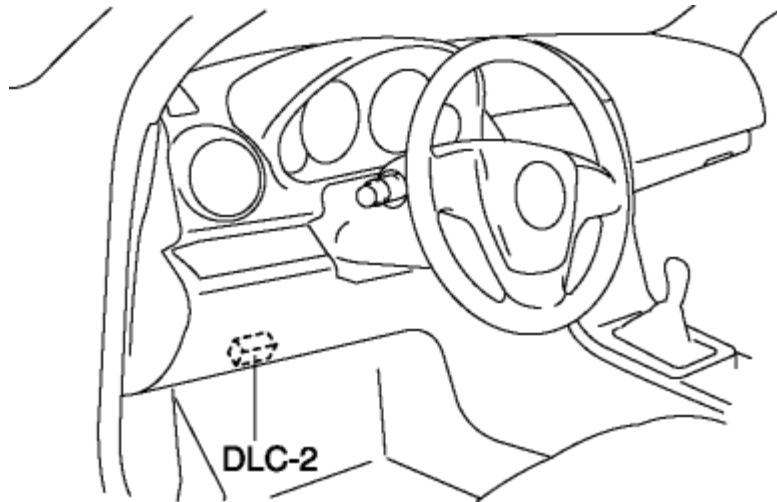


2012 - Mazda6 - Engine

ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6]

DTC Reading Procedure

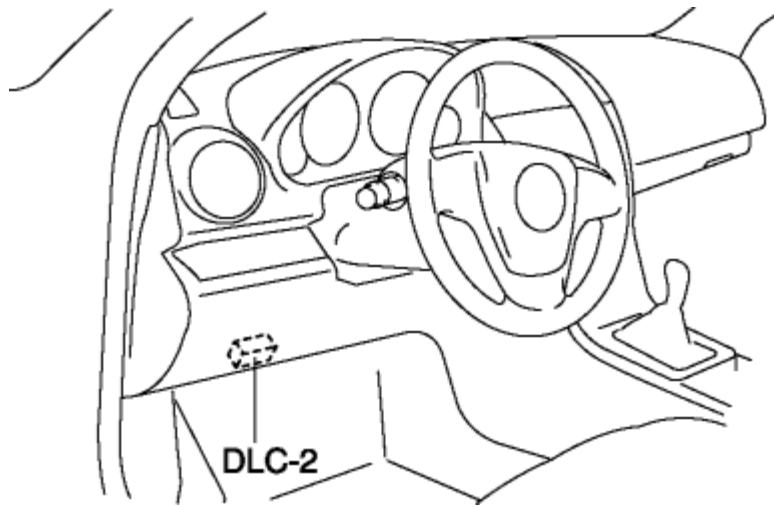
1. Connect the M-MDS (IDS) to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the IDS.
 - a. Select "Self Test".
 - b. Select "Modules".
 - c. Select "PCM".
3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the IDS screen.
4. Verify the DTC according to the directions on the IDS screen.
 - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
5. After completion of repairs, clear all DTCs stored in the PCM, while referring to "AFTER REPAIR PROCEDURE".

Pending Trouble Code Access Procedure

1. Connect the M-MDS (IDS) to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the IDS.

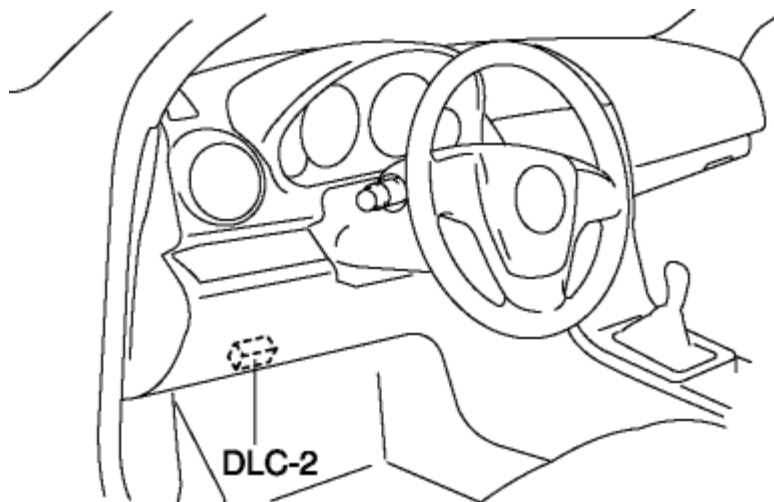
- a. Select "Self Test".
- b. Select "Modules".
- c. Select "PCM".

3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the IDS screen.

4. Retrieve the pending trouble codes according to the directions on the IDS screen.

Freeze Frame PID Data Access Procedure

1. Connect the M-MDS (IDS) to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the IDS.

- a. Select "Self Test".
- b. Select "Modules".
- c. Select "PCM".

3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the IDS screen.

4. Retrieve the freeze frame PID data according to the directions on the IDS screen.

NOTE:

- Freeze frame data appears at the top of the help screen when the displayed DTC is selected.

