SERVICE BULLETIN

MITSUBISHI MOTORS

GLOBAL AFTER SALES OFFICE, MITSUBISHI MOTORS CORPORATION

PURPOSE : INFORMATION	ISSUE NO. : MSB-11E00-015	DATE : 2011-09-25.
SUBJECT : INFORMATION ON 2012 LANCER/LANCER SPORTBACK		<MODEL> (EUR/RUSSIA) <M/Y> 12
GROUP : GENERAL		LANCER(CY0A) LANCER SPORTBACK(CX0A)

1. Description:

This Service Bulletin contains the information about the 2012 LANCER/LANCER SPORTBACK

2. Applicable Manuals:

Manual	Pub. No.	Attached Sheet
2012 LANCER/LANCER SPORTBACK Workshop Manual	CG1E12E1-CD(Eng) CG1F12E1-CD(Fre) CG1G12E1-CD(Ger) CG1S12E1-CD(Spa) CG1I12E1-CD(Ita) Russia:N/A	Attached sheet

3. Details:

See Attached sheet

OUTLINE OF CHANGE ON 2012 MODELS

Group		Details of change
11	ENGINE <4A9>	・4A91 is discontinued. ・EPS (electric power steering) is changed to HPS (hydraulic power steering). <Euro4> ・Flywheel is changed.
	ENGINE <4B1>	・4B11−Turbo is discontinued. ・EPS (electric power steering) model is discontinued. All power steering models are with HPS (hydraulic power steering). ・Drive belt tension is changed. ・According to the discontinuation of exhaust side MIVEC, the following changes are applied. 　・Exhaust valve timing is changed. 　・Exhaust oil feeder control valve is discontinued. 　・Exhaust V.V.T. sprocket is changed to the exhaust camshaft sprocket. 　・Exhaust camshaft position sensor is discontinued.
	ENGINE <4J1>	4J1 engine (1800) is newly introduced.
	ENGINE <4N1>	・According to the change of drive belt layout (discontinuation of idle pulley between crankshaft and air conditioner compressor), the indicator marking and the drive belt tension are changed. ・According to the discontinuation of MIVEC, the following changes are applied. <Low−power models> 　・Oil feeder control valve is discontinued. 　・Rocker arm & shaft assembly is changed.
13	MPI <4A9>	The specification of the oxygen sensor is changed.
	MPI <4B1>	According to the discontinuation of exhaust side MIVEC, the following changed are applied. 　・Exhaust oil feeder control valve is discontinued. 　・Exhaust V.V.T. sprocket is changed to the exhaust camshaft sprocket. 　・Exhaust camshaft position sensor is discontinued.
	MPI <4J1>	4J1 engine (1800) is newly introduced.
	DIESEL FUEL	・AS&G system is introduced on low−power models. ・Fuel filter pressure switch is discontinued.
14	ENGINE COOLING	・Cooling line is changed. <4N1> ・4J1 engine (1800) is newly introduced.
15	INTAKE・EXHAUST	・Vertically−mount style main muffler layout is adopted. ・4J1 engine (1800) is newly introduced. ・The specification of the oxygen sensor is changed. <4A9> ・EGR is discontinued. <4B1>
16	ENGINE ELECTRICAL	・According to the discontinuation of the exhaust side MIVEC, the following change is applied. <4B1> 　・Exhaust camshaft position sensor is discontinued. ・4J1 engine (1800) is newly introduced.
17	ENGINE・EMISSION CONTROL	・EGR is discontinued. <4B1> ・EGR cooler is changed. <4N1 (except MIVEC)>
23	CVT	・CVT fluid is changed. (DIA QUEEN CVTF−J1→ DIA QUEEN CVTF−J4)
34	REAR SUSPENSION	New specification is added. <4J1 engine (1800)>
35A	SERVICE BRAKE	New specification is added. <4J1 engine (1800)>
35C	ASC	・Hill start assist system is discontinued. ・ASG specification is added.
37	STEERING	EPS (electric power steering) is changed to HPS (hydraulic power steering). <1600>
51	EXTERIOR	Rear spoiler is changed. <Sportback>
52A	INTERIOR	・Automatic day/night inside rearview mirror is introduced. ・Rear split seat is changed. <Sedan>
54A	CHASSIS ELECTRICAL	・Corner sensor ECU is connected to the CAN communication line. ・Inside rearview mirror with built−in rear monitor is introduced.
54C	CAN	・Valve lift control unit is added. <4J1> ・Corner sensor ECU is connected to the CAN communication line.
55A	HEATER・AIR CONDITIONER・VENTILATION	A/C compressor is changed. (QS90 → QS70) <1600>
PERIODIC INSPECTION PROCEDURE		・No change in the periodic inspection procedure due to the discontinuation of MIVEC on 4B1. ・Valve clearance inspection interval <4J1 engine>: 60,000 km

GROUP 00

GENERAL

CONTENTS

VEHICLE IDENTIFICATION 00-2
MODELS <LANCER> 00-2
MODELS <LANCER SPORTBACK> 00-5
VEHICLE IDENTIFICATION NUMBER (CHASSIS NUMBER) 00-6
VEHICLE INFORMATION CODE PLATE. . 00-7
MANUFACTURER PLATE 00-8
VEHICLE IDENTIFICATION NUMBER (VIN) PLATE 00-8
ENGINE MODEL STAMPING 00-9

GENERAL DATA AND SPECIFICATIONS 00-10
GENERAL DATA AND SPECIFICATIONS <LANCER> 00-10
GENERAL DATA AND SPECIFICATIONS <LANCER SPORTBACK> 00-19

VEHICLE IDENTIFICATION

MODELS <LANCER>

M1001000306587

VEHICLES FOR EUROPE

<1600>

Model code		Engine model	Transmission model	Fuel supply system
CY1A	SRSPL6	4A92 (1,590 mL) DOHC MIVEC petrol engine <Low CO_2 specification>	F4A4A (Front wheel drive 2WD, 4A/T)	MPI
	SNSPL6		F5M43 (Front wheel drive 2WD, 5M/T)	
	SNSPR6			
	SNSXL6	4A92 (1,590 mL) DOHC MIVEC petrol engine <Low CO_2 specification> with Auto Stop & Go (AS&G) <Clear Tec AS&G>		

<1800>

Model code		Engine model	Transmission model	Fuel supply system
CY6A	SNSPL6	4J10 (1,798 mL) SOHC MIVEC petrol engine <Low CO_2 specification>	F5MBB (Front wheel drive 2WD, 5M/T)	MPI
	STSPL6		F1CJA (Front wheel drive 2WD, INVECS-III CVT with sport mode)	
	SNXPL6		F5MBB (Front wheel drive 2WD, 5M/T)	
	STXPL6		F1CJA (Front wheel drive 2WD, INVECS-III CVT with sport mode)	
	STXPR6			
	SNXXL6	4J10 (1,798 mL) SOHC MIVEC petrol engine <Low CO_2 specification> with Auto Stop & Go (AS&G) <Clear Tec AS&G>	F5MBB (Front wheel drive 2WD, 5M/T)	

Model code		Engine model	Transmission model	Fuel supply system
CY9A	SJLSL6	4N13 (1,798 mL) DOHC MIVEC Low-power diesel engine with intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>	F6MBA (Front wheel drive 2WD, 6M/T)	Common rail fuel injection (Electrical fuel injection)
	SJSSL6			
	SJSSR6			
	SJXSL6			
	SJXSR6			
	SJLXL6	4N13 (1,798 mL) DOHC MIVEC diesel engine with intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>		
	SJSXL6			
	SJXXL6			

VEHICLES FOR RUSSIA (EASTERM EUROPE COUNTRIES)

<1600>

Model code		Engine model	Transmission model	Fuel supply system
CY1A	SNSHL6Z	4A92 (1,590 mL) DOHC MIVEC petrol engine	F5M43 (Front wheel drive 2WD, 5M/T)	MPI
	SRSHL6Z		F4A4A (Front wheel drive 2WD, 4A/T)	

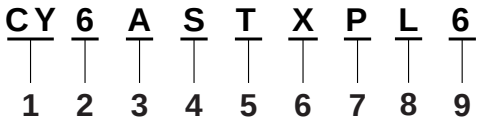
<1800>

Model code		Engine model	Transmission model	Fuel supply system
CY3A	SNSHL6Z	4B10 (1,798 mL) DOHC MIVEC petrol engine	F5MBB (Front wheel drive 2WD, 5M/T)	MPI
	STSHL6Z		F1CJA (Front wheel drive 2WD, INVECS-III CVT with sport mode)	

<2000>

Model code		Engine model	Transmission model	Fuel supply system
CY4A	SNXHL6Z	4B11 (1,998 mL) DOHC MIVEC petrol engine	F5MBB (Front wheel drive 2WD, 5M/T)	MPI
	STXHL6Z		F1CJA (Front wheel drive 2WD, INVECS-III CVT with sport mode)	

MODEL CODE



ACB01720

No.	Item	Content	
1	Development	CY	LANCER
2	Engine type	1	1.6L petrol engine (4A92)
		3	1.8L petrol engine (4B10)
		4	2.0L petrol engine (4B11)
		6	1.8L petrol engine (4J10)
		9	1.8L diesel engine (4N13)
3	Vehicle type	A	Passenger car
4	Body style	S	4-door sedan
5	Transmission type	J	6M/T
		N	5M/T
		R	4A/T
		T	CVT
6	Price class (Trim level)	L	BASE
		S	INFORM <Vehicles for Europe (Except for Russia)>
			INVITE <Vehicles for Russia>
		X	INTENSE
7	Engine specification	H	MIVEC (DOHC)
		P	Low CO_2 specification <Petrol engine>
		S	Intercooled turbocharger (Low-power)
		X	Auto Stop & Go (AS&G) <Clear Tec AS&G>
8	Steering wheel location	L	Left hand drive
		R	Right hand drive
9	Destination	6	Vehicles for Europe (Except for Eastern Europe countries)
		6Z	Vehicles for Russia (Eastern Europe countries)

MODELS <LANCER SPORTBACK>

M1001000306598

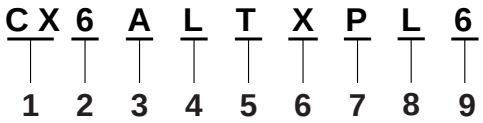
<1600>

Model code		Engine model	Transmission model	Fuel supply system
CX1A	LNSPL6	4A92 (1,590 mL) DOHC MIVEC petrol engine <Low CO_2 specification>	F5M43 (Front wheel drive 2WD, 5M/T)	MPI
	LNSPR6			
	LNSXL6	4A92 (1,590 mL) DOHC MIVEC petrol engine <Low CO_2 specification> with Auto Stop & Go (AS&G) <Clear Tec AS&G>		
	LNSXR6			

<1800>

Model code		Engine model	Transmission model	Fuel supply system
CX6A	LNSPL6	4J10 (1,798 mL) SOHC MIVEC petrol engine <Low CO_2 specification>	F5MBB (Front wheel drive 2WD, 5M/T)	MPI
	LTSPL6		F1CJA (Front wheel drive 2WD, INVECS-III CVT with sport mode)	
	LTSPR6			
	LNXPL6		F5MBB (Front wheel drive 2WD, 5M/T)	
	LTXPL6		F1CJA (Front wheel drive 2WD, INVECS-III CVT with sport mode)	
	LTXPR6			
	LNXXL6	4J10 (1,798 mL) SOHC MIVEC petrol engine <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>	F5MBB (Front wheel drive 2WD, 5M/T)	
CX9A	LJLSL6	4N13 (1,798 mL) DOHC MIVEC Low-power diesel engine with Intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>	F6MBA (Front wheel drive 2WD, 6M/T)	Common rail fuel injection (Electrical fuel injection)
	LJSSL6			
	LJSSR6			
	LJXSL6			
	LJXSR6			
	LJLXL6	4N13 (1,798 mL) DOHC MIVEC diesel engine with Intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>		
	LJSXL6			
	LJXXL6			

MODEL CODE



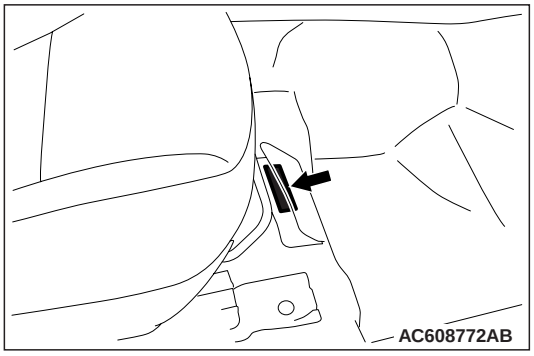
ACB01721

No.	Item	Content	
1	Development	CX	LANCER SPORTBACK
2	Engine type	1	1.6 L petrol engine (4A92)
		6	1.8 L petrol engine (4J10)
		9	1.8 L diesel engine (4N13)
3	Vehicle type	A	Passenger car
4	Body style	L	4-door with tailgate
5	Transmission type	J	6M/T
		N	5M/T
		T	CVT
6	Price class (Trim level)	L	BASE
		S	INFORM
		X	INTENSE
7	Engine specification	P	Low CO_2 specification <Petrol engine>
		S	Intercooled turbocharger (Low-power)
		X	Auto Stop & Go (AS&G) <Clear Tec AS&G>
8	Steering wheel location	L	Left hand drive
		R	Right hand drive
9	Destination	6	Vehicles for Europe

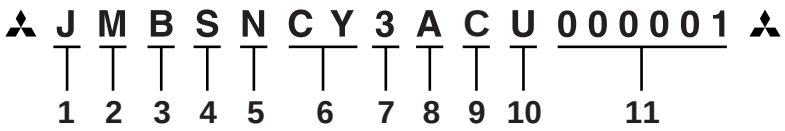
VEHICLE IDENTIFICATION NUMBER (CHASSIS NUMBER)

The vehicle identification number (chassis number) is stamped on the front floor pan right side.

M1001005602592



CODE CHART

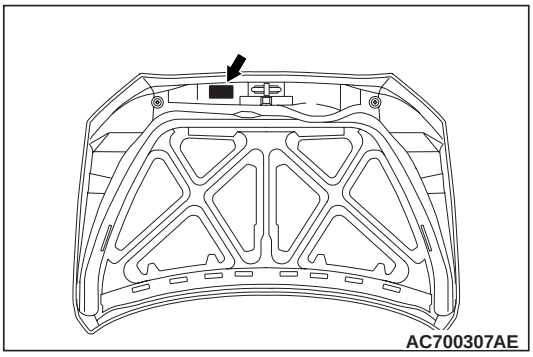


AC809191AE

No.	Item	Content	
1	Country	J	Japan
2	Make	M	Mitsubishi Motors Corporation.
3	Destination	A	Vehicles for Europe, right hand drive
		B	Vehicles for Europe, left hand drive
4	Body style	S	4-door sedan
		L	4-door with tailgate
5	Transmission type	J	6M/T
		N	5M/T
		R	4A/T
		T	CVT
6	Development order	CY	LANCER
		CX	LANCER SPORTBACK
7	Engine type	1	1.6L petrol engine (4A92)
		3	1.8L petrol engine (4B10)
		4	2.0L petrol engine (4B11)
		6	1.8L petrol engine (4J10)
		9	1.8L diesel engine (4N13)
8	Vehicle type	A	Passenger car
9	Model year	C	2012 year
10	Plant	U	Mizushima
11	Serial number	000001 to 999999	

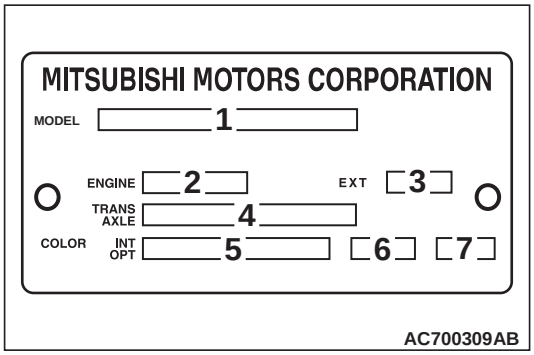
VEHICLE INFORMATION CODE PLATE

M1001005403201



The vehicle information code plate is riveted to the back of the hood.

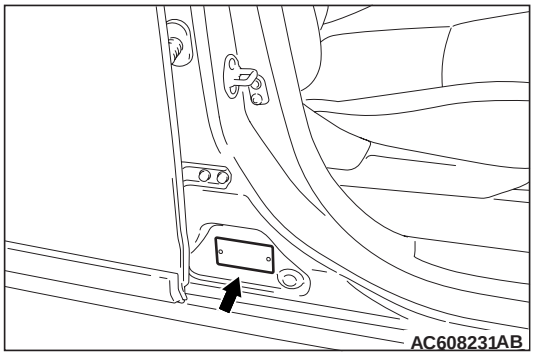
CODE CHART



No.	Item	Example	Content
1	MODEL	CY6AST XPL6	Vehicle model Model series
2	ENGINE	4J10	Engine model
3	EXT	W37A	Exterior code
4	TRANS AXLE	F1CJA 6120	F1CJA: Transmission model 6120: Rear differential final gear ratio (a decimal point is omitted)
5	COLOUR	W37	Body colour code
6	INT	04X	Interior code
7	OPT	ZP6	Equipment code

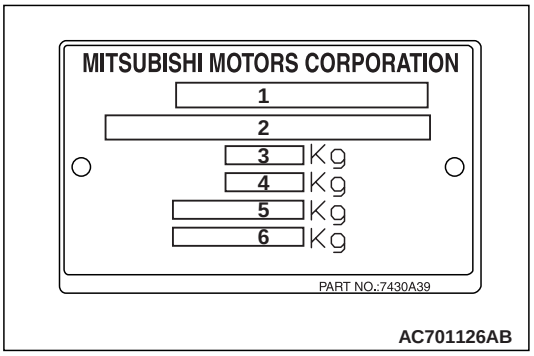
MANUFACTURER PLATE

M1001017600162



The manufacturer plate is attached to the face of the right door sill.

CODE CHART

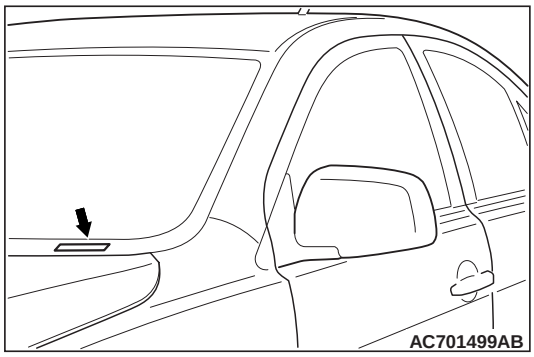


No.	Content
1	WVTA No. (Whole vehicle type approval number) <Vehicles for Europe>
	None <Vehicles for Russia>
2	Chassis No. (Vehicle identification number)
3	Gross vehicle weight
4	Gross combination weight
5	Gross axle weight front
6	Gross axle weight rear

VEHICLE IDENTIFICATION NUMBER (VIN) PLATE

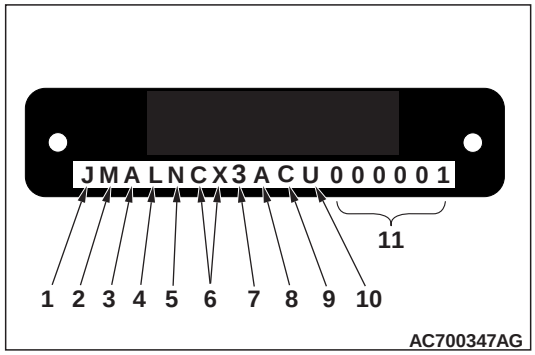
M1001005501990

<RIGHT HAND DRIVE VEHICLES>



The vehicle identification number (VIN) plate is located on a plate attached to the left top side of the instrument panel.

CODE CHART

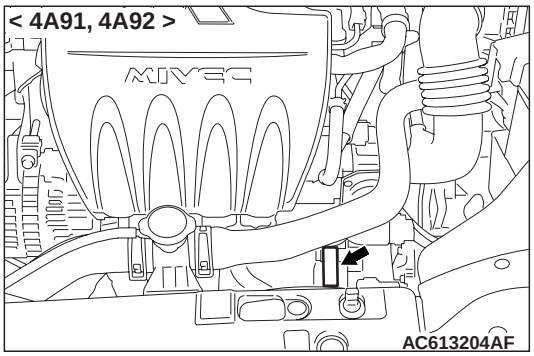


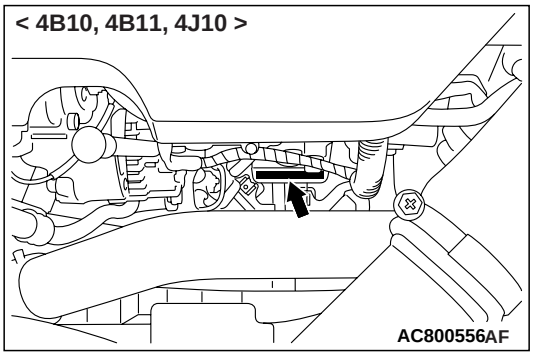
No.	Item	Content	
1	Country	J	Japan
2	Make	M	Mitsubishi Motors Corporation.
3	Destination	A	Vehicles for Europe, right hand drive
4	Body style	S	4-door sedan
		L	4-door with tailgate
5	Transmission type	J	6M/T
		N	5M/T
		T	CVT
6	Development order	CY	LANCER
		CX	LANCER SPORTBACK

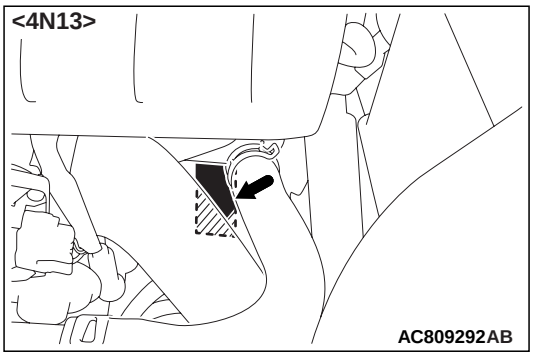
No.	Item	Content	
7	Engine type	1	1.6L (4A92)
		3	1.8L (4B10)
		4	2.0L (4B11)
		6	1.8L (4J10)
		9	1.8L (4N13)
8	Vehicle type	A	Passenger car
9	Model year	C	2012 year
10	Plant	U	Mizushima
11	Serial number	000001 to 999999	

ENGINE MODEL STAMPING

M1001005701109







The engine model is stamped on the cylinder block. These engine model numbers are as shown as follows.

Engine model	Engine displacement
4A92	1,590 mL
4J10	1,798 mL
4B10	1,798 mL
4N13	1,798 mL
4B11	1,998 mL

The engine serial number is stamped near the engine model number.

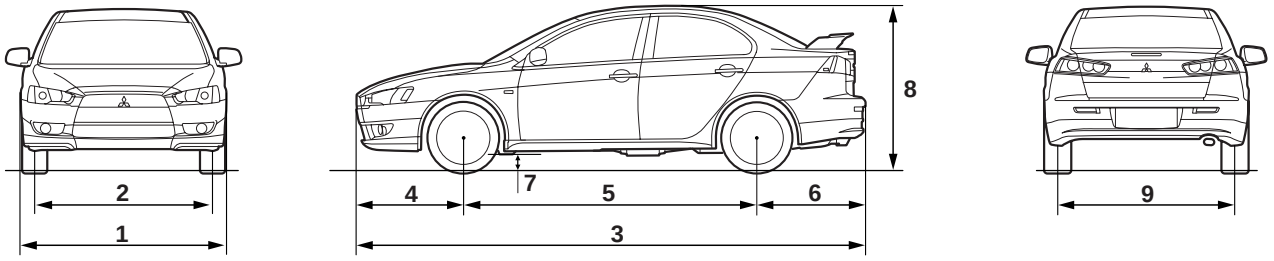
Engine serial number	AA0201 to YY9999

GENERAL DATA AND SPECIFICATIONS

GENERAL DATA AND SPECIFICATIONS <LANCER>

M1001000906824

VEHICLES FOR EUROPE



AC608677AB

<1600>

Item			**INFORM**	
			CY1A	
			SRSPL6	**SNSPL6/SNSPR6**
Vehicle dimension mm	Overall width	1	1,760	1,760
	Front track	2	1,530	1,530
	Overall length	3	4,570	4,570
	Front overhang	4	955	955
	Wheelbase	5	2,635	2,635
	Rear overhang	6	980	980
	Ground clearance (unladen)	7	140	140
	Overall height (unladen)	8	1,480	1,480
	Rear track	9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts	1,280	1,260
		With optional parts	1,338	1,316
	Max. gross vehicle weight		1,750	1,750
	Max. axle weight rating-front		905	905
	Max. axle weight rating-rear		915	915
Seating capacity			5	5
Engine	Model code		4A92	4A92
	Type		DOHC MIVEC <Low CO_2 specification>	DOHC MIVEC <Low CO_2 specification>
	Total displacement mL		1,590	1,590
Fuel system	Fuel supply system		MPI	MPI

Item		INFORM	
		CY1A	
		SRSPL6	SNSPL6/SNSPR6
Transmission	Model code	F4A4A	F5M43
	Type	Front wheel drive 2WD, 4A/T	Front wheel drive 2WD, 5M/T
Turning radius m	Wheel	5.0	5.0
	Body	5.4	5.4

Item				INFORM
				CY1A
				SNSXL6
Vehicle dimension mm	Overall width		1	1,760
	Front track		2	1,530
	Overall length		3	4,570
	Front overhang		4	955
	Wheelbase		5	2,635
	Rear overhang		6	980
	Ground clearance (unladen)		7	140
	Overall height (unladen)		8	1,480
	Rear track		9	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,260
		With optional parts		1,316
	Max. gross vehicle weight			1,750
	Max. axle weight rating-front			905
	Max. axle weight rating-rear			915
Seating capacity				5
Engine	Model code			4A92
	Type			DOHC MIVEC <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>
	Total displacement mL			1,590
Fuel system	Fuel supply system			MPI
Transmission	Model code			F5M43
	Type			Front wheel drive 2WD, 5M/T
Turning radius m	Wheel			5.0
	Body			5.4

<1800>

Item				INFORM	
				CY6A	
				SNSPL6	STSPL6
Vehicle dimension mm	Overall width		1	1,760	1,760
	Front track		2	1,530	1,530
	Overall length		3	4,570	4,570
	Front overhang		4	955	955
	Wheelbase		5	2,635	2,635
	Rear overhang		6	980	980
	Ground clearance (unladen)		7	140	140
	Overall height (unladen)		8	1,480	1,480
	Rear track		9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,305	1,335
		With optional parts		1,361	1,391
	Max. gross vehicle weight			1,850	1,850
	Max. axle weight rating-front			990	990
	Max. axle weight rating-rear			930	930
Seating capacity				5	5
Engine	Model code			4J10	4J10
	Type			SOHC MIVEC <Low CO_2 specification>	SOHC MIVEC <Low CO_2 specification>
	Total displacement mL			1,798	1,798
Fuel system	Fuel supply system			MPI	MPI
Transmission	Model code			F5MBB	F1CJA
	Type			Front wheel drive 2WD, 5M/T	Front wheel drive 2WD, INVECS-III CVT with sport mode
Turning radius m	Wheel			5.0	5.0
	Body			5.4	5.4

Item			INTENSE	
			CY6A	
			SNXPL6	STXPL6/STXPR6
Vehicle dimension mm	Overall width	1	1,760	1,760
	Front track	2	1,530	1,530
	Overall length	3	4,570	4,570
	Front overhang	4	955	955
	Wheelbase	5	2,635	2,635
	Rear overhang	6	980	980
	Ground clearance (unladen)	7	150	150
	Overall height (unladen)	8	1,490	1,490
	Rear track	9	1,530	1,530

