| Component/                          | Fault           | Monitor Strategy  | Malfunction   | Threshold                 | Secondary                                    | Enable  | Time                                   | MIL   | Special |
|-------------------------------------|-----------------|---|---|---------------------------|--|---|--|---|---------|
| System                              | Code            | Description   | Criteria  | Value                     | Parameters                                   | Conditions  | Required                               | Illumin.  | Prep    |
| atalytic Converter                  | P0420           | Time for Rear O2 sensor signal  |   | < 1400 msec               | Delta load                                   | -2 < delta load < 2 g/s                           | 13 - 30 sec,                           |   | гтер    |
| onitoring                           | F0420           | to go low. Catalyst monitoring  | Time for rear O2 to go low. Value<br>corrected to standard flow and | < 1400 Hisec              |  |   |  | Statistical treatment, up to<br>6 DCY, after limit is |         |
| omtoring                            |                 | performed at idle. Wait for   | catalyst temperature.   |                           | Vehicle speed                                | < 15,5 mph  | Once / DCY                             | reached: immediate MIL                                |         |
|                                     |                 | throttle closed period, then a  |   |                           | Engine speed                                 | 900 +200/-100 rpm                                 |  | illumination  |         |
|                                     |                 | number of front O2 sensor   |   |                           | Load MAF                                     | 3,5 – 9 g/s                                       |  |   |         |
|                                     |                 | oscillations to measure average   |   |                           | Min time after engine start                  | > 230 s   |  |   |         |
|                                     |                 | fuel trim value. Then rich fueling  | 2   |                           | Fuel control                                 | Closed loop - then rich - then lean               |  |   |         |
|                                     |                 | to purge oxygen, wait for high  |   |                           |  | *   |  |   |         |
|                                     |                 | rear O2 sensor value to indicate  |   |                           | Catalyst temperature                         | 450 - 700 °C, modeled                             |  |   |         |
|                                     |                 | purged cat - or max time, then  |   |                           | Throttle                                     | Closed  |  |   |         |
|                                     |                 | lean fueling and measure time for   | 9   |                           | Nr of Front O2 oscillations for averaged     | 2   |  |   |         |
|                                     |                 | rear O2 sensor signal to fall.  |   |                           | integrator value.                            |   |  |   |         |
|                                     |                 |   |   |                           | Rich fuelling time                           | 1,5 to 10 seconds                                 |  |   |         |
|                                     |                 | Time measurement in phase 3   |   |                           | Evaporative canister purge                   | Not active  |  |   |         |
|                                     |                 | begins when front O2 sensor   |   |                           | Rear O2 sensor voltage before switch to lean | Time according to value in matrix, examples:      |  |   |         |
|                                     |                 | output goes below 450 mV and  |   |                           |  | 640 mV + 5 sec,                                   |  |   |         |
|                                     |                 | stops when rear O2 sensor outpu   | 1   |                           |  | 870  mV + 0  sec                                  |  |   |         |
|                                     |                 | goes below 450 mV   |   |                           | Lambda integrator                            | $0 \pm 15\%$                                      |  |   |         |
|                                     |                 |   |   |                           | Brake switch status changes                  | Max 3   |  |   |         |
|                                     |                 |   |   |                           | No DTC set                                   | Front O2 sensor                                   |  |   |         |
|                                     |                 |   |   |                           |  | Rear O2 sensor                                    |  |   |         |
|                                     |                 |   |   |                           |  |   |  |   |         |
|                                     |                 |   |   |                           |  | MAF sensor  |  |   |         |
|                                     |                 |   |   |                           | Battery voltage                              | 11 to 18 V  |  |   |         |
|                                     | •               | •   |   | •                         | •  |   | •                                      |   |         |
| nchronization error                 | P0340           | Rationality, Sync error, high due   | Ignition  | Not synchronized          | Engine speed                                 | Running   | 600 revs                               | Two DCY   |         |
|                                     |                 | to soot   | I-B   |                           |  | =   |  |   |         |
|                                     |                 |   |   |                           | Revolutions                                  | >500 after start phase                            | Once / DCY                             |   |         |
|                                     |                 |   |   |                           |  |   |  |   |         |
|                                     | P1340           | Rationality, Sync error low   | Ignition  | Not synchronized          | Engine speed                                 | Running   | 600 revs                               | Two DCY   |         |
|                                     |                 |   |   |                           | Revolutions                                  | >500 after start phase                            | Once / DCY                             |   |         |
|                                     | · L             |   | 1   |                           | <u> </u>                                     |   | I                                      |   |         |
| :-6: D-++:                          | P0300 to        | Ionization detection  | Misfire counter 1000 revs   | - 20/                     | F:   | > idle rpm at warm engine – 150 rpm               | 1000 OR 200 revs, continuous           | Tour DOV / MILL LUIS                                  |         |
| isfire Detection                    | P0300 to        | At idle: combination of   |   | > 3%                      | Engine speed                                 |   |  | Two DCY / MIL blink                                   |         |
|                                     | F0304           | ionization- and crankshaft speed  | Misfire counter 200 revs  | See separate map          | Load change transient MAP (for Man           | < ± 3,0 kPa/combustion                            | Continuous                             |   |         |
|                                     |                 | evaluation  | -   |                           | Transmission) Torque                         | > 0 and not in disable region                     |  |   |         |
|                                     |                 | evaluation  |   |                           |  |   |  |   |         |
|                                     |                 |   |   |                           | Fuel cut                                     | Not active  |  |   |         |
|                                     |                 |   |   |                           | Battery voltage                              | > 10.0 V  |  |   |         |
|                                     |                 |   |   |                           | Enabling delay when Coolant temp is below    | Delayed until Coolant temp > 21°C                 |  |   |         |
|                                     |                 |   |   |                           | −7 °C at start                               |   |  |   |         |
|                                     |                 |   |   |                           |  |   |  |   |         |
| isfire Detected With Lov            | w P0313         | Same as above   | Misfire counter 200 revolutions                                     | See separate map          | Same as above                                | Same as above                                     | 200 revolutions                        | MIL blink   |         |
| iel                                 |                 |   |   |                           |  |   |  |   |         |
|                                     |                 |   |   |                           | Fuel level                                   | < 8% (5 liters)                                   | Continuous                             |   |         |
|                                     |                 |   |   |                           |  |   |  |   |         |
| etect signals                       | P1312           | Signal high during fuel cut OR a  | Detect signal   | High                      | Engine speed                                 | Engine started                                    | 125 revolutions                        | Two DCY   |         |
| =                                   |                 | start OR compared to defined  |   | _                         | Engine synchronization                       | During or after                                   | Continuous                             |   |         |
|                                     |                 | min dom.  |   |                           | Engine synchronization                       | During of arter                                   | Continuous                             |   |         |
|                                     |                 |   |   |                           |  |   |  |   |         |
|                                     | P1341 to P1344  | Combustion signal cyl 1 OR 2  | Detect signal   | Low                       | Engine speed                                 | Engine started                                    | 45 revolutions                         | Two DCY   |         |
|                                     |                 | OR 3 OR 4 missing   |   |                           | Engine synchronization                       | During or after                                   | Continuous                             |   |         |
|                                     |                 |   |   |                           | No DTC                                       | Powertrain relay rationality                      |  |   |         |
|                                     |                 |   |   |                           |  |   |  | l I   |         |
|                                     | 2000            | le se se e  | In  |                           |  | In  | las                                    | m n.orr   |         |
| n detection system error            | P1315           | Ion Detect Module connector   | Combustion AND ignition signals                                     | = 0 for more than 25 revs | Engine speed                                 | Running > 400 rpm                                 | 25 revolutions                         | Two DCY   |         |
|                                     |                 | disconnected  |   |                           | Fuel cut                                     | Not active  | Continuous                             |   |         |
|                                     |                 |   |   |                           | Load   | > 10 mg/combustion                                |  |   |         |
|                                     | 1               |   | 1   | I                         | 1  | 1   | L                                      | 1   |         |
| n datast modula isniri              | D1250 to D1254  | All or single culinder isniti to  | Vnock signal information  | = 0 at combustion strat-  | Engine cheed                                 | Punning > 400 rpm                                 | 9 ravolutions                          | Two DCV   |         |
|                                     | 1 1330 to F1334 |   | ENOCK SIGNAL INTOLLIBRIUM   | - o at combustion stroke  |  |   |  | 1 WO DC 1   |         |
| g mput                              |                 |   |   |                           |  |   | Continuous                             |   |         |
|                                     |                 | moonig  |   |                           | Load   | > 10 mg/combustion                                |  |   |         |
|                                     |                 | •   |   |                           | •  | •   | •                                      | L   |         |
| nock signal                         | P0325           | Faulty knock signal   | Knock signal  | No knock pulses           | Accelerator nedal                            | Not released                                      | 8 revolutions                          | Two DCY   |         |
|                                     | . 3323          | auncy knock signal  | rances organi   | Knock puises              |  |   |  | 1 110 DC 1  |         |
|                                     |                 |   | 1   | 1                         | Engine speed                                 | Engine started                                    | Continuous                             | 1   |         |
| Ü                                   |                 |   |   |                           | Coolant temperature                          | > 60°°C   |  |   |         |
| n detect module ignition<br>g input | P1350 to P1354  | All or single cylinder ignition tri input to ion detect module missing  Faulty knock signal | Knock signal information  | = 0 at combustion stroke  | Load  Engine speed Fuel cut                  | > 10 mg/combustion  Running > 400 rpm  Not active | 8 revolutions Continuous 8 revolutions | Two DC  |         |

| Component/                  | Fault                | Monitor Strategy                | Malfunction               | Threshold                    | Secondary                             | E                            | nable                            | Time              | MIL      | Special  |
|-----------------------------|----------------------|---------------------------------|---------------------------|------------------------------|---------------------------------------|------------------------------|----------------------------------|-------------------|----------|----------|
| System                      | Code                 | Description                     | Criteria                  | Value                        | Parameters                            |                              | nditions                         | Required          | Illumin. | Prep     |
| njector Circuit             | P0201 to P0204       | El. Check – Min, max, open      | Short cut OR open circuit | Short cut to ground, battery |                                       | > 6.0 V                      |                                  | 1 sec             | Two DCY  | 1        |
| ,                           |                      | circuit                         |                           | or not connected             | Engine speed                          | Engine moving OR running     | p                                | Continuous        |          |          |
|                             |                      |                                 |                           |                              | No DTC                                | Powertrain relay rationality |                                  |                   |          |          |
|                             |                      |                                 |                           |                              |                                       |                              | <u>'</u>                         |                   |          |          |
| nition coil trigs 1, 2, 3 & | P2300, P2303, P2306, | Control circuit range check min | Short-cut                 | To ground or not connected   | d Engine speed                        | Engine running               |                                  | 1 sec             | Two DCY  |          |
|                             | P2309                |                                 |                           |                              | Supply voltage                        | > 11 V                       |                                  | Continuous        |          |          |
|                             |                      |                                 |                           |                              |                                       |                              |                                  |                   |          |          |
|                             | P2301, P2304, P2307, | Control circuit range check max | Short-cut                 | To battery voltage           | Engine speed                          | Engine running               |                                  | 1 sec continuous  | Two DCY  |          |
|                             | P2310                |                                 |                           |                              | Supply voltage                        | > 11 V                       |                                  | Continuous        |          |          |
|                             |                      |                                 |                           |                              |                                       |                              |                                  |                   |          | 1        |
| VAP Canister Vent Valve     | P0498                | Circuit continuity check        | Short-cut                 | To ground or not connected   | d Engine speed                        | Running                      |                                  | 6 sec, Continuous | Two DCY  | 1        |
|                             |                      |                                 |                           |                              | Battery voltage                       | > 11 V                       |                                  |                   |          |          |
|                             | P0499                |                                 | Short-cut                 | To battery voltage           | Purge                                 | Not active                   |                                  | At engine start   |          |          |
|                             |                      |                                 |                           |                              | No DTC                                | Purge valve                  |                                  |                   |          |          |
