# 2. Diagnostic Trouble Code (DTC) Detecting Criteria

## A: DTC P0500 VEHICLE SPEED SENSOR “A”

### 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of VDC wheel speed sensor.
- Judge as NG when the VDC wheel speed sensor value is a specified value or more.

### 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10.9 V |

### 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Vehicle speed (from Vehicle Dynamics Control Module)<br>NOTE:<br>The VDC controller detects malfunction if one of the speed sensors does not output a signal and the other vehicle speed sensor output signal is above 7.46 MPH. | ≥ 186.4 MPH |

**Time Needed for Diagnosis:** 2.5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# B: DTC P0560 SYSTEM VOLTAGE

## 1. OUTLINE OF DIAGNOSIS

- Detect the abnormality of back-up power supply voltage.
- Judge as NG when the back-up power supply voltage is a specified value or less even though the battery voltage is normal.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage (Ignition state = Run or crank) | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Voltage of back-up power (TCM input voltage) | < 5 V |

**Time Needed for Diagnosis:** 10 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# C: DTC P0601 INTERNAL CONTROL MODULE MEMORY CHECKSUM ERROR

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction in ROM area of the TCM.
- Judge as NG when the consistency in the ROM area is lost.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Checksum (ROM) | Error |

**Time Needed for Diagnosis:**Immediately
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# D: DTC P0603 INTERNAL CONTROL MODULE KEEP ALIVE MEMORY (KAM) ERROR

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction in the back-up RAM area of the TCM.
- Judge as NG when the consistency in the back-up RAM area is lost.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Checksum (KAM) | Error |

**Time Needed for Diagnosis:**Immediately
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# E: DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction in RAM area of the TCM.
- Judge as NG if an attempt to write to RAM area failed.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Writing-check (RAM)<br>NOTE:<br>This check is carried out about the RAM only used for CAN communication. | Error |

**Time Needed for Diagnosis:**Immediately
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# F: DTC P062F INTERNAL CONTROL MODULE EEPROM ERROR

## 1. OUTLINE OF DIAGNOSIS

- Detect TCM EEPROM malfunction.
- Judge as NG when the SUM check result of EEPROM writing value is abnormal and the contents of EEPROM can not be read.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 9 V |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| Writing-check (EEPROM) | Error |
| **Diagnosis 2** | |
| Checksum (EEPROM) | Error |

**Time Needed for Diagnosis:**Immediately
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# G: DTC P0705 TRANSMISSION RANGE SENSOR CIRCUIT (PRNDL INPUT)

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of the Range Switch.
- Judge as NG when multiple Range Switch inputs are detected.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Two or more transmission range switches ON<br>NOTE:<br>“Transmission range switch ON” is defined as transmission range switch input voltage < 2.9 V. | True |

**Time Needed for Diagnosis:** 5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# H: DTC P0708 AT RANGE SWITCH NOT INPUTTED

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of the Range Switch.
- Judge as NG when no Range Switch inputs are detected.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |
| Brake switch B OFF<br>NOTE:<br>"Brake switch B OFF" is defined as Brake switch B input voltage ≥ 4.1 V. | True |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| All transmission range switches OFF<br>NOTE:<br>"Transmission range switch OFF" is defined as transmission range switch input voltage ≥ 4.1 V. | True |

**Time Needed for Diagnosis:** 10 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# I: DTC P0711 ATF TEMP. SENSOR CIRCUIT RANGE/PERFORMANCE

## 1. OUTLINE OF DIAGNOSIS

Diagnosis 1
- Detect the malfunction of transmission oil temperature sensor.
- Transmission oil temperature sensor is below the specified value (20°C (68°F))
- Judge as characteristics malfunction (transmission oil temperature sensor signal stuck) when a condition where the voltage change detected by transmission oil temperature sensor is 0.049 V or less is detected, even after driving for 10 minutes.

Diagnosis 2
- Judge the malfunction of transmission oil temperature sensor characteristics (stuck to high temperature side).
- Judge as malfunction when the difference of engine coolant temperature and CVT oil temperature at starting is a predetermined value or more.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 10 V |
| Engine speed (The timer is held when the following conditions are not satisfied.) | > 600 rpm |
| Transmission range | Drive |
| Vehicle speed (from output shaft speed sensor) | ≥ 21.9 MPH |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 10 V |
| Engine coolant temperature at the end of the previous drive cycle – Engine coolant temperature at engine start | ≥ 40 degC |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| Absolute change of measured Transmission fluid temperature sensor input voltage | ≤ 0.049 V |
| Transmission fluid temperature | < 20°C |
| **Diagnosis 2** | |
| Transmission fluid temperature – Engine coolant temperature at engine start | > 46 degC |

**Time Needed for Diagnosis:**
- **Diagnosis 1:** 600 s
- **Diagnosis 2:** 300 s

**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# J: DTC P0712 TRANSMISSION FLUID TEMPERATURE SENSOR CIRCUIT LOW INPUT

## 1. OUTLINE OF DIAGNOSIS

- Detect the ground short circuit of transmission oil temperature sensor.
- Judge as NG if the voltage detected by the transmission oil temperature sensor is lower than 0.117 V.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured Transmission fluid temperature sensor input voltage<br>(Transmission fluid temperature) | < 0.117 V<br>(> 146°C (294.8°F)) |

**Time Needed for Diagnosis:** 1 second
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# K: DTC P0713 TRANSMISSION FLUID TEMPERATURE SENSOR CIRCUIT HIGH INPUT

## 1. OUTLINE OF DIAGNOSIS

- Detect open circuit or short circuit to power supply of the 5 V system in the transmission oil temperature sensor.
- Judge as NG if the voltage detected by the transmission oil temperature sensor is higher than 4.507 V.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |
| Vehicle speed (from Output shaft speed sensor) | ≥ 6.3 MPH |
| Above condition satisfied for | ≥ 50 s |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured Transmission fluid temperature sensor input voltage | > 4.507 V |
| (Transmission fluid temperature) | (< –52°C (–61.6°F)) |

**Time Needed for Diagnosis:** 1 second
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# L: DTC P0716 TORQUE CONVERTER TURBINE SPEED

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of turbine speed sensor characteristics.
- Judge as NG when the deviation between engine speed and turbine speed becomes equal to or larger than the predetermined value.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Measured turbine shaft speed | ≥ 50 rpm |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Engine speed – Measured turbine shaft speed | > Table 1 rpm |

**Table 1**

| Measured turbine shaft speed (rpm) | 0 | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 |
|---|---|---|---|---|---|---|---|---|
| Engine speed – Measured turbine shaft speed (rpm) | 3700 | 3227 | 2755 | 2282 | 1856 | 1519 | 1213 | 956 |

| Measured turbine shaft speed (rpm) | 4000 | 4500 | 5000 | 5500 | 6000 | 6500 | 7000 |
|---|---|---|---|---|---|---|---|
| Engine speed – Measured turbine shaft speed (rpm) | 786 | 713 | 651 | 601 | 569 | 544 | 520 |

