FRONT SUSPENSION

CONTENTS

M33AA--

SPECIFICATIONS

M33CA-

GENERAL SPECIFICATIONS

<FWD>

Items	M/T		A/T	
Suspension system	McPherson strut with coil spring and compression rod type		McPherson strut with coil spring and compression rod type	
Coil spring				
Wire dia. x O.D. x free length mm (in.)	13.5x173.5x358 (.53x6.83x14.1)	14.0x174.0x376* (.55x6.85x14.8)	13.8x173.8x367 (.54x6.84x14.4)	14.0x174.0x376* (.55x6.85x14.8)
Coil spring identification color	Blue x 2	Pink x 2*	Pink x 1	Pink x 2*
Spring constant N/mm (lbs./in.)	20.0 (112)	20.0 (112)"	20.0 (112)	20.0 (112)*
Shock absorber				
Type	Hydraulic, cylindrical double acting type			
Maximum length mm (in.)	487 (19.17)			
Compressed length mm (in.)	340 (13.39)			
Stroke mm (in.)	147 (5.79)			
Damping force [at 0.3 m/sec. (.984 ft./sec.)]				
Expansion N (lbs.)	1,000 (220)			
Contraction N (lbs.)	300 (66)			

NOTE
* mark: <DOHC>

<AWD–UP TO 1992 MODELS>

Items	MIT	A/T, Turbo
Suspension system	McPherson strut with coil spring and compression rod type	McPherson strut with coil spring and compression rod type
Coil spring		
Wire dia. x O.D. x free length mm (in.)	14.2 x 174.2 x 352 (.56 x 6.86 x 13.9)	14.3 x 174.3 x 359.5 (.56 x 6.86 x 14.2)
Coil spring identification color	Orange x 1	Orange x 2
Spring constant N/mm (lbs./in.)	24 (134)	24 (134)
Shock absorber		
Type	Hydraulic, cylindrical double acting type	
Maximum length mm (in.)	501 (19.72)	
Compressed length mm (in.)	356 (14.01)	
Stroke mm (in.)	145 (5.71)	
Damping force [at 0.3 m/sec. (.984 ft./sec.)]		
Expansion N (lbs.)	1,400 (309)	
Contraction N (lbs.)	450 (99)	

SERVICE SPECIFICATIONS

M33CB–

Items		FWD	AWD
Standard value			
Camber		22' ± 30'	31' ± 30'
Caster		2° ± 30'	1°56' ± 30'
Toe-in	mm (in.)	0 ± 3 (0 ± .12)	0 ± 3 (0 ± .12)
Protruding length of stabilizer bar mounting bolt	mm (in.)	16-18 (.63–.70)*	–
Lower arm ball joint starting torque	N m (in.lbs.)	3–10 (26–87)	3–10 (26-87)
Stabilizer link ball joint starting torque	N m (in.lbs.)	1.7-3.2 (15-28)	1.7-3.2 (15–28)

NOTE
*: <1989 models>

TORQUE SPECIFICATIONS

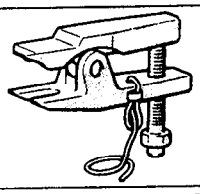
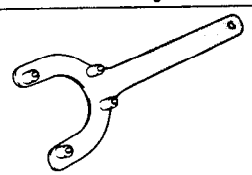
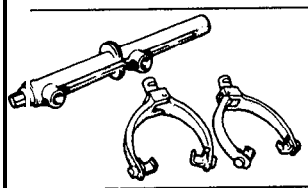
M33CC–

Items	Nm	ft.lbs.
Strut assembly to body	40–50	29-36
Knuckle to ball joint	60–72	43-52
Knuckle to strut assembly	90–105	65-76
Strut top end nut	60–70	43-51
Stabilizer bar bracket to crossmember	30–42	22–30
Stabilizer link	35-45	25-33
Lower arm clamp to crossmember (nut)	35-47	25-37
Lower arm clamp to crossmember (bolt)	80–100	58-72
Lower arm to crossmember	100–120	72-87
Stay to crossmember	70–80	51–81
Front exhaust pipe to exhaust manifold	40–50	29-36
Front exhaust pipe clamp	30–40	22-29
Stay to crossmember	70–80	51–58
Crossmember to body	80–100*1 [100–120]*2	58–72*1 [72–87]*2
Centermember installation bolts (rear)	80–100	58-72
Gusset to centermember	70–80	51–58
Left member installation bolt (front)	80–100	58-72
Left member installation bolt (rear)	70–80	51–58
Transfer assembly		
M/T	55–60	40–43
A/T	60–80	44-57

NOTE
*1: Bolt embossed ⑦ on bolt head
*2: Bolt embossed ⑩ on bolt head

SPECIAL TOOLS

M33DA-

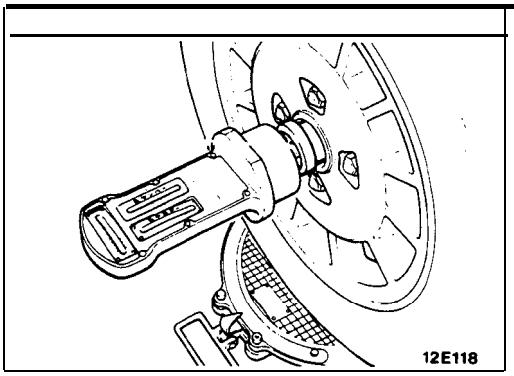
Tool	Number	Name	Use
	MB991113-01 OPTIONAL: AVAILABLE FROM O.T.C.	Steering linkage puller	Removal of the lower arm ball joint and tie rod
	MB991176	Spring seat holder	Disassembly/assembly of the strut assembly
	MB991237 MB991238	Spring compressor body Arm set	Compression of the front coil spring
	MB990800-01	Ball joint remover and installer	Installation of the dust cover

TROUBLESHOOTING

M33EAAC

Symptom	Probable cause	Remedy
Steering wheel is heavy, vibrates or pulls to one side	Suspension malfunction Ball joint Coil spring Wheel alignment	Adjust or replace
	Unbalanced or worn tires	Adjust or replace
Excessive vehicle rolling	Broken or deteriorated stabilizer Shock absorber malfunciton	Replace
Poor riding	Improper tire inflation pressure	Adjust
	Broken or deteriorated coil spring Shock absorber malfunction	Replace
Inclination of vehicle	Broken or deteriorated coil spring	Replace
Noise	Lack of lubrication	Lubricate
	Looseness and wear of each part	Retighten or replace
	Broken coil spring Shock absorber malfunction	Replace

TSB Revision



SERVICE ADJUSTMENT PROCEDURES

FRONT WHEEL ALIGNMENT M33FBAQ

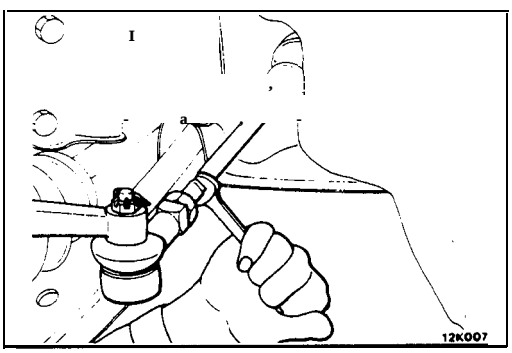
NOTE
The front suspension assembly must be free of worn, loose or damaged parts prior to measurement of front wheel alignments.
Measure wheel alignment by using the tool.

CAMBER AND CASTER

Standard value:	<FWD>	<AWD>
Camber	22' ± 30'	31' ± 30
Caster	2° ± 30	1°56' ± 30

Camber and caster are pre-set at the factory and cannot be adjusted.

NOTE
If camber and caster are not within specifications, replace bent or damaged parts.



TOE-IN

Standard value: 0 ± 3 mm (Of .12 in.)

1. Adjust the toe-in by undoing the clips and turning the left and right tie rod turnbuckles by the same amount (in opposite directions).
2. The toe will move out as the left turnbuckle is turned toward the front of the vehicle and the right turnbuckle is turned toward the rear of the vehicle.
3. For each half turn of the left and right tie rods, the toe-in will be adjusted by 6 mm (.24 in.).
4. After making the adjustments, use a turning radius gauge to confirm that the steering wheel turning angle is within the standard value range. (Refer to GROUP 37A–Service Adjustment Procedures.)

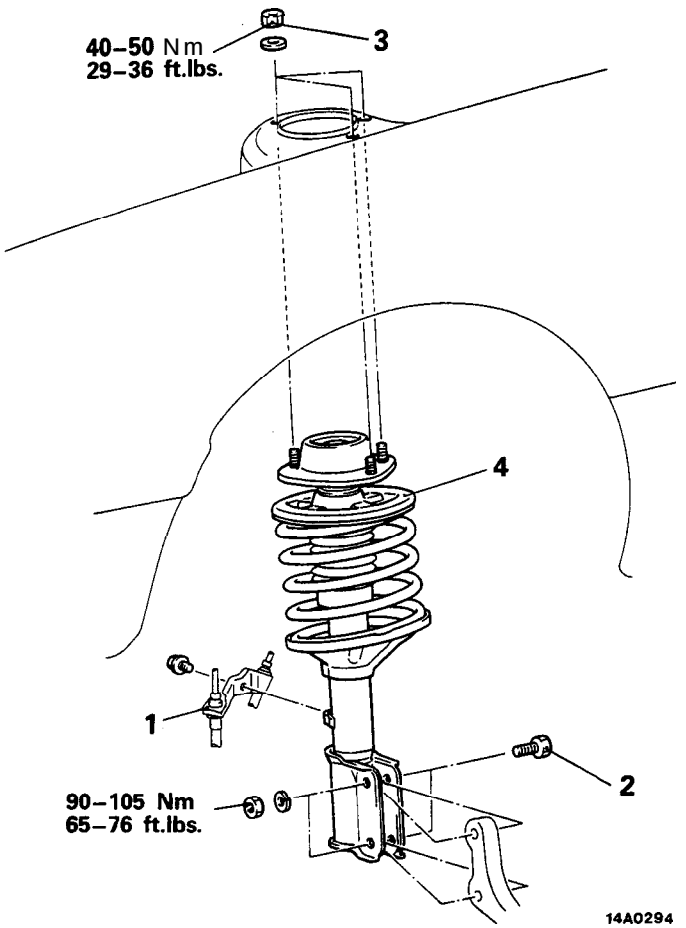
WHEEL BEARING ADJUSTMENT M33FCAA

Bearing preload is pre-set to the specified value by design and therefore can not be adjusted.

STRUT ASSEMBLY

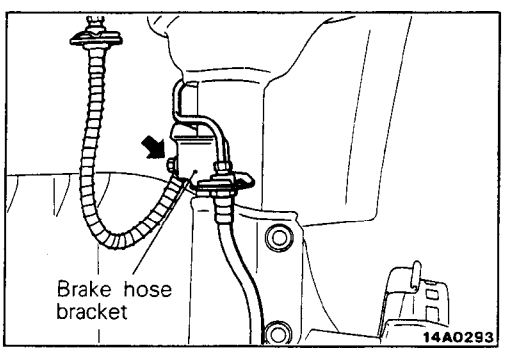
M33LA--

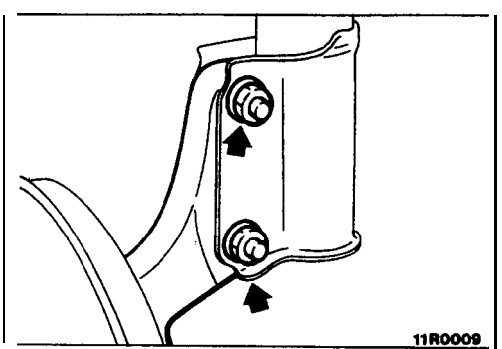
REMOVAL AND INSTALLATION



Removal steps

◆◆ 1. Brake hose and tube bracket
◆◆ 2. Strut lower mounting bolt
3. Strut upper mounting nut
◆◆ 4. Strut assembly





SERVICE POINTS OF REMOVAL

M33LBAF

1. REMOVAL OF BRAKE HOSE AND TUBE BRACKET

Do not pry the brake hose and tube clamp away when removing it.

2. REMOVAL OF STRUT LOWER MOUNTING BOLTS

After the union between the strut and the knucke has been removed, jack up the lower arm, attaching the brake hose, tube and drive shaft to the knuckle with wire so that they will not be pulled on.

INSPECTION

M33LCAB

- Check for oil leaks from the strut assembly.
- Check the strut assembly shock absorber for damage or deformation.

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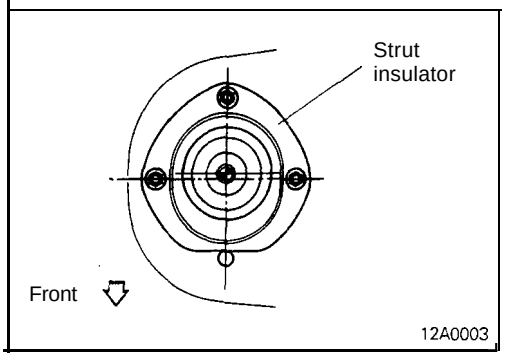


SERVICE POINTS OF INSTALLATION M33LDAG

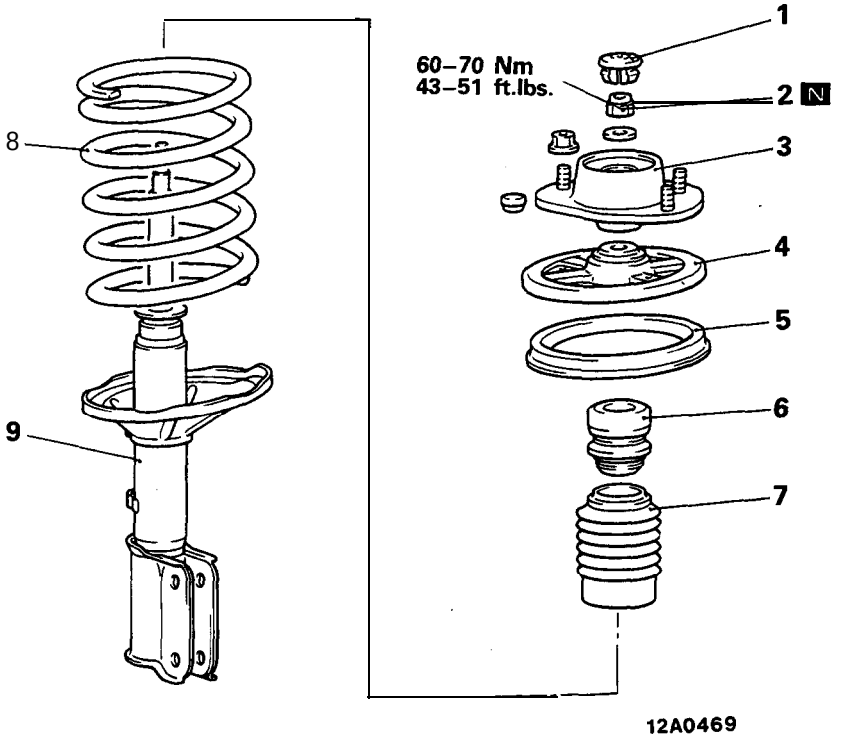
4. INSTALLATION OF STRUT ASSEMBLY

Install the strut assembly so that the strut insulator faces in the direction indicated in the illustration.

NOTE

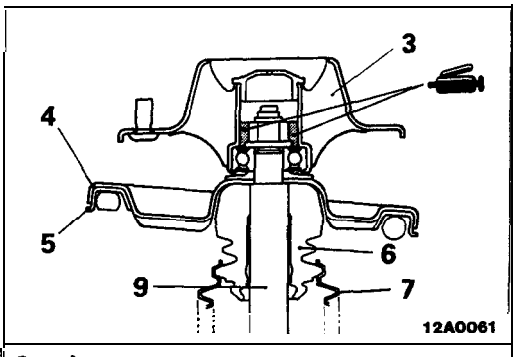
Be sure to confirm that the direction is correct, because there will be a deviation of the wheel alignment if it is not.

DISASSEMBLY AND REASSEMBLY M33LE--



Disassembly steps

- 1. Dust cover
- ◆◆ ● + 2. Self-locking nut
- 3. Strut insulator
- ◆◆ 4. Spring seat, upper
- 5. Spring pad, upper
- ● + 6. Bump rubber
- ● + 7. Dust cover
- 8. Coil spring
- ◆◆ 9. Strut assembly



Caution
When applying the grease, take care that grease does not adhere to the insulator's rubber part.

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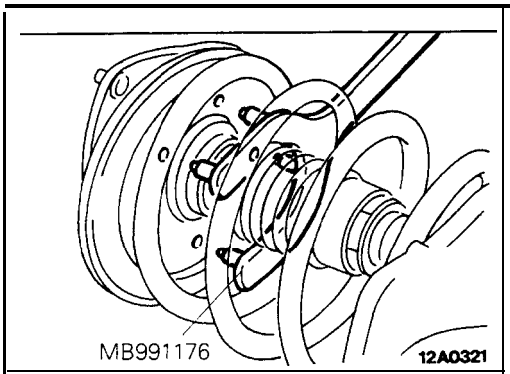
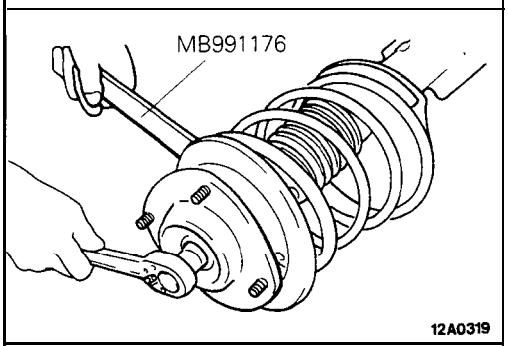


SERVICE POINTS OF DISASSEMBLY M33LFAI

2. REMOVAL OF SELF-LOCKING NUT

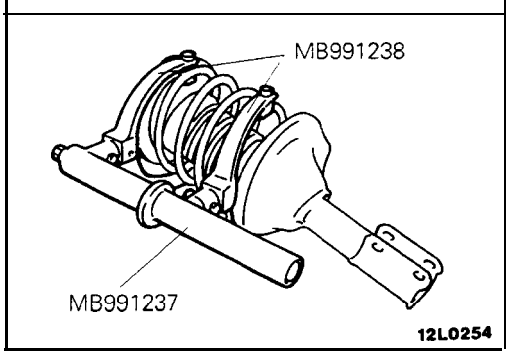
(1) Holding the spring upper seat with the special tool, loosen the self-locking nut.

Caution
The self-locking nut should be loosened only, not removed.



(2) Using the special tools, compress the coil spring, and then remove the self-locking nut.

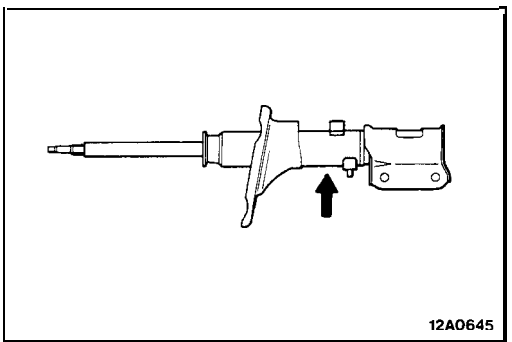
NOTE
Install the special tools evenly, and so that the maximum length will be attained within the installation range.



9. REMOVAL OF STRUT ASSEMBLY

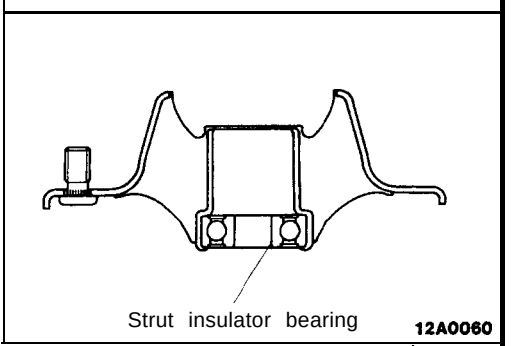
If it is to be discarded, place it horizontally with the piston rod sticking out and drill a hole approximately 3 mm (.12 in.) in diameter in the position shown in the figure to release the gas.

Caution
The gas is non-toxic but wear protective glasses because there is danger that dust from the drill, etc. may fly out along with the gas.

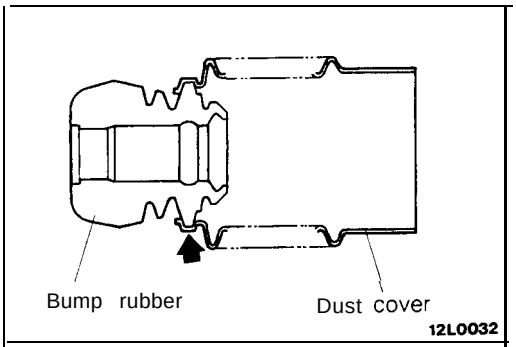


INSPECTION M33LGAE

- Check the strut insulator bearing for wear or rust.
- Check the rubber parts for damage or deterioration.
- Check the spring for deformation, deterioration or damage.
- Check the shock absorber for deformation.



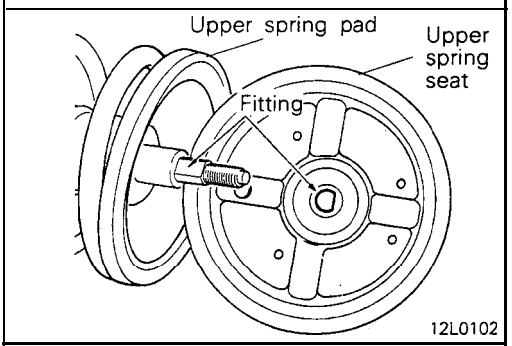
TSB Revision



SERVICE POINTS OF REASSEMBLY M33LHAL

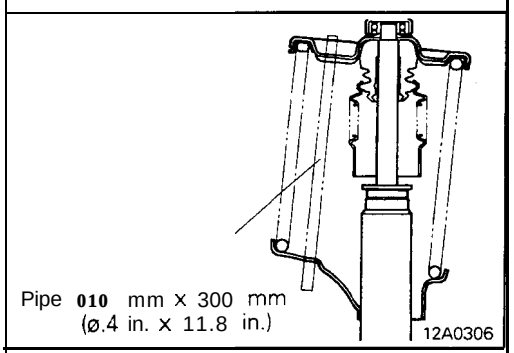
7. INSTALLATION OF DUST COVER/G. BUMP RUBBER

Join the dust cover and bump rubber.



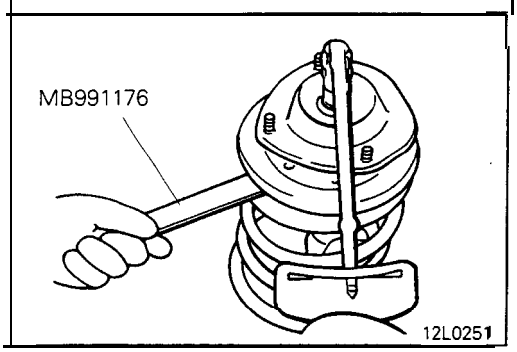
4. INSTALLATION OF SPRING UPPER SEAT ASSEMBLY

(1) Assemble the spring upper seat to the piston rod, fitting the notch in the rod to the shaped hole in spring seat.



(2) Line up the holes in the strut assembly spring lower seat with the hole in the spring upper seat.

NOTE
The job is easily accomplished with a pipe [ø10 mm x 300 mm (ø.4 in. x 11.8 in.)].



2. INSTALLATON OF SELF-LOCKING NUT

(1) With the coil spring held compressed by the special tools (MB991237 and MB991238), temporarily tighten the self-locking nut.

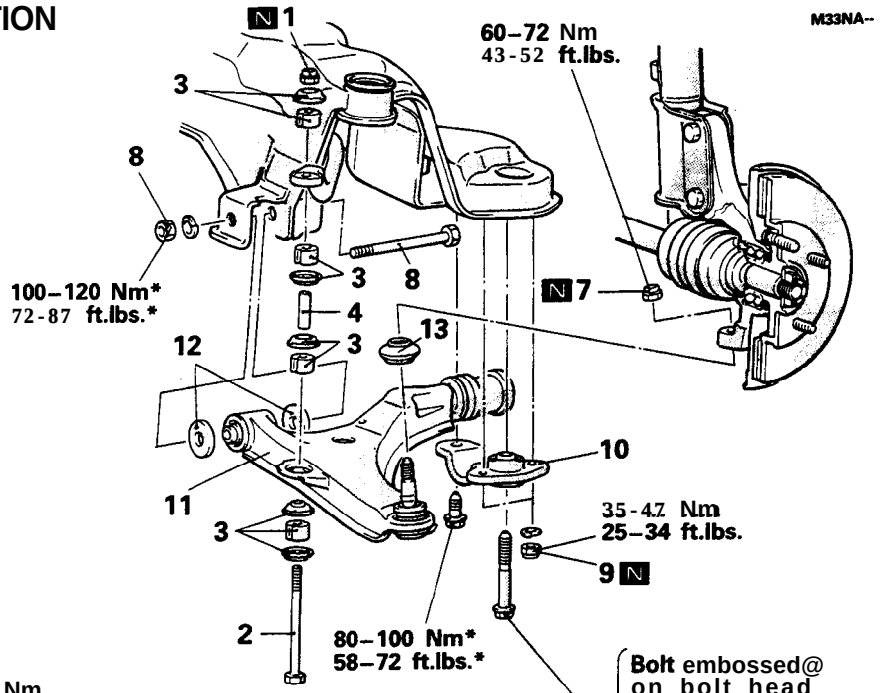
(2) Correctly align both ends of the coil spring with the grooves in the spring seat, and then loosen the special tools (MB991237 and MB991238).

(3) Using the special tool, tighten the strut insulator at the specified torque.

LOWER ARM

REMOVAL AND INSTALLATION

<1989 models>



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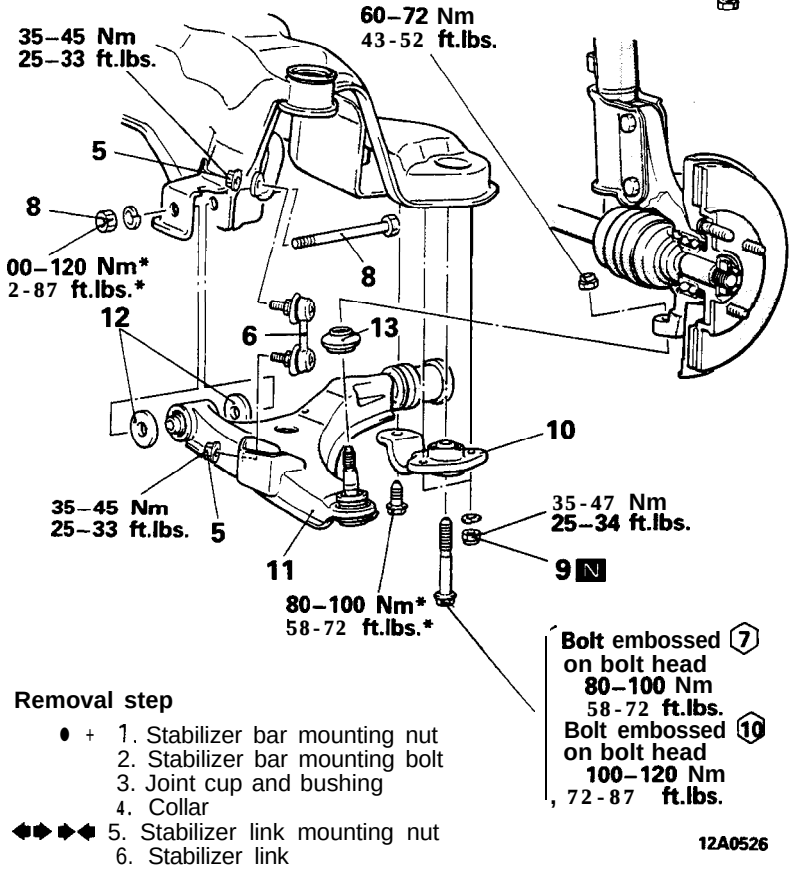

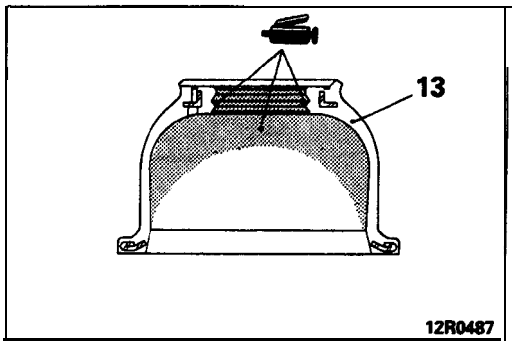

Removal step

- • + 1. Stabilizer bar mounting nut
- 2. Stabilizer bar mounting bolt
- 3. Joint cup and bushing
- 4. Collar
- ◆■▶◀ 5. Stabilizer link mounting nut
- 6. Stabilizer link
- • ☒ 7. Self-locking nut
- 8. Lower arm mounting nut and bolt
- 9. Self-locking nut
- 10. Clamp
- 11. Lower arm
- 12. Stopper
- 13. Ball joint dust cover

NOTE
• : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.

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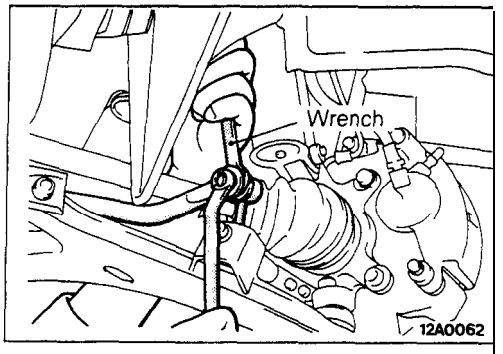
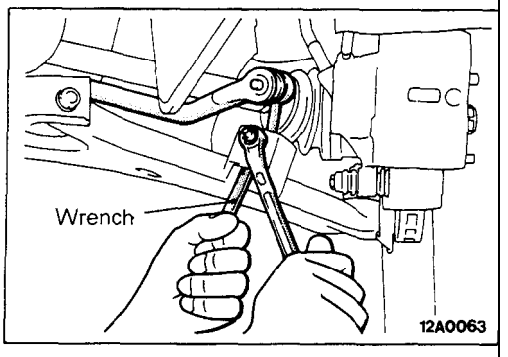


SERVICE POINTS OF REMOVAL M33NBAL

5. REMOVAL OF STABILIZER LINK MOUNTING NUTS

Using a wrench or similar tool to secure the ball studs at both ends of the stabilizer link, remove the mounting nuts.



