

AUTO TRANS DIAGNOSIS - 01M

Article Text

1996 Volkswagen Golf
For Volkswagen Technical Site
Copyright © 1998 Mitchell Repair Information Company, LLC
Thursday, August 19, 1999 11:28PM

ARTICLE BEGINNING

AUTOMATIC TRANSMISSIONS
Volkswagen Type 01M

Cabrio, Golf, Golf III, GTI Jetta, Jetta III, Passat

APPLICATION & LABOR TIMES

APPLICATION & LABOR TIMES

AA

Vehicle Application	Labor Times		Trans. Model
	(1) R & I	(2) Overhaul	
1995- 96			
Cabrio	4.4	6.3	01M (CLK)
Golf, GTI & Jetta			
4-Cylinder			
Gas	4.4	6.3	01M (CLK)
Turbo Diesel	4.4	6.3	01M (CKZ)
V6	4.4	6.3	01M (CLB)
Passat			
4-Cylinder			
Gas	4.9	6.3	01M (CLK)
Turbo Diesel	4.9	6.3	01M (CKZ)
V6	4.9	6.3	01M (CLB)

- (1) - Removal and installation of transmission from vehicle chassis.
- (2) - On bench overhaul for transmission and differential.
DOES NOT include removal and installation.

AA

IDENTIFICATION

Volkswagen Audi Group (VAG) transaxle type is cast into top of transaxle case, next to ATF cooler. Transaxle code and build date are located on top of transaxle case, next to starter.

DESCRIPTION & OPERATION

Transaxle includes a 4-speed automatic transmission, lock-up torque converter, final drive and solenoid-operated valve body. See Fig. 1. Under normal conditions, all shifts are controlled by a Transaxle Control Module (TCM). See Fig. 2. Fourth gear is an overdrive gear.

AUTO TRANS DIAGNOSIS - 01M

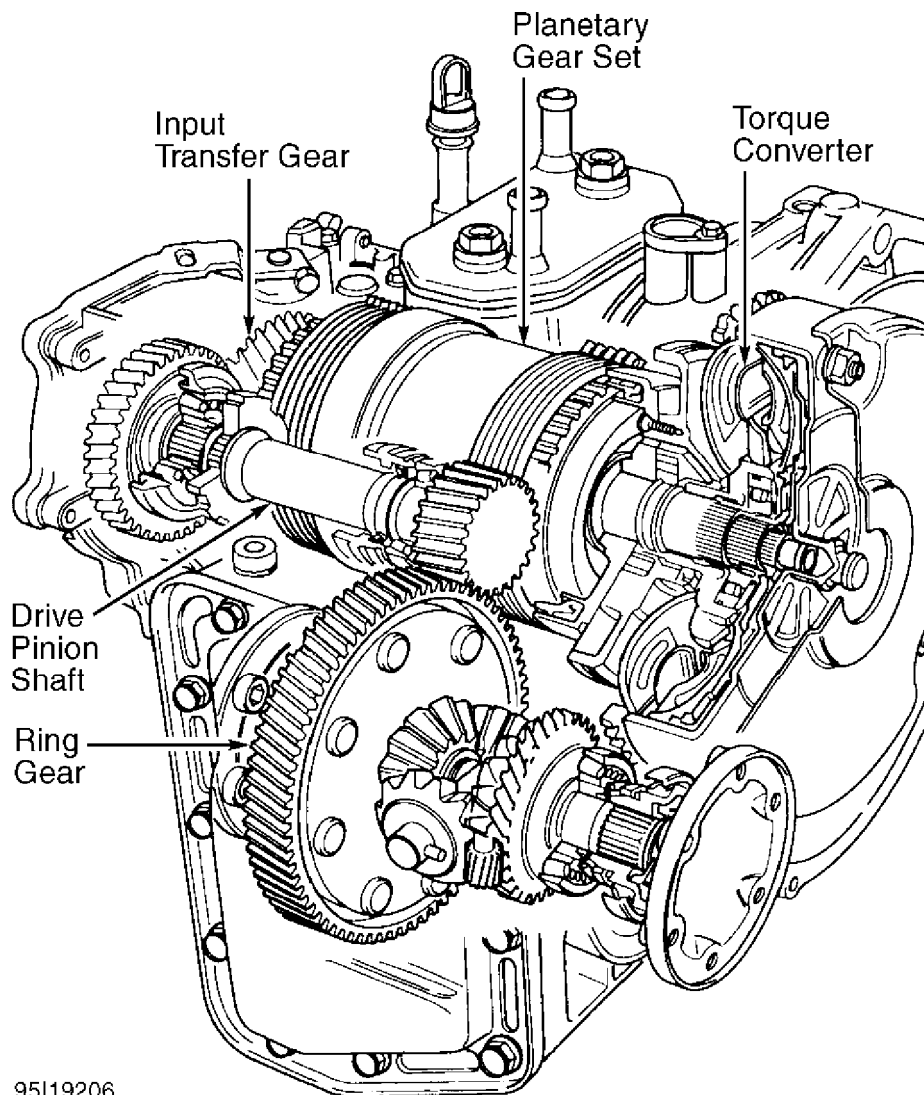
Article Text (p. 2)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



95119206

Fig. 1: Cross-Sectional View Of Transaxle Components
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

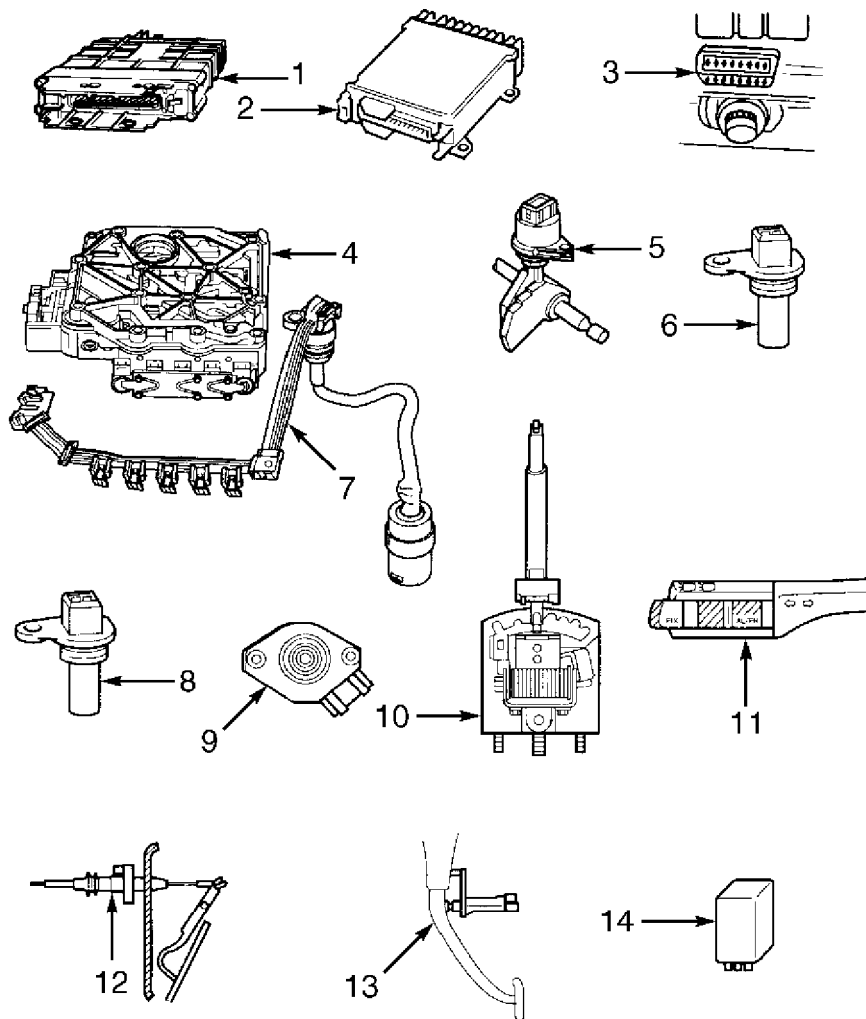
Article Text (p. 3)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



- | | |
|--|--|
| 1. Transmission Control Module (TCM) | 7. Conductor Strip (With Integrated Transmission Fluid Temperature Sensor) |
| 2. Powertrain Control Module (PCM) | 8. Vehicle Speed Sensor (VSS) |
| 3. Data Link Connector (DLC) | 9. Throttle Position (TP) Sensor |
| 4. Valve Body | 10. Shift Lock Solenoid |
| 5. Transmission Range (TR) Switch | 11. Cruise Control Solenoid |
| 6. Transmission Vehicle Speed Sensor (VSS) | 12. Kickdown Switch |
| | 13. Brakelight Switch |
| | 14. Park/Neutral Position Relay |

96C04631

Fig. 2: Identifying TCM & Shift Lock Electrical Components
Courtesy of Volkswagen United States, Inc.

The transmission elements consist of a planetary gear set, one-way roller clutch, 3 apply clutches, 2 brake clutches and a torque converter lock-up clutch. See Figs. 1 and 3.

All 4 forward gears are hydraulically activated. When the lock-up clutch is engaged, the forward gears become mechanically driven by eliminating torque converter slip. The lock-up clutch is

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 4)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

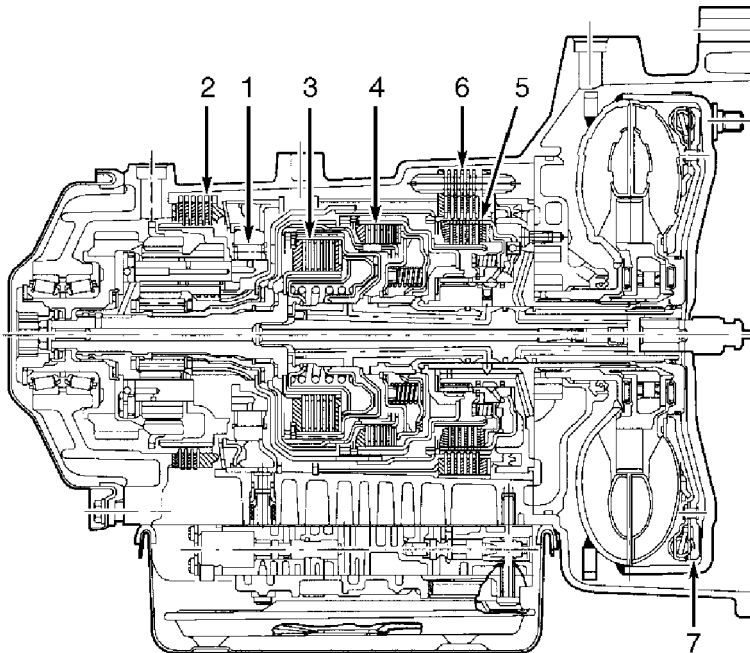
engaged depending on engine load and vehicle speed.

Power from the transmission is connected to the drive pinion through transfer gears. A ring gear and differential assembly are connected to flanges which spin the drive axles.

The electronic control consists of a TCM (located under rear seat), control solenoids, various sensors and switches. The control solenoids direct oil pressure inside the valve body. Solenoid valves No. 1-4 control the apply and brake clutches. Solenoid valves No. 5 and 7 control shift smoothness. Solenoid valve No. 6 is a frequency valve and controls the main hydraulic pressure. The TCM controls the main hydraulic pressure by varying the duty cycle.

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 (also known as emergency running mode). If TCM enters fail-safe mode, the transaxle will operate manually in reverse, 1st or 3rd gear. In fail-safe mode, 3rd gear operates with gear selector in 2nd, 3rd or "D". If engine is started with TCM in fail-safe mode, TCM activates 3rd gear hydraulically. The TCM memory can only be read using Scan Tool (VAG 1551) and Adapter (VAG 1551/3).

The TCM also controls shift lock system. This system locks the gear selector in Park or Neutral position unless the brake pedal is pressed. The TCM uses a shift lock control relay to release a gear-selector mounted solenoid. See Fig. 2.



- | | |
|------------------------------|------------------------------|
| 1. One-Way Roller Clutch | 5. Reverse Gear Apply Clutch |
| 2. Reverse Gear Brake Clutch | 6. 2nd-4th Gear Brake Clutch |
| 3. 4th Gear Apply Clutch | 7. Torque Converter |
| 4. 1st-3rd Gear Apply Clutch | Lock-Up Clutch |

96A04630

Fig. 3: View Of Transaxle Clutch Elements

Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 5)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

LUBRICATION & ADJUSTMENTS

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

TROUBLE SHOOTING

SYMPTOM DIAGNOSIS

Leak At Torque Converter

Check drive plate clearance, torque converter bushing, oil seal or oil pump assembly. Repair as necessary.

Transaxle Fluid In Coolant

Faulty transaxle oil cooler. Replace transaxle oil cooler and friction plates in transaxle. Clean transaxle.

Transaxle & Differential Oils Mixed

Replace "O" ring and drive pinion seal on inner bearing support.

Gear Selector Hard To Move

Check gear selector between shifter and transaxle. Repair as necessary. Check parking lock assembly inside transaxle. Repair as necessary.

No Drive In 1st Gear

Check for faulty 1st-3rd apply clutch or reverse brake clutch.

No Drive In "D", "2" Or "3"

Check for faulty 1st-3rd apply clutch or one-way clutch.

No 2nd Gear In "D", "2" Or "3"

Check for faulty 2nd-4th brake clutch.

No 3rd Gear In "D" Or "3"

Check for faulty reverse apply clutch.

No 4th Gear In "D"

Check for faulty 2nd-4th brake clutch.

No Reverse

Check for faulty reverse apply clutch or reverse brake clutch.

No Drive In All Forward Gear Positions

Check for faulty 1st-3rd apply clutch, reverse brake clutch or one-way clutch.

Missing Shifts Up Or Down

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 6)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

Check valve body for sticking valve(s) or faulty shift solenoid(s).

Erratic Or Harsh Shifts

Short in wiring to shift solenoid(s) or faulty shift solenoid(s). Check for proper throttle angle adjustment. See TECHNICAL SERVICE BULLETINS.

Harsh Shift In One Gear Only

Determine elements involved. Air check elements. Check for faulty shift solenoid or shift valve.

Stuck In Emergency Running Mode

Check for incorrect TCM installed, faulty wiring, bad solenoid electrical strip (inside oil pan) or stuck valve.

Park Lock Will Not Engage

Check for misadjusted selector lever cable. Check for faulty locking mechanism.

Bucking Or Poor Idling

Check throttle housing and air ducts for leaks. Check for possible air entering oil pump pickup.

Excess Engine RPM Drop When Shifting Into 1st Gear

Faulty Powertrain Control Module (PCM).

Engine Starts In Gear Or No Start In Park/Neutral

Check for faulty Park/Neutral safety switch.

Shift Lock Not Holding Selector In Park/Neutral

Check for faulty shift lock solenoid, shift lock mechanism or bad TCM.

MECHANICAL, HYDRAULIC & ELECTRICAL COMPONENTS

1) If gear selector is stuck in Park or Neutral position, go to SHIFT LOCK SYSTEM under TROUBLE SHOOTING. 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.

2) If problems are still present, disconnect electrical connector at transaxle. Test drive vehicle. Check if transaxle will operate manually in reverse and 1st gear. Move gear selector to 2nd, 3rd or "D" position. Transaxle should operate in 3rd gear (2nd, 3rd or "D").

3) If transaxle operates as described, problem may be electrical. See ELECTRONIC SELF-DIAGNOSTICS. If transaxle does not operate as described, problem may be mechanical or hydraulic. See ROAD TEST.

NOTE: If transaxle does not operate in manual 1st gear, check 1st-3rd apply clutch and reverse brake clutch for damage or

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 7)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

wear. If transaxle does not operate in manual reverse gear, check reverse apply clutch and reverse brake clutch for damage or wear.

ROAD TEST

WARNING: DO NOT exceed safe or legal speed limits during road test.

1) Road test vehicle with transaxle in "D" range. With vehicle at a speed above kickdown speed, press throttle pedal down and note kickdown shift speeds. Compare kickdown shift speeds to kickdown shift speed specifications. See KICKDOWN SHIFT SPEED SPECIFICATIONS table.

NOTE: In the following table, letter suffix following gear application refers to Hydraulic ("H") or Mechanical ("M") gear operation. Hydraulic or manual gear operation depends on operating mode of torque converter lock-up clutch.

KICKDOWN SHIFT SPEED SPECIFICATIONS

AA

Application	Kickdown (MPH)
4-Cylinder (CLK)	
1H- 1M	30- 34
1M- 2H	30- 34
2H- 2M	61- 65
2M- 3H	61- 65
3H- 3M	85- 89
3M- 4H	85- 89
4H- 4M	85- 89
4M- 4H	86- 83
4H- 3M	86- 83
3M- 3H	61- 57
3H- 2M	61- 57
2M- 2H	61- 57
2H- 1M	26- 22
1M- 1H	26- 22
Turbo Diesel (CKZ)	(1)
V6 (CLB)	
1H- 1M	37- 41
1M- 2H	37- 41
2H- 2M	76- 80
2M- 3H	76- 80
3H- 3M	111- 115
3M- 4H	111- 115
4H- 4M	111- 115
4M- 4H	112- 108
4H- 3M	112- 108
3M- 3H	75- 71
3H- 2M	75- 71
2M- 2H	75- 71

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 8)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

2H- 1M	32- 28
1M- 1H	32- 28

(1) - Information not available from manufacturer.

AA

2) Connect scan tool and appropriate adapter to diagnostic connector. Select function 08 "READ MEASURING VALUE BLOCK". Test solenoid valves and upshift speeds following scan tool manufacturers instructions.

3) If transaxle does not shift within specified MPH range, and scan tool values are within specification, determine affected elements. See APPLY & BRAKE CLUTCH APPLICATION.

4) If all apply and brake clutch elements are affected, check oil pump, oil filter, cooler lines, solenoid valve No. 6, and condition of torque converter and/or engine. Repair as necessary.

5) If one or more apply and brake clutch elements are affected, remove valve body. Locate appropriate fluid circuit in transaxle case and valve body. Check for leaks and/or blockage. Repair as necessary.

6) If hydraulic circuits are okay, or problems with apply and brake clutch elements are mechanical, repair transaxle.

NOTE: If transaxle does not operate in manual 1st gear, check 1st-3rd apply clutch and reverse brake clutch for damage or wear. If transaxle does not operate in manual reverse gear, check reverse apply clutch and reverse brake clutch for damage or wear.

APPLY & BRAKE CLUTCH APPLICATION

APPLY & BRAKE CLUTCH APPLICATION (1)

AA

Gear Application	Elements In Use
1st Gear	1st-3rd Apply & One-Way Clutch Holding
2nd Gear	1st-3rd Apply & 2nd-4th Brake
3rd Gear	1st-3rd & 4th Apply Clutches
4th Gear	4th Apply & 2nd-4th Brake
Reverse	Reverse Apply & Reverse Brake
Park & Neutral	All Apply & Brake Clutches Released Or Ineffective

(1) - All forward gear elements shown are in "hydraulic-state". Forward gear elements switch to a "mechanical-state" with the addition of torque converter lock-up clutch apply.

AA

SHIFT LOCK SYSTEM

Operation

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 9)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

All models are equipped with an electronic shift lock system. TCM controls shift lock system. See Fig. 2. This system locks gear selector in Park or Neutral position unless brake pedal is pressed. TCM uses shift lock control relay to release a solenoid mounted on gear selector assembly.

NOTE: Shift lock relay will not lock gear selector when vehicle speed is greater than 3 MPH.

A mechanical control cable prevents ignition key from being removed unless gear selector is in Park position. With ignition key removed, gear selector locks in Park position.

NOTE: If battery is disconnected or discharged, gear selector can be moved out of Park position by turning ignition key to START position.

Functional Check

1) With ignition key removed, ensure gear selector cannot be moved from "P" position. Insert key in ignition switch.

2) Turn ignition on. Ensure gear selector can only be moved with brake pedal pressed. Move gear selector to "N" position.

3) Without pressing brake pedal, ensure gear selector cannot move out of "N" position. Press brake pedal down. Ensure it is now possible to move gear selector.

4) If shift lock system does not operate as described, adjust gear selector, solenoid and control cable. If shift lock system does not operate after adjustments are made, check shift lock electrical system with Scan Tool (VAG 1551).

5) See testing information under ELECTRONIC SELF-DIAGNOSTICS. See Figs. 10-13. If any problems are found, service harness or components. If no problems are found, TCM may be defective. If shift lock system still does not operate correctly, check for worn or damaged parts and replace as necessary. See Figs. 2 and 4.

AUTO TRANS DIAGNOSIS - 01M

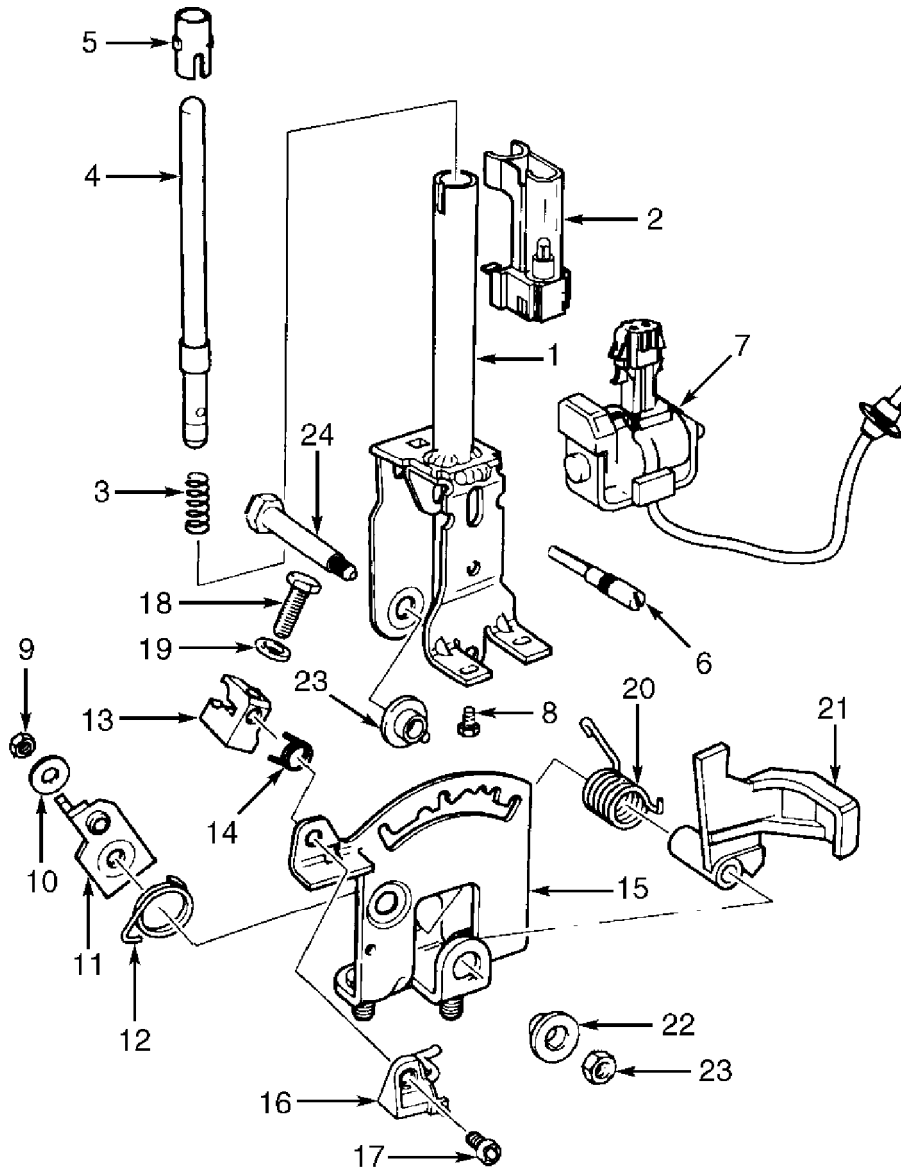
Article Text (p. 10)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



- | | |
|-----------------------------------|------------------------------|
| 1. Selector Lever | 13. Locking Cable Retainer |
| 2. Indicator Lighting | 14. Spring |
| 3. Spring | 15. Detent Plate |
| 4. Push Rod | 16. Locking Pin |
| 5. Guide Sleeve | 17. Screw |
| 6. Shift Lock Set Screw (Replace) | 18. Screw |
| 7. Shift Lock Solenoid | 19. Washer |
| 8. Screw | 20. Spring |
| 9. Nut (Replace) | 21. Shift Lock Control Lever |
| 10. Washer | 22. Bushing |
| 11. Locking Lever | 23. Nut (Replace) |
| 12. Coil Spring | 24. Shouldered Bolt |

95A19208

Fig. 4: Exploded View Of Shift Lock & Gear Selector Assembly
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 11)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

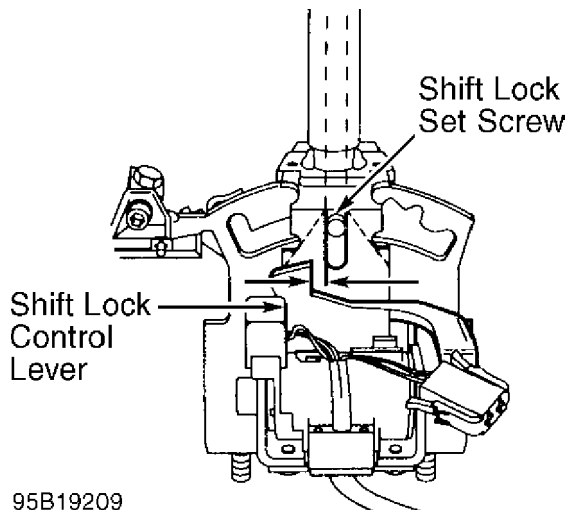
NOTE: Perform the following adjustments in order given.