Item			INTENSE	
			CY6A	
			SNXPL6	STXPL6/STXPR6
Vehicle weight kg	Kerb weight	Without optional parts	1,325	1,355
		With optional parts	1,374	1,404
	Max. gross vehicle weight		1,850	1,850
	Max. axle weight rating-front		990	990
	Max. axle weight rating-rear		930	930
Seating capacity			5	5
Engine	Model code		4J10	4J10
	Type		SOHC MIVEC <Low CO_2 specification>	SOHC MIVEC <Low CO_2 specification>
	Total displacement mL		1,798	1,798
Fuel system	Fuel supply system		MPI	MPI
Transmission	Model code		F5MBB	F1CJA
	Type		Front wheel drive 2WD, 5M/T	Front wheel drive 2WD, INVECS-III CVT with sport mode
Turning radius m	Wheel		5.0	5.0
	Body		5.4	5.4

Item				INTENSE
				CY6A
				SNXXL6
Vehicle dimension mm	Overall width		1	1,760
	Front track		2	1,530
	Overall length		3	4,570
	Front overhang		4	955
	Wheelbase		5	2,635
	Rear overhang		6	980
	Ground clearance (unladen)		7	150
	Overall height (unladen)		8	1,490
	Rear track		9	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,325
		With optional parts		1,374
	Max. gross vehicle weight			1,850
	Max. axle weight rating-front			990
	Max. axle weight rating-rear			930
Seating capacity				5
Engine	Model code			4J10
	Type			SOHC MIVEC <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>
	Total displacement mL			1,798

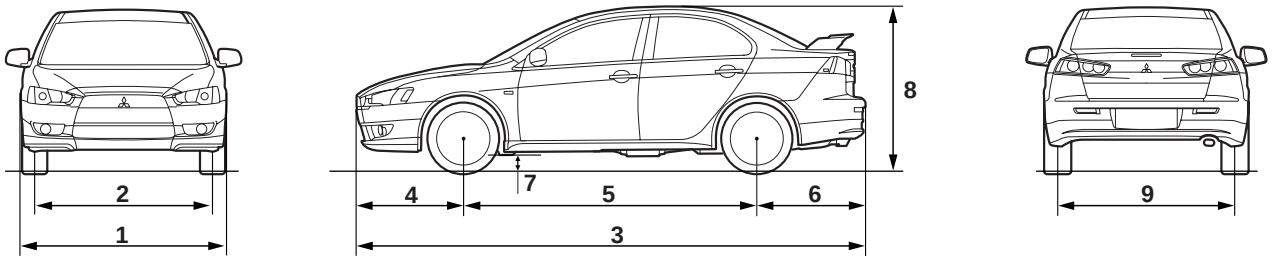
Item		INTENSE
		CY6A
		SNXXL6
Fuel system	Fuel supply system	MPI
Transmission	Model code	F5MBB
	Type	Front wheel drive 2WD, 5M/T
Turning radius m	Wheel	5.0
	Body	5.4

Item				BASE	
				CY9A	
				SJLXL6	SJLSL6
Vehicle dimension mm	Overall width		1	1,760	1,760
	Front track		2	1,530	1,530
	Overall length		3	4,570	4,570
	Front overhang		4	955	955
	Wheelbase		5	2,635	2,635
	Rear overhang		6	980	980
	Ground clearance (unladen)		7	140	140
	Overall height (unladen)		8	1,480	1,480
	Rear track		9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,370	1,365
		With optional parts		1,375	1,370
	Max. gross vehicle weight			1,940	1,940
	Max. axle weight rating-front			1,080	1,080
	Max. axle weight rating-rear			930	930
Seating capacity				5	5
Engine	Model code			4N13	4N13
	Type			DOHC MIVEC with intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>	DOHC MIVEC low-power diesel with intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>
	Total displacement mL			1,798	1,798
Fuel system	Fuel supply system			Common rail fuel injection	Common rail fuel injection
Transmission	Model code			F6MBA	F6MBA
	Type			Front wheel drive 2WD, 6M/T	Front wheel drive 2WD, 6M/T
Turning radius m	Wheel			5.0	5.0
	Body			5.4	5.4

Item				INFORM	
				CY9A	
				SJSXL6	SJSSL6/SJSSR6
Vehicle dimension mm	Overall width		1	1,760	1,760
	Front track		2	1,530	1,530
	Overall length		3	4,570	4,570
	Front overhang		4	955	955
	Wheelbase		5	2,635	2,635
	Rear overhang		6	980	980
	Ground clearance (unladen)		7	140	140
	Overall height (unladen)		8	1,480	1,480
	Rear track		9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,425	1,420
		With optional parts		1,473	1,468
	Max. gross vehicle weight			1,940	1,940
	Max. axle weight rating-front			1,080	1,080
	Max. axle weight rating-rear			930	930
Seating capacity				5	5
Engine	Model code			4N13	4N13
	Type			DOHC MIVEC with intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>	DOHC MIVEC low-power diesel with intercooled <Low CO_2 specification> turbocharger, Auto Stop & Go (AS&G) <Clear Tec AS&G>
	Total displacement mL			1,798	1,798
Fuel system	Fuel supply system			Common rail fuel injection	Common rail fuel injection
Transmission	Model code			F6MBA	F6MBA
	Type			Front wheel drive 2WD, 6M/T	Front wheel drive 2WD, 6M/T
Turning radius m	Wheel			5.0	5.0
	Body			5.4	5.4

Item				INTENSE	
				CY9A	
				SJXXL6	SJXSL6/SJXSR6
Vehicle dimension mm	Overall width		1	1,760	1,760
	Front track		2	1,530	1,530
	Overall length		3	4,570	4,570
	Front overhang		4	955	955
	Wheelbase		5	2,635	2,635
	Rear overhang		6	980	980
	Ground clearance (unladen)		7	150	140
	Overall height (unladen)		8	1,490	1,480
	Rear track		9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,445	1,440
		With optional parts		1,486	1,481
	Max. gross vehicle weight			1,940	1,940
	Max. axle weight rating-front			1,080	1,080
	Max. axle weight rating-rear			930	930
Seating capacity				5	5
Engine	Model code			4N13	4N13
	Type			DOHC MIVEC with intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>	DOHC MIVEC low-power diesel with intercooled turbocharger, <Low CO_2 specification> Auto Stop & Go (AS&G) <Clear Tec AS&G>
	Total displacement mL			1,798	1,798
Fuel system	Fuel supply system			Common rail fuel injection	Common rail fuel injection
Transmission	Model code			F6MBA	F6MBA
	Type			Front wheel drive 2WD, 6M/T	Front wheel drive 2WD, 6M/T
Turning radius m	Wheel			5.0	5.0
	Body			5.4	5.4

VEHICLES FOR RUSSIA



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<1600>

Item				INVITE	
				CY1A	
				SNSHL6Z	SRSHL6Z
Vehicle dimension mm	Overall width		1	1,760	1,760
	Front track		2	1,530	1,530
	Overall length		3	4,570	4,570
	Front overhang		4	955	955
	Wheelbase		5	2,635	2,635
	Rear overhang		6	980	980
	Ground clearance (unladen)		7	165	165
	Overall height (unladen)		8	1,505	1,505
	Rear track		9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,255	1,275
		With optional parts		1,317	1,337
	Max. gross vehicle weight			1,750	1,750
	Max. axle weight rating-front			905	905
	Max. axle weight rating-rear			915	915
Seating capacity				5	5
Engine	Model code			4A92	4A92
	Type			DOHC MIVEC	DOHC MIVEC
	Total displacement mL			1,590	1,590
Fuel system	Fuel supply system			MPI	MPI
Transmission	Model code			F5M43	F4A4A
	Type			Front wheel drive 2WD, 5M/T	Front wheel drive 2WD, 4A/T
Turning radius m	Wheel			5.0	5.0
	Body			5.4	5.4

<1800>

Item				INVITE	
				CY3A	
				SNSHL6Z	STSHL6Z
Vehicle dimension mm	Overall width		1	1,760	1,760
	Front track		2	1,530	1,530
	Overall length		3	4,570	4,570
	Front overhang		4	955	955
	Wheelbase		5	2,635	2,635
	Rear overhang		6	980	980
	Ground clearance (unladen)		7	165	165
	Overall height (unladen)		8	1,505	1,505
	Rear track		9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,290	1,320
		With optional parts		1,358	1,388
	Max. gross vehicle weight			1,850	1,850
	Max. axle weight rating-front			990	990
	Max. axle weight rating-rear			930	930
Seating capacity				5	5
Engine	Model code			4B10	4B10
	Type			DOHC MIVEC	DOHC MIVEC
	Total displacement mL			1,798	1,798
Fuel system	Fuel supply system			MPI	MPI
Transmission	Model code			F5MBB	F1CJA
	Type			Front wheel drive 2WD, 5M/T	Front wheel drive 2WD, INVECS-III CVT with sport mode
Turning radius m	Wheel			5.0	5.0
	Body			5.4	5.4

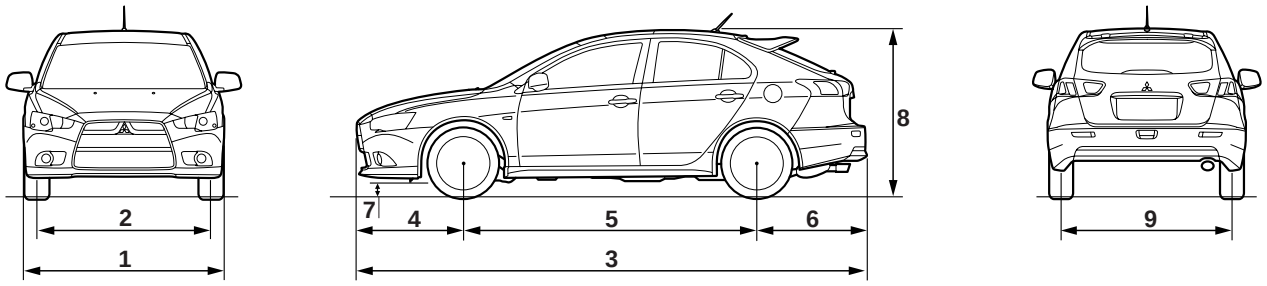
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Item			INTENSE	
			CY4A	
			SNXHL6Z	STXHL6Z
Vehicle dimension mm	Overall width	1	1,760	1,760
	Front track	2	1,530	1,530
	Overall length	3	4,570	4,570
	Front overhang	4	955	955
	Wheelbase	5	2,635	2,635
	Rear overhang	6	980	980
	Ground clearance (unladen)	7	140	140
	Overall height (unladen)	8	1,480	1,480
	Rear track	9	1,530	1,530

Item			INTENSE	
			CY4A	
			SNXHL6Z	STXHL6Z
Vehicle weight kg	Kerb weight	Without optional parts	1,295	1,325
		With optional parts	1,360	1,390
	Max. gross vehicle weight		1,850	1,850
	Max. axle weight rating-front		990	990
	Max. axle weight rating-rear		930	930
Seating capacity			5	5
Engine	Model code		4B11	4B11
	Type		DOHC MIVEC	DOHC MIVEC
	Total displacement mL		1,998	1,998
Fuel system	Fuel supply system		MPI	MPI
Transmission	Model code		F5MBB	F1CJA
	Type		Front wheel drive 2WD, 5M/T	Front wheel drive 2WD, INVECS-III CVT with sport mode
Turning radius m	Wheel		5.0	5.0
	Body		5.4	5.4

GENERAL DATA AND SPECIFICATIONS <LANCER SPORTBACK>

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<1600>

Item				INFORM	
				CX1A	
				LNSPL6/LNSPR6	LNSXL6/LNSXR6
Vehicle dimension mm	Overall width		1	1,760	1,760
	Front track		2	1,530	1,530
	Overall length		3	4,585	4,585
	Front overhang		4	955	955
	Wheelbase		5	2,635	2,635
	Rear overhang		6	995	995
	Ground clearance (unladen)		7	140	140
	Overall height (unladen)		8	1,505	1,505
	Rear track		9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,300	1,300
		With optional parts		1,356	1,356
	Max. gross vehicle weight			1,800	1,800
	Max. axle weight rating-front			905	905
	Max. axle weight rating-rear			965	965
Seating capacity				5	5
Engine	Model code			4A92	4A92
	Type			DOHC MIVEC <Low CO_2 specification>	DOHC MIVEC <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>
	Total displacement mL			1,590	1,590
Fuel system	Fuel supply system			MPI	MPI
Transmission	Model code			F5M43	F5M43
	Type			Front wheel drive 2WD, 5M/T	Front wheel drive 2WD, 5M/T
Turning radius m	Wheel			5.0	5.0
	Body			5.4	5.4

<1800>

Item				**INFORM**	
				CX6A	
				LNSPL6	**LTSPL6/LTSPR6**
Vehicle dimension mm	Overall width		1	1,760	1,760
	Front track		2	1,530	1,530
	Overall length		3	4,585	4,585
	Front overhang		4	955	955
	Wheelbase		5	2,635	2,635
	Rear overhang		6	995	995
	Ground clearance (unladen)		7	140/165*	140/165*
	Overall height (unladen)		8	1,505/1,530*	1,505/1,530*
	Rear track		9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,345	1,375
		With optional parts		1,409	1,439
	Max. gross vehicle weight			1,900	1,900
	Max. axle weight rating-front			990	990
	Max. axle weight rating-rear			980	980
Seating capacity				5	5
Engine	Model code			4J10	4J10
	Type			SOHC MIVEC <Low CO_2 specification>	SOHC MIVEC <Low CO_2 specification>
	Total displacement mL			1,798	1,798
Fuel system	Fuel supply system			MPI	MPI
Transmission	Model code			F5MBB	F1CJA
	Type			Front wheel drive 2WD, 5M/T	Front wheel drive 2WD, INVECS-III CVT with sport mode
Turning radius m	Wheel			5.0	5.0
	Body			5.4	5.4

NOTE:

- **:Vehicles with high ground suspensions optional.*

Item				INTENSE	
				CX6A	
				LNXPL6	LTXPL6/LTXPR6
Vehicle dimension mm	Overall width		1	1,760	1,760
	Front track		2	1,530	1,530
	Overall length		3	4,585	4,585
	Front overhang		4	955	955
	Wheelbase		5	2,635	2,635
	Rear overhang		6	995	995
	Ground clearance (unladen)		7	150	150
	Overall height (unladen)		8	1,515	1,515
	Rear track		9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,365	1,395
		With optional parts		1,423	1,453
	Max. gross vehicle weight			1,900	1,900
	Max. axle weight rating-front			990	990
	Max. axle weight rating-rear			980	980
Seating capacity				5	5
Engine	Model code			4J10	4J10
	Type			SOHC MIVEC <Low CO_2 specification>	SOHC MIVEC <Low CO_2 specification>
	Total displacement mL			1,798	1,798
Fuel system	Fuel supply system			MPI	MPI
Transmission	Model code			F5MBB	F1CJA
	Type			Front wheel drive 2WD, 5M/T	Front wheel drive 2WD, INVECS-III CVT with sport mode
Turning radius m	Wheel			5.0	5.0
	Body			5.4	5.4

Item			INTENSE
			CX6A
			LNXXL6
Vehicle dimension mm	Overall width	1	1,760
	Front track	2	1,530
	Overall length	3	4,585
	Front overhang	4	955
	Wheelbase	5	2,635
	Rear overhang	6	995
	Ground clearance (unladen)	7	150
	Overall height (unladen)	8	1,515
	Rear track	9	1,530

Item			INTENSE
			CX6A
			LNXXL6
Vehicle weight kg	Kerb weight	Without optional parts	1,365
		With optional parts	1,423
	Max. gross vehicle weight		1,900
	Max. axle weight rating-front		990
	Max. axle weight rating-rear		980
Seating capacity			5
Engine	Model code		4J10
	Type		SOHC MIVEC <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>
	Total displacement mL		1,798
Fuel system	Fuel supply system		MPI
Transmission	Model code		F5MBB
	Type		Front wheel drive 2WD, 5M/T
Turning radius m	Wheel		5.0
	Body		5.4

Item				BASE	
				CX9A	
				LJLSL6	LJLXL6
Vehicle dimension mm	Overall width		1	1,760	1,760
	Front track		2	1,530	1,530
	Overall length		3	4,585	4,585
	Front overhang		4	955	955
	Wheelbase		5	2,635	2,635
	Rear overhang		6	995	995
	Ground clearance (unladen)		7	140	140
	Overall height (unladen)		8	1,505	1,505
	Rear track		9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,400	1,405
		With optional parts		1,405	1,410
	Max. gross vehicle weight			1,990	1,990
	Max. axle weight rating-front			1,080	1,080
	Max. axle weight rating-rear			980	980
Seating capacity				5	5

Item		BASE	
		CX9A	
		LJLSL6	LJLXL6
Engine	Model code	4N13	4N13
	Type	DOHC MIVEC low-power diesel with intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>	DOHC MIVEC with intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>
	Total displacement mL	1,798	1,798
Fuel system	Fuel supply system	Common rail fuel injection	Common rail fuel injection
Transmission	Model code	F6MBA	F6MBA
	Type	Front wheel drive 2WD, 6M/T	Front wheel drive 2WD, 6M/T
Turning radius m	Wheel	5.0	5.0
	Body	5.4	5.4

Item				INFORM	
				CX9A	
				LJSSL6/LJSSR6	LJSXL6
Vehicle dimension mm	Overall width		1	1,760	1,760
	Front track		2	1,530	1,530
	Overall length		3	4,585	4,585
	Front overhang		4	955	955
	Wheelbase		5	2,635	2,635
	Rear overhang		6	995	995
	Ground clearance (unladen)		7	140	140
	Overall height (unladen)		8	1,505	1,505
	Rear track		9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,460	1,465
		With optional parts		1,508	1,513
	Max. gross vehicle weight			1,990	1,990
	Max. axle weight rating-front			1,080	1,080
	Max. axle weight rating-rear			980	980
Seating capacity				5	5
Engine	Model code			4N13	4N13
	Type			DOHC MIVEC low-power diesel with intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>	DOHC MIVEC with intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>
	Total displacement mL			1,798	1,798

Item			INFORM	
			CX9A	
			LJSSL6/LJSSR6	LJSXL6
Fuel system	Fuel supply system		Common rail fuel injection	Common rail fuel injection
Transmission	Model code		F6MBA	F6MBA
	Type		Front wheel drive 2WD, 6M/T	Front wheel drive 2WD, 6M/T
Turning radius m	Wheel		5.0	5.0
	Body		5.4	5.4

Item				INTENSE	
				CX9A	
				LJXSL6/LJXSR6	LJXXL6
Vehicle dimension mm	Overall width		1	1,760	1,760
	Front track		2	1,530	1,530
	Overall length		3	4,585	4,585
	Front overhang		4	955	955
	Wheelbase		5	2,635	2,635
	Rear overhang		6	995	995
	Ground clearance (unladen)		7	150	150
	Overall height (unladen)		8	1,515	1,515
	Rear track		9	1,530	1,530
Vehicle weight kg	Kerb weight	Without optional parts		1,480	1,485
		With optional parts		1,518	1,523
	Max. gross vehicle weight			1,990	1,990
	Max. axle weight rating-front			1,080	1,080
	Max. axle weight rating-rear			980	980
Seating capacity				5	5
Engine	Model code			4N13	4N13
	Type			DOHC MIVEC low-power diesel with Intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>	DOHC MIVEC with Intercooled turbocharger <Low CO_2 specification>, Auto Stop & Go (AS&G) <Clear Tec AS&G>
	Total displacement mL			1,798	1,798
Fuel system	Fuel supply system			Common rail fuel injection	Common rail fuel injection
Transmission	Model code			F6MBA	F6MBA
	Type			Front wheel drive 2WD, 6M/T	Front wheel drive 2WD, 6M/T
Turning radius m	Wheel			5.0	5.0
	Body			5.4	5.4

GROUP 11K

ENGINE MECHANICAL <4J1>

CONTENTS

SEALANTS AND ADHESIVES 11K-2

SPECIAL TOOLS. 11K-3

CRANKSHAFT PULLEY 11K-7

CRANKSHAFT PULLEY REMOVAL AND INSTALLATION. 11K-7

ROCKER COVER ASSEMBLY 11K-11

ROCKER COVER ASSEMBLY REMOVAL AND INSTALLATION. 11K-11

ROCKER ARM AND CAMSHAFT ASSEMBLY 11K-12

ROCKER ARM AND CAMSHAFT ASSEMBLY REMOVAL AND INSTALLATION 11K-12

VALVE STEM SEAL 11K-16

VALVE STEM SEAL REMOVAL AND INSTALLATION 11K-16

OIL PAN 11K-20

OIL PAN REMOVAL AND INSTALLATION 11K-20

OIL PAN INSPECTION. 11K-21

CRANKSHAFT OIL SEAL 11K-22

CRANKSHAFT OIL SEAL REMOVAL AND INSTALLATION 11K-22

CYLINDER HEAD GASKET. 11K-25

CYLINDER HEAD GASKET REMOVAL AND INSTALLATION 11K-25

TIMING CHAIN CASE ASSEMBLY . . 11K-27

TIMING CHAIN CASE ASSEMBLY. 11K-27

TIMING CHAIN 11K-29

TIMING CHAIN REMOVAL AND INSTALLATION 11K-29

ENGINE ASSEMBLY 11K-31

ENGINE ASSEMBLY REMOVAL AND INSTALLATION 11K-31

VALVE LIFT CONTROL MOTOR. . . . 11K-34

VALVE LIFT CONTROL MOTOR REMOVAL AND INSTALLATION 11K-34

VALVE LIFT SENSOR 11K-34

VALVE LIFT SENSOR REMOVAL AND INSTALLATION 11K-34

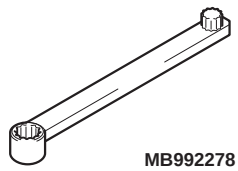
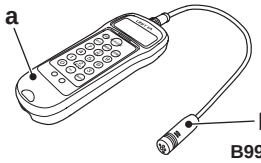
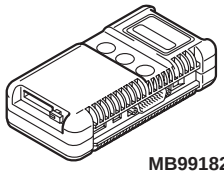
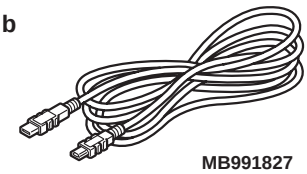
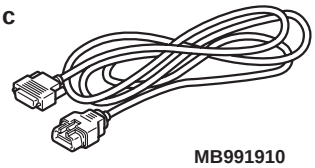
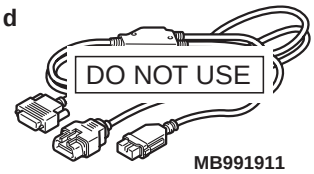
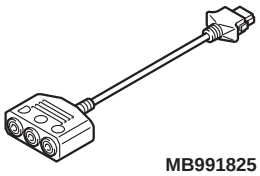
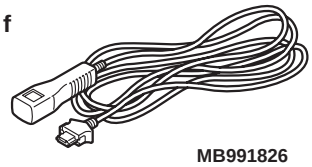
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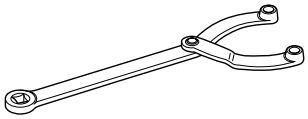
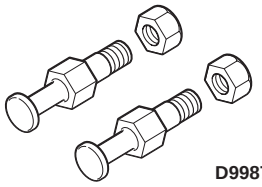
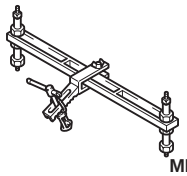
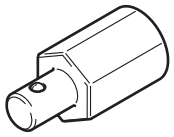
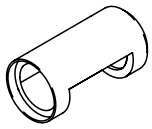
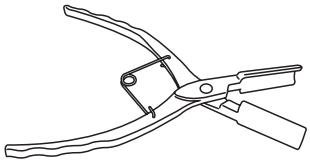
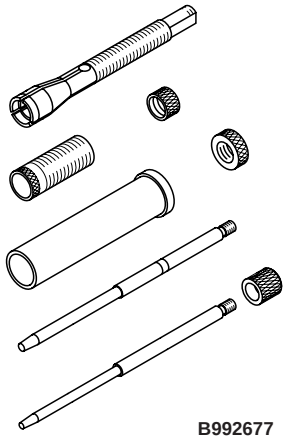
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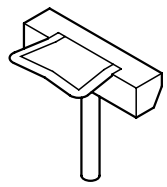
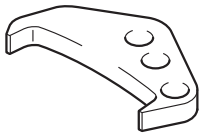
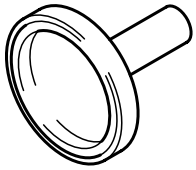
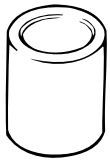
Item	Specified sealant and adhesive	Remark
Rocker arm and camshaft assembly (matching area of the rocker arm and camshaft assembly and the cylinder head)	ThreeBond 1227D, ThreeBond 1217G (Mitsubishi Genuine Part No.1000A923), LOCTITE 5900 or equivalent	Semi-drying sealant
Engine oil pan	ThreeBond 1227D, ThreeBond 1217G (Mitsubishi Genuine Part No.1000A923), ThreeBond 1207F (Mitsubishi Genuine Part No.1000A992), LOCTITE 5970, LOCTITE 5900 or equivalent	
Flywheel bolt <M/T> or drive plate bolt <CVT>	ThreeBond 1324 or equivalent	Anaerobic adhesive

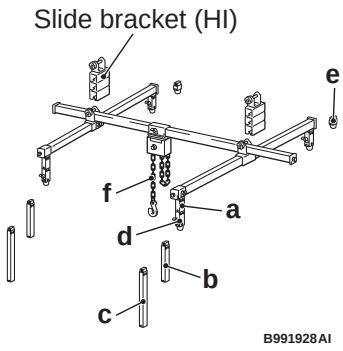
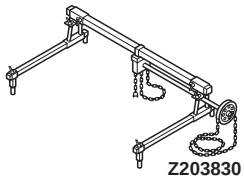
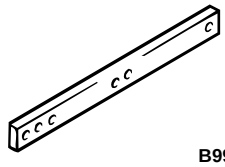
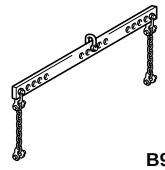
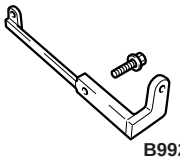
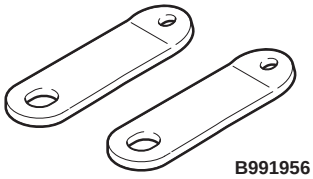
SPECIAL TOOLS

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Tool	Number	Name	Use
 MB992278	MB992278	Belt tension release wrench	Drive belt auto-tensioner tension release
 B992080	MB992080 a: MB992081 b: MB992082	Belt tension meter set a: Belt tension meter b: Microphone assembly	Drive belt tension check
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	M.U.T.-III sub assembly a: Vehicle communication interface (V. C. I.) b: M.U.T.-III USB cable c: M.U.T.-III main harness A (Vehicles with CAN communication system) d: M.U.T.-III main harness B (Vehicles without CAN communication system) e: M.U.T.-III adapter harness f: M.U.T.-III trigger harness	⚠ CAUTION **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.** • Checking the ignition timing • Checking the idle speed

Tool	Number	Name	Use
 B990767	MB990767	Front hub and flange yoke holder	Holding the crankshaft pulley
 D998719	MD998719	Pin	
 MD998772	MD998772	Valve spring compressor	Valve spring compression
 B992090	MB992090	Retainer holder attachment	
	MB992089	Retainer holder C	
	MB992085	Valve stem seal pliers	Valve stem seal removal
 B992677	MB992677	Valve stem seal installer adjustable	Valve stem seal press-fitting

Tool	Number	Name	Use
 D998727	MD998727	Oil pan FIPG cutter	Engine oil pan removal
 MB991883	MB991883	Flywheel stopper	Supporting the flywheel <M/T> or drive plate <CVT>
	MD998718	Crankshaft rear oil seal installer	Press-fitting the crankshaft rear oil seal
	MB991448	Bush remover and installer base	Press-fitting the crankshaft front oil seal

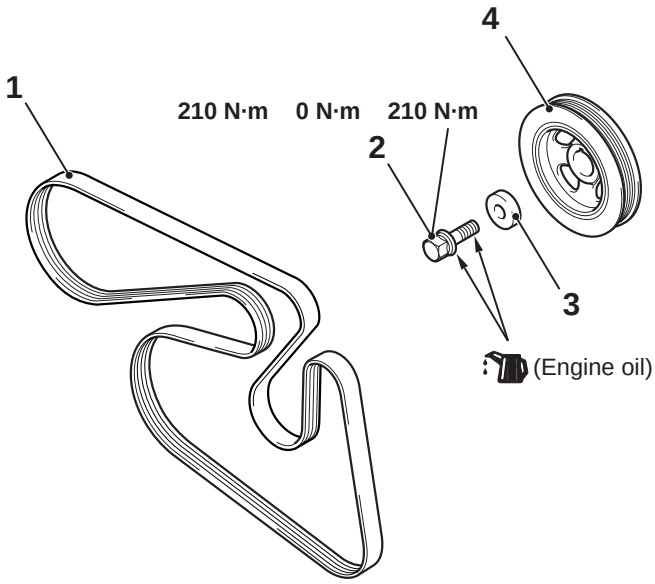
Tool	Number	Name	Use
	MB991928 a: MB991929 b: MB991930 c: MB991931 d: MB991932 e: MB991933 f: MB991934	Engine hanger a: Joint (50) × 2 b: Joint (90) × 2 c: Joint (140) × 2 d: Foot (standard) × 4 e: Foot (short) × 2 f: Chain and hook assembly	Supporting the engine assembly • For the engine hanger balancer (MB991454), use the chain only. *NOTE: Engine hanger balancer (MB991454) is a part of the engine hanger assembly (MB991453).*
	MB991895	Engine hanger	
	MB991527	Hanger	
	MB991454	Engine hanger balancer	
	MB992853	Engine hanger plate	
	MB991956	Engine hanger plate	

CRANKSHAFT PULLEY

REMOVAL AND INSTALLATION

M1112001604616

Pre-removal Operation	Post-installation Operation
• Engine Room Under Cover Front A, B and Engine Room Side Cover (RH) Removal (Refer to GROUP 51 – Under Cover).	• Drive Belt Tension Check (Refer to). • Engine Room Under Cover Front A, B and Engine Room Side Cover (RH) Installation (Refer to GROUP 51 – Under Cover).