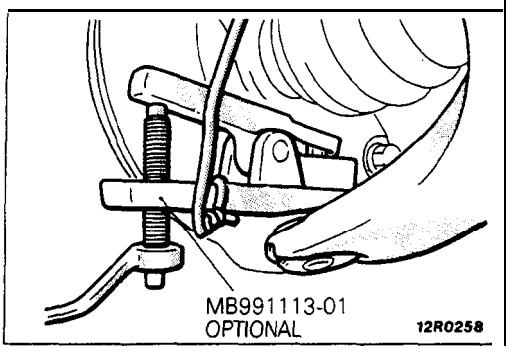
7. REMOVAL OF SELF-LOCKING NUT

Using the special tool, disconnect the lower arm ball joint from the knuckle.

Caution

1. Be sure to tie the cord of the special tool to the nearby part.

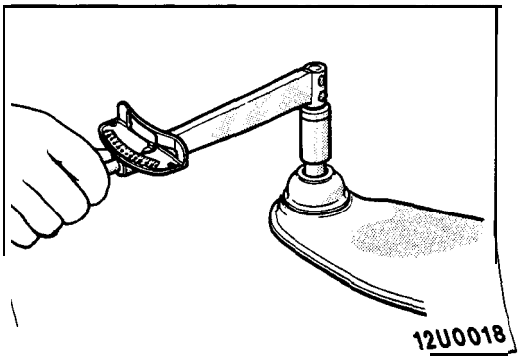
2. Loosen the nut but do not remove it.



INSPECTION M33NCAE

- Check the bushing for wear and deterioration.
- Check the lower arm for bend or breakage.
- Check the clamp for deterioration or damage.
- Check the ball joint dust cover for cracks.
- Check all bolts for condition and straightness.

CHECKING OF BALL JOINT FOR STARTING TORQUE



(1) If a crack is noted in the dust cover, replace it, adding grease.

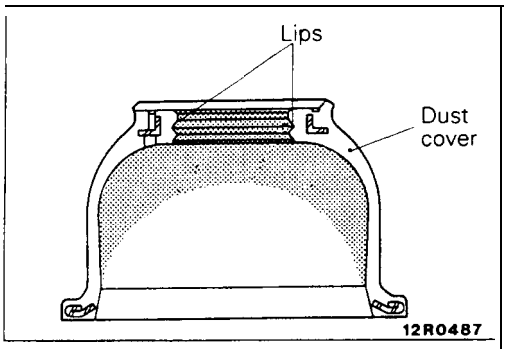
(2) Deflect from side to side the ball joint stud several times.

(3) Mount two nuts on the ball joint, and then measure the ball joint starting torque.

Standard value: 3–10 Nm (26-87 in.lbs.)

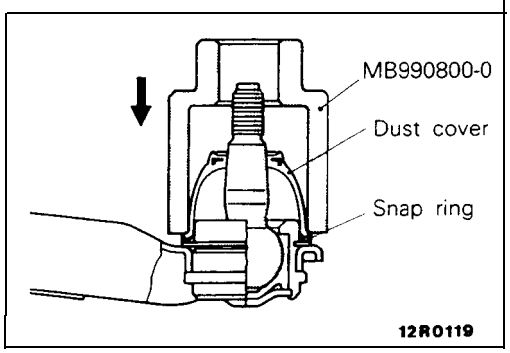
(4) If the starting torque exceeds the upper limit of standard value, replace the lower arm assembly.

(5) Even if the starting torque is below the lower limit of the standard value, the ball joint may be reused unless it has drag and excessive play.



BALL JOINT DUST COVER REPLACEMENT M33NEAF

(1) Remove the dust cover.
(2) Apply multipurpose grease to the lip and inside of the dust cover.

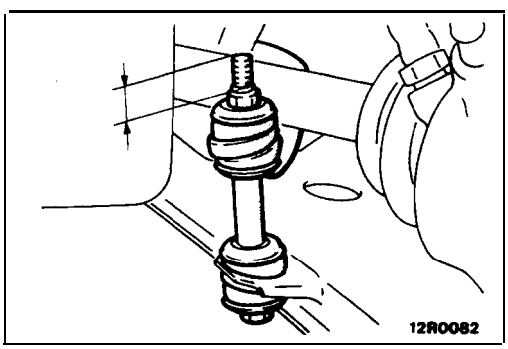


(3) Drive in the dust cover with special tool until it is fully seated.

SERVICE POINTS OF INSTALLATION M33NFAO

5. INSTALLATION OF STABILIZER LINK MOUNTING NUTS

Using a wrench or similar tool to secure the ball studs at both ends of the stabilizer link, tighten the mounting nuts.



1. INSTALLATION OF STABILIZER BAR MOUNTING NUT

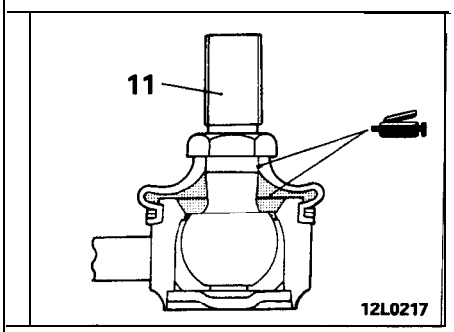
Tighten the nut on the stabilizer bar bolt to the specified distance.

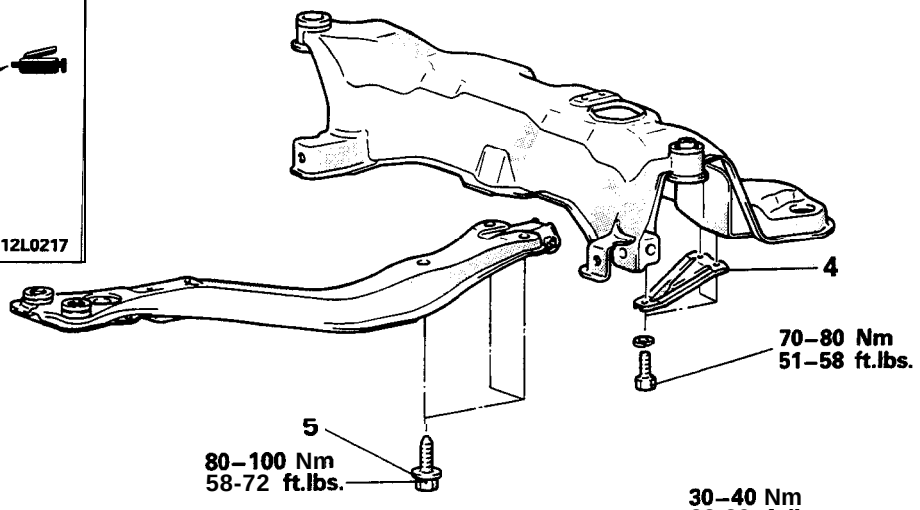
Protruding length of stabilizer bar mounting bolt
Standard value: 16-18 mm **(.63–.70** in.)

STABILIZER BAR <FWD>

REMOVAL AND INSTALLAT ON

M33TA-A





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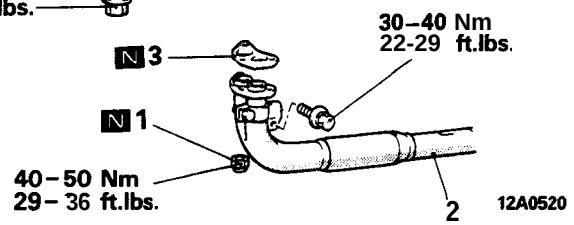
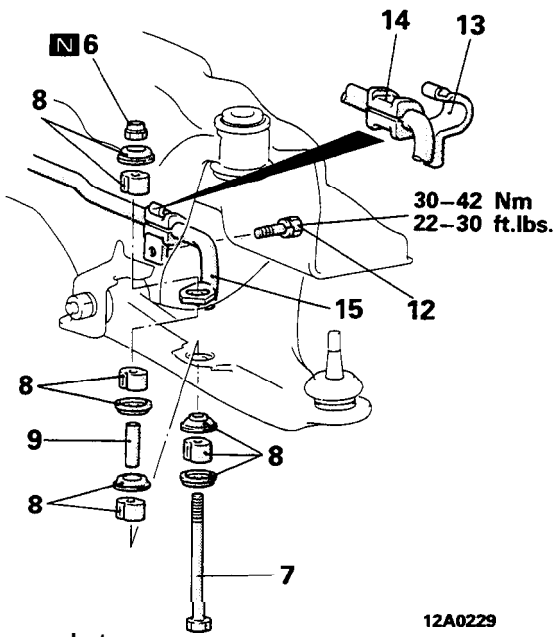
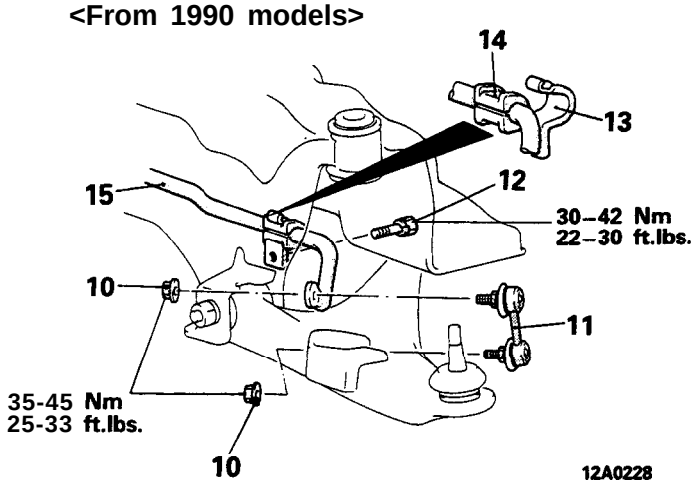




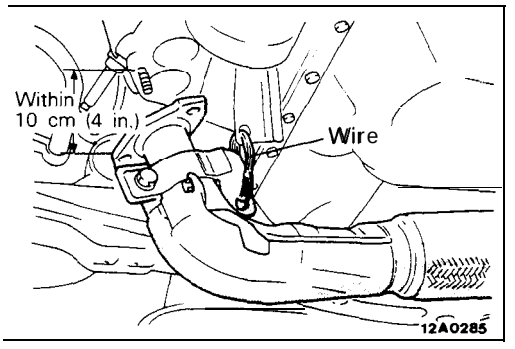
<From 1990 models>



Removal steps

1. Self-locking nut
◆◆ 2. Front exhaust pipe
3. Gasket
4. Stay
5. Centermember rear installation bolt
◆◆ 6. Stabilizer bar mounting nut
7. Stabilizer bar mounting bolt
8. Joint cup and bushing
9. Collar
◆◆ ● +10. Stabilizer link mounting nut
11. Stabilizer link
12. Stabilizer bar bracket mounting bolt
◆◆ 13. Stabilizer bar bracket
14. Bushing
◆◆ 15. Stabilizer bar

TSB Revision

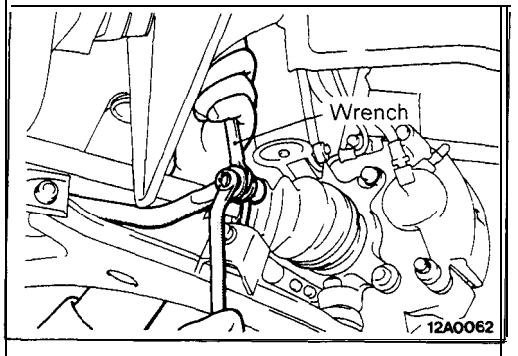


SERVICE POINTS OF REMOVAL M33TBAFa

2. REMOVAL OF FRONT EXHAUST PIPE

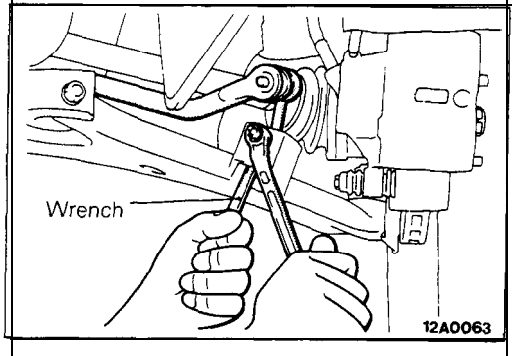
After disconnection of the front exhaust pipe assembly and the exhaust manifold, use wire, etc. to hang the front exhaust pipe down.

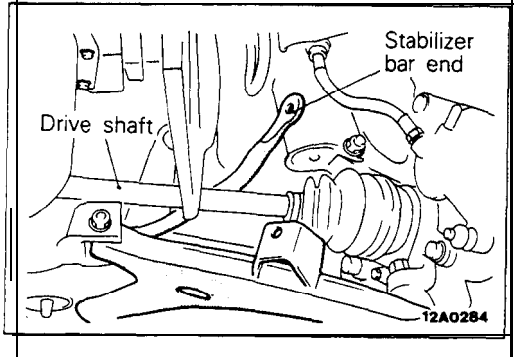
Caution
There is danger of damage to the interior if the flexible joint is bent very much. Do not bend it more than shown in the figure.



10. REMOVAL OF STABILIZER LINK MOUNTING NUT

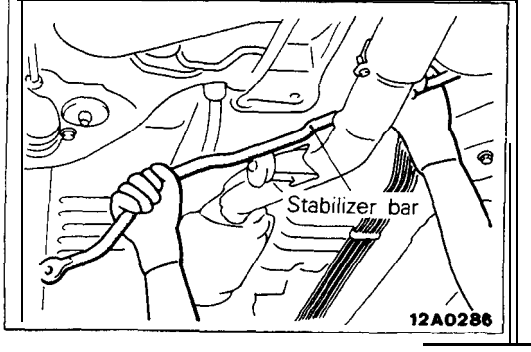
Using a wrench or similar tool to secure the ball studs at both ends of the stabilizer link, remove the mounting nuts.





15. REMOVAL OF STABILIZER BAR

(1) Pull out both ends of the stabilizer bar to the rear of the drive shaft.



(2) Move the right stabilizer bar until the end of the stabilizer bar clears the lower arm.
(3) **With** the end that has cleared the lower arm, pull out the stabilizer bar diagonally.

INSPECTION

M33TCAF

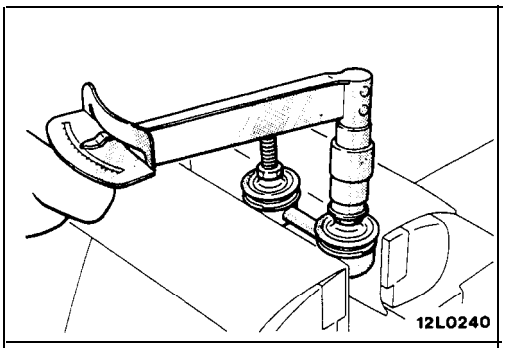
- Check the bushing for wear and deterioration.
- Check the stabilizer bar for deterioration or damage.
- Check the stabilizer link ball joint dust cover for cracks.
- Check all bolts for condition and straightness.

CHECKING OF STABILIZER LINK BALL JOINT FOR STARTING TORQUE

(1) If a crack is noted in the dust cover, replace it, adding grease.
(2) Deflect side to side the stabilizer link ball joint stud several times.
(3) Mount two nuts on the ball joint, and then measure the ball joint starting torque.

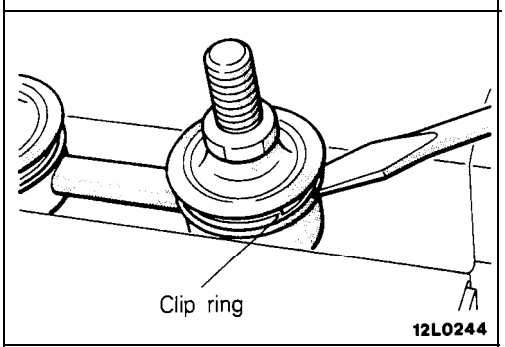
Standard value: 1.7-3.2 Nm (15-28 in.lbs.)

(4) If the starting torque exceeds the upper limit of standard value, replace the stabilizer link.
(5) Even if the starting torque is below the lower limit of the standard value, the ball joint may be reused unless it has drag and excessive play.

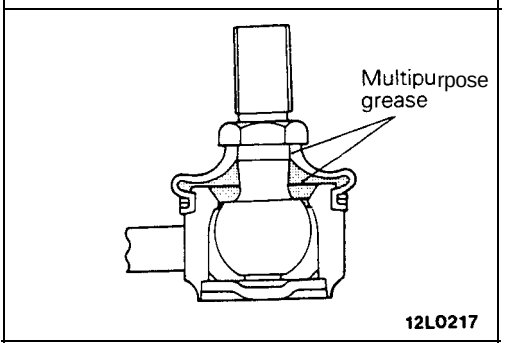


BALL JOINT DUST COVER REPLACEMENT-

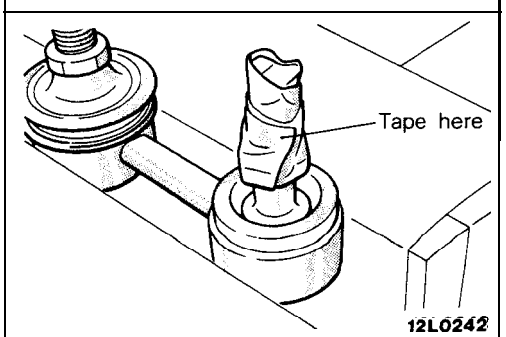
(1) Remove the clip ring and the dust cover.

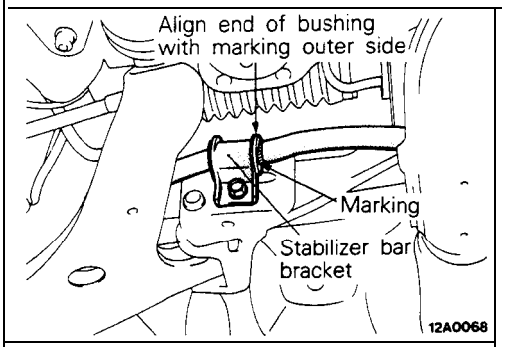


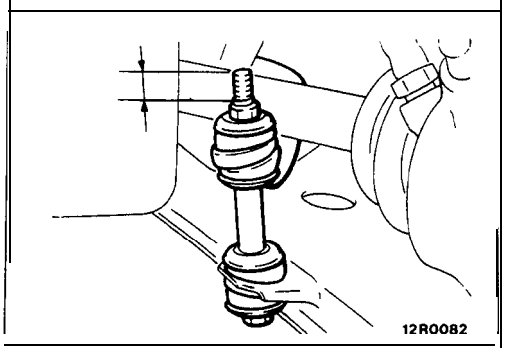
(2) Apply multipurpose grease to the lip and inside of the dust cover.



(3) Use vinyl tape to tape the stabilizer link where shown in the illustration, and then install the dust cover to the stabilizer link.
(4) Secure the dust cover by the clip link.







SERVICE POINTS OF INSTALLATION M33TDAK

13. INSTALLATION OF STABILIZER BAR BRACKET

(1) Temporarily tighten the stabilizer bar bracket.
(2) Align the bushing end with the marked part of the stabilizer bar, and then fully tighten the stabilizer bar bracket.

10. INSTALLATION OF STABILIZER LINK MOUNTING NUT

Using a wrench or similar tool to secure the ball studs at both ends of the stabilizer link, tighten the mounting nuts.

6. INSTALLATION OF STABILIZER BAR MOUNTING NUT

Tighten the nut on the stabilizer bar bolt to the specified distance.

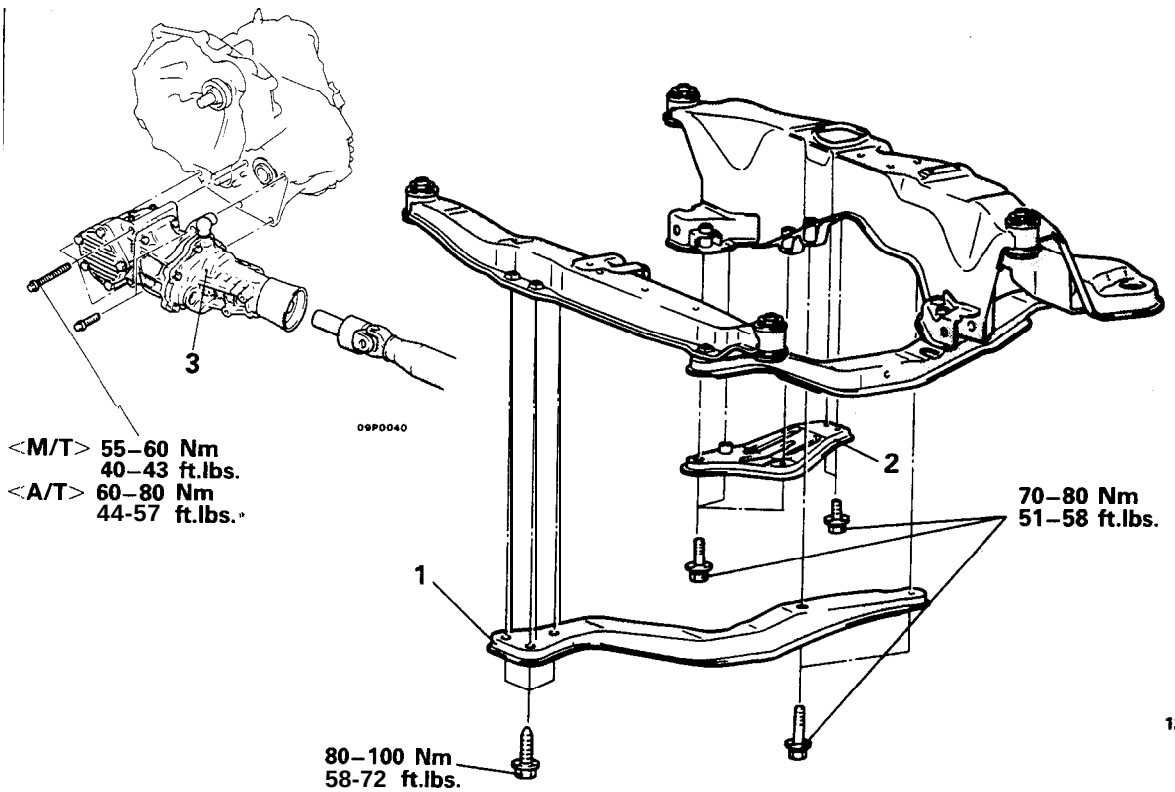
Protruding length of stabilizer bar mounting bolt
Standard value: 16-18 mm (.63–.70 in.)

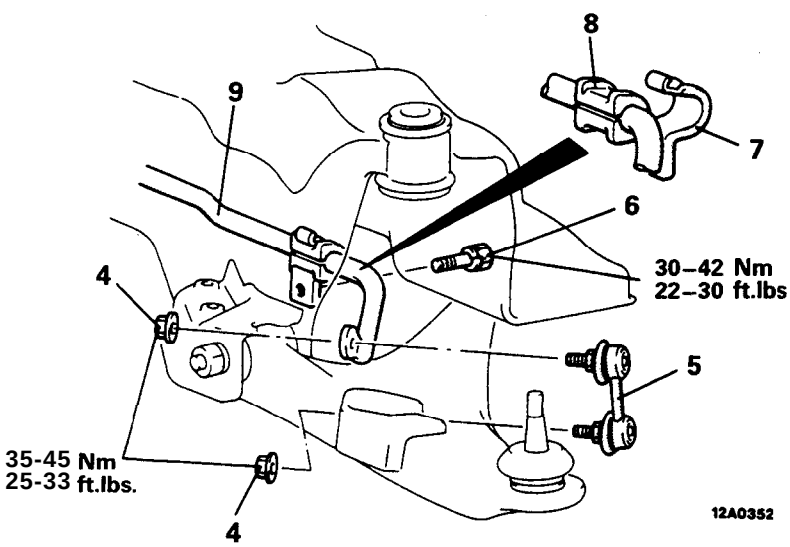
STABILIZER BAR <AWD–UP TO 1992 MODELS>

M33TA-B

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
@Removal of Front Exhaust Pipe
(Refer to GROUP 15–Exhaust Pipe and Main Muffler.)





Removal steps

1. Left member
2. Gusset
3. Transfer
4. Stabilizer link mounting nut (Refer to P.33A-14, 16.)
5. Stabilizer link
6. Stabilizer bar bracket installation bolt
7. Stabilizer bar bracket (Refer to P.33A-16.)
8. Bushing

◀■▶ 9. Stabilizer bar

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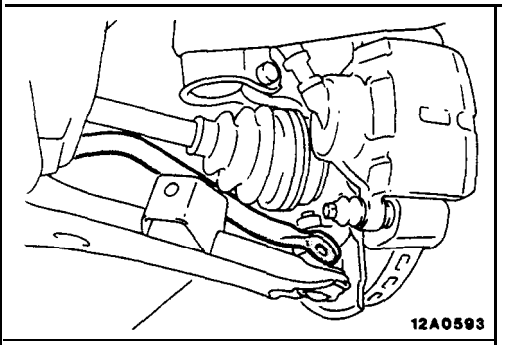

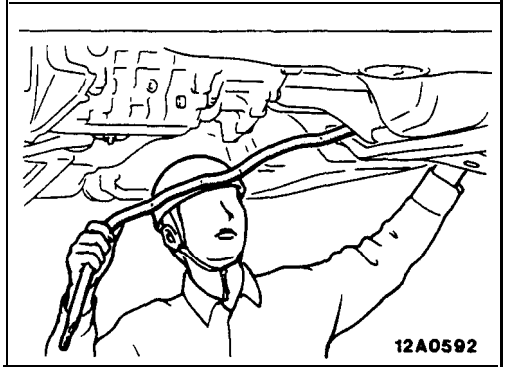

SERVICE POINTS OF REMOVAL M33TBAH

9. REMOVAL OF STABILIZER BAR

(1) Disconnect the coupling of the knuckle and lower arm at the right side.
(2) Pull out the left side stabilizer bar edge, pulling it out between the drive shaft and lower arm.

(3) Pull out the right side stabilizer bar edge, pulling it out from below the lower arm.

INSPECTION M33TCAI

Refer to P.33A-15.

BALL JOINT DUST COVER REPLACEMENT M33TEAE

Refer to P.33A-15.

ACTIVE-ELECTRONIC CONTROL SUSPENSION

CONTENTS

M33AA--

SPECIFICATIONS

M33CA--

GENERAL SPECIFICATIONS

Items	Front suspension	Rear suspension
Suspension system	McPherson strut with coil spring and compression rod type	3-link, torsion axle with coil spring type
Coil spring		
Front	<Up to 1990 models>	<Up to 1990 models>
Wire dia. x upper end O.D. x lower end O.D. x free length mm (in.) [Coil spring identification color]	L.H. side 13.0 x 173 x 193 x 391 (.51 x 6.81 x 7.59 x 15.39) [Light green x 1]	L.H. side 9.5 x 119.5 x 119.5 x 428 (.37 x 4.70 x 4.70 x 16.85) [Light green x 1]
	R.H. side 13.0 x 173 x 193 x 379 (.51 x 6.81 x 7.59 x 14.92) [Blue x 2]	R.H. side 9.5 x 119.5 x 119.5 x 412 (.51 x 4.70 x 4.70 x 16.22) [Light green x 2]
Rear	<From 1990.5 models>	<From 1990.5 models>
Wire dia. x O.D. x free length mm (in.) [Coil spring identification color]	L.H. side 13.5 x 173.5 x 192.5 x 317 (.53 x 6.83 x 7.58 x 12.48) [Light green x 1]	L.H. side 10.1 x 122.1 x 381.5 (.40 x 4.81 x 15.02) [Light green x 2]
	R.H. side 13.5 x 173.5 x 192.5 x 309 (.53 x 6.83 x 7.58 x 12.17) [Blue x 2]	R.H. side 10.1 x 122.1 x 370 (.40 x 4.81 x 14.57) [Light green x 1]
Spring constant N/mm (lbs./in.)	12.9 (72.24) <Up to 1990 models> 19.4 (108.63) <From 1990.5 models>	9.4 (52.64) <Up to 1990 models> 13.5 (75.60) <From 1990.5 models>
Shock absorber		
Type	Hydraulic, cylindrical double acting type	Hydraulic, cylindrical double acting type
	<Up to 1990 models> <From 1990.5 models>	<up to 1990 models> <From 1990.5 models>
Max. length mm (in.)	489.5 (19.27) 489.5 (19.27)	491 (19.33) 491 (19.33)
Min. length mm (in.)	339.5 (13.37) 339.5 (13.37)	341 (13.43) 341 (13.43)
Stroke mm (in.)	150 (5.91) 150 (5.91)	150 (5.91) 150 (5.91)
Damping force [at 0.3 m/sec. (.9 ft./sec.)]		
Expansion N (lbs.)		
HARD	1,650 (364) 2,250 (496)	1,450 (320) 1,700 (375)
MEDIUM	1,100 (243) 1,100 (243)	850 (187) 850 (187)
SOFT	300 (66) 300 (66)	270 (60) 270 (60)
Contraction N (lbs.)		
HARD	570 (126) 570 (126)	500 (110) 540 (119)
MEDIUM	400 (88) 400 (88)	350 (77) 350 (77)
SOFT	220 (49) 220 (49)	200 (44) 200 (44)

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SERVICE SPECIFICATIONS

M33CB--

Items	Specifications
Standard value	
Toe-in mm (in.)	0 ± 3 (0 ± .12)
Camber	20' ± 30'
Caster	2" ± 30'
Rear height sensor rod Installation location dimension mm (in.)	314-316 (12.36-12.44)
Wheel arch height to center of wheel mm (in.)	
Front	381–391 (15.0–15.4)
Rear	357-367 (14.1–14.4)
High-pressure switch	
Pressure switch shut off pressure kPa (psi)	900 (128) or more
Pressure switch operation pressure kPa (psi)	710–810 (101–115)
Low-pressure switch	
Return pump activation pressure kPa (psi)	100–180 (14.2-25.6)
Return pump stop pressure kPa (psi)	50 (7.1) or less
Setting of T.J. boot length mm (in.)	80 ± 3 (3.15 ± .12)
Lower arm ball joint starting torque Nm (in.lbs.)	3–1 0 (26-87)
Stabilizer link ball joint starting torque Nm (in.lbs.)	1.7-3.2 (15-28)
Crossmember bushings projection mm (in.)	
Bushing A	7.2–10.2 (.28–.40)
Bushing B	6.5-9.5 (.26–.37)
Air compressor relief pressure kPa (psi)	1,000–1,300 (142-185)

