

AUTO TRANS OVERHAUL - V.A.G. 01V

Article Text

1998 Volkswagen Passat

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ARTICLE BEGINNING

1997-98 AUTOMATIC TRANSMISSIONS
Volkswagen/Audi V.A.G. 01V Overhaul

Audi:
1997-98; A4, A4 AWD
1998; A6, A6 AWD
Volkswagen:
1998; Passat

APPLICATIONS

TRANSAXLE APPLICATIONS

Vehicle Make & Model Transaxle Model & Code

Audi
1997-98 A4 01V.DCS (1) & DDT (2)
1997-98 A4 AWD 01V.CJP
1998 A6 (3) 01V.DPS
1998 A6 AWD 01V.DPT
Volkswagen
1998 Passat (1.8L) (4) 01V.DDT
1998 Passat (2.8L) (5) 01V.DRD

- (1) - From 4/95, 2.72 differential gearing.
- (2) - From 9/96, 3.09 differential gearing.
- (3) - From 7/97, 2.91 differential gearing.
- (4) - From 4/97, 3.09 differential gearing.
- (5) - From 8/97, 2.72 differential gearing.

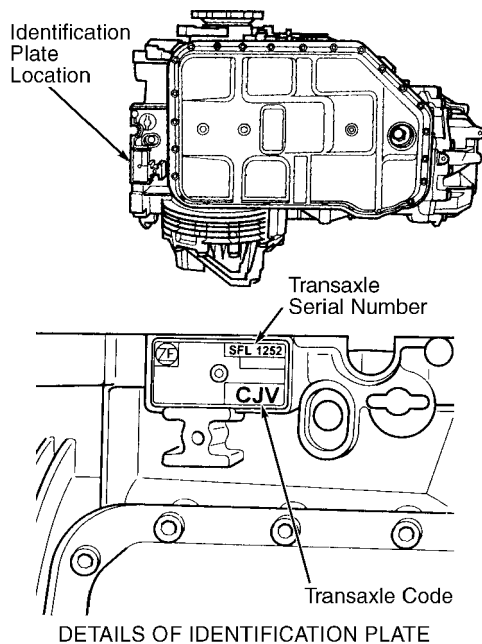
REAR FINAL DRIVE APPLICATION

Vehicle Make & Model Final Drive Model & Code

1997-98 Audi A4 AWD 01H.B.ABU
1998 A6 AWD 01R.CUB

IDENTIFICATION

Volkswagen Audi Group (VAG) transaxle type is cast into transaxle case above left output shaft flange. Transaxle code and build date are located on front top of transaxle case. See Fig. 1.



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Fig. 1: Locating Transaxle Identification Plate
 Courtesy of Audi of America, Inc.

DESCRIPTION & OPERATION

TRANSAXLE

Transaxle includes a 5-speed automatic transaxle, a torque converter with clutch, a final drive and solenoid-operated valve body. Under normal conditions, all shifts are controlled by a Transaxle Control Module (TCM), 5th gear is an overdrive. The electronic control consists of a TCM (located in left plenum chamber), control solenoids, various sensors and switches. The control solenoids direct oil pressure inside the valve body. The TCM monitors input and output signals. If electrical problems occur, TCM will record faults in TCM memory and may go into fail-safe mode. The TCM memory can only be read on VAG Tester (1551). The TCM also controls shift-lock system. This system locks the gear selector in Park or Neutral unless the brake pedal is pushed down. The TCM uses a shift-lock control relay to release a gear-selector mounted solenoid.

LUBRICATION & ADJUSTMENTS

NOTE: See appropriate AUTOMATIC TRANSMISSION SERVICING article in TRANSMISSION SERVICING.

ON-VEHICLE SERVICE

DRIVE AXLE SHAFTS

See appropriate AXLE SHAFTS article in AXLE SHAFTS & TRANSFER CASES.

OIL COOLER FLUSHING

Remove oil lines and allow fluid to drain. Using pressurized solvent, flush remaining fluid and debris from oil lines and cooler. Repeat flushing if necessary. Use pressurized shop air to remove solvent from oil lines and oil cooler. Install a new external oil filter.

