MITSUBISHI MOTORS

WORKSHOP MANUAL

SUPPLEMENT

LANCER
EVOLUTION-VIII

LANCER
EVOLUTION VIII

FOREWORD

This manual contains details of the main changes to the '03 model Lancer Evolution VIII. Since only differences to the Lancer Evolution VII have been included, please use this manual in conjunction with the relevant pages in the material previously published.
We recommend that work is carried out with careful reference to this manual, to ensure that servicing is done correctly and quickly, so that vehicle performance is maintained.
This manual is based on the current model (January 2003). Please bear in mind that as a result of subsequent changes to vehicle specifications, some information may not correspond to more recently published details.
All the units shown in this manual follow the internationally recognised SI unit system. Please note that the practice of using the old units together with SI units has been dropped. (Please note, however, that figures and units specified on various forms may still use the old units)

Any opinions, requests, or questions concerning this manual, should be written on the 'Servicing Comment Form' at the end, and sent to us by fax.

January 2003

MITSUBISHI MOTOR CORPORATION

CONTENTS

General 00
Engine 11
Fuel 13
Engine Cooling 14
Intake and Exhaust 15
Engine Electrical 16
Engine and Emission Control 17
Manual Transmission 22
Front Axle 26
Rear Axle 27
Engine and Transmission Mounting 32
Body 42
Exterior 51
Interior and SRS Airbag 52
Chassis Electrical 54

Related materials

Title	No.	Issue date
New model manuals		
• Mirage, Lancer	1036F30	10/1995
• Mirage, Lancer	1036F31	1/1996
• Mirage, Lancer	1036F32	8/1996
• Mirage, Lancer	1036F33	7/1997
• Lancer	1036F34	1/1998
• Mirage, Lancer	1036F35	10/1998
• Lancer	1036F36	1/1999
• Lancer	1036F37	12/1999
• Lancer Sedia	1036K30	5/2000
• Lancer Sedia	1036K31	7/2000
• Lancer Evolution VII	1036K32	1/2001
• Lancer Sedia	1036K33	5/2001
• Lancer Sedia	1036K34	5/2001
• Lancer Evolution VII	1036K35	1/2002
• Lancer Sedia	1036K36	5/2002
• Lancer Evolution VII	1036K37	1/2003
Workshop Manuals		
• Lancer Sedia	1036k00	5/2000
• Lancer Sedia (supplement)	1036K01	7/2000
• Lancer Evolution VII (supplement)	1036K02	1/2001
• Lancer Sedia (supplement)	1036K03	5/2001
• Lancer Sedia (supplement)	1036K04	10/2001
• Lancer Evolution VII (supplement)	1036K05	1/2002
• Lancer Sedia (supplement)	1036K06	5/2002
Body edition Workshop Manuals		
• Mirage, Lancer (supplement)	1036F32	8/1996
• Lancer Sedia	1036K50	5/2000
• Lancer Sedia (supplement)	1036K51	7/2000
• Lancer Evolution VII (supplement)	1036K52	5/2001
• Lancer Sedia (supplement)	1036K53	10/2001
Electrical Wiring Diagrams Workshop Manuals		
• Lancer Evolution VIII	1036K77	1/2003
Engine Workshop Manuals		
• 4G6 engine	1039G46	1/2001
• 4G6 engine (supplement)	1039G63	1/2003
Transmission Workshop Manual		
• W5M51 manual transmission	1039M17	1/2001
• W5M51 manual transmission (supplement)	1039M22	1/2003
• W6MAA manual transmission	1039M23	1/2003

WARNING REGARDING SERVICING OF VEHICLES FITTED WITH SRS AIR BAGS · SEAT BELTS WITH PRE-TENSIONERS

Warning

1. Improper servicing or maintenance of any SRS air bag or pretensioner fitted seatbelt component, or related parts, could cause major injury as a result of the unintentional setting-off (incorrect deployment) of the SRS air bag or pretensioner fitted seatbelt, or non-operation.

2. When they could be subject to the effects of heat during the painting process, please remove the SRS-ECU, driver side air bag module, passenger side air bag module, pretensioner fitted seatbelt, and clock spring, as follows:

- **93°C and above: driver side air bag module, passenger side air bag module, clock spring**
- **90°C and above: pretensioner fitted seat belts**

3. Service or maintenance of any SRS air bag or pretensioner fitted seatbelt components or related parts must be performed by an authorised MITSUBISHI dealer.

4. This manual must be consulted (with special reference to Chapter 52B SRS Air Bag) before any servicing or maintenance is carried out on SRS air bag or pretensioner fitted seatbelt components or related parts.

Note

Sections titles with an asterisk (*) indicate areas where special attention must be paid to SRS airbags and pretensioner fitted seatbelts.

SECTION 00

GENERAL

CONTENTS

Model line-up.....1 **Troubleshooting and Inspection 2**

Applied vehicle numbers 1

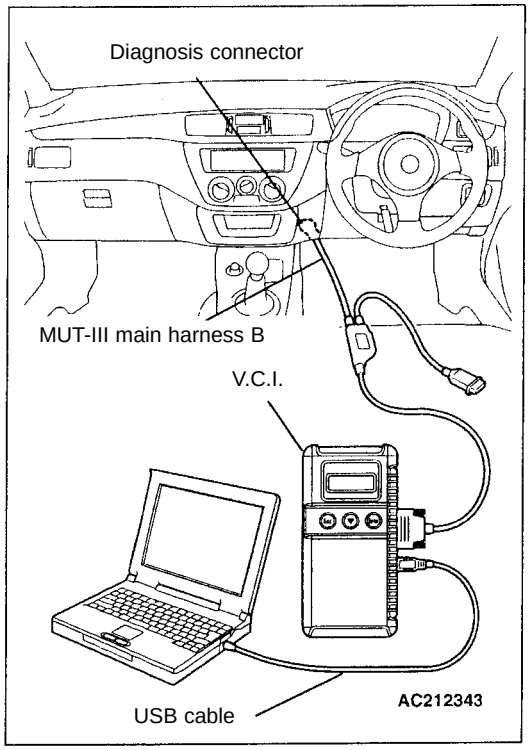
Model line-up

Model	Version	'03 Model	Grade	Engine Model	Transmission	Fuel System
GH-CT9A	SNDFZ	○	RS	4G63 (2 000 DOHC 16 valve intercooler turbo)	W5M51 (4WD, 5M/T)	MPI
	SYGFZ	X	GT-A		W5A51 [4WD, INVECS-II Sports mode 5 A/T (with steering shift switch)	
	SJDFZ	●	RS		W6MAA (4WD, 6 M/T)	
	SJGFZ	●	GSR			

Note
[●] New model [○] Continued model [X] Discontinued model

Applied vehicles

GH-CT9A: CT9A-0200001 ~

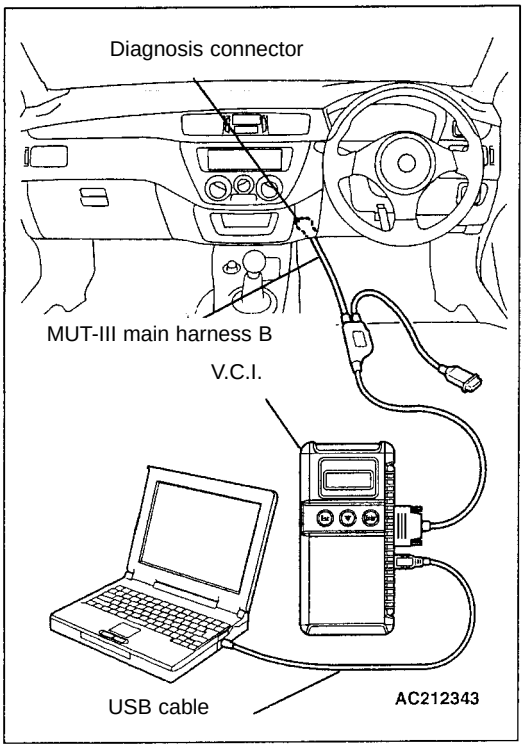


TROUBLESHOOTING AND INSPECTION

Diagnosis Functions

Reading Diagnosis Code

Connect the MUT-III to 16 pin diagnosis connector and read diagnosis code as described below.
NB. Please refer to the User Manual for a detailed explanation of how to use the MUT-III.
(1) Check that the ignition switch is in the LOCK (OFF) position.
(2) Connect special V.C.I. (MB991824) and PC with special USB cable (MB991827).
(3) Connect special MUT-III main harness B (MB991911) to V.C.I.
(4) Connect MUT-III main harness B to vehicle diagnosis connector.
(5) Turn V.C.I. power switch ON.
(6) After switching V.C.I. ON, the green V.C.I. indicator light should come on.
(7) Start up the PC MUT-III system, and turn vehicle switch to the ON position.
(8) Read diagnosis code.
(9) When disconnecting, turn ignition switch to LOCK (OFF) position, and follow reverse procedure.



Diagnosis Code Deletion

Connect MUT-III to diagnosis connector in the same way as for ‘Reading Diagnosis Codes’, then delete diagnosis codes.

SECTION 11A

ENGINE

CONTENTS

General 1
Sealants 1
Special Tools 1
Engine adjustment 2
1. Checking compression pressure 2
Camshaft, valve stem seals 2
Timing belt, timing belt B.....11

4G6 ENGINE

General

The servicing information specified below accompanies changes to the 4G63-MPI-T/C engine installed on the new Lancer Evolution VIII. Other servicing information remains the same.

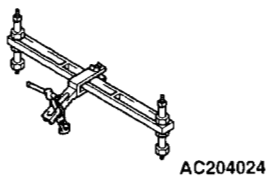
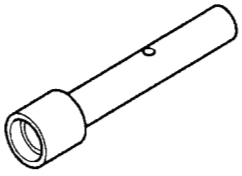
- The crank angle sensor and O_2 sensor connector have been changed
- The timing belt front cover is now split into 2

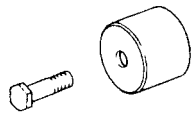
Sealants

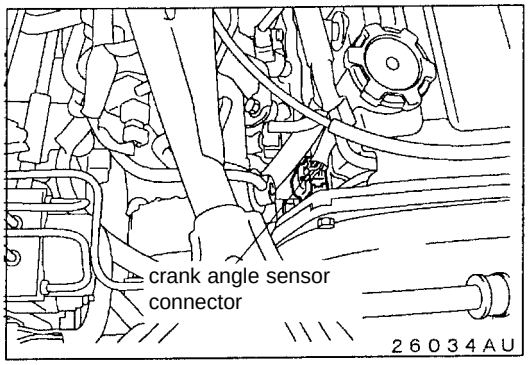
Location	Name
Rocker cover	Semi-dry sealant: Three Bond 1207D (MZ100168) (contains 150g)
Rocker cover gasket	
Cylinder head	
Camshaft end seal	Semi-dry sealant: Three Bond 1211 (MZ100057) (contains 100g)
Camshaft position sensor support	Semi-dry sealant: Three Bond 1207F (MZ100191) (contains 150g)

Note
( ) are original products

Special Tools

Tool	Number	Name	Function
 AC204024	MD998772	Valve spring compressor	Valve spring compression
	MD998737	Valve stem seal installer	Valve seal stem installation

Tool	Number	Name	Function
	MD998713	Camshaft Oil seal Installer	Camshaft oil seal insertion



ENGINE ADJUSTMENT

1. Checking compression pressure

The crank angle sensor connector position has been changed.

CAMSHAFT, VALVE STEM SEAL

Removal and Fitting

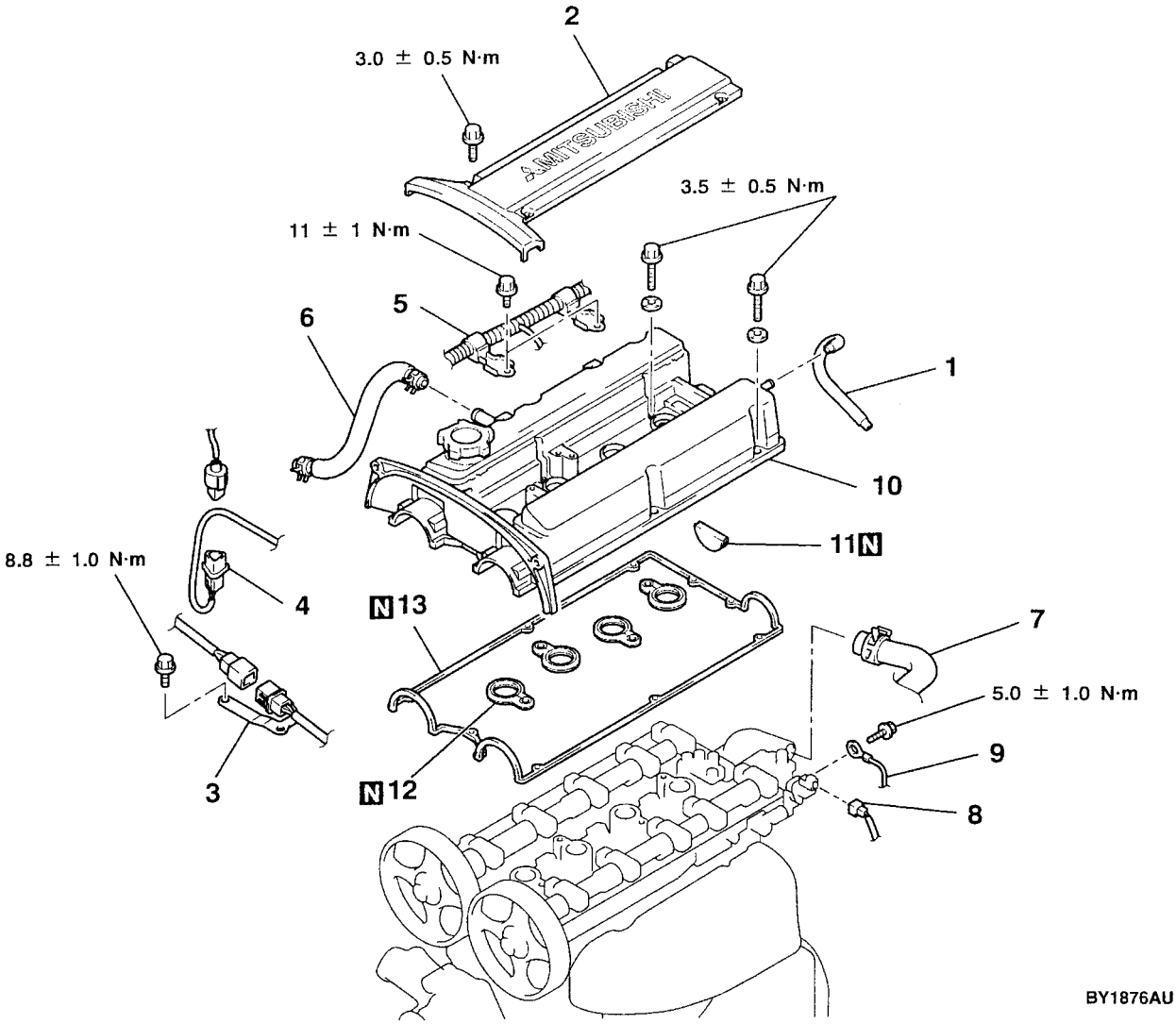
Caution

1. When Brembo brake callipers are used, there is concern over paint peeling off, so when doing servicing work, make sure they are not scratched by other components and tools. Furthermore, if any brake fluid gets onto the calipers, it should be wiped off immediately.

2. The fitting and removal of parts marked with an * should be carried out for each cylinder.

Jobs to do before removal and after fitting

- Removal and fitting of undercover (refer to Chapter 51 Front Bumper)
- Checking drive belt tension <only after fitting>
- Draining and filling of coolant
- Removal and fitting of air duct
- Removal and fitting of air pipe C (refer to Chapter 15 Intercooler)
- Removal and fitting of timing belt (refer to P.11A-12)



Removal procedure
1. Breather hose
   • Air bag ASSY
   (refer to Chapter 15-2 Secondary Air Control System)
2. Centre cover
   • Ignition coil
   (refer to Chapter 16 Ignition Equipment)
3. O_2 sensor connector
4. Crank angle sensor connector
5. Connecting the control harness
6. PCV hose

◀A▶ ▶N◀ 7. Radiator upper hose

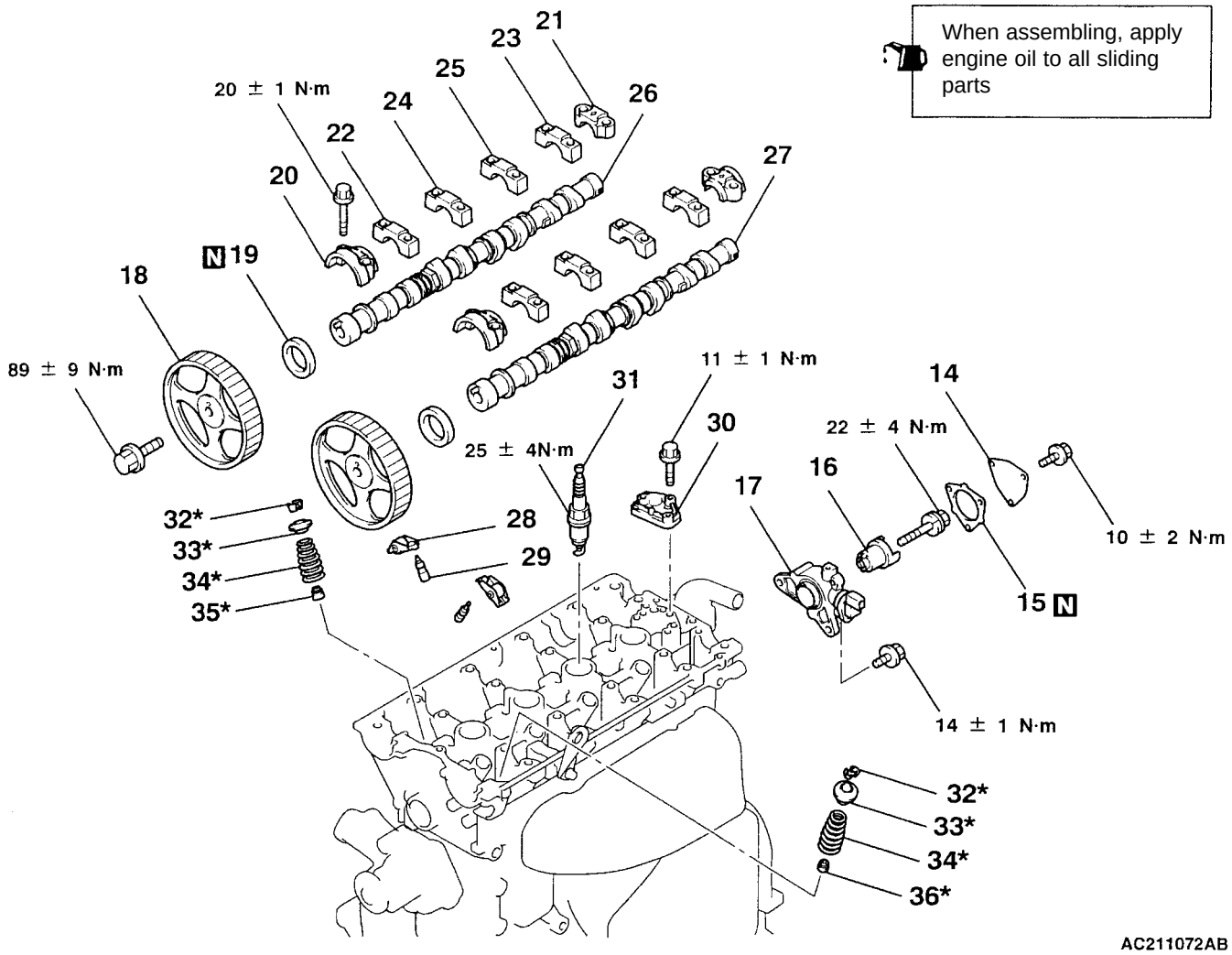
8. Camshaft position sensor connector
9. Connecting earth cable

▶M◀ 10. Rocker cover ASSY

▶L◀ 11. Camshaft end seal

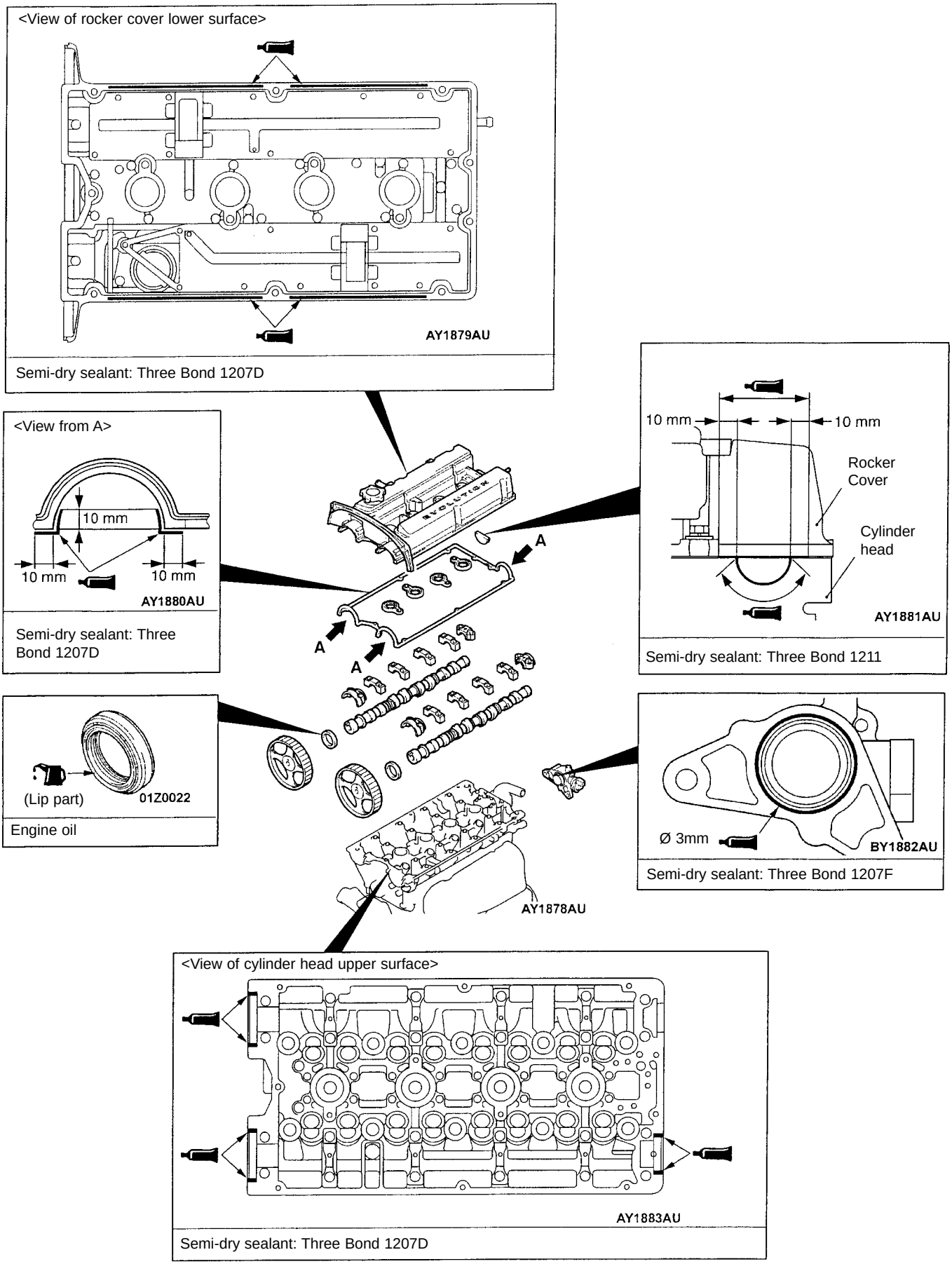
12. Spark plug hole gasket

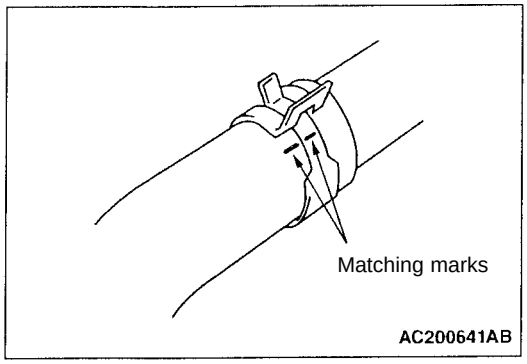
▶K◀ 13. Rocker cover gasket



14. Camshaft position sensor support cover
15. Camshaft position sensor support cover gasket
▸J◂ 16. Camshaft position sensing cylinder
▸I◂ 17. Camshaft position sensor support
◂B▸ ▸H◂ 18. Camshaft sprocket
▸G◂ 19. Camshaft oil seal
▸F◂ 20. Camshaft bearing cap front
▸F◂ 21. Camshaft bearing cap rear
▸F◂ 22. Camshaft bearing cap No.2
▸F◂ 23. Camshaft bearing cap No.5
▸F◂ 24. Camshaft bearing cap No.3
▸F◂ 25. Camshaft bearing cap No.4
▸E◂ 26. Inlet camshaft
▸E◂ 27. Exhaust camshaft
28. Rocker arm
▸D◂ 29. Lash adjuster
30. Oil delivery body
31. Spark plug
◂C▸ ▸C◂ 32. Valve spring retainer lock
33. Valve spring retainer
▸B◂ 34. Valve spring
▸A◂ 35. Inlet valve stem seal
▸A◂ 36. Exhaust valve stem seal

Lubricant and seal application locations

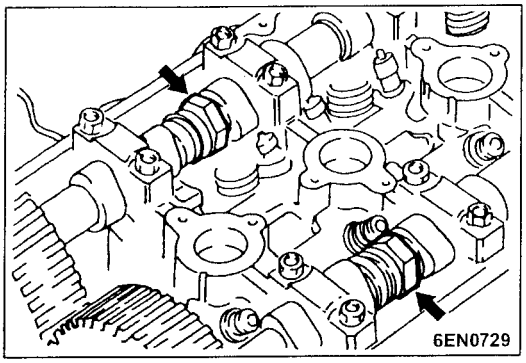




MAIN POINTS REGARDING REMOVAL

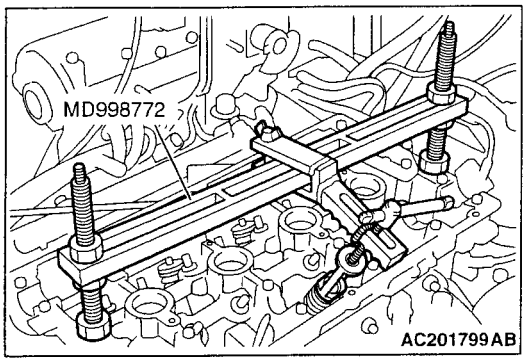
◀ A ▶ DETACHING RADIATOR UPPER HOSE

Align the matching marks on radiator upper hose and hose clamp, then detach radiator upper hose.



◀ B ▶ REMOVING CAMSHAFT SPROCKETS

Hold camshaft hexagonal part with a wrench, loosen mounting bolt, and remove camshaft sprocket.



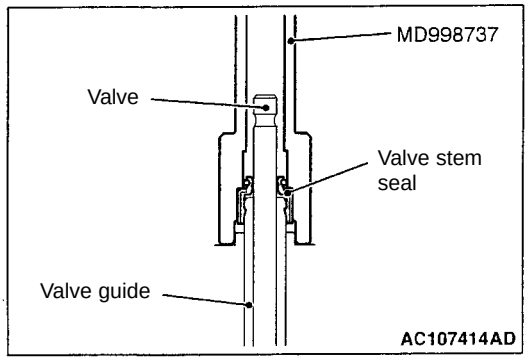
◀ C ▶ REMOVING VALVE SPRING RETAINER LOCK

Compress valve spring using the special valve spring compressor tool (MD998772), and remove valve spring retainer lock.

CAUTION

When removing the valve spring retainer lock, all cylinder pistons should be in the top dead centre position. If pistons are not in the top dead centre position, valves could fall into the cylinders.

ASSEMBLY - MAIN POINTS



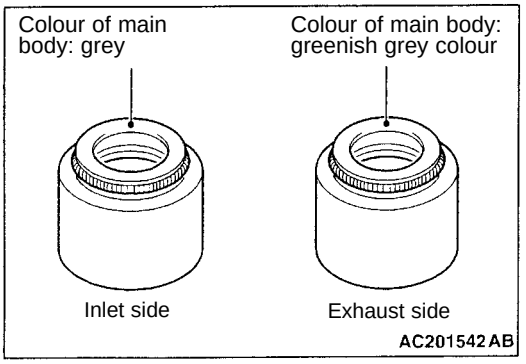
▶ A ◀ Fitting exhaust valve stem seals/inlet valve stem seals

1. Apply a small quantity of engine oil to valve stem seals
2. Place the valve stem into the guides, then insert a new valve stem seal into the valve guide using the special valve stem seal installer (MD998737).

CAUTION

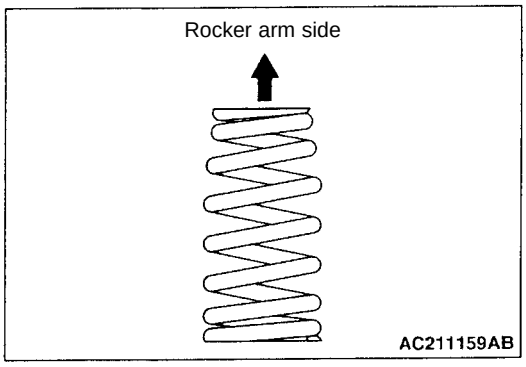
(1) Valve stem seals cannot be re-used.

(2) If valve stem seals are not fitted correctly, it could lead to oil leaking down, so the special valve stem seal installer tool (MD998737) should be used for fitting.



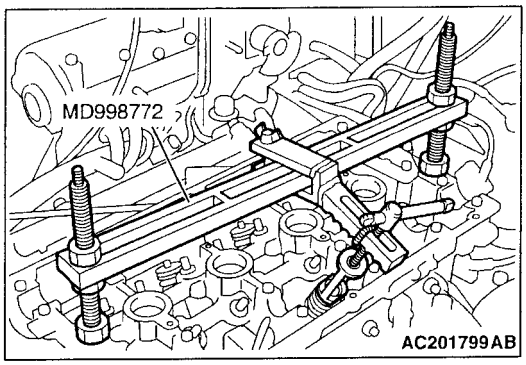
Note

Check the colours on the rubber parts to identify inlet valve stem seals and exhaust valve stem seals.



▸B◂ FITTING VALVE SPRING

Fit so that the valve spring small radius end is on the rocker arm side.



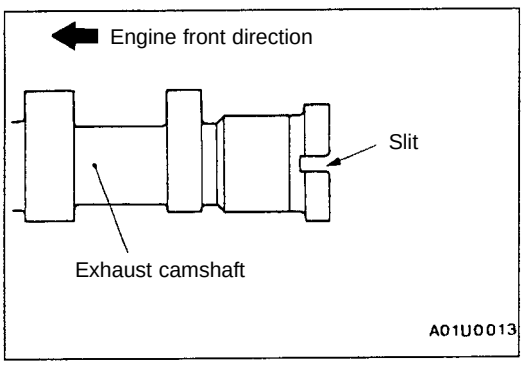
▸C◂ FITTING VALVE SPRING RETAINER LOCK

Compress the valve spring using the same valve spring compressor tool (MD998772) as the one used for removal and fit the valve spring retainer lock.

▸D◂ FITTING LASH ADJUSTER

CAUTION

When re-using lash adjuster, without fail wash and check before fitting. (Refer to Engine Workshop Manual)

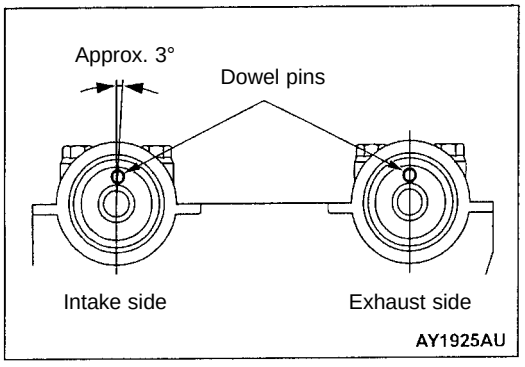


▸E◂ FITTING EXHAUST CAMSHAFT / INLET CAMSHAFT

1. Remove any sealant adhering to the cylinder head.
2. Apply engine oil to camshaft cams and journals.
3. Fit camshaft to cylinder head.

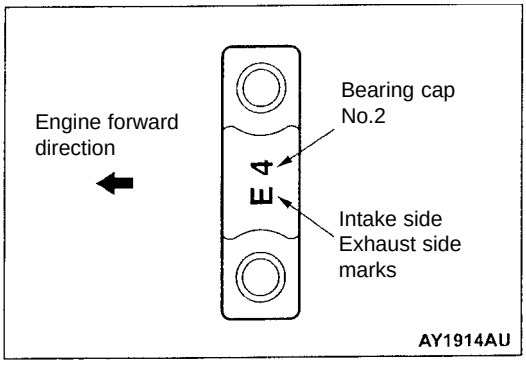
CAUTION

Do not get intake and exhaust sides the wrong way round. The exhaust camshaft has a slit on the rear end.

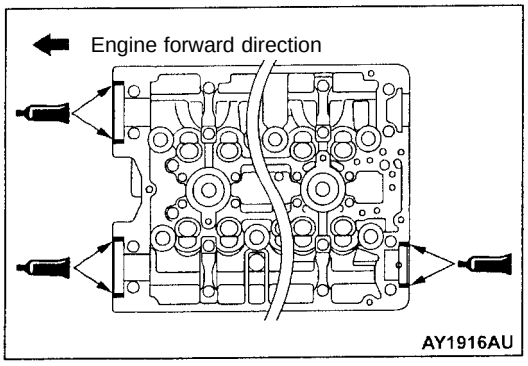


▸F◂ FITTING CAMSHAFT BEARING CAP No.4/ FITTING CAMSHAFT BEARING CAP No.3/ FITTING CAMSHAFT BEARING CAP No.5/ FITTING CAMSHAFT BEARING CAP No.2/ FITTING CAMSHAFT BEARING CAP REAR/ FITTING CAMSHAFT BEARING CAP FRONT

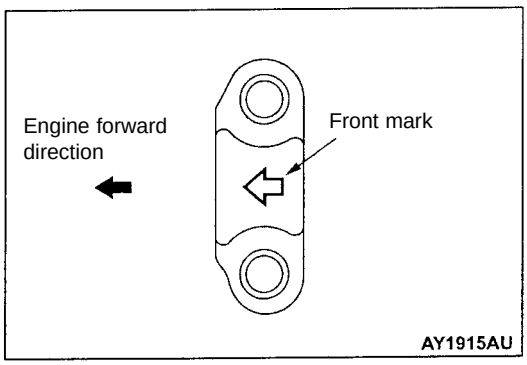
1. Set the camshaft dowel pins in the position shown in the diagram.



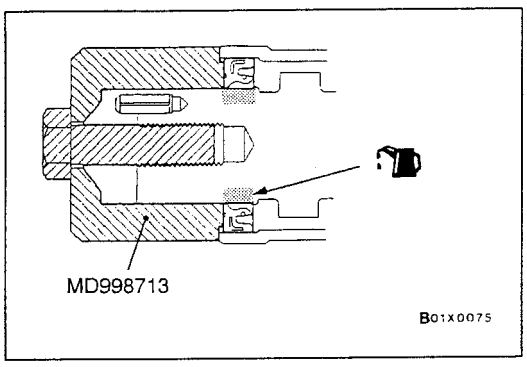
2. The camshaft bearing caps No.2~5 are the same shape, so check the identification marks before fitting in the direction shown in the diagram, in order to avoid getting bearing cap number, and intake and exhaust sides, mixed up.
   Identification marks (stamped on front and on bearing caps No.2~5)
   I: Intake side
   E: Exhaust side



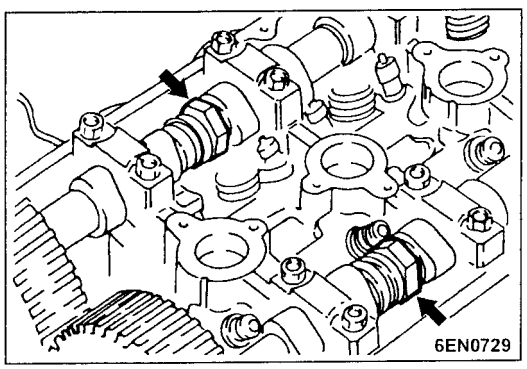
3. Apply sealant to the 6 positions indicated in the diagram on the upper surface of the cylinder head.
   Semi-dry sealant: Three Bond 1207D



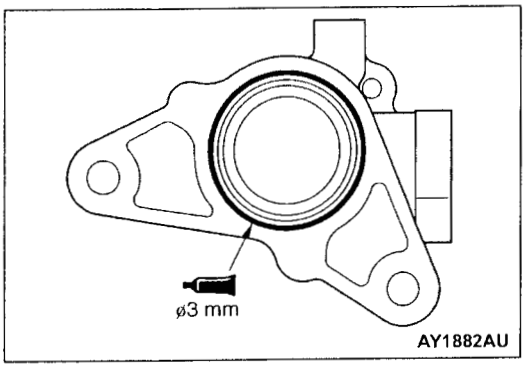
4. Fit camshaft bearing caps so that front marks are in the direction indicated.
5. Check the identification marks on the camshaft bearing cap fronts, so that, as with bearing caps No.2~5, there are no mistakes over intake and exhaust sides.
6. Gradually tighten the bearing cap mounting bolts, 2~3 turns at a time, to the specified torque.
   Tightening torque: 20 ± 1 N·M
7. Check that the rocker arm is fitted correctly.
   NB. Wipe away any traces of sealant squeezed out.



▸G◂ FITTING CAMSHAFT OIL SEAL
1. Apply engine oil around the entire circumference of the oil seal lip.
2. Insert oil seal using the special camshaft oil seal installer tool (MD998713), as shown in the diagram.

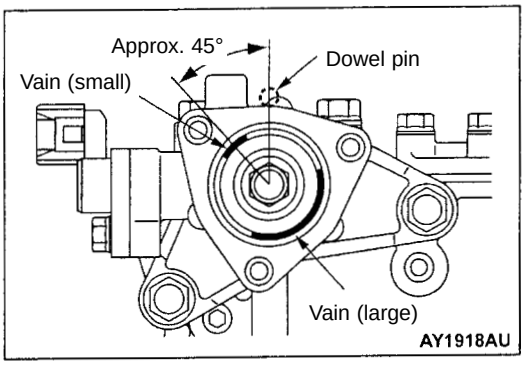


▸H◂ As when removing, hold the camshaft hexagonal part with a wrench, then tighten the mounting bolts to the torque specified.
Tightening torque: 89 ± 9 N·M



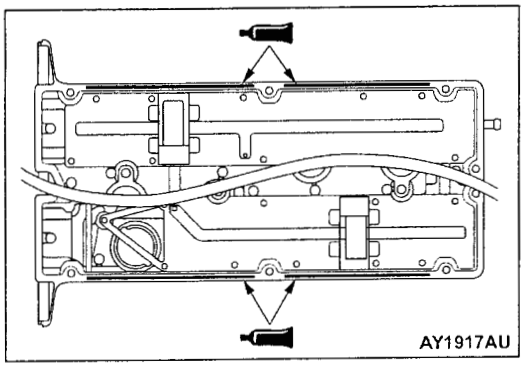
◗I◖ FITTING CAMSHAFT POSITION SENSOR SUPPORT

1. Remove any sealant on the camshaft position sensor support.
2. Apply sealant to the camshaft position sensor support flange, as shown in the diagram, then fit to the cylinder head.
   Semi-dry sealant: Three Bond 1207F
3. Tighten camshaft position sensor support mounting bolts to the torque specified.
   Tightening torque: 14 ± 1 N·M



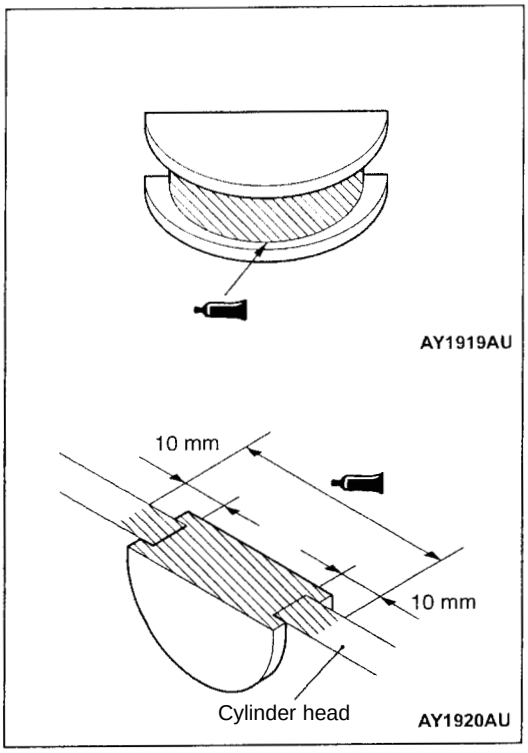
◗J◖ FITTING CAMSHAFT POSITION SENSING CYLINDER

1. Set the exhaust camshaft dowel pin in the position shown in the diagram (No.1 cylinder compression top dead centre)
   Note
   It will turn slightly in a counter-clockwise direction, under pressure from the exhaust valve spring.
2. As shown in the diagram, fit the camshaft position sensing cylinder vain (small), so that it is approximately 45° relative to the exhaust camshaft dowel pin.
3. Tighten the camshaft position sensing cylinder mounting bolts to the torque specified.
   Tightening torque: 22 ± 4 N·M



◗K◖ FITTING ROCKER COVER GASKET

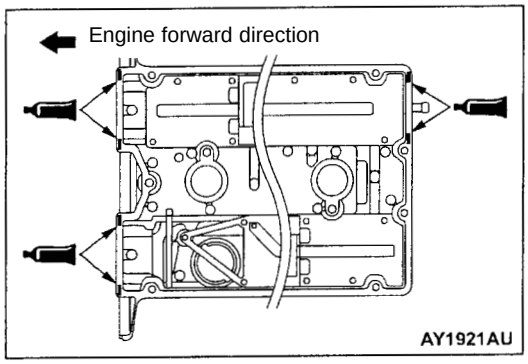
1. Remove any sealant on the rocker cover gasket.
2. Apply sealant to 4 locations on the rocker cover lower surface, as shown in the diagram.
   Semi-dry sealant: Three Bond 1207D
3. Fit the rocker cover gasket to the rocker cover.



◆L◆ FITTING CAMSHAFT END SEALS

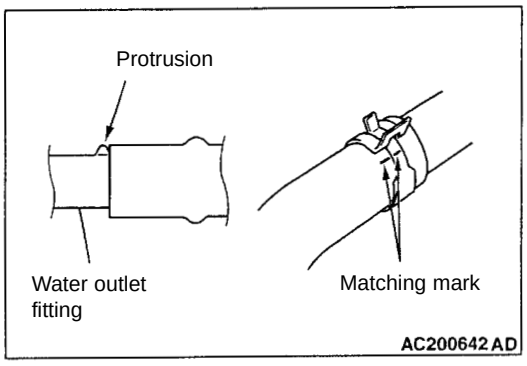
Apply sealant to the locations on the camshaft end seal, as shown in the diagram, then fit to the cylinder head.

Semi-dry sealant: Three Bond 1211



◆M◆ FITTING ROCKER COVER ASSY

1. Apply sealant to the 6 locations on the rocker cover gasket, as shown in the diagram.
   Semi-dry sealant: Three Bond 1207D
2. Fit the rocker cover ASSY to the cylinder head.



◆N◆ CONNECTING RADIATOR UPPER HOSE

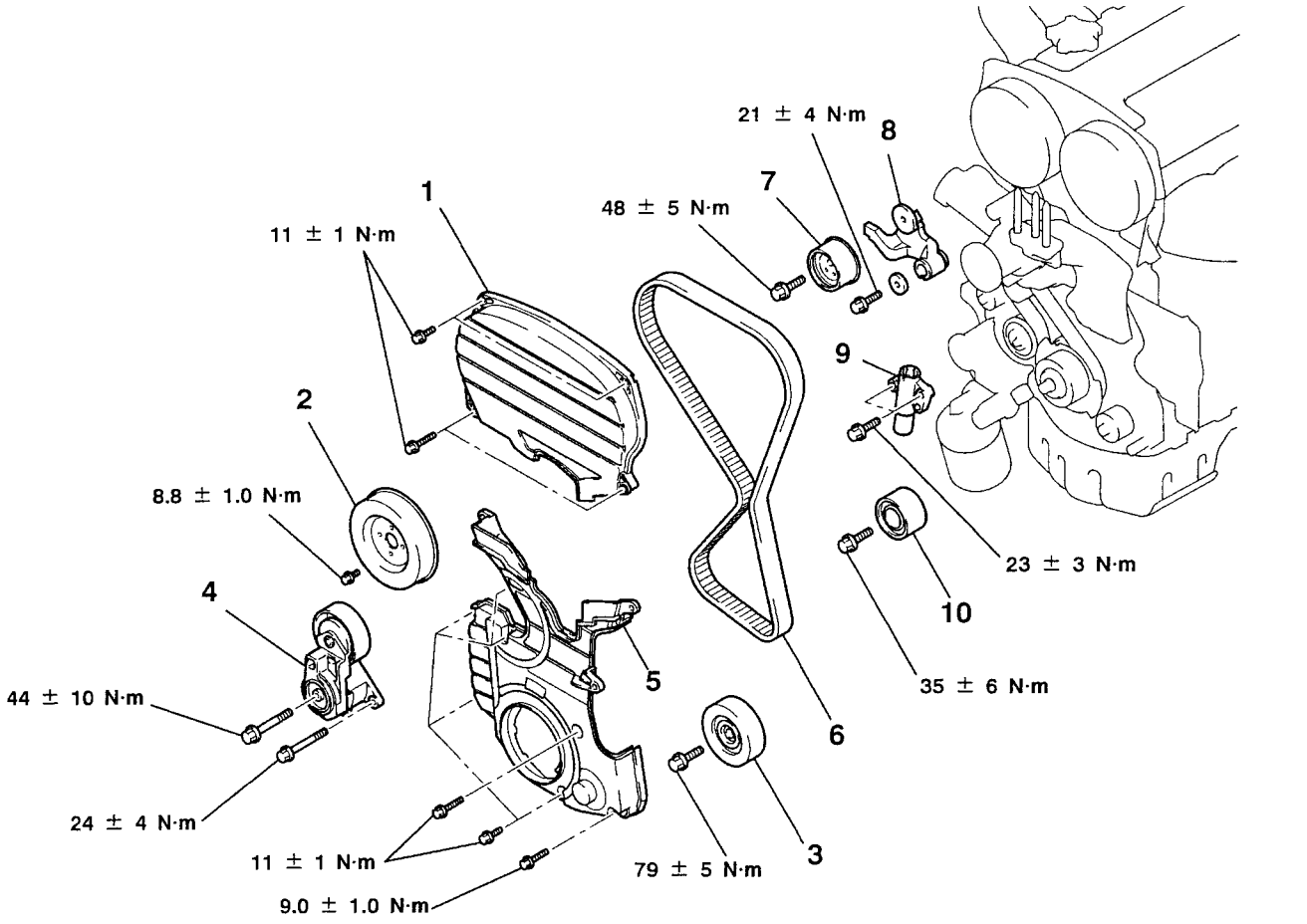
1. Insert radiator upper hose as far as the protrusion on the water outlet fitting.
2. Align the radiator upper hose and hose clamp matching marks to fit the radiator upper hose.

TIMING BELT and TIMING BELT B

Removal and Fitting

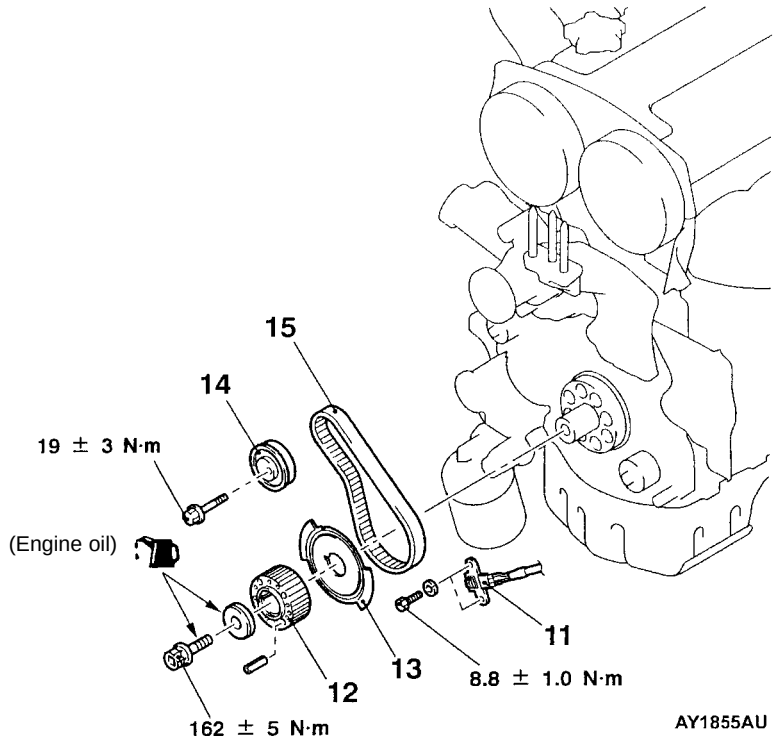
Caution
When Brembo brake callipers are used, there is concern over paint peeling off, so when doing servicing work, make sure they are not scratched by other components and tools. Furthermore, if any brake fluid gets onto the calipers, it should be wiped off immediately.

Jobs to do before removal and after fitting
• Removal and fitting of undercover (refer to Chapter 51 Front Bumper)
• Removal and fitting of LH side cover
• Checking drive belt tension <only after fitting>
• Removal and fitting of crank shaft pulley
• Removal and fitting cross member bar
• Removal and fitting of front exhaust pipe



Removal procedure
1. Timing belt front upper cover
2. Water pump pulley
3. Idler pulley
4. Drive belt auto-tensioner
5. Timing belt front lower cover

◗G◖ • Timing belt tension adjustment
◖A◗ ◗F◖ 6. Timing belt
◗E◖ 7. Tensioner pulley
8. Connecting earth cable
◗D◖ 9. Auto-tensioner
10. Idler pulley



11. Crank angle sensor
◀B▶ ▶C◀ 12. Crank shaft sprocket
▶C◀ 13. Crank shaft sensing blade
▶B◀ • Timing belt B tension adjustment
▶A◀ 14. Timing belt B tensioner
◀C▶ ▶A◀ 15. Timing belt B

Note
Carry out removal and fitting in accordance with existing instructions

SECTION 13

FUEL

CONTENTS

Multipoint Injection (MPI).....13A

Fuel supply.....13B

SECTION 13A

MPI (Multipoint Injection)

CONTENTS

General..... 2
Special tools 3
Troubleshooting 5
Injectors 100
Engine control registers and relays.....102

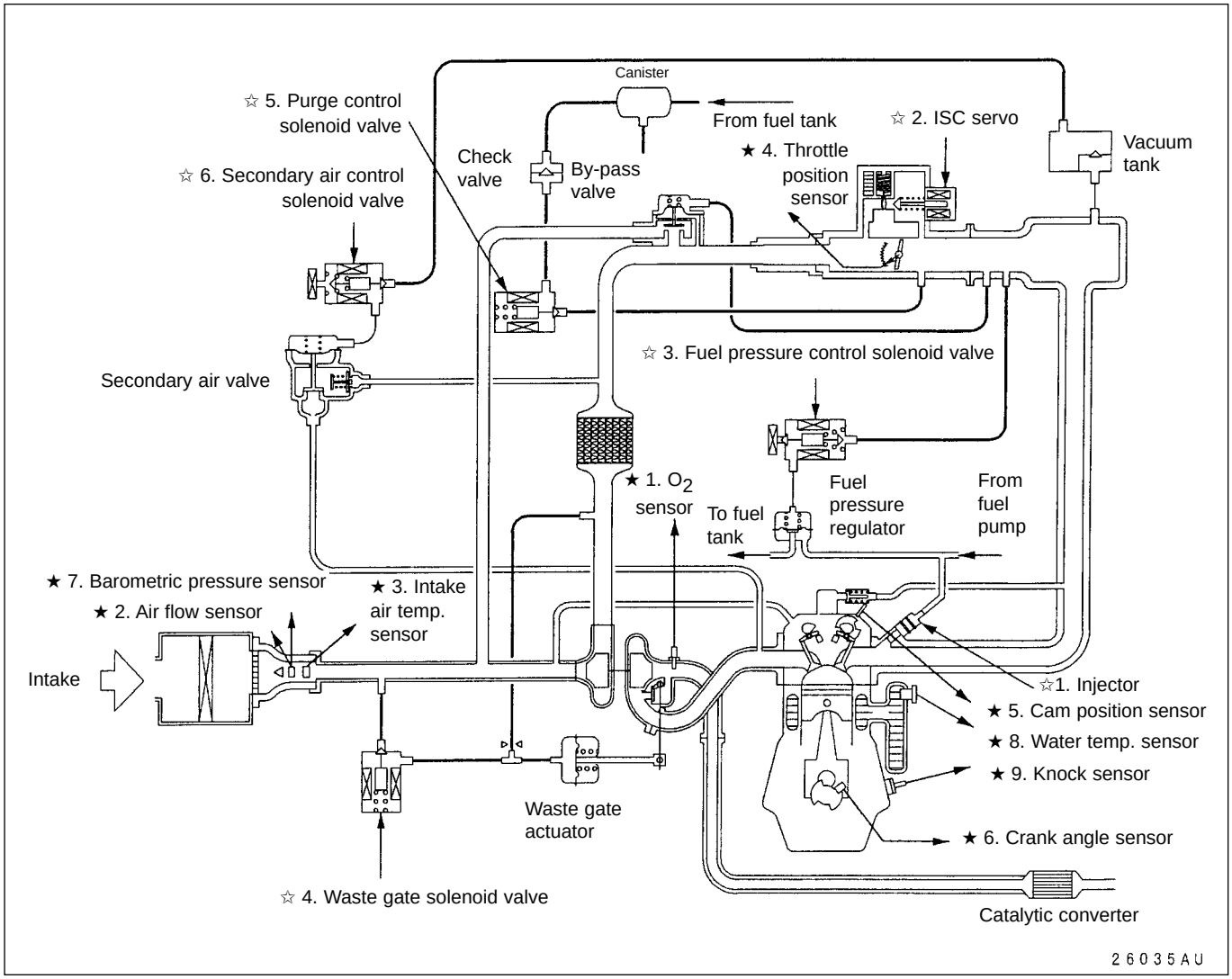
General

The following changes have been made to vehicles fitted with the 4G63-DOHC-T/C engine. Otherwise the system remains the same.

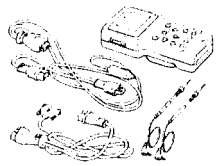
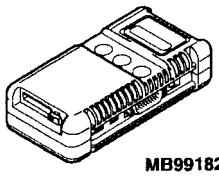
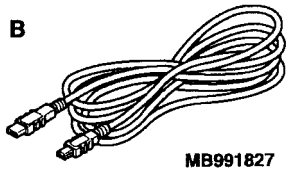
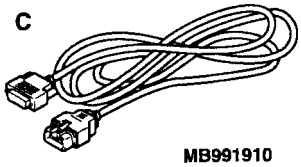
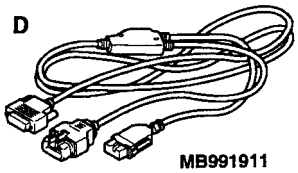
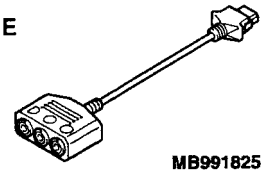
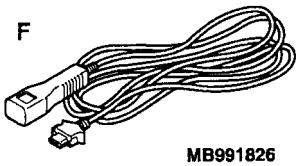
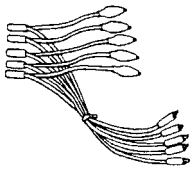
- The engine ECU has been changed
- An immobiliser system has been fitted
- A plated metal delivery pipe has been adopted
- Fuel pump relay mounting position has been changed

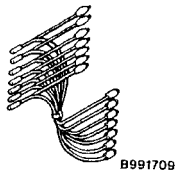
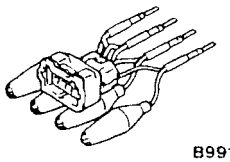
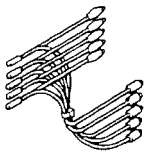
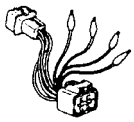
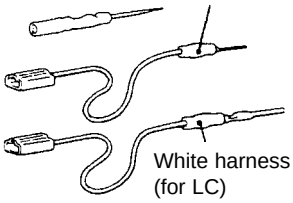
MPI SYSTEM DIAGRAM

★ 1. O_2 sensor ★ 2. Air flow sensor ★ 3. Intake air temp. sensor ★ 4. Throttle position sensor ★ 5. Cam position sensor ★ 6. Crank angle sensor ★ 7. Barometric pressure sensor ★ 8. Water temp. sensor ★ 9. Knock sensor	• Power supply • Ignition switch IG • Ignition switch ST • Vehicle speed sensor • A/C switch • A/C load signal • Power steering fluid pressure switch • Alternator FR signal • Intercooler water spray switch (auto) • Intercooler water spray switch (manual)	⇨	Engine ECU	⇨	☆ 1. Injector ☆ 2. ISC servo ☆ 3. Fuel pressure control solenoid valve ☆ 4. Waste gate solenoid valve ☆ 5. Purge control solenoid valve ☆ 6. Secondary air control solenoid valve	• Engine control relay • Fuel pump relay 2,3 • A/C relay • Ignition coil • Fan controller • Condenser fan Relay (HI) • Condenser fan relay (LO) • Engine warning light • Diagnosis output • Alternator G terminal • Intercooler water spray relay • Intercooler water spray lamp • Tachometer



Special Tools

Tool	Number	Name	Use
	MB991502	MUT-II sub-ASSY	MPI system inspection
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  MB991825 F  MB991826 MB991955	MB991955 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991825 F: MB991826	MUT-III sub-ASSY A:V.C.I. (Vehicle Communication Interface) B:USB cable C:MUT-III main harness B (for use on vehicles that have not adopted CAN communication) D:MUT-III main harness B (for use on vehicles that have not adopted CAN communication) E:Adapter for taking measurements F:Trigger harness	
	MB991348	Test harness set	Inspection using oscilloscope

Tool	Number	Name	Use
 B991709	MB991709	Test harness	• Troubleshooting voltage measurement • Inspection using an oscilloscope
 B991536	MB991536	TPS adjustment check harness	Troubleshooting voltage measurement
 B991658	MB991658	Test harness	Inspection using an oscilloscope
	MB998464	Test harness (4P, square)	Troubleshooting voltage measurement
	MD998478	Test harness (3P, triangular)	• Troubleshooting voltage measurement • Inspection using an oscilloscope
Red harness (for DLI)  White harness (for LC) 00005906	MB991223	Inspection harness set connector • Pin contact pressure inspection harness • Commercial tester connection probe (for general connector)	Terminal voltage measurement

TROUBLESHOOTING

1. Diagnosis Function

1-1. Engine warning light (engine check lamp)

Engine warning light checks have been changed.

Items that are linked to the engine warning light are:

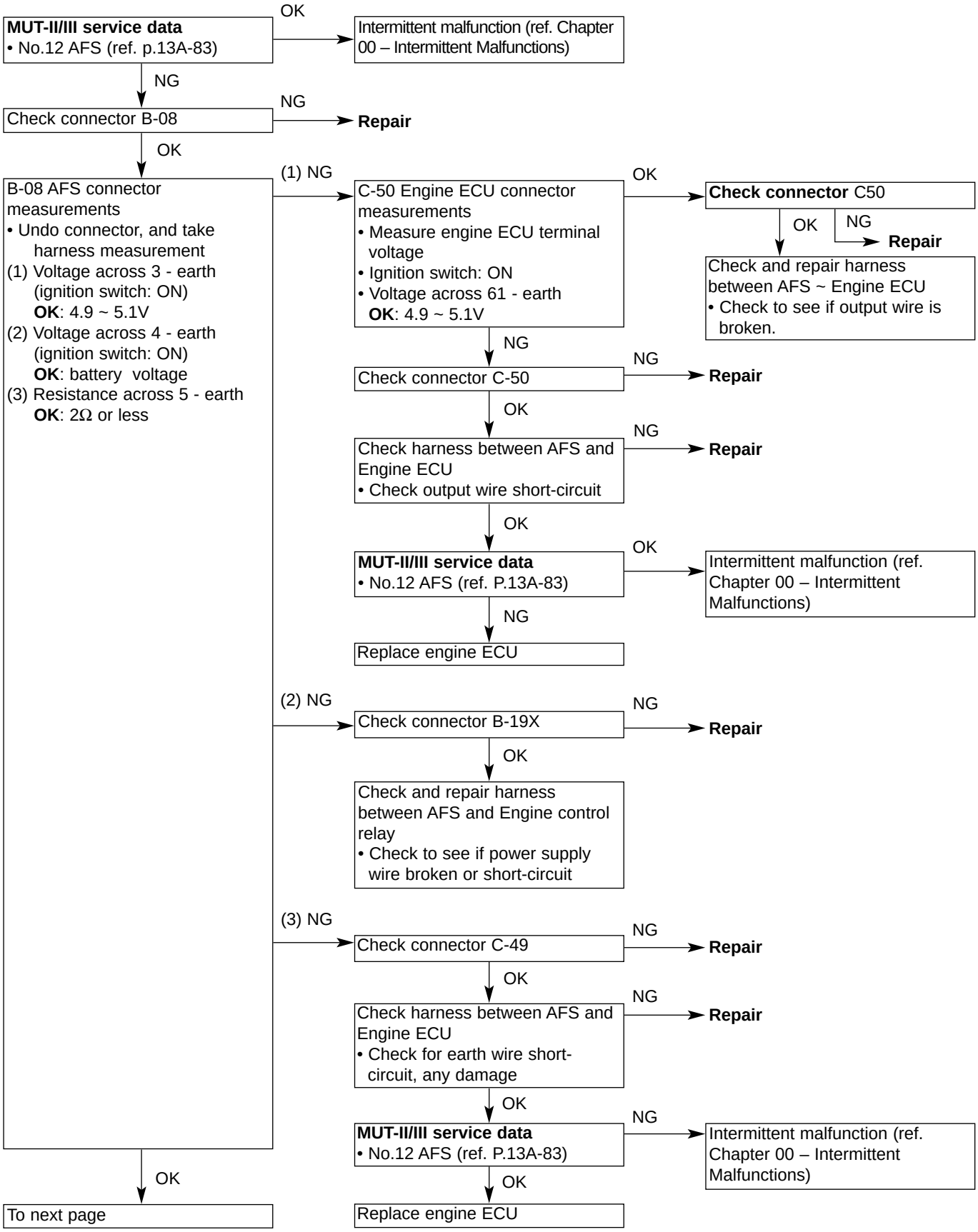
Engine ECU
Air flow sensor (AFS)
Intake air temperature sensor
Throttle position sensor (TPS)
Water temperature sensor
Crank angle sensor
Cam position sensor
Injector
Ignition coil (housing a power transistor)
Barometric pressure sensor
O_2 sensor
O_2 sensor heater
Fuel system abnormality
Immobiliser system
Knock sensor

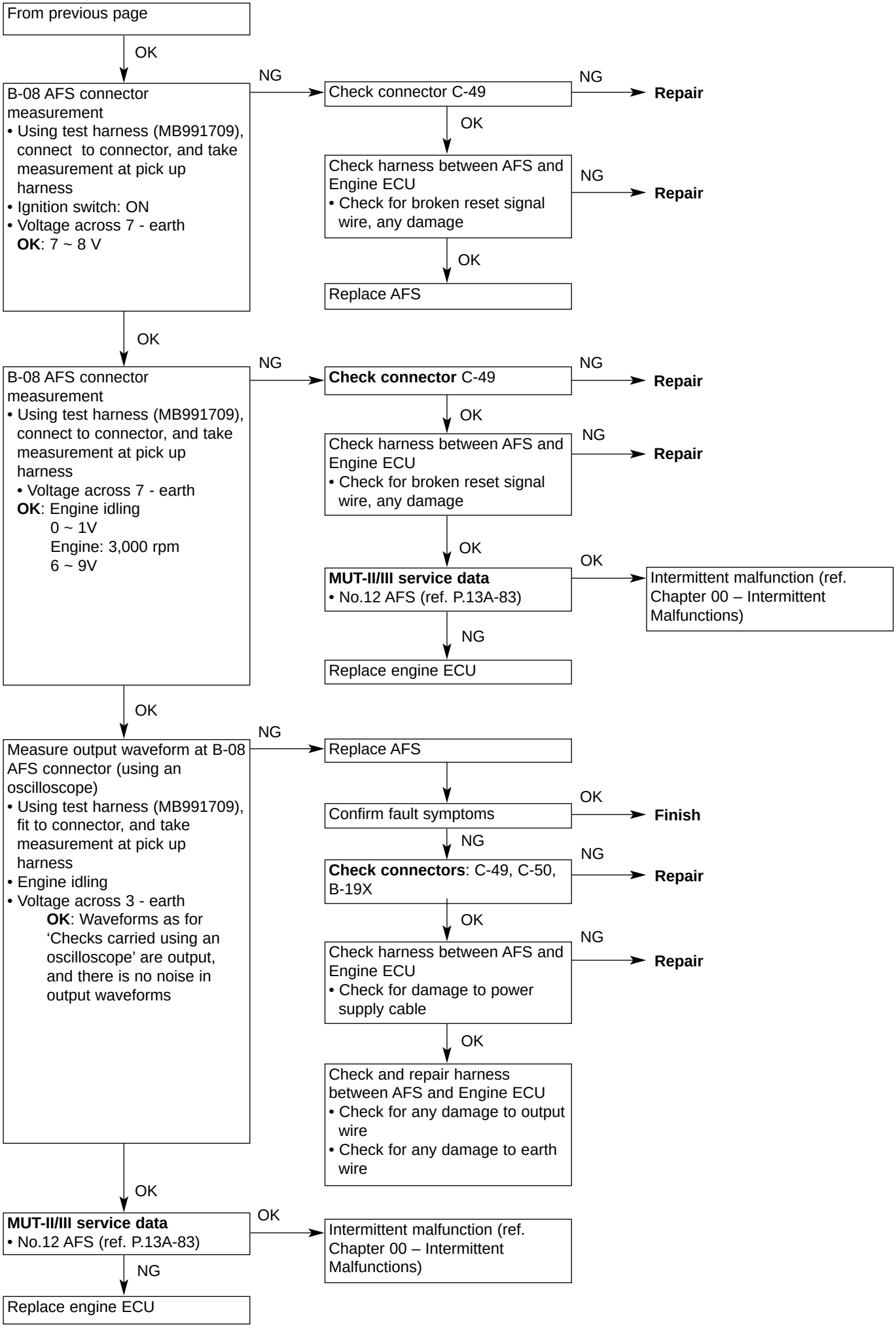
2. Table showing diagnosis codes

Code No.	Diagnosis Items	Page
PO100	Air flow sensor (AFS)	13A-6
PO105	Barometric pressure sensor	13A-8
PO110	Intake air temperature sensor system	13A-10
PO115	Water temperature sensor system	13A-11
PO120	Throttle position sensor (TPS) system	13A-13
PO130	O_2 sensor system	13A-16
PO135	O_2 sensor heater	13A-18
PO170	Fuel system abnormality	13A-19
PO201	No.1 injector system	13A-20
PO202	No.2 injector system	13A-21
PO203	No.3 injector system	13A-22
PO204	No.4 injector system	13A-23
PO300	Ignition coil (housing a power transistor) system	13A-24
PO325	Knock sensor system	13A-25
PO335	Crank angle sensor system	13A-26
PO340	Cam position sensor system	13A-28
PO500	Vehicle speed sensor system	13A-30
PO513	Immobiliser system	13A-31
P1500	Alternator FR terminal system	13A-32
P1603	Battery back-up line system	13A-33

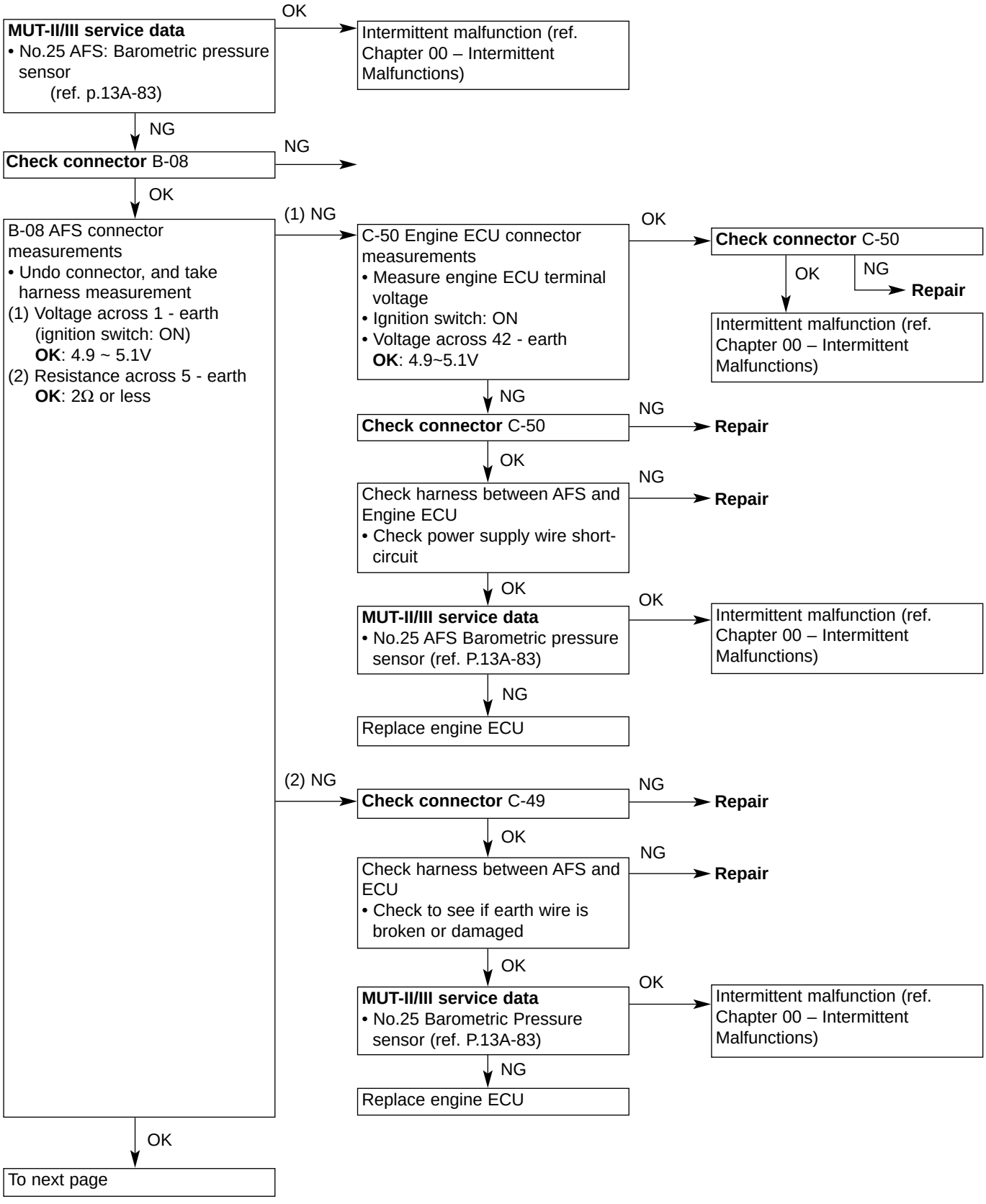
3. CHECKING PROCEDURES BY DIAGNOSIS CODE

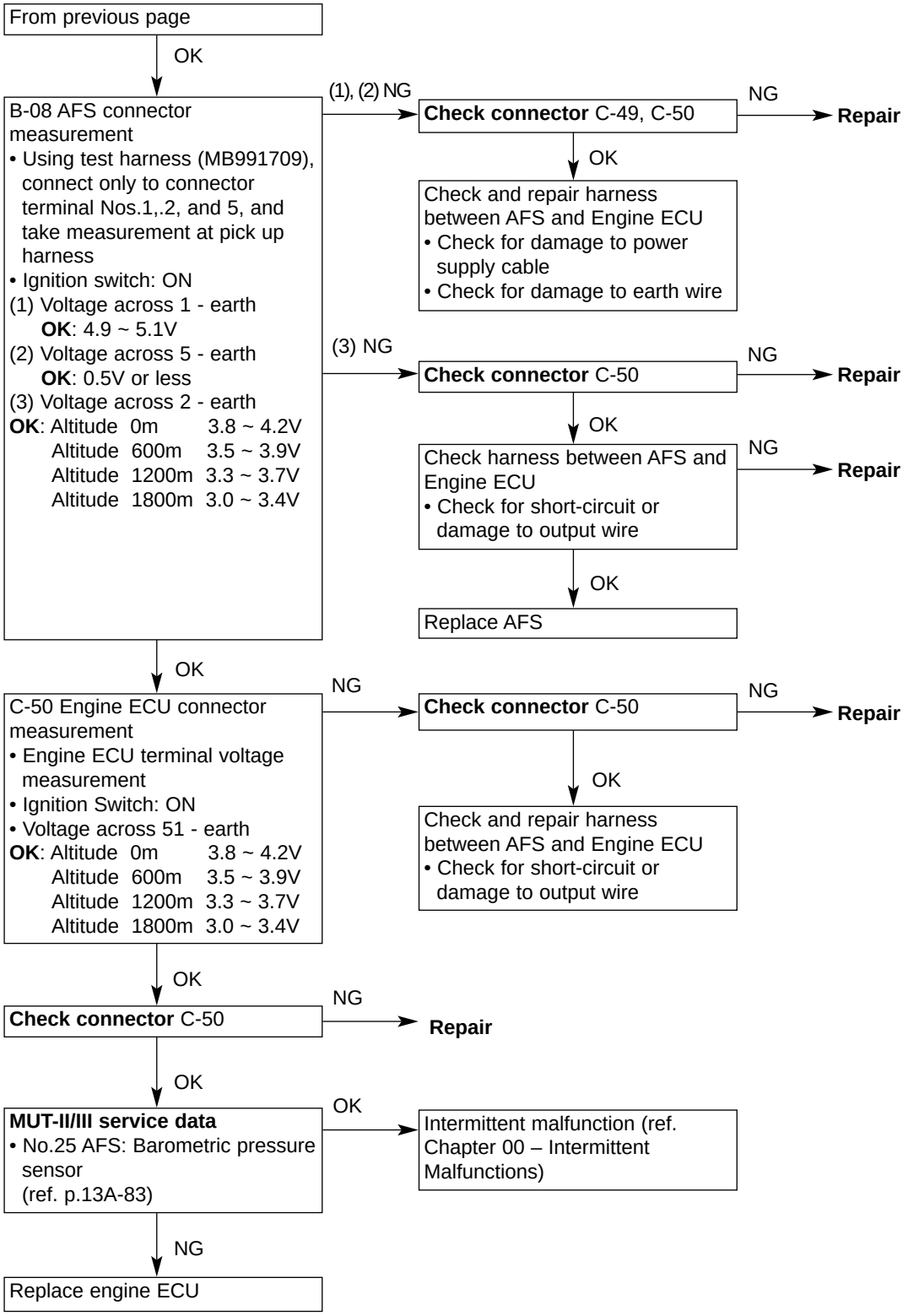
Code No. P0100 Air Flow Sensor (AFS) Checking Procedure	Probable Causes
Inspection Conditions • Engine speed: at least 500rpm Evaluation conditions • Sensor output frequency to 3Hz or less for 4 seconds, or continue at 10Hz or less	• AFS malfunction • AFS circuit broken, short-circuit, or poor connector contact • Engine ECU malfunction



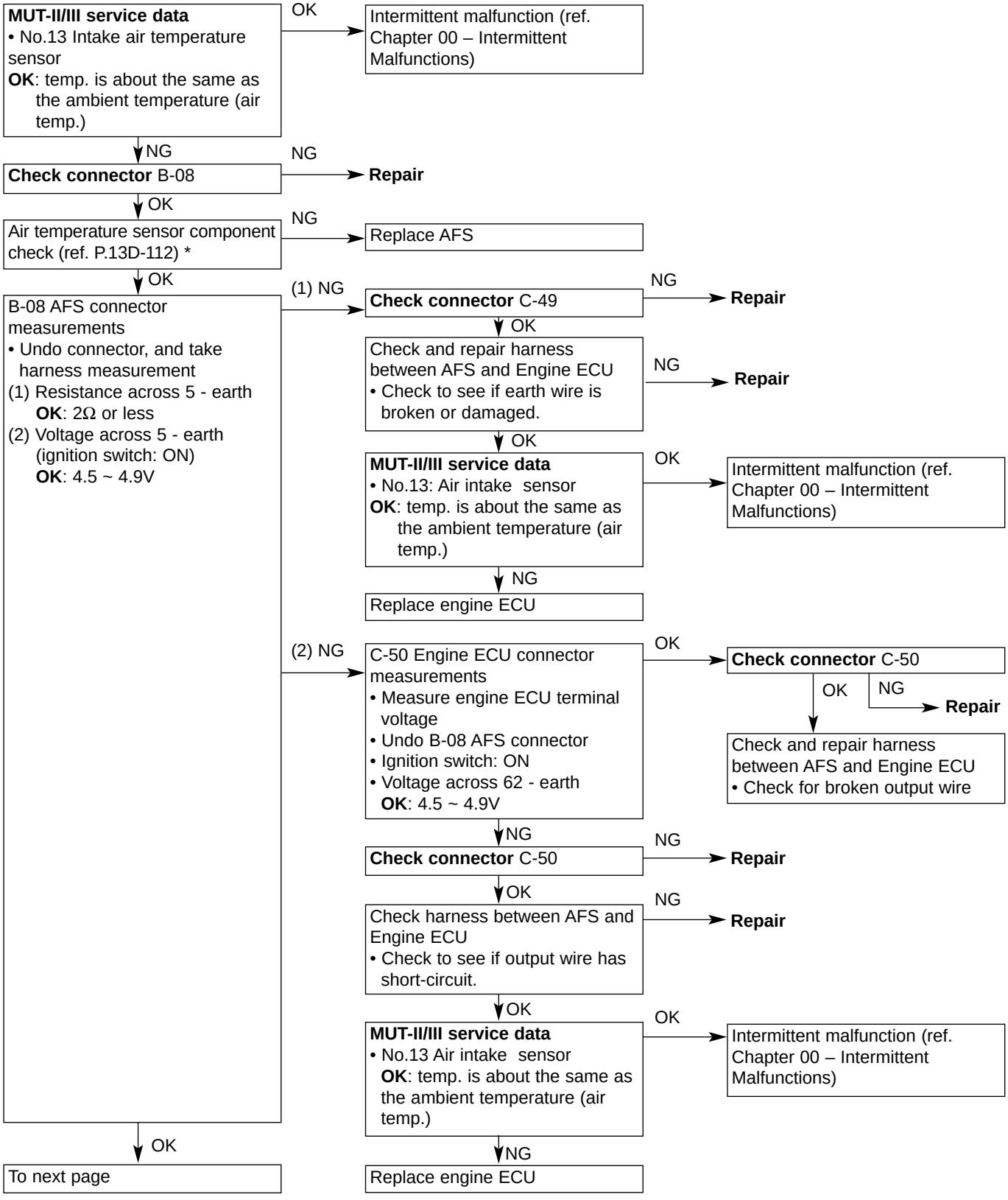

From previous page
OK
B-08 AFS connector measurement
• Using test harness (MB991709), connect to connector, and take measurement at pick up harness
• Ignition switch: ON
• Voltage across 7 - earth
OK: 7 ~ 8 V
NG
Check connector C-49
NG
Repair
OK
Check harness between AFS and Engine ECU
• Check for broken reset signal wire, any damage
NG
Repair
OK
Replace AFS
OK
B-08 AFS connector measurement
• Using test harness (MB991709), connect to connector, and take measurement at pick up harness
• Voltage across 7 - earth
OK: Engine idling
0 ~ 1V
Engine: 3,000 rpm
6 ~ 9V
NG
Check connector C-49
NG
Repair
OK
Check harness between AFS and Engine ECU
• Check for broken reset signal wire, any damage
NG
Repair
OK
MUT-II/III service data
• No.12 AFS (ref. P.13A-83)
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace engine ECU
OK
Measure output waveform at B-08 AFS connector (using an oscilloscope)
• Using test harness (MB991709), fit to connector, and take measurement at pick up harness
• Engine idling
• Voltage across 3 - earth
OK: Waveforms as for 'Checks carried using an oscilloscope' are output, and there is no noise in output waveforms
NG
Replace AFS
OK
Confirm fault symptoms
OK
Finish
NG
Check connectors: C-49, C-50, B-19X
NG
Repair
OK
Check harness between AFS and Engine ECU
• Check for damage to power supply cable
NG
Repair
OK
Check and repair harness between AFS and Engine ECU
• Check for any damage to output wire
• Check for any damage to earth wire
OK
MUT-II/III service data
• No.12 AFS (ref. P.13A-83)
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace engine ECU

Code No. P0105 Barometric Pressure Sensor System	Probable causes
Inspection Conditions • Ignition switch ON • Excluding a 2 second period after turning ignition switch to ON position, or immediately after engine has fully started Evaluation conditions • Sensor output voltage at least 4.5V (equivalent to barometric pressure of at least 114kPa) or • Sensor output voltage 0.2V or less (equivalent to barometric pressure of 5kPa or less)	• Barometric pressure sensor malfunction • Barometric pressure sensor circuit broken, short-circuit, or poor connector contact • Engine ECU malfunction

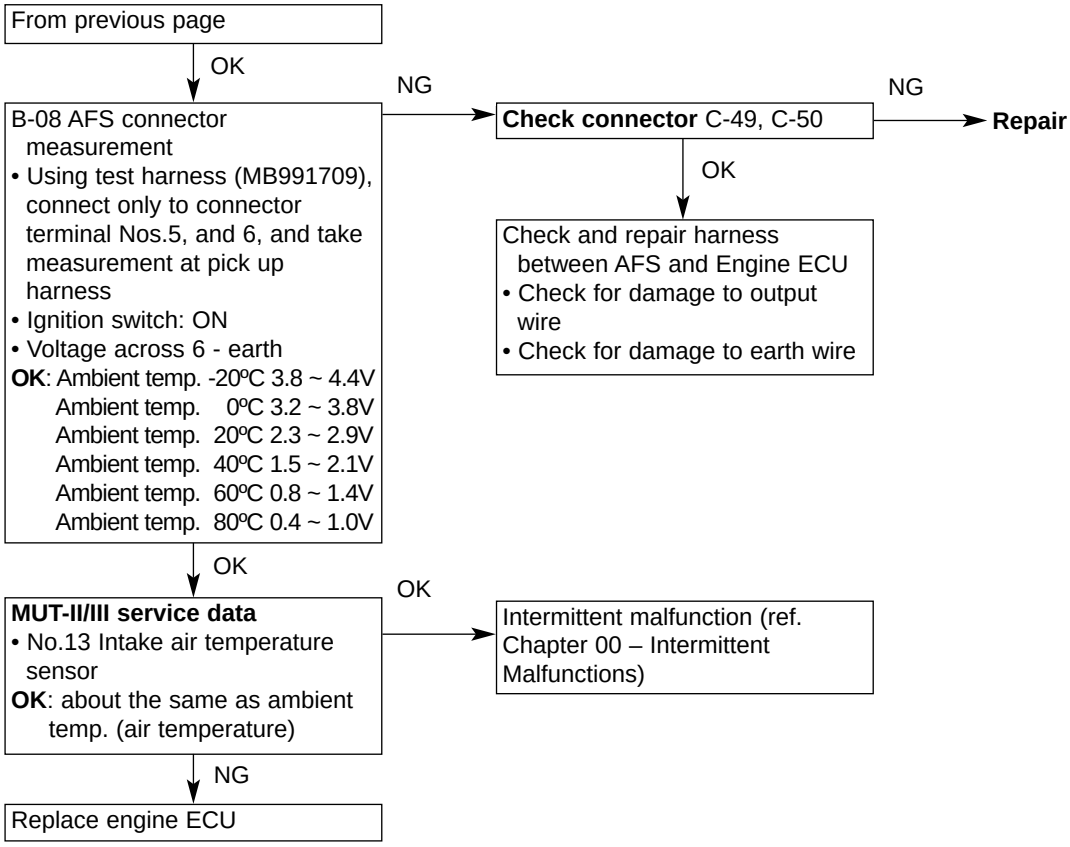



From previous page
OK
B-08 AFS connector measurement
• Using test harness (MB991709), connect only to connector terminal Nos.1,.2, and 5, and take measurement at pick up harness
• Ignition switch: ON
(1) Voltage across 1 - earth
OK: 4.9 ~ 5.1V
(2) Voltage across 5 - earth
OK: 0.5V or less
(3) Voltage across 2 - earth
OK: Altitude 0m 3.8 ~ 4.2V
Altitude 600m 3.5 ~ 3.9V
Altitude 1200m 3.3 ~ 3.7V
Altitude 1800m 3.0 ~ 3.4V
(1), (2) NG
Check connector C-49, C-50
NG
Repair
OK
Check and repair harness between AFS and Engine ECU
• Check for damage to power supply cable
• Check for damage to earth wire
(3) NG
Check connector C-50
NG
Repair
OK
Check harness between AFS and Engine ECU
• Check for short-circuit or damage to output wire
NG
Repair
OK
Replace AFS
OK
C-50 Engine ECU connector measurement
• Engine ECU terminal voltage measurement
• Ignition Switch: ON
• Voltage across 51 - earth
OK: Altitude 0m 3.8 ~ 4.2V
Altitude 600m 3.5 ~ 3.9V
Altitude 1200m 3.3 ~ 3.7V
Altitude 1800m 3.0 ~ 3.4V
NG
Check connector C-50
NG
Repair
OK
Check and repair harness between AFS and Engine ECU
• Check for short-circuit or damage to output wire
OK
Check connector C-50
NG
Repair
OK
MUT-II/III service data
• No.25 AFS: Barometric pressure sensor
(ref. p.13A-83)
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace engine ECU

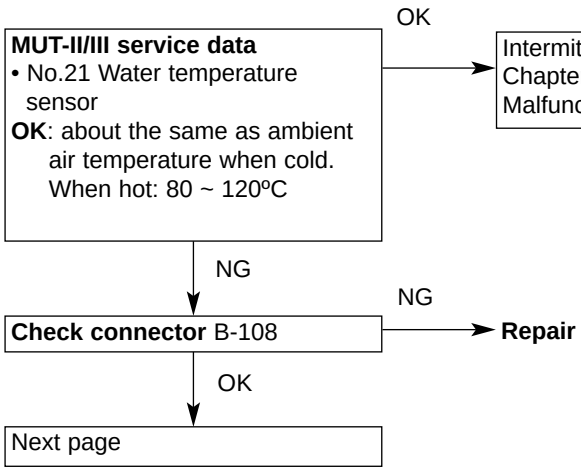
Code No. P0110 Intake Air Temperature Sensor System	Probable causes
Inspection Conditions • Ignition switch ON • Excluding a 2 second period after turning ignition switch to ON position, or immediately after engine has fully started Evaluation conditions • Sensor output voltage at least 4.6V for a period of 4 seconds (equivalent to intake air temperature -40ºC or less) or • Sensor output voltage 0.2V or less for a period of 4 seconds (equivalent to intake air temperature of at least 120ºC)	• Air intake temperature sensor malfunction • Air intake temperature sensor circuit broken, short-circuit, or poor connector contact • Engine ECU malfunction



* Refer to '01 Lancer Evolution VII Workshop Manual (No.1036K02)



Code No. P0115 Water Temperature Sensor System	Probable causes
Inspection Conditions • Ignition switch: ON • Excluding a 2 second period after turning ignition switch to ON position, or immediately after engine has fully started Evaluation conditions • Sensor output voltage at least 4.6V for a period of 4 seconds (equivalent to water temperature -45ºC or less) or • Sensor output voltage 0.1V or less for a period of 4 seconds (equivalent to water temperature of at least 140ºC)	• Water temperature sensor malfunction • Water temperature sensor circuit broken, short-circuit, or poor connector contact • Engine ECU malfunction
Inspection Conditions • Ignition switch ON • Engine speed approx. 50rpm or more Evaluation conditions • Rising from sensor output voltage 1.6V or less (equivalent to water temperature at least 40ºC) condition, to 1.6V or more (equivalent to water temperature 40ºC or less) • After that, for 5 minutes, sensor output voltage of at least 1.6V	



From previous page

OK

B-108 Water temperature sensor connector measurements
• Undo connector and take harness measurement
• Resistance across 1 – 2
OK: Water temp. -20ºC 14 ~ 17kΩ
Water temp. 0ºC 5.1 ~ 6.5 kΩ
Water temp. 20ºC 2.1 ~ 2.7 kΩ
Water temp. 40ºC 0.9 ~ 1.3 kΩ
Water temp. 60ºC 0.48 ~ 0.68 kΩ
Water temp. 80ºC 0.26 ~ 0.36 kΩ

NG → Replace water temperature sensor

OK

B-108 Water temperature sensor connector measurements
• Undo connector, and take harness measurement
(1) Voltage across 1 - earth (ignition switch: ON)
OK: 4.5 ~ 4.9V
(2) Resistance across 2 - earth
OK: 2Ω or less

(1) NG → C-50 Engine ECU connector measurement
• Engine ECU terminal voltage measurement
• Undo B108 water temperature sensor connector
• Ignition Switch ON
• Voltage across 44 - earth
OK: 4.5 ~ 4.9V

OK → **Check connector** C-50
OK → Check and repair harness between water temp. sensor and Engine ECU
• Check to see if output wire is broken
NG → **Repair**

NG → **Check connector** C-50
NG → **Repair**

OK → Check harness between water temp. sensor and Engine ECU
• Check to see if output wire has short-circuit
NG → **Repair**

OK → MUT-II/III service data
• No.21 Water temperature sensor
OK: about the same as ambient air temperature when cold.
When hot: 80 ~ 120ºC
OK → Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)

NG → Replace engine ECU

(2) NG → **Check connector** C-50
NG → **Repair**

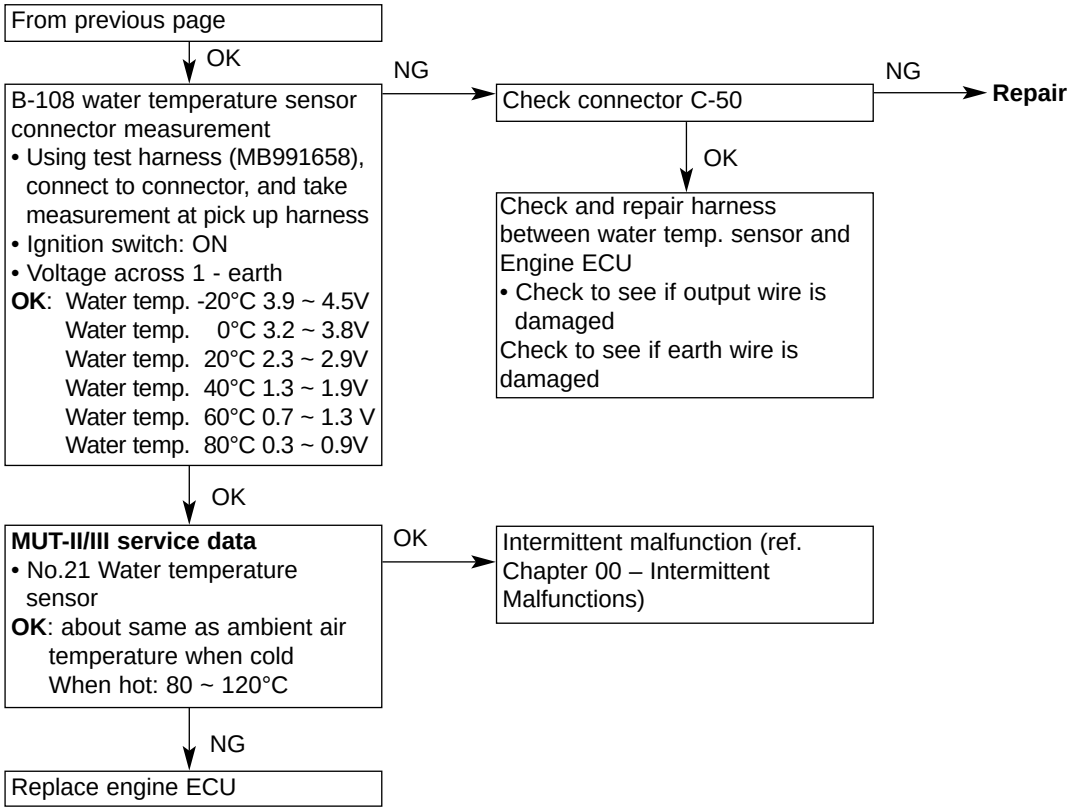
OK → Check harness between water temp. sensor and Engine ECU
• Check to see if earth wire is broken or damaged
NG → **Repair**

OK → **MUT-II/III service data**
• No.21 Water temperature sensor
OK: about the same as ambient air temperature when cold
When hot: 80 ~ 120ºC
OK → Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)

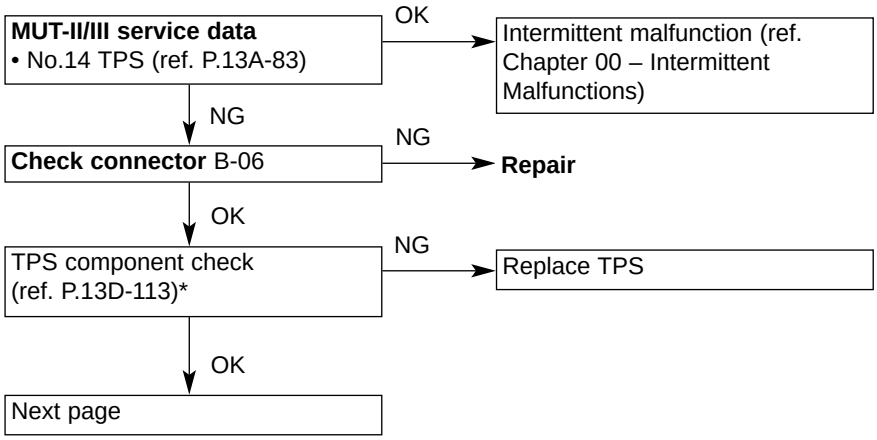
NG → Replace engine ECU

OK

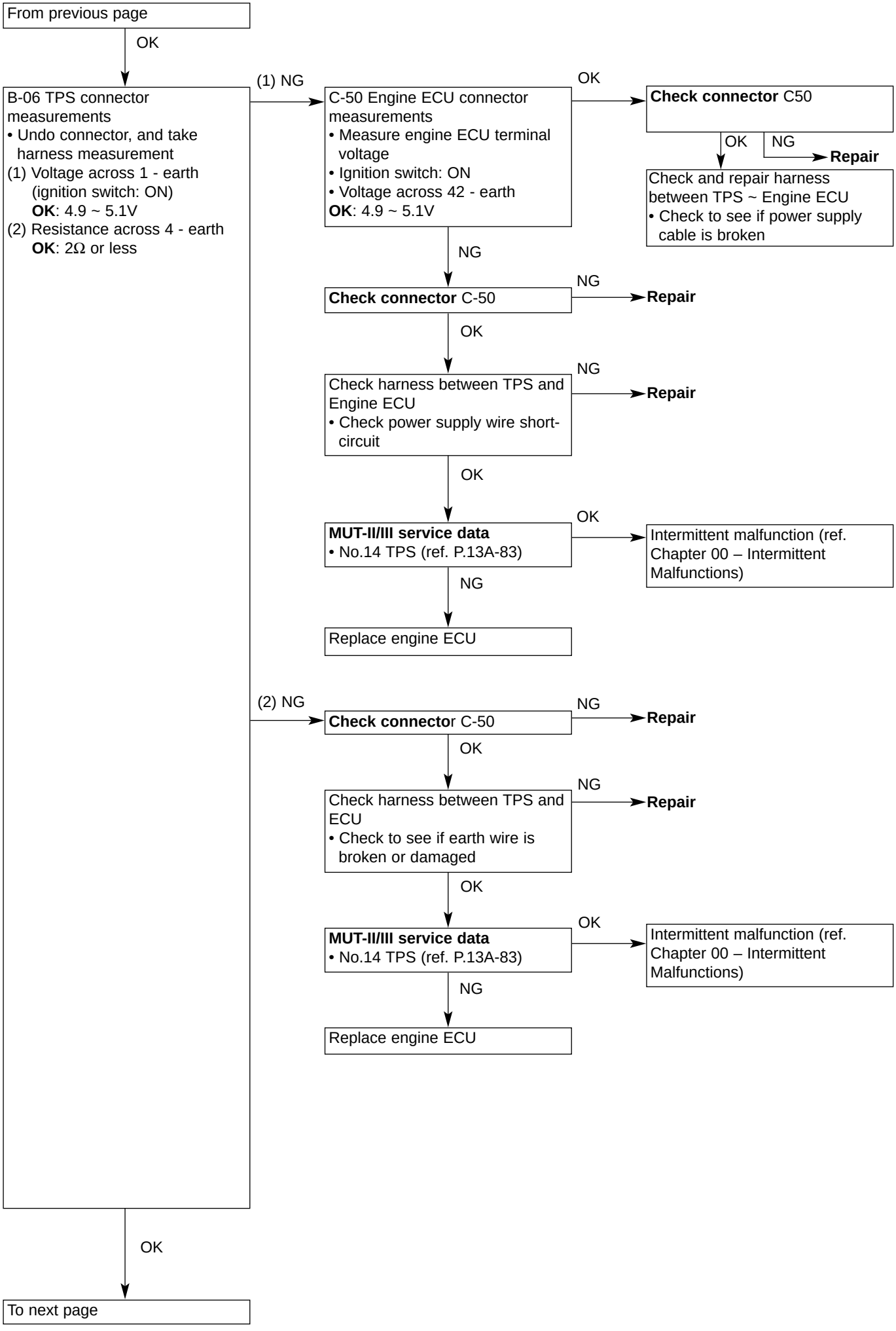
To next page

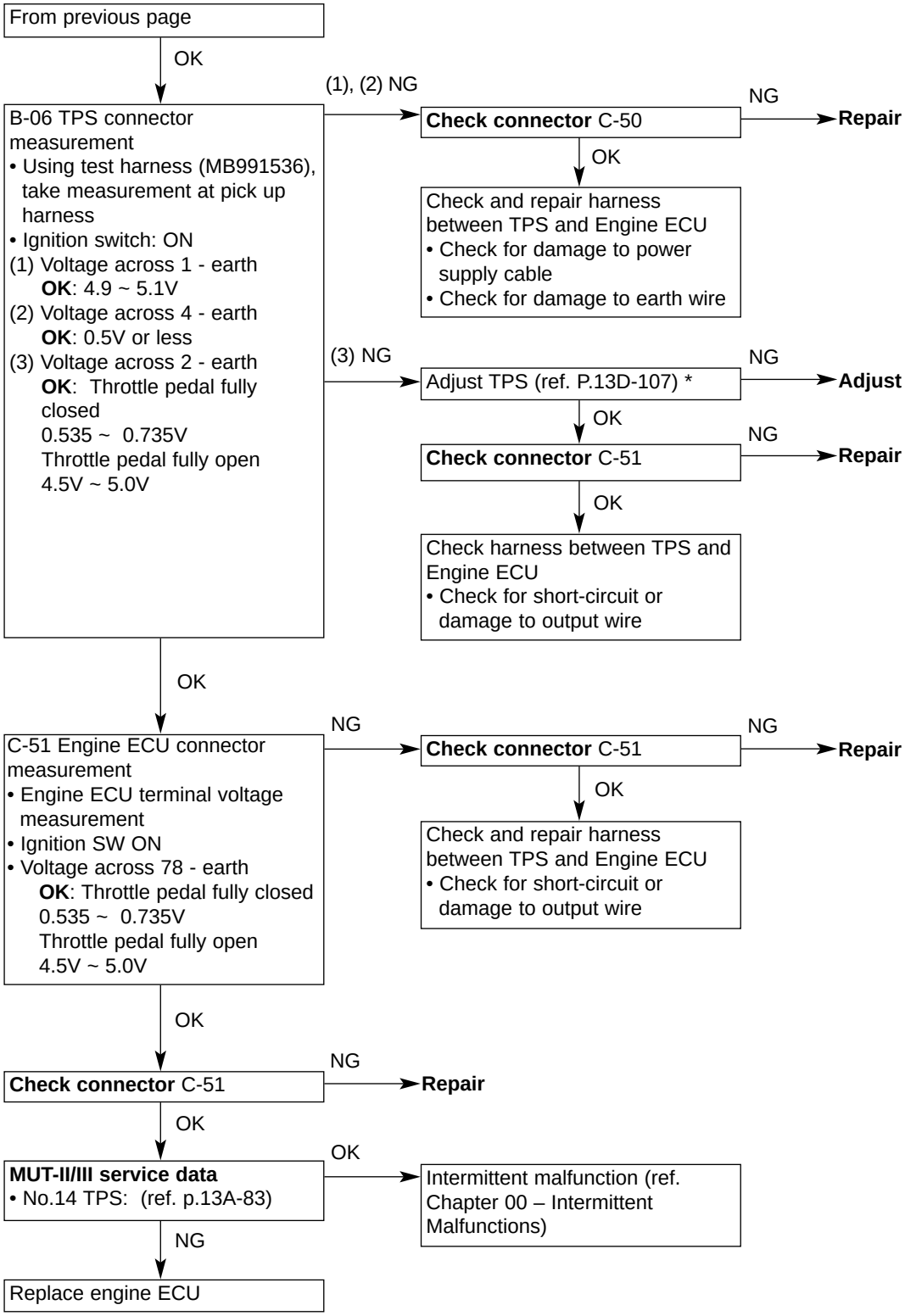


Code No. P0120 Throttle Position Sensor System	Probable causes
Inspection Conditions • Ignition switch: ON • Excluding a 2 second period after turning ignition switch to ON position, or immediately after engine has fully started Evaluation conditions • Sensor output voltage 0.2V or less for 2 seconds	• TPS malfunction • TPS circuit broken, short-circuit, or poor connector contact • Engine ECU malfunction
Inspection Conditions • Engine speed approx. 1000rpm or less • Volumetric efficiency 60% or less Evaluation conditions • Sensor output voltage at least 2.0V for 2 seconds	



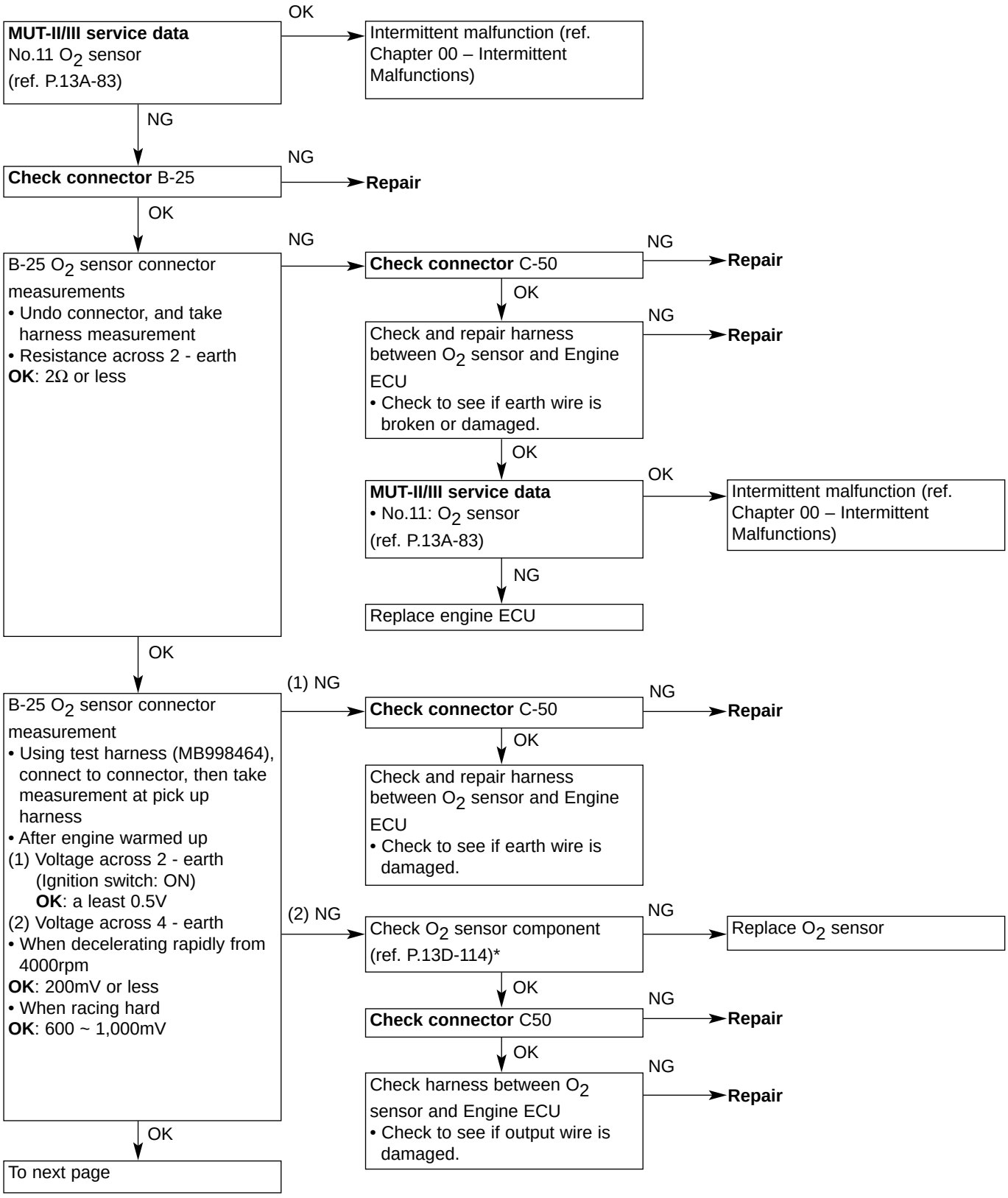
* Refer to '01 Lancer Evolution VII Workshop Manual (No.1036K02)


From previous page
OK
B-06 TPS connector measurements
• Undo connector, and take harness measurement
(1) Voltage across 1 - earth (ignition switch: ON)
OK: 4.9 ~ 5.1V
(2) Resistance across 4 - earth
OK: 2Ω or less
(1) NG
C-50 Engine ECU connector measurements
• Measure engine ECU terminal voltage
• Ignition switch: ON
• Voltage across 42 - earth
OK: 4.9 ~ 5.1V
OK
Check connector C50
OK
NG
Repair
Check and repair harness between TPS ~ Engine ECU
• Check to see if power supply cable is broken
NG
Check connector C-50
NG
Repair
OK
Check harness between TPS and Engine ECU
• Check power supply wire short-circuit
NG
Repair
OK
MUT-II/III service data
• No.14 TPS (ref. P.13A-83)
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace engine ECU
(2) NG
Check connector C-50
NG
Repair
OK
Check harness between TPS and ECU
• Check to see if earth wire is broken or damaged
NG
Repair
OK
MUT-II/III service data
• No.14 TPS (ref. P.13A-83)
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace engine ECU
OK
To next page

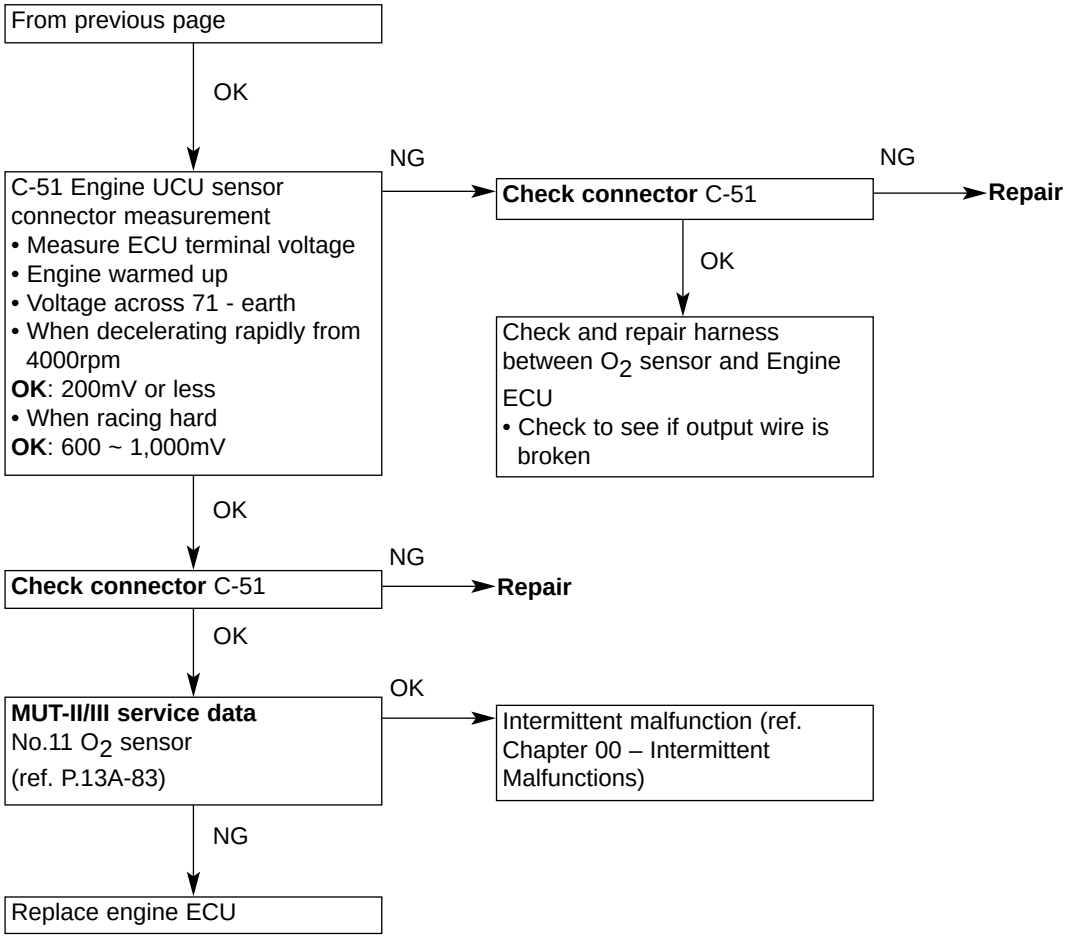


* Refer to '01 Lancer Evolution VII Workshop Manual (No.1036K02)

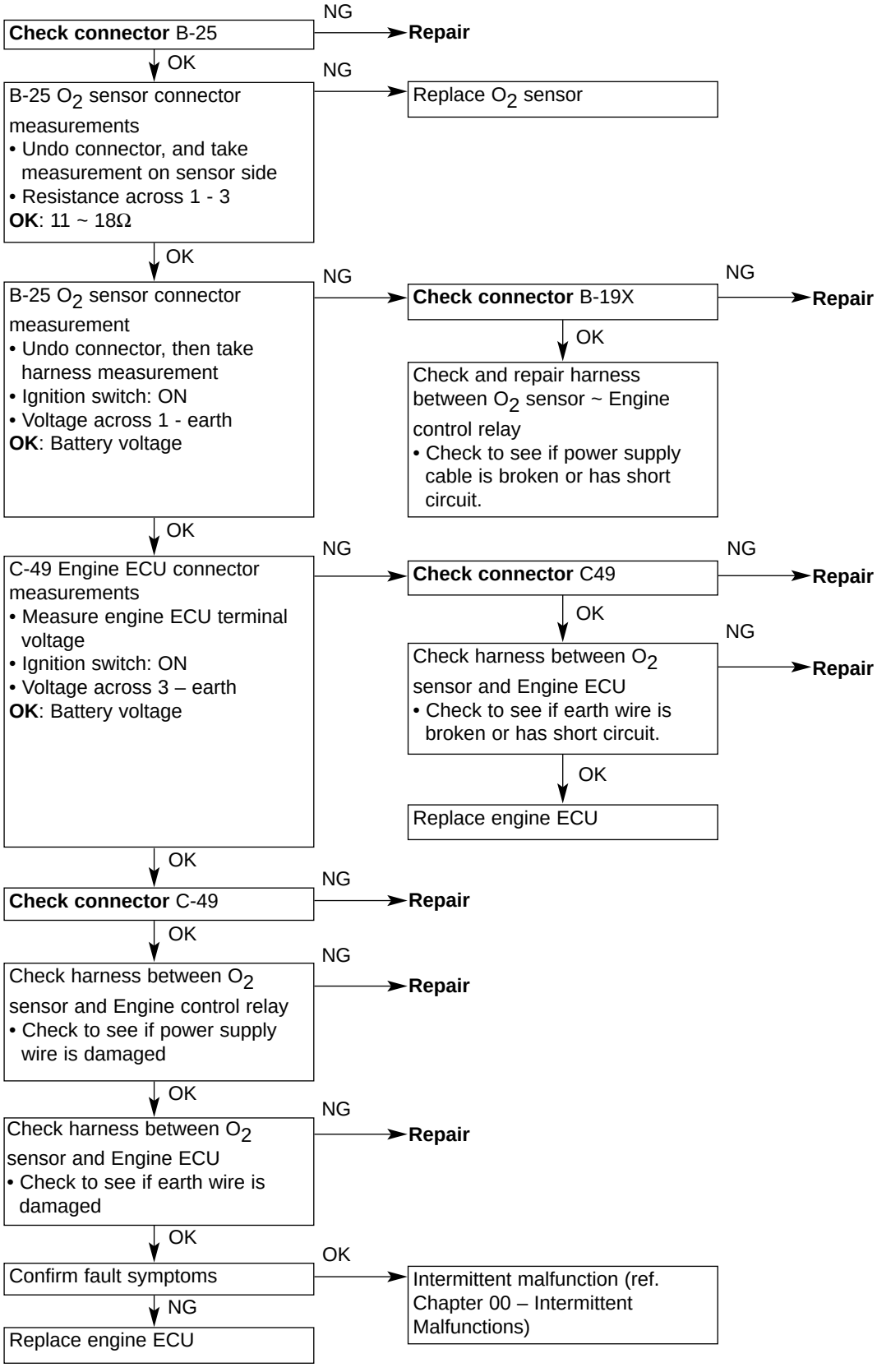
Code No. P0130 O_2 Sensor System	Probable causes
Inspection Conditions • For at least 3 minutes after engine has fully started • Engine cooling water temperature at least 82ºC • Volumetric efficiency at least 25% • Engine speed at least 1200rpm Evaluation conditions • With O_2 sensor output voltage 0.2V or less, and 5V applied to O_2- sensor inside engine ECU, sensor output voltage at least 4.5V	• O_2 sensor malfunction • O_2 sensor circuit broken, short-circuit, or poor connector contact • Engine ECU malfunction



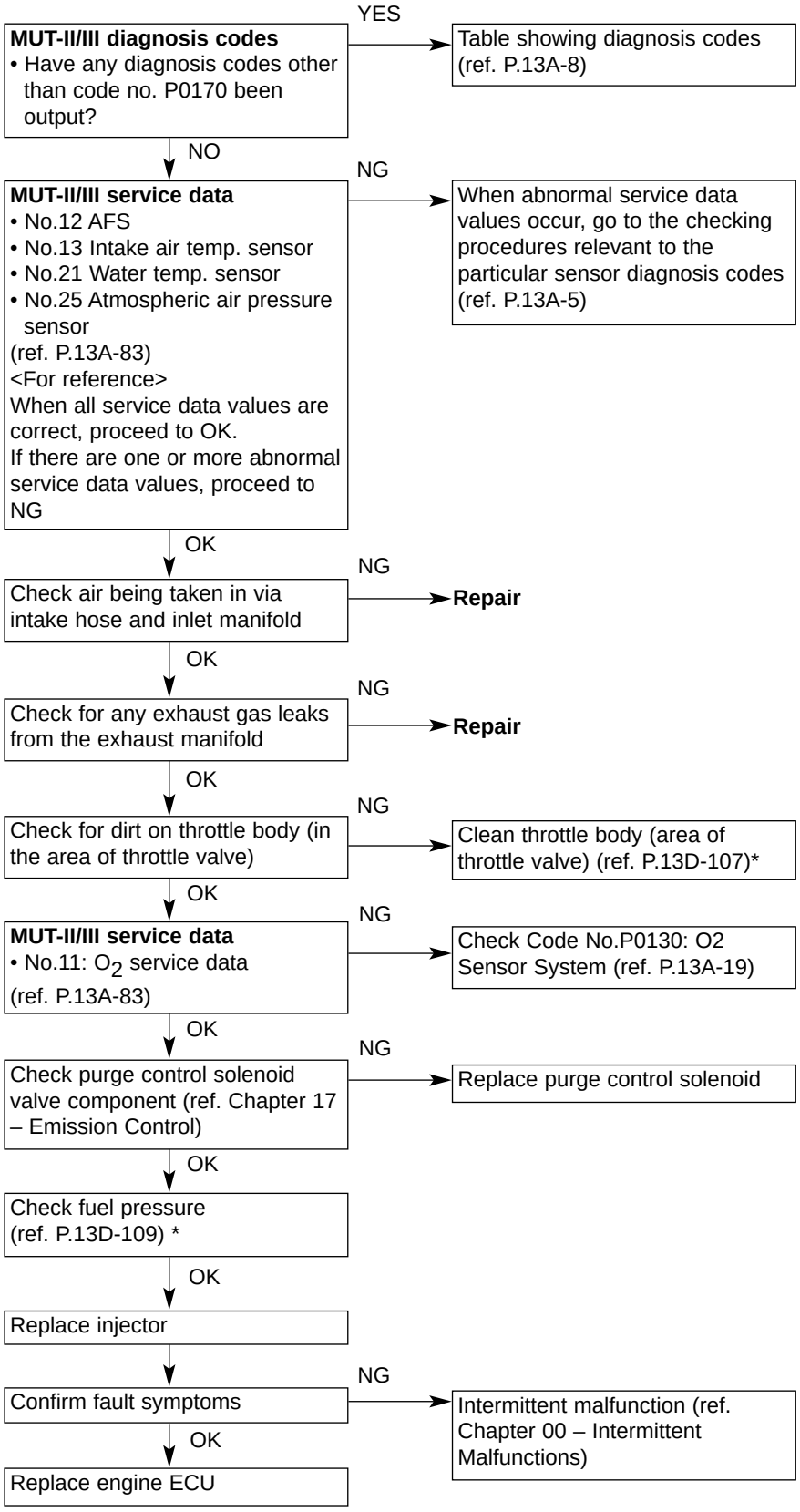
* Refer to '01 Lancer Evolution VII Workshop Manual (No.1036K02)


From previous page
OK
C-51 Engine UCU sensor connector measurement
• Measure ECU terminal voltage
• Engine warmed up
• Voltage across 71 - earth
• When decelerating rapidly from 4000rpm
OK: 200mV or less
• When racing hard
OK: 600 ~ 1,000mV
NG
Check connector C-51
NG
Repair
OK
Check and repair harness between O_2 sensor and Engine ECU
• Check to see if output wire is broken
OK
Check connector C-51
NG
Repair
OK
MUT-II/III service data
No.11 O_2 sensor
(ref. P.13A-83)
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace engine ECU

Code No. P0135 O_2 Sensor Heater System	Probable causes
Inspection Conditions • Engine cooling water temperature approx. 20ºC or more • O_2 sensor heater ON • Engine speed at least 50rpm • A/C relay: OFF, Radiator Fan: OFF • Battery voltage 11 ~ 16V Evaluation conditions • With O_2 sensor heater current 0.2A or less, or 3.5A or more, for 4 seconds	• O_2 sensor heater malfunction • O_2 sensor heater circuit broken, short-circuit, or poor connector contact • Engine ECU malfunction

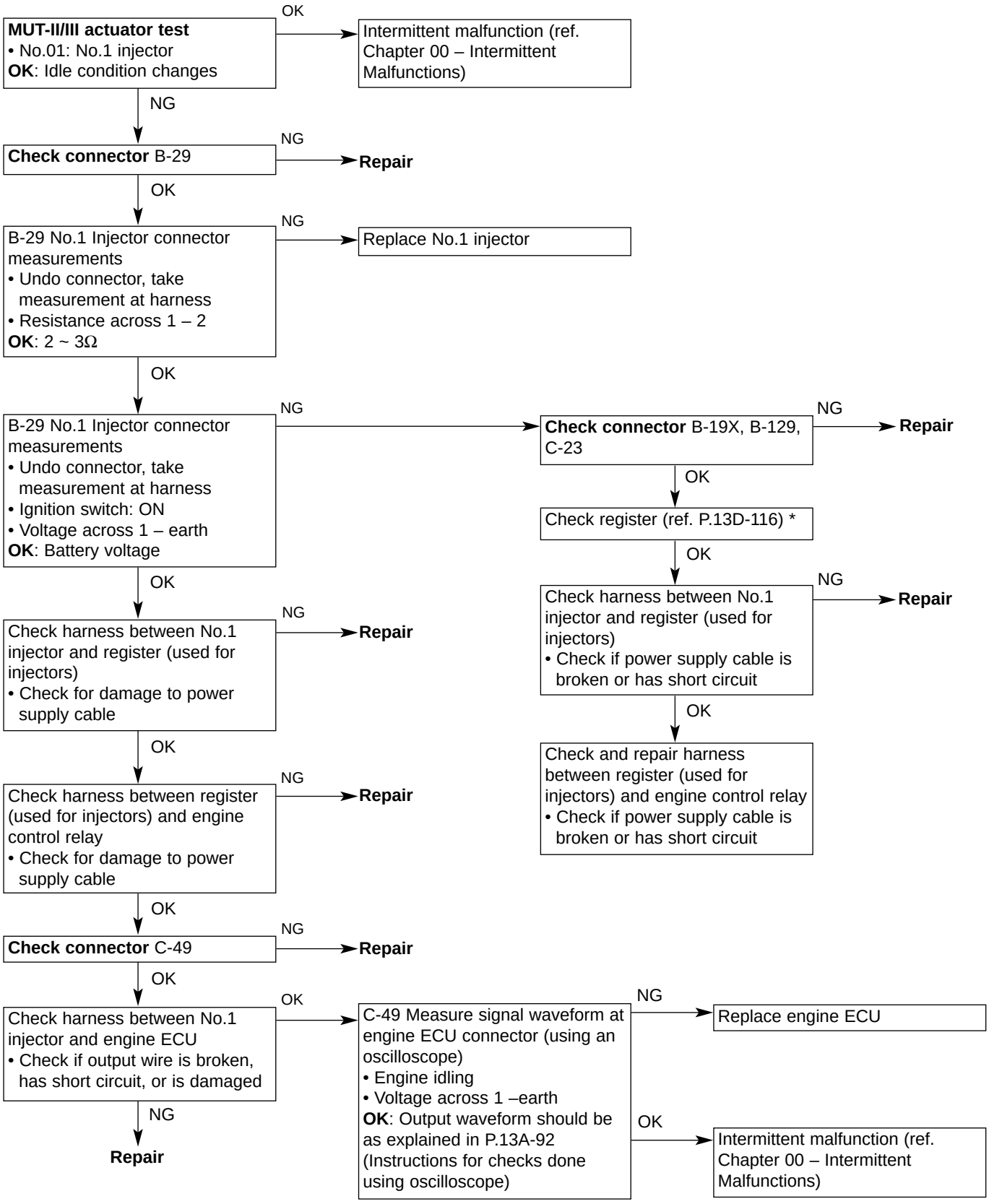


Code No. P0170 Fuel System Abnormality	Probable causes
Inspection Conditions • Engine Air-fuel ratio learning Evaluation conditions • At least 5 second duration when injected fuel correction value is abnormally low or • At least 5 second duration when injected fuel correction value is abnormally high	• Fuel supply system malfunction • O_2 sensor malfunction • Intake air temperature sensor malfunction • Atmospheric air pressure sensor malfunction • Air flow sensor malfunction • Purge control solenoid valve malfunction • Engine ECU malfunction



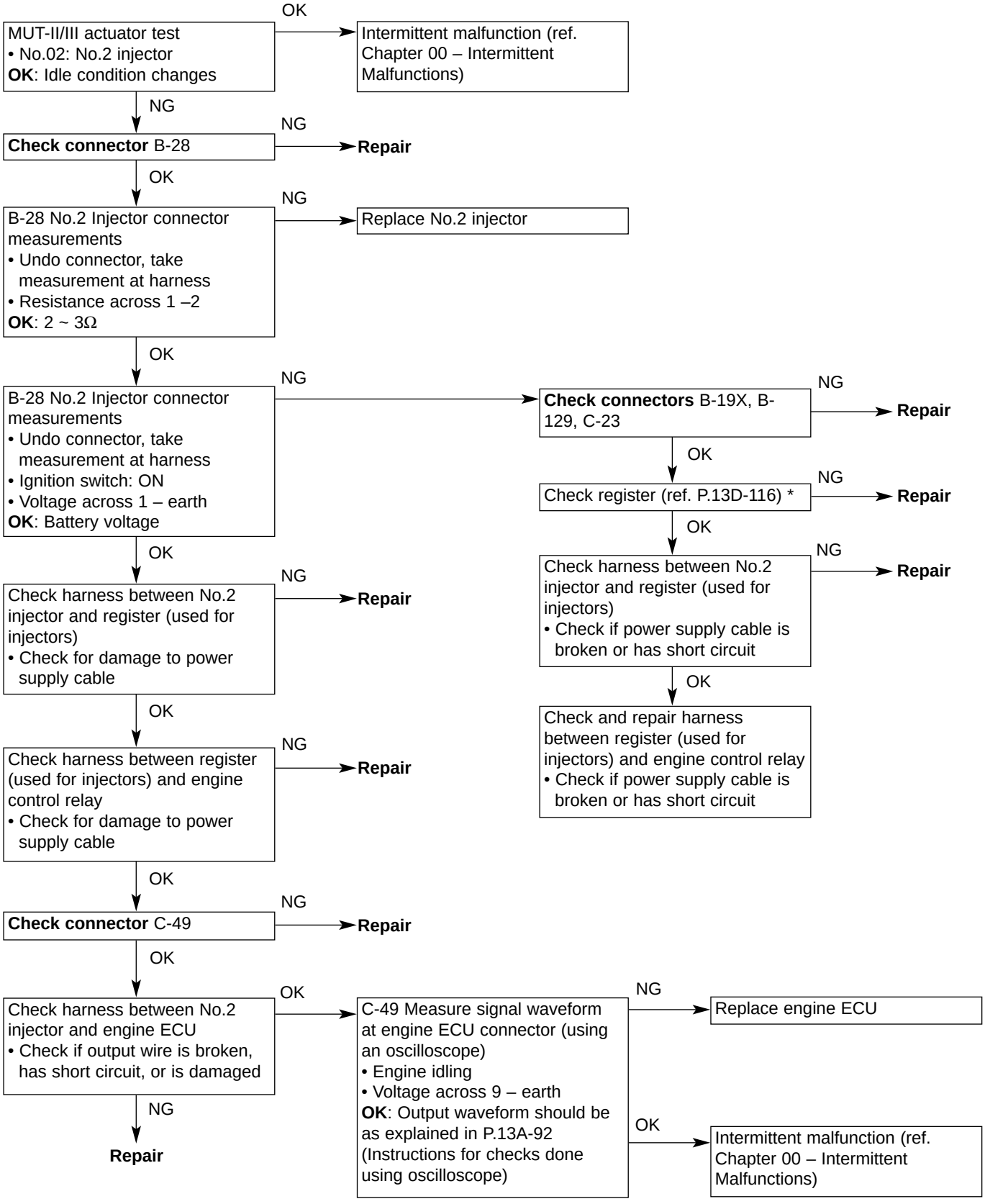
* Refer to '01 Lancer Evolution VII Workshop Manual (No.1036K02)

Code No.P0201 No.1 Injector System	Probable causes
Inspection Conditions • Engine speed: 50 ~ 1,000rpm • TPS output voltage 1.15V or less • Not during MUTII/III forced drive (actuator test) Evaluation conditions • Injector coil surge voltage not detected for a 2 second duration	• No.1 injector malfunction • No.1 injector circuit broken, has short circuit, or poor connector contact • Engine ECU malfunction



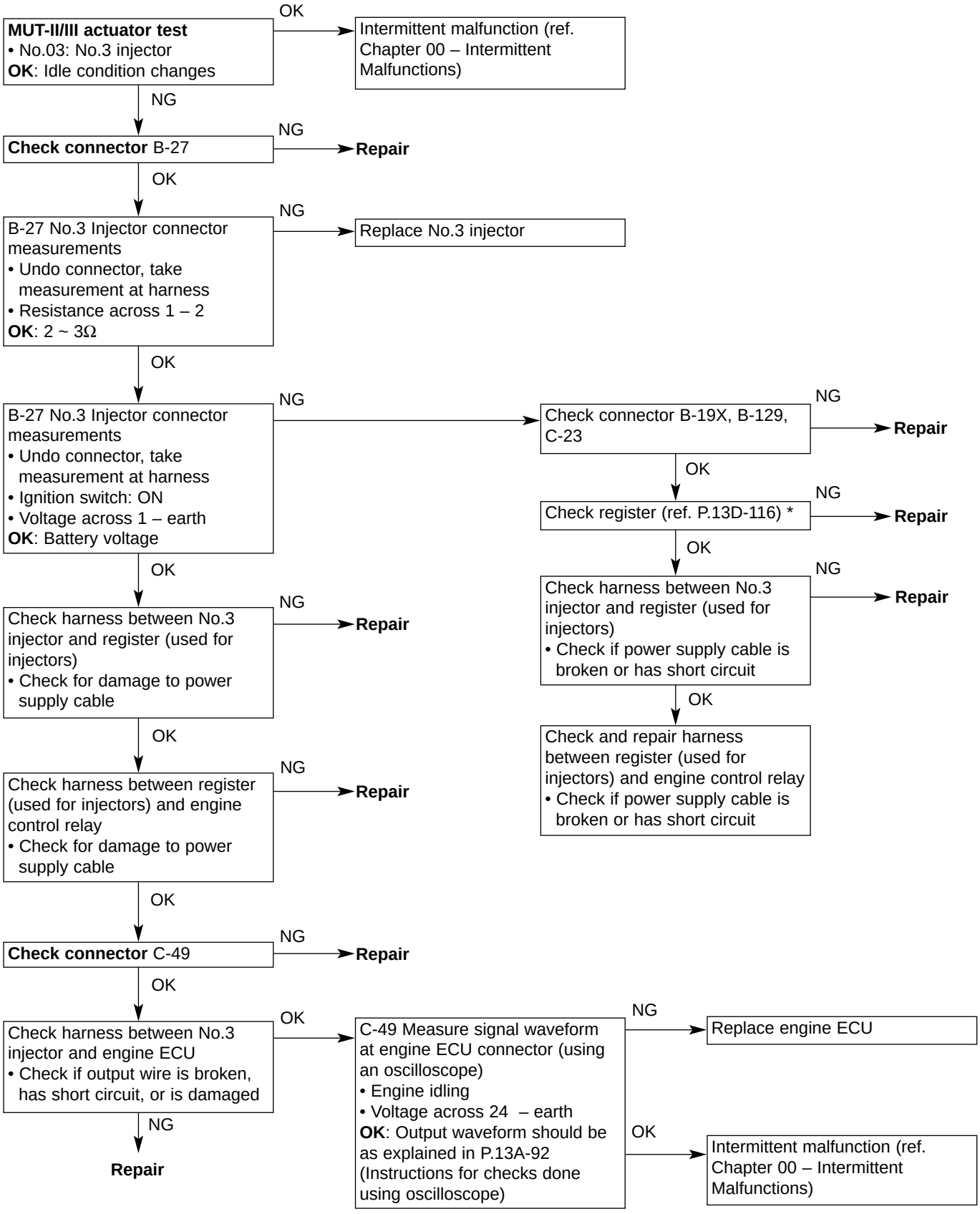
* Refer to '01 Lancer Evolution VII Workshop Manual (No.1036K02)

Code No.P0202 No.2 Injector System	Probable causes
Inspection Conditions • Engine speed: 50 ~ 1,000rpm or less • TPS output voltage 1.15V or less • Not during MUTII/III forced drive (actuator test) Evaluation conditions • Injector coil surge voltage not detected for a 2 second duration	• No.2 injector malfunction • No.2 injector circuit broken, has short circuit, or poor connector contact • Engine ECU malfunction



