

2008-10 ENGINE PERFORMANCE

Mode 06 - X6

MODE 06

Model year as from: 08

Issue: 9/17/2007

Vehicle type(s): E71

Engine: N54

Engine control unit: MSD81

Country: US

Mode \$06 Monitor ID - N54 Engine

| CAN (ISO 15765-4)                              |                                         |                                          |                      |                                                                                                                                                                           |                                        |                                    |                   |
|------------------------------------------------|-----------------------------------------|------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------------|-------------------|
| On Board Diagnostic Monitor ID<br>OBDMID (hex) | Component/System                        | Std./Manuf. Defined TID<br>S/MDTID (hex) | Type (linear/binary) | Test                                                                                                                                                                      | Threshold/Type (upper/lower threshold) | Unit and Scaling ID<br>UASID (hex) | Scaling/Factor    |
| 01                                             | Oxygen Sensor Monitor Bank 1 - Sensor 1 |                                          |                      |                                                                                                                                                                           |                                        |                                    |                   |
|                                                |                                         | 83                                       | linear               | <b>Dynamic test</b><br><br>A fixed number of defined lambda amplitudes is precontrolled. The measured amplitudes are averaged and related to a defined limit value sensor | lower threshold                        | 04                                 | 0,001 pe<br>bit   |
| 02                                             | Oxygen Sensor Monitor Bank 1 - Sensor 2 |                                          |                      |                                                                                                                                                                           |                                        |                                    |                   |
|                                                |                                         | 01                                       | binary               | <b>Rich to lean sensor</b>                                                                                                                                                | upper threshold                        | 0A                                 | 0,122m<br>per bit |

|  |  |    |        |                                                                                                                                                                                                                                       |                 |    |                  |
|--|--|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----|------------------|
|  |  |    |        | <b>threshold voltage (constant)</b>                                                                                                                                                                                                   |                 |    |                  |
|  |  | 02 | binary | <b>Lean to rich sensor threshold voltage (constant)</b>                                                                                                                                                                               | upper threshold | 0A | 0,122mV per bit  |
|  |  | 07 | binary | <b>Minimum sensor voltage for test cycle (calculated)</b><br>The minimum voltage value is displayed                                                                                                                                   | lower threshold | 0A | 0,122mV per bit  |
|  |  | 08 | binary | <b>Maximum sensor voltage for test cycle (calculated)</b><br>The maximum voltage value is displayed                                                                                                                                   | upper threshold | 0A | 0,122mV per bit  |
|  |  | 81 | binary | <b>Dynamic test - Switching Time</b><br>During the transition to trailing throttle condition, the time is checked, which the sensor voltage needs to fall from control voltage at lambda 1 to below a minimum value in lean condition | upper threshold | 05 | 0,000030 per bit |

|    |                                         |    |        |                                                                                                                                                                           |                 |    |                                |
|----|-----------------------------------------|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----|--------------------------------|
|    |                                         |    |        | during trailing throttle. This measurement is carried out several times, the mean value is weighted.                                                                      |                 |    |                                |
| 05 | Oxygen Sensor Monitor Bank 2 - Sensor 1 |    |        |                                                                                                                                                                           |                 |    |                                |
|    |                                         | 83 | linear | <b>Dynamic test</b><br><br>A fixed number of defined lambda amplitudes is precontrolled. The measured amplitudes are averaged and related to a defined limit value sensor | lower threshold | 04 | 0,001 pe<br>bit                |
| 06 | Oxygen Sensor Monitor Bank 2 - Sensor 2 |    |        |                                                                                                                                                                           |                 |    |                                |
|    |                                         | 01 | binary | <b>Rich to lean sensor threshold voltage (constant)</b>                                                                                                                   | upper threshold | 0A | 0,122m <sup>3</sup><br>per bit |
|    |                                         | 02 | binary | <b>Lean to rich sensor threshold voltage (constant)</b>                                                                                                                   | upper threshold | 0A | 0,122m <sup>3</sup><br>per bit |
|    |                                         | 07 | binary | <b>Minimum sensor voltage for test cycle (calculated)</b><br>The minimum voltage value is displayed                                                                       | lower threshold | 0A | 0,122m <sup>3</sup><br>per bit |
|    |                                         | 08 | binary | <b>Maximum</b>                                                                                                                                                            | upper threshold | 0A | 0,122m <sup>3</sup>            |