TROUBLE SHOOTING

MECHANICAL & ELECTRICAL CHECKS

CAUTION: When battery is disconnected, Transmission Control Module (TCM) must be reset to Basic Setting using VAG Tester (1551).

If gear selector is stuck in Park or Neutral, see AUDI SHIFT LOCK SYSTEMS article. If gear positions are missing, shift quality is poor or no shifts are possible, ensure all electrical connections are okay and fluid level is correct. Check for Diagnostic Trouble Codes (DTC). See VOLKSWAGEN/AUDI V.A.G. 01V ELECTRONIC CONTROLS article.

FAIL-SAFE FUNCTION

When one or more components or sensors fail, the TCM will substitute functions and continue to operate. If a critical component fails, and the TCM is active, transaxle will shift into 4th gear with torque converter clutch disengaged and entire gear display will light. Reverse can be engaged and selector lock will not work. If a critical component fails, and the TCM is inactive, symptoms will be the same, but OBD codes cannot be accessed.

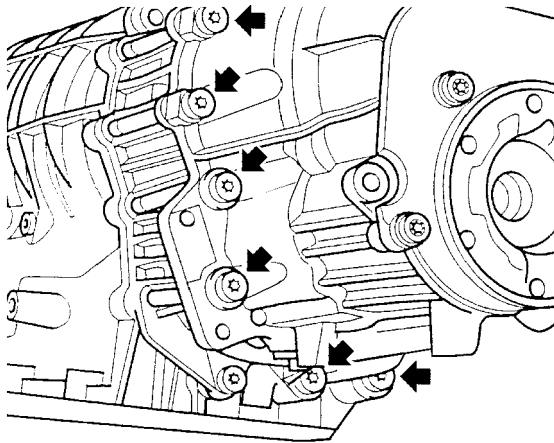
REMOVAL & INSTALLATION

CENTER DIFFERENTIAL (AWD)

Removal & Installation

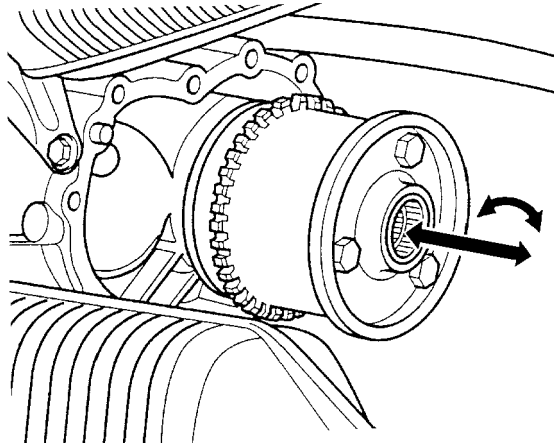
1) Disconnect left and right catalyts from rear exhaust system and press both rear catalyts apart. Remove heat shield from under drive shaft and loosen drive shaft from transaxle flange. Drain transaxle fluid from center differential and loosen retaining bolts for differential and remove. See Fig. 2. Be careful when removing center differential that torsen differential does not fall out of back of transaxle.

2) Remove torsen differential completely in direction of arrow from back of output shaft. See Fig. 3. To install reverse removal procedure. Inspect sealing surfaces for damage and install new gasket. Turn torsen differential while installing to ensure correct spline engagement. Tighten center differential bolts to correct specification. See TORQUE SPECIFICATIONS. Fill differential with transmission fluid and check level.



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Fig. 2: Removing Center Differential Bolts
 Courtesy of Audi of America, Inc.



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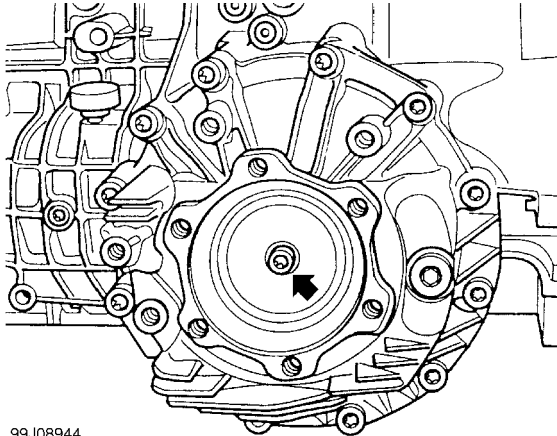
Fig. 3: Removing Torsen Differential Assembly
 Courtesy of Audi of America, Inc.