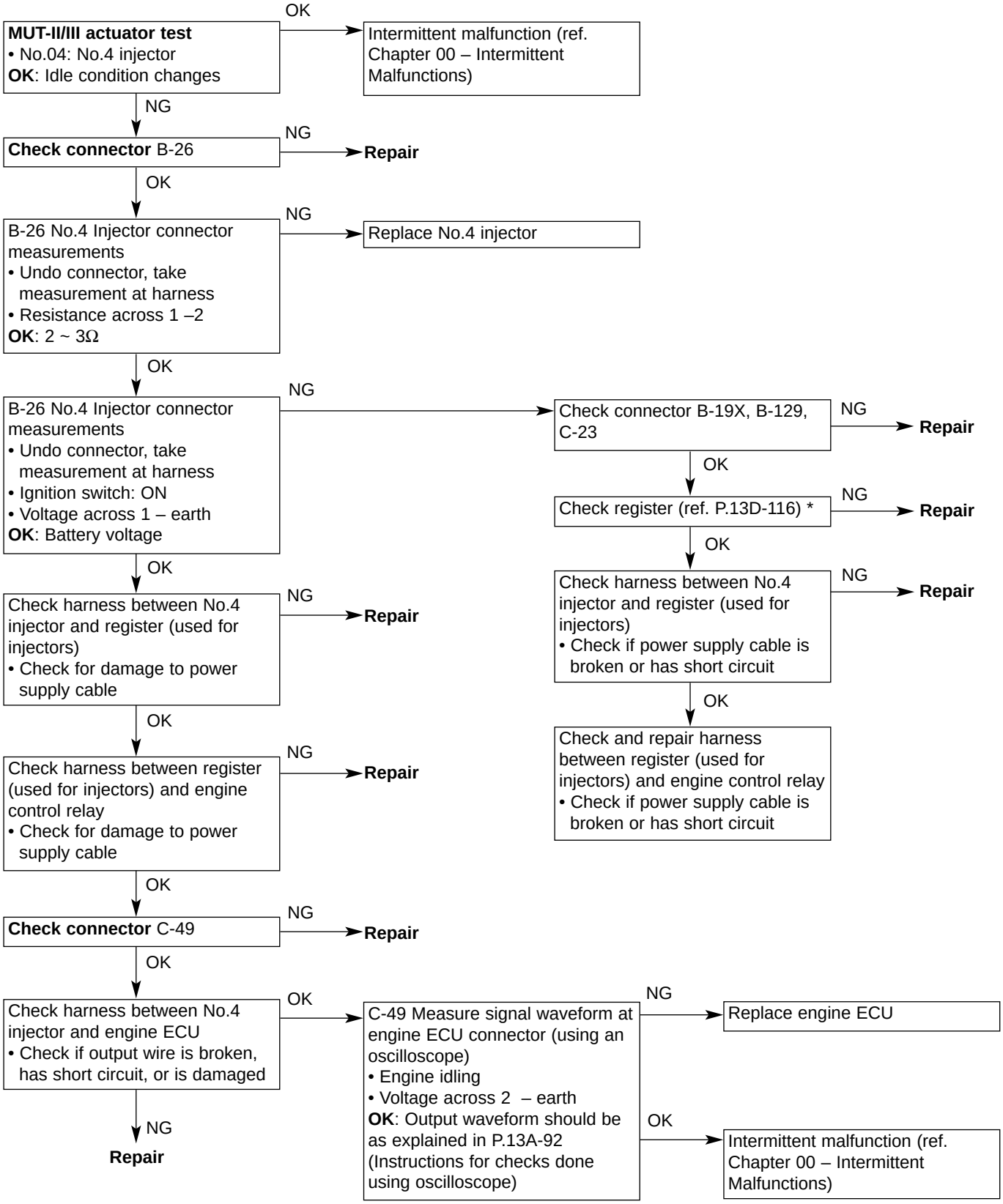
* Refer to '01 Lancer Evolution VII Workshop Manual (No.1036K02)

Code No.P0203 No.3 Injector System	Probable causes
Inspection Conditions • Engine speed: 50 ~ 1,000rpm or less • TPS output voltage 1.15V or less • Not during MUTII/III forced drive (actuator test) Evaluation conditions • Injector coil surge voltage not detected for a 2 second duration	• No.3 injector malfunction • No.3 injector circuit broken, has short circuit, or poor connector contact • Engine ECU malfunction



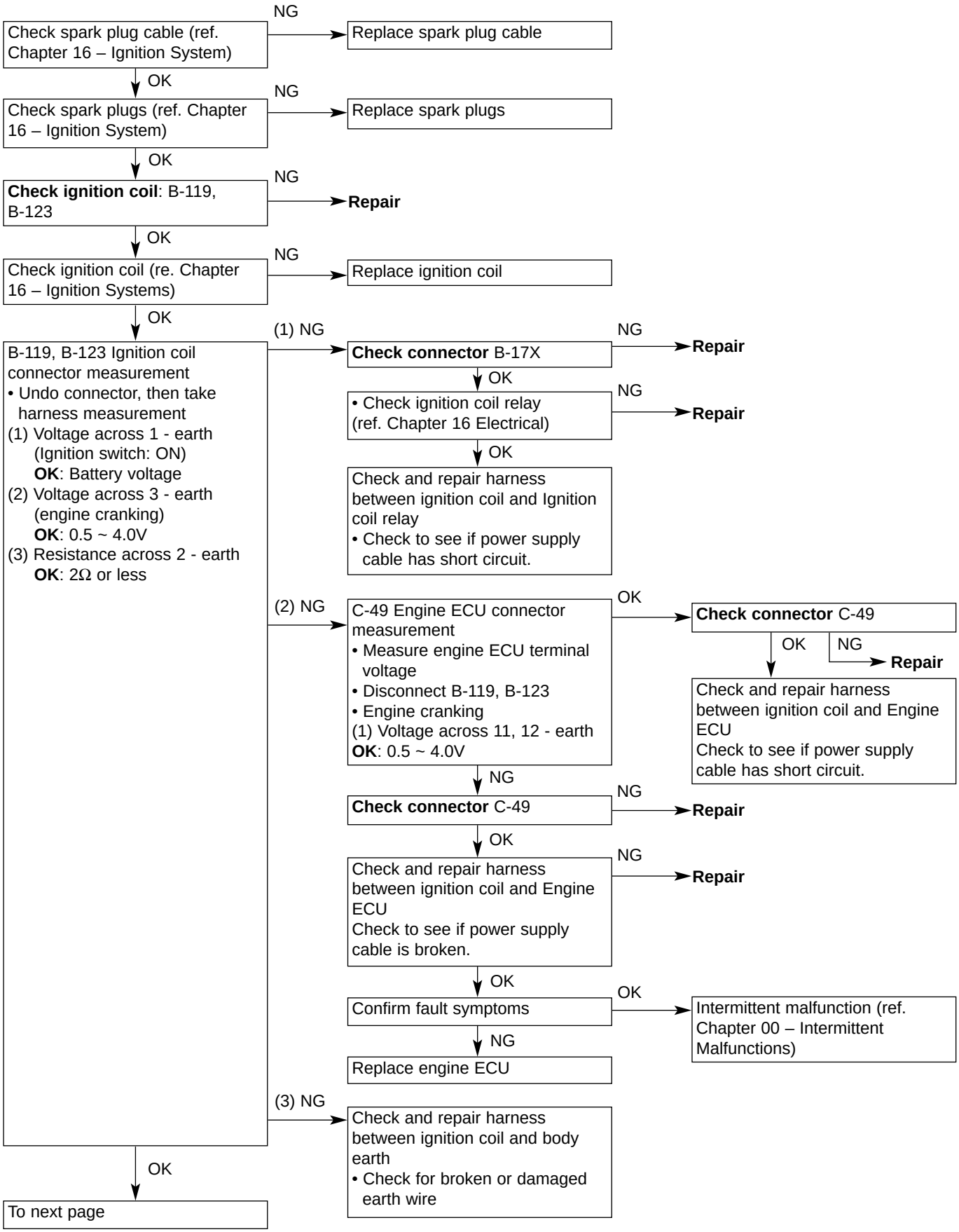
* Refer to '01 Lancer Evolution VII Workshop Manual (No.1036K02)

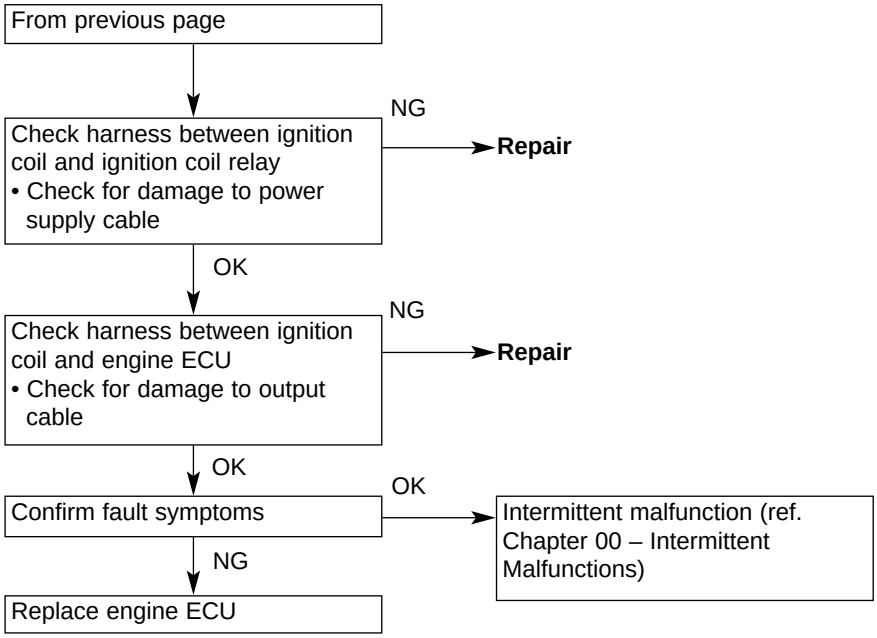
Code No.P0204 No.4 Injector System	Probable causes
Inspection Conditions • Engine speed: 50 ~ 1,000rpm or less • TPS output voltage 1.15V or less • Not during MUTII/III forced drive (actuator test) Evaluation conditions • Injector coil surge voltage not detected for a 2 second duration	• No.4 injector malfunction • No.4 injector circuit broken, has short circuit, or poor connector contact • Engine ECU malfunction



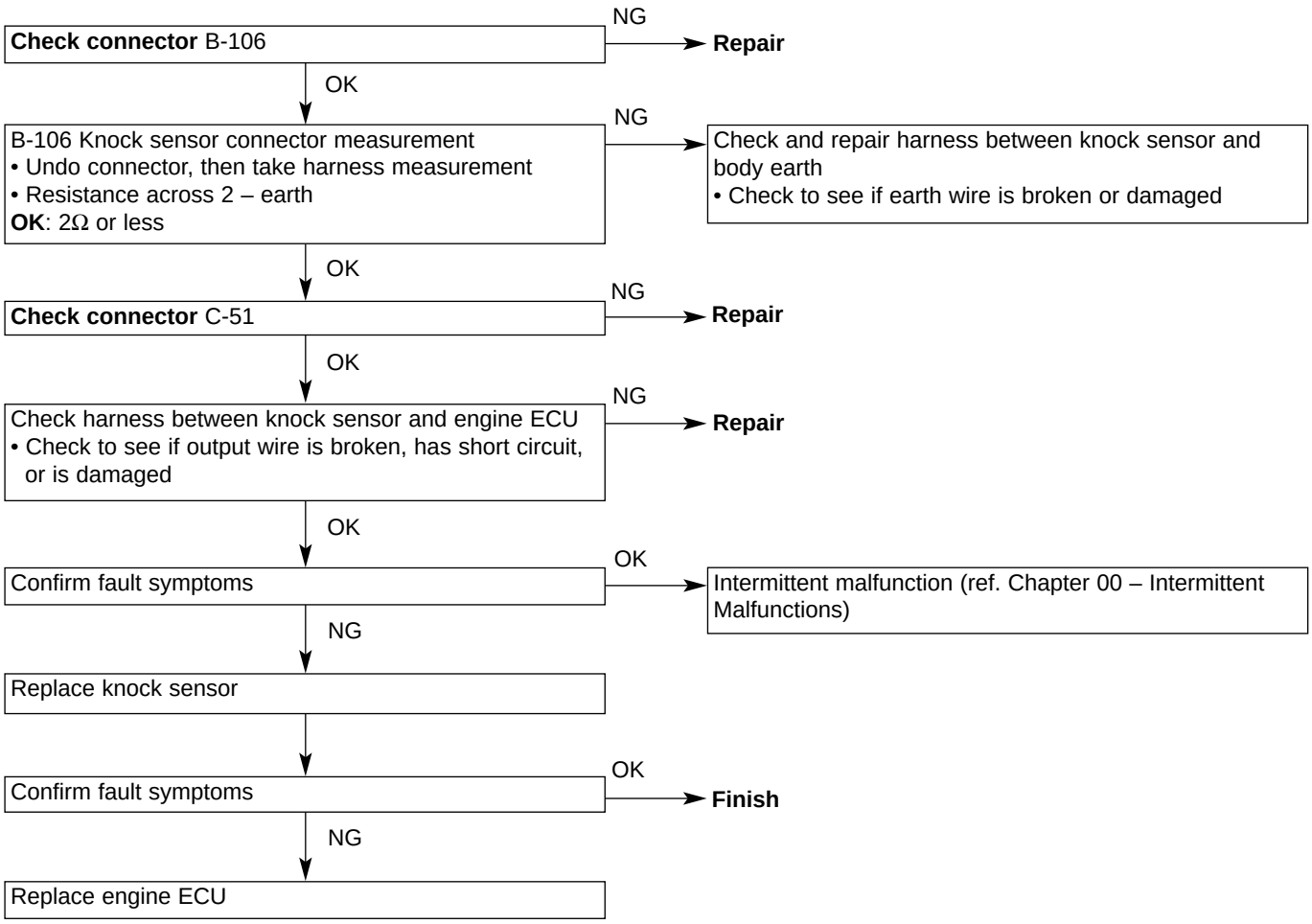
* Refer to '01 Lancer Evolution VII Workshop Manual (No.1036K02)

Code No.P0300 Injection Coil (housing a power transistor) System	Probable causes
Inspection Conditions • Engine speed: 1500 ~ 3,500rpm or less • Volumetric efficiency 40% - 80% • Not whilst engine is cranking Evaluation conditions • Detecting engine speed abnormalities caused by misfiring, using crank angle sensor (one of the two coils is for fuel)	• Ignition coil malfunction • Spark plug malfunction • Spark plug cable malfunction • Ignition primary circuit broken, has a short circuit, or poor connector contact • Engine ECU malfunction

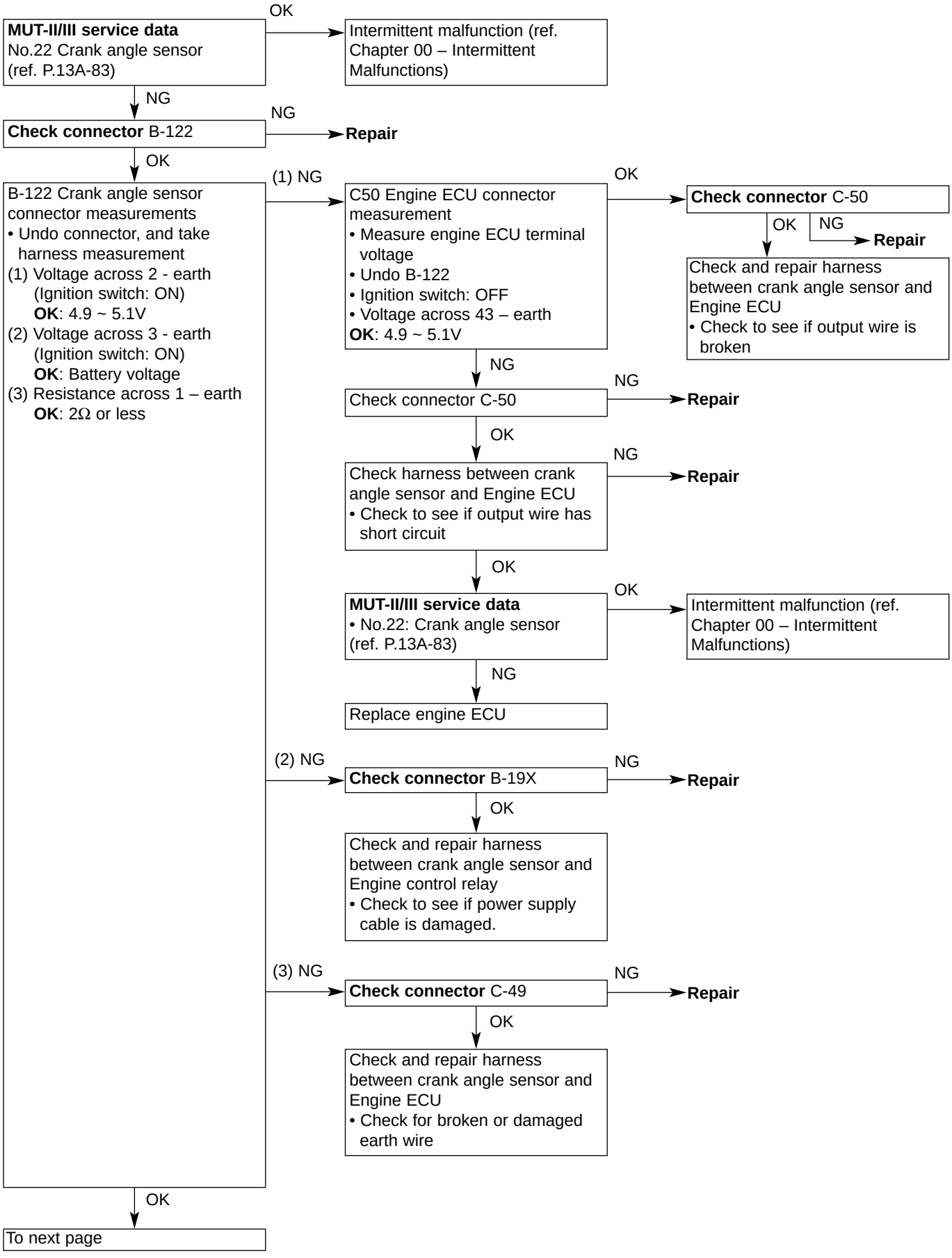


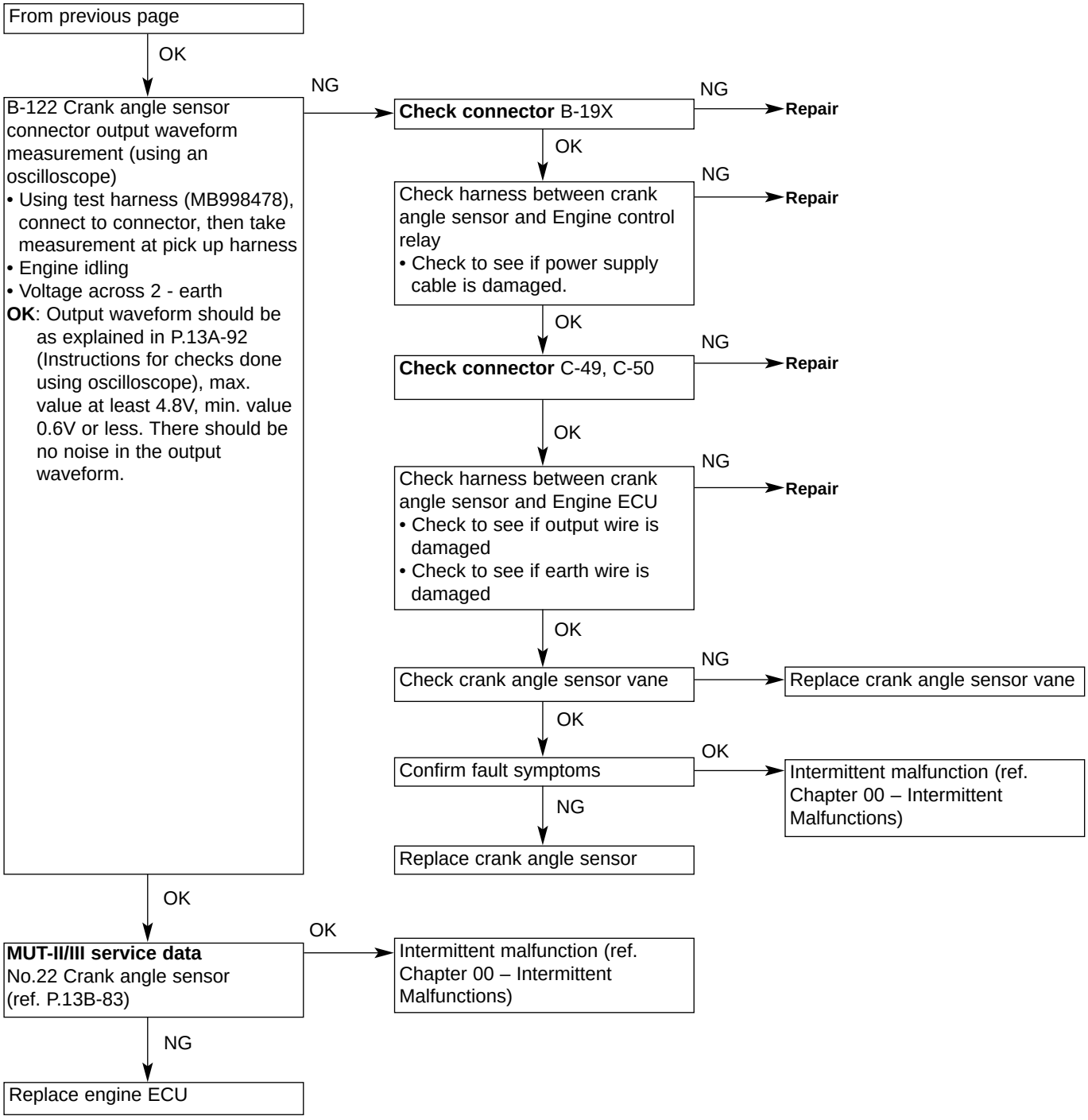


Code No.P0325 Knock Sensor System	**Probable causes**
Inspection Conditions • Ignition switch: ON • Excluding a duration of 2 seconds after turning ignition to ON position, or immediately after engine has fully started up • Engine speed approx. 2,500rpm or more • Volumetric efficiency at least 30% Evaluation conditions • For 200 continuous cycles, change in knock sensor output voltage (knock sensor peak value for each half turn of crank shaft) 0.06V or less	• Knock sensor malfunction • Knock sensor circuit broken, has a short circuit, or poor connector contact • Engine ECU malfunction

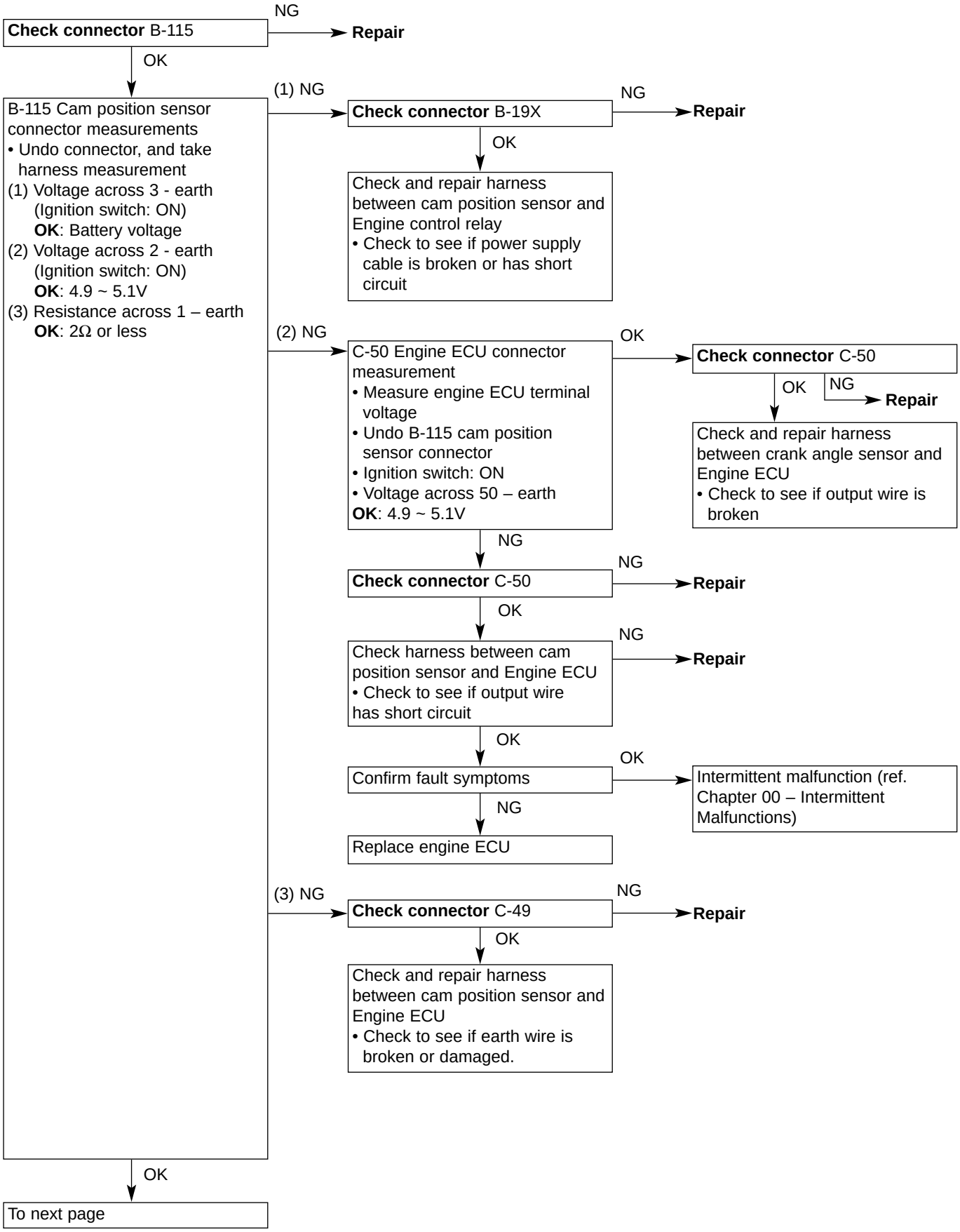


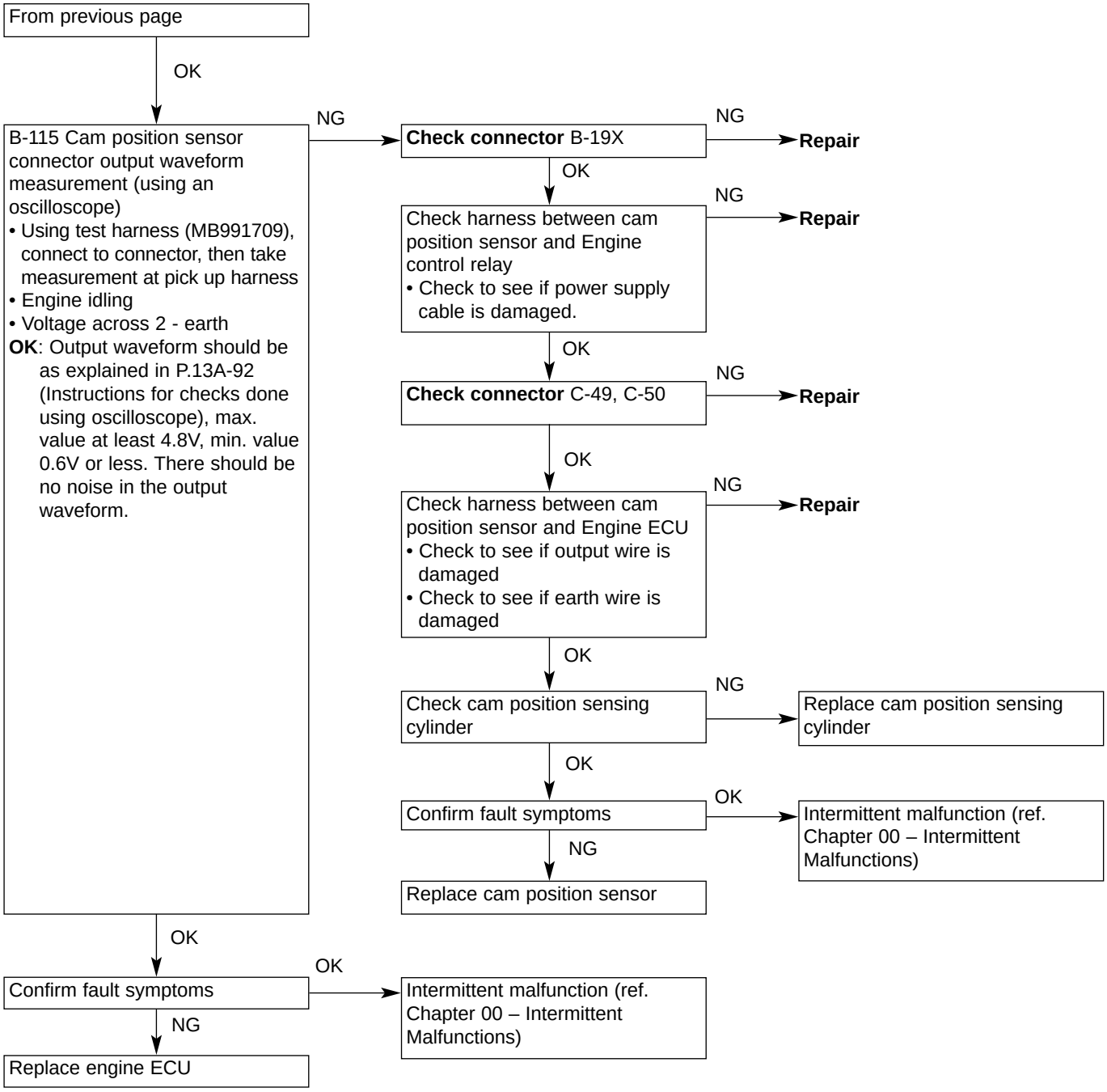
Code No.P0335 Crank Angle Sensor System	Probable causes
Inspection Conditions • Engine cranking Evaluation conditions • No change in sensor output voltage for duration of 4 seconds (pulse signal is not input)	• Crank angle sensor malfunction • Crank angle sensor circuit broken, has a short circuit, or poor connector contact • Engine ECU malfunction



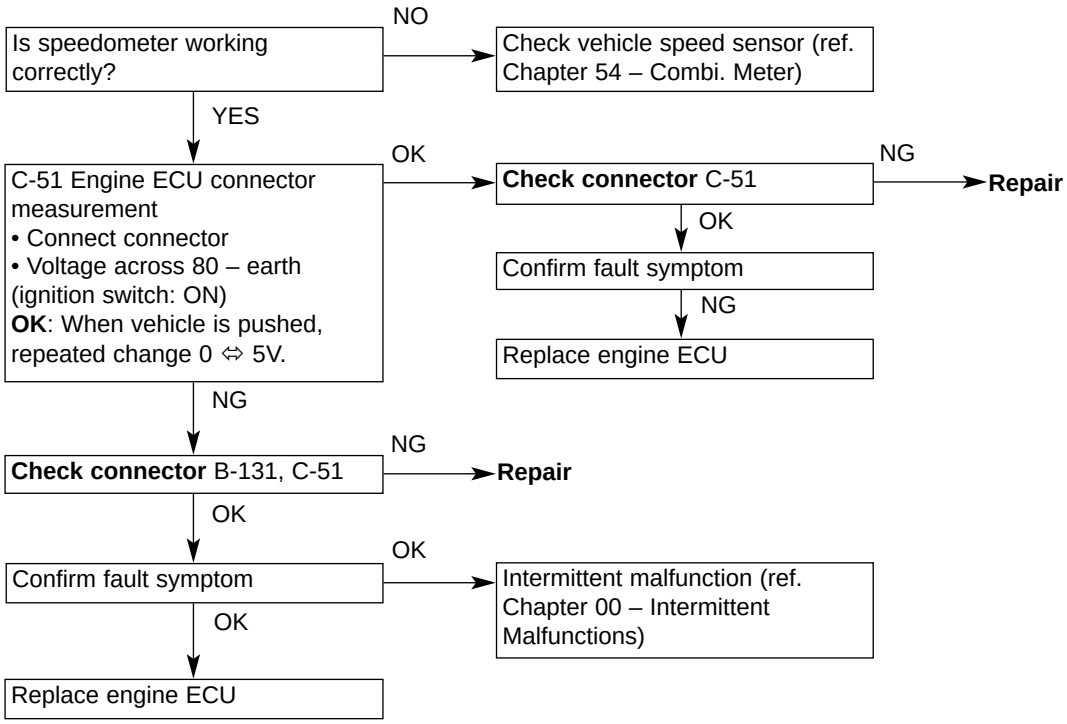

From previous page
OK
B-122 Crank angle sensor connector output waveform measurement (using an oscilloscope)
• Using test harness (MB998478), connect to connector, then take measurement at pick up harness
• Engine idling
• Voltage across 2 - earth
OK: Output waveform should be as explained in P.13A-92 (Instructions for checks done using oscilloscope), max. value at least 4.8V, min. value 0.6V or less. There should be no noise in the output waveform.
NG
Check connector B-19X
NG
Repair
OK
Check harness between crank angle sensor and Engine control relay
• Check to see if power supply cable is damaged.
NG
Repair
OK
Check connector C-49, C-50
NG
Repair
OK
Check harness between crank angle sensor and Engine ECU
• Check to see if output wire is damaged
• Check to see if earth wire is damaged
NG
Repair
OK
Check crank angle sensor vane
NG
Replace crank angle sensor vane
OK
Confirm fault symptoms
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace crank angle sensor
OK
MUT-II/III service data
No.22 Crank angle sensor (ref. P.13B-83)
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace engine ECU

Code No.P0340 Cam Position Sensor System	Probable causes
Inspection Conditions • Ignition switch: ON • Engine speed approx. 50rpm or more Evaluation conditions • No change in sensor output voltage for duration of 4 seconds (pulse signal is not input)	• Cam position sensor malfunction • Cam position sensor circuit broken, has a short circuit, or poor connector contact • Engine ECU malfunction



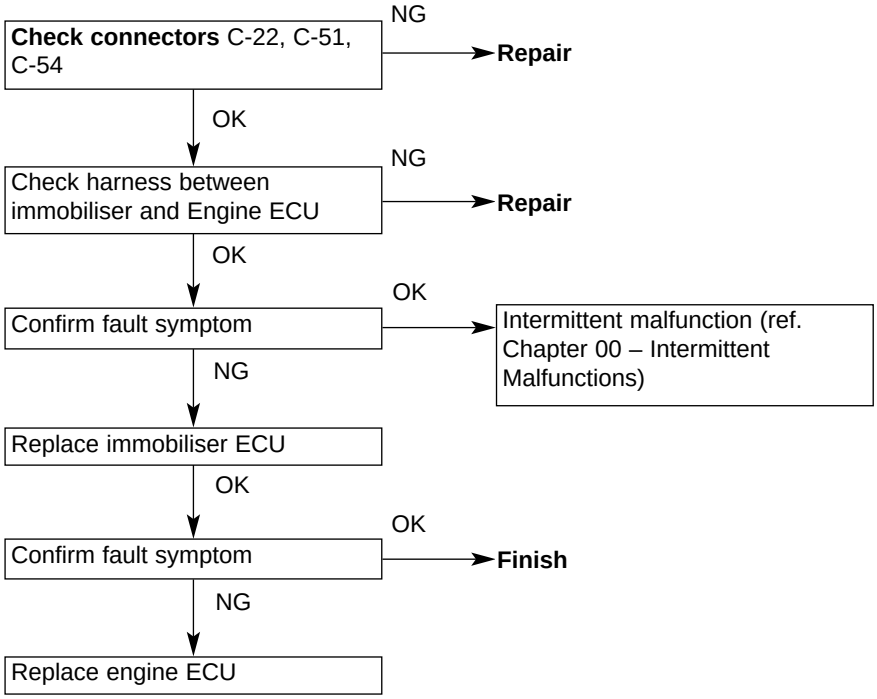

From previous page
OK
B-115 Cam position sensor connector output waveform measurement (using an oscilloscope)
• Using test harness (MB991709), connect to connector, then take measurement at pick up harness
• Engine idling
• Voltage across 2 - earth
OK: Output waveform should be as explained in P.13A-92 (Instructions for checks done using oscilloscope), max. value at least 4.8V, min. value 0.6V or less. There should be no noise in the output waveform.
NG
Check connector B-19X
NG
Repair
OK
Check harness between cam position sensor and Engine control relay
• Check to see if power supply cable is damaged.
NG
Repair
OK
Check connector C-49, C-50
NG
Repair
OK
Check harness between cam position sensor and Engine ECU
• Check to see if output wire is damaged
• Check to see if earth wire is damaged
NG
Repair
OK
Check cam position sensing cylinder
NG
Replace cam position sensing cylinder
OK
Confirm fault symptoms
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace cam position sensor
OK
Confirm fault symptoms
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace engine ECU

Code No.P0500 Vehicle Speed Sensor System	**Probable causes**
Inspection Conditions • Ignition switch: ON • After ignition switch has been turned to ON position, or after 2 seconds from the time the engine has fully started up • Engine speed approx. 2,000~4,000 rpm Evaluation conditions • No change in vehicle speed signal for duration of 4 seconds (pulse signal is not input)	• Vehicle speed sensor malfunction • Vehicle speed sensor circuit broken, has a short circuit, or poor connector contact • Engine ECU malfunction

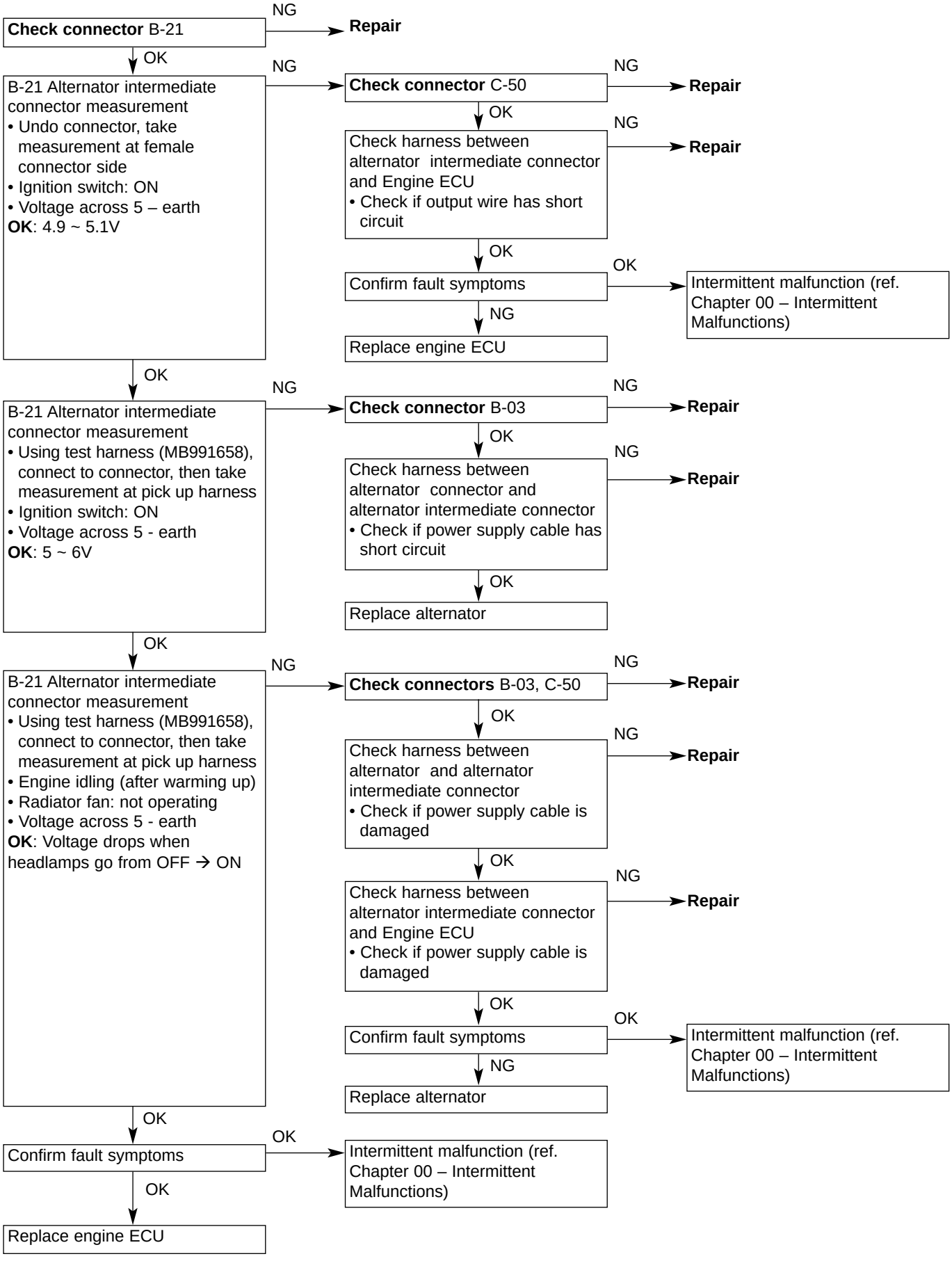


Code No.P0513 Immobiliser System	Probable causes
Inspection Conditions • Ignition switch: ON Evaluation conditions • Communication error between engine ECU and immobiliser detected.	• Circuit broken, has a short circuit, or poor connector contact • Immobiliser ECU malfunction • Engine ECU malfunction

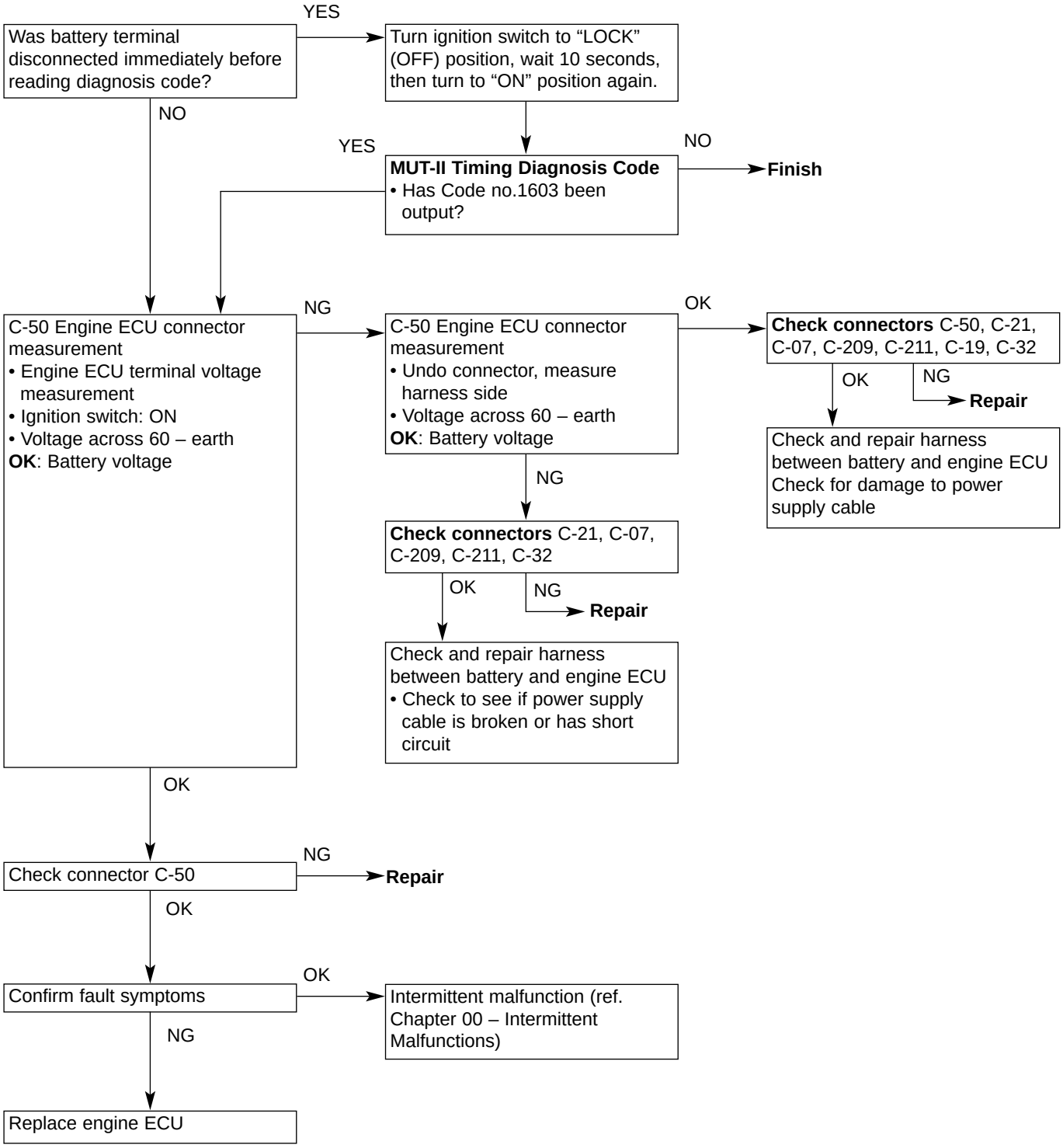
Remarks
(1) When starting the engine, in cases where there are a number of registered ignition keys within close range, these codes could be displayed as a result of electrical interference.
(2) These codes may be displayed at the time key ID codes are registered.



Code No.P1500 Alternator FR Terminal System	Probable causes
Inspection Conditions • Engine speed: at least 50rpm Evaluation conditions • For a 20 second duration, input voltage from the FR terminal, 4.8 ~ 5.2V, or battery voltage	• Alternator FR terminal circuit broken • Engine ECU malfunction



Code No.P1603 Battery Back-up Line System	Probable causes
Inspection Conditions • Ignition switch: ON Evaluation conditions • Back-up RAM information from the last time the ignition switch was turned OFF, has not been recorded	• Battery back-up line circuit is broken, has a short circuit, or connector contact is poor • Engine ECU malfunction



4. List of Fault Symptoms

ITEMS	Fault Symptoms		Checking procedures
Communication with MUT II/III	No communication between MUT-II/III and any other system		1
	Only MUT-II/III and Engine ECU can communicate		2
Engine warning light	The engine warning light does not come on immediately after turning ignition switch to “ON “ position		3
	Engine warning light remains lit. Does not go off.		4
Starting	Starting not possible (starter does not turn over)	Starter does not function	5
	Starting not possible (starter turns over but no initial firing)	Starter functions and cranks, but there is no combustion inside cylinders and engine does not start	6
	Starting not possible (fires, but not fully)	Combustion in cylinders, but engine stalls immediately	7
	Poor starting (starting takes a long time)	Engine starts, but cranking takes a long time	
Poor idling	Irregular idling (rough idling, hunting)	During idle running, engine speed fluctuates. This can normally be seen in the tachometer needle swinging, and vibrations felt through the steering wheel, gear stick, and body	8
	Incorrect idling speed	Does not idle at correct speed	
	Engine stalls when idling (dies out)	During idling, the engine stalls irrespective of whether the vehicle is moving	
Engine stall	Engine stalls when pulling away from standing (‘pass out’)	When vehicle is idling and throttle pedal is depressed, or during operation, engine stalls	9
	Engine stalls during deceleration	Engine stalls when decelerating.	10
Driving	Pulsating/discontinuous combustion (hesitation, sag)	When throttle pedal is depressed in order to accelerate from certain speeds, vehicle response (engine speed) is delayed. Furthermore, during acceleration, (engine speed) drops momentarily. These symptoms are generally referred to as ‘hesitation’. Severe hesitation is referred to as ‘sag’	11
	Poor acceleration	Driving at steady speeds is smooth, but when accelerating, the rate of acceleration does not respond to increased throttle. So highest speeds are not reached	
	Stumble	When pulling away from standing, engine speed responds slowly to initial throttle pedal movement	
	Surge	Driving at steady speeds, or when accelerating, the vehicle repeatedly jerks backwards and forwards	
	Acceleration shock	A major shock is generated on acceleration	12
	Deceleration shock	A major shock is generated on deceleration	13
	Knocking	Thudding noise like a dull hammering comes from cylinder walls during driving, resulting in rough driving.	14
	Ignition mistiming	Discrepancy between firing timing and standard values specified for timing.	15
Stopping	Run-on (dieseling/pinking)	Engine continues to run after ignition switch is turned to “LOCK” (OFF) position.	16
Exhaust fumes	Smelly, white smoke, black smoke CO and HC densities are high when idling	Exhaust fumes smell unusually strong. Exhaust is white or black. CO and HC densities are high when idling	17
Charging	Flat battery	Battery loses its charge immediately. Or battery charging capacity is low	18
Cooling	Overheating	Engine cooling water temperature unusually high	19
	Radiator fan motor running abnormally	Irrespective of engine cooling water temperature, when ignition switch is turn to the ON position, the fan motor starts running	20
A/C performance	A/C not effective	Air not cooled down. Or there is a discrepancy with temperature set.	21

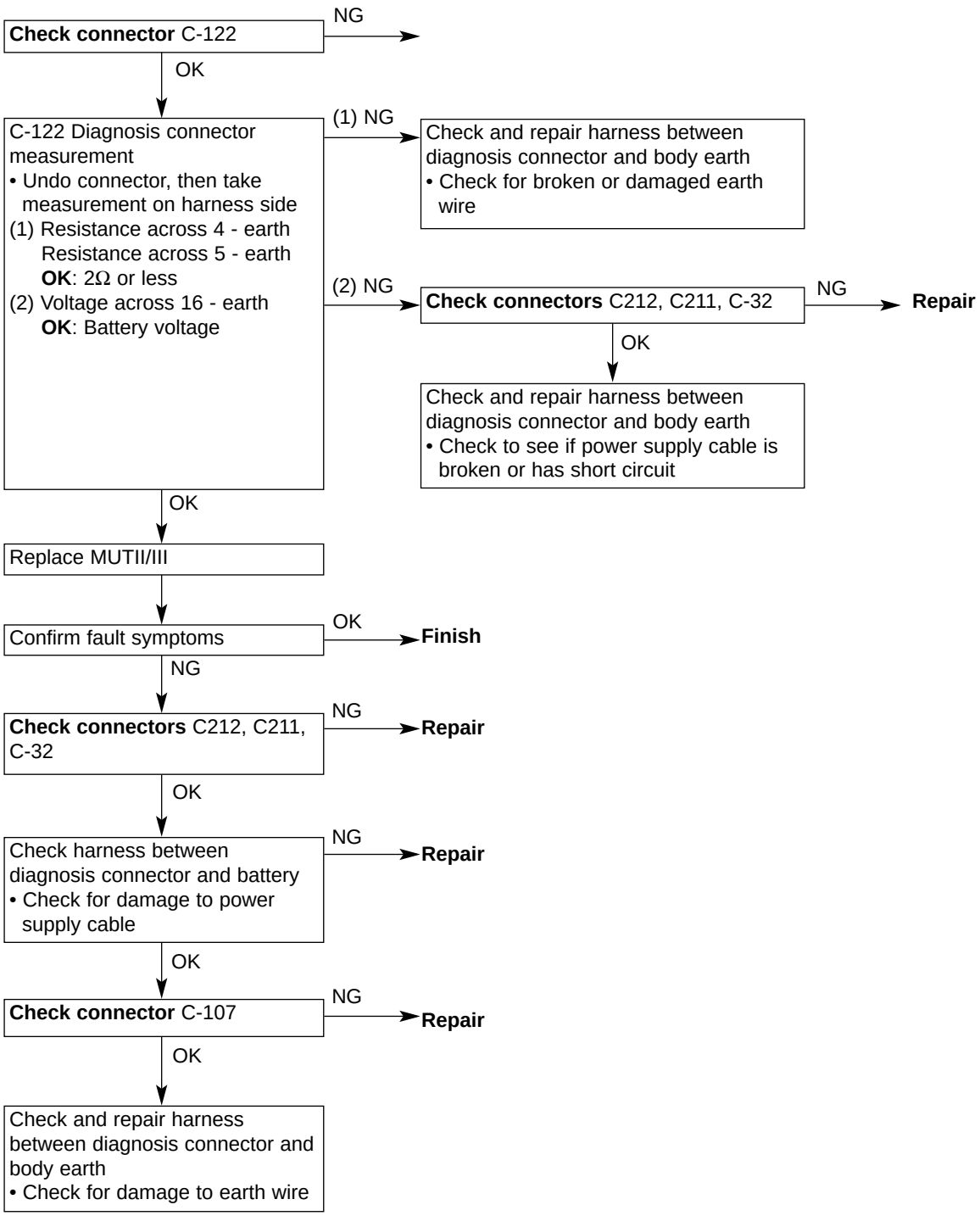
4-1. List of Fault Symptoms

Check procedures	Check Items	Page
1	No communication between MUT-II/III and any other system	13A-36
2	Only MUT-II/III and Engine ECU can communicate	13A-37
3	The engine warning light does not come on immediately after turning ignition switch to "ON " position	13A-38
4	Engine warning light remains lit. Does not go off.	13A-39
5	Starting not possible (starter does not turn over)	13A-40
6	Starting not possible (starter turns over but no initial firing)	13A-42
7	Starting not possible (fires, but not fully)	13A-44
	Poor starting (starting takes a long time)	
8	Irregular idling (rough idling, hunting)	13A-46
	Incorrect idling speed	
	Engine stalls when idling (dies out)	
9	Engine stalls when pulling away from standing ('pass out')	13A-49
10	Engine stalls during deceleration	13A-50
11	Pulsating/discontinuous combustion (hesitation, sag)	13A-50
	Poor acceleration	
	Stumble	
	Surge	
12	Acceleration shock	13A-52
13	Deceleration shock	13A-53
14	Knocking	13A-53
15	Ignition mistiming	13A-54
16	Run-on (dieseling/pinking)	13A-55
17	Smelly, white smoke, black smoke CO and HC densities are high when idling	13A-55
18	Flat battery	13A-57
19	Overheating	13A-58
20	Radiator fan motor running abnormally	13A-59
21	A/C not effective	13A-60
22	Engine ECU power supply, engine control relay, ignition switch – IG1 system	13A-61
23	Fuel pump system	13A-63
24	Radiator fan control relay system	13A-65
25	Condenser fan control relay system	13A-67
26	A/C switch system	13A-70
27	A/C compressor relay	13A-71
28	A/C load signal system	13A-73
29	Power steering fluid pressure switch system	13A-74
30	Purge solenoid valve system	13A-75
31	Fuel pressure control solenoid valve system	13A-76
32	Secondary air control solenoid valve	13A-77
33	Waste gate solenoid valve system	13A-78
34	Idle speed control (ISC) servo (stepper motor) system	13A-79
35	Intercooler water spray circuit system	13A-80
36	Intercooler water spray lamp system	13A-82

6. Checking Procedure for each Fault

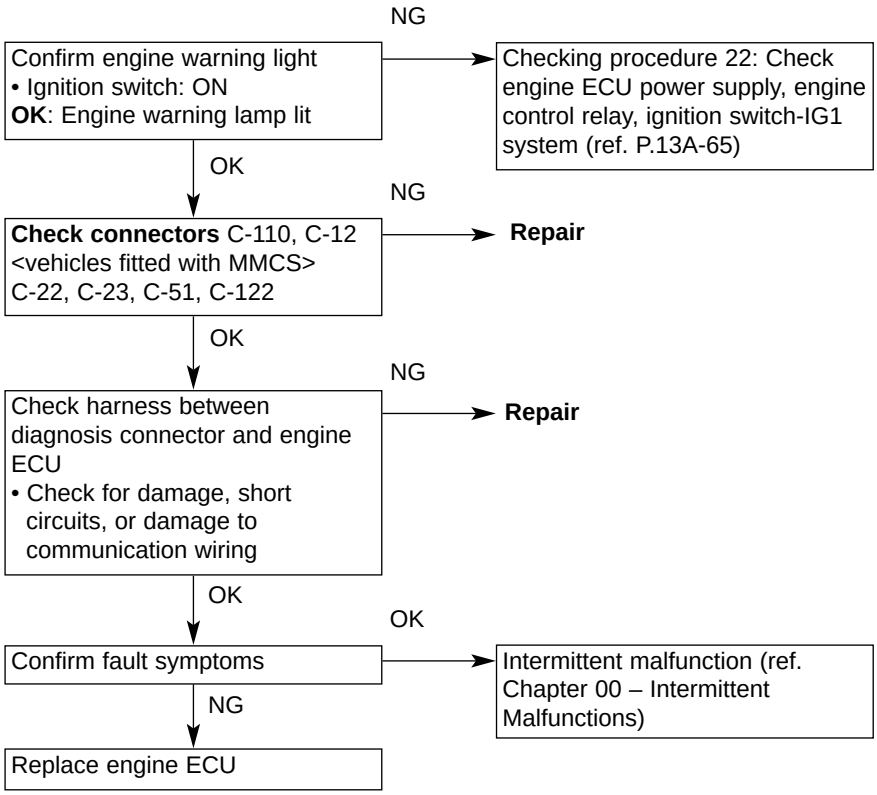
Checking Procedure 1

No Communication between MUT-II/III and any other system	Probable causes
The probable causes are noted right.	• Diagnosis connector malfunction • MUT-II/III malfunction



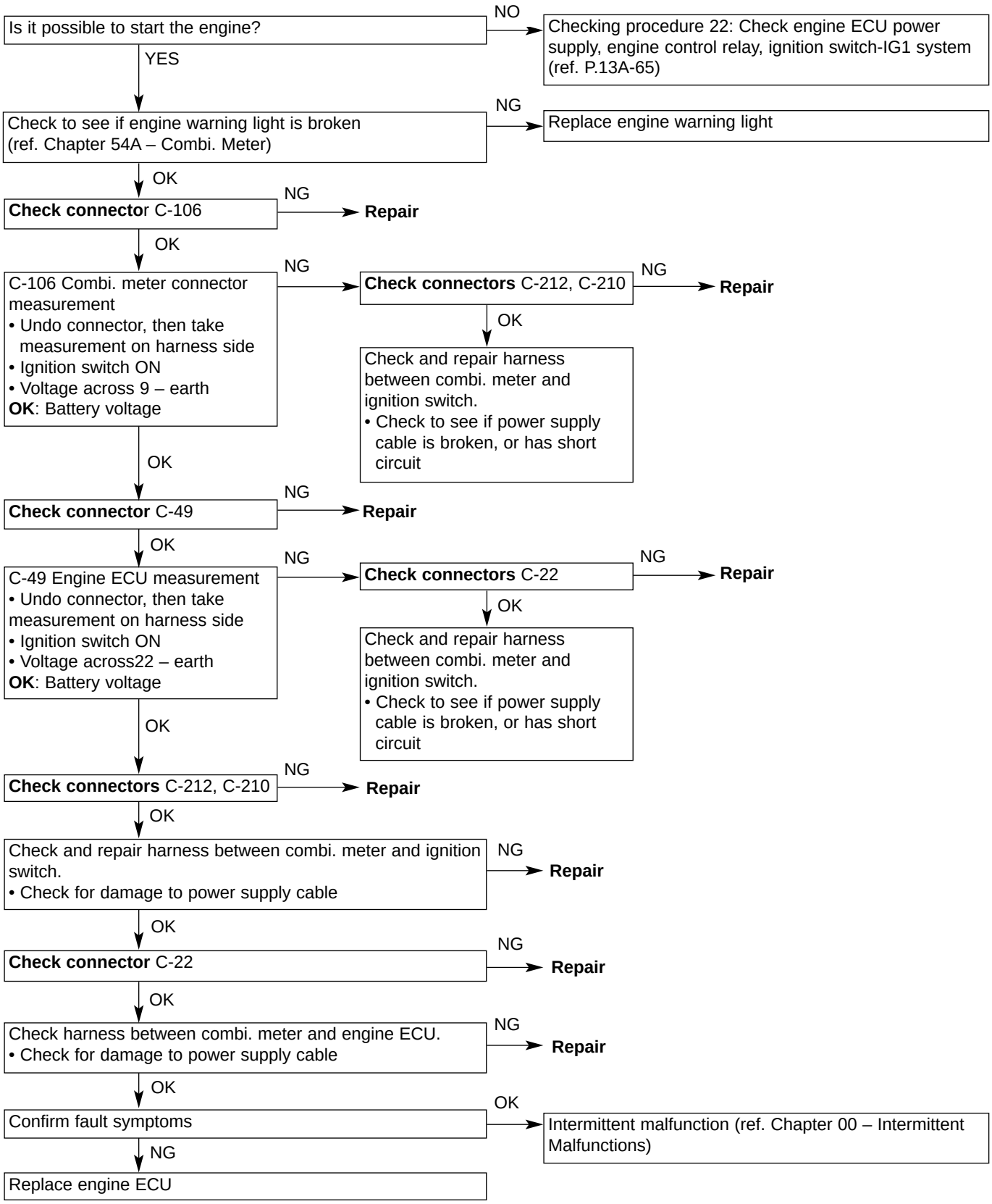
Checking Procedure 2

Only MUT-II/III and engine ECU can communicate	**Probable causes**
The probable causes are noted right.	• Ignition switch malfunction • Engine control relay malfunction • Engine ECU malfunction



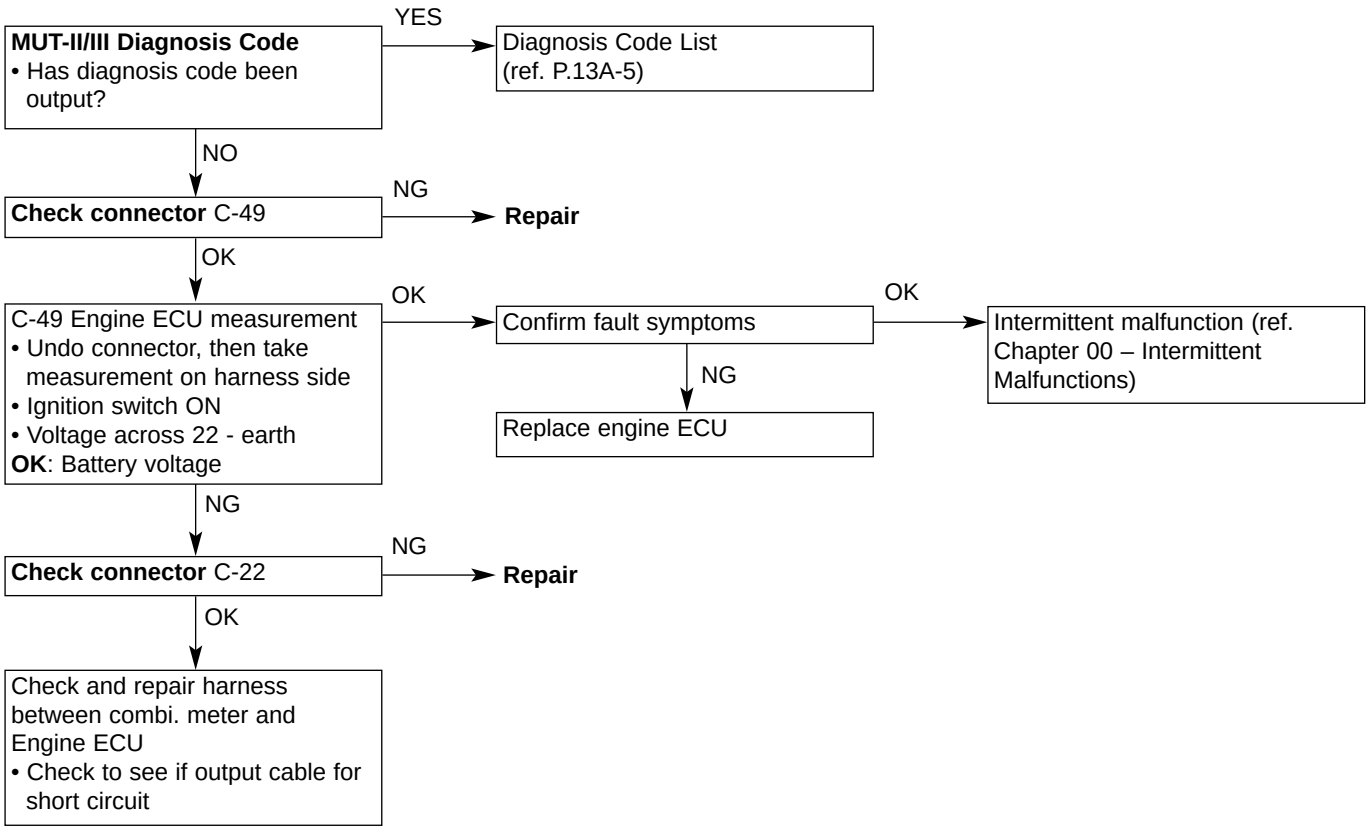
Checking Procedure 3

The engine warning light does not come on immediately after turning ignition switch ON.	**Probable causes**
To check whether the engine warning light bulb is broken or not, the engine ECU checks the engine warning light for a duration of 5 seconds immediately after the ignition switch is turned to the ON position.	• Engine warning lamp bulb is broken • Ignition switch malfunction • Engine control relay malfunction • Engine ECU malfunction



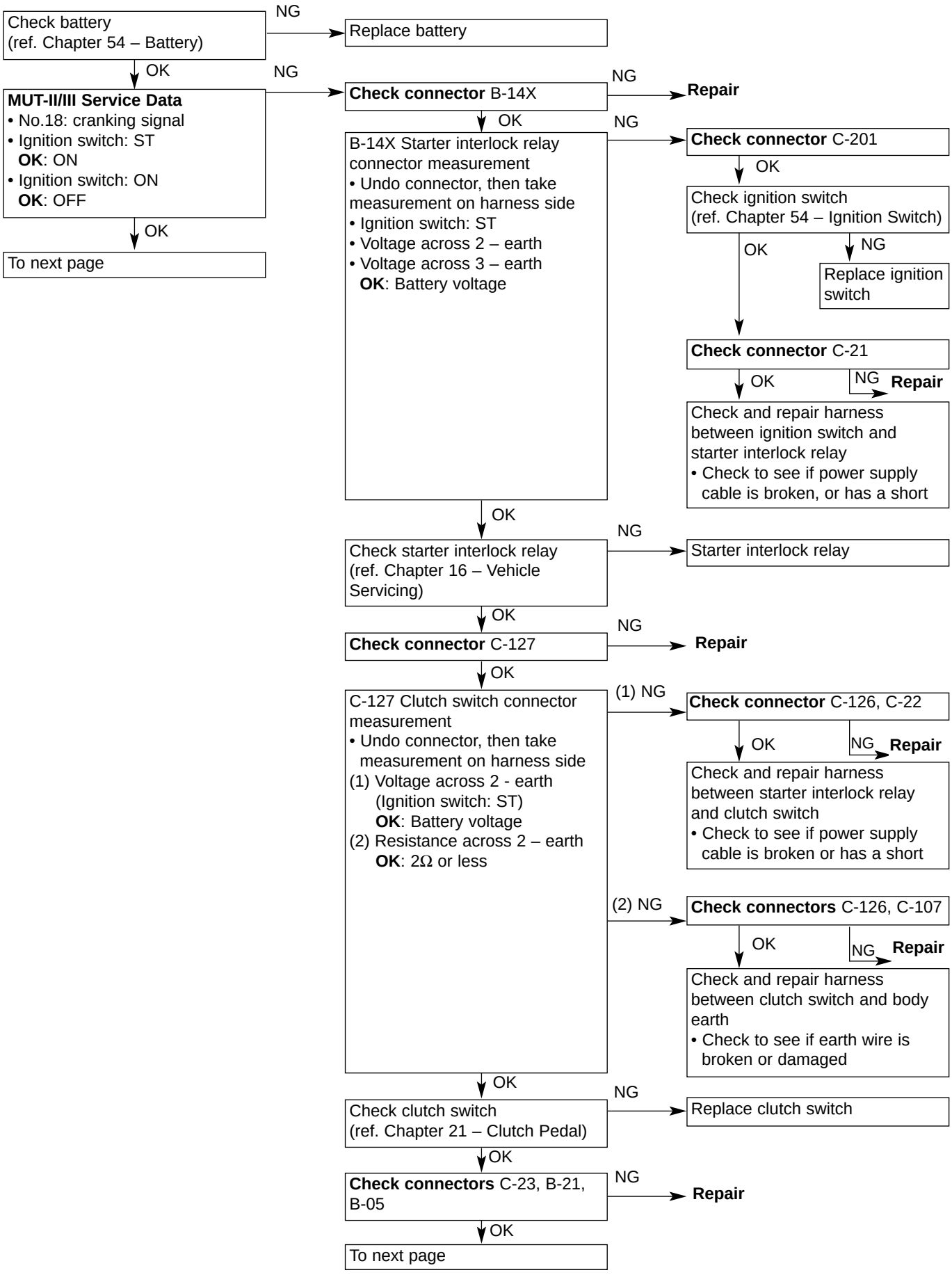
Checking Procedure 4

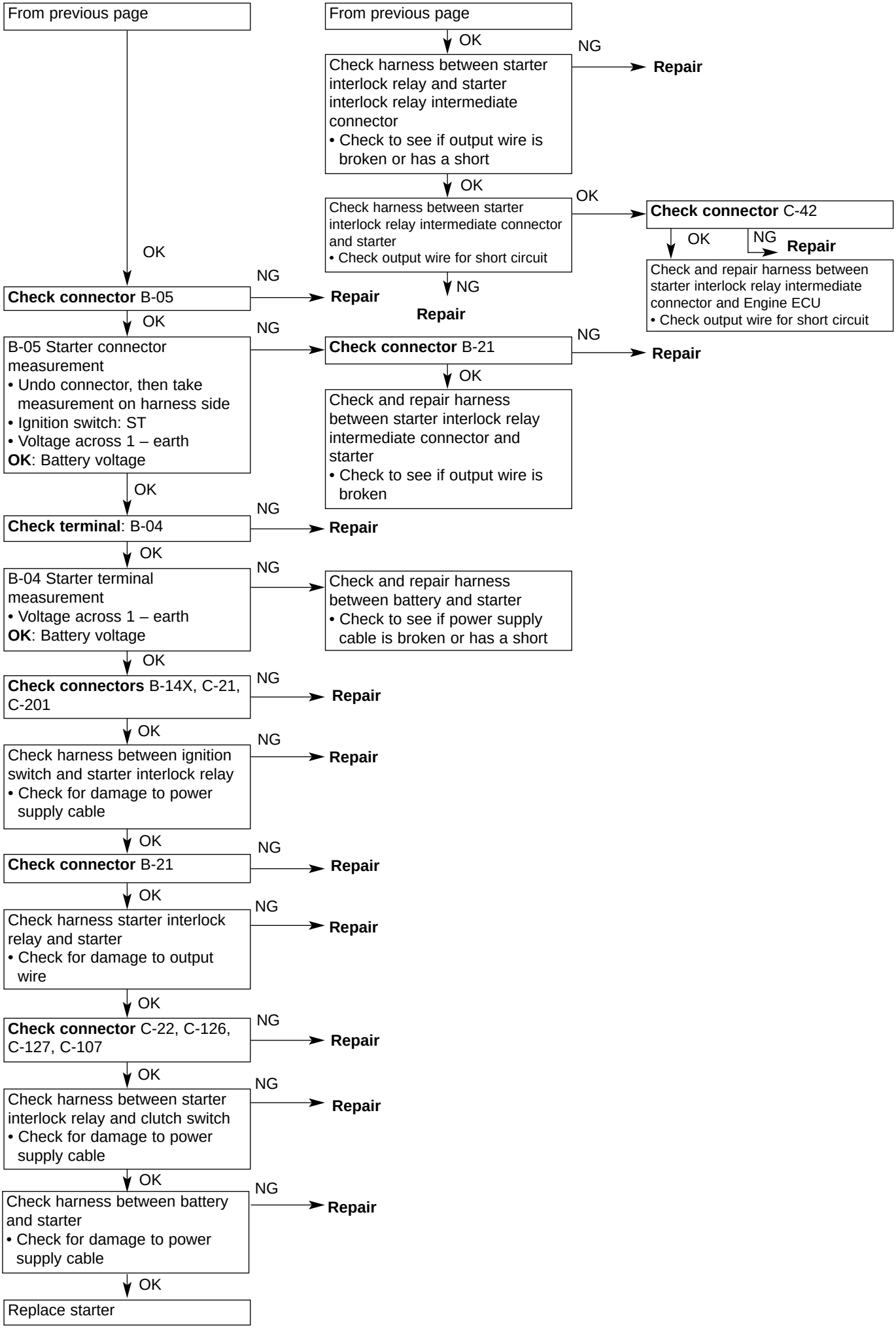
Engine warning light stays lit (does not go off)	Probable causes
When the engine ECU records the generation of the diagnosis code, it turns the engine warning light on.	• Engine ECU malfunction



Checking Procedure 5

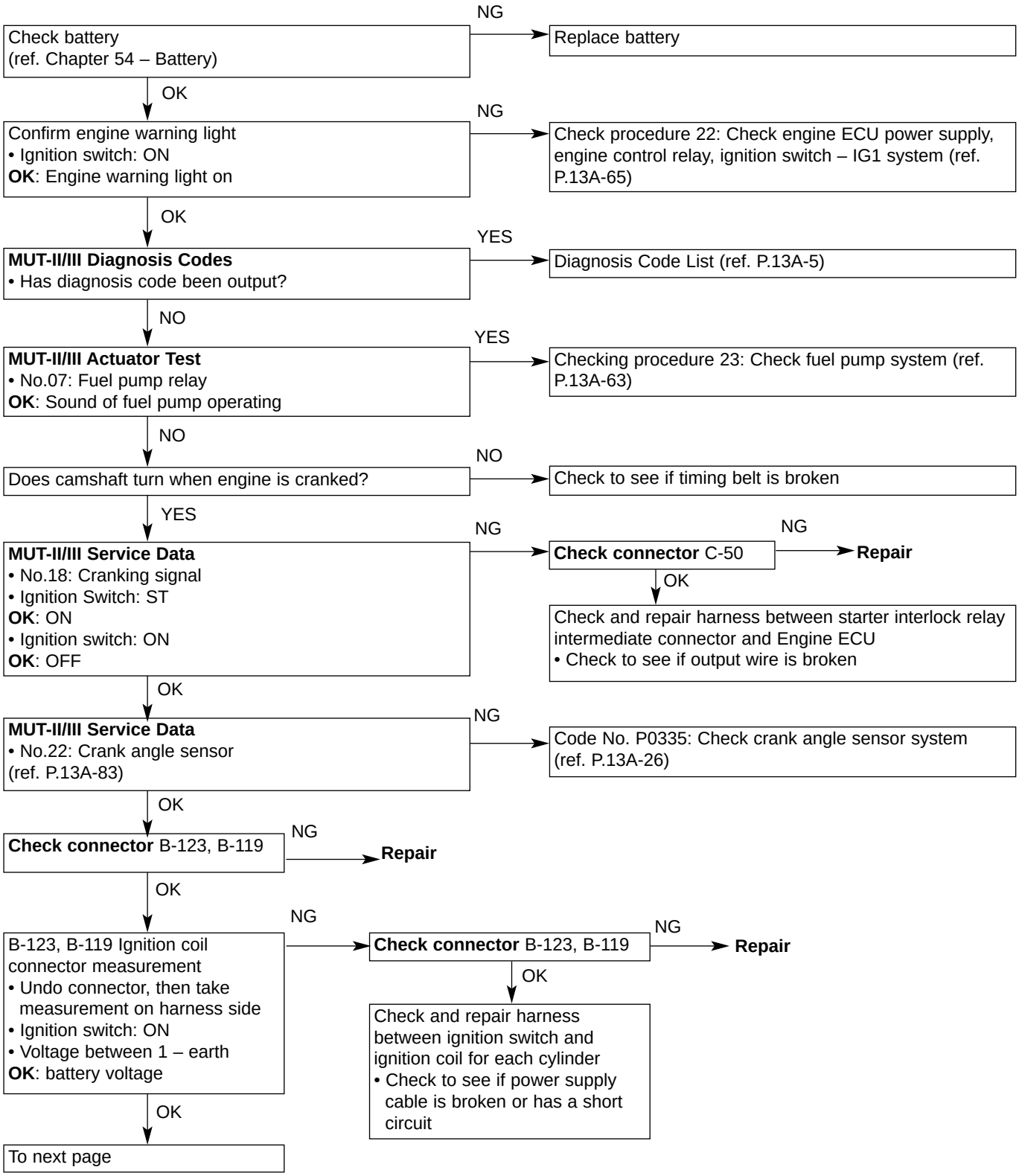
Starting not possible (starter does not turn over)	Probable causes
The probable causes are noted right.	• Battery malfunction • Ignition switch malfunction • Starter malfunction

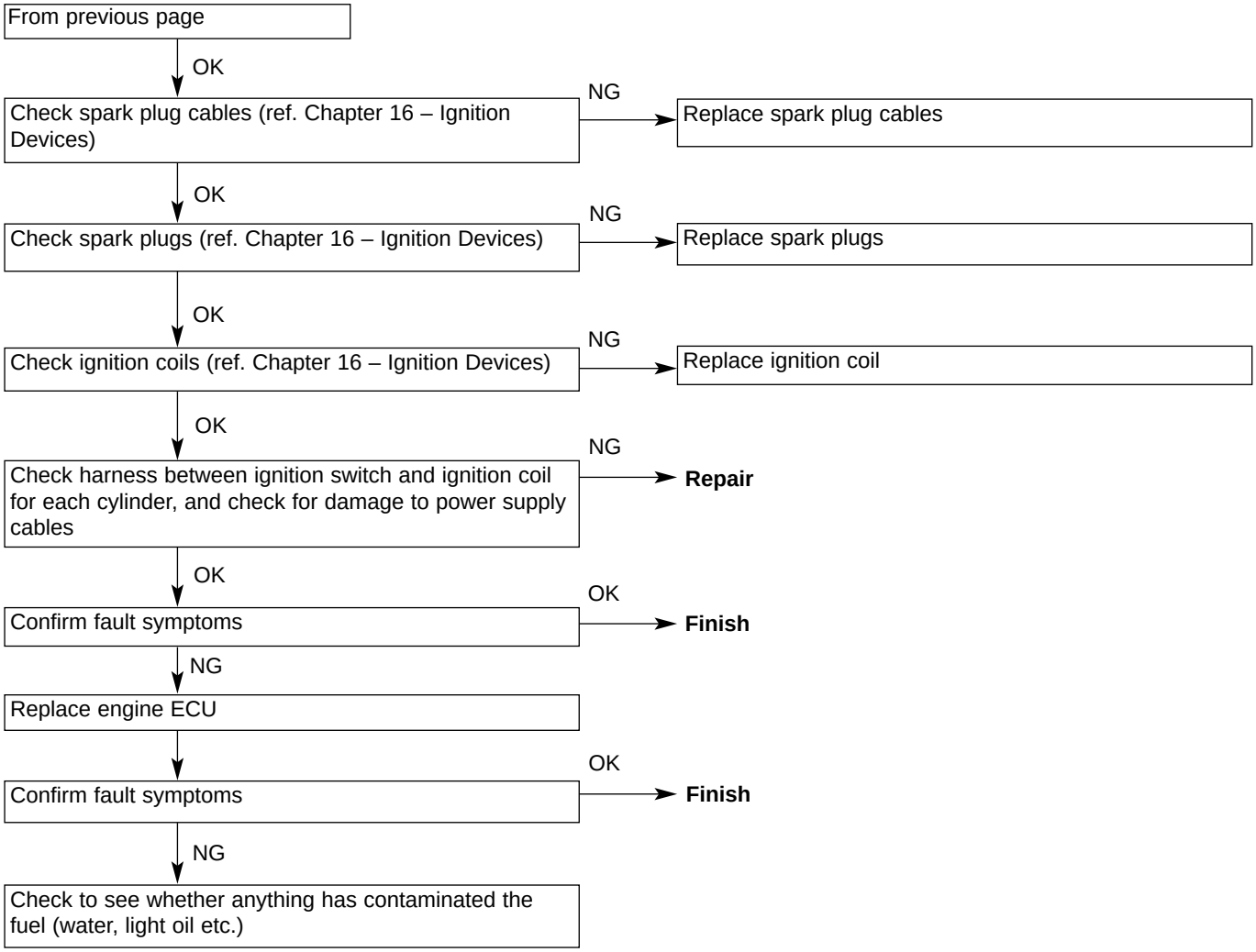



From previous page
From previous page
OK
NG
Check harness between starter interlock relay and starter interlock relay intermediate connector
• Check to see if output wire is broken or has a short
Repair
OK
Check harness between starter interlock relay intermediate connector and starter
• Check output wire for short circuit
OK
Check connector C-42
OK
NG
Repair
Check and repair harness between starter interlock relay intermediate connector and Engine ECU
• Check output wire for short circuit
NG
Repair
OK
Check connector B-05
NG
Repair
OK
B-05 Starter connector measurement
• Undo connector, then take measurement on harness side
• Ignition switch: ST
• Voltage across 1 – earth
OK: Battery voltage
NG
Check connector B-21
NG
Repair
OK
Check and repair harness between starter interlock relay intermediate connector and starter
• Check to see if output wire is broken
OK
Check terminal: B-04
NG
Repair
OK
B-04 Starter terminal measurement
• Voltage across 1 – earth
OK: Battery voltage
NG
Check and repair harness between battery and starter
• Check to see if power supply cable is broken or has a short
OK
Check connectors B-14X, C-21, C-201
NG
Repair
OK
Check harness between ignition switch and starter interlock relay
• Check for damage to power supply cable
NG
Repair
OK
Check connector B-21
NG
Repair
OK
Check harness starter interlock relay and starter
• Check for damage to output wire
NG
Repair
OK
Check connector C-22, C-126, C-127, C-107
NG
Repair
OK
Check harness between starter interlock relay and clutch switch
• Check for damage to power supply cable
NG
Repair
OK
Check harness between battery and starter
• Check for damage to power supply cable
NG
Repair
OK
Replace starter

Checking Procedure 6

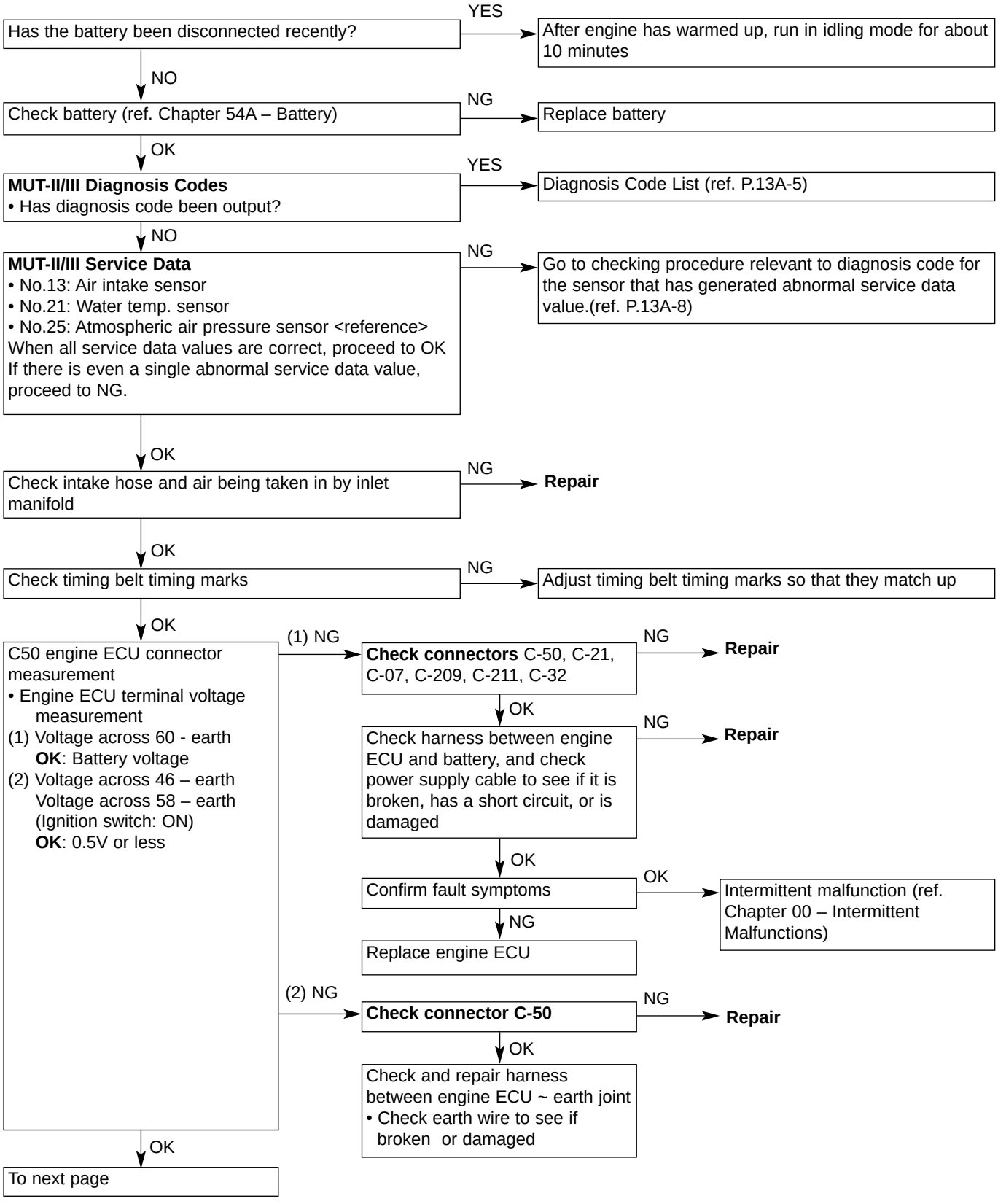
Starting not possible (starter turns over but no initial firing)	Probable causes
The probable causes are noted right.	• Battery malfunction • Ignition switch malfunction • Ignition system malfunction • Fuel system malfunction • Throttle valve malfunction • Timing belt malfunction • Engine ECU malfunction

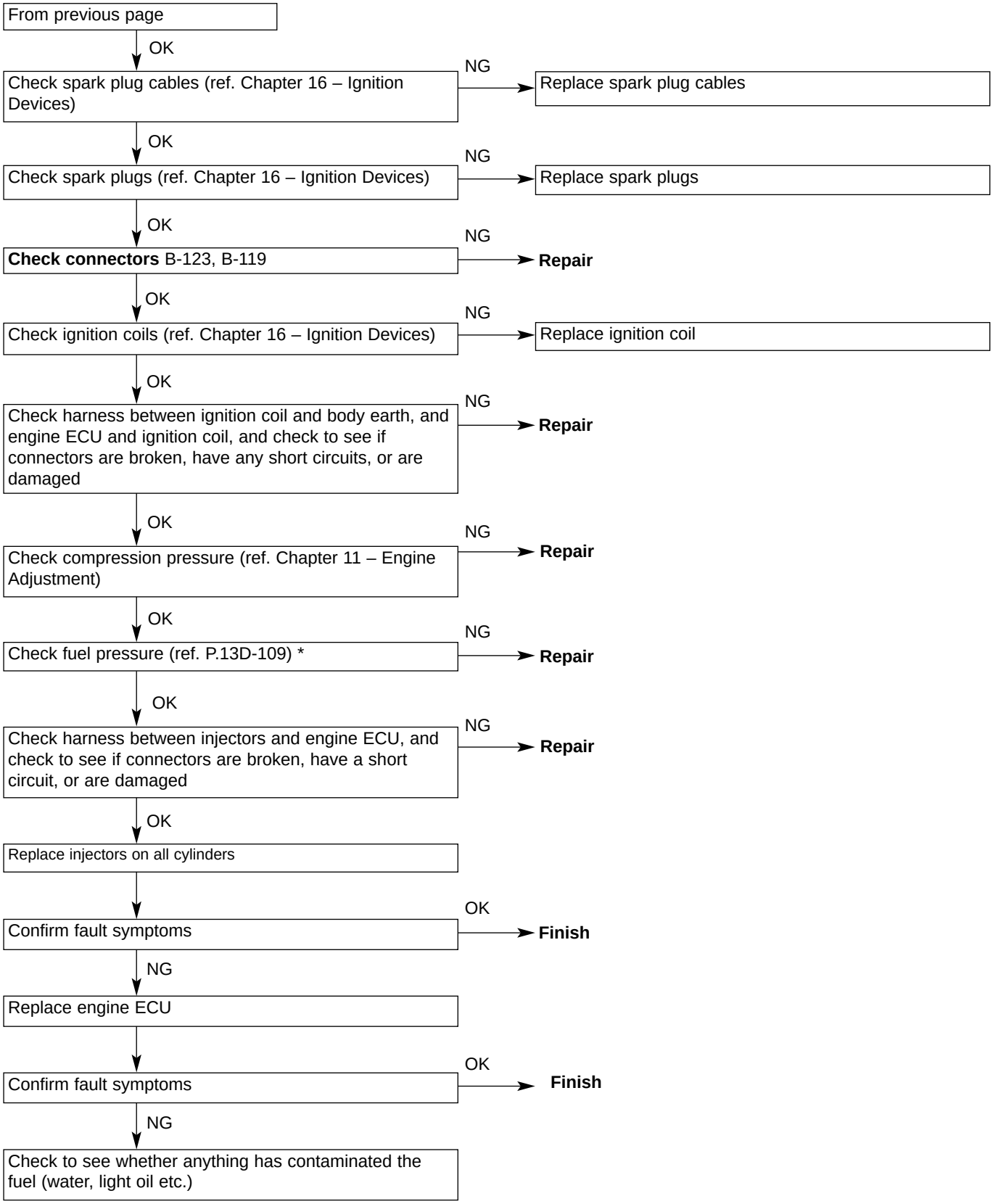



From previous page
OK
Check spark plug cables (ref. Chapter 16 – Ignition Devices)
NG
Replace spark plug cables
OK
Check spark plugs (ref. Chapter 16 – Ignition Devices)
NG
Replace spark plugs
OK
Check ignition coils (ref. Chapter 16 – Ignition Devices)
NG
Replace ignition coil
OK
Check harness between ignition switch and ignition coil for each cylinder, and check for damage to power supply cables
NG
Repair
OK
Confirm fault symptoms
OK
Finish
NG
Replace engine ECU
Confirm fault symptoms
OK
Finish
NG
Check to see whether anything has contaminated the fuel (water, light oil etc.)

Checking Procedure 7

Starting not possible (there is initial firing, but not full firing), start malfunction (starting takes a long time)	**Probable causes**
The probable causes are noted right.	• Battery malfunction • Ignition system malfunction • Fuel system malfunction • Air intake system malfunction • Timing belt malfunction • Compression pressure poor • Engine ECU malfunction

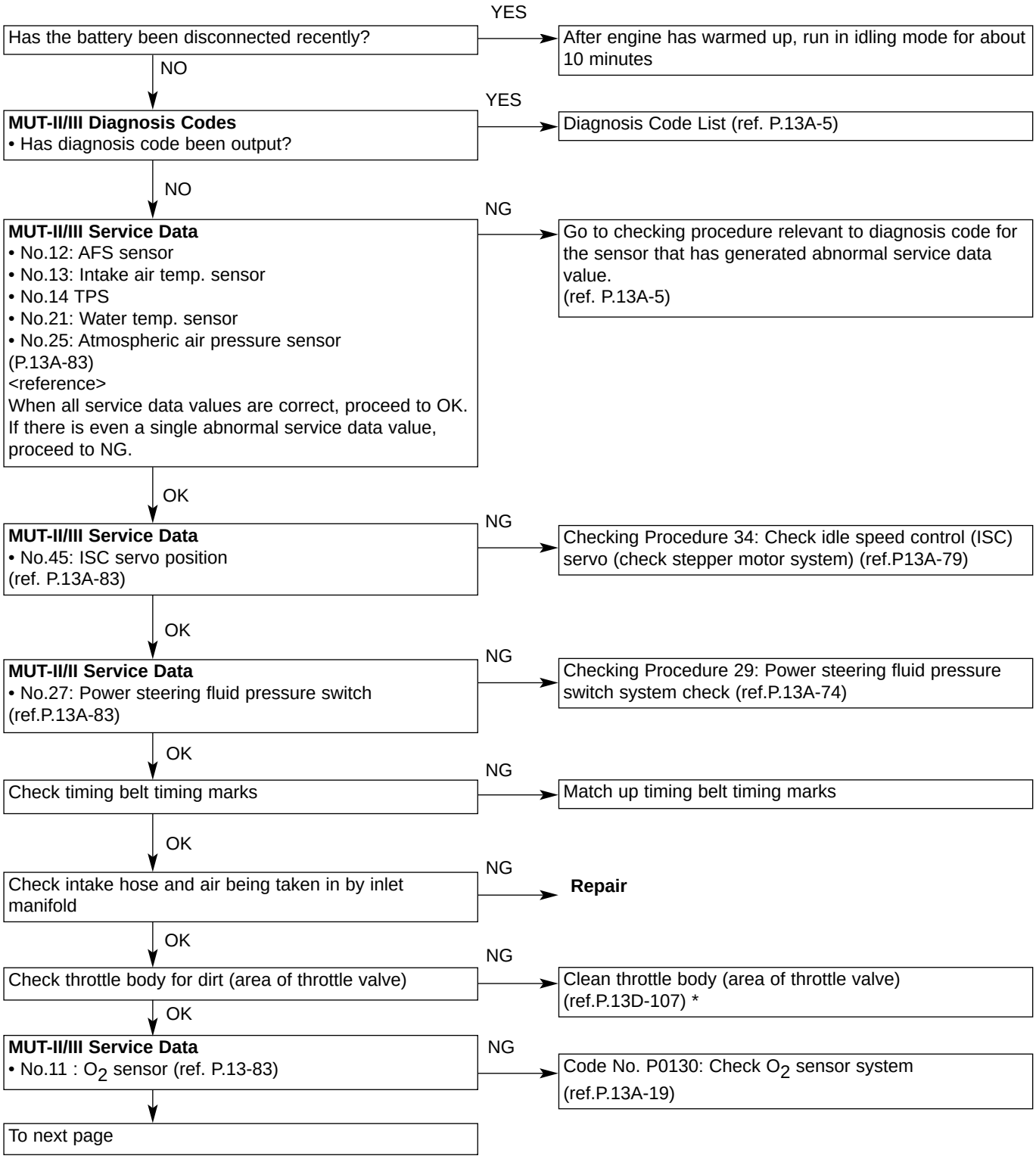




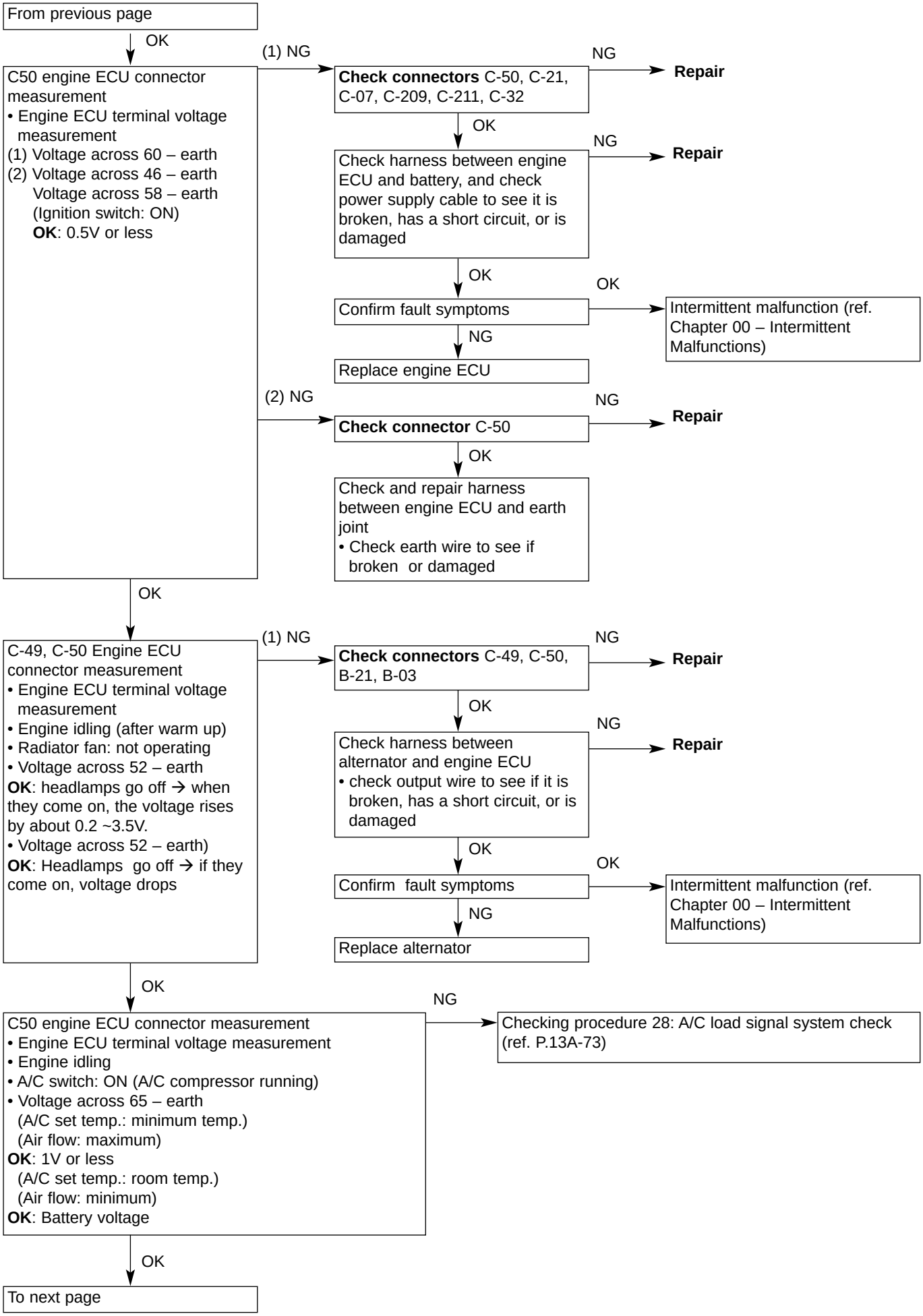
* Refer to '01–1 Lancer Evolution VII Workshop Manual (No.1036K02)

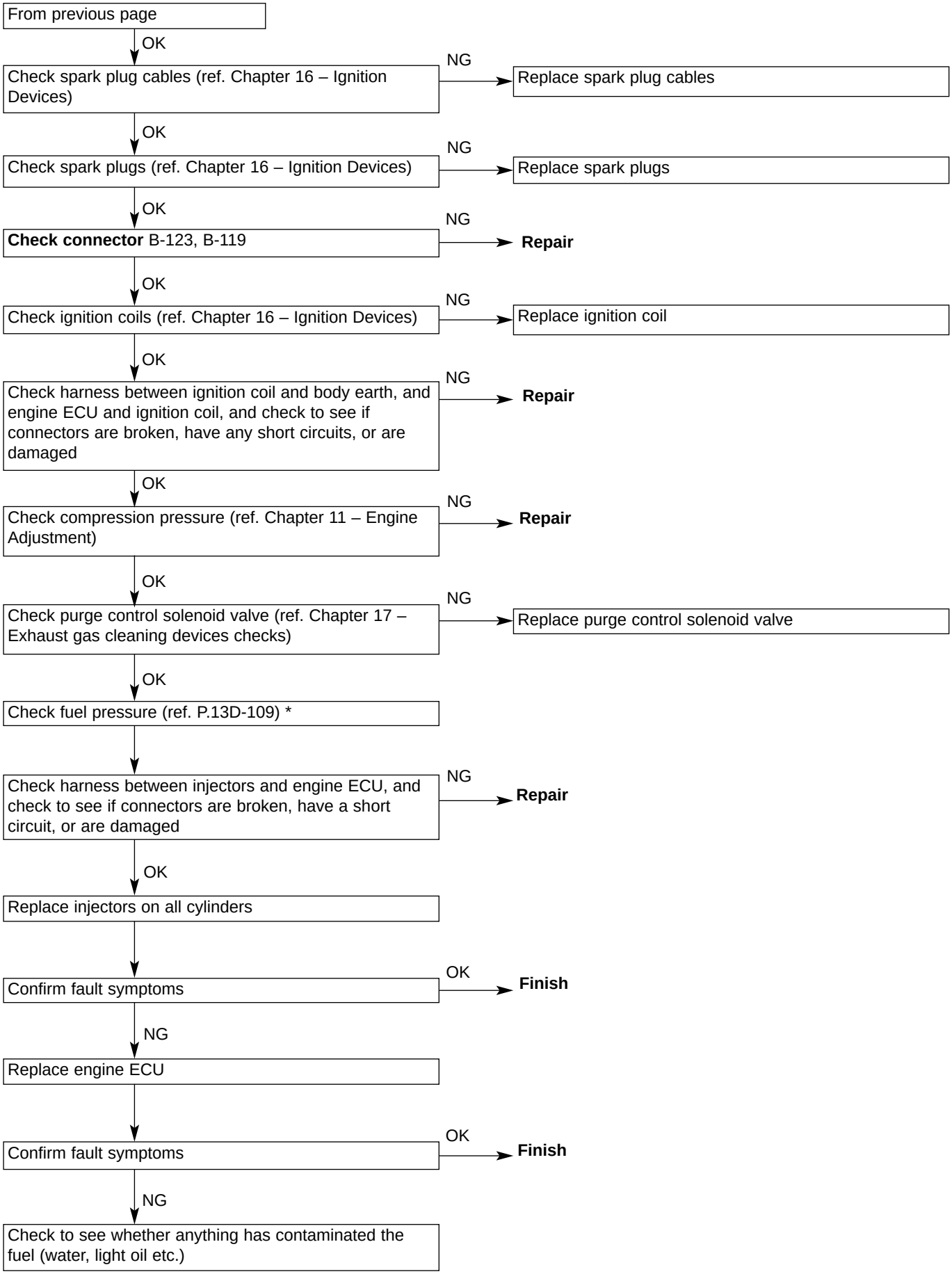
Checking Procedure 8

Irregular idling (rough idling, hunting), incorrect idling speed (high or low idling speed), engine stalls when idling (dies out)	**Probable causes**
The probable causes are noted right.	• ISC control system malfunction • Air fuel control system malfunction • Ignition system malfunction • Fuel system malfunction • Exhaust system malfunction • Exhaust gas cleaning system malfunction • Throttle valve malfunction • Timing belt malfunction • Compression pressure malfunction • Engine ECU malfunction



* Refer to '01–1 Lancer Evolution VII Workshop Manual (No.1036K02)

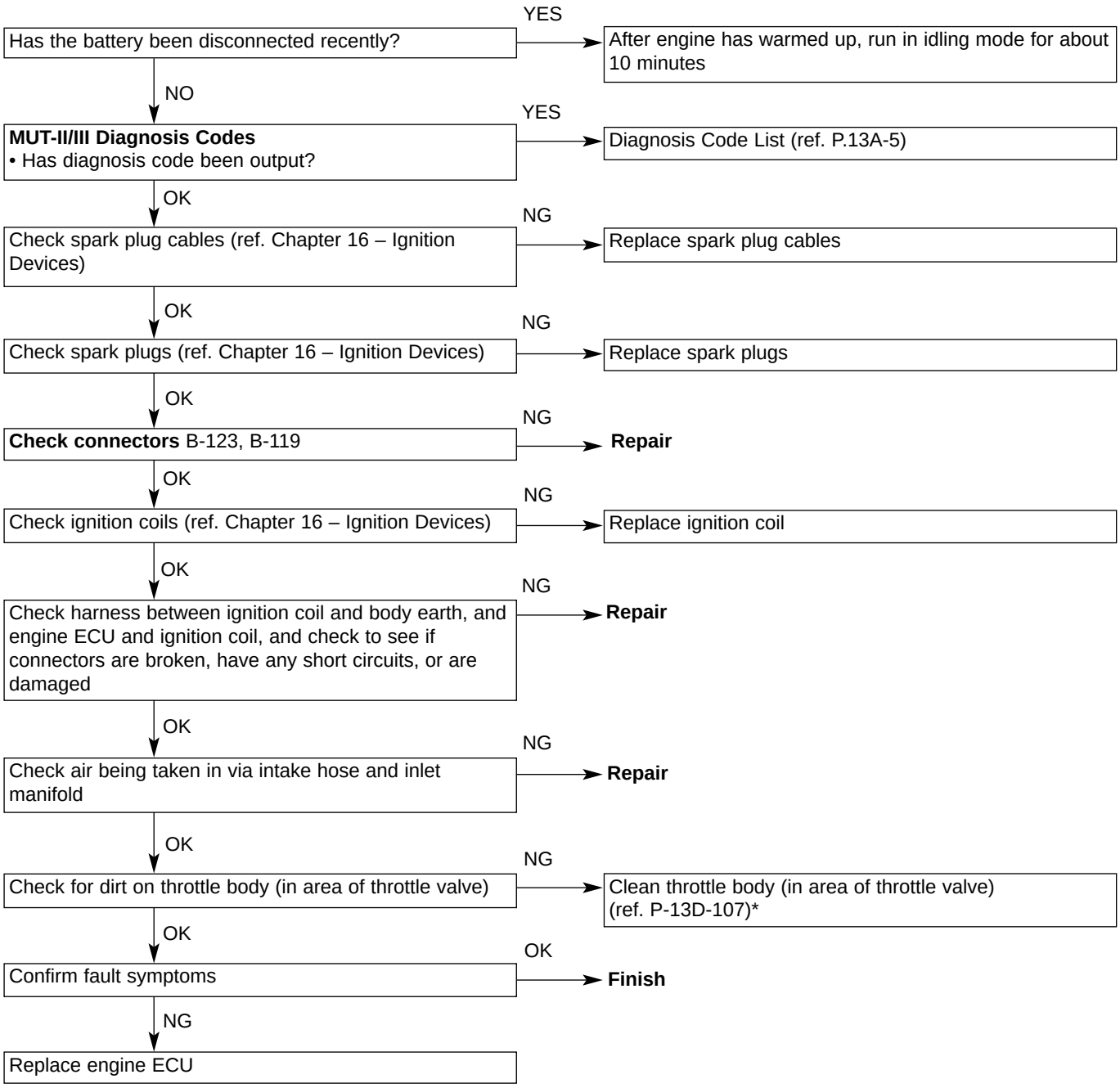

From previous page
OK
C50 engine ECU connector measurement
• Engine ECU terminal voltage measurement
(1) Voltage across 60 – earth
(2) Voltage across 46 – earth
Voltage across 58 – earth
(Ignition switch: ON)
OK: 0.5V or less
(1) NG
Check connectors C-50, C-21, C-07, C-209, C-211, C-32
NG
Repair
OK
Check harness between engine ECU and battery, and check power supply cable to see it is broken, has a short circuit, or is damaged
NG
Repair
OK
Confirm fault symptoms
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace engine ECU
(2) NG
Check connector C-50
NG
Repair
OK
Check and repair harness between engine ECU and earth joint
• Check earth wire to see if broken or damaged
OK
C-49, C-50 Engine ECU connector measurement
• Engine ECU terminal voltage measurement
• Engine idling (after warm up)
• Radiator fan: not operating
• Voltage across 52 – earth
OK: headlamps go off → when they come on, the voltage rises by about 0.2 ~3.5V.
• Voltage across 52 – earth)
OK: Headlamps go off → if they come on, voltage drops
(1) NG
Check connectors C-49, C-50, B-21, B-03
NG
Repair
OK
Check harness between alternator and engine ECU
• check output wire to see if it is broken, has a short circuit, or is damaged
NG
Repair
OK
Confirm fault symptoms
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace alternator
OK
C50 engine ECU connector measurement
• Engine ECU terminal voltage measurement
• Engine idling
• A/C switch: ON (A/C compressor running)
• Voltage across 65 – earth
(A/C set temp.: minimum temp.)
(Air flow: maximum)
OK: 1V or less
(A/C set temp.: room temp.)
(Air flow: minimum)
OK: Battery voltage
NG
Checking procedure 28: A/C load signal system check (ref. P.13A-73)
OK
To next page



* Refer to '01–1 Lancer Evolution VII Workshop Manual (No.1036K02)

Checking Procedure 9

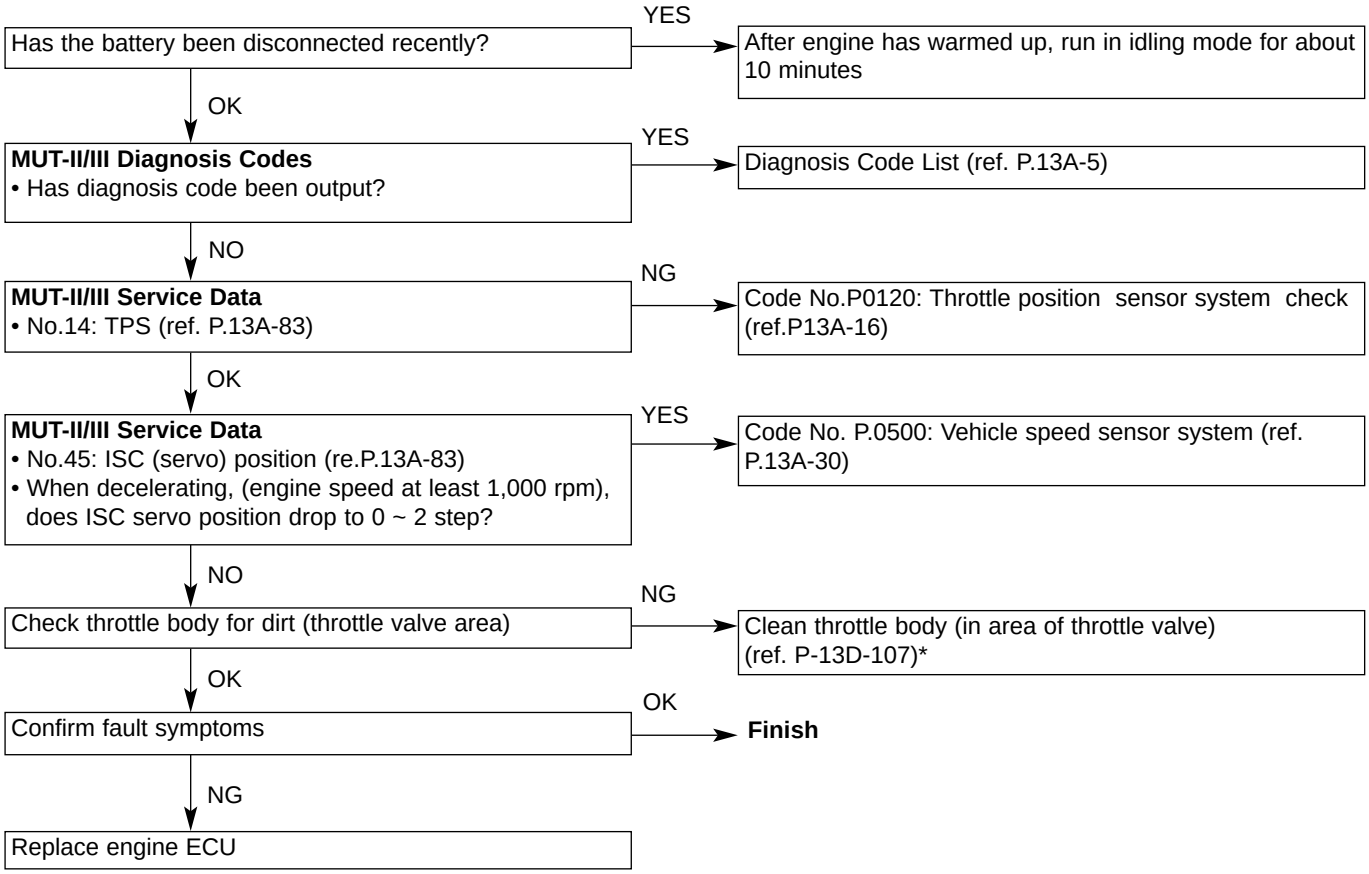
Engine stalling when pulling away from standing (pass out)	Probable causes
The probable causes are noted right.	• Ignition system malfunction • Air intake system malfunction • Exhaust gas cleaning system malfunction • Throttle body malfunction • Engine ECU malfunction



* Refer to '01–1 Lancer Evolution VII Workshop Manual (No.1036K02)

Checking Procedure 10

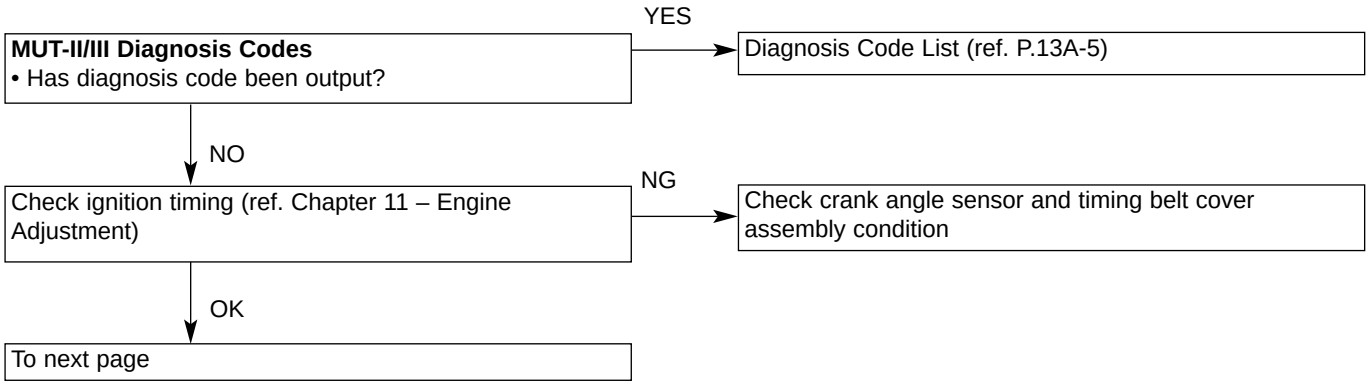
Engine stalling during deceleration	Probable causes
The probable causes are noted right.	• ISC control system malfunction • Exhaust gas cleaning system malfunction • Throttle valve malfunction • Engine ECU malfunction



* Refer to '01–1 Lancer Evolution VII Workshop Manual (No.1036K02)

Checking Procedure 11

Pulsating/Discontinuous Combustion (hesitation, sag), Poor Acceleration, Stumble, Surge	Probable causes
The probable causes are noted right.	• Air fuel ratio control system malfunction • Ignition system malfunction • Fuel system malfunction • Intake/Exhaust system malfunction • Exhaust gas cleaning system malfunction • Compression pressure poor • Turbocharger system malfunction



From previous page

OK

Check injector operating noise (Use sound scope)

NG → Abnormal cylinder code No.P0201 ~ P0204: Check injector system

OK

MUT-II/III Service Data
• No.13: Intake air temp. sensor
• No.14: TPS
• No.21: Water temp. sensor
(ref. P.13A-83)
<reference>
When all service data values are correct, proceed to OK
If there is even a single abnormal service data value, proceed to NG.

NG → Go to checking procedure relevant to diagnosis code for the sensor that has generated abnormal service data value.(ref. P.13A-5)

OK

Check purge control solenoid valve (ref. Chapter 17 –Exhaust Gas Cleaning Device Checks)

NG → Replace purge control solenoid valve

OK

MUT-II/III Service Data
• No.11: O_2 sensor (ref. P.13A-83)

NG → Code No. P0130: Check O_2 sensor system (P.13A-19)

OK

Check spark plug cables (ref. Chapter 16 – Ignition Devices)

→ Replace spark plug cables

OK

Check spark plugs (ref. Chapter 16 – Ignition Devices)

NG → Replace spark plugs

OK

Check connectors B-123, B-119

NG → **Repair**

OK

Check ignition coils (ref. Chapter 16 – Ignition Devices)

NG → Replace ignition coil

OK

Check harness between ignition coil and body earth, and engine ECU and ignition coil, and check to see if connectors are broken, have any short circuits, or are damaged

NG → **Repair**

OK

MUT-II/III Actuator Test
• No.12: Waste gate solenoid valve
(P.13A-83)

NG → Checking Procedure 33: Check waste gate solenoid valve system (P.13A-78)

OK

To next page

From previous page
↓ OK
Check turbocharger pressure (ref. Chapter 15 – Intake Exhaust and Vehicle Servicing) → NG → **Repair**
↓ OK
Check turbocharging pressure control system (ref. Chapter 15 – Intake Exhaust and Vehicle Servicing) → NG → **Repair**
↓ OK
MUT-II/III Actuator Test
No. 09: Fuel pressure control solenoid valve (P.13A-87) → Checking procedure 31: Fuel pressure control solenoid valve system (ref. P.13A-76)
↓ OK
Check fuel pressure (P.13D-109) * → NG → **Repair**
↓ OK
Confirm fault symptoms → OK → **Finish**
↓ NG
Check compression pressure (ref. Chapter 11 – Engine Adjustment) → NG → **Repair**
↓ OK
Confirm fault symptoms → OK → **Finish**
↓ NG
Check and repair broken intake hose or inlet manifold, and air intake

* Refer to '01–1 Lancer Evolution VII Workshop Manual (No.1036K02)

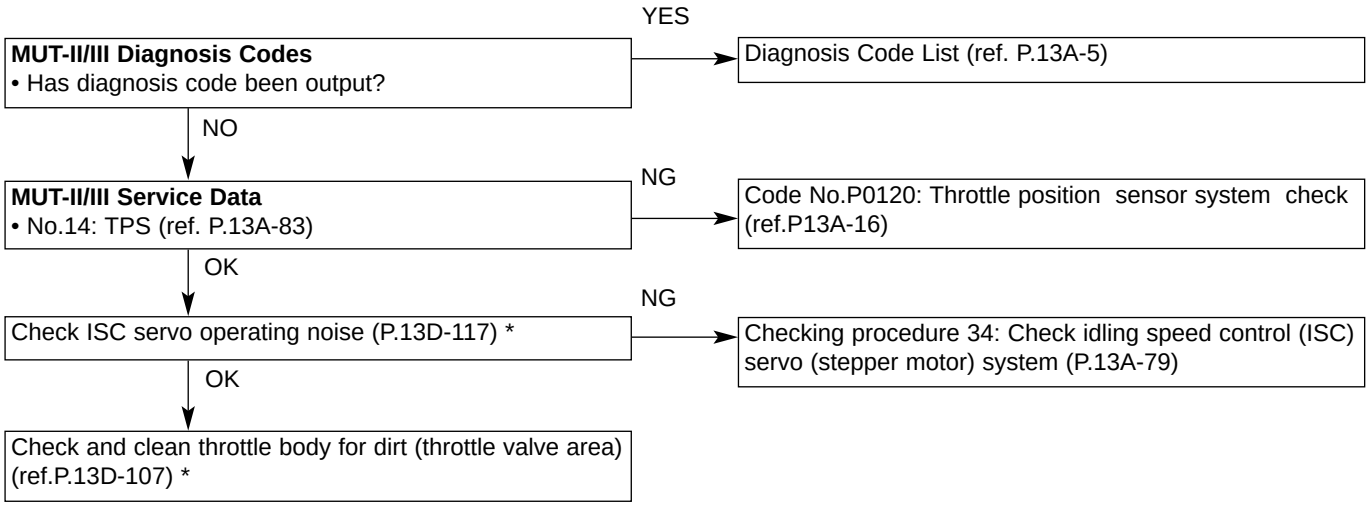
Checking Procedure 12

Acceleration Shock	**Probable causes**
The reason is likely to be ignition leak associated with an increase in spark plug demand voltage during acceleration.	• Ignition system malfunction.

MUT-II/III Diagnosis Codes
• Has diagnosis code been output? → YES → Diagnosis Code List (ref. P.13A-5)
↓ NO
Check spark plug cables (ref. Chapter 16 – Ignition Devices) → NG → Replace spark plug cables
↓ OK
Check spark plugs (ref. Chapter 16 – Ignition Devices) → NG → Replace spark plugs
↓ OK
Check connectors B-123, B-119 → NG → **Repair**
↓ OK
Check ignition coil component (ref. Chapter 16 – Ignition Devices) → NG → Replace ignition coil
↓ OK
Check harness between ignition coil and body earth, and engine ECU and ignition coil, and check to see if connectors are broken, have any short circuits, or are damaged

Checking Procedure 13

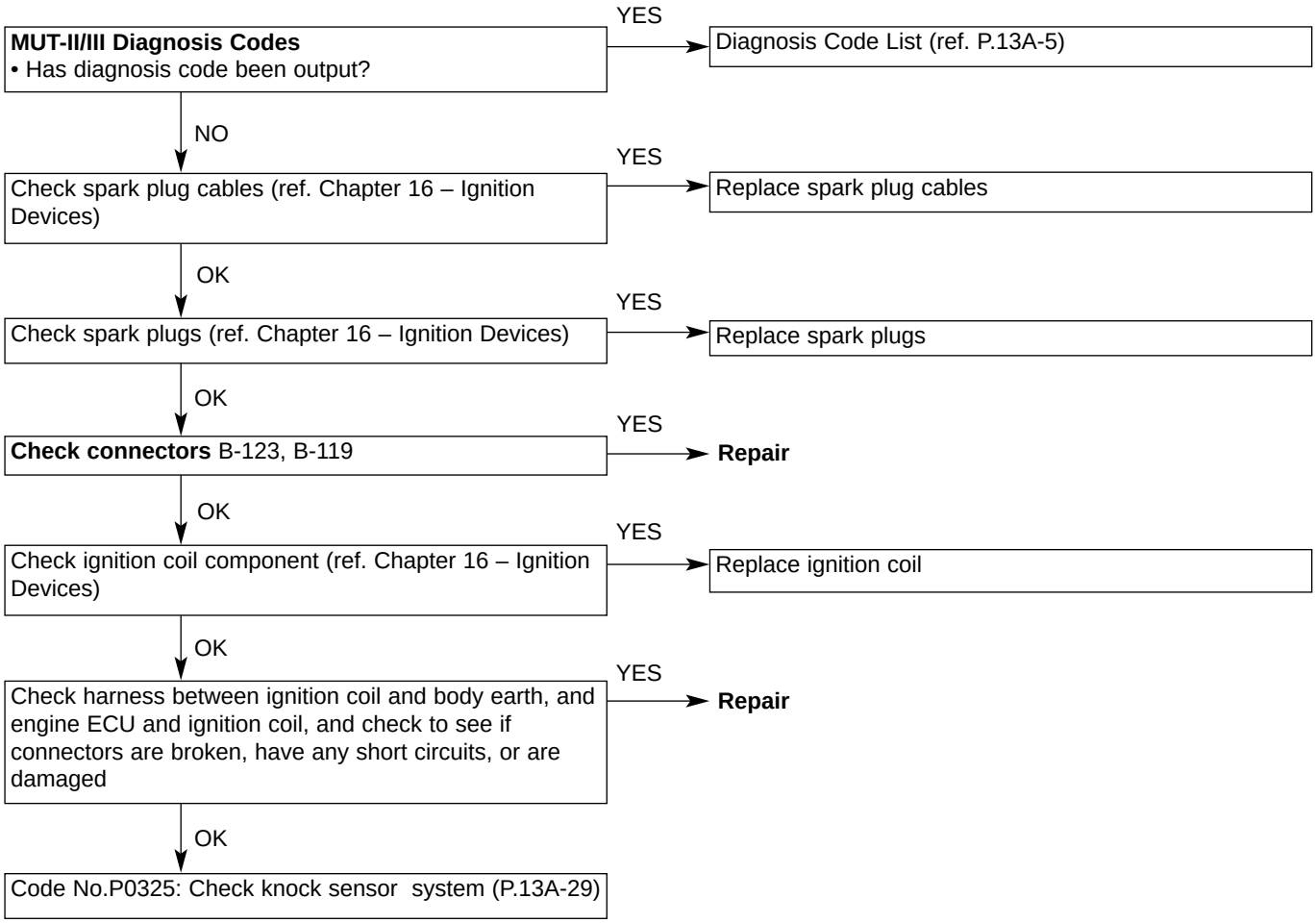
Acceleration Shock	Probable causes
ISC malfunction is a likely cause.	• ISC control system malfunction



* Refer to '01–1 Lancer Evolution VII Workshop Manual (No.1036K02)

Checking Procedure 14

Knocking	Probable causes
The probable causes are noted right.	• Knock sensor malfunction • Knock control system malfunction • Spark plug malfunction • Ignition system malfunction • Engine ECU malfunction



Checking Procedure 15

Ignition timing delay	Probable causes
The probable causes are noted right.	• Crank angle sensor malfunction • Cam position sensor malfunction • Timing belt malfunction • Engine ECU malfunction

MUT-II/III Diagnosis Codes
• Has diagnosis code been output?
YES → Diagnosis Code List (ref. P.13A-5)

NO ↓

Crank angle sensor and can position sensor output waveform measurement
(using an oscilloscope)
• Engine idling
<crank angle sensor>
• B-122 Crank angle sensor connector output waveform measurement
• Using test harness (MD998478), connect connector, then take measurement at pick up harness
• Voltage between 2 – earth
<Cam position sensor>
• B-115 Cam position sensor connector output waveform measurement
• Using test harness (MD991709), connect connector, then take measurement at pick up harness
• Voltage between 2 – earth
OK: Both output waveforms should be as explained in P.13A-92 (Instructions for checks done using oscilloscope)

OK → Confirm fault symptoms
OK → Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG → Replace engine ECU

NG ↓

Confirm crank angle sensor and cam position sensor mounting conditions
NG → **Repair**

OK ↓

Check timing belt timing marks
NG → Match up timing belt timing marks

OK ↓

Check crank angle sensor vanes
NG → Replace crank angle sensor vanes

OK ↓

Check cam position sensing cylinder
NG → Replace cam position sensing cylinder

OK ↓

Replace crank angle sensor

Confirm fault symptoms
OK → **Finish**

NG ↓

Replace cam position sensor

Confirm fault symptoms
OK → Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)

NG ↓

Replace engine ECU

Checking Procedure 16

Dieseling/pinking (run-on)	Probable causes
The probable causes are noted right.	• Injector malfunction • Engine ECU malfunction

Replace injectors on all cylinders
↓
Confirm fault symptoms → OK → **Finish**
↓ NG
Replace engine ECU

Checking Procedure 17

Smelly, white smoke, black smoke CO and HC densities are high when idling	Probable causes
The probable causes are noted right.	• Fuel air ratio control system malfunction • Ignition system malfunction • Fuel system malfunction • Intake/Exhaust system malfunction • Exhaust gas cleaning device system malfunction • Compression pressure NG • Catalyst malfunction • Engine ECU malfunction

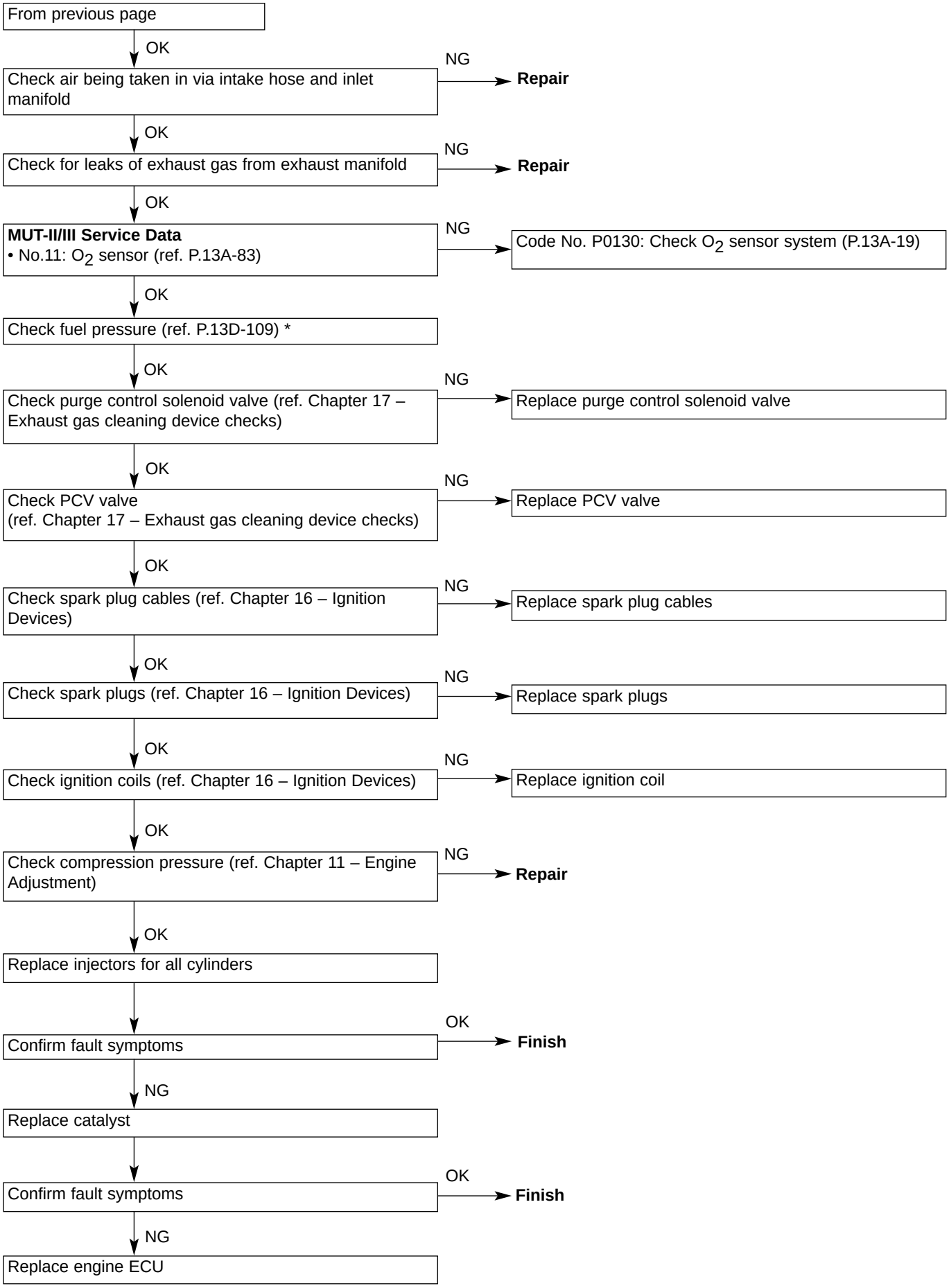
MUT-II/III Diagnosis Codes
• Has diagnosis code been output?
→ YES → Diagnosis Code List (ref. P.13A-5)
↓ NO

MUT-II/III Actuator Test
• No.01: No.1 injector
• No.02: No.2 injector
• No.03: No.3 injector
• No.04: No.4 injector
OK Idling condition changes
• In cases where, even when injectors stop, cylinder idling condition not changing (NG cylinders) is observed, proceed to NG
• In cases where all cylinders are OK, or no NG cylinders can be observed, proceed to OK
→ NG → Code No.P0201: Check No.1 injector, P202: No.2 injector, P0203: No.3 injector, P.204: No.4 injector systems (ref.P13A-24, 25, 26, 27)
↓ OK

Check ignition timing (ref. Chapter 11, Engine Adjustment)
→ NG → Checking procedure 15 : Check to see if ignition timing is out (P.13A-54)
↓ OK

MUT-II/III Service Data
• No.12: AFS sensor
• No.13: Intake air temp. sensor
• No.21: Water temp. sensor
• No.25 Atmospheric air pressure sensor
(ref. P.13A-83)
<reference>
When all service data values are correct, proceed to OK
If there is even a single abnormal service data value, proceed to NG.
→ NG → Go to checking procedure relevant to diagnosis code for the sensor that has generated abnormal service data value. (ref. P.13A-5)
↓ OK

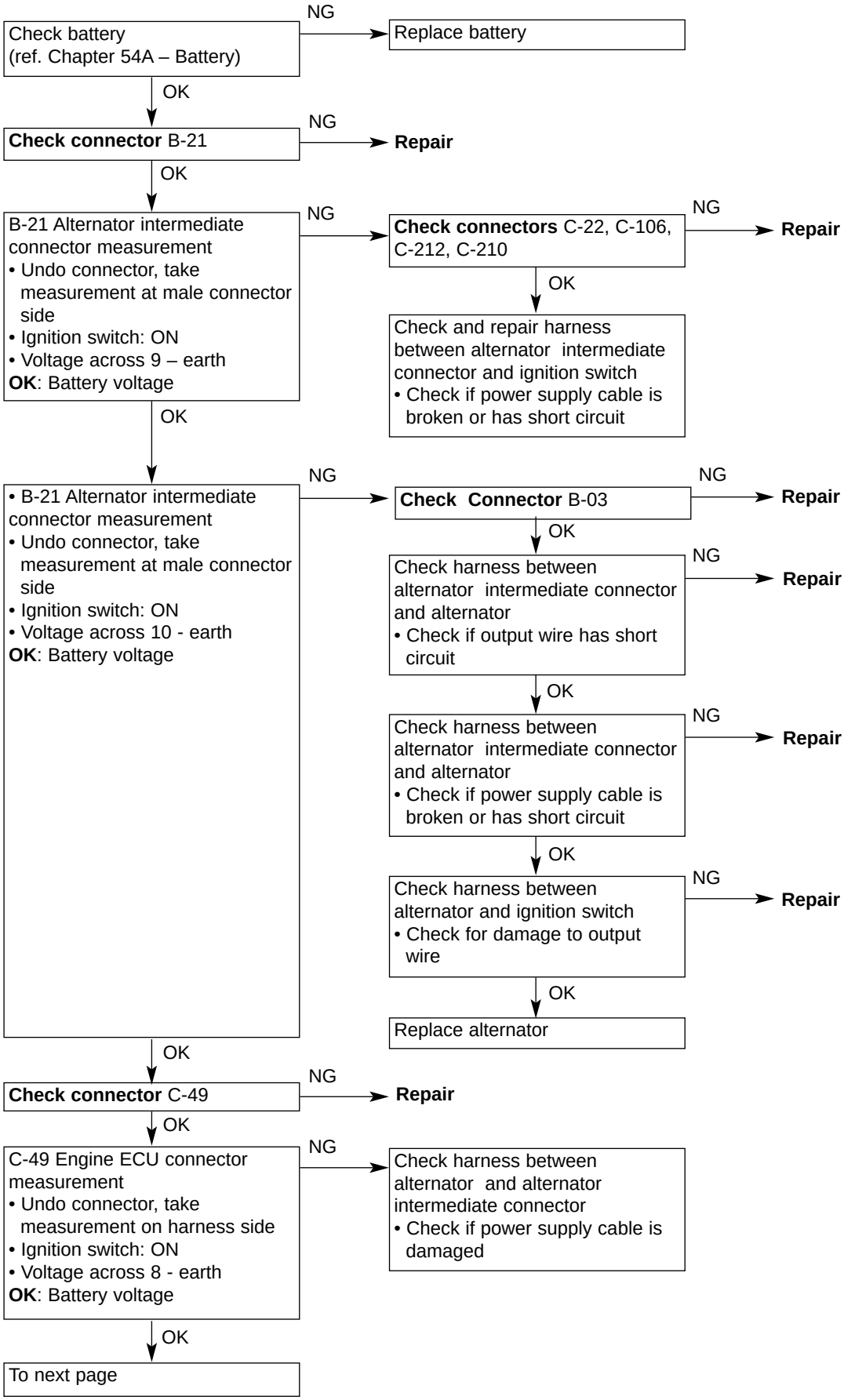
To next page



* Refer to '01–1 Lancer Evolution VII Workshop Manual (No.1036K02)

Checking Procedure 18

Flat Battery	Probable causes
The probable causes are noted right.	• Battery malfunction • G terminal shorting • Alternator malfunction • Engine ECU malfunction



From previous page

↓ OK

C-49 Engine ECU connector measurements
• Measure engine ECU terminal voltage
• Engine idling (after warm up)
• Radiator fan: not operating
• Voltage across 8 – earth
OK: Voltage increases 0.2 ~ 3.5V when headlamps go from OFF → ON

NG → Check battery charging device (ref. Chapter 16 Battery Charging Devices)

↓ OK

Confirm fault symptoms

OK → Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)

↓ NG

Replace engine ECU

Checking Procedure 19

Overheating	**Probable causes**
The probable causes are noted right.	• Engine cooling water insufficient or deteriorated • Fan controller malfunction • Water temp. sensor malfunction • Thermostat malfunction • Water pump malfunction • Condenser fan relay malfunction • Radiator core malfunction • Engine ECU malfunction

MUT-II/III Diagnosis Codes
• Has diagnosis code been output?

