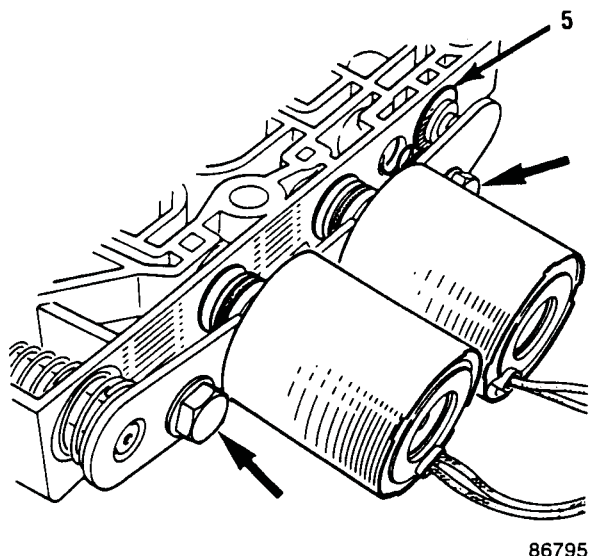
- the manual valve (2)
- the plate and two seals below the valve body

Remove the security clip (3) from the sealed junction box (4) and remove the valve body and solenoid valves as an assembly.

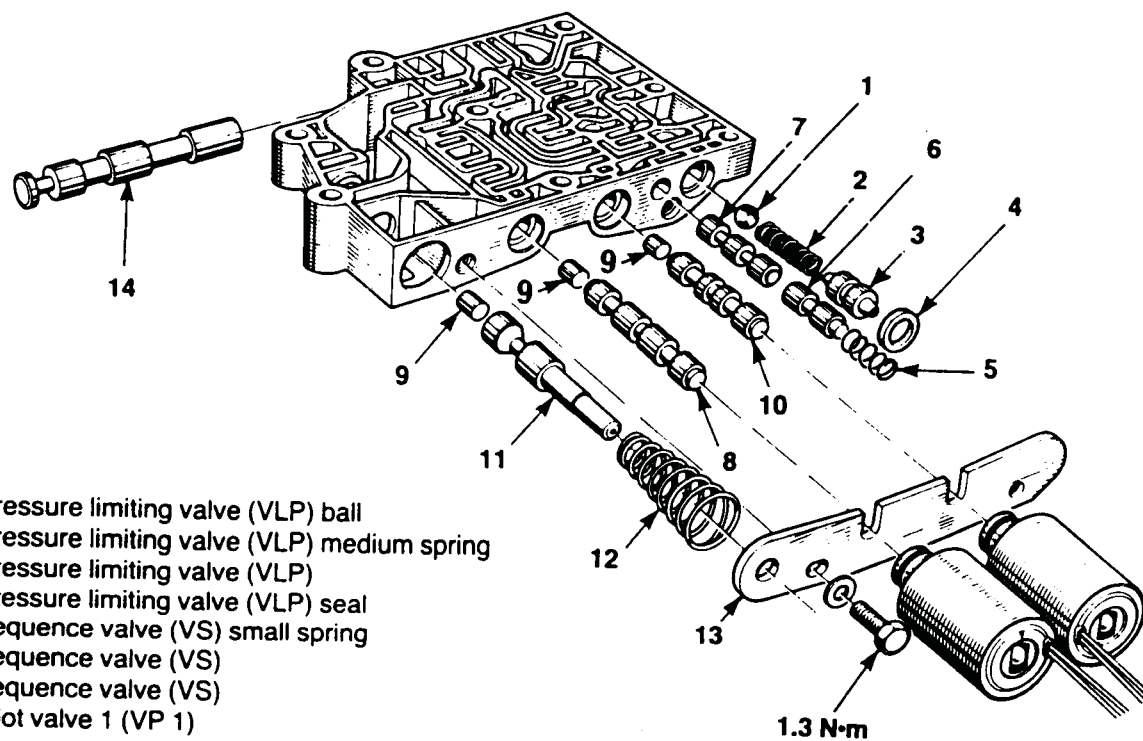


Disassembly

NOTE: Use extreme care when disassembling the valve body, do repairs only in a clean area to prevent dirt or other contaminants from entering the valve body that may cause damage or a binding condition. Remove the two closure plate bolts, remove the manual valve (5) and turn the unit over.



86795



- 1 - Pressure limiting valve (VLP) ball
- 2 - Pressure limiting valve (VLP) medium spring
- 3 - Pressure limiting valve (VLP)
- 4 - Pressure limiting valve (VLP) seal
- 5 - Sequence valve (VS) small spring
- 6 - Sequence valve (VS)
- 7 - Sequence valve (VS)
- 8 - Pilot valve 1 (VP 1)
- 9 - Plungers
- 10 - Pilot valve 2 (VP2)
- 11 - Pressure regulating valve (VRP)
- 12 - Pressure regulating valve (VRP) spring
- 13 - Closure plate
- 14 - Manual valve (VM)

Note:

Plungers (9) are identical.

Valves (3, 7, 8, 10) are symmetrical.

Valve 6 is not symmetrical.

86796

Assembly

The larger head on sequence valve (6) faces small spring (5).

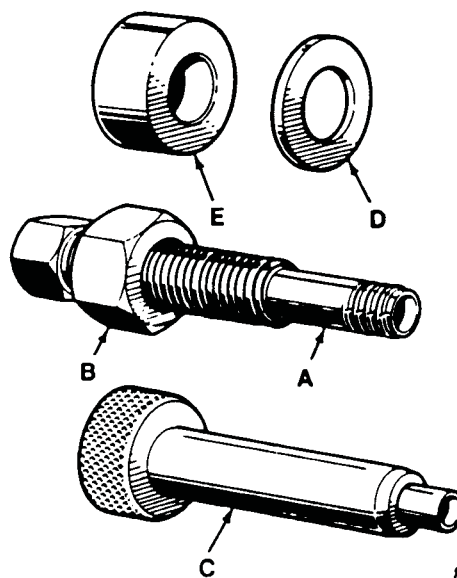
The solenoid valve with the arrow mark must be installed on the pressure regulating valve side.

Tighten the closure plate bolts (13) with the specified torque.

Speedometer Drive Shaft Oil Seal Removal

The speedometer drive shaft oil seal may be removed by using Tool B.Vi. 905, which consists of:

- a seal extractor (A) with nut (B)
- an inserting tool (C)
- a thin spacer (D)
- a thick spacer (E), which is not used



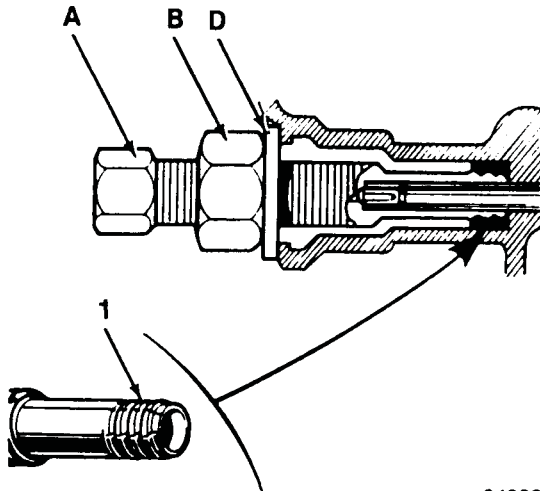
86797

Disconnect the speedometer cable at the automatic transaxle.

Insert the extractor (A) with nut (B) and spacer (D).

Screw (A) in about 3 turns, after contact with the seal is felt, so that thread (1) enters the rubber.

To remove the seal rotate nut (B) while holding extractor (A).



84803A

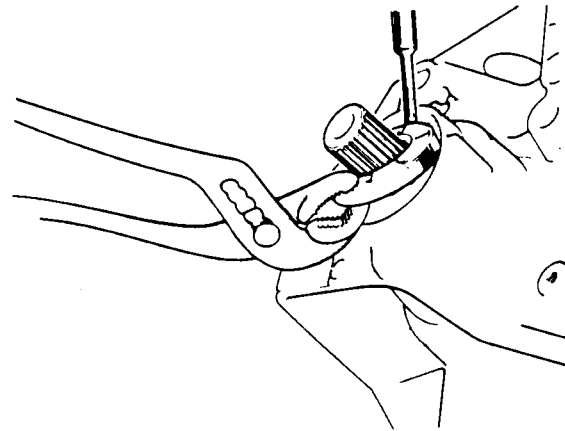
Differential Oil Seal Removal

MB Transaxle

Remove the O-rings from the pinion gears.

Tap the base of the oil seal using a small drift and a hammer to tilt the seal.

Remove the seal using pliers. Do not damage the pinion gear during seal removal.



86031

MJ Transaxle

Remove the O-rings from the pinion gears and remove the bolts holding the differential closure plate.

Tap the end of the right side gear to remove the closure plate.

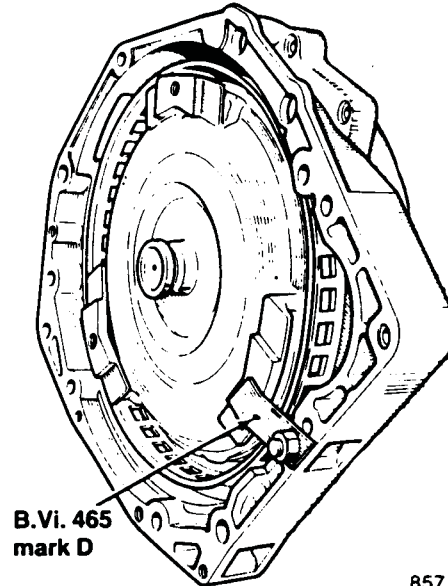
Take care that the differential assembly does not drop during the above operation.

Remove the two deflectors and lip-type oil seals.

Torque Converter Removal

CAUTION: Before removing the transaxle from the engine, mark the converter and drive plate for assembly alignment reference. These components must be aligned to ensure proper function of the ignition system. The ignition control module input is dependent upon a correct signal input from the converter circumference and TDC sensor.

Remove the retaining lug B.Vi. 465, Mark D (installed when the transaxle was removed).



85710-1

Pull the converter towards you to remove it.
Check the condition of:

- the converter central boss (flywheel side)
- the seal bearing surface
- the converter bushing on the three mounting points
- the timing target
- the freewheel for MB1

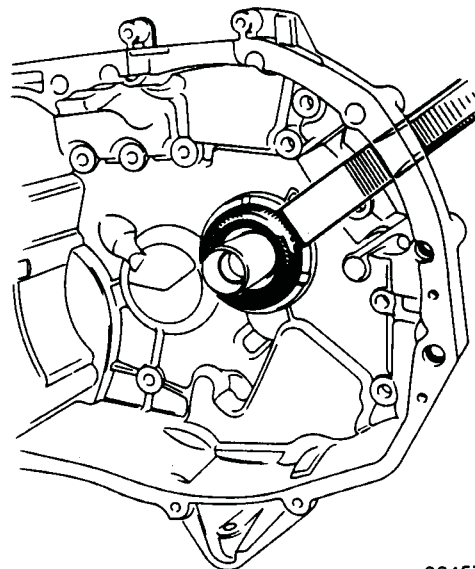
NOTE: If the transaxle fluid is contaminated by brake or clutch lining particles (black fluid with a burned smell) replace the converter.

Torque Converter Oil Seal Removal

MB Transaxle

Remove the seal using a cold chisel.

Check the condition of the smooth part of the stator support.



86457

MJ Transaxle

Remove the oil seal (use a burr-free tool so as not to damage the housing).

Check the condition of the smooth part of the stator support.

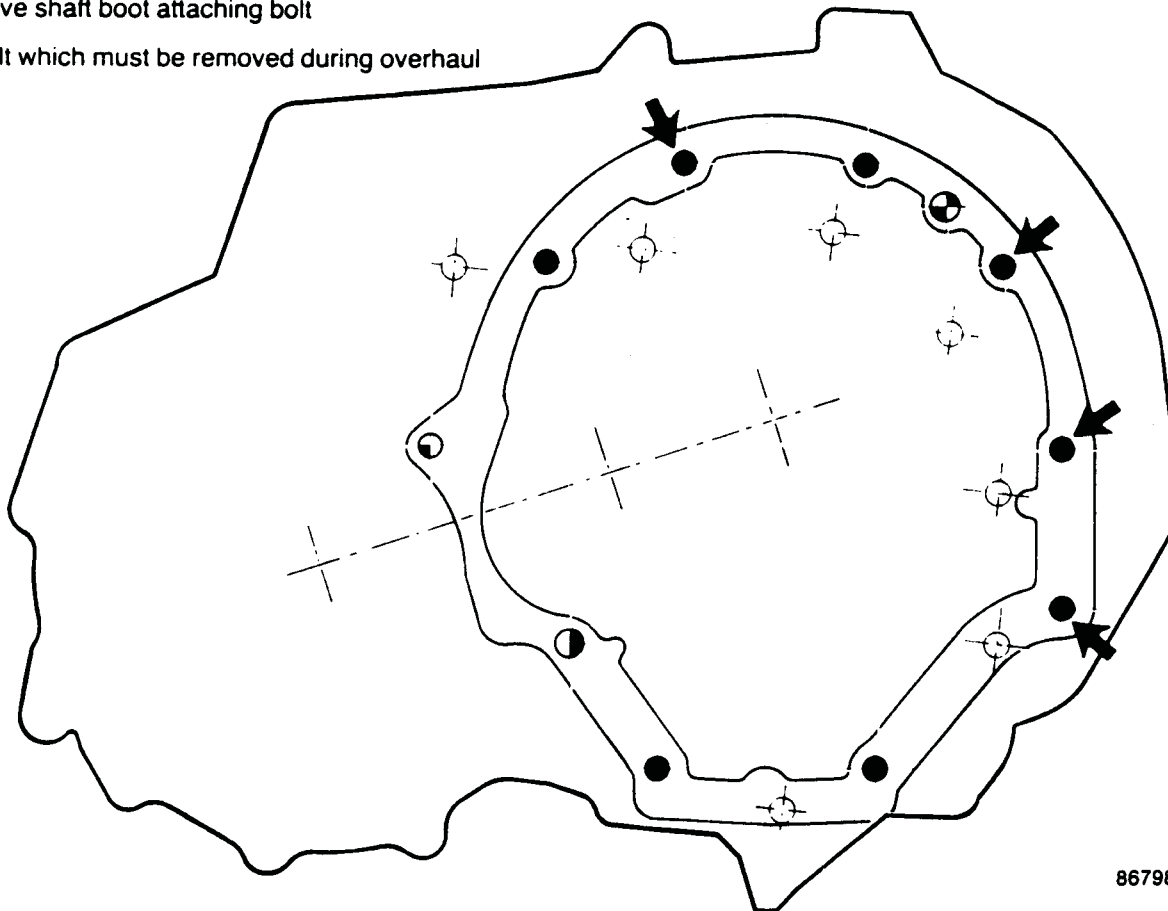
Rear Case Removal (MB-MJ)

NOTE: The removal and disassembly of the rear case should be performed on a bench with a clean, padded rubber or plastic work surface.

With the converter removed, separate the rear case from the differential case.

