| Component /   | Fault      | Monitor Strategy   | Malfunction Criteria                      | Threshold Value | Secondary Parameters   | Enable Conditions                         | Time        | MIL IIIum |
|---|------------|--|---|-----------------|--|---|-------------|-----------|
| System  | Code       | Description  |   |                 |  |   | Required    |           |
| Transmission Flui   | d Temperat | ure  |   | r               | 1  |   |             |           |
| Transmission Fluid<br>Temperature<br>Sensor Circuit<br>Range /<br>Performance | P0711      | I his test detects<br>performance of the<br>transmission fluid<br>temperature sensor by<br>comparing changes in<br>temperature from start up | All 5 Cases                               |                 | Not Test Failed This Key On  | P0711<br>P0716<br>P0717<br>P0721<br>P0722 |             | в         |
|   |            | and between samples to calibration values.   |   |                 | No Fault Pending DTCs for this drive cycle   | P0742<br>P0716<br>P0717<br>P0721<br>P0722 |             |           |
|   |            |  |   |                 | No Pass DTCs for this drive cycle  | P0711                                     |             |           |
|   |            |  |   |                 | No Fault Active DTC  | P0711                                     |             |           |
|   |            |  |   |                 | Components powered   |   |             |           |
|   |            |  |   |                 | AND<br>Battery Voltage between   | 19 V and 18 V                             |             |           |
|   |            |  |   |                 | Engine Speed between   | 200 RPM and 7500 RPM                      |             |           |
|   |            |  |   |                 | for  | 5 seconds                                 |             |           |
|   |            |  |   |                 | Start-up transmission fluid temperature is<br>available<br>Transmission fluid temperature<br>between<br>ECT is not defaulted | -<br>-39 deg. C and 149 deg. C            |             |           |
|   |            |  | Case 1 (Stuck sensor after cold start-up) |                 |  |   | 300 seconds |           |

| Component /<br>System | Fault<br>Code | Monitor Strategy<br>Description | Malfunction Criteria                      | Threshold Value             | Secondary Parameters                                      | Enable Conditions          | Time<br>Required | MIL IIIum |
|-----------------------|---------------|---------------------------------|---|-----------------------------|---|----------------------------|------------------|-----------|
|                       |               |                                 | Start-up temperature change               | <= 2 deg. C                 | Start-up transmission fluid temperature between           | -40 deg. C and 21 deg. C   |                  |           |
|                       |               |                                 | for a time                                | >= 100 seconds              |   |                            |                  |           |
|                       |               |                                 | AND                                       |                             | TCC Slip  | >= 120 RPM                 |                  |           |
|                       |               |                                 | Vehicle speed                             |                             | for a time  | >= 300 seconds             |                  |           |
|                       |               |                                 | for a time                                | >= 300 seconds.             | engine coolant temperature                                | >= 70 deg. C               |                  |           |
|                       |               |                                 |   |                             |   |                            |                  |           |
|                       |               |                                 |   |                             | AND<br>engine coolant temperature change from<br>start-up | >= 15 deg. C               |                  |           |
|                       |               |                                 | Case 2 (Stuck sensor after warm start-up) |                             |   |                            | 300 seconds      | 1         |
|                       |               |                                 | Start-up temperature change               | <= 3 deg. C                 | Start-up transmission fluid temperature between           | 115 deg. C and 150 deg. C. |                  |           |
|                       |               |                                 | for a time                                | >= 100 seconds              |   |                            |                  |           |
|                       |               |                                 | AND                                       | ,                           | TCC Slip  | >= 120 RPM                 |                  |           |
|                       |               |                                 |   |                             | for a time  | >= 300 seconds             |                  |           |
|                       |               |                                 |   |                             | engine coolant temperature                                | >= 70 deg. C               |                  |           |
|                       |               |                                 | Vehicle speed<br>for a time               | >= 8 KPH<br>>= 300 seconds. | AND<br>engine coolant temperature change from<br>start-up | ' >= 55 deg. C             |                  |           |
|                       |               |                                 | Case 3 (Noisy sensor)                     |                             |   |                            | 7 seconds        |           |

| Component /<br>System | Fault<br>Code | Monitor Strategy<br>Description | Malfunction Criteria                   | Threshold Value   | Secondary Parameters       | Enable Conditions | Time<br>Required | MIL IIIum |
|-----------------------|---------------|---------------------------------|--|---|----------------------------|-------------------|------------------|-----------|
|                       |               | · · ·                           | Change from previous temperature       | >= 20 deg. C  |                            |                   |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 | for                                    | 14 events   |                            |                   |                  |           |
|                       |               |                                 | in a time                              | < 7 seconds.  |                            |                   |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 | Case 4 (Doesn't warm up to at least 20 |   | net engine torque          | >= 150 Nm         | 2200<br>seconds  |           |
|                       |               |                                 | uug. 07                                |   |                            |                   | 00001140         |           |
|                       |               |                                 | Time Enabled Criteria met AND          |   | and                        | <= 1492 Nm        |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 | AND                                    |   | vehicle speed              | >= 22 KPH         |                  |           |
|                       |               |                                 | Transmission Fluid Temperature         | < 20 deg. C   | and                        | ~- 512 KPH        |                  |           |
|                       |               |                                 |  | < 20 deg. 0.  | anu                        | <= 312 RFT        |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 |  |   | %throttle                  | >= 10.5%          |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 | Time Enabled Criteria is determined    | 250 seconds when start-up temperature is $> -20$ deg. C | and                        | <= 100%           |                  |           |
|                       |               |                                 | by a lookup table ranging nom          | temperature is >= 20 deg. C                             |                            |                   |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 |  |   | engine speed               | >= 500 RPM        |                  |           |
|                       |               |                                 | to                                     | 2200 seconds when start-up                              | and                        | <= 6500 RPM       |                  |           |
|                       |               |                                 |  | temperature is <= -40 deg. C.                           |                            |                   |                  |           |
|                       |               |                                 |  |   | engine coolant temperature | >= -39 deg. C     |                  |           |
|                       |               |                                 |  |   |                            |                   |                  |           |
|                       |               |                                 |  |   | and                        | <= 149 deg. C     |                  |           |
|                       |               |                                 | 1                                      | l   |                            |                   |                  | I         |

| Component /                       | Fault | Monitor Strategy  | Malfunction Criteria                 | Threshold Value | Secondary Parameters                    | Enable Conditions    | Time        | MIL IIIum |
|-----------------------------------|-------|-------------------|--------------------------------------|-----------------|---|----------------------|-------------|-----------|
| Oystem                            | ooue  | Description       | Case 5 (Reasonableness at start-up): |                 |   |                      | 2 seconds   |           |
|                                   |       |                   |                                      |                 |   |                      |             |           |
|                                   |       |                   |                                      |                 | Intake Air Temperature is not defaulted |                      |             |           |
|                                   |       |                   | Engine Speed                         | > 500 RPM       |   |                      |             |           |
|                                   |       |                   | AND                                  |                 |   |                      |             |           |
|                                   |       |                   | Engine Coolant Temperature           | > -39 deg. C    |   |                      |             |           |
|                                   |       |                   |                                      |                 |   |                      |             |           |
|                                   |       |                   | AND                                  | < 50 deg. C     |   |                      |             |           |
|                                   |       |                   | for                                  | >- 2 seconds    |   |                      |             |           |
|                                   |       |                   |                                      | 2 3000103       |   |                      |             |           |
|                                   |       |                   | AND                                  |                 |   |                      |             |           |
|                                   |       |                   | ((450)(47 507)                       |                 |   |                      |             |           |
|                                   |       |                   | ((ABS(IAT-ECT)                       | <= 6 deg. C     |   |                      |             |           |
|                                   |       |                   | AND                                  |                 |   |                      |             |           |
|                                   |       |                   | (TFT-ECT))                           | > 40 deg. C     |   |                      |             |           |
|                                   |       |                   | OR                                   |                 |   |                      |             |           |
|                                   |       |                   | (ABS(IAT-ECT)                        | > 6 deg. C      |   |                      |             |           |
|                                   |       |                   |                                      |                 |   |                      |             |           |
|                                   |       |                   |                                      | > 60 deg. C     |   |                      |             |           |
|                                   |       |                   | (                                    | · 00 dog. 0.    |   |                      |             |           |
| Transmission Fluid<br>Temperature | P0712 | Out of range low. |                                      |                 | Not Test Failed This Key On             | P0711                | 2.5 seconds | В         |
| Sensor Circuit Low                |       |                   | transmission fluid tomporature       | 5-150 dog. C    |   | D0712                |             |           |
| Input                             |       |                   |                                      | 2-100 deg. C    |   | 10/12                |             |           |
|                                   |       |                   |                                      |                 |   |                      |             |           |
|                                   |       |                   |                                      |                 |   | 50740                |             |           |
|                                   |       |                   | for a time                           | > 2.5 seconas.  |   | P0713                |             |           |
|                                   |       |                   |                                      |                 |   |                      |             |           |
|                                   |       |                   |                                      |                 |   |                      |             |           |
|                                   |       |                   |                                      |                 |   |                      |             |           |
|                                   |       |                   |                                      |                 |   |                      |             |           |
|                                   |       |                   |                                      |                 | AND<br>Battery Voltage between          | 9 V and 18 V         |             |           |
|                                   |       |                   |                                      |                 |   |                      |             |           |
|                                   |       |                   |                                      |                 |   |                      |             |           |
|                                   |       |                   |                                      |                 | Engine Speed between                    | 200 RPM and 7500 RPM |             |           |
|                                   |       |                   |                                      |                 |   |                      |             |           |
|                                   |       |                   |                                      |                 |   |                      |             |           |
| 1                                 | 1     | 1                 | 1                                    | 1               | 1                                       | 1                    | I           | 1         |

| Component /         | Fault | Monitor Strategy           | Malfunction Criteria           | Threshold Value | Secondary Parameters        | Enable Conditions    | Time        | MIL IIIum |
|---------------------|-------|----------------------------|--------------------------------|-----------------|-----------------------------|----------------------|-------------|-----------|
| Oystem              | Oode  | Description                |                                |                 | for                         | 5 seconds            | Required    |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
| Transmission Fluid  | P0713 | Out of range high.         |                                |                 | Not Test Failed This Key On | P0711                | 2.5 seconds | В         |
| Temperature         |       |                            |                                |                 |                             |                      |             |           |
| Sensor Circuit High |       |                            | transmission fluid temperature | <= -45 dea. C   |                             | P0712                |             |           |
| pat                 |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            | for a time                     | > 2.5 seconds   |                             | P0713                |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 | Components powered          |                      |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 | AND                         |                      |             |           |
|                     |       |                            |                                |                 | Battery Voltage between     | 9 V and 18 V         |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 | Engine Speed between        | 200 RPM and 7500 RPM |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 | for                         | 5 seconds            |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 | IF Engine run time          | <= 600 seconds       |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 | THEN                        | must have 20 days C  |             |           |
|                     |       |                            |                                |                 | Engine Coolant Temperature  | must be > 20 deg. C  |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 | AND                         |                      |             |           |
|                     |       |                            |                                |                 | not defaulted for a time    | >= 20 seconds.       |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
| Speed Sensors       |       |                            | L                              | l               | l                           | ·                    | I           |           |
|                     |       |                            |                                |                 |                             |                      |             |           |
| Input / Turbine     | P0716 | This test detects large    | All cases                      |                 | Not Test Failed This Kev On | P0716                |             | A         |
| Speed Sensor        |       | changes in Input Speed and |                                |                 | ,,,,,,                      |                      |             |           |
| Circuit Range /     |       | noisy Input Speed by       |                                |                 |                             | P0717<br>P0721       |             |           |
| renormance          |       | values.                    |                                |                 |                             | P0722                |             |           |

| Component / | Fault | Monitor Strategy | Malfunction Criteria                         | Threshold Value | Secondary Parameters                 | Enable Conditions | Time         | MIL IIIum |
|-------------|-------|------------------|--|-----------------|--------------------------------------|-------------------|--------------|-----------|
| System      | Code  | Description      |  |                 |                                      |                   | Required     |           |
|             |       |                  |  |                 | No Fault Pending DTCs for this drive | P0721 P0722       |              |           |
|             |       |                  |  |                 | cycle.                               |                   |              |           |
|             |       |                  |  |                 | Shifting complete                    |                   |              |           |
|             |       |                  |  |                 |                                      |                   |              |           |
|             |       |                  | Case 1: (Uprealictically large changes in    |                 | Input Speed                          | > 200 PPM         | 0 15 seconds |           |
|             |       |                  | input speed)                                 |                 |                                      |                   | 0.10 3000103 |           |
|             |       |                  |  |                 | (m. 1                                | 0.5               |              |           |
|             |       |                  | Change of Input Speed between samples        |                 | 101                                  | >= 0.5 seconds    |              |           |
|             |       |                  |  | >= 800 RPM      |                                      |                   |              |           |
|             |       |                  | for  | >= 0 15 seconds |                                      |                   |              |           |
|             |       |                  |  |                 |                                      |                   |              |           |
|             |       |                  |  |                 |                                      |                   |              |           |
|             |       |                  | Case 2: (Noisy Input Speed)                  |                 | Input Speed                          | > 200 RPM         | 2 seconds    |           |
|             |       |                  |  |                 |                                      |                   |              |           |
|             |       |                  |  |                 |                                      |                   |              |           |
|             |       |                  | For sample size                              | 80              | for                                  | >= 0.5 seconds    |              |           |
|             |       |                  |  |                 |                                      |                   |              |           |
|             |       |                  | IF the change in Input Speed                 | <= -800 RPM     |                                      |                   |              |           |
|             |       |                  |  |                 |                                      |                   |              |           |
|             |       |                  | TUEN the Law Counter is incremented          |                 |                                      |                   |              |           |
|             |       |                  | THEN THE LOW Counter is incremented          |                 |                                      |                   |              |           |
|             |       |                  | IF the change in Input Speed                 | >= 800 PDM      |                                      |                   |              |           |
|             |       |                  | in the change in input Speed                 | >= 000 KF W     |                                      |                   |              |           |
|             |       |                  |  |                 |                                      |                   |              |           |
|             |       |                  | THEN the High Counter is incremented         |                 |                                      |                   |              |           |
|             |       |                  | -  |                 |                                      |                   |              |           |
|             |       |                  | This test fails if both the Low Counter and  |                 |                                      |                   |              |           |
|             |       |                  | the High Counter                             | >= 5            |                                      |                   |              |           |
|             |       |                  | Low Counter                                  | >= 5            |                                      |                   |              |           |
|             |       |                  |  |                 |                                      |                   |              |           |
|             |       |                  | OR<br>High Counter                           | >= 5            |                                      |                   |              |           |
|             |       |                  | 3  |                 |                                      |                   |              |           |
|             |       |                  | For Case 3: (Wires to speed sensors swapped) |                 | Input speed                          | > 100 RPM         | 4 seconds    |           |
|             |       |                  |  |                 |                                      |                   |              |           |
|             |       |                  | Increment counter when range attained        |                 | AND<br>Engine speed                  | > 100 RPM         |              |           |
|             |       |                  | and range commanded are neutral for a        |                 | giilo opood                          |                   |              |           |
|             |       |                  | time   |                 | for a time                           | >= 0.2 seconds    |              |           |
|             |       |                  |  |                 |                                      |                   |              |           |

| Component /       | Fault | Monitor Strategy   | Malfunction Criteria   | Threshold Value          | Secondary Parameters         | Enable Conditions   | Time     | MIL IIIum |
|-------------------|-------|--|--|--------------------------|------------------------------|---|----------|-----------|
| System            | Code  | Description  |  |                          |                              |   | Required |           |
|                   |       |  | AND  | <= 3.5 seconds           | Hydraulic system pressurized |   |          |           |
|                   |       |  | when ratio of engine speed and input<br>speed<br>Arm test when counter | >= 3<br>>=20             |                              |   |          |           |
|                   |       |  | OR<br>when time  | > 3.5 seconds            |                              |   |          |           |
|                   |       |  | Malfunction is reported when, for a time                               | > 0.5 seconds            |                              |   |          |           |
|                   |       |  | the range commanded is NOT neutral                                     |                          |                              |   |          |           |
|                   |       |  | AND the on-coming clutch control is complete                           |                          |                              |   |          |           |
|                   |       |  | AND<br>input speed   | > 100 RPM                |                              |   |          |           |
|                   |       |  | AND<br>engine speed  | < 100 RPM                |                              |   |          |           |
| Input/Turbine     | P0717 | This test detects  | Failure pending if transmission input                                  |                          | Not Test Failed This Key On  | P0717   | 1 second | A         |
| Circuit No Signal |       | input/turbine speed or                                   | speed  | < 61 RPM                 |                              | P0729   |          |           |
|                   |       | unrealistically large changes<br>in input/turbine speed. | This test fails if input speed   | < 61 RPM                 |                              | P0731<br>P0732  |          |           |
|                   |       |  | AND<br>output speed<br>for a time                                      | > 500 RPM<br>> 1 second. | No Fault Pending DTCs        | P0733<br>P0734<br>P0735<br>P0736<br>P0721<br>P0722<br>P0721 |          |           |
|                   |       |  |  |                          |                              |   |          |           |

| Component /<br>System | Fault<br>Code | Monitor Strategy<br>Description | Malfunction Criteria                     | Threshold Value | Secondary Parameters                    | Enable Conditions | Time<br>Required | MIL IIIum |
|-----------------------|---------------|---------------------------------|--|-----------------|---|-------------------|------------------|-----------|
|                       |               |                                 |  |                 |   | P0722             |                  |           |
|                       |               |                                 |  |                 | Reverse-to-Neutral shift not in process |                   |                  |           |
|                       |               |                                 |  |                 | Shifting complete                       |                   |                  |           |
|                       |               |                                 |  |                 |   |                   |                  |           |
|                       |               |                                 |  |                 | Range attained is not neutral           |                   |                  |           |
|                       |               |                                 |  |                 |   |                   |                  |           |
|                       |               |                                 |  |                 | Transmission fluid temperature          | > -25 deg. C      |                  |           |
|                       |               |                                 |  |                 |   |                   |                  |           |
|                       |               |                                 |  |                 |   |                   |                  |           |
|                       |               |                                 |  |                 | Engine speed                            | >= 400 RPM        |                  |           |
|                       |               |                                 |  |                 | Transmission output speed               | >= 150 RPM        |                  |           |
|                       |               |                                 |  |                 |   |                   |                  |           |
| Output Speed          | P0721         | This test detects a noisy       | Case 1: (Unrealistically large change in |                 | All Cases                               |                   | Case 1:          | A         |
| Sensor Circuit        |               | output speed sensor or          | output speed)                            |                 | Not Test Failed This Key On             | P0716             | 0.65 seconds     |           |
| Performance           |               | changes in output speed.        |  |                 |   |                   | 0.00 00001140    |           |
|                       |               |                                 | Change in output speed                   | >= 500 RPM      |   | P0717             |                  |           |
|                       |               |                                 |  |                 |   |                   |                  |           |
|                       |               |                                 | for a time                               | >= 0.15 seconds |   | P0721             |                  |           |
|                       |               |                                 |  |                 |   |                   |                  |           |
|                       |               |                                 | Case 2: (Noisy output speed)             |                 |   | P0722             | Case 2:          |           |
|                       |               |                                 |  |                 |   |                   | 0000 21          |           |
|                       |               |                                 |  | ~~              |   | D0740 D0747       | <b>a</b> 1       |           |
|                       |               |                                 | For sample size                          | 80              | cycle                                   | P0/16 P0/17       | 2 seconds        |           |
|                       |               |                                 | IF the change in output speed            | <= -500 RPM     |   |                   |                  |           |
|                       |               |                                 |  |                 |   |                   |                  |           |
|                       |               |                                 |  |                 |   |                   |                  |           |
|                       |               |                                 | THEN the Low Counter is incremented.     |                 | Output Spood                            | > 200 ₽₽M         |                  |           |
|                       |               |                                 |  | 500 DDM         | Output Speed                            |                   |                  |           |
|                       |               |                                 | IF the change in output speed            | >= 200 KMM      | for a time                              | >= U.S SECONOS    |                  |           |
|                       |               |                                 |  |                 |   |                   |                  |           |
|                       |               |                                 | THEN the High Counter is incremented.    |                 |   |                   |                  |           |

|   |           | 9   |   |                        |   |  |       |   |
|---|-----------|---|---|------------------------|---|--|-------|---|
|   |           | 5   | Shift complete<br>AND<br>range attained NOT neutral   | >= 5                   | Test fails if both the Low Counter and the<br>High Counter  |  |       |   |
|   |           |   |   | >= 5                   | OR<br>the Low Counter   |  |       |   |
|   |           |   |   | >= 5                   | OR<br>the High Counter  |  |       |   |
| Output Speed<br>Sensor Circuit No<br>Signal | A         | P0721                                     | All Cases<br>Not Test Failed This Key On  |                        | All Cases   | This test detects<br>unrealistically low value of<br>output speed or<br>unrealistically large change<br>in output speed. | P0722 | Output Speed<br>Sensor Circuit No<br>Signal |
|   | 1 second  | 1<br>>= 600 RPM                           | Test enabled when output speed  |                        | Case 1: (Unrealistically large change in output speed)  |  |       |   |
|   |           | e >= 1 seconds                            | for a time  |                        | Failure pending if  |  |       |   |
|   |           |   |   | >= 600 RPM             | change in output speed  |  |       |   |
|   |           | <= 600 RPM                                | Test disabled when output speed   |                        | Failure sets if range attained is Neutral   |  |       |   |
|   |           | > 1 seconds                               | for a time  |                        |   |  |       |   |
|   | 4 seconds |   |   |                        | Case 2: (Unrealistically low value of output speed)   |  |       |   |
|   |           | P0731                                     | Not Test Failed This Key On   | < 61 RPM               | Failure pending if output speed   |  |       |   |
|   |           | P0732<br>P0733<br>P0734<br>P0735<br>P0736 |   | < 61 RPM               | Failure sets if not monitoring for low<br>speed neutral and output speed<br>AND<br>range is 3rd, 4th, 5th, or 6th   |  |       |   |
| Output Speed<br>Sensor Circuit No<br>Signal |           | P0721                                     | All Cases<br>Not Test Failed This Key On<br>Test enabled when output speed<br>for a time<br>Test disabled when output speed<br>for a time | >= 600 RPM<br>< 61 RPM | All Cases<br>Case 1: (Unrealistically large change in<br>output speed)<br>Failure pending if<br>change in output speed<br>Failure sets if range attained is Neutral<br>Case 2: (Unrealistically low value of<br>output speed)<br>Failure pending if output speed<br>Failure sets if not monitoring for low<br>speed neutral and output speed<br>AND<br>range is 3rd, 4th, 5th, or 6th | This test detects<br>unrealistically low value of<br>output speed or<br>unrealistically large change<br>in output speed. | P0722 | Output Speed<br>Sensor Circuit No<br>Signal |

| Component /               | Fault | Monitor Strategy             | Malfunction Criteria                    | Threshold Value | Secondary Parameters                     | Enable Conditions | Time         | MIL IIIum |
|---------------------------|-------|------------------------------|---|-----------------|--|-------------------|--------------|-----------|
| System                    | Code  | Description                  | fan a tinn                              | 4               |  | 00740             | Required     |           |
|                           |       |                              | Ior a ume                               | > i second      |  | P0716             |              |           |
|                           |       |                              |   |                 |  | P0717             |              |           |
|                           |       |                              | Failure sets if not monitoring for low  |                 |  |                   |              |           |
|                           |       |                              | speed neutral and output speed          |                 | No Fault Pending DTCs for this drive     | P0716             |              |           |
|                           |       |                              |   |                 | cycle                                    |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              |   |                 |  | P0717             |              |           |
|                           |       |                              | AND                                     | < 61 RPM        |  |                   |              |           |
|                           |       |                              | <i>и</i>                                | 400.14          |  |                   |              |           |
|                           |       |                              | ((net engine torque                     | < -100 Nm       | Engine is running                        |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              | OR                                      |                 | Shift not in process                     |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              |   | 400 N=-         | Dense etteined is not Neutral            |                   |              |           |
|                           |       |                              | net engine torque)                      | > 100 NM        | Range attained is not Neutral            |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              | OR                                      |                 | Reverse to Neutral shift not in process  |                   |              |           |
|                           |       |                              | (turbine speed                          | > 1500 RPM      |  |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              | AND                                     |                 | Transmission fluid temperature           | > -25 deg. C      |              |           |
|                           |       |                              |   |                 |  | 20 00g. 0         |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              |   |                 | Transmission insultanced                 | 4050 DDM          |              |           |
|                           |       |                              | range is 2nd))                          |                 | I ransmission input speed                | >= 1050 RPM       |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              | for a time                              | >= 4 seconds.   | Not waiting for Manual Selector Valve to |                   |              |           |
|                           |       |                              |   |                 | attain forward range                     |                   |              |           |
|                           |       |                              |   |                 |  |                   |              |           |
|                           |       |                              |   |                 | PRNDL State is NOT D4_NOT                |                   |              |           |
|                           |       |                              |   |                 | Transitional D4                          |                   |              |           |
| <b>Range Verification</b> |       |                              |   |                 |  |                   |              |           |
| Gear 1 Incorrect          | P0731 | This test verifies           | Pending failure occurs when accumulated |                 |  |                   | 2.25 seconds | А         |
| Ratio                     |       | transmission operating ratio | event timer                             |                 |  |                   |              |           |
|                           |       | while 1st range is           |   |                 | Not Toot Eailed This Key On              | P0877             |              |           |
|                           |       | commanded by comparing       |   | >= 2 second     | NOLTEST Falled THIS KEY ON               |                   |              |           |
|                           |       | compared ratio to the        | Timer accumulates when transmission is  |                 |  | P0878             |              |           |
|                           |       | sonnandou ratio.             | in forward or reverse range             |                 |  | P0721             |              |           |
|                           |       |                              | -<br>-                                  |                 |  | P0722             |              |           |
|                           |       |                              | AND                                     | 100 DDM         |  | P0716             |              |           |
|                           |       |                              | output speed                            | >= 100 KMVI     |  | PU/1/             |              |           |
|                           |       |                              | ΑΝΠ                                     |                 |  |                   |              |           |
|                           |       |                              | gear slip                               | > 100 RPM       | No Fault Pending DTC for this drive      | P0717             |              |           |

| Component /<br>System | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction Criteria  | Threshold Value             | Secondary Parameters                         | Enable Conditions                         | Time<br>Required | MIL IIIum |
|-----------------------|---------------|---|---|-----------------------------|--|---|------------------|-----------|
|                       |               |   | In response to pending failure, a<br>diagnostic response range is<br>commanded. |                             | cycle.<br>No range switch response active    |   |                  |           |
|                       |               |   | During this command, this test fails if<br>Abs(Converter Slip)                  |                             | Hydraulic System Pressurized                 |   |                  |           |
|                       |               |   | for   | >= 230 RPM<br>> 10 samples. | Shift complete                               |   |                  |           |
|                       |               |   |   |                             | Output speed                                 | >= 200 RPM                                |                  |           |
|                       |               |   |   |                             | No hydraulic default condition present       |   |                  |           |
|                       |               |   |   |                             | Normal powertrain shutdown not in process    |   |                  |           |
|                       |               |   |   |                             | Normal powertrain initialization is complete |   |                  |           |
| Gear 2 Incorrect      | P0732         | This test verifies  | Pending failure occurs when accumulated   |                             |  |   | 2.25 seconds     | A         |
|                       |               | while 2nd range is<br>commanded by comparing<br>computed ratio to the<br>commanded ratio. | Timer accumulates when transmission is<br>in forward or reverse range           | >= 2 second                 | Not Test Failed This Key On                  | P0877<br>P0878<br>P0721<br>P0722<br>P0716 |                  |           |
|                       |               |   | output speed  | >= 100 RPM                  |  | P0717                                     |                  |           |
|                       |               |   | AND<br>gear slip  | > 100 RPM                   | No Fault Pending DTC for this drive          | P0717                                     |                  |           |

| Component /               | Fault | Monitor Strategy   | Malfunction Criteria  | Threshold Value | Secondary Parameters                         | Enable Conditions       | Time         | MIL IIIum |
|---------------------------|-------|--|---|-----------------|--|-------------------------|--------------|-----------|
| System                    | Code  | Description  |   |                 | avala  |                         | Required     |           |
|                           |       |  | In response to pending failure, a<br>diagnostic response range is<br>commanded. |                 | cycle.<br>No range switch response active    |                         |              |           |
|                           |       |  | During this command, this test fails if<br>Abs(Converter Slip)                  |                 | Hydraulic System Pressurized                 |                         |              |           |
|                           |       |  |   | >= 230 RPM      |  |                         |              |           |
|                           |       |  | for   | > 10 samples.   | Shift complete                               |                         |              |           |
|                           |       |  |   |                 | Output speed                                 | >= 200 RPM              |              |           |
|                           |       |  |   |                 | No hydraulic default condition present       |                         |              |           |
|                           |       |  |   |                 | Normal powertrain shutdown not in process    |                         |              |           |
|                           |       |  |   |                 | Normal powertrain initialization is complete |                         |              |           |
| Gear 3 Incorrect<br>Ratio | P0733 | This test verifies<br>transmission operating ratio<br>while 3rd range is | Pending failure occurs when accumulated event timer                             |                 |  |                         | 2.25 seconds | A         |
|                           |       | commanded by comparing   |   | >= 2 second     | Not Test Failed This Key On                  | P0877                   |              |           |
|                           |       | commanded ratio.   | Timer accumulates when transmission is<br>in forward or reverse range           |                 |  | P0878<br>P0721<br>P0722 |              |           |
|                           |       |  | AND<br>output speed   | >= 100 RPM      |  | P0716<br>P0717          |              |           |
|                           |       |  | AND<br>gear slip  | > 100 RPM       | No Fault Pending DTC for this drive cycle.   | P0717                   |              |           |
|                           |       |  | In response to pending failure, a<br>diagnostic response range is               |                 | No range switch response active              |                         |              |           |
|                           |       |  | commanded.<br>During this command, this test fails if<br>Abs(Converter Slip)    |                 | Hydraulic System Pressurized                 |                         |              |           |
|                           |       |  |   |                 |  |                         |              |           |
|                           |       |  |   | >= 230 RPM      |  |                         |              |           |
|                           |       |  | for   | > 10 samples.   | Shift complete                               |                         |              |           |
|                           |       |  |   |                 | Output speed                                 | >= 200 RPM              |              |           |
|                           |       |  |   |                 | No hydraulic default condition present       |                         |              |           |
|                           |       |  |   |                 | Normal powertrain shutdown not in            |                         | 1            |           |

| Component /<br>System     | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction Criteria  | Threshold Value | Secondary Parameters  | Enable Conditions                         | Time<br>Required | MIL IIIum |
|---------------------------|---------------|---|---|-----------------|---|---|------------------|-----------|
|                           |               |   |   |                 | process<br>Normal powertrain initialization is<br>complete                                      |   |                  |           |
| Gear 4 Incorrect<br>Ratio | P0734         | This test verifies<br>transmission operating ratio<br>while 4th range is<br>commanded by comparing<br>computed ratio to the | Pending failure occurs when accumulated<br>event timer                          | >= 2 second     | Not Test Failed This Key On   | P0877                                     | 2.25 seconds     | A         |
|                           |               | commanded ratio.  | Timer accumulates when transmission is<br>in forward or reverse range<br>AND    | 5- 100 RBM      |   | P0878<br>P0721<br>P0722<br>P0716<br>P0717 |                  |           |
|                           |               |   | AND   | > 100 RPM       | No Fault Pending DTC for this drive   | P0717                                     |                  |           |
|                           |               |   | In response to pending failure, a<br>diagnostic response range is               |                 | No range switch response active   |   |                  |           |
|                           |               |   | commanded.<br>During this command, this test fails if<br>Abs(Converter Slip)    |                 | Hydraulic System Pressurized  |   |                  |           |
|                           |               |   |   | >= 230 RPM      |   |   |                  |           |
|                           |               |   | for   | > 10 samples.   | Shift complete  |   |                  |           |
|                           |               |   |   |                 | Output speed  | >= 200 RPM                                |                  |           |
|                           |               |   |   |                 | No hydraulic default condition present  |   |                  |           |
|                           |               |   |   |                 | Normal powertrain shutdown not in<br>process<br>Normal powertrain initialization is<br>complete |   |                  |           |
| Gear 5 Incorrect<br>Ratio | P0735         | This test verifies<br>transmission operating ratio<br>while 5th range is  | Pending failure occurs when accumulated<br>event timer                          |                 | Not Test Failed This Kay On   | P0877                                     | 2.25 seconds     | A         |
|                           |               | comparing<br>computed ratio to the<br>commanded ratio.  | Timer accumulates when transmission is<br>in forward or reverse range           | >= 2 second     | Not reach dired this key on   | P0878<br>P0721<br>P0722                   |                  |           |
|                           |               |   | AND<br>output speed   | >= 100 RPM      |   | P0716<br>P0717                            |                  |           |
|                           |               |   | AND<br>gear slip  | > 100 RPM       | No Fault Pending DTC for this drive cycle.  | P0717                                     |                  |           |
|                           |               |   | In response to pending failure, a<br>diagnostic response range is<br>commanded. |                 | No range switch response active   |   |                  |           |

| Component /       | Fault | Monitor Strategy            | Malfunction Criteria                    | Threshold Value | Secondary Parameters                   | Enable Conditions | Time      | MIL IIIum |
|-------------------|-------|-----------------------------|---|-----------------|--|-------------------|-----------|-----------|
| System            | Code  | Description                 | During this command, this test fails if |                 | Hydraulic System Pressurized           |                   | Required  |           |
|                   |       |                             | Abs(Converter Slip)                     |                 |  |                   |           |           |
|                   |       |                             |   |                 |  |                   |           |           |
|                   |       |                             |   |                 |  |                   |           |           |
|                   |       |                             |   | >= 230 RPM      |  |                   |           |           |
|                   |       |                             | for                                     | > 10 samples.   | Shift complete                         |                   |           |           |
|                   |       |                             |   |                 |  |                   |           |           |
|                   |       |                             |   |                 |  |                   |           |           |
|                   |       |                             |   |                 | Output speed                           | >= 200 RPM        |           |           |
|                   |       |                             |   |                 |  |                   |           |           |
|                   |       |                             |   |                 | No hydraulic default condition present |                   |           |           |
|                   |       |                             |   |                 | Normal powertrain shutdown not in      |                   |           |           |
|                   |       |                             |   |                 | process                                |                   |           |           |
|                   |       |                             |   |                 | complete                               |                   |           |           |
| Reverse Incorrect | P0736 | This test verifies          |   |                 |  |                   | 2 seconds | A         |
| Italio            |       | reverse range is commanded  |   |                 |  |                   |           |           |
|                   |       | by comparing computed ratio | Accumulated event timer                 | >= 2 seconds    | Not Test Failed This Key On            | P0877             |           |           |
|                   |       | to the commanded ratio.     |   |                 |  |                   |           |           |
|                   |       |                             |   |                 |  | D0878             |           |           |
|                   |       |                             | Timer accumulates when transmission is  |                 |  | P0721             |           |           |
|                   |       |                             | in forward or reverse range             |                 |  | P0722             |           |           |
|                   |       |                             | AND                                     |                 |  | P0718             |           |           |
|                   |       |                             | output speed                            | >= 100 RPM      |  |                   |           |           |
|                   |       |                             | AND                                     |                 | No Fault Pending DTC for this drive    | P0717             |           |           |
|                   |       |                             | gear slip                               | > 100 RPM       | cycle.                                 |                   |           |           |
|                   |       |                             |   |                 |  |                   |           |           |
|                   |       |                             |   |                 | No range switch response active        |                   |           |           |
|                   |       |                             |   |                 |  |                   |           |           |
|                   |       |                             |   |                 | Hydraulic System Pressurized           |                   |           |           |
|                   |       |                             |   |                 |  |                   |           |           |
|                   |       |                             |   |                 |  |                   |           |           |
|                   |       |                             |   |                 |  |                   |           |           |
|                   |       |                             |   |                 | Shift complete                         |                   |           |           |
|                   |       |                             |   |                 |  |                   |           |           |
|                   |       |                             |   |                 | Output speed                           | >= 200 RPM        |           |           |
|                   |       |                             |   |                 |  |                   |           |           |
|                   |       |                             |   |                 | No hydraulic default condition present |                   |           |           |
|                   |       |                             |   |                 | Normal powertrain shutdown not in      |                   |           |           |
| 1                 |       |                             |   |                 | process                                |                   |           |           |

| Component /  | Fault  | Monitor Strategy   | Malfunction Criteria  | Threshold Value             | Secondary Parameters  | Enable Conditions                         | Time         | MIL IIIum |
|--|--------|--|---|-----------------------------|---|---|--------------|-----------|
| System   | Coue   | Description  |   |                             | Normal powertrain initialization is   |   | Kequileu     |           |
|  |        |  |   |                             | complete  |   |              |           |
| Gear 6 Incorrect<br>Ratio                            | P0729  | This test verifies<br>transmission operating ratio<br>while 6th range is | Pending failure occurs when accumulated event timer                             |                             |   | D0077                                     | 2.25 seconds | A         |
|  |        | commanded by comparing<br>computed ratio to the<br>commanded ratio.      | Timer accumulates when transmission is<br>in forward or reverse range<br>AND    | >= 2 second                 | Not Lest Failed This Key On   | P0877<br>P0878<br>P0721<br>P0722<br>P0716 |              |           |
|  |        |  | output speed  | >= 100 RPM                  |   | P0717                                     |              |           |
|  |        |  | gear slip   | > 100 RPM                   | No Fault Pending DTC for this drive   | P0717                                     |              |           |
|  |        |  | In response to pending failure, a<br>diagnostic response range is<br>commanded. |                             | cycie.<br>No range switch response active   |   |              |           |
|  |        |  | During this command, this test fails if<br>Abs(Converter Slip)                  |                             | Hydraulic System Pressurized  |   |              |           |
|  |        |  | for   | >= 230 RPM<br>> 10 samples. | Shift complete  |   |              |           |
|  |        |  |   |                             | Output speed  | >= 200 RPM                                |              |           |
|  |        |  |   |                             | No hydraulic default condition present  |   |              |           |
|  |        |  |   |                             | Normal powertrain shutdown not in<br>process<br>Normal powertrain initialization is |   |              |           |
| Torque Converter                                     | Clutch | l  | 1   | 1                           | complete  | 1   |              | l         |
| Torque Converter<br>Clutch Circuit<br>Performance or | P0741  | This test detects the torque<br>converter being stuck off<br>(unlocked)  |   |                             |   |   | 15 seconds   | В         |
| Stuck Off  |        | (4.100.004).   | TCC Slip  | >= 80 RPM                   | Not Test Failed This Key On   | P2761                                     |              |           |
|  |        |  | for a time  | >= 15 seconds.              |   | P2763                                     |              |           |
|  |        |  |   |                             |   | P2764<br>P0721<br>P0722<br>P0716<br>P0717 |              |           |

| Component /       | Fault | Monitor Strategy             | Malfunction Criteria | Threshold Value | Secondary Parameters                 | Enable Conditions           | Time     | MIL IIIum |
|-------------------|-------|------------------------------|----------------------|-----------------|--------------------------------------|-----------------------------|----------|-----------|
| System            | Code  | Description                  |                      |                 |                                      |                             | Required |           |
|                   |       |                              |                      |                 | No Fault Pending DTCs for this drive | P2761                       |          |           |
|                   |       |                              |                      |                 | cycle.                               | P2763                       |          |           |
|                   |       |                              |                      |                 |                                      | P2764                       |          |           |
|                   |       |                              |                      |                 |                                      | P0721<br>P0722              |          |           |
|                   |       |                              |                      |                 |                                      | P0716                       |          |           |
|                   |       |                              |                      |                 |                                      | P0717                       |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 | Components powered                   |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 | AND                                  | 0.1/                        |          |           |
|                   |       |                              |                      |                 | Battery Voltage between              | 9 V and 18 V                |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 | Engine Speed between                 | 200 DDM and 7500 DDM        |          |           |
|                   |       |                              |                      |                 | Engine Speed between                 | 200 RPM and 7500 RPM        |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 | for                                  | 5 seconds                   |          |           |
|                   |       |                              |                      |                 |                                      | 3 3000103                   |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 | Must be in forward range             |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 | 0/ Three #10                         | 10.9%                       |          |           |
|                   |       |                              |                      |                 | % I nrottle                          | > 10 % and <= 90 %          |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 | Transmission fluid temperature       | > 5 deg. C and < 130 deg. C |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 | Time Since Range Change              | >= 6 seconds                |          |           |
|                   |       |                              |                      |                 | 5                                    |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 | AND                                  |                             |          |           |
|                   |       |                              |                      |                 | TCC apply is complete                |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   |       |                              |                      |                 | ΑΝΠ                                  |                             |          |           |
|                   |       |                              |                      |                 | TCC pressure                         | >= 1000 kPa                 |          |           |
|                   |       |                              |                      |                 |                                      |                             |          |           |
|                   | D0740 | This tost datasts the target |                      |                 |                                      |                             |          | P         |
| i orque Converter | FU/42 | This lest detects the lorque |                      |                 |                                      |                             | 1        | D         |

| Component /<br>System      | Fault<br>Code | Monitor Strategy<br>Description    | Malfunction Criteria   | Threshold Value   | Secondary Parameters                        | Enable Conditions                | Time<br>Required     | MIL IIIum |
|----------------------------|---------------|------------------------------------|--|-------------------|---|----------------------------------|----------------------|-----------|
| Clutch Circuit Stuck<br>On |               | converter being stuck on (locked). | Case 1: (High Torque condition)  |                   | Not Test Failed This Key On                 | P2761                            | Case 1:              |           |
|                            |               |                                    | Set fault pending when throttle  | >= 70%            |   | P2763                            | 2 Seconds            |           |
|                            |               |                                    | AND<br>net engine torque   | >= 275 Nm.        |   | P2764<br>P0721                   |                      |           |
|                            |               |                                    | Report malfunction when fault pending<br>exists continuously<br>for a time   | >= 2 seconds.     |   | P0716<br>P0717<br>U0100          |                      |           |
|                            |               |                                    | Case 2: (High Acceleration condition)  |                   | No Fault Pending DTCs for this drive cycle. | P2761<br>P2763                   | Case 2:<br>5 Seconds |           |
|                            |               |                                    | Set fault pending when output shaft<br>acceleration  | >= 100 RPM/second |   | P2764<br>P0721                   |                      |           |
|                            |               |                                    | Report malfunction when fault pending<br>exists continuously<br>for a time   | >= 5 seconds.     |   | P0722<br>P0716<br>P0717<br>U0100 |                      |           |
|                            |               |                                    |  |                   | Components powered                          |                                  |                      |           |
|                            |               |                                    | Case 3: (Accel/Decel/Accel condition)  |                   | AND<br>Battery Voltage between              | 9 V and 18 V                     | Case 3:<br>4 Seconds |           |
|                            |               |                                    | Report malfunction when output<br>acceleration event is followed by output<br>deceleration event and followed by<br>another output acceleration event. An<br>output acceleration event occurs when |                   | Engine Speed between                        | 200 RPM and 7500 RPM             |                      |           |
|                            |               |                                    | output shaft acceleration  |                   | for   | 5 seconds                        |                      |           |
|                            |               |                                    |  |                   | Must be in forward range                    |                                  |                      |           |