Control Cable Adjustment

Loosen lock screw at gear selector lever on transaxle. Move gear selector in center console to Park position. Ensure front wheels are locked. Tighten cable housing to gear selector lever lock screw.

Shift Lock Solenoid Adjustment

Place gear selector in "N" or "P" position. Loosen shift lock solenoid mounting screws. Insert a .019" (.30 mm) feeler gauge between shift lock solenoid push rod and shift lever. See Fig. 5. If necessary, move shift lock solenoid and tighten screws.



95B19209

Fig. 5: Adjusting Shift Lock Solenoid
Courtesy of Volkswagen United States, Inc.

Shift Lock Cable Adjustment

1) Move gear selector to "1" position. Remove steering column covers. Turn ignition key to START position and release. Check clearance between shift lock cable lever and ignition switch locking pin.

2) Clearance should be .028" (.70 mm). If clearance is not correct, loosen lock nut on shift lock cable sheath. Position shift lock cable lever to obtain correct clearance. Tighten lock nut. See Fig. 6. Tighten gear selector housing screws and install steering column covers.

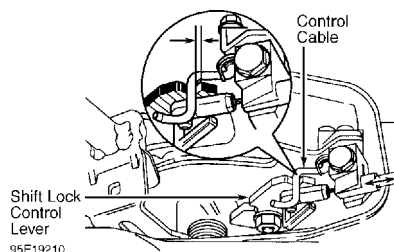


Fig. 6: Adjusting Shift Lock Cable
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 12)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

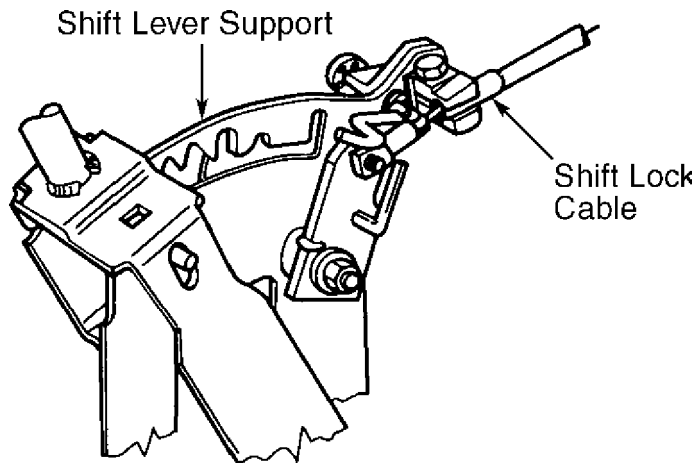
Thursday, August 19, 1999 11:28PM

Removal & Installation (Control Cable)

Remove lower cover from center console. Remove circlip from control cable end. Remove exhaust covers. On models equipped with V6 engines, remove catalytic converter. On all models, loosen lock nut and remove control cable from shift lever on transaxle. To install, reverse removal procedure. Adjust control cable. See CONTROL CABLE ADJUSTMENT under SHIFT LOCK SYSTEM.

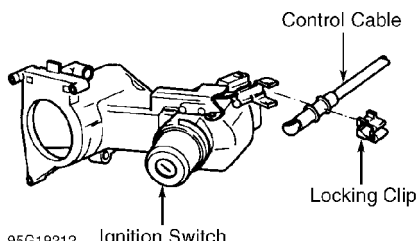
Removal & Installation (Shift Lock Cable)

- 1) Remove shift lever handle. Remove center console cover. Disconnect negative battery cable and wait 30 seconds.
- 2) Using Torx wrench, remove air bag retaining screws from rear side of steering wheel. Lift off air bag unit from steering wheel, and tilt air bag unit downward. Disconnect wiring connector from air bag unit. Remove steering wheel. Remove dash panel.
- 3) Place gear selector in rear position. Loosen screw holding cable sheath to gear selector support. Remove cable from lever. See Fig. 7.
- 4) Remove cover from ignition switch. Remove spring clip holding cable housing to ignition assembly. Lift and tilt shift lock cable housing upward. Pull up shift lock cable until shift lock cable unhooks from ignition switch. See Fig. 8.



95F19211

Fig. 7: Removing Shift Lock Cable From Shift Lever Support
Courtesy of Volkswagen United States, Inc.



95C19212 Ignition Switch

Fig. 8: Removing Shift Lock Cable From Ignition Switch
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 13)

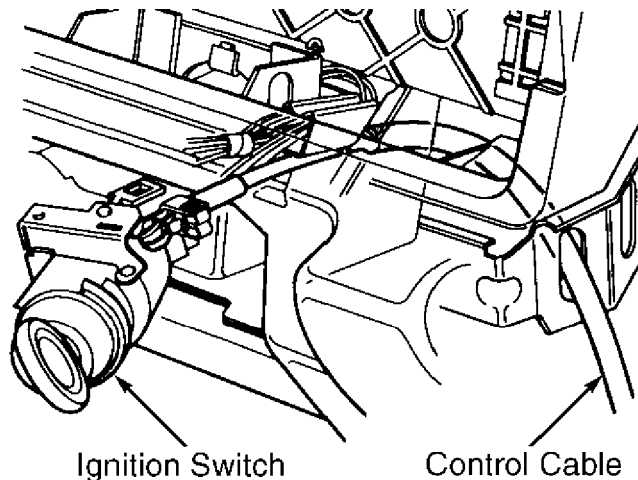
1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

5) Remove shift lock cable from under dash near A/C-heater housing and remove from vehicle. To install, position shift lock cable through under-dash panels. See Fig. 9. To complete installation, reverse removal procedure. Adjust shift lock control cable. See SHIFT LOCK CABLE ADJUSTMENT under SHIFT LOCK SYSTEM.



95H19213

Fig. 9: Routing Shift Lock Cable To Ignition Switch
Courtesy of Volkswagen United States, Inc.

ELECTRONIC SELF-DIAGNOSTICS

RETRIEVING TROUBLE CODES

1) Electronic control consists of a TCM (located under rear seat), control solenoids, and various sensors and switches. TCM monitors input and output signals. See Fig. 2.

2) If TCM detects problems in transaxle-related circuits or devices, TCM may record a trouble code in memory. To retrieve obtain trouble codes, use Scan Tool (VAG 1551) and Adapter (VAG 1551/3). All trouble code and related testing information is contained in scan tool.

TESTING

ELECTRICAL

NOTE: Manufacturer does not provide electrical component tests or specifications. All testing information is contained in Scan Tool (VAG 1551).

1) To isolate TCM circuit problems without a scan tool, circuit resistance and voltage can be checked by using Test Box (VAG 1598/18).

2) When checking circuit voltage, leave battery connected with test box connected to TCM and TCM vehicle harness. When checking circuit resistance, disconnect negative battery cable and connect test

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 14)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

box to TCM vehicle harness. Leave TCM disconnected.

3) Measure voltage and resistance between specified sockets on test box. See Figs. 10-13. If a problem is found, service harness or components as necessary. If no problem is found, TCM may be defective.

RESISTANCE & VOLTAGE TESTS

Sockets On VAG 1598/18	Area To Be Tested	• Testing Requirements & Additional Steps	Test Result Specifications	If Test Results NOT Within Specs
23 + 1	Transaxle TCM Voltage Supply	• Switch Ignition ON	About Battery Voltage	Check Wire From Terminal No. 1 Check Wire From Terminal No. 23 For Continuity With C/15A In Relay Panel
5 + 28	Throttle Position (TP) Sensor	• Switch Ignition OFF No Throttle Full Throttle	700-1800 Ohms 2100-3900 Ohms	Check Wiring Calibrate Throttle Position (TP) Sensor
5 + 50	Throttle Position (TP) Sensor	• Switch Ignition OFF No Throttle Full Throttle	2100-3900 Ohms 700-1800 Ohms	Check Wiring Calibrate Throttle Position (TP) Sensor
29 + 15	Solenoid Switch For Shift Interlock	• Switch Ignition ON • Selector Lever In P Or N Brakes Applied	About Battery Voltage	Check Wiring Replace Shiftlock Solenoid
			About 0.2 Volt	
15 + 1	Signal From Brake Light Switch	• Switch Ignition ON DO NOT Apply Brakes Brakes Applied	0 Volt	Check Wiring Replace Brake Light Switch
			About Battery Voltage	

96B04598

Fig. 10: Testing TCM Harness & Components (1 Of 4)

Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 15)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

RESISTANCE TESTS

VAG 1598/18 Terminals	Component To Be Tested	• Test Conditions & Additional Steps	Specified Value Or Results	If Test Results NOT Within Specs
63 + 1	Multifunction Switch	<ul style="list-style-type: none"> • Switch Ignition OFF Move Selector Lever To Positions R, N, D, 2 & 3 	Open	Check Wire Routing Replace Multifunction Switch
			.8 – 1.0 Ohms	
40 + 1		<ul style="list-style-type: none"> Move Selector Lever To Position P, R, 2 & 1 	Open	
		<ul style="list-style-type: none"> Move Selector Lever To Position N, D & 3 	.8 – 1.0 Ohms	
62 + 1		<ul style="list-style-type: none"> • Switch Ignition OFF Move Selector Lever To Position P, R, N & D 	Open	
		<ul style="list-style-type: none"> Move Selector Lever To Position 3, 2 & 1 	.8 – 1.0 Ohms	
18 + 1		<ul style="list-style-type: none"> • Switch Ignition ON Move Selector Lever To Position P, R & N 	About Battery Voltage	
		<ul style="list-style-type: none"> Move Selector Lever To Position D, 3, 2 & 1 	0 Volt	
55 + 67	Solenoid Valve No. 1	<ul style="list-style-type: none"> • Switch Ignition OFF 	55 – 65 Ohms	Check Harness
55 + 1		Control Unit Removed	Open	Replace Valve Body
54 + 67	Solenoid Valve No. 2	<ul style="list-style-type: none"> • Switch Ignition OFF 	55 – 65 Ohms	Check Harness
54 + 1		Control Unit Removed	Open	Replace Valve Body

96F04627

Fig. 11: Testing TCM Harness & Components (2 Of 4)

Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 16)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

RESISTANCE TESTS

Sockets On VAG 1598/18	Area To Be Tested	• Testing Requirements & Additional Steps	Test Result Specifications	If Test Results NOT Within Specs
9 + 67	Solenoid Valve No. 3	<ul style="list-style-type: none"> • Switch Ignition OFF TCM Disconnected	55 – 65 Ohms	Check Harness Routing
9 + 1			Open	Replace Valve Body
47 + 67	Solenoid Valve No. 4	<ul style="list-style-type: none"> • Switch Ignition OFF TCM Disconnected	4.5 – 6.5 Ohms	Check Harness Routing
47 + 1			Ohms	Replace Valve Body
56 + 67	Solenoid Valve No. 5	<ul style="list-style-type: none"> • Switch Ignition OFF TCM Disconnected	55 – 65 Ohms	Check Harness Routing
56 + 1			Open	Replace Valve Body
58 + 22	Solenoid Valve No. 6	<ul style="list-style-type: none"> • Switch Ignition OFF TCM Disconnected	4.5 – 6.5 Ohms	Check Harness Routing
58 + 1/22 + 1			Open	Replace Valve Body
10 + 67	Solenoid Valve No. 7	<ul style="list-style-type: none"> • Switch Ignition OFF TCM Disconnected	55 – 65 Ohms	Check Harness Routing
10 + 1			Open	Replace Valve Body
23 + 29	Solenoid Switch for Shift Interlock	<ul style="list-style-type: none"> • Switch Ignition OFF TCM Disconnected	14 – 25 Ohms	Check Harness Routing Replace Shiftlock Solenoid Assembly
1 + 16	Kickdown Switch	<ul style="list-style-type: none"> • Switch Ignition OFF • TCM Disconnected DO NOT Press Accelerator Pedal Depress Accelerator Fully	Open	Check Harness Routing Adjust Or Replace Accelerator Cable
			Less Than 1.5 Ohms	

96G04628

Fig. 12: Testing TCM Harness & Components (3 Of 4)
Courtesy of Volkswagen United States, Inc.

RESISTANCE TESTS

VAG 1598/18 Terminals	Component To Be Tested	• Test Conditions & Additional Steps	Specified Value Or Results	If Test Results NOT Within Specs	
20 + 65	Vehicle Speed Sensor	<ul style="list-style-type: none"> • Switch Ignition OFF • TCM Disconnected • Set Ohmmeter To 2 k/ohm Scale 	800 – 900 Ohms	Check Harness Routing Replace Vehicle Speed Sensor	
6 + 67	ATF Temperature Sensor	<ul style="list-style-type: none"> • Switch Ignition OFF • TCM Disconnected • Set Ohmmeter To 200 k/ohm Scale ATF Temperature 68°F (20°C)	24,700 Ohms	Check Harness Routing Replace Valve Body	
			<ul style="list-style-type: none"> • Set Ohmmeter to 200 k/ohm scale ATF Temperature 140°F (60°C)		About 48,800 Ohms
			ATF Temperature 248°F (120°C)		About 7400 Ohms
21 + 66	Transmission Vehicle Speed Sensor	<ul style="list-style-type: none"> • Switch Ignition OFF • TCM Disconnected • Set Ohmmeter To 2 k/ohm Scale 	800 – 900 Ohms	Check Harness Routing Replace Vehicle Speed Sensor	

96I04629

Fig. 13: Testing TCM Harness & Components (4 Of 4)
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 17)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

HYDRAULIC PRESSURE

Check operation of apply and brake clutches by air checking fluid passages of valve body and transaxle case. Install Pressure Gauge (VAG 1702) to transaxle pressure tap located near dipstick tube. Check main hydraulic pressure under normal driving conditions. See MAIN PRESSURE table. If main hydraulic pressures are not correct, check for incorrect idle speed, problem with pump or sticking valves in valve body. Repair as necessary.

MAIN PRESSURE

AA

Application psi (Bar)

"D"

Idle RPM 49-55 (3.4-3.8)
2000 RPM (1) 146-164 (10.1-11.3)

"R"

Idle RPM 94-109 (6.5-7.5)
2000 RPM (1) 334-348 (23.0-24.0)

(1) - With solenoid valve connector disconnected. After test, reconnect solenoid valves and using appropriate scan tool, erase trouble codes from memory.

AA

STALL SPEED

CAUTION: DO NOT operate engine at stall speed for more than 5 seconds. If you need to repeat stall speed test, wait 20 seconds.

- 1) Engage parking brake and block drive wheels. Connect tachometer to engine. Warm engine to normal operating temperature.
- 2) Firmly press brake pedal. Move gear selector to "D" position. Open throttle to wide open throttle position. Note engine speed and release throttle pedal.
- 3) Compare measured stall speed with stall speed specification. See STALL SPEED SPECIFICATIONS table. If stall speed is within range, test is complete.
- 4) If stall speed is up to 200 RPM too low, check engine condition and adjustments. If stall speed is greater than 200 RPM too low, torque converter is faulty. If stall speed is too high, check 1st-3rd apply clutch or one-way clutch for slipping or damage.

STALL SPEED SPECIFICATIONS

AA

Application RPM

CLK 2600-2900
CLB & CKZ 2250-2550

AA

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 18)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

ON-VEHICLE SERVICE

DRIVE AXLE SHAFTS

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

OIL COOLER FLUSHING

1) Remove external oil filter. 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.

2) Use pressurized shop air to remove solvent from oil lines and oil cooler. Install a new external oil filter.

TRANSAXLE COMPONENTS

Following components may be serviced with transaxle in vehicle. For removal and installation procedures, see **TRANSAXLE DISASSEMBLY**.

- * Drive Flanges
- * External Oil Filter
- * Gear Selector Lever
- * Multifunction Switch, Speedometer Drive Shaft & Speed Sensor
- * Oil Pan & Valve Body Assembly
- * Planetary Gear Cover

REMOVAL & INSTALLATION

See appropriate **AUTOMATIC TRANSMISSION REMOVAL** article in **TRANSMISSION SERVICING** section.

TORQUE CONVERTER

1) Remove torque converter. Check torque converter for any wear or damage, and replace if necessary. If torque converter is being reused, drain old fluid.

2) Extract ATF from torque converter using Torque Converter Service Station (VAG 1358 A) and Probe (VAG 1358 A/1).

TRANSAXLE DISASSEMBLY

TRANSAXLE UNIT

1) Remove torque converter. Remove oil pan and valve body assembly. Remove sealing plug from transaxle case. See Fig. 14.

2) Measure and record turbine shaft end play. See Fig. 15. Remove oil pump bolts. Using two M8 bolts, remove oil pump from front of transaxle. See Fig. 16.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 19)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

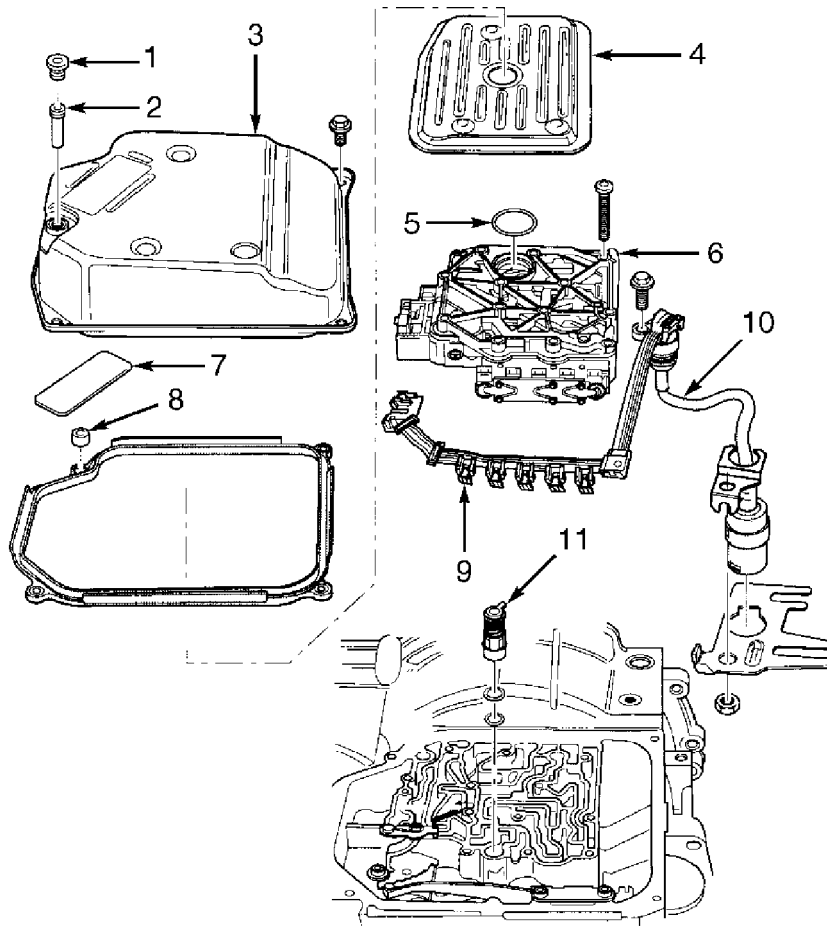
Thursday, August 19, 1999 11:28PM

3) Remove all clutches with support tube, 2nd-4th gear clutch plates, springs and spring caps together. See Figs. 17 and 18.

4) Lock drive shell in place by inserting a screwdriver through hole of large sun gear into side of transaxle case. See Fig. 19. Loosen and remove small planetary drive shaft bolt, washer and shim. See Fig. 20. Remove small planetary drive shaft.

5) Remove large drive shaft and sun gear. Remove Vehicle Speed Sensor (VSS) from transaxle case. Remove supporting tube and one-way clutch circlips. Remove one-way clutch assembly.

6) Remove planetary carrier with dished spring. Remove reverse brake clutch assembly. See Figs. 17, 20 and 21. DO NOT remove input gear assembly, unless bearing or gear damage is present.



- | | |
|------------------|-----------------------------|
| 1. Drain Plug | 7. Magnet |
| 2. Overflow Tube | 8. Spacer Bushing |
| 3. Oil Pan | 9. Solenoid Valve Connector |
| 4. ATF Screen | 10. Conductor Strip |
| 5. "O" Ring | 11. Sealing Plug |
| 6. Valve Body | |

96E04632

Fig. 14: Exploded View Of Oil Pan & Valve Body

Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

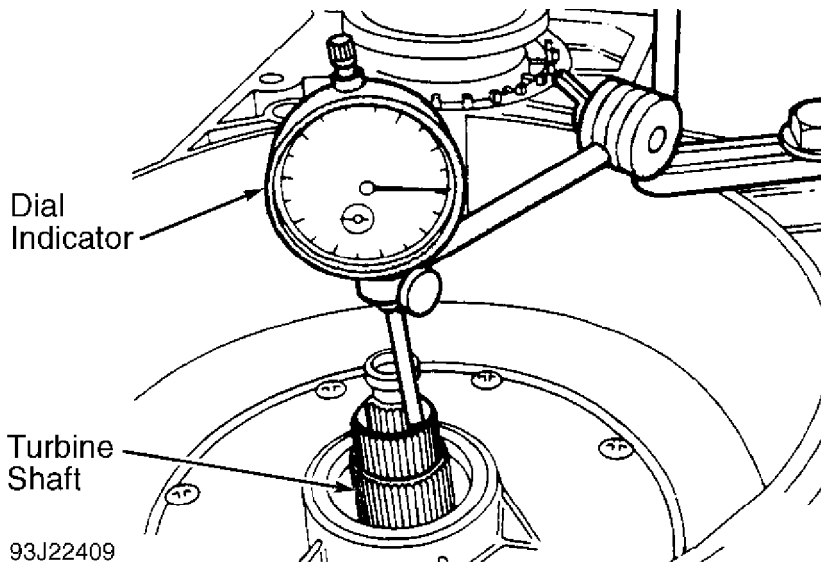
Article Text (p. 20)

1996 Volkswagen Golf

For Volkswagen Technical Site

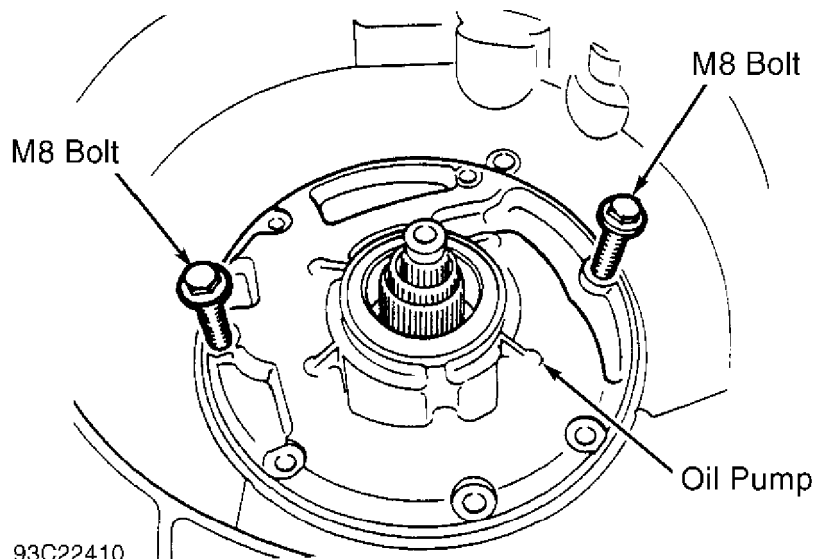
Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



93J22409

Fig. 15: Checking Turbine Shaft End Play
Courtesy of Volkswagen United States, Inc.