YES → Diagnosis Code List (ref. P.13A-5)

↓ NO

Check engine cooling water
(ref. Chapter 14 Vehicle Servicing)
<Remarks>
When there is a significant decrease in engine cooling water, check to see if water is leaking from anywhere and, if necessary, repair

NG → Change or add engine cooling water.

↓ OK

MUT-II/III Actuator Test
• No.21: Fan controller
• Ignition switch: ON
OK: Radiator fan operating

NG → Checking procedure 24: Radiator fan control relay system check (P.13A-65)

↓ OK

MUT-II/III Actuator Test
• No.37: Condenser fan (HI)
• No.38: Condenser fan (LOW)
Ignition SW: ON
OK: condenser fan operates (low speed)
OK: condenser fan operates (high speed)

NG → Checking procedure 25: Condenser fan control relay system check (ref. P.13A-67)

↓ OK

MUT-II/III Service Data
• No.21: Water temp. sensor
OK: when cold, it is about the same as ambient air temp.
When hot, 80 ~ 120°C

NG → Code no. P0115: water temp. sensor system check (ref.P13A-14)

↓ OK

Thermostat check
(ref. Chapter 14 Thermostat)

NG → Replace thermostat

↓ OK

Check water pump

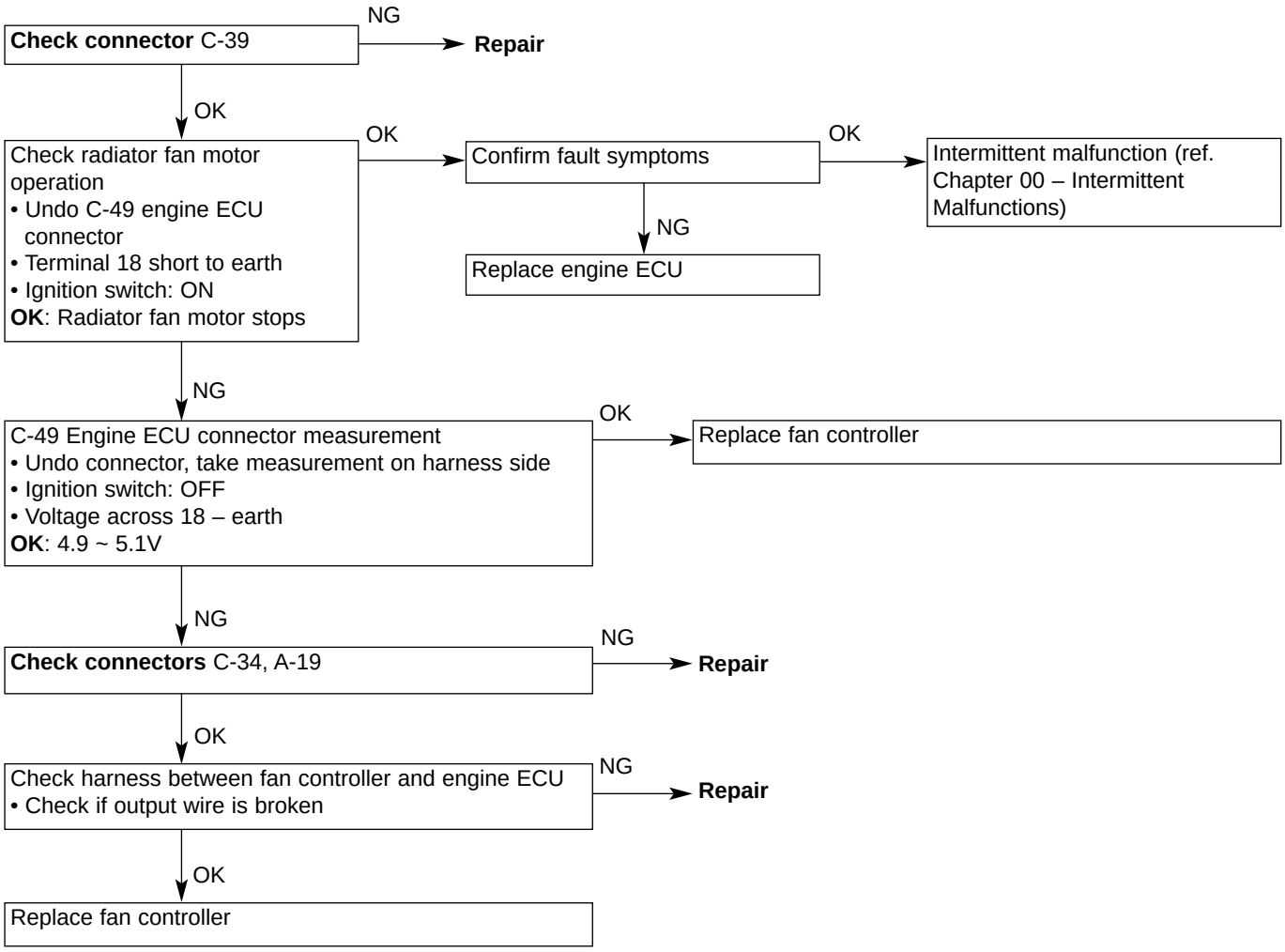
NG → Replace water pump

↓ OK

Replace radiator core

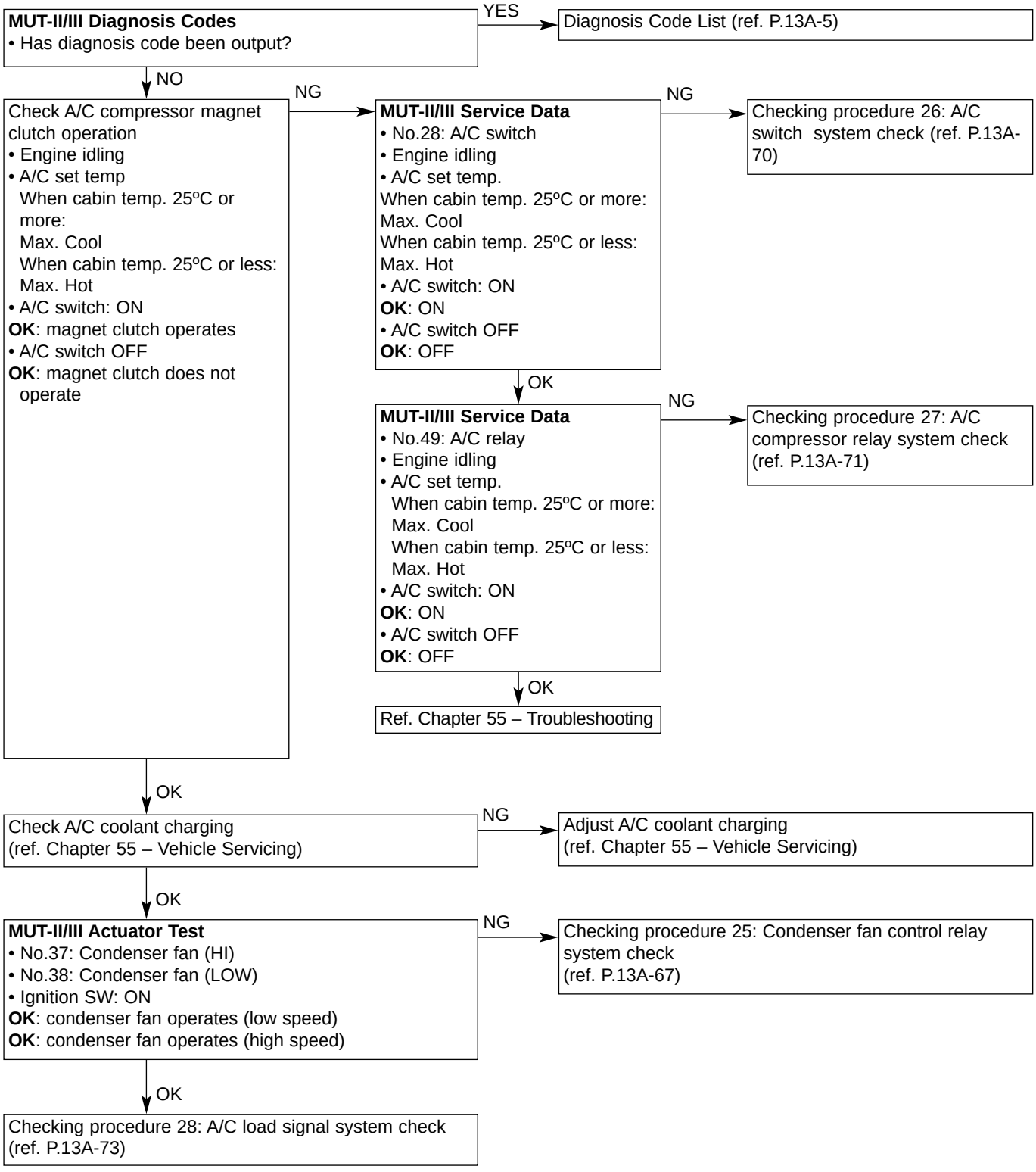
Checking Procedure 20

Radiator Fan Motor Running Abnormally	Probable causes
The probable causes are noted right.	• Fan controller malfunction • Engine ECU malfunction



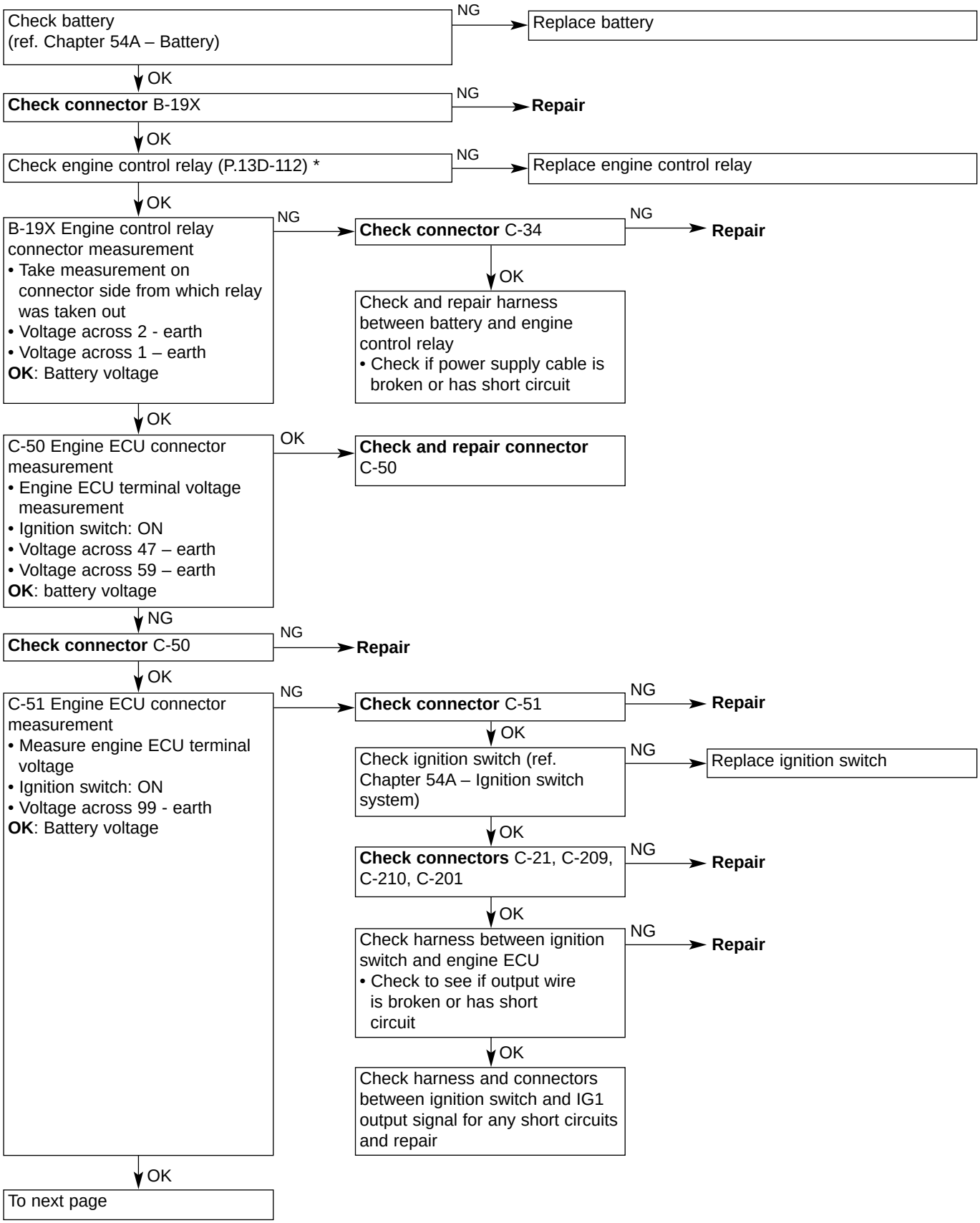
Checking Procedure 21

A/C ineffective	Probable causes
The probable causes are noted right.	• A/C coolant malfunction or overfilled • A/C compressor relay malfunction • Condenser fan system malfunction • A/C-ECU malfunction • Engine ECU malfunction

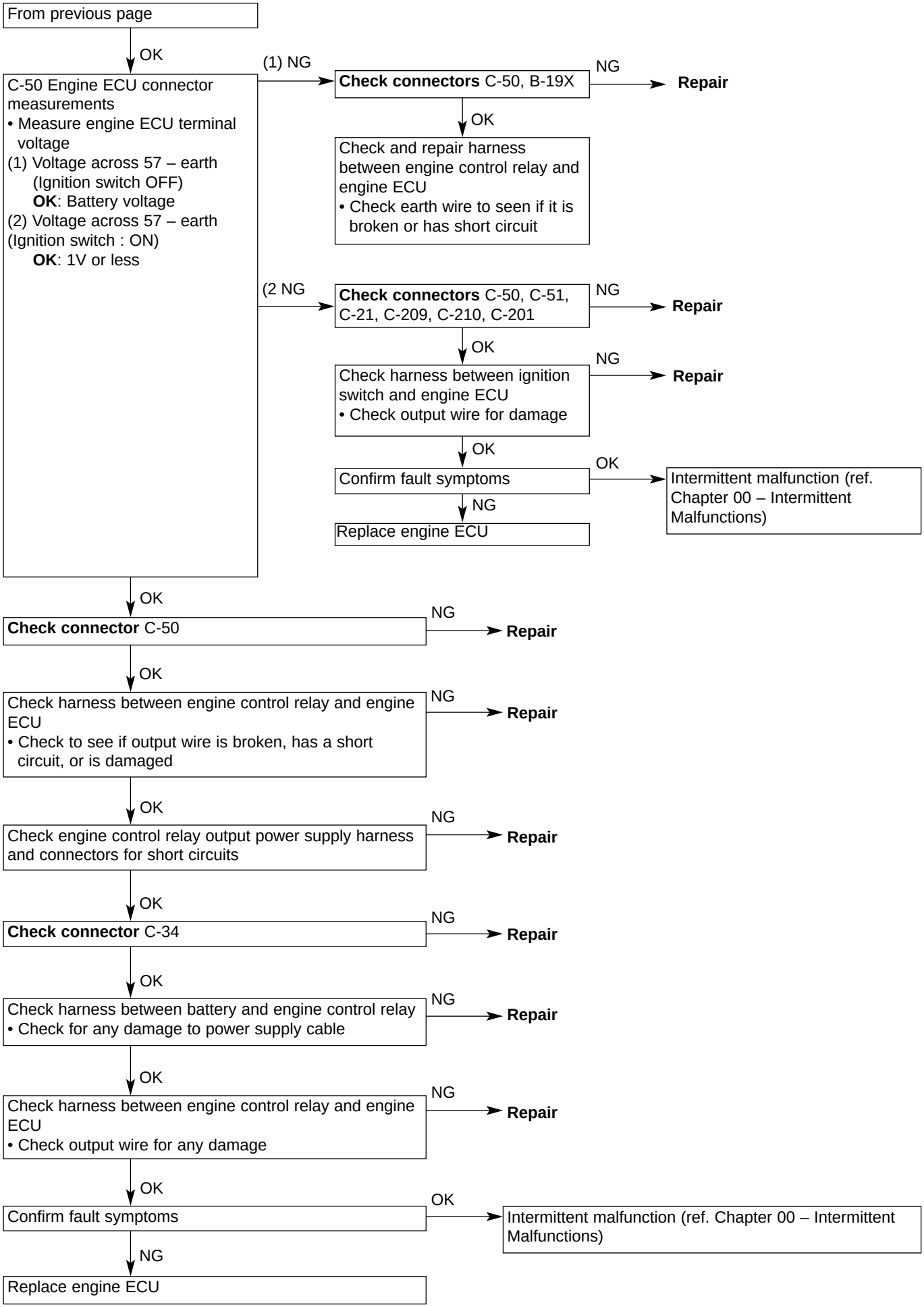


Checking Procedure 22

Engine ECU Power Supply, Engine Control Relay, Ignition Switch IG1 System	**Probable causes**
When ignition switch ON signal is input to ECU, the engine ECU turns engine control relay ON. As a result, a battery voltage is supplied to engine ECU, sensor, and actuator	• Ignition switch malfunction • Engine control relay malfunction • Engine ECU malfunction

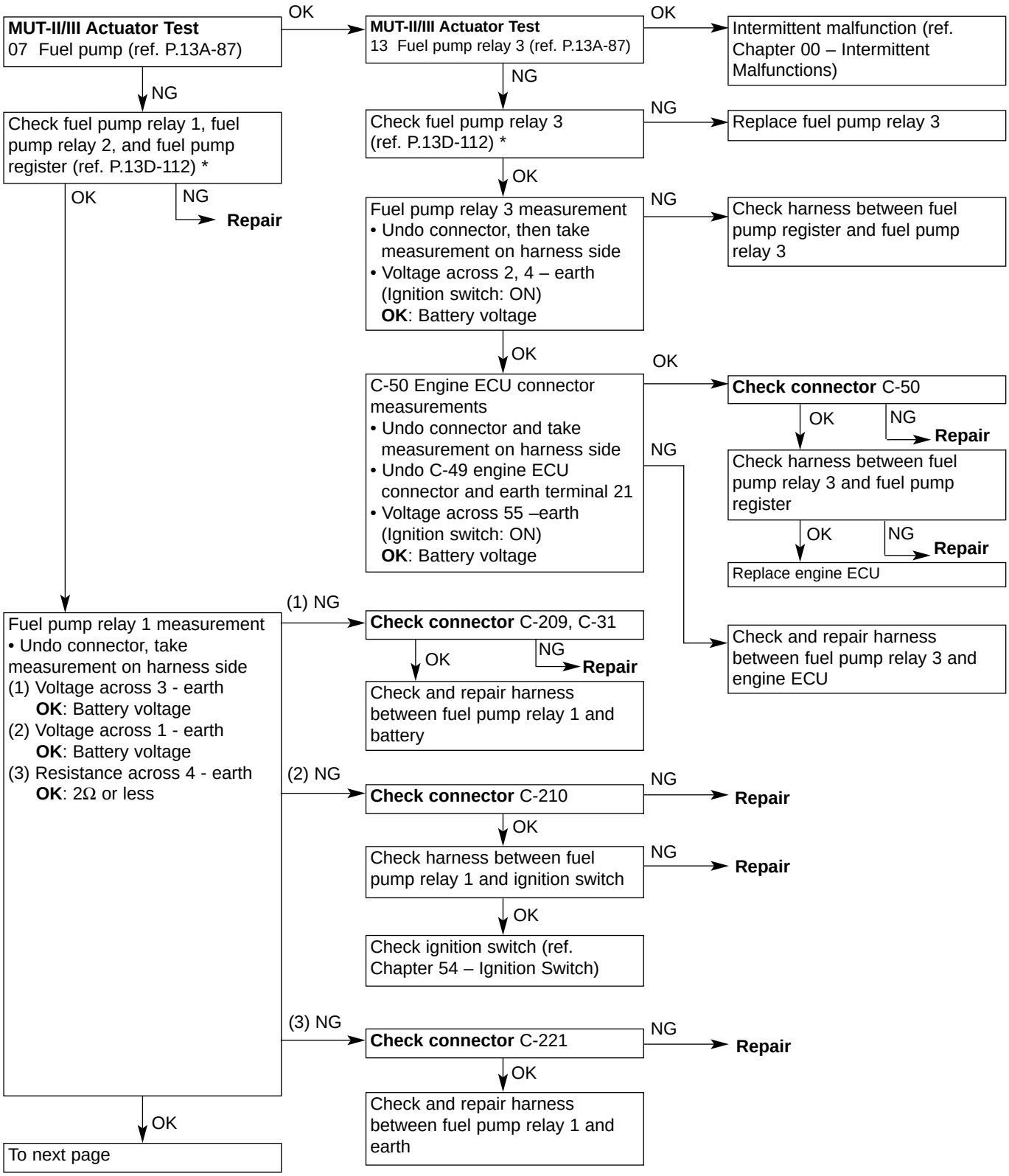


* Refer to '01–1 Lancer Evolution VII Workshop Manual (No.1036K02)

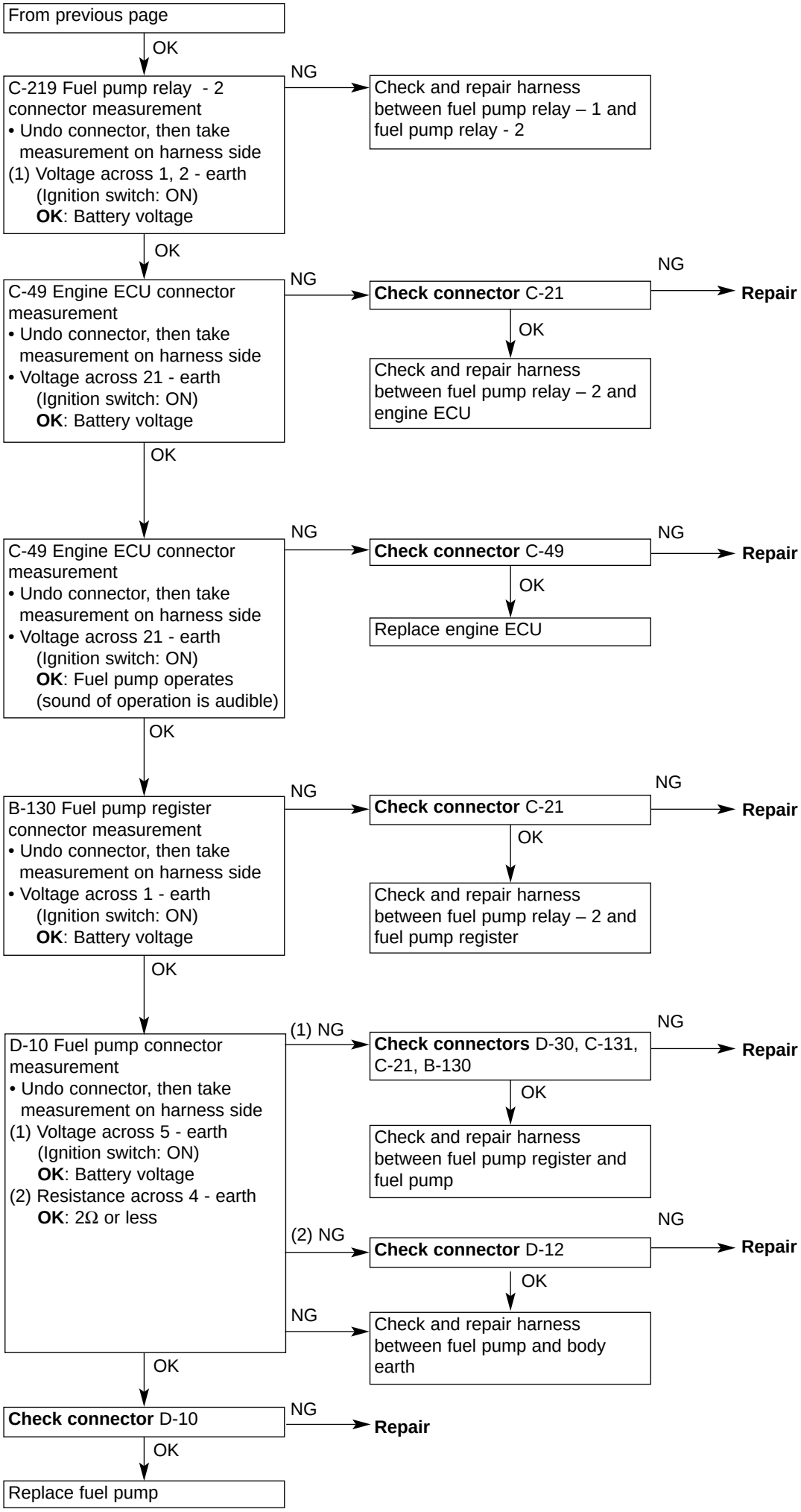

From previous page
OK
C-50 Engine ECU connector measurements
• Measure engine ECU terminal voltage
(1) Voltage across 57 – earth (Ignition switch OFF)
OK: Battery voltage
(2) Voltage across 57 – earth (Ignition switch : ON)
OK: 1V or less
(1) NG
Check connectors C-50, B-19X
NG
Repair
OK
Check and repair harness between engine control relay and engine ECU
• Check earth wire to seen if it is broken or has short circuit
(2 NG
Check connectors C-50, C-51, C-21, C-209, C-210, C-201
NG
Repair
OK
Check harness between ignition switch and engine ECU
• Check output wire for damage
NG
Repair
OK
Confirm fault symptoms
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace engine ECU
OK
Check connector C-50
NG
Repair
OK
Check harness between engine control relay and engine ECU
• Check to see if output wire is broken, has a short circuit, or is damaged
NG
Repair
OK
Check engine control relay output power supply harness and connectors for short circuits
NG
Repair
OK
Check connector C-34
NG
Repair
OK
Check harness between battery and engine control relay
• Check for any damage to power supply cable
NG
Repair
OK
Check harness between engine control relay and engine ECU
• Check output wire for any damage
NG
Repair
OK
Confirm fault symptoms
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace engine ECU

Checking Procedure 23

Fuel Pump System	Probable causes
• During cranking and driving, engine ECU turns fuel pump relay ON, and supplies power driving the fuel pump • When driving with a low load, the engine ECU supplies power, via the register, to the fuel pump. Also, when driving with a heavy load, power is supplied directly, and the quantity of fuel sent from the fuel pump increases	• Fuel pump relay 1 malfunction • Fuel pump relay 2 malfunction • Fuel pump relay 3 malfunction • Fuel pump malfunction • Fuel pump register malfunctions • Fuel pump circuit broken, has short circuit, or poor connector contact • Engine ECU malfunction

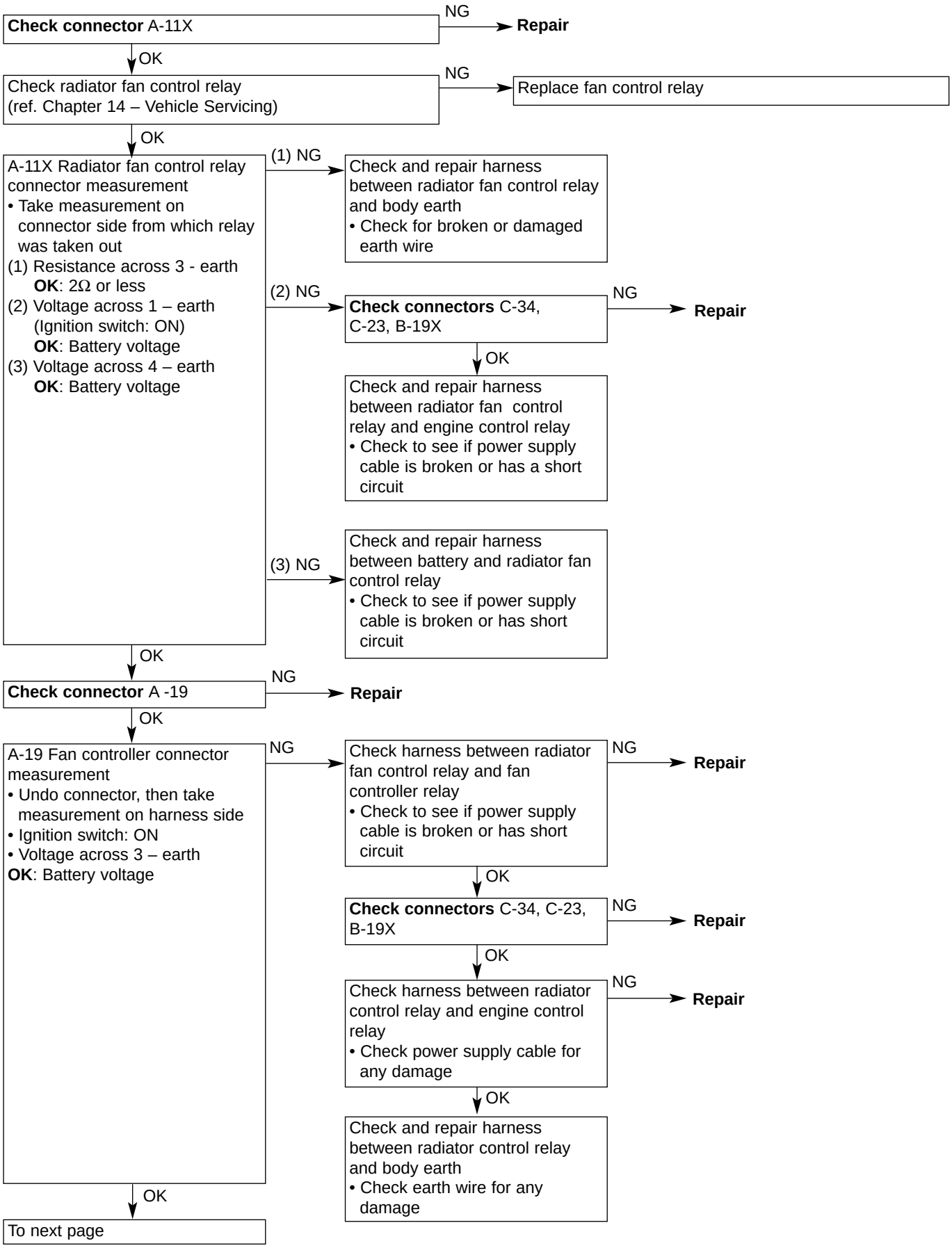


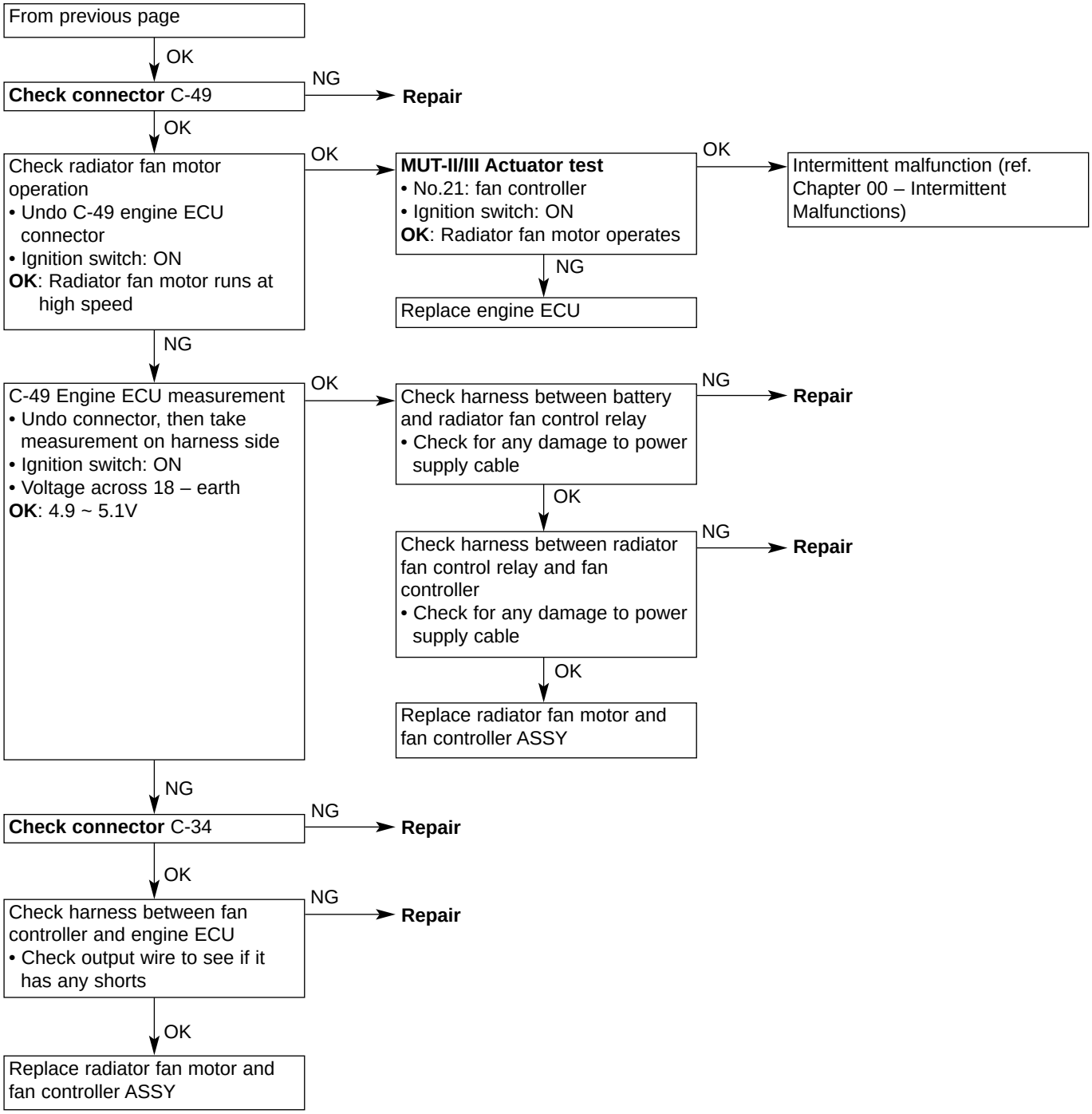
* Refer to '01–1 Lancer Evolution VII Workshop Manual (No.1036K02)


From previous page
OK
C-219 Fuel pump relay - 2 connector measurement
• Undo connector, then take measurement on harness side
(1) Voltage across 1, 2 - earth (Ignition switch: ON)
OK: Battery voltage
NG
Check and repair harness between fuel pump relay – 1 and fuel pump relay - 2
OK
C-49 Engine ECU connector measurement
• Undo connector, then take measurement on harness side
• Voltage across 21 - earth (Ignition switch: ON)
OK: Battery voltage
NG
Check connector C-21
NG
Repair
OK
Check and repair harness between fuel pump relay – 2 and engine ECU
OK
C-49 Engine ECU connector measurement
• Undo connector, then take measurement on harness side
• Voltage across 21 - earth (Ignition switch: ON)
OK: Fuel pump operates (sound of operation is audible)
NG
Check connector C-49
NG
Repair
OK
Replace engine ECU
OK
B-130 Fuel pump register connector measurement
• Undo connector, then take measurement on harness side
• Voltage across 1 - earth (Ignition switch: ON)
OK: Battery voltage
NG
Check connector C-21
NG
Repair
OK
Check and repair harness between fuel pump relay – 2 and fuel pump register
OK
D-10 Fuel pump connector measurement
• Undo connector, then take measurement on harness side
(1) Voltage across 5 - earth (Ignition switch: ON)
OK: Battery voltage
(2) Resistance across 4 - earth
OK: 2Ω or less
(1) NG
Check connectors D-30, C-131, C-21, B-130
NG
Repair
OK
Check and repair harness between fuel pump register and fuel pump
(2) NG
Check connector D-12
NG
Repair
OK
NG
Check and repair harness between fuel pump and body earth
OK
Check connector D-10
NG
Repair
OK
Replace fuel pump

Checking Procedure 24

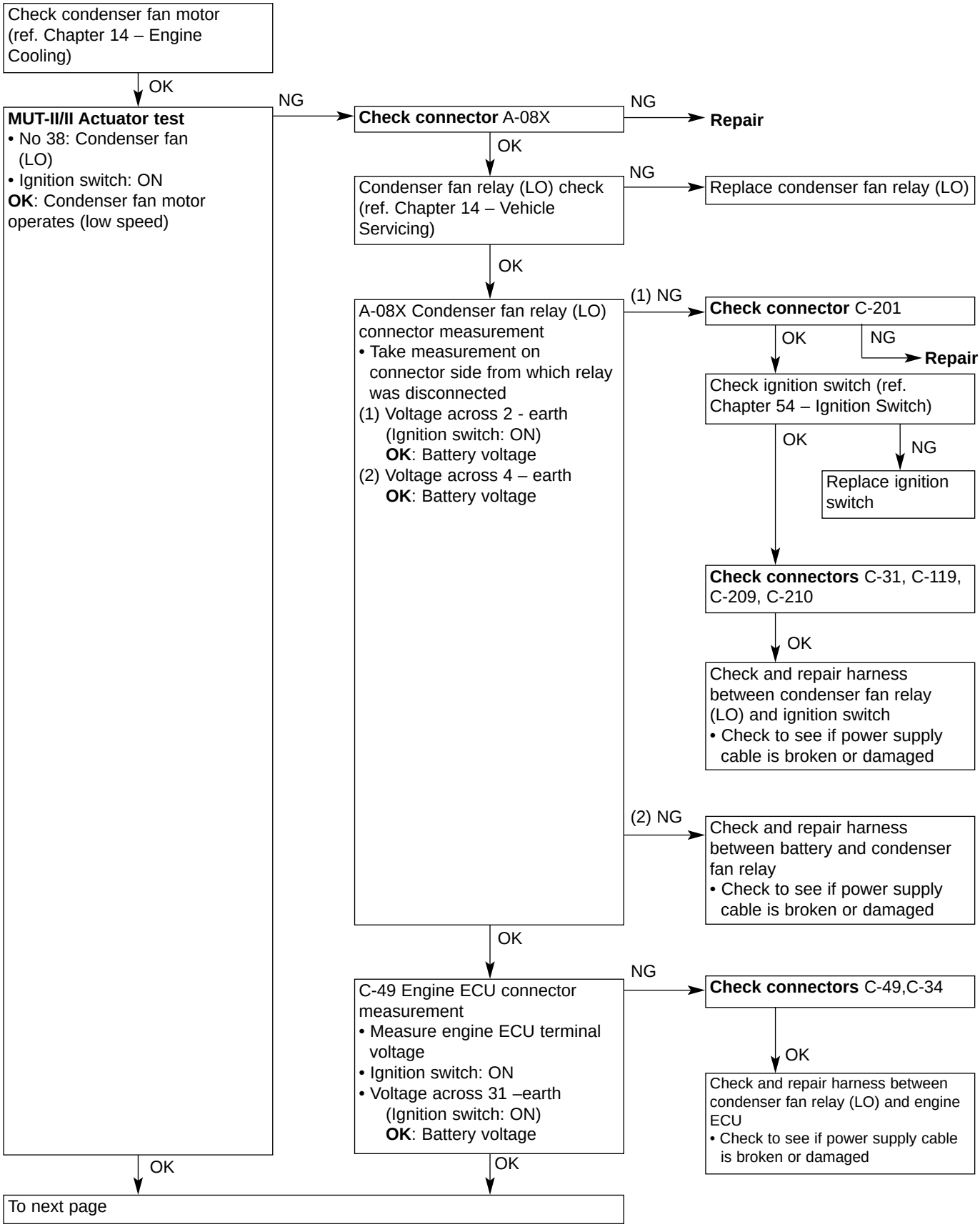
Radiator Fan Control Relay System	Probable causes
When engine control relay is turned ON, the radiator fan control relay switches ON at the same time, supplying power to the fan controller. Also, when fan motor drive signal is input to the fan controller from the ECU, the radiator fan motor operates.	• Radiator fan control relay malfunction • Fan controller malfunction • Radiator fan motor malfunction • Engine ECU malfunction

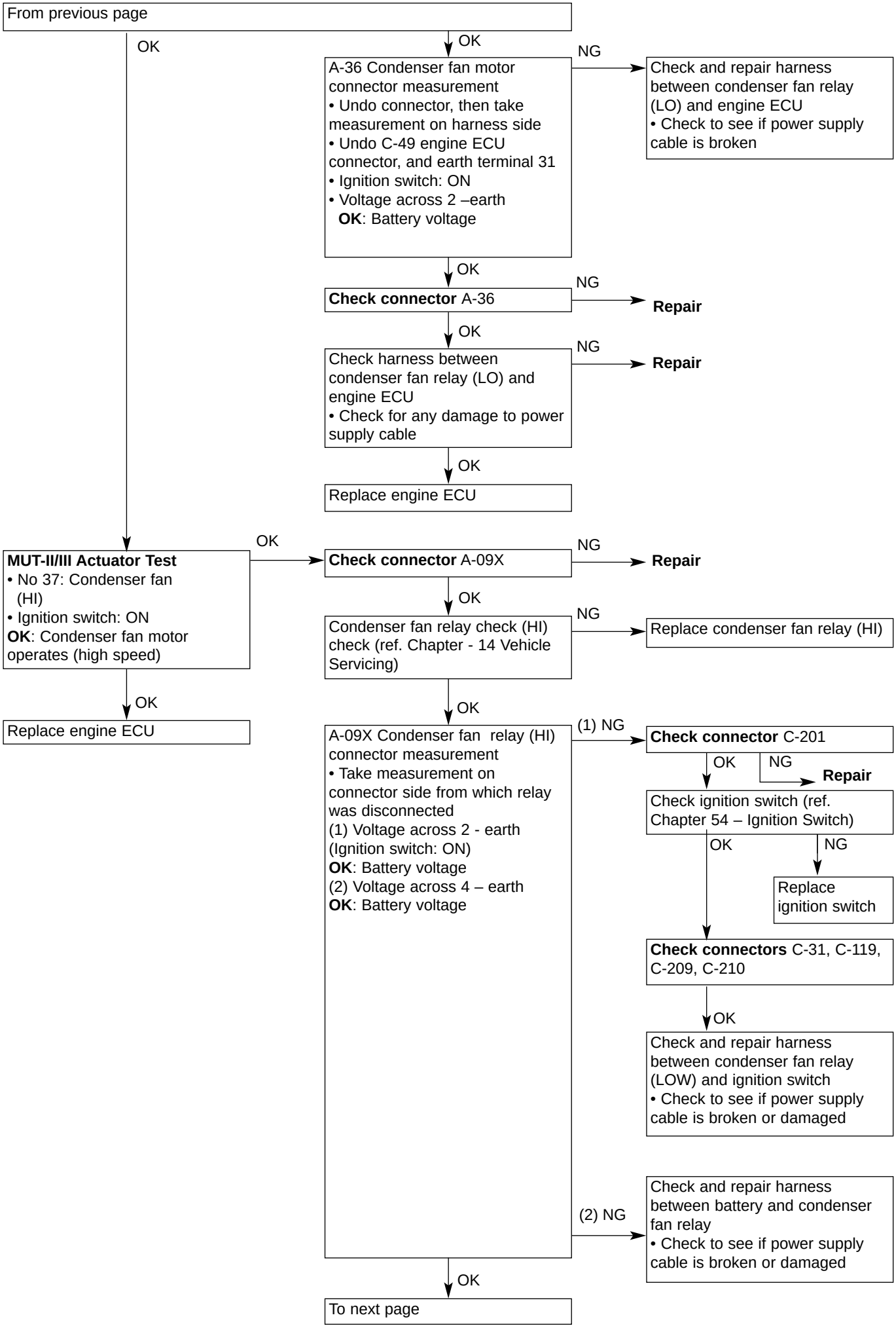


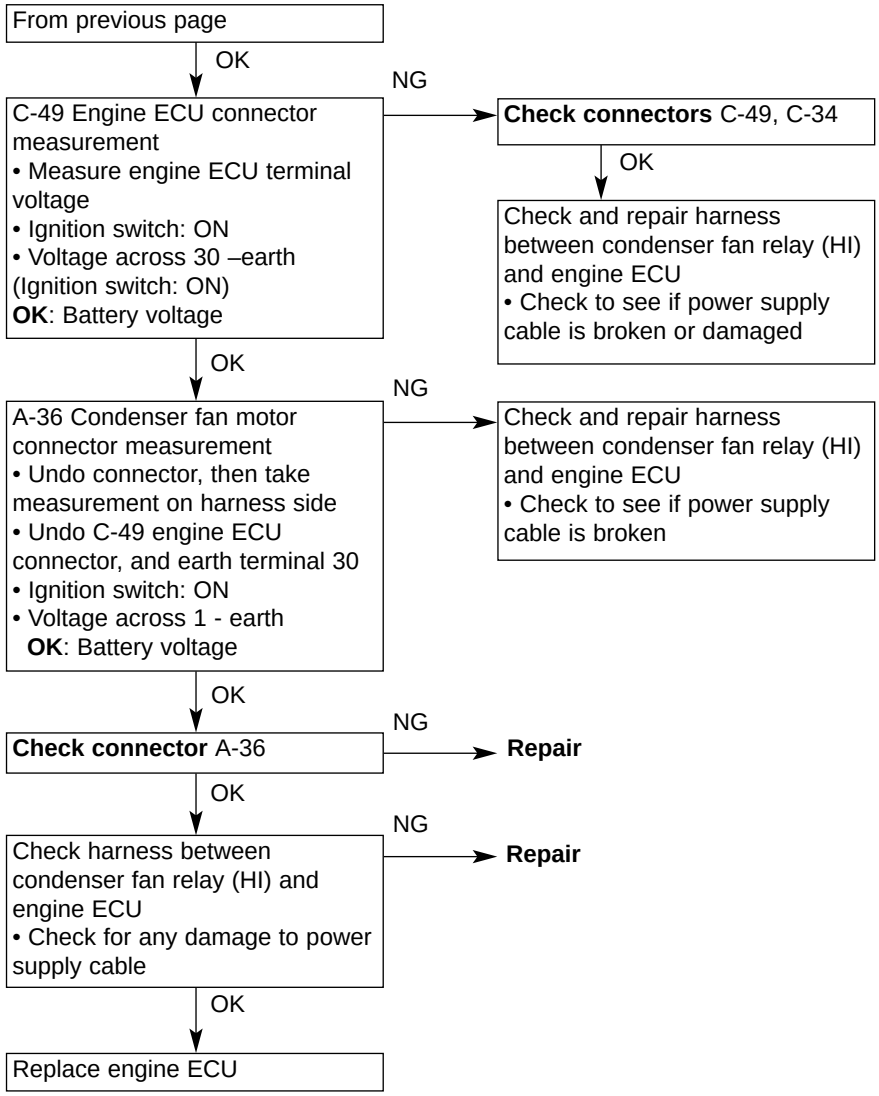

From previous page
OK
Check connector C-49
NG
Repair
OK
Check radiator fan motor operation
• Undo C-49 engine ECU connector
• Ignition switch: ON
OK: Radiator fan motor runs at high speed
OK
MUT-II/III Actuator test
• No.21: fan controller
• Ignition switch: ON
OK: Radiator fan motor operates
OK
Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
NG
Replace engine ECU
NG
C-49 Engine ECU measurement
• Undo connector, then take measurement on harness side
• Ignition switch: ON
• Voltage across 18 – earth
OK: 4.9 ~ 5.1V
OK
Check harness between battery and radiator fan control relay
• Check for any damage to power supply cable
NG
Repair
OK
Check harness between radiator fan control relay and fan controller
• Check for any damage to power supply cable
NG
Repair
OK
Replace radiator fan motor and fan controller ASSY
NG
Check connector C-34
NG
Repair
OK
Check harness between fan controller and engine ECU
• Check output wire to see if it has any shorts
NG
Repair
OK
Replace radiator fan motor and fan controller ASSY

Checking Procedure 25

Condenser Fan Relay	Probable causes
The signal from the engine ECU turns the condenser fan relay ON, supplying power to the condenser fan motor.	• Condenser fan relay (HI) malfunction • Condenser fan relay (LO) malfunction • Condenser fan motor malfunction • Condenser fan circuit broken, has a short circuit, or there is poor connector contact • Engine ECU malfunction

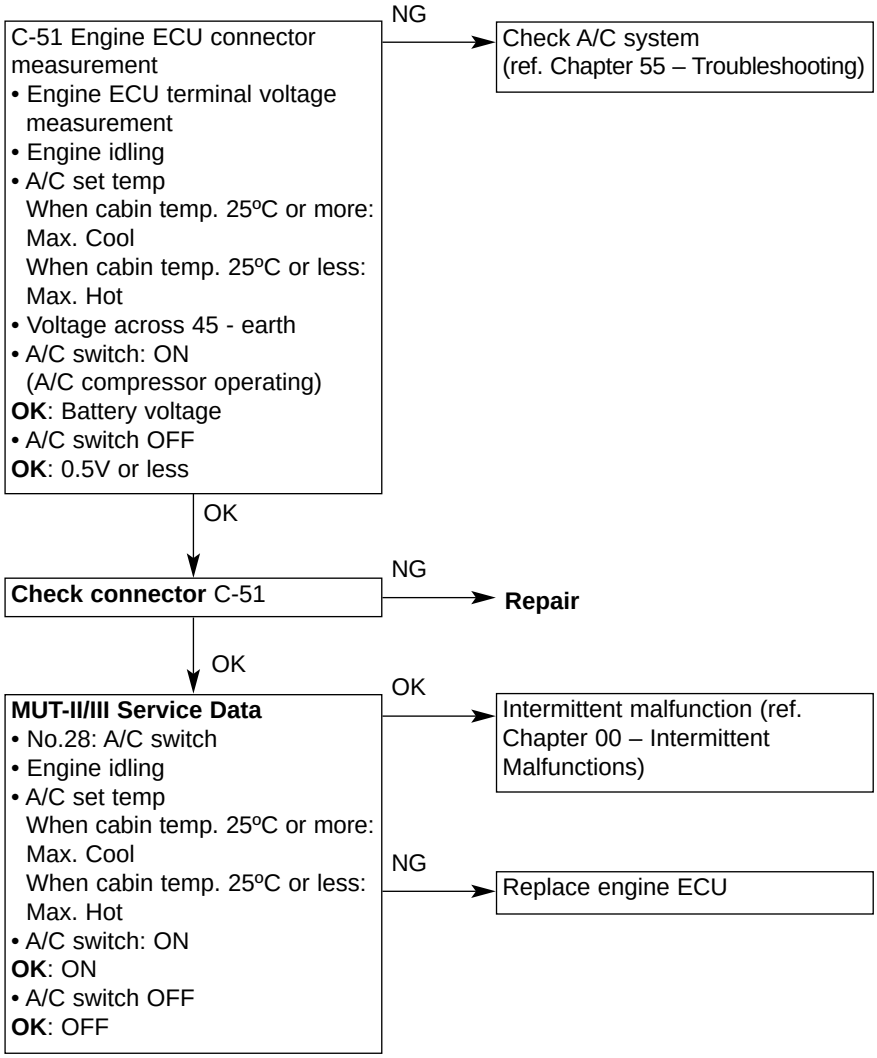



From previous page
OK
OK
NG
A-36 Condenser fan motor connector measurement
• Undo connector, then take measurement on harness side
• Undo C-49 engine ECU connector, and earth terminal 31
• Ignition switch: ON
• Voltage across 2 –earth
OK: Battery voltage
Check and repair harness between condenser fan relay (LO) and engine ECU
• Check to see if power supply cable is broken
OK
NG
Check connector A-36
Repair
OK
NG
Check harness between condenser fan relay (LO) and engine ECU
• Check for any damage to power supply cable
Repair
OK
Replace engine ECU
MUT-II/III Actuator Test
• No 37: Condenser fan (HI)
• Ignition switch: ON
OK: Condenser fan motor operates (high speed)
OK
Check connector A-09X
NG
Repair
OK
Condenser fan relay check (HI) check (ref. Chapter - 14 Vehicle Servicing)
NG
Replace condenser fan relay (HI)
OK
Replace engine ECU
OK
A-09X Condenser fan relay (HI) connector measurement
• Take measurement on connector side from which relay was disconnected
(1) Voltage across 2 - earth (Ignition switch: ON)
OK: Battery voltage
(2) Voltage across 4 – earth
OK: Battery voltage
(1) NG
Check connector C-201
OK
NG
Repair
Check ignition switch (ref. Chapter 54 – Ignition Switch)
OK
NG
Replace ignition switch
Check connectors C-31, C-119, C-209, C-210
OK
Check and repair harness between condenser fan relay (LOW) and ignition switch
• Check to see if power supply cable is broken or damaged
(2) NG
Check and repair harness between battery and condenser fan relay
• Check to see if power supply cable is broken or damaged
OK
To next page


From previous page
OK
C-49 Engine ECU connector measurement
• Measure engine ECU terminal voltage
• Ignition switch: ON
• Voltage across 30 –earth (Ignition switch: ON)
OK: Battery voltage
NG
Check connectors C-49, C-34
OK
Check and repair harness between condenser fan relay (HI) and engine ECU
• Check to see if power supply cable is broken or damaged
OK
A-36 Condenser fan motor connector measurement
• Undo connector, then take measurement on harness side
• Undo C-49 engine ECU connector, and earth terminal 30
• Ignition switch: ON
• Voltage across 1 - earth
OK: Battery voltage
NG
Check and repair harness between condenser fan relay (HI) and engine ECU
• Check to see if power supply cable is broken
OK
Check connector A-36
NG
Repair
OK
Check harness between condenser fan relay (HI) and engine ECU
• Check for any damage to power supply cable
NG
Repair
OK
Replace engine ECU

Checking Procedure 26

A/C Switch System	Probable causes
When the control panel A/C switch is turned ON, the A/C switch ON signal is input to the engine ECU. As a result, the engine ECU turns the A/C compressor ON.	• Control panel A/C switch malfunction • A/C system malfunction • Engine ECU malfunction



Checking Procedure 27

A/C Compressor System	Probable causes
When the A/C switch ON signal is input to the engine ECU, the engine ECU turns the A/C compressor relay ON. As a result, the A/C compressor magnet clutch operates.	• A/C compressor relay malfunction • A/C compressor magnet clutch malfunction • Engine ECU malfunction

Check connector B20-X
NG → **Repair**
OK ↓

Check A/C compressor relay (ref. Chapter 55A – Vehicle Servicing)
NG → Replace A/C compressor relay
OK ↓

B-20X A/C compressor relay connector measurement
• Take measurement on connector side from which relay was taken out
(1) Voltage across 2 - earth (Ignition switch: ON)
OK: Battery voltage
(2) Voltage across 1 – earth
OK: Battery voltage

(1) NG → **Check connector** C-20, C-119, C-209, C-210, C-201
NG → **Repair**
OK ↓
Check and repair harness between ignition switch and A/C compressor relay
• Check to see if power supply cable is broken or has a short circuit

(2) NG → **Check connector** C-34
NG → **Repair**
OK ↓
Check and repair harness between battery and radiator fan control relay
• Check to see if power supply cable is broken or has short circuit

OK ↓

Check connector A -39
NG → **Repair**
OK ↓

A-39 A/C compressor connector measurement
• Undo connector, then take measurement on harness side
• Remove B-20X A/C compressor relay, then create a short circuit between harness side connector terminals 1 - 4
• Ignition switch: ON
• Voltage across 1 – earth
OK: Battery voltage

NG → **Check connector** C-34
NG → **Repair**
OK ↓
Check harness between A/C compressor relay and A/C compressor
• Check output wire cable for any damage

OK ↓

C-49 Engine ECU connector measurement
• Engine ECU terminal voltage measurement
• Ignition switch: ON
• Voltage across 20 – earth
OK: Battery voltage

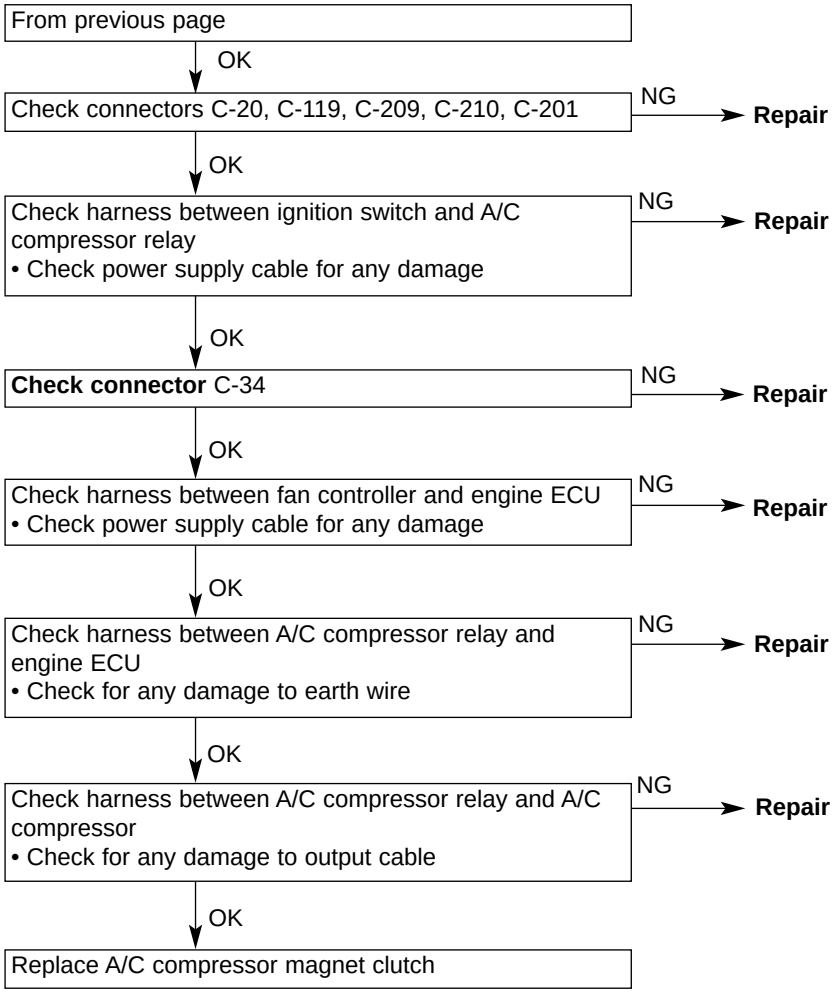
(1) NG → **Check connector** C-49
NG → **Repair**
OK ↓
Check harness between A/C compressor relay and engine ECU
• Check to see if earth wire is broken or damaged
NG → **Repair**
OK ↓

MUT-II/III Service Data
• No.49: A/C relay
• Engine idling
• A/C set temp
When cabin temp. 25°C or more:
Max. Cool
When cabin temp. 25°C or less:
Max. Hot
• A/C switch: ON
OK: ON
• A/C switch OFF
OK: OFF

OK → Intermittent malfunction (ref. Chapter 00 – Intermittent Malfunctions)
OK → Replace engine ECU

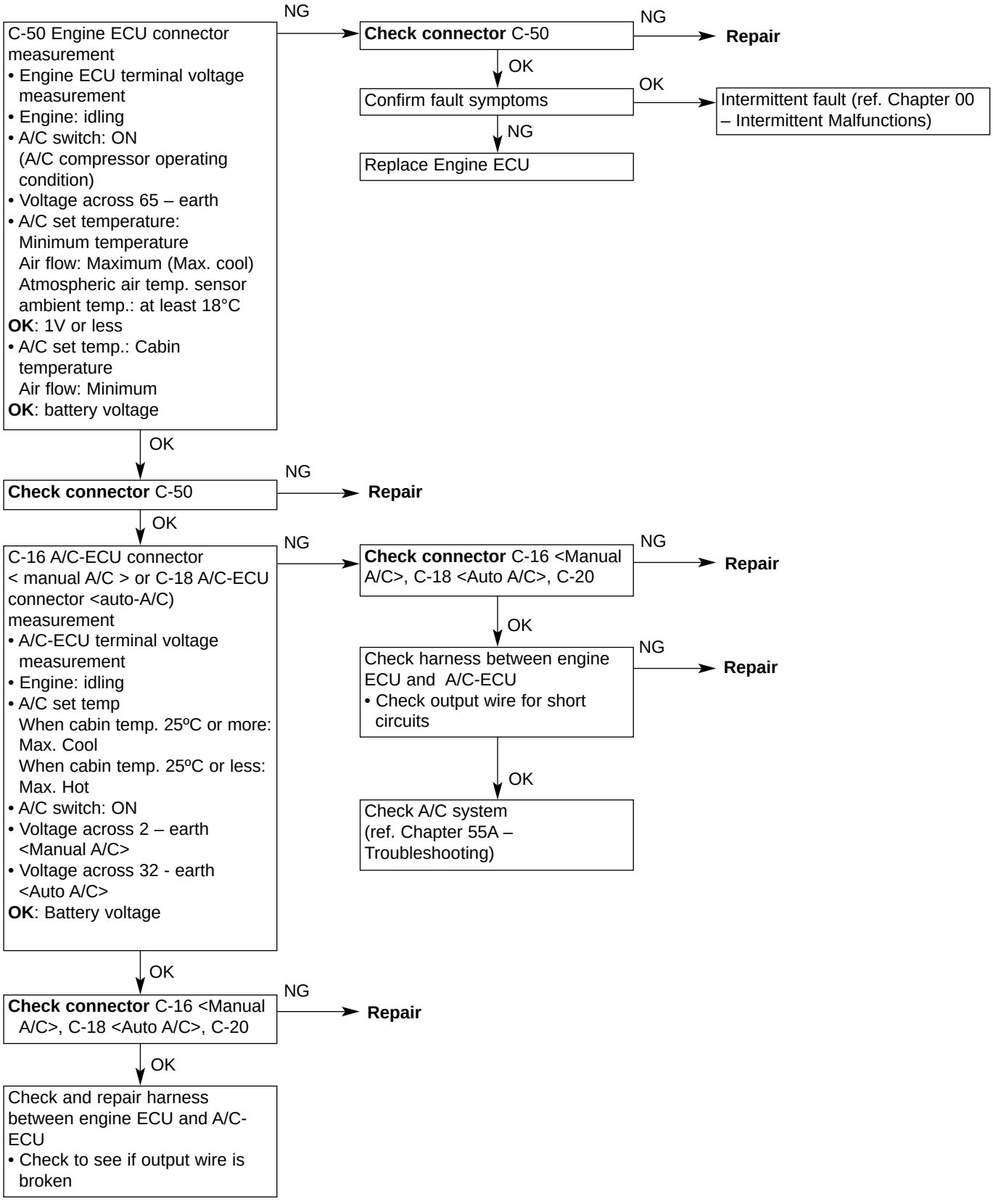
OK ↓

To next page


From previous page
OK
Check connectors C-20, C-119, C-209, C-210, C-201
NG
Repair
OK
Check harness between ignition switch and A/C compressor relay
• Check power supply cable for any damage
NG
Repair
OK
Check connector C-34
NG
Repair
OK
Check harness between fan controller and engine ECU
• Check power supply cable for any damage
NG
Repair
OK
Check harness between A/C compressor relay and engine ECU
• Check for any damage to earth wire
NG
Repair
OK
Check harness between A/C compressor relay and A/C compressor
• Check for any damage to output cable
NG
Repair
OK
Replace A/C compressor magnet clutch

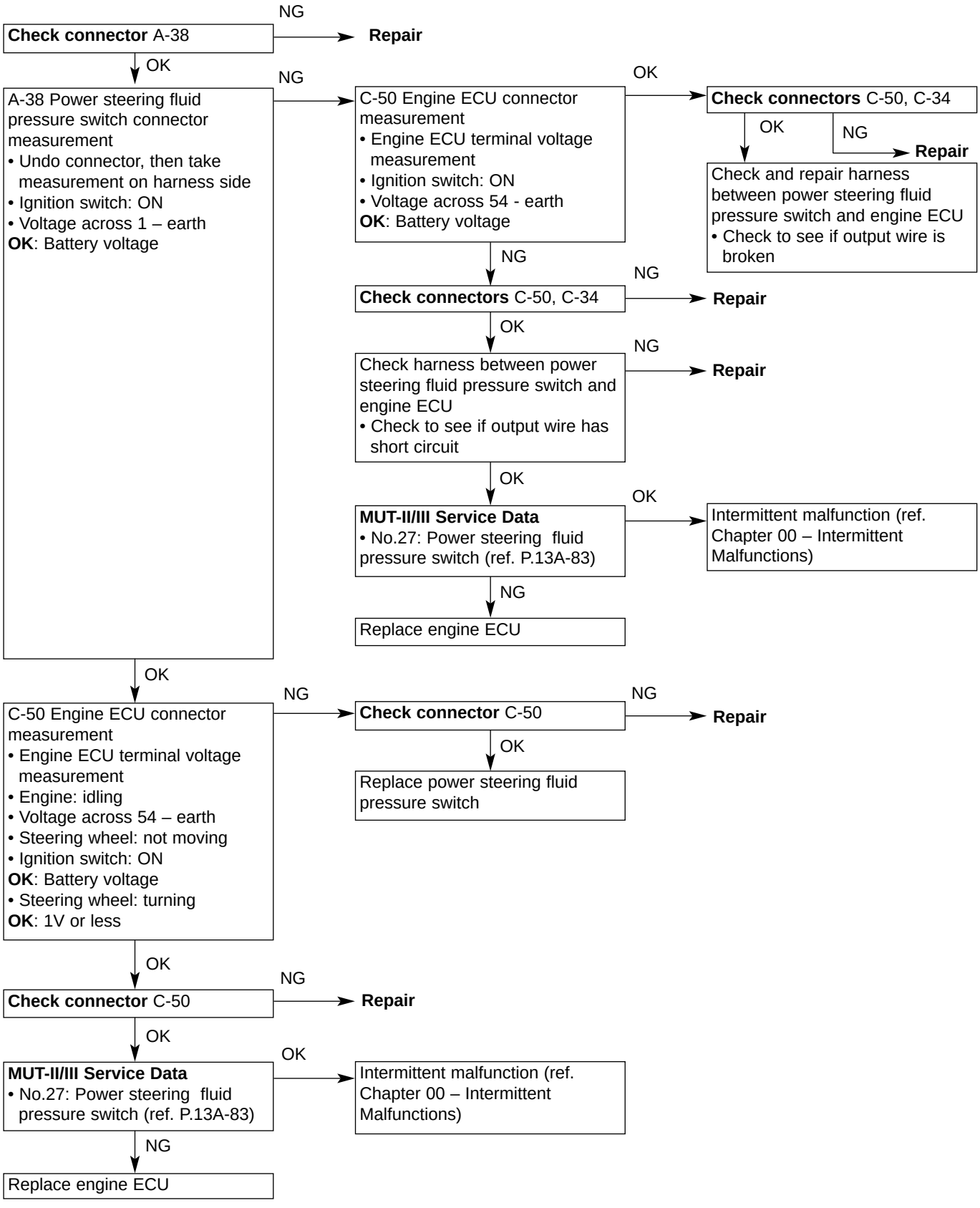
Checking Procedure 28

A/C Load Signal System	Probable causes
Detects the size of the A/C compressor load, which depends on differences in the set temperature. When a high A/C load signal is input to the engine ECU, the engine ECU decides that the A/C compressor load is high and operates the throttle valve control servo so that idling speed increases.	• A/C-ECU malfunction • Engine ECU malfunction



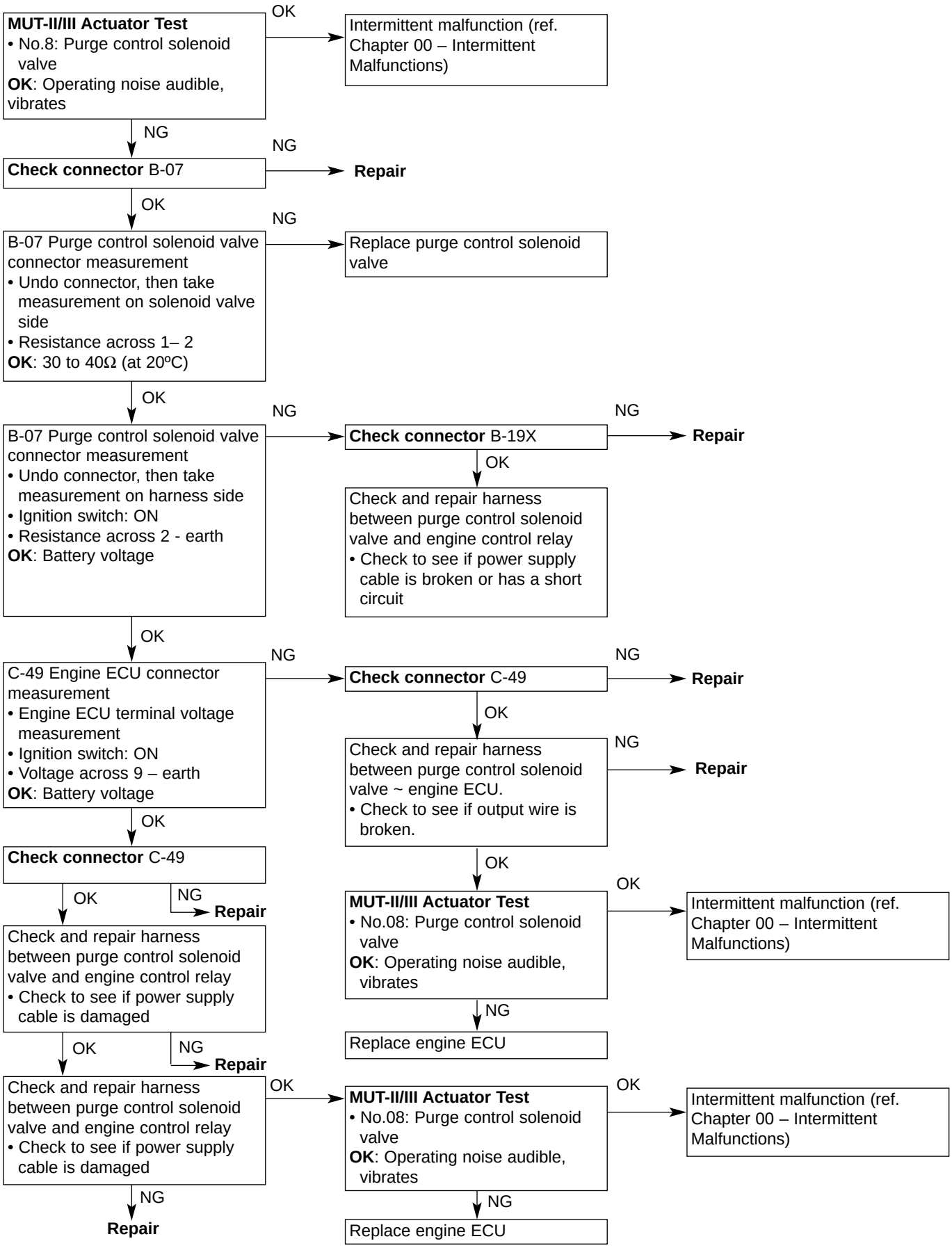
Checking Procedure 29

Power Steering Fluid Pressure Switch System	Probable causes
Detects a power steering oil pump load caused by turning of the steering wheel. When a power steering fluid pressure switch ON signal is input to engine ECU, the engine ECU decides that there is an increase in the power steering oil pump load, and operates the throttle valve control servo so that idling speed increases.	• Power steering fluid pressure switch malfunction • Engine ECU malfunction



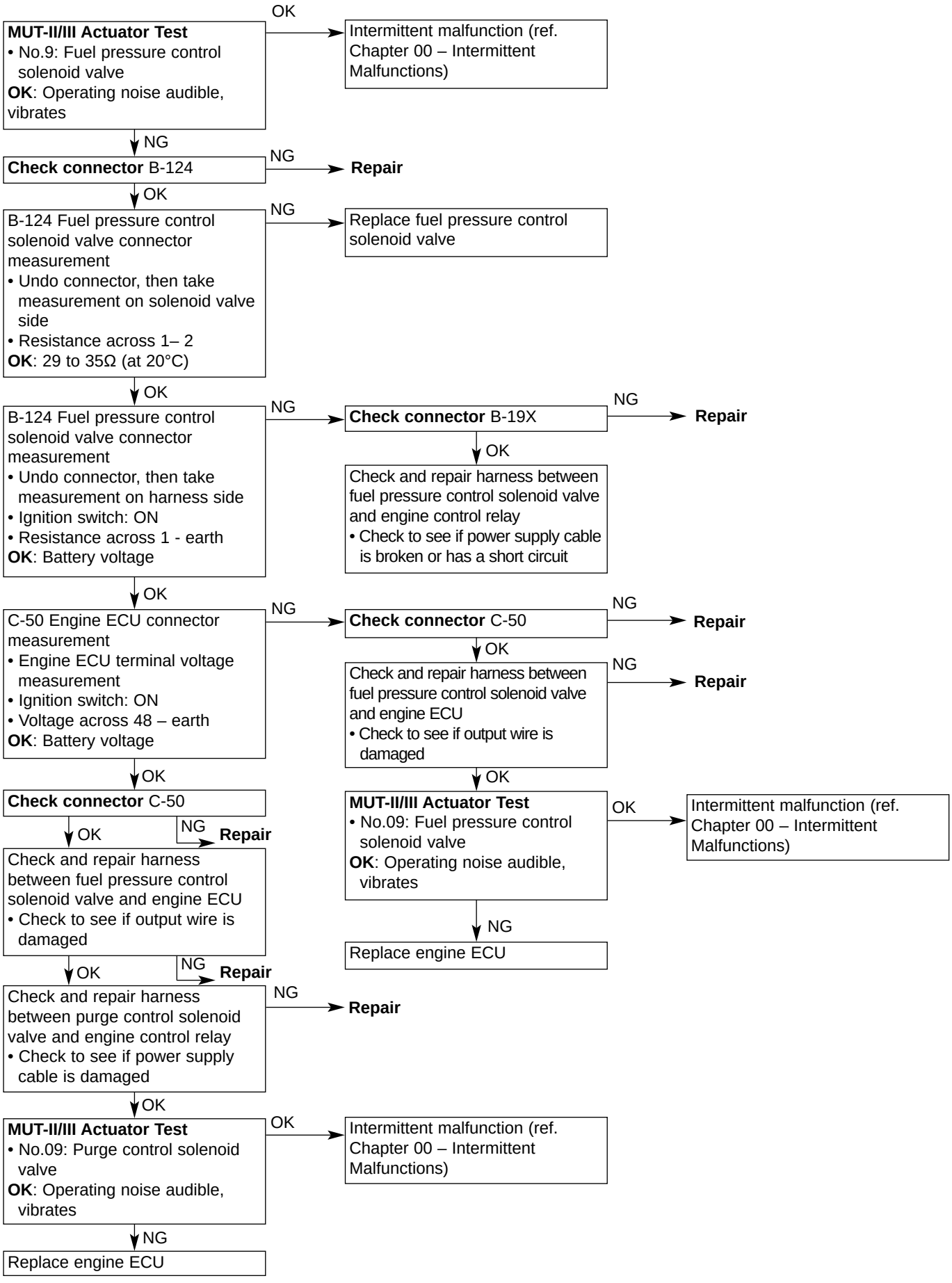
Checking Procedure 30

Purge Control Solenoid Valve System	Probable causes
The engine ECU controls air purged from the canister, by controlling the purge control solenoid valve.	• Purge control solenoid valve malfunction • Purge control solenoid valve circuit broken, has a short circuit, or poor connector contacts • Engine ECU malfunction



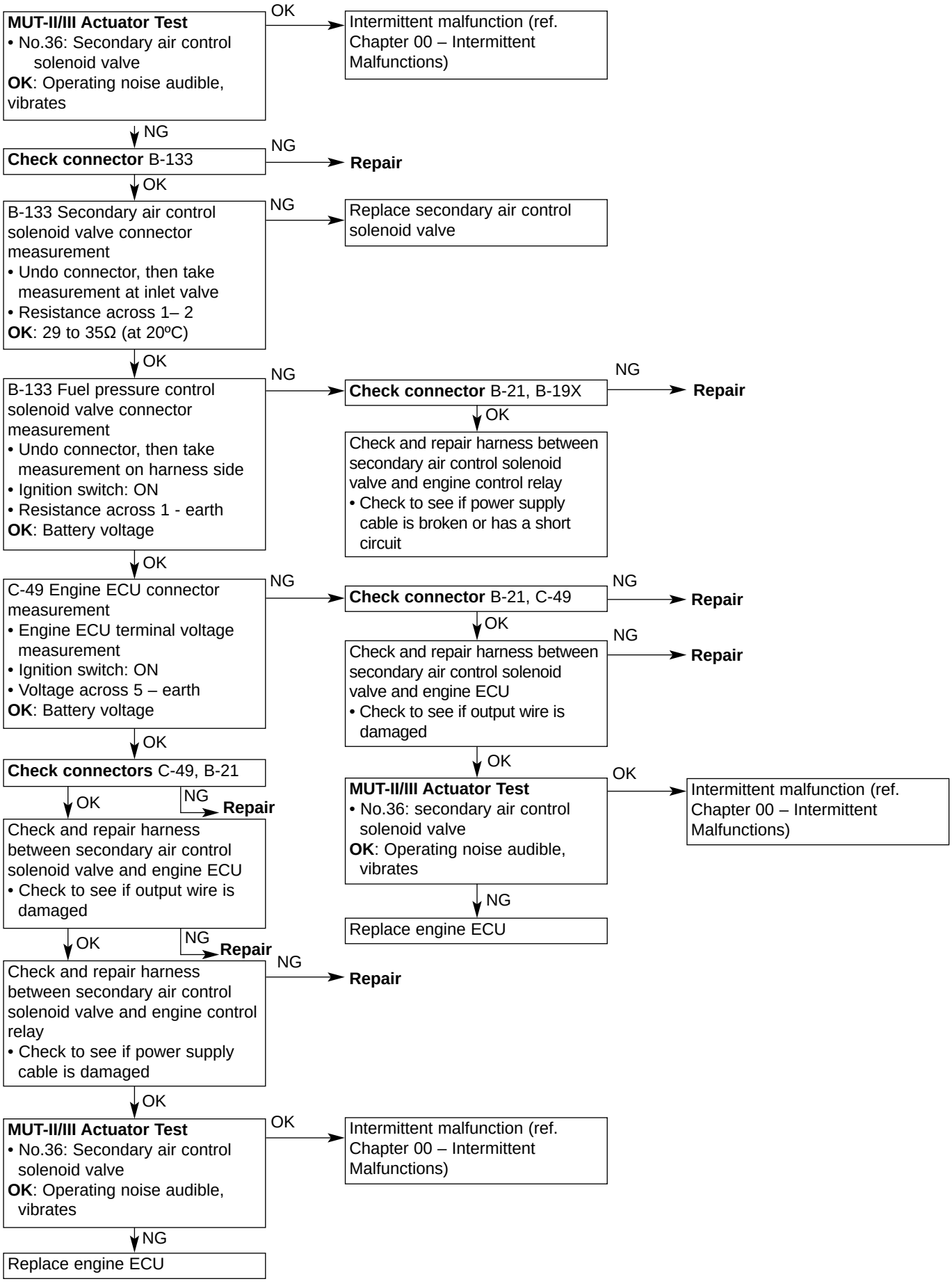
Checking Procedure 31

Fuel Pressure Control Solenoid Valve System	Probable causes
The fuel pressure control solenoid valve switches pressure introduced to the fuel pressure regulator between the inlet manifold and atmosphere pressure.	• Fuel pressure control solenoid malfunction • Engine ECU malfunction



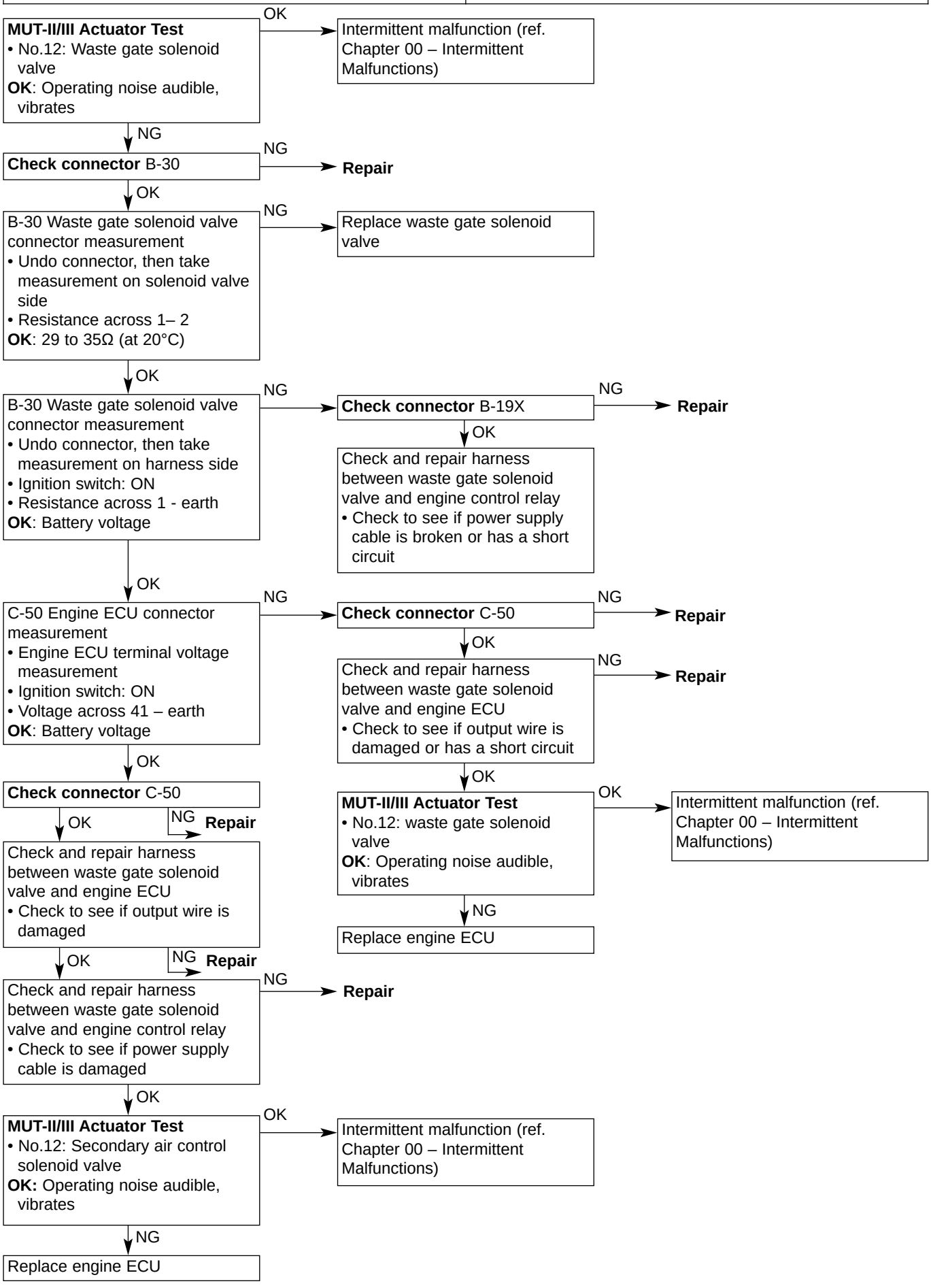
Checking Procedure 32

Secondary Air Control Solenoid Valve System	Probable causes
The secondary air control solenoid valve, switches pressure introduced to the secondary air valve between the intake manifold and atmosphere pressure.	• Secondary air control solenoid valve malfunction • Engine ECU malfunction



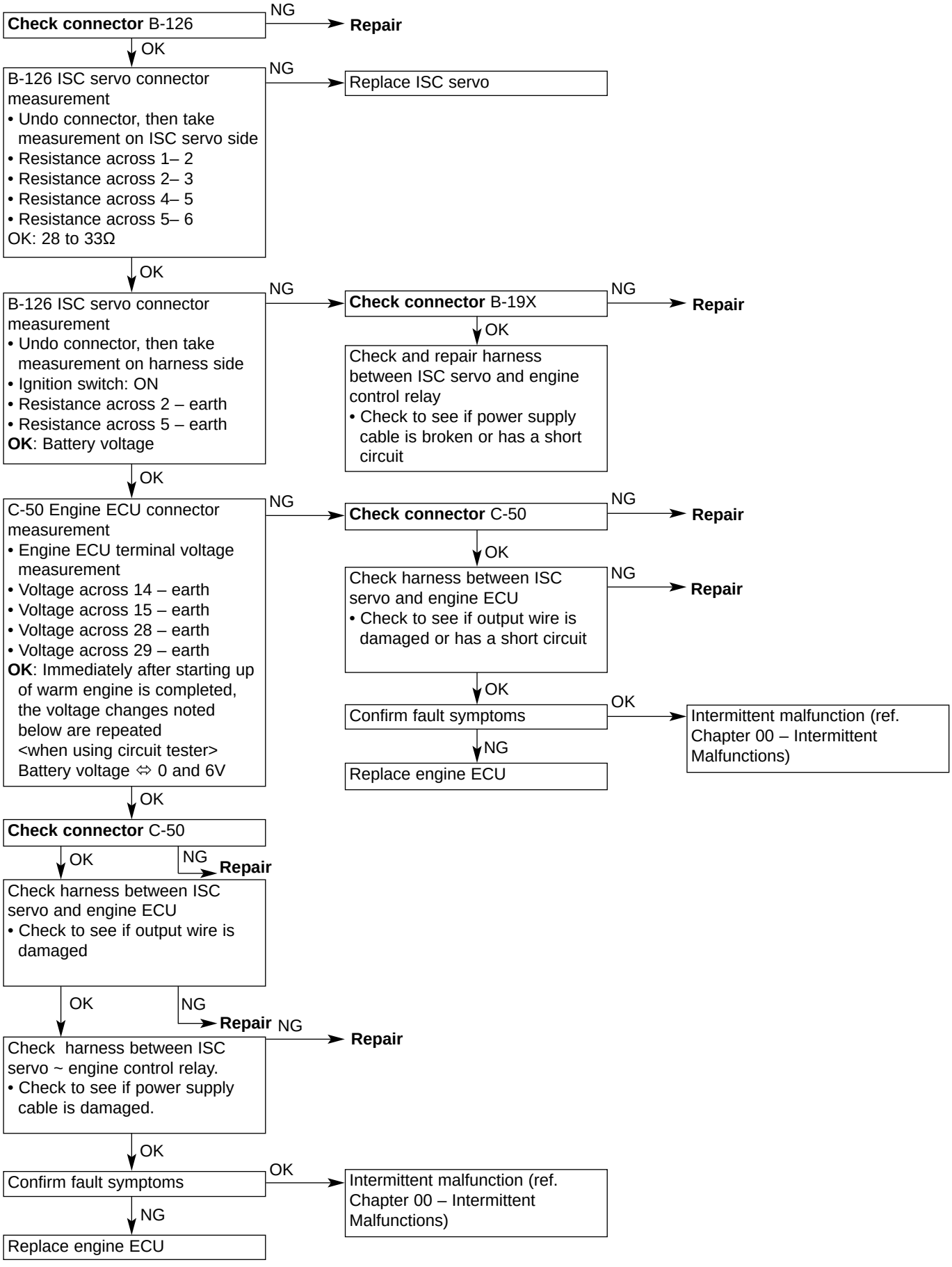
Checking Procedure 33

Waste Gate Solenoid Valve System	Probable causes
The waste gate solenoid valve controls pressure that is introduced to the turbocharger waste gate actuator	• Waste gate solenoid valve malfunction • Engine ECU malfunction



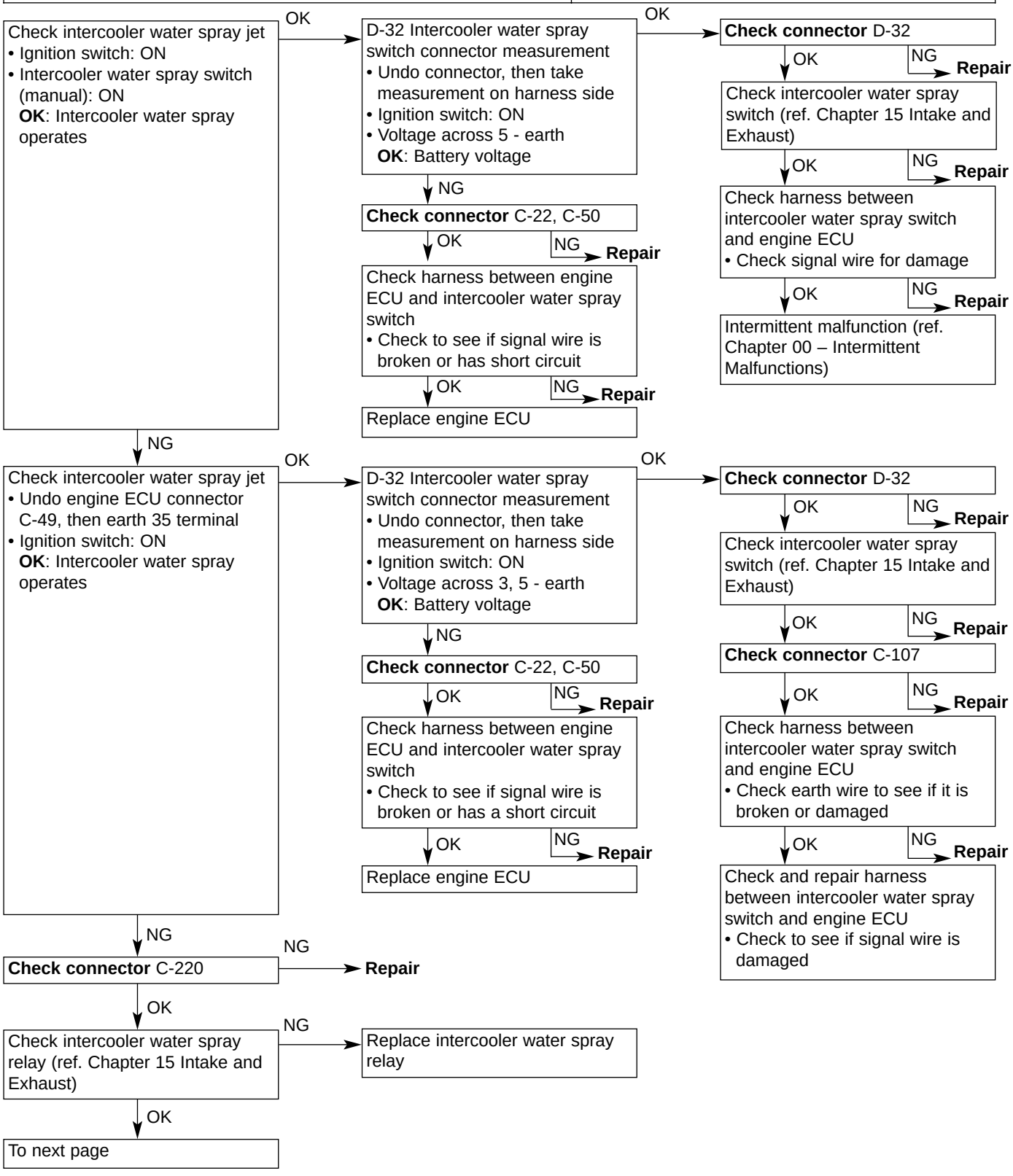
Checking Procedure 34

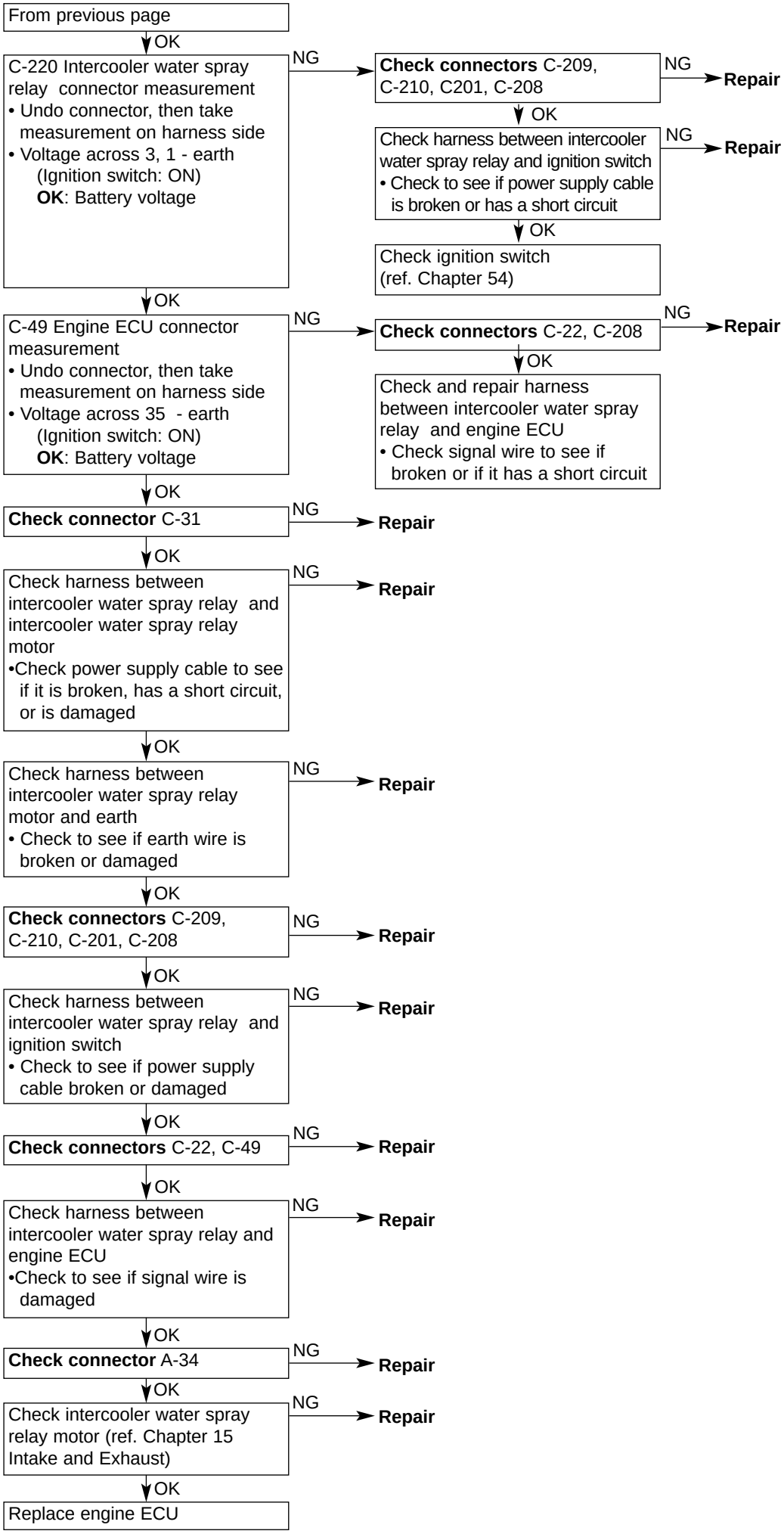
Idle speed control (ISC) servo (servo motor)	Probable causes
The engine ECU controls the volume of air intake during idling, by opening and closing the servo valve in a by-pass passage.	• ISC servo malfunction • ISC servo circuit broken, has a short circuit, or poor connector contact • Engine ECU malfunction



Checking Procedure 35

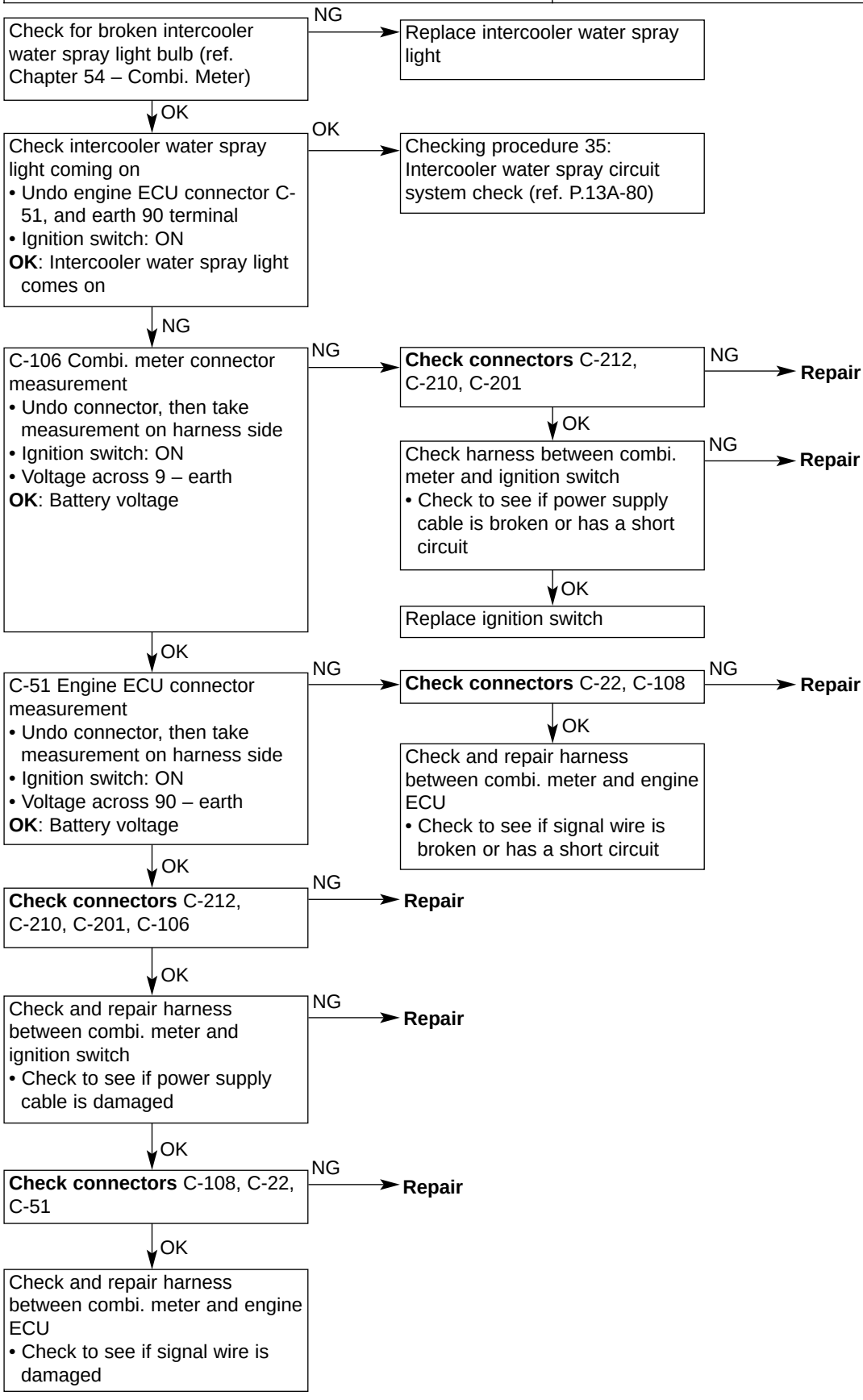
Intercooler Water Spray Circuit System	Probable causes
• When the intercooler water spray switch (manual) is turned ON, an intercooler water spray manual ON signal is input to the engine ECU. When it receives this signal, the engine ECU turns the intercooler water spray switch ON, runs the intercooler water spray switch motor, sprays water into the intercooler to cool the intake air, and improves filling efficiency. • When the intercooler water spray switch (auto) is turned ON, an intercooler water spray switch auto ON signal is input to the engine ECU. When it receives this signal, the engine ECU, during high load driving conditions, intermittently turns the intercooler water spray relay ON, runs the intercooler water spray motor, sprays water into the intercooler to cool the intake air, and improves filling efficiency.	• Intercooler water spray switch malfunction • Intercooler water spray relay malfunction • Intercooler water spray motor malfunction • Intercooler water spray relay circuit broken, short circuit, or poor connector contact • Intercooler water spray switch circuit broken, short circuit, or poor connector contact • Ignition switch malfunction • Engine ECU malfunction




From previous page
OK
C-220 Intercooler water spray relay connector measurement
• Undo connector, then take measurement on harness side
• Voltage across 3, 1 - earth (Ignition switch: ON)
OK: Battery voltage
NG
Check connectors C-209, C-210, C201, C-208
NG
Repair
OK
Check harness between intercooler water spray relay and ignition switch
• Check to see if power supply cable is broken or has a short circuit
NG
Repair
OK
Check ignition switch (ref. Chapter 54)
OK
C-49 Engine ECU connector measurement
• Undo connector, then take measurement on harness side
• Voltage across 35 - earth (Ignition switch: ON)
OK: Battery voltage
NG
Check connectors C-22, C-208
NG
Repair
OK
Check and repair harness between intercooler water spray relay and engine ECU
• Check signal wire to see if broken or if it has a short circuit
OK
Check connector C-31
NG
Repair
OK
Check harness between intercooler water spray relay and intercooler water spray relay motor
•Check power supply cable to see if it is broken, has a short circuit, or is damaged
NG
Repair
OK
Check harness between intercooler water spray relay motor and earth
• Check to see if earth wire is broken or damaged
NG
Repair
OK
Check connectors C-209, C-210, C-201, C-208
NG
Repair
OK
Check harness between intercooler water spray relay and ignition switch
• Check to see if power supply cable broken or damaged
NG
Repair
OK
Check connectors C-22, C-49
NG
Repair
OK
Check harness between intercooler water spray relay and engine ECU
•Check to see if signal wire is damaged
NG
Repair
OK
Check connector A-34
NG
Repair
OK
Check intercooler water spray relay motor (ref. Chapter 15 Intake and Exhaust)
NG
Repair
OK
Replace engine ECU

Checking Procedure 36

Intercooler Water Spray Light System	Probable causes
The engine ECU turns the intercooler water spray switch light on when the intercooler water spray switch (auto) is ON.	• Intercooler water spray bulb breaking • Ignition switch malfunction • Intercooler water spray light circuit broken, has a short circuit, or poor connector contact • Intercooler water spray switch circuit broken, has a short circuit, or poor connector contact • Engine ECU malfunction



6. SERVICE DATA TABLE

Item No.	Check Items	Checking Conditions		Normal condition	Code No. or Checking Procedure No.	Page
11	O_2 sensor	Engine warm (lean by decelerating, rich by racing)	When decelerating rapidly from 4,000rpm	200mV or less	Code No. P0130	13A-16
			During harsh racing	600 to 1,000 mV		
		Engine warm (Using O_2 sensor signal, as well as checking air/fuel ratio, control status is checked by ECU	Idle running	400mV or less ↔ 600 to 1,000mV (changes)		
			2,500rpm			
12	Air flow sensor *	• Engine cooling water temp: 80 to 95ºC • Lights/ignition devices, electric cooling fans, ancillary devices: OFF • Transmission in Neutral	Idle running	17 to 43Hz	-	-
			2,500rpm	40 to 100Hz		
			Racing	Frequency will increase in response to racing		
13	Intake air temperature sensor	Ignition switch: ON or engine running	When intake air temp. is -20ºC	-20ºC	Code No. P0110	13A-10
			When intake air temp. is 0ºC	0ºC		
			When intake air temp. is 20ºC	20ºC		
			When intake air temp. is 40ºC	40ºC		
			When intake air temp. is 80ºC	80ºC		
14	Throttle position sensor	Ignition switch: ON	In idle position	535 to 735mV	Code No.P0120	13A-13
			Gradually open	Increases as valve opens		
			Fully open	4,500 to 5,000mV		
16	Battery voltage	Ignition switch: ON		Battery voltage	Procedure No. 22	13A-61
18	Cranking signal (ignition switch – ST)	Ignition switch: ON	Engine: stopped	OFF	Procedure No.22	13A-61
			Engine: cranking	ON		

Remarks
* When vehicle is new (about 500km or less), the air flow sensor output frequency may be about 10% high

Item No.	Check Items	Checking Conditions		Normal condition	Code No. or Checking Procedure No.	Page
21	Water temp. sensor	Ignition switch: ON or engine running	When water temp. is –20ºC	-20ºC	Code No. P0115	13A-11
			When water temp. is 0ºC	0ºC		
			When water temp. is 20ºC	20ºC		
			When water temp. is 40ºC	40ºC		
			When water temp. is 80ºC	80ºC		
22	Crank angle sensor	• Engine cranking • Engine speed meter: Connected	Compare engine speeds from engine speed meter and MUT-II	Same	-	-
		Engine: idling	When water temp. is –20ºC	1,300 to 1,500rpm	-	-
			When water temp. is 0ºC	1,300 to 1,500rpm		
			When water temp. is 20ºC	1,300 to 1,500rpm		
			When water temp. is 40ºC	1,150 to 1,350rpm		
			When water temp. is 80ºC	600 to 900rpm		
25	Atmospheric air pressure	Ignition switch: ON	Altitude: 0m	101kPa	Code No.P0105	13A-8
			Altitude: 600m	95kPa		
			Altitude: 1200m	88kPa		
			Altitude: 1800m	81kPa		
27	Power steering fluid pressure switch	Engine: idling	Steering wheel not moving	OFF	Procedure No.29	13A-74
			Steering wheel turning	ON		
28	A/C switch	Engine: idling (when A/C switch is ON, the compressor should be running	A/C switch: OFF	OFF	Procedure No.26	13A-70
			A/C switch: ON	ON		
34	Air flow sensor reset signal	Engine: warmed up	Idling	ON	Code No.P0100	13A-6
			3,000rpm	OFF		
37	Volumetric efficiency	• Engine cooling water: 85 to 95ºC • Lights/ignition devices, electric cooling fans, ancillary devices: OFF	Idling	15 to35%	-	-
			2,500rpm	15 to 35%		
			Harsh racing	Volumetric efficiency will increase in response to racing		

Item No.	Check Items	Checking Conditions		Normal condition	Code No. or Checking Procedure No.	Page
41	Injector operating time *1	Engine: cranking	When water temperature 0ºC (all cylinders injecting simultaneously)	25 to 37ms	-	-
			When water temperature 20ºC	15 to 22ms		
			When water temp. 80ºC	4.2 to 6.3ms		
	Injector operating time *2	• Engine: Cooling water temp. 80 to 95ºC • Lights/ignition devices, electric cooling fans, ancillary devices: OFF • Transmission: Neutral	Idle running	1.5 to 2.7ms		
			2,500rpm	1.2 to 2.4ms		
			During harsh racing	Increases		
44	Ignition advance	• After engine has warmed up • Set timing light (Set timing light for firing on actual ignition timing)	Idle running	0 to 13ºC BTDC	-	-
			2,500rpm	20 to 40ºBTDC		
45	ISC (servo) position *3	• Engine: Cooling water temp. 80 to 90ºC • Lights/ignition devices, electric cooling fans, ancillary devices: OFF • Transmission: Neutral • Engine: idle running (when A/C switch ON, compressor is operated)	A/C switch: OFF	2 to 25 STEP	-	-
			A/C switch OFF → ON	10 to 70 step increase		
49	A/C relay	Engine: after warming up, idle running	A/C switch: OFF	OFF (compressor clutch not operating)	Procedure No.27	13A-71
			A/C switch: ON	ON (compressor clutch operating)		

Item No.	Check Items	Checking Conditions		Normal condition	Code No. or Checking Procedure No.	Page
A1★	O_2 sensor	Engine: after warming up ((lean by decelerating, rich by racing)	Rapid deceleration from 4,000rpm	200mV or less	Code No.P0130	13A-16
			During harsh racing	600 to 1,000mV		
		Engine: after warming up (as well as using the O_2 sensor signal to check air/fuel ratio), control status is checked by engine ECU	Idle running	400mV or less 600↔ 1,000mV (changes)		
			2,500rpm			
24 ★	Vehicle speed sensor	Driving at 40km/h		Approx. 40km/h	Code No.P0500	13A-30
81 ★	Learned value	Engine: warmed up, no load 2,500rpm (during fuel/ratio feedback control)		-12.5 to 12.5%	Code No.P0170	13A-19
82 ★	Feedback	Engine: warmed up, no load 2,500rpm (during fuel/ratio feedback control)		-20 to 20%	Code No.P0170	13A-19
87 ★	Engine load	Engine: after warming up	Idle running	15 to 35%	-	-
			2,500rpm	15 to 35%	-	-
8A ★	TPS1 (Throttle valve opening)	• Engine: after warming up • Ignition switch: ON (engine stopped)	Foot off the throttle pedal	8 to 16%	Code No.P0120	13A-13
			Foot depressing throttle pedal	Increases in response to pedal pressure		
			Throttle pedal fully open	80 to100%		

Remarks
*1. The duration that injectors operate represents the time during which the power supply voltage is 11V, and cranking speed is 250rpm or less.
*2. When the vehicle is new (500km or less on the clock), the injector operating time may be as much as 10% longer than the standard time.
*3. When the vehicle is new (500km or less on the clock), the stepper motor step may be as much as 30 steps more than the standard value.
★ This is not shown when check motor service data is selected.

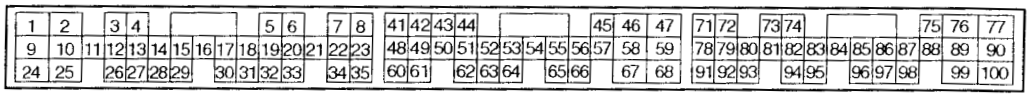
7. ACTUATOR TEST TABLE

Item No.	Check Items	Drive details	Checking Conditions		Normal condition	Code No. or Checking Procedure No.	Page
01	No.1 injector	Cuts fuel to No.1 injector	Engine: after warming up, engine idling (Fuel supply to each injector is cut in turn. Cylinders where the idling condition does not change are checked)		Idling condition changes (either fluctuating, or stalling engine)	Code No.P0201	13A-20
02	No.2 injector	Cuts fuel to No.2 injector				Code No.P0202	13A-21
03	No.3 injector	Cuts fuel to No.3 injector				Code No.P0203	13A-22
04	No.4 injector	Cuts fuel to No.4 injector				Code No.P0204	13A-23
07	Fuel pump	Fuel pump which circulates fuel operates	• Engine: cranking • Fuel pump: forced driving Checks to be done for both the above conditions	Pinch the return hose with fingers, and feel for the pulse of fuel flowing	Pulse is felt	Procedure No.23	13A-63
				Listen for the sound of the pump near the fuel tank	Operating noise is audible		
08	Purge control solenoid valve	Solenoid valve turns from OFF to ON	Ignition switch: ON		Operating noise is audible when driven	Procedure No.30	13A-75
09	Fuel pressure control solenoid valve	Solenoid valve turns from OFF to ON	Ignition switch: ON		Operating noise is audible when driven	Procedure No.31	13A-76
12	Waste gate solenoid valve	Solenoid valve turns from OFF to ON	Ignition switch: ON		Operating noise is audible when drive	Procedure No.33	13A-78
13	Fuel pump relay - 3	Fuel pump relay –3 turns from OFF to ON	• Ignition switch: ON • Listen for sound of pump operating near the fuel tank		Operating noise is audible when driven	Procedure No.23	13A-63
17	Standard ignition timing	Sets engine ECU to ignition timing adjustment mode	• Engine: idling • Timing light is set		5ºBTDC	-	-
21	Fan controller	Radiator fan motor is driven	Ignition switch: ON		Fan motor rotates at high speed	Procedure No.24	13A-65
36	Secondary air control solenoid valve	Solenoid valve turns from OFF to ON	Ignition switch: ON		Operating noise is audible when driven	Procedure No.32	13A-77
37	Condenser fan (HI)	Condenser fan motor is driven	• Ignition switch: ON		Fan motor rotates at high speed	Procedure No.25	13A-67
38	Condenser fan (LOW)	Condenser fan motor is driven	• Ignition switch: ON		Fan motor rotates at low speed		

8. ENGINE ECU CHECKS

8-1 Terminal voltage chart

Engine ECU connectors



26038AU

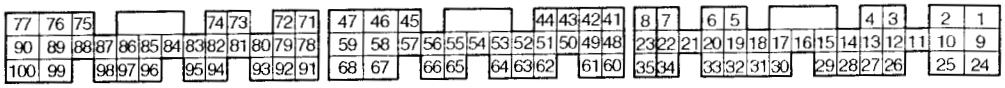
Item No.	Check Items	Checking Conditions (engine condition)	Normal condition
1	No.1 injector	Engine: after warming up, from engine idling the throttle pedal is suddenly depressed (Fuel supply to each injector is cut in turn. Cylinders where the idling condition does not change are checked)	Momentary slight drop from 11 to 14V
9	No.2 injector		
24	No.3 injector		
2	No.4 injector		
3	O_2 sensor	Engine: idling	1V or less
		Engine: 5,000 rpm	Battery voltage
5	Secondary air control solenoid valve	Ignition switch: ON	Battery voltage
8	Alternator G terminal	• Engine: after warming up, idling • Radiator fan: not operating • Headlights: OFF → ON • Brake light: OFF → ON • Rear demister switch: OFF → ON	Voltage increase 0.2 to 3.5V
11	Ignition coil No.1 – No.4	Engine: 3,000rpm	0.3 to 3.0V
12	Ignition coil No.2 – No.3		
14	Stepper motor coil (A1)	Engine: Immediately after warm engine has finished starting up	Battery voltage ↔ 0 to 6V (repeatedly changing)
28	Stepper motor coil (A2)		
15	Stepper motor coil (B1)		
29	Stepper motor coil (B2)		
16	Purge control solenoid valve	Ignition switch: ON	Battery voltage
		Engine: idling	1V or less
18	Fan controller	Radiator fan not operating	0 to 0.3V
		Radiator fan operating	0.7V or more
19	Air flow sensor reset signal	Engine: idling	0 to 1V
		Engine: 3,000rpm	6 to 9V
20	A/C relay	• Engine: idling • A/C switch: OFF → ON (compressor operating)	Battery voltage or transient 6V or more → 1V or less
21	Fuel pump relay	Ignition switch: ON	Battery voltage
		Engine: idling	1V or less
22	Engine warning light	Engine switch: LOCK (OFF) → ON	1V or less → Battery voltage (after several seconds)
30	Compressor fan motor relay (HI)	Fan not operating (cooling water temp.: 90ºC or less)	Battery voltage
		Fan high speed operation (cooling water temp.: 105ºC or more)	1V or less

Item No.	Check Items	Checking Conditions (engine condition)		Normal condition
31	Condenser fan motor relay (LOW)	Fan not operating (cooling water temp. 90ºC) or less)		Battery voltage
		Fan low speed operation (cooling water temp. 95ºC to 100ºC or more)		1V or less
35	Intercooler spray relay	Ignition switch: ON		Battery voltage
		Ignition switch: LOCK (OFF)		1V or less
41	Waste gate solenoid valve	Ignition switch: ON Engine: after warming up, idling (using Premium petrol)		Battery voltage
				1V or less
42	Voltage applied to sensor	Ignition switch: ON		4.9 to 5.1V
43	Crank angle sensor	Engine: cranking		0.4 to 4.0V
		Engine: idling		1.5 to 2.5V
44	Water temp. sensor	Ignition switch:ON	When water temp.:-20ºC	3.9 to 4.5V
			When water temp.: -0ºC	3.2 to 3.8V
			When water temp.:20ºC	2.3 to 2.9V
			When water temp.:40ºC	1.3 to 1.9V
			When water temp.:60ºC	0.7 to 1.3V
			When water temp.:80ºC	0.3V to 0.9V
45	Tachometer output	Engine speed: 3,000rpm		0.3 to 3.0V
47	Power supply	Ignition switch: ON		Battery voltage
59				
48	Fuel pressure control solenoid valve	Ignition switch: ON		Battery voltage
		Engine: Cranking → idling (within about 2 minutes)		1V or less → Battery voltage
50	Cam position sensor	Engine: cranking		0.4 to 3.0V
		Engine: idling		0.5 to 2.0V
51	Atmospheric air pressure sensor	Ignition switch: ON	At altitude 0m	3.8 to 4.2V
			At altitude 600m	3.5 to 3.9V
			At altitude 1,200m	3.3 to 3.7V
			At altitude 1,800m	3.0 to 3.4V
52	Alternator FR terminal	• Engine: after warming up, idling • Radiator fan: not operating • Headlights: OFF → ON • Brake lights: OFF → ON • Rear demister switch OFF → ON		Voltage drops
54	Power steering fluid pressure switch	Engine: after warming up, idling	Steering wheel: still condition	Battery voltage
55	Fuel pump relay –3	Engine: From idling condition, throttle pedal is depressed suddenly		From 1V or less, there is a slight momentary increase
57	Engine control relay	Ignition switch: LOCK (OFF)		Battery voltage
		Ignition switch: ON		1V or less
60	Back-up power supply	Ignition switch: LOCK (OFF)		Battery voltages
61	Air flow sensor	Engine: idling		2.2 to 3.2V
		Engine: 2,500rpm		
62	Intake air temp. sensor	Ignition switch: ON	When intake air temp.:-20ºC	3.8 to 4.4V
			When intake air temp.: -0ºC	3.2 to 3.8V
			When intake air temp.:20ºC	2.3 to 2.9V
			When intake air temp.:40ºC	1.5 to 2.1V
			When intake air temp.:60ºC	0.8 to 1.4V
			When intake air temp.:80ºC	0.4 to 1.0V

Item No.	Check Items	Checking Conditions (engine condition)		Normal condition
85	A/C load	• Engine: idling • A/C switch: ON (A/C compressor operating)	• External air temperature sensor ambient temp.: 18ºC • A/C set temp.: Minimum temperature • A/C air flow: Maximum (Max Cool)	1V or less
			• A/C set temp.: Cabin temperature • A/C air flow: Minimum	Battery voltage
66	Intercooler water spray switch (Auto)	• Ignition switch: ON • Intercooler water spray switch: ON		1V or less
		• Ignition switch: ON • Intercooler water spray switch: OFF		Battery voltage
67	Intercooler water spray switch (Manual)	• Ignition switch: ON • Intercooler water spray switch: ON		1V or less
		• Ignition switch: ON • Intercooler water spray switch: OFF		Battery voltage
68	Ignition switch – ST	Engine: cranking		8V or more
99	Ignition switch – IG	Ignition switch: ON		Battery voltage
71	O_2 sensor	Engine: after warming up, maintain 2,500 rpm (Check using a digital voltmeter)		0 ↔ 8V (changes repeatedly)
78	Throttle position sensor	Ignition switch: ON	Throttle valve set to idle position	0.535 to 0.735V
			Throttle valve set to fully open	4.5 to 5.0V
80	Vehicle speed sensor	• Ignition switch: ON • Vehicle moving slowly forwards		0 ↔ 5V (changes repeatedly)
83	A/C switch	Engine: idling	A/C switch: OFF	0.5V or less
			• A/C switch: ON • A/C set temp. When cabin temp. 25ºC or more: Max cool When cabin temp. 25ºC or less: Max Hot	Battery voltage
40	Intercooler water spray light	Ignition switch: ON		Battery voltage
		Ignition switch: LOCK (OFF)		1V or less

8-2. TABLE SHOWING HARNESS SIDE CONNECTOR TERMINAL RESISTANCES AND CONTINUITY

Engine ECU harness side connectors

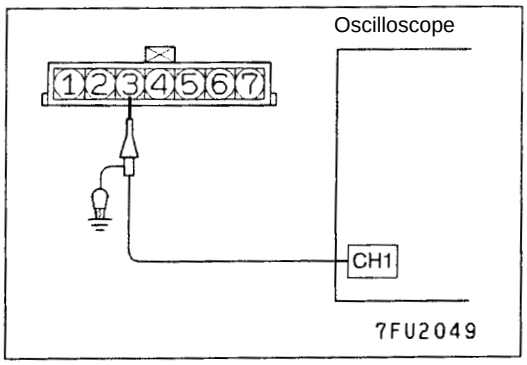


26039AU

Terminal number	Check item	Standard value, normal condition (Check condition)
1-47	No.1 injector	7.8 to 9.2Ω (at 20ºC)
9-47	No.2 injector	
24-47	No.3 injector	
2-47	No.4 injector	
3-47	O_2 sensor	11to18 Ω (at 20ºC)
5-47	Secondary air control solenoid valve	28 to 36 Ω (at 20ºC)
14-47	Stepper motor coil (A1)	28 to 33 Ω (at 20ºC)
28-47	Stepper motor coil (A2)	
15-47	Stepper motor coil (B1)	
29-47	Stepper motor coil (B2)	
16-47	Purge control solenoid valve	22 to 26 Ω (at 20ºC)
41-47	Waste gate solenoid valve	62 to 74 Ω (at 20ºC)
44-49	Water temperature sensor	14 to 17k Ω (at 20ºC)
		5.1 to 6.5k Ω (at 0ºC)
		2.1 to 2.7k Ω (at 20ºC)
		0.9 to 1.3k Ω (at 40ºC)
		0.48 to 0.68k Ω (at 60ºC)
		0.26 to 0.36k Ω (at 80ºC)
46-Body earth	Engine ECU earth	There is continuity (0 Ω)
58-Body earth		
47-48	Fuel pressure control solenoid valve	28 to 36 Ω (at 20ºC)
62-49	Intake air temperature sensor	13 to 17 Ω (when intake air temp. -20ºC)
		5.3 to 6.7 Ω (when intake air temp. 0ºC)
		2.3 to 3.0 Ω (when intake air temp. 20ºC)
		1.0 to 1.5 Ω (when intake air temp. 40ºC)
		0.56 to 0.76 Ω (when intake air temp. 60ºC)
		0.30 to 0.42 Ω (when intake air temp. 80ºC)

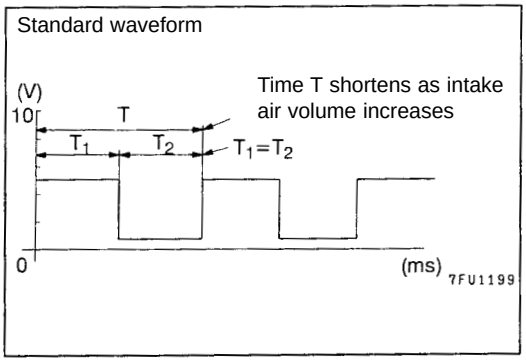
9. Checks using an oscilloscope

Taking waveform measurements using an oscilloscope means that sensor outputs signals and actuator drive signals can be checked visually.



9-1 Air flow sensor
<Measurement Method>
(1) Disconnect the air flow sensor connector, and connect the special tool (test harness MB991709). (All the terminals should be connected)
(2) Connect the oscilloscope to air flow sensor connector terminal No.3.

Comments
When taking measurements at the engine ECU connector, connect oscilloscope probe to terminal No.61.



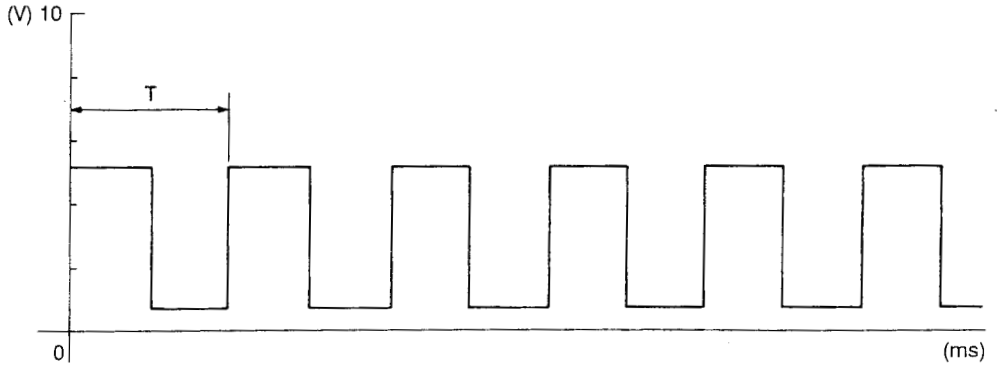
<Standard waveform>
Observation conditions

Probe switch	x1
AC-GND-DC	DC
TIME/DIV.	5ms
VOLTS/DIV.	2V
Other	-
Engine	Idling

Observation conditions (Only change to the conditions already specified is engine speed, which is as follows)

Engine speed	2,000rpm

Standard waveform

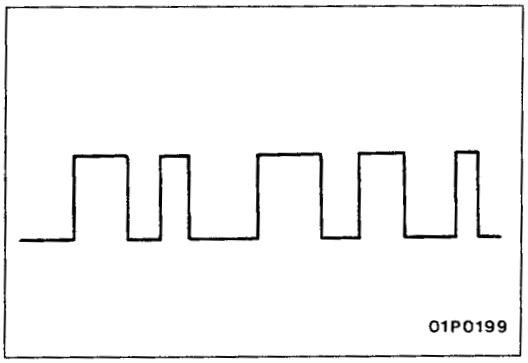


7FU0880

<An explanation of waveforms>
• The air flow sensor sends a frequency pulse signal relative in size to the air flow to the engine ECU. By measuring the pulse signal cycle time T (seconds), the output signal frequency can be calculated using the following formula:

Frequency (Hz) = 1/T (seconds)

<Waveform Observation Points>
• Check that, as the engine speed increases, cycle time T gets shorter, and frequency increases.



<Examples of abnormal waveforms>

• Example 1

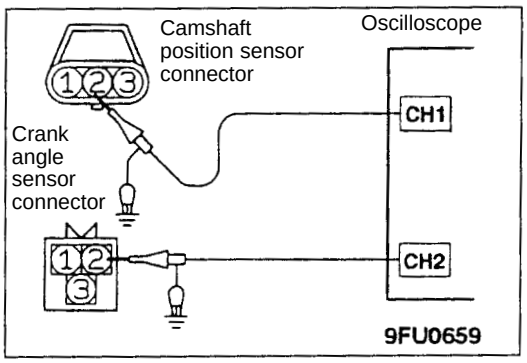
Waveform characteristics
Rectangular waveform is output, even when the engine is not started.

Cause of problem
Sensor interface fault

• Example 2

Waveform characteristics
Unstable waveform with unstable frequency.
However, when an ignition leak occurs during acceleration, the waveform will momentarily be distorted, even though the air flow sensor is normal.

Cause of problem
Damaged rectifier or vortex generation column



9-2 Cam position sensor and crank angle sensor
<Measurement method>

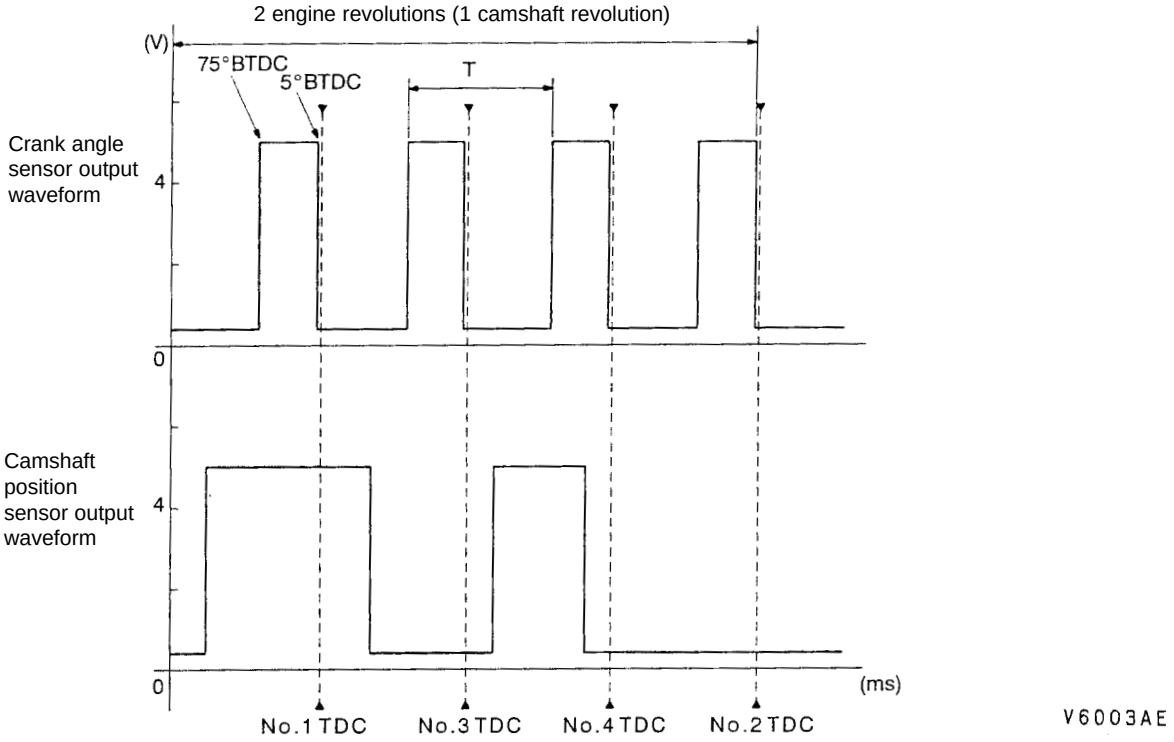
(1) Undo the camshaft position sensor connector, then connect the special test harness (MB991709). (All terminals should be connected)
(2) Undo crank angle sensor connector, then connect the special test harness (MD998478).
(3) Connect the probe for each channel on the oscilloscope to the camshaft position sensor connector No.2 terminal, and to the crank angle sensor connector terminal No.2 (the black clip on the special tool).
Note
When doing engine ECU connector measurement, connect the probe for each channel on the oscilloscope to terminal No.50 (camshaft position sensor) and terminal No.43 (crank angle sensor).

<Standard waveform>

Observation Conditions

	Camshaft position sensor	Crank angle sensor
Probe switch	x1	x1
AC-GND-DC	DC	DC
TIME/DIV.	10ms	10ms
VOLTS/DIV.	2V	2V
Other	-	-
Engine	Idling	

Standard waveform



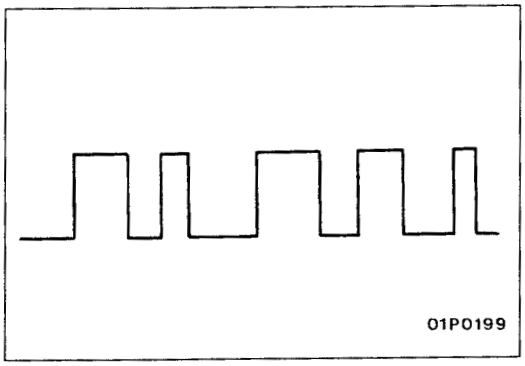
<Explanation of waveforms>

- Camshaft position sensors detect the compression top dead centre (TDC) for each cylinder. Simultaneous observation of this and other control signals makes it possible to distinguish between each of the cylinders.
- Crank angle sensors are sensors designed to detect cylinder crank angles. For each 2 revolutions of the engine, 4 evenly spaced crank angle sensor HIGH signals are output. So, by measuring the cycle time (seconds), the engine speed can be calculated using the following formula:

  Engine speed = 2/4T (seconds) x 60 = 30/T (seconds)

<Waveform Observation Points>

- Check that, as the engine speed increases, cycle time T gets shorter, and frequency increases.



<Examples of abnormal waveforms>

• Example 1

Waveform characteristics

Rectangular waveform is output, even when the engine is not started.

Cause of problem

Sensor interface fault

• Example 2

Waveform characteristics

Waveform is displaced to the left or right

Cause of problem

Loose timing belt

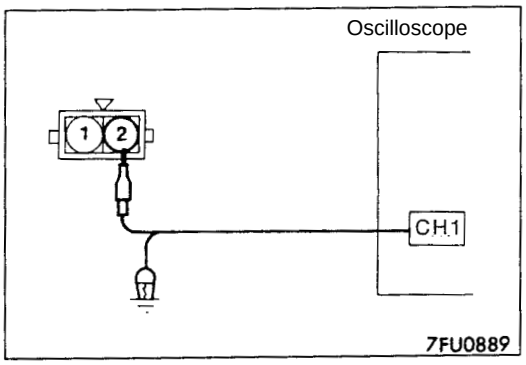
Sensor disk abnormality

9-3 Injectors

<Measurement Method>

(1) Undo injector connector, then connect the special test harness (MB991348). (All terminals should be connected)

(2) Connect oscilloscope probe to injector connector terminal No.2.



Note

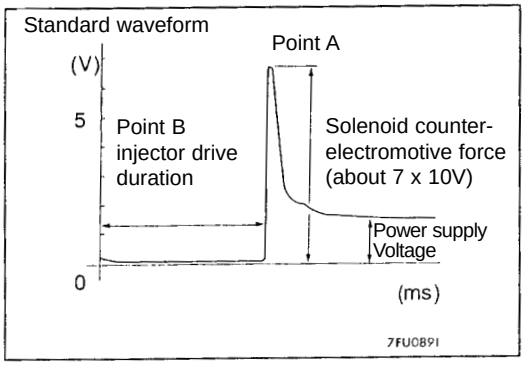
When doing engine ECU connector measurement, take measurements, connecting oscilloscope probe, at each of the following terminals.

When looking at No.1 cylinder: Terminal No.1.

When looking at No.2 cylinder: Terminal No. 9.

When looking at No.3 cylinder: Terminal No. 24.

When looking at No.4 cylinder: Terminal No. 2.