| Component /<br>System                        | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value                  | Secondary Parameters   | Enable Conditions       | Time<br>Required | MIL IIIum |
|--|---------------|--|---|----------------------------------|--|-------------------------|------------------|-----------|
|  |               |  | for a time  | >= 40 RPM/second<br>>= 4 seconds | TCC is commanded off   | se 20 PDM and re 20 PDM |                  |           |
|  |               |  | An output deceleration event occurs<br>when output shaft acceleration is  | 40 RPM/second                    |  |                         |                  |           |
|  |               |  | for a time  | >= 2.5 seconds.                  | % Throttle   | >= 25%                  |                  |           |
|  |               |  |   |                                  | Net Engine Torque  | >= 175 Nm               |                  |           |
|  |               |  |   |                                  | Engine speed   | <= 3500 RPM             |                  |           |
|  |               |  |   |                                  | Input speed  | <= 3500 RPM             |                  |           |
|  |               |  |   |                                  | Output speed   | >= 100 RPM              |                  |           |
| Pressure Switches                            | 3             |  |   |                                  |  |                         |                  |           |
| Pressure Switch<br>Solenoid 1 Circuit<br>Low | P0842         | This test compares the<br>commanded valve position to<br>the PS1 pressure switch<br>feedback. (part of S1 valve<br>integrity test) | Pending failure occurs when PS1<br>pressure switch indicates stroked for a<br>time  |                                  | S1 valve is destroked  |                         | 100 ms           | A         |
|  |               |  |   | > 0.08 seconds                   |  |                         |                  |           |
|  |               |  |   |                                  | NOT Cold initialization unless<br>transmission fluid temperature | > -25 deg. C            |                  |           |
|  |               |  |   |                                  | Shutdown is NOT in process                                       |                         |                  |           |
|  |               |  | In response to the pending failure, S1<br>valve is retried by triggering S1 valve<br>command to stroked and back to<br>destroked. If PS1 pressure switch<br>continues to indicate stroked, then one of<br>three malfunction cases exists:<br>For Case 1 (electrical malfunction), |                                  |  |                         |                  |           |

| Component /<br>System  | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value | Secondary Parameters                          | Enable Conditions | Time<br>Required | MIL IIIum |
|--|---------------|--|---|-----------------|---|-------------------|------------------|-----------|
|  |               |  | SS1 Circuit Low reports failure, also.  | P0973           |   |                   |                  |           |
|  |               |  | For Case 2 (mechanical malfunction),  |                 |   |                   |                  |           |
|  |               |  | Shift Solenoid 1 (SS1) Valve<br>Performance – Stuck On reports failure,<br>also.  | P0752           |   |                   |                  |           |
|  |               |  | For Case 3 (intermittent malfunction),  |                 |   |                   |                  |           |
|  |               |  | SS1 valve retry attempted   | 15 times        |   |                   |                  |           |
|  |               |  | AND<br>PS1 pressure switch continues to indicate<br>stroked.  |                 |   |                   |                  |           |
| Shift Solenoid 1<br>(SS1) Valve                              | P0751         | This test compares the<br>change of state of the valve   |   |                 | S1 valve commanded from destroked to stroked. |                   | 5 seconds        | A         |
| Performance –<br>Stuck Off                                   |               | command to the change of<br>state of the PS1 pressure<br>switch feedback. (part of the<br>S1 valve timeout test)                                 | S1 valve is commanded from destroked<br>to stroked and the PS1 pressure switch<br>indication remains destroked for a time | >= 5 seconds    |   |                   |                  |           |
|  |               |  |   |                 |   |                   |                  |           |
|  |               |  | transmission fluid temperature  | >= 0 deg. C     |   |                   |                  |           |
|  |               |  | (Time increases as temperature  |                 |   |                   |                  |           |
|  |               |  | decreases with maximum time   | 12 seconds      |   |                   |                  |           |
|  |               |  | at<br>transmission fluid temperature)   | <= -40 deg. C   |   |                   |                  |           |
|  |               |  |   |                 |   |                   |                  |           |
| Shift Solenoid 1<br>(SS1) Valve<br>Performance –<br>Stuck On | P0752         | This test compares the<br>change of state of the valve<br>command to the change of<br>state of the PS1 pressure<br>switch feedback. (part of the | S1 valve commanded from stroked to<br>destroked and the PS1 pressure switch   |                 | S1 valve commanded from stroked to destroked  |                   | 6.6 seconds      | A         |
|  |               | S1 valve timeout test).  | Indication remains stroked for a time   | > 6.2 seconds   |   |                   |                  |           |

| Component /<br>System                         | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria   | Threshold Value                             | Secondary Parameters   | Enable Conditions | Time<br>Required | MIL IIIum |
|---|---------------|--|--|---|--|-------------------|------------------|-----------|
|   |               |  | transmission fluid temperature<br>(Time increases as temperature<br>decreases with maximum time<br>at<br>transmission fluid temperature)   | >= 0 deg. C.<br>10 seconds<br><= -40 deg. C |  |                   |                  |           |
| Pressure Switch<br>Solenoid 1 Circuit<br>High | P0843         | This test compares the<br>commanded valve position to<br>the PS1 pressure switch<br>feedback. (part of S1 valve<br>integrity test) | Pending failure occurs when PS1<br>pressure switch indicates destroked for a<br>time<br>IF a main pressure dropout is<br>suspected then time limit increases to<br>In response to the pending failure, S1<br>valve is retried by triggering S1 valve<br>command to destroked and back to<br>stroked. If the PS1 pressure switch<br>continues to indicate destroked, then one<br>of three malfunction cases exists. | > 0.07 seconds<br>5 seconds                 | S1 valve is stroked<br>NOT Cold initialization unless<br>transmission fluid temperature<br>Shutdown NOT in process | > -25 deg. C      | 70 ms            | A         |
|   |               |  | For Case 1 (electrical malfunction),<br>SS1 Control Circuit Low reports<br>failure, also.<br>For Case 2 (mechanical malfunction),<br>Shift Solenoid 1 (SS1) Valve<br>Performance – Stuck Off reports failure,<br>also.<br>For Case 3 (intermittent malfunction),   | P0973<br>P0751                              |  |                   |                  |           |

| Component /<br>System | Fault<br>Code | Monitor Strategy            | Malfunction Criteria                                    | Threshold Value   | Secondary Parameters           | Enable Conditions | Time<br>Required | MIL IIIum |
|-----------------------|---------------|-----------------------------|---|-------------------|--------------------------------|-------------------|------------------|-----------|
| System                | Code          | Description                 | S1 valve retry attempted                                | 15 times          |                                |                   | Kequileu         |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             | AND   |                   |                                |                   |                  |           |
|                       |               |                             | PS1 pressure switch continues to<br>indicate destroked. |                   |                                |                   |                  |           |
| Pressure Switch       | P0847         | This test compares the      | Pending failure occurs when PS2                         |                   |                                |                   | 40 ms            | A         |
| Solenoid 2 Circuit    |               | commanded valve position to | pressure switch indicates stroked for a                 |                   | S2 valve is destroked          |                   |                  |           |
| LOW                   |               | feedback (part of the S2    | line  |                   |                                |                   |                  |           |
|                       |               | valve integrity test).      |   | 0.04004           |                                |                   |                  |           |
|                       |               |                             |   | > 0.04004 seconds |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             |   |                   | NOT Cold initialization unless |                   |                  |           |
|                       |               |                             | IF a main pressure dropout is                           |                   | transmission fluid temperature | > -25 deg. C      |                  |           |
|                       |               |                             | suspected then time limit increases to                  | 0.2998 seconds    |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             | In response to the pending failure, S2                  |                   | Shutdown is NOT in process     |                   |                  |           |
|                       |               |                             | valve is retried by triggering S2 valve                 |                   |                                |                   |                  |           |
|                       |               |                             | destroked. If PS2 pressure switch                       |                   |                                |                   |                  |           |
|                       |               |                             | continues to indicate stroked, then one of              |                   |                                |                   |                  |           |
|                       |               |                             | three malfunction cases exists.                         |                   |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             | For Case 1 (electrical malfunction),                    |                   |                                |                   |                  |           |
|                       |               |                             | SS2 Control Circuit Low reports                         | P0976             |                                |                   |                  |           |
|                       |               |                             | failure, also.  |                   |                                |                   |                  |           |
|                       |               |                             | For Case 2 (mechanical malfunction)                     |                   |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             | Shift Solenoid 2 Valve Performance –                    | P0757             |                                |                   |                  |           |
|                       |               |                             | Stuck On reports failure, also.                         |                   |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             | For Case 3 (intermittent malfunction),                  |                   |                                |                   |                  |           |
|                       |               |                             | S2 valve retry attempted                                | 2 times           |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             |   |                   |                                |                   |                  |           |
|                       |               |                             | AND<br>PS2 pressure switch continues to                 |                   |                                |                   |                  |           |
|                       |               |                             | indicate stroked.                                       |                   |                                |                   |                  |           |

| Component /<br>System                                | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value  | Secondary Parameters                             | Enable Conditions | Time<br>Required | MIL IIIum |
|--|---------------|--|---|--|--|-------------------|------------------|-----------|
| Shift Solenoid 2<br>Valve Performance<br>– Stuck Off | P0756         | This test compares the<br>change of state of the valve<br>command to the change of<br>state of the PS2 pressure<br>switch feedback (part of the<br>S2 valve timeout test). | If the S2 valve is commanded from<br>destroked to stroked and the PS2<br>pressure switch indication remains<br>destroked for a time<br>WITH<br>transmission fluid temperature<br>(Time increases as temperature<br>decreases with maximum time<br>at<br>transmission fluid temperature) | >= 5 seconds<br>>= 0 deg. C.<br>12 seconds<br><= -40 deg. C.   | S2 valve commanded from destroked to<br>stroked. |                   | 5 seconds        | A         |
| Shift Solenoid 2<br>Valve Performance<br>– Stuck On  | P0757         | This test compares the<br>commanded valve position to<br>the PS2 pressure switch<br>feedback (part of the S2<br>valve timeout test).                                       | S2 valve commanded from stroked to<br>destroked and the PS2 pressure switch<br>does not indicate destroked for a time<br>WITH<br>transmission fluid temperature<br>decreases as temperature<br>decreases with maximum time<br>at<br>transmission fluid temperature)                     | >= 6.5 seconds<br>>= 0 deg. C.<br>22 seconds<br><= -40 deg. C. | S2 valve commanded from stroked to destroked     |                   | 6.5 sec          | A         |
| Pressure Switch<br>Solenoid 2 Circuit<br>High        | P0848         | This test compares the<br>commanded valve position to<br>the PS2 pressure switch<br>feedback (part of the S2<br>valve integrity test).                                     | Pending failure occurs when PS2<br>pressure switch indicates destroked for a<br>time  | > 0.30 seconds   | S2 valve is stroked                              |                   | 300 ms           | A         |

| Component /<br>System                        | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value  | Secondary Parameters   | Enable Conditions | Time<br>Required | MIL IIIum |
|--|---------------|--|---|------------------|--|-------------------|------------------|-----------|
|  |               |  | IF a main pressure dropout is suspected,<br>THEN time limit increases to  | 5 seconds        | NOT Cold initialization unless<br>transmission fluid temperature | > -25 deg. C      |                  |           |
|  |               |  | In response to the pending failure, S2<br>valve is retried by triggering S2 valve<br>command to destroked and back to<br>stroked. If PS2 pressure switch continues<br>to indicate destroked, then one of three<br>malfunction cases exists. |                  | Shutdown NOT in process  |                   |                  |           |
|  |               |  | For Case 1 (electrical malfunction),<br>SS2 Control Circuit Low reports<br>failure, also.   | P0976            |  |                   |                  |           |
|  |               |  | For Case 2 (mechanical malfunction),<br>Shift Solenoid 2 Valve Performance –<br>Stuck Off reports failure, also.  | P0756            |  |                   |                  |           |
|  |               |  | For Case 3 (intermittent malfunction),<br>S2 valve retry attempted  | 2 times          |  |                   |                  |           |
|  |               |  | AND<br>PS2 pressure switch continues to indicate<br>destroked.  |                  |  |                   |                  |           |
| Pressure Switch<br>Solenoid 3 Circuit<br>Low | P0872         | This test compares the<br>commanded valve position to<br>the PS3 pressure switch<br>feedback. (part of S3 valve<br>integrity test) | Pending failure occurs when PS3<br>pressure switch indicates stroked for a<br>time  | 0.0405 accords   | S3 valve is destroked  |                   | 20 ms            | A         |
|  |               |  |   | > U.UT95 SECONAS | NOT Cold initialization unless transmission fluid temperature    | > -25 deg. C      |                  |           |

| Component /<br>System                                | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value | Secondary Parameters                          | Enable Conditions | Time<br>Required | MIL IIIum |
|--|---------------|--|---|-----------------|---|-------------------|------------------|-----------|
|  |               |  | In response to the pending failure, S3<br>valve is retried by triggering S3 valve<br>command to stroked and back to<br>destroked. If PS3 pressure switch<br>continues to indicate stroked, then one of<br>three malfunction cases exists. |                 | Shutdown is NOT in process                    |                   |                  |           |
|  |               |  | For Case 1 (electrical malfunction),<br>SS3 Control Circuit Low reports failure,<br>also.   | P0979           |   |                   |                  |           |
|  |               |  | For Case 2 (mechanical malfunction),<br>Shift Solenoid 3 Valve Performance –<br>Stuck On reports failure, also.   | P0762           |   |                   |                  |           |
|  |               |  | For Case 3 (intermittent malfunction),<br>S3 valve retry attempted  | 2 times         |   |                   |                  |           |
|  |               |  | AND<br>PS3 pressure switch continues to<br>indicate stroked.  |                 |   |                   |                  |           |
| Shift Solenoid 3<br>Valve Performance<br>– Stuck Off | P0761         | This test compares the<br>change of state of the valve<br>command to the change of<br>state of the PS3 pressure<br>switch feedback. (part of the | If the S3 valve is commanded from<br>destroked to stroked and the PS3<br>pressure switch indication remains<br>destroked for a time   |                 | S3 valve commanded from destroked to stroked. |                   | 5 seconds        | A         |
|  |               | S3 valve timeout test)   |   | >= 5 seconds    |   |                   |                  |           |
|  |               |  | transmission fluid temperature  | >= 0 deg. C.    |   |                   |                  |           |
|  |               |  | (Time increases as temperature<br>decreases with maximum time   | 12 seconds      |   |                   |                  |           |
|  |               |  | at<br>transmission fluid temperature)   | <= -40 deg. C.  |   |                   |                  |           |
|  |               |  |   |                 |   |                   |                  |           |

| Component /<br>System                         | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value               | Secondary Parameters  | Enable Conditions | Time<br>Required | MIL IIIum |
|---|---------------|--|---|-------------------------------|---|-------------------|------------------|-----------|
| Valve Performance<br>– Stuck On               | P0762         | commanded valve position to<br>the PS3 pressure switch<br>feedback (part of the S3<br>valve timeout test).                         | S3 valve commanded from stroked to<br>destroked and the PS3 pressure switch<br>does not indicate destroked for a time<br>WITH<br>transmission fluid temperature   | > 6.5 seconds<br>>= 0 deg. C. | S3 valve commanded from stroked to<br>destroked   |                   | 6.6 seconds      | A         |
|   |               |  | (Time increases as temperature decreases with maximum time  | 22 seconds                    |   |                   |                  |           |
|   |               |  | at<br>transmission fluid temperature)   | >= -40 deg. C.                |   |                   |                  |           |
| Pressure Switch<br>Solenoid 3 Circuit<br>High | P0873         | This test compares the<br>commanded valve position to<br>the pressure switch PS3<br>feedback. (part of S3 valve<br>integrity test) | Pending failure occurs when PS3<br>pressure switch indicates destroked for a<br>time  | > 0.30 seconds                | S3 valve is stroked   |                   | 300 ms           | A         |
|   |               |  | IF a main pressure dropout is suspected<br>THEN time limit increases to   | 5 seconds                     | NOT Cold initialization unless<br>transmission fluid temperature<br>Shutdown NOT in process | > -25 deg. C      |                  |           |
|   |               |  | In response to the pending failure, S3<br>valve is retried by triggering S3 valve<br>command to destroked and back to<br>stroked. If PS3 pressure switch continues<br>to indicate destroked, then one of the<br>three malfunction cases exists. |                               |   |                   |                  |           |
|   |               |  | For Case 1 (electrical malfunction),<br>SS3 Control Circuit Low reports<br>failure, also.   | P0979                         |   |                   |                  |           |

| Component /<br>System                     | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria   | Threshold Value | Secondary Parameters   | Enable Conditions    | Time<br>Required | MIL IIIum |
|---|---------------|--|--|-----------------|--|----------------------|------------------|-----------|
|   |               |  | For Case 2 (mechanical malfunction),<br>Shift Solenoid 3 Valve Performance –<br>Stuck Off reports failure, also. | P0761           |  |                      |                  |           |
|   |               |  | For Case 3 (intermittent malfunction),   |                 |  |                      |                  |           |
|   |               |  | S3 valve retry attempted   | 2 times         |  |                      |                  |           |
|   |               |  |  |                 |  |                      |                  |           |
|   |               |  | AND<br>PS3 pressure switch continues to<br>indicate destroked.   |                 |  |                      |                  |           |
| Pressure Switch<br>Reverse Circuit<br>Low | P0877         | This test detects Reverse<br>Pressure Switch closed<br>indication by comparing the<br>Reverse Pressure Switch<br>state to the PRNDL switch<br>state. | Case 1: (Forward range)  |                 | All Cases<br>Not Test Failed This Key On                           | P0877                | 5 seconds        | A         |
|   |               |  | For a sample size  | 100 samples     |  | P0878                |                  |           |
|   |               |  | (if dropout suspected, NLT or N02 cmded, use sample size)  | 255 samples     |  | P0708                |                  |           |
|   |               |  | PRNDL is P, D1, D2, D3, D4, D5, D6, T8,<br>or T4<br>AND  |                 | No Fault Pending DTCs for this drive<br>cycle<br>Engine is Running | P0708                |                  |           |
|   |               |  | RPS indicates Reverse  |                 | Components powered AND   |                      |                  |           |
|   |               |  | for a time   | >= 1 seconds    | Battery Voltage between  | 9 V and 18 V         |                  |           |
|   |               |  | (if dropout suspected, NLT   |                 |  |                      |                  |           |
|   |               |  | or N02 cmded, use time)  | 30 seconds      | Engine Speed between   | 200 RPM and 7500 RPM |                  |           |
|   |               |  |  |                 | 1  |                      |                  |           |

| Component /             | Fault | Monitor Strategy   | Malfunction Criteria   | Threshold Value | Secondary Parameters                       | Enable Conditions | Time       | MIL IIIum |
|-------------------------|-------|--|--|-----------------|--|-------------------|------------|-----------|
| System                  | Code  | Description  |  |                 |  | -                 | Required   |           |
|                         |       |  | Case 2: (Range indefinite)   |                 | for  | 5 seconds         |            |           |
|                         |       |  | For a sample size,   | 20 samples      |  |                   |            |           |
|                         |       |  | net engine torque  | >= 100 Nm       | Transmission Fluid Temperature             | >= 0 deg. C       |            |           |
|                         |       |  | PRNDL is indefinitely D3 or another<br>forward range                   |                 | Hydraulic System Pressurized               |                   |            |           |
|                         |       |  | for a time   | > 1 second      | Reverse Pressure Switch State indicates    |                   |            |           |
| Pressure Switch         | P0878 | This test detects the Reverse  | All Cases  | ı               | Transmission Fluid Temperature             |                   |            | A         |
| Reverse Circuit<br>High |       | Pressure switch being stuck in the open position by  |  |                 |  | >= 0 deg. C       |            | ~         |
|                         |       | comparing to the PRNDL<br>switch state and detects the<br>Reverse Pressure switch<br>stuck open at shutdown. | Case 1: (RPS State and PRNDL State do<br>not agree)<br>For sample size | 40 samples      | Not Test Failed This Key On                | P0877<br>P0878    | 3 seconds  |           |
|                         |       |  | PRNDL is REVERSE   |                 |  | P0708             |            |           |
|                         |       |  | RPS indicates NOT REVERSE  |                 | No Fault Pending DTC for this drive cycle. | P0708             |            |           |
|                         |       |  | after a time   | >= 1 second     |  |                   |            |           |
|                         |       |  |  |                 | Battery Voltage between                    | 9 V and 18 V      |            |           |
|                         |       |  |  |                 | No range switch response active            |                   |            |           |
|                         |       |  | For Case 2: (RPS Shutdown Test)  |                 | Ignition Key State is NOT RUN              |                   | 60 seconds |           |

| Component /<br>System                        | Fault<br>Code      | Monitor Strategy<br>Description   | Malfunction Criteria  | Threshold Value | Secondary Parameters                                    | Enable Conditions | Time<br>Required | MIL IIIum |
|--|--------------------|---|---|-----------------|---|-------------------|------------------|-----------|
|  |                    |   | If RPS indicates  | not Reverse     | Engine Stopped or Stalled                               |                   |                  |           |
|  |                    |   | for a time  | > 40 seconds    |   |                   |                  |           |
|  |                    |   | at transmission fluid temperature                               | 0 deg. C.       | End of Trip timer                                       | >= 5 seconds      |                  |           |
|  |                    |   | during engine shutdown  |                 |   |                   |                  |           |
|  |                    |   | This time varies with transmission fluid temperature, from time | 25 seconds      | Engine had been cranking or running<br>this drive cycle |                   |                  |           |
|  |                    |   |   |                 |   |                   |                  |           |
|  |                    |   | at transmission fluid temperature                               | > 35 deg. C     |   |                   |                  |           |
|  |                    |   | to time   | 60 seconds      | Engine speed  | < 50 RPM          |                  |           |
|  |                    |   | at transmission fluid temperature                               | < -20 deg. C.   | Turbine speed   | < 50 RPM          |                  |           |
|  |                    |   |   |                 | Output speed  | < 50 RPM          |                  |           |
| On-coming/Off-goi<br>Pressure Control        | ing Ratio<br>P2723 | This test determines if the on-   | Pending failure occurs when accumulated                         |                 |   |                   | 2.25 seconds     | A         |
| Solenoid 1<br>Controlled Clutch<br>Stuck Off |                    | coming clutch energized by<br>Pressure Control Solenoid 1<br>engages during a forward<br>range shift. | event timer   | >= 2 seconds    | Not Test Failed This Key On                             | P0721             |                  |           |

| Component /<br>System | Fault<br>Code | Monitor Strategy<br>Description | Malfunction Criteria  | Threshold Value | Secondary Parameters                                  | Enable Conditions | Time<br>Required | MIL IIIum |
|-----------------------|---------------|---------------------------------|---|-----------------|---|-------------------|------------------|-----------|
|                       |               |                                 | (For rough road conditions, use)                                  | 2 seconds       |   | P0722             |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 |   | P0716             |                  |           |
|                       |               |                                 | Timer accumulates when transmission is shifting.                  |                 |   | P0717<br>P0877    |                  |           |
|                       |               |                                 | output speed  | >= 60 RPM       |   | P0878             |                  |           |
|                       |               |                                 | AND commanded gear slip speed                                     | > 75 RPM        |   |                   |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 | (For rough road conditions, use)                                  | 150 RPM.        | Output Speed  | >= 125 RPM        |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 | Turbine Speed   | >= 60 RPM         |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 | In response of pending failure, a<br>diagnostic response range is |                 | Hydraulic System Pressurized                          |                   |                  |           |
|                       |               |                                 | commanded. During this command, this                              |                 |   |                   |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 | Normal powertrain shutdown not in                     |                   |                  |           |
|                       |               |                                 |   | >= 230 RPM      | process   |                   |                  |           |
|                       |               |                                 |   | 200 NI W        |   |                   |                  |           |
|                       |               |                                 | for sample size   | > 10 samples    | Normal or Cold powertrain initialization is complete  |                   |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 | No range switch response active                       |                   |                  |           |
|                       |               |                                 |   |                 | No Cold Mode operation                                |                   |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 | No abusive garage shift to 1st range                  |                   |                  |           |
|                       |               |                                 |   |                 | detected  |                   |                  |           |
|                       |               |                                 |   |                 | On-coming clutch control enabled                      |                   |                  |           |
|                       |               |                                 |   |                 |   |                   |                  |           |
|                       |               |                                 |   |                 | Power downshift abort to previous range<br>NOT active |                   |                  |           |

| Component /<br>System | Fault<br>Code | Monitor Strategy<br>Description                         | Malfunction Criteria  | Threshold Value | Secondary Parameters                        | Enable Conditions | Time<br>Required | MIL IIIum |
|-----------------------|---------------|---|---|-----------------|---|-------------------|------------------|-----------|
| Pressure Control      | P0776         | This test determines if the on-                         | Pending failure occurs when accumulated                                   |                 |   |                   | 2.25 seconds     | A         |
| Solenoid 2            |               | coming clutch energized by                              | event timer   |                 |   |                   |                  |           |
| Controlled Clutch     |               | Pressure Control Solenoid 2<br>engages during a forward |   | >= 2 seconds    | Not Test Failed This Key On                 | P0721             |                  |           |
|                       |               | range shift.  |   |                 | ,,  |                   |                  |           |
|                       |               |   | (For rough road conditions, use)  | 2 cocondo       |   | P0722             |                  |           |
|                       |               |   | (For rough road conditions, use)  | 2 Seconds       |   | F0722             |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   |   |                 |   | P0716             |                  |           |
|                       |               |   | Timer accumulates when transmission is                                    |                 |   | P0717             |                  |           |
|                       |               |   | output speed  | >= 60 RPM       |   | P0877<br>P0878    |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   | AND commanded gear slip speed   | > 75 RPM        | Output Speed                                | >= 125 RPM        |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   | (For rough road conditions, use)  | 150 RPM.        | Turbine Speed                               | >= 60 RPM         |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   | In response of pending failure, a   |                 | Hydraulic System Pressurized                |                   |                  |           |
|                       |               |   | diagnostic response range is  |                 |   |                   |                  |           |
|                       |               |   | commanded. During this command, this<br>test fails if ABS(Converter slip) |                 |   |                   |                  |           |
|                       |               |   | ······································                                    |                 |   |                   |                  |           |
|                       |               |   |   |                 | Normal powertrain shutdown not in           |                   |                  |           |
|                       |               |   |   |                 | process                                     |                   |                  |           |
|                       |               |   |   | >= 230 RPM      |   |                   |                  |           |
|                       |               |   | for sample size   | > 10 samples    | Normal or Cold powertrain initialization is |                   |                  |           |
|                       |               |   |   |                 | complete                                    |                   |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   |   |                 | No range switch response active             |                   |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   |   |                 | No Cold Mode operation                      |                   |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   |   |                 | No abusive garage shift to 1st range        |                   |                  |           |
|                       |               |   |   |                 | detected                                    |                   |                  |           |
|                       |               |   |   |                 | On-coming clutch control enabled            |                   |                  |           |
|                       |               |   |   |                 |   |                   |                  |           |
|                       |               |   |   |                 | Power downshift abort to previous range     |                   |                  |           |
|                       |               |   |   |                 | NOT active                                  |                   |                  |           |

| Component /<br>System   | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria   | Threshold Value   | Secondary Parameters                                 | Enable Conditions | Time<br>Required | MIL IIIum |
|---|---------------|--|--|-------------------|--|-------------------|------------------|-----------|
| Pressure Control<br>Solenoid 1<br>Controlled Clutch<br>Stuck On | P2724         | This test determines if the off-<br>going clutch energized by<br>Pressure Control solenoid 1<br>remains engaged during a<br>forward range shift. | Accumulated fail timer   | >= 0.2998 seconds | Not Test Failed This Key On                          | P0721             | 3 seconds        | A         |
|   |               |  | for forward range upshift;   |                   |  | P0722             |                  |           |
|   |               |  | OR accumulated fail timer  | >= 3.0 seconds    |  | P0716             |                  |           |
|   |               |  | for direction change shifts;   |                   |  | P0717             |                  |           |
|   |               |  | OR accumulated fail timer  | >= 0.500 seconds  |  | P0877             |                  |           |
|   |               |  | for forward range closed throttle<br>downshift;<br>OR accumulated fail timer   | >= 1.0 second     | No Fault Pending DTC for this drive cycle.           | P0878<br>P0717    |                  |           |
|   |               |  | for forward downshifts above closed throttle.                                  |                   | Output Speed   | >= 200 RPM        |                  |           |
|   |               |  | Fail timer accumulates during range to<br>range shifts when attained gear slip |                   | Turbine Speed  | >= 200 RPM        |                  |           |
|   |               |  | speed  | <= 25 RPM         | Normal powertrain shutdown not in<br>process         |                   |                  |           |
|   |               |  |  |                   | Normal or Cold powertrain initialization is complete |                   |                  |           |
|   |               |  |  |                   | No range switch response active                      |                   |                  |           |
|   |               |  |  |                   | No Cold Mode operation                               |                   |                  |           |
|   |               |  |  |                   |  |                   |                  |           |
|   |               |  |  |                   | No abusive garage shift to 1st range<br>detected     |                   |                  |           |

| Component /<br>System   | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria   | Threshold Value   | Secondary Parameters                                    | Enable Conditions | Time<br>Required | MIL IIIum |
|---|---------------|--|--|-------------------|---|-------------------|------------------|-----------|
| Pressure Control<br>Solenoid 2<br>Controlled Clutch<br>Stuck On | P0777         | This test determines if the off-<br>going clutch energized by<br>Pressure Control solenoid 2<br>remains engaged during a<br>forward range shift. | Accumulated fail timer   | >= 0.2998 seconds | Not Test Failed This Key On                             | P0721             | 3 seconds        | A         |
|   |               |  | for forward range upshift;   |                   |   | P0722             |                  |           |
|   |               |  | OR accumulated fail timer  | >= 3.0 seconds    |   | P0716             |                  |           |
|   |               |  | for direction change shifts;   |                   |   | P0717             |                  |           |
|   |               |  | OR accumulated fail timer  | >= 0.500 seconds  |   | P0877             |                  |           |
|   |               |  | for forward range closed throttle<br>downshift;<br>OR accumulated fail timer   | >= 1.0 second     | No Fault Pending DTC for this drive cycle.              | P0878<br>P0717    |                  |           |
|   |               |  | for forward downshifts above closed throttle.                                  |                   | Output Speed  | >- 200 PDM        |                  |           |
|   |               |  | Fail timer accumulates during range to<br>range shifts when attained gear slip |                   | Turbine Speed   | >= 200 RPM        |                  |           |
|   |               |  | speed  | <= 25 RPM         | Normal powertrain shutdown not in process               |                   |                  |           |
|   |               |  |  |                   | Normal or Cold powertrain initialization is<br>complete |                   |                  |           |
|   |               |  |  |                   | No range switch response active                         |                   |                  |           |
|   |               |  |  |                   | No Cold Mode operation                                  |                   |                  |           |
|   |               |  |  |                   | No abusive garage shift to 1st range detected           |                   |                  |           |

| Component /                                | Fault    | Monitor Strategy  | Malfunction Criteria  | Threshold Value | Secondary Parameters     | Enable Conditions                 | Time                          | MIL IIIum |
|--|----------|---|---|-----------------|--------------------------|-----------------------------------|-------------------------------|-----------|
| System                                     | Code     | Description   |   |                 |                          |                                   | Required                      |           |
| PRNDL/IMS                                  | <b>1</b> | •   | 1   | r               | 1                        | 1                                 | Ī                             | I         |
| Transmission<br>Range Sensor High<br>Input | P0708    | This test monitors the<br>transmission range switch for<br>invalid input conditions and<br>parity errors occurring over<br>consecutive ignition cycles. | For Case 1 (No Information):  |                 | Components powered       |                                   | Case 1:                       | A         |
|  |          |   | Illegal electrical state for a time   | >= 1 second     | AND                      |                                   | 1 second                      |           |
|  |          |   |   |                 | Battery Voltage between  | 9 V and 18 V                      |                               |           |
|  |          |   | For Case 2 (Long-term Parity):  |                 |                          |                                   | Case 2:                       |           |
|  |          |   | There are 3 counters for long-term parity.<br>These counters are updated at the end of<br>each drive cycle, immediately prior to<br>TCM shutdown.   |                 | Engine Speed between for | 200 RPM and 7500 RPM<br>5 seconds | 5 <sup>th</sup><br>occurrence |           |
|  |          |   | For Counter 1, increment counter IF Parity<br>Error Detected; decrement counter IF No<br>Parity Error Detected AND No Motion<br>Detected.   |                 |                          |                                   |                               |           |
|  |          |   | IF Counter 1<br>THEN report failure.  | >= 15 counts    |                          |                                   |                               |           |
|  |          |   | For Counter 2, increment counter IF Parity<br>Error Detected AND (No Valid Drive<br>Detected OR No Valid Park/Neutral<br>Detected) AND Motion Detected;<br>decrement counter IF No Parity Error<br>Detected AND Valid Park/Neutral<br>Detected AND Valid Drive Detected AND<br>Motion Detected. |                 |                          |                                   |                               |           |
|  |          |   | IF Counter 2,<br>THEN report failure.   | >= 5 counts     |                          |                                   |                               |           |

| Component / | Fault | Monitor Strategy | Malfunction Criteria                       | Threshold Value | Secondary Parameters | Enable Conditions | Time     | MIL IIIum |
|-------------|-------|------------------|--|-----------------|----------------------|-------------------|----------|-----------|
| System      | Code  | Description      |  |                 |                      |                   | Required |           |
|             |       |                  | For Counter 3, increment Counter 3 IF      |                 |                      |                   |          |           |
|             |       |                  | Parity Error Detected while in Reverse     |                 |                      |                   |          |           |
|             |       |                  | AND No Valid Reverse Detected AND          |                 |                      |                   |          |           |
|             |       |                  | Motion Detected. Decrement Counter 3       |                 |                      |                   |          |           |
|             |       |                  | Reverse Detected AND Motion Detected       |                 |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  | IE Counter 2                               | E counto        |                      |                   |          |           |
|             |       |                  | ir Counter 3,                              |                 |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  | THEN report failure.                       |                 |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  | Where                                      |                 |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  | Parity Error Detected is defined as a      |                 |                      |                   |          |           |
|             |       |                  | failure of the 4-bit PRNDL input such that |                 |                      |                   |          |           |
|             |       |                  | the sum of those bits yields an odd result |                 |                      |                   |          |           |
|             |       |                  | for a time;                                | s - 20 cocondo: |                      |                   |          |           |
|             |       |                  |  | >= 30 seconds,  |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  | Mating Datastad is defined as autout       |                 |                      |                   |          |           |
|             |       |                  | Notion Detected is defined as output       | >= 200 RPM      |                      |                   |          |           |
|             |       |                  | 60000                                      | - 200 10 10     |                      |                   |          |           |
|             |       |                  | for a time;                                | >= 10 seconds   |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  | Valid Drive Detected is defined as the 4-  |                 |                      |                   |          |           |
|             |       |                  | bit DL indicates Valid Drive for a time;   | >= 3 seconds    |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  | Valid Dade Data stadia dafina dua tha A    |                 |                      |                   |          |           |
|             |       |                  | bit PRNDL indicates Valid Park for a time  |                 |                      |                   |          |           |
|             |       |                  |  | >= 0.2 seconds  |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  | and output speed:                          | 20 RPM          |                      |                   |          |           |
|             |       |                  | and output speed,                          | <= 20 KF M      |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  | Valid Deverse Detected in defined as       |                 |                      |                   |          |           |
|             |       |                  | the 4-bit PRNDL indicates Valid Reverse    |                 |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  | for a time;                                | >= 15 seconds;  |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  |  |                 |                      |                   |          |           |
|             |       |                  | Valid Neutral Detected is defined as the   | I               |                      | 1                 |          |           |

| Component /<br>System                | Fault<br>Code | Monitor Strategy<br>Description                              | Malfunction Criteria                      | Threshold Value | Secondary Parameters           | Enable Conditions        | Time<br>Required | MIL IIIum |
|--------------------------------------|---------------|--|---|-----------------|--------------------------------|--------------------------|------------------|-----------|
|                                      |               |  | 4-bit PRNDL indicates Valid Neutral       |                 |                                |                          |                  |           |
|                                      |               |  | for a time                                | >= 0.2 seconds  |                                |                          |                  |           |
|                                      |               |  |   |                 |                                |                          |                  |           |
|                                      |               |  | and output speed                          | <= 20 RPM       |                                |                          |                  |           |
|                                      |               |  |   |                 |                                |                          |                  |           |
|                                      |               |  | OR for a time.                            | >= 3 seconds    |                                |                          |                  |           |
|                                      |               |  |   |                 |                                |                          |                  |           |
| Transmission                         | P0706         | This test monitors the                                       |   |                 |                                |                          | 200 ms           | В         |
| Range Sensor                         |               | transmission range switch                                    | For sample size,                          | > 7 samples     | Not Test Failed This Key On    | P0706                    | 200 110          | 5         |
| Circuit<br>Range/Performanc          |               | inputs at engine start to<br>determine that it is indicating |   |                 |                                |                          |                  |           |
| e                                    |               | a valid starting position (Park                              | PRNDL C input is closed OR PRNDL P is     |                 |                                |                          |                  |           |
|                                      |               | or Neutral).   | NOT closed.                               |                 | Battery voltage between        | 9V and 18V               |                  |           |
|                                      |               |  |   |                 |                                |                          |                  |           |
|                                      |               |  |   |                 |                                |                          |                  |           |
|                                      |               |  |   |                 | Powertrain State is READY or   |                          |                  |           |
|                                      |               |  |   |                 | CRANKING                       |                          |                  |           |
|                                      |               |  |   |                 | Engine speed                   | > 100 RPM and < 350 RPM. |                  |           |
|                                      |               |  |   |                 |                                |                          |                  |           |
| Colored Flooring                     |               |  | <u> </u>                                  |                 | <u> </u>                       |                          |                  |           |
| Solenoid Electrica                   | P0960         | This test detects solenoid                                   | Fault pending is set at single hardware   |                 |                                |                          | 1050 ms          | Δ         |
| Modulation/Line                      |               | electrical open circuit                                      | fault occurrence                          |                 |                                |                          | 1000 110         | ~         |
| Pressure Control<br>Solenoid Control |               | malfunctions.  | IF hardware fault is present for a sample |                 | Not Test Failed This Key On    | P0657<br>P0658           |                  |           |
| Circuit Open                         |               |  | size                                      | >= 40 samples   |                                | P0659                    |                  |           |
|                                      |               |  |   |                 |                                |                          |                  |           |
|                                      |               |  | AND<br>Engine speed                       | >= 15 RPM       | Components powered             |                          |                  |           |
|                                      |               |  | Engine spood                              |                 |                                |                          |                  |           |
|                                      |               |  |   |                 |                                |                          |                  |           |
|                                      |               |  | THEN initiate intrusive test by opening   |                 | AND<br>Battery voltage between | 9\/ and 18\/             |                  |           |
|                                      |               |  | low side driver                           |                 | Dattery voltage between        |                          |                  |           |
|                                      |               |  |   |                 |                                |                          |                  |           |
|                                      |               |  |   |                 |                                |                          |                  |           |
|                                      |               |  |   |                 | It Engine Cranking, then       |                          |                  |           |
|                                      |               |  |   |                 |                                |                          |                  |           |
|                                      |               |  | IF intrusive test indicates no short to   |                 | Crank Time                     | < 4 seconds              |                  |           |
|                                      |               |  | ground exists for a sample size,          |                 |                                |                          |                  |           |
|                                      |               |  |   |                 | AND                            |                          |                  |           |

| Component /            | Fault | Monitor Strategy             | Malfunction Criteria                    | Threshold Value         | Secondary Parameters                  | Enable Conditions | Time     | MIL IIIum |
|------------------------|-------|------------------------------|---|-------------------------|---------------------------------------|-------------------|----------|-----------|
| Gystein                | ooue  | Description                  |   | >= 2 samples            | Battery Voltage                       | > 10 V            | noquirou |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
|                        |       |                              | THEN report malfunction                 |                         |                                       |                   |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
|                        |       |                              |   |                         | High Side Driver 1 Enabled            |                   |          |           |
|                        |       |                              |   |                         | , , , , , , , , , , , , , , , , , , , |                   |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
| Main                   | P0961 | This test detects the        |   |                         |                                       |                   | 1000 ms  | A         |
| Modulation/Line        |       | performance of the solenoid  | Case 1:                                 | <- 0 mA                 | Not Test Failed This Key On           | P0657             |          |           |
| Solenoid Control       |       | current to actual duty cycle | AND                                     |                         | Not rest railed this key of           | P0658             |          |           |
| Circuit<br>Performance |       |                              | Actual Duty Cycle<br>For a sample size, | >= 40%<br>>= 40 samples |                                       | P0659<br>P0960    |          |           |
|                        |       |                              | THEN report malfunction                 |                         |                                       | P0961<br>P0962    |          |           |
|                        |       |                              |   |                         |                                       | 1 0002            |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
|                        |       |                              | Case 2 <sup>.</sup>                     |                         | No Fault Pending DTC for this drive   | P0960             |          |           |
|                        |       |                              | Desired current                         | >= 500 mA               | cycle.                                | P0962             |          |           |
|                        |       |                              | AND                                     |                         | Components powered                    |                   |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
|                        |       |                              | Actual Duty Cycle                       | <= 10%                  |                                       |                   |          |           |
|                        |       |                              | r or a sample size,                     |                         | Battery voltage between               | 9V and 18V        |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
|                        |       |                              | THEN report malfunction                 |                         |                                       |                   |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
|                        |       |                              |   |                         | If Engine Cranking, then              |                   |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
|                        |       |                              |   |                         | Crank Time                            | < 4 seconds       |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
|                        |       |                              |   |                         | AND<br>Battery Voltage                | > 10 V            |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
|                        |       |                              |   |                         | High Side Driver 1 Enabled            |                   |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
|                        |       |                              |   |                         |                                       |                   |          |           |
| Component /<br>System   | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria   | Threshold Value       | Secondary Parameters           | Enable Conditions       | Time<br>Required | MIL IIIum |
|---|---------------|--|--|-----------------------|--------------------------------|-------------------------|------------------|-----------|
|   |               |  |  |                       | Shift Complete                 |                         |                  |           |
|   |               |  |  |                       | Lockup Apply Complete          |                         |                  |           |
|   |               |  |  |                       | OR<br>Lockup Release Complete  |                         |                  |           |
| Main<br>Modulation/Line<br>Pressure Control<br>Solenoid Control<br>Circuit Low  | P0962         | This test detects solenoid<br>electrical ground circuit<br>malfunctions.         | Fault pending is set at single hardware<br>fault occurrence<br>IF hardware fault is present for a sample<br>size | >= 40 samples         | Not Test Failed This Key On    | P0657<br>P0658<br>P0659 | 1050 ms          | A         |
|   |               |  | AND<br>Engine speed  | >= 15 RPM             | Components powered             |                         |                  |           |
|   |               |  | THEN initiate intrusive test by opening low side driver.   |                       | AND<br>Battery voltage between | 9V and 18V              |                  |           |
|   |               |  |  |                       | If Engine Cranking, then       |                         |                  |           |
|   |               |  | IF intrusive test indicates short to ground exists for a sample size   |                       | Crank Time                     | < 4 seconds             |                  |           |
|   |               |  |  | >= 2 samples          | AND                            |                         |                  |           |
|   |               |  | THEN report malfunction  |                       | Battery Voltage                | > 10 V                  |                  |           |
|   |               |  |  |                       | High Side Driver 1 Enabled     |                         |                  |           |
| Main<br>Modulation/Line<br>Pressure Control<br>Solenoid Control<br>Circuit High | P0963         | This test detects solenoid<br>electrical short to power<br>circuit malfunctions. | Short to power is present for  | 3 consecutive samples | Not Test Failed This Key On    | P0657                   | 75 ms            | A         |

| Component /      | Fault | Monitor Strategy           | Malfunction Criteria                      | Threshold Value | Secondary Parameters        | Enable Conditions     | Time     | MIL IIIum |
|------------------|-------|----------------------------|---|-----------------|-----------------------------|-----------------------|----------|-----------|
| Oystelli         | ooue  | Description                | AND                                       |                 |                             | P0658                 | Required |           |
|                  |       |                            | Engine speed                              | >=15 RPM        |                             | P0659                 |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            |   |                 | Components powered          |                       |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            |   |                 | Battery voltage between     | 9V and 18V            |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            |   |                 | If Engine Cranking then     |                       |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            |   |                 | Crank Time                  | < 4 seconds           |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            |   |                 | AND                         | 40.4                  |          |           |
|                  |       |                            |   |                 | Battery Voltage             | > 10 V                |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            |   |                 | High side driver 1 enabled  |                       |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
| Pressure Control | P0964 | This test detects solenoid | Fault pending is set a single hardware    |                 | Not Test Failed This Key On | P2669                 | 225 ms   | A         |
| Circuit Open     |       | malfunctions.              | IF hardware fault is present for a sample |                 | Not rest railed this key of | P2670                 |          |           |
|                  |       |                            | size                                      | >= 6 samples    |                             | P2671                 |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            | AND                                       |                 | Components powered          |                       |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            | Engine speed                              | >= 15 RPM       | AND                         |                       |          |           |
|                  |       |                            |   |                 | Battery voltage between     | $\Omega$ / and $18$ / |          |           |
|                  |       |                            |   |                 | Dattery voltage between     | 5V ANU 10V            |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            | THEN initiate intrusive test by opening   |                 |                             |                       |          |           |
|                  |       |                            | low side driver.                          |                 | If Engine Cranking, then    |                       |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |
|                  |       |                            | IF intrusive test indicates no short to   |                 | Crank Time                  | < 4 seconds           |          |           |
|                  |       |                            | ground exists for a sample size,          |                 |                             |                       |          |           |
|                  |       |                            |   |                 | AND                         |                       |          |           |
|                  |       |                            |   | >= 3 samples    | Battery Voltage             | > 10 V                |          |           |
|                  |       |                            |   |                 |                             |                       |          |           |

