Transmission Control Systems: Testing and Inspection
Diagnosis By Symptom

Chart Index & Directions
Diagnosis By Symptom

The Diagnosis by Symptom Charts give the technician diagnostic information and direction and list possible components, using a symptom as a starting point.

The Diagnosis by Symptom Charts are divided into two categories: electrical routines, indicated by 200 series numbers, and hydraulic/mechanical routines, indicated by 300 series numbers. The electrical routines fist the possible electrical components that can cause or contribute to the symptom described. The hydraulic/mechanical routines list the possible hydraulic or mechanical components that can cause or contribute to the symptom described.

Diagnosis by Symptom Chart Directions

1. Using the Diagnosis by Symptom Index, select the concern/symptom that best describes the condition.
2. Refer to the routine indicated in the diagnosis by symptom index. See: Diagnosis By Symptom Index
3. Always begin diagnosis of a symptom with:
   - Preliminary inspections.
   - Verification of condition.
   - Check the fluid level.
   - Carry out other test procedures as directed.

4. **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 those 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, proceed to the hydraulic/mechanical routine listed.
5. The hydraulic/mechanical routines list possible hydraulic or mechanical components that can cause the concern. These components are listed in the removal sequence and by most likely cause. You must inspect all components listed to make a correct repair.

Diagnosis By Symptom Index
Diagnosis by Symptom Index

4R100	Routines	
	Electrical (a)	Hydraulic/Mechanical
Engagement Concerns		
• No forward only	201	301
• No REVERSE only	202	302
• Harsh REVERSE only	203	303
• Harsh forward only	204	304
• Delayed/soft REVERSE only	205	305
• Delayed/soft forward only	206	306
• No forward and no REVERSE only	207	307
• Harsh forward and REVERSE	208	308
• Delayed/soft forward and REVERSE	209	309
Shift Concerns		
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• Timing concerns	—	—
— early/late (some/all)	211	311
— erratic/hunting (some/all)	212	312
• Feel concerns	—	—
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— harsh (some/all)	214	314
• No 1st gear in drive, engages in higher gear	215	315
• No MANUAL 1st gear	216	316
• No MANUAL 2nd gear	217	317
Torque Converter Clutch Operation Concerns		
• No apply	240	340
• Always applied/stalls vehicle	241	341
• Cycling/shudder/chatter	242	342

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4R100	Routines	
	Electrical (a)	Hydraulic/Mechanical
Other Concerns		
• Shift lever efforts high	251	351
• External leaks	252	352
• Driveability	253	353
• Noise/vibration — forward or REVERSE	254	354
• Engine will not crank	255	355
• No PARK range	256	356
• Overheating	257	357
• No engine braking in MANUAL 2 position only	258	358
• No engine braking in MANUAL 1 position only	259	359
• No engine braking with OVERDRIVE cancelled	260	360
• No engine braking in MANUAL 1, 2 and 3	261	361
• Fluid venting or foaming	262	362

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(a) Carry out electrical routines first.

201/301: No Forward Only

Engagement Concern: No Forward Only

Possible Component	Reference/Action
201 — ELECTRICAL ROUTINE	
• No electrical concerns	
301 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid	
• Incorrect Level	• Adjust fluid to correct level.
• Condition	• Inspect according to instructions under Fluid Condition Check.
Shift Linkage (Internal/External) or Cable	
• Damaged, misadjusted, disconnected	• Inspect and repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Incorrect Pressures	
• Line Pressure — low	• Check pressure at line tap. Carry out Line Pressure and Stall Speed Tests. Refer to the Line Pressure Chart for specification. If pressures are low, check the following possible components: Pump inlet filter and seal assembly, main controls, pump assembly, forward clutch assembly.
Filter Assembly and Seal	
• Filter Seal — damaged, cut	• Inspect filter assembly and seal for damage. Install a new filter and seal as required.
Main Controls	
• Manual Valve — stuck, damaged	• Inspect for damage and repair as required.
• Control Body Housing — leaking	• Tighten bolts to specification.

Possible Component	Reference/Action
• Bolts not tightened to specification • Gaskets — damaged	• Tighten bolts to specification. • Inspect gasket for damage and install a new gasket as required.
Forward Clutch Assembly	
• Assembly	• Air Check Clutch Assembly.
• Piston, Seal, Check Ball — damaged, missing, not seating	• Inspect seals for damage, check ball seating, location. Install a new piston assembly as required.
• Feed Bolt — loose, missing	• Install new feedbolts and tighten to specification.
• Center Support — damaged, holes blocked/missing	• Inspect for damage. Install new as required.
• Forward Clutch Sealing Rings — damaged	• Inspect for damage. Install new as required.
• Forward Clutch Ring Gear — damaged	• Inspect for damage. Install new as required.
• Friction Elements — damaged, worn. Spline Teeth — damaged, missing	• Check for abnormal wear, damage. Install new as required.
Forward/Reverse Sun Gear	
• Forward/Reverse Sun Gear — damaged	• Inspect for damage. Install a new forward/reverse sun gear as required.
Front Planet Assembly	
• Front Planet Assembly — damaged	• Inspect for damage. Install a new front planet assembly as required.
Output Shaft	
• Splines — damaged	• Inspect for damage. Install new as required.
Low One-Way Clutch Assembly (Planetary)	
• Worn, damaged or misassembled	• Inspect for damage. Install a new low one-way clutch assembly (planetary) as required.

Part 2 Of 2

202/302: No Reverse Only

Engagement Concern: No Reverse Only

Possible Component	Reference/Action
202 — ELECTRICAL ROUTINE	
• No electrical concerns	
302 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid	
• Incorrect Level	• Adjust fluid to correct level.
• Condition	• Inspect per instructions under Fluid Condition Check.
Shift Linkage (Internal/External) or Cable	
• Damaged or misadjusted	• Inspect and repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Incorrect Pressures	

Part 1 Of 2

Possible Component	Reference/Action
• Line Pressure — low	• Check pressure at line pressure tap. Carry out Line Pressure and Stall Speed Tests. Refer to the Line Pressure Chart for specifications. If pressures are low, check the following possible components: Pump inlet filter and seal assembly, main control, pump assembly, reverse clutch assembly, coast clutch assembly, direct clutch assembly.
Filter Assembly and Seal	
• Damaged or seal missing	• Inspect filter assembly and seal for damage. Install new as required.
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Valve Springs, Main Control Valve Body, Direct Clutch Accumulator Valve — damaged, stuck, missing or misassembled	• Inspect for damage. Repair as required.
• Reinforcing Plate — incorrectly installed. Bolts — not torqued to specification	• Inspect for correct installation. Tighten bolts to specification.
Direct Clutch Assembly	
NOTE: Only if third gear also is inoperative	
• Assembly	• Air Check Clutch Assembly.
• Seals or Piston — damaged	• Inspect for damage. Install new as required.
• Clutch Plates — burnt, missing	• Inspect for damage. Install new as required.
• Check Ball — damaged, missing	• Inspect for damage. Install new as required.
• Center Support — damaged or holes blocked	• Inspect for damage. Repair as required.
• Center Support Hub — damaged	• Inspect for damage. Install new as required.
Reverse Clutch Assembly	
• Assembly	• Air Check Clutch Assembly.
• Seals or Piston — damaged	• Inspect for damage. Install new as required.
• Piston Bore — damaged	• Inspect for damage. Install new as required.
• Friction Elements — damaged, worn. Plates — missing	• Inspect for damage. Install new as required.
• Feed Hole — damaged, plugged, missing	• Inspect for damage. Repair as required.

Part 2 Of 2

203/303: Harsh Reverse Only

Engagement Concern: Harsh Reverse Only

Possible Component	Reference/Action
203 — ELECTRICAL ROUTINE	
Powertrain Control System	

Part 1 Of 2

Possible Component	Reference/Action
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, Throttle Position Sensor, TSS, OSS, ABS Electronic Pressure Control	• Run On-Board Diagnostics. Refer to the Powertrain Management for diagnosis. Carry out Engagement Test, Electronic Pressure Control Test. GO to Pinpoint Test E using the Transmission Tester and Cable and Overlay as outlined Repair as required. Clear codes, road test, rerun On-Board Diagnostics.
303 — HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures	
• Line Pressure — high	• Check pressure at line pressure tap. Carry out Line Pressure and Stall Speed Tests. Refer to the Line Pressure Chart for specification. If high, check the main controls.
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gasket — damaged	• Inspect for damage and install a new gasket.
• EPC Solenoid — stuck or damaged	• Carry out Electronic Pressure Control Tests described in routine No. 203. Install new as required.
Pump Assembly	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Main Regulator/Booster Valve — stuck, damaged, misassembled	• Inspect for damage. Repair as required.