**Time Needed for Diagnosis:** 10 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# M: DTC P0717 INPUT/TURBINE SPEED SENSOR "A" CIRCUIT NO SIGNAL

## 1. OUTLINE OF DIAGNOSIS

- Detect no signal input of turbine speed sensor.
- Judge as NG when the turbine speed is not input while the primary speed on the same axis has been input with the forward/reverse clutch engaged in “D”, “R” range.
- Judge as NG when the turbine speed is not input while the engine speed sensor signal on the same axis has been input with the forward/reverse clutch released in “P”, “N” range.
- Judge as NG when no speed sensor inputs are received from TCM connector during driving.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Condition 1** | |
| 12 V battery system voltage | ≥ 10 V |
| Engine speed | ≥ 400 rpm |
| Actual primary pulley shaft speed | ≥ 500 rpm |
| Transmission range | Drive or Reverse |
| **Condition 2** | |
| 12 V battery system voltage | ≥ 10 V |
| Engine speed | ≥ 400 rpm |
| Transmission range | Park or Neutral |
| **Condition 3** | |
| 12 V battery system voltage | ≥ 10 V |
| Measured secondary pulley shaft speed | 0 rpm |
| Measured output shaft speed | 0 rpm |
| Actual primary pulley shaft speed | ≥ 500 rpm |
| Transmission range | Drive or Reverse |
| Vehicle speed (from vehicle dynamics control module) | ≥ 6.3 MPH |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured turbine shaft speed | 0 rpm |

**Time Needed for Diagnosis:**

- **Condition 1:** 1 s
- **Condition 2:** 3 s
- **Condition 3:** 0.6 s

**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# N: DTC P0719 BRAKE SWITCH CIRCUIT LOW

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of brake SW signal Low.
- Judge as NG when detecting the condition ten times where the vehicle speed is from more than 18.8 MPH to less than 0.6 MPH with brake SW signal OFF.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| The brake switch B is continuously OFF while the vehicle speed changed from “X” to “Y”. | |
| Vehicle speed “X” | ≥ 18.8 MPH |
| Vehicle speed “Y” | < 0.6 MPH |
| NOTE:<br>“Brake switch B OFF” is defined as Brake switch B input voltage ≤ 2.9 V. | |

**Time Needed for Diagnosis:** 10 times
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# O: DTC P0720 OUTPUT SPEED SENSOR CIRCUIT

## 1. OUTLINE OF DIAGNOSIS

- Detect no signal input of front wheel speed sensor.
- Judge as NG if the front wheel speed is not input while vehicle speed is detected by VDC wheel speed sensor when driving in “D”, “R” range.
- Judge as NG if the front wheel speed sensor has no input signals while the secondary speed sensor on the same axle has input signals when driving in “D” or “R” range.
- Judge as NG when no speed sensor inputs are received from TCM connector during driving.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Condition 1** | |
| 12 V battery system voltage | ≥ 10 V |
| Vehicle speed (from vehicle dynamics control module) | ≥ 3.1 MPH |
| Transmission range | Drive or Reverse |
| MIL is illuminated for DTCs. | P0500, U0073, U0122, U0416 |
| **Condition 2** | |
| 12 V battery system voltage | ≥ 10 V |
| Secondary pulley shaft speed | ≥ 800 rpm |
| Transmission range | Drive or Reverse |
| **Condition 3** | |
| 12 V battery system voltage | ≥ 10 V |
| Measured turbine shaft speed | 0 rpm |
| Measured secondary pulley shaft speed | 0 rpm |
| Actual primary pulley shaft speed | ≥ 500 rpm |
| Transmission range | Drive or Reverse |
| Vehicle speed (from vehicle dynamics control module) | ≥ 6.3 MPH |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured output shaft speed | 0 rpm |

**Time Needed for Diagnosis:**

- **Condition 1:** 1 s
- **Condition 2:** 1 s
- **Condition 3:** 0.6 s

**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# P: DTC P0721 OUTPUT SHAFT SPEED SENSOR CIRCUIT RANGE/PERFORMANCE

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of front wheel speed sensor characteristics.
- Judge as NG when the deviation between vehicle speeds from VDC and from front wheel speed sensor becomes 10 MPH or more.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Vehicle speed (from vehicle dynamics control module) | ≥ 12 MPH |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Absolute value (Vehicle speed (calculated from output shaft speed) – Vehicle speed (from vehicle dynamics control module)) | > 10 MPH |

**Time Needed for Diagnosis:** 5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# Q: DTC P0724 BRAKE SWITCH CIRCUIT HIGH

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of brake SW signal High.
- Judge as NG when detecting the condition ten times where the vehicle speed is from less than 0.6 MPH to more than 18.8 MPH with brake SW signal ON.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| The brake switch B is continuously ON while the vehicle speed changed from “Y” to “X”. | |
| Vehicle speed “Y” | < 0.6 MPH |
| Vehicle speed “X” | ≥ 18.8 MPH |
| NOTE:<br>“Brake switch B ON” is defined as Brake switch B input voltage ≥ 4.1 V. | |

**Time Needed for Diagnosis:** 10 times
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# R: DTC P0730 GEARSHIFT CONTROL PERFORMANCE ABNORMAL

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission gear ration control function.
- Judge as NG when the difference between the transmission target gear ratio that is an internal data and the actual gear ratio is larger than the predetermined value (compare the “Target gear ratio × Secondary pulley speed ≈ Target primary speed equivalent value” with the primary pulley speed).

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Transmission range | Drive |
| Transmission fluid pump speed (MTFP or ETFP) | ≥ 500 rpm |
| Measured secondary pulley shaft speed | > 150 rpm |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Absolute value (Target primary pulley shaft speed – Actual primary pulley shaft speed) | ≥ 800 rpm |
| (Commanded duty of shift up pressure control solenoid<br>or<br>Commanded duty of shift down pressure control solenoid) | ≥ 100% |

**Time Needed for Diagnosis:** 5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# S: DTC P0746 PRESSURE CONTROL SOLENOID "A" PERFORMANCE/STUCK OFF

## 1. OUTLINE OF DIAGNOSIS

• Detect the malfunction of transmission line pressure solenoid and hydraulic circuit (stuck to low pressure side).
• Judge as NG when the actual line pressure is smaller than the predetermined value.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Engine speed | ≥ 500 rpm |
| or | |
| Actual primary pulley shaft speed | |
| Measured line pressure control solenoid valve current | ≤ 0.78 A |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured line pressure | < Map 1 kPa |