93C22410

Fig. 16: Removing Oil Pump
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

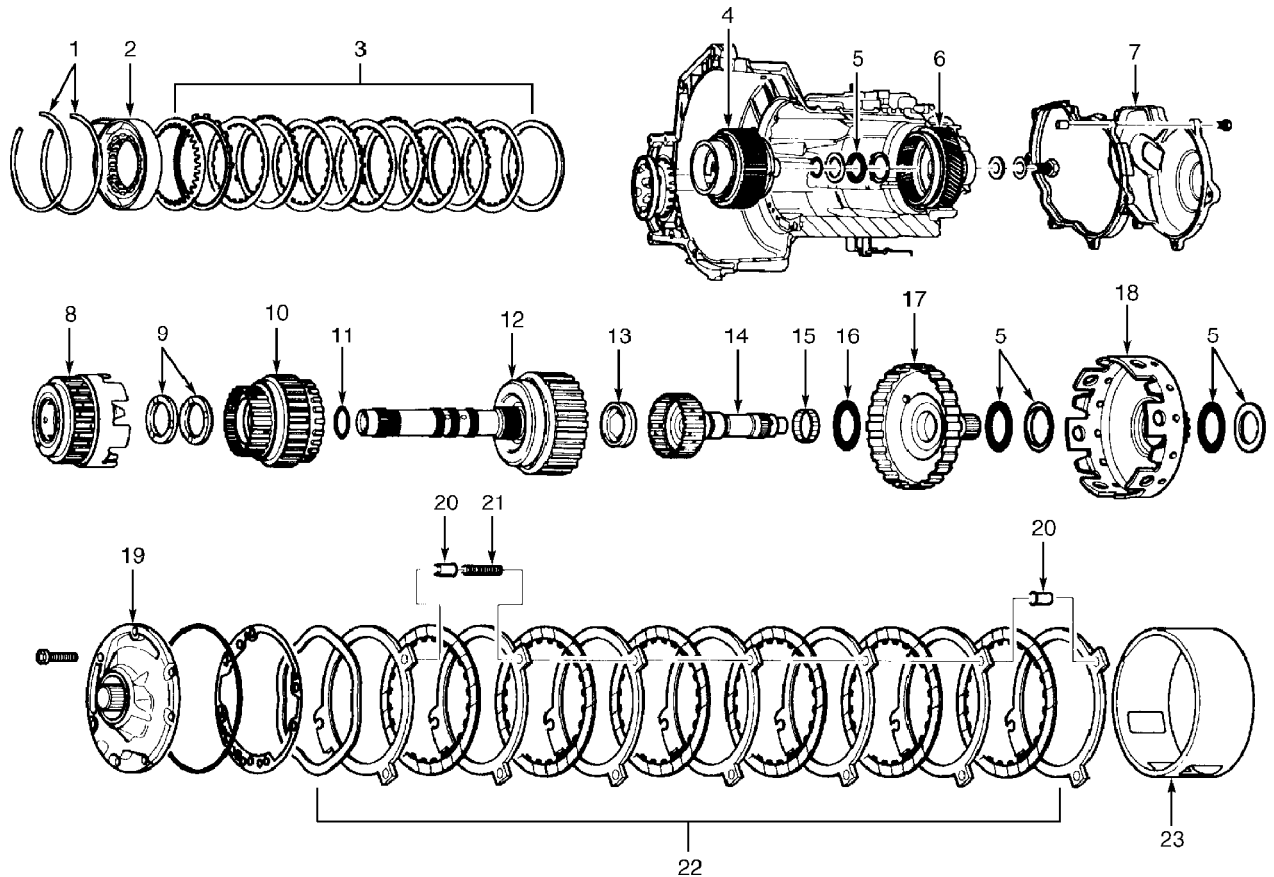
Article Text (p. 21)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

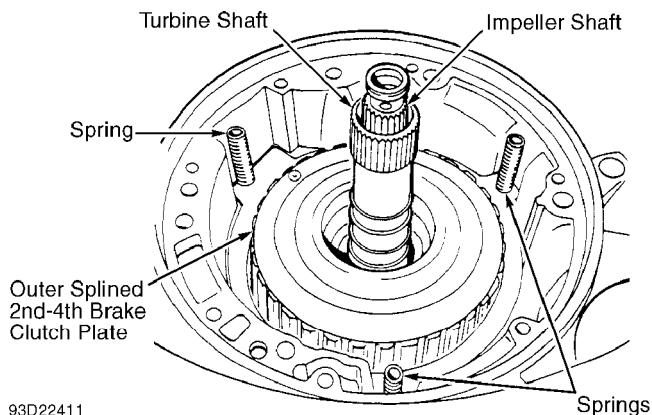
Thursday, August 19, 1999 11:28PM



- | | | |
|----------------------------------|---|-----------------------------------|
| 1. Circlips | 9. Shims | 16. Axial Needle Bearing |
| 2. One-Way Roller Clutch | 10. 1st-3rd Apply Clutch Assembly | 17. Small Sun Gear Drive Shell |
| 3. Reverse Brake Clutch Assembly | 11. Seal | 18. Large Sun Gear Drive Shell |
| 4. Planetary Carrier Assembly | 12. Turbine Shaft & 4th Apply Clutch Assembly | 19. Oil Pump |
| 5. Bearing Assembly | 13. Axial Needle Bearing With Washer | 20. Spring Cap |
| 6. Input Gear | 14. Small Planetary Drive Shaft | 21. Spring |
| 7. Cover | 15. Needle Bearing | 22. 2nd-4th Brake Clutch Assembly |
| 8. Reverse Apply Clutch Assembly | | 23. Support Tube |

96G04633

Fig. 17: Exploded View Of Transaxle Components
 Courtesy of Volkswagen United States, Inc.



93D22411

Fig. 18: Removing Turbine Shaft With 2nd-4th Brake Clutch & 1st-3rd Apply Clutch
 Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

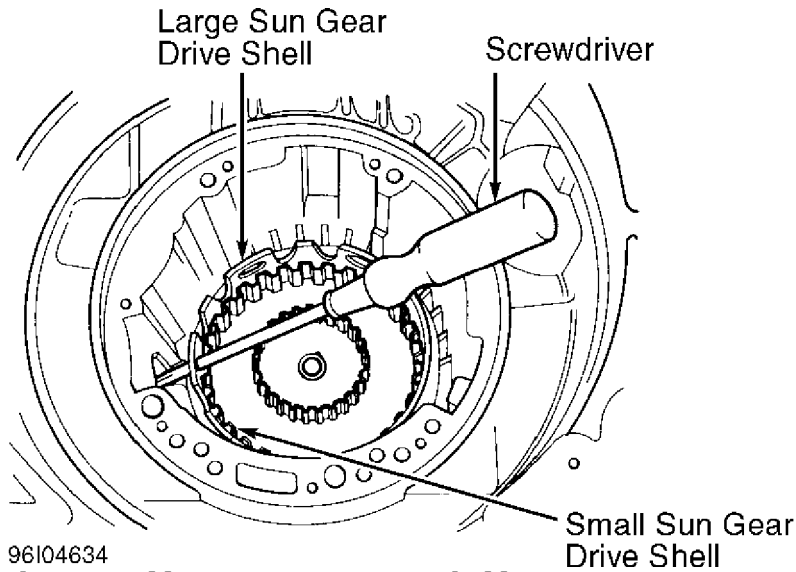
Article Text (p. 22)

1996 Volkswagen Golf

For Volkswagen Technical Site

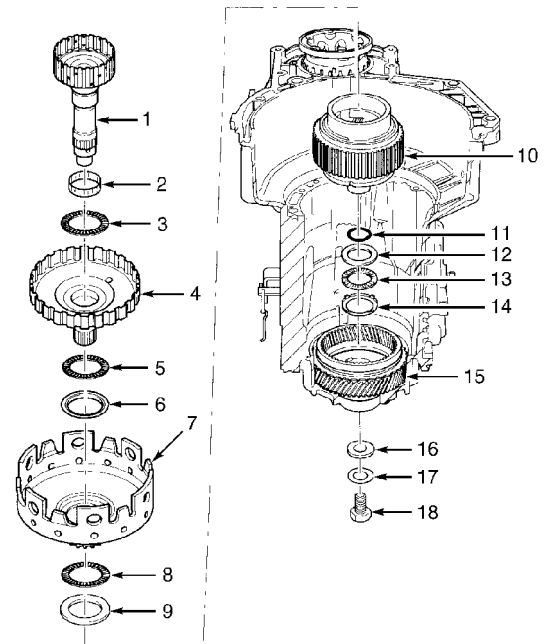
Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



96104634

Fig. 19: Locking Small Sun Gear Drive Shell
Courtesy of Volkswagen United States, Inc.



- | | |
|--------------------------------|--------------------------------|
| 1. Small Planetary Drive Shaft | 9. Washer |
| 2. Needle Bearing | 10. Planetary Carrier Assembly |
| 3. Axial Needle Bearing | 11. Seal |
| 4. Small Sun Gear Drive Shell | 12. Washer |
| 5. Axial Needle Bearing | 13. Axial Needle Bearing |
| 6. Washer | 14. Washer |
| 7. Large Sun Gear Drive Shell | 15. Input Gear |
| 8. Axial Needle Bearing | 16. Planetary Carrier Shim |
| | 17. Washer |
| | 18. Bolt |

96B04635

Fig. 20: Removing Small Planetary Drive Shaft
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

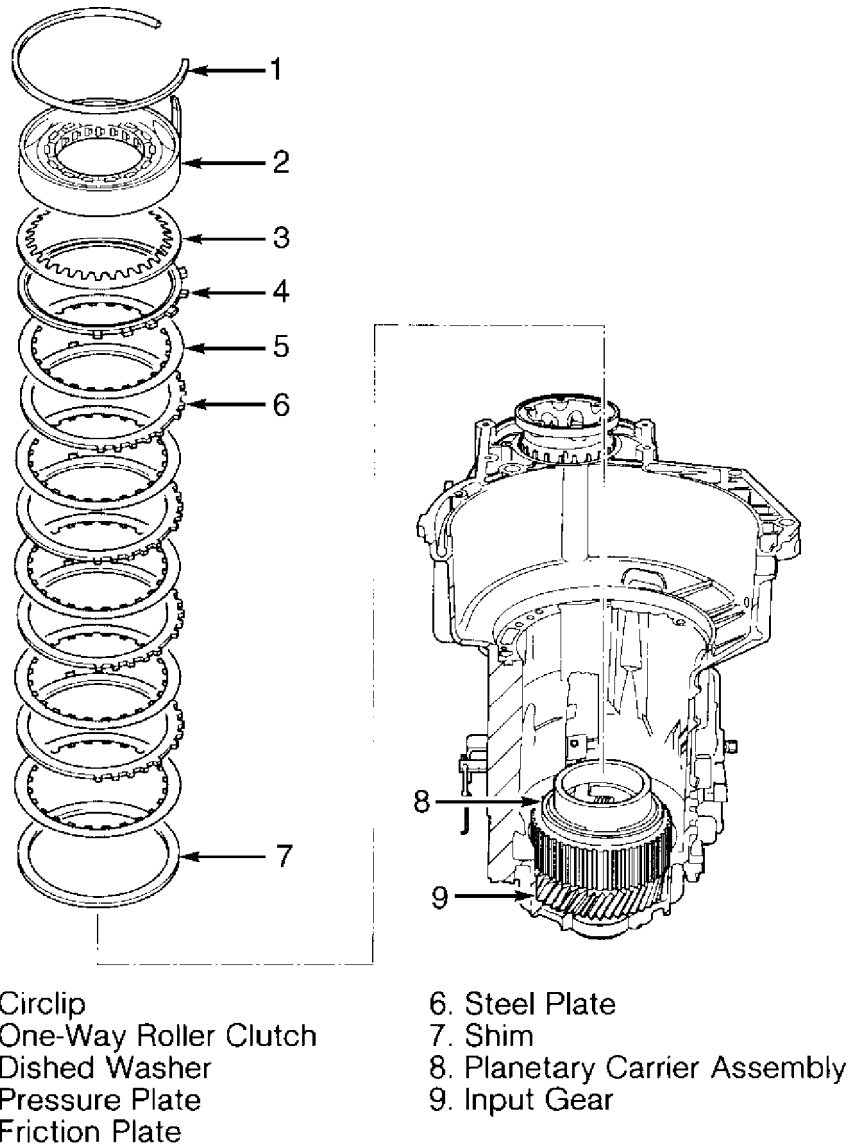
Article Text (p. 23)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



96D04636
Fig. 21: Removing Planetary Carrier & Reverse Brake Clutch Assembly
Courtesy of Volkswagen United States, Inc.

FINAL DRIVE & TRANSFER GEARS

1) Drain gear oil. Attach INCH-lb. torque wrench to a 1 5/8" (41 mm) socket wrench. See Fig. 22. Measure and record total roller bearing turning torque of drive pinion gear. This measurement is required for reassembly reference if roller bearings are reused.

2) Engage parking pawl. Using a 7/8" (22 mm) Allen wrench socket, remove fastener nut. See Fig. 22. Remove dished washer, shim and bearing.

3) Install fastener nut. Using Pressing Adapter (VW771), thread tool until 1/8" clearance is present between bearing race and fastener nut.

4) Pull input gear out until it bottoms in pressing adapter.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 24)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

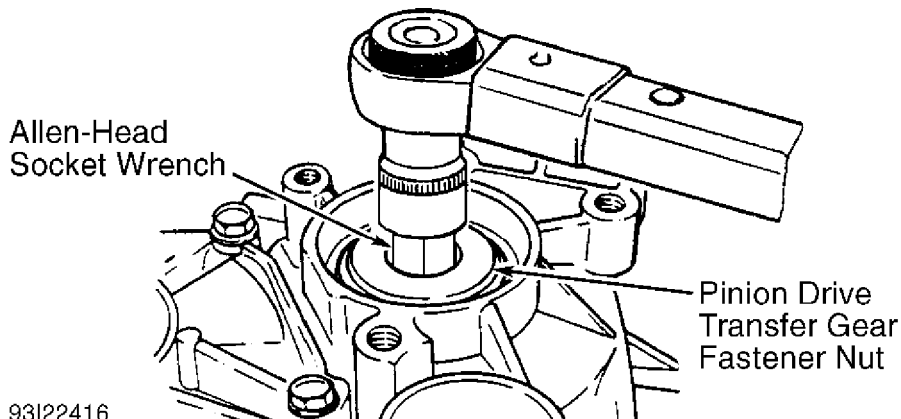
Remove pressing adapter. Remove input transfer gear assembly from transaxle case.

5) Remove speedometer drive shaft. See Fig. 23. On left axle flange, remove bolt and remove axle flange. On right axle flange, remove circlip. Using puller, remove right axle flange.

6) Remove differential ring gear cover. If bearings are being reused, mark differential adjuster ring (torque converter side) bearing carrier to transaxle case. Using Bearing Adjuster Ring Socket (3155), remove both differential bearing carriers. See Fig. 24. Remove differential assembly from transaxle case. See Fig. 23.

7) Remove drive pinion and input transfer gear cover (if not already removed). See Fig. 25. Using INCH-lb. torque wrench, measure turning force of drive pinion and transfer gear bearings. Record measurement for reassembly.

8) Engage parking pawl. Remove nut from pinion. See Fig. 26. Using puller, remove output gear. See Fig. 27. Remove selector shaft and parking pawl assembly. See Fig. 36. Remove outer bearing support. Remove parking gear from pinion. Remove pinion and bearing from transaxle. Using pin socket, remove inner bearing support with drive pinion seal.



93122416

Fig. 22: Removing Input Transfer Gear Fastener Nut
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

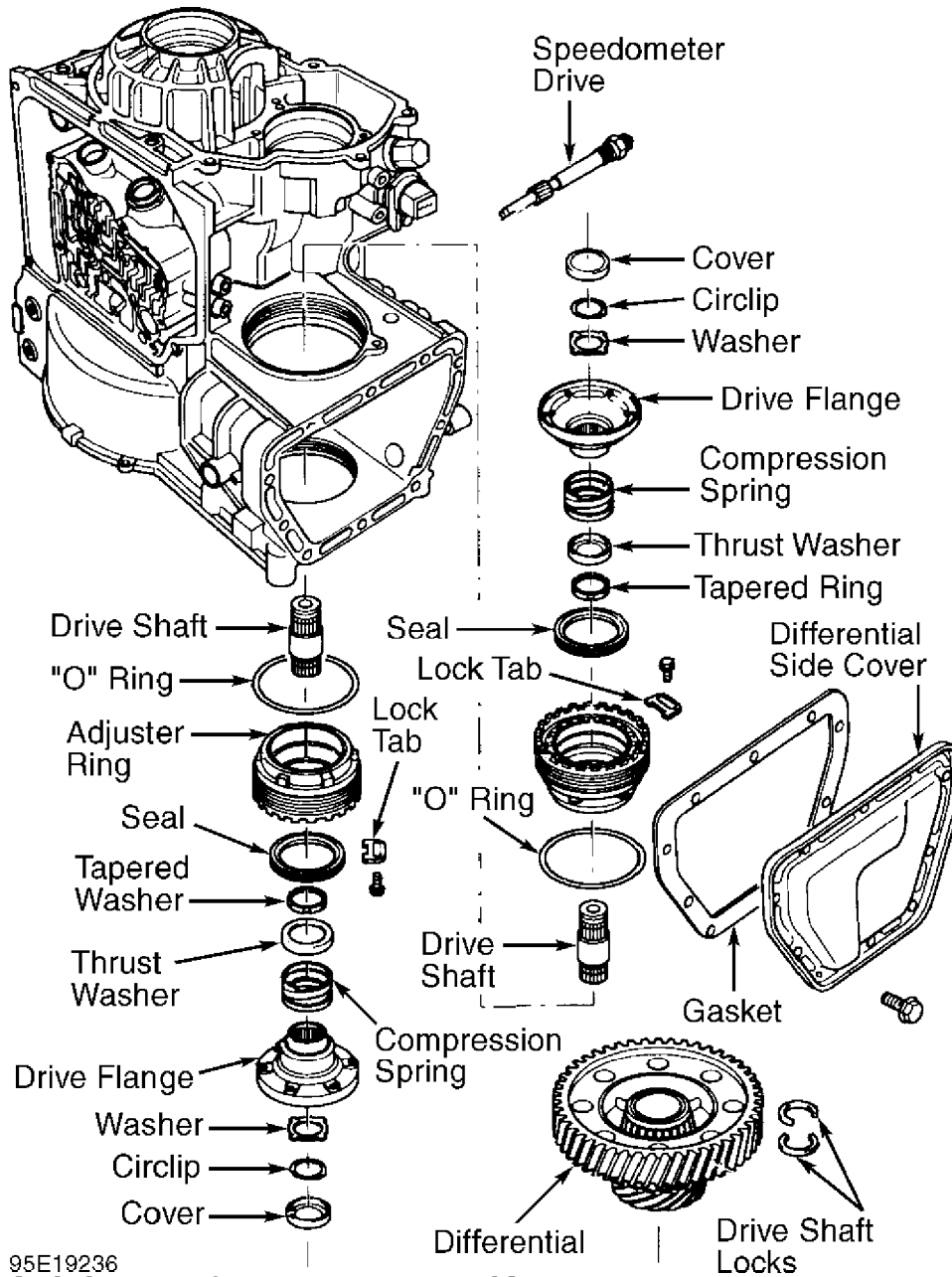
Article Text (p. 25)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



95E19236

Fig. 23: Exploded View Of Drive Gear Assembly
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

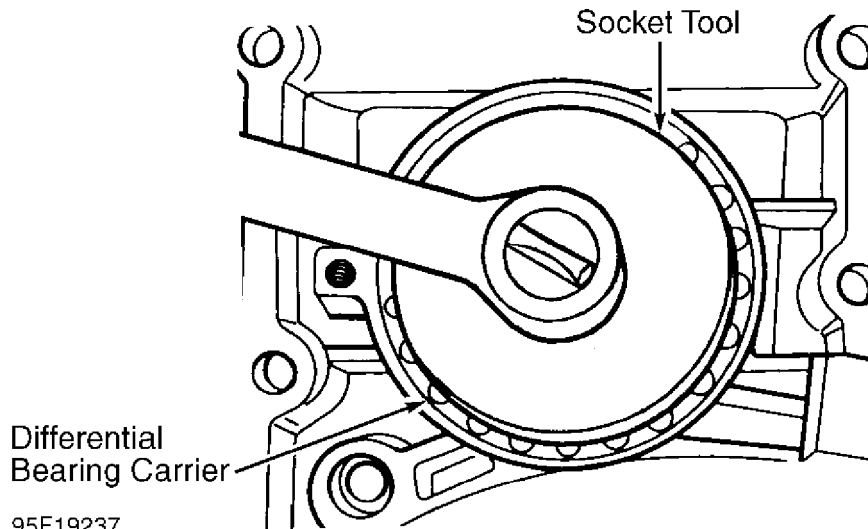
Article Text (p. 26)

1996 Volkswagen Golf

For Volkswagen Technical Site

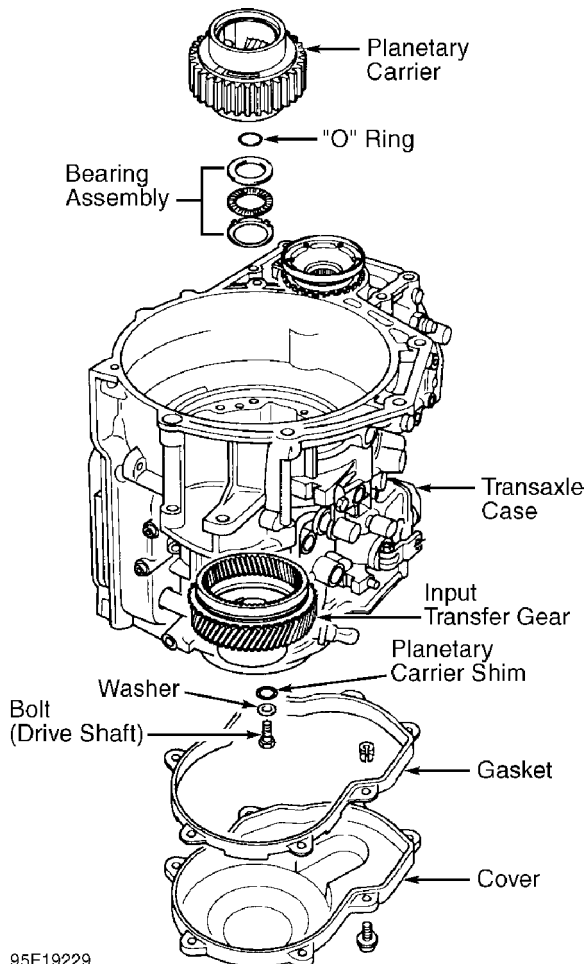
Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



95F19237

Fig. 24: Removing Bearing Adjuster Ring Bearing Carrier
Courtesy of Volkswagen United States, Inc.



95F19229

Fig. 25: Locating Planetary & Input Gear Assembly
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

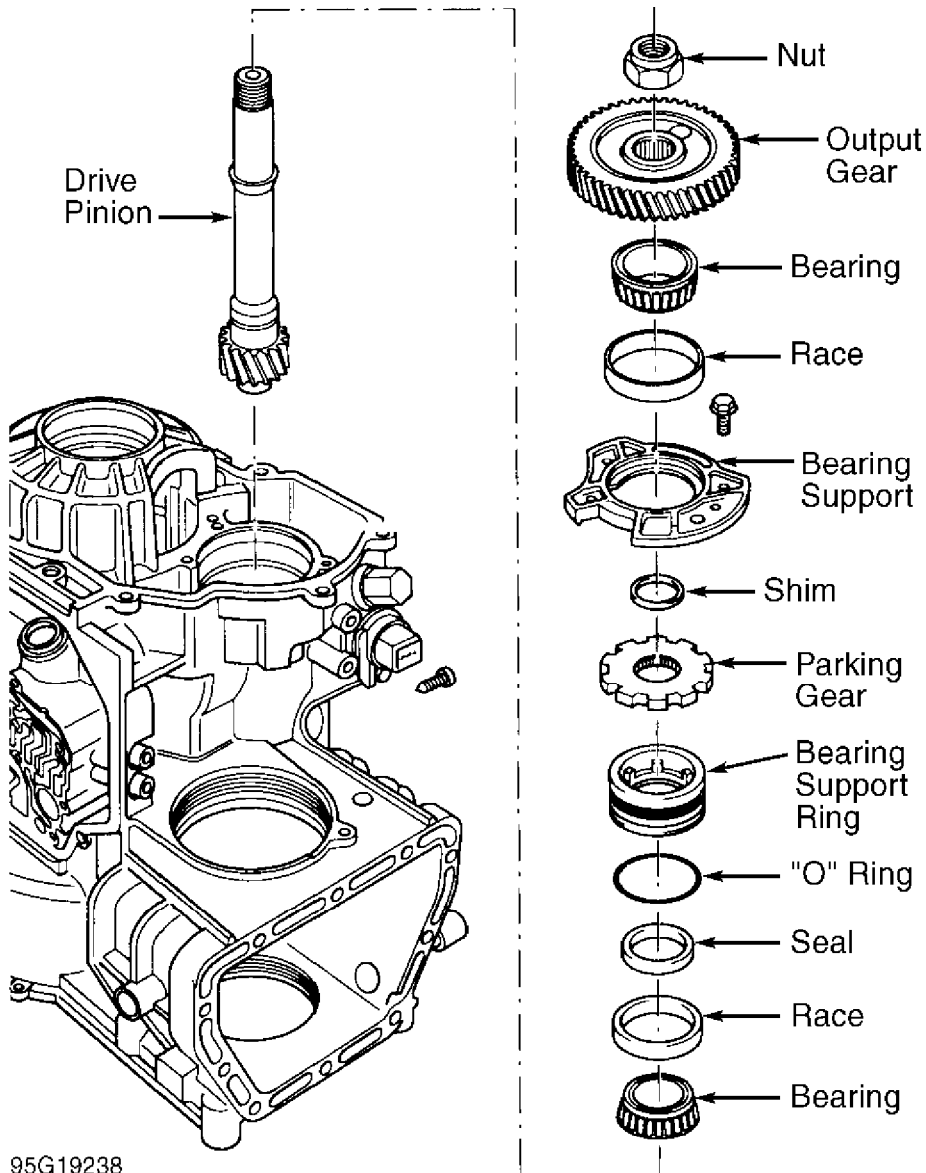
Article Text (p. 27)

1996 Volkswagen Golf

For Volkswagen Technical Site

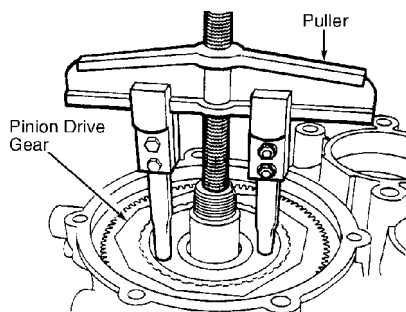
Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



95G19238

Fig. 26: Exploded View Of Drive Pinion & Output Gear Assembly
Courtesy of Volkswagen United States, Inc.



