INSPECTION PROCESS FOR TROUBLE SYMPTOMS

INSPECTION PROCEDURE 1

Communication with the scan tool	Possible cause
If communication with the scan tool is not possible, the cause is probably a defective diagnostic trouble line or the PCM is not functioning.	-Malfunction of diagnostic trouble line -Malfunction of connector -Malfunction of the PCM

INSPECTION PROCEDURES

1. Is communication with other systems possible using the scan tool?

Yes	No	Check the diagnostic trouble line with the scan tool and repair if necessary.

2. Check the continuity and voltage of the PCM

Is the PCM normal?

Yes	No	Go to step 7

3. Check the data link connector

Is the data link connector normal?

Yes	No	Repair the connector.

4. Check the harness

1. Turn the ignition switch OFF and disconnect the PCM connector.
2. Check the continuity between the data link connector and the PCM.

Is the harness normal?

Yes	No	Repair or replace as necessary.

5. Check the trouble symptoms

Is the communication normal?

No

6. Replace the PCM

7. Check the PCM connector

1. Turn the ignition switch OFF and disconnect the PCM connector.
2. Check that the PCM connector for loose, poor connection, bent, corrosion, contamination, deterioration, or damage.

Is the PCM connector normal?

Yes

No	Repair or replace as necessary.

8. Check the PCM harness

1. Turn the ignition switch OFF and disconnect the PCM connector.
2. Turn the ignition switch ON.
3. Check the voltage between the power supply and the PCM.
4. Check the voltage between the PCM and ground.

- **Specifications : approximately 5V**

Is the PCM harness normal?

Yes

No	Repair or replace as necessary.

9. Check the trouble symptoms

Is the communication normal?

Yes

No	Repair or replace as necessary.

10. Replace the PCM

1. Disconnect the battery (-) terminal and disconnect the PCM connector.
2. Replace the PCM.

Is the output shaft speed sensor normal?

INSPECTION PROCEDURE 2

Starting impossible	Possible cause
Starting is not possible when the selector lever is in “P” or “N” range. In such cases, the cause is probably a defective engine system, torque converter or oil pump.	- Malfunction of the engine system - Malfunction of the torque converter - Malfunction of the oil pump

INSPECTION PROCEDURES

1. Is communication with other systems possible using the scan tool?

Yes	No	Check the diagnostic trouble line with the scan tool and repair if necessary.

2. Check the torque converter

1. Check for incorrect installation (Inserted at an angle, etc) and for damaged splines.

Is the torque converter normal?

Yes	No	Repair if possible. If the splines are damaged and repairs are not possible, replace the torque converter assembly.

3. Replace the oil pump assembly (The oil pump cannot be dissembled)

INSPECTION PROCEDURE 3

Does not move	Possible cause
If the vehicle does not move forward when the selector lever is shifted from “N” to “D” range while the engine is idling, the cause is probably abnormal line pressure or a malfunction of the underdrive clutch or valve body.	- Abnormal line pressure - Malfunction of the underdrive solenoid valve - Malfunction of the underdrive clutch - Malfunction of the valve body

INSPECTION PROCEDURES

1. The actuator test of the underdrive solenoid valve

Sound of operation can be heard?

Yes	No	Replace the underdrive solenoid valve

2. Hydraulic pressure test

1. Measure the hydraulic pressure for each element when in range.

Is the pressure normal?

Yes	No	Go to step 5

3. Check the Underdrive clutch system

1. Remove the transaxle assembly, valve body cover and valve body.
2. Piston should operate and pressure should be maintained when air is blown through the underdrive clutch oil hole in the transaxle case.

Is the underdrive clutch system normal?

No	Yes	Go to step 5

4. Check the Underdrive clutch

1. Check for burning of the facing, defective piston seal rings, and interference at the retainer.

5. Clean the valve body (Valve body disassembly, cleaning and reassembly)

1. Pay particular attention to loosening of bolts, and valve bodies.
2. If the damage cannot be repaired, replace the valve body assembly.