**Map 1**

| | | Engine speed (rpm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 500 | 1000 | 1500 | 2000 | 2500 | 3000 |
| Transmission fluid temperature (degC) | – 40 | 0 | 0 | 377 | 421 | 462 | 514 | 570 |
| | – 20 | 0 | 0 | 299 | 336 | 384 | 436 | 499 |
| | 0 | 0 | 0 | 277 | 323 | 359 | 414 | 474 |
| | 20 | 0 | 0 | 278 | 323 | 367 | 412 | 464 |
| | 40 | 0 | 0 | 280 | 335 | 371 | 420 | 475 |
| | 60 | 0 | 0 | 260 | 316 | 353 | 403 | 457 |
| | 80 | 0 | 0 | 245 | 304 | 353 | 394 | 440 |
| | 100 | 0 | 0 | 227 | 286 | 323 | 369 | 412 |
| | 120 | 0 | 0 | 211 | 260 | 300 | 340 | 385 |
| | 140 | 0 | 0 | 184 | 230 | 273 | 310 | 357 |

| | | Engine speed (rpm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 3500 | 4000 | 4500 | 5000 | 5500 | 6000 | 6500 |
| Transmission fluid temperature (degC) | – 40 | 648 | 722 | 810 | 904 | 1010 | 1105 | 1175 |
| | – 20 | 555 | 633 | 711 | 808 | 923 | 1038 | 1130 |
| | 0 | 544 | 615 | 682 | 767 | 873 | 1001 | 1111 |
| | 20 | 527 | 590 | 668 | 761 | 854 | 980 | 1110 |
| | 40 | 533 | 591 | 666 | 742 | 836 | 937 | 1071 |
| | 60 | 515 | 573 | 641 | 713 | 800 | 897 | 1024 |
| | 80 | 493 | 548 | 607 | 675 | 749 | 839 | 916 |
| | 100 | 468 | 521 | 576 | 632 | 697 | 756 | 824 |
| | 120 | 440 | 484 | 536 | 589 | 638 | 691 | 737 |
| | 140 | 397 | 449 | 728 | 533 | 564 | 595 | 623 |

**Time Needed for Diagnosis:** 5 seconds
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# T: DTC P0747 PRESSURE CONTROL SOLENOID "A" STUCK ON

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission line pressure solenoid and hydraulic circuit (stuck to high pressure side).
- Judge as NG when the actual line pressure is larger than the predetermined value.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Engine speed | ≥ 500 rpm |
| or | |
| Actual primary pulley shaft speed | |
| Measured line pressure control solenoid valve current | ≥ 0.5 A |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured line pressure | > Map 1 kPa |

**Map 1**

| | | Engine speed (rpm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 500 | 1000 | 1500 | 2000 | 2500 | 3000 |
| Transmission fluid temperature (degC) | – 40 | 25600 | 25600 | 5590 | 5769 | 5915 | 5970 | 6000 |
| | – 20 | 25600 | 25600 | 5925 | 6012 | 6064 | 6083 | 6115 |
| | 0 | 25600 | 25600 | 5887 | 5971 | 6015 | 6023 | 6035 |
| | 20 | 25600 | 25600 | 5451 | 5491 | 5568 | 5598 | 5610 |
| | 40 | 25600 | 25600 | 4564 | 5429 | 5461 | 5542 | 5576 |
| | 60 | 25600 | 25600 | 2598 | 4527 | 5412 | 5455 | 5514 |
| | 80 | 25600 | 25600 | 1798 | 3735 | 5271 | 5368 | 5402 |
| | 100 | 25600 | 25600 | 993 | 2867 | 4341 | 5282 | 5353 |
| | 120 | 25600 | 25600 | 742 | 2556 | 3969 | 5200 | 5254 |
| | 140 | 25600 | 25600 | 438 | 1902 | 3293 | 4531 | 5114 |

| | | Engine speed (rpm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 3500 | 4000 | 4500 | 5000 | 5500 | 6000 | 6500 |
| Transmission fluid temperature (degC) | – 40 | 5988 | 5988 | 6040 | 6100 | 6100 | 6110 | 6200 |
| | – 20 | 6130 | 6170 | 6190 | 6240 | 6250 | 6250 | 6250 |
| | 0 | 6056 | 6078 | 6145 | 6176 | 6201 | 6212 | 6256 |
| | 20 | 5637 | 5675 | 5693 | 5740 | 5752 | 5752 | 5797 |
| | 40 | 5626 | 5640 | 5676 | 5700 | 5711 | 5751 | 5787 |
| | 60 | 5546 | 5576 | 5612 | 5636 | 5658 | 5658 | 5715 |
| | 80 | 5502 | 5525 | 5545 | 5597 | 5602 | 5602 | 5684 |
| | 100 | 5422 | 5460 | 5504 | 5538 | 5574 | 5574 | 5624 |
| | 120 | 5326 | 5391 | 5429 | 5457 | 5472 | 5472 | 5533 |
| | 140 | 5185 | 5280 | 5337 | 5365 | 5377 | 5377 | 5440 |

**Time Needed for Diagnosis:** 5 seconds
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# U: DTC P0751 SHIFT SOLENOID "A" PERFORMANCE/STUCK OFF

## 1. OUTLINE OF DIAGNOSIS

• Detect the malfunction of shift-up fluid pressure control solenoid characteristics and hydraulic circuit characteristics (stuck to low pressure side).
• Judge as NG when the gear ratio is more than 1.5 and less than 2.549 and the variation amount of the gear ratio per second is –0.12 or more even though up-shift command is issued.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Engine speed | ≥ 1000 rpm |
| or | |
| Actual primary pulley shaft speed | ≥ 1000 rpm |
| Commanded duty of shift down pressure control solenoid | 0% |
| Actual pulley ratio* | > 1.5<br>and<br>< 2.549 |

* Actual pulley ratio: Actual primary pulley shaft speed / Measured secondary pulley shaft speed

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Actual pulley ratio change for 1 second | > – 0.12 |
| Commanded duty of shift up pressure control solenoid | ≥ 90% |

**Time Needed for Diagnosis:** 1 second
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# V: DTC P0752 SHIFT SOLENOID "A" STUCK ON

## 1. OUTLINE OF DIAGNOSIS

• Detect the malfunction of shift-up fluid pressure control solenoid and hydraulic circuit characteristics (stuck to high pressure side).
• Judge as NG when the gear ratio is less than 0.5 and the variation amount of the gear ratio per second is between –0.12 and 0.12 even though down-shift command is issued.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Engine speed | ≥ 1000 rpm |
| or | |
| Actual primary pulley shaft speed | ≥ 1000 rpm |
| Commanded duty of shift up pressure control solenoid | 0% |
| Actual pulley ratio* | < 0.5 |

* Actual pulley ratio: Actual primary pulley shaft speed / Measured secondary pulley shaft speed

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Actual pulley ratio change for 1 second | > – 0.12 |
| | and |
| | < 0.12 |
| Commanded duty of shift down pressure control solenoid | > 80% |

**Time Needed for Diagnosis:** 1 second
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# W: DTC P0756 SHIFT SOLENOID "B" PERFORMANCE/STUCK OFF

