


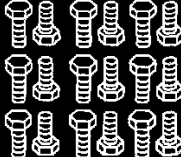




Transmission Control Systems: Testing and Inspection

Diagnosis By Symptom

Index Directions

 <p>ST1389-A</p>	Transmission Tester 007-00130 or equivalent
	Digital TR Sensor Overlay 007-00131 or equivalent
 <p>ST1137-A</p>	73III Digital Multimeter 105-R0057 or equivalent
 <p>ST1940-A</p>	Screw Set, Transmission Test Plate 307-126 (T82P-7006-C)

Special Tools

 <p>ST1931-A</p>	<p>Plate, Transmission Air Test 307-312 (T94P-77001-EH)</p>
 <p>ST1931-A</p>	<p>Gasket, Transmission Air Test Plate 307-313 (T94P-77001-EH1)</p>
 <p>ST1633-A</p>	<p>TRS Alignment Tool 307-351 (T97L-70010-A)</p>
 <p>ST1391-A</p>	<p>EEC-V 104-Pin Breakout Box 418-049 (T94L-50-EEC-V) or equivalent</p>
 <p>ST2332-A</p>	<p>Worldwide Diagnostic System (WDS) 418-F224 New Generation STAR (NGS) Tester 418-F052 or equivalent</p>

Special Tools

Diagnosis by Symptom Chart Directions

1. Always begin diagnosis of a symptom with:
 - 1 Preliminary inspections.
 - 2 Verifications of condition.
 - 3 Checking the fluid levels.
 - 4 Carry out other test procedures as directed.

2. **Note:** Not all concerns and conditions with electrical components will set a Diagnostic Trouble Code (DTC). Be aware that the components listed may still be the cause. Verify correct function of these components prior to proceeding to the Hydraulic/Mechanical Routine listed.

Begin with the Electrical Routine, if indicated. Follow the reference or action required statements. Always carry out the on-board diagnostic tests as required. Never skip steps. Repair as required. If the concern is still present after electrical diagnosis, then proceed to the Hydraulic/Mechanical Routine listed.

3. The Hydraulic/Mechanical Routines list possible hydraulic or mechanical components that could cause the concern. These components are listed in the removal sequence and by most probable cause. All components listed must be inspected to ensure correct repair.

Title	Routines	
	Electrical ⁽¹⁾	Hydrau- lic/Mechanical
Engagement Concerns		
No Forward	201	301
No Reverse	202	302
Harsh Reverse	203	303
Harsh Forward	204	304
Delayed/Soft Reverse	205	305
Delayed/Soft Forward	206	306
—Soft/Slipping	213	313
—Harsh	214	314
No 1st Gear, Engages in Higher Gear	215	315
No Manual 1st Gear	216	316
Torque Converter Operation Concerns		
Torque Converter: No Apply	240	340
Torque Converter: Always Applied/Stalls Vehicle	241	341
Torque Converter: Cycling/Shudder/Chatter	242	342
Other Concerns		
No Engine Braking in 1st Gear, Manual 1st Position	250	350
Shift Lever Efforts High	251	351
External Leaks	252	352
Vehicle Driveability Concerns	253	353

Title	Routines	
	Electrical ⁽¹⁾	Hydrau- lic/Mechanical
Noise/Vibration - Forward or Reverse	254	354
Engine Will Not Crank	255	355
No Park Range	256	356
Overheating	257	357

(1) Carry out electrical routine first.

201/301: No Forward

Possible Component	Reference/Action
201 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> No electrical concerns 	<ul style="list-style-type: none"> If DTC P1700 is present check for a low transmission fluid level, then continue to Hydraulic/Mechanical Routines.
301 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage <ul style="list-style-type: none"> Damaged or out of adjustment 	<ul style="list-style-type: none"> Inspect and repair as required. Verify linkage adjustment. Refer to Section 307-05. After servicing linkage, verify digital (TR) sensor is correctly adjusted. Refer to Digital Transmission Range (TR) Sensor in this section.
Incorrect Pressures <ul style="list-style-type: none"> Low forward clutch pressure, low line pressure, low EPC pressure 	<ul style="list-style-type: none"> Check pressure at line and EPC taps. Carry out Line Pressure Tests And Stall Speed Tests. Refer to Special Testing Procedures in this section. See the Line Pressure Chart for specification. If pressures are low, check the following possible components: <ul style="list-style-type: none"> Main control valve body, Pump assembly, Low intermediate clutch assembly, Low intermediate apply tube and seal, N-D accumulator assembly.
Main Control Valve Body <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate — damaged, off location Manual Control Valve — damaged 	<ul style="list-style-type: none"> Adjust bolts to specification. Inspect gaskets for damage. Install new components. Inspect. Repair as required.
Pump Assembly <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate — damaged, off location Porosity/cross leaks/ball missing or leaking Components damaged 	<ul style="list-style-type: none"> Adjust bolts to specification. Inspect for damage. Install new components as required. Inspect for porosity and leaks. Install new components as required. Inspect for damage. Install new components as required.
Low/Intermediate One-Way Clutch Assembly <ul style="list-style-type: none"> Worn, damaged, misassembled Roller—damaged Case—damaged Springs—damaged 	<ul style="list-style-type: none"> DTC P1700 present Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required.

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Possible Component	Reference/Action
<ul style="list-style-type: none"> Inner/Outer Races—damaged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
Low/Intermediate Clutch Assembly <ul style="list-style-type: none"> Seals, Piston—damaged Fluid Tubes and Seals—worn, damaged, loose, leaking Friction Elements—damaged, clearance check incorrect Wave Spring—damaged, missing 	<ul style="list-style-type: none"> Carry out Air Pressure Test. Refer to Special Testing Procedures Inspect. Install new components as required. Inspect. Repair as required. Inspect. Repair as required.
Low/Intermediate Accumulator Assembly <ul style="list-style-type: none"> Piston Seals—damaged, leaking Shaft or Bore—damaged, leaking 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.

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202/302: No Reverse

Possible Component	Reference/Action
202 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> No electrical concerns 	<ul style="list-style-type: none"> If DTC P1700 is present check for a low transmission fluid level, then continue to Hydraulic/Mechanical Routines.
302 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal/External) <ul style="list-style-type: none"> Damaged or out of adjustment 	<ul style="list-style-type: none"> Inspect and repair as required. Verify linkage adjustment. After servicing linkage, verify that the digital (TR) sensor is correctly adjusted.
Incorrect Pressures <ul style="list-style-type: none"> Low line pressure, low EPC pressure 	<ul style="list-style-type: none"> Carry out Line Pressure Tests and Stall Speed Tests. Refer to Special Testing Procedures. Check pressure at line and EPC taps. See the Line Pressure Chart for specifications. If pressures are low, check the following possible components: <ul style="list-style-type: none"> main control valve body, pump assembly, reverse clutch assembly, reverse apply tube and seal, N-R accumulator assembly.
Main Control Valve Body <ul style="list-style-type: none"> Bolts out of torque specification Gasket and Separator Plate — damaged, off location Manual Control Valve, Springs — stuck, damaged 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect for damage. Repair as required.
Pump Assembly <ul style="list-style-type: none"> Bolts out of torque specification Gaskets damaged Porosity/cross leaks, pump assembly leaking, plugged hole Components damaged 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage and install new components as required. Install a new pump assembly. Inspect for damage and install new components as required.

(Continued)

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Possible Component	Reference/Action
Reverse Clutch Assembly <ul style="list-style-type: none"> Seals, Piston, Springs — damaged Clearance check out of specification Friction Elements — damaged or worn Reverse Apply Tube and Seal — leaking or incorrectly installed 	<ul style="list-style-type: none"> Carry out Air Pressure Test. Refer to Special Testing Procedures in this section. Inspect for damage. Repair as required. Inspect. Carry out clearance checks. Inspect for damage. Repair as required. Inspect. Repair as required.
N-R Accumulator Assembly <ul style="list-style-type: none"> Seals, Piston — damaged, leaking Shaft or Bore — damaged, leaking 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required.

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203/303: Harsh Reverse

Possible Component	Reference/Action
203 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), EPC Solenoid, TFT, TSS, TP Sensor, MAF Sensor, OSS, IAT Sensor, ISC and PSP Sensor, Engine rpm. 	<ul style="list-style-type: none"> • Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. • Carry out Pinpoint Tests B, E, and F. Refer to Pinpoint Tests — Non OSC Equipped Vehicles in this section.
303 — HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures <ul style="list-style-type: none"> • High line pressure, high EPC pressure 	<ul style="list-style-type: none"> • Carry out Line Pressure and Stall Speed Tests. Refer to Special Testing Procedures. Check pressure at line and EPC pressure taps. See the Line Pressure Chart for specifications. If high, check the following possible components: Main Control Valve Body, Fluid Filter and Fluid Screen Ring.
Main Controls <ul style="list-style-type: none"> • Bolts out of torque specification • Gasket and Separator Plate — damaged, off location • B1 Check Ball, Pressure Failsafe Valve, Main Regulator Valve — stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components as required. • Inspect for damage. Repair as required.
Pump Assembly <ul style="list-style-type: none"> • Bolts out of torque specification • Gasket — damaged, off location • Components damaged • Reverse Apply Tube — leaking or incorrectly installed • Wave Spring — damaged, worn • EPC Solenoid — stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specifications. • Inspect for damage and install a new gasket. • Inspect for damage and install new components as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Carry out Pinpoint Test E. Repair as required. Activate solenoid using a Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
Reverse Clutch Assembly <ul style="list-style-type: none"> • Piston — damaged, stuck • Friction Elements — damaged, worn • Return Spring — damaged, worn, stuck 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required.

