# 2005 3.0L (L81) for Saturn L-series
# ENGINE DIAGNOSTIC PARAMETERS

**NOTE:** Printing this file may require 8.5" x 14" (legal size) paper, depending on your printer setup.

| Component/ System | Fault Code | Monitor Strategy Description | Primary Malfunction Signal and Criteria | Threshold Value | Specified Units | Secondary Parameters | Enable Condition | Enable Value | Units | Time Required | Frequency of Checks | Criteria for Code | MIL Illumination |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mass Air Flow Sensor** | **P0101** | Rationality check | difference between measured and | < see table | | difference between both | < | 0.6 | % | 3 sec | 0.1 sec | 50 sec | two driving |
| | | | calculated air mass flow | GRDSMSS + DGRDSDMSS | | throttle signals | | | | | | cumulative | cycles |
| | | | | | | throttle 1 / throttle 2 | < | 0.5 | - | | | | 50 sec |
| | | | gradient of above signal | > see GRDSGDMSS | | Intake manifold pressure | | | | | | | cumulative |
| | | | | | | / front of throttle | < | 0.95 | - | | | | |
| | | | | | | WOT | not set | not set | - | | | | |
| | | | | | | integartor stop | not set | not set | - | | | | |
| | | | | | | time | > | 3 | sec | | | | |
| | **P0102** | range check low | Measured value | < see table KFMLDMN | | battery voltage | > | 10.5 | V | 0.6sec | 0.01 sec | | |
| | | | | > 0.6 | sec | time after start | > | 0.6 | sec | | | | |
| | **P0103** | range check high | Measured value | > see table KFMLDMX | | Error: throttle position | not set | | - | 0.6sec | 0.01 sec | | |
| | | | time | > 0.6 | sec | | | | | | | | |
| **Intake air temperature sensor** | **P0112** | range check high | temperature > threshold | 139.5 | °C | time after start | > | 180 | sec | 2 sec | 0.1 sec | 50 sec | two driving |
| | **P0113** | range check low | temperature < threshold | -42.75 | °C | time in idle | > | 10 | sec | | | cumulative | cycles |
| | | | | | | time | > | 2 | sec | | | | 50 sec |
| | | | | | | | | | | | | | cumulative |
| **Coolant temperature sensor** | **P0116** | plausibility check | ( modeled coolant temperature | 12 | °C | engine speed | > | 20 | rpm | 2 sec | 0.1 sec | 50 sec | two driving |
| | | | - measured coolant temperature) | | | | | | | | | cumulative | cycles |
| | **P0117** | range check high | temperature | 139.5 | °C | | | | | | | | 50 sec |
| | **P0118** | range check low | temperature | -42.75 | °C | | | | | | | | cumulative |
| | **P0125** | signal check | timer depending on airflow | | | time after engine start | > | 120 . . . 300 | sec | | | | |
| | | | | | | (timer depending on airflow) | | | | | | | |
| **Engine Coolant** | **P0128** | Coolant Temperature | (modeled coolant temperature | > 10.5 | °C | debouncing time | > | 20 | sec | about | 0.1 sec | 50 sec | two driving |
| **Thermostat Monitoring** | | Below Thermostat | - measured coolant temperature) > | | | fuel cut-off | not set | | - | 1000 sec | | cumulative | cycles |
| | | Regulating Temperature | | | | error: engine coolant temp | not set | | - | during | | | 50 sec |
| | | (plausibility check) | Calculated reference coolant model Limit | 87 | °C | error: vehicle speed | not set | | - | warm up | | | cumulative |
| | | | | | | ambient temperature model | > | -10.5 | °C | | | | |
| | | | | | | ambient temperature model | < | 45 | °C | | | | |
| | | | | | | vehicle speed | > | 9.38 | mph | | | | |
| | | | | | | engine speed | > | 960 | rpm | | | | |
| | | | | | | engine coolant temp at start | < | 68.3 | °C | | | | |
| | | | | | | integrated air mass flow | > | 2000 | g | | | | |
| | | | | | | engine soaking time | > | 7200 | sec | | | | |
| | | | | | | engine block heating | not detected | - | - | | | | |
| | | | | | | or engine running | > | 25 | sec | | | | |
| **Throttle Position** | | | | | | | | | | | | | |
| **Sensor 1 (primary)** | **P0121** | range check poti voltage | sensor performance | > 9 | % | battery voltage | > | 7 | V | continuous | 0.01 sec | 50 sec | 5 sec |
| | **P0122** | plausibility to other poti | sensor circuit low voltage | < 0.195 | V | | | | | | | cumulative | |
| | **P0123** | | sensor circuit high voltage | > 4.609 | V | | | | | | | | |
| **Sensor 2 (redundant)** | **P0221** | range check poti voltage, | sensor performance | > 9 | % | battery voltage | > | 7 | V | | | | |
| | **P0222** | plausibility to other poti | sensor circuit low voltage | < 0.156 | V | | | | | | | | |
| | **P0223** | | sensor circuit high voltage | > 4.805 | V | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Primary A/F sensor** | | circuit continuity | sensor signal voltage for time | > 4.81 | V | none | | | | 2 sec | 0.01 sec | 50 sec | two driving |
| **Bank 1** | **P0130** | | or | | | error: primary A/F heating | not set | - | - | | | cumulative | cycles |
| **Bank 2** | **P0150** | | | | | error: secondary O2 sensor | not set | - | - | 2 . . . 16 sec | | | 50 sec |
| | | | | | | error: secondary O2 aging | not set | - | - | | | | cumulative |
| | | | sensor signal value for time | > 0.995 | | indicator self adjust | | | | | | | |
| | | | sensor signal value for time | < 1.005 | | secondary O2 sensor voltage | > | 0.85 | V | | | | |
| | | | | | | secondary O2 sensor voltage | < | 0.103 | V | | | | |
| | | | | | | | | | | | | | |
| | | | | | | secondary O2 sensor voltage | > | 0.85 | V | 2 . . . 16 sec | | | |
| | | | or | | | error: secondary O2 sensor | not set | - | - | | | | |
| | | | sensor signal value | > 1.2 | | error: secondary O2 aging | not set | - | - | | | | |
| | | | | | | | | | | | | | |
| | | | | | | secondary O2 sensor voltage | < | 0.103 | V | 2 . . . 16 sec | | | |
| | | | or | | | error: secondary O2 sensor | not set | - | - | | | | |
| | | | sensor signal value | < 0.8 | | error: secondary O2 aging | not set | - | - | | | | |
| | | | | | | | | | | | | | |
| **Primary A/F sensor** | | range check low | standardized dynamic value | 0.566 | ratio | volumetric efficiency | > | 24 | % | approx. | 0.01 sec | 50 sec | two driving |
| **Bank 1** | **P0133** | | / modeled expected value < | | | volumetric efficiency | < | 43.5 | % | 500 sec | | cumulative | cycles |
| **Bank 2** | **P0153** | | | | | engine speed | > | 1440 | rpm | | | | 50s |
| | | | | | | engine speed | < | 2280 | rpm | | | | cumulative |
| | | | | | | lambda value | > | 0.953 | | | | | |
| | | | | | | lambda value | < | 1.047 | | | | | |
| | | | | | | event counter | > | 80 | events | | | | |
| | | | | | | error: misfire | not set | - | - | | | | |
| | | | | | | error: purge valve | not set | - | - | | | | |
| | | | | | | error: evap system | not set | - | - | | | | |
| | | | | | | error: fuel trim | not set | - | - | | | | |
| | | | | | | high canister loading factor | not detected | - | - | | | | |
| | | | | | | closed loop control maximum | | | | | | | |
| | | | | | | closed loop control minimum | | | | | | | |
| | | | | | | | | | | | | | |
| **Primary A/F sensor** | | range check high | lambda offset | 0.03 | | engine | | | | 2 sec | 0.01 sec | 50 sec | two driving |
| **Bank 1** | **P0132** | | | | | error: secondary O2 sensor | not set | | | | | cumulative | cycles |
| **Bank 2** | **P0152** | | | | | error: secondary O2 aging | not set | | - | | | | 50s |
| | | | | | | secondary O2 sensor | | | | | | | cumulative |
| | | | | | | aging diagnosis | complete | | | | | | |
| | | | | | | | | | | | | | |
| **Primary A/F sensor** | | no activity detected | lambda value | 0.1 | | event counter | > | 30 | - | approx. | 0.01 sec | 50 sec | two driving |
| **Bank 1** | **P0134** | | | | | timer | > | 0.5 | sec | 100 sec | | cumulative | cycles |
| **Bank 2** | **P0154** | | | | | exhaut gas model temp. | > | 460 | °C | | | | 50s |
| | | | | | | time after engine start | > | 25 | sec | | | | cumulative |
| | | | | | | forced lambda amplitude | active | active | - | | | | |
| | | | | | | high canister loading factor | FALSE | | - | | | | |
| | | | | | | O2 sensor max value exceeded | FALSE | | - | | | | |
| | | | | | | | | | | | | | |
| **Secondary O2 sensor** | | | sensor signal voltage | < 0.040 | V | engine | running | | | 20 sec | 0.02 sec | 50 sec | two driving |
| **Bank 1** | **P0137** | plausibility check of | time | | | Catalyst temperature model | < | 800 | °C | | | cumulative | cycles |