| Component /<br>System  | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value                     | Secondary Parameters   | Enable Conditions                                  | Time<br>Required | MIL IIIum |
|--|---------------|--|---|-------------------------------------|--|--|------------------|-----------|
|  |               |  | THEN report malfunction   |                                     | High Side Driver 2 Enabled                                       |  | logunou          |           |
| Pressure Control<br>Solenoid 2 Control<br>Circuit<br>Performance | P0965         | This test detects the<br>performance of the solenoid<br>by comparing desired<br>current to actual duty cycle | Case 1:<br>Desired current<br>AND<br>Actual Duty Cycle<br>For a sample size,<br>THEN report malfunction | <= 50 mA<br>>= 40%<br>>= 10 samples | Not Test Failed This Key On                                      | P2669<br>P2670<br>P2671<br>P0964<br>P0965<br>P0966 | 250ms            | A         |
|  |               |  | Case 2:<br>Desired current<br>AND   | >= 500 mA                           | No Fault Pending DTC for this drive cycle.<br>Components powered | P0964<br>P0966                                     |                  |           |
|  |               |  | Actual Duty Cycle<br>For a sample size,   | <= 15%<br>>= 10 samples             | AND<br>Battery voltage between                                   | 9V and 18V   |                  |           |
|  |               |  | THEN report malfunction   |                                     |  |  |                  |           |
|  |               |  |   |                                     | If Engine Cranking, then<br>Crank Time                           | < 4 seconds  |                  |           |
|  |               |  |   |                                     | AND<br>Battery Voltage   | > 10 V   |                  |           |
|  |               |  |   |                                     | High Side Driver 2 Enabled                                       |  |                  |           |
|  |               |  |   |                                     | Shift Complete   |  |                  |           |

| Component /<br>System                                 | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria   | Threshold Value       | Secondary Parameters           | Enable Conditions       | Time<br>Required | MIL IIIum |
|---|---------------|--|--|-----------------------|--------------------------------|-------------------------|------------------|-----------|
|   |               |  |  |                       | Lockup Apply Complete          |                         |                  |           |
|   |               |  |  |                       | OR<br>Lockup Release Complete  |                         |                  |           |
| Pressure Control<br>Solenoid 2 Control<br>Circuit Low | P0966         | This test detects solenoid<br>electrical ground circuit<br>malfunctions. | Fault pending is set at single hardware<br>fault occurrence<br>IF hardware fault is present for a sample<br>size | >= 6 samples          | Not Test Failed This Key On    | P2669<br>P2670<br>P2671 | 200 ms           | A         |
|   |               |  | AND<br>Engine speed  | >= 15 RPM             | Components powered             |                         |                  |           |
|   |               |  | THEN initiate intrusive test by opening<br>low side driver.  |                       | AND<br>Battery Voltage between | 9 V and 18 V            |                  |           |
|   |               |  | IF intrusive test indicates short to ground<br>exists for a sample size  |                       | If Engine Cranking, then       |                         |                  |           |
|   |               |  |  | >= 2 samples          | Crank Time                     | < 4 seconds             |                  |           |
|   |               |  | THEN report malfunction.   |                       | AND                            |                         |                  |           |
|   |               |  |  |                       | Battery Voltage                | > 10 V                  |                  |           |
|   |               |  |  |                       | High Side Driver 2 Enabled     |                         |                  |           |
| Brossure Control                                      | P0067         | This test detects colonaid   |  |                       |                                |                         | 75 mg            | ٨         |
| Solenoid 2 Control<br>Circuit High                    | FU301         | electrical short to power<br>circuit malfunctions.                       | Short to power is present for  | 3 consecutive samples | Not Test Failed This Key On    | P2669                   | 73 ms            | A         |
|   |               |  | AND<br>Engine speed  | >= 15 RPM             |                                | P2670<br>P2671<br>P0967 |                  |           |

| Component /<br>System | Fault<br>Code | Monitor Strategy<br>Description | Malfunction Criteria  | Threshold Value | Secondary Parameters        | Enable Conditions | Time<br>Required | MIL IIIum |
|-----------------------|---------------|---------------------------------|---|-----------------|-----------------------------|-------------------|------------------|-----------|
|                       |               |                                 |   |                 | Components powered          |                   |                  |           |
|                       |               |                                 |   |                 |                             |                   |                  |           |
|                       |               |                                 |   |                 | AND                         | 0.1/ 1.40.1/      |                  |           |
|                       |               |                                 |   |                 | Battery Voltage between     | 9 V and 18 V      |                  |           |
|                       |               |                                 |   |                 |                             |                   |                  |           |
|                       |               |                                 |   |                 | If Engine Cranking, then    |                   |                  |           |
|                       |               |                                 |   |                 |                             |                   |                  |           |
|                       |               |                                 |   |                 | Crank Time                  | < 4 seconds       |                  |           |
|                       |               |                                 |   |                 | ΔΝΟ                         |                   |                  |           |
|                       |               |                                 |   |                 | Battery Voltage             | > 10 V            |                  |           |
|                       |               |                                 |   |                 | High Side Driver 2 Enabled  |                   |                  |           |
|                       |               |                                 |   |                 |                             |                   |                  |           |
|                       |               |                                 |   |                 |                             |                   |                  |           |
| Pressure Control      | P2727         | This test detects solenoid      | Fault pending is set a single hardware                      |                 | Not Test Failed This Key On | P0657             | 200 ms           | A         |
| Circuit Open          |               | malfunctions.                   | IF hardware fault is present for a sample                   |                 | Not restraired this key off | P0658             |                  |           |
|                       |               |                                 | 5120  | >= 5 samples    |                             | 10005             |                  |           |
|                       |               |                                 | AND<br>Engine speed   | ~- 15 RPM       | Components powered          |                   |                  |           |
|                       |               |                                 | Ligino speca  |                 |                             |                   |                  |           |
|                       |               |                                 |   |                 | AND                         |                   |                  |           |
|                       |               |                                 | THEN initiate intrusive test by opening<br>low side driver. |                 | Battery Voltage between     | 9 V and 18 V      |                  |           |
|                       |               |                                 |   |                 |                             |                   |                  |           |
|                       |               |                                 | IF intrusive test indicates no short to                     |                 | If Engine Cranking, then    |                   |                  |           |
|                       |               |                                 | ground exists for a sample size,                            |                 |                             |                   |                  |           |
|                       |               |                                 |   |                 | Crank Time                  | < 4 seconds       |                  |           |
|                       |               |                                 |   |                 |                             |                   |                  |           |
|                       |               |                                 |   | >= 3 samples    | AND                         |                   |                  |           |
|                       |               |                                 | THEN report malfunction                                     |                 | Battery Voltage             | > 10 V            |                  |           |
|                       |               |                                 |   |                 |                             |                   |                  |           |
|                       |               |                                 |   |                 |                             |                   |                  |           |

| Component /      | Fault | Monitor Strategy             | Malfunction Criteria       | Threshold Value | Secondary Parameters                | Enable Conditions | Time     | MIL IIIum |
|------------------|-------|------------------------------|----------------------------|-----------------|-------------------------------------|-------------------|----------|-----------|
| System           | Code  | Description                  |                            |                 |                                     |                   | Required |           |
|                  |       |                              |                            |                 | High side driver 1 enabled          |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  | D0700 |                              | <b>2</b> 1                 |                 |                                     |                   | 050      |           |
| Pressure Control | P2728 | I his test detects the       | Case 1:<br>Desired current | <= 50 mA        | Not Test Failed This Key On         | P0657             | 250ms    | A         |
| Circuit          |       | by comparing desired         | AND                        |                 | Not rest railed mis key on          | P0658             |          |           |
| Performance      |       | current to actual duty cycle | Actual Duty Cycle          | >= 40%          |                                     | P0659             |          |           |
|                  |       |                              | For a sample size,         | >= 10 samples   |                                     | P2727             |          |           |
|                  |       |                              | THEN report malfunction    |                 |                                     | P2729             |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              | Case 2:                    |                 | No Fault Pending DTC for this drive | P2727             |          |           |
|                  |       |                              | Desired current            | >= 500 mA       | cycle.                              | P2729             |          |           |
|                  |       |                              | AND                        |                 | Components powered                  |                   |          |           |
|                  |       |                              |                            |                 | Components powered                  |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              | Actual Duty Cycle          | <= 15%          |                                     |                   |          |           |
|                  |       |                              | i or a sample size,        |                 | Battery voltage between             | 9V and 18V        |          |           |
|                  |       |                              |                            |                 | , , ,                               |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              | THEN report malfunction    |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 | If Engine Cranking, then            |                   |          |           |
|                  |       |                              |                            |                 | <b>0</b>                            |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 | Crank Time                          | < 4 seconds       |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 | Battery Voltage                     | > 10 V            |          |           |
|                  |       |                              |                            |                 | , , ,                               |                   |          |           |
|                  |       |                              |                            |                 | High Side Driver 1 Epobled          |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 | Shift Complete                      |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 | Lockup Apply Complete               | 1                 |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              |                            |                 |                                     |                   |          |           |
|                  |       |                              | l                          |                 | OR                                  | l                 |          |           |

| Component /<br>System                                  | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria   | Threshold Value       | Secondary Parameters           | Enable Conditions       | Time<br>Required | MIL IIIum |
|--|---------------|--|--|-----------------------|--------------------------------|-------------------------|------------------|-----------|
|  |               |  |  |                       | Lockup Release Complete        |                         |                  |           |
|  | Domo          |  |  |                       |                                |                         | 177              |           |
| Pressure Control<br>Solenoid 1 Control<br>Circuit Low  | P2729         | I his test detects solenoid<br>electrical ground circuit<br>malfunctions.        | Fault pending is set at single hardware<br>fault occurrence<br>IF hardware fault is present for a sample<br>size | >= 5 samples          | Not Test Failed This Key On    | P0657<br>P0658<br>P0659 | 175 ms           | A         |
|  |               |  | AND<br>Engine speed  | >= 15 RPM             | Components powered             |                         |                  |           |
|  |               |  | THEN initiate intrusive test by opening<br>low side driver.  |                       | AND<br>Battery Voltage between | 9 V and 18 V            |                  |           |
|  |               |  | IF intrusive test indicates short to ground<br>exists for a sample size  |                       | If Engine Cranking, then       |                         |                  |           |
|  |               |  |  |                       | Crank Time                     | < 4 seconds             |                  |           |
|  |               |  | THEN report malfunction  | >= 2 samples          | AND                            |                         |                  |           |
|  |               |  |  |                       | Battery Voltage                | > 10 V                  |                  |           |
|  |               |  |  |                       | High side driver 1 enabled     |                         |                  |           |
| Pressure Control<br>Solenoid 1 Control<br>Circuit High | P2730         | This test detects solenoid<br>electrical short to power<br>circuit malfunctions. | Short to power is present for  | 3 consecutive samples | Not Test Failed This Key On    | P0657                   | 75 ms            | A         |
|  |               |  | AND<br>Engine speed  | >= 15 RPM             |                                | P0658<br>P0659<br>P2730 |                  |           |
|  |               |  |  |                       | Components powered             |                         |                  |           |
| 1  |               |  | l  | I                     | AND                            |                         |                  | I         |

| Component /<br>System                       | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value | Secondary Parameters           | Enable Conditions       | Time<br>Required | MIL IIIum |
|---|---------------|--|---|-----------------|--------------------------------|-------------------------|------------------|-----------|
|   |               |  |   |                 | Battery Voltage between        | 9 V and 18 V            |                  |           |
|   |               |  |   |                 | If Engine Cranking, then       |                         |                  |           |
|   |               |  |   |                 | Crank Time                     | < 4 seconds             |                  |           |
|   |               |  |   |                 | AND<br>Battery Voltage         | > 10 V                  |                  |           |
|   |               |  |   |                 | High side driver 1 enabled     |                         |                  |           |
|   |               |  |   |                 |                                |                         |                  |           |
| Shift Solenoid 1<br>Control Circuit<br>Open | P0972         | This test detects solenoid<br>electrical open circuit<br>malfunctions. | Fault pending is set a single hardware<br>fault occurrence<br>IF hardware fault is present for a sample<br>size | >= 10 samples   | Not Test Failed This Key On    | P2669<br>P2670<br>P2671 | 325 ms           | A         |
|   |               |  | AND<br>Engine speed   | >= 15 RPM       | Components powered             |                         |                  |           |
|   |               |  | THEN initiate intrusive test by opening<br>low side driver.   |                 | AND<br>Battery Voltage between | 9 V and 18 V            |                  |           |
|   |               |  | IF intrusive test indicates no short to<br>ground exists for a sample size,                                     |                 | If Engine Cranking, then       |                         |                  |           |
|   |               |  |   |                 | Crank Time                     | < 4 seconds             |                  |           |
|   |               |  |   | >= 3 samples    | AND                            |                         |                  |           |
|   |               |  | THEN report malfunction   |                 | Battery Voltage                | > 10 V                  |                  |           |
|   |               |  |   |                 | High side driver 2 enabled     |                         |                  |           |
| I   | 1             | 1  | I   | 1               | I                              |                         |                  | I         |

| Component /<br>System                    | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria   | Threshold Value       | Secondary Parameters           | Enable Conditions       | Time<br>Required | MIL IIIum |
|--|---------------|--|--|-----------------------|--------------------------------|-------------------------|------------------|-----------|
| Shift Solenoid 1<br>Control Circuit Low  | P0973         | This test detects solenoid<br>electrical ground circuit<br>malfunctions.         | Fault pending is set at single hardware<br>fault occurrence<br>IF hardware fault is present for a sample<br>size | >= 10 samples         | Not Test Failed This Key On    | P2669<br>P2670<br>P2671 | 300 ms           | A         |
|  |               |  | AND<br>Engine speed  | >= 15 RPM             | Components powered             |                         |                  |           |
|  |               |  | THEN initiate intrusive test by opening<br>low side driver.  |                       | AND<br>Battery Voltage between | 9 V and 18 V            |                  |           |
|  |               |  | IF intrusive test indicates short to ground<br>exists for a sample size  |                       | If Engine Cranking, then       |                         |                  |           |
|  |               |  |  | >= 2 samples          | Crank Time                     | < 4 seconds             |                  |           |
|  |               |  | THEN report malfunction  |                       | AND                            |                         |                  |           |
|  |               |  |  |                       | Battery Voltage                | > 10 V                  |                  |           |
|  |               |  |  |                       | High side driver 2 enabled     |                         |                  |           |
|  |               |  |  |                       |                                |                         |                  |           |
| Shift Solenoid 1<br>Control Circuit High | P0974         | This test detects solenoid<br>electrical short to power<br>circuit malfunctions. | Short to power is present for  | 3 consecutive samples | Not Test Failed This Key On    | P2669                   | 75 ms            | A         |
|  |               |  | AND<br>Engine speed  | >= 15 RPM             |                                | P2670<br>P2671          |                  |           |
|  |               |  |  |                       | Components powered             | P0974                   |                  |           |
|  |               |  |  |                       | AND<br>Battery Voltage between | 9 V and 18 V            |                  |           |
|  |               |  |  |                       |                                |                         |                  |           |

| Component /<br>System                       | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value | Secondary Parameters           | Enable Conditions       | Time<br>Required | MIL IIIum |
|---|---------------|--|---|-----------------|--------------------------------|-------------------------|------------------|-----------|
|   |               |  |   |                 | If Engine Cranking, then       |                         |                  |           |
|   |               |  |   |                 | Crank Time                     | < 4 seconds             |                  |           |
|   |               |  |   |                 | AND<br>Battery Voltage         | > 10 V                  |                  |           |
|   |               |  |   |                 | High side driver 2 enabled     |                         |                  |           |
|   |               |  |   |                 |                                |                         |                  |           |
| Shift Solenoid 2<br>Control Circuit<br>Open | P0975         | This test detects solenoid<br>electrical open circuit<br>malfunctions.   | Fault pending is set a single hardware<br>fault occurrence<br>IF hardware fault is present for a sample<br>size | >= 10 samples   | Not Test Failed This Key On    | P2669<br>P2670<br>P2671 | 325 ms           | A         |
|   |               |  | AND<br>Engine speed   | >= 15 RPM       | Components powered             |                         |                  |           |
|   |               |  | THEN initiate intrusive test by opening<br>low side driver.   |                 | AND<br>Battery Voltage between | 9 V and 18 V            |                  |           |
|   |               |  | IF intrusive test indicates no short to<br>ground exists for a sample size,                                     |                 | If Engine Cranking, then       |                         |                  |           |
|   |               |  |   |                 | Crank Time                     | < 4 seconds             |                  |           |
|   |               |  |   | >= 3 samples    | AND                            |                         |                  |           |
|   |               |  | THEN report malfunction   |                 | Battery Voltage                | > 10 V                  |                  |           |
|   |               |  |   |                 | High side driver 2 enabled     |                         |                  |           |
| Shift Solenoid 2<br>Control Circuit Low     | P0976         | This test detects solenoid<br>electrical ground circuit<br>malfunctions. | Fault pending is set at single hardware<br>fault occurrence<br>IF hardware fault is present for a sample        |                 | Not Test Failed This Key On    | P2669<br>P2670          | 300 ms           | A         |

| Component /<br>System                    | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria   | Threshold Value       | Secondary Parameters           | Enable Conditions | Time<br>Required | MIL IIIum |
|--|---------------|--|--|-----------------------|--------------------------------|-------------------|------------------|-----------|
|  |               |  | size   | >= 10 samples         |                                | P2671             |                  |           |
|  |               |  | AND<br>Engine speed  | >= 15 RPM             | Components powered             |                   |                  |           |
|  |               |  | THEN initiate intrusive test by opening<br>low side driver.          |                       | AND<br>Battery Voltage between | 9 V and 18 V      |                  |           |
|  |               |  | IF intrusive test indicates short to ground exists for a sample size |                       | If Engine Cranking, then       |                   |                  |           |
|  |               |  |  | >= 2 samples          | Crank Time                     | < 4 seconds       |                  |           |
|  |               |  | THEN report malfunction  |                       | AND                            |                   |                  |           |
|  |               |  |  |                       | Battery Voltage                | > 10 V            |                  |           |
|  |               |  |  |                       | High side driver 2 enabled     |                   |                  |           |
|  |               |  |  |                       |                                |                   |                  |           |
| Shift Solenoid 2<br>Control Circuit High | P0977         | This test detects solenoid<br>electrical short to power<br>circuit malfunctions. | Short to power is present for  | 3 consecutive samples | Not Test Failed This Key On    | P2669             | 75 ms            | A         |
|  |               |  | AND<br>Engine speed  | >= 15 RPM             |                                | P2670<br>P2671    |                  |           |
|  |               |  |  |                       | Components powered             | P0977             |                  |           |
|  |               |  |  |                       | AND<br>Battery Voltage between | 9 V and 18 V      |                  |           |
|  |               |  |  |                       | If Engine Cranking, then       |                   |                  |           |
|  | 1             | l  | I  | 1                     | I                              |                   |                  |           |

| Component /<br>System                    | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria   | Threshold Value       | Secondary Parameters                                 | Enable Conditions       | Time<br>Required | MIL IIIum |
|--|---------------|--|--|-----------------------|--|-------------------------|------------------|-----------|
|  |               |  |  |                       | Crank Time<br>AND                                    | < 4 seconds             |                  |           |
|  |               |  |  |                       | Battery Voltage                                      | > 10 V                  |                  |           |
|  |               |  |  |                       | High side driver 2 enabled                           |                         |                  |           |
|  | D0070         |  |  |                       |  |                         | 450              |           |
| Control Circuit Low                      | P0979         | electrical ground circuit<br>malfunctions.                                       | Fault pending is set at single hardware<br>fault occurrence<br>IF hardware fault is present for a sample<br>size | >= 6 samples          | Not Test Failed This Key On                          | P2669<br>P2670<br>P2671 | 150 ms           | A         |
|  |               |  | AND<br>Engine speed  | >= 15 RPM             |  | P0979                   |                  |           |
|  |               |  | THEN report malfunction  |                       | Components powered                                   |                         |                  |           |
|  |               |  |  |                       | AND<br>Battery Voltage between                       | 9 V and 18 V            |                  |           |
|  |               |  |  |                       | If Engine Cranking, then                             |                         |                  |           |
|  |               |  |  |                       | Crank Time   | < 4 seconds             |                  |           |
|  |               |  |  |                       | AND<br>Battery Voltage                               | > 10 V                  |                  |           |
|  |               |  |  |                       | High side driver 2 enabled                           |                         |                  |           |
|  |               |  |  |                       | Commanded gear NOT Reverse Trim,<br>NOT 5th, NOT 6th |                         |                  |           |
| Shift Solenoid 3<br>Control Circuit High | P0980         | This test detects solenoid<br>electrical short to power<br>circuit malfunctions. | Short to power is present for  | 3 consecutive samples | Not Test Failed This Key On                          | P2669                   | 75 ms            | A         |
|  |               |  | AND  |                       |  | P2670                   |                  |           |

| Component /<br>System               | Fault<br>Code | Monitor Strategy<br>Description                        | Malfunction Criteria  | Threshold Value | Secondary Parameters             | Enable Conditions | Time<br>Required | MIL IIIum |
|-------------------------------------|---------------|--|---|-----------------|----------------------------------|-------------------|------------------|-----------|
|                                     |               |  | Engine speed  | >= 15 RPM       |                                  | P2671             |                  |           |
|                                     |               |  |   |                 |                                  | P0980             |                  |           |
|                                     |               |  |   |                 | Components powered               |                   |                  |           |
|                                     |               |  |   |                 |                                  |                   |                  |           |
|                                     |               |  |   |                 |                                  |                   |                  |           |
|                                     |               |  |   |                 | Battery Voltage between          | 9 V and 18 V      |                  |           |
|                                     |               |  |   |                 |                                  |                   |                  |           |
|                                     |               |  |   |                 |                                  |                   |                  |           |
|                                     |               |  |   |                 | If Engine Cranking, then         |                   |                  |           |
|                                     |               |  |   |                 |                                  |                   |                  |           |
|                                     |               |  |   |                 | Crank Time                       | < 4 seconds       |                  |           |
|                                     |               |  |   |                 |                                  |                   |                  |           |
|                                     |               |  |   |                 | AND<br>Battery Voltage           | > 10 V            |                  |           |
|                                     |               |  |   |                 |                                  |                   |                  |           |
|                                     |               |  |   |                 | High side driver 2 enabled       |                   |                  |           |
|                                     |               |  |   |                 |                                  |                   |                  |           |
|                                     |               |  |   |                 |                                  |                   |                  |           |
|                                     |               |  |   |                 | Commanded gear NOT Reverse Trim, |                   |                  |           |
|                                     |               |  |   |                 | NOT 5th, NOT 6th                 |                   |                  |           |
| Actuator Supply 1<br>(HSD1) Voltage | P0657         | This test detects if the<br>voltage measured at the    | Report malfunction when the number of<br>failure events                         | >= 3            | Not Test Failed This Key On      | P0657             | 75 ms            | A         |
| Open                                |               | HSD1 detection circuit shows                           | AND<br>Engine speed   | ~- 15 RPM       | HSD1 is commanded ON             |                   |                  |           |
|                                     |               | detection circuits indicate                            | Engine speed  |                 | TIGD TIS commanded ON            |                   |                  |           |
|                                     |               | open, but the high side<br>detection circuit indicates |   |                 |                                  |                   |                  |           |
|                                     |               | high voltage.  |   |                 |                                  |                   |                  |           |
|                                     |               |  | A failure event occurs when the number of<br>failed solenoids connected to HSD1 |                 | Components powered               |                   |                  |           |
|                                     |               |  |   |                 |                                  |                   |                  |           |
|                                     |               |  |   |                 | AND                              | 0.1/ and 10.1/    |                  |           |
|                                     |               |  |   | <i>&gt;= 2</i>  | Dallery vollage between          | and 10 A          |                  |           |
|                                     |               |  |   |                 |                                  |                   |                  |           |
|                                     |               |  | AND<br>HSD1 voltage   | >= 6V           | If Engine Cranking, then         |                   |                  |           |
|                                     |               |  | Ĭ   |                 |                                  |                   |                  |           |
|                                     |               |  |   |                 |                                  |                   |                  |           |

| Component /<br>System                      | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value | Secondary Parameters        | Enable Conditions | Time<br>Required | MIL IIIum |
|--|---------------|--|---|-----------------|-----------------------------|-------------------|------------------|-----------|
|  |               |  |   |                 | Crank Time<br>AND           | < 4 seconds       |                  |           |
|  |               |  |   |                 | Battery Voltage             | > 10 V            |                  |           |
| Actuator Supply 1<br>(HSD1) Voltage<br>Low | P0658         | This test detects low voltage<br>when high voltage is<br>expected indicating a short to  | Report malfunction when short to ground<br>is detected for a number of events |                 | Not Test Failed This Key On | P0658             | 75 ms            | A         |
|  |               | ground at the circuit.   |   | >= 3 times      | HSD1 is commanded ON        |                   |                  |           |
|  |               |  |   |                 |                             |                   |                  |           |
|  |               |  | Engine speed  | >= 15 RPM       | Components powered          |                   |                  |           |
|  |               |  |   |                 | AND                         |                   |                  |           |
|  |               |  |   |                 | Battery Voltage between     | 9 V and 18 V      |                  |           |
|  |               |  |   |                 | If Engine Cranking, then    |                   |                  |           |
|  |               |  |   |                 |                             |                   |                  |           |
|  |               |  |   |                 | Crank Time                  | < 4 seconds       |                  |           |
|  |               |  |   |                 | AND<br>Battery Voltage      | > 10 V            |                  |           |
| Actuator Supply 1                          | P0659         | This test detects if the   |   |                 |                             |                   | 18.75 ms         | A         |
| High                                       |               | HSD 1 detection circuit<br>indicates high during<br>initialization (when the circuit   | During initialization, report malfunction when the number of failure events   |                 | During initialization       |                   |                  |           |
|  |               | is off)  |   | >= 3 times      |                             |                   |                  |           |
|  |               |  | A failure event occurs when HSD1 voltage                                      | >= 6V           |                             |                   |                  |           |
| Actuator Supply2                           | P2669         | This test detects if the   | Report malfunction when the number of   | >= 3            | Not Test Failed This Koy On | P2669             | 75 ms            | A         |
| (HSD2) Voltage<br>Open                     |               | HSD2 detection circuit shows   | AND   | >= 3            |                             | F2003             |                  |           |
|  |               | Inat multiple low side<br>detection circuits indicate<br>open, but the high side<br>detection circuit indicates<br>high voltage. | Engine speed  | N''N' CI =<     | IS Commanded ON             |                   |                  |           |
|  |               | 5  |   |                 |                             |                   |                  |           |

| Component /                         | Fault | Monitor Strategy  | Malfunction Criteria                      | Threshold Value | Secondary Parameters        | Enable Conditions | Time     | MIL IIIum |
|-------------------------------------|-------|---|---|-----------------|-----------------------------|-------------------|----------|-----------|
| System                              | Code  | Description   | A failure event occurs when the number of |                 | Components powered          |                   | Required |           |
|                                     |       |   | failed solenoids connected to HSD2        |                 |                             |                   |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   |   |                 | AND                         |                   |          |           |
|                                     |       |   |   | >= 2            | Battery Voltage between     | 9 V and 18 V      |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   | AND                                       |                 |                             |                   |          |           |
|                                     |       |   | HSD2 voltage                              | >= 6V           | If Engine Cranking, then    |                   |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   |   |                 | Crank Time                  | < 4 seconds       |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   |   |                 | AND<br>Battery Voltage      | > 10 V            |          |           |
|                                     | D0070 |   |   |                 |                             |                   | 76       |           |
| (HSD2) Voltage                      | P2670 | when high voltage is                                      | Report malfunction when short to ground   |                 | Not Test Failed This Key On | P2670             | 75 ms    | A         |
| Low                                 |       | expected indicating a short to                            | is detected for a number of events        | s – 2 timos     |                             |                   |          |           |
|                                     |       | ground at the circuit.                                    |   | >= 5 times      | HSD2 is commanded ON        |                   |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   | AND                                       | >= 15 PDM       |                             |                   |          |           |
|                                     |       |   | Liigiile speeu                            | 2- 13 Kr W      | Components powered          |                   |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   |   |                 | AND                         |                   |          |           |
|                                     |       |   |   |                 | Battery Voltage between     | 9 V and 18 V      |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   |   |                 | If Engine Cranking, then    |                   |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   |   |                 | Crank Time                  | < 4 seconds       |          |           |
|                                     |       |   |   |                 |                             |                   |          |           |
|                                     |       |   |   |                 | AND<br>Battery Voltage      | > 10 V            |          |           |
|                                     | D0071 |   |   |                 |                             |                   | 10.75    |           |
| Actuator Supply 2<br>(HSD2) Voltage | P2671 | I his test detects if the<br>voltage measured at the      |   |                 |                             |                   | 18.75 ms | A         |
| High                                |       | HSD 2 detection circuit                                   | During initialization, report malfunction |                 | During initialization       |                   |          |           |
|                                     |       | indicates high during<br>initialization (when the circuit | when the number of failure events         |                 |                             |                   |          |           |
|                                     |       | is off)   |   | >= 3 timos      |                             |                   |          |           |
|                                     |       |   |   | 2- 3 IIIIES     |                             |                   |          |           |
|                                     |       |   | A failure event occurs when HSD1          | l               | I                           |                   |          |           |

| Component /<br>System  | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value                    | Secondary Parameters                       | Enable Conditions                                  | Time<br>Required | MIL IIIum |
|--|---------------|--|---|------------------------------------|--|--|------------------|-----------|
|  |               |  | voltage   | 2>= 6V                             |  |  |                  |           |
| TCC Pressure<br>Control Solenoid<br>Control Circuit<br>Open        | P2761         | This test detects torque<br>converter solenoid electrical<br>open circuit malfunctions.                      | Fault pending is set a single hardware<br>fault occurrence<br>IF hardware fault is present for a sample<br>size | >= 120 samples                     | Not Test Failed This Key On                | P0657<br>P0658<br>P0659                            | 3075 ms          | В         |
|  |               |  | AND<br>Engine speed   | >= 15 RPM                          | Components powered                         |  |                  |           |
|  |               |  | THEN initiate intrusive test by opening low side driver.  |                                    | AND<br>Battery Voltage between             | 9 V and 18 V                                       |                  |           |
|  |               |  | IF intrusive test indicates no short to<br>ground exists for a sample size,                                     |                                    | If Engine Cranking, then                   |  |                  |           |
|  |               |  |   |                                    | Crank Time                                 | < 4 seconds  |                  |           |
|  |               |  |   | >= 3 samples                       | AND  |  |                  |           |
|  |               |  | THEN report malfunction   |                                    | Battery Voltage                            | > 10 V   |                  |           |
|  |               |  |   |                                    | High side driver 1 enabled                 |  |                  |           |
| TCC Pressure<br>Control Solenoid<br>Control Circuit<br>Performance | P2762         | This test detects the<br>performance of the solenoid<br>by comparing desired<br>current to actual duty cycle | Case 1:<br>Desired current<br>AND<br>Actual Duty Cycle<br>For a sample size,<br>THEN report malfunction         | <= 0 mA<br>>= 40%<br>>= 40 samples | Not Test Failed This Key On                | P0657<br>P0658<br>P0659<br>P2761<br>P2762<br>P2763 | 1000 ms          | В         |
|  |               |  | Case 2:<br>Desired current<br>AND   | >= 500 mA                          | No Fault Pending DTC for this drive cycle. | P2761<br>P2763                                     |                  |           |

| Outer     Outer     Outer Hold     Negated       Image: Spring stress of the  |
|---|
| Actual Duty Cycle <= 10%  |
| Actual Dury Oyde See 10%<br>For a sample size, See 40 samples we also samples and Battery voltage between by and 18V<br>THEN report malfunction<br>If Engine Cranking, then<br>Crank Time 4 seconds<br>If Engine Cranking by and 18V<br>If Engine Cranking, then<br>If Engi |
| For a sample size, >= 40 samples AND   Battery voltage between 9V and 18V   THEN report malfunction If Engine Cranking, then Crank Time 4 seconds Battery Voltage 10 V High Side Driver 1 Enabled Shift Complete  |
| THEN report maifunction       If Engine Cranking, then         If Engine Cranking, then </td  |
| THEN report malfunction     If Engine Cranking, then     If Engine Cranking, then     Crank Time     A seconds     If Engine Cranking, then     If Engine Cranking, then </td   |
| THEN report malfunction<br>If Engine Cranking, then<br>Then Peport malfunction<br>If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>10 V<br>High Side Driver 1 Enabled<br>Shift Complete  |
| If Engine Cranking, then<br>If Engine Cranking, then<br>Crank Time < 4 seconds<br>Crank Time < 4 seconds<br>AND<br>Battery Voltage<br>> 10 V<br>High Side Driver 1 Enabled<br>Shift Complete  |
| If Engine Cranking, then   If Engine Cranking, then   Crank Time   If Engine Cranking, then   If Engine Cranking, then </td  |
| If Engine Cranking, then<br>Crank Time < 4 seconds<br>AND<br>Battery Voltage<br>I 0 V<br>High Side Driver 1 Enabled<br>Shift Complete   |
| Image: Crank Time 4 seconds   Image: Crank Time 4 seconds   Image: Crank Time 4 seconds   Image: Crank Time 10 V   Image: Crank Time 10 V   Image: Crank Time Image: Crank Time   |
| Image: Second secon   |
| AND       AND         Battery Voltage       > 10 V         High Side Driver 1 Enabled       Shift Complete  |
| AND       AND         Battery Voltage       > 10 V         High Side Driver 1 Enabled   |
| Image: Shift Complete   |
| High Side Driver 1 Enabled  |
| High Side Driver 1 Enabled  |
| Shift Complete  |
| Shift Complete  |
| Shift Complete  |
| Shift Complete  |
|   |
|   |
| Lockup Apply Complete   |
|   |
|   |
| OR  |
| Lockup Release Complete   |
|   |
|   |
| TCC Pressure P2763 This test detects solenoid 75 ms B   |
| Control Solenoid electrical short to power Short to power is present for 3 consecutive samples Not Test Failed This Key On P0657<br>Control Circuit High circuit malfunctions.  |
|   |
|   |
| AND P0658   |
| Elgine speed >= 15 KPW P0059  |
| P2763   |
| Components powered  |
|   |

| Component /<br>System                                   | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria   | Threshold Value | Secondary Parameters           | Enable Conditions       | Time<br>Required | MIL IIIum |
|---|---------------|--|--|-----------------|--------------------------------|-------------------------|------------------|-----------|
|   |               |  |  |                 | AND<br>Battery Voltage between | 9 V and 18 V            | rioquiiou        |           |
|   |               |  |  |                 | If Engine Cranking, then       |                         |                  |           |
|   |               |  |  |                 | Crank Time                     | < 4 seconds             |                  |           |
|   |               |  |  |                 | AND<br>Battery Voltage         | > 10 V                  |                  |           |
|   |               |  |  |                 | High side driver 1 enabled     |                         |                  |           |
|   |               |  |  |                 |                                |                         |                  |           |
| TCC Pressure<br>Control Solenoid<br>Control Circuit Low | P2764         | This test detects solenoid<br>electrical ground circuit<br>malfunctions. | Fault pending is set at single hardware<br>fault occurrence<br>IF hardware fault is present for a sample<br>size | >= 120 samples  | Not Test Failed This Key On    | P0657<br>P0658<br>P0659 | 3050 ms          | В         |
|   |               |  | AND<br>Engine speed  | >= 15 RPM       | Components powered             |                         |                  |           |
|   |               |  | THEN initiate intrusive test by opening<br>low side driver   |                 | AND<br>Battery Voltage between | 9 V and 18 V            |                  |           |
|   |               |  | IF intrusive test indicates short to ground exists for a sample size   |                 | If Engine Cranking, then       |                         |                  |           |
|   |               |  |  | >= 2 samples    | Crank Time                     | < 4 seconds             |                  |           |
|   |               |  | THEN report malfunction  |                 | AND                            |                         |                  |           |
|   |               |  |  |                 | Battery Voltage                | > 10 V                  |                  |           |

| Component /<br>System         | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value        | Secondary Parameters   | Enable Conditions                         | Time<br>Required | MIL IIIum |
|-------------------------------|---------------|--|---|------------------------|--|---|------------------|-----------|
|                               |               |  |   |                        | High side driver 1 enabled   |   |                  |           |
|                               |               |  |   |                        |  |   |                  |           |
| Miscellaneous                 | P2771         | This test detects abnormal   | Case 1 (Stuck Off)  | 1                      |  |   | 5 seconds        | В         |
| Switch Circuit<br>Malfunction |               | drive indication switch input<br>by comparing switch state<br>range to calculated range. | This test fails when, for number of<br>occurrences,<br>the transfer case 4WD switch indicates<br>High range and the calculated transfer<br>case range is Low range for a time | >= 200<br>>= 5 seconds | Not Test Failed This Key On<br>No Fault Active DTCs for this drive cycle | P2771<br>P0721<br>P0722<br>P2771<br>P0721 | 5 3000103        |           |
|                               |               |  | Case 2 (Stuck On)   |                        | No Fault Pending DTCs for this drive cycle                               | P0722<br>P0721                            |                  |           |
|                               |               |  | This test fails when, for number of<br>occurrences,<br>the transfer case 4WD switch indicates<br>Low range and the calculated transfer  | >= 200                 | Output Speed   | P0722<br>> 60 RPM                         |                  |           |
|                               |               |  | case range is migh range for a line   |                        | Transfer Case is NOT Neutral   |   |                  |           |
|                               |               |  |   | >= 5 seconds.          | Transmission fluid temperature   | > 20 deg. C and < 130 deg. C              |                  |           |
|                               |               |  |   |                        | Engine Speed between   | 200 RPM and 7500 RPM                      |                  |           |
|                               |               |  |   |                        | Shift complete AND   |   |                  |           |
|                               |               |  |   |                        |  |   |                  |           |
| Transmission<br>Component     | P0894         | This test detects the number<br>of turbine slip events during                            | For this ignition cycle, when the number<br>of Neutral Locked Turbine (NLT) Slip  |                        |  |   | 8075 ms          | В         |

| Component /<br>System                | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value | Secondary Parameters           | Enable Conditions    | Time<br>Required | MIL IIIum |
|--------------------------------------|---------------|--|---|-----------------|--------------------------------|----------------------|------------------|-----------|
| Slipping                             |               | the Neutral Locked Turbine<br>(NLT) request from engine<br>controller. | events,   |                 | Components powered             |                      |                  |           |
|                                      |               |  | then report fail  | >= 3            | AND<br>Battery Voltage between | 9 V and 18 V         |                  |           |
|                                      |               |  | Where number of NLT Slip events for this<br>ignition cycle = Number of accumulated<br>NLT Slip events – Number of NLT Slip<br>events from previous ignition cycles. |                 | Engine Speed between           | 200 RPM and 7500 RPM |                  |           |
|                                      |               |  |   |                 | for                            | 5 seconds            |                  |           |
|                                      |               |  | And, where number of accumulated NLT<br>Slip events is incremented when<br>commanded gear or attained gear is NLT   |                 |                                |                      |                  |           |
|                                      |               |  | AND<br>turbine speed  | > 50 RPM        |                                |                      |                  |           |
|                                      |               |  | for a time  | > 3 seconds.    |                                |                      |                  |           |
|                                      |               |  |   |                 |                                |                      |                  |           |
| Ignition Switch<br>Run/Start Circuit | P2534         | Out of range low.  |   |                 |                                |                      | 35 seconds       | A         |
|                                      |               |  | Ignition voltage  | < 5 volts       | Not Test Failed This Key On    | P2534                |                  |           |
|                                      |               |  | for a time  | >= 30 seconds   |                                |                      |                  |           |
|                                      |               |  |   |                 | Components powered             |                      |                  |           |
|                                      |               |  |   |                 | AND<br>Battery Voltage between | 9 V and 18 V         |                  |           |
|                                      |               |  |   |                 | Engine Speed between           | 200 RPM and 7500 RPM |                  |           |
|                                      |               |  |   |                 | for                            | 5 seconds            |                  |           |

| Component /<br>System                              | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction Criteria  | Threshold Value | Secondary Parameters                            | Enable Conditions    | Time<br>Required | MIL IIIum |
|--|---------------|---|---|-----------------|---|----------------------|------------------|-----------|
| GMLAN Bus Reset<br>Counter Overrun                 | U0073         | This test detects if the<br>GMLAN bus is off for a<br>calibration duration.   | CANB_bus is off for a time  | >= 3 seconds    | Components powered                              |                      | 8 seconds        | В         |
|  |               |   |   |                 | AND<br>Battery Voltage between                  | 9 V and 18 V         |                  |           |
|  |               |   |   |                 | Engine Speed between                            | 200 RPM and 7500 RPM |                  |           |
|  |               |   |   |                 | for   | 5 seconds            |                  |           |
| GMLAN ECM<br>Controller State of<br>Health Failure | U0100         | This test detects CAN<br>(GMLAN) bus failures by<br>detecting State of Health<br>failures in GMLAN message<br>\$191 from ECM. | Case 1 (x out of y):  |                 | All Cases<br>Components powered AND             |                      | 8 seconds        | В         |
|  |               |   | The failure counter increments when a<br>State of Health (SOH) failure is detected.<br>A SOH failure occurs when message is |                 | Battery Voltage between                         | 9 V and 18 V         |                  |           |
|  |               |   | missing. When the failure counter is a number of samples  |                 | Engine Speed between                            | 200 RPM and 7500 RPM |                  |           |
|  |               |   |   |                 | for   | 5 seconds            |                  |           |
|  |               |   |   | >= 5 samples    |   |                      |                  |           |
|  |               |   | out of a number of samples,   | 7 samples       | Ignition Key State is RUN                       |                      |                  |           |
|  |               |   | report fail.  |                 | CMI AN manage \$101 is received from            |                      |                  |           |
|  |               |   | Case 2 ( intermittent):   |                 | GIVIL-AN THESSAGE \$191 IS TECEIVED ITOM<br>ECM |                      |                  |           |
|  |               |   | Report fail, when the failure counter   | > 0 counts      |   |                      |                  |           |

| Component /<br>System                                      | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction Criteria   | Threshold Value | Secondary Parameters   | Enable Conditions                                      | Time<br>Required             | MIL IIIum |
|--|---------------|---|--|-----------------|--|--|------------------------------|-----------|
|  |               |   | for a number of sample windows   | < 5 samples     | Enable criteria met for a time   | > 3 seconds  |                              |           |
| Brake Switch<br>Circuit                                    | P0571         | This test counts how many<br>vehicle acceleration events<br>occur while the brake switch<br>indicates "ON" or the number<br>of vehicle deceleration<br>events while the brake switch<br>indicates "OFF" | Case 1:<br>The number of vehicle accelerations with<br>the brake switch "on"   | >= 10           | All Cases<br>Not Test Failed This Key On<br>No Fault Pending DTCs                                | P0571<br>P0721<br>P0722<br>P0721                       | 10<br>Acceleration<br>Events | С         |
|  |               |   | Case 2:<br>The number of vehicle decelerations with<br>the brake switch "off"  | >= 10           | Not Fault Active<br>Components powered<br>AND<br>Battery Voltage between<br>Engine Speed between | P0722<br>P0703<br>9 V and 18 V<br>200 RPM and 7500 RPM | 10<br>Deceleration<br>Events |           |
| Brake Pedal<br>Possition Switch<br>Signal Rolling<br>Count | P0703         | This test detects rolling count<br>failures for the Brake Switch<br>GMLAN Message   | The failure count increments when the<br>GMLAN message is not received or the<br>rolling counter does not agree with the<br>expected value |                 | for<br>Components powered<br>AND<br>Battery Voltage between                                      | 5 seconds<br>9 V and 18 V                              | 15 seconds                   | С         |

