

## 13 OBDG05C FSCM Diagnostics

This document was prepared in the following main sections (worksheet tabs) for MY13 GM OBD Group 05C Diagnostics for Electronically Regulated Fuel Control System and Front Grille Active Aero Shutters

### ■ Section 1: C101\_LUK &VRI

Contains information that is common to all C101 ERFS applications within 13OBDG05C featuring RPOs VRI (Frt Lower Grille Active Aero Shutters) and XFE (Extra Fuel Econ)

|                  |  |
|------------------|--|
| with engine RPOs | 1) LUK 2.4L BAS+ Hybrid Ecotec I-4 SIDI &HP6 Hybrid Propulsion Parallel Electric |
| with VPPCs       | 1) GMX351, GMX353  |

### ■ Section 2 : C101\_Common LUK -VRI

Contains information that is common to all C101 ERFS applications within 13OBDG05C not featuring RPOs VRI &XFE

|                  |  |
|------------------|--|
| with engine RPOs | 1) LUK 2.4L BAS+ Hybrid Ecotec I-4 SIDI &HP6 Hybrid Propulsion Parallel Electric |
| with VPPCs       | 1) GMX350  |

Original submission \_\_\_\_\_ 1-Sep-11

| Component/<br>System                                      | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction<br>Criteria   | Threshold<br>Value | Secondary<br>Parameters   | Enable<br>Conditions   | Time<br>Required  | MIL<br>Illum.           |
|---|---------------|--|---|--------------------|---|--|---|-------------------------|
| Fuel Rail Pressure (FRP) Sensor Performance (rationality) | P018B         | This DTC detects a fuel pressure sensor response stuck within the normal operating range | Absolute value of fuel pressure change as sensed during intrusive test. | <= 30 kPa          | 1. FRP Circuit Low DTC (P018C)<br>2. FRP Circuit High DTC (P018D)<br>3. FuelPump Circuit Low DTC (P0231)<br>4. FuelPump Circuit High DTC (P0232)<br>5. FuelPump Circuit Open DTC (P023F)<br>6. Reference Voltage DTC (P0641)<br>7. Fuel Pump Control Module Driver Over-temperature DTC (P064A) | Not active<br>Not active<br>Not active<br>Not active<br>Not active<br>Not active | Frequency:<br>Continuous; 12.5 ms loop.<br>60 seconds between intrusive tests that pass<br>Intrusive test requested if fuel system is clamped for >= 5 seconds or fuel pressure error variance <= typically (0.3 to 0.6) (calculated over a 2.5sec period); otherwise report pass<br>Duration of intrusive test is fueling related (5 to 12 seconds).<br>Intrusive test is run when fuel flow is below Max allowed fuel flow rate (Typical values in the range of 11 to 50 g/s) | DTC Type<br>A<br>1 trip |

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| Component/<br>System                                 | Fault<br>Code | Monitor Strategy<br>Description                                      | Malfunction<br>Criteria | Threshold<br>Value | Secondary<br>Parameters   | Enable<br>Conditions  | Time<br>Required   | MIL<br>Illum.        |
|--|---------------|--|-------------------------|--------------------|---|---|--|----------------------|
|  |               |  |                         |                    | 8. Control Module Internal Performance DTC (P0606)<br>9. Engine run time<br>10. Emissions fuel level (PPEI \$3FB)<br>11. Fuel pump control<br>12. Fuel pump control state<br>13. Engine fuel flow<br>14. ECM fuel control system failure (PPEI \$1ED) | Not active<br>>=5 seconds<br>Not low<br>Enabled<br>Normal or FRP rationality control<br>> 0.047 g/s<br>Not failed |  |                      |
| Fuel Rail Pressure (FRP) Sensor Circuit Low Voltage  | P018C         | This DTC detects if the fuel pressure sensor circuit is shorted low  | FRP sensor voltage      | < 0.14 V           | Ignition  | Run or Crank  | 72 failures out of 80 samples<br>1 sample/12.5 ms                                      | DTC Type A<br>1 trip |
| Fuel Rail Pressure (FRP) Sensor Circuit High Voltage | P018D         | This DTC detects if the fuel pressure sensor circuit is shorted high | FRP sensor voltage      | > 4.86 V           | Ignition  | Run or Crank  | 72 failures out of 80 samples<br>1 sample/12.5 ms                                      | DTC Type A<br>1 trip |
| Fuel Pump Control Circuit Low Voltage                | P0231         | This DTC detects if the fuel pump control circuit is shorted to low  | Fuel Pump Current       | > 14.48A           | Ignition<br>OR<br>HS Comm<br>OR   | Run or Crank<br><br>enabled   | 72 test failures in 80 test samples if Fuel Pump Current <100A<br><br>1 sample/12.5 ms | DTC Type A<br>1 trip |