|                             |                      |                                 |                           |                              |                                       | Powertrain relay             |                                  |                   |          |          |
|                             |                      |                                 |                           |                              | <u> </u>                              |                              |                                  |                   |          | 1        |
|                             | P0446                | Rationality check               | Fuel tank pressure        | Not raised 400 Pa within 8   | Fuel tank pressure                    | < -800 Pa                    |                                  | ???               | ???      | 1        |
|                             |                      | ,                               |                           | sec                          | EVAP test                             | Not active                   |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              | Canister Vent Valve                   | Not active                   |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              | Fuel tank pressure sensor             | Adaption performed           |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              | Depend to                             | Canister Vent Valve circui   | ı                                |                   |          |          |
|                             |                      |                                 |                           |                              | IAT                                   | > +4 °C                      | -                                |                   |          |          |
|                             |                      |                                 |                           |                              | No DTC set                            | Purge valve                  |                                  |                   |          |          |
|                             |                      |                                 |                           |                              | 110 210 301                           | Fuel tank pressure sensor    |                                  |                   |          |          |
|                             |                      |                                 |                           |                              |                                       | Powertrain relay             |                                  |                   |          |          |
|                             |                      |                                 |                           |                              | Purge rationality diagnostic          | Not active                   |                                  |                   |          |          |
|                             |                      |                                 |                           |                              | rurge rationality diagnostic          | Not active                   |                                  |                   |          |          |
| AP leak test                | 1                    | 1                               |                           |                              |                                       | Enable                       | Disable                          |                   |          | ı        |
| eneral conditions           |                      |                                 |                           |                              | ECT & IAT                             | > +4 °C                      | < +4 °C                          |                   |          | <u> </u> |
|                             |                      |                                 |                           |                              | Ambient temperature                   | + 35 deg C                   | + 35 deg C                       |                   |          |          |
|                             |                      |                                 |                           |                              | MAF A                                 | + 33 deg C                   | ±90 mg/comb                      |                   |          |          |
|                             |                      |                                 |                           |                              | Fuel tank pressure                    | < 200 Pa                     | < 200 Pa                         |                   |          |          |
|                             |                      |                                 |                           |                              | MAP                                   | < -15 kPa                    |                                  |                   |          |          |
|                             |                      |                                 |                           |                              | WAF                                   | <-13 KFa                     | < -15 kPa (during pull-<br>down) |                   |          |          |
|                             |                      |                                 |                           |                              | Max number of vapor disables in DCY   | 2                            | 2                                |                   |          |          |
|                             |                      |                                 |                           |                              | Ramp 0: Slosh                         |                              |                                  |                   |          |          |
|                             |                      |                                 |                           |                              | Pressure change in expected direction |                              | > 70 Pa                          |                   |          |          |
|                             |                      |                                 |                           |                              | Pressure change in opposite direction |                              | > 70 Pa                          |                   |          |          |
|                             |                      |                                 |                           |                              | Ramp 0: ECT                           | > 40 °C                      |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              | Ramp 1: Slosh                         |                              |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              | Pressure change in expected direction |                              | > 300 Pa                         |                   |          |          |
|                             | 1                    |                                 |                           |                              | Pressure change in opposite direction |                              | > 160 Pa                         |                   |          |          |
|                             | 1                    |                                 |                           |                              | Ramp 2: Slosh                         |                              |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              | Pressure change in expected direction |                              | > 111 Pa                         |                   |          |          |
|                             | 1                    |                                 |                           |                              | Pressure change in opposite direction |                              | > 80 Pa                          |                   |          |          |
|                             | 1                    |                                 |                           |                              | Battery voltage                       | 10 - 16 Volts                | •                                |                   |          |          |
|                             | 1                    |                                 |                           |                              | Fuel cut                              | Not active                   |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              | Canister vent valve rationality test  | Not active                   |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              | DTC not set                           | Tank pressure sensor         |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              |                                       | Tank pressure adaption       |                                  |                   |          |          |
|                             |                      |                                 |                           |                              |                                       | Vehicle speed sensor         |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              |                                       | Canister vent valve          |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              |                                       | Purge valve                  |                                  |                   |          |          |
|                             |                      |                                 |                           |                              |                                       | Brake light switch           |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              |                                       | ECT sensor                   |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              |                                       | IAT sensor                   |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              |                                       | ABS communication            |                                  |                   |          |          |
|                             | 1                    |                                 |                           |                              | Time between test of                  |                              |                                  |                   |          | 1        |
|                             | 1                    | 1                               | I                         | I                            | Time between test attempts            | 30 sec                       |                                  | I                 | I        | 1        |

|  | IL Special<br>nin. Prep |
|--|-------------------------|
| System processing   System   S   | Fieb                    |
| Purpose   Purp   |                         |
| Purge range      |                         |
| Purgu vayor RC content   |                         |
| Part Volume  |                         |
| Part   Seet   Closed    |                         |
| Landa control   Conset Loop   Not active     |                         |
| Author   Conference   Confer    |                         |
| AR diagnosic   Not arrive   N   |                         |
| March   Marc   |                         |
| March   Marc   |                         |
| March   Marc   |                         |
| Delication   Company   C   |                         |
| Stake activations  |                         |
| Purge HCA vs. start   1900     |                         |
| Purge Adoption   |                         |
| Page ICA vs. start   12.5%     |                         |
| Lambbai inegrator Av. start   Ambient pressure A. Sarah   Sarah Sara   |                         |
| Anhient pressure Δ   |                         |
| Field tank pressure  |                         |
| Ramp   |                         |
| Vehicle moving test   Vehicle speed   Vehic    |                         |
| Vehicle speed Δ vs. start  |                         |
| Vehicle speed Δ vs. start   Speed μ  |                         |
| Brake activations  |                         |
| Purge adaption   Purge HCA vs. start   |                         |
| Purge HC A vs. start   |                         |
| Lambda integrator \( \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \   |                         |
| Ambient pressure A (4kPu/3 min (4kPu/3 mi  |                         |
| Fuel tank pressure 2-700 Pa < -2750 Pa 5 1,1 Pa/s  Fuel tank pressure Ramp 0 vapor generation  Fuel tank pressure Ramp 0 vapor generation  Fuel tank pressure Ramp 0 vapor generation  Fuel tank pressure Puel tank pressure Ramp 0 vapor generation  Fuel tank pressure Ramp 0 vapor generati |                         |
| Ramp 0 vapor generation  Ramp 0 vapor generation  Ramp 0 vapor generation  Piller cap test, big leak / high vapor generation  Piller cap test, big leak / high vapor generation  Piller cap test, big leak / high vapor generation  Purge HC A vs. start  Ambient pressure A  Ambient pressure A  Ramp 0 vapor generation  Purge HC A vs. start  Ambient pressure A  Ramp 0 vapor generation  Purge HC A vs. start  Ambient pressure A  Ramp 0 vapor generation  Purge HC A vs. start  Ambient pressure A  Ramp 0 vapor generation  Purge HC A vs. start  Ambient pressure A  Ramp 0 vapor generation  Purge HC A vs. start  Ambient pressure A  Ramp 0 vapor generation  Purge HC A vs. start  Ambient pressure A  Ramp 0 vapor generation  Purge HC A vs. start  Ambient pressure A  Ramp 0 vapor generation  Pressure does not reach specified level in specified time. See separate document  EVAP large leak  > 3 mm  Pressure does not reach specified time. See separate document   |                         |
| Filler cap test, big leak / high vapor generation  Filler cap test, big leak / high vapor generation  Filler cap test, big leak / high vapor generation  Filler cap test, big leak / high vapor generation  Filler cap test, big leak / high vapor generation  Vehicle speed M vs. start   |                         |
| Vehicle speed Δ vs. start  Purge adaption  Purge HC Δ vs. start  Ambient pressure Δ  Fuel tank pressure  Ramp 0 vapor generation  EVAP large leak  3 mm  Vehicle speed Δ vs. start  Vehicle speed Δ vs. start  Brake activations  Max 1  Max 1  Max 1  Ambient pressure Δ  SkPa/3 min  SkPa/3 min  Fuel tank pressure  Ramp 0 vapor generation  Vehicle speed Δ vs. start  Purge adaption  Purge HC Δ vs. start  Lambda integrator Δ vs. start  Ambient pressure Δ  Fuel tank pressure  Ramp 0 vapor generation  Vehicle speed Δ vs. start  Purge adaption  Purge HC Δ vs. start  Lambda integrator Δ vs. start  Ambient pressure Δ  Fuel tank pressure  Pressure does not reach specified level in specified level in specified level in specified level in specified document  Two DCY  Two DCY  Two DCY   |                         |
| Neigh vapor generation   Separation   Purge adaption   Purge adaption   Purge adaption   Purge HCA vs. start   |                         |
| Brake activations Max 1 Max 1 Purge adaption >-24% Purge HC \( \Delta \) vs. start > 30% Lambda integrator \( \Delta \) vs. start > 25% Ambient pressure \( \Delta \) 5kPa/3 min > 5kPa/3 min Fuel tank pressure \( \Delta \) -700 Pa < 2500 Pa Ramp 0 vapor generation > 12 Pa/s  EVAP large leak > 3 mm  EVAP large leak possible to the specified level in specified level in specified time. See separate document   Two DCY   |                         |
| Purge daption > -24% Purge HC Δ vs. start  |                         |
| Purge HC Δ vs. start Lambda integrator Δ vs. start Ambient pressure Δ  |                         |
| Purge HC Δ vs. start Lambda integrator Δ vs. start Ambient pressure Δ  |                         |
| Lambda integrator A vs. start  Ambient pressure A  Ambient pressure A  SkPa/3 min  SkPa/3  |                         |
| Ambient pressure A < 5kPa/3 min > 5kPa/3 min < -2500 Pa < -2500 Pa < -2500 Pa < -2500 Pa > 12 Pa/s    EVAP large leak > 3 mm P0455 Rationality check Pressure does not reach specified level in specified time. See separate document Pressure does not reach specified lime. See separate document Pressure does not reach specified lime. See separate document Two DCY  |                         |
| Fuel tank pressure >-700 Pa <-2500 Pa   12 Pa/s   12 Pa/ |                         |
| Ramp 0 vapor generation > 12 Pa/s  |                         |
| EVAP large leak > 3 mm P0455 Rationality check Pressure does not reach specified level in specified time. See separate document Properties of the company of |                         |
| > 3 mm level in specified time. See separate document  |                         |
| > 3 mm level in specified time. See separate document  |                         |
| separate document  |                         |
|  |                         |
|  |                         |
|  |                         |
| TVAD constituents 1904.2 Designation should Designation should Designation should See Handson feature 6  |                         |
| EVAP small leak P0442 Rationality check Pressure gradient check. See Leakage factor 4 Two DCY  |                         |
| separae uscument   |                         |
| P1442 When fuel level info is incorrect  |                         |
|  |                         |
| EVAP very small leak P0456 Rationality check Pressure gradient check. See Average leak factor > 0 Up to eight DCY  | ıCV                     |
| EVAP very small leak P0456 Rationality check Pressure gradient check. See Average leak factor > 0 Up to eight DCY (valid values –3 to 3) 13  | C1                      |
| values in stack  |                         |
| P1456 When fuel level info is incorrect  |                         |
|  |                         |
|  |                         |

| Component/<br>System | Fault<br>Code                            | Monitor Strategy Description       | Malfunction<br>Criteria           | Threshold<br>Value                      | Secondary<br>Parameters            | Enable<br>Conditions              | Time<br>Required | MIL<br>Illumin. | Special<br>Prep |
|----------------------|--|------------------------------------|-----------------------------------|---|------------------------------------|-----------------------------------|------------------|-----------------|-----------------|
|                      | P0452                                    | Low end check                      | Short cut                         | To ground or not connected              |                                    | >2 sec                            | 3 sec            | Two DCY         |                 |
|                      | P0453                                    | High end check                     | Short cut                         | To battery                              | Engine speed                       | Running                           | Continuous       |                 |                 |
| !                    | 10433                                    | riigii ciid ciicek                 | Short cut                         | 10 battery                              | Battery voltage                    | >11,0 V                           | Continuous       |                 |                 |
|                      |  |                                    |                                   |   | Battery voltage                    | 211,0 1                           | +                |                 |                 |
|                      | P0451                                    | Rationality                        | Number of flank shifts (of 25 Pa) | > 15 times in 5 sec                     | Ignition on                        | >2 sec                            | 5 sec            | Two DCY         |                 |