Freeze frame data

- The freeze frame data consists of data for vehicle and engine control system operation conditions when malfunctions in the engine control system are detected and stored in the PCM.
- Freeze frame data is stored at the instant the malfunction indicator lamp illuminates, and only a part of the DTC data is stored.
- For the freeze frame data, if there are several malfunctions in the engine control system, the data for the malfunction which occurred initially is stored. Thereafter, if a misfire or fuel injection control malfunction occurs, data from the misfire or fuel injection control malfunction is written over the initially stored data. However, if the initially stored freeze frame data is a misfire or fuel injection control malfunction, it is not overwritten.

Freeze frame data table

NOTE:

- Refer to PID monitor table for confirm the engine control system operation status while the PCM does not store the DTC. (See **PCM INSPECTION [MZI 3.7 V6]**.)
- Freeze frame data items are not displayed, according to detected DTC.

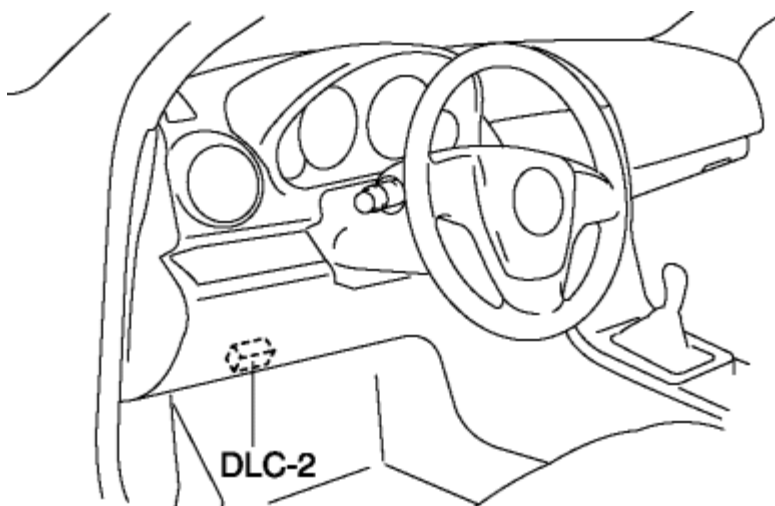
Freeze frame data item	Unit			Description	Corresponding PID data monitor item
FUELSYS1	Open Loop/Closed Loop/OL-Drive/OL-Fault/CL-Fault			Fuel system status	FUELSYS
LOAD	%			Calculated engine load	—
ECT	°C		°F	Engine coolant temperature	ECT
SFT1	%			Short term fuel trim	SHRTFT1
LFT1	%			Long term fuel trim	LONGFT1
MAP	kPa	psi	Bar	Manifold absolute pressure	MAP

RPM	RPM			Engine speed	RPM
VS	KPH	MPH		Vehicle speed	VSS
SPARKADV	°			Ignition timing	SPARKADV
IAT	°C	°F		Intake air temperature	IAT
MAF	g/sec			Mass airflow	MAF
TP	%			Throttle valve position No.1	TP1
RUNTM	hh:mm:ss			Time from engine start	—
EGRPCT	%			Target EGR valve position	SEGRP_DSD
EVAPPCT	%			Purge solenoid valve controlled value	EVAPCP
FLI	%			Fuel level in fuel tank	FLI
WARMUPS	—			Number of warm-up cycle after DTC cleared	—
CLRDIST	Km	miles		Mileage after DTC cleared	—
EVAP_VP	kPa	psi	Bar	Fuel tank pressure	FTP
BARO	kPa	psi	Bar	Barometric pressure	BARO
CATTEMP11	°C	°F		Estimated catalytic converter temperature	CATT11_DSD
VPWR	V			Module supply voltage	VPWR
ALV	%			Engine load	LOAD
EQ_RAT	—			Target equivalence ratio (lambda)	EQ_RAT11_DSD
TP_REL	%			Relative throttle position	TP REL
AAT	°C	°F		Ambient air temperature	AAT
TP_B	%			Throttle valve position No.2	TP2

APP_D	%	Accelerator pedal position No.1	APP1
APP_E	%	Accelerator pedal position No.2	APP2
TAC_PCT	%	Target throttle valve position	ETC_DSD

On-Board System Readiness Tests Access Procedure

1. Connect the M-MDS (IDS) to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the IDS.
 - a. Select "Powertrain".
 - b. Select "OBD Test Modes".
 - c. Select "Mode 1 Powertrain Data".
 - d. Select "PCM".
3. Then, select the "****SUP" and "***EVAL" PIDs in the PID selection screen.
4. Monitor those PIDs and check it system monitor is completed.

NOTE:

- If the on-board system readiness tests are not completed the PCM stores DTC P1000.

