

AUTO TRANS DIAGNOSIS - HYDRA-MATIC 3L30

Article Text

1995 Suzuki Sidekick

For saer Nira Sakhalin Russia 693013

Copyright © 1998 Mitchell Repair Information Company, LLC

Sunday, January 13, 2002 07:54PM

ARTICLE BEGINNING

AUTOMATIC TRANSMISSIONS

Hydra-Matic 3L30

Geo; Tracker

Suzuki; Sidekick

APPLICATION & LABOR TIMES

APPLICATION & LABOR TIMES

AA

Vehicle Application	Labor Times		Trans. Model
	(1) R & I	(2) Overhaul	

Geo			
1995-96 Tracker			
2WD	4.8	7.1	3L30
4WD	5.8	7.1	3L30
Suzuki			
1995-96 Sidekick			
2WD	4.8	7.1	3L30
4WD	5.8	7.1	3L30

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

AA

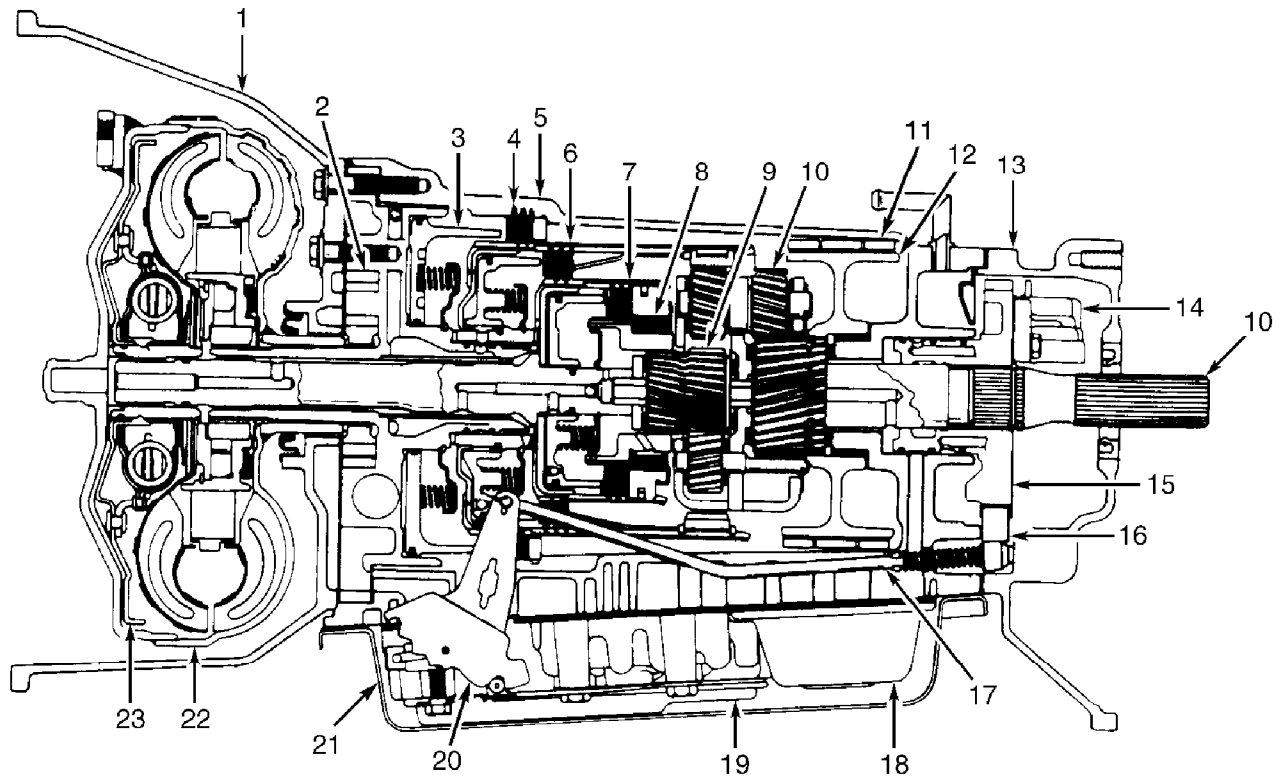
IDENTIFICATION

Transmission is identified by identification plate attached to transmission case, located on left side, above oil pan. Vehicle Identification Number (VIN) may also be used in identifying transmission. VIN locations are at top left of instrument panel and driver's-side door post. VIN is used to ensure correct application of component parts and assemblies.

DESCRIPTION & OPERATION

Automatic transmission provides 3 forward speeds and reverse. Main internal components are; oil pump, Torque Converter w/Clutch (TCC), reverse clutch, 2nd clutch, 3rd clutch, one-way clutch (sprag type), compound planetary gear set, low brake, governor and valve body. See Fig. 1.

Gear shifting is controlled by valve body. Components that regulate shifting schedules are; governor, modulator and kick-down valve. TCC is operated by an electric solenoid. TCC solenoid operation depends on signals provided by the Engine Coolant Temperature (ECT) sensor, brake switch, Throttle Position (TP) sensor, Vehicle Speed Sensor (VSS) and gear position.



- | | |
|-----------------------------|------------------------------|
| 1. Torque Converter Housing | 12. Planetary Rear Sun Gear |
| 2. Oil Pump | 13. Adapter Case |
| 3. Reverse Clutch Piston | 14. Governor Assembly |
| 4. Reverse Clutch Plate | 15. Governor Hub |
| 5. Transmission Case | 16. Parking Lock Pawl |
| 6. 2nd Clutch | 17. Parking Lock Actuator |
| 7. 3rd Clutch | 18. Servo Piston Cover |
| 8. Sprag Assembly | 19. Valve Body Assembly |
| 9. Planetary Input Sun Gear | 20. Select Shaft Inner Lever |
| 10. Planetary Gear Carrier | 21. Oil Pan |
| 11. Low Brake Band | 22. Torque Converter |
| | 23. Torque Converter Clutch |

95G21168

Fig. 1: Cross-Sectional View Of 3L30 Transmission
 Courtesy of Suzuki of America Corp.

LUBRICATION & ADJUSTMENTS

See appropriate **AUTOMATIC TRANSMISSION SERVICING** article in
TRANSMISSION SERVICE **AUTO TRANS DIAGNOSIS - HYDRA-MATIC 3L30** Article Text (p. 2) 1995 Suzuki

TROUBLE SHOOTING

NOTE: Poor engine performance can have a negative effect on transmission performance.

Preliminary Checks

Ensure fluid level is correct. Inspect and adjust shift linkage and park/neutral position switch (if necessary). Check idle speed RPM and adjust as necessary. Road test vehicle to ensure proper engine performance.

SYMPTOM DIAGNOSIS

Low Fluid Level

Check for fluid leak out of filler tube, external fluid leak(s) and faulty vacuum modulator.

Fluid Leak From Filler Tube

Check for high fluid level, engine coolant in transmission fluid, pinched breather hose and leak in oil pump suction circuit.

Low Fluid Pressure

Check for low fluid level, clogged oil pump screen, leak in oil pump suction circuit, leak in oil pressure circuit, pressure regulator valve malfunction and/or missing valve body sealing ball (plug).

High Fluid Pressure

Check for leaking modulator vacuum line, malfunctioning modulator, leaking engine vacuum system or faulty pressure regulator valve.

Excessive Smoke From Exhaust

Inspect vacuum modulator.

No Torque Converter Clutch Application

Check for 12-volt power supply to transmission, good ground in transmission, faulty harness connections, defective pressure switch, sticking converter clutch control valve, cut or leaking TCC solenoid valve "O" ring, damaged or mispositioned oil pump wear plate, incorrectly tightened converter housing-to-oil pump bolts and/or cut turbine shaft "O" ring.

No Torque Converter Clutch Release Or Shudder

Check for sticking TCC control valve, restricted TCC apply passage, low fluid level, low fluid pressure, low engine RPM, faulty

and/or cut turbine shaft "O" ring.

No Vehicle Movement In Any Range

Check fluid level, clogged oil pump screen, disconnected manual valve link or manual select shaft inner lever, broken input shaft, pressure regulator valve stuck in open position or faulty oil pump.

No Vehicle Movement In Any Gear Position

Check for parking pawl disengagement.

Vehicle Movement Under RPM Increase Only

Check for stuck servo piston, low fluid level, faulty oil pump, missing oil pump screen or missing valve body sealing ball (plug).

Heavy Jerking During Initial Vehicle Movement

Check for low fluid pressure, incorrect modulator valve, stuck pressure regulator valve or missing valve body sealing ball (plug).

No Vehicle Movement In "D" Or "2", Vehicle Moves In "L" Or "R"

Input sprag installed backwards or sprag failure.

No Movement In "R" Only

Check for reverse clutch failure.

Vehicle Movement In Neutral Position

Check for improperly adjusted shift selector cable, broken planetary gear carrier and/or low band adjustment.

No 1-2 Upshift

Check for stuck governor valves, 1-2 shift valve stuck in 1st position, leaking oil pump seal rings, leak in governor pressure circuit and/or clogged governor oil screen.

No 2-3 Upshift

Check for stuck 2-3 shift valve and/or leak in governor pressure circuit.

Upshifting Under Full Throttle Only

Check for faulty modulator, leaking modulator vacuum line, engine vacuum leak and/or stuck kick-down valve or cable.

Upshifting Under Part Throttle Only

Check for stuck kick-down pressure regulator valve and/or misadjusted kick-down cable.

AUTO TR

Vehicle Movement In "1", No Vehicle Movement In "2" Or "R"
1st and reverse control valve stuck in 1st or "R" position.

No Part Throttle 3-2 Downshift At Low Vehicle Speeds
Check 3-2 downshift control valve.

No Forced Downshift
Check kick-down cable adjustment and kick-down pressure
regulator valve.

Transmission Immediately Shifts Into Lower Gear Once Throttle
Is Eased After Full Throttle Upshifting
Check for kick-down valve stuck in open position, stuck kick-
down cable and/or spliced modulator vacuum line.

Transmission Shifts Into Lower Gear At Higher Speeds
Manual select shaft spring pin dropped out, loose connection
at manual valve or pressure loss at governor.

Hard Disengagement Of Select Lever From "P" Position
Missing parking lock actuator guide bushing or stuck manual
select shaft.

Engine Flare, 1-2 Shift
Check for low fluid pressure, missing valve body sealing ball
(plug), leaking 2nd clutch piston seals, 2nd clutch piston check ball
stuck open, broken or cracked 2nd clutch piston, 2nd clutch piston
plates worn or leaking oil pump hub sealing rings.

Engine Flare, 2-3 Shift
Check for low fluid pressure, low band adjustment, missing
valve body sealing ball (plug), leaking 3rd clutch piston seals, 3rd
clutch piston check ball stuck open, broken or cracked 3rd clutch
piston and/or worn input shaft bushing.