## 1. OUTLINE OF DIAGNOSIS

• Detect the malfunction of shift-down fluid pressure control solenoid characteristics and hydraulic circuit characteristics (stuck to low pressure side).
• Judge as NG if the variation amount of gear rate per second is between –0.12 and 0.12 even though the down-shift command is issued.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Engine speed | ≥ 1000 rpm |
| or | |
| Actual primary pulley shaft speed | ≥ 1000 rpm |
| Commanded duty of shift up pressure control solenoid | 0% |
| Actual pulley ratio* | ≥ 0.406 |
| | and |
| | ≤ 2.549 |

* Actual pulley ratio: Actual primary pulley shaft speed / Measured secondary pulley shaft speed

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Actual pulley ratio change for 1 second | > – 0.12 |
| | and |
| | < 0.12 |
| Commanded duty of shift down pressure control solenoid | > 80% |

**Time Needed for Diagnosis:** 1 second
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# X: DTC P0757 SHIFT SOLENOID "B" STUCK ON

## 1. OUTLINE OF DIAGNOSIS

• Detect the malfunction of shift-down fluid pressure control solenoid characteristics and hydraulic circuit characteristics (stuck to high pressure side).
• Judge as NG if the variation amount of gear ratio per second is 0.04 or more even though the up-shift command is issued.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Engine speed | ≥ 1000 rpm |
| or | |
| Actual primary pulley shaft speed | ≥ 1000 rpm |
| Commanded duty of shift down pressure control solenoid | 0% |
| Actual pulley ratio* | ≥ 0.406 |
| | and |
| | ≤ 2.549 |

* Actual pulley ratio: Actual primary pulley shaft speed / Measured secondary pulley shaft speed

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Actual pulley ratio change for 1 second | > 0.04 |
| Commanded duty of shift up pressure control solenoid | > 50% |

**Time Needed for Diagnosis:** 1 s × 10 times
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# Y: DTC P0776 PRESSURE CONTROL SOLENOID "B" PERFORMANCE/STUCK OFF

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of the transmission forward/reverse clutch control function.
- Judge as NG if the deviation between the turbine speed and primary pulley speed becomes the predetermined value or more, even though the forward/reverse clutch should be engaged in the current control status.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 10 V |
| Transmission range | Drive |
| Actual primary pulley shaft speed | ≥ 100 rpm |
| Measured turbine shaft speed | ≥ 100 rpm |
| Vehicle speed (from vehicle dynamics control module) | ≥ 6 MPH |
| Commanded forward & reverse clutch pressure control solenoid current | < 0.8 A |
| Engine speed | ≥ 500 rpm |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 10 V |
| Transmission range | Drive |
| Actual primary pulley shaft speed | < 100 rpm |
| Vehicle speed (from vehicle dynamics control module) | < 6 MPH |
| Commanded forward & reverse clutch pressure control solenoid current | < 0.8 A |
| Accelerator pedal position (from ECM) | > 6% |
| Engine speed | ≥ 500 rpm |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| Absolute value (Measured turbine shaft speed – Actual primary pulley shaft speed) | > Table 1 rpm |
| **Diagnosis 2** | |
| Measured turbine shaft speed | > 2000 rpm |

**Table 1**

| Vehicle speed (MPH) | 0 | 13 | 25 | 38 | 50 | 63 | 75 |
|---|---|---|---|---|---|---|---|
| Absolute value (Measured turbine shaft speed – Actual primary pulley shaft speed) (rpm) | 150 | 100 | 100 | 100 | 100 | 100 | 100 |

| Vehicle speed (MPH) | 88 | 100 | 113 | 125 | 138 | 150 | 159 |
|---|---|---|---|---|---|---|---|
| Absolute value (Measured turbine shaft speed – Actual primary pulley shaft speed) (rpm) | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Time Needed for Diagnosis:** 5 seconds
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# Z: DTC P0841 SECONDARY OIL PRESSURE SENSOR PERFORMANCE

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission fluid pressure control function.
- Judge as NG when the pressure difference of 0.5 MPa or more occurs by comparing the Secondary Pressure Target, which is an internal data, and Secondary pressure sensor detecting value.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Transmission fluid pump speed (MTFP or ETFP) | ≥ Table 1 rpm |

**Table 1**

| Target line pressure (MPa) | 0 | 500 | 1000 | 1500 | 2000 | 3000 | 4000 | 5000 | 6000 |
|---|---|---|---|---|---|---|---|---|---|
| Transmission fluid pump speed * (rpm) | 665 | 1144 | 1463 | 1702 | 1822 | 2128 | 2500 | 2793 | 3059 |

* MTFP or ETFP

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Absolute value (Target line pressure – Measured line pressure) | ≥ 500 kPa |
| Absolute value (Correction value of line pressure control solenoid valve feedback control) | ≥ 0.2 A |

**Time Needed for Diagnosis:** 5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AA:DTC P0842 SECONDARY OIL PRESSURE SENSOR CIRCUIT (LOW)

## 1. OUTLINE OF DIAGNOSIS

- Detect the ground short circuit of the transmission line pressure sensor.
- Judge as NG if the detected voltage of transmission line pressure sensor is less than 0.195 V.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured line pressure sensor input voltage<br>(Line pressure) | < 0.195 V<br>(< – 574 kPa) |

**Time Needed for Diagnosis:** 0.5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AB:DTC P0843 SECONDARY OIL PRESSURE SENSOR CIRCUIT (HIGH)

## 1. OUTLINE OF DIAGNOSIS

- Detect open circuit or short circuit to power supply of the 5 V system in the transmission line pressure sensor.
- Judge as NG if the voltage detected by the transmission line pressure sensor is higher than 4.883 V.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured line pressure sensor input voltage<br>(Line pressure) | > 4.883 V<br>(> 8200 kPa) |

**Time Needed for Diagnosis:** 1.5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AC:DTC P0890 AT SELF-SHUT RELAY DIAGNOSIS (LOW)

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission fluid pressure solenoid drive power supply relay circuit.
- Judge as NG when a status where transmission fluid pressure solenoid drive power supply voltage is less than 2 V is detected.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| TCM Power Relay output command | ON |
| Ignition state | Run or crank |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured TCM input voltage which is supplied from 12 V battery system through the TCM Power Relay | < 2 V |

**Time Needed for Diagnosis:** 0.5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AD:DTC P0961 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT RANGE/PERFORMANCE

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission line pressure solenoid drive circuit.
- Judge as NG when the deviation between target current and actual current of the transmission line pressure solenoid becomes equal to or larger than the predetermined value.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Absolute value<br>(Target line pressure control solenoid valve current – Measured line pressure control solenoid valve current) | > 0.2 A |

**Time Needed for Diagnosis:** 5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AE:DTC P0962 SECONDARY SOLENOID CIRCUIT (LOW)

## 1. OUTLINE OF DIAGNOSIS

Diagnosis 1
- Detect the ground short of the transmission line pressure solenoid drive circuit.
- Judge as NG if the transmission line pressure solenoid drive current is more than 1.1 A.