93R22419

Fig. 27: Removing Pinion Drive Gear
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 28)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

COMPONENT DISASSEMBLY & REASSEMBLY

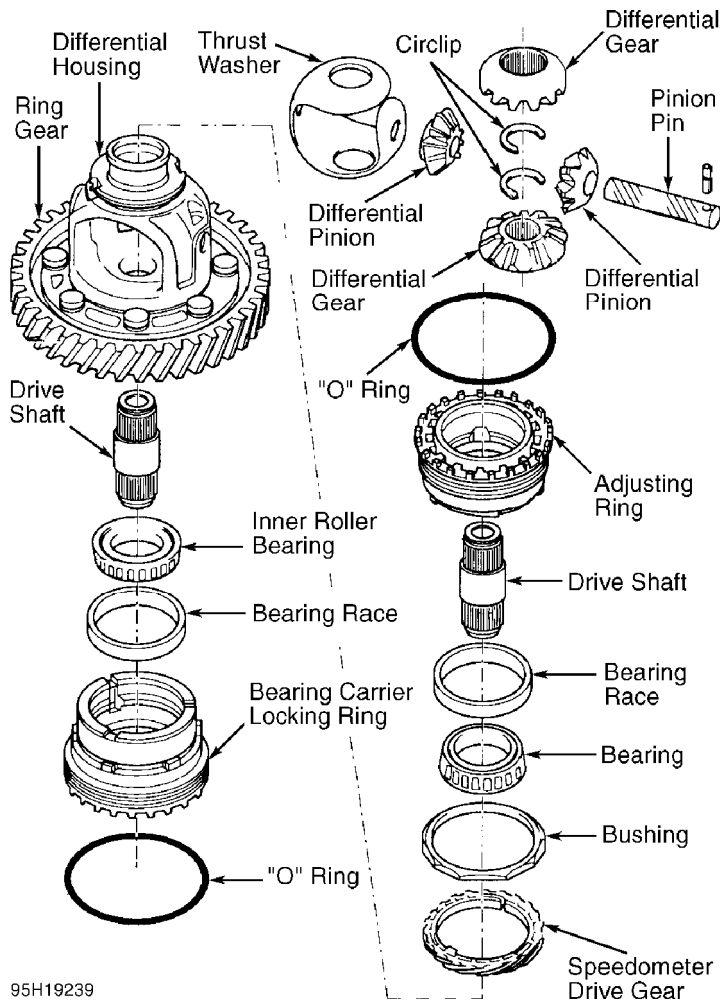
FINAL DRIVE

1) Disassemble differential. See Fig. 28. If ring gear or differential housing is damaged, replace differential housing. To reassemble differential, reverse disassembly.

NOTE: If differential bearings are replaced, check differential side bearing preload and ring gear position. See FINAL DRIVE & TRANSFER GEARS under TRANSAXLE REASSEMBLY.

2) Using puller, remove roller bearing from differential housing. Remove speedometer drive gear and bushing.

3) Check all bearing races in adjuster rings and replace if necessary. Using hydraulic press, replace bearing race(s). Replace each roller bearing and race as a set.



95H19239

Fig. 28: Exploded View Of Differential
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 29)

1996 Volkswagen Golf

For Volkswagen Technical Site

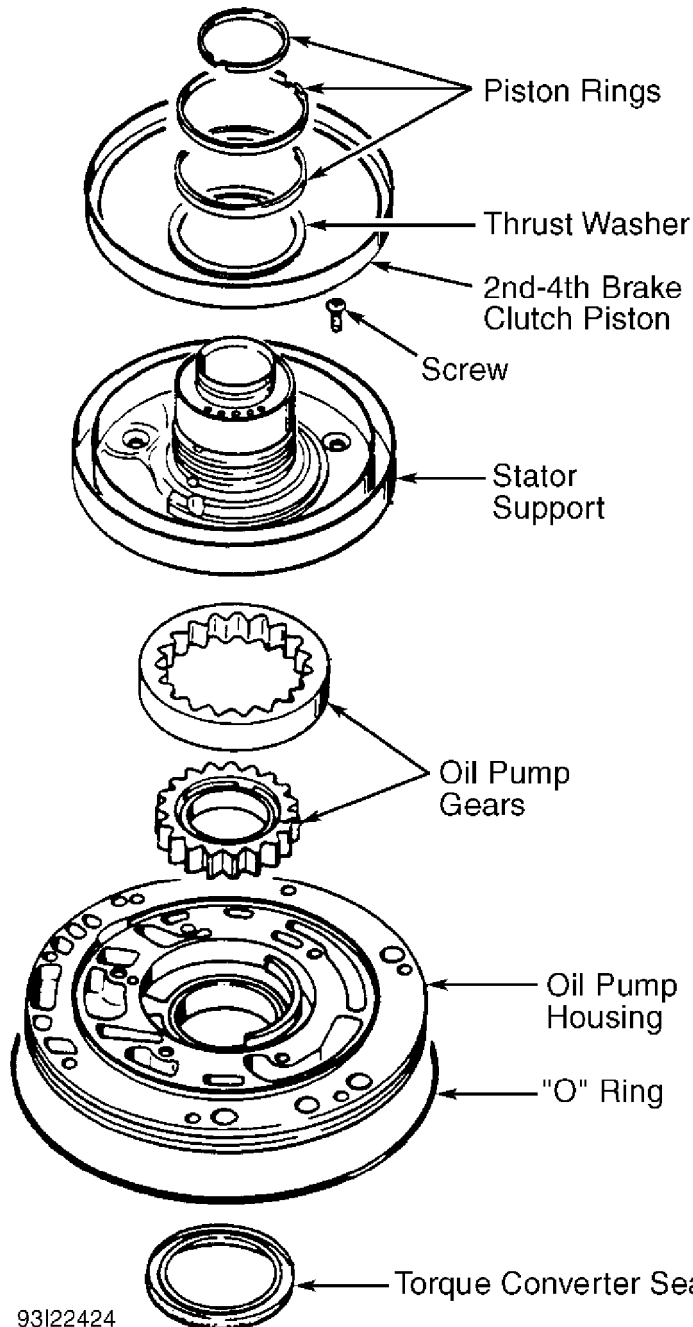
Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

OIL PUMP & 2ND-4TH BRAKE CLUTCH PISTON

Disassemble oil pump and 2nd-4th brake clutch piston. Check for worn or damaged parts and replace as necessary. Replace all seals and reassemble. See Fig. 29.

NOTE: Specifications are not available from manufacturer.



93122424
Fig. 29: Exploded View Of Oil Pump & 2nd-4th Brake Clutch Piston
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 30)

1996 Volkswagen Golf

For Volkswagen Technical Site

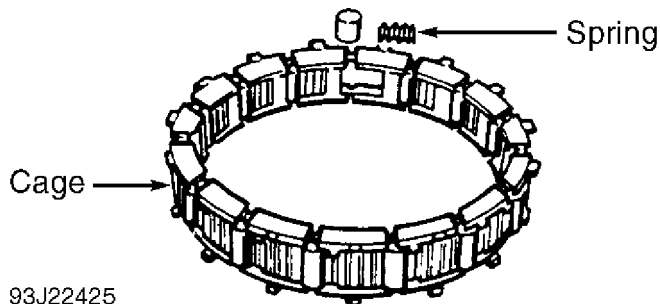
Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

ONE-WAY CLUTCH

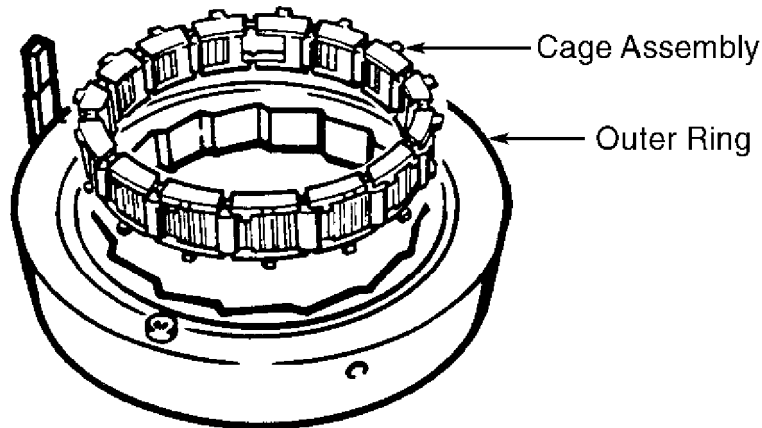
1) Disassemble one-way clutch. Check for worn or damaged parts and replace as necessary. Compress each spring and install into cage. See Fig. 30.

2) Hold cage assembly with large lugs up. Install cage assembly into outer ring. See Figs. 31-33. Rotate cage clockwise until lugs touch stop. Install piston into outer ring.



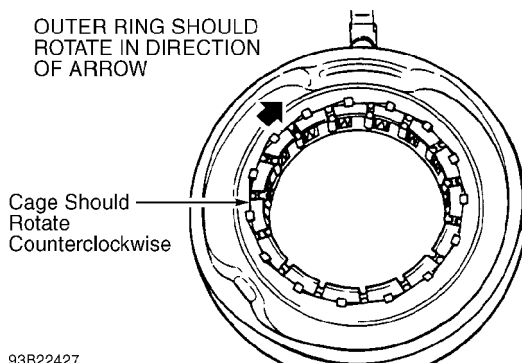
93J22425

Fig. 30: Installing Springs Into Cage
Courtesy of Volkswagen United States, Inc.



93A22426

Fig. 31: Installing Cage Assembly Into Outer Ring
Courtesy of Volkswagen United States, Inc.



93B22427

Fig. 32: Checking One-Way Clutch Rotation
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

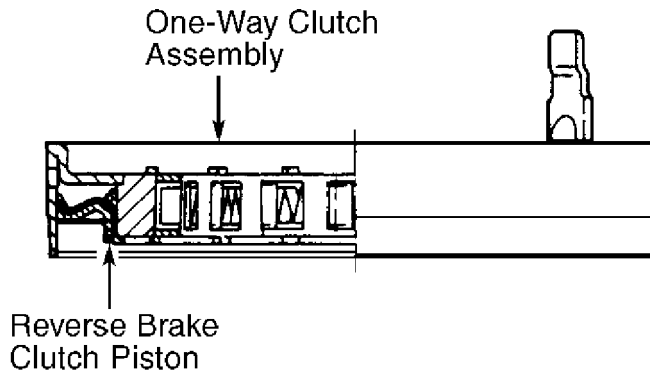
Article Text (p. 31)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



93C22428

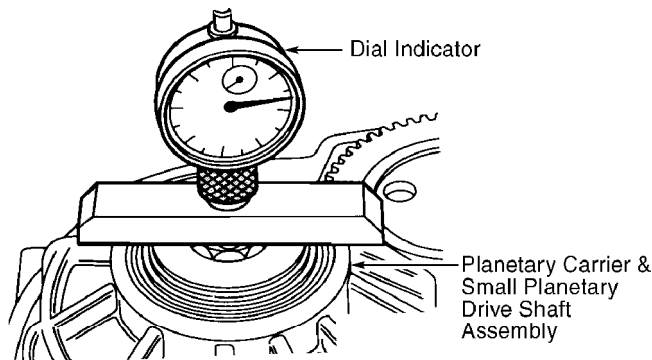
Fig. 33: Installing Piston Into One-Way Clutch
Courtesy of Volkswagen United States, Inc.

PLANETARY CARRIER

NOTE: Disassembly and reassembly procedures are not available from manufacturer.

Inspection & Adjustment

- 1) Inspect planetary carrier, pinion gears, sun gears and related parts for wear or damage. Replace parts as necessary.
- 2) Assemble sun gear drive shells, planetary carrier, small sun gear, pinion drive transfer gear and all related bearings and washers onto small planetary drive shaft. See Figs. 17 and 20.
- 3) Place assembly into transaxle case. Install adjustment shim, washer and bolt to pinion drive transfer gear end of small planetary drive shaft. Using a screwdriver, lock large sun gear drive shell to transaxle case. See Fig. 19. Tighten bolt to 22 ft. lbs. (30 N. m).
- 4) Place Dial Indicator Support (VW 382/7) on top of assembly. See Fig. 34. Measure end play of small sun gear drive shaft.
- 5) If end play is not .009-.014 (.23-.37 mm), replace adjustment shim. Adjustment shims range in thickness from .040" (1.00 mm) to .114" (2.90 mm) in .004" (.10 mm) increments.



95E19251

Fig. 34: Adjusting Planetary Carrier End Play
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 32)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

APPLY CLUTCH PLATE APPLICATIONS

APPLY CLUTCH PLATE APPLICATIONS

AA

Application	Number Of Plates
Reverse Clutch	
Inner	5
Outer	5
1st-3rd Clutch	
Inner	5
Outer	
CLB & CLK	5
CKZ	4
4th Clutch	
Inner	
CLB & CKZ	6
CLK	5
Outer	
CLB & CKZ	5
CLK	4

AA

REVERSE APPLY CLUTCH

NOTE: Soak all friction-faced clutch plates in ATF for at least 15 minutes before installation.

1) Mark circlip for installation reference and remove.

Disassemble clutch plates. See Fig. 35. Compress spring support, and remove circlip. Remove clutch piston.

2) Check for worn or damaged parts and replace as necessary.

Ensure check ball in clutch housing is not damaged. Piston seal is part of piston. If damaged, replace reverse apply clutch piston.

Reassemble reverse apply clutch. See APPLY CLUTCH PLATE APPLICATIONS table.

NOTE: Assembled clutch clearance specification is not available from manufacturer. Ensure thrust plate is installed with shouldered side facing circlip.

AUTO TRANS DIAGNOSIS - 01M

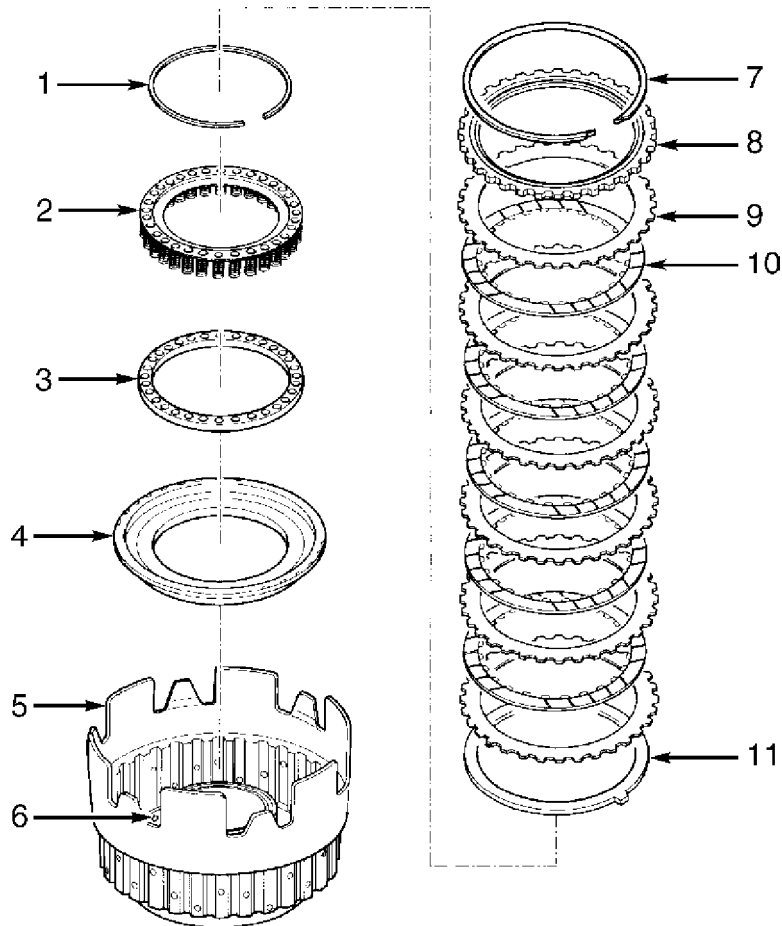
Article Text (p. 33)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



- 1. Circlip
- 2. Spring Assembly
- 3. Spring Support
- 4. Piston
- 5. Clutch Housing

- 6. Check Ball
- 7. Circlip
- 8. Thrust Plate
- 9. Steel Plate
- 10. Friction Plate
- 11. Corrugated Washer

96F04637

Fig. 35: Exploded View Of Reverse Apply Clutch Assembly
Courtesy of Volkswagen United States, Inc.

REVERSE & 2ND-4TH BRAKE CLUTCHES

Reverse and 2nd-4th brake clutches are disassembled and reassembled during transaxle disassembly and reassembly. See TRANSAXLE DISASSEMBLY and TRANSAXLE REASSEMBLY.

TRANSAXLE CASE

1) Remove multifunction switch, all seals, manual valve assembly, parking pawl and sensors. If necessary, remove parking pawl pin, detent spring screws and selector rod for manual valve from case. See Fig. 36. Inspect bushings and bearing races, and replace if necessary.

2) Install new "O" ring to gear change shaft. Install gear

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 34)

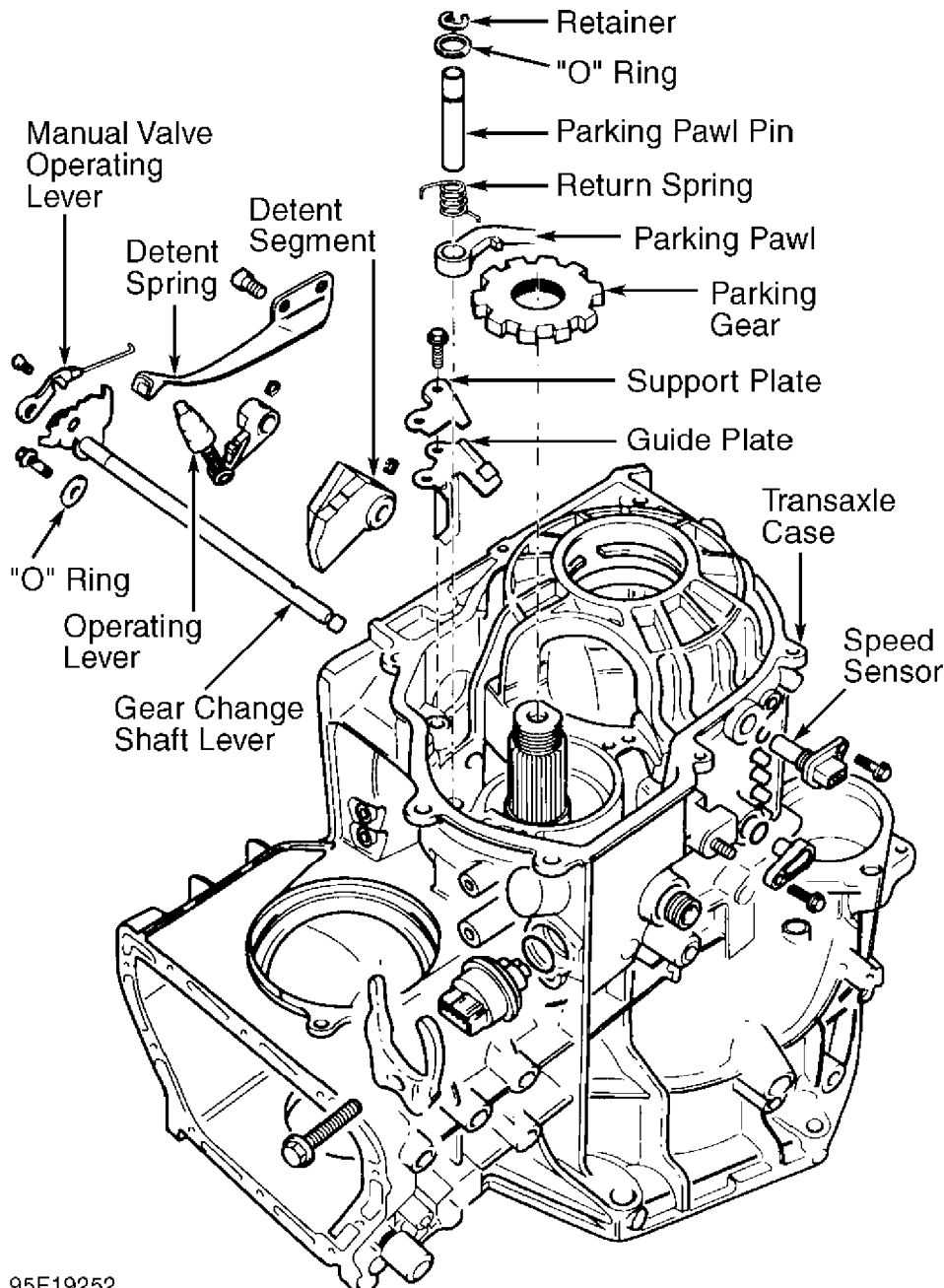
1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

change shaft. Install parking pawl pin (if removed). Using a center punch,peen parking pawl pin. Install operating rod for manual valve, detent spring screws, multifunction switch and new seals.



95F19252

Fig. 36: Exploded View Of Transaxle Case Components
Courtesy of Volkswagen United States, Inc.

TRANSFER GEARS

Using puller and adapter, remove tapered bearing from output gear. See Fig. 37. Using hydraulic press, install bearing to drive pinion transfer gear. Set transfer and drive pinion gears aside.

AUTO TRANS DIAGNOSIS - 01M

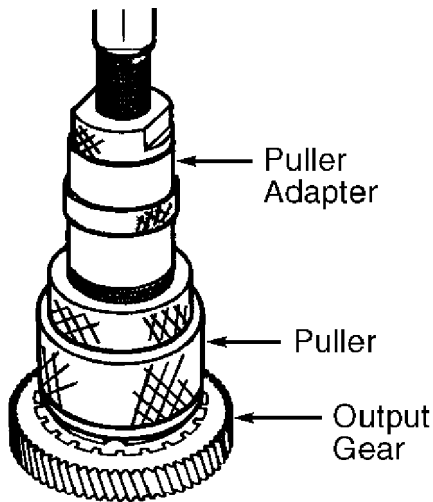
Article Text (p. 35)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



95G19253

Fig. 37: Removing Output Gear Roller Bearing
Courtesy of Volkswagen United States, Inc.

VALVE BODY

NOTE: Disassembly and reassembly procedures are not available from manufacturer.

1ST & 3RD APPLY CLUTCH

1) Remove support ring. Mark circlip for installation reference, and remove circlip. Disassemble clutch plates. See Fig. 38. Remove diaphragm spring circlip. Compress spring support, and remove circlip. See Fig. 39. Remove spring plates and clutch piston.

2) Remove piston rings from piston. Piston seal is part of piston. If damaged, replace 1st-3rd apply clutch piston. Remove seal rings from turbine shaft. Check for worn or damaged parts and replace as necessary. Ensure check ball in clutch housing is not damaged.