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TORQUE SPECIFICATIONS

M33CC-

Items	Nm	ft.lbs.
Strut assembly		
Front strut upper mounting nut	40–50	29-36
Air tube to strut	8–10	6-7
Front height sensor rod mounting bolt	17-26	12-19
Front strut lower mounting nut	90–105	16-76
Actuator bracket to strut	40–60	29-43
Strut insulator installation nut	80–100	58-72
Lower arm		
Lower arm ball joint to knuckle	60–72	43-52
Lower arm clamp to crossmember (nut)	35-47	25-34
Lower arm clamp to crossmember (bolt)	80–100	58-72
Lower arm to crossmember	95–120	69-87
Stabilizer link mounting nut	35-45	25-33
Front height sensor rod mounting bolt	17-26	12-18
Stabilizer bar		
Center member rear installation bolt	80–100	58-72
Stay to crossmember	70–80	51-58
Front exhaust pipe to exhaust manifold		
<FWD (Non-Turbo)>	40–50	29-36
<AWD (Non-Turbo)>	30–40	22-29
Front exhaust pipe to exhaust fitting (Turbo>	40–60	29-43
Front exhaust pipe clamp	30–40	22-29
Front exhaust pipe to hanger	10–15	7-11
Stabilizer link mounting nut	35-45	25-33
Stabilizer bracket mounting bolt	30–42	22–30

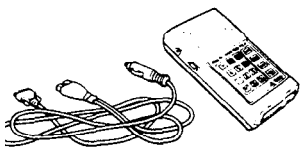
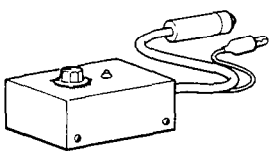
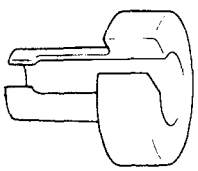
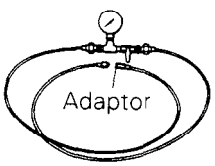
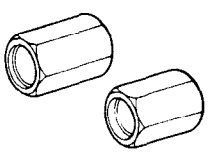
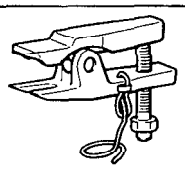
Items	Nm	ft.lbs.
Shock absorber assembly		
Air tube to shock absorber	8–10	6-7
Shock absorber upper mounting nut	40–50	29-36
Shock absorber lower mounting nut	80–100	58-72
Rear height sensor mounting bolt	17-26	12-19
Actuator bracket mounting nut	45-55	33–40
Piston rod tightening nut	45-55	33–40
Rear suspension assembly		
Brake tube bracket mounting bolt	17–26	12-19
Rear brake assembly mounting bolt	50–60	36-43
Dust shield mounting bolt	9-14	7–10
Flange nut	200–260	144-188
Rear speed sensor mounting bolt <Vehicles with *A.B.S.>	9-14	7–10
Air tube to shock absorber	8–10	6-7
Shock absorber upper mounting nut	40–50	29-36
Lateral rod mounting nut (body side)	80–100	58-72
Trailing arm mounting bolt	100–120	72-87
Rear height sensor rod mounting bolt	17-26	12-19
Lateral rod		
Lateral rod mounting nut (body side)	80–100	58-72
Lateral rod mounting nut (axle beam side)	100–120	72-87
Rear height sensor rod mounting bolt	17-26	12-19
Torsion axle and arm assembly		
Brake tube bracket mounting bolt	17-26	12-19
Rear brake assembly mounting bolt	50–60	36-43
Dust shield mounting bolt	9-14	7–10
Flange nut	200–260	144-188
Rear speed sensor mounting bolt <Vehicles with *A.B.S.>	9-14	7–10
Shock absorber lower mounting nut	80–100	58-72
Rear height sensor rod mounting bolt	17-26	12-19
Lateral rod mounting nut (axle beam side)	100–120	72-87
Trailing arm mounting bolt	100–120	72-87
Reserve tank		
Tank holder to body	9–14	7–10
Air tube to reserve tank	8–10	6–7

NOTE
*A.B.S.: Anti-lock braking system

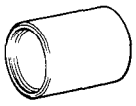
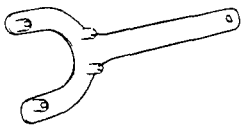
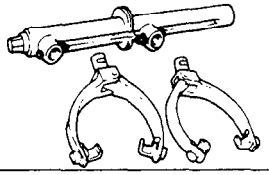
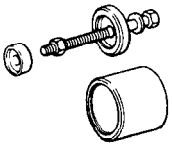
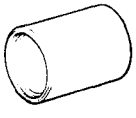
Items	Nm	ft.lbs.
Air compressor		
Air compressor mounting bolt	4 - 6	3 - 4
Air tube to air compressor	8–10	6 - 7
Compressor mounting bracket to transaxle	9 - 14	7–10
Solenoid valve and dryer		
Front solenoid valve bracket to body	7–11	5 - 8
Front solenoid valve to bracket	7 - 11	5 - 8
Air tube to dryer	8–10	6 - 7
Flow control solenoid valve to body	7–11	5 - 8
Rear solenoid valve bracket mounting nut	4 - 6	3 - 4
Rear solenoid valve to bracket	7–11	5 - 8
Air tube		
Joint	8–10	6 - 7
Height sensor		
Front height sensor rod to sensor	17-26	12-19
Front height sensor rod to lower arm	17-26	12-19
Front height sensor rod jam nut	9 - 14	7–10
Protector to body	9 - 14	7–10
Rear height sensor to body	9 - 14	7–10
Rear height sensor rod to sensor	4.8-7.2	4 - 5
Rear height sensor rod to bracket (1989 models)	17-26	12-19
Rear height sensor rod to bracket (From 1990 models)	4.8-7.2	4 - 5
Rear height sensor bracket (A) to bracket (B)	9 - 14	7–10
Front height sensor rod jam nut	9 - 14	7–10
G sensor		
G sensor bracket to body	4 - 6	3 - 4

SPECIAL TOOLS

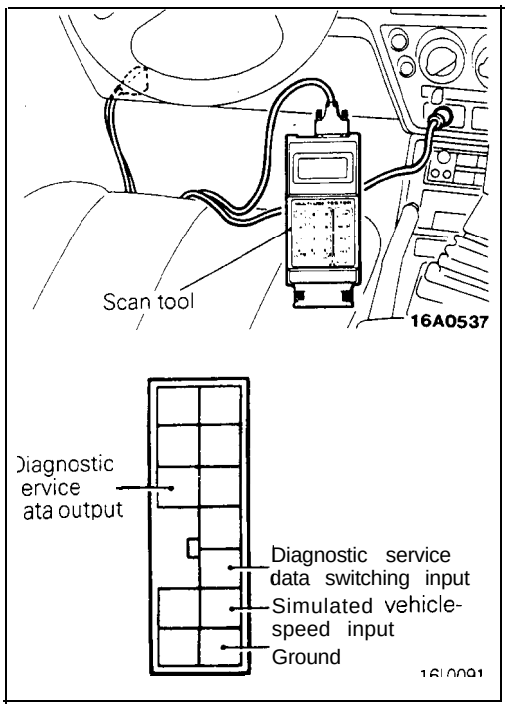
M33DA-A

Tool	Number	Name	Use
	MB991269 (1989 models) MB991341 (1990, 1991, 1992, 1993 models)	Scan tool (Multi-use tester <MUT>)	Checking of self-diagnosis codes Read-out of service data Testing of the actuator ACTIVE-ECS–Service Adjustment Procedures
	[For the number, refer to GROUP 00–Precautions Before Service]	ROM pack	
	MB991139	Vehicle-speed simulator	ACTIVE-ECS–Service Adjustment Procedures
	MB991229	Air tube releaser	Removal/installation of the air tube
	MB991075-01 Adaptor A (M 10 female) B (M 10 male) C (M 12 male) D (M 10 female)	Air pressure gauge	To check air pressure
	MB991226	Adaptor set	
	MB991113-01 OPTIONAL. AVAILABLE FROM O.T.C.	Steering linkage puller	Removal of the lower arm ball joint and tie rod
	MB990800-01 OPTIONAL: AVAILABLE FROM O.T.C.	Ball joint remover and installer	Installation of the dust cover

TSB Revision

Tool	Number	Name	Use
	MB990847-01	Rear suspension bushing remover and installer base	Installation of the oil seal
	MB990947-01	Lower arm bushing arbor	
	MB991176	Spring seat holder	Disassembly/assembly of the strut assembly
	MB991237 MB991238, MB991239	Spring compressor body Arm set	Compression of the front coil spring (MB991237, MB991238) Compression of the rear coil spring (MB991237, MB991239)
	MB991159	Bushing remover and installer	Driving-out and press-fitting of the trailing arm bushing
	MB990947-01	Lower arm bushing arbor	Driving-out and press-fitting of the lateral rod bushing
	MB990945	Lower arm bushing ring	
	MB990847-01	Bushing remover and installer base	

NOTES



TROUBLESHOOTING

M33EAADa

TROUBLESHOOTING POINTS

REGARDING THE DIAGNOSTIC FUNCTION

For the ACTIVE-Electronic Control Suspension (ACTIVE-ECS), the electronic control unit has been provided with the following functions in order to make checking of the electronic-control system easier.

(1) Diagnostic trouble code output
(2) Service data output
(3) Actuator test

Note that all of the above can be checked by using the scan tool.

Also note that the diagnostic trouble codes can be checked by using the voltmeter.

NOTE

For information concerning testing procedures by using the scan tool, refer to P.33B-11.

CHECKING THE ELECTRONIC CONTROL UNIT (ECU) SIGNAL CIRCUIT

(1) The circuit tester used must be highly sensitive and highly precise, with internal batteries of 3V or more.
(2) Care should be taken about the outflow of current from the tester when checking for continuity of terminals and the power-supply circuitry for the photo sensors (front and rear height sensors and steering angle velocity sensor). Use of the ×10 range is preferable, but the xl range can be used if the indicator does not move sufficiently to the right.
(3) The resistance values noted as standard values are simply reference values. If there is continuity, the part can be considered to be OK.
(4) If a power relay or solenoid valve is to be activated, first check carefully to be sure that there is no damaged or disconnected wiring or a short-circuit. Also do not make unnecessary connections so that wiring contacts the body. Take particular care to be sure that the wiring of battery power-supply connections is secure.

CHECKING BY USING THE SCAN TOOL

1. DIAGNOSTIC TROUBLE CODE OUTPUT

TROUBLESHOOTING CHART

Diagnostic trouble code No.	Malfunction	Vehicle condition	Probable cause	Action
0	Normal	–	–	–
*11	Damaged or disconnected wiring or short-circuit of G sensor input circuit, or G sensor malfunction.	Alarm light illuminates; among attitude-control modes, only rolling control stops. (Others operate normally.)	• Improper installation of G sensor. • G sensor internal wiring damaged or disconnected. • Damaged or disconnected wiring or short-circuit of G sensor circuit. • Connector of G sensor circuit disconnected. • Malfunction of ECU.	Troubleshooting hints classified by circuit [1]
*12	With the ignition key at the ON position and the vehicle speed at 40 km/h (25 mph) or higher, the output voltage of the generator "L" terminal is approximately 5V or lower	The charging warning light illuminates, and, furthermore, the system does not function when the vehicle is stopped (vehicle speed of 3 km/h (2 mph) or lower). NOTE The alarm light does not illuminate, and, furthermore, there is no detection of harness damage or disconnection between the generator "L" terminal and the ECU.	• Insufficient generator "L" terminal output voltage (malfunction of the charging system). • Harness short-circuit between the generator "L" terminal and the ECU. • ECU malfunction.	Troubleshooting hints classified by circuit [2]
13	The low-pressure switch is not switched OFF even though the attitude-control function is performed 30 times. The return pump is activated frequently.	The alarm light illuminates, and only the attitude-control function stops. (Other functions are normal.)	• Low-pressure switch is fused. • Damaged or disconnected wiring, or short-circuit, of the low-pressure switch circuit harness. • The connector of the low-pressure switch circuit is disconnected. • Air leakage from the low-pressure tank (including tubing). • ECU malfunction.	Troubleshooting hints classified by circuit [3]
*21	Damaged or disconnected wiring of the steering angular-velocity sensor input circuit, or a malfunction of the steering angular-velocity sensor.	The alarm light illuminates, and the attitude-control function stops. The damping force is held to MEDIUM, and the vehicle height is held to NORMAL	• Steering angular-velocity sensor malfunction. • Damaged or disconnected wiring of the steering angular-velocity sensor circuit harness. • Disconnection of the connector of the steering angular-velocity sensor circuit. • ECU malfunction.	Troubleshooting hints classified by circuit [9]

Diagnostic trouble code No.	Malfunction	Vehicle condition	Probable cause	Action
"22	An abnormal signal (a signal unlike any normal signal such as an error code, etc.) is input from the front height sensor; or, a malfunction of the vehicle-height discrimination circuit within the ECU.	The alarm light illuminates, and the attitude-control function and the vehicle-height control function are stopped. The damping force is held to MEDIUM. NOTE Note that 32 seconds are required to determine that there is a malfunction.	• Front height sensor malfunction. • Damaged or disconnected wiring, or a short-circuit, of the front height sensor circuit. • Disconnection of the connector of the front height sensor circuit. • ECU malfunction.	Troubleshooting hints classified by circuit [10]
"23	An abnormal signal is input from the rear height sensor; or, a malfunction of the vehicle-height discrimination circuit within the ECU.	The alarm light illuminates, and the attitude-control function and the vehicle height control function are stopped. The damping force is held to MEDIUM NOTE Note that 32 seconds are required to determine that there is a malfunction.	• Rear height sensor malfunction. • Damaged or disconnected wiring, or a short-circuit, of the rear height sensor circuit. • Disconnection of the connector of the rear height sensor circuit. • ECU malfunction	Troubleshooting hints classified by circuit [11]
"24	There is damaged or disconnected wiring, or a short-circuit, of the vehicle-speed sensor input circuit. (The throttle is open 30% or more, and the output of the generator "L" terminal is HIGH level, but even so the input of the vehicle-speed pulses is not 30*1 seconds or longer.)	The alarm light illuminates, and the attitude-control function stops. The damping force is held to MEDIUM, and the vehicle height is held to NORMAL.	• Malfunction of the vehicle-speed sensor (damaged or disconnected wiring, or a short-circuit). • Damaged or disconnected wiring, or a short-circuit, of the vehicle-speed sensor circuit. • The connector of the vehicle-speed sensor circuit is disconnected. • ECU malfunction.	Troubleshooting hints classified by circuit [12]
25	There is damaged or disconnected wiring of the rear pressure sensor input circuit. (The rear internal pressure is abnormally high.)	The attitude-control function and the vehicle-height control function are stopped. The damping force is held to MEDIUM. NOTE This code is also output during driving in an overloaded condition.	• Rear pressure sensor malfunction. • Damaged or disconnected wiring, or a short-circuit, of the rear pressure sensor circuit. • Disconnection of the connector of the rear pressure sensor circuit. • ECU malfunction	Troubleshooting hints classified by circuit [13]

NOTE
*1: 1989 models
From 1990 models: 60

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Diagnostic trouble code No.	Malfunction	Vehicle condition	Probable cause	Action
41	Damaged or disconnected wiring of the damping force switching actuator (step motor type) or of the actuator circuit, or a malfunction of an output transistor within the ECU.	The alarm light illuminates, and the attitude-control function and the damping-force control function are stopped. The vehicle height is held to NORMAL.	• All connectors of the damping-force switching actuator (step motor type) and the actuator circuit are disconnected. • Damaged or disconnected wiring, or a short-circuit, of the damping-force switching actuator (step motor type) and the harness of the ECU part of the actuator circuit. • ECU malfunction.	Troubleshooting hints classified by circuit [17]
42	There is damaged or disconnected wiring, or a short-circuit, of the solenoid valve power source relay circuit.	The alarm light illuminates, and the attitude-control function and the vehicle-height control function are stopped. The damping force is held to MEDIUM.	• The solenoid valve power source relay contacts are fused. • Damaged or disconnected wiring of the solenoid valve power source relay coil. • Damaged or disconnected wiring, or a short-circuit, of the solenoid valve power source relay circuit. • Disconnection of the connector of the solenoid valve power source relay circuit. • ECU malfunction.	Troubleshooting hints classified by circuit [7]
43	Damaged or disconnected wiring, or a short-circuit, of the compressor relay circuit, or a malfunction of an output transistor within the ECU.	The alarm light illuminates, and the attitude-control function and the vehicle-height control function are stopped. The damping force is held to MEDIUM.	• Damaged or disconnected wiring, or a short-circuit, of the compressor relay coil. • Damaged or disconnected wiring, or a short-circuit, of the compressor relay circuit harness. • Disconnection of the compressor relay circuit connector. • ECU malfunction.	Troubleshooting hints classified by circuit [18]
44	Damaged or disconnected wiring, or a short-circuit, of the return pump relay circuit, or a malfunction of an output transistor within the ECU.	The alarm light illuminates, and the attitude-control function and the vehicle-height control function are stopped. The damping force is held to MEDIUM.	• Damaged or disconnected wiring, or a short-circuit, of the return pump relay coil. • Damaged or disconnected wiring, or a short-circuit, of the return pump relay circuit harness. • Disconnection of the return pump relay circuit connector. • ECU malfunction.	Troubleshooting hints classified by circuit [19]

Diagnostic trouble code No.	Malfunction	Vehicle condition	Probable cause	Action
45	Damaged or disconnected wiring, or a short-circuit, of the exhaust valve actuation circuit (for vehicle-height adjustment), or a malfunction of an output transistor within the ECU.	The alarm light illuminates, and the attitude-control function and the vehicle-height control function are stopped. The damping force is held to MEDIUM.	• Damaged or disconnected wiring, or a short -circuit, of the exhaust valve coil (for vehicle -height adjustment). • Damaged or disconnected wiring, or a short -circuit, of the exhaust valve actuation circuit (for vehicle-height adjustment). • Disconnection of the connector of the exhaust valve actuation circuit (for vehicle-height adjustment). • ECU malfunction.	Troubleshooting hints classified by circuit [20]
46	Damaged or disconnected wiring, or a short-circuit, of the flow-rate switchover valve actuation circuit, or a malfunction of an output transistor within the ECU.	The alarm light illuminates, and the attitude-control function and the vehicle-height control function are stopped. The damping force is held to MEDIUM.	• Damaged or disconnected wiring, or a short -circuit, of the flow-rate switchover valve coil. • Damaged or disconnected wiring, or a short-circuit, of the flow-rate switchover valve circuit harness. • Disconnection of the flow-rate switchover valve circuit connector. • ECU malfunction.	Troubleshooting hints classified by circuit [21]
47	Damaged or disconnected wiring of the front or rear exhaust valve actuation circuit (for active control), or a malfunction of an output transistor within the ECU.	The alarm light illuminates, and the attitude-control function and the vehicle-height control function are stopped. The damping force is held to MEDIUM.	• Damaged or disconnected wiring of the front or rear exhaust valve coil (for active control). • Damaged or disconnected wiring of the front or rear exhaust valve circuit (for active control). • Disconnection of the connector of the front or rear exhaust valve circuit (for active control). • ECU malfunction.	Troubleshooting hints classified by circuit [22]
51	Damaged or disconnected wiring of the front or rear air-supply valve actuation circuit, or a malfunction of an output transistor within the ECU.	The alarm light illuminates, and the attitude-control function and the vehicle-height control function are stopped. The damping force is held to MEDIUM.	• Damaged or disconnected wiring of the front or rear air-supply valve coil. • Damaged or disconnected wiring of the front or rear air-supply valve circuit harness. • Disconnection of the connector of the front or rear air-supply valve circuit. • ECU malfunction.	Troubleshooting hints classified by circuit [23], [24]

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Diagnostic trouble code No	Malfunction	Vehicle condition	Probable cause	Action
52	Damaged or disconnected wiring of the left front or right front valve actuation circuit, or a malfunction of an output transistor within the ECU.	The alarm light illuminates, and the attitude-control function and the vehicle-height control function are stopped. The damping force is held to MEDIUM.	• Damaged or disconnected wiring of the left front or right front valve coil. • Damaged or disconnected wiring of the left front or right front valve circuit harness. • Disconnection of the connector of the left front or right front valve circuit. • ECU malfunction.	Troubleshooing hints classified by circuit [25]
53	Damaged or disconnected wiring of the left rear or right rear valve actuation circuit, or a malfunction of an output transistor within the ECU.	The alarm light illuminates, and the attitude-control function and, the vehicle-height control function are stopped. The damping force is held to MEDIUM.	• Damaged or disconnected wiring of the left rear or right rear valve coil. • Damaged or disconnected wiring of the left rear or right rear valve circuit harness. • Disconnection of the connector of the left rear or right rear valve circuit. • ECU malfunction.	Troubleshooting hints classified by circuit [26]
54	Even though three minutes or more have passed for the vehicle-height adjustments of the front and the rear, and the pressure within the high-pressure tank is sufficient (the high-pressure switch is OFF), the vehicle-height adjustments are not completed.	The alarm light illuminates, and the attitude-control function and the vehicle-height control function are stopped. The damping force is held to MEDIUM.	• Overloaded condition. • Improper adjustment of the front or rear vehicle-height sensor. • Air-pressure line is clogged. • Malfunction of the front strut unit or the rear shock absorber unit air spring. • ECU malfunction.	Refer to Malfunction Symptoms Chart [A] on P.33B-17.
55	Even though three minutes or more have passed for the vehicle-height adjustments of the front and the rear, and with insufficient pressure within the high-pressure tank (the high-pressure switch is ON), the vehicle-height adjustments are not completed, or the compressor has operated continuously for four minutes or longer.	The alarm light illuminates, and the attitude-control function and the vehicle-height control function are stopped. The damping force is held to MEDIUM.	• Compressor malfunction. Damaged or disconnected wiring of the harness between the compressor relay and the compressor. Malfunction of the air compression of the compressor. • Air leakage from the high-pressure tank (non-airtight connection with the low-pressure tank). • High-pressure switch is fused.	Refer to Malfunction Symptoms Chart [B] on P.33B-17.
56	The return pump is continuously activated (repeatedly starts and stops eight times), even though neither the attitude-control function nor the vehicle-height control function has been initiated.	Control functions are not stopped (alarm lamp does not illuminate).	Air leakage within the front (left or right) or rear (left or right) valve.	Replace the front or rear solenoid valve.

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NOTE

(1) The alarm light does not illuminate for an abnormal condition (code No.12) of the generator output voltage ("L" terminal) or for air leakage (code No.56) within the front or rear valves.

(2) For malfunctions represented by a code number with the * symbol, if the malfunction is of a temporary nature (such as improper contact of a connector, etc.), the warning lamp's illumination will stop when the malfunction stops, and the function will return to normal.

(3) When the alarm light is illuminated (i.e. when a malfunction has been detected), the control mode cannot be switched (with the exception of a certain few malfunctions) when the control switch is pressed,.

(4) If two or more malfunctions occur at the same time, the corresponding code numbers will be displayed in order from the lowest one.

(5) Cancellation of malfunction codes after checking and repair (from 1990 models)

Method 1: Connect a scan tool and cancel as described below.

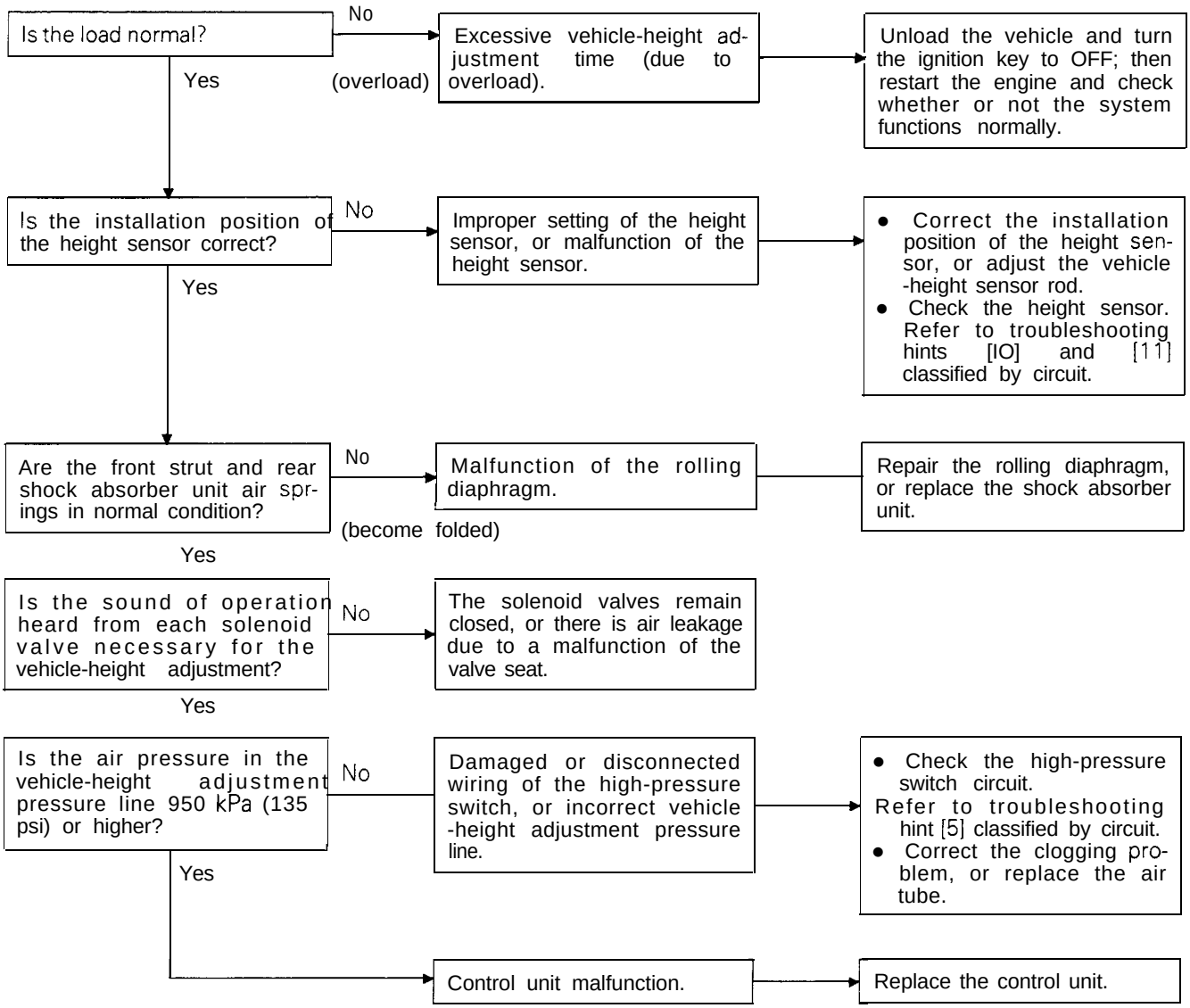
① Select "4 SPECIAL TEST" of the scan tool's function-select menu.
② Next, select item No.5 "ERASE DIAG.".
③ Press the YES key when "ERASE DIAG. DODE?" is displayed.
④ Input I D NBR. "3 7".
⑤ Press the CLEAR key when "FINISHED ERASING DIAG. CODE" is displayed.
⑥ Disconnect the scan tool.

Method 2: Disconnect the ground cable from the battery's negative terminal for 10 seconds or longer, and then reconnect.

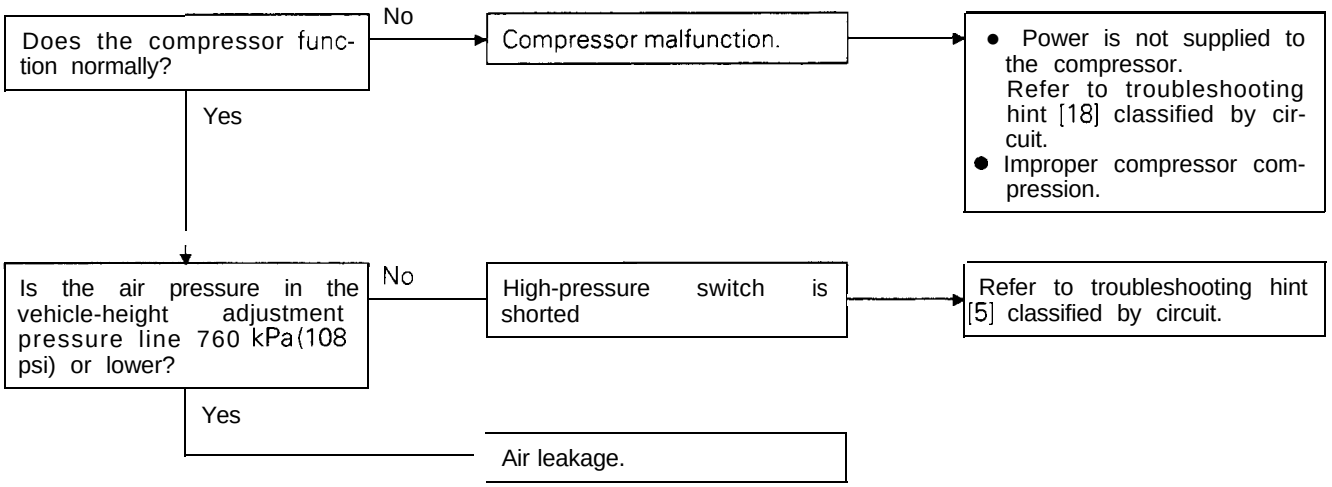
If this method is used, note that data entered to the memory of the radio and the clock will be erased, so readjustment is necessary after the work is completed.

CHECKING ACCORDING TO CHARTS CLASSIFIED BY THE MALFUNCTION SYMPTOM

[A] DIAGNOSTIC TROUBLE CODE NO.54



[B] DIAGNOSTIC TROUBLE CODE NO.55



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2. SERVICE DATA OUTPUT

Item No.	Service data item	Conditions for checking	Standard
11	G sensor	Vehicle horizontal condition	2.5 ± 0.6V
		After checking the above, shake the body to the left and right.	The indication fluctuate! above and below 2.5V.
12	Generator L terminal	Ignition switch at ON; engine not running.	LOW
		While engine is running.	HIGH
13	Low-pressure switch	Internal pressure of the low-pressure tank 40 kPa (5.7 psi) or lower. (In the actuator test mode, cause the return pump relay to switch ON several times in succession.)	ON
		Internal pressure of the low-pressure tank 170 kPa (24 psi) or higher. (In the actuator test mode, conduct the anti-roll action several times in succession.)	OFF
14	Throttle-position sensor	Gradually depress the accelerator pedal.	500mV | 5000mV
15	High-pressure switch	Internal pressure of the high-pressure tank 710 kPa (101 psi) or lower. (In the actuator test mode, activate the vehicle-height-increase function and vehicle-height-decrease function several times in succession until the compressor is activated.)	ON
		Internal pressure of the high-pressure tank 1,000 kPa (142 psi) or higher. (In the actuator test mode, cause the compressor relay to switch ON several times in succession.)	OFF
16	Ignition switch	Ignition switch OFF	OFF
		Ignition switch ON	ON
17	Control mode selection switch	Do not press any switch.	5.00V
		"HIGH" switch (only) ON.	4.02V
		"SOFT" switch (only) ON.	2.71V
		"AUTO" switch (only) ON.	1.53V
		"SPORT" switch (only) ON.	0.00V
18	Headlight switch	Headlight switch OFF	OFF
		Headlight switch ON	ON
21	Steering angle-velocity sensor	Turn the steering wheel at a very slow speed.	Left turn ↕ Right turn ST1 ST2 ON ON ON OFF OFF OFF OFF ON

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Item No.	Service data item	Conditions for checking	Standard
22	Front vehicle-height sensor	Switch ON the "HIGH" switch to set to the high vehicle height.	H 1011
		Switch ON the "AUTO" switch to set to the normal vehicle height.	N 1111
		Simulate a vehicle speed of 130 km/h (81 mph) to set to the low vehicle height.	L 0011
23	Rear vehicle-height sensor	Switch ON the "HIGH switch to set to the high vehicle height.	H 1011
		Switch ON the "AUTO" switch to set to the normal vehicle height.	N 1111
		Simulate a vehicle speed of 130 km/h (81 mph) to set to the low vehicle height.	L 0011
24	Vehicle-speed sensor	Actual driving	The speedometer indication and the value indicated by the scan tool must agree.
25	Rear pressure sensor	In the actuator test mode, activate the vehicle-height-increase function several times in order to increase the internal pressure of the rear struts.	The indicated value should Increase to the range of 0 to 5V each time the vehicle height is increased.
		Reference: When the vehicle is at the normal height, with the vehicle in the unladen condition.	0.90V
		Reference: When the vehicle is at the high height.	1.60V
		Reference: When the vehicle is at the low height.	0.86V
26	Stop light switch	Brake pedal not depressed.	OFF
		Brake pedal depressed.	ON
32	Back-up light switch	Move the shift lever to "reverse"	ON
		Return the shift lever to "neutral"	OFF
33	Door switches	Close all doors.	OFF
		Open each door one by one.	ON

3. ACTUATOR TEST

Before conducting the actuator test, check to be sure that the vehicle attitude is level.