PID/ DATA Monitor and Record Procedure

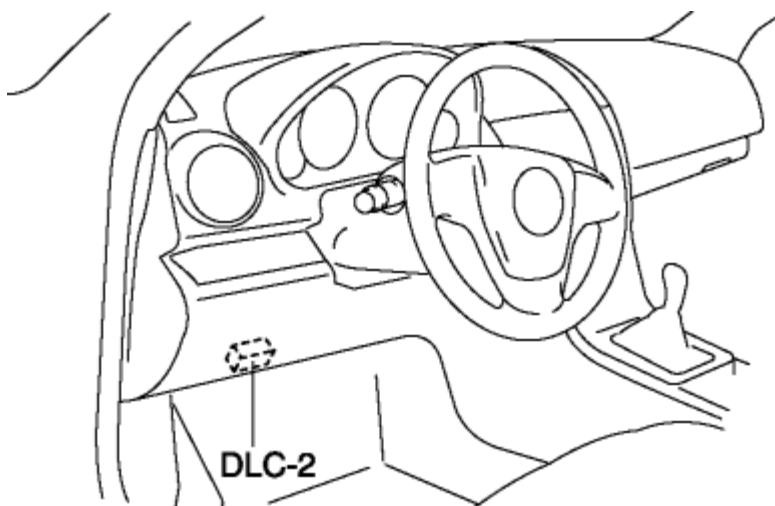
NOTE:

- The PID data screen function is used for monitoring the calculated value of input/output

signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually.

- When detecting DTCs, PIDs related to a malfunctioning system may not display even if the module is normal. Therefore, if a PID is not displayed, it is necessary to verify the DTC, perform malfunction diagnosis of the DTC that was detected, and do repairs.

1. Connect the M-MDS (IDS) to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the IDS.

- Select "DataLogger".
- Select "Modules".
- Select "PCM".

3. Select the applicable PID from the PID table.

4. Verify the PID data according to the detections on the screen.

PID/ Data Monitor Table

Item	Definition	Unit/Condition		
AAT	Ambient air temperature	°C	°F	
AC_PRES	Refrigerant pressure sensor	V		
		kPa	psi	Bar
AC_REQ	A/C request signal	Off/On		

ACCS	A/C relay	Off/On		
ALTF	Generator field current control duty value	%		
APP	Accelerator pedal position	%		
APP1	APP sensor No.1	%		
		V		
APP2	APP sensor No.2	%		
		V		
ARPMDES	Target engine speed	RPM		
AXLE	Axle ratio	—		
BARO	Barometric pressure	kPa	psi	Bar
BOO	Brake switch	Off/On		
BPA	Brake pressure applied switch	Off/On		
CATT11_DSD	Estimated catalytic converter temperature (RH)	°C		°F
CATT21_DSD	Estimated catalytic converter temperature (LH)	°C		°F
CHRGLP	Generator warning light	Off/On		
CHT	CHT sensor	°C		°F
		V		
COLP	Refrigerant pressure sensor	Off/On		
ECT	Engine coolant temperature	°C		°F
EQ_RAT11	Equivalence ratio (lambda) A/F sensor (RH)	—		
EQ_RAT11_DSD	Desired equivalence ratio (lambda)	—		
EQ_RAT21	Equivalence ratio (lambda) A/F sensor (LH)	—		

ETC_ACT	Electronic throttle control actual	°		
ETC_DSD	Electronic throttle control desired	%		
		°		
EVAPCP	Purge solenoid valve duty value	%		
EVAPCV	CV solenoid valve	Off/On		
FAN_DUTY	Cooling fan control	%		
FCL	Fuel cap warning light	Off/On		
FLI	Fuel level	%		
FP	Fuel pump relay	Off/On		
		%		
FPM	Fuel pump monitor	%		
FTP	Fuel tank pressure sensor	V		
		kPa	psi	Bar
FUELSYS	Fuel system loop status (RH)	OL/CL/OL-Drive/OL-Fault/CL-Fault		
GENVDSD	Generator voltage desired	V		
HTR11	A/F sensor heater (RH)	%		
		Off/On		
HTR12	HO2S heater (RH)	Off/On		
HTR21	A/F sensor heater (LH)	%		
		Off/On		
HTR22	HO2S heater (LH)	Off/On		
IAT	IAT sensor	°C		°F