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| Component/<br>System                                    | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction<br>Criteria   | Threshold<br>Value                                      | Secondary<br>Parameters  | Enable<br>Conditions   | Time<br>Required   | MIL<br>Illum.           |
|---|---------------|--|---|---|--|--|--|-------------------------|
|   |               |  |   |   | Fuel Pump Control<br>AND<br>Ignition Run/Crank Voltage   | enabled<br><br>9V < voltage < 32V                                    |  |                         |
| Fuel Pump Control<br>Circuit High Voltage               | P0232         | This DTC detects if<br>the fuel pump<br>control circuit is<br>shorted to high            | Voltage measured at<br>fuel pump circuit  | > 3.86 V  | Commanded fuel pump<br>output<br><br>Fuel pump control enable<br><br>Time that above conditions<br>are met | 0% duty cycle (off)<br><br>False<br><br>>=4.0 seconds                | 36 test failures in<br>40 test samples;<br>1 sample/12.5ms<br><br>Pass/Fail<br>determination<br>made only once<br>per trip | DTC Type<br>A<br>1 trip |
| Fuel Pump Control<br>Circuit (Open)                     | P023F         | This DTC detects if<br>the fuel pump<br>control circuit is<br>open                       | Fuel Pump Current<br><br>AND<br>Fuel Pump Duty Cycle  | <=0.5A<br><br>□<br><br>>20%                             | Ignition<br>OR<br>HS Comm<br><br>OR<br>Fuel Pump Control<br>AND<br>Ignition Run/Crank Voltage              | Run or Crank<br><br>enabled<br><br>enabled<br><br>9V < voltage < 32V | 72 test failures in<br>80 test samples;<br>1 sample/12.5ms   | DTC Type<br>A<br>1 trip |
| Fuel System Control<br>Module Enable Control<br>Circuit | P025A         | This DTC detects if<br>there is a fault in<br>the fuel pump<br>control enable<br>circuit | PPEI (PPEI<br>(Powertrain Platform<br>Electrical Interface)<br>Fuel System Request<br>(\$1ED) | ≠ Fuel Pump Control<br>Module Enable<br>Control Circuit | Ignition<br>AND<br>PPEI Fuel System Request<br>(\$1ED)   | Run or Crank<br><br>valid  | 72 failures out of<br>80 samples<br><br>1 sample/12.5 ms   | DTC Type<br>A<br>1 trip |

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| Component/<br>System                                  | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction<br>Criteria                  | Threshold<br>Value  | Secondary<br>Parameters   | Enable<br>Conditions  | Time<br>Required  | MIL<br>Illum.            |
|---|---------------|---|--|---|---|---|---|--------------------------|
| Mechanical Actuator<br>Performance<br>(Functionality) | P059F         | Compare<br>commanded shutter<br>position to sensed<br>position                            | Failure to achieve<br>commanded position | Two (2) consecutive<br>intrusive tests fail to<br>achieve commanded<br>position.<br><br>Intrusive tests are<br>triggered<br>immediately following<br>any failure to achieve<br>a commanded<br>position. | 1. Power mode<br><br><br><br><br><br><br><br><br><br><br>2. Shutter Control<br>3. Ignition Run/Crank<br>Voltage | Run/Crank<br><br><br><br><br><br><br><br><br><br><br>Enabled<br>11V < voltage < 32V | Frequency:<br>1 sample after<br>every shutter<br>movement.<br><br>Intrusive test<br>requested if<br>shutter movement<br>is commanded<br>and position<br>feedback differs<br>after 19.5<br>seconds;<br>otherwise report<br>pass.<br><br>Duration of<br>intrusive test is<br>shutter movement<br>related (40 to 80<br>seconds). | DTC Type<br>B<br>2 trips |
| Control Module Read<br>Only Memory (ROM)              | P0601         | This DTC will be<br>stored if any<br>software or<br>calibration check<br>sum is incorrect | Calculated Checksum<br>(CRC16)           | ≠ stored checksum<br>for any of the parts<br>(boot, software,<br>application<br>calibration, system<br>calibration)   | Ignition<br>OR<br><br><br>HS Comm<br>OR<br>Fuel Pump Control  | Run or Crank<br><br><br><br><br><br>enabled<br><br><br>enabled                      | 1 failure if it occurs<br>during the first<br>ROM test of the<br>ignition cycle,<br>otherwise 5<br>failures<br><br>Frequency:<br>Runs continuously<br>in the background   | DTC Type<br>A<br>1 trip  |

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| Component/<br>System                      | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction<br>Criteria  | Threshold<br>Value       | Secondary<br>Parameters                              | Enable<br>Conditions                       | Time<br>Required   | MIL<br>Illum.        |
|---|---------------|--|--|--------------------------|--|--|--|----------------------|
| Control Module Not Programmed             | P0602         | Indicates that the FSCM needs to be programmed   | This DTC is set via calibration, when<br><br>KeMEMD_b_NoStartCal | = TRUE                   | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control | Run or Crank<br><br>enabled<br><br>enabled | Runs once at power up  | DTC Type A<br>1 trip |
| Control Module Long Term Memory Reset     | P0603         | Non-volatile memory checksum error at controller power-up                                | Checksum at power-up   | ≠ checksum at power-down | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control | Run or Crank<br><br>enabled<br><br>enabled | 1 failure<br><br>Frequency:<br>Once at power-up  | DTC Type A<br>1 trip |
| Control Module Random Access Memory (RAM) | P0604         | Indicates that control module is unable to correctly write and read data to and from RAM | Data read  | ≠ Data written           | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control | Run or Crank<br><br>enabled<br><br>enabled | 1 failure if it occurs during the first RAM test of the ignition cycle, otherwise 5 failures<br><br>Frequency:<br>Runs continuously in the background. | DTC Type A<br>1 trip |