Item No.	Actuator test description		Standard
01	Activation of the damping-switching actuator	SOFT	Check, one wheel at a time, to be sure that the damping becomes higher step by step when the check is conducted in the sequence 01 to 02 to 03 to 04.
02		AUTO-SOFT	
03		MEDIUM	
04		HARD	
05	Compressor relay: ON		The compressor should be activated at the moment of the setting to item No. 05, and then should stop three seconds later.
06	Return pump relay: ON		The return pump should be activated at the moment of the setting to item No. 06, and then should stop three seconds later.

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Item No.	Simulation test description		Flow-control solenoids			Front solenoids			Rear solenoids			Vehicle -height adjust-ment exhaust solenoid	Standard
			Flow-rate switchover valve	Front exhaust valve	Rear exhaust valve	Front air-supply valve	Right front valve	Left front valve	Rear air-supply valve	Right rear valve	Left rear valve		
07	Vehicle -height -decrease control	Start	OFF	ON	ON	OFF	ON	ON	OFF	ON	ON	ON	There must be no variation of the amount of decrease of the vehicle height for the front and rear and for the left and right sides. Moreover, there should be an immediate reset, three seconds later, to the original condition.
		Reset	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	
08	Vehicle -height -increase control	Start	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	There must be no variation of the amount of increase of the vehicle height for the front and rear and for the left and right sides. Moreover, there should be an immediate reset, three seconds later, to the original condition.
		Reset	OFF	ON	ON	OFF	ON	ON	OFF	ON	ON	ON	
09	Anti -rolling control (left turn)	Start*	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	There should be no noticeable difference of the amount of inclination of the body when left-turn and right-turn simulations are conducted. Moreover, there should be an immediate reset, three seconds later, to the original condition.
		Start	ON	OFF	OFF	ON	OFF	ON	ON	OFF	ON	OFF	
		Hold	OFF	ON	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	
		Reset	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
10	Anti -rolling control (right turn)	Start*	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	
		Start	ON	OFF	OFF	ON	ON	OFF	ON	ON	OFF	OFF	
		Hold	OFF	ON	ON	OFF	ON	OFF	OFF	ON	OFF	OFF	
		Reset	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	

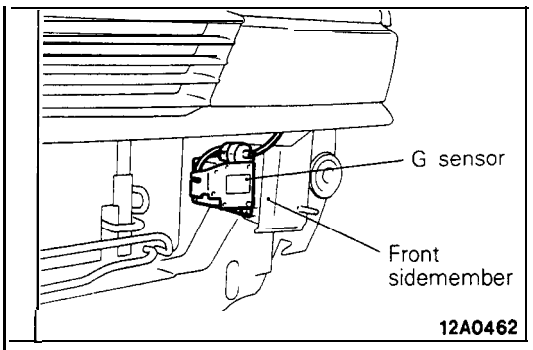
Actuation valve check points:
- Presence of an operation sound (if there is no operation sound, it is possible that air is not being supplied because of valve sticking.)
- There should be no abnormal noise.
- There should be no air leakage.

*: connection closed between right and left wheels

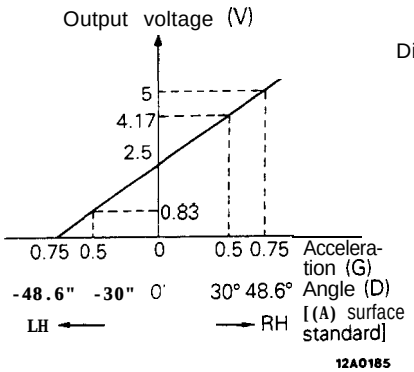
TROUBLESHOOTING HINTS CLASSIFIED ACCORDING TO CIRCUITS

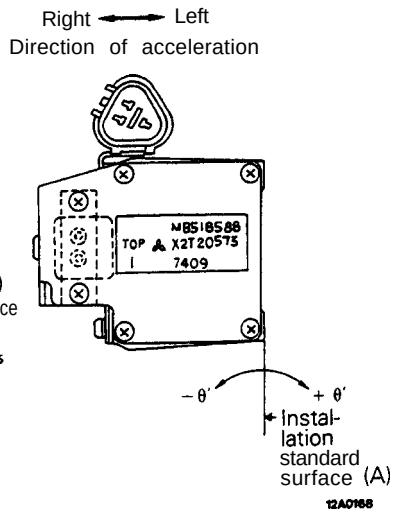
Contents

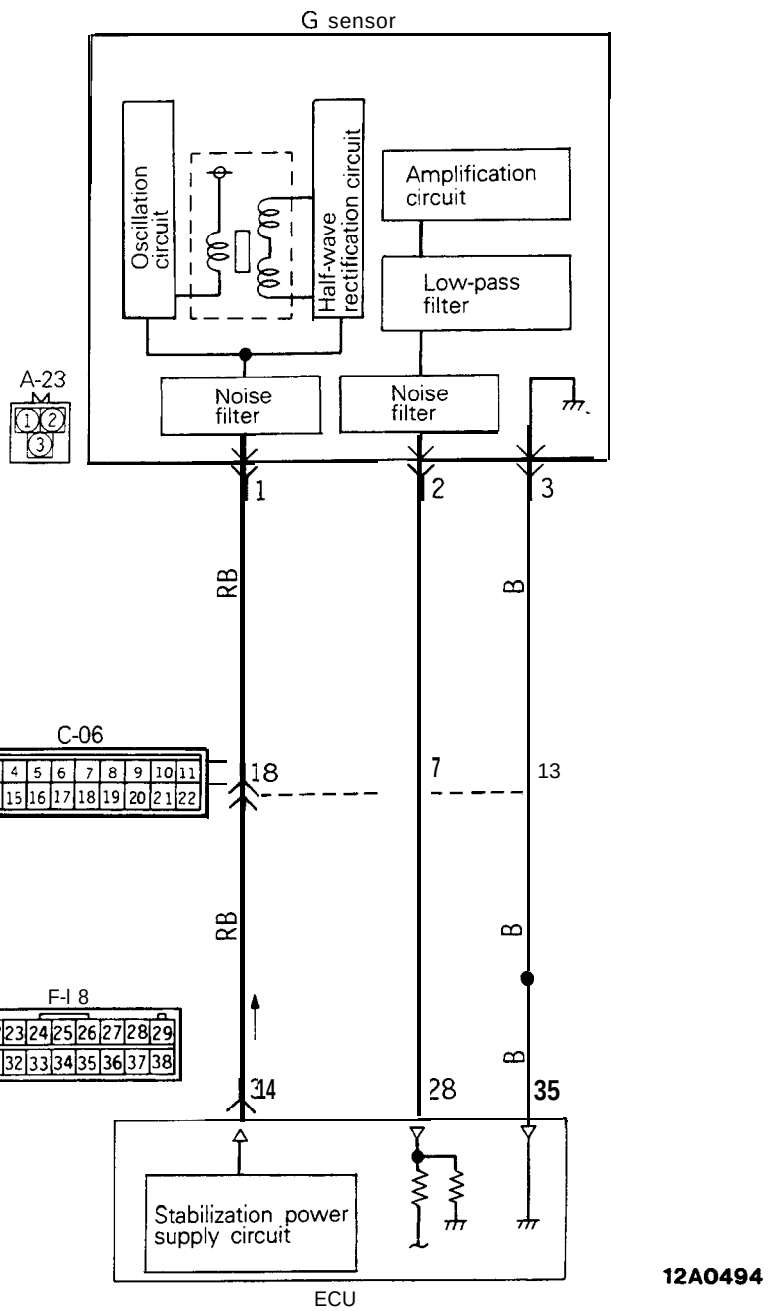
[1] G-SENSOR CIRCUIT



G-sensor output characteristic







Operation

The G-sensor detects the amount of acceleration that is generated (to the left or right) when the vehicle body turns. Applying the principle of the differential transformer, the magnetic field changes when the movable iron core within the coil moves in response to acceleration, and these changes are taken out as changes of voltage. Within the coil, silicon oil is enclosed in order to suppress the vibration of the movable iron core. Note that the G-sensor is a special sensor for control of rolling.

Diagnostic

When signals that are otherwise virtually inconceivable are input due to damaged or disconnected wiring or a short-circuit or similar problem of a heavy-line circuit, the alarm light illuminates and control is as described in the table below.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
11	Rolling control only stops	Normal operation	Normal operation	Accept			

Service data indication

Code No	Indication	Standard value	Display
11	G-sensor output voltage	2.5V when vehicle is horizontal	11: G SNSR. 2.5V

ECU terminal voltages (when connector is connected)

Terminal No	Signal	Condition	Terminal voltage
34	Power supply for sensor	When the ECU is activated	7.3V
28	G-sensor output signal	When stopped	2.5V
		When wiring is damaged or disconnected	0V
35	Sensor circuit earth	Constantly	0V

Checking the G-sensor circuit (with the connector disconnected)

Terminal No	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
28	G-sensor output	Resistance	28-2	Constantly	Continuity
34	G-sensor power source	Resistance	34-1	Constantly	Continuity

Troubleshooting hints

Malfunction mode	Malfunction probable cause	Malfunction	Note
Silicon oil leakage	Because the silicon oil for suppression of vibrations of the G-sensor movable iron core is leaking due to a collision, the sensitivity is oversensitive.	• Rolling control occurs frequently	–
Damaged or disconnected earth line	The ground line is damaged or disconnected. Malfunction is not detected because the ground line is grounded to the G sensor's body itself, however, noise is easily picked up.	• There are times of a feeling of incompatibility of the rolling control • Rolling control occurs suddenly; an error occurs	–

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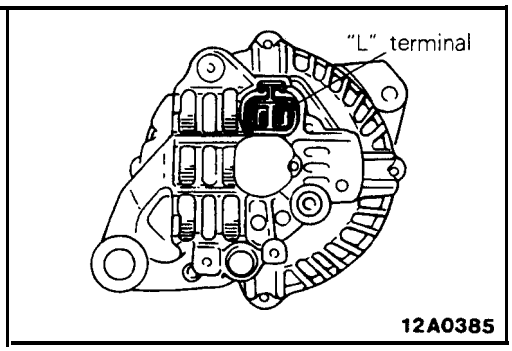
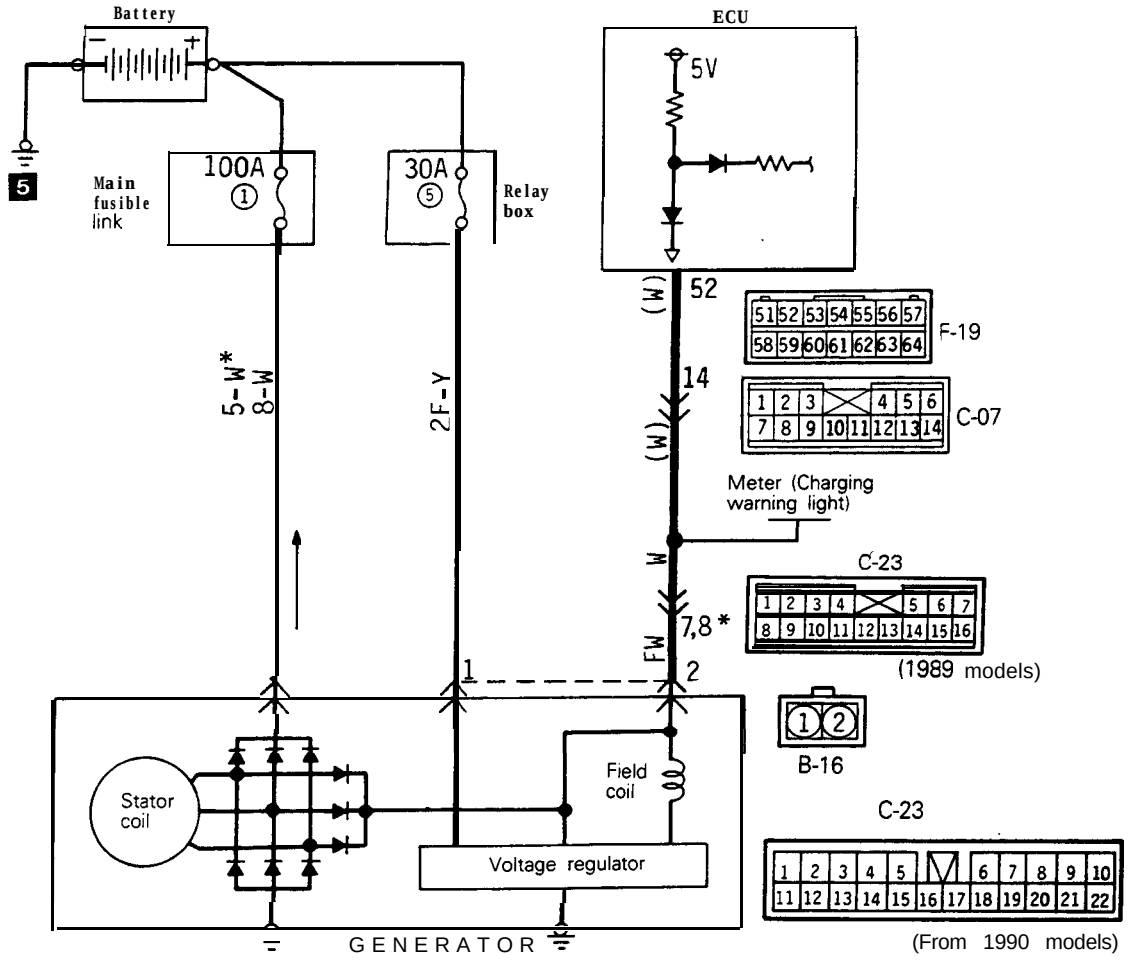
[2] GENERATOR "L" TERMINAL CIRCUIT





NOTE
* mark is applicable for 1990, 1991, 1992, 1993 models.

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Operation

The generator "L" terminal signal is used to determine whether or not the engine is operating.
This is in order to reduce the frequency of compressor operation, and is because activation of the system is possible while the engine is operating, or at a vehicle speed of 3 km/h (2 mph) or higher.

Diagnostic

When the generator "L" terminal is LOW level (as a result of a short-circuit of the heavy-line circuit or due to an abnormal condition of the generator) even though the vehicle speed is 40 km/h (25 mph), control is as described in the table below. Note, however, that there is no detection if there is damaged or disconnected wiring of the harness, and the alarm light does not illuminate.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
12	*"L" terminal "L" logic						

*"L" terminal "L" logic: As a result of system operation conditions, the system is not activated at a vehicle speed of less than 3 km/h (2 mph). When the vehicle speed becomes 3 km/h (2 mph) or higher all functions are normal. (Refer to the explanation of the operation.)

Service data indication

Code No.	Indication	Display
12	The output voltage level of the generator "L" terminal is indicated.	12: ALT. L TERMI. HIGH/LOW

ECU terminal voltage (when connector is connected)

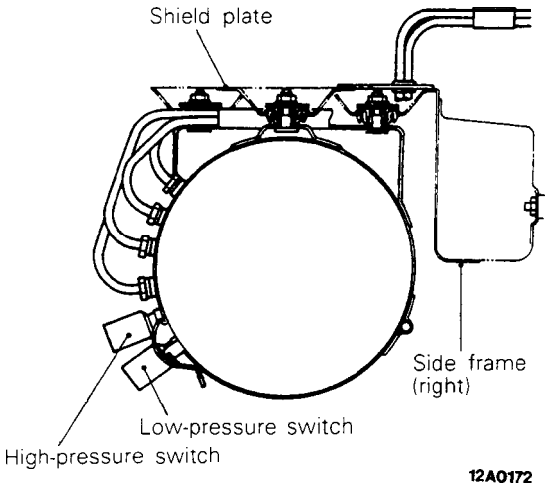
Terminal No.	Signal	Condition	Terminal voltage
52	Generator 'I" terminal signal	When engine stalls	0.5–3V
		When engine is operating	13–15V
		When harness wiring is damaged or disconnected	5V

Checking the generator "L" terminal circuit (with the connector disconnected)

Terminal No.	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
52	Generator	Voltage	52 ground	Ignition switch ON	2–5V
				While engine is operating	B+

B+: Battery positive voltage

[3] LOW-PRESSURE SWITCH CIRCUIT



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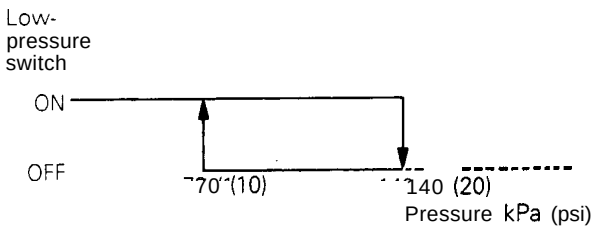
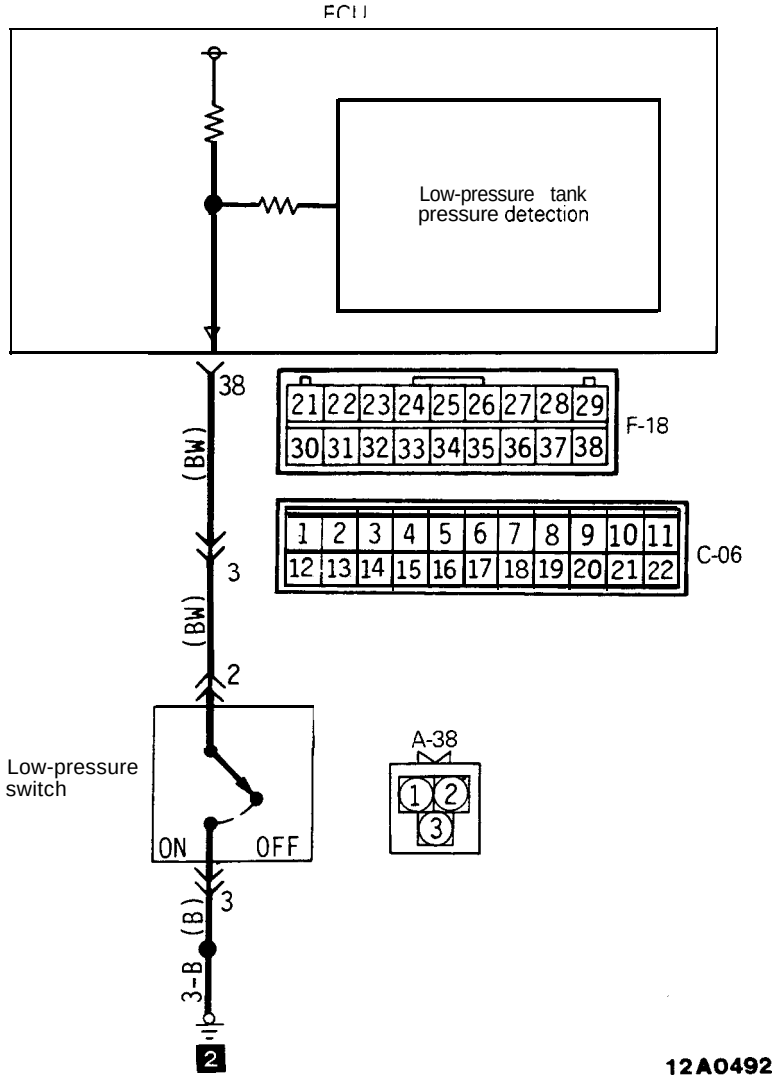


12A0461



12A0492

Operation

The low-pressure switch is switched ON and OFF by the pressure in the low-pressure tank, and as a result the ECU functions to control the activation and stop of the return pump.
When the pressure in the low-pressure tank becomes 140 kPa (20 psi) or higher, it is switched OFF, and as a result the ECU sends the drive signal to the return pump. It is switched ON at a pressure of 70 kPa (10 psi) or lower, and the return pump stops two seconds later.

Diagnostic

If there is a short-circuit, or damaged or disconnected wiring, of the heavy-line circuit, or if the low-pressure switch becomes shorted, and the low-pressure switch is as a result always ON, (the alarm light illuminates during active attitude control)*, and control is as described in the table below.

*: Information in ( ) is applicable to 1989 models. Not applicable to 1990 models.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
13	Control stop	Normal operation	Normal operation	Accept			

Service data indication

Code No.	Indication	Display
13	Indicates ON or OFF condition of the low-pressure switch	13: LOW PRESS. SW. ON/OFF

ECU terminal voltages (when connector is connected)

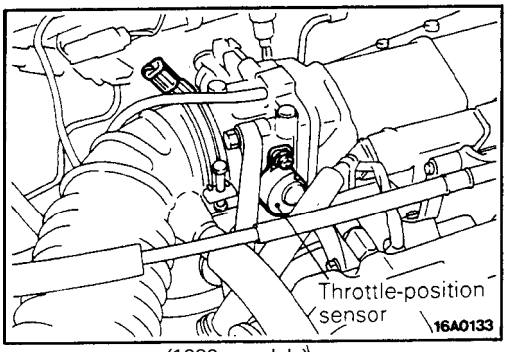
Terminal No.	Signal	Condition	Terminal voltage
38	Low-pressure tank pressure signal	When the low-pressure switch is ON	ov
		When the low-pressure switch is OFF	5V

Checking the low-pressure switch circuit [with the connector disconnected).

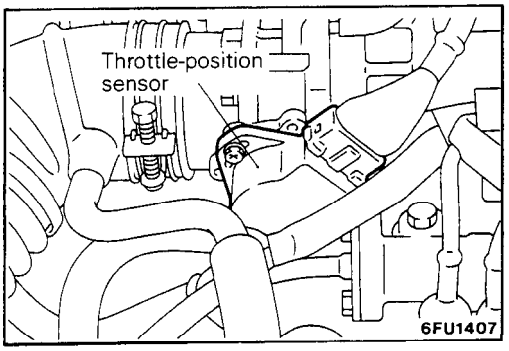
Terminal No.	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
38	Low-pressure switch	Resistance	38-36	Low-pressure tank internal pressure 70 kPa (10 psi) or below	Continuity
				Low-pressure tank internal pressure 140 kPa (20 psi) or higher.	No continuity

TSB Revision

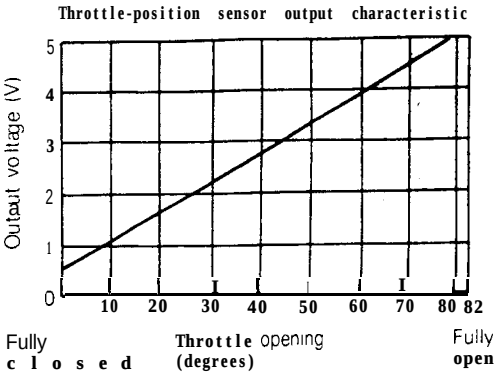
[4] THROTTLE-POSITION SENSOR CIRCUIT

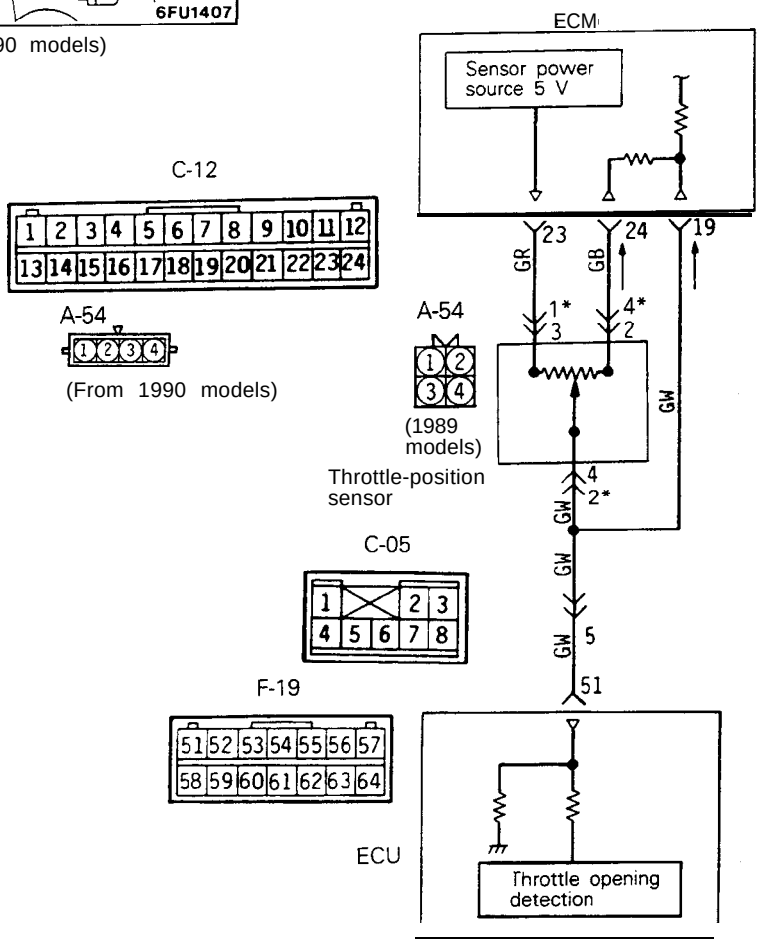


(1989 models)



(From 1990 models)





NOTE
* mark is applicable for 1990, 1991, 1992, 1993 models.

Operation

The throttle-position sensor is the same for the ECM of engine and transaxle. The ECM estimates the acceleration status of the vehicle according to the sensor output.

Service data indication

Code No	Indication	Display
14	The output voltage of the throttle -position sensor is indicated.	14: TPS 549 mV

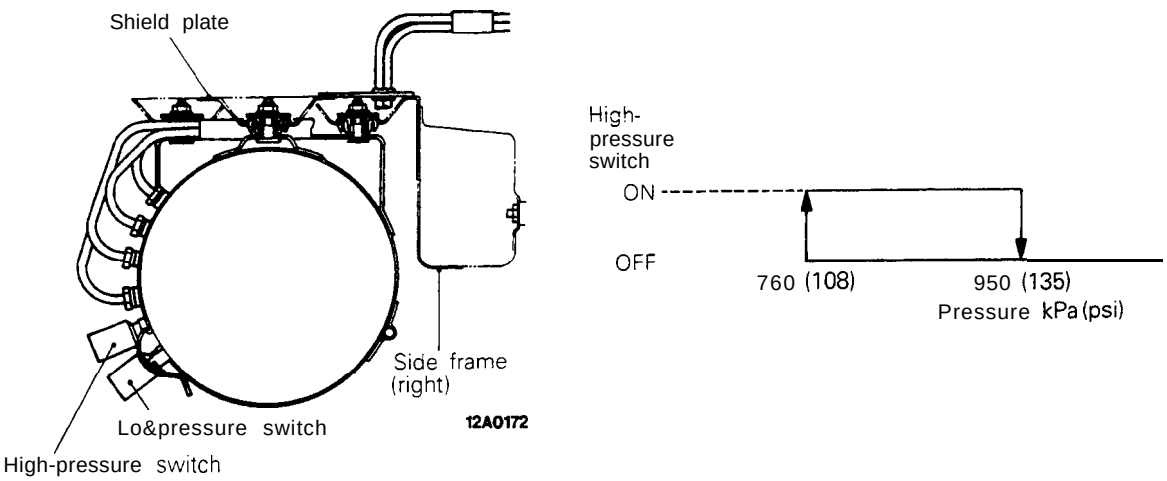
ECU terminal voltages (when connector is connected)

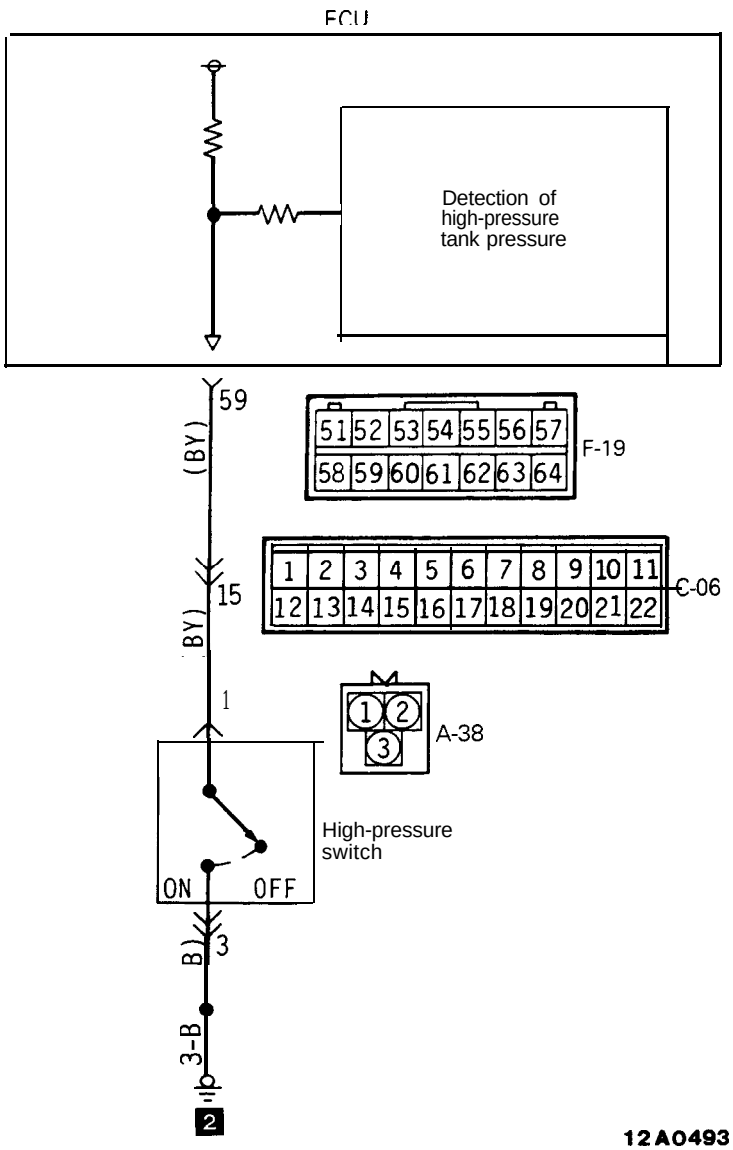
Terminal No.	Signal	Condition	Terminal voltage
51	Throttle-position sensor signal	During idle	0–1V
		When fully open	5V
		When there is damaged or disconnected wiring	0V

Checking the throttle-position sensor circuit (with the connector disconnected)

Terminal No	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
51	Throttle-positron sensor	Resistance	51 -ground	Change according to the throttle opening should be smooth and within the standard value range shown at the right.	0.5–5 kΩ

[5] HIGH-PRESSURE SWITCH CIRCUIT





TSB Revision

Operation

The high-pressure switch is switched ON and OFF by the pressure in the high-pressure tank, and as a result the ECU functions to control the activation and stop of the compressor.
When the pressure in the high-pressure tank becomes 760 kPa(108 psi) or lower, the high-pressure switch is switched ON, and as a result the ECU sends the drive signal to the compressor.