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			Removal steps
<<A>>		•	Radiator condenser tank
<<B>>	>>B<<	1.	Drive belt
<<C>>	>>A<<	2.	Crankshaft pulley centre bolt
<<C>>	>>A<<	3.	Crankshaft pulley washer
<<C>>	>>A<<	4.	Crankshaft pulley

REMOVAL SERVICE POINTS

<<A>> RADIATOR CONDENSER TANK REMOVAL

Move the radiator condenser tank to a place where it does not interfere with the drive belt removal and installation.

<<B>> DRIVE BELT REMOVAL

To introduce the serpentine drive system with the auto-tensioner, the following operations will be required.

⚠ CAUTION

To reuse the drive belt, draw an arrow indicating the rotating direction on the back of the belt using chalk to install the same direction.

⚠ WARNING

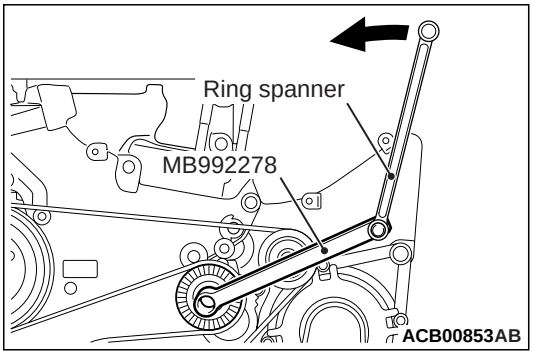
Always work from above when releasing the tension of the auto-tensioner. When you try to gain access from underneath the vehicle, you will experience difficulty, thus causing the tool to be dropped off.

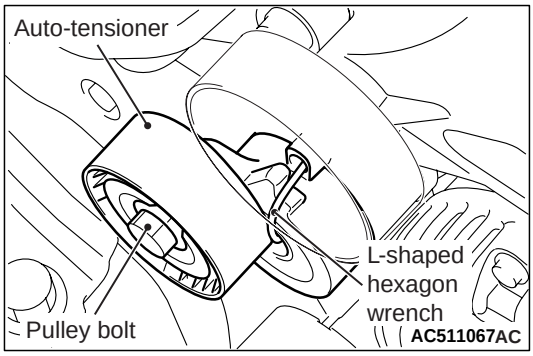
⚠ CAUTION

To work at the optimum angle, you must choose a most suitable ring spanner is applied to the special tool.

⚠ WARNING

Be sure to set the ring spanner and the special tool to the hexagonal parts securely to prevent the tool from falling off because the tension of the auto-tensioner is high.

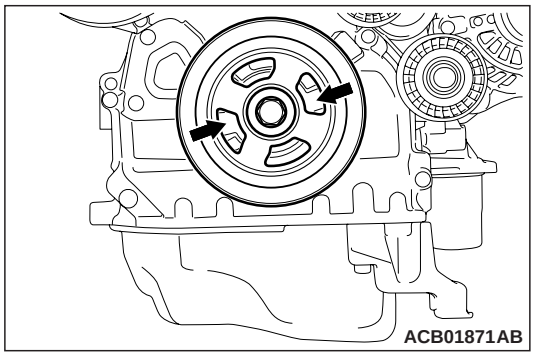




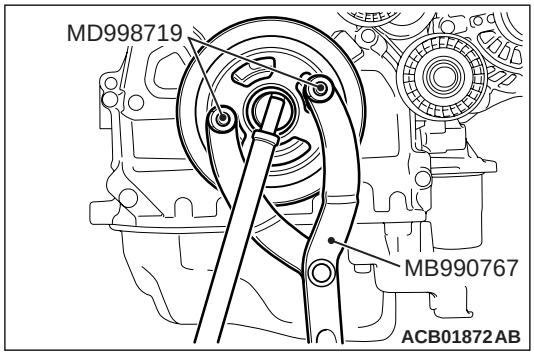
1. Install special tool belt tension release wrench (MB992278) and a ring spanner at the optimum angle.
2. Rotate the pulley bolt of the auto-tensioner anti-clockwise.
3. Insert the L-shaped hexagon wrench into the auto-tensioner hole to fix the auto-tensioner.
4. Remove the drive belt.

<<C>> CRANKSHAFT PULLEY CENTRE BOLT/ CRANKSHAFT PULLEY WASHER/CRANKSHAFT PULLEY REMOVAL

⚠ CAUTION



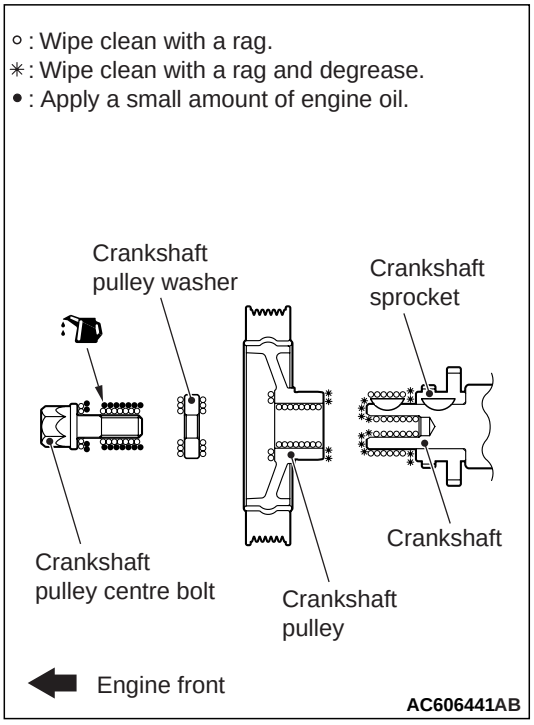
Insert the special tool pins deep into the position shown in the figure to hold the special tool without interfering with the protrusion of the timing chain case.



1. Use the following special tools to support the crankshaft pulley:
   - Front hub and flange yoke holder (MB990767)
   - Pin (MD998719)
2. Loosen the crankshaft pulley centre bolt and remove the crankshaft pulley washer and crankshaft pulley.

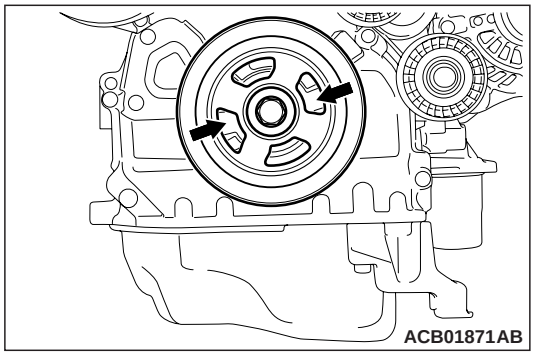
INSTALLATION SERVICE POINTS

>>A<< CRANKSHAFT PULLEY/CRANKSHAFT PULLEY WASHER/CRANKSHAFT PULLEY CENTRE BOLT INSTALLATION

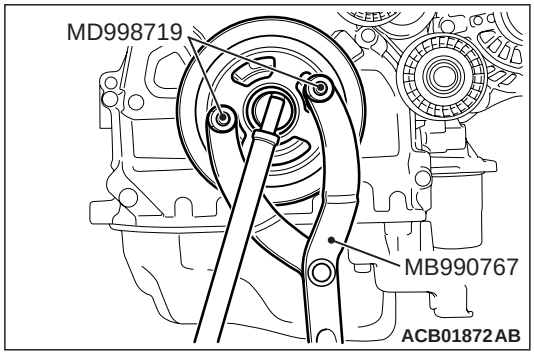


1. Wipe off the dirt on the crankshaft sprocket, crankshaft and crankshaft pulley as shown in the figure using a rag, and then degrease the areas.
   NOTE: Degrease them to prevent drop in the friction coefficient of the pressed area which is caused by oil adhesion.
2. Install the crankshaft pulley.
3. Wipe off the dirt on the crankshaft pulley washer and the crankshaft pulley centre bolt as shown in the figure using a rag.
4. Apply an adequate and minimum amount of engine oil to the thread of the crankshaft pulley centre bolt and the lower area of the flange.

⚠ CAUTION



Insert the special tool pins deep into the position shown in the figure to hold the special tool without interfering with the protrusion of the timing chain case.

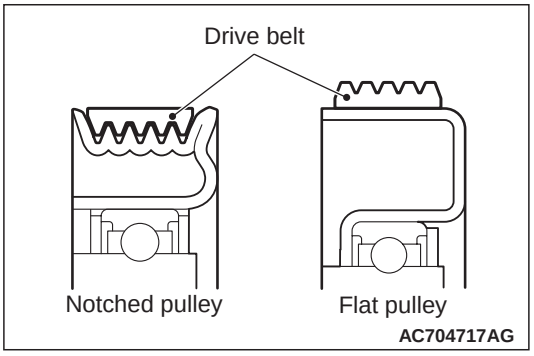


5. Use the following special tools as during removal to support the crankshaft pulley:
   - Front hub and flange yoke holder (MB990767)
   - Pin (MD998719)
6. Tighten the crankshaft pulley centre bolt to the specified torque.
   Tightening torque: 210 N·m
7. Loosen the crankshaft pulley centre bolt fully.
8. Tighten the crankshaft pulley centre bolt to the specified torque again.
   Tightening torque: 210 N·m

>>B<< DRIVE BELT INSTALLATION

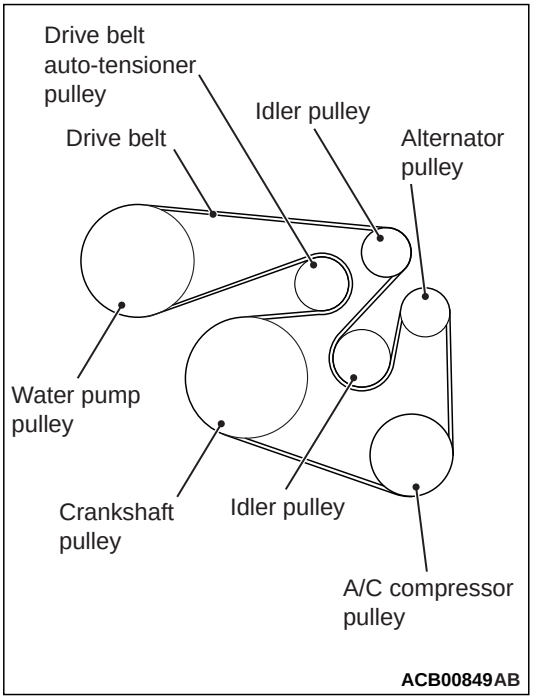
⚠ CAUTION

- **To reuse the drive belt, install it by aligning the arrow mark on the backside of belt marked at the removal with the rotating direction.**



Check that the notches of the notched pulley and the notches of the drive belt are fit correctly.

- **Check that the drive belt is installed in the centre of the flat surface of the flat pulley.**



1. Install the drive belt to each pulley as shown in the figure.

⚠ WARNING

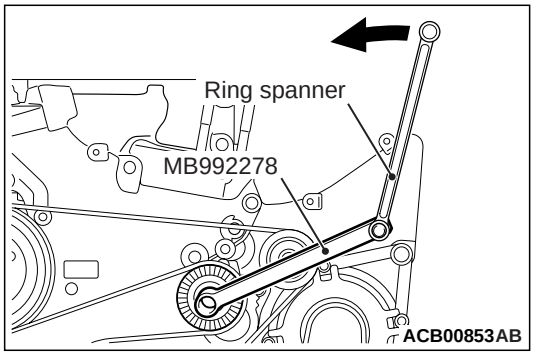
Always work from above when releasing the tension of the auto-tensioner. When you try to gain access from underneath the vehicle, you will experience difficulty, thus causing the tool to be dropped off.

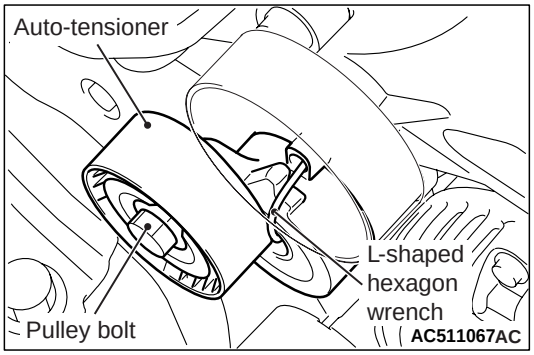
⚠ CAUTION

To work at the optimum angle, you must choose a most suitable ring spanner is applied to the special tool.

⚠ WARNING

Be sure to set the ring spanner and the special tool to the hexagonal parts securely to prevent the tool from falling off because the tension of the auto-tensioner is high.



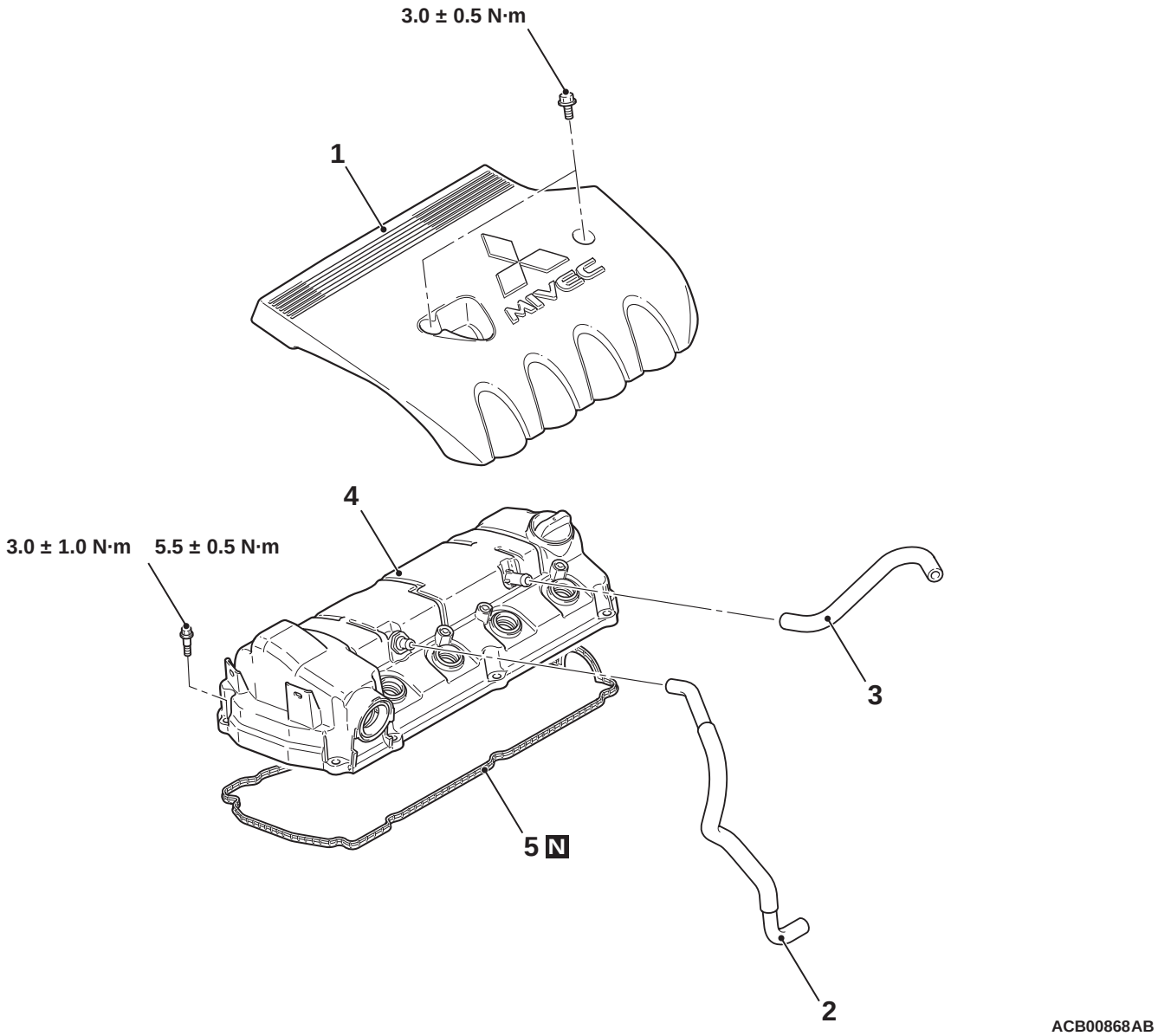


2. Install special tool belt tension release wrench (MB992278) and a ring spanner at the optimum angle.
3. Rotate the auto-tensioner anti-clockwise and remove the L-shaped hexagon wrench fixing the auto-tensioner.
4. Apply tension to the drive belt while slowly turning the auto-tensioner clockwise.

ROCKER COVER ASSEMBLY

REMOVAL AND INSTALLATION

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Removal steps

1. Engine upper cover
2. PCV hose
3. Breather hose
- Control wiring harness connection
- Ignition coil (Refer to GROUP 11L – Alternator and Ignition System).
- Valve lift control motor, motor bracket (Refer to).

<<A>> >>A<< 4. Rocker cover assembly

5. Rocker cover gasket

REMOVAL SERVICE POINT

<<A>> ROCKER COVER ASSEMBLY REMOVAL

To avoid damage to the spark plug guide oil seal, remove the rocker cover assembly along the spark plug guide.

INSTALLATION SERVICE POINT

>>A<< ROCKER COVER ASSEMBLY INSTALLATION

For the installation procedure, refer to GROUP 11L – Oil Pan and Timing Chain Case .

ROCKER ARM AND CAMSHAFT ASSEMBLY

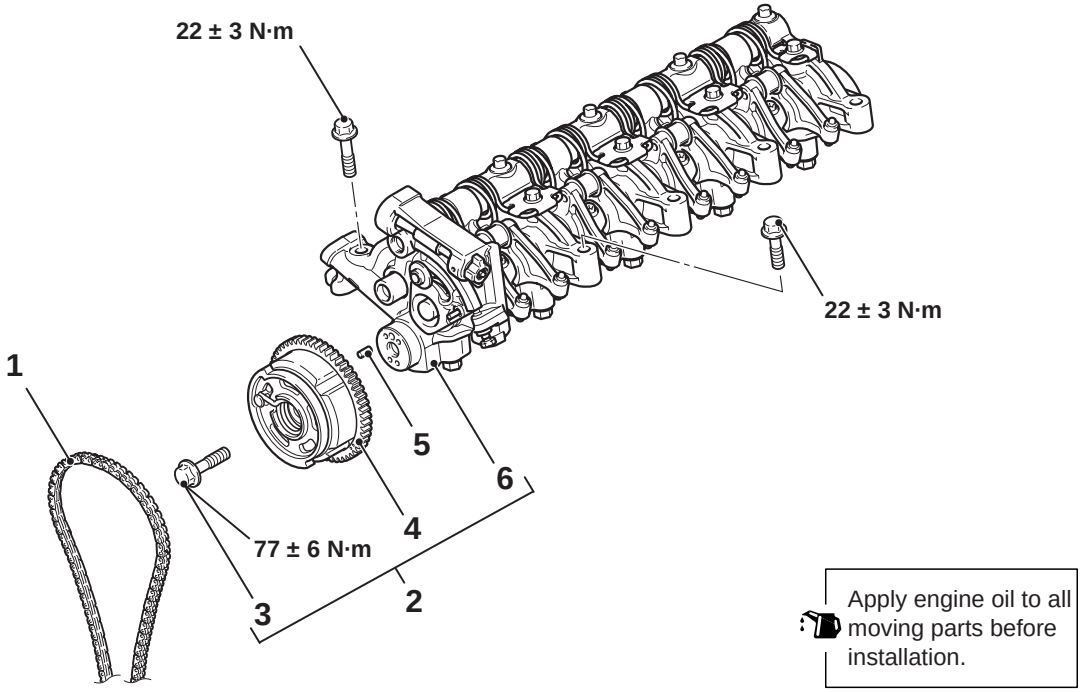
REMOVAL AND INSTALLATION

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⚠ CAUTION

- **Do not disassemble any rocker arm and camshaft assembly components other than those described in this manual. Never loosen any bolts other than the rocker arm and camshaft assembly mounting bolts as relevant components have been adjusted at factory.**
- **If the rocker arm and camshaft assembly is installed, removed or replaced, initialise the learned value by using M.U.T.-III (Refer to GROUP 00 – Precautions before Service, Initialisation Procedure for Learning Value in MPI Engine).**

Pre-removal operation	Post-installation operation
• Rocker Cover Assembly Removal (Refer to). • Timing Chain Case Cover Removal (Refer to).	• Valve Clearance Adjustment (Refer to). • Timing Chain Case Cover Installation (Refer to). • Rocker Cover Assembly Installation (Refer to).



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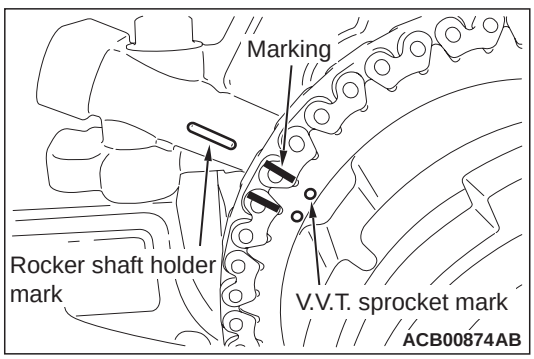
Removal steps

<<A>>	>>C<<	1.	Timing chain
<<B>>	>>B<<	2.	V.V.T. sprocket, rocker arm and camshaft assembly
<<C>>	>>A<<	3.	V.V.T. sprocket bolt
<<C>>	>>A<<	4.	V.V.T. sprocket assembly
	>>A<<	5.	Dowel pin
		•	Valve lift sensor (Refer to).
		6.	Rocker arm and camshaft assembly

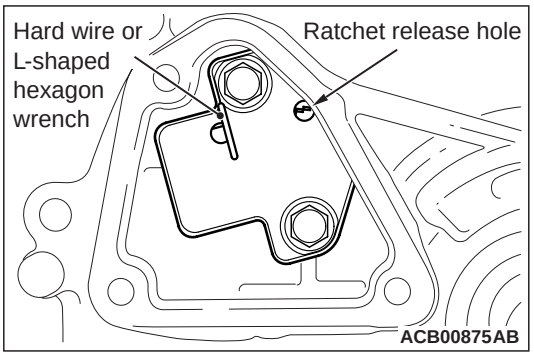
NOTE: Do not remove the dowel pin. When it must be assembled, refer to Service Points of Removal.

REMOVAL SERVICE POINTS

<<A>> TIMING CHAIN REMOVAL



1. Align the mark for removal and installation of the rocker arm and camshaft assembly on the V.V.T. sprocket with the mark on the rocker shaft holder, and then mark the timing chain.



2. Insert a precision flat-tipped screwdriver through the service hole on the timing chain case to release the timing chain tensioner ratchet.
3. While counterholding the crankshaft, tension the timing chain tensioner side of the chain by turning the flats of the camshaft end in direction of engine rotation to compress the plunger.
4. Insert hard wire (such as the piano wire) or the L-shaped hexagon wrench (1.5 mm) to fix the plunger of the timing chain tensioner.

⚠ CAUTION

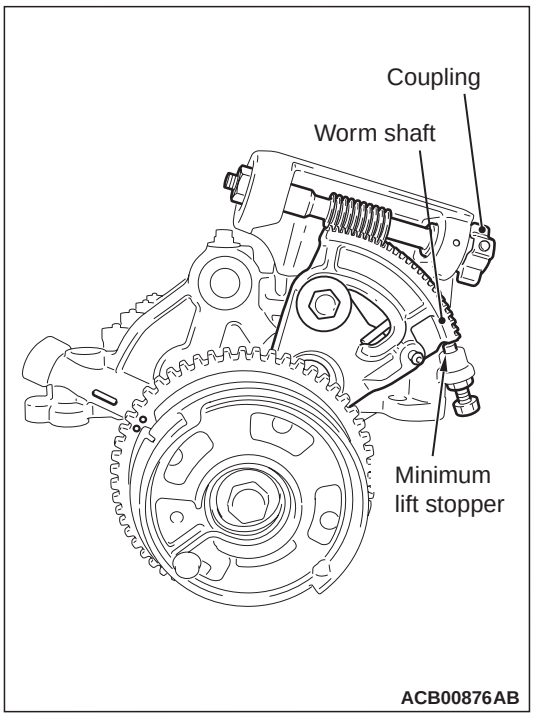
Be careful not to drop the timing chain tensioner mounting bolts into the timing chain case.