| **Bank 2** | **P0157** | sensor signal | | | | battery voltage | > | 10.5 | V | | | | 50s |
| | | | or | | | lambda target value | = | 1 | | 600 sec | | | cumulative |
| | | | | | | time after dew-point | > | 90 | sec | additional | | | |
| | | | | | | engine coolant temperature | < | 143 | °C | if fuel level | | | |
| | | | | | | coolant temp at engine stop | > | -48 | °C | is valid and | | | |
| | | | | | | error: engine coolant temp | not set | - | - | low | | | |
| | | | | | | | | | | | | | |
| **Secondary O2 sensor** | | | | | | engine | running | | | 5.1 sec | 0.02 sec | 50 sec | two driving |
| **Bank 1** | **P0138** | range check high | sensor signal voltage | > 1.20 | V | modeled catalyst temperature | < | 800 | °C | | | cumulative | cycles |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Bank 2** | **P0158** | | time | | | battery voltage | > | 10.5 | V | | | | 50s |
| | | | | | | lambda target value | = | 1 | | | | | cumulative |
| | | | | | | time after dew-point | > | 90 | sec | | | | |
| | **P0139** | oscillation check high/low | sensor voltage continuously > | range: 0.509 to 0.598 | V | Secondary closed loop control | active | | - | approx. | | | |
| | **P0159** | | | ( table KFUSHK ) | | | | | | 1000 sec | | | |
| **Secondary O2 sensor** | | oscillation check high/low | sensor voltage continuously < | range: 0.509 to 0.598 | V | Secondary closed loop control | active | | | approx. | 0.01 sec | 50 sec | two driving |
| **Bank 1** | **P0139** | | | ( table KFUSHK ) | | | | | | 1000 sec | | cumulative | cycles |
| **Bank 2** | **P0159** | | | > 0.2 | V | fuel cut-off | active | | | | | | 50s |
| | | | | | | | | | | | | | cumulative |
| **Secondary O2 sensor** | | no activity detected | sensor signal voltage > | > 0.421 | V | engine | running | | | 50 sec | 0.02 sec | 50 sec | two driving |
| **Bank 1** | **P0140** | | sensor signal voltage < | < 0.479 | V | modeled catalyst temperature | < | 800 | °C | | | cumulative | cycles |
| **Bank 2** | **P0160** | | | | | battery voltage | > | 10.5 | V | 600 sec | | | 50s |
| | | | | | | lambda target value | = | 1 | | | | | cumulative |
| | | | | | | time after exhaust dew-point | > | 90 | sec | | | | |
| **Secondary heater** | **P0141** | sensor element impedance | measured sensor impedance > | > see tables KFRINH * | Ohms | modeled catalyst temperature | > | 400 | °C | 15 sec | 0.1 sec | 50 sec | two driving |
| **Bank 1** | | | | FRINH | | modeled catalyst temperature | < | 580 | °C | | | cumulative | cycles |
| **Bank 2** | **P0161** | | | | | error: O2 heater circuit | not set | - | - | | | | 50s |
| | | | | | | time after exhaust dew-point | > | 15 | sec | | | | cumulative |
| **Secondary heater power stage check** | | | | IC internal | | engine speed | > | 40 | rpm | 0.5 sec | 0.1 sec | 50 sec | two driving |
| **Bank 1** | **P0036** | open circuit | Voltage | | | battery voltage | > | 7.5 | V | | | cumulative | cycles |
| **Bank 2** | **P0056** | | | | | battery voltage | < | 17.3 | V | | | | 50s |
| | | | | | | output | eactivated for complete checking | | | | | | cumulative |
| | **P0037** | range check low | | | | | | | | | | | |
| | **P0057** | | | | | | | | | | | | |
| | **P0038** | range check high | | | | | | | | | | | |
| | **P0058** | | | | | | | | | | | | |
| **Heater front** | | | | | | | | | | | | | |
| **Bank 1** | **P0030** | signal check | heater voltage | > 2.34 | V | battery voltage | > | 10.5 | V | 0.04 sec | 0.01 sec | 50 sec | two driving |
| **Bank 2** | **P0050** | | | < 3.6 | V | | < | 17.3 | V | | | cumulative | cycles |
| | | | | | | heater output stage | not active | | | | | | 50s |
| | | | | | | engine speed | running | | | | | | cumulative |
| | **P0031** | range check low | heater voltage | > 2.34 | V | battery voltage | > | 10.5 | V | | | | |
| | **P0051** | | | | | | < | 17.3 | V | | | | |
| | **P0032** | range check high | heater voltage | < 3.6 | V | heater output stage | active | | - | | | | |
| | **P0052** | | | | | engine speed | running | | - | | | | |
| | **P0135** | plausibility check | time after heater on | > 30 | sec | battery voltage | > | 10.5 | V | 30 sec | | | |
| | **P0155** | | | | | | < | 17.3 | V | | | | |
| | | | | | | heater output stage | active | | - | | | | |
| | | | | | | engine speed | running | | - | | | | |
| **Fuel system** | | | | | | | | | | | | | |
| **Bank 1 - Lean** | **P0171** | fuel trim limits exceeded | additive correction > | 8.02 | % | fuel system status | closed loop | | closed loop | 30 sec | 0.2 sec | 50 sec | two driving |
| | | | multiplicative correction > | 21.0 | % | fuel trim adaptation | active | | - | | | cumulative | cycles |
| | | | | | | | | | | once | | | 50s |
| | | | | | | | | | | adaptation | | | cumulative |
| **Bank 1 - Rich** | **P0172** | | additive correction < | -8.02 | % | | | | | has exceeded | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | multiplicative correction < | 21.0 | % | | | | | the limit | | | |
| **Bank 2 - Lean** | **P0174** | | additive correction > | 8.02 | % | | | | | | | | |
| | | | multiplicative correction > | 21.0 | % | | | | | | | | |
| **Bank 2 - Rich** | **P0175** | | additive correction < | -8.02 | % | | | | | | | | |
| | | | multiplicative correction < | -21.0 | % | | | | | | | | |
| **Fuel Injector** | | | | | | | | | | | | | |
| **Cylinder 1** | **P0201** | open circuit | voltage | IC internal | IC internal | engine speed | > | 40 | rpm | 0.5 sec | 0.1 sec | 50 sec | two driving |
| **Cylinder 2** | **P0202** | | | | | battery voltage | > | 7.5 | V | | | cumulative | cycles |
| **Cylinder 3** | **P0203** | | | | | battery voltage | < | 17.3 | V | | | | 50s |
| **Cylinder 4** | **P0204** | | | | | output | eactivated for complete checking | | | | | | cumulative |
| **Cylinder 5** | **P0205** | | | | | | | | | | | | |
| **Cylinder 6** | **P0206** | | | | | | | | | | | | |
| **Cylinder 1** | **P0261** | range check low | | | | | | | | | | | |
| **Cylinder 2** | **P0264** | | | | | | | | | | | | |
| **Cylinder 3** | **P0267** | | | | | | | | | | | | |
| **Cylinder 4** | **P0270** | | | | | | | | | | | | |
| **Cylinder 5** | **P0273** | | | | | | | | | | | | |
| **Cylinder 6** | **P0276** | | | | | | | | | | | | |
| **Cylinder 1** | **P0262** | range check high | | | | | | | | | | | |
| **Cylinder 2** | **P0265** | | | | | | | | | | | | |
| **Cylinder 3** | **P0268** | | | | | | | | | | | | |
| **Cylinder 4** | **P0271** | | | | | | | | | | | | |
| **Cylinder 5** | **P0274** | | | | | | | | | | | | |
| **Cylinder 6** | **P0277** | | | | | | | | | | | | |
| **Misfire** | | crankshaft speed | Emissions relevant misfire rate | 1.87 | % | engine speed | > | 480 | rpm | 1000 revs | continuously | detected | Fault during |
| **Multiple Cylinder** | **P0300** | fluctuation cylinder 1 to | | | | engine speed | < | 6520 | rpm | | monitored | during | 1st interval: |
| **Cylinder 1** | **P0301** | cylinder 6 | | | | relative load (idle, no drive) | > | 13.9 | % | | | 1st interval: | 2 faults in |
| **Cylinder 2** | **P0302** | | | | | relative load (drive) | > | 13.5 . . . 33.8 | % | | 3X per rev | 1 fault | 2 different |
| **Cylinder 3** | **P0303** | | | | | engine speed change | < | 5500 | rpm/sec | | | | drive cycles. |
| **Cylinder 4** | **P0304** | | | | | load change | < | 500-750 | %/segment | | | | |
| **Cylinder 5** | **P0305** | | | | | ignitions after engine start | > | 5 | ignitions | | | | Fault during |
| **Cylinder 6** | **P0306** | | | | | air temperature | > | -30 | °C | | | detected | remaining |
| | | | | | | rough road | not detected | - | - | | | during | intervals: |
| | | | | | | traction control | off | - | - | | | remaining | 8 faults in 2 |
| | | | | | | leak detection pull down phase | off | - | - | | | intervals: | different |
| | | | | | | ABS | not active | - | - | | | 4 faults | drive cycles |
| | | | | | | engine drag control | not active | - | - | | | | with at least |
| | | | | | | fuel cut off | not active | - | - | | | | 4 faults in |
| | | | | | | fuel level | >= | 11.6 | % | | | | each. |
| | | | | | | OR fuel level | < | 11.6 | % | | | | |
| | | | | | | AND solid misfire MIL | on | - | - | | | | |