Conversely, when the pressure of the high-pressure tank becomes 950 kPa (135 psi) or higher, the high-pressure switch is switched OFF, and the compressor is stopped two seconds thereafter.
Note, however, that the compressor is not activated, even if the high-pressure switch is switched ON, if the return pump is in operation. Note also that there is no diagnostic function for the high-pressure switch.

Service data indication

Code No	Indication	Display
15	Indicates the ON/OFF status of the high-pressure switch.	15: HIGH PRESS. SW. ON/OFF

ECU terminal voltages (with connector connected)

Terminal No.	Signal	Condition	Terminal voltage
59	High-pressure tank pressure signal	When high-pressure switch is ON (low pressure)	ov
		When high-pressure switch is OFF (high pressure)	5V

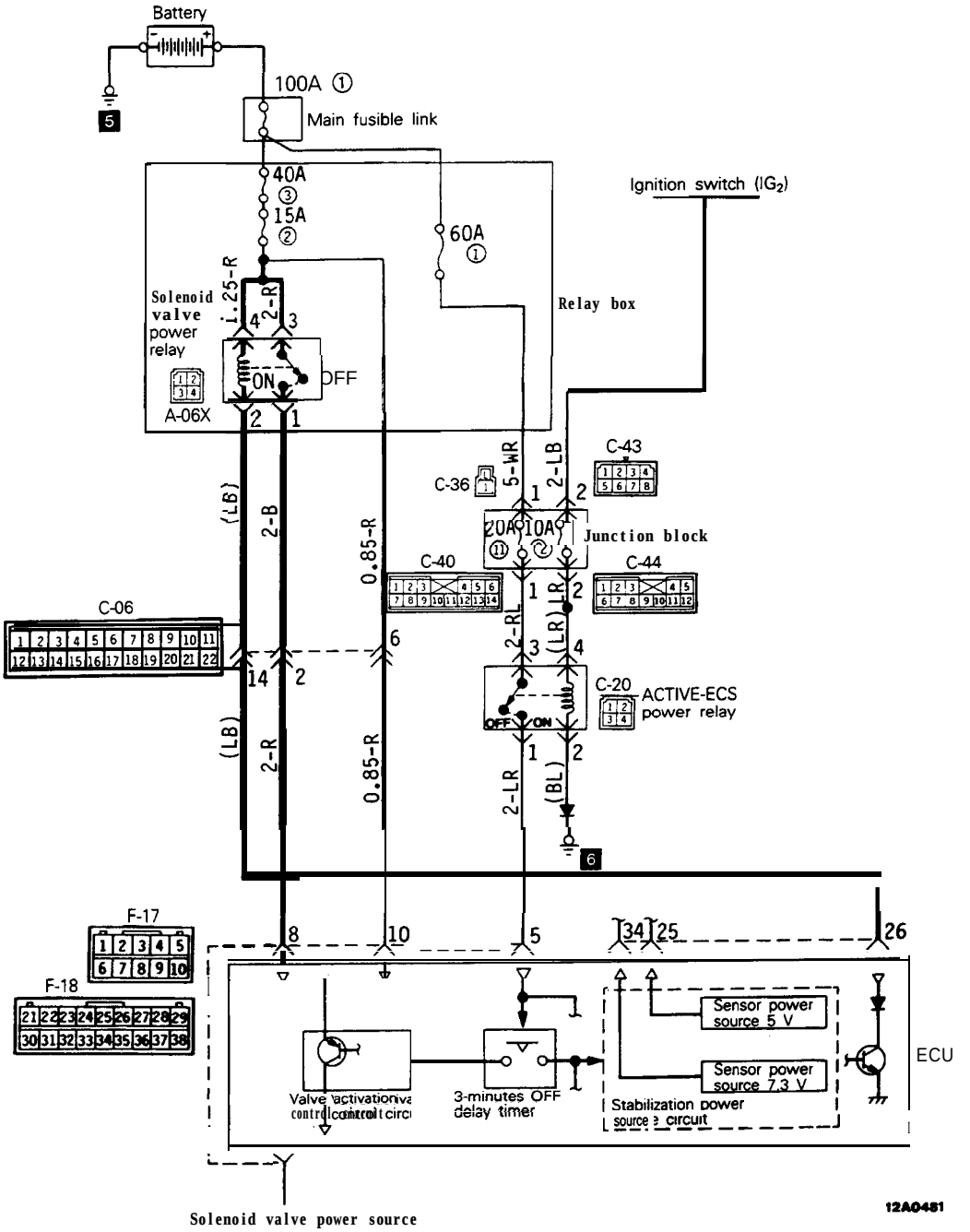
Checking the high-pressure switch circuit (with the connector disconnected)

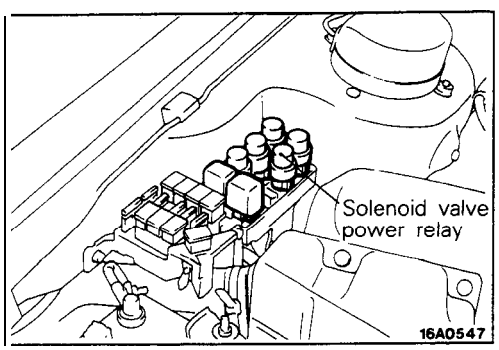
Terminal No	Connection destination or Measurement measured part		Tester connection	Check condition	Standard
59	High-pressure switch	Resistance	59-36	High-pressure tank internal pressure 760 kPa (108 psi) or lower	Continuity
				High-pressure tank internal pressure 950 kPa (135 psi) or higher	No continuity

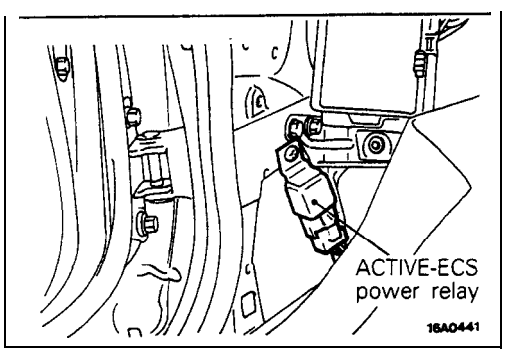
Troubleshooting hints

Malfunction mode	Malfunction probable cause	Malfunction	Note
Harness wiring damage or disconnection	Harness wiring damage or disconnection, or Improper switch contact	Compressor doesn't operate.	–
Harness short-circuit	Harness short-circuit, or switch short-circuit,	Compressor operates without stopping.	Diagnostic No.55 output.
Air leakage.	O-ring worn or damaged.	Rolling control feeling of Incompatibility. very freauent operation of compressor.	–

[6] ACTIVE-ECS POWER SOURCE CIRCUIT







TSB Revision

Operation

When the ignition is switched ON, the ECS power relay is also switched ON, and power is supplied to the system. At the same time, the ECU switches ON the solenoid valve power relay, and power is supplied to the solenoid valve activation circuit. As a result, system operation is possible.

When the ignition switch is switched OFF after driving, the three-minute OFF delay timer makes vehicle-height adjustment (down only) possible for a period of three minutes, thus preventing the vehicle height from increasing while passengers get out of the vehicle, etc.

Diagnostic

When problems such as damage or disconnection of the heavy-line circuit, or fusing of the contacts of the solenoid valve power relay, etc. occur, the alarm light illuminates, and control is as described in the table below.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
42	Rolling control only stops.	Held at MEDIUM	Rolling control only stops	Not accept			

Service data indication

Code No	Indication	Display
16	Indicates ON/OFF status of the ignition switch.	16: IGNITION SW. ON/OFF

ECU terminal voltage (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
5	Ignition (IG_2) power source signal	When ignition switch is ON	B+
		When ignition switch is OFF	0V
8	Solenoid valve power relay output signal	When system is normal	B+
		During fail-safe	0V
10	Battery (+B) power source	Constantly	B+
34	Sensor power source (7.3V)	Constantly	7.3V
25	Sensor power source (5V)	Constantly	5V
26	Solenoid valve power relay drive signal	When solenoid valve power relay is ON	0V
		When solenoid valve power relay is OFF	B+

B+: Battery positive voltage

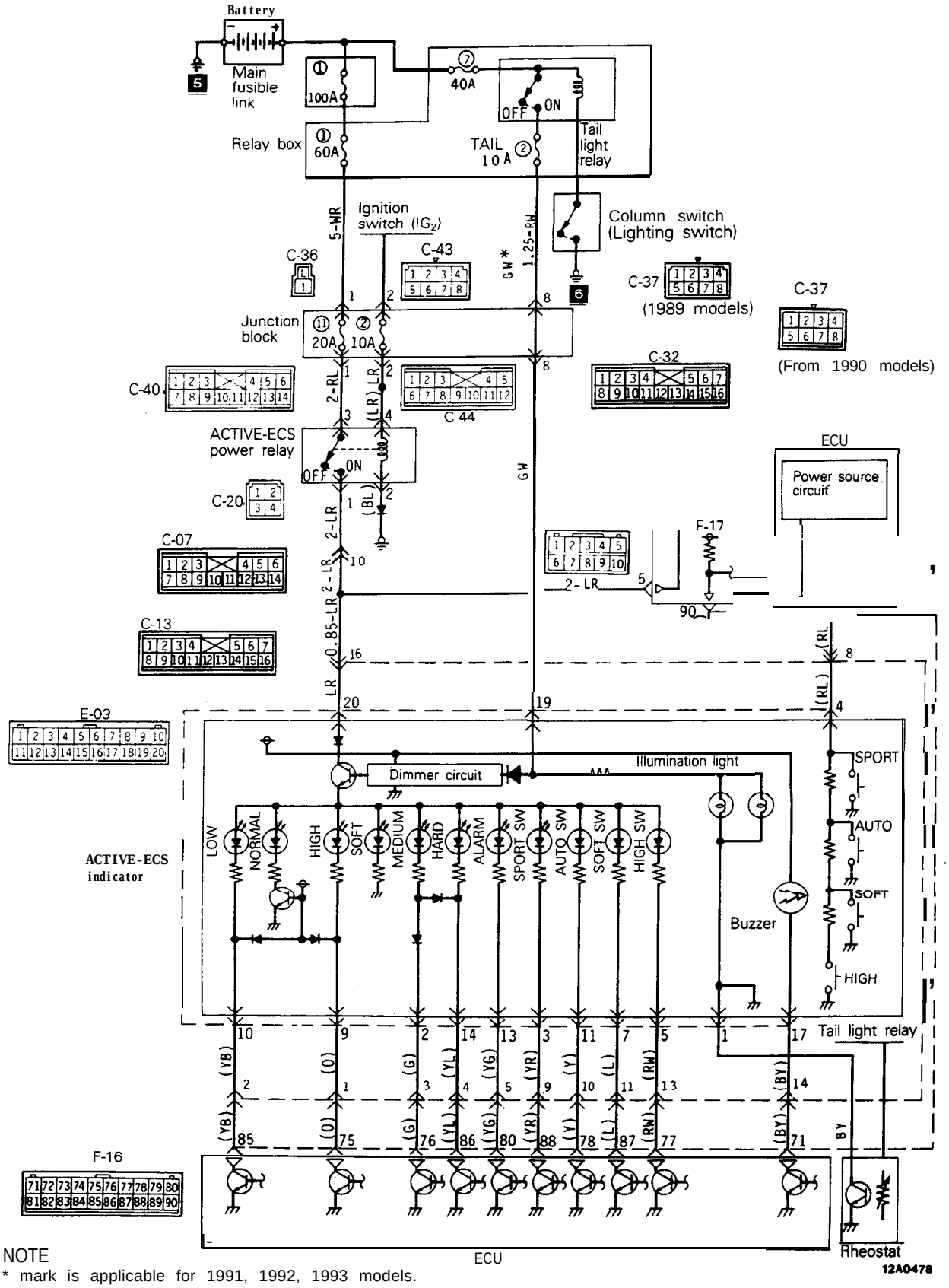
Checking the ACTIVE-ECS power source circuit (with the connector disconnected)

Terminal No.	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
5	Ignition switch	Voltage	5–ground	Ignition switch OFF	0 V
				Ignition switch OFF-ON	0→B+
8	Solenoid valve power relay	Voltage	8–ground	Terminal 26 open.	0V
				Terminal 26 grounded	0-B+
10	ECU back-up power source	Voltage	1 0-ground	Constantly	B+

B+: Battery positive voltage

TSB Revision

[7] ACTIVE-ECS indicators circuit



NOTE
* mark is applicable for 1991, 1992, 1993 models.

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Service data indication

Code No	Indication	Standard value		Indication example
17	ECU input voltage indications when SPORT, AUTO, SOFT, HIGH switches are pressed.	When switches are open	5V	17: MANUAL CNG. SW 4.03V
		When SPORT switch is ON	0V	
		When AUTO switch is ON	1.53V	
		When SOFT switch is ON	2.71V	
		When HIGH switch is ON	4.02V	

ACTIVE-ECS indicators check chart

1. Checking the power source circuit

Disconnect the battery terminals, and, after erasure of the ECU mode memory, turn the ignition key to the ON position.

↓

The sound of the damping force switching actuators (step motors), installed at the front struts and at the rear shock absorbers, will be heard.

No → • The ACTIVE-ECS power relay doesn't function
• Disconnected or damaged wiring of the fusible link, the fuse and/or the harness between the battery and the ACTIVE-ECS power relay contacts

Yes

When terminal 15 of the ACTIVE-ECS indicator is grounded, the "SOFT" damping force characteristic indicator and the "NORM" vehicle-height indicator will illuminate.

Yes → • Disconnected or damaged wiring of the ground line 15 of the ACTIVE-ECS indicator.

No

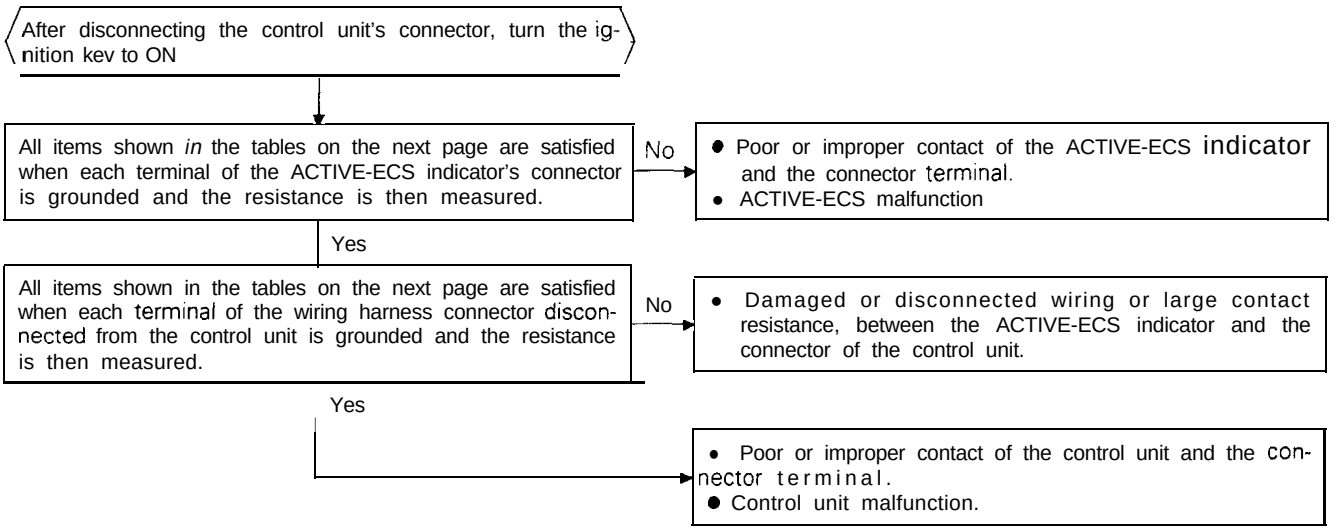
Approximately 12V is measured when the voltage between ground and terminal 20 of the indicator and the ACTIVE-ECS is measured.

No → • Disconnected or damaged wiring between the ACTIVE-ECS power relay and ECS indicator terminal 20.

Yes

ACTIVE-ECS Indicator power source circuit OK Proceed to checking of the individual ACTIVE-ECS indicators

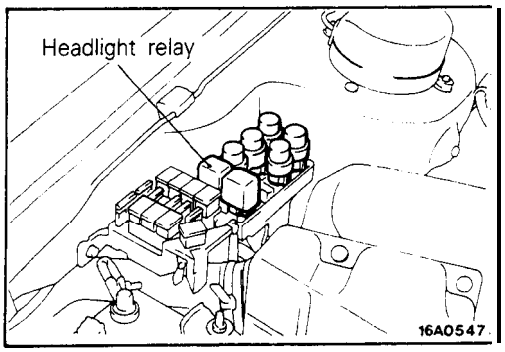
2. Checking the individual ACTIVE-ECS indicators

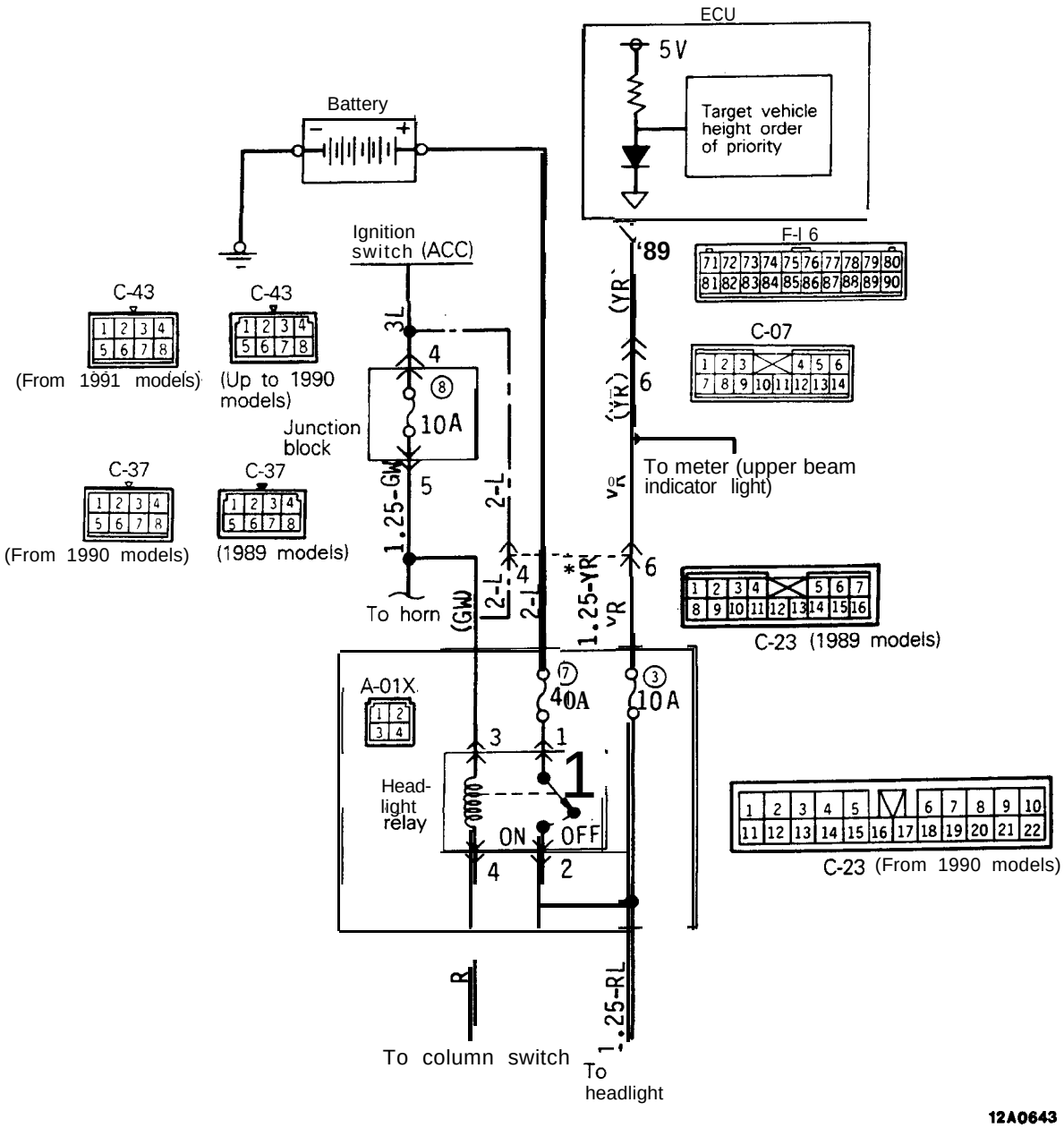


ACTIVE-ECS indicator connector terminal No	Control unit wiring harness connector terminal No	Normal
All terminals are not earthed	–	The "SOFT" damping force characteristic indicator and the "NORM" vehicle-height indicator illuminate.
1	–	The illumination light illuminates when battery voltage is applied to terminal 19.
2	76	In addition to the "SOFT" and "NORM" indicators, the "MEDIUM" damping force characteristic Indicator also illuminates.
3	88	In addition to the "SOFT" and "NORM" indicators, the "SOFT"*1 switch indicator also illuminates.
4	90	Connect a circuit tester and measure the resistance when the control mode and vehicle-height select switches are pressed: No switch is p No continuity. / SPORT 10Ω or less / AUTO Approx. 330 Ω / SOFT Approx. 890 Ω / HIGH Approx. 3090 Ω
5	77	In addition to the "SOFT" and "NORM" indicators, the "HIGH" switch indicator also illuminates
6*2	–	In addition to the "SOFT" and "NORM" indicators, the alarm light illuminates.
7	87	In addition to the "SOFT" and "NORM" indicators, the "SOFT" switch indicator also illuminates.
9	75	The "NORM" vehicle-height indicator illumination stops, and the "HIGH" vehicle-height indicator illuminates; the "SOFT" damping force characteristic indicator remains illuminated.
10	85	The "NORM" vehicle-height Indicator illumination stops, and the "LOW" vehicle-height indicator illuminates; the "SOFT" damping force characteristic indicator remains illuminated.
11	78	In addition to the "SOFT" and "NORM" indicators, the "AUTO" switch indicator also illuminates.
13	80	In addition to the "SOFT" and "NORM" indicators, the alarm light illuminates.
14	86	In addition to the "SOFT" and "NORM" indicators, the "MEDIUM" and "HARD" damping force characteristic indicators also illuminate
15	–	The "SOFT" damping force characteristic indicator and the vehicle-height indicator illuminate.
17	71	The buzzer sounds.
19	–	The "SOFT" and "NORM" indicators become slightly dimmer when terminal 20 is connected to terminal 19

NOTE
*1: 1989 models
"SPORT" mode is applicable for 1990, 1991, 1992, 1993 models
- *: Applicable to 1989 models only.

[8] HEADLIGHT SWITCH CIRCUIT





NOTE
* mark and chain line indicate 1991, 1992, 1993 models.

Operation

The ACTIVE-ECS system functions, in order to improve the "air drag" characteristic, to adjust the vehicle height to the LOW setting at the front end only during the daytime when the vehicle speed reaches 90 km/h (56 mph) or higher and continues at that speed for a period of ten seconds or longer.

During the nighttime, however, in order to prevent deviation of the headlight beams from the required directional path, the vehicle height is adjusted to the LOW setting for both the front end and the rear end when signals from the headlight relay are input.

Service data indication

Code No.	Indication	Display
18	Indicates the ON or OFF status of the headlight switch.	18: HEADLAMP SW. ON/OFF

ECU terminal voltages (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
89	Headlight switch signal	When headlight switch is ON	B+
		When headlight switch is OFF	ov
		When there is damaged or disconnected wiring	5V

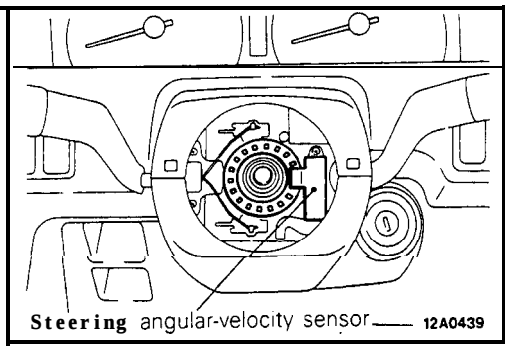
B+: Battery positive voltage

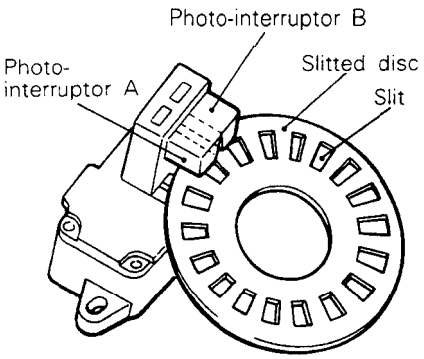
Headlight switch circuit (with the connector disconnected)

Terminal No.	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
89	Headlight relay	Voltage	89–ground	When the headlight switch is OFF	ov
				When the headlight switch is ON	B+

B+: Battery positive voltage

[9] STEERING ANGULAR-VELOCITY SENSOR CIRCUIT





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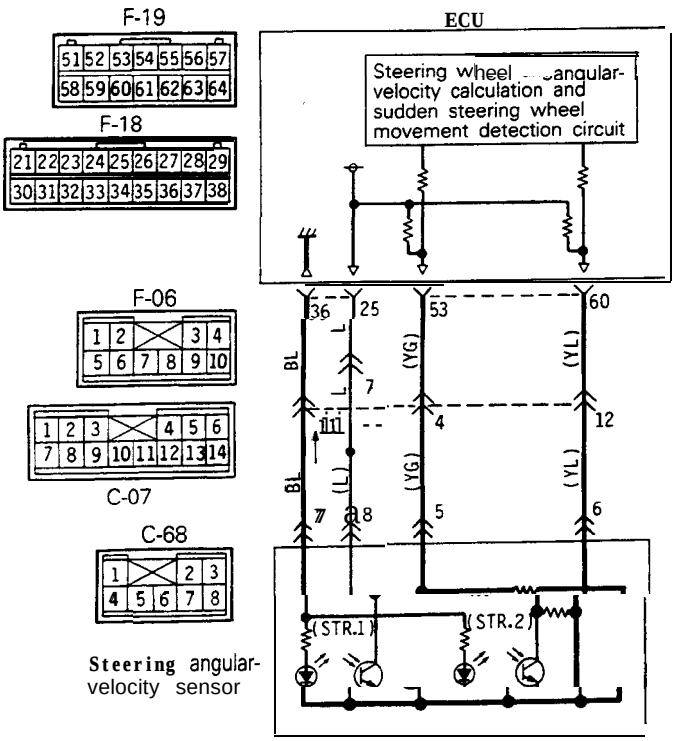

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Operation

The slitted disc installed to the steering shaft interrupts, or allows light to pass with the result that electric signals corresponding to the angular-velocity of the steering wheel movement are detected and passed to the ECU.