5. Remove the timing chain tensioner.
6. Remove the timing chain from the V.V.T. sprocket.

<<B>> V.V.T. SPROCKET, ROCKER ARM AND CAMSHAFT ASSEMBLY REMOVAL

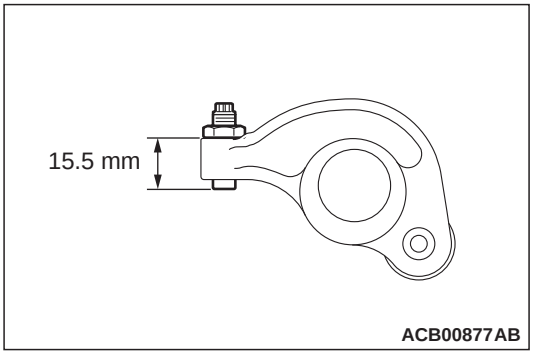
⚠ CAUTION

- **To avoid damage, be careful not to apply torque exceeding 3 N·m when rotating the coupling.**
- **Do not hit the worm wheel against the minimum lift stopper too strongly.**
- **Never loosen the minimum lift stopper.**

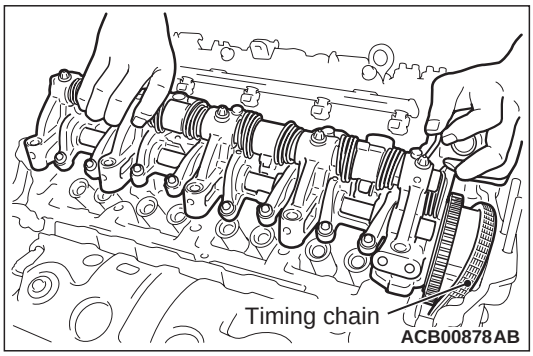


1. Rotate the coupling clockwise until the worm wheel contacts the minimum lift stopper slightly.

   NOTE: When rotating the coupling by hand, insert a 12-point socket (24 mm) into the coupling ca. 5 mm away from the rocker shaft holder. Then use a small torque wrench to rotate it slowly.



2. Pull down the adjusting screw of the exhaust side rocker arm at least to the shown dimension.
3. Loosen the mounting bolts of the rocker arm and camshaft assembly, and remove them.



4. Lift off the V.V.T. sprocket, the rocker arm and camshaft assembly from the cylinder head while loosening the timing chain.

<<C>> V.V.T. SPROCKET BOLT / V.V.T. SPROCKET ASSEMBLY REMOVAL

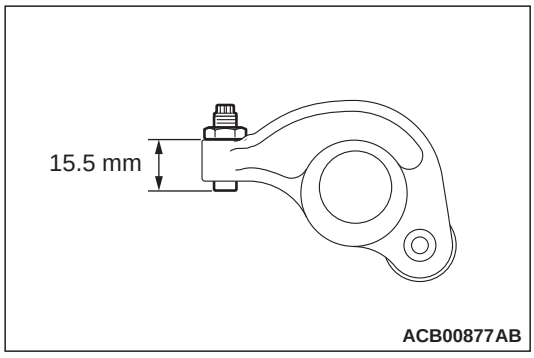
For the removal procedure, refer to GROUP 11L – Rocker Arm and Camshaft .

INSTALLATION SERVICE POINTS

>>A<< DOWEL PIN / V.V.T. SPROCKET ASSEMBLY / V.V.T. SPROCKET BOLT INSTALLATION

For the installation procedure, refer to GROUP 11L – Rocker Arm and Camshaft .

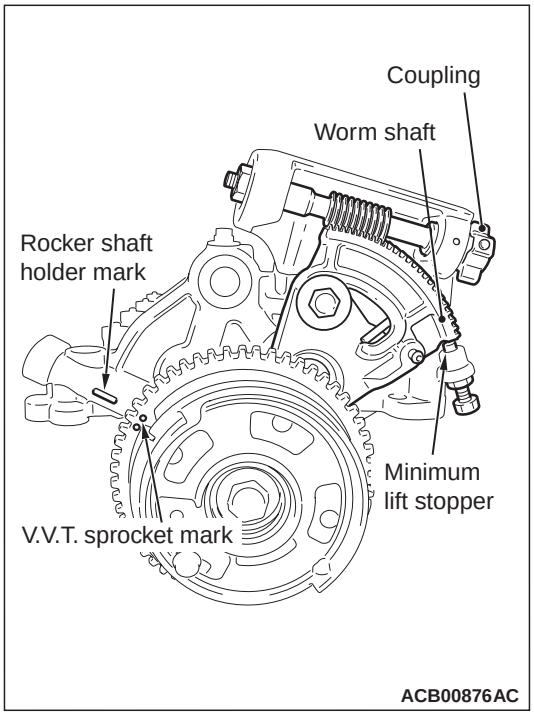
>>B<< V.V.T. SPROCKET, ROCKER ARM AND CAMSHAFT ASSEMBLY INSTALLATION



1. Pull down the adjusting screw of the exhaust side rocker arm at least to the shown dimension.

⚠ CAUTION

- **To avoid damage, be careful not to apply torque exceeding 3 N·m when rotating the coupling.**
- **Do not hit the worm wheel against the minimum lift stopper too strongly.**
- **Never loosen the minimum lift stopper.**

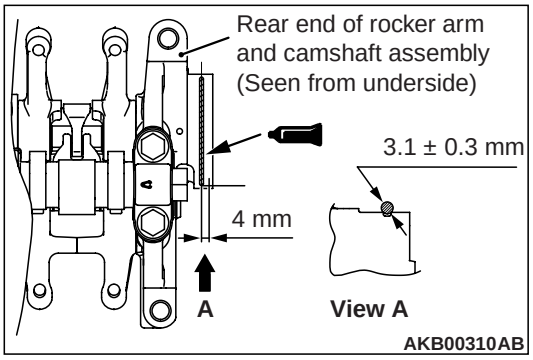


2. Rotate the coupling clockwise until the worm wheel contacts the minimum lift stopper slightly.

   NOTE: When rotating the coupling by hand, insert a 12-point socket (24 mm) into the coupling ca. 5 mm away from the rocker shaft holder. Then use a small torque wrench to rotate it slowly.
3. Align the mark for removal and installation of the rocker arm and camshaft assembly on the V.V.T. sprocket with the mark on the rocker shaft holder.
4. Completely remove the sealant adhering to the cylinder head and the rocker arm/camshaft assembly using a remover or others and degrease the area using a volatile degreasing agent.

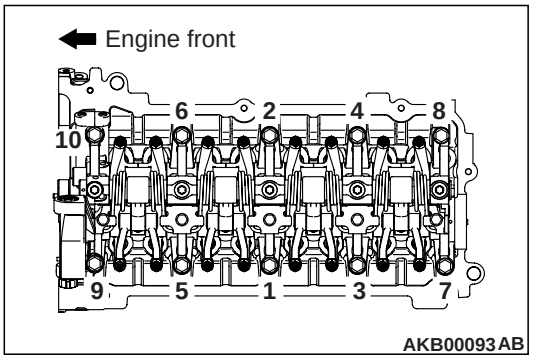
⚠ CAUTION

The rocker arm and camshaft assembly cannot be installed with the rocker arms hanging down.



5. Apply sealant to the underside of the rocker arm and camshaft assembly without a gap and immediately install the V.V.T. sprocket, rocker arm and camshaft assembly to the cylinder head.

   Specified sealant: ThreeBond 1217G or equivalent



6. Temporarily tighten the mounting bolts of the rocker arm and camshaft assembly to 8.0 N·m in the order shown in the figure.

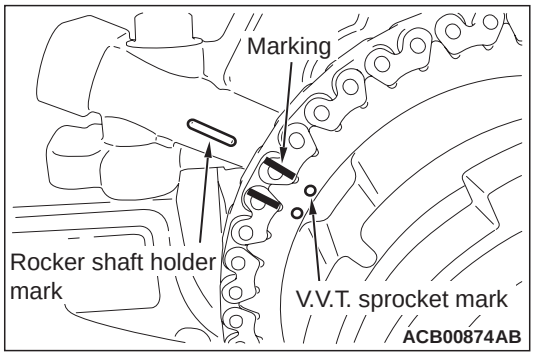
⚠ CAUTION

- **After installation, wipe off excessive sealant thoroughly from the sealant application area.**
- **After the installation, until a sufficient period of time (one hour or more) elapses, do not apply the oil or water to the sealant application area or start the engine.**

7. Tighten the mounting bolts of the rocker arm and camshaft assembly to the specified torque in the order shown in the figure.

   Tightening torque: 22 ± 3 N·m

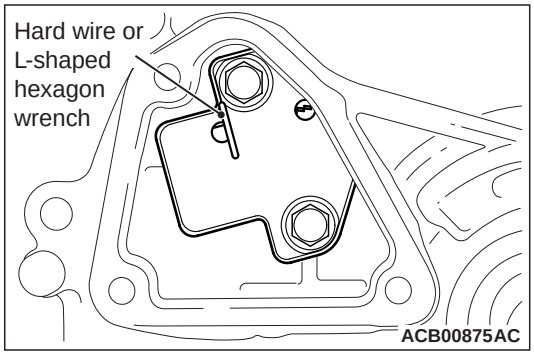
>>C<< TIMING CHAIN INSTALLATION



1. Align the timing chain mark made during removal with the mark for removal and installation of the rocker arm and camshaft assembly on the V.V.T. sprocket.

⚠ CAUTION

Be careful not to drop the timing chain tensioner mounting bolts into the timing chain case.



2. Assemble the timing chain tensioner, and tighten the mounting bolts to the specified torque.

   Tightening torque: 11 ± 3 N·m

3. Remove the hard wire or L-shaped hexagon wrench fixing the plunger of the timing chain tensioner to apply tension to the timing chain.

VALVE STEM SEAL

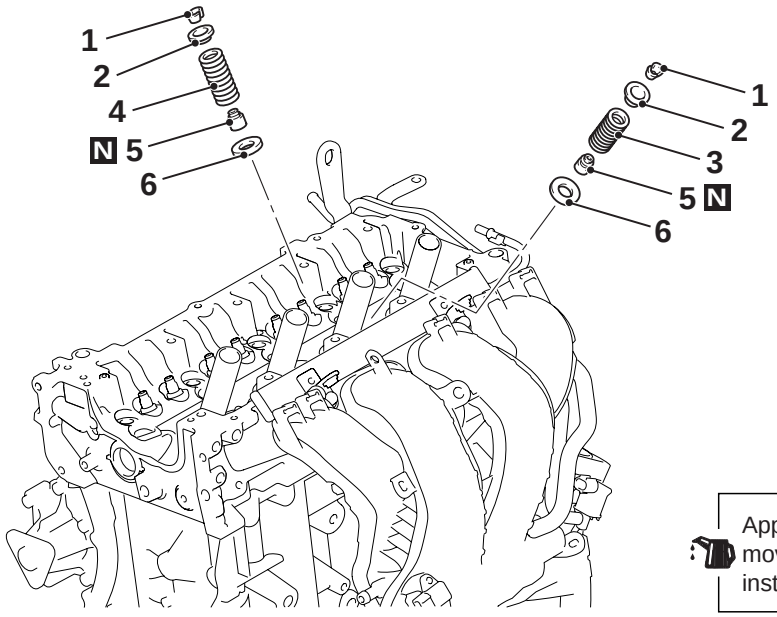
REMOVAL AND INSTALLATION

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⚠ CAUTION

Remove and assemble the marked parts in each cylinder unit.

Pre-removal operation	Post-installation operation
• Timing Chain Removal (Refer to). • Spark plug Removal (Refer to GROUP 11L – Alternator and Ignition System).	• Spark plug Installation (Refer to GROUP 11L – Alternator and Ignition System). • Timing Chain Installation (Refer to).



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			Removal steps
<<A>>	>>D<<	•	V.V.T. sprocket, rocker arm and camshaft assembly
<<B>>	>>C<<	1.	Valve spring retainer lock
		2.	Valve spring retainer
	>>B<<	3.	Inlet valve spring
	>>B<<	4.	Exhaust valve spring
<<C>>	>>A<<	5.	Valve stem seal
	>>A<<	6.	Valve spring seat

REMOVAL SERVICE POINTS

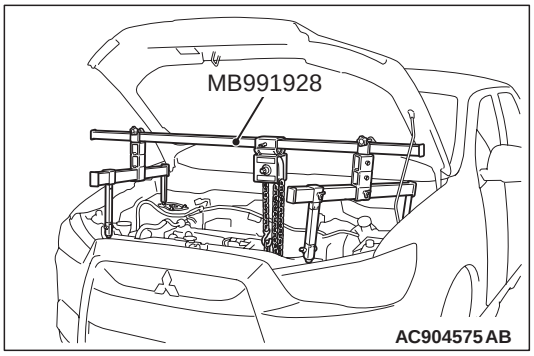
<<A>> V.V.T. SPROCKET, ROCKER ARM AND CAMSHAFT ASSEMBLY REMOVAL

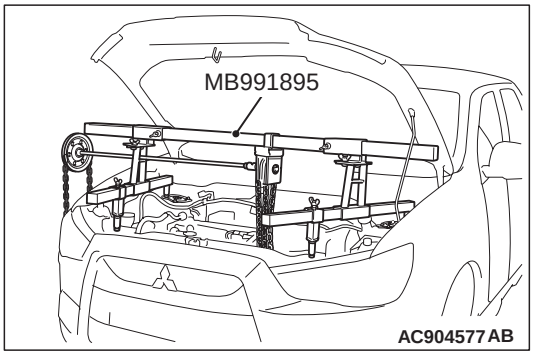
1. Temporarily install the engine oil pan which was removed at the timing chain removal.

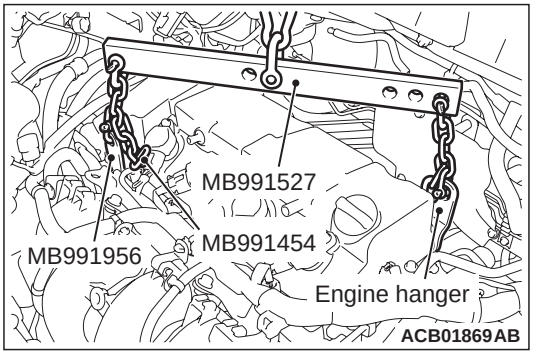
⚠ CAUTION

When supporting the engine and transmission assembly with a garage jack, be careful not to deform the engine oil pan.

2. Place a garage jack against the engine oil pan with a piece of wood in between to support the engine and transmission assembly.

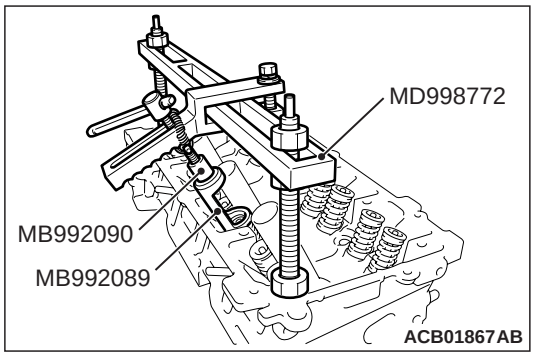






3. Remove the following special tools for holding the engine assembly, which have been attached when the timing chain case assembly was removed.
   - Engine hanger (MB991928 or MB991895)
   - Hanger (MB991527)
4. Remove the V.V.T. sprocket, rocker arm and camshaft assembly (Refer to).

<<B>> VALVE SPRING RETAINER LOCK REMOVAL



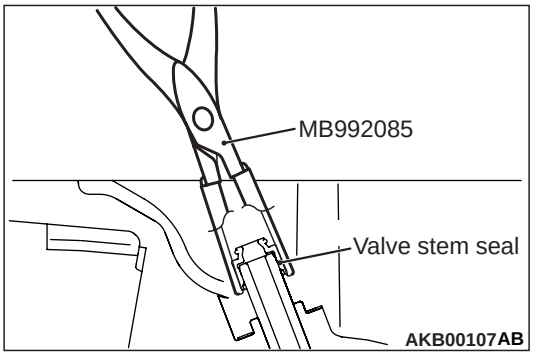
1. Screw in special tool retainer holder attachment (MB992090) to special tool valve spring compressor (MD998772), and assemble special tool retainer holder C (MB992089).

⚠ CAUTION

When removing the valve spring retainer lock, leave the piston of the cylinder in the TDC (Top Dead Centre) position. The valve may fall into the cylinder if the piston is not properly in the TDC position.

2. Install special tool MD998772 (with special tools MB992090 and MB992089 attached) to the cylinder head and compress the valve spring. Then, remove the valve spring retainer lock.

<<C>> VALVE STEM SEAL REMOVAL



Use special tool valve stem seal pliers (MB992085) to nip the base of the stem seal (where the outside diameter is larger) securely, and remove it by twisting it to the left and right.

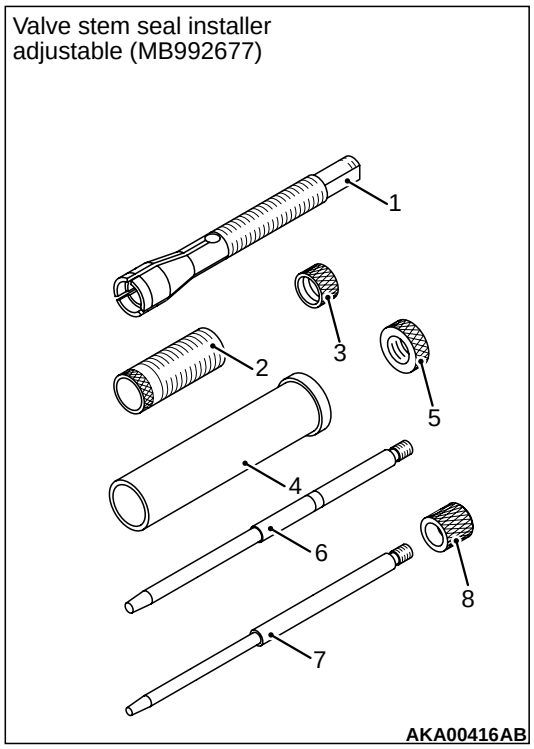
INSTALLATION SERVICE POINTS

>>A<< VALVE SPRING SEAT / VALVE STEM SEAL INSTALLATION

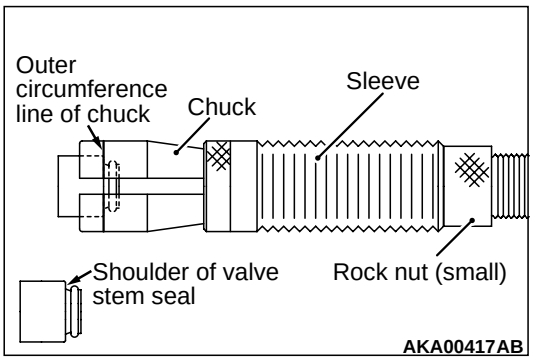
⚠ CAUTION

- **The valve stem seal must not be reused.**
- **Do not damage the tappet wall during assembly.**
- **Be sure to use a special tool to install the valve stem seal. Poor installation causes oil loss via valve guides.**
- **If oil is not applied, the valve stem seal may rise to the surface after it is press fitted.**

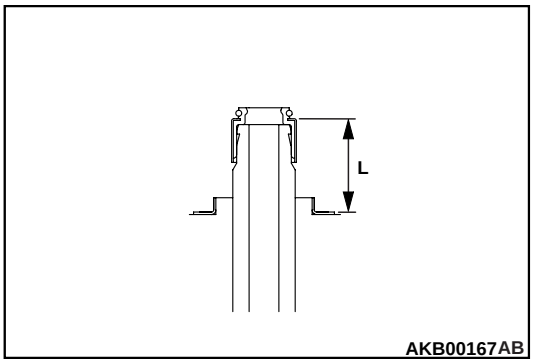
1. Apply a small amount of engine oil to the press-fit part and lip part of the new valve stem seal.
2. Use a special tool to install the valve stem seal, obeying the following procedures.

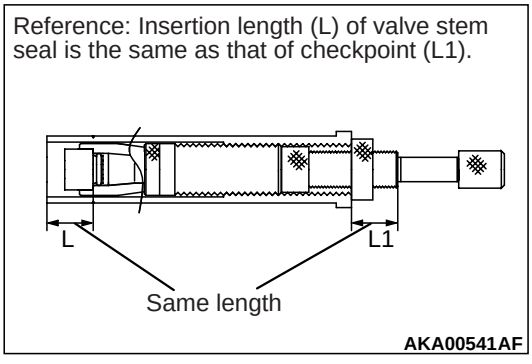


3. The special tool valve stem seal installer adjustable (MB992677) is composed of the components shown in the illustration.
   1: Chuck
   2: Sleeve
   3: Rock nut (small)
   4: Outer pipe
   5: Rock nut (large)
   6: Guide pin (5.9)
   7: Guide pin (4.9)
   8: Cap
4. Adjust the inside chuck diameter, obeying the following procedures.

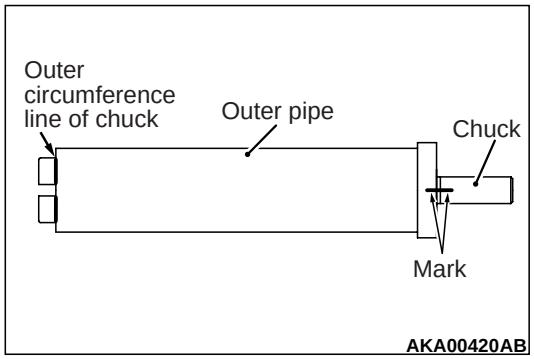


   (1) Install the sleeve to the chuck as shown in the illustration.
   (2) Install the shoulder of the valve stem seal to the chuck, aligning with the outer circumference line of the chuck as shown in the illustration.
   (3) Turn the sleeve to wring the chuck.
   (4) Stop the sleeve at the position where you can easily remove the valve stem seal by hand.
   (5) Use the (small) rock nut to fix the sleeve.





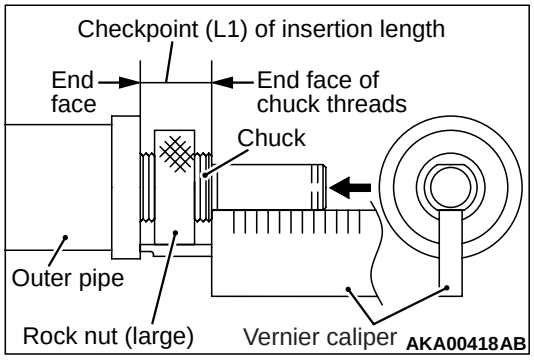
5. Adjust the stem seal insertion length, obeying the following procedures.



(1) The position, in which the end face of the outer pipe is aligned with the outer circumference line of the chuck, is 0 mm of the insertion length. Insert the chuck and the sleeve into the outer pipe to fit the nut as shown in the illustration.

(2) Turn the chuck to adjust the valve stem seal insertion length.

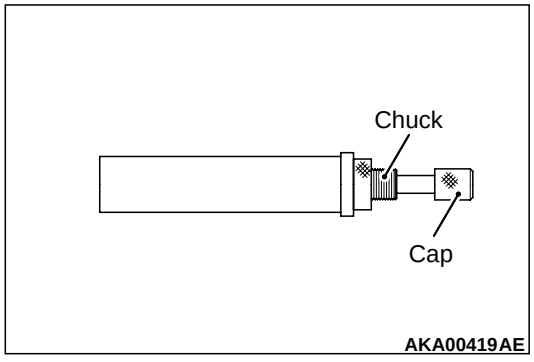
NOTE: The insertion length can change by 1 mm per the chuck turn.
To easily know how many times the chuck is turned, put the mark at the position shown in the illustration.



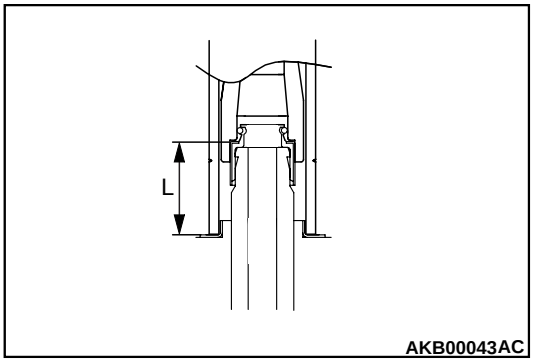
(3) Use a vernier caliper to measure the checkpoint (L1) of the insertion length shown in the illustration. Check the insertion length.

- Inlet side: 16.8 mm
- Exhaust side: 21.4 mm

(4) Use the (large) rock nut to fix the sleeve.

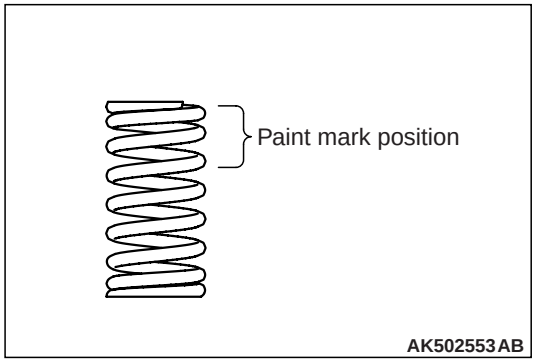


6. Install the cap to the chuck.
7. Apply the engine oil to the valve stem seal to set the chuck.
8. Install the valve spring seat.



9. Use the plastic hammer to insert the valve stem seal.

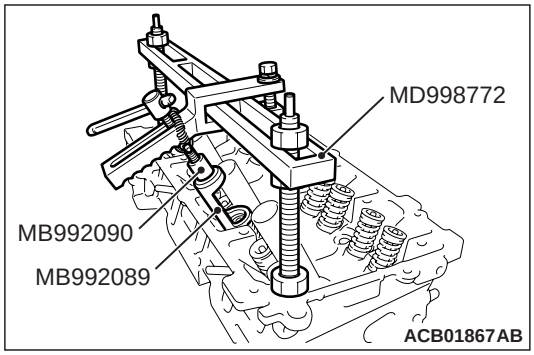
>>B<< VALVE SPRING INSTALLATION



Install the inlet valve spring so that its painted side faces the rocker arm side.

NOTE: The exhaust valve springs can be fitted either way up.

>>C<< VALVE SPRING RETAINER LOCK INSTALLATION



In the same manner as removal, use special tool valve spring compressor (MD998772) with special tool retainer holder attachment (MB992090) and special tool retainer holder C (MB992089) attached to compress the valve spring, and install the valve spring retainer lock.

>>D<< V.V.T. SPROCKET, ROCKER ARM AND CAMSHAFT ASSEMBLY INSTALLATION

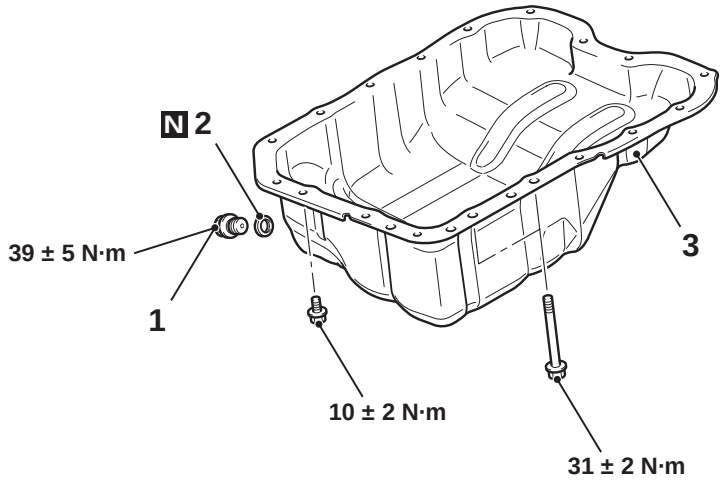
1. Install the V.V.T. sprocket, rocker arm and camshaft assembly (Refer to).
2. Attach the special tool for holding the engine assembly as during removal.
3. Remove the engine oil pan installed temporarily.

OIL PAN

REMOVAL AND INSTALLATION

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Pre-removal operation	Post-installation operation
• Engine Room Under Cover Front A, B and Engine Room Side Cover (RH) Removal (Refer to GROUP 51 – Under Cover). • Engine Oil Draining (Refer to GROUP 12 – On-vehicle Service, Engine Oil Replacement). • Drive Belt Removal (Refer to).	• Drive Belt Installation (Refer to). • Engine Oil Refilling (Refer to GROUP 12 – On-vehicle Service, Engine Oil Replacement). • Engine Room Under Cover Front A, B and Engine Room Side Cover (RH) Installation (Refer to GROUP 51 – Under Cover).