The arrows in the following illustration indicates the bolts on the intermediate case which must be removed. The other bolts are located on the torque converter or differential.

- ⊕ Case centering dowel
- ① Locator bolt equipped with an O-ring (must be removed during overhaul and replace if worn or damaged)
- Bolt which should not be removed during overhaul
- ↪ Drive shaft boot attaching bolt
- Bolt which must be removed during overhaul

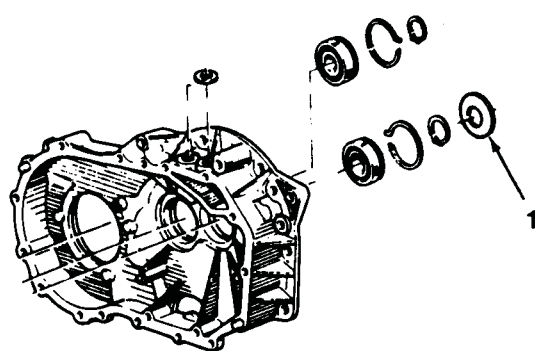


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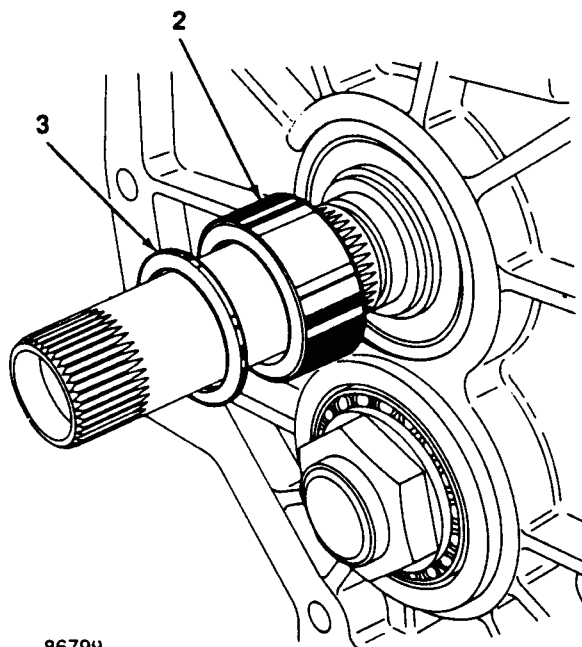
AUTOMATIC TRANSMISSION SERVICE GROUP

Leave the spacer (1) (axial play adjustment) on the converter case — intermediary case assembly.

Leave spacer (2) and shim (3) on the output shaft.



MB



86799

Rear Case Disassembly

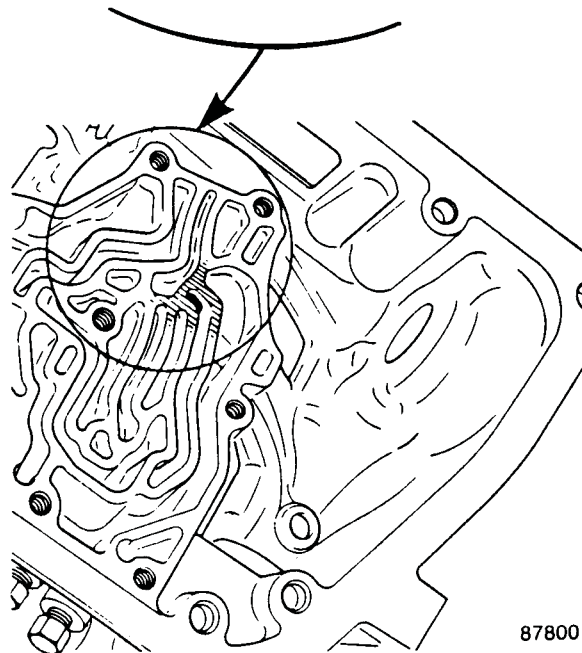
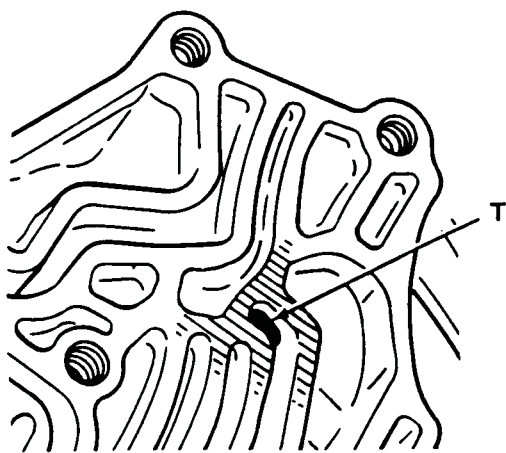
Remove the following from the rear case:

- "park" wheel (21),
- nylon washer (19),
- the oil pan (sump plate)

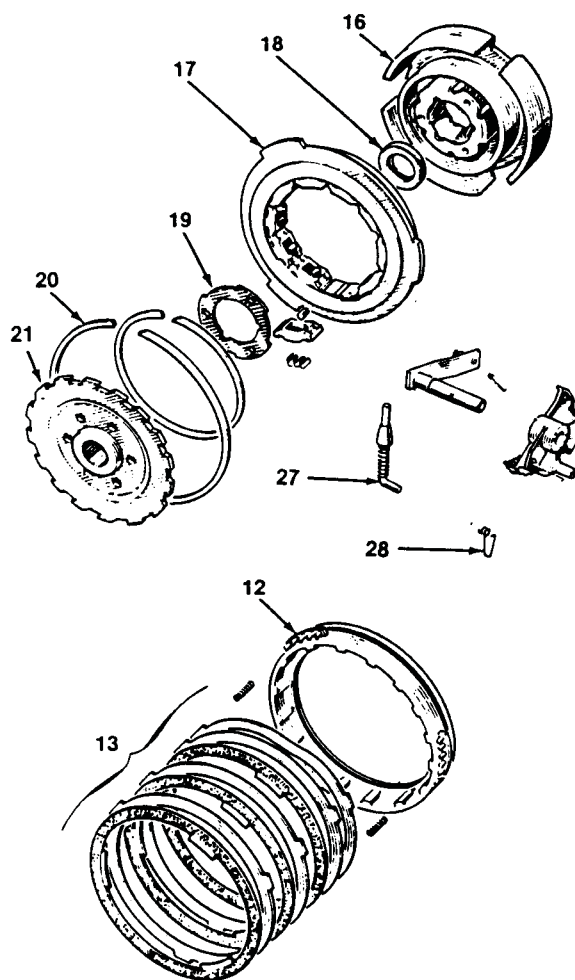
Remove the Park linkage (27) and the safety clip (28).

Remove the needle roller thrust bearing (18) and the large snap ring (20).

Remove the piston (12) by blowing compressed air through hole (T).

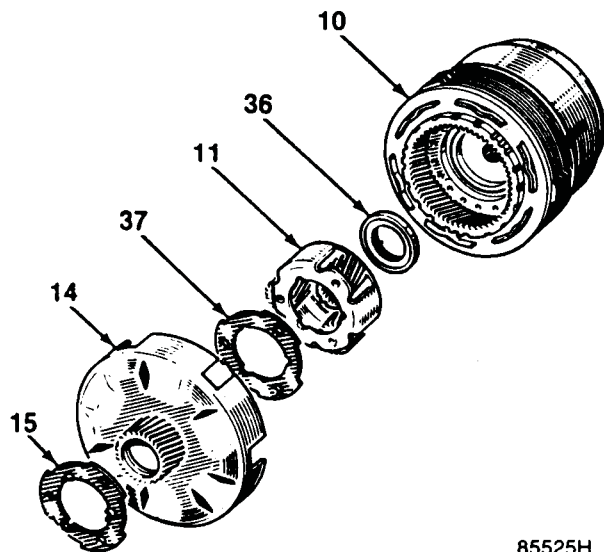


87800

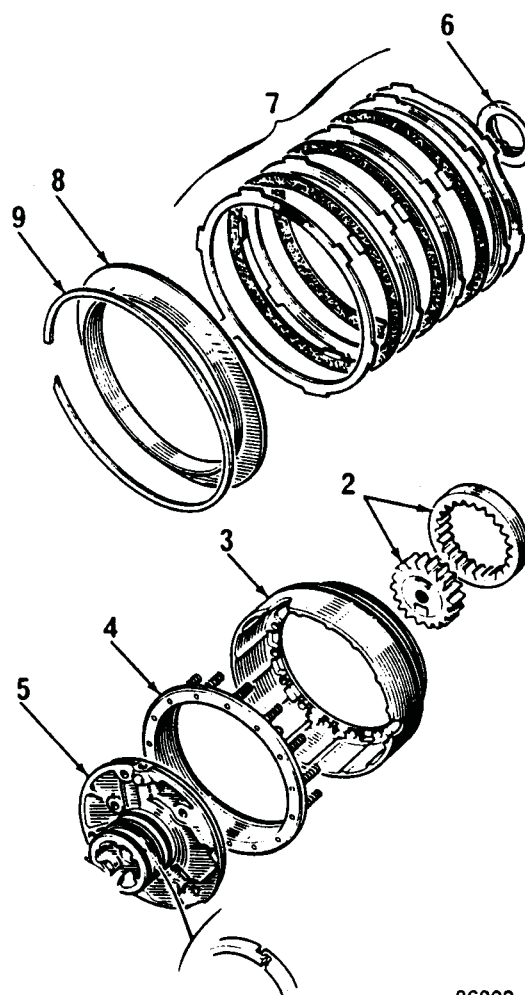
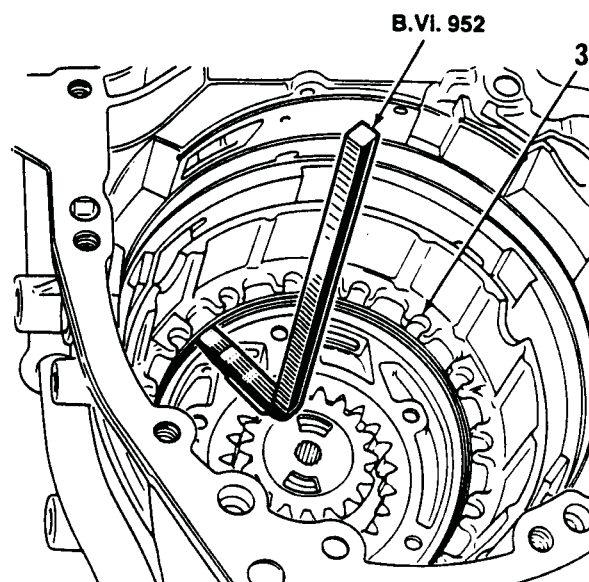


86802

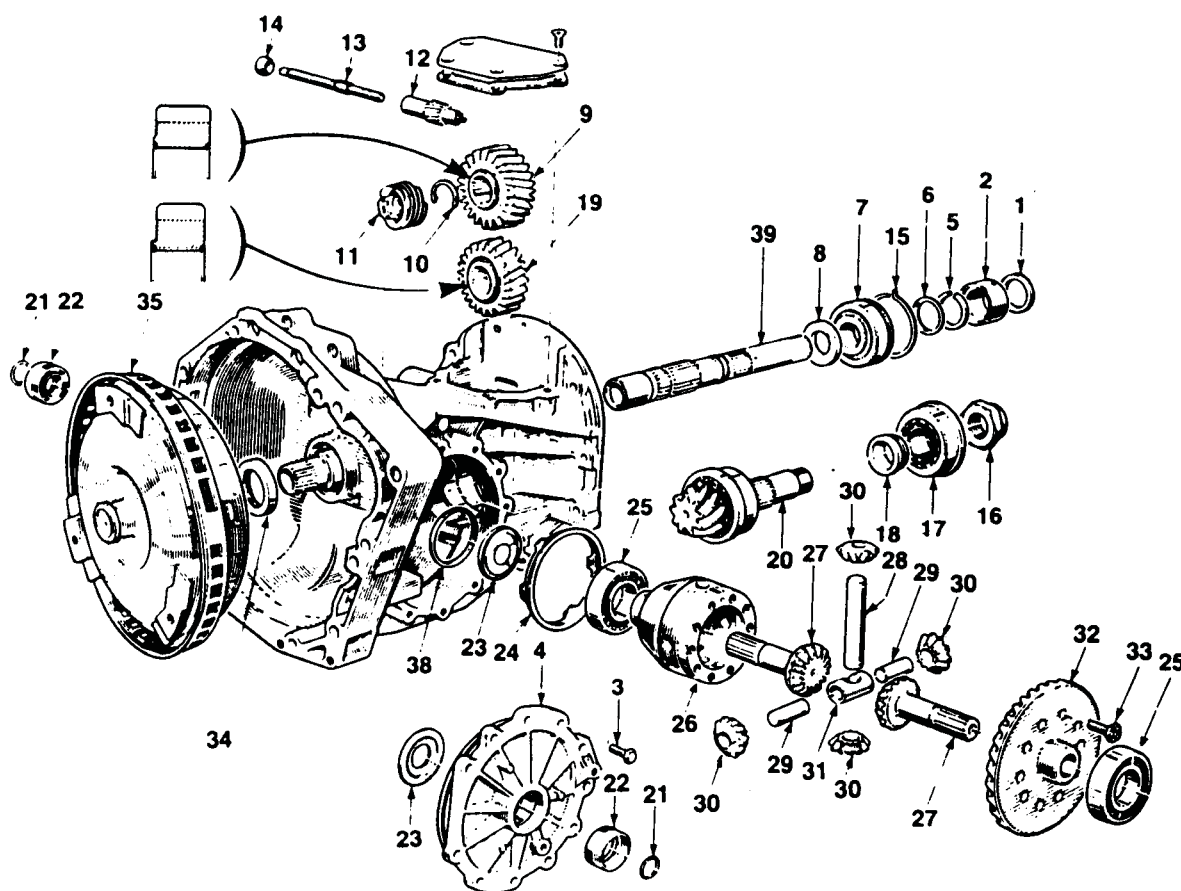
Remove the friction washer (15), the E2 bell-housing (14), the second friction washer (37), the forward drive train (11) and the E1-E2 clutches. The E1-E2 clutches cannot be dismantled, only the needle roller bearing (36) may be removed.



Remove the snap ring (9), the F1 piston carrier (8), the F2 disc stack (7), the needle roller bearing (6), the feed hub (5) and the F2 cup; using Tool B.Vi. 952 to take out the F2 piston (3).