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| Component/<br>System   | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction<br>Criteria   | Threshold<br>Value   | Secondary<br>Parameters   | Enable<br>Conditions   | Time<br>Required   | MIL<br>Illum.           |
|--|---------------|---|---|--|---|--|--|-------------------------|
| Control Module<br>Internal Performance<br><br>1. Main Processor<br>Configuration Register<br>Test<br><br><br><br><br><br><br><br>2. Processor clock test<br><br><br><br><br><br><br><br>3. External watchdog<br>test | P0606         | This DTC indicates the FSCM has detected an internal processor fault or external watchdog fault (PID 2032 discriminates the source of the fault ) | 1. For all I/O configuration register faults:<br><br>•Register contents<br><br><br><br>2. For Processor Clock Fault:<br>•EE latch flag in EEPROM.<br>OR<br>• RAM latch flag.<br><br>3. For External Watchdog Fault:<br>• Software control of fuel pump driver | Incorrect value.<br><br><br><br>0x5A5A<br><br>0x5A<br><br>Control Lost | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control<br><br>1. For all I/O configuration register faults:<br>•KeMEMD_b_ProcFltCfgRegEnbl<br><br>2. For Processor Clock Fault:<br>•KeMEMD_b_ProcFltCLKDiagEnbl<br><br>3. For External Watchdog Fault:<br>•KeFRPD_b_FPExtWDogDiagEnbl<br><br>3. For External Watchdog Fault:<br>•Control Module ROM(P0601)<br><br>3. For External Watchdog Fault:<br>•Control Module RAM(P0604) | Run or Crank<br><br>enabled<br><br>enabled<br><br>TRUE<br><br>TRUE<br><br>TRUE<br><br>not active<br><br>not active | Tests 1 and 2<br>1 failure<br>Frequency:<br>Continuously<br>(12.5ms)<br><br><br><br><br><br><br><br>Test 3<br>3 failures out of 15 samples<br><br>1 sample/12.5 ms | DTC Type<br>A<br>1 trip |

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| Component/<br>System  | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction<br>Criteria                  | Threshold<br>Value   | Secondary<br>Parameters                              | Enable<br>Conditions                       | Time<br>Required   | MIL<br>Illum.            |
|---|---------------|---|--|--|--|--|--|--------------------------|
| Control Module Long<br>Term Memory<br>(EEPROM)<br>Performance | P062F         | Indicates that the<br>NVM Error flag has<br>not been cleared  | Last EEPROM write                        | Did not complete   | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control | Run or Crank<br><br>enabled<br><br>enabled | 1 test failure<br>Once on controller<br>power-up         | DTC Type<br>A<br>1 trip  |
| 5Volt Reference Circuit<br>(Short High/Low/Out of<br>Range)   | P0641         | Detects continuous<br>short or out of<br>range on the #1 5V<br>sensor reference<br>circuit  | Reference voltage<br>AND<br>Output       | >= 0.5V<br><br>inactive  | Ignition   | Run or Crank                               | 15 failures out of<br>20 samples<br><br>1 sample/12.5 ms | DTC Type<br>A<br>1 trip  |
|   |               |   | OR<br>Reference voltage<br>AND<br>Output | >= 5.5V<br><br>active  |  |  |  |                          |
|   |               |   | OR<br>Reference voltage<br>AND<br>Output | <= 4.5V<br><br>active  |  |  |  |                          |
|   |               |   | OR<br>Reference voltage<br>□             | > 105% nominal (i.e.,<br>5.25V)<br>OR<br><95% nominal<br>(i.e., 4.75V) |  |  |  |                          |
| Fuel Pump Control<br>Module - Driver Over-<br>temperature 1   | P064A         | This DTC detects if<br>an internal fuel<br>pump driver<br>overtemperature<br>condition exists<br>under normal<br>operating conditions | Pump Driver Temp                         | > 150C   | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control | Run or Crank<br><br>Enabled<br><br>Enabled | 3 failures out of 15<br>samples<br><br>1 sample/12.5 ms  | DTC Type<br>B<br>2 trips |



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| Component/<br>System                           | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction<br>Criteria              | Threshold<br>Value   | Secondary<br>Parameters                                    | Enable<br>Conditions | Time<br>Required  | MIL<br>Illum.            |
|--|---------------|---|--------------------------------------|--|--|----------------------|---|--------------------------|
|  |               |   |                                      |  | KeFRPD_b_FPOverTemp<br>DiagEnbl                            | TRUE                 |   |                          |
|  |               |   |                                      |  | Ignition Run/Crank   | 9V<voltage<32V       |   |                          |
| Ignition 1 Switch<br>Circuit Low Voltage       | P2534         | This DTC detects if<br>the Ignition1 Switch<br>circuit is shorted to<br>low or open                             | Ignition 1 voltage                   | <= 6 V   | Engine   | Running              | 180 failures out of<br>200 samples<br><br>1 sample/25.0 ms  | DTC Type<br>A<br>1 trip  |
| Fuel Pump Flow<br>Performance<br>(rationality) | P2635         | This DTC detects<br>degradation in the<br>performance of the<br>SIDI electronically<br>regulated fuel<br>system | Filtered fuel rail<br>pressure error | <= Low Threshold<br>(tabulated function of<br>desired fuel rail<br>pressure and fuel<br>flow rate -- 15% of<br>requested Target<br>Pressure )<br><br>OR<br><br>>= High Threshold<br>(tabulated function of<br>desired fuel rail<br>pressure and fuel<br>flow rate -- 15% of<br>requested Target<br>Pressure)<br><br>( See Supporting<br>Tables tab ) | 1. FRP Circuit Low DTC<br>(P018C)                          | Not active           | Filtered fuel rail<br>pressure error<br>Time Constant =<br>12.5 seconds<br><br>Frequency:<br>Continuous<br>12.5 ms loop | DTC Type<br>B<br>2 trips |
|  |               |   |                                      |  | 2. FRP Circuit High DTC<br>(P018D)                         | Not active           |   |                          |
|  |               |   |                                      |  | 3. Fuel Rail Pressure<br>Sensor Performance DTC<br>(P018B) | Not active           |   |                          |
|  |               |   |                                      |  | 4. FuelPump Circuit Low<br>DTC (P0231)                     | Not active           |   |                          |
|  |               |   |                                      |  | 5. FuelPump Circuit High<br>DTC (P0232)                    | Not active           |   |                          |
|  |               |   |                                      |  | 6. FuelPump Circuit Open<br>DTC (P023F)                    | Not active           |   |                          |