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Possible Component	Reference/Action
<ul style="list-style-type: none"> • Wave Spring — damaged 	
N-R Accumulator Assembly <ul style="list-style-type: none"> • Stuck, damaged, components missing • Shaft or Bore — damaged 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.

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Possible Component	Reference/Action
204 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), TP, MAF, IAT, ISC, OSS, PSP, EPC, TFT, TSS, Internal Harness 	<ul style="list-style-type: none"> Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Tests B, E and F. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
304 — HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures <ul style="list-style-type: none"> High line pressure, high EPC pressure Check pressure at line and EPC pressure taps. See the Line Pressure Chart for specification. If pressures are high, check the following possible components: Main Controls, Pump Assembly. 	<ul style="list-style-type: none"> Carry out Line Pressure Test. Refer to Special Testing Procedures
Main Controls <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate—damaged, off location Main Regulator Valve, Pressure Failsafe Valve B3 Check Ball—damaged, missing 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect. Repair as required. Inspect for damage and contamination. Repair as required.
Pump Assembly <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator—damaged, off location EPC Solenoid—stuck, damaged 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect for damage and contamination. Repair as required. Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
Low Intermediate Clutch Assembly <ul style="list-style-type: none"> Seals, Piston—worn, damaged Friction Element—damaged Wave Spring—damaged 	<ul style="list-style-type: none"> Carry out Air Pressure Test. Refer to Special Testing Procedures Inspect for damage. Install new components as required. Inspect for damage. Install new components as required.
Neutral-to-Drive Accumulator <ul style="list-style-type: none"> Piston — stuck, Seals or Springs, — missing, damaged 	<ul style="list-style-type: none"> Check for damage. Install new components as required.

Possible Component	Reference/Action
205 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), EPC Solenoid, TFT, Digital TR Sensor, Internal Harness 	<ul style="list-style-type: none"> • Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Tests B, D and E. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
305 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal/External) <ul style="list-style-type: none"> • Damaged, out of adjustment 	<ul style="list-style-type: none"> • Inspect and repair as required. Verify linkage adjustment. After servicing linkage, verify that the digital TR sensor is correctly adjusted.
Incorrect Pressures <ul style="list-style-type: none"> • Low line pressure, low EPC pressure 	<ul style="list-style-type: none"> • Check pressure at line and EPC taps. Carry out Line Pressure and Stall Speed Tests. Refer to Special Testing Procedures. If pressures are low, check the following possible components: Main Control Valve Body, Pump Assembly, Reverse Clutch Assembly, Reverse Clutch Tube.
Main Controls <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate — damaged, off location • Manual Control Valve, Main Regulator Valve, Converter Drain Back Valve, Springs—missing, damaged, misassembled 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components as required. • Inspect for damage. Repair as required.
Pump Assembly <ul style="list-style-type: none"> • Bolts out of torque specification • Porosity/cross leaks, pump assembly leaking • Gaskets — damaged, off location • EPC Solenoid — stuck, damaged • Components damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Install a new pump assembly. • Inspect for damage and install new components as required. • Inspect for damage. Carry out Pinpoint Test E. Repair as required. Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required. • Inspect for damage and install new components as required.
Reverse Clutch Assembly <ul style="list-style-type: none"> • Seals, Piston — worn, damaged • Wave Spring — damaged • Friction Elements — damaged or worn • Return Spring — damaged or worn • Reverse Apply Tube or Seal — leaking 	<ul style="list-style-type: none"> • Carry out Air Pressure Test. Refer to Special Testing Procedures • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect. Repair as required.
Neutral-Drive Accumulator <ul style="list-style-type: none"> • Piston, Seals — damaged, leaking 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required.

Possible Component	Reference/Action
206 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), EPC Solenoid, TFT, Digital TR Sensor, Internal Harness 	<ul style="list-style-type: none"> • Run On-Board Diagnostic. Refer Powertrain Management Carry out Pinpoint Tests B, D and E. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
306 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage <ul style="list-style-type: none"> • Damaged, out of adjustment 	<ul style="list-style-type: none"> • Inspect and repair as required. Verify linkage adjustment. After servicing linkage, verify that the digital TR sensor is correctly adjusted. Refer to Digital Transmission Range (TR) Sensor
Incorrect Pressures <ul style="list-style-type: none"> • Low line pressure, low EPC pressure 	<ul style="list-style-type: none"> • Check pressure at line and EPC taps. Carry out Line Pressure and Stall Speed Tests. Refer to Special Testing Procedures. If pressures are low, check the following possible components: Main Control Valve Body and Pump Assembly, Low/Intermediate Clutch.
Main Control Valve Body <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • Main Regulator Valve—stuck, damaged, missing 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components. • Inspect. Repair as required.
Pump Assembly <ul style="list-style-type: none"> • Bolts out of torque specification • Porosity/cross leaks • Gaskets — damaged, off location • EPC Solenoid — stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for porosity and leaks. Install new components as required. • Inspect for damage and install new components as required. • Inspect for damage. Carry out Pinpoint Test E. Repair as required. Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
Low/Intermediate Clutch Assembly <ul style="list-style-type: none"> • Seals, Piston — worn, damaged • Low/Intermediate Fluid Tubes and Seals — damaged, loose, leaking • Band, Anchor Pins — damaged • Wave Spring — damaged 	<ul style="list-style-type: none"> • Carry out Air Pressure Test. Refer to Special Testing Procedures • Inspect seals and piston for damage. Install new components as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.
Neutral-Drive Accumulator <ul style="list-style-type: none"> • Seals, Bore — damaged, stuck, leaking 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required.

207/307: No Forward and No Reverse

Possible Component	Reference/Action
207 — ELECTRICAL ROUTINE	
<ul style="list-style-type: none"> No Electrical Concerns 	
307 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid <ul style="list-style-type: none"> Incorrect level—low 	<ul style="list-style-type: none"> Adjust fluid to correct level.
Halfshaft <ul style="list-style-type: none"> Splines—worn, damaged Shaft—misassembled, incorrect 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
Shift Linkage (Internal/External) <ul style="list-style-type: none"> Damaged, out of adjustment, misassembled 	<ul style="list-style-type: none"> Inspect. Repair as required. Verify linkage adjustment. After servicing linkage, verify that the digital TR sensor is correctly adjusted.
Incorrect Pressures <ul style="list-style-type: none"> Low line pressure, low EPC pressure 	<ul style="list-style-type: none"> Carry out Line Pressure and Stall Tests. Check pressure at line pressure and EPC taps. See the Line Pressure Chart for specifications. If pressures are low, check the following possible components: Fluid Filter and Seal Assembly, Main Control, Pump Assembly, Reverse Clutch Assembly, Forward Clutch Assembly.
Fluid Filter and Seal Assembly <ul style="list-style-type: none"> Plugged, damaged 	<ul style="list-style-type: none"> Replace filter and seal assembly
Main Controls <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate—damaged, off location Pump Shaft—broken Forward Clutch Control Valve, Manual Valve, Springs—stuck, damaged Main Regulator Valve (only if line pressure is out of specification)—damaged Components—damaged 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect. Repair/install new components as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required.
Pump Assembly <ul style="list-style-type: none"> Bolts out of torque specification Gaskets—damaged, off location Porosity/cross leaks—leaking, plugged hole Components damaged 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Install a new pump assembly. Inspect for damage. Install new components as required.
Support Assembly—Driven Sprocket <ul style="list-style-type: none"> Bolts out of torque specification Seals — missing or damaged Seal Grooves — damaged 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect seals. Install new components as required. Inspect for damage. Repair as required.
Forward Clutch Assembly <ul style="list-style-type: none"> Seals, Piston and Seal Assembly Check Balls Piston—cracked Friction Elements—worn, damaged Retaining Ring — missing 	<ul style="list-style-type: none"> Carry out Air Pressure Tests. Refer to Special Testing Procedures Inspect for mislocation, poor seating and damage. Install a new cylinder as required. Inspect piston. Install new components as required. Check for abnormal wear, damage. Install new components as required. Inspect for ring/damage. Repair as required.

Possible Component	Reference/Action
Low One-Way Clutch Assembly <ul style="list-style-type: none"> Worn, damaged, misassembled 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
Output Shaft <ul style="list-style-type: none"> Splines — damaged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
Other Possible Components <ul style="list-style-type: none"> Turbine Shafts Chain Flexplate Sprockets Front Sun Gear and Shell Assembly Front or Rear Planetaries Rear Sun Drum and Race Assembly Final Drive Assembly Pump Shaft Assembly 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required.