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			Removal steps
<<**A**>>			• A/C compressor and clutch assembly (Refer to GROUP 55 – Compressor Assembly). • A/C compressor bracket (Refer to GROUP 55 – Compressor Assembly).
		1.	Engine oil pan drain plug
	>>**B**<<	2.	Engine oil pan drain plug gasket
<<**B**>>	>>**A**<<	3.	Engine oil pan

REMOVAL SERVICE POINTS

<<A>> A/C COMPRESSOR AND CLUTCH ASSEMBLY REMOVAL

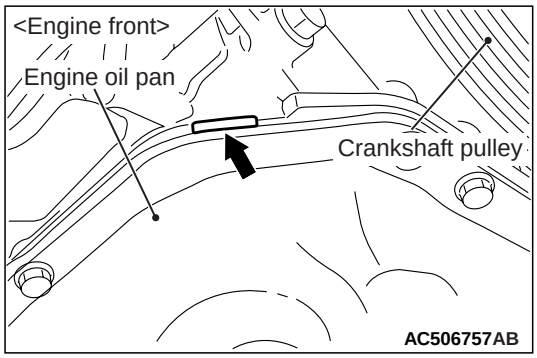
1. Remove the A/C compressor and clutch assembly together with the hose from the bracket.
2. Tie the removed A/C compressor and clutch assembly with a string at a position where they will not interfere with the removal and installation of engine oil pan.

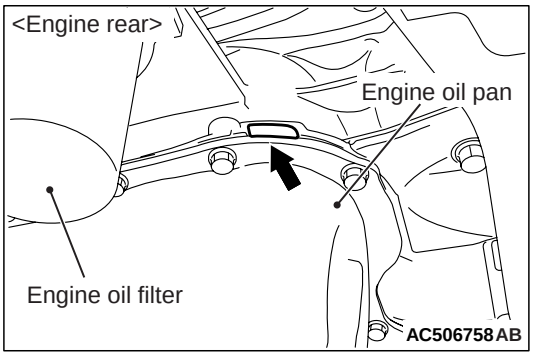
<<B>> ENGINE OIL PAN REMOVAL

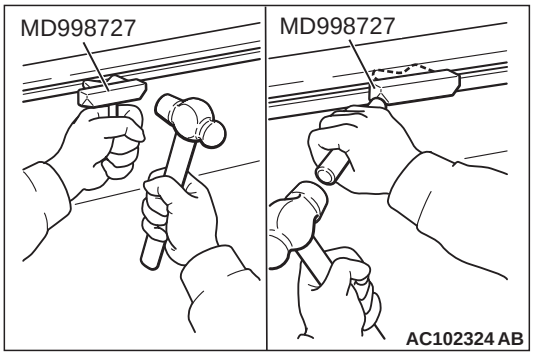
1. Remove the engine oil pan mounting bolts.

⚠ CAUTION

Do not forcibly drive in special tool oil pan FIPG cutter (MD998727) to avoid damage to the engine oil pan seal surface of cylinder block assembly.





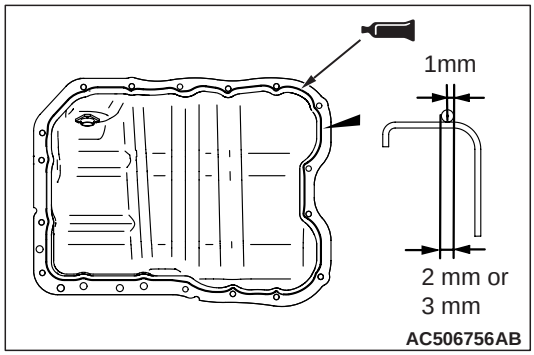


2. Insert special tool oil pan FIPG cutter (MD998727) from the engine oil pan removal groove of the cylinder block assembly.
3. Lightly tap the special tool with a hammer to slide the engine oil pan seal surface, cut off the liquid gasket, and remove the engine oil pan.

INSTALLATION SERVICE POINTS

>>A<< ENGINE OIL PAN INSTALLATION

1. Remove all the traces of sealant adhering to the engine oil pan and cylinder block assembly using a remover or others. Then, degrease them.



2. Apply the sealant without any gap to the mating surface of engine oil pan as shown in the figure, and install the engine oil pan to the cylinder block assembly.

   Specified sealant: ThreeBond 1217G or equivalent

   NOTE: Install the engine oil pan immediately after applying sealant.

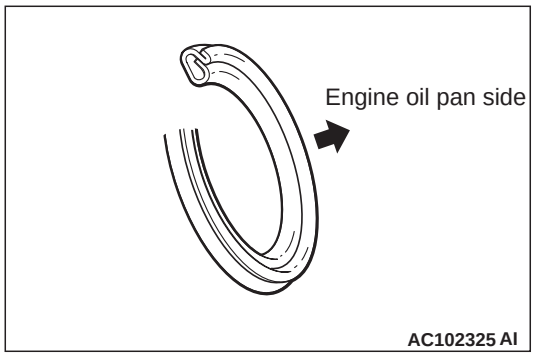
⚠ CAUTION

After the installation, until a sufficient period of time (one hour or more) elapses, do not apply the engine oil or water to the sealant application area or start the engine.

3. Tighten the engine oil pan mounting bolts to the specified torque.

   Tightening torque:
   M6: 10 ± 2 N·m
   M8: 31 ± 2 N·m

>>B<< ENGINE OIL PAN DRAIN PLUG GASKET INSTALLATION



Replace the engine oil pan drain plug gasket with a new one. Install the new gasket in the direction shown in the illustration.

INSPECTION

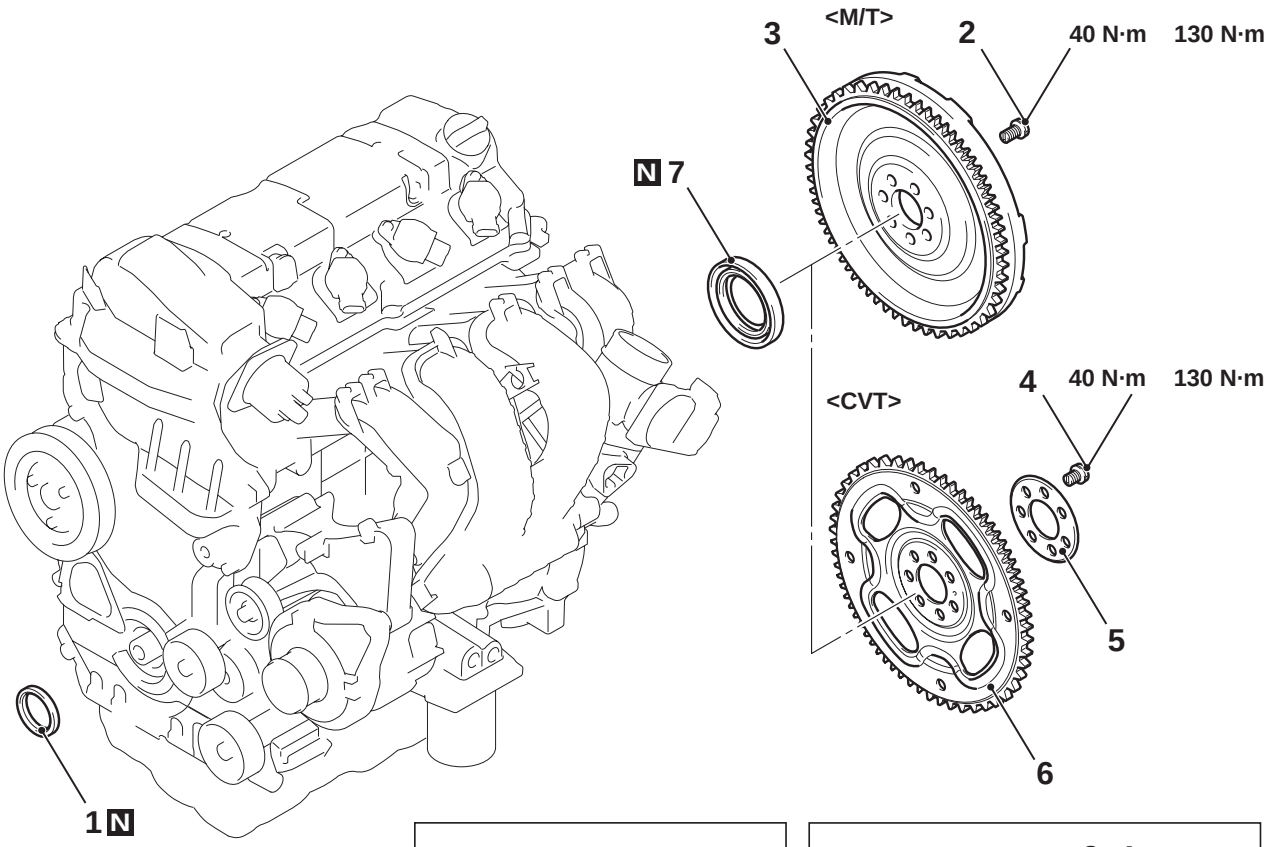
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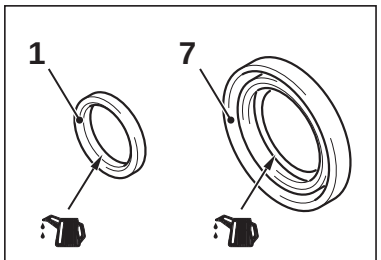
- Check the engine oil pan for cracks.
- Check the engine oil pan sealant-coated surface for damage and deformation.

CRANKSHAFT OIL SEAL

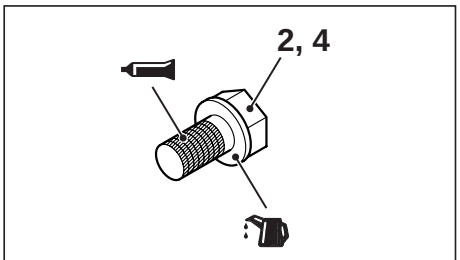
REMOVAL AND INSTALLATION

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Engine oil



Seating surface: Engine oil
Thread: ThreeBond 1324 or equivalent

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Crankshaft front oil seal removal steps

- Crankshaft pulley (Refer to)

>>C<< 1. Crankshaft front oil seal

Crankshaft rear oil seal removal steps <M/T>

- Transmission assembly (Refer to GROUP 22A – Transmission Assembly)
- Clutch cover and clutch disc (Refer to GROUP 21C – Clutch)

<<A>> >>B<< 2. Flywheel bolt

Crankshaft rear oil seal removal steps <M/T> (Continued)

>>B<< 3. Flywheel assembly
>>A<< 7. Crankshaft rear oil seal

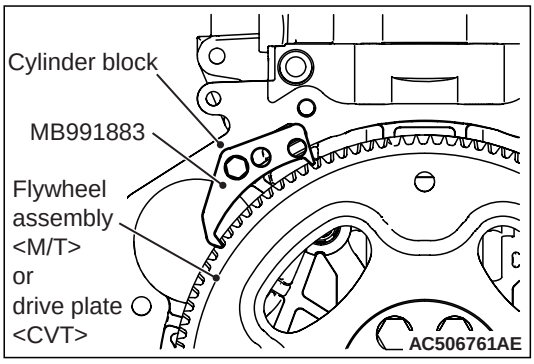
Crankshaft rear oil seal removal steps <CVT>

- Transmission assembly (Refer to GROUP 23A – Transmission Assembly)

<<A>> >>B<< 4. Drive plate bolt
>>B<< 5. Drive plate adapter plate
>>B<< 6. Drive plate
>>A<< 7. Crankshaft rear oil seal

REMOVAL SERVICE POINT

<<A>> FLYWHEEL BOLT <M/T>/DRIVE PLATE BOLT <CVT> REMOVAL

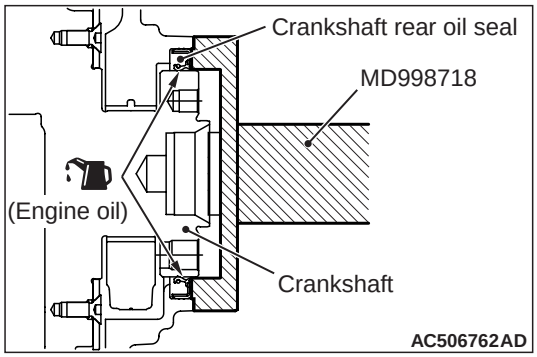


Fix the flywheel assembly using special tool flywheel stopper (MB991883), and loosen the flywheel bolts <M/T>.
Fix the drive plate using special tool MB991883, and loosen the drive plate bolts <CVT>.

INSTALLATION SERVICE POINTS

>>A<< CRANKSHAFT REAR OIL SEAL INSTALLATION

1. Apply a small amount of engine oil to the entire inner diameter of the crankshaft rear oil seal lip.



2. Using special tool crankshaft rear oil seal installer (MD998718), press in the crankshaft rear oil seal up to the cylinder block assembly end surface.

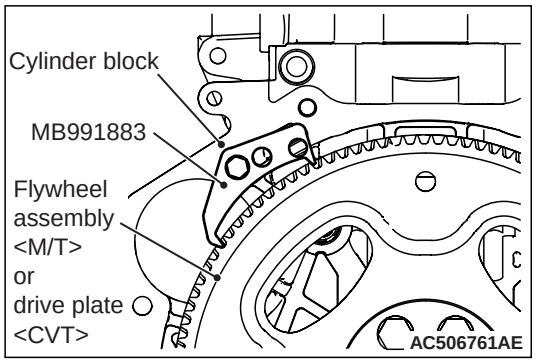
>>B<< DRIVE PLATE <CVT>/DRIVE PLATE ADAPTER PLATE <CVT>/DRIVE PLATE BOLT <CVT>/FLYWHEEL ASSEMBLY <M/T>/ FLYWHEEL BOLT <M/T> INSTALLATION

1. Remove the sealant, engine oil, and other adhering materials from the drive plate installation face, the crankshaft screw hole and drive plate bolts <CVT>.

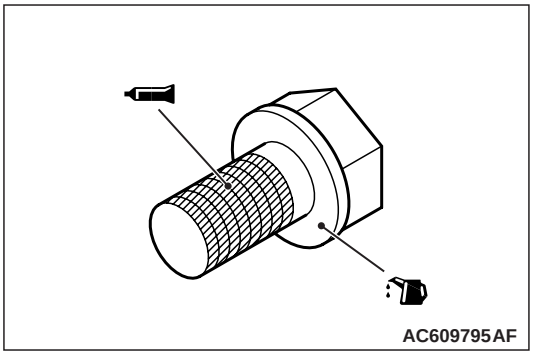
   Remove the sealant, engine oil, and other adhering materials from the flywheel assembly installation face, the crankshaft screw hole and flywheel bolts <M/T>.

2. Install the drive plate and drive plate adapter plate to the crankshaft <CVT>.

   Install the flywheel assembly to the crankshaft <M/T>.



3. Fix the drive plate <CVT> or flywheel assembly <M/T> using special tool flywheel stopper (MB991883) in the same manner as removal.

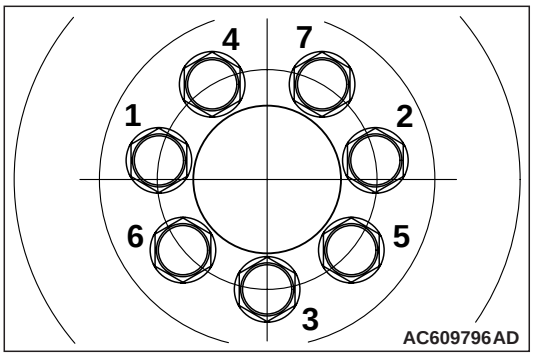


4. Apply the engine oil to the installation face of the drive plate bolts for the drive plate <CVT>.

   Apply the engine oil to the installation face of the flywheel bolts for the flywheel assembly <M/T>.

5. Apply specified sealant to the drive plate bolts <CVT> or flywheel bolts <M/T> threads.

   Specified sealant: ThreeBond 1324 or equivalent



6. Tighten the drive plate bolts <CVT> or flywheel bolts <M/T> to the specified torque in the order shown in the illustration.

   Tightening torque: 40 N·m

7. Tighten the drive plate bolts <CVT> or flywheel bolts <M/T> to the specified torque again in the order shown in the illustration.

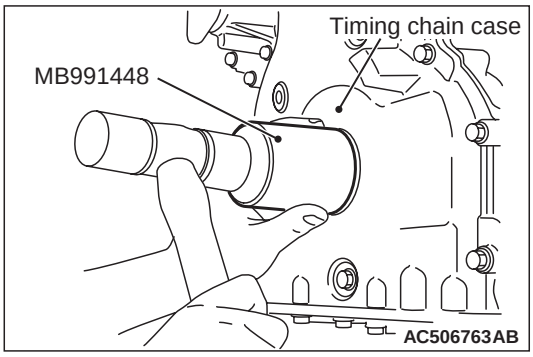
   Tightening torque: 130 N·m

>>C<< CRANKSHAFT FRONT OIL SEAL INSTALLATION

1. Apply a small amount of engine oil to the entire inner diameter of the crankshaft front oil seal lip.

⚠ CAUTION

When installing the crankshaft front oil seal, be careful to avoid damage to the crankshaft front oil seal.



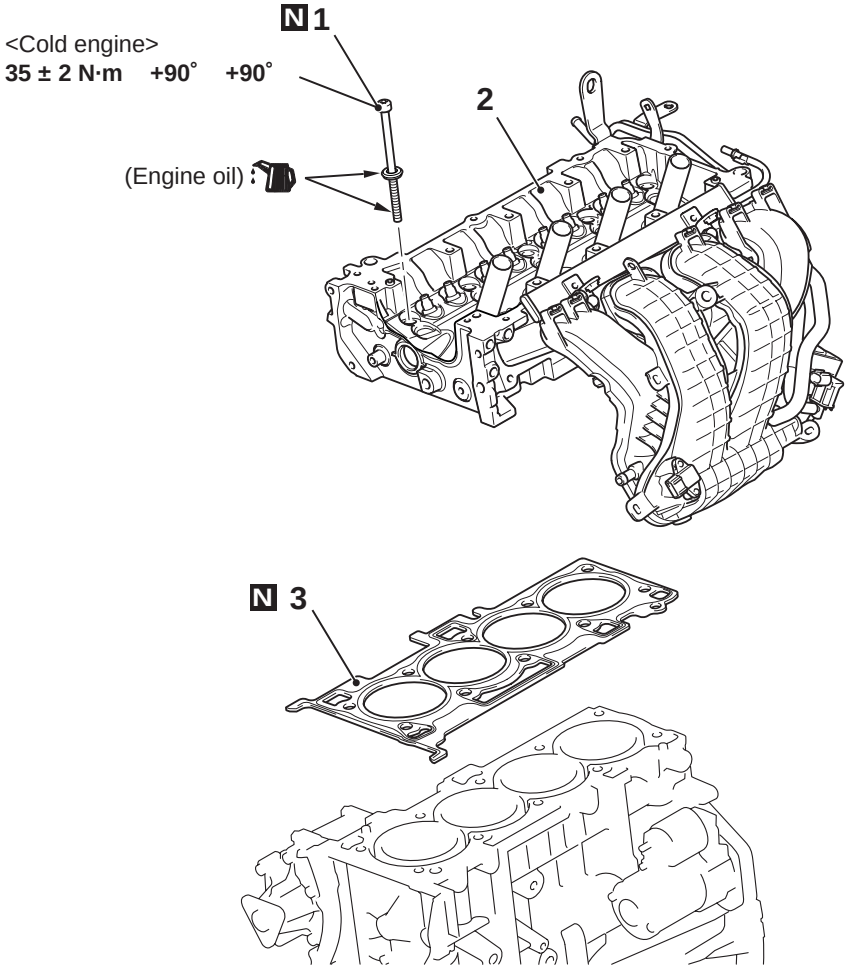
2. Using special tool bush remover and installer base (MB991448), press in the crankshaft front oil seal up to the chamfered surface of timing chain case.

CYLINDER HEAD GASKET

REMOVAL AND INSTALLATION

M1112004005092

Pre-removal operation	Post-installation operation
• Engine Upper Cover Removal (Refer to). • Oil Feeder Control Valve (OCV) Removal (Refer to GROUP 11L – Rocker Arm and Camshaft). • Air Cleaner Assembly Removal (Refer to GROUP 15 – Air Cleaner). • Ignition Coil Removal (Refer to GROUP 11L – Alternator and Ignition System). • Exhaust Manifold Removal (Refer to GROUP 15 – Exhaust Manifold). • Throttle Body Assembly Removal (Refer to GROUP 13F – Throttle Body Assembly). • Inlet Manifold Stay Removal (Refer to GROUP 15 – Exhaust Manifold).	• Inlet Manifold Stay Installation (Refer to GROUP 15 – Exhaust Manifold). • Throttle Body Assembly Installation (Refer to GROUP 13F – Throttle Body Assembly). • Exhaust Manifold Installation (Refer to GROUP 15 – Exhaust Manifold). • Ignition Coil Installation (Refer to GROUP 11L – Alternator and Ignition System). • Air Cleaner Assembly Installation (Refer to GROUP 15 – Air Cleaner). • Oil Feeder Control Valve (OCV) Installation (Refer to GROUP 11L – Rocker Arm and Camshaft). • Engine Upper Cover Installation (Refer to).



ACB00905AB

Removal steps

- Control wiring harness connection
- Brake booster vacuum hose connection (Refer to GROUP 35A – Master Cylinder Assembly and Brake Booster).

Removal steps (Continued)

- Canister vacuum hose connection (Refer to GROUP 17 – Emission Control, Canister).
- Engine oil level gauge

Removal steps (Continued)

- Heater hose connection (Refer to GROUP 14 – Water Hose and Water Pipe).
- Radiator upper hose connection (Refer to GROUP 14 – Water Hose and Water Pipe).
- Radiator lower hose connection (Refer to GROUP 14 – Thermostat).
- Water pump inlet pipe (Refer to GROUP 14 – Water Hose and Water Pipe).
- Fuel high-pressure hose connection (Refer to GROUP 13F – Injector).
- Timing chain (Refer to).

<<A>> >>C<< • V.V.T. sprocket, rocker arm and camshaft assembly

>>B<< 1. Cylinder head bolt assembly

>>A<< 2. Cylinder head assembly

>>A<< 3. Cylinder head gasket

- Oil feeder control valve filter (Refer to GROUP 11L – Cylinder Head and Valves).

REMOVAL SERVICE POINT

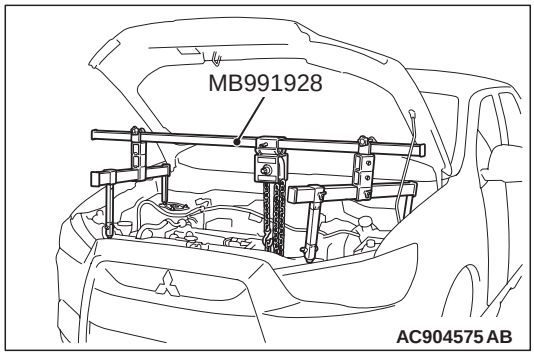
<<A>> V.V.T. SPROCKET, ROCKER ARM AND CAMSHAFT ASSEMBLY REMOVAL

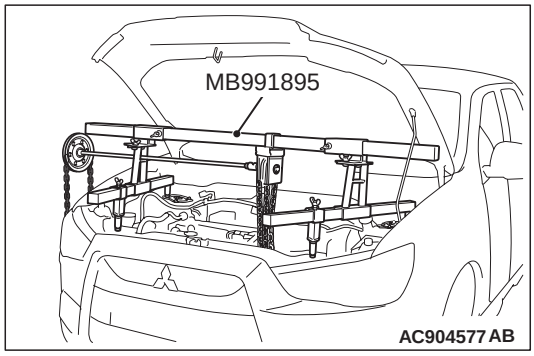
1. Temporarily install the engine oil pan which was removed at the timing chain removal.

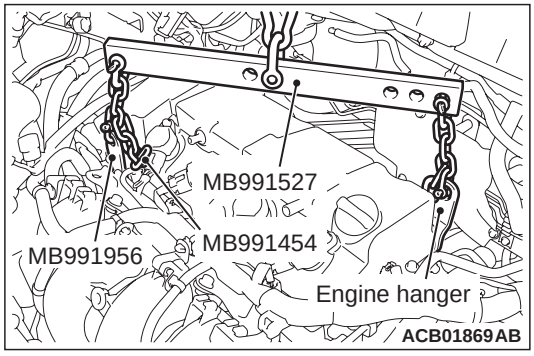
⚠ CAUTION

When supporting the engine and transmission assembly with a garage jack, be careful not to deform the engine oil pan.

2. Place a garage jack against the engine oil pan with a piece of wood in between to support the engine and transmission assembly.







3. Remove the following special tools for holding the engine assembly, which have been attached when the timing chain case assembly was removed.
   - Engine hanger (MB991928 or MB991895)
   - Hanger (MB991527)
4. Remove the V.V.T. sprocket, rocker arm and camshaft assembly (Refer to).

INSTALLATION SERVICE POINTS

>>A<< CYLINDER HEAD GASKET/CYLINDER HEAD ASSEMBLY INSTALLATION

For the installation procedure, refer to GROUP 11L – Cylinder Head and Valves .

>>B<< CYLINDER HEAD BOLT ASSEMBLY INSTALLATION

For the installation procedure, refer to GROUP 11L – Cylinder Head and Valves .

>>C<< V.V.T. SPROCKET, ROCKER ARM AND CAMSHAFT ASSEMBLY INSTALLATION

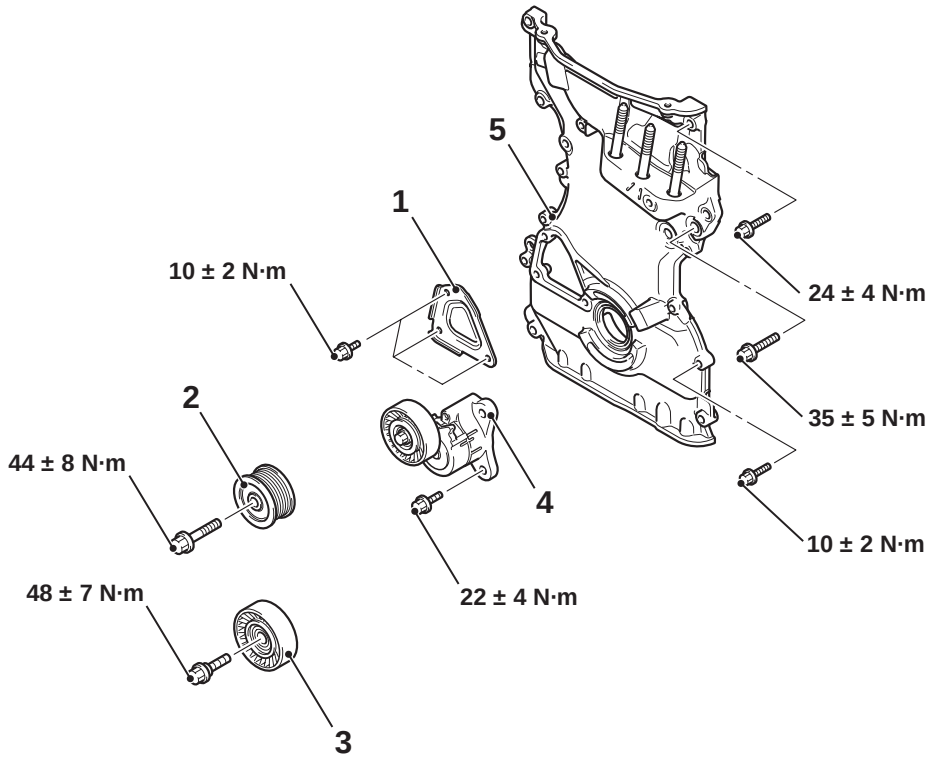
1. Install the V.V.T. sprocket, rocker arm and camshaft assembly (Refer to).
2. Attach the special tool for holding the engine assembly as during removal.
3. Remove the engine oil pan installed temporarily.