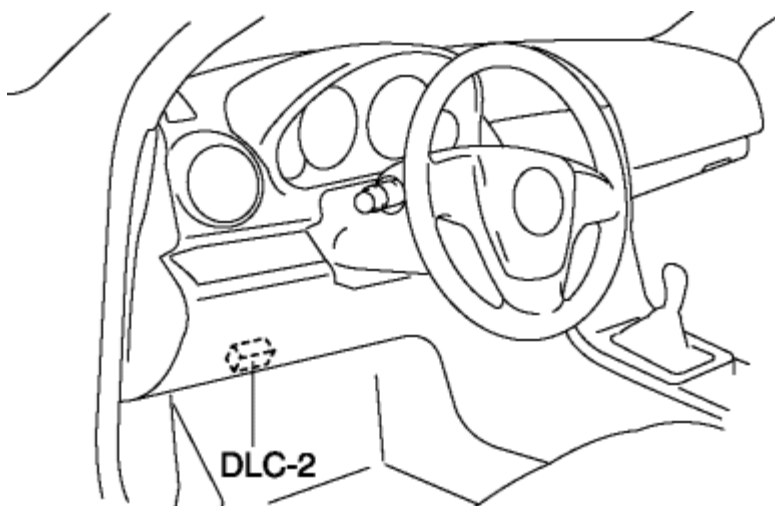
		V
INGEAR	Load/no load condition	Off/On
INJ_PWR	Injector Power Monitor	V
IVS	CTP condition	Idle/Off Idle
KNOCKR	Knocking retard	°
LOAD	Engine load	%
LONGFT1	Long term fuel trim (RH)	%
LONGFT2	Long term fuel trim (LH)	%
MAF	MAF sensor	g/s
		V
MIL_DIS	Traveled distance since the MIL illuminated	km
O2S11	A/F sensor (RH)	A
O2S12	HO2S (RH)	V
O2S21	A/F sensor (LH)	A
O2S22	HO2S (LH)	V
PSP	Power steering pressure switch	Off/On
RO2FT1	HO2S fuel trim (RH)	%
RO2FT2	HO2S fuel trim (LH)	%
RPM	Engine speed	RPM
SC_CANCEL	Speed control cancel switch	Inactive / Active
SC_OFF	Cruise control OFF switch	Inactive / Active
SC_ON	Cruise control ON switch	Inactive / Active

SC_RES	Cruise resume switch	Inactive / Active
SC_SET-	Cruise coast switch	Inactive / Active
SC_SET+	Cruise set/acceleration switch	Inactive / Active
SCCS	Speed control command switch	V
SHRTFT1	Short term fuel trim (RH)	%
SHRTFT12	Short term fuel trim (HO2S) (RH)	%
SHRTFT2	Short term fuel trim (LH)	%
SHRTFT22	Short term fuel trim (HO2S) (LH)	%
SPARKADV	Ignition timing	°
TIRESIZE	Tire revolution per mile	—
TP_REL	Relative throttle position	%
TP1	TP sensor No.1	%
		V
TP2	TP sensor No.2	%
		V
VPWR	Battery voltage	V
VSS	Vehicle speed	KPH
VT_ACT1	Actual valve timing (RH)	°
VT_ACT2	Actual valve timing (LH)	°
VT_DIFF1	Difference between target and actual valve timing (RH)	°
VT_DIFF2	Difference between target and actual valve timing (LH)	°
VT_DUTY1	CMP sensor duty value (RH)	%

VT DUTY2	CMP sensor duty value (LH)	%
VT_DSD	Desired Intake Camshaft Position	°

Diagnostic Monitoring Test Results Access Procedure

1. Connect the M-MDS (IDS) to the DLC-2.

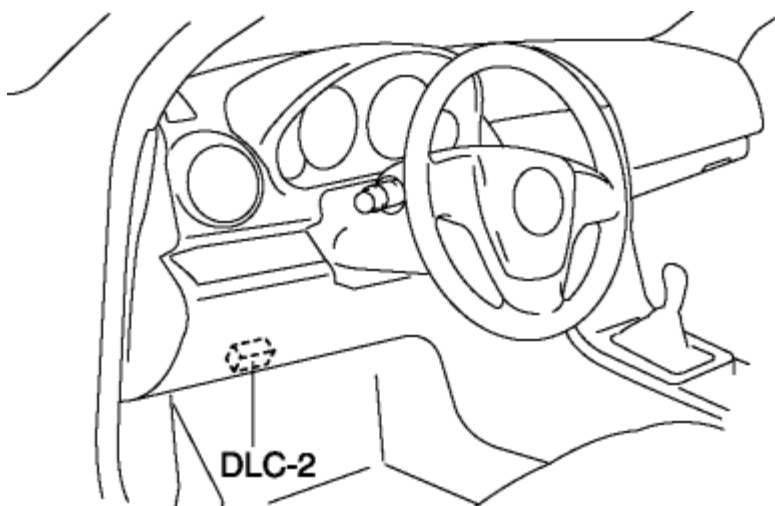


2. After the vehicle is identified, select the following items from the initialization screen of the IDS.
 - a. Select "Powertrain".
 - b. Select "OBD Test Modes".
 - c. Select "Mode 6 On-Board Test Results".

3. Verify the diagnostic monitoring test result according to the directions on the IDS screen.

Active Command Modes Procedure

1. Connect the M-MDS (IDS) to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the IDS.
 - a. Select "DataLogger".
 - b. Select "Modules".
 - c. Select "PCM".
3. Select the simulation items from the PID table.
4. Using the active command modes function, inspect the operations for each parts.
 - If the operation of output parts cannot be verified after the active command mode inspection is performed, this could indicate the possibility of an open or short circuit, sticking, or operation malfunction in the output parts.