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208/308: Harsh Forward and No Reverse

Possible Component	Reference/Action
208 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), TP, MAF, OSS, IAT, PSP, TFT, Digital TR Sensor, Internal Harness, EPC Solenoid, Engine rpm, ISC 	<ul style="list-style-type: none"> Run On-Board Diagnostic. Refer Powertrain Management for diagnosis. Carry out Pinpoint Tests B, D and E. Refer to Pinpoint Tests — Non OSC Equipped Vehicles.
308 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid <ul style="list-style-type: none"> Incorrect level 	<ul style="list-style-type: none"> Adjust fluid to correct level.
Incorrect Pressures <ul style="list-style-type: none"> High line pressure, high EPC pressure 	<ul style="list-style-type: none"> Carry out Line Pressure Test. Check pressure at line and EPC pressure taps. See the the Line Pressure Chart for specifications. If pressures are high, check the following possible components: Main Controls Fluid Filter and Seal Assembly.
Main Controls <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator—damaged, off location B 1, B4 Check Ball, Pressure Failsafe Valve, Main Regulator Valve—stuck, damaged, missing Line Modulator Valve—stuck open 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required.
Pump Assembly <ul style="list-style-type: none"> Bolts out of torque specification Gaskets—damaged, off location Components—damaged 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect for damage. Install new components as required.

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Possible Component	Reference/Action
<ul style="list-style-type: none"> EPC Solenoid—stuck, damaged 	<ul style="list-style-type: none"> Inspect for damage and contamination. Repair as required. Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
Forward Clutch Assembly <ul style="list-style-type: none"> Seals, Piston—worn, damaged Friction Elements—damaged, worn Check Ball—missing 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required.

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209/309: Delayed/Soft Forward and Reverse

Possible Component	Reference/Action
209 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), TFT, Digital TR Sensor, Internal Harness, EPC Solenoid 	<ul style="list-style-type: none"> Run On-Board Diagnostic. Refer Powertrain Management for diagnosis. Carry out Pinpoint Tests B, D and E. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
309 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid <ul style="list-style-type: none"> Incorrect level Condition 	<ul style="list-style-type: none"> Adjust fluid to correct level. Inspect. Repair as required.
Shift Linkage (Internal/External) <ul style="list-style-type: none"> Damaged, out of adjustment 	<ul style="list-style-type: none"> Inspect. Repair as required. Verify linkage adjustment. After servicing linkage, verify that the digital TR sensor is correctly adjusted.
Incorrect Pressures <ul style="list-style-type: none"> Low line pressure, low EPC pressure 	<ul style="list-style-type: none"> Carry out Line Pressure and Stall Speed Tests. Refer to Special Testing Procedures Check pressure at line and EPC tap. See the Line Pressure Chart for specifications. If pressures are low, check the following possible components: Main Control, Pump Assembly.
Fluid Filter and Seal Assembly <ul style="list-style-type: none"> Plugged, damaged, not correctly seated Filter Seal—damaged 	<ul style="list-style-type: none"> Install a new filter and seal assembly.
Main Controls <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate—damaged, off location Seals, Manual Valve, Main Regulator Valve, Line Modulator Valve, Springs—missing, damaged or misassembled 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect for damage. Repair as required.
Pump Assembly <ul style="list-style-type: none"> Bolts out of torque specification Gaskets—damaged, off location Porosity/cross leaks—leaking Components damaged 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage and install new components. Install a new pump assembly. Inspect for damage. Install new components as required.

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Possible Component	Reference/Action
<ul style="list-style-type: none"> EPC Solenoid—stuck, damaged 	<ul style="list-style-type: none"> Inspect for damage. Install new components as required. Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
Forward Clutch Assembly <ul style="list-style-type: none"> Assembly Seals, Piston—damaged, worn Check Ball—missing, damaged Piston—cracked Friction Elements—damaged, worn 	<ul style="list-style-type: none"> Carry out Air Pressure Test. Inspect seals for damage. Repair as required. Inspect for mislocation, poor seating and damage. Install a new cylinder as required. Inspect piston. Install new components as required. Check for abnormal wear, damage. Install new components as required.

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Possible Component	Reference/Action
250 — ELECTRICAL ROUTINE	
• No Electrical Concerns	
350 — HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures • Line pressure, EPC pressure	• Check pressure at line and EPC taps. Carry out Line Pressure Test. Refer to Special Testing Procedures See the Line Pressure Chart for specifications. If not OK, check Main Control Valve Body and Direct Clutch Assembly.
Main Control Valve Body • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • Shift Valve, Manual Downshift Modulator Valve, B8 Check Ball—stuck or damaged	• Tighten bolts to specification. • Inspect for damage. Install new components as required. • Inspect. Clean or repair as required.
Direct Clutch Assembly • See Routine 321	• Inspect. Repair or install new components as required.
Direct One-Way Clutch • Damaged, see Routine 321	• Inspect for damage. Repair as required.
Coast Band • Band—damaged • Coast Band Apply Tube/Seal—damaged, loose • Apply Servo, Cover, Seals—damaged	• Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.

Possible Component	Reference/Action
251 — ELECTRICAL ROUTINE	
• No Electrical Concerns	
351 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal, External) • Damaged or out of adjustment	• Inspect and repair as required. Verify linkage adjustment After servicing linkage, verify that the digital TR sensor is correctly adjusted. Refer to Digital Transmission Range (TR) Sensor
Manual Lever • External Retaining Pin — damaged, Nut — loose, Detent Spring—bent, damaged; or Park Mechanism — damaged, incorrect lever used	• Inspect and repair/install new components as required.
Main Control Valve Body • Manual Valve — stuck • Bolts out of torque specification	• Inspect and repair or install a new valve as necessary. • Tighten bolts to specification.
Brake Shift Interlock	• Refer to Brakes and Traction Control

Possible Component	Reference/Action
252 — ELECTRICAL ROUTINE	
• No Electrical Concerns	
352 — HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Fluid Level	• Adjust the fluid to the correct level.
Seals, Gaskets • Leaks: Converter, TSS, Halfshaft Axles, Gasket/Seal Manual Lever, Fluid Level Indicator, Servo Covers, Transaxle Pans, Incorrect Hub Seal, Chain Cover-to-Case	• Locate source. Repair as required.
Other • Leaks: Cooler Fitting, Pressure Taps, Transmission Connectors, Cooler Tubes, Transaxle Pans, Case Porosity, Chain Cover Porosity, Case Cracked • Vent—blocked/damaged	• Locate source. Repair as required. • Check vent for damage or blockage. Repair as required.

Possible Component	Reference/Action
253 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), TCC Solenoid, TP, OSS, MAF, IAT Sensors, Internal Wiring Harness 	<ul style="list-style-type: none"> • Carry out Shift Point Road Test. Refer to Shift Point Road Test in this section and carry out Torque Converter Operation Test. Refer to Torque Converter Diagnosis • Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Test C using Transmission Tester. Repair as required. Clear codes. Road test and rerun On-Board Diagnostic.
353 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid <ul style="list-style-type: none"> • Low Level 	<ul style="list-style-type: none"> • Adjust the fluid to the correct level.
Verify Proper Shift Scheduling, Engagements, Line Pressures and Stall Speed	<ul style="list-style-type: none"> • Go to the appropriate Diagnostic Routines per Index.
Converter Clutch Always Applied	<ul style="list-style-type: none"> • Go to Routine 341.

254/354: Noise Vibration - Forward or Reverse

Possible Component	Reference/Action
254 — ELECTRICAL ROUTINE	
<ul style="list-style-type: none"> • No Electrical Concerns 	
354 — HYDRAULIC/MECHANICAL ROUTINE	
For Noises/Vibrations That Change With Engine Speed <ul style="list-style-type: none"> • Converter components • Engine Drive Accessories 	<ul style="list-style-type: none"> • Locate source of disturbance. Repair as required. • Fluid Level (low)—pump cavitation. • Pump Assembly.

