

# MECHANICAL SYSTEM TESTS

## STALL TEST

The object of this test is to check the overall performance of the transmission and engine by measuring the stall speeds in the D and R ranges.

**NOTICE:**

- Perform the test at normal operating fluid temperature (50–80°C or 122–176°F).
- Do not continuously run this test longer than 5 seconds.
- To ensure safety, conduct this test in a wide, clear, level area, which provides good traction.
- The stall test should always be carried out in pairs. One technician should observe the conditions of wheels or wheel stoppers outside the vehicle while the other is performing the test.

## MEASURE STALL SPEED

- (a) Chock the four wheels.
- (b) Connect a tachometer to the engine.
- (c) Fully apply the parking brake.
- (d) Keep your left foot pressed firmly on the brake pedal.
- (e) Start the engine.
- (f) Shift into the D range. Step all the way down on the accelerator pedal with your right foot. Quickly read the stall speed at this time.

**Stall speed: 2,200 ± 150 rpm**

- (g) Perform the same test in R range.



## EVALUATION

Problem		Possible cause
(a)	Stall speed low in D and R ranges.	<ul style="list-style-type: none"> <li>• Engine output may be insufficient</li> <li>• Stator one-way clutch is not operating properly</li> </ul> <p>HINT: If more than 600 rpm below the specified value, the torque converter could be faulty.</p>
(b)	Stall speed high in D range.	<ul style="list-style-type: none"> <li>• Line pressure too low</li> <li>• Forward clutch slipping</li> <li>• No. 2 one-way clutch not operating properly</li> <li>• O/D one-way clutch not operating properly</li> </ul>
(c)	Stall speed high in R range.	<ul style="list-style-type: none"> <li>• Line pressure too low</li> <li>• Direct clutch slipping</li> <li>• First and reverse brake slipping</li> <li>• O/D one-way clutch not operating properly</li> </ul>
(d)	Stall speed high in D and R ranges.	<ul style="list-style-type: none"> <li>• Line pressure too low</li> <li>• Improper fluid level</li> <li>• O/D one-way clutch not operating properly</li> </ul>

## TIME LAG TEST

When the shift lever is shifted while the engine is idling, there will be a certain time lapse or lag before the shock can be felt. This is used for checking the condition of the O/D direct clutch, forward clutch, direct clutch, and first and reverse brake.

### NOTICE:

- Perform the test at normal operating fluid temperature (50–80°C or 122–176°F).
- Be sure to allow a one minute interval between tests.
- Make three measurements and take the average value.

## MEASURE TIME LAG

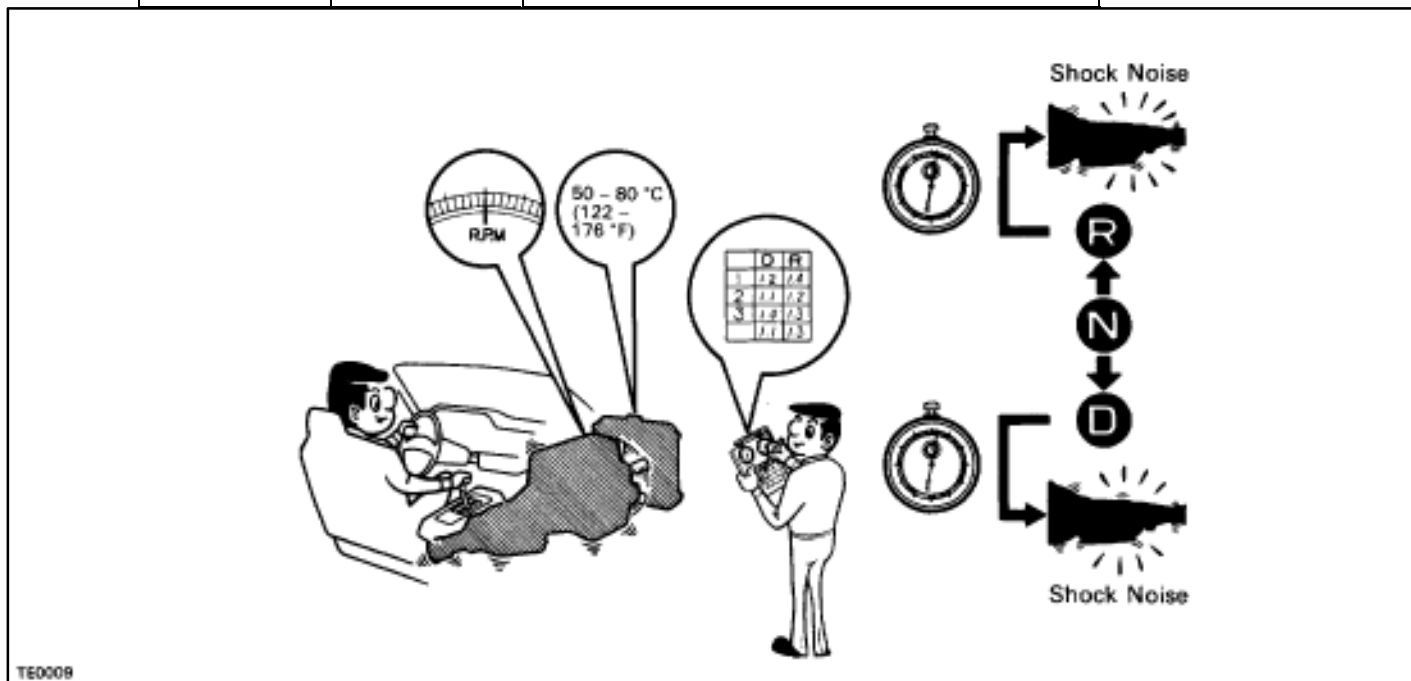
- Fully apply the parking brake.
- Start the engine and check idle speed.