Harsh 1-2 Shift
Check for high fluid pressure, stuck 1-2 accumulator valve
and/or broken 2nd clutch spring cushion.

Harsh 2-3 Shift
Check for high fluid pressure or incorrect low band
adjustment.

Harsh 3-2 Manual Downshift
Check for stuck open high speed downshift valve and low band
adjustment.

Harsh 3-2 Coasting Downshift

Check for stuck open low speed downshift timing valve.

High Speed Downshift Flare

Check for low fluid pressure or low band adjustment

Low Speed Forced Downshift Flare

Check for low fluid pressure, low band adjustment, closed high speed downshift timing valve and/or one-way clutch does not lock on 3-1 downshifting.

No Engine Braking In Low

Check select cable adjustment and/or stuck manual low control valve.

No Engine Braking In "2" Range

Check select cable adjustment.

Transmission Does Not Hold In Park

Improperly adjusted select cable, broken parking lock actuator spring or damaged parking pawl and governor hub.

Excessive Noise In All Ranges

Check backlash between sun gear and planetary gears, loose planetary carrier lock plate, defective thrust bearing, worn bushings or loose converter housing bolt contacting torque converter.

Screeching Noise When Starting

Torque converter failure.

Short Vibrating, Hissing Noise Shortly Before 1-2 Upshift

Reverse clutch spring cushion wearing into transmission case.

Buzzing Noise

Clogged oil pump screen.

TRANSMISSION COMPONENT APPLICATION CHART

AA

Selector Lever Position Elements In Use

"D" (Drive)

1st Gear One-Way Clutch & Low Band

2nd Gear 2nd Clutch & Low Band

3rd Gear 2nd Clutch, 3rd Clutch & One-Way Clutch

"2" (Intermediate)

1st Gear One-Way Clutch & Low Band

"L" (1st Gear) 3rd Clutch, One-Way Clutch
& Low Band
"R" (Reverse) Reverse Clutch, 3rd Clutch
& One-Way Clutch
"N" (Neutral) One-Way Clutch
"P" (Park) One-Way Clutch
AA

ELECTRONIC TESTING

TORQUE CONVERTER CLUTCH (TCC)

NOTE: Before performing the following procedures, connect a scan tool to Data Link Connector (DLC) and retrieve any stored Diagnostic Trouble Codes (DTCs). Repair any engine performance-related DTCs first. On Geo, a DTC P0740 identifies a TCC electrical circuit malfunction. On Suzuki, a DTC P0740 or P0770 identifies a TCC solenoid malfunction. Check for blown fuses and repair short(s) to ground if necessary. See appropriate wiring diagram in WIRING DIAGRAMS to aid in component, wire color and terminal identification.

1) Ensure ignition is off. Access Powertrain Control Module (PCM), located under left side of instrument panel, near kick panel. Disconnect PCM 22-pin harness connector (C2 on Geo or E34 on Suzuki).

2) Turn ignition on. Using a voltmeter, measure voltage between ground and PCM harness connector C2 or E34, terminal No. 16 (White/Yellow wire). If battery voltage is present, go to next step. If battery voltage is not present, check TCC relay. See TORQUE CONVERTER CLUTCH (TCC) RELAY. Replace if necessary. If relay is okay, go to step 4).

3) Start engine and allow it to reach normal operating temperature. Raise and support vehicle to allow rear wheels to spin freely. Shift selector lever to "D" position and accelerate. If voltage reading decreases to 0-1 volt at about 47 MPH, check TCC relay. See TORQUE CONVERTER CLUTCH (TCC) RELAY. Replace if necessary. If relay is okay, go to step 6). If voltage reading is not as specified, go to step 5).

4) Check for poor TCC relay harness connection. Check White/Yellow wire between TCC relay and PCM for an open or short to ground. Check Blue/Black wire between TCC relay and main relay for an open or short to ground. Repair as necessary. If no problems are found, substitute a known-good PCM and retest system.

5) Check for poor harness connections at PCM. Repair as necessary. If no problems are found, substitute a known-good PCM and retest system.

6) Turn ignition off. Disconnect TCC relay. Turn ignition on.

Using a voltmeter, measure voltage between ground and TCC relay harness connector terminal No. 2 (Black/White wire). If reading is battery voltage, go to next step. If reading is not as specified, repair open in Black/White wire.

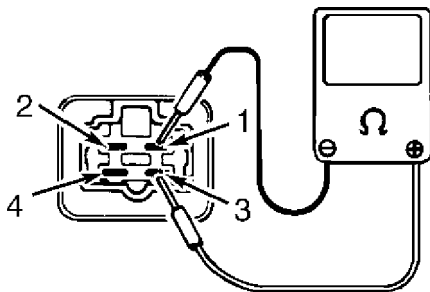
7) Check TCC solenoid. See TORQUE CONVERTER CLUTCH (TCC) SOLENOID. Replace if necessary. If solenoid is okay, go to next step.

8) Check White wire between TCC relay and TCC solenoid for an open or poor connection. Repair as necessary. If no problem is found, check for low fluid pressure, misadjusted kick-down cable or other internal transmission problems.

TORQUE CONVERTER CLUTCH (TCC) RELAY

1) Turn ignition off. Remove TCC relay. Using an ohmmeter, measure resistance between relay terminals No. 1 and 3. See Fig. 2. Resistance should be 90-110 ohms. Continuity should not be present between terminals No. 2 and 4.

2) Apply battery voltage to terminal No. 1, and ground terminal No. 3. Continuity should now be present between terminals No. 2 and 4. Replace relay if it does not test as specified.



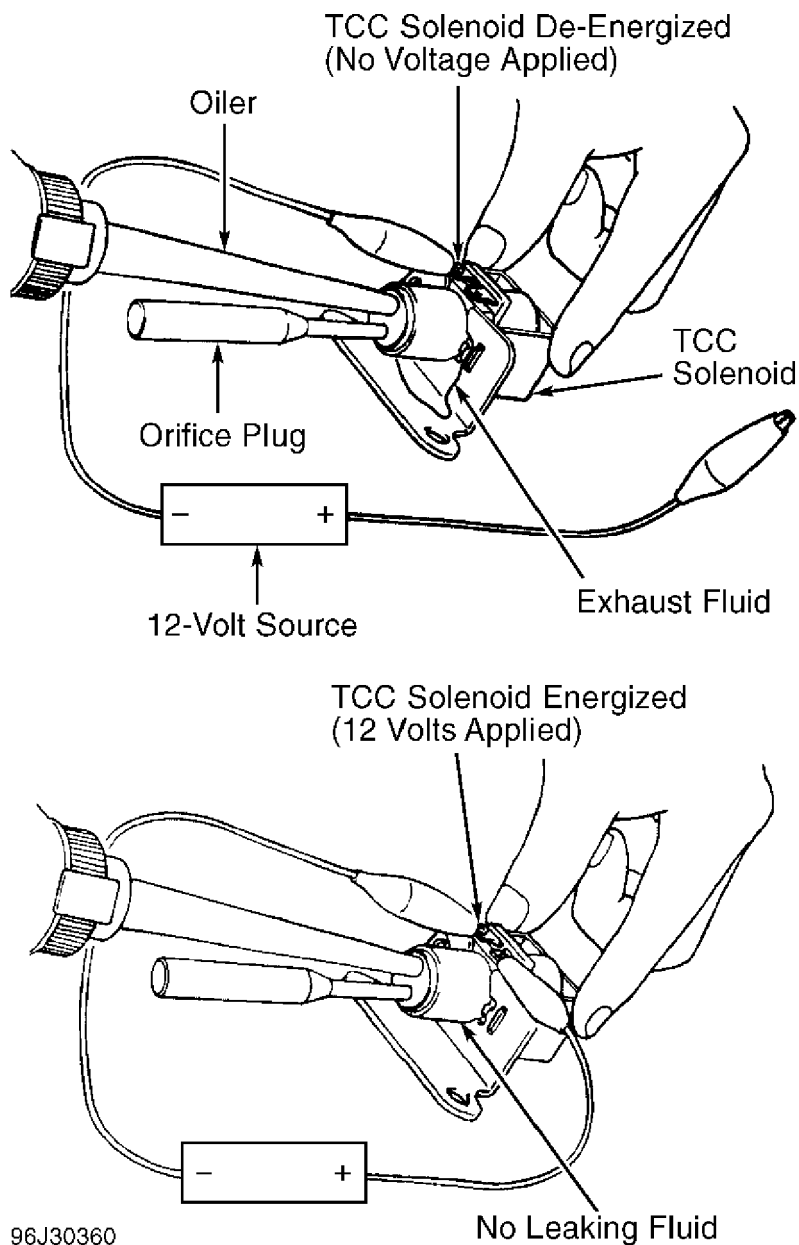
96B09869

Fig. 2: Identifying TCC Relay Terminals
Courtesy of Suzuki of America Corp.

TORQUE CONVERTER CLUTCH (TCC) SOLENOID

1) Remove TCC solenoid from transmission. Using Orifice Plug (09922-85811), plug one oil passage on TCC solenoid. Using an oiler, add ATF to remaining oil passage. See Fig. 3. Oil should exhaust from solenoid.

2) Using fused jumper wires, apply battery voltage and ground to TCC solenoid terminals. Solenoid should click and not allow any oil to exhaust. Replace TCC solenoid if it does not test as specified.



96J30360

Fig. 3: Testing TCC Solenoid
 Courtesy of Suzuki of America Corp.

TESTING

TIME LAG TEST

1) Engine and transmission must be at normal operating temperature. Start engine and ensure idle RPM is within specification with A/C off. Apply service and parking brakes. Using stop watch, measure time until engagement shock is felt when selector lever is shifted from "N" to "D" position.

2) Allow one minute intervals between tests. Perform time measurements 2 more times and calculate average value. Time should be less than 1.2 seconds. Repeat test procedure to test time lag when selector lever is shifted from "N" to "R" position. Time lag should be less than 1.5 seconds. If results are not within specification, inspect internal components.

ROAD TEST

1) Ensure vehicle is at operating temperature. Shift transmission into drive. Accelerate vehicle and ensure vehicle upshifts from 1st to 2nd, then to 3rd gear. TCC should apply while in 3rd gear.

2) Depress accelerator pedal to 1/2 position. TCC should release, then transmission should downshift to 2nd gear. Accelerate to cruising speed until TCC is applied. Using left foot, very lightly apply brake pedal. TCC should disengage.

3) Release accelerator pedal. As vehicle is slowing down, manually shift into 2nd gear, then into low position. Ensure transmission shifts into lower gears and engine braking occurs. Stop vehicle and shift into reverse. Lightly accelerate vehicle to confirm reverse operation. Stop vehicle on slight incline. Shift vehicle into park. Ensure vehicle does not move.