INSPECTION PROCEDURE 4

Does not reverse	Possible cause

If the vehicle does not reverse when the selector lever is shifted from “N” to “R” range while the engine is idling, the cause is probably abnormal pressure in the reverse clutch or low and reverse brake or a malfunction of the reverse clutch, low and reverse brake or valve body.	- Abnormal reverse clutch pressure - Abnormal low and reverse brake pressure - Malfunction of the low and reverse solenoid valve - Malfunction of the reverse clutch - Malfunction of the low and reverse brake - Malfunction of the valve body

INSPECTION PROCEDURES

1. Is communication with other systems possible using the scan tool?

Yes	No	Check the diagnostic trouble line with the scan tool and repair if necessary.

2. Check the torque converter

1. Check for incorrect installation (Inserted at an angle, etc) and for damaged splines.

Is the torque converter normal?

Yes	No	Repair if possible. If the splines are damaged and repairs are not possible, replace the torque converter assembly.

3. Replace the oil pump assembly (The oil pump cannot be dissembled)

INSPECTION PROCEDURE 5

Does not move (forward or reverse)	Possible cause
If the vehicle does not move forward or reverse when the selector lever is shifted to any position while the engine is idling, the cause is probably abnormal line pressure, or a malfunction of the power train, oil pump or valve body.	- Abnormal line pressure - Malfunction of the underdrive solenoid valve - Malfunction of the underdrive clutch - Malfunction of the valve body

INSPECTION PROCEDURES

1. Hydraulic pressure test

1. Measure the hydraulic pressure for each element when moving forward and back.

Is the pressure normal?

Yes	No	Replace the transaxle.

2. Check the power train

1. If OK, replace transaxle.

INSPECTION PROCEDURE 6

Engine stalling when shifting	Possible cause
If the engine stalls when the selector lever is shifted from N to D or R range while the engine is idling, the cause is probably a malfunction of the engine system, torque converter clutch soledoid, valve body or torque converter (torque converter clutch malfunction).	- Malfunction of the engine system - Malfunction of the torque converter clutch solenoid - Malfunction of the valve body - Malfunction of the torque converter (Malfunction of the torque converter clutch)

INSPECTION PROCEDURES

1. Check the engine system

1. Check the control system, ignition, fuel system and main system.

Is the engine system normal?

Yes	No	Repair

3. Replace the torque converter clutch solenoid

Have the problem?

Yes

3. **Replace the torque converter**

INSPECTION PROCEDURE 7

Shocks when changing from N to D range and time lag	Possible cause
If abnormal shocks or a time lag of 2 second or more occur when the selector lever is shifted from N to D range while the engine is idling, the cause is probably abnormal underdrive clutch pressure or a malfunction of the underdrive clutch, valve body or closed throttle position switch.	- Abnormal line pressure - Malfunction of the underdrive solenoid valve - Malfunction of the underdrive clutch - Malfunction of the valve body - Malfunction of the closed throttle position switch

INSPECTION PROCEDURES

1. **The actuator test of the underdrive solenoid valve**

Sound of operation can be heard?

Yes	No	Replace the underdrive solenoid valve

2. **When does the shock occur?**

Shifting	Starting	Go to step 4

3. **Hydraulic pressure test**

1. Measure the hydraulic pressure when shifting from "N" to "D".

Is the hydraulic pressure normal?

	No	Go to step 6

4. Replace the underdrive solenoid valve

Is the underdrive clutch system normal?

Yes		
	No	Go to step 6

5. Check the scan tool data

1. Turns from ON to OFF when the accelerator pedal is slightly depressed from the closed position.

Is the scan tool data normal?

Yes

6. Replace the transaxle

INSPECTION PROCEDURE 8

Shock when changing from “N” to “R” and large time lag	Possible cause
If abnormal shocks or a time lag of 2seconds or more occurs when the selector lever is shifted from “N” to “R” range while the engine is idling, the cause is probably abnormal reverse clutch pressure or low and reverse brake pressure, or a malfunction or the reverse clutch, low and reverse brake.	- Abnormal reverse clutch pressure - Abnormal low-reverse brake pressure - Malfunction of the low-reverse solenoid valve - Malfunction of the reverse clutch - Malfunction of the low-reverse brake - Malfunction of the valve body

INSPECTION PROCEDURES

1. The actuator test of the low-reverse solenoid valve

Sound of operation can be heard?