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Possible Component	Reference/Action
<ul style="list-style-type: none"> • Fluid Cooler Tubes grounding out • Flexplate 	
For Noises/Vibrations That Change With Vehicle Speed: <ul style="list-style-type: none"> • Engine Mounts—loose or damaged • Driveline concerns: <ul style="list-style-type: none"> — Halfshaft shudder — CV joints — Suspension — Modifications • Output/Halfshaft Splines — worn or damaged • TSS — incorrectly installed 	<ul style="list-style-type: none"> • Locate source of disturbance and repair as required. • Inspect. Repair as required.
Other Noises/Vibrations <ul style="list-style-type: none"> • Main Controls—Valve resonance • Shift Cable—vibration, grounding • Fluid Cooler Tubes — grounding • Anti-Lock (ABS) Brake System • Power Steering Pump 	<ul style="list-style-type: none"> • Locate source of disturbance and repair as required • Locate source of disturbance and repair as required. • Locate source of disturbance and repair as required. • Refer to Brakes and Traction Control • Refer to Steering and Suspension

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Possible Component	Reference/Action
255 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), Digital TR Sensor 	<ul style="list-style-type: none"> • Carry out Torque Converter Operation Test. Refer to Torque Converter Diagnosis in this section. Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
355 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage/Cable (Internal/External) <ul style="list-style-type: none"> • Damaged or out of adjustment 	<ul style="list-style-type: none"> • Inspect and repair as required. Verify linkage adjustment. After servicing linkage, verify that the digital TR sensor is correctly adjusted. Refer to Digital Transmission Range (TR) Sensor

Possible Component	Reference/Action
256 — ELECTRICAL ROUTINE	
<ul style="list-style-type: none"> • No Electrical Concerns 	
356 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal/External) <ul style="list-style-type: none"> • Damaged or out of adjustment 	<ul style="list-style-type: none"> • Inspect and repair as required. Verify linkage adjustment. After servicing linkage, verify that the digital TR sensor is correctly adjusted.
Park Mechanism <ul style="list-style-type: none"> • Park Brake Pawl, Parking Pawl Return Spring, Park Rod Abutment, Parking Pawl Shaft, Parking Pawl Actuating Rod, Manual Lever, Manual Lever Detent Spring—damaged 	<ul style="list-style-type: none"> • Inspect. Repair as required.

Possible Component	Reference/Action
257 — ELECTRICAL ROUTINE	
• No Electrical Concerns	
357 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid • Incorrect level • Condition	• Adjust fluid to correct level. • Inspect fluid.
Cooler Lines • Damaged, blocked, reversed, leaking	• Inspect and repair as required.
Auxiliary Cooler • Damaged, blocked, restricted or incorrectly installed	• Inspect and repair as required.
Vehicle Concerns Causing Engine Overheating	• Refer to Cooling System
Main Control Valve Body • Bypass Clutch Control Valve and Plunger, Converter Regulator Valve Cooler Bypass Valve/Spring—stuck, damaged	• Inspect and repair as required.
Torque Converter Not Applying • Seized Converter One-Way Clutch	• See Routine 240/340. Inspect. Repair as required.
Excessive Towing Loads	• Check gross vehicle weight (GVW).
Idle or Driveability Concern	• Refer to Powertrain Management
Incorrect Clutch or Band Application or Oil Pressure Control System	• Carry out line pressure tests. Refer to Special Testing Procedures in this section and carry out shift point road test. Refer to Shift Point Road Test Repair as required. See the Line Pressure Chart, and Band/Clutch Application Chart No. 601 for specifications. Repair as required.

210/310: Some or All Shifts Missing

Possible Component	Reference/Action
210 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), Shift Solenoids, (SSA, SSB, SSC), TP, MAF, OSS, Digital TR Sensor, Internal Wiring Harness. 	<ul style="list-style-type: none"> Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Tests A and D. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
310 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid <ul style="list-style-type: none"> Incorrect level Condition 	<ul style="list-style-type: none"> Adjust fluid to correct level. Inspect fluid condition. Refer to Preliminary Inspection
Shift Linkage (Internal/External) <ul style="list-style-type: none"> Damaged, out of adjustment 	<ul style="list-style-type: none"> Inspect and repair as required. Verify linkage adjustment. After servicing linkage, verify that the digital TR sensor is correctly adjusted.
Vehicle Speed Input <ul style="list-style-type: none"> Insufficient, erratic or no input received by the PCM from the OSS sensor. 	<ul style="list-style-type: none"> Inspect. Repair as required. Carry out pinpoint test G.
Fluid Filter and Seal Assembly <ul style="list-style-type: none"> Plugged, missing 	<ul style="list-style-type: none"> Inspect. Repair as required.
Apply and Release Fluid Tubes <ul style="list-style-type: none"> Damaged, missing Seal or O-ring—damaged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required.
Forward Support, Driven Sprocket <ul style="list-style-type: none"> Seals—damaged Holes—blocked 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required.

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Possible Component	Reference/Action
Planetary Gear Sets <ul style="list-style-type: none"> Damaged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
One-Way Clutch Assembly <ul style="list-style-type: none"> Damaged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
Other Components <ul style="list-style-type: none"> Clutches Output Shafts (Differential) Overdrive Band Powerflow Components Go to Reference/Action <ul style="list-style-type: none"> Shift Concern: No 1-2 Shift Concern: No 2-3 Shift Concern: No 3-4 Shift Concern: No 4-3 Shift Concern: No 3-2 Shift Concern: No 2-1 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Refer further diagnosis, see the appropriate shift routine(s): <ul style="list-style-type: none"> Routine 220/320 Routine 221/321 Routine 222/322 Routine 223/323 Routine 224/324 Routine 225/325

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211/311: Timing - Early/Late

Possible Component	Reference/Action
211 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), Shift Solenoids (SSA, SSB, SSC), TP, MAF, OSS, IAT, ECT, TFT, Internal Wire Harness, EPC Solenoid 	<ul style="list-style-type: none"> Carry out shift point road test. Refer to Shift Point Road Test and carry out torque converter operation test. Refer to Torque Converter Diagnosis Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Tests A, B and E. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
311 — HYDRAULIC/MECHANICAL ROUTINE	
Other <ul style="list-style-type: none"> Tire size chain ratio—change, Speedometer Gear 	<ul style="list-style-type: none"> See the specification decal and verify vehicle has original equipment. Changes in tire size and chain ratio will affect shift timing.
Fluid <ul style="list-style-type: none"> Incorrect level 	<ul style="list-style-type: none"> Adjust the fluid to the correct level.
Shift Linkage <ul style="list-style-type: none"> Damaged, out of adjustment 	<ul style="list-style-type: none"> Inspect. Repair as required. Verify linkage adjustment. After servicing linkage, verify the digital TR sensor is correctly adjusted.
Main Controls <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate—damaged, off location Valves, Accumulators, Seals, Springs, Clips—damaged, missing, misassembled 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components. Inspect for damage and contamination. Repair as required.

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Possible Component	Reference/Action
	<ul style="list-style-type: none"> See the appropriate shift concern for further diagnosis: <ul style="list-style-type: none"> Shift Concern: Soft/Slipping 1-2—Routine 226/326 Shift Concern: Soft/Slipping 2-3—Routine 227/327 Shift Concern: Soft/Slipping 3-4—Routine 228/328 Shift Concern: Soft/Slipping 4-3—Routine 229/329 Shift Concern: Soft/Slipping 3-2—Routine 230/330 Shift Concern: Soft/Slipping 2-1—Routine 231/331
Front Support—Driven Sprocket <ul style="list-style-type: none"> Seals—damaged Holes—blocked 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required.
Planetary Gear Sets <ul style="list-style-type: none"> Damaged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
One-Way Clutch Assembly <ul style="list-style-type: none"> Damaged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
Other Components <ul style="list-style-type: none"> Clutches Output Shaft (Differential) Overdrive Band Powerflow Components 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required.
Front Support—Driven Sprocket <ul style="list-style-type: none"> Seals—damaged Holes—blocked 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required.
Vehicle Speed Input <ul style="list-style-type: none"> Insufficient, erratic or no input received by the PCM from the OSS sensor. 	<ul style="list-style-type: none"> Inspect. Repair as required. Carry out pinpoint test G.
Filter and Seal Assembly <ul style="list-style-type: none"> Plugged, missing 	<ul style="list-style-type: none"> Inspect. Repair as required.
Apply and Release Fluid Tubes <ul style="list-style-type: none"> Damaged, missing Seal or O-ring—damaged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required.

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212/312: Timing - Erratic/Hunting

Possible Component	Reference/Action
212 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), TCC and Shift Solenoids (SSA, SSB, SSC), TP, OSS, ECT, IAT, MAF, TR, TFT Sensors, Internal Wire Harness. 	<ul style="list-style-type: none"> • Carry out shift point road test. Refer to Shift Point Road Test and carry out torque converter operation test. Refer to Torque Converter Diagnosis • Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Tests A, B, C, D and F. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
312 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid <ul style="list-style-type: none"> • Incorrect level • Condition 	<ul style="list-style-type: none"> • Adjust fluid to correct level. • Inspect. Repair as required.

