13-1

FUEL

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MULTIPOINT INJECTION (MPI)

GENERAL

OUTLINE OF CHANGE

- The descriptions of the troubleshooting using an MUT-II tester have been added.
- The fuel system and its management of EVOLUTION-VI are different from those of EVOLUTION-V
 in the following items. Accordingly, the service procedures for these items are described herein. The
 service procedures for the remaining item are the same as those for EVOLUTION-V.
 - Fan motor control
 - Fuel pump drive control
 - Fuel pump relay No.2
 - Fuel pump resistor
 - Actuator test function of MUT-II (The test of the following items has been made possible.) a) Item No.36: Secondary air control solenoid valve
 - b) Item No.37: Air conditioner condenser fan (High)
 - c) Item No.38: Air conditioner condenser fan (Low)

MPI System Diagram





SERVICE SPECIFICATIONS

Items		Specifications	
Basic ignition timing °BTDC		5 ± 3	
Basic idle speed rpm			850 ± 50
Throttle position sensor adju	usting voltage mV		400 - 1,000
Throttle position sensor resi	stance kΩ		3.5 – 6.5
ISC servo coil resistance (a	t 20°C) Ω		28 – 33
Intake air temperature sensor resistance $k\Omega$		At 20°C	2.3 – 3.0
At 80°C		0.30 - 0.42	
Coolant temperature sensor resistance kΩ At 20°C		2.1 – 2.7	
At 80°C		0.26 – 0.36	
Fuel pressure kPa	When vacuum hose is connected		230
	When vacuum hose is disconnected		289 – 309
Injector coil resistance Ω		2 – 3	
Amount of injector fuel leak drop/min		1 or less	
Oxygen sensor output voltage V		0.6 – 1.0	
Fuel pressure control valve coil resistance (at 20°C) Ω		28 - 36	

SEALANT

Item	Specified sealant	Remark
Engine coolant temperature sensor threaded portion	3M Nut Locking Part No.4171 or equivalent	Drying sealant

SPECIAL TOOLS

Tool	Number	Name	Use
B991502	MB991502	MUT-II sub assembly	MPI system inspection
	MB991348	Test harness set	 Measurement of voltage during trouble- shooting Inspection using an oscilloscope
	MB991519	Alternator harness connector	Measurement of voltage during troubleshooting
	MD998478	Test harness (3-pin, triangle)	 Measurement of voltage during trouble- shooting Inspection using an oscilloscope
Red harness White harness	MB991223	 Inspection test harness set Pin contact pressure inspection harness Market tester contact probe (for general connectors) 	Measurement of terminal voltage
В991529	MB991529	Diagnostic trouble code check har- ness	Reading of diagnosis codes
	MB991709	Test harness	 Measurement of voltage during trouble- shooting Inspection using an oscilloscope

TROUBLESHOOTING

DIAGNOSIS TROUBLESHOOTING FLOW

Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points.



DIAGNOSIS FUNCTION

ENGINE WARNING LAMP (CHECK ENGINE LAMP)

If an abnormality occurs in any of the following items related to the Multipoint Fuel Injection (MPI) system, the engine warning lamp will illuminate.

If the lamp remains illuminated or if the lamp illuminates while the engine is running, check the diagnosis code output.

Engine warning lamp inspection items

Engine-ECU
Air flow sensor
Intake air temperature sensor
Throttle position sensor
Engine coolant temperature sensor
Crank angle sensor
Camshaft position sensor
Barometric pressure sensor
Detonation sensor
Injector
Ignition coil, power transister unit

METHOD OF READING AND ERASING DIAGNOSIS CODES

Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points.

INSPECTION USING MUT-II DATA LIST AND ACTUATOR TESTING

- 1. Carry out inspection by connecting the MUT-II. If there is an abnormality, check and repair the chassis harnesses and components.
- 2. After repairing, check that the abnormal input and output have returned to normal as a result of the repairs.
- 3. Erase the diagnosis code memory.
- 4. Remove the MUT-II and carry out a road test to confirm that the problem has disappeared.

FAIL-SAFE FUNCTION REFERENCE TABLE

When the main sensor malfunctions are detected by the diagnosis function, the vehicle is controlled by means of the pre-set control logic to maintain safe conditions for driving.

Malfunctioning item	Control contents during malfunction
Air flow sensor	 Uses the throttle position sensor signal and engine speed signal (crank angle sensor signal) to take reading of the basic injector drive time and basic ignition timing from the pre-set mapping. Fixes the ISC servo in the appointed position so idle control is not performed.
Intake air temperature sensor	Controls as if the intake air temperature is 25°C.
Throttle position sensor	No increase in fuel injection amount during acceleration due to the throttle position sensor signal.
Engine coolant temperature sensor	 Controls as if the engine coolant temperature is 80°C. (This condition is maintained until the ignition switch is turned off even when the sensor signal returns normal.) Lets the fan motor (radiator and condenser) run at high speed.
Camshaft position sensor	Injects fuel to all cylinders simultaneously for 4 seconds. (However, after the ignition switch is turned to ON, the No. 1 cylinder top dead centre is not detected at all.)
Barometric pressure sensor	Controls as if the barometric pressure is 101 kPa.
Detonation sensor	Switches the ignition timing from ignition timing for super petrol to ignition timing for standard petrol.
Ignition coil, power transistor unit	Cuts off the fuel supply to cylinders with an abnormal ignition.
Alternator FR terminal	Does not control the output of the alternator according to an electrical load. (works as a normal alternator)

3. INSPECTION CHART FOR DIAGNOSIS CODES

Code No.	Diagnosis item	Reference page
12	Air flow sensor system	13-8
13	Intake air temperature sensor system	13-9
14	Throttle position sensor system	13-9
21	Engine coolant temperature sensor system	13-10
22	Crank angle sensor system	13-11
23	Camshaft position sensor system	13-12
24	Vehicle speed sensor system	13-13
25	Barometric pressure sensor system	13-14
31	Detonation sensor system	13-15
41	Injector system	13-15
44	Ignition coil and power transistor unit system	13-16
64	Alternator FR terminal system	13-17

INSPECTION PROCEDURE FOR DIAGNOSIS CODES

Code No. 12 Air flow sensor system	Probable cause
 Range of Check Engine speed is 500 r/min or more. Set conditions Sensor output frequency is 3 Hz or less for 4 seconds. 	 Malfunction of the air flow sensor Improper connector contact, open or short-circuited harness wire of the air flow sensor Malfunction of the engine-ECU



Code No. 13 Intake air temperature sensor system	Probable cause
 Range of Check Ignition switch: ON Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts. Set conditions Sensor output voltage is 4.6 V or more (corresponding to an intake air temperature of -45°C or less) for 4 seconds. Sensor output voltage is 0.2V or less (corresponding to an intake air temperature of 125°C or more) for 4 seconds. 	 Malfunction of the intake air temperature sensor Improper connector contact, open or short-circuited harness wire of the intake air temperature sensor circuit Malfunction of the engine-ECU



Code No. 14 Throttle position sensor system	Probable cause
 Range of Check Ignition switch: ON Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts. Set conditions The sensor output voltage is 0.2 V or less for 4 seconds. 	 Malfunction of the throttle position sensor Improper connector contact, open or short-circuited harness wire of the throttle position sensor circuit Improper "ON" state of idle position switch Short circuit of the idle position switch signal line Malfunction of the engine-ECU



Code No. 21 Engine coolant temperature sensor system	Probable cause
 Range of Check Ignition switch: ON Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts. Set conditions Sensor output voltage is 4.6 V or more (corresponding to an engine coolant temperature of -45°C or less) for 4 seconds. or Sensor output voltage is 0.1 V or less (corresponding to an engine coolant temperature of 140°C or more) for 4 seconds. 	 Malfunction of the engine coolant temperature sensor Improper connector contact, open or short-circuited harness wire of the engine coolant temperature sensor circuit Malfunction of the engine-ECU
 Range of Check Ignition switch: ON Engine speed is approx. 50 r/min or more Set conditions The sensor output voltage increases from 1.6 V or less (corresponding to an engine coolant temperature of 40°C or more) to 1.6 V or more (corresponding to an engine coolant temperature of 40°C or less). After this, the sensor output voltage is 1.6 V or more for 5 minutes. 	









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Code No. 31 Detonation sensor system	Probable cause
 Range of Check Ignition switch: ON Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts. Engine speed is approx. 5,000 r/min or more Set conditions The change in the detonation sensor output voltage (detonation sensor peak voltage at each 1/2 revolution of the crankshaft) is less than 0.06 V for 200 times in succession. 	 Malfunction of the detonation sensor Improper connector contact, open or short-circuited harness wire of the detonation sensor circuit Malfunction of the engine-ECU



Code No. 41 Injector system	Probable cause
 Range of Check Engine speed is approx. 50-1,000 r/min The throttle position sensor output voltage is 1.15 V or less. Actuator test by MUT-II is not carried out. Set conditions Surge voltage of injector coil is not detected for 4 seconds. 	 Malfunction of the injector Improper connector contact, open or short-circuited harness wire of the injector circuit Malfunction of the engine-ECU



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Code No. 64 Alternator FR terminal system **Probable cause** Range of Check Open circuit in alternator FR terminal circuit Engine speed is approx. 50 r/min or more Malfunction of the engine-ECU • • Set Conditions • The input voltage from the alternator FR terminal is higher than 4.5 V for 20 seconds. OK Measure at the alternator connector A-05. Replace the engine-ECU. Connect the connector. (Use the test harness: MB991519.) • Voltage between 4 (blue clip) and earth



INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom		Inspection procedure No.	Reference page
Communication Communication with all systems is impossible.		1	13-20
impossible.	Communication with engine-ECU only is impossible.	2	13-20
Engine warning Iamp does not illuminate right after the ignition switch is turned to the ON position.		3	13-21
related parts	The engine warning lamp remains illuminating and never goes out.	4	13-21
Starting	No initial combustion (starting impossible)	5	13-22
	Initial combustion but no complete combustion (starting impossible)	6	13-23
	Long time to start (improper starting)	7	13-24
Idling stability (Improper idling)Unstable idling (Rough idling, hunting)Idling speed is high. (Improper idling speed)		8	13-25
		9	13-26
	Idling speed is low. (Improper idling speed)	10	13-27
Idling stability	When the engine is cold, it stalls at idling. (Die out)	11	13-28
	When the engine is hot, it stalls at idling. (Die out)	12	13-29
	The engine stalls when starting the car. (Pass out)		13-30
	The engine stalls when decelerating.	14	13-30
Driving	Hesitation, sag or stumble	15	13-31
	The feeling of impact or vibration when accelerating	16	13-31
	The feeling of impact or vibration when decelerating	17	13-32
	Poor acceleration	18	13-32
Surge		19	13-33
	Knocking	20	13-33
Dieseling		21	13-33
Too high CO and	HC concentration when idling	22	13-34
Low alternator ou	itput voltage (approx. 12.3 V)	23	13-35

PROBLEM SYMPTOMS TABLE (FOR YOUR INFORMATION)

Items		Symptom
Starting	Won't start	The starter is used to crank the engine, but there is no combustion within the cylinders, and the engine won't start.
	Fires up and dies	There is combustion within the cylinders, but then the engine soon stalls.
	Hard starting	Engine starts after cranking a while.
Idling	Hunting	Engine speed doesn't remain constant; changes at idle.
Stability	Rough idle	Usually, a judgement can be based upon the movement of the tachometer pointer, and the vibration transmitted to the steering wheel, shift lever, body, etc. This is called rough idle.
	Incorrect idle speed	The engine doesn't idle at the usual correct speed.
	Engine stall (Die out)	The engine stalls when the foot is taken from the accelerator pedal, regardless of whether the vehicles is moving or not.
	Engine stall (Pass out)	The engine stalls when the accelerator pedal is depressed or while it is being used.
Driving	Hesitation, Sag	"Hesitation" is the delay in response of the vehicle speed (engine speed) that occurs when the accelerator is depressed in order to accelerate from the speed at which the vehicle is now traveling, or a temporary drop in vehicle speed (engine speed) during such acceleration. Serious hesitation is called "sag". (Refer to Figure 1.)
	Poor acceleration	Poor acceleration is inability to obtain an acceleration corresponding to the degree of throttle opening, even though acceleration is smooth, or the inability to reach maximum speed.
	Stumble	Engine speed increase is delayed when the accelerator pedal is initially depressed for acceleration. (Refer to Figure 2.)
	Shock	The feeling of a comparatively large impact or vibration when the engine is accelerated or decelerated.
	Surge	This is repeated surging ahead during constant speed travel or during variable speed travel.
	Knocking	A sharp sound like a hammer striking the cylinder walls during driving and which adversely affects driving.
Stopping	Run on ("Dieseling")	The condition in which the engine continues to run after the ignition switch is turned to OFF. Also called "Dieseling".





INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

INSPECTION PROCEDURE 1



MUT-II communication with engine-ECU is impossible.	Probable cause
 One of the following causes may be suspected. No power supply to engine-ECU. Defective earth circuit of engine-ECU. Defective engine-ECU. Improper communication line between engine-ECU and MUT-II 	 Malfunction of engine-ECU power supply circuit Malfunction of engine-ECU Open circuit between immobilizer-ECU and diagnosis connector



The engine warning lamp does not illuminate right after the ignition switch is turned to the ON position.		Probable cause	
For checking for burnt-out bulb, the engine-ECU causes the ere to illuminate for five seconds immediately after the ignition switt If the engine warning lamp does not illuminate immediately after is turned to ON, one of the malfunctions listed at right has pro-	ngine warning ch is turned t r the ignition bably occurre	lamp o ON. switch ed.	 Burnt-out bulb of the engine warning lamp Defective engine warning lamp circuit Malfunction of the engine-ECU
MUT-II Data list	NG	Check	the engine-ECU power supply and earth circuit.
 16 engine-ECU power supply voltage (Refer to P.13-57) OK Measure at the engine-ECU connector B-60. Disconnect the connector, and measure at the harness side. Earth the terminal No.36. (Ignition switch: ON) OK: The engine warning lamp illuminates. 	ок	(Refer Check conne	the following the following Ctor: B-60 ↓OK
NG ▼ Check for burnt-out bulb. OK Replace	-	Check Replac	trouble symptom.
 Measure at the combination meter connector B-08. Disconnect the connector, and measure at the harness side. Voltage between 42 and earth (Ignition switch: ON) OK: System voltage 	NG	Check if nece	the engine warning lamp power supply circuit, and repair ssary.
OK Check the following connectors: B-08, B-65, B-60 OK	NG ▶	Repair	
Check trouble symptom.] <mark>───</mark> ►	Check ECU c	the harness wire between combination meter and engine- onnector, and repair if necessary.

The engine warning lamp remains illuminating and never goes out.		Probable cause
In cases such as the above, the cause is probably that the engine-ECU is detecting a problem in a sensor or actuator, or that one of the malfunctions listed at right has occurred.		 Short-circuit between the engine warning lamp and engine-ECU Malfunction of the engine-ECU
MUT-II Self-Diag code Are diagnosis codes displayed?	Yes Refer	0 P.13-8, INSPECTION CHART FOR DIAGNOSIS CODES.
No Measure at the combination meter connector B-08. Disconnect the connector, and measure at the harness side. Disconnect the engine-ECU connector Continuity between 53 and earth OK: No continuity	NG ECU o	the harness wire between combination meter and engine- connector, and repair if necessary.
OK Replace the engine-ECU.]	

No initial combustion (starting impossible)		Probable cause	
In cases such as the above, the cause is probably that a spark plug is defective, or that the supply of fuel to the combustion chamber is defective. In addition, foreign materials (water, kerosene, etc.) may be mixed with the fuel.		 Malfunction of the ignition system Malfunction of the fuel pump system Malfunction of the injectors Malfunction of the engine-ECU Foreign materials in fuel 	
Check system voltage when cranking	NG	the battery	
OK: 8 V or higher		the battery.	
ОК			
MUT-II: Inspection of no initial combustion. (Refer to P.13-47, INSPECTION PROCEDURE 37.)]		
ок			
Can any sound be heard from the injectors when cranking (check using a soundscope)?	Check CEDU	the injector system. (Refer to P.13-15, INSPECTION PRO- RE FOR DIAGNOSIS CODE 41.)	
ОК			
Ignition system: Inspection of no initial combustion. (Refer to P.13-47, INSPECTION PROCEDURE 38.)]		
ок			
 Check the following items. Check the ignition coil, spark plugs, spark plug cables. Check if the injectors are clogged. Check if foreign materials (water, alcohol, etc.) got into fuel. Check the compression pressure. 			

Initial combustion but no complete combustion (starting impossible)		Probable ca	ause		
In such cases as the above, the cause is probably that the spark plugs are generating sparks but the sparks are weak, or the initial mixture for starting is not appropriate.		ating iate. Malfunction o Malfunction c Foreign mate Poor compres Malfunction c	f the ignition of the injector rials in fuel ssion of the engine-	system system ECU	
Check system voltage when graphing	NG	- [Chook the bettery		
OK: 8 V or higher			Check the battery.		
ОК	-				
MUT-II: Check if uncompleted combustion occurs. (Refer to P.13-48, INSPECTION PROCEDURE 39.)					
ок	NG				
Can any sound be heard from the injectors when cranking (check using a soundscope)?			Check the injector system CEDURE FOR DIAGNO	n, (Refer to P. SIS CODE 4	13-15, INSPECTION PRO- 1.)
ОК	Vaa			NC	
Is starting good if the engine is cranked with the accelerator pedal slightly depressed?			Check ISC servo for op- eration sound.		Check the ISC servo sys- tem. (Refer to P.13-44, IN-
No		L	ОК		DURE 33.)
			 Clean the throttle val Adjust the fixed SAS 	ve area. . (Refer to P.	13-30.)*
	NG	_			
Check the ignition timing when cranking. OK: Approx. 5°BTDC			Check that the crank and installed properly.	le sensor an	d the timing belt cover are
ок					
 Check the following items. Check the ignition coil, spark plugs, spark plug cables. Check the injectors for clogging and leakage. Check the compression pressure. Check fuel lines for clogging. Check if foreign materials (water, alcohol, etc.) got into fuel. 					

NOTE

Long time to start (Improper starting)		Probable cause
In cases such as the above, the cause is probably that the spark i is difficult, the initial mixture for starting is not appropriate, or suf pressure is not being obtained.	s weak and ignitio ficient compressio	 Malfunction of the ignition system Malfunction of the injector system Inappropriate gasoline use Poor compression
	NG	
Check system voltage when cranking OK: 8 V or higher	► Ch	eck the battery.
ОК		
MUT-II: Check if uncomplete combustion occurs. (Refer to P.13-48, INSPECTION PROCEDURE 39.)		
ок	NG	
Can any sound be heard from the injectors when cranking (check using a soundscope)?	Che Che	eck the injector system. (Refer to P.13-15, INSPECTION PRO- DURE FOR DIAGNOSIS CODE 41.)
ОК	NG	
Check the ignition timing when cranking. OK: Approx. 5°BTDC	Che inst	eck that the crank angle sensor and the timing belt cover are alled properly.
ОК		
 Check the following items. Check the ignition coil, spark plugs, spark plug cables. Check the injectors for clogging and leakage. Check the compression pressure. Check if foreign materials (water, alcohol, etc.) got into fuel. 		