| | | | | | | OR fuel level error | set | - | - | | | | |
| | | | | | | error: throttle position | not set | - | - | | | | |
| | | | | | | error: crankshaft sensor | not set | - | - | | | OR | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | error: canister purge valve | not set | - | - | | | | |
| | | | OR | | | | | | | | | | |
| | | | Catalyst damaging misfire rate | | | Includes all the above with the | | | | 1000 revs | | 1 fault | First |
| | | | misfire counts | | | following exceptions: | | | | First interval | | | occurrence: |
| | | | weighted with range table | | | First interval extention | < | 48 | °C | 200 revs | | | immediate |
| | | | | | | fuel level | >= | 11.6 | % | all remaining | | | flashing |
| | | | Damaging if value | | | OR fuel level | < | 11.6 | % | intervals | | | while error |
| | | | > | 16000 | weighted | AND blinking MIL | - | - | - | | | | present, then |
| | | | | first interval | counts | AND NOT first blink | - | - | - | | | | no MIL |
| | | | | (see attached document) | | | | | | | | | with no error. |
| | | | | or | weighted | | | | | | | | |
| | | | | 3200 | counts | | | | | | | | Second |
| | | | | remaining intervals | | | | | | | | | occurrence: |
| | | | | (see attached document) | | | | | | | | | immediate |
| | | | | | | | | | | | | | flashing |
| | | | | | | | | | | | | | while error |
| | | | | | | | | | | | | | present, then |
| | | | | | | | | | | | | | solid MIL |
| | | | | | | | | | | | | | with no error. |
| **Fault with low fuel** | **P0313** | OBD error with low fuel | fuel level < | 11.6 | % | error: misfire | active | - | - | 10 sec | 1.0 sec | 50 sec | no |
| | | | | | | OR error: fuel trim | active | - | - | | | cumulative | |
| **Rough Road Signal** | **P0318** | signal missing | signal missing | | - | no | - | - | - | 1.0 sec | 0.1 sec | 50 sec | no |
| | | | | | | | | | | | | cumulative | |
| **Knock control module** | **P0324** | rationality | IC output voltage | > 44.983 | V/s | engine coolant temperature | > | 39.8 | °C | continuous | 0.1 sec | 50 sec | two driving |
| | | | | > 0.215 | V | knock control | active | | | | | cumulative | cycles |
| | | | | < 3.691 | V | | | | rpm | | | | 50s |
| | | | | | | | | | | | | | cumulative |
| **Knock sensor** | | | | | | | | | | approx. | 0.1 sec | 50 sec | two driving |
| **Bank 1** | **P0327** | range check low | voltage < | < see table UDKSNU | V | engine coolant temperature | > | 39.75 | °C | 300 sec | | cumulative | cycles |
| | **P0328** | range check high | voltage > | > see table UDKSNO | V | engine speed | > | 2000 | rpm | | | | 50s |
| | | | | | | | | | | | | | cumulative |
| **Bank 2** | **P0332** | range check low | voltage < | < see table UDKSNU | V | | | | | | | | |
| | **P0333** | range check high | voltage > | > see table UDKSNO | V | | | | | | | | |
| **Crankshaft Position sensor** | **P0335** | malfunction | no signal from crank sensor | - | - | number of cam rotations > | 8 | - | - | approx. | 0.01 sec | 50 sec | two driving |
| | | | | | | camshaft sensor signal | active | | - | 5 sec | | cumulative | cycles |
| | | | | | | | | | | | | | 50s |
| | | | | | | | | | | | | | cumulative |
| **Camshaft position sensor** | **P0341** | rationality | inconsistent cam high / low state | => 12 | times | engine speed | > | 20 | rpm | 5 sec | 0.1 sec | 50 sec | two driving |
| | **P0342** | range check low | cam continuously low | | | | | | | | | cumulative | cycles |
| | **P0343** | range check high | cam continuously high | | | | | | | | | | 50s |
| | | | | | | | | | | | | | cumulative |
| **Catalyst monitoring** | | Determining the oxygen | Catalyst quality factor | > 0.375 | - | engine speed | > | 1000 | rpm | approx. | 0.05 sec | 1 fault | two driving |
| **Bank 1** | **P0421** | storage capability by | | | | | < | 2120 | rpm | 500 sec | once per | | cycles |
| **Bank 2** | **P0431** | comparing the amplitude | | | | volumetric efficiency | > | 20 . . . 24 | % | | driving cycle | | |
| | | obtained from secondary | | | | | < | 30 . . . 45 | % | | | | |
| | | O2 sensor to a modeled | | | | fuel system status | | | | | | | |
| | | sensor signal | | | | cumulative monitoring time | >= | 65 | sec | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | modeled catalyst temperature | > | 350 | °C | | | | |
| | | | | | | modeled signal amplitude | > | 0.36 | | | | | |
| | | | | | | catalyst load value | < | 10 . . . 30 | 1/sec | | | | |
| | | | | | | canister loading factor | < | 6 | | | | | |
| | | | | | | error: primary A/F sensor | not set | | - | | | | |
| | | | | | | error: secondary O2 sensor | not set | | | | | | |
| | | | | | | error: misfire | not set | | | | | | |
| | | | | | | error: mass air flow | not set | | | | | | |
| | | | | | | error: throttle position | not set | | | | | | |
| | | | | | | error: evap system | not set | | | | | | |
| | | | | | | error: fuel trim | not set | | | | | | |
| | | | | | | | | | | | | | |
| **Evaporative system and leak monitor** | | | | | | | | | | | | | |
| **Small Leak - 0.020 "** | **P0442** | natural pressure/vacuum | filtered fault index > | 0.7 | - | Eng. Running Vac. pull down | complete | ( see P0455 for | added details ) | approx. | 0.1 sec | filter | one driving |
| | | in tank | | | | Vac. pull down result suspec | 0.020" leak | ( see P0455 for | added details ) | 600 sec | once per | value | cycle |
| | | | based on: | | | estimated ambient air temp | > | 1.5 | ° C | each test | engine off | must | |
| | | | ( peak pressure - peak vacuum ) < | | | estimated ambient air temp | < | 32.25 | ° C | | cycle | be | once filter |
| | | | | | | coolant temp at engine stop | > | 74.25 | ° C | approx. | | exceeded | value |
| | | | | | | engine run time | > | 600 | sec | 6 test | | | has |
| | | | | | | distance travelled | > | 5 | miles | average | | | been |
| | | | | | | above vehicle speed | > | 1.5625 | mph | run length | | | exceeded |
| | | | | | | fuel volatility | < | 8 | factor | | | | |
| | | | | | | fuel level | > | 11.6 | % | | | | |
| | | | | | | fuel level | < | 88.5 | % | | | | |
| | | | | | | fuel level change w/ key off | < | 10 | % | | | | |
| | | | | | | error: vehicle speed | not set | - | - | | | | |
| | | | | | | error: engine coolant temp | not set | - | - | | | | |
| | | | | | | error: purge valve | not set | - | - | | | | |
| | | | | | | error: fuel tank pressure | not set | - | - | | | | |
| | | | | | | error: system voltage | not set | - | - | | | | |
| | | | | | | error: canister vent valve | not set | - | - | | | | |
| | | | | | | altitude adaption | valid | - | - | | | | |
| | | | | | | tank vacuum out of range | FALSE | - | - | | | | |
| | | | | | | intake air temp - eng start temp | < | 9.75 | ° C | | | | |
| | | | | | | engine coolant temp at start | < | 39.75 | ° C | | | | |
| | | | | | | Start-up intake air temperature | > | 1.5 | ° C | | | | |
| | | | | | | Start-up intake air temperature | < | 32.3 | ° C | | | | |
| | | | | | | time since previous test | > | 0 | sec | | | | |
| | | | | | | ambient pressure model | > | 68 | kPa | | | | |
| | | | | | | battery voltage | > | 11 | V | | | | |
| | | | | | | Vehicle Odometer | > | 12.4 | miles | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| **Tank vent valve** | **P0446** | underpressure in tank | tank pressure < | -270 | Pa | fuel system status | closed loop | - | - | approx. | 0.1 sec | 50 sec | two driving |
| | | | | | | vehicle speed | < | 1.875 | mph | 20 sec | | cumulative | cycles |
| | | | | | | engine | idling | - | - | | only one | | 50 sec |
| | | | | | | battery voltage | > | 10.5 | V | | completed | | cumulative |
| | | | | | | battery voltage | < | 17.3 | V | | test per | | |
| | | | | | | estimated HC concentration | < | 12 | factor | | driving cycle | | |
| | | | | | | fuel tank pressure | > | -2500 | Pa | | is allowed. | | |
| | | | | | | fuel tank pressure | < | 1000 | Pa | | | | |
| | | | | | | ratio: ( MAP Model / Baro ) | < | 0.555 | - | | | | |
| | | | | | | est amb air temp | > | 1.5 | ° C | | | | |
| | | | | | | est amb air temp | < | 32.3 | ° C | | The test | | |
| | | | | | | fuel level | > | 11.6 | % | | will attempt | | |
| | | | | | | fuel level | < | 88.5 | % | | to run up to | | |