|                      | P1451                                    | When fivel level info is incompact | Same as above                     | Same as above                           | Engine speed                       | Dynamica                          | Once / DCY       |                 |                 |
|                      | P1451                                    | When fuel level info is incorrect  | Same as above                     | Same as above                           | Engine speed                       | Running                           | Once / DC Y      |                 |                 |
| !                    |  |                                    |                                   |   | Battery voltage                    | >11,0 V                           |                  |                 |                 |
|                      |  |                                    |                                   |   | ECT & IAT                          | >+4°C                             |                  |                 |                 |
| !                    |  |                                    |                                   |   | Fuel in tank                       | < 85% (53 liters)                 |                  |                 |                 |
| !                    |  |                                    |                                   |   | No DTC set                         | Fuel tank pressure sensor circuit |                  |                 |                 |
| !                    |  |                                    |                                   |   |                                    | Canister vent valve               |                  |                 |                 |
| !                    |  |                                    |                                   |   |                                    | Purge valve                       |                  |                 |                 |
| !                    |  |                                    |                                   |   |                                    | Fuel tank pressure adaption       |                  |                 |                 |
|                      |  |                                    |                                   |   | Fuel level                         | Updated                           |                  |                 |                 |
| Such touls mass      | Descours ad                              |                                    |                                   |   | PARO arecover                      | 75 to 106 kPo                     |                  |                 | +               |
|                      | Pressure adaption,<br>general conditions |                                    |                                   |   | BARO pressure                      | 75 to 106 kPa                     |                  | 1               | 1               |
| !                    | o  |                                    |                                   |   | Vehicle speed<br>Engine speed      | 0                                 |                  |                 |                 |
| !                    |  |                                    |                                   |   | ECT                                | <+40°C                            |                  |                 |                 |
| !                    |  |                                    |                                   |   | Fuel tank volume                   | < 80,5% (50 liter)                |                  |                 |                 |
| !                    |  |                                    |                                   |   | IAT                                | > 0°C                             |                  |                 |                 |
|                      |  |                                    |                                   |   | No DTC set                         | Fuel tank pressure                |                  |                 |                 |
| !                    |  |                                    |                                   |   | ECU                                | First time after Power Up         |                  |                 |                 |
|                      |  |                                    |                                   |   | Eco                                | 1 his time after 1 ower Op        | +                |                 |                 |
|                      | P1452                                    | Sensor Offset                      | Min failure                       | Adaption value < -750 Pa                | Engine speed                       | Running                           | Ignition on + 5s | Two DCY         | 1               |
|                      | P1492                                    | Sensor offset when fuel level info | d and a second                    | rauption value v 750 ru                 | Fuel tank pressure sensor adaption | Performed                         | Once / DCY       | 1,10,201        |                 |
| !                    |  | is incorrect                       |                                   |   | Fuel level                         | Updated                           |                  |                 |                 |
|                      |  |                                    |                                   |   | Battery voltage                    | > 11,0 V                          |                  |                 |                 |
|                      |  |                                    |                                   |   |                                    | 1                                 |                  |                 |                 |
| !                    | P1453                                    | Sensor Offset                      | Max failure                       | Adaption value >1000 Pa                 | Engine speed                       | Running                           | Ignition on + 5s | Two DCY         |                 |
|                      | P1493                                    | Sensor offset when fuel level info | d                                 | *                                       | Fuel tank pressure sensor adaption | Performed                         | Once / DCY       |                 |                 |
| !                    |  | is incorrect                       |                                   |   | Fuel level                         | Updated                           |                  |                 |                 |
|                      |  |                                    | l                                 | I                                       | Battery voltage                    | > 11,0 V                          |                  |                 |                 |
|                      |  |                                    |                                   |   |                                    |                                   |                  |                 |                 |
| EVAP Purge Valve     | P0441                                    | Valve leaking                      | Tank pressure drop when valve is  | > 30 Pa/sec                             | Vehicle speed                      | 0                                 | 3 sec            | Two DCY         |                 |
| !                    |  |                                    | commanded closed                  |   | Fuel volume                        | 15 - 85 %                         | Once / DCY       | 1               | 1               |
| !                    |  |                                    |                                   |   | Engine speed                       | Running                           |                  | 1               | 1               |
| !                    |  |                                    |                                   |   | Purge                              | Not active                        |                  |                 |                 |
| !                    |  |                                    |                                   |   | IAT & ECT at engine start          | +4 to +40 °C                      |                  |                 |                 |
| !                    |  |                                    |                                   |   | Battery voltage                    | 11 to 16 Volts                    |                  |                 |                 |
|                      |  |                                    |                                   |   | MAP                                | < -15 kPa                         |                  |                 |                 |
| !                    |  |                                    |                                   |   | No DTC set                         | Canister Vent Valve               |                  |                 |                 |
| !                    |  |                                    |                                   |   |                                    | ECT sensor                        |                  |                 |                 |
| !                    |  |                                    |                                   |   |                                    | Vehicle Speed                     |                  |                 |                 |
| !                    |  |                                    |                                   |   |                                    | Fuel tank pressure adaption       |                  |                 |                 |
|                      |  |                                    |                                   |   |                                    | Powertrain relay                  |                  |                 |                 |
|                      |  |                                    |                                   |   | Depend to                          | Purge Valve circuit               |                  |                 | 1               |
|                      |  |                                    |                                   |   | ECU                                | First time after Power Up         |                  |                 | <b></b>         |
| !                    | P0444                                    | or to the state                    | es                                | en                                      | n :                                | , .                               | ,                | m pov           | -               |
| !                    | P0444                                    | Circuit continuity check           | Short-cut                         | Short cut to ground or not<br>connected | Engine speed                       | Running                           | 1 sec            | Two DCY         | 1               |
| !                    | P0445                                    |                                    | Short-cut                         | Short cut to battery voltage            | Battery voltage                    | > 11,0 V                          | Continuous       |                 |                 |
|                      | <u> </u>                                 |                                    | <u> </u>                          | l .                                     | Purge valve                        | Active (ECT > 40°C)               |                  | 1               | 1               |
| i                    |  |                                    |                                   |   | i uigo vaivo                       | 110110 (EC1 > 40 C)               | 1                | 1               | 1               |
|                      |  |                                    |                                   |   | No DTC                             | Powertrain relay                  |                  |                 |                 |

| Component/<br>System | Fault<br>Code | Monitor Strategy Description                                 | Malfunction<br>Criteria | Threshold<br>Value          | Secondary<br>Parameters   | Enable<br>Conditions   | Time<br>Required | MIL<br>Illumin.               | Special<br>Prep     |
|----------------------|---------------|--|-------------------------|-----------------------------|---|--|------------------|-------------------------------|---------------------|
|                      | P0463         | Max signal   | AD value                | > 25000                     | Battery voltage   | > 11,0 V   |                  | DTC for EVAP<br>rationalities | default: 64,5 % (40 |
|                      |               |  |                         |                             |   |  |                  | rationanties                  | liters)             |
|                      | P0460         | Rationality, no activity                                     | Fuel level info change  | < 1,6% (1 liter)            | Engine speed  | Running  | 15,5 miles       |                               |                     |
|                      |               |  |                         |                             | Battery voltage   | > 11,0 V   |                  |                               |                     |
|                      |               |  |                         |                             | No DTC set  | Fuel level el. check   |                  |                               |                     |
|                      |               |  |                         |                             | If the volume increases with more than 16%  | When volume reference > 85% (53 liters) OR < 3,2% (2                 |                  |                               |                     |
|                      |               |  |                         |                             | (10 liters) during DCY, refueling is assumed,<br>and a new reference will be taken. | liters), driving distance for evaluation is increased to 93,2 miles. |                  |                               |                     |
|                      |               |  |                         |                             | and a new reference will be taken.  | mics.  |                  |                               |                     |
|                      | P0461         | Rationality, fuel consumption                                | Fuel level change       | Fuel consumption less than  | Reference volume updated when Vehicle spec  | ett 24 9 mph   | 5 X 21,7 miles   | No MIL, will set alternat     | Sets fuel volume to |
|                      | 10101         | radiomanty, ruer consumption                                 | r der rever endarge     | 0,8% (0,5 liters). 5 checks |   |  | 5 11 21,7 miles  | DTC for EVAP                  | default: 64,5 % (40 |
|                      |               |  |                         | done for fault setting.     | Evaluation distance   | 21,7 miles   |                  | rationalities                 | liters)             |
|                      |               |  |                         |                             | Evaluation distance when fuel level >90%  | 43,5 miles   |                  |                               |                     |
|                      |               |  |                         | between DCY:s.              | Depend to   | Fuel tank level el. check or rationality                             |                  |                               |                     |
|                      | <u>.</u>      |  | I.                      |                             |   |  | <u> </u>         |                               |                     |
| el trim, long term   | P0171         | System lean  | Long term               | <-24,6%                     | Engine speed  | Running  | 1 sec            | Two DCY                       |                     |
|                      | P0172         | System rich  | Long term               | >+24,6%                     | Lambda control  | Active   | Continuous       |                               |                     |
|                      |               | Fuel trim matrix with 20                                     |                         |                             | Fuel trim   | 6 updates in actual load/rpm cell (100 msec cycle time)              |                  |                               |                     |
|                      |               | load/rpm cells. Diagnostic will                              |                         |                             | Coolant temperature   | > 71 deg C   |                  |                               |                     |
|                      |               | fail if the trim value in present<br>cell is above threshold |                         |                             | Depend to   | MAF  |                  |                               |                     |
|                      |               | cen is above threshold                                       |                         |                             |   | Front O2 Sensor  |                  |                               |                     |
|                      | _             |  |                         |                             |   | •  |                  |                               |                     |
| ont O2 sensor        | P0132         | Range check high   | Voltage                 | >1200 mV                    | Engine speed  | Running  | 6 sec            | Two DCY                       |                     |
|                      |               |  |                         |                             | Battery voltage   | 11,0 < U < 18,0V   | Continuous       |                               |                     |
|                      |               |  |                         |                             | Front O2 sensor heater  | Active - sensor warmed up  |                  |                               |                     |
|                      |               |  |                         |                             | Closed-loop fueling   | Active   |                  |                               |                     |
|                      |               |  |                         |                             |   |  |                  |                               |                     |
|                      | P0131         | Range check low  | Voltage                 | < 100 mV in 30 sec          | Engine speed  | Running  | 30 sec           | Two DCY                       |                     |
|                      |               |  |                         |                             | Rear sensor signal  | > 700 mV   | Continuous       |                               |                     |
|                      |               |  |                         |                             | Front O2 sensor heater  | Active - sensor warmed up  |                  |                               |                     |
|                      |               |  |                         |                             | Battery voltage   | > 11,0V  |                  |                               |                     |
|                      |               |  |                         |                             | Lambda control  | Active > 5 sec   |                  |                               |                     |
|                      |               |  |                         |                             | Load  | > 0  |                  |                               |                     |