| Component /<br>System     | Fault<br>Code | Monitor Strategy<br>Description         | Malfunction Criteria   | Threshold Value | Secondary Parameters        | Enable Conditions    | Time<br>Required | MIL IIIum |
|---------------------------|---------------|---|--|-----------------|-----------------------------|----------------------|------------------|-----------|
|                           |               |   |  |                 | Engine Speed between        | 200 RPM and 7500 RPM |                  |           |
|                           |               |   | When the failure counter is  | > 5             |                             |                      |                  |           |
|                           |               |   | for a time of  | > 10 seconds    | for                         | 5 seconds            |                  |           |
|                           |               |   | Report Failure   |                 |                             |                      |                  |           |
| Upshift Switch<br>Circuit | P0815         | This test detects the upshift switch ON | When PRNDL state is N, P or R  |                 | Not Test Failed This Key On | P0826                | 603 seconds      | С         |
|                           |               |   | and has been unchanged   |                 |                             | P0708                |                  |           |
|                           |               |   | for a time   | >= 2.5 seconds  |                             |                      |                  |           |
|                           |               |   | AND  |                 | Components powered          |                      |                  |           |
|                           |               |   | upshift switch state is ON   |                 | AND                         |                      |                  |           |
|                           |               |   | for a time   | >= 3 seconds.   | Battery Voltage between     | 9 V and 18 V         |                  |           |
|                           |               |   | AND  |                 | Engine Speed between        | 200 RPM and 7500 RPM |                  |           |
|                           |               |   | When PRNDL state is a forward range<br>and has been unchanged for a time |                 | for                         | 5 seconds            |                  |           |
|                           |               |   |  | >= 2.5 seconds  |                             |                      |                  |           |
| 1                         |               |   | AND  | I               | I                           |                      |                  |           |

| Component /         | Fault | Monitor Strategy   | Malfunction Criteria                  | Threshold Value | Secondary Parameters        | Enable Conditions    | Time        | MIL IIIum |
|---------------------|-------|--|---------------------------------------|-----------------|-----------------------------|----------------------|-------------|-----------|
| System              | Code  | Description  | upshift switch state is ON            |                 |                             |                      | Required    |           |
|                     |       |  |                                       |                 |                             |                      |             |           |
|                     |       |  |                                       |                 |                             |                      |             |           |
|                     |       |  | for a time                            | >= 600 seconds. |                             |                      |             |           |
| Davidati (1 Ovitati | Donac | This 45 st slada sta 46 s                                |                                       |                 |                             |                      | 000 0       | 0         |
| Circuit             | P0816 | downshift switch ON.                                     |                                       |                 |                             |                      | 603 Seconas | C         |
|                     |       |  | When PRNDL state is N, P or R and has |                 | Not Test Failed This Key On | P0826                |             |           |
|                     |       |  | been unchanged                        | >= 2.5 seconds  |                             | P0708                |             |           |
|                     |       |  |                                       | 2.0 3000103     |                             |                      |             |           |
|                     |       |  | AND                                   |                 | Components powered          |                      |             |           |
|                     |       |  |                                       |                 |                             |                      |             |           |
|                     |       |  | downshift switch state is ON          |                 |                             |                      |             |           |
|                     |       |  |                                       |                 |                             |                      |             |           |
|                     |       |  |                                       |                 |                             |                      |             |           |
|                     |       |  | for a time.                           | >= 3 seconds.   | Battery Voltage between     | 9 V and 18 V         |             |           |
|                     |       |  |                                       |                 |                             |                      |             |           |
|                     |       |  |                                       |                 |                             |                      |             |           |
|                     |       |  | AND                                   |                 |                             |                      |             |           |
|                     |       |  |                                       |                 | Engine Speed between        | 200 RPM and 7500 RPM |             |           |
|                     |       |  |                                       |                 |                             |                      |             |           |
|                     |       |  | When PRNDL state is a forward range   |                 | (m. 1)                      | C                    |             |           |
|                     |       |  | and has been unchanged for a time     |                 |                             | 5 seconds            |             |           |
|                     |       |  |                                       | >= 2.5 seconds  |                             |                      |             |           |
|                     |       |  |                                       |                 |                             |                      |             |           |
|                     |       |  | AND                                   |                 |                             |                      |             |           |
|                     |       |  |                                       |                 |                             |                      |             |           |
|                     |       |  |                                       |                 |                             |                      |             |           |
|                     |       |  | for a time                            | >= 600 seconds. |                             |                      |             |           |
|                     |       |  |                                       |                 |                             |                      |             |           |
| Up and Down Shift   | P0826 | This test detects  |                                       |                 |                             |                      | 10 seconds  | С         |
| Switch Circuit      |       | upshift/downshift switch<br>circuit at an illegal state. | Switch state is ILLEGAL for a time    | >= 10 seconds.  | Not Test Failed This Key On | P0826                |             |           |
|                     |       | -  |                                       |                 |                             |                      |             |           |

| Component /<br>System           | Fault<br>Code | Monitor Strategy<br>Description                                 | Malfunction Criteria  | Threshold Value | Secondary Parameters           | Enable Conditions    | Time<br>Required | MIL IIIum |
|---------------------------------|---------------|---|---|-----------------|--------------------------------|----------------------|------------------|-----------|
|                                 |               |   |   |                 | Components powered             |                      |                  |           |
|                                 |               |   |   |                 |                                |                      |                  |           |
|                                 |               |   |   |                 | AND<br>Battery Voltage between | 9 V and 18 V         |                  |           |
|                                 |               |   |   |                 |                                |                      |                  |           |
|                                 |               |   |   |                 | Engine Speed between           | 200 RPM and 7500 RPM |                  |           |
|                                 |               |   |   |                 |                                |                      |                  |           |
|                                 |               |   |   |                 | for                            | Faccordo             |                  |           |
|                                 |               |   |   |                 |                                | 5 Seconds            |                  |           |
| Upshift and<br>Downshift Switch | P1761         | This test detects rolling count<br>failures for the Upshift and | The failure count increments when the<br>GMLAN message is not received or the |                 |                                |                      | 15 seconds       | С         |
| Signal Rolling<br>Count         |               | Downshift GMLAN Message   | rolling counter does not agree with the<br>expected value                     |                 | Components powered             |                      |                  |           |
|                                 |               |   |   |                 |                                |                      |                  |           |
|                                 |               |   |   |                 | AND<br>Battery Voltage between | 9 V and 18 V         |                  |           |
|                                 |               |   |   |                 |                                |                      |                  |           |
|                                 |               |   | When the follows counter is   |                 | Engine Speed between           | 200 DDM and 7500 DDM |                  |           |
|                                 |               |   | when the failure counter is   | > 5             | Engine Speed between           | 200 RPM and 7500 RPM |                  |           |
|                                 |               |   |   |                 |                                |                      |                  |           |
|                                 |               |   | for a time of   | > 10 seconds    |                                |                      |                  |           |
|                                 |               |   | Report Failure  |                 | for                            | 5 seconds            |                  |           |
|                                 |               |   |   |                 |                                |                      |                  |           |

| Component/System        | Fault    | Monitor Strategy     | Malfunction Criteria                   | Threshold Value | Secondary Parameters                 | Enable Conditions       | Time Required | MIL   |
|-------------------------|----------|----------------------|--|-----------------|--------------------------------------|-------------------------|---------------|-------|
|                         | Code     | Description          |  |                 | -                                    |                         |               | Illum |
| Transmission Fluid Temp | perature |                      |  | •               | •                                    | -                       |               |       |
| Transmission Fluid      | P0711    | This test detects    | All 5 Cases                            |                 |                                      |                         |               | В     |
| Temperature Sensor      |          | performance of the   |  |                 | Not Test Failed This Key On          | P0711                   |               | -     |
| Circuit Pango /         |          | transmission fluid   |  |                 | Not rest railed mis key on           | D0710                   |               |       |
| Defermence              |          |                      |  |                 |                                      | P0716                   |               |       |
| Performance             |          | temperature sensor   |  |                 |                                      | P0717                   |               |       |
|                         |          | by comparing         |  |                 |                                      | P0721                   |               |       |
|                         |          | changes in           |  |                 |                                      | P0722                   |               |       |
|                         |          | temperature from     |  |                 |                                      | P0742                   |               |       |
|                         |          | start up and between |  |                 |                                      | D0772                   |               |       |
|                         |          | samples to           |  |                 |                                      | P077C                   |               |       |
|                         |          | calibration values   |  |                 |                                      | P077D                   |               |       |
|                         |          | calibration values.  |  |                 |                                      | P07BF                   |               |       |
|                         |          |                      |  |                 |                                      | P07C0                   |               |       |
|                         |          |                      |  |                 |                                      |                         |               |       |
|                         |          |                      |  |                 | No Fault Pending DTCs for this drive | P0716                   |               |       |
|                         |          |                      |  |                 | No Fault Ferding DT03 for this drive | 0710                    |               |       |
|                         |          |                      |  |                 | cycle                                | P0/1/                   |               |       |
|                         |          |                      |  |                 |                                      | P0721                   |               |       |
|                         |          |                      |  |                 |                                      | P0722                   |               |       |
|                         |          |                      |  |                 |                                      | P077C                   |               |       |
|                         |          |                      |  |                 |                                      | P077D                   |               |       |
|                         |          |                      |  |                 |                                      | DOZDE                   |               |       |
|                         |          |                      |  |                 |                                      | P07BF                   |               |       |
|                         |          |                      |  |                 |                                      | P07C0                   |               |       |
|                         |          |                      |  |                 |                                      |                         |               |       |
|                         |          |                      |  |                 | No Pass DTCs for this drive cycle    | P0711                   |               |       |
|                         |          |                      |  |                 |                                      |                         |               |       |
|                         |          |                      |  |                 |                                      |                         |               |       |
|                         |          |                      |  |                 |                                      | 00711                   |               |       |
|                         |          |                      |  |                 | No Fault Active DTC                  | P0711                   |               |       |
|                         |          |                      |  |                 |                                      |                         |               |       |
|                         |          |                      |  |                 | Components powered                   |                         |               |       |
|                         |          |                      |  |                 | AND                                  |                         |               |       |
|                         |          |                      |  |                 | Battery Voltage between              | 9 V and 18 V            |               |       |
|                         |          |                      |  |                 | Dattery Voltage Detween              |                         |               |       |
|                         |          |                      |  |                 |                                      |                         |               |       |
|                         |          |                      |  |                 | Engine Speed between                 | 200 RPM and 7500        |               |       |
|                         |          |                      |  |                 |                                      | RPM                     |               |       |
|                         |          |                      |  |                 | for                                  | 5 seconds               |               |       |
|                         |          |                      |  |                 |                                      |                         |               |       |
|                         |          |                      |  |                 | Start-up transmission fluid          |                         |               |       |
|                         |          |                      |  |                 | tomporaturo is available             |                         |               |       |
|                         |          |                      |  |                 |                                      |                         |               |       |
|                         |          |                      |  |                 | Transmission fluid temperature       | -39 deg. C and 149 deg. |               |       |
|                         |          |                      |  |                 | between                              | С                       |               |       |
|                         |          |                      |  |                 | ECT is not defaulted                 |                         |               |       |
|                         |          |                      | Case 1 (Stuck sensor after cold start- |                 |                                      |                         | 300 seconds   | 1     |
|                         |          |                      | (au                                    |                 |                                      |                         |               |       |
|                         |          |                      | Stort up temperature abange            | 1 2 dag C       | Stort up transmission fluid          | 10 dog C opd 21 dog     |               |       |
|                         |          |                      | Start-up temperature change            | <= 2 deg. C     | Start-up transmission nuid           | -40 deg. C and 21 deg.  |               |       |
|                         |          |                      | for a time                             | >= 100 seconds  | temperature between                  | C                       |               |       |
|                         |          |                      |  |                 |                                      |                         |               |       |
|                         |          |                      | AND                                    |                 | TCC Slip                             | >= 120 RPM              |               |       |
|                         |          |                      |  |                 | for a time                           | >= 300 seconds          |               |       |
|                         |          |                      | Vehicle speed                          | >− 8 КРН        |                                      |                         |               |       |
|                         |          |                      |  |                 |                                      | TO data C               |               |       |
|                         |          |                      | tor a time                             | >= 300 seconds. | engine coolant temperature           | >= 70 deg. C            |               |       |
|                         |          |                      |  |                 | AND                                  |                         |               |       |
|                         |          |                      |  |                 | engine coolant temperature change    |                         |               |       |
|                         |          |                      |  |                 | from start-up                        | >= 15 deg. C            |               |       |
| 1                       | 1        |                      | Case 2 (Stuck sensor after warm start- |                 | · · · ·                              |                         | 300 seconds   | 1     |
|                         |          |                      |  |                 |                                      |                         |               | 1     |
|                         |          |                      | Chart up terreseture ab er se          | a data C        | Chart up transmission fluid          | 115 day 0 and 150       |               |       |
|                         |          |                      | Start-up temperature change            |                 | Start-up transmission fluid          | The deg. C and 150      |               | 1     |
| 1                       | 1        |                      | for a time                             | >= 100 seconas  | temperature between                  | uey. C.                 |               | 1     |
|                         |          |                      |  |                 |                                      |                         |               | 1     |
| 1                       | 1        |                      | AND                                    |                 | TCC Slip                             | >= 120 RPM              |               | 1     |
|                         |          |                      |  |                 | for a time                           | >= 300 seconds          |               | 1     |
|                         |          |                      |  |                 | engine coolant temperature           | >= 70 deg. C            |               | 1     |
| I                       | 1        | 1                    | I                                      | 1               | engine coolant temperature           |                         | I             | 1     |

| Component/System   | Fault | Monitor Strategy   | Malfunction Criteria                   | Threshold Value               | Secondary Parameters                     | Enable Conditions   | Time Required | MIL   |
|--------------------|-------|--------------------|--|-------------------------------|--|---------------------|---------------|-------|
|                    | Code  | Description        |  |                               |  |                     |               | Illum |
|                    |       |                    | Vehicle speed                          | >- 8 KPH                      | AND<br>engine coolant temperature change |                     |               |       |
|                    |       |                    | for a time                             | >= 300 seconds.               | from start-up                            | >= 55 deg. C        |               |       |
|                    |       |                    | Case 3 (Noisy sensor)                  |                               | · · · ·                                  |                     | 7 seconds     |       |
|                    |       |                    | Change from previous temperature       | >= 20 deg. C                  |  |                     |               |       |
|                    |       |                    | for                                    | >= 14 events                  |  |                     |               |       |
|                    |       |                    | Case 4 (Doesn't warm up to at least 20 | < 7 seconds.                  |  |                     | 2200 seconds  | -     |
|                    |       |                    | deg. C)                                |                               | net engine torque                        | >= 150 Nm           |               |       |
|                    |       |                    | Time Enabled Criteria met AND          |                               | and                                      | <= 1492 Nm          |               |       |
|                    |       |                    | AND                                    |                               | vehicle speed                            | >= 22 KPH           |               |       |
|                    |       |                    | Transmission Fluid Temperature         | < 20 deg. C.                  | and<br>%throttle                         | <= 511 KPH          |               |       |
|                    |       |                    | Time Enabled Criteria is determined by | 250 seconds when start-up     | and                                      | >= 10.0%<br><= 100% |               |       |
|                    |       |                    | a lookup table ranging from            | temperature is >= 20 deg. C   | engine speed                             | >= 500 RPM          |               |       |
|                    |       |                    | to                                     | 2200 seconds when start-up    | and                                      | <= 6500 RPM         |               |       |
|                    |       |                    |  | temperature is <= -40 deg. C. | engine coolant temperature               | >= -39 deg. C       |               |       |
|                    |       |                    | Case 5 (Reasonableness at start-up):   |                               | and                                      | <= 149 deg. C       | 2 seconds     |       |
|                    |       |                    | Case 5 (Neasonabieness at start-up).   |                               | Intake Air Temperature is not            |                     | 2 3600103     |       |
|                    |       |                    | Engine Speed                           | > 500 RPM                     | defaulted                                |                     |               |       |
|                    |       |                    | AND                                    |                               |  |                     |               |       |
|                    |       |                    | Engine Coolant Temperature             | > -39 deg. C                  |  |                     |               |       |
|                    |       |                    | AND                                    | < 50 deg. C                   |  |                     |               |       |
|                    |       |                    | AND                                    | 2 2 30001103                  |  |                     |               |       |
|                    |       |                    |  |                               |  |                     |               |       |
|                    |       |                    | ((ABS(IAT-ECT)                         | <= 6 deg. C                   |  |                     |               |       |
|                    |       |                    | AND<br>(TET-ECT))                      | > 40 deg. C                   |  |                     |               |       |
|                    |       |                    | OR                                     | - 40 dog. 0                   |  |                     |               |       |
|                    |       |                    | (ABS(IAT-ECT)                          | > 6 deg. C                    |  |                     |               |       |
|                    |       |                    | AND                                    | 22.45.2                       |  |                     |               |       |
|                    |       |                    | (TFT-ECT)))                            | > 60 deg. C.                  |  |                     |               |       |
| Transmission Fluid | P0712 | Out of range low.  |  |                               | Not Test Failed This Key On              | P0711               | 2.5 seconds   | В     |
| Temperature Sensor |       |                    | transmission fluid temperature         | >= 140 deg. C                 |  | P0712               |               |       |
| Circuit Low input  |       |                    |  |                               |  |                     |               |       |
|                    |       |                    | for a time                             | > 2.5 seconds.                | Componente powered                       | P0713               |               |       |
|                    |       |                    |  |                               | Components powered<br>AND                |                     |               |       |
|                    |       |                    |  |                               | Battery Voltage between                  | 9 V and 18 V        |               |       |
|                    | 1     |                    |  |                               | Engine Speed between                     | 200 RPM and 7500    |               |       |
|                    |       |                    |  |                               |  | RPM                 |               |       |
|                    |       |                    |  |                               | for                                      | 5 seconds           |               |       |
| Transmission Fluid | P0713 | Out of range high. |  |                               | Not Test Failed This Key On              | P0711               | 2.5 seconds   | В     |
| Temperature Sensor |       |                    | transmission fluid temperature         | <                             |  | P0712               |               |       |
| Circuit High Input |       |                    |  | - +0 dog. 0                   |  | 1 01 12             |               |       |
|                    |       |                    | for a time                             | > 2.5 seconds                 |  | P0713               |               |       |
|                    | 1     |                    |  |                               | Components powered                       |                     |               |       |
|                    |       |                    |  |                               | AND                                      | 0.1/                |               |       |
|                    | 1     |                    |  |                               | Battery voltage between                  | A A UU IR A         |               |       |
|                    | 1     |                    |  |                               | Engine Speed between                     | 200 RPM and 7500    |               |       |
|                    | 1     |                    |  |                               |  | RPM                 |               |       |
|                    | 1     |                    |  |                               | for                                      | 5 seconds           |               |       |
| 1                  | 1     | 1                  | 1                                      | 1                             | 1  | 1                   | 1             | 1     |

| Component/System         | Fault | Monitor Strategy                        | Malfunction Criteria  | Threshold Value               | Secondary Parameters                 | Enable Conditions   | Time Required | MIL |
|--------------------------|-------|---|---|-------------------------------|--------------------------------------|---------------------|---------------|-----|
|                          | Coue  | Description                             |   |                               | IF Engine run time                   | <= 600 seconds      |               | mum |
|                          |       |   |   |                               | THEN                                 |                     |               |     |
|                          |       |   |   |                               | Engine Coolant Temperature           | must be > 20 deg. C |               |     |
|                          |       |   |   |                               |                                      |                     |               |     |
|                          |       |   |   |                               | not defaulted for a time             | >= 20 seconds.      |               |     |
|                          |       |   |   |                               |                                      |                     |               |     |
| Speed Sensors            |       |   | 1   |                               |                                      |                     | 1             |     |
| Input/Turbine Speed      | P0716 | This test detects                       | All cases   |                               | Not Test Failed This Key On          | P0716               |               | A   |
| Range/Performance        |       | Input Speed and<br>noisy Input Speed by |   |                               |                                      | F0717               |               |     |
|                          |       | calibration values.                     |   |                               | No Fault Pending DTCs for this drive | P07BF               |               |     |
|                          |       |   |   |                               | cycle.                               | P07C0               |               |     |
|                          |       |   |   |                               |                                      |                     |               |     |
|                          |       |   |   |                               |                                      |                     |               |     |
|                          |       |   |   |                               | Not Low Voltage Disable              |                     |               |     |
|                          |       |   |   |                               |                                      |                     | 0.45          |     |
|                          |       |   | in input speed)   |                               |                                      |                     | 0.15 seconds  |     |
|                          |       |   | Change of Input Speed between                                   | 000 BBM                       |                                      |                     |               |     |
|                          |       |   | for   | >= 800 RPM<br>>= 0.15 seconds |                                      |                     |               |     |
|                          |       |   | AND   |                               |                                      |                     |               |     |
|                          |       |   | NOT Low Voltage Response  |                               |                                      |                     |               |     |
|                          |       |   | Case 2: (Noisy Input Speed)                                     |                               |                                      |                     | 2 seconds     |     |
|                          |       |   | For sample size<br>IF the change in Input Speed                 | 80<br><= -800 RPM             |                                      |                     |               |     |
|                          |       |   | THEN the Low Counter is incremented                             |                               |                                      |                     |               |     |
|                          |       |   |   |                               |                                      |                     |               |     |
|                          |       |   | IF the change in Input Speed                                    | >= 800 RPM                    |                                      |                     |               |     |
|                          |       |   | THEN the High Counter is incremented                            |                               |                                      |                     |               |     |
|                          |       |   |   |                               |                                      |                     |               |     |
|                          |       |   | This test fails if both the Low Counter<br>and the High Counter | >= 5                          |                                      |                     |               |     |
|                          |       |   | OR  |                               |                                      |                     |               |     |
|                          |       |   | Low Counter   | >= 5                          |                                      |                     |               |     |
|                          |       |   | High Counter  | >= 5                          |                                      |                     |               |     |
| Input/Turbine Speed      | P0717 | This test detects                       | Failure pending if transmission input                           |                               | Not Test Failed This Key On          | P0717               | 1 second      | А   |
| Sensor Circuit No Signal |       | unrealistically low                     | speed   | < 61 RPM                      |                                      | P0729               |               |     |
|                          | 1     | value of input/turbine speed or         | This test fails if input speed                                  | < 61 RPM                      |                                      | P0731<br>P0732      |               |     |
|                          | 1     | unrealistically large                   | AND   |                               |                                      | P0733               |               |     |
|                          | 1     | changes in<br>input/turbine speed.      | output speed  | > 500 RPM                     |                                      | P0734<br>P0735      |               |     |
|                          | 1     |   | AND   |                               |                                      | P0736               |               |     |
|                          | 1     |   | NOT Low Voltage Response  |                               |                                      | P0721               |               |     |
|                          |       |   |   |                               |                                      | P0722<br>P0716      |               |     |
|                          |       |   |   |                               |                                      | P07BF               |               |     |

| Component/System    | Fault  | Monitor Strategy      | Malfunction Criteria                      | Threshold Value  | Secondary Parameters                   | Enable Conditions | Time Required | MIL   |
|---------------------|--------|-----------------------|---|------------------|--|-------------------|---------------|-------|
|                     | Code   | Description           |   |                  |  | D07C0             |               | illum |
|                     |        |                       |   |                  |  | P07C0             |               |       |
|                     |        |                       |   |                  |  | P077C             |               |       |
|                     |        |                       |   |                  |  | P077D             |               |       |
|                     |        |                       |   |                  | No Fourth Depiding DTCo                | D0704             |               |       |
|                     |        |                       |   |                  | No Fault Pending DTCs                  | P0721             |               |       |
|                     |        |                       |   |                  |  | P0722             |               |       |
|                     |        |                       |   |                  |  | PU/BF             |               |       |
|                     |        |                       |   |                  |  | P07C0             |               |       |
|                     |        |                       |   |                  |  | P077C             |               |       |
|                     |        |                       |   |                  |  | FUTTD             |               |       |
|                     |        |                       |   |                  | NOT Low Voltage Disable                |                   |               |       |
|                     |        |                       |   |                  |  |                   |               |       |
|                     |        |                       |   |                  | Engine is running                      |                   |               |       |
|                     |        |                       |   |                  | Reverse-to-Neutral shift not in        |                   |               |       |
|                     |        |                       |   |                  | process                                |                   |               |       |
|                     |        |                       |   |                  | Shifting complete                      |                   |               |       |
|                     |        |                       |   |                  | Range attained is not neutral          |                   |               |       |
|                     |        |                       |   |                  | I ransmission fluid temperature        | > -25 deg. C      |               |       |
|                     |        |                       |   |                  | Engine speed                           | >= 400 RPM        |               |       |
|                     |        |                       |   |                  | Transmission output speed              | >= 150 RPM        |               |       |
|                     |        |                       |   |                  |  |                   |               |       |
| Output Spood Sonsor | D0721  | This test detects a   | Case 1: (Liprealistically large chapge in |                  |  |                   | Case 1:       | ۸     |
| Circuit             | F0721  | noisy output speed    | output speed)                             |                  | Not Test Failed This Key On            | P0721             | 0 15 seconds  | ^     |
| Range/Performance   |        | sensor or circuit by  | Change in output speed                    | >= 500 RPM       | Not restriction mistrey on             | P0722             | 0.10 0000100  |       |
|                     |        | detecting large       | for a time                                | > = 0.15 seconds |  | 1 01 22           |               |       |
|                     |        | changes in output     |   |                  |  |                   |               |       |
|                     |        | speed.                | NOT Low Voltage Response                  |                  |  |                   |               |       |
|                     |        |                       | ite i zen tenage iteepenee                |                  |  |                   |               |       |
|                     |        |                       |   |                  | -                                      |                   |               |       |
|                     |        |                       | Case 2: (Noisy output speed)              |                  |  |                   | Case 2:       |       |
|                     |        |                       | For sample size                           | 80               | No Fault Pending DTCs for this drive   | P077C             | 2 seconds     |       |
|                     |        |                       |   | -                | cycle                                  | P077D             |               |       |
|                     |        |                       | IF the change in output speed             | <                |  |                   |               |       |
|                     |        |                       |   |                  |  |                   |               |       |
|                     |        |                       | THEN the Low Counter is incremented.      |                  | INO I LOW VOItage Disable              |                   |               |       |
|                     |        |                       |   |                  |  |                   |               |       |
|                     |        |                       |   |                  |  |                   |               |       |
|                     |        |                       | IF the change in output speed             | >= 500 RPM       | range attained NOT neutral             |                   |               |       |
|                     |        |                       | THEN the High Counter is                  |                  |  |                   |               |       |
|                     |        |                       |   |                  |  |                   |               |       |
|                     |        |                       | Test fails if both the Low Counter and    | -                |  |                   |               |       |
|                     |        |                       |   | >= 5             |  |                   |               |       |
|                     |        |                       | OR  | -                |  |                   |               |       |
|                     |        |                       | the Low Counter                           | >= 5             |  |                   |               |       |
|                     |        |                       | UR<br>the Llink Counter                   |                  |  |                   |               |       |
|                     |        |                       | the High Counter                          | >= 5             |  |                   |               |       |
|                     |        |                       |   |                  |  |                   |               |       |
| Output Speed Sensor | P0722  | This test detects     | All Cases                                 |                  | All Cases                              |                   |               | А     |
| Circuit No Signal   | 1 0122 | unrealistically low   |   |                  | Not Test Failed This Key On            | P0721             |               | ~     |
|                     |        | value of output speed |   |                  |  | P0722             |               |       |
|                     |        | or unrealistically    |   |                  |  | P077C             |               |       |
|                     |        | large change in       |   |                  |  | P077D             |               |       |
|                     |        | output speed.         |   |                  |  |                   |               |       |
|                     |        |                       |   |                  | No Fault Pending DTCs for this drive   | P077C             |               |       |
|                     |        |                       |   |                  | the reader of daily broot of the drive | P077D             |               |       |
|                     |        |                       |   |                  |  |                   |               |       |
|                     |        |                       | 1   |                  | NOT Low Voltage Disable                |                   |               |       |
| I                   | I      | I                     | 1   | l                | NOT LOW VOILage DISable                | 1                 | I             | 1     |

| Component/System        | Fault | Monitor Strategy     | Malfunction Criteria                       | Threshold Value | Secondary Parameters                  | Enable Conditions | Time Required | MIL   |
|-------------------------|-------|----------------------|--|-----------------|---------------------------------------|-------------------|---------------|-------|
|                         | Code  | Description          | <u> </u>                                   |                 |                                       |                   | <u> </u>      | Illum |
|                         |       |                      |  |                 | <b>T</b>                              |                   | 4             | -     |
|                         |       |                      | Case 1: (Unrealistically large change in   |                 | lest enabled when output speed        | 5 600 RDM         | 1 second      |       |
|                         |       |                      | Ecilura ponding if                         |                 | for a time                            |                   |               |       |
|                         |       |                      | Failure pending li                         | > = 600 PPM     | for a time                            | >= 1 seconds      |               |       |
|                         |       |                      | Eniluro sots if range attained is Neutral  | >= 600 RPM      | Tost disabled when output speed       |                   |               |       |
|                         |       |                      | r allule sets il range attained is Neutrai |                 | Test disabled when output speed       | <- 600 RPM        |               |       |
|                         |       |                      |  |                 | for a time                            | > 1 seconds       |               |       |
|                         |       |                      | Case 2: (Unrealistically low value of      |                 |                                       |                   | 4 seconds     | -     |
|                         |       |                      | output speed)                              |                 |                                       |                   |               |       |
|                         |       |                      | Failure pending if output speed            | < 61 RPM        | Not Test Failed This Key On           | P0729             |               |       |
|                         |       |                      | Failure sets if not monitoring for low     |                 |                                       | P0731             |               |       |
|                         |       |                      | speed neutral and output speed             |                 |                                       | P0732             |               |       |
|                         |       |                      |  | < 61 RPM        |                                       | P0733             |               |       |
|                         |       |                      | AND  |                 |                                       | P0734             |               |       |
|                         |       |                      | range is 3rd, 4th, 5th, or 6th             |                 |                                       | P0735             |               |       |
|                         |       |                      | for a time                                 | > 1 second      |                                       | P0736             |               |       |
|                         |       |                      | AND  |                 |                                       | P0716             |               |       |
|                         |       |                      | NOT Low Voltage Response                   |                 |                                       | P0717             |               |       |
|                         |       |                      |  |                 |                                       | P07BF             |               |       |
|                         |       |                      | Foilure acts if not monitoring for low     |                 |                                       | P07C0             |               |       |
|                         |       |                      | Failure sets in not monitoring for low     |                 | No Foult Bonding DTCs for this drive  | D0716             |               |       |
|                         |       |                      | speed field and output speed               |                 | No Fault Fending DTCs for this drive  | P0710             |               |       |
|                         |       |                      |  |                 |                                       | POZRE             |               |       |
|                         |       |                      |  |                 |                                       | P07C0             |               |       |
|                         |       |                      | AND  | < 61 RPM        |                                       |                   |               |       |
|                         |       |                      | ((net engine torgue                        | < -100 Nm       | Engine is running                     |                   |               |       |
|                         |       |                      | OR   |                 | Shift not in process                  |                   |               |       |
|                         |       |                      | net engine torque)                         | > 100 Nm        | Range attained is not Neutral         |                   |               |       |
|                         |       |                      | OR   |                 | Reverse to Neutral shift not in       |                   |               |       |
|                         |       |                      | (turbine speed                             | > 1500 RPM      | process                               |                   |               |       |
|                         |       |                      | AND  |                 | Transmission fluid temperature        | > -25 deg. C      |               |       |
|                         |       |                      | range is 2nd))                             |                 | Transmission input speed              | >= 1050 RPM       |               |       |
|                         |       |                      | for a time                                 | >= 4 seconds.   | Not waiting for Manual Selector Valve |                   |               |       |
|                         |       |                      | AND  |                 | to attain forward range               |                   |               |       |
|                         |       |                      | NOT Low Voltage Response                   |                 | PRNDL State is NOT D4, NOT            |                   |               |       |
|                         |       |                      |  |                 | Transitional D4                       |                   |               |       |
| Input/Turbine Speed     | P07BF | This test detects    | IF voltage                                 | <= 0.25 volts   | Not Test Failed This Key On           | P07BF             | 0.8 sec       | А     |
| Sensor Ckt Voltage Low  |       | either open or short | ii Võitago                                 |                 | OR                                    |                   |               |       |
|                         |       | to ground circuit    | for  | 0.2 second      | No Fault Active DTC                   | P07BF             |               |       |
|                         |       | malfunctions.        |  |                 |                                       |                   |               |       |
|                         |       |                      | THEN increment fail timer                  |                 | No Fault Active DTC                   | P07C0             |               |       |
|                         |       |                      | IF fail timer                              | >= 4 counts     |                                       |                   |               |       |
|                         |       |                      | AND  |                 | NOT Low Voltage Disable               |                   |               |       |
|                         |       |                      | Engine Speed                               | >= 20 rpm       |                                       |                   |               |       |
|                         |       |                      | AND  |                 |                                       |                   |               |       |
|                         |       |                      | NOT Low Voltage Response                   |                 |                                       |                   |               |       |
|                         |       |                      | THEN report malfunction                    |                 |                                       |                   |               |       |
|                         | 00700 | This can determ      | LE Le                                      | 4.75            |                                       | D0700             | 0.0           |       |
| Input/Turbine Speed     | P07C0 | This test detects    | IF voltage                                 | >= 4.75         | Not Test Failed This Key On           | P07C0             | 0.8 sec       | A     |
| Sensor CKI voltage High |       | to ground circuit    |  |                 | No Foult Active DTC                   | DOZCO             |               |       |
|                         |       | malfunctions.        | for  | 0.2 second      | No Fault Active DTC                   | F07C0             |               |       |
|                         |       |                      | THEN increment fail timer                  | 0.2 300010      | No Fault Active DTC                   | P07BF             |               |       |
|                         |       |                      | IF fail timer                              | >= 4 counts     |                                       |                   |               |       |
|                         | 1     |                      | AND  |                 | Components powered                    |                   |               | 1     |
|                         |       |                      | Engine Speed                               | >= 20 rpm       | AND                                   |                   |               | 1     |
|                         |       |                      | THEN report malfunction                    |                 | Battery Voltage between               | 9 V and 18 V      |               | 1     |

| Component/System        | Fault | Monitor Strategy     | Malfunction Criteria                    | Threshold Value            | Secondary Parameters                | Enable Conditions | Time Required | MIL   |
|-------------------------|-------|----------------------|---|----------------------------|-------------------------------------|-------------------|---------------|-------|
|                         | Code  | Description          |   |                            |                                     |                   |               | Illum |
| Output Speed Sensor Ckt | P077C | This test detects    | IF voltage                              | <= 0.25 volts              | Not Test Failed This Key On         | P077C             | 0.8 sec       | A     |
| Voltage Low             | 10110 | either open or short | ii voitage                              | - 0.20 VOIG                | OR                                  | 1 0170            | 0.0 000       | ~     |
|                         |       | to ground circuit    |   |                            | No Fault Active DTC                 | P077C             |               |       |
|                         |       | malfunctions.        | for                                     | 0.2 second                 |                                     |                   |               |       |
|                         |       |                      | THEN increment fail timer               | 4                          |                                     | 00770             |               |       |
|                         |       |                      |   | >= 4 counts                | No Fault Active DTC                 | P077D             |               |       |
|                         |       |                      | Engine Speed                            | >= 20 rpm                  | NOT Low Voltage Disable             |                   |               |       |
|                         |       |                      | AND                                     |                            |                                     |                   |               |       |
|                         |       |                      | NOT Low Voltage Response                |                            |                                     |                   |               |       |
|                         |       |                      | THEN report malfunction                 |                            |                                     |                   |               |       |
| Output Speed Sensor Ckt | P077D | This test detects    | IF voltage                              | >- 4 75                    | Not Test Failed This Key On         | P077D             | 0.8 sec       |       |
| Voltage High            | 10/10 | either open or short | ii voitage                              |                            | OR                                  | 10110             | 0.0 000       |       |
| 0 0                     |       | to ground circuit    |   |                            | No Fault Active DTC                 | P077D             |               |       |
|                         |       | malfunctions.        | for                                     | 0.2 second                 |                                     |                   |               |       |
|                         |       |                      | THEN increment fail timer               |                            | No Fault Active DTC                 | P077C             |               |       |
|                         |       |                      | IF fail timer                           | >= 4 counts                |                                     |                   |               |       |
|                         |       |                      | Engine Speed                            | >= 20 rom                  | AND                                 |                   |               |       |
|                         |       |                      | THEN report malfunction                 | r = 20 (pm                 | Battery Voltage between             | 9 V and 18 V      |               |       |
|                         |       |                      |   |                            |                                     |                   |               |       |
| Range Verification      |       |                      |   | •                          | •                                   |                   |               | -     |
| Gear 1 Incorrect Ratio  | P0731 | This test verifies   | Pending failure occurs when             |                            |                                     |                   | 2.25 seconds  | А     |
|                         |       | transmission         | accumulated event timer                 | >= 2 second                |                                     | D0077             |               |       |
|                         |       | 1st range is         |   |                            | dropout suspected or detected)      | P0877             |               |       |
|                         |       | commanded by         | IF main pressure dropout is suspected   |                            |                                     | P0878             |               |       |
|                         |       | comparing computed   | THEN accumulated event timer is         | 4                          |                                     |                   |               |       |
|                         |       | ratio to the         | IF main pressure dropout is detected    | >= 1 second                | Not Fault Pending with cmd gear     | P0877             |               |       |
|                         |       | commanueu ratio.     | THEN accumulated event timer is         | 0.75 accord                | Rev_Logic1 and RPS/PRNDL conflict   |                   |               |       |
|                         |       |                      |   | >= 0.75 Second             | -                                   |                   |               |       |
|                         |       |                      | Timer accumulates when transmission     |                            |                                     |                   |               |       |
|                         |       |                      | is in forward or reverse range          |                            | Not Fault Active with cmd gear      | P0877             |               |       |
|                         |       |                      | AND                                     |                            | Rev_Logic1 and RPS/PRNDL conflict   |                   |               |       |
|                         |       |                      | output speed                            | >= 100 RPM                 |                                     |                   |               |       |
|                         |       |                      | AND                                     | . 400 BDM                  | Net Test Failed This Key On         | D0704             |               |       |
|                         |       |                      | gear sip                                | > 100 RPM                  | Not Test Failed This Key On         | P0721             |               |       |
|                         |       |                      |   |                            |                                     | P0722             |               |       |
|                         |       |                      | In response to pending failure, a       |                            |                                     | P0716             |               |       |
|                         |       |                      | diagnostic response range is            |                            |                                     | P0717             |               |       |
|                         |       |                      | commanded.                              |                            |                                     | P07BF             |               |       |
|                         |       |                      |   |                            |                                     | P07C0             |               |       |
|                         |       |                      | During this command, this test fails if | 050 0014                   |                                     | P077C             |               |       |
|                         |       |                      | Abs(Converter Sip)                      | >= 250 RPM<br>> 10 samples |                                     | P0//D             |               |       |
|                         |       |                      | 101                                     | > to samples.              | No Fault Pending DTC for this drive | P0717             |               |       |
|                         |       |                      |   |                            | cycle.                              | P07BF             |               |       |
|                         |       |                      |   |                            |                                     | P07C0             |               |       |
|                         |       |                      |   |                            |                                     |                   |               |       |
|                         |       |                      |   |                            | NOT Low Voltage Disable             |                   |               |       |
|                         |       |                      |   |                            | No range switch response active     |                   |               |       |
|                         |       |                      |   |                            |                                     |                   |               |       |
|                         |       |                      |   |                            | Hydraulic System Pressurized        |                   |               |       |
|                         |       |                      | I                                       |                            | l                                   |                   | l             | 1     |