FRONT DIFFERENTIAL COVER

Removal & Installation

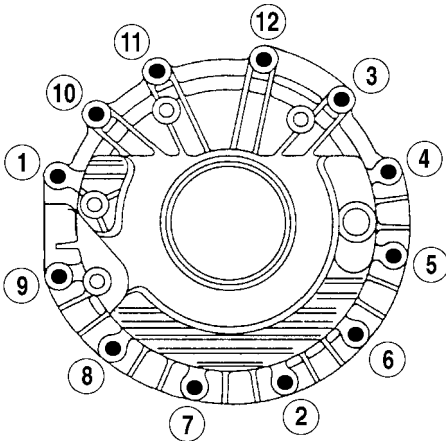
1) Remove right front wheel and heat shield for right drive shaft. Remove right drive shaft. See appropriate AXLE SHAFTS article in AXLE SHAFTS & TRANSFER CASES. Remove left and right front exhaust pipes with vibration element. Support transmission with jack and remove right transmission support. Hold right flange shaft with drift to keep from turning and remove center bolt of right flange shaft. See Fig. 4. Place drip tray under transaxle and pull out right flange shaft.

2) Remove bolts of differential cover in opposite order of tightening sequence and remove. See Fig. 5. Replace O-ring. To install, reverse removal procedure. Tighten bolts in 2 stages. Tighten bolts 1, 2 and 3 by hand. Then tighten bolts 1-12 to final torque specification in proper sequence. See TORQUE SPECIFICATIONS. Check gear oil in final drive and top up.



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Fig. 4: Removing Right Flange Shaft Center Bolt
 Courtesy of Audi of America, Inc.



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Fig. 5: Differential Cover Bolts Tightening Sequence
 Courtesy of Audi of America, Inc.

TORQUE CONVERTER

Removal & Installation

Remove torque converter. Check torque converter for any wear or damage, and replace if necessary. If torque converter is being reused, drain old fluid. Tilt converter on bench and siphon out all fluid.

TRANSAXLE

NOTE: For further information, see appropriate AUTOMATIC TRANSMISSION REMOVAL article in TRANSMISSION SERVICING.