Part 2 Of 2

204/304: Harsh Forward Only

Engagement Concern: Harsh Forward Only

Possible Components	Reference/Action
204 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, Throttle Position Sensor, TSS, OSS, ABS Electronic Pressure Control	• Run On-Board Diagnostics. Carry out Engagement Test, Electronic Pressure Control Test. GO to Pinpoint Test E using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test, rerun On-Board Diagnostics.
304 HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures	
• Line Pressure — high	• Check pressure at line pes are high, check main controls.

Part 1 Of 2

Possible Components	Reference/Action
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Electronic Pressure Control Solenoid — stuck or damaged	• Carry out Electronic Pressure Control Tests described in routine No. 204. Install new as required.
• Engagement Control Valve, Springs — damaged, stuck, misassembled, contaminated	• Inspect for damage. Repair as required.
Pump Assembly	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Main Regulator/Booster Valve — stuck, damaged, misassembled	• Inspect for damage. Repair as required.
Forward Clutch Assembly	
• Assembly	• Air Check Clutch Assembly.
• Plates — burnt, missing. Check Ball — missing, damaged. Hub — damaged	• Inspect for damage. Install new as required.

Part 2 Of 2

NOTE: All gasoline vehicles will have new adaptive shift strategies. Whenever the vehicle battery has been disconnected for any type of service or repair, the strategy parameters stored in the keep alive memory **(KAM)** will be lost. The strategy will start to relearn once the battery is reconnected and the vehicle is driven. This is a temporary condition and will return to normal operating condition once the Powertrain Control Module **(PCM)** relearns all the parameters from the driving conditions. There is no set time frame for this process. If a concern is present during downshifts or converter clutch apply, it is not the fault of the shift strategy and will require diagnosis. The customer needs to be notified that they may experience slightly different upshifts (either soft or firm) and that this is a temporary condition and will eventually return to normal operating condition.

205/305: Delayed/Soft Reverse Only

Engagement Concern: Delayed/Soft Reverse Only

Possible Component	Reference/Action
205 — ELECTRICAL ROUTINE	
• No electrical concerns	
305 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage or Cable	
• Damaged, misadjusted	• Inspect and repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Direct Clutch Accumulator Regulator Valve, Low Reverse Modulator Valve, Springs — stuck, damaged, missing, misassembled	• Inspect for damage. Repair as required.
• Check Ball —missing, damaged	• Inspect for damage. Install new as required.
• Reinforcing Plate — incorrectly installed, bolts not tightened to specification	• Inspect for correct installation. Tighten bolts to specification.
Coast Clutch Assembly	
• Air Check Clutch Assembly.	
• Assembly	• Inspect for damage. Install new as required.
• Piston Seals — damaged, missing	• Inspect for damage. Install new as required.
• Stator Support Seals — damaged	• Inspect for damage. Install new as required.

Part 1 Of 2

Possible Component	Reference/Action
Reverse Clutch Assembly	
• Assembly	• Air Check Clutch Assembly.
• Seals, Piston — damaged	• Inspect for damage. Install new as required.
• Friction Elements — damaged, worn	• Inspect for damage. Install new as required.
• Assembly Leakage	• Inspect for damage. Repair as required.

Part 2 Of 2

206/306: Delayed/Soft Forward Only

Engagement Concern: Delayed/Soft Forward Only

Possible Component	Reference/Action
206 — ELECTRICAL ROUTINE	
• No electrical concerns	
306 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid	
• Incorrect Level	• Adjust fluid to correct level.
• Condition	• Inspect according to instructions under Fluid Condition Check.
Shift Linkage or Cable	
• Damaged, misadjusted	• Inspect and repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Incorrect Pressures	
• Line Pressure — low	• Check pressure at line tap. Carry out Line Pressure and Stall Speed Tests. Refer to the Line Pressure Chart for specification. If pressures are low, check the following possible components: pump inlet filter and seal assembly, main controls, pump assembly.
Filter Assembly and Seal	
• Plugged, damaged • Filter Seal — damaged	• Inspect filter assembly and seal for damage. Install new as required.
Main Controls	
• Bolt not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
Center Support Assembly	

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Possible Component	Reference/Action
• Feedbolts — missing, incorrectly tightened	• Install new feedbolts and tighten to specification.
• Hub — damaged, holes blocked or missing	• Inspect for damage. Repair as required.
Forward Clutch Assembly	
• Assembly	• Air Check Clutch Assembly.
• Seals or Piston — damaged	• Inspect seals for damage. Install new as required.
• Check Balls — damaged, missing	• Inspect for mislocation, poor seating, damage. Install a new cylinder as required.
• Clutch Hub — damaged	• Inspect for damage. Install new as required.
• Friction Elements — damaged, missing	• Inspect for damage. Install new as required.
• Forward Clutch Cylinder Seals —damaged	• Inspect for damage. Install new as required.

Part 2 Of 2

NOTE: All gasoline vehicles will have new adaptive shift strategies. Whenever the vehicle battery has been disconnected for any type of service or repair, the strategy parameters stored in the keep alive memory **(KAM)** will be lost. The strategy will start to relearn once the battery is reconnected and the vehicle is driven. This is a temporary condition and will return to normal operating condition once the Powertrain Control Module **(PCM)** relearns all the parameters from the driving conditions. There is no set time frame for this process. If a concern is present during downshifts or converter clutch apply, it is not the fault of the shift strategy and will require diagnosis.
The customer needs to be notified that they may experience slightly different upshifts (either soft or firm) and that this is a temporary condition and will eventually return to normal operating condition.

207/307: No Forward and No Reverse Only

Engagement Concern: No Forward and No Reverse Only

Possible Component	Reference/Action
207 — ELECTRICAL ROUTINE	
• No electrical concerns	
307 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid	
• Incorrect Level • Condition	• Adjust fluid to correct level. Inspect according to instructions under Fluid Condition Check.
• Converter Drainback Valve	• Inspect converter drainback valve. Carry out Torque Converter Drainback Test. Install new as required.
Shift Linkage (Internal/External) or Cable	
• Damaged, misadjusted or disconnected	• Inspect for damage. Repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Incorrect Pressures	
• Line Pressures — low	• Check pressure at line tap. Carry out Line Pressure Test. Refer to the Line Pressure Chart for specification. If pressures are low, check the following possible components: pump inlet filter and seal assembly, main controls, pump assembly, forward clutch assembly.
Filter Assembly and Seal	
• Plugged, damaged • Filter Seal — damaged or cut	• Inspect filter assembly and seal for damage. Install new as required.
Main Controls	
• Manual Valve — stuck, damaged • Control Body Housing — leaking	• Inspect for damage. Repair as required.
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
Pump Assembly	

Possible Component	Reference/Action
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Main Regulator/Booster Valve — damaged, missing, misassembled	• Inspect for damage. Repair as required.
• Excessive Pump Gear End Clearance	• Carry out pump gear end clearance check.
Center Support Assembly	
• Damaged, holes blocked	• Inspect for damage. Repair as required.
• Feedbolts — missing or incorrectly tightened	• Install new bolts and tighten to specification.
Forward/Reverse Sun Gear	
• Damaged	• Inspect for damage. Install new as required.
Forward Planet Assembly	
• Damaged	• Inspect for damage. Install new as required.
Input Shaft/Center Shaft/Output Shaft	
• Splines — damaged	• Inspect for damage. Install new as required.
Overdrive Carrier	
• Damaged	• Inspect for damage. Install new as required.
Drive in (D) with Overdrive cancelled	
Note: For diagnostic purposes only. Not for extended driving.	
Overdrive OWC	
• Misassembled, damaged	• Inspect for damage. Repair as required.
• Sprags or Races — damaged	• Inspect for damage. Install new as required.