# 2005 3.0L (L81) for Saturn L-series
# ENGINE DIAGNOSTIC PARAMETERS

| Component/ System | Fault Code | Monitor Strategy Description | Primary Malfunction Signal and Criteria | Threshold Value | Specified Units | Secondary Parameters | Enable Condition | Enable Value | Units | Time Required | Frequency of Checks | Criteria for Code | MIL Illumination |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | engine start temp - amb. temp | < | 9.8 | ° C | | the maximum | | |
| | | | | | | time after engine start | > | 1000 | sec | | number of | | |
| | | | | | | or fuel mixture adaptation | stable | | | | attempts | | |
| | | | | | | maximum number of attempts | < | 10 | - | | allowed | | |
| | | | | | | error: mass air flow | not set | | | | until | | |
| | | | | | | error: throttle position | not set | | | | successfully | | |
| | | | | | | error: coolant temp | not set | | | | completed. | | |
| | | | | | | error: intake air temp | not set | | | | | | |
| | | | | | | error: fuel tank pres | not set | | | | | | |
| | | | | | | error: system voltage | not set | | | | | | |
| | | | | | | error: purge valve | not set | | | | | | |
| | | | | | | error: vehicle speed | not set | | | | | | |
| | | | | | | error: canister vent valve | not set | | | | | | |
| | | | | | | error: purge valve flow | not set | | | | | | |
| | | | | | | error: accelerator pedal | not set | | | | | | |
| **Leaking purge valve** | **P0496** | underpressure in tank | tank pressure | -50 | Pa | fuel system status | closed loop | - | - | approx. | 0.1 sec | 50 sec | two driving |
| | | | & within the time elapsed | 4 | sec | vehicle speed | < | 1.875 | mph | 20 sec | | cumulative | cycles |
| | | | | | | engine | idling | - | - | | only one | | 50 sec |
| | | | | | | battery voltage | > | 10.5 | V | | completed | | cumulative |
| | | | | | | battery voltage | < | 17.3 | V | | test per | | |
| | | | | | | estimated HC concentration | < | 12 | factor | | driving cycle | | |
| | | | | | | fuel tank pressure | > | -2500 | Pa | | is allowed. | | |
| | | | | | | fuel tank pressure | < | 1000 | Pa | | | | |
| | | | | | | ratio: ( MAP Model / Baro ) | < | 0.555 | - | | | | |
| | | | | | | est amb air temp | > | 1.5 | ° C | | | | |
| | | | | | | est amb air temp | < | 32.3 | ° C | | The test | | |
| | | | | | | fuel level | > | 11.6 | % | | will attempt | | |
| | | | | | | fuel level | < | 88.5 | % | | to run up to | | |
| | | | | | | engine start temp - amb. temp | < | 9.8 | ° C | | the maximum | | |
| | | | | | | time after engine start | > | 1000 | sec | | number of | | |
| | | | | | | or fuel mixture adaptation | stable | | | | attempts | | |
| | | | | | | maximum number of attempts | < | 10 | - | | allowed | | |
| | | | | | | error: mass air flow | not set | | | | until | | |
| | | | | | | error: throttle position | not set | | | | successfully | | |
| | | | | | | error: coolant temp | not set | | | | completed. | | |
| | | | | | | error: intake air temp | not set | | | | | | |
| | | | | | | error: fuel tank pres | not set | | | | | | |
| | | | | | | error: system voltage | not set | | | | | | |
| | | | | | | error: purge valve | not set | | | | | | |
| | | | | | | error: vehicle speed | not set | | | | | | 40 sec |
| | | | | | | error: canister vent valve | not set | | | | | | |
| | | | | | | error: purge valve flow | not set | | | | | | |
| | | | | | | error: accelerator pedal | not set | | | | | | |
| **Purge control valve circuit** | **P0443** | open circuit | voltage | IC internal | | engine speed | > | 40 | rpm | 0.5 sec | 0.1 sec | 50 sec | two driving |
| | **P0458** | range check low | | | | battery voltage | > | 7.5 | V | | | cumulative | cycles |
| | **P0459** | range check high | | | | battery voltage | < | 17.3 | V | | | | 50s |
| | | | | | | output | eactivated for complete checking | | | | | | cumulative |
| **Evaporative emission control system vent valve** | **P0498** | range check low | voltage | IC internal | | engine speed | > | 40 | rpm | 0.5 sec | 0.1 sec | 50 sec | two driving |
| | **P0499** | range check high | | | | battery voltage | > | 7.5 | V | | | cumulative | cycles |
| | **P0449** | open circuit | | | | battery voltage | < | 17.3 | V | | | | 50s |
| | | | | | | output | eactivated for complete checking | | | | | | cumulative |
| **Tank System pressure sensor** | **P0451** | rationality - Increment check | sensor signal value change < | 63 | Pa | purge duty cycle change | > | 40 | % duty cycle | 10 sec | 0.1 sec | 50 sec | two driving |