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| Component/<br>System | Fault<br>Code | Monitor Strategy<br>Description | Malfunction<br>Criteria | Threshold<br>Value | Secondary<br>Parameters   | Enable<br>Conditions  | Time<br>Required | MIL<br>Illum. |
|----------------------|---------------|---------------------------------|-------------------------|--------------------|---|---|------------------|---------------|
|                      |               |                                 |                         |                    | 7. Reference Voltage DTC (P0641)                                  | Not active  |                  |               |
|                      |               |                                 |                         |                    | 8. Fuel Pump Control Module Driver Over-temperature DTC's (P064A) | Not active  |                  |               |
|                      |               |                                 |                         |                    | 9. Control Module Internal Performance DTC (P0606)                | Not active  |                  |               |
|                      |               |                                 |                         |                    | 10. An ECM fuel control system failure (PPEI \$1ED)               | Not occurred  |                  |               |
|                      |               |                                 |                         |                    | 11. The Barometric pressure (PPEI \$4C1) signal                   | Valid (for absolute fuel pressure sensor)   |                  |               |
|                      |               |                                 |                         |                    | 12. Engine run time   | >= 30 seconds   |                  |               |
|                      |               |                                 |                         |                    | 13. Emissions fuel level (PPEI \$3FB)                             | Not low   |                  |               |
|                      |               |                                 |                         |                    | 14. Fuel pump control   | Enabled   |                  |               |
|                      |               |                                 |                         |                    | 15. Fuel pump control state                                       | Normal  |                  |               |
|                      |               |                                 |                         |                    | 16. Battery Voltage   | 11V<=voltage=<32V   |                  |               |
|                      |               |                                 |                         |                    | 17. Fuel flow rate ( See Supporting Tables tab )                  | > 0.047 g/s<br><b>AND</b><br><= Max allowed fuel flow rate as a function of desired rail pressure & Vbatt (Typical values in the range of 11 to 50 g/s) |                  |               |
|                      |               |                                 |                         |                    | 18. Fuel Pressure Control System                                  | Is not responding to an over-pressurization due to pressure build during DFCO or a decreasing desired pressure command.                                 |                  |               |

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| Component/<br>System                           | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction<br>Criteria | Threshold<br>Value | Secondary<br>Parameters   | Enable<br>Conditions                               | Time<br>Required  | MIL<br>Illum.            |
|--|---------------|---|-------------------------|--------------------|---|--|---|--------------------------|
| Control Module<br>Communication Bus<br>"A" Off | U0073         | Detects that a CAN<br>serial data bus<br>shorted condition<br>has occurred to<br>force the CAN<br>device driver to<br>enter a bus-off state | Bus Status              | Off                | Power mode  | Run/Crank  | 5 failures out of 5<br>samples ( 5<br>seconds)                | DTC Type<br>B<br>2 trips |
| Lost Communication<br>With ECM/PCM "A"         | U0100         | Detects that CAN<br>serial data<br>communication has<br>been lost with the<br>ECM   | Message \$0C9           | Undetected         | 1. Power mode<br><br>2. Ignition Run/Crank<br>Voltage<br>3. U0073 | Run/Crank<br><br>11V<voltage<32V<br><br>not active | 12 failures out of<br>12 samples (12<br>seconds)              | DTC Type<br>B<br>2 trips |
| Lost Communication<br>With "Actuator"          | U0284         | Detects loss of<br>communication<br>condition has<br>occurred between<br>ECU and device<br>Active Grill Air<br>Shutter "A" actuator         | PWM Message             | Undetected         | 1. Power mode<br><br>2. Ignition Run/Crank<br>Voltage             | Run/Crank<br><br>11V < voltage < 32V               | Frequency:<br>100ms<br><br>150 failures out of<br>167 samples | DTC Type<br>B<br>2 trips |

| Component/<br>System                                      | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction<br>Criteria   | Threshold<br>Value | Secondary<br>Parameters   | Enable<br>Conditions  | Time<br>Required  | MIL<br>Illum.        |
|---|---------------|--|---|--------------------|---|---|---|----------------------|
| Fuel Rail Pressure (FRP) Sensor Performance (rationality) | P018B         | This DTC detects a fuel pressure sensor response stuck within the normal operating range | Absolute value of fuel pressure change as sensed during intrusive test. | <= 30 kPa          | 1. FRP Circuit Low DTC (P018C)<br>2. FRP Circuit High DTC (P018D)<br>3. FuelPump Circuit Low DTC (P0231)<br>4. FuelPump Circuit High DTC (P0232)<br>5. FuelPump Circuit Open DTC (P023F)<br>6. Reference Voltage DTC (P0641)<br>7. Fuel Pump Control Module Driver Over-temperature DTC (P064A)<br>8. Control Module Internal Performance DTC (P0606)<br>9. Engine run time | Not active<br>Not active<br>Not active<br>Not active<br>Not active<br>Not active<br>Not active<br>>=5 seconds | Frequency:<br>Continuous; 12.5 ms loop.<br>60 seconds between intrusive tests that pass<br>Intrusive test requested if fuel system is clamped for >= 5 seconds or fuel pressure error variance <= typically (0.3 to 0.6) (calculated over a 2.5sec period); otherwise report pass<br>Duration of intrusive test is fueling related (5 to 12 seconds).<br>Intrusive test is run when fuel flow is below Max allowed fuel flow rate (Typical values in the range of 11 to 50 g/s) | DTC Type A<br>1 trip |