| Odds         Decleption         (Main   | Component/System       | Fault | Monitor Strategy      | Malfunction Criteria                    | Threshold Value | Secondary Parameters                   | Enable Conditions | Time Required | MIL   |
|---|------------------------|-------|-----------------------|---|-----------------|--|-------------------|---------------|-------|
| Ges 2 honeo Raio         P722<br>Normal postantial dutations of a<br>promovable<br>in management and interval<br>source of a second<br>in the second and interval<br>in the second and interval<br>in the second and interval<br>in the second and interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>interval<br>inte |                        | Code  | Description           |   |                 | 01:11                                  |                   |               | Illum |
| Star 2 houses       Mar P       Performation of the second device   |                        |       |                       |   |                 | Shift complete                         |                   |               |       |
| Geor 2 Incomes Ratio         No. 722         No. with a low every low of a low every low of a low every low of a lo   |                        |       |                       |   |                 | Output speed                           | >= 200 RPM        |               |       |
| Dear 2 incorrect, Reico       P372       This field without a construction of the part of   |                        |       |                       |   |                 | No bydraulic default condition         |                   |               |       |
| Geor 2 Incomed Ratio         No.722         Not rest verified<br>command georetrian initiation on a<br>composed<br>of many as<br>of many  |                        |       |                       |   |                 | present                                |                   |               |       |
| Gent 2 Income (Noto)         PHO400 billine socrawing in process in account leader on the social billine socrawing in process in account leader on the social billine socrawing in process in account leader on the social billine socrawing in process in account leader on the social billine socrawing in the social billine  |                        |       |                       |   |                 | Normal powertrain shutdown not in      |                   |               |       |
| Series         Normal powertrain indication is<br>compared with<br>manningstand<br>compared of points<br>compared of points<br>compared<br>compared of points<br>compared of points<br>compoints<br>compoints<br>compared of points<br>compoints<br>compared of points<br>c   |                        |       |                       |   |                 | process                                |                   |               |       |
| Gene 2         Income Is Ratio<br>operating information<br>operating information<br>information operating informatin<br>information operating informatin<br>information operating informa   |                        |       |                       |   |                 | Normal powertrain initialization is    |                   |               |       |
| Central Processed Ratio         Product failure occurs with pressure deports is supported for an pressure deports is supported for an pressure deports is supported for an operating deport in the support and pressure deports is supported for an operating deport in the support and pressure deports is supported for an operating and with the support and pressure deports is supported for an operating and with the support and pressure deports is supported for an operating and with the support and pressure deports is a forward or reverse range i  |                        |       |                       |   |                 | complete                               |                   |               |       |
| Specify 2         Normal Parks         Perspective failure out in the park of the parks of the park of the parks of the  |                        |       |                       |   |                 |  |                   |               |       |
| In tradinision<br>porming information<br>porming information<br>commanded net<br>commanded net<br>commanded<br>commanded net<br>commanded ne  | Gear 2 Incorrect Ratio | P0732 | This test verifies    | Pending failure occurs when             | >= 2 second     |  |                   | 2.25 seconds  | А     |
| Sport and name     If main pressure dropuit is suggested     disport suggested of detected     PG873       If main pressure dropuit is suggested     if main pressure dropuit is suggested     Not Fault Rending with ond gear PG877       Rev_Logit 1 and RPS/PRNDL conflic     If main pressure dropuit is suggested     Not Fault Rending with ond gear PG877       Rev_Logit 1 and RPS/PRNDL conflic     Three accumulates when information     Not Fault Active with ond gear PG877       Not Fault Active with ond gear PG877     Rev_Logit 1 and RPS/PRNDL conflic       Not Fault Active with ond gear PG877     Rev_Logit 1 and RPS/PRNDL conflic       Not Fault Active with ond gear PG877     Rev_Logit 1 and RPS/PRNDL conflic       Not Fault Active with ond gear PG877     Rev_Logit 1 and RPS/PRNDL conflic       Not Fault Active with ond gear PG877     Rev_Logit 1 and RPS/PRNDL conflic       Not Fault Active with ond gear PG877     Rev_Logit 1 and RPS/PRNDL conflic       Not gear gear     > 10 RPM       Not Fault Pending DTC for this drive PC77     PC700       PC700     PC700       PC700     PC700       PC700     PC700       Not Fault Pending DTC for this drive PC717     PC700       Nor Fault Pending DTC for this drive PC717     PC700       Nor Fault Pending DTC for this drive PC717     PC700       PC700     PC700       Nor Fault Actin concreate anter resonance acrin     Nor Fauge sea  |                        |       | transmission          | accumulated event timer                 |                 | Not Test Failed This Key On (except if | P0877             |               |       |
| Incommanded programming computing computed computing computed computing computing computing computing com   |                        |       | operating ratio while | IF main pressure dropout is suspected   |                 | dropout suspected or detected)         | P0878             |               |       |
| icongaring oppided<br>commanded ratio     iF main pressure dropout is delected<br>THEN accumulated event time is<br>is in forward or reverse range<br>is in forward or reverse range is<br>is in forward or traverse range is<br>is in forward in traverse range is<br>is in traverse range is<br>is in forward in the test fail<br>is in the test fail<br>is in forward in the test fail<br>is in the te  |                        |       | commanded by          | THEN accumulated event timer is         |                 |  |                   |               |       |
| ratio to the<br>continuinded ratio.       re rest produced is durated in the part of the set of   |                        |       | comparing computed    | IE main procesure dropout is detected   | >= 1 second     | Not Foult Donding with and goor        | D0977             |               |       |
| Outmain bourse <ul> <li> <ul> <li> <ul> <li></li></ul></li></ul></li></ul>  |                        |       | ratio to the          | THEN accumulated event timer is         |                 | Rev Logic1 and RPS/PRNDL conflict      | FU077             |               |       |
| Immer accumulates when transmission<br>is in forward or reverse range<br>output speed<br>AND<br>Output speed<br>Set in forward or reverse range<br>AND<br>Output speed<br>Set in forward or reverse range<br>AND<br>Output speed<br>Set in forward or reverse range<br>AND<br>Output speed<br>Set in response to pending failure, a<br>diagnostic response due<br>portor<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P077C0<br>P  |                        |       | commanued ratio.      | THEN accumulated event timer is         | >= 0.75 second  |  |                   |               |       |
| Image: control des when transmission     Not Fault Active with ond geal P0977       AND     Rev       Output speed     100 RPM       AND     Not Test Failed This Key On       Output speed     100 RPM       AND     Not Test Failed This Key On       Output speed     100 RPM       Bin forward or reverse revers  |                        |       |                       |   |                 |  |                   |               |       |
| Image: Sin forward or reverse range       Rev_Logic1 and RPS/PRNDL conflict         AND       > 10 RPM         AND       Not Test Failed This Key On       P0721         P0776       P0776         P0770       P0776         Abs(Converter Stip)       >=250 RPM.         Abs(Converter Stip)       >=250 RPM.         No Fault Pending DTC for this drive       P0777         cycle       P078F         P078F       P078F         P078F       P078F         P078F       P078F         Output speed       >200 RPM         No rang  |                        |       |                       | Timer accumulates when transmission     |                 | Not Fault Active with cmd gear         | P0877             |               |       |
| Image: Control of Contro   |                        |       |                       | is in forward or reverse range          |                 | Rev_Logic1 and RPS/PRNDL conflict      |                   |               |       |
| Image: Comparison of Compar   |                        |       |                       | AND                                     | 100 0004        |  |                   |               |       |
| AND     Not Test Failed This Key On PO72       ger stip     100 RPM     P074       P074     P074       P074     P074       P0776     P0776       P0770     P0770       During this command.et     P0770       Abs/Converter Stip     >=250 RPM       No range swtch response active     Norange swtch response active       Hydrault: System Pressurized     Abs/Converter Stip       Abs/Converter Stip     >=200 RPM       No hydraulte denglate condition proces     =       Abs/Converter Stip     Normal powertrain shudown ont in process  |                        |       |                       | output speed                            | >= 100 RPM      |  |                   |               |       |
| Image: Single   |                        |       |                       | AND                                     |                 | Not Test Failed This Key On            | P0721             |               |       |
| In response to pending failure, a diagnostic response range is dis diagnosti response range is diagnosti range is diagnostic range   |                        |       |                       | gear slip                               | > 100 RPM       |  | P0722             |               |       |
| In response to pending tailing, is a commanded.       P077F         P077C       P077C         P077D       P077D         Abs/Convertsition is amples.       P077D         No Fault Pending DTC for this drive p0717       P078F         P077D       P077D         NOT Low Voltage Disable       P077C         NOT Low Voltage Disable       NO range switch response active         No range switch response active       No range switch response active         No hydraulic System Pressurized       Shift complete         Output speed       > 200 RPM         No hydraulic fault on oin pressent       No rang powrtrain initialization is complete  |                        |       |                       |   |                 |  | P0716             |               |       |
| commanded       P07C0         p07C0       P07E         p07E       P07E         p07E       P07E         p07E       P07E         p07E       P07E         p07E       P07E         p07E       P07E         p0E  |                        |       |                       | diagnostic response range is            |                 |  | P0717<br>P07BE    |               |       |
| During this command, this test fails if<br>Abs(Converter Sip) >= 250 RPM   for > 10 samples.     No Fault Pending DTC for this drive   P077D   P070D   P0   |                        |       |                       | commanded.                              |                 |  | P07C0             |               |       |
| During this command, this test fails if   Abs(Converter Slip)   >= 250 RPM   No Fault Pending DTC for this drive   P07E0   P0   |                        |       |                       |   |                 |  | P077C             |               |       |
| Abs(Converter Slip) >= 250 RPM   for > 10 samples.     No Fault Pending DTC for this drive   P07C0     NOT Low Voltage Disable     No range switch response active   Hydraulic System Pressurized     Shift complete     Output speed   >= 200 RPM     No range owner ressurized     Normal powertrain initialization is     Normal powertrain initialization is  |                        |       |                       | During this command, this test fails if |                 |  | P077D             |               |       |
| No Fault Pending DTC for this drive P0717<br>oycle. P07BF<br>P07C0<br>NOT Low Voltage Disable<br>No range switch response active<br>Hydraulic System Pressurized<br>Shift complete<br>Output speed >= 200 RPM<br>No hydraulic default condition<br>present<br>Normal powertrain shutdown not in<br>process<br>Normal powertrain initialization is<br>complete   |                        |       |                       | Abs(Converter Slip)                     | >= 250 RPM      |  |                   |               |       |
| NOT Low Voltage Disable<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO<br>POTCO            |                        |       |                       | for                                     | > 10 samples.   | No Fault Pending DTC for this drive    | P0717             |               |       |
| NOT Low Voltage Disable   NOT Low Voltage Disable   No range switch response active   Hydraulic System Pressurized   Shift complete   Output speed >= 200 RPM   No hydraulic default condition<br>present   No manal powertrain shutdown not in<br>process   Normal powertrain initialization is<br>complete  |                        |       |                       |   |                 | cycie.                                 | P07BF             |               |       |
| NOT Low Voltage Disable   No range switch response active   No range switch response active   Hydraulic System Pressurized   Shift complete   Output speed   >= 200 RPM   No hydraulic default condition<br>present   No mand powertrain shutdown not in<br>process   Normal powertrain initialization is<br>complete   |                        |       |                       |   |                 |  | 10/00             |               |       |
| No range switch response active   Hydraulic System Pressurized   Shift complete   Output speed   Output speed   No hydraulic default condition present   Normal powertrain shutdown not in process   Normal powertrain initialization is complete   |                        |       |                       |   |                 | NOT Low Voltage Disable                |                   |               |       |
| Hydraulic System Pressurized<br>Shift complete<br>Output speed<br>> 200 RPM<br>> 200 RPM<br>No hydraulic default condition<br>present<br>Normal powertrain shutdown not in<br>process<br>Normal powertrain initialization is<br>complete  |                        |       |                       |   |                 | No range switch response active        |                   |               |       |
| Shift complete   Output speed   >= 200 RPM   No hydraulic default condition<br>present   No hydraulic default condition<br>present   Normal powertrain shutdown not in<br>process   Normal powertrain initialization is<br>complete   |                        |       |                       |   |                 | Hydraulic System Pressurized           |                   |               |       |
| Output speed       >= 200 RPM         No hydraulic default condition present       No hydraulic default condition present         Normal powertrain shutdown not in process       Normal powertrain initialization is complete  |                        |       |                       |   |                 | Shift complete                         |                   |               |       |
| No hydraulic default condition<br>present<br>Normal powertrain shutdown not in<br>process<br>Normal powertrain initialization is<br>complete  |                        |       |                       |   |                 | Output speed                           | >= 200 RPM        |               |       |
| No hydraulic default condition<br>present<br>Normal powertrain shutdown not in<br>process<br>Normal powertrain initialization is<br>complete  |                        |       |                       |   |                 |  | - 200 141 111     |               |       |
| Normal powertrain shutdown not in<br>process<br>Normal powertrain initialization is<br>complete   |                        |       |                       |   |                 | No hydraulic default condition         |                   |               |       |
| Normal powertrain shutdown not in<br>process<br>Normal powertrain initialization is<br>complete   |                        |       |                       |   |                 | present                                |                   |               | 1     |
| Normal powertrain initialization is<br>complete   |                        |       |                       |   |                 | Normal powertrain shutdown not in      |                   |               |       |
| Normal powertrain initialization is<br>complete   |                        |       |                       |   |                 | process                                |                   |               |       |
| Normal powertrain initialization is<br>complete   |                        |       |                       |   |                 | Normal powertrain initialization in    |                   |               |       |
|   |                        |       |                       |   |                 | complete                               |                   |               |       |

| Code         Packet/pitco   | Component/System        | Fault | Monitor Strategy      | Malfunction Criteria                    | Threshold Value | Secondary Parameters   | Enable Conditions                       | Time Required | MIL   |
|---|-------------------------|-------|-----------------------|---|-----------------|--|---|---------------|-------|
| Open 4 hoursed Ratio<br>bear 4 hoursed Ratio<br>en and product adjusted<br>sequences and the sequences and<br>comparing controls.         Private plate sequences and<br>sequences and<br>comparing controls.         Private plate sequences and<br>sequences and<br>comparing controls.         Private plate sequences and<br>comparing controls.         A manual controls.         Private<br>controls.         Private plate sequences and<br>comparing controls.         A manual controls.         Private<br>controls.         Private controls.         Private controls.         Private controls   |                         | Code  | Description           |   |                 |  |   |               | Illum |
| Object ALL MORE AREAN       PUTA       Putation of the manufacture of the manu   | Coor 2. Incorroct Rotio | D0722 | This test verifies    | Danding failure acours when             |                 |  |   | 2.25 accordo  | ٨     |
| Started month         Prime pressure documents         2 second         Nor data Period setesco         Prime pressure documents         Prime presupres         Pr  | Gear 5 Incorrect Ratio  | P0733 | transmission          | accumulated event time                  |                 | Not Test Failed This Key On (except it                               | P0877                                   | 2.25 seconds  | A     |
| Sold rough is<br>bottom to be<br>with |                         |       | operating ratio while | IE main prossure dropout is suspected   | >= 2 second     | dropout suspect or detected)   | D0979                                   |               |       |
| Sector in an operation of the sector in the secto   |                         |       | 3rd range is          | In main pressure dropout is suspected   |                 |  | F 0070                                  |               |       |
| General homeses and popularie denotes in homeses and popularie denotes in the frame homeses and popularies when the second in the frame homeses and popularies when the second in the frame homeses and popularies when the second in the frame homeses and popularies when the second in the frame homeses and popularies when the second in the frame homeses and popularies when the second in the frame homeses and popularies when the second in the frame homeses and popularies when the second in the frame homeses and popularies when the second in the frame homeses and popularies when the second in the frame homeses and popularies a   |                         |       | commanded by          | THEN accumulated event timer is         | >= 1 second     |  |   |               |       |
| Gend 4 bourses Ratio         The searcembar and a devent interindical deve  |                         |       | comparing computed    | IF main pressure dropout is detected    | 1               | Not Fault Pending with cmd gear                                      | P0877                                   |               |       |
| Output percent       - 0.75 second       Net Fund Addressin millions       Net Fund Addressin mi  |                         |       | ratio to the          | THEN accumulated event timer is         | 5               | Rev_Logic1 and RPS/PRNDL conflict                                    | t                                       |               |       |
| Gene 4 Income: Ratio       Pendag Information in any pendag   |                         |       | commanded ratio.      |   | >= 0.75 second  |  |   |               |       |
| Order 4. Incorrect Ratio       The set vertices<br>commanded<br>performing in the set of the set of the<br>set of the section of the<br>in hower of the set of the<br>in hower of the set of the<br>in hower of the set of the<br>set of the section of the<br>section of the set of the<br>section of the<br>set of the section of the<br>section of the<br>set of the section of the<br>set of the<br>section of the<br>set of the section of the<br>set of the<br>section of the<br>set of the<br>section of the<br>set of the<br>section of the<br>set of the<br>section of the<br>section of the<br>section of the<br>section of the<br>set of the<br>section of the<br>section of the<br>section of the<br>section of the<br>set of the<br>section of the<br>section of the<br>set of the<br>section of the<br>section of the<br>set of the<br>section   |                         |       |                       |   |                 |  |   |               |       |
| Gear 4 Incomend Ratio       Perding fighter course where<br>source provide regiones in pr   |                         |       |                       | Timer accumulates when transmission     | 1               | Not Fault Active with cmd gear                                       | P0877                                   |               |       |
| Cent 4 hormed Fally       No 12       Provide fally countilies of a suggestion of a suggestio   |                         |       |                       | is in forward or reverse range          |                 | Rev_Logic1 and RPS/PRNDL conflict                                    | t i i i i i i i i i i i i i i i i i i i |               |       |
| Gent 4         Normation         Pending failure counside<br>and sevent times 4<br>output sevent<br>burning failure counside<br>and count to totak sevent<br>burning  |                         |       |                       | ANL                                     |                 |  |   |               |       |
| Gear 4 Incorrect Ratio         P017         P01  |                         |       |                       | output speed                            | >= 100 RPM      |  |   |               |       |
| Gear 4 Incorrect Ratio       P0731       In response to pending failure, a contrast shafe a security failure accurate shafe and the security failure accurate shafe a security failure accurate shafe a security failure accurate shafe a security failure accurate shafe and the securate shafe and the securet shafe and the secu   |                         |       |                       | ANL                                     | <b>'</b>        |  |   |               |       |
| Gear 4 Incorrect Ratio       P073<br>(hin rage south in the set of index participation index part participation in the set of index part pa   |                         |       |                       | gear slip                               | > 100 RPM       | Not Test Failed This Key On  | P0721                                   |               |       |
| Gear 4 Incorrect Rate       P074       Provide proportion to pending failure, a adjuncie to commanded pration       P0770       P07   |                         |       |                       |   |                 |  | P0722                                   |               |       |
| Gear 4 Incorrect Ratio       P074       P077       P0777       P0777         Ocear 4 Incorrect Ratio       P074       P0770       P0770       P0770         No Fault Pending DTC for this dive       P0777       P0777       P0770       P0770         No Fault Pending DTC for this dive       P0777       P0770       P0770       P0770       P0770         No Fault Pending DTC for this dive       P0770       P0770       P0770       P0770       P0770         No Fault Pending DTC for this dive       P0770       P0770       P0770       P0770       P0770         No Fault Pending DTC for this dive       P0771       Opcies       P0770       P0770       P0770         No Fault Pending DTC for this dive       P0771       Opcies       P0770       P0770       P0770         No Fault Pending DTC for this dive       P0771       Opcies       P0770       P0770       P0770         No Fault Pending Direct Fault       P0770       P0770       P0770       P0770       P0770       P0770         Sam 4       Incomplete       Sam 4       P0770       P0770       P0770       P0770       P0770         No Fault Pending Direct Fau  |                         |       |                       | In response to pending failure, a       | 1               |  | P0716                                   |               |       |
| Gear 4 Incomed Ratio       P173       This lest verifies       Panding failure occurs when accumulated event timers is >= 100 RPM       Not Text Pailed This Key 0 (scope)       P0770       P0770         Gear 4 Incomed Ratio       P173       This lest verifies       Panding failure occurs when accumulated event timers is >= 100 RPM       Not Text Pailed This Key 0 (scope)       P0787         Gear 4 Incomed Ratio       P173       This lest verifies       Panding failure occurs when accumulated event timers is >= 0.75 second       Not Text Pailed This Key 0 (scope)       P0877         Gear 4 Incomed Ratio       P173       This lest verifies       Panding failure occurs when accumulated event timers is >= 0.75 second       Not Text Pailed This Key 0 (scope) # 00877       P0877         Gear 4 Incomed Ratio       P173       This lest verifies       P13 seconds       >= 1 second       Not Text Pailed This Key 0 (scope) # 00877       P0877         Gear 4 Incomed Ratio       P174 seconds       P174 sec  |                         |       |                       | diagnostic response range is            | 5               |  | P0717                                   |               |       |
| Gear 4 Incomed Ratio       P074       This lest verifies       Pending falue occurs when accurations of the set on times is a second of evering range       Not Test Paind This Key On (second times)       P077       P0705       P07075       P0705       P0  |                         |       |                       | commanded.                              |                 |  | P07BF                                   |               |       |
| Gear 4 Incorrect Ratio       P0734       Prise test verifies our set of poil is not material point our time part is not material point out time part is not point out tis not point out tis point out tis point out time part is not poin   |                         |       |                       | During this command, this tost fails if |                 |  | P07C0                                   |               |       |
| Gear 4 Incorrect Ratio       P034<br>organization of the commanded by<br>commanded by<br>co   |                         |       |                       | Abs(Converter Slin)                     | >= 250 RPM      |  | P077C                                   |               |       |
| Gear 4 Incorrect Ratio       Portage failure occurs when the range is on the organing on the range is   |                         |       |                       | for                                     | > 10 samples    |  | 10110                                   |               |       |
| Gear 4 Incorrect Ratio       Portal Transmission       Pending failure occurs when so accumulated event times accumulated eve   |                         |       |                       |   | r lo campioci   | No Fault Pending DTC for this drive                                  | P0717                                   |               |       |
| Gear 4 Incorrect Ratio       P074       This test verifies<br>roomanded by<br>commanded ratio.       Pending faulure occurs with<br>auspector       Pending faulure occurs with<br>auspector       Pending faulure occurs with<br>auspector       Not Test Failed This Key On (see pet if<br>Po377       P0737       2.25 seconds       A         Gear 4 Incorrect Ratio       Po174<br>ratio to the<br>commanded ratio.       Pending faulure occurs with<br>auspector       Pending faulure occurs with<br>auspector       Not Test Failed This Key On (see pet if<br>Po377       P0377       2.25 seconds       A         Gear 4 Incorrect Ratio       Po174<br>ratio to the<br>commanded ratio.       Pending faulure occurs with<br>auspector       Pending faulure occurs with<br>auspector       P0177       2.25 seconds       A         Gear 4 Incorrect Ratio       P0174<br>ratio to the<br>commanded by<br>commanded ratio.       Pending faulure occurs with<br>auspector       P0177       P0377         Not Fault Active with more gar<br>Not Fault Active with more gar<br>P0177       P0377  |                         |       |                       |   |                 | cycle  | P07BF                                   |               |       |
| Gear 4 Incorrect Ratio       Porting ratio write<br>hange sign for sesure dropout is suspected<br>to fine an pressure dropout is detected<br>ratio is in forward or reverse range<br>output speed       NOT Low Voitage Disable<br>No range switch response active<br>Hydraulic System Pressure<br>Output speed       Percenting file<br>speed       Percenting speed       Percenting speecenting speecenting speed       Percenting sp   |                         |       |                       |   |                 |  | P07C0                                   |               |       |
| Gear 4 Incorrect Ratio       P0734       This test verifies<br>rransmission<br>commanded ratio.       Pending failure occurs when<br>support of the accumulated event timer is<br>in forward or reverse range<br>AND       No Test Failed This Key On (except I)<br>P0877       P0877       2.25 seconds       A  |                         |       |                       |   |                 | NOT Low Voltage Disable  |   |               |       |
| Gear 4 Incorrect Ratio       P0734       This test verifies       Pending failure occurs when transmission of the many essure dropout is subgeded to the many essure dropout is detected to the ma  |                         |       |                       |   |                 | NOT LOW VORAGE DISable   |   |               |       |
| Gear 4 Incorrect Ratio       P073       This test verifies transmission operating ratio while operating ratio while commanded ratio.       Pending failure occurs when transmission is in forward or reverse range of the second is in fo  |                         |       |                       |   |                 | No range switch response active                                      |   |               |       |
| Gear 4 Incorrect Ratio       P0734       This test verifies commanded by commanded ratio.       Pending failure occurs when accumulated event timer is be 100 RPM       Not Test Failed This Key On (except i) ratio ra   |                         |       |                       |   |                 | Hydraulic System Pressurized   |   |               |       |
| Gear 4 Incorrect Ratio       P0734       This test verifies transmission computed ratio.       Pending failure occurs when accumulated event timer is be accomulated event timer is be accumulated event timer is be accumulate timer is accumulated event timer is be accumulate even  |                         |       |                       |   |                 | Shift complete   | •                                       |               |       |
| Gear 4 Incorrect Ratio       P0734       This test verifies       Pending failure occurs when accumulated event timer is accumulated event timer is is in forward or reverse range is in forwa  |                         |       |                       |   |                 | Output speed   | >= 200 RPM                              |               |       |
| Gear 4 Incorrect Ratio       P0734       This test verifies transmission or transmission or transmission or transmission or transmission or comparing computes       Pending failure occurs when accumulated event time is suspected THEN accumulated event time is is in forward or reverse range       Not Test Failed This Key On (except if P0877 dropout suspect or detected)       P0877         Not Fault Pending with cmd gear       P0877       P0877       P0877       P0877       P0877         Not Fault Pending viation is in forward or reverse range       >= 0.75 second       Not Fault Pending with cmd gear       P0877       P0877         Not Fault Active with cmd gear       P0877       P0877       P0877       P0877       P0877         Not Fault Pending with cmd gear       P0877       P0877       P0877       P0877       P0877       P0877   |                         |       |                       |   |                 | No bydraulic default condition                                       |   |               |       |
| Gear 4 Incorrect Ratio       P0734       This test verifies transmission operating ratio while than pressure dropout is suspected than pressure dropout is suspected to the commanded pressure dropout is detected. THEN accumulated event timer is >= 1 second       Not Test Failed This Key On (except if P0877 except if P0877 e  |                         |       |                       |   |                 | present  | t                                       |               |       |
| Gear 4 Incorrect Ratio       P0734       This test verifies transmission operating ratio while divent timer is complete       Pending failure occurs when accumulated event timer is >= 2 second       Not Test Failed This Key On (except if dropout suspect of detected)       P0877       2.25 seconds       A         Gear 4 Incorrect Ratio       P0734       This test verifies transmission operating ratio while divent timer is comparing comparing computed is suspected THEN accumulated event timer is >= 1 second       Not Test Failed This Key On (except if dropout suspect or detected)       P0877       2.25 seconds       A         If main pressure dropout is detected ratio to the commanded by comparing computer ratio to the commanded ratio.       P0877   |                         |       |                       |   |                 |  |   |               |       |
| Gear 4 Incorrect Ratio       P0734       This test verifies transmission operating ratio while 4th range is commanded by comparing computed ratio to the commanded ratio.       Pending failure occurs when accumulated event timer is >= 2 second       Not Test Failed This Key On (except if dropout suppert or detected)       P0877       P0878       2.25 seconds       A         IF main pressure dropout is supperted ratio to the commanded by comparing computed ratio to the commanded ratio.       P0.75 second       Not Test Failed This Key On (except if dropout suppert or detected)       P0878       P0877       P0878       P0877       P0878       P0877   |                         |       |                       |   |                 | Normal powertrain shutdown not in                                    | 1                                       |               |       |
| Image: Second   |                         |       |                       |   |                 | process  | 5                                       |               |       |
| Gear 4 Incorrect Ratio       P0734       This test verifies transmission operating ratio while 4th range is commanded by comparing computed event timer is in forward or reverse range       Pending failure occurs when accumulated event timer is in forward or reverse range       Not Test Failed This Key On (except if dropout suspect or detected.)       P0877       P0878       P0877       P0878       Point Poi  |                         |       |                       |   |                 |  |   |               |       |
| Gear 4 Incorrect RatioP0734This test verifies<br>transmission<br>operating ratio while<br>4th range is<br>commanded by<br>comparing computed<br>ratio to the<br>commanded ratio.Pending failure occurs when<br>accumulated event timer is<br>is in forward or reverse range<br>AND<br>output speed<br>a NotNot Test Failed This Key On (except if<br>dropout suspect or detected.)P0877<br>P08772.25 secondsAP0734Image is<br>commanded by<br>comparing computed<br>ratio to the<br>commanded ratio.Pending failure occurs when<br>accumulated event timer is<br>is in forward or reverse range<br>output speed<br>b = 100 RPMNot Test Failed This Key On (except if<br>dropout suspect or detected.)P0877<br>P0877P0877<br>P0877P0877<br>P0877P0877  |                         |       |                       |   |                 | Normal powertrain initialization is                                  |   |               |       |
| Gear 4 Incorrect Ratio       P0734       This test verifies<br>transmission<br>operating ratio while<br>4th range is<br>commanded by<br>comparing computed<br>ratio to the<br>commanded ratio.       Pending failure occurs when<br>accumulated event timer<br>IF main pressure dropout is suspected<br>THEN accumulated event timer is<br>e 0.75 second       Not Test Failed This Key On (except if<br>dropout suspect or detected.)       P0877       P0878       P0878       A         Not Test Failed This Key On (except if<br>dropout suspect or detected.)       Not Test Failed This Key On (except if<br>dropout suspect or detected.)       P0877       P0877       P0878       P0877         IF main pressure dropout is detected<br>ratio to the<br>commanded ratio.       IF main pressure dropout is detected<br>THEN accumulated event timer is<br>is in forward or reverse range<br>Output speed       >= 0.75 second       Not Fault Pending with cmd gear<br>Not Fault Active with cmd gear       P0877       P0877       P0877  |                         |       |                       |   |                 | complete   |   |               |       |
| transmission       accumulated event timer       >= 2 second       Not Test Failed This Key On (except if P0877         operating ratio while<br>4th range is       IF main pressure dropout is suspected       IF main pressure dropout is detected       >= 1 second         oommanded by       IF main pressure dropout is detected       >= 0.75 second       Not Fault Pending with cmd gear       P0877         ratio to the       If main or accumulated event timer is       >= 0.75 second       Not Fault Pending with cmd gear       P0877         Timer accumulates when transmission<br>is in forward or reverse range       AND       Not Fault Active with cmd gear       P0877         Not Fault Active with cmd gear       P0877       Rev_Logic1 and RPS/PRNDL conflict       P0877   | Gear 4 Incorrect Ratio  | P0734 | This test verifies    | Pending failure occurs when             |                 | 1  | t                                       | 2.25 seconds  | A     |
| operating ratio while<br>4th range is<br>commanded by<br>comparing computed<br>ratio to the<br>commanded ratio.       IF main pressure dropout is suspected<br>THEN accumulated event timer is<br>is pressure dropout is detected<br>THEN accumulated event timer is<br>= 0.75 second       Autoput suspect or detected.<br>Not Fault Pending with cmd gear<br>Rev_Logic1 and RPS/PRNDL conflict       P0878         Not Fault Active with cmd gear<br>Commanded ratio.       Timer accumulated event timer is<br>is in forward or reverse range<br>output speed       >= 100 RPM       Not Fault Active with cmd gear<br>Not Fault Active with cmd gear P0877  |                         |       | transmission          | accumulated event time                  | >= 2 second     | Not Test Failed This Key On (except in                               | P0877                                   |               |       |
| 4th range is<br>commanded by<br>comparing computed<br>ratio to the<br>commanded ratio.       THEN accumulated event timer is<br>IF main pressure dropout is detected<br>THEN accumulated event timer is<br>the accumulated event timer is<br>is in forward or reverse range       >= 0.75 second       Not Fault Pending with cmd gear<br>Rev_Logic1 and RPS/PRNDL conflict         Timer accumulates when transmission<br>is in forward or reverse range       Not Fault Active with cmd gear<br>Not Fault Active with cmd gear P0877         Output speed       >= 100 RPM       Not Fault Active with cmd gear<br>Not Fault Active of the conflict   |                         |       | operating ratio while | IF main pressure dropout is suspected   |                 | dropout suspect or detected.)  | P0878                                   |               |       |
| comparing computed by comparing computed ratio to the commanded ratio.       IF main pressure dropout is detected THEN accumulated event time is >= 0.75 second       Not Fault Pending with cmd gear P0877         ratio to the commanded ratio.       Timer accumulates when transmission is in forward or reverse range Output speed output speed Second Output speed S  |                         |       | 4th range is          | THEN accumulated event timer is         | >= 1 second     |  |   |               |       |
| The Naccumulated event timer is >= 0.75 second     Not Fault Pending with cmd gear P0877       ratio to the commanded ratio.     Timer accumulates when transmission is in forward or reverse range       AND     Not Fault Active with cmd gear P0877       Not Fault Active with cmd gear P0877       Rev_Logic1 and RPS/PRNDL conflict   |                         |       | commanded by          | IF main pressure dropout is detected    |                 |  |   |               |       |
| Timer accumulates when transmission<br>is in forward or reverse range<br>output speed >= 100 RPM<br>AND   |                         |       | ratio to the          | THEN accumulated event timer is         | >= 0.75 second  | Not Fault Pending with cmd gear                                      | P0877                                   |               |       |
| AND     Not Fault Active with cmd gear       Output speed     >= 100 RPM       AND     Rev_Logic1 and RPS/PRNDL conflict  |                         | 1     | commanded ratio.      | Timer accumulates when transmission     |                 | Nev_LUGICT AND KPS/PRINDL CONTIIC                                    | L                                       | 1             |       |
| AND Not Fault Active with cmd gear P0877  Not Fault Active with Active wit  |                         | 1     |                       | is in forward or reverse range          |                 | 1  |   | 1             |       |
| AND NOTFault Active with cma gear/P0877 NotFault Active with cma gear/P08777 NotFault Active with cma gear/P08777 NotFault Active with cma  |                         |       |                       | is in forward of foverse failinge       |                 | Net Feult Active with and serve                                      | D0077                                   |               |       |
|   |                         |       |                       | AND                                     | >= 100 RPM      | Not Fault Active with cmd geal<br>Rev. Logic1 and RPS/PRNDL conflict | PU8//                                   |               |       |
|   |                         |       |                       |   |                 |  |   |               |       |

| Component/System       | Fault | Monitor Strategy      | Malfunction Criteria   | Threshold Value | Secondary Parameters                   | Enable Conditions | Time Required | MIL   |
|------------------------|-------|-----------------------|--|-----------------|--|-------------------|---------------|-------|
|                        | Code  | Description           |  |                 |  |                   |               | Illum |
|                        |       |                       | gear slip  | > 100 RPM       |  |                   |               |       |
|                        |       |                       | La construction de la construction |                 | Not Test Failed This Key On            | P0721             |               |       |
|                        |       |                       | In response to pending failure, a  |                 |  | P0722             |               |       |
|                        |       |                       | diagnostic response range is   |                 |  | P0716             |               |       |
|                        |       |                       | commanded.   |                 |  | P0717             |               |       |
|                        |       |                       | During this command, this tast fails if  |                 |  | P07BF             |               |       |
|                        |       |                       | During this command, this test fails in<br>Abs(Converter Slip)   | > - 250 PPM     |  | P07C0             |               |       |
|                        |       |                       | Abs(Converter Slip)  |                 |  | P077D             |               |       |
|                        |       |                       | 101  | > to samples.   |  | 10/10             |               |       |
|                        |       |                       |  |                 | No Fault Pending DTC for this drive    | P0717             |               |       |
|                        |       |                       |  |                 | cycle.                                 | P07BF             |               |       |
|                        |       |                       |  |                 |  | P07C0             |               |       |
|                        |       |                       |  |                 |  |                   |               |       |
|                        |       |                       |  |                 | NOT Low Voltage Disable                |                   |               |       |
|                        |       |                       |  |                 |  |                   |               |       |
|                        |       |                       |  |                 | No range switch response active        |                   |               |       |
|                        |       |                       |  |                 |  |                   |               |       |
|                        |       |                       |  |                 | Hydraulic System Pressurized           |                   |               |       |
|                        |       |                       |  |                 | Shift complete                         |                   |               |       |
|                        |       |                       |  |                 | Shin complete                          |                   |               |       |
|                        |       |                       |  |                 | Output speed                           | >= 200 RPM        |               |       |
|                        |       |                       |  |                 |  | - 200 10 10       |               |       |
|                        |       |                       |  |                 | No hydraulic default condition         |                   |               |       |
|                        |       |                       |  |                 | present                                |                   |               |       |
|                        |       |                       |  |                 |  |                   |               |       |
|                        |       |                       |  |                 | Normal powertrain shutdown not in      |                   |               |       |
|                        |       |                       |  |                 | process                                |                   |               |       |
|                        |       |                       |  |                 |  |                   |               |       |
|                        |       |                       |  |                 | Normal powertrain initialization is    |                   |               |       |
|                        |       |                       |  |                 | compiete                               |                   |               |       |
| Gear 5 Incorrect Ratio | P0735 | This test verifies    | Pending failure occurs when  |                 |  |                   | 2 25 seconds  | A     |
|                        |       | transmission          | accumulated event timer  | >= 2 second     | Not Test Failed This Key On (except if | P0877             | 2.20 0000140  |       |
|                        |       | operating ratio while | IF main pressure dropout is suspected  |                 | dropout suspect or detected.)          | P0878             |               |       |
|                        |       | 5th range is          | THEN accumulated event timer is  | >= 1 second     |  |                   |               |       |
|                        |       | commanded by          | IF main pressure dropout is detected   |                 |  |                   |               |       |
|                        |       | comparing computed    | THEN accumulated event timer is  | >= 0.75 second  | Not Fault Pending with cmd gear        | P0877             |               |       |
|                        |       | ratio to the          |  |                 | Rev_Logic1 and RPS/PRNDL conflict      |                   |               |       |
|                        |       | commanded ratio.      | Timer accumulates when transmission  |                 |  |                   |               |       |
|                        |       |                       | is in forward or reverse range   |                 |  |                   |               |       |
|                        |       |                       | AND  |                 | Not Fault Active with cmd gear         | P0877             |               |       |
|                        |       |                       | output speed   | >= 100 RPM      | Rev_Logic1 and RPS/PRNDL conflict      |                   |               |       |
|                        |       |                       | gear slip  | > 100 RPM       |  |                   |               |       |
|                        |       |                       |  |                 |  |                   |               |       |
|                        |       |                       | In response to pending failure, a  |                 | Not Test Failed This Key On            | P0721             |               |       |
|                        |       |                       | diagnostic response range is   |                 |  | P0722             |               |       |
|                        |       |                       | commanded.   |                 |  | P0716             |               |       |
|                        |       |                       |  |                 |  | P0717             |               |       |
|                        |       |                       | During this command, this test fails if  |                 |  | P07BF             |               |       |
|                        |       |                       | Abs(Converter Slip)  | >= 250 RPM      |  | P07C0             |               |       |
|                        |       |                       | for  | > 10 samples.   |  | P077C             |               |       |
|                        |       |                       |  |                 |  | P077D             |               |       |
|                        |       |                       |  |                 |  |                   |               |       |
|                        |       |                       |  |                 | No Fault Pending DTC for this drive    | P0717             |               |       |
|                        |       |                       |  |                 | cycle.                                 | P07BF             |               |       |
|                        |       |                       |  |                 |  | P07C0             |               |       |
| 1                      | 1     | 1                     | 1  |                 | 1                                      |                   |               | 1     |

| Component/System        | Fault | Monitor Strategy   | Malfunction Criteria  | Threshold Value             | Secondary Parameters  | Enable Conditions       | Time Required | MIL   |
|-------------------------|-------|--|---|-----------------------------|---|-------------------------|---------------|-------|
|                         | Code  | Description  |   |                             | NOT Low Voltage Disable   |                         |               | llium |
|                         |       |  |   |                             | No range switch response active   |                         |               |       |
|                         |       |  |   |                             | Hydraulic System Pressurized  |                         |               |       |
|                         |       |  |   |                             | Shift complete  |                         |               |       |
|                         |       |  |   |                             | Output speed  | >= 200 RPM              |               |       |
|                         |       |  |   |                             | No hydraulic default condition<br>present                               |                         |               |       |
|                         |       |  |   |                             | Normal powertrain shutdown not in process                               |                         |               |       |
|                         |       |  |   |                             | Normal powertrain initialization is<br>complete                         |                         |               |       |
| Reverse Incorrect Ratio | P0736 | This test verifies   |   |                             |   |                         | 2 seconds     | А     |
|                         |       | transmission range<br>while reverse range<br>is commanded by<br>comparing computed | Accumulated event timer<br>IF main pressure dropout is suspected<br>THEN accumulated event timer is | >= 2 seconds<br>>= 1 second | Not Test Failed This Key On (except if<br>dropout suspect or detected.) | P0877<br>P0878          |               |       |
|                         |       | ratio to the commanded ratio.  | THEN accumulated event timer is   | >= 0.75 second              | Not Fault Pending with cmd gear<br>Rev_Logic1 and RPS/PRNDL conflict    | P0877                   |               |       |
|                         |       |  | Timer accumulates when transmission<br>is in forward or reverse range<br>AND<br>output speed        | >= 100 RPM                  | Not Fault Active with cmd gear<br>Rev_Logic1 and RPS/PRNDL conflict     | P0877                   |               |       |
|                         |       |  | gear slip   | > 100 RPM                   | Not Test Failed This Key On   | P0721                   |               |       |
|                         |       |  |   |                             |   | P0722                   |               |       |
|                         |       |  |   |                             |   | P0716<br>P0717          |               |       |
|                         |       |  |   |                             |   | P07BF                   |               |       |
|                         |       |  |   |                             |   | P07C0                   |               |       |
|                         |       |  |   |                             |   | P077D                   |               |       |
|                         |       |  |   |                             | No Fault Pending DTC for this drive cycle.                              | P0717<br>P07BF<br>P07C0 |               |       |
|                         |       |  |   |                             | NOT Low Voltage Disable   |                         |               |       |
|                         |       |  |   |                             | No range switch response active   |                         |               |       |
|                         |       |  |   |                             | Hydraulic System Pressurized  |                         |               |       |
|                         |       |  |   |                             | Shift complete  |                         |               |       |
|                         |       |  |   |                             | Output speed  | >= 200 RPM              |               |       |
|                         |       |  |   |                             | No hydraulic default condition present                                  |                         |               |       |
|                         |       |  |   |                             | Normal powertrain shutdown not in                                       |                         | l             |       |

| Code     Description       process   | Illum |
|--|-------|
| process  |       |
|  |       |
| Normal nowertrain initialization is  |       |
|  |       |
|  |       |
| Gear 6 Incorrect Ratio P0729 This test verifies Pending failure occurs when 2.25 seconds   | A     |
| transmission range accumulated event timer >= 2 second Not Test Failed This Key On (except if P0877  |       |
| while 6th range is IF main pressure dropout is suspected dropout suspect or detect) P0878  |       |
| commanded computed LE mein second drapput i detocted   |       |
| rin interpreter and pressure and output is detected in the second and the second second in the transfer of the transfer and the second second is the second se |       |
| commanded ratio. Rev Logici and RPS/PRIDL conflict   |       |
| Timer accumulates when transmission  |       |
| is in forward or reverse range   |       |
| AND Not Fault Active with and gear P0877   |       |
| output speed >= 100 RPM Rev_Logic1 and RPS/PRINDL connict  |       |
| AND  |       |
| gear slip > 100 RPM Not Test Failed This Key On P0721  |       |
| P0722  |       |
| In response to pending failure, a P0716  |       |
| diagnostic response range is P0717   |       |
| commanded. P07BF   |       |
| During this command, this test fails if P077C  |       |
| Abs(Converter Siii) >= 250 RPM P077D   |       |
| for > 10 samples.  |       |
| No Fault Pending DTC for this drive P0717  |       |
| cycle. P07BF   |       |
| P07C0  |       |
| NOT Law Veltage Disable  |       |
| NOT LOW YOUNGE DISADLE   |       |
| No range switch response active  |       |
|  |       |
| Hydraulic System Pressurized   |       |
|  |       |
| Shift complete   |       |
| Output speed >= 200 RPM  |       |
| Output speed >= 200 KFM  |       |
| No hydraulic default condition   |       |
| present  |       |
|  |       |
| Normal powertrain shutdown not in  |       |
| process  |       |
| Normal nowertrain initialization is  |       |
|  |       |
|  |       |
| Torque Converter Clutch  |       |
| Torque Converter Clutch P0741 This test detects the 15 seconds   | В     |
| Circuit Performance or locate convenier TCC Stip >= 80 KPM Not Test Pared This Key On P2/61  |       |
| (unlocked).  |       |
| P0721  |       |
| P0722  |       |
| P0716  |       |
| P0717  |       |
| P077C<br>P077D   |       |
| Component/System        | Fault | Monitor Strategy      | Malfunction Criteria                   | Threshold Value   | Secondary Parameters                 | Enable Conditions    | Time Required | MIL   |
|-------------------------|-------|-----------------------|--|-------------------|--------------------------------------|----------------------|---------------|-------|
|                         | Code  | Description           |  |                   |                                      |                      |               | Illum |
|                         |       |                       |  |                   |                                      | P07BF                |               |       |
|                         |       |                       |  |                   |                                      | P07C0                |               |       |
|                         |       |                       |  |                   |                                      |                      |               |       |
|                         |       |                       |  |                   | No Fault Pending DTCs for this drive | P2761                |               |       |
|                         |       |                       |  |                   | cycle.                               | P2763                |               |       |
|                         |       |                       |  |                   |                                      | P2764                |               |       |
|                         |       |                       |  |                   |                                      | P0721                |               |       |
|                         |       |                       |  |                   |                                      | P0722                |               |       |
|                         |       |                       |  |                   |                                      | P0716                |               |       |
|                         |       |                       |  |                   |                                      | P0717                |               |       |
|                         |       |                       |  |                   |                                      | P077C                |               |       |
|                         |       |                       |  |                   |                                      | D077D                |               |       |
|                         |       |                       |  |                   |                                      |                      |               |       |
|                         |       |                       |  |                   |                                      |                      |               |       |
|                         |       |                       |  |                   |                                      | P07C0                |               |       |
|                         |       |                       |  |                   |                                      |                      |               |       |
|                         |       |                       |  |                   | Components powered                   |                      |               |       |
|                         |       |                       |  |                   | AND                                  |                      |               |       |
|                         |       |                       |  |                   | Battery Voltage between              | 9 V and 18 V         |               |       |
|                         |       |                       |  |                   |                                      |                      |               |       |
|                         |       |                       |  |                   | Engine Speed between                 | 200 RPM and 7500     |               |       |
|                         |       |                       |  |                   |                                      | RPM                  |               |       |
|                         |       |                       |  |                   | for                                  | 5 seconds            |               |       |
|                         |       |                       |  |                   |                                      |                      |               |       |
|                         |       |                       |  |                   | Must be in forward range             |                      |               |       |
|                         |       |                       |  |                   | 3.                                   |                      |               |       |
|                         |       |                       |  |                   | % Throttle                           | > 10 % and <= 90 %   |               |       |
|                         |       |                       |  |                   | <i>/•</i> 1110440                    |                      |               |       |
|                         |       |                       |  |                   |                                      |                      |               |       |
|                         |       |                       |  |                   | Transmission fluid tomporatura       | > 5 deg. C and < 130 |               |       |
|                         |       |                       |  |                   | Transmission nuid temperature        |                      |               |       |
|                         |       |                       |  |                   |                                      | ueg. C               |               |       |
|                         |       |                       |  |                   | Time Ciese Deses Change              | Casaanda             |               |       |
|                         |       |                       |  |                   | Time Since Range Change              | >= 6 seconds         |               |       |
|                         |       |                       |  |                   | AND                                  |                      |               |       |
|                         |       |                       |  |                   | TCC apply is complete                |                      |               |       |
|                         |       |                       |  |                   | AND                                  |                      |               |       |
|                         |       |                       |  |                   | TCC pressure                         | >= 1000 kPa          |               |       |
|                         |       |                       |  |                   |                                      |                      |               |       |
| Torque Converter Clutch | P0742 | This test detects the |  |                   |                                      |                      |               | В     |
| Circuit Stuck On        |       | torque converter      | Case 1: (High Torque condition)        |                   | Not Test Failed This Key On          | P2761                | Case 1:       |       |
|                         |       | being stuck on        | Set fault pending when throttle        | >= 70%            |                                      | P2763                | 2 Seconds     |       |
|                         |       | (locked).             | AND                                    |                   |                                      | P2764                |               |       |
|                         |       |                       | net engine torque                      | >= 275 Nm.        |                                      | P0721                |               |       |
|                         |       |                       |  |                   |                                      | P0722                |               |       |
|                         |       |                       | Report malfunction when fault pending  |                   |                                      | P0716                |               |       |
|                         |       |                       | exists continuously                    |                   |                                      | P0717                |               |       |
|                         |       |                       | for a time                             | >= 2 seconds.     |                                      | U0100                |               |       |
|                         |       |                       |  |                   |                                      | P077C                |               |       |
|                         |       |                       |  |                   |                                      | P077D                |               |       |
|                         |       |                       |  |                   |                                      | P07BE                |               |       |
|                         |       |                       |  |                   |                                      | P07C0                |               |       |
|                         |       |                       |  |                   |                                      |                      |               |       |
|                         |       |                       | Case 2: (High Acceleration condition)  |                   | No Foult Ponding DTCs for this date  | P2761                | Case 2:       |       |
|                         |       |                       | Case 2. (Fligh Acceleration condition) |                   | NO Paul Penuing DTCS for this drive  | 0762                 | Case 2.       |       |
|                         |       |                       |  |                   | cycle.                               | F 2103               | 5 560010S     |       |
|                         | 1     |                       | Set fault pending when output shaft    |                   |                                      | F2/04                |               |       |
|                         |       |                       | acceleration                           | >= 100 RPM/second |                                      | PU/21                |               |       |
|                         |       |                       |  |                   |                                      | PU/22                |               |       |
|                         |       |                       | Report malfunction when fault pending  |                   |                                      | P0/16                |               |       |
|                         |       |                       | exists continuously                    |                   |                                      | P0717                |               |       |
|                         |       |                       | for a time                             | >= 5 seconds.     |                                      | U0100                |               |       |
|                         | I     |                       |  |                   |                                      | P077C                | 1             |       |