AUTO TRANS DIAGNOSIS - 01M

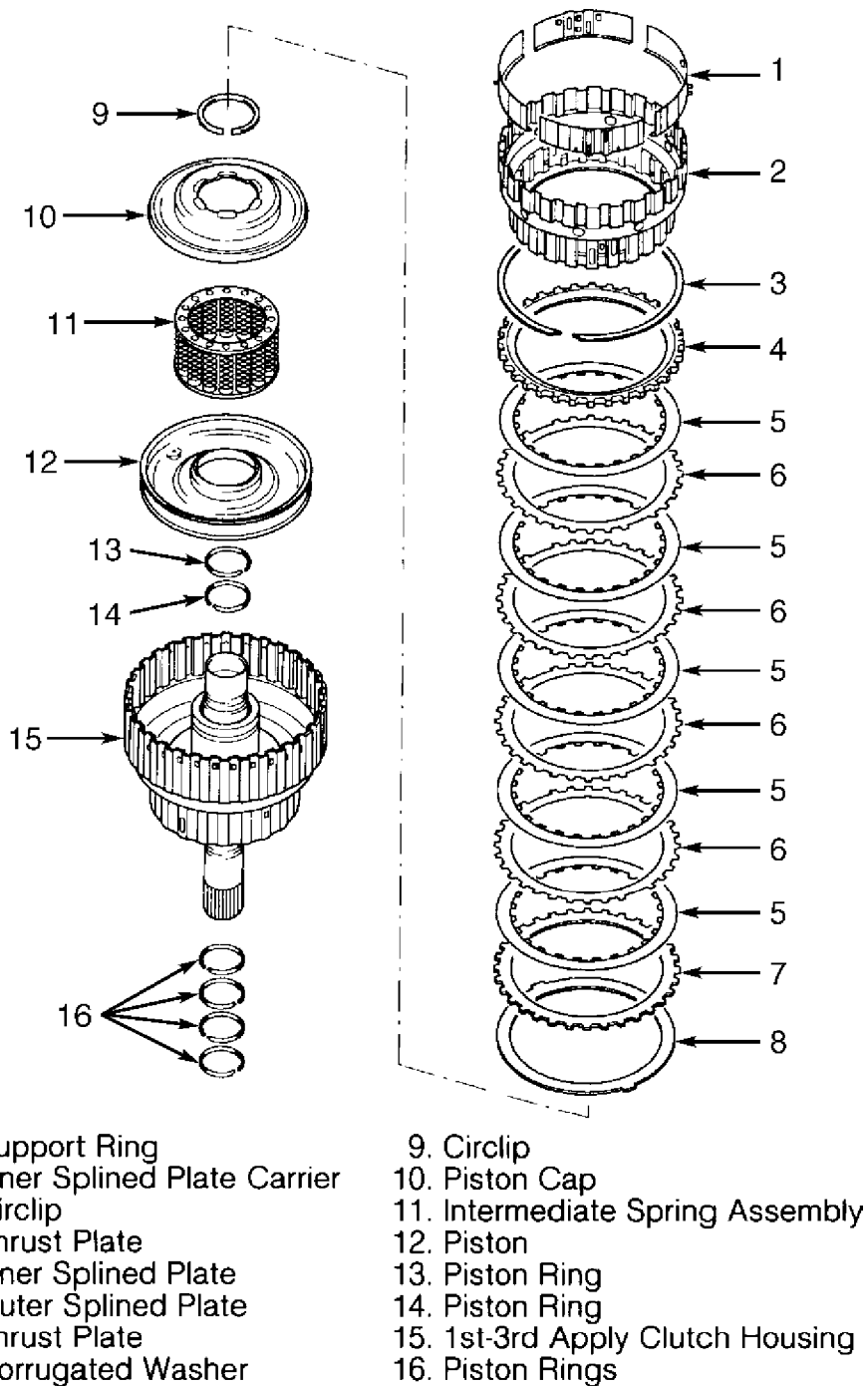
Article Text (p. 36)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



96A04588
Fig. 38: Exploded View Of 1st-3rd Apply Clutch
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

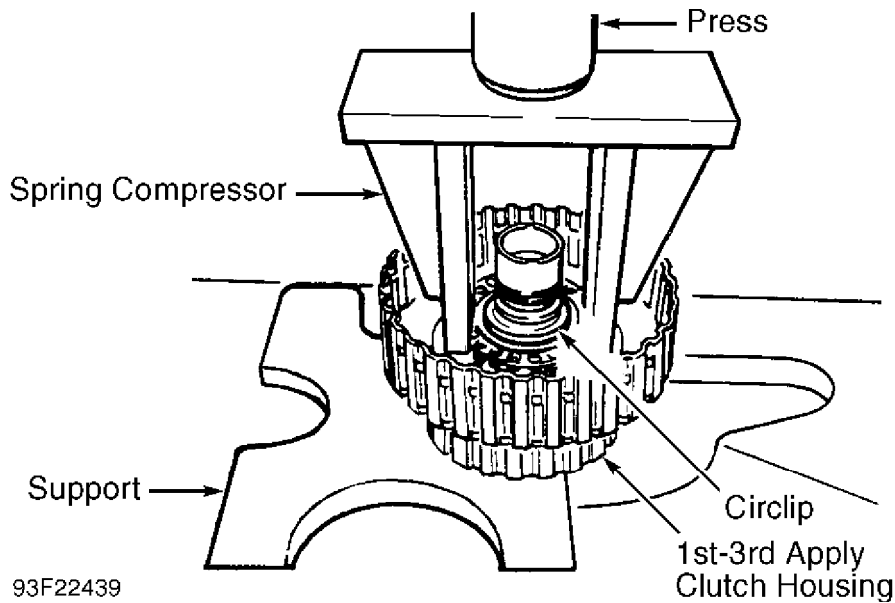
Article Text (p. 37)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



93F22439

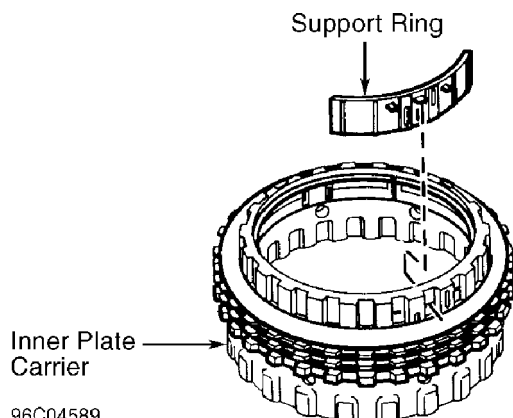
Fig. 39: Removing & Installing Spring Circlip
Courtesy of Volkswagen United States, Inc.

3) Install new seal rings to clutch piston, and install piston in clutch housing. Install plate springs. Compress spring support and install circlip. See Fig. 39.

4) Install bottom thrust plate with smooth side facing clutch plate. Install one inner splined and one outer splined clutch plate into clutch housing. See Fig. 38.

5) Place inner plate carrier on bench. Install remaining clutch plates to inner plate carrier. See APPLY CLUTCH PLATE APPLICATIONS. Insert top thrust plate with smooth side facing clutch plate. Install support ring with step tabs up after installing thrust plate, friction plates and steel plates. See Fig. 40

6) Install inner plate carrier into clutch housing. Install circlip in clutch housing. See Fig. 41.



96C04589

Fig. 40: Installing Support Ring
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

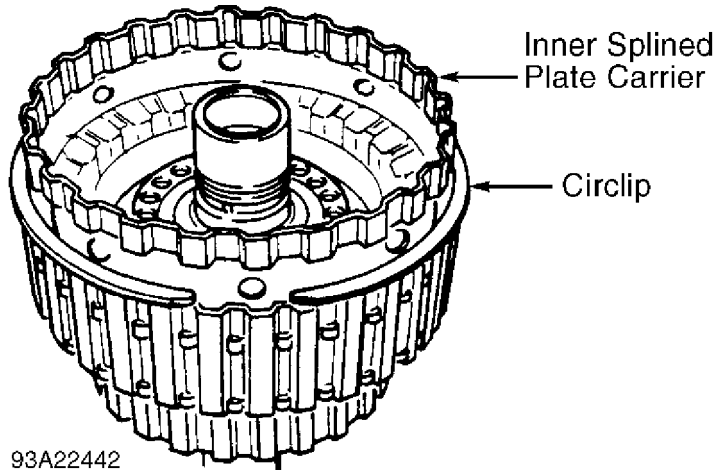
Article Text (p. 38)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



93A22442

Fig. 41: Installing Clutch Housing Circlip
Courtesy of Volkswagen United States, Inc.

4TH APPLY CLUTCH

NOTE: Soak all friction-faced clutch plates in ATF for at least 15 minutes before installation.

1) Mark circlip for installation reference and remove. Disassemble clutch plates. See Fig. 42. Compress spring support ring, and remove circlip. Remove spring support ring and spring. Remove clutch piston.

2) Remove front impeller seal rings. DO NOT remove inner impeller seal rings unless damaged. Check for worn or damaged parts and replace as necessary.

3) Piston seal is part of piston. If damaged, replace 3rd-4th apply clutch piston. Reassemble 3rd-4th apply clutch. See APPLY CLUTCH PLATE APPLICATIONS table.

NOTE: Assembled clutch clearance specification is not available from manufacturer. Ensure top thrust plate is installed with shouldered side facing circlip.

AUTO TRANS DIAGNOSIS - 01M

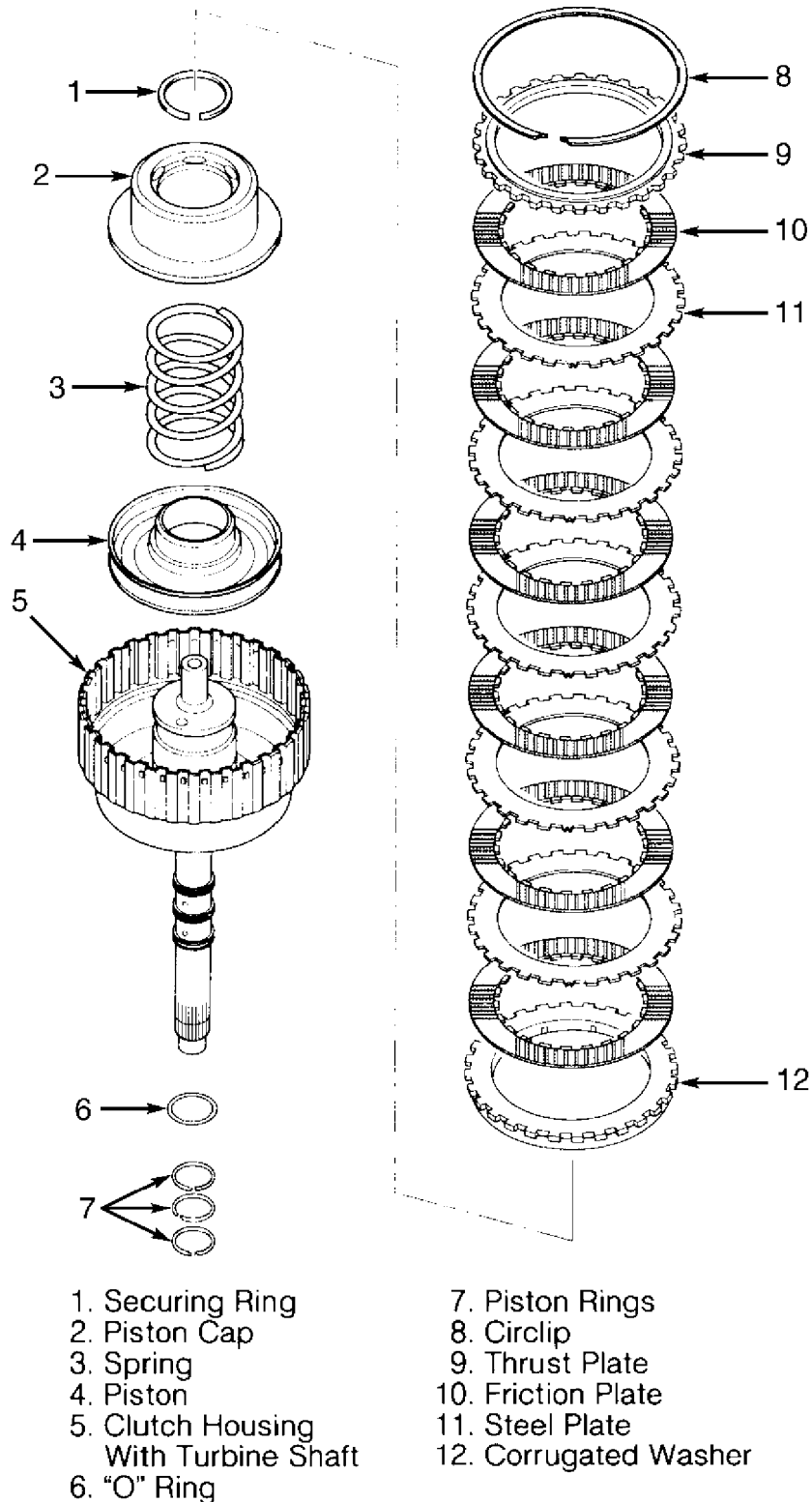
Article Text (p. 39)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



96H04638
Fig. 42: Exploded View Of 4th Apply Clutch
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 40)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

TRANSAXLE REASSEMBLY

FINAL DRIVE & TRANSFER GEARS

NOTE: Reassembly procedures include bearing and shim adjustments. Perform all steps in the order given. If no parts were replaced, skip adjustment steps and reassemble final drive and transfer gear assembly using new seals. Ensure turning torque of complete assembly is within specifications. See INPUT TRANSFER GEAR ADJUSTMENT & REASSEMBLY procedure. If turning torque is not within specifications, check all adjustments.

Drive Pinion Roller Bearing Adjustment

1) Install drive pinion assembly with smaller bearing and inner bearing support (with pinion seal and "O" ring). Install parking gear (rounded side facing drive pinion gear), park lock lug and large pinion bearing race support. Go to next step.

NOTE: Install drive pinion seal with lip opening facing closest roller bearing.

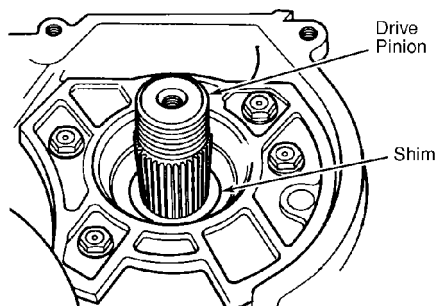
2) If reusing drive pinion and large pinion bearing, DO NOT remove existing shims from drive pinion shaft. See Fig. 43. Go to step 4). If replacing drive pinion and/or pinion bearings, install large pinion roller bearing to drive pinion. Go to next step.

3) Remove large roller bearing race support. Place two .06" (1.5 mm) thick shims onto drive pinion shaft. See Fig. 43. Install large roller bearing race support. Go to next step.

4) Install output drive pinion gear and nut. See Figs. 36 and 44. Engage parking lug to lock drive pinion shaft. Tighten nut to 184 ft. lbs. (250 N.m). Go to next step.

5) If reusing drive pinion and large pinion bearing, go to step 9). If replacing drive pinion and/or pinion bearings, go to next step.

6) DO NOT rotate drive pinion. Mount a dial indicator on transaxle case. See Fig. 45. Move drive pinion up and down (DO NOT rotate). Measure and record end play. Go to next step.



95C19283

Fig. 43: Installing Drive Pinion Shim
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

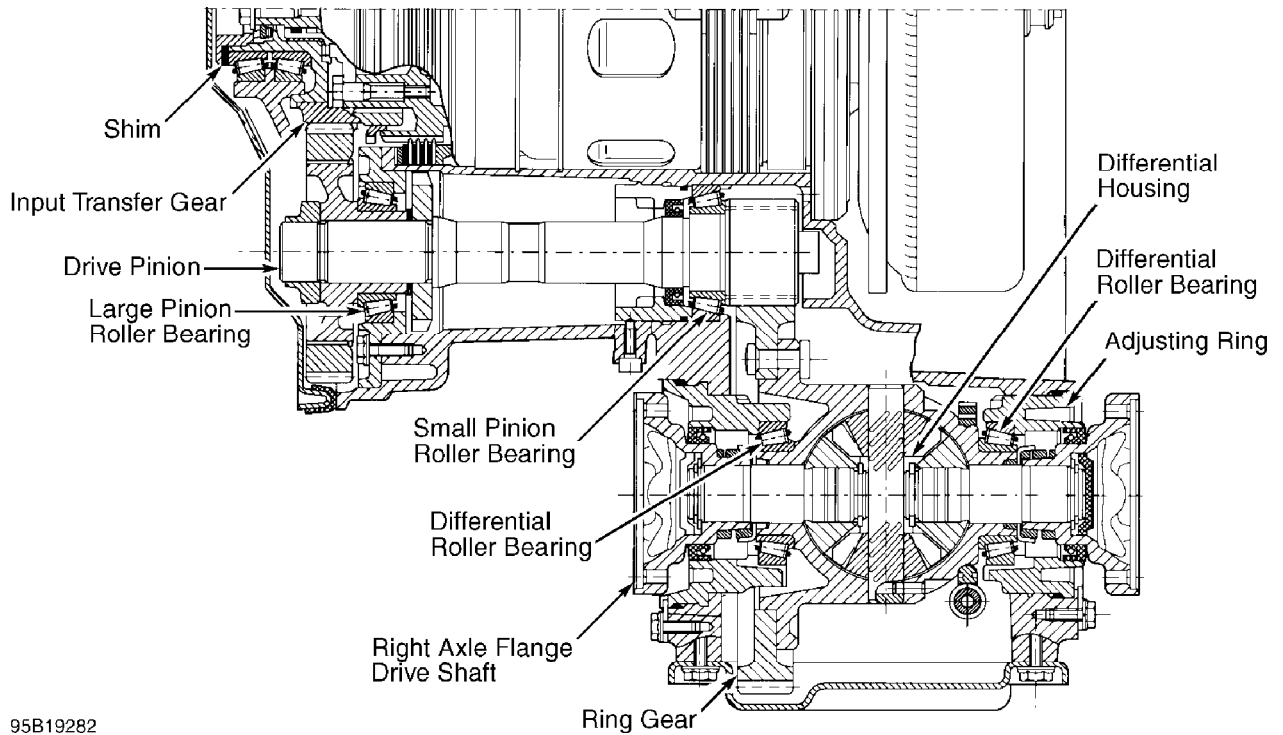
Article Text (p. 41)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

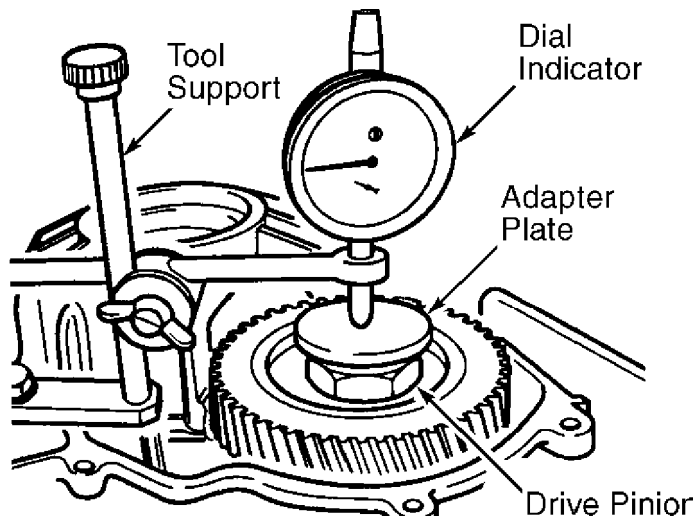
Thursday, August 19, 1999 11:28PM



95B19282

Fig. 44: Locating Final Drive Roller Bearings, Races & Adjustment Shims

Courtesy of Volkswagen United States, Inc.



95D19284

Fig. 45: Checking Drive Pinion Roller Bearing End Play

Courtesy of Volkswagen United States, Inc.

7) Drive pinion requires .008" (.220 mm) preload. To determine correct shim thickness, perform the following procedure. Dimensions are given as an EXAMPLE ONLY:

- * Subtract end play reading .037" (0.93 mm) recorded in step 6) from .118" (3.00 mm) shim pack added in step 3). This will

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 42)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

result in zero end play.

- * Next, subtract .008" (.220 mm) to achieve required preload.
- * Total shim thickness required to achieve correct preload would be .073" (1.85 mm).
- * Shims are available in thickness ranging from .040-.106" (1.00-2.70 mm), in .001" (.025 mm) increments.

8) Remove nut, drive pinion gear and bearing. Install shim calculated in step 7). Apply gear oil to bearings. Install drive pinion gear and nut. Tighten nut to 184 ft. lbs. (250 N.m) to seat bearings.

9) Using INCH-lb. torque wrench, rotate torque wrench at least 8 turns to determine turning torque. Measure turning torque of drive pinion roller bearings. See Fig. 46. See DRIVE PINION ROLLER BEARING SPECIFICATIONS table. After turning torque is correct, bend locking plate on nut.

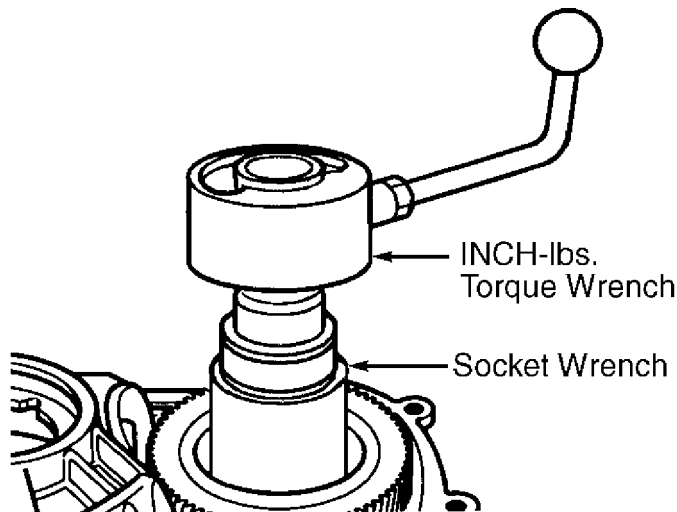
DRIVE PINION ROLLER BEARING SPECIFICATIONS

Application	Turning Torque
-------------	----------------

New Bearings	7-11 INCH Lbs. (.73-1.20 N.m)
Used Bearings	(1) Same As Before Disassembly

(1) - Recorded during disassembly. See FINAL DRIVE & TRANSFER GEARS under TRANSAXLE DISASSEMBLY.

AA



95E19285

Fig. 46: Checking Pinion Roller Bearing Preload
Courtesy of Volkswagen United States, Inc.

Input Transfer Gear Adjustment & Reassembly

- 1) Ensure inner race for roller bearing is installed in transaxle case.
- 2) Install input transfer gear with roller bearing and axial

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 43)

1996 Volkswagen Golf

For Volkswagen Technical Site

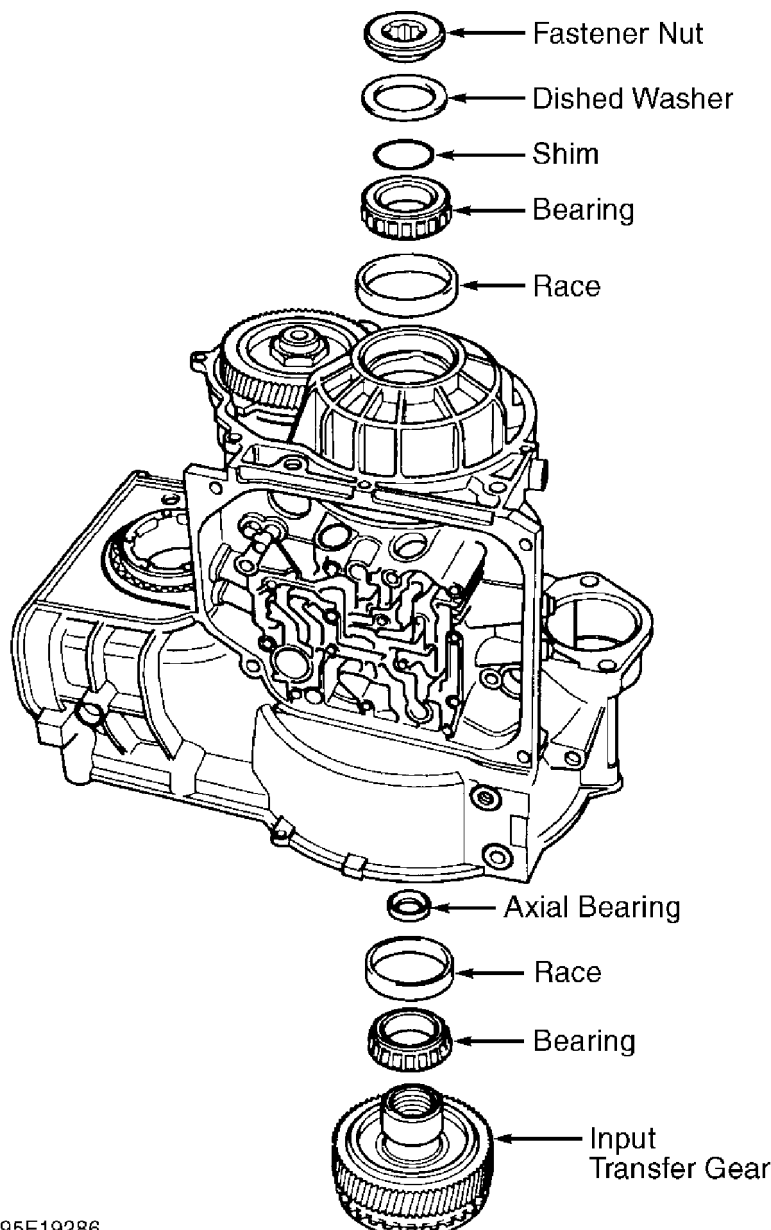
Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

needle bearing (flat side facing input gear) into transaxle case. See Figs. 1, 44 and 47. Align lugs on outer roller bearing to fit between lugs on inner roller bearing. See Fig. 48.

3) Install outer roller bearing (without dished washer or shim) on input transfer gear. See Figs. 44 and 47. Engage parking gear. Using an Allen-head socket, tighten fastener nut to 74 ft. lbs. (100 N.m). See Fig. 49.

4) Remove fastener nut. Using a dial indicator, measure distance between input transfer gear and inner race of roller bearing. See Fig. 50. Measure thickness of dished washer.



95F19286

Fig. 47: Locating Input Transfer Gear Assembly
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

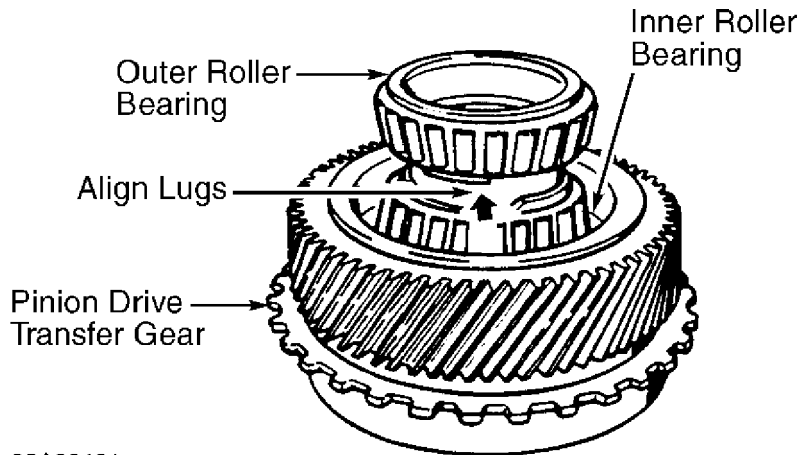
Article Text (p. 44)

1996 Volkswagen Golf

For Volkswagen Technical Site

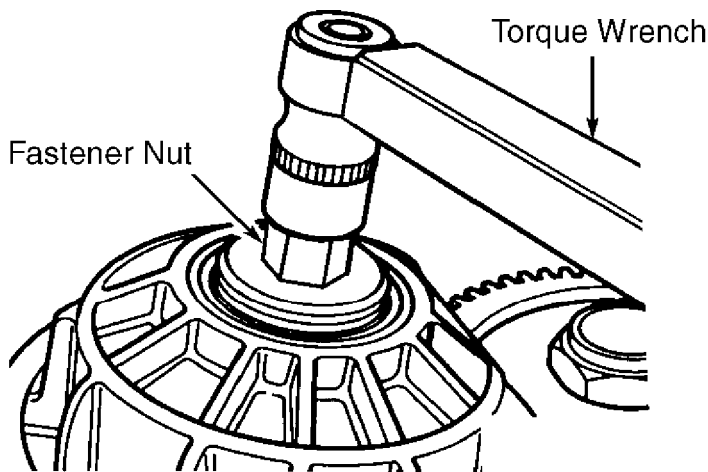
Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



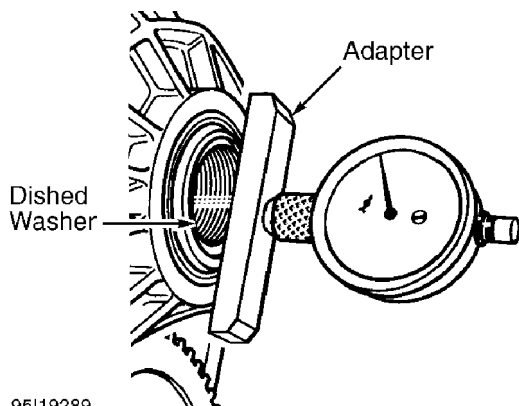
93A22491

Fig. 48: Aligning Lugs On Input Transfer Gear Roller Bearings
Courtesy of Volkswagen United States, Inc.