| Component/<br>System                                 | Fault<br>Code | Monitor Strategy<br>Description                                      | Malfunction<br>Criteria | Threshold<br>Value | Secondary<br>Parameters   | Enable<br>Conditions   | Time<br>Required   | MIL<br>Illum.        |
|--|---------------|--|-------------------------|--------------------|---|--|--|----------------------|
|  |               |  |                         |                    | 10. Emissions fuel level (PPEI \$3FB)<br>11. Fuel pump control<br>12. Fuel pump control state<br>13. Engine fuel flow<br>14. ECM fuel control system failure (PPEI \$1ED) | Not low<br><br>Enabled<br>Normal or FRP rationality control<br><br>> 0.047 g/s<br><br>Not failed |  |                      |
| Fuel Rail Pressure (FRP) Sensor Circuit Low Voltage  | P018C         | This DTC detects if the fuel pressure sensor circuit is shorted low  | FRP sensor voltage      | < 0.14 V           |   |  | 72 failures out of 80 samples<br><br>1 sample/12.5 ms                                  | DTC Type A<br>1 trip |
| Fuel Rail Pressure (FRP) Sensor Circuit High Voltage | P018D         | This DTC detects if the fuel pressure sensor circuit is shorted high | FRP sensor voltage      | > 4.86 V           |   |  | 72 failures out of 80 samples<br><br>1 sample/12.5 ms                                  | DTC Type A<br>1 trip |
| Fuel Pump Control Circuit Low Voltage                | P0231         | This DTC detects if the fuel pump control circuit is shorted to low  | Fuel Pump Current       | > 14.48A           |   |  | 72 test failures in 80 test samples if Fuel Pump Current <100A<br><br>1 sample/12.5 ms | DTC Type A<br>1 trip |
|  |               |  |                         |                    | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control<br>AND<br>Ignition Run/Crank Voltage   | Run or Crank<br><br>enabled<br><br>enabled<br><br>9V < voltage < 32V                             |  |                      |

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| Component/<br>System                                       | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction<br>Criteria  | Threshold<br>Value  | Secondary<br>Parameters  | Enable<br>Conditions   | Time<br>Required   | MIL<br>Illum.           |
|--|---------------|--|--|---|--|--|--|-------------------------|
| Fuel Pump Control<br>Circuit High Voltage                  | P0232         | This DTC detects if<br>the fuel pump control<br>circuit is shorted to<br>high          | Voltage measured at fuel<br>pump circuit   | > 3.86 V  | Commanded fuel pump<br>output<br><br>Fuel pump control enable<br><br>Time that above conditions<br>are met | 0% duty cycle (off)<br><br>False<br><br>>=4.0 seconds                | 36 test failures in 40<br>test samples;<br>1 sample/12.5ms<br><br>Pass/Fail<br>determination made<br>only once per trip  | DTC Type<br>A<br>1 trip |
| Fuel Pump Control<br>Circuit (Open)                        | P023F         | This DTC detects if<br>the fuel pump control<br>circuit is open                        | Fuel Pump Current<br><br>AND<br>Fuel Pump Duty Cycle                                       | <=0.5A<br><br>□<br><br>>20%   | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control<br>AND<br>Ignition Run/Crank Voltage                  | Run or Crank<br><br>enabled<br><br>enabled<br><br>9V < voltage < 32V | 72 test failures in 80<br>test samples;<br>1 sample/12.5ms   | DTC Type<br>A<br>1 trip |
| Fuel System<br>Control Module<br>Enable Control<br>Circuit | P025A         | This DTC detects if<br>there is a fault in the<br>fuel pump control<br>enable circuit  | PPEI (PPEI (Powertrain<br>Platform Electrical<br>Interface) Fuel System<br>Request (\$1ED) | ≠ Fuel Pump<br>Control Module<br>Enable Control<br>Circuit  | Ignition<br>AND<br>PPEI Fuel System Request<br>(\$1ED)   | Run or Crank<br><br>valid  | 72 failures out of 80<br>samples<br><br>1 sample/12.5 ms   | DTC Type<br>A<br>1 trip |
| Control Module<br>Read Only Memory<br>(ROM)                | P0601         | This DTC will be<br>stored if any software<br>or calibration check<br>sum is incorrect | Calculated Checksum<br>(CRC16)   | ≠ stored checksum<br>for any of the parts<br>(boot, software,<br>application<br>calibration, system<br>calibration) | Ignition<br>OR   | Run or Crank   | 1 failure if it occurs<br>during the first ROM<br>test of the ignition<br>cycle, otherwise 5<br>failures<br><br>Frequency:<br>Runs continuously in<br>the background | DTC Type<br>A<br>1 trip |