VALVE BODY

Removal & Installation

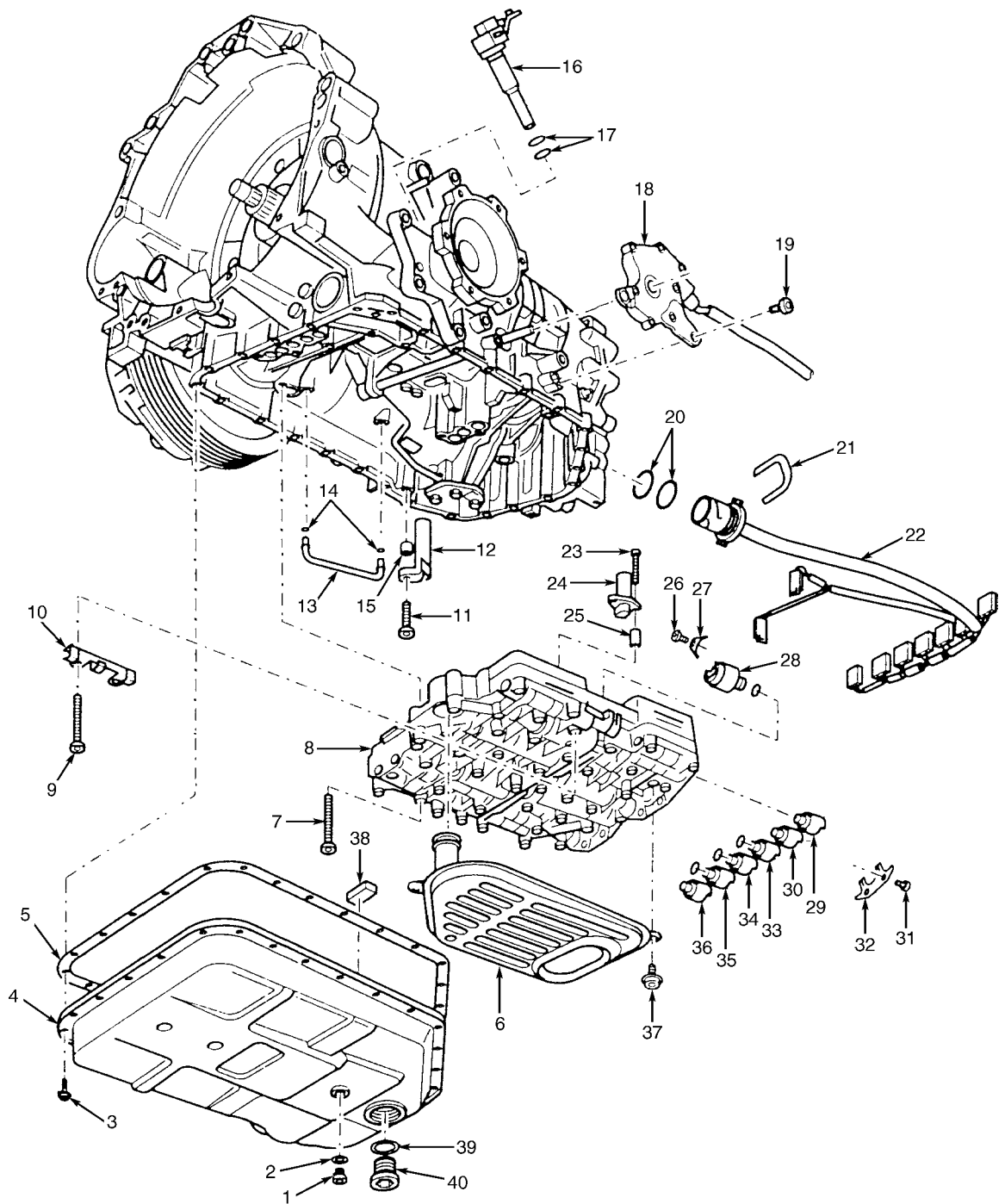
1) Open drain plug and drain ATF. Remove oil pan bolts diagonally in stages. remove 2 bolts retaining oil strainer and pull strainer off valve body. Remove clasp retaining wiring harness connector and disconnect connector at transaxle Vehicle Speed Sensor (VSS). See Fig. 7.

2) Only loosen valve body bolts indicated in Fig. 8. If other

bolts are loosened, operation of valve body may be affected or valve body may become separated. Bolts are of different lengths. Ensure they are properly matched to correct location. Remove valve body and wiring harness with connector. DO NOT set valve body down on top of transaxle input speed sensor. Apply petroleum jelly to O-rings of wiring harness connector and install wiring harness connector into transaxle housing.

3) Install valve body without using force and install pin of detent washer into groove of selector valve. See Fig. 9. Install clasp for securing wiring harness connector and ensure complete engagement. Using proper sequence, tighten valve body bolts by hand first, then tighten bolts for valve body to 70 INCH lbs. (8 N.m). See Fig. 8.

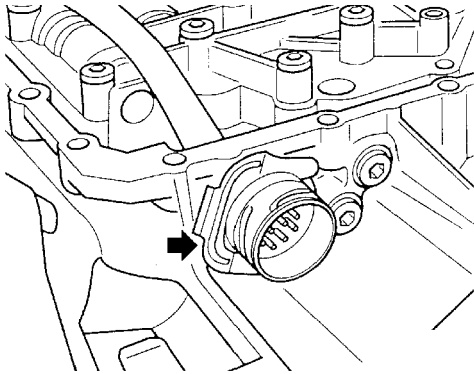
4) Apply a thin coat of petroleum jelly to gasket on oil strainer and install oil strainer. Replace oil pan gasket and install oil pan. Tighten bolts to correct torque specification and tighten diagonally. See TORQUE SPECIFICATIONS. Change ATF or top up after repairs. See appropriate AUTOMATIC TRANSMISSION SERVICING article in TRANSMISSION SERVICING.