| Component/System         | Fault | Monitor Strategy      | Malfunction Criteria                     | Threshold Value  | Secondary Parameters           | Enable Conditions   | Time Required | MIL   |
|--------------------------|-------|-----------------------|--|------------------|--------------------------------|---------------------|---------------|-------|
|                          | Code  | Description           |  |                  |                                |                     |               | Illum |
|                          |       |                       |  |                  |                                | P077D               |               |       |
|                          |       |                       |  |                  |                                | P07BF               |               |       |
|                          |       |                       |  |                  |                                | P07C0               |               |       |
|                          |       |                       |  |                  |                                |                     |               |       |
|                          |       |                       |  |                  | Components powered             |                     |               |       |
|                          |       |                       |  |                  | Components powered             |                     | 0             |       |
|                          |       |                       | Case 3: (Accel/Decel/Accel condition)    |                  | AND                            |                     | Case 3:       |       |
|                          |       |                       |  |                  | Battery Voltage between        | 9 V and 18 V        | 4 Seconds     |       |
|                          |       |                       | Report malfunction when output           |                  |                                |                     |               |       |
|                          |       |                       | acceleration event is followed by output |                  | Engine Speed between           | 200 RPM and 7500    |               |       |
|                          |       |                       | deceleration event and followed by       |                  |                                | RPM                 |               |       |
|                          |       |                       | another output acceleration event. An    |                  | for                            | 5 seconds           |               |       |
|                          |       |                       | output acceleration event occurs when    |                  | Engine speed not defaulted     |                     |               |       |
|                          |       |                       | output shaft acceleration                |                  | Must be in forward range       |                     |               |       |
|                          |       |                       |  | >= 40 PPM/second | indet be in fernale range      |                     |               |       |
|                          |       |                       | for a time                               |                  | TCC is commanded off           |                     |               |       |
|                          |       |                       | tor a time                               | >= 4 seconds     | TCC is commanded on            |                     |               |       |
|                          |       |                       |  |                  |                                |                     |               |       |
|                          |       |                       |  |                  | TCC Slip                       | >=-20 RPM and <= 20 |               |       |
|                          |       |                       | An output deceleration event occurs      |                  |                                | RPM                 |               |       |
|                          |       |                       | when output shaft acceleration is        |                  |                                |                     |               |       |
|                          |       |                       |  | <=-40 RPM/second |                                |                     |               |       |
|                          |       |                       | for a time                               | >= 2.5 seconds   | % Throttle                     | >= 25%              |               |       |
|                          |       |                       |  |                  | Net Engine Torque              | >= 175 Nm           |               |       |
|                          |       |                       |  |                  | Facial and a                   | >= 175 Nill         |               |       |
|                          |       |                       |  |                  | Engine speed                   | <= 3500 RFM         |               |       |
|                          |       |                       |  |                  | Input speed                    | <= 3500 RPM         |               |       |
|                          |       |                       |  |                  | Output speed                   | >= 100 RPM          |               |       |
|                          |       |                       |  |                  |                                |                     |               |       |
| Pressure Switches        | 1     | I                     |  |                  | T                              | 1                   |               | 1     |
| Pressure Switch Solenoid | P0842 | This test compares    | Pending failure occurs when PS1          |                  |                                |                     | 80 ms         | A     |
| 1 Circuit Low            |       | the commanded         | pressure switch indicates stroked for a  |                  | S1 valve is destroked          |                     |               |       |
|                          |       | valve position to the | time                                     | > 0.08 seconds   |                                |                     |               |       |
|                          |       | PS1 pressure switch   |  |                  | NOT Cold initialization unless |                     |               |       |
|                          |       | feedback. (part of S1 |  |                  | transmission fluid temperature | > -25 deg. C        |               |       |
|                          |       | valve integrity test) |  |                  |                                |                     |               |       |
|                          |       |                       |  |                  | NOT Low Voltage Disable        |                     |               |       |
|                          |       |                       |  |                  |                                |                     |               |       |
|                          |       |                       | In response to the pending failure, S1   |                  | NOT Shutdown with Active Diag  |                     |               |       |
|                          |       |                       | valve is retried by triggering S1 valve  |                  |                                |                     |               |       |
|                          |       |                       | command to stroked and back to           |                  | Hydraulic System Pressurized   |                     |               |       |
|                          |       |                       | destroked If PS1 pressure switch         |                  |                                |                     |               |       |
|                          |       |                       | continues to indicate stroked, then one  |                  | NOT Hydraulia Dafault Cmd      |                     |               |       |
|                          |       |                       | of three malfunction cases exists:       |                  | NOT Hydraulic Delault Chiu     |                     |               |       |
|                          |       |                       |  |                  |                                |                     |               |       |
|                          |       |                       |  |                  |                                |                     |               |       |
|                          |       |                       |  |                  |                                |                     |               |       |
|                          |       |                       | For Case 1 (electrical malfunction),     |                  |                                |                     |               |       |
|                          |       |                       |  |                  |                                |                     |               |       |
|                          |       |                       | SS1 Circuit Low reports failure, also.   | P0973            |                                |                     |               |       |
|                          |       |                       |  |                  |                                |                     |               |       |
|                          |       |                       |  |                  |                                |                     |               |       |
|                          |       |                       | For Case 2 (mechanical malfunction),     |                  |                                |                     |               |       |
|                          |       |                       |  |                  |                                |                     |               |       |
|                          |       |                       | Shift Solenoid 1 (SS1) Valve             | P0752            |                                |                     |               |       |
|                          |       |                       | Performance - Stuck On reports failure,  |                  |                                |                     |               |       |
|                          |       |                       | also.                                    |                  |                                |                     |               |       |
|                          |       |                       |  |                  |                                |                     |               |       |
|                          | I     |                       | For Case 3 (intermittent malfunction)    |                  |                                |                     |               | 1     |
|                          | 1     |                       |  |                  |                                |                     |               | 1     |
|                          | I     |                       | CC1 volvo rotru attanatad                | 15 timos         |                                |                     |               | 1     |
|                          | I     |                       | SS1 valve retry attempted                | 15 umes          |                                |                     |               |       |
|                          | I     |                       | AND                                      |                  |                                |                     |               |       |
|                          | 1     |                       | PS1 pressure switch continues to         |                  |                                |                     |               |       |
| 1                        | 1     | 1                     | indicate stroked.                        |                  | 1                              | 1                   | 1             | 1     |

| Component/System   | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value  | Secondary Parameters   | Enable Conditions | Time Required | MIL<br>Illum |
|--|---------------|--|---|--|--|-------------------|---------------|--------------|
|  |               |  |   |  |  |                   |               |              |
| Shift Solenoid 1 (SS1)<br>Valve Performance –<br>Stuck Off | P0751         | This test compares<br>the change of state<br>of the valve<br>command to the<br>change of state of<br>the PS1 pressure<br>switch feedback.<br>(part of the S1 valve<br>timeout test)  | S1 valve is commanded from destroked<br>to stroked and the PS1 pressure switch<br>indication remains destroked for a time<br>WITH<br>transmission fluid temperature<br>(Time increases as temperature<br>decreases with maximum time<br>at<br>transmission fluid temperature)   | >= 5 seconds<br>>= 0 deg. C<br>12 seconds<br><= -40 deg. C   | S1 valve commanded from destroked<br>NOT Low Voltage Disable<br>NOT Shutdown with Active Diag<br>Hydraulic System Pressurized<br>NOT Hydraulic Default Cmd   |                   | 5 seconds     | A            |
| Shift Solenoid 1 (SS1)<br>Valve Performance –<br>Stuck On  | P0752         | This test compares<br>the change of state<br>of the valve<br>command to the<br>change of state of<br>the PS1 pressure<br>switch feedback.<br>(part of the S1 valve<br>timeout test). | S1 valve commanded from stroked to<br>destroked and the PS1 pressure switch<br>indication remains stroked for a time<br>WITH<br>transmission fluid temperature<br>(Time increases as temperature<br>decreases with maximum time<br>at<br>transmission fluid temperature)  | > 6.2 seconds<br>>= 0 deg. C.<br>10 seconds<br><= -40 deg. C | S1 valve commanded from stroked to<br>destroked<br>NOT Low Voltage Disable<br>NOT Shutdown with Active Diag<br>Hydraulic System Pressurized<br>NOT Hydraulic Default Cmd   |                   | 6.6 seconds   | A            |
| Pressure Switch Solenoid<br>1 Circuit High                 | P0843         | This test compares<br>the commanded<br>valve position to the<br>PS1 pressure switch<br>feedback. (part of S1<br>valve integrity test)  | Pending failure occurs when PS1<br>pressure switch indicates destroked for<br>a time<br>IF a main pressure dropout is<br>suspected then time limit increases to<br>In response to the pending failure, S1<br>valve is retried by triggering S1 valve<br>command to destroked and back to<br>stroked. If the PS1 pressure switch<br>continues to indicate destroked, then<br>one of three malfunction cases exists.<br>For Case 1 (electrical malfunction),<br>SS1 Control Circuit Low reports<br>failure, also.<br>For Case 2 (mechanical malfunction),<br>Shift Solenoid 1 (SS1) Valve<br>Performance – Stuck Off reports failure,<br>also.<br>For Case 3 (intermittent malfunction),<br>S1 valve retry attempted<br>AND | > 0.07 seconds<br>5 seconds<br>P0973<br>P0751<br>15 times    | S1 valve is stroked<br>NOT Cold initialization unless<br>transmission fluid temperature<br>NOT Low Voltage Disable<br>NOT Shutdown with Active Diag<br>Hydraulic System Pressurized<br>NOT Hydraulic Default Cmd | > -25 deg. C      | 70 ms         | A            |

| Pressure Switch Solenoid       P0847       This test compares the commanded valve position to the PS2 pressure switch indicates stroked for a valve position to the PS2 pressure switch indicates stroked for a valve integrity test).       Pending failure occurs when PS2 pressure switch indicates stroked for a time > 0.04004 seconds       S2 valve is destroked       A         Image: Sign of the position to the PS2 pressure switch indicates stroked for a valve integrity test).       IF a main pressure dropout is suspected then time limit increases to over the pending failure, S2 valve integrity test).       NOT Cold initialization unless transmission fluid temperature pressure valve is retried by triggering S2 valve over the pending failure, S2 valve is retried by triggering S2 valve over switch destroked. If PS2 pressure switch continues to indicate stroked, then one of three malfunction cases exists.       NOT Shutdown with Active Diag Hydraulic System Pressurized NOT Hydraulic Default Cmd       NOT Hydraulic Default Cmd | Component/System                                  | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value  | Secondary Parameters  | Enable Conditions | Time Required | MIL<br>Illum |
|--|---|---------------|--|---|--|---|-------------------|---------------|--------------|
| Pressure Switch Solenoid       P0847       This test compares<br>the commanded<br>valve position to the<br>PS2 pressure switch<br>feedback (part of the<br>SS2 valve integrity<br>test).       This test compares<br>the commanded<br>time > 0.04004 seconds       S2 valve is destroked       40 ms       A         Valve position to the<br>PS2 pressure switch<br>  |   |               |  | indicate destroked.   |  |   |                   |               |              |
| Valve is retried by triggering S2 valve     Hydraulic System Pressurized       command to stroked and back to     Hydraulic System Pressurized       destroked. If PS2 pressure switch     NOT Hydraulic Default Cmd       continues to indicate stroked, then one     NOT Hydraulic Default Cmd       of three malfunction cases exists.     For Case 1 (electrical malfunction),   | 2 Circuit Low                                     | P0847         | This test compares<br>the commanded<br>valve position to the<br>PS2 pressure switch<br>feedback (part of the<br>S2 valve integrity<br>test). | Pending failure occurs when PS2<br>pressure switch indicates stroked for a<br>time<br>IF a main pressure dropout is<br>suspected then time limit increases to<br>In response to the pending failure, S2 | <ul> <li>&gt; 0.04004 seconds</li> <li>0.2998 seconds</li> </ul> | S2 valve is destroked<br>NOT Cold initialization unless<br>transmission fluid temperature<br>NOT Low Voltage Disable<br>NOT Shutdown with Active Diag | > -25 deg. C      | 40 ms         | A            |
| For Case 1 (electrical malfunction),   |   |               |  | valve is retried by triggering S2 valve<br>command to stroked and back to   |  | Hydraulic System Pressurized  |                   |               |              |
| For Case 1 (electrical malfunction),   |   |               |  | continues to indicate stroked, then one<br>of three malfunction cases exists.   |  | NOT Hydraulic Default Cmd   |                   |               |              |
|  |   |               |  | For Case 1 (electrical malfunction),  |  |   |                   |               |              |
| SS2 Control Circuit Low reports P0976<br>failure, also.  |   |               |  | SS2 Control Circuit Low reports failure, also.  | P0976  |   |                   |               |              |
| For Case 2 (mechanical malfunction),<br>Shift Solenoid 2 Valve Performance<br>– Stuck On reports failure, also.  |   |               |  | For Case 2 (mechanical malfunction),<br>Shift Solenoid 2 Valve Performance<br>– Stuck On reports failure, also.   | P0757  |   |                   |               |              |
| For Case 3 (intermittent malfunction),<br>S2 valve retry attempted 2 times<br>AND<br>PS2 pressure switch continues to<br>indicate stroked.   |   |               |  | For Case 3 (intermittent malfunction)<br>S2 valve retry attem<br>PS2 pressure switch continue<br>indicate stro  | 2 times  |   |                   |               |              |
| Shift Solenoid 2 Valve     P0756     This test compares<br>the change of state<br>of the valve     If the S2 valve is commanded from<br>destroked to stroked and the PS2<br>to stroked.     S2 valve commanded from destroked<br>to stroked.     5 seconds     A   | Shift Solenoid 2 Valve<br>Performance – Stuck Off | P0756         | This test compares<br>the change of state  | If the S2 valve is commanded from<br>destroked to stroked and the PS2<br>pressure switch indication remains   |  | S2 valve commanded from destroked to stroked.   |                   | 5 seconds     | A            |
| command to the destroked for a time >= 5 seconds NOT Low Voltage Disable   |   |               | command to the change of state of  | destroked for a time  | >= 5 seconds   | NOT Low Voltage Disable   |                   |               |              |
| the PS2 pressure<br>switch feedback (part<br>transmission fluid temperature >= 0 deg. C. NOT Shutdown with Active Diag   |   |               | the PS2 pressure<br>switch feedback (part  | transmission fluid temperature  | >= 0 deg. C.   | NOT Shutdown with Active Diag   |                   |               |              |
| timeout test). (Time increases as temperature decreases with maximum time 12 seconds decreases with maximum time 12 seconds  |   |               | timeout test).   | (Time increases as temperature<br>decreases with maximum time   | 12 seconds   | Hydraulic System Pressurized  |                   |               |              |
| at NOT Hydraulic Default Cmd transmission fluid temperature) <= -40 deg. C.  |   |               |  | at<br>transmission fluid temperature)   | <= -40 deg. C.   | NOT Hydraulic Default Cmd   |                   |               |              |
| Shift Solenoid 2 Valve       P0757       This test compares<br>the commanded<br>valve position to the<br>PS2 pressure switch       S2 valve commanded from stroked to<br>destroked and the PS2 pressure switch<br>be commanded       6.5 sec       A   | Shift Solenoid 2 Valve<br>Performance – Stuck On  | P0757         | This test compares<br>the commanded<br>valve position to the<br>PS2 pressure switch  | S2 valve commanded from stroked to<br>destroked and the PS2 pressure switch<br>does not indicate destroked for a time   | >= 6.5 seconds   | S2 valve commanded from stroked to destroked  |                   | 6.5 sec       | A            |
| feedback (part of the<br>S2 valve timeout<br>transmission fluid temperature<br>text)     WITH<br>NOT Low Voltage Disable   |   |               | feedback (part of the S2 valve timeout   | WITH transmission fluid temperature   | >= 0 deg. C.   | NOT Low Voltage Disable   |                   |               |              |
| (Time increases as temperature<br>docreases with maximum time [2] accords  |   |               | iesij.   | (Time increases as temperature  | 22 aaaanda   | NOT Shutdown with Active Diag   |                   |               |              |
| at<br>transmission fluid temperature) <= -40 deg. C. NOT Hydraulic Default Cmd   |   |               |  | transmission fluid temperature)   | <= -40 deg. C.   | NOT Hydraulic Default Cmd   |                   |               |              |

| Component/System                           | Fault | Monitor Strategy   | Malfunction Criteria   | Threshold Value   | Secondary Parameters   | Enable Conditions | Time Required | MIL   |
|--|-------|--|--|---|--|-------------------|---------------|-------|
|  | Code  | Description  |  |   |  |                   |               | Illum |
| Pressure Switch Solenoid                   | P08/8 | This test compares   | Pending failure occurs when PS2  |   |  |                   | 300 ms        | Δ     |
| Pressure Switch Solenoid<br>2 Circuit High | P0848 | This test compares<br>the commanded<br>valve position to the<br>PS2 pressure switch<br>feedback (part of the<br>S2 valve integrity<br>test). | Pending failure occurs when PS2<br>pressure switch indicates destroked for<br>a time<br>IF a main pressure dropout is<br>suspected, THEN time limit increases to<br>In response to the pending failure, S2<br>valve is retried by triggering S2 valve<br>command to destroked and back to<br>stroked. If PS2 pressure switch<br>continues to indicate destroked, then<br>one of three malfunction cases exists.<br>For Case 1 (electrical malfunction),<br>SS2 Control Circuit Low reports<br>failure, also.<br>For Case 2 (mechanical malfunction),<br>Shift Solenoid 2 Valve Performance –<br>Stuck Off reports failure, also.<br>For Case 3 (intermittent malfunction),<br>S2 valve retry attempted<br>AND<br>PS2 pressure switch continues to<br>indicate destroked. | <ul> <li>&gt; 0.30 seconds</li> <li>5 seconds</li> <li>P0976</li> <li>P0756</li> <li>2 times</li> </ul> | S2 valve is stroked<br>NOT Cold initialization unless<br>transmission fluid temperature<br>NOT Low Voltage Disable<br>NOT Shutdown with Active Diag<br>Hydraulic System Pressurized<br>NOT Hydraulic Default Cmd   | > -25 deg. C      | 300 ms        |       |
| Pressure Switch Solenoid<br>3 Circuit Low  | P0872 | This test compares<br>the commanded<br>valve position to the<br>PS3 pressure switch<br>feedback. (part of S3<br>valve integrity test)        | Pending failure occurs when PS3<br>pressure switch indicates stroked for a<br>time<br>In response to the pending failure, S3<br>valve is retried by triggering S3 valve<br>command to stroked and back to<br>destroked. If PS3 pressure switch<br>continues to indicate stroked, then one<br>of three malfunction cases exists.<br>For Case 1 (electrical malfunction),<br>SS3 Control Circuit Low reports<br>failure, also.<br>For Case 2 (mechanical malfunction),<br>Shift Solenoid 3 Valve Performance –<br>Stuck On reports failure, also.  | > 0.0195 seconds<br>P0979<br>P0762  | S3 valve is destroked<br>NOT Cold initialization unless<br>transmission fluid temperature<br>NOT Low Voltage Disable<br>NOT Shutdown with Active Diag<br>Hydraulic System Pressurized<br>NOT Hydraulic Default Cmd | > -25 deg. C      | 20 ms         | A     |

| Component/System         | Fault<br>Code | Monitor Strategy                             | Malfunction Criteria   | Threshold Value | Secondary Parameters               | Enable Conditions | Time Required | MIL  |
|--------------------------|---------------|--|--|-----------------|------------------------------------|-------------------|---------------|------|
|                          | Coue          | Description                                  | For Case 3 (intermittent malfunction).                                   |                 |                                    |                   |               | inum |
|                          |               |  |  |                 |                                    |                   |               |      |
|                          |               |  | S3 valve retry attempted   | 2 times         |                                    |                   |               |      |
|                          |               |  | AND  |                 |                                    |                   |               |      |
|                          |               |  | indicate stroked.  |                 |                                    |                   |               |      |
|                          |               |  |  |                 |                                    |                   |               |      |
| Shift Solenoid 3 Valve   | P0761         | This test compares                           | If the S3 valve is commanded from  |                 | S3 valve commanded from destroked  |                   | 5 seconds     | A    |
| Performance – Stuck Off  |               | the change of state                          | destroked to stroked and the PS3<br>pressure switch indication remains   |                 | to stroked.                        |                   |               |      |
|                          |               | command to the                               | destroked for a time   |                 | NOT Low Voltage Disable            |                   |               |      |
|                          |               | change of state of                           |  | >= 5 seconds    |                                    |                   |               |      |
|                          |               | the PS3 pressure                             | WITH   |                 | NOT Shutdown with Active Diag      |                   |               |      |
|                          |               | (part of the S3 valve                        | transmission fluid temperature   | >= 0 deg. C.    | Hudroulia Sustam Drasourized       |                   |               |      |
|                          |               | timeout test)                                | (Time increases as temperature   |                 | Hydraulic System Pressurized       |                   |               |      |
|                          |               |  | decreases with maximum time  | 12 seconds      | NOT Hydraulic Default Cmd          |                   |               |      |
|                          |               |  | at   |                 |                                    |                   |               |      |
|                          |               |  | transmission fluid temperature)  | <= -40 deg. C.  |                                    |                   |               |      |
| Shift Solenoid 3 Valve   | P0762         | This test compares                           | S3 valve commanded from stroked to                                       |                 |                                    |                   | 6.6 seconds   | А    |
| Performance – Stuck On   |               | the commanded                                | destroked and the PS3 pressure switch                                    |                 | S3 valve commanded from stroked to |                   |               |      |
|                          |               | valve position to the                        | does not indicate destroked for a time                                   |                 |                                    |                   |               |      |
|                          |               | PS3 pressure switch<br>feedback (part of the |  | > 6.5 seconds   | NOT Low Voltage Disable            |                   |               |      |
|                          |               | S3 valve timeout                             | transmission fluid temperature   | >= 0 deg. C.    | NOT Shutdown with Active Diag      |                   |               |      |
|                          |               | test).                                       |  |                 |                                    |                   |               |      |
|                          |               |  | (Time increases as temperature   | 22 seconds      | Hydraulic System Pressurized       |                   |               |      |
|                          |               |  | decreases with maximum time  |                 | NOT Undreulie Default Card         |                   |               |      |
|                          |               |  | transmission fluid temperature)  | >= -40 deg C    | NOT Hydraulic Delault Cffid        |                   |               |      |
|                          |               |  |  | - 10 009. 0.    |                                    |                   |               |      |
| Pressure Switch Solenoid | P0873         | This test compares                           | Pending failure occurs when PS3  |                 |                                    |                   | 300 ms        | А    |
| 3 Circuit High           |               | the commanded                                | pressure switch indicates destroked for                                  | > 0.30 soconds  | S3 valve is stroked                |                   |               |      |
|                          |               | pressure switch PS3                          |  |                 | NOT Cold initialization unless     |                   |               |      |
|                          |               | feedback. (part of S3                        | IF a main pressure dropout is  |                 | transmission fluid temperature     | > -25 deg. C      |               |      |
|                          |               | valve integrity test)                        | suspected THEN time limit increases to                                   | 5 seconds       |                                    |                   |               |      |
|                          |               |  |  |                 | NOT Low Voltage Disable            |                   |               |      |
|                          |               |  | In response to the pending failure, S3                                   |                 | NOT Shutdown with Active Diag      |                   |               |      |
|                          |               |  | valve is retried by triggering S3 valve                                  |                 |                                    |                   |               |      |
|                          |               |  | command to destroked and back to   |                 | Hydraulic System Pressurized       |                   |               |      |
|                          |               |  | stroked. If PS3 pressure switch<br>continues to indicate destroked, then |                 |                                    |                   |               |      |
|                          |               |  | one of the three malfunction cases                                       |                 | NOT Hydraulic Delault Ciliu        |                   |               |      |
|                          |               |  | exists.  |                 |                                    |                   |               |      |
|                          |               |  |  |                 |                                    |                   |               |      |
|                          |               |  | For Cose 1 (electrical molfunction)                                      |                 |                                    |                   |               |      |
|                          |               |  | For Case T (electrical mailunction),                                     |                 |                                    |                   |               |      |
|                          |               |  | SS3 Control Circuit Low reports  | P0979           |                                    |                   |               |      |
|                          |               |  | failure, also.   |                 |                                    |                   |               |      |
|                          |               |  | For Case 2 (mechanical malfunction)                                      |                 |                                    |                   |               |      |
|                          |               |  | r or case 2 (mechanical maluncion),                                      |                 |                                    |                   |               |      |
|                          |               |  | Shift Solenoid 3 Valve Performance                                       | P0761           |                                    |                   |               |      |
|                          |               |  | <ul> <li>Stuck Off reports failure, also.</li> </ul>                     |                 |                                    |                   |               |      |
|                          |               |  |  |                 |                                    |                   |               |      |
| 1                        | 1             | 1  | 1  | 1               | 1                                  | 1                 | 1             |      |

| Units         Units         Units         Every difference         For Case 3 (statember multiculos),<br>31 Value for y statepho 2 forms.<br>PER (passard stateh) commands<br>indexed states)         Forms.<br>PER (passard state)         Forms.<br>PER (passard state) <th>Component/System</th> <th>Fault</th> <th>Monitor Strategy</th> <th>Malfunction Criteria</th> <th>Threshold Value</th> <th>Secondary Parameters</th> <th>Enable Conditions</th> <th>Time Required</th> <th>MIL</th>   | Component/System        | Fault | Monitor Strategy                  | Malfunction Criteria                    | Threshold Value | Secondary Parameters                 | Enable Conditions | Time Required | MIL   |
|--|-------------------------|-------|-----------------------------------|---|-----------------|--------------------------------------|-------------------|---------------|-------|
| Image: Construction         Point lat induced<br>Protocol Status (Construction)         Solve (registion)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         Solve (registion)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         Solve (registion)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         Solve (registion)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         Solve (registion)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         Solve (registion)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         Solve (registion)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         Solve (registion)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         Solve (registion)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         Solve (registion)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         Solve (registion)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         All Cases         Not Test Failed Thickey on<br>Protocol Status (Construction)         All C   |                         | Code  | Description                       | For Case 2 (intermittent malfunction)   |                 | ł                                    |                   |               | illum |
| No.         No. <td></td> <td></td> <td></td> <td>i or case 5 (intermittent manufiction),</td> <td></td> <td></td> <td></td> <td></td> <td></td>   |                         |       |                                   | i or case 5 (intermittent manufiction), |                 |                                      |                   |               |       |
| Process South<br>Reverse Criteria Low         PROF<br>Process South<br>Reverse Design<br>Reverse Design<br>Re  |                         |       |                                   | S3 valve retry attempted                | 2 times         |                                      |                   |               |       |
| Pressue Suition<br>Reverse Suition<br>Reverse<br>Reverse Suition<br>Reverse Suition<br>Reverse<br>Reverse Suition<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse<br>Reverse |                         |       |                                   | AND                                     |                 |                                      |                   |               |       |
| Image: Constraint of the order designed in the order of the   |                         |       |                                   | PS3 pressure switch continues to        |                 |                                      |                   |               |       |
| Process Switch<br>Reverse Citual Low         PMD7         This test detachts<br>process Switch<br>detachts hap<br>Reverse Citual Low         PMD7         Reverse Citual Low         PMD7         Socion/Is         A           Reverse Citual Low         PMD7         Reverse Citual Low         PMD7         Reverse Presson<br>Detacht also predict AT FMD2<br>condut, use amptis con<br>DS Web rates of the<br>PMD1 service Presson<br>(if deposit alsocietation<br>Detacht also predict alsocietation<br>Detacht alsocietation<br>Detacht also predict alsocietation<br>Detacht alsocie  |                         |       |                                   | indicate destroked.                     |                 |                                      |                   |               |       |
| Reverse Croat Low         No         Reverse Pressen<br>Location is<br>Reverse Pressen<br>Bisch Hate Sol<br>Reverse Pressen<br>Bi   | Pressure Switch         | P0877 | This test detects                 |   |                 | All Cases                            |                   | 5 seconds     | А     |
| Built cload<br>in dialation by<br>Reverse Pression<br>Statut is use to be<br>PRIDL such and the<br>PRIDL such and the<br>PRIDL such and the<br>PRIDL such and the<br>PRIDL such and<br>the comp path<br>PRIDL such and<br>the comp path<br>PRIDL such and<br>the comp path<br>PRIDL such and<br>the comp path<br>PRIDL is inderession<br>of the comp path<br>PRIDL is inderession<br>path<br>PRIDL is inderession<br>of the comp path<br>PRIDL is inderession<br>of the comp path<br>PRIDL is inderession<br>of the comp path<br>PRIDL is inderession<br>path<br>PRIDL is  | Reverse Circuit Low     |       | Reverse Pressure                  | Case 1: (Forward range)                 |                 | Not Test Failed This Key On          | P0877             |               |       |
| Present Switch Revenue<br>Carcular High:     PROD: B P. D1, D2, D3, D4, D5, D5<br>PRNDL: B P. D1, D2, D3, D4, D5<br>PRNDL: B indefinition<br>PRNDL: B in  |                         |       | Switch closed                     | For a sample size                       | 100 samples     |                                      | P0878             |               |       |
| Pressure Switch Reverse<br>Crunt High         POTO<br>Bill Lis P, D1, D2, D3, D4, D5, D5, D6,<br>PRNDL is P, D1, D2, D3, D4, D5, D6,<br>PRNDL is Inderfered, D4, D5, D6,<br>PRND  |                         |       | indication by                     | (if dropout suspected, NLT or N02       |                 |                                      | P0708             |               |       |
| Switch dates the<br>PRNDL selds hales<br>PRNDL se  |                         |       | Companing the<br>Reverse Pressure | cmded, use sample size)                 | 255 samples     |                                      | D0700             |               |       |
| PRNDL switch tatter  |                         |       | Switch state to the               |   |                 | No Fault Pending DTCs for this drive | P0708             |               |       |
| Image: Second  |                         |       | PRNDL switch state.               | T8 or T4                                |                 | Cycle                                |                   |               |       |
| Image: Seconds     PPS indicates Reverse to a sample a seconds to a same - 1 seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), to implement bound in the seconds (if dropout steppende), the seconds (if dropout steppend), the seconds (if dropout steppende), the seconds (if dr   |                         |       |                                   | AND                                     |                 | Engine had been cranking or          |                   |               |       |
| RPS indicits Revents<br>(if dopot tageeds, NT)<br>or NZ conductions [00 decodes<br>(if dopot tageeds, NT)<br>or S2 (Range indefinite)<br>(if dopot tageeds, NT)<br>decage 2 (Range indefinite)<br>(if a time) 1 second<br>decage 2 (Range indefinite)<br>(if Range switch response active<br>decage 2 (Range indefinite)<br>(if Range active indefini  |                         |       |                                   |   |                 | running this drive cycle             |                   |               |       |
| Image: set in the set in th  |                         |       |                                   | RPS indicates Reverse                   |                 | Components powered AND               |                   |               |       |
| Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Engine Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Engine Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in PM in Critical Condex, use time 30 accords.     Image: Speed between 200 RPM and 7500 in Critical Condex, use time 30 accords.     Image: Speed Between 200 RPM and 7500 in Critical Condex, use time 30 accords.     Image: Speed Between 20 Condex, use time 30 accords.     Image: Speed Be   |                         |       |                                   | for a time                              | >= 1 seconds    | Ignition Voltage between             | 9 V and 18 V      |               |       |
| Image: construction of the second   |                         |       |                                   | (if dropout suspected, NLT              |                 |                                      |                   |               |       |
| Image: Constant of the second seco  |                         |       |                                   | or N02 cmded, use time)                 | 30 seconds      | Engine Speed between                 | 200 RPM and 7500  |               |       |
| List Loss L. (Keight mission For samples in the regist roughes in the register roughes in the ro  |                         |       |                                   | Case 2: (Pange indefinite)              |                 | for                                  | F soconds         |               |       |
| Image: Source of the indicates on the indit  |                         |       |                                   | For a sample size                       | 20 samples      | 101                                  | 5 seconds         |               |       |
| Image: Solution of the set   |                         |       |                                   | net engine torque                       | >= 100 Nm       | Transmission Fluid Temperature       | >= 0 deg. C       |               |       |
| Image: series of the series  |                         |       |                                   | AND                                     |                 |                                      | Ŭ                 |               |       |
| Image: Second forward range for a time > 1 second       Hydraulic System Pressurized Reverse Pressure Switch State Indicates REVERSE       Not Test Failed This Key On P0877 P0678 P0708   |                         |       |                                   | PRNDL is indefinitely D3 or another     |                 |                                      |                   |               |       |
| Image: state indicates State state indicates REVERSE       Reverse Pressure Switch State indicates REVERSE       All Cases       All Cases       Not Test Failed This Key OP 09877<br>P0708       09877<br>P0708       All Cases       All Cases       All Cases       All Cases       Not Test Failed This Key OP 09877<br>P0708       09877<br>P0708       P0708       All Cases       All Cases       All Cases       All Cases       All Cases       Not Test Failed This Key OP 09877<br>P0708       P0708       All Cases       All  |                         |       |                                   | forward range                           |                 | Hydraulic System Pressurized         |                   |               |       |
| Image: Note of the series o  |                         |       |                                   | for a time                              | > 1 second      | Devices December Switch State        |                   |               |       |
| Image: Control of the control of t  |                         |       |                                   |   |                 | indicates REVERSE                    |                   |               |       |
| Pressure Switch Reverse<br>Circuit High       P0878       This test detects the<br>Reverse Pressure<br>switch being stuck in<br>the open position by<br>comparing to the<br>PRNLs witch state<br>and detects the<br>Reverse Pressure<br>switch stuck open at<br>shutdown.       All Cases       Not Test Failed This Key On P0877<br>P0708       No Test Failed This Key On P0877<br>P0708       All Cases       All Cases         Image: Case 1: (RPS State and Gear Ratio do<br>not agree)       Image: Case 1: (RPS State and Gear Ratio do<br>not agree)       No Fault Pending DTC for this drive<br>comparing to the<br>switch stuck open at<br>shutdown.       No range switch response active       No Tage switch response active       Is seconds       Is seconds       Is seconds       Is seconds       Is seconds       Is seconds       <  |                         |       |                                   |   |                 |                                      |                   |               |       |
| Circuit High Reverse Pressure<br>switch being stuck in<br>the open position by<br>comparing to the<br>PRNDL switch state<br>and detects the<br>Reverse Pressure<br>switch stuck open at<br>shutdown.<br>Case 1: (RPS State and Gear Ratio do<br>not agree)<br>IF Rev Gear Ratio and RPS indicates<br>tor >= 0.5 second<br>For Case 2: (RPS Shutdown Test)<br>For Case 2: (RPS Shutdown Test)<br>For Case 2: (RPS Shutdown Test)<br>If RPS indicates not Reverse<br>for >= 0.5 second<br>For Shut Comparing >= 10 sponds<br>Power Mode is NOT off<br>Transmission Fluid Temperature<br>== 0 deg. C  | Pressure Switch Reverse | P0878 | This test detects the             | All Cases                               |                 | Not Test Failed This Key On          | P0877             |               | А     |
| Switch being stuck in<br>the open position by<br>comparing to the<br>PRNDL switch state<br>and detects the<br>Reverse Pressure<br>switch stuck open at<br>shutdown.       No Fault Pending DTC for this drive<br>oc/de.       P0708         Case 1: (RPS State and Gear Ratio do<br>not agree)       No range switch response active       No range switch response active         IF Rev Gear Ratio and RPS indicates<br>build over at<br>shutdown.       IF Rev Gear Ratio and RPS indicates<br>report malfunction       not Reverse<br>for > 10 Seconds       NOT Fault Active<br>lightion Voltage between<br>Switch response active       P0878<br>Vand 18 V         For Case 2: (RPS Shutdown Test)       For Case 2: (RPS Shutdown Test)       No Fault Pending DTC for biol as NOT Off<br>Transmission Fluid Temperature<br>>= 0 deg. C       10 seconds  | Circuit High            |       | Reverse Pressure                  |   |                 |                                      | P0878             |               |       |
| Image: Inclusion of the period of the per  |                         |       | switch being stuck in             |   |                 |                                      | P0708             |               |       |
| PRNDL switch state<br>and detects the<br>Reverse Pressure<br>switch stuck open at<br>shutdown.       Image: Contraining Direction into the Property<br>opdie       Property<br>opdie         Case 1: (RPS State and Gear Ratio do<br>not agree)       Image: Case 1: (RPS State and Gear Ratio do<br>not agree)       No range switch response active       NoT Fault Active       P0878       1.5 seconds         IF Rev Gear Ratio and RPS indicates<br>of agree)       IF Rev Gear Ratio and RPS indicates not Reverse<br>for >= 0.5 second       NOT Fault Active       P0878       1.5 seconds         First Range Commanded       Shift Complete       >= 100 rpm       Shift Complete       >= 100 rpm         For Case 2: (RPS Shutdown Test)       If RPS indicates not Reverse<br>for a time > 10 seconds       Power Mode is NOT Off       10 seconds   |                         |       | comparing to the                  |   |                 | No Fault Ponding DTC for this drive  | P0708             |               |       |
| and detects the<br>Reverses Pressure<br>switch stuck open at<br>shutdown.       and detects the<br>Reverses Pressure<br>witch stuck open at<br>shutdown.       and detects the<br>Reverses Pressure<br>switch stuck open at<br>shutdown.       Case 1: (RPS State and Gear Ratio do<br>not agree)       No range switch response active       NOT Fault Active<br>lignition Voltage between 9 V and 18 V         IF Rev Gear Ratio and RPS indicates<br>and agree)       IF Rev Gear Ratio and RPS indicates<br>for >= 0.5 second       NOT Fault Active<br>lignition Voltage between 9 V and 18 V       1.5 seconds         For Case 2: (RPS Shutdown Test)       For Case 2: (RPS Shutdown Test)       For Case 2: (RPS Shutdown Test)       Power Mode is NOT Of<br>Transmission Fluid Temperature >= 0 deg. C       10 seconds   |                         |       | PRNDL switch state                |   |                 | cvcle.                               | 1 0700            |               |       |
| Reverse Pressure<br>switch stuck open at<br>shutdown.       Reverse Pressure<br>switch stuck open at<br>shutdown.       No range switch response active       Image: Stuck and Gear Ratio do<br>not agree)         If Rev Gear Ratio and RPS indicates<br>a gree)       If Rev Gear Ratio and RPS indicates<br>for >= 0.5 second       NOT Fault Active<br>Ignition Voltage between 9 V and 18 V<br>First Range Commanded<br>Shift Complete<br>Output Speed       1.5 seconds         For Case 2: (RPS Shutdown Test)       For Case 2: (RPS Shutdown Test)       Image: Shutdown Test)       Power Mode is NOT of<br>Transmission Fluid Temperature       10 seconds  |                         |       | and detects the                   |   |                 |                                      |                   |               |       |
| Switch stuck open at shutdown.       switch stuck open at shutdown.       Image: Switch s  |                         |       | Reverse Pressure                  |   |                 | No range switch response active      |                   |               |       |
| Situdowit.   |                         |       | switch stuck open at              |   |                 |                                      |                   |               |       |
| Case 1: (RPS State and Gear Ratio do not agree)       NOT Fault Active P0878       1.5 seconds         IF Rev Gear Ratio and RPS indicates for agree)       not Reverse       Ignition Voltage between 9 V and 18 V       1.5 seconds         AND Engine Torque >= 100 Nm       Shift Complete       Output Speed       >= 100 rpm       1.5 seconds         For Case 2: (RPS Shutdown Test)       For Case 2: (RPS Shutdown Test)       Power Mode is NOT Off Transmission Fluid Temperature >= 0 deg. C       10 seconds   |                         |       | Shutdown.                         |   |                 |                                      |                   |               |       |
| Image: constraint of agree)       Not agree)       Not agree)       Not Fault Active       P0878       1.5 seconds         IF Rev Gear Ratio and RPS indicates       not Reverse       Ignition Voltage between 9 V and 18 V       V       V       Science       1.5 seconds         AND Engine Torque       >= 0.5 second       First Range Commanded       Shift Complete       V and 18 V       V         AND Engine Torque       >= 100 Nm       Shift Complete       Output Speed       >= 100 rpm       V         For Case 2: (RPS Shutdown Test)       For Case 2: (RPS Shutdown Test)       Power Mode is NOT Off Transmission Fluid Temperature       V       10 seconds         If RPS indicates not Reverse for a time > 10 seconds       Transmission Fluid Temperature       >= 0 deg. C       10 seconds   |                         |       |                                   | Case 1: (RPS State and Gear Ratio do    |                 |                                      |                   |               | -     |
| IF Rev Gear Ratio and RPS indicates<br>for >= 0.5 second       not Reverse<br>for >= 0.5 second       NOT Fault Active<br>Ignition Voltage between<br>9 V and 18 V       9.0 and 18 V         AND Engine Torque<br>for >= 1 second       First Range Commanded       9.1.5 seconds         Output Speed       >= 100 rpm         For Case 2: (RPS Shutdown Test)       Power Mode is NOT Off<br>for a time > 10 seconds       10 seconds         If RPS indicates not Reverse<br>for a time > 10 seconds       Power Mode is NOT Off<br>Transmission Fluid Temperature       10 seconds  |                         |       |                                   | not agree)                              |                 |                                      |                   |               |       |
| IF Rev Gear Ratio and RPS indicates<br>for >= 0.5 second       Ignition Voltage between<br>First Range Commanded<br>Shift Complete       9 V and 18 V         AND Engine Torque<br>for >= 100 Nm<br>report malfunction       >= 100 Nm       Shift Complete       >> 100 rpm         For Case 2: (RPS Shutdown Test)       For Case 2: (RPS Shutdown Test)       Power Mode is NOT Off<br>Transmission Fluid Temperature       10 seconds         If RPS indicates not Reverse<br>for a time > 10 seconds       10 seconds       0 deg. C       10 seconds   |                         |       |                                   |   |                 | NOT Fault Active                     | P0878             | 1.5 seconds   |       |
| Image: Second first Range Commanded AND Engine Torque >= 100 Nm for >= 1 second for preperting for preper  |                         |       |                                   | IF Rev Gear Ratio and RPS indicates     | not Reverse     | Ignition Voltage between             | 9 V and 18 V      |               |       |
| AND Engine Torque >= 100 Nm     Shift Complete       for >= 1 second     Output Speed       report malfunction     Output Speed       For Case 2: (RPS Shutdown Test)     Power Mode is NOT Off       If RPS indicates not Reverse<br>for a time > 10 seconds     Transmission Fluid Temperature<br>>= 0 deg. C     10 seconds   |                         |       |                                   | for                                     | >= 0.5 second   | First Range Commanded                |                   |               |       |
| Image: Second interpret malfunction report malfunction     Image: Second interpret malfunction     Image: Second interpret malfunction       For Case 2: (RPS Shutdown Test)     For Case 2: (RPS Shutdown Test)     Power Mode is NOT Off interpret malfunction     10 seconds       If RPS indicates not Reverse for a time > 10 seconds     Transmission Fluid Temperature >= 0 deg. C     10 seconds   |                         |       |                                   | AND Engine Torque                       | >= 100 Nm       | Shift Complete                       | 100               |               |       |
| For Case 2: (RPS Shutdown Test)     Power Mode is NOT Off     10 seconds       If RPS indicates not Reverse for a time > 10 seconds     Transmission Fluid Temperature >= 0 deg. C     10 seconds  |                         |       |                                   | TOF<br>report malfunction               | >= 1 second     | Output Speed                         | >= 100 rpm        |               |       |
| For Case 2: (RPS Shutdown Test)     Power Mode is NOT Off     10 seconds       If RPS indicates not Reverse<br>for a time > 10 seconds     Transmission Fluid Temperature >= 0 deg. C     10 seconds   |                         |       |                                   | report manufaction                      |                 |                                      |                   |               |       |
| For Case 2: (RPS Shutdown Test)     Power Mode is NOT Off     10 seconds       If RPS indicates not Reverse<br>for a time > 10 seconds     Transmission Fluid Temperature >= 0 deg. C     10 seconds   |                         |       |                                   |   |                 |                                      |                   |               |       |
| For Case 2: (RPS Shutdown Test)     Power Mode is NOT Off     10 seconds       If RPS indicates not Reverse<br>for a time > 10 seconds     Transmission Fluid Temperature >= 0 deg. C     10 seconds   |                         |       |                                   |   |                 |                                      |                   |               |       |
| For Case 2: (RPS Shutdown Test)     Power Mode is NOT Off     10 seconds       If RPS indicates not Reverse<br>for a time > 10 seconds     Transmission Fluid Temperature<br>>= 0 deg. C     0 deg. C  |                         |       |                                   |   |                 |                                      |                   |               |       |
| For Case 2: (RPS Shutdown Test) If RPS indicates not Reverse for a time > 10 seconds If a t   |                         |       |                                   |   |                 |                                      |                   |               | 4     |
| If RPS indicates not Reverse     Transmission Fluid Temperature >= 0 deg. C       for a timel > 10 seconds     Transmission Fluid Temperature >= 0 deg. C  |                         |       |                                   | For Case 2: (RPS Shutdown Test)         |                 | Dourse Marta is NOT Of               |                   | 10 seconds    |       |
| for a time > 10 seconds  |                         |       |                                   | If PDS indicator                        | not Reverse     | Transmission Fluid Temperature       |                   |               |       |
|  |                         |       |                                   | for a time                              | > 10 seconds    | Tanamasion nuid remperature          | - 0 dog. 0        |               |       |