|    |                         |    |        |                                                                                                                                                                                                                                                                                                                                            |                 |    |                  |
|----|-------------------------|----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----|------------------|
|    |                         |    |        | <b>sensor voltage for test cycle (calculated)</b><br>The maximum voltage value is displayed                                                                                                                                                                                                                                                |                 |    | per bit          |
|    |                         | 81 | binary | <b>Dynamic test - Switching Time</b><br>During the transition to trailing throttle condition, the time is checked, which the sensor voltage needs to fall from control voltage at lambda 1 to below a minimum value in lean condition during trailing throttle. This measurement is carried out several times, the mean value is weighted. | upper threshold | 05 | 0,000030 per bit |
| 21 | Catalyst Monitor Bank 1 |    |        |                                                                                                                                                                                                                                                                                                                                            |                 |    |                  |
|    |                         | 81 |        | <b>Oxygen storage capacity (OSC)</b><br>A fixed number of defined lambda                                                                                                                                                                                                                                                                   | upper threshold | 05 | 0,000030 per bit |

|    |                         |    |  |                                                                                                                                                                                                       |                 |    |                   |
|----|-------------------------|----|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----|-------------------|
|    |                         |    |  | amplitudes is precontrolled. During these amplitudes the OSC is measured via sensor 2, thus weighting the catalyst condition                                                                          |                 |    |                   |
| 22 | Catalyst Monitor Bank 2 |    |  |                                                                                                                                                                                                       |                 |    |                   |
|    |                         | 81 |  | <b>Oxygen storage capacity (OSC)</b><br>A fixed number of defined lambda amplitudes is precontrolled. During these amplitudes the OSC is measured via sensor 2, thus weighting the catalyst condition | upper threshold | 05 | 0,000030 per bit  |
| 3B | EVAP Monitor (0.040")   |    |  |                                                                                                                                                                                                       |                 |    |                   |
|    |                         | 81 |  | <b>Small leak - long cycle</b>                                                                                                                                                                        | upper threshold | 0D | 0,003906 mA per l |
|    |                         | 82 |  | <b>Small leak - short cycle</b>                                                                                                                                                                       | upper threshold | 0D | 0,003906 mA per l |
| 3C | EVAP Monitor (0.020")   |    |  |                                                                                                                                                                                                       |                 |    |                   |
|    |                         | 81 |  | <b>Very small leak - short cycle</b>                                                                                                                                                                  | upper threshold | 0D | 0,003906 mA per l |
| 3D | Purge Flow Monitor      |    |  |                                                                                                                                                                                                       |                 |    |                   |
|    |                         | 81 |  | <b>Functional check EVAP purge valve step ***:</b>                                                                                                                                                    | lower threshold | 05 | 0,000030 per bit  |
|    |                         | 82 |  | <b>Functional check EVAP purge valve</b>                                                                                                                                                              | upper threshold | 03 | 0,01 per l        |

|    |                                                |    |        |                                                                                                                                                                                                                                                                                                                                                                                                             |                       |    |               |
|----|------------------------------------------------|----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----|---------------|
|    |                                                |    |        | step ***:                                                                                                                                                                                                                                                                                                                                                                                                   |                       |    |               |
|    |                                                | 83 |        | <b>Functional check EVAP purge valve step ***:</b>                                                                                                                                                                                                                                                                                                                                                          | upper threshold       | 2D | 0,01 mg/strok |
| 41 | Oxygen Sensor Heater Monitor Bank 1 - Sensor 1 |    |        |                                                                                                                                                                                                                                                                                                                                                                                                             |                       |    |               |
|    |                                                | 85 | linear | <b>Sensor temperature</b><br>Monitors the electrical heater output of the sensor. The electrical output is controlled by means of an output-stage depending on the sensor ceramic temperature. When the control variable exceed's maximum value and falls below the sensor minimum temperature, a sensor with a defective heating is detected. Standard range of the ceramic temperature [°C] : 760 - 800°C | lower/upper threshold | 96 | 0,1°C per bit |
| 42 | Oxygen Sensor Heater Monitor Bank 1 - Sensor 2 |    |        |                                                                                                                                                                                                                                                                                                                                                                                                             |                       |    |               |
|    |                                                | 81 | binary | <b>Sensor resistance</b><br>Checking the Nernst element                                                                                                                                                                                                                                                                                                                                                     | upper threshold       | 01 | 1 per bi      |