## 2005 3.0L (L81) for Saturn L-series
## ENGINE DIAGNOSTIC PARAMETERS

| Component/ System | Fault Code | Monitor Strategy Description | Primary Malfunction Signal and Criteria | Threshold Value | Specified Units | Secondary Parameters | Enable Condition | Enable Value | Units | Time Required | Frequency of Checks | Criteria for Code | MIL Illumination |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | vehicle speed | >= | 0 | mph | | | | |
| | | | | | | ratio: ( MAP Model / Baro ) | < | 0.602 | - | | | | |
| | | | | | | fuel level too high | FALSE | | | | | | |
| | | | | | | fuel level too low | FALSE | | | | | | |
| | | rationality - Out of range | sensor signal value > | 1500 | Pa | coolant temperature at start | <= | 35 | ° C | 10 sec | | cumulative | cycles |
| | | | or < | -1500 | Pa | time after start | > | 1 | sec | 10 sec | | | |
| | **P0451** | Signal - Signal noise | sensor signal value change > | 1219 | Pa | vehicle speed | < | 18.6 | mph | 25.5 | | | |
| | **P0452** | voltage/range check low | sensor signal value < | -2812 | Pa | | | | | 10 sec | | | 50s |
| | **P0453** | voltage/range check high | sensor signal value > | 2938 | Pa | - | - | - | - | 10 sec | | | |
| **Rough leak** | **P0455** | vacuum pulldown slope | absolute value | range | | fuel system status | closed loop | - | - | approx. | 0.1 sec | 50 sec | two driving |
| | | | of vacuum pulldown slope < | 30 to 70 | Pa / sec | vehicle speed | < | 1.875 | mph | 20 sec | | cumulative | cycles |
| | | | | ( see KLGGRTED05 ) | | engine | idling | - | - | | only one | | 50 sec |
| | | | | | | battery voltage | > | 10.5 | V | | completed | | cumulative |
| | | | | | | battery voltage | < | 17.3 | V | | test per | | |
| | | | | | | estimated HC concentration | < | 12 | factor | | driving cycle | | |
| | | | | | | fuel tank pressure | > | -2500 | Pa | | is allowed. | | |
| | | | | | | fuel tank pressure | < | 1000 | Pa | | | | |
| | | | | | | ratio: ( MAP Model / Baro ) | < | 0.555 | - | | | | |
| | | | | | | est amb air temp | > | 1.5 | ° C | | | | |
| | | | | | | est amb air temp | < | 32.3 | ° C | | The test | | |
| | | | | | | fuel level | > | 11.6 | % | | will attempt | | |
| | | | | | | fuel level | < | 88.5 | % | | to run up to | | |
| | | | | | | engine start temp - amb. temp | < | 9.8 | ° C | | the maximum | | |
| | | | | | | time after engine start | > | 1000 | sec | | number of | | |
| | | | | | | or fuel mixture adaptation | stable | | | | attempts | | |
| | | | | | | maximum number of attempts | < | 10 | - | | allowed | | |
| | | | | | | error: mass air flow | not set | | | | until | | |
| | | | | | | error: throttle position | not set | | | | successfully | | |
| | | | | | | error: coolant temp | not set | | | | completed. | | |
| | | | | | | error: intake air temp | not set | | | | | | |
| | | | | | | error: fuel tank pres | not set | | | | | | |
| | | | | | | error: system voltage | not set | | | | | | |
| | | | | | | error: purge valve | not set | | | | | | |
| | | | | | | error: vehicle speed | not set | | | | | | |
| | | | | | | error: canister vent valve | not set | | | | | | |
| | | | | | | error: purge valve flow | not set | | | | | | |
| | | | | | | error: accelerator pedal | not set | | | | | | |
| **Fuel level sensor** | **P0462** | range check low | | < 0.2 | V | - | - | - | - | 60 sec | 0.1 sec | 50 sec | no |
| | **P0463** | range check high | voltage | > 3.1 | V | | | | | | | cumulative | |
| | **P0461** | rationality | Liter | >15 | liters | | | | | 600 sec | 0.1 sec | 50 sec | no |
| | | | | <-15 | liters | | | | | | | cumulative | |
| | | | | deviation from last | | | | | | | | | |
| | | | | detected refueling | | | | | | | | | |
| **Cooling fan control ciruit** | **P0480** | open circuit | voltage | IC internal | | engine speed | > | 40 | rpm | 0.5 sec | 0.1 sec | 50 sec | two driving |
| **Fan A** | **P0691** | range check low | | | | battery voltage | > | 7.5 | V | | | cumulative | cycles |