TIMING CHAIN CASE ASSEMBLY

REMOVAL AND INSTALLATION

M1112010100026

Pre-removal Operation	Post-installation Operation
• Rocker Cover Assembly Removal (Refer to). • Camshaft Position Sensor Removal (Refer to GROUP 11L – Valve Lift Control Actuator). • Engine Oil pan Removal (Refer to).	• Engine Oil pan Installation (Refer to). • Camshaft Position Sensor Installation (Refer to GROUP 11L – Valve Lift Control Actuator). • Rocker Cover Assembly Installation (Refer to).



ACB01036AB

Removal steps

<<A>> • Crankshaft pulley (Refer to).
>>D<< 1. Timing chain case cover
>>C<< • Water pump pulley (Refer to GROUP 14 – Water Pump).
2. Idler pulley
3. Idler pulley
4. Drive belt auto-tensioner
• Alternator upper bracket (Refer to GROUP 11L – Alternator and Ignition System).

Removal steps (Continued)

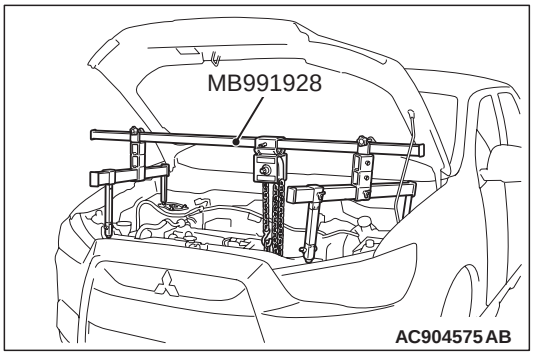
• Alternator bracket (Refer to GROUP 11L – Inlet manifold and Fuel System).
<<B>> >>B<< • Engine mounting insulator (Refer to GROUP 32 – Engine Mounting).
<<C>> >>A<< 5. Timing chain case assembly
• Crankshaft front oil seal (Refer to).

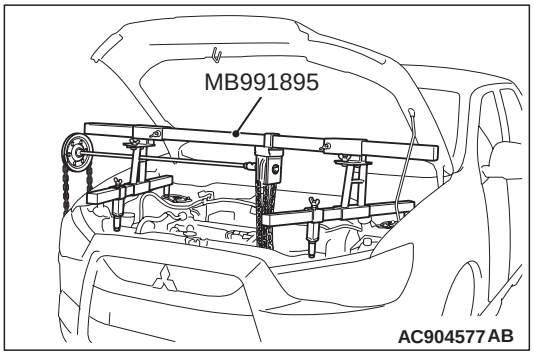
REMOVAL SERVICE POINTS

<<A>> CRANKSHAFT PULLEY REMOVAL

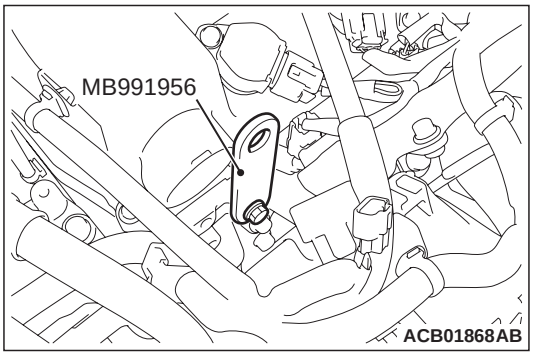
When removing the crankshaft pulley, slightly loosen the water pump pulley mounting bolts before removal of the drive belt.

<<B>> ENGINE MOUNTING INSULATOR REMOVAL

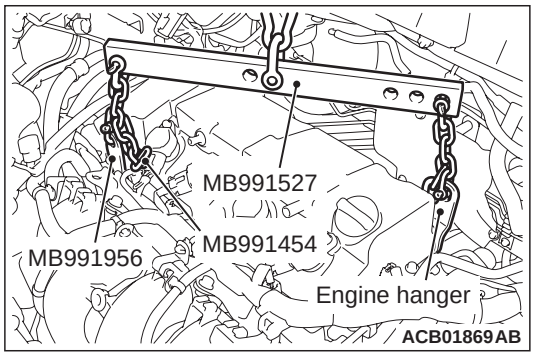




1. Secure special tool engine hanger (MB991928 or MB991895) for holding the engine assembly (Refer to GROUP 22A –Transmission Assembly) <M/T> or (Refer to GROUP 23A –Transmission Assembly) <CVT>.



2. Install special tool engine hanger plate (MB991956) to the motor bracket mounting of the cylinder head.



3. Set the following special tools to special tool MB991956 and the engine hanger to hold the engine assembly.
   - Hanger (MB991527)
   - Chain of engine hanger balancer (MB991454)
4. Adjust the special tool not to allow the weight of the engine and transmission assembly to rest on the engine mounting insulator. Then remove the engine mounting insulator.

<<C>> TIMING CHAIN CASE ASSEMBLY REMOVAL

For the removal procedure, refer to GROUP 11L – Oil Pan and Timing Chain Case .

INSTALLATION SERVICE POINTS

>>A<< TIMING CHAIN CASE ASSEMBLY INSTALLATION

For the installation procedure, refer to GROUP 11F – Oil Pan and Timing Chain Case .

>>B<< ENGINE MOUNTING INSULATOR INSTALLATION

Use the special tool as during removal to install the engine mounting insulator.

>>C<< WATER PUMP PULLEY INSTALLATION

Temporarily tighten the water pump pulley mounting bolts. Then, tighten them to the specified torque after the installation of drive belt.

Tightening torque: 9.0 ± 1.0 N·m

>>D<< TIMING CHAIN CASE COVER INSTALLATION

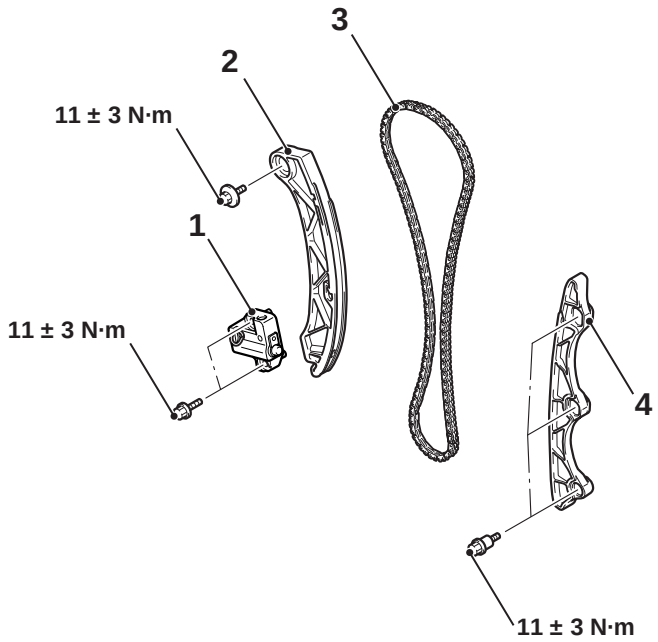
For the installation procedure, refer to GROUP 11L – Oil Pan and Timing Chain Case .

TIMING CHAIN

REMOVAL AND INSTALLATION

M1112007201918

Pre-removal Operation	Post-installation Operation
• Timing chain case assembly Removal (Refer to).	• Timing chain case assembly Installation (Refer to).



ACB01037AB

Removal steps

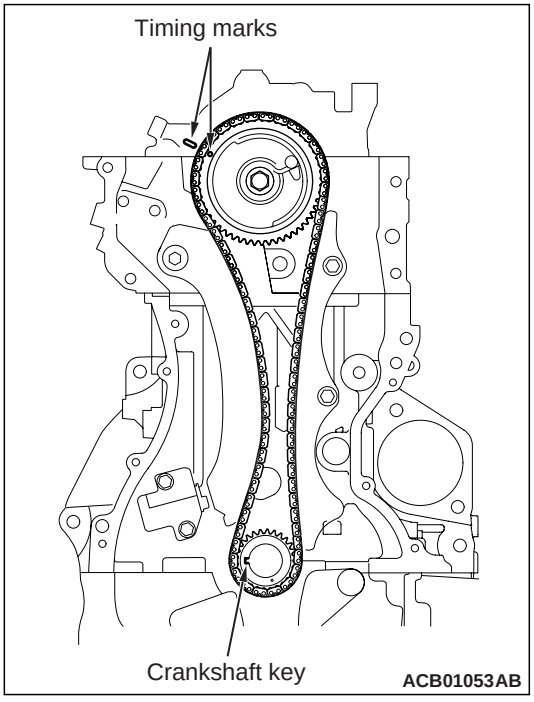
<<A>> >>B<< 1. Timing chain tensioner
2. Tensioner lever
>>A<< 3. Timing chain
4. Timing chain guide

REMOVAL SERVICE POINT

<<A>> TIMING CHAIN TENSIONER REMOVAL

1. Temporarily install the crankshaft pulley to the crankshaft.

⚠ CAUTION
Turn the crankshaft clockwise.

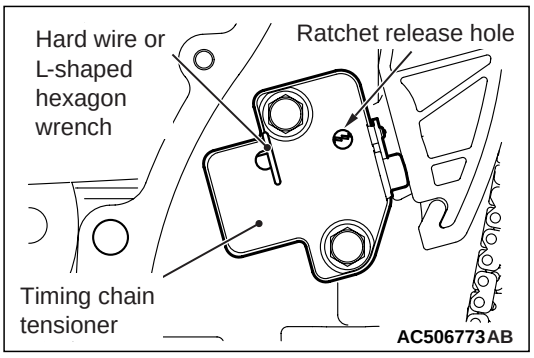


ACB01053AB

2. Turn the crankshaft clockwise to align the V.V.T. sprocket timing mark as shown in the figure and set the cylinder No. 1 to the top dead centre of compression.

NOTE: At this time, it is not necessary that the link plate (blue and orange) of the timing chain always aligns with each sprocket timing mark.

3. Check that the crankshaft key is in the position shown in the figure.
4. Remove the crankshaft pulley installed temporarily.



5. Using a precision flat-tipped screwdriver, release the ratchet of timing chain tensioner.
6. Compress the plunger of timing chain tensioner and insert hard wire (such as the piano wire) or the L-shaped hexagon wrench (1.5 mm) to fix the plunger of the timing chain tensioner.
7. Remove the timing chain tensioner.

INSTALLATION SERVICE POINTS

>>A<< TIMING CHAIN INSTALLATION

For the installation procedure, refer to GROUP 11L – Timing Chain .

>>B<< TIMING CHAIN TENSIONER INSTALLATION

For the installation procedure, refer to GROUP 11L – Timing Chain .

ENGINE ASSEMBLY

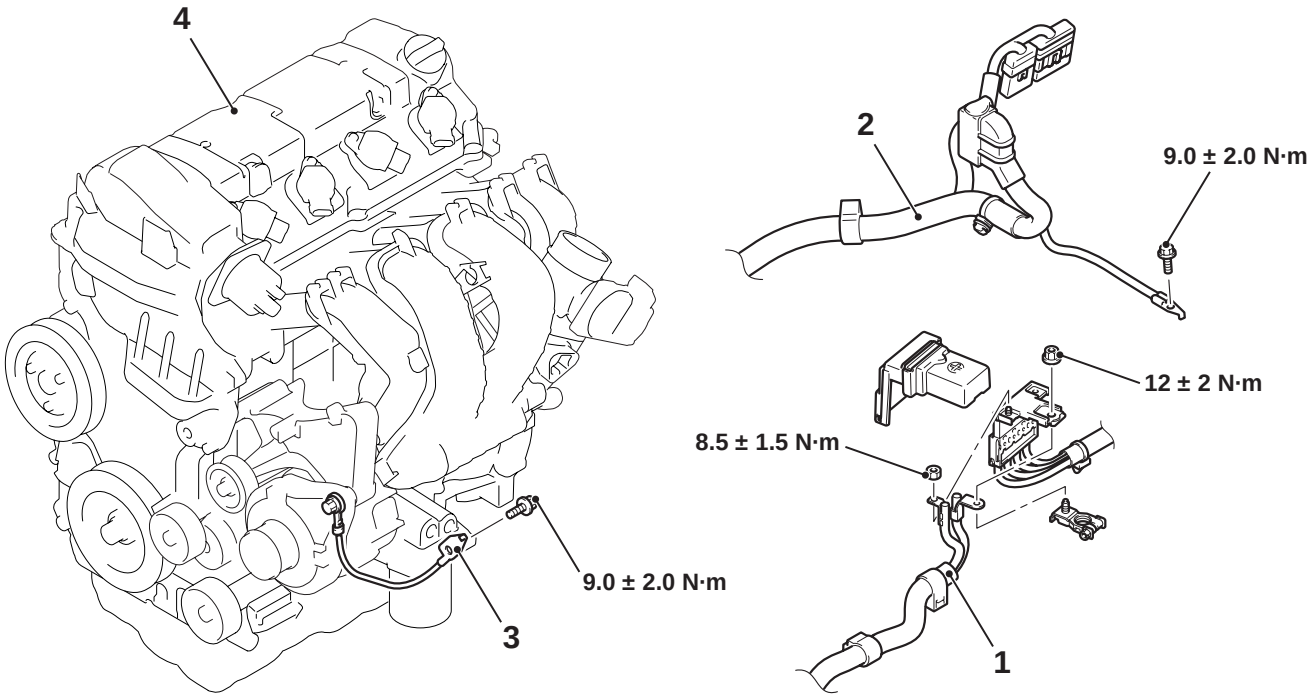
REMOVAL AND INSTALLATION

M1112001006795

⚠ CAUTION

When the engine assembly is replaced, initialise the learned value using M.U.T.-III (Refer to GROUP 00 – Precautions before Service, and Initialisation Procedure of MPI Engine Learned Value).

Pre-removal Operation	Post-installation Operation
• Hood Removal (Refer to GROUP 42A – Hood). • Fuel Line Pressure Reduction (Refer to GROUP 13F – On-vehicle Service, Reduce Pressurized Fuel Lines). • Engine Room Under Cover Front A, B and Engine Room Side Cover Removal (Refer to GROUP 51 – Under Cover). • Engine Coolant Draining (Refer to GROUP 14 – On-vehicle Service, Engine Coolant Replacement). • Engine Oil Draining (Refer to GROUP 12 – On-vehicle Service, Engine Oil Replacement). • Transmission Oil Draining (Refer to GROUP 22A – On-vehicle Service, Transmission Oil Replacement) <M/T>. • Transmission Fluid Draining (Refer to GROUP 23A – On-vehicle Service, CVT Fluid Replacement) <CVT>. • Engine Upper Cover Removal (Refer to). • Air Cleaner Assembly and Air Cleaner Bracket Removal (Refer to GROUP 15 – Air Cleaner). • Battery and Battery Tray Removal (Refer to GROUP 54A – Battery). • Exhaust Manifold Removal (Refer to GROUP 15 – Exhaust Manifold). • Drive Belt Removal (Refer to).	• Drive Belt Installation (Refer to). • Exhaust Manifold Installation (Refer to GROUP 15 – Exhaust Manifold). • Battery and Battery Tray Installation (Refer to GROUP 54A – Battery). • Air Cleaner Assembly and Air Cleaner Bracket Installation (Refer to GROUP 15 – Air Cleaner). • Engine Upper Cover Installation (Refer to). • Transmission Oil Refilling (Refer to GROUP 22A – On-vehicle Service, Transmission Oil Replacement) <M/T>. • Transmission Fluid Refilling (Refer to GROUP 23A – On-vehicle Service, CVT Fluid Replacement) <CVT>. • Engine Oil Refilling (Refer to GROUP 12 – On-vehicle Service, Engine Oil Replacement). • Engine Coolant Refilling (Refer to GROUP 14 – On-vehicle Service, Engine Coolant Replacement). • Drive Belt Tension Check (Refer to). • Fuel Leak Check. • Engine Room Under Cover Front A, B and Engine Room Side Cover Installation (Refer to GROUP 51 – Under Cover). • Hood Installation (Refer to GROUP 42A – Hood).



ACB01892AB

Removal steps

1. Battery wiring harness connection
2. Control wiring harness connection
3. Earth cable connection
- Heater hose connection (Refer to GROUP 14 – Water Hose and Water Pipe).
- Radiator upper hose connection (Refer to GROUP 14 – Water Hose and Water Pipe).
- Radiator lower hose connection (Refer to GROUP 14 – Thermostat).

<<A>>
- A/C compressor and clutch assembly (Refer to GROUP 55A – Compressor Assembly).
- Fuel high-pressure hose (Refer to GROUP 13F – Injector).
- Transmission assembly (Refer to GROUP 22A – Transmission Assembly) <M/T>.
- Transmission assembly (Refer to GROUP 23A – Transmission Assembly) <CVT>.

<<B>> >>B<<
- Engine mounting bracket (Refer to GROUP32 – Engine mounting).

<<C>> >>A<<
4. Engine assembly

REMOVAL SERVICE POINTS

<<A>> A/C COMPRESSOR AND CLUTCH ASSEMBLY REMOVAL

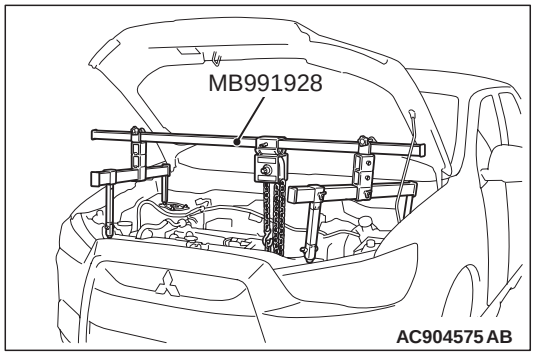
1. Remove the A/C compressor and clutch assembly together with the hose from the bracket.
2. Tie the removed A/C compressor and clutch assembly with a string at a position where they will not interfere with the removal and installation of engine assembly.

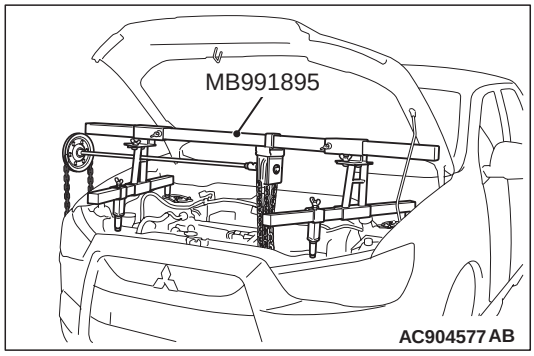
<<B>> ENGINE MOUNTING BRACKET REMOVAL

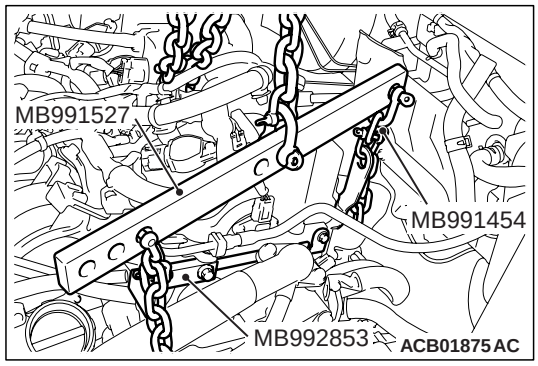
⚠ CAUTION

When supporting the engine assembly with a garage jack, be careful not to deform the engine oil pan.

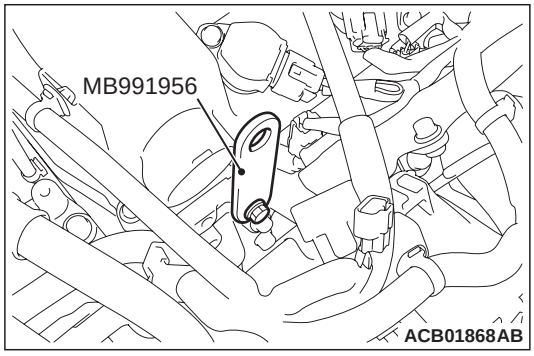
1. Place a garage jack against the engine oil pan with a piece of wood in between to support the engine assembly.



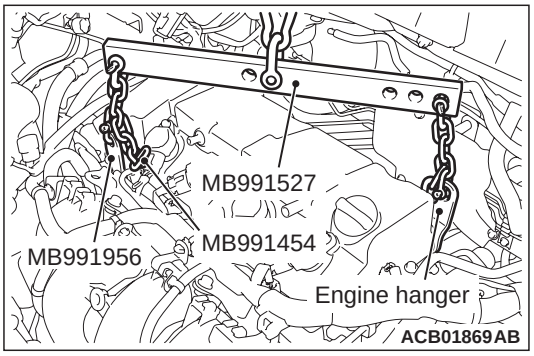




2. Remove the special tool for holding the engine assembly, which has been set when the transmission assembly is removed.
   - Engine hanger (MB991928 or MB991895)
   - Hanger (MB991527)
   - Chain of engine hanger balancer (MB991454)
   - Engine hanger plate (MB992853)
3. Remove the motor bracket (Refer to).



4. Install special tool engine hanger plate (MB991956) to the motor bracket mounting of the cylinder head.



5. Set the following special tools to special tool MB991956 and the engine hanger to hold the engine assembly.
   - Hanger (MB991527)
   - Chain of engine hanger balancer (MB991454)
6. Operate a garage jack so that the engine weight is not applied to the engine mounting insulator, and remove the engine mounting bracket.

<<C>> ENGINE ASSEMBLY REMOVAL

After checking that all cables, hoses and wiring harness connectors and so on are disconnected from the engine, lift the engine assembly slowly with the chain block to remove the engine assembly upward from the engine compartment.

INSTALLATION SERVICE POINTS

>>A<< ENGINE ASSEMBLY INSTALLATION

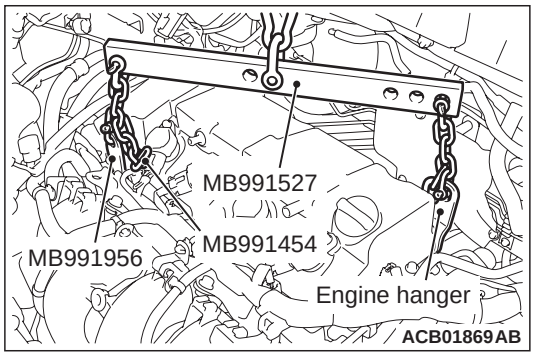
Install the engine assembly, being careful not to pinch the cables, hoses, or wiring harness connectors.

>>B<< ENGINE MOUNTING BRACKET INSTALLATION

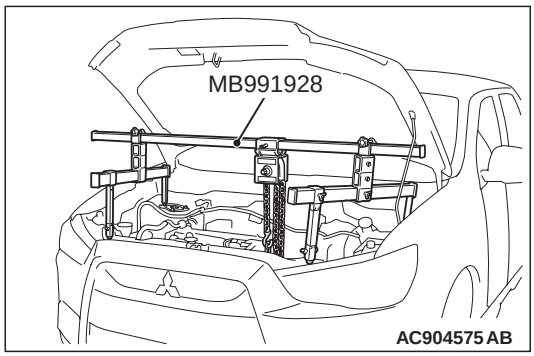
⚠ CAUTION

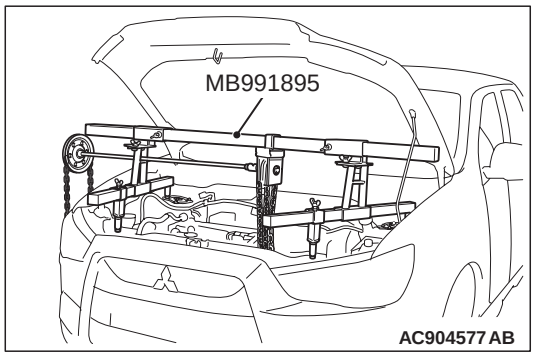
When supporting the engine assembly with a garage jack, be careful not to deform the engine oil pan.

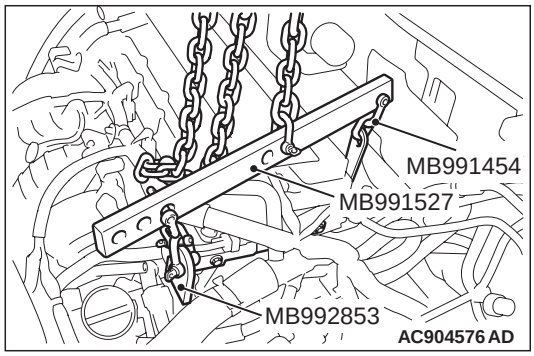
1. Place a garage jack against the engine oil pan with a piece of wood in between, and install the engine mounting bracket while adjusting the position of the engine.



2. Remove the special tool for holding the engine assembly.
   - Hanger (MB991527)
   - Chain of engine hanger balancer (MB991454)
   - Engine hanger plate (MB991956)
3. Install the motor bracket (Refer to).







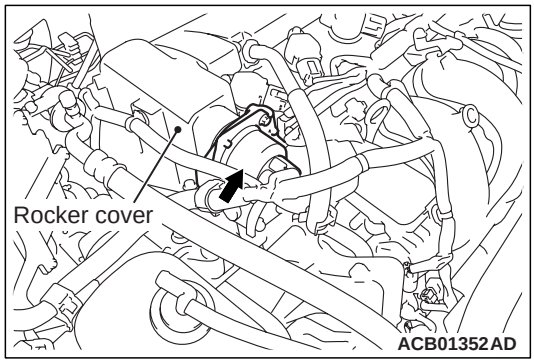
4. Secure the special tool for holding the engine assembly, which will be used when the transmission assembly is installed (Refer to GROUP 22A –Transmission Assembly) <M/T> or (Refer to GROUP 23A –Transmission Assembly) <CVT>.
   - Engine hanger (MB991928 or MB991895)
   - Hanger (MB991527)
   - Chain of engine hanger balancer (MB991454)
   - Engine hanger plate (MB992853)
5. Remove the garage jack which supports the engine assembly.

VALVE LIFT CONTROL MOTOR

REMOVAL AND INSTALLATION

M1112011200015

Pre-removal operation	Post-installation operation
• Engine Upper Cover Removal (Refer to). • Injector Protector Front Removal (Refer to GROUP 15 – Exhaust Manifold).	• Injector Protector Front Installation (Refer to GROUP 15 – Exhaust Manifold). • Engine Upper Cover Installation (Refer to).



For the removal and installation procedures, refer to GROUP 11L – Valve Lift Control Actuator .

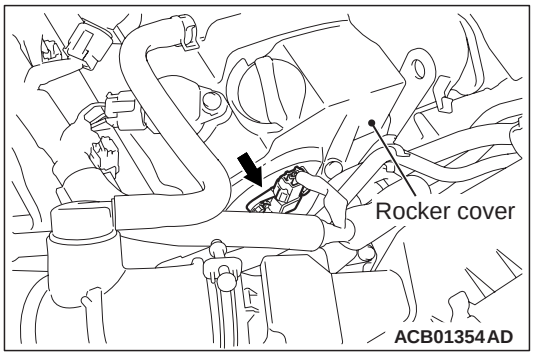
VALVE LIFT SENSOR

REMOVAL AND INSTALLATION

M1112011400019

⚠ CAUTION

If the valve lift sensor is installed, removed or replaced, initialise the learned value by using M.U.T.-III (Refer to GROUP 00 – Precautions before Service, Initialisation Procedure for Learning Value in MPI Engine).



For the removal and installation procedures, refer to GROUP 11L – Valve Lift Control Actuator .