208/308: Harsh Forward and Reverse

Engagement Concern: Harsh Forward and Reverse

Possible Components	Reference/Action
208 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, Powertrain Control Module, Electronic Pressure Control, Throttle Position Sensor	• Run On-Board Diagnostics. Refer to the Powertrain Management for diagnosis. Carry out Engagement Test, Electronic Pressure Control Test. GO to Pinpoint Test E using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
308 — HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures	
• Line Pressure — high	• Check pressure at line pressure tap. Carry out Line Pressure Test. Refer to the Line Pressure Chart for specification. If high, check main controls.
Main Controls	

Possible Components	Reference/Action
• Bolts not tightened to specification • Gasket — damaged • EPC Solenoid — stuck or damaged • Engagement Control Valve — stuck, damaged, contaminated, misassembled	• Tighten bolts to specification. • Inspect for damage and install a new gasket. • Carry out Electronic Pressure Control Tests described in routine No. 208. Install new as required. • Inspect for damage, contamination. Repair as required.
Pump Assembly	
• Bolts not tightened to specification • Gaskets — damaged • Main Regulator/Booster Valve — stuck, damaged, misassembled	• Tighten bolts to specification. • Inspect for damage and install a new gasket. • Inspect for damage. Repair as required.

Part 2 Of 2

209/309: Delayed/Soft Forward and Reverse

Engagement Concern: Delayed/Soft Forward and Reverse

Possible Component	Reference/Action
209 — ELECTRICAL ROUTINE	
• No electrical concerns	
309 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage or Cable	
• Damaged, misadjusted	• Inspect and repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted; refer to the Digital Transmission Range (TR) Sensor.
Fluid	
• Incorrect Level	• Adjust to correct level.
Incorrect Pressures	
• Line Pressure — low	• Check pressure at line tap. Refer to the Line Pressure Chart for specification. If low, check the following components: pump inlet filter/seal assembly, main control, pump assembly.
Filter Assembly and Seal	
• Plugged, damaged • Seal —damaged, cut	• Inspect filter assembly and seal for damage. Install new as required.
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Springs — stuck, damaged, missing, misassembled	• Inspect for damage. Repair as required.
Torque Converter Drainback (Initial Engagement Only)	• Refer to Torque Converter Drainback Test procedures for diagnosis.

251/351: Shift Lever Effort Is High

Other Concerns: Shift Lever Efforts High

Possible Component	Reference/Action
251 — ELECTRICAL ROUTINE	
• No electrical concerns	
351 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal/External) or Cable	

Part 1 Of 2

Possible Component	Reference/Action
• Damaged, misadjusted	• Inspect and repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Manual Control Lever Outer and Shaft Assembly	
• Retaining Pin — damaged. Nut — loose. Detent Spring — bent/damaged. Park Mechanism — damaged	• Inspect for damage. Repair as required. Inspect locking nuts for correct torque, Tighten to correct specification as required.
Main Controls	
• Manual Valve — sticking	• Inspect for damage. Repair as required.
• Bolts not tightened to specification	• Tighten bolts to specification.

Part 2 Of 2

252/352: External Leaks

Other Concerns: External Leaks

Possible Component	Reference/Action
252 — ELECTRICAL ROUTINE	
• No electrical concerns	
352 — HYDRAULIC/MECHANICAL ROUTINE	
Engine Rear Seal	
• Locate source and install a new seal as required.	
Seals/Gaskets	
• Torque Converter Assembly, Pump, Transmission Fluid Pan, Transmission Connector, Extension Housing Gasket Seal, Manual Lever, Fluid Level Indicator, Fluid Filler Tube, Pump Bolts	• Locate source and repair as required.
Other	
• Cooler Fitting, Pressure Taps, Converter Drain Plug, Band Anchor Pins, Cooler Tubes, Case — porosity, case cracked	• Locate source and repair as required.
• Vent — blocked or damaged	• Check case vent assembly for damage or blockage. Repair as required.
• Overfilled Transmission	• Check level and adjust as required.
• Overheating	• Refer to routines No. 257/357.
• Pump Assembly	• Locate source and repair as required.

253/353: Driveability Concerns

Other Concerns: Engine Driveability Concerns

Possible Component	Reference/Action
253 — ELECTRICAL ROUTINE	
Powertrain Control System	• Carry out Torque Converter Clutch Operation Test.

Part 1 Of 2

Possible Component	Reference/Action
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, Other Engine Related Items, TCC Solenoid, TP Sensor, Digital (TR) Sensor, TFT Sensor	• Run On-Board Diagnostics. GO to Pinpoint Test B, GO to Pinpoint Test C and GO to Pinpoint Test D using the Transmission Tester, Cable and Overlay and TRS-E Cable. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
353 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal/External) or Cable	
• Damaged, misadjusted	• Inspect for damage. Repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Shift Scheduling	• Carry out Shift Point Road Test
• Incorrect	• Go to the appropriate diagnostic routines for shift concerns No. 210-211.
Engagements	
• Gear Selection — incorrect	• Go to the appropriate diagnostic routines for shift concerns No. 215/315.
Converter Clutch Always Applied	• Go to routine No. 341.
Converter One-Way Clutch	
• Damaged	• Go to Torque Converter One-Way Clutch Check

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254/354: Noise Vibration - Forward or Reverse

Other Concerns: Noise/Vibration-Forward or Reverse

Possible Component	Reference/Action
254 — ELECTRICAL ROUTINE	
• No electrical concerns	
354 — HYDRAULIC/MECHANICAL ROUTINE	
For Noises/Vibrations that change with engine speed: • Torque converter components • Fluid level (low) pump cavitation • Pump assembly • Engine drive accessories • Transmission fluid cooler lines grounding out • Flexplate • Fluid filler tube grounding out	• Locate source of disturbance. Repair as required.
For Noise/Vibrations that change with vehicle speed:	

Part 1 Of 2

Possible Component	Reference/Action
• Engine mounts — Loose, damaged • Driveline concerns • U-joints • Rear axle assembly • Suspension • Modifications/misalignment • First gear — one-way clutch, gear set — friction elements — torque converter assembly • Second gear — intermediate OWC — friction elements — torque converter assembly • Third gear — one-way clutch — torque converter assembly — friction elements • Fourth gear — one-way clutch — gear set — friction elements — torque converter assembly • REVERSE — gear set — friction elements — torque converter assembly • Shaft spline fit • Slip yoke, park gear	• Locate source of disturbance. Repair as required. • For specific shifts or torque converter concern, refer to appropriate routines: — No Shift 1-2, Routine 320 — No Shift 2-3, Routine 321 — No Shift 3-4, Routine 322 — No Shift 4-3, Routine 323 — No Shift 3-2, Routine 324 — No Shift 2-1, Routine 325 — No Converter Cycling, Routine 242/342
Other Noises/Vibrations: • Main controls • Valve resonance • Shift cable • Vibration, grounding — transmission fluid cooler lines or fluid filler tube	• Locate source of disturbance. Repair as required.

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255/355: Engine Will Not Crank

Other Concerns: Engine Will Not Crank

Possible Component	Reference/Action
255 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, Digital (TR) Sensor	• Run On-Board Diagnostics. GO to Pinpoint Test D using the Transmission Tester, Cable and Overlay and TRS-E Cable. Repair as required. Clear codes, and rerun On-Board Diagnostics.
355 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal/External) or Cable/Digital (TR) Sensor	

Part 1 Of 2

Possible Component	Reference/Action
• Damaged, misadjusted	• Inspect and repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Pump Assembly	
• Seized	• Refer to Pump Assembly. Inspect for damage. Repair as required.
Flexplate	
• Damaged	• Inspect for damage. Install a new flexplate.

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256/356: No Park (P) Range

Other Concerns: No Park Range

Possible Component	Reference/Action
256 — ELECTRICAL ROUTINE	
• No electrical concerns	
356 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal/External) or Cable	
• Damaged, misadjusted	• Inspect for damage. Repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Park Mechanism	
• Park Gear, Parking Pawl, Parking Pawl Return Spring, Park Guide Plate, Parking Pawl Shaft, Parking Pawl Actuating Rod, Manual Control Lever Outer and Shaft Assembly, Inner Manual Valve Detent Lever — damaged, misassembled	• Inspect for damage. Repair as required.
Super Duty Only	
• Parking Brake Drum — damaged	• Inspect for damage. Install new as required.