**Idle speed: 650 rpm (In N range and air conditioner OFF)**

- Shift the shift lever from N to D position. Using a stop watch, measure the time it takes from shifting the lever until the shock is felt.

In same manner, measure the time lag for N → R.

Time lag	N → D	Less than 1.2 seconds
	N → R	Less than 1.5 seconds



## EVALUATION

If N → D or N → R time lag are longer than specified:

Problem	Possible cause
N → D time lag is longer	Line pressure too low Forward clutch worn O/D one-way clutch not operating properly Accumulator back pressure too low
N → R time lag is longer	Line pressure too low Direct clutch worn First and reverse brake worn O/D one-way clutch not operating properly Accumulator back pressure too low

## HYDRAULIC TEST

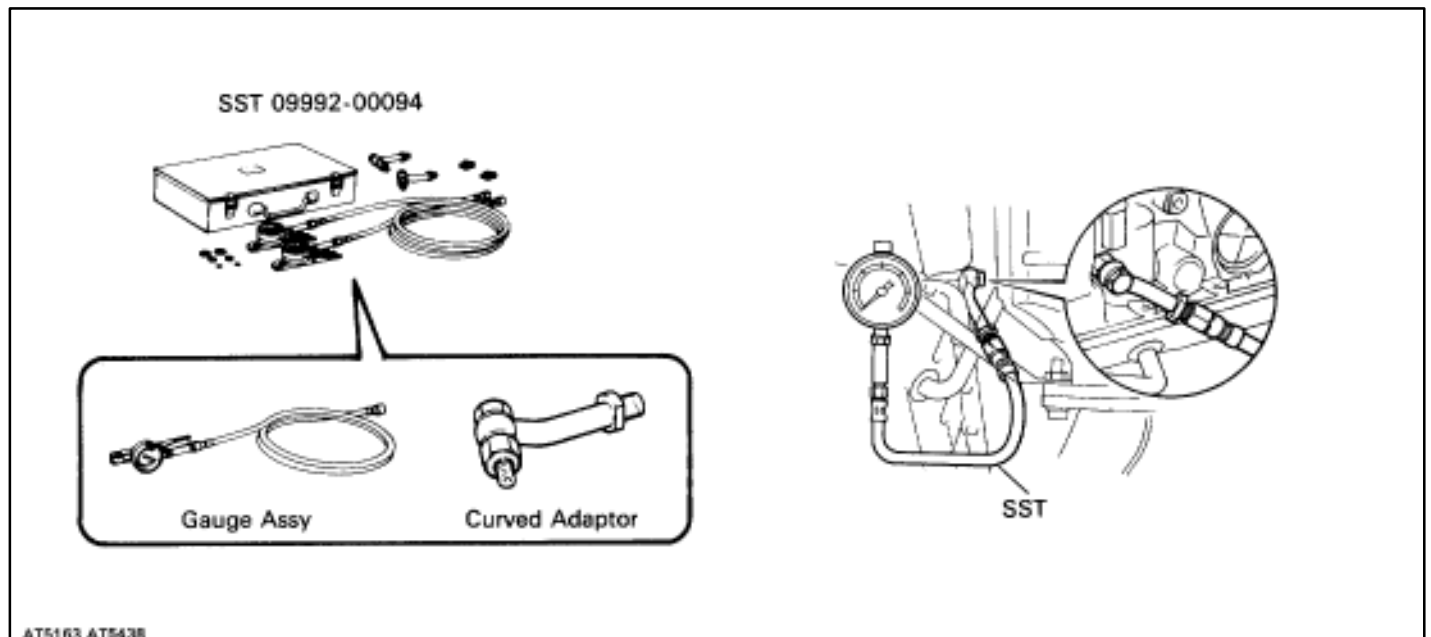
### Measure Line Pressure

#### NOTICE:

- Perform the test at normal operating fluid temperature (50–80°C or 122–176°F).