Unstable idling (Rough idling, hunting)		Probable cause			
in cases as the above, the cause is probably that the ignition system, air/fuel mixture, idle speed control (ISC) or compression pressure is defective. Because the range of possible causes is broad, inspection is narrowed down to simple items.		 Malfunction of the ignition system Malfunction of air-fuel ratio control system Malfunction of the ISC servo system Poor compression Drawing air into exhaust system Secondary air backflow to the intake system 			
Were the bettery terminale disconnected recently?	Yes	> Aff	tor warming up, let the angine rup at idling for about 10 minutes		
were the battery terminals disconnected recently?		All	ter warming-up, let the engine run at idling for about 10 minutes.		
No	Voc				
MUT-II Self-Diag code			Refer to P.13-8, INSPECTION CHART FOR DIAGNOSIS CODES.		
Are diagnosis codes displayed?			· · · · ·		
No	Vec				
Does idling speed fluctuate excessively?		— 🕨 Ch	neck if hunting occurs.		
No		(R	efer to P.13-48, INSPECTION PROCEDURE 40.)		
Check the ISC servo for operation sound.			neck the ISC servo system.		
ОК		(R	efer to P.13-44, INSPECTION PROCEDURE 33.)		
, ↓ ○∩	_ NG				
Check the injector for operation.			neck the injector system. (Refer to P.13-15, INSPECTION PRO-		
ок			EDURE FOR DIAGNOSIS CODE 41.)		
MUT-II: Check if idling speed is unstable. (Refer to P.13-49, INSPECTION PROCEDURE 41.)					
OK					
Check the ignition timing. (Refer to GROUP 11 – Engine Adjustment.)*	NG Check install		neck that the crank angle sensor and the timing belt cover are stalled properly.		
ОК					
Check the following items. • Check the ignition coil, spark plugs, spark plug cables. • Check the secondary air supply system. (Ensure that there	is no b	ack flow o	of secondary air into the intake system.)		

Check the compression pressure.

• Check if foreign materials (water, alcohol, etc.) got into fuel.

NOTE

Idling speed is high. (Improper idling spee	ed)		Probable cause
In such cases as the above, the cause is probably that the intake air volume during idling is too great.		 Malfunction of the ISC servo system Malfunction of the throttle body 	
	Yes	Pofort	
Are diagnosis codes displayed?		Relei	0 F. 13-0, INSPECTION CHART FOR DIAGNOSIS CODES.
N o	NG		
Check the ISC servo for operation sound.		- Check (Refer	the ISC servo system. to P.13-44, INSPECTION PROCEDURE 33.)
↓ ^{OK}	NG	(
MUT-II Data list 26 Idle position switch (Refer to P.13-58.)	Check (Refer		the idle position switch system. to P.13-38, INSPECTION PROCEDURE 26.)
OK	NG		
MUT-II Data list 21 Engine coolant temperature sensor (Refer to P.13-57.)	Check (Refe		the engine coolant temperature sensor system. to P.13-10, INSPECTION PROCEDURE FOR DIAGNOSIS
OK		CODE	21.)
	NG		
MUT-II Data list 28 A/C switch (Refer to P.13-58.)	•	Check (Refer	the A/C switch and A/C relay system. to P.13-39, INSPECTION PROCEDURE 29.)
ок			
Basic idle speed adjustment (Refer to P.13-30.)*			
¥	NG		
Check trouble symptom.		Clean	the throttle valve area.
			+
		Adjust	the fixed SAS. (Refer to P.13-30.)*

NOTE

Idling speed is low. (Improper idling speed))	Probable cause
In cases such as the above, the cause is probably that the intal idling is too small.	ke air volume du	 Malfunction of the ISC servo system Malfunction of the throttle body
MUT-II Self-Diag code Are diagnosis codes displayed? No Check the ISC servo for operation sound. OK MUT-II Data list 26 Idle position switch (Refer to P.13-58.) OK MUT-II Data list 21 Engine coolant temperature sensor (Refer to P.13-57.) OK Basic idle speed adjustment (Refer to P.13-30.)*	$\begin{array}{c} Yes \\ NG \\ NG \\ NG \\ NG \\ NG \\ NG \\ O \\ $	Refer to P.13-8, INSPECTION CHART FOR DIAGNOSIS CODES. Check the ISC servo system. (Refer to P.13-44, INSPECTION PROCEDURE 33.) Check the idle position switch system. (Refer to P.13-38, INSPECTION PROCEDURE 26.) Check the engine coolant temperature sensor system. (Refer to P.13-10, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 21.)
Check trouble symptom.	NG	Clean the throttle valve area.
		Adjust the fixed SAS. (Refer to P.13-30.)*

NOTE

When the engine is cold, it stalls at idling. (I	Die out)		Probable cause
In such cases as the above, the cause is probably that the air/fuel mix when the engine is cold, or that the intake air volume is insuff	ture is inapproicient.	opriate	 Malfunction of the ISC servo system Malfunction of the throttle body Malfunction of the injector system Malfunction of the ignition system
	Yes		
Were the battery terminals disconnected recently?	} −−►	After w	varming-up, let the engine run at idling for about 10 minutes.
No	Voo		
MUT-II Self-Diag code Are diagnosis codes displayed?		Refert	© P.13-8, INSPECTION CHART FOR DIAGNOSIS CODES.
No			
Does the engine stall right after the accelerator pedal is released?	_Yes ►	Clean	the throttle valve Adjust the fixed SAS.
No		area.	(Réfer to P.13-30.)*
•	Ne		
Is engine-idling stable after the warming-up?		Check	for unstable idling (Rough idling, hunting).
Yes		(Refer	to P.13-25, INSPECTION PROCEDURE 8.)
	_ NG		
Check the ISC servo for operation sound.	►	Check	the ISC servo system.
ОК		(INEIEI	to F.13-44, INSECTION FROCEDORE 33.
	ר NG	Charle	
Check the injector for operation sound.		CEDU	RE FOR DIAGNOSIS CODE 41.)
UK			
MUT-II Data list	_ NG	Check	the idle position switch system.
26 Idle position switch (Refer to P.13-58.)		(Refer	to P.13-38, INSPECTION PROCEDURE 26.)
ок			
MUT-II Data list	_ NG	Check	the engine coolant temperature sensor system.
21 Engine coolant temperature sensor (Refer to P.13-57.)		(Refer	to P.13-10, INSPECTION PROCEDURE FOR DIAGNOSIS
ок		CODE	. 21.)
Check the fuel pressure. (Refer to P.13-30.)*]		
ок			
Check the ignition timing. (Refer to GROUP 11 – Engine Adjustments.)*	►	Check	that the crank angle sensor and the timing belt cover are ed properly.
ОК			
 Check the following items. Check the ignition coil, spark plugs, spark plug cables. Check the compression pressure. Check the engine oil viscosity. 			

NOTE

When the engine is hot, it stalls at idling. (Die out)			Probable cause
In such cases as the above, the cause is probably that ignition syst idle speed control (ISC) or compression pressure is defective. In addition, if the engine suddenly stalls, the cause may also be a contact.	em, air/fuel mi defective coni	xture, nector	 Malfunction of the ignition system Malfunction of air-fuel ratio control system Malfunction of the ISC servo system Drawing air into intake system Improper connector contact Backflow of secondary air to the intake system
	Voc		
Were the battery terminals disconnected recently?	► Tes	After wa	arming-up, let the engine run at idling for about 10 minutes.
No			
MUT-II Diagnosis code Are diagnosis codes displayed?	Yes	Refer to	P.13-8, INSPECTION CHART FOR DIAGNOSIS CODES.
No			
Check the ISC servo for operation sound.] <mark>───►</mark>	Check (Refer	
ок		INGIGI	IN F.13-44, INSELCTION FROCEDORE 33.)
Check the injector for operation sound.	NG ►	Check t	he injector system. (Refer to P.13-15, INSPECTION PRO-
ОК	-	CEDUF	RE FOR DIAGNOSIS CODE 41.)
♦ Does the engine stall right after the accelerator pedal is released?	Yes	Clean t	the throttle valve Adjust the fixed SAS.
No		area.	(Refer to P.13-30.)*
	Na		
Does the engine stall easily again?		Whileca	arrying out an intermittent malfunction simulation test (Refer
Yes	_	for sude	UP 00 – Points to Note for Intermittent Malfunctions.), check den changes in the signals shown below.
MUT-II: Engine stalling inspection when the engine is warm and idling. (Refer to P.13-50, INSPECTION PROCEDURE 42.)		 Crail Injer 	nk angle sensor signal ctor drive signal L nump drive signal
ОК	L	• Air	flow sensor signal
★	NG		
Check the ignition timing. (Refer to GROUP 11 – ENGINE ADJUSTMENTS.)*		Check to installed	that the crank angle sensor and the timing belt cover are d properly.
ОК			
 Check the following items. Check the ignition coil, spark plugs, spark plug cables. Check the secondary air supply system. (Ensure that there Check if the injectors are clogged. Check the compression pressure. 	is no backflo	w of sec	ondary air into the intake system.)

• Check if foreign materials (water, alcohol, etc.) got into fuel.

NOTE

The engine stalls when starting the car. (Pass out)		Probable cause	
In cases such as the above, the cause is probably misfiring due to a weak spark, or an inappropriate air/fuel mixture when the accelerator pedal is depressed.		Drawing air into intake systemMalfunction of the ignition system	
MUT-II Self-Diag code Are diagnosis codes displayed?	Yes Refer t	0 P.13-8, INSPECTION CHART FOR DIAGNOSIS CODES.	
 Check the following items. Check the ignition coil, spark plugs, spark plug cables. Check if air was drawn into the intake system. Broken intake manifold gasket Broken or disconnected vacuum hose Improper operation of the PCV valve 			

INSPECTION PROCEDURE 14

Broken air intake hose

The engine stalls when decelerating.	Probable cause
In cases such as the above, the cause is probably that the intake air volume is insufficient due to a defective idle speed control (ISC) servo system.	Malfunction of the ISC servo system



• Check and adjust the fixed SAS.