Yes		
	No	Replace the low-reverse solenoid valve

2. When does the shock occur?

Shifting	Starting	Go to step 6

3. Hydraulic pressure test

1. Measure the reverse clutch pressure in "R" range.

Is the reverse clutch pressure normal?

Yes	No	Go to step 8

4. Check the reverse clutch system and low-reverse brake syst

1. Remove the transaxle assembly, valve body cover and valve body.
2. Piston should operate and pressure should be maintained when air is blown through the reverse clutch oil hole and reverse brake in the transaxle case.

Are the reverse clutch system and low-reverse brake system normal?

No	Yes	Go to step 8

5. Check the reverse clutch and low-reverse brake

1. Check the burning of the facing, defective piston seal rings and interference at the retainer.

Are the reverse clutch and the low-reverse brake normal?

Yes	No	Repair the reverse clutch and low-reverse brake

6. Shock sometime occur

Yes	No	Go to step 8

7. Check the scan tool data

1. Turns from ON to OFF when the accelerator pedal is slightly depressed from the fully closed position.

Is the scan tool data normal?

Yes

8. The valve body cleaning (Valve body disassembly, cleaning and reassembly)

1. Pay particular attention to loosening of bolts, and to damage and slippage of O-rings, valves and valve bodies.
2. If the damage cannot be repaired, replace the valve body assembly.

INSPECTION PROCEDURE 9

Shocks when changing from “N” to “R”, “N” to “D” and large time lag	Possible cause
If abnormal shocks or a time lag of 2 seconds or more occurs when the selector lever is shifted from “N” to “R” range while the engine is idling, the cause is probably abnormal line pressure or a malfunction of the oil pump or valve body.	- Abnormal line pressure - Malfunction of the oil pump - Malfunction of the valve body

INSPECTION PROCEDURES

1. Hydraulic pressure test

1. Measure the hydraulic pressure for each element when in "D" range and "R" range.

Is the hydraulic pressure normal?

Yes

No	Replace the transaxle

2. When does the shock occur?

Shifting

Starting	Replace the transaxle

3. Replace the oil pump assembly (The oil pump cannot be disassembled)

INSPECTION PROCEDURE 10

Shocks and running up	Possible cause
If shocks occur when driving due to upshifting or downshifting and the transaxle speed becomes higher than the engine speed, the cause is probably abnormal line pressure or a malfunction of a solenoid valve, oil pump, valve body, brake or clutch.	-Abnormal line pressure -Malfunction of each solenoid valve -Malfunction of the oil pump -Malfunction of the valve body -Malfunction of each brake and each clutch

INSPECTION PROCEDURES

1. The actuator test of the low-reverse solenoid valve, underdrive solenoid valve, second solenoid valve, overdrive solenoid valve

Sound of operation can be heard?

Yes	No	Replace the solenoid valve

2. Adjust the line pressure

Have the problem?

Yes	No	Go to step 4

3. Check the clutch and the brake

1. Check the burning of the facing, defective piston seal rings and interference at the retainer.

4. Replace the oil pump assembly (The oil pump cannot be disassembled)

Have the problem?

Yes

5. The valve body cleaning (Valve body disassembly, cleaning and reassembly)

1. Pay particular attention to loosening of bolts, and to damage and slippage of O-rings, valves and valve bodies.
2. If the damage cannot be repaired, replace the valve body assembly.

INSPECTION PROCEDURE 11

All points (Displaced shifting points)	Possible cause
If all shift points are displaced while driving, the cause is probably a malfunction of the output shaft speed sensor, TPS or a solenoid valve.	- Malfunction of the output shaft speed sensor - Malfunction of the throttle position sensor - Malfunction of each solenoid valve - Abnormal line pressure - Malfunction of the valve body - Malfunction of the PCM

INSPECTION PROCEDURES

1. Check the scan tool data of the output shaft speed sensor

- OK : Increases in proportion to vehicle speed.

Is the scan tool data normal?