257/357: Overheating

Other Concerns: Transmission Overheating

Possible Component	Reference/Action
257 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, TCC Solenoid	• Run On-Board Diagnostics. GO to Pinpoint Test C using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
357 — HYDRAULIC/MECHANICAL ROUTINE	

Possible Component	Reference/Action
Excessive Vehicle or Towing Loads, Severe Vehicle Usage	• Refer to the vehicle specification manual for load and GVW/GCW information. Refer to owner guide. • NOTE: If auxiliary cooler is desired, use only Ford original factory equipment installed to factory specifications.
Fluid	
• Incorrect Level • Condition	• Adjust fluid to correct level. Inspect according to instructions under Fluid Condition Check.
Transmission Cooling System	
• Damaged, blocked, restricted, or incorrectly installed • Cooler Bypass Valve (CBV) — damaged, blocked, restricted or incorrectly installed	• Carry out Transmission Fluid Cooler Flow Test. • Inspect for damage, restrictions. Repair as required.
Vehicle Concerns Causing Engine Overheating	• Refer to Cooling System.
Torque Converter Clutch	
• Not engaging	• See Routine No. 240/340.

Part 2 Of 2

258/358: No Engine Braking In Manual 2ND Position Only

Other Concerns: No Engine Braking in MANUAL 2 Position Only

Possible Component	Reference/Action
258 — ELECTRICAL ROUTINE	
• No electrical concerns	
358 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• BS1, BS6, CB1 Check Balls — missing, seat damaged	• Inspect for damage. Install new as required.
• Valve Body Separator Plate — damaged	• Inspect for damage. Install new as required.
• 4-3-2 Timing Valve, D2 Valve, 2-3 Shift Valve, Coast Clutch Shift Valve, 1-2 Manual Transition Valve, 3-4 Shift Valve — damaged, stuck, misassembled	• Inspect for damage. Repair as required.
Coast Clutch Assembly	
• Assembly	• Air Check Clutch Assembly.
• Seals or Piston — damaged	• Inspect for damage. Install new as required.
• Stator Support — damaged or holes blocked. Seal Rings — damaged	• Inspect for damage. Repair as required.
• Cylinder Hub — damaged or holes blocked	• Inspect for damage. Repair as required.
• Friction Elements — damaged, burnt	• Inspect for damage. Install new as required.
Intermediate Servo/Band Assembly	
• Servo Piston or Bore — damaged	• Inspect for damage. Install new as required.
• Band or Drum — burnt, damaged	• Inspect for damage. Install new as required.

259/359: No Engine Braking In Manual 1ST Position Only

Other Concerns: No Engine Braking in MANUAL 1 Position Only

Possible Component	Reference/Action
259 — ELECTRICAL ROUTINE	
• No electrical concerns	
359 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• 3-4 Shift Valve, Low Reverse Clutch Modulator Valve, D2 Valve, 4-3-2 Timing Valve, 2-3 Shift Valve, Coast Clutch Shift Valve — damaged, misassembled, stuck	• Inspect for damage. Repair as required.
• BS1, CB1 Ball — damaged, missing	• Inspect for damage. Install new as required.
• Valve Body Separator Plate — damaged	• Inspect for damage. Install new as required.
• Reinforcing Plate Bolts — loose	• Tighten bolts to specification.
Coast Clutch Assembly	
• Assembly	• Air Check Clutch Assembly; refer to Air Pressure Tests.
• Seal or Piston — damaged	• Inspect for damage. Install new as required.
• Stator Support — damaged or holes blocked. Seal Rings — damaged	• Inspect for damage. Repair as required.
• Cylinder Hub — damaged or holes blocked	• Inspect for damage. Repair as required.
• Friction Elements — damaged, burnt	• Inspect for damage. Install new as required.
Low One-Way Clutch Assembly	
• Assembly	• Air Check Clutch Assembly; refer to Air Pressure Tests.
• Seals or Piston — damaged	• Inspect for damage. Install new as required.
• Friction Elements — damaged, worn	• Inspect for damage. Install new as required.
• Sealing Area in Case — damaged	• Inspect for damage. Install a new case.

260/360: No Engine Braking w/(D) Canceled (Manual 1 & 2 Have Engine Braking)

Other Concerns: No Engine Braking with Overdrive Cancelled (MANUAL 1st and MANUAL 2nd Have Engine Braking)

Possible Component	Reference/Action
260 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, CCS	• Run On-Board Diagnostics. GO to Pinpoint Test G using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
360 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.

Possible Component	Reference/Action
• CCS — damaged, stuck	• Refer to electrical routine No. 260.
• BS3 Check Balls — missing. Valve Body Separator Plate Seat — damaged	• Inspect for damage. Install new as required.
• 3-4 Shift Valve — stuck, damaged or misassembled	• Inspect for damage. Repair as required.

Part 2 Of 2

261/361: No Engine Braking In Manual 1, 2, and 3

No Engine Braking in Manual 1, 2 and 3

	Reference/Action
261— ELECTRICAL ROUTINE	• No electrical concerns
361 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Valve Body Separator Plate—damaged	• Inspect for damage. Install new as required.
• Gaskets — damaged	• Inspect for damaged or missing gasket. Install new as required.
Coast Clutch Assembly	
• Coast Clutch Cylinder Snap Ring Grove—damaged	• Inspect cylinder for damage. Install new as required. Inspect flatness of grove. Install new cylinder as required.
• Not machined flat	• Inspect cylinder and snap ring for damage.
• Coast Clutch Cylinder Snap Ring—loose installed	• Inspect new as required. Inspect for flatness of grove. Install new as required.

262/362: Fluid Venting/Foaming

Other Concerns: Fluid Venting/Foaming

Possible Component	Reference/Action
262 — ELECTRICAL ROUTINE	
	• No electrical concerns
362 — HYDRAULIC/MECHANICAL ROUTINE	
• Case Vent Assembly — blocked or damaged	• Check case vent assembly for damage or blockage. Repair as required.
• Overfilled Transmission	• Check level and adjust as required.
• Fluid — contaminated (coolant, water)	• Check for contamination, locate source of contamination. Repair as required.
• Overheating	• Refer to Routine No. 257/357.
• Filter Assembly and Seal — damaged or misassembled	• Inspect filter assembly and seal for damage. Install new as required.
• Pump to Case Gasket — damaged, misaligned	• Inspect for damage and install a new gasket.

210/310: Some or All Shifts Missing

Shift Concerns: Some or All Shifts Missing

Possible Component	Reference/Action
210 — ELECTRICAL ROUTINE	
Powertrain Control System	

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Possible Component	Reference/Action
• Electrical Inputs/Outputs, Vehicle Wiring Harness, PCM, Throttle Position Sensor, Digital (TR) Sensor, TSS, OSS, ABS, SSA, SSB	• Carry out Shift Point Road Test. • Run On-Board Diagnostics. GO to Pinpoint Test A and GO to Pinpoint Test D using the Transmission Tester, Cable and Overlay and the TRS-E Cable. Repair as required. Clear code, road test, rerun On-Board Diagnostics.
310 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid	
• Incorrect Level • Condition	• Adjust fluid to correct level. Inspect according to instructions under Fluid Condition Check.
Shift Linkage (Internal/External) or Cable	
• Damaged, misadjusted, disconnected	• Inspect and repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Filter Assembly and Seal	
• Plugged, damaged • Filter Seal — damaged	• Inspect filter assembly and seal for damage. Install new as required.
Main Controls	
• Valves — stuck, damaged, misassembled	• Inspect for damage. Repair as required.
For diagnosis related to a specific shift, see Reference/Action	• To diagnose specific No Shift, refer to the appropriate shift routine. — No Shift 1-2, Routine 220/320 — No Shift 2-3, Routine 221/321 — No Shift 3-4, Routine 222/322 — No Shift 4-3, Routine 223/323 — No Shift 3-2, Routine 224/324 — No Shift 2-1, Routine 225/325

Part 2 Of 2

211/311: Timing - Early/Late (Some/All)

Shift Concerns: Shift Timing-Early/Late (Some/All)

Possible Component	Reference/Action
211 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, Throttle Position Sensor, TFT Sensor, TSS, OSS, ABS, SSA, SSB	• Carry out Shift Point Road Test. • Run On-Board Diagnostics. GO to Pinpoint Test A and GO to Pinpoint Test B using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
Other Electrical Concerns	
• No power to PCM, Keep-Alive Memory erased from PCM	• Restore memory by carrying out Transmission Drive Cycle Test.
311 — HYDRAULIC/MECHANICAL ROUTINE	
Other	