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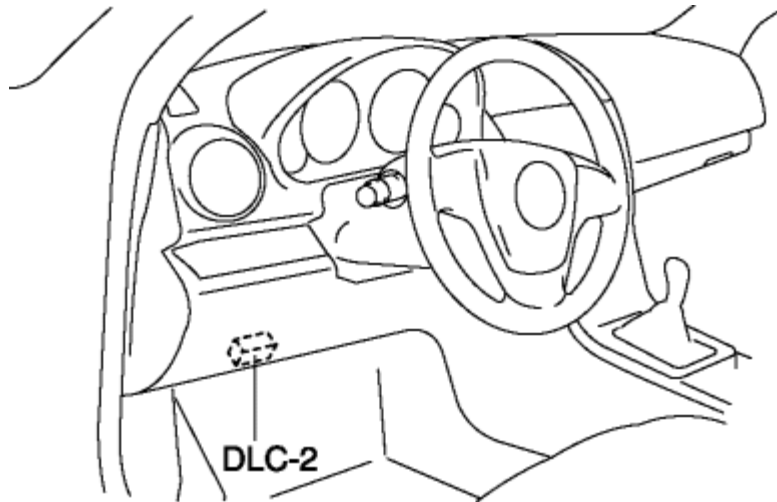
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2012 - Mazda6 - Engine

ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6]

DTC Reading Procedure

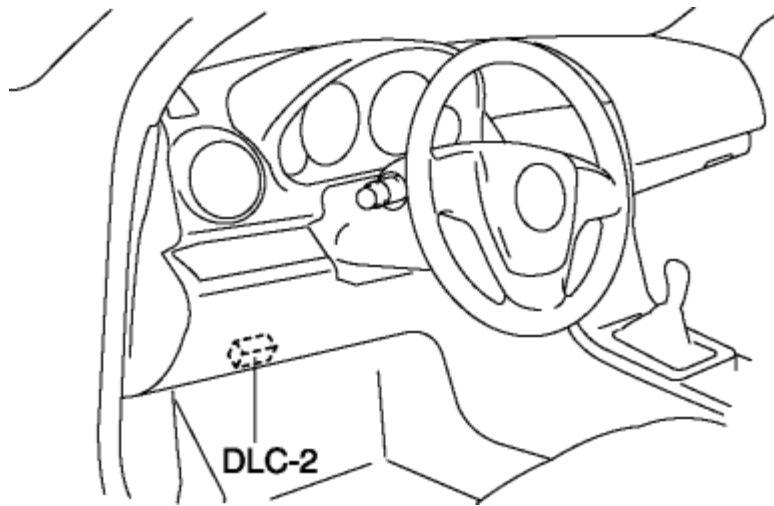
1. Connect the M-MDS (IDS) to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the IDS.
 - a. Select "Self Test".
 - b. Select "Modules".
 - c. Select "PCM".
3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the IDS screen.
4. Verify the DTC according to the directions on the IDS screen.
 - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
5. After completion of repairs, clear all DTCs stored in the PCM, while referring to "AFTER REPAIR PROCEDURE".

Pending Trouble Code Access Procedure

1. Connect the M-MDS (IDS) to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the IDS.

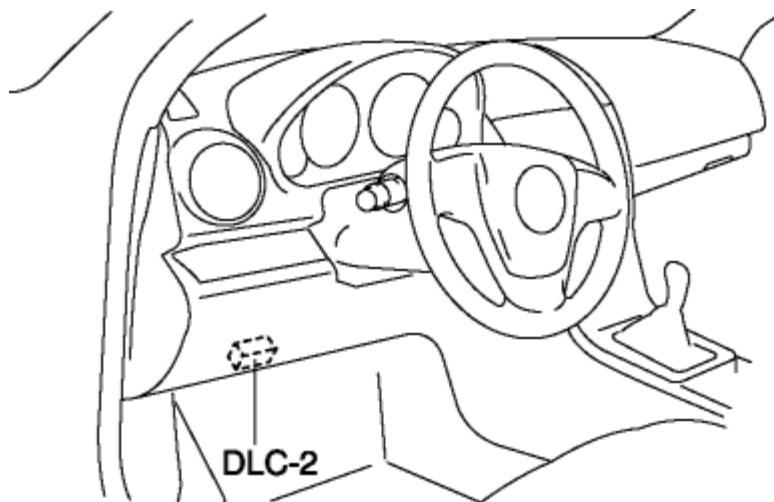
- a. Select "Self Test".
- b. Select "Modules".
- c. Select "PCM".

3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the IDS screen.

4. Retrieve the pending trouble codes according to the directions on the IDS screen.

Freeze Frame PID Data Access Procedure

1. Connect the M-MDS (IDS) to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the IDS.

- a. Select "Self Test".
- b. Select "Modules".
- c. Select "PCM".

3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the IDS screen.