  - The line pressure test should always be carried out in pairs. One technician should observe the conditions of wheels or wheel stoppers outside the vehicle while the other is performing the test.
  - Be careful to prevent the oil pressure gauge hose from interfering with the exhaust pipe.
- (a) Warm up the transmission fluid.
  - (b) Remove the test plug on the transmission case front left side and connect the oil pressure gauge (SST).

SST 09992-00094 (Oil pressure gauge)

HINT: Connecting the oil pressure gauge will be made easier by moving LH side heat insulator aside.

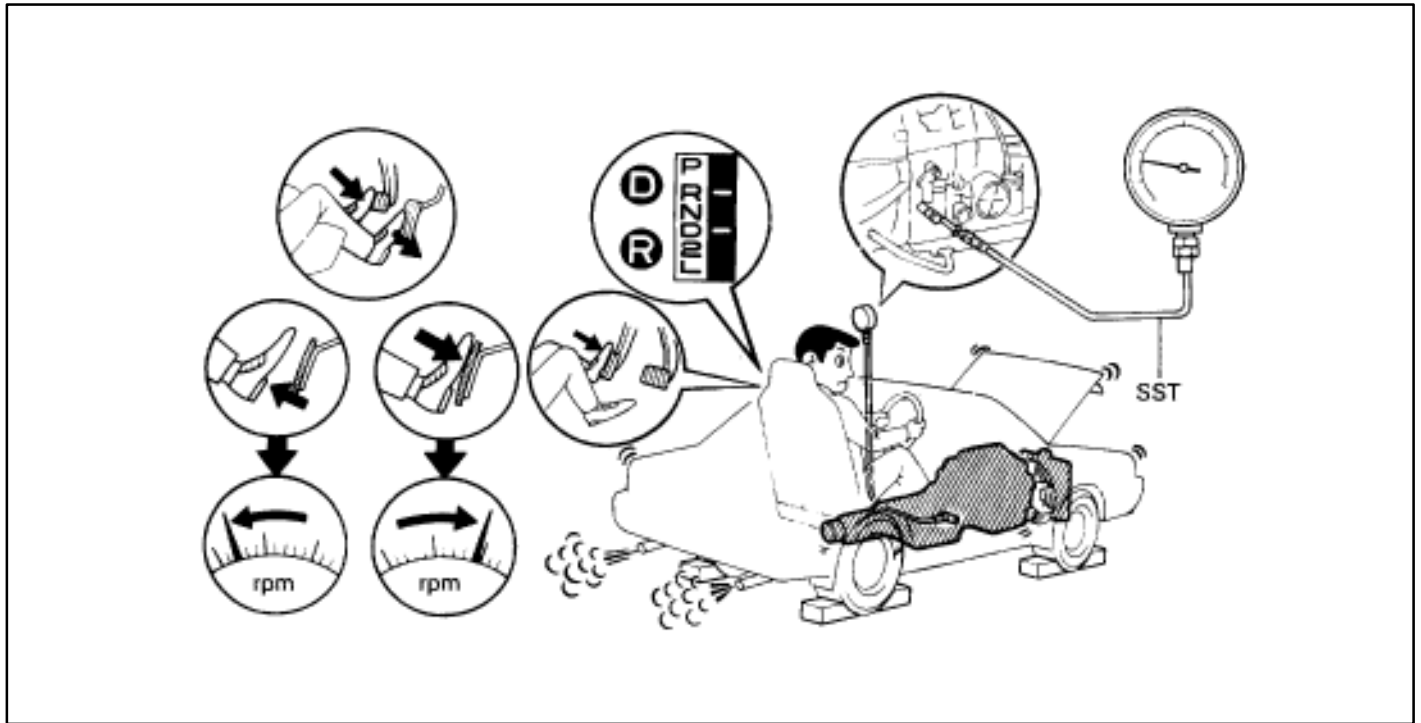


- (c) Fully apply the parking brake and chock the four wheels.
- (d) Start the engine and check idling rpm.
- (e) Keep your left foot pressed firmly on the brake pedal and shift into D range.
- (f) Measure the line pressure when the engine is idling.
- (g) Press the accelerator pedal all the way down. Quickly read the highest line pressure when engine speed reaches stall speed.
- (h) In the same manner, perform the test in R range.