<Standard waveforms>

Observation conditions

Probe switch	x10
AC-GND-DC	DC
VOLTS/DIV.	1V
TIME/DIV.	0.5ms
Other	-
Engine speed	Idling

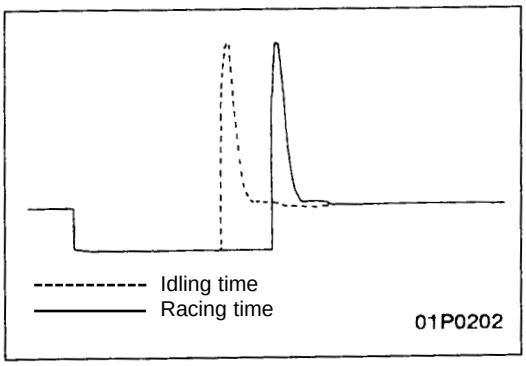
Explanation of waveforms

- A power supply voltage is normally applied, but when there is a signal from the engine ECU, the voltage drops to about 0V for the duration of that drive signal.
- When the signal from the engine ECU is cut, a voltage peak is seen as a result of the counter-electromotive force, then a return to power supply voltage.
- Injector drive time:
  Fuel injection time is determined by the engine ECU based on AFS and other sensor output values.
  Injector drive time = effective injection time + ineffective injection time (ineffective drive time: for correcting operating delays that result from drop in power supply voltage)
- Solenoid coil counter-electromotive force:
  If the signal from the engine ECU is switched OFF, a counter-electromotive force occurs in the injector coil.
  (about 65 to 75V)
- Power supply voltage:
  When there is no signal from the engine ECU, power supply voltage will be applied. When this power supply voltage is low, the ineffective injection time increases, and the drive time increases as well.

Waveform observation points

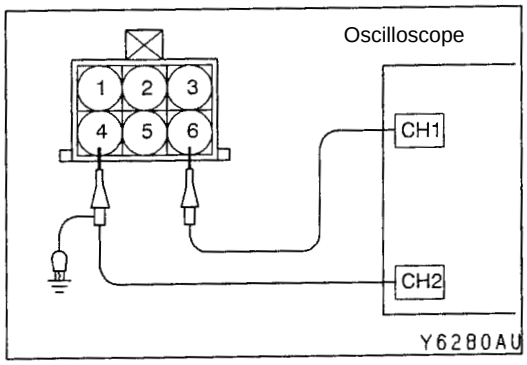
- Point A: Height of the solenoid coil counter-electromotive force

Solenoid coil counter-electromotive force is low or does not exist	Injector solenoid shorts



Point B: Injector drive time

Drive time	Synchronized with the MUT-II/III display
Harsh racing	The drive time is extended greatly for an instant, then immediately matches engine speed



10-4 ISC Servo (stepper motor)
<Measurement Method>
(1) Undo the ISC servo connector, then connect the special test harness (MB991709). (All terminals should be connected)
(2) Connect the probe for each oscilloscope channel either to ISC servo connector terminals Nos.1 and 3, or to terminals Nos.4 and 6.

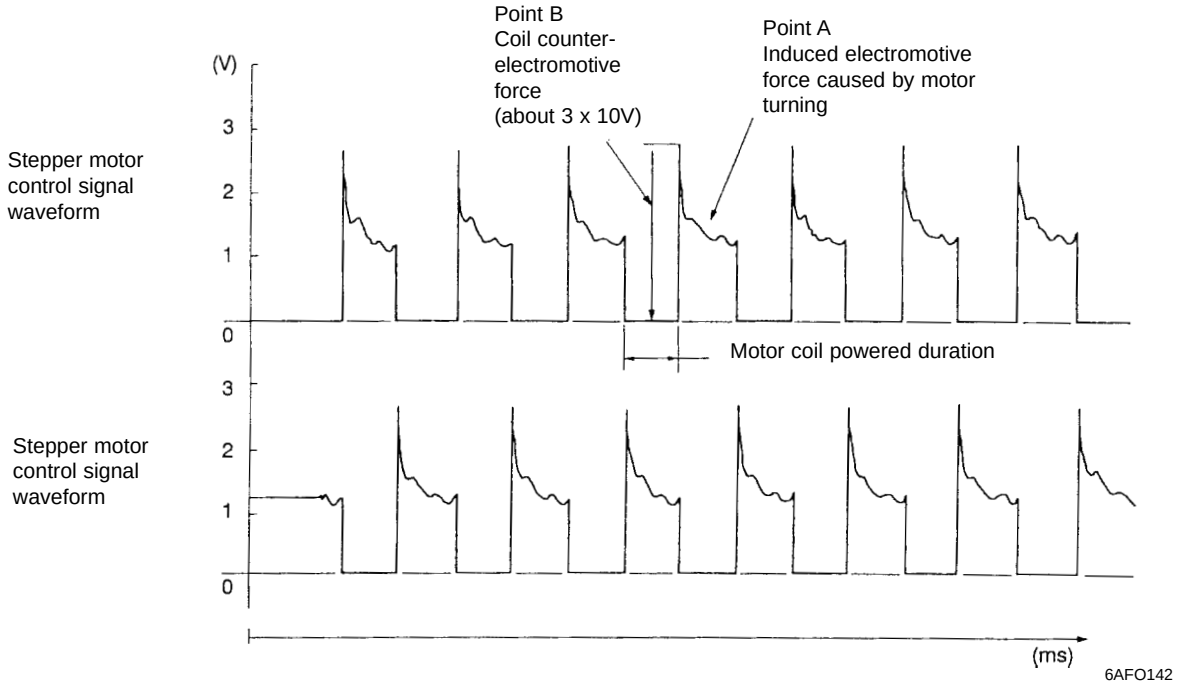
Note
When doing engine ECU connector measurement, take measurements for the following terminals.
Connect the probe for each oscilloscope channel either to terminals Nos.14 and 28, or to terminals Nos.15 and 29.

Standard waveform

Observation conditions (2CH both the same)

Probe switch	x10
AC-GND-DC	DC
VOLTS/DIV.	1V
TIME/DIV.	20ms
Other	Either ignition switch ON, OFF (engine cooling water temp. 20°C or less), or A/C switch ON, OFF (when idling)
Engine speed	-

Standard waveform



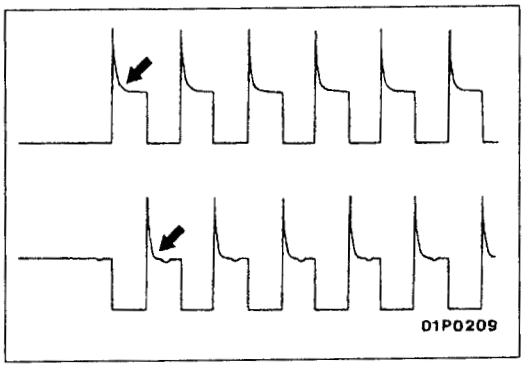
<Explanation of waveform>
- When, for example, ignition switches ON (and where engine cooling water temperature is 20ºC or less), or when A/C operates, the waveform is seen for an instant.
- Motor coil counter-electromotive force:
  When signal from engine ECU is switched OFF, a counter-electromotive force (about 30V) is seen in the motor coil.
- Induced electromotive force caused by motor turning:
  Induced electromotive force, caused by motor turning, is seen.

<Waveform Observation Points>
- Check that standard waveform appears when motor operating conditions are met.
- Point A: Presence or absence of induced electromotive force from the engine turning (ref. Abnormal waveform Example 1.)

Differences to standard waveform	Possible causes
Induced electromotive force is either absent or extremely low	Motor malfunction

- Point B: Height of coil counter-electromotive force

Differences to standard waveform	Possible causes
Coil counter-electromotive force is either absent or extremely low	Coil short



<Abnormal waveform>

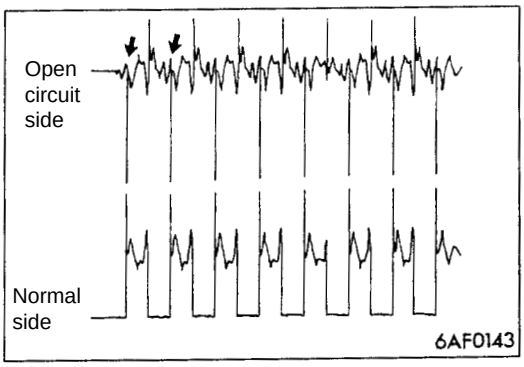
• Example 1

Waveform characteristics

Motor turning induced electromotive force is absent.

Cause of fault

Motor malfunction (motor is not turning)s



• Example 2

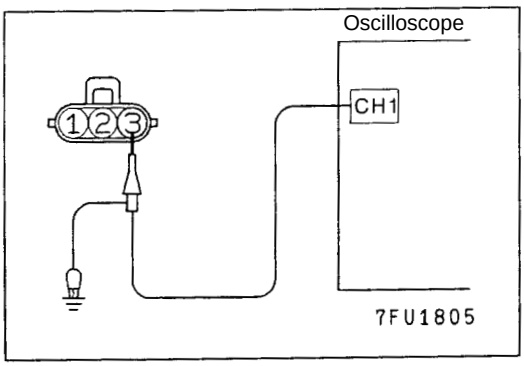
Waveform characteristics

Current is not supplied to the motor coil on the open circuit side. (Voltage does not drop to 0V).

Furthermore, the induced electromotive waveform on the normal side is slightly different to the standard waveform.

Cause of fault

Circuit is broken between the motor and engine ECU.



10-5 Ignition coil (power transistor control signal)

<Measurement Method>

(1) Undo ignition coil connector, then connect special harness (MBB991658). (All terminals should be connected)

(2) Connect oscilloscope probe to ignition coil connector terminal No.3.

Note

When doing engine ECU connector measurement, connect the oscilloscope probe to terminal No.11 (Ignition coil Nos.1 and 4), terminal No.12 (Ignition coil Nos.2 and 3).

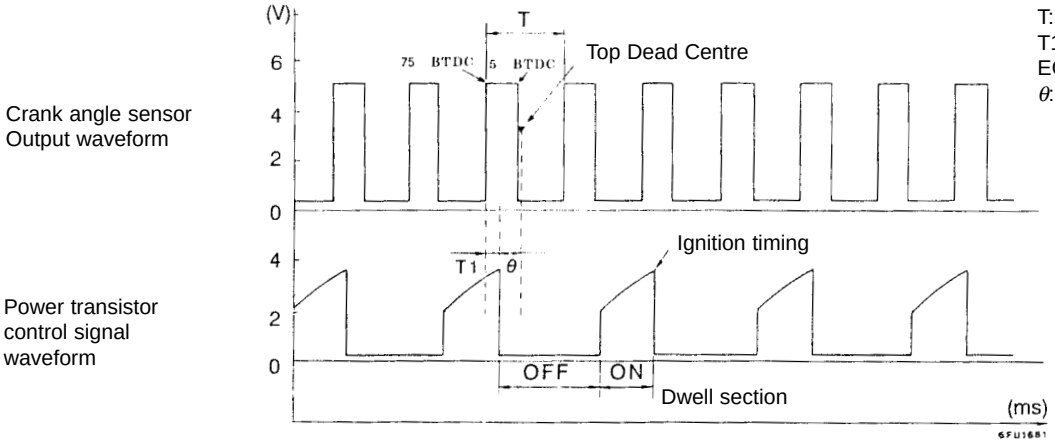
(3) To check ignition advance condition, simultaneously observe crank angle sensor output signal.

<Standard waveform>

Observation conditions

	Power transistor control signal	Crank angle sensor
Probe switch	x1	x1
AC-GND-DC	DC	DC
VOLTS/DIV.	2V	2V
TIME/DIV.	10ms	10ms
Other	-	-
Engine speed	About 1,200 rpm	

Standard waveform



T: Crank angle
T1: Time calculated by engine ECU
θ: Ignition advance angle

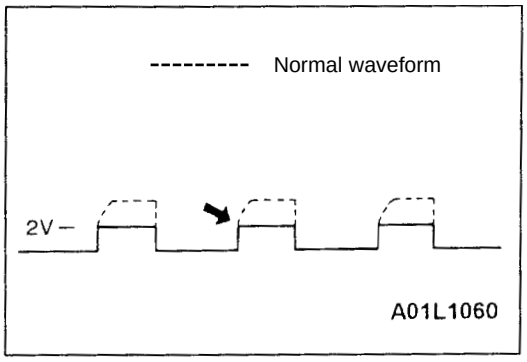
<Explanation of waveform>

- When spark angle is advanced by, for example, engine speed increasing, conditions such as those illustrated above arise.
  Ignition advance angle $\theta = 75° - T_1 / T \times 180°$
- Power transistor ON
  Condition where the power transistor is turned ON, and ignition coil primary side is powered (Dwell Section). The time it is powered will be shorter when the battery voltage is high, and it will be controlled so that the primary current at the time of ignition stabilises (about 6A). (The waveform for this section will be rising to the right)
- Power transistor OFF
  With the power transistor OFF, the power transistor drive signal is not output from the engine ECU.

<Waveform Observation Points>

- Waveform starting point condition and maximum voltage (ref. Abnormal waveform Examples 1, 2)

Waveform starting point condition and maximum voltage	Possible causes
Rises, upwards and to the right, up to about 4.5V from about 2V	Normal
Rectangular wave about 2V	Ignition primary circuit open
Power supply voltage rectangular wave	Power transistor fault

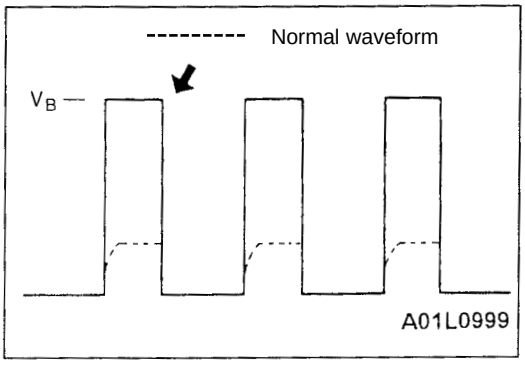


<Abnormal waveform>

• Example 1
Waveform when engine cranking

Waveform characteristics
At start up point, wave does not move upwards to the right, and the voltage is low at about 2V.

Cause of fault
Ignition primary circuit open



• Example 2
Waveform during engine cranking

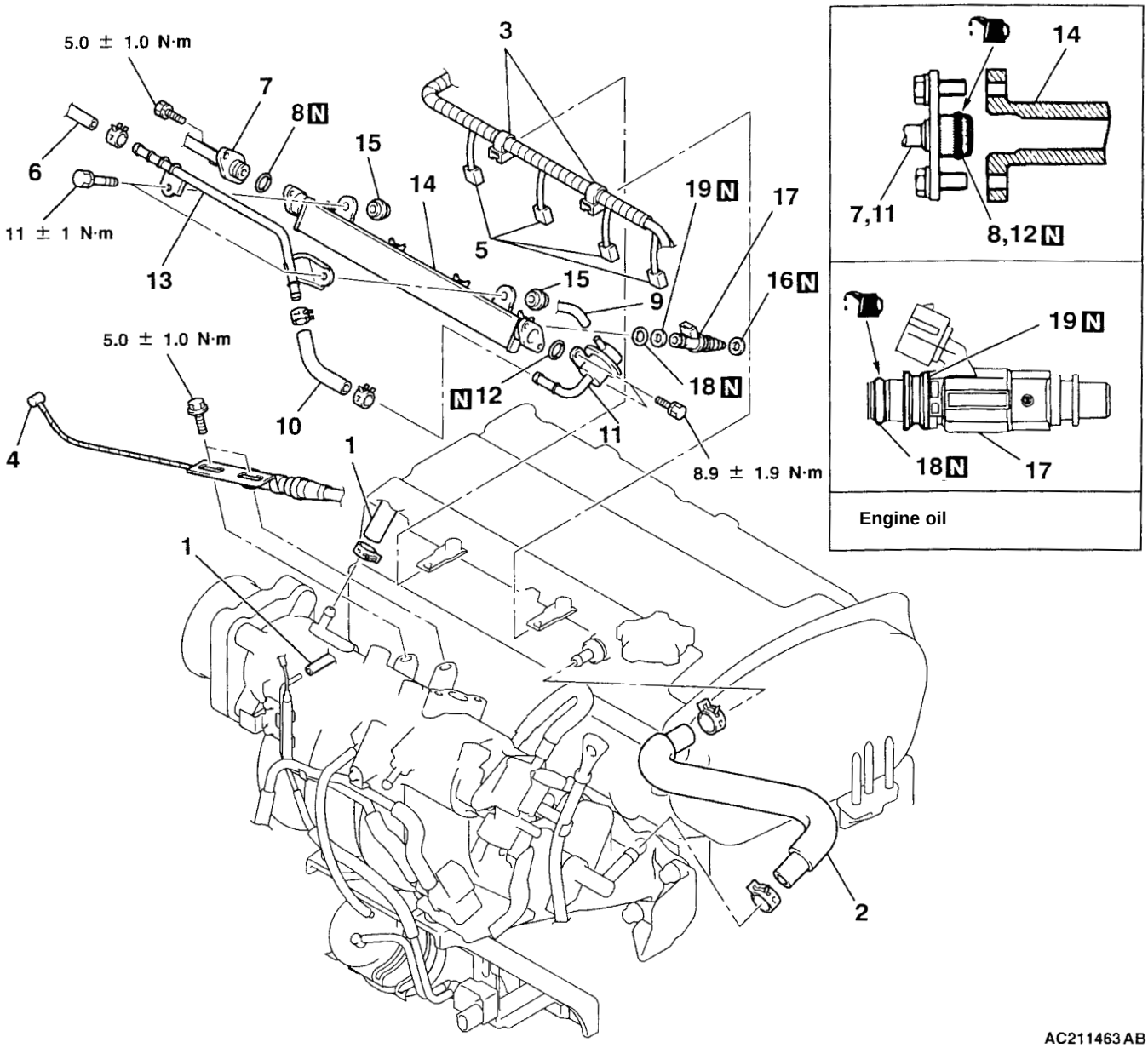
Waveform characteristics
There is a power supply voltage when the power transistor is ON.

Cause of fault
Power transistor fault.

INJECTORS

Disassembly and reassembly

Work that needs to be done before disassembly and after assembly • Measures to prevent fuel escaping (only prior to removal) • Removal and fitting of strut tower bar • Removal and fitting of air hose E, air by-pass hose, and air pipe C (ref. Chapter 15 Intercooler) • Check for any fuel leaks (only after fitting)



AC211463 AB

Disassembly procedure

1. Vacuum hose connection
2. PCV hose connection
3. Control harness clamp connection
4. Throttle cable connection (throttle body side)
5. Injector harness connector
6. Fuel return hose connection
7. ▶A◀ Fuel high pressure hose connection
8. O-ring
9. Vacuum hose connection
10. Fuel return hose
11. ▶A◀ Fuel pressure regulator
12. O-ring
13. Fuel return pipe
14. ◀A▶ Delivery pipe
15. Insulator
16. Insulator
17. ◀A▶ ▶A◀ Injector
18. O-ring
19. Grommet

Disassembly service points

◀A▶ Delivery pipe/injector removal

Remove the delivery pipe with the injector attached.

Assembly service points

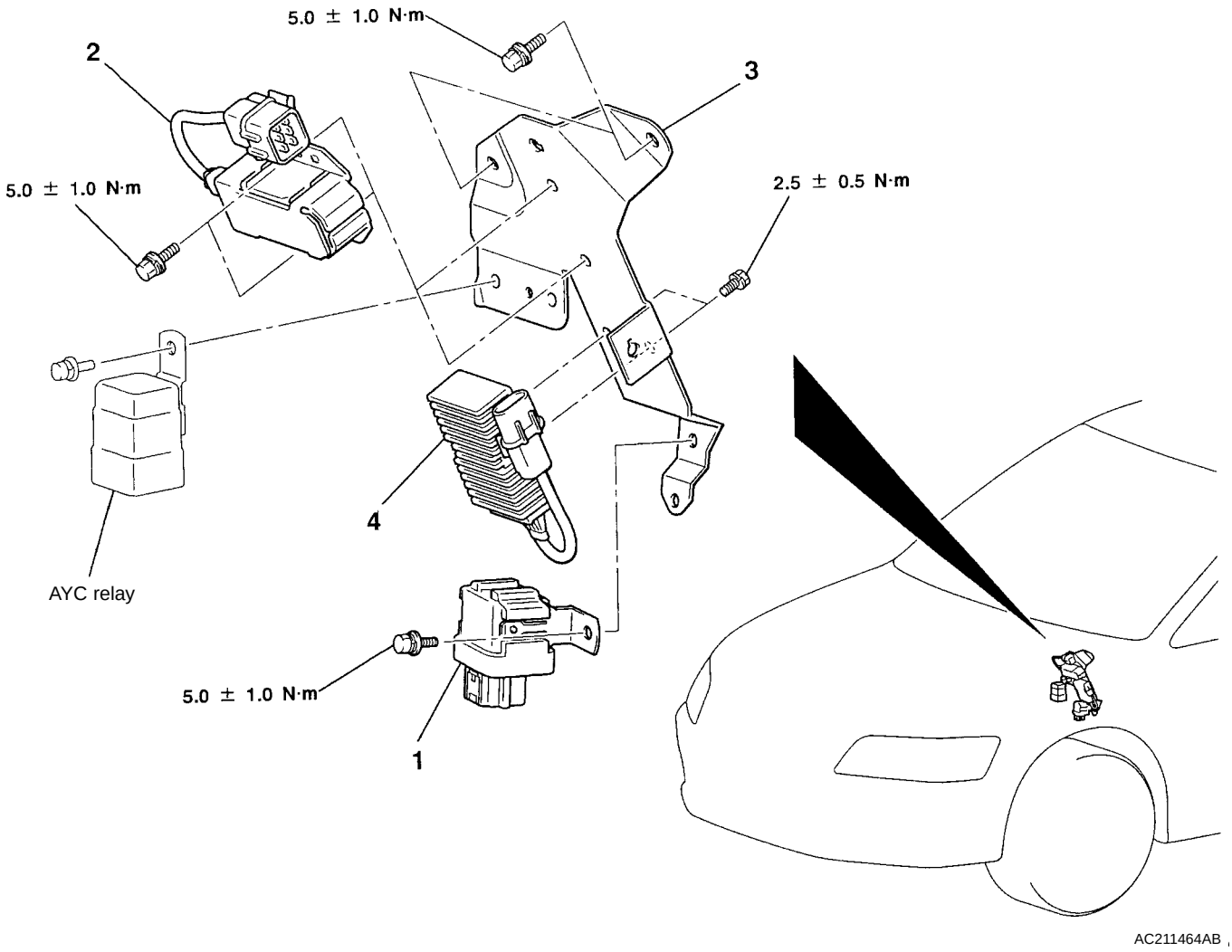
▶A◀ Assembling injectors/fuel pressure regulator/fuel high pressure hose

1. Apply a small quantity of new engine oil to O-ring
2. Being careful not to damage it, fit O-ring to delivery pipe whilst rotating fuel pressure regulator, and fuel high pressure hose, to left and right, making sure that you rotate them smoothly.
3. If they are not rotated smoothly, the O-ring could be pinched, so remove the part and check the O-ring for any damage, then re-insert into delivery pipe and check.
4. Tighten fuel pressure regulator to specified torque.
   Tightening torque: 8.9 ± 1.9 N·m
5. Tighten fuel high pressure hose to specified torque.
   Tightening torque: 5.0 ± 1.0 N·m

Engine control resistor and relay

Removal and Installation

Pre-removal and post-installation operations
- Removal and fitting of strut tower bar
- Removal and fitting of harness connector connection



Removal procedure
- AYC relay

1. Fuel pump relay
2. Injector resistor
3. Relay bracket
4. Fuel pump resistor

SECTION 13B

FUEL SUPPLY

CONTENTS

General Information.....1 **Fuel Tank 2**

General Information

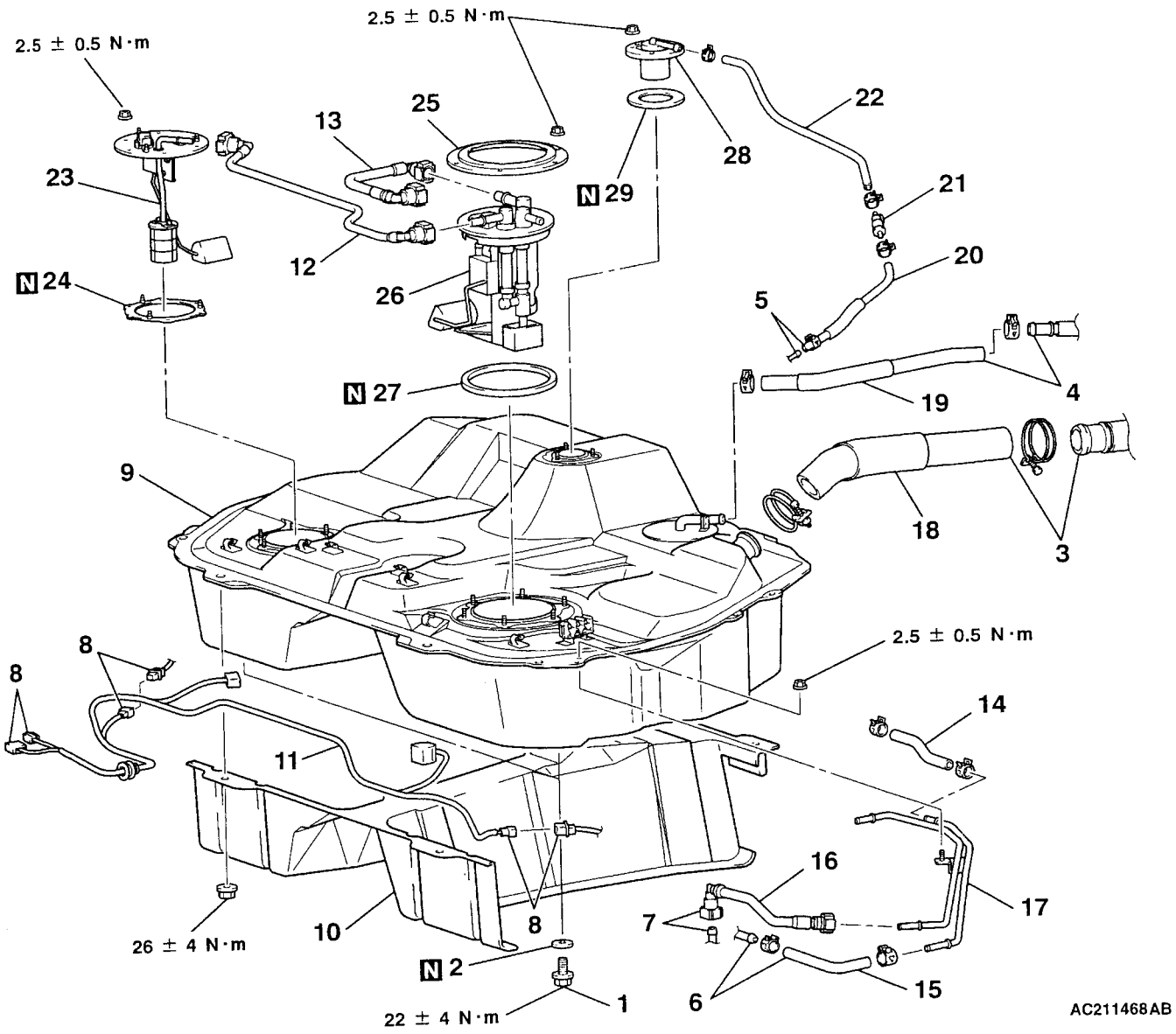
The following servicing information has been issued in conjunction with changes to the fuel tank.

Fuel Tank

Disassembly and Assembly

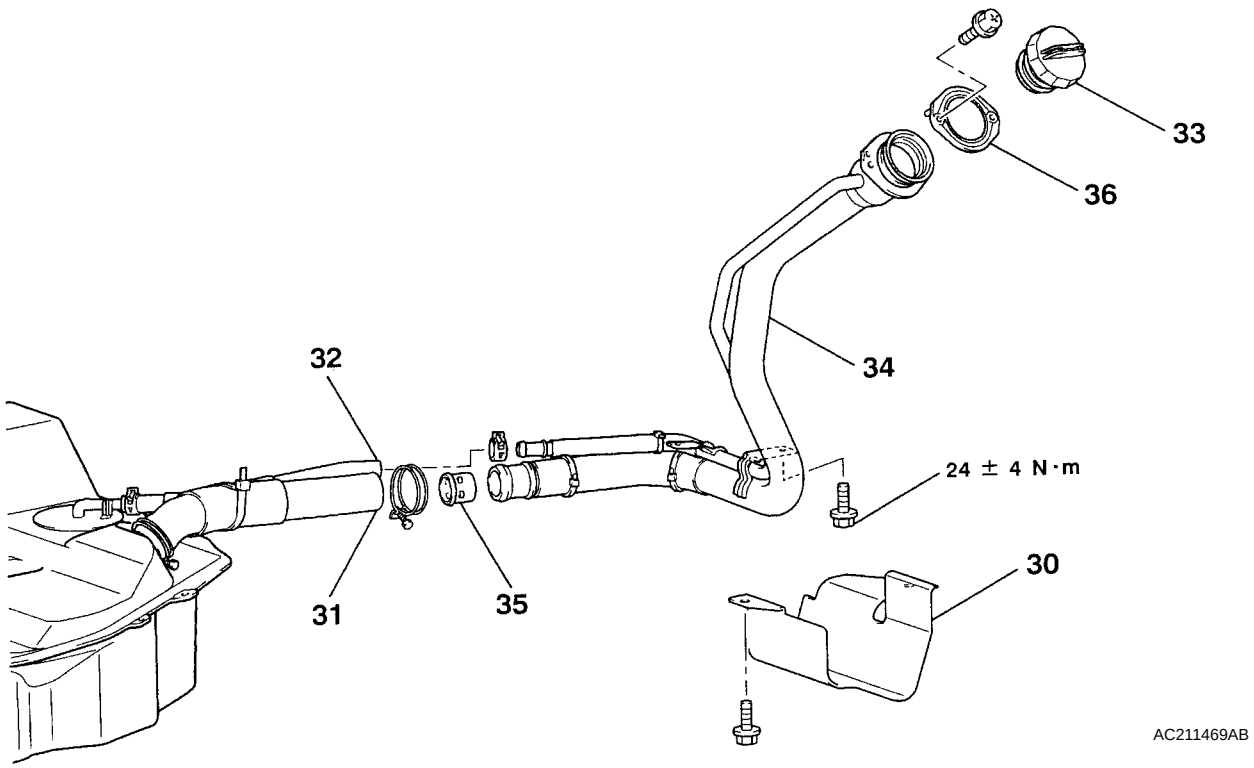
Work that needs to be done before disassembly and after assembly	
• Measures to prevent fuel escaping (only prior to removal)	• Removal and fitting of propeller shaft
• Emptying or filling of fuel	• Removal and fitting of centre exhaust pipe
• Checking for any fuel leaks (only after assembly)	

<Fuel tank ASSY>



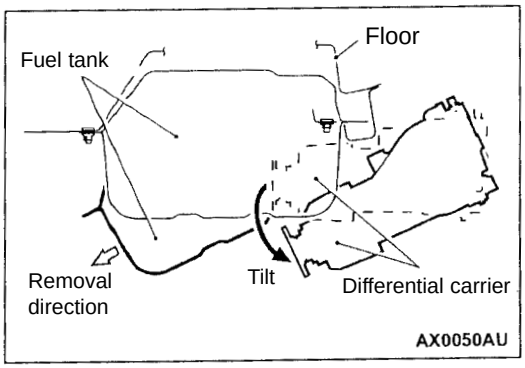
1. Drain plug
2. Gasket
3. Filler neck hose connection
4. Filler neck vapour hose connection
5. Vapour hose connection
6. Return hose connection
- ▶A◀ 7. High pressure hose connection
8. Fuel tank harness connection
   - Parking brake cable clamp
   - ABS wheel speed sensor rear harness connector and harness clamp connection
- ◀A▶ 9. Fuel tank ASSY
10. Protector
11. Fuel tank harness
- ▶A◀ 12. Suction hose
- ▶A◀ 13. High pressure hose
14. Fuel tank return hose
15. Return hose
- ▶A◀ 16. High pressure hose
17. Fuel tank pipe ASSY
18. Filler neck hose
19. Filler neck vapour hose
20. Vapour hose
21. Check valve
22. Fuel tank vapour hose
23. Pipe and gauge ASSY
24. Packing
25. Plate
26. Fuel pump & gauge ASSY
27. Packing
28. Cut-off valve ASSY
29. Packing

<Fuel filler neck ASSY>



Fuel filler neck ASSY disassembly procedure

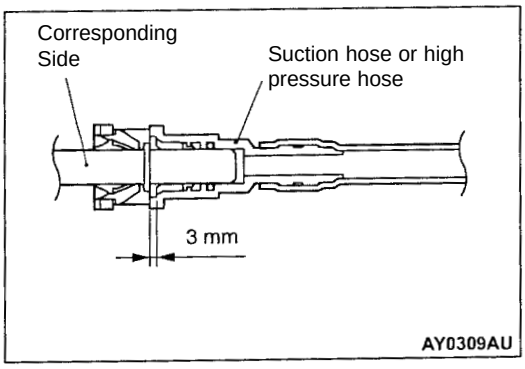
30. Protector
31. Filler neck hose connection
32. Filler neck vapour hose connection
33. Fuel filler cap
34. Filler neck ASSY
35. Fuel shut-off valve
36. Packing



REMOVAL

◀A▶ Fuel tank ASSY removal

1. Remove differential support member bolt, and tilt the differential carrier down.
2. Support the fuel tank with a transmission jack, then remove the nut connected to the fuel tank.
3. Then remove the fuel tank, without hitting the differential carrier, in the tilting direction.



INSTALLATION

▶A◀ Fitting suction hose / High pressure hose

Caution
Snap the high pressure fuel hose or suction hose one-touch joint into place, then pull back slightly on the hose to confirm that it is securely in place. However, check that the connection has about 3mm play.

SECTION 14

ENGINE COOLING

CONTENTS

General Information 1
Sealants 1
Thermostat 2
2Water hose and water pipe 4

General Information

The following servicing information has been issued in conjunction with changes to the 4G63-MPI-T/C engine on the new Lancer Evolution VIII.
Other servicing information remains the same.

• Sealant has been added to the water outlet fitting and thermostat case mounting surface.
• The shapes of the water hose and pipe have been changed.

Sealants

Location	Name
Water outlet fitting	Semi-dry sealant: Three Bond silicone-based liquid gasket sealant 1207F [MZ100191] (contents 150g)
Thermostat case	

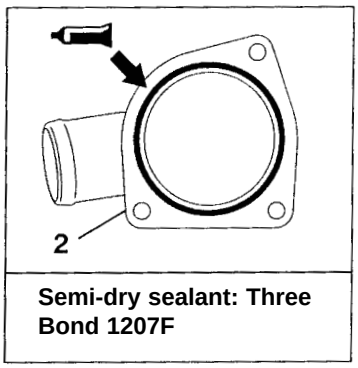
Note

[ ]: original part numbers

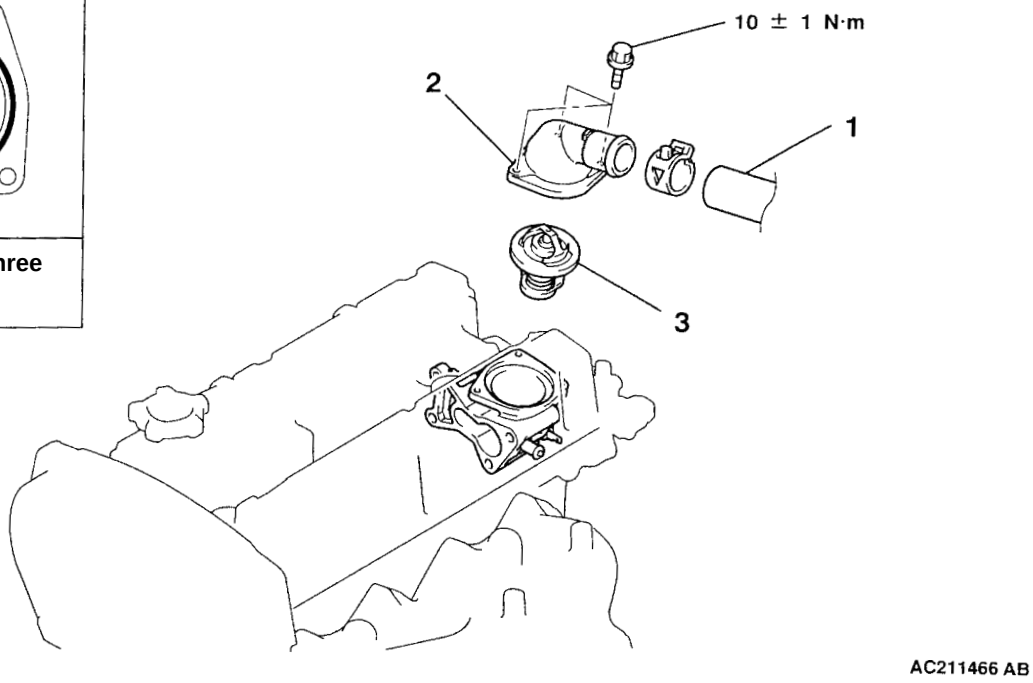
Thermostat

Removal and Fitting

Pre-removal and post-fitting operations
- Draining and filling of coolant
- Removal and fitting or air ducts
- Removal and fitting of air pipe ASSY (ref. Chapter 15-2 Secondary Air Control System)



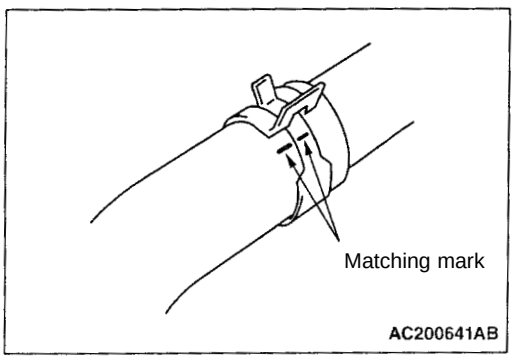
Semi-dry sealant: Three Bond 1207F



AC211466 AB

Removal procedure

◀A▶ ▶C◀ 1. Radiator upper hose connection
▶B◀ 2. Water outlet fitting
▶A◀ 3. Thermostat



AC200641AB

REMOVAL

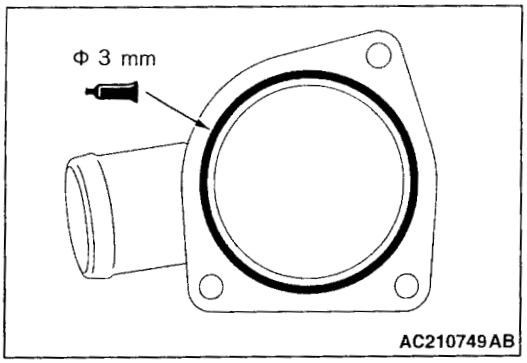
◀A▶ Disconnect radiator upper hose
Disconnect radiator upper hose after having first aligned the matching marks on the radiator upper hose and hose clamp.

FITTING

▶A◀ Fitting thermostat

Fit the thermostat being careful not to fold over or damage the rubber ring.

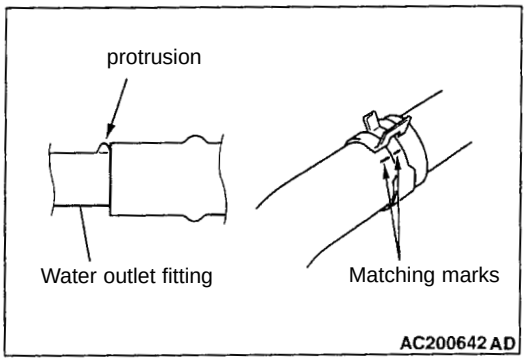
Caution
Make absolutely sure that no oil is adhering to the rubber ring of the thermostat. Moreover, if the rubber ring is damaged, replace the thermostat.



▶B◀ Installing water outlet fitting

1. Remove any sealant adhering to water outlet fitting and thermostat casing.
2. As shown in the diagram, apply sealant to the thermostat case mounting surface of the water outlet fitting.
   Semi-dry sealant: Three Bond 1207F
3. Mount the water outlet fitting on the thermostat case.

   Note
   Mount the water outlet fitting on the thermostat case while the sealant is still moist (within 15 minutes of applying the sealant).



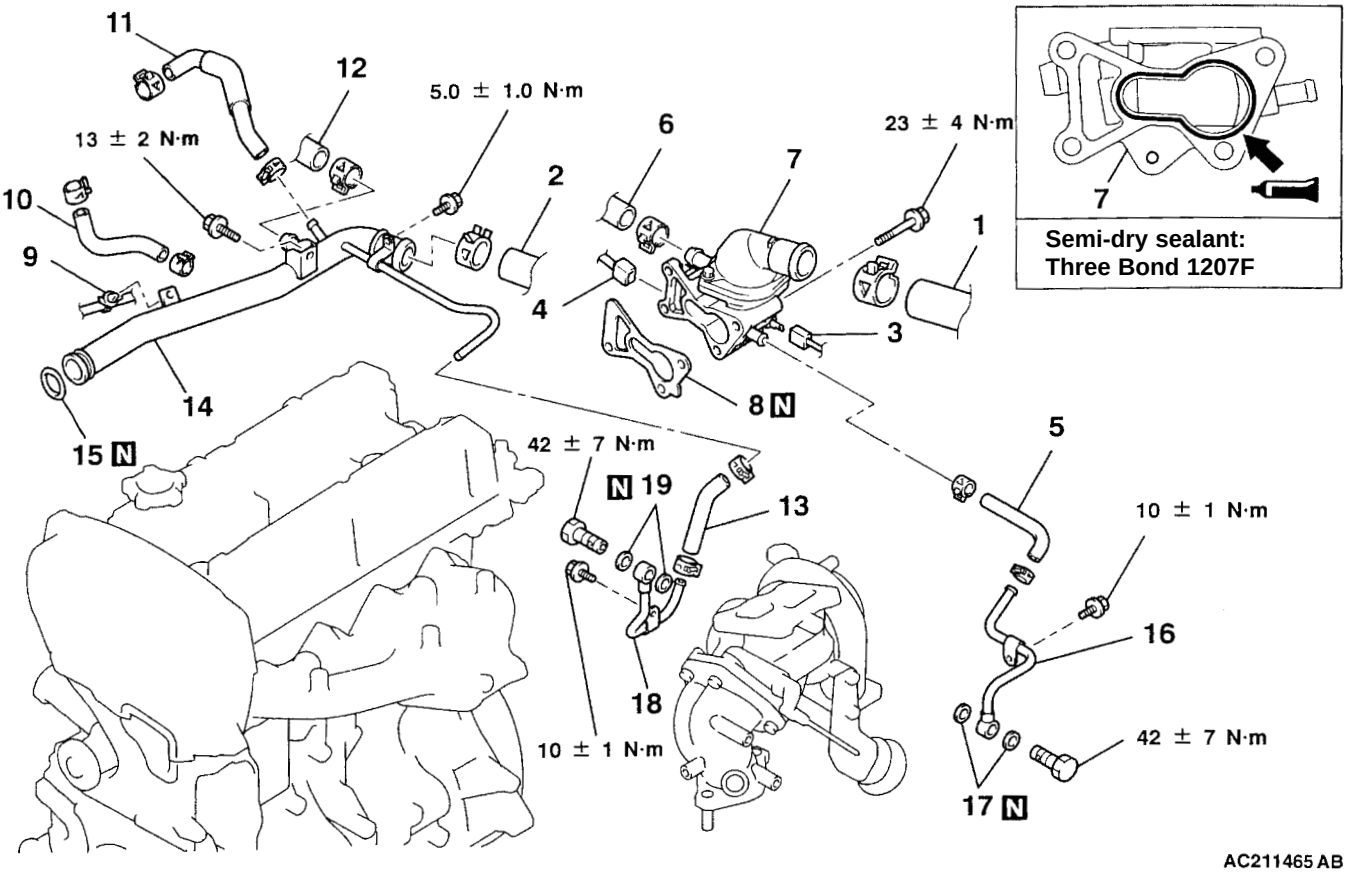
▶C◀ Radiator upper hose connection

1. Insert radiator upper hose as far as the protrusion on the water outlet fitting.
2. Fit the radiator upper hose, aligning the matching marks on the radiator upper hose and hose clamp.

Water hose and pipe

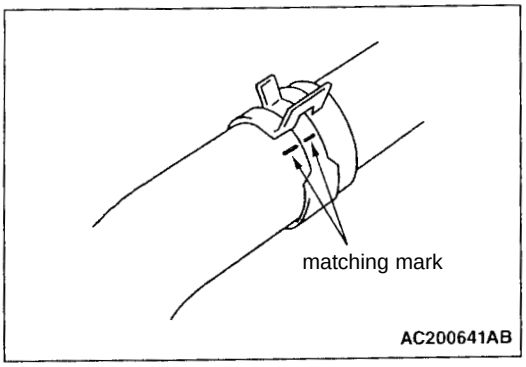
Removal and Fitting

Pre-removal and post-fitting operations
- Removal and fitting of cover
- Draining and filling of coolant
- Removal and fitting of air cleaner ASSY
- Removal and fitting of air by-pass valve ASSY, air by-pass hose, air hose D and E, and air pipe C (ref. Chapter 15 - Intercooler)
- Removal and fitting of air control valve bracket (ref. Chapter 15 –2 Secondary Air Control System)



Fuel tank ASSY disassembly procedure

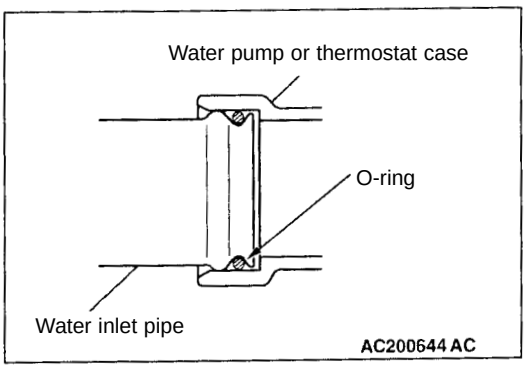
◀A▶ ▶C◀ 1. Radiator upper hose connection
◀A▶ ▶C◀ 2. Radiator lower hose connection
3. Water temperature gauge unit connector
4. Water temperature sensor connector
5. Water hose
6. Heater hose connection
▶B◀ 7. Water outlet fitting & thermostat case ASSY
8. Thermostat case gasket
9. Knock sensor harness clamp
10. Water hose
11. Water hose
12. Heater hose connection
13. Water hose
▶A◀ 14. Water inlet pipe
▶A◀ 15. O-ring
16. Turbocharger water feed pipe
17. Gasket
• Turbocharger ASSY
18. Turbocharger water return pipe
19. Gasket



REMOVAL

◂ A ▸ Disconnect radiator upper hose /radiator lower hose

Disconnect radiator hoses after having first aligned matching marks on radiator hose and hose clamp.



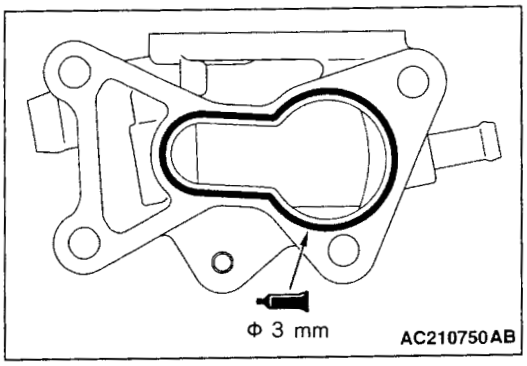
FITTING

▸ A ◂ O-ring /water inlet pipe fitting

Insert O-ring into the groove on the water inlet pipe, then insert the pipe after wetting the area around the circumference of the O-ring or the inner surface of water inlet pipe where it connects with water

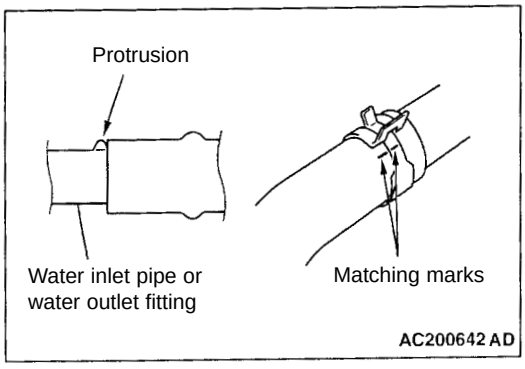
Caution

Make absolutely sure that no engine oil or other grease is adhering to the O-ring.



▸ B ◂ Water outlet fitting and thermostat case ASSY

1. Remove any sealant adhering to the thermostat case or cylinder head.
2. As shown in the diagram, apply sealant to the cylinder head mounting surface the thermostat case.
   Semi-dry sealant: Three Bond 1207F
3. Fit the water outlet fitting and thermostat case ASSY to the cylinder head.
   Note
   Mount the water outlet fitting & thermostat case ASSY on the cylinder head while the sealant is still moist (within 15 minutes of applying the sealant).



▸ C ◂ Connecting radiator lower hose/radiator upper hose

1. Insert hoses as far as the protrusion on the water inlet pipe and water outlet fitting.
2. Connect the radiator hoses, aligning the matching marks on the radiator hose and hose clamp.

SECTION 15

INTAKE & EXHAUST

CONTENTS

General Information 1
Servicing specifications.....1
On-vehicle servicing.....1
1. Turbocharger super charging pressure check 1
2. Air by-pass valve check 1
Intercooler 2
Intercooler water spray 3
Secondary air control system.....6
Inlet manifold 7

General Information

The following servicing information has been issued in conjunction with changes to the 4G63-MPI-T/C engine on the new Lancer Evolution VIII.
Other servicing information remains the same.
• Change to turbocharger supercharging pressure
• Change to air by-pass valve operation opening pressure
• Change to intercooler
• Change to intercooler water spray hose
• Change to air by-pass valve and air hose
• Deletion of EGR valve and manifold differential pressure (MDP) sensor

Servicing specifications

Item	Standard value
Turbocharger supercharging pressure kPa	89 and 138
Air by-pass valve operation opening pressure kPa	About 61

ON-VEHICLE SERVICING

1. Turbocharger supercharging pressure check
The turbocharger supercharging pressure has been changed.

Standard value: 89 and 138kPa

2. Air by-pass valve check
Air by-pass valve standard value has been changed.

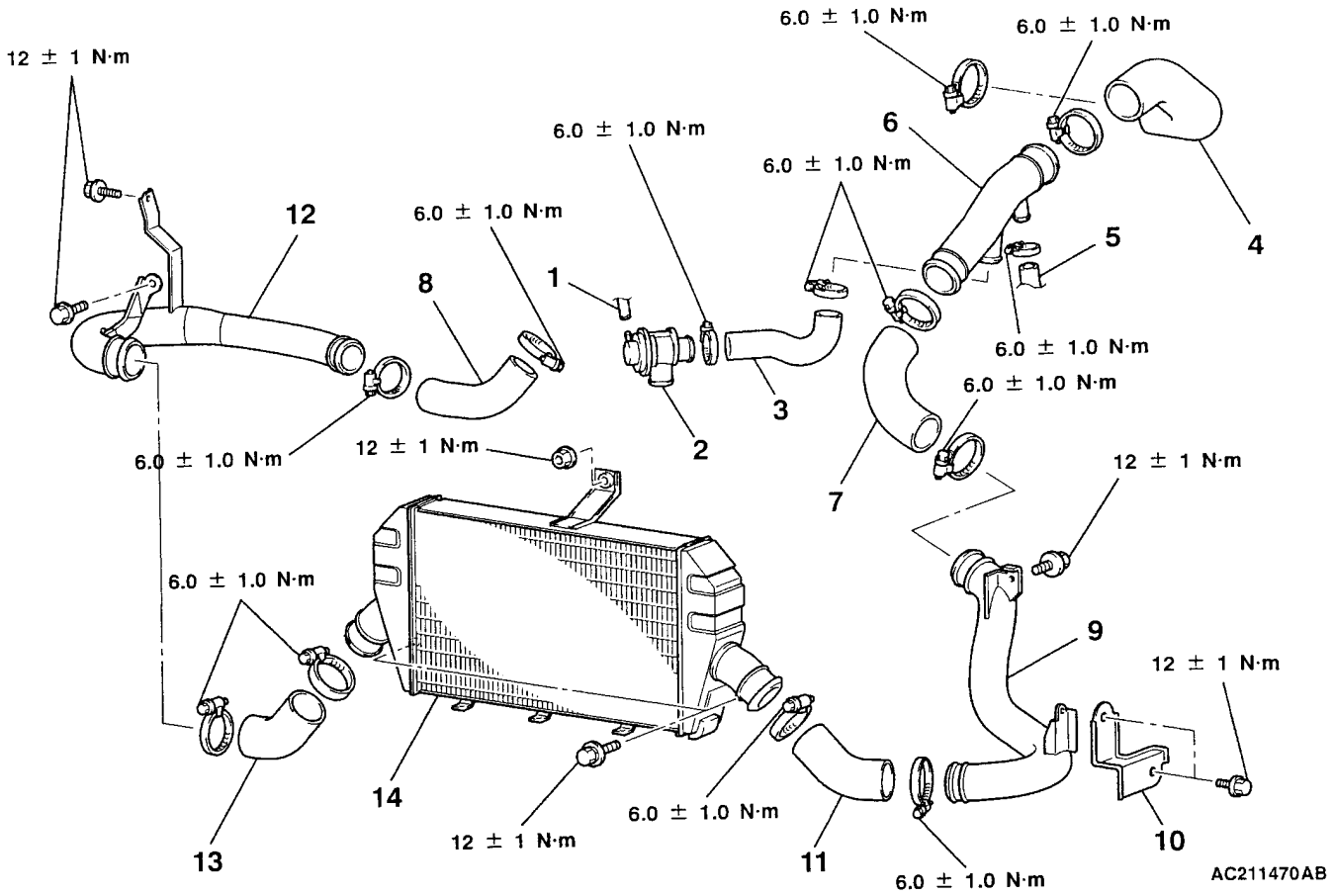
Standard value:

Negative pressure	Valve operation
About 61kPa	Starts to open

Intercooler

Removal and fitting

Pre-removal and post-fitting operations
• Removal and fitting of air duct and air cleaner ASSY

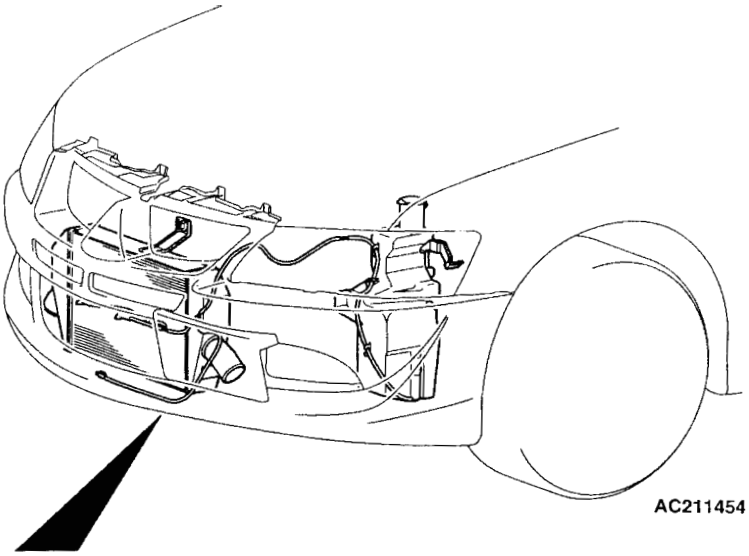


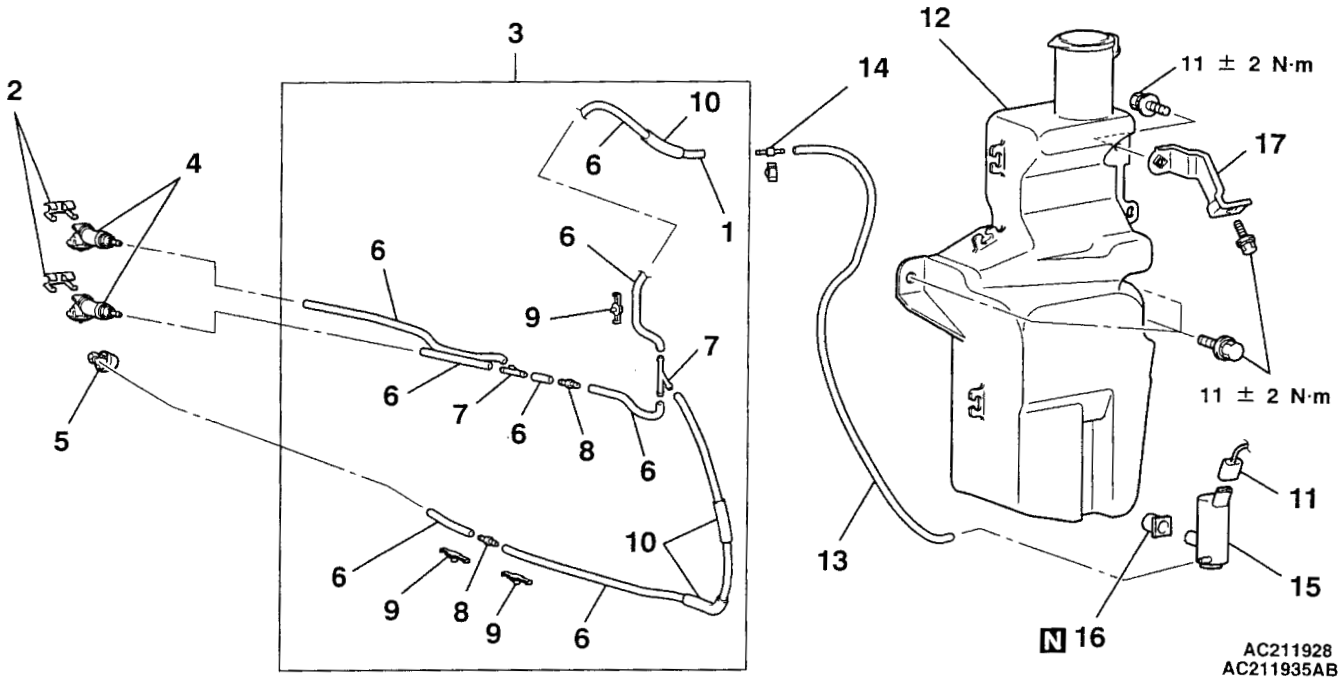
Removal procedure
1. Vacuum hose connection
2. Air by-pass valve ASSY
3. Air by-pass hose
4. Air hose E
5. Air hose connection (secondary air control system)
6. Air pipe C
7. Air hose D
• Cover (ref. Chapter 51)
8. Air hose A
• Front bumper ASSY (ref. Chapter 51)
9. Air pipe B
10. Bracket
11. Air hose C
12. Air pipe A
13. Air hose B
14. Intercooler ASSY

Intercooler Water Spray

Removal and fitting

<Water spray nozzle, hose, washer tank>



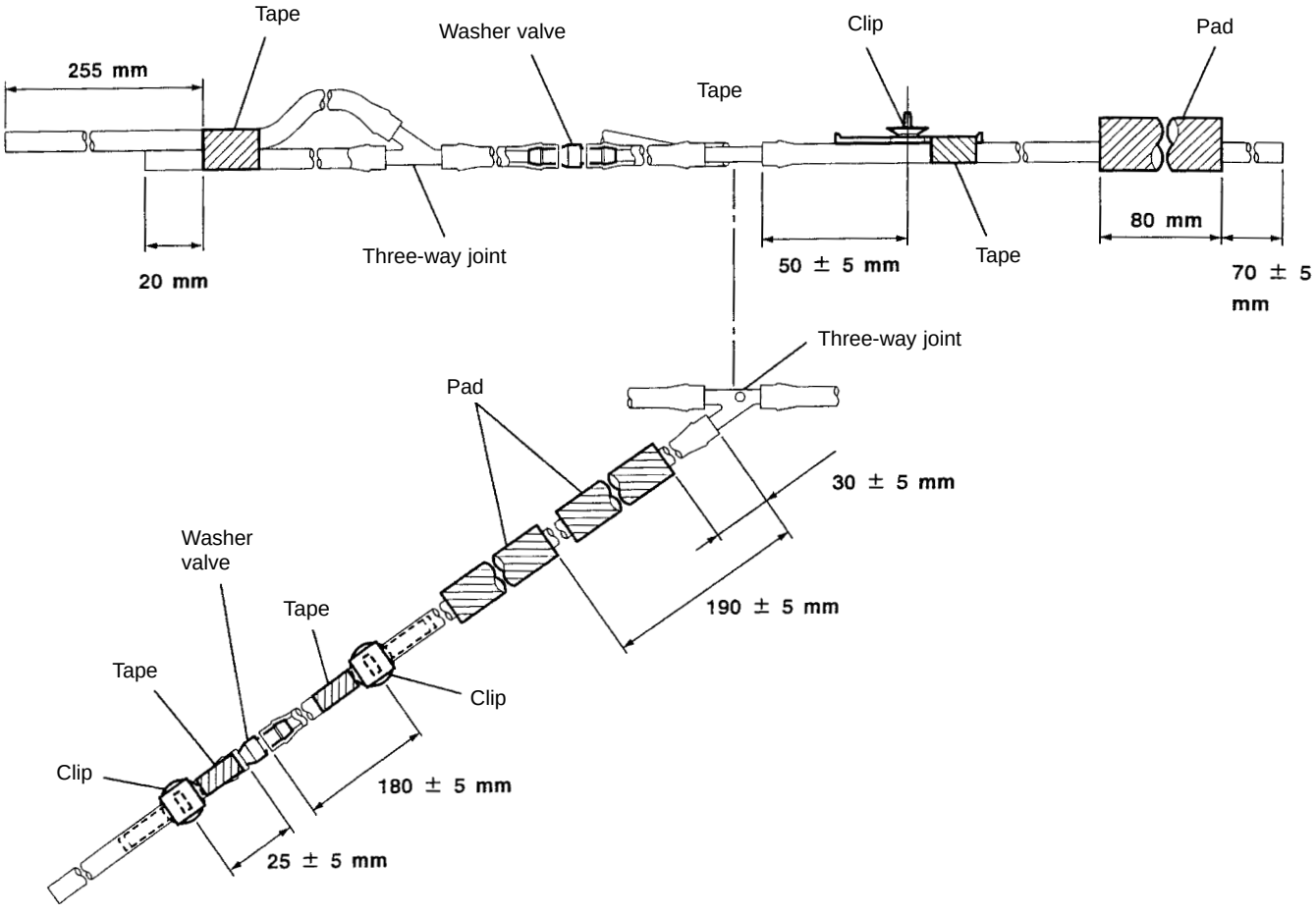


Water spray nozzle and hose disassembly procedure
1. Water spray hose connection
• Front bumper ASSY
(ref. Chapter 51)
◗A◖ • Tape (for mounting water spray hose ASSY)
2. Clamp
◗A◖ 3. Water spray hose ASSY
4. Water spray nozzle (upper side)
5. Water spray nozzle (lower side)
6. Water spray hose
7. Three-way joint
8. Washer valve
• Tape (for attaching clip)
9. Clip
10. Pad

Washer tank removal procedure
1. Water spray hose connection
11. Harness connector connection
12. Washer tank
13. Water spray hose
14. Washer valve
15. Water spray motor
16. Packing
17. Bracket

Fitting

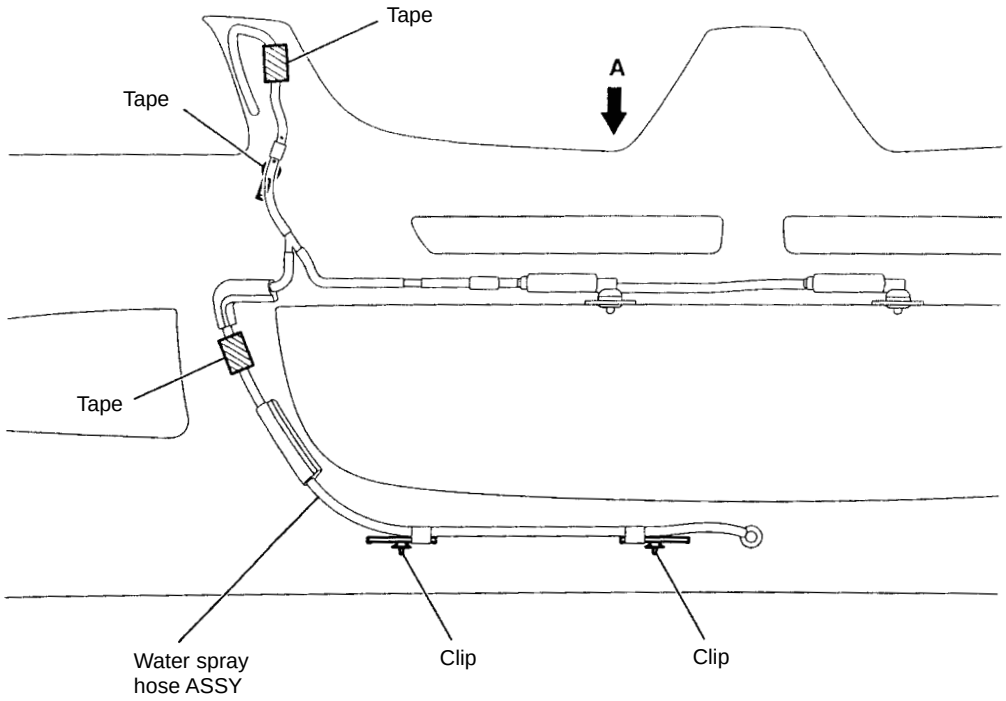
◗A◖ **Fitting water spray hose ASSY/Tape (for mounting water spray hose ASSY)**
1. After fitting water spray hose, three-way joint, and washer valve, stick on pads, clip, and tape as shown in the diagram.

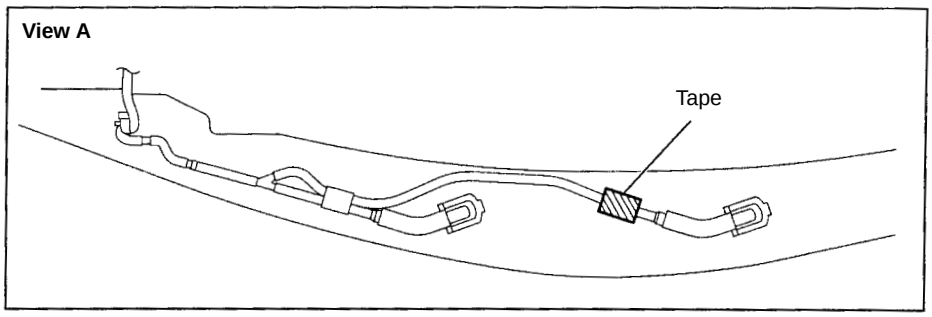


AC211929AB

2. Attach the water spray hose ASSY to the front bumper using the water spray hose ASSY clip.
3. Stick tape on as illustrated, so that the water spray hose ASSY does not slip.

View of front bumper rear surface



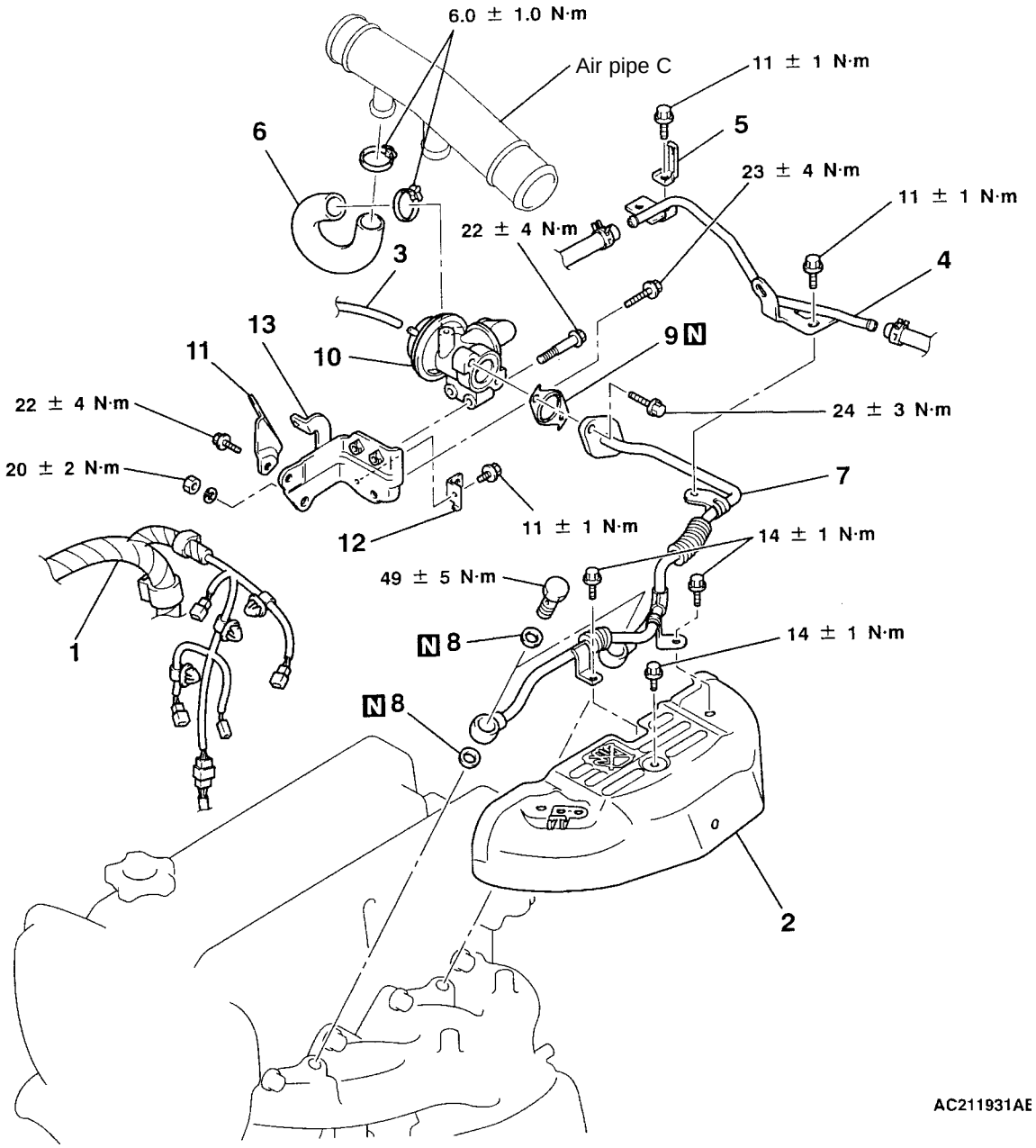


AC211930AB

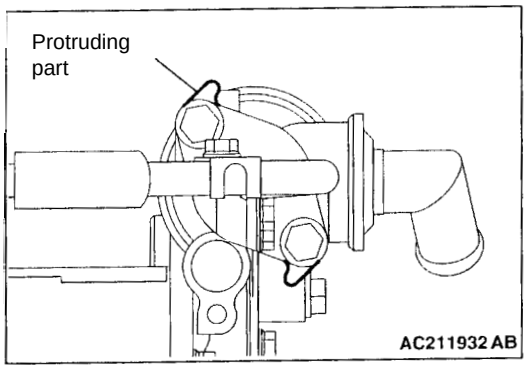
Secondary Air Control System

Removal and fitting

Pre-removal and post-fitting operations
• Removal and fitting of the air duct
• Removal and fitting of the strut tower bar



Removal procedure
1. Control harness connection
2. Heat protector
3. Vacuum hose connection
• Air pipe C (ref. P.15-8)
4. Vacuum pipe
5. Harness bracket (secondary air control system)
6. Air hose
7. Air pipe ASSY
8. Gasket
▶A◀ 9. Gasket
10. Secondary air control valve
11. Engine hanger
12. Harness bracket
13. Air control valve bracket



FITTING

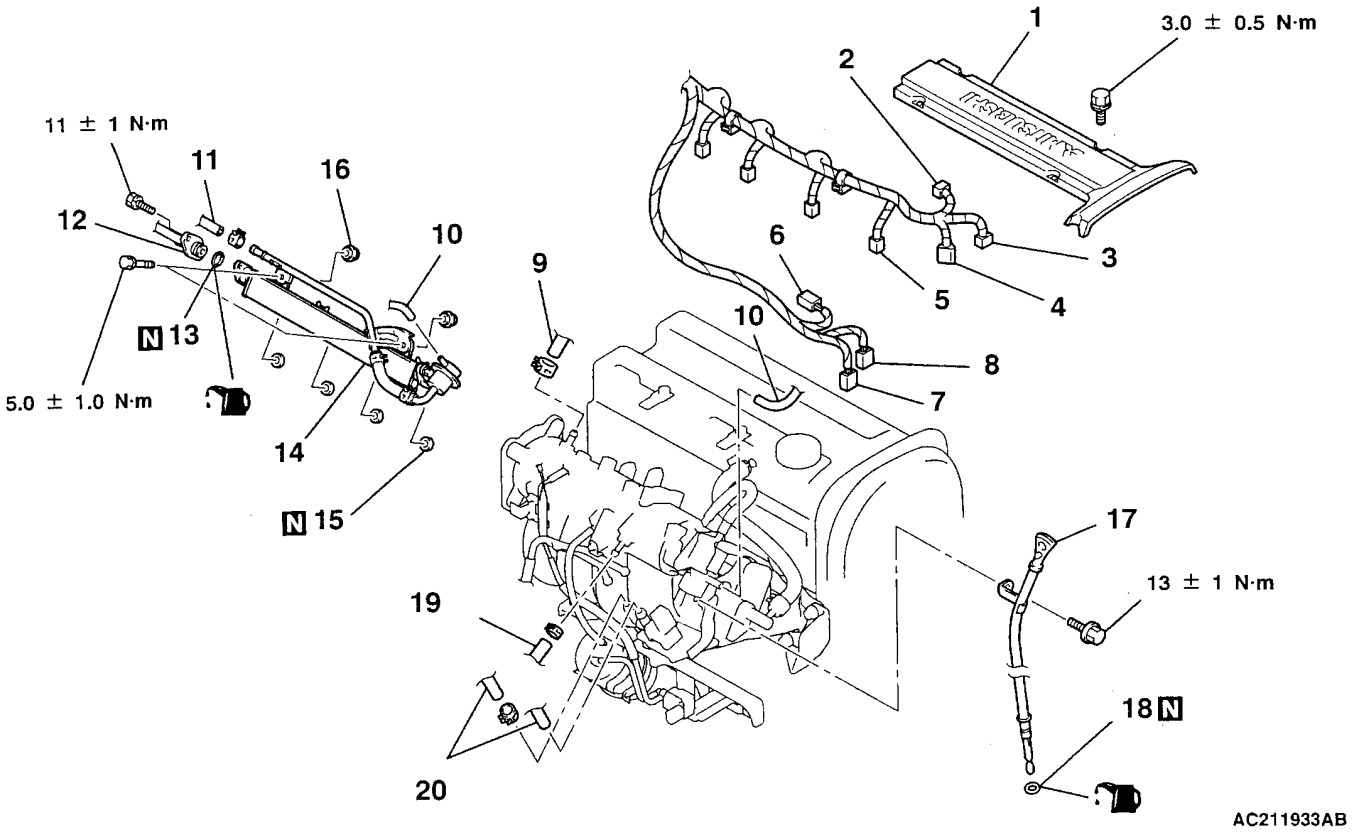
▶A◀ Gasket fitting

Fit so that the gasket protruding part points in the direction indicated in the diagram.

Inlet manifold

Fitting and removal

Pre-removal and post-fitting operations
- Measures to prevent any leakage of fuel <pre-removal only>
- Removal and fitting of cover (ref. Chapter 51 – Front Bumper)
- Draining and filling of coolant
- Removal and fitting of air duct
- Removal and fitting of strut tower bar
- Removal and fitting of throttle body
- Removal and fitting of air control valve bracket (P.15-6)
- Removal and fitting of cross member bar
- Removal and fitting of front exhaust pipe

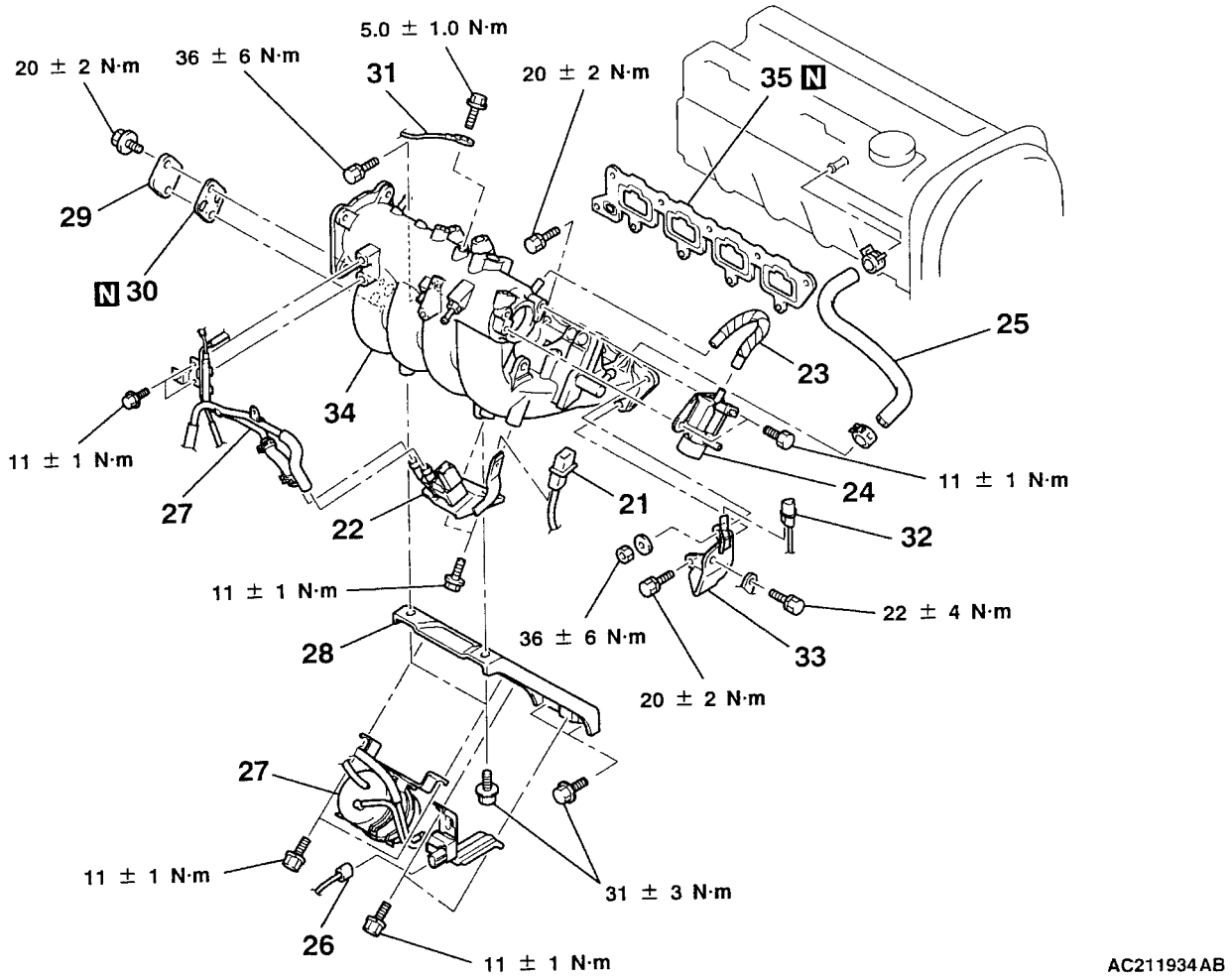


Removal procedure

1. Centre cover
2. Ignition coil connector connection
3. O_2 sensor connector connection
4. Crank angle sensor connector connection
5. Injector connector connection
6. Fuel pressure solenoid valve connector connection
7. Purge solenoid valve connector connection
8. Knock sensor connector connection
9. Vacuum hose connection
10. Vacuum hose
11. Fuel return hose connection

◀A▶

12. Fuel high pressure hose connection
13. O-ring
14. Delivery pipe, injector & fuel pressure regulator ASSY
15. Insulator
16. Insulator
17. Oil level gauge & guide ASSY
18. O-ring
19. Brake booster vacuum hose connection
20. Purge hose connection



Removal procedure
21. Knock sensor connector connection
22. Purge control solenoid valve ASSY
23. Vacuum hose
24. Fuel pressure solenoid valve ASSY
25. PCV hose
• Alternator
26. ACV solenoid valve connector connection
27. Vacuum tank, ACV solenoid valve, vacuum hose & pipe ASSY
28. Inlet manifold stay
29. Cover
30. Gasket
31. Earth cable connection
32. Crank angle sensor connector connection
33. Alternator brace stay
34. Inlet manifold
35. Inlet manifold gasket

REMOVAL

◀A▶ Delivery pipe, injector and fuel pressure regulator ASSY removal

Remove the delivery pipe with the injector and fuel pressure regulator attached.

CAUTION
When removing the delivery pipe, be careful not to drop the injector.

FITTING

▶A◀ Fuel high pressure hose connection
1. Apply a small quantity of new engine oil to the O-ring, then insert the O-ring into the delivery pipe without damaging it.
2. Check that the high pressure hose turns smoothly. When it does not turn smoothly, it is possible that the O-ring is being pinched, in which case remove the high pressure hose and, after checking to see if the O-ring is damaged, re-insert into the delivery pipe.
3. Tighten mounting bolt to specified torque.

Specified torque: 5.0 ± 1.0 N·m

SECTION 16

ENGINE ELECTRICAL

CONTENTS

Starting devices 1
General 1
Starter 1
Ignition devices 2
General.....2
Crank angle sensor 2

Starting devices

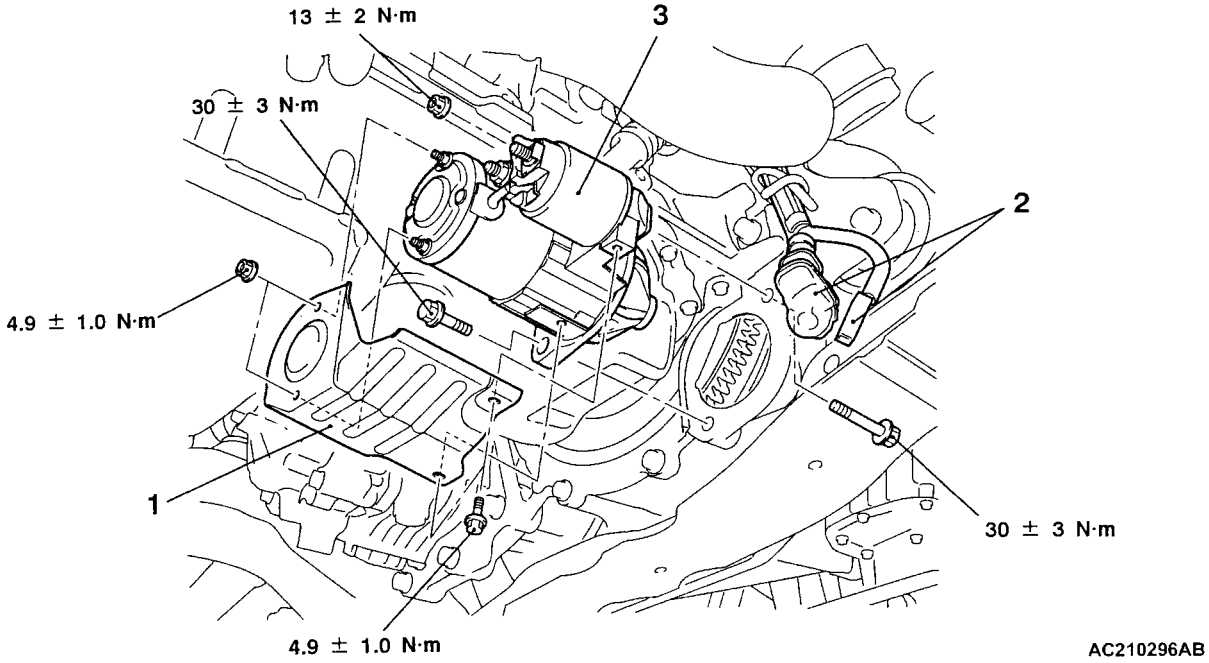
General

The following servicing information has been issued in conjunction with changes to the 4G63-MPI-T/C engine starter ASSY on the new Lancer Evolution VIII.
Other servicing information remains the same.

Starter

Removal and fitting

Pre-removal and post-fitting operations
- Removal and fitting or cover (ref. Chapter 51 – Front Bumper)
- Removal and fitting of cross member bar
- Removal and fitting of front exhaust pipe



Removal procedure
1. Starter cover
2. Starter connector and terminal
3. Starter ASSY

Ignition devices

General

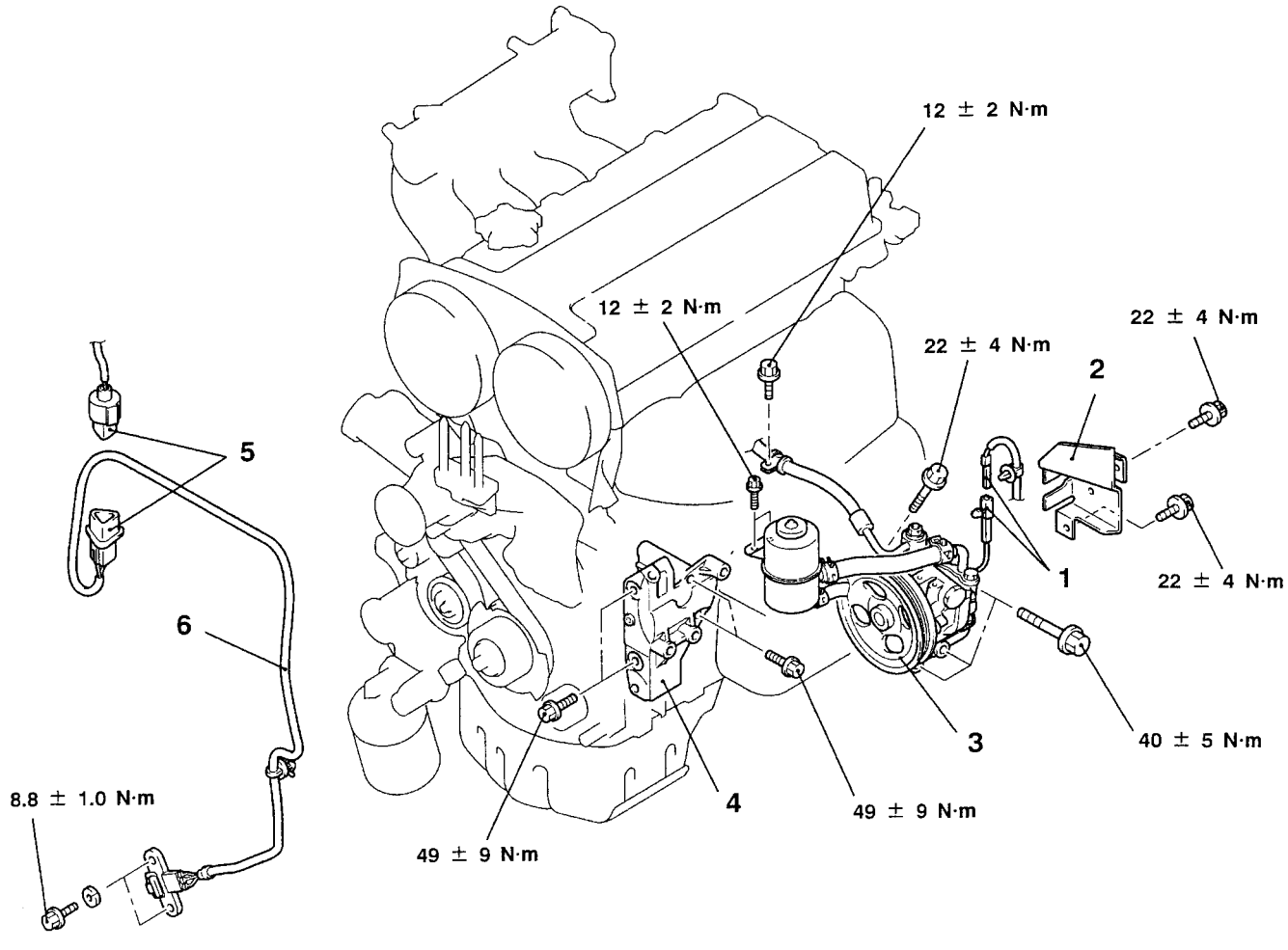
The following servicing information has been issued in conjunction with changes to the 4G63-MPI-T/C engine crank angle sensor on the new Lancer Evolution VIII.
Other servicing information remains the same.

Crank angle sensor

Fitting and removal

CAUTION
When Brembo brake calipers are used, there is concern over paint peeling off, so when doing servicing work, make sure they are not scratched by other components and tools. Furthermore, if any brake fluid gets onto the calipers, it should be wiped off immediately.

Pre-removal and post-fitting operations
• Removal and fitting of timing belt (ref. Chapter 11A)
• Removal and fitting of radiator reservoir tank ASSY
• Removal and fitting of centre cover (ref. Chapter 11A – Camshaft, Valve Stem Seals)



AC210409AB

Removal procedure

1. Power steering oil pressure switch connector
2. Power steering oil pump heat protector
◂ A ▸ 3. Power steering pump oil pump, bracket, and oil reservoir ASSY
4. Power steering oil pump bracket
5. Crank angle sensor connector
6. Crank angle sensor

REMOVAL

◂ A ▸ **Power steering oil pump, bracket, and oil reservoir ASSY removal**

Remove the power steering oil pump, bracket, and oil reservoir, from the power steering oil pump bracket, with the hose attached.

Note
The power steering oil pump, bracket, and oil reservoir ASSY which have been removed, should be tied together, using something such as rope, so that they do no interfere with the removal or fitting of the power steering oil pump bracket

SECTION 17

ENGINE and EMISSION CONTROL

CONTENTS

Emission control <MPI> 1
General 1

On-vehicle servicing 2
System diagram 2
Vacuum hose layout 3
Checks 3
Exhaust gas cleaning device list 4

EMISSION CONTROL <MPI>

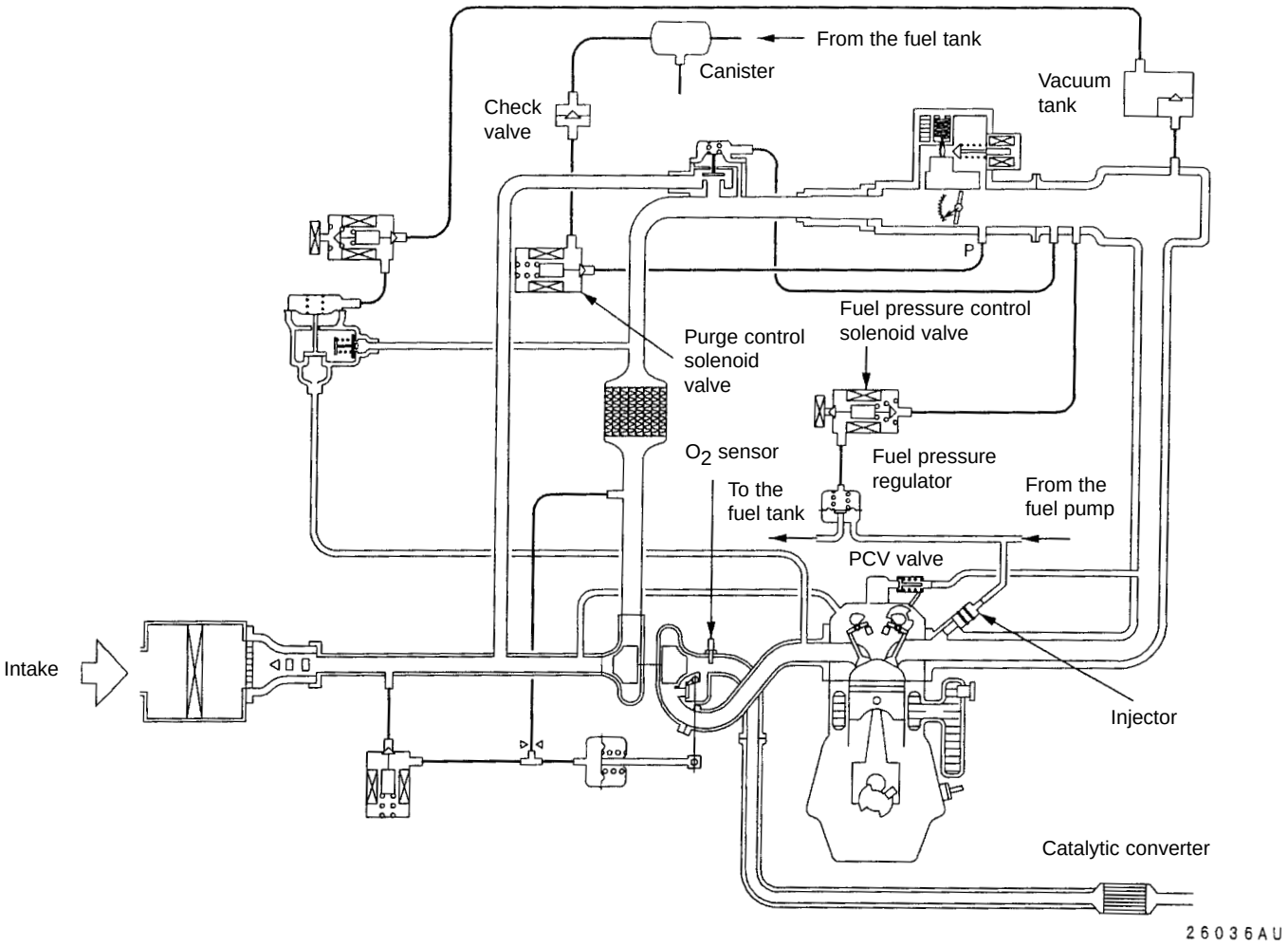
General

These are based on the existing Lancer Evolution VII 4G63-DOHC-T/C engine control system, and the Exhaust Gas Recirculation (EGR) devices have been deleted.

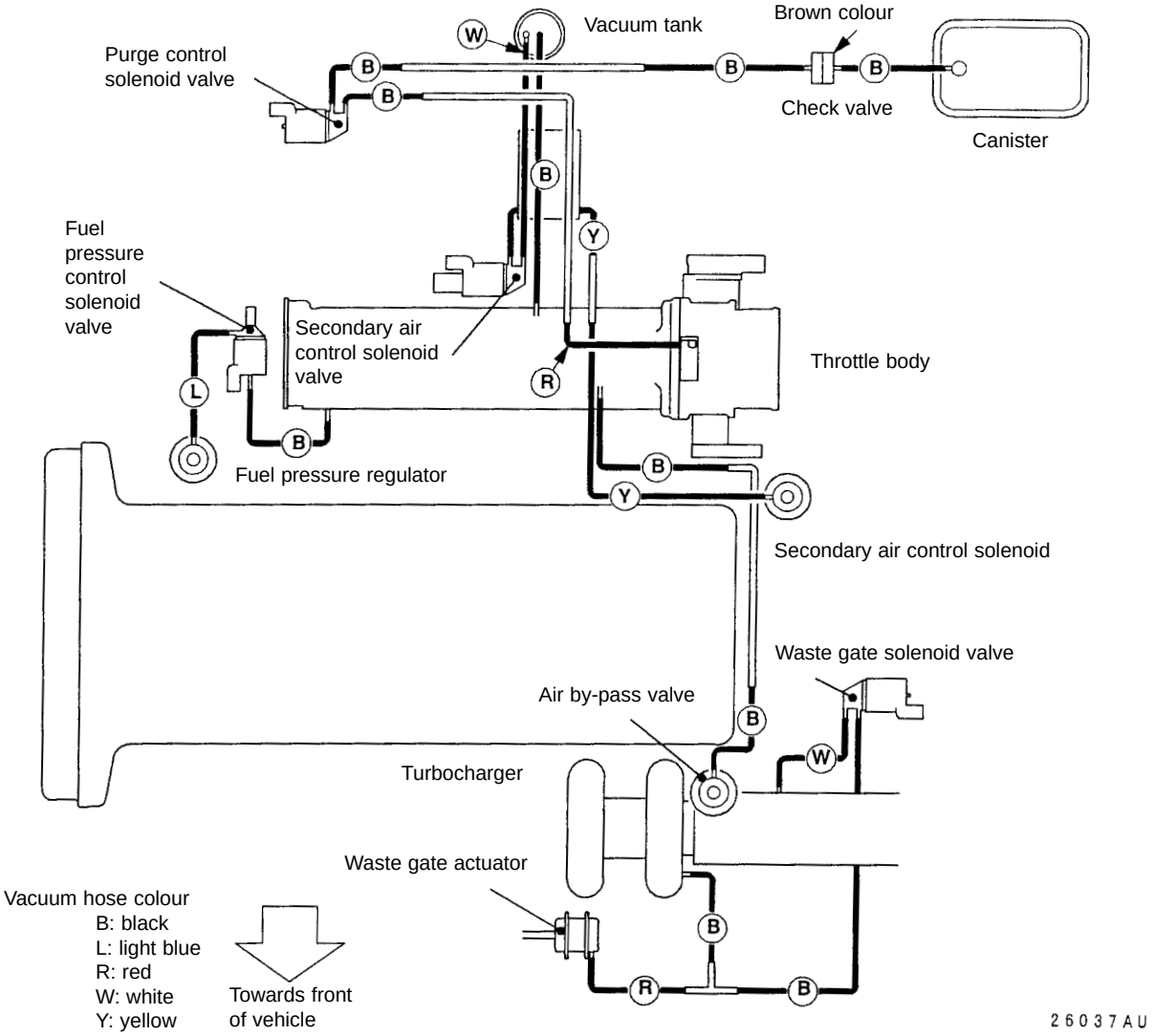
Other servicing information remains the same.

On-vehicle servicing

System diagram



Vacuum Hose Layout



Checks

1. Check that the vacuum hoses are correctly laid out, based on the Vacuum Hose Layout diagram above.
2. Check the connection condition (detached, loose etc.) of the vacuum hoses, and confirm they are not bent or damaged.

Exhaust Gas Cleaning Device List

Related parts	Air fuel ratio control device	Blow-by gas circulation device	Evaporative emission control device	3-way catalytic converter	Component page reference
Engine ECU	O				-
O_2 sensor	O				*1
Air flow sensor	O				*1
Intake air temperature sensor	O				*1
Atmospheric air pressure sensor	O				*1
Water temperature sensor	O				*1
Throttle position sensor	O				*1
Crank angle sensor	O				*1
Cam position sensor	O				*1
Injector	O				*1
Positive Crank Case Ventilation (PCV) valve		O			17-8*2
Canister			O		-
Check valve			O		17-9*2
Purge control solenoid valve			O		17-22*2
Catalytic converter				O	-

Note
*1: Refer to Chapter 13A On-vehicle Servicing
*2: Refer to '01-1 Lancer Evolution VII Service Manual (No. 1036K02)

SECTION 22

MANUAL TRANSMISSION

CONTENTS

General.....1
Lubricants.....1
Special Tools.....2
Troubleshooting.....3
On-vehicle Servicing.....9
1. Replacing transmission oil <6M/T>.....9
2. Select cable (inside cabin) adjustment <6M/T>.....9
Transmission Control*.....10
Transfer ASSY <6M/T>*.....12
Transmission ASSY <6M/T>*.....14
Sensors / Switches / Relays <vehicles fitted with ACD, ACD+AYC> 18

Precautions Regarding Servicing of Vehicles Fitted with SRS Airbags

1. **Before removing or fitting any SRS Airbag related components, it is essential that you refer to the '00-5 Lancer Sedia Service Manual (No. 1036K00), Chapter 52B - "Servicing Precautions".**
2. **Make certain that, when removing or fitting any component in a system marked with an * in the above list of section titles, you do not knock any SRS Airbag related components.**

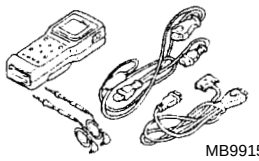
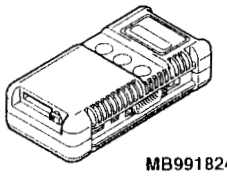
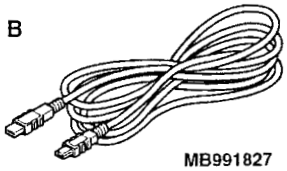
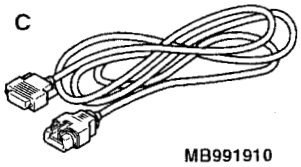
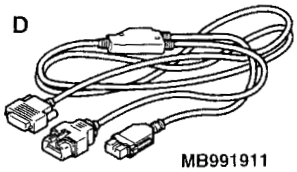
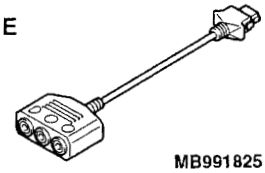
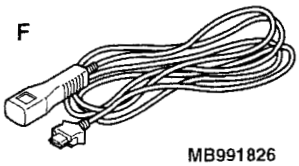
General

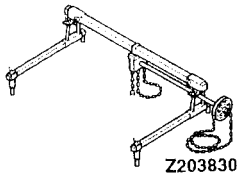
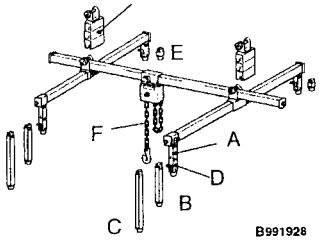
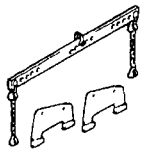
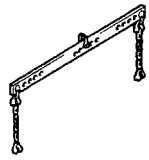
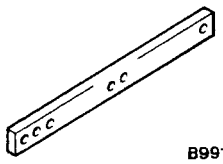
The following servicing information has been changed with the introduction of the new Lancer Evolution VIII. Servicing details otherwise remain unchanged, and are the same as for the Lancer Evolution VII.

Lubrication

Item	Name	Capacity dm^3
Transmission oil <6M/T>	Mitsubishi Genuine DIA QUEEN Super Multi-gear oil (75W/85W)	2.2

Special Tools

Tools	Number	Name	Use
 MB991502	MB991502	MUT-II Sub-ASSY	Diagnosis code checking
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  MB991825 F  MB991826 MB991955	MB991955 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991825 F: MB991826	MUT-III Sub-ASSY A: V.C.I. (Vehicle Communication Interface) B: USB cable C: MUT-III main harness A (vehicles with CAN communication) D: MUT-III main harness B (vehicles without CAN communications) E: Adapter for measurements F: Trigger harness	

Tools	Number	Name	Use
	Recommended tools Anzen Jidosha (Co. Ltd) MZ203831 Or Banzai (Co. Ltd) MZ203830	Engine lifter	To hold the engine ASSY when removing or fitting the transmission. Note 1. The engine lifter balancer (MB991454) is one part of the engine lifter ASSY (MB991453). 2. Only use a chain with the engine lifter balancer (MB991454)
Slide bracket (HI) 	MB991928 A: MB991929 B: MB991930 C: MB991931 D: MB991932 E: MB991933 F: MB991934	Engine lifter A: Joint (50) x 2 B: Joint (90) x 2 C: Joint (140) x 2 D: Feet (stand) x 4 E: Feet (short) x 2 F: Chain & hook ASSY	
	MB991453	Engine lifter attachment set	
	MB991454	Engine lifter balancer	
	MB991527	Engine lifter	

Troubleshooting

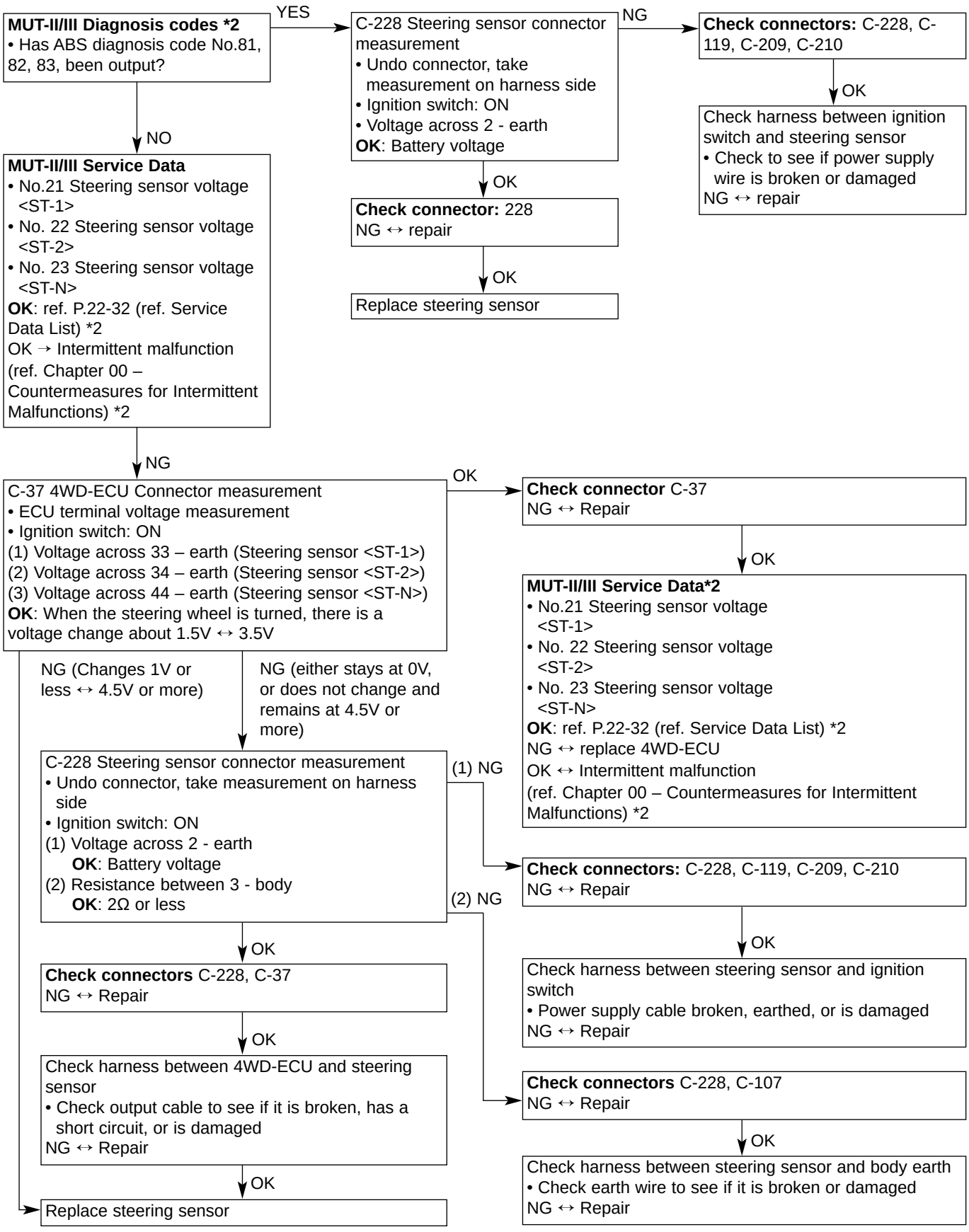
1. Diagnosis Code List

Diagnosis code No.	Diagnosis item		Reference page
31	Steering sensor <ST-1, ST-2, ST-N> system	Broken wire or short	22-4
63	Parking brake switch system	Short or forgotten to return	22-5
65	ABS monitor system (vehicles fitted with ACD + AYC)	Broken wire or ABS fault	22-6
82	Electromotive pump relay system	Electromotive pump fault or pressure sensor abnormality	22-7

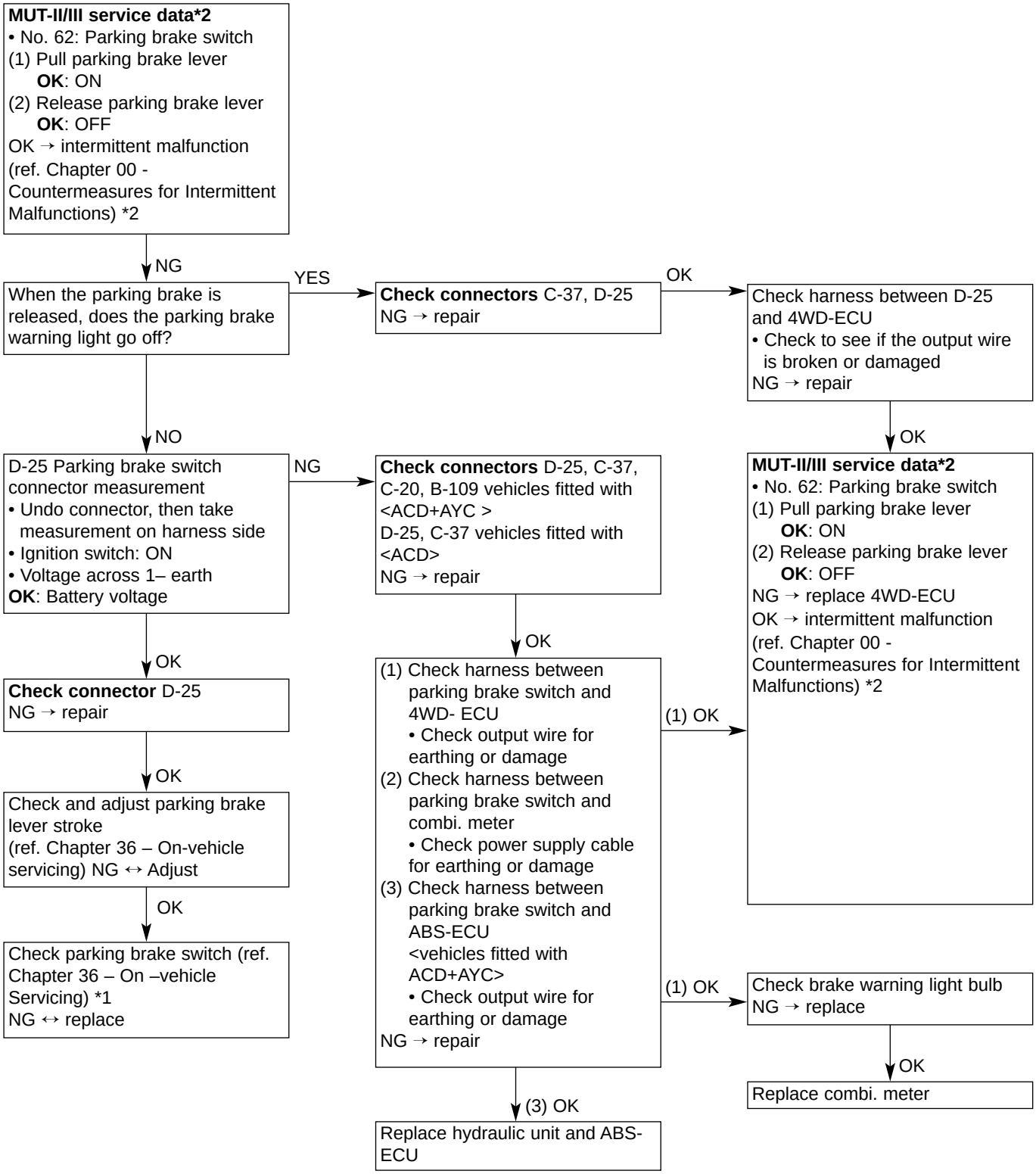
2. Checking Procedure for each Diagnosis Code

Note
*1: Refer to '00 – 5 Lancer Sedia Service Manual (No.103K00)
*2: Refer to '01-1 Lancer Evolution VII Service Manual (No.1036K02)

Code No.31 Steering sensor <ST-1, ST-2, ST-3>	Possible causes
When a steering sensor output wire (ST-1, ST-2, or ST-N) is broken or has a short circuit, No.31 will be output.	∑ Steering sensor malfunction ∑ Harness, connector malfunction ∑ 4WD-ECU malfunction



Code No.63 Parking brake switch system	Probable causes
At vehicle speeds of 15km/h and over, code No. 63 is output if the parking brake stays ON for 15 minutes or more.	• Parking brake switch malfunction • Harness, connector malfunction • ABS-ECU malfunction (vehicles fitted with ACD + AYC) • 4WD-ECU malfunction



Code No.65 ABS Monitoring System	Probable causes
When ABS operating for 1 minute or more continuously is detected, code No. 65 is output.	• Harness, connector malfunction • ABS-ECU malfunction <vehicles fitted with ACD+AYC> • 4WD-ECU malfunction

<Vehicles fitted with ACD+AYC>

MUT-II/III service data*2
• No. 61: ABS monitor
(1) ABS-ECU connector: disconnect
OK: ON
(2) ABS-ECU connector: connect
OK: OFF
OK → intermittent malfunction
(ref. Chapter 00 - Countermeasures for Intermittent Malfunctions) *2

(1) NG → **Check connectors** C-37, C-20, B-109
NG → repair
OK → Check harness between 4WD-ECU and ABS –ECU
• Check output wire to see if it broken or damaged
NG → repair

(2) NG

C-37 4WD-ECU connector measurement
• Undo connector, then take measurement on harness side
• Voltage across 48 – body earth
OK: battery voltage

NG → **Check connectors** C-37, C-20, B-109
NG → repair
OK → Check harness between 4WD-ECU and ABS-ECU
• Check output wire to see if it is broken, has a short, or is damaged
OK → B-109 ABS-ECU connector measurement
• Measure ECU terminal voltage
• Voltage across 3 – body earth
• Do ABS actuator test (No.05: ABS signal)
OK: 1V or less for a period of 10 seconds during the test, and battery voltage after that
NG → replace hydraulic unit and ABS-ECU

OK → Check connector C-37
NG → repair

OK → **MUT-II/III service data**
• No. 61: ABS monitor
OK: OFF
NG → replace 4WD-ECU
OK → intermittent fault
(ref. Chapter 00 - Countermeasures for Intermittent Malfunctions) *2

<Vehicles fitted with ACD>

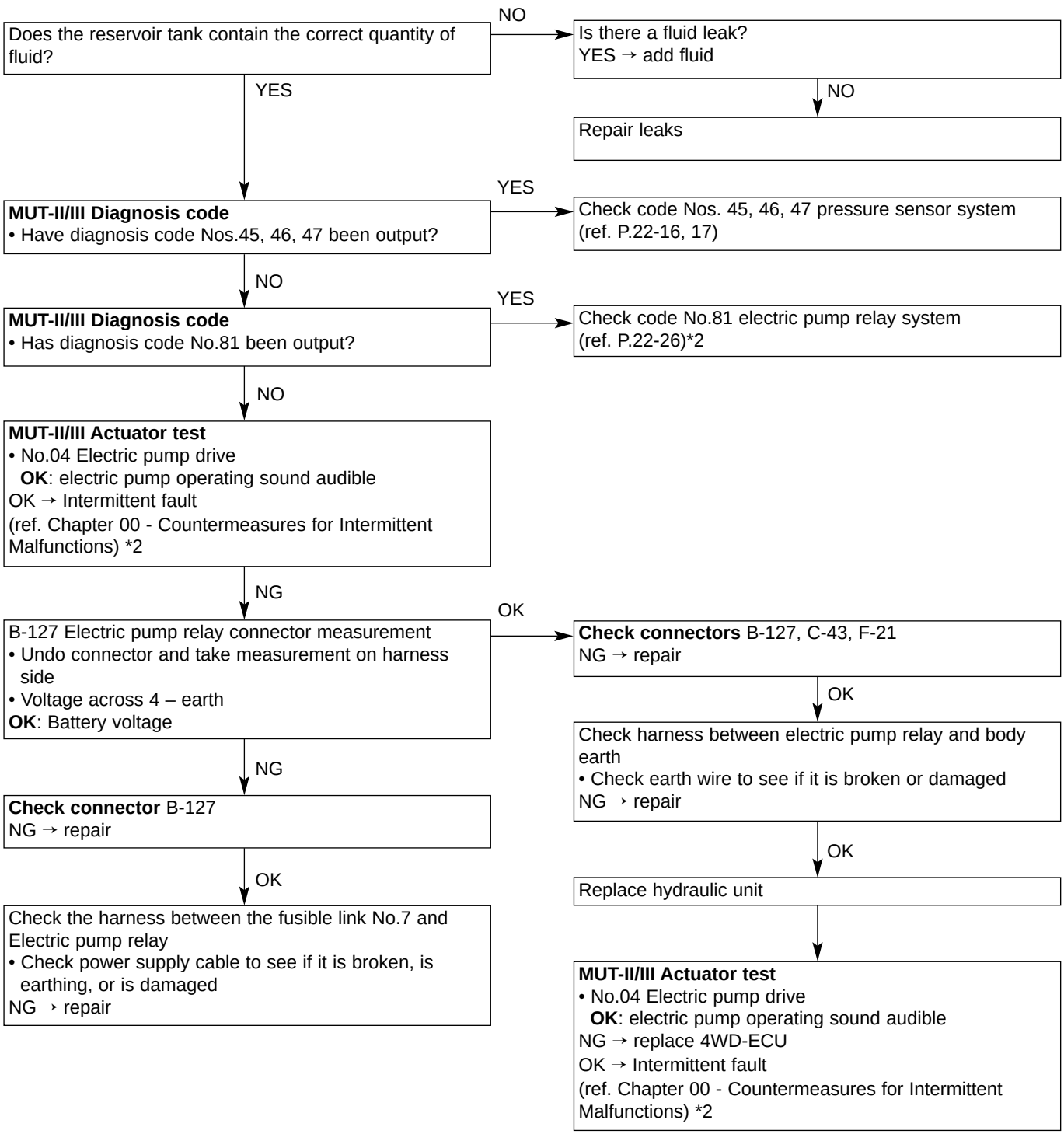
C-37 4WD-ECU connector measurement
• Undo connector, then take measurement on harness side
• Resistance across 50 – body earth
OK: 2Ω or less

NG → **Check connectors** C-37, C-107
• Check to see if earth wire is broken or damaged
NG → repair
OK → Check harness between 4WD-ECU and body earth
Check earth wire to see if it is broken or damaged
NG → repair

OK → **Check connectors** C-37, C-107
NG → repair

OK → Replace 4WD-ECU

Code No.82 Electric Pump Relay System	Probable causes
Code No.82 is output when the pressure sensor does not reach the specified value, even if the 4WD-ECU has output the electric pump motor drive command.	• Insufficient fluid • Pressure sensor malfunction • Hydraulic pressure unit malfunction • Harness, connector malfunction • 4WD-ECU malfunction • Electric pump relay malfunction



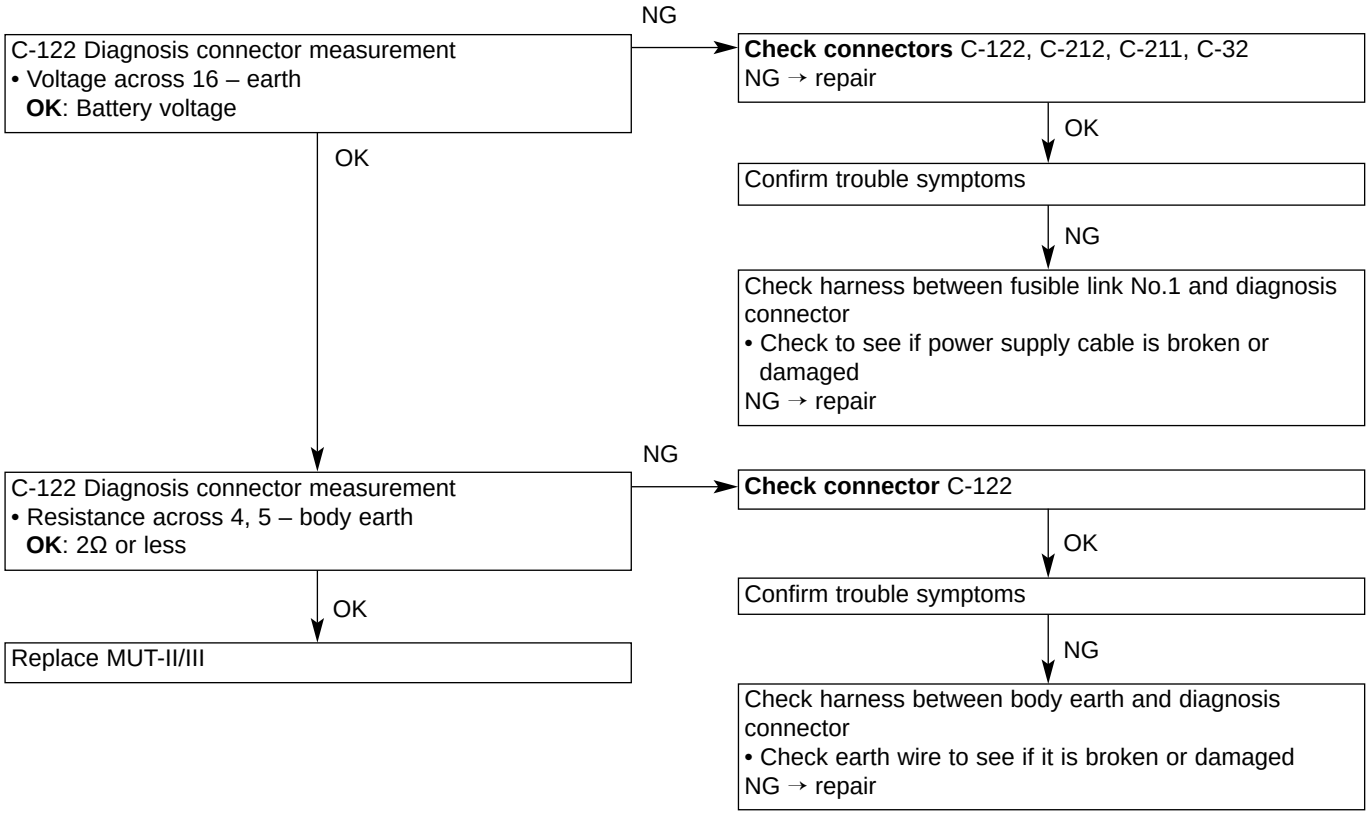
5. Inspection Chart for Trouble Symptoms

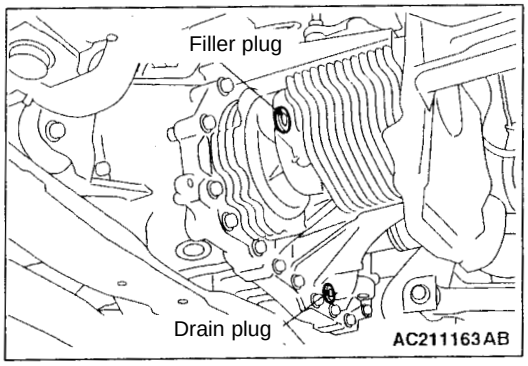
Fault symptom	Checking Procedure No.	Page
No communication possible between MUT-II/III and any other system	1	22-8

6. Trouble Symptom Checking Procedures

Checking Procedure 1

No communication possible between MUT-II/III and any other system	**Possible causes**
It is possible that there is a malfunction in the diagnosis connector power supply circuit, the earth circuit, or the MUT-II/III.	• Diagnosis connector malfunction • Harness, connector malfunction • MUT-II/III malfunction



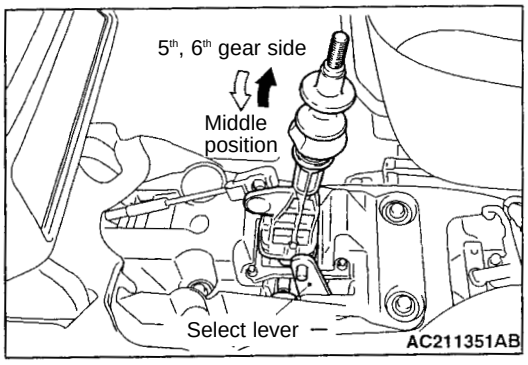


On-vehicle Servicing

1. Changing transmission oil <6 M/T>

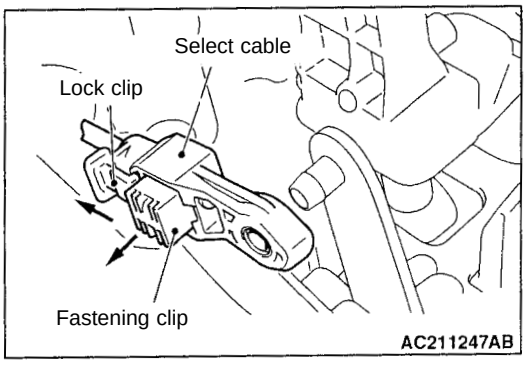
Servicing information other than that noted below remains the same.

Transmission oil
Specified transmission oil:
Mitsubishi DIA QUEEN SUPER MULTIGRADE OIL <75W/85W>
Quantity: 2.2 dm³

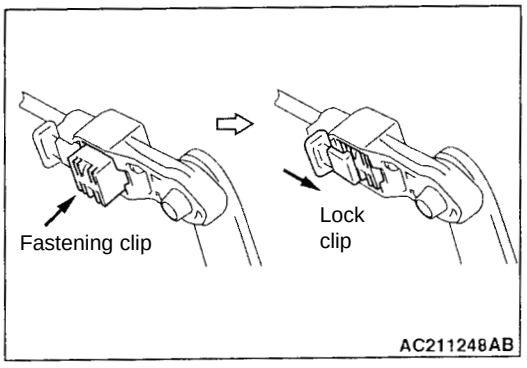


2. Select cable (inside cabin) adjustment <6M/T>

1. Put gear stick in the neutral position
2. Remove front floor console. (ref. '01-1 Lancer Evolution VII Service Manual (No.1036K02) – Chapter 52A)
3. Disconnect the select cable from the select lever
4. Move the gear stick towards the 5th and 6th gears so that it touches the stopper, then check the cable connection is secure and the assembly is running smoothly (run-in).
5. Remove hand from gear stick, and allow it to return naturally to the neutral position



6. Move the select cable lock clip in the direction of the arrow in the diagram, pulling the fastening clip
7. Without moving the gear stick from the neutral position, connect the select cable to the select lever.
8. Adjust the select cable



9. Press the select cable fastening clip in, and move the lock clip back.
10. Check by shifting the gear stick into each gear.
    NOTE
    Repeat steps 3and10 if the gear stick does not go into a gear, or if it catches and does not move smoothly.
11. Fit the front floor console
    (ref. '01-1 Lancer Evolution VII Service Manual (No. 1036K02) – Chapter 52A)

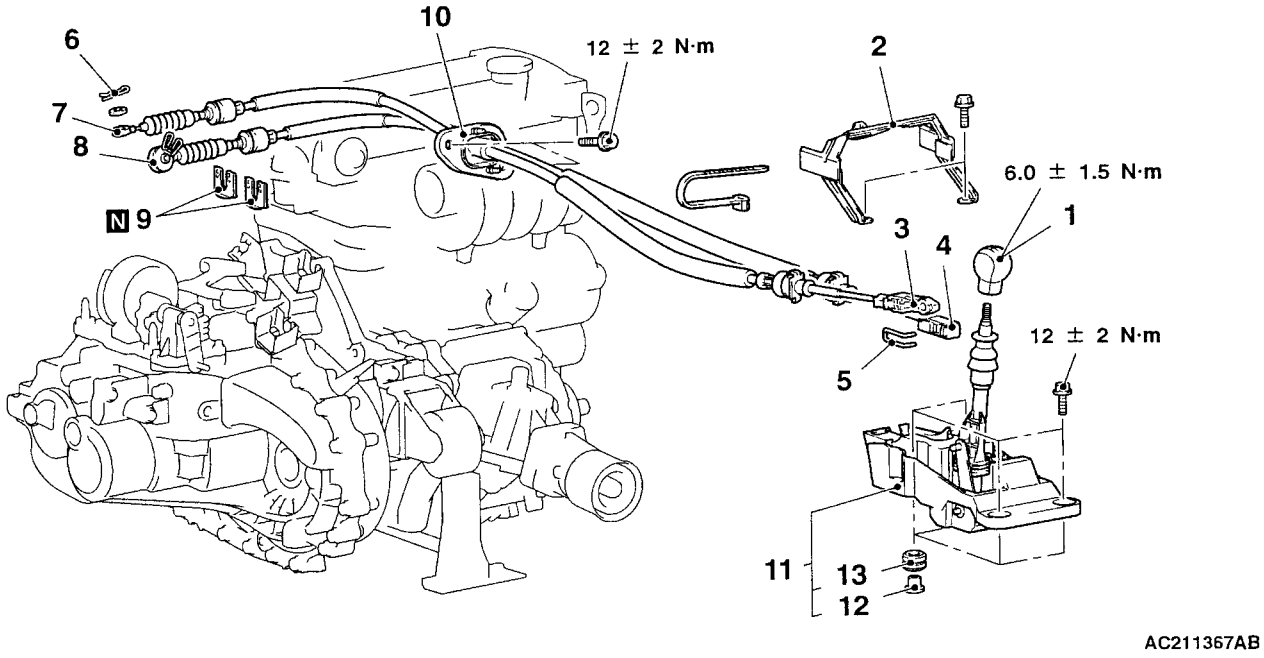
Transmission Control <6M/T>

Removal and Fitting

CAUTION
1. **On the gear stick ASSY, do not disassemble anything other than the distance piece and bush. (Non-supplied parts)**
2. **Never use mineral oil on the moving parts of the gear stick ASSY. This is because if mineral oil is used, it could cause plastic parts to break.**

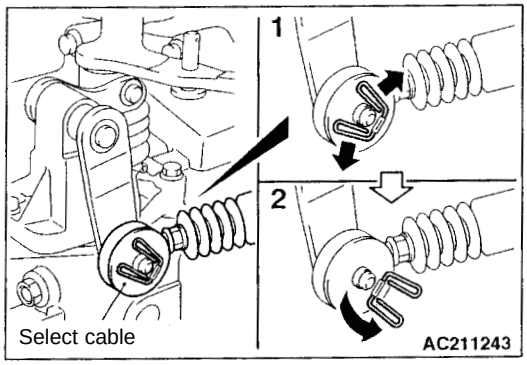
Pre-removal and post-fitting operations
- Removal and fitting of air cleaner ASSY
- Removal and fitting of air by-pass hose, air hose E, air pipe C, air hose D (ref. Chapter 15 – Intercooler)
- Removal and fitting of battery, battery tray

Caution: SRS
Do not subject the SRS-ECU to any shocks when removing or fitting shift and select cable ASSY, or gear stick ASSY.



Shift cable & select cable ASSY removal procedure
1. Gear stick knob
   - Front floor console
2. Front floor console bracket
▶B◀ 3. Select cable connection (inside cabin)
4. Shift cable connection (inside cabin)
5. Clip (inside cabin)
6. Snap pin
▶A◀ 7. Shift cable connection (transmission side)
◀A▶ ▶A◀ 8. Select cable connection (transmission side)
◀B▶ ▶A◀ 9. Clip (transmission side)
10. Shift cable & select cable ASSY

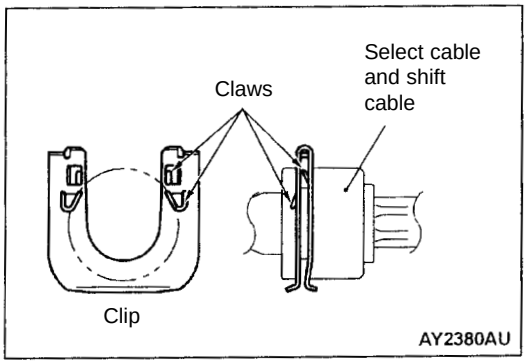
Gear stick ASSY fitting procedure
1. Gear stick knob
   - Front floor console
2. Front floor console bracket
▶B◀ 3. Select cable connection (inside cabin)
4. Shift cable connection (inside cabin)
5. Clip (inside cabin)
11. Gear stick ASSY
12. Distance piece
13. Bush



Removal

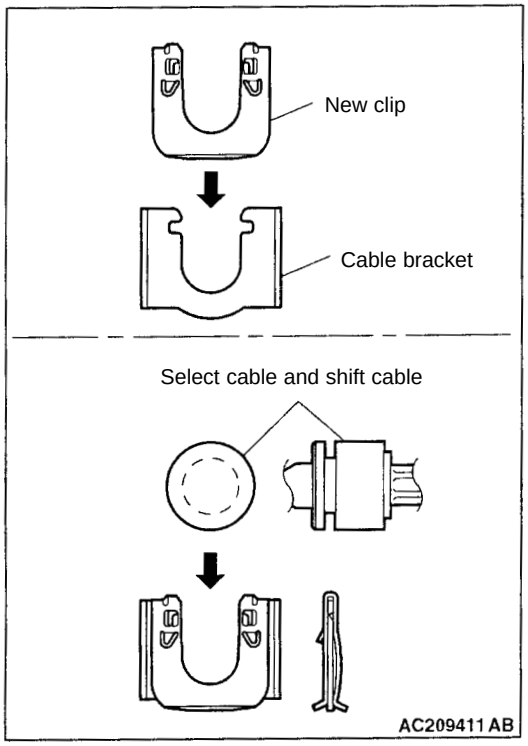
◀ A ▶ Removal of select cable connection (transmission side)

Set the select cable clip in the position indicated in the diagram, then undo the select cable connection.



◀ B ▶ Clip removal (transmission side)

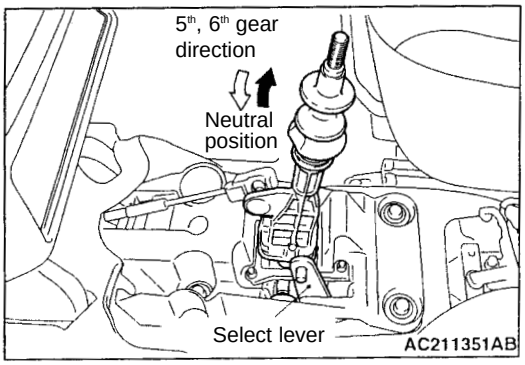
Use a screwdriver or similar device to undo the claws of the clip, then remove the clip and each of the cables from the bracket.



Fitting

▶ A ◀ Fitting of select cable connection (transmission side), shift cable connection (transmission side), clip (transmission side)

1. Set the gear stick on the transmission side to neutral position
2. Fit the shift cable end (transmission side) and the select cable (transmission side) facing the snap pin.
3. After fitting the new clip to the transmission cable bracket, fit the shift cable and select cable to the cable bracket.
   NOTE
   The clip can be fitted either way round.
   CAUTION
   When fitting the clip, select cable and shift cable, make sure you hear them snap tight so that they are securely connected.
4. Check that the gear stick (inside cabin) moves smoothly into all of the gears.