# 2005 3.0L (L81) for Saturn L-series
## ENGINE DIAGNOSTIC PARAMETERS

| Component/ System | Fault Code | Monitor Strategy Description | Primary Malfunction Signal and Criteria | Threshold Value | Specified Units | Secondary Parameters | Enable Condition | Enable Value | Units | Time Required | Frequency of Checks | Criteria for Code | MIL Illumination |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **P0692** | range check high | | | | battery voltage | < | 17.3 | V | | | | 50s |
| | | | | | | output | eactivated for complete checking | | | | | | cumulative |
| **Fan B** | **P0481** | open circuit | | | | | | | | | | | |
| | **P0693** | range check low | | | | | | | - | | | | |
| | **P0694** | range check high | | | | | | | | | | | |
| **vehicle speed sensor** | **P0500** | rationality | vehicle speed | < 12.4 | mph | engaged gear | = | 4 | | 1 sec | 0.1 sec | 50 sec | two driving |
| | | | | | | error: transmission gear state | FALSE | - | - | | | cumulative | cycles |
| | | | | | | coolant temperature | > | 64.5 | ° C | | | | 50s |
| | | | | | | engine speed | > | 1800 | rpm | | | | cumulative |
| | | | | | | engine speed | < | 6500 | rpm | | | | |
| **idle speed control** | **P0506** | functional check | actual - desired rpm > | > 100 | rpm | coolant temperature | > | 70.5 | ° C | 2 sec | 0.2 sec | 50 sec | two driving |
| | | | actual - desired rpm < | < -200 | rpm | intake air temperature | > | -10.5 | ° C | | | cumulative | cycles |
| | **P0507** | | or | | | vehicle speed | = | 0 | mph | | | | 50s |
| | | | fuel cut off during this idle | > 3 | times | high canister loading factor | not detected | | | | | | cumulative |
| | | | | | | evap diagnostic intrusive test | not active | | | | | | |
| | | | | | | error: throttle position | not set | - | - | | | | |
| | | | | | | error: vehicle speed | not set | - | - | | | | |
| | | | | | | error: engine coolant temp | not set | - | - | | | | |
| | | | | | | error: intake air temperature | not set | - | - | | | | |
| | | | | | | error: evap. System leak | not set | - | - | | | | |
| | | | | | | error: canister purge valve | not set | - | - | | | | |
| | | | | | | volumetric efficiency | < | 50.25 | % | | | | |
| **system voltage** | **P0560** | open circuit | system voltage < | 2.5 | V | | | | | 0.2 sec | 0.01 sec | 50 sec | no |
| | **P0562** | range check low | system voltage < | 9 | V | time after start | > | 180 | sec | | | cumulative | |
| | **P0563** | range check high | system voltage > | 17.3 | V | vehicle speed | > | 0 | mph | | | | |
| **calculator monitoring** | **P0601** | ROM check | check sum ROM error | | | no | | | | 30 sec | 0.01 sec | 5 sec | 5 sec |
| **calculator monitoring** | **P0603** | calculator check | calculator check | | | no | | | | 0.05 sec | 0.01 sec | 5 sec | 5 sec |
| **calculator monitoring** | **P0604** | RAM check | Read- and write-test | | | no | | | | 0.05 sec | 0.01 sec | 5 sec | 5 sec |
| **function monitoring** | **P0606** | monitoring torque safety | torque out of range calculator error | | | engine speed | > | 1120 | rpm | 0.05 sec | 0.01 sec | 5 sec | 5 sec |
| | **P2110** | fuel cut off | in function | | | | | | | | | | |
| **Electronic Throttle Control** | **P0638** | range check low | powerstage duty cycle < | -80 | % | battery voltage | > | 7 | V | 0.6 sec | | 5.0 sec | 5 sec |
| | | | | | | | | | | reversible | | | |
| | | range check high | powerstage duty cycle > | 80 | % | battery voltage | | | | 5.0 sec | | | |
| | | | | | | | | | | latched | | | |
| **Malfunction indicator (MIL) request** | **P0700** | MIL control request from | OBD2 failure | | | time | > | 5 | sec | 2 sec | 1 sec | 5 sec | 5 sec |
| | | TCM | | | | no TCM failure | not set | | - | | | | |
| | | (Specific TCM DTC shown | | | | | | | | | | | |
| | | in freeze frame) | | | | | | | | | | | |
| **DV-E limp home air position** | **P1551** | limp-home throttle position | throttle position | < 1.699 | % | vehicle speed | <= | 0 | mph | 0.5 sec | 0.01 sec | 50 sec | two driving |
| | | out of range | OR | | | engine speed | < | 40 | rpm | | | cumulative | cycles |
| | | | throttle position | > 11.73 | % | engine coolant temperature | >= | 5.3 | ° C | | | | 50 sec |
| | | | | | | engine coolant temperature | <= | 99.8 | ° C | | | | cumulative |
| | | | | | | intake air temperature | >= | 5.3 | ° C | | | | |

# 2005 3.0L (L81) for Saturn L-series
## ENGINE DIAGNOSTIC PARAMETERS

| Component/ System | Fault Code | Monitor Strategy Description | Primary Malfunction Signal and Criteria | Threshold Value | Specified Units | Secondary Parameters | Enable Condition | Enable Value | Units | Time Required | Frequency of Checks | Criteria for Code | MIL Illumination |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | battery voltage | > | 10 | V | | | | |
| | | | | | | accelerator pedal position | < | 14.9 | % | | | | |
| **DV-E power stage switch off** | **P2100** | powerstage circuit switch-off | output circuits not deactivated as commanded | - | - | - | - | - | - | 0.1 sec | 0.01 sec | 5 sec | 5 sec |
| **DV-E position throttle blade** | **P2101** | difference between set and actual position | ce between set and actual position of throt | typical 4% to 50% dependent on rate of change | | electronic throttle adaptation | not active | - | - | 0.5 sec | 0.001 sec | 5 sec | 5 sec |
| | | | | | | battery voltage | > | 7 | V | | | | |
| **DV-E return spring check** | **P2119** | functionality of return spring | throttle blade return response | 0.56 | sec | vehicle speed | <= | 0 | mph | 0.5 sec | 0.01 sec | 5 sec | 5 sec |
| | | | | | | engine speed | < | 40 | rpm | | | | |
| | | | | | | engine coolant temperature | >= | 5.3 | ° C | | | | |
| | | | | | | engine coolant temperature | <= | 99.8 | ° C | | | | |
| | | | | | | intake air temperature | >= | 5.3 | ° C | | | | |
| | | | | | | battery voltage | > | 10 | V | | | | |
| | | | | | | accelerator pedal position | < | 14.9 | % | | | | |
| **Accelerator Pedal Position Sensor 1** | **P2122** | range check low | voltage < | 0.879 | V | battery voltage | > | 7 | V | 0.14 sec | 0.01 sec | 5 sec | 5 sec |
| | **P2123** | range check high | or voltage > | 4.824 | V | | | | | | | | |
| **Accelerator Pedal Position 1 vs. 2** | **P2138** | plausibility | voltage difference - idle range > | 0.234 | V | | | | | | | | |
| | | | voltage diff. - pedal partial press > | 0.273 | V | | | | | | | | |
| | | | voltage diff. - pedal fully pressed > | 1.074 | V | | | | | | | | |
| | | plausibility when leaving idle | pedal 2 voltage delta filtered volts < | 0.039 | V | pedal 1 voltage increase from to | < > | 1.133 1.289 | V V | 0.1 sec | | | |
| **Accelerator Pedal Position Sensor 2** | **P2127** | range check low | voltage < | 0.664 | V | battery voltage | > | 7 | V | 0.14 sec | 0.01 sec | 5 sec | 5 sec |
| | **P2128** | range check high | or voltage > | 4.824 | V | | | | | | | | |
| **DV-E lower mechanical stop throttle blade** | **P2176** | throttle replacement detected and no re-learn | | | | vehicle speed | <= | 0 | mph | 0.5 sec | 0.01 sec | 50 sec cumulative | two driving cycles |
| | | | | | | engine speed | < | 40 | rpm | | | | |
| | | | | | | engine coolant temperature | >= | 5.3 | ° C | | | | 50 sec |
| | | | | | | | | | | | | | cumulative |
| | | learning prohibited due to secondary parms not met | range check poti1 value at lower stop < | 0.2356 | V | engine coolant temperature | <= | 99.8 | ° C | | | | no |
| | | | range check poti1 value at lower stop > | 0.8215 | V | intake air temperature | >= | 5.3 | ° C | | | | |
| | | minimum throttle position out of range | range check poti2 value at lower stop < | 4.204 | V | battery voltage | > | 10 | V | | | | |
| | | | range check poti2 value at lower stop > | 4.77 | V | accelerator pedal position | < | 14.9 | % | | | | |
| | **P2176** | initial throttle learn failed | | | | | | | | | | | 5 sec |
| **CAN-BUS communication malfuction** | **U0121** | CAN-BUS circuit | common not identified bus error | - | - | engine speed | > | 25 | rpm | 25 sec | 0.1 sec | 50 sec cumulative | no |
| **CAN-BUS fewer controllers on Bus than specified** | **P0606** | CAN-BUS circuit | Fewer controllers on bus than programmed in the vehicle CAN configuration list | - | - | engine speed | > | 25 | rpm | 25 sec | 0.1 sec | 50 sec cumulative | no |
| **CAN-BUS Reset counter overrun** | **U0073** | CAN-BUS circuit | Reset counter | - | - | engine speed | > | 25 | rpm | 25 sec | 0.1 sec | 50 sec cumulative | two driving cycles |