HYDRAULIC PRESSURE TESTS

Line Pressure Test

1) Ensure transmission fluid is at normal operating temperature. Raise and support vehicle. Place a wood block between distributor housing and firewall to prevent damage to distributor cap when lowering transmission.

2) Support transmission with jack. Unbolt cross member and lower transmission to gain access to pressure port. Connect appropriate pressure gauge to line pressure test port on transmission. See Fig. 4.

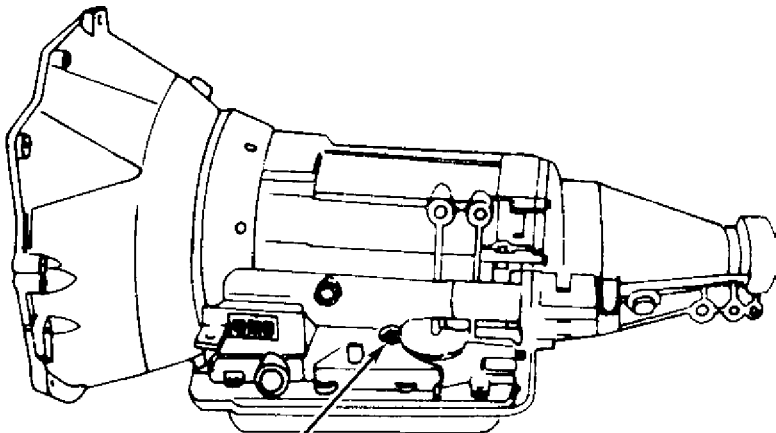
3) Apply service brake and shift transmission to "D" position. Release brake and allow wheels to accelerate to approximately 28 MPH. Allow engine to idle (approximately 1500 RPM). Check line pressure and record pressure reading. Repeat test in "2" and "L" position.

4) Apply brakes. Shift transmission to "D" position. Disconnect modulator vacuum line. Depress accelerator pedal to Wide Open Throttle (WOT). Do not hold engine at WOT for more than 5 seconds. Check line pressure and record pressure reading. Repeat test in "2" and "L" position. See LINE PRESSURE SPECIFICATIONS table.

LINE PRESSURE SPECIFICATIONS

AA

Shifter Position	psi (kg/cm ²)
Idle Speed	
Geo	
"D" & "2"	65 (4.6)
"L"	95 (6.7)
Suzuki	
"D" & "2"	54-63 (3.8-4.5)
"L"	87-102 (6.1-7.1)
WOT	
Geo	
"D" & "2"	118 (8.3)
"L"	160 (11.2)
Suzuki	
"D" & "2"	100-112 (7.0-7.9)
"L"	161-177 (11.3-12.4)
AA	



Line Pressure Port

95A21170

Fig. 4: Identifying Pressure Test Port
 Courtesy of Suzuki of America Corp.

VACUUM MODULATOR

NOTE: A faulty vacuum modulator can cause:

- * Harsh upshift and downshifts.
- * Delayed upshifts.
- * Soft upshifts and downshifts.
- * Slips in "L", "D" and "R".
- * Transmission overheating.
- * Burnt transmission fluid.

1) Remove modulator. Hold modulator so vacuum fitting points downward. Replace modulator if full of transmission fluid. **AUTO TRANS DIAGN**

2) Connect vacuum pump. Apply 20 In. Hg of vacuum. Ensure modulator operates and holds vacuum. Replace if necessary.

ON-VEHICLE SERVICE

EXTENSION HOUSING & GOVERNOR ASSEMBLY

Removal

1) Raise and support vehicle. Place reference marks on drive shaft and companion flange. Remove drive shaft, speedometer cable and speedometer driven gear. Support transmission with jack. Remove transmission-to-cross-member bolts and rear mount from extension housing.

2) Remove extension housing bolts and remove extension housing. Note bolt length and location. On 4WD vehicles, remove transfer case and adaptor. See appropriate article in AXLE SHAFTS & TRANSFER CASES section.

3) Remove snap ring, speedometer drive gear and remaining snap ring from output shaft. Remove governor assembly (if applicable).

Installation To install, reverse removal procedure. Ensure output shaft bolt hole is aligned with governor assembly. Install extension housing and new gasket. Clean all bolt threads.

SHIFT LINKAGE

For shift linkage adjustment, see ADJUSTMENTS in appropriate AUTOMATIC TRANSMISSION SERVICING article.

KICKDOWN CABLE/THROTTLE CABLE

For kickdown or throttle cable adjustment, see ADJUSTMENTS in appropriate AUTOMATIC TRANSMISSION SERVICING article.

REMOVAL & INSTALLATION

For transmission removal and installation procedure, see REMOVAL & INSTALLATION in appropriate AUTOMATIC TRANSMISSION REMOVAL article.

TORQUE CONVERTER

NOTE: Torque converter is a sealed unit and must be serviced as a complete assembly. Perform the following tests to check torque converter condition. Torque converter and transmission cooler must be thoroughly cleaned and flushed if transmission fluid is contaminated.

STATOR (ONE-WAY CLUTCH) TEST

Insert finger into splined inner race of roller clutch and try to turn race in both directions. Clutch should lock when rotated counterclockwise, and turn freely when rotated clockwise. Replace torque converter if clutch fails test.

TRANSMISSION DISASSEMBLY

1) Remove oil pan and filter. Remove manual detent roller assembly. Remove TCC solenoid and harness assembly. Remove governor pressure switch from valve body. Remove reinforcement plate under TCC solenoid. Remove servo cover.

2) Unbolt and remove valve body with manual valve, link, separator plate and gaskets. Remove check ball in transmission case. See Fig. 5. Using Servo Compressor (09927-66020 or J-23075), compress servo piston assembly and remove snap ring. See Fig. 6.

3) Remove compressor. Remove servo assembly with spring and rod. Remove Park/Neutral Position (PNP) switch. Pull roll pin from manual select shaft. Place a metal plate between manual select shaft inner lever and case. Loosen nut on end of shaft and remove. Remove lever and select shaft.

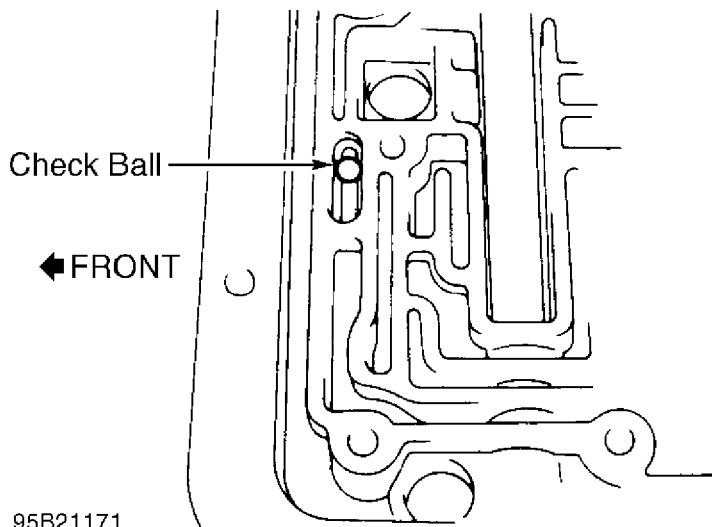
4) Remove extension housing or transfer case. Remove modulator and modulator plunger. Remove roll pin from kickdown valve sleeve. Remove remaining kickdown valve components. See Fig. 7. Remove speedometer gear retaining snap ring, gear and snap ring.

5) Remove governor hub. Remove governor from hub. Remove small filter screen from hub. See Fig. 8. Remove "O" ring from input shaft. Remove bolts securing converter housing to transmission case.

6) Remove housing, oil pump and reverse clutch piston as complete assembly. Remove 2nd and 3rd clutch assemblies. See Fig. 8. Remove remaining reverse clutch plate and pressure plate.

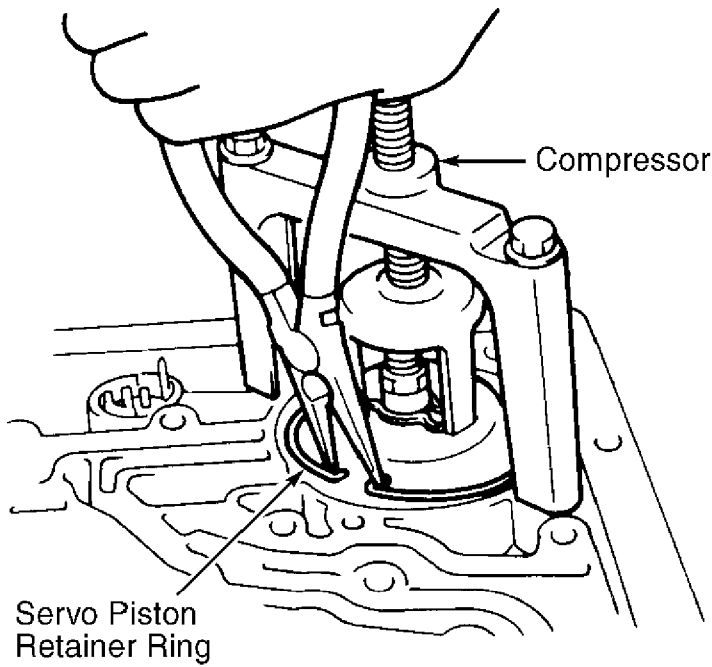
7) Remove planetary gear. Remove thrust bearing from top of sun gear if bearing did not stay with planetary gear. Remove rear sun gear assembly. Remove low brake band and any remaining thrust bearing and washer.

8) Remove manual select shaft inner lever and parking lock actuator assembly. Separate 2nd clutch from 3rd clutch. Remove electrical harness connector.



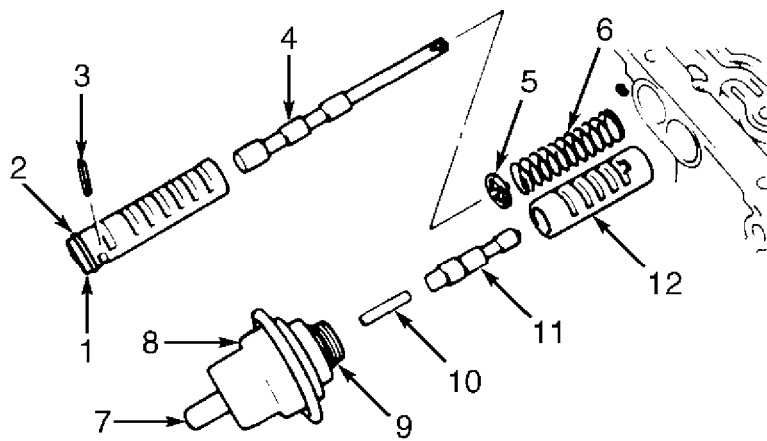
95B21171

Fig. 5: Locating Transmission Case Check Ball
 Courtesy of Suzuki of America Corp.



