EVAP System Monitoring System (ORVR)

IXSQ01111002-01

EVAP System Monitoring Procedure

IXSQ01111003-01

DTC Description / Detecting Condition / Confirmation Procedure

P0440, P0455

Refer to "DTC P0440 / P0455: EVAP Control System Malfunction / Leak Detected (Gross Leak)".

EVAP Control System Monitor

Operation

DTCs	P0440, P0455 (gross leak)
Monitor execution	Once per driving cycle
Sensors / components OK	Engine speed, MAF, TP, ECT, Fuel tank pressure, Fuel level, IAC control system, MDP, Back-up power, Primary / Secondary HO2S, Primary / Secondary HO2S Heater, VSS
Monitoring Duration	Min. 18 s

Enable condition

Parameter	Minimum	Maximum
Engine coolant temp.	70 (158) °C (°F)	110 (230) °C (°F)
Intake air temp.	–8 (17.6) °C (°F)	
Barometric pressure	560 mmHg	
Fuel level		85%
Engine speed	1000 rpm	3500 rpm
Vehicle speed	15 km/h	
MDP	160 mmHg	
Fuel system status	Closed loop mode	
Calculated load value	12.5%	
Purge accumulation time	300 s	
Disablement period for fuel slosh	20 s	

Typical malfunction thresholds

P0440
Tank pressure change during depressurized condition > 2.93 – 10.25 mmHg (G16) (according to Fuel level) Tank pressure change during depressurized condition > 4.39 – 11.72 mmHg (J20) (according to Fuel level)
P0455
Max tank pressure change < 2.9 mmHg Tank pressure: –6.8 – 6.8 mmHg

MODE $06 Data

Test item (related DTC)	Test value		Description	Scaling
	TID	CID		
EVAP control system (P0440 / P0455)	$24	$00	Differential pressure	*16.67/256/256 kPa
	$24	$10	Differential pressure	*16.67/256/256 kPa
	$24	$20	Differential rising pressure	(N-128)*16.67/256/256 kPa
	$24	$30	Differential pressure	(N-128)*16.67/256/256 kPa
	$24	$31	Differential pressure	(N-128)*16.67/256/256 kPa
	$24	$40	Differential pressure	(N-128)*16.67/256/256 kPa
	$24	$41	Differential pressure	(N-128)*16.67/256/256 kPa

OBD System Description - Fuel System Monitor

print=OFF, SXSQ011111011 (03(01)

Phase 1
Pull-up voltage > 4.5 V
Phase 2
Max voltage average < 0.60 V Min. voltage average < 0.30 V
P0132
Max voltage average > 0.74 V Min. voltage average > 0.34 V

Secondary HO2S Circuit Monitor

Operation

DTCs	P0136
Monitor execution	Once per driving cycle
Sensors / components OK	ECT, Primary / Secondary HO2S heater
Monitoring Duration	**Phase 1: 2 s** **Phase 2: 7 min**

Enable condition

Parameter	Minimum	Maximum
Heater operation time (Phase 1)	24 s	
Intake air temp.	–10 (14) °C (°F)	
Barometric pressure	560 mmHg	
Fuel level	15%	
Fuel system status	Closed loop mode	
CTP switch	OFF	

Typical malfunction thresholds

Phase 1
Pull-up voltage > 4.5 V
Phase 2
Voltage average < 0.12 V or > 0.9 V Max voltage average < 0.20 V Min. voltage average > 0.40 V

MODE $06 Data

Self diagnostic test item (related DTC)	Test value		Description	Scaling
	TID	CID		
O2S 1 circuit low volt (P0131)	$26	$00	Minimum terminal voltage	*5/256/256 V
	$26	$10	Minimum sensor voltage	*5/1024/256 V
	$26	$11	Maximum sensor voltage	*5/1024/256 V
O2S 1 circuit high volt (P0132)	$27	$00	Minimum terminal voltage	*5/256/256 V
	$27	$01	Minimum sensor voltage	*5/1024/256 V
	$27	$02	Maximum sensor voltage	*5/1024/256 V
Slow response (P0133)	$28	$00	Rich to lean sensor switch time	*0.01/256 s
	$28	$01	Lean to rich sensor switch time	*0.01/256 s
	$28	$02	Time between sensor transitions	*0.025/256 s
No activity detect (P0134)	$29	$00	Maximum sensor voltage	*5/1024/256 V
	$29	$01	Unexpected transition time	*0.5/256 s
O2S 2 circuit volt (P0136)	$2B	$00	Minimum terminal voltage	*5/256/256 V
	$2B	$10	Mean sensor voltage	*5/256/256 V
	$2B	$10	Mean sensor voltage	*5/256/256 V
	$2B	$11	Minimum sensor voltage	*5/1024/256 V
	$2B	$12	Maximum sensor voltage	*5/1024/256 V

OBD System Description - HO2S Heater Monitor

print=OFF, SXSQ011111013 (03(01)

System Description / Monitoring Procedure

For both primary and secondary HO2S heaters, the system monitors proper current and loaded voltage. The HO2S heaters are monitored once per driving cycle during monitoring conditions.