Yes	No	Check the output shaft speed sensor system

2. Check the scan tool data of the throttle position sensor

- OK : Increases in proportion to accelerator pedal opening angle.

Is the scan tool data normal?

Yes	No	Check the throttle position sensor system

3. Check the scan tool data of the solenoid valve

1. Low-reverse solenoid valve duty %
2. Underdrive solenoid valve duty %
3. Second solenoid valve duty %
4. Overdrive solenoid valve duty %

- OK : Refer to the table below

Is the scan tool data of the solenoid valve normal?

Yes	No	Go to step 6

4. Adjust the line pressure

Have the problem?

Yes

5. The valve body cleaning (Valve body disassembly, cleaning and reassembly)

1. Pay particular attention to loosening of bolts, and to damage and slippage of O-rings, valves and valve bodies.
2. If the damage cannot be repaired, replace the valve body assembly.

6. Replace the solenoid valve

Have the problem?

Yes

7. Replace the PCM

INSPECTION PROCEDURE 12

Some points (Displaced shifting points)	Possible caus
If some of the shift points are displaced while driving, the cause is probably a malfunction of the valve body, or it is related to control and is not an abnormality.	-Malfunction of the valve body

INSPECTION PROCEDURES

1. Do standard shifting occur normally?

No

Yes	Go to step 3

2. Does the problem occur only when the automatic transaxle fluid temperature is -29˚C or lower or 125˚C or higher?

Yes	No	Replace the transaxle

3. It is related to adaptive logic control and is not an abnormality.

INSPECTION PROCEDURE 13

No diagnostic trouble codes (Does not shift)	Possible cause
If shifting does not occur while driving and no diagnostic trouble codes are output, the cause is probably a malfunction of the Park/Neutral position switch, or PCM.	- Malfunction of the Park/Neutral position switch - Malfunction of the PCM

INSPECTION PROCEDURES

1. Does the transaxle remain in 3rd gear with selector lever in position "D"?

Yes	No	Go to step 5

2. Is backup power being supplied to the PCM?

Yes	No	Go to step 4

3. Is power being supplied to the PCM?

No	Yes	Go to step 5

4. Check the power supply circuit

1. Pay particular attention to an open circuit in the harness or poor connector.
2. If there is a blown fuse, investigate why a short circuit has occurred and then replace the fuse.

5. The PCM input signal and selector lever position should match

INSPECTION PROCEDURE 14

Poor acceleration	Possible cause
If acceleration is poor even if downshifting occurs while driving, the cause is probably a malfunction of the engine system, brake or clutch.	-Malfunction of the engine system -Malfunction of the brake or clutch

INSPECTION PROCEDURES

1. Check the DTC

Have the DTC?

No	Yes	Correct condition

2. Check the engine system

1. Check the control system, ignition system, fuel system, and main system.

Have the problem?

Yes	No	Repair or replace

3. Check the brake or clutch

1. Check the burning of the facing, defective piston seal rings and interference at the retainer.

INSPECTION PROCEDURE 15

Vibration	Possible cause

If vibration occurs when driving at constant speed or when accelerating in top range, the cause is probably abnormal damper clutch pressure or a malfunction of the engine system, damper clutch control solenoid, torque converter or valve body.	- Abnormal damper clutch pressure - Malfunction of the engine system - Malfunction of the damper clutch control solenoid - Malfunction of the torque converter - Malfunction of the valve body

INSPECTION PROCEDURES

1. The actuator test of the damper clutch control solenoid valve

Sound of operation can be heard?

Yes

No	Replace the damper clutch control solenoid valve

2. Does the problem occur even when the oil temperature sensor connector is disconnected?

No

Yes	Go to step 5

3. Hydraulic pressure test

1. Measure the damper clutch pressure.

Is the hydraulic pressure normal?

No

Yes	Replace the torque converter assembly

4. The valve body cleaning (Valve body disassembly, cleaning and reassembly)

1. Pay particular attention to loosening of bolts, and to damage and slippage of O-rings, valves and valve bodies.
2. If the damage cannot be repaired, replace the valve body assembly.

5. Check the engine system

1. Check the control system, ignition system, fuel system, and main system.