95G19287

Fig. 49: Tightening Fastener Nut On Input Transfer Gear Roller Bearings
Courtesy of Volkswagen United States, Inc.



95I19289

Fig. 50: Checking Distance Between Input Transfer Gear & Inner Race Of Roller Bearings
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 45)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

5) Add dished washer thickness to distance measured in step 3). Subtract .007" (.180 mm) to obtain shim thickness for desired roller bearing preload. Shims are available in thickness ranging from .040-.106" (1.00-2.70 mm), in .001" (.025 mm) increments.

6) Install selected shim. Install dished washer with curved side facing fastener nut. Apply ATF to bearings. Install and tighten fastener nut to 184 ft. lbs. (250 N.m) to seat bearings.

7) Using INCH-lb. torque wrench, rotate torque wrench at least 8 turns to determine turning torque. Measure combined turning torque of pinion and input transfer gear roller bearings. See Fig. 46. See INPUT TRANSFER GEAR ROLLER BEARING SPECIFICATIONS table.

INPUT TRANSFER GEAR ROLLER BEARING SPECIFICATIONS

AA

Application	Turning Torque
-------------	----------------

New Bearings

Without Drive Pinion Bearings ... 18 INCH Lbs. (2.0 N.m)

With Drive Pinion Bearings .. (1) 27 INCH Lbs. (3.0 N.m)

Used Bearings (2) Same As Before Disassembly

(1) - Based on a drive pinion torque of 9 INCH Lbs. (1.0 N.m).

(2) - Recorded during disassembly. See FINAL DRIVE & TRANSFER GEARS under TRANSAXLE DISASSEMBLY.

AA

8) Remove fastener nut. If necessary, select a shim and recheck roller bearing preload. If roller bearing preload is okay, apply Locking Compound (AMV 100 01) to shaft side of roller bearing.

9) Align lugs with notches of opposite roller bearing. See Fig. 48. Install axial needle bearing with flat side facing drive shaft. Engage parking gear lug. Install fastener nut and tighten to 184 ft. lbs. (250 N.m).

Final Drive Assembly

1) Oil bearings and place differential assembly inside transaxle. Install seals, "O" rings and new bearing races (if required) to bearing carrier and bearing adjuster ring.

2) Install and tighten bearing carrier to 111 ft. lbs. (150 N.m). Install locking tab.

3) Install bearing adjuster ring. Tighten adjuster ring. See Fig. 51. If using original bearings, tighten bearing adjuster ring to marks made during disassembly.

4) If using new bearings, differential or bearing carrier, tighten bearing adjuster ring to 37 ft. lbs. (50 N.m). Turn bearing adjuster ring 5 locking lugs tighter. Install locking tab. See Fig. 51.

5) Using INCH-lb. torque wrench, rotate torque wrench at least 8 turns to determine turning torque. Measure combined turning torque of pinion, input transfer gear and differential side roller bearings. See Fig. 46. See DIFFERENTIAL ROLLER BEARING SPECIFICATIONS

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 46)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

table.

DIFFERENTIAL ROLLER BEARING SPECIFICATIONS

AA

Application	Turning Torque
-------------	----------------

Including Transfer & Pinion Bearings

New Bearings	33 INCH Lbs. (3.7 N.m)
--------------	------------------------

Used Bearings	Same As Before Disassembly
---------------	----------------------------

Differential Side Bearings Only

New Bearings	5-7 INCH Lbs. (.6-.8 N.m)
--------------	---------------------------

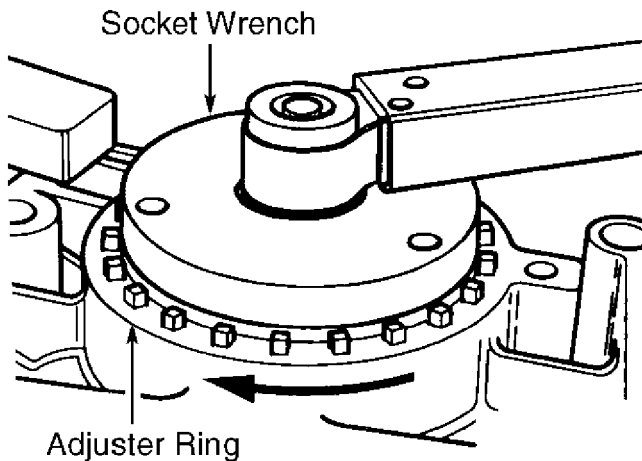
Used Bearings	Same As Before Disassembly
---------------	----------------------------

(1) - Recorded during disassembly. See FINAL DRIVE & TRANSFER GEARS under TRANSAXLE DISASSEMBLY.

AA

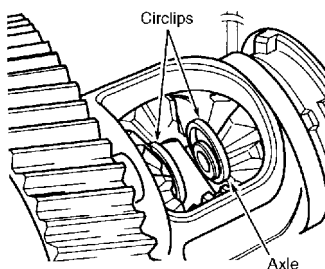
6) Install circlips to end of each axle. See Fig. 52. Install "O" rings and new seals to drive axle flange. Fill space between seal and dust lip with multi-purpose grease.

7) Install drive axle flanges to transaxle. Install and tighten differential cover bolts to 21 ft. lbs. (28 N.m). Install speedometer drive.



95B19290

Fig. 51: Preloading Differential Side Bearings
Courtesy of Volkswagen United States, Inc.



95C19291

Fig. 52: Installing Circlips To Axles
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 47)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

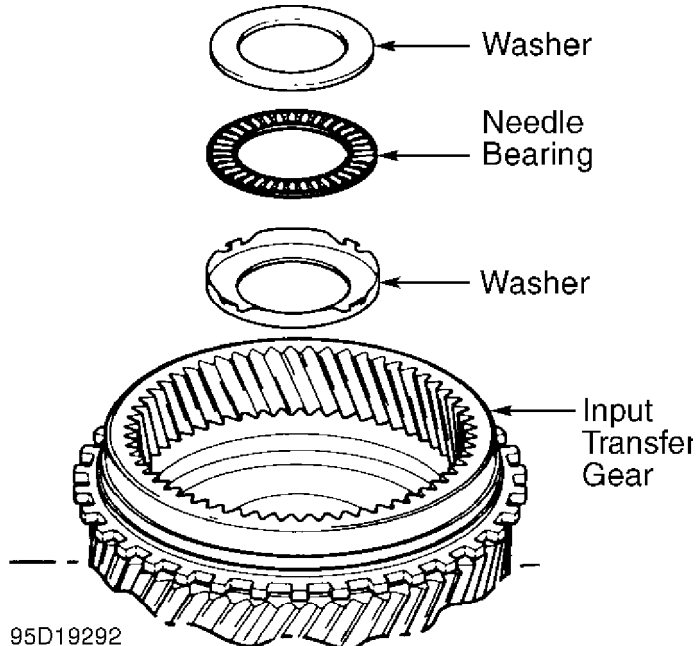
TRANSMISSION

NOTE: Soak all friction-faced clutch plates in ATF for at least 15 minutes before installation. Apply assembly lubrication to all bushings, washers, shims and bearings before installation. See Fig. 17.

1) Input transfer gear, drive pinion and differential assemblies should be adjusted and installed at this time. Install axial needle bearing to input transfer gear. See Fig. 53. Install "O" ring and planetary carrier. Install washer and axial needle bearing into planetary carrier. See Figs. 25 and 54. Install end plate shim for reverse brake clutch plates. See Fig. 55.

2) Install reverse brake clutch plates. See Fig. 56. See BRAKE CLUTCH PLATE APPLICATIONS table. Using Assembly Ring(VW 3267), install one-way clutch and secure using circlip. See Figs. 57 and 58.

3) Using a feeler gauge, check installed reverse brake clutch clearance. See Fig. 59. Clearance should be .047-.071" (1.2-1.8 mm). If clearance is not as specified, replace end plate shim. End plate shims are available in thicknesses ranging from .040" (1.0 mm) to .070" (1.9 mm) in .004" (.10 mm) increments.



95D19292

Fig. 53: Installing Axial Needle Bearing To Input Transfer Gear
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

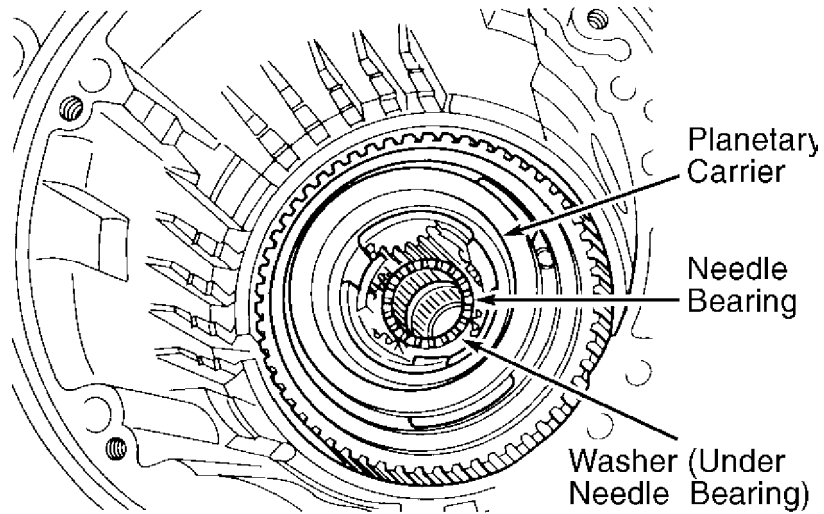
Article Text (p. 48)

1996 Volkswagen Golf

For Volkswagen Technical Site

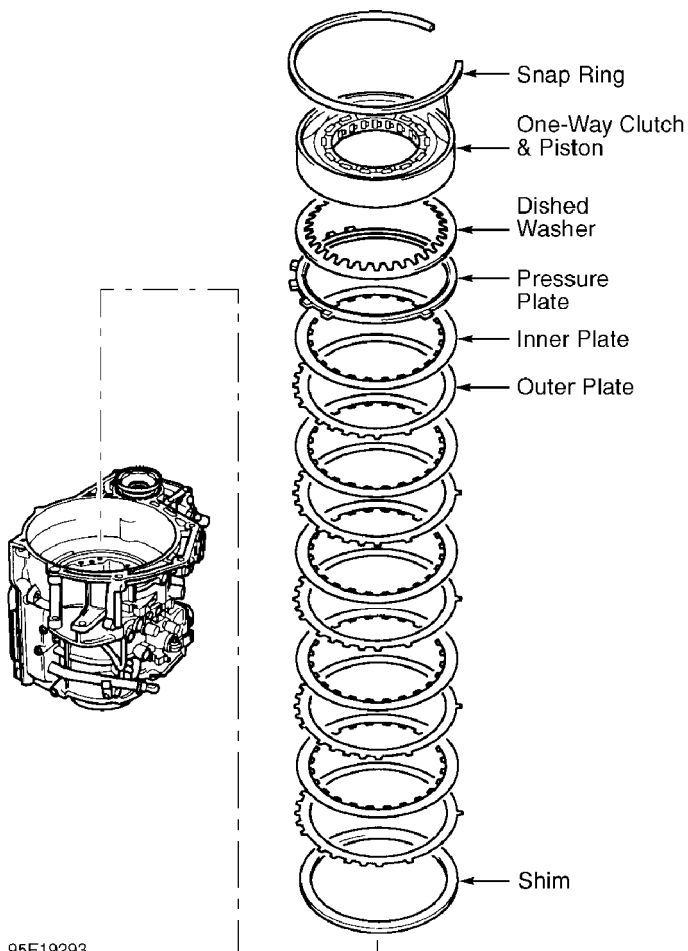
Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



96E04590

Fig. 54: Installing Planetary Carrier & Axial Needle Bearing
Courtesy of Volkswagen United States, Inc.



95E19293

Fig. 55: Exploded View Reverse Brake Clutch Assembly
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

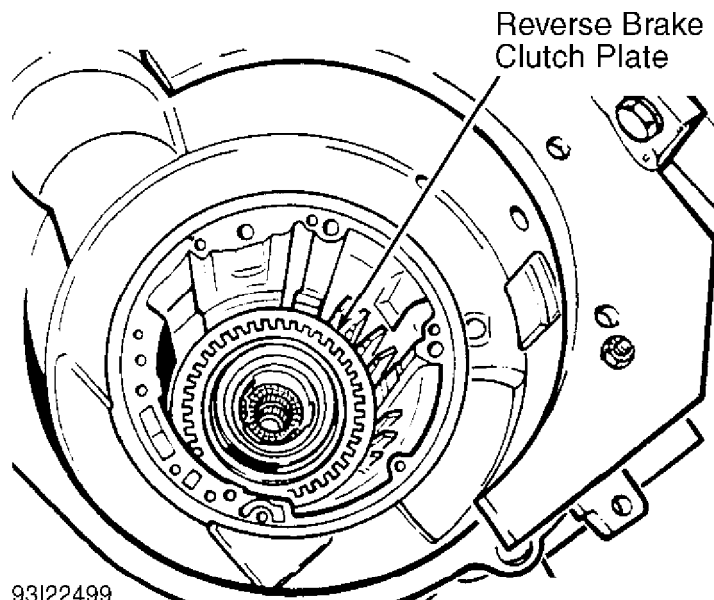
Article Text (p. 49)

1996 Volkswagen Golf

For Volkswagen Technical Site

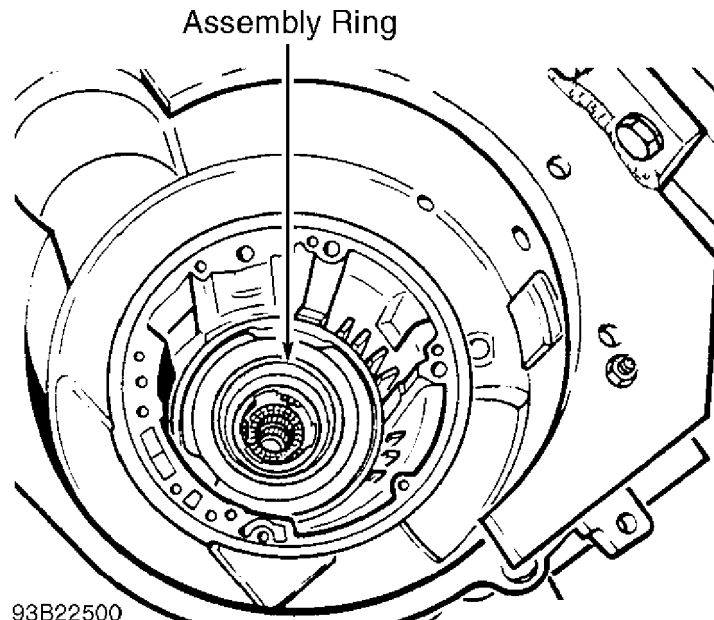
Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



93I22499

Fig. 56: Installing Reverse Brake Clutch Plates
Courtesy of Volkswagen United States, Inc.



93B22500

Fig. 57: Installing One-Way Clutch
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

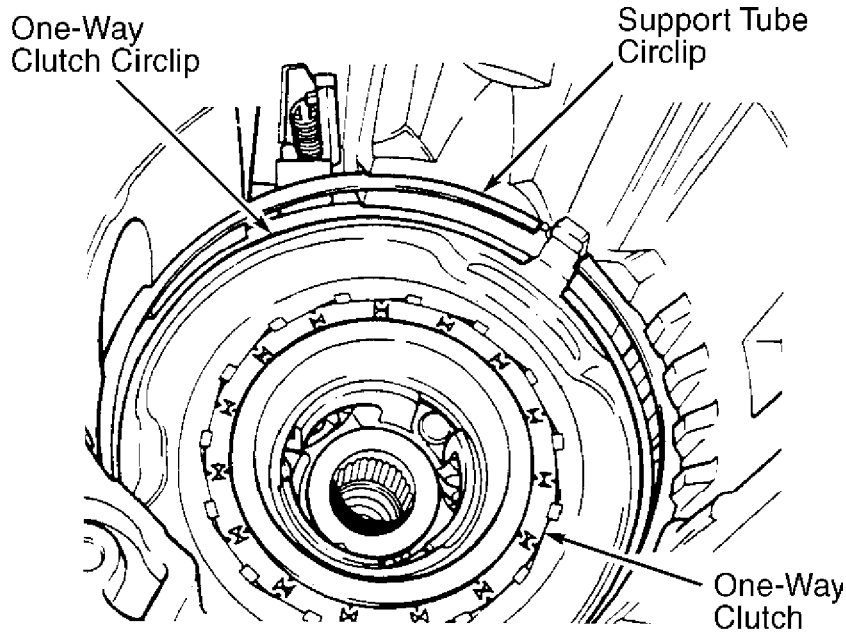
Article Text (p. 50)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

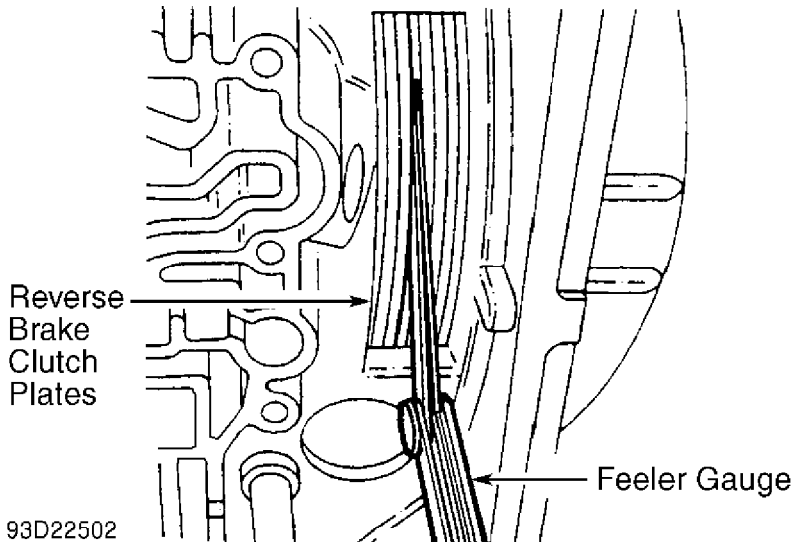
Thursday, August 19, 1999 11:28PM



93C22501

Fig. 58: Installing Circlips

Courtesy of Volkswagen United States, Inc.



93D22502

Fig. 59: Checking Reverse Brake Clutch Clearance

Courtesy of Volkswagen United States, Inc.

BRAKE CLUTCH PLATE APPLICATIONS

AA

Application	Number Of Plates
Reverse Clutch	
Inner	5
Outer	5
2nd-4th Clutch	
Inner	6

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 51)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

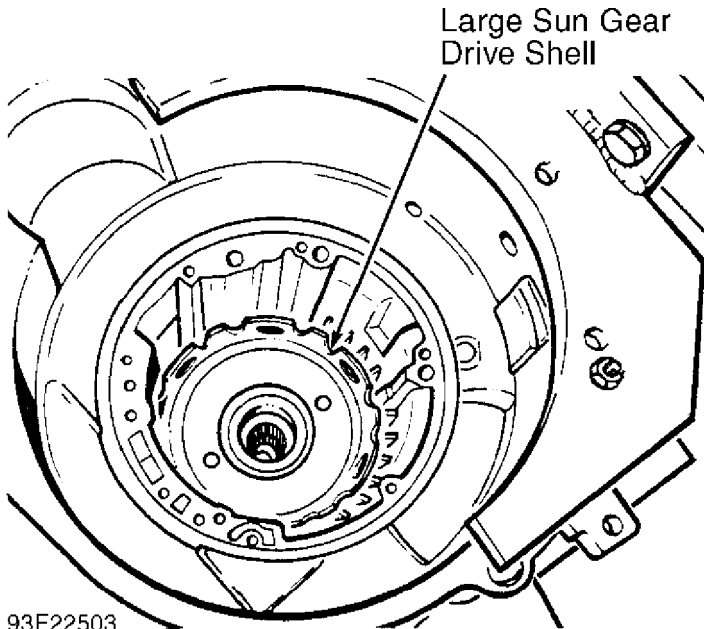
Thursday, August 19, 1999 11:28PM

Outer 7
AA

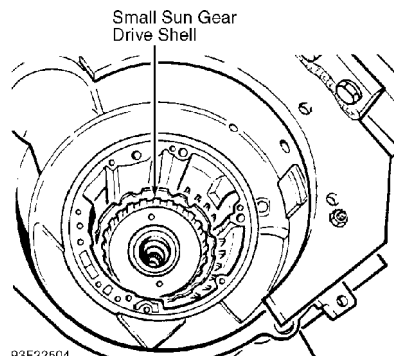
4) Install upper circlip for support tube. See Fig. 58. Install washer and needle bearing into large sun gear drive shell. See Fig. 17. Install large sun gear drive shell. See Fig. 60.

5) Install small sun gear drive shell. Install small planetary drive shaft with needle bearings. See Figs. 17, 61 and 62. Using a screwdriver, lock small sun gear drive shell to large sun gear drive shell. See Fig. 19. Install adjustment shim, washer and bolt on end of small planetary drive shaft. Tighten bolt to 22 ft. lbs. (30 N. m).

6) Ensure end play is .009-.014" (.23-.37 mm). If end play is not as specified, recheck assembly or adjustment. See PLANETARY CARRIER under COMPONENT DISASSEMBLY & REASSEMBLY.



93E22503
Fig. 60: Installing Large Sun Gear Drive Shell
Courtesy of Volkswagen United States, Inc.



93F22504
Fig. 61: Installing Small Sun Gear Drive Shell
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

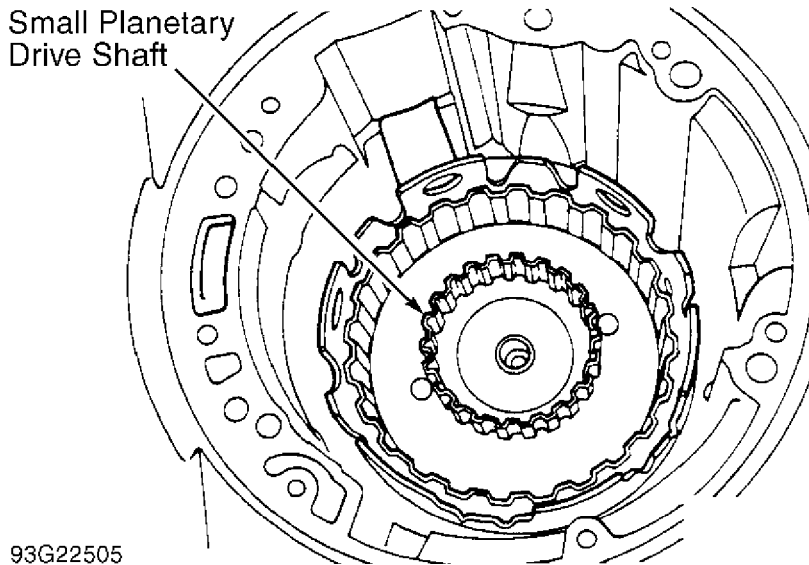
Article Text (p. 52)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



93G22505

Fig. 62: Installing Small Planetary Drive Shaft
Courtesy of Volkswagen United States, Inc.

7) Install bearing, washer, and impeller shaft and 4th apply clutch. See Fig. 63. Install bearing, washer and 1st-3rd apply clutch with turbine shaft assembly. See Fig. 64. Install thrust shims on 1st-3rd apply clutch housing. Install reverse apply clutch and support tube. See Fig. 65.

NOTE: Turbine shaft end play was measured before disassembly. If end play is okay, use original thrust shims. If end play is not okay or new parts are installed, calculate end play and install required thrust shims.

8) For checking purposes, install oil pump gasket and oil pump. See Fig. 17. Position dial indicator and Support (VW 387) on transaxle case. See Fig. 66.

9) Press dial indicator on turbine shaft, and apply .040" (1.0 mm) preload. Move turbine shaft up and down. Turbine shaft end play should be .019-.047" (.50-1.20 mm).

10) If end play is okay, go to next step. If end play is not okay, install required thrust shims. Thrust shims are available in thicknesses ranging from .04" (1.0 mm) to .07" (1.8 mm) in .008" (.20 mm) increments. Recheck turbine shaft end play.

11) Remove oil pump and oil pump gasket. Install support tube and .118" (3.0 mm) thick outer splined plate for reverse apply clutch. Ensure groove on support tube engages wedge of one-way clutch. See Figs. 17 and 65.