95C21172

Fig. 6: Compressing Servo Piston Assembly
 Courtesy of Suzuki of America Corp.

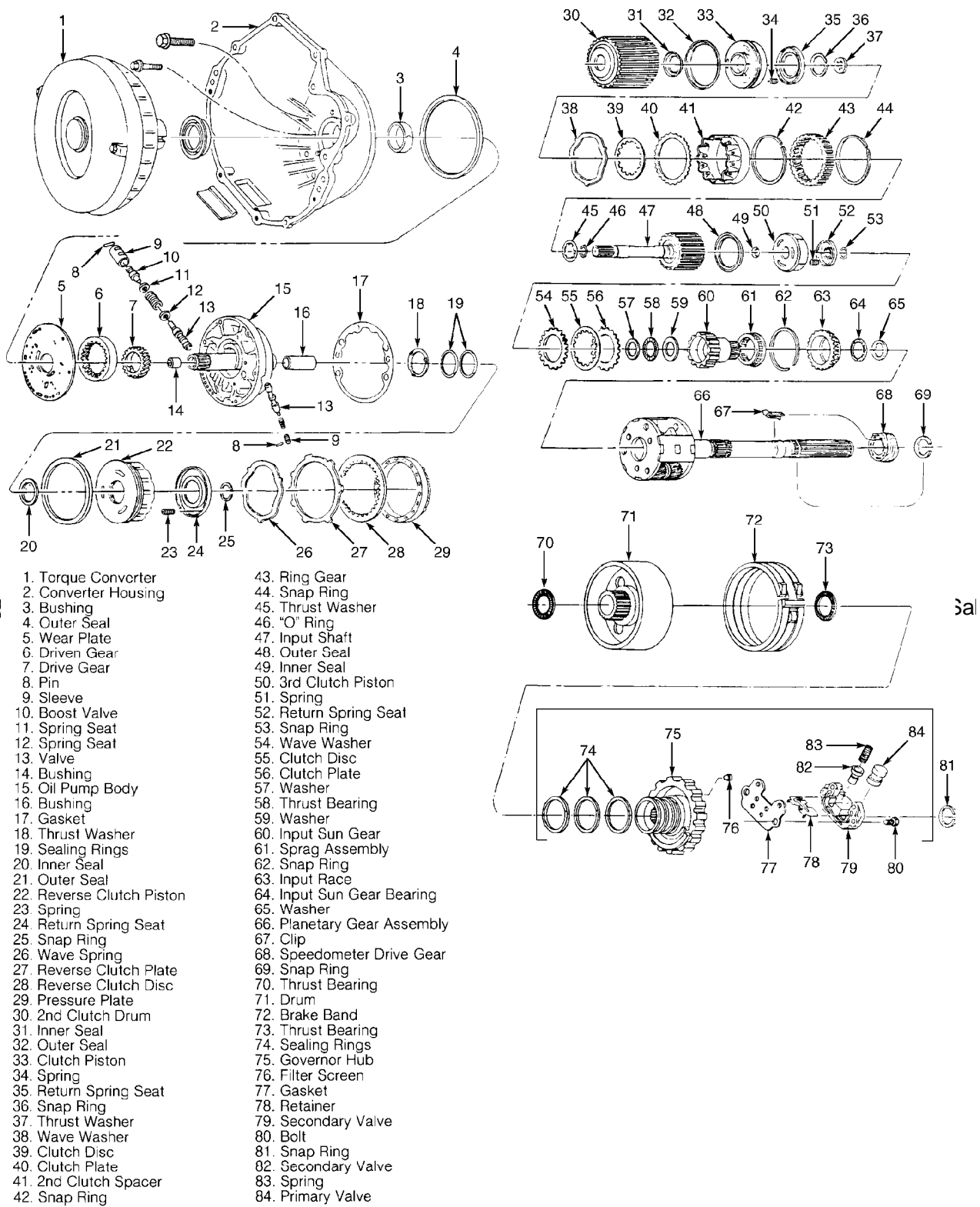


- | | |
|--------------------------|----------------------------|
| 1. Kickdown Valve Sleeve | 7. Hose No. 1 |
| 2. "O" Ring | 8. Vacuum Modulator |
| 3. Spring Pin | 9. "O" Ring |
| 4. Kickdown Valve | 10. Modulator Plunger |
| 5. Spring Seat | 11. Modulator Valve |
| 6. Spring | 12. Modulator Valve Sleeve |

95D21173

Fig. 7: Exploded View Of Modulator & Kick-Down Assemblies
 Courtesy of Suzuki of America Corp.

AUTO TRAN:



95E21174

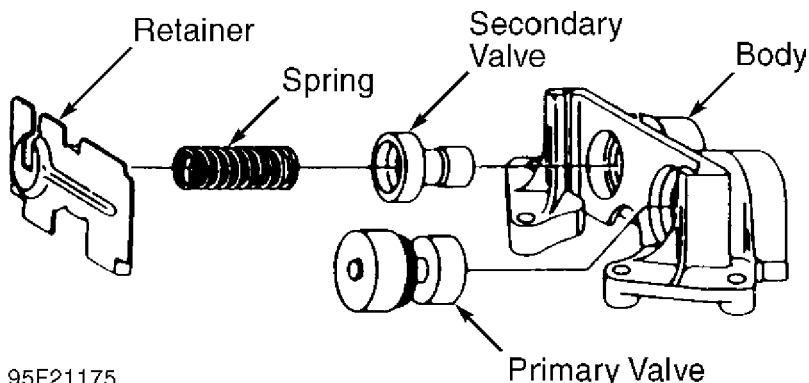
Fig. 8: Exploded View Of Transmission Assembly
 Courtesy of Suzuki of America Corp.

COMPONENT DISASSEMBLY & REASSEMBLY

GOVERNOR BODY

Disassembly & Reassembly

Depress secondary valve spring and remove secondary valve spring retainer. See Fig. 9. Remove components from governor body. Inspect valves for scoring, nicks or burrs. Polish with crocus cloth. To assemble, reverse disassembly procedures. Ensure valves move freely.



95F21175
Fig. 9: Exploded View Of Governor Assembly
 Courtesy of Suzuki of America Corp.

VALVE BODY ASSEMBLY

NOTE: All valve body components must be installed in original location. Lay all components in sequence during removal for reassembly reference.

Disassembly

Remove manual valve. Individually remove each valve retaining pins. Remove all components. See Fig. 10.

Inspection

Clean all parts in solvent. Dry with compressed air. Ensure all valve body passages are clear. Inspect valves for scoring or roughness. Ensure valves slide freely in bores. Inspect valve springs for damage, squareness and collapsed coils. Measure spring free length and outer diameter. Replace spring if not within specification. See appropriate VALVE BODY SPRING SPECIFICATIONS table.

VALVE BODY SPRING SPECIFICATIONS (GEO)

AA

Description	Diameter		Free Length		Color
	In.	(mm)	In.	(mm)	

1-2 Shift Control			
Valve	(1)	(1)	(1)
1-2 Shift Valve .....	.750 (19.1)	.. 2.438 (61.9)	(1)
2-3 Shift Control			
Valve .....	.687 (17.4)	.. 1.750 (44.5)	(1)
3-2 Control Valve .....	.438 (11.1)	.. 1.750 (44.5)	(1)
Detent Pressure			
Regulator .....	.500 (12.7)	.. 1.625 (41.3)	(1)
High Speed Downshift			
Valve .....	.438 (11.1)	.. 1.313 (33.4)	(1)
Low Speed Downshift			
Valve .....	.438 (11.1)	.. 1.375 (34.9)	(1)
Low Reverse Control			
Valve .....	.438 (11.1)	.. 1.313 (33.4)	(1)
1-2 Accumulator			
Valve .....	.500 (12.7)	.. 1.063 (27.0)	(1)

(1) - Information not available from manufacturer.

AA

VALVE BODY SPRING SPECIFICATIONS (SUZUKI)

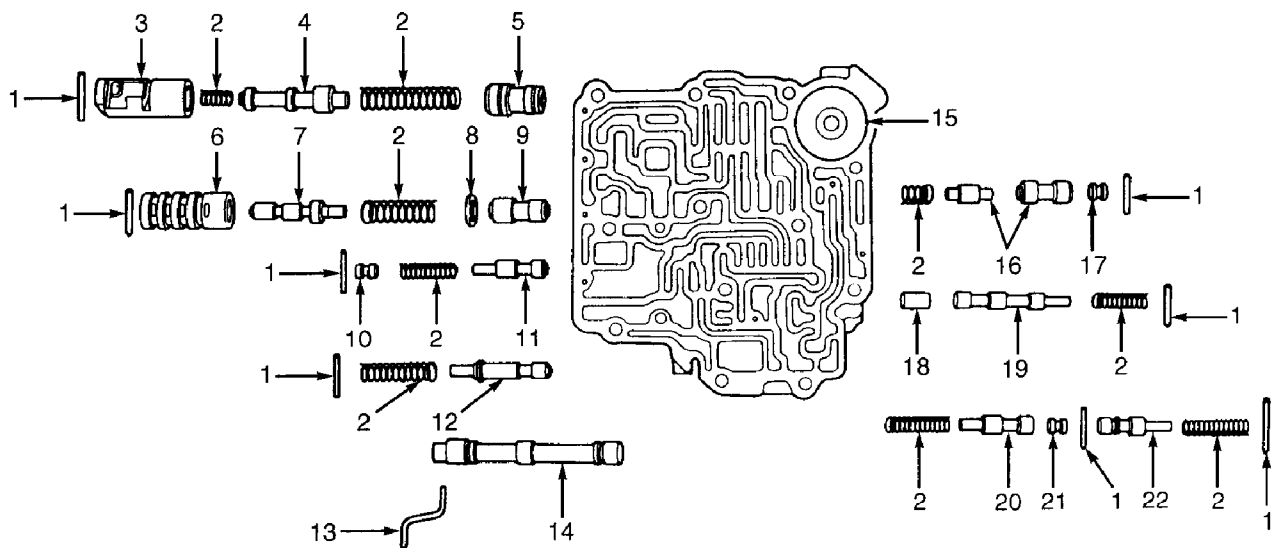
AA

Description	Diameter		Free Length		Color
	In.	(mm)	In.	(mm)	
1-2 Shift Control					
Valve .....	.31	(8)	....	.53 (13.5)	Black
1-2 Shift Valve .....	.72	(18.3)	...	2.46 (62.5)	Lt. Blue
2-3 Shift Control					
Valve .....	.72	(18.3)	....	2.13 (54)	Brown/Yellow
3-2 Control Valve .....	.41	(10.3)	....	1.61 (41)	Silver
Detent Pressure					
Regulator .....	.47	(12)	.....	1.57 (40)	Yellow/Green
High Speed Downshift					
Valve .....	.48	(12.2)	..	1.31 (33.2)	Blue/Pink
Low Speed Downshift					
Valve .....	.4	(10.3)	....	1.30 (33)	Blue/Green
Low Reverse Control					
Valve .....	.4	(10.3)	....	1.34 (34)	Light Green
1-2 Accumulator					
Valve .....	.52	(13.3)	...	.67 (17)	Green/Yellow

AA

Reassembly

Install valves, springs, plugs and retaining pins in proper order and location. Use a liberal amount of transmission fluid. Ensure valves move freely and snap back when moved.