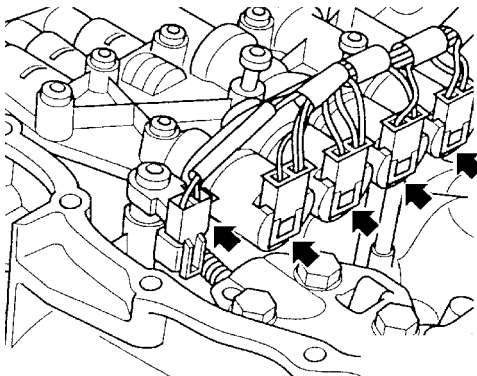
- | | | | |
|-----------------|----------------------|--------------------------|--------------------------|
| 1. Drain Plug | 11. Bolt | 21. Locking Clasp | 31. Screw |
| 2. Seal | 12. Transmission VSS | 22. Wiring Harness | 32. Bracket |
| 3. Bolt | 13. Inner Oil Line | 23. Bolt | 33. Solenoid Valve No. 6 |
| 4. Oil Sump | 14. "O" Ring | 24. Input Speed Sensor | 34. Solenoid Valve No. 7 |
| 5. Gasket | 15. Spacer Sleeve | 25. Spacer Sleeve | 35. Solenoid Valve No. 5 |
| 6. Oil Strainer | 16. Speedometer VSS | 26. Screw | 36. Solenoid Valve No. 1 |
| 7. Bolt | 17. "O" Ring | 27. Bracket | 37. Bolt |
| 8. Valve Body | 18. TR Switch | 28. Solenoid Valve No. 4 | 38. Magnet |
| 9. Bolt | 19. Bolt | 29. Solenoid Valve No. 3 | 39. "O" Ring |
| 10. Bracket | 20. "O" Ring | 30. Solenoid Valve No. 2 | 40. ATF Filler Plug |

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Fig. 6: Exploded View Of Valve Body Components
 Courtesy of Audi of America, Inc.



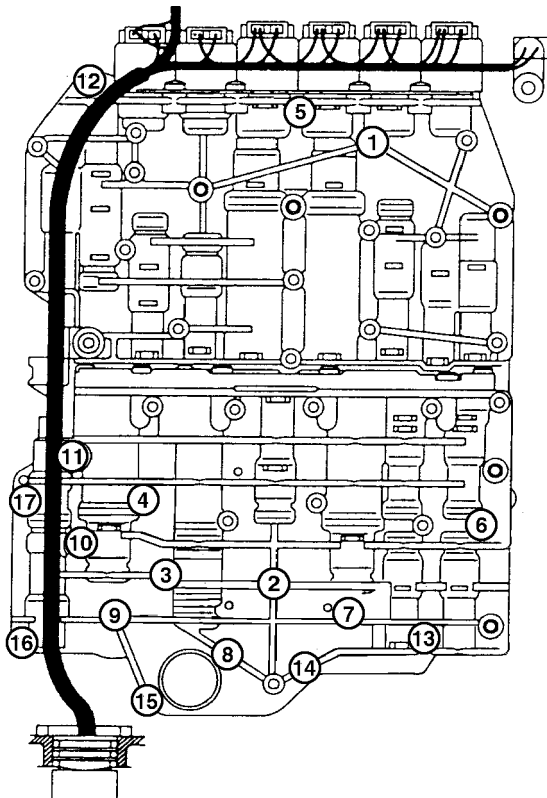
TRANSMISSION HARNESS CONNECTOR



SOLENOIDS & OIL TEMPERATURE
SENSOR CONNECTORS

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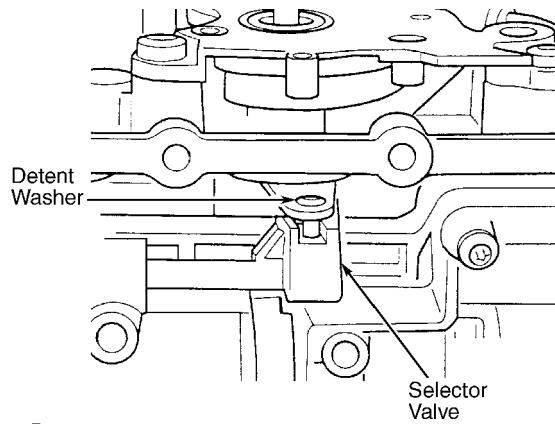
Fig. 7: Disconnecting Wiring Harness
Courtesy of Audi of America, Inc.