|                      |               |  |                         |                             | AIR   | Not active   |                  |                               |                     |
|                      |               |  |                         |                             | EVAP leak test  | Not active   |                  |                               |                     |
|                      |               |  |                         |                             | Fuel cut  | Not active   |                  |                               |                     |
|                      |               |  |                         |                             |   |  |                  |                               |                     |
|                      | P0134         | Circuit Continuity check                                     | Voltage                 | 300 to 600 mV               | Engine speed  | Running  | 10 sec           | Two DCY                       |                     |
|                      |               |  |                         |                             | Battery voltage   | >11,0V   | Continuous       |                               |                     |
|                      |               |  |                         |                             | Sensor heater   | Active   |                  |                               |                     |
|                      |               |  |                         |                             | Sensor heater active time from engine starting                                      |  |                  |                               |                     |
|                      |               |  |                         |                             | depending on IAT or ECT at start.   | -8 to 8°C for 270 sec  |                  |                               |                     |
|                      |               |  |                         |                             |   | >8°C for 80 sec  |                  |                               |                     |
|                      | 1             |  |                         |                             | EVAP leak test  | Not active   | 1                | 1                             |                     |
|                      | 1             |  |                         |                             | No DTC set  | IAT  | 1                | 1                             |                     |
|                      |               |  |                         |                             | Lambda control  | Closed loop  |                  |                               |                     |
|                      |               |  |                         |                             |   |  |                  |                               |                     |
|                      | P0133         | Response rate  | Signal switches         | < 4 in 140 revolutions      | Engine speed  | 1500 – 3000 rpm  | 135 revolutions  | Two DCY                       |                     |
|                      |               |  | OR                      |                             | Lambda control  | Closed loop  | Once / DCY       |                               |                     |
|                      | 1             |  | Revolutions             | > 110 for 4 switches        | Battery voltage   | > 11,0 V   |                  | 1                             |                     |
|                      | 1             |  |                         |                             | Engine load   | 210 - 500 mg/combustion  |                  | 1                             |                     |
|                      | 1             |  |                         |                             | Lambda Integrator   | Within ±15%  | 1                | 1                             |                     |
|                      | 1             |  |                         |                             | ECT   | >70°C  |                  | 1                             |                     |
|                      | 1             |  |                         |                             | Time from engine starting   | > 180 sec  |                  | 1                             |                     |
|                      | 1             |  |                         |                             | Purge fuel factor   | > -10%   |                  | 1                             |                     |
|                      |               |  |                         |                             | No DTC set  | O2 Sensor Switch Point   |                  |                               |                     |
|                      | ı             | l  | Î                       |                             | i   | MAF  | 1                |                               | 1                   |

| Component/             | Fault  | Monitor Strategy        | Malfunction    | Threshold                  | Secondary                                | Enable                        | Time                | MIL      | Special              |
|------------------------|--------|-------------------------|----------------|----------------------------|--|-------------------------------|---------------------|----------|----------------------|
| System                 | Code   | Description             | Criteria       | Value                      | Parameters                               | Conditions                    | Required            | Illumin. | Prep                 |
| O2 Sensor Switch Point | P1131  | Switch point trim value | Lean           | > 11,5 revolutions         | Engine speed                             | Running                       | 20 / 25 revolutions | Two DCY  | Steady-state at 56 m |
|                        | P1132  |                         | Rich           | > 11,5 revolutions         | Coolant temp                             | > 70 ° C                      | Continuous          |          | for 5 minutes        |
|                        | 11132  |                         | Rich           | > 11,5 revolutions         | Delta load, positive                     | < 60 mg/combustion/250 msec   | Continuous          |          |                      |
|                        |        |                         |                |                            | Delta load, negative                     | > - 15 mg/combustion/250 msec |                     |          |                      |
|                        |        |                         |                |                            | _  |                               |                     |          |                      |
|                        |        |                         |                |                            | Engine speed                             | 1500 - 2800 rpm               |                     |          |                      |
|                        |        |                         |                |                            | Load                                     | 200 - 400 mg/combustion       |                     |          |                      |
|                        |        |                         |                |                            | Time after engine start                  | >200 s                        |                     |          |                      |
|                        |        |                         |                |                            | Fuel control                             | Closed loop                   |                     |          |                      |
|                        |        |                         |                |                            | Rear sensor voltage for trim activation  | > 625 mV or < 575 mV          |                     |          |                      |
|                        |        |                         |                |                            | Purge adaption                           | > -5%                         |                     |          |                      |
|                        |        |                         |                |                            | Stable time                              | 25 sec                        |                     |          |                      |
|                        |        |                         |                |                            | Additional stable time if after fuel-cut | 40 sec                        |                     |          |                      |
|                        |        |                         |                |                            | Time between adaptions                   | 10 sec                        |                     |          |                      |
|                        |        |                         |                |                            | No DTC set                               | MAF                           |                     |          |                      |
|                        |        |                         |                |                            | Depend to                                | Rear O2 Sensor                |                     |          |                      |
|                        |        |                         |                |                            | Depend to                                | Real O2 Sensor                |                     |          |                      |
| E 02 1                 | D0021  | D d d i.                | Ch             | T                          | Iri.                                     | lp                            | le                  | T DCV    |                      |
| Front O2 sensor heater | P0031  | Range check min         | Short cut      | To ground or not connected | Engine speed                             | Running                       | 6 sec               | Two DCY  |                      |
| 1                      |        |                         |                |                            | Battery voltage                          | > 11,0 V                      | Continuous          |          |                      |
|                        |        |                         |                |                            | O2 heater frequency                      | 10 % < PWM < 85 %             |                     |          |                      |
|                        |        |                         |                |                            |  |                               |                     |          |                      |
| i                      | P0032  | Range check max         | Short cut      | To battery voltage         | Engine speed                             | Running                       | 6 sec               | Two DCY  | _                    |
|                        | 1 0032 | Range check max         | Short cut      | 10 battery voltage         |  |                               |                     | TWO DC I |                      |
|                        |        |                         |                |                            | Battery voltage                          | > 11,0 V                      | Continuous          |          |                      |
|                        |        |                         |                |                            | O2 heater frequency                      | 10 % < PWM < 85 %             |                     |          |                      |
| i                      |        |                         |                |                            |  |                               |                     |          |                      |
|                        | P0030  | Rationality             | Heater current | < 300 mA for > 16 sec      | Engine speed                             | Running                       | 16 sec              | Two DCY  |                      |
|                        |        |                         |                |                            | Battery voltage                          | > 11,0 V                      | Continuous          |          |                      |
|                        |        |                         |                |                            | PWM Duty Cycle                           | 10 to 85 %                    |                     |          |                      |
|                        |        |                         |                |                            | No DTC set                               | Fuel pump relay               |                     |          |                      |
|                        |        |                         |                |                            |  |                               | I                   |          |                      |
| Rear 02 sensor         | P0137  | Signal low              | Voltage        | < 100 mV for > 30 sec      | Engine speed                             | Running                       | 6 sec               | Two DCY  |                      |
| rear oz sensor         | 10137  | organi ion              | Vollage        | (100 m / 101 × 30 sec      | Battery voltage                          | > 11,0 V                      | Continuous          | 1,10,001 |                      |
|                        |        |                         |                |                            |  |                               | Continuous          |          |                      |
|                        |        |                         |                |                            | Rear O2 sensor heater                    | Active - sensor warmed up     |                     |          |                      |
|                        |        |                         |                |                            | Lambda closed loop                       | > 5 sec                       |                     |          |                      |
|                        |        |                         |                |                            | Lambda integrator                        | Within -20 to +20 %           |                     |          |                      |
|                        |        |                         |                |                            | Load                                     | > 210 mg                      |                     |          |                      |
|                        |        |                         |                |                            |  | No AIR                        |                     |          |                      |
|                        |        |                         |                |                            |  | No EVAP leak test             |                     |          |                      |
|                        |        |                         |                |                            |  | No Fuel Cut                   |                     |          |                      |
|                        |        |                         |                |                            | No DTC set                               | MAF                           |                     |          |                      |
|                        |        |                         |                |                            | TO DIE SEL                               |                               |                     |          | _                    |
|                        | P0138  | Cional high             | Voltage        | > 1200 mV                  | Engine speed                             | Dunning                       | 6.000               | Two DCV  |                      |
|                        | E0138  | Signal high             | Voltage        | >1200 mV                   | Engine speed                             | Running                       | 6 sec               | Two DCY  |                      |
|                        |        |                         |                |                            | Battery voltage                          | > 11,0 V                      | Continuous          |          |                      |
|                        |        |                         |                |                            | Rear O2 sensor heater                    | Active - sensor warmed up     |                     |          |                      |
|                        |        |                         |                |                            |  |                               |                     |          |                      |
|                        | P0140  | Activity                | Sensor voltage | >400 mV                    | Engine speed                             | Running                       | 200 msec            | Two DCY  | Unified cycle demo   |
|                        |        |                         |                |                            | Fuel cut                                 | Active for > 6,5 sec          | Once/DCY            |          |                      |
|                        |        |                         |                |                            | Battery voltage                          | > 11,0 V                      |                     |          |                      |
|                        |        |                         |                |                            | Lambda control                           | Active for > 20 sec           |                     |          |                      |
|                        |        |                         |                |                            | Rear O2 sensor heater                    | Active - sensor warmed up     |                     |          |                      |
|                        | 1      |                         | 1              |                            | Je sensor nearer                         | rearc - sensor warmed up      |                     | 1        |                      |
| D 02 b                 | D0027  | Daniel de de min        | Ch             | Tr                         | Irania and                               | In                            | Ic                  | T DCV    |                      |
| Rear O2 sensor heater  | P0037  | Range check min         | Short cut      | To ground or not connected |  | Running                       | 6 sec               | Two DCY  |                      |
|                        |        |                         |                |                            | Battery voltage                          | > 11,0 V                      | Continuous          |          |                      |
|                        |        |                         |                |                            | Sensor heater                            | Active                        |                     |          |                      |
|                        | 1      | 1                       |                |                            | O2 heater frequency                      | 10 % < PWM < 85 %             |                     |          |                      |
|                        |        |                         |                |                            |  |                               |                     |          |                      |
|                        |        |                         |                |                            |  |                               |                     |          |                      |
|                        | P0038  | Range check max         | Short cut      | To battery voltage         | Engine speed                             | Running                       | 6 sec               | Two DCY  |                      |