Part 1 of 2

Possible Component	Reference/Action
• Tire size change	• Refer to the specification decal on door panel and verify that vehicle has original equipment. Changes in tire size or axle ratio may affect shift timing.
• Speedometer Gear Change (model dependent)	
• Axle Ratio Change	
Power/Engine Driveability Concerns— engine runs poor	
• Refer to Routine No. 253/353.	
Main Controls	
• Valves, Accumulators — stuck or damaged	• Inspect for damage, contamination. Repair as required.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Bolts not tightened to specification	• Tighten bolts to specification.
For diagnosis related to a specific shift or if all above are OK, see Reference/Action.	• To diagnose specific shift/timing concern refer to Soft/Slipping routines: — Soft/Slipping Shift 1-2, Routine 226/326 — Soft/Slipping Shift 2-3, Routine 227/327 — Soft/Slipping Shift 3-4, Routine 228/328 — Downshifts, 229/329

Part 2 of 2

212/312: Timing - Erratic/Hunting (Some/All)

Shift Concerns: Timing-Erratic/Hunting (Some/All)

Possible Component	Reference/Action
212 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Vehicle Wiring Harnesses, PCM, TP Sensor, TFT Sensor, SSA, SSB, Digital (TR) Sensor, TCC Solenoid	• Carry out Shift Point Road Test and Torque Converter Clutch Operation Tests. • Run On-Board Diagnostics. GO to Pinpoint Test A, GO to Pinpoint Test B, GO to Pinpoint Test C and GO to Pinpoint Test D using the Transmission Tester, Cable and Overlay and the TRS-E Cable. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
With Speed Control On	
• Torque Converter Cycling	• Re-evaluate with speed control off or depress TCS (overdrive cancelled). If condition still exists, proceed with diagnosis.
• Shift Cycling (3-4/4-3 shifts)	• Re-evaluate with speed control off or depress TCS (overdrive cancelled). If condition still exists, proceed with diagnosis.
312 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid	
• Incorrect Level	• Adjust fluid to correct level.
Filter Assembly and Seal	
• Plugged, damaged	• Inspect filter assembly and seal for damage. Install a new filter assembly and seal as required.

Part 1 Of 2

Possible Component	Reference/Action
• Filter Seal — damaged	• Inspect filter assembly and seal for damage. Install a new filter assembly and seal as required.
Main Control	
• Valves, Accumulators — damaged, stuck	• Inspect for damage. Repair as required.
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Wrong parts used in rebuild	• Verify that correct parts were used.
• Torque Converter Clutch	• Refer to Torque Converter Clutch Operation Concern: Cycling/Shudder/Chatter (No. 342).
• For further diagnosis of timing issues, refer to Reference/Action	• Refer to the following shift routine(s) for further diagnosis: • No 1-2 Shift, Routine 220/330 • No 2-3 Shift, Routine 221/331 • No 3-4 Shift, Routine 222/332 • No 4-3 Shift, Routine 233/323 • No 3-2 Shift, Routine 224/324 • No 2-1 Shift, Routine 225/325 • Soft/Slip 1-2 Shift, Routine 226/326 • Soft/Slip 2-3 Shift, Routine 227/327 • Soft/Slip 3-4 Shift, Routine 228/328 • Soft/Slip 4-3 Shift, Routine 229/329 • Soft/Slip 3-2 Shift, Routine 229/329 • Soft/Slip 2-1 Shift, Routine 229/329 • Harsh 1-2 Shift, Routine 232/332 • Harsh 2-3 Shift, Routine 233/333 • Harsh 3-4 Shift, Routine 224/334 • Harsh 4-3 Shift, Routine 235/335 • Harsh 3-2 Shift, Routine 236/336 • Harsh 2-1 Shift, Routine 237/337

Part 2 Of 2

213/313: Feel - Soft/Slipping (Some/All)

Shift Concerns: Feel-Soft/Slipping (Some/All)

Possible Component	Reference/Action
213 — ELECTRICAL ROUTINE	
Powertrain Control System	

Part 1 Of 2

Possible Component	Reference/Action
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, TP Sensor, Electronic Pressure Control, TFT Sensor	• Carry out Shift Point Road Test. • Run On-Board Diagnostics. GO to Pinpoint Test E and GO to Pinpoint Test B using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test, rerun On-Board Diagnostics.
313 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid	
• Incorrect Level	• Adjust fluid to correct level.
• Condition	• Inspect according to instructions under Fluid Condition Check.
Incorrect Pressures	
• Line Pressure — low	• Check pressures at line pressure tap. Carry out Line Pressure Tests. Refer to the Line Pressure Chart for specifications. If pressures are low or all shifts are soft/slipping, go to main controls.
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Line Modulator Valve Springs — damaged, stuck, misassembled	• Inspect for damage, contamination. Repair as required.
• EPC Solenoid — failure to operate in a normal manner	• Refer to Electrical Routine No. 213.
• Accumulator Assembly — damaged or wrong assembly	• Inspect for damage. Install new as required. Verify correct assembly is used.
Pump Assembly	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Main Regulator/Booster Valve — damaged, misassembled	• Inspect for damage. Repair as required.
• Electronic Pressure Control Air Bleed Check Valve — damaged or missing	• Inspect for damage. Install new as required.
For diagnostics related to specific shifts, see Reference/Action.	• Refer to the following Shift Routine(s) for further diagnosis: — Soft/Slipping Shift 1-2, Routine 226/326 — Soft/Slipping Shift 2-3, Routine 227/327 — Soft/Slipping Shift 3-4, Routine 228/328 — Downshifts, 229/329

Part 2 Of 2

NOTE: All gasoline vehicles will have new adaptive shift strategies. Whenever the vehicle battery has been disconnected for any type of service or repair, the strategy parameters stored in the keep alive memory **(KAM)** will be lost. The strategy will start to relearn once the battery is reconnected and the vehicle is driven. This is a temporary condition and will return to normal operating condition once the Powertrain Control Module **(PCM)** relearns all the parameters from the driving conditions. There is no set time frame for this process. If a concern is present during downshifts or converter clutch apply, it is not the fault of the shift strategy and will require diagnosis. The customer needs to be notified that they may experience slightly different upshifts (either soft or firm) and that this is a temporary condition and will eventually return to normal operating condition.

214/314: Feel - Harsh (Some/All)

Shift Feel-Harsh (Some/All)

Possible Component	Reference/Action
214 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, Electronic Pressure Control, TFT Sensor, TP Sensor, Digital (TR) Sensor	• Run On-Board Diagnostics. GO to Pinpoint Test B, GO to Pinpoint Test D and GO to Pinpoint Test E using the Transmission Tester, Cable and Overlay and the TRS-E Cable. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
Engine Driveability Issues	• Refer to the Powertrain Management for diagnosis.
314 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid	
• Incorrect Level	• Adjust fluid to correct level.
• Condition	• Inspect according to instructions under Fluid Condition Check.
Incorrect Pressures	
• Line Pressure — high	• Check pressures at line pressure tap. Carry out Line Pressure and Stall Speed Tests. If pressures are high or all shifts are harsh, go to Main Controls.
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Line Modulator Valve/Spring — misassembled, stuck, damaged	• Inspect for damage, contamination.
• EPC Solenoid — failure to operate in a normal manner	• Install new as required.
• Accumulator Assembly — damaged or wrong assembly	• Refer to Electrical Routine No. 214. • Inspect for damage. Install new as required. Verify correct assembly is used.
Pump Assembly	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.