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Possible Component	Reference/Action
Shift Linkage (Internal/External) <ul style="list-style-type: none"> Damaged, out of adjustment 	<ul style="list-style-type: none"> Inspect. Repair as required. Verify linkage adjustment. After servicing linkage, verify that the digital TR sensor is correctly adjusted. Refer to Digital Transmission Range (TR) Sensor
Main Control Valve Body <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate—damaged, off location Valves, Accumulators, Seals, Clips, Check Ball—stuck, damaged, contaminated 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect for damage. Repair as required.
Vehicle Speed Input <ul style="list-style-type: none"> Insufficient, erratic or no input received by the PCM from the OSS sensor. 	<ul style="list-style-type: none"> Inspect. Repair as required. Carry out pinpoint test G.
Torque Converter Clutch	<ul style="list-style-type: none"> See Torque Converter Cycling (Routine 242/342).
Front Support, Driven Sprocket <ul style="list-style-type: none"> Seals—damaged Holes—blocked 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required.
Planetary Gear Sets <ul style="list-style-type: none"> Damaged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
One-Way Clutch Assembly <ul style="list-style-type: none"> Damaged Other components, clutches Output Shaft (differential) Overdrive Band Powerflow Components 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required.
Fluid Filter and Seal Assembly <ul style="list-style-type: none"> Plugged, missing 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
Apply and Release Fluid Tubes <ul style="list-style-type: none"> Damaged, missing Seal or O-ring—damaged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required.
For Diagnosis Related to a Specific Shift <ul style="list-style-type: none"> Shift Concern: No 1-2 Shift Concern: No 2-3 Shift Concern: No 3-4 Shift Concern: No 4-3 Shift Concern: No 3-2 Shift Concern: No 2-1 Shift Concern: Soft/Slip 1-2 Shift Concern: Soft/Slip 2-3 Shift Concern: Soft/Slip 3-4 Shift Concern: Soft/Slip 4-3 Shift Concern: Soft/Slip 3-2 Shift Concern: Soft/Slip 2-1 Shift Concern: Harsh 1-2 	<ul style="list-style-type: none"> See the appropriate routine for further diagnosis: Routine 220/320 Routine 221/321 Routine 222/322 Routine 223/323 Routine 224/324 Routine 225/325 Routine 226/326 Routine 227/327 Routine 228/328 Routine 229/329 Routine 230/330 Routine 231/331 Routine 232/332

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Possible Component	Reference/Action
<ul style="list-style-type: none"> Shift Concern: Harsh 2-3 Shift Concern: Harsh 3-4 Shift Concern: Harsh 4-3 Shift Concern: Harsh 3-2 Shift Concern: Harsh 2-1 	<ul style="list-style-type: none"> Routine 233/333 Routine 234/334 Routine 235/335 Routine 236/336 Routine 237/337

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213/313: Feel - Soft/Slipping

Possible Component	Reference/Action
213 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), EPC Solenoid, MAF, TP, ECT, IAT, TFT, Internal Harness, TSS. 	<ul style="list-style-type: none"> Carry out Shift Point Road Test. Refer to Road Testing Vehicle Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Tests B, E and F. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
313 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid <ul style="list-style-type: none"> Incorrect level Condition 	<ul style="list-style-type: none"> Adjust the fluid to the correct level. Carry out fluid condition check. Refer to Preliminary Inspection
Fluid Filter and Seal Assembly <ul style="list-style-type: none"> Damaged, partially plugged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
Shift Linkage (Internal/External) <ul style="list-style-type: none"> Damaged, out of adjustment 	<ul style="list-style-type: none"> Inspect. Repair as required. Verify linkage adjustment. After servicing linkage, verify that the digital TR sensor is correctly adjusted.
Incorrect Pressures <ul style="list-style-type: none"> Low line pressure, low EPC pressure 	<ul style="list-style-type: none"> Check pressures at line and EPC taps. See the Line Pressure Chart for specification. If pressures are low or all shifts are soft/slipping, go to Main Control. If pressures are OK and a specific shift is soft/slipping, see the following chart: <ul style="list-style-type: none"> Soft/Slipping Shift 1-2, Routine 226/326 Soft/Slipping Shift 2-3, Routine 227/327 Soft/Slipping Shift 3-4, Routine 228/328 Soft/Slipping Shift 4-3, Routine 229/329 Soft/Slipping Shift 3-2, Routine 230/330 Soft/Slipping Shift 2-1, Routine 231/331
Main Controls <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate — damaged, off location Line Modulator Valve, 2-3 Capacity Modulator Valve, Accumulator/Regulator Valve, Main Regulator Valve, Check Balls, 3-2 Shift Timing Valve, Clips, Springs — damaged, missing 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect. Repair as required.

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Possible Component	Reference/Action
Pump Assembly <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator—damaged, off location EPC Solenoid—stuck, damaged 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect for damage and contamination. Repair as required. Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
Front Support Assembly—Drive <ul style="list-style-type: none"> Damaged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
Apply and Release Fluid Supply Tubes <ul style="list-style-type: none"> Damaged, blocked Seal—leaking 	<ul style="list-style-type: none"> Inspect for damage. Repair as required. Inspect for damage. Repair as required.

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214/314: Feel - Harsh

Possible Component	Reference/Action
214 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), EPC Solenoid, MAF, TP, OSS, ECT, IAT, PSP, TFT, Digital TR Sensor, Internal Wire Harness and Shift Solenoid No. 3 (SSC), A/C 	<ul style="list-style-type: none"> • Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Test A, B, D and E. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
314 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid <ul style="list-style-type: none"> • Incorrect level 	<ul style="list-style-type: none"> • Adjust fluid to correct level.
Incorrect Pressures <ul style="list-style-type: none"> • High line pressure • High EPC pressure 	<ul style="list-style-type: none"> • Check pressures at line and EPC taps. Carry out Line Pressure Test. Refer to Special Testing Procedures See the Line Pressure Chart for specifications. If pressures are high or all shifts are harsh, go to Main Control Valve Body. • If pressures are OK and a specific shift is harsh. See the appropriate shift routine in the following chart: <ul style="list-style-type: none"> — Shift 1-2, Routine 232/332 — Shift 2-3, Routine 233/333 — Shift 3-4, Routine 234/334 — Shift 4-3, Routine 235/335 — Shift 3-2, Routine 236/336 — Shift 2-1, Routine 237/337
Main Control Valve Body <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 2-3 Capacity Modulator Valve, Main Regulator Valve, Line Modulator Valve, 3-2 Timing Valve, Springs, Clips, Check Balls—stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components as required. • Inspect. Repair as required.

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Possible Component	Reference/Action
Pump Assembly <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator—damaged, off location • EPC Solenoid—stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components as required • Inspect for damage and contamination. Repair as required. Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.

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Possible Component	Reference/Action
215 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), Shift Solenoids (SSA, SSB, SSC), OSS Sensor, Internal Wire Harness 	<ul style="list-style-type: none"> Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Test A using the Transmission Tester. Repair as required. If DTC P1700 is present, check for a low transaxle fluid level, then continue to Hydraulic/Mechanical Routines. Clear codes. Road Test and rerun On-Board Diagnostic.
315 — HYDRAULIC/MECHANICAL ROUTINE	
Main Control Valve Body <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate—damaged, off location Shift Valves, Forward Clutch Control Valve, Springs, Clips—stuck, damaged, missing, misassembled Shift Solenoid—stuck, damaged <p>• For diagnosis related to a specific gear, use the Transmission Tester to select the gear.</p>	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect. Repair as required. Inspect for damage. Carry out Pinpoint Test A. Repair as required. Activate solenoid using a Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required. See the following routines: <ul style="list-style-type: none"> Shift 1-2, Routine 220/320 Shift 2-3, Routine 221/321 Shift 3-4, Routine 222/322
Mechanical <ul style="list-style-type: none"> Fluid Tubes—damaged Bands, Clutches or Seals — damaged or worn 	<ul style="list-style-type: none"> Inspect. Repair as required. Inspect. Repair as required.

Possible Component	Reference/Action
216 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> No electrical concerns. 	
316 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal/External) <ul style="list-style-type: none"> Damaged or out of adjustment 	<ul style="list-style-type: none"> Inspect and repair as required. Verify linkage adjustment. After servicing linkage, verify that the digital TR sensor is correctly adjusted.
Incorrect Pressures <ul style="list-style-type: none"> Low line pressure, low EPC pressure 	<ul style="list-style-type: none"> Check pressure at line and EPC pressure taps. Carry out Line Pressure Test. Refer to Special Testing Procedures See the Line Pressure Chart for specifications. If pressures are low, check the following possible components: Main Control Valve Body.
Main Control Valve Body <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate—damaged, off location Manual Control Valve, Manual Downshift Valve, Springs, Shift Valves, Clips—stuck, damaged, missing B8 Check Ball — damaged, missing 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required.
Low/Intermediate One-Way Clutch Assembly <ul style="list-style-type: none"> Worn, damaged, misassembled Roller—damaged Case—damaged Springs—damaged Inner/Outer Races—damaged 	<ul style="list-style-type: none"> DTC P1700 present Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required. Inspect for damage. Repair as required.

Possible Component	Reference/Action
220 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), Shift Solenoids, (SSA, SSB), Digital TR Sensor, Internal Wire Harness NOTE: If SSA is ON, it equals a third gear start. 	<ul style="list-style-type: none"> Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Test A and D. Refer to Pinpoint Tests — Non OSC Equipped Vehicles If DTC P1700 is present check for a low transaxle fluid level, then continue to Hydraulic/Mechanical Routines and repair as required. Clear codes. Road Test and rerun On-Board Diagnostic.
320 — HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures <ul style="list-style-type: none"> Line pressure, EPC pressure 	<ul style="list-style-type: none"> Check pressure at line, and EPC taps. Carry out Line Pressure Test. Refer to Special Testing Procedures See the Line Pressure Chart for specifications. If not OK, check Main Control Valve Body.