- 1. Pin
- 2. Spring
- 3. Sleeve
- 4. 1-2 Shift Control Valve
- 5. 1-2 Shift Valve
- 6. Sleeve
- 7. 2-3 Shift Control Valve
- 8. Spring Seat
- 9. 2-3 Shift Valve
- 10. Plug
- 11. 3-2 Control Valve
- 12. Detent Pressure Regulator Valve
- 13. Link
- 14. Manual Valve
- 15. 1-2 Accumulator Piston Assembly
- 16. 1-2 Accumulator Valve
- 17. Plug
- 18. Reverse Control Valve
- 19. Manual Low Control Valve
- 20. Low Speed Downshift Timing Valve
- 21. Intermediate Valve
- 22. High Speed Downshift Timing Valve

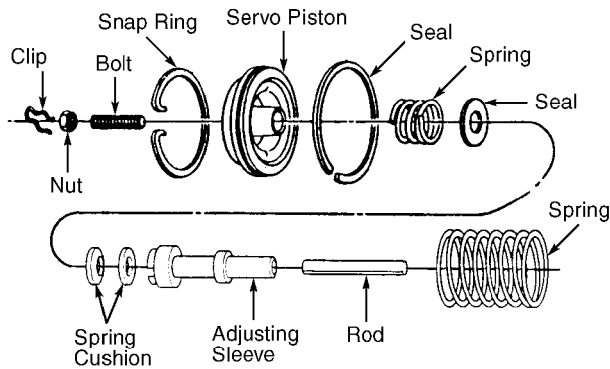
95G21176

Fig. 10: Exploded View Of Valve Body Assembly
 Courtesy Of Suzuki of America Corp.

SERVO PISTON ASSEMBLY

Disassembly & Reassembly

Loosen adjusting stud nut and remove. Compress piston and remove clip. See Fig. 11. Clean all parts and inspect for wear or damage. To reassemble, reverse disassembly procedure.



95H21177

Fig. 11: Exploded View Of Servo Piston Assembly
 Courtesy of Suzuki of America Corp.

CONVERTER HOUSING, OIL PUMP & REVERSE CLUTCH ASSEMBLY

Disassembly

1) Remove selective thrust washer from oil pump shaft (if necessary). Remove bolts and separate converter housing from oil pump. Remove pump wear plate. Mark pump gears with reference marks and remove gears.

2) Using appropriate compressor, compress reverse clutch spring seat. Remove snap ring. Remove reverse clutch piston. See Fig. 8. If necessary, remove valve assemblies from oil pump by removing retaining pins.

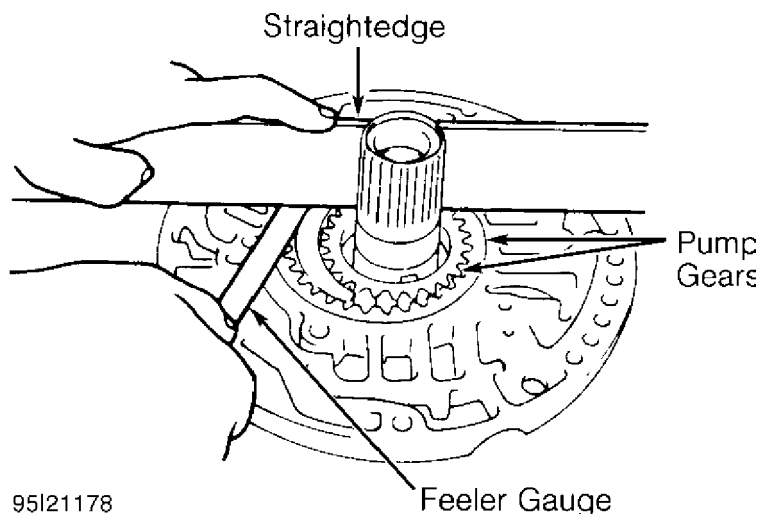
Inspection

Clean all components in solvent. Inspect valves and valve bores for scoring, burrs and nicks. Polish valves with crocus cloth (as needed). Using straightedge and feeler gauge, inspect pump to gear clearance. See Fig. 12. Clearance should be .0005-.0032" (.02-.08 mm).

Reassembly

1) Place wear plate on pump and align bolt holes. Install NEW oil seal in converter housing. Place converter housing on oil pump. Loosely install bolts. Install oil pump Aligning Sleeve (09927-66010 or J-23082-01) through converter housing into pump. Tighten bolts to specification. See TORQUE SPECIFICATIONS.

2) Install reverse clutch piston onto rear face of pump. Place springs onto piston. Install spring seat. Compress spring seat and install snap ring.



95I21178

Feeler Gauge

Fig. 12: Checking Oil Pump Gear Clearance
Courtesy of Suzuki of America Corp.

2ND CLUTCH ASSEMBLY

1) Remove snap ring from 2nd clutch drum. Remove ring gear, snap ring and spacer. See Fig. 8. Remove clutch plates and discs. Remove bronze thrust washer.

2) Using appropriate spring compressor, compress spring seat and remove snap ring. Remove spring seat, return springs and piston.

Inspection & Reassembly

Apply compressed air to piston check ball. Ensure air passes in one direction only. To assemble 2nd clutch assembly, reverse disassembly procedure.

3RD CLUTCH ASSEMBLY

Disassembly

1) Mount 3rd clutch assembly in soft-jawed vise. Compress retaining ring using several thin blade screwdrivers. Insert screwdrivers in slots in drum and push up on inside clutch plate to force snap ring from groove.

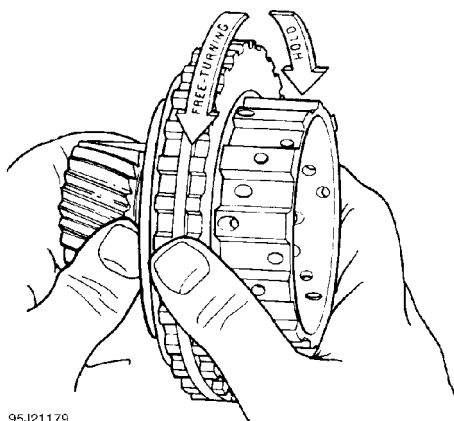
2) Remove 3rd clutch hub, clutch plates, thrust bearing and washer. See Figs. 8 and 13. Disassemble 3rd clutch hub. Note direction of sprag assembly.

3) Using appropriate spring compressor, compress return spring seat and remove snap ring. Remove spring seat, return springs and piston.

Inspection & Reassembly

1) Apply compressed air to piston check ball. Ensure air passes in one direction only. Once hub assembly is assembled, check one-way clutch rotation.

2) Holding hub assembly with input gear facing forward, input gear should lock in clockwise rotation. See Fig. 13. To assemble remaining 3rd clutch components, reverse disassembly procedure.



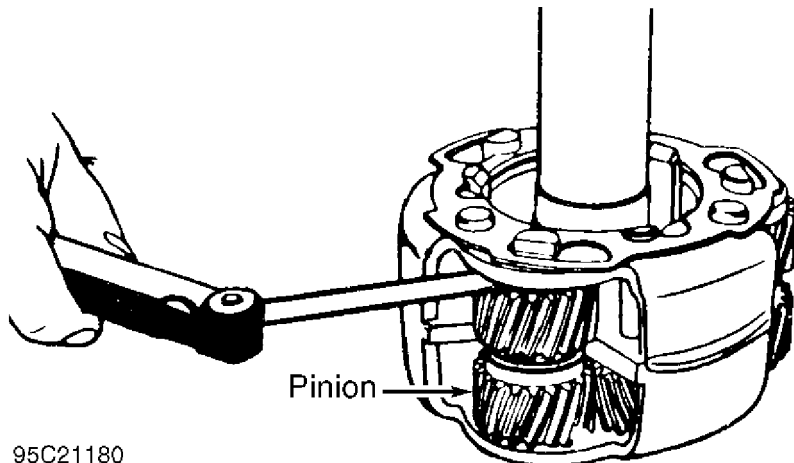
95J21179

Fig. 13: Checking 3rd Clutch Hub Rotation
Courtesy of Suzuki of America Corp.

PLANETARY GEAR CARRIER

Inspection

Visually check carrier for distortion and damage. Using feeler gauge, check planetary pinion gear clearance. See Fig. 14. Clearance should be .005-.035" (.13-.85 mm). Replace as needed.



95C21180

Fig. 14: Checking Planetary Gear Pinion Gear Clearance
Courtesy of Suzuki of America Corp.

TRANSMISSION REASSEMBLY

NOTE: Ensure correct thrust bearing and washer placement during reassembly. See Fig. 15.

NOTE: Soak all friction discs and brake band in transmission fluid for at least 15 minutes before reassembly.

1) Align tangs of clutch discs in 2nd clutch assembly and install 3rd clutch assembly. Place transmission case facing up. Install brake band. Install thrust washer, thrust bearing and low brake drum (planetary rear sun gear) with rear sun gear thrust washer.

2) Place thrust bearing and washer on planetary rear sun gear and install planetary gear carrier. Place thrust washer and bearing into top of planetary carrier. Insert 2nd/3rd clutch assemblies into case.

NOTE: Manufacturer does not provide reverse clutch pressure plate thickness specifications for Geo. The following procedure applies to Suzuki only.

3) Determine correct reverse clutch pressure plate thickness. Stack steel and lined plates with spring plate on surface plate. Place current pressure plate on top of stack. Compress stack by hand. Using

vernier caliper, measure stack height. See Fig. 16.