12) Install friction plates and outer splined plates for reverse apply clutch into transaxle case. See Fig. 67. Install 3 caps and springs. Install 2nd-4th brake clutch plates. See Fig. 68. See BRAKE CLUTCH PLATE APPLICATIONS table. Install 3 spring caps to springs.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 53)

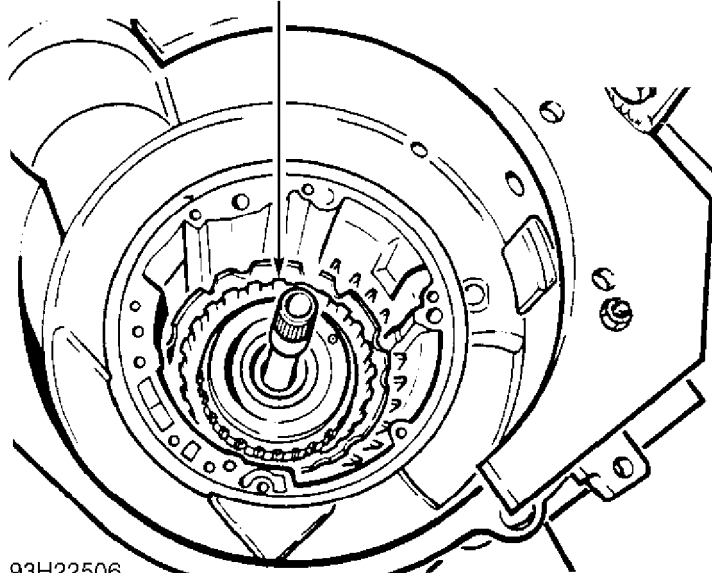
1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

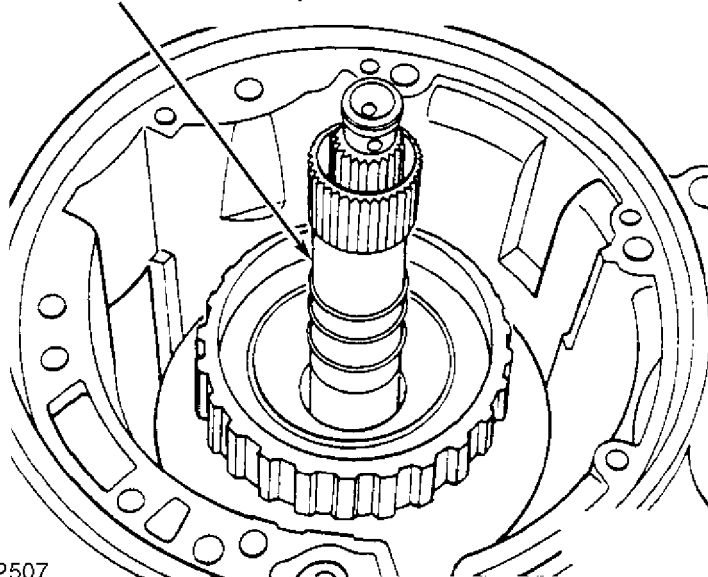
3rd-4th Apply Clutch
& Impeller Shaft Assembly



93H22506

Fig. 63: Installing 4th Apply Clutch & Impeller Shaft
Courtesy of Volkswagen United States, Inc.

1st-2nd Apply Clutch
& Turbine Shaft Assembly



93I22507

Fig. 64: Installing 1st-3rd Apply Clutch & Turbine Shaft
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

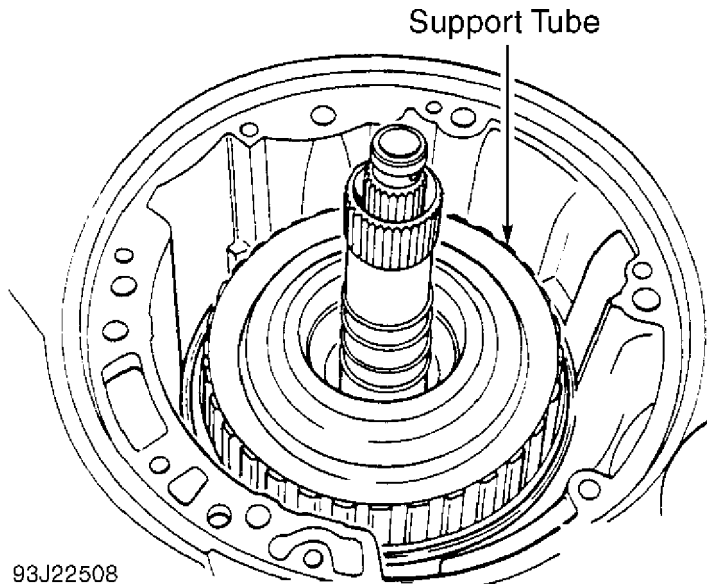
Article Text (p. 54)

1996 Volkswagen Golf

For Volkswagen Technical Site

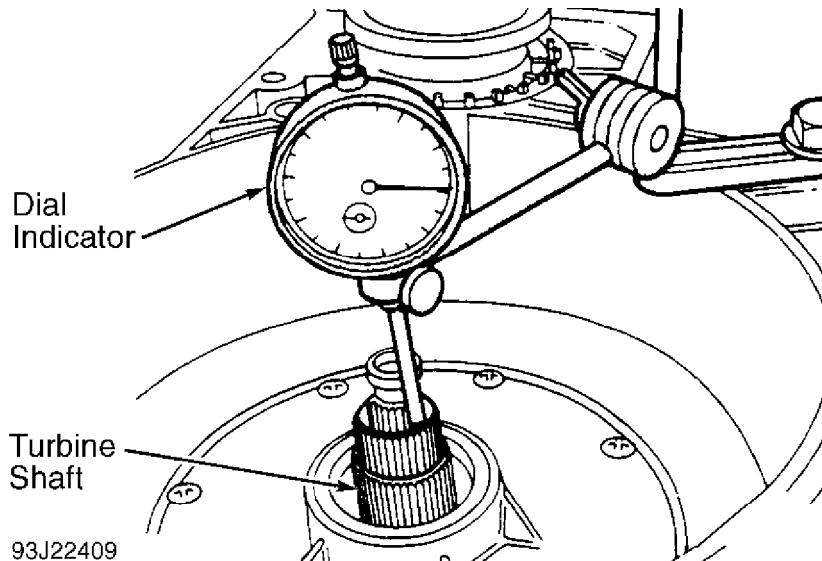
Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



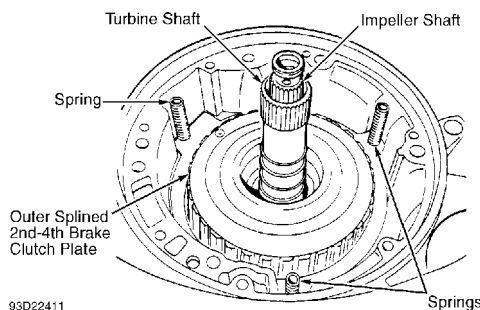
93J22508

Fig. 65: Installing Support Tube
Courtesy of Volkswagen United States, Inc.



93J22409

Fig. 66: Checking Turbine Shaft End Play
Courtesy of Volkswagen United States, Inc.



93D22411

Springs

Fig. 67: Installing 2nd-4th Brake Clutch Plate & Springs
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 55)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

13) DO NOT install top outer splined clutch plate or waved spring washer. Determine clearance of 2nd-4th brake clutch. Press 2nd-4th brake clutch assembly down. Using a depth gauge, measure distance from top of oil pump flange to 2nd-4th brake clutch (inner splined). See Fig. 69.

14) Place a straightedge across top of piston. Place gasket on oil pump flange. Using depth gauge, measure distance from straightedge to oil pump flange gasket. See Fig. 70. Subtract thickness of straightedge.

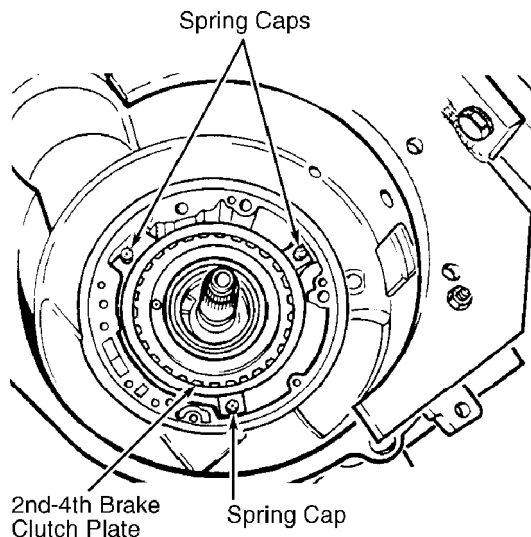
15) Subtract distance measured in step 13) from distance calculated in step 14). This gives 2nd-4th brake clutch-to-piston distance.

16) Subtract .140" (3.6 mm) from value calculated in step 15). This determines thickness of last outer splined 2nd-4th brake clutch plate. Outer splined 2nd-4th brake clutch plates are available in thickness ranging from .080-.148" (2.00-3.75 mm), in .010" (.25 mm) increments.

NOTE: Manufacturer uses .140" (3.6 mm) value to allow for waved spring washer thickness installed with 2nd-4th brake clutch plates.

17) Install last outer 2nd-4th brake clutch plate. Install waved spring washer. Install oil pump gasket. Install "O" ring to oil pump, and install oil pump. Install cover for transfer gears.

18) Move gear change shaft to "P" position. Push manual valve operating lever with manual valve into valve body. Tighten set screw. Install sealing plug. See Figs. 14 and 36. Install valve body. Install oil filter screen and oil pan. See Figs. 14, 71 and 72. Install torque converter.



93A22509

Fig. 68: Installing 2nd-4th Clutch Plates
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 56)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

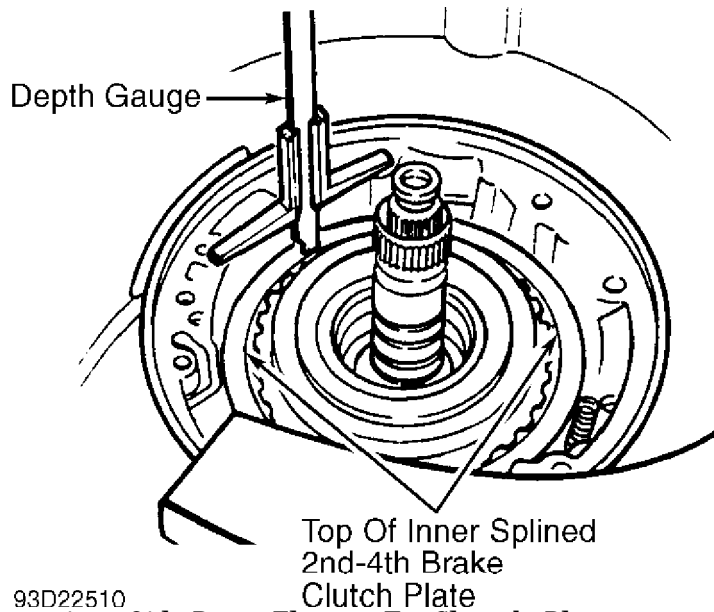


Fig. 69: Measuring Oil Pump Flange-To-Clutch Plate
Courtesy of Volkswagen United States, Inc.

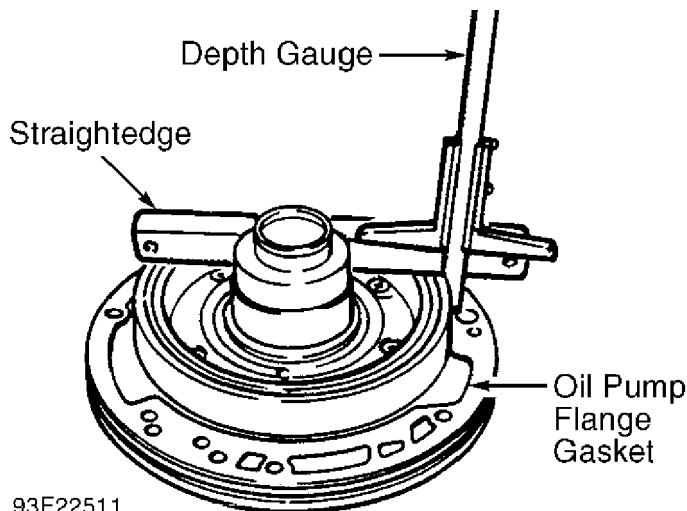


Fig. 70: Measuring Height Of Piston

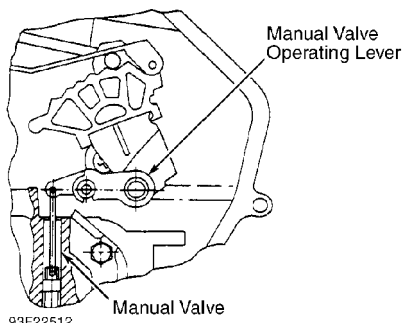


Fig. 71: Installing Manual Valve Operating Lever
Courtesy of Volkswagen United States, Inc.

AUTO TRANS DIAGNOSIS - 01M

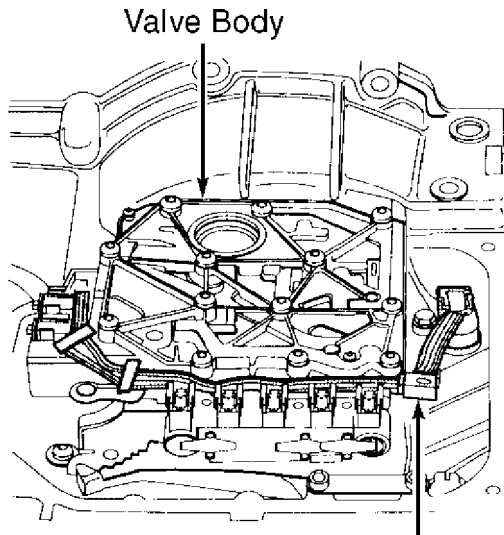
Article Text (p. 57)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM



96F30424

Fig. 72: Installing Valve Body
 Courtesy of Volkswagen United States, Inc.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

AA

Application	Ft. Lbs. (N. m)
Differential Bearing Carrier	111 (150)
Differential Housing Cover Bolts	21 (28)
Drive Axle Flange Bolts	33 (45)
Drive Pinion Bearing & "O" Ring Support	148 (200)
Drive Pinion Nut	184 (250)
Input Transfer Gear Nut	184 (250)
Oil Cooler Banjo Bolts	26 (35)
Small Planetary Drive Shaft Bolt	22 (30)
Starter-To-Transaxle Bolts	44 (60)
Subframe-To-Transaxle Support Nut	44 (60)
Torque Converter Nuts	44 (60)
Transaxle-To-Engine Bolts	
10-mm Diameter	44 (60)
12-mm Diameter	59 (80)
Transaxle-To-Transaxle Support Bolts	44 (60)

INCH Lbs. (N. m)

Detent Spring Screws	84 (10)
Differential Bearing Carrier/Adjuster	
Locking Tab Bolt	108 (12)
Oil Pan Bolts	108 (12)
Oil Pump-To-Transaxle Bolts	
Step 1	71 (8)
Step 2	Additional 90 Degrees
Transfer Gear Cover Bolts	71 (8)

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 58)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

Valve Body Bolts	44 (5)
Valve Body Conductor Strip Bolt	89 (10)
AA	

TRANSMISSION SPECIFICATIONS

TRANSMISSION SPECIFICATIONS

AA

Application	In. (mm)
Clutch Clearance	
Apply Clutches	(1)
Brake Clutches	
2nd-4th	(2) .060-.068 (1.50-1.74)
Reverse047-.071 (1.2-1.8)
Gear & Shaft End Play	
Planetary Carrier009-.014 (.23-.37)
1st-3rd To Reverse Apply Clutch019-.047 (.50-1.20)
Turbine Shaft019-.047 (.50-1.20)

(1) - Assembled clutch clearance is not available.

(2) - See TRANSMISSION under TRANSAXLE REASSEMBLY.

AA

TECHNICAL SERVICE BULLETINS

SHIFTING ERRATIC, HARSH OR DELAYED

1993-On Cabrio, Golf, GTI, Jetta & Passat (Group 01, TSB No. 97-01, 1-8-97)

Transaxle may shift erratic, harsh or hold shifts too long (delayed upshifts) with no trouble codes stored in memory. This condition is normally caused by improper throttle angle setting. If shifting quality is a concern, perform THROTTLE ANGLE SETTING procedure.

NOTE: On a newly installed TCM, basic settings must be set prior to performing the following procedure. Basic settings can be set with Scan Tool (VAG 1551) using Function "04", Display "000".

Throttle Angle Setting

1) Connect scan tool. Turn ignition on. Press "1" to select RAPID DATA TRANSFER. Enter address word 02 "TRANSMISSION ELECTRONICS" and advance until "SELECT FUNCTION XX" appears in scan tool display.

2) Press buttons "0", then "8" to select function 08 "READ MEASURING VALUE BLOCK". Press "Q" button to confirm input. Press "Q" button once more, then enter group No. 001. Press "Q" button to confirm input.

3) Print screen. While observing scan tool display, slowly press accelerator pedal until display reads 25 percent. DO NOT release

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 59)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:28PM

pedal. Print screen.

4) While observing scan tool display, slowly press accelerator pedal until display reads 50 percent. DO NOT release pedal. Print screen.

5) While observing scan tool display, slowly press accelerator pedal until display reads 75 percent. DO NOT release pedal. Print screen.

6) While observing scan tool display, slowly press accelerator pedal until display reads 99 percent. DO NOT release pedal (resistance of kickdown switch should be felt). Print screen.

7) Continue pressing accelerator pedal to its stop while observing fourth digit on right-side 8 digit display. Fourth digit must change from 0 to 1, indicating kickdown. Hold for 5 seconds to set throttle angle.

8) Release accelerator pedal, then press right arrow button on scan tool. Select function 06 "END OUTPUT". Repeat procedure from beginning.

9) Compare voltage readings and throttle angle percentages on printout from first test with that of second test. If readings do not match, throttle angle was set incorrectly.

10) If readings do match, road test vehicle and activate kickdown switch several times to ensure proper operation.

WIRING DIAGRAMS

AUTO TRANS DIAGNOSIS - 01M
Article Text (p. 60)
 1996 Volkswagen Golf
 For Volkswagen Technical Site
 Copyright © 1998 Mitchell Repair Information Company, LLC
 Thursday, August 19, 1999 11:28PM

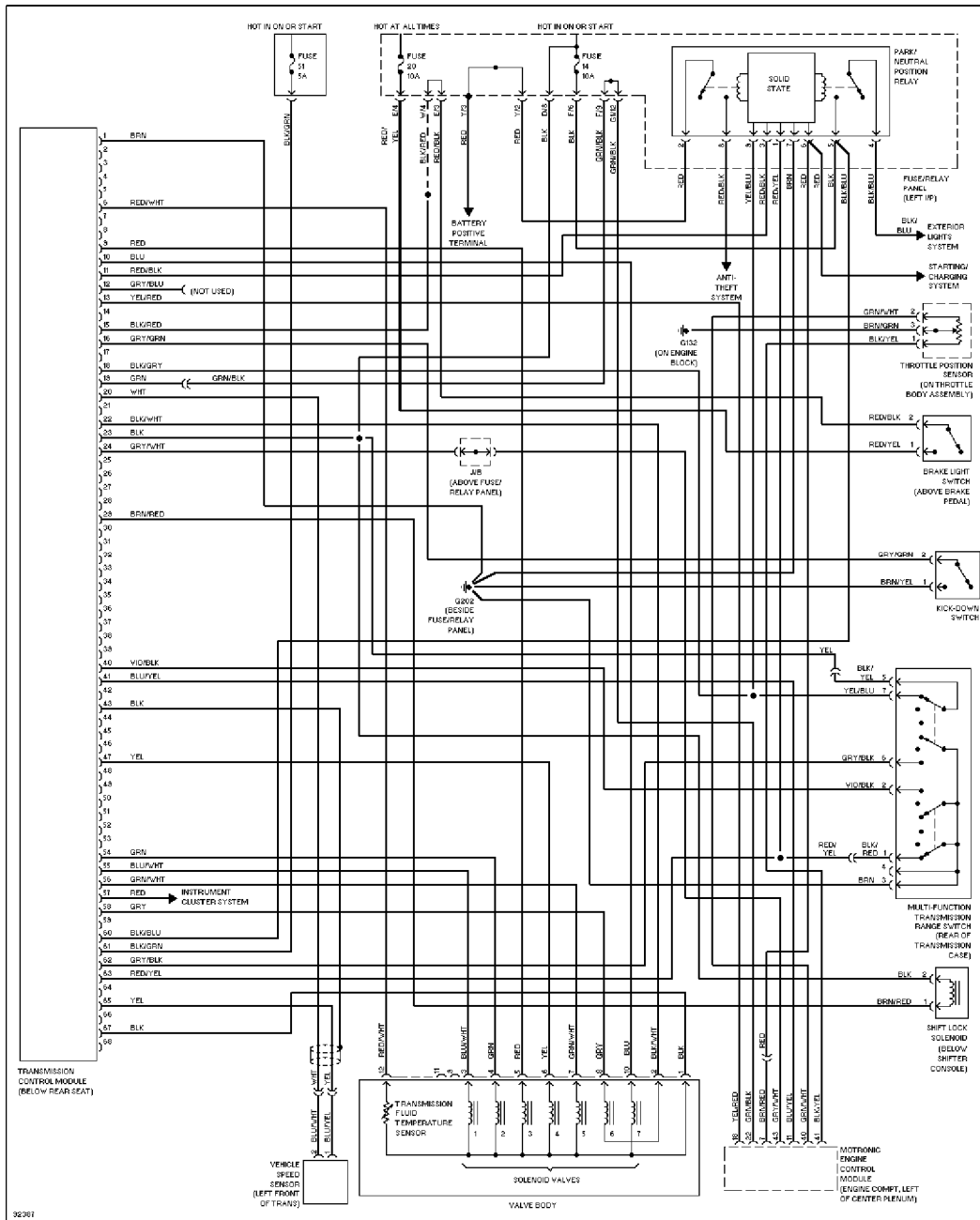


Fig. 73: 1995 Transaxle Wiring Diagram (Cabrio, Golf & Jetta 2.0L - Early Production)

AUTO TRANS DIAGNOSIS - 01M
Article Text (p. 61)
 1996 Volkswagen Golf
 For Volkswagen Technical Site
 Copyright © 1998 Mitchell Repair Information Company, LLC
 Thursday, August 19, 1999 11:28PM

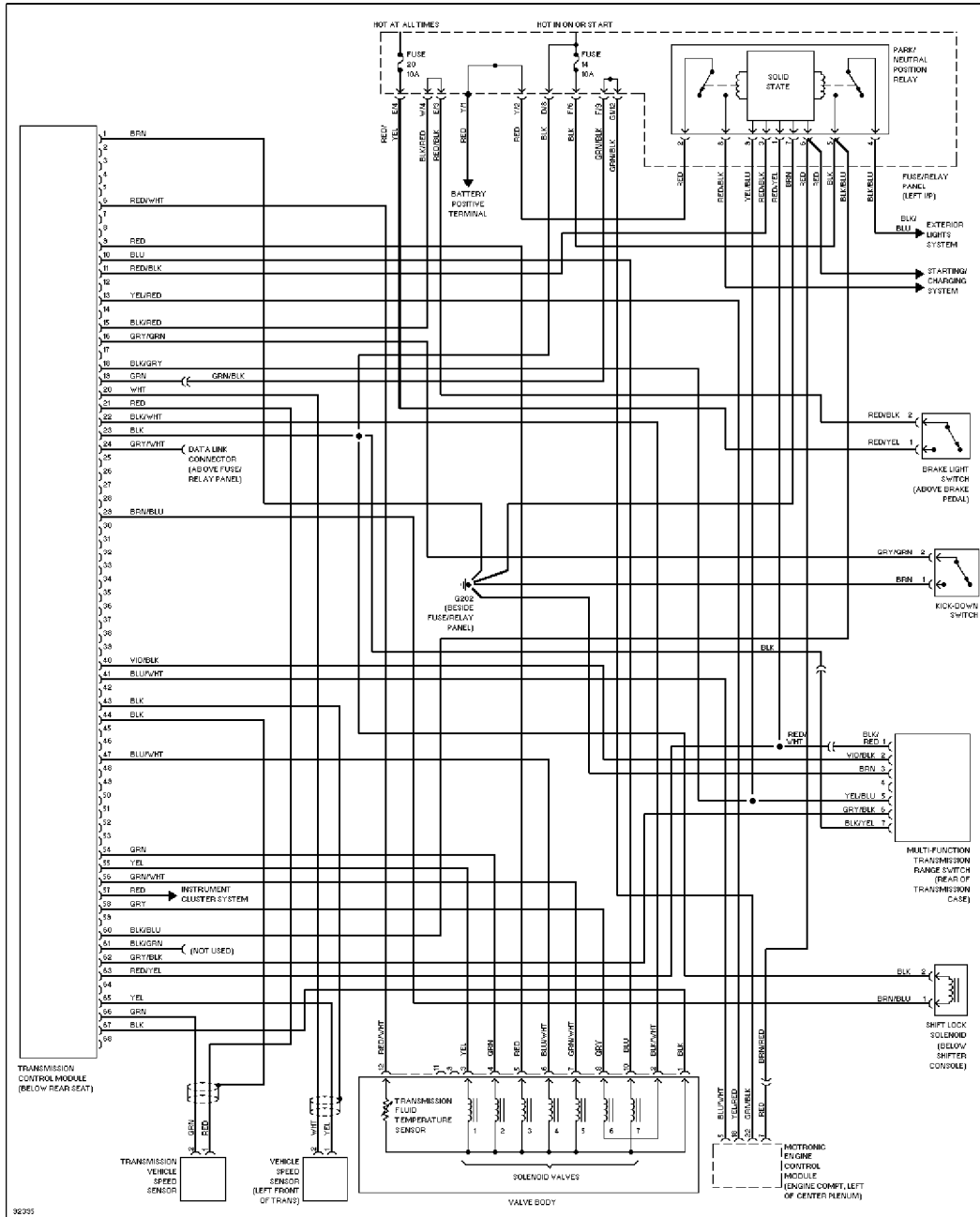


Fig. 74: 1995 Transaxle Wiring Diagram (Cabrio 2.0L - Late Production)