| Component/System          | Fault | Monitor Strategy     | Malfunction Criteria                     | Threshold Value | Secondary Parameters                 | Enable Conditions | Time Required | MIL   |
|---------------------------|-------|----------------------|--|-----------------|--------------------------------------|-------------------|---------------|-------|
|                           | Code  | Description          |  |                 |                                      |                   |               | Illum |
|                           |       |                      | at transmission fluid temperature        | 0 deg. C.       |                                      |                   |               |       |
|                           |       |                      | during engine shutdown                   |                 | Engine had been cranking or          |                   |               |       |
|                           |       |                      |  |                 | running this drive cycle             |                   |               |       |
|                           |       |                      | This time varies with transmission fluid | 3 seconds       |                                      |                   |               |       |
|                           |       |                      | at transmission fluid temperature        | > 35 deg. C     | Engine speed                         | < 50 RPM          |               |       |
|                           |       |                      | to time                                  | 12 seconds      | Turbine speed                        | < 50 RPM          |               |       |
|                           |       |                      | at transmission fluid temperature        | < -20 deg. C.   | Output speed                         | < 50 RPM          |               |       |
|                           |       |                      |  |                 |                                      |                   |               |       |
|                           |       |                      | report malfunction at Init               |                 |                                      |                   |               |       |
|                           |       |                      |  |                 |                                      |                   |               |       |
| On-coming/Off-going       |       |                      |  |                 |                                      |                   |               |       |
| Pressure Control Solenoid | P2723 | This test determines | Pending failure occurs when              | [               | [                                    |                   | 2 25 seconds  | А     |
| 1 Controlled Clutch Stuck |       | if the on-coming     | accumulated event timer                  | >= 2 seconds    | Not Test Failed This Key On          | P0721             |               |       |
| Off                       |       | clutch energized by  | (For rough road conditions use)          | 2 seconds       |                                      | P0722             |               |       |
| 0.1                       |       | Pressure Control     | (i or rough roud contaitions, use)       | 2 30001103      |                                      | P0716             |               |       |
|                           |       | Solenoid 1 engages   | Timer accumulates when transmission      |                 |                                      | P0717             |               |       |
|                           |       | during a forward     | is chifting                              |                 |                                      | F 07 17           |               |       |
|                           |       | range shift          | is siliuity,                             | CO DDM          |                                      | P0077             |               |       |
|                           |       |                      | output speed                             |                 |                                      | FU070             |               |       |
|                           |       |                      | AND commanded gear slip speed            | > 75 RPM        |                                      | P07BF             |               |       |
|                           |       |                      | (For rough road conditions, use)         | 150 RPM.        |                                      | P07C0             |               |       |
|                           |       |                      |  |                 |                                      | P077C             |               |       |
|                           |       |                      |  |                 |                                      | P077D             |               |       |
|                           |       |                      | In response of pending failure, a        |                 |                                      |                   |               |       |
|                           |       |                      | diagnostic response range is             |                 |                                      |                   |               |       |
|                           |       |                      | commanded. During this command, this     |                 | Output Speed                         | >= 125 RPM        |               |       |
|                           |       |                      | test fails if ABS(Converter slip)        |                 | Turbine Speed                        | >= 60 RPM         |               |       |
|                           |       |                      |  | >= 250 RPM      |                                      |                   |               |       |
|                           |       |                      | for sample size                          | > 10 samples    | Hydraulic System Pressurized         |                   |               |       |
|                           |       |                      |  |                 |                                      |                   |               |       |
|                           |       |                      |  |                 | Normal powertrain shutdown not in    |                   |               |       |
|                           |       |                      |  |                 | process                              |                   |               |       |
|                           |       |                      |  |                 |                                      |                   |               |       |
|                           |       |                      |  |                 | Normal or Cold powertrain            |                   |               |       |
|                           |       |                      |  |                 | initialization is complete           |                   |               |       |
|                           |       |                      |  |                 |                                      |                   |               |       |
|                           |       |                      |  |                 | No range switch response active      |                   |               |       |
|                           |       |                      |  |                 |                                      |                   |               |       |
|                           |       |                      |  |                 |                                      |                   |               |       |
|                           |       |                      |  |                 | No Cold Mode operation               |                   |               |       |
|                           |       |                      |  |                 |                                      |                   |               |       |
|                           |       |                      |  |                 | No obugivo gorogo obift to 1st rongo |                   |               |       |
|                           |       |                      |  |                 | No abusive garage shint to 1st range |                   |               |       |
|                           |       |                      |  |                 | delected                             |                   |               |       |
|                           |       |                      |  |                 |                                      |                   |               |       |
|                           |       |                      |  |                 | On-coming clutch control enabled     |                   |               |       |
|                           |       |                      |  |                 |                                      |                   |               |       |
|                           |       |                      |  |                 |                                      |                   |               |       |
|                           |       |                      |  |                 | Power downshift abort to previous    |                   |               |       |
|                           |       |                      |  |                 | range NOT active                     |                   |               |       |
|                           |       |                      |  |                 |                                      |                   |               |       |
|                           |       |                      |  |                 | NOT Low Voltage Disable              |                   |               |       |
|                           |       |                      |  |                 | Į                                    |                   | <u>+</u>      |       |
| Pressure Control Solenoid | P0776 | This test determines | Pending failure occurs when              |                 |                                      |                   | 2.25 seconds  | A     |
| 2 Controlled Clutch Stuck |       | If the on-coming     | accumulated event timer                  | >= 2 seconds    | Not Test Failed This Key On          | P0721             |               |       |
| Off                       | 1     | clutch energized by  | (For rough road conditions, use)         | 2 seconds       | 1                                    | P0722             |               |       |
|                           | 1     | Pressure Control     |  |                 | 1                                    | P0716             |               |       |
|                           |       | Solenoid 2 engages   | Timer accumulates when transmission      |                 |                                      | P0717             |               |       |
|                           |       | during a forward     | is shifting,                             |                 |                                      | P0877             |               |       |
|                           | 1     | range shift.         | output speed                             | >= 60 RPM       |                                      | P0878             |               |       |
|                           | 1     |                      | AND commanded gear slip speed            |                 | 1                                    | P07BF             |               |       |
|                           |       |                      |  | > 75 RPM        |                                      | P07C0             |               |       |

| Component/System           | Fault | Monitor Strategy        | Malfunction Criteria                   | Threshold Value   | Secondary Parameters                 | Enable Conditions | Time Required | MIL |
|----------------------------|-------|-------------------------|--|-------------------|--------------------------------------|-------------------|---------------|-----|
|                            | Code  | Description             | ( <b>-</b> )                           | (=0.00)/          |                                      | D.0.770           |               | mum |
|                            |       |                         | (For rough road conditions, use)       | 150 RPM.          |                                      | P077C             |               |     |
|                            |       |                         |  |                   |                                      | P077D             |               |     |
|                            |       |                         | In response of pending failure, a      |                   |                                      |                   |               |     |
|                            |       |                         | diagnostic response range is           |                   | Output Speed                         | >= 125 RPM        |               |     |
|                            |       |                         | commanded. During this command, this   |                   | Turbine Speed                        | >= 60 RPM         |               |     |
|                            |       |                         | test fails if ABS(Converter slip)      |                   |                                      |                   |               |     |
|                            |       |                         | · · · · · · · · · · · · · · · · · · ·  | >- 250 RPM        | Hydraulic System Pressurized         |                   |               |     |
|                            |       |                         | for comple size                        |                   |                                      |                   |               |     |
|                            |       |                         | tor sample size                        | > to samples      | Normal nowartrain abutdown not in    |                   |               |     |
|                            |       |                         |  |                   | Normal powertrain shutdown not in    |                   |               |     |
|                            |       |                         |  |                   | process                              |                   |               |     |
|                            |       |                         |  |                   |                                      |                   |               |     |
|                            |       |                         |  |                   | Normal or Cold powertrain            |                   |               |     |
|                            |       |                         |  |                   | initialization is complete           |                   |               |     |
|                            |       |                         |  |                   |                                      |                   |               |     |
|                            |       |                         |  |                   | No range switch response active      |                   |               |     |
|                            |       |                         |  |                   |                                      |                   |               |     |
|                            |       |                         |  |                   |                                      |                   |               |     |
|                            |       |                         |  |                   | No Cold Mode operation               |                   |               |     |
|                            |       |                         |  |                   |                                      |                   |               |     |
|                            |       |                         |  |                   | No abusive garage shift to 1st range |                   |               |     |
|                            |       |                         |  |                   | detected                             |                   |               |     |
|                            |       |                         |  |                   |                                      |                   |               |     |
|                            |       |                         |  |                   | On-coming clutch control enabled     |                   |               |     |
|                            |       |                         |  |                   | on coming datari control chabled     |                   |               |     |
|                            |       |                         |  |                   |                                      |                   |               |     |
|                            |       |                         |  |                   | Dowor downobift abort to provious    |                   |               |     |
|                            |       |                         |  |                   | Power downsnint abort to previous    |                   |               |     |
|                            |       |                         |  |                   | range NOT active                     |                   |               |     |
|                            |       |                         |  |                   |                                      |                   |               |     |
|                            |       |                         |  |                   | NOT Low Voltage Disable              |                   |               |     |
|                            |       |                         |  |                   |                                      |                   |               |     |
| Deserves Control Color aid | D0704 | This test data wais as  |  |                   |                                      |                   | 2 aaaaada     |     |
| 1 Controlled Clutch Stuck  | FZ/24 | if the off going olutoh |  | 0.0000            | Net Test Failed This Key On          | 00704             | 5 Seconds     | ~   |
|                            |       | I the on-going clutch   | Accumulated fail timer                 | >= 0.2998 seconds | Not rest Failed This Key On          | P0721             |               |     |
| On                         |       | energized by            | for forward range upshift;             |                   |                                      | P0722             |               |     |
|                            |       | Pressure Control        | OR accumulated fail timer              | >= 3.0 seconds    |                                      | P0716             |               |     |
|                            |       | solenoid 1 remains      | for direction change shifts;           |                   |                                      | P0717             |               |     |
|                            |       | engaged during a        | OR accumulated fail timer              | >= 0.500 seconds  |                                      | P0877             |               |     |
|                            |       | forward range shift.    | for forward range closed throttle      |                   |                                      | P0878             |               |     |
|                            |       |                         | downshift;                             |                   |                                      | P07BF             |               |     |
|                            |       |                         | OR accumulated fail timer              | >= 1.0 second     |                                      | P07C0             |               |     |
|                            |       |                         | for forward downshifts above closed    |                   |                                      | P077C             |               |     |
|                            |       |                         | throttle                               |                   |                                      |                   |               |     |
|                            |       |                         | unotue.                                |                   |                                      | FUITD             |               |     |
|                            |       |                         | Fail timer accumulates during range to |                   | Output Spood                         | 200 BDM           |               |     |
|                            |       |                         | Fail timer accumulates during range to |                   | Culput Speed                         | >= 200 RPIVI      |               |     |
|                            |       |                         | range shints when attained geal slip   | 25 BBM            | Turbine Speed                        | ~- 200 NEW        |               | L   |
|                            |       |                         | speed                                  | <= 20 RPIVI       | Normal powertrain shutdown of the    |                   |               |     |
|                            |       |                         |  |                   | Normal powertrain shutdown not in    |                   |               |     |
|                            |       |                         |  |                   | process                              |                   |               |     |
|                            |       |                         |  |                   | New Jac Orbitan and                  |                   |               |     |
|                            |       |                         |  |                   | Normal or Cold powertrain            |                   |               |     |
|                            |       |                         |  |                   | initialization is complete           |                   |               |     |
|                            |       |                         |  |                   | Manager and Malager and Malager      |                   |               |     |
|                            |       |                         |  |                   | No range switch response active      |                   |               | L   |
|                            |       |                         |  |                   |                                      |                   |               | 1   |
|                            |       |                         |  |                   | No Cold Mode operation               |                   |               | 1   |
|                            |       |                         |  |                   | Manaharaharan Matanaharan            |                   |               | L   |
|                            |       |                         |  |                   | NO abusive garage shift to 1st range |                   |               | L   |
|                            |       |                         |  |                   | detected                             |                   |               | L   |
|                            |       |                         |  |                   |                                      |                   |               | 1   |
| I                          | I     | I                       | I I                                    |                   | NOT Low Voltage Disable              |                   | I             | L   |

| Component/System   | Fault | Monitor Strategy   | Malfunction Criteria  | Threshold Value  | Secondary Parameters  | Enable Conditions  | Time Required  | MIL   |
|--|-------|--|---|--|---|--|--|-------|
|  | Code  | Description  | /   | l'   | l'  |  |  | Illum |
|  |       |  |   | 1  | 1   |  |  |       |
| Pressure Control Solenoid<br>2 Controlled Clutch Stuck<br>On | P0777 | This test determines<br>if the off-going clutch<br>energized by<br>Pressure Control<br>solenoid 2 remains<br>engaged during a<br>forward range shift.            | Accumulated fail timer<br>for forward range upshift;<br>OR accumulated fail timer<br>for direction change shifts;<br>OR accumulated fail timer<br>for forward range closed throttle<br>downshift;<br>OR accumulated fail timer<br>for forward downshifts above closed<br>throttle.<br>Fail timer accumulates during range to<br>range shifts when attained gear slip<br>speed                           | >= 0.2998 seconds<br>>= 3.0 seconds<br>>= 0.500 seconds<br>>= 1.0 second | Not Test Failed This Key On<br>Output Speed<br>Turbine Speed<br>Normal powertrain shutdown not in<br>process<br>Normal or Cold powertrain<br>initialization is complete<br>No range switch response active<br>No Cold Mode operation<br>No abusive garage shift to 1st range<br>detected<br>NOT Low Voltage Disable | P0721<br>P0722<br>P0716<br>P0717<br>P0877<br>P0878<br>P07BF<br>P07C0<br>P077C<br>P077C<br>>= 200 RPM<br>>= 200 RPM | 3 seconds  | A     |
|  |       |  |   | 1  | 1   |  |  |       |
|  |       | <u> </u>   |   | L  | L   |  |  | _     |
| Transmission Range<br>Sensor High Input                      | P0708 | This test monitors the<br>transmission range<br>switch for invalid<br>input conditions and<br>parity errors<br>occurring over<br>consecutive ignition<br>cycles. | For Case 1 (No Information):<br>Illegal electrical state for a time<br>For Case 2 (Long-term Parity):<br>There are 3 counters for long-term<br>parity. These counters are updated at<br>the end of each drive cycle, immediately<br>prior to TCM shutdown.<br>For Counter 1, increment counter IF<br>Parity Error Detected; decrement<br>counter IF No Parity Error Detected<br>AND No Motion Detected. | >= 1 second  | Components powered<br>AND<br>Battery Voltage between<br>Engine Speed between<br>for   | 9 V and 18 V<br>200 RPM and 7500<br>RPM<br>5 seconds   | Case 1:<br>1 second<br>Case 2:<br>5 <sup>th</sup> occurrence | A     |
|  |       |  | IF Counter 1<br>THEN report failure.<br>For Counter 2, increment counter IF<br>Parity Error Detected AND (No Valid<br>Drive Detected AND Valid<br>Park/Neutral Detected) AND Motion<br>Detected; decrement counter IF No<br>Parity Error Detected AND Valid   | >= 15 counts   |   |  |  |       |

| Component/System   | Fault | Monitor Strategy       | Malfunction Criteria                                | Threshold Value          | Secondary Parameters         | Enable Conditions | Time Required | MIL   |
|--------------------|-------|------------------------|---|--------------------------|------------------------------|-------------------|---------------|-------|
|                    | Code  | Description            | Barty/Neutral Datastad (NID Valid Drive             |                          | <b></b>                      |                   | <u> </u>      | Illum |
|                    |       |                        | Detected AND Motion Detected                        |                          |                              |                   |               |       |
|                    |       |                        | Deteoled And Motion Deteoled.                       |                          |                              |                   |               |       |
|                    |       |                        |   |                          |                              |                   |               |       |
|                    |       |                        | IF Counter 2.                                       | >= 5 counts              |                              |                   |               |       |
|                    |       |                        | THEN report failure.                                |                          |                              |                   |               |       |
|                    |       |                        |   |                          |                              |                   |               |       |
|                    |       |                        | For Counter 3, increment Counter 3 IF               |                          |                              |                   |               |       |
|                    |       |                        | Parity Error Detected while in Reverse              |                          |                              |                   |               |       |
|                    |       |                        | AND No Valid Reverse Detected AND                   |                          |                              |                   |               |       |
|                    |       |                        | IF No Parity Error Detected AND Valid               |                          |                              |                   |               |       |
|                    |       |                        | Reverse Detected AND Motion                         |                          |                              |                   |               |       |
|                    |       |                        | Detected.   |                          |                              |                   |               |       |
|                    |       |                        |   |                          |                              |                   |               |       |
|                    |       |                        |   |                          |                              |                   |               |       |
|                    |       |                        | IF Counter 3,                                       | >= 5 counts              |                              |                   |               |       |
|                    |       |                        | THEN report failure.                                |                          |                              |                   |               |       |
|                    |       |                        | Whore   |                          |                              |                   |               |       |
|                    |       |                        | Parity Error Detected is defined as a               |                          |                              |                   |               |       |
|                    |       |                        | failure of the 4-bit PRNDL input such               |                          |                              |                   |               |       |
|                    |       |                        | that the sum of those bits yields an odd            |                          |                              |                   |               |       |
|                    |       |                        | result for a time;                                  |                          |                              |                   |               |       |
|                    |       |                        |   | >= 30 seconds;           |                              |                   |               |       |
|                    |       |                        | Matian Datastad is defined as output                |                          |                              |                   |               |       |
|                    |       |                        | Motion Detected is delined as output<br>speed       | ~- 200 RPM               |                              |                   |               |       |
|                    |       |                        | for a time;   | >= 10 seconds            |                              |                   |               |       |
|                    |       |                        |   |                          |                              |                   |               |       |
|                    |       |                        | Valid Drive Detected is defined as the 4-           |                          |                              |                   |               |       |
|                    |       |                        | bit DL indicates Valid Drive for a time;            |                          |                              |                   |               |       |
|                    |       |                        |   | >= 3 seconds             |                              |                   |               |       |
|                    |       |                        | Valid Park Detected is defined as the 4             |                          |                              |                   |               |       |
|                    |       |                        | bit PRNDL indicates Valid Park for a                |                          |                              |                   |               |       |
|                    |       |                        | time  | >= 0.2 seconds           |                              |                   |               |       |
|                    |       |                        | and output speed;                                   | <= 20 RPM                |                              |                   |               |       |
|                    |       |                        |   |                          |                              |                   |               |       |
|                    |       |                        | Valid Reverse Detected is defined as                |                          |                              |                   |               |       |
|                    |       |                        | Reverse   |                          |                              |                   |               |       |
|                    |       |                        | for a time;   | >= 15 seconds;           |                              |                   |               |       |
|                    |       |                        |   |                          |                              |                   |               |       |
|                    |       |                        | Valid Neutral Detected is defined as                |                          |                              |                   |               |       |
|                    |       |                        | the 4-bit PRNDL indicates Valid Neutral             |                          |                              |                   |               |       |
|                    |       |                        | for a time  | 0.2 000000               |                              |                   |               |       |
|                    |       |                        | and output speed                                    | >= 0.2 seconds<br>20 RPM |                              |                   |               |       |
|                    |       |                        | OR for a time.                                      | >= 3 seconds             |                              |                   |               |       |
|                    |       | I                      |   |                          |                              |                   |               |       |
| Transmission Range | P0706 | This test monitors the |   |                          |                              |                   | 200 ms        | В     |
| Sensor Circuit     |       | transmission range     | For sample size,                                    | > 7 samples              | Not Test Failed This Key On  | P0706             |               |       |
| Range/Performance  |       | switch inputs at       | PRNDL C input is closed OK PKNDL P<br>is NOT closed |                          |                              |                   |               |       |
|                    |       | determine that it is   | 13 110 1 010000.                                    |                          | Ignition voltage between     | 9V and 18 V       |               |       |
|                    |       | indicating a valid     |   |                          | ignition voltage betteen.    |                   |               |       |
| 1                  |       | starting position      |   |                          | Powertrain State is READY or |                   |               |       |
|                    |       | (Park or Neutral).     |   |                          | CRANKING                     |                   |               |       |
|                    |       |                        |   |                          |                              |                   |               |       |

| Component/System          | Fault | Monitor Strategy      | Malfunction Criteria                       | Threshold Value | Secondary Parameters                | Enable Conditions   | Time Required | MIL |
|---------------------------|-------|-----------------------|--|-----------------|-------------------------------------|---------------------|---------------|-----|
|                           | Code  | Description           |  |                 | Engine speed                        | > 100 RPM and < 350 |               | mum |
|                           |       |                       |  |                 |                                     | RPM.                |               |     |
|                           |       |                       |  |                 |                                     |                     |               |     |
| Solenoid Electrical       |       | L                     |  |                 | <u> </u>                            |                     |               | _   |
| Main Modulation/Line      | P0960 | This test detects     | Fault pending is set on a single           | [               |                                     |                     | 125 ms        | А   |
| Pressure Control Solenoid |       | solenoid electrical   | occurrence of hardware ground or           |                 | Net Test Failed This Key Or         | Docco               |               |     |
| Control Circuit Open      |       | open circuit          | open fault.                                |                 | Not Test Failed This Key On         | P2009               |               |     |
|                           |       | manuncuons.           |  |                 |                                     | P2670               |               |     |
|                           |       |                       | IF either hardware faults are present for  | >= 3 counts     |                                     | P2671               |               |     |
|                           |       |                       | THEN initiate intrusive test by opening    |                 |                                     |                     |               |     |
|                           |       |                       | low side driver                            |                 | Components powered                  |                     |               |     |
|                           |       |                       | IF intrusive test indicates open for       | >= 2 counts     | AND                                 |                     |               |     |
|                           |       |                       | THEN report malfunction                    |                 | Battery voltage between             | 9V and 18 V         |               |     |
|                           |       |                       |  |                 |                                     |                     |               |     |
|                           |       |                       |  |                 | If Engine Cranking, then            |                     |               |     |
|                           |       |                       |  |                 | Crank Time                          | < 4 seconds         |               |     |
|                           |       |                       |  |                 | AND                                 |                     |               |     |
|                           |       |                       |  |                 | Battery Voltage                     | > 10 V              |               |     |
|                           |       |                       |  |                 | Engine speed                        | >= 20 RPM           |               |     |
|                           |       |                       |  |                 |                                     |                     |               |     |
|                           |       |                       |  |                 | High Side Driver 2 Enabled          |                     |               |     |
| Main Modulation/Line      | P0961 | This test detects the |  |                 |                                     |                     | 1000 ms       | А   |
| Pressure Control Solenoid |       | performance of the    |  |                 | Not Test Failed This Key On         | P2669               |               |     |
| Control Circuit           |       | solenoid by           | IF delta(desired current - actual current) | >= 0.5 amps     |                                     |                     |               |     |
| Performance               |       | comparing desired     | FOR  | >= 40 counts    |                                     | P2670               |               |     |
|                           |       | cycle                 | For a sample size                          | < 80 samples    |                                     | P2671               |               |     |
|                           |       |                       |  |                 |                                     | P0960               |               |     |
|                           |       |                       | THEN report malfunction                    |                 |                                     | P0961               |               |     |
|                           |       |                       |  |                 |                                     | P0962               |               |     |
|                           |       |                       |  |                 | No Fault Pending DTC for this drive | P0960               |               |     |
|                           |       |                       |  |                 | cycle.                              | P0962               |               |     |
|                           |       |                       |  |                 |                                     |                     |               |     |
|                           |       |                       |  |                 | Components powered                  |                     |               |     |
|                           |       |                       |  |                 | Battery voltage between             | 9 V and 18 V        |               |     |
|                           |       |                       |  |                 | , , ,                               |                     |               |     |
|                           |       |                       |  |                 | If Engine Cranking, then            | . A seconda         |               |     |
|                           |       |                       |  |                 | Crank Time<br>AND                   | < 4 seconds         |               |     |
|                           |       |                       |  |                 | Battery Voltage                     | > 10 V              |               |     |
|                           |       |                       |  |                 | Engine speed                        | >= 20 RPM           |               |     |
|                           |       |                       |  |                 | High Side Driver 2 Enabled          |                     |               |     |
|                           |       |                       |  |                 | Shift Complete                      |                     |               |     |
|                           |       |                       |  |                 |                                     |                     |               |     |
|                           |       |                       |  |                 | LOCKUP Apply Complete               |                     |               |     |
|                           |       |                       |  |                 | Lockup Release Complete             |                     |               |     |
| Main Modulation/Line      | P0962 | This test detects     |  |                 |                                     |                     | 125 ms        | A   |

| Component/System  | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction Criteria   | Threshold Value             | Secondary Parameters  | Enable Conditions   | Time Required | MIL<br>Illum |
|---|---------------|---|--|-----------------------------|---|---|---------------|--------------|
| Pressure Control Solenoid<br>Control Circuit Low                          |               | solenoid electrical<br>ground circuit<br>malfunctions.  | Fault pending is set on a single<br>occurrence of hardware ground or<br>open fault.<br>IF either hardware faults are present for<br>THEN initiate intrusive test by opening<br>low side driver<br>IF intrusive test indicates grid for<br>THEN report malfunction    | >= 3 counts<br>>= 2 counts  | Not Test Failed This Key On<br>Components powered<br>AND<br>Battery voltage between   | P2669<br>P2670<br>P2671<br>9 V and 18 V                                       |               |              |
|   |               |   |  |                             | If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>Engine speed<br>High Side Driver 2 Enabled  | < 4 seconds<br>> 10 V<br>>= 20 RPM  |               |              |
| Main Modulation/Line<br>Pressure Control Solenoid<br>Control Circuit High | P0963         | This test detects<br>solenoid electrical<br>short to power circuit<br>malfunctions.                       | Short to power fault present for   | > = 3 counts                | Not Test Failed This Key On<br>Components powered<br>AND<br>Battery voltage between<br>If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>Engine speed   | P2669<br>P2670<br>P2671<br>9 V and 18 V<br>< 4 seconds<br>> 10 V<br>>= 20 RPM | 75 ms         | A            |
| Pressure Control Solenoid<br>2 Control Circuit Open                       | P0964         | This test detects<br>solenoid electrical<br>open circuit<br>malfunctions.                                 | Fault pending is set on a single<br>occurrence of hardware ground rough<br>open fault.<br>IF either hardware faults are present for<br>THEN initiate intrusive test by opening<br>low side driver<br>IF intrusive test indicates open for<br>THEN report malfunction | >= 3 counts<br>>= 2 counts  | High Side Driver 2 Enabled<br>Not Test Failed This Key On<br>Components powered<br>AND<br>Battery voltage between<br>If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>Engine speed<br>High Side Driver 1 Enabled | P0657<br>P0658<br>P0659<br>9 V and 18 V<br>< 4 seconds<br>> 10 V<br>>= 20 RPM | 125 ms        | A            |
| Pressure Control Solenoid<br>2 Control Circuit<br>Performance             | P0965         | This test detects the<br>performance of the<br>solenoid by<br>comparing desired<br>current to actual duty | IF delta(desired current - actual current)<br>FOR  | >= 0.5 amps<br>>= 10 counts | Not Test Failed This Key On   | P0657<br>P0658<br>P0659<br>P0964  | 250ms         | A            |

| Component/System                                    | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction Criteria   | Threshold Value | Secondary Parameters                                 | Enable Conditions                | Time Required | MIL<br>Illum |
|---|---------------|---|--|-----------------|--|----------------------------------|---------------|--------------|
|   |               | cycle   | For a sample size  | < 20 samples    |  | P0965<br>P0966                   |               |              |
|   |               |   | THEN report malfunction  |                 | No Fault Pending DTC for this drive cycle.           | P0964<br>P0966                   |               |              |
|   |               |   |  |                 | Components powered<br>AND                            |                                  |               |              |
|   |               |   |  |                 | Battery voltage between                              | 9 V and 18 V                     |               |              |
|   |               |   |  |                 | If Engine Cranking, then<br>Crank Time<br>AND        | < 4 seconds                      |               |              |
|   |               |   |  |                 | Battery Voltage                                      | > 10 V                           |               |              |
|   |               |   |  |                 | Engine speed   | >= 20 RPM                        |               |              |
|   |               |   |  |                 | High Side Driver 1 Enabled                           |                                  |               |              |
|   |               |   |  |                 | Shift Complete                                       |                                  |               |              |
|   |               |   |  |                 | Lockup Apply Complete                                |                                  |               |              |
|   |               |   |  |                 | Lockup Release Complete                              |                                  |               |              |
| Pressure Control Solenoid<br>2 Control Circuit Low  | P0966         | This test detects<br>solenoid electrical<br>ground circuit<br>malfunctions.         | Fault pending is set on a single<br>occurrence of hardware ground or<br>open fault.<br>IF either hardware faults are present for<br>THEN initiate intrusive test by opening<br>low side driver | >= 3 counts     | Not Test Failed This Key On                          | P0657<br>P0658<br>P0659          | 125 ms        | A            |
|   |               |   | IF intrusive test indicates grnd for<br>THEN report malfunction  | >= 2 counts     | Components powered                                   |                                  |               |              |
|   |               |   |  |                 | AND<br>Battery Voltage between                       | 9 V and 18 V                     |               |              |
|   |               |   |  |                 | If Engine Cranking, then<br>Crank Time               | < 4 seconds                      |               |              |
|   |               |   |  |                 | AND<br>Battery Voltage                               | > 10 V                           |               |              |
|   |               |   |  |                 | Engine speed   | >= 20 RPM                        |               |              |
|   |               |   |  |                 | High Side Driver 1 Enabled                           |                                  |               |              |
| Pressure Control Solenoid<br>2 Control Circuit High | P0967         | This test detects<br>solenoid electrical<br>short to power circuit<br>malfunctions. | Short to power fault present for   | > = 3 counts    | Not Test Failed This Key On                          | P0657<br>P0658<br>P0659<br>P0967 | 75 ms         | A            |
|   |               |   |  |                 | Components powered<br>AND<br>Battery Voltage between | 9 V and 18 V                     |               |              |
|   |               |   |  |                 | If Engine Cranking, then<br>Crank Time<br>AND        | < 4 seconds                      |               |              |

| Component/System                                    | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction Criteria  | Threshold Value                             | Secondary Parameters  | Enable Conditions   | Time Required | M | MIL<br>Illum |
|---|---------------|---|---|---|---|---|---------------|---|--------------|
|   |               |   |   |   | Battery Voltage   | > 10 V  |               |   |              |
|   |               |   |   |   | Engine speed  | >= 20 RPM   |               |   |              |
|   |               |   |   |   | High Side Driver 1 Enabled  |   |               |   |              |
|   |               |   |   |   | High Side Driver 1 Enabled  |   |               |   |              |
| Pressure Control Solenoid<br>1 Control Circuit Open | P2727         | This test detects<br>solenoid electrical<br>open circuit<br>malfunctions.                 | Fault pending is set on a single<br>occurrence of hardware ground or<br>open fault.<br>IF either hardware faults are present for<br>THEN initiate intrusive test by opening<br>low side driver<br>IF intrusive test indicates open for<br>THEN report malfunction | >= 3 counts<br>>= 2 counts                  | Not Test Failed This Key On<br>Components powered<br>AND<br>Battery Voltage between<br>If Engine Cranking, then<br>Crank Time   | P2669<br>P2670<br>P2671<br>9 V and 18 V<br>< 4 seconds  | 125 ms        |   | A            |
|   |               |   |   |   | AND<br>Battery Voltage  | > 10 V  |               |   |              |
|   |               |   |   |   | Engine speed  | >= 20 RPM   |               |   |              |
|   |               |   |   |   | High Side Driver 2 Enabled  |   |               |   |              |
|   |               |   |   |   |   |   |               |   |              |
| I Control Circuit<br>Performance                    |               | performance of the<br>solenoid by<br>comparing desired<br>current to actual duty<br>cycle | IF delta(desired current) FOR<br>FOR<br>For a sample size<br>THEN report malfunction  | >= 0.5 amps<br>>= 10 counts<br>< 20 samples | Not Test Failed This Key On<br>No Fault Pending DTC for this drive<br>cycle.<br>Components powered<br>AND<br>Battery voltage between<br>If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>Engine speed<br>High Side Driver 2 Enabled<br>Shift Complete<br>Lockup Apply Complete | P2669<br>P2670<br>P2671<br>P2727<br>P2728<br>P2729<br>P2729<br>9 V and 18 V<br>< 4 seconds<br>> 10 V<br>>= 20 RPM |               |   |              |
|   |               |   |   |   | Lockup Release Complete   |   |               |   |              |
| Pressure Control Solenoid<br>1 Control Circuit Low  | P2729         | This test detects<br>solenoid electrical<br>ground circuit<br>malfunctions.               | Fault pending is set on a single<br>occurrence of hardware ground or<br>open fault.   |   | Not Test Failed This Key On   | P2669<br>P2670<br>P2671   | 125 ms        |   | A            |

| Component/System                                    | Fault<br>Code | Monitor Strategy   | Malfunction Criteria   | Threshold Value | Secondary Parameters  | Enable Conditions  | Time Required | MIL |
|---|---------------|--|--|-----------------|---|--|---------------|-----|
|   |               |  | IF either hardware faults are present for<br>THEN initiate intrusive test by opening<br>low side driver<br>IF intrusive test indicates grnd for<br>THEN report malfunction | >= 3 counts     | Components powered<br>AND<br>Battery Voltage between<br>If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>Engine speed<br>High Side Driver 2 Enabled                                | 9 V and 18 V<br>< 4 seconds<br>> 10 V<br>>= 20 RPM                                     |               |     |
| Pressure Control Solenoid<br>1 Control Circuit High | P2730         | This test detects<br>solenoid electrical<br>short to power circuit<br>malfunctions.  | Short to power fault present for   | > = 3 counts    | Not Test Failed This Key On<br>Components powered<br>AND<br>Battery Voltage between<br>If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>Engine speed<br>High Side Driver 2 Enabled | P2669<br>P2670<br>P2671<br>P2730<br>9 V and 18 V<br>< 4 seconds<br>> 10 V<br>>= 20 RPM | 75 ms         | A   |
| Shift Solenoid 1 Control<br>Circuit Low/Open        | P0973         | This test detects<br>solenoid electrical<br>ground and open<br>circuit malfunctions. | Fault pending is set on a single<br>occurrence of hardware ground or<br>open fault.<br>IF either hardware fault is present for<br>THEN report malfunction                  | >= 10 counts    | Not Test Failed This Key On<br>Components powered<br>AND<br>Battery Voltage between<br>If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>Engine speed<br>High Side Driver 1 Enabled | P0657<br>P0658<br>P0659<br>9 V and 18 V<br>< 4 seconds<br>> 10 V<br>>= 20 RPM          | 250 ms        | A   |
| Shift Solenoid 1 Control<br>Circuit High            | P0974         | This test detects<br>solenoid electrical<br>short to power circuit<br>malfunctions.  | Short to power fault present for   | > = 3 counts    | Not Test Failed This Key On<br>Components powered<br>AND<br>Battery Voltage between   | P0657<br>P0658<br>P0659<br>P0974<br>9 V and 18 V                                       | 75 ms         | A   |

| Component/System                         | Fault<br>Code | Monitor Strategy<br>Description          | Malfunction Criteria                            | Threshold Value | Secondary Parameters           | Enable Conditions | Time Required | MIL<br>Illum |
|--|---------------|--|---|-----------------|--------------------------------|-------------------|---------------|--------------|
|  |               |  |   |                 | If Engine Cranking, then       |                   |               |              |
|  |               |  |   |                 | Crank Time                     | < 4 seconds       |               |              |
|  |               |  |   |                 | Battery Voltage                | > 10 V            |               |              |
|  |               |  |   |                 |                                |                   |               |              |
|  |               |  |   |                 | Engine speed                   | >= 20 RPM         |               |              |
|  |               |  |   |                 | High Side Driver 1 Enabled     |                   |               |              |
|  |               |  |   |                 |                                |                   |               |              |
| Shift Solenoid 2 Control                 | P0976         | This test detects                        |   |                 |                                |                   | 250 ms        | A            |
| Circuit Low/Open                         |               | solenoid electrical                      | Fault pending is set on a single                |                 | Not Test Failed This Key On    | P0657             |               |              |
|  |               | circuit malfunctions.                    | occurrence of hardware ground                   |                 |                                | P0659             |               |              |
|  |               |  | IF either hardware fault is present for         | >= 10 counts    |                                |                   |               |              |
|  |               |  | THEN report malfunction                         |                 | Components powered             |                   |               |              |
|  |               |  |   |                 | AND                            |                   |               |              |
|  |               |  |   |                 | Battery Voltage between        | 9 V and 18 V      |               |              |
|  |               |  |   |                 | If Engine Cranking, then       |                   |               |              |
|  |               |  |   |                 | Crank Time                     | < 4 seconds       |               |              |
|  |               |  |   |                 | AND<br>Battery Voltage         | > 10 V            |               |              |
|  |               |  |   |                 | Engine speed                   | - 20 RPM          |               |              |
|  |               |  |   |                 | Lingine speed                  | 20 KF WI          |               |              |
|  |               |  |   |                 | High Side Driver 1 Enabled     |                   |               |              |
|  |               |  |   |                 |                                |                   |               |              |
| Shift Solenoid 2 Control<br>Circuit High | P0977         | This test detects<br>solenoid electrical |   |                 | Not Test Failed This Key On    | P0657             | 75 ms         | A            |
|  |               | short to power circuit                   | Short to power fault present for                | > = 3 counts    |                                | P0658             |               |              |
|  |               | malfunctions.                            |   |                 |                                | P0659             |               |              |
|  |               |  |   |                 |                                | P0977             |               |              |
|  |               |  |   |                 | Components powered             |                   |               |              |
|  |               |  |   |                 | AND<br>Battery Voltage between | 9 V and 18 V      |               |              |
|  |               |  |   |                 | Dationy Voltage Detriven       |                   |               |              |
|  |               |  |   |                 | If Engine Cranking, then       | < 4 seconds       |               |              |
|  |               |  |   |                 | AND                            | < 4 36001103      |               |              |
|  |               |  |   |                 | Battery Voltage                | > 10 V            |               |              |
|  |               |  |   |                 | Engine speed                   | >= 20 RPM         |               |              |
|  |               |  |   |                 | High Side Driver 1 Enabled     |                   |               |              |
| Shift Solenoid 3 Control                 | P0979         | This test detects                        |   |                 |                                |                   | 250 ms        | A            |
| Circuit Low/Open                         |               | solenoid electrical                      | Fault pending is set on a single                |                 | Not Test Failed This Key On    | P0657             |               |              |
|  |               | ground or open<br>circuit malfunctions.  | occurrence of hardware ground or<br>open fault. |                 |                                | P0658<br>P0659    |               |              |
|  |               |  | IF either hardware fault is present for         | >= 10 counts    |                                | P0979             |               |              |
|  |               |  | THEN report malfunction                         |                 | Companying                     |                   |               |              |
|  | 1             |  |   |                 | Components powered<br>AND      |                   |               |              |
|  | 1             |  |   |                 | Battery Voltage between        | 9 V and 18 V      |               |              |
|  | 1             |  |   |                 |                                |                   |               |              |
|  | 1             |  |   |                 | If Easting Organization that   |                   |               |              |
| I  | 1             | I  | I   | l               | IT Engine Cranking, then       | I                 | 1             |              |

| Component/System                         | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction Criteria  | Threshold Value             | Secondary Parameters  | Enable Conditions                | Time Required | MIL<br>Illun |
|--|---------------|---|---|-----------------------------|---|----------------------------------|---------------|--------------|
|  |               |   |   |                             | Crank Time<br>AND<br>Battery Voltage                                      | < 4 seconds<br>> 10 V            |               |              |
|  |               |   |   |                             | Engine speed  | >= 20 RPM                        |               |              |
|  |               |   |   |                             | High Side Driver 1 Enabled  |                                  |               |              |
| Shift Solenoid 3 Control<br>Circuit High | P0980         | This test detects<br>solenoid electrical<br>short to power circuit<br>malfunctions.         | Short to power fault present for  | > = 3 counts                | Not Test Failed This Key On   | P0657<br>P0658<br>P0659<br>P0980 | 75 ms         | A            |
|  |               |   |   |                             | Components powered<br>AND   |                                  |               |              |
|  |               |   |   |                             | Battery Voltage between   | 9 V and 18 V                     |               |              |
|  |               |   |   |                             | If Engine Cranking, then<br>Crank Time                                    | < 4 seconds                      |               |              |
|  |               |   |   |                             | Battery Voltage   | > 10 V                           |               |              |
|  |               |   |   |                             | Engine speed  | >= 20 RPM                        |               |              |
|  |               |   |   |                             | High Side Driver 1 Enabled  |                                  |               |              |
| Actuator Supply 1 (HSD1)                 | P0657         | This test detects if  |   |                             |   |                                  | 75 ms         | A            |
| Voltage Open                             |               | the voltage<br>measured at the<br>HSD1 detection<br>circuit shows that<br>multiple low side | IF HSD1 fault is indeterminate<br>THEN initiate intrusive test<br>Command intrusive gear.<br>Override pressure control solenoid 2<br>THEN exit intrusive test after | >= 0.075 sec<br>> 0.050 sec | Not Test Failed This Key On<br>HSD1 is commanded ON<br>Components powered | P0657                            |               |              |
|  |               | indicate open, but the<br>high side detection   | Report malfunction when the number of failure events  | >= 3                        | AND<br>Battery Voltage between  | 9 V and 18 V                     |               |              |
|  |               | circuit indicates high voltage.   |   |                             | If Engine Cranking, then<br>Crank Time                                    | < 4 seconds                      |               |              |
|  |               |   | A failure event occurs when the number<br>of failed solenoids connected to HSD1   | >= 2                        | Battery Voltage   | > 10 V                           |               |              |
|  |               |   |   |                             | Engine speed  | >= 20 RPM                        |               |              |
| Actuator Supply 1 (HSD1)<br>Voltage Low  | P0658         | This test detects low<br>voltage when high<br>voltage is expected                           | Report malfunction when short to<br>ground is detected for a number of  |                             | Not Test Failed This Key On   | P0658                            | 75 ms         | A            |
|  |               | indicating a short to ground at the circuit.  | events  | >= 3 times                  | HSD1 is commanded ON  |                                  |               |              |
| Actuator Supply 1 (HSD1)<br>Voltage High | P0659         | This test detects if<br>the voltage<br>measured at the<br>HSD 1 detection                   | During initialization, report malfunction when the number of failure events   | >= 3 times                  | During initialization   |                                  | 18.75 ms      | A            |
|  |               | circuit indicates high<br>during initialization<br>(when the circuit is<br>off)             |   |                             | Battery Voltage   | >= 9V                            |               |              |
| Actuator Supply2 (HSD2)                  | P2669         | This test detects if  |   |                             | 1   |                                  | 75 ms         | A            |