DTC Description / Detecting Condition / Confirmation Procedure

P0135

Refer to “DTC P0135: HO2S-1 Heater Circuit Malfunction”.

P0141

Refer to “DTC P0141: HO2S-2 Heater Circuit Malfunction”.

Primary HO2S Heater Monitor

Operation

DTCs	P0135
Monitor execution	Continuous
Monitoring Duration	3 s

Enable condition

Parameter	Minimum	Maximum
Heater control	On	

Typical malfunction thresholds

Heater current < 0.15 A or > 4.03 A Heater voltage < 10 V or > 13.8 V

Secondary HO2S Heater Monitor

Operation

DTCs	P0141
Monitor execution	Continuous
Monitoring Duration	3 s

Enable condition

Parameter	Minimum	Maximum
Heater control	On	

Typical malfunction thresholds

Heater current < 0.15 A or > 4.03 A Heater voltage < 10 V or > 13.8 V

MODE $06 Data

Self diagnostic test item (related DTC)	Test value		Description	Scaling
	TID	CID		
O2S 1 heater circuit malfunction (P0135)	$2D	$00	Duration of unexpected current	*0.025/256 s
	$2D	$01	Duration of unexpected voltage	*0.025/256 s
O2S 2 heater circuit malfunction (P0141)	$2E	$00	Duration of unexpected current	*0.025/256 s
	$2E	$01	Duration of unexpected voltage	*0.025/256 s

OBD System Description - EGR System Monitor

print=OFF, SXSQ011111014 (03(01)

System Description / Monitoring Procedure

To monitor electric controlled EGR system, the system measures pressure change caused by switching of the EGR valve during deceleration condition and also measures the voltage of EGR valve stepping motor electrical circuit continuously.

EGR System Monitoring System

IXSQ01111004-01

DTC Description / Detecting Condition / Confirmation Procedure

P0400

Refer to “DTC P0400: Exhaust Gas Recirculation (EGR) Flow Malfunction”.

P0403

Refer to “DTC P0403: Exhaust Gas Recirculation (EGR) Circuit Malfunction”.

EGR System Monitor

Operation

DTCs	P0400
Monitor execution	Once per driving cycle
Sensors / components OK	MDP, TP, ECT, Back-up power
Monitoring Duration	3 s

Enable condition

Parameter	Minimum	Maximum
Engine coolant temp.	55 (131) °C (°F)	110 (230) °C (°F)
Intake air temp.	–8 (17.6) °C (°F)	
Barometric pressure	560 mmHg	
Engine speed	1780 rpm	4000 rpm
Vehicle speed	50 km/h	
Engine speed change		100 rpm / s
EGR operation time	30 s	
Time from switch change (A/C, PPS, P/N position switch)	6.3 s	
Fuel control status	Fuel shut-off mode	

Typical malfunction thresholds

MDP difference between EGR ON & OFF < 42.0 – 100.1 mmHg (1.6 L) (according to engine speed) MDP difference between EGR ON & OFF < 28.8 – 93.7 mmHg (2.0 L) (according to engine speed)

EGR System Circuit Monitor

Operation

DTCs	P0403
Monitor execution	Continuous
Monitoring Duration	3 s

Enable condition

Parameter	Minimum	Maximum
Valve control	Low	

Typical malfunction thresholds

Monitor signal: High

MODE $06 Data

Self diagnostic test item (related DTC)	Test value		Description	Scaling
	TID	CID		
EGR (P0400)	$30	$00	Differential Pressure	*31.68/256/256 kPa

OBD System Description - Comprehensive Component (Engine Input) Monitor

print=OFF, SXSQ011111016 (03(01)

Monitoring Procedure

Input signals of MAF (P0102 / P0103), MDP (P1408), IAT (P0112 / P0113), ECT (P0117 / P0118), TP (P0122 / P0123), Fuel tank pressure sensor (P0450), Fuel level sensor (P0463) and Barometric pressure sensor (P2227 / P2228 / P2229) are checked for open, short of circuit by monitoring input voltage.

DTC Description / Detecting Condition / Confirmation Procedure

P0101

Refer to “DTC P0101: Mass Air Flow (MAF) Sensor Circuit Performance Problem”.

P0102

Refer to “DTC P0102: Mass Air Flow (MAF) Sensor Circuit Low Input”.

P0103

Refer to “DTC P0103: Mass Air Flow (MAF) Sensor Circuit High Input”.

P0111

Refer to “DTC P0111: Intake Air Temperature (IAT) Sensor Circuit Range / Performance Problem”.