DIFFERENTIAL COMPONENTS (MJ)



- | | |
|---------------------------------|--|
| 1 - End play adjusting shim | 20 - Final drive pinion |
| 2 - Spacer | 21 - "O" ring |
| 3 - Closure plate bolt | 22 - Lip-type oil seal |
| 4 - Closure plate | 23 - Deflector |
| 5 - Snap ring | 24 - Collar |
| 6 - Tapered washer | 25 - Tapered roller bearing |
| 7 - Ball bearing | 26 - Differential housing |
| 8 - Thick washer | 27 - Side gears |
| 9 - Step-down driving gear | 28 - Long shaft |
| 10 - Snap ring | 29 - Short shaft |
| 11 - Speedo. worm gear | 30 - Spider gears |
| 12 - Speedo. drive gear | 31 - Core |
| 13 - Speedo. drive spindle | 32 - Ring gear |
| 14 - Speedo. drive spindle seal | 33 - Ring gear bolts |
| 15 - Snap ring | 34 - Converter oil seal |
| 16 - Final drive pinion nut | 35 - Converter |
| 17 - Tapered roller bearing | 38 - Differential preload adjusting shim |
| 18 - Spacer | 39 - Output shaft |
| 19 - Step-down driven gear | 40 - Spacers |

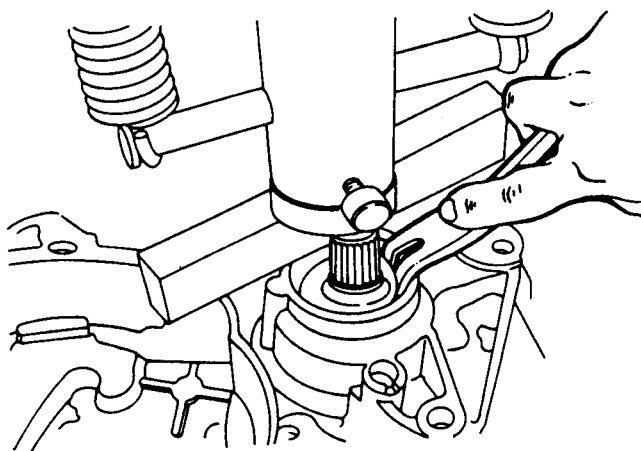
86804

Differential Removal (MB)

Place a block of wood under the gear that is part of the differential case.

Using an arbor press, apply a press force to the differential case to release snap ring .

Remove the differential case by applying a press force against the planetary gear. Remove the spring washer .



33986

Differential Components Removal (MJ)

Use a bearing extractor to remove bearings (25).

The collar (24) must be destroyed in order to work inside the differential housing (26).

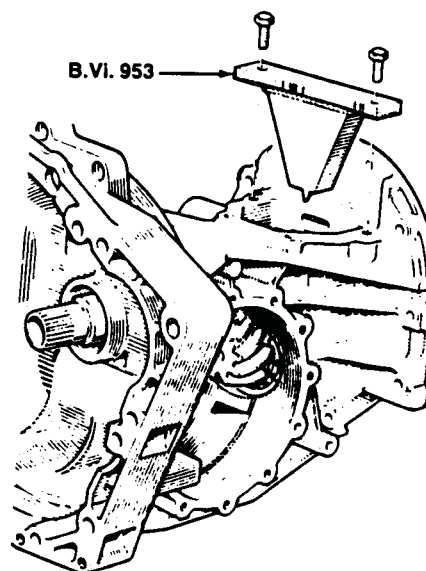
NOTE: Removal and disassembly of the differential components should be performed on a bench with a padded rubber or plastic work surface.

Remove the end play adjustment shim (1), spacer (2), closure plate bolts (3) and the closure plate (4).

Remove the snap ring (5), tapered washer (6), speedometer drive spindle (13), speedo. drive gear (12), speedo drive seal (14) and the snap ring (10). Open the snap ring (15) and pull on the output shaft (39) at the same time.

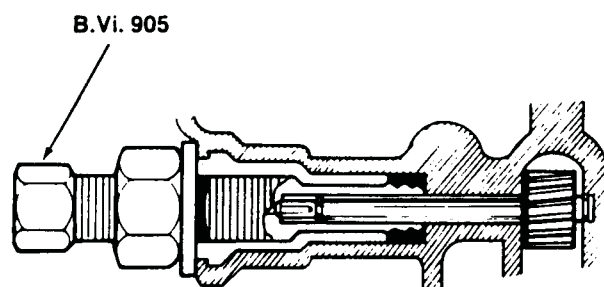
Remove the ball bearings (7). Push the speedometer worm gear (11) toward the converter and pull on the output shaft.

Remove the speedo. worm gear, step-down driving gear, thick washer and the output shaft,. Using tool B.Vi. 953, block the step-down driven gear (19), unlock the lock plates, remove the screws and remove the final drive pinion nut (16).



86138

Use tool B.Vi. 905 to remove the speedometer drive oil seal if it was not removed previously.



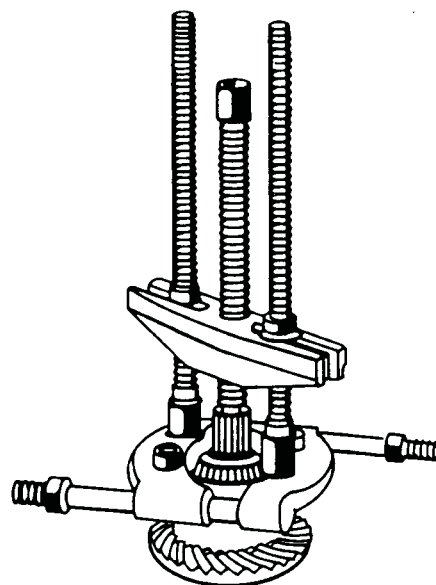
84803

Push out the final drive pinion (20) using a mallet. Remove the step-down driven gear and spacer (18).

Remove the pinion bearing outer races. The needle roller bearing on the output shaft cannot be removed from the differential case.

The taper roller bearings are removed with a bearing splitter extractor.

The band ring collar will have to be destroyed to work inside the differential housing.



86806

Differential Components Disassembly (MB)

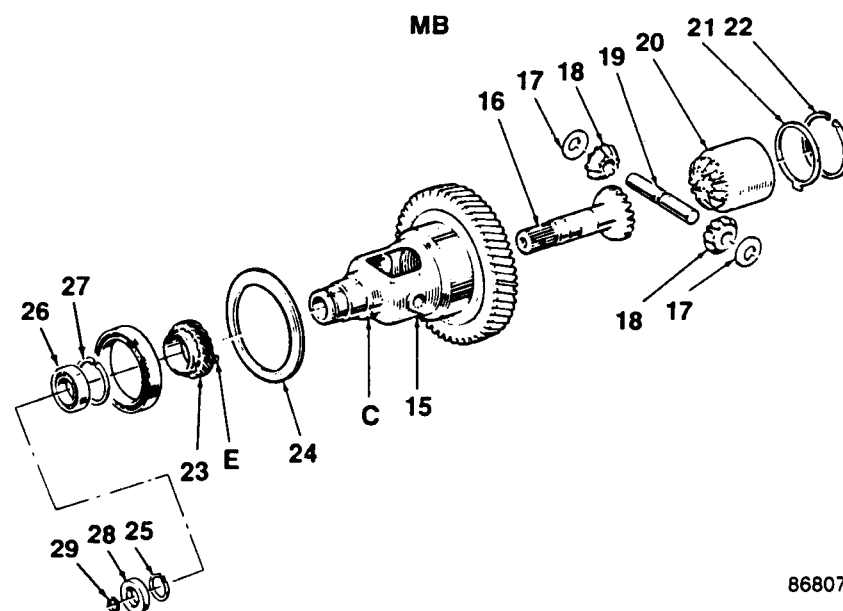
Remove the speedometer drive wheel gear (23).

Mount the differential case in a vise equipped with protective jaws.

Remove the snap ring (22), washer (21), tripod planetary gear (20), the side gear shaft (19), the side gears (18), the side gear washers (17) and the stemmed planetary gear (16).

Tie the washers (17) to the respective side gears.

NOTE: Two different width snap ring (25) slots for the small bearing are used in the differential cases. Type 1 -(early production) case slot width is . . . 1.75 mm (0.069 in) Type 2 -(current production) case slot width is . . . 2.5 mm (0.099 in) Be sure to install the correct snap ring.

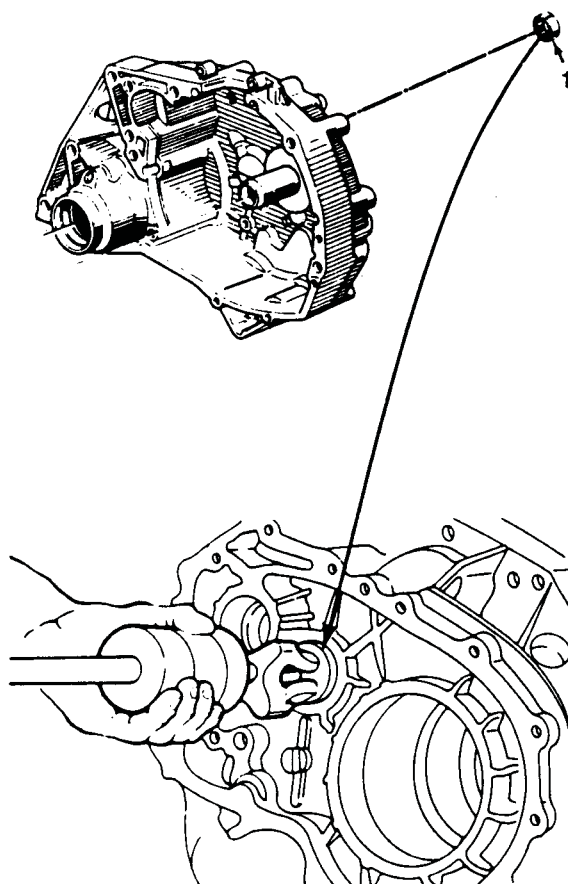


86807

Converter and Differential Bearing Removal (MB)

The bearing is staked in position. Using a grinder or sharp chisel, remove the case material which retains the bearing.

Using a universal bearing puller, remove the caged roller bearing (1) from the converter side of the housing.

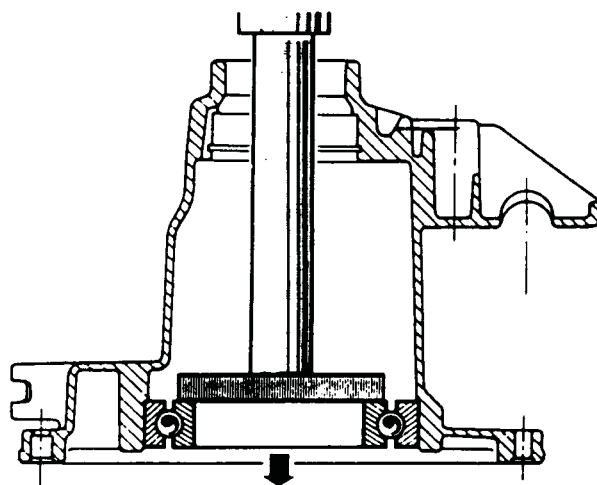


86808

Large Differential Bearing Removal

Insert a steel bar in the case. Place it flat on the bearing.

Use a piece of tube and an arbor press to remove the bearing.

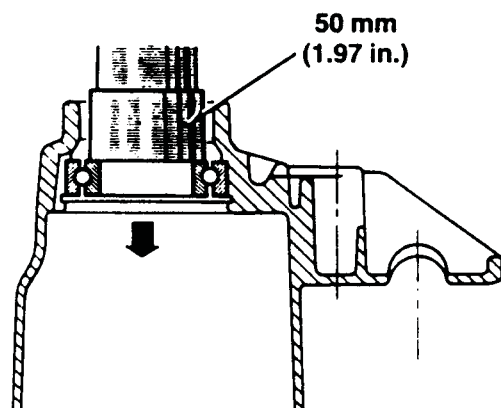


85705

Small Differential Bearing Removal

Remove and discard the snap ring holding the bearing. Remove the bearing using a 50 mm (1.97 in) diameter tube and an arbor press.

Press the bearing into the case.



86809

Speedometer Drive Gear Removal

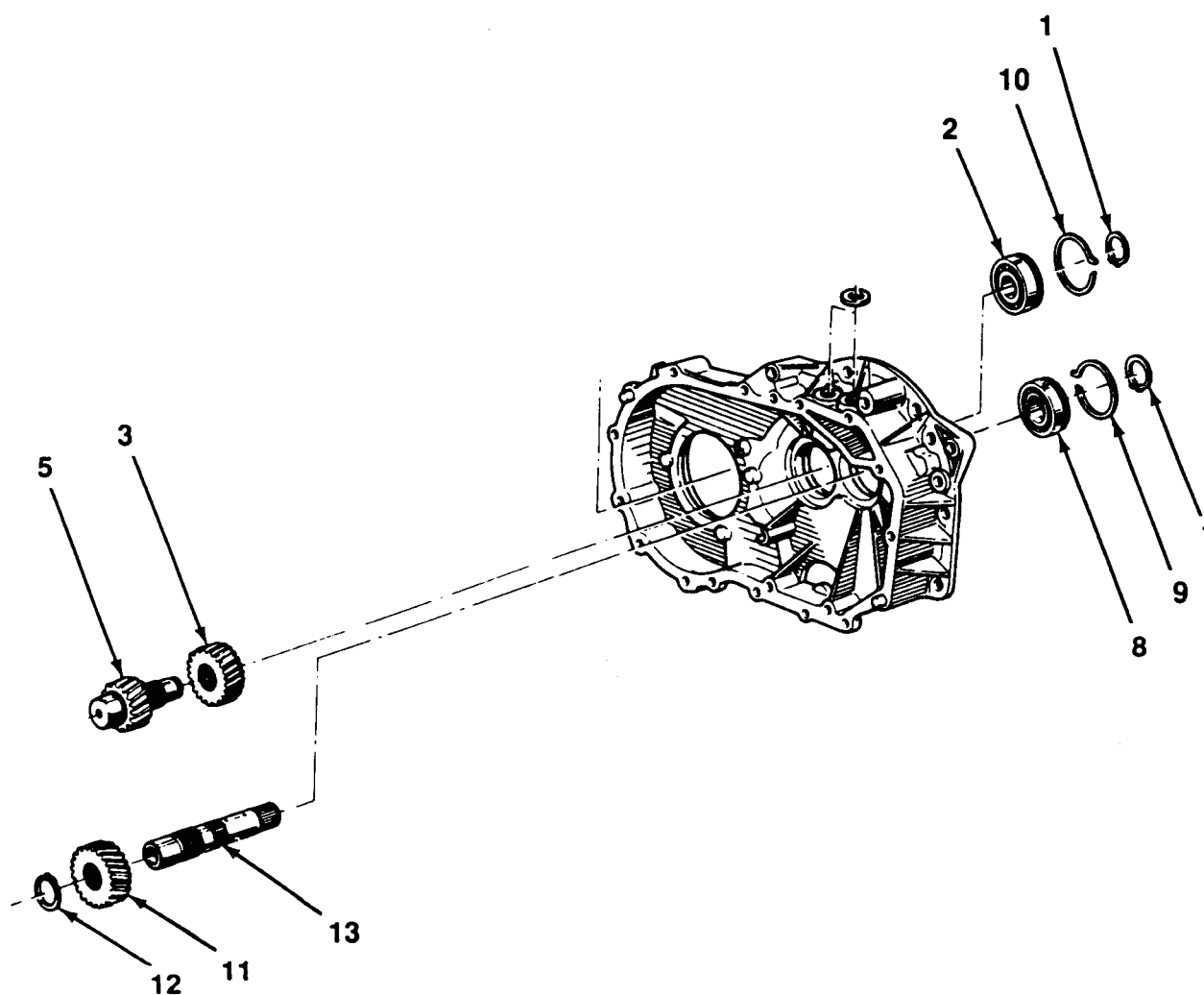
The transaxle must be disassembled and the speedometer gear shaft must be broken to remove the drive gear.