GROUP 13F

MULTIPOINT FUEL INJECTION (MPI) <4J1>

CONTENTS

TROUBLESHOOTING **13F-2**
DIAGNOSIS CODE CHART 13F-2

TROUBLESHOOTING

INSPECTION CHART FOR DIAGNOSIS CODE

M1131151006116

⚠ *WARNING*

When touching the throttle valve, surely shut off the driving circuits of the throttle valve. In the event that the throttle valve is operated, a finger might be injured as the result of being caught by the throttle valve.

⚠ **CAUTION**

When the ignition switch is turned ON with the connector disconnected in proceeding with trouble-shooting, the diagnosis code may be stored in other systems.Erase codes if diagnosis codes of all the systems are checked and the codes are output after completion of the troubleshooting.

Code No.	Diagnosis item	Reference page
P0010	Oil feeder control valve system	
P0011	Variable valve timing system	
P0031	Oxygen sensor (front) heater circuit low input	
P0032	Oxygen sensor (front) heater circuit high input	
P0037	Oxygen sensor (rear) heater circuit low input	
P0038	Oxygen sensor (rear) heater circuit high input	
P0068	Trustful check air flow sensor	
P0102	Air flow sensor circuit low input	
P0103	Air flow sensor circuit high input	
P0107	Manifold absolute pressure sensor circuit low input	
P0108	Manifold absolute pressure sensor circuit high input	
P0112	Intake air temperature sensor circuit low input	
P0113	Intake air temperature sensor circuit high input	
P0117	Engine coolant temperature sensor circuit low input	
P0118	Engine coolant temperature sensor circuit high input	
P0121	Trustful check throttle position sensor (main)	
P0122	Throttle position sensor (main) circuit low input	
P0123	Throttle position sensor (main) circuit high input	
P0125	Insufficient coolant temperature for closed loop fuel control	
P0131	Oxygen sensor (front) circuit low voltage	
P0132	Oxygen sensor (front) circuit high voltage	
P0133	Oxygen sensor (front) circuit slow response	
P0134	Oxygen sensor (front) circuit no activity detected	
P0137	Oxygen sensor (rear) circuit low voltage	
P0138	Oxygen sensor (rear) circuit high voltage	
P0140	Oxygen sensor (rear) circuit no activity detected	
P0171	Abnormal fuel system (lean)	
P0172	Abnormal fuel system (rich)	
P0201	No. 1 injector system	
P0202	No. 2 injector system	

Code No.	Diagnosis item	Reference page
P0203	No. 3 injector system	
P0204	No. 4 injector system	
P0221	Trustful check throttle position sensor (sub)	
P0222	Throttle position sensor (sub) circuit low input	
P0223	Throttle position sensor (sub) circuit high input	
P0300	Random/multiple cylinder misfire detected	
P0301	No. 1 cylinder misfire detected	
P0302	No. 2 cylinder misfire detected	
P0303	No. 3 cylinder misfire detected	
P0304	No. 4 cylinder misfire detected	
P0327	Detonation sensor circuit low input	
P0328	Detonation sensor circuit high input	
P0335	Crank angle sensor system	
P0340	Camshaft position sensor system	
P0420	Catalyst malfunction	
P0443	Purge control solenoid valve system	
P0500	Vehicle speed sensor system <M/T>	
P0513	Immobilizer malfunction	
P0515	Battery temperature sensor system	
P0557	Brake booster pressure sensor circuit low input	
P0558	Brake booster pressure sensor circuit high input	
P0602	Variant coding system	
P0604	RAM error	
P0606	Engine-ECU main processor malfunction	
P060B	A/D converter	
P060D	Trustful check accelerator pedal position sensor	
P061A	Torque monitoring	
P061C	Trustful check engine speed	
P061F	Fail-safe control system	
P0620	Alternator control circuit	
P0622	Alternator FR terminal system	
P062F	EEPROM malfunction	
P0630	Chassis number not programmed	
P0638	Throttle valve control servo circuit range/performance problem	
P0642	Throttle position sensor power supply	
P0657	Throttle valve control servo relay circuit malfunction	
P1040	Minimum valve lift not learned yet	
P1041	Valve lift control motor abnormal voltage drop of driving power supply	
P1231	Trustful check active stability control (ASC)	
P1238	Air flow sensor trustful for torque monitoring	

Code No.	Diagnosis item	Reference page
P1240	Trustful check ignition angle	
P1242	Fail-safe control monitoring	
P1243	Inquiry/response error	
P1247	Trustful check CVT <CVT>	
P1590	CVT-ECU to engine-ECU communication error in torque reduction request <CVT>	
P1603	Battery backup circuit malfunction	
P1608	Battery current sensor system	
P1609	Battery current sensor circuit range/performance	
P2100	Throttle valve control servo circuit (open)	
P2101	Throttle valve control servo magneto malfunction	
P2122	Accelerator pedal position sensor (main) circuit low input	
P2123	Accelerator pedal position sensor (main) circuit high input	
P2127	Accelerator pedal position sensor (sub) circuit low input	
P2128	Accelerator pedal position sensor (sub) circuit high input	
P2135	Throttle position sensor (main and sub) range/performance problem	
P2138	Accelerator pedal position sensor (main and sub) range/performance problem	
P2228	Barometric pressure sensor circuit low input	
P2229	Barometric pressure sensor circuit high input	
P2252	Oxygen sensor offset circuit low voltage	
P2253	Oxygen sensor offset circuit high voltage	
P2530	Ignition switch-IG1 circuit	
P2646	Valve lift control motor control performance	
P2648	Valve lift control motor coil open	
P2649	Valve lift control motor over current	
P264B	Valve lift sensor poor sensitivity	
P264C	Valve lift sensor circuit low input	
P264D	Valve lift sensor circuit high input	
P265B	Abnormal hall sensor implanted into valve lift control motor	
U0001	Bus off	
U0101	CVT-ECU time-out <CVT>	
U011B	Valve lift ECU time-out	
U0121	ASC-ECU time-out	
U0131	EPS-ECU time-out	
U0141	ETACS-ECU time-out	
U0167	KOS-ECU <Vehicles with KOS> or WCM <Vehicles with WCM> communication error	
U0415	ASC-ECU CAN data abnormality	
U1004	AS&G-ECU time-out <Vehicles with AS&G system>	

GROUP 52A

INTERIOR

CONTENTS

TROUBLESHOOTING <INSIDE REAR VIEW MIRROR> 52A-2
DIAGNOSIS TROUBLESHOOTING FLOW 52A-2
SYMPTOM CHART. 52A-2
SYMPTOM PROCEDURES 52A-2
THE AUTOMATIC ANTI-DAZZLING FUNCTION DOES NOT WORK NORMALLY 52A-2

INSIDE REAR VIEW MIRROR. 52A-5
GENERAL INFORMATION. 52A-5
SEALANTS OR ADHESIVES 52A-6
INSIDE REAR VIEW MIRROR {EXCEPT INSIDE REAR VIEW MIRROR (WITH MONITOR)} . 52A-6
INSIDE REAR VIEW MIRROR {EXCEPT INSIDE REAR VIEW MIRROR (WITH MONITOR)} REMOVAL AND INSTALLATION 52A-6
INSIDE REAR VIEW MIRROR (WITH MONITOR) 52A-7
INSIDE REAR VIEW MIRROR (WITH MONITOR) REMOVAL AND INSTALLATION 52A-7

TROUBLESHOOTING <INSIDE REAR VIEW MIRROR>

DIAGNOSIS TROUBLESHOOTING FLOW

M1521010900181

Refer to GROUP 00 – How to Use Troubleshooting/ Inspection Service Points - Contents of Trouble-shooting .

SYMPTOM CHART

M1521003500482

Symptom	Inspection procedure No.	Reference page
The automatic anti-dazzling function does not work normally	1	
Rear view camera image is not correctly displayed <With rear view camera>	2	Refer to GROUP 54A – Rear View Camera

SYMPTOM PROCEDURES

Inspection Procedure 1: The automatic anti-dazzling function does not work normally.

COMMENTS ON TROUBLE SYMPTOM

When the ignition switch is turned to the "ON" position, the dimming function activates automatically. If the dimming function does not work normally, the inside rear view mirror, ignition switch circuit system, input circuit system of the back-up lamp switch <M/T> or inhibitor switch <CVT, A/T> may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of the back-up lamp switch <MT>
- Malfunction of the inhibitor switch <CVT, A/T>
- Malfunction of the inside rear view mirror

DIAGNOSIS PROCEDURE

STEP 1. Check the inside rear view mirror.

Check the illumination condition of the indicator.

(1) Turn the ignition switch to the "ON" position.
(2) Move the selector lever <CVT, A/T> or shift lever <M/T> to the "R" (Reverse) position.
(3) Check that the indicator of the inside rear view mirror illuminates.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Go to Step 3.

STEP 2. Check the inside rear view mirror.

Check the illumination condition of the indicator.

(1) Turn the ignition switch to the "ON" position.
(2) Move the selector lever <CVT, A/T> or shift lever <M/T> to the "R" (Reverse) position.
(3) Check that the indicator of the inside rear view mirror illuminates in green.

Q: Is the check result normal?

YES : Go to Step 21.
NO : Go to Step 3.

STEP 3. M.U.T.-III other system diagnosis code.

Check if the diagnosis code is set to the ETACS-ECU.

Q: Is the diagnosis code set?

YES : Diagnose the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU – Diagnostic Function).
NO : Go to Step 4.

STEP 4. M.U.T.-III other system data list.

Check the input signal of ACC relay.

- Turn the ignition switch to the "ACC" position.

Item No.	Item name	Normal condition
288	ACC switch	ON

OK: Normal condition is displayed.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Refer to GROUP 54A – ETACS-ECU – The Ignition Switch (ACC) Signal is Not Received .

STEP 5. M.U.T.-III data list.
Check if ETACS-ECU related signal is set.
- Turn the ignition switch to the "ON" position.

Item No.	Item name	Normal condition
254	IG voltage	System voltage

OK: Normal condition is displayed.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Refer to GROUP 54A – ETACS-ECU – The Ignition Switch (IG1) Signal is Not Received .

STEP 6. M.U.T.-III data list.
Check if ETACS-ECU related signal is set.
- Turn the ignition switch to the "ON" position.
- Selector lever <CVT, A/T> or shift lever <M/T> is "R" (Reverse) position.

Item No.	Item name	Normal condition
289	Backup lamp or shift reveres SW	ON

OK: Normal condition is displayed.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Go to Step 13.

STEP 7. Connector check: D-46 inside rear view mirror connector.

Q: Is the check result normal?
YES : Go to Step 8.
NO : Repair the defective connector.

STEP 8. Voltage measurement at D-46 inside rear view mirror connector.
(1) Disconnect the connector, and measure at the wiring harness-side connector.
(2) Turn the ignition switch to the "ACC" position.
(3) Voltage between D-46 inside rear view mirror connector terminal No. 1 and the body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 10.
NO : Go to Step 9.

STEP 9. Check the wiring harness between D-46 inside rear view mirror connector terminal No. 1 and C-315 ETACS-ECU connector terminal No. 9.
- Check the power supply lines (battery power supply) for open circuit and short circuit.

NOTE: Before the wiring harness inspection, inspect the C-130 intermediate connector, and repair if necessary.

Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions).
NO : Repair the wiring harness.

STEP 10. Resistance measurement at D-46 inside rear view mirror connector.
(1) Disconnect D-46 inside rear view mirror connector, and measure the resistance available at the wiring harness side of the connector.
(2) Check the continuity between terminal No. 4 and body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 12.
NO : Go to Step 11.

STEP 11. Check the wiring harness between D-46 inside rear view mirror connector terminal No. 4 and body earth.
- Check the earth wires for open circuit.

Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions).
NO : Repair the wiring harness.

STEP 12. Voltage measurement at D-46 inside rear view mirror connector.
(1) Disconnect the connector, and measure at the wiring harness-side connector.
(2) Turn the ignition switch to the "ON" position.
(3) Move the selector lever <CVT, A/T> or shift lever <M/T> to the "R" (Reverse) position.
(4) Voltage between D-46 inside rear view mirror

connector terminal No. 2 and the body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 21.
NO : Go to Step 19.

STEP 13. Connector check: C-313 ETACS-ECU connector and B-110 back-up lamp switch connector <M/T> or B-109 inhibitor switch connector <CVT, A/T>.

Q: Is the check result normal?
YES : Go to Step 14.
NO : Repair the defective connector.

STEP 14. Check the wiring harness between C-313 ETACS-ECU connector terminal No. 4 and B-110 back-up lamp switch connector terminal No. 2 <M/T> or B-109 inhibitor switch connector terminal No. 3 <4J1,4B1>or No. 8 <4A9> <CVT, A/T>.

- Check the communication lines for open circuit and short circuit.

NOTE: Before the wiring harness inspection, inspect the C-31 and A-60 <Diesel> or A-11<Petrol> intermediate connector, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 15.
NO : Repair the wiring harness.

STEP 15. Connector check: C-304 ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 16.
NO : Repair the defective connector.

STEP 16. Check the wiring harness between C-304 ETACS-ECU connector terminal No. 2 and B-110 back-up lamp switch connector terminal No. 1 <M/T> or B-109 inhibitor switch connector terminal No. 9 <4J1,4B1>or No. 7 <4A9> <CVT, A/T>.

- Check the communication lines for open circuit and short circuit.

NOTE: Before the wiring harness inspection, inspect the A-60 <Diesel> or A-11 <Petrol> intermediate connector, and repair if necessary.

Q: Is the check result normal?
YES <CVT, A/T> : Go to Step 17.
YES <M/T> : Go to Step 18.
NO : Repair the wiring harness.

STEP 17. Check the inhibitor switch and the control cable.

Check that the inhibitor switch and the control cable are adjusted correctly (Refer to GROUP 23A – On-vehicle Service – Inhibitor Switch and Control Cable Adjustment <CVT> or GROUP 23C – On-vehicle Service – Inhibitor Switch and Control Cable Adjustment <A/T>).

Q: Is the check result normal?
YES : Go to Step 18.
NO : Adjust the inhibitor switch and the control cable.

STEP 18. Check the back-up lamp switch <M/T> or inhibitor switch <CVT, A/T>.

- Check the continuity of the back-up lamp switch <M/T> (Refer to GROUP 22B – Transmission – Transmission Inspection).
- Check the continuity of the inhibitor switch <CVT, A/T> (Refer to GROUP 23A – On-vehicle Service – Inhibitor Switch Continuity Check <CVT> or GROUP 23C – On-vehicle Service – Inhibitor Switch Check <A/T>).

Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions).
NO : Replace the back-up lamp switch <M/T> or inhibitor switch <CVT, A/T>

STEP 19. Connector check: C-311 ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 20.
NO : Repair the defective connector.

STEP 20. Check the wiring harness between C-311 ETACS-ECU connector terminal No. 2 and D-46 inside rear view mirror connector terminal No. 2.

- Check the communication lines for open circuit and short circuit.

NOTE: Before the wiring harness inspection, inspect the C-28 and C-130 intermediate connector, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 21.
NO : Repair the wiring harness.

STEP 21. Check the inside rear view mirror.
Refer to .

Q: Is the check result normal?

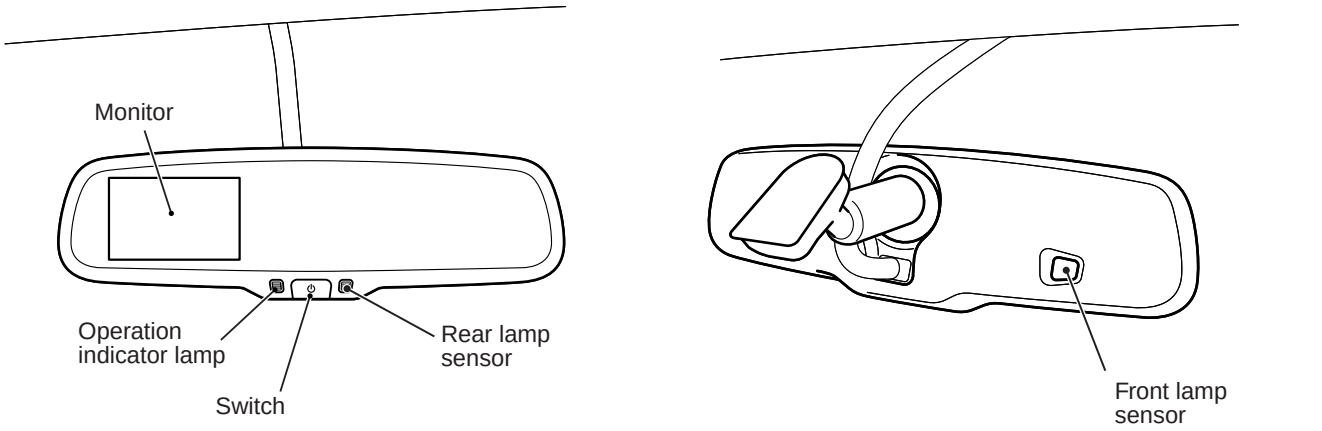
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions).
NO : Replace the inside rear view mirror (with monitor).

INSIDE REAR VIEW MIRROR

GENERAL INFORMATION

M1521000101284

An inside rear view mirror (with monitor) has been installed.



ACB00188AB

AUTOMATIC ANTI-DAZZLING FUNCTION

Inside rear view mirror changes the reflection rate of the inside rear view mirror depending on the intensity of headlamp glare reflection.

- The inside rear view mirror changes the reflection rate of the inside rear view mirror depending on the intensity of headlamp glare reflection. incorporates a front lamp sensor, rear lamp sensor, and control unit. The front lamp sensor detects the outside brightness, and the rear lamp sensor detects the brightness of headlamps coming from behind. Depending on the difference of the quantity of lamp, the quantity of reflection is controlled to reduce glare from behind.
- When the vehicle is moving backward, the anti-dazzling function is deactivated to secure a clear rear view.
- The anti-dazzling function can be turned ON/OFF by the switch.
- The operation indicator illuminates green when the anti-dazzling function is ON and goes off when the anti-dazzling function is OFF.

MONITOR FUNCTION

- Refer to GROUP 54 – Rear View Camera

SWITCH OPERATION AND SYSTEM OPERATION

Function	Selector lever position	Time for the switch to be pressed	Operation
Inside rear view mirror anti-dazzling function	Other than the "R" (Reverse) position	Less than 3 seconds	Turning the anti-dazzling function ON/OFF. After turning the anti-dazzling function OFF, the next time the ignition is turned to the "ON" position, the anti-dazzling function turns ON.
Inside rear view mirror monitor function	"R" (Reverse) position	Less than 5 seconds	Monitor on and off. When the ignition switch is turned "ON", the monitor will be switched on automatically.If the switch is pressed to switch the monitor off, the indicator illuminates orange.
		6 - 11 seconds	Language selection for warning text on the monitor. Languages is changed over each time the switch is pressed.An applicable language will be memorized in five seconds after it is selected.
		More than 12 seconds	Setting the monitor to be always off. The indicator illuminates orange.When the ignition switch is turned "ON" at the next time, this monitor-OFF setting is memorized.If the switch is pressed, the monitor will be restored.

ADHESIVE

M1521000500182

Application	Brand name
Inside rear view mirror	Inside rear view mirror adhesive kit MU-150Kit [MZ100425]

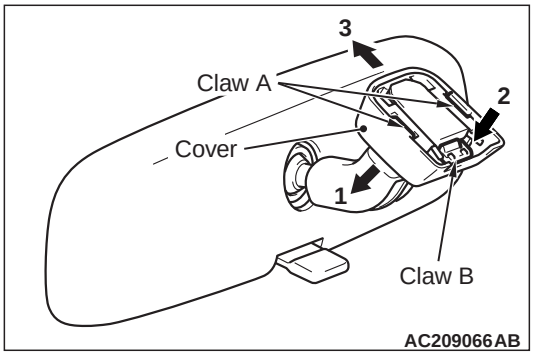
NOTE: The symbol in parentheses indicates a part number.

INSIDE REAR VIEW MIRROR {EXCEPT INSIDE REAR VIEW MIRROR (WITH MONITOR)}

REMOVAL AND INSTALLATION

M1521015400062

REMOVAL SERVICE POINT

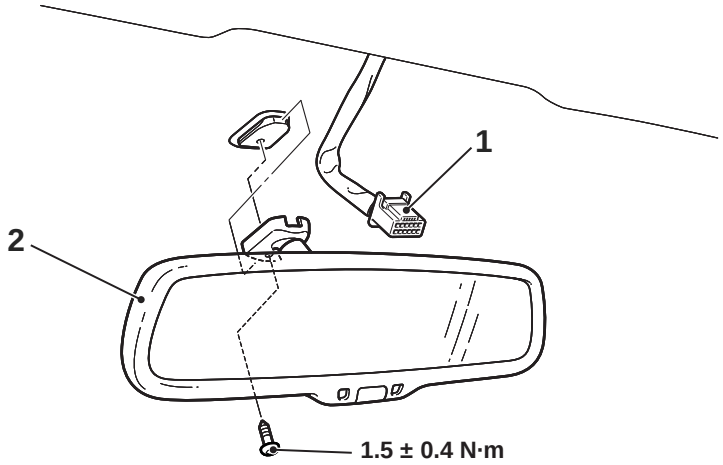


1. Disengage the claw A and lower the cover toward arrow 1 direction.
2. Push the claw B toward arrow 2 direction to unlock, and pull out the mirror toward arrow 3 direction.

INSIDE REAR VIEW MIRROR (WITH MONITOR)

REMOVAL AND INSTALLATION

M1521015500122



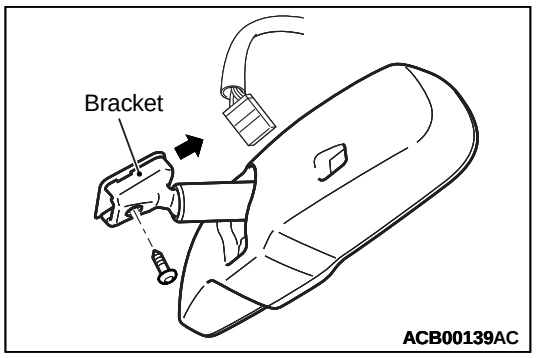
ACA03938AD

Removal steps

1. Harness connector
<<A>> 2. Inside rear view mirror (with monitor)

REMOVAL SERVICE POINT

<<A>> INSIDE REAR VIEW MIRROR REMOVAL



1. Remove the bracket screw.
2. Slide the bracket upward to remove.

GROUP 54A

CHASSIS ELECTRICAL

CONTENTS

REAR VIEW CAMERA. 54A-2

GENERAL INFORMATION. 54A-2
SPECIAL TOOL(S) 54A-3
TROUBLESHOOTING 54A-5
DIAGNOSIS TROUBLESHOOTING FLOW 54A-5
SYMPTOM CHART. 54A-5
SYMPTOM PROCEDURES 54A-6
REAR VIEW CAMERA IMAGE IS NOT CORRECTLY DISPLAYED. <VEHICLES WITHOUT MMCS> 54A-6
REAR VIEW CAMERA REMOVAL AND INSTALLATION 54A-13

REAR VIEW CAMERA

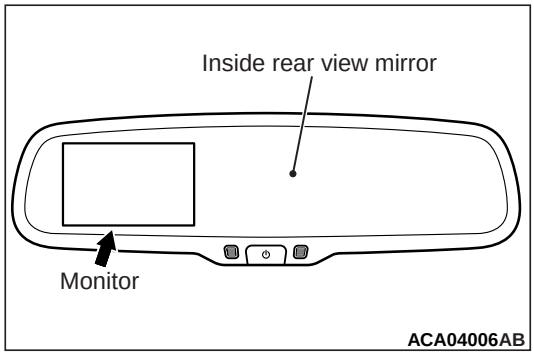
GENERAL INFORMATION

M1540905600487

<VEHICLES WITH MMCS>

The rear view camera displays the rear view image of the vehicle on the multivision display for easy confirmation of safety when driving backward.

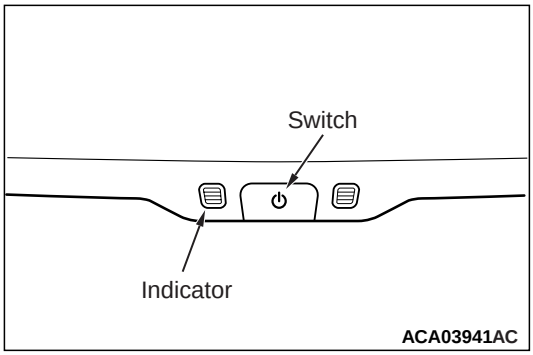
<VEHICLES WITHOUT MMCS>



Since the monitor that displays the rear view camera image has been incorporated in the inside rear view mirror.

OPERATION

- When the shift lever <M/T> or selector lever <A/T, CVT> is moved to the R (Reverse) position with the ignition switch ON, the rear view monitor (integrated in inside-rear view mirror) displays the rear view via the rear-view camera automatically.



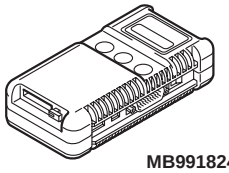
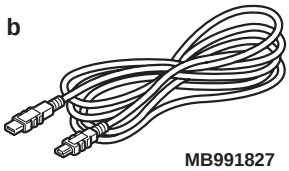
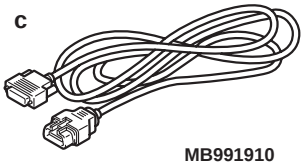
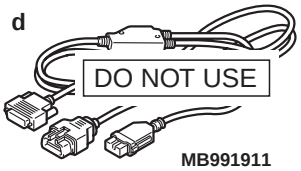
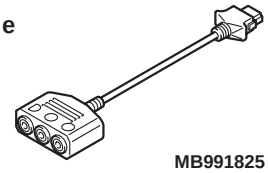
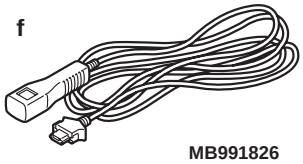
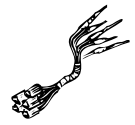
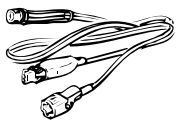
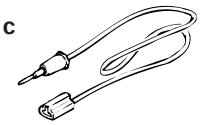
- The indicator illuminates green when the rear view monitor (integrated in inside-rear view mirror) displays the rear view.
- Functions can be changed over each time the switch is pressed.

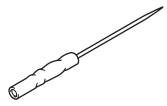
SWITCH OPERATION AND SYSTEM OPERATION

Time for the switch to be pressed (second)	Operation
0 – 6	Monitor on and off. When the ignition switch is turned ON, the monitor will be switched on automatically. If the switch is pressed to switch the monitor off, the indicator illuminates orange.
6 – 12	Language selection for warning text on the monitor. Languages is changed over each time the switch is pressed. An applicable language will be memorized in five seconds after it is selected.
12 – 15	Setting the monitor to be always off. The indicator illuminates orange. When the ignition switch is turned ON at the next time, this monitor-OFF setting is memorized. If the switch is pressed, the monitor will be restored.

SPECIAL TOOLS

M1540902100074

Tool	Number	Name	Use
a  MB991824 b  MB991827 c  MB991910 d  DO NOT USE MB991911 e  MB991825 f  MB991826 MB991955	MB991955 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991825 f. MB991826	M.U.T.-III sub-assembly a. Vehicle Communication Interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III measure adapter f. M.U.T.-III trigger harness	**⚠ CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.** CAN bus diagnostics or service data check.
a  b  c  d  DO NOT USE MB991223	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222	Harness set a. Check harness b. LED harness c. LED harness adapter d. Probe	Continuity check and voltage measurement at harness wire or connector a. For checking connector pin contact pressure b. For checking power supply circuit c. For checking power supply circuit d. For connecting a locally sourced tester

Tool	Number	Name	Use
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector

TROUBLESHOOTING

TROUBLE SYMPTOM CHART

M1540900300492

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1540902300067

Refer to GROUP 00 – Contents of troubleshooting .