#### SPECIFIED LINE PRESSURE

Range	D range		R range	
Engine speed	Idling	Stall	Idling	Stall
Line pressure kPa (kgf/cm, psi)	382–441 (3.9–4.5, 55–64)	1,265–1,402 (12.9–14.3, 183–203)	637–716 (6.5–7.3, 92–104)	1,726–2,060 (17.6–21.0, 250–298)

If the measured pressures are not up to specified values, recheck the throttle cable adjustment and perform a retest.



## EVALUATION

Problem	Possible cause
If the measured values at all ranges are higher.	<ul style="list-style-type: none"> <li>• Throttle cable out of adjustment</li> <li>• Throttle valve defective</li> <li>• Regulator valve defective</li> </ul>
If the measured values at all ranges are lower.	<ul style="list-style-type: none"> <li>• Throttle cable out of adjustment</li> <li>• Throttle valve defective</li> <li>• Regulator valve defective</li> <li>• Oil pump defective</li> <li>• O/D direct clutch defective</li> </ul>
If pressure is low in the D range only.	<ul style="list-style-type: none"> <li>• D range circuit fluid leakage</li> <li>• Forward clutch defective</li> </ul>
If pressure is low in the R range only.	<ul style="list-style-type: none"> <li>• R range circuit fluid leakage</li> <li>• Direct clutch defective</li> <li>• First and reverse brake defective</li> </ul>

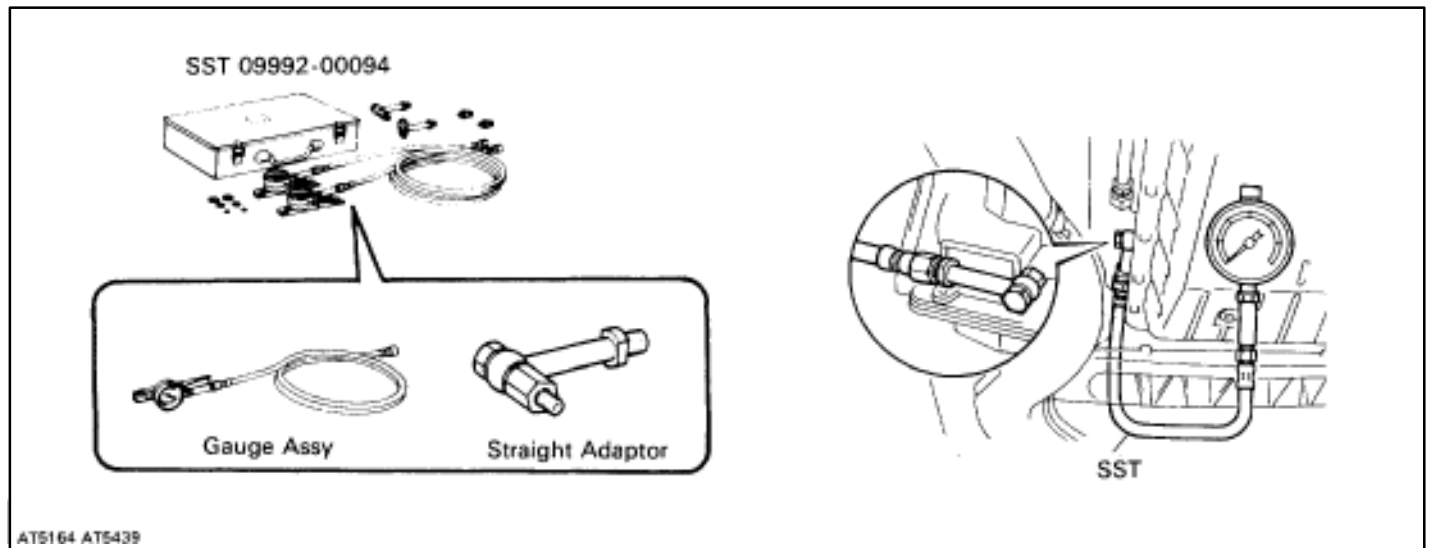
## MEASURE ACCUMULATOR BACK PRESSURE

### NOTICE:

- Perform the test at normal operating fluid temperature (50–80°C or 122–176°F).
- Be careful to prevent the oil pressure gauge hose from interfering with the exhaust pipe.
  - (a) Warm up the transmission fluid.
  - (b) Remove the test plug on the transmission case rear right side and connect the oil pressure gauge (SST).