Clean and inspect the transaxle cases and internal components. Replace damaged components as necessary.

Intermediary Case Disassembly

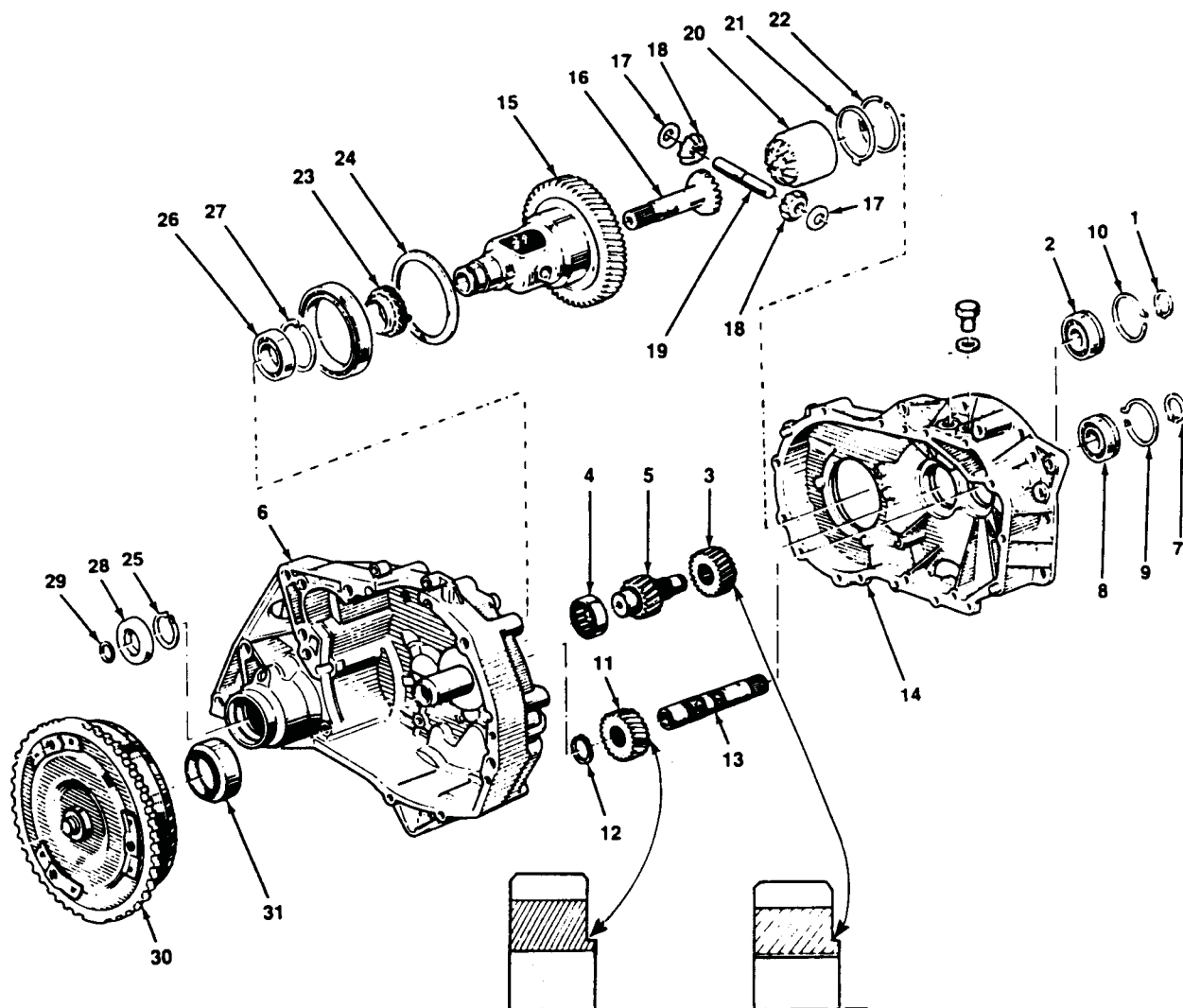
Remove snap rings (1) and (7) and remove the output shaft (13) with snap ring (12) and step-down gear (11) mounted on the shaft.

Remove the secondary shaft (5) and the step-down driven gear (3).



86810

INTERMEDIARY CASE



- | | |
|--------------------------------------|---------------------------------|
| 1 Snap ring | 17 Side gear washers |
| 2 Ball bearing | 18 Side gears |
| 3 Step down driven gear | 19 Side gear shaft |
| 4 Roller bearing | 20 Tripod planetary gear |
| 5 Secondary shaft | 21 Washer |
| 6 Converter and differential housing | 22 Snap ring |
| 7 Snap ring | 23 Speedometer drive wheel gear |
| 8 Ball bearing | 24 Spring washer |
| 9 Snap ring | 25 Snap ring |
| 10 Snap ring | 26 Ball bearing |
| 11 Step down gear on output shaft | 27 Snap ring |
| 12 Snap ring | 28 Lip type oil seal |
| 13 Output shaft | 29 O-ring |
| 14 Intermediary housing | 30 Converter |
| 15 Differential case | 31 Converter oil seal |
| 16 Stemmed planetary gear | |

86812

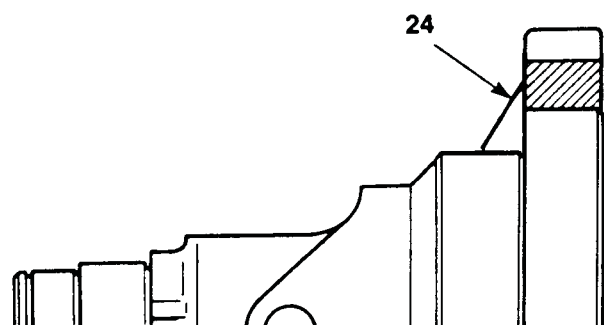
ASSEMBLY

Intermediary Case Assembly

Install snap rings (9) and (10) in the case. Install bearings (2) and (8) using tool B.Vi. 947.

Bearing (8) has an outside diameter larger than bearing (2). Therefore, carefully center B.Vi. 947 on bearing (8) before installation.

Install the spring washer (24) at the base of the cone, facing the differential housing gear. Install the differential in the converter and differential housing.

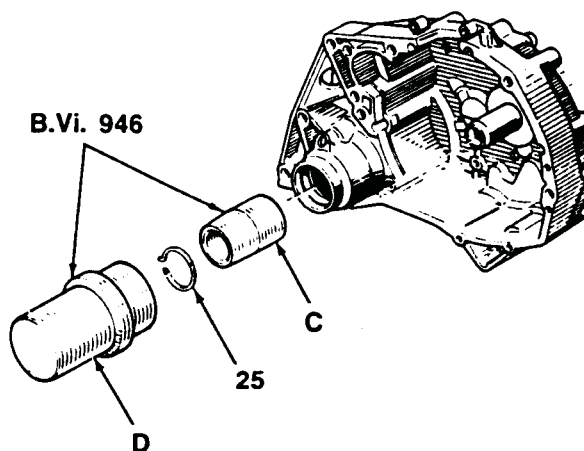


86813

Place a wood block under the differential case. Install Tool C from B.Vi. 946 (conical side facing the outside) on the planetary gear stem.

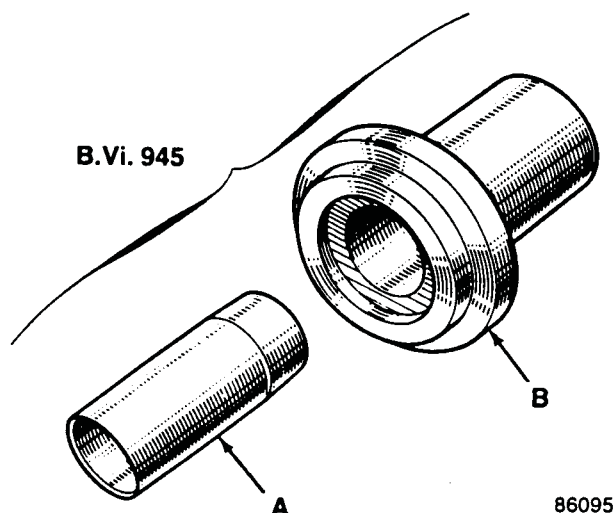
Install snap ring (25) on the conical part of Tool C.

Using Tool D from B.Vi. 946 and an arbor press, push the snap ring into position in the groove.

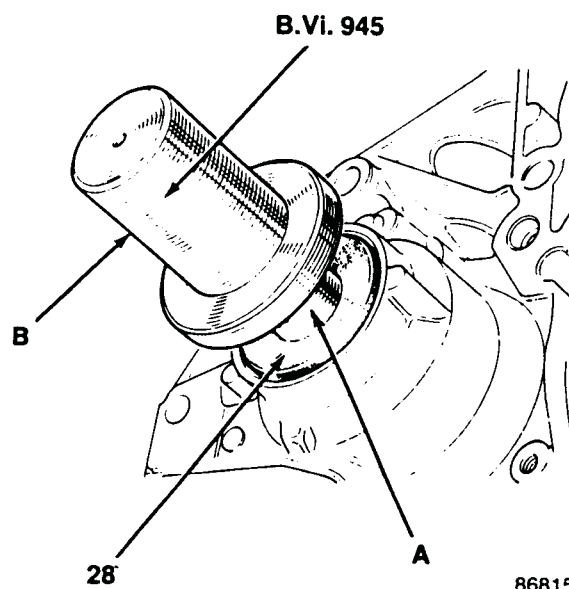


86814

Use B.Vi. 945, consisting of one seal protector (A) and the seal installing Tool (B), to install seal (28).



Lubricate protector (A) and insert it over the planetary gear. Position the oil seal with the tool (B).



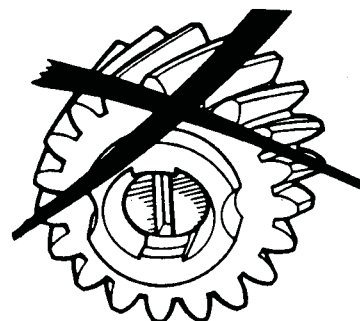
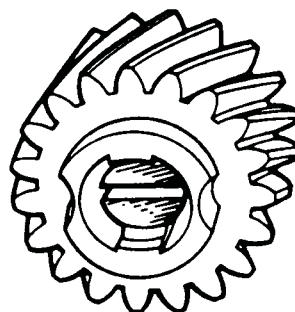
Speedometer Gear and Shaft Installation

The pinion gear and gear shaft must be installed by hand.

Position the shaft in relation to the locking notches in the gear as shown.

Install the gear on the gear shaft by striking it with a soft hammer.

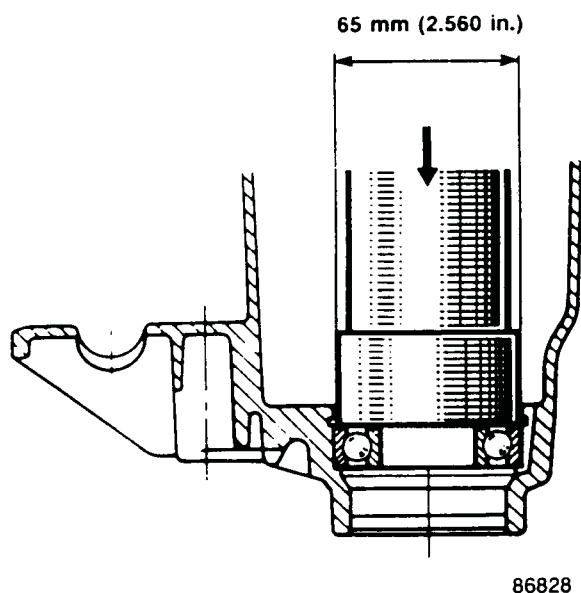
The reaction shaft and needle bearing cannot be removed from the case.



Small Differential Housing Bearing Installation

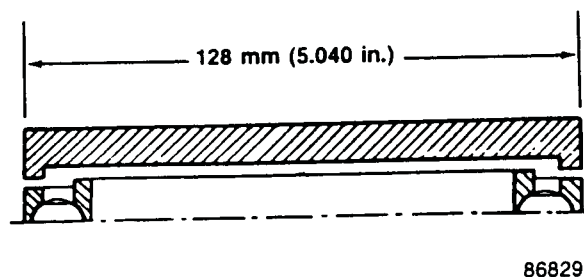
Position the new bearing over the opening and install it using an arbor press and a piece of 65 mm (2.560 in) tube.

Install a new retaining snap ring.



Large Differential Housing Bearing Installation

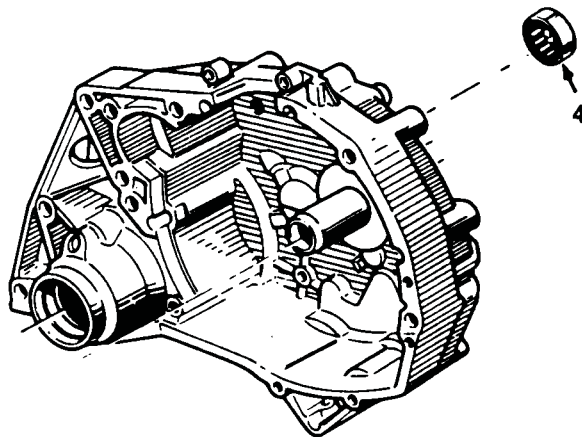
Position the new bearing over the opening and install it using an arbor press and a slightly shouldered steel bar 130 mm (5.118 in) long, or a 125-128 mm (4.921 to 5.040 in) diameter tube.



Converter and Differential Bearing Installation

Clean the seat area for the bearing thoroughly. Use emery cloth, a clean rag and compressed air to remove all burrs and dust.

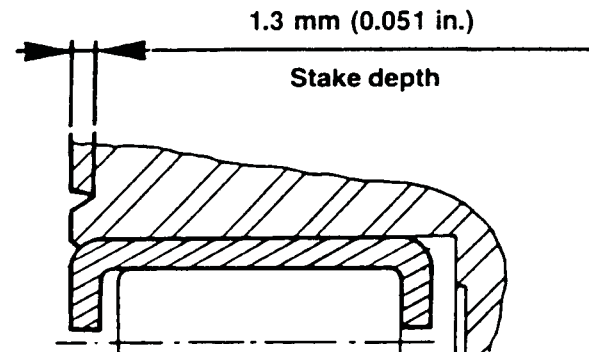
Using an arbor press, install the bearing (4) flush with the inside face of the case.



86398

Stake the bearing in place using a narrow cold chisel. The depth should be 1.3 mm (0.051 in.).

NOTE: This bearing must be replaced whenever the complete transaxle or final drive is overhauled.



