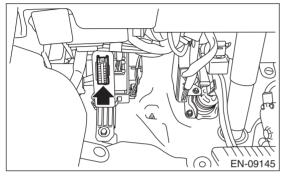
8. General Scan Tool

A: OPERATION

1. HOW TO USE GENERAL SCAN TOOL

- 1) Prepare a scan tool (general scan tool) required by SAE J1978.
- 2) Connect the general scan tool to data link connector located in the lower portion of the instrument panel (on the driver's side).



- 3) Using the general scan tool, call up each data. General scan tool functions consist of:
 - (1) MODE \$01: Current powertrain diagnostic data
 - (2) MODE \$02: Powertrain freeze frame data
 - (3) MODE \$03: Emission-related powertrain DTC
 - (4) MODE \$04: Clear/Reset emission-related diagnostic information
 - (5) MODE \$06: Request on-board monitoring test results for intermittently monitored systems
 - (6) MODE \$07: Request on-board monitoring test results for continuously monitored systems
 - (7) MODE \$08: Request control for on-board system, test, and component
 - (8) MODE \$09: Request vehicle information
- 4) Read out the data according to repair procedures. (For detailed operation procedure, refer to the general scan tool operation manual.)

NOTE:

For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DO w/o HEV)(diag)-96, List of Diagnostic Trouble Code (DTC).>

2. MODE \$01: (CURRENT POWERTRAIN DIAGNOSTIC DATA)

Refer to data denoting the current operating condition of analog input/output, digital input/output or the powertrain system.

A list of the support data and PID (Parameter Identification) codes are shown in the following table.

\$0.00 brut information — \$0.00 brut information — \$0.00 brut information — \$0.00 brut information % \$0.00 brut information MPH \$0.00 brut information % \$0.00 brutine MPH \$0.00 brutine MPH <t< th=""><th>PID</th><th>Data</th><th>Unit of measure</th></t<>	PID	Data	Unit of measure			
504 Calculated engine load value % 505 Engine coolant temperature "C 60 Short term fuel trim % 507 Long term fuel trim % 508 Intake manifold absolute pressure KPa 500 Engine speed mpm 500 Vehicle speed MPH 501 Intake air amount "C 502 Intake air emperature "C 503 Intake air amount "g/s 511 Throttle valve opening angle "C 511 Throttle valve opening angle "C 512 Nature Intake air amount "G 513 Air fuel ratio sensor "— 515 Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor (Bank 1 Sensor 2) V and % 515 Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor (Bank 1 Sensor 2) V and % 516 Elapsed time after starting the engine "se 517 Elapsed time after starting the engine "se 521	\$01		_			
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\$5C Engine oil temperature °C			%			
			°C			
			_			

NOTE:

Refer to general scan tool manufacturer's operation manual to access current powertrain diagnostic data (MODE \$01).

3. MODE \$02 (POWERTRAIN FREEZE FRAME DATA)

Refer to data denoting the operating condition when trouble is detected by on-board diagnosis system. A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure				
\$02	DTC that caused freeze frame data to be stored —					
\$03	Fuel system control status —					
\$04	Calculated engine load value	%				
\$05	Engine coolant temperature	°C				
\$06	Short term fuel trim (Bank 1 Sensor 1)	%				
\$07	Long term fuel trim (Bank 1 Sensor 1)	%				
\$0B	Intake manifold absolute pressure	kPa				
\$0C	Engine speed	rpm				
\$0D	Vehicle speed	MPH				
\$0E	Ignition timing advance	0				
\$0F	Intake air temperature	°C				
\$10	Intake air amount	g/s				
\$11	Throttle valve opening angle	%				
\$13	Air fuel ratio sensor	_				
\$15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor (Bank 1 Sensor 2)	V and %				
\$1C	Supporting OBD system	_				
\$1F	Elapsed time after starting the engine	sec				
\$2C	Target EGR	%				
\$2D	EGR deviation	%				
\$2E	Evaporative purge	%				
\$2F	Fuel level	%				
\$33	Barometric pressure	kPa				
\$42	ECM power voltage	V				
\$43	Absolute load	%				
\$44	A/F target lambda	_				
\$45	Relative throttle opening angle	%				
\$46	Ambient temperature	°C				
\$47	Absolute throttle opening angle 2	%				
\$49	Absolute accelerator opening angle 1	%				
\$4A	Absolute accelerator opening angle 2					
\$4C	Target throttle opening angle %					
\$51	Fuel used	_				
\$65	Neutral status	_				

NOTE:

Refer to general scan tool manufacturer's instruction manual to access freeze frame data (MODE \$02).