## 2005 3.0L (L81) for Saturn L-series
## ENGINE DIAGNOSTIC PARAMETERS

| Component/ System | Fault Code | Monitor Strategy Description | Primary Malfunction Signal and Criteria | Threshold Value | Specified Units | Secondary Parameters | Enable Condition | Enable Value | Units | Time Required | Frequency of Checks | Criteria for Code | MIL Illumination |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | 50 sec |
| | | | | | | | | | | | | | cumulative |
| **CAN-BUS** | **U0101** | CAN-BUS circuit | no communication with TCM | - | - | engine speed | > | 25 | rpm | 25 sec | 0.1 sec | 5 sec | 5 sec |
| **lost communication with TCM** | | | | | | | | | | | | | |
| **CAN-BUS** | **U0140** | CAN-BUS circuit | no communication with BCM | - | - | engine speed | > | 25 | rpm | 25 sec | 0.1 sec | 50 sec | no |
| **lost communication with BCM** | | | | | | | | | | | | cumulative | |
| | | | | | | | | | | | | | |

# 2005 3.0L (L81) for Saturn L-series
## ENGINE DIAGNOSTIC PARAMETERS

| Component/ System | Fault Code | Monitor Strategy Description | Primary Malfunction Signal and Criteria | Threshold Value | Specified Units | Secondary Parameters | Enable Condition | Enable Value | Units | Time Required | Frequency of Checks | Criteria for Code | MIL Illumination |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## ENGINE DIAGNOSTIC PARAMETER--LOOK-UP TABLES

**P0101**

GRDSDMSS **gradient of air flow**

x: grdwdkba_w gradient of throttle angel [ -]

| grdwdkba_w | 0.0 | 0.0 | 0.0 | 2.0 | 2.5 | 3.0 | 4.0 | 5.0 |
|---|---|---|---|---|---|---|---|---|
| GRDSDMSS | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |

GRDSGDMSS **related gradient of throttle angle**

x: grdwdkba_w gradient of throttle angel [ -]

| grdwdkba_w | 0.0 | 0.0 | 0.0 | 1.0 | 2.5 | 3.0 |
|---|---|---|---|---|---|---|
| GRDSGDMSS | 2.0 | 2.0 | 4.0 | 4.0 | 4.0 | 4.0 |

**P0102**

KFMLDMN minimum air mass flow threshold

| Mass air flow **(kg/h)** | Percent throttle (%) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| engine speed [rpm] | 0.00 | 14.06 | 28.13 | 42.19 | 56.25 | 70.31 | 84.38 | 99.61 |
| 300 | -10.0 | -10.0 | -10.0 | -10.0 | -10.0 | -10.0 | -10.0 | -10.0 |
| 800 | 0.5 | 9.3 | 14.4 | 14.5 | 15.0 | 15.0 | 15.0 | 15.0 |
| 1200 | 0.9 | 13.3 | 22.8 | 27.9 | 28.2 | 28.5 | 28.5 | 27.5 |
| 2000 | 1.2 | 22.4 | 38.9 | 43.7 | 45.6 | 45.6 | 45.3 | 45.3 |
| 3000 | 1.9 | 23.8 | 58.0 | 84.3 | 103.4 | 109.3 | 111.2 | 110.5 |
| 4000 | 2.8 | 24.6 | 67.5 | 100.7 | 117.4 | 124.1 | 126.5 | 126.5 |

| Component/ System | Fault Code | Monitor Strategy Description | Primary Malfunction Signal and Criteria | Threshold Value | Specified Units | Secondary Parameters | Enable Condition | Enable Value | Units | Time Required | Frequency of Checks | Criteria for Code | MIL Illumination |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

# ENGINE DIAGNOSTIC PARAMETER--LOOK-UP TABLES

**P0103**

KFMLDMX maximum air mass flow threshold

| Mass air flow **(kg/h)** | Percent throttle (%) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| engine speed [rpm] | 0.00 | 14.06 | 28.13 | 42.19 | 56.25 | 70.31 | 84.38 | 99.61 |
| 300 | 300.0 | 300.0 | 300.0 | 300.0 | 300.0 | 300.0 | 300.0 | 300.0 |
| 800 | 88.9 | 88.9 | 98.2 | 98.3 | 102.0 | 102.0 | 102.0 | 104.6 |
| 1200 | 140.7 | 160.0 | 173.0 | 186.0 | 188.7 | 191.6 | 191.6 | 191.6 |
| 2000 | 182.4 | 202.0 | 264.0 | 277.0 | 280.5 | 283.4 | 284.7 | 283.1 |
| 3000 | 184.3 | 212.1 | 421.5 | 505.0 | 524.0 | 537.0 | 547.0 | 554.0 |
| 4000 | 190.0 | 217.9 | 450.0 | 573.0 | 606.0 | 632.0 | 645.0 | 658.0 |
| 5000 | 210.0 | 231.6 | 482.0 | 634.4 | 686.5 | 713.7 | 726.0 | 750.0 |
| 6000 | 228.0 | 255.0 | 508.0 | 685.2 | 762.2 | 804.0 | 855.5 | 916.7 |

| Mass air flow **(g/s)** | Percent throttle (%) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| engine speed [rpm] | 0.00 | 14.06 | 28.13 | 42.19 | 56.25 | 70.31 | 84.38 | 99.61 |
| 300 | 83.4 | 83.4 | 83.4 | 83.4 | 83.4 | 83.4 | 83.4 | 83.4 |
| 800 | 24.7 | 24.7 | 27.3 | 27.3 | 28.4 | 28.4 | 28.4 | 29.1 |
| 1200 | 39.1 | 44.5 | 48.1 | 51.7 | 52.5 | 53.3 | 53.3 | 53.3 |
| 2000 | 50.7 | 56.2 | 73.4 | 77.0 | 78.0 | 78.8 | 79.1 | 78.7 |
| 3000 | 51.2 | 59.0 | 117.2 | 140.4 | 145.7 | 149.3 | 152.1 | 154.0 |
| 4000 | 52.8 | 60.6 | 125.1 | 159.3 | 168.5 | 175.7 | 179.3 | 182.9 |
| 5000 | 58.4 | 64.4 | 134.0 | 176.4 | 190.8 | 198.4 | 201.8 | 208.5 |
| 6000 | 63.4 | 70.9 | 141.2 | 190.5 | 211.9 | 223.5 | 237.8 | 254.8 |

**P0141**

KFRINH

x: tkatmf, modeled catalyst temperature [ 'C]

y: phlsnhf, Seconday O2 sensor heater performance

w: Seconday heater element impedance [ Ohms]

| phlsnhf \ tkatmf | 300 | 400 | 500 | 600 | 700 |
|---|---|---|---|---|---|
| 0.7 | 1200 | 544 | 384 | 352 | 320 |
| 0.8 | 1048 | 352 | 320 | 272 | 224 |
| 1 | 848 | 224 | 192 | 176 | 160 |

FRINH multiplication factor for secondary sensor element impedance bank 1

x: tkatmf, modeled catalyst temperature [ 'C]

w: FRINH

| tkatmf | 300 | 400 | 500 | 600 | 700 |
|---|---|---|---|---|---|
| FRINH | 63.75 | 42 | 6 | 5 | 5 |

# 2005 3.0L (L81) for Saturn L-series
# ENGINE DIAGNOSTIC PARAMETERS

| Component/ System | Fault Code | Monitor Strategy Description | Primary Malfunction Signal and Criteria | Threshold Value | Specified Units | Secondary Parameters | Enable Condition | Enable Value | Units | Time Required | Frequency of Checks | Criteria for Code | MIL Illumination |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## ENGINE DIAGNOSTIC PARAMETER--LOOK-UP TABLES