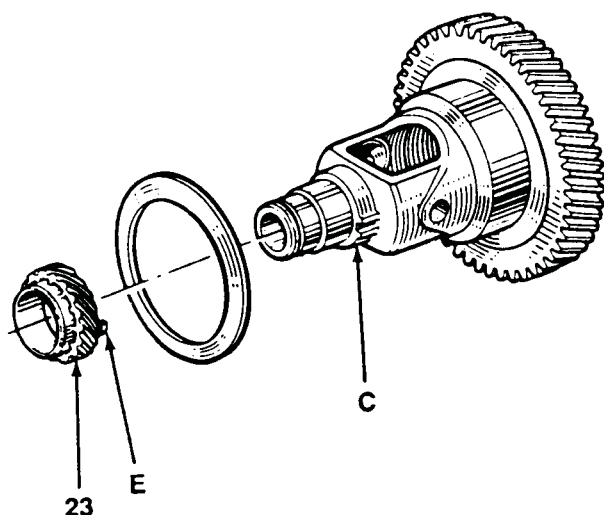
86830

Differential Components Assembly (MB)

Assembly is performed by reversing the disassembly procedures.

NOTE: Dip all differential components in automatic transmission fluid prior to assembly.

Be sure that tab (E) on the speedometer drive wheel gear (23) is located in notch (C) of the case when the parts are assembled.



86817

Converter Oil Seal Installation (MB)

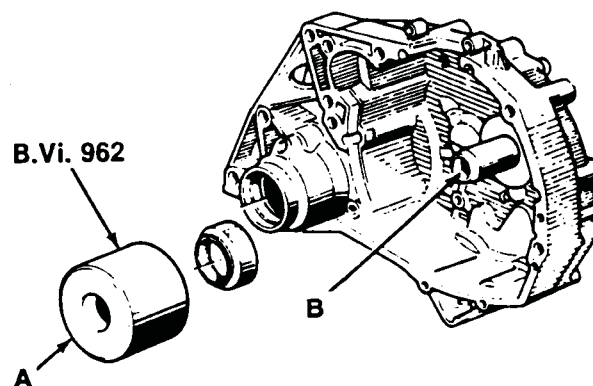
Check the condition of the smooth part of the stator support. Polish any minor irregularities with crocus cloth.

Before installing the new seal, coat the outside diameter of the seal with AMC/Jeep/Renault Gasket-In-A-Tube or equivalent RTV silicone sealer. Do not allow any sealant into the seal bore.

CAUTION: Do not apply excessive sealant. Sealant inside the case can cause filter plugging and transaxle failure.

Using Tool B.Vi. 962, push in a new seal by tapping the tool with a hammer until tool face (A) is flush with the end of the stator support (B). Then apply a small bead of sealant around the seal after it is installed.

Lubricate the seal lip with transaxle fluid and install the converter.

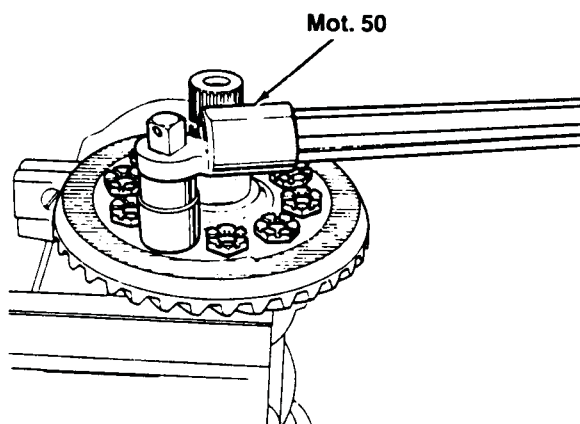
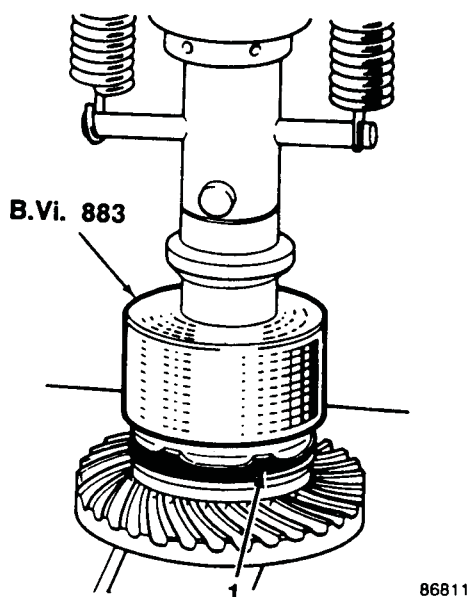


86374

Differential Components Assembly (MJ)

The collar (1) must be crimped in position using an arbor press and Tool B.Vi. 883. The tapered roller bearing must not be in position at this time.

Install the ring gear using replacement bolts. Use Torque Wrench Mot. 50, or equivalent, tighten the bolts to the specified torque.

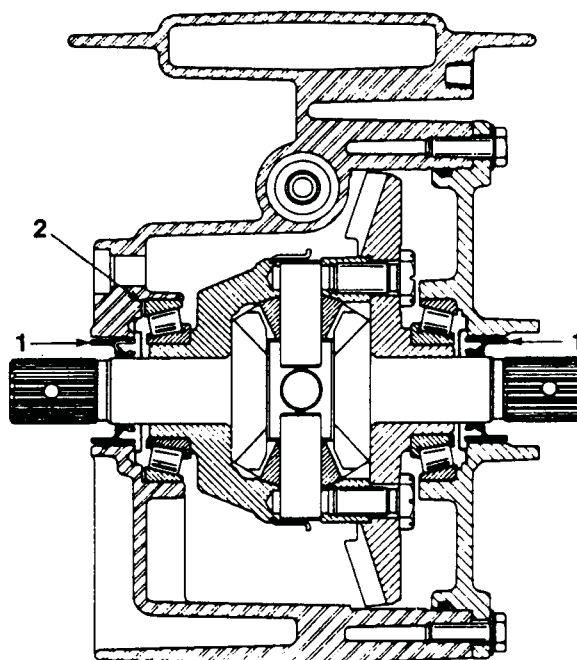


Differential Preload (MJ)

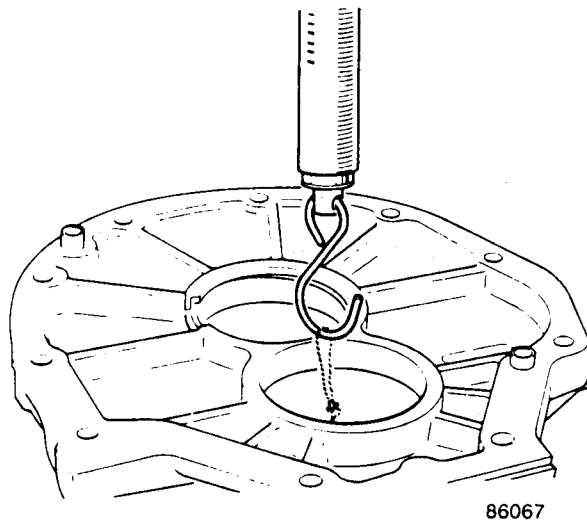
NOTE: The differential preload must be checked and adjusted if necessary whenever the final drive components are disassembled.

The differential preload adjustment is performed without the lip seals (1) or the pinion in place.

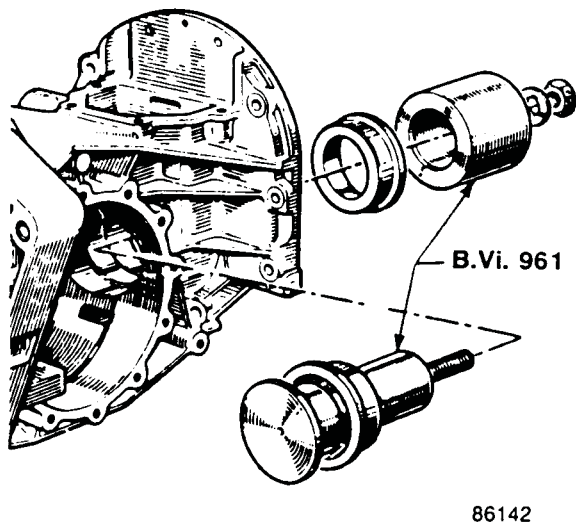
When the differential preload shim (2) increases in thickness, the preload increases and vice versa.



The differential components must rotate under a load of 15 to 30 N (3 to 7 lbs) pull when new bearings are installed. These components must rotate freely and without play when bearings are reused.



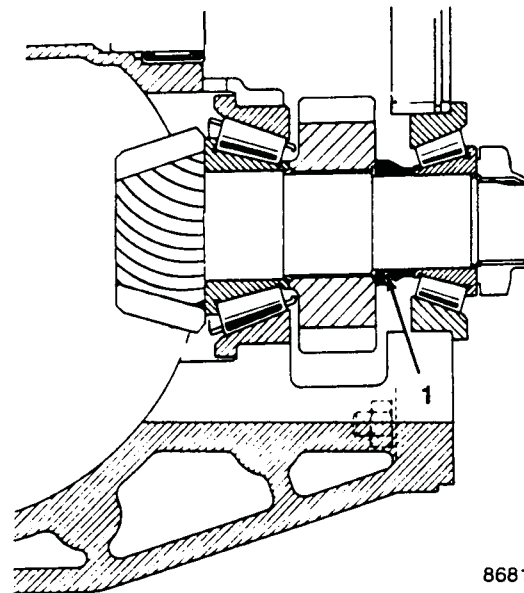
The final drive pinion outer track rings are refitted using tool B.Vi. 961 if new bearings are to be installed.



Pinion Preload (MJ)

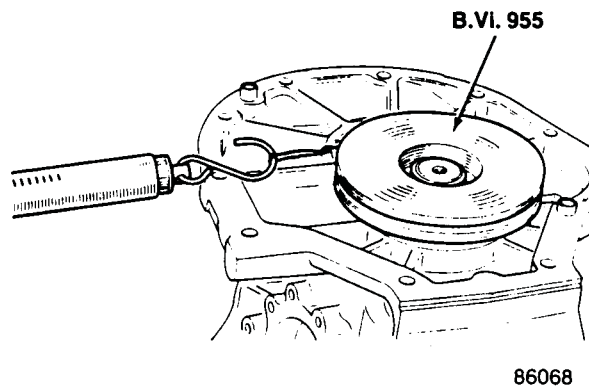
The differential pinion preload is checked without the differential installed.

The thickness of spacer (1) determines pinion preload.



Install Tool B.Vi. 955 on the differential pinion nut.

The pinion should rotate under a load of 20 to 35 N (4.5 to 8 lbs) pull when new bearings are installed. The pinion should rotate freely and without play when bearings are reused.



As the thickness of the pinion spacer is increased, preload is decreased and vice versa.

When this adjustment is completed, the differential assembly may be installed.

Differential Installation

Install the differential pinion and the differential assembly.

Install the differential closure plate and O-ring after coating the contact surfaces of the plate with Perfect Seal. Tighten the plate mounting bolts to the specified torque.

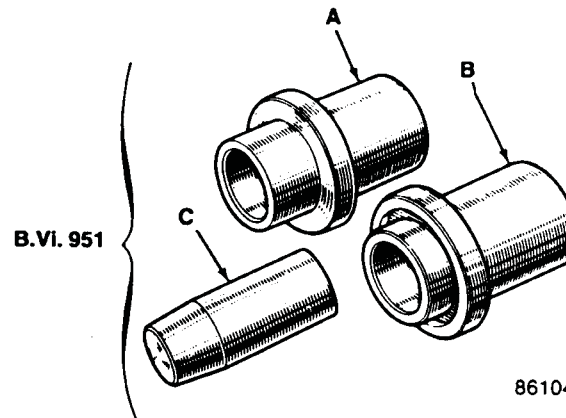
Side Gear Seals

The lip-type oil seals must be installed using the various parts of Tool B.Vi. 951.

A -the oil seal inserting tool for the differential closure plate end

B -the oil seal inserting tool for the other end

C -the protecting sleeve (lubricate before using)



At the differential closure plate end, install sleeve C over the side gear, fit the seal over the sleeve and position the seal using tool A.

At the other end, proceed as described above but use tool B to position the seal.

Install snap ring in the case.

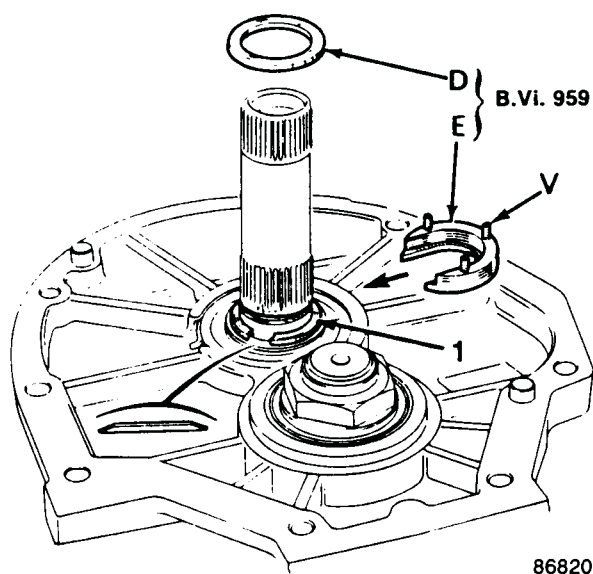
Install step down driving gear and the speedometer worm gear on the output shaft.

Install snap ring, ball bearing and tapered washer on the output shaft.

Install the assembly in the case and, using Tool B.Vi. 959, install circlip.

Install circlip in the following manner:

- place washer D from tool B.Vi. 959 on top of circlip (1).
- place clip E from B.Vi. 959 in the output shaft groove. Tighten the three screws V until the circlip enters the groove.



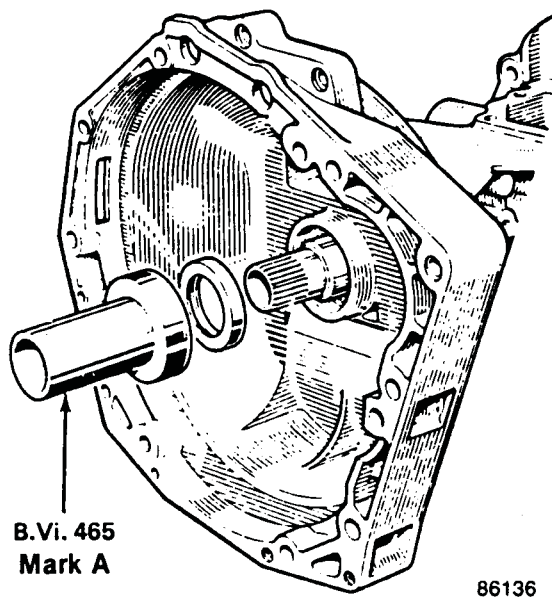
Converter Oil Seal Installation (MJ)

Check the condition of the smooth part of the stator support.

Lightly lubricate the new seal and place it on the chamfer.

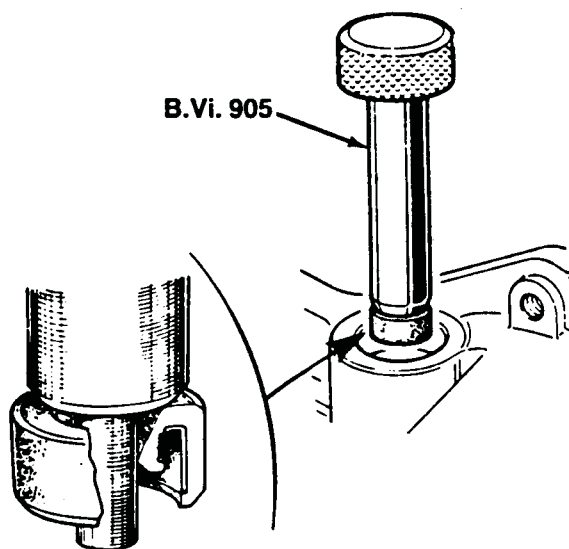
Use tool B.Vi. 465, mark A, and tap it gently to position the seal.