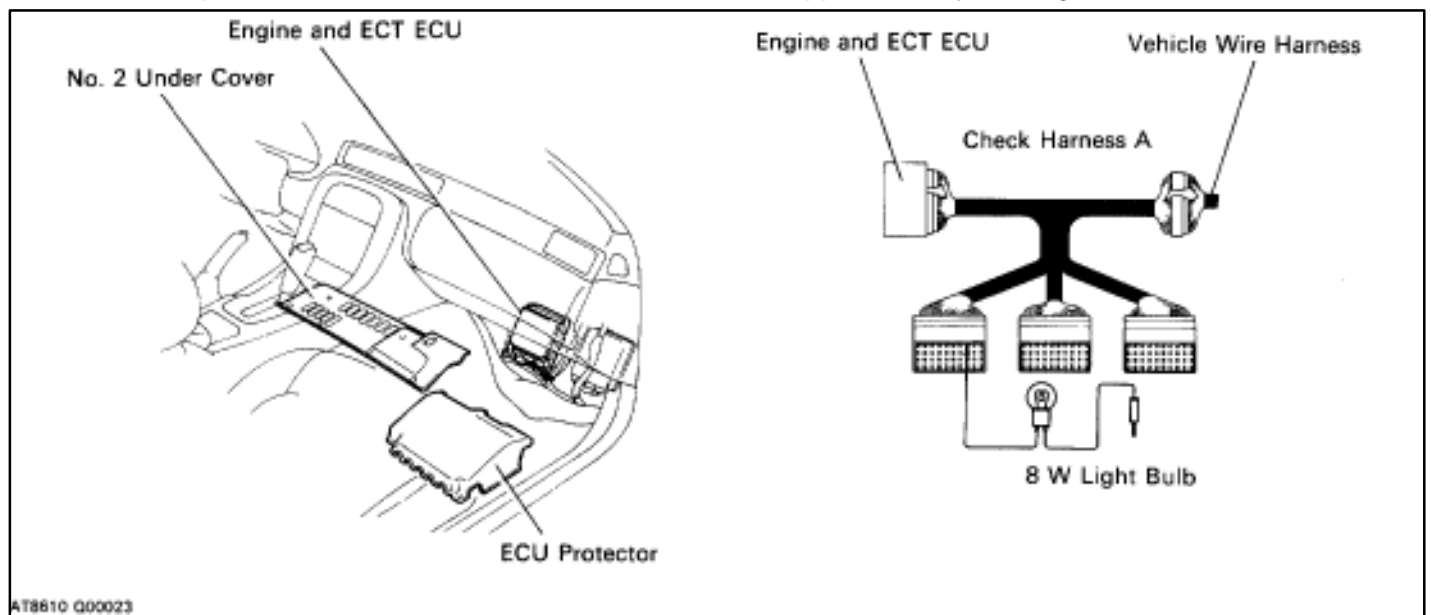
SST 09992-00094 (Oil pressure gauge)

HINT: Connecting the oil pressure gauge will be made easier by moving the RH side head insulator aside.