Diagnosis 2
- Detect the ground short of the transmission line pressure solenoid drive circuit.
- Judge as NG if the solenoid current of the transmission line pressure solenoid drive circuit is more than 1.2 A.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 9 V |
| Commanded line pressure control solenoid current | ≥ 0.1 A |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| Measured line pressure control solenoid current | ≥ 1.1 A |
| **Diagnosis 2** | |
| Signal of malfunction from solenoid driver IC | ON |
| As defined by: | |
| Measured line pressure control solenoid current | ≥ 1.2 A |

**Time Needed for Diagnosis:** 0.5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AF:DTC P0963 SECONDARY SOLENOID CIRCUIT (HIGH)

## 1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the transmission line pressure solenoid drive circuit.
- Judge as NG if the transmission line pressure solenoid drive current is less than 0.1 A.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |
| Commanded line pressure control solenoid valve current | ≥ 0.2 A |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured line pressure control solenoid valve current | < 0.1 A |

**Time Needed for Diagnosis:** 0.5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AG:DTC P0965 FORWARD & REVERSE SOLENOID FUNCTION

## 1. OUTLINE OF DIAGNOSIS

Diagnosis 1
• Detect the malfunction of transmission forward/reverse clutch pressure solenoid drive circuit characteristics.
• Judge as NG when the deviation between set current and actual current of the transmission forward/reverse clutch pressure solenoid drive circuit becomes equal to or larger than the predetermined value (0.2 A).
Diagnosis 2
• Detect the malfunction of transmission forward/reverse clutch pressure solenoid drive circuit characteristics.
• Judge as NG when the transmission forward/reverse clutch pressure solenoid drive current is within the predetermined value.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 9 V |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| Absolute value (Target forward & reverse clutch pressure control solenoid current – Measured forward & reverse clutch pressure control solenoid circuit) | > 0.2 A |
| **Diagnosis 2** | |
| Measured forward & reverse clutch pressure control solenoid current | > 1.08 A<br>and<br>≤ 1.9 A |

**Time Needed for Diagnosis:** 5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AH:DTC P0966 FORWARD & REVERSE SOLENOID CIRCUIT (LOW)

## 1. OUTLINE OF DIAGNOSIS

- Detect the GND-output short in transmission forward/reverse clutch pressure solenoid circuit.
- Judge as NG when the transmission forward/reverse clutch pressure solenoid drive current is 1.9 A or more.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from solenoid driver IC<br>As defined by:<br>Measured line pressure control solenoid current ≥ 1.9 A | ON |

**Time Needed for Diagnosis:** 0.02 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AI: DTC P0967 FORWARD & REVERSE LINEAR SOLENOID CIRCUIT (HIGH)

## 1. OUTLINE OF DIAGNOSIS

- Detect open circuit or short circuit to power supply in the transmission forward/reverse clutch pressure solenoid circuit.
- Judge as NG if the transmission forward/reverse clutch pressure solenoid drive current is less than 0.15 A.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |
| Commanded forward & reverse clutch pressure control solenoid current | ≥ 0.3 A |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured forward & reverse clutch pressure control solenoid current | < 0.15 A |

**Time Needed for Diagnosis:** 1 second
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AJ:DTC P0973 PRIMARY SOLENOID SYSTEM A CIRCUIT (LOW)

## 1. OUTLINE OF DIAGNOSIS

- Detect the ground short of the shift-up fluid pressure control solenoid drive circuit.
- Judge as NG when the shift-up hydraulic control solenoid drive voltage is 0.8 V or less.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |
| Commanded duty of shift up pressure control solenoid | 100% |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from solenoid driver IC | ON |
| As defined by: | |
| Measured shift up pressure control solenoid voltage ≤ 0.8 V | |

**Time Needed for Diagnosis:** 0.2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AK:DTC P0974 PRIMARY SOLENOID SYSTEM A CIRCUIT (HIGH)

## 1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the shift-up fluid pressure control solenoid drive circuit.
- Judge as NG when the shift-up hydraulic control solenoid drive voltage is 2.5 V or more.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |
| Commanded duty of shift up pressure control solenoid | 0% |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from solenoid driver IC<br>As defined by:<br>Measured shift up pressure control solenoid voltage ≥ 2.5 V | ON |

**Time Needed for Diagnosis:** 0.2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AL:DTC P0976 PRIMARY SOLENOID SYSTEM B CIRCUIT (LOW)

## 1. OUTLINE OF DIAGNOSIS

- Detect the ground short of the shift-down fluid pressure control solenoid drive circuit.
- Judge as NG when the shift-down hydraulic control solenoid drive voltage is 0.8 V or less.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |
| Commanded duty of shift down pressure control solenoid | 100% |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from solenoid driver IC | ON |
| As defined by: | |
| Measured shift down pressure control solenoid voltage ≤ 0.8 V | |

**Time Needed for Diagnosis:** 0.2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AM:DTC P0977 PRIMARY SOLENOID SYSTEM B CIRCUIT (HIGH)

## 1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the shift-down fluid pressure control solenoid drive circuit.
- Judge as NG when the shift-down hydraulic control solenoid drive voltage is 2.5 V or more.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |
| Commanded duty of shift down pressure control solenoid | 0% |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from solenoid driver IC | ON |
| As defined by: | |
| Measured shift down pressure control solenoid voltage ≥ 2.5 V | |

**Time Needed for Diagnosis:** 0.2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AN:DTC P0B0A AUXILIARY TRANSMISSION FLUID PUMP MOTOR SUPPLY VOLTAGE CIRCUIT LOW

## 1. OUTLINE OF DIAGNOSIS

- Detect the short to 100 V system GND of electric oil pump 100 V power supply.
- Judge as NG when a status where 100 V power supply voltage is less than 66 V is detected.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Pre-charge contactor (in the hybrid battery pack) | Open |
| Positive contactor (in the hybrid battery pack) | Closed |
| Negative contactor (in the hybrid battery pack) | Closed |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from ETFP control module<br>As defined by:<br>ETFP control module input voltage < 66 V | ON |

**Time Needed for Diagnosis:** 0.5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AO:DTC P0B0B AUXILIARY TRANSMISSION FLUID PUMP MOTOR SUPPLY VOLTAGE CIRCUIT HIGH

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of electric oil pump 100 V power supply HIGH side.
- Judge as NG when the 100 V power supply voltage is 210 V or more.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Pre-charge contactor (in the hybrid battery pack) | Open |
| Positive contactor (in the hybrid battery pack) | Closed |
| Negative contactor (in the hybrid battery pack) | Closed |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from ETFP control module<br>As defined by:<br>ETFP control module input voltage ≥ 210 V | ON |

**Time Needed for Diagnosis:** 10 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AP:DTC P0B0D AUXILIARY TRANSMISSION FLUID PUMP MOTOR CONTROL MODULE

## 1. OUTLINE OF DIAGNOSIS

- Detect ROM/RAM malfunction of the electric oil pump.
- Judge as NG through a ROM/RAM diagnosis executed at the electric oil pump inverter.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from ETFP control module | ON |
| As defined by: | |
| Writing-check (RAM)<br>or<br>Checksum (ROM) | Error |

**Time Needed for Diagnosis:** 1 count
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AQ:DTC P0C21 AUXILIARY TRANSMISSION FLUID PUMP PHASE U-V-W CIRCUIT LOW

## 1. OUTLINE OF DIAGNOSIS

Diagnosis 1
- Detect the open or ground short circuit of electric oil pump U/V/W line.
- Judge as NG when a status where the total current value of three phase line is 50 A or more and then any of voltage sensor values of U/V/W lines is less than 2.7 V.