Lubricate the seal face with transaxle fluid and install the converter.



Coat the case contact surface with AMC/Jeep/ Renault Gasket Sealing Compound P/N 8993539 or Perfect Seal and assemble the differential case to the rear case. Tighten the bolts with the specified torque.

Install the speedometer drive gear, spindle and the speedometer drive spindle seal using Tool B.Vi. 905.



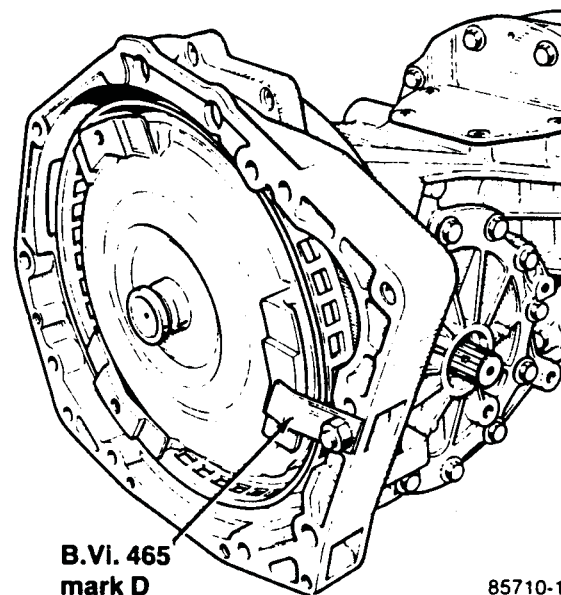
84821

Install the top plate and gasket.

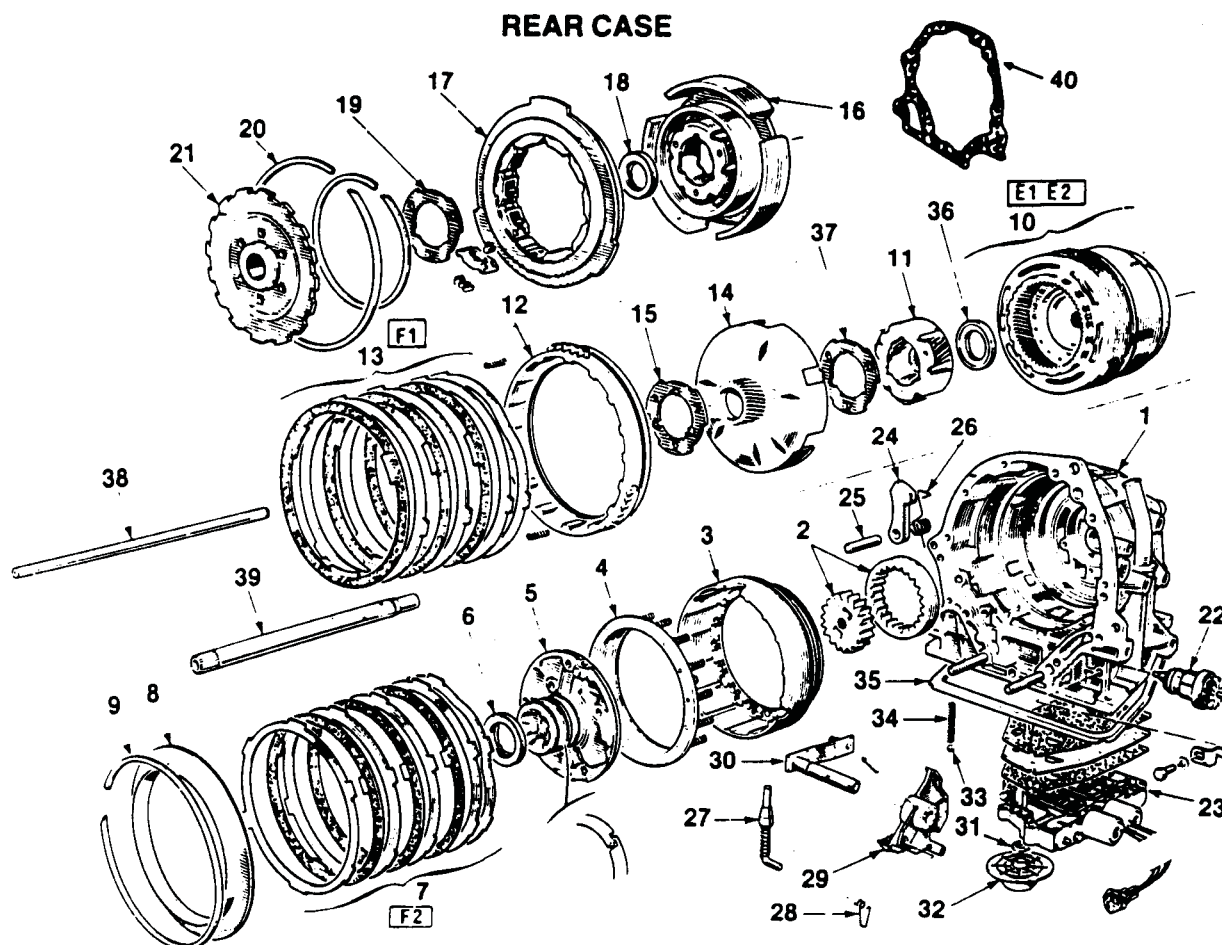
Lubricate the converter oil seal face.

CAUTION: To ensure proper ignition system operation, be sure the converter and drive plate are properly aligned. Ignition control module input is dependent upon correct signal input from the converter circumference and TDC sensor.

Install the converter with the white paint mark on the converter aligned with the sharp corners on the drive plate. Place the retaining lug B.Vi. 465 mark D in position as shown.



85710-1



- | | |
|---|--|
| 1 - Rear case | 22 - Capsule |
| 2 - Oil pump | 23 - Valve Body |
| 3 - F2 piston | 24 - "Park" latch |
| 4 - F2 cup | 25 - "Park" latch shaft |
| 5 - Feed hub | 26 - "Park" latch spring |
| 6 - Needle roller thrust bearing | 27 - "Park" linkage |
| 7 - F2 disc stack | 28 - Safety clip |
| 8 - F1 piston carrier | 29 - Quadrant |
| 9 - Snap ring | 30 - Input shaft |
| 10 - E1 - E2 clutches | 31 - Suction gauze gasket |
| 11 - Forward drive train | 32 - Suction gauze |
| 12 - F1 piston | 33 - Quadrant lock ball |
| 13 - F1 disc stack | 34 - Quadrant spring |
| 14 - E2 bellhousing | 35 - Sump plate gasket |
| 15 - Friction washer (1.5 mm thick) | 36 - Needle roller bearing |
| 16 - Reverse drive train | 37 - Friction washer (1.5 mm thick) |
| 17 - Freewheel | 38 - Pump shaft |
| 18 - Needle roller thrust bearing | 39 - Turbine shaft |
| 19 - Friction washer (thickness to be determined) | 40 - Rear Case-to-Intermediary Case gasket |
| 20 - Snap ring | |
| 21 - "Park" wheel | |

86822



Rear Case Cleaning

CAUTION: DO NOT use trichlorethylene to clean the rear case. It can leave damaging deposits on the seals.

Use mineral spirits or a commercial degreaser to clean the case (except oil seals). Use only lint free shop towels for cleaning.

Use compressed air to dry the components. Direct it into all holes, oil feed passages and lubrication channels in the following:

- rear case (1)
- freewheel (17)
- forward drive train (11)
- reverse drive train (16)
- E2 bellhousing (14)
- pistons (1), (2) and (3)
- feed hub (5)
- oil pump (2)
- oil pump shaft (38)
- turbine shaft (39)
- converter oil return calibrated jet

Clutches and Brakes

In most cases, all intermediate plain and lined discs must be replaced, together with the E1 -E2 assembly, if one of the F1 or F2 assemblies has been overheated.

	F2		F1	
	MB	MJ	MB	MJ
Wave disk	1	1	1	1
Steel disks	4	5	3	4
Lined disks	3	4	3	4

86823

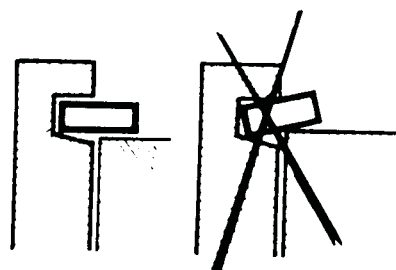
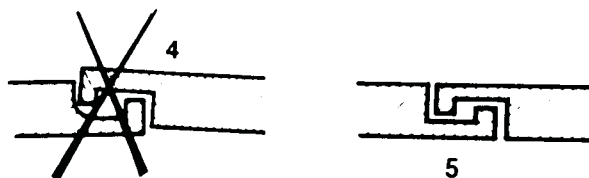
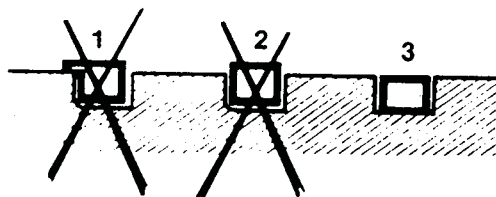
Sealing Rings

Check the snap ring grooves.

Replace all components which have worn or damaged sleeves.

Check the following:

- the amount of seal land wear (1)
- the condition of the bottom of the ring grooves (2). There should be well-defined sharp corners which allow the rings to bottom fully in the grooves.
- ring gaps (4). The gaps must mate perfectly (5).



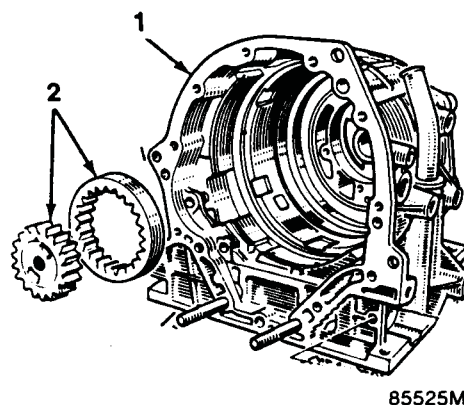
86824

Planetary Gear Checks

Check the condition of all the gear teeth. Be sure that the forward and reverse clusters rotate freely on the shaft.

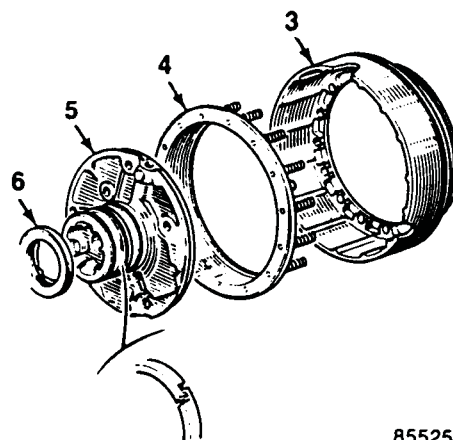
Rear Case Assembly

Install the oil pump gears (2). Make sure they rotate freely in the case (1).



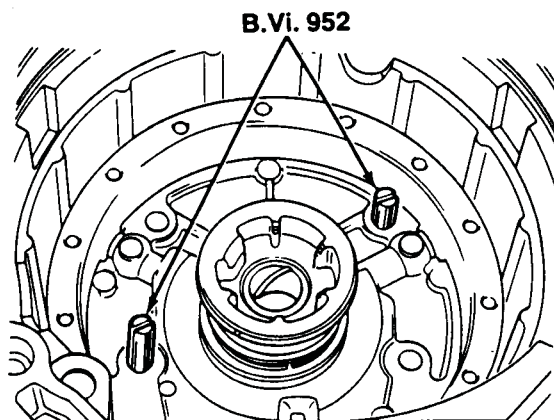
85525M

Install the F2 piston (3) with the seals in place and the F2 piston cup (4). Be sure that the springs enter the seats in the F2 piston.



85525N

Install the feed hub (5) with rings. Use aligning dowels B.Vi. 952. Install the bolts alternately and evenly in sequence. Tighten the bolts to the specified torque.



86024

Install the following:

- needle roller bearing (6) and the F2 brake steel clips
- one wave form disc from assembly (7)
- one plain disc and one lined disc, alternately as follows:

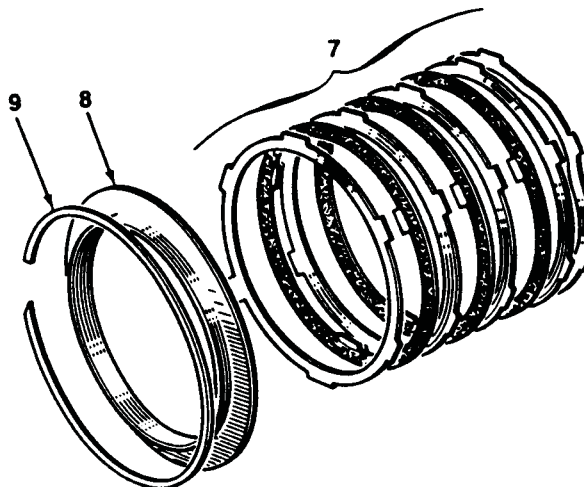
MB transmissions have:

- 1 wave form disc
- 4 plain discs
- 3 lined discs

MJ transmissions have:

- 1 wave form disc
- 5 plain discs
- 4 lined discs

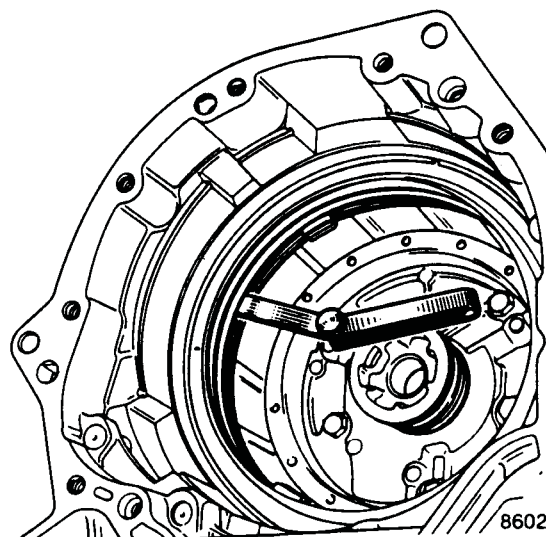
Install the F1 piston carrier (8) and the circlip (9)



85525P

The F2 operating clearance should be between 1.3 and 3.2 mm (0.051 to 0.126 in) for the MB transaxle. It should be between 1.7 and 3.7 mm (0.067 to 0.146 in) for MJ transaxle.

Using a feeler gauge, check the disc assembly clearance.