| Component/System  | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria  | Threshold Value                             | Secondary Parameters  | Enable Conditions   | Time Required | MIL<br>Illum |
|---|---------------|--|---|---|---|---|---------------|--------------|
| Voltage Open  |               | the voltage<br>measured at the<br>HSD2 detection<br>circuit shows that<br>multiple low side<br>detection circuits<br>indicate open, but the<br>high side detection<br>circuit indicates high<br>voltage. | Report malfunction when the number of<br>failure events<br>A failure event occurs when the number<br>of failed solenoids connected to HSD1  | >= 3<br>>= 2                                | Not Test Failed This Key On<br>HSD2 is commanded ON<br>Components powered<br>AND<br>Battery Voltage between<br>If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>Engine Speed       | P2669<br>9 V and 18 V<br>< 4 seconds<br>> 10 V<br>>= 20 rpm                   |               |              |
| Actuator Supply2 (HSD2)<br>Voltage Low                          | P2670         | This test detects low<br>voltage when high<br>voltage is expected<br>indicating a short to<br>ground at the circuit.   | Report malfunction when short to<br>ground is detected for a number of<br>events  | >= 3 times                                  | Not Test Failed This Key On<br>HSD2 is commanded ON   | P2670   | 75 ms         | A            |
| Actuator Supply 2 (HSD2)<br>Voltage High                        | P2671         | This test detects if<br>the voltage<br>measured at the<br>HSD 2 detection<br>circuit indicates high<br>during initialization<br>(when the circuit is<br>off)   | During initialization, report malfunction<br>when the number of failure events  | >= 3 times                                  | During initialization<br>Battery Voltage  | >= 9  | 18.75 ms      | A            |
| TCC Pressure Control<br>Solenoid Control Circuit<br>Open        | P2761         | This test detects<br>torque converter<br>solenoid electrical<br>open circuit<br>malfunctions.  | Fault pending is set on a single<br>occurrence of hardware ground or<br>open fault.<br>IF either hardware faults are present for<br>THEN initiate intrusive test by opening<br>low side driver<br>IF intrusive test indicates open for<br>THEN report malfunction | >= 3 counts<br>>= 2 counts                  | Not Test Failed This Key On<br>Components powered<br>AND<br>Battery Voltage between<br>If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>Engine Speed<br>High Side Driver 2 Enabled | P2669<br>P2670<br>P2671<br>9 V and 18 V<br>< 4 seconds<br>> 10 V<br>>= 20 rpm | 125 ms        | В            |
| TCC Pressure Control<br>Solenoid Control Circuit<br>Performance | P2762         | This test detects the<br>performance of the<br>solenoid by<br>comparing desired<br>current to actual duty<br>cycle   | IF delta(desired current - actual current)<br>FOR<br>For a sample size<br>THEN report malfunction   | >= 0.5 amps<br>>= 40 counts<br>< 80 samples | Not Test Failed This Key On<br>No Fault Pending DTC for this drive<br>cycle.  | P2669<br>P2670<br>P2671<br>P2761<br>P2762<br>P2764<br>P2761<br>P2763          | 1000 ms       | В            |

| Component/System   | Fault<br>Code | Monitor Strategy  | Malfunction Criteria  | Threshold Value            | Secondary Parameters   | Enable Conditions  | Time Required | MIL |
|--|---------------|---|---|----------------------------|--|--|---------------|-----|
|  |               |   |   |                            | Components powered<br>AND<br>Battery voltage between<br>If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>Engine Speed<br>High Side Driver 2 Enabled<br>Shift Complete<br>Lockup Apply Complete<br>OR<br>Lockup Release Complete | 9 V and 18 V<br>< 4 seconds<br>> 10 V<br>>= 20 rpm                                     |               |     |
| TCC Pressure Control<br>Solenoid Control Circuit<br>High | P2763         | This test detects<br>solenoid electrical<br>short to power circuit<br>malfunctions. | Short to power fault present for  | > = 3 counts               | Not Test Failed This Key On<br>Components powered<br>AND<br>Battery Voltage between<br>If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>Engine Speed<br>High Side Driver 2 Enabled  | P2669<br>P2670<br>P2671<br>P2763<br>9 V and 18 V<br>< 4 seconds<br>> 10 V<br>>= 20 rpm | 75 ms         | В   |
| TCC Pressure Control<br>Solenoid Control Circuit<br>Low  | P2764         | This test detects<br>solenoid electrical<br>ground circuit<br>malfunctions.         | Fault pending is set on a single<br>occurrence of hardware ground or<br>open fault.<br>IF either hardware faults are present for<br>THEN initiate intrusive test by opening<br>low side driver<br>IF intrusive test indicates grnd for<br>THEN report malfunction | >= 3 counts<br>>= 2 counts | Not Test Failed This Key On<br>Components powered<br>AND<br>Battery Voltage between<br>If Engine Cranking, then<br>Crank Time<br>AND<br>Battery Voltage<br>Engine Speed<br>High Side Driver 2 Enabled  | P2669<br>P2670<br>P2671<br>9 V and 18 V<br>< 4 seconds<br>> 10 V<br>>= 20 rpm          | 125 ms        | В   |

| Component/System               | Fault | Monitor Strategy       | Malfunction Criteria                     | Threshold Value | Secondary Parameters                 | Enable Conditions     | Time Required | MIL |
|--------------------------------|-------|------------------------|--|-----------------|--------------------------------------|-----------------------|---------------|-----|
| A W/h a al Daire I and Southak | DOZZA | This to st date sta    | Case 4 (Church Off)                      |                 |                                      |                       | 0 5 second    | num |
| 4 Wheel Drive Low Switch       | P2//1 | This test detects      |  |                 | All Cases                            | 5.077 (               | 0.5 second    | в   |
| Circuit Mairunction            |       | abnormal conditions    | This test fails when, for number of      |                 | Not Test Failed This Key On          | P2771                 |               |     |
|                                |       | for the four-wheel     | occurrences,                             | >= 1            |                                      | P0721                 |               |     |
|                                |       | drive indication       | the transfer case 4WD switch indicates   |                 |                                      | P0722                 |               |     |
|                                |       | switch input by        | High range and the calculated transfer   |                 |                                      | P077C                 |               |     |
|                                |       | comparing switch       | case range is Low range for a time       | >= 0.5 second   |                                      | P077D                 |               |     |
|                                |       | state range to         |  |                 |                                      |                       |               |     |
|                                |       | calculated range.      |  |                 |                                      |                       |               |     |
|                                |       |                        |  |                 | No Fault Active DTCs for this drive  | P2771                 |               |     |
|                                |       |                        |  |                 | cycle                                | P0721                 |               |     |
|                                |       |                        |  |                 |                                      | P0722                 |               |     |
|                                |       |                        |  |                 |                                      | P077C                 |               |     |
|                                |       |                        |  |                 |                                      | P077D                 |               |     |
|                                |       |                        |  |                 |                                      |                       |               |     |
|                                |       |                        | Case 2 (Stuck On)                        |                 | No Fault Pending DTCs for this drive | P0721                 |               |     |
|                                |       |                        | This test fails when for number of       |                 | cycle                                | P0722                 |               |     |
|                                |       |                        |  | <b>x</b> = 1    | oyoic                                | P0722                 |               |     |
|                                |       |                        | occurrences,                             | 2= 1            |                                      | P077C                 |               |     |
|                                |       |                        |  |                 |                                      | P0//D                 |               |     |
|                                |       |                        | the transfer case 4WD switch indicates   |                 | NOT Tranfer Case failure suspect     |                       |               |     |
|                                |       |                        | Low range and the calculated transfer    |                 |                                      |                       |               |     |
|                                |       |                        | case range is High range for a time      | >= 0.5 second   | Transfer Case is NOT Neutral or      |                       |               |     |
|                                |       |                        |  |                 | defaulted                            |                       |               |     |
|                                |       |                        |  |                 |                                      |                       |               |     |
|                                |       |                        |  |                 | Transmission fluid temperature       | > 20 deg. C and < 130 |               |     |
|                                |       |                        |  |                 |                                      | deg. C                |               |     |
|                                |       |                        |  |                 |                                      |                       |               |     |
|                                |       |                        |  |                 |                                      |                       |               |     |
|                                |       |                        |  |                 | Engine Speed between                 | 200 RPM and 7500      |               |     |
|                                |       |                        |  |                 |                                      | RPM                   |               |     |
|                                |       |                        |  |                 | for                                  | 5 seconds             |               |     |
|                                |       |                        |  |                 | Shift complete AND                   |                       |               |     |
|                                |       |                        |  |                 | range attained NOT Neutral           |                       |               |     |
|                                |       |                        |  |                 |                                      |                       |               |     |
| Transmission Component         | P0894 | This test detects the  | For this ignition cycle, when the number |                 |                                      |                       | 8075 ms       | В   |
| Slipping                       |       | number of turbine slip | of Neutral Locked Turbine (NLT) Slip     |                 | Components powered                   |                       |               |     |
|                                |       | events during the      | events,                                  | >= 3            | AND                                  |                       |               |     |
|                                |       | Neutral Locked         | then report fail                         |                 | Battery Voltage between              | 9 V and 18 V          |               |     |
|                                |       | Turbine (NLT)          | Where number of NLT Slip events for      |                 |                                      |                       |               |     |
|                                |       | request from engine    | this ignition cycle = Number of          |                 | Engine Speed between                 | 200 RPM and 7500      |               |     |
|                                |       | controller.            | accumulated NLT Slip events - Number     |                 |                                      | RPM                   |               |     |
|                                |       |                        | of NLT Slip events from previous         |                 | for                                  | 5 seconds             |               |     |
|                                |       |                        | ignition cycles.                         |                 |                                      |                       |               |     |
|                                |       |                        | And, where number of accumulated         |                 |                                      |                       |               |     |
|                                |       |                        | NLT Slip events is incremented when      |                 |                                      |                       |               |     |
|                                |       |                        | commanded gear or attained gear is       |                 |                                      |                       |               |     |
|                                |       |                        | NLT                                      |                 |                                      |                       |               |     |
|                                |       |                        | AND                                      |                 |                                      |                       |               |     |
|                                |       |                        | turbine speed                            | > 50 RPM        |                                      |                       |               |     |
|                                |       |                        | for a time                               | > 3 seconds.    |                                      |                       |               |     |
|                                |       |                        |  |                 |                                      |                       |               |     |
| Ignition Switch Run/Start      | P2534 | Out of range low.      |  |                 |                                      |                       | 5 seconds     | А   |
| Circuit                        |       | 3                      | Ignition voltage                         | < 5 volts       | Not Test Failed This Kev On          | P2534                 |               | 1   |
|                                |       |                        | THEN increment fail counter              |                 |                                      |                       |               |     |
|                                |       |                        | IF fail counter                          | >= 200 counts   | Components powered                   |                       |               | 1   |
|                                |       |                        | AND                                      |                 | AND                                  |                       |               | 1   |
|                                |       |                        | (BattChargeSysStable TRUE OR NOT         |                 | Battery Voltage between              | 9 V and 18 V          |               | 1   |
|                                |       |                        | P0882)                                   |                 |                                      |                       |               | 1   |
|                                |       |                        | ,  |                 | Engine Speed between                 | 200 RPM and 7500      |               | 1   |
|                                |       |                        | THEN report malfunction                  |                 |                                      | RPM                   |               | 1   |
|                                |       |                        |  |                 | for                                  | 5 seconds             |               | 1   |
|                                |       | 1                      | 1  |                 |                                      |                       | 1             |     |

| Component/System                                       | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction Criteria  | Threshold Value  | Secondary Parameters  | Enable Conditions   | Time Required | MIL<br>Illum |
|--|---------------|---|---|------------------|---|---|---------------|--------------|
|  |               |   |   |                  |   |   |               | -            |
| GMLAN Bus Reset<br>Counter Overrun                     | U0073         | This test detects if<br>the GMLAN bus is off<br>for a calibration   | CAN Hardware Circuitry Detects a Bus<br>Voltage Error (CAN bus off) | = TRUE (Boolean) | >= 3 counts   |   |               | В            |
|  |               |   | Bus Indeterminate State)  |                  | all conditions A and (B or C) below<br>must occur for stabilization time<br>Bus Stabilization time<br>A) Service mode \$04 active and end<br>of trip pocessing active<br>A) normal serial data communication<br>enabled<br>A) U0073 status not<br>B) secured controller or emission<br>critical then use ignition voltage<br>B) secured controller or emission<br>critical Ignition Voltage<br>B) Power Mode<br>C) ignition off enable<br>C) power Mode<br>C) battery voltage | >= 3 seconds<br>= FALSE (Boolean)<br>= TRUE (Boolean)<br>= fault active<br>=<br>CeCANR_e_OBDII_Dsb<br>I (Boolean)<br>>= 11 volts<br>= Run<br>= TRUE (Boolean)<br>= accessory<br>>11 volts |               |              |
| GMLAN ECM Controller<br>State of Health Failure        | U0100         | This test detects<br>GMLANbus failures<br>by detecting State of<br>Health failures in<br>GMLAN messages   | TCM Rx message missed frame<br>TCM Rx frame message missed frame    | = TRUE (Boolean) | fail times are caculated based on Rx<br>message enable calibration set to<br>CeCANR e BusA ECM<br>TCM Rx frame calibration enabled  | Tx controller<br>( see Table 1 in<br>supporting document)   | >= 10 seconds | В            |
|  |               | \$191, \$0BE,<br>\$0C9,\$1A1, \$287,<br>\$2C3, \$3B9,<br>\$3D1,\$3E9, \$3F9,<br>\$4C1, and \$4F1 from<br>ECM.                                   |   |                  | Frame recovery stabilization delay<br>all conditions A and (B or C) below<br>must occur for stabilization time<br>Bus Stabilization time<br>A) Service mode \$04 active and end<br>of trip pocessing active<br>A) normal serial data communication<br>enabled<br>A) U0073 status not<br>B) secured controller or emission<br>critical then use ignition voltage<br>B) secured controller or emission<br>critical Ignition Voltage<br>B) Power Mode                            | enumeration<br>>= 0.4 seconds<br>= FALSE (Boolean)<br>= TRUE (Boolean)<br>= fault active<br>= CeCANR_e_OBDII_Dsb<br>I (Boolean)<br>>= 11 volts<br>= Run<br>= TRUE (Boolean)               |               |              |
|  |               |   |   |                  | C) Power Mode<br>C) battery voltage<br>U0100 fault status is not<br>Not Test Failed This Key On   | =accessory<br>>11 volts<br>= fault active<br>U0073  |               |              |
| Lost Communication with<br>GMLAN ABS Control<br>Module | U0121         | This test detects<br>CAN (GMLAN) bus<br>failures by detecting<br>State of Health<br>(SOH) failures in the<br>following GMLAN<br>messages \$0C1, | TCM Rx message missed frame   | = TRUE (Boolean) | fail times are caculated based on Rx<br>message enable calibration set to<br>CeCANR_e_BusA_ABS<br>TCM Rx frame calibration enabled<br>Frame recovery stabilization delay  | Tx controller<br>( see Table 1 in<br>supporting document)<br>enumeration<br>>= 0.4 seconds  | >= 10 seconds | С            |
|  |               | \$0C5, \$0D0, \$1E9,<br>and \$2F9 from<br>Antilock Brake  |   |                  | all conditions A and (B or C) below<br>must occur for stabilization time<br>Bus Stabilization time  | >= 3 seconds  |               |              |

| Component/System                               | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction Criteria   | Threshold Value  | Secondary Parameters  | Enable Conditions  | Time Required          | MIL<br>Illum |
|--|---------------|--|--|------------------|---|--|------------------------|--------------|
|  |               | System (ABS)<br>Control Module <u>.</u>  |  |                  | <ul> <li>A) Service mode \$04 active and end of trip pocessing active</li> <li>A) normal serial data communication enabled</li> <li>A) P0073 status not</li> <li>B) secured controller or emission critical then use ignition voltage</li> <li>B) secured controller or emission critical ignition Voltage</li> <li>B) secured controller or emission critical ignition Voltage</li> <li>B) Power Mode</li> <li>C) ignition off enable</li> <li>C) Power Mode</li> <li>C) battery voltage</li> <li>U0121 fault status is not</li> <li>Not Test Failed This Key On</li> </ul>  | = FALSE (Boolean)<br>= TRUE (Boolean)<br>= fault active<br>=<br>CeCANR_e_OBDII_Dsb<br>I (Boolean)<br>>= 11 volts<br>= Run<br>= TRUE (Boolean)<br>=accessory<br>> 11 volts<br>= fault active<br>U0073   |                        |              |
| Lost Communication With<br>Body Control Module | U0140         | This test detects<br>CAN (GMLAN) bus<br>failures by detecting<br>State of Health<br>(SOH) failures in the<br>following GMLAN<br>messages \$0F1,  | TCM Rx message missed frame<br>TCM Rx frame message missed frame   | = TRUE (Boolean) | fail times are caculated based on Rx<br>message enable calibration set to<br>CeCANR_e_BusA_BCM<br>TCM Rx frame calibration enabled  | Tx controller<br>( see Table 1 in<br>supporting document)  | >= 10 seconds          | С            |
|  |               | \$1E1, \$1F3, and<br>\$3F1 from the Truck<br>Body Computer<br>(TBC) Control  |  |                  | Frame recovery stabilization delay<br>all conditions A and (B or C) below<br>must occur for stabilization time<br>Bus Stabilization time<br>A) Service mode \$04 active and end<br>of trip pocessing active<br>A) normal serial data communication<br>enabled<br>A) P0073 status not<br>B) secured controller or emission<br>critical then use ignition voltage<br>B) secured controller or emission<br>critical lgnition voltage<br>B) secured controller or emission<br>critical lgnition voltage<br>B) secured controller or emission<br>critical lgnition voltage<br>B) Power Mode<br>C) ignition off enable<br>C) power Mode<br>C) battery voltage<br>U0140 fault status is not<br>Not Test Failed This Key On | enumeration<br>>= 0.4 seconds<br>= 3 seconds<br>= FALSE (Boolean)<br>= TRUE (Boolean)<br>= fault active<br>= CeCANR_e_OBDII_Dsb<br>I (Boolean)<br>>= 11 volts<br>= Run<br>= TRUE (Boolean)<br>=accessory<br>>11 volts<br>= fault active<br>U0073 |                        |              |
| Brake Switch Circuit                           | P0571         | This test counts how<br>many vehicle<br>acceleration events<br>occur while the brake<br>switch indicates "ON"<br>or the number of<br>vehicle deceleration<br>events while the<br>brake switch<br>indicates "OFF" | Case1:<br>The number of vehicle accelerations<br>with the brake switch "on"<br>Case 2:<br>The number of vehicle decelerations<br>with the brake switch "off" | >= 10<br>>= 10   | All Cases<br>NOT Test Failed This Key On<br>No Fault Pending DTCs   | P0571<br>P0716<br>P0717<br>P078F<br>P07C0<br>P0721<br>P0722<br>P077C<br>P077D  | 10 Acceleration Events | C            |

| Component/System         | Fault<br>Code | Monitor Strategy<br>Description            | Malfunction Criteria   | Threshold Value     | Secondary Parameters           | Enable Conditions       | Time Required          | MIL<br>Illum |
|--------------------------|---------------|--|--|---------------------|--------------------------------|-------------------------|------------------------|--------------|
|                          |               |  |  |                     | Not Fault Active               | P0703                   | 10 Deceleration Events |              |
|                          |               |  |  |                     | Components powered             |                         |                        |              |
|                          |               |  |  |                     | Battery Voltage between        | 9 V and 18 V            |                        |              |
|                          |               |  |  |                     | Engine Speed between           | 200 RPM and 7500        |                        |              |
|                          |               |  |  |                     | for                            | 5 seconds               |                        |              |
| Brake Pedal Possition    | P0703         | This test detects                          |  |                     |                                |                         | 15 seconds             | С            |
| Switch Signal Rolling    |               | rolling count failures                     | The failure count increments when the                          |                     | Components powered             |                         |                        |              |
| oount                    |               | GMLAN Message                              | rolling counter does not agree with the                        |                     | Battery Voltage between        | 9 V and 18 V            |                        |              |
|                          |               |  | expected value   | -                   | Engine Speed between           | 200 RPM and 7500        |                        |              |
|                          |               |  | When the failure counter is<br>for a time of<br>Report Failure | > 5<br>> 10 seconds | for                            | RPM<br>5 seconds        |                        |              |
| Upshift Switch Circuit   | P0815         | This test detects the<br>upshift switch ON | When PRNDL state is N. P or R                                  |                     | Not Test Failed This Key On    | P0826                   | 603 seconds            | С            |
|                          |               |  | and has been unchanged   | >= 2.5 seconds      |                                | P0708                   |                        |              |
|                          |               |  | AND<br>upshift switch state is ON                              |                     | Components powered             |                         |                        |              |
|                          |               |  | for a time   | >= 3 seconds.       | Battery Voltage between        | 9 V and 18 V            |                        |              |
|                          |               |  | AND  |                     | Engine Speed between           | 200 RPM and 7500        |                        |              |
|                          |               |  | When PRNDL state is a forward range                            |                     | for                            | RPM<br>5 seconds        |                        |              |
|                          |               |  | AND  | >= 2.5 seconds      |                                | 0.00001140              |                        |              |
|                          |               |  | upshift switch state is ON                                     | >= 600 seconds      |                                |                         |                        |              |
| Downshift Switch Circuit | P0816         | This test detects the                      |  |                     |                                |                         | 603 Seconds            | С            |
|                          |               | downshift switch ON.                       | When PRNDL state is N, P or R and                              |                     | Not Test Failed This Key On    | P0826                   |                        | Ũ            |
|                          |               |  | for a time   | >= 2.5 seconds      |                                | 1 0700                  |                        |              |
|                          |               |  | downshift switch state is ON                                   | >- 3 seconds        | AND<br>Battery Voltage between | 9 V and 18 V            |                        |              |
|                          |               |  | AND  | >= 3 3600103.       | Dattery voltage between        | S V and TO V            |                        |              |
|                          |               |  | When PRNDL state is a forward range                            |                     | Engine Speed between           | 200 RPM and 7500        |                        |              |
|                          |               |  | and has been unchanged for a time                              | >= 2.5 seconds      | for                            | 5 seconds               |                        |              |
|                          |               |  | AND  | 2.0 3600103         |                                |                         |                        |              |
|                          |               |  | for a time   | >= 600 seconds.     |                                |                         |                        |              |
| Up and Down Shift Switch | P0826         | This test detects                          |  |                     |                                | 50000                   | 10 seconds             | С            |
| Circuit                  |               | upshift/downshift<br>switch circuit at an  | Switch state is ILLEGAL for a time                             | >= 10 seconds.      | NOT LEST Failed This Key On    | 20826                   |                        |              |
|                          |               | illegal state.                             |  |                     | Components powered<br>AND      |                         |                        |              |
|                          |               |  |  |                     | Battery Voltage between        | 9 V and 18 V            |                        |              |
|                          |               |  |  |                     | Engine Speed between           | 200 RPM and 7500<br>RPM |                        |              |

| Component/System                         | Fault<br>Code | Monitor Strategy   | Malfunction Criteria  | Threshold Value  | Secondary Parameters   | Enable Conditions | Time Required   | MIL     |
|--|---------------|--|---|------------------|--|-------------------|---|---------|
|  | ooue          | Description  |   |                  | for  | 5 seconds         |   | interne |
|  |               |  |   |                  |  |                   |   |         |
| Controller Memory                        |               |  |   |                  |  |                   |   |         |
| Tool_name                                | P0601         | This test performs a   |   |                  | Not Test Failed This Key On                                  | P0601             |   | A       |
| Control Module Read Only<br>Memory (ROM) |               | check for ECC fault<br>at controller<br>intiaization and a   | Incorrect program/calibrations  |                  |  |                   | = 1 Fail Counts first pass after reset (background task continuous) |         |
|  |               | checksum test of all<br>areas of ROM code<br>using a CRC16 table<br>driven method in<br>boolconund | test of all checksum<br>OM code<br>C16 table<br>hod in<br>d   | = TRUE (Boolean) |  |                   | >= 5 Fail Counts after first pass (background task continuous)      |         |
|  |               |  | Errors in the software and calibration<br>segments in the flash, detected by the<br>micro's hardware based fault detection  | = TRUE Boolean   |  |                   | >= 254 counts (Controller Initialization)                           |         |
| Control Module Long Term                 | P0603         | This function tests for  |   |                  | Not Test Failed This Key On                                  | P0603             |   | A       |
| Memory Reset                             |               | error flags from the<br>NVDP and logs a<br>code if an error was<br>detected.                       | fault condition exists that affects the<br>validity of the copy of battery<br>independent non-volatile data kept in<br>RAM. | = TRUE (Boolean) |  |                   | every controller initialization                                     |         |
|  |               |  | latest copy of the battery independent<br>non-volatile data may have been lost.   | = TRUE (Boolean) |  |                   | >= 3 counts (controller initialization)                             |         |
|  |               |  |   |                  | NVI_TestDiagEnbl   | TRUE              |   |         |
| Control Module Random                    | P0604         | RAM diagnostic   | Test fails for any of following.  |                  | Not Test Failed This Key On                                  | P0604             |   | A       |
| Access Memory (RAM)                      |               | Ū Ū  |   |                  |  |                   |   |         |
|  |               |  | secondary micro processor RAM error   | = IRUE (Boolean) |  |                   | 1000 ms cont.   |         |
|  |               |  | OR dual store RAM write time out error  | = TRUE (Boolean) |  |                   | > 175 ms ((interrupt driven based on calling functions)             |         |
|  |               |  | OR<br>errors in the system RAM segment<br>detected by the micro's hardware based<br>fault detection                         | = TRUE (Boolean) |  |                   | >= 254 counts (controller initialization)                           |         |
|  |               |  | OR<br>parity errors in cache memory detected<br>by the micro's hardware based fault<br>detection                            | = TRUE (Boolean) |  |                   | >= 3 counts (controller initialization )                            |         |
|  |               |  | OR signature faults detected in the TPU   |                  |  |                   | >= 5 counts (controller initialization)                             |         |
|  |               |  | microcode by the micro's hardware<br>based fault detection  | = TRUE (Boolean) |  |                   |   |         |
|  |               |  | OR<br>write attempt occurred during RAM lock  | = TRUE (Boolean) | Service mode \$04 active or end of<br>trip processing active | FALSE             | > 655534 counts (background task continuous)                        |         |
| I  |               | 1  | I   |                  |  | l                 |   |         |

| Fault | Monitor Strategy          | Malfunction Criteria  | Threshold Value   | Secondary Parameters   | Enable Conditions   | Time Required  | MIL   |
|-------|---------------------------|---|---|--|---|--|---|
| Code  | Description               |   |   |  |   |  | Illum   |
| P0606 | Processor integrity test. |   |   | Not Test Failed This Key On  | P0606   |  | A   |
|       |                           | main processor RAM error detection circuit hardware failure   | = TRUE (Boolean)  | RAM diagnotic test enable  | = 1 (Boolean)   | >= 5 counts (controller initialization)  |   |
|       |                           |   |   | hardware reset source is controller<br>power up reset  | = TRUE (Boolean)  |  |   |
|       |                           | main processor flash EPROM error<br>detection circuit hardware failure  | = TRUE (Boolean)  | flash EPROM diagnotic test enable  | = 1 (Boolean)   | >= 5 counts (controller initialization)  |   |
|       |                           | OR  |   | hardware reset source is controller<br>power up reset  | = TRUE (Boolean)  |  |   |
|       |                           | main processor memory stack failure   | = TRUE (Boolean)  | diagnostic system enabled (diagnostic<br>code clear not in progress AND all of<br>the diag loops have completed their<br>re-enable paths).   | = TRUE (Boolean)  | >= 5 counts (100 msec continuous)  |   |
|       |                           |   |   | main processor memory stack test<br>enable   | = 1 (Boolean)   |  |   |
|       |                           | OR<br>secondary processor memory stack<br>failure<br>OR   | = TRUE (Boolean)  | Post code clear diagnostitc disabled   | = FALSE (Boolean)   | two consecutive counts continuously upon receival<br>from secondary(every 12.5 ms)   |   |
|       |                           | main processor ROM first test complete  | = FALSE (Boolean)   |  |   | >= 35 counts (controller power up 12.5 msec<br>continuous)   |   |
|       |                           | no new seed from secondary processor<br>to main processor seed  | = TRUE (Boolean)  | main processor to secondary<br>processor serial peripheral interface<br>error (main or 2dry detected)  | = FALSE (Boolean)   | for more than 0.5 seconds  |   |
|       |                           | OR  |   | battery voltage<br>ignition voltage  | > 11 Volts<br>>= 8 Volts  |  |   |
|       |                           | seed sequence error   | ≠ FALSE (Boolean)   | main processor to secondary<br>processor serial peripheral interface<br>error (main or 2dry detected)  | = FALSE (Boolean)   | 3 counts out of 17 (on the 12.5 msec loop)   |   |
|       |                           | OR  |   | battery voltage<br>ignition voltage  | > 11 Volts<br>>= 8 Volts  |  |   |
|       |                           | seed key fault received from 2ndry  | = TRUE (Boolean)  | Post code clear diagnostic disabled  | = FALSE (Boolean)   | two consecutive counts (on the 12.5 ms loop)   |   |
|       |                           | OR  |   |  |   |  |   |
|       |                           | normalize 0-5 volt (absolute value<br>(analog to digital test voltage<br>commanded - actual analog to digital<br>voltage feedback))   | > 3 percent   | diagnostic system enabled (diagnostic<br>code clear not in progress AND all of<br>the diag loops have completed their<br>re-enable paths)  | = TRUE (Boolean)  | 3 out of 8 counts OR continuous for 0.2 sec (50 ms)  |   |
|       |                           |   |   | analog to digital voltage test enabled   | = TRUE (Boolean)  |  |   |
|       |                           |   |   | analog to digital voltage<br>analog to digital voltage channel<br>enabled<br>analog to digital test voltage  | TRUE (Boolean)  |  |   |
|       |                           | OR  |   | command  |   |  |   |
|       | Fault<br>Code<br>P0606    | Fault       Monitor Strategy         Description       Processor integrity         P0606       Processor integrity         test.       Processor integrity         Image: state s | Fault         Monitor Strategy<br>Description         Malfunction Criteria           P0606         Processor integrity<br>test.         main processor RAM error detection<br>circuit hardware failure           P0606         Processor integrity<br>test.         main processor RAM error detection<br>circuit hardware failure           OR         main processor flash EPROM error<br>detection circuit hardware failure         OR           Main processor memory stack failure         OR           main processor memory stack failure         OR           main processor ROM first test complete         OR           main processor ROM first test complete         OR           main processor ROM first test complete         OR           no new seed from secondary processor<br>to main processor seed         OR           No         Seed sequence error           OR         Seed sequence error           OR         OR           Normalize 0-5 volt (absolute value<br>(analog to digital test voltage<br>commanded - actual analog to digital<br>voltage feedback)) | Fault       Monitor Strategy       Malunction Criteria       Threshold Value         Code       Description       Imain processor RAM error detection crout hardware failure       TRUE (Boolean)         Processor integrity       main processor flash EPROM error detection crout hardware failure       TRUE (Boolean)         Main processor flash EPROM error detection crout hardware failure       TRUE (Boolean)       Resolution         Main processor memory stack failure       TRUE (Boolean)       Resolution         Main processor ROM first test complete       TRUE (Boolean)       Resolution         Main processor ROM first test complete       FALSE (Boolean)       Resolution         Main processor ROM first test complete       FALSE (Boolean)       Resolution         No new seed from secondary processor       TRUE (Boolean)       Resolution         No new seed from secondary processor       TRUE (Boolean)       Resolution         No new seed from secondary processor       TRUE (Boolean)       Resolution         No new seed from secondary processor seed       TRUE (Boolean)       Resolution         No       seed sequence error       FALSE (Boolean)       Resolution         No       seed sequence error       FALSE (Boolean)       Resolution         No       seed key fault received from 2ndry       TRUE (Boolean)       Re | Pault<br>Decide         Monitor Strategy<br>(add Description)         Mafunction Criteria         Threshold Value         Secondary Parameters           Podo         Processor integrity<br>(bst.         main processor RAM error detection<br>circuit hardware failure<br>detection circuit hardware failure<br>errol (Boolean)         = TRUE (Boolean)         Post code clear diagnostic disabled<br>main processor memory stack failure<br>errol (main or 2000 getted bet<br>re-enable detection<br>to main processor serial perpharial intraface<br>error (main or 2000 getted bet<br>re-enable detection<br>to main processor serial perpharial intraface<br>error (main or 2000 getted bet<br>re-enable detection<br>error (main or 2000 getted bet<br>re-enable detection<br>error (main or 2000 getted bet<br>re-enable detection<br>error (main or 2000 getted bet<br>re-enable detection<br>code clear not in progress AND all of<br>the diaglooph torges charled<br>ganostic system enabled (diagnostic<br>code clear not in progress AND all of<br>the diaglooph torges charled<br>ganobig to digital voltage test enable<br>ganobig to digital voltage charled<br>analog to digital voltage charled<br>analog to digital voltage charled<br>analog to digital voltage charled<br>analog to digital voltage charled<br>an | Pault<br>(add)         Martinetion Criteria         Threshold Value         Secondary Parameters         Enable Conditions           19000         Increased integrity<br>test.         Increased integrity<br>test.         Increased integrity<br>itest.         Not Test Failed This Key On<br>Cricult hardware failure<br>outcome failure<br>detection cricult hardware failure<br>detection in progress AND all of<br>the diag loops fave cricing failure<br>detection cricult paths.<br>main processor memory stack failure<br>failure<br>detection in progress AND all of<br>the diag loops fave cricing failure<br>detection cricult paths.<br>main processor ROM first test complete<br>for<br>to main processor ROM first test complete<br>for<br>to main processor ROM first test complete<br>for<br>seed sequence error<br>failure<br>commande - sculat paths.<br>(RA<br>(analy point seed sequence error<br>failure<br>commande - sculat paths.<br>(RA<br>(analy point seed sequence error<br>failure<br>commande - sculat paths.<br>(RA<br>(analy point secondary processor failure<br>for main processor for<br>failure<br>for<br>analy processor failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure<br>for<br>failure | Paul         Monitor Strategy         Mathematication         Threshold Value         Recentary Parameters         Enable Conditions         Time Required           V0068         Processor Integrity         International Value         Recentary Parameters         Enable Conditions         Time Required           V0068         Processor Integrity         International Value         RAM disprace rest on the Conditions         Time Required         Social Value         < |

| Component/System | Fault | Monitor Strategy | Malfunction Criteria  | Threshold Value   | Secondary Parameters   | Enable Conditions                          | Time Required   | MIL   |
|------------------|-------|------------------|---|-------------------|--|--|---|-------|
|                  | Code  | Description      | P   | l                 |  |  | <u></u>   | Illum |
|                  |       |                  | arithmatic logic unit test pass                                 | = FALSE (Boolean) | arithmatic logic unit test enable  | = 1 (Boolean)                              | two consecutive counts at controller initialization, then two consecutive counts continuously every 12.5 ms               |       |
|                  |       |                  |   |                   | diagnostic system enabled<br>(diagnostic code clear not in progress<br>AND all the diag loops have<br>completed their re-enable paths)             | = TRUE (Boolean)                           |   |       |
|                  |       |                  |   |                   | A and B and C must occur<br>A: starter motor engaged<br>B: ignition voltage<br>C: starter motor engaged time                                       | = TRUE (Boolean)<br>> 11 Volts<br>> 15 sec |   |       |
|                  |       |                  | OR<br>secondary processor arithmatic logic<br>unit fault        | = TRUE (Boolean)  | Post code clear diagnostitc disabled   | = FALSE (Boolean)                          | two consecutive counts continuously upon receival<br>from secondary(every 12.5 ms)  |       |
|                  |       |                  | OR  |                   |  |  |   |       |
|                  |       |                  | clock test fail   | = TRUE (Boolean)  | clock test enable  | = 1 (Boolean)                              | two consecutive counts at controller initialization, then two consecutive counts continuously every 12.5 ms               |       |
|                  |       |                  |   |                   | diagnostic system enabled<br>(diagnostic code clear not in progress<br>AND all the diag loops have<br>completed their re-enable paths <del>)</del> | =TRUE (Boolean)                            |   |       |
|                  |       |                  |   |                   | A and B and C must occur<br>A: starter motor engaged<br>B: ignition voltage<br>C: starter motor engaged time                                       | = TRUE (Boolean)<br>> 11 Volts<br>> 15 sec |   |       |
|                  |       |                  | OR  |                   |  |  |   |       |
|                  |       |                  | configuration register test fail                                | = TRUE (Boolean)  | configuration register test enable   | = 1 (Boolean)                              | two consecutive counts at controller initialization, then two consecutive counts continuously every 12.5 ms               |       |
|                  |       |                  |   |                   | diagnostic system enabled<br>(diagnostic code clear not in progress<br>AND all the diag loops have<br>completed their re-enable paths)             | = TRUE (Boolean)                           |   |       |
|                  |       |                  |   |                   | A and B and C must occur<br>A: starter motor engaged<br>B: ignition voltage<br>C: starter motor engaged time                                       | = TRUE (Boolean)<br>> 11 Volts<br>> 15 sec |   |       |
|                  |       |                  | OR<br>secondary processor configuration<br>register fault<br>OR | = TRUE (Boolean)  | Post code clear diagnostitc disabled   | = FALSE (Boolean)                          | two consecutive counts continuously upon receival<br>from secondary(every 12.5 ms)  |       |
|                  |       |                  | main SOH discrete fault   | = TRUE (Boolean)  | Post code clear diagnostite disabled   | = FALSE (Boolean)                          | two consecutive counts continuously upon receival   |       |
|                  |       |                  |   |                   | FUSI LUUE CIERI URGINUSING UBRUIGA   |  | nom secondary(every 12.3 ms)  |       |
|                  |       |                  | OR<br>secondary processor reports SPI<br>communication fault    | = TRUE (Boolean)  | Post code clear diagnostic enabled   | = FALSE (Boolean)                          | two consecutive counts continuously upon received<br>from secondary (every 12.5 ms)                                       |       |
|                  |       |                  | OR  |                   |  |  |   |       |
|                  |       |                  | SPI valid messsage received by main<br>micro processor          | = FALSE (Boolean) | A and B and C and D must occur   |  | 39 continuous counts after init OR 39 continuous<br>counts after valid message received OR 159 counts<br>out of 399 total |       |
|                  |       |                  |   | 1                 | A: starter motor engaged   | = TRUE (Boolean)                           |   |       |

| Component/System                               | Fault | Monitor Strategy                                       | Malfunction Criteria  | Threshold Value  | Secondary Parameters  | Enable Conditions   | Time Required                  | MIL   |
|--|-------|--|---|------------------|---|---|--------------------------------|-------|
|  | Code  | Description  |   |                  |   |   |                                | Illum |
|  |       |  |   |                  | B: ignition voltage<br>C: starter motor engaged time<br>D:equivalent to "Loss or invalid<br>message of SPI communicaton from<br>the secondary processor detected by<br>the primary processor" | <= 11 Volts<br>< 15 sec                                     |                                |       |
|  |       |  |   |                  | OR<br>SPI message checksum fault<br>OR<br>type of message received same as<br>type of message sent  | ¥ FALSE (Boolean)<br>≠ FALSE (Boolean)<br>≠ FALSE (Boolean) |                                |       |
| Control Module Long Term<br>Memory Performance | P062F | Tests non volatile<br>memory long term<br>performance. | TCM Non-Volatile Memory read or write error (every controller intialization). | = TRUE (Boolean) | Not Test Failed This Key On   | P062F   | every controller intialization | A     |
|  |       |  | assembly calibration integrity (every controller initialization)              | = TRUE (Boolean) | NVM write error diagnotic enable  | TRUE  | every controller intialization | -     |

## 15 OBDG11 TCM Diagnostic Table

| т | a | b | le | 1 |  |
|---|---|---|----|---|--|
| _ |   |   |    | _ |  |

KaCANG\_RxDeviceIndx KaCANG\_RxDeviceIndx

| Axis CeCANG_e_RcvMsg_0BE | CeCANG_e_RcvMsg_0C1_BusA | CeCANG_e_RcvMsg_0C5_BusA | CeCANG_e_RcvMsg_0C9_BusA | CeCANG_e_RcvMsg_0D0_BusA | CeCANG_e_RcvMsg_0F1_BusA | CeCANG_e_RcvMsg_191_BusA | frame             |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------|
| Curve CeCANR_e_BusA_ECM  | CeCANR_e_BusA_ABS        | CeCANR_e_BusA_ABS        | CeCANR_e_BusA_ECM        | CeCANR_e_BusA_ABS        | CeCANR_e_BusA_BCM        | CeCANR_e_BusA_ECM        | enable or invalid |
|                          | CeCANG_e_RcvMsg_1A1_BusA | CeCANG_e_RcvMsg_1CF_BusA | CeCANG_e_RcvMsg_1E1_BusA | CeCANG_e_RcvMsg_1E9_BusA | CeCANG_e_RcvMsg_1F3_BusA | CeCANG_e_RcvMsg_1F9_BusA | frame             |
|                          | CeCANR_e_BusA_ECM        | CeCANR_e_InvalidRxDevice | CeCANR_e_BusA_BCM        | CeCANR_e_BusA_ABS        | CeCANR_e_BusA_BCM        | CeCANR_e_BusA_PTO        | enable or invalid |
|                          | CeCANG_e_RcvMsg_1FC_BusA | CeCANG_e_RcvMsg_287_BusA | CeCANG_e_RcvMsg_2C3_BusA | CeCANG_e_RcvMsg_2D1_BusA | CeCANG_e_RcvMsg_2F9_BusA | CeCANG_e_RcvMsg_3B9_BusA | frame             |
|                          | CeCANR_e_InvalidRxDevice | CeCANR_e_BusA_ECM        | CeCANR_e_BusA_ECM        | CeCANR_e_InvalidRxDevice | CeCANR_e_BusA_ABS        | CeCANR_e_BusA_ECM        | enable or invalid |
|                          | CeCANG_e_RcvMsg_3D1_BusA | CeCANG_e_RcvMsg_3E9_BusA | CeCANG_e_RcvMsg_3F1_BusA | CeCANG_e_RcvMsg_3F9_BusA | CeCANG_e_RcvMsg_4C1_BusA | CeCANG_e_RcvMsg_4F1_BusA | frame             |
|                          | CeCANR_e_BusA_ECM        | CeCANR_e_BusA_ECM        | CeCANR_e_BusA_BCM        | CeCANR_e_BusA_ECM        | CeCANR_e_BusA_ECM        | CeCANR_e_BusA_ECM        | enable or invalid |