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Fig. 8: View Of Valve Body Bolts

Courtesy of Audi of America, Inc.



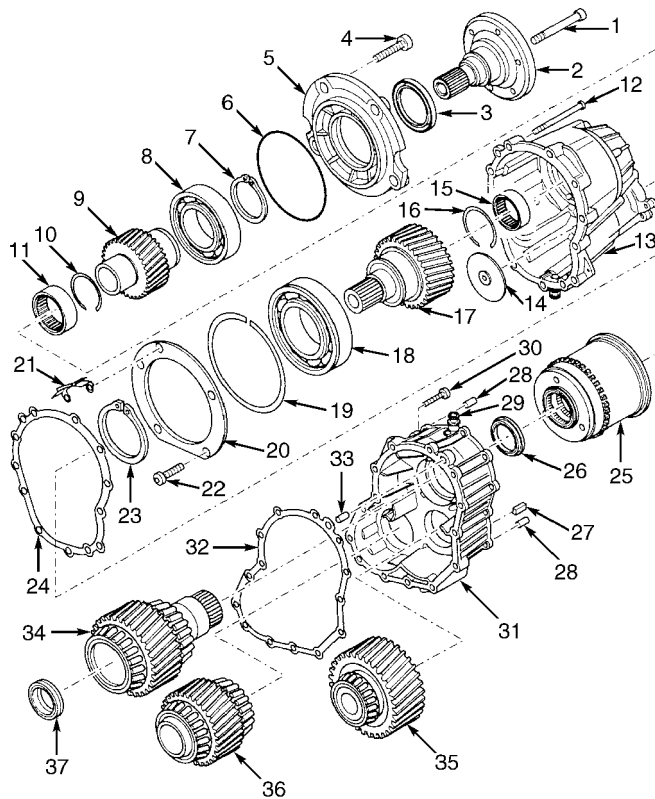
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Fig. 9: Aligning Selector Valve To Linkage
Courtesy of Audi of America, Inc.

COMPONENT DISASSEMBLY & REASSEMBLY

CENTER DIFFERENTIAL ASSEMBLY

NOTE: Information is not available. For exploded view of center differential assembly, see Fig. 10.



- 1. Bolt
- 2. Rear Flange Shaft
- 3. Seal
- 4. Bolt
- 5. Housing Cover
- 6. "O" Ring
- 7. Lock Ring
- 8. Ball Bearing
- 9. Spur Gear
- 10. Circlip
- 11. Needle Bearing
- 12. Bolt
- 13. Differential Housing
- 14. Tension Nut
- 15. Needle Bearing
- 16. Circlip
- 17. Spur Gear
- 18. Ball Bearing
- 19. Circlip
- 20. Fastening Disc
- 21. Manifold Baffle
- 22. Bolt
- 23. Lock Ring
- 24. Seal
- 25. Torsen Differential
- 26. Double Seal
- 27. Magnet
- 28. Sleeve
- 29. Breather
- 30. Bolt
- 31. Intermediate Drive Flange
- 32. Seal
- 33. Sleeve
- 34. Drive Pinion
- 35. Intermediate Drive Pinion
- 36. Output Pinion
- 37. Double Seal

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Fig. 10: Exploded View Of Center Differential
 Courtesy of Audi of America, Inc.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

AA

Application

Ft. Lbs. (N.m)

| | |
|--|---------|
| Center Differential-To-Transaxle Bolts (AWD) | 17 (23) |
| Center Differential Cover Bolts (FWD) | 17 (23) |
| Drive Axle Attaching Bolt (Left Side Only) | 18 (25) |
| Drive Axle Flange Bolts | 59 (80) |
| Torque Converter Nuts | 63 (85) |
| Transaxle-To-Engine Bolts | |
| 10-mm Diameter | 33 (45) |
| 12-mm Diameter | 48 (65) |

Transaxle-To-Transaxle Support Bolts 30 (40)

INCH Lbs. (N.m)

Oil Filter (In Pan) Bolts 53 (6)

Oil Pan Bolts 10 (7)

Valve Body Bolts 70 (8)

AA

END OF ARTICLE