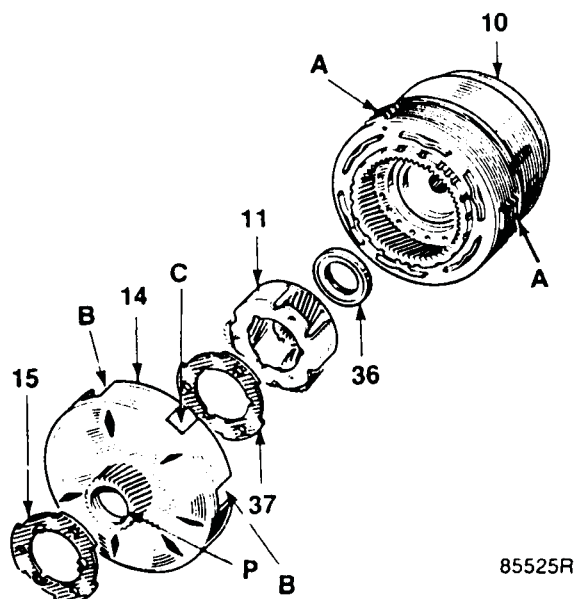


86023

Assemble the needle roller bearings, the forward drive train, the friction washer, the E2 bellhousing and the turbine shaft. The three pegs (A) of the E1 and E2 clutches (10) fit in the three notches of the E2 bellhousing.

The pegs of the F2 discs fit into the notches (C).

Check that the Assembly is correct by measuring between face (P) and the outside face of the E1 and E2 clutches. The clearance should be 40.6 ± 0.7 mm (1.598 ± 0.028 in). Check the order of assembly if this dimension is incorrect.



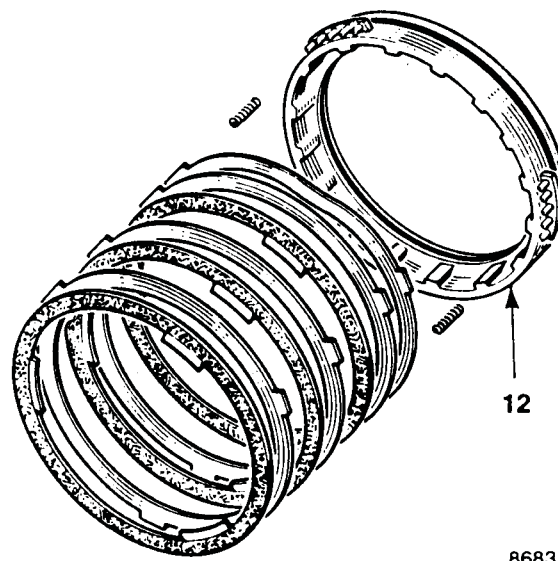
Install the F1 piston (12) followed by the wave form disc, one plain disc and one lined disc as follows:

MB:

- 1 wave form disc
- 3 plain discs
- 3 lined discs

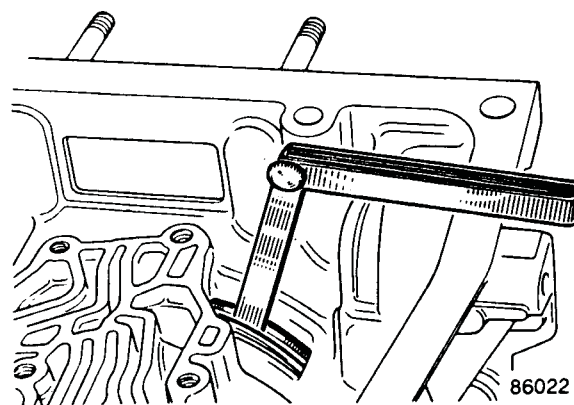
MJ:

- 1 wave form disc
- 4 plain discs
- 4 lined discs

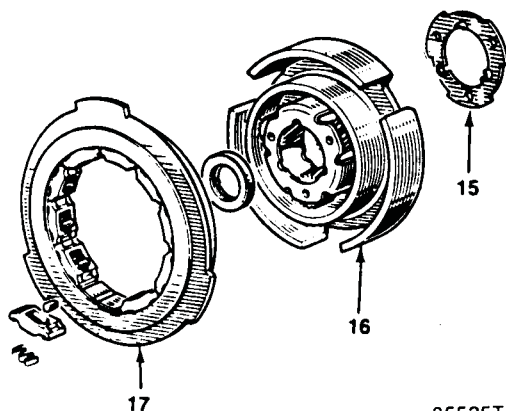


The F1 operating clearance for MB transaxles should be between 0.8 and 2.7 mm (0.031 and 0.106 in).

The F1 operating clearance for MJ transaxles should be between 1.1 and 3.1 mm (0.043 and 0.122 in).



Install the freewheel (17) on the reverse drive train (16).



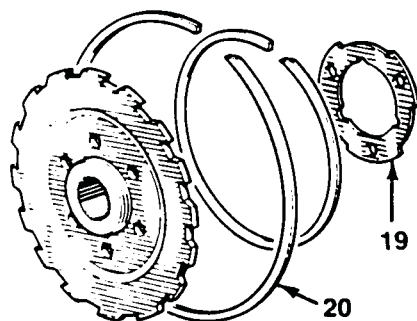
85525T

Install friction washer (15). This washer is 1.5 mm (0.05 in) thick.

Install the freewheel assembly. be sure that the lugs on washer enter the slots on the reverse drivetrain assembly.

Install the circlip.

Make the two adjustments on the rear case described under Reverse Gear Train and End Play Adjustment.



85525U

Valve Body

Prior to valve body installation, an air pressure should be performed.

Air Pressure Test

Air pressure testing is used as a method of confirming proper clutch and brake operation after a repair. The tests involve substituting air pressure for fluid pressure and by applying air pressure to the appropriate case passages and movement of piston can be felt and a soft thud may be heard as the clutch or brake applied, check for excessive air leakage.

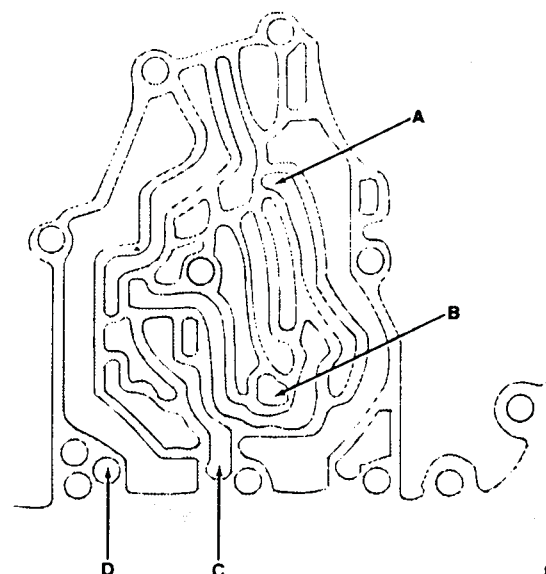
CAUTION: Use dry, filtered compressed air only when performing air pressure tests. Pressure of 207 to 689 KPa (30 to 100 psi) are required to perform the tests.

Applying air to passage A will apply F1 brake.

Applying air to passage B will apply F2 brake.

Applying air to passage C will apply E2 clutch.

Applying air to passage D will apply E1 clutch.



86825

Solenoid Valve and Valve Body Installation

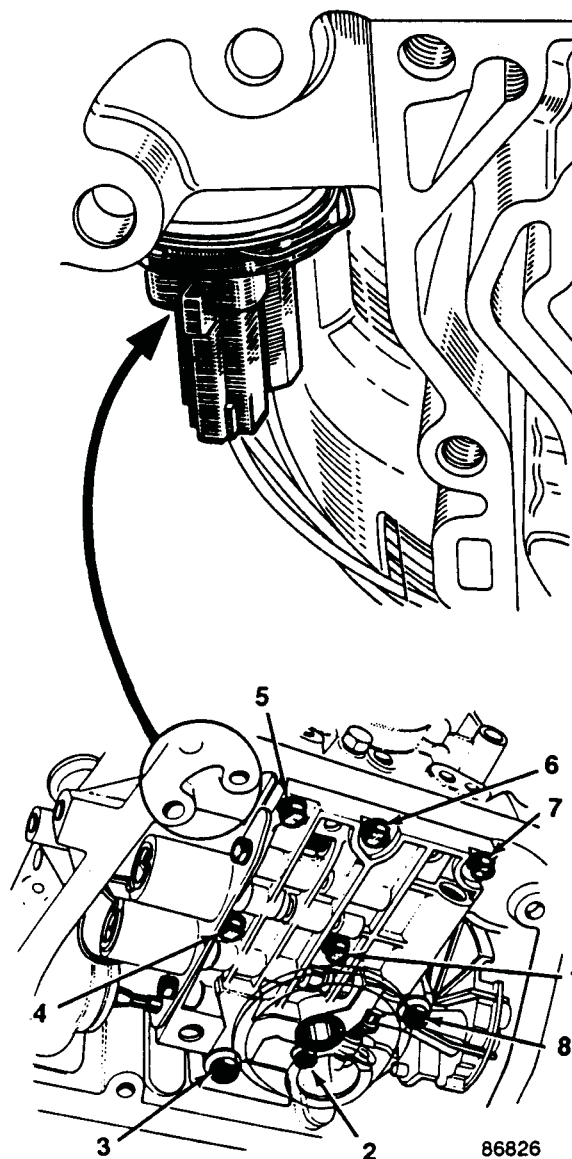
Install:

- the sealed junction box and clip
- the manual valve into the tooth quadrant

Position the valve body with two seals and the plate.

Hand tighten bolts (2) and (6) to establish the position of the valve body.

Install and tighten the remaining valve body bolts, in sequence, to the specified torque.



Case Assembly (MB)

The bolts to be installed are indicated by an arrow in the chart. They are located on the step down drive case.

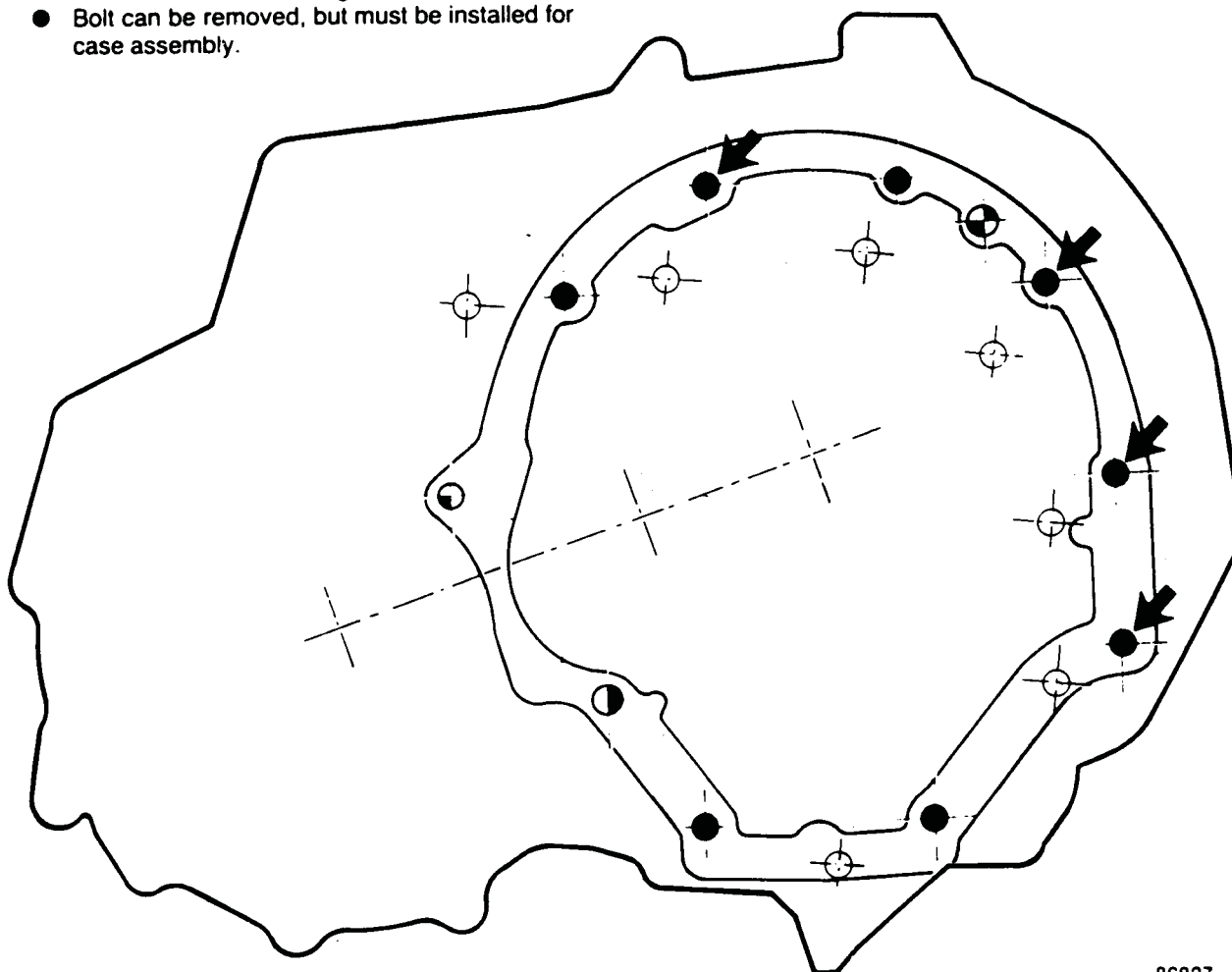
All other bolts are on the converter and differential case. Tighten all bolts with the specified torque.

CAUTION: Do not apply excessive sealant. Sealant inside the case can cause filter plugging and transaxle failure.

Be sure the differential assembly is clean. Coat the joint face and gasket with AMC/Jeep/Renault Gasket Sealing Compound or Perfect Seal and assemble it to the rear case.

Tighten the bolts with the specified torque.

- ⊕ Case centering dowel
- ① Locator: Bolt length 80 mm (3.14 in.)
The O-ring on the bolt
- Bolt must not be removed
- ⊕ Drive shaft boot mounting bolt
- Bolt can be removed, but must be installed for case assembly.



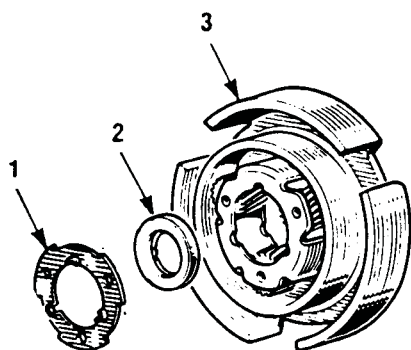
86827

Rear Case Adjustments

NOTE: If any rear case internal component has been replaced, perform the two adjustments described below.

Reverse Gear Train Adjustment

Shim (1) is used for adjustment, (2) is the needle roller thrust bearing and (3) is the reverse drive train.



85525V

Use Tool B.Vi 715 to measure dimensions A and B. Subtract B from A.

$$X = A - B$$

Measure dimension (C) on the park wheel (21)

$$\text{Overall clearance: } JT = X + C$$

The shim thickness is: $JT - 0.4 \text{ mm (0.16 in)}$.