Part 1 Of 2

Possible Component	Reference/Action
• Main Regulator/Booster Valve — damaged, misassembled	• Inspect for damage. Repair as required.
For diagnostics related to a specific shift, see Reference/Action	• Refer to the following Shift Routine(s) for further diagnosis: — Harsh Shift 1-2, Routine 232/332 — Harsh Shift 2-3, Routine 233/333 — Harsh Shift 3-4, Routine 234/334 — Harsh Shift 4-3, Routine 235/335 — Harsh Shift 3-2, Routine 236/336 — Harsh Shift 2-1, Routine 237/337

Part 2 Of 2

NOTE: All gasoline vehicles will have new adaptive shift strategies. Whenever the vehicle battery has been disconnected for any type of service or repair, the strategy parameters stored in the keep alive memory **(KAM)** will be lost. The strategy will start to relearn once the battery is reconnected and the vehicle is driven. This is a temporary condition and will return to normal operating condition once the Powertrain Control Module **(PCM)** relearns all the parameters from the driving conditions. There is no set time frame for this process. If a concern is present during downshifts or converter clutch apply, it is not the fault of the shift strategy and will require diagnosis. The customer needs to be notified that they may experience slightly different upshifts (either soft or firm) and that this is a temporary condition and will eventually return to normal operating condition.

215/315: No 1ST Gear In Drive, Engages In Higher Gear

Shift Concerns: No 1st Gear in Drive, Engages in Higher Gear

Possible Component	Reference/Action
215 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, SSA, SSB, Digital (TR) Sensor	• Run On-Board Diagnostics. GO to Pinpoint Test A and GO to Pinpoint Test D using the Transmission Tester. Cable and Overlay and the TRS-E Cable. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
315 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal/External) or Cables, Digital Transmission Range (TR) Sensor	
• Damaged, not connected, misadjusted	• Inspect and repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged, misaligned	• Inspect for damage and install a new gasket.
• SSA, SSB — stuck or damaged	• Refer to Electrical Routine No. 215.
• Solenoid Regulator Valve, 2-3 Shift Valve, 3-4 Shift Valve, D2 Valve — stuck, missing, misassembled, damaged	• Inspect for damage. Repair as required.
• Air Bleeds for S1-S2 Circuits — missing	• Inspect for damage. Install a new case.
• Wrong components used in rebuild	• Verify that correct components were used. Install new as required.
Mechanical	
• Band Servo, Clutches — damaged	• Refer to correct disassembly procedures
For diagnosis related to a specific gear, use Transmission Tester to determine gear	Refer to the following routine(s) for further diagnosis: • No Shift 1-2, Routine 220/320 • No Shift 2-3, Routine 221/321 • No Shift 3-4, Routine 222/322
Reverse Ring Gear	

Possible Component	Reference/Action
• Damaged Gear Lugs to Reverse Carrier	• Inspect for damage. Install new as required.
Low One-Way Clutch	
• Damaged, misassembled	• Inspect for damage, correct assembly. Repair as required.

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216/316: No Manual 1ST Gear

Shift Concerns: No Manual 1st Gear

Possible Component	Reference/Action
216 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, SSA1, SSB, Digital (TR) Sensor	• Run On-Board Diagnostics. GO to Pinpoint Test A and GO to Pinpoint Test D using the Transmission Tester, Cable and Overlay and the TRS-E Cable. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
316 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal/External) or Cable	
• Damaged, misadjusted, not connected	• Inspect for damage. Repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Manual Control Lever Outer and Shaft Assembly, Manual Valve, Low Reverse Modulator Valve, 1-2 Shift Valve, 2-3 Shift Valve, BS1 Check Ball, 4-3-2 Timing Valve — stuck, damaged	• Inspect for damage. Repair as required.
• SSA — failure to operate in a normal manner	• Refer to Electrical Routine No. 216.
• Air Bleed for SSA/SS1 Circuit — damaged or missing	• Inspect for damage. Install a new case.
• Wrong parts used in rebuild	• Verify that correct parts were used.
Low One-Way Clutch Assembly	
• Damaged, misassembled	• Inspect for damage. Repair as required.

217/317: No Manual 2ND Gear

Shift Concerns: No Manual 2nd Gear

Possible Component	Reference/Action
217 — ELECTRICAL ROUTINE	
Powertrain Control System	

Part 1 Of 2

Possible Component	Reference/Action
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, SSA, SSB, Digital (TR) Sensor	• Run On-Board Diagnostics. GO to Pinpoint Test A and GO to Pinpoint Test D using the Transmission Tester, Cable and Overlay and the TRS-E Cable. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
317 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal/External) or Cable	
• Damaged, misadjusted	• Inspect for damage. Repair as required. Verify linkage/cable adjustment. After linkage/cable repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• 2-3 Shift Valve, 3-4 Shift Valve, Manual 1-2 Transition Valve, Spring — stuck, damaged, missing, misassembled	• Inspect for damage. Repair as required.
• BS6, BS1 — missing, leaks or seats damaged	• Inspect for damage. Install new as required.
• Incorrect parts used in rebuild	• Verify that correct parts were used.
Intermediate Clutch Assembly	
• Assembly	• Air Check Clutch Assembly,
• Seals or Piston — damaged	• Inspect for damage. Install new as required.
• Friction Elements — worn, missing, damaged, misassembled	• Inspect for damage. Repair as required.
• Ball Check — stuck/missing	• Inspect for damage. Repair as required.
• Feedbolt — torque incorrect, leaks, missing	• Inspect and tighten bolts as required.
• Cylinder Assembly Outer Diameter/Case Bore — damaged, leaking	• Inspect for damage. Repair as required.
Intermediate One-Way Clutch Assembly	
• Housing — damaged	• Inspect for damage. Install new as required (a clicking sound heard when rotated by hand is normal).

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220/320: No 1-2 Shift (Automatic)

Shift Concerns: No 1-2 Shift (Automatic)

Possible Component	Reference/Action
220 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, TP Sensor, TSS, OSS, ABS, SSA, SSB	• Run On-Board Diagnostics. GO to Pinpoint Test A using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.

Possible Component	Reference/Action
320 — HYDRAULIC/MECHANICAL ROUTINE	
Shift Linkage (Internal/External) or Cable	
• Damage, misadjusted • Digital (TR) Sensor — damaged, misadjusted	• Inspect for damage. Repair as required. Verify linkage adjustment. After linkage repair/adjustment, verify that the digital (TR) sensor is correctly adjusted.
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged, misaligned	• Inspect for damage and install a new gasket.
• SSB — failure to operate in a normal manner	• Refer to Electrical Routine No. 220.
• D2 Valve, 1-2 Shift Valve, 1-2 Manual Transition Valve, Intermediate Clutch Accumulator Regulator Valves, Springs — stuck, damaged, missing or misassembled	• Inspect for damage. Repair as required.
• Air Bleed for SSB Circuit — damaged or missing	• Inspect for damage. Install a new case.
• Wrong parts used in rebuild	• Verify that correct parts were used.
Intermediate Clutch Assembly	
• Assembly	• Air Check Clutch Assembly.
• Seals or Piston — damaged	• Inspect for damage. Install new as required.
• Friction Elements — worn, missing, damaged, misassembled	• Inspect for damage. Repair as required.
• Ball Check — stuck/missing	• Inspect for damage. Repair as required.
• Feedbolt — torque incorrect, leaks, missing	• Inspect and tighten bolts as required.
• Cylinder Assembly Outer Diameter/Case Bore — damaged, leaking	• Inspect for damage. Install new as required.
Intermediate One-Way Clutch Assembly	
• Housing — damaged	• Inspect for damage. Install new as required.

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221/321: No 2-3 Shift (Automatic)

Shift Concerns: No 2-3 Shift (Automatic)

Possible Component	Reference/Action
221 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harness, PCM, TP Sensor, TSS, OSS, ABS, SSA, SSB	• Run On-Board Diagnostics. GO to Pinpoint Test A using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
321 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.

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Possible Component	Reference/Action
• SSA — failure to operate in a normal manner	• Refer to Electrical Routine No. 221.
• Direct Clutch Accumulator Regulator Valve, 2-3 Shift Valve, Springs — stuck, missing, damaged, misassembled	• Inspect for damage. Repair as required.
• Air Bleed for SSB Circuit — damaged or missing	• Inspect for damage. Install a new case.
• Incorrect components used in rebuild	• Verify that correct components are used.
Center Support Assembly	
• Feedbolts — missing, not tightened to specification	• Inspect, install new feedbolts and tighten to specification.
• Seal Rings — damaged	• Inspect for damage. Install new as required.
• Assembly — damaged	• Inspect for damage. Install new as required.
• Outside Diameter or Case Bore — damaged or leaking	• Inspect for damage. Install new as required.
Direct Clutch Assembly	
• Assembly	• Air Check Clutch Assembly.
• Center Support Hub Seals — damaged	• Inspect for damage. Install new as required.
• Seals, Piston Cylinder — damaged	• Inspect for damage. Install new as required.
• Friction Elements — missing or damaged	• Inspect for damage. Install new as required.
• Ball Check — missing, damaged	• Inspect for damage. Install new as required.