▶ B ◀ Fitting of select cable connection (inside cabin)

1. Move the gear stick towards 5th and 6th gears until it touches the stopper, then check the cable connection is secure and the assembly is running smoothly (run-in).
2. Remove hand from the gear stick, then fit the select cable (inside cabin) to the select lever in the neutral position (to which it returns naturally).
3. Check that the shift cable (inside cabin) and select cable (inside cabin) are securely connected, then move the gear stick into each of the gear positions.
4. If the gear stick does not go into all of the gear positions, adjust the select cable (ref. P.22-9)

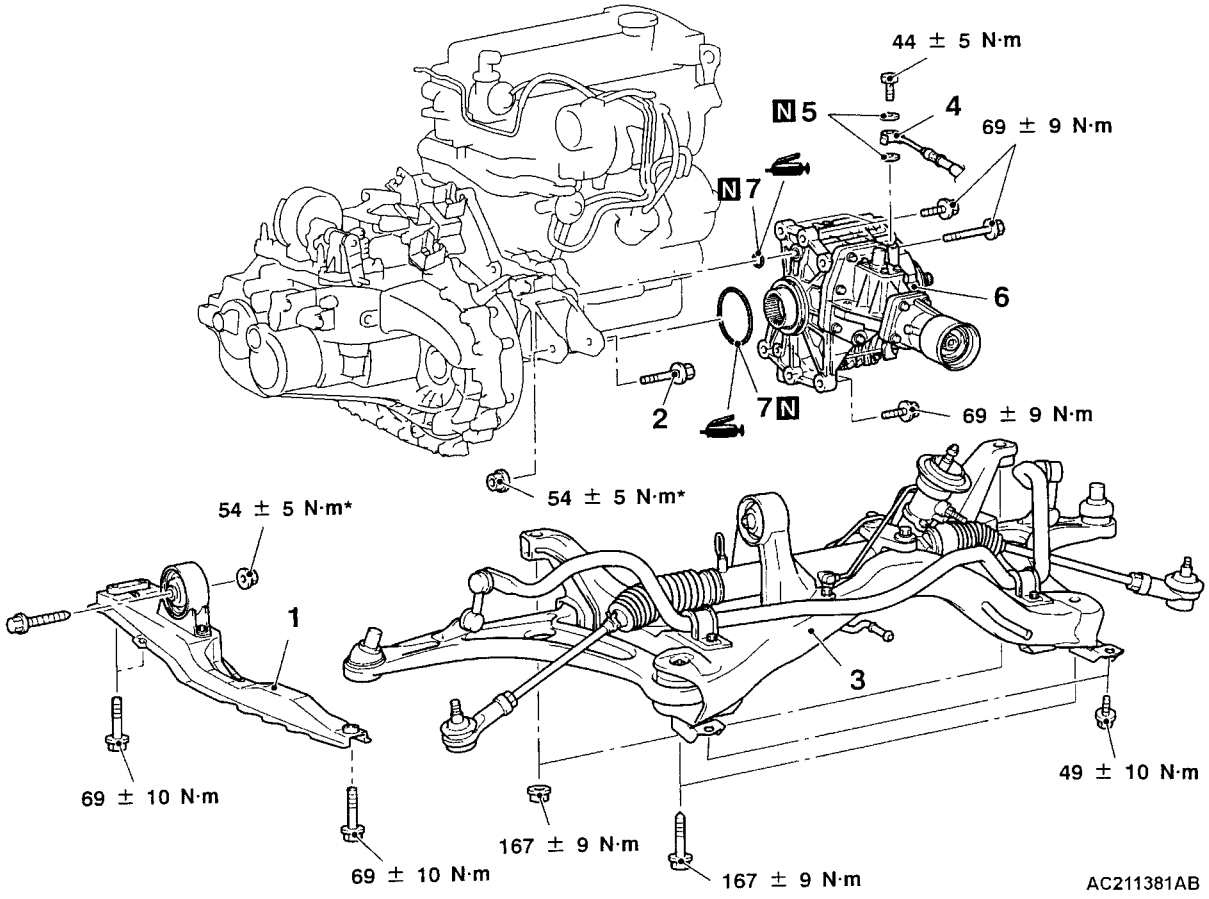
Transfer ASSY <6M/T>

CAUTION

1. **Before removing steering wheel and airbag module ASSY, without fail read Chapter 52-B Precautions for Servicing and Airbag Module and Clock Spring.**
2. **When Brembo brake calipers are used, there is concern over paint peeling off, so when doing servicing work, make sure they are not scratched by other components and tools.**
3. ***Indicates parts which should be initially tightened, and then fully tightened when the engine weight is supported by the vehicle body.**

Removal and fitting

Pre-removal and Post-fitting operations	
• Removal and fitting of steering wheel	• Removal and fitting of front propeller shaft
• Removal and fitting of cover (ref. Chapter 51 – Front Bumper)	• Removal and fitting of drive shaft, output shaft
• Removal and fitting of side cover (ref. Chapter 51 – Front Bumper)	• Draining and filling of transmission oil
• Removal and fitting of steering shaft cover	• Draining and filling of transfer oil
• Removal and fitting of steering gear and joint connection	• Bleeding and hydraulic pressure check <ACD> <only after fitting>
• Removal and fitting of cross member bar	• Bleeding <AYC> <only after fitting>
• Removal and fitting of front exhaust pipe	• Power steering fluid filling and bleeding <only after fitting>
	• Wheel alignment check, adjustment <only after fitting>

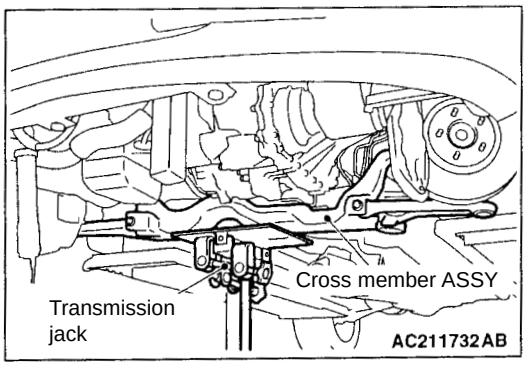


Removal procedure

1. Centre member
   • Power steering return hose and steering gear connection
   • Power steering pressure hose and steering gear connection
2. Rear roll stopper connecting bolt

◀A▶
◀B▶

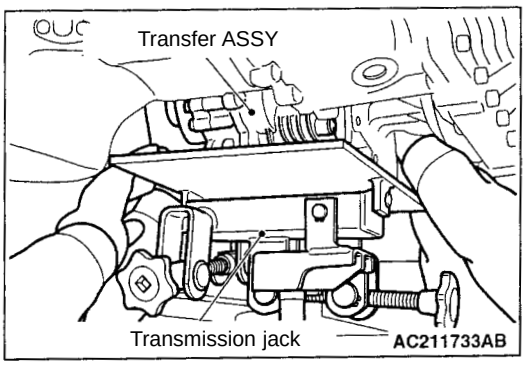
3. Cross member ASSY
4. Transfer pressure hose ASSY
5. Gasket
6. Transfer ASSY
7. O-ring



Removal

◀A▶ Removal of cross member ASSY

Support the cross member ASSY with the transmission jack, then remove the cross member fixing bolt and cross member ASSY



◀B▶ Removal of transfer ASSY

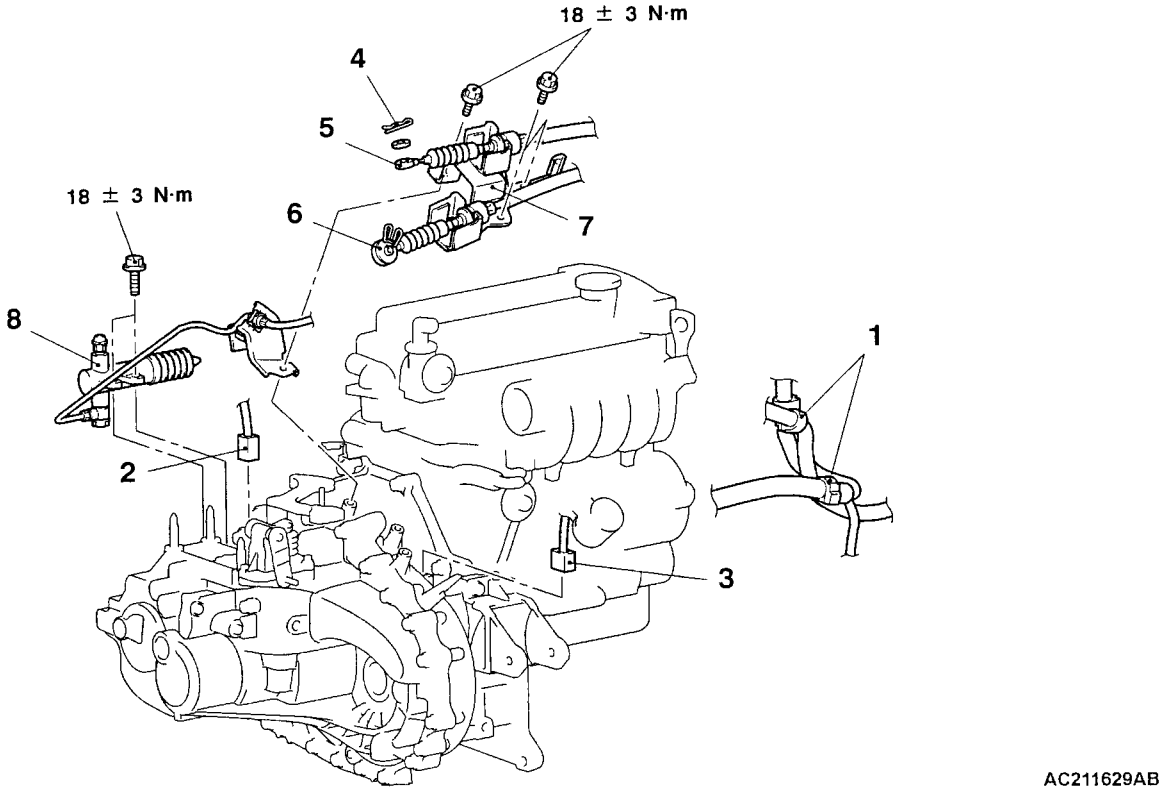
Support the transfer ASSY with the transmission jack, then remove the transfer fixing bolt and transfer ASSY.

Transmission ASSY <6M/T>

CAUTION
1. Before removing steering wheel and airbag module ASSY, be sure to read Chapter 52-B Precautions for Servicing, Airbag Module and Clock Spring.
2. When Brembo brake calipers are used, there is concern over paint peeling off, so when doing servicing work, make sure they are not scratched by other components and tools.
3. * Indicates parts which should be initially tightened, and then fully tightened when the engine weight is supported by the vehicle body.

Removal and fitting

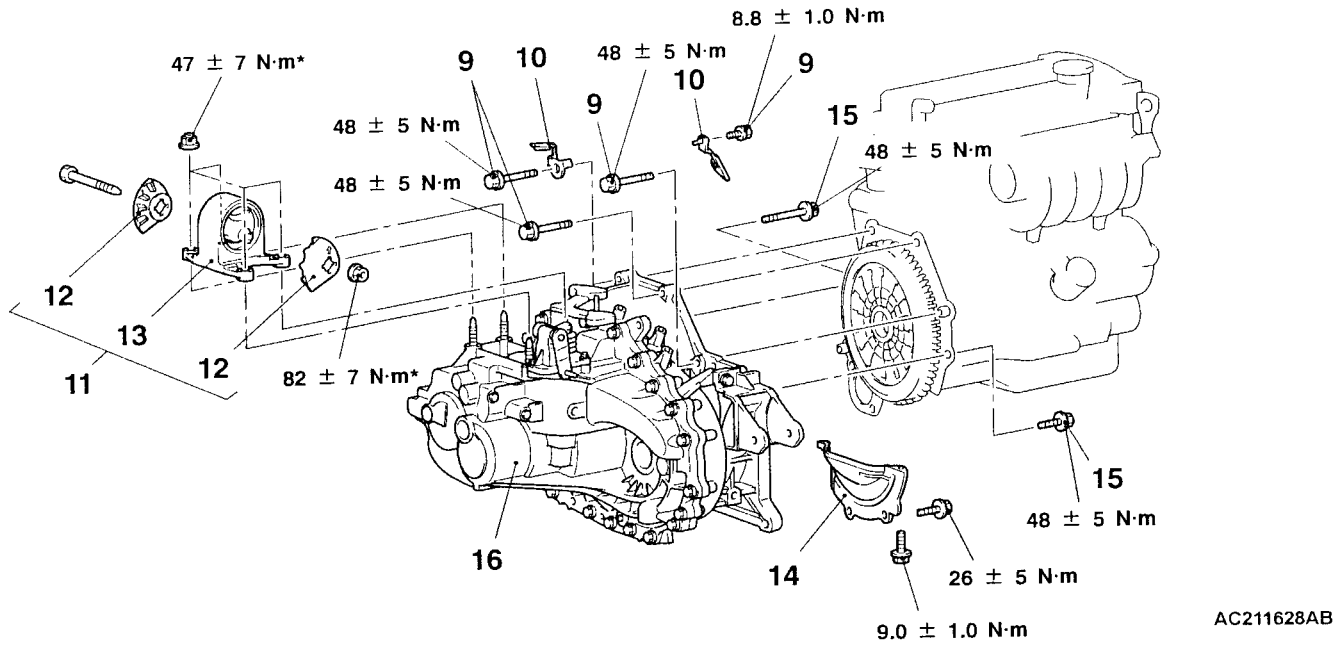
Pre-removal and Post-fitting operations	
• Removal and fitting of transfer ASSY (ref. P.22-18)	• Removal and fitting of air pipe hose, air hose E, air pipe C, air hose D (ref. Chapter 15 – Intercooler)
• Removal and fitting of battery and battery tray	• Removal and fitting of air cleaner ASSY
• Removal and fitting of strut and tower bar	• Removal and fitting of air intake hose
• Temporary fitting of strut ASSY fixing bolt <only before removal>	• Removal and fitting of canister
• Removal and fitting of air duct	• Removal and fitting of starter ASSY (ref. Chapter 16 – Starter)



Removal procedure
1. Main harness clamp connection
2. Reversing light switch connector connection
3. Vehicle speed sensor connector connection
4. Snap pin
5. Shift cable connection

◀ A ▶

6. Select cable connection
7. Control cable ASSY & bracket (transmission side)
8. Clutch release cylinder & clutch oil pipe



9. Transmission ASSY upper part coupling bolts
10. Harness clamp

◂B▸ 11. Transmission mount ASSY

▸A◂ 12. Transmission mount stopper

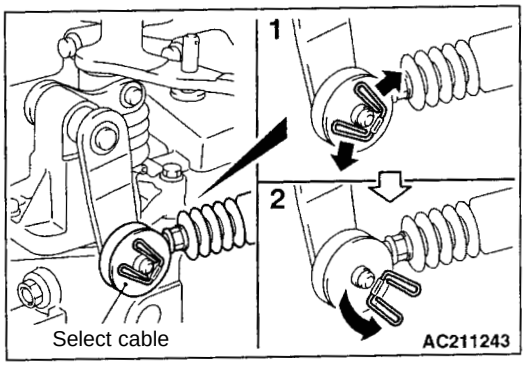
13. Transmission mount bracket

◂C▸ • Engine ASSY support
• For lifting the engine

14. Bell housing cover

◂D▸ • Clutch release bearing connection

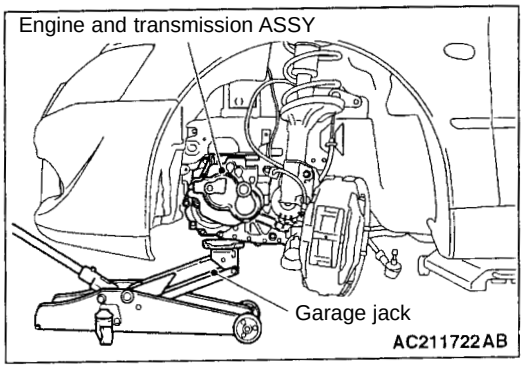
15. Transmission lower coupling bolts
16. Transmission ASSY



Removal

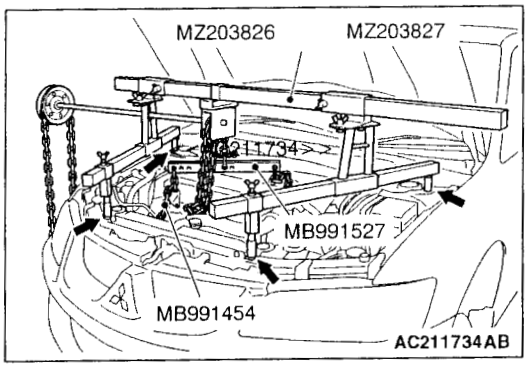
◂A▸ Removal of select cable connection (transmission side) removal

Set the select cable clip in the positions indicated (1,2) in the diagram, then undo the select cable connection.



◂B▸ Transmission mount ASSY removal

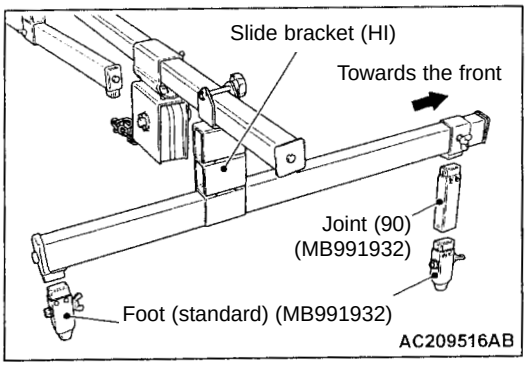
Support the engine and transmission ASSY with a garage jack, then remove the transmission mount ASSY.



◀C▶ **Engine ASSY Support**

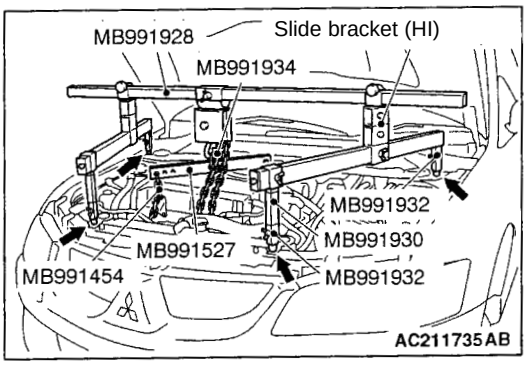
<When using the special engine lifter tool (MZ203831 or MZ203830)

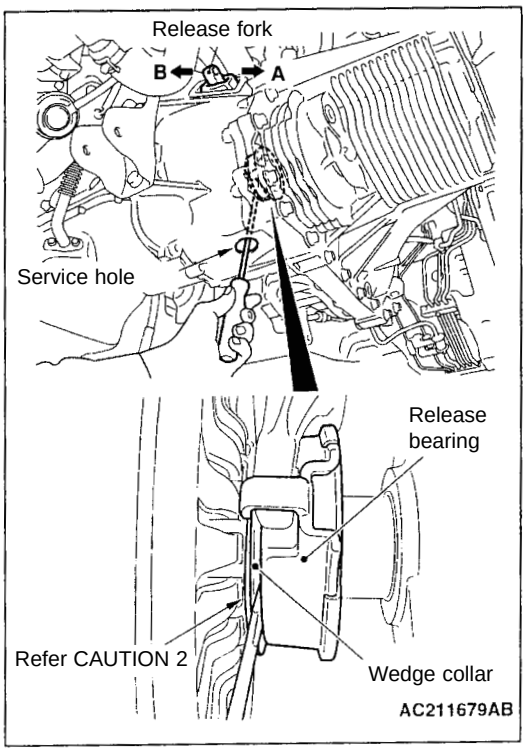
1. Fit the special engine lifter to the strut mounting nuts and radiator support upper insulator mounting bolts, shown in the diagram, in the engine bay.
2. Fit the special engine lifter (MB991527) and engine lifter balancer (MB991454) chains, supporting the engine and transmission ASSY.



<When using the special engine lifter (MB991928)>

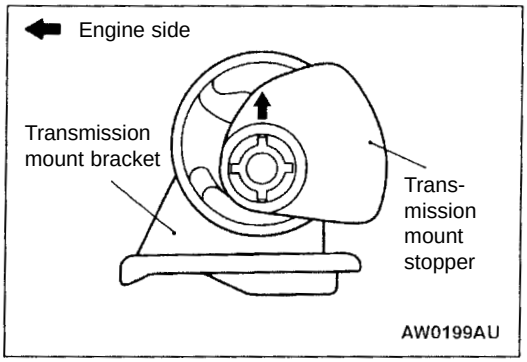
1. Assemble the special engine lifter tool (MB991928)
   (Fit the following parts to the lower lifter)
   • slide bracket (HI)
   • foot (standard) (MB991932)
   • joint (90) (MB991930)
2. Fit the special engine lifter (MB991928) to the strut mounting nuts and radiator support upper insulator mounting bolts, shown in the diagram, in the engine bay.
3. Fit the special engine lifter (MB991527) and engine lifter balancer (MB991454) chains.
   NOTE
   Adjust the balance by sliding the special engine lifter (MB991928) slide bracket (HI).
4. Support the engine and transmission ASSY.





◀D▶ **Separate clutch release bearing**

1. Remove the clutch housing service hole cover
2. Whilst lightly pushing the release fork, by hand, in direction A, insert a flat-tip screwdriver between the release bearing and wedge collar.
   CAUTION
   (1) Do not insert the flat tip screwdriver before pressing the release fork in direction A.
   (2) Do not insert the flat tip screwdriver between the wedge collar and wave spring by mistake.
3. Twist the screwdriver gently (turning the handle about 90º) and separate the release bearing and wedge collar
   NOTE
   The release fork will be forced to move fully in direction B by the return spring, as soon as it is separated from the collar.
   CAUTION
   If it is hard to turn the screwdriver (the release bearing cannot be separated), remove the screwdriver, then repeat the above procedure after pushing the release fork in direction A 2 or three times. Forcibly trying to separate the release bearing could damage or break it.



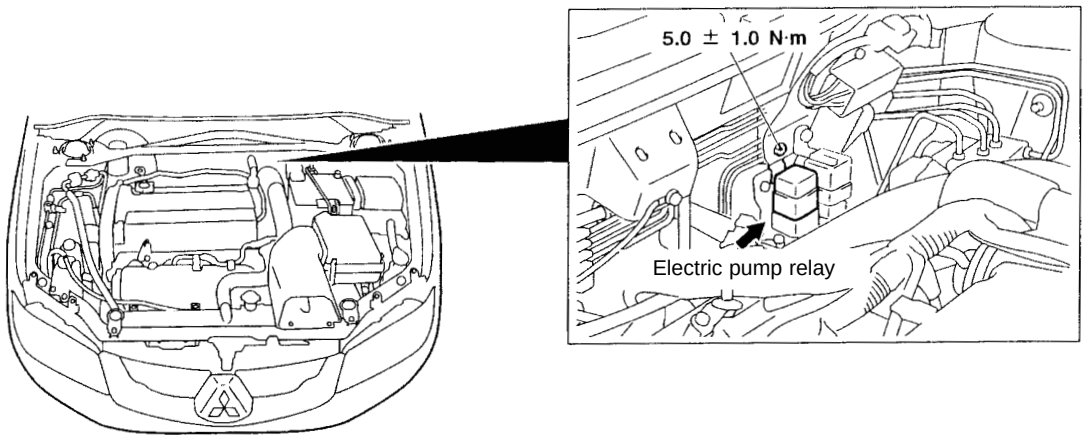
Fitting

A Fitting transmission mount stopper

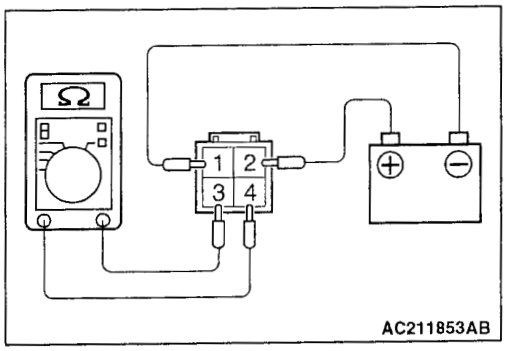
Fit so that the arrow on the transmission mount stopper is vertical relative to the vehicle body.

Sensor, Switch, Relay <ACD,ACD+AYC>

Removal and fitting



AC211871AB



AC211853AB

Check

Electric pump relay continuity check

1. Remove electric pump relay connector

Check item		Normal condition
Tester connection terminal No.	Battery connection terminal No.	
3,4	-	No continuity
	Connect battery (+) terminal to 2, and battery (-) terminal to 1.	2Ω or less

2. If there is a malfunction, replace electric pump relay.

SECTION 27B

REAR AXLE

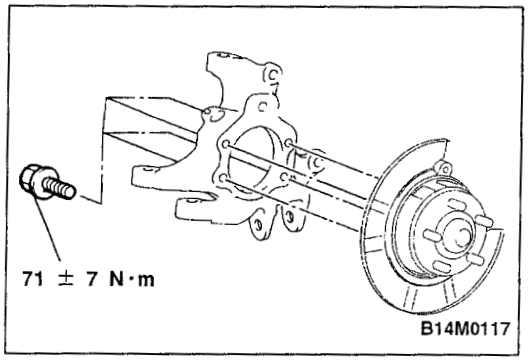
CONTENTS

General Information.....1
Lubricants.....1
Rear Hub ASSY 1
Drive Shaft.....2

General Information

Service information changes are noted below. Servicing details otherwise remain the same as on the existing vehicle.
• The type of differential gear oil used for the AYC torque transfer differential is changed <vehicles fitted with ACD+AYC>
• The AYC torque transfer differential torque transfer mechanism gear oil quantity is changed <vehicles fitted with <ACD+AYC>
• Rear hub ASSY tightening torque has been changed
• Drive shaft servicing information has been changed following the fitting of EBJ joint on the wheel side of the drive shaft

ITEM			Specified lubricant	Quantity
Vehicles fitted with ACD+AYC	Gear oil	Differential	Mitsubishi Genuine DIA QUEEN LSD gear oil (GL-5)	0.55±0.02dm^3
		Torque transfer mechanism	Mitsubishi Genuine DIA QUEEN ATF-SPIII	0.55and0.6dm^3
EBJ joint			Repair kit grease	80±10g
TJ joint			Repair kit grease	135±10g

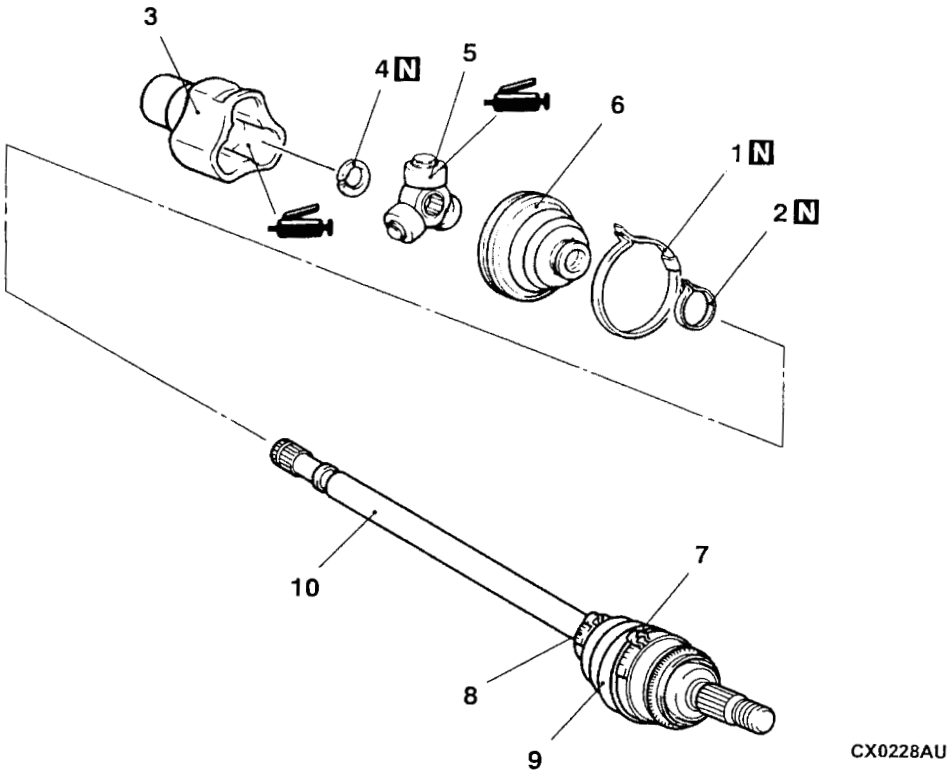


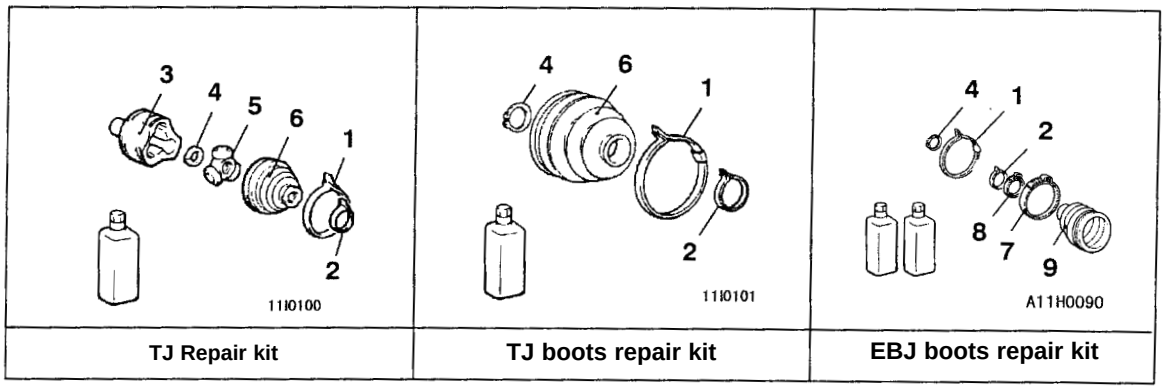
Rear Hub ASSY

The knuckle and hub coupling bolt torque is changed.

Drive Shaft

CAUTION
1. When disassembling or assembling, do not damage the ABS rotor attached to the EBJ outer race.
2. The only part of the EBJ ASSY that can be dismantled is the EBJ boot.



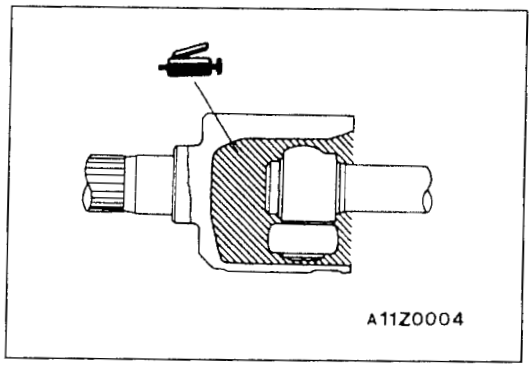


TJ Repair kit	TJ boots repair kit	EBJ boots repair kit

Disassembly procedure

- ▸B◂ 1. TJ boot band (large)
- ▸B◂ 2. TJ boot band (small)
- ◂A▸ ▸A◂ 3. TJ case
- 4. Snap link
- ◂A▸ ▸A◂ 5. Spider ASSY
- ◂B▸ 6. TJ boot
- 7. EBJ boot band (large)
- 8. EBJ boot band (small)
- 9. EBJ boot
- 10. EBJ ASSY

NOTE
Disassembly should be carried out in the same way as that specified for the existing vehicle.



Assembly

▶A◀ Fitting the spider ASSY/TJ case

Apart from changes noted below, all other details remain the same.
Having filled the TJ case with the specified grease, insert the drive shaft, then fill with grease again.

Specified grease: Repair kit grease
Quantity: 135 ± 10g

NOTE
When using repair kit grease, use half the total amount of grease for the joints and half for the boot.

CAUTION
Special grease is used for the joint, so do not mix old and new, or different types of grease.

Replacing EBJ Boot (plastic boot)

Apart from changes noted below, all other details remain the same.
Use the specified amount of specified grease in the boot.

Specified grease: Repair kit grease
Quantity: 80 ± 10g

CAUTION
Special grease is used for the joint, so do not mix old and new, or different types of grease.

SECTION 32

POWER PLANT MOUNT

CONTENTS

General.....1 **Transmission Mount.....2**

General

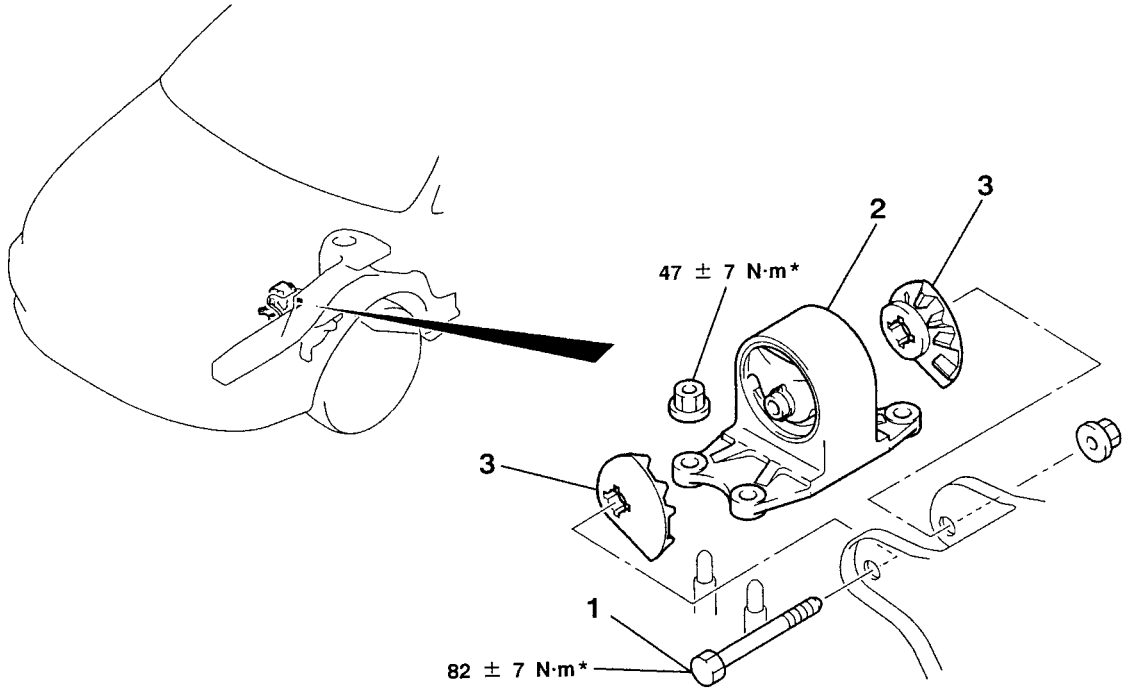
The servicing information specified below accompanies transmission changes to the newly installed 6-speed manual transmission. Other servicing information remains the same.

Transmission Mount

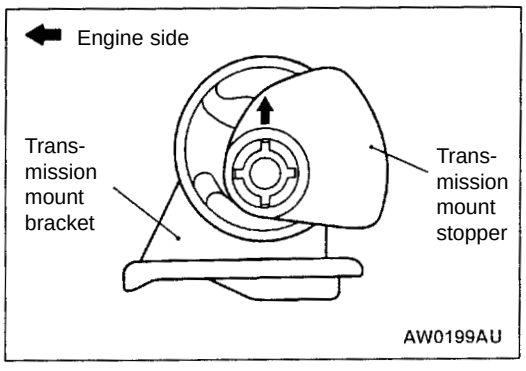
Removal and fitting

CAUTION
*** Indicates parts which should be initially tightened, and then fully tightened when the engine weight is supported by the vehicle body.**

Jobs to do before removal and after fitting
- Removal and fitting of cover (ref. Chapter 51 – Front Bumper)
- Removal and fitting of battery and battery tray
- Removal and fitting of air cleaner ASSY
- Removal and fitting of air pipe C, air by-pass hose, and air hose D (ref. Chapter 15 – Intercooler)
- Removal and fitting of radiator
- Jack up the engine and transmission ASSY to a position where there is no weight on the insulator (before removal)
- Removal and fitting of rear roll stopper



Removal Procedure
1. Transmission mount coupling bolt
2. Transmission mount
◗A◖ 3. Transmission mount stopper



Fitting
◗A◖ Fitting transmission mount stopper

Fit so that the arrow on the transmission mount stopper is vertical relative to the vehicle body.

SECTION 42

BODY

CONTENTS

General 1
Bonnet 2
Doors.....3
Door handles and latches 3
Boot lid … 5
Keyless entry system 5
Troubleshooting 5
On-vehicle service 5

General

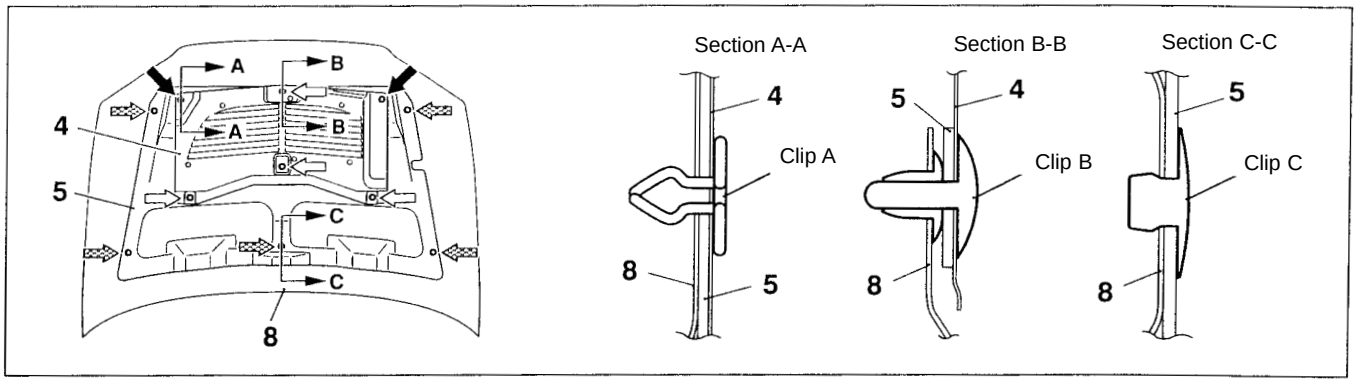
The following servicing information has been added in line with the changes described below.

• Information relating to changes to shape of bonnet
• Information relating to changes to door latches
• Information relating to addition of security alarm function to keyless entry system
• Information relating to changes in boot lid torsion bar (vehicles fitted with rear spoiler)

Apart from the details given below, the servicing information is the same as that for the previous model.

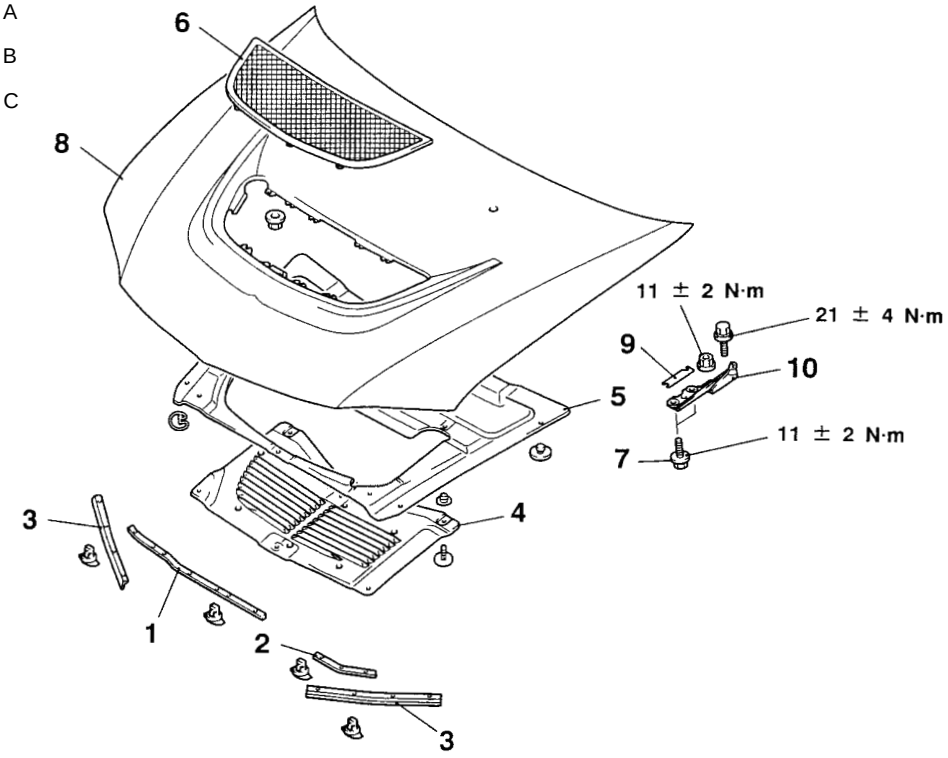
BONNET

Removal and Installation



Remarks

- ⬅ indicates the position of clip A
- ⇦ indicates the position of clip B
- ⇦ indicates the position of clip C



Bonnet removal procedure

1. Bonnet weather strip (Right side)
2. Bonnet weather strip (Left side)
3. Headlamp weather strip
4. Bonnet heat protector panel
5. Bonnet heat protector
   - Washer hose and nozzle connection
6. Bonnet outlet trim

◗A◖ 7. Bonnet hinge bolt (bonnet side)

8. Bonnet
9. Shim
10. Bonnet hinge

Installation service point

▶A◀ Bonnet hinge bolt installation

Caution
Because the bonnet is made from aluminium, a special coating is provided on the bonnet hinge bolt (bonnet side), and therefore special parts should be used.

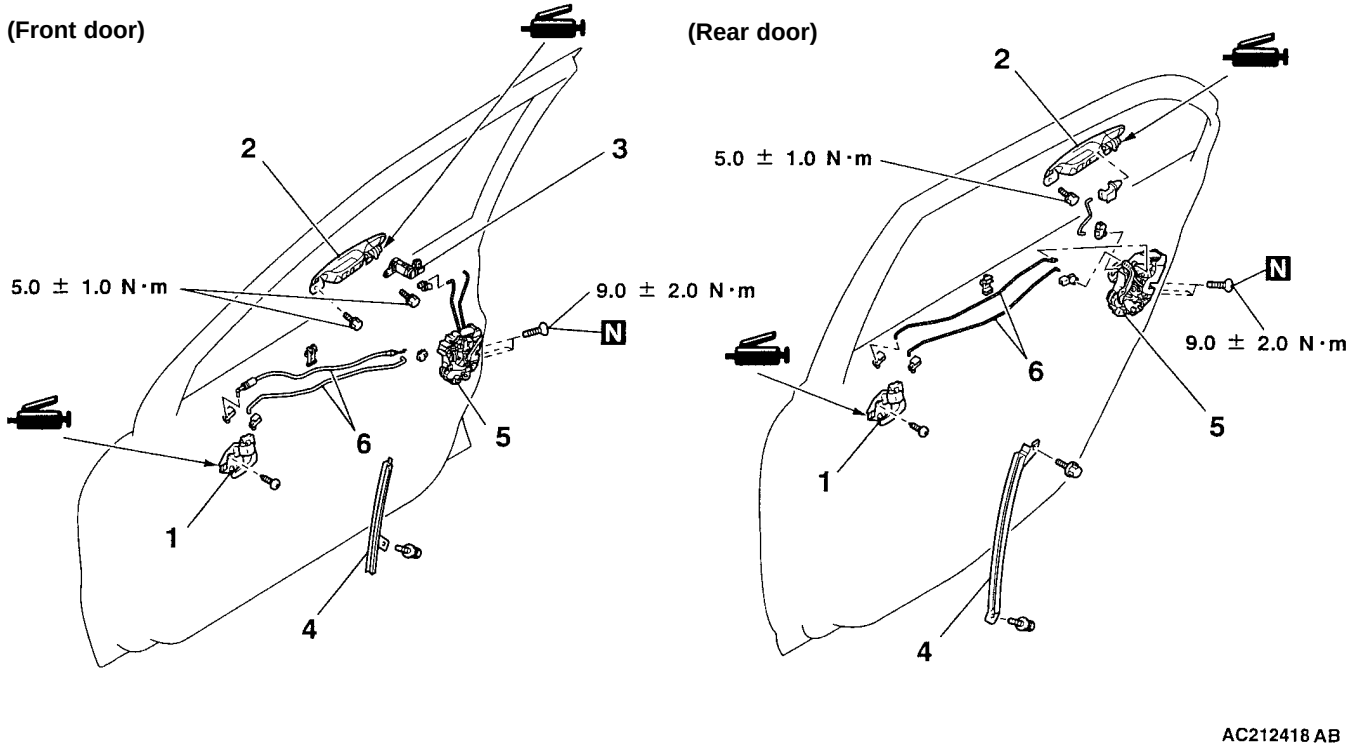
DOORS

Door handles and latches

Removal and Installation

Pre-Removal Operations
• Door trim removal

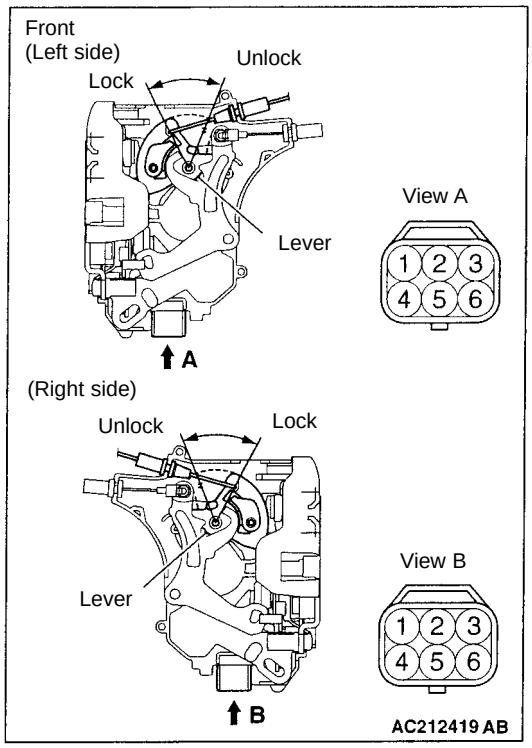
Post-Removal Operations
• Door inside handle looseness check
• Door outside handle looseness check
• Door trim installation



Removal procedure
▶B◀ 1. Door inside handle
• Waterproof film
2. Door outside handle
3. Key cylinder
▶A◀ 4. Lower sash
5. Door latch assembly
6. Link

Installation service point

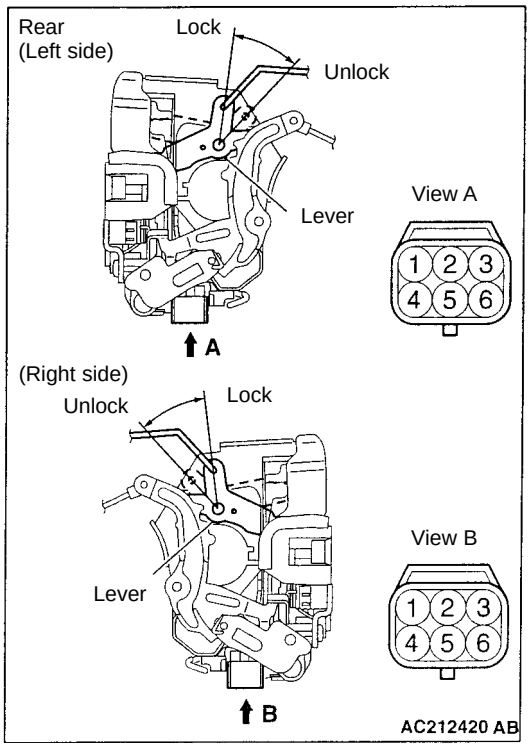
The installation points are the same as the previous model.



INSPECTION

Front door lock actuator check

Rod position		Terminal No.					Rod operation
		1	2	3	4	6	
Actuator	Lock				⊕	⊖	Lock to Unlock
	Unlock				⊖	⊕	Unlock to Lock
Latch	Lock		○	○			
	Unlock	○		○			



Rear door lock actuator check

Lever position	Terminal No.		Lever operation
	4	6	
Lock	⊕	⊖	Lock to Unlock
Unlock	⊖	⊕	Unlock to Lock

Boot Lid

The following servicing information now applies, due to changes in the boot lid torsion bar. Apart from the points described below, the servicing information is the same as that for the previous model.

Installation service points

▶A◀ Boot lid torsion bar installation

Apart from the identification colours used for the boot lid torsion bar, the procedure is the same as in the previous model.

Boot lid torsion bar		Identification colour
LH	Vehicle fitted with rear spoiler	Green
	Vehicle not fitted with rear spoiler	None
RH	Vehicle fitted with rear spoiler	Yellow
	Vehicle not fitted with rear spoiler	Red

Keyless Entry System

With the addition of the security alarm function to the keyless entry system, the following servicing information now applies. With the exception of these details, the servicing information is the same as that for the previous model.

Troubleshooting

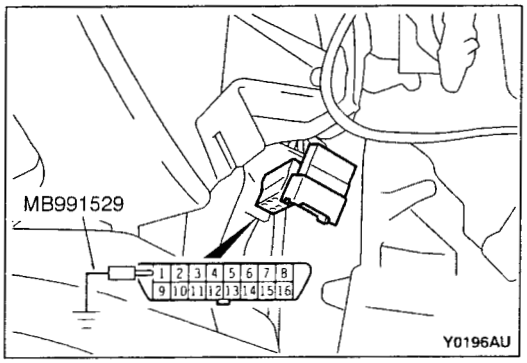
Diagnosis function

For troubleshooting information, see Chapter 54B – SWS.

On-vehicle Service

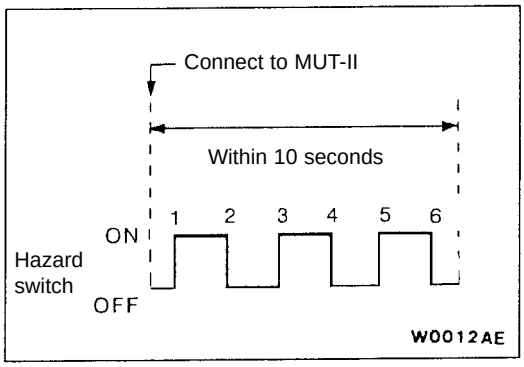
1. Encrypted code registration method

Unique encrypted codes are registered in each transmitter, and in the following cases, this code must be re-registered in the EEPROM in the ETACS-ECU.
• If the transmitter or the ETACS-ECU is replaced
• If a transmitter is added
• If an encrypted code registration error is thought to be the cause of a problem.
Up to four different encrypted codes for four different transmitters can be stored in the EEPROM memory space. When the first code is registered, all previous encrypted codes are erased. This means that when there are two or more transmitters, or when a transmitter is added, all of the codes must be re-registered.
1. Check that the normal door lock function is working at the door key cylinder.
2. Insert the ignition key into the ignition switch.
3. Connect the MUT-II/III to the diagnosis connector.



Remarks
If no MUT-II/III is present, the system is set to an encrypted code registration ready state, by earthing the No.1 terminal of the diagnosis connector.

Caution
The ignition switch must be set to the LOCK(OFF) position when connecting or disconnecting the MUT-II/III (connecting or disconnecting the earth).



4. Switch the hazard switch ON and OFF 6 times, within the space of 10 seconds after connecting to the MUT-II/III (earth connection).

Remarks
(1) When these 6 on/off operations are completed, the door lock locks and unlocks once, and assumes a registration mode.
(2) The ON/OFF status of the hazard switch changes each time the hazard switch is pressed.

5. Press the transmitter switch and then press it twice again within 10 seconds to register the code.

6. When registration is complete, the door lock will automatically lock and unlock once.

7. If there are two or more transmitters or if a transmitter is to be added, then all the transmitters must be registered within one minute after setting the registration mode. The registration method is the same as that for the first code.

8. The registration mode terminates in any of the following cases.
   • When encrypted codes for four transmitters have been registered.
   • When one minute has passed after entering registration mode.
   • When the MUT-II/III connection is removed (earth is disconnected).
   • When the ignition key is removed.

9. After registration mode has terminated, use the following procedure to check the operation of the keyless entry system.
   • Remove the ignition key
   • Close all doors

SECTION 51

EXTERIOR

CONTENTS

General 1
Front bumper 2
Adhesives 2
Front bumper 2
Rear spoiler 4
Adhesive 4
Rear spoiler 5
Marks 6

GENERAL

New servicing information now applies with the following changes and additions. Apart from the information below, servicing is the same as the Lancer Evolution VII.

• Changes in the shape of the front bumper and addition of new components
• Addition of components due to changes in rear spoiler shape, and change in the positioning of double-sided adhesive tape
• Change in the shape of three diamond mark, EVOLUTION mark and LANCER mark, and change in the positioning of EVOLUTION mark and LANCER mark.

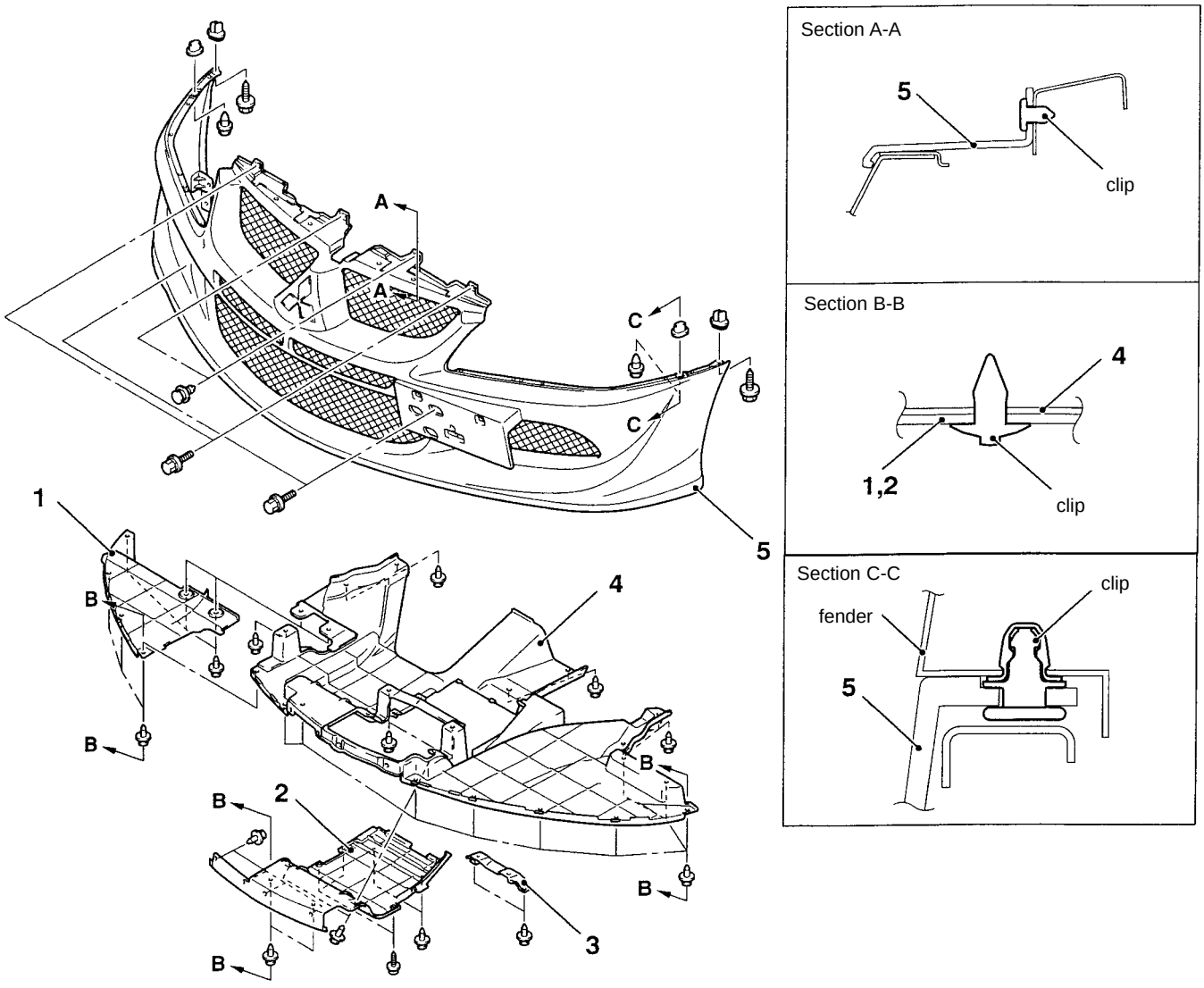
Front Bumper

Adhesive

Application	Brand
Three Diamond Mark	Double-sided tape: Generic product (width 20 mm, thickness 0.8 mm)

Front bumper

Removal and Installation

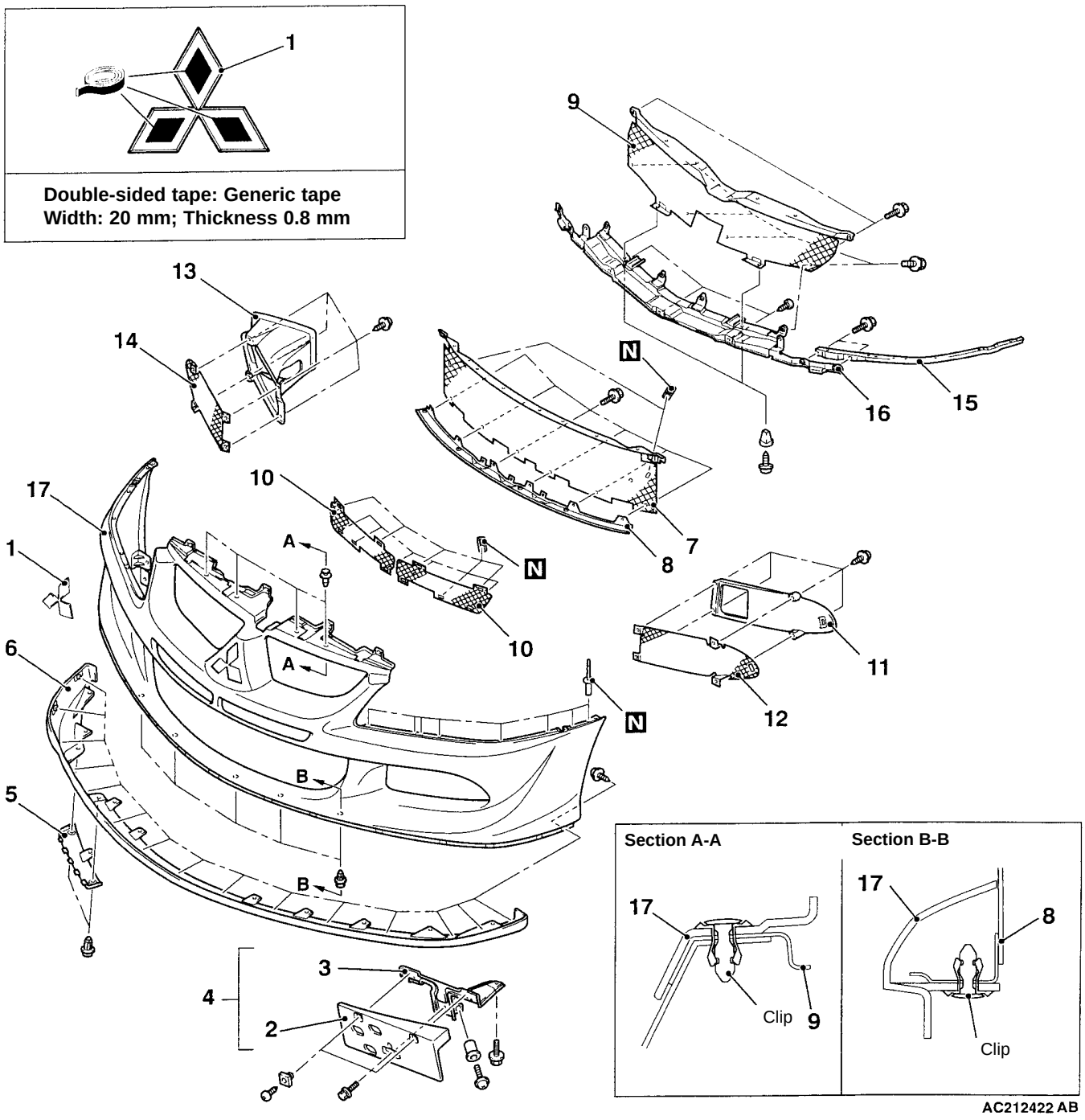


AC212421 AB

Removal procedure

1. Side under cover
2. Centre under cover
3. Under cover centre bracket
4. Front under cover
   - Splash shield installation clip
   - Water spray hose connection (see Chapter 15)
5. Front bumper assembly

Disassembly and Reassembly



Disassembly Procedure

1. Three diamond mark
2. Licence plate trim
3. Licence plate bracket
4. Licence plate bracket assembly
5. Cover
6. Front air dam panel
7. Front bumper lower plate assembly
8. Front bumper lower reinforcement assembly
9. Front bumper reinforcement assembly
10. Bumper net
11. Front bumper side cover
12. Bumper side net (LH)
13. Oil cooler duct
14. Bumper side net (RH)
    • Water spray hose and nozzle (see Chap. 15)

◂A▸ ▸A◂

15. Front bumper side plate assembly
16. Front bumper upper reinforcement assembly
17. Front bumper face

Disassembly service points

◂A▸ Removal of front bumper side plate

Use the same procedure as that for removal of front bumper rivets in previous model.

Reassembly service points

▸A◂ Installation of front bumper side plate

Use the same procedure as that for installation of front bumper rivets in previous model.

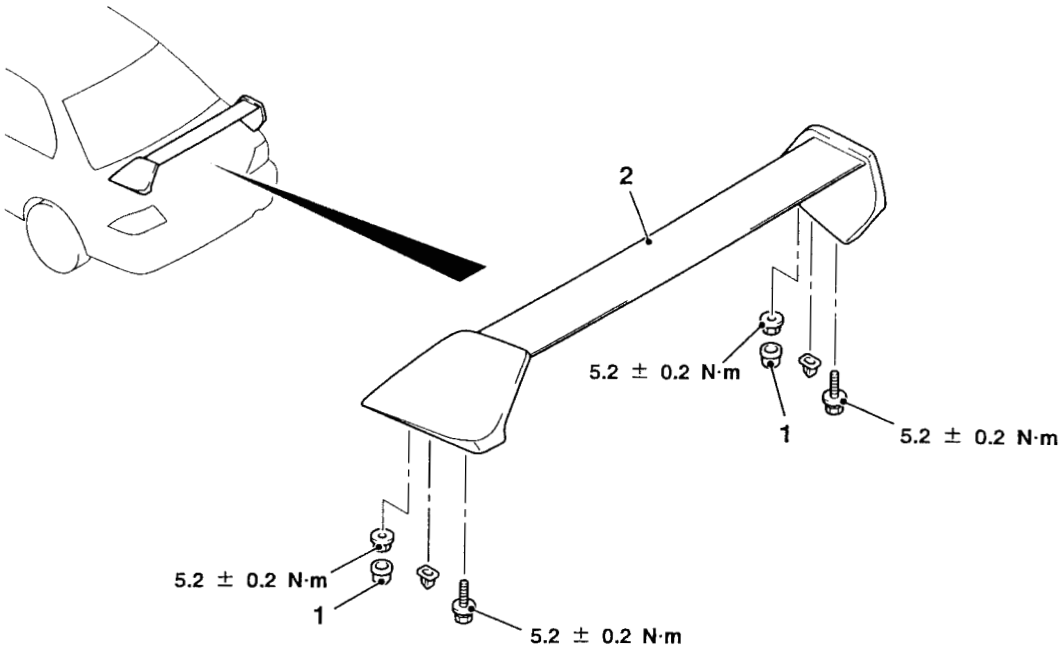
Rear Spoiler

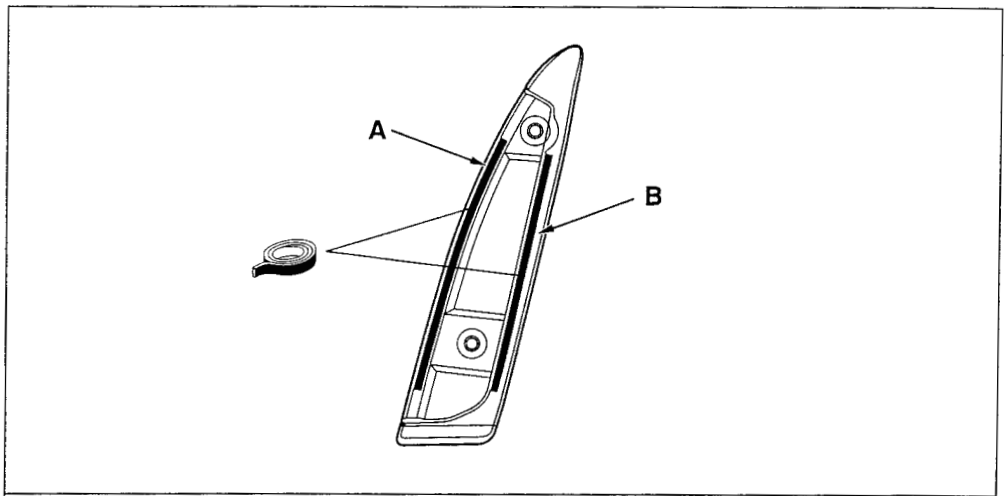
Adhesive

Application	Brand
Rear Spoiler	Double-sided tape : Generic product A (width 5 mm, thickness 0.8 mm); B (width 5 mm, thickness 1.2 mm)
	Double-sided tape removing agent : Sumitomo 3M 4000 double-sided tape remover (made by Sumitomo 3M)
	Primer : Sumitomo 3M 8107 parts primer (made by Sumitomo 3M)

Rear Spoiler

Removal and Installation





Double-sided tape: Generic products A: width 5 mm, thickness 0.8 mm, B: width 5 mm, thickness 1.2 mm
Primer: Sumitomo 3M 8107 PP parts primer

AC212423 AB

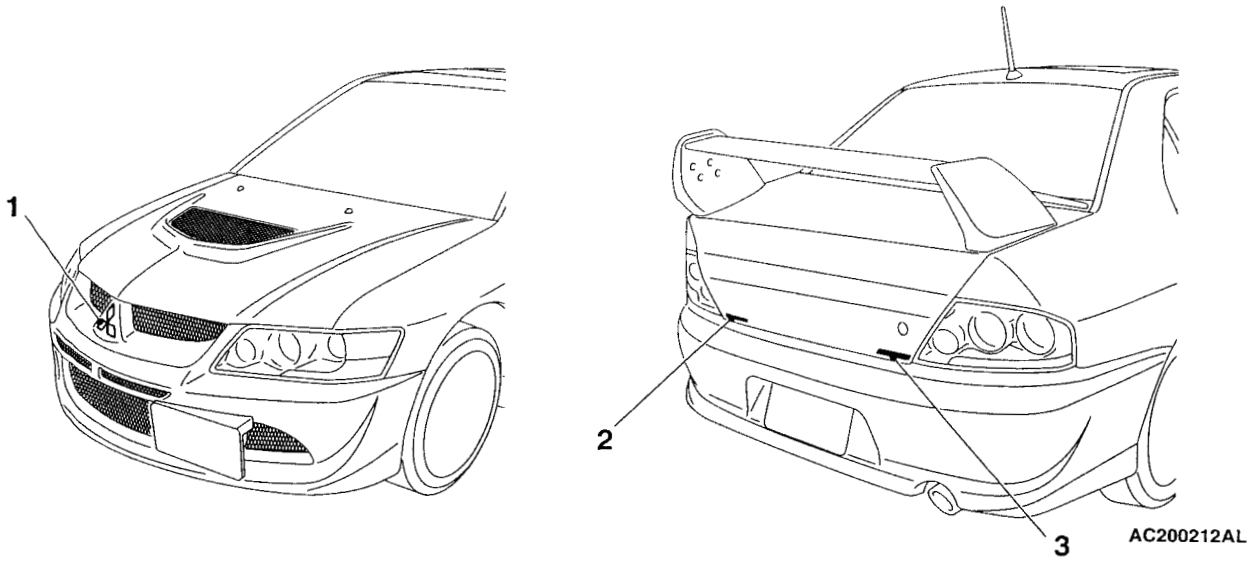
Removal procedure

• Boot lid bumper
1. Cap
◂A▸ ▸A◂ 2. Rear spoiler

Remarks :
The removal and installation service points are the same as those for the air dam, bumper moulding, wing and door moulding in the previous model.

Marks

Removal and Installation



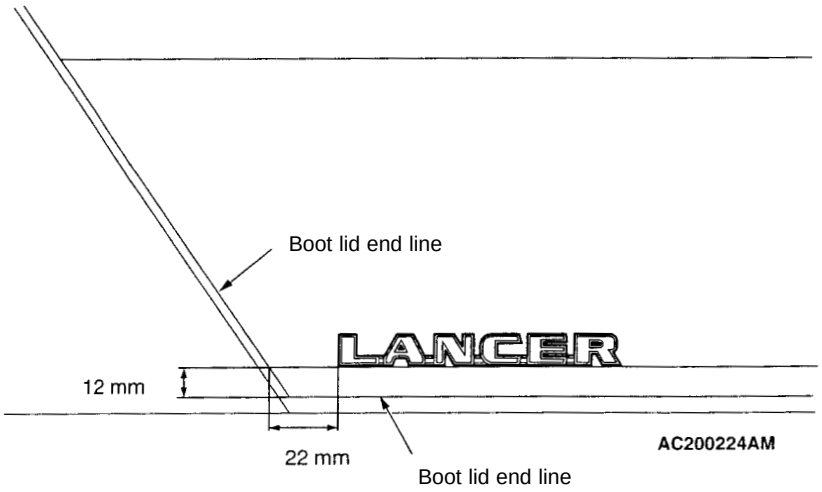
1. Three diamond mark
▶A◀ 2. LANCER mark
▶A◀ 3. EVOLUTION mark

Installation service points

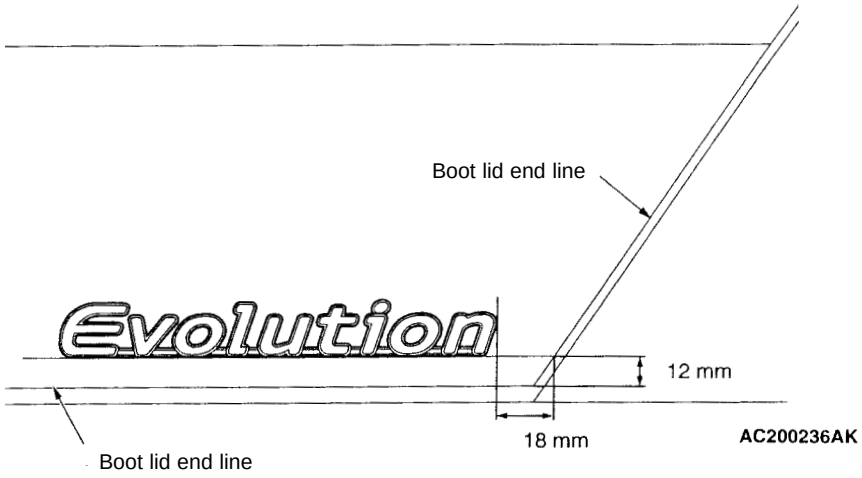
▶A◀ Installation of marks

1. Installation position

(2) LANCER mark



(3) EVOLUTION mark



2. Installation procedure
(1) Remove grease from installation surface of the body, using unleaded gasoline.
(2) Peel off the protective backing of the mark and apply it to the installation position.

Caution
1) Perform this operation in a dust-free environment at a room temperature of 20 – 38°C.
2) If the room temperature is less than 20°C, then the mark and body (installation position) must be heated to 20 – 30°C.
3) The mark must be pressed to eliminate any air bubbles.

SECTION 52

INTERIOR & SRS

CONTENTS

Interior.....52A

Suplemental Restraint System (SRS).....52B

SECTION 52A

INTERIOR

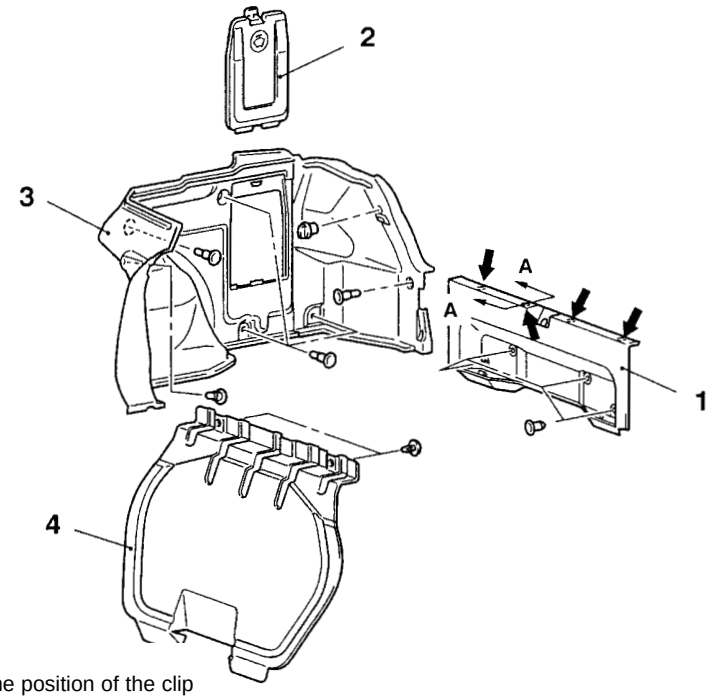
CONTENTS

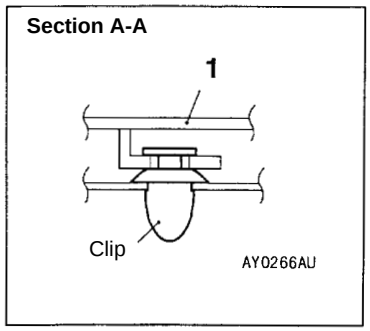
General 1
Boot interior trim 1
Interior mirror 1

General

• The removal information for the boot interior trim has been changed due to the addition of a front trim.
• The removal information for the interior mirror has been changed due to design changes in the mirror.

Boot interior trim

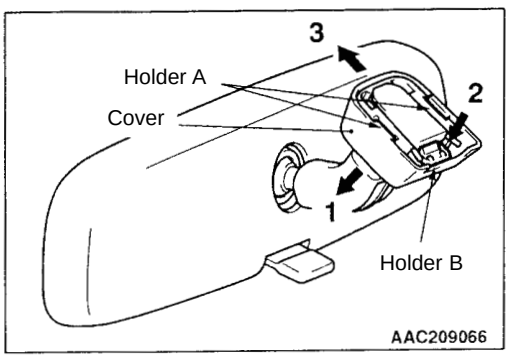




AAC211106

Remarks
←This symbol indicates the position of the clip

1. Rear end trim
2. Side trim lid
3. Side trim
4. Front trim



Interior Mirror

Removal procedure

1. Detach fitting at holder A, and pull cover down in direction of arrow 1.
2. Press holder B is direction of arrow 2 to disengage lock, and then pull mirror down in direction of arrow 3.

SECTION 52B

SRS AIRBAGS

CONTENTS

General ……………..……… 1
Service precautions ……… 1
Special tools………..……… 2
Test equipment ………..……… 3
Troubleshooting………..……… 4
Post-Collision diagnosis……… 28
Servicing SRS airbag and seat belt pre-tensioner components 29
Caution labels……………… 29
Front impact sensors………. 30
Airbag modules and clock spring………..……… 32
Seat belt pre-tensioner……......................34
Disposal procedures for airbag module and seat belt pre-tensioner ....…34

Caution
To ensure safety, carefully read through the service precautions before starting work.

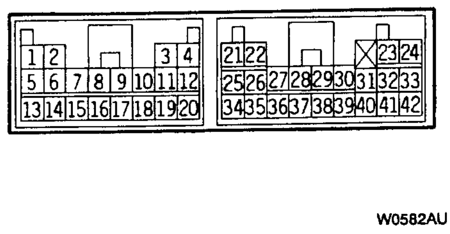
General

New servicing information has been established with the following changes. Apart from the information below, servicing is the same as in the previous model.
• Front impact sensors added (vehicles not fitted with front passenger's seat airbag module)
• Clock springs and seat belt pre-tensioners have been changed

Service Precautions

Precautions relating to the front impact sensors have been added. With the exception of the following, precautions are the same as those for the previous model.
1. If there is a fault in a front impact sensor, then it must always be replaced by a new sensor.

SRS-ECU connector

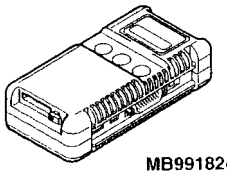
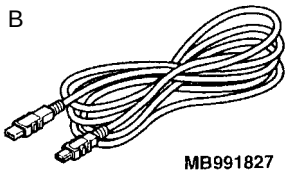
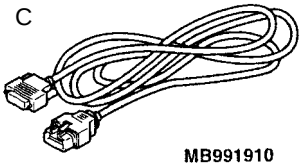
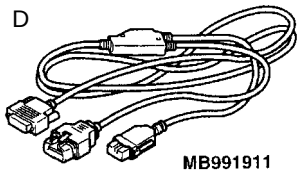
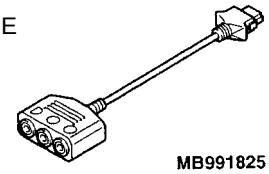
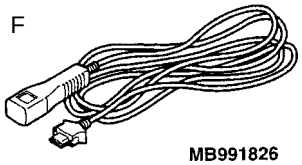
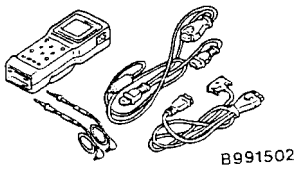
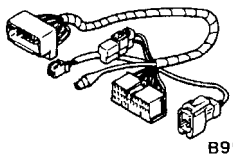


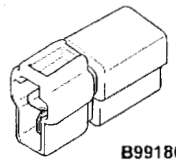
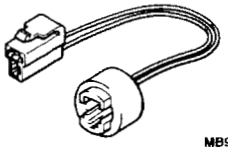
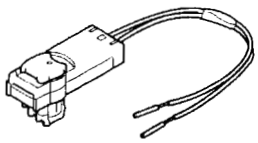
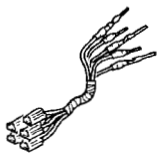
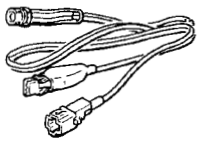
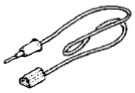
2. If there is an abnormality in the SRS airbag harness connector, then this must be replaced by a new one. If there is an abnormality in the harness, then it must be repaired or replaced, in accordance with the following table.

SRS-ECU Terminal No.	Harness connection point	Measure
1, 2	Instrument panel harness → Front harness (RH) → Front impact sensor (RH)	Repair or replace respective harnesses
3, 4	Instrument panel harness → Front harness (LH) → Front impact sensor (LH)	Repair or replace respective harnesses

3. When painting, if the temperature is likely to rise to 93°C or above, the front impact sensors should be removed in advance.

Special Tools

Tool	Number	Name	Use
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  MB991825 F  MB991826 MB991955	MB991502 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991825 F: MB991826	MUT-III Assembly A: V.C.I (Vehicle Communication Interface) B: USB cable C: MUT-III main harness A (for vehicles fitted with CAN communications) D: MUT-III main harness B (for vehicles not fitted with CAN communications) E: Measurement adapter F: Trigger harness	Reading and erasing diagnosis codes
 B991502	MB991502	MUT-II sub-assembly	• Reading and erasing diagnosis codes • Reading problem duration time • Reading no. of memory erasure operations
 B991613	MB991606 or MB991613	SRS check harness	Checking SRS airbag electrical circuits

Tool	Number	Name	Use
 B991865	MB991865	Dummy resistor	Checking electrical circuits of SRS airbags and seat belt pre-tensioners
 MB991884	MB991884	Resistance harness (for pre-tensioners)	Checking electrical circuits of seat belt pre-tensioners
 MB991885	MB991885	Seat belt pre-tensioner harness adapter	Operating seat belt pre-tensioners from inside or outside vehicle
A  B  C  D  C991223	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Check harness B: LED harness C: LED harness adapter D: Probe	Checking connectivity and measuring voltage at SRS-ECU harness connectors

Test equipment

Device	Name	Use
 13R0746	Digital circuit tester	Checking SRS airbag circuits (use a meter which has a maximum test current of 2 mA or less in the minimum resistance value range)

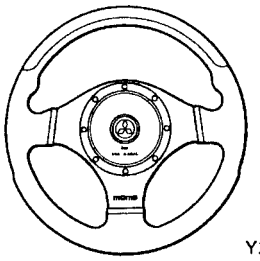
Troubleshooting

With the exception of the following points, servicing follows the same procedure as in the previous model.

Remarks
In the Inspection procedure, based on the diagnosis code, the driver's airbag module (squib) system is set up differently depending on the type of steering wheel, as indicated below.

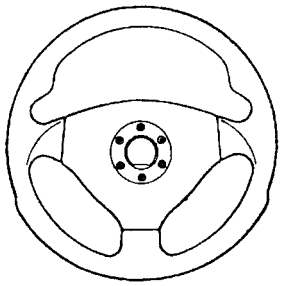
1. Type 1: Separate systems for steering wheel and airbag module system (fitted as standard in GSR, optional in RS)
2. Type 2: Integrated system for steering wheel and airbag module (fitted as standard in RS)

(Type 1)



Y2058AU

(Type 2)



13R0025

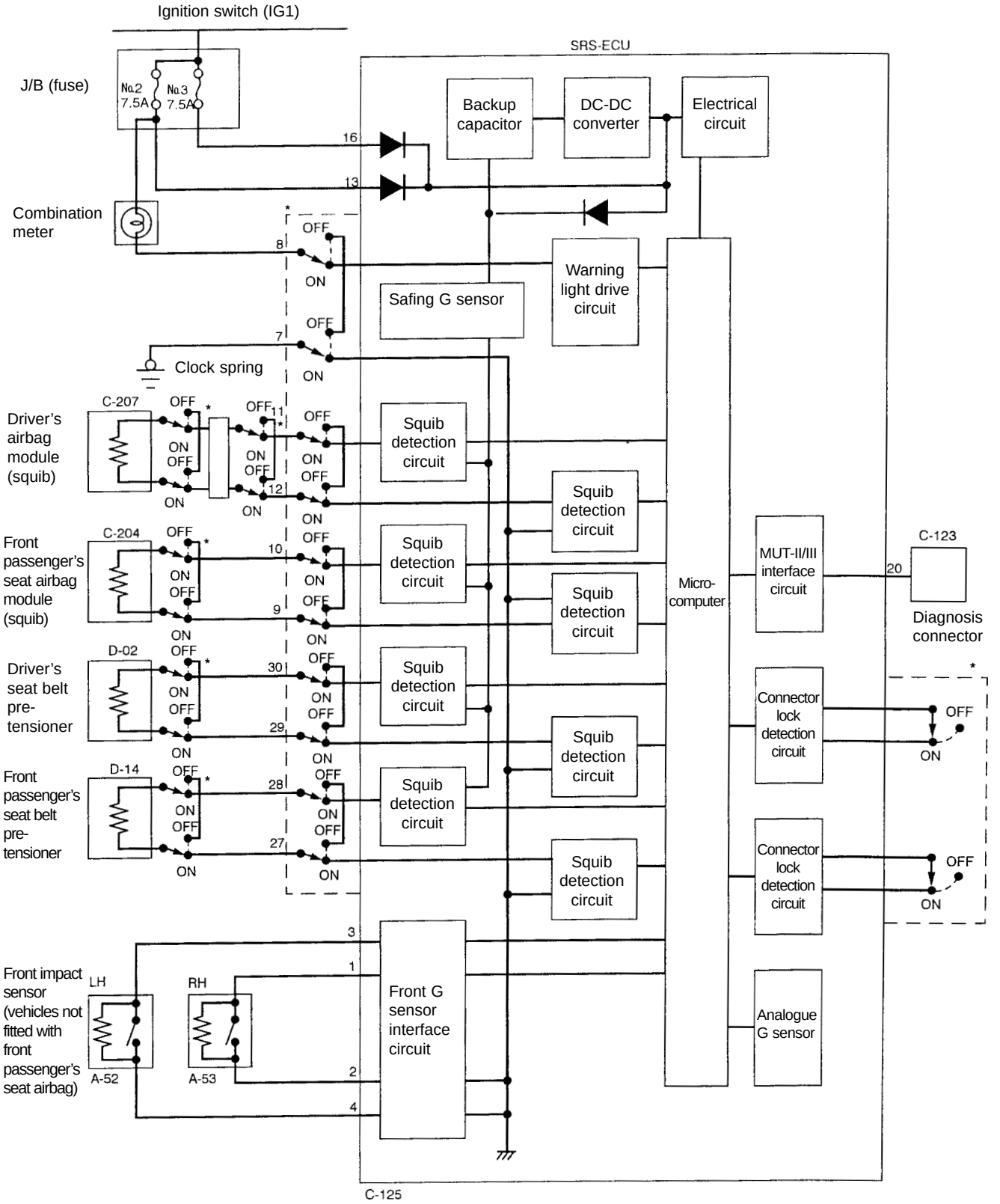
1. Basic procedure for fault diagnosis

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

2. Diagnosis function
2-1 Reading diagnosis codes
Connect the MUT-II/III to the 16-pin diagnosis connector and read out the diagnosis codes.
(Refer to Chapter 00 – How to Use Troubleshooting / Service Inspection Points.)

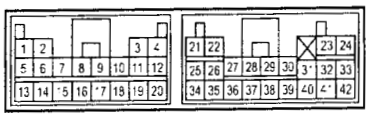
2-2 Erasing diagnosis codes
Connect the MUT-II/III to the 16-pin diagnosis connector and erase the diagnosis codes.
(Refer to Chapter 00 – How to Use Troubleshooting / Service Inspection Points.)

3. SRS System Circuit Diagram



Remarks : *Connector lock switch
(Connector engaged: ON
Connector disengaged: OFF)

SRS-ECU connector



AC102367

4. Chart of Diagnosis Codes

Code No.	Diagnostic Item		Page
1A	Front impact sensor LH system	Shorting between sensor terminals	52B-7
1B	Front impact sensor LH system	Disconnection of sensor circuit	
1C	Front impact sensor LH system	Shorting of power supply to sensor circuit	
1D	Front impact sensor LH system	Shorting of earth to sensor circuit	
2A	Front impact sensor RH system	Shorting between sensor terminals	
2B	Front impact sensor RH system	Disconnection of sensor circuit	
2C	Front impact sensor RH system	Shorting of power supply to sensor circuit	
2D	Front impact sensor RH system	Shorting of earth to sensor circuit	
21*1	Driver's airbag module (squib) system	Shorting between terminals of squib circuit	52B-8
22*1	Driver's airbag module (squib) system	Disconnection of squib circuit	52B-12
26*1	Driver seat belt pre-tensioner (squib) system	Shorting between terminals of squib circuit	52B-15
27*1	Driver seat belt pre-tensioner (squib) system	Disconnection of squib circuit	52B-17
28*1	Front passenger's seat belt pre-tensioner (squib) system	Shorting between terminals of squib circuit	52B-18
29*1	Front passenger's seat belt pre-tensioner (squib) system	Disconnection of squib circuit	52B-20
39	All airbags deployed		52B-21
46*2	SRS-ECU assembled incorrectly		52B-21
61	Driver's airbag module (squib) system	Short-circuited to power supply	52B-22
62	Driver's airbag module (squib) system	Short-circuited to earth	52B-22
66	Driver seat belt pre-tensioner (squib) system	Short-circuited to power supply	52B-25
67	Driver seat belt pre-tensioner (squib) system	Short-circuited to earth	52B-25
68	Front passenger's seat belt pre-tensioner (squib) system	Short-circuited to power supply	52B-26
69	Front passenger's seat belt pre-tensioner (squib) system	Short-circuited to earth	52B-26

Remarks

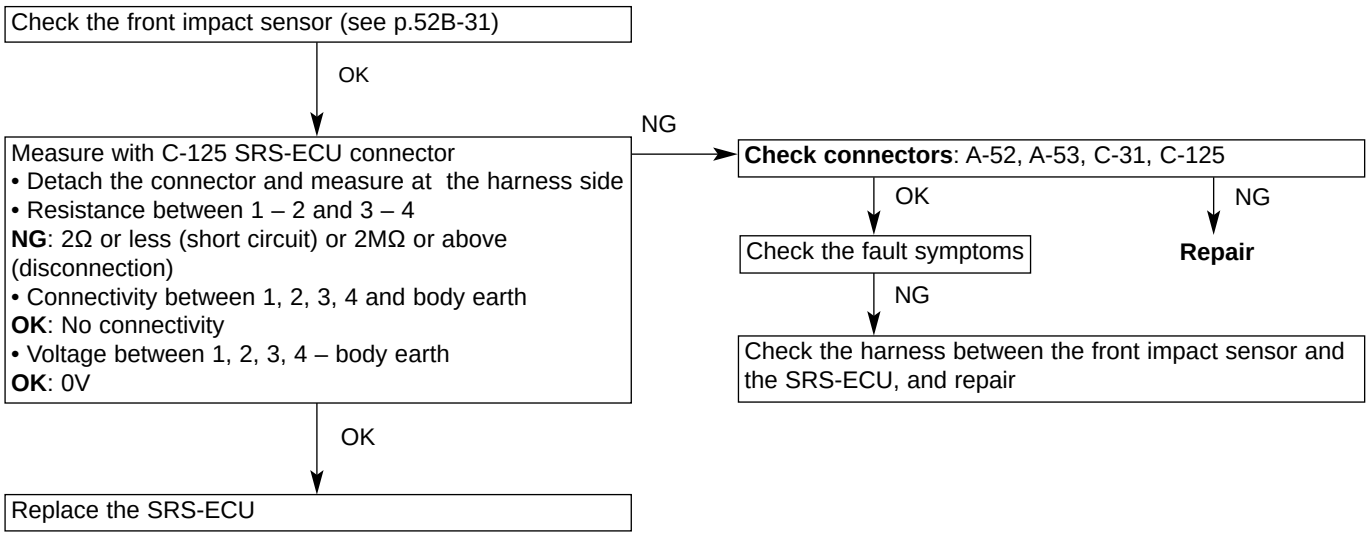
1. *1 : When system reverts to normal, diagnosis code will remain stored in diagnosis code memory when the SRS warning light switches off.
2. *2 : When system reverts to normal, diagnosis code will be automatically erased when the SRS warning light switches off.

5. Inspection Procedure Classified by Diagnosis Code

Code No. 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D Front impact sensor system	**Possible cause**
These codes are output whenever the resistance between the input terminals of the front impact sensors of the SRS-ECU differs from the normal value. Refer to the table below for the fault cause for each code number.	• Harness, contactor malfunction • Front impact senor malfunction • SRS-ECU malfunction

Table 1

Code No.	Cause of fault
1A	Shorting of left-side front impact sensor or harness short-circuit
1B	Disconnection of left-wide front impact sensor or disconnection of harness
1C	Harness of left-side front impact sensor shorted to power supply
1D	Harness of left-side front impact sensor shorted to vehicle earth
2A	Shorting of right-side front impact sensor or harness short-circuit
2B	Disconnection of right-wide front impact sensor or disconnection of harness
2C	Harness of right-side front impact sensor shorted to power supply
2B	Harness of right-side front impact sensor shorted to vehicle earth

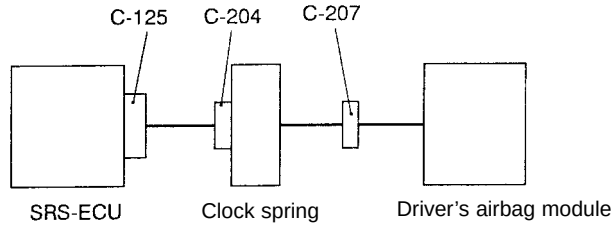


Code No. 21 Driver's airbag module (squib) system	Possible cause
This code is output when shorting occurs between the terminals of the driver's airbag module (squib) circuit of the SRS-ECU. When normal operation is resumed, the SRS warning light goes out. (The diagnosis code is not erased.)	• Fault in the connector fitting or fault in the short bar* • Shorting in the clock spring • Shorting between the terminals of the driver's airbag module (squib) circuit • Connector fault • SRS-ECU fault

Remarks:

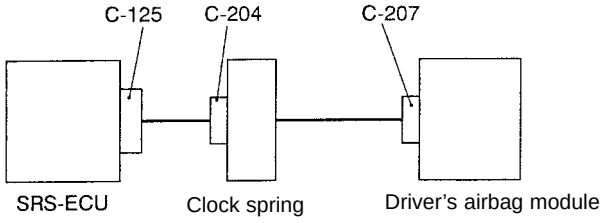
*The connector of the squib circuit contains a short bar (which shorts the (+) cable to the (–) cable of the squib circuit when the connector is not connected, in order to avoid erroneous deployment due to static electricity, or the like). Therefore, when a connector is connected, the short bar may not be released if there is a fault in the connector fitting or a malfunction in the connector itself, as illustrated below. Before proceeding to the troubleshooting steps on the next page, disconnect the connector as shown below, and then reconnect it. If no diagnosis code is output, then it can be assumed that the code was previously output due to poor fitting of the connector.

Type 1



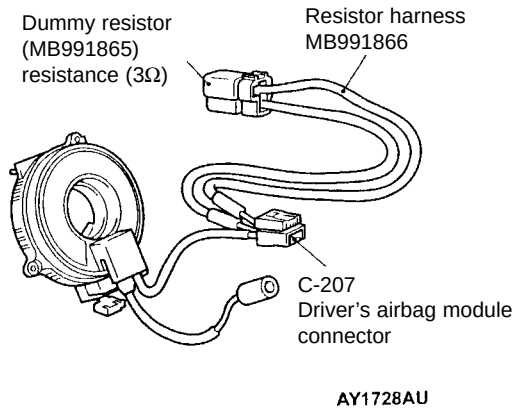
AC105785

Type 2



AC105787AB

(Type 1)



(Checking the driver's airbag module (squib))
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the driver's airbag module connector C-207
- Connect the dummy resistor (MB991865) to the resistor harness (MB 991866)
- Insert the probe of the resistor harness (MB991866) behind the driver's airbag module connector C-207 of the clock spring

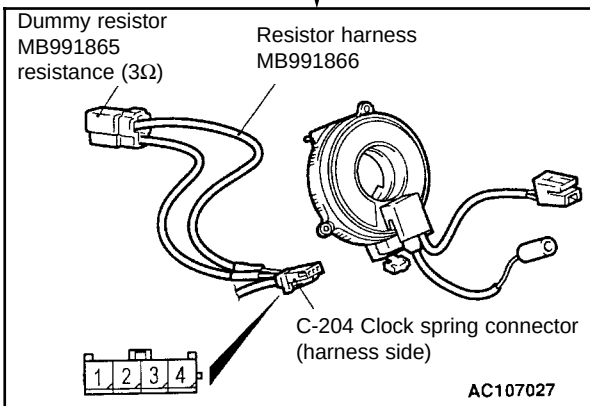
Caution
Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

- Connect the (–) terminal of the battery.
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No.21 output?

NO → Replace the driver's airbag module (squib)

YES ↓



(Checking the clock spring)
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the clock spring connector (4 pin) C-204
- Connect the dummy resistor (MB991865) to the resistor harness (MB991866)
- Insert the probe of the resistor harness (MB991866) between terminal 3 and 4, behind the clock spring connector C-204 (harness side)

Caution
Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

- Connect the (–) terminal of the battery.
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No.21 output?

YES ↓ → To next page

NO → Replace the clock spring

From previous page

YES

(Checking the circuit between the SRS-ECU and the clock spring)
Measure at the SRS-ECU connector C-125
- Detach the SRS-ECU connector C-125
- Detach the clock spring connector C-204

Caution
In the following operation, detach the SRS-ECU connector and short the squib circuit before releasing the short bar of the connector.

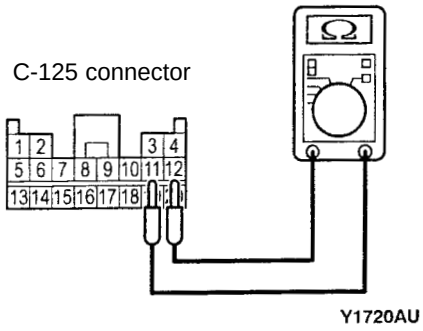
- Insert insulating material, such as cable bands (3mm wide, 0.5mm thick), between the short bar and the terminals 11, 12 of the SRS-ECU connector (harness side) C-125. Release the short bar. (See Fig. A)

Caution
If the insulating material is not inserted sufficiently, then it may be impossible to release the short bar. Ensure that the insulating material is inserted to a depth of at least 4mm.

- Check connectivity between 11 and 12

Caution
Do not insert the probe, etc. directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

OK : No connectivity



OK

Replace the SRS-ECU

Check connectors: C-125, C-204

OK

Confirm the symptoms

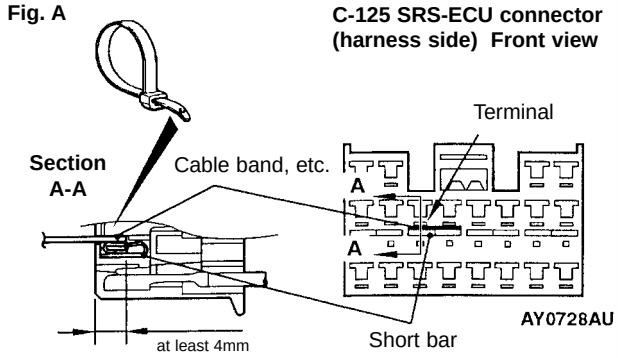
NG

Check the harness between the clock spring and the SRS-ECU, and repair.

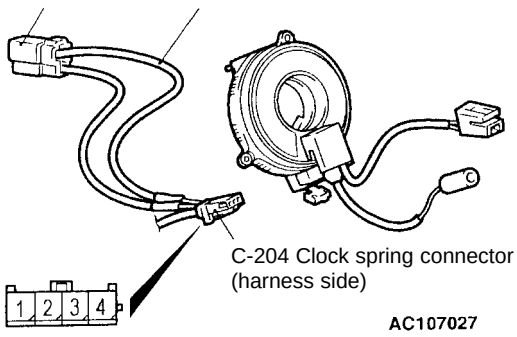
NG

Repair

Fig. A **C-125 SRS-ECU connector (harness side) Front view**



(Type 2)



(Checking the driver's airbag and clock spring)
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the clock spring connector (4-pin) C-204
- Connect the dummy resistor (MB991865) to the resistor harness (MB 991866)
- Insert the probe of the resistor harness (MB991866) between terminals 3 and 4, behind clock spring connector C-204 (harness side)

  Caution
  Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.
- Connect the (–) terminal of the battery.
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No.21 output?

YES

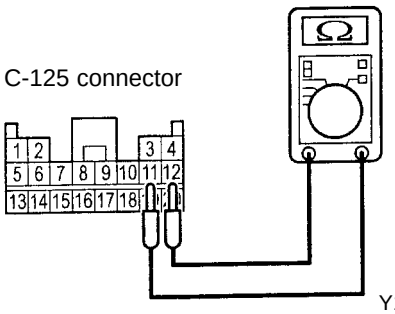
(Checking the circuit between the SRS-ECU and the clock spring)
Measure at the SRS-ECU connector C-125
- Detach the SRS-ECU connector C-125
- Detach the clock spring connector C-203

  Caution
  In the following operation, detach the SRS-ECU connector and short the squib circuit before releasing the short bar of the connector.
- Insert insulating material, such as cable bands (3mm wide, 0.5mm thick), between the short bar and the terminals 11, 12. Release the short bar. (See Fig. A)

  Caution
  If the insulating material is not inserted sufficiently, then it may be impossible to release the short bar. Ensure that the insulating material is inserted to a depth of at least 4mm.
- Measure at the harness side
- Check connectivity between 11 and 12

  Caution
  Do not insert the probe, etc. directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

OK: No connectivity



OK

Replace the SRS-ECU

NO

Check the clock spring (see p.52B-33)

OK

Replace the driver's airbag module (squib)

NG

Replace the clock spring

NG

Check connectors: C-125, C-203

OK

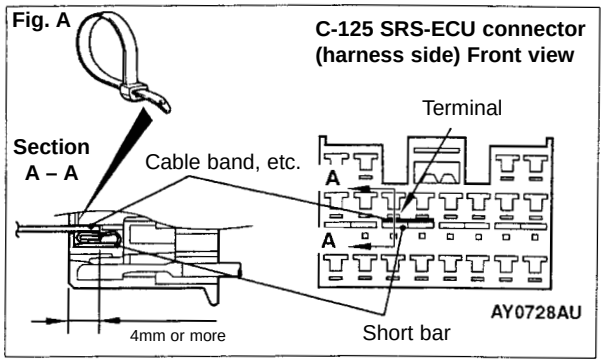
Confirm the fault symptoms

NG

Check the harness between the clock spring and the SRS-ECU, and repair.

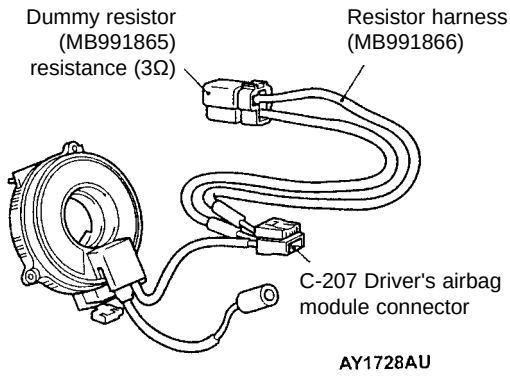
NG

Repair



Code No. 22 Driver's airbag module (squib) system	Possible cause
This code is output when there is a disconnection in the driver's airbag module (squib) circuit of the SRS-ECU. When normal operation is resumed, the SRS warning light goes out. (The diagnosis code is not erased.)	• Disconnection of the clock spring • Half-disconnection due to incorrect neutral positioning of the clock spring • Disconnection in the driver's airbag module (squib) circuit • Detachment of the driver's airbag module (squib) connector • Connector contact fault • SRS-ECU fault

(Type 1)



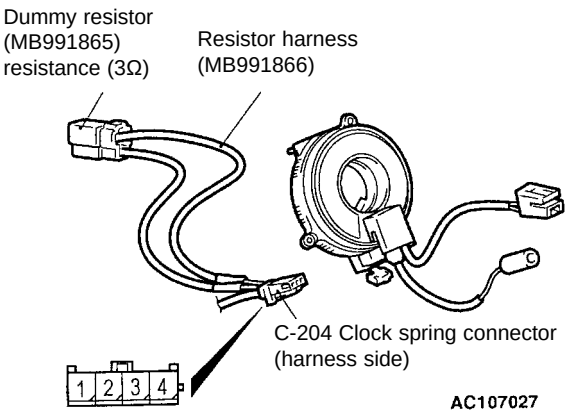
(Checking the driver's airbag module (squib))
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the driver's airbag module connector C-207
- Connect the dummy resistor (MB991865) to the resistor harness (MB 991866)
- Insert the probe of the resistor harness (MB991866) behind the driver's airbag module connector C-207 of the clock spring.

  Caution
  Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.
- Connect the (–) terminal of the battery.
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No.22 output?

NO → Replace the driver's airbag module (squib)

YES ↓



(Checking the clock spring)
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the clock spring connector (4-pin) C-204
- Connect the dummy resistor (MB991865) to the resistor harness (MB 991866)
- Insert the probe of the resistor harness (MB991866) between terminals 3 and 4, behind clock spring connector C-204 (harness side)

  Caution
  Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.
- Connect the (–) terminal of the battery.
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No.22 output?

YES ↓ → To next page

NO → Replace the clock spring

From previous page

YES

(Checking the circuit between the SRS-ECU and the clock spring)

Measure at SRS-ECU connector C-125 and clock spring connector C-204

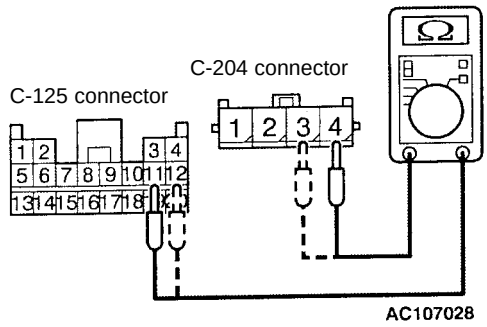
- Detach the SRS-ECU connector C-125 and the clock spring connector C-125 and measure at the harness side
- Check connectivity between the following terminals

C-125 connector	C-204 connector
11	4
12	3

Caution

Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

OK: Connectivity (2Ω max.)



NG → Check connectors : C-125, C-205

OK → Confirm the fault symptoms

NG → Check the harness between the clock spring and the SRS-ECU, and repair.

NG → **Repair**

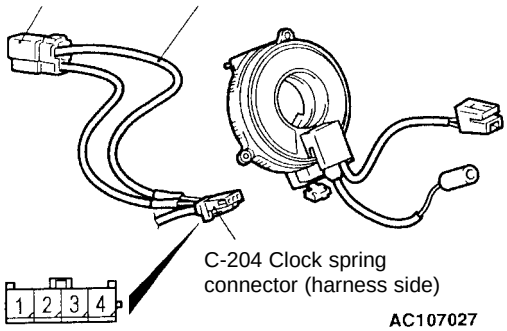
OK

Replace the SRS-ECU

(Type 2)

Dummy resistor (MB991865) resistance (3Ω)

Resistor harness (MB991866)



(Checking the driver's airbag and clock spring)
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the clock spring connector (4-pin) C-204
- Connect the dummy resistor (MB991865) to the resistor harness (MB 991866)
- Insert the probe of the resistor harness (MB991866) between terminals 3 and 4, behind clock spring connector C-204 (harness side)

Caution
Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

- Connect the (–) terminal of the battery.
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

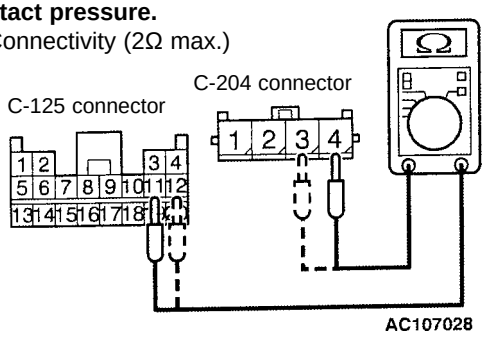
Is Code No.22 output?

YES

(Checking the circuit between the SRS-ECU and the clock spring)
Measure at SRS-ECU connector C-125 and clock spring C-203
- Detach the SRS-ECU connector C-125 and the clock spring connector C-203 and measure at the harness side
- Check connectivity between the following terminals

C-125 connector	C-203 connector
11	2
12	1

Caution
Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.
OK : Connectivity (2Ω max.)



OK

Replace the SRS-ECU

NO

Check the clock spring (see p.52B-34)

OK

Replace the driver's airbag module (squib)

NG

Replace the clock spring

NG

Check connectors: C-125, C-203

OK

Confirm the fault symptoms

NG

Check the harness between the clock spring and the SRS-ECU, and repair.

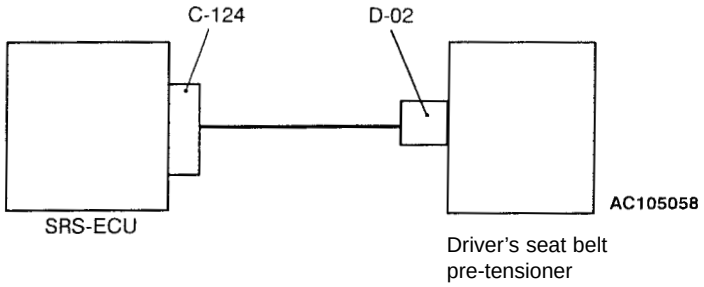
NG

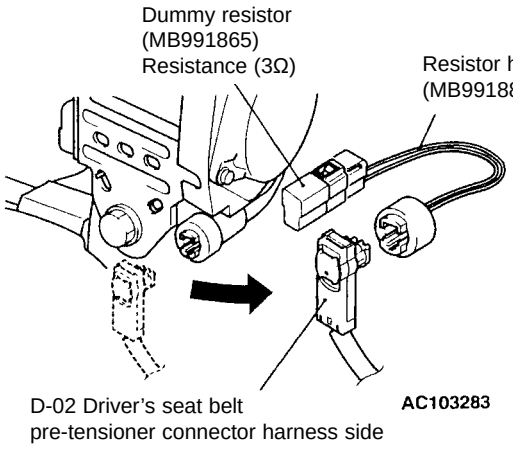
Repair

Code No. 26 Driver's seat belt pre-tensioner (squib) system	Possible cause
This code is output when shorting occurs between the terminals of the driver's seat belt pre-tensioner (squib) circuit of the SRS-ECU. When normal operation is resumed, the SRS warning light goes out. (The diagnosis code is not erased.)	• Fault in the connector fitting or fault in the short bar* • Shorting between the terminals of the driver's seat belt pre-tensioner (squib) circuit • Connector fault • SRS-ECU fault

Remarks:

* The connector of the squib circuit contains a short bar (which shorts the (+) cable to the (–) cable of the squib circuit when the connector is not connected, in order to avoid erroneous deployment due to static electricity, or the like). Therefore, when a connector is connected, the short bar may not be released if there is a fault in the connector fitting or a malfunction in the connector itself, as illustrated below. Before proceeding to the troubleshooting steps on the next page, disconnect the connector as shown below, and then reconnect it. If no diagnosis code is output, then it can be assumed that the code was previously output due to poor fitting of the connector.





(Checking the driver's seat belt pre-tensioner (squib))
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the driver's seat belt pre-tensioner connector D-02 (see p.52B-34)
- Connect the dummy resistor (MB991865) to the resistor harness (MB 991884)
- Connect the resistor harness (MB991884) to the harness side of the driver's seat belt pre-tensioner connector D-02
- Connect the (–) terminal of the battery
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No.26 output?

YES

NO

Replace the driver's seat belt pre-tensioner

(Checking the circuit between the SRS-ECU and the driver's seat belt pre-tensioner)
Measure at the SRS-ECU connector C-124
- Detach the SRS-ECU connector C-124
- Detach the driver's seat belt pre-tensioner connector D-02 (see p.52B-34)

Caution
In the following operation, detach the SRS-ECU connector and short the squib circuit before releasing the short bar of the connector.

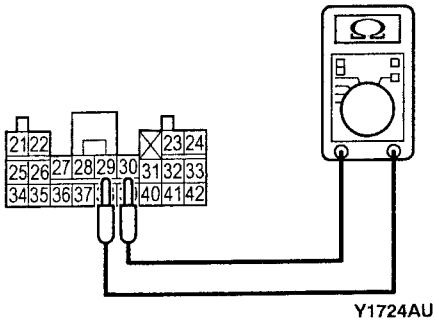
- Insert insulating material, such as cable bands (3mm wide, 0.5mm thick), between the short bar and the terminals 29, 30 of the SRS-ECU connector (harness side) C-124. Release the short bar. (See Fig. A)

Caution
If the insulating material is not inserted sufficiently, then it may be impossible to release the short bar. Ensure that the insulating material is inserted to a depth of at least 4mm.

- Check connectivity between 29 and 30

Caution
Do not insert the probe, etc. directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

OK: No connectivity



NG

Check connectors: C-124, D-02, C-116

OK

NG

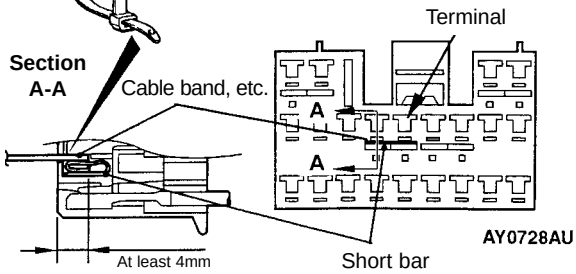
Confirm the symptoms

Repair

NG

Check the harness between the driver's seat belt pre-tensioner and the SRS-ECU, and repair.

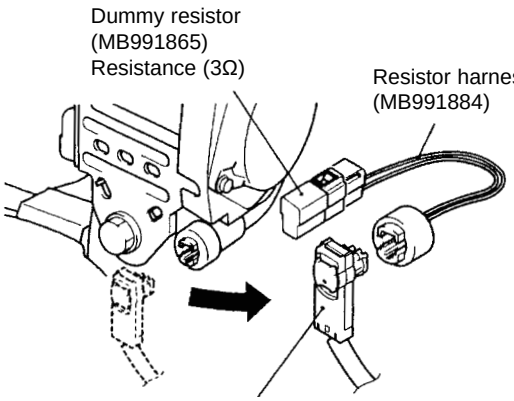
Fig. A **C-124 SRS-ECU connector (harness side) Front view**



OK

Replace the SRS-ECU

Code No. 27 Driver's seat belt pre-tensioner (squib) system	Possible cause
seat belt pre-tensioner (squib) circuit of the SRS-ECU. When normal operation is resumed, the SRS warning light goes out. (The diagnosis code is not erased.)	• Connector contact fault • Disconnection in the driver's seat belt pre-tensioner (squib) circuit • SRS-ECU fault



D-02 Driver's seat belt pre-tensioner connector harness side

(Checking the driver's seat belt pre-tensioner (squib))
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the driver's seat belt pre-tensioner connector D-02 (see p.52B-34)
- Connect the dummy resistor (MB991865) to the resistor harness (MB 991884)
- Connect the resistor harness (MB991884) to the harness side of the driver's seat belt pre-tensioner connector D-02
- Connect the (–) terminal of the battery
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No.27 output?

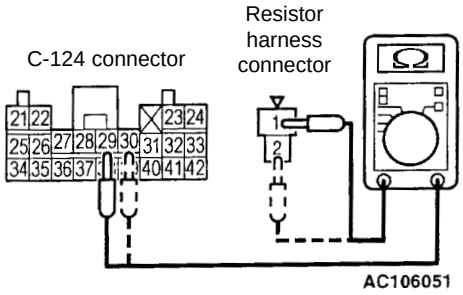
YES

(Checking the circuit between the SRS-ECU and the driver's seat belt pre-tensioner)
Measure at the SRS-ECU connector C-124 and driver's seat belt pre-tensioner connector D-02
- Detach the SRS-ECU connector C-124 and measure at harness side
- Detach the driver's seat belt pre-tensioner connector D-02 (see p.52B-34), and connect the resistor harness (MB991884) to the harness side.
- Check connectivity between the following terminals.

C-124 connector	Resistor harness Connector
29	1
30	2

Caution
Do not insert the probe, etc. directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

OK: Connectivity (2Ω max.)



OK

Replace the SRS-ECU

NO

Replace the driver's seat belt pre-tensioner

NG

Check connectors: C-124, D-02, C-116

OK

Confirm the fault symptoms

NG

Check the harness between the driver's seat belt pre-tensioner and the SRS-ECU, and repair.

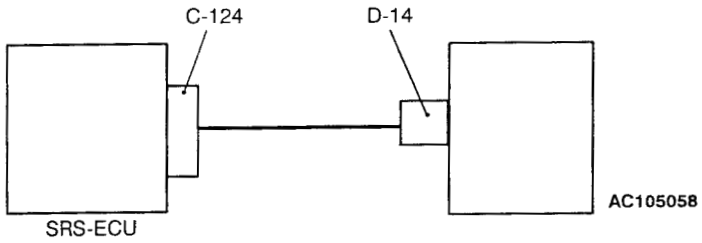
NG

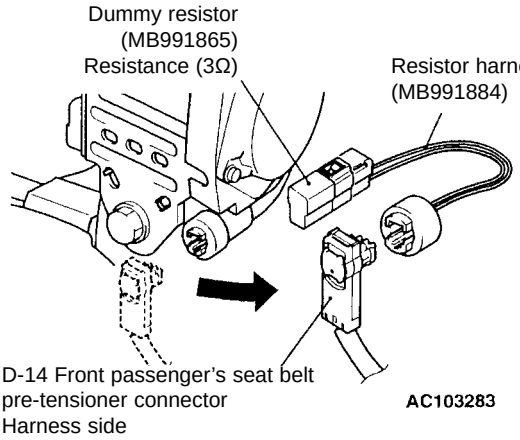
Repair

Code No. 28 Front passenger's seat belt pre-tensioner (squib) system	Possible cause
This code is output when shorting occurs between the terminals of the front passenger's seat belt pre-tensioner (squib) circuit of the SRS-ECU. When normal operation is resumed, the SRS warning light goes out. (The diagnosis code is not erased.)	• Fault in the connector fitting or fault in the short bar* • Shorting between the terminals of the front passenger's seat belt pre-tensioner (squib) circuit • Connector fault • SRS-ECU fault

Remarks:

* The connector of the squib circuit contains a short bar (which shorts the (+) cable to the (–) cable of the squib circuit when the connector is not connected, in order to avoid erroneous deployment due to static electricity, or the like). Therefore, when a connector is connected, the short bar may not be released if there is a fault in the connector fitting or a malfunction in the connector itself, as illustrated below. Before proceeding to the troubleshooting steps on the next page, disconnect the connector as shown below, and then reconnect it. If no diagnosis code is output, then it can be assumed that the code was previously output due to poor fitting of the connector.





(Checking the front passenger's seat belt pre-tensioner (squib))
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the front passenger's seat belt pre-tensioner connector D-14 (see p.52B-34)
- Connect the dummy resistor (MB991865) to the resistor harness (MB 991884)
- Connect the resistor harness (MB991884) to the harness side of the front passenger's seat belt pre-tensioner connector D-14
- Connect the (–) terminal of the battery
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No.28 output?

YES

NO

Replace the front passenger's seat belt pre-tensioner

(Checking the circuit between the SRS-ECU and the front passenger's seat belt pre-tensioner)
Measure at the SRS-ECU connector C-124
- Detach the SRS-ECU connector C-124
- Detach the front passenger's seat belt pre-tensioner connector D-14 (see p.52B-34)

Caution
In the following operation, detach the SRS-ECU connector and short the squib circuit before releasing the short bar of the connector.

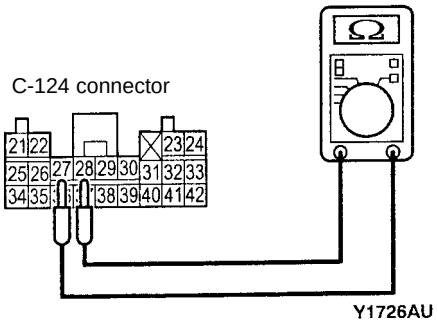
- Insert insulating material, such as cable bands (3mm wide, 0.5mm thick), between the short bar and the terminals 27, 28 of the SRS-ECU connector (harness side) C-124. Release the short bar. (See Fig. A)

Caution
If the insulating material is not inserted sufficiently, then it may be impossible to release the short bar. Ensure that the insulating material is inserted to a depth of at least 4mm.

- Check connectivity between 27 and 28

Caution
Do not insert the probe, etc. directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

OK: No connectivity



NG

Check connectors: C-124, D-14, C-29

OK

NG

Confirm the symptoms

Repair

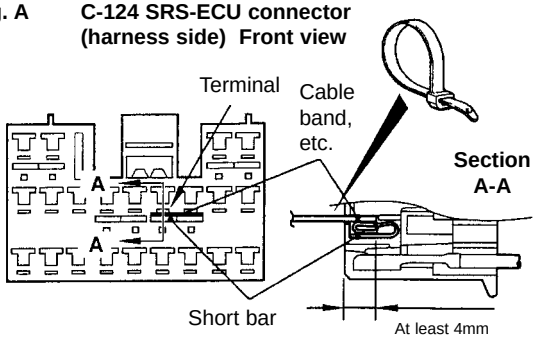
NG

Check the harness between the front passenger's seat belt pre-tensioner and the SRS-ECU, and repair.

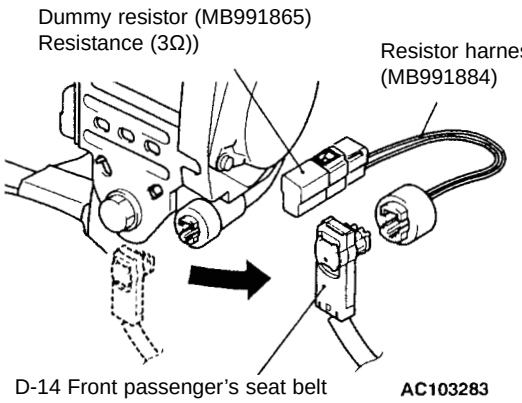
OK

Replace the SRS-ECU

Fig. A C-124 SRS-ECU connector (harness side) Front view



Code No. 29 Front passenger's seat belt pre-tensioner (squib) system	Possible cause
This code is output when there is a disconnection in the front passenger's seat belt pre-tensioner (squib) circuit of the SRS-ECU. When normal operation is resumed, the SRS warning light goes out. (The diagnosis code is not erased.)	• Disconnection in the driver's seat belt pre-tensioner (squib) circuit • Connector contact fault • SRS-ECU fault



(Checking the front passenger's seat belt pre-tensioner (squib))
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the front passenger's seat belt pre-tensioner connector D-14 (see p.52B-34)
- Connect the dummy resistor (MB991865) to the resistor harness (MB 991884)
- Connect the resistor harness (MB991884) to the harness side of the front passenger's seat belt pre-tensioner connector D-14
- Connect the (–) terminal of the battery
- After erasing the diagnosis code memory, reconfirm the diagnosis code.
- Is Code No.29 output?

YES

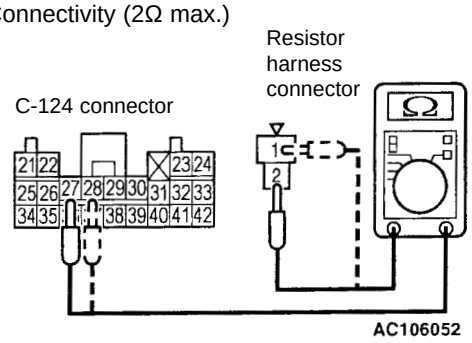
NO

Replace the front passenger's seat belt pre-tensioner

(Checking the circuit between the SRS-ECU and the front passenger's seat belt pre-tensioner)
Measure at the SRS-ECU connector C-124 and front passenger's seat belt pre-tensioner connector D-14
- Detach the SRS-ECU connector C-124 and measure at harness side
- Detach the front passenger's seat belt pre-tensioner connector D-14 (see p.52B-34), and connect the resistor harness (MB991884) to the harness side.
- Check connectivity between the following terminals.

C-124 connector	Resistor harness Connector
27	2
28	1

Caution
Do not insert the probe, etc. directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.
OK: Connectivity (2Ω max.)



NG

Check connectors: C-124, D-02, C-116

OK

NG

Confirm the fault symptoms

Repair

OK

Check the harness between the front passenger's seat belt pre-tensioner and the SRS-ECU, and repair.

OK

Replace the SRS-ECU

Code No. 39 All airbags deployed system	Possible cause
This code is output after an operation in which all the airbags have deployed. If this code is output before all the airbags have deployed, then this indicates that there is an internal malfunction in the SRS-ECU.	SRS-ECU fault

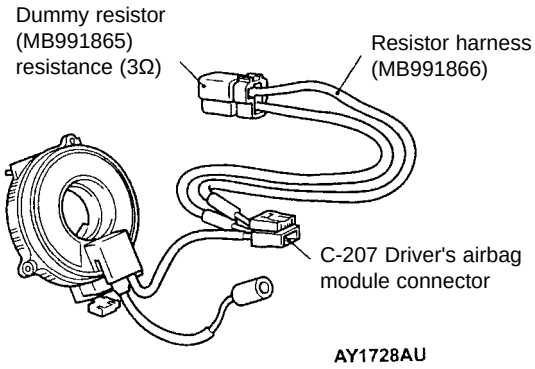
If the Code No. above is output, then replace the SRS-ECU.

Code No. 46 Incorrect SRS-ECU installation	Possible cause
This code is output if an SRS-ECU compatible with driver airbag only, is mistakenly installed in a vehicle fitted with front passenger airbag.	Installation of incorrect SRS-ECU

If the Code No. above is output, then replace the SRS-ECU with one which is compatible with a front passenger airbag.

Code No. 61 Driver's airbag module (squib) system (shorted to power supply)	**Possible cause**
Code No. 62 Driver's airbag module (squib) system (shorted to earth)	
This code is output when the driver's airbag module (squib) circuit of the SRS-ECU is shorted to the power supply (Code No. 61) or shorted to earth (Code No. 62).	• Clock spring fault • Harness or connector fault • Shorting of driver's airbag module (squib) harness to power supply (Code No. 61) or to earth (Code No. 62) • SRS-ECU fault

(Type 1)



(Checking the driver's airbag module (squib))
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the driver's airbag module connector C-207
- Connect the dummy resistor (MB991865) to the resistor harness (MB 991866)
- Insert the probe of the resistor harness (MB991866) behind the driver's airbag module connector C-207 of the clock spring.

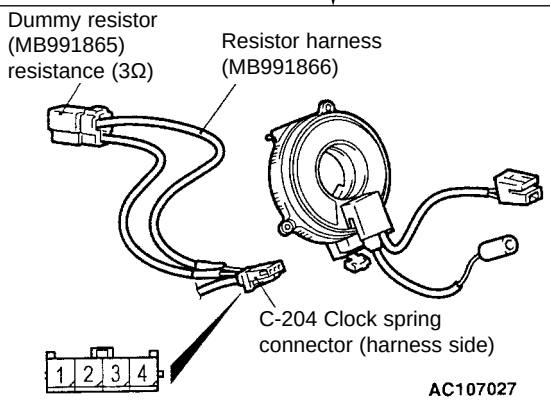
Caution
Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

- Connect the (–) terminal of the battery.
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No.61 or No. 62 output?

NO → Replace the driver's airbag module (squib)

YES ↓



(Checking the clock spring)
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the clock spring connector (4-pin) C-204
- Connect the dummy resistor (MB991865) to the resistor harness
- Insert the probe of the resistor harness (MB991866) between terminals 3 and 4, behind clock spring connector C-204 (harness side)

Caution
Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

- Connect the (–) terminal of the battery.
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No.61 or No.62 output?

YES (No.61 output) ↓ → To next page

YES (No.62 output) ↓ → To next page

NO → Replace the clock spring

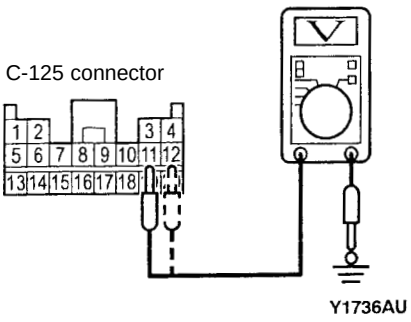
From previous page

YES (No.61 output)

(Checking the circuit between the SRS-ECU and the clock spring)
Measure at SRS-ECU connector C-125
- Detach the SRS-ECU connector C-125
- Detach the clock spring connector C-204
- Ignition switch ON
- Measure at harness side of C-125 SRS-ECU connector
- Voltage between 11, 12 and body earth

Caution
Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

OK: 0V



OK

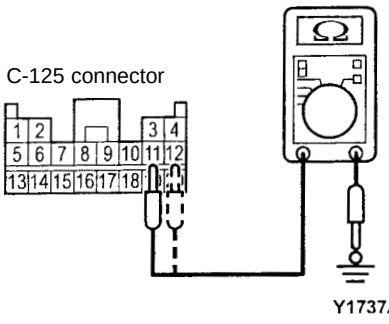
NG

YES (No.62 output)

(Checking the circuit between the SRS-ECU and the clock spring)
Measure at SRS-ECU connector C-125
- Detach the SRS-ECU connector C-125
- Detach the clock spring connector C-204
- Measure at harness side of C-125 SRS-ECU connector
- Connectivity between 11, 12 and body earth

Caution
Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

OK: No connectivity



OK → Replace the SRS-ECU

NG

NG

Check connectors: C-125, C-204 → NG → **Repair**

OK

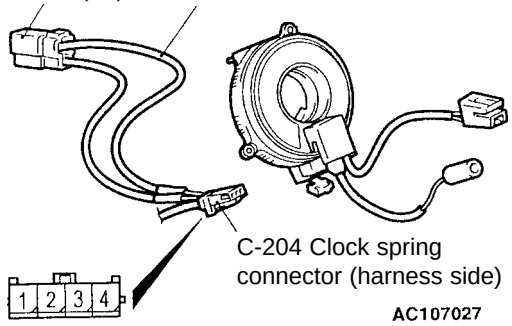
Confirm the fault symptoms

NG

Replace the SRS-ECU

Check the harness between the clock spring and the SRS-ECU, and repair

(Type 2)



(Checking the clock spring)
MUT-II/III diagnosis code
- Detach the (–) terminal of the battery
- Detach the clock spring connector (4-pin) C-204
- Connect the dummy resistor (MB991865) to the resistor harness
- Insert the probe of the resistor harness (MB991866) between terminals 3 and 4, behind clock spring connector C-204 (harness side)

Caution
Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

- Connect the (–) terminal of the battery.
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No.61 or No.62 output?

YES (No.61 output)

YES (No.62 output)

NO

Check the clock spring (see p.52B-33)

OK

Replace the driver's airbag module (squib)

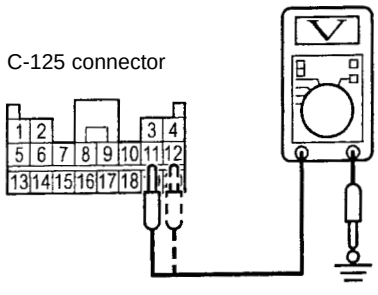
NG

Replace the clock spring

(Checking the circuit between the SRS-ECU and the clock spring)
Measure at SRS-ECU connector C-125
- Detach the SRS-ECU connector C-125
- Detach the clock spring connector C-203
- Ignition switch ON
- Voltage between 11, 12 and body earth

Caution
Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

OK: 0V



OK

Replace the SRS-ECU

NG

Check connectors: C-125, C-203

NG

Repair

OK

Confirm the fault symptoms

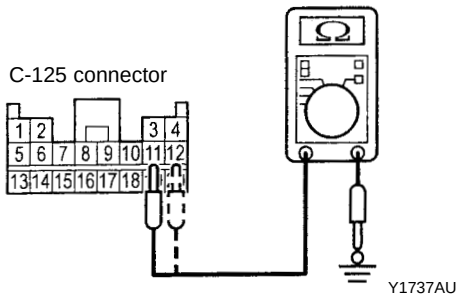
NG

Check the harness between the clock spring and the SRS-ECU, and repair.

(Checking the circuit between the SRS-ECU and the clock spring)
Measure at SRS-ECU connector C-125
- Detach the SRS-ECU connector C-125
- Detach the clock spring connector C-203
- Measure at the harness side
- Connectivity between 11, 12 and body earth

Caution
Do not insert the probe directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

OK: No connectivity

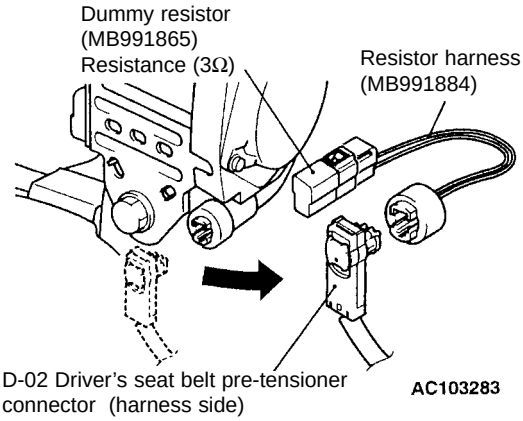


OK

Replace the SRS-ECU

NG

Code No. 66 Driver's seat belt pre-tensioner (squib) system (shorted to power supply)	**Possible cause**
Code No. 67 Driver's seat belt pre-tensioner (squib) system (shorted to earth)	
This code is output when the driver's seat belt pre-tensioner (squib) circuit of the SRS-ECU is shorted to the power supply (Code No. 66) or shorted to earth (Code No. 67).	• Harness or connector fault • Shorting of driver's seat belt pre-tensioner (squib) harness to power supply (Code No. 66) or to earth (Code No. 67) • SRS-ECU fault



(Checking the driver's seat belt pre-tensioner (squib))
MUT-II/III diagnosis code
- Connect the dummy resistor (MB991865) to the resistor harness (MB 991884)
- Detach the driver's seat belt pre-tensioner connector D-02 (see p.52B-34)
- Connect the resistor harness (MB991884) to the harness side of the driver's seat belt pre-tensioner connector D-02
- Connect the (–) terminal of the battery
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No. 66 or 67 output?

YES (No.66 output)

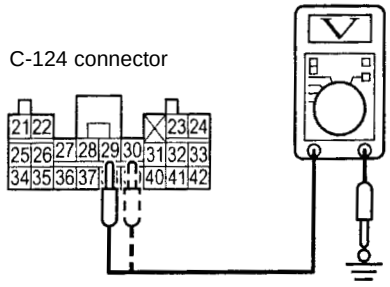
YES (No.67 output)

NO → Replace the driver's seat belt pre-tensioner

(Checking the circuit between the SRS-ECU and the driver's seat belt pre-tensioner)
Measure at the SRS-ECU connector C-124
- Detach the SRS-ECU connector C-124
- Detach the driver's seat belt pre-tensioner connector D-02 (see p.52B-34)
- Ignition switch ON
- Measure at harness side
- Voltage between 29, 30 and body earth

Caution
Do not insert the probe, etc. directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

OK: 0V

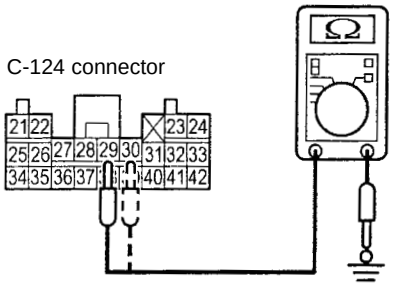


OK → Replace the SRS-ECU

(Checking the circuit between the SRS-ECU and the driver's seat belt pre-tensioner)
Measure at the SRS-ECU connector C-124
- Detach the SRS-ECU connector C-124
- Detach the driver's seat belt pre-tensioner connector D-02 (see p.52B-34)
- Measure at harness side
- Voltage between 29, 30 and body earth

Caution
Do not insert the probe, etc. directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.