AUTO TRANS DIAGNOSIS - 01M
Article Text (p. 62)
 1996 Volkswagen Golf
 For Volkswagen Technical Site
 Copyright © 1998 Mitchell Repair Information Company, LLC
 Thursday, August 19, 1999 11:28PM

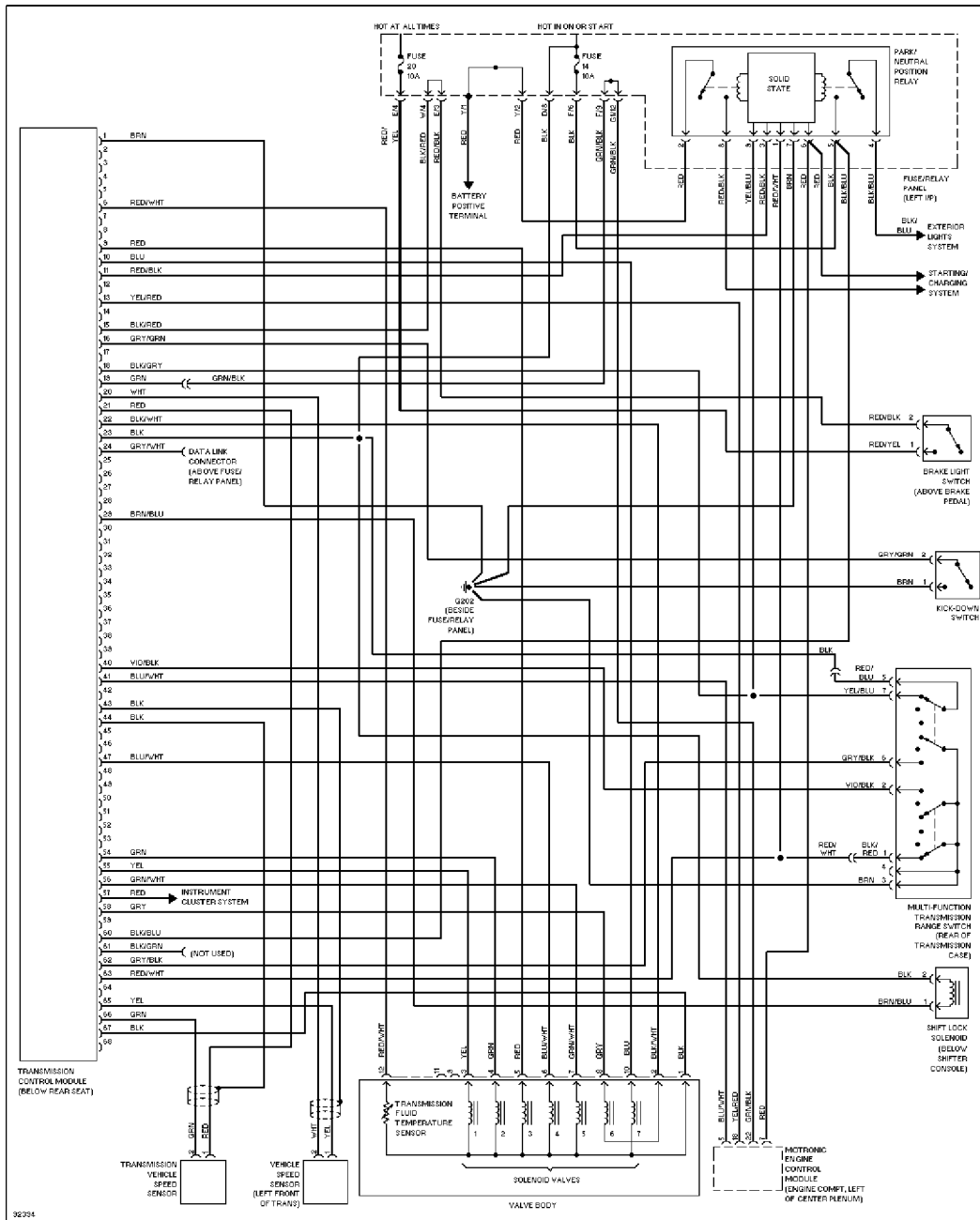


Fig. 75: 1995 Transaxle Wiring Diagram (Golf & Jetta 2.0L - Late Production)

AUTO TRANS DIAGNOSIS - 01M
Article Text (p. 63)
 1996 Volkswagen Golf
 For Volkswagen Technical Site
 Copyright © 1998 Mitchell Repair Information Company, LLC
 Thursday, August 19, 1999 11:29PM

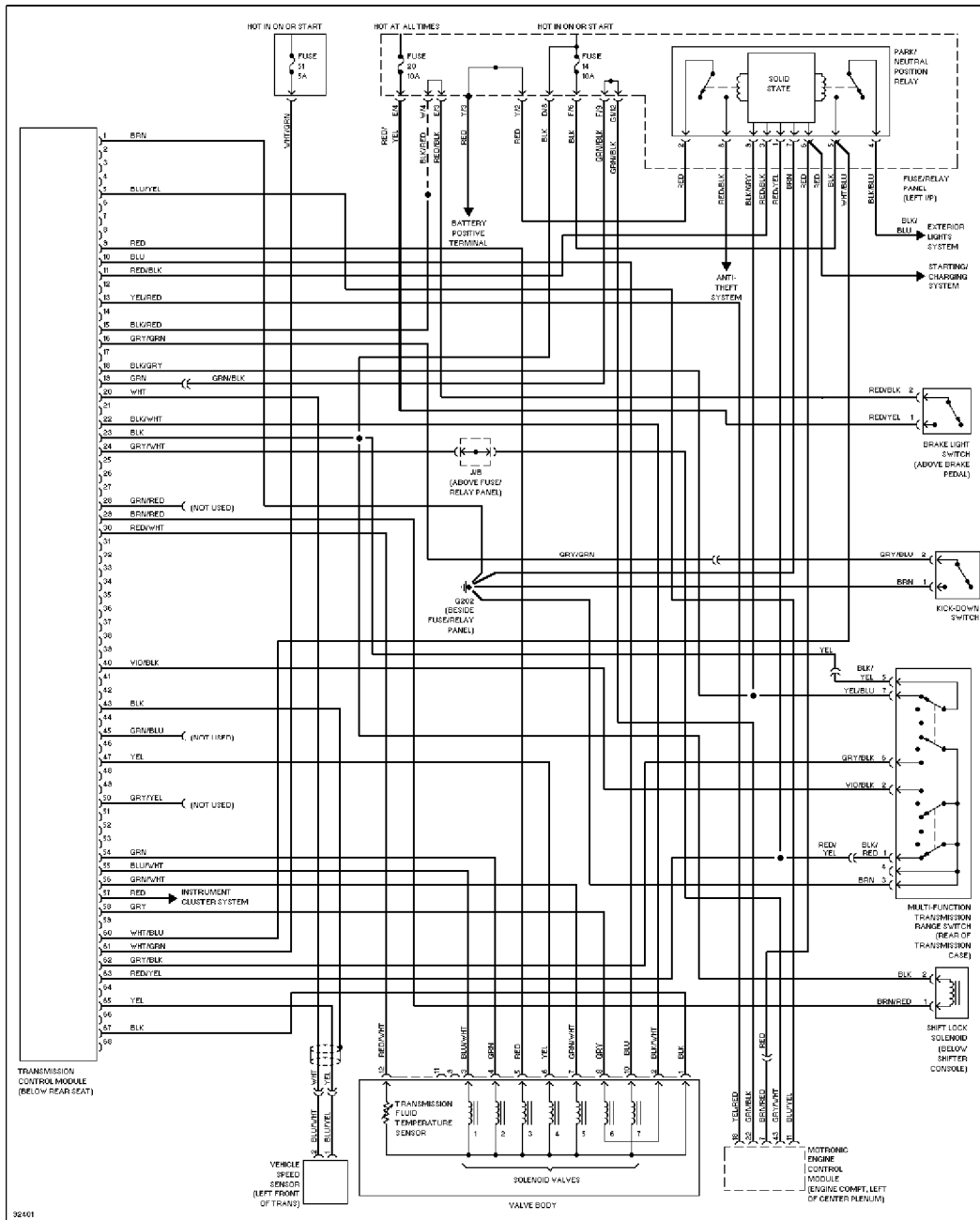


Fig. 76: 1995 Transaxle Wiring Diagram (Jetta 2.8L)

AUTO TRANS DIAGNOSIS - 01M
Article Text (p. 64)
 1996 Volkswagen Golf
 For Volkswagen Technical Site
 Copyright © 1998 Mitchell Repair Information Company, LLC
 Thursday, August 19, 1999 11:29PM

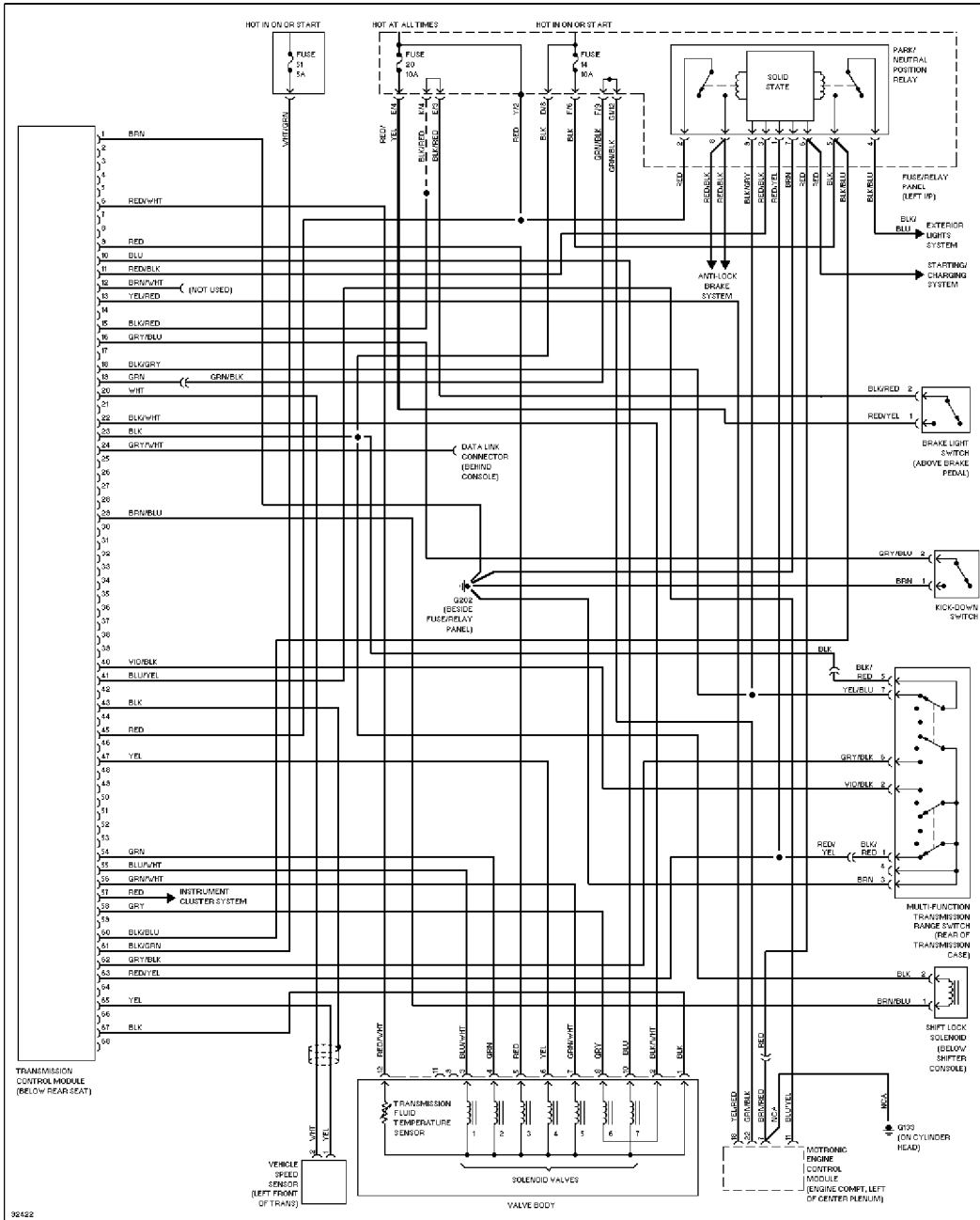


Fig. 77: 1995 Transaxle Wiring Diagram (Passat)

AUTO TRANS DIAGNOSIS - 01M
Article Text (p. 65)
 1996 Volkswagen Golf
 For Volkswagen Technical Site
 Copyright © 1998 Mitchell Repair Information Company, LLC
 Thursday, August 19, 1999 11:29PM

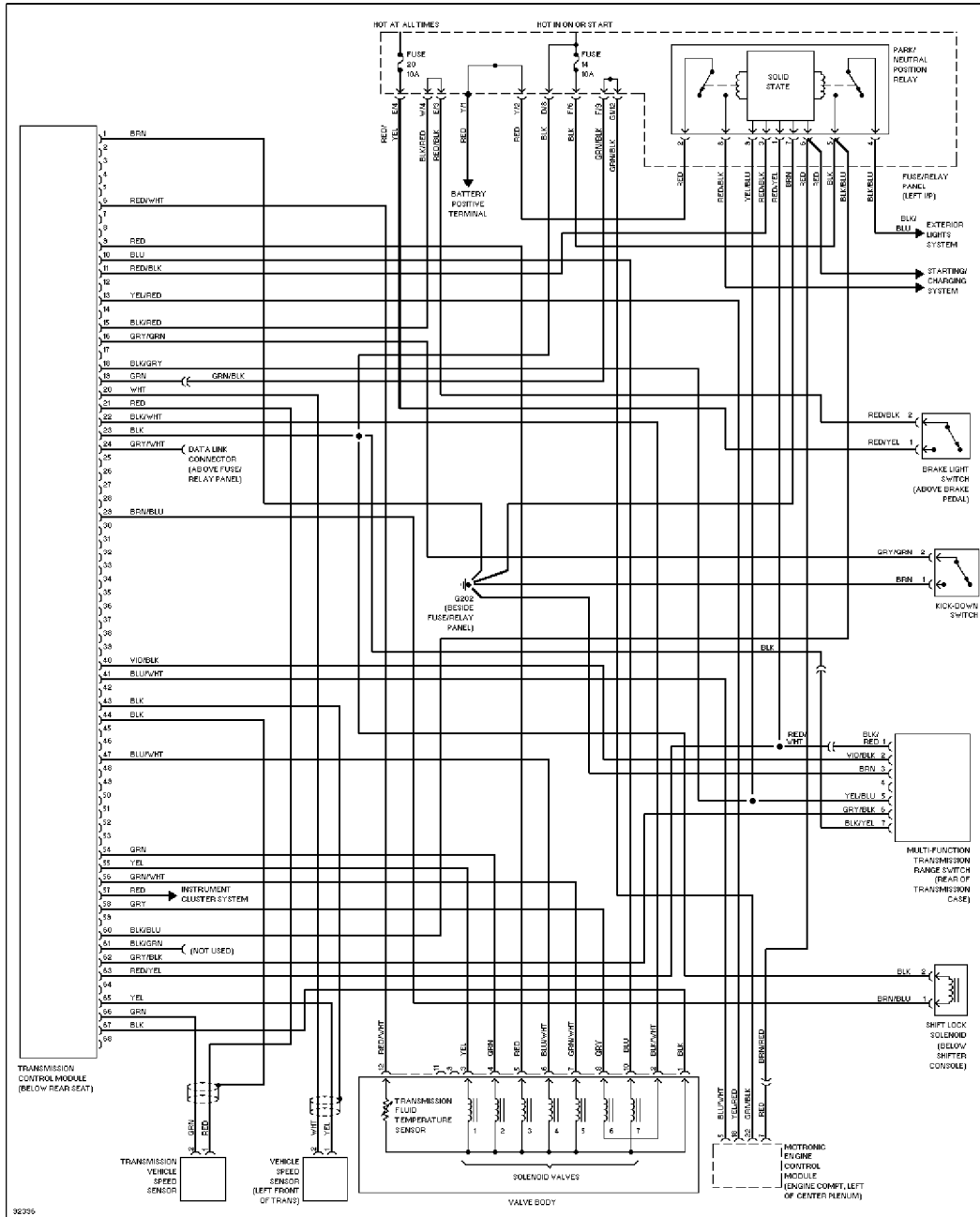


Fig. 78: 1996 Transaxle Wiring Diagram (Cabrio)

AUTO TRANS DIAGNOSIS - 01M
Article Text (p. 66)
 1996 Volkswagen Golf
 For Volkswagen Technical Site
 Copyright © 1998 Mitchell Repair Information Company, LLC
 Thursday, August 19, 1999 11:29PM

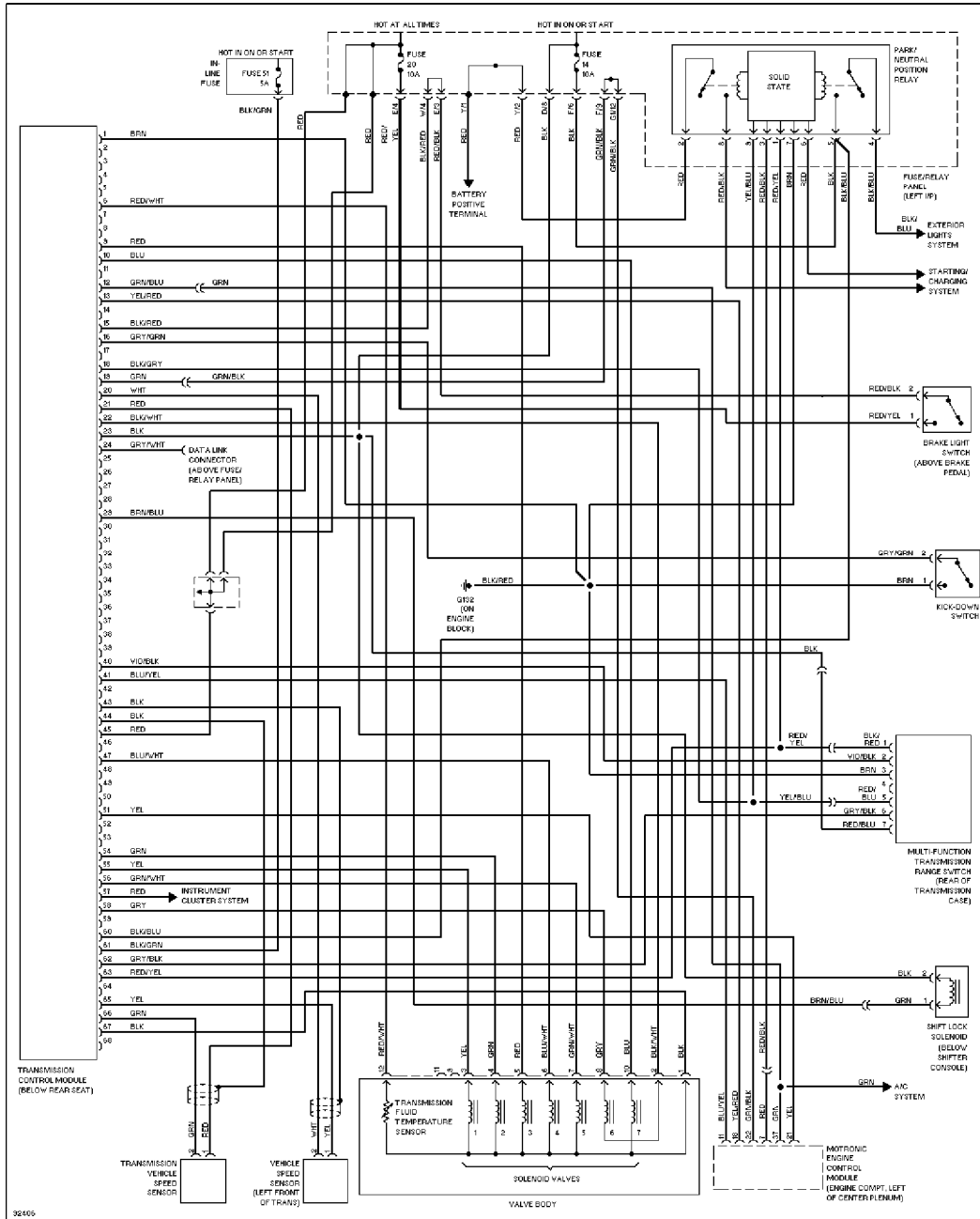


Fig. 79: 1996 Transaxle Wiring Diagram (Golf 2.0L & Jetta 2.0L & 2.8L)

AUTO TRANS DIAGNOSIS - 01M

Article Text (p. 67)

1996 Volkswagen Golf

For Volkswagen Technical Site

Copyright © 1998 Mitchell Repair Information Company, LLC

Thursday, August 19, 1999 11:29PM

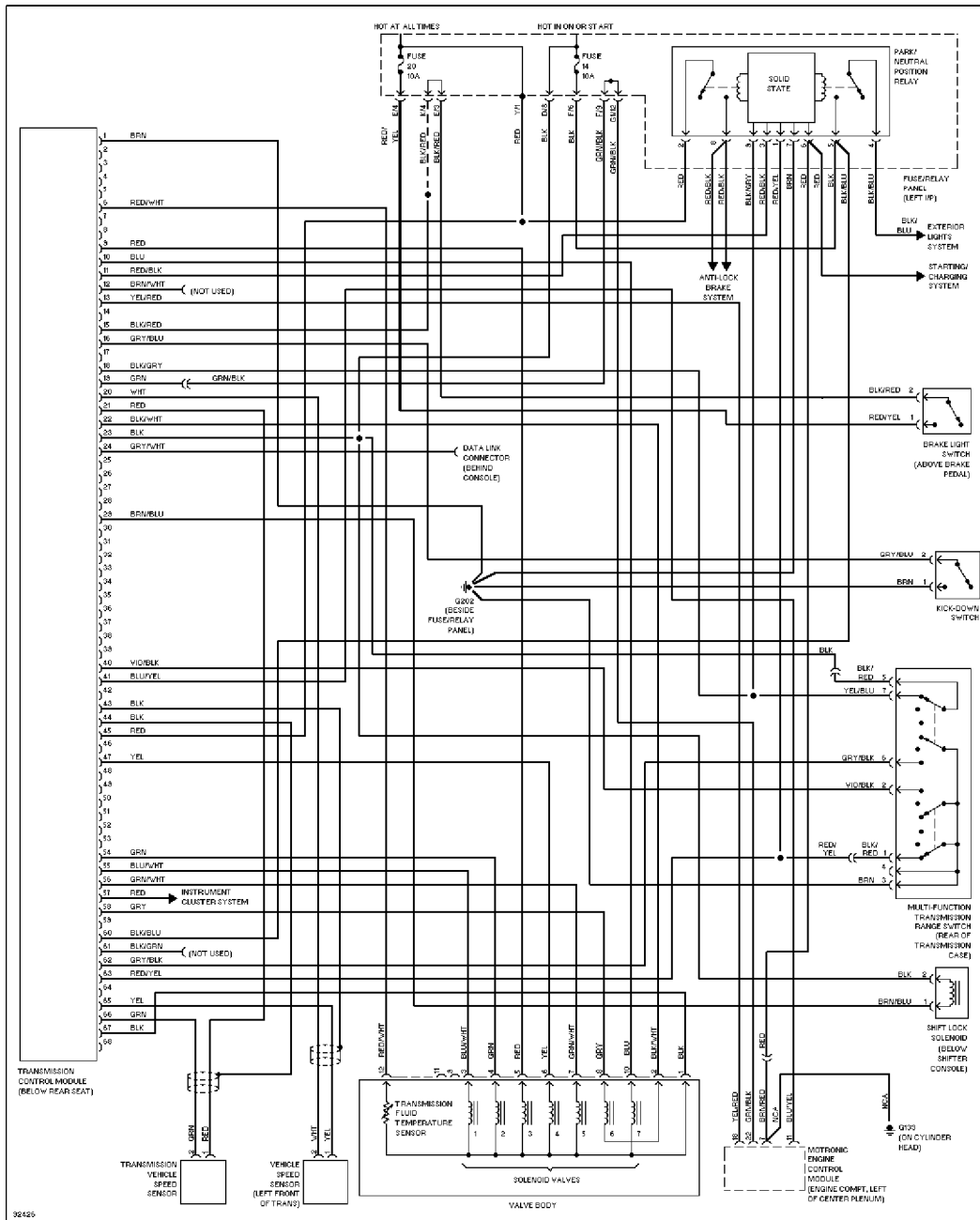


Fig. 80: 1996 Transaxle Wiring Diagram (Passat)

END OF ARTICLE

Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>