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222/322: No 3-4 Shift (Automatic)

Shift Concerns: No 3-4 Shift (Automatic)

Possible Component	Reference/Action
222 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, TP Sensor, TSS, OSS, ABS, SSA, SSB	• Run On-Board Diagnostics. GO to Pinpoint Test A using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
322 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged or misaligned	• Inspect for damage and install a new gasket.
• SSA, SSB — failure to operate in a normal manner	• Refer to Electrical Routine No. 222.
• Overdrive Accumulator Regulator Valve and Spring, 3-4 Shift Valve and Spring — damaged, stuck, misassembled, missing	• Inspect for damage. Repair as required.
• Incorrect components used in rebuild	• Verify that correct components were used in the rebuild.
Overdrive Clutch Assembly	
• Assembly	• Air Check Clutch Assembly.
• Clutch Plates — burnt, missing	• Inspect for damage. Install new as required.

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Possible Component	Reference/Action
• Cylinder — damaged	• Inspect for damage. Install new as required.
• Feedbolts — loose, missing, leaking. Seals — damaged	• Install new feedbolts and tighten to specification.
• Cylinder Check Ball —missing	• Inspect for damage. Install new as required.
Overdrive One-Way Clutch Assembly	
• Damaged	• Inspect for damage. Install new as required.
Overdrive Planet Assembly	
• Damaged	• Inspect for damage. Install new as required.

Part 2 Of 2

223/323: No 4-3 Shift (Automatic)

Shift Concerns: No 4-3 Shift (Automatic)

Possible Component	Reference/Action
223 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, TP Sensor, TSS, OSS, ABS, SSB	• Run On-Board Diagnostics. GO to Pinpoint Test A using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
323 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged, misaligned	• Inspect for damage and install a new gasket.
• SSB — failure to operate in a normal manner	• Refer to Electrical Routine No. 223.
• BS2, 3-4 Shift Valve — damaged, missing, misassembled, stuck	• Inspect for damage. Repair as required.

224/324: No 3-2 Shift (Automatic)

Shift Concerns: No 3-2 Shift (Automatic)

Possible Component	Reference/Action
224 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, TP Sensor, TSS, OSS, ABS, SSA	• Run On-Board Diagnostics. GO to Pinpoint Test A and GO to Pinpoint Test D using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
324 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged, misaligned	• Inspect for damage and install a new gasket.
• SSA — failure to operate in a normal manner	• Refer to Electrical Routine No. 224.
• 3-2 Shift Valve — stuck, damaged	• Inspect for damage. Repair as required.

225/325: No 2-1 Shift (Automatic)

Shift Concerns: No 2-1 Shift (Automatic)

Possible Component	Reference/Action
225 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, TP Sensor, TSS, OSS, ABS, SSB	• Run On-Board Diagnostics. GO to Pinpoint Test A using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
325 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets, Separator Plate — damaged, misaligned	• Inspect for damage and install a new gasket.
• SSB — failure to operate in a normal manner	• Refer to Electrical Routine No. 225.
• D2 Shift Valve — damaged, stuck	• Inspect for damage. Repair as required.

226/326: Soft/Slipping 1-2 Only (Automatic)

Shift Concerns: Soft/Slipping 1-2 Only (Automatic)

Possible Component	Reference/Action
226 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM	• Run On-Board Diagnostics. Repair as required.
326 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged, misaligned	• Inspect for damage and install a new gasket.
• Intermediate Clutch Accumulator Regulator Valve or Plunger, Springs — stuck, damaged, missing or misassembled	• Inspect for damage. Repair as required.
• Wrong parts used in rebuild	• Verify that correct parts were used.
Intermediate Clutch Assembly	
• Assembly	• Air Check Clutch Assembly.
• Seals or Piston — damaged	• Inspect for damage. Install new as required.
• Friction Elements — worn, missing, misassembled or damaged	• Inspect for damage. Repair as required.
• Feedbolt — torque incorrect, missing	• Inspect and install new feedbolts and tighten to specification.
• Ball Check — missing, not seating	• Inspect for damage. Repair as required.
• Cylinder Assembly Outer Diameter/Case Bore — damaged	• Inspect for damage. Install new as required.

227/327: Soft/Slipping 2-3 Only (Automatic)

Shift Concerns: Soft/Slipping 2-3 Only (Automatic)

Possible Component	Reference/Action
227 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM	• Run On-Board Diagnostics. Repair as required
327 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Direct Clutch Accumulator Regulator Valve, Plungers, Springs — stuck, missing, damaged, misassembled	• Inspect for damage. Repair as required.
• Incorrect parts used in rebuild	• Verify that correct parts were used.
Center Support Assembly	
• Feedbolts — missing, not tightened to specification	• Inspect, install new feedbolts and tighten to specification.
• Seal Rings — damaged	• Inspect for damage. Install new as required.
• Assembly — damaged	• Inspect for damage. Install new as required.
• Outside Diameter Or Case Bore — damaged or leaking	• Inspect for damage. Install new as required.
Direct Clutch Assembly	
• Assembly	• Air Check Clutch Assembly.
• Center Support Hub Seals — damaged	• Inspect for damage. Install new as required.
• Seals, Piston Cylinder — damaged	• Inspect for damage. Install new as required.
• Friction Elements — burnt, missing	• Inspect for damage. Repair as required.
• Plates — incorrect quantity installed	• Inspect for correct quantity. Repair as required.
• Ball Check — missing, not seating	• Inspect for damage. Repair as required.
• Intermediate Brake Drum Inner Diameter — damaged	• Inspect for damage. Install new as required.

228/328: Soft/Slipping 3-4 Only (Automatic)

Shift Concerns: Soft/Slipping 3-4 Only (Automatic)

Possible Component	Reference/Action
228 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM	• Run On-Board Diagnostics. Repair as required.
328 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged or misaligned	• Inspect for damage and install a new gasket.
• Overdrive Accumulator Regulator Valve and Spring, Overdrive Accumulator Plunger and Springs — damaged, misassembled, stuck, missing	• Inspect for damage. Repair as required.

Possible Component	Reference/Action
• Incorrect parts used in rebuild	• Verify that correct parts were used.
Overdrive Clutch Assembly	
• Assembly	• Air Check Clutch Assembly
• Friction Elements — burnt, missing	• Inspect for damage. Install new as required.
• Cylinder — damaged. Seals — damaged	• Inspect for damage. Install new as required.
• Feedbolts — loose, missing, leaking, not tightened to specification	• Install new feedbolts and tighten to specification.
• Cylinder Check Ball —not seating, missing	• Inspect for damage. Repair as required.

229/329: Soft/Slipping Downshifts (Automatic)

Shift Concerns: Soft/Slipping Downshifts (Automatic)

Possible Component	Reference/Action
229 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM	• Run On-Board Diagnostics. Repair as required.
329 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged, misaligned	• Inspect for damage and install a new gasket.
• CB7 Check Ball — missing, wrong	• Inspect for damage. Install new as required.
• Valve Body Separator Plate — damaged	• Inspect for damage. Install new as required.
• Incorrect parts used in rebuild	• Verify that correct parts were used.

232/332: Harsh 1-2 Shift Only (Automatic)

Shift Concerns: Harsh 1-2 Shift Only (Automatic)

Possible Component	Reference/Action
232 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM	• Run On-Board Diagnostics. Repair as required.
332 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged, misaligned	• Inspect for damage and install a new gasket.
• Intermediate Clutch Accumulator Regulator Valve or Plunger Springs — stuck, damaged, missing or misassembled	• Inspect for damage. Repair as required.
• Wrong parts used in rebuild	• Verify that correct parts were used.
Intermediate Clutch Assembly	

Possible Component	Reference/Action
• Assembly	• Air Check Clutch Assembly
• Seals or Piston — damaged	• Inspect for damage. Repair as required.
• Friction Elements — missing or misassembled. Plates — damaged or incorrect quantity installed	• Inspect for damage. Repair as required.