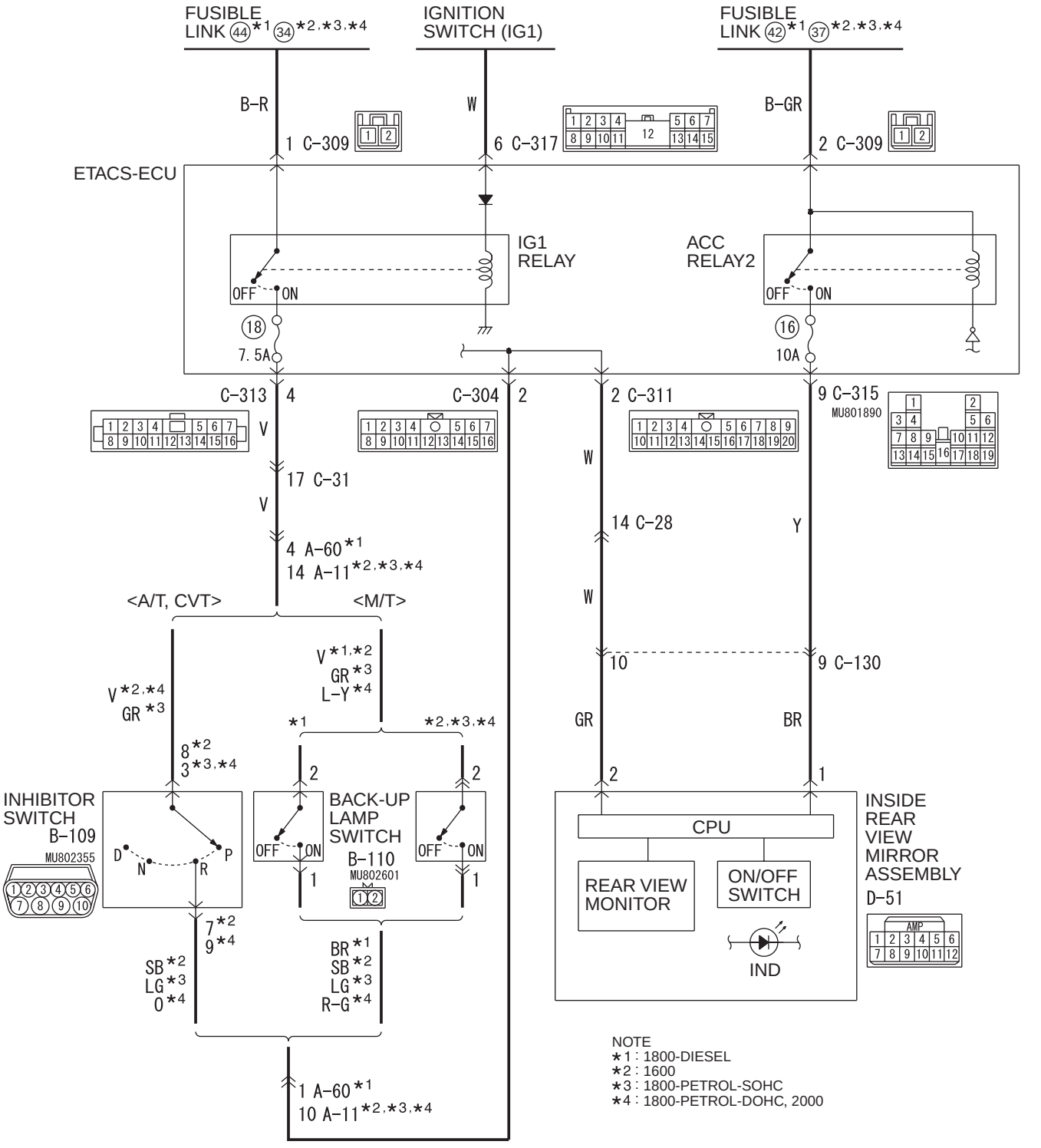
Trouble symptom		Reference page
Rear view camera image is not correctly displayed.	<Vehicles without MMCS>	

SYMPTOM PROCEDURES

Rear view camera image is not correctly displayed. <Vehicles without MMCS>

⚠ CAUTION
Before replacing the rear view camera or inside rear view mirror assembly, ensure that the power supply circuit, the earth circuit, and the communication circuit are normal.

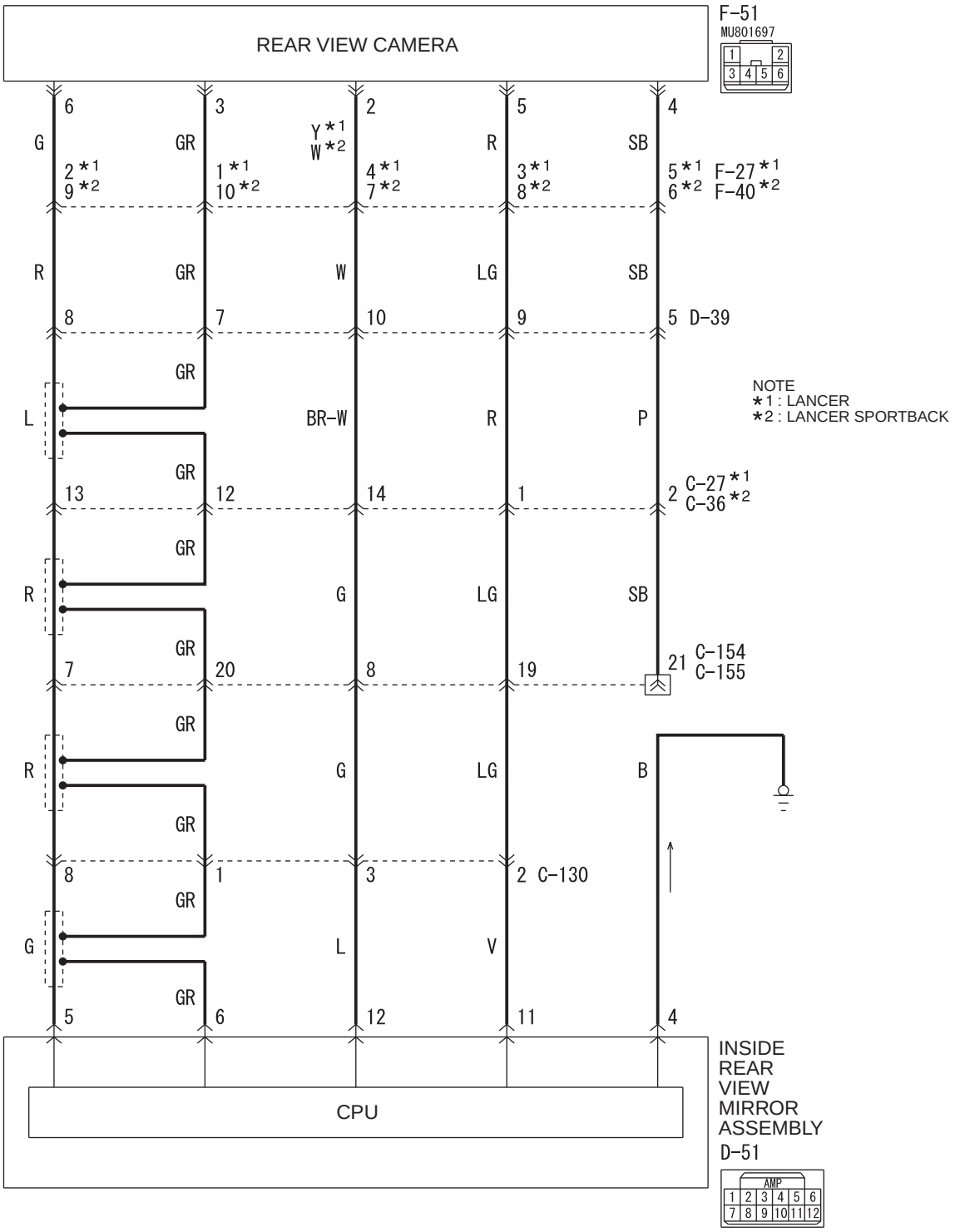
Rear View Camera Circuit



NOTE
*1 : 1800-DIESEL
*2 : 1600
*3 : 1800-PETROL-SOHC
*4 : 1800-PETROL-DOHC, 2000

Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple SI : Silver WDH54E017A

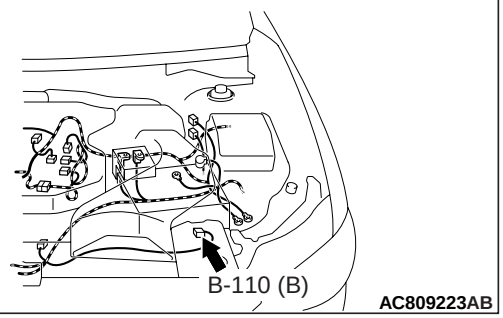
Rear View Camera Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple SI : Silver

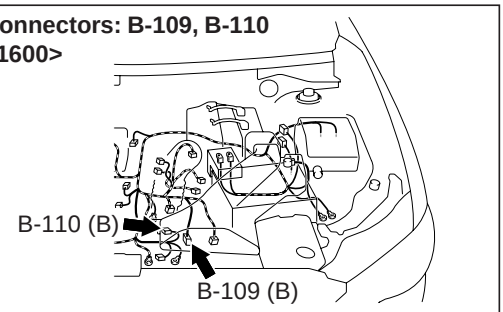
WDH54E018A

Connector: B-110 <1800-DIESEL>



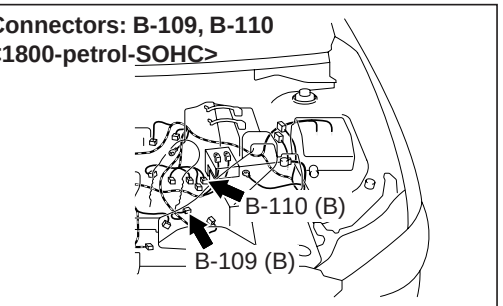
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Connectors: B-109, B-110 <1600>



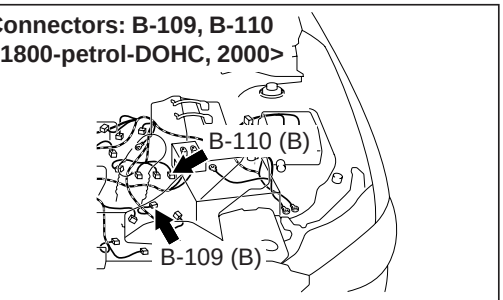
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Connectors: B-109, B-110 <1800-petrol-SOHC>



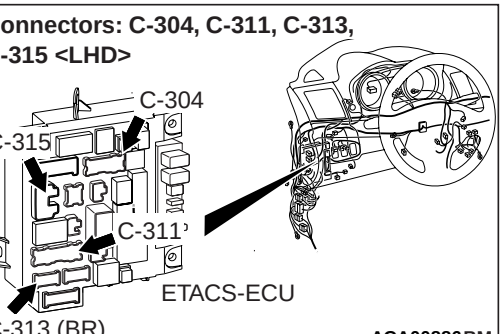
ACB02651AB

Connectors: B-109, B-110 <1800-petrol-DOHC, 2000>



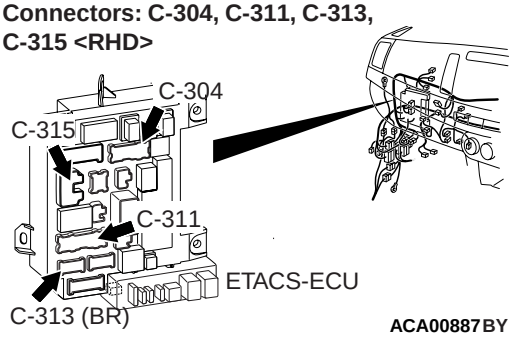
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Connectors: C-304, C-311, C-313, C-315 <LHD>



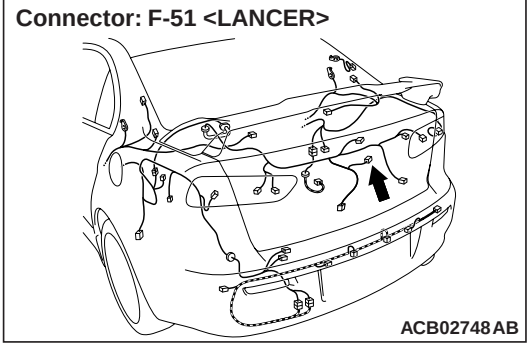
ACA00886BM

Connectors: C-304, C-311, C-313, C-315 <RHD>



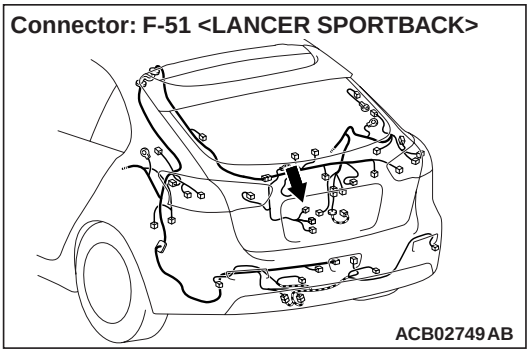
ACA00887BY

Connector: F-51 <LANCER>



ACB02748AB

Connector: F-51 <LANCER SPORTBACK>



ACB02749AB

COMMENTS ON TROUBLE SYMPTOM

When the screen of rear view camera is not shown even if the selector lever <CVT, A/T> or shift lever <M/T> is "R" (Reverse) position, the rear view camera, the inside rear view mirror assembly, the wiring harness, connectors, back-up lamp switch <M/T> or inhibitor switch <CVT, A/T> may be defective.

NOTE: If the indicator on the inside rear view mirror assembly is illuminated in orange but the monitor is not displayed, this is not a malfunction as the monitor has been set to always stay OFF.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of the back-up lamp switch <M/T>
- Malfunction of the inhibitor switch <CVT, A/T>
- Malfunction of the rear view camera
- Malfunction of the inside rear view mirror assembly

DIAGNOSIS PROCEDURE

STEP 1. Check the inside rear view mirror assembly.

Check the illumination condition of the indicator.
(1) Turn the ignition switch to the "ON" position.
(2) Move the selector lever <CVT, A/T> or shift lever <M/T> to the "R" (Reverse) position.
(3) Check that the indicator of the inside rear view mirror assembly illuminates.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Go to Step 4.

STEP 2. Check the inside rear view mirror assembly.

Check the illumination condition of the indicator.
(1) Turn the ignition switch to the "ON" position.
(2) Move the selector lever <CVT, A/T> or shift lever <M/T> to the "R" (Reverse) position.
(3) Check that the indicator of the inside rear view mirror assembly illuminates in green.

Q: Is the check result normal?
YES : Go to Step 22.
NO : Go to Step 3.

STEP 3. Check the inside rear view mirror assembly.

Check that the rear view screen is displayed on the monitor of the inside rear view mirror assembly.
(1) Turn the ignition switch to the "ON" position.
(2) Move the selector lever <CVT, A/T> or shift lever <M/T> to the "R" (Reverse) position.
(3) Press the switch of the inside rear view mirror assembly and check that the rear view screen is displayed.

NOTE: The illumination colour of the indicator of the inside rear view mirror assembly changes from orange to green.

Q: Is the check result normal?
YES : Go to Step 22.
NO : Go to Step 4.

STEP 4. M.U.T.-III other system diagnosis code

Check again if the diagnosis code is set to the ETACS-ECU.

Q: Is the diagnosis code set?
YES : Diagnose the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU – Troubleshooting).
NO : Go to Step 5.

STEP 5. M.U.T.-III other system data list

Check the input signal of ACC relay.
- Turn the ignition switch to the "ACC" position.

Item No.	Item name	Normal condition
Item 288	ACC switch	ON

OK: Normal condition is displayed.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Refer to ETACS – Input Signal Procedure 1 "The ignition switch (ACC) signal is not sent to the ETACS-ECU" .

STEP 6. M.U.T.-III data list

Check if ETACS-ECU related signal is set.
- Turn the ignition switch to the "ON" position.

Item No.	Item name	Normal condition
254	IG voltage	System voltage

OK: Normal condition is displayed.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Refer to ETACS – Inspection Procedure 2 "The ignition switch (IG1) signal is not received" .

STEP 7. M.U.T.-III data list

Check if ETACS-ECU related signal is set.
- Turn the ignition switch to the "ON" position.
- selector lever <CVT, A/T> or shift lever <M/T> is "R" (Reverse) position

Item No.	Item name	Normal condition
289	Backup lamp or shift reveres SW	ON

OK: Normal condition is displayed.

Q: Is the check result normal?
YES : Go to Step 8.
NO : Go to Step 14.

STEP 8. Connector check: D-46 inside rear view mirror assembly connector.

Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair the defective connector.

STEP 9. Voltage measurement at D-46 inside rear view mirror assembly connector.

(1) Disconnect the connector, and measure at the wiring harness-side connector.
(2) Turn the ignition switch to the "ACC" position.
(3) Voltage between D-46 inside rear view mirror assembly connector terminal No. 1 and the body earth

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 11.
NO : Go to Step 10.

STEP 10. Check the wiring harness between D-46 inside rear view mirror assembly connector terminal No. 1 and C-315 ETACS-ECU connector terminal No. 9

- Check the power supply lines (battery power supply) for open circuit and short circuit.

NOTE: Before the wiring harness inspection, inspect the C-130 intermediate connector, and repair if necessary.

Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).
NO : Repair the wiring harness.

STEP 11. Resistance measurement at D-46 inside rear view mirror assembly connector.

(1) Disconnect D-46 inside rear view mirror assembly connector, and measure the resistance available at the wiring harness side of the connector.
(2) Check the continuity between terminal No. 4 and body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 13.
NO : Go to Step 12.

STEP 12. Check the wiring harness between D-46 inside rear view mirror assembly connector terminal No. 4 and body earth.

- Check the earth wires for open circuit.

Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).
NO : Repair the wiring harness.

STEP 13. Voltage measurement at D-46 inside rear view mirror assembly connector.

(1) Disconnect the connector, and measure at the wiring harness-side connector.
(2) Turn the ignition switch to the "ON" position.
(3) Move the selector lever <CVT, A/T> or shift lever <M/T> to the "R" (Reverse) position.
(4) Voltage between D-46 inside rear view mirror assembly connector terminal No. 2 and the body earth

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 22.
NO : Go to Step 20.

STEP 14. Connector check: C-313 ETACS-ECU connector and B-110 back-up lamp switch connector <M/T> or B-109 inhibitor switch connector <CVT, A/T>.

Q: Is the check result normal?
YES : Go to Step 15.
NO : Repair the defective connector.

STEP 15. Check the wiring harness between C-313 ETACS-ECU connector terminal No. 4 and B-110 back-up lamp switch <M/T> connector terminal No. 2 or B-109 inhibitor switch <CVT, A/T> connector terminal No. 3 <4J1, 4B1> or 8 <4A9>.

- Check the communication lines for open circuit and short circuit.

NOTE: Before the wiring harness inspection, inspect the A-11 <4A9, 4J1, 4B1>, A-60 <4N1> and C-31 intermediate connectors, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 16.
NO : Repair the wiring harness.

STEP 16. Connector check: C-304 ETACS-ECU connector .

Q: Is the check result normal?
YES : Go to Step 17.
NO : Repair the defective connector.

STEP 17. Check the wiring harness between C-304 ETACS-ECU connector terminal No. 2 and B-110 back-up lamp switch <M/T> connector terminal No. 1 or B-109 inhibitor switch <CVT, A/T> connector terminal No. 9 <4J1, 4B1> or 7 <4A9>.

- Check the communication lines for open circuit and short circuit.

NOTE: Before the wiring harness inspection, inspect the A-11 <4A9, 4J1, 4B1> or A-60 <4N1> intermediate connectors, and repair if necessary.

Q: Is the check result normal?
YES <CVT, A/T> : Go to Step 18.
YES <M/T> : Go to Step 19.
NO : Repair the wiring harness.

STEP 18. Check the inhibitor switch and the control cable.
Check that the inhibitor switch and the control cable are adjusted correctly. (GROUP 23A– On-vehicle Service, inhibitor switch and control cable adjustment <M/T> or GROUP 23C– On-vehicle Service, inhibitor switch and control cable adjustment <CVT, A/T>)

Q: Is the check result normal?
YES : Go to Step 19.
NO : Adjust the inhibitor switch and the control cable.

STEP 19. Check the back-up lamp switch <M/T> or inhibitor switch <CVT, A/T>.

- Check the continuity of the back-up lamp switch. <M/T> (Refer to GROUP 22B – Transmission, Transmission inspection).
- Check the continuity of the inhibitor switch. <CVT, A/T> (Refer to GROUP 23A – On-vehicle service, Inhibitor switch continuity check).

Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).
NO : Replace the back-up lamp switch <M/T> or inhibitor switch <CVT, A/T>

STEP 20. Connector check: C-311 ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 21.
NO : Repair the defective connector.

STEP 21. Check the wiring harness between C-311 ETACS-ECU connector terminal No. 2 and D-46 inside rear view mirror assembly connector terminal No. 2.

- Check the communication lines for open circuit and short circuit.

NOTE: Before the wiring harness inspection, inspect the C-28, C-130 intermediate connectors, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 22.
NO : Repair the wiring harness.

STEP 22. Connector check: F-51 rear view camera connector and D-46 inside rear view mirror assembly connector.

Q: Is the check result normal?
YES : Go to Step 23.
NO : Repair the defective connector.

STEP 23. Check the wiring harness between F-51 rear view camera connector terminal No. 2, 3, 5, 6 and D-46 inside rear view mirror assembly connector terminal No. 12, 6, 11, 5.

- Check the communication lines for open circuit and short circuit.

NOTE: Before the wiring harness inspection, inspect the C-27 <LANCER>, C-36 <LANCER SPORTBACK>, C-130, C-154, C-155, D-39, F-27 <LANCER> and F-40 <LANCER SPORTBACK> intermediate connectors, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 24.
NO : Repair the wiring harness.

STEP 24. Trouble symptom recheck
Check that the display of rear view camera is shown normally.

Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).
NO : Replace the rear view camera temporarily and go to Step 25.

STEP 25. Trouble symptom recheck
Check that the display of rear view camera is shown normally.

Q: Is the check result normal?

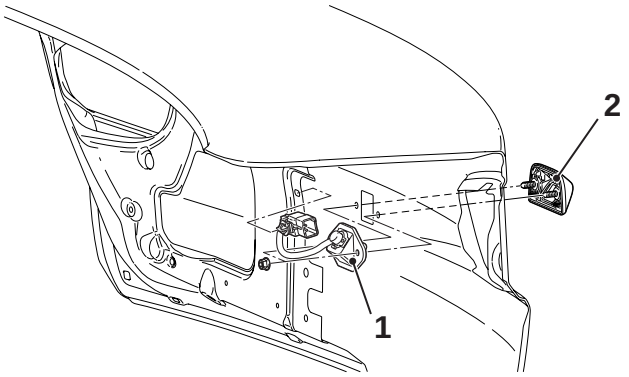
YES : Replace the rear view camera.
NO : Replace the inside rear view mirror assembly.

REMOVAL AND INSTALLATION

M1540901800144

<LANCER>

Pre-removal operation	Post-installation operation
• Removal of trunk lid trim (Refer to GROUP 52A – Interior trim)	• Installation of trunk lid trim (Refer to GROUP 52A – Interior trim)

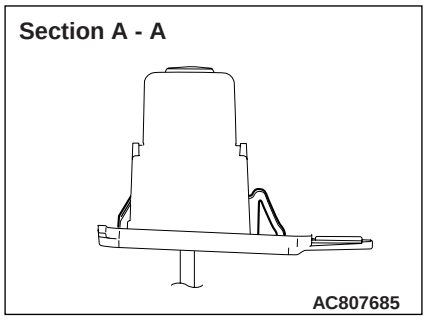


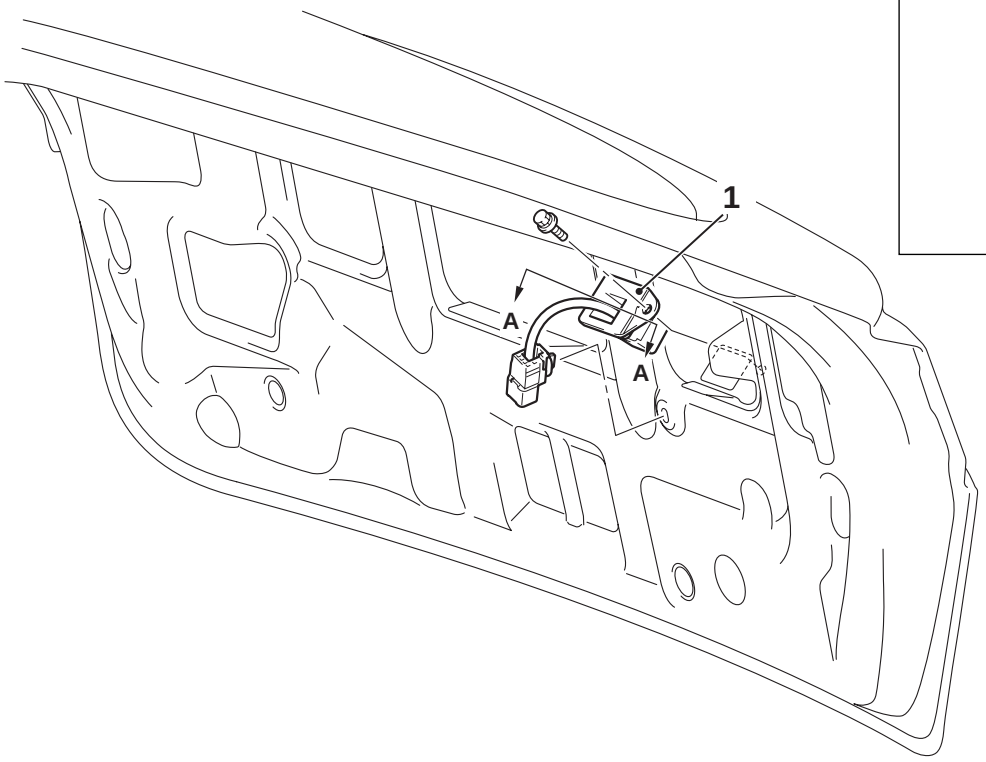
AC705028AD

Removal Steps
1. Rear view camera
2. Rear view camera cover

<LANCER SPORTBACK>

Pre-removal operation	Post-installation operation
• Removal of tailgate lower trim (Refer to GROUP 52A – Tailgate trim)	• Installation of tailgate lower trim (Refer to GROUP 52A – Tailgate trim)





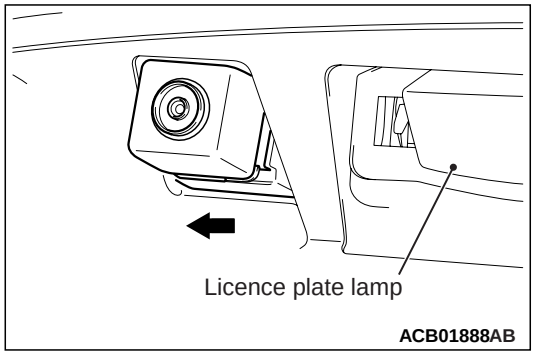
AC806135 AC

Removal Steps

<<**A**>> 1. Rear view camera

REMOVAL SERVICE POINT

<<A>>REAR VIEW CAMERA REMOVAL



Wrap cloth or adhesive tape around a flat-tipped screwdriver. Then use the screwdriver to press the rear view camera to the left to remove it.