Diagnostic

If there is damage or disconnection of the heavy-line circuit, the alarm light illuminates and control is as described in the table below.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
21	Control stop	Held at MEDIUM	Held at NORM vehicle height.	Not accept			

Service data indication

Code No.	Indication	Display
21	Indicates the ON or OFF status individually for STR 1 and STR. 2.	21: STEER. SNSR. ST1 ON/OFF ST2 ON/OFF

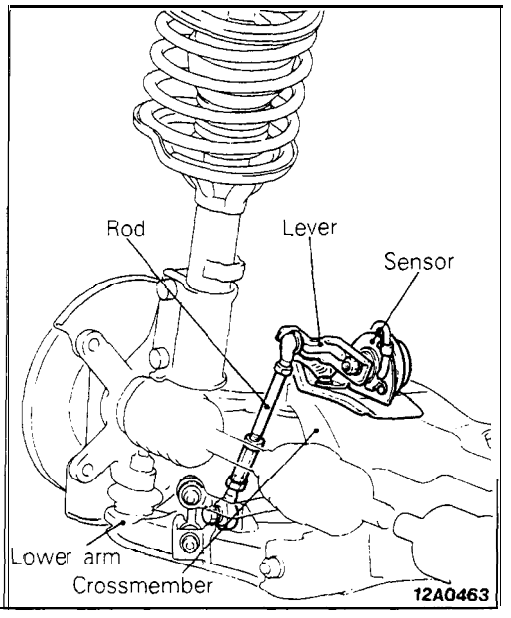
ECU terminal voltages (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
25	Power source for sensor	When the ECU is activated	5V
53	Steering angular-velocity sensor (1)	When the photo-interruptor is ON	ov
		When the photo-interruptor is OFF	3.5V
60	Steering angular-velocity sensor (2)	When there is damaoe or disconnection of the harness	5V
36	Sensor circuit ground	Constantly	ov

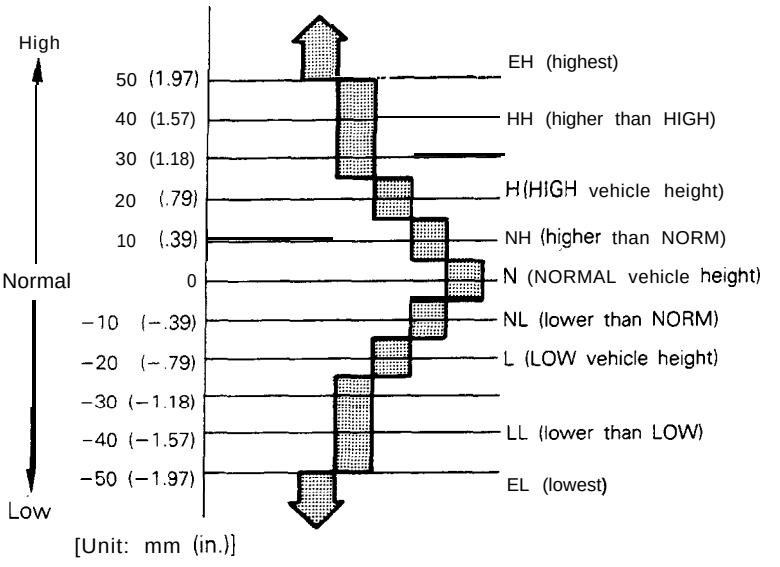
Checking the steering angular-velocity sensor circuit (with the connector disconnected)

Terminal No.	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
25 36	Steering angular-velocity sensor power-supply circuit	Resistance	25-36	Connect the tester's (–) probe to terminal 25, and the (+) probe to terminal 36. Note: Even if the result is good, the sensor must not be judged to be working.	Continuity exists. (The indicator fluctuates)
53 36	Steering angular-velocity sensor	Resistance	53-36	Turn the steering wheel slowly.	No continuity ↕ Continuity

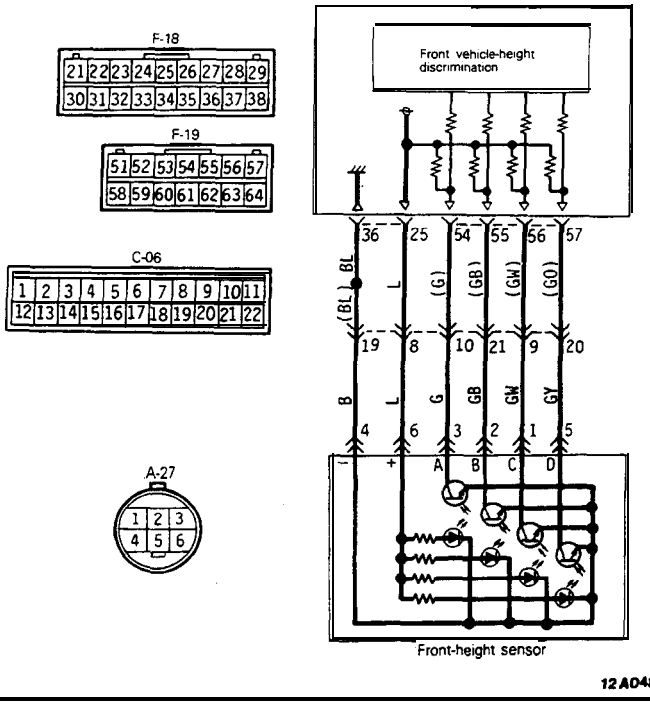
IO] FRONT-HEIGHT SENSOR CIRCUIT



Relationship between N (normal vehicle height) and other vehicle-height levels



[Unit: mm (in.)]



Operation

The front-height sensor detects (by detecting the relative position of the body and the front axle) the action movements (bouncing, nose diving, etc.), and the vehicle height, of the front of the vehicle,

The rotating disc plate rotates in the area between four pairs of light-emitting diodes and photo-transistors, and the slits in the disc thus interrupt, or let pass, the light beams between the light-emitting diodes and the photo-transistors.

By employing the data gathered in this way, the sensor can detect the vehicle height as any one of the nine level classifications.

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Diagnostic

When a signal (error code) indicating an abnormal condition (resulting from damage or disconnection of the heavy-line circuit, or a malfunction of a photo-transistor, etc.) is input, the alarm light illuminates and control is as described in the table below.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
22	Control stop	Held at MEDIUM	Control stop	Not accept			

Service data indication

Code No	Indication	Indication example	
22	Current vehicle-height level (ERROR when there is a malfunction) Indicates the ON or OFF status of each photo-interruptor.	When normal	22;N 1111 Indicates the vehicle-height level. ↳ Status of each photo-interruptor 1: ON, 0: OFF
		If mal-function	22; ERROR 0010 Indicates that an error code is beina output. ↳ Status of each photo-interruptor 1: ON. 0: OFF

ECU terminal voltages (when connector is connected)

Terminal No	Signal	Condition	Terminal voltage
25	Power source for sensor	When the ECU is activated	5V
54, 55 56.57	Front vehicle-height signal	When the photo-interruptors are ON	ov
		When the photo-interruptors are OFF	5V
36	Sensor circuit ground	Constantlv	ov

Checking the front-height sensor circuit (with the connector disconnected)

Terminal No	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
25 36	Front-height sensor power-supply circuit	Resistance	25-36	Contact the tester's (–) probe to terminal 25, and the (+) probe to terminal 36. Note Even if the result is good here, the sensor must not be judged tc be certainly good.	Continuity (The indicator fluctuates)
54 55 56 57	Front-height sensor	Resistance	54-36 55-36 56-36 57-36	Contact the tester's (–) probe to terminal 25, and the (+) probe to terminal 36, and check to be sure that there is continuity, leave the connections as they are. Connect the tester's (–) probe to each terminal of the wiring harness connector, and the (+) probe to terminal 36 Separate the lever (of the height sensor) from the rod, and slowly move the lever up and down.	No Continuity Continuity

Troubleshooting hints (mechanical malfunctions)

Malfunction mode	Malfunction probable cause	Malfunction	Note
Improper adjustment of the front-height sensor rod	Because of the improper adjustment of the front-height sensor rod, a signal not corresponding to the actual vehicle height is being sent to the ECU	• When the engine is stopped and left as it is, the height of only the front end decreases to lower than the NORMAL vehicle height • With the engine running, the height of the front end is lower than the NORMAL vehicle height • With the engine running (AUTO mode and NORMAL vehicle height), the height of the front end becomes higher than the NORMAL height)	–

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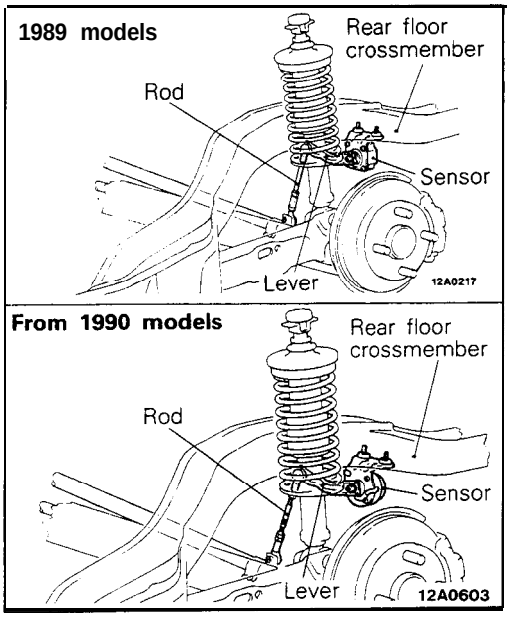
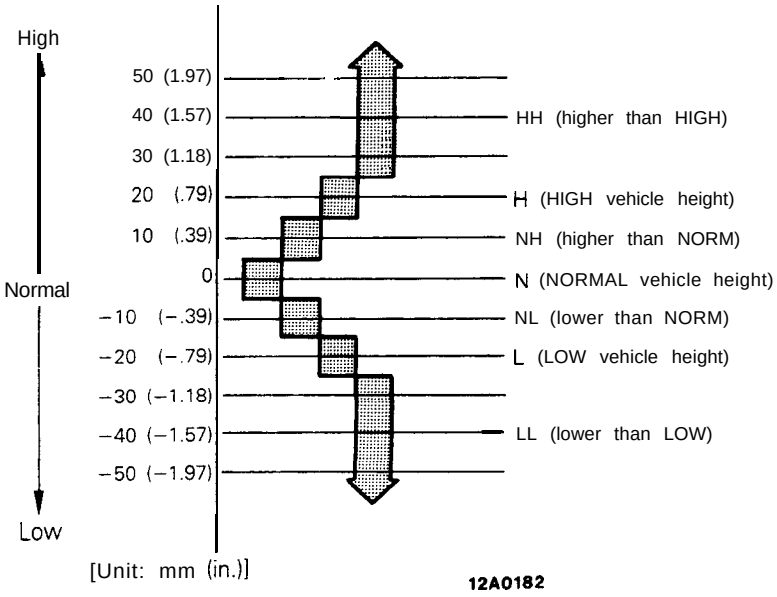
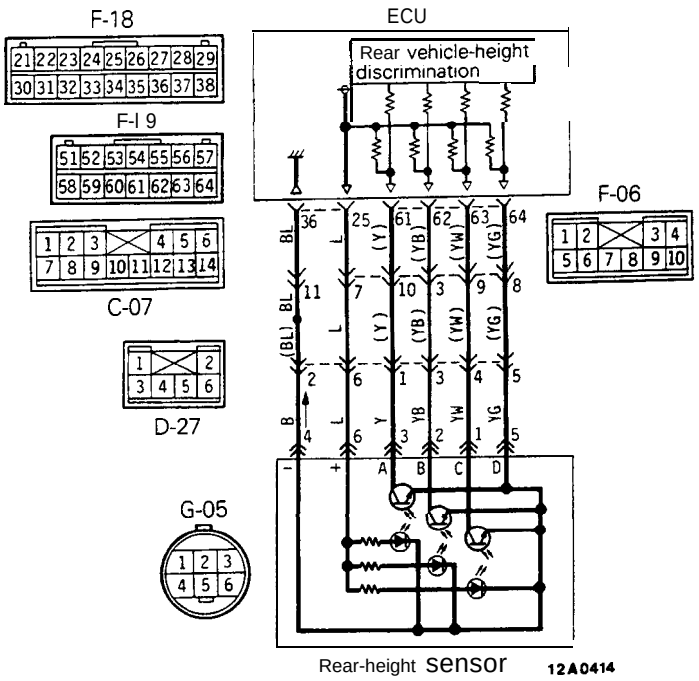
[11] REAR-HEIGHT SENSOR CIRCUIT







Operation

The rear-height sensor detects (by detecting the relative position of the body and the rear axle) the action movements (bouncing, pitching, etc.), and the vehicle height, of the rear of the vehicle. The rotating disc plate rotates in the area between three pairs of light-emitting diodes and photo-transistors, and the slits in the disc thus interrupt, or let pass. the light beams between the light-emitting diodes and the photo-transistors. By employing the data gathered in this way, the sensor can detect the vehicle height as any one of the seven level classifications.

TSB Revision

Diagnostic

When a signal (error code) indicating an abnormal condition (resulting from damage or disconnection of the heavy-line circuit, or a malfunction of a photo-transistor, etc.) is input, the alarm light illuminates and control is as described in the table below.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
23	Control stop	Held at MEDIUM	Control stop	Not accept			

Service data indication

Code No	Indication	Indication example	
23	Current vehicle-height level (ERROR when there is a malfunction) Indicates the ON or OFF status of each photo-interruptor.	When normal	23;N Indicates the vehicle-height level → 1111 Status of each photo-interruptor 1: ON, 0. OFF
		If mal-function	23; ERROR Indicates that an error code is being output. → 0010 Status of each photo-interruptor 1: ON, 0: OFF

ECU terminal voltages (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
25	Power source for sensor	When the ECU is activated	5V
61.62 63, 64	Front vehicle-height signal	When the photo-mterruptors are ON	ov
		When the photo-interruptors are OFF	5V
36	Sensor circuit ground	Constantly	ov

Checking the rear-height sensor circuit (with the connector disconnected)

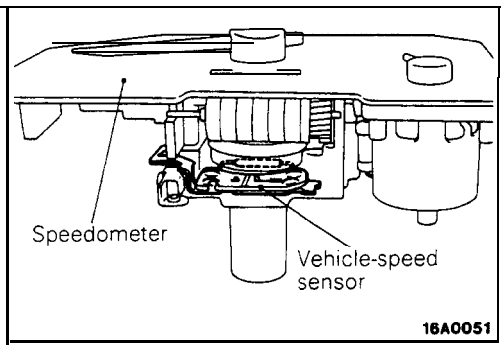
Terminal No	Connection destination or Measurement measured part		Tester connection	Check condition	Standard
25 36	Rear-height sensor power-supply circuit	Resistance	25-36	Contact the tester's (–) probe to terminal 25. and the (+) probe to terminal 36 Note Even if the result is good here, the sensor must not be judged to be certainly good.	Continuity (The indicator fluctuates)
61 62 63	Rear-height sensor	A B C	Resistance	61-36 62-36 63-36	Contact the tester's (–) probe to terminal 25, and the (+) probe to terminal 36, and check to be sure that there is continuity; leave the connections as they are. Connect the tester's (–) probe to each terminal of the wiring harness connector, and the (+) probe to terminal 36. Separate the lever (of the height sensor) from the rod, and slowly move the lever up and down	No Continuity ↕ Continuity
64		D	Resistance	64–ground	Constantly	Continuity

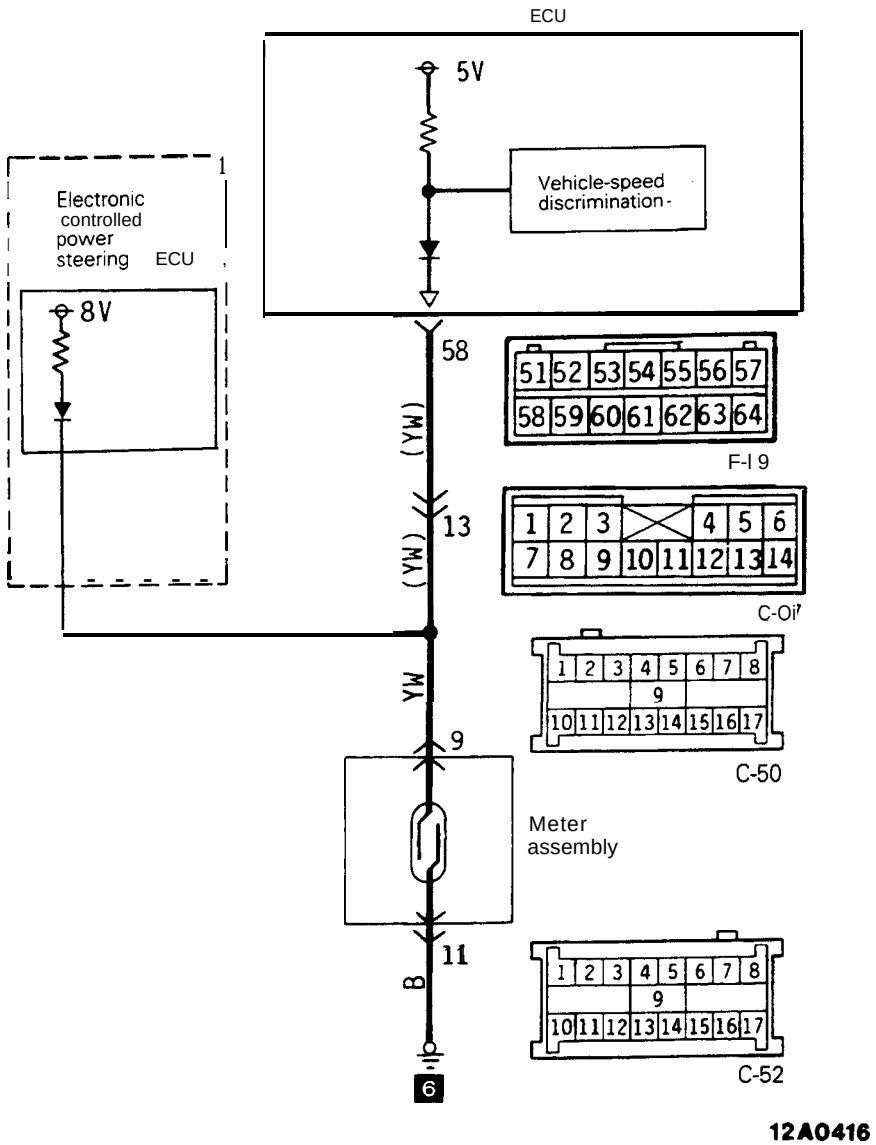
Troubleshooting hints (mechanical malfunctions)

Malfunction mode	Malfunction probable cause	Malfunction	Note
Improper adjustment of the rear-height sensor rod	Because of the improper adjustment of the rear-height sensor rod, a signal not corresponding to the actual vehicle height is being sent to the ECU	• When the engine is stopped and left as it is, the height of only the rear end decreases to lower than the NORMAL vehicle height. • With the engine running, the height of the rear end is lower than the NORMAL vehicle height • With the engine running (AUTO mode and NORMAL vehicle height), the height of the rear end becomes higher than the NORMAL height).	–

TSB Revision

[12] VEHICLE-SPEED SENSOR CIRCUIT





Operation

The vehicle-speed sensor is a reed switch type with pulse signals being sent four times for each rotation of the transaxle output gear.

Diagnostic

If there is damage or disconnection of the heavy-line circuit, or a malfunction of the vehicle-speed sensor, the alarm light illuminates and control is as described in the table below.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
24	Control stop	Held at MEDIUM	Held at NORMAL	Not accept			

Service data indication

Code No	Indication	Display
24	Indicates the vehicle speed input to the ECU (including the simulated vehicle speed)	24: SPEED SNSR. 0 km/h

ECU terminal voltages (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
58	Vehicle-speed signal	When the vehicle-speed sensor reed switch is ON	ov
		*When the vehicle-speed sensor reed switch is OFF	8V

*In order to supply the EPS pull-up power (8V)

Checking the vehicle-speed sensor circuit (with the connector disconnected)

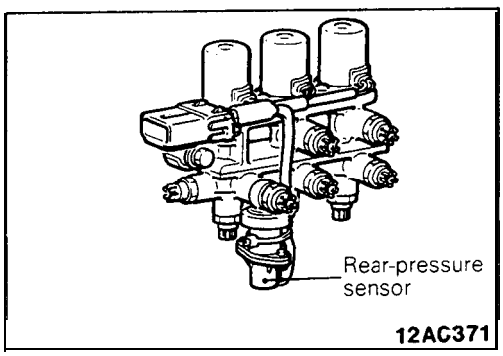
Terminal No	Connection destination or measured part	$M_{easurement}$	Tester connection	Check condition	Standard
58	Vehicle-speed sensor	Resistance	58–ground	With the battery's (–) terminal disconnected, move the vehicle back and forth.	Continuity I No continuity

Troubleshooting hints

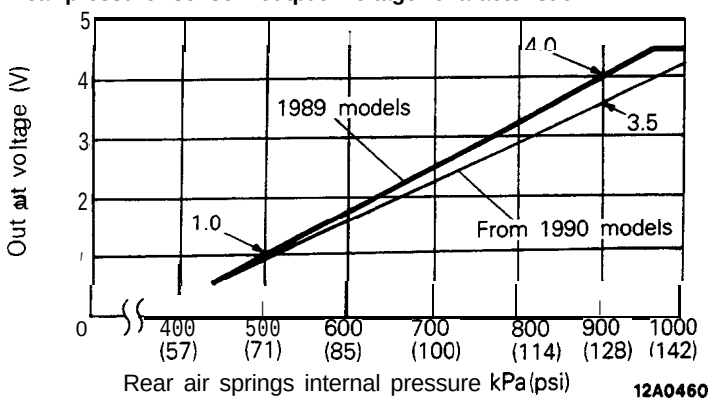
In actual urban driving, it is not so likely that the throttle is kept 30% or more open for more than 30 seconds. Therefore, the conditions have been somewhat stricter to prevent unnecessary application of the fall safe function due to the racing of the engine when stopped. However, the vehicle may run uncontrolled for some distance when the speed sensor fails.

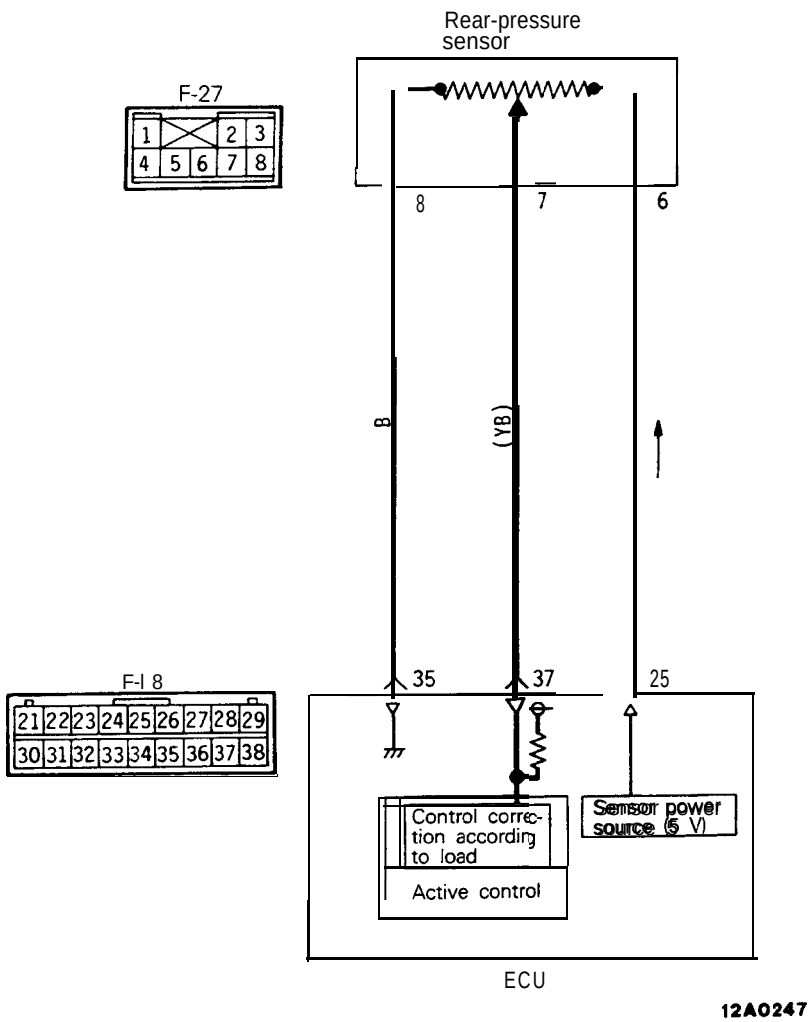
This takes into account that the vehicle speed sensor is shared by many systems such as EPS, Auto-cruise control, etc. and that the failure of the sensor can also be detected from the state of these systems.

[13] REAR-PRESSURE SENSOR CIRCUIT



Rear-pressure sensor output voltage characteristic





Operation

The rear-pressure sensor detects the internal pressure of the rear air springs.

Although the timing of air supply and exhaust for control of the vehicle attitude is basically determined according to a predetermined "map", the supplying and exhaust times are corrected as necessary, according to data from this sensor, in order to cope with changes of the load carried by the vehicle and other factors.

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Diagnostic

If, because of damage or disconnection of the heavy-line circuit, or a malfunction of the rear-pressure sensor, etc., a higher than normal value of the internal pressure of the air springs is indicated continuously, the alarm light illuminates*, and control is as described in the table below. Note, however, this diagnostic signal is given if there is an overload.

* 1989 models
  The alarm light does not illuminate for 1990, 1991, 1992, 1993 models.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
25	Control stop	Normal operation	Only the vehicle-height increase control function stops.	Not accept	Accept		

1990, 1991, 1992, 1993 models: HIGH-AUTO change possible. If the above diagnostic number is detected, the damping force that is the base of the SOFT mode and AUTO mode changes to the MEDIUM damping force.

Service data indication

Code No.	Indication	Standard value	Display
25	Rear-pressure sensor output voltage	Fluctuates within a range of 0.5V to 4.5V when the body is shaken from side to side.	25; RR. PRESS. SNSR. 2.45V

Condition		Reference value
Front seats: 2 persons	When HIGH vehicle height	1.60V
	When NORMAL vehicle height	0.90V
	When LOW vehicle height	0.86V

ECU terminal voltages (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
25	Power supply for sensor	When the ECU is activated	5V
37	Rear air spring pressure signal	Low rear air spring pressure High rear air spring pressure	0.5V | 4.5V
		When wiring is damaged or disconnected	5V
35	Sensor circuit ground	Constantly	ov

Checking the rear-pressure sensor (with the connector disconnected)

Terminal No	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
25 35	Rear-pressure sensor All resistances	Resistance	25-35	Constantly	Approx. 5 kΩ
37	Rear-pressure sensor output	Resistance	37-35	Change should be smooth (according to the air pressure applied to the rear -pressure sensor) within the standard value range shown at the right	0–5 kΩ

Troubleshooting hints (mechanical malfunctions)

Malfunction mode	Malfunction probable cause	Malfunction	Note
Harness short-circuit	Because of a short-circuit of the harness, etc , no correction of the air-supply and exhaust time can be made to compensate for a loaded condition of the vehicle.	Insufficient control of the attitude, resulting in a feeling of incompatibility	–
Air leakage	Wear, damage, etc. of the O-ring	Vehicle height decreases if not corrected	–

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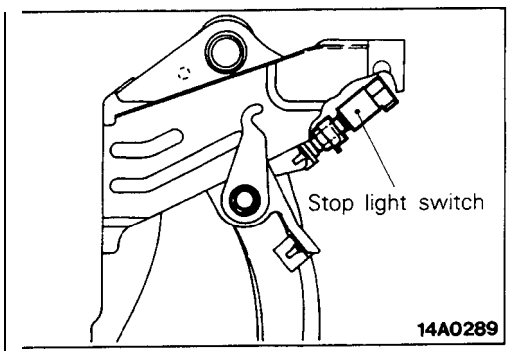
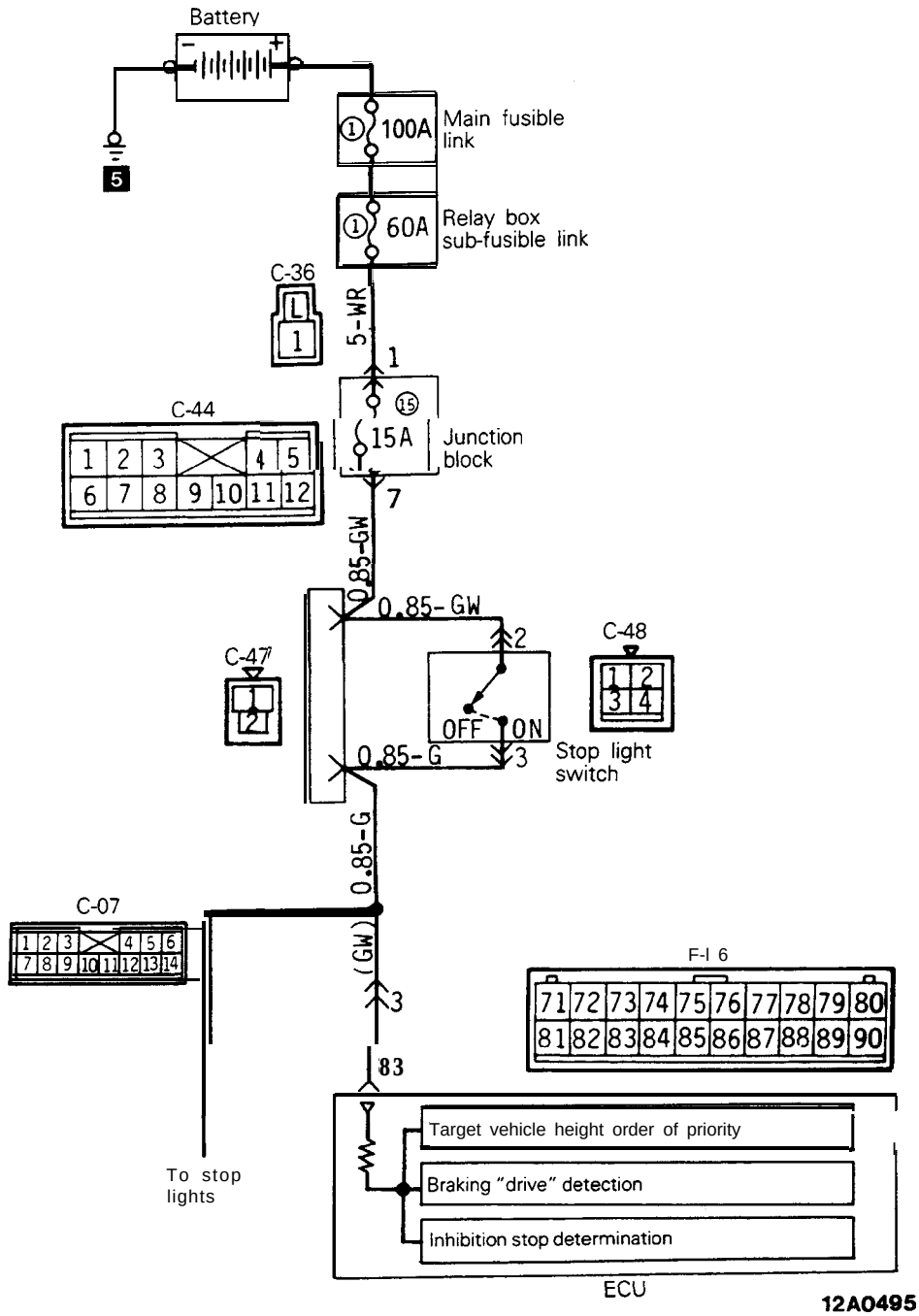
[14] STOP LIGHT SWITCH CIRCUIT





TSB Revision

Operation

When the brake pedal is depressed, the stop light switch is switched ON and 12V is sent to the ECU, thus resulting in the detection that braking is in progress.

