

## MECHANICAL SYSTEM TESTS

### 1. STALL SPEED TEST

#### HINT:

This test is to check the overall performance of the engine and transmission.

#### NOTICE:

- **Do not perform the stall speed test for longer than 5 seconds.**
  - **To ensure safety, perform this test in an open and level area that provides good traction.**
  - **The stall speed test should always be performed by at least 2 people. One person should observe the condition of the wheels and wheel chocks while the other is performing the test.**
- (a) Connect the intelligent tester to the CAN VIM. Then connect the CAN VIM to the DLC3.
  - (b) Run the vehicle until the transmission fluid temperature has reached 50 to 80°C (122 to 176°F).
  - (c) Allow the engine to idle with the air conditioning OFF.
  - (d) Chock all 4 wheels.
  - (e) Set the parking brake and keep the brake pedal depressed firmly with your left foot.
  - (f) Shift the shift lever into the drive position.
  - (g) Depress the accelerator pedal as much as possible with your right foot.
  - (h) Read the engine rpm (stall speed) and release the accelerator pedal immediately.

#### Standard value:

**2,250 to 2,550 rpm**

#### Evaluation:

| Test Result                               | Possible Cause   |
|---|--|
| Stall speed is lower than standard value  | <ul style="list-style-type: none"> <li>• Stator one-way clutch is not operating properly</li> <li>• Torque converter is faulty (stall speed is less than standard value by 600 rpm or more)</li> <li>• Engine power may be insufficient</li> </ul> |
| Stall speed is higher than standard value | <ul style="list-style-type: none"> <li>• Line pressure is low</li> <li>• No. 1 clutch (C1) slipping</li> <li>• No. 3 one-way clutch (F3) is not operating properly</li> <li>• Improper fluid level</li> </ul>                                      |

### 2. SHIFT TIME LAG TEST

#### HINT:

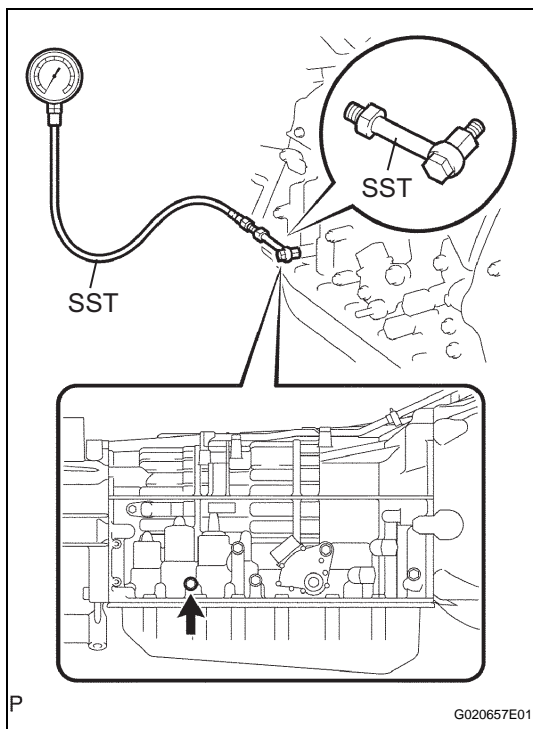
This test is to check the condition of the direct clutch, forward clutch, 1st brake and reverse brake.

- (a) Connect the intelligent tester to the CAN VIM. Then connect the CAN VIM to the DLC3.
- (b) Run the vehicle until the transmission fluid temperature has reached 50 to 80°C (122 to 176°F).
- (c) Allow the engine to idle with the air conditioning OFF.
- (d) Set the parking brake and keep the brake pedal depressed firmly.