Diagnosis 2
- Detect the open or ground short circuit of electric oil pump U/V/W line.
- Judge as NG when IGBT of V line is ON and any of voltage sensor values of U/V/W lines is 58 V or less.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 10 V |
| Pre-charge contactor (in the hybrid battery pack) | Open |
| Positive contactor (in the hybrid battery pack) | Closed |
| Negative contactor (in the hybrid battery pack) | Closed |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 10 V |
| Pre-charge contactor (in the hybrid battery pack) | Open |
| Positive contactor (in the hybrid battery pack) | Closed |
| Negative contactor (in the hybrid battery pack) | Closed |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| Signal of malfunction from ETFP control module | ON |
| As defined by:<br>Inverter phase U voltage < 2.7 V<br>or<br>Inverter phase V voltage < 2.7 V<br>or<br>Inverter phase W voltage < 2.7 V<br>Actual current of ETFP inverter ≥ 50 A | |
| **Diagnosis 2** | |
| Signal of malfunction from ETFP control module | ON |
| As defined by:<br>Inverter phase U voltage when the V phase high side IGBT is ON ≤ 58 V<br>or<br>Inverter phase V voltage when the V phase high side IGBT is ON ≤ 58 V<br>or<br>Inverter phase W voltage when the V phase high side IGBT is ON ≤ 58 V | |

**Time Needed for Diagnosis:** 0.2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AR:DTC P0C22 AUXILIARY TRANSMISSION FLUID PUMP PHASE U-V-W CIRCUIT HIGH

## 1. OUTLINE OF DIAGNOSIS

- Detect the short circuit to 100 V power supply system of electric oil pump U/V/W line.
- Judge as NG when a status where the total current value of three phase line is 50 A or more and then any of voltage sensor values of U/V/W lines is more than 58 V.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Pre-charge contactor (in the hybrid battery pack) | Open |
| Positive contactor (in the hybrid battery pack) | Closed |
| Negative contactor (in the hybrid battery pack) | Closed |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from ETFP control module<br>As defined by:<br>Inverter phase U voltage > 58 V<br>or<br>Inverter phase V voltage > 58 V<br>or<br>Inverter phase W voltage > 58 V<br>Actual current of ETFP control module ≥ 50 A | ON |

**Time Needed for Diagnosis:** 0.2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AS:DTC P0C29 AUXILIARY TRANSMISSION FLUID PUMP DRIVER CURRENT PERFORMANCE

## 1. OUTLINE OF DIAGNOSIS

Diagnosis 1
- Detect the overcurrent of electric oil pump U/V/W line.
- Judge as NG when a status where the total current value of three phase line is 14 A or more lasts 3 seconds or more.

Diagnosis 2
- Detect the overcurrent of electric oil pump U/V/W line.
- Judge as NG when a status where the total current value of three phase line is 50 A or more is detected two times or more in one driving cycle.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 10 V |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| Signal of malfunction from ETFP control module | ON |
| As defined by: | |
| Actual current of ETFP control module ≥ 14 A | |
| **Diagnosis 2** | |
| Signal of malfunction from ETFP control module | ON |
| As defined by: | |
| Actual current of ETFP control module ≥ 50 A | |

**Time Needed for Diagnosis:**
- **Diagnosis 1:** 3 s
- **Diagnosis 2:** 2 s

**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AT:DTC P0C2A AUXILIARY TRANSMISSION FLUID PUMP MOTOR STALLED

## 1. OUTLINE OF DIAGNOSIS

- Detect low speed revolution malfunction of electric oil pump.
- Judge as NG if the Set speed – Actual speed of electric oil pump is more than the predetermined value.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Commanded ETFP speed | ≥ 800 rpm |
| Pre-charge contactor (in the hybrid battery pack) | Open |
| Positive contactor (in the hybrid battery pack) | Closed |
| Negative contactor (in the hybrid battery pack) | Closed |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from ETFP control module | ON |
| As defined by: | |
| Commanded ETFP speed – Actual ETFP speed > 270 rpm | |

**Time Needed for Diagnosis:** 3 sec × 2 times
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AU:DTC P160A RANDOM ACCESS MEMORY (RAM) ERROR

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction in RAM area of the TCM.
- Judge as NG if an attempt to write to RAM area has failed.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Writing-check (RAM)<br>NOTE:<br>This check is carried out about the RAM used except for CAN communication. | Error |

**Time Needed for Diagnosis:**Immediately
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# AV:DTC P172A AUXILIARY TRANSMISSION FLUID PUMP REVERSE ROTATION

## 1. OUTLINE OF DIAGNOSIS

- Detect high speed revolution malfunction of electric oil pump.
- Judge as NG when a status where 100 V power supply voltage is more than 225 V is detected.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Commanded ETFP speed | 0 rpm |
| Pre-charge contactor (in the hybrid battery pack) | Open |
| Positive contactor (in the hybrid battery pack) | Closed |
| Negative contactor (in the hybrid battery pack) | Closed |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from ETFP control module<br>As defined by:<br>ETFP control module input voltage ≥ 225 V | ON |

**Time Needed for Diagnosis:** 1 second
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AW:DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of ignition SW circuit.
- Judge as NG if the ignition SW signals are lost 5 times or more even though the engine is ON.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10.9 V |
| Engine speed | ≥ 500 rpm |
| or | |
| Vehicle speed | ≥ 1.2 MPH |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Count of temporarily discontinuous input of ignition switch | ≥ 5 count |

**Time Needed for Diagnosis:** 5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AX:DTC P2714 PRESSURE CONTROL SOLENOID "D" PERFORMANCE/STUCK OFF

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of the transmission output clutch control function.
- Judge as NG when the deviation between values of the output clutch output speed and the output clutch input speed calculated from the secondary speed becomes equal to or larger than the predetermined value (180 rpm), even though the output clutch should be engaged in the current control status.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Transmission fluid pump speed (MTFP or ETFP) | ≥ 700 rpm |
| Transmission range | Drive or Reverse |
| Commanded output clutch control solenoid current | ≤ 0.8 A |
| Measured secondary pulley shaft speed | ≥ 100 rpm |
| Measured output shaft speed | ≥ 100 rpm |
| or | |
| MIL is not illuminated for DTCs | P0500, U0073, U0122, U0416 |
| Vehicle speed (from vehicle dynamics control module) | 0 MPH |
| Measured output shaft speed | 0 rpm |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Absolute value (Input speed of output clutch* – Measured output shaft speed) | ≥ 180 rpm |