233/333: Harsh 2-3 Shift Only (Automatic)

Shift Concerns: Harsh 2-3 Shift Only (Automatic)

Possible Component	Reference/Action
233 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM	• Run On-Board Diagnostics. Repair as required.
333 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Direct Clutch Accumulator Regulator Valve, Plungers, Springs — stuck, missing, damaged, misassembled	• Inspect for damage. Repair as required.
• Wrong parts used in rebuild	• Verify that correct parts were used.
Center Support Assembly	
• Seal Rings — damaged	• Inspect for damage. Install new as required.
• Outside Diameter or Case Bore — damaged or leaking	• Inspect for damage. Install new as required.
Direct Clutch Assembly	
• Assembly	• Air Check Clutch Assembly
• Seals, Piston or Cylinder — damaged	• Inspect for damage. Install new as required.
• Friction Elements — damaged, missing or incorrect quantity of plates were installed	• Inspect for damage. Repair as required.

234/334: Harsh 3-4 Shift Only (Automatic)

Shift Concerns: Harsh 3-4 Shift Only (Automatic)

Possible Component	Reference/Action
234 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM	• Run On-Board Diagnostics. Repair as required.
334 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged or misaligned	• Inspect for damage and install a new gasket.

Possible Component	Reference/Action
• Overdrive Accumulator Regulator Valve and Spring, Overdrive Accumulator Plunger and Springs, — stuck, damaged, misassembled, missing	• Inspect for damage. Repair as required.
• Incorrect parts used in rebuild	• Verify that correct parts were used.
Overdrive Clutch Assembly	
• Assembly	• Air Check Clutch Assembly.
• Friction Elements — burnt, missing	• Inspect for damage. Install new as required.
• Cylinder — damaged. Seals — damaged. Retaining Ring — not seated	• Inspect for damage. Repair as required.

235/335: Harsh 4-3 Shift Only (Automatic)

Shift Concerns: Harsh 4-3 Shift Only (Automatic)

Possible Component	Reference/Action
235 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM	• Run On-Board Diagnostics. Repair as required.
335 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged, misaligned	• Inspect for damage and install a new gasket.
• CB7 Check Ball —missing	• Inspect for damage. Install new as required.
• Separator Plate — damaged	• Inspect for damage. Install new as required.

236/336: Harsh 3-2 Shift Only (Automatic)

Shift Concerns: Harsh 3-2 Shift Only (Automatic)

Possible Component	Reference/Action
236 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM	• Run On-Board Diagnostics. Repair as required.
336 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged, misaligned	• Inspect for damage and install a new gasket.
• CB6 Check Ball —missing	• Inspect for damage. Install new as required.
• Separator Plate — damaged	• Inspect for damage. Install new as required.

237/337: Harsh 2-1 Shift Only (Automatic)

Shift Concerns: Harsh 2-1 Shift Only (Automatic)

Possible Component	Reference/Action
237 — ELECTRICAL ROUTINE	
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM	• Run On-Board Diagnostics. Repair as required.
337 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Gaskets — damaged, misaligned	• Inspect for damage and install a new gasket.
• CB14 Check Ball — missing	• Inspect for damage. Install new as required.
• Separator Plate — damaged	• Inspect for damage. Install new as required.

240/340: No Apply

Torque Converter Clutch Operation Concern: No Apply

Possible Component	Reference/Action
240 — ELECTRICAL ROUTINE	
Powertrain Control System	• Carry out Torque Converter Clutch Operation Test.
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, TCC Solenoid, BPP Switch, TP Sensor, TFT Sensor	• Run On-Board Diagnostics. Carry out Torque Converter Engagement Test. GO to Pinpoint Test B and GO to Pinpoint Test C using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test and rerun On-Board Diagnostics.
340 — HYDRAULIC/MECHANICAL ROUTINE	
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• TCC Solenoid or TFT Sensor — failure to operate in a normal manner	• Refer to Electrical Routine No. 240.
• Gaskets — damaged	• Inspect gasket for damage and install a new gasket.
Pump Assembly	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Cup Plugs — missing, cross leaks	• Inspect for porosity/leaks, cup plugs missing, install a new pump as required.
• Gaskets — damaged	• Inspect and install new gaskets.
• Converter Clutch Control Valve and Regulator Valve — stuck, misassembled, damaged	• Inspect for damage. Install a new pump.
Stator Support	
• Teflon® Seals — damaged, leaking	• Inspect for damage. Install new as required.
Torque Converter Assembly	
• Leakage. Friction Material — damaged. Internal Seals — damaged	• Inspect the torque converter for damage.

241/341: Always Applied/Stalls Vehicle

Torque Converter Clutch Operation Concern: Always Applied/Stalls Vehicle (See Note in No. 241 Before Proceeding)

Possible Component	Reference/Action
241 — ELECTRICAL ROUTINE	
NOTE: Stalls in DRIVE and MANUAL 2 only (MANUAL 1 and REVERSE are OK)	• Go to Hydraulic/Mechanical No. 341 • Carry out Torque Converter Clutch Operation Test.
Powertrain Control System	
• Electrical Inputs/Outputs, Vehicle Wiring Harnesses, PCM, TCC Solenoid • Stalls in any range.	• Run On-Board Diagnostics. Carry out Torque Converter Engagement Test. GO to Pinpoint Test C using the Transmission Tester and Cable and Overlay. Repair as required. Clear codes, road test and rerun On-Board Diagnostics. • Refer to 341 Fluid Filter.
341 — HYDRAULIC/MECHANICAL ROUTINE	
Incorrect Pressures	
• Line Pressures — low	• Check line pressure at line tap. Carry out Line Pressure and Stall Speed Tests. Refer to the Line Pressure Chart for specification.
Fluid Filter	
• Filter or Seal — damaged • Filter Seal — disengaged from pump inlet bore	• Install a new filter and seal assembly.
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Torque Converter Clutch Solenoid — failure to operate in a normal manner	• Refer to Electrical Routine No. 241.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
Pump Assembly	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Converter Clutch Control Valve— misassembled, stuck, damaged	• Inspect for damage. Repair as required.
• Porosity/cross leaks	• Inspect for porosity/leaks, valve damaged, install a new pump as required.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Pump Gear End Clearance — excessive	• Carry out pump gear end clearance check.
Torque Converter Assembly	
• End Play (none)	• Carry out End Play Check
• Piston Plate — damaged/stuck to cover	• Inspect for damage. Repair as required. • Inspect transmission cooling system for correct lube flow. Follow the procedures

242/342: Cycling/Shudder/Chatter

Torque Converter Clutch Operation Concern: Cycling/Shudder/Chatter

Possible Component	Reference/Action
242 — ELECTRICAL ROUTINE	
Powertrain Control System	

Possible Component	Reference/Action
• Electrical Inputs/Outputs, Vehicle Harnesses, PCM, TCC Solenoid, Digital (TR) Sensor, BPP Switch, PCM	• Carry out Torque Converter Engagement Test. GO to Pinpoint Test C and GO to Pinpoint Test D using the Transmission Tester, Cable and Overlay and TRS-E Cable. Clear codes, road test and rerun On-Board Diagnostics.
Speed Control Equipped Vehicles	NOTE: Refer to Routine No. 212 before proceeding to No. 342.
342 — HYDRAULIC/MECHANICAL ROUTINE	
Fluid Condition	• Inspect fluid condition. If burnt or contaminated, drain fluid from the transmission assembly and converter assembly. Check control attaching bolts for correct torque. Tighten as required. Record and erase On-Board Diagnostics codes. Bring vehicle to normal operating temperature. Carry out Transmission Drive Cycle Carry out On-Board Diagnostics. If condition still exists, continue diagnosis.
Main Controls	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Torque Converter Clutch Solenoid — failure to operate in a normal manner	• Refer to Electrical Routine No. 242.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
Pump Assembly	
• Bolts not tightened to specification	• Tighten bolts to specification.
• Cross Leaks	• Inspect for porosity/leaks, valve damage, install a new pump as required.
• Gaskets — damaged	• Inspect for damage and install a new gasket.
• Converter Clutch Regulator Valve — damaged	• Inspect for damage. Install new as required.
Stator Support	
• Teflon® Seal on Nose of Stator — damaged, cut, leaking	• Inspect for damage. Install new as required.
Torque Converter Assembly	
• End Play (excessive) — internal leakage	• Inspect the torque converter for damage.