| Component/<br>System       | Fault<br>Code | Monitor Strategy<br>Description                                  | Malfunction<br>Criteria | Threshold<br>Value         | Secondary Parameters                    | Enable<br>Conditions                                    | Time<br>Required                  | MIL<br>Illumin. | Special<br>Prep |
|----------------------------|---------------|--|-------------------------|----------------------------|---|---|-----------------------------------|-----------------|-----------------|
| Cyclon.                    | 1             | Boomption  | - Critoria              | Tuiu0                      | Sensor heater                           | Active  | - Roquirou                        | inginini.       | 1.00            |
|                            |               |  |                         |                            | O2 heater frequency                     | 10 % < PWM < 85 %                                       |                                   |                 |                 |
|                            |               |  |                         |                            | 52 neater requestey                     |   |                                   |                 |                 |
|                            | P0036         | Rationality  | Heater current          | < 200 mA for > 16 sec      | Engine speed                            | Running   | 16 sec                            | Two DCY         |                 |
|                            | 1 0030        | Kationanty   | ricator current         | < 200 mm ror > 10 sec      | Battery voltage                         | > 11,0 V  | Continuous                        | I WO DC I       |                 |
|                            |               |  |                         |                            | 1 -                                     |   | Continuous                        |                 |                 |
|                            |               |  |                         |                            | Sensor heater                           | Active  |                                   |                 |                 |
|                            |               |  |                         |                            | No DTC set                              | Max/min fault rear O2S heater                           |                                   |                 |                 |
|                            |               |  |                         |                            |   | Fuel pump relay   |                                   |                 |                 |
|                            |               |  |                         |                            |   |   |                                   |                 |                 |
| MAP – Turbocharger Boos    | stP023D       | Rationality MAP vs. Turbo boos                                   | Pressure difference     | > 12 kPa for 3 readings    | Engine speed                            | 0   | 3 readings                        | Two DCY         |                 |
| Pressure Correlation       |               | sensors  |                         |                            | Vehicle speed                           | 0   | Once / DCY                        |                 |                 |
|                            |               |  |                         |                            | Ignition on                             | Ignition off OR engine not moving OR no rpm for 3 sec   |                                   |                 |                 |
|                            |               |  |                         |                            |   | preceding ignition on                                   |                                   |                 |                 |
|                            |               |  |                         |                            | No DTC set                              | HW I/O Manifold Air Pressure                            |                                   |                 |                 |
|                            |               |  |                         |                            |   | Turbo boost pressure sensor                             |                                   |                 |                 |
|                            |               |  |                         |                            |   | -   |                                   |                 |                 |
| MAP sensor                 | P0106         | Rationality  | MAP                     | > 50 kPa for 400 msec      | Engine speed                            | Running > 1300 rpm                                      | 5 readings                        | Two DCY         | +               |
|                            |               |  |                         |                            | Accelerator pedal                       | Released for > 400 msec                                 | Once / DCY                        | 130201          | 1               |
|                            | 1             |  |                         |                            | -                                       |   | Once / DC I                       |                 |                 |
|                            |               |  |                         |                            | Load                                    | < 110 mg/combustion                                     |                                   |                 |                 |
|                            |               |  |                         |                            | No DTC set                              | HW I/O Manifold Air Pressure                            |                                   |                 |                 |
|                            |               |  |                         |                            |   | Crankshaft position sensor                              |                                   |                 |                 |
|                            |               |  |                         |                            |   |   |                                   |                 |                 |
|                            | P0107         | Range check min  | Short-cut               | To ground or not connected | I Ignition                              | On (Engine not moving OR engine moving OR engine        | 1 sec Continuous                  | Two DCY         |                 |
|                            |               |  |                         |                            |   | running)  |                                   |                 |                 |
|                            |               |  |                         |                            |   |   |                                   |                 |                 |
|                            | P0108         | Range check max  | Short-cut               | To sensor supply voltage   | Ignition                                | On (Engine not moving OR engine moving OR engine        | 1 sec Continuous                  | Two DCY         |                 |
|                            |               |  |                         |                            |   | running)  |                                   |                 |                 |
|                            | •             | *  | •                       | *                          |   |   | •                                 | •               | •               |
| Turbo boost pressure senso | pr P0237      | Range check min  | Short-cut               | To ground or not connected | I Ignition                              | On (Engine not moving OR engine moving OR engine        | 1 sec Continuous                  | Two DCY         |                 |
|                            |               |  |                         |                            | Ī                                       | running)  |                                   |                 |                 |
|                            |               |  |                         |                            |   |   |                                   |                 |                 |
|                            | P0238         | Range check max  | Short-cut               | T                          | Ignition                                | On (Engine not moving OR engine moving OR engine        | 1 sec Continuous                  | Two DCY         | 1               |
|                            | P0238         | Range check max  | Short-cut               | To sensor supply voltage   | Ignition                                | running)  | 1 sec Continuous                  | I WO DC 1       |                 |
|                            |               |  |                         |                            |   | running)  |                                   |                 |                 |
|                            |               |  |                         |                            |   |   |                                   |                 |                 |
| MAF sensor                 | P0102         | Range check, low signal  | Short-cut               | To ground or not connected | Engine speed                            | Running OR Moving                                       | Continuous                        | Two DCY         |                 |
|                            |               |  |                         |                            | N. DWG                                  | n   |                                   |                 |                 |
|                            |               |  |                         |                            | No DTC set                              | Powertrain relay  |                                   |                 |                 |
|                            |               |  |                         |                            |   |   |                                   |                 |                 |
|                            | P0103         | Range check, high signal   | Short-cut               | To sensor supply voltage   | Engine speed                            | Running OR Moving                                       | Continuous                        | Two DCY         |                 |
|                            |               |  |                         |                            | No DTC set                              | Powertrain relay  |                                   |                 |                 |
|                            | 1             |  |                         |                            | 110 2 10 301                            | 1 orientam rotay  |                                   |                 | 1               |
| MAF sensor, rationality    | P0101         | Comparison of measured MAF                                       | MAF deviation AND       | > -24%                     | Engine speed                            | Running   | 500 complex or more               | Two DCY         | 1               |
| viar sensor, rationality   | F0101         | Comparison of measured MAF<br>sensor signal with mass air flow   |                         | > -24%<br>> -20%           | Engine speed                            | Running > 11 Volts                                      | 500 samples or more<br>Continuous | I WO DC I       |                 |
|                            |               | calculated from throttle area,                                   |                         |                            | Battery Voltage                         |   | Continuous                        |                 |                 |
|                            |               | BARO, MAP and Turbo Boost  | OR MAF deviation AND    | > 24%                      | Coolant Temperature                     | 67 - 115 °C   |                                   |                 |                 |
|                            |               | sensors. Samples are taken in                                    | Fuel Trim               | > 20%                      | Engine Speed                            | 1400 – 4000 rpm   |                                   |                 |                 |
|                            |               | two load windows, below and                                      | OR MAF deviation        | > ±30%                     | Pressure quote, MAP vs. pressure before | 0,39 - 0,70   |                                   |                 |                 |
|                            |               | above 15 g air/sec. To report                                    |                         |                            | throttle                                |   |                                   |                 |                 |
|                            | 1             | fault, the average deviation in                                  |                         |                            | MAP deviation between samples           | < ±2,5 kPa in 1500 msec                                 |                                   |                 |                 |
|                            |               | one of the windows has to be                                     |                         |                            | Calculated Mass Air Flow (from MAP)     | > 7 g/s   |                                   |                 |                 |
|                            |               | above the limit after 500<br>samples. To report pass, 500        |                         |                            | Boost by-pass status change             | No change for 500 ms                                    |                                   |                 |                 |
|                            | 1             | samples. To report pass, 500<br>samples have to be taken in both |                         |                            | Vehicle speed to enable test            | > 18,6 mph for 60 sec                                   |                                   |                 |                 |
|                            | 1             | load windows with less deviation                                 |                         |                            | Fuel cut                                | Inactive  |                                   |                 |                 |
|                            |               | than the fault limit.  |                         |                            | BARO                                    | > 72 kPa  |                                   |                 |                 |
|                            |               |  |                         |                            | ECT at start                            | > 72 KFa<br>> -7°C                                      |                                   |                 |                 |
|                            |               |  |                         |                            | EC 1 at start                           | 2-1 C   | 1                                 | i i             | 1               |
|                            |               |  |                         |                            | Po 1.                                   | MAD   |                                   |                 |                 |
|                            |               |  |                         |                            | Depend to                               | MAP sensor  |                                   |                 |                 |
|                            |               |  |                         |                            | Depend to                               | MAP sensor<br>IAT sensor<br>Turbo boost pressure sensor |                                   |                 |                 |

| Component/<br>System          | Fault<br>Code | Monitor Strategy<br>Description | Malfunction<br>Criteria  | Threshold<br>Value                            | Secondary Parameters   | Enable<br>Conditions                                      | Time<br>Required                       | MIL<br>Illumin. | Special<br>Prep |
|-------------------------------|---------------|---------------------------------|--|---|--|---|--|-----------------|-----------------|
| AT sensor                     | P0112         | Range check min                 | Device driver detects min error  | Circuit low                                   | Ignition   | On (Engine not moving OR engine moving OR engine running) | 1 sec Continuous                       | Two DCY         |                 |
|                               | P0113         | Range check max                 | Device driver detects max error  | Circuit high                                  | Ignition   | On (Engine not moving OR engine moving OR engine running) | 1 sec Continuous                       | Two DCY         |                 |
|                               | P0111         | Rationality, no activity        | IAT sensor output change   | <1 °C   | Soak time  | > 600 min   | 900 sec                                | Two DCY         |                 |
|                               |               |                                 |  |   | Run time<br>Engine   | > 900 sec<br>Running                                      | Once / DCY                             |                 |                 |
|                               |               |                                 |  |   | Load<br>For time   | > 270 mg/comb<br>150 sec cumulative                       |  |                 |                 |
|                               |               |                                 |  |   | ECM reset  | Not allowed   |  |                 |                 |
| CT sensor                     | P0115         | Rationality, No activity        | Temp. change   | < 2 °C  | Engine speed Load < 150 mg/combustion AND > 270 mg/combustion ECT at start | Running<br>180 sec<br>150 sec<br>=< 71 °C                 | Load condition depandant<br>Once / DCY | Two DCY         |                 |
|                               |               |                                 |  |   | Vehicle speed<br>No DTC set  | > 0 mph<br>ECT  |  |                 |                 |
| hermostat / ECT<br>ationality | P0128         | Rationality                     | Sample period of 200 sec starts<br>when modeled ECT reaches 80   | > 30 °C above modeled<br>ECT                  | Engine speed   | Running   | 300 to 700 sec                         | Two DCY         |                 |
|                               |               |                                 | °C. Comparison at end of sample<br>period: Mean value of difference<br>between ECT reading and                 | OR<br>> Calculated limit below<br>modeled ECT | ECT at start-up<br>Calculated coolant temp                                 | < 52 °C<br>> 80 °C  | Once / DCY                             |                 |                 |
|                               |               |                                 | modeled coolant temperature  |   | Idle portion of DCY Fuel cut portion of DCY BARO                           | < 50 %<br>< 50 %<br>> 72 kPa                              |  |                 |                 |
|                               |               |                                 |  |   | ECT at start Time after start Depend to                                    | > -7°C<br>< 750 sec<br>ECT sensor                         |  |                 |                 |
|                               |               |                                 |  |   | Disables for remainder of DCY if Vehicle                                   | IAT sensor<br>Vehicle speed<br>> 87 mph for > 30 sec      |  |                 |                 |