* Input speed of output clutch: Measured secondary pulley shaft speed / 1.405**
**1.405: Secondary reduction gear ratio

**Time Needed for Diagnosis:** Table 1 s

**Table 1**

| Absolute value (Input speed of output clutch – Measured output shaft speed) | 30 | 40 | 100 | 200 | 300 | 400 | 500 |
|---|---|---|---|---|---|---|---|
| Time Required (sec) | 10.0 | 10.0 | 10.0 | 10.0 | 7.0 | 5.0 | 5.0 |

**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AY:DTC P2719 PRESSURE CONTROL SOLENOID D CONTROL CIRCUIT RANGE/PERFORMANCE

## 1. OUTLINE OF DIAGNOSIS

Diagnosis 1
- Detect the characteristic malfunction of the transmission output clutch linear solenoid drive circuit.
- Judge as NG when the deviation between set current and actual current of the transmission output clutch linear solenoid drive circuit becomes equal to or larger than the predetermined value (0.2 A).

Diagnosis 2
- Detect the characteristic malfunction of the transmission output clutch linear solenoid drive circuit.
- Judge as NG when the transmission output clutch linear solenoid drive current is within the predetermined value.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 9 V |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| Absolute value (Target output clutch pressure control solenoid current – Measured output clutch pressure control solenoid current) | > 0.2 A |
| **Diagnosis 2** | |
| Measured output clutch pressure control solenoid current | > 1.08 A<br>and<br>< 1.9 A |

**Time Needed for Diagnosis:** 5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# AZ:DTC P2720 PRESSURE CONTROL SOLENOID D CONTROL CIRCUIT LOW

## 1. OUTLINE OF DIAGNOSIS

- Detect the GND-output short in transmission output clutch pressure solenoid circuit.
- Judge as NG when the transmission output clutch pressure solenoid drive current is 1.9 A or more.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from solenoid driver IC<br>As defined by:<br>Measured output clutch pressure control solenoid current ≥ 1.9 A | ON |

**Time Needed for Diagnosis:** 0.02 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BA:DTC P2721 PRESSURE CONTROL SOLENOID D CONTROL CIRCUIT HIGH

## 1. OUTLINE OF DIAGNOSIS

- Detect open circuit or short circuit to power supply in the transmission output clutch pressure solenoid circuit.
- Judge as NG if the transmission output clutch pressure solenoid drive current is less than 0.15 A.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |
| Commanded output clutch control solenoid current | ≥ 0.3 A |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured output clutch pressure control solenoid current | < 0.15 A |

**Time Needed for Diagnosis:** 1 second
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BB:DTC P2750 SEC. PULLEY REVOLUTION SPEED SENSOR CIRCUIT

## 1. OUTLINE OF DIAGNOSIS

Diagnosis 1
- Detect the malfunction of secondary speed sensor signal characteristics.
- Judge as NG if the secondary speed, compared with the primary speed, is outside the possible range considering the hardware capabilities.

Diagnosis 2
- Detect the malfunction of secondary speed sensor signal characteristics.
- Judge as NG when the secondary speed exceeds 13500 rpm.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 9 V |
| Transmission range | Drive or Reverse |
| (Actual primary pulley shaft speed / Measured front output shaft speed) | ≥ 0.36<br>and<br>≤ 2.34 |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 9 V |
| Transmission range | Drive or Reverse |
| (Actual primary pulley shaft speed / Measured front output shaft speed) | ≥ 0.36<br>and<br>≤ 2.34 |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| (Measured primary pulley shaft speed / Measured secondary pulley shaft speed) | < 0.33<br>or<br>> 2.58 |
| **Diagnosis 2** | |
| Measured secondary pulley shaft speed | > 13500 rpm |

**Time Needed for Diagnosis:** 5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BC:DTC P2751 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT NO SIGNAL

## 1. OUTLINE OF DIAGNOSIS

- Detect no signal input of secondary speed sensor.
- Judge as NG when there is no input to the secondary speed sensor while the primary speed is input.
- Judge as NG when no speed sensor inputs are received from TCM connector during driving.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Condition 1** | |
| 12 V battery system voltage | ≥ 10 V |
| Transmission range | Drive or Reverse |
| Actual primary pulley shaft speed | ≥ 1000 rpm |
| **Condition 2** | |
| 12 V battery system voltage | ≥ 10 V |
| Measured turbine shaft speed | 0 rpm |
| Measured output shaft speed | 0 rpm |
| Actual primary pulley shaft speed | ≥ 500 rpm |
| Transmission range | Drive or Reverse |
| Vehicle speed (from vehicle dynamics control module) | ≥ 6.3 MPH |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured secondary pulley shaft speed | 0 rpm |

**Time Needed for Diagnosis:**

- **Condition 1:** 0.5 s
- **Condition 2:** 0.6 s

**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BD:DTC P2757 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT PERFORMANCE/STUCK OFF

## 1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of lock-up clutch pressure control function.
- Judge as NG when the deviation between the engine speed and the turbine speed is the predetermined value or more, even though the lock-up hydraulic pressure control solenoid is issuing an engagement command.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Transmission range | Drive |
| Commanded Torque converter clutch pressure | ≥ 700 kPa |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Absolute value (Engine speed – Measured turbine shaft speed) | ≥ 40 + Vehicle speed / 1.25 rpm<br>(Vehicle speed: MPH) |

**Time Needed for Diagnosis:** 10 seconds
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# BE:DTC P2758 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON

## 1. OUTLINE OF DIAGNOSIS

• Detect the malfunction of lock-up fluid pressure control solenoid, and hydraulic circuit, or drive circuit characteristics (stuck to high pressure side).
• Judge as NG if the deviation between engine speed and turbine speed is the predetermined value or less, even though the lock-up open request has been issued.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Engine speed | ≥ 1000 rpm |
| Transmission range | Drive |
| Engine torque | > Table 1 N·m |
| Commanded duty of torque converter clutch pressure control solenoid | ≤ 0% |

**Table 1**

| Vehicle speed (rpm) | 0 | 13 | 25 | 38 | 50 | 63 | 75 | 88 | 100 | 113 |
|---|---|---|---|---|---|---|---|---|---|---|
| Engine torque (N·m) | 60 | 73 | 92 | 118 | 154 | 170 | 205 | 244 | 286 | 332 |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Absolute value (Engine speed – Measured turbine shaft speed) | < Table 2 rpm |

**Table 2**

| Measured turbine shaft speed (rpm) | 0 | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 |
|---|---|---|---|---|---|---|---|---|
| Absolute value (Engine speed – Measured turbine shaft speed) (rpm) | 0 | 0 | 50 | 50 | 50 | 50 | 50 | 50 |

| Measured turbine shaft speed (rpm) | 4000 | 4500 | 5000 | 5500 | 6000 | 6500 | 7000 |
|---|---|---|---|---|---|---|---|
| Absolute value (Engine speed – Measured turbine shaft speed) (rpm) | 50 | 50 | 50 | 50 | 50 | 50 | 50 |

**Time Needed for Diagnosis:** 10 seconds
**Malfunction Indicator Light Illumination:** Illuminates when malfunction occurs in 2 continuous driving cycles.