Hesitation, sag or stumble		Probable cause
In cases such as the above, the cause is probably that ignition sys or compression pressure is defective.	tem, air/fuel n	 Malfunction of the ignition system Malfunction of air-fuel ratio control system Malfunction of the fuel supply system Poor compression Malfunction of the turbocharger system Malfunction of the secondary air supply system
MUT-II Self-Diag code	Yes	Refer to P.13-8, INSPECTION CHART FOR DIAGNOSIS CODES.
No		
Check the injectors for operation sound.	NG ┣──►	Check the injector system. (Refer to P.13-15, INSPECTION PRO- CEDURE FOR DIAGNOSIS CODE 41.)
	_ NG	
Check the ignition timing. (Refer to GROUP 11 – Engine Adjustments.)*		Check that the crank angle sensor and the timing belt cover are installed properly.
ок	_	
MUT-II: Check if hesitation, sag, stumble or poor acceleration occurs. (Refer to P.13-51, INSPECTION PROCEDURE 43.)		
ок	_	
Check the fuel pressure. (Refer to P.13-30.)*		
 Check the following items. Check the ignition coil, spark plugs, spark plug cables. Check the turbocharger boost pressure. Check the boost pressure control system. Check the turbocharger turbine wheel for smooth rotation. Check the compression pressure. Check the fuel filter or fuel line for clogging. Check the secondary air supply system. 		

NOTE

*: Refer to Workshop Manual for LANCER EVOLUTION-IV and EVOLUTION-V (Pub. No. S9806CNCP9).

The feeling of impact or vibration when accelerating	Probable cause
In cases such as the above, the cause is probably that there is an ignition leak accompanying the increase in the spark plug demand voltage during acceleration.	Malfunction of the ignition system

MUT-II Self-Diag code Are diagnosis codes displayed?	Yes Refer to P.13-8, INSPECTION CHART FOR DIAGNOSIS CODES.
No	
 Check the following items. Check the ignition coil, spark plugs, spark plug cables. Check for occurrence of ignition leak. 	

The feeling of impact or vibration when dec	elerating		Probable cause
Malfunction of the ISC servo system is suspected.			Malfunction of the ISC servo system
MUT-II Self-Diag code Are diagnosis codes displayed?	Yes	Refer t	0 P.13-8, INSPECTION CHART FOR DIAGNOSIS CODES.
No			
Check the ISC servo for operation sound.		Check	the ISC servo system.
, ok	NG		
MUT-II Data list 14 Throttle position sensor (Refer to P.13-57.)	►	Check SPEC	the throttle position sensor system. (Refer to P.13-9, IN- TION PROCEDURE FOR DIAGNOSIS CODE 14.)
ОК	-		
MUT-II Data list	NG	Check	the idle position switch system.
26 Idle position switch (Refer to P.13-58.)		(Refer	to P.13-38, INSPECTION PROCEDURE 26.)
	1		
Clean the throttle valve area.			
INSPECTION PROCEDURE 18			
Poor acceleration			Probable cause
Defective ignition system, abnormal air-fuel ratio, poor compres are suspected.	sion pressur	e, etc.	 Malfunction of the ignition system Malfunction of air-fuel ratio control system Malfunction of the fuel supply system Poor compression pressure Clogged exhaust system Malfunction of the turbocharger system
MUT-II Self-Diag code Are diagnosis codes displayed?	Yes	Refert	0 P.13-8, INSPECTION CHART FOR DIAGNOSIS CODES.
No	NG		
Check the injectors for operation sound.	 	Check CEDU	the injector system. (Refer to P.13-15, INSPECTION PRO- RE FOR DIAGNOSIS CODE 41.)
OK	NO	L	,
Check the ignition timing. (Refer to GROUP 11 – Engine Adjustments.)*	NG ►	Check installe	that the crank angle sensor and the timing belt cover are ed properly.
ОК	-		
MUT-II: Check if hesitation, sag, stumble or poor acceleration occur. (Refer to P.13-51, INSPECTION PROCEDURE 43.)			
ОК	_		
Check the fuel pressure. (Refer to P.13-30.)*]		
, OK			
 Check the following items. Check the ignition coil, spark plugs, spark plug cables. Check the turbocharger boost pressure. Check the boost pressure control system. Check the turbocharger turbine wheel for smooth rotation. Check the compression pressure. Check the fuel filter or fuel line for clogging. Broken air intake hose Clogged air cleaner Clogged exhaust system 			

Surge		Probable cause
Defective ignition system, abnormal air-fuel ratio, etc. are susp	ected.	 Malfunction of the ignition system Malfunction of air-fuel ratio control system
MUT-II Self-Diag code Are diagnosis codes displayed? No Check the injectors for operation sound.	Yes Refe NG Chec CED	r to P.13-8, INSPECTION CHART FOR DIAGNOSIS CODES. ck the injector system. (Refer to P.13-15, INSPECTION PRO- URE FOR DIAGNOSIS CODE 41.)
Check the ignition timing. (Refer to GROUP 11 – Engine Adjustments.)* OK MUT-II: Check if surge occurs. (Refer to P.13-52, INSPECTION PROCEDURE 44.)	NG Chec insta	ck that the crank angle sensor and the timing belt cover are lled properly.
OK Check the fuel pressure. (Refer to P.13-30.)*]	
Check the following items.Check the ignition coil, spark plugs, spark plug cables.Check the waste gate actuator.		

NOTE

*: Refer to Workshop Manual for LANCER EVOLUTION-IV and EVOLUTION-V (Pub. No. S9806CNCP9).

INSPECTION PROCEDURE 20

Knocking	Probable cause
In cases as the above, the cause is probably that the detonation control is defective or the heat value of the spark plug is inappropriate.	Defective detonation sensorInappropriate heat value of the spark plug

MUTH Colf Diam and	Yes	
Are diagnosis codes displayed?		Relet to P. 13-6, INSPECTION CHART FOR DIAGNOSIS CODES.
No	No	
Does knocking occur when driving with the sensor disconnected? At this time, use the MUT-II to check if the timing is retarded compared to when the detonation sensor connector is con- nected.		Check the detonation sensor system. (Refer to P.13-15, INSPEC- TION PROCEDURE FOR DIAGNOSIS CODE 31.)
Yes		
Check the following items. Spark plugs 		

• Check if foreign materials (water, alcohol, etc.) got into fuel.

INSPECTION PROCEDURE 21

Probable cause	Dieseling
Fuel leakage from injectors	Fuel leakage from injectors is suspected.
Fuel leakage from injectors	Fuel leakage from injectors is suspected.

Check the injectors for fuel leakage.

Too high CO and HC	concentration when id	ling		Probable cause)
Abnormal air-fuel ratio is suspe	ected.			 Malfunction of the a Deteriorated catalyst 	air-fuel ratio control system
MUT-II Self-Diag code Are diagnosis codes displayed?	No	Yes	Refert	o P.13-8, INSPECTION C	CHART FOR DIAGNOSIS CODES.
Check the ignition timing.	Adjustments)*	NG	Check install	that the crank angle ser	nsor and the timing belt cover are
	OK	_ NG	Instant	a propeny.	
MUT-II Data list 21 Engine coolant temperature	sensor. (Refer to P.13-57.)	•	 Check (Refer CODE 	the engine coolant temp to P.13-10, INSPECTION 21.)	perature sensor system. I PROCEDURE FOR DIAGNOSIS
MUT-II Data list	V.	NG	Check	the intake air temperatur	e sensor system. (Refer to P.13-9.
13 Intake air temperature sense	or (Refer to P.13-56.) OK		INSPE	CTION PROCEDURE F	OR DIAGNOSIS CODE 13.)
MUT-II Data list		NG	Check	the barometric pressure	sensor system. (Refer to P.13-14,
25 Barometric pressure sensor	OK		INSPE	CTION PROCEDURE F	OR DIAGNOSIS CODE 25.)
MUT-II Data list 11 Oxygen sensor OK: 600-1.000 mV when	racing suddenly		Check PROC	the oxygen sensor syster EDURE FOR DIAGNOS	m. (Refer to P.13-15, INSPECTION SIS CODE 31.)
	OK	_ ОК	Denley		
MUT-II Data list 11 Oxygen sensor OK: Repeat 0-400 mV and idling	d 600–1,000 mV alternately when			ce the oxygen sensor.	•
	NG	_	Check	trouble symptom.	NG
Check the fuel pressure. (Refe	r to P.13-30.)* OK				•
Check the following items. • Check the injectors for oper • Check the injectors for fuel • Check the ignition coil, span • Check the compression pre • Check the positive crankcas • Check the evaporative emis	ration sound. leakage. rk plugs, spark plug cables. ssure. se ventilation system. sion control system.				•
Check the trouble symptom.	, -]			
Replace the catalytic converter.	NG]			

NOTE

Low alternator output voltage (approx. 12.3 V)	Probable cause
The alternator may be defective, or malfunctions, which are listed in the right column, may be suspected.	 Malfunction of charging system Short circuit in harness between alternator G terminal and engine-ECU Malfunction of engine-ECU



Power supply system and ignition switch-IG	6 system	Probable cause
When an ignition switch ON signal is input to the engine-ECU, the the control relay ON. This causes system voltage to be supplied injectors and air flow sensor.	e engine-ECU turns to the engine-ECU,	 Malfunction of the ignition switch Malfunction of the control relay Improper connector contact, open or short-circuited harness wire Disconnected engine-ECU earth wire Malfunction of the engine-ECU
Check the control relay. (Refer to P.13-68.) OK Measure at the control relay connector B-27. • Disconnect the connector, and measure at the harness side. • Voltage between 3, 4 and earth OK: System voltage	NG NG ► Check conne	ce the following sctor: A-28 OK
OK Check the engine-ECU power supply and earth circuit. (Refer to P.13-53, INSPECTION PROCEDURE 45.)	Check Check and re	trouble symptom. NG the harness wire between battery and control relay connector, pair if necessary.

INSPECTION PROCEDURE 25 <EVOLUTION-IV, EVOLUTION-V>

Fuel pump system			Probable cause
The engine-ECU turns the control relay ON when the engine is of and this supplies power to drive the fuel pump.	cranking or ru	inning,	 Malfunction of the fuel pump relay Malfunction of the fuel pump Improper connector contact, open or short-circuited harness wire Malfunction of the engine-ECU
	NG		
Check the fuel pump operation by applying the system voltage to the fuel pump drive terminal.	▶	Check (Refer	the fuel pump circuit. to P.13-53, INSPECTION PROCEDURE 46.)
ОК			
Check the fuel pump relay. (Refer to P.13-68.)	_NG ►	- Replac	e
ОК			
Measure at the fuel pump relay connector B-28. • Connect the connector. • Voltage between 1 and earth • MUT-II Actuator test: Fuel pump drive	NG	Check (Refer	the fuel pump drive control circuit. to P.13-54, INSPECTION PROCEDURE 47.)
OK: System voltage			
OK	NG		
Check the following connectors: D-18, D-04, B-64, A-124, A-123, B-59, B-60		- Repair	
OK	NG		
Check the fuel pump relay No.2. (Refer to P.13-68)	→	- Replac	e
ОК	NG		
 Measure at the fuel pump relay No.2 connector A-123. Disconnect the connector. Voltage between each of 3 and 5 and earth MUT-II Actuator test: Fuel pump drive OK: System voltage 		Check relay N	the harness wire between fuel pump relay and fuel pump lo.2 connector, and repair if necessary.
ОК			
Measure at the engine-ECU connector B-60. Connect the connector. Voltage between 39 and earth MUT-II Actuator test: Fuel pump drive OK: System voltage		Check engine	the harness wire between fuel pump relay No.2 and -ECU connector, and repair if necessary.
ОК			
 Measure at the resistor connector A-124. Disconnect the connector. Voltage between 1 and earth MUT-II Actuator test: Fuel pump relay No.2 drive OK: System voltage 	NG	Check connec	the harness wire between fuel pump relay No.2 and resistor ctor, and repair if necessary.
ОК	_		
Check the resistor. (Refer to P.13-34.)*	NG	- Replac	e
ОК	-		
Check the harness wire between resistor connector and fuel pump drive terminal and between fuel pump relay No.2 connector and fuel pump drive terminal, and repair if necessary.			

NOTE

INSPECTION PROCEDURE 25 <EVOLUTION-VI>

Fuel pump system			Probable cause
 The engine-ECU turns the fuel pump relay ON when the errunning, and this supplies power to drive the fuel pump. The engine-ECU supplies power to the fuel pump through the operations. It supplies power directly to the fuel pump at h to increase the pump output. 	ngine is crank e resistor at lov igh load oper	ing or w load ations	 Malfunction of the fuel pump relay Malfunction of the fuel pump relay No.2 Malfunction of the fuel pump Malfunction of fuel pump resistor Improper connector contact, open or short-circuited harness wire Malfunction of engine-ECU
 Perform fuel pump operation check. Disconnect the fuel pump relay No.2 connector. Apply system voltage to terminal No.2 of the harness side connector. OK: Fuel pump operates. 	NG ►	Check (Refer	the fuel pump circuit. to P.13-54, INSPECTION PROCEDURE 46.)
OK			
 Perform fuel pump operation check. Disconnect the fuel pump resistor connector. Apply system voltage to terminal No.2 of the harness side connector. OK: Fuel pump operates. 	NG ▶	Check connec	the harness wire between fuel pump resistor and fuel pump ctor, and repair if necessary.
ОК			
Check the fuel pump relay. (Refer to P.13-68.)	NG ►	Replac	e
ОК			
Check the fuel pump relay No.2 and fuel pump resistor. (Refer to P.13-68.)	_NG ►	Replac	e
ОК			
Measure at the fuel pump relay No.2 connector A-123. Disconnect the connector, and measure at the harness side. Disconnect the fuel pump resistor connector. Voltage between each of 1 and 3 and earth MUT-II Actuator test: 07 Fuel pump drive OK: System voltage OK		Check Check Check relay N	the following connector: B-28 OK Trouble symptom. NG NG NG NG Repair NG Repair NG Repair
	NG	Check (Refer	the fuel pump drive control circuit. to P.13-54, INSPECTION PROCEDURE 47.)
 Measure at the fuel pump resistor connector A-124. Disconnect the connector, and measure at the harness side. Voltage between 1 and earth MUT-II Actuator test: 13 Fuel pump relay No.2 OK: System voltage 		Check relay c	the harness wire between fuel pump resistor and fuel pump onnector, and repair if necessary.
ОК			
 Measure at the engine-ECU connector B-60. Disconnect the connector, and measure at the harness side. Voltage between 39 and earth MUT-II Actuator test: 07 Fuel pump OK: System voltage 	NG►	Check Check	the following connector: A-123 NG Repair OK trouble symptom.
OK			↓
Check the following connector: B-60		Check engine	the harness wire between fuel pump relay No.2 and -ECU connector, and repair if necessary.
Check trouble symptom	7		
Replace the engine-ECU.			



NOTE

*: Refer to Workshop Manual for LANCER EVOLUTION-IV and EVOLUTION-V (Pub. No. S9806CNCP9).

Ignition switch-ST system	Probable cause
The ignition switch-ST inputs a HIGH signal to the engine-ECU while the engine is cranking. The engine-ECU controls fuel injection, etc. during starting based on this input.	 Malfunction of ignition switch Improper connector contact, open or short-circuited harness wire Malfunction of the engine-ECU



Power steering fluid pressure switch system	Probable cause
The presence or absence of power steering load is input to the engine-ECU. The engine-ECU controls the idle speed control (ISC) servo based on this input.	 Malfunction of power steering fluid pressure switch Improper connector contact, open or short-circuited harness wire Malfunction of the engine-ECU
	Manufaction of the engine-ECO



A/C switch and A/C relay system	Probable cause
When an A/C ON signal is input to the engine-ECU, the engine-ECU carries out control of the idle speed control (ISC) servo, and also operates the A/C compressor magnetic clutch.	 Malfunction of A/C control system Malfunction of A/C switch Improper connector contact, open or short-circuited harness wire Malfunction of the engine-ECU



INSPECTION PROCEDURE 30 <EVOLUTION-IV, EVOLUTION-V>

Fan motor relay system (Radiator fan, A/C co	ondenser fan)	Probable cause
The engine-ECU turns on/off the built-in power transistor to co relay.	ntrol the fan motor	 Malfunction of the fan motor relay Malfunction of the fan motor Improper connector contact, open or short-circuited harness wire Malfunction of engine-ECU
Measure at the engine-ECU connector B-59. • Disconnect the connector, and measure at the harness side. • Voltage between each of 20 and 21 and earth (Ignition switch: ON) • OK: System voltage • Short the terminal 21 to earth. (Ignition switch: ON) • OK: Fan operates at low speed. • Short the terminals 20 and 21 to earth. (Ignition switch: ON) • OK: Fan operates at high speed. • NG	OK ► Check Check Replac	trouble symptom. NG NG NG NG NG Ce the engine-ECU.

- Check the radiator fan circuit. Check the A/C condenser fan circuit. (Refer to Electrical Wirings.) •

INSPECTION PROCEDURE 30 <EVOLUTION-VI>

Fan motor relay system (Radiator fan, A/C co	ondense	r fan)	Probable cause
The engine-ECU turns on/off the built-in power transistor to co relay.	ontrol the far	n motor	 Malfunction of the fan motor relay Malfunction of the fan motor Malfunction of thermostat Improper connector contact, open or short-circuited harness wire Malfunction of engine-ECU
	NO		
 Measure at the engine-ECU connector B-59. Disconnect the connector, and measure at the harness side. Check the radiator fan for operating condition. (Ignition switch: ON) OK: Radiator fan is stationary. Voltage between each of 20 and 21 and earth (Ignition switch: ON) OK: System voltage Short the terminal 20 to earth. (Ignition switch: ON) OK: Radiator fan operates at high speed. Short the terminal 21 to earth. (Ignition switch: ON) OK: Radiator fan operates at low speed. 	NG	- Check	the radiator fan circuit. (Refer to Electrical Wirings.)
OK	NC		
Check the following connector: B-59		 Repair 	r
ОК			
Check trouble symptom.	7		
NG			
 Measure at the engine-ECU connector B-60. Disconnect the connector, and measure at the harness side. Check the A/C condenser fan for operating condition. (Ignition switch: ON) OK: A/C condenser fan is stationary. Voltage between each of 32 and 34 and earth (Ignition switch: ON) OK: System voltage Short the terminal 32 to earth. (Ignition switch: ON) OK: A/C condenser fan operates at high speed. Short the terminal 34 to earth. (Ignition switch: ON) OK: A/C condenser fan operates at low speed. 	NG	Check	the A/C condenser fan circuit. (Refer to Electrical Wirings.)
	¬ NG		
Check the following connector: B-60		 Repair 	r
UK	7		
Check trouble symptom.			
NG MUT-II Data list 21 Engine coolant temperature sensor OK: The engine coolant temperature agrees with the reading of MUT-II when measured with the engine idling in warm condition.	- OK	Check Replac	C the thermostat. ► Replace OK Ce the engine-ECU.
NG			
Check the engine coolant temperature sensor. (Refer to P.13-10, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 21.)			

INSPECTION PROCEDURE 31 <EVOLUTION-IV>

NG

ОК

between

NG

► Repair

Oxygen sensor system		Probable cause	
 When CO or HC concentration is too high, the malfunction of the parts shown at right may be the cause. The oxygen sensor detects the density of oxygen in exhaust gas and inputs it to the engine-ECU after converting into a voltage signal. The engine-ECU controls the fuel injection amount based on this signal such that the stoichiometric air/fuel mixture ratio can be obtained. 		 Malfunction of oxygen sensor Improper connector contact, on harness wire Malfunction of engine-ECU 	pen or short-circuited
Check the oxygen sensor. (Refer to P.13-32.)*	NG ► Repl	ace	
ОК			NC
Measure at the oxygen sensor connector A-63.	Che	k the following connector: B-62	► Repair
 Disconnect the connector, and measure at the namess side. Continuity between 2 and earth 		ок	
OK: Continuity	Cheo	k trouble symptom.	
		NG	
Check the following connector: A-63	Cheo	k the harness wire between	NG ► Repair
OK	engi	ne-ECU and oxygen sensor connector.	•
Check trouble symptom.]	OK	

Replace the engine-ECU.

Check the harness wire

engine-ECU and oxygen sensor connector.

NOTE

*: Refer to Workshop Manual for LANCER EVOLUTION-IV and EVOLUTION-V (Pub. No. S9806CNCP9).

Replace the engine-ECU.

INSPECTION PROCEDURE 31 <EVOLUTION-V, EVOLUTION-VI>

Oxygen sensor system	Probable cause
 When CO or HC concentration is too high, the malfunction of the parts shown at right may be the cause. The oxygen sensor detects the density of oxygen in exhaust gas and inputs it to the engine-ECU after converting into a voltage signal. The engine-ECU controls the fuel injection amount based on this signal such that the stoichiometric air/fuel mixture ratio can be obtained. 	 Malfunction of oxygen sensor Improper connector contact, open or short-circuited harness wire Malfunction of engine-ECU



NOTE



INSPECTION PROCEDURE 33

connector: B-59

Idle speed control (ISC) servo (Stepper moto	Probable cause	
The engine-ECU controls the intake air volume during idling by c the servo valve located in the bypass air passage.	pening and closing	 Malfunction of ISC servo Improper connector contact, open or short-circuited harness wire Malfunction of the engine-ECU
NG Check the ISC servo. ↓OK Measure at the ISC servo connector A-18. ● Disconnect the connector and measure at the harness side. ● Voltage between 2 and earth, and 5 and earth (Ignition switch: ON) OK: System voltage	NG Chec necto	sk the harness wire between control relay and ISC servo con- or, and repair if necessary.
OK Measure at the engine-ECU connector B-59. • Disconnect the connector, measure at the harness side. • Voltage between each of 4, 5, 17, 18 and earth (Ignition switch: ON) OK: System voltage	NG Chec	K the following NG ► Repair OK V k trouble symptom.
Check the following Repair	Chec	k harness wire between engine-ECU and ISC servo connector,

and repair if necessary. OK NG Replace the engine-ECU. Check trouble symptom.

Fuel pressure control valve system	F	Probable cause		
The fuel pressure control valve switches the pressure introduction in regulator between the intake manifold and atmosphere.	nto the fuel pre	essure	 Malfunction of solenoid valve Improper connector contact, open or short-circuited harness wire Malfunction of engine-ECU 	
[¬ NG			
Check the fuel pressure control valve.	►	Replace		
OK	NG			
 Measure at the fuel pressure control valve connector A-12. Disconnect the connector, and measure at the harness side. Voltage between 1 and earth (Ignition switch: ON) OK: System voltage 		Check the connecto	e harness wire between control relay and solenoid valve r, and repair if necessary.	
ОК	-			
Measure at the engine-ECU connector B-59. • Disconnect the connector, and measure at the harness side. • Voltage between 3 and earth (Ignition switch: ON)	NG	Check the	NG ► Repair OK NG ► Repair	
OK: System voltage		Check lit	NG	
ОК				
Check the following connector: B-59 Repair		Check the connecto	e harness wire between engine-ECU and solenoid valve r, and repair if necessary.	
	¬ NG			
Check trouble symptom.	┣━━►	Replace	the engine-ECU.	
INSPECTION PROCEDURE 35 Waste gate solenoid valve		F	Probable cause	
The waste gate solenoid valve controls the boost pressure introdugate actuator in the turbocharger.	uced into the	waste	 Malfunction of solenoid valve Improper connector contact, open or short-circuited harness wire Malfunction of engine-ECU 	
Check the waste gate solenoid valve. (Refer to Group 15 – On-vehicle service.)*	NG NG	Replace		
 Measure at the waste gate solenoid valve connector A-23. Disconnect the connector, and measure at the harness side. Voltage between 2 and earth (Ignition switch: ON) OK: System voltage 		Check the connecto	e harness wire between control relay and solenoid valve r, and repair if necessary.	
OK	-			
Measure at the engine-ECU connector B-59. Disconnect the connector, and measure at the harness side. Voltage between 11 and earth (Ignition switch: ON) OK: System voltage	NG	Check the	NG ► Repair OK ► Duble symptom.	
Ιοκ	L		NG ▼	
Check the following connector: B-59 NG Repair		Check the connecto	e harness wire between engine-ECU and solenoid valve r, and repair if necessary.	
	NG	Dent		
Check trouble symptom.	▶	Replace	the engine-ECU.	

NOTE

Secondary air control solenoid valve syster	n	Probable cause	
The secondary air control solenoid valve switches the pressure i secondary air valve between the intake manifold and atmosphe	ntroduction intere.	 Malfunction of solenoid valve Improper connector contact, open or short-circuited harness wire Malfunction of engine-ECU 	
Check the secondary air control solenoid valve. (Refer to Group 15 – INTAKE AND EXHAUST.)*	NG	Replace	
 Measure at the secondary air control solenoid connector A-127. Disconnect the connector, and measure at the harness side. Voltage between 1 and earth (Ignition switch: ON) OK: System voltage 	NG [← Check the following connector: A-88 → Repair OK Check trouble symptom.	
ОК]	NG Check the harness wire between control relay and solenoid valve connector, and repair if necessary.	
 Measure at the engine-ECU connector B-59. Disconnect the connector, and measure at the harness side. Voltage between 6 and earth (Ignition switch: ON) OK: System voltage 	NG	Check the following connectors: A-127, A-88 OK Check trouble symptom	
OK]	NG	
Check the following connector: B-59 Repair		connector, and repair if necessary.	
Check trouble symptom.	┣	Replace the engine-ECU.	

MUT-II: Inspection of no initial combustion



INSPECTION PROCEDURE 38

Ignition system: Inspection of no initial combustion.



MUT-II: Check if uncomplete combustion occurs. Yes **MUT-II Self-Diag code** Refer to P.13-8, INSPECTION CHART FOR DIAGNOSIS CODES. Are diagnosis codes displayed? No NG Check the fuel pump system. (Refer to P.13-36, INSPECTION PROCEDURE 25.) **MUT-II** Actuator test 07 Fuel pump (Refer to P.13-61.) OK NG **MUT-II Data list** Check the engine coolant temperature sensor system. (Refer to P.13-10, INSPECTION PROCEDURES FOR DIAGNOSIS 21 Engine coolant temperature sensor (Refer to P.13-57.) CODE 21.) ОK NG Check the ignition switch-ST system. MUT-II Data list (Refer to P.13-38, INSPECTION PROCEDURE 27.) 18 Ignition switch-ST (Refer to P.13-57.)

INSPECTION PROCEDURE 40

Check if hunting occurs.
Clean the throttle body.
Check and adjust the fixed SAS. (Refer to P.13-30.)*
•
Check trouble symptom.
NG
Inspect the intake of air into the air intake system Broken intake manifold gasket Broken air intake hose Broken vacuum hose Positive crankcase ventilation valve does not operate.

NOTE



NOTE

MUT-II: Engine stalling inspection when the engine is warmed up and idling.



NOTE

MUT-II: Check if hesitation, sag, stumble or poor acceleration occurs.



NOTE

MUT-II: Check if surge occurs.



NOTE

Check the engine-ECU power supply and earth circuit.



INSPECTION PROCEDURE 46 < EVOLUTION-IV, EVOLUTION-V>

Check fuel pump circuit.



INSPECTION PROCEDURE 46 <EVOLUTION-VI>

Check fuel pump circuit.



Check air flow sensor control circuit.





INSPECTION PROCEDURE 50

Check injector control circuit.



DATA LIST REFERENCE TABLE

ltem No.	Inspection item	Inspection contents		Normal condition	Inspection procedure No.	Reference page
11	Oxygen sensor	Engine:After having warmed up Air/fuel mixture is	When at 4,000 r/min, engine is suddenly decelerated	200 mV or less	Procedure No. 31	13-42
		richer when racing.	When engine is suddenly raced	600 – 1,000 mV		
		Engine:After having warmed up The oxygen sensor signal is used to check	Engine is idling	400 mV or less (Changes)		
		the air/fuel mixture ratio, and control condition is also checked by the ECU.	2,500 r/min	600 – 1,000 mV		
12	Air flow sensor*	flow sor* /OLU- N-IV> • Engine coolant temperature: 80 – 95°C • Lamps, electric cooling fan and all accessories: OFF • Transmission: Neutral (A/T: P range)	Engine is idling	17 – 43 Hz	-	_
	<evolu- TION-IV></evolu- 		2,500 r/min	46 – 86 Hz		
			Engine is raced	Frequency increases in response to racing		
12	12 Air flow	 Engine coolant temperature: 80 – 	Engine is idling	12 – 38 Hz	_	-
	<evolu- TION-V, VI></evolu- 	VOLU- DN-V, VI> • Lamps, electric cooling fan and all accessories: OFF • Transmission: Neutral (A/T: P range)	2,500 r/min	36 – 76 Hz		
			Engine is raced	Frequency increases in response to racing		
13	Intake air temperature	Ignition switch: ON or with engine running	When intake air temperature is –20°C	–20°C	Code No. 13	13-9
	sensor		When intake air temperature is 0°C	0°C		
			When intake air temperature is 20°C	20°C		
			When intake air temperature is 40°C	40°C		
			When intake air temperature is 80°C	80°C		

NOTE

*: In a new vehicle [driven approximately 500 km or less], the air flow sensor output frequency is sometimes 10% higher than the standard frequency.

ltem No.	Inspection item	Inspection contents		Normal condition	Inspection procedure No.	Reference page
14	Throttle	Ignition switch: ON	Set to idle position	300 – 1,000 mV	Code No. 14	13-9
	position sensor		Gradually open	Increases in proportion to throttle opening angle		
			Open fully	4,500 – 5,500 mV		
16	Power supply voltage	Ignition switch: ON		System voltage	Procedure No. 24	13-35
18	Cranking signal	Ignition switch: ON	Engine: Stopped	OFF	Procedure No. 27	13-38
	(ignition switch-ST)		Engine: Cranking	ON		
21	Engine coolant temperature	Engine coolant temperature sensor	When engine coolant temperature is –20°C	–20°C	Code No. 21	13-10
	Sensor		When engine coolant temperature is 0°C	0°C		
			When engine coolant temperature is 20°C	20°C		
			When engine coolant temperature is 40°C	40°C		
			When engine coolant temperature is 80°C	80°C		

ltem No.	Inspection item	Inspection contents		Normal condition	Inspection procedure No.	Reference page
22	Crank angle sensor	 Engine: Cranking Tachometer: Connected 	Compare the engine speed readings on the tachometer and the MUT-II.	Accord	_	
		 Engine: Idling Idle position switch: ON 	When engine coolant temperature is –20°C	1,300 – 1,500 rpm		
			When engine coolant temperature is 0°C	1,300 – 1,500 rpm		
			When engine coolant temperature is 20°C	1,300 – 1,500 rpm		
			When engine coolant temperature is 40°C	1,150 – 1,350 rpm		
			When engine coolant temperature is 80°C	750 – 950 rpm		
25	Barometric	tric Ignition switch: ON	At altitude of 0 m	101 kPa	Code No. 25	13-14
	sensor		At altitude of 600 m	95 kPa		
			At altitude of 1,200 m	88 kPa		
			At altitude of 1,800 m	81 kPa		
26	Idle position switch	dle position Ignition switch: ON Switch Check by operating	Throttle valve: Set to idle position	ON	Procedure No. 26	13-38
		repeatedly.)	Throttle valve: Slightly open	OFF*		
27	Power steering fluid	Engine: Idling	Steering wheel stationary	OFF	Procedure No. 28	13-39
	switch		Steering wheel turning	ON		
28	A/C switch	A/C switch Engine: Idling (when A/C switch is	A/C switch: OFF	OFF	Procedure No. 29	13-39
		ON, A/C compressor should be operating.)	A/C switch: ON	ON		

*: The idle position switch normally turns off when the voltage of the throttle position sensor is 50 – 100 mV higher than the voltage at the idle position. If the throttle position switch turns back on after the throttle valve has opened, the idle position switch and the throttle position sensor need to be adjusted.

ltem No.	Inspection item	Inspection contents		Normal condition	Inspection procedure No.	Reference page
41	Injectors* ¹ <evolu- TION-IV></evolu- 	Engine: Cranking	When engine coolant temperature is 0°C (injection is carried out for all cylinders simultaneously)	27 – 41 ms		
			When engine coolant temperature is 20°C	14 – 22 ms		
			When engine coolant temperature is 80°C	3.9 – 5.9 ms		
	Injectors* ² <evolu-< td=""><td rowspan="3"> brs*² Engine coolant temperature: 80–95°C Lamps, electric cooling fan and all accessories: OFF Transmission: Neutral (A/T : P range) </td><td>Engine is idling</td><td>1.2 – 2.4 ms</td></evolu-<>	 brs*² Engine coolant temperature: 80–95°C Lamps, electric cooling fan and all accessories: OFF Transmission: Neutral (A/T : P range) 	Engine is idling	1.2 – 2.4 ms		
			2,500 r/min	1.0 – 2.2 ms		
			When engine is suddenly raced	Increases		
41	Injectors*1 <evolu- TION-V, VI></evolu- 	njectors*1 EVOLU- ION-V, VI>	When engine coolant temperature is 0°C	27 – 40 ms	-	
			When engine coolant temperature is 20°C	14.5 – 21.7 ms		
			When engine coolant temperature is 80°C	3.8 – 5.6 ms	-	
	Injectors* ² <evolu-< td=""><td rowspan="3">njectors*2 EVOLU- TION-V, VI> • Engine coolant temperature: 80–95°C • Lamps, electric cooling fan and all accessories: OFF • Transmission: Neutral (A/T : P range)</td><td>Engine is idling</td><td>0.9 – 2.1 ms</td><td rowspan="3">-</td><td></td></evolu-<>	njectors*2 EVOLU- TION-V, VI> • Engine coolant temperature: 80–95°C • Lamps, electric cooling fan and all accessories: OFF • Transmission: Neutral (A/T : P range)	Engine is idling	0.9 – 2.1 ms	-	
	1011-1, 112		2,500 r/min	0.7 – 1.9 ms		
			When engine is suddenly raced	Increases		

- *1: The injector drive time represents the time when the cranking speed is at 250 r/min or below when the power supply voltage is 11 V. *2: In a new vehicle [driven approximately 500 km or less], the injector drive time is sometimes 10%
- longer than the standard time.

Item No.	Inspection item	Inspection contents		Normal condition	Inspection procedure No.	Reference page
44	Ignition coils and power transistors <evolu-< td=""><td> Engine: After having warmed up Timing lamp is set. (The timing lamp </td><td>Engine is idling</td><td>3°ATDC – 13°BTDC</td><td>-</td><td>-</td></evolu-<>	 Engine: After having warmed up Timing lamp is set. (The timing lamp 	Engine is idling	3°ATDC – 13°BTDC	-	-
	TION-IV>	is set in order to check actual ignition timing.)	2,500 r/min	24 – 44°BTDC		
44	Ignition coils and power transistors	 Engine: After having warmed up Timing lamp is set. 	Engine is idling	0 – 13°BTDC	-	_
	<evolu- TION-V, VI></evolu- 	LU- V, VI>	2,500 r/min	24 – 44°BTDC		
45	45 ISC (stepper) motor position *	 Engine coolant temperature: 80 – 90°C Lamps, electric cooling fan and all accessories: OFF Transmission: Neutral (A/T : P range) Idle position switch: ON Engine: Idling When A/C switch is ON, A/C compressor should be operating 	A/C switch: OFF	2 – 25 steps		
			A/C switch: OFF \rightarrow ON	Increases by 10 – 70 steps		
			 A/C switch: OFF Select lever: N range → D range 	Increases by 5 – 50 steps		
49	A/C relay	Engine: After having warmed up/Engine is idling	A/C switch: OFF	OFF (Compressor clutch is not operating)	Procedure No. 29	13-39
			A/C switch: ON	ON (Compressor clutch is operating)		

*: In a new vehicle [driven approximately 500 km or less], the stepper motor has sometimes 30 steps greater than the standard value.

Caution

When shifting the select lever to D range, the brakes should be applied so that the vehicle does not move forward.

8. ACTUATOR TEST REFERENCE TABLE

ltem No.	Inspection item	Drive contents	Inspection conte	ents	Normal condition	Inspection procedure No.	Reference page
01	Injectors	Cut fuel to No. 1 injector	Engine: After having wa	Engine: After having warmed		Code No. 41	13-15
02		Cut fuel to No. 2 injector	(Cut the fuel sup injector in turn a	ng pply to each and check	ble, resulting in engine stall).		
03		Cut fuel to No. 3 injector	cylinders which idling.)	don't affect			
04		Cut fuel to No. 4 injector					
07	Fuel pump	Fuel pump operates and fuel is recircu- lated.	 Engine: Cranking Fuel pump: Forced driving Inspect ac- cording to 	Pinch the return hose with fingers to feel the pulse of the fuel being recirculated.	Pulse is felt.	Procedure No. 25	13-36
			cording to both the above condi- tions.	Listen near the fuel tank for the sound of fuel pump operation.	Sound of opera- tion is heard.		
09	Fuel pressure control valve	Solenoid valve turns from OFF to ON.	Ignition switch:	ON	Sound of opera- tion can be heard when solenoid valve is driven.	Procedure No. 34	13-45
12	Waste gate solenoid valve	Solenoid valve turns from OFF to ON.	Ignition switch:	Ignition switch: ON		Procedure No. 35	13-45
13	Fuel pump relay No.2	Turn fuel pump relay No.2 from OFF to ON.	 Ignition switch: ON Listen to pump operation sound near fuel tank. 		Sound of opera- tion can be heard.	Procedure No. 25	13-36
17	Basic igni- tion timing	Set to ignition timing adjust- ment mode	 Engine: Idl Timing ligh 	ing t is set	5°BTDC	-	_

ltem No.	Inspection item	Drive contents	Inspection contents	Normal condition	Inspection procedure No.	Reference page
20	Radiator fan (HIGH), condenser fan (HIGH)* ¹	Drive the fan motors (for radiator and condenser* ¹)	 Ignition switch: ON A/C switch: ON*¹ 	Fan motors operate at high speed.	Procedure No. 30	13-40
21	Radiator fan (LOW), condenser fan (LOW)* ¹	Drive the fan motors (for radiator and condenser* ¹)	 Ignition switch: ON A/C switch: ON*¹ 	Fan motors operate at low speed.		
36* ²	Secondary air control solenoid valve	Turn solenoid valve from OFF to ON.	Ignition switch: ON	Sound of opera- tion can be heard when solenoid valve is driven.	Procedure No. 36	13-46
37* ²	A/C con- denser fan (HIGH)	Drive A/C condenser fan motor	Ignition switch: ON	A/C condenser fan motor oper- ates at high speed.	Procedure No. 30	13-41
38* ²	A/C con- denser fan (LOW)	Drive A/C condenser fan motor	Ignition switch: ON	A/C condenser fan motor oper- ates at low speed.		

NOTE *1: EVOLUTION-IV and EVOLUTION-V *2: EVOLUTION-VI

ENGINE-ECU INSPECTION TERMINAL VOLTAGES

Engine ECU connector

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Terminal No.	Check item	Check condition (Engine condition)	Normal condition				
1	No.1 injector	While engine is idling after having been warmed up,	Momentarily drops				
14	No.2 injector	suddenly depress the accelerator pedal.	signuy from 11 – 14 v.				
2	No.3 injector						
15	No.4 injector						
3	Fuel pressure control	Ignition switch: ON	System voltage				
	valve	Engine: Cranking to idling (within about two minutes)	0 – 3 V to sytem voltage				
4	Stepper motor coil (A1)	Engine: Immediately after engine has been started	Changes repeatedly				
17	Stepper motor coil (A2)		to $0 - 6$ V and from 0				
5	Stepper motor coil (B1)		voltage.				
18	Stepper motor coil (B2)						
6	Secondary air control solenoid valve	Ignition switch: ON	System voltage				
8	Fuel pump relay	Ignition switch: ON	System voltage				
		Engine: Idling	0 – 3 V				
10	Power transistor unit (A)	Engine speed: 3,000 r/min	0.3 – 3.0 V				
23	Power transistor unit (B)						
11	Wastegate solenoid	Ignition switch: ON	System voltage				
	valve	Engine: At idle after having been warmed up (when premium gasoline is used)	0 – 3 V				
12	Power supply	Ignition switch: ON	System voltage				
25							
19	Air flow sensor reset	Engine: Idling	0 – 1 V				
	signal	Engine speed: 3,000 r/min	6 – 9 V				
20	Fan motor relay (HI) <evolution-iv, v=""></evolution-iv,>	Fan not operating (coolant temperature: 90°C or below)	System voltage				
		Fan at high speed (coolant temperature: 105°C or above)	0 – 3 V				

Terminal No.	Check item	Check condition (Engine	e condition)	Normal condition			
20	Radiator fan motor relay (HI)	Radiator fan not opera 95°C or below)	ting (coolant temperature:	System voltage			
	<evolution-vi></evolution-vi>	Radiator fan at high sp 105°C or above)	eed (coolant temperature:	0 – 3 V			
21	Fan motor relay (LOW) <evolution-iv, v=""></evolution-iv,>	Fan not operating (cool below)	System voltage				
		Fan at low speed (coolan	nt temperature: 95 – 100°C)	0 – 3 V			
21	Radiator fan motor relay (LOW)	Radiator fan not opera 95°C or below)	ting (coolant temperature:	System voltage			
	<=VOLUTION-VI>	Radiator fan at low spee – 105°C)	ed (coolant temperature: 95	0 – 3 V			
22	A/C relay	 Engine: Idling A/C switch: OFF to driven.) 	ON (Compressor is being	System voltage, or 6 V or more instanta- neously to 0 – 3 V			
32	A/C condenser fan motor relay (HI)	A/C condenser fan not o coolant temperature: 10	System voltage				
	<evolution-vi></evolution-vi>	A/C condenser fan at hi coolant temperature: 10	0 – 3 V				
33	Alternator G terminal	 Engine: Warm, idle Headlamp: OFF to Brake lamp: OFF t Rear defogger swit 	e (radiator fan: OFF) ON to ON tch: OFF to ON	Voltage rises by 0.2 – 3.5 V.			
34	A/C condenser fan motor relay (LOW)	A/C condenser fan not o coolant temperature: 10	System voltage				
		A/C condenser fan at log coolant temperature: 10	w speed (A/C switch: OFF, 5°C or above)	0 – 3 V			
36	Engine warning lamp	Ignition switch: OFF \rightarrow (NO	$0 - 3 V \rightarrow System$ voltage (After several seconds have elapsed)			
37	Power steering fluid pressure switch	Engine: Idling after warming up	When steering wheel is stationary	System voltage			
			When steering wheel is turned	0 – 3 V			
38	Control relay	Ignition switch: OFF		System voltage			
		Ignition switch: ON		0 – 3 V			
39	Fuel pump relay No.2	While engine is idling accelerator pedal.	g, suddenly depress the	Momentarily rises slightly from 0 to 3 V.			
40	Exhaust temperature warning lamp	Ignition switch: OFF to C	0 – 3 V to system voltage (After several seconds have elapsed)				

13-0	65
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Terminal No.	Check item	Check condition (Engine	e condition)	Normal condition				
41	Alternator FR terminal	 Engine: Warm, idle Headlamp: OFF to Brake lamp: OFF Rear defogger swith 	e (radiator fan: OFF) ON to ON tch: OFF to ON	Voltage drops by 0.2 – 3.5 V.				
45	A/C switch	Engine: Idle speed	Turn the A/C switch OFF	0 – 3 V				
			Turn the A/C switch ON (A/C compressor is oper- ating)	System voltage				
60	Oxygen sensor heater	Engine: Idling		0 – 3 V				
	<evolution-v, vi=""></evolution-v,>	Engine speed: 5,000 r/n	nin	System voltage				
71	Ignition switch-ST	Engine: Cranking		8 V or more				
72	Intake air temperature sensor	Ignition switch: ON	When intake air tempera- ture is 0°C	3.2 – 3.8 V				
			When intake air tempera- ture is 20°C	2.3 – 2.9 V				
			1.5 – 2.1 V					
			When intake air tempera- ture is 80°C	0.4 – 1.0 V				
76	Oxygen sensor	Engine: Running at 2,0 warmed up (Check usin	$0 \leftrightarrow 0.8 \text{ V}$ (Changes repeatedly)					
80	Backup power supply	Ignition switch: OFF	System voltage					
81	Sensor impressed voltage	Ignition switch: ON		4.5 – 5.5 V				
82	Ignition switch-IG	Ignition switch: ON		System voltage				
83	Engine coolant temperature sensor	Ignition switch: ON	When engine coolant temperature is 0°C	3.2 – 3.8 V				
			When engine coolant temperature is 20°C	2.3 – 2.9 V				
			When engine coolant temperature is 40°C	1.3 – 1.9 V				
			When engine coolant temperature is 80°C	0.3 – 0.9 V				
84	Throttle position sensor	Ignition switch: ON	Set throttle valve to idle position	0.3 – 1.0 V				
			Fully open throttle valve	4.5 – 5.5 V				
85	Barometric pressure	Ignition switch: ON	When altitude is 0 m	3.7 – 4.3 V				
			When altitude is 1,200 m	3.2 – 3.8 V				
86	Vehicle speed sensor	 Ignition switch: ON Move the vehicle state 	l slowly forward	$0 \leftrightarrow 5 V$ (Changes repeatedly)				

Terminal No.	Check item	Check condition (Engine	e condition)	Normal condition				
87	Idle position switch	Ignition switch: ON	0 – 1 V					
			Slightly open throttle valve	4 V or more				
88	Camshaft position	Engine: Cranking	0.4 – 3.0 V					
	Sensor	Engine: Idle speed	0.5 – 2.0 V					
89	Crank angle sensor	Engine: Cranking		0.4 – 4.0 V				
		Engine: Idle speed		1.5 – 2.5 V				
90	Air flow sensor	Engine: Idle speed		2.2 – 3.2 V				
		Engine speed: 2,000 r/min						

RESISTANCE AND CONTINUITY BETWEEN HARNESS SIDE CONNECTORS AND TERMINALS Engine-ECU Harness Side Connector Terminal Arrangement

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Terminal No.	Inspection item	Normal condition (Check condition)
1 – 12	No.1 injector	2 – 3 Ω (At 20°C)
14 – 12	No.2 injector	_
2 – 12	No.3 injector	
15 – 12	No.4 injector	
3 – 12	Fuel pressure control valve	28 – 36 Ω (At 20°C)
4 – 12	Stepper motor coil (A1)	28 – 33 Ω (At 20°C)
17 – 12	Stepper motor coil (A2)	
5 – 12	Stepper motor coil (B1)	
18 – 12	Stepper motor coil (B2)	_
6 – 12	Secondary air control solenoid valve	28 – 36 Ω (At 20°C)
11 – 12	Wastegate solenoid valve	62 – 74 Ω (At 20°C)
60 – 12	Oxygen sensor heater <evolution-v, vi=""></evolution-v,>	11 – 18 Ω (at 20°C)
13 – Body earth	Engine-ECU earth	Continuity established (0 Ω)
26 – Body earth		
72 – 92	Intake air temperature sensor	$5.3-6.7~k\Omega$ (When intake air temperature is $0^\circ C)$
		$2.3-3.0~\text{k}\Omega$ (When intake air temperature is $20^\circ\text{C}\text{)}$
		$1.0 - 1.5 \text{ k}\Omega$ (When intake air temperature is 40°C)
		$0.30-0.42~k\Omega$ (When intake air temperature is $80^\circ C)$
74 – 77	High temperature sensor	3Ω or less
83 – 92	Engine coolant temperature sensor	5.1 – 6.5 k Ω (When coolant temperature is 0°C)
		2.1 – 2.7 k Ω (When coolant temperature is 20°C)
		$0.9-1.3~k\Omega$ (When coolant temperature is $40^\circ\text{C})$
		$0.26-0.36~k\Omega$ (When coolant temperature is $80^\circ\text{C})$
87 – 92	Idle position switch	Continuity established (when throttle valve is at idle position)
		No continuity (when throttle valve is slightly open)
91 – Body earth	-	Continuity established

ON-VEHICLE SERVICE

FUEL PUMP RESISTOR CHECK <EVOLUTION-VI>

Standard value: 0.45 – 0.65 Ω

The inspection procedures are the same as for the preceding year-models.

FUEL PUMP RELAY No.2 CONTINUITY CHECK <EVOLUTION-VI>

Battery voltage	Terminal N	Terminal No.											
	1	2	3	4									
Not supplied			0	-0									
Supplied			—	—Θ									
	0	0											



ENGINE CONTROL RELAY AND FUEL PUMP RELAY CONTINUITY CHECK

Battery voltage	Terminal N	0.		
	1	2	3	4
Not supplied		0		-0
Supplied	0			_
		Θ		

FUEL SUPPLY

GENERAL

OUTLINE OF CHANGE

The service procedures have been revised as shown below because of change in the fuel pump & gauge assembly and the fuel gauge unit. <EVOLUTION-VI>

FUEL TANK <EVOLUTION-VI>

REMOVAL AND INSTALLATION



Removal steps

- 1. Fuel hose
- 2. Fuel pump & gauge assembly
- 3. Packing 4. High-pressure fuel hose

- 5. Fuel pipe assembly
 - 6. Fuel gauge unit 7. Packing
- 7. Packi

NOTE

The service procedures other than those mentioned above remain unchanged.

INSTALLATION SERVICE POINT

►A HIGH-PRESSURE FUEL HOSE INSTALLATION

Caution

After connecting the quick-release joint of the high-pressure fuel hose, pull it gently in the direction of removal to check that the hose is firmly connected with a play of about 3 mm.

NOTES