Example:

$$A = 158.2 \text{ mm (6.228 in)}$$

$$B = 156.9 \text{ mm (6.177 in)}$$

$$C = 1.3 \text{ mm (0.051 in)}$$

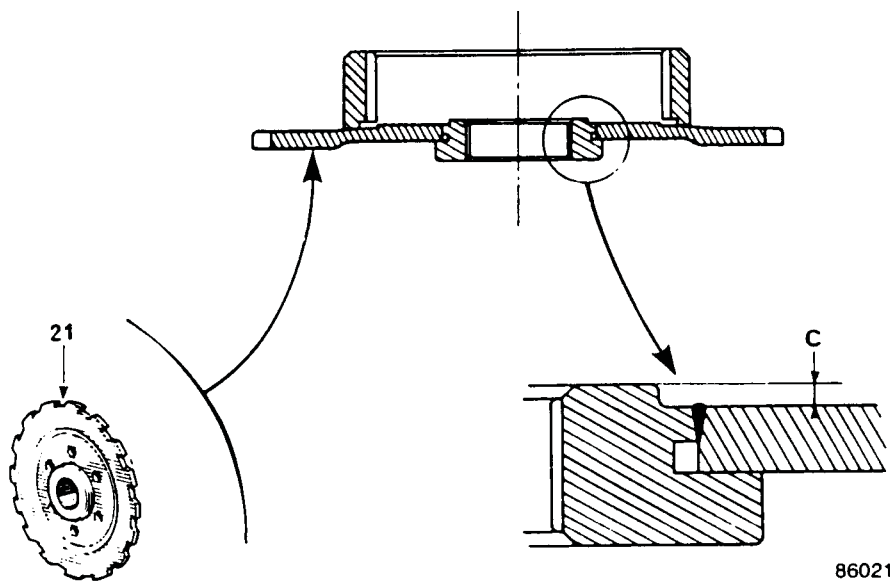
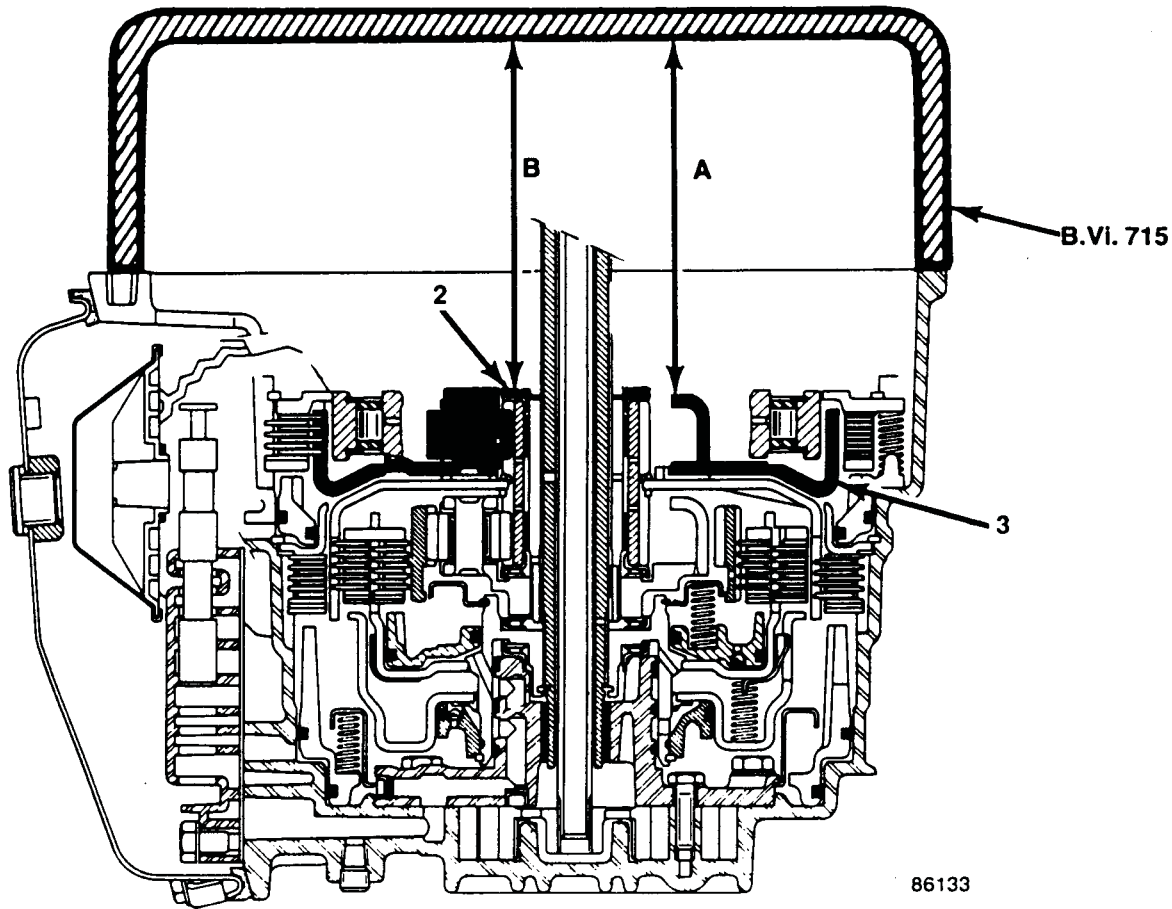
$$X = A - B = 158.2 \text{ mm (6.228 in)} - 156.9 \text{ mm (6.177 in)} = 1.3 \text{ mm (0.051 in)}$$

$$JT = X + C =; 1.3 \text{ mm (0.051 in)} + 1.3 \text{ mm (0.051 in)} = 2.6 \text{ mm (0.102 in)}$$

$$\text{Shim thickness required: } 2.6 \text{ mm (0.102 in)} - 0.4 \text{ mm (0.016 in)} = 2.2 \text{ mm (0.086 in)}$$

Shims available: 1.5 mm (0.059 in), 2 mm (0.079 in), 2.6 mm (0.102 in) and 3.2 mm (0.126 in)

In the example, a shim is selected that gives an operating clearance as close to the ideal as possible, in this case a 2-mm (0.079-in) shim.



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Technical Service Information

End Play Adjustment

Shim (K) is used for end play adjustment.

Measure dimension G. It equals F-H, with the gasket in place.

Measure dimension E. It equals H-D.

Overall end play equals G-E.

Average operating clearance equals 0.8 mm (0.031 in).

Based on the information above, the thickness of shim (K) = overall end play - 0.8 mm (0.031 in).

Example:

$$\begin{aligned} H &= 120 \text{ mm (4.725 in)} \\ F &= 145.3 \text{ mm (5.720 in)} \\ D &= 97.6 \text{ mm (3.843 in)} \end{aligned}$$

$$\begin{aligned} F &= 145.3 \text{ mm (5.720 in)} \\ - H &= 120 \text{ mm (4.725 in)} \\ \hline G &= 25.3 \text{ mm (0.996 in)} \end{aligned}$$

$$\begin{aligned} H &= 120 \text{ mm (4.725 in)} \\ - D &= 97.6 \text{ mm (3.843 in)} \\ \hline E &= 22.4 \text{ mm (0.882 in)} \end{aligned}$$

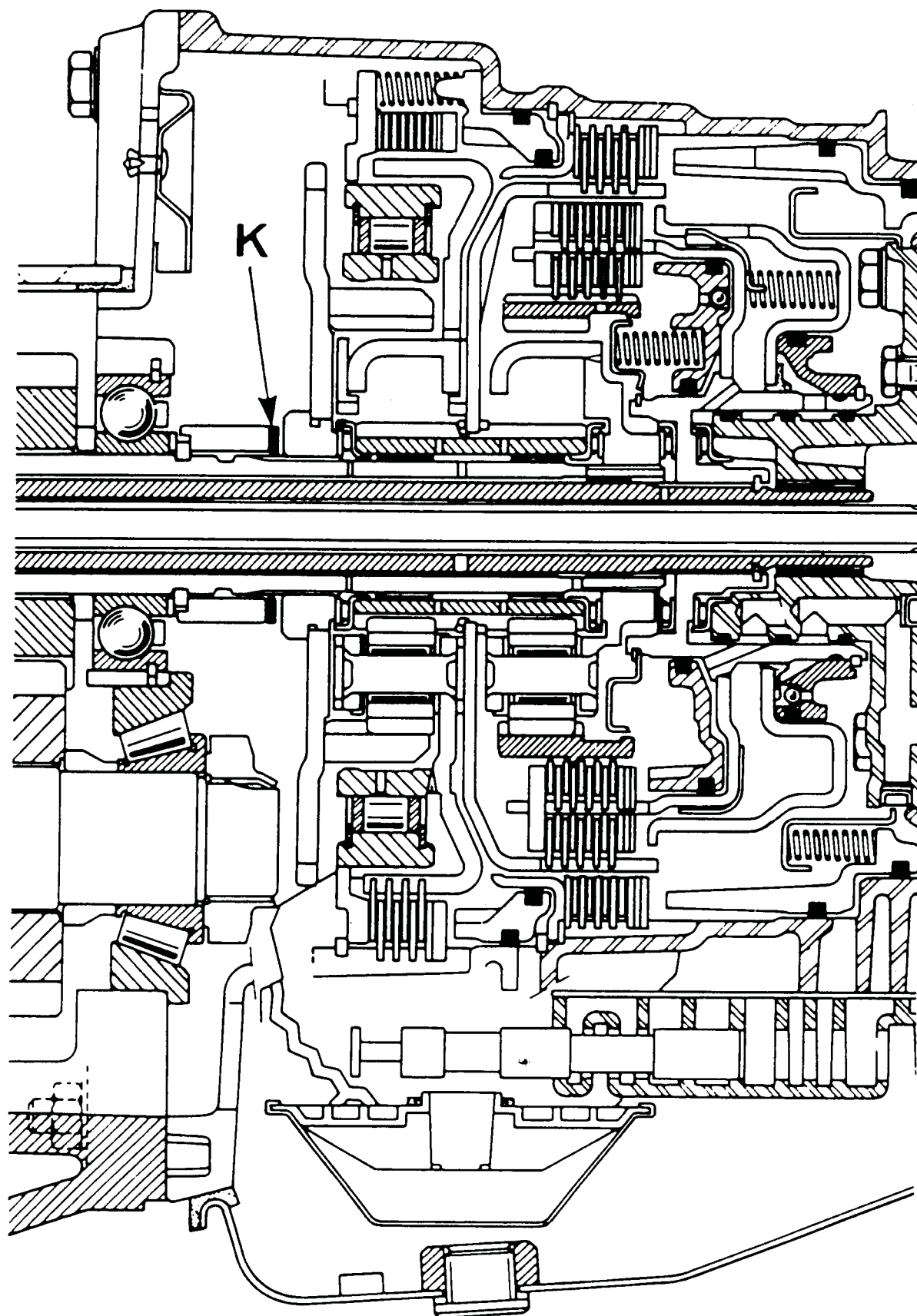
$$\begin{aligned} G &= 25.3 \text{ mm (0.996 in)} \\ - E &= 22.4 \text{ mm (0.882 in)} \\ \hline \text{overall endplay} &= 2.9 \text{ mm (0.114 in)} \end{aligned}$$

$$\begin{aligned} \text{overall endplay} &= 2.9 \text{ mm (0.114 in)} \\ - \text{desired endplay} &= 0.8 \text{ mm (0.31 in)} \\ \hline \text{required shim} &= 2.1 \text{ mm (.083 in)} \end{aligned}$$

Shims available:

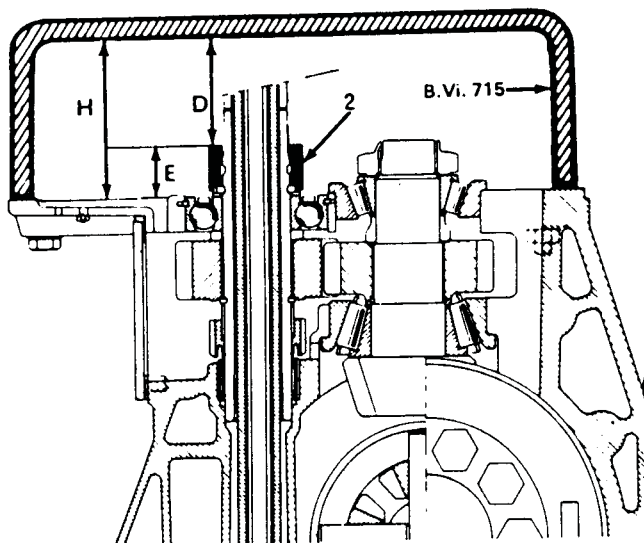
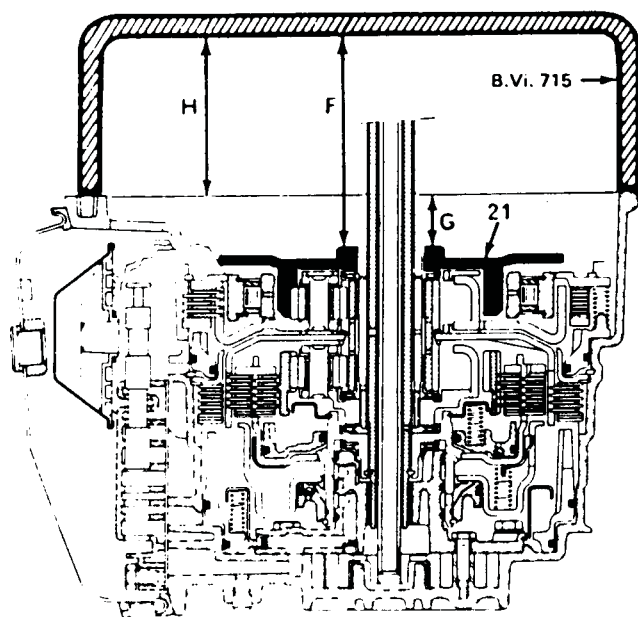
0.25 mm (0.010 in)	1.7 mm (0.067 in)
0.7 mm (0.028 in)	2.3 mm (0.091 in)
1.1 mm (0.043 in)	

In the example shown, a shim 2.3 mm (0.091 in) thick would be selected to provide the nearest to ideal clearance of 0.8 mm (0.031 in).



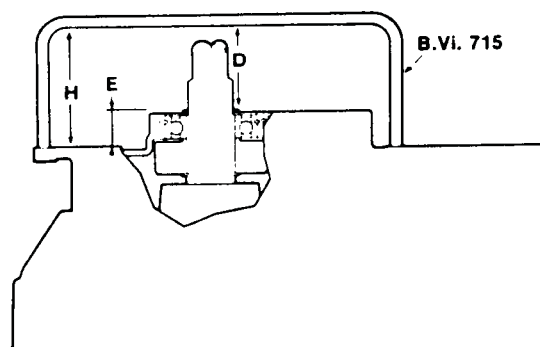
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NOTE: The end play adjustment should also be made if a replacement rear case is being installed.



21-Park Wheel
2-Spacer

86832





Technical Service Information

Vacuum Capsule Installation

Install the vacuum capsule, mounting bracket and bolt.

Connect the vacuum pipe.

Check the fluid level in the transaxle and test the fluid pressure after the transaxle is assembled and installed.