|                               |               |                                 |  |   | speed<br>Block heater start  | (accumulated time)<br>Not allowed                         |  |                 |                 |
| ow sided ECT rationality      | y P0126       | Rationality                     | Sample period of 60 sec starts   | ECT < 5 ° C                                   | Engine speed   | Running   | 150 to 300 sec                         | Two DCY         |                 |
|                               |               |                                 | when modeled ECT reaches 10 °C. Comparison at end of sample period: Mean value of ECT reading is compared with |   | ECT at start-up IAT or ECT sensor  | <0 °C<br>Below -7 deg C<br><50 %                          | Once / DCY                             |                 |                 |
|                               |               |                                 | threshold  |   | Idle portion of DCY Fuel cut portion of DCY BARO Time after start          | < 50 %<br>< 50 %<br>> 72 kPa<br>< 800 sec                 |  |                 |                 |
|                               |               |                                 |  |   | Depend to  | ECT sensor<br>IAT sensor<br>Vehicle speed                 |  |                 |                 |
|                               |               |                                 |  |   | Disables for remainder of DCY if Vehicle<br>speed<br>Block heater start    | > 87 mph for > 30 sec (cumulative)  Not allowed           |  |                 |                 |
| CT sensor                     | P0117         | Range check min                 | Device driver detects min error  | Circuit low                                   | Engine speed   | Not moving OR running                                     | 1 sec Continuous                       | Two DCY         |                 |
|                               | P0118         | Range check max                 | Device driver detects max error  | Circuit high                                  | Engine speed   | Not moving OR running                                     | 1 sec Continuous                       | Two DCY         |                 |
|                               | P0119         | Too quick change                | Mean value in stack (of 5 values)  | > 10 °C                                       | Engine speed   | Running   | 5 readings, time base 100 msec         | Two DCY         |                 |

| Component/                | Fault    | Monitor Strategy     | Malfunction                             | Threshold                      | Secondary   | Enable                         | Time       | MIL      | Special   |
|---------------------------|----------|----------------------|---|--------------------------------|---|--------------------------------|------------|----------|-----------|
| System                    | Code     | Description          | Criteria                                | Value                          | Parameters  | Conditions                     | Required   | Illumin. | Prep      |
| Ī                         |          |                      |   |                                | Comparison of each ECT reading, insert into                 | >5 ℃                           | Continuous |          |           |
| ļ                         | 1        |                      |   |                                | stack when diff. from previous reading                      |                                |            |          |           |
| ļ                         |          |                      |   |                                |   |                                |            |          |           |
| ļ                         | P0119    | Too quick change     | Difference between consecutive          | > 60 °C                        | Engine speed  | Running                        | Continuous | Two DCY  |           |
| ļ                         | 1        |                      | values                                  |                                | Circuit continuity check                                    | No fault reported during 2 sec |            |          |           |
|                           | 1        | I                    |   |                                | -   | -                              |            |          |           |
| ECT sensor stuck above    | P011B    | Rationality          | ECT vs IAT reading at engine            | ECT > 20 deg C above IAT       | Engine speed  | Running                        | 45 sec     | Two DCY  |           |
| maximum enable / ECT vs.  | 1        |                      | start                                   | OR                             |   | 500                            | o /pow     |          |           |
| IAT comparison            | 1        |                      |   | IAT > 30 deg C above ECT       | Engine off time   | > 600 min                      | Once / DCY |          |           |
|                           | 1        |                      |   |                                | Engine run time   | 45 sec                         |            |          |           |
|                           | 1        |                      |   |                                | ECT drop after 45 sec                                       | < 2 deg C                      |            |          |           |
|                           | 1        |                      |   |                                | Block heater start  | Not allowed                    |            |          |           |
| ,<br>I                    | 1        |                      |   |                                | ECM reset   | Not allowed                    |            |          |           |
|                           |          | •                    |   | •                              |   |                                | •          | •        | •         |
| Turbocharger bypass valve | P0034    | Control circuit Low  | Device driver detects valve error       | Circuit low                    | Engine speed  | Running                        | Continuous | Two DCY  |           |
|                           | 1        |                      |   |                                | Turbo bypass valve  | Active                         |            |          |           |
|                           |          |                      |   |                                |   |                                |            |          |           |
|                           | P0035    | Control circuit High | Device driver detects valve error       | Circuit high                   | Engine speed  | Running                        | Continuous | Two DCY  |           |
| ,                         | 1        |                      |   |                                | Turbo bypass valve  | Active                         |            |          |           |
| ,                         |          |                      |   |                                |   |                                |            |          |           |
| ,                         | P0033    | Rationality          | Mean value of 50 MAF pulsations         | > 1.90 mg/sec                  | Engine speed  | Running < 3500 rpm             | 600 msec,  | Two DCY  | US06 demo |
| ,                         | 1        |                      | at Accelerator released                 |                                | Turbo bypass valve  | Commanded Open                 | > 1 time   |          |           |
| ,                         | 1        |                      |   |                                | Turbo boost pressure  | > BARO + 35 kPa                | Continuous |          |           |
| l                         | 1        |                      | AND                                     |                                | BARO model  | Updated                        |            |          |           |
| ,                         | 1        |                      | Mean value of 50 Turbo Boost            | > 1.1kPa                       | BARO  | > 72 kPa                       |            |          |           |
| l                         | 1        |                      | Pressure pulsations at Accelerator      |                                | ECT at start  | > -7°C                         |            |          |           |
| l                         | 1        |                      | released                                |                                | No DTC set  | MAP sensor                     |            |          |           |
| ,                         | 1        |                      |   |                                |   | Powertrain Relay               |            |          |           |
| ,                         | 1        |                      |   |                                | Mean value of Throttle during pulsation perio               | d< 2,6 %                       |            |          |           |
|                           | L        |                      |   |                                | <u> </u>  |                                |            |          |           |
| Turbocharger wastegate    | P0245    | Control circuit Low  | Device driver detects min error         | Circuit low                    | Engine speed  | Running                        | Continuous | Two DCY  |           |
| solenoid                  | 1 02 13  | Condor circuit 2011  | Device driver detects min error         | Circuit iow                    | No DTC  | Powertrain relay rationality   | Continuous | 1,10,001 |           |
| ,                         | <b>—</b> |                      |   |                                |   |                                |            |          |           |
| ,                         | P0246    | Control circuit High | Device driver detects max error         | Circuit high                   | Engine speed  | Running                        | Continuous | Two DCY  |           |
| ,                         |          |                      |   | Ü                              | 0 .   | 3                              |            |          |           |
| ,                         | D0244    | The state of the     | m 1 1                                   | 12 1010                        | 7   | 2200 0 5000                    | 1.0        | m pow    | TIMOS I   |
| ,                         | P0244    | Rationality          | Turbo boost pressure decrease<br>slope  | + 12 to - 10 kPa/sec           | Engine speed  | > 2200 rpm & < 5000 rpm        | 1,0 sec    | Two DCY  | US06 demo |
| l                         | 1        |                      |   | 44.17                          | Turbo boost pressure  | > BARO + 39 kPa                | Continuous |          |           |
| l                         | 1        |                      | AND Mean pressure diff over<br>throttle | > 23 kPa                       | BARO model  | Updated                        |            |          |           |
| l                         | 1        |                      | unottie                                 | > 30 kPa when BARO > 85<br>kPa |   | > 72 kPa                       |            |          |           |
| ļ                         | 1        |                      |   | Ki ü                           | ECT   | >71°C                          |            |          |           |
| ļ                         | 1        |                      |   |                                | Accelerator position  | 5 - 50%                        |            |          |           |
| ļ                         | 1        |                      |   |                                | Max throttle change during sample period vs.<br>start value | < 10%                          |            |          |           |
| ļ                         | 1        |                      |   |                                |   |                                |            |          |           |
| l                         | 1        |                      |   |                                | ECT at start (out of limits)                                | > -7°C                         |            |          |           |
| ļ                         | 1        |                      |   |                                | Boost adaption  | Done (also in earlier DCY)     |            |          |           |
|                           | 1        |                      |   |                                | No DTC set  | Wastegate circuit              |            |          |           |
| ļ                         | 1        |                      |   |                                | Depend to   | Turbo boost sensor             |            |          |           |
|                           | 1        |                      |   |                                |   | MAP                            |            | 1        |           |
|                           | 1        |                      |   |                                |   |                                |            |          |           |
|                           | 1        |                      |   |                                |   |                                |            | 1        |           |
|                           | 1        |                      |   |                                |   | 1                              | 1          | 1        |           |
|                           | 1        |                      |   |                                |   |                                |            | 1        |           |
| !                         | 1        | Rationality          | Pressure difference over throttle       | < -300 mg/comb                 | lika med ovanför  |                                | 500 msec   | 1        | US06 demo |
|                           | 1        |                      |   |                                |   |                                | Continuous | 1        |           |
|                           | 1        |                      |   |                                |   |                                |            | 1        |           |
|                           | <u> </u> |                      |   |                                |   |                                |            |          |           |
|                           |          |                      |   |                                |   |                                |            |          |           |

| Component/                  | Fault    | Monitor Strategy               | Malfunction                       | Threshold  | Secondary                                | Enable                                     | Time                 | MIL          | Special     |
|-----------------------------|----------|--------------------------------|-----------------------------------|--|--|--|----------------------|--------------|-------------|
| System                      | Code     | Description                    | Criteria                          | Value  | Parameters                               | Conditions                                 | Required             | Illumin.     | Prep        |
| Time to closed loop         | P0125    | Rationality                    | Time before entering closed loop  | > 600 sec  | Engine speed                             | Running                                    | 600 sec              | Two DCY      |             |
|                             |          |                                |                                   |  | Start Temperature, lowest of ECT/IAT     | <-7°C                                      | Once / DCY           |              |             |
|                             |          |                                | Time before entrained level level | . 150  | Facility and d                           | Powering.                                  | 200                  | T DCV        | +           |
|                             |          |                                | Time before entering closed loop  | >150 sec   | Engine speed                             | Running                                    | 300 sec              | Two DCY      |             |
|                             |          |                                |                                   |  | Start Temperature, lowest of ECT/IAT     | -7°C < T < 10°C                            | Once / DCY           |              | +           |
|                             |          |                                | Time before entering closed loop  | > 60 sec   | Engine speed                             | Running                                    | 120 sec              | Two DCY      | +           |
|                             |          |                                |                                   |  | Start Temperature, lowest of ECT/IAT     | >10°C                                      | Once / DCY           |              |             |
| 0 110 22                    | noara    | la                             | In                                | T. 100   | lo 1: 16 11                              |  | la s                 | ly e         |             |
| Crankshaft position sensor  | P0337    | Sensor circuit low             | Engine speed at cranking          | < 100 rpm  | Cranking defined by                      |  | 3,5 sec              | Immediately  |             |
|                             | 1        |                                |                                   |  | Battery voltage<br>AND MAP vs. BARO diff | $\Delta > 0.6 \text{ V}$<br>> 2 kPa        | Once / DCY           |              |             |
|                             |          |                                |                                   |  |  | For 2 sec                                  |                      |              |             |
|                             |          |                                |                                   |  | IF above conditions not met:             |  |                      |              |             |
|                             |          |                                |                                   |  | THEN Close throttle                      | For 1,5 sec                                |                      |              |             |
|                             |          |                                |                                   |  | MAP vs. BARO diff                        | > 5 kPa                                    |                      |              |             |
|                             | ļ        |                                |                                   |  | AND check engine speed                   |  |                      |              | _           |
|                             | P0339    | Rationality                    | Lost position in same DCY         | Position found then lost                         | Vehicle speed                            | = 0 mph                                    | 3 sec                | Two DCY      | +           |
|                             |          |                                |                                   | during 10 msec, > 7 times                        | Engine speed                             | Cranking OR Running < 3 sec                | Continuous           |              |             |
|                             |          |                                |                                   |  | Ignition                                 | On   | Continuous           |              |             |
|                             | 1        |                                |                                   | <del> </del>                                     | Igiilioii                                | Oil  |                      |              | +           |