# BF:DTC P2763 LOCK-UP DUTY SOLENOID CIRCUIT (HIGH)

## 1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the lock-up clutch pressure control solenoid drive circuit.
- Judge as NG when the lock-up clutch pressure control solenoid drive voltage is 0.8 V or less.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |
| Commanded duty of torque converter clutch pressure control solenoid | 0% |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from solenoid driver IC<br>As defined by:<br>Measured torque converter clutch pressure control solenoid voltage ≤ 0.8 V | ON |

**Time Needed for Diagnosis:** 0.2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BG:DTC P2764 LOCK-UP DUTY SOLENOID CIRCUIT (LOW)

## 1. OUTLINE OF DIAGNOSIS

- Detect the ground short of the lock-up clutch pressure control solenoid drive circuit.
- Judge as NG when the lock-up clutch pressure control solenoid drive voltage is 2.5 V or more.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 9 V |
| Commanded duty of torque converter clutch pressure control solenoid | 100% |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Signal of malfunction from solenoid driver IC | ON |
| As defined by: | |
| Measured torque converter clutch pressure control solenoid voltage ≥ 2.5 V | ≥ 2.5 V |

**Time Needed for Diagnosis:** 0.2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BH:DTC P2797 AUXILIARY TRANSMISSION FLUID PUMP

## 1. OUTLINE OF DIAGNOSIS

- Detect function malfunction of electric oil pump.
- Judge as NG if the secondary pressure is less than 0.2 MPa while the electric oil pump is driven.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |
| Commanded ETFP speed | ≥ 800 rpm |
| Pre-charge contactor (in the hybrid battery pack) | Open |
| Positive contactor (in the hybrid battery pack) | Closed |
| Negative contactor (in the hybrid battery pack) | Closed |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| Measured line pressure | < 200 kPa |

**Time Needed for Diagnosis:** 1 second
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BI: DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure has occurred.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| CAN bus condition | Bus off |

**Time Needed for Diagnosis:** 2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BJ:DTC U0075 CONTROL MODULE COMMUNICATION BUS "PU-CAN" OFF

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure has occurred.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| CAN bus condition | Bus off |

**Time Needed for Diagnosis:** 2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BK:DTC U0100 LOST COMMUNICATION WITH ECM/PCM “A”

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication with ECM is not possible.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| CAN data from ECM | Lost |

**Time Needed for Diagnosis:** 0.5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BL:DTC U0110 LOST COMMUNICATION WITH DRIVE MOTOR CONTROL MODULE "A"

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication with drive motor CM is not possible.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| CAN data from Drive Motor Control Module | Lost |

**Time Needed for Diagnosis:** 0.5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BM:DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication with VDCCM is not possible.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| CAN data from Vehicle Dynamics Control Module | Lost |

**Time Needed for Diagnosis:** 0.5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BN:DTC U0287 LOST COMMUNICATION WITH TRANSMISSION FLUID PUMP MODULE

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication with electric oil pump inverter is not possible.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| CAN data from ETFP Control Module | Lost |

**Time Needed for Diagnosis:** 0.5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BO:DTC U0293 LOST COMMUNICATION WITH HYBRID POWERTRAIN CONTROL MODULE

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication with hybrid powertrain CM is not possible.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| CAN data from HPCM | Lost |

**Time Needed for Diagnosis:** 0.5 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BP:DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from ECM is not normal.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| CAN data from ECM | Did not change |

**Time Needed for Diagnosis:** 2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BQ:DTC U0411 INVALID DATA RECEIVED FROM DRIVE MOTOR CONTROL MODULE "A"

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from drive motor CM is not normal.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 10 V |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| CAN data from Drive Motor Control Module | Did not change |
| **Diagnosis 2** | |
| CAN data from Drive Motor Control Module | Check sum error |

**Time Needed for Diagnosis:**

- **Diagnosis 1:** 2 s
- **Diagnosis 2:** 3 times

**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BR:DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from the VDCCM is not normal.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| CAN data from Vehicle Dynamics Control Module | Did not change |

**Time Needed for Diagnosis:** 2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BS:DTC U0588 INVALID DATA RECEIVED FROM TRANSMISSION FLUID PUMP MODULE

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from electric oil pump inverter is not normal.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 10 V |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| CAN data from ETFP Control Module | Did not change |
| **Diagnosis 2** | |
| CAN data from ETFP Control Module | Check sum error |

**Time Needed for Diagnosis:**

- **Diagnosis 1:** 2 s
- **Diagnosis 2:** 3 times

**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BT:DTC U0594 INVALID DATA RECEIVED FROM HYBRID POWERTRAIN CONTROL MODULE

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from hybrid powertrain CM is not normal.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| CAN data from HPCM | Did not change |

**Time Needed for Diagnosis:** 2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BU:DTC U1100 LOST COMMUNICATION WITH ECM/PCM PU-CAN

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication with ECM is not possible.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| CAN data from ECM | Lost |

**Time Needed for Diagnosis:** 2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BV:DTC U1293 LOST COMMUNICATION WITH HYBRID POWERTRAIN CONTROL MODULE PU-CAN

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication with hybrid powertrain CM is not possible.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| CAN data from HPCM | Lost |

**Time Needed for Diagnosis:** 2 seconds
**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BW:DTC U1401 INVALID DATA RECEIVED FROM ECM/PCM PU-CAN

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from ECM is not normal.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 10 V |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| CAN data from ECM | Did not change |
| **Diagnosis 2** | |
| CAN data from ECM | Check sum error |

**Time Needed for Diagnosis:**

- **Diagnosis 1:** 2 s
- **Diagnosis 2:** 3 times

**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# BX:DTC U1594 INVALID DATA RECEIVED FROM HYBRID POWERTRAIN CONTROL MODULE PU-CAN

## 1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from hybrid powertrain CM is not normal.

## 2. ENABLE CONDITIONS

| Secondary Parameters | Enable Conditions |
|---|---|
| **Diagnosis 1** | |
| 12 V battery system voltage | ≥ 10 V |
| **Diagnosis 2** | |
| 12 V battery system voltage | ≥ 10 V |

## 3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

**Judgment Value**

| Malfunction Criteria | Threshold Value |
|---|---|
| **Diagnosis 1** | |
| CAN data from HPCM | Did not change |
| **Diagnosis 2** | |
| CAN data from HPCM | Check sum error |

**Time Needed for Diagnosis:**

- **Diagnosis 1:** 2 s
- **Diagnosis 2:** 3 times

**Malfunction Indicator Light Illumination:** Illuminates as soon as a malfunction occurs.

# MANUAL TRANSMISSION AND DIFFERENTIAL

# 5MT