4. Retrieve the freeze frame PID data according to the directions on the IDS screen.

NOTE:

- Freeze frame data appears at the top of the help screen when the displayed DTC is selected.

Freeze frame data

- The freeze frame data consists of data for vehicle and engine control system operation conditions when malfunctions in the engine control system are detected and stored in the PCM.
- Freeze frame data is stored at the instant the malfunction indicator lamp illuminates, and only a part of the DTC data is stored.
- For the freeze frame data, if there are several malfunctions in the engine control system, the data for the malfunction which occurred initially is stored. Thereafter, if a misfire or fuel injection control malfunction occurs, data from the misfire or fuel injection control malfunction is written over the initially stored data. However, if the initially stored freeze frame data is a misfire or fuel injection control malfunction, it is not overwritten.

Freeze frame data table

NOTE:

- Refer to PID monitor table for confirm the engine control system operation status while the PCM does not store the DTC. (See **PCM INSPECTION [MZI 3.7 V6]**.)
- Freeze frame data items are not displayed, according to detected DTC.

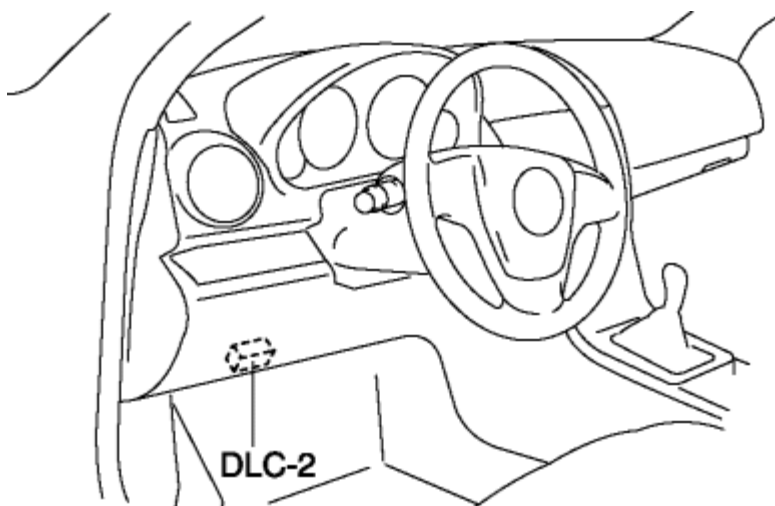
Freeze frame data item	Unit			Description	Corresponding PID data monitor item
FUELSYS1	Open Loop/Closed Loop/OL-Drive/OL-Fault/CL-Fault			Fuel system status	FUELSYS
LOAD	%			Calculated engine load	—
ECT	°C		°F	Engine coolant temperature	ECT
SFT1	%			Short term fuel trim	SHRTFT1
LFT1	%			Long term fuel trim	LONGFT1
MAP	kPa	psi	Bar	Manifold absolute pressure	MAP

RPM	RPM			Engine speed	RPM
VS	KPH	MPH		Vehicle speed	VSS
SPARKADV	°			Ignition timing	SPARKADV
IAT	°C	°F		Intake air temperature	IAT
MAF	g/sec			Mass airflow	MAF
TP	%			Throttle valve position No.1	TP1
RUNTM	hh:mm:ss			Time from engine start	—
EGRPCT	%			Target EGR valve position	SEGRP_DSD
EVAPPCT	%			Purge solenoid valve controlled value	EVAPCP
FLI	%			Fuel level in fuel tank	FLI
WARMUPS	—			Number of warm-up cycle after DTC cleared	—
CLRDIST	Km	miles		Mileage after DTC cleared	—
EVAP_VP	kPa	psi	Bar	Fuel tank pressure	FTP
BARO	kPa	psi	Bar	Barometric pressure	BARO
CATTEMP11	°C	°F		Estimated catalytic converter temperature	CATT11_DSD
VPWR	V			Module supply voltage	VPWR
ALV	%			Engine load	LOAD
EQ_RAT	—			Target equivalence ratio (lambda)	EQ_RAT11_DSD
TP_REL	%			Relative throttle position	TP REL
AAT	°C	°F		Ambient air temperature	AAT
TP_B	%			Throttle valve position No.2	TP2

APP_D	%	Accelerator pedal position No.1	APP1
APP_E	%	Accelerator pedal position No.2	APP2
TAC_PCT	%	Target throttle valve position	ETC_DSD

On-Board System Readiness Tests Access Procedure

1. Connect the M-MDS (IDS) to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the IDS.
 - a. Select "Powertrain".
 - b. Select "OBD Test Modes".
 - c. Select "Mode 1 Powertrain Data".
 - d. Select "PCM".
3. Then, select the "****SUP" and "***EVAL" PIDs in the PID selection screen.
4. Monitor those PIDs and check it system monitor is completed.

NOTE:

- If the on-board system readiness tests are not completed the PCM stores DTC P1000.