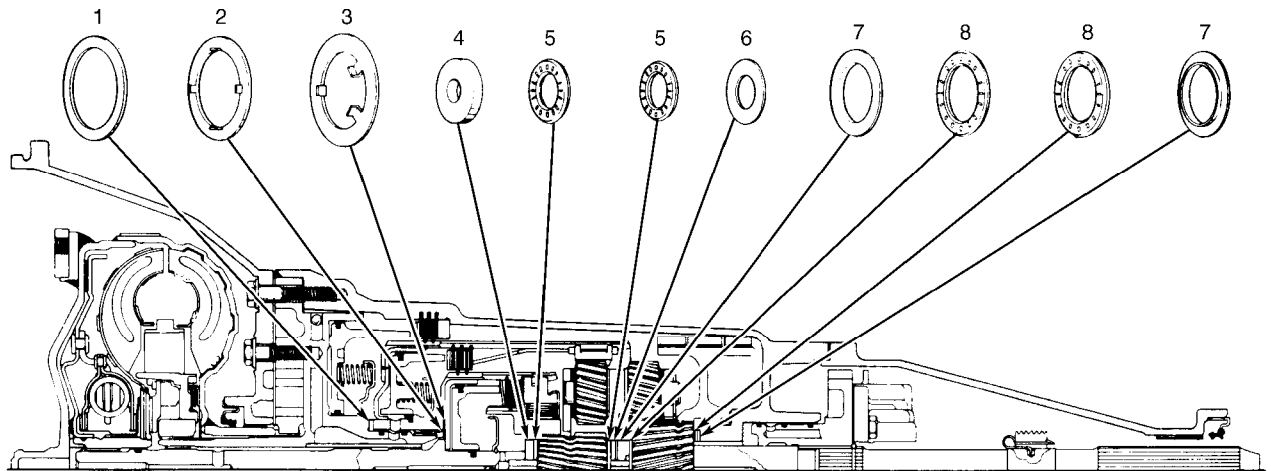
4) To determine correct pressure plate, see REVERSE CLUTCH PRESSURE PLATE SELECTION (SUZUKI) table. Install selected pressure plate, steel clutch plate, then clutch disc and repeat. End with spring cushion plate.

REVERSE CLUTCH PRESSURE PLATE SELECTION (SUZUKI)

AA

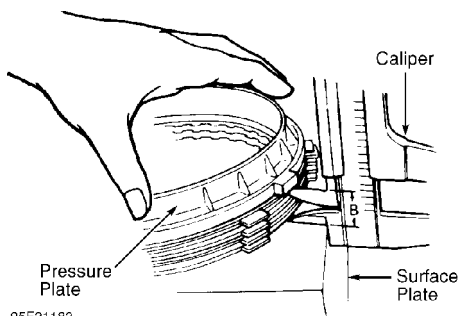
Stack Height	Pressure Plate
In. (mm)	In. (mm)
.741-.750 (18.82-19.11) .....	.248-.252 (6.30-6.40)
.730-.741 (18.53-18.81) .....	.259-.263 (6.59-6.69)
.718-.729 (18.24-18.52) .....	.271-.275 (6.88-6.98)
.707-.718 (17.95-18.23) .....	.282-.286 (7.17-7.27)

AA



- | | |
|-----------------------------------|---------------------------------|
| 1. Selective Thrust Washer | 5. Input Sun Gear Bearing |
| 2. 2nd-To-3rd Clutch Washer | 6. Input Gear-To-Carrier Washer |
| 3. 2nd-To-3rd Clutch Washer | 7. Reaction Gear Bearing |
| 4. Input Shaft-To-Sun Gear Washer | 8. Reaction Gear Washer |

95D21181
Fig. 15: Identifying Transmission Thrust Bearings & Washers
 Courtesy of Suzuki of America Corp.



95E21182
Fig. 16: Measuring Reverse Clutch Stack Height (Suzuki)
 Courtesy of Suzuki of America Corp.

5) Determine correct input shaft thrust washer. Place Depth Measuring Tool (09923-46010 or J-23085) on flange of case. See Fig. 17. Loosen thumb screw and allow plunger to contact thrust face of 2nd clutch housing. Tighten thumb screw.

6) Remove measuring tool. Using feeler gauge, measure length of plunger protrusion. Select appropriate thrust washer to obtain .014-.031" (.36-.79 mm) end play and install. See SELECTIVE THRUST WASHER SELECTION table.

SELECTIVE THRUST WASHER SELECTION

AA

I.D No.	Color	Thickness
2	Yellow	.060-.074 (1.52-1.88)
3	Red	.068-.079 (1.73-2.01)
4	Black	.075-.084 (1.91-2.13)
5	Natural	.083-.089 (2.11-2.26)
6	Green	.090-.094 (2.29-2.39)
7	Blue	.095-.102 (2.41-2.59)

AA

7) Install reverse clutch, oil pump and converter housing assembly. Install bolts and tighten to specification. See TORQUE SPECIFICATIONS. Inspect input shaft end play. Ensure end play is .014-.031" (.36-.79 mm). If end play is not within specification, select alternate thrust washer and remeasure.

8) Install "O" ring on input shaft. Install governor assembly on back end of transmission. Install snap ring, speedometer drive gear and snap ring. Install extension housing or transfer case (as applicable).

9) Install servo piston return spring and piston rod into case. Install servo piston. Ensure adjustment bolt is loose. Using Servo Compressor (09927-66020 or J-23075), compress servo piston assembly and install snap ring. See Fig. 6.

10) Adjust brake band. Secure servo piston sleeve with wrench. Turn adjustment bolt until it contacts band. Using torque wrench, tighten adjustment bolt to 40 INCH lbs. (4.5 N.m). Back off adjustment bolt EXACTLY 5 turns and tighten lock nut.

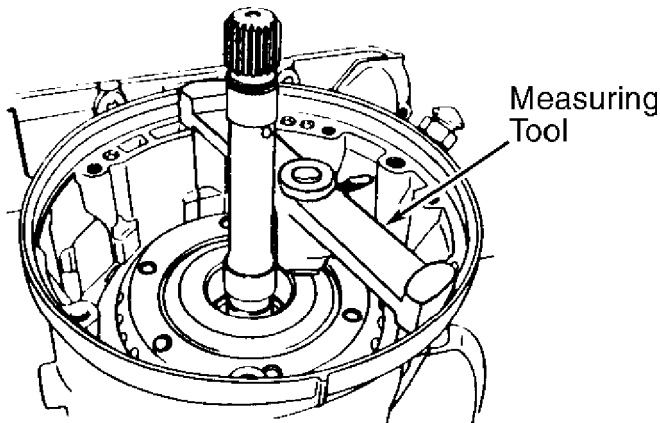
11) Install lever and select shaft. Tighten nut on end of shaft. Install roll pin in manual select shaft. Install park/neutral position switch. Install check ball in case oil passage. See Fig. 5.

12) Install valve body onto case with new gaskets and separator plate. Ensure manual valve link is attached to select lever. Tighten valve body bolts to specified torque. See TORQUE SPECIFICATIONS. See Fig. 18.

13) Install detent roller assembly. Install filter (screen). Install reinforcement plate. Install oil pressure switch. Install TCC solenoid with oil pipes. Install and connect wiring harness. Install

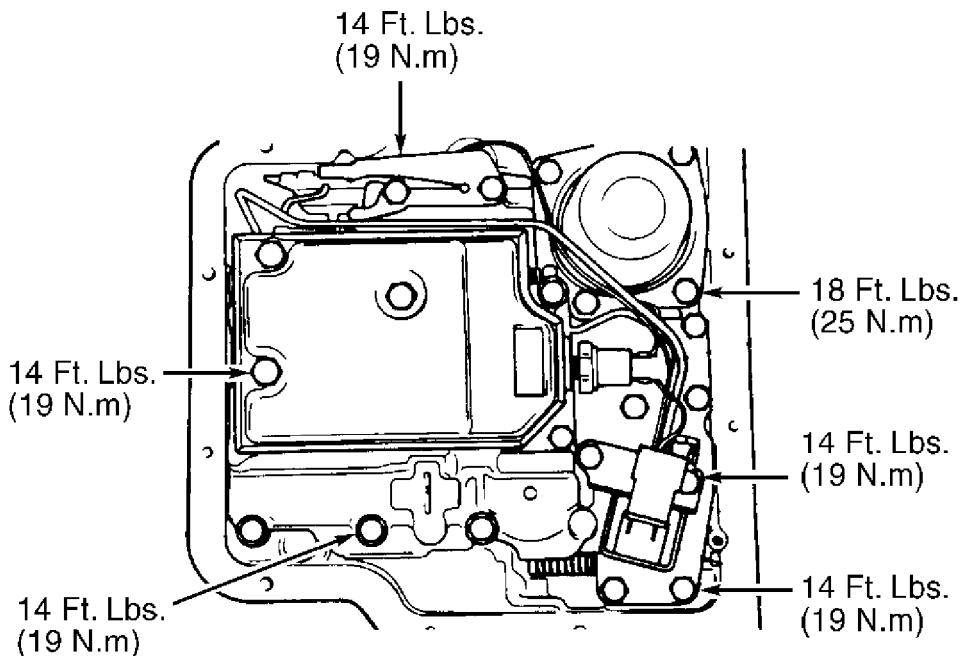
servo cover.

14) Install kick-down cable. Install oil pan with magnets. Install oil cooler pipes. Tighten bolts to specification. See TORQUE SPECIFICATIONS. Install torque converter. Measure converter installed depth to confirm correct installation. See Fig. 19. Depth on Sidekick should be 1.21-1.33" (30.67-33.83 mm). Depth on Tracker should be .83-.91" (21.2-23.2 mm).



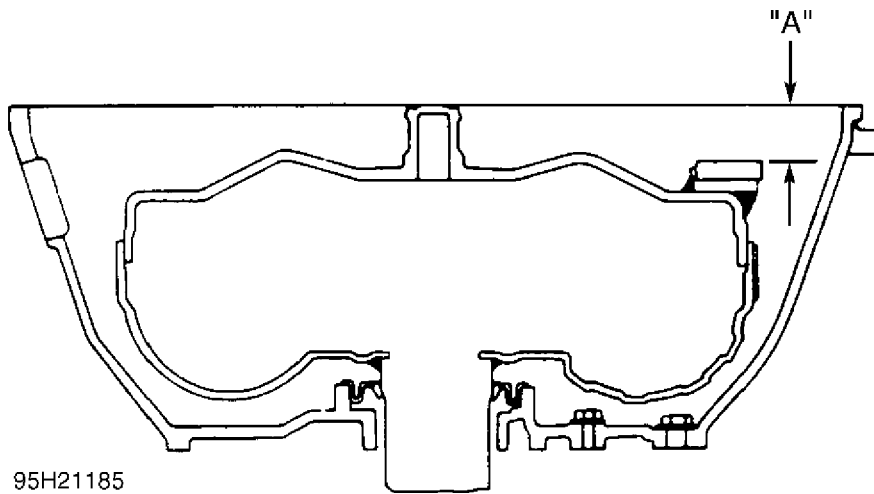
95F21183

Fig. 17: Measuring 2nd Clutch Drum Depth
Courtesy of Suzuki of America Corp.