OK: No connectivity



OK → Replace the SRS-ECU

NG → **Check connectors**: C-116, C-124, D-02

NG → **Repair**

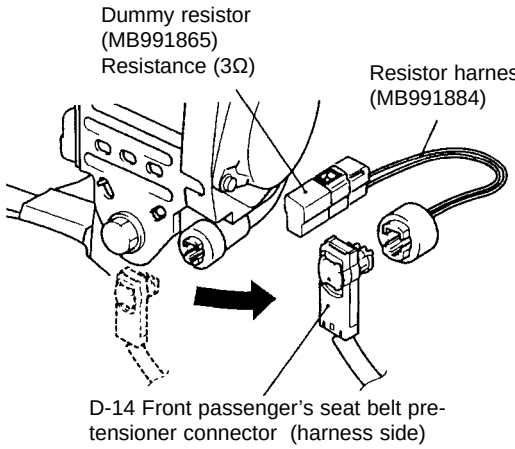
OK → Check the fault symptoms

NG → Check harness between the driver's seat belt pre-tensioner & SRS-ECU

OK → Replace the SRS-ECU

NG → **Check connectors**: C-116, C-124, D-02

Code No. 68 Front passenger's seat belt pre-tensioner (squib) system (shorted to power supply)	**Possible cause**
Code No. 69 Front passenger's seat belt pre-tensioner (squib) system (shorted to earth)	
This code is output when the front passenger's seat belt pre-tensioner (squib) circuit of the SRS-ECU is shorted to the power supply (Code No. 68) or shorted to earth (Code No. 69).	• Harness or connector fault • Shorting of front passenger's seat belt pre-tensioner (squib) harness to power supply (Code No. 68) or to earth (Code No. 69) • SRS-ECU fault



(Checking the front passenger's seat belt pre-tensioner (squib))
MUT-II/III diagnosis code
- Connect the dummy resistor (MB991865) to the resistor harness (MB 991884)
- Detach the front passenger's seat belt pre-tensioner connector D-14 (see p.52B-34)
- Connect the resistor harness (MB991884) to the harness side of the front passenger's seat belt pre-tensioner connector D-14
- Connect the (–) terminal of the battery
- After erasing the diagnosis code memory, reconfirm the diagnosis code.

Is Code No. 68 or 69 output?

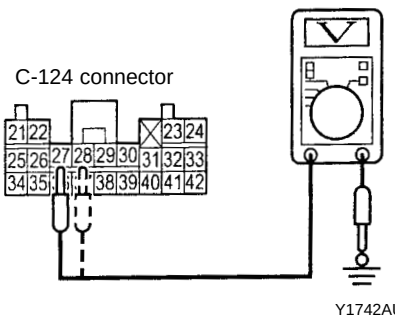
YES (No.68 output)

YES (No.69 output)

NO → Replace the front passenger's seat belt pre-tensioner

(Checking the circuit between the SRS-ECU and the front passenger's seat belt pre-tensioner)
Measure at the SRS-ECU connector C-124
- Detach the SRS-ECU connector C-124
- Detach the front passenger's seat belt pre-tensioner connector D-14 (see p.52B-34)
- Ignition switch ON
- Measure at harness side
- Voltage between 27, 28 and body earth

Caution
Do not insert the probe, etc. directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.
OK: 0V



OK → NG → **Check connectors**: C-116, C-124, D-14

NG → **Repair**

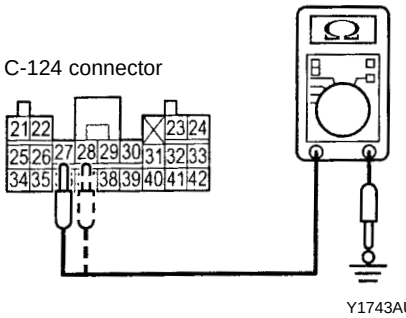
OK → Check the fault symptoms

NG → Check harness between the front passenger's seat belt pre-tensioner & SRS-ECU

OK → Replace the SRS-ECU

(Checking the circuit between the SRS-ECU and the front passenger's seat belt pre-tensioner)
Measure at the SRS-ECU connector C-124
- Detach the SRS-ECU connector C-124
- Detach the front passenger's seat belt pre-tensioner connector D-14 (see p.52B-34)
- Measure at harness side
- Voltage between 29, 30 and body earth

Caution
Do not insert the probe, etc. directly into the terminal from the front side of the connector, as this may cause a reduction in contact pressure.
OK: No connectivity



OK → Replace the SRS-ECU

NG → **Check connectors**: C-116, C-124, D-14

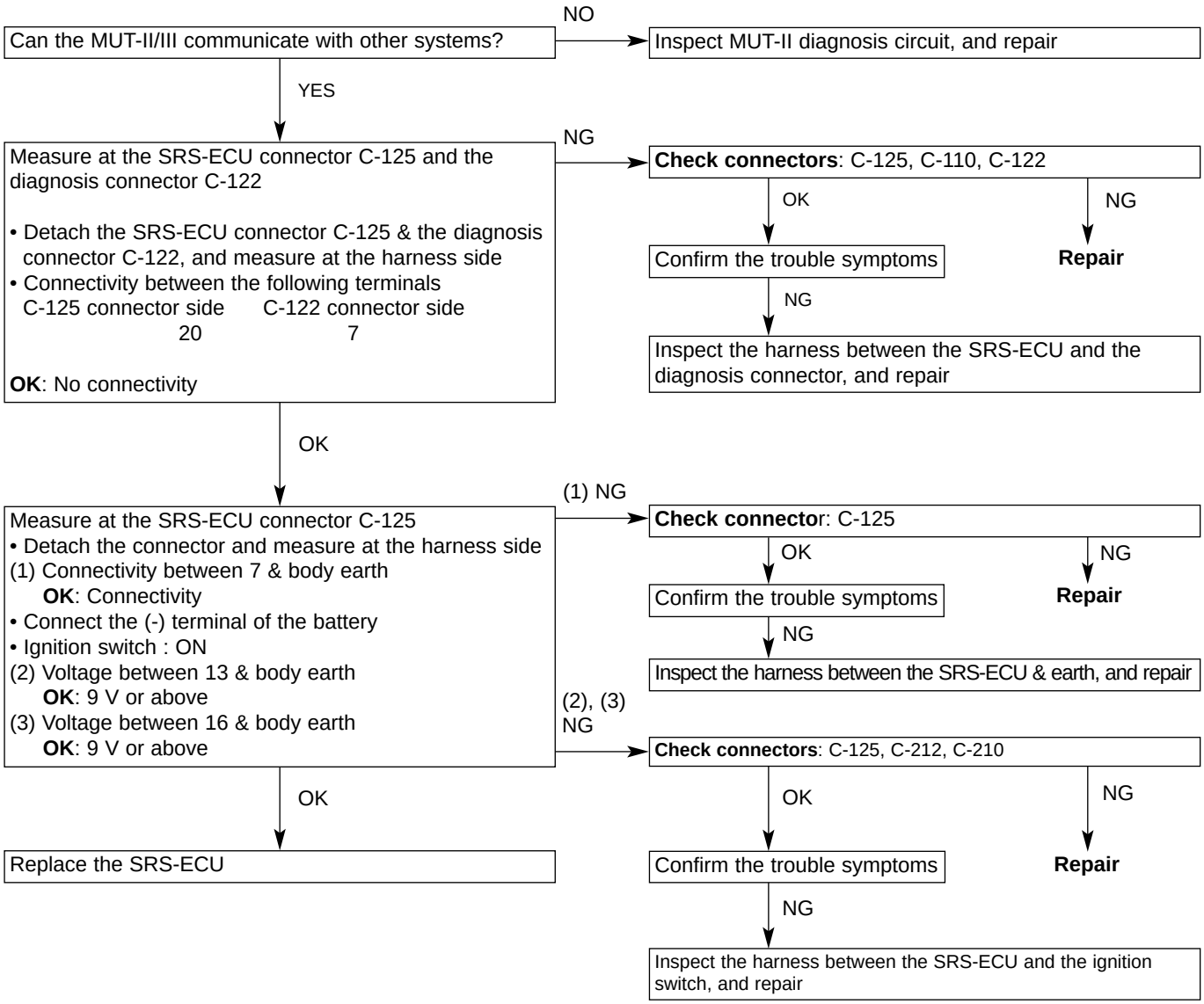
6. Trouble Symptoms Category Chart

Symptom	Symptom Inspection Procedure No.	Reference page
Cannot communicate with MUT-II/III	1	52B-27

7. Trouble Symptoms Inspection Procedures

Inspection Procedure 1

Cannot communicate with MUT-II/III	**Possible cause**
If there is no communication with any other parts of the system, then there is a high probability that the diagnosis circuit is malfunctioning. If communication is only possible with the SRS airbags, then it may be that there is a disconnection in the SRS-ECU diagnosis output circuit or power supply circuit (including earth circuit).	• Harness or connector fault • SRS-ECU fault • Incompatible MUT ROM pack



Post-Collision Diagnosis

The following procedure must be used to check and service the vehicle after a collision, regardless of whether or not the airbags have been deployed. Apart from the items listed below, servicing is the same as that for the previous model.

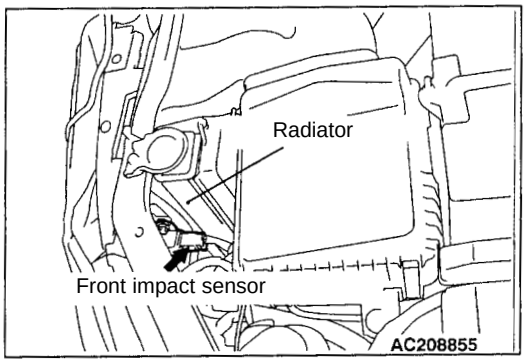
1. Repair procedure

1-1 When the SRS airbags have deployed

(1) Replace the front impact sensors with new sensors. (See p.52B-30)
(2) Check for pinching of the harness, damage to the connectors and deformation of the terminals.

1-2 When the airbags have not deployed, in a low-speed collision

(1) Inspect the front impact sensors.
(2) If a visual inspection of the front impact sensors reveals any dents, fractures, deformation, or the like, then the sensors must be replaced with new ones.
(3) For information on removing and reinstalling front impact sensors, see “Servicing SRS airbag and seat belt pre-tensioner components” (p.52B-29–31).



Front impact sensors

(1) Check for any deformation or corrosion of the headlight support panel
(2) Check for any dents, fractures or deformations in the front impact sensors.
(3) Check for any pinching of the centre harness, damage to the connectors, or deformation of the terminals.

Servicing of SRS airbags and seat belt pre-tensioner components

SRS airbag and seat belt pre-tensioner components must be removed and installed by means of the following procedure. (p.52B-29 – 33). Apart from the items described below, servicing is the same as that for the previous model.

Caution

1. If temperatures in excess of 93°C are likely to be reached during painting work, then the front impact sensors must be removed in advance.

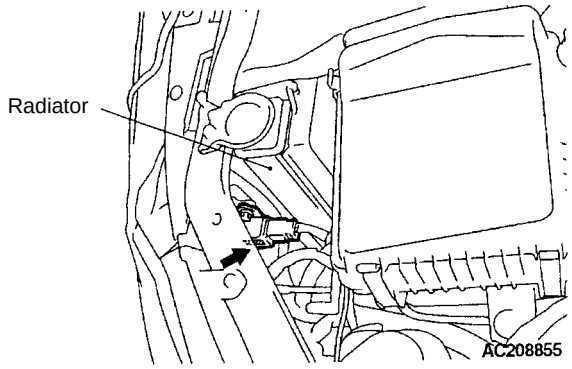
2. The removed front impact sensors must be stored in a clean and dry place.

Caution labels

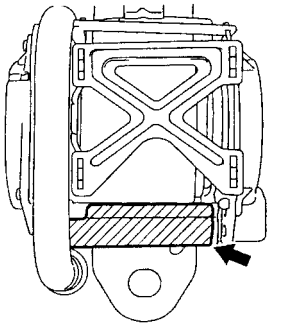
Labels indicating caution items relating to the handling or servicing of SRS airbags are located in the positions indicated below.

If the labels are damaged or soiled, they should be replaced with new labels.

Front impact sensors



Seat belt pre-tensioner



Front Impact Sensors

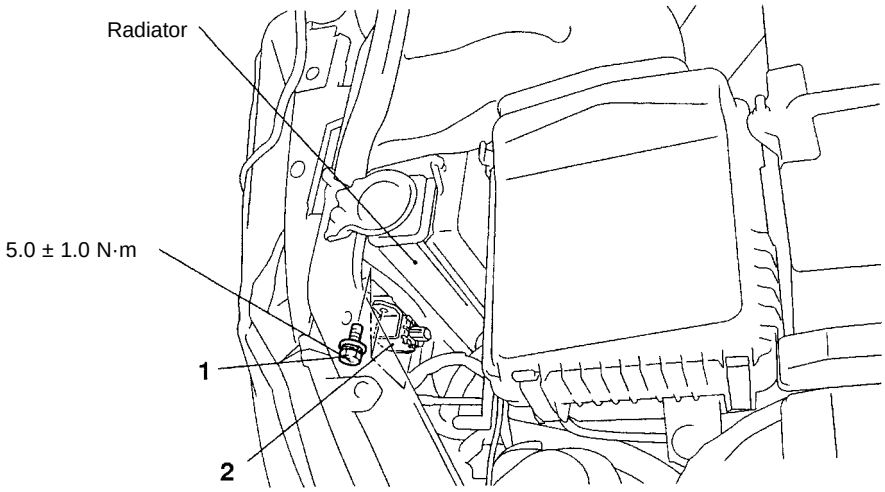
(Vehicle not fitted with front passenger's seat airbag)

Caution

1. After disconnecting the (–) terminal of the battery, wait for at least 60 seconds before starting work. Isolate the disconnected (–) terminal by winding tape around it.
2. The front impact sensors must never be taken apart or repaired. In the event of a fault, they must be replaced with a new front impact sensor.
3. Handle the front impact sensors with care, and avoid dropping them or subjecting them to vibrations or shocks. If there is any dent, fracture, or deformation, etc. in a front impact sensor, then it must be replaced with a new one.
4. The front impact sensors must always be replaced after the airbags have deployed.

Removal and Installation

Steps prior to removal
• Turn the ignition switch to the LOCK (OFF) position.
• Disconnect the (–) terminal of the battery.



AAC211681

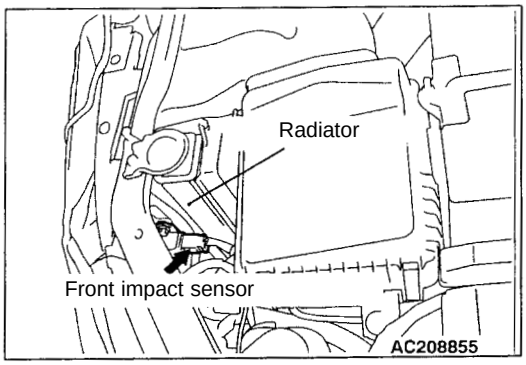
Removal procedure
1. Earth bolt
2. Front impact sensor

Installation procedure
▶A◀ • Pre-installation check
▶B◀ 2. Front impact sensor
1. Earth bolt
• Connect (–) terminal of battery
▶C◀ • Post-installation check

Remarks
The diagram above shows the left-side front impact sensor.

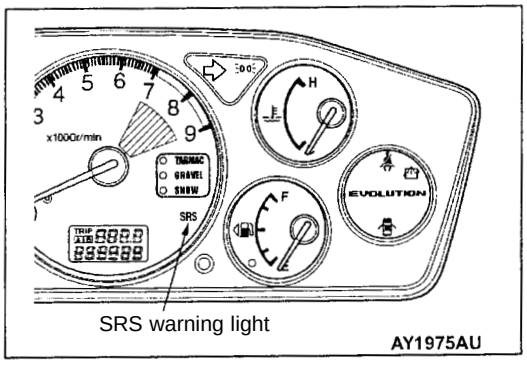
Installation Service Points

▸A◂ Pre-installation check
When installing a new front impact sensor, a check must be carried out before installation. (see Check items)

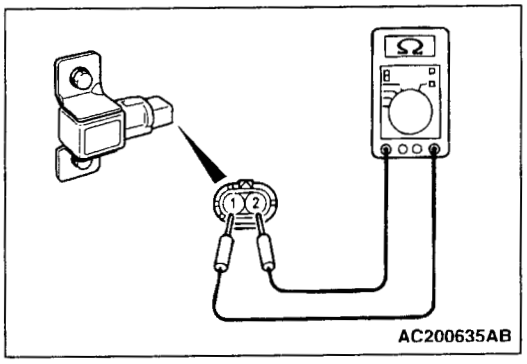


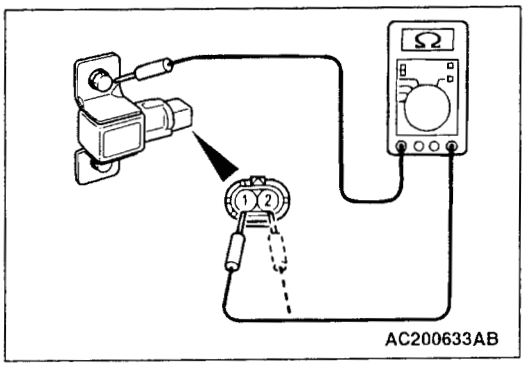
▸B◂ Installing front impact sensors
1. Attach the connectors securely.
2. Place the arrow indicated on the front impact sensor label towards the front of the vehicle, and install securely.

Caution
Insecure or inaccurate installation of a front impact sensor will impede proper operation of the front airbags.

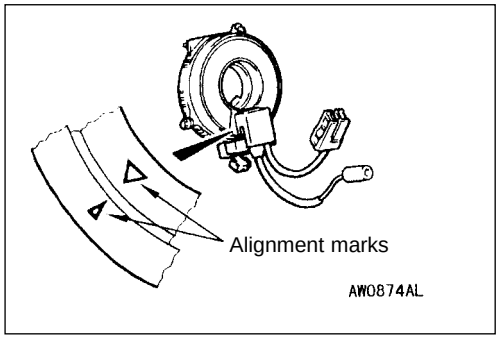


▸C◂ Post-installation check
1. Set the ignition switch to the ON position.
2. Verify that the SRS warning light lights up for 6 – 8 seconds and then switches off for at least 5 seconds.
3. If the light does not switch off, then troubleshooting must be performed. (See p.52B-4)





Check procedures
1. Dents, fractures, deformations or corrosion in front impact sensors
   Caution
   In the event of any dents, fractures, deformations, or the like, the sensor must be replaced with a new one.
2. Checking for shorting or disconnection between front impact sensor terminals
   If shorted : 2Ω or lower
   If disconnected : 2MΩ or above
   Caution
   If the resistance value indicates shorting or a disconnection, then the front impact sensor must be replaced with a new sensor.
3. Checking connectivity between terminal and bracket
   If there a current is flowing, then this indicates an insulation fault in the sensor. Replace the sensor with a new one.
4. Deformation and corrosion of headlight support panel



Airbag module and clock spring

Apart from the following items, removal, installation and inspection procedures are the same as those for the previous model.

Installation service points

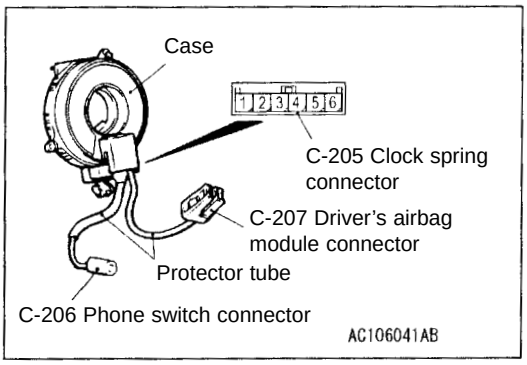
▸B◂ Installation of clock spring

1. Check that the steering wheel is in the straight ahead position.
2. Perform centre alignment of the clock spring as instructed below, and then install the clock spring on the column switch.

Centre alignment of clock spring

Turn the clock spring fully in the clockwise direction, then turn it back in the opposite direction by about 3 3/4 turns, to line up the alignment marks.

Caution
If the clock spring is not centre aligned, then problems may occur, such as jamming of the steering wheel during use, or severing of the internal cables of the clock spring, thus impeding the proper operation of the SRS airbag.



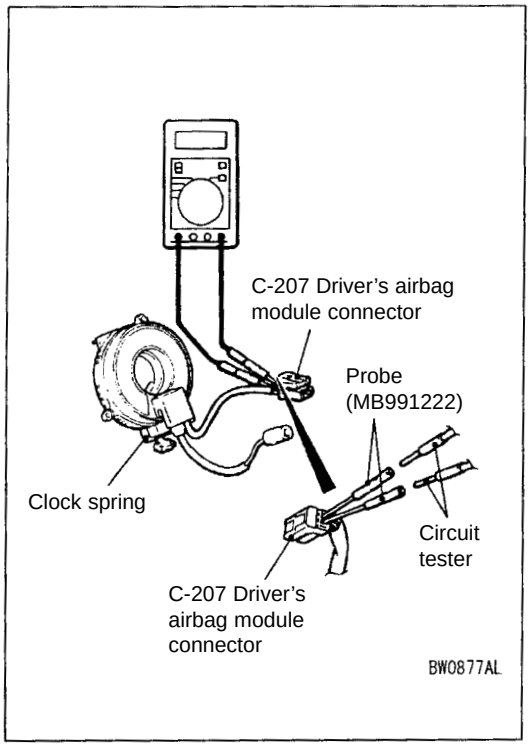
Check procedure

Apart from the following items, servicing is the same as in the previous model.

Clock spring

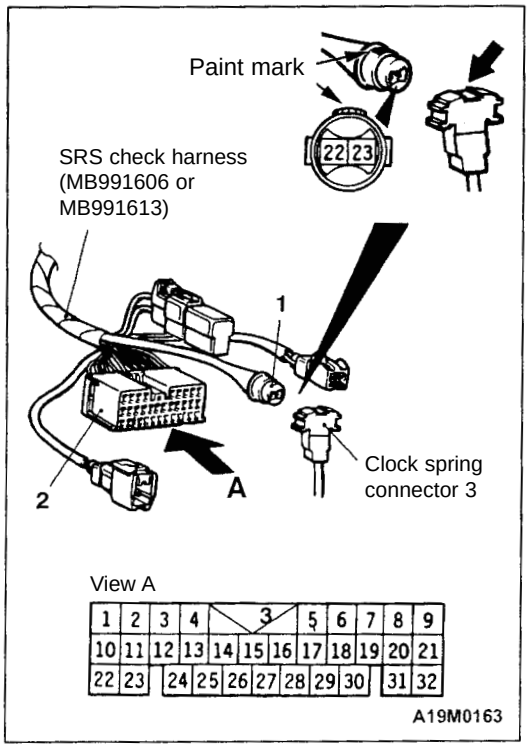
If any of the following checks reveals a non-conformity, then the clock spring must be replaced with a new one.

(1) Damage to the connectors or protector tube, or deformation of the terminals
(2) Damage to the case
(3) Check that there is connectivity between the C-205 clock spring connector terminal 1 and the C-206 phone switch connector.



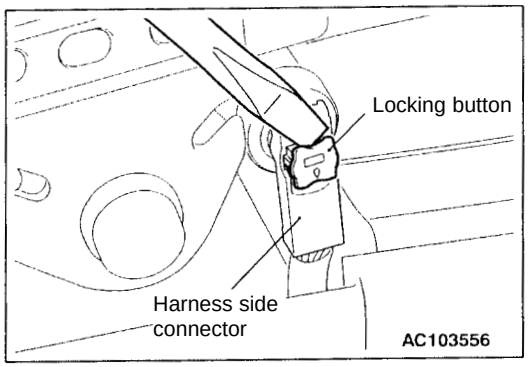
(4) (Vehicle with integrated airbag module)
Insert the special probe (MB991222) behind the Driver's airbag module connector C-207.
Caution
Do not insert the probe directly into the terminal from the front side of the connector.

(5) Connect the circuit tester to the special tool, as illustrated in the diagram, and check that there is connectivity between the terminals.



(4) (Vehicle with separate airbag module)
Align the paint mark of the No.1 connector of the special SRS check harness (MB991606 or MB991613) with the arrow on the No.3 connector of the clock spring. Couple the connectors together.

(5) (Using SRS check harness (MB199606))
Check that there is connectivity between the terminals 25 – 26 of the No.2 connector of the SRS check harness.
(Using SRS check harness MB991613)
Check that there is connectivity between the terminals 22 – 23 of the No.2 connector of the SRS check harness.



Seat belt Pre-Tensioner

Apart from the following items, servicing is the same as for the previous model.

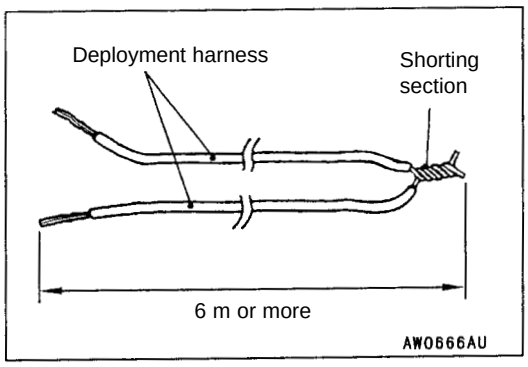
Removal service points

Removal of seat belt pre-tensioner
Using a flathead screwdriver, pull the locking button of the harness side connector two steps towards you, release the lock and remove the connector.

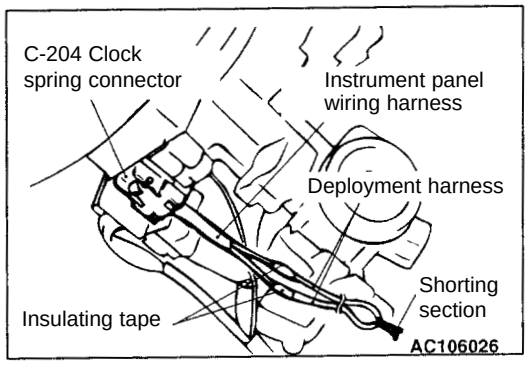
Disposal procedures for airbag module and seat belt pre-tensioner

When disposing of an airbag module or seat belt pre-tensioner, or when disposing of a vehicle fitted with airbag modules and seat belt pre-tensioners, the following procedures must be observed so that the airbag module and/or pre-tensioner are actuated before disposal.

Disposal of airbag module
Apart from the deployment harnesses shown below which are used to deploy the driver's airbag module in the vehicle, servicing information is the same as that for the previous model.



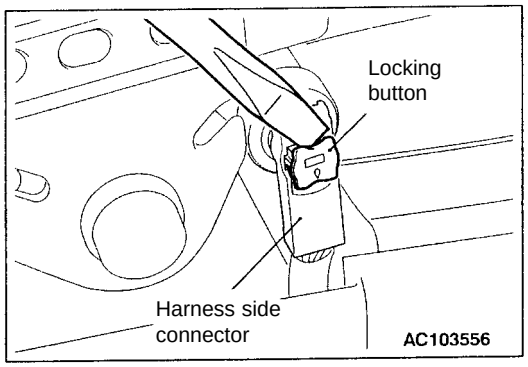
• Deployment harness
(1) Prepare two deployment harnesses at least 6m long, and connect together (short) the terminal sections on either side. This will prevent accidental deployment of the driver's airbag due to static electricity, etc.
(2) Touch the vehicle body with your bare hand to eliminate any accumulated static electricity.
Caution
The procedure above is designed to prevent malfunction due to static electricity, and must be carried out in all cases.



(3) Detach the clock spring connector C-204.
(4) Using a clipper, or the like, cut the instrument panel wiring harnesses as illustrated in the diagram.
Remarks
In this step, the harnesses should be cut at a sufficient distance from the clock spring connector, taking into account the connection position of the deployment harnesses.
(5) Connect the deployment harnesses respectively to the two cut harnesses, and seal the connected sections with insulating tape. Trail the deployment harnesses outside of the vehicle.
(6) Take the connector which is coupled to the deployment harnesses, and connect it to the clock spring connector C-204.

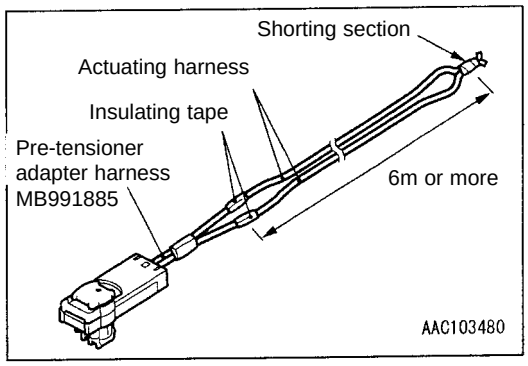
Disposal of seat belt pre-tensioner

Apart from the pre-tensioner connector removal information and the pre-tensioner adapter harness described below, servicing is the same as that for the previous model.



• Removal of pre-tensioner connector

Using a flathead screwdriver, pull the locking button of the harness side connector two steps towards you, release the lock and remove the connector.



• Pre-tensioner adapter harness

When actuating the pre-tensioner, both inside and outside the vehicle, a special tool, the Pre-tensioner adapter harness (MB991885), is used.

SECTION 54

CHASSIS ELECTRICAL

CONTENTS

Chassis Electrical.....54A

Smart Wiring System (SWS).....54B

SECTION 54A

CHASSIS ELECTRICAL

CONTENTS

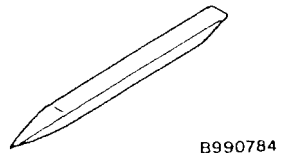
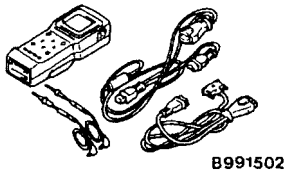
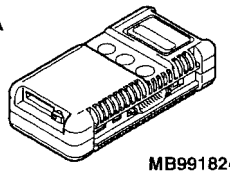
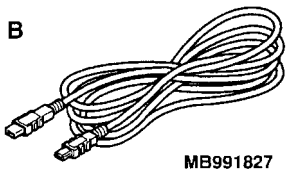
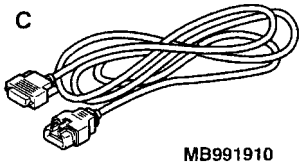
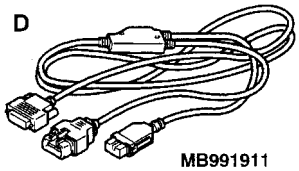
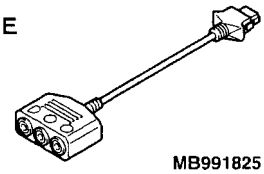
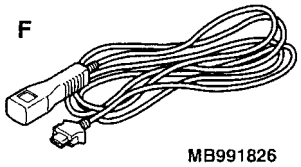
General 1
Ignition switch, engine immobiliser.....2
Special tools.....2
Troubleshooting.....3
Immobiliser ECU check.....6
Ignition switch, engine immobiliser ECU 7

General

New servicing information has been established with the adoption of an engine immobiliser system. Apart from the information below, servicing is the same as in the previous model.

Ignition switch and engine immobiliser

Special tools

Tool	Number	Name	Use
	MB990784	Ornament remover	Removing under cover assembly and column cover
	MB991502	MUT-II sub-assembly	Reading diagnosis codes
A  B  C  D  E  F  MB991955	MB991955 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991825 F: MB991826	MUT-III sub-assembly A: V.C.I. (Vehicle Communication Interface) B: USB cable C: MUT-III main harness A (for vehicles fitted with CAN communications) D: MUT-III main harness B (for vehicles not fitted with CAN communications) E: Measurement adapter F: Trigger harness	Reading diagnosis codes

Troubleshooting

Engine immobiliser

1. Diagnosis functions

1-1. Reading diagnosis codes
1-1-1. Using the MUT-II/III

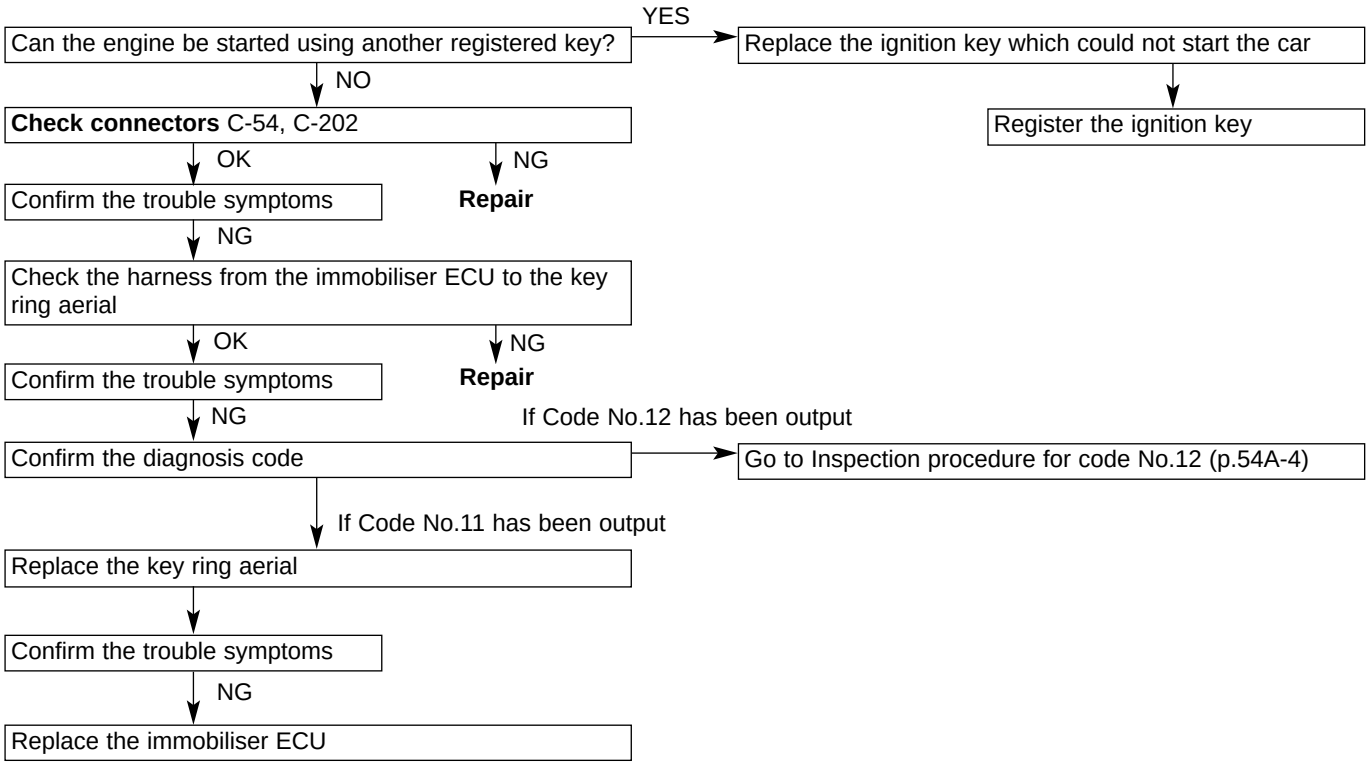
The MUT-II/III is used to read the diagnosis codes.
(See Chapter 00, How to Use Troubleshooting and Inspection Service Points.)

2. Chart of diagnosis codes

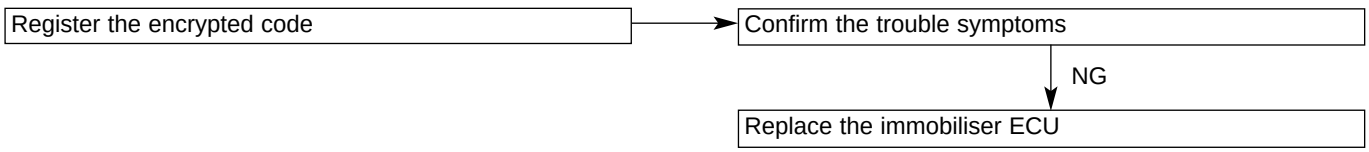
Code No.	Diagnostic Item	Page
11	Problem relating to communication with the ignition key	54A-4
12	Ignition key not registered or code from ignition key does not match	54A-4

3. Inspection procedure classified by diagnosis code

Code No. 11 Problem relating to communication with the ignition key	**Possible cause**
When the ignition switch is set to the ON position, the ID code is not transmitted from the ignition key to the immobiliser ECU.	• Fault in ignition key • Fault in immobiliser ECU • Fault in harness/ connector



Code No. 12 Ignition key not registered or code not from ignition key does not match	**Possible cause**
The ignition key is not registered in the immobiliser ECU.	• The ignition key has not been registered with the immobiliser ECU • Fault in immobiliser ECU



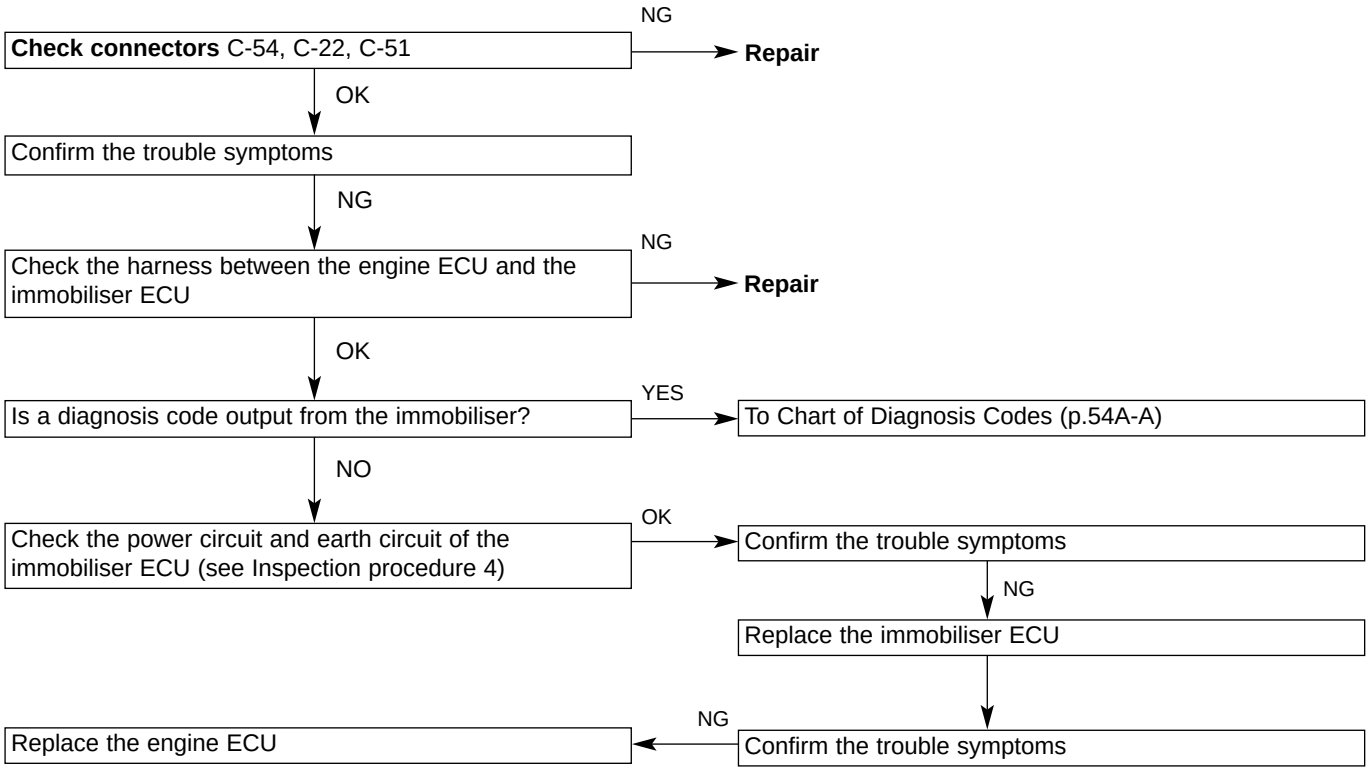
4. Inspection Chart for Trouble Symptoms

Trouble symptom	Inspection procedure No.	Reference page
The diagnosis code No.54 is generated by the engine ECU and there is no communication between the MUT-II/III and the immobiliser ECU	1	54A-5
The ignition keys cannot be registered using the MUT-II/III	2	54A-6
The engine does not start. (It cranks but will not fire.)	3	54A-7
Check the immobiliser ECU power supply and earth circuit system	4	54A-7

5. Inspection Procedures for Trouble Symptoms

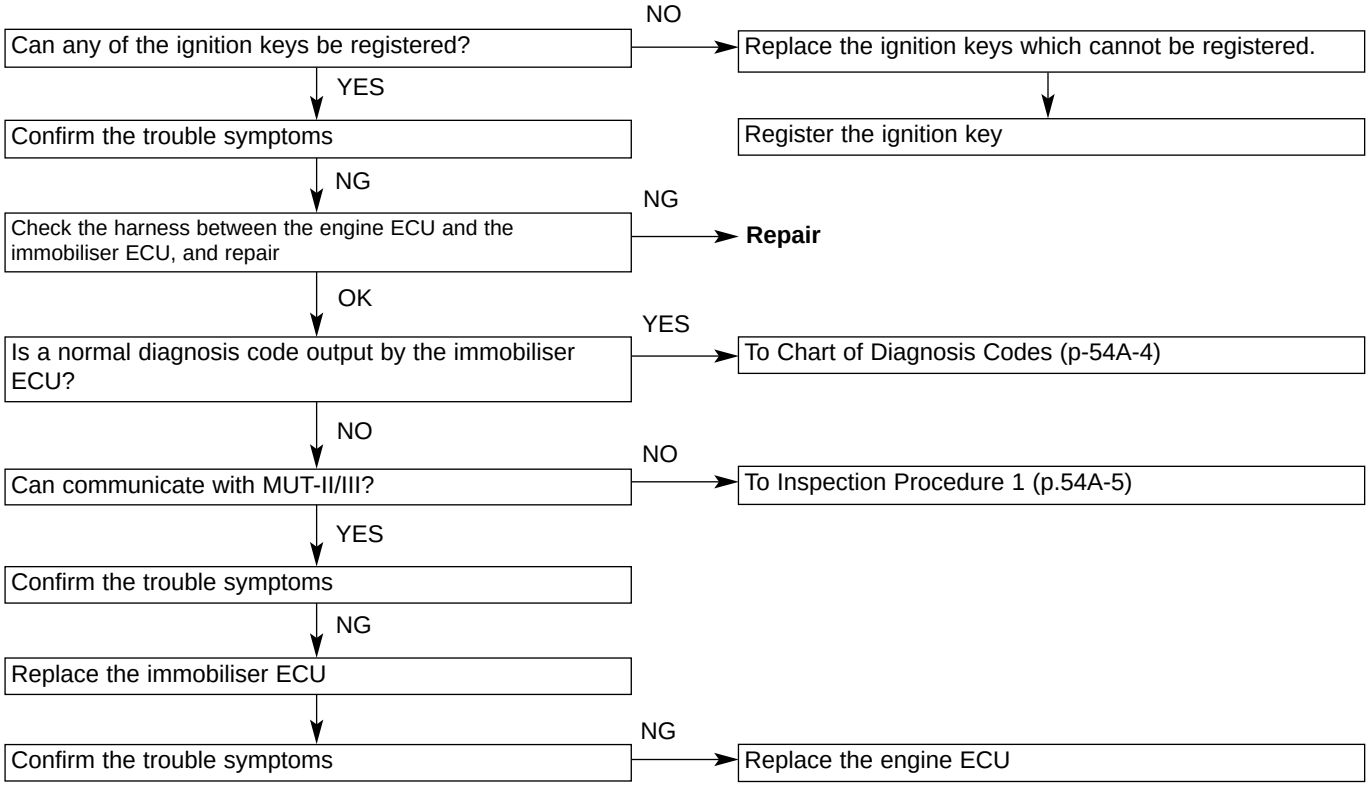
Inspection Procedure 1

Diagnosis code No.54 is generated by the engine ECU and there is no communication between the MUT-II/III and the immobiliser ECU	**Possible cause**
There is probably a communications fault between the engine ECU and the immobiliser ECU	• Fault in immobiliser ECU power supply or earthing • Fault in harness between engine ECU and immobiliser ECU



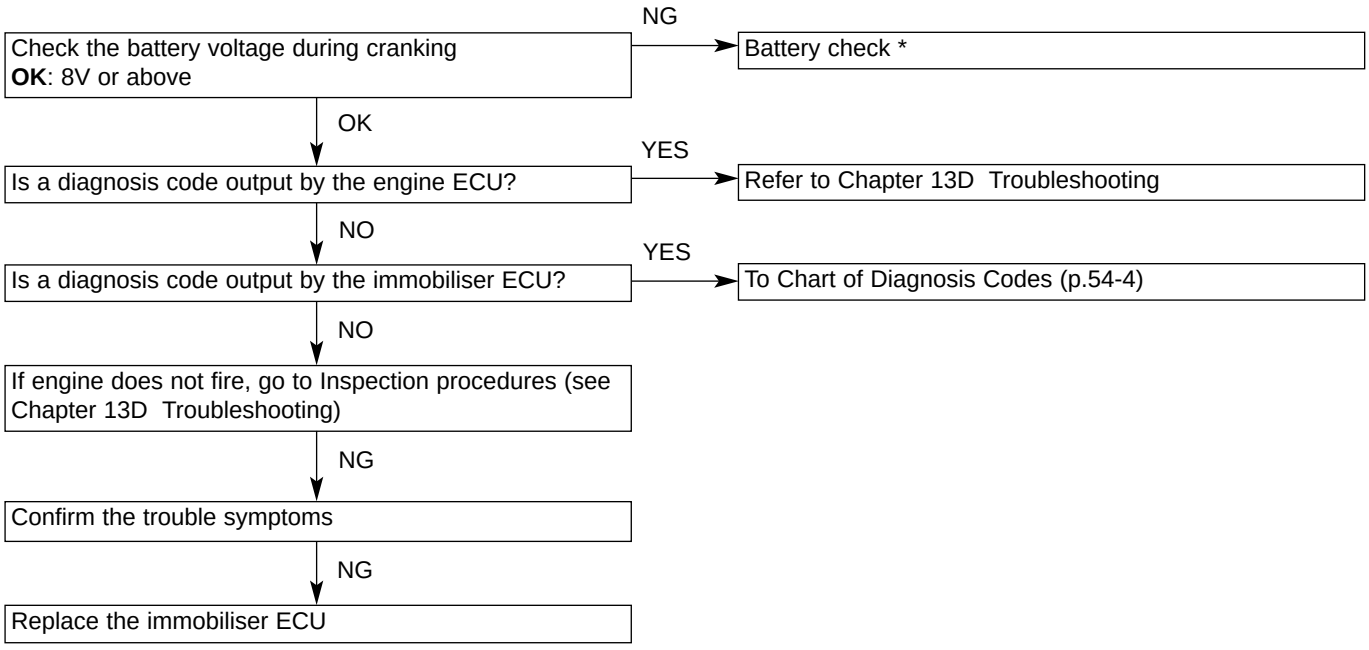
Inspection Procedure 2

The ignition keys cannot be registered using the MUT-II/III	Possible cause
If only some of the ignition keys cannot be registered, then there is a probably a fault with the ignition keys themselves. If none of the ignition keys can be registered, then there is probably a fault in the immobiliser ECU	• Fault in ignition key • Fault in harness or connector • Fault in immobiliser ECU



Inspection Procedure 3

The engine does not start. (The engine cranks, but will not fire.)	Possible cause
If the fuel injection does not start, then there may be a problem in the MPI system, in addition to the possibility of a fault in the immobiliser ECU. It is normal for the above situation to occur, if it has attempted to start the engine with a key which has not been registered properly.	• Fault in MPI system • Fault in immobiliser ECU



Remarks
* : See '00-5 Lancer Cedia Servicing Manual (No. 1036K00)

Inspection Procedure 4

Checking the power supply and earth circuit system of the immobiliser ECU

Measure at the immobiliser ECU connector D-54
- Detach the connector and measure on the harness side
- Ignition switch : ON

(1) Voltage between 7 & body earth
OK: Battery voltage

(2) Voltage between 3 & body earth
OK: Connectivity

(1) NG → **Check connectors**: B-19X, C-23, C-22, C-54

OK → Confirm the trouble symptoms

NG → **Repair**

NG → Check the harness between the engine control relay and the immobiliser ECU, and repair

(2) NG → **Check connectors** C-54

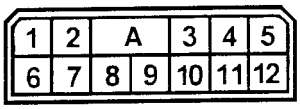
OK → Confirm the trouble symptoms

NG → **Repair**

NG → Check the harness between the immobiliser ECU and the body earth

Immobiliser ECU check

Terminal voltage check table

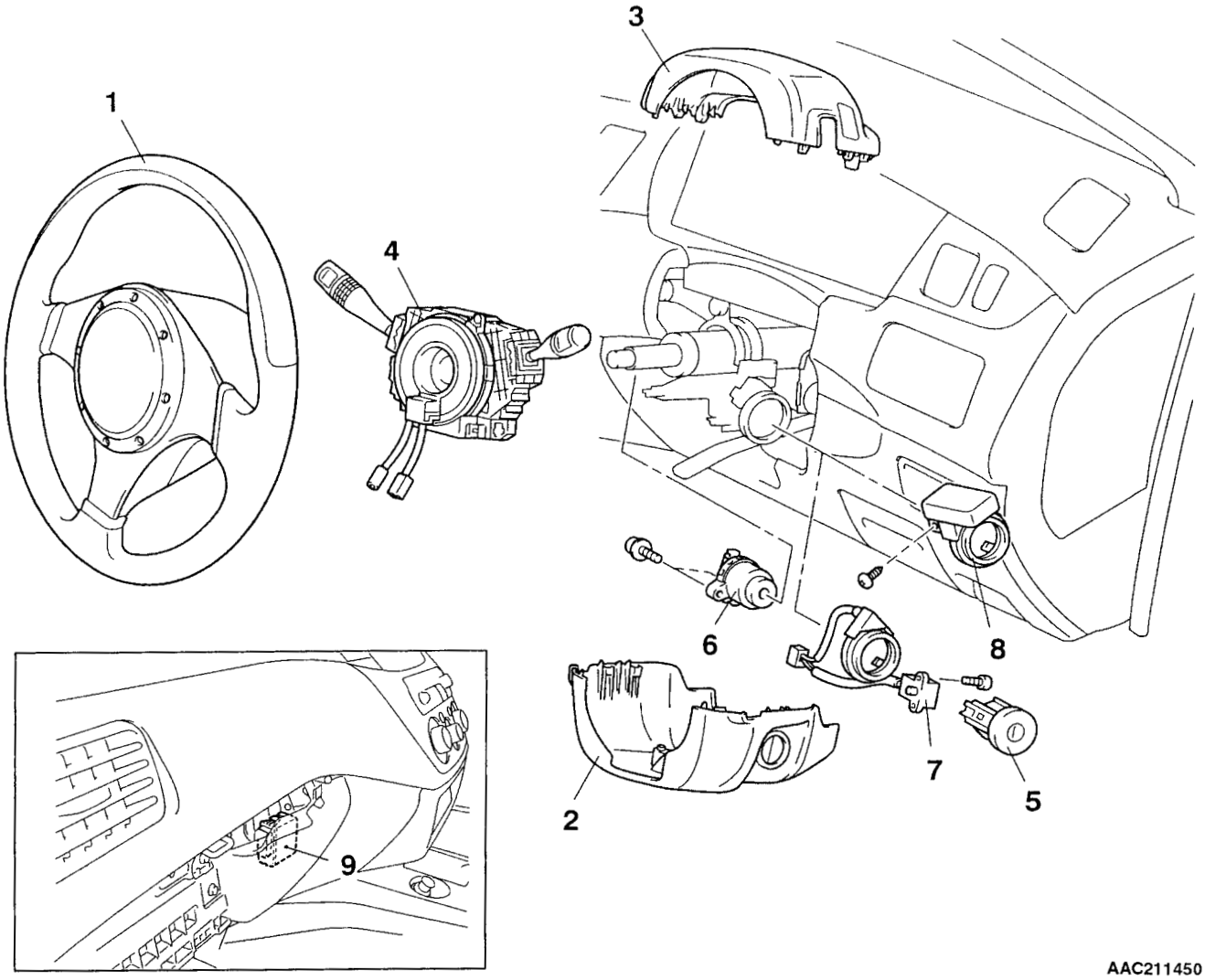


ACX01564AB

Terminal No.	Signal	Check conditions	Terminal voltage
3	Immobiliser ECU earth	At all times	0V
5	Engine ECU	-	-
7	Immobiliser ECU power supply	At all times	Battery voltage
10	Ignition key ring aerial input	-	-
11	Ignition key ring aerial output	-	-

Ignition switch and Immobiliser ECU

Removal and Installation



Removal Procedure

1. Steering wheel (See Chapter 37A)*
2. Power column cover (See Chapter 52A, Instrument Panel)*
3. Upper column cover (See Chapter 52A, Instrument Panel)*

◀ A ▶

4. Column switch
5. Steering lock cylinder
6. Ignition switch
7. Key reminder switch
8. Key ring aerial
9. Immobiliser ECU

Remarks
* : See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

SECTION 54B

SMART WIRING SYSTEM (SWS)

CONTENTS

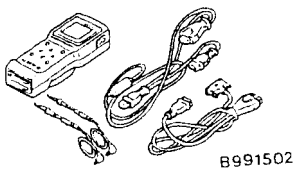
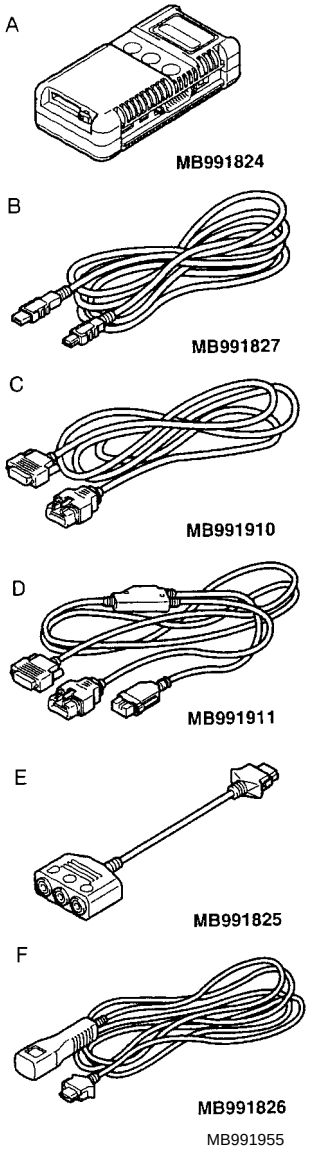
General.....2
Special Tools.....2
Troubleshooting.....4
1. Before starting troubleshooting.....4
2. Standard flow of diagnostic troubleshooting.....4
3. SWS monitor connections.....5
4. ECU check service points.....8
5. Service data check service points.....9
6. Pulse check service points (MUT-II/III or voltmeter).....20
7. MUT-II/III flight recorder functions.....20
8. Chart of trouble symptoms.....21
9. Confirming problems in input signal check.....24
10. Inspection procedures classified by diagnosis code.....26
11. Chart of terminal voltages.....112

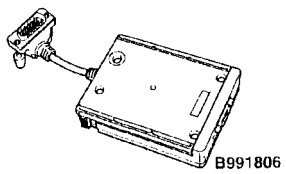
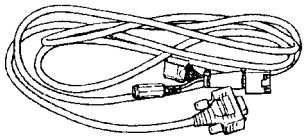
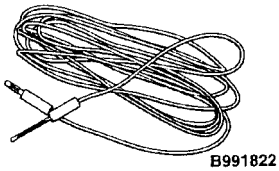
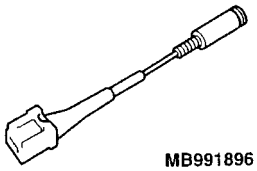
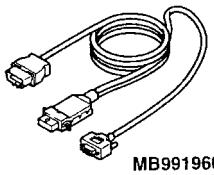
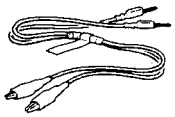
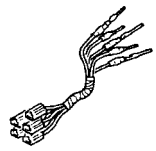
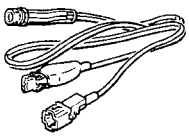
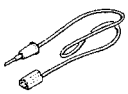
On-vehicle servicing.....117
Adjustment function (User mode).....117
Adjustment function (Dealer mode).....118

General

The SWS version has been changed from the previous Ver.0 to Ver.3. The following servicing information has been established accordingly.

Special tools

Tool	Number	Name	Use
	MB991502	MUT-II sub-assembly	Checking SWS communications line (ECU check, service data)
	MB991955 A: MB991824 B: MB991827 C: MB991910 D: MB991991 E: MB991825 F: MB991826	MUT-III sub-assembly A: V.C.I. (Vehicle Communication Interface) B: USB cable C: MUT-III main harness A (for vehicles fitted with CAN communications) D: MUT-III main harness B (for vehicles not fitted with CAN communications) E: Measurement adapter F: Trigger harness	Checking SWS communications line (ECU check, service data) Remarks In vehicles not fitted with CAN communications, the MUT-III main harness B must be used instead of the MUT-III main harness A.

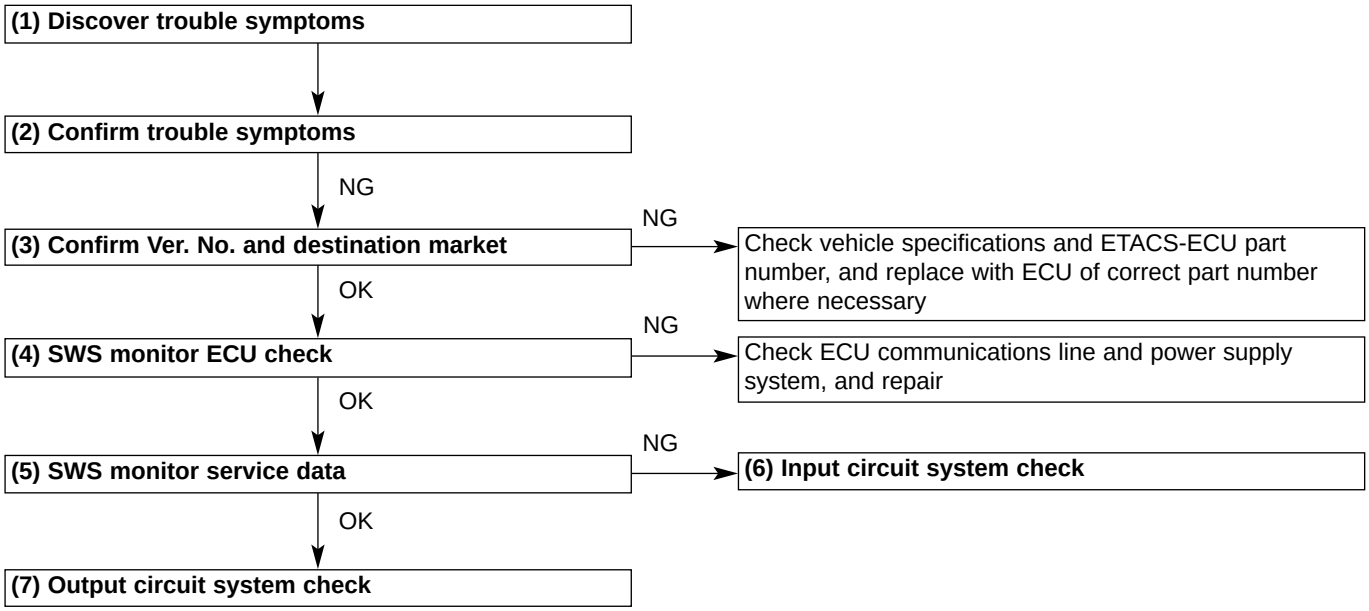
Tool	Number	Name	Use
A  B991806 B  B991812 C  B991822	MB991862 A: MB991806 B: MB991812 C: MB991822	SWS monitor kit A : SWS monitor cartridge B : SWS monitor harness (using column ECU) C : Probe harness	Checking SWS communications line (ECU check, service data)
 MB991896	MB991896	Door-to-door communications adapter harness	Checking door-to-door communications line (service data)
 MB991960	MB991960	Intermediate harness for customizing SWS monitor	Checking SWS communications line (ECU check, service data)
	MB991529	Diagnosis code check harness	Checking input signals by voltmeter
A  B  C  D  C991223	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	Checking connectivity and measuring voltage between harnesses and connectors A : For testing contact pressure of connector pins B: For checking power supply circuit C: For checking power supply circuit D: For connecting a commercial tester

Troubleshooting

1. Before starting troubleshooting

Before starting troubleshooting, make sure that there is no problem with either of the following:
• Check the state of coupling of the connectors between the ETACS-ECU and the junction box, and between the front ECU and the relay box in the engine room
• Check that the fuses and fusible links relating to all systems have not blown.

2. Standard flow or diagnostic troubleshooting



(1) Discover trouble symptoms

(2) Confirm trouble symptoms

Note:
If there is a fault in the SWS communications line, then the ECU isolated from the communications line will enter a fail-safe operation, or back-up operation. Therefore, in such cases, the circumstances may not match the items listed in the Chart of Trouble Symptoms.
However, it is possible to discover the cause of the trouble by proceeding with diagnostic troubleshooting using the SWS monitor described below.

(3) Confirm Version No. and destination market

Check that the vehicle specifications and the SWS version No. (3) and destination market (Japan) are not different.
If they are different, replace the ETACS-ECU with the correct one.

(4) SWS monitor ECU check

Check whether or not the ECUs used on the input side or output side relating to the function causing the trouble has a normal communications state.
• If all related ECUs show “OK”:
All ECUs are communicating correctly, but a disconnection may occur if there is an abnormality in the input circuit system or output circuit system. Check the SWS monitor service data.
• If any one of the related ECUs shows “NG”:
Either there is a malfunction in the actual ECU showing “NG”, or in its power supply or earth system, or a malfunction in the harness or connectors leading to the ECU. Check the ECU, and the harness and connectors relating to that ECU.

(5) SWS monitor service data

From the Diagnosis by Function menu, select the function which is causing the trouble, and check the service data shown for each item of the function.

Note:
The SWS monitor service data also includes a Service data menu, in addition to the Diagnosis by Function menu.
All items for all ECUs can be checked.
(1) Monitoring the SWS communications line
It can be determined whether the cause is located in the input circuit system or the output circuit system, by checking whether or not the communications data is normal.
- If the switch status does not match the service data display:
  Input system relating to function where trouble is occurring.
- If the switch status matches the service data display:
  Output system relating to function where trouble is occurring.

(2) Monitoring the door-to-door communications line
The communications data transmitted by the electric window module (electric window main switch) can be checked. By changing the position at which the probe is inserted, the location of the cause can be narrowed down.
- If the switch status does not match the service data display:
  Harness/connector between the electric window module and the location of the probe.
- If the switch status matches the service data display:
  Harness/connector from the location of the probe to the respective door motors, or the motors themselves.

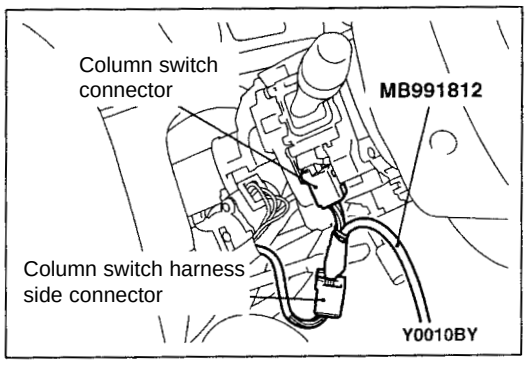
(6) Input circuit system check
Check the relevant switches, sensors and input side ECUs, and the harnesses and connectors between them.

(7) Output circuit system check
Check the output side ECUs and load sections and the harnesses and connectors between them.

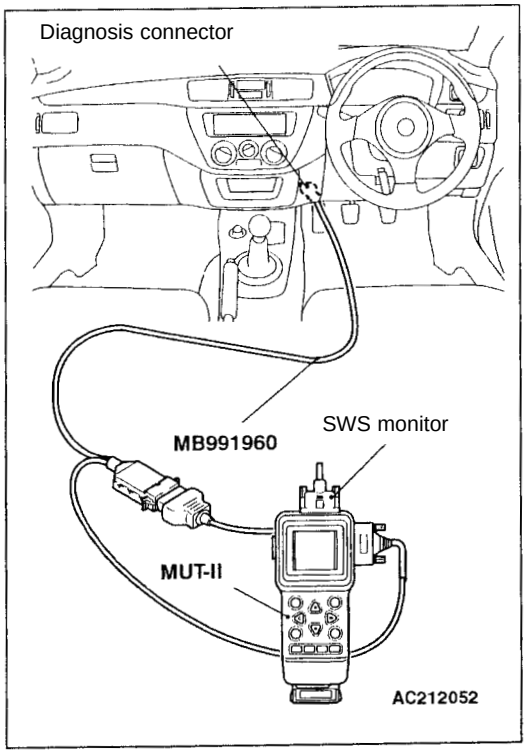
3. SWS monitor connections

How to connect the SWS communications line

Note :
Connection or disconnection of the SWS monitor and MUT-II/III must always be carried out with the ignition switch in the LOCK (OFF) position.

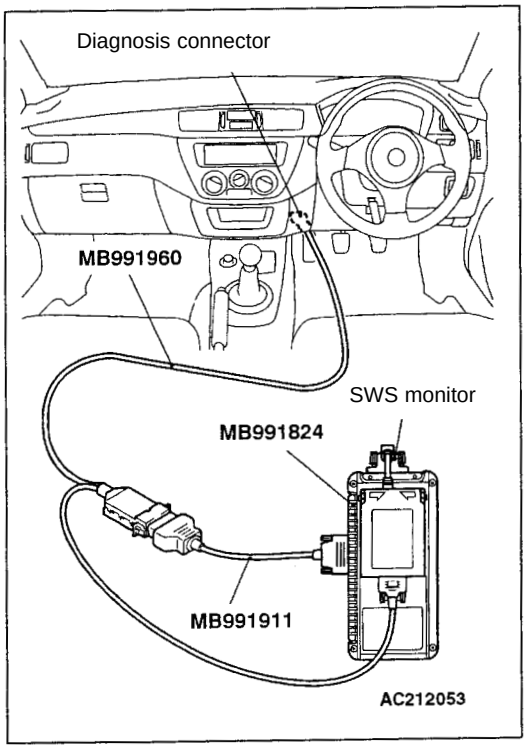


(Connecting the SWS monitor harness to the column switch)
(1) Connect the MUT-II/III to the diagnosis connector.
(2) Remove the column cover.
(3) Detach the column switch connector.
(4) Connect the special SWS monitor harness (MB991812) to the column switch connector and the column switch harness side connector.



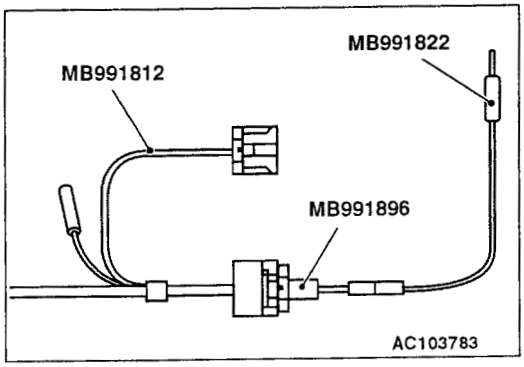
(Connecting to the diagnosis connector using the Intermediate harness for customizing the SWS monitor (using the MUT-II))

(1) Connect the MUT-II to the Intermediate harness for customizing the SWS monitor (MB991960).
(2) Take the Intermediate harness for customizing the SWS monitor (connected at step (1)), and connect it to the diagnosis connector and the SWS monitor.



(Connecting to the diagnosis connector using the Intermediate harness for customizing the SWS monitor (using the MUT-III))

(1) Connect the MUT-III main harness B (MB991911) to the Intermediate harness for customizing the SWS monitor (MB991960).
(2) Take the MUT-III main harness B (connected at step (1)), and connect it to the V.C.I. (MB991824).
(3) Take the Intermediate harness for customizing the SWS monitor (MB991960) (connected at step 1), and connect it to the diagnosis connector and the SWS monitor.



Door-to-door communications connection method

(1) Connect the SWS monitor harness (MB991812) and the Door-to-door communications adapter harness (MB991896).
(2) Connect the Probe harness (MB991822) to the Door-to-door communications adapter harness (MB991896) connected at step (1).
(3) After all connections have been made, insert the probe section of the probe harness into the terminals of the respective female connectors on the door-to-door communications line, from the rear side of the connector.

Note:
Refer to the chart below for the connector and terminal nos. on the door-to-door communications line into which to insert the probe.

Chart of connector numbers and terminal numbers in door-to-door communications line

Insert the probe section of the probe harness into the terminal of the respective female connectors of the door-to-door communications line, from the rear side of the connector.

Connector name		Connector No.	Terminal No.
Intermediate connector	Coupling between instrument panel harness and front door harness (RH)	C-114 (Front door harness side)	7
	Coupling between instrument panel harness and front door harness (LH)	C-33 (Front door harness side)	8
	Coupling between floor harness (RH) and rear door harness (RH)	D-03 (Floor harness side)	7
	Coupling between floor harness (LH) and rear door harness (LH)	D-13 (Floor harness side)	7
Electric window main switch		E-02	11
Electric window sub-switch (front : LH)		E-06	6
Electric window sub-switch (rear : RH)		E-102	6
Electric window sub-switch (rear : LH)		E-105	6

4. ECU check service points

(1) The ECU check is performed using the MUT-II/III and SWS monitor.
(See MUT-II Reference Manual or MUT-III Instruction Manual)
(2) The following ECU checks can be performed when the ECU is connected to the MUT-II/III and the SWS monitor.

Note:
If an abnormality arises during ECU checking, then troubleshooting should be performed by referring to the Inspection procedures classified by trouble symptoms.
(See p.54B-21)

ECU subjected to ECU communications check using SWS monitor, and possible ECU states

ECU under inspection	MUT display	Normal state	ECU state
Column switch (column ECU)	Column ECU	OK*1	Column switch, power supply, earth, communications line : all normal
ETACS-ECU	ETACS	OK	ETACS-ECU, power supply, earth, communications line : all normal
Front ECU	Front ECU	OK*2	Front ECU, power supply, earth, communications line : all normal
Electric window main switch (electric window module)	P/W module	OK*2 (Ignition switch: ON)	Electric window main switch, power supply, earth, communications line : all normal
Sunroof motor assembly (sunroof ECU)	Sunroof ECU	OK*2	Sunroof motor assembly, power supply, earth, communications line : all normal
Multi-centre display	Centre display	OK*3	Multi-centre display, power supply, earth, communications line : all normal
ECUs relating to parts of SWS other than the above	All other ECU apart from above	NG	ECU not installed

Note:
(1) *1: If the ignition switch is OFF when “NG” is displayed on the ETACS-ECU, then “NG” is displayed on the column ECU.
(2) *2: If “NG” is displayed on the ETACS-ECU, then “NG” will be displayed on the front ECU, electric window main switch (electric window module), and sunroof assembly (sunroof ECU).
(3) *3: If “NG” is displayed on the column ECU, then “NG” will be displayed on the multi-centre display.

5. Service data check service points

(1) The service data is checked using the MUT-II/III and the SWS monitor.
A service data check performed using the SWS monitor only relates to the signals present on the SWS communications line and the door-to-door communications line. For information on the input signals which are not checked by the SWS monitor, refer to the Pulse check service points (MUT-II/III or voltmeter) p.54B-20.

(2) The following input signals can be checked when the MUT-II/III and SWS monitor are connected.

Note:
If an abnormality arises during service data checking, then troubleshooting should be performed by referring to Confirming problems in input signal check (Service data, Diagnosis by Function, or pulse check). (See p.54B-24)

(Service data chart)

• Column switch (column ECU)

Item No.	Check item	MUT display	Check conditions	Normal state
00	Headlight switch	Headlight SW	Lighting switch : HEAD	ON
			Lighting switch : not HEAD	OFF
01	Tail light switch	Tail light SW	Light switch : TAIL	ON
			Light switch : OFF	OFF
02	Dimmer switch	Dimmer SW	Dimmer switch : ON	ON
			Dimmer switch : OFF	OFF
03	Passing switch	Passing SW	Passing switch : ON	ON
			Passing switch : OFF	OFF
05	Windscreen intermittent wiper switch	INT wiper SW	Wiper switch : INT	ON
			Wiper switch : not INT	OFF
06	Windscreen low-speed wiper switch	LO wiper SW	Wiper switch : LO	ON
			Wiper switch : not LO	OFF
07	Windscreen high-speed wiper switch	HI wiper SW	Wiper switch : HI	ON
			Wiper switch : not HI	OFF
08	Windscreen mist wiper switch	Mist wiper SW	Power switch : Mist	ON
			Power switch : not Mist	OFF
09	Windscreen washer switch	Front washer SW	Windscreen washer switch : ON	ON
			Windscreen washer switch : OFF	OFF
10	RH turn indicator light switch	RH turn indicator light SW	Turn indicator light switch : RH	ON
			Turn indicator light switch : not RH	OFF
11	LH turn indicator light switch	LH turn indicator light SW	Turn indicator light switch : LH	ON
			Turn indicator light switch : not LH	OFF
13	Rear wiper switch	Rear wiper SW	Rear wiper switch : INT	ON
			Rear wiper switch : not INT	OFF
14	Rear washer switch	Rear washer SW	Rear wiper switch : Washer	ON
			Rear wiper switch not Washer	OFF

Item No.	Check item	MUT display	Check conditions	Normal state
15	Windscreen intermittent wiper volume on/off	Intermittent VOL	Vehicle with intermittent volume	YES
			Vehicle without intermittent volume	NO

- ETACS-ECU

Item No.	Check item	MUT display	Check conditions	Normal state
30	Ignition switch (IG1)	Ignition SW IG1	Ignition switch : ON or START	ON
			Ignition switch : LOCK (OFF) or ACC	OFF
31	Ignition switch (ACC)	Ignition SW ACC	Ignition switch : ACC or ON	ON
			Ignition switch : LOCK (OFF) or START	OFF
32	Driver's door switch	Driver's door SW	Driver's door switch: ON (driver's door open)	ON
			Driver's door switch: OFF (driver's door closed)	OFF
33	Powered window switch enabled	P/W SW enabled	Ignition switch : ON or START	Enabled
			Ignition switch : ON or START → LOCK (OFF) or ACC	Enabled → Prohibited (after approx. 30)
34	Multi-mode keyless entry	Multi-mode keyless	1. Keyless entry transmitter LOCK switch : ON 2. Repeat keyless entry transmitter LOCK switch : ON (The second ON operation involves pressing for at least 1 second within 30 seconds of the first operation)	Multi-close (at instant of switch operation only)
			1. Keyless entry transmitter UNLOCK switch : ON 2. Repeat keyless entry transmitter UNLOCK switch : ON (The second ON operation involves pressing for at least 1 second within 30 seconds of the first operation)	Multi-open (at instant of switch operation only)
			1. During multi-mode operation 2. Repeat keyless entry transmitter Either switch : ON	Multi-stop (at instant of switch operation only)
			All other conditions apart from the above	Standby
35	Headlight automatic cut-off function	HD light auto cut	1. Lighting switch : not OFF 2. Ignition switch : ON or START → LOCK (OFF) or ACC 3. Driver's door switch : ON (Driver's door : open)	OFF → ON (after about 1 second)
			Conditions for headlight automatic cut-off function are not satisfied	OFF
36	Fog light lighting request	Fog lamp	1. Lighting switch :HEAD or TAIL 2. Fog light switch : ON	ON
			All other conditions apart from the above	OFF
37	Windscreen intermittent wiper time	Wiper INT time	1. Ignition switch : ACC or ON 2. Operate intermittent wiper volume to change interval between wiper movements.	Display interval time corresponding to intermittent wiper volume

Item No.	Check item	MUT display	Check conditions	Normal state
38	All door switch	Security alarm	Any door : open	ON
			All doors : closed	OFF
41	Reversing light switch	Inhibitor SW (R)	Reversing light switch : ON	ON
			Reversing light switch : OFF	OFF
42	Wiper drive indication at start up	Wiper drive indication	1. Wiper switch : INT 2. Travel at 7 km/h or above	YES
			Any conditions apart from the above	NO
43	Buzzer	Buzzer	1. Ignition switch : LOCK (OFF) 2. Key reminder switch : ON 3. Driver's door switch : ON (Driver-s door : open)	ON
			Conditions for sounding of any buzzer are not satisfied.	OFF

Note : When inspecting Item No.43 Buzzer, in addition to the conditions listed in the table, "ON" is displayed due to operation of the light switch-off reminder warning function.

- Multi-display

Item No.	Check item	MUT display	Check conditions	Normal state
60	beep data	beep data	1. Ignition switch : ACC or ON 2. Perform audio preset operation.	ON (2 kHz) (only at instant of switch operation)
			Any other conditions	OFF
61	Centre display sleep mode	Display asleep	Ignition switch : LOCK (OFF)	Asleep
			Ignition switch : ACC or ON	Active
62	Centre display input signal	Display input	1. Ignition switch : ACC or ON 2. Perform audio preset operation.	YES (Only at instant of switch operation)
			Any other conditions	NO

Item No.	Check item	MUT display	Check conditions	Normal state
70	Front ECU response	Front ECU response	Lighting switch : not OFF (except for high-beam on) or Wiper switch : not OFF	Normal response
			• Ignition switch : ON or START • Lighting switch : OFF • Wiper switch : OFF	Sleep response
			• Lighting switch : HEAD • Headlight : High beam on	High beam response
				No response

Note:
When Item No.70 Front ECU check is performed and “No response” is displayed, then “NG” is shown in the ECU check as well.

- Electric window main switch (electric window module)

Item No.	Check item	MUT display	Check conditions	Normal state
71	Electric window module response	P/W module response	Ignition switch : ON or START	Normal response
			1. Ignition switch : ON or START 2. Operate any switch of the electric window main switch	Input check (only at instant of switch operation)
				No response

Note: When Item No.71 P/W module response check is performed and “No response” is displayed, then “NG” is shown in the ECU check as well.

- Sunroof motor assembly (sunroof ECU)

Item No.	Check item	MUT display	Check conditions	Normal state
72	Sunroof ECU response	Sunroof ECU response	1. Ignition switch : ON or START 2. Sunroof halted	Normal response → Sleep response (after about 30 secs.)
			1. Ignition switch : ON or START 2. Sunroof switch : Any switch ON	Input check → Normal response
				No response

Note :
Note: When Item No.72 Sunroof ECU response check is performed and “No response” is displayed, then “NG” is shown in the ECU check as well.

- Door-to-door communications

Item No.	Check item	MUT display	Check conditions	Normal state
C0	Front passenger electric window switch UP	Passenger window UP	Front passenger electric window switch : UP	ON
			Front passenger electric window switch : not UP	OFF
C1	Front passenger electric window switch DOWN	Passenger window DOWN	Front passenger electric window switch : DOWN	ON
			Front passenger electric window switch : not DOWN	OFF
C2	Front passenger electric window switch AUTO	Passenger window AUTO	Front passenger electric window switch : AUTO	ON
			Front passenger electric window switch : not AUTO	OFF
C4	Rear right-hand electric window switch UP	Rear RH UP	Rear right-hand electric window switch : UP	ON
			Rear right-hand electric window switch : not UP	OFF
C5	Rear right-hand electric window switch DOWN	Rear RH DOWN	Rear right-hand electric window switch : DOWN	ON
			Rear right-hand electric window switch : not DOWN	OFF
C6	Rear right-hand electric window switch AUTO	Rear RH AUTO	Rear right-hand electric window switch : AUTO	ON
			Rear right-hand electric window switch : not AUTO	OFF
C8	Rear left-hand electric window switch UP	Rear LH UP	Rear left-hand electric window switch : UP	ON
			Rear left-hand electric window switch : not UP	OFF
C9	Rear left-hand electric window switch DOWN	Rear LH DOWN	Rear left-hand electric window switch : DOWN	ON
			Rear left-hand electric window switch : not DOWN	OFF
CA	Rear left-hand electric window switch AUTO	Rear LH AUTO	Rear left-hand electric window switch : AUTO	ON
			Rear left-hand electric window switch : not AUTO	OFF
CB	Electric window lock switch	P/W LOCK SW	Electric window lock switch : ON	ON
			Electric window lock switch : OFF	OFF
CD	Multi-stop	Multi-mode STOP	1. During multi-mode operations 2. Any switch of keyless entry transmitter : ON	ON (only at instant of switch operation)
			Any conditions other than above	OFF
CE	Electric window switch enabled	P/W SW enabled	Ignition switch : ON or START	Enabled
			Ignition switch : ON or START → LOCK (OFF) or ACC	Enabled → Prohibited (after about 30 secs.)
CF	Ignition switch (IG1)	IG1	Ignition switch : ON or START	ON
			Ignition switch : LOCK (OFF) or ACC	OFF

Note:
The door-to-door service data is output from the electric window main switch to the door-to-door communications line, and therefore unless a probe is inserted, the normal state will not change from "OFF".

(Diagnosis by Function)
In diagnosis by function, the service data displayed for each item of a function, and the normal states for each item, are collated into a single table. The normal state column indicates the value displayed when the named item is operated.

- Wipers

Item	Input signal name	Item No.	MUT display	Normal state
INT Intermittent	Windscreen intermittent wiper switch	05	INT Wiper SW	ON
	Windscreen low-speed wiper switch	06	LO Wiper SW	OFF
	Windscreen high-speed wiper switch	07	Hi Wiper SW	OFF
	Windscreen mist wiper switch	08	Mist Wiper SW	OFF
	Windscreen washer switch	09	Front Washer SW	OFF
	Ignition switch (ACC)	31	Ignition SW ACC	ON
	Windscreen intermittent wiper time interval	37	Wiper INT Time	Shows intermittent interval according to position of intermittent wiper volume
	Front ECU response	70	Front ECU Response	Normal response or high beam response
LO (low speed)	Windscreen intermittent wiper switch	05	INT Wiper SW	OFF
	Windscreen low-speed wiper switch	06	LO Wiper SW	ON
	Windscreen high-speed wiper switch	07	Hi Wiper SW	OFF
	Windscreen mist wiper switch	08	Mist Wiper SW	OFF
	Windscreen washer switch	09	Front Washer SW	OFF
	Ignition switch (ACC)	31	Ignition SW ACC	ON
	Front ECU response	70	Front ECU response	Normal response or high beam response

Item	Input signal name	Item No.	MUT display	Normal state
HI (High speed)	Windscreen intermittent wiper switch	05	INT Wiper SW	OFF
	Windscreen low-speed wiper switch	06	LO Wiper SW	OFF
	Windscreen high-speed wiper switch	07	Hi Wiper SW	ON
	Windscreen mist wiper switch	08	Mist Wiper SW	OFF
	Windscreen washer switch	09	Front Washer SW	OFF
	Ignition switch (ACC)	31	Ignition SW ACC	ON
	Front ECU response	70	Front ECU Response	Normal response or high beam response
Mist	Windscreen intermittent wiper switch	05	INT Wiper SW	OFF
	Windscreen low-speed wiper switch	06	LO Wiper SW	ON
	Windscreen high-speed wiper switch	07	Hi Wiper SW	OFF
	Windscreen mist wiper switch	08	Mist Wiper SW	OFF
	Windscreen washer switch	09	Front Washer SW	OFF
	Ignition switch (ACC)	31	Ignition SW ACC	ON
	Front ECU response	70	Front ECU response	Normal response or high beam response
Washer	Windscreen mist wiper switch	08	Mist Wiper SW	OFF
	Windscreen washer switch	09	Front Washer SW	ON
	Ignition switch (ACC)	31	Ignition SW ACC	ON
	Front ECU response	70	Front ECU response	Normal response or high beam response

- Rear Wiper

Item	Input signal name	Item No.	MUT display	Normal state
Rear wiper	Rear wiper switch	13	Rear wiper SW	ON
	Rear washer switch	14	Rear washer SW	OFF
	Ignition switch (ACC)	31	Ignition SW ACC	ON
Reverse travel	Rear wiper switch	13	Rear wiper SW	ON
	Ignition switch (ACC)	31	Ignition SW ACC	ON
	Reversing light switch	41	Inhibitor SW (R)	ON
Rear washer	Rear washer switch	14	Rear washer SW	ON
	Ignition switch (ACC)	31	Ignition SW ACC	ON

- Lighting

Item	Input signal name	Item No.	MUT display	Normal state
Lighting	Headlight switch	00	Headlight SW	OFF
	Tail light switch	01	Tail light SW	OFF
	Passing switch	03	Passing SW	OFF
	Ignition switch (IG1)	30	Ignition SW IG1	ON
	Headlight automatic cut-off function	35	HD light auto cut	OFF
	Front ECU response	70	Front ECU response	Normal response or sleep response
Tail	Headlight switch	00	Headlight SW	OFF
	Tail light switch	01	Tail light SW	ON
	Passing switch	03	Passing SW	OFF
	Ignition switch (IG1)	30	Ignition SW IG1	ON
	Headlight automatic cut-off function	35	HD light auto cut	OFF
	Front ECU response	70	Front ECU response	Normal response
LO (low beam)	Headlight switch	00	Headlight SW	ON
	Dimmer switch	02	Dimmer SW	OFF
	Passing switch	03	Passing SW	OFF
	Ignition switch (IG1)	30	Ignition SW IG1	ON
	Headlight automatic cut-off function	35	HD light auto cut	OFF
	Front ECU response	70	Front ECU response	Normal response
HI (high beam)	Headlight switch	00	Headlight SW	ON
	Dimmer switch	02	Dimmer SW	ON
	Ignition switch (IG1)	30	Ignition SW IG1	ON
	Headlight automatic cut-off function	35	HD light auto cut	OFF
	Front ECU response	70	Front ECU response	High beam response
Passing	Passing switch	03	Passing SW	ON
	Front ECU response	70	Front ECU response	Normal response or high beam response

Item	Input signal name	Item No.	MUT display	Normal state
Fog lamp	Headlight switch	00	Headlight SW	Any ON
	Tail light switch	01	Tail light SW	
	Ignition switch (IG1)	30	Ignition SW IG1	ON
	Headlight automatic cut-off function	35	HD light auto cut	OFF
	Fog light light request	36	Fog lamp	ON
	Front ECU response	70	Front ECU response	Normal response
Automatic cut-off	Headlight switch	00	Headlight SW	Any ON
	Tail light switch	01	Tail light SW	
	Ignition switch (IG1)	30	Ignition SW IG1	OFF
	Driver's door switch	32	Driver's door SW	ON
	Headlight automatic cut-off function	35	HD light auto cut	ON
	Front ECU response	70	Front ECU response	Normal response or high beam response

Note : When performing an input signal check for the lighting, tail lights, LO (low beam) or HI (high beam) operation, the headlight cut-off function is set to be switched OFF in order that accurate conclusions can be made when the ignition switch is "ON". However, since this has no direct bearing on the actual operation of the lights, it is not included in the reverse conditions in the title section of the MUT-II display.
When performing a HI (high beam) check, the display for Item No.02 Dimmer SW is "OFF", even when the high beam is lit. Therefore, check that the display changes to "ON" when the dimmer switch is operated.

- Turn indicator lamps

Item	Input signal name	Item No.	MUT display	Normal state
RH Turn indicator light	RH Turn indicator light switch	10	RH turn indicator SW	ON
	LH Turn indicator light switch	11	LH turn indicator SW	OFF
	Ignition switch (IG1)	30	Ignition SW IG1	ON
RH Turn indicator light	RH Turn indicator light switch	10	RH turn indicator SW	OFF
	LH Turn indicator light switch	11	LH turn indicator SW	ON
	Ignition switch (IG1)	30	Ignition SW IG1	ON

- Buzzer

Item	Input signal name	Item No.	MUT display	Normal state
Lighting monitor buzzer	Headlight switch	00	Headlight SW	Any ON
	Tail light switch	01	Tail light SW	
	Ignition switch (IG1)	30	Ignition SW IG1	OFF
	Driver's door switch	32	Driver's door SW	ON
	Headlight automatic cut-off function	35	HD light auto cut	OFF
	Buzzer	43	Buzzer	ON

Item	Input signal name	Item No.	MUT display	Normal state
Remove key reminder buzzer	Ignition switch (IG1)	30	Ignition SW IG1	OFF
	Driver's door switch	32	Driver's door SW	ON
	Buzzer	43	Buzzer	ON
Back buzzer	Ignition switch (IG1)	30	Ignition SW IG1	ON
	Inhibitor switch (R)	41	Inhibitor (R)	ON
	Buzzer	43	Buzzer	ON
Display buzzer	Buzzer	43	Buzzer	ON
	beep data	60	beep data	ON (2 kHz) (Only at instant of switch operation)

Note : Approximately one second after the lighting monitor buzzer has started to sound, the headlight automatic cut-off function activates, and the buzzer switches off.

- Electric windows

Item	Input signal name	Item No.	MUT display	Normal state
Electric window	Ignition switch (IG1)	30	Ignition SW IG1	ON
	Electric window switch enabled	33	P/W SW enabled	Enabled
	Electric window module response	71	P/W module response	Input check (only at instant of switch operation)

- Keyless entry

Item	Input signal name	Item No.	MUT display	Normal state
Multi-stop	Electric window switch enabled	33	P/W SW enabled	Enabled
	Multi-mode keyless entry	34	Multi-mode keyless	Multi-stop (only at instant of switch operation)
	Electric window module response	71	P/W module response	Normal response or P/W lock response
Multi-open	Electric window switch enabled	33	P/W SW enabled	Enabled
	Multi-mode keyless entry	34	Multi-mode keyless	Multi-open (only at instant of switch operation)
	Electric window module response	71	P/W module response	Normal response or P/W lock response
Multi-close	Electric window switch enabled	33	P/W SW enabled	Enabled
	Multi-mode keyless entry	34	Multi-mode keyless	Multi-close (only at instant of switch operation)
	Electric window module response	71	P/W module response	Normal response or P/W lock response
	Sunroof ECU response	72	Sunroof ECU response	Normal response

- Sunroof

Item	Input signal name	Item No.	MUT display	Normal state
Sunroof operation	Ignition switch (IG1)	30	Ignition SW IG1	ON
	Electric window module response	71	P/W module response	Normal response
	Sunroof ECU response	72	Sunroof ECU response	Input check (only at instant of switch operation)

(ETACS Switch Data Chart)

Item No.	Check item	MUT display	Check conditions	Normal state
01	Specifications change terminal	Specifications change		A/T
03	Key reminder switch	Key reminder SW	Key reminder switch : ON (ignition key removed)	ON
			Key reminder switch : OFF (ignition key inserted)	OFF
04	Hazard light switch	Hazard light SW	Hazard light switch : ON (switch operated)	ON
			Hazard light switch : OFF (switch not operated)	OFF
09	Rear wiper automatic stop switch	R wiper A/STOP	Rear wiper operating	ON
			Rear wiper not operating	OFF
10	Fog light switch	F for light SW	Fog light switch : ON (switch operated)	ON
			Fog light switch : OFF (switch not operated)	OFF
14	Motorized remote control mirrors (fold/return) switch	Motorized mirrors SW	Motorized remote control mirrors (fold/return) switch : ON (switch operated)	ON
			Motorized remote control mirrors (fold/return) switch : OFF (switch operated)	OFF
20	Impact sensor	Impact sensor		OFF
21	Driver-s door lock actuator lock switch	Dr Door lock SW	Locked	ON
			Any state but Locked	OFF
22	Driver-s door lock actuator unlock switch	Dr Door unlock SW	Unlocked	ON
			Any state but Unlocked	OFF
26	Central door lock switch	Central door lock		OFF
27	Central door unlock switch	Central door unlock		OFF
36	MUT diagnosis connector	MUT diagnosis connector	Diagnosis control connected	ON
			Diagnosis control not connected	OFF

(ETACS Analogue Data Chart)

Item No.	Check item	MUT display	Check conditions
02	Windscreen wiper intermittent volume	Wiper volume voltage	Displays voltage j of windscreen wiper intermittent volume Changes according to position of windscreen wiper intermittent volume
03	Vehicle speed signal	Speed signal	Displays vehicle speed Changes with vehicle speed
04	Interior light automatic cut-off timer interval	Interior light timer	Displays operating time for interior light automatic cut-off function
05	Headlight automatic cut-off timer interval	HD light timer	Displays operating time for headlight automatic cut-off function
06	Electric window key off timer interval	P/W key off timer	Displays operating time for electric window key off timer
07	Intermittent wiper time interval	Wiper INT time	Displays the intermittent time interval for the windscreen wipers as calculated from the windscreen wiper intermittent volume and the vehicle speed signal Changes with windscreen wiper intermittent volume position and vehicle speed

6. Pulse check service points (MUT-II/III or voltmeter)

(1) A pulse check is used to inspect input signals which cannot be inspected on the SWS monitor using the MUT-II/III or voltmeter (input signals which are not present on the communications line).
(See Chapter 00, How to Use Troubleshooting and Inspection Service Points.)
(2) The following input signals are checked in this state.

Note :
If a problem arises in the pulse check, then troubleshooting should be performed by referring to Confirming Problems in Input Signal Check (Service data, Diagnosis by Function or Pulse Check) (see p.54B-24).

Switches and conditions for performing pulse check

Input signal	Buzzer sounding conditions
Load on generic fuse No. 17	Using load where generic fuse No.17 is taken as power supply

7. MUT-II/III flight recorder function

(1) It is possible to store communications data for ECU checks, service data and function-based diagnosis in a memory in the SWS monitor cartridge. The stored communications data can be reproduced on a chart or graph display.
(2) If data is stored for a long time by means of the flight recorder function, then in order to reduce vehicle battery consumption, it is possible to remove the MUT-II/III with the data stored in the SWS monitor cartridge.

Note :
For details of the MUT-II/III flight recorder function, see the MUT-II Reference Manual or MUT-III Instruction Manual.

8. Chart of Trouble Symptoms

(ESU communications system)

Trouble Symptom	Inspection Procedure No.	Reference page
No communication with SWS monitor	A-1	54B-26
No communication with column switch (column ECU)	A-2	54B-27
No communication with ETACS-ECU	A-3	54B-28
No communication with front ECU	A-4	54B-29
No communication with electric window main switch (electric window module)	A-5	54B-30
No communication with sunroof motor assembly	A-6	54B-31
No communication with multi-centre display	A-7	54B-32

(ESU communications system)

Trouble Symptom		Inspection Procedure No.	Reference page
Warning functions	Ignition key left in reminder function not working correctly	B-1	54B-33
	Lights left on reminder function not working correctly	B-2	54B-34
	Door ajar warning function not working correctly	B-3	54B-35
	Turn indicator light operating noise not working correctly	B-4	54B-36
	Multi-centre display operating noise function not working correctly	B-5	54B-37
Central door locking	Central door locking not working at all	C-1	54B-38
	Some doors not operating, even when lock or unlock is performed	C-2	54B-39
Electric windows	None of electric windows working	D-1	54B-40
	Driver's electric window not responding to electric window main switch	D-2	54B-41
	Front passenger's or rear passenger's electric windows not responding to their respective switches	D-3	54B-42
	Front and/or rear passenger electric window not responding to electric window main switch	D-4	54B-45
	Electric window timer function not working correctly	D-5	54B-46
	While the window is winding up, it automatically starts to come down again	D-6	54B-47
	Electric window trapping prevention function not working correctly	D-7	54B-48
Keyless entry system	Keyless entry system not working at all	E-1	54B-50
	Keyless entry hazard answerback function or interior light answerback function not working correctly	E-2	54B-51
	Encrypted code cannot be registered	E-3	54B-52
	Multi-mode keyless entry function not working at all	E-4	54B-53
	Electric windows not working correctly with multi-mode keyless entry function	E-5	54B-54
	Sunroof close operation not working correctly with multi-mode keyless entry function	E-6	54B-55
Sunroof	Sunroof not working at all	F-1	54B-56
	Sunroof timer function not working correctly	F-2	54B-57
	Particular sunroof functions not working	F-3	54B-57
	Sunroof trap prevention function not working correctly	F-4	54B-57

Trouble Symptom		Inspection Procedure No.	Reference page
Windscreen wipers / Washer	Windscreen wipers not working at all	G-1	54B-58
	Windscreen wipers do not work at INT, washer or mist positions, and operate at low speed in both Lo & Hi positions.	G-2	54B-59
	Windscreen wipers do not stop in correct position	G-3	54B-59
	Windscreen wipers cannot be operated normally	G-4	54B-60
	Intermittent time interval of windscreen wipers does not change with vehicle speed or operation of intermittent windscreen wiper volume	G-5	54B-61
	Intermittent time interval of windscreen wipers does not change with vehicle speed	G-6	54B-62
	Windscreen washer not working correctly	G-7	54B-63
Rear wiper / washer	Rear wiper not working at all	H-1	54B-64
	Rear wiper does not stop in correct position	H-2	54B-65
	Rear wiper does not operate continuously, even when shift is set to R position	H-3	54B-66
	Rear washer does not work	H-4	54B-67
Motorized retractable door mirrors	Motorized retractable door mirrors not working at all	I-1	54B-68
	Motorized retractable door mirror timer function not working	I-2	54B-69
	Motorized retractable door mirror automatic return function (vehicle speed sensitive opening function) does not work correctly	I-3	54B-69
	Motorized retractable door mirror automatic return function (ignition driven function) does not work correctly	I-4	54B-70
	Motorized retractable door mirror automatic return function (keyless driven function) does not work correctly	I-5	54B-71
	One of the motorized retractable door mirrors is not working.	I-6	54B-72
Ignition key cylinder illumination lamp	Ignition key cylinder illumination light does not light up and switch off correctly	J-1	54B-73
Headlights, tail lamps	Headlights do not light up when passing switch is on. Low beam lights up (cannot be changed using dimmer switch)	K-1	54B-76
	Tail lights do not light up correctly	K-2	54B-76
	Head lights (low beam) do not light up	K-3	54B-77
	Head lights (high beam) do not light up	K-4	54B-78
	Head lights (low beam and high beam) do not light up when passing switch is ON	K-5	54B-79
	Headlight automatic cut-off function not working correctly	K-6	54B-80
	One of the headlights does not light up (including high beam indicator lamp)	K-7	54B-81
	One of the tail lights, position lights, or licence plate lights does not light up	K-8	54B-82
Fog lights	Fog lights do not light up correctly	L-1	54B-83
	One of the fog lights does not light up (including fog light indicator lamp)	L-2	54B-84
Flasher timer	Turn indicator lights do not light up	M-1	54B-85
	Hazard lights do not light up	M-2	54B-86
	One of the indicator lights does not light up	M-3	54B-87

Trouble Symptom		Inspection Procedure No.	Reference page
Interior light	Interior light does not light up or switch off correctly	N-1	54B-88
	Interior light automatic cut-off function not working correctly (cars fitted with keyless entry system)	N-2	54B-91
Door ajar indicator lamp	Door ajar indicator light does not light up or switch off correctly	O-1	54B-92
Security alarms	Security alarm does not enter warning state	P-1	54B-93
	Interior warning does not operate correctly when security alarm operates	P-2	54B-94
	Hazard lights do not flash when security alarm operates	P-3	54B-94
	Horn does not sound when security alarm operates	P-4	54B-95
Multi-centre display	Multi-centre display not working correctly	Q-1	See Chap. 54A*

Note * : See '00-5 Lancer Cedia Servicing Manual (No.1036K00)

9. Confirming problems in input signal check

(Service data, Diagnosis by Function or Pulse Check)

If a problem arises during the service data service points, then perform an inspection by referring to the table below.

Trouble Symptom		Inspection Procedure No.	Reference page
Ignition switch (ACC) signal not input		R-1	54B-96
Ignition switch (IG1) signal not input		R-2	54B-96
Reversing light switch signal not input		R-3	54B-97
Driver's door switch signal not input		R-4	54B-98
Column switches	Tail light switch signal not input	R-5	54B-99
	Headlight switch signal not input		
	Dimmer switch signal not input		
	Passing switch signal not input		
	LH turn indicator light switch signal not input		
	RH turn indicator light switch signal not input		
	Windscreen mist wiper switch signal not input	R-6	54B-100
	Windscreen intermittent wiper switch signal not input		
	Windscreen low speed wiper switch signal not input		
	Windscreen high speed wiper switch signal not input		
	Windscreen washer switch signal not input		
	Rear wiper switch signal not input		
	Rear washer switch signal not input		
	Windscreen intermittent wiper volume signal not input	R-7	54B-101
Electric window main switch	Respective switch signals not input	R-8	54B-101
Sunroof	Respective switch signals not input	R-9	54B-102
Multi-centre display	Respective switch signals not input	R-10	54B-103
Key reminder switch signal not input		R-11	54B-103
Motorized remote control mirror switch (fold / return switch) signal not input		R-12	54B-104
Hazard light switch signal not input		R-13	54B-105
All door switch signals not input (except driver's door)		R-14	54B-106
Driver's door lock actuator signal not input		R-15	54B-107
Vehicle speed signal not input		R-16	54B-108
Various switch signals of keyless entry transmitter not input		R-17	54B-109
Fog light switch signal not input		R-18	54B-110
Generic fuse No.17 load use signal not detected		R-19	54B-111

Chart of operational functions classified by input signal inspection procedure number

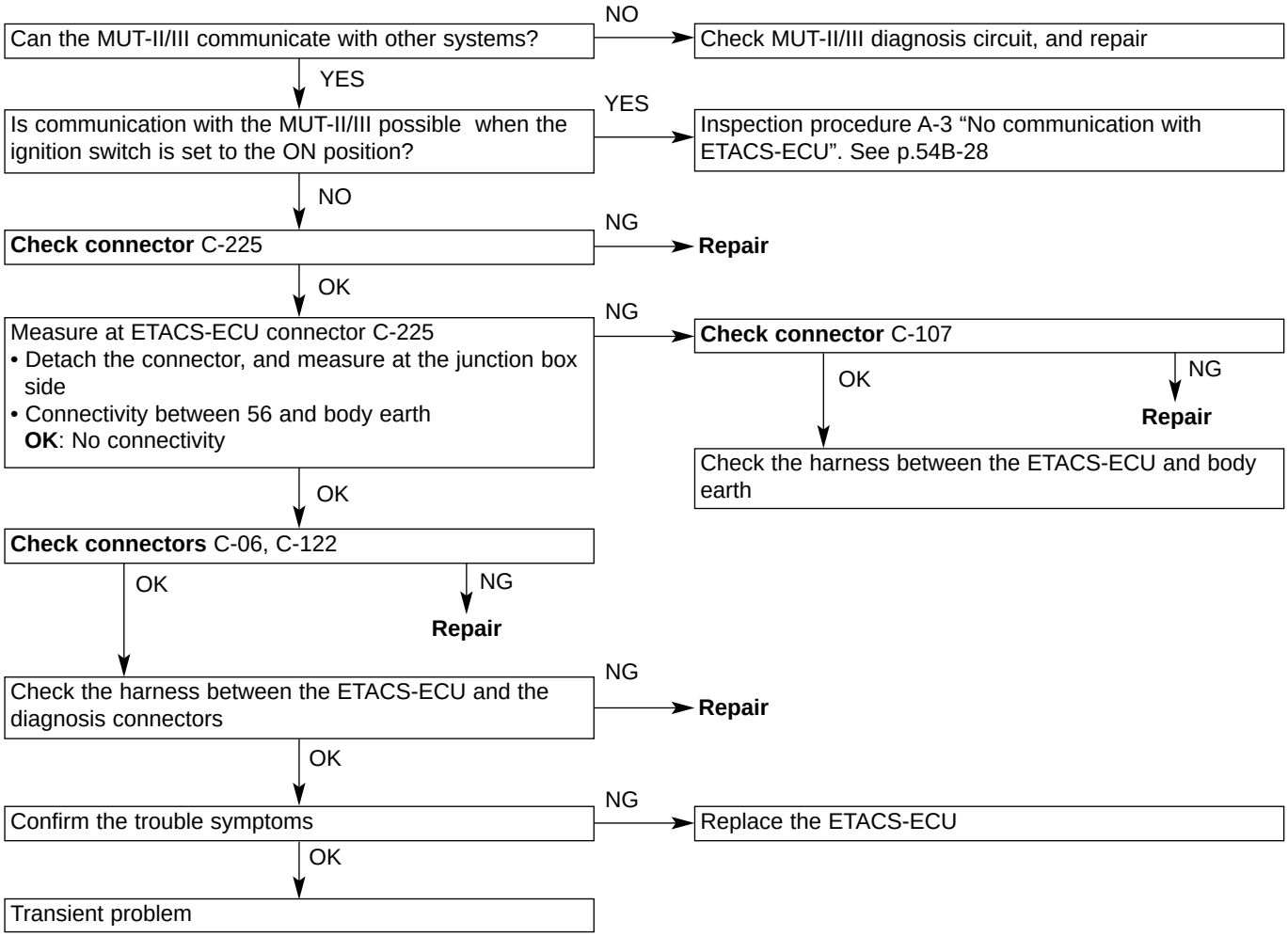
If a problem arises in a number of different functions when using the SWS, perform an input signal check by referring to the table below.
(Only the input signals and functions which may possibly give rise to multiple problems are listed in the table)

Name of function	R-1	R-2	R-3	R-4	R-5	R-6	R-11	R-13	R-14	R-15	R-16	R-17	R-19
Ignition key left in reminder warning		●		●			●						
Lights left on reminder warning		●		●	●								
Door ajar warning function				●						●	●		
Turn indicator light operating noise					●			●					
Central door locking control										●			
Keyless entry				●			●	●	●	●		●	
Keyless entry answer back		●								●			
Multi-mode keyless entry												●	
Electric window control		●											
Electric window timer		●		●									
Sunroof control				●									
Windscreen wiper & washer control	●					●					●		
Rear wiper & washer control	●		●			●							
Motorized retractable door mirror control		●									●		
Ignition key cylinder illumination light control		●		●			●						●
Tail light control					●								
Headlight control					●								
Headlight automatic cut-off		●		●	●								
Fog light control					●								
Turn indicator light control		●			●								
Hazard light control								●					
Interior light control		●		●			●		●	●			●
Interior light automatic cut-off	●												●
Door ajar indicator lamp				●					●				●
Security alarm	●			●			●		●			●	

10. Inspection Procedures Classified by Trouble Symptoms

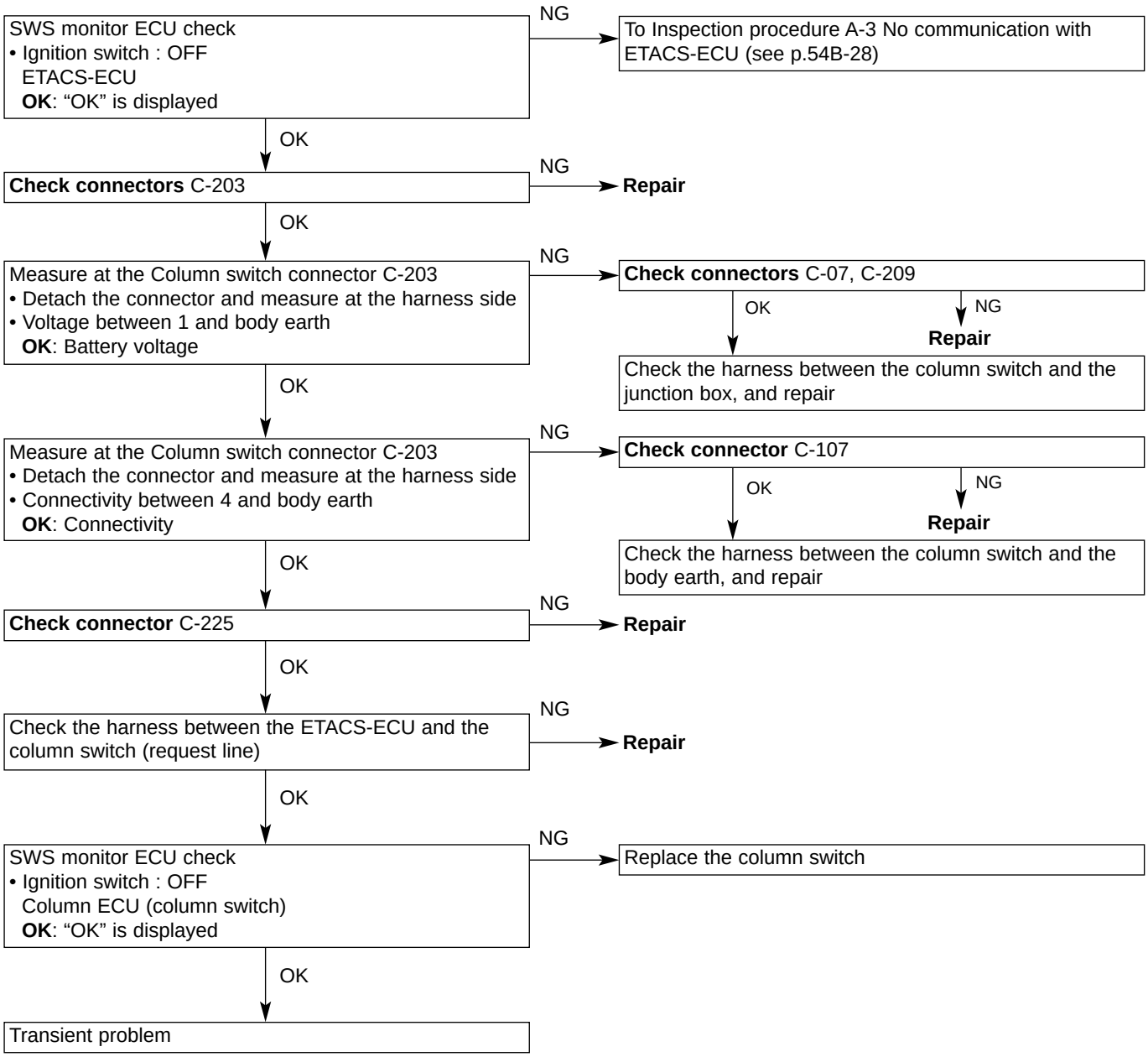
Inspection Procedure

No communication with SWS monitor	Probable Cause
There may be a malfunction in the connections to the SWS monitor	• Fault in SWS monitor main unit (I/F cartridge) • Fault in SWS monitor harness • Fault in harness / connectors • Fault in ETACS-ECU



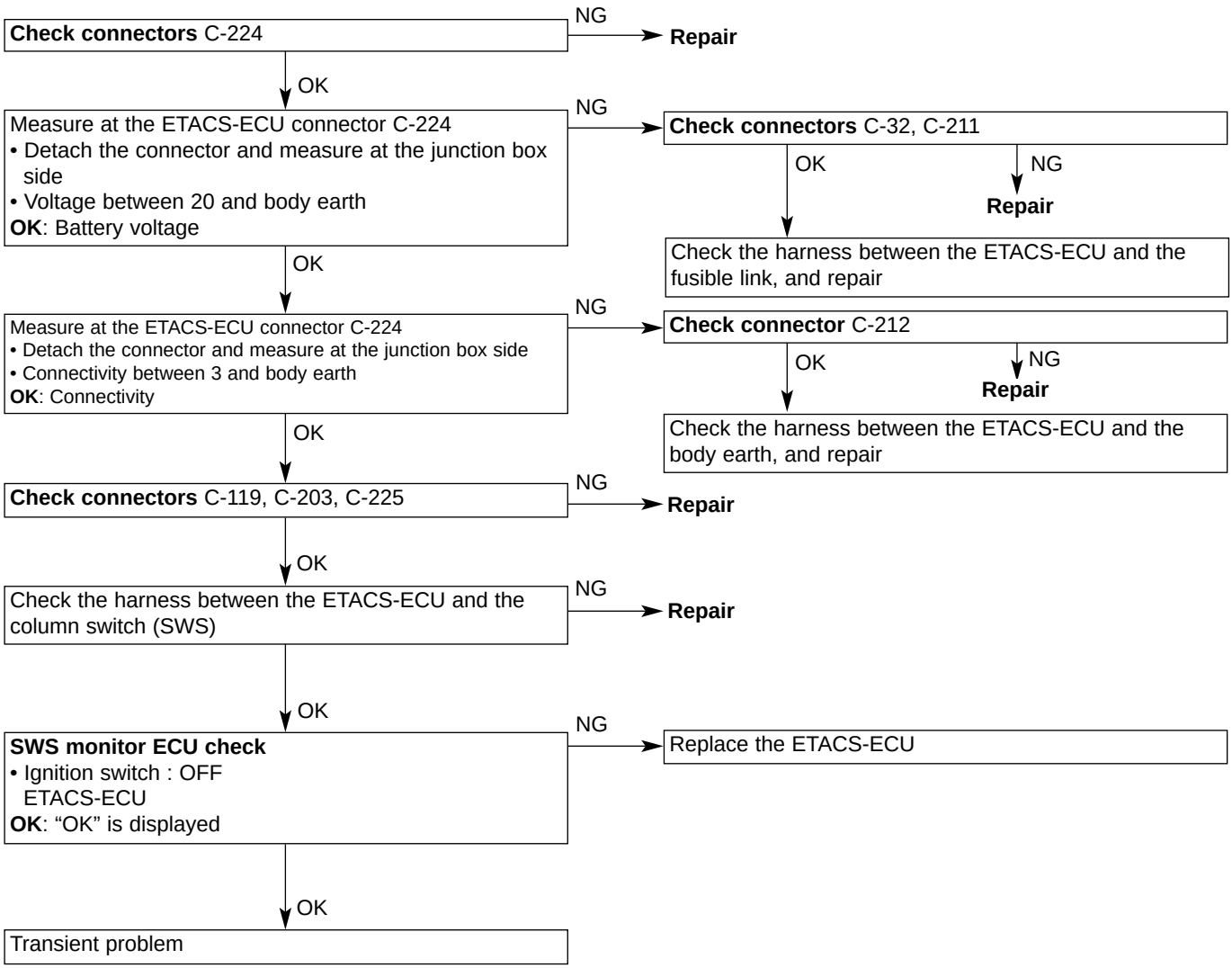
Inspection Procedure A-2

No communication with column switch (column ECU)	Probable Cause
There may be a problem in the column switch (column ECU) power supply circuit system. If there is a problem in the harness of the ECU battery power supply circuit (column switch terminal No.1), then the ignition switch (IG1) power supply circuit (column switch terminal No.9) should also be checked and repaired at the same time.	• Fault in column switch • Fault in harness or connectors



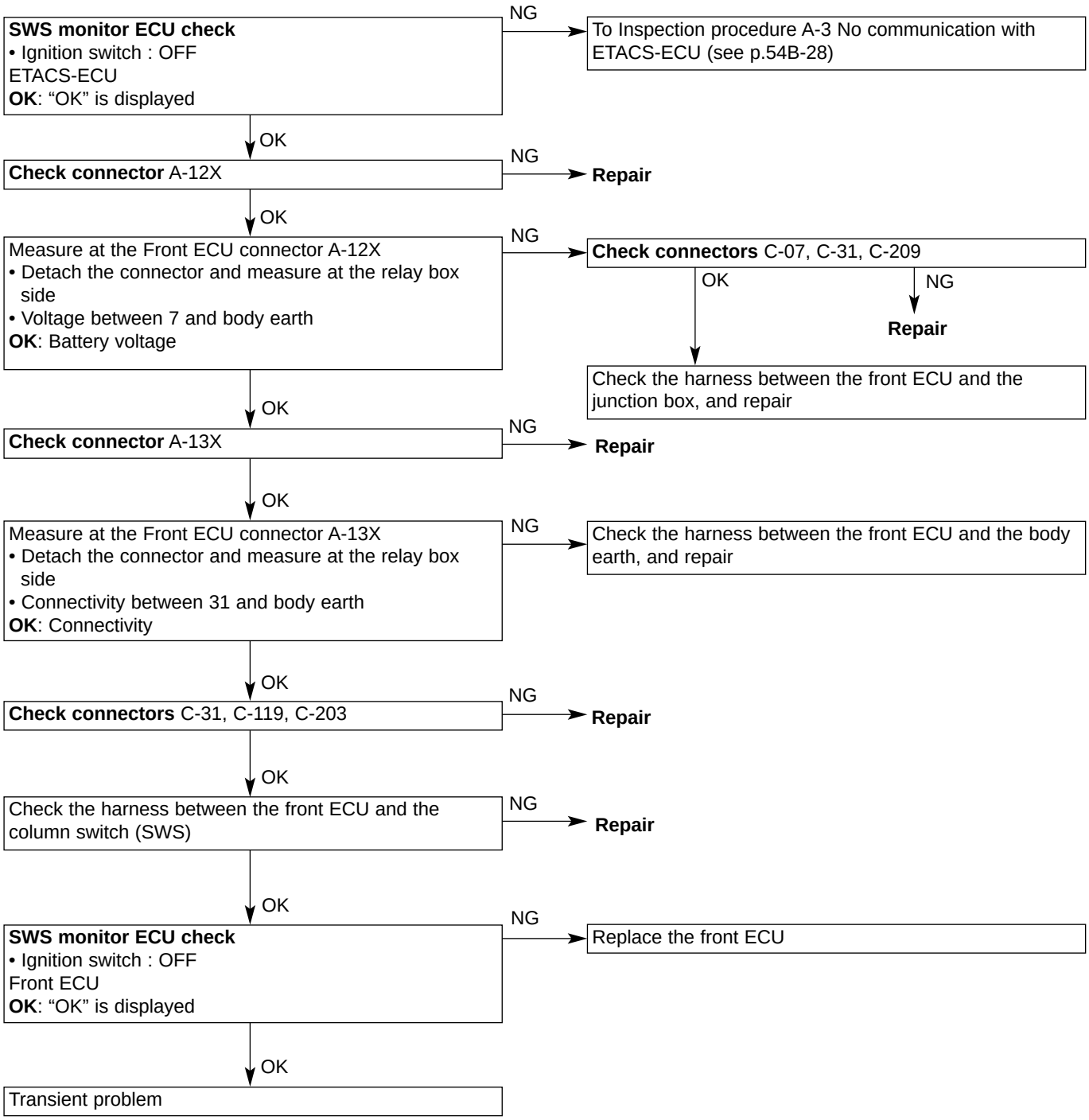
Inspection Procedure A-3

No communication with ETACS-ECU	Probable Cause
There may be an abnormality in the power supply circuit of the ETACS-ECU or a problem in the harness or connectors between the SWS monitor and the ETACS-ECU. In the event of an abnormality in the harness of the ECU battery power supply (ETACS-ECU terminal No.20), the ignition switch (IG1) power supply circuit (ETACS-ECU terminal No.8) should be checked and repaired at the same time. Furthermore, in the event of an abnormality in the harness of the ECU earth circuit (ETACS-ECU terminal No.3), the centre earth circuit (ETACS-ECU terminal No.56) should be checked and repaired at the same time.	• Fault in ETACS-ECU • Fault in harness or connectors



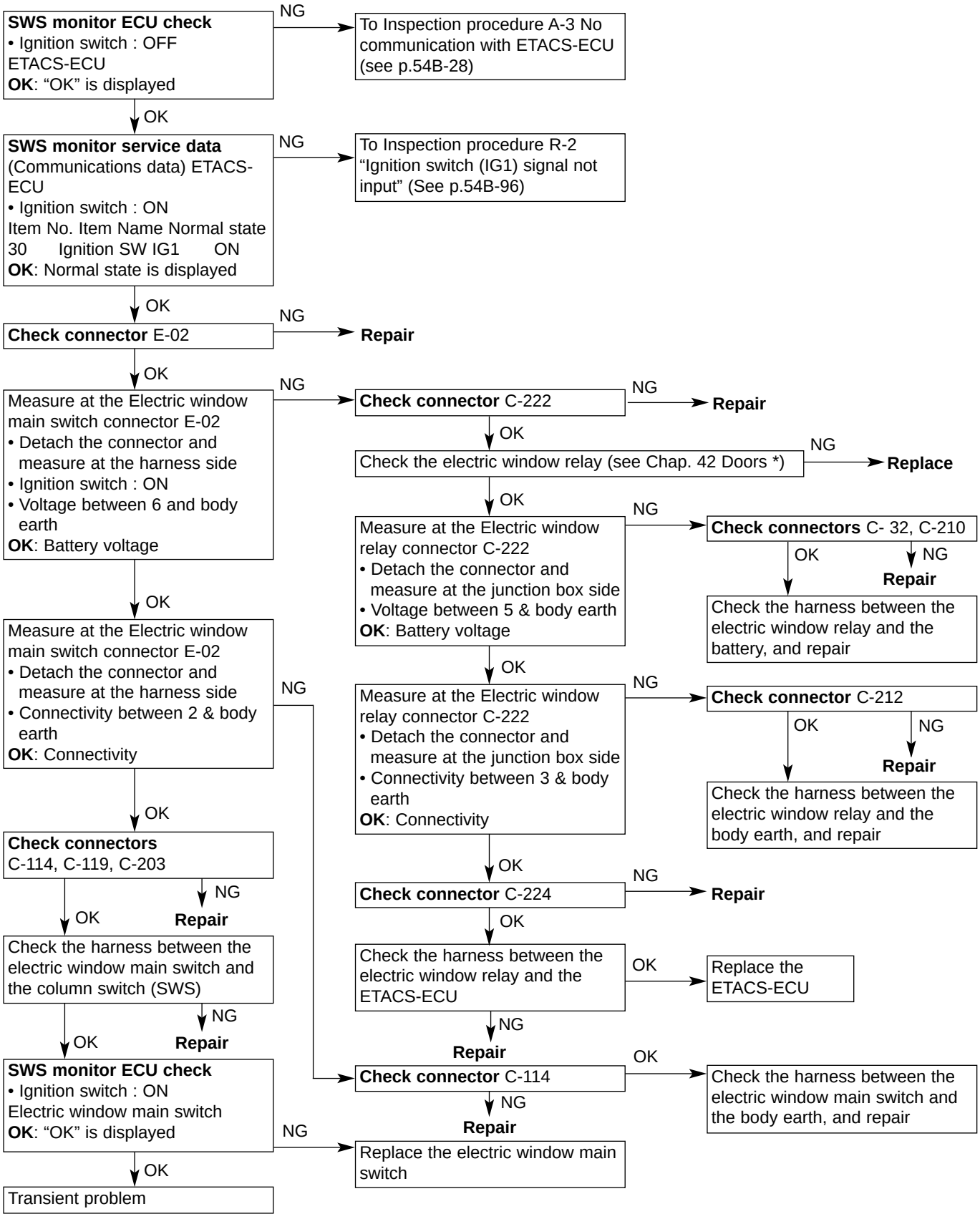
Inspection Procedure A-4

No communication with front ECU	Probable Cause
There may be an abnormality in the front ECU power supply circuit system, or a problem the harness and connectors between the SWS monitor and the front ECU. In the event of an abnormality in the harness of the ECU battery power supply circuit (Front ECU terminal No.7), the ignition switch (IG2) power supply circuit (front ECU terminal No.30) at the same time.	• Fault in front ECU • Fault in harness or connectors



Inspection Procedure A-5

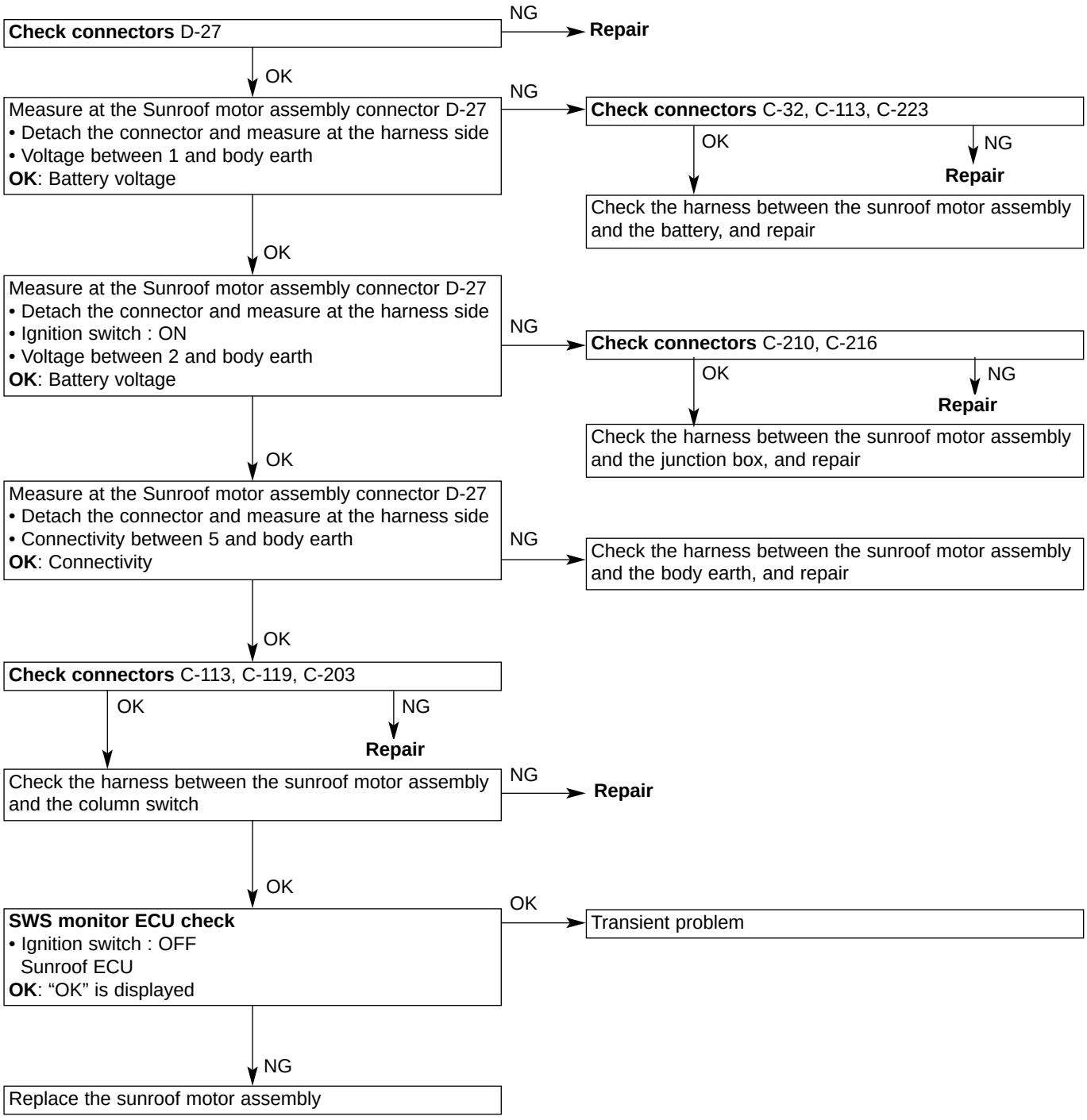
No communication with electric window main switch (electric window module)	Probable Cause
There may be an abnormality in the power supply circuit system of the electric window main switch (electric window relay drive circuit system), or in the communications circuit system.	• Fault in electric window main switch • Fault in electric window relay • Fault in ETACS-ECU • Fault in harness or connectors



Note * : See '00-5 '00-5 Lancer Cedia Servicing Manual (No. 1036K00)

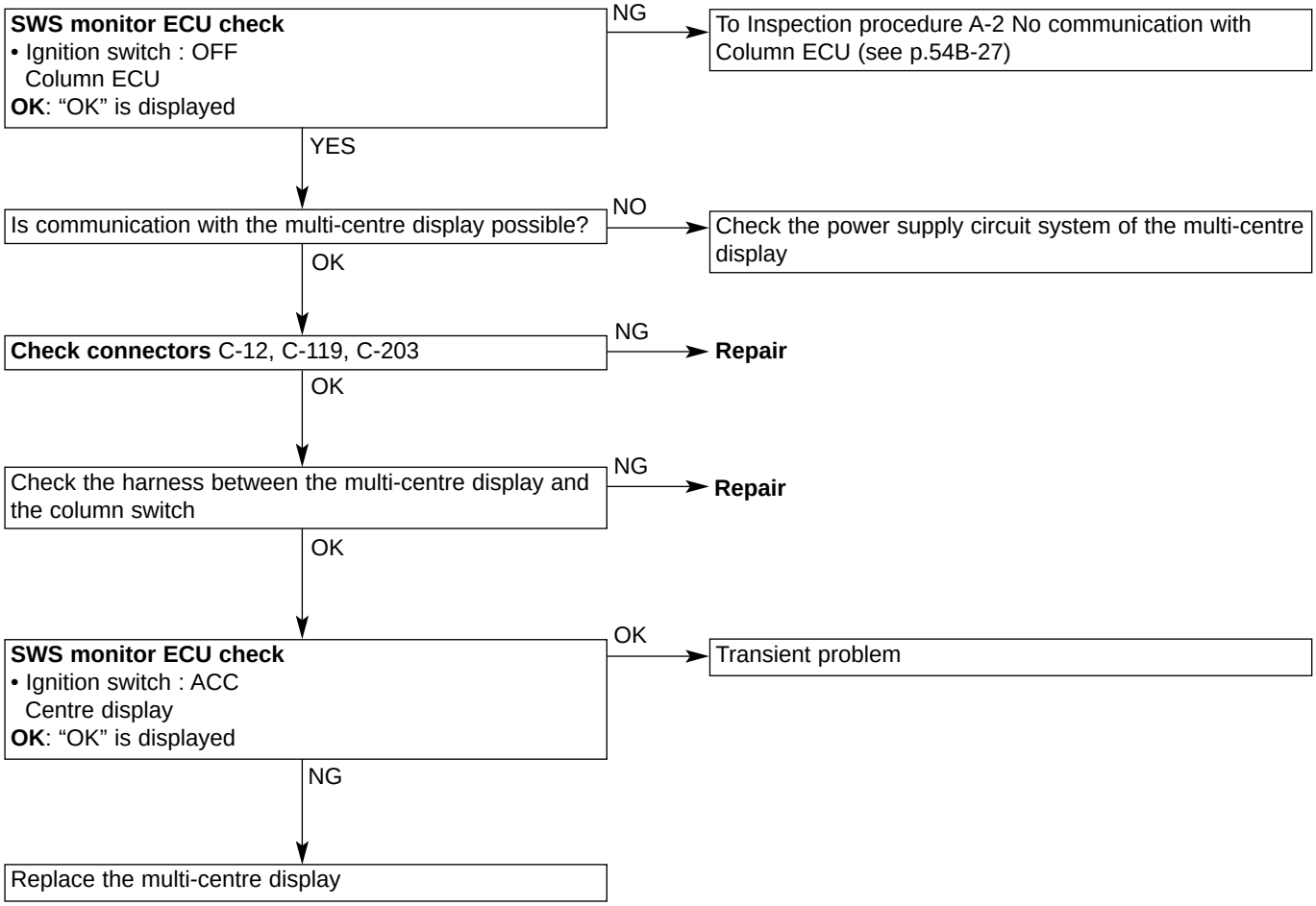
Inspection Procedure A-6

No communication with sunroof motor assembly	Probable Cause
There may be an abnormality in the communications circuit system or the power supply circuit system of the sunroof motor assembly	• Fault in sunroof motor assembly • Fault in harness or connectors



Inspection Procedure A-7

No communication with multi-centre display	Probable Cause
There may be an abnormality in the communications circuit system or the power supply circuit system of the multi-centre display	• Fault in multi-centre display • Fault in harness or connectors



Inspection Procedure B-1

Ignition key left in reminder function not working correctly	Probable Cause
This function is operated by determining the following input signals in the ETACS-ECU. • Ignition switch (IG1) • Key reminder switch • Driver's door switch If the function is not working properly, then there is probably a problem in the input circuit system for these signals, or a malfunction in the ETACS-ECU.	• Fault in key reminder switch • Fault in driver's door switch • Fault in ETACS-ECU • Fault in harness or connectors

SWS monitor ECU check
• Ignition switch : OFF
ETACS-ECU
OK: "OK" is displayed

NG → To Inspection procedure A-3 No communication with ETACS-ECU (see p.54B-28)

OK ↓

SWS monitor service data
(Diagnosis by Function) Buzzer : Remove key reminder buzzer
• Ignition switch : OFF (key inserted)
• Driver's door : open

Item No.	Item Name	Normal state
(a) 30	Ignition SW IG1	OFF
(b) 32	Driver door SW RH	ON
(c) 43	Buzzer	ON

OK: All display normal state

NG (a) → To Inspection procedure R-2 "Ignition switch (IG1) signal not input" (See p.54B-96)

NG (b) → To Inspection procedure R-4 "Driver's door switch signal not input" (See p.54B-98)

NG (c) →

SWS monitor service data
ETACS switch data
• Ignition switch : OFF (key inserted)

Item No.	Item Name	Normal state
03	Key reminder SW	OFF

OK: Displays normal state

OK ↓ Replace the ETACS-ECU

NG → To Inspection procedure R-11 "Key reminder switch signal not input" (See p.54B-103)

OK ↓

Confirm the trouble symptoms

NG → Replace the ETACS-ECU

OK ↓

Transient problem

Inspection Procedure B-2

Lights left on reminder function not working correctly	Probable Cause
This function is operated by determining the following input signals in the ETACS-ECU. • Ignition switch (IG1) • Key reminder switch • Driver's door switch • Tail light switch If the function is not working properly, then there is probably a problem in the input circuit system for these signals, or a malfunction in the ETACS-ECU.	• Fault in key reminder switch • Fault in driver's door switch • Fault in column switch • Fault in ETACS-ECU • Fault in Front ECU • Fault in column ECU • Fault in harness or connectors

SWS monitor ECU check
• Ignition switch : OFF
(1) ETACS-ECU
(2) Column ECU
OK: "OK" is displayed for all

NG (1) → To Inspection procedure A-3 No communication with ETACS-ECU (see p.54B-28)

NG (2) → To Inspection procedure A-2 No communication with Column ECU (see p.54B-27)

OK ↓

SWS monitor service data
(Diagnosis by Function) Buzzer : Lighting monitor buzzer
• Ignition switch : OFF (key removed)
• Tail light switch : ON
• Driver's door : open

Item No.	Item Name	Normal state
(a) 01	Tail light SW	ON
(a) 30	Ignition SW IG1	OFF
(b) 32	Driver door SW RH	ON
(c) 43	Buzzer	ON

OK: All display normal state

NG (a) → To Inspection procedure R-5 "Tail light switch signal not input" (See p.54B-99)

NG (b) → To Inspection procedure R-2 "Ignition switch (IG1) signal not input" (See p.54B-96)

NG (c) → To Inspection procedure R-4 "Driver's door switch signal not input" (See p.54B-98)

NG (d) → Replace the ETACS-ECU

OK ↓

Confirm the trouble symptoms

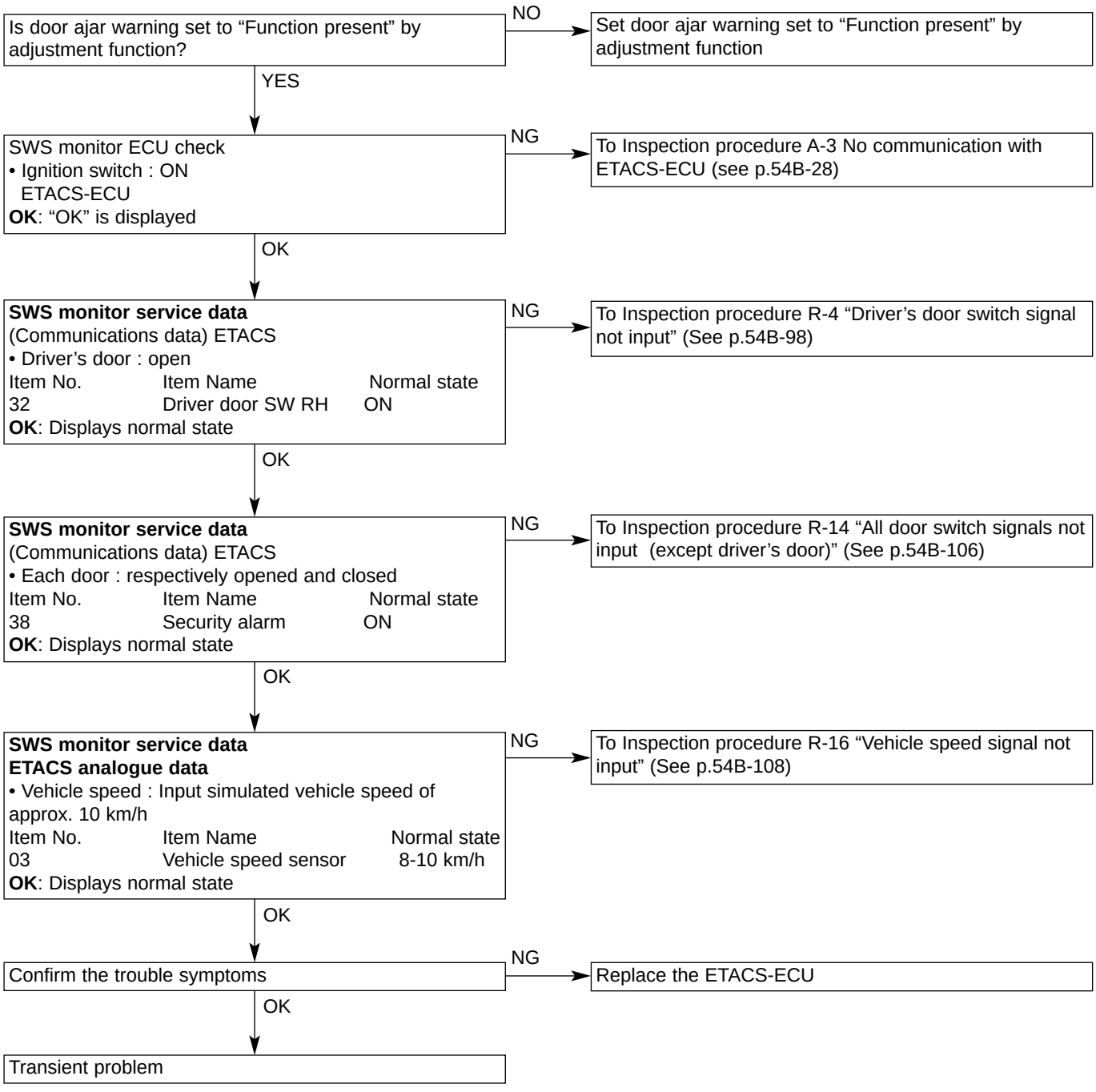
NG → Replace the ETACS-ECU

OK ↓

Transient problem

Inspection Procedure B-3

Door ajar warning function not working correctly	Probable Cause
This function is operated by determining the following input signals in the ETACS-ECU. • All door switch • Vehicle speed signal	• Fault in all door switch • Fault in ETACS-ECU • Fault in harness or connectors



nspection Procedure B-4

Turn indicator light operating noise not working correctly	Probable Cause
This function is operated by determining the following input signals in the ETACS-ECU. • Turn indicator light switch • Hazard light switch	• Fault in column switch • Fault in ETACS-ECU • Fault in harness or connectors

Is the turn indicator operating noise function set to "Function present" by the adjustment function?