Service data indication

Code No.	Indication	Display
26	Indicates the ON or OFF status of the stop light switch.	26; STOP LAMP SW. ON/OFF

ECU terminal voltages (when connector is connected)

Terminal No	Signal	Condition	Terminal voltage
83	Stop light switch signal	When the stop light switch is ON	0 V
		When the stop light switch is OFF	B+

B+: Battery positive voltage

Checking the stop light switch circuit (with the connector disconnected)

Terminal No	Connection destination or measured part	Measurement	Tester connection	Check condition		Standard
83	Stop light switch	Voltage	83–ground	Ignition switch ON	Depress the brake pedal.	B+
					Do not depress the brake pedal.	0 V

B+: Battery positive voltage

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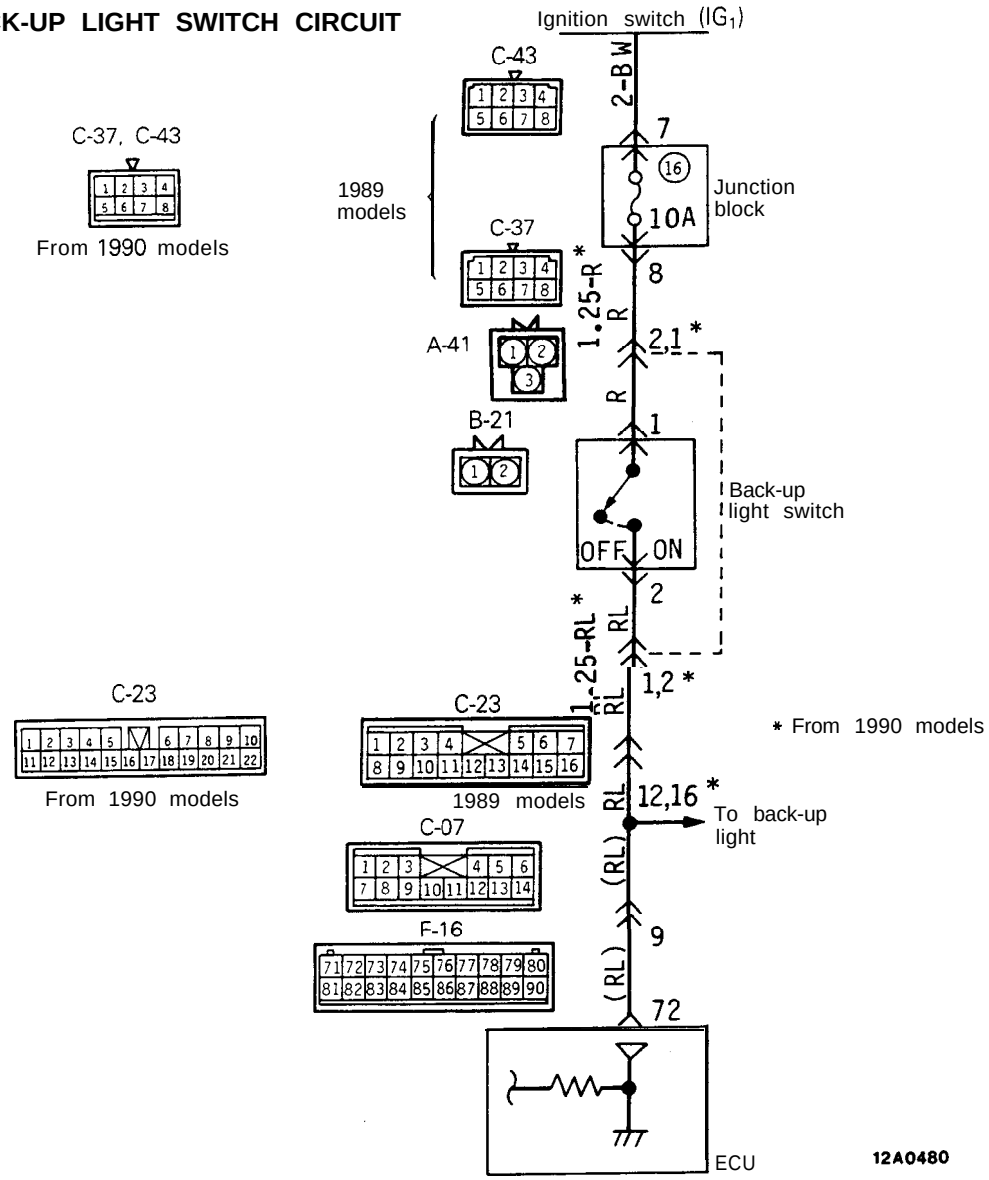
[15] BACK-UP LIGHT SWITCH CIRCUIT



Checking the back-up light switch circuit (with the connector disconnected)

Terminal No.	Connection destination or measured part	Measurement	Tester connection	Check condition		Standard
72	Back-up light	Voltage	72–ground	With the shift lever shifted to the REVERSE position	Ignition switch OFF	ov
					Ignition switch ON	B+

B+: Battery positive voltage

Service data indication

Code No.	Indication	Display
32	Indicates the ON or OFF status of the back-up light switch.	32; M/T BACK LAMP ON/OFF

ECU terminal voltages (when connector is connected)

Terminal No	Signal	Condition	Terminal voltage
72	Manual transaxle back-up signal	When the back-up light switch is ON	B+
		When the back-up light switch is OFF	ov

B+: Battery positive voltage

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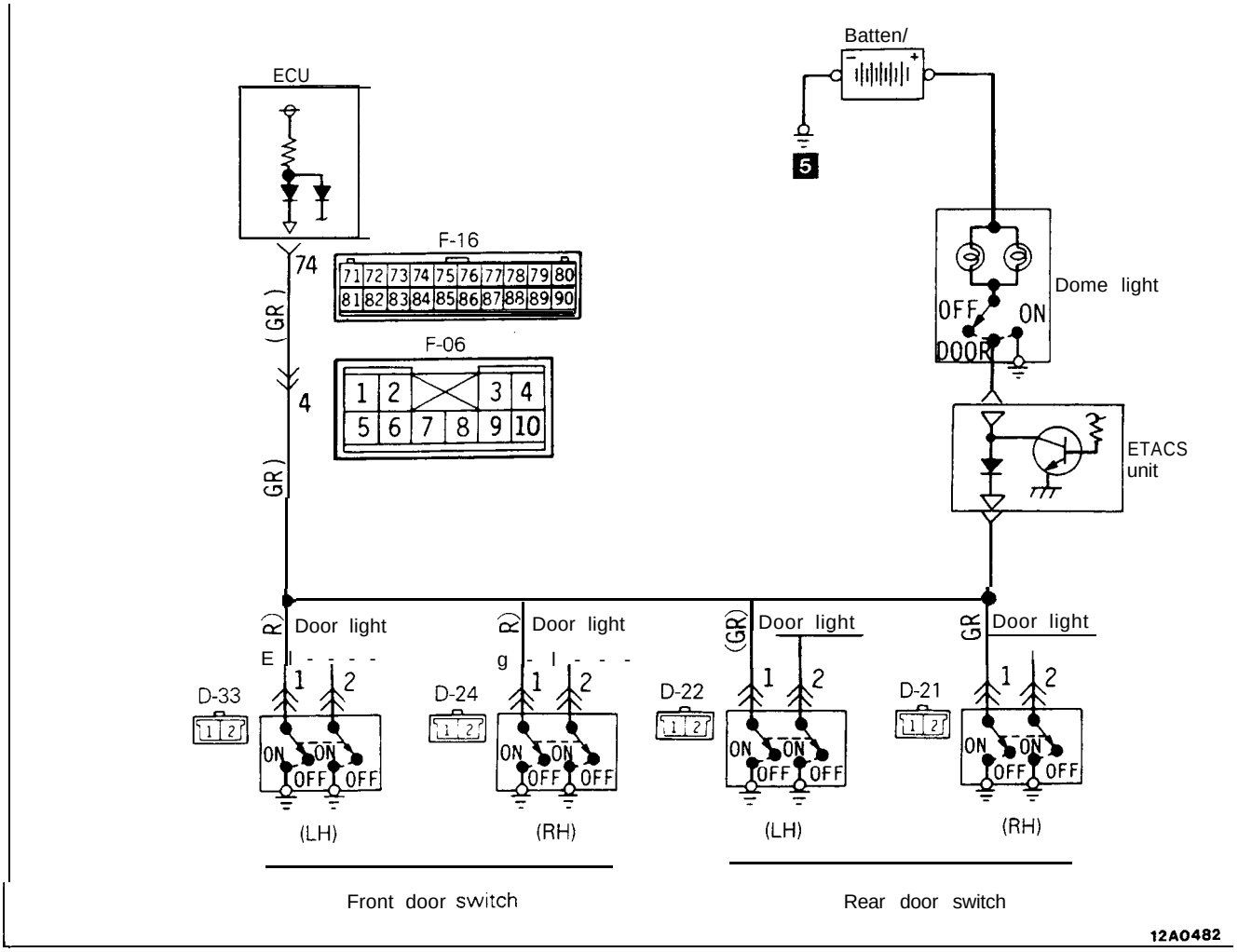
[16] DOOR SWITCH CIRCUIT



Service data indication

Code No	Indication	Display
33	Indicates the ON or OFF status of the door switch (Indicates ON if at least one door is opened.)	33: DOOR SW. ON/OFF

ECU terminal voltages (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
74	Door switch signal	When a door (at least one) is opened	ov
		When the door is closed	B+

B+: Battery positive voltage

Checking the door switch circuit (with the connector disconnected)

Terminal No.	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
74	Door switch	Resistance	74–ground	Disconnect the battery's negative (–) terminal and close all doors.	No continuity
				Disconnect the battery's negative (–) terminal and open the doors one by one.	Continuity

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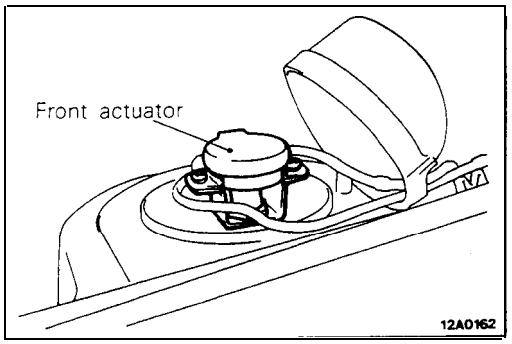
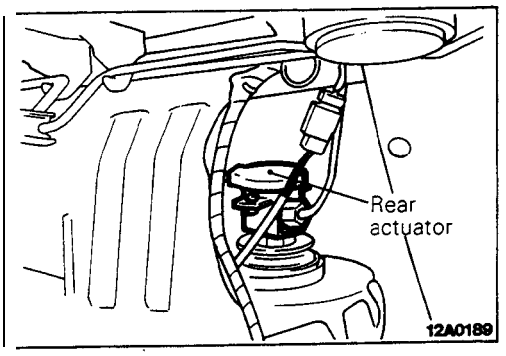
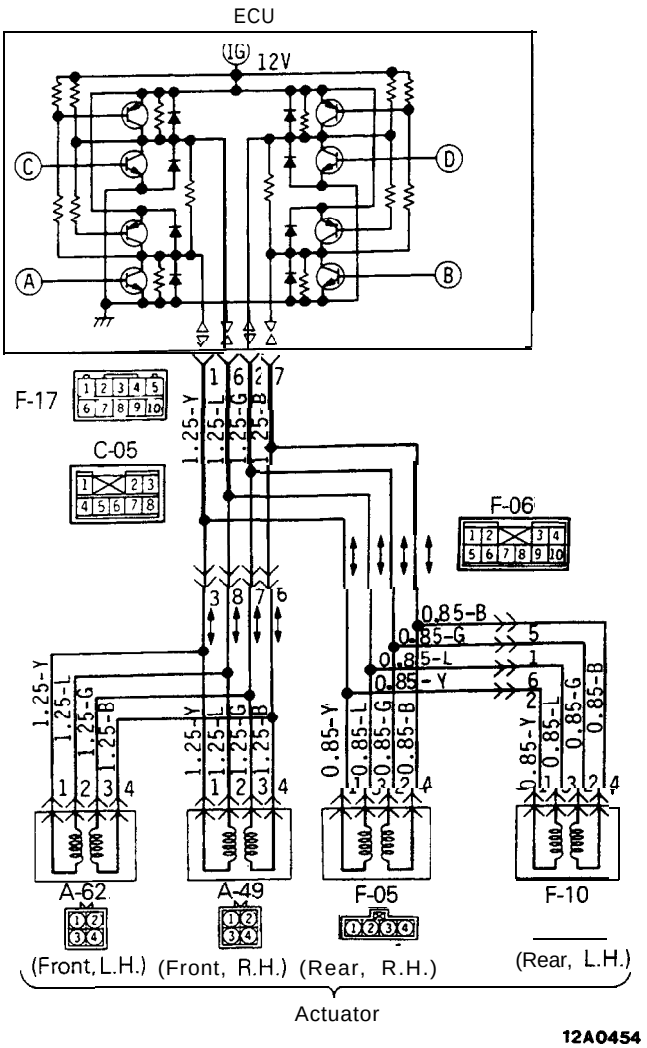
[17] DAMPING FORCE SWITCHING ACTUATOR DRIVE CIRCUIT







Operation

The damping force switching actuator is the step motor. That allows the control rod of each shock absorber to rotate, thus selecting the damping force at one of four levels (HARD, MEDIUM, AUTO-SOFT or SOFT).

Diagnostic

If there is damage or disconnection of the heavy-line circuit, the alarm light illuminates, and control is as described in the table below. (Because the actuators are connected in parallel, there can be no detection if wiring damage or disconnection occurs at the final circuit.)

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
41	Control stop	Control stop	Held at NORMAL	Not accept			

Actuator compulsory activation

Code No.	Applicable operatron	Description of activation
01	SOFT damping force	The damping force is compulsorily switched to SOFT: there is a return to the original damping force three seconds thereafter
02	AUTO-SOFT damping force	The damping force is compulsorily switched to AUTO-SOFT; there is a return to the original damping force three seconds thereafter
03	MEDIUM damping force	The damping force is compulsorily switched to MEDIUM; there is a return to the original damping force three seconds thereafter
04	HARD damping force	The damping force is compulsorily switched to HARD; there is a return to the original damping force three seconds thereafter

ECU terminal voltages (when connector is connected)

Terminal No	Signal	Condition	Terminal voltage
1	Damping force switching actuator activation signal Phase A	When the damping force switching actuator is stopped	6V
2	Damping force switching actuator activation signal Phase B	When the damping force switching actuator is activated	0 ⇄ B+
		When wiring is damaged or disconnected	B+
6	Damping force switching actuator activation signal Phase C	When the damping force switching actuator is stopped	6V
7	Damping force switching actuator activation signal Phase D	When the damping force switching actuator is activated	B+ ⇄ 0 pulse
		When wiring is damaged or disconnected	ov

B+: Battery positive voltage

Checking the damping force switching actuator drive circuit (with the connector disconnected)

Terminal No	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
1 6	Damping force switching actuator (step motor)	Resistance	1–6	Four coils that have a constant resistance of 6.4 ± 0.1 ohms are connected in parallel (front and rear)	Approx 1.6 Ω
2 7	Damping force switching actuator (step motor)	Resistance	2-7	Four coils that have a constant resistance of 6.4 ± 0.1 ohms are connected in parallel (front and rear).	Approx. 1.6Ω

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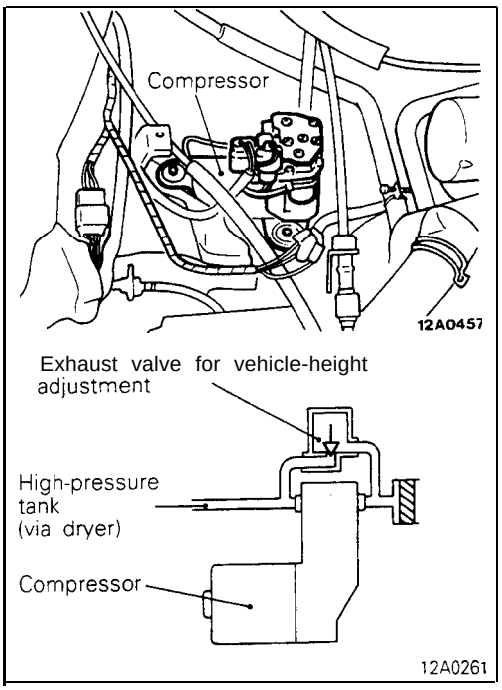
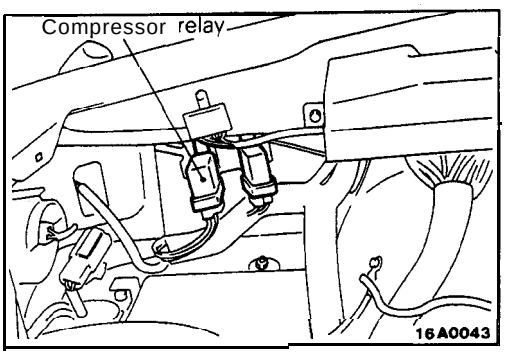
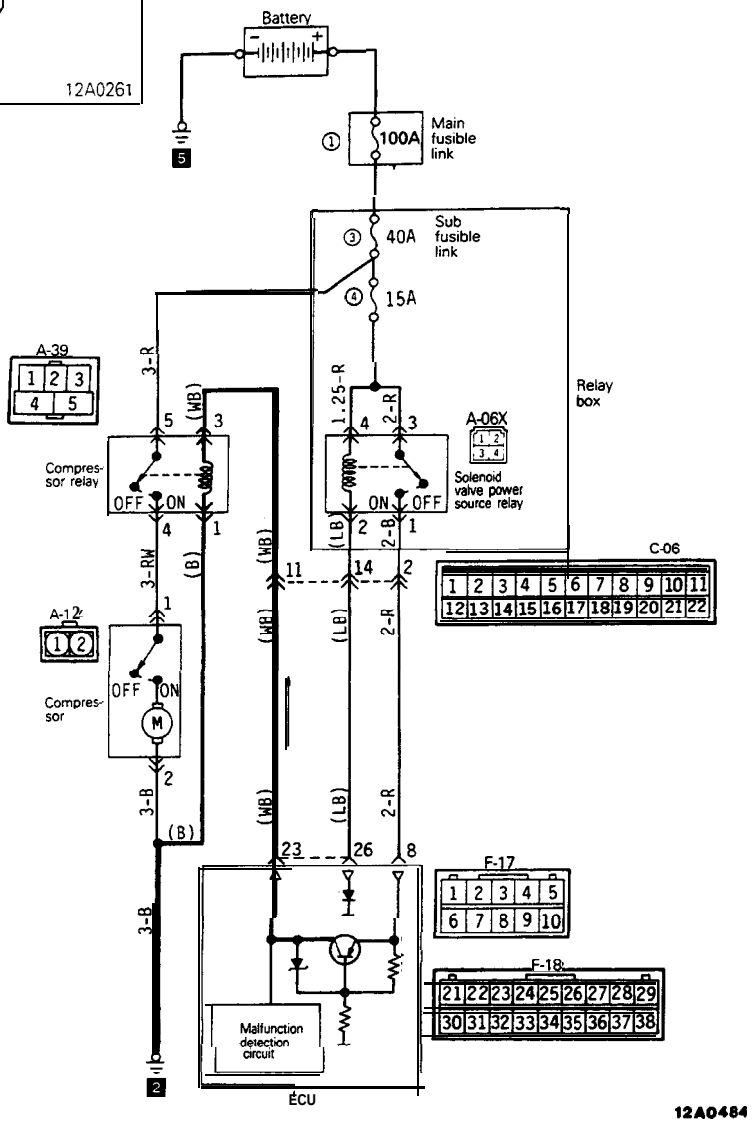
[18] COMPRESSOR DRIVE CIRCUIT







TSB Revision

Operation

The compressor is activated when the pressure within the high-pressure tank decreases to 760 kPa (108 psi) or lower, and then stops two seconds after the pressure reaches 950 kPa (135 psi). Note, however, that the compressor is not activated while the return pump is operating. A thermal switch is provided at the motor circuit. This thermal switch functions to interrupt the power to the motor (in order to protect the compressor) if the temperature within the compressor becomes high.

Diagnostic

If there is damage or disconnection of the heavy-line circuit, or a short-circuit, or a malfunction of the output transistor within the ECU, the alarm light illuminates and control is as described in the table below.
(Note that the diagnostic is only applicable up to the compressor relay.)

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
43	Control stop	Held at MEDIUM	Control stop	Not accept			

Actuator compulsory activation

Code No.	Applicable operation	Description of activation
05	Compressor relay ON	The compressor relay is compulsorily switched ON for a period of three seconds.

ECU terminal voltages (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
23	Compressor relay activation signal	When the compressor relay is ON	B+
		When the compressor relay is OFF	ov
		During fail-safe (solenoid valve power-source relay switch OFF)	ov

B+: Battery positive voltage

Checking the compressor drive circuit (with the connector disconnected)

Terminal No.	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
23	Compressor relay	Resistance	52–ground	Constantly	Approx. 75Ω
				Next apply battery voltage to terminal 23.	Compressor operation

Troubleshooting hints (mechanical malfunctions)

Malfunction mode	Malfunction probable cause	Malfunction	Note
The compressor relay is fused.	The compressor relay contacts are shorted.	The compressor won't stop, causing the battery to discharge.	–
The compressor is stuck.	The compressor won't operate due to shorting, etc.	The vehicle height can't be increased.	–

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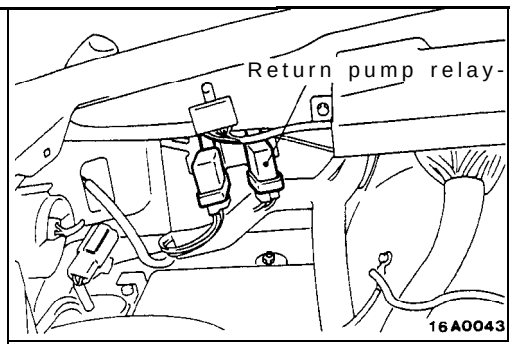
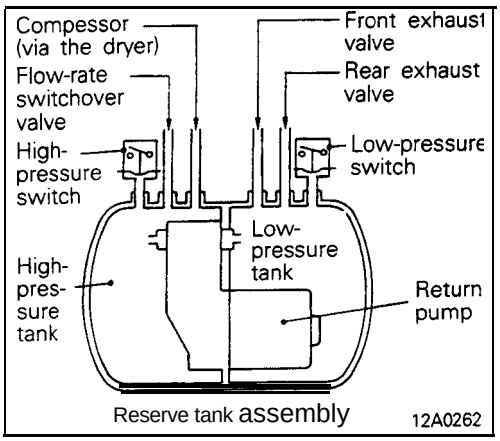
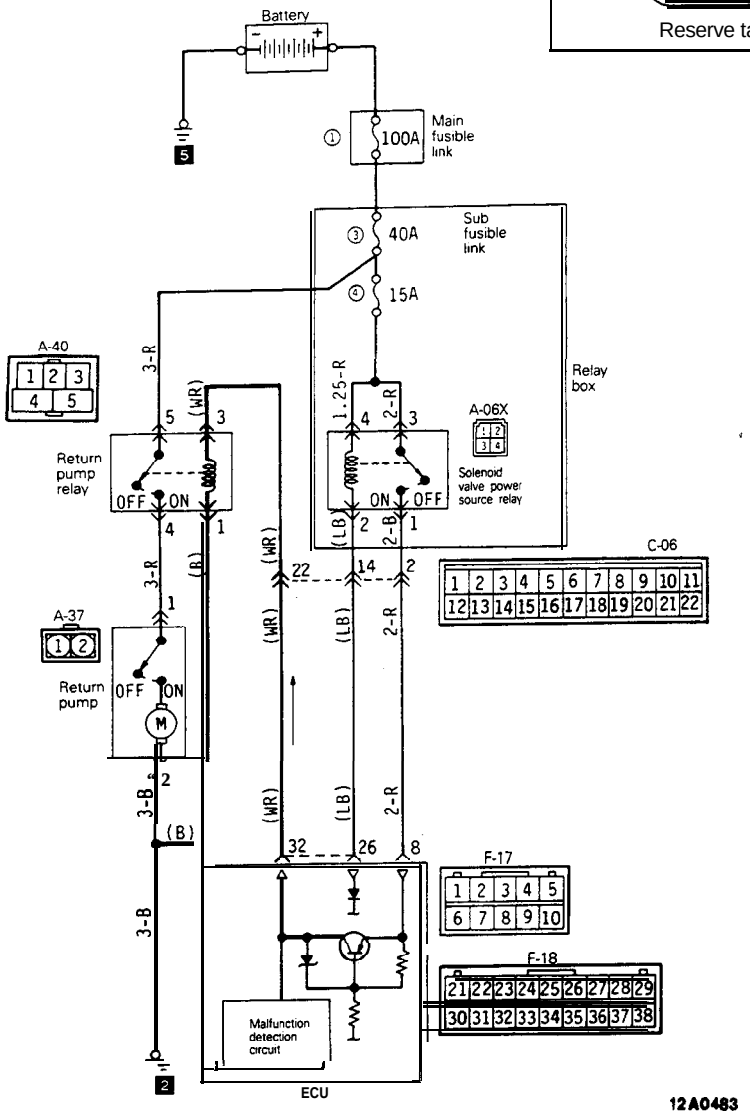
[19] RETURN PUMP DRIVE CIRCUIT







Operation

The return pump is activated when the pressure within the low-pressure pressure tank increases to 140 kPa (20 psi) or higher, and then stops two seconds after the pressure is reduced to 70 kPa (10 psi) or lower.

A thermal switch is provided at the motor circuit. This thermal switch functions to interrupt the power to the motor (in order to protect the return pump) if the temperature within the return pump becomes high.

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Diagnostic

If there is damage or disconnection of the heavy-line circuit, or a short-circuit, or a malfunction of the output transistor within the ECU, the alarm light illuminates and 'control is as described in the table below. (Note that the diagnostic is only applicable up to the compressor relay.)

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
44	Rolling control only stops.	Held at MEDIUM	Rolling control only stops.	Not accept			

Actuator compulsory activation

Code No	Applicable operation	Description of activation
06	Return pump relay ON	The return pump relay is compulsorily switched ON for a period of three seconds.

ECU terminal voltages (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
32	Return pump relay activation signal	When the return pump relay is ON	B+
		When the return pump relay is OFF	ov
		During fail-safe (solenoid valve power source relay switch OFF)	ov

B+: Battery positive voltage

Checking the return pump drive circuit (with the connector disconnected)

Terminal No.	Connection destination o r measured part	Measurement	Tester connection	Check condition	Standard
32	Return pump relay	Resistance	32–ground	Constatly	Approx 75Ω
				Next apply battery voltage to terminal 32.	Return pump operation

NOTE (Refer to Vol.2 GENERAL for the circuit diagram.)
Procedures for changing the internal pressure of the low-pressure tank
(1) For 70 kPa (10 psi) or lower
Short-circuit the battery power-source ⑩ terminal to the return pump relay ㉜ terminal in order to activate the return pump for a few seconds, and then leave as is.
(2) For 140 kPa (20 psi) or higher
Short-circuit the battery power-source ⑩ terminal to the front intake-air solenoid ㉑ terminal and the front right solenoid ④ terminal in order to connect the high-pressure tank and low-pressure tank, and then leave as is for a few seconds.
Procedures for changing the internal pressure of the high-pressure tank
(1) For 760 kPa (108 psi) or lower
Short-circuit the battery power-source ⑩ terminal to the discharge-air solenoid (for vehicle-height adjustment) ㉛ terminal, the front intake-air solenoid ㉑ terminal and the front right solenoid ④ terminal and the front discharge-air solenoid ㉔ terminal in order to release the atmosphere inside the high-pressure tank, and then leave as is for a few seconds.
(2) For 950 kPa (135 psi) or higher
Short-circuit the battery power-source ⑩ terminal to the compressor relay ㉓ terminal in order to activate the compressor for a few seconds, and then leave as is.

Troubleshooting hints (mechanical malfunctions)

Malfunction mode	Malfunction probable cause	Malfunction	Note 1
The return pump relay is fused	The return pump relay contacts are shorted.	The return pump won't stop, causing the battery to discharge.	–
The return pump is stuck.	The return pump won't operate due to shorting, etc.	* Insufficient attitude-control effect. • Vehicle height increases after rolling control.	–

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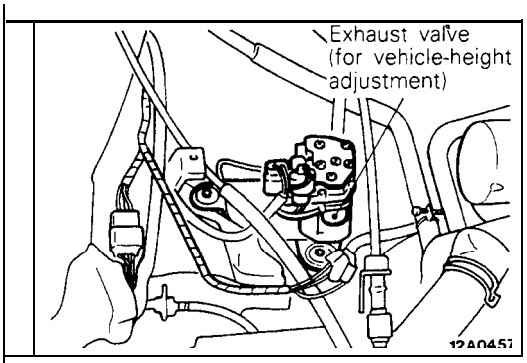
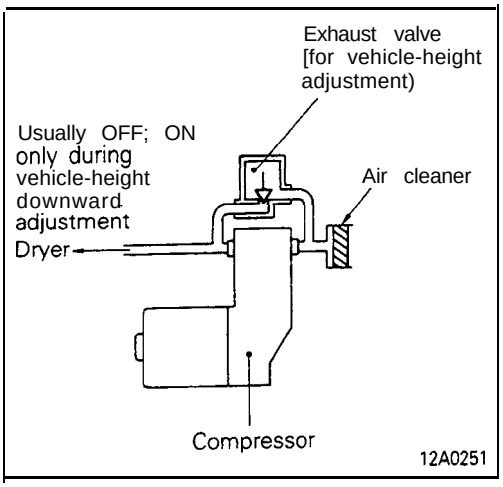
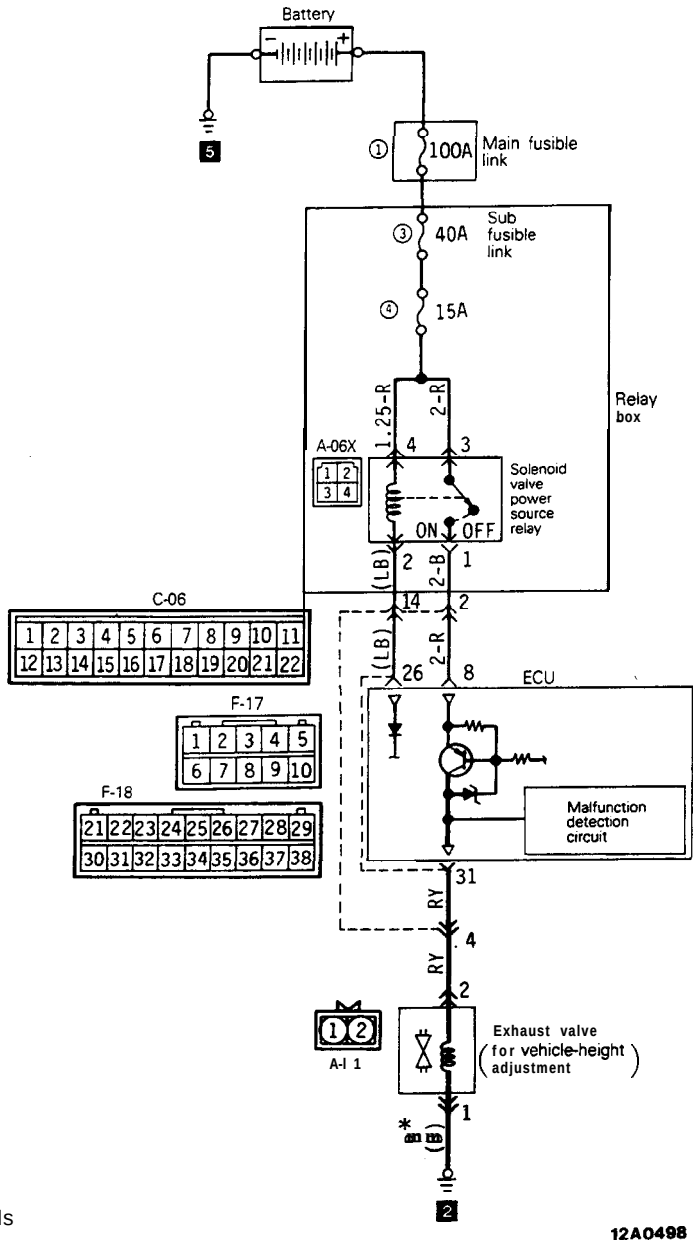
[20] EXHAUST VALVE ACTIVATION CIRCUIT (FOR VEHICLE-HEIGHT ADJUSTMENT)







*: 1991 models

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Operation

The exhaust valve for adjustment of the vehicle height is installed at the compressor assembly.
This valve is switched ON only when a downward adjustment of the vehicle height is being made; it functions to discharge air (from the air springs) into the atmosphere.