95G21184

Fig. 18: Installing Valve Body
Courtesy of Suzuki of America Corp.



95H21185

Fig. 19: Measuring Torque Converter Installation
 Courtesy of Suzuki of America Corp.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

AA

Application	Ft. Lbs. (N.m)
Converter-To-Drive Plate Bolt	
Geo	35 (48)
Suzuki	47 (65)
Cooler Union Nut	
Geo	15 (20)
Suzuki	21 (30)
Extension Housing-To-Case Bolt	23 (31)
Oil Pump-To-Converter Housing Bolt	14 (19)
Oil Screen Bolt	14 (19)
Park/Neutral Position Switch	
Adjusting Bolt	15 (21)
Selector Lever Nut	
Geo	20 (27)
Suzuki	14 (19)
Servo Cover Bolt	18 (25)
Transmission Case-To-Converter Housing Bolt	25 (34)
Transfer Case Bolt	17 (23)
Valve Assembly-To-Case Bolt	14 (19)

INCH Lbs. (N.m)

Brake Band Adjusting Bolt	36 (4.1)
Oil Pan Bolt	108 (12.2)
Oil Pressure Switch	84 (9.5)

AA

WIRING DIAGRAMS

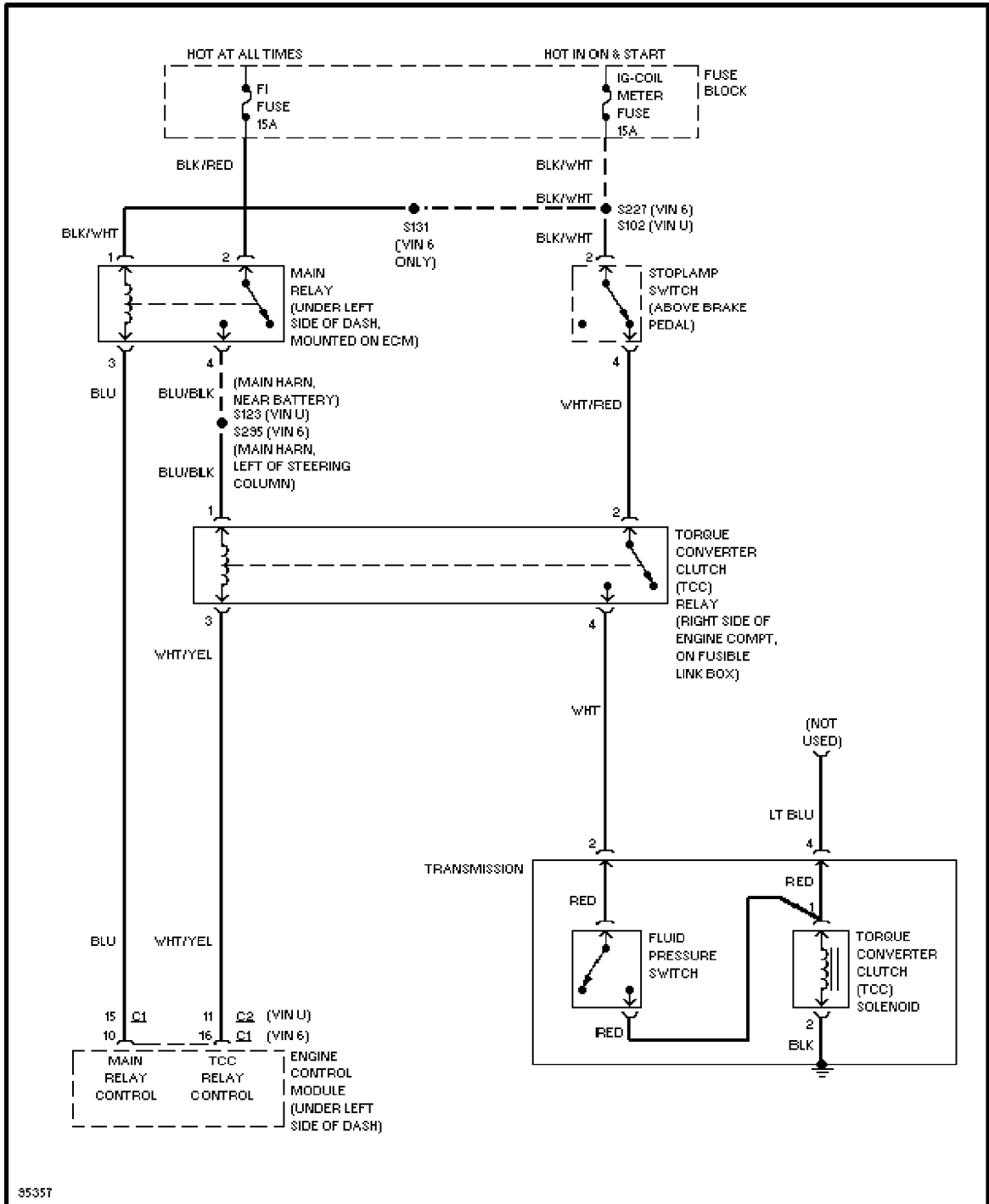


Fig. 20: 1995 Transmission Wiring Diagram (Geo Tracker)

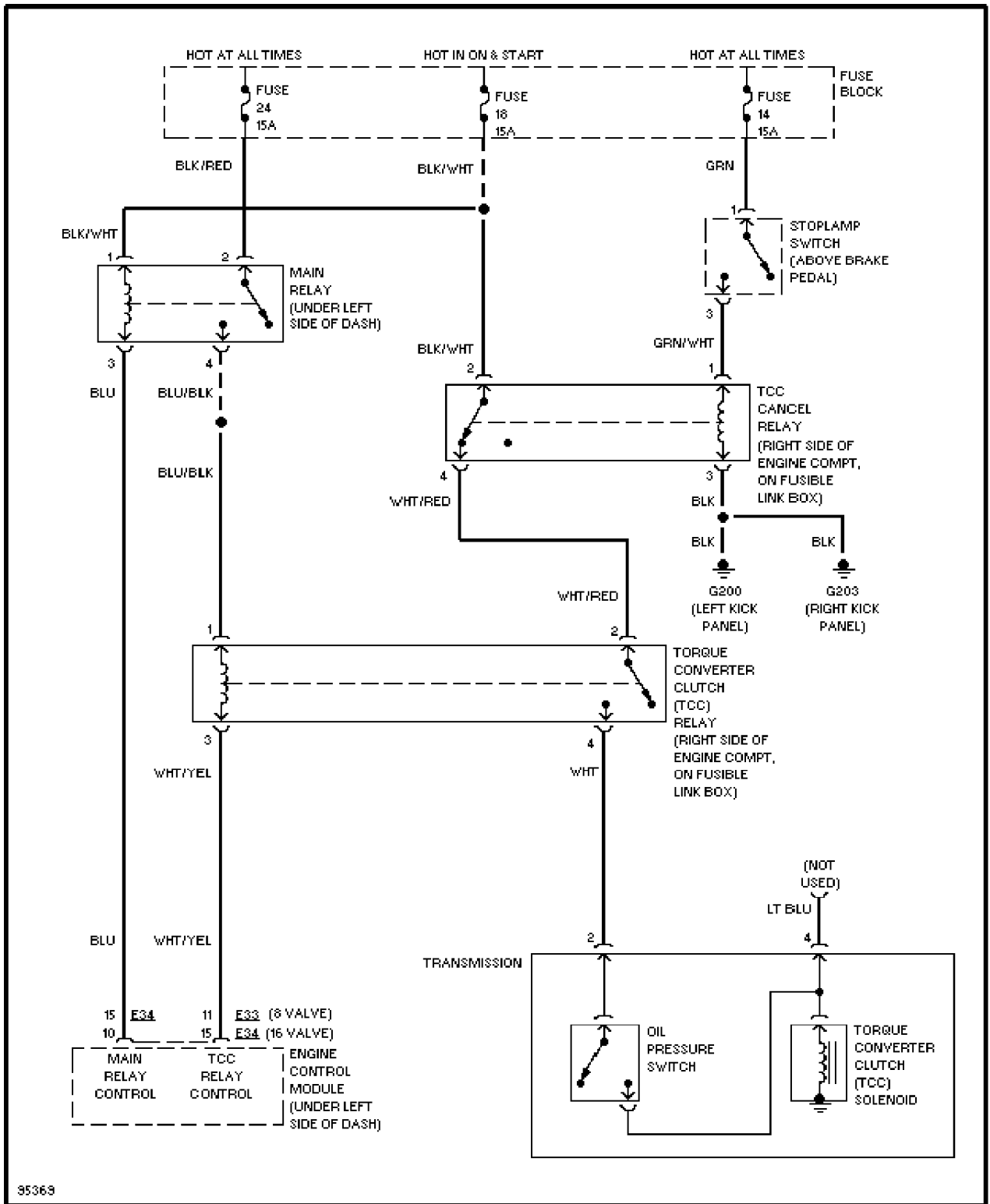


Fig. 21: 1995 Transmission Wiring Diagram (Suzuki Sidekick 1.6L)