4. MODE \$03 (EMISSION-RELATED POWERTRAIN DTC)

Refer to "List of Diagnostic Trouble Code (DTC)" for information about data denoting emission-related powertrain DTC. <Ref. to EN(H4DO w/o HEV)(diag)-96, List of Diagnostic Trouble Code (DTC).>

5. MODE \$04 (CLEAR/RESET EMISSION-RELATED DIAGNOSTIC INFORMATION)

Refer to the mode used to clear or reset emission-related diagnostic information.

NOTE:

Refer to general scan tool manufacturer's instruction manual to clear the emission-related diagnostic information (MODE \$04).

6. MODE \$06

Refer to diagnostic value of troubleshooting and data of test limit indicated on the support data bit sequence table. A list of the support data is shown in the following table.

NOTE:

Some items are not displayed according to the specifications.

OBDMID	TID	SID	Diagnostic item
	\$84	\$1E	
	\$85	\$1E	A/F sensor range failure (Bank 1 Sensor 1)
	\$86	\$20	
	\$91	\$20	A/F sensor response failure (Bank 1 Sensor 1)
	\$92	\$10	
	\$A3	\$20	
004	\$A4	\$10	
\$01	\$AC	\$10	
	\$AD	\$10	
	\$AE	\$10	
	\$AF	\$10	
	\$CD	\$20	
	\$CF	\$20	
	\$DF	\$10	
	\$07	\$0B	Ovugan cancer dran failure (Pank 1 Cancer 2)
	\$08	\$0B	Oxygen sensor drop failure (Bank 1 Sensor 2)
	\$05	\$10	
\$02	\$06	\$10	Oxygen sensor response failure (Bank 1 Sensor 2) Oxygen sensor delay failure (Bank 1 Sensor 2)
	\$BD	\$10	
	\$D1	\$10	
	\$D2	\$01	Oxygen sensor delay failure (Darik i Sensor 2)
\$21	\$89	\$20	Catalyst deterioration diagnosis (Bank 1)
\$31	\$8A	\$FD	EGR system diagnosis
	\$8B	\$9D	VVT monitor (Bank 1)
	\$8C	\$9D	
	\$8D	\$9D	
\$35	\$8E	\$9D	
	\$D3	\$9D	
	\$D5	\$9D	
	\$D6	\$9D	
	\$8B	\$9D	VVT monitor (Bank 2)
	\$8C	\$9D	
	\$8D	\$9D	
\$36	\$8E	\$9D	
	\$D3	\$9D	
	\$D5	\$9D	
	\$D6	\$9D	

General Scan Tool

ENGINE (DIAGNOSTICS)

OBDMID	TID	SID	Diagnostic item
	\$96	\$FE	
	\$C1	\$FE	
	\$C2	\$FE	
	\$C3	\$FE	Evaporative emission control system (0.02 inch leak)
	\$C4	\$FE	
\$3C	\$C5	\$FE	
	\$C6	\$35	
	\$C7	\$FE	
	\$C8	\$FE	
	\$C9	\$FE	
	\$CA	\$FE	
#0D	\$98	\$FE	Evaporative emission control system (purge flow)
\$3D	\$E2	\$FE	ELCM purge flow
\$41	\$9B	\$14	A/F sensor heater characteristics failure (Bank 1 Sensor 1)
\$42	\$A2	\$24	Oxygen sensor heater characteristics failure (Bank 1 Sensor 2)
ΦΛ4	\$0B	\$24	Misfire monitoring (all cylinders)
\$A1	\$0C	\$24	
ф л О	\$0B	\$24	Misfire monitoring (#1 cylinder)
\$A2	\$0C	\$24	
Ф А О	\$0B	\$24	Misfire monitoring (#0 orlinder)
\$A3	\$0C	\$24	Misfire monitoring (#2 cylinder)
Φ Δ Δ	\$0B	\$24	Misfire monitoring (#2 ordinder)
\$A4	\$0C	\$24	Misfire monitoring (#3 cylinder)
Ф А Б	\$0B	\$24	Misfire monitoring (#4 cylinder)
\$A5	\$0C	\$24	

7. MODE \$07

Refer to the data of DTC (pending code) for troubleshooting result about emission in the first time.

8. MODE \$09

Perform "Active Test" of the on-board system.

9. MODE \$09

Refer to the data of the vehicle specification.