Diagnostic

If there is damage or disconnection of the heavy-line circuit, or a short-circuit, or a malfunction of the output transistor within the ECU, the alarm light illuminates and control is as described in the table below.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
45	Rolling control only stops	Held at MEDIUM	Rolling control only stops.	Not accept			

Actuator compulsory activation

The exhaust valve for vehicle-height adjustment is activated by the following.

Code No	Applicable operation
07	Vehicle height downward adjustment

ECU terminal voltages (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
31	Exhaust valve (for vehicle-height adjustment) activation signal	When the exhaust valve (for vehicle-height adjustment) is ON (open)	B+
		When the exhaust valve (for vehicle-height adjustment) is OFF (closed)	ov
		During fail-safe (for solenoid valve power source relay switch OFF)	ov

B+: Battery positive voltage

Checking the exhaust valve (for vehicle-height adjustment) activation circuit (with the connector disconnected)

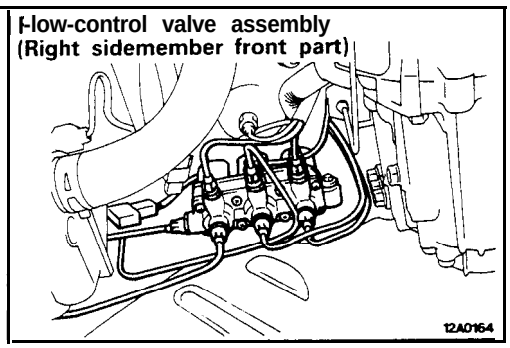
Terminal No	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
31	Exhaust valve (for vehicle-height adjustment)	Resistance	31 -ground	Constantly	Approx. 15Ω

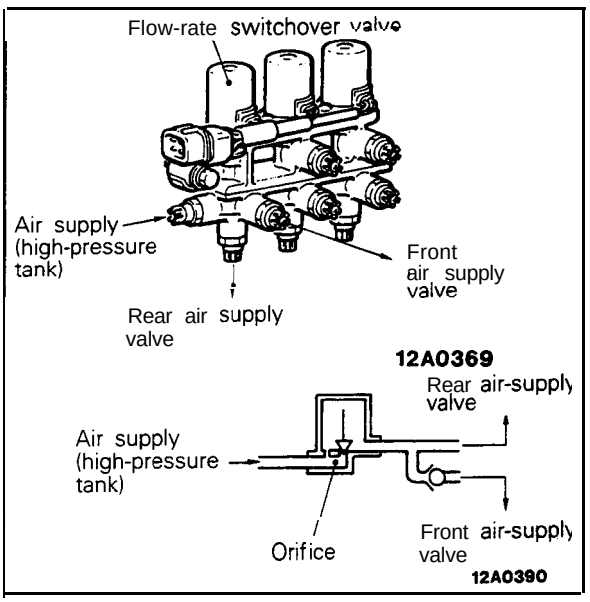
Troubleshooting hints (mechanical malfunctions)

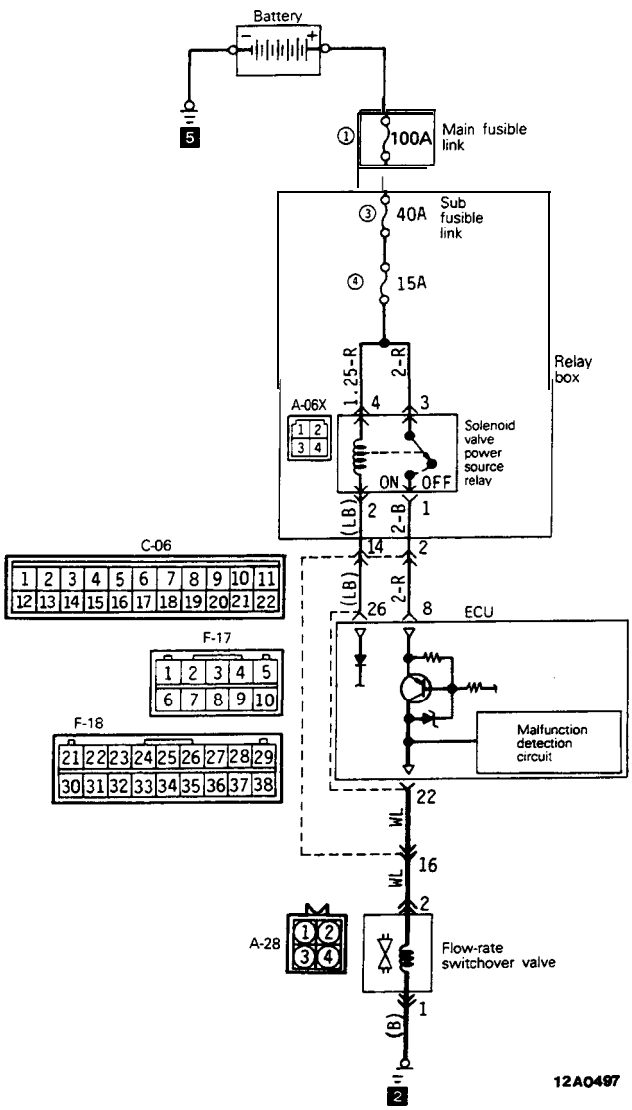
Malfunction mode	Malfunction probable cause	Malfunction	Note
Stuck in the OFF (closed) position	Air cannot be discharged because the valve is stuck in the OFF (closed) due to corrosion, freezing, etc. caused by moisture penetration.	Vehicle height doesn't decrease.	Diagnostic trouble code No.54 is output.
Stuck in the ON (open) position	Air discharge cannot be stopped because the valve is stuck in the ON (open) due to corrosion, freezing, etc. caused by moisture penetration.	• Vehicle height doesn't increase. • Compressor doesn't stop.	Diagnostic trouble code No.55 is output.
Air leakage at valve seat	Valve seat is worn.	• Vehicle height doesn't increase. • Compressor doesn't stop.	Diagnostic trouble code No.55 is output

TSB Revision

[21] FLOW-RATE SWITCHOVER VALVE ACTIVATION CIRCUIT







Operation

The flow-rate switchover valve switches, in two stages, the intake air flow volume supplied to each of the air springs.
Usually, during ordinary adjustments of the vehicle height, the flow-rate switchover valve is OFF (closed) in order to suppress the speed of the change of vehicle height to the appropriate speed, and the air is supplied to each of the air springs with the flow volume restricted by the orifice.
This valve is switched ON (opened) for rapid adjustment of the vehicle height, or during control of rolling, etc., when the vehicle is traveling on a bad road surface, thus permitting a greater amount of air to be supplied to the air springs.

Diagnostic

If there is damage or disconnection of the heavy-line circuit, or a short-circuit, or a malfunction of the output transistor within the ECU, the alarm light illuminates and control is as described in the table below.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
46	Rolling control only stops	Held at MEDIUM	Rolling control only stops	Not accept			

Actuator compulsory activation

The flow-rate switchover valve is activated by the following.

Code No	Applicable operation
09	Rolling control (left turn)
10	Rolling control (right turn)

ECU terminal voltages (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
22	Flow-rate switchover valve activation signal	When the flow-rate switchover valve is ON (open)	B+
		When the flow-rate switchover valve is OFF (closed)	ov
		During fail-safe (solenoid valve power source relay switch OFF)	ov

B+: Battery positive voltage

Checking the flow-rate switchover valve activation circuit (with the connector disconnected)

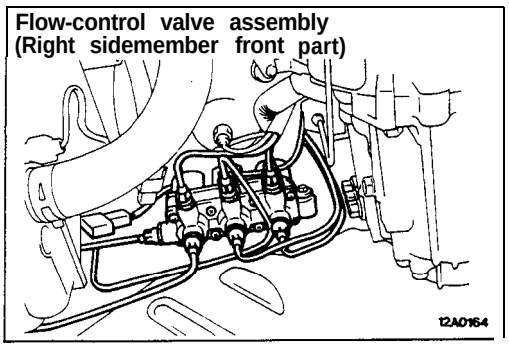
Terminal No	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
22	Flow-rate switchover valve activation signal	Resistance	22–ground	Constantly	Approx. 10Ω

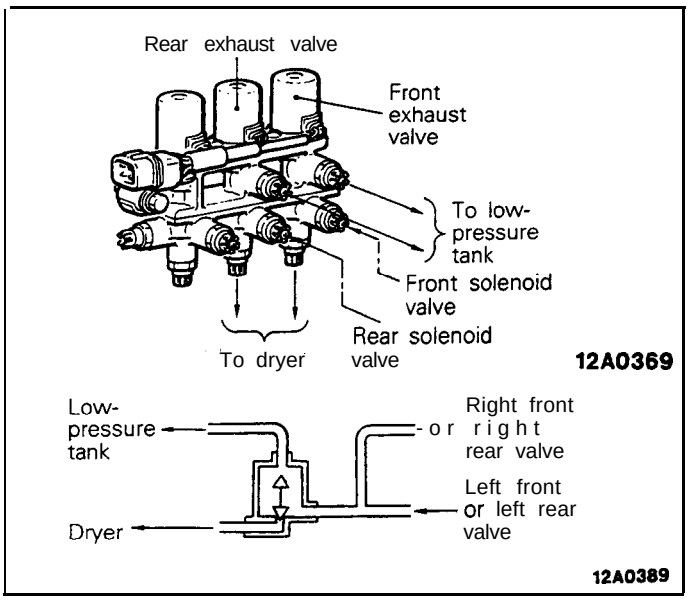
Troubleshooting hints (mechanical malfunctions)

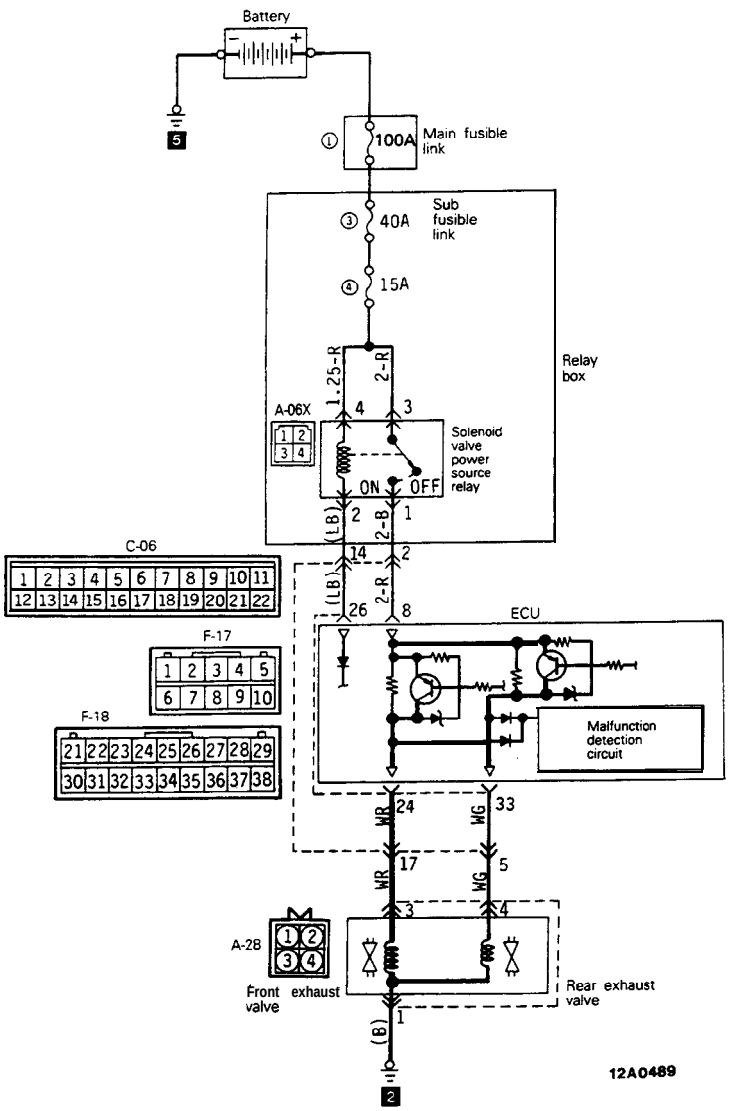
Malfunction mode	Malfunction probable cause	Malfunction	Note
Stuck in the OFF (closed) position	The valve is stuck in the OFF (closed) due to corrosion, freezing, etc. caused by moisture penetration.	• Insufficient rolling control effect, A feeling of incompatibility. • The vehicle height decreases after rolling control. • The vehicle height upward adjustment is slow when a poor road surface is detected.	
Stuck in the ON (open) position	The valve is stuck in the ON (open) due to corrosion, freezing, etc. caused by moisture penetration.	• The upward adjustment of the vehicle height is excessive. • There is a feelina of incompatibility during rolling control (excessive control):	–
Air leakage to atmosphere	Wear, etc of the O-ring, etc.	• The compressor is activated too frequently. • There is a feeling of incompatibility during rolling control	Very slight leakages cannot be detected Such leakage is detected a long time afterward by a decrease of the vehicle height.

TSB Revision

[22] FRONT/REAR EXHAUST VALVE ACTIVATION CIRCUIT







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Operation

These valves switch the air exhausted (from the front and rear left and right strut air springs) to either internal recirculation or discharge to the atmosphere. These valves are OFF (closed) during the attitude-control air-exhaust mode, and the exhaust air is led to the low-pressure tank and is once again circulated within the system. The valves are ON (open) during downward adjustment of the vehicle height, and the exhaust air, after passing through the dryer, is discharged (from the exhaust valves for vehicle-height adjustment) into the atmosphere. These valves are switched ON (opened), in order to maintain the differential pressure of the strut air springs, when the rolling control is being maintained.
(At this time, because the exhaust valves for vehicle-height adjustment are OFF (closed), air is not discharged to the atmosphere.)

Diagnostic

If there is damage or disconnection of the heavy-line circuit, or a malfunction of an output transistor within the ECU, the alarm light illuminates, and control is as described in the table below.
Note that the malfunction-detection circuit is the same for the front and the rear exhaust valves.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
47	Control stop	Held at MEDIUM	Control stop	Not accept			

Actuator compulsory activation

The front or the rear exhaust valves are activated by the following.

Code No	Applicable operation
07	Vehicle height downward adjustment
09	Rolling control (left turn)
10	Rolling control (right turn)

ECU terminal voltage (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
24	Front exhaust valve activation signal	When the front/rear exhaust valves are ON (open)	B+
		When the front/rear exhaust valves are OFF (closed)	o v
33	Rear exhaust valve activation signal	During fail-safe (for solenoid valve power source relay switch OFF)	o v

B+: Battery positive voltage

Checking the front/rear exhaust valves activation circuit (with the connector disconnected)

Terminal No	Connection destination measured pan	or $M_{easur}e\ m\ e_{nt}$	Tester connection	Check condition	Standard
24	Front exhaust valve	Resistance	24–ground	Constantly	Approx. 10Ω
33	Rear exhaust valve	Resistance	33–ground	Constantly	Approx 1 0Ω

Troubleshooting hints (mechanical malfunctions)

Malfunction mode	Malfunction probable cause	Malfunction	Note
Stuck in the OFF (closed) position	The exhaust air cannot be switched to the outside-discharge mode because the valve is stuck in the OFF (closed) due to corrosion, freezing, etc caused by moisture penetration	• The vehicle-height adjustment (downward) cannot be made at the front or rear. • The vehicle height decreases at the front or rear during rolling control hold. • The vehicle-height adjustment (downward) is too fast and is excessive. • The return pump is activated during the vehicle-height adjustment (downward)	–
Stuck in the ON (open) position	The exhaust air cannot be switched to the internal-circulation mode because the valve is stuck in the ON (open) due to corrosion, freezing, etc caused by moisture penetration.	• Insufficient attitude control effect (air cannot be discharged). • The front or rear vehicle height increases after the rolling control.	–

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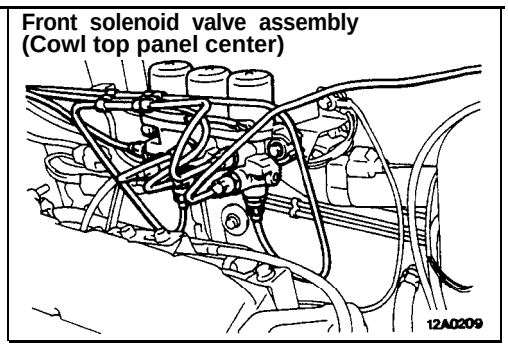
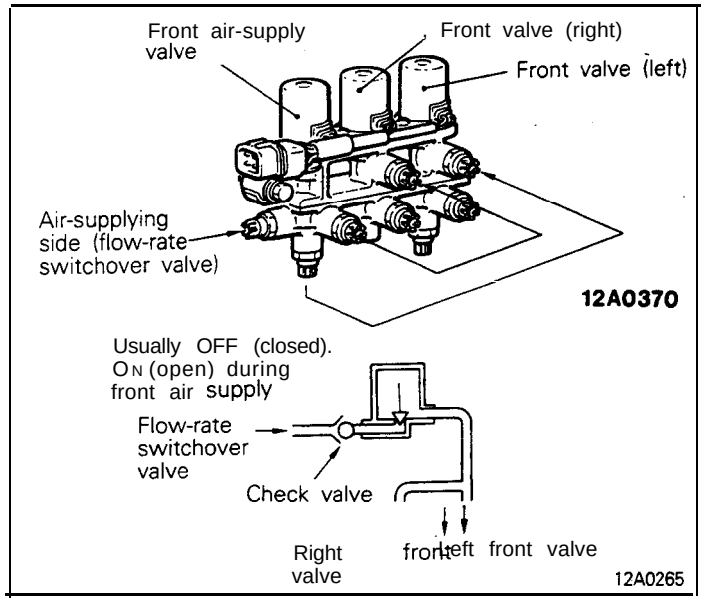
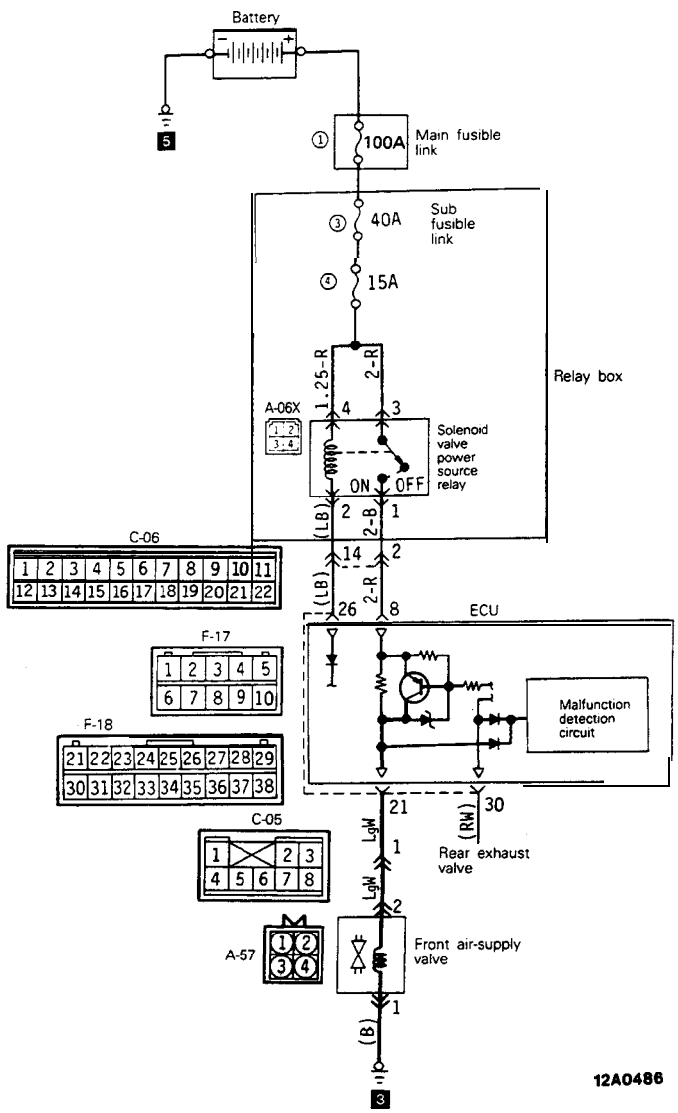
[23] FRONT AIR-SUPPLY VALVE ACTIVATION CIRCUIT







Operation

The front air-supply valves are switched ON (opened) for air supply to the left and right strut air springs during attitude control and during vehicle-height adjustment upward.

Usually, and during air exhaust, these valves are OFF (closed).
Note that a check valve is provided in these valves in order to prevent reverse flow of the air.

Diagnostic

If there is damage or disconnection of the heavy-line circuit, or a malfunction of an output transistor within the ECU, the alarm light illuminates, and control is as described in the table below.
Note that the malfunction-detection circuit is the same for the rear air-supply valves.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
51	Control stop	Held at MEDIUM	Control stop	Not accept			

Actuator compulsory activation

The front air-supply valves are activated by the **following.**

Code No	Applicable operation
0	Vehicle herght upward adjustment
09	Rolling control (left turn)
10	Rolling control (right turn)

ECU terminal voltage {when connector is connected)

Terminal No	Signal	Condition	Terminal voltage
21	Front air-supply valve activation signal	When the front air-supply valves are ON (open)	B+
		When the front air-supply valves are OFF (closed)	ov
		During fail-safe (for solenoid valve power source relay switch OFF)	ov

B+: Battery positive voltage

Checking the front air-supply valve activation circuit (with the connector disconnected)

Terminal No.	Connection destination or measured part	$M_{easurement}$	Tester connection	Check condition	Standard
21	Front air-supply valve	Resistance	21 -ground	Constantly	Approx. 10Ω

Troubleshooting hints (mechanical malfunctions)

Malfunction mode	Malfunction probable cause	Malfunction	Note
Stuck in the OFF (closed) position	Air cannot be supplied in because the valve is stuck in the OFF (closed) due to corrosion, freezing, etc caused by moisture penetration	• The front vehicle-height will not increase. • Insufficient control of rolling and braking dive • The front vehicle-height decreases after rolling control.	–
Stuck in the ON (open) position	Air supply cannot be stopped because the valve is stuck in the ON (open) due to corrosion, freezing, etc. caused by moisture penetratron.	The front vehicle-height increases and the body tilts to one side	–
Air leakage at the valve seat	Valve seat is worn,	• When left as is, the front vehicle-height increases. • The front vehicle-height downward adjustment frequency increases.	Diagnostic No.56 output
Air leakage to **atmosphere**	Wear, etc of the O-ring, etc.	• When left as IS, the front vehicle-height decreases. • Air is not accumulated in the high-pressure tank. • The compressor is activated too frequently.	Very slight leakages cannot be detected Such leakage is detected a long time afterward by a decrease of the vehicle height

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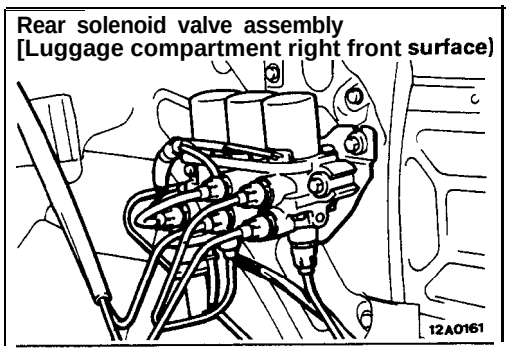
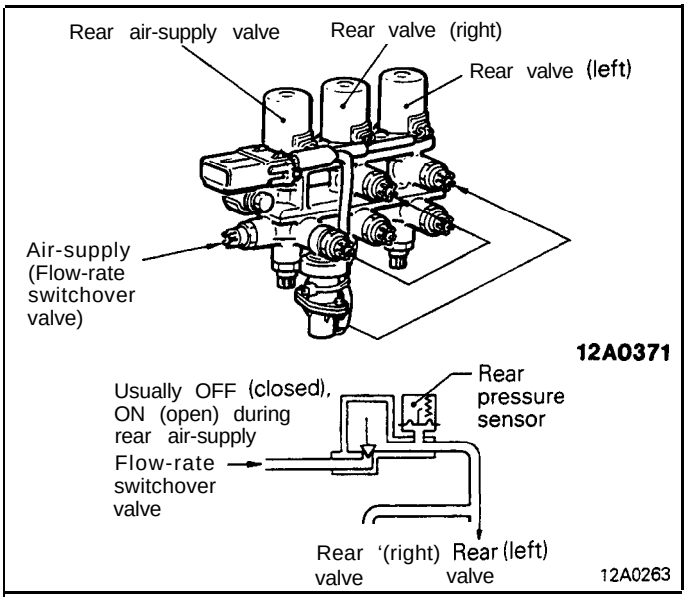
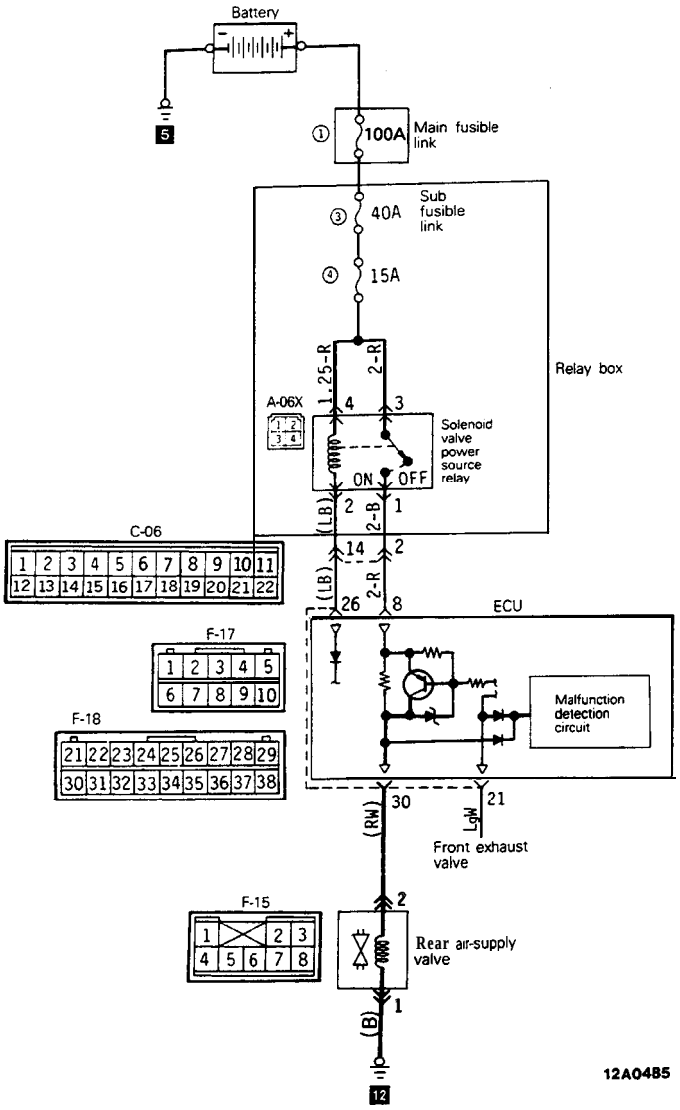
[24] REAR AIR-SUPPLY VALVE ACTIVATION CIRCUIT







Operation

The rear air-supply valves are switched ON (opened) for air supply to the left and right air springs during attitude control and during vehicle-height adjustment upward. Usually, and during air exhaust, these valves are OFF (closed). Note that the rear-pressure sensors, for detection of the internal pressure of the rear shock absorbers, are installed in thesevalves.

Diagnostic

If there is damage or disconnection of the heavy-line circuit, or a malfunction of an output transistor within the ECU, the alarm light illuminates, and control is as described in the table below.
Note that the malfunction-detection circuit is the same for the front air-supply valves.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
51	Control stop	Held at MEDIUM	Control stop	Not accept			

Actuator compulsory activation

The rear air-supply valves are activated by the following.

Code No	Applicable operation
08	Vehicle height downward adjustment
09	Rolling control (left turn)
10	Rolling control (right turn)

ECU terminal voltage (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
30	Rear air-supply valve activation signal	When the rear air-supply valves are ON (open)	B+
		When the rear air-supply valves are OFF (closed)	0 v
		During fail-safe (for solenoid valve power source relay switch OFF)	0 v

B+: Battery positive voltage

Checking the rear air-supply valve activation circuit (with the connector disconnected)

Terminal No.	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
30	Rear air-supply valve	Resistance	30–ground	Constantly	Approx. 10Ω

Troubleshooting hints (mechanical malfunctions)

Malfunction mode	Malfunction probable cause	Malfunction	Note
Stuck in the OFF (closed) position	Air cannot be supplied in because the valve is stuck in the OFF (closed) due to corrosion, freezing, etc. caused by moisture penetration.	• The rear vehicle-height will not increase • Insufficient control of rolling and squat. • The rear vehicle-height decreases after rolling control.	–
Stuck in the ON (open) position	Air supply cannot be stopped because the valve is stuck in the ON (open) due to corrosion, freezing, etc. caused by moisture penetration.	The rear vehicle-height increases and the body tilts to one side	–
Air leakage at the valve seat	Valve seat is worn.	• When left as is, the rear vehicle-height increases • The rear vehicle-height downward adjustment frequency increases.	Diagnostic No.56 output
Air leakage to atmosphere	Wear, etc. of the O-ring, etc	• When left as is, the rear vehicle-height decreases • Air is not accumulated in the high-pressure tank • The compressor is activated too frequently.	Very slight leakages cannot be detected Such leakage is detected a long time afterward by a decrease of the vehicle height

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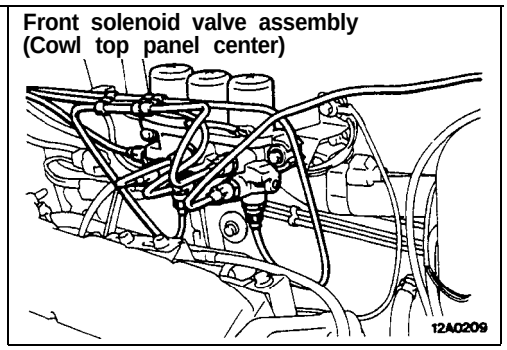