NO → Set the turn indicator operating noise function to "Function present" by the adjustment function

YES ↓

SWS monitor ECU check
• Ignition switch : ON
(1) Column ECU
(2) ETACS-ECU
OK: "OK" is displayed for all

NG (1) → To Inspection procedure A-2 No communication with Column ECU (see p.54B-27)

NG (2) → To Inspection procedure A-3 No communication with ETACS-ECU (see p.54B-28)

OK ↓

SWS monitor service data
(Diagnosis by Function) Turn indicator light : R Turn indicator
• Turn indicator light switch : RH
• Ignition switch : ON

Item No.	Item Name	Normal state
(a) 10	RH turn indicator SW	ON
(b) 30	Ignition SW IG1	ON

OK: All display normal state

NG (a) → To Inspection procedure R-5 "Column switches Lighting, Turn indicator light switch) signal not input" (See p.54B-99)

NG (b) → To Inspection procedure R-2 "Ignition switch (IG1) signal not input" (See p.54B-96)

OK ↓

SWS monitor service data
(Diagnosis by Function) Turn indicator light : L Turn indicator
• Turn indicator light switch : LH
• Ignition switch : ON

Item No.	Item Name	Normal state
(a) 11	LH turn indicator SW	ON

OK: Displays normal state

NG → To Inspection procedure R-5 "Column switches Lighting, Turn indicator light switch) signal not input" (See p.54B-99)

OK ↓

Confirm the trouble symptoms

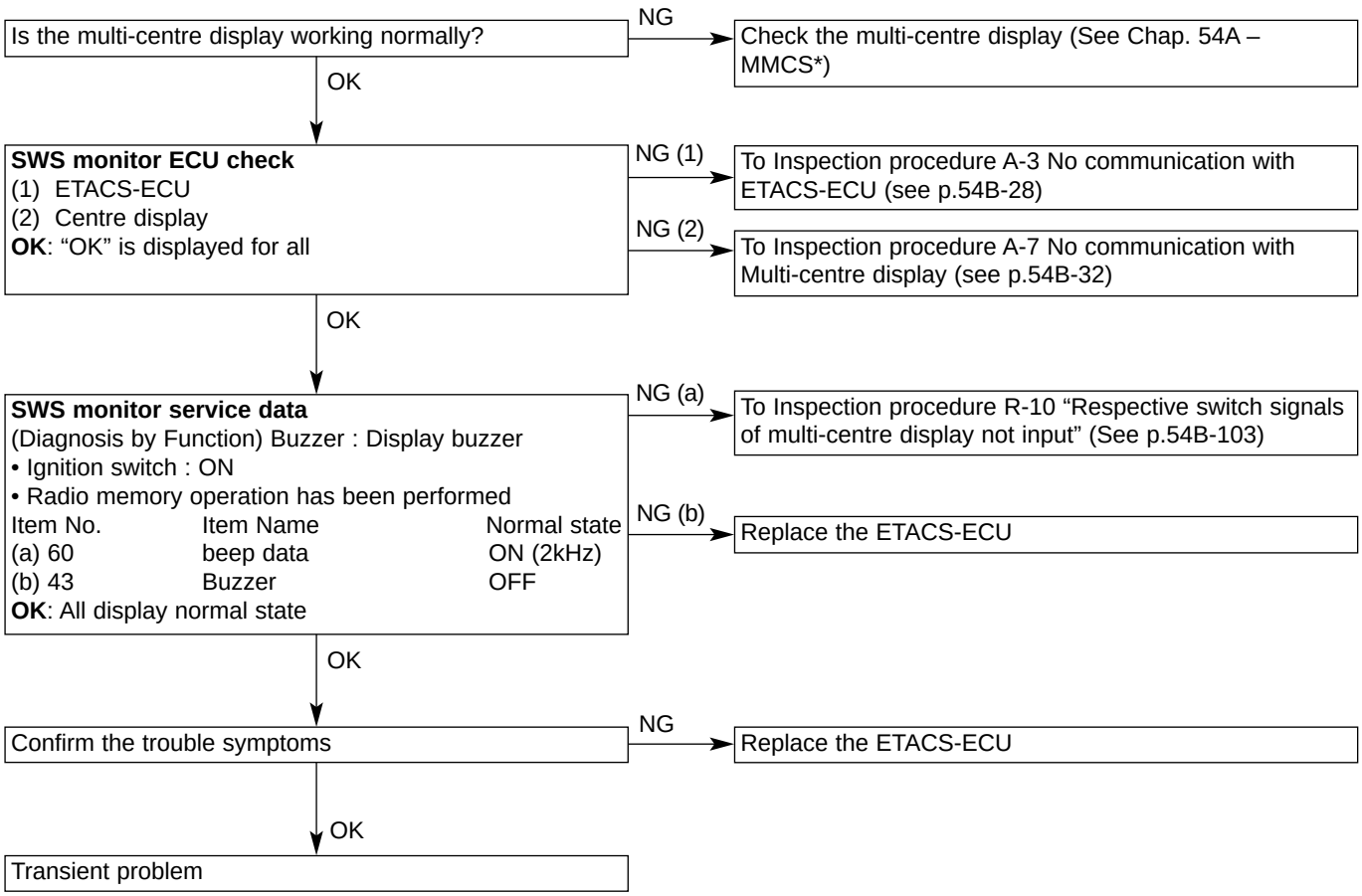
NG → Replace the ETACS-ECU

OK ↓

Transient problem

Inspection Procedure B-5

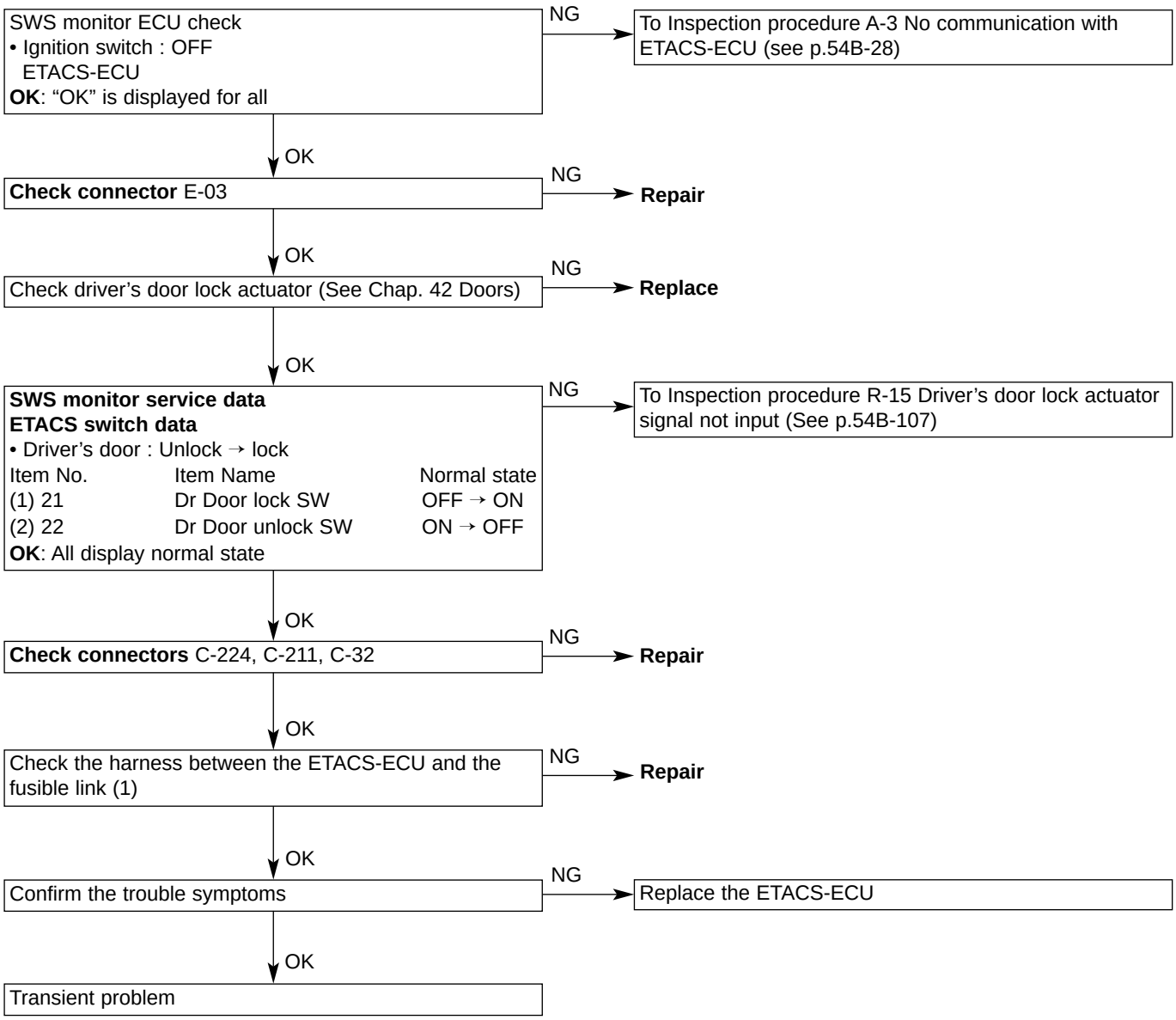
Multi-centre display operating noise function not working correctly	Probable Cause
A buzzer sounds when the ETACS-ECU receives a sound request signal from the multi-centre display. If this function does not work correctly, then this is probably due to an abnormality in the communications circuit, a fault in the multi-centre display, or a fault in the ETACS-ECU.	• Fault in multi-centre display • Fault in ETACS-ECU • Fault in harness or connectors



Note :
(1) When performing the SWS monitor service data check, confirm at the same time that the 60 beep data state changes momentarily from "OFF" to the normal state when the image operating switch is activated.
(2) *: See '00-5 Lancer Cedia Servicing Manual (No. 1036K00)

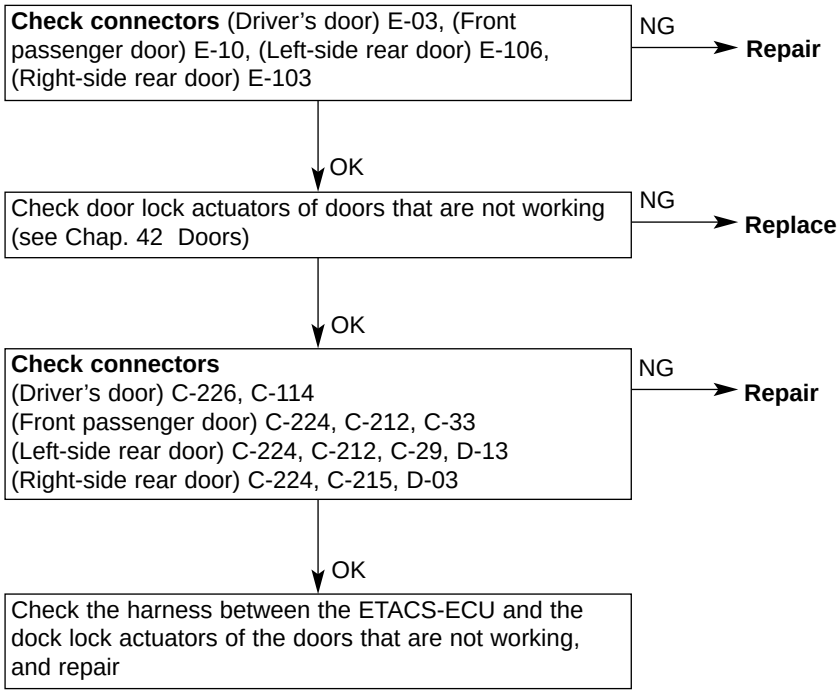
Inspection Procedure C-1

Central door locking not working at all	**Probable Cause**
The ETACS-ECU locks or unlocks all the doors by activating all of the door lock actuators, when there is a change in the input signal from the driver's door lock actuator. If this function does not work properly, then there is probably a fault in the driver's door lock actuators or a fault in the ETACS-ECU.	• Fault in driver's door lock actuator • Fault in ETACS-ECU • Fault in harness or connectors



Inspection Procedure C-2

Some doors not operating, even when lock or unlock is performed	Probable Cause
There is probably a fault in the door lock actuator of the door(s) which are not working.	• Fault in door lock actuator • Fault in harness or connectors



Inspection Procedure D-1

None of electric windows working	Probable Cause
This is probably due to a fault in the electric window relay, a fault in the electric window main switch or a fault in the ETACS-ECU.	• Fault in electric window main switch • Fault in ETACS-ECU • Fault in harness or connectors

SWS monitor ECU check
• Ignition switch : ON
(1) ETACS-ECU
(2) Electric window module
OK: “OK” is displayed for all

NG (1) → To Inspection procedure A-3 No communication with ETACS-ECU (see p.54B-28)

NG (2) → To Inspection procedure A-5 No communication with electric window main switch (electric window module) p.54B-30

OK ↓

SWS monitor service data
ETACS switch data
• Driver’s door : Unlock → lock

Item No.	Item Name	Normal state
(a) 30	Ignition SW IG1	ON
(b) 33	P/W SW enabled	Enabled
(c) 71	P/W module response	Input check*

OK: All display normal state

NG (a) → Go to Inspection procedure R-2 Ignition switch (IG1) signal not input (p.54B-96)

NG (b) → Replace the ETACS-ECU

NG (c) → Replace the electric window main switch

OK ↓

SWS monitor service data
(Communications data) Door-to-door communications
• Insert probe at probe position in door-to-door communications line. See p.54B-6 for probe position.
• Ignition switch : ON
• Electric window main switch : UP

Item No.	Item Name	Normal state
C0	Driver window UP	ON

OK: All display normal state

NG → Replace the electric window main switch

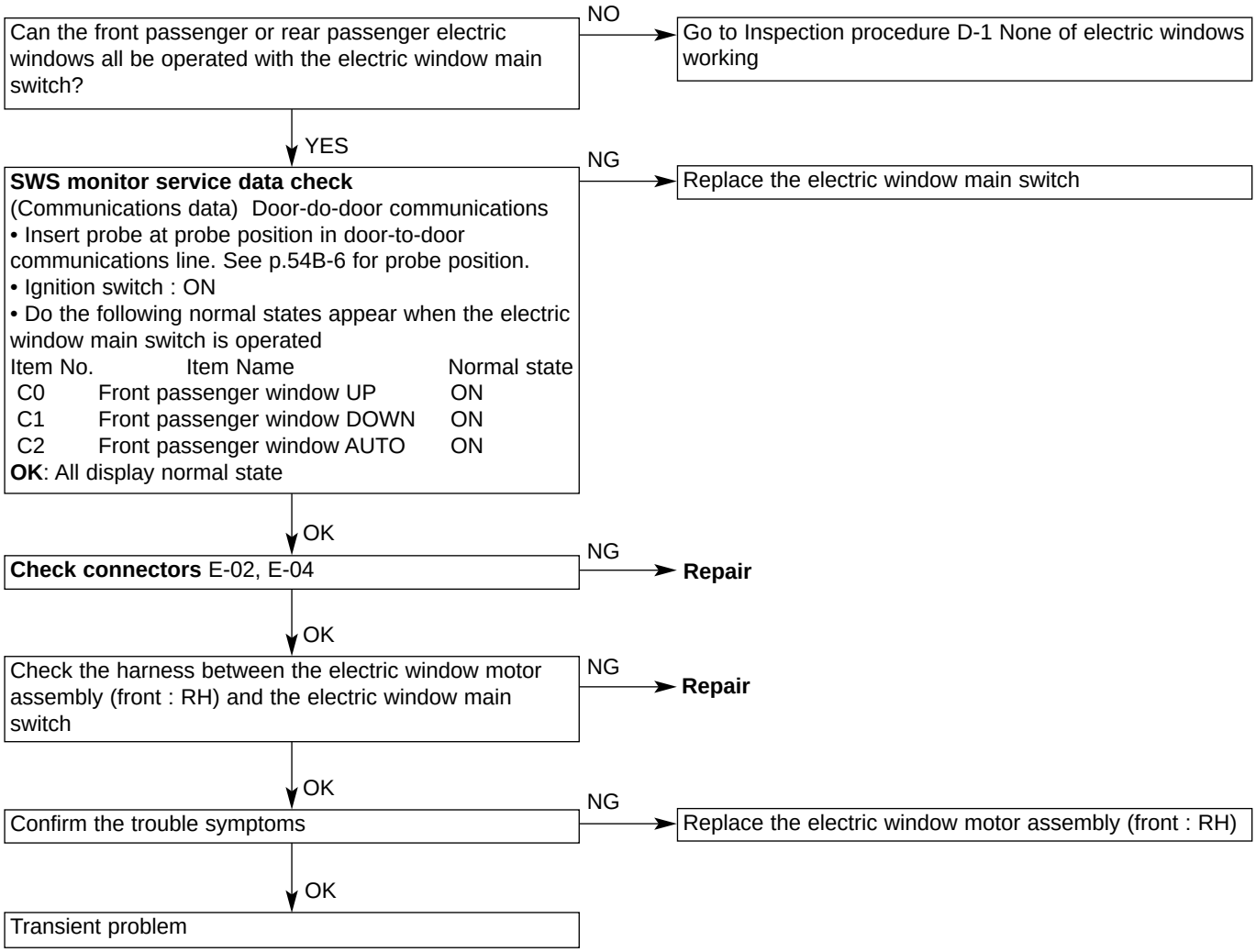
OK ↓

Check the harness between the respective electric window motor assemblies and the electric window main switch, and repair

Note :
*: Also check that the “Normal response” changes momentarily to “Input check” when the electric window main switch is operated.

Inspection Procedure D-2

Driver's electric window not responding to electric window main switch	**Probable Cause**
There is probably a fault in the electric window main switch or the driver's electric window motor.	• Fault in electric window main switch • Fault in driver's electric window motor assembly • Fault in harness or connectors



Inspection Procedure D-3

Front passenger's or rear passenger's electric windows not responding to their respective switches	**Probable Cause**
There is probably a fault in the electric window sub switch or the front or rear passenger electric window motor.	• Fault in electric window sub switch • Fault in front or rear passenger electric window motor assembly • Fault in harness or connectors

Is the lock switch of the electric window main switch turned off?
- NO → Turn off the lock switch of the electric window main switch
- YES ↓

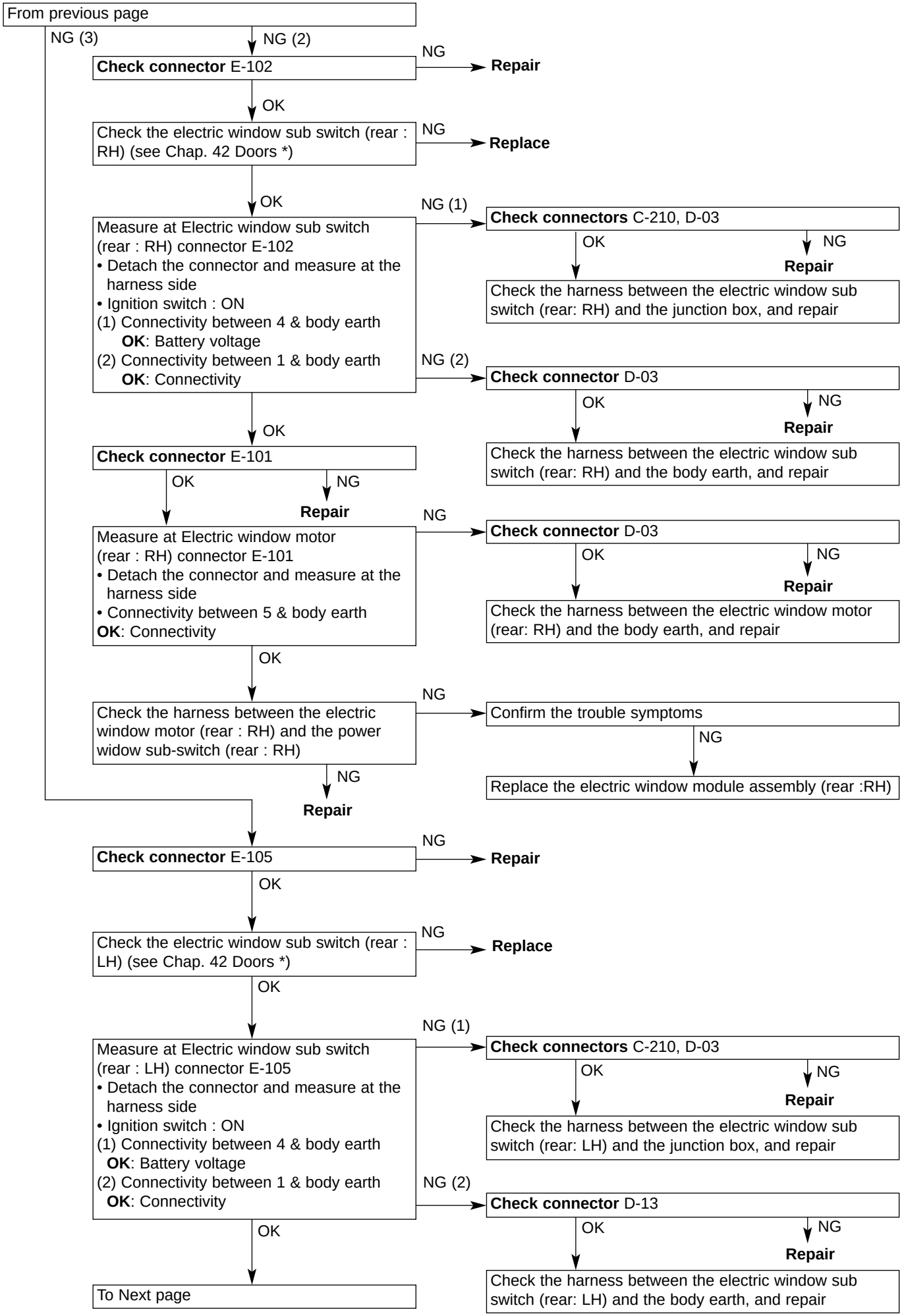
SWS monitor service data check
(Communications data) Door-do-door communications
- Insert probe at probe position in door-to-door communications line. See p.54B-6 for probe position.
- Ignition switch : ON
- Electric window main switch lock : OFF

Item No.	Item Name	Normal state
CB	P/W LOCK SW	OFF

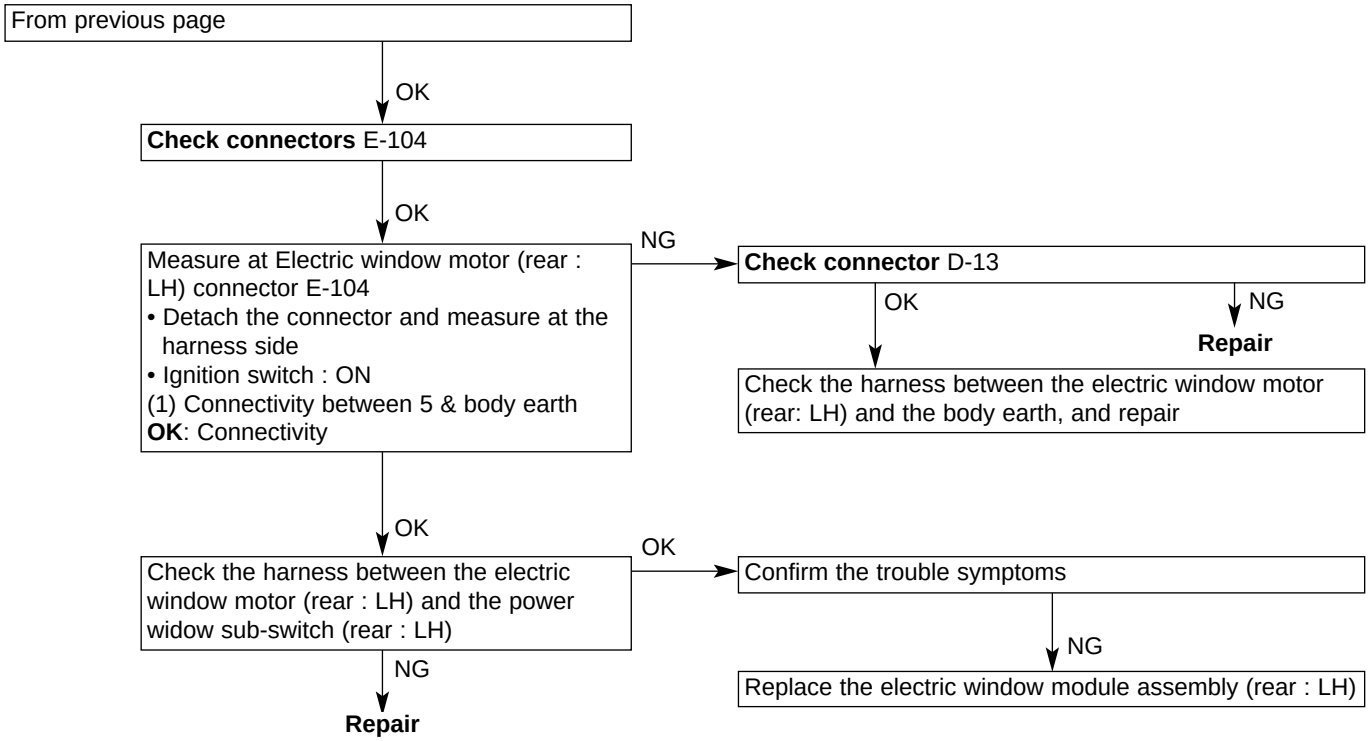
OK: All display normal state
- NG → Replace the electric window main switch
- OK ↓

Do any of the electric windows respond to their switches?
NG: (1) Front LH electric window not working
(2) Rear : RH electric window not working
(3) Rear : LH electric window not working
- NG (1) → **Check connector** E-06
  - OK → Check electric window sub switch (front : LH) (see Chap. 42 Doors *)
    - OK → Measure at Electric window sub switch (front : LH) connector E-06
      - NG (1) → **Check connectors** C-210, C-33
        - OK → Check the harness between the electric window sub switch (front : LH) & junction box, and repair
        - NG → **Repair**
      - NG (2) → **Check connector** C-33
        - OK → Check the harness between the electric window sub switch (front : LH) & body earth, and repair
        - NG → **Repair**
      - OK → **Check connectors** E-09
        - OK → Measure at Electric window motor (front : LH) connector E-09
          - NG → **Check connector** C-33
            - OK → Check the harness between the electric window motor (front : LH) and the body earth, and repair
            - NG → **Repair**
          - OK → Check the harness between the electric window motor (front : LH) and the electric window sub switch (front : LH)
            - OK → Confirm the trouble symptoms
              - NG → Replace the electric window motor assembly (front LH)
            - NG → **Repair**
        - NG → **Repair**
    - NG → **Replace**
  - NG → **Repair**
- NG (2) → To next page
- NG (3) → To next page

Note * : See '00-5 Lancer Cedia Servicing Manual (No. 1036K00)



Note * : See '00-5 Lancer Cedia Servicing Manual (No. 1036K00)


From previous page
OK
Check connectors E-104
OK
Measure at Electric window motor (rear : LH) connector E-104
• Detach the connector and measure at the harness side
• Ignition switch : ON
(1) Connectivity between 5 & body earth
OK: Connectivity
NG
Check connector D-13
OK
NG
Repair
Check the harness between the electric window motor (rear: LH) and the body earth, and repair
OK
Check the harness between the electric window motor (rear : LH) and the power widow sub-switch (rear : LH)
OK
Confirm the trouble symptoms
NG
Replace the electric window module assembly (rear : LH)
NG
Repair

Inspection procedure D-4

Front and/or rear passenger electric window not responding to electric window main switch	**Probable Cause**
There is probably a fault in the electric window main switch or the front or rear passenger electric window sub switch	• Fault in electric window main switch • Fault in front or rear passenger electric window sub switch • Fault in harness or connectors

Do the electric windows respond to their respective electric window sub switches?

NO → To Inspection procedure D-3 Front passenger's or rear passenger's electric windows not responding to their respective switches (p.54B-42)

YES ↓

SWS monitor ECU check
• Ignition switch: ON
P/W module
OK: "OK" is displayed

NG → To Inspection procedure A-5 No communication with electric window main switch (electric window module) (p.54B-30)

OK ↓

SWS monitor service data check
(Communications data) Door-do-door communications
• Insert probe between the electric window main switch and the electric window sub switch of the door whose electric window does not operate with the electric window main switch. See p.54B-6 for probe position.
• Ignition switch: ON
• Are the following normal states displayed when the respective electric window switches of the electric window main switch are operated?

Item No.	Item Name	Normal state
(a) C0	Front passenger window LH UP	ON
(b) C1	Front passenger window LH DOWN	ON
(c) C2	Front passenger window LH AUTO	ON
(d) C4	Rear RH UP	ON
(e) C5	Rear RH DOWN	ON
(f) C6	Rear RH AUTO	ON
(g) C8	Rear LH UP	ON
(h) C9	Rear LH DOWN	ON
(i) CA	Rear LH AUTO	ON

OK: All display normal state

NG (All a-i) → Check connectors Probe insertion point – E-02
- OK → Check the harness between the probe insertion point and the electric window main switch
  - OK → NG (Any of a-i) → Confirm the trouble symptoms
    - NG → Replace the electric window main switch
    - OK → Transient problem
  - NG → **Repair**
- NG → **Repair**

OK ↓

Check connectors Between probe insertion point and electric window sub switch at the door where the window is not working

NG → **Repair**

OK ↓

Check the harness between probe connection point and the electric window sub switch at the door where the window is not working

NG → **Repair**

OK ↓

Confirm the trouble symptoms

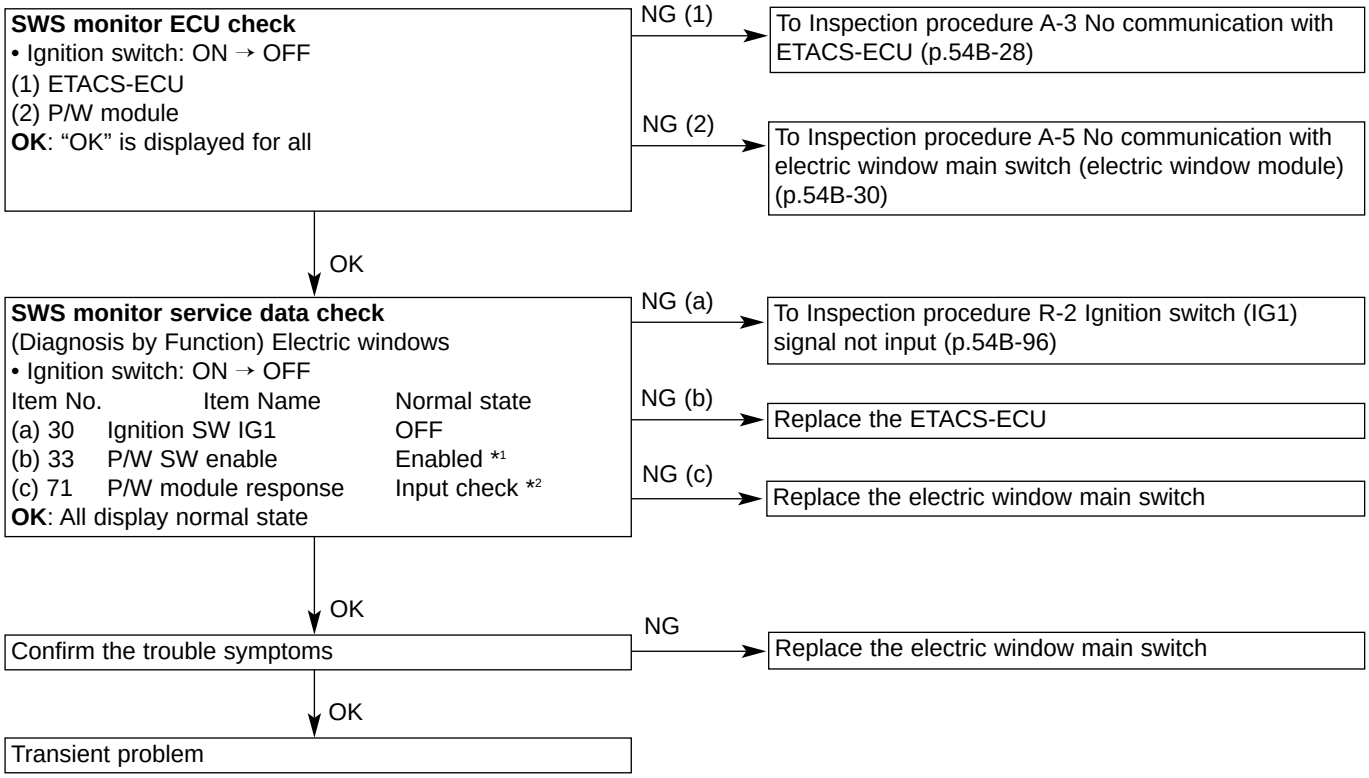
NG → Replace the electric window sub switch of the door where the window is not working

OK ↓

Transient problems

Inspection procedure D-5

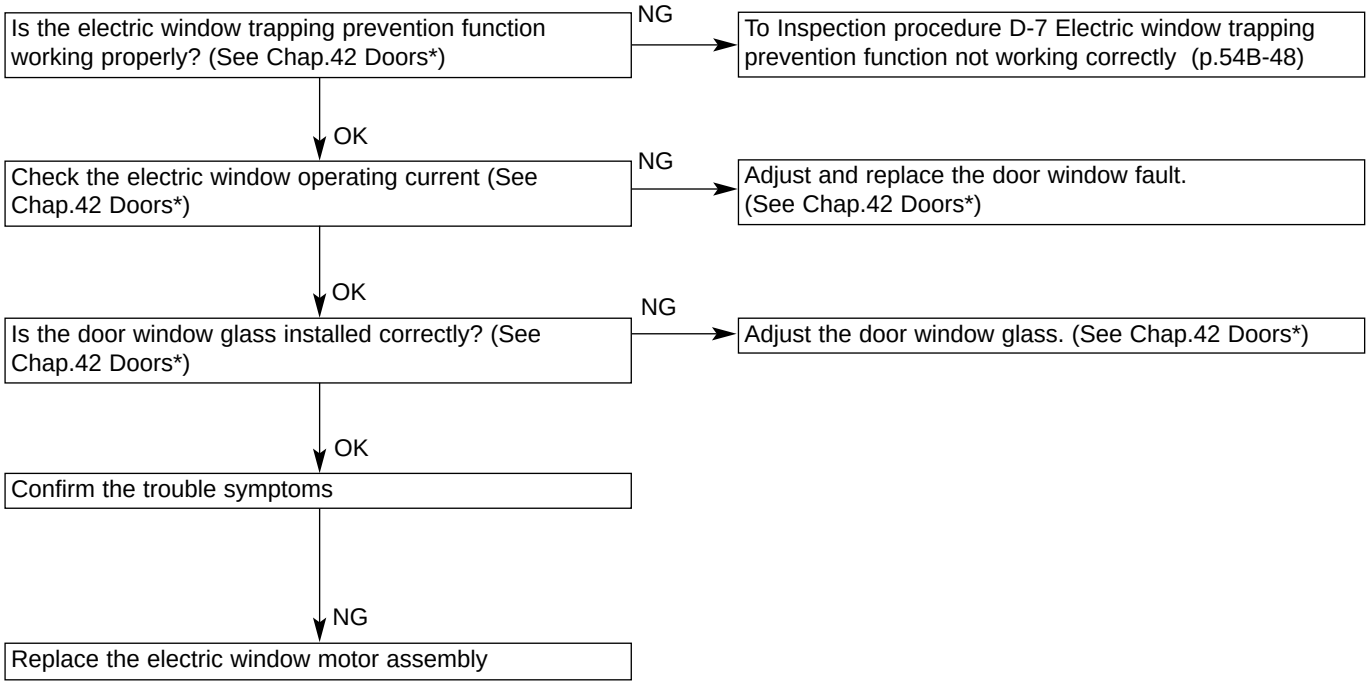
Electric window timer function not working correctly	Probable Cause
This function is operated by determining the following input signals in the ETACS-ECU • Ignition switch (IG1) • Driver's door switch If the function is not working properly, then this is probably due to a problem in the input circuit for these signals, a fault in the electric window main switch, or a fault in the ETACS-ECU.	• Fault in driver's door switch • Fault in electric window main switch • Fault in ETACS-ECU • Fault in harness or connectors



Note:
(1) When performing the SWS monitor check, in analyzing the electric window main switch (electric window module), "OK" is displayed for about 1 min. and then the display changes to "NG". However, the ETACS-ECU only displays "OK".
(2) *1: "Enabled" is shown for 30 seconds, and then the display changes to "Prohibited".
*2 Check also that the response changes momentarily from "normal response" to "input check" when the electric window main switch is operated.
(3) In both (1) and (2) above, the electric window timer period (approx. 30 seconds) can be extended by means of a delay operation.
(See '00-5 Lancer Cedia Servicing Manual (No. 1036K00))

Inspection procedure D-6

While the window is winding up, it automatically starts to come down again	Probable Cause
If there is a large resistance to the movement of the window glass when the electric window is being raised, then it is judged that the window is trapping an object and it is lowered by approx. 150 mm.	• Error in adjustment of window glass • Fault or deformation in glass sliding mechanism • Fault in electric window motor assembly • Fault in window regulator assembly



Note:
See '00-5 Lancer Cedia Servicing Manual (No. 1036K00)

Inspection procedure D-7

Electric window trapping prevention function not working correctly	Probable Cause
There is probably a fault in the rotation detector sensor in the electric window motor	• Fault in electric window motor assembly

Check the electric window operating current (See Chap.42 Doors *)
NG → Adjust and replace door window fault (See Chap. 42 Doors *)
OK ↓

Does the trapping prevention function work on any of the respective electric windows?
NG: (1) Front: RH electric window: Not working
(2) Front: LH electric window: Not working
(3) Rear: RH electric window: Not working
(4) Rear: LH electric window: Not working
NG (1) → **Check connectors** E-02, E-04
OK → Measure at Electric window main switch connector E-02 and Electric window motor (front: RH) connector E-04
• Detach the connector and measure at the harness side
• Connectivity between the following terminals
OK: Connectivity

Electric window main switch		Electric window motor (front RH)
8	–	5
9	–	2
10	–	3
12	–	6

NG → Check the harness between the electric window main switch and the electric window motor (front: RH)
OK → Confirm the trouble symptoms
NG → Replace the electric window motor assembly (front: RH)
NG → Repair
OK ↓

NG (2) → **Check connector** E-09
NG → **Repair**
OK ↓

Measure at the Electric window motor (front: LH) connector E-09
• Detach the connector and measure at the harness side
• Connectivity between 5 and body earth
OK: Connectivity
NG → **Check connector** C-33
OK → Check the harness between the electric window main switch (front: LH) and the body earth, and repair
NG → Repair
OK ↓

NG (3) → **Check connector** E-06
NG → **Repair**
OK ↓

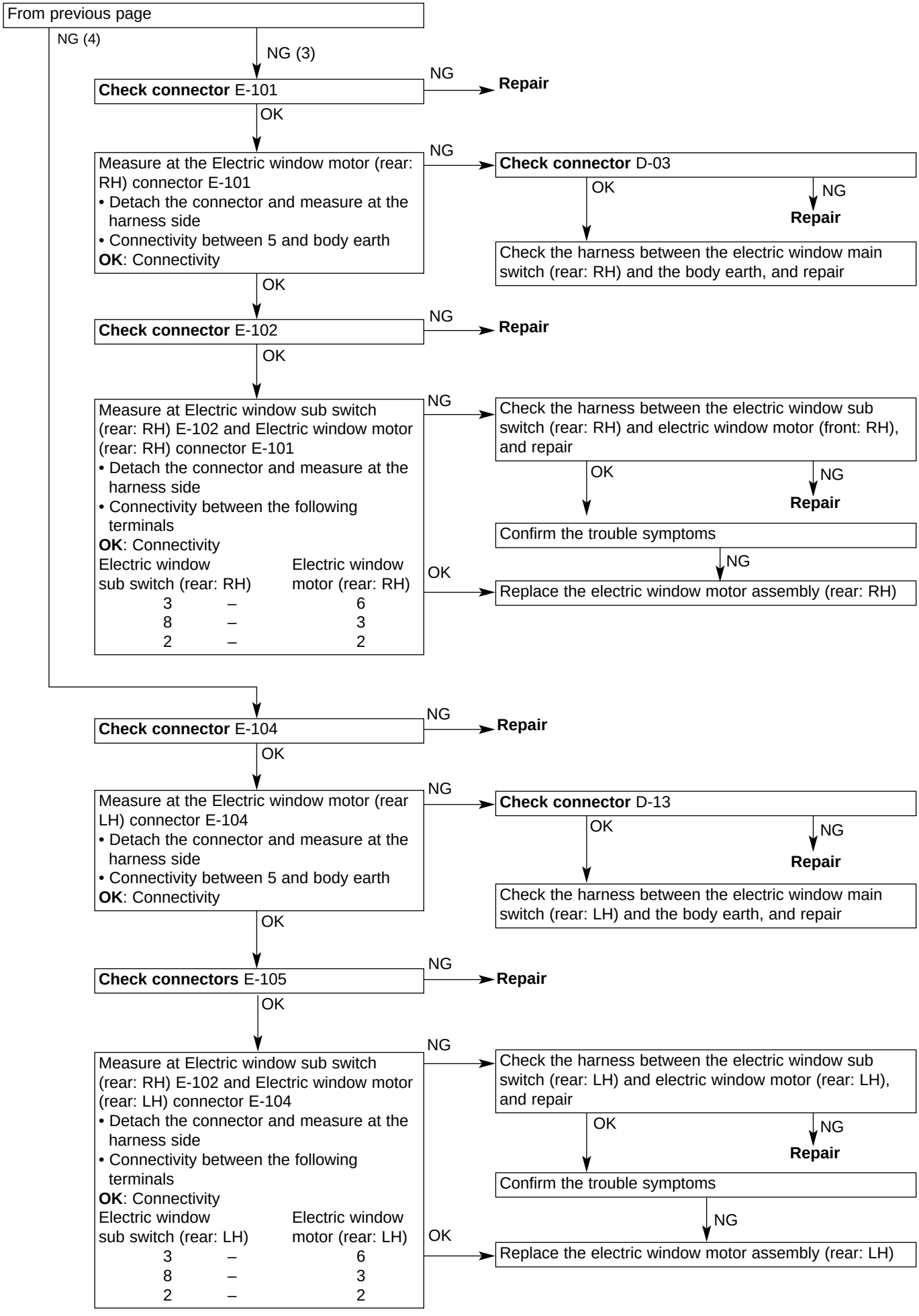
Measure at Electric window sub switch (front: LH) connector E-06 and Electric window motor (front: LH) connector E-09
• Detach the connector and measure at the harness side
• Connectivity between the following terminals
OK: Connectivity

Electric window sub switch (front: LH)		Electric window motor (front LH)
3	–	6
8	–	3
2	–	2

NG → Check the harness between the electric window sub switch (front: LH) and electric window motor (front: LH), and repair
OK → Confirm the trouble symptoms
NG → Repair
NG → Replace the electric window motor assembly (front: LH)
OK ↓

NG (4) → To next page

Note: See '00-5 Lancer Cedia Servicing Manual (No. 1036K00)


From previous page
NG (4)
NG (3)
Check connector E-101
NG
Repair
OK
Measure at the Electric window motor (rear: RH) connector E-101
• Detach the connector and measure at the harness side
• Connectivity between 5 and body earth
OK: Connectivity
NG
Check connector D-03
OK
NG
Repair
Check the harness between the electric window main switch (rear: RH) and the body earth, and repair
OK
Check connector E-102
NG
Repair
OK
Measure at Electric window sub switch (rear: RH) E-102 and Electric window motor (rear: RH) connector E-101
• Detach the connector and measure at the harness side
• Connectivity between the following terminals
OK: Connectivity
Electric window sub switch (rear: RH) – Electric window motor (rear: RH)
3 – 6
8 – 3
2 – 2
NG
Check the harness between the electric window sub switch (rear: RH) and electric window motor (front: RH), and repair
OK
NG
Repair
Confirm the trouble symptoms
NG
OK
Replace the electric window motor assembly (rear: RH)
Check connector E-104
NG
Repair
OK
Measure at the Electric window motor (rear LH) connector E-104
• Detach the connector and measure at the harness side
• Connectivity between 5 and body earth
OK: Connectivity
NG
Check connector D-13
OK
NG
Repair
Check the harness between the electric window main switch (rear: LH) and the body earth, and repair
OK
Check connectors E-105
NG
Repair
OK
Measure at Electric window sub switch (rear: RH) E-102 and Electric window motor (rear: LH) connector E-104
• Detach the connector and measure at the harness side
• Connectivity between the following terminals
OK: Connectivity
Electric window sub switch (rear: LH) – Electric window motor (rear: LH)
3 – 6
8 – 3
2 – 2
NG
Check the harness between the electric window sub switch (rear: LH) and electric window motor (rear: LH), and repair
OK
NG
Repair
Confirm the trouble symptoms
NG
OK
Replace the electric window motor assembly (rear: LH)

Inspection procedure E-1

Keyless entry system not working at all	Probable Cause
This function is operated by determining the following input signals in the ETACS-ECU. • Key reminder switch • All door switch • Keyless entry transmitter • Driver's door lock actuator If the function is not working properly, then there is probably a problem in the input circuit system for these signals, or a fault in the ETACS-ECU.	• Fault in key reminder switch • Fault in door switch • Fault in keyless entry transmitter • Fault in ETACS-ECU

SWS monitor ECU check
• Ignition switch: OFF
ETACS-ECU
OK: "OK" is displayed

NG → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)

OK ↓

SWS monitor keyless entry reception check
Check the status of the keyless entry transmitter
• Keyless entry transmitter
Lock switch: ON

MUT display	Normal state
Lock	❍

• Keyless entry transmitter

Unlock switch:	ON
MUT display	Normal state
Unlock	❍

OK: All display normal state

NG → To Inspection procedure R-17 Various switch signals of keyless entry transmitter not input (p.54B-109)

OK ↓

SWS monitor service data
(Communications data) ETACS
• Respective doors: open and closed

Item No.	Item Name	Normal state
38	Security alarm	ON

OK: Displays normal state

NG → To Inspection procedure R-14 All door switch signals not input (except driver's door) (p.54B-106)

OK ↓

Confirm the trouble symptoms

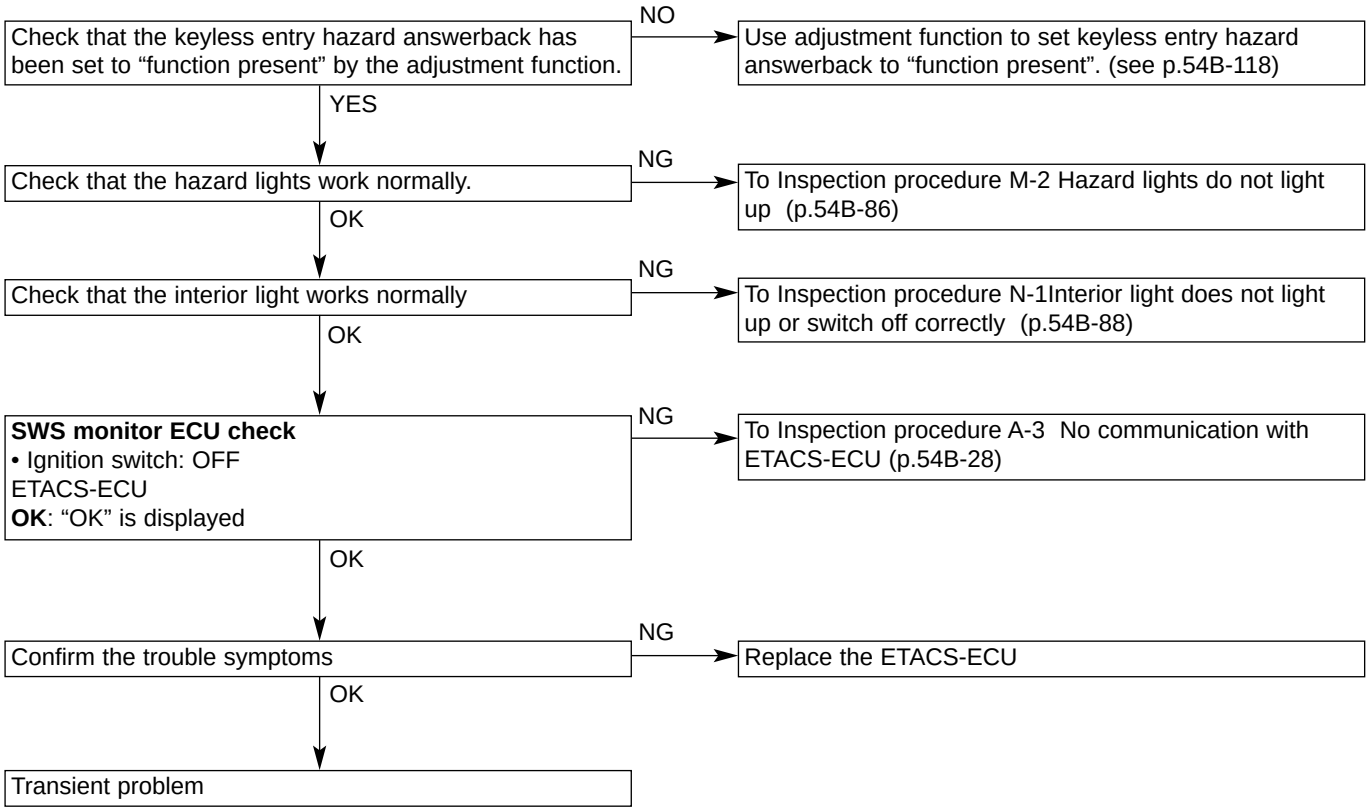
NG → Replace the ETACS-ECU

OK ↓

Transient problem

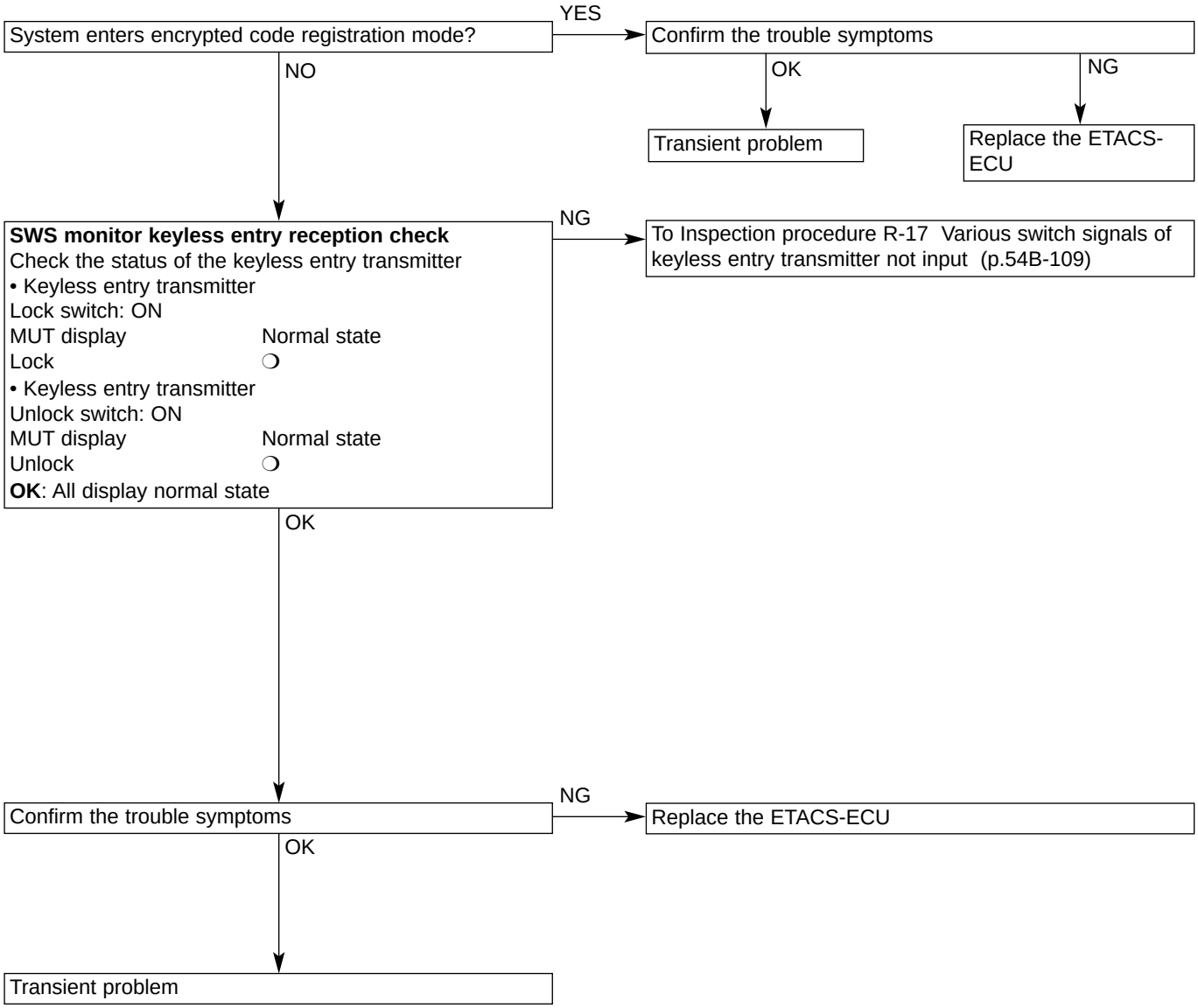
Inspection procedure E-2

Keyless entry hazard answerback function or interior light answerback function not working correctly	**Probable Cause**
If the hazard lights and interior light are working normally, then there is probably a fault in the ETACS-ECU. It is also possible that the function is switched off by the adjustment function.	• Fault in turn indicator lights • Fault in interior light • Fault in ETACS-ECU • Fault in harness or connectors



Inspection procedure E-3

Encrypted code cannot be registered	Probable Cause
If the system cannot be set to encrypted code registration mode, then there is probably a problem in the input circuit system or a fault in the ETACS-ECU. If the encrypted code registration mode can be entered, but codes still cannot be registered, then there is probably a fault in the keyless entry transmitter or a fault in the ETACS-ECU.	• Fault in keyless entry transmitter • Fault in ETACS-ECU • Fault in harness or connectors



Inspection procedure E-4

Multi-mode keyless entry function not working at all	Probable Cause
If the electric windows, sunroof, and motorized door mirrors are all working normally, then there is probably a fault in the ETACS-ECU. It is also possible that the electric window and sunroof operation has been set to “Operation switched off” by the adjustment function.	• Fault in ETACS-ECU • Fault in keyless entry transmitter • Fault in electric window main switch

Keyless entry system working normally?
NO → To Inspection procedure E-1 Keyless entry system not working at all (p.54B-50)
YES ↓

Has electric window and sunroof operation in the multi-mode keyless entry system been set to “Operation switched off” by the adjustment function?
NO → Use adjustment function to set the electric window and sunroof operation in the multi-mode keyless entry system to “Operation switched on”.
YES ↓

SWS monitor ECU check
• Ignition switch: OFF
• Multi-mode operation performed using keyless entry transmitter
(1) ETACS-ECU
(2) Electric window module
OK: “OK” is displayed for all

NG (1) → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)
NG (2) → To Inspection procedure A-5 No communication with electric window main switch (electric window module) (p.54B-30)
OK ↓

SWS monitor keyless entry reception check
Check the status of the keyless entry transmitter
• Keyless entry transmitter
Lock switch: Long press

MUT display	Normal state
Lock	❍
Lock long press	❍

• Keyless entry transmitter
Unlock switch: Long press

MUT display	Normal state
Unlock	❍
Unlock long press	❍

OK: All display normal state

NG → To Inspection procedure R-17 Various switch signals of keyless entry transmitter not input (p.54B-109)
OK ↓

SWS monitor service data
(Communications data) ETACS-ECU
• Ignition switch: OFF
• Multi-mode operation performed using keyless entry transmitter

Item No.	Item Name	Normal state
34	Multi-mode keyless	Multi-close or multi-open or multi-stop

OK: Displays normal state for each operation

NG → Replace the ETACS-ECU
OK ↓

Confirm the trouble symptoms
NG → Replace the electric window main switch
OK ↓

Transient problem

Inspection procedure E-5

Electric windows not working correctly with multi-mode keyless entry function	**Probable Cause**
If the electric windows are working correctly in normal operation, then there is probably a fault in the ETACS-ECU.	• Fault in ETACS-ECU • Fault in electric window main switch

Is the vehicle fitted with a sunroof?
- NO → To Inspection procedure E-4 Keyless entry system not working at all (p.54B-53)
- YES ↓

Are electric windows working normally?
- NO → To Inspection procedure D-1 None of electric windows working
- YES ↓

SWS monitor ECU check
- Ignition switch: OFF
- Multi-mode operation performed using keyless entry transmitter

(1) ETACS-ECU
(2) Electric window module
OK: "OK" is displayed for all

- NG (1) → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)
- NG (2) → To Inspection procedure A-5 No communication with electric window main switch (electric window module) (p.54B-30)
- OK ↓

SWS monitor service data
(Diagnosis by Function) Multi-mode keyless entry Multi-close
- Ignition switch: OFF
- Multi-mode operation performed using keyless entry transmitter

Item No.	Item Name	Normal state
34	Multi-mode keyless	Multi-close

OK: Displays normal state for each operation

- NG → Replace the ETACS-ECU
- OK ↓

SWS monitor service data
(Communications data) Door-to-door communications
- ∑ Ignition switch: OFF
- ∑ Multi-mode operation performed using keyless entry transmitter

Item No.	Item Name	Normal state
C2	Front passenger AUTO	ON *
C62	Rear RH AUTO	ON *
CA	Rear LH AUTO	ON*

OK: All display normal state

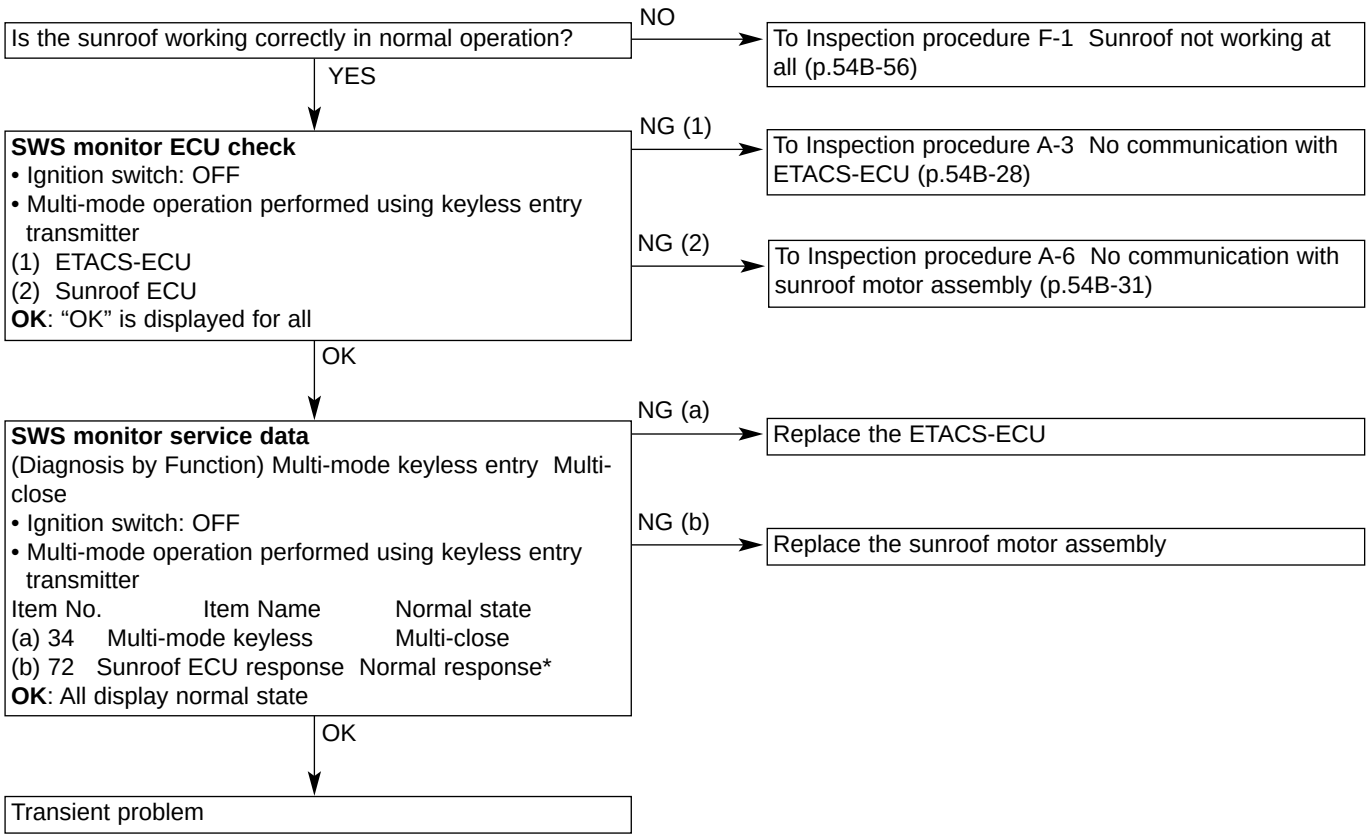
- NG → Replace the electric window main switch
- OK ↓

Transient problem

Note:
- When performing the SWS monitor ECU check, after operating the transmitter, the analysis for the electric window main switch (electric window module) will display "¸" for approximately 1 minute, and then change to "¥". However, the ETACS-ECU will only display "¸".
- *: When a close operation is performed using the multi-mode keyless entry function, the display will change from "OFF" to the normal state.

Inspection procedure E-6

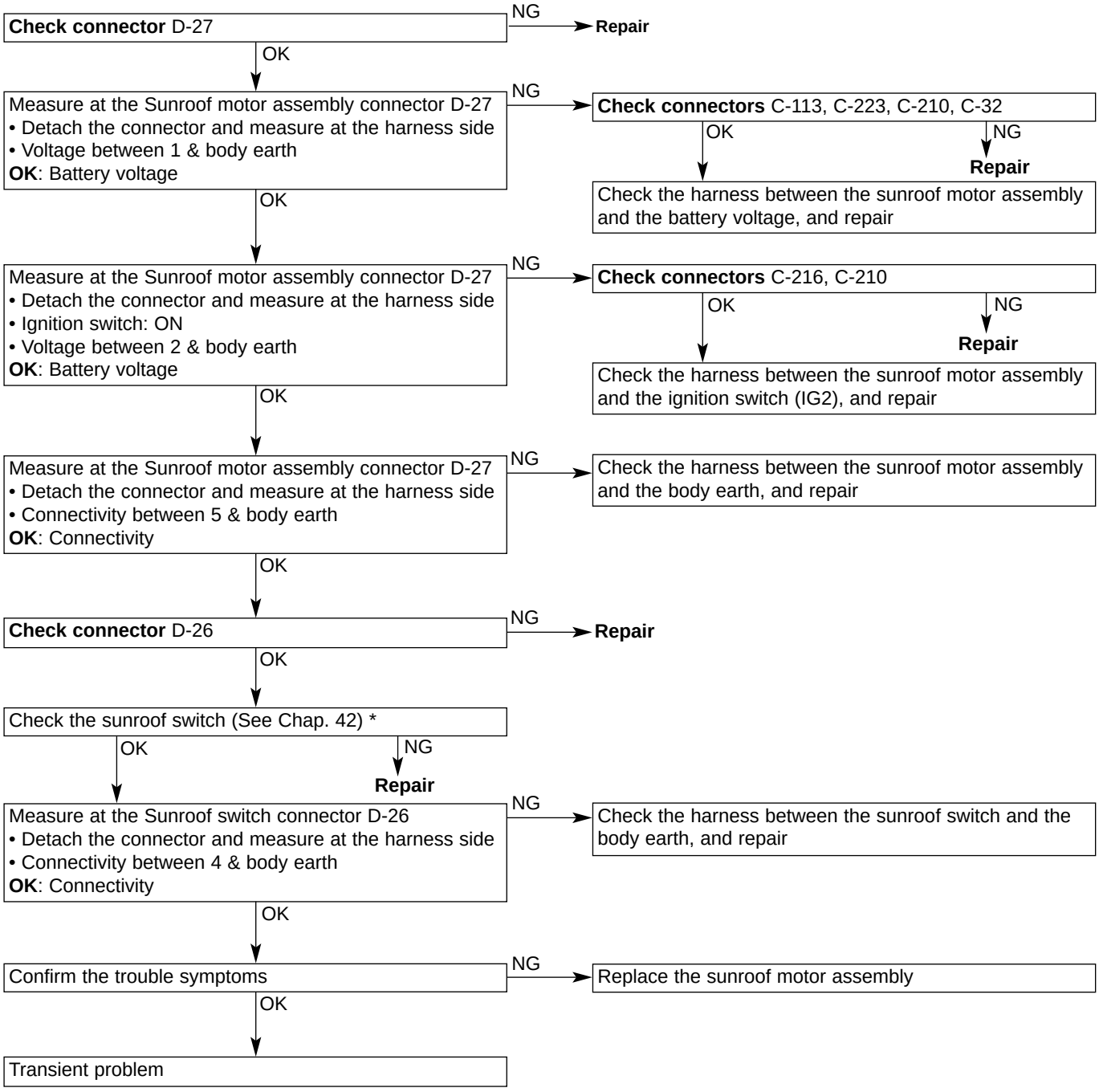
Sunroof close operation not working correctly with multi-mode keyless entry function	Probable Cause
If the sunroof is working correctly in normal operation, then there is probably a fault in the ETACS-ECU.	• Fault in ETACS-ECU • Fault in sunroof motor assembly



Note:
*: About 30 seconds after the end of the multi-mode operation, the display will change from "normal response" to "sleep response".

Inspection Procedure F-1

Sunroof not working at all	Probable Cause
There is probably a fault in the sunroof switch, a problem in the sunroof motor assembly power circuit, or a fault in the sunroof motor assembly.	• Fault in sunroof switch • Fault in sunroof motor assembly • Fault in harness or connectors



Note:
*: See '00-5 Lancer Cedia Servicing Manual (No. 1036K00)

Inspection procedure F-2

Sunroof timer function not working	Probable Cause
This function is operated by determining the ignition switch (IG1) signal from the ignition switch (IG2) circuit of the sunroof motor assembly and the ETACS-ECU.	• Fault in sunroof motor assembly • Fault in ETACS-ECU • Fault in harness or connectors

SWS monitor ECU check
• Ignition switch: OFF
(1) ETACS-ECU
(2) Sunroof ECU
OK: "OK" is displayed for all

NG (1) → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)

NG (2) → To Inspection procedure A-6 No communication with sunroof motor assembly (p.54B-31)

OK ↓

SWS monitor service data
(Diagnosis by Function) Sunroof: Sunroof operation
• Ignition switch: ON ‡ OFF
• P/W lock SW: OFF

Item No.	Item Name	Normal state
(a) 30	Ignition SW IG1	OFF
(b) 72	Sunroof ECU response	Normal response

OK: All display normal state

NG (a) → To Inspection procedure R-2 Ignition switch (IG1) signal not input (p.54B-96)

NG (b) → Replace the sunroof motor assembly

OK ↓

Confirm the trouble symptoms

NG → Replace the sunroof motor assembly

OK ↓

Transient problem

Note
When performing the SWS monitor service data check, the normal analysis value for Item No.72 Sunroof ECU response will show "Normal response" for about 30 seconds, before changing to "Sleep response". The sunroof timer period can be extended by means of a delay operation. (See '00-5 Lancer Cedia Servicing Manual (No. 1036K00))

Inspection procedure F-3

Particular sunroof functions not working	Probable Cause
If particular sunroof functions cannot be operated, then there is probably a fault in the sunroof motor assembly, or the sunroof switch.	• Fault in sunroof motor assembly • Fault in sunroof switch

SWS monitor service data
(Diagnosis by Function) Sunroof: Sunroof operation
• Sunroof switch: Particular

Item No.	Item Name	Normal value
72	Sunroof ECU response	Input check

OK: Displays normal value at appropriate switch position

NG → Replace the sunroof switch

OK ↓

Confirm the trouble symptoms

NG → Replace the sunroof motor assembly

OK ↓

Transient problem

Inspection procedure F-4

Sunroof trap prevention function not working correctly	Probable Cause
There is probably a fault in the rotation detector sensor of the sunroof motor assembly.	• Fault in sunroof motor assembly

Replace the sunroof motor assembly

Inspection procedure G-1

Windscreen wipers not working at all	Probable Cause
There is probably a fault in the windscreen wipers, a fault in the column ECU or a fault in the front ECU. If the SWS monitor ECU check returns an NG result, then the wiper backup circuit should also be checked, and repaired, if necessary.	• Fault in column switch • Fault in front ECU • Fault in harness or connectors

SWS monitor ECU check
• Ignition switch: OFF
(1) Column switch
(2) Front ECU
OK: "OK" is displayed for all

NG (1) → To Inspection procedure A-2 No communication with column switch (column ECU) (p.54B-27)

NG (2) → To Inspection procedure A-4 No communication with front ECU (p.54B-29)

OK ↓

SWS monitor service data
(Diagnosis by Function) Windscreen wipers: INT
• Ignition switch: ACC
• Windscreen wiper switch: INT

Item No.	Item Name	Normal value
(a) 05	INT wiper SW	ON
(b) 70	Front ECU response	Normal response or high beam response

OK: All display normal value

NG (a) → Replace the column ECU

NG (b) → Replace the front ECU

OK ↓

Check connector A-13X

NG → **Repair**

OK ↓

Measure at Front ECU connector A-13X
• Detach the connector and measure at the relay box side
• Ignition switch: ACC
• Voltage between 24 & body earth
OK: Battery voltage

NG → **Check connectors** C-21, C-209, C-210

OK → Check the harness between the front ECU and the ignition switch (ACC)

NG → **Repair**

OK ↓

Check connector B-12

NG → **Repair**

OK ↓

Check the windscreen wiper motor (See Chap. 51*)

NG → **Replace**

OK ↓

Measure at Windscreen wiper motor connector B-12
• Detach the connector and measure at the harness side
• Connectivity between 5 & body earth
OK: Connectivity

NG → Check the harness between windscreen wiper motor and the body earth

OK ↓

Check connector C-34

NG → **Repair**

OK ↓

Confirm the trouble symptoms

NG → Replace the front ECU

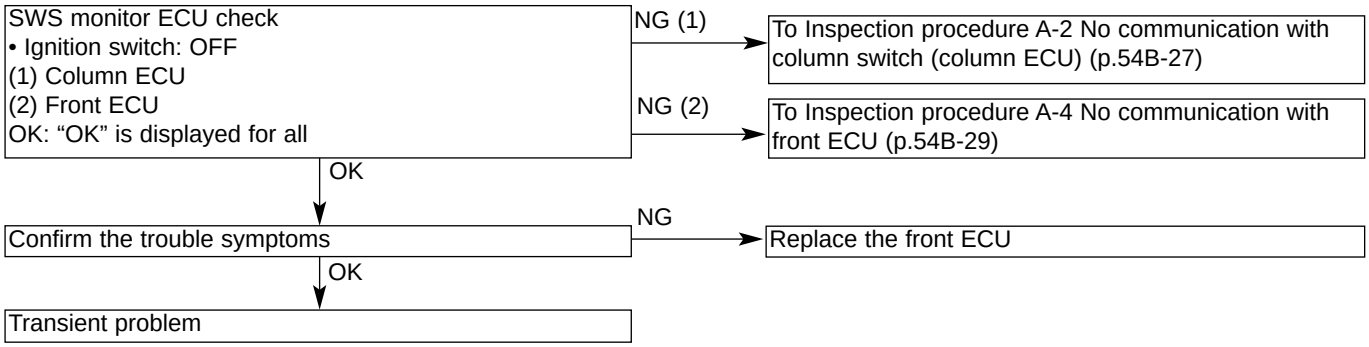
OK ↓

Transient problem

Note:
*: See '00-5 Lancer Cedia Servicing Manual (No. 1036K00)

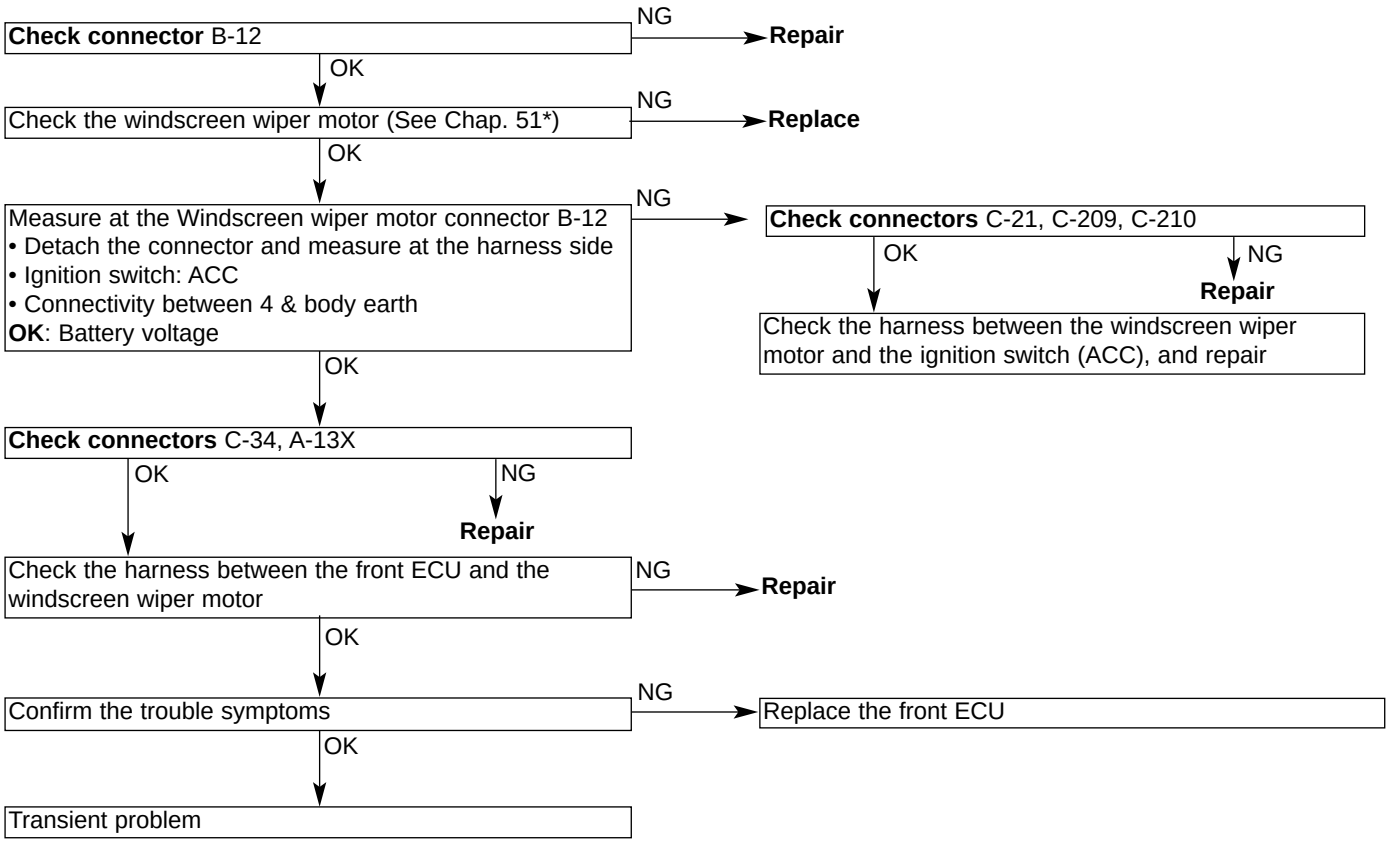
Inspection procedure G-2

Windscreen wipers do not work at INT, washer or mist positions, and operate at low speed in both Lo & Hi positions.	**Probable Cause**
The failsafe has probably engaged, due to a fault in the SWS communications line. If the ignition switch ACC signal is not input, due to a disconnection, etc., then a failsafe status is assumed at the ignition switch ACC position.	• Fault in column switch • Fault in front ECU • Fault in ETACS-ECU • Fault in harness or connectors



Inspection procedure G-3

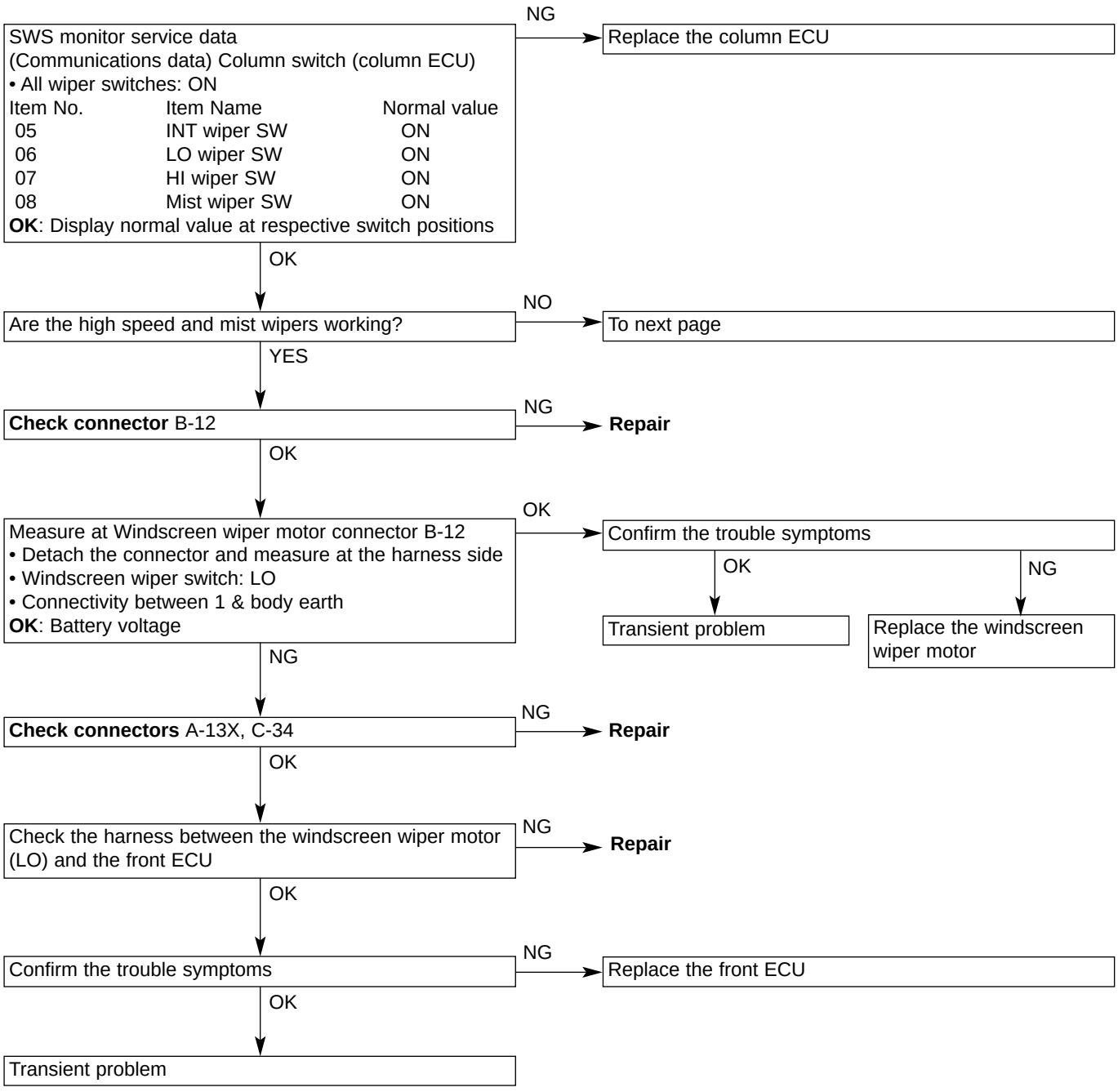
Windscreen wipers do not stop in correct position	**Probable Cause**
There is probably a fault in the windscreen wiper motor or a fault in the front ECU	• Fault in windscreen wiper motor • Fault in front ECU • Fault in harness or connectors

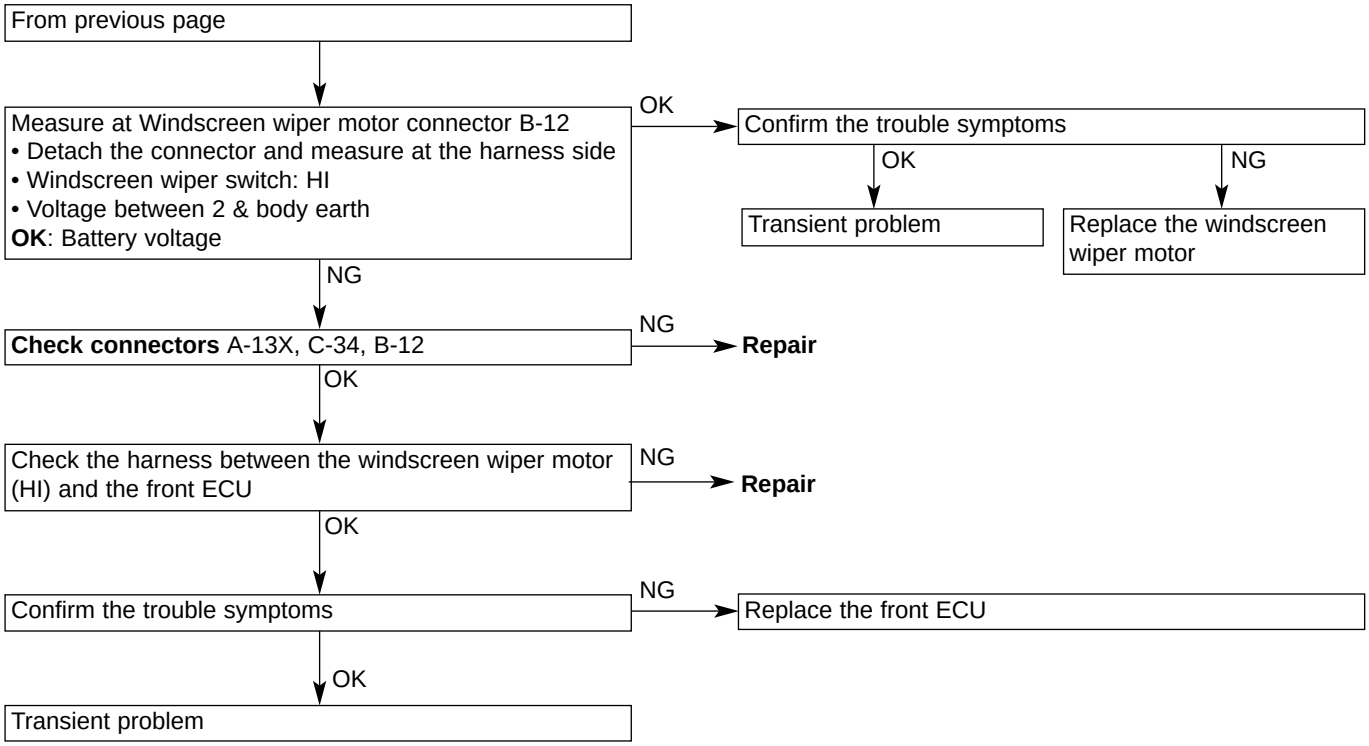


Note:
*: See '00-5 Lancer Cedia Servicing Manual (No. 1036K00)

Inspection procedure G-4

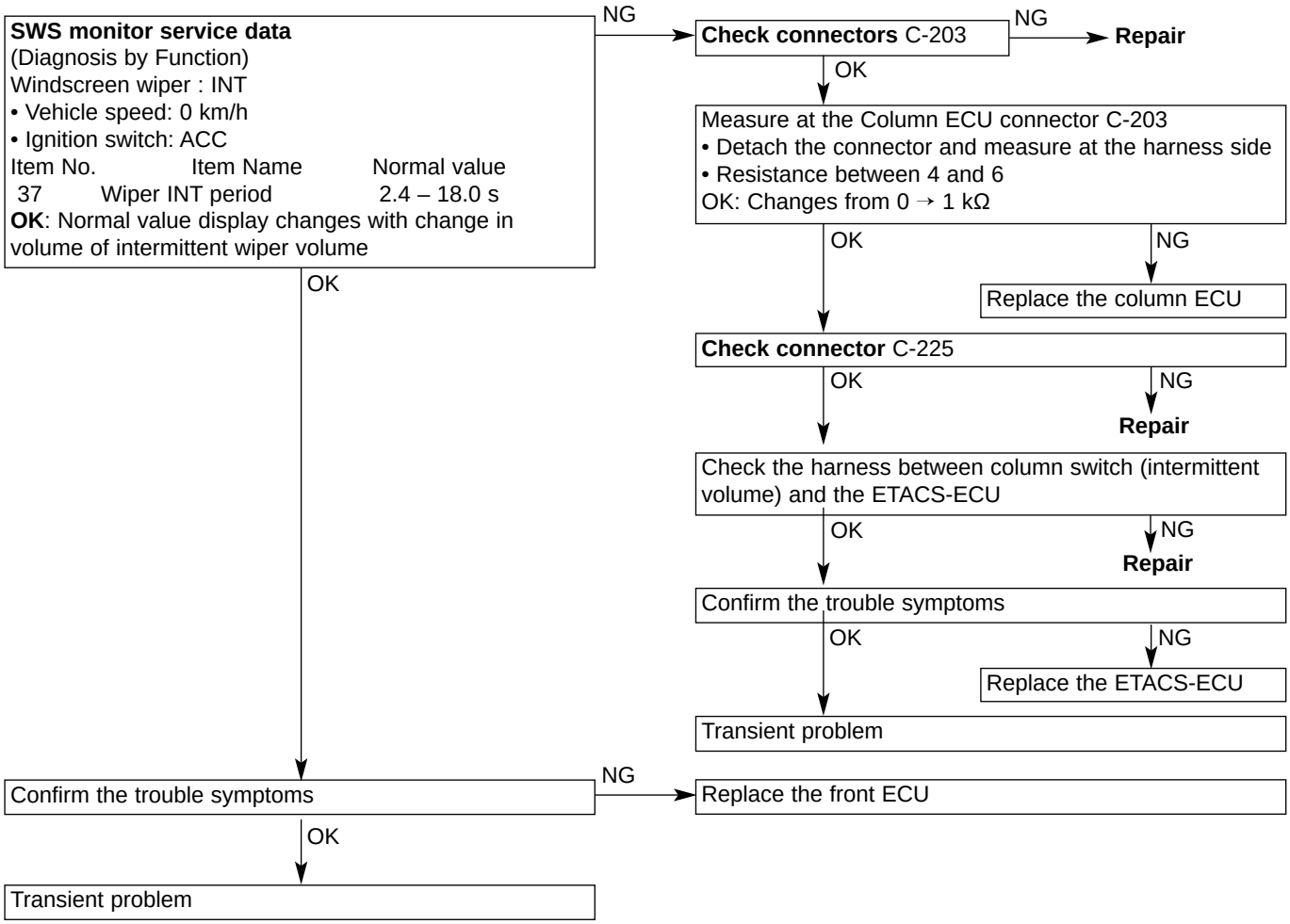
Windscreen wipers cannot be operated normally	**Probable Cause**
There is probably a fault in the windscreen wiper motor, a fault in the column ECU, or a fault in the front ECU	• Fault in column switch • Fault in windscreen wiper motor • Fault in front ECU • Fault in harness or connectors





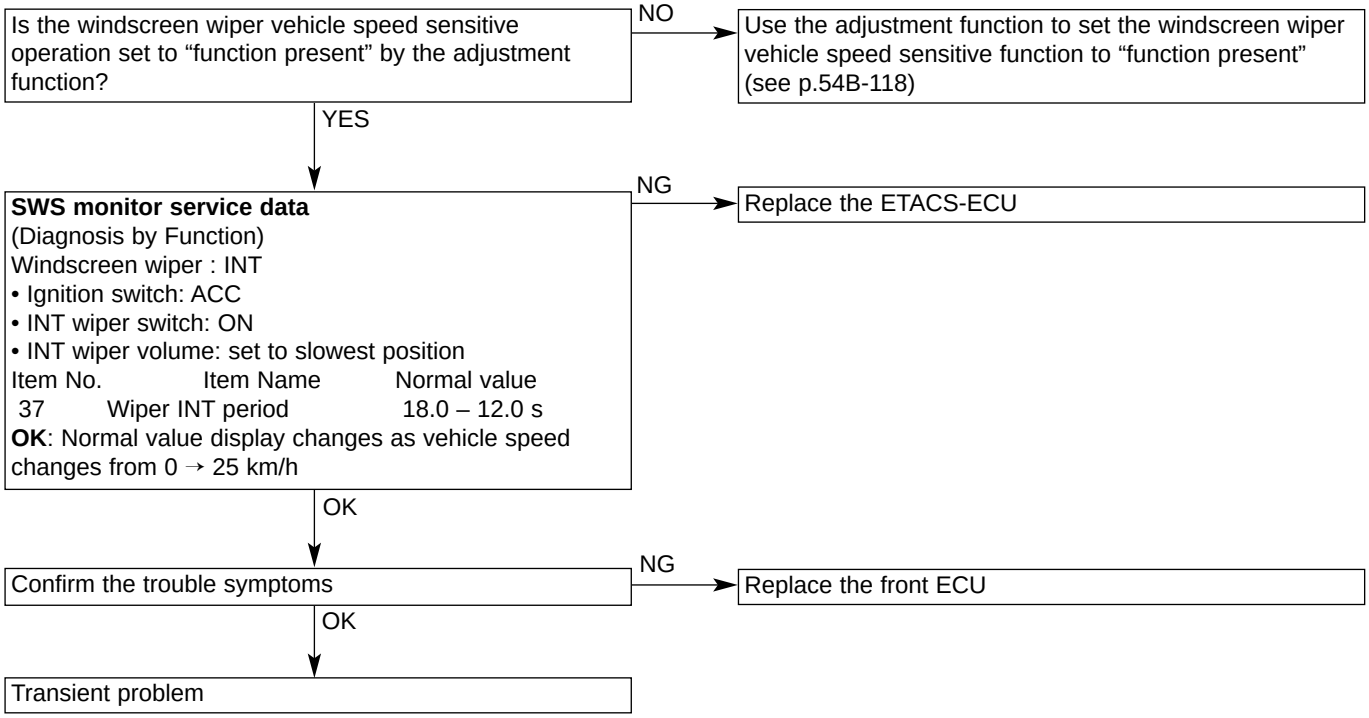
Inspection procedure G-5

Intermittent time interval of windscreen wipers does not change with vehicle speed or operation of intermittent windscreen wiper volume	**Probable Cause**
There is probably a fault in the front ECU or the ETACS-ECU.	• Fault in front ECU • Fault in ETACS-ECU • Fault in harness or connectors



Inspection procedure G-6

Intermittent time interval of windscreen wipers does not change with vehicle speed	**Probable Cause**
There is probably a fault in the front ECU or the ETACS-ECU.	• Fault in front ECU • Fault in ETACS-ECU • Fault in harness or connectors



Inspection procedure G-7

Windscreen washer not working correctly	Probable Cause
There is probably a fault in the windscreen washer motor, a fault in the column ECU, or a fault in the front ECU	• Fault in column switch • Fault in front ECU • Fault in windscreen washer motor • Fault in harness or connectors

Are the windscreen wipers working correctly?
NO → To Inspection procedure G-1 Windscreen wipers not working at all (see p.54B-58)
YES ↓

SWS monitor ECU check
• Ignition switch: OFF
(1) Column ECU
(2) Front ECU
OK: "OK" is displayed for all
NG (1) → To Inspection procedure A-2 No communication with column switch (column ECU) (p.54B-27)
NG (2) → To Inspection procedure A-4 No communication with front ECU (p.54B-29)
OK ↓

SWS monitor service data
(Diagnosis by Function)
Windscreen wiper: Washer
• Windscreen washer switch: ON
• Ignition switch: ACC

Item No.	Item Name	Normal value
(a) 09	Front washer SW	ON
(b) 70	Front ECU response	Normal response or high beam response

OK: Normal values displayed for all
NG (a) → Replace the column switch
NG (b) → Replace the front ECU
OK ↓

Check connector F-19
NG → **Repair**
OK ↓

Check the windscreen washer motor (See Chap. 51*)
NG → **Replace**
OK ↓

Measure at Windscreen washer motor connector F-19
• Detach the connector and measure on the harness side
• Connectivity between 1 & body earth
OK: Connectivity
NG → Check the harness between the windscreen washer motor and the body earth
OK ↓

Check connectors A-13X, C-31, C-116
OK ↓
NG → **Repair**

Check the harness between the windscreen washer motor and the front ECU
NG → **Repair**
OK ↓

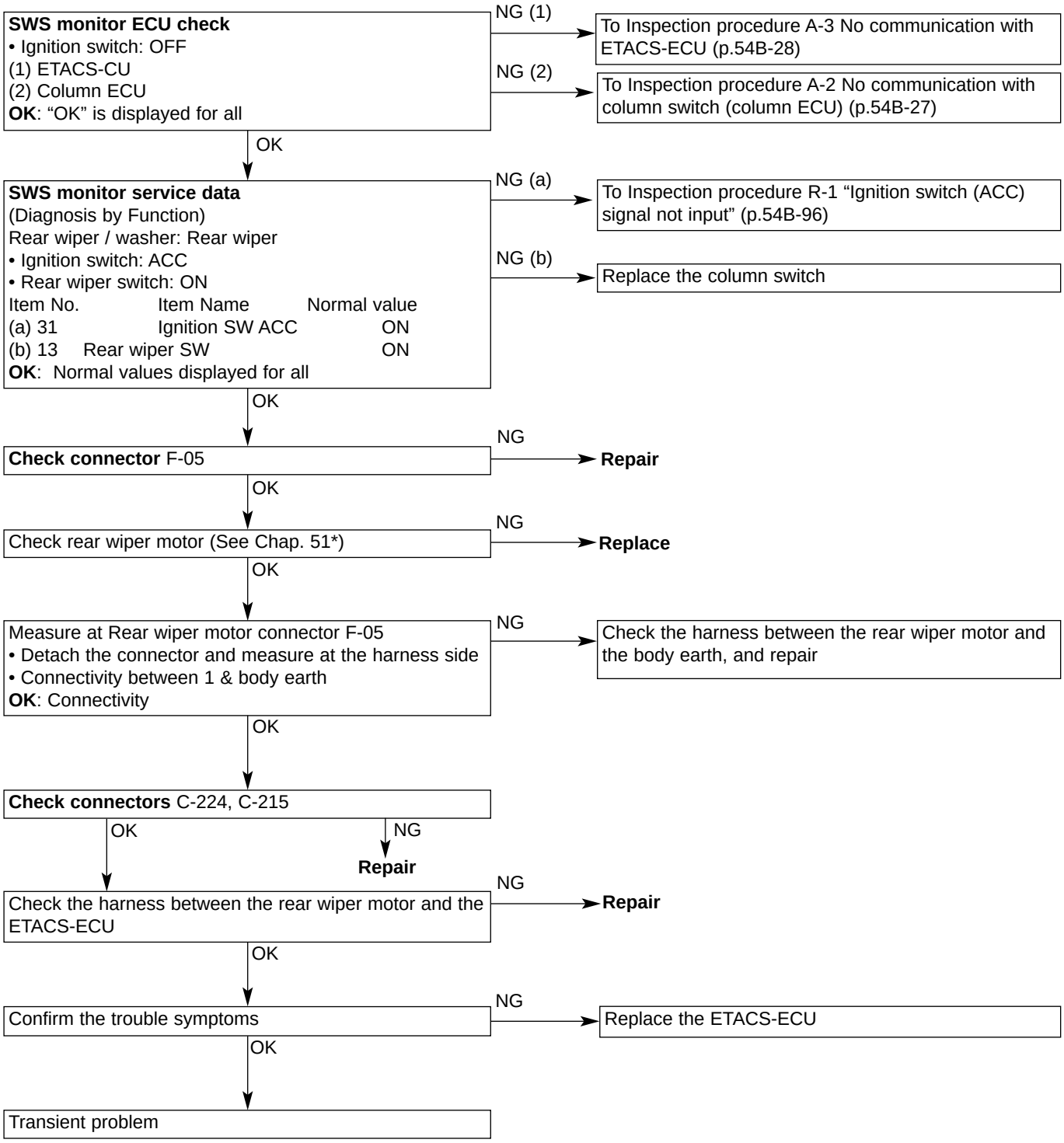
Confirm the trouble symptoms
NG → Replace the front ECU
OK ↓

Transient problem

Note
*: See '01-1 Lancer Evolution VII Servicing Manual (No. 1036K02)

Inspection procedure H-1

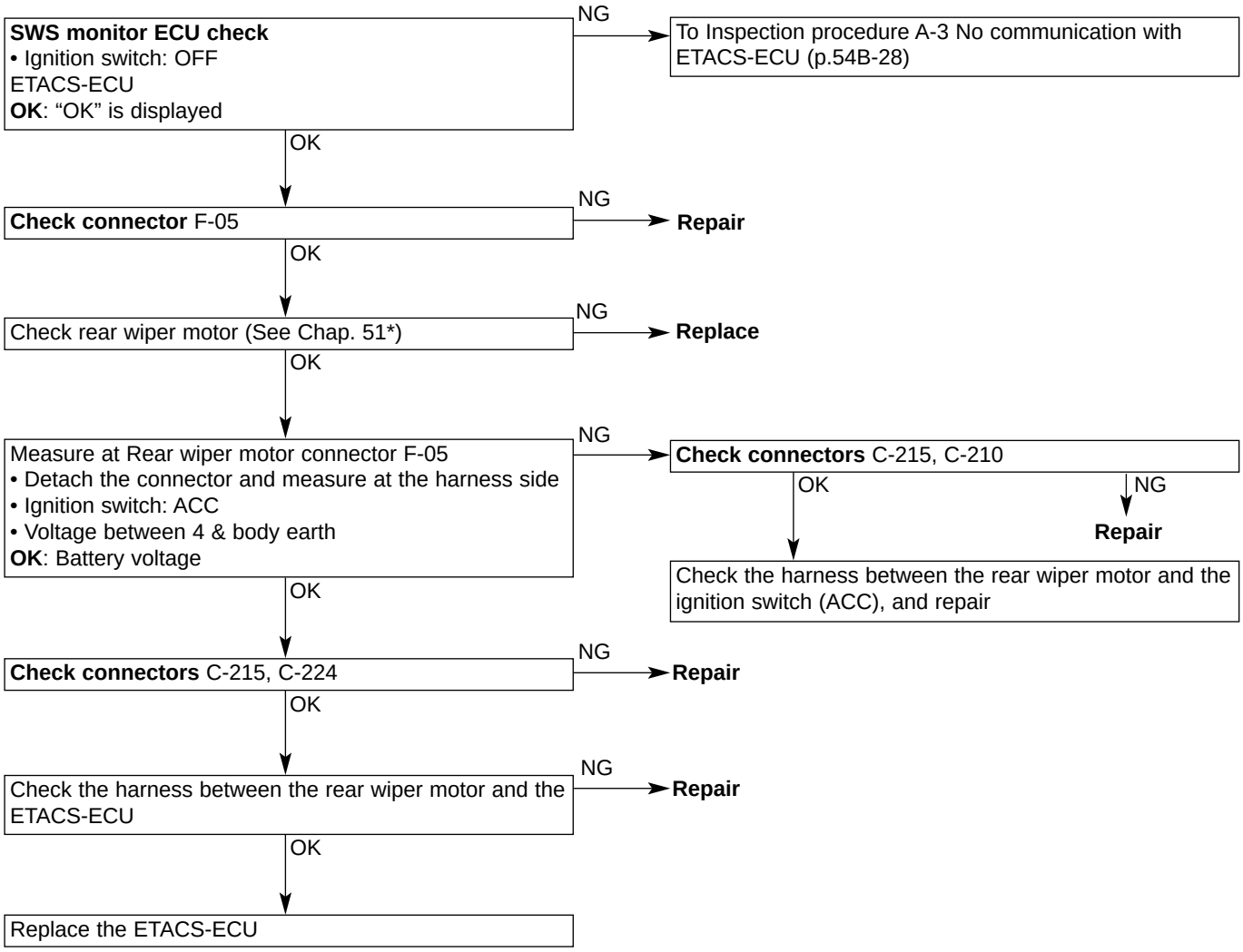
Rear wiper not working at all	Probable Cause
The rear wiper is operated by determining the following input signals in the ETACS-ECU. • Ignition switch (ACC) • Rear wiper switch If the rear wiper does not work, then there is probably a malfunction in the input circuit system for these signals, or a fault in the rear wiper motor, or a fault in the ETACS-ECU.	• Fault in rear wiper motor • Fault in column switch • Fault in ETACS-ECU • Fault in harness or connectors



Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

Inspection procedure H-2

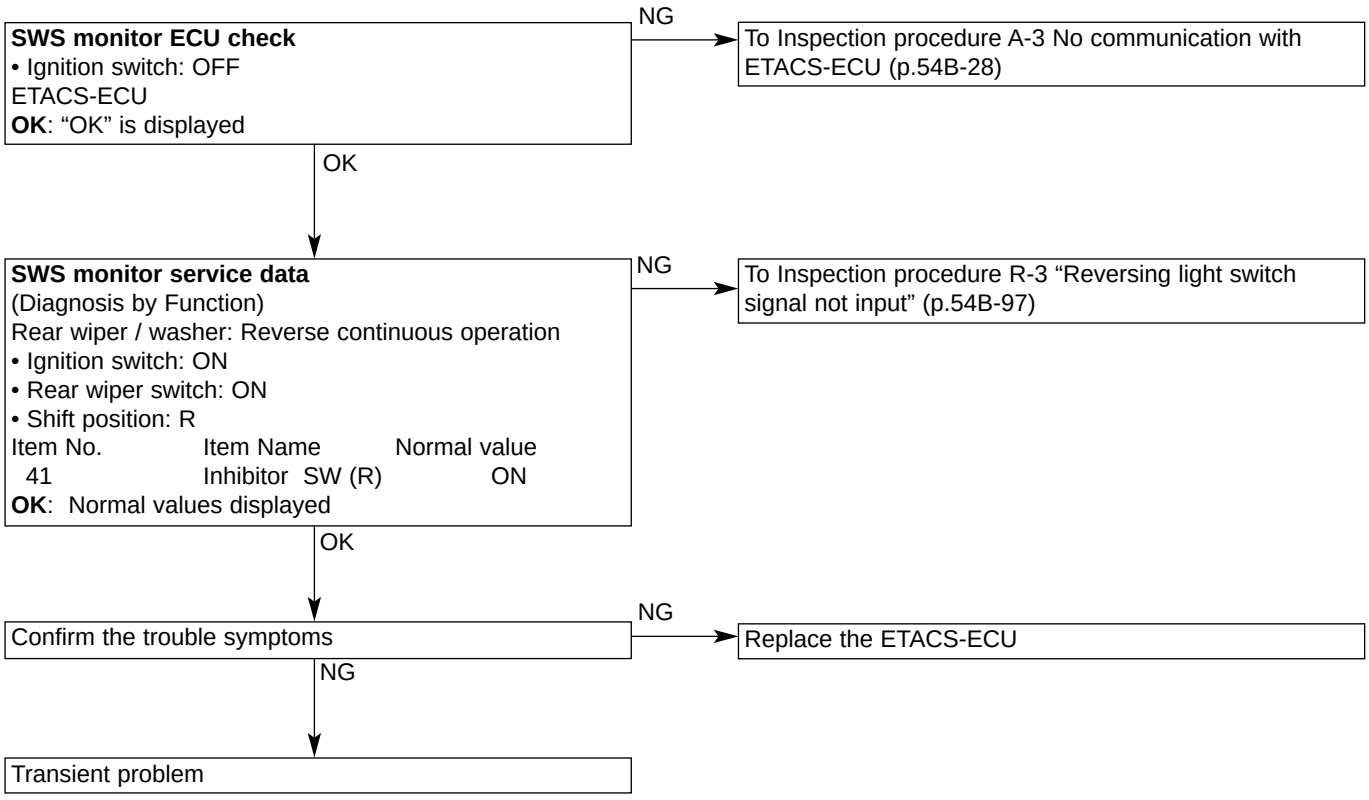
Rear wiper does not stop in correct position	Probable Cause
There is probably a fault in the rear wiper motor or a fault in the ETACS-ECU	• Fault in rear wiper motor • Fault in ETACS-ECU • Fault in harness or connectors



Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

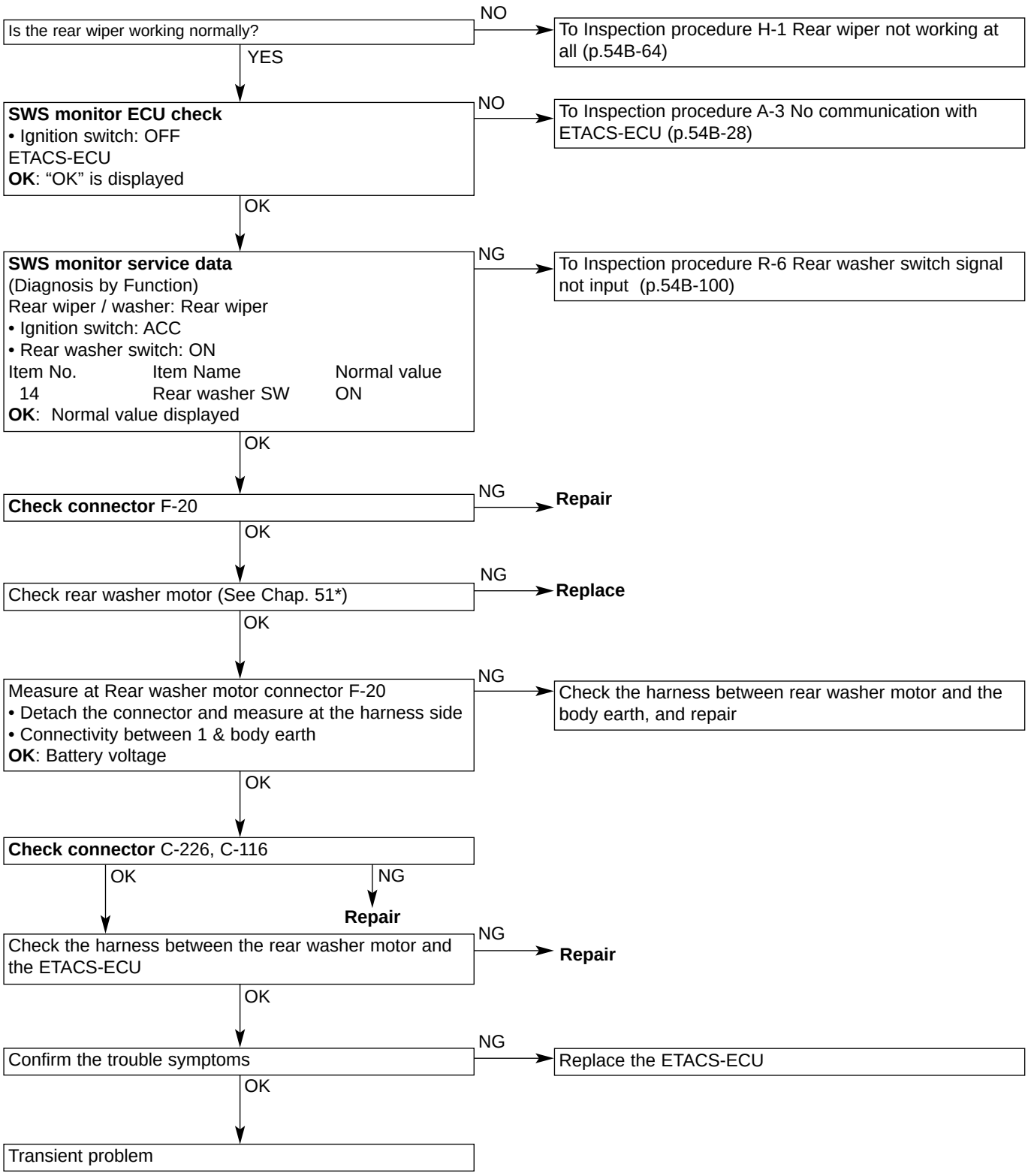
Inspection procedure H-3

Rear wiper does not operate continuously, even when shift is set to R position	**Probable Cause**
There is probably a malfunction in the reversing light switch input circuit system, or a fault in the ETACS-ECU.	• Fault in reverse light switch • Fault in ETACS-ECU • Fault in harness or connectors



Inspection procedure H-4

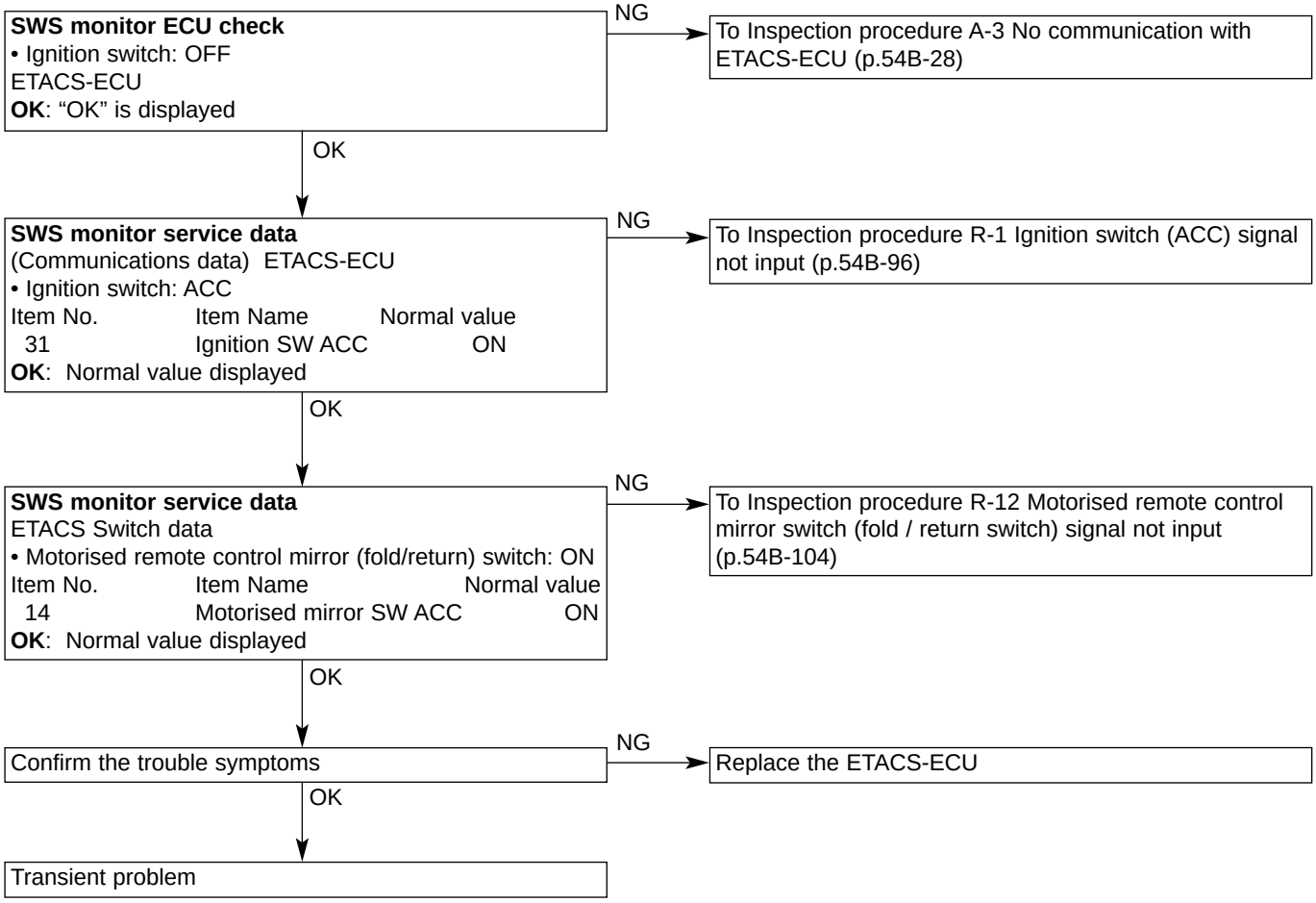
Rear washer does not work	Probable Cause
There is probably an abnormality in the rear washer switch input circuit system, a fault in the rear washer motor, or a fault in the ETACS-ECU.	• Fault in rear washer motor • Fault in column switch • Fault in ETACS-ECU • Fault in harness or connectors



Note
*: See '01-1 Lancer Evolution VII Servicing Manual (No. 1036K02)

Inspection procedure I-1

Motorised retractable door mirrors not working at all	Probable Cause
The motorised retractable door mirrors are operated by determining the following input signals in the ETACS-ECU. • Ignition switch (ACC) • Motorised remote control mirror switch (fold/return switch) If the motorised retractable door mirrors do not operate, then there is probably a malfunction in the input circuit system for the above signals, or a fault in the door mirrors, or a fault in the ETACS-ECU.	• Fault in motorised remote control mirror switch • Fault in mirror assembly • Fault in ETACS-ECU • Fault in harness or connectors



Inspection procedure I-2

Motorised retractable door mirror timer function not working	Probable Cause
If the mirrors can be operated (folded in or out) using the motorised remote control mirror switch (fold / return switch), then there is probably a fault in the ETACS-ECU.	• Fault in ETACS-ECU

Can the mirrors can be operated (folded in or out) using the motorised remote control mirror switch (fold / return switch)?
NO → To Inspection procedure I-1 Motorised retractable door mirrors not working at all (p.54B-68)
YES ↓

SWS monitor ECU check
• Ignition switch: OFF
ETACS-ECU
OK: “OK” is displayed
NG → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)
OK ↓

Confirm the trouble symptoms
NG → Replace the ETACS-ECU
OK ↓

Transient problem

Inspection procedure I-3

Motorised retractable door mirror automatic return function (vehicle speed sensitive opening function) does not work correctly	Probable Cause
This function is operated by determining the following input signals in the ETACS-ECU. • Vehicle speed If the function does not operate correctly, then there is probably a malfunction in the input circuit for this signal, or a fault in the ETACS-ECU. There is also a possibility that the function is set to “Function switched off” by the adjustment function.	• Fault in vehicle speed sensor • Fault in ETACS-ECU • Fault in harness or connectors

Is the automatic return function for the motorised door mirrors set to “Vehicle speed sensitive function ON” by the adjustment function?
NO → Use the adjustment function to set the automatic return function for the motorised door mirrors to “Vehicle speed sensitive function ON” (see p.54B-118)
YES ↓

SWS monitor ECU check
• Ignition switch: ON
ETACS-ECU
OK: “OK” is displayed
NG → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)
OK ↓

SWS monitor service data
ETACS analogue data
• Vehicle speed: changed 0 → 25 km/h

Item No.	Item Name	Normal value
03	Vehicle speed sensor	Shows vehicle speed (changes with vehicle speed)

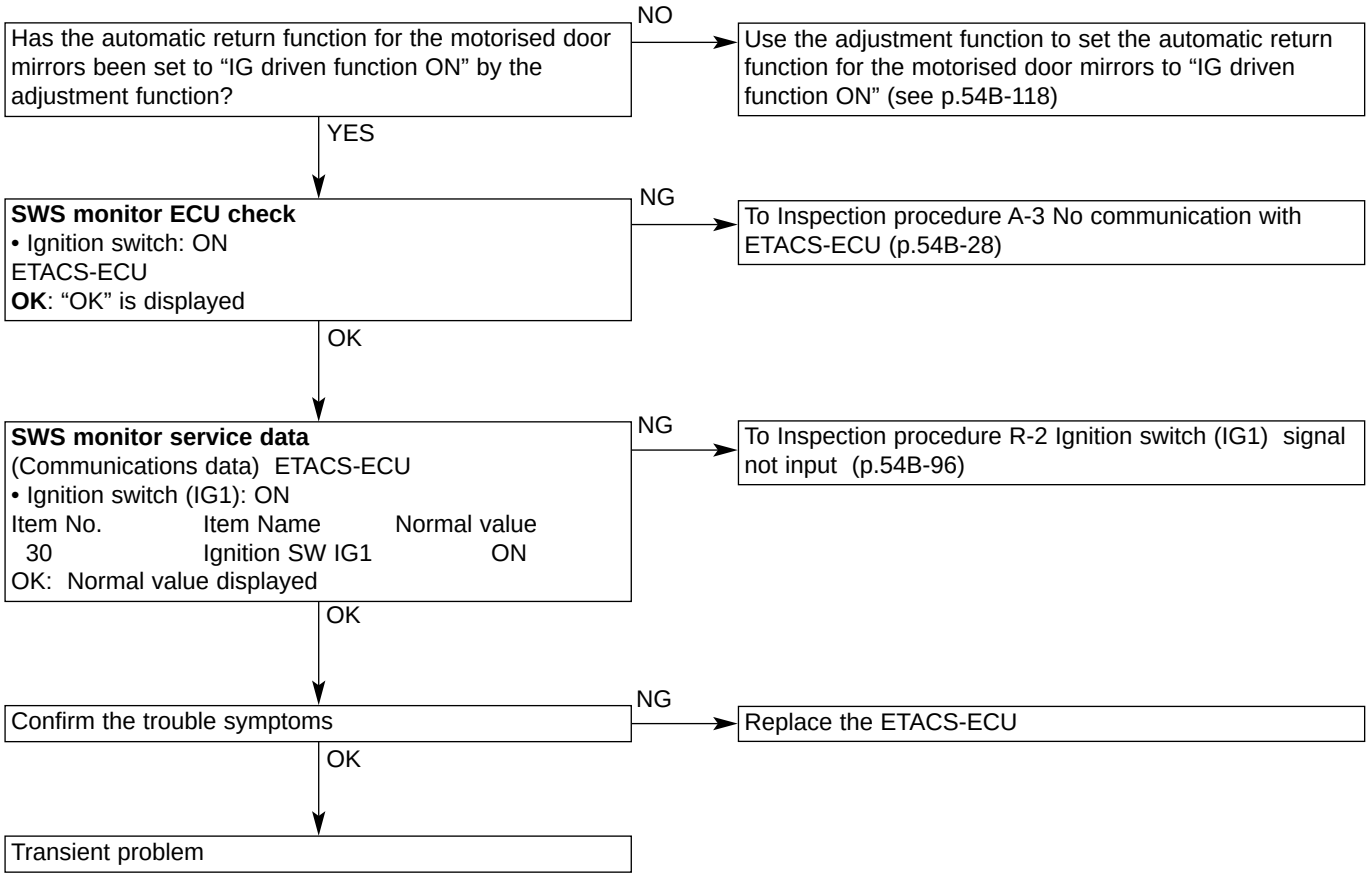
OK: Normal value display changes similarly as vehicle speed changes from 0 → 25 km/h.
NG → To Inspection procedure R-16 Vehicle speed signal not input (p.54B-108)
OK ↓

Confirm the trouble symptoms
NG → Replace the ETACS-ECU
OK ↓

Transient problem

Inspection procedure I-4

Motorised retractable door mirror automatic return function (ignition driven function) does not work correctly	**Probable Cause**
This function is operated by determining the following input signals in the ETACS-ECU. • Ignition switch (IG1) If this function does not operate correctly, then there is probably a malfunction in the input circuit system for this signal, or a fault in the ETACS-ECU. There is also a possibility that the function has been switched off by the adjustment function.	• Fault in ETACS-ECU • Fault in harness or connectors



Inspection procedure I-5

Motorised retractable door mirror automatic return function (keyless driven function) does not work correctly	**Probable Cause**
This function is operated by determining the following input signals in the ETACS-ECU. • Keyless entry transmitter If this function does not operate correctly, then there is probably a malfunction in the input circuit system for this signal, or a fault in the ETACS-ECU. There is also a possibility that the function has been switched off by the adjustment function.	• Fault in keyless entry transmitter • Fault in ETACS-ECU • Fault in harness or connectors

Has the automatic return function for the motorised door mirrors been set to “Keyless driven function ON” by the adjustment function?