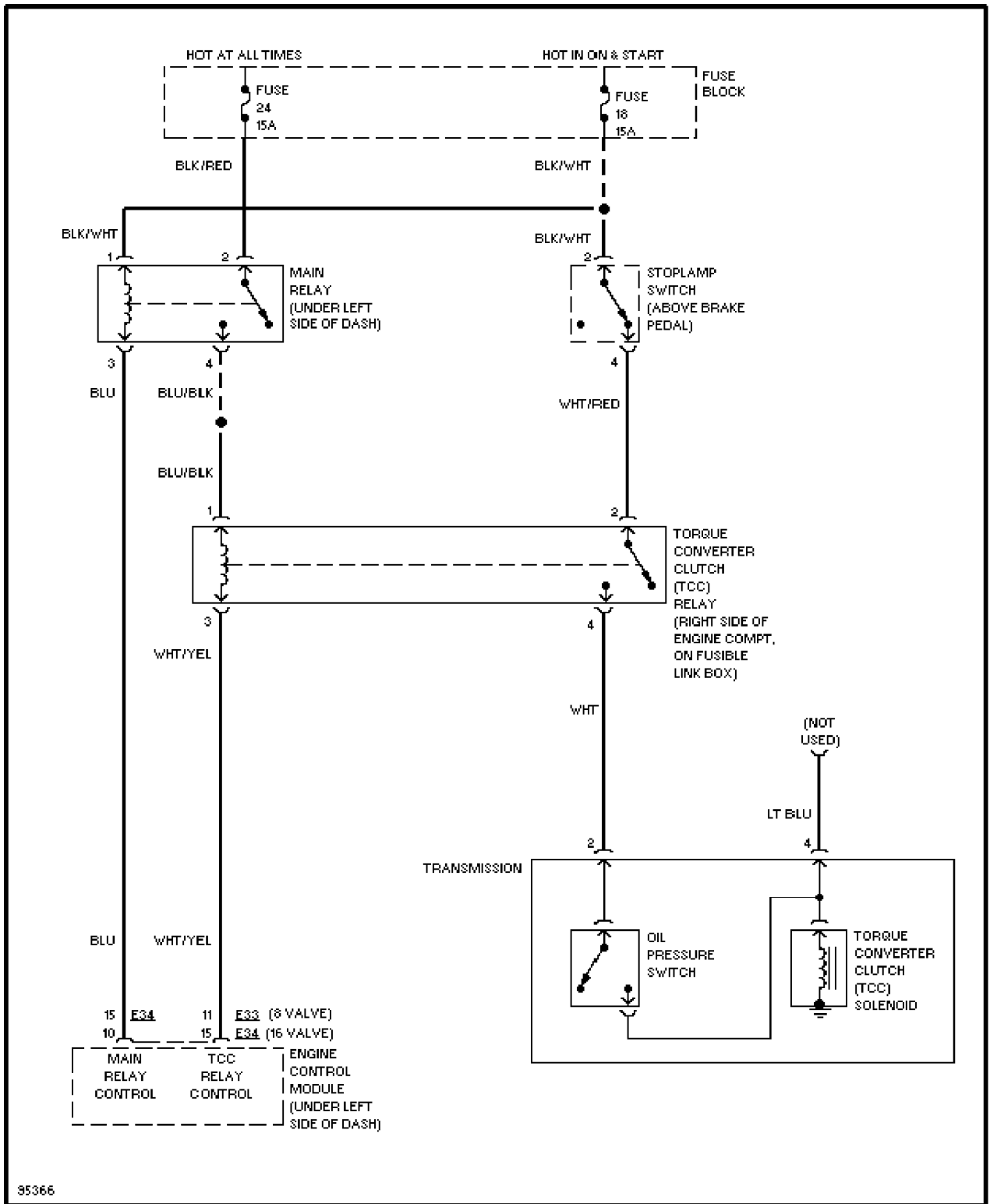
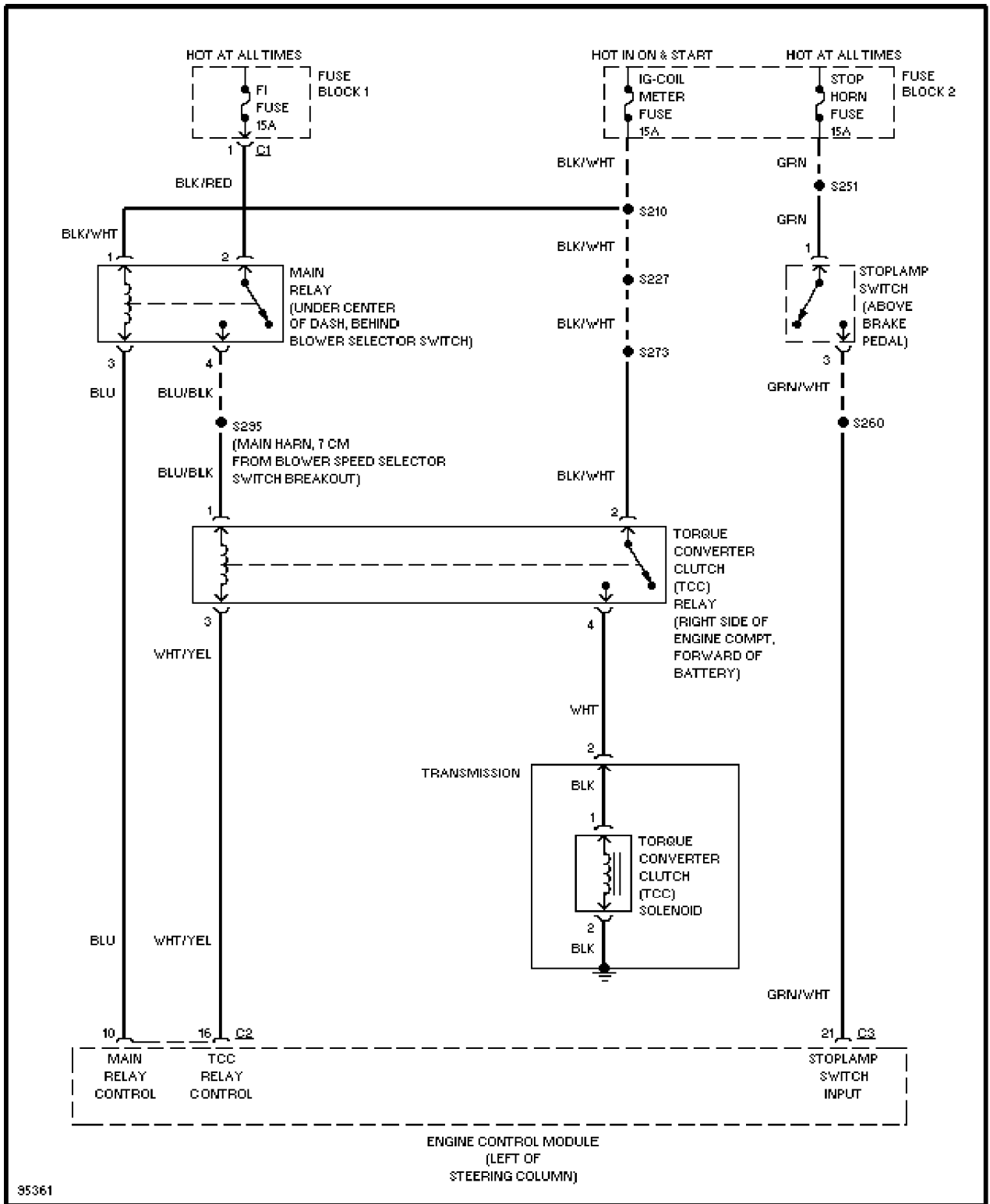


Fig. 22: 1996 Transmission Wiring Diagram (Geo Tracker)



95361

Fig. 23: 1996 Transmission Wiring Diagram (Suzuki Sidekick 1.6L)
 AUTO TRANS DIAGNOSIS - HYDRA-MATIC 3L30 Article Text (p. 30) 1995 Suzuki Sidekick For saer Nira Sal

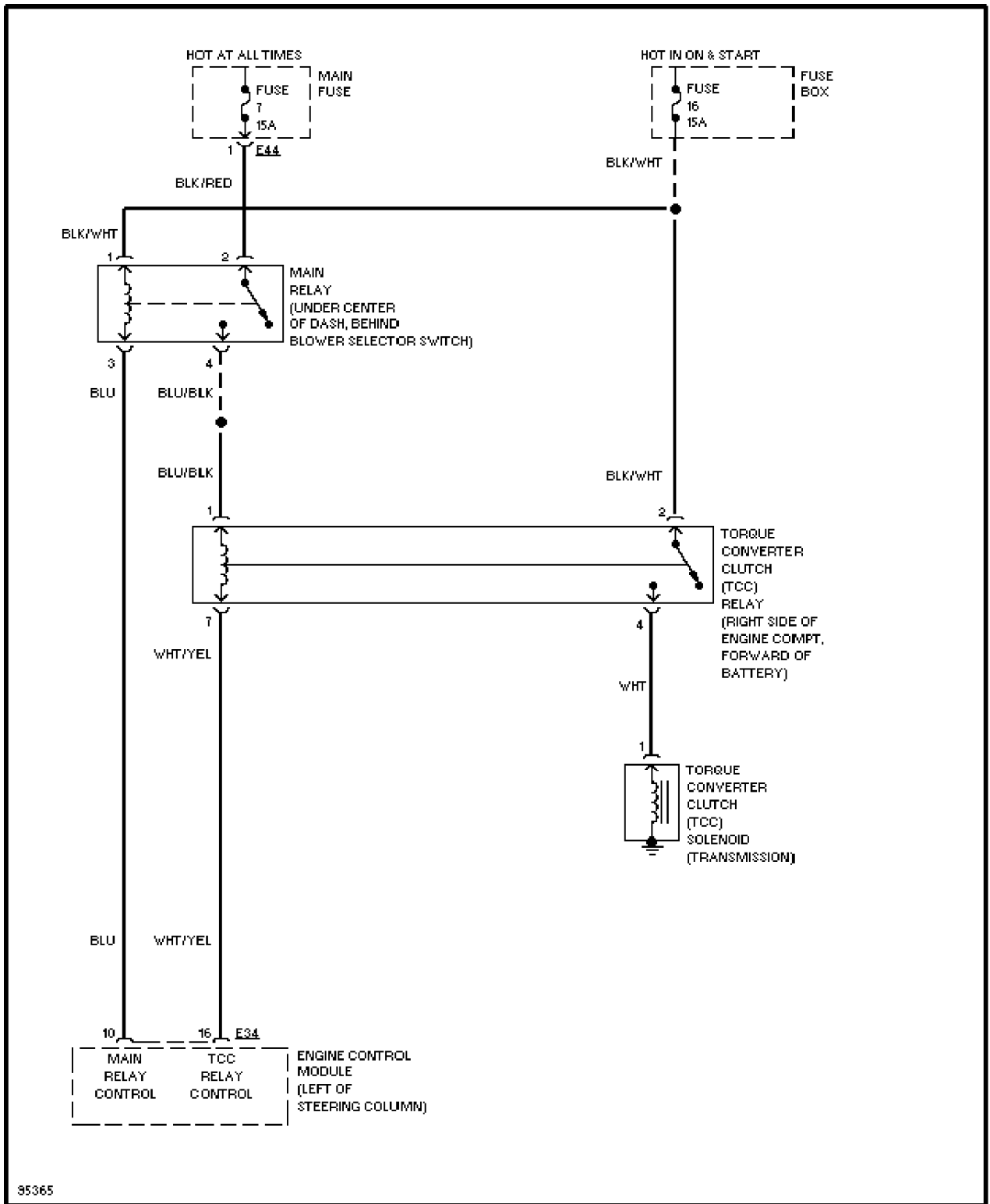


Fig. 24: 1996 Transmission Wiring Diagram (Suzuki Sidekick 1.6L)
 AUTO TRANS DIAGNOSIS - HYDRA-MATIC 3L30 Article Text (p. 31) 1995 Suzuki Sidekick For saer Nira Sal
 END OF ARTICLE