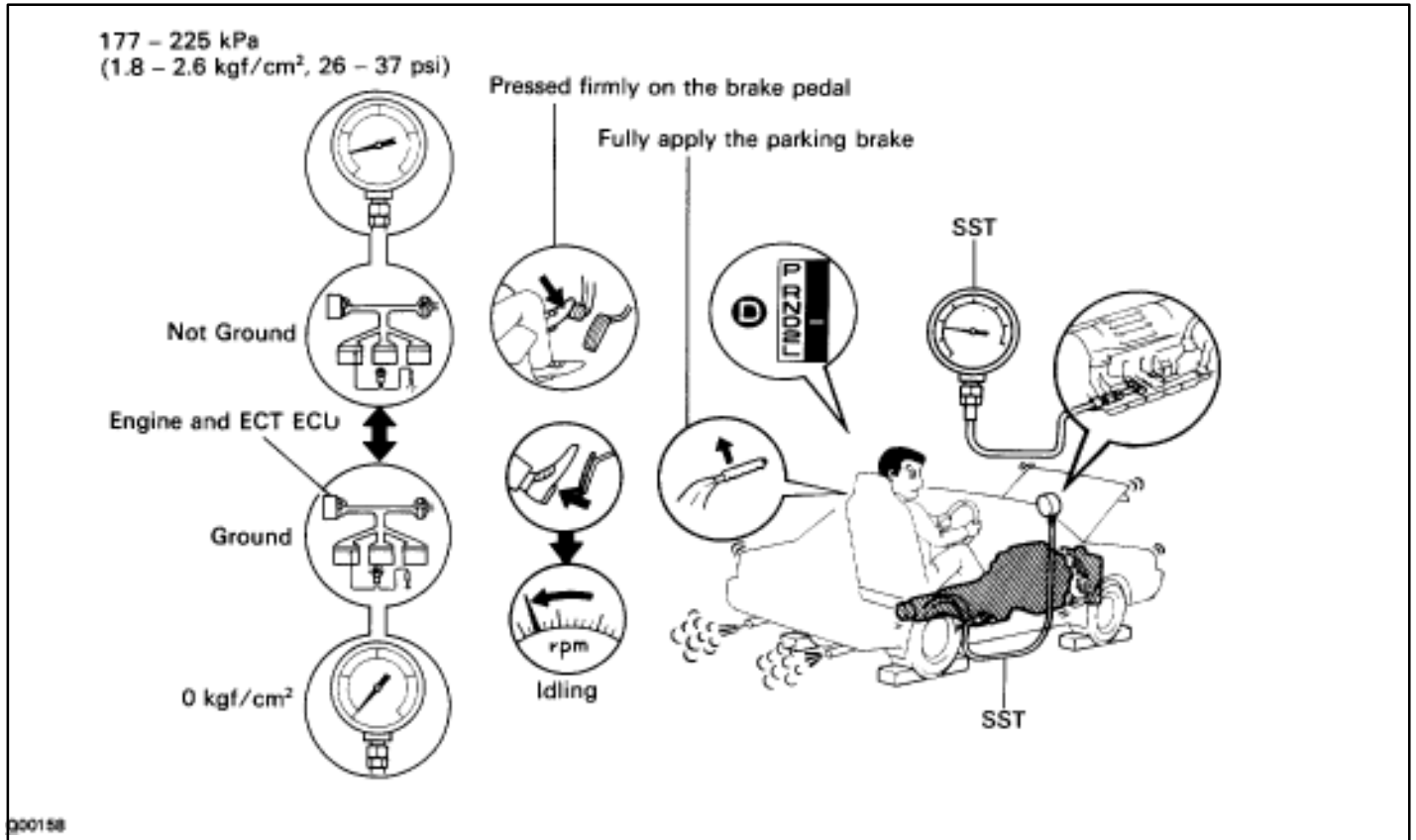


- (c) Remove the passenger side No. 2 under cover and ECU protector.
  - (d) Connect the SST (check harness A) between ECU and connector of vehicle wire harness.
- SST: 09990-01000
- (e) Install one test lead probe into the terminal SLN of the engine and ECT ECU wire harness side connector and take care not to ground the other test lead probe.

HINT: Prepare test leads which are connected with an approximately 8 W light bulb.



- (f) Fully apply the parking brake and chock the four wheels.
- (g) Start the engine and check idling rpm.
- (h) Keep your left foot pressed firmly on the brake pedal and shift into D range.
- (i) Measure the accumulator back pressure.
- (j) With the conditions the same as in (h), ground the other probe of the test lead which has one end inserted into the terminal SLN of the engine and ECT ECU harness side connector, then measure the accumulator back pressure again.



### SPECIFIED ACCUMULATOR BACK PRESSURE

Range	D range	
Engine speed	Idling	
Condition of Engine and ECT ECU terminal SLN	Not ground	Ground
Accumulator back pressure kPa (kgf/cm, psi)	177–255 (1.8–2.6, 26–37)	0

### EVALUATION

Problem	Possible cause
The accumulator back pressure is not as specified (high or low) when the terminal SLN is not ground.	<ul style="list-style-type: none"> <li>• Throttle cable out of adjustment</li> <li>• Throttle valve defective</li> <li>• Solenoid modulator valve defective</li> <li>• SLN solenoid valve defective</li> <li>• Accumulator control valve defective</li> </ul>
The accumulator back pressure does not become 0 kgf/cm when the terminal SLN is grounded.	<ul style="list-style-type: none"> <li>• SLN solenoid valve defective</li> </ul>