PID/ DATA Monitor and Record Procedure

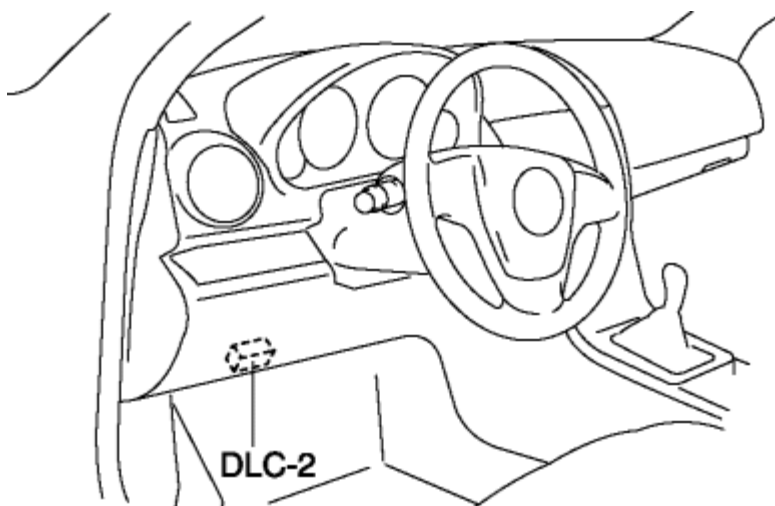
NOTE:

- The PID data screen function is used for monitoring the calculated value of input/output

signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually.

- When detecting DTCs, PIDs related to a malfunctioning system may not display even if the module is normal. Therefore, if a PID is not displayed, it is necessary to verify the DTC, perform malfunction diagnosis of the DTC that was detected, and do repairs.

1. Connect the M-MDS (IDS) to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the IDS.

- Select "DataLogger".
- Select "Modules".
- Select "PCM".

3. Select the applicable PID from the PID table.

4. Verify the PID data according to the detections on the screen.

PID/ Data Monitor Table

Item	Definition	Unit/Condition		
AAT	Ambient air temperature	°C	°F	
AC_PRES	Refrigerant pressure sensor	V		
		kPa	psi	Bar
AC_REQ	A/C request signal	Off/On		

ACCS	A/C relay	Off/On		
ALTF	Generator field current control duty value	%		
APP	Accelerator pedal position	%		
APP1	APP sensor No.1	%		
		V		
APP2	APP sensor No.2	%		
		V		
ARPMDES	Target engine speed	RPM		
AXLE	Axle ratio	—		
BARO	Barometric pressure	kPa	psi	Bar
BOO	Brake switch	Off/On		
BPA	Brake pressure applied switch	Off/On		
CATT11_DSD	Estimated catalytic converter temperature (RH)	°C		°F
CATT21_DSD	Estimated catalytic converter temperature (LH)	°C		°F
CHRGLP	Generator warning light	Off/On		
CHT	CHT sensor	°C		°F
		V		
COLP	Refrigerant pressure sensor	Off/On		
ECT	Engine coolant temperature	°C		°F
EQ_RAT11	Equivalence ratio (lambda) A/F sensor (RH)	—		
EQ_RAT11_DSD	Desired equivalence ratio (lambda)	—		
EQ_RAT21	Equivalence ratio (lambda) A/F sensor (LH)	—		

ETC_ACT	Electronic throttle control actual	°		
ETC_DSD	Electronic throttle control desired	%		
		°		
EVAPCP	Purge solenoid valve duty value	%		
EVAPCV	CV solenoid valve	Off/On		
FAN_DUTY	Cooling fan control	%		
FCL	Fuel cap warning light	Off/On		
FLI	Fuel level	%		
FP	Fuel pump relay	Off/On		
		%		
FPM	Fuel pump monitor	%		
FTP	Fuel tank pressure sensor	V		
		kPa	psi	Bar
FUELSYS	Fuel system loop status (RH)	OL/CL/OL-Drive/OL-Fault/CL-Fault		
GENVDSD	Generator voltage desired	V		
HTR11	A/F sensor heater (RH)	%		
		Off/On		
HTR12	HO2S heater (RH)	Off/On		
HTR21	A/F sensor heater (LH)	%		
		Off/On		
HTR22	HO2S heater (LH)	Off/On		
IAT	IAT sensor	°C		°F