13 OBDG05C FSCM Diagnostics

| Component/<br>System                            | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction<br>Criteria  | Threshold<br>Value          | Secondary<br>Parameters                                  | Enable<br>Conditions                       | Time<br>Required  | MIL<br>Illum.           |
|---|---------------|--|--|-----------------------------|--|--|---|-------------------------|
|   |               |  |  |                             | HS Comm<br>OR<br>Fuel Pump Control                       | enabled<br><br>enabled                     |   |                         |
| Control Module Not<br>Programmed                | P0602         | Indicates that the<br>FSCM needs to be<br>programmed   | This DTC is set via<br>calibration, when<br>KeMEMD_b_NoStartCal = TRUE |                             | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control     | Run or Crank<br><br>enabled<br><br>enabled | Runs once at power up   | DTC Type<br>A<br>1 trip |
| Control Module<br>Long Term Memory<br>Reset     | P0603         | Non-volatile memory<br>checksum error at<br>controller power-up                                      | Checksum at power-up   | ≠ checksum at<br>power-down | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control     | Run or Crank<br><br>enabled<br><br>enabled | 1 failure<br><br>Frequency:<br>Once at power-up   | DTC Type<br>A<br>1 trip |
| Control Module<br>Random Access<br>Memory (RAM) | P0604         | Indicates that control<br>module is unable to<br>correctly write and<br>read data to and from<br>RAM | Data read  | ≠ Data written              | Ignition<br>OR<br>HS Comm<br><br>OR<br>Fuel Pump Control | Run or Crank<br><br>enabled<br><br>enabled | 1 failure if it occurs<br>during the first RAM<br>test of the ignition<br>cycle, otherwise 5<br>failures<br><br>Frequency:<br>Runs continuously in<br>the background. | DTC Type<br>A<br>1 trip |

| Component/<br>System   | Fault<br>Code | Monitor Strategy<br>Description   | Malfunction<br>Criteria   | Threshold<br>Value   | Secondary<br>Parameters   | Enable<br>Conditions   | Time<br>Required  | MIL<br>Illum.           |
|--|---------------|---|---|--|---|--|---|-------------------------|
| Control Module<br>Internal<br>Performance<br><br>1. Main Processor<br>Configuration<br>Register Test<br><br><br><br><br><br><br><br><br><br>2. Processor clock<br>test<br><br><br><br><br><br><br>3. External<br>watchdog test | P0606         | This DTC indicates the FSCM has detected an internal processor fault or external watchdog fault (PID 2032 discriminates the source of the fault ) | 1. For all I/O configuration register faults:<br><br>•Register contents<br><br>2. For Processor Clock Fault:<br>•EE latch flag in EEPROM.<br>OR<br>• RAM latch flag.<br><br>3. For External Watchdog Fault:<br>• Software control of fuel pump driver | Incorrect value.<br><br><br><br>0x5A5A<br><br>0x5A<br><br>Control Lost | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control<br><br>1. For all I/O configuration register faults:<br>•KeMEMD_b_ProcFitCfgRegEnbl<br><br>2. For Processor Clock Fault:<br>•KeMEMD_b_ProcFitCLKDiagEnbl<br><br>3. For External Watchdog Fault:<br>•KeFRPD_b_FPExtWDogDiagEnbl<br><br>3. For External Watchdog Fault:<br>•Control Module ROM(P0601)<br><br>3. For External Watchdog Fault:<br>•Control Module RAM(P0604) | Run or Crank<br><br>enabled<br><br>enabled<br><br>TRUE<br><br>TRUE<br><br>TRUE<br><br>not active<br><br>not active | Tests 1 and 2<br>1 failure<br>Frequency:<br>Continuously (12.5ms)<br><br><br><br><br><br><br><br><br><br>Test 3<br>3 failures out of 15 samples<br><br>1 sample/12.5 ms | DTC Type<br>A<br>1 trip |



13 OBDG05C FSCM Diagnostics

| Component/<br>System   | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction<br>Criteria                  | Threshold<br>Value   | Secondary<br>Parameters                              | Enable<br>Conditions                       | Time<br>Required   | MIL<br>Illum.            |
|--|---------------|--|--|--|--|--|--|--------------------------|
| Control Module<br>Long Term Memory<br>(EEPROM)<br>Performance  | P062F         | Indicates that the<br>NVM Error flag has<br>not been cleared   | Last EEPROM write                        | Did not complete   | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control | Run or Crank<br><br>enabled<br><br>enabled | 1 test failure<br>Once on controller<br>power-up         | DTC Type<br>A<br>1 trip  |
| 5Volt Reference<br>Circuit (Short<br>High/Low/Out of<br>Range) | P0641         | Detects continuous<br>short or out of range<br>on the #1 5V sensor<br>reference circuit  | Reference voltage<br>AND<br>Output       | >= 0.5V<br><br>inactive  | Ignition   | Run or Crank                               | 15 failures out of 20<br>samples<br><br>1 sample/12.5 ms | DTC Type<br>A<br>1 trip  |
|  |               |  | OR<br>Reference voltage<br>AND<br>Output | >= 5.5V<br><br>active  |  |  |  |                          |
|  |               |  | OR<br>Reference voltage<br>AND<br>Output | <= 4.5V<br><br>active  |  |  |  |                          |
|  |               |  | OR<br>Reference voltage<br>□             | > 105% nominal<br>(i.e., 5.25V)<br>OR<br><95% nominal<br>(i.e., 4.75V) |  |  |  |                          |
| Fuel Pump Control<br>Module - Driver<br>Over-temperature 1     | P064A         | This DTC detects if an<br>internal fuel pump<br>driver<br>overttemperature<br>condition exists under<br>normal operating<br>conditions | Pump Driver Temp                         | > 150C   | Ignition<br>OR<br>HS Comm<br>OR<br>Fuel Pump Control | Run or Crank<br><br>Enabled<br><br>Enabled | 3 failures out of 15<br>samples<br><br>1 sample/12.5 ms  | DTC Type<br>B<br>2 trips |