|    |                                                |    |        |                                                                                                                                                                                                                                                                                                                                                                                                            |                 |    |               |
|----|------------------------------------------------|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----|---------------|
|    |                                                |    |        | internal resistance of sensor 2. When this is too large the sensor cannot be heated sufficiently, and an error is detected.                                                                                                                                                                                                                                                                                |                 |    |               |
| 45 | Oxygen Sensor Heater Monitor Bank 2 - Sensor 1 |    |        |                                                                                                                                                                                                                                                                                                                                                                                                            |                 |    |               |
|    |                                                | 85 | linear | <b>Sensor temperature</b><br>Monitors the electrical heater output of the sensor. The electrical output is controlled by means of an output-stage depending on the sensor ceramic temperature. When the control variable exceeds maximum value and falls below the sensor minimum temperature, a sensor with a defective heating is detected. Standard range of the ceramic temperature [°C] : 760 - 800°C | upper threshold | 96 | 0,1°C per bit |
| 46 | Oxygen Sensor Heater Monitor Bank 2 - Sensor 2 |    |        |                                                                                                                                                                                                                                                                                                                                                                                                            |                 |    |               |
|    |                                                |    |        |                                                                                                                                                                                                                                                                                                                                                                                                            |                 |    |               |

|    |                         |    |        |                                                                                                                                                                                    |                 |    |               |
|----|-------------------------|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----|---------------|
|    |                         | 81 | binary | <b>Sensor resistance</b><br>Checking the Nernst element internal resistance of sensor 2. When this is too large the sensor cannot be heated sufficiently, and an error is detected | upper threshold | 01 | 1 per bi      |
| A2 | Misfire Cylinder 1 Data |    |        |                                                                                                                                                                                    |                 |    |               |
|    |                         | 0C |        | <b>Misfire counts for last/current driving cycle's</b>                                                                                                                             | upper threshold | 24 | 1 count p bit |
|    |                         | 0B |        | <b>EWMA (Exponential Weighted Moving Average) misfire counts for last ten (10) driving cycles</b>                                                                                  | upper threshold | 24 | 1 count p bit |
| A3 | Misfire Cylinder 2 Data |    |        |                                                                                                                                                                                    |                 |    |               |
|    |                         | 0C |        | <b>Misfire counts for last/current driving cycle's</b>                                                                                                                             | upper threshold | 24 | 1 count p bit |
|    |                         | 0B |        | <b>EWMA (Exponential Weighted Moving Average) misfire counts for last ten (10) driving cycles</b>                                                                                  | upper threshold | 24 | 1 count p bit |

|    |                         |    |  |                                                                                            |                 |    |               |
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| A4 | Misfire Cylinder 3 Data |    |  |                                                                                            |                 |    |               |
|    |                         | 0C |  | Misfire counts for last/current driving cycles                                             | upper threshold | 24 | 1 count p bit |
|    |                         | 0B |  | EWMA (Exponential Weighted Moving Average) misfire counts for last ten (10) driving cycles | upper threshold | 24 | 1 count p bit |
| A5 | Misfire Cylinder 4 Data |    |  |                                                                                            |                 |    |               |
|    |                         | 0C |  | Misfire counts for last/current driving cycles                                             | upper threshold | 24 | 1 count p bit |
|    |                         | 0B |  | EWMA (Exponential Weighted Moving Average) misfire counts for last ten (10) driving cycles | upper threshold | 24 | 1 count p bit |
| A6 | Misfire Cylinder 5 Data |    |  |                                                                                            |                 |    |               |
|    |                         | 0C |  | Misfire counts for last/current driving cycle's                                            | upper threshold | 24 | 1 count p bit |
|    |                         | 0B |  | EWMA (Exponential Weighted Moving Average) misfire counts for last ten (10) driving        | upper threshold | 24 | 1 count p bit |

|    |                         |    |  |                                                                                            |                 |    |               |
|----|-------------------------|----|--|--------------------------------------------------------------------------------------------|-----------------|----|---------------|
|    |                         |    |  | cycles                                                                                     |                 |    |               |
| A7 | Misfire Cylinder 6 Data |    |  |                                                                                            |                 |    |               |
|    |                         | 0C |  | Misfire counts for last/current driving cycles                                             | upper threshold | 24 | 1 count p bit |
|    |                         | 0B |  | EWMA (Exponential Weighted Moving Average) misfire counts for last ten (10) driving cycles | upper threshold | 24 | 1 count p bit |