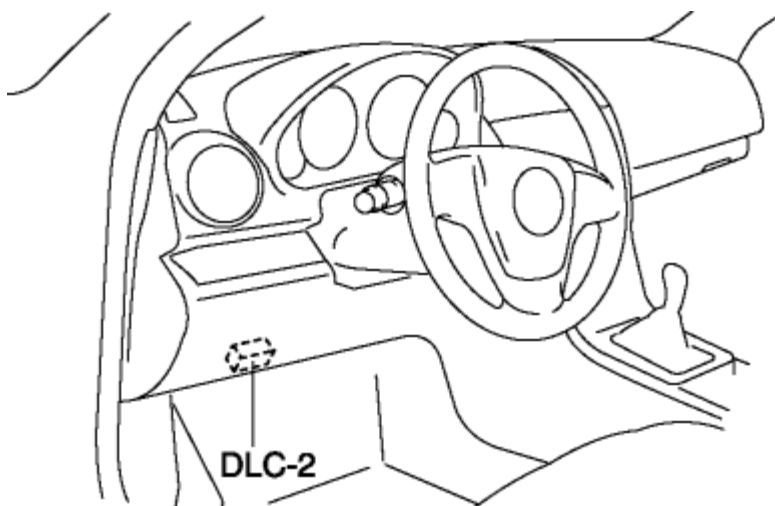
		V
INGEAR	Load/no load condition	Off/On
INJ_PWR	Injector Power Monitor	V
IVS	CTP condition	Idle/Off Idle
KNOCKR	Knocking retard	°
LOAD	Engine load	%
LONGFT1	Long term fuel trim (RH)	%
LONGFT2	Long term fuel trim (LH)	%
MAF	MAF sensor	g/s
		V
MIL_DIS	Traveled distance since the MIL illuminated	km
O2S11	A/F sensor (RH)	A
O2S12	HO2S (RH)	V
O2S21	A/F sensor (LH)	A
O2S22	HO2S (LH)	V
PSP	Power steering pressure switch	Off/On
RO2FT1	HO2S fuel trim (RH)	%
RO2FT2	HO2S fuel trim (LH)	%
RPM	Engine speed	RPM
SC_CANCEL	Speed control cancel switch	Inactive / Active
SC_OFF	Cruise control OFF switch	Inactive / Active
SC_ON	Cruise control ON switch	Inactive / Active

SC_RES	Cruise resume switch	Inactive / Active
SC_SET-	Cruise coast switch	Inactive / Active
SC_SET+	Cruise set/acceleration switch	Inactive / Active
SCCS	Speed control command switch	V
SHRTFT1	Short term fuel trim (RH)	%
SHRTFT12	Short term fuel trim (HO2S) (RH)	%
SHRTFT2	Short term fuel trim (LH)	%
SHRTFT22	Short term fuel trim (HO2S) (LH)	%
SPARKADV	Ignition timing	°
TIRESIZE	Tire revolution per mile	—
TP_REL	Relative throttle position	%
TP1	TP sensor No.1	%
		V
TP2	TP sensor No.2	%
		V
VPWR	Battery voltage	V
VSS	Vehicle speed	KPH
VT_ACT1	Actual valve timing (RH)	°
VT_ACT2	Actual valve timing (LH)	°
VT_DIFF1	Difference between target and actual valve timing (RH)	°
VT_DIFF2	Difference between target and actual valve timing (LH)	°
VT_DUTY1	CMP sensor duty value (RH)	%

VT DUTY2	CMP sensor duty value (LH)	%
VT_DSD	Desired Intake Camshaft Position	°

Diagnostic Monitoring Test Results Access Procedure

1. Connect the M-MDS (IDS) to the DLC-2.



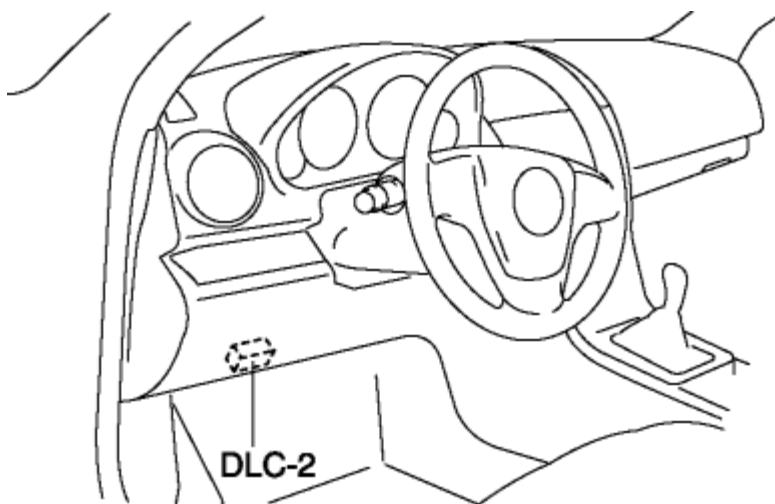
2. After the vehicle is identified, select the following items from the initialization screen of the IDS.

- a. Select "Powertrain".
- b. Select "OBD Test Modes".
- c. Select "Mode 6 On-Board Test Results".

3. Verify the diagnostic monitoring test result according to the directions on the IDS screen.

Active Command Modes Procedure

1. Connect the M-MDS (IDS) to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the IDS.
 - a. Select "DataLogger".
 - b. Select "Modules".
 - c. Select "PCM".
3. Select the simulation items from the PID table.
4. Using the active command modes function, inspect the operations for each parts.
 - If the operation of output parts cannot be verified after the active command mode inspection is performed, this could indicate the possibility of an open or short circuit, sticking, or operation malfunction in the output parts.

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