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Possible Component	Reference/Action
Main Control Valve Body <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate—damaged, off location 1-2 Shift Valve, Springs, Clips—loose, stuck, missing, misassembled SSA and SSB not functioning correctly 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect. Repair as required. Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
Pump Assembly <ul style="list-style-type: none"> Porosity/cross leaks Gasket — damaged, off location Component damaged 	<ul style="list-style-type: none"> Inspect. Install new components as required. Inspect for damage. Install new components as required. Inspect for damage, missing ball. Install a new pump assembly, if required.
1-2 Accumulator Assembly	
<ul style="list-style-type: none"> Piston Seals, Springs—damaged, missing 	<ul style="list-style-type: none"> Carry out Air Pressure Test. Refer to Special Testing Procedures Inspect for damage. Repair as required.
Support Assembly—Driven Sprocket <ul style="list-style-type: none"> Seals—damaged, missing Holes — blocked 	<ul style="list-style-type: none"> Inspect for damage, missing or blockage. Repair as required.
Low One-Way Clutch Assembly <ul style="list-style-type: none"> Not overrunning, damaged 	<ul style="list-style-type: none"> Inspect for damage. Install new components as required.
Intermediate Clutch Assembly <ul style="list-style-type: none"> Seals — damaged Piston—damaged Friction—damaged, worn Cylinder Hub Lube Grooves—blocked, damaged Return Spring Assembly—damaged 	<ul style="list-style-type: none"> Carry out Air pressure Test. Refer to Special Testing Procedures Inspect for damage. Install new components as required. Inspect for damage. Install new components as required. Inspect for damage. Install new components as required. Inspect for damage. Install new components as required. Inspect for damage. Install new components as required.
Front Planetary Carrier <ul style="list-style-type: none"> Damaged 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.

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Possible Component	Reference/Action
221 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), Shift Solenoid (SSA), Internal Wire Harness 	<ul style="list-style-type: none"> • Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Test A, using the scan tool. Repair as required. Clear codes. Road Test and rerun On-Board Diagnostic.
321 — HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures <ul style="list-style-type: none"> • Line pressure, EPC pressure 	<ul style="list-style-type: none"> • Check pressure at EPC and line taps. Carry out Line Pressure Test. Refer to Special Testing Procedures. See the Line Pressure Chart for specifications. If not OK, check the Main Control Valve Body.
Main Control Valve Body <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 1-2 Shift Valve, 2-3 Shift Valve, 2-3 Capacity Modulator Valve—stuck, damaged • B8 Check Ball—damaged, missing • SSA damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components as required. • Inspect. Repair as required. • Inspect for damage. Repair as required. • Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
Support Assembly—Driven Sprocket <ul style="list-style-type: none"> • Seals—damaged, missing, holes blocked 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required.
Direct One-Way Clutch <ul style="list-style-type: none"> • Not holding, damaged 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required.
Direct Clutch Assembly <ul style="list-style-type: none"> • Seals—damaged • Piston—damaged • Friction Plates — damaged or worn • Check Ball — not seating • Return Spring Assembly—damaged 	<ul style="list-style-type: none"> • Carry out Air Pressure Test. Refer to Special Testing Procedures in this section. • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required.
2-3 Accumulator <ul style="list-style-type: none"> • Pistons, Seals—leaking, damaged • Rod or Bore, Spring—damaged 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.

Possible Component	Reference/Action
222 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), Shift Solenoid SSC, Digital TR Sensor, Internal Wire Harness, OSS 	<ul style="list-style-type: none"> • Run On-Board Diagnostic. Refer Powertrain Management for diagnosis. • Carry out Pinpoint Test A and D. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
322 — HYDRAULIC/MECHANICAL ROUTINE	
Overdrive Servo Assembly <ul style="list-style-type: none"> • Apply Rod — incorrect • Servo Bore or Piston — damaged, incorrect • Piston Seals—damaged • Return Spring Retaining Clip—broken, missing 	<ul style="list-style-type: none"> • Carry out Air Pressure Test. Refer to Special Testing Procedures • Inspect. Install a new apply rod if incorrect. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.
Main Control Valve Body <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 3-4 Shift Valve, Line Modulator Valve, Forward Clutch Control Valve—stuck, damaged • SSC not functioning correctly 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components as required. • Inspect. Repair as required. • Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
3-4 Accumulator Assembly <ul style="list-style-type: none"> • Accumulator Piston—damaged • Piston Seals—missing, damaged • Springs—damaged • Rod or Bore—damaged 	<ul style="list-style-type: none"> • Carry out Air Pressure Test. Refer to Special Testing Procedures • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.
OD Band <ul style="list-style-type: none"> • OD Band—damaged, worn, misassembled • Direct One-Way Clutch Assembly damaged 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required.

223/323: No 4-3 Shift

Possible Component	Reference/Action
223 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), Shift Solenoid (SSC), Digital (TR) sensor, Internal Wiring Harness, OSS 	<ul style="list-style-type: none"> • Carry out Torque Converter Clutch Operation Test. Refer to Torque Converter Diagnosis • Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. • Carry out Pinpoint Tests A and D. Refer to Pinpoint Tests — Non OSC Equipped Vehicles in this section. Repair as required. Clear codes. Road Test and rerun On-Board Diagnostic.

Possible Component	Reference/Action
323 — HYDRAULIC/MECHANICAL ROUTINE	
Component Special Note	<ul style="list-style-type: none"> • Carry out manual 4-3 pull in. If OK, go to Overdrive Servo assembly in this routine. If not OK, go to Main Control in this routine.
Main Control <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 3-4 Shift Valve—stuck, damaged • SSC—damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components. • Inspect for damage. Repair as required. • Inspect for damage and contamination. Repair as required. Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
OD Band <ul style="list-style-type: none"> • OD Band—damaged, worn misassembled 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required.
Overdrive Servo Assembly <ul style="list-style-type: none"> • Apply Rod—incorrect • Servo Bore or Piston—damaged • Piston Seals—damaged • Return Spring Retaining Clip—broken, missing 	<ul style="list-style-type: none"> • Inspect rod. Refer to Transaxle Assembly in this section. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.

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224/324: No 3-2 Shift

Possible Component	Reference/Action
224 — ELECTRICAL ROUTINE	
<ul style="list-style-type: none"> • No Electrical Concerns 	
324 — HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures <ul style="list-style-type: none"> • EPC pressure • Line pressure 	<ul style="list-style-type: none"> • Carry out Line Pressure Tests. Refer to Special Testing Procedures. • Check pressure at line and EPC taps. Refer to Special Testing Procedures. See the Line Pressure Chart for specification; if not within specification, check main control valve body.
Vehicle Speed Input <ul style="list-style-type: none"> • Insufficient, erratic or no input received by the PCM from the OSS sensor. 	<ul style="list-style-type: none"> • Inspect. Repair as required. Carry out pinpoint test G.
Main Control Valve Body <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 2-3 Shift Valves, 2-3 Capacity Modulator Valve—stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components as required. • Inspect. Repair as required.

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Possible Component	Reference/Action
Low One-Way Clutch Assembly <ul style="list-style-type: none"> • Not Overrunning—damaged 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required.
Forward Clutch Assembly <ul style="list-style-type: none"> • Check Ball — leaking 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required.
Direct Clutch Assembly <ul style="list-style-type: none"> • Friction Material — damaged, worn • Check Ball — damaged, not releasing (sticking) • Seals — damaged • Piston — damaged 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.

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Possible Component	Reference/Action
225 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), Shift Solenoids (SSA, SSB), OSS, Digital TR Sensor 	<ul style="list-style-type: none"> Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Test A and D. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
325 — HYDRAULIC/MECHANICAL ROUTINE	
Main Control Valve Body <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate—damaged, off location 1-2 Shift Valve SSA, SSB — damaged 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect for damage. Install new components as required. Inspect. Repair as required. Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
Intermediate Clutch Assembly <ul style="list-style-type: none"> Return Spring—damaged, misassembled Piston and Seal—damaged Balance Dam—damaged Friction Element—damaged, worn 	<ul style="list-style-type: none"> Carry out Air Pressure Test. Refer to Special Testing Procedures Inspect for damage. Install new components as required. Inspect for damage. Install new components as required. Inspect for damage. Install new components as required. Inspect for damage. Install new components as required.
Low One-Way Clutch Assembly <ul style="list-style-type: none"> Not holding, damaged 	<ul style="list-style-type: none"> Inspect for damage. Install new components as required.