**P0161**

KFRINH

x: tkatmf, modeled catalyst temperature [ 'C]

y: phlsnhf, Seconday O2 sensor heater performance

w: Seconday heater element impedance [ Ohms]

| phlsnhf \ tkatmf | 300 | 400 | 500 | 600 | 700 |
|---|---|---|---|---|---|
| 0.7 | 1200 | 552 | 384 | 352 | 320 |
| 0.8 | 1048 | 504 | 320 | 272 | 224 |
| 1 | 848 | 328 | 192 | 176 | 160 |

FRINH multiplication factor for secondary sensor element impedance bank 1

x: tkatmf, modeled catalyst temperature [ 'C]

w: FRINH

| tkatmf | 300 | 400 | 500 | 600 | 700 |
|---|---|---|---|---|---|
| FRINH | 63.75 | 57 | 12 | 8 | 8 |

**P0138, P0158, P0139, P0159**

KFUSHK reference voltage for post lambda closed loop control

| Ref. Voltage [V] | engine speed [rpm] | | | | | |
|---|---|---|---|---|---|---|
| Vol. Efficiency [%] | 1000 | 1520 | 2000 | 2520 | 3000 | 4000 |
| 15 | 0.598 | 0.593 | 0.588 | 0.582 | 0.577 | 0.551 |
| 20.3 | 0.593 | 0.588 | 0.582 | 0.577 | 0.572 | 0.546 |
| 24.8 | 0.582 | 0.577 | 0.572 | 0.567 | 0.561 | 0.546 |
| 35.3 | 0.567 | 0.551 | 0.541 | 0.541 | 0.541 | 0.541 |
| 45 | 0.541 | 0.515 | 0.515 | 0.525 | 0.53 | 0.541 |
| 54.8 | 0.53 | 0.509 | 0.509 | 0.509 | 0.52 | 0.535 |

**P0327, P0332**

UDKSNU lower reference voltage limit - knock diagnosis

| engine speed [rpm] | 400 | 800 | 1200 | 1600 | 2000 | 2400 | 2800 | 3200 |
|---|---|---|---|---|---|---|---|---|
| UDKSNU [V] | 0.00 | 0.00 | 0.00 | 0.00 | 0.51 | 0.70 | 0.70 | 0.80 |
| cont. | 3600 | 4000 | 4400 | 4800 | 5200 | 5600 | 6000 | 6400 |
| | 0.90 | 1.31 | 1.41 | 1.89 | 2.30 | 2.70 | 3.01 | 5.00 |

**P0328, P0333** upper reference voltage limit - knock diagnosis

| UDKSNO | 400 | 800 | 1200 | 1600 | 2000 | 2400 | 2800 | 3200 |
|---|---|---|---|---|---|---|---|---|
| engine speed [rpm] | 29.61 | 29.61 | 29.61 | 29.61 | 29.61 | 29.61 | 29.61 | 38.11 |
| UDKSNO [V] | | | | | | | | |
| cont. | 3600 | 4000 | 4400 | 4800 | 5200 | 5600 | 6000 | 6400 |
| | 46.70 | 52.60 | 57.79 | 65.00 | 72.50 | 80.29 | 87.50 | 95.00 |

# 2005 3.0L (L81) for Saturn L-series
# ENGINE DIAGNOSTIC PARAMETERS

| Component/ System | Fault Code | Monitor Strategy Description | Primary Malfunction Signal and Criteria | Threshold Value | Specified Units | Secondary Parameters | Enable Condition | Enable Value | Units | Time Required | Frequency of Checks | Criteria for Code | MIL Illumination |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## ENGINE DIAGNOSTIC PARAMETER--LOOK-UP TABLES

**P0442**

KFEONVPT expected pressure difference ( peak pressure - peak vacuum )

| pressure delta **( hPa )** | estimated ambient air temperature ( ° C ) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| fuel level ( % ) | -4.50 | -1.50 | 1.50 | 7.50 | 10.50 | 16.50 | 22.50 | 25.50 | 28.50 | 34.50 |
| 11 | 9.27 | 8.63 | 8.22 | 8.62 | 9.78 | 13.33 | 15.23 | 14.62 | 13.81 | 9.77 |
| 14 | 8.93 | 8.38 | 8.06 | 8.54 | 9.68 | 13.21 | 15.27 | 14.41 | 13.35 | 9.64 |
| 20 | 8.68 | 8.53 | 8.47 | 8.83 | 9.61 | 12.41 | 14.59 | 13.36 | 12.18 | 10.07 |
| 32 | 7.05 | 7.80 | 8.20 | 8.66 | 9.15 | 10.32 | 11.75 | 10.17 | 9.51 | 12.26 |
| 41 | 6.10 | 7.24 | 7.49 | 7.34 | 7.90 | 8.60 | 9.72 | 8.80 | 8.92 | 13.53 |
| 50 | 7.43 | 8.59 | 8.25 | 6.34 | 6.56 | 6.33 | 7.00 | 7.54 | 8.82 | 14.29 |
| 59 | 8.45 | 8.77 | 7.50 | 4.45 | 4.94 | 5.36 | 5.88 | 7.48 | 8.96 | 12.94 |
| 69 | 7.88 | 8.14 | 7.32 | 5.82 | 6.98 | 7.65 | 6.68 | 7.99 | 8.66 | 10.79 |
| 81 | 5.90 | 6.20 | 5.88 | 5.68 | 6.99 | 8.26 | 7.76 | 8.65 | 8.66 | 10.05 |
| 90 | 6.81 | 6.83 | 6.24 | 5.34 | 5.86 | 6.40 | 6.43 | 6.94 | 7.04 | 9.41 |
| 93 | 7.04 | 7.04 | 6.40 | 5.29 | 5.55 | 5.68 | 5.70 | 6.04 | 6.19 | 8.93 |

| pressure delta **( Pa )** | estimated ambient air temperature ( ° C ) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| fuel level ( % ) | -4.50 | -1.50 | 1.50 | 7.50 | 10.50 | 16.50 | 22.50 | 25.50 | 28.50 | 34.50 |
| 11 | 927 | 863 | 822 | 862 | 978 | 1333 | 1523 | 1462 | 1381 | 977 |
| 14 | 893 | 838 | 806 | 854 | 968 | 1321 | 1527 | 1441 | 1335 | 964 |
| 20 | 868 | 853 | 847 | 883 | 961 | 1241 | 1459 | 1336 | 1218 | 1007 |
| 32 | 705 | 780 | 820 | 866 | 915 | 1032 | 1175 | 1017 | 951 | 1226 |
| 41 | 610 | 724 | 749 | 734 | 790 | 860 | 972 | 880 | 892 | 1353 |
| 50 | 743 | 859 | 825 | 634 | 656 | 633 | 700 | 754 | 882 | 1429 |
| 59 | 845 | 877 | 750 | 445 | 494 | 536 | 588 | 748 | 896 | 1294 |
| 69 | 788 | 814 | 732 | 582 | 698 | 765 | 668 | 799 | 866 | 1079 |
| 81 | 590 | 620 | 588 | 568 | 699 | 826 | 776 | 865 | 866 | 1005 |
| 90 | 681 | 683 | 624 | 534 | 586 | 640 | 643 | 694 | 704 | 941 |
| 93 | 704 | 704 | 640 | 529 | 555 | 568 | 570 | 604 | 619 | 893 |

**P0455**

KLGGRTED05 vacuum decay rate

| fuel level **( L )** | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 75 | 80 |
|---|---|---|---|---|---|---|---|---|---|---|
| vac. decay ( **hPa** / sec ) | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |

| fuel level **( % )** | 0 | 17 | 33 | 50 | 66 | 83 | 99 | 116 | 124 | 132 |
|---|---|---|---|---|---|---|---|---|---|---|
| vac. decay ( **Pa** / sec ) | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 |