- (e) Check the D range time lag.
- (1) Shift the shift lever into the N position and wait for 1 minute.
  - (2) Shift the shift lever into the D position and measure the time until the shock is felt.
  - (3) Repeat the 2 procedures above 3 times, and calculate the average time of the 3 tests.
- (f) Check the R range time lag.
- (1) Shift the shift lever into the N position and wait for 1 minute.
  - (2) Shift the shift lever into the R position and measure the time until the shock is felt.
  - (3) Repeat the 2 procedures above 3 times, and calculate the average time of the 3 tests.

**Standard value:****D range time lag is less than 1.2 seconds****R range time lag is less than 1.5 seconds****Evaluation:**

| Test Result                             | Possible Cause   |
|---|--|
| D range time lag exceeds standard value | <ul style="list-style-type: none"> <li>• Line pressure is low</li> <li>• No. 1 clutch (C1) is worn</li> <li>• No. 3 one-way clutch (F3) is not operating properly</li> </ul>                                     |
| R range time lag exceeds standard value | <ul style="list-style-type: none"> <li>• Line pressure is low</li> <li>• No. 3 clutch (C3) is worn</li> <li>• No. 4 brake (B4) is worn</li> <li>• No. 1 one-way clutch (F1) is not operating properly</li> </ul> |

**HYDRAULIC TEST****1. PERFORM HYDRAULIC TEST**

- (a) Measure the line pressure.

**NOTICE:**

- Perform the test at the normal operating ATF (Automatic Transmission Fluid) temperature of 50° to 80°C (122° to 176°F).
- The line pressure test should always be carried out in pairs. One technician should observe the condition of the wheels or wheel stoppers outside the vehicle while the other is doing the test.
- Be careful to prevent the SST hose from interfering with the exhaust pipe.
- This check must be conducted after checking and adjusting the engine.
- Perform with the A/C OFF.
- Do not conduct stall tests for longer than 5 seconds continuously.

- (1) Warm up the ATF.
- (2) Lift the vehicle up.
- (3) Remove the test plug on the transmission case center right side and connect SST.

**SST 09992-00095 (09992-00151, 09992-00271)**

- (4) Fully apply the parking brake and chock the 4 wheels.
- (5) Start the engine and check the idling speed.

- (6) Keep your left foot pressing firmly on the brake pedal and shift into the D position.
- (7) Measure the line pressure while the engine is idling.
- (8) Depress the accelerator pedal all the way down. Quickly read the highest line pressure when the engine speed reaches the stall speed.
- (9) In the same manner, do the test in the R position.

### Specified line pressure

| Condition  | D position  | R position  |
|------------|---|---|
| Idling     | 356 to 426 kPa<br>(3.6 to 4.3 kgf/cm <sup>2</sup> , 52 to 62 psi)         | 500 to 600 kPa<br>(5.1 to 6.1 kgf/cm <sup>2</sup> , 73 to 87 psi)         |
| Stall test | 1,367 to 1,477 kPa<br>(14.0 to 15.1 kgf/cm <sup>2</sup> , 198 to 214 psi) | 1,278 to 1,506 kPa<br>(13.0 to 15.4 kgf/cm <sup>2</sup> , 185 to 218 psi) |

### Evaluation:

| Problem  | Possible cause  |
|--|---|
| Measured values are higher than specified in all positions | <ul style="list-style-type: none"> <li>• Shift solenoid valve SLT defective</li> <li>• Regulator valve defective</li> </ul>   |
| Measured values are lower than specified in all positions  | <ul style="list-style-type: none"> <li>• Shift solenoid valve SLT defective</li> <li>• Regulator valve defective</li> <li>• Oil pump defective</li> </ul>                               |
| Pressure is low in D position only                         | <ul style="list-style-type: none"> <li>• D position circuit fluid leakage</li> <li>• No. 1 clutch (C<sub>1</sub>) defective</li> </ul>  |
| Pressure is low in R position only                         | <ul style="list-style-type: none"> <li>• R position circuit fluid leakage</li> <li>• No. 3 clutch (C<sub>3</sub>) defective</li> <li>• No. 4 brake (B<sub>4</sub>) defective</li> </ul> |