Possible Component	Reference/Action
226 — ELECTRICAL ROUTINE	
<ul style="list-style-type: none"> No electrical concerns. 	
326 — HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures <ul style="list-style-type: none"> Line pressure, EPC pressure 	<ul style="list-style-type: none"> Carry out Line Pressure and Stall Speed Tests. Check pressure at EPC and line taps. Refer to Special Testing Procedures. See the Line Pressure Chart for specifications. If not OK, check the following possible component: Main Control.
Main Control <ul style="list-style-type: none"> Bolts out of torque specification Gaskets and Separator Plate—damaged, off location 1-2 Shift Valve, Springs, Clips—loose, stuck, missing, misassembled 	<ul style="list-style-type: none"> Tighten bolts to specification. Inspect gaskets for damage and install new components. Inspect. Repair as required.
Pump Assembly <ul style="list-style-type: none"> Porosity/cross leak Gaskets—damaged, off location Components—damaged 	<ul style="list-style-type: none"> Inspect. Install new components as required. Inspect for damage. Install new components as required. Inspect for damage, missing ball. Install a new pump assembly, if required.
1-2 Accumulator Assembly <ul style="list-style-type: none"> Piston Seals, Springs—damaged, missing 	<ul style="list-style-type: none"> Inspect for damage. Repair as required.
Support Assembly—Driven Sprocket <ul style="list-style-type: none"> Seals—damaged, missing Holes—partially blocked 	<ul style="list-style-type: none"> Inspect for damage, missing or blockage. Repair as required.
Intermediate Clutch Assembly <ul style="list-style-type: none"> Seals—damaged, leaking Piston—damaged Friction—damaged, worn Cylinder Hub Lube Groove—restricted 	<ul style="list-style-type: none"> Inspect for damage. Install new components as required. Inspect for damage. Install new components as required. Inspect for damage. Install new components as required. Inspect for restriction. Repair as required.

Possible Component	Reference/Action
227— ELECTRICAL ROUTINE	
• No Electrical Concerns	
327 HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures • Line pressure, EPC pressure	• Carry out Line Pressure and Stall Speed. • Check pressure at EPC and line taps. Refer to Special Testing Procedures See the Line Pressure Chart for specifications. If not OK, check the following possible component: Main Control.
Main Control • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 1-2 Shift Valve, 2-3 Shift Valve, Line Modulator Valve, 2-3 Capacity Modulator Valve, Spring—stuck, damaged • B8 Check Ball—damaged, missing or hole damaged	• Tighten bolts to specification. • Inspect gaskets and replace. • Inspect. Repair as required. • Inspect for damage. Repair as required.

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Possible Component	Reference/Action
Support Assembly—Drive Sprocket • Seals—damaged, missing, holes partially blocked	• Inspect for damage. Repair as required.
Direct Clutch Assembly • Seals—damaged, worn • Piston—damaged, worn • Friction—damaged, worn • Check Ball—not seating • Return Spring Assembly—damaged, worn	• Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required.
Direct/Intermediate Clutch Hub • Damaged or holes partially blocked	• Inspect for damage. Repair as required.
2-3 Accumulator Assembly • Piston, Seals, Spring, Rod or Bore—damaged	• Inspect for damage. Repair as required.

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Possible Component	Reference/Action
228— ELECTRICAL ROUTINE	
• No Electrical Concerns	
328 HYDRAULIC/MECHANICAL ROUTINE	
Overdrive Servo Assembly • Apply Rod—damaged • Servo Bore or Piston—damaged • Piston Seals—damaged, missing	• Inspect. Install a new apply rod if incorrect. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.
Main Control • Bolts out of torque specification. • Gaskets and Separator Plate—damaged, off location • 3-4 Shift Valve, Line Modulator Valve, Forward Clutch Control Valve—stuck, damaged	• Tighten bolts to specification. • Inspect gaskets for damage. Install new gaskets. • Inspect. Repair as required.
3-4 Accumulator Assembly • Accumulator Piston—stuck, damaged • Piston Seals—damaged, missing • Springs—damaged • Rod or Bore—damaged	• Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.
OD Band • OD Band—damaged, worn, misassembled	• Inspect for damage. Install new components as required.

229/329: Soft/Slipping 4-3

Possible Component	Reference/Action
229—ELECTRICAL ROUTINE	
• No Electrical Concerns	
329 HYDRAULIC/MECHANICAL ROUTINE	
Main Control <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 3-4 Shift Valve, Line Modulator Valve—stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components. • Inspect. Repair as required.

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Possible Component	Reference/Action
OD Band <ul style="list-style-type: none"> • OD Band—damaged, worn, misassembled 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required.
Overdrive Servo Assembly <ul style="list-style-type: none"> • Apply Rod—incorrect • Servo Bore or Piston—damaged • Piston Seals—damaged • Return Spring Retaining Clip—damaged, missing 	<ul style="list-style-type: none"> • Inspect rod. Refer to Transaxle Assembly • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.
Direct Clutch Assembly <ul style="list-style-type: none"> • Direct Clutch assembly • Damaged • Check Ball—damaged 	<ul style="list-style-type: none"> • Carry out Air Pressure Test. Refer to Special Testing Procedures • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.
Support Assembly—Drive Sprocket <ul style="list-style-type: none"> • Seals—damaged, holes partially blocked 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required.

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Possible Component	Reference/Action
230 ELECTRICAL ROUTINE	
• No Electrical Concerns	
330 HYDRAULIC/MECHANICAL ROUTINE	
Main Control <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 1-2 Shift Valve, 3-4 Shift Valve, Line Modulator Valve, 3-2 Timing Valve—stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components. • Inspect. Repair as required.
Direct Clutch Assembly <ul style="list-style-type: none"> • Clutch Assembly—damaged • Ball Check — damaged • Seals—leaking 	<ul style="list-style-type: none"> • Carry out Air Pressure Test. Refer to Special Testing Procedures • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.
Support Assembly—Driven <ul style="list-style-type: none"> • Seals—damaged, leaking, hole partially blocked 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required.
Forward Clutch Assembly <ul style="list-style-type: none"> • Check Ball—damaged, missing • Clutch Assembly—damaged • Friction Plates—damaged 	<ul style="list-style-type: none"> • Carry out Air Pressure Test. Refer to Special Testing Procedures • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.

Possible Component	Reference/Action
231 ELECTRICAL ROUTINE	
• No Electrical Concerns	
331 HYDRAULIC/MECHANICAL ROUTINE	
Main Control <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 1-2 Shift Valve, 3-4 Shift Valve, Line Modulator Valve, 3-2 Timing Valve—stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components. • Inspect. Repair as required.
Low One-Way Clutch Assembly <ul style="list-style-type: none"> • Clutch Assembly—damaged 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required.
Support Assembly—Drive Sprocket <ul style="list-style-type: none"> • Seals—damaged, leaking, hole partially blocked 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required.
Forward Clutch Assembly <ul style="list-style-type: none"> • Forward Clutch assembly • Check Ball—damaged, missing • Clutch Assembly—damaged • Friction—damaged 	<ul style="list-style-type: none"> • Carry out Air Pressure Test. Refer to Special Testing Procedures. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.

232/332: Harsh 1-2 Shift

Possible Component	Reference/Action
232 ELECTRICAL ROUTINE	
• No Electrical Concerns	
332 HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures <ul style="list-style-type: none"> • Line Pressure, EPC pressure 	<ul style="list-style-type: none"> • Carry out Line Pressure Test. Refer to Special Testing Procedures. • Check pressure at line and EPC taps. See the Line Pressure Chart for specifications. If not OK, check the following possible component: Main Control
Main Control <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 1-2 Shift Valve, Springs, B10 Check Ball, Clips—stuck, missing, misassembled 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect gaskets for damage. Install new components. • Inspect. Repair as required.
Pump Assembly <ul style="list-style-type: none"> • Porosity/cross leak • Gaskets—damaged, off location • Components—damaged 	<ul style="list-style-type: none"> • Inspect. Install new components as required. • Inspect for damage. Install new components as required. • Inspect for damage, missing ball. Install a new pump assembly, if required.
1-2 Accumulator Assembly <ul style="list-style-type: none"> • Piston Seals, Springs—damaged, missing • Piston or Rod—stuck, damaged 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.

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Possible Component	Reference/Action
Intermediate Clutch Assembly <ul style="list-style-type: none"> • Seals—damaged • Piston—damaged • Friction Plates—damaged, worn • Return Spring—damaged, broken • Wave spring damaged 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.

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Possible Component	Reference/Action
233 ELECTRICAL ROUTINE	
• No Electrical Concerns	
333 HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures <ul style="list-style-type: none"> • Line pressure, EPC pressure 	<ul style="list-style-type: none"> • Carry out Line Pressure Test. Refer to Special Testing Procedures • Check pressure at EPC and line taps. See the Line Pressure Chart for specifications. Refer to Special Testing Procedures If not OK, check the following possible component: Main Control.
Main Control <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 2-3 Shift Valve, 2-3 Capacity Modulator Valve/Spring—stuck, damaged • Line Modulator or Capacity Modulator Check Valves/Springs—damaged, missing 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect gaskets and install new components. • Inspect. Repair as required. • Inspect for damage. Repair as required.
Direct Clutch Assembly <ul style="list-style-type: none"> • Seals—damaged, worn • Piston—damaged, worn • Friction—damaged, worn • Return Spring Assembly—damaged, worn 	<ul style="list-style-type: none"> • Carry out Air Pressure Test. Refer to Special Testing Procedures • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required.
2-3 Accumulator Assembly <ul style="list-style-type: none"> • Piston, Seals, Rod or Bore—damaged, stuck 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required.