13 OBDG05C FSCM Diagnostics

| Component/<br>System                           | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction<br>Criteria              | Threshold<br>Value   | Secondary<br>Parameters                               | Enable<br>Conditions   | Time<br>Required  | MIL<br>Illum.            |
|--|---------------|--|--------------------------------------|--|---|------------------------|---|--------------------------|
|  |               |  |                                      |  | KeFRPD_b_FPOverTemp<br>DiagEnbl<br>Ignition Run/Crank | TRUE<br>9V<voltage<32V |   |                          |
| Ignition 1 Switch<br>Circuit Low Voltage       | P2534         | This DTC detects if<br>the Ignition1 Switch<br>circuit is shorted to<br>low or open                          | Ignition 1 voltage                   | <= 6 V   | Engine  | Running                | 180 failures out of 200<br>samples<br><br>1 sample/25.0 ms  | DTC Type<br>A<br>1 trip  |
| Fuel Pump Flow<br>Performance<br>(rationality) | P2635         | This DTC detects<br>degradation in the<br>performance of the<br>SIDI electronically<br>regulated fuel system | Filtered fuel rail pressure<br>error | <= Low Threshold<br>(tabulated function<br>of desired fuel rail<br>pressure and fuel<br>flow rate -- 15% of<br>requested Target<br>Pressure )<br><br>OR<br><br>>= High Threshold<br>(tabulated function<br>of desired fuel rail<br>pressure and fuel<br>flow rate -- 15% of<br>requested Target<br>Pressure)<br><br><b>( See Supporting<br/>Tables tab )</b> | 1. FRP Circuit Low DTC<br>(P018C)                     | Not active             | Filtered fuel rail<br>pressure error Time<br>Constant = 12.5<br>seconds<br><br>Frequency:<br>Continuous<br>12.5 ms loop | DTC Type<br>B<br>2 trips |
|  |               |  |                                      |  | 2. FRP Circuit High DTC<br>(P018D)                    | Not active             |   |                          |

13 OBDG05C FSCM Diagnostics

| Component/<br>System | Fault<br>Code | Monitor Strategy<br>Description | Malfunction<br>Criteria | Threshold<br>Value | Secondary<br>Parameters   | Enable<br>Conditions                      | Time<br>Required | MIL<br>Illum. |
|----------------------|---------------|---------------------------------|-------------------------|--------------------|---|---|------------------|---------------|
|                      |               |                                 |                         |                    | 3. Fuel Rail Pressure Sensor Performance DTC (P018B)              | Not active                                |                  |               |
|                      |               |                                 |                         |                    | 4. FuelPump Circuit Low DTC (P0231)                               | Not active                                |                  |               |
|                      |               |                                 |                         |                    | 5. FuelPump Circuit High DTC (P0232)                              | Not active                                |                  |               |
|                      |               |                                 |                         |                    | 6. FuelPump Circuit Open DTC (P023F)                              | Not active                                |                  |               |
|                      |               |                                 |                         |                    | 7. Reference Voltage DTC (P0641)                                  | Not active                                |                  |               |
|                      |               |                                 |                         |                    | 8. Fuel Pump Control Module Driver Over-temperature DTC's (P064A) | Not active                                |                  |               |
|                      |               |                                 |                         |                    | 9. Control Module Internal Performance DTC (P0606)                | Not active                                |                  |               |
|                      |               |                                 |                         |                    | 10. An ECM fuel control system failure (PPEI \$1ED)               | Not occurred                              |                  |               |
|                      |               |                                 |                         |                    | 11. The Barometric pressure (PPEI \$4C1) signal                   | Valid (for absolute fuel pressure sensor) |                  |               |
|                      |               |                                 |                         |                    | 12. Engine run time   | >= 30 seconds                             |                  |               |
|                      |               |                                 |                         |                    | 13. Emissions fuel level (PPEI \$3FB)                             | Not low                                   |                  |               |
|                      |               |                                 |                         |                    | 14. Fuel pump control   | Enabled                                   |                  |               |
|                      |               |                                 |                         |                    | 15. Fuel pump control state                                       | Normal                                    |                  |               |
|                      |               |                                 |                         |                    | 16. Battery Voltage   | 11V<=voltage=<32V                         |                  |               |

| Component/<br>System                           | Fault<br>Code | Monitor Strategy<br>Description  | Malfunction<br>Criteria | Threshold<br>Value | Secondary<br>Parameters   | Enable<br>Conditions   | Time<br>Required                              | MIL<br>Illum.            |
|--|---------------|--|-------------------------|--------------------|---|--|---|--------------------------|
|  |               |  |                         |                    | 17. Fuel flow rate<br>( See Supporting Tables<br>tab )            | > 0.047 g/s<br><b>AND</b><br><= Max allowed fuel<br>flow rate as a function<br>of desired rail pressure<br>& Vbatt (Typical values<br>in the range of 11 to 50<br>g/s) |   |                          |
|  |               |  |                         |                    | 18. Fuel Pressure Control<br>System                               | Is not responding to an<br>over-pressurization<br>due to pressure build<br>during DFCO or a<br>decreasing desired<br>pressure command.                                 |   |                          |
| Control Module<br>Communication Bus<br>"A" Off | U0073         | Detects that a CAN<br>serial data bus<br>shorted condition has<br>occurred to force the<br>CAN device driver to<br>enter a bus-off state | Bus Status              | Off                | Power mode  | Run/Crank  | 5 failures out of 5<br>samples ( 5 seconds)   | DTC Type<br>B<br>2 trips |
| Lost<br>Communication<br>With ECM/PCM "A"      | U0100         | Detects that CAN<br>serial data<br>communication has<br>been lost with the<br>ECM  | Message \$0C9           | Undetected         | 1. Power mode<br><br>2. Ignition Run/Crank<br>Voltage<br>3. U0073 | Run/Crank<br><br>11V<voltage<32V<br><br>not active   | 12 failures out of 12<br>samples (12 seconds) | DTC Type<br>B<br>2 trips |