|                             | 1        |                                | Lost position in same DCY         | Position found then lost                         | Vehicle speed                            | > 18,6 mph                                 | Error occurs 3 times | Two DCY      | +           |
|                             |          |                                | Lost position in same DC i        | during 10 msec, > 3 times                        |  |  |                      | I WO DC I    |             |
|                             |          |                                |                                   | during 10 moce, > 5 times                        | Brake                                    | Not active                                 | Continuous           |              |             |
|                             |          |                                |                                   |  | Engine speed                             | Running > 3 sec                            |                      |              |             |
|                             | <u> </u> |                                |                                   |  | Ignition                                 | On   |                      |              |             |
| Vehicle speed               | P0501    | Fault reported from ABS        | Wheel Angular Velocity Front      | Not received within 1 sec                        | Ignition                                 | On for > 3 sec                             | 1 sec, continuous    | Two DCY      | <del></del> |
| veincie speed               | 1 0501   | raun reported from ABS         | Left Validity bit AND             | Not received within 1 sec                        | Battery voltage                          | 6.0 V to 16.0 V                            | r see, continuous    | 1 WO DC 1    |             |
|                             |          |                                | Wheel Angular Velocity Front      | 4  |  | Not in sleep mode OR programming mode      |                      |              |             |
|                             |          |                                | Right Validity bit                |  | Nodes on HS CAN                          | , , , , , ,                                |                      |              |             |
|                             | <u> </u> |                                | rugin vanuary on                  | <u> </u>   | No DTC set                               | Lost communication with ABS module (P1625) |                      |              |             |
| Brake light switch          | P0719    | Rationality - low              | Vehicle speed                     | 4 times decreases from 24,9                      | 9 Engine speed                           | Running                                    | Once / DCY           | Two DCY      |             |
| _                           |          |                                |                                   | to 1,9 mph within 2 to 12                        | Brake                                    | Not active                                 |                      |              |             |
|                             | <u> </u> |                                |                                   | sec  |  |  |                      |              | +           |
|                             | P0724    | Rationality - high             | Vehicle speed                     | 4 times increases from 1,9                       | Engine speed                             | Running                                    | Once / DCY           | Two DCY      | +           |
|                             | 10/24    | Radonanty - Ingn               | venicie speed                     | to 24,9 mph within 2 to 12                       |  | Active                                     | Once / Be I          | I WO DC I    |             |
|                             | <u> </u> |                                |                                   | sec  |  |  |                      |              |             |
| Accelerator position sensor | P2122    | Range check min                | Short cut                         | To ground OR open circuit                        | Ignition                                 | Off OR On                                  | 100 msec             | Immediately  |             |
| 1                           | P2123    | Range check max                | Short cut                         | (< 10%)<br>To battery (> 93%)                    | Engine speed                             | Moving, not moving, running, stopping      | Continuous           |              |             |
|                             | F2123    | Kange check max                | Short cut                         | 10 battery (> 95%)                               | Eligilie speed                           | woving, not moving, running, stopping      | Continuous           |              |             |
|                             | P2121    | Rationality check              | Detected by MCP if Main           | Signal out of range (< 10%,                      | , Ignition                               | Off OR On                                  | 100 msec             | Immediately  | +           |
|                             | 1 2121   | Rationality check              | processor faulty                  | > 93%)   | , ignition                               |  | 100 msec             | miniediatery |             |
|                             |          |                                | 1                                 | Min or max fault not                             | Engine speed                             | Moving, not moving, running, stopping      | Continuous           |              |             |
|                             | 1        |                                |                                   | possible to determine                            | No DTC set                               | Accel. pos 1 circuit                       |                      |              |             |
|                             |          |                                |                                   | ·  |  | •  |                      |              |             |
| Accelerator position sensor | P2127    | Range check min                | Short cut                         | To ground OR open circuit (< 5%)                 | Ignition                                 | Off OR On                                  | 100 msec             | Immediately  |             |
| 2                           | P2128    | Range check max                | Short cut                         | To battery (> 50%)                               | Engine speed                             | Moving, not moving, running, stopping      | Continuous           |              |             |
|                             | <u> </u> |                                | +                                 | <del>                                     </del> |  |  |                      |              | +           |
|                             | P2126    | Rationality check              | Detected by MCP if Main           | Signal out of range (< 5%,                       | Ignition                                 | Off OR On                                  | 100 msec             | Immediately  | +           |
|                             | 1        |                                | processor faulty                  | > 50%)   |  |  |                      |              |             |
|                             | 1        |                                |                                   | Min or max fault not<br>possible to determine    | Engine speed                             | Moving, not moving, running, stopping      | Continuous           |              |             |
|                             | 1        |                                |                                   | DOMESTO GETERMINE                                | No DTC set                               | Accel. pos 2 circuit                       |                      |              |             |
|                             |          |                                | <u> </u>                          | <u>-                                      </u>   |  | <u> </u>                                   |                      |              |             |
|                             | P2138    | Rationality check, correlation | Difference between 1 & 2          | > 5,2%   | Ignition                                 | Off OR On                                  | 200 msec             | Immediately  |             |
| sensors 1 & 2               | 1        | fault                          | OR difference between adaptation  | 1 > 3,4% for 192 msec                            | Engine speed                             | Moving, not moving, running, stopping      | Continuous           |              |             |
|                             | <u> </u> |                                | values of 1 & 2                   |  |  |  |                      |              |             |

| Range check min Range check max Rationality check Rationality check min Range check min Range check min Range check max Rationality check Rationality check, correlation fault Rationality check, throttle min pos learning fault Rationality check, throttle position fault | Malfunction Criteria  Short cut Short cut  Detected by MCP if Main processor faulty  Short cut  Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement | Threshold Value  To ground OR open circuit (< 5.5%) To battery (> 94,5%)  Signal out of range (< 5,5% > 94.5%)  Min or max fault not nossible to determine  To ground OR open circuit (< 5.5%) To battery (> 94,5%)  Signal out of range (< 5,5% > 94.5%)  Signal out of range (< 5,5% > 94.5%)  Min or max fault not nossible to determine  > 4% for 192 msec   | Engine speed  Ignition Engine speed No DTC set  Ignition Engine speed  | Off OR On Moving, not moving, running, stopping  Off OR On Moving, not moving, running, stopping Throttle pos 1 circuit  Off OR On Moving, not moving, running, stopping Throttle pos 1 circuit  Off OR On Moving, not moving, running, stopping Throttle pos 2 circuit  Off OR On Moving, not moving, running, stopping Throttle pos 2 circuit  Off OR On Moving, not moving, running, stopping | Time Required  100 msec Continuous   | Immediately  Immediately  Immediately  Immediately  Immediately  Immediately   | Special<br>Prep  |
|--|--|--|--|--|--|--|--|
| Range check min  Range check max  Rationality check  Range check min  Range check max  Rationality check  Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle                           | Short cut  Short cut  Detected by MCP if Main processor faulty  Short cut  Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement                      | To ground OR open circuit (< 5.5%) To battery (> 94,5%) Signal out of range (< 5.5% ≥ 94.5%) Min or max fault not nossible to determine  To ground OR open circuit (< 5.5%) To battery (> 94,5%)  Signal out of range (< 5.5% ≥ 94.5%) Min or max fault not nossible to determine  > 4%  > 4%  > 4%  > 4% for 192 msec   | Ignition Engine speed  Ignition Engine speed No DTC set  Ignition Engine speed Ignition Engine speed No DTC set  Ignition Engine speed No DTC set  Ignition Engine speed Ignition Engine speed | Off OR On  Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  Throttle pos 1 circuit  Off OR On  Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping  Throttle pos 2 circuit   | 100 msec Continuous  100 msec Continuous  100 msec Continuous  100 msec Continuous  200 msec Continuous  | Immediately  Immediately  Immediately  Immediately  Immediately  | Prep   |
| Range check max  Rationality check  Range check min  Range check max  Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | Short cut  Detected by MCP if Main processor faulty  Short cut  Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement                                 | C   5 %   To battery (> 94,5%)   | Engine speed  Ignition Engine speed No DTC set  Ignition Engine speed Ignition Engine speed No DTC set  Ignition Engine speed No DTC set   | Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  Throttle pos 1 circuit  Off OR On  Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping  Throttle pos 2 circuit  | Continuous  100 msec Continuous  100 msec Continuous  100 msec Continuous  200 msec Continuous   | Immediately  Immediately  Immediately  Immediately   |  |
| Range check max  Rationality check  Range check min  Range check max  Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | Short cut  Detected by MCP if Main processor faulty  Short cut  Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement                                 | C   S   S   S  | Engine speed  Ignition Engine speed No DTC set  Ignition Engine speed Ignition Engine speed No DTC set  Ignition Engine speed No DTC set   | Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  Throttle pos 1 circuit  Off OR On  Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping  Throttle pos 2 circuit  | Continuous  100 msec Continuous  100 msec Continuous  100 msec Continuous  200 msec Continuous   | Immediately  Immediately  Immediately  Immediately   |  |
| Rationality check  Range check min  Range check max  Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle  | Detected by MCP if Main processor faulty  Short cut Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement   | To battery (> 94,5%)  Signal out of range (< 5,5% > 94,5%)  Min or max fault not nossible to determint  To ground OR open circuit (< 5,5%)  To battery (> 94,5%)  Signal out of range (< 5,5% > 94,5%)  Min or max fault not nossible to determint  > 4%  No movement after 10 alternations  | Ignition Engine speed No DTC set  Ignition Engine speed Ignition Engine speed No DTC set  Ignition Engine speed No DTC set   | Off OR On Moving, not moving, running, stopping Throttle pos 1 circuit  Off OR On Moving, not moving, running, stopping  Off OR On Moving, not moving, running, stopping Throttle pos 2 circuit  Off OR On Moving, not moving, running, stopping Throttle pos 2 circuit  | 100 msec Continuous  100 msec Continuous  100 msec Continuous  200 msec Continuous   | Immediately  Immediately  Immediately  |  |
| Rationality check  Range check min  Range check max  Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle  | Detected by MCP if Main processor faulty  Short cut Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement   | Signal out of range (< 5,5%  > 94,5%) Min or max fault not nossible to determine  To ground OR open circuit (< 5,5%, To battery (> 94,5%)  Signal out of range (< 5,5%, > 94,5%)  Signal out of range (< 1,5%, > 94,5%)  A win or max fault not nossible to determine  > 4%    24%   34% | Ignition Engine speed No DTC set  Ignition Engine speed Ignition Engine speed No DTC set  Ignition Engine speed No DTC set   | Off OR On Moving, not moving, running, stopping Throttle pos 1 circuit  Off OR On Moving, not moving, running, stopping  Off OR On Moving, not moving, running, stopping Throttle pos 2 circuit  Off OR On Moving, not moving, running, stopping Throttle pos 2 circuit  | 100 msec Continuous  100 msec Continuous  100 msec Continuous  200 msec Continuous   | Immediately  Immediately  Immediately  |  |
| Range check min  Range check max  Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | processor faulty  Short cut  Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement  | > 94.5%) Min or max fault not possible to determine  To ground OR open circuit (< 5.5%) To battery (> 94.5%)  Signal out of range (< 5.5%)  Signal out of range (< 5.5%) Min or max fault not possible to determine  > 4%  > 4% for 192 msec   | Engine speed No DTC set  Ignition Engine speed Jignition Engine speed No DTC set  Ignition Engine speed Ignition Engine speed  | Moving, not moving, running, stopping Throttle pos 1 circuit  Off OR On  Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  | Continuous  100 msec Continuous  100 msec Continuous  200 msec Continuous  | Immediately  Immediately  Immediately  |  |
| Range check min  Range check max  Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | processor faulty  Short cut  Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement  | > 94.5%) Min or max fault not possible to determine  To ground OR open circuit (< 5.5%) To battery (> 94.5%)  Signal out of range (< 5.5%)  Signal out of range (< 5.5%) Min or max fault not possible to determine  > 4%  > 4% for 192 msec   | Engine speed No DTC set  Ignition Engine speed Jignition Engine speed No DTC set  Ignition Engine speed Ignition Engine speed  | Moving, not moving, running, stopping Throttle pos 1 circuit  Off OR On  Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  | Continuous  100 msec Continuous  100 msec Continuous  200 msec Continuous  | Immediately  Immediately  Immediately  |  |
| Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | Short cut Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement   | Min or max fault not nossible to determin  To ground OR open circuit (< 5.5%) To battery (> 94,5%)  Signal out of range (< 5,5% × 94.5%)  Min or max fault not nossible to determin  > 4%  > 4% for 192 msec  No movement after 10 alternations  | No DTC set  Ignition Engine speed  Ignition Engine speed No DTC set  Ignition Engine speed   | Throttle pos 1 circuit  Off OR On  Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping   | 100 msec Continuous 100 msec Continuous 200 msec Continuous  | Immediately  |  |
| Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement   | To ground OR open circuit (< 5.5%) To battery (> 94.5%) Signal out of range (< 5.5% > 94.5%) Min or max fault not possible to determine > 4% To battery (> 94.5%)  No movement after 10 alternations   | No DTC set  Ignition Engine speed  Ignition Engine speed No DTC set  Ignition Engine speed   | Throttle pos 1 circuit  Off OR On  Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping   | 100 msec Continuous 100 msec Continuous 200 msec Continuous  | Immediately  |  |
| Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement   | To ground OR open circuit (< 5.5%) To battery (> 94,5%)  Signal out of range (< 5,5%) > 94.5%) Min or max fault not nossible to determine  > 4%  > 4%  No movement after 10 alternations   | Ignition Engine speed  Ignition Engine speed No DTC set Ignition Engine speed  | Off OR On  Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping   | Continuous  100 msec Continuous  200 msec Continuous   | Immediately  |  |
| Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement   | Ic 5.5%) To battery (> 94,5%)  Signal out of range (< 5,5%) > 94.5%) Min or max fault not possible to determine  > 4% n> 4% for 192 msec  No movement after 10 alternations  | Ignition Engine speed  Ignition Engine speed No DTC set Ignition Engine speed  | Off OR On  Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping   | Continuous  100 msec Continuous  200 msec Continuous   | Immediately  |  |
| Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement   | Ic 5.5%) To battery (> 94,5%)  Signal out of range (< 5,5%) > 94.5%) Min or max fault not possible to determine  > 4% n> 4% for 192 msec  No movement after 10 alternations  | Engine speed  Ignition  Engine speed  No DTC set  Ignition  Engine speed   | Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping  | Continuous  100 msec Continuous  200 msec Continuous   | Immediately  |  |
| Rationality check  Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | Short cut  Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement   | Ic 5.5%) To battery (> 94,5%)  Signal out of range (< 5,5%) > 94.5%) Min or max fault not possible to determine  > 4% n> 4% for 192 msec  No movement after 10 alternations  | Engine speed  Ignition  Engine speed  No DTC set  Ignition  Engine speed   | Moving, not moving, running, stopping  Off OR On  Moving, not moving, running, stopping  Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping  | Continuous  100 msec Continuous  200 msec Continuous   | Immediately  |  |
| Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle  | Detected by MCP if Main processor faulty  Difference between 1 & 2  OR difference between adaptation values of 1 & 2  Throttle movement  | Signal out of range (< 5,5% 2.94.5%) Min or max fault not possible to determine  > 4%  > 4%  > 4% for 192 msec  No movement after 10 alternations  | 5. Ignition Engine speed No DTC set  Ignition Engine speed   | Off OR On  Moving, not moving, running, stopping Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping  Off OR On   | 100 msec Continuous  200 msec Continuous   | Immediately  |  |
| Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle  | Difference between 1 & 2 OR difference between adaptation values of 1 & 2 Throttle movement  | > 94 5%) Min or max fault not possible to determine  > 4%  > 4% for 192 msec  No movement after 10 alternations  | Engine speed No DTC set  Ignition Engine speed   | Moving, not moving, running, stopping Throttle pos 2 circuit  Off OR On Moving, not moving, running, stopping  Off OR On   | Continuous  200 msec Continuous  | Immediately  |  |
| Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle  | Difference between 1 & 2 OR difference between adaptation values of 1 & 2 Throttle movement  | > 94 5%) Min or max fault not possible to determine  > 4%  > 4% for 192 msec  No movement after 10 alternations  | Engine speed No DTC set  Ignition Engine speed   | Moving, not moving, running, stopping Throttle pos 2 circuit  Off OR On Moving, not moving, running, stopping  Off OR On   | Continuous  200 msec Continuous  | Immediately  |  |
| Rationality check, correlation fault  Rationality check, throttle min pos learning fault  Rationality check, throttle  | Difference between 1 & 2 OR difference between adaptation values of 1 & 2 Throttle movement  | > 94 5%) Min or max fault not possible to determine  > 4%  > 4% for 192 msec  No movement after 10 alternations  | Engine speed No DTC set  Ignition Engine speed   | Moving, not moving, running, stopping Throttle pos 2 circuit  Off OR On Moving, not moving, running, stopping  Off OR On   | Continuous  200 msec Continuous  | Immediately  |  |
| fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | Difference between 1 & 2 OR difference between adaptation values of 1 & 2  Throttle movement   | Min or max fault not possible to determin  > 4%  > 4% for 192 msec  No movement after 10 alternations  | No DTC set  Ignition Engine speed  | Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping  Off OR On  | 200 msec<br>Continuous   |  |  |
| fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | OR difference between adaptation values of 1 & 2  Throttle movement  | > 4%  > 4% for 192 msec  No movement after 10 alternations   | No DTC set  Ignition Engine speed  | Throttle pos 2 circuit  Off OR On  Moving, not moving, running, stopping  Off OR On  | 200 msec<br>Continuous   |  |  |
| fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | OR difference between adaptation values of 1 & 2  Throttle movement  | n > 4% for 192 msec  No movement after 10 alternations   | Ignition Engine speed Ignition   | Off OR On Moving, not moving, running, stopping Off OR On  | Continuous  1,5 sec  |  |  |
| fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | OR difference between adaptation values of 1 & 2  Throttle movement  | n > 4% for 192 msec  No movement after 10 alternations   | Engine speed  Ignition   | Moving, not moving, running, stopping  Off OR On   | Continuous  1,5 sec  |  |  |
| fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | OR difference between adaptation values of 1 & 2  Throttle movement  | n > 4% for 192 msec  No movement after 10 alternations   | Engine speed  Ignition   | Moving, not moving, running, stopping  Off OR On   | Continuous  1,5 sec  |  |  |
| fault  Rationality check, throttle min pos learning fault  Rationality check, throttle   | values of 1 & 2  Throttle movement   | No movement after 10 alternations  | Engine speed  Ignition   | Off OR On  | 1,5 sec  |  |  |
| pos learning fault  Rationality check, throttle  | values of 1 & 2  Throttle movement   | No movement after 10 alternations  | Ignition   | Off OR On  | 1,5 sec  | Immediately  |  |
| pos learning fault  Rationality check, throttle  |  | alternations   |  |  |  | Immediately  |  |
| pos learning fault  Rationality check, throttle  |  | alternations   |  |  |  | Immediately  |  |
| Rationality check, throttle  | Throttle movement  |  | Engine speed   | Moving, not moving, running, stopping  | Continuous   |  |  |
|  | Throttle movement  | In wrong direction OR  |  |  | Continuous   |  |  |
|  | Throttle movement  | In wrong direction OR  |  |  | 1  |  |  |
|  |  |  | Ignition   | Off OR On  | 400 msec   | Immediately  |  |
|  |  | Does not follow calculated   | Engine speed   | Moving, not moving, running, stopping  | Continuous   |  |  |
|  | 1  | movement test pattern OR   | Liighte speed  | Moving, not moving, running, stopping  | Continuous   |  |  |
|  |  |  |  |  |  |  |  |
|  |  | > Calculated limit in  |  |  |  |  |  |
| <del></del>  |  | Bowden cable mode  |  |  | +  | <del>-  </del>   |  |
| Pationality chack throttle defaul  | Throttle position  | > 41% datacted by Main   | Ignition   | Off OR On  | 1 sac  | Immediately  |  |
|  | Throttle position  | OR   | iginuon  | On Ok Oil  | 1 sec  | ininediately   |  |
| position ratio   |  | Not within 27% to 41%  | Engine speed   | Moving, not moving, running, stopping  | Continuous   |  |  |
|  |  | detected by MCP OR   |  |  |  |  |  |
|  | MAF Air flow   | > 23 g/s   | Throttle motor power   | Disabled   |  |  |  |
|  |  |  |  |  |  |  |  |
| Sensor switching fault   | Transistor to pull one throttle  | 700 msec   | Engine speed   | Not moving, moving, running, stopping  | 700 msec   | Immediately  |  |
|  |  |  |  |  |  |  |  |
|  | TPS1 is grounded like TPS2   | TPS1 changes > 20% when  | Ignition   | On   | Continuous   |  |  |
|  |  | grounding TPS2   |  |  |  |  |  |
|  |  | TPS2 > 25%   |  |  |  |  |  |
|  | Ishould be   | I  | I  | 1  |  |  | 1  |
| ROM checkeum control   | Checksum   | Faulty for 200 mean  | Ignition   | On   | 200 msec   | Immediately  |  |
| KOWI CHECKSUIII COHUOI   | CHECKSUIII   | raunty 101 200 HISEC   |  |  |  | minieuratery   |  |
|  |  |  | Engine speed   | Running, moving, not moving, stopping  | Continuous   |  |  |
|  |  |  | -  |  | <del></del>  | <del></del>  |  |
| RAM check  | RAM  | Faulty for 200 msec  | Ignition   | On   | 200 msec   | Immediately  |  |
|  |  |  | Engine speed   | Running, moving, not moving, stopping  | Continuous   |  |  |
|  | I  |  | <u> </u>   |  |  |  | 1  |
| Tr. 1  | ECD ( CDV) I   | E t. 6 200   | Y 102  | Io.  | lann   | - Iv   | 1  |
|  |  | raulty for 200 msec  |  |  |  | Immediately  |  |
| supervision  | Communication  |  | Engine speed   | Running, moving, not moving, stopping  | Continuous   |  |  |
|  |  |  | -  |  | <del></del>  | <del></del>  |  |
| CPU control  | CPU  | Faulty for 200 msec  | Engine speed   | Ignition off, not moving, moving, running, stopping  | 200 msec   | Immediately  |  |
| •  |  |  |  | •  |  |  |  |
| ECU programming supervision  | CAN vehicle configuration  | Unprogrammed   | Ignition   | On   | Continuous   | Two DCY  |  |
|  |  |  | -  | · · · ·  |  | 1  |  |
| <del> </del>   |  |  | 4  |  | 200 HISEC  |  |  |
|  |  |  |  |  |  |  |  |
|  | Wheel circumference  | Unprogrammed   |  |  |  |  | <u> </u>   |
|  | ROM checksum control  RAM check  Internal communication supervision  | MAF Air flow  Sensor switching fault  Transistor to pull one throttle sensor to ground does not toggle within OR TPS1 is grounded like TPS2  TPS2 is not grounded like it should be  ROM checksum control  Checksum  RAM check  RAM  Internal communication supervision  ECM CPU Internal serial communication  CPU control  CPU   | position fault    MAF Air flow   > 23 g/s  | Position fault    MAF Air flow   > 23 g/s   Throttle motor power   | Dok twithin 27% to 41%   Not within 27% to 41%   Not woring, running, stopping | Position fault   Not within 27% to 41%   And the continuous   And Fair flow   Sensor switching fault   Transistor to pull one throttle sensor to ground does not toggle sensor to ground dike TPS2   TPS1 is grounded like it   TPS2   TPS1 is grounded like it   TPS2   TPS1 is prounded like it   TPS2   TPS2 is not grounded like it   TPS2   TPS3   TPS2   TPS3   T | Position fault   Not within 27% to 41%   detected the MCP CB |

| Component/  | Fault  | Monitor Strategy               | Malfunction                                       | Threshold                  | Secondary                                   | Enable   | Time              | MIL          | Special |
|---|--------|--------------------------------|---|----------------------------|---|--|-------------------|--------------|---------|
| System  | Code   | Description                    | Criteria  | Value                      | Parameters                                  | Conditions   | Required          | Illumin.     | Prep    |
| /ref 1  | P0641  | Voltage supply 1 out of range  | Voltage supply 1                                  | Not within 87,75 to 92,25% |   | On   | 100 msec          | Immediately  | Пер     |
| iei i   | F0041  | voltage supply 1 out of range  | voltage supply 1                                  | Not within 87,73 to 92,23% |   |  | Continuous        | miniediately |         |
|   |        |                                |   |                            | Engine speed                                | Running, moving, not moving, stopping                                  | Continuous        |              |         |
|   | Income | Trans.                         | Iv  | Dr. III on an on an        | dr  | la .   | Lan               | Tr           | 1       |
| Vref 2  | P0651  | Voltage supply 2 out of range  | Voltage supply 2                                  | Not within 87,75 to 92,25% | -   | On   | 100 msec          | Immediately  |         |
|   |        |                                |   |                            | Engine speed                                | Running, moving, not moving, stopping                                  | Continuous        |              |         |
|   |        |                                |   |                            |   |  |                   |              |         |
| ECM int A/D   | P1680  | Comparison A/D conversion of   |   | > 3%                       | Ignition                                    | On   | 200 msec          | Immediately  |         |
|   |        | Pedal Position sensor          | conversion difference of Pedal<br>position sensor |                            | Engine speed                                | Running, moving, not moving, stopping                                  | Continuous        |              |         |
|   |        |                                | position sensor                                   |                            |   |  |                   |              |         |
| TCM CAN data  | P1623  | Transmission controller data   | Message TCM general status                        | Not received within 1 sec  | Ignition                                    | On (3 sec since power up)  | 1 sec             | Two DCY      | I       |
| Civi Criiv data   | 11023  | missing on CAN BUS             | Wessage Telvi general status                      | rvot received within 1 see | Battery voltage                             | 6 – 18 V   | Continuous        | TWO DC I     |         |
|   |        |                                |   |                            | 1 -   |  |                   |              |         |
|   |        |                                |   |                            | Communication                               | Normal Communication not disabled with diagnostic servic<br>(SID \$28) |                   |              |         |
|   |        |                                |   |                            | Gear box                                    | Automatic  |                   |              |         |
|   |        |                                |   |                            | Recover from a reset, over or under voltage | THIS MALLE   |                   |              |         |
|   |        |                                |   |                            | condition                                   |  |                   |              |         |
|   | •      |                                | •   | •                          |   |  |                   | •            | •       |
| ΓCS/ABS CAN data  | P1625  | TCS/ABS controller data missin | Message ABS general status                        | Not received within 1 sec  | Ignition                                    | On for more than 3 sec   | 3 sec             | Two DCY      |         |
|   |        | on CAN BUS                     | OR  |                            | Battery voltage                             | 6 – 18 V   | Continuous        |              |         |
|   |        |                                | message response to Wheel                         | Not received within 1 sec  | HS CAN                                      | All nodes not in sleep mode  |                   |              |         |
|   |        |                                | Angular Velocity Front Right                      |                            |   | •  |                   |              |         |
|   |        |                                | Validity hit check                                |                            |   |  |                   |              |         |
| Deed assess and ass                                     | P0628  | Circuit continuites should     | Short-cut   | Ir                         | Ir  | Not moving OR Running  | 1 sec             | Two DCY      | 1       |
| Fuel pump relay   | P0028  | Circuit continuity check       | Snort-cut   | To ground or not connected |   | I = = = = = = = = = = = = = = = = = = =                                |                   | TWO DC Y     |         |
|   |        |                                |   |                            | Battery voltage                             | > 11,0 V   | Continuous        |              |         |
|   | P0629  |                                | Short-cut   | To battery voltage         | Ignition                                    | On   |                   |              |         |
|   |        |                                |   |                            |   |  |                   |              |         |
| Powertrain relay  | P0686  | Circuit continuity check       | Short-cut   | To ground or not connected |   | Not moving OR Running  | 0,5 sec           | Two DCY      |         |
|   |        |                                |   |                            | Battery voltage                             | > 11,0 V   | Continuous        |              |         |
|   | P0687  |                                | Short-cut   | To battery voltage         | Ignition                                    | On   |                   |              |         |
|   |        |                                |   |                            |   |  |                   |              |         |
|   | P0685  | Rationality                    | Powertrain relay                                  | Activated                  | Engine speed                                | Not moving OR Running  | 0,5 sec           | Two DCY      |         |
|   |        |                                | AND BoostControl                                  | Reports low fault          |   |  | Continuous        |              |         |
|   |        |                                | AND PurgeValve                                    | Reports low fault          |   |  |                   |              |         |
|   |        |                                | Injector 1  | Reports low fault          |   |  |                   |              |         |
|   |        |                                | Injector 2  | Reports low fault          |   |  |                   |              |         |
|   |        |                                | Injector 3  | Reports low fault          |   |  |                   |              |         |
|   |        |                                |   | •                          |   |  |                   |              |         |
|   |        |                                | Injector 4  | Reports low fault          |   |  |                   |              |         |
|   |        |                                | Combustion detect signals                         | 0                          |   |  |                   |              |         |
|   | 1      |                                | 1   | 1                          | 1   | 1  | ı                 |              | 1       |
| dle Rpm Control   | P0506  |                                | Engine idle                                       | Nominal – 100 rpm          | Vehicle speed                               | 0  | 10 sec            | Two DCY      |         |
|   |        |                                | AND Load  | < 225 mg/comb              | Battery voltage                             | > 11,0 V   | Continuous        |              |         |
|   |        |                                | AND Air to raise idle rpm                         | Reached maximum            | Accelerator pedal                           | Released   |                   |              |         |
|   |        |                                | AND all of the above during                       | 10 sec                     | Throttle limp home                          | Not active   |                   |              |         |
|   |        |                                |   |                            | BARO  | > 72 kPa   |                   |              |         |
|   |        |                                |   |                            |   |  |                   |              |         |
|   | P0507  |                                | Engine idle                                       | Nominal + 200 rpm          | Vehicle speed                               | 0  | 10 sec            | Two DCY      | 1       |
|   |        |                                | AND Air to raise idle rpm                         | Reached minimum            | Battery voltage                             | > 11,0 V   | Continuous        |              |         |
|   |        |                                | AND all of the above during                       | 10 sec                     | Accelerator pedal                           | Released   |                   |              |         |
|   |        |                                | an or the above during                            | 10 300                     | Throttle limp home                          | Not active   |                   |              |         |
|   |        |                                |   |                            | BARO  | > 72 kPa   |                   |              |         |
|   |        |                                |   | 1                          |   |  |                   | m v ov :     | ļ       |
|   |        |                                |   | < 5 degrees                | Cold start strategy                         | Enabled  | 10 sec cumulative | Two DCY      | 1       |
|   | P1400  |                                | Timing retard                                     | < 5 degrees                |   |  |                   | I WO DC I    |         |
| Cold start emission<br>reduction strategy<br>diagnostic | P1400  |                                | or<br>Idle speed increase                         | < 75 rpm                   | Load Load stable                            | < 380 mg/comb < 10 mg/comb/100 msec change, after this 1,5 sec before  | Once / DCY        | Two Be I     |         |