234/334: Harsh 3-4 Shift

Possible Component	Reference/Action
234 — ELECTRICAL ROUTINE	
• No Electrical Concerns	
334— HYDRAULIC/MECHANICAL ROUTINE	
Overdrive Servo Assembly <ul style="list-style-type: none"> • Apply Rod—incorrect • Return Spring Retaining Clip—broken, missing 	<ul style="list-style-type: none"> • Inspect. Install a new apply rod if incorrect. • Inspect for damage. Repair as required.

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Possible Component	Reference/Action
Main Control <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 3-4 Shift Valve, Line Modulator Valve, Forward Clutch Control Valve—stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components. • Inspect. Repair as required.
3-4 Accumulator Assembly <ul style="list-style-type: none"> • Accumulator Piston—stuck, damaged • Piston Seals—damaged • Springs—damaged, missing • Rod or Bore—damaged 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.
OD Band <ul style="list-style-type: none"> • OD Band—damaged, worn, misassembled 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required.

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Possible Component	Reference/Action
235— ELECTRICAL ROUTINE	
• No Electrical Concerns	
335— HYDRAULIC/MECHANICAL ROUTINE	
Main Control <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 3-4 Shift Valve, Line Modulator Valve — stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components. • Inspect. Repair as required.
OD Band <ul style="list-style-type: none"> • OD Band—damaged, worn, misassembled 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required.
Over Drive Servo Assembly <ul style="list-style-type: none"> • Apply Rod—incorrect • Servo Bore or Piston—damaged • Piston Seals—damaged • Return Spring Retaining Clip—damaged, missing 	<ul style="list-style-type: none"> • Inspect rod. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.
Support Assembly—Drive Sprocket <ul style="list-style-type: none"> • Seals—damaged, holes partially blocked 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required.

236/336: Harsh 3-2 Shift

Possible Component	Reference/Action
236— ELECTRICAL ROUTINE	
• No Electrical Concerns	
336— HYDRAULIC/MECHANICAL ROUTINE	
Main Control <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 3-2 Shift Timing Valve, Line Modulator Valve, 1-2, 3-4 Shift Valves—stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Repair as required. • Inspect. Repair as required.
Direct Clutch Assembly <ul style="list-style-type: none"> • Clutch Assembly—damaged • Seals—leaking 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required. • Inspect for damage. Repair as required.

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Possible Component	Reference/Action
Support Assembly—Drive Sprocket <ul style="list-style-type: none"> • Seals—damaged, leaking, holes blocked, missing 	<ul style="list-style-type: none"> • Inspect for damage, missing or blockage. Repair as required.
Low One-Way Clutch Assembly <ul style="list-style-type: none"> • Not overrunning—damaged 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required.
Forward Clutch Assembly <ul style="list-style-type: none"> • Forward Clutch Assembly • Clutch Assembly—damaged • Check Ball— not functioning, missing 	<ul style="list-style-type: none"> • Carry out Air Pressure Test. Refer to Special Testing Procedures • Inspect for damage. Install new components as required. • Inspect for damage. Install new components as required.

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Possible Component	Reference/Action
237 — ELECTRICAL ROUTINE	
• No Electrical Concerns	
337 — HYDRAULIC/MECHANICAL ROUTINE	
Main Control <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • 1-2 Shift Valve, Line Modulator Valve, 3-2 Timing Valve—stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components. • Inspect. Repair as required.
Support Assembly—Driven <ul style="list-style-type: none"> • Seals—damaged, holes blocked 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required.
Forward Clutch Assembly <ul style="list-style-type: none"> • Forward Clutch assembly • Check Ball—damaged, missing • Friction Element—damaged • Support Assembly—damaged 	<ul style="list-style-type: none"> • Carry out Air Pressure Test. Refer to Special Testing Procedures • Inspect for damage. Repair as required. • Inspect for damage. Repair as required. • Inspect for damage. Repair as required.
Low One-Way Clutch Assembly <ul style="list-style-type: none"> • Not holding, damaged 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required.

240/340: Does Not Apply

Possible Component	Reference/Action
240 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), TCC Solenoid, Internal Wiring Harness, TP, TFT, TSS Sensor, BPP Switch 	<ul style="list-style-type: none"> • Carry out Torque Converter Operation Test. Refer to Torque Converter Diagnosis • Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Test B, C, and F. Refer to Pinpoint Tests — Non OSC Equipped Vehicles

Possible Component	Reference/Action
340 — HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures <ul style="list-style-type: none"> • Low line pressure • Low EPC pressure 	<ul style="list-style-type: none"> • Carry out Line Pressure Tests. Refer to Special Testing Procedures • Check pressure at line and EPC taps. See the Line Pressure Chart for specifications. Refer to Special Testing Procedures If low, check main control valve body.
Main Control Valve Body <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets—damaged, off location • Valve Body Pilot Sleeve—damaged, out of alignment. Manual Valve, Main Regulator Valve, Bypass Clutch Control Valve, Converter Regulator Valve, Springs, Solenoid Regulator Valve—stuck, damaged • TCC Solenoid — not functioning correctly 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect gaskets. Repair as required. • Inspect. Repair as required. • Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
Turbine Shaft <ul style="list-style-type: none"> • Seals—damaged, missing • Holes—missing, plugged 	<ul style="list-style-type: none"> • Inspect for damage. Repair as required. • Inspect for damage. Install new components as required.
Pump Assembly Shaft <ul style="list-style-type: none"> • Seals, Bearing—damaged, missing 	<ul style="list-style-type: none"> • Inspect seals for damage. Repair as required.
Converter <ul style="list-style-type: none"> • See the Reference/Action. 	<ul style="list-style-type: none"> • Inspect as described. Repair as required.

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241/341: Always Applied/Stalls Vehicle

Possible Component	Reference/Action
241 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), TCC Solenoid, Internal Wiring Harness 	<ul style="list-style-type: none"> • Carry out Torque Converter Operation Test. Refer to Torque Converter Diagnosis in this section. Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Test C using the scan tool. Repair as required. Clear codes, Road Test and rerun On-Board Diagnostic.
341 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • Bypass Clutch Control Valve and Plunger, Solenoid Regulator Valve, Converter Regulator Valve—stuck, damaged 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect gaskets. Repair as required. • Inspect. Repair as required.

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Possible Component	Reference/Action
<ul style="list-style-type: none"> • TCC Solenoid—not functioning correctly 	<ul style="list-style-type: none"> • Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid.
Converter <ul style="list-style-type: none"> • No End Clearance to Turbine 	<ul style="list-style-type: none"> • Check torque converter end play. Refer to End Play Check Repair as required.

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Possible Component	Reference/Action
242 — ELECTRICAL ROUTINE	
Powertrain Control System <ul style="list-style-type: none"> • Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module (PCM), TCC, TFT Sensor, BPP Switch, Internal Wiring Harness, TSS 	<ul style="list-style-type: none"> • Carry out Torque Converter Clutch Operation Test as described under Road Test Vehicle. Run On-Board Diagnostic. Refer to Powertrain Management for diagnosis. Carry out Pinpoint Tests B, C and F. Refer to Pinpoint Tests — Non OSC Equipped Vehicles
342 — HYDRAULIC/MECHANICAL ROUTINE	
<ul style="list-style-type: none"> • Fluid condition 	<ul style="list-style-type: none"> • Prior to carrying out this action, make sure all electrical diagnostics have been carried out. Inspect fluid condition. If burnt, drain fluid and converter. Install new fluid and fluid filter assembly. Bring vehicle to normal operating temperature. Carry out Transaxle Drive Cycle Test. Carry out On-Board Diagnostic. If condition still exists, continue diagnostics.
Incorrect Pressures <ul style="list-style-type: none"> • Low line pressure, low EPC 	<ul style="list-style-type: none"> • Check pressure at line and EPC taps. Carry out Line Pressure and Stall Speed Tests. Refer to Special Testing Procedures in this section. See the Line Pressure Chart for specification. • If not OK, check the Main Control Valve Body.
Main Control Valve Body <ul style="list-style-type: none"> • Bolts out of torque specification • Gaskets and Separator Plate—damaged, off location • Valve Body Pilot Sleeve—damaged, misaligned Manual Valve, Bypass Clutch Control Valve and Plunger, Converter Regulator Valve, Solenoid Regulator Valve—stuck, damaged • TCC Solenoid — not functioning correctly 	<ul style="list-style-type: none"> • Tighten bolts to specification. • Inspect for damage. Install new components as required. • Inspect. Repair as required. • Activate solenoid using Transmission Tester. If solenoid operation cannot be felt when placing hand on solenoid, install a new solenoid. Inspect O-rings for damage. Repair as required.
Turbine Shaft <ul style="list-style-type: none"> • Seals—damaged, missing 	<ul style="list-style-type: none"> • Inspect for damage. Install new components as required.
Pump Shaft <ul style="list-style-type: none"> • Seals — damaged, missing 	<ul style="list-style-type: none"> • Inspect seals for damage. Repair as required.
Torque Converter <ul style="list-style-type: none"> • Refer to Torque Converter in this section. 	