P2635 Fuel Pump Performance Maximum Fuel Flow map ( grams / s )

X-axis= Desired Fuel Pressure ( kiloPascals)

Y-axis= Battery voltage ( volts )

|      | 200      | 250      | 300      | 350      | 400      | 450      | 500      | 550       | 600      |
|------|----------|----------|----------|----------|----------|----------|----------|-----------|----------|
| 4.5  | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 6    | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 7.5  | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 9    | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 10.5 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 12   | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 13.5 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.47656 |
| 15   | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 16.5 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 18   | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 19.5 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 21   | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 22.5 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 24   | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 25.5 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 27   | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |
| 28.5 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.89844 | 13.898438 | 13.89844 |

P2635 Fuel Pump Performance Filtered Pressure Error Fault Threshold High map ( kiloPascals )

X-axis= Target Fuel Pressure ( kiloPascals)

Y-axis= Fuel Flow ( grams / s )

|      | 200 | 250  | 300 | 350  | 400 | 450  | 500 | 550  | 600 |
|------|-----|------|-----|------|-----|------|-----|------|-----|
| 0    | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 1.5  | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 3    | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 4.5  | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 6    | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 7.5  | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 9    | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 10.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 12   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 13.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 15   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 16.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 18   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 19.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 21   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 22.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 24   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 25.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 27   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 28.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 30   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 31.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 33   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 34.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 36   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 37.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 39   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 40.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 42   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 43.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 45   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 46.5 | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |
| 48   | 30  | 37.5 | 45  | 52.5 | 60  | 67.5 | 75  | 82.5 | 90  |

P2635 Fuel Pump Performance Filtered Pressure Error Fault RePass Threshold High map ( kiloPascals )

X-axis= Target Fuel Pressure ( kiloPascals)

Y-axis= Fuel Flow ( grams / s )

|      | 200  | 250    | 300   | 350    | 400 | 450    | 500   | 550    | 600  |
|------|------|--------|-------|--------|-----|--------|-------|--------|------|
| 0    | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 1.5  | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 3    | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 4.5  | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 6    | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 7.5  | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 9    | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 10.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 12   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 13.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 15   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 16.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 18   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 19.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 21   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 22.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 24   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 25.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 27   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 28.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 30   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 31.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 33   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 34.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 36   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 37.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 39   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 40.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 42   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 43.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 45   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 46.5 | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |
| 48   | 25.5 | 31.875 | 38.25 | 44.625 | 51  | 57.375 | 63.75 | 70.125 | 76.5 |

P2635 Fuel Pump Performance Filtered Pressure Error Fault Threshold Low map ( kiloPascals )

X-axis= Target Fuel Pressure ( kiloPascals)  
 Y-axis= Fuel Flow ( grams / s )

|      | 200  | 250   | 300    | 350    | 400 | 450   | 500 | 550   | 600 |
|------|------|-------|--------|--------|-----|-------|-----|-------|-----|
| 0    | -260 | -210  | -160   | -110   | -60 | -67.5 | -75 | -82.5 | -90 |
| 1.5  | -145 | -125  | -102.5 | -81.25 | -60 | -67.5 | -75 | -82.5 | -90 |
| 3    | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 4.5  | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 6    | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 7.5  | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 9    | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 10.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 12   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 13.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 15   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 16.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 18   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 19.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 21   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 22.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 24   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 25.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 27   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 28.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 30   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 31.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 33   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 34.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 36   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 37.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 39   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 40.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 42   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 43.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 45   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 46.5 | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |
| 48   | -30  | -37.5 | -45    | -52.5  | -60 | -67.5 | -75 | -82.5 | -90 |



P2635 Fuel Pump Performance Filtered Pressure Error Fault RePass Threshold Low map ( kiloPascals )

X-axis= Target Fuel Pressure ( kiloPascals)

Y-axis= Fuel Flow ( grams / s )

|      | 200     | 250     | 300     | 350      | 400 | 450     | 500    | 550     | 600   |
|------|---------|---------|---------|----------|-----|---------|--------|---------|-------|
| 0    | -221    | -178.5  | -136    | -93.5    | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 1.5  | -123.25 | -106.25 | -87.125 | -69.0625 | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 3    | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 4.5  | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 6    | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 7.5  | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 9    | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 10.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 12   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 13.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 15   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 16.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 18   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 19.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 21   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 22.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 24   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 25.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 27   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 28.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 30   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 31.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 33   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 34.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 36   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 37.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 39   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 40.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 42   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 43.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 45   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 46.5 | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |
| 48   | -25.5   | -31.875 | -38.25  | -44.625  | -51 | -57.375 | -63.75 | -70.125 | -76.5 |