NO → Use the adjustment function to set the automatic return function for the motorised door mirrors to “Keyless driven function ON” (see p.54B-118)

YES ↓

SWS monitor ECU check
• Ignition switch: ON
ETACS-ECU
OK: “OK” is displayed

NG → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)

OK ↓

SWS monitor keyless entry reception check
Check using all keyless entry transmitters with which problems were confirmed
• Keyless entry transmitter
Lock switch: ON

MUT display	Normal state
Lock	❍

• Keyless entry transmitter
Unlock switch: Long press

MUT display	Normal state
Unlock	❍

OK: All display normal state

NG → To Inspection procedure R-17 Various switch signals of keyless entry transmitter not input (p.54B-109)

OK ↓

Confirm the trouble symptoms

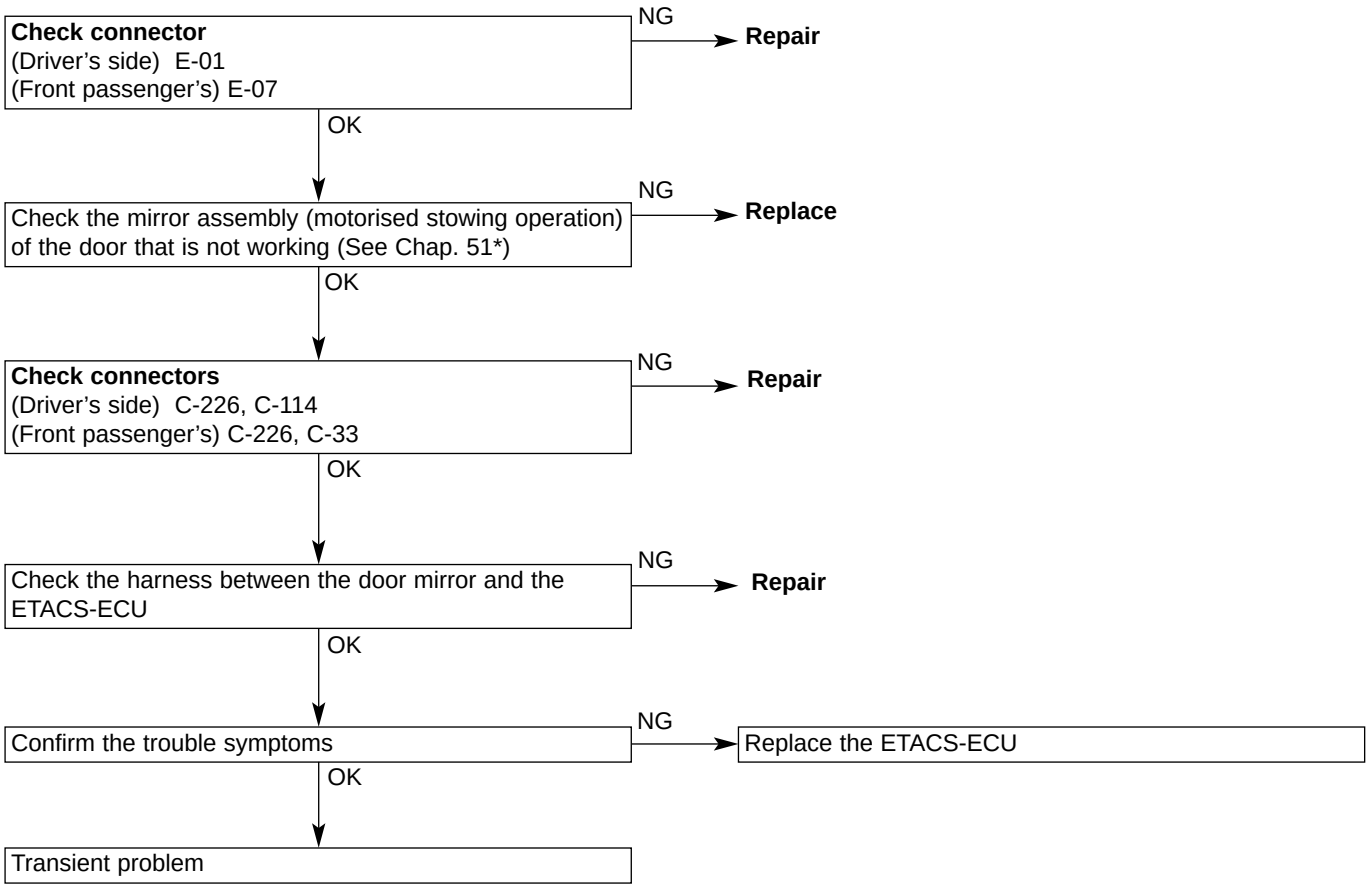
NG → Replace the ETACS-ECU

OK ↓

Transient problem

Inspection procedure I-6

One of the motorised retractable door mirrors is not working.	Probable Cause
The motorised retractable door mirrors are operated by determining the following input signals in the ETACS-ECU. • Ignition switch (ACC) If any of the motorised door mirrors is not working, then there is probably a malfunction in the input circuit system for this signal, a fault in the door mirror, or a fault in the ETACS-ECU.	• Fault in mirror assembly • Fault in ETACS-ECU • Fault in harness or connectors



Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

Inspection procedure J-1

Ignition key cylinder illumination light does not light up and switch off correctly	**Probable Cause**
(Vehicle not fitted with keyless entry) The ignition key cylinder illumination light is switched on by determining the following input signals in the ETACS-ECU. • Ignition switch (IG1) • Key reminder switch • Driver's door switch If it does not work correctly, then there is probably a malfunction in the input circuit system for these signals, a fault in the ignition key cylinder illumination light, or a fault in the ETACS-ECU.	• Fault in key reminder switch • Fault in driver's door switch • Fault in ignition key cylinder illumination light • Fault in ETACS-ECU • Fault in harness or connectors
(Vehicle fitted with keyless entry) The ignition key cylinder illumination light is switched on by determining the following input signals in the ETACS-ECU. In addition, since the interior lights are switched off by the interior light cut-off function, then the input signal for the interior light cut off should also be checked at the same time. • Ignition switch (ACC) • Ignition switch (IG1) • Key reminder switch • Driver's door switch • All door switch • Generic fuse No.17 If it does not work correctly, then there is probably a malfunction in the input circuit systems for these signals, a fault in the ignition key cylinder illumination light, a malfunction in the interior light cut-off, or a fault in the ETACS-ECU.	• Fault in key reminder switch • Fault in driver's door switch • Fault in ignition key cylinder illumination light • Fault in ETACS-ECU • Fault in harness or connectors

(Vehicle not fitted with keyless entry)

SWS monitor ECU check
• Ignition switch: OFF
ETACS-ECU
OK: "OK" is displayed

NG → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)

OK ↓

SWS monitor service data
(Communications data) ETACS-ECU
• Ignition switch: ON
• Driver's door: Open

Item No.	Item Name	Normal value
(a) 30	Ignition SW IG1	ON
(b) 32	Driver's door SW RH	ON

OK: Normal value displayed for all

NG (a) → To Inspection procedure R-2 Ignition switch (IG1) signal not input (p.54B-96)

NG (b) → To Inspection procedure R-4 Driver's door switch signal not input (p.54B-98)

OK ↓

SWS monitor service data
ETACS switch data
• Ignition switch: OFF (key inserted)

Item No.	Item Name	Normal value
03	Key reminder SW	OFF

OK: Normal value displayed for all

NG → To Inspection procedure R-11 Key reminder switch signal not input (p.54B-103)

OK ↓

Check connector C-202

NG → **Repair**

OK ↓

Check at Ignition key cylinder illumination light connector C-202
• Detach the connector and check at the harness side
• Voltage between 2 & body earth
OK: Battery voltage

NG → **Check connectors** C-32, C-110, C-211, C-224, C-225

OK ↓ / NG → **Repair**

Check the harness between the ETACS-ECU and the fusible link (1)

OK ↓ / NG → **Repair**

Confirm the trouble symptoms

OK ↓ → Transient problem

NG → Replace the ETACS-ECU

OK ↓

Check the ignition key cylinder illumination light bulb

OK ↓ / NG → **Replace**

Check connector C-225

OK ↓ / NG → **Repair**

Check the harness between the ETACS-ECU and the ignition key cylinder illumination light

OK ↓ / NG → **Repair**

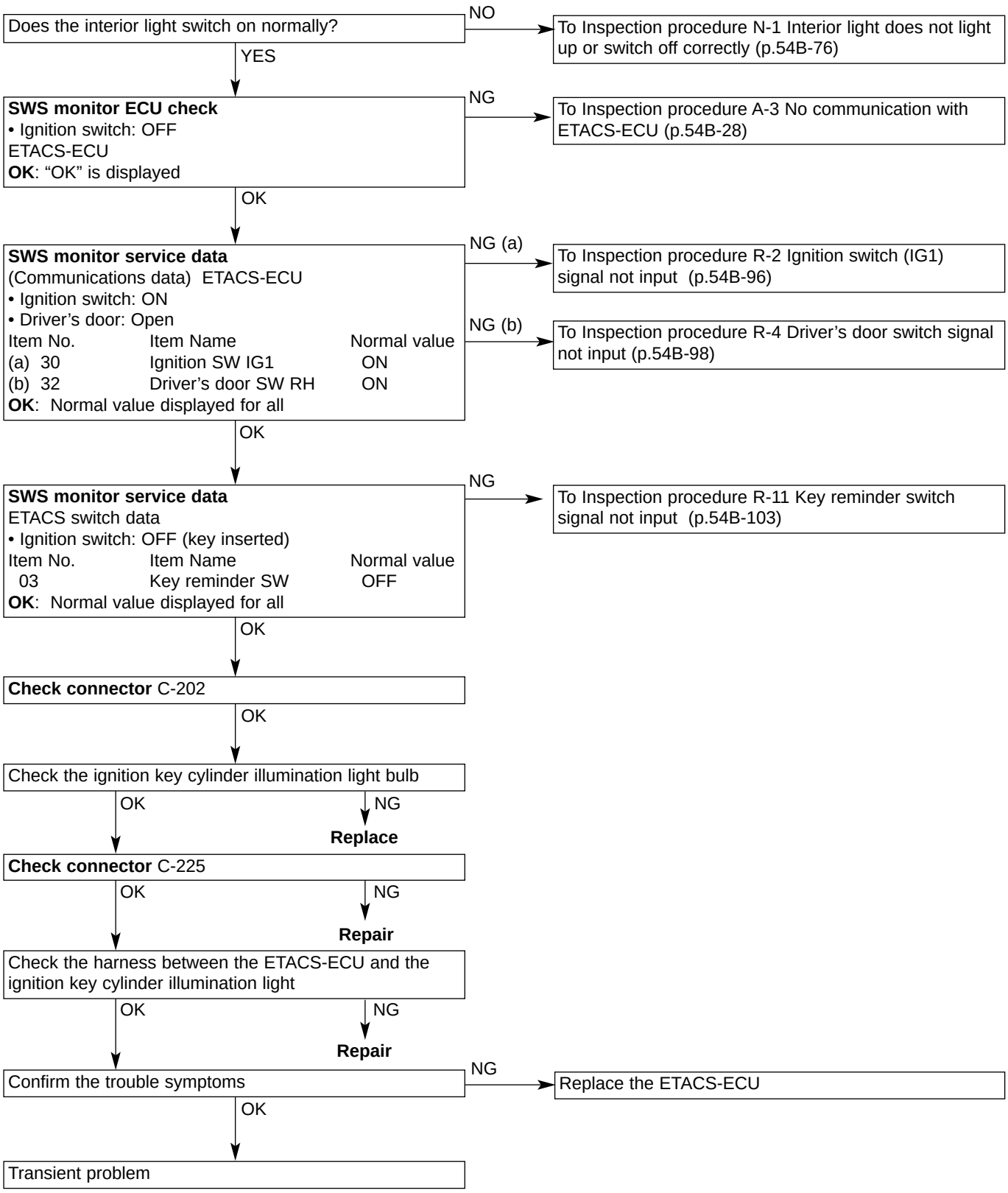
Confirm the trouble symptoms

NG → Replace the ETACS-ECU

OK ↓

Transient problem

(Vehicle fitted with keyless entry)



Inspection procedure K-1

Head lights do not light up when passing switch is on. Low beam lights up (cannot be changed using dimmer switch)	**Probable Cause**
If the low beam turns on, regardless of the position of the headlight switch, then the headlight failsafe function has probably engaged.	• Fault in column switch • Fault in front ECU • Fault in ETACS-ECU • Fault in harness or connectors

SWS monitor ECU check
• Ignition switch: OFF
(1) ETACS-ECU
(2) Column ECU
(3) Front ECU
OK: "OK" is displayed for all

NG (1) → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)
NG (2) → To Inspection procedure A-2 No communication with column switch (column ECU) (p.54B-27)
NG (3) → To Inspection procedure A-4 No communication with front ECU (p.54B-29)

OK ↓

Transient problem

Inspection procedure K-2

Tail lights do not light up correctly	**Probable Cause**
If all of the tail lights do not light up properly, then there is probably a malfunction in the tail light switch input circuit system or a fault in the front ECU.	• Fault in column switch • Fault in front ECU • Fault in harness or connectors

SWS monitor ECU check
• Ignition switch: OFF
(1) Column ECU
(2) Front ECU
OK: "OK" is displayed for all

NG (1) → To Inspection procedure A-2 No communication with column switch (column ECU) (p.54B-27)
NG (2) → To Inspection procedure A-4 No communication with front ECU (p.54B-29)

OK ↓

SWS monitor service data
(Function by Diagnosis) Lighting: Tail
• Ignition switch: ON
• Tail light switch: ON

Item No.	Item Name	Normal value
(a) 01	Tail light SW	ON
(b) 35	HD light auto cut-off	OFF
(c) 70	Front ECU response	Normal response

OK: Normal value displayed for all

NG (a) → To Inspection procedure R-5 Tail light switch signal not input (p.54B-99)
NG (b) → To Inspection procedure K-6 Headlight automatic cut-off function not working correctly (p.54B-80)
NG (c) → Replace the front ECU

OK ↓

Confirm the trouble symptoms

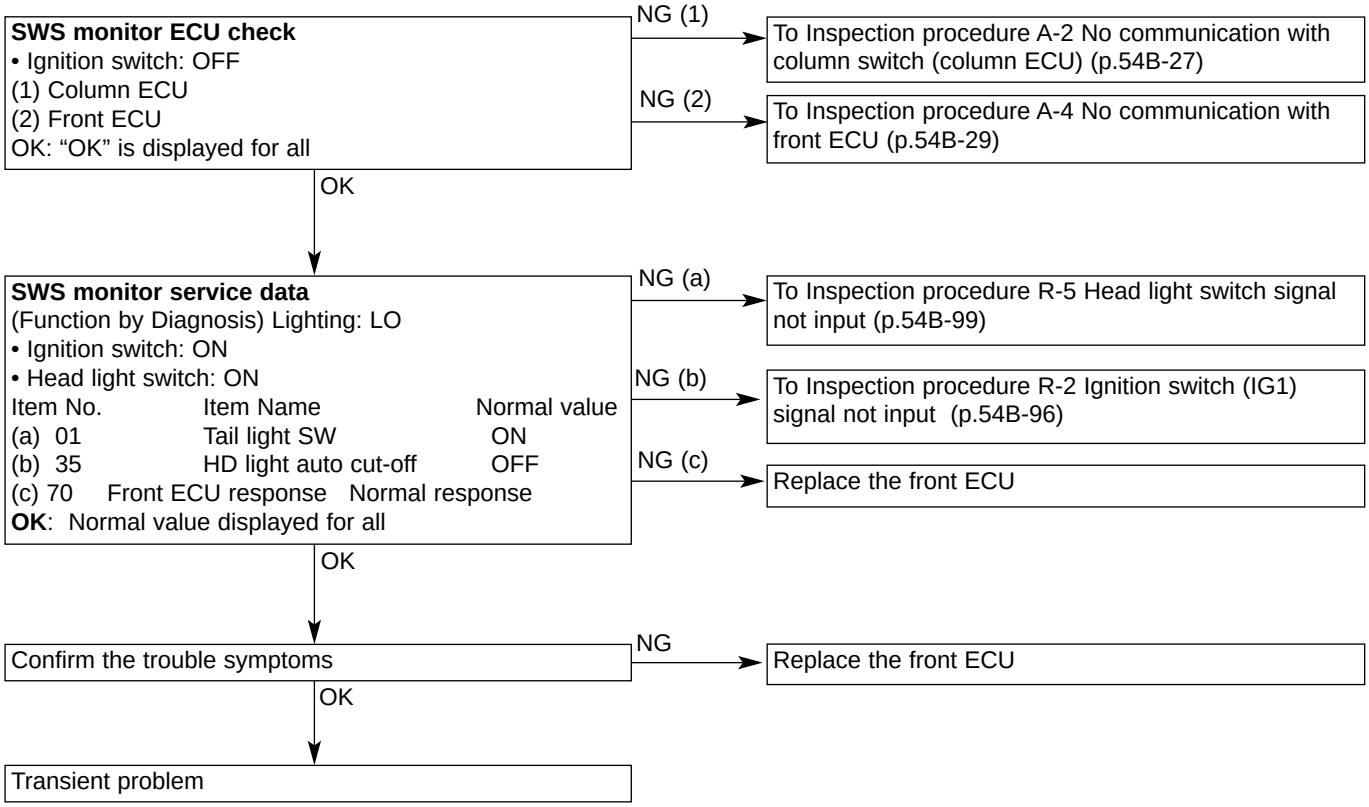
NG → Replace the front ECU

OK ↓

Transient problem

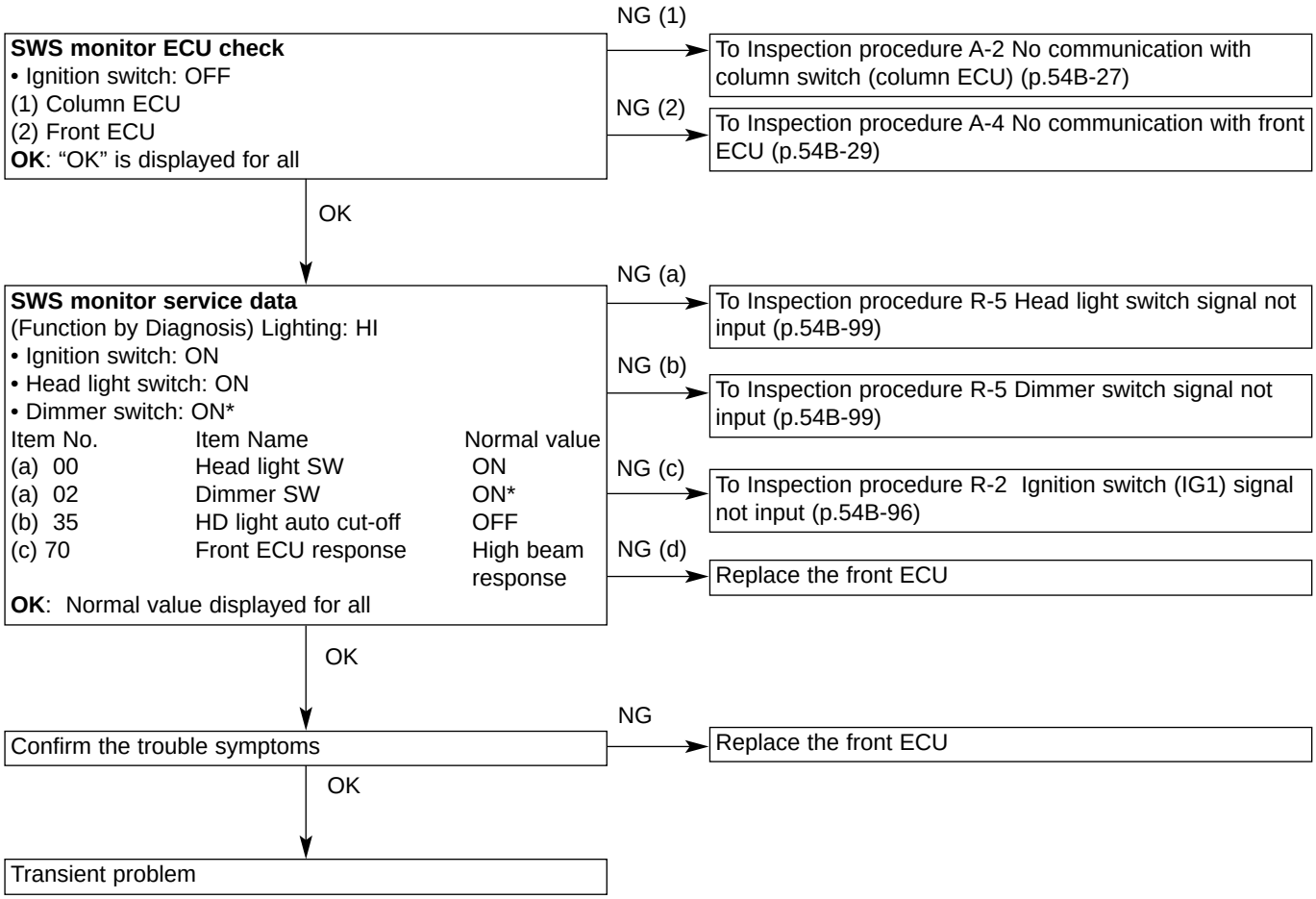
Inspection procedure K-3

Head lights (low beam) do not light up	Probable Cause
If neither of the head lights (low beam) lights up properly, then there is probably a malfunction in the head light switch input circuit system, or a fault in the front ECU. If the SWS monitor ECU check returns an “NG” result, then the headlight backup circuit should also be checked and repaired at the same time. (Column switch No.10 – Front ECU No.25)	• Fault in column switch • Fault in front ECU • Fault in column ECU • Fault in harness or connectors



Inspection procedure K-4

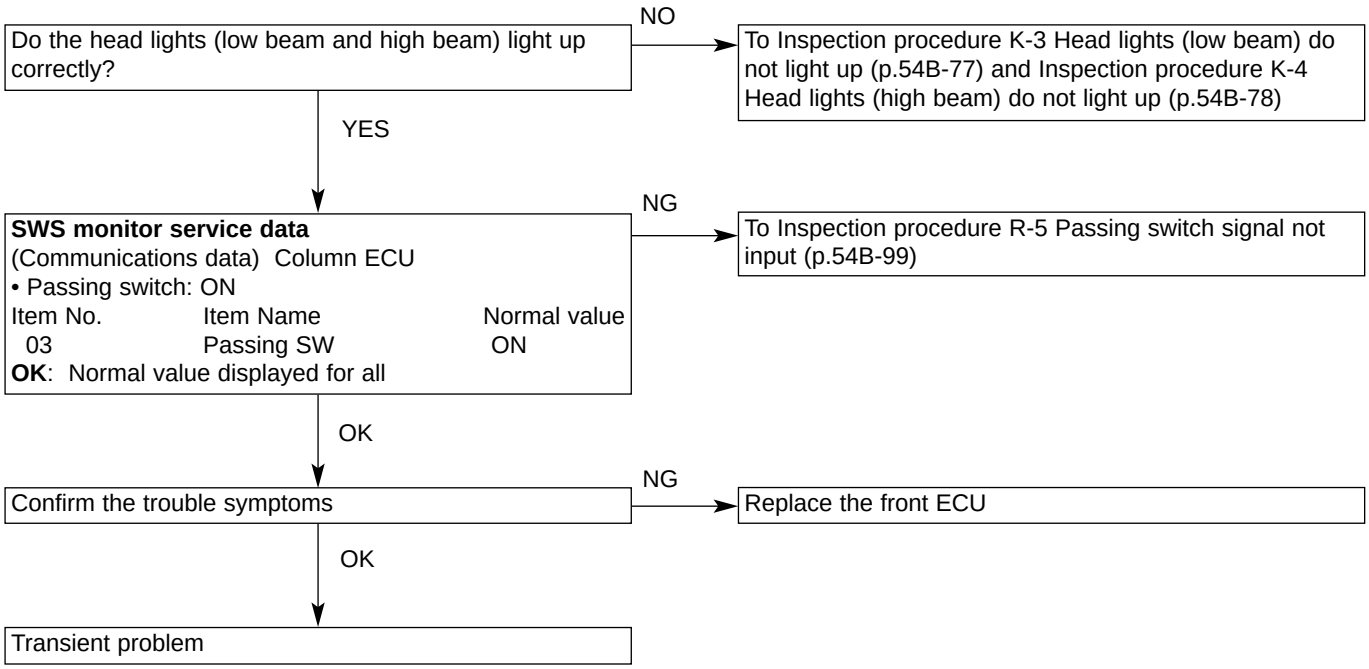
Head lights (high beam) do not light up	**Probable Cause**
If neither of the head lights (high beam) lights up properly, then there is probably a problem in the dimmer switch input circuit system or a fault in the front ECU	• Fault in column switch • Fault in front ECU • Fault in column ECU • Fault in harness or connectors



Note
*: The display will show "OFF" when the high beam lights are on, but check that it changes to "ON" when the dimmer switch is operated.

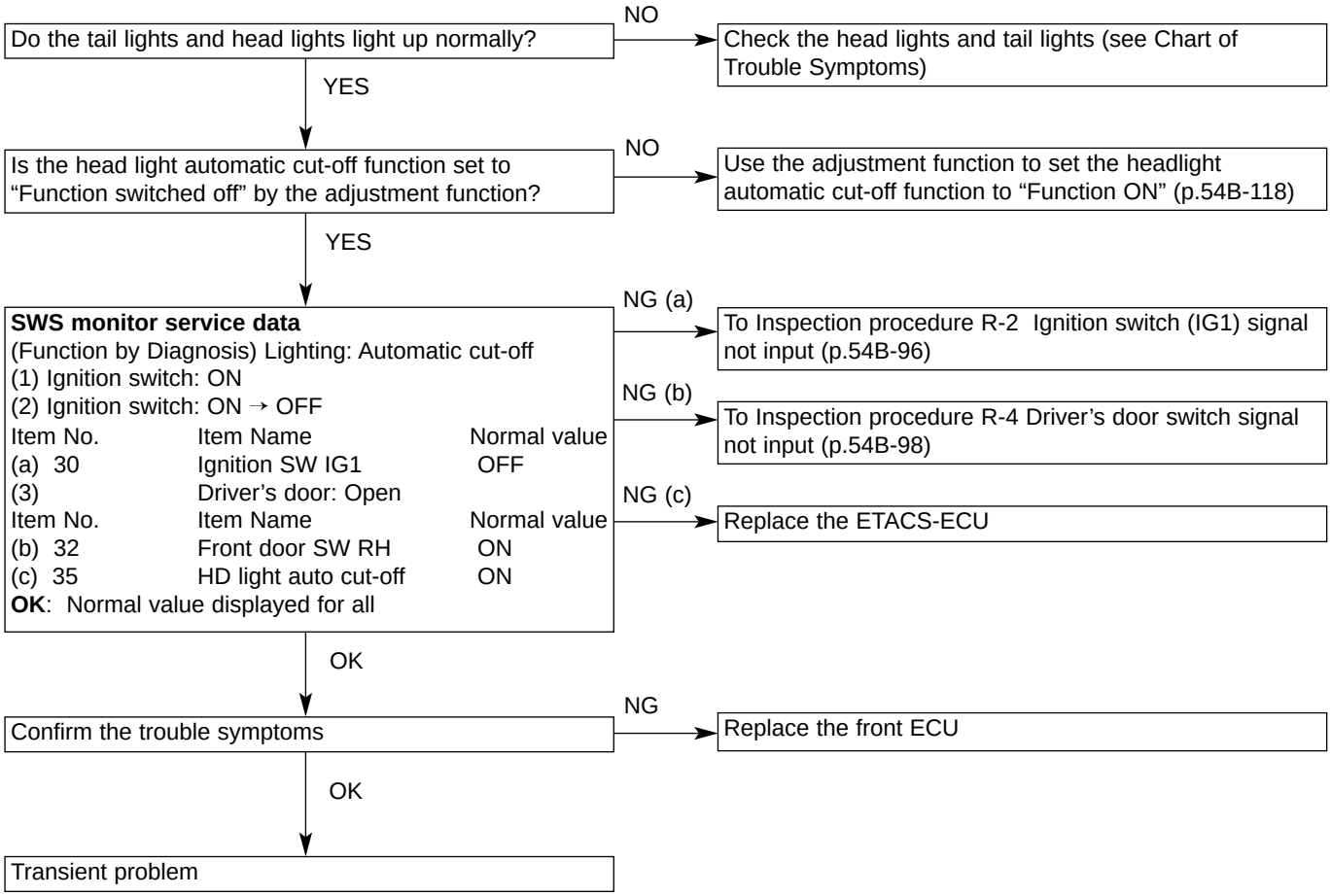
Inspection procedure K-5

Head lights (low beam and high beam) do not light up when passing switch is ON	**Probable Cause**
If neither of the head lights (low beam and high beam) lights up properly, then there is probably a problem in the passing switch input circuit system or a fault in the front ECU	• Fault in column switch • Fault in column ECU • Fault in front ECU • Fault in harness or connectors



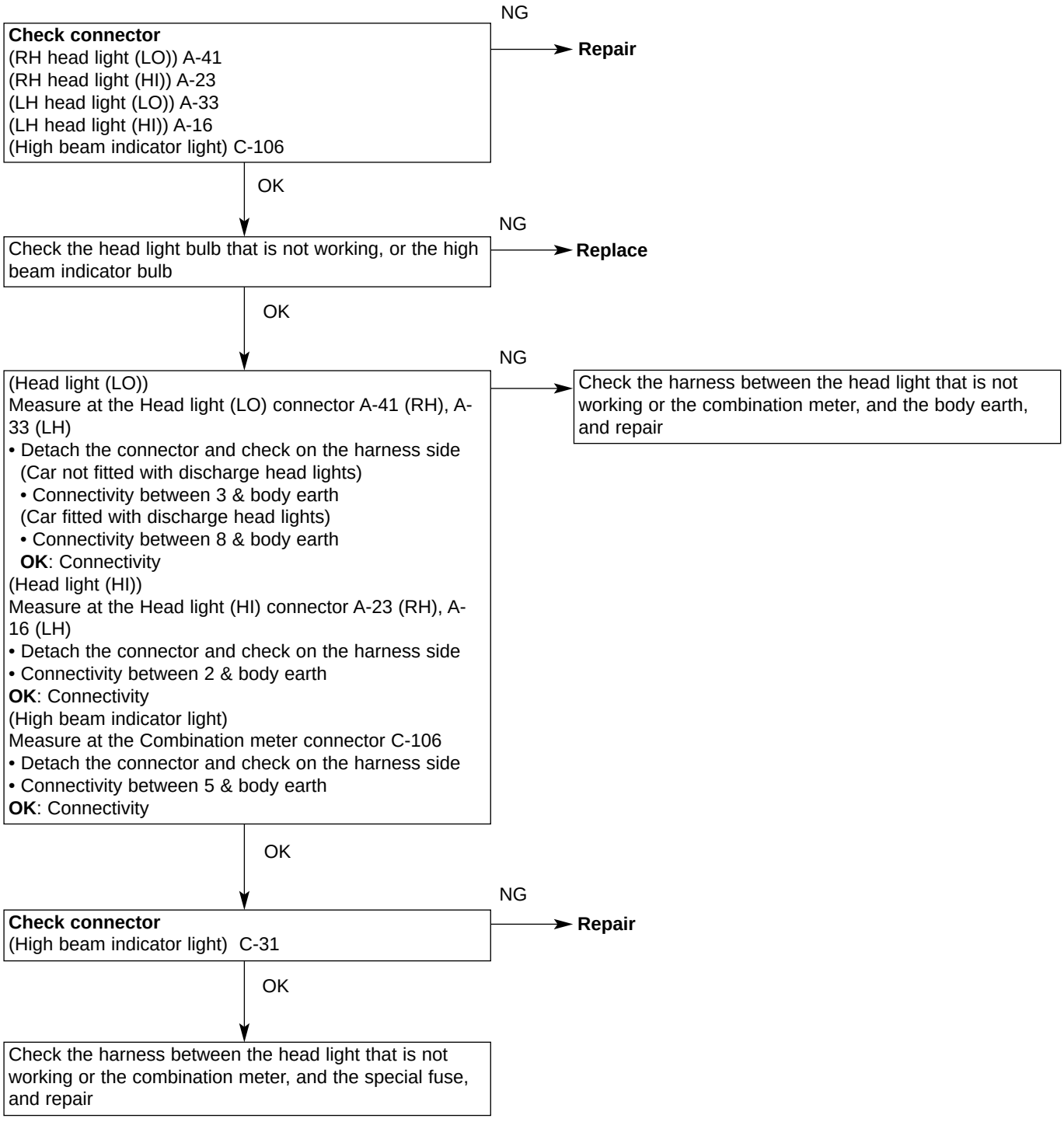
Inspection procedure K-6

Head light automatic cut-off function not working correctly	**Probable Cause**
This function is operated by determining input signals from the ignition switch (IG1) and the driver's door switch in the ETACS-ECU. If it does not work properly, then there is probably a malfunction in the input circuit system, a fault in the front ECU or a fault in the ETACS-ECU. It is also a possibility that the function has been switched off by the adjustment function.	• Fault in driver's door switch • Fault in front ECU • Fault in ETACS-ECU • Fault in harness or connectors



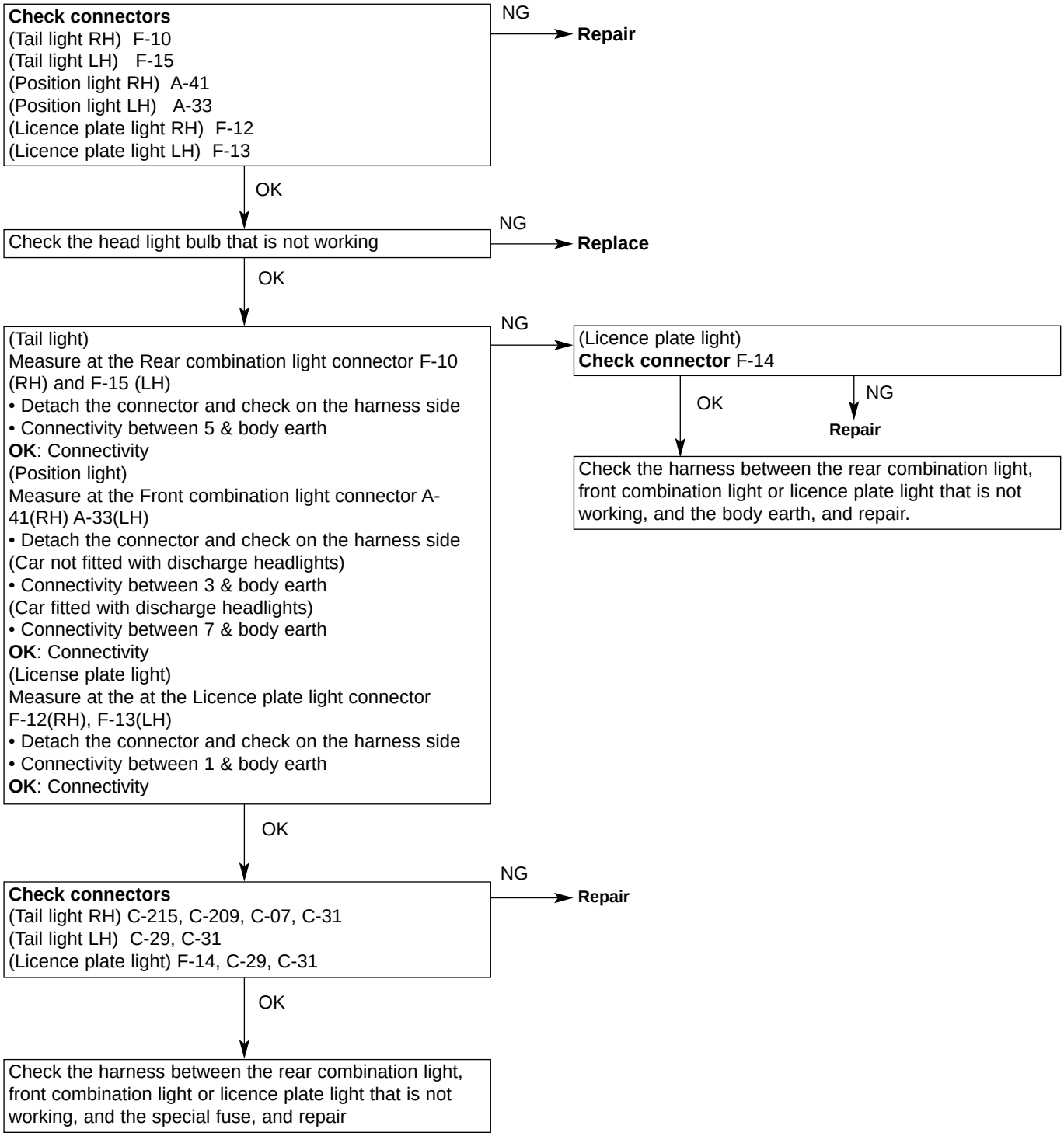
Inspection procedure K-7

One of the head lights does not light up (including high beam indicator light)	**Probable Cause**
If any one of the head lights does not light up correctly, then there is probably a fault in the harness connectors, or a fault in the bulb, or the fuse has blown.	• Fault in headlight bulb • Fault in high beam indicator bulb • Fault in harness or connectors



Inspection procedure K-8

One of the tail lights, position lights, or licence plate lights does not light up	**Probable Cause**
If any one of the tail lights, position lights or licence plate lights does not light up correctly, then there is probably a fault in the harness connectors, or a fault in the bulb, or the fuse has blown.	• Fault in tail light bulb • Fault in position light • Fault in licence plate light bulb • Fault in harness or connectors



Inspection procedure L-1

Fog lights do not light up correctly	Probable Cause
If any one of the fog lights does not light up correctly, but the tail lights and head lights are working normally, then there is probably a problem in the fog light switch input circuit system, a problem in the fog light relay, or a fault in the front ECU.	• Fault in fog light switch • Fault in fog light relay • Fault in front ECU • Fault in harness or connectors

Are the tail lights and head lights working normally?
- NO → Check the head lights and tail lights (See Chart of Trouble Symptoms)
- YES ↓

SWS monitor service data
(Function by Diagnosis) Lighting: Fog light
• Ignition switch: ON
• Tail light switch: ON
• Fog light switch: ON

Item No.	Item Name	Normal value
(a) 30	Ignition SW IG1	ON
(b) 36	Fog light	ON

OK: Normal value displayed for all

- NG (a) → To Inspection procedure R-2 Ignition switch (IG1) signal not input (p.54B-96)
- NG (b) → To Inspection procedure R-18 Fog light switch signal not input (p.54B-110)
- OK ↓

Check connectors A-06X
- NG → **Repair**
- OK ↓

Check fog light relay
(See Chap 54A Fog lights *)
- NG → **Replace**
- OK ↓

Measure at the Fog light relay connector A-06X
• Remove the relay, and check on the relay box side
• Voltage between 2 and body earth
• Voltage between 4 and body earth
OK: Battery voltage
- NG → Check the harness between the fog light relay and the special fuse, and repair.
- OK ↓

Check connectors A-12X
- NG → **Repair**
- OK ↓

Check the harness between the fog light relay and the front ECU
- NG → **Repair**
- OK ↓

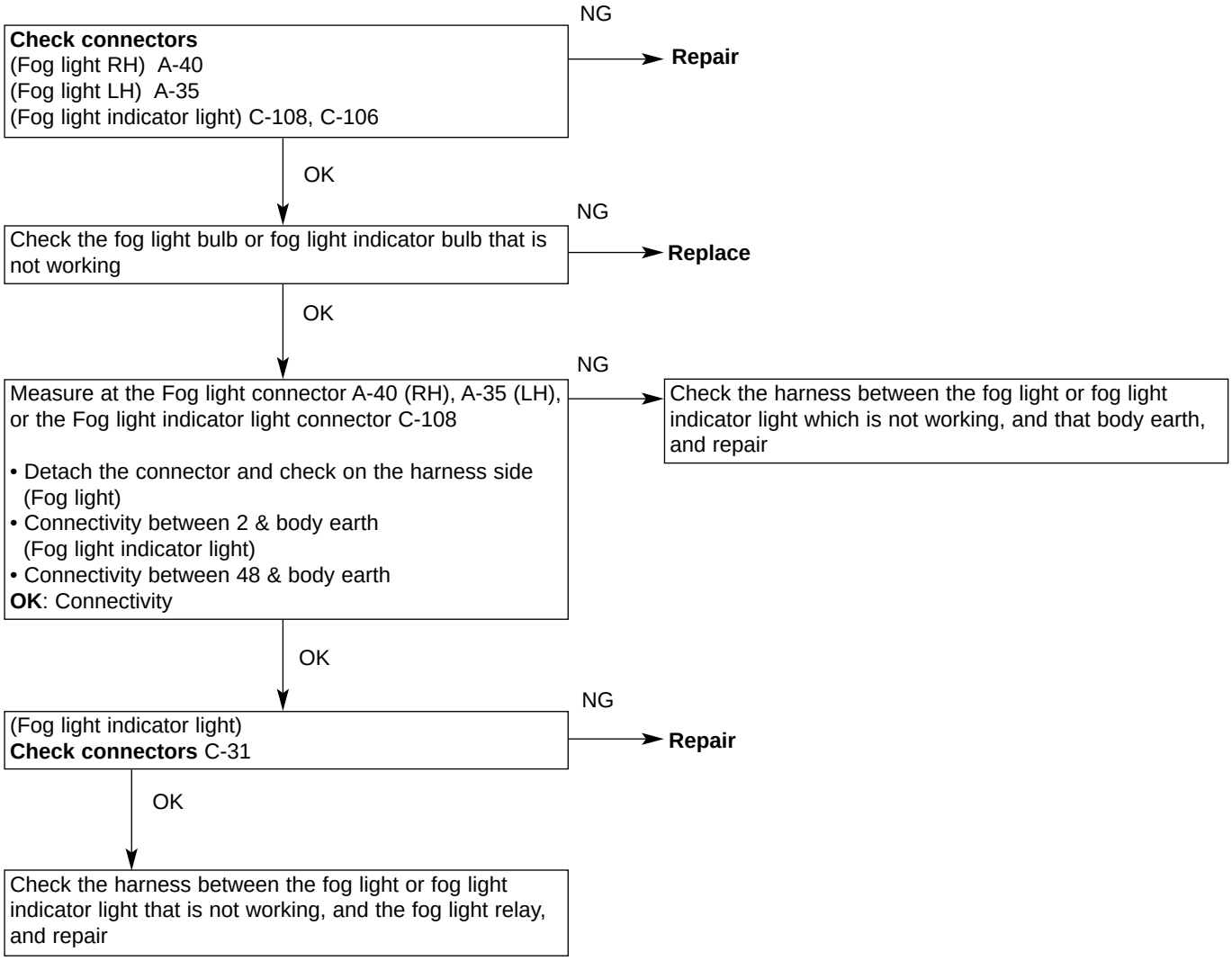
Confirm the trouble symptoms
- NG → Replace the front ECU
- OK ↓

Transient problem

Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

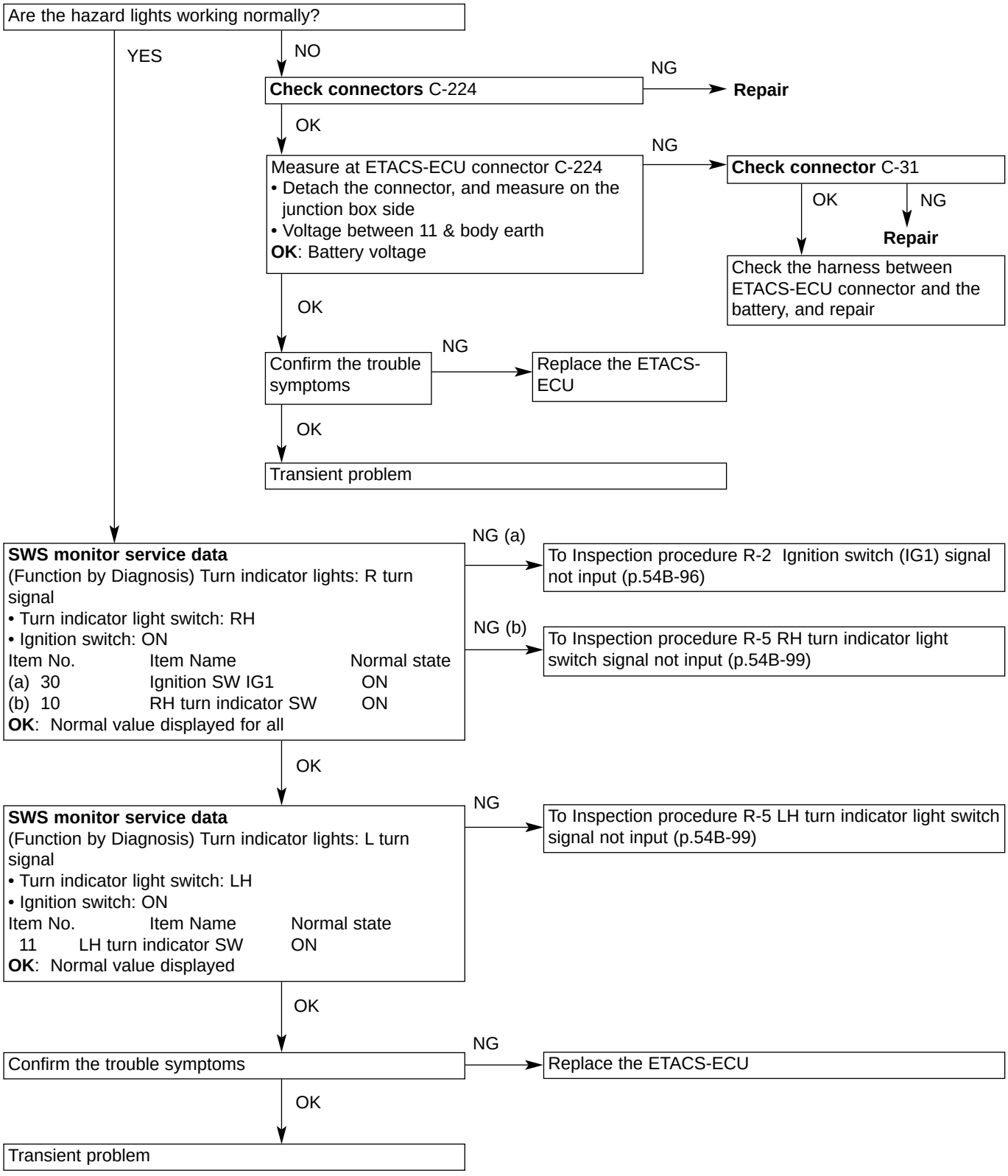
Inspection procedure L-2

One of the fog lights does not light up (including fog light indicator light)	Probable Cause
If any one of the fog lights does not light up normally, then there is probably a fault in the harness/connectors, or a fault in the bulb	• Fault in fog light bulb • Fault in harness or connectors



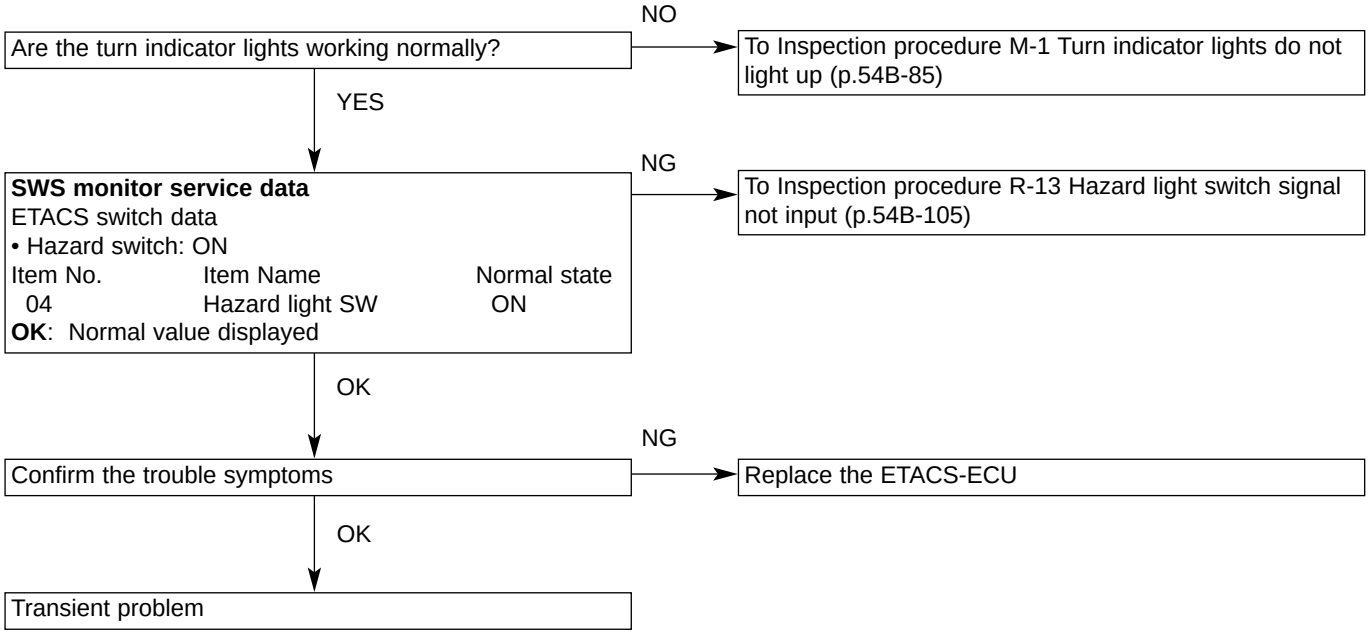
Inspection procedure M-1

Turn indicator lights do not light up	Probable Cause
If none of the turn indicator lights is working, then there is probably a problem in the ignition switch (IG1) or turn indicator light switch input circuit system, or a fault in the ETACS-ECU.	• Fault in column switch • Fault in ETACS-ECU • Fault in harness or connectors



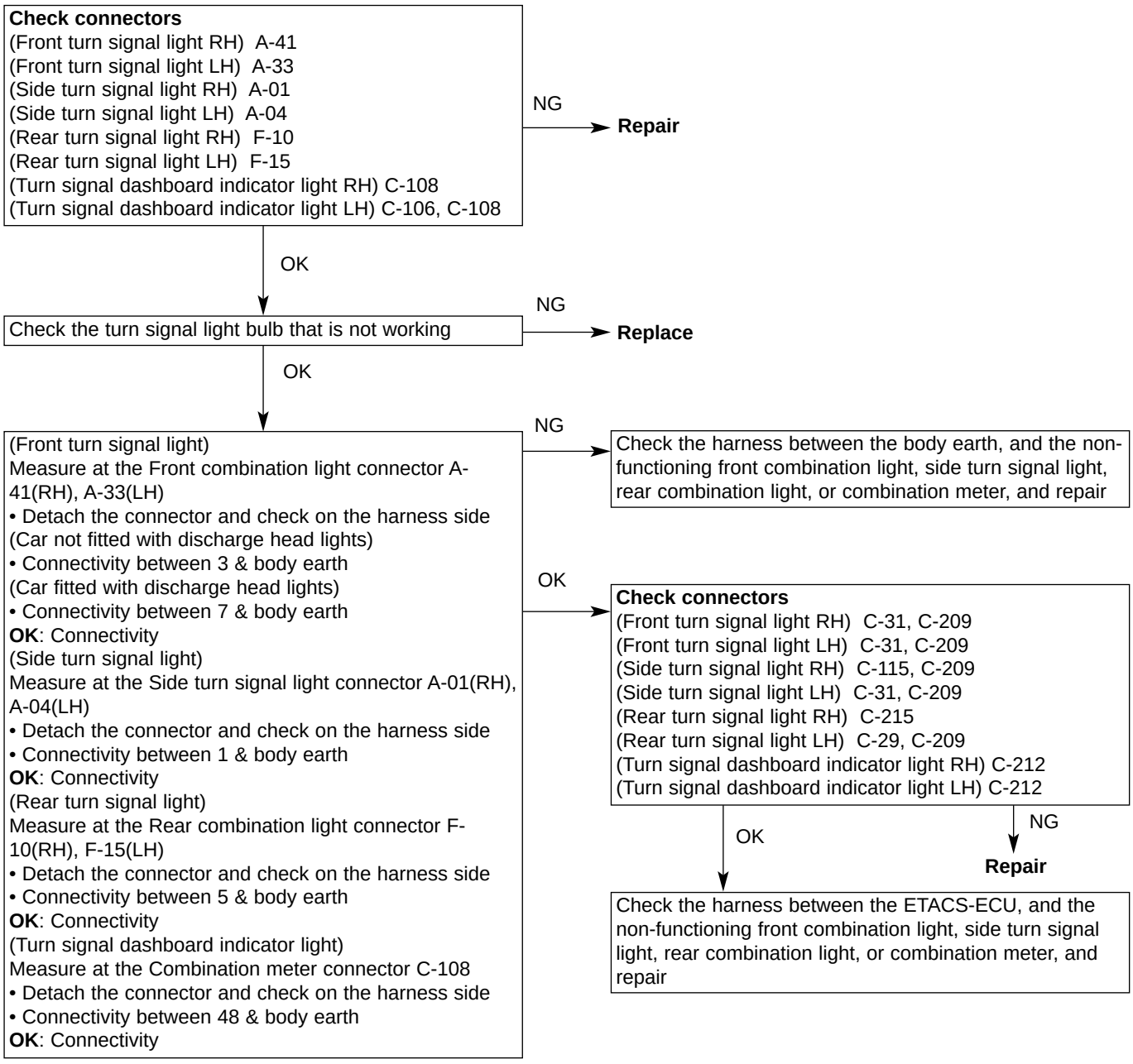
Inspection procedure M-2

Hazard lights do not light up	Probable Cause
If the hazard lights do not light up, then there is probably a problem in the hazard light switch input circuit system, or a fault in the ETACS-ECU.	• Fault in hazard light switch • Fault in ETACS-ECU • Fault in harness or connectors



Inspection procedure M-3

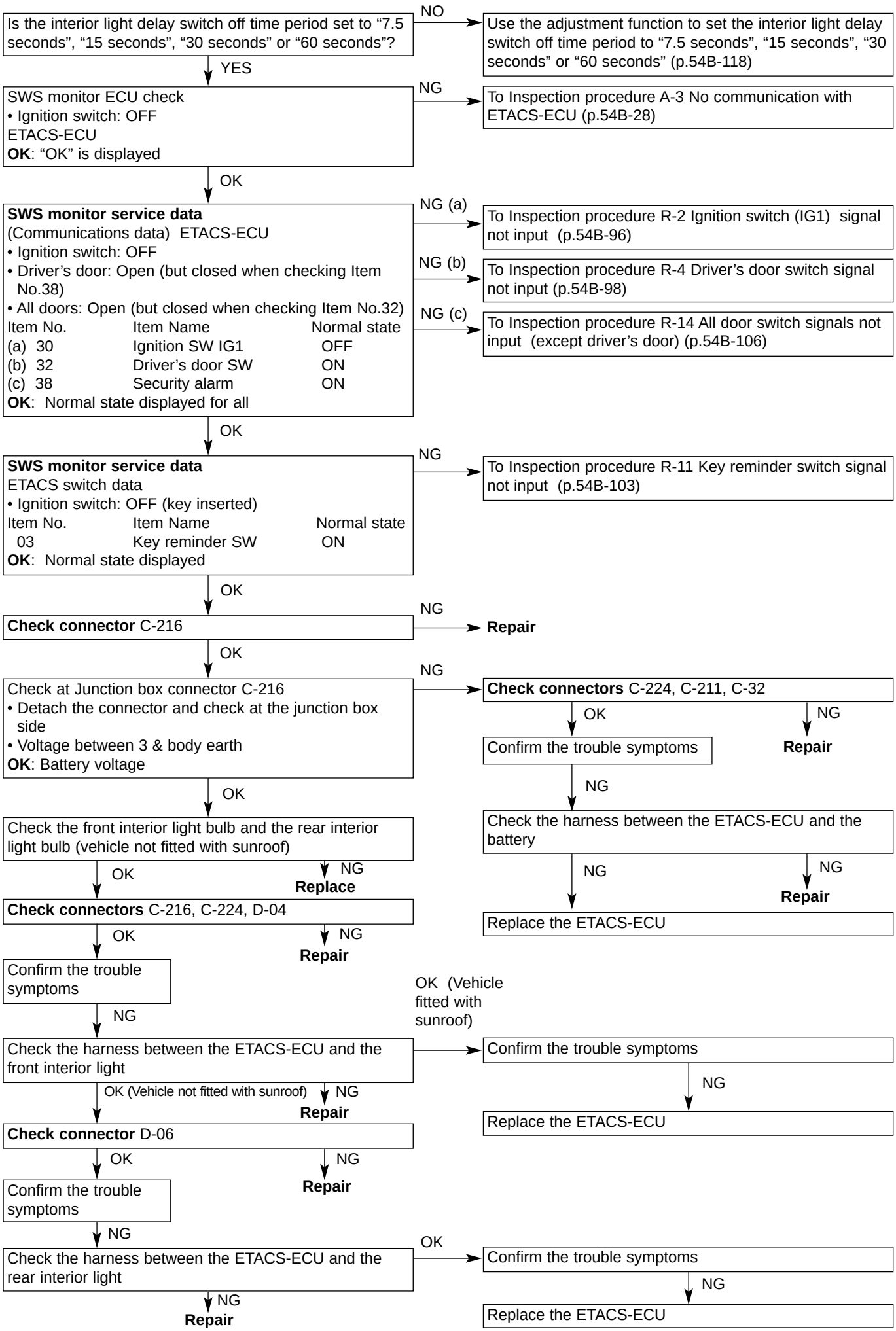
One of the turn indicator lights does not light up	Probable Cause
If one of the turn indicator lights is not working correctly, then there is probably a fault in the harness/connector, or a fault in the bulb.	• Fault in turn indicator light bulb • Fault in harness or connectors



Inspection procedure N-1

Front interior light and/or rear interior light does not light up or switch off correctly (vehicle not fitted with sunroof)	**Probable Cause**
(Vehicle not fitted with keyless entry) The front interior light and/or rear interior light (in vehicles not fitted with a sunroof) switches on/off by determining the following input signals in the ETACS-ECU. • Ignition switch (IG1) • Key reminder switch • Driver's door switch • All door switch • Driver's door lock actuator If the lights do not work correctly, then there is probably a problem in the input circuit system for these signals, or a fault in the ETACS-ECU. It is possible that the delay switch off time has been set to "0 seconds" by the adjustment function.	• Fault in key reminder switch • Fault in door switch • Fault in driver's door lock actuator • Fault in ETACS-ECU • Fault in harness or connectors
(Vehicle fitted with keyless entry) The front interior light and/or rear interior light (in vehicles not fitted with a sunroof) switches on/off by determining the following input signals in the ETACS-ECU. Moreover, since the interior lights are switched off by the interior light automatic cut-off function, the input signal from this interior light automatic cut-off function must be checked at the same time. • Ignition switch (ACC) • Ignition switch (IG1) • Key reminder switch • Driver's door switch • All door switch • Driver's door lock actuator • Generic fuse No. 17 If the lights do not work correctly, then there is probably a problem in the input circuit system for these signals, a malfunction in the interior light automatic cut-off function, or a fault in the ETACS-ECU. It is possible that the delay switch off time has been set to "0 seconds" by the adjustment function.	• Fault in key reminder switch • Fault in door switch • Fault in driver's door lock actuator • Fault in ETACS-ECU • Fault in harness or connectors

(Vehicle not fitted with keyless entry)



(Vehicle fitted with keyless entry)

Is the interior light delay switch off time period set to “7.5 seconds”, “15 seconds”, “30 seconds” or “60 seconds”?
- NO → Use the adjustment function to set the interior light delay switch off time period to “7.5 seconds”, “15 seconds”, “30 seconds” or “60 seconds” (p.54B-118)
- YES ↓

SWS monitor ECU check
• Ignition switch: OFF
ETACS-ECU
OK: “OK” is displayed
- NO → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)
- OK ↓

SWS monitor service data
(Communications data) ETACS-ECU
• Ignition switch: OFF
• Driver’s door: Open (but closed when checking Item No.38)
• All doors: Open (but closed when checking Item No.32)

Item No.	Item Name	Normal state
(a) 30	Ignition SW IG1	OFF
(b) 32	Driver’s door SW	ON
(c) 38	Security alarm	ON

OK: Normal state displayed for all
- NG (a) → To Inspection procedure R-1 Ignition switch (ACC) signal not input (p.54B-96)
- NG (b) → To Inspection procedure R-2 Ignition switch (IG1) signal not input (p.54B-96)
- NG (c) → To Inspection procedure R-4 Driver’s door switch signal not input (p.54B-98)
- NG (d) → To Inspection procedure R-14 All door switch signals not input (except driver’s door) (p.54B-106)
- OK ↓

SWS monitor service data
ETACS switch data
• Ignition switch: OFF (key inserted)

Item No.	Item Name	Normal state
30	Key reminder SW	ON

OK: Normal state displayed
- NG → To Inspection procedure R-11 Key reminder switch signal not input (p.54B-103)
- OK ↓

MUT-II/III pulse check
Generic fuse No.17
OK MUT-II/III buzzer sounds once
- NG → To Inspection procedure R-19 Generic fuse No.17 load use signal not detected (p.54B-111)
- OK ↓

Check the front interior light bulb and the rear interior light bulb (vehicle not fitted with sunroof)
- OK ↓
- NG → **Replace**

Check connectors C-224, C-216, D-04
- OK ↓
- NG → **Repair**

Confirm the trouble symptoms
- NG ↓
- OK (Vehicle fitted with sunroof)

Check the harness between the ETACS-ECU and the rear personal light
- OK (Vehicle not fitted with sunroof) ↓
- NG → **Repair**
- OK (Vehicle fitted with sunroof) → Confirm the trouble symptoms
  - NG → Replace the ETACS-ECU

Check connectors D-06
- OK ↓
- NG → **Repair**

Confirm the trouble symptoms
- NG ↓

Check the harness between the ETACS-ECU and the rear interior light
- OK → Confirm the trouble symptoms
  - OK → Replace the ETACS-ECU
- **Repair**

Inspection procedure N-2

Interior light automatic cut-off function not working correctly (cars fitted with keyless entry system)	**Probable Cause**
The interior light automatic cut-off function is operated by determining the following input signals in the ETACS-ECU. • Ignition switch (IG1) • Ignition switch (ACC) • Driver's door switch • All door switch • Generic fuse No. 17 If the lights do not work correctly, then there is probably a problem in the input circuit system for these signals, or a fault in the ETACS-ECU. There is also a possibility that the interior light automatic cut-off function has been switched off by the adjustment function.	• Fault in all door switch • Fault in interior light switch • Fault in ETACS-ECU • Fault in harness or connectors

Is the interior light automatic cut-off function set to "Function ON"?

NO → Use the adjustment function to set the interior light automatic cut-off function to "Function ON" (p.54B-118)

YES

SWS monitor ECU check
• Ignition switch: OFF
ETACS-ECU
OK: "OK" is displayed

NG → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)

OK

SWS monitor service data
(Communications data) ETACS-ECU
• Ignition switch: OFF
• Driver's door: Open (but closed when checking Item No.38)
• All doors: Open (but closed when checking Item No.32)

Item No.	Item Name	Normal state
(a) 31	Ignition switch (ACC)	OFF
(a) 30	Ignition switch (IG1)	OFF
(b) 32	Driver's door SW	ON
(c) 38	Security alarm	ON

OK: Normal state displayed for all

NG (a) → To Inspection procedure R-1 Ignition switch (ACC) signal not input (p.54B-96)

NG (b) → To Inspection procedure R-2 Ignition switch (IG1) signal not input (p.54B-96)

NG (c) → To Inspection procedure R-4 Driver's door switch signal not input (p.54B-98)

NG (d) → To Inspection procedure R-14 All door switch signals not input (except driver's door) (p.54B-106)

OK

MUT-II/III pulse check
Generic fuse No.17
OK MUT-II/III buzzer sounds once

NG → To Inspection procedure R-19 Generic fuse No.17 load use signal not detected (p.54B-111)

OK

Confirm the trouble symptoms

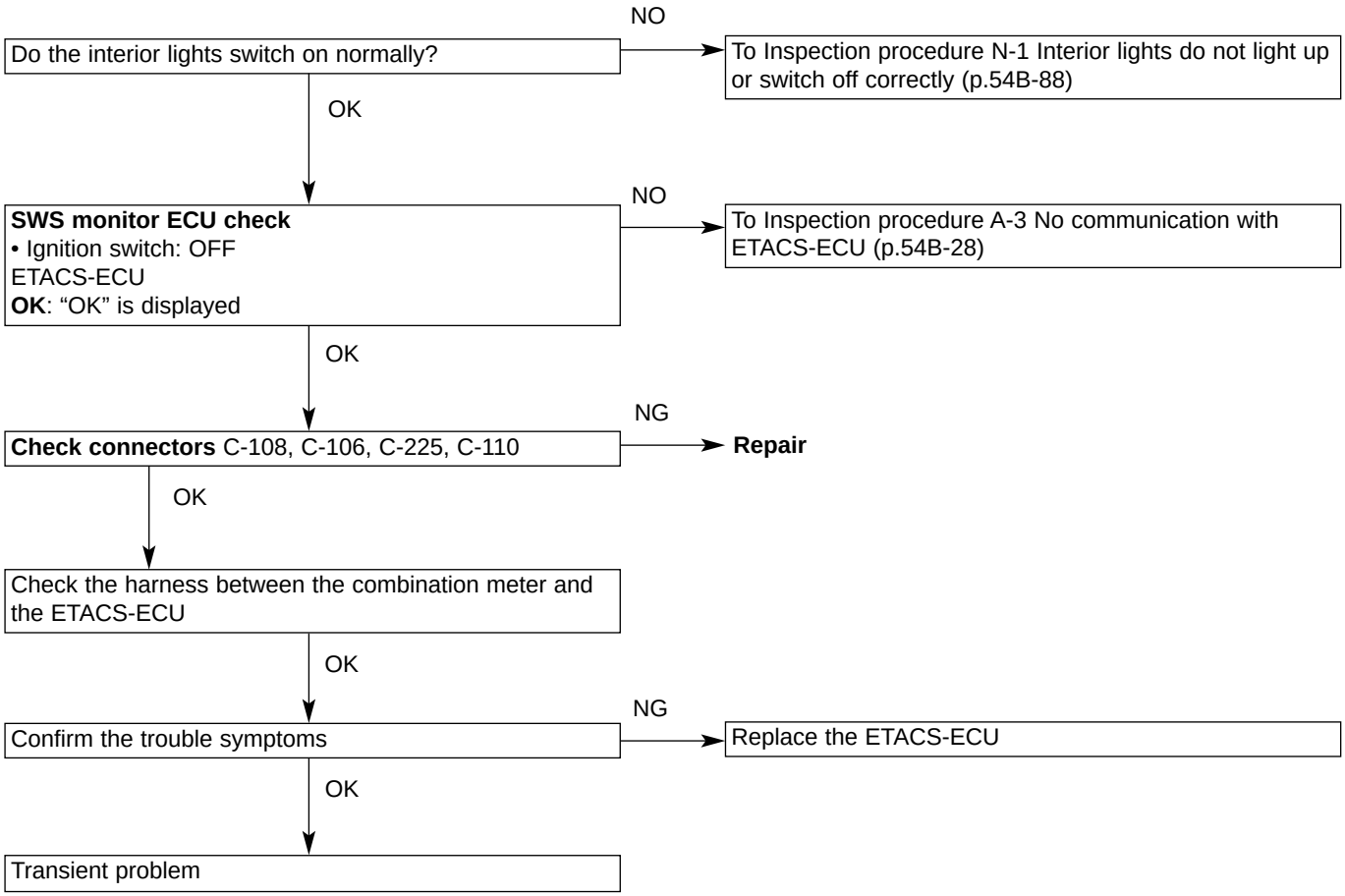
OK

Replace the ETACS-ECU

Note:
If only one of the interior lights will not switch off (front interior light, rear interior light (vehicle not fitted with sunroof), boot interior light, door ajar indicator light, ignition key cylinder illumination light), then check the bulb, and the harnesses between the ETACS-ECU and the light, and the light and the body earth.

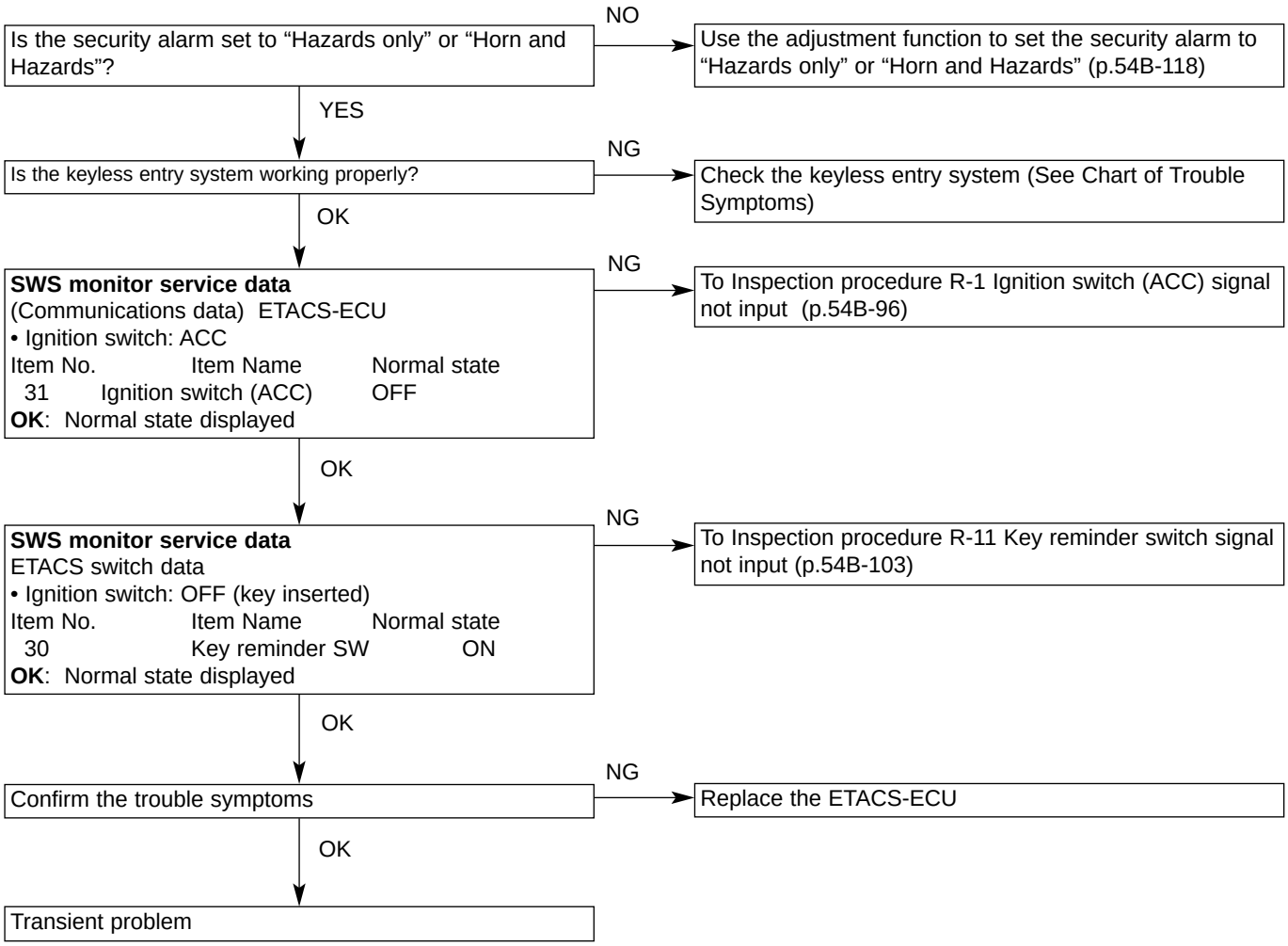
Inspection procedure O-1

Door ajar indicator light does not light up or switch off correctly	Probable Cause
The door ajar indicator light is lit up by determining the following input signals in the ETACS-ECU. • Driver's door switch • All door switch If the light does not work correctly, then there is probably a problem in the input circuit system for these signals, or a fault in the ETACS-ECU.	• Fault in all door switch • Fault in combination meter • Fault in ETACS-ECU • Fault in harness or connectors



Inspection procedure P-1

Security alarm does not enter warning state	Probable Cause
This function is operated by determining the following input signals in the ETACS-ECU. • Keyless entry transmitter switch • Key reminder switch • Ignition switch (ACC) If the function does not work correctly, then there is probably a problem in the input circuit system for these signals, or a fault in the ETACS-ECU.	• Fault in keyless entry transmitter • Fault in key reminder switch • Fault in ETACS-ECU • Fault in harness or connectors



Inspection procedure P-2

Interior warning does not operate correctly when security alarm operates	Probable Cause
This function is operated by determining the all door switch input signal in the ETACS-ECU. If the function does not work correctly, then there is probably a problem in the input circuit system for this signal, or a fault in the ETACS-ECU.	• Fault in all door switch • Fault in ETACS-ECU • Fault in harness or connectors

Is the security alarm set to “Hazards only” or “Horn and Hazards”?
NO → Use the adjustment function to set the security alarm to “Hazards only” or “Horn and Hazards” (p.54B-118)
YES ↓

SWS monitor ECU check
• Ignition switch: OFF
ETACS-ECU
OK: “OK” is displayed
NG → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)
OK ↓

SWS monitor service data
(Communications data) ETACS-ECU
• All doors: respectively opened and closed

Item No.	Item Name	Normal state
38	Security alarm	ON

OK: Normal state displayed
NG → To Inspection procedure R-14 All door switch signals not input (except driver’s door) (p.54B-106)
OK ↓

Confirm the trouble symptoms
NG → Replace the ETACS-ECU
OK ↓

Transient problem

Inspection procedure P-3

Hazard lights do not flash when security alarm operates	Probable Cause
This function is operated by the ETACS-ECU. If the hazard lights do not flash properly, then there is probably a fault in the ETACS-ECU.	• Fault in ETACS-ECU • Fault in harness or connectors

Is the security alarm set to “Hazards only” or “Horn and Hazards”?
NO → Use the adjustment function to set the security alarm to “Hazards only” or “Horn and Hazards” (p.54B-118)
YES ↓

Are the hazard lights working normally?
NO → To Inspection procedure M-2 Hazard lights do not light up (p.54B-86)
YES ↓

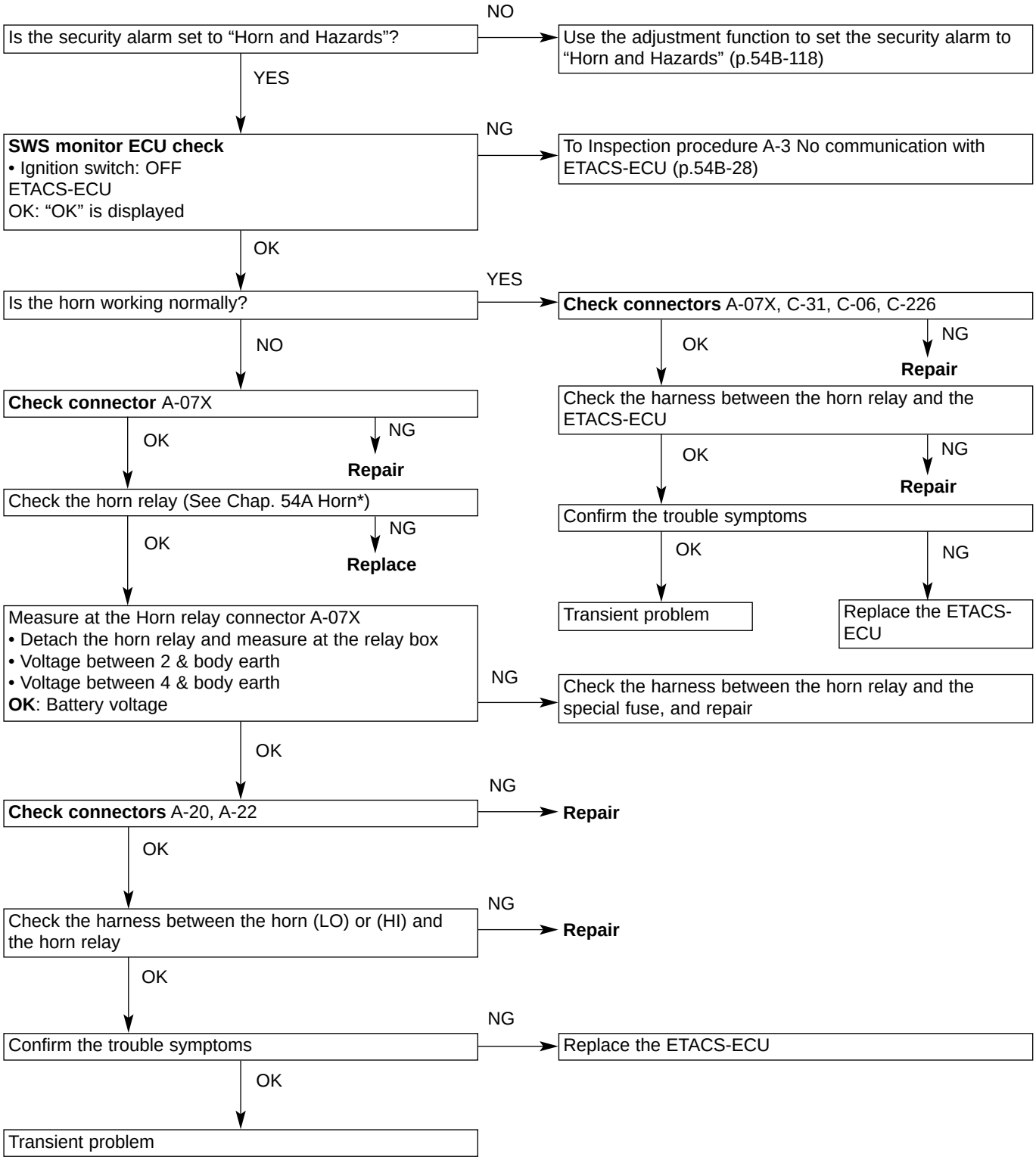
SWS monitor ECU check
• Ignition switch: OFF
ETACS-ECU
OK: “OK” is displayed
NG → To Inspection procedure A-3 No communication with ETACS-ECU (p.54B-28)
OK ↓

Confirm the trouble symptoms
NG → Replace the ETACS-ECU
OK ↓

Transient problem

Inspection procedure P-4

Horn does not sound when security alarm operates	Probable Cause
This function is operated by the ETACS-ECU. If the horn does not sound, then there is probably a fault in the ETACS-ECU.	• Fault in ETACS-ECU • Fault in harness or connectors



*: See ’00-5 Lancer Sedia Servicing Manual (No. 1036K00)

Inspection procedure R-1

Ignition switch (ACC) signal not input	Probable Cause
If there is a problem in the ignition switch (ACC) input signal, then the ignition switch (ACC) signal will cease to be output to the SWS communications line.	• Fault in ETACS-ECU • Fault in harness or connectors

Check connector C-224
NG → **Repair**
OK ↓

Measure at the ETACS-ECU connector C-224
• Detach the connector and measure at the junction box side
• Ignition switch . ACC
• Voltage between 4 & body earth
OK: Battery voltage
NG → **Check connector** C-210
OK ↓ Check the harness between the ETACS-ECU and the ignition switch (ACC), and repair
NG → **Repair**
OK ↓

SWS monitor service data
(Communications data) ETACS-ECU
• Ignition switch: ACC

Item No.	Item Name	Normal state
31	Ignition SW ACC	ON

OK: Normal state displayed
OK → Transient problem
NG ↓

Replace the ETACS-ECU

Inspection procedure R-2

Ignition switch (IG1) signal not input	Probable Cause
If there is a problem in the ignition switch (IG1) input signal, then the ignition switch (IG1) signal will cease to be output to the SWS communications line.	• Fault in ETACS-ECU • Fault in harness or connectors

Check connector C-224
NG → **Repair**
OK ↓

Measure at the ETACS-ECU connector C-224
• Detach the connector and measure at the junction box side
• Ignition switch: ON
• Voltage between 8 & body earth
OK: Battery voltage
NG → **Check connector** C-210
OK ↓ Check the harness between the ETACS-ECU and the ignition switch (IG1), and repair
OK → **Repair**
OK ↓

SWS monitor service data
(Communications data) ETACS-ECU
• Ignition switch: ACC

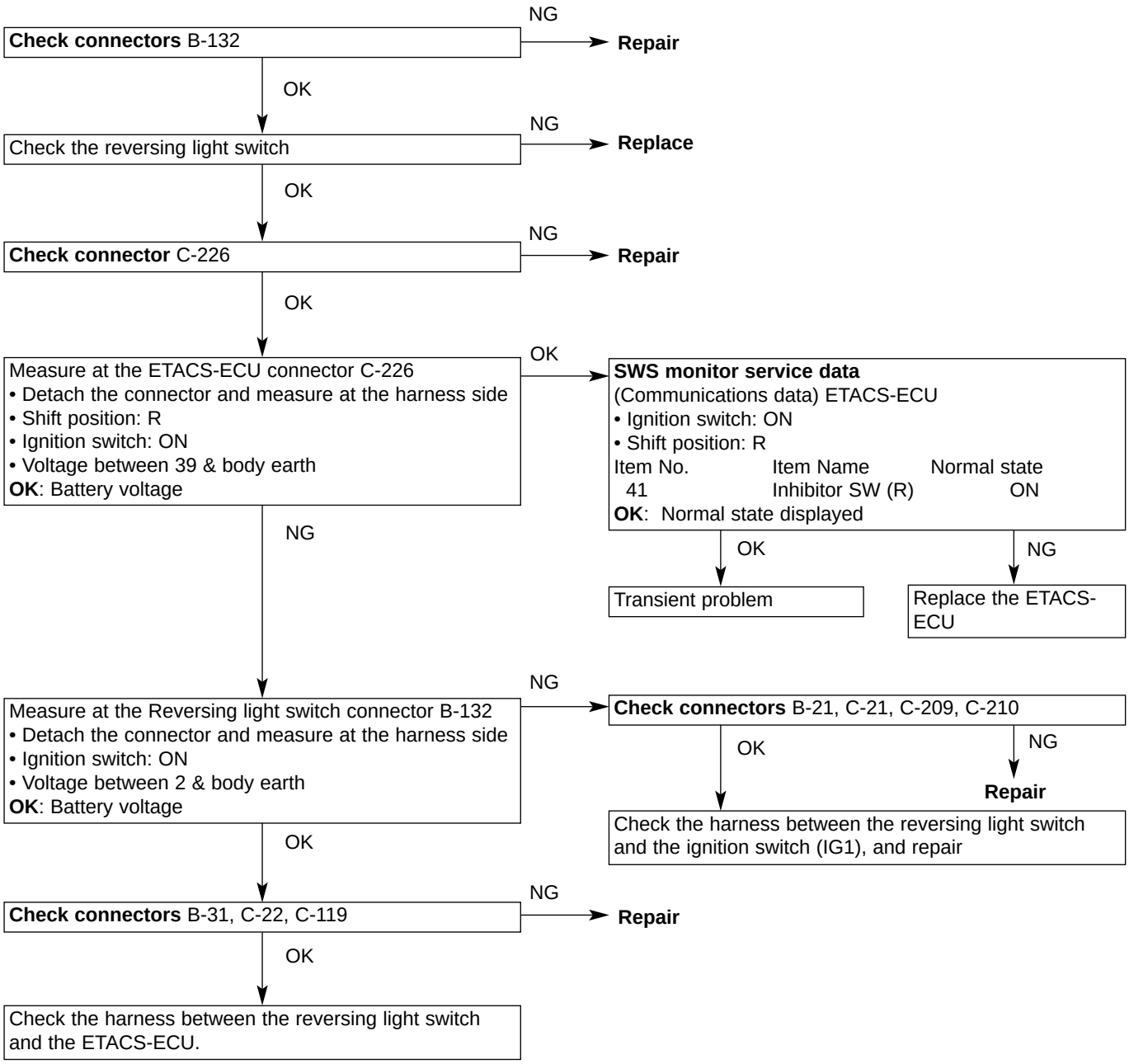
Item No.	Item Name	Normal state
30	Ignition SW IG1	ON

OK: Normal state displayed
OK → Transient problem
NG ↓

Replace the ETACS-ECU

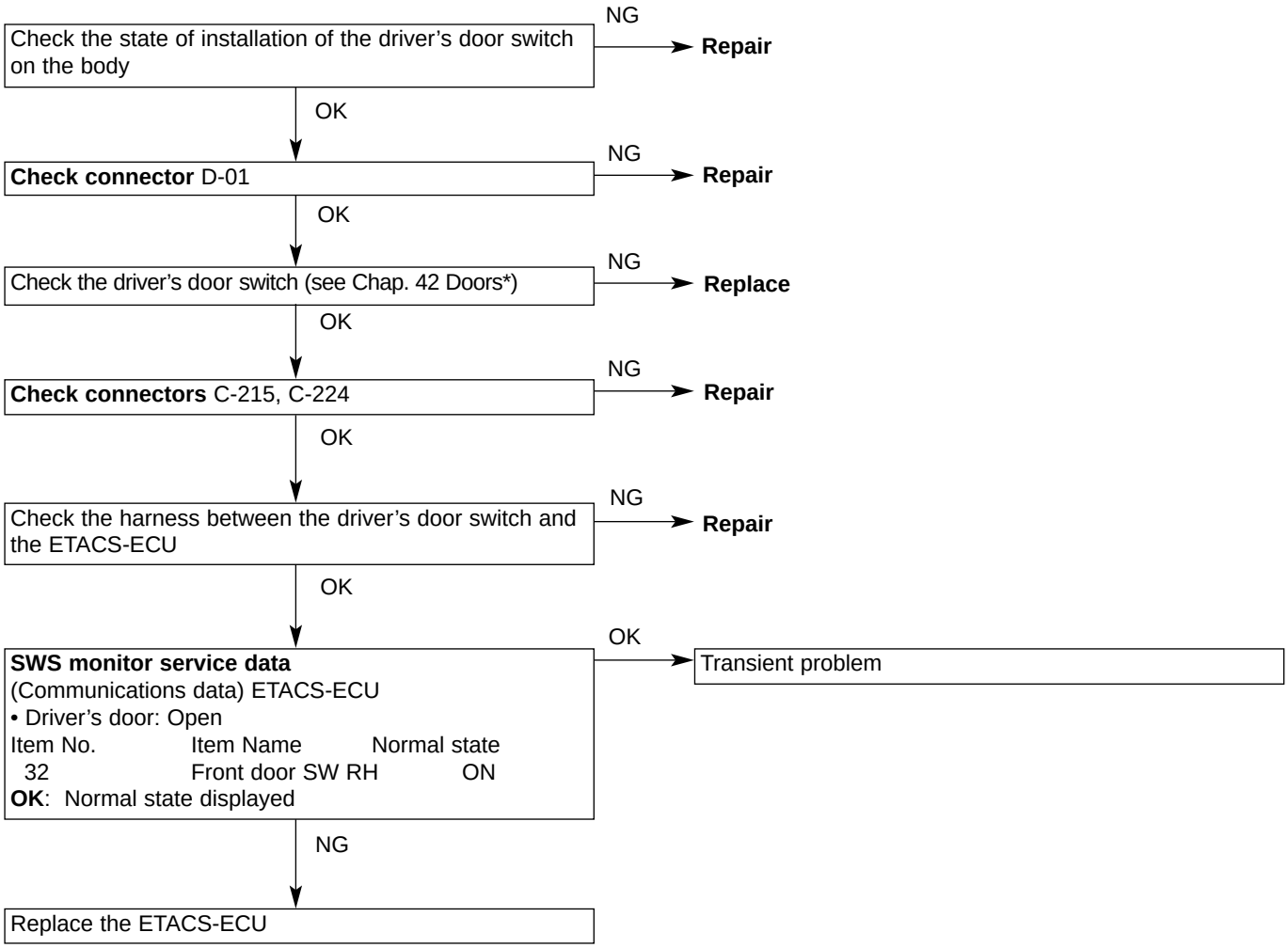
Inspection procedure R-3

Reversing light switch signal not input	Probable Cause
If there is a problem in the reversing light switch input signal, then the reversing light switch signal will cease to be output to the SWS communications line.	• Fault in the reversing light • Fault in ETACS-ECU • Fault in harness or connectors



Inspection procedure R-4

Driver's door switch signal not input	Probable Cause
If there is a problem in the input signal for the driver's door switch, then this driver's door switch signal will cease to be output to the SWS communications line.	• Fault in driver's door switch • Fault in ETACS-ECU • Fault in harness or connectors



Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

Inspection procedure R-5

Column switches **• Tail light switch signal not input** **• Headlight switch signal not input** **• Dimmer switch signal not input** **• Passing switch signal not input** **• LH turn indicator light switch signal not input** **• RH turn indicator light switch signal not input**	**Probable Cause**
If there is a problem in the input signal of the column switch (lighting switch), then the column switch signal (light switch signal) will cease to be output to the SWS communications line.	• Fault in column switch • Fault in harness or connectors

Check connectors: Wiper / washer switch, lighting switch, switch body
NG → **Repair**

OK ↓

Check column switch (light switch) (Chap. 54A – Column Switches *)
NG → **Replace**

OK ↓

SWS monitor ECU check
• Ignition switch: OFF
Column ECU
OK: "OK" is displayed
NG → To Inspection procedure A-2 No communication with column ECU (p.54B-27)

OK ↓

SWS monitor service data
(Communications data) Column ECU

Item No.	Item Name	Normal state
00	Head light SW	ON
01	Tail light SW	ON
02	Dimmer SW	ON
03	Passing SW	ON
10	Turn signal RH SW	ON
11	Turn signal LH SW	ON

OK: Normal states displayed at respective switch positions
OK → Transient problem

NG ↓

Replace the column switch

Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

Inspection procedure R-6

Column switches **• Windscreen mist wiper switch signal not input** **• Windscreen intermittent wiper switch signal not input** **• Windscreen low speed wiper switch signal not input** **• Windscreen high speed wiper switch signal not input** **• Windscreen washer switch signal not input** **• Rear wiper switch signal not input** **• Rear washer switch signal not input**	**Probable Cause**
If there is a problem in the input signal of the column switches (wiper switches), then the column switch signal (wiper switch signal) will cease to be output to the SWS communications line.	• Fault in column switch • Fault in harness or connectors

SWS monitor ECU check
• Ignition switch: OFF
Column ECU
OK: "OK" is displayed

NG → To Inspection procedure A-2 No communication with column ECU (p.54B-27)

OK ↓

SWS monitor service data
(Communications data) Column ECU

Item No.	Item Name	Normal state
05	INT wiper SW	ON
06	LO wiper SW	ON
07	HI wiper SW	ON
08	Mist wiper SW	ON
08	Front washer SW	ON
13	Rear wiper INT SW	ON
14	Rear washer SW	ON

OK: Normal states displayed at respective switch positions

OK → Transient problem

NG ↓

Replace the column switch

Inspection procedure R-7

Windscreen intermittent wiper volume signal not input from column switch	**Probable Cause**
If there is a problem in the input signal for the intermittent windscreen wiper volume, then the intermittent wiper interval output to the SWS communications line will be set constantly to 4 seconds.	• Fault in column switch • Fault in ETACS-ECU • Fault in harness or connectors

Check connector C-203
NG → **Repair**
OK ↓

Measure at the C-203 Column switch connector
• Detach the connector and measure at the column switch side
• Resistance between 4 and 6
OK: Resistance changes from 0 → 1 kW as windscreen wiper intermittent wiper volume is turned from FAST to SLOW.
NG → Replace the column switch
OK ↓

Check connector C-225
NG → **Repair**
NG ↓

Check the harness between the column switch and the ETACS-ECU
NG → **Repair**
OK ↓

SWS monitor service data
(Diagnosis by Function) Wiper: INT
• Ignition switch: ACC
• Wiper switch: INT

Item No.	Item Name	Normal state
37	Wiper INT period	2.4 – 18.0 s

OK: Display of normal state changes as the intermittent wiper volume is changed.
OK → Transient problem
NG ↓

Replace the ETACS-ECU

Inspection procedure R-8

Respective switch signals not input from power window main switch	**Probable Cause**
If there is a problem in the power window main switch, then the input check response signals will cease to be output to the SWS communications line from the power window main switch.	• Fault in power window main switch • Fault in harness or connectors

SWS monitor ECU check
• Ignition switch: ON
Power window main switch
OK: "OK" is displayed
NG → To Inspection procedure A-5 No communication with Power window main switch (p.54B-30)
OK ↓

SWS monitor service data
(Communications data) Fr-ECU / P/W / S/R
• Ignition switch: ON

Item No.	Item Name	Normal state
71	P/W module response	Input check

OK: Normal state displayed at each switch position
OK → Transient problem
NG ↓

Replace the power window main switch

Inspection procedure R-9

Respective switch signals not input for sunroof	Probable Cause
If there is a problem in the sunroof switch input signal, then the sunroof input check response signal will cease to be output to the SWS communications line.	• Fault in sunroof motor assembly • Fault in sunroof switch • Fault in harness or connectors

SWS monitor ECU check
• Ignition switch: OFF
Sunroof ECU
OK: "OK" is displayed
NG → To Inspection procedure A-6 No communication with Sunroof motor assembly (p.54B-31)
OK ↓

Check connector D-26
NG → **Repair**
OK ↓

Check sunroof switch (See Chap. 42 Sunroof *)
NG → **Replace**
OK ↓

Measure at the Sunroof switch connector D-26
• Detach the connector and measure at the harness side
• Connectivity between 4 & body earth
OK: Connectivity
NG → Check the harness between the sunroof switch and the body earth, and repair
OK ↓

Check connector D-27
NG → **Repair**
OK ↓

Check the harness between the sunroof switch and the sunroof motor assembly
NG → **Repair**
OK ↓

SWS monitor service data
(Communications data) Fr-ECU / P/W / S/R
• Ignition switch: ON

Item No.	Item Name	Normal state
72	Sunroof ECU response	Input check

OK: Normal state displayed at each switch position
OK → Transient problem
NG ↓

Replace the Sunroof motor assembly

Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

Inspection procedure R-10

Respective switch signals not input for multi-centre display	Probable Cause
If there is a problem in the multi-centre display, then the multi-centre display input check response signal will cease to be output to the SWS communications line.	• Fault in multi-centre display • Fault in harness or connectors

SWS monitor ECU check
Centre display
OK: "OK" is displayed
NG → To Inspection procedure A-7 No communication with multi-centre display (p.54B-32)
OK ↓

Check the multi-centre display
NG → **Repair, Replace**
OK ↓

SWS monitor service data
(Communications data) Centre display
• Ignition switch: ACC

Item No.	Item Name	Normal state
62	Display input	ON

OK: Normal state displayed when audio operating stick is pressed, except for volume
OK → Transient problem
NG ↓

Replace the multi-centre display

Inspection procedure R-11

Key reminder switch signal not input	Probable Cause
The input signal of the key reminder switch is used when determining the operation of the following functions. Therefore, if there is a problem in this input signal, then these functions will not operate correctly. • Ignition key left in warning function • Key left in warning function • Keyless entry • Ignition key cylinder illumination light • Interior lights	• Fault in key reminder switch • Fault in ETACS-ECU • Fault in harness or connectors

Check connector C-202
NG → **Repair**
OK ↓

Check the key reminder switch (Chap. 54A Ignition switch *)
NG → **Replace**
OK ↓

Measure at the Key reminder switch connector C-202
• Detach the connector and measure at the harness side
• Connectivity between 4 & body earth
OK: Connectivity
NG → **Check connector** C-107
OK ↓ / NG → **Repair**
Check the harness between the key reminder switch and the body earth, and repair
OK ↓

Check connector C-226
OK ↓ / NG → **Repair**

Check the harness between the key reminder switch and the ETACS-ECU
NG → **Repair**
OK ↓

SWS monitor service data
ETACS switch data
• Ignition switch: OFF (key inserted)

Item No.	Item Name	Normal state
03	Key reminder SW	ON

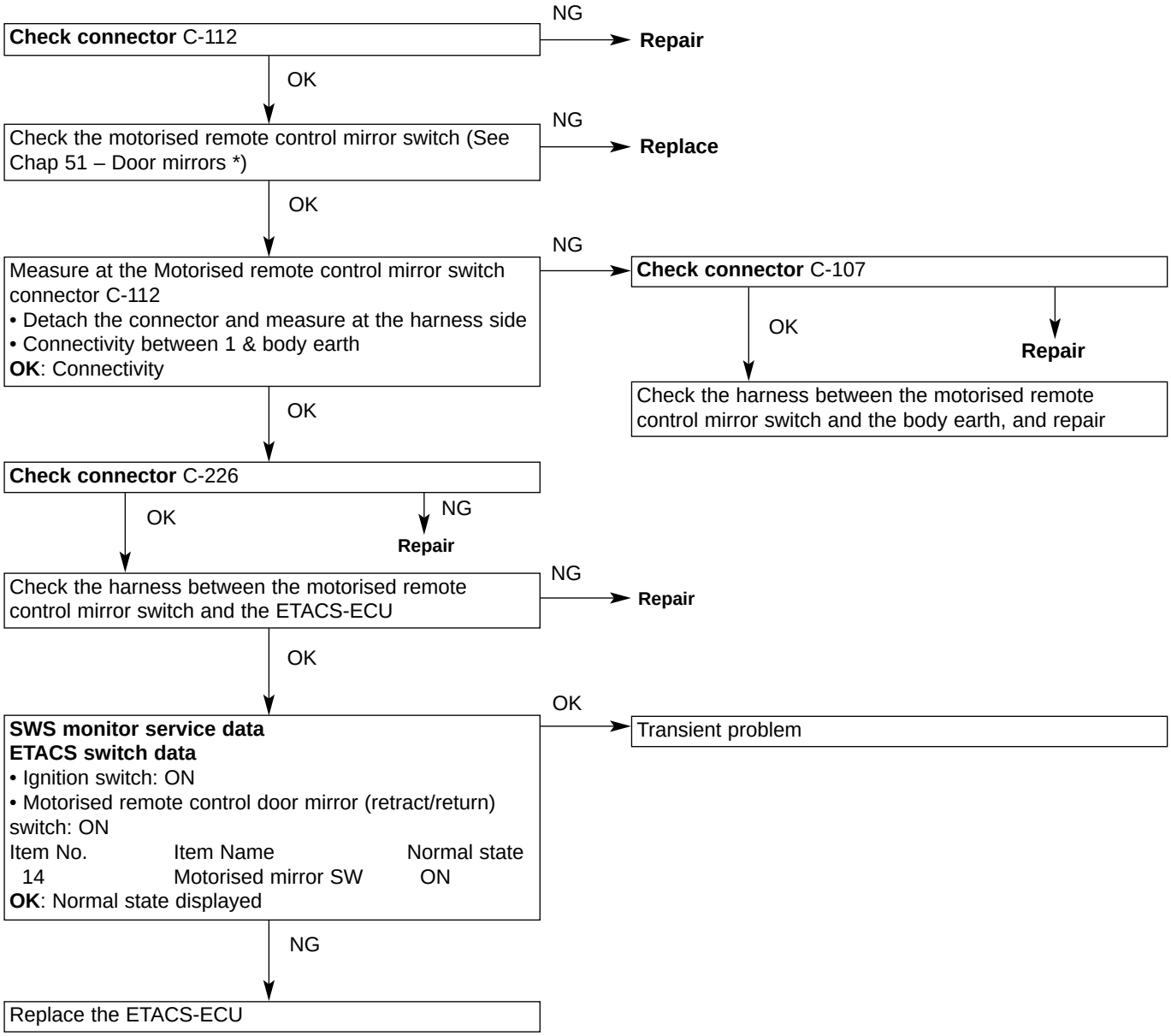
OK: Normal state displayed
NG → Replace the ETACS-ECU
OK ↓

Transient problem

Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

Inspection procedure R-12

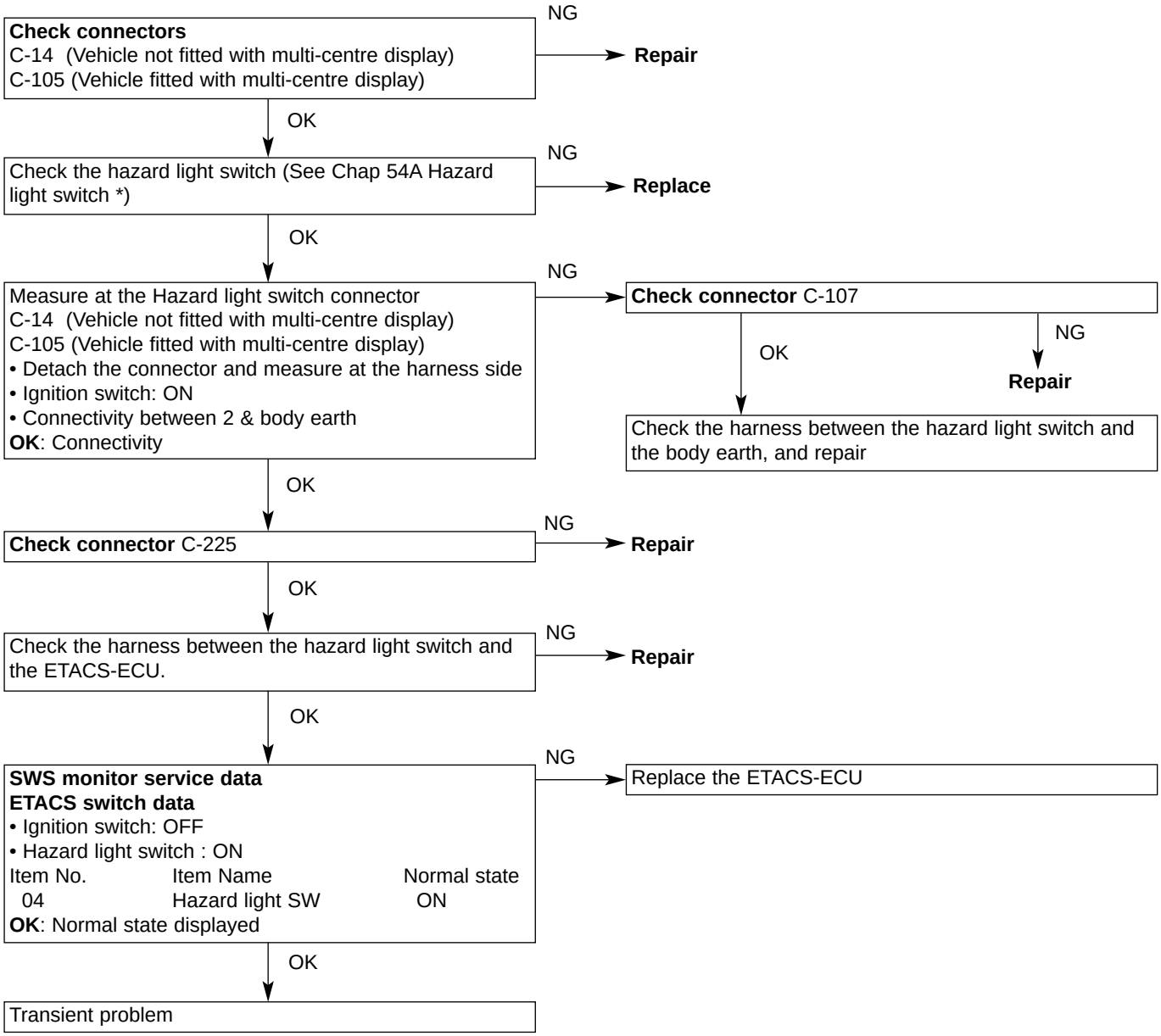
Motorised remote control mirror switch (retract / return switch) signal not input	Probable Cause
The input signal of the motorised remote control mirror switch (retract / return) switch is used to determine the operation of the motorised retractable door mirrors, and therefore, if there is a problem with this signal, the retract/return operation for the door mirrors will not be possible, even when the motorised remote control mirror switch is pressed.	∑ Fault in motorised remote control mirror switch ∑ Fault in ETACS-ECU ∑ Fault in harness or connectors



Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

Inspection procedure R-13

Hazard light switch signal not input	**Probable Cause**
The hazard light switch input signal is used to determine the operation of the hazard lights, and therefore, if there is a problem with this signal, then the hazard lights will not light up.	• Fault in hazard light switch • Fault in ETACS-ECU • Fault in harness or connectors



Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

Inspection procedure R-14

All door switch signals not input (except driver's door)	Probable Cause
Because the input signals from all the door switches are used to determine the operation of the following functions, these functions will not work correctly if there is an error in the input signals. • Keyless entry system • Room light The driver's door switch is connected internally via the ETACS-ECU, so it should also be checked that there is no malfunction in the driver's door switch input signal.	• Fault in door switch • Fault in ETACS-ECU • Fault in harness or connectors

SWS monitor service data
(Communications data) ETACS-ECU
• Driver's door: Open

Item No.	Item Name	Normal state
32	Front door SW RH	ON

OK: Normal state displayed

NG → To Inspection procedure R-4 Driver's door switch signal not input (p.54B-98)

OK ↓

Check the state of installation of the door switch on the body

NG → **Repair**

OK ↓

Check connectors
(Front passenger door) D-15
(Rear left passenger door) D-09
(Rear right passenger door) D-07

NG → **Repair**

OK ↓

Check the door switch (See Chap. 42 Doors*)

NG → **Replace**

OK ↓

Check connectors
(Front passenger door) C-29, C-212, C-224
(Rear left passenger door) C-29, C-212, C-224
(Rear right passenger door) C-215, C-224

NG → **Repair**

OK ↓

Check the harnesses between the respective door switches and the ETACS-ECU

NG → **Repair**

OK ↓

SWS monitor service data
(Communications data) ETACS
• Doors: Respectively opened and closed

Item No.	Item Name	Normal state
38	Security alarm	ON

OK: Normal state displayed

OK → Transient problem

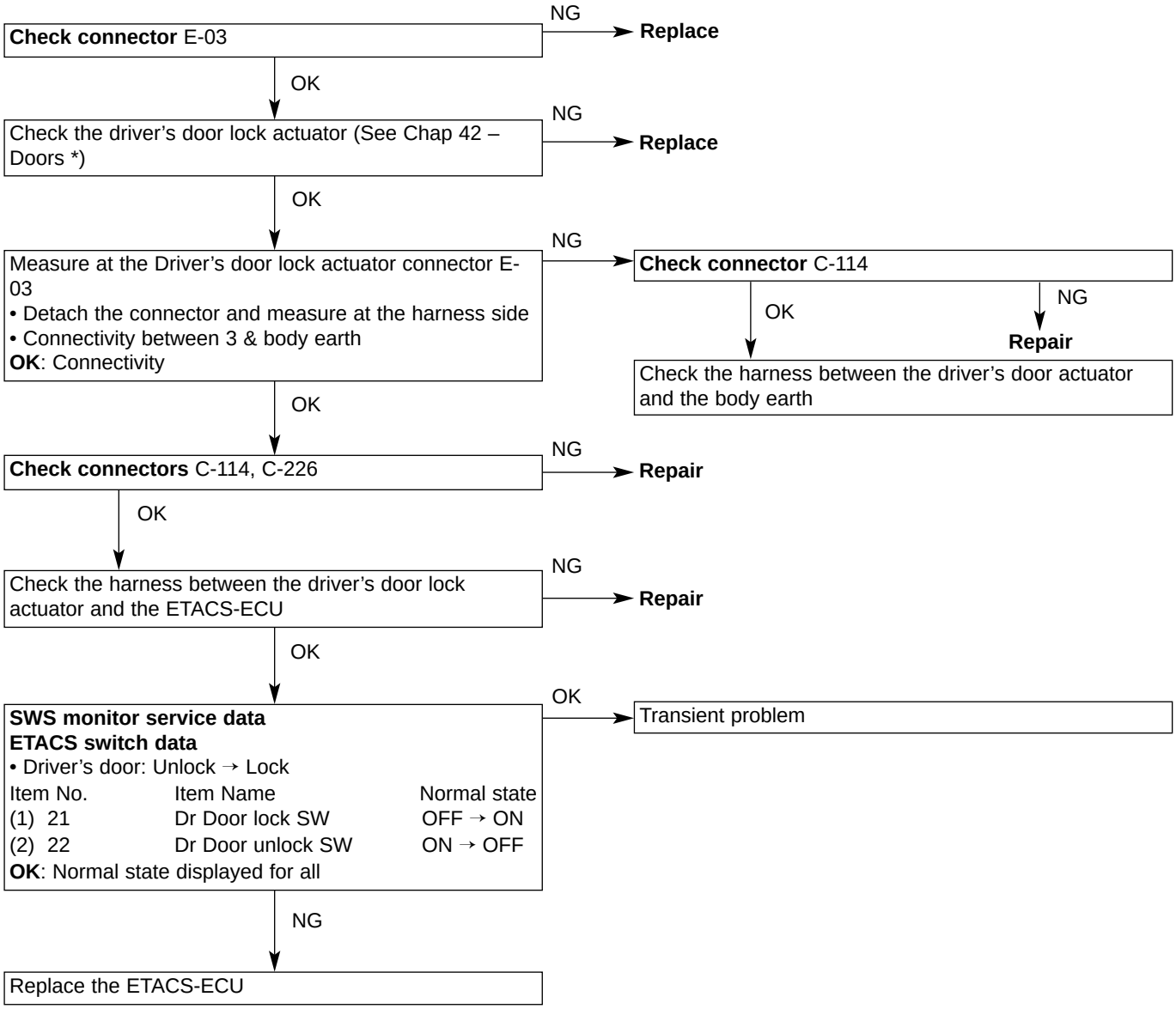
NG ↓

Replace the ETACS-ECU

Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

Inspection procedure R-15

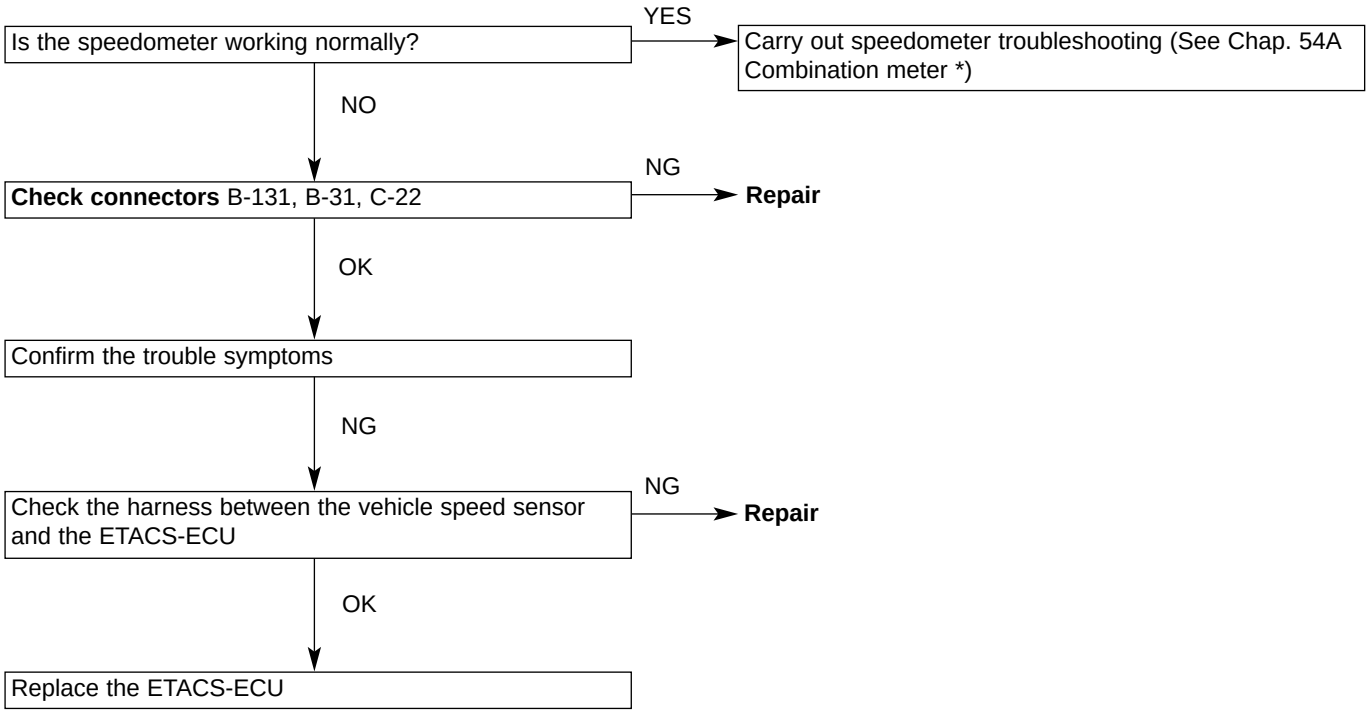
Driver's door lock actuator signal not input	Probable Cause
Because the driver's door actuator input signal is used to determine the operation of the following functions, these functions will not work correctly if there is an error in the input signal. • Key left in reminder function • Central door locking • Keyless entry system • Interior lights (operating keyless entry answer back)	• Fault in driver's door lock actuator • Fault in ETACS-ECU • Fault in harness or connectors



Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

Inspection procedure R-16

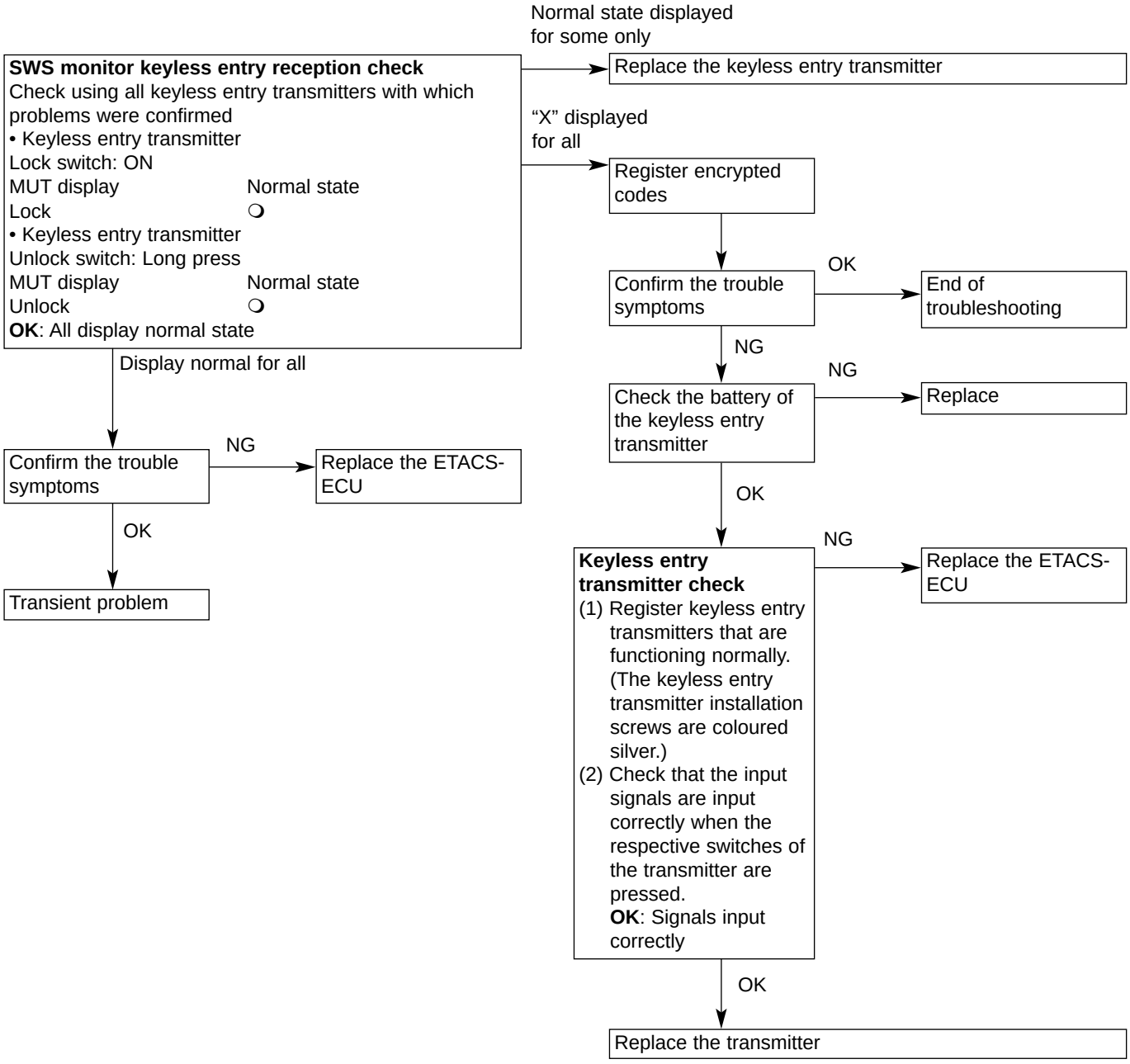
Vehicle speed signal not input	Probable Cause
Because the vehicle speed signal is used to determine the operation of the following functions, these functions will not work correctly if there is an error in the input signal. • Windscreen wipers/washers (speed sensitive wiper function) • Motorised retractable door mirrors (automatic return function)	• Fault in vehicle speed sensor • Fault in ETACS-ECU • Fault in harness or connectors



Note:
(1) The vehicle speed senor signal input is checked during actual travel of the vehicle.
(2) *: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

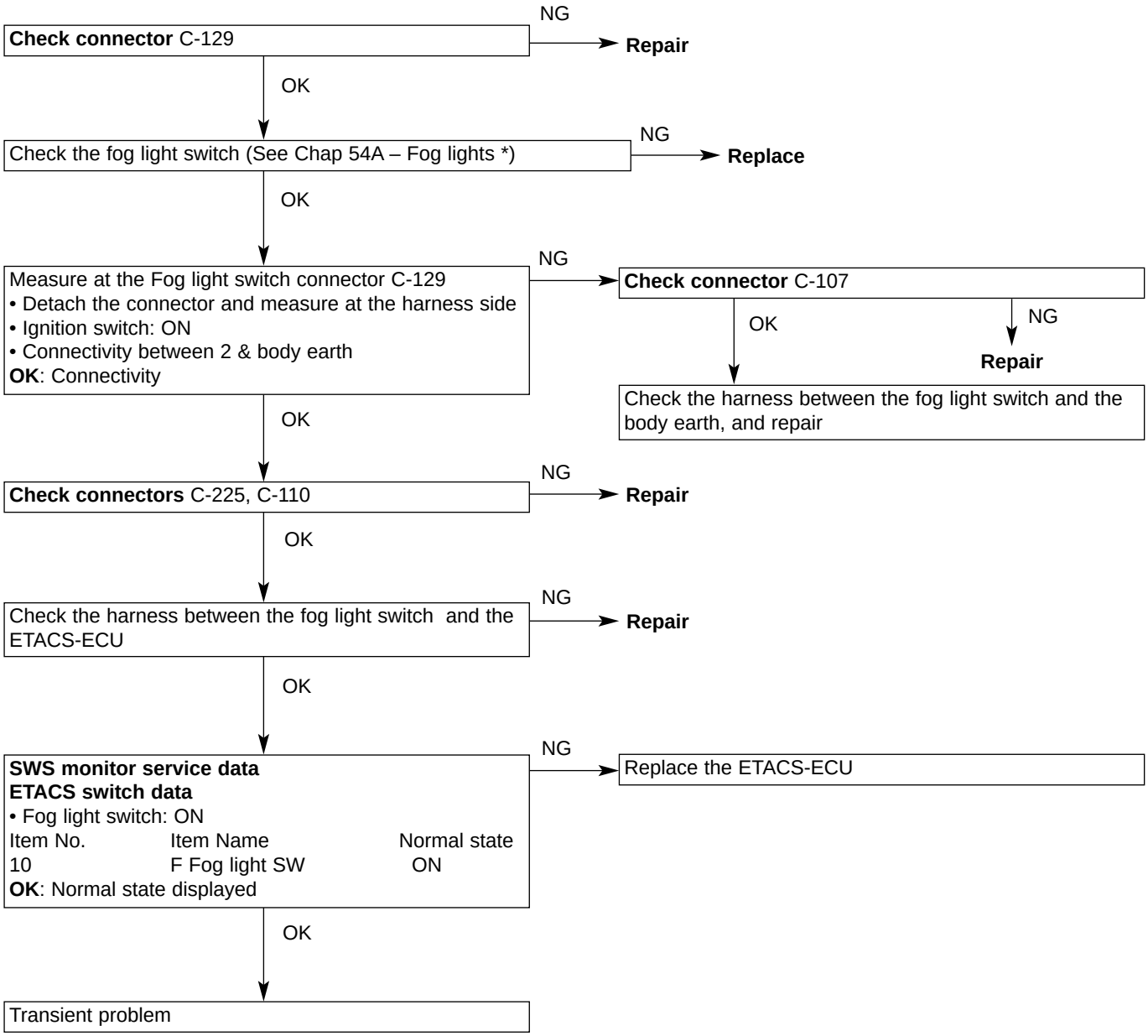
Inspection procedure R-17

Various switch signals of keyless entry transmitter not input	Probable Cause
The keyless entry transmitter input signal is used to determine the operation of the keyless entry system, and if there is a problem with this signal, then the keyless entry system will not work correctly.	• Fault in keyless entry transmitter • Fault in keyless entry transmitter battery • Fault in ETACS-ECU



Inspection procedure R-18

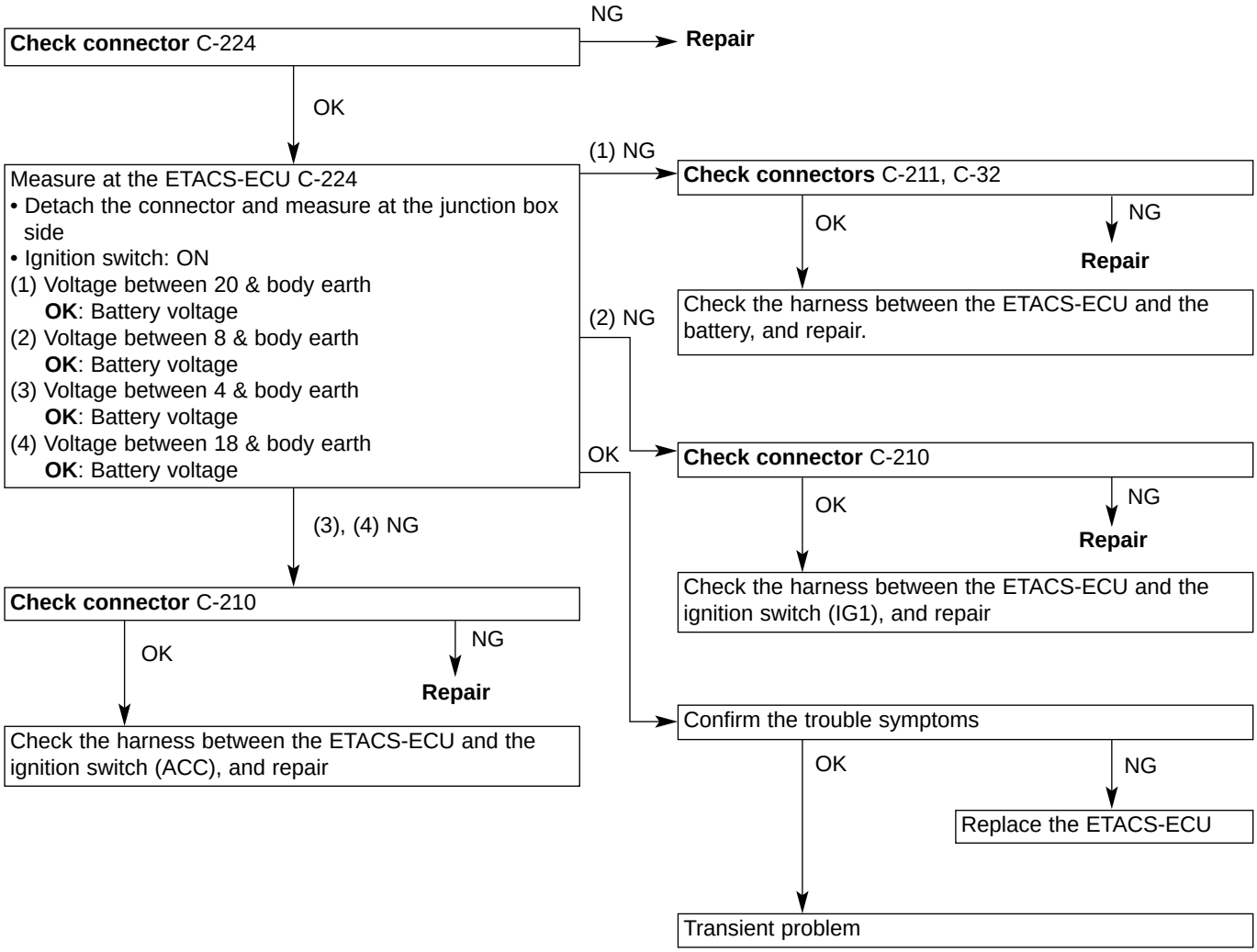
Fog light switch signal not input	Probable Cause
The fog light switch input signal is used to determine the operation of the fog lights, so any problem in this signal will prevent the fog lights from lighting up.	• Fault in fog light switch • Fault in ETACS-ECU • Fault in harness or connectors



Note:
*: See '00-5 Lancer Sedia Servicing Manual (No. 1036K00)

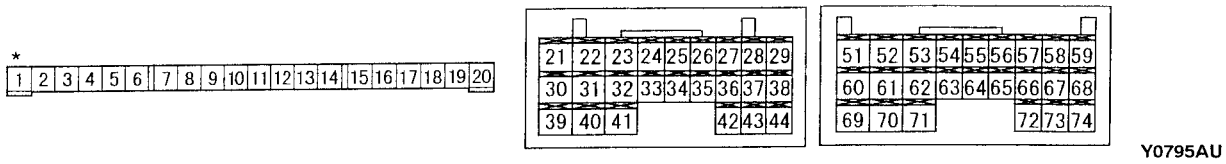
Inspection procedure R-19

Generic fuse No.17 load use signal not detected	Probable Cause
The generic fuse No.17 load signal is used to determine the interior light cut-off function, and if there is a problem in this signal, then the following functions will cease to work properly. • Ignition key cylinder illumination light • Interior light	• Fault in ETACS-ECU • Fault in harness or connectors



11. Chart of terminal voltages

11-1 ETACS-ECU

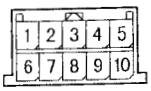


Note :
Terminals No. 1 to 20 cannot be measured as the ETACS-ECU is installed directly on the junction box, and they are listed for reference.

Terminal No.	Check Item	Check Conditions	Normal State
1	Electric window relay output	Electric windows operable	Battery voltage
2	Central door lock power supply (battery voltage)	Any	Battery voltage
3	Earth (for ECU)	Any	0V
4	Ignition switch (ACC)	Ignition switch : ACC	Battery voltage
5	Interior light output	Interior lights switched on	2V or lower
6	Interior light power supply (battery voltage)	Any (Interior light cut-off function not operating)	Battery voltage
7	All door switch input	Any door switch : ON (door open)	0V
8	Ignition switch (IG1) power supply	Ignition switch : ON	Battery voltage
9	RH Turn indicator light output	RH Turn indicator light on	Battery voltage
10	Driver's door switch input	Driver's door switch : ON (door open)	0V
11	Hazard light power supply (battery voltage)	Any	Battery voltage
12	Central door locking (lock) output	Door lock actuator operating (lock operation)	Battery voltage
13	Central door locking (unlock) output (except driver's)	Door lock actuator operating (unlock operation)	Battery voltage
14	LH Turn indicator light output	LH Turn indicator light on	Battery voltage
15			
16	Rear wiper output	Rear wiper operating	Battery voltage
17	Rear wiper automatic stop signal input	Rear wiper operating	Battery voltage
18	Ignition switch (ACC) power supply	Ignition switch : ACC	Battery voltage
19			
20	Battery voltage (for ECU)	Any	Battery voltage
21			
22	Central door locking (unlock) output (for driver's door) (Vehicle fitted with keyless entry)	Door lock actuator operating (unlock operation)	Battery voltage
23	Rear washer output	Rear washer operating	Battery voltage
24	Motorised remote control mirror switch (fold / return switch) input	Motorised remote control mirror switch (fold / return) switch : ON	0V
25 – 29			
30	Key reminder switch input	Key reminder switch : ON (Ignition key removed)	0V
31	Motorised foldable door mirror output	Motorised foldable door mirrors operating (fold operation)	Battery voltage

Terminal No.	Check Item	Check Conditions	Normal State
32 – 34			
35	Driver's door lock actuator (lock switch) input	Driver's door lock: when locked	0V
36	Driver's door lock actuator (unlock switch) input	Driver's door lock: when unlocked	0V
37, 38			
39	Reversing light switch input	Shift lever : R Ignition switch : ON	Battery voltage
40	Motorised foldable door mirror output	Motorised foldable door mirror operating (folding operation)	12V
41 – 43			
44	Horn output	Alarm operating (horn output)	0V
51	Diagnosis output or input check signal output	Diagnosis being output(MUT-II/III connection or diagnosis connector No.1 earthed to body)	0 – 12V (pulse signal)
		When input check is being output	0V, 12V (changing input signal)
52			
53	Door ajar indicator light output	Door ajar indicator light switched on	0V
54	Fog light switch input	Fog light switch : ON	0V
55	Hazard light switch input	Hazard light switch : ON	0V
56	Earth (for sensor)	Any	0V
57,58			
59	SWS communications line	Any	0 – 12V (pulse signal)
60-62			
63	Vehicle speed signal input	Vehicle travelling	0 – 12V (pulse signal)
64, 65			
66	Intermittent windscreen wiper volume input	Ignition switch : ACC Volume position : FAST → SLOW	0 → 2.5 V
67	Diagnosis control input	MUT-II/III connected	0V
68	SWS request signal output	Any	0 – 12V (pulse signal)
69	Ignition key cylinder illumination light output	Ignition key cylinder illumination switched on	2V or lower
70			
71	Interior light power supply	Any (Interior light cut-off function not operating)	Battery voltage
72-74			

11-2 Column switch



X1209CA

Terminal No.	Check Item	Check Conditions	Normal State
1	Battery power supply	Any	Battery voltage
2	SWS request signal input	Any	0 – 12 V (pulse signal)
3	SWS communications line	Any	0 – 12 V (pulse signal)
4	Earth	Any	0V
5			
6	Intermittent windscreen wiper volume output	Ignition switch : ACC Volume position : FAST → SLOW	0 → 2.5V
7			
8	Windscreen wiper switch back-up output	Low speed windscreen wiper or High speed windscreen wiper : ON	0V
9	Ignition switch (IG1) power supply	Ignition switch : ON	Battery voltage
10	Head light switch back-up output	Head light switch : ON	0V

11-3 Front ECU

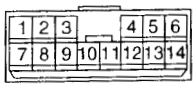
X1210CA

Note : The front ECU is installed directly on the relay box, and cannot be measured. The terminals are listed here for reference.

Terminal No.	Check Item	Check Conditions	Normal State
1	Fog light output	Fog lights switched on	
2	Head light (high beam) output	Head lights (high beam) switched on	Battery voltage
3, 4	Battery power supply (for head light)	Any	Battery voltage
5	Battery power supply (for tail light)	Any	Battery voltage
6	Head light (low beam) output	Head lights (low beam) switched on	Battery voltage
7	Battery power supply (for ECU)	Any	Battery voltage
8	Tail light output	Tail lights switched on	Battery voltage
9 – 11			
21	Windscreen washer output	Windscreen washer operating	Battery voltage
22	SWS communications line	Any	0 – 12V (pulse signal)
23	Windscreen wiper automatic stop signal input	Windscreen wiper operating	Battery voltage
24	Ignition switch (ACC) power supply	Ignition switch : ACC	Battery voltage
25	Head light switch back-up input	Head light switch : ON	0V
26	Windscreen wiper switch back-up input	Low-speed windscreen wiper switch or high-speed windscreen wiper switch : ON	0V
27	Windscreen wiper (LO speed) output	Windscreen wiper operating (Low speed operation)	Battery voltage
28	Windscreen wiper (HI speed) output	Windscreen wiper operating (High speed operation)	Battery voltage

Terminal No.	Check Item	Check Conditions	Normal State
29	Earth	Any	0V
30	Ignition switch (IG2) power supply	Ignition switch : ON	Battery voltage
31	Earth	Any	0V

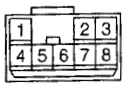
11-4 Electric window main switch



AC103264

Terminal No.	Check Item	Check Conditions	Normal State
1	Electric window motor output		
2	Earth	Any	0V
3			
4	SWS communications line (with ETACS-ECU)	Any	0 – 12V (pulse signal)
5			
6	Power supply	Electric window relay : ON	Battery voltage
7	Electric window motor output		
8	Electric window motor input (pulse sensor GND)		0V
9	Electric window motor input (pulse sensor signal)	During electric window operation	0 – 5V (pulse signal)
10	Electric window motor input (pulse sensor signal)	During electric window operation	0 – 5V (pulse signal)
11	Communications line (electric window sub switch)	Electric window relay : ON	0 – 12V (pulse signal)
12	Electric window motor input (pulse sensor power supply)	During electric window operation	5V
13, 14			

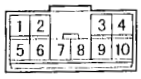
11-5 Electric window sub switch



AC103265

Terminal No.	Check Item	Check Conditions	Normal State
1	Earth	Any	0V
2	Electric window motor input		
3	Electric window motor input		
4	Power supply	Electric window relay : ON	Battery voltage
5	Electric window motor output		
6	Communications line	Electric window relay : ON	0 – 12V (pulse signal)
7	Electric window motor output		
8	Electric window motor input		

11-6 Sunroof motor assembly



X1214CA

Terminal No.	Check Item	Check Conditions	Normal State
1	Battery voltage (for motor)	Any	Battery voltage
2	Ignition switch (IG2) power supply	Ignition switch : ON	Battery voltage
3, 4			
5	Earth	Any	0V
6	Sunroof switch (close / open) input	Sunroof switch : Close / Open	0V
7	Sunroof switch (up) input	Sunroof switch : Up	0V
8	Sunroof switch (open) input	Sunroof switch : Open	0V
9			
10	SWS communications line	Any	0 – 12V (pulse signal)

On Vehicle Servicing

Adjustment function (User Mode)

By setting the various switches to match the conditions for entering adjustment mode, you can switch the security alarm function on and off, or adjust the warning output. Any adjustments made are saved, even when the battery is disconnected.

1. Entering adjustment mode

(1) Set the following switches as indicated.
- Driver's door switch: ON (driver's door open)
- Key reminder switch: ON (ignition key removed)
- Lighting switch: OFF

(2) If the windscreen washer switch is switched on continuously for 10 seconds or more (by pulling the wiper lever towards you), then the ETACS-ECU buzzer will sound once, and the system will enter adjustment mode. In this state (and keeping the wiper lever pulled towards you) the setting can be changed each time you press the unlock switch on the transmitter.

2. Adjusting the security alarm functions

You can switch the security alarm function on and off, and change the alarm time, in the following sequence. (After option c, the sequence starts again from a.)

a. Security alarm function OFF. (Initial state): Buzzer sounds once.
b. Security alarm function ON. (Hazard and horn used for alarm): Buzzer sounds 3 times.
c. Security alarm function ON. (Horn only used for alarm): Buzzer sounds 5 times.

3. Cancelling adjustment mode

The adjustment mode is cancelled when any one of the following conditions is met.
- Driver's door switch: OFF (Driver's door closed)
- Key reminder switch: OFF (ignition key inserted)
- Lighting switch: ON
- Windscreen washer switch: OFF
- If 30 seconds have elapsed without the unlock switch being pressed.

Note

1. Although the wiper washer switch and transmitter are operated during adjustment mode, the wiper/washer and keyless entry system are not activated by these operations.
2. This adjustment function is also described in the Owner's Manual, so that users are able to perform the adjustment procedure themselves.
3. The user's wishes should be confirmed fully before setting up this function. (Where possible, get users to set up the function themselves, so that they understand how it works.)

Adjustment function (Dealer mode)

The following functions can be adjusted from the MUT-II/III. Any adjustments made will be saved, even if the battery is disconnected.

- Door ajar warning.
  If any one of the doors, including the boot, is open whilst the vehicle is travelling, then this function warns the driver that a door is open by sounding a buzzer and causing a door ajar indicator light to flash on the combination meter..
- Turn indicator buzzer
  This function causes a buzzer to sound in synchronization with the hazard lights and turn indicator lights.
- Keyless entry system hazard light answer back function
  This function allows the driver to confirm a lock/unlock operation, even when he or she is away from the car. The hazard lights flash when a lock or unlock operation is performed by the keyless entry transmitter.
- Operation of electric window and sunroof by multi-mode keyless entry system
  This function causes the electric window and sunroof to close when the keyless entry transmitter is operated, even when the driver is away from the car.
- Timer lock delay after keyless entry unlock
  If any door, including the boot, is not opened after the doors have been unlocked by operation of the keyless entry transmitter, then after a prescribed time delay, the doors are automatically locked again.
- Electric window and sunroof timer function.
  This function allows the electric window and sunroof to be operated for a prescribed time, even after the ignition switch has been set to the LOCK (OFF) position.
- Electric window lock driver operation
  This function allows electric windows other than the driver's window to be operated by the electric window main switch, when the electric window lock switch built into the electric window main switch has been pressed.
- Vehicle speed sensitive wiper function
  This function changes the intermittent wiper period in accordance with the intermittent wiper adjustment knob and the vehicle speed, when the windscreen wiper switch is set to the intermittent position.
- Rear wiper intermittent period
  When the rear wiper switch is on, the rear wipers work intermittently. This function sets the rear wiper to continuous operation, when the rear wiper switch is operated continuously.
- Automatic return function for motorised retractable door mirror
  This function opens the door mirrors automatically if the vehicle is travelling with the door mirrors retracted. Other methods can also be used to perform the retract / return operation of the door mirrors.
- Head light automatic cut-off function
  This function automatically turns off the head lights if the driver's door is opened when the lighting switch is set to the TAIL, AUTO, or HEAD position, and the ignition switch is set to LOCK (OFF).
- Interior light delayed switch off period
  This function causes the interior lights to switch off automatically after a prescribed delay, when the door has been closed with the ignition switch in the LOCK (OFF) position.

- Interior light automatic cut-off function
  This function automatically switches off the interior lights after a specified time delay if they have been left on with the ignition switch in the LOCK (OFF) position.
- Security alarm
  Switches the security alarm function on and off.
- Adjustment during electric window key off timer
  This function allows electric windows other than the driver's window to be operated during operation of the electric window timer.
- Initialise all functions (return to initial settings)
  This function returns all the adjusted functions to their original factory settings.

Item No.	MUT item display	Item	MUT adjustment display	Details of adjustment
2	HD auto cut-off	Head light automatic cut-off function	Function ON (A)	Function ON: The tail lights are automatically switched off, if turned on when the ignition switch is at the LOCK (OFF) position.
			Function ON (D)	Function ON: The tail lights are not automatically switched off, if turned on when the ignition switch is at the LOCK (OFF) position. (Initial setting)
			Function OFF	Function OFF
4	Speed sensitive wiper	Vehicle speed sensitive wiper function	Function ON	Function ON (initial setting)
			Function OFF	Function OFF
5	Door mirror	Motorised retractable door mirror: automatic return function	Speed sensitive function ON	Vehicle speed sensitive deployment (initial setting)
			IG operated function ON	Linked to ignition
			Keyless operated function ON	Linked to keyless entry
			Function OFF	No function
6*1	Keyless (horn)	Keyless entry horn answer back	Lock operated	Sounds at each lock operation
			Lock operated twice	Sounds when lock is operated twice consecutively (within 1 second)
			Function OFF	Function OFF
8*1	Keyless (horn) night time	Keyless entry horn answerback: night time disabling	Normal	Operates according to keyless entry horn answerback adjustment function setting
			Night time operation disabled	Operates according to keyless entry horn answerback adjustment function setting, but horn sound disabled during night time
9	Keyless (hazard)	Keyless entry system: hazard answer back function	Light up on lock, unlock	Function ON for both lock and unlock (initial setting)
			Light up on lock only	Function ON for lock only
			Light up on unlock only	Function ON for unlock only
			Function OFF	Function OFF

Item No.	MUT item display	Item	MUT adjustment display	Details of adjustment
10	Keyless (P/W)	Multi-mode keyless entry system: Electric window and sunroof operation	Open and close	Both close and open operations (open operation for windows only)
			Close only	Close operation only (initial setting)
			Function OFF	Function OFF
11	Security alarm	Security alarm	Horn and hazard	Function ON: Horn & Hazard
			Hazard only	Function ON: Hazard only
			Function OFF	Function OFF (initial setting)
15	Turn indicator buzzer	Turn indicator light operating sound function	Function ON	Function ON
			Function OFF	Function OFF (initial setting)
16	Interior light response time	Interior light delayed switch off time	60 s	60 s
			30 s	30 s
			15 s	15 s
			7.5 s	7.5 s
			NO delayed switch off	0 s (no delay operation)
18	Key off timer period	Electric window & sunroof timer function period	Timer function OFF	Timer function OFF
			30 s	30 s (initial setting)
			3 min.	3 min.
			10 min.	10 min.
19	P/W key off timer	Operational adjustment during electric window key off timer *2	Normal operation	Accepts normal operation during timer period (initial setting)
			Main S/W operation prohibited	Prohibits operation of electric windows (except driver's) from electric window main switch, during timer period
24	Keyless timer lock T	Timer lock time after keyless entry unlock	30 s	30 s (initial setting)
			60 s	1 min.
			120 s	2 min.
			180 s	3 min.
26	Door ajar buzzer	Door ajar warning function	Function ON	Function ON (initial setting)
			Function OFF	Function OFF
28	Rear wiper INT period	Rear wiper intermittent period	8 s	8 s: No continuous operation (initial setting)
			4 s (continuous ON)	4 s (continuous ON)
			8 s (continuous ON)	8 s (continuous ON)
			16 s (continuous ON)	16 s (continuous ON)
			Continuous operation	Continuous operation (no intermittent operation)
30	Interior light auto cut-off	Interior light automatic cut-off function	3 min.	Automatic cut-off ON: 3 min.
			30 min.	Automatic cut-off ON: 30 min. (initial setting)
			60 min.	Automatic cut-off ON: 60 min.
			Function OFF	Automatic cut-off OFF
31	P/W lock mode	Electric window lock driver operation	All seat operation ON	Operation possible from all seats when locked (initial setting)
			Only driver's seat operation	Operation prohibited from seats other than driver's, when locked

Note

1. *1 optional: Can only be adjusted when the smart entry system is fitted. After fitting the smart entry system, a list of adjustable functions will be displayed when the entry system is operated for the first time. If all the functions are initialised, then the adjusted items will be deleted, but by activating the smart entry system, the list of adjusted functions will be displayed again.

2. *2 This adjustment item restricts the operation of the electric window timer function, and is used when performing Inspection procedure D-8 “Electric window comes down automatically”.

Initialising all functions (Returning to initial settings)
This function allows all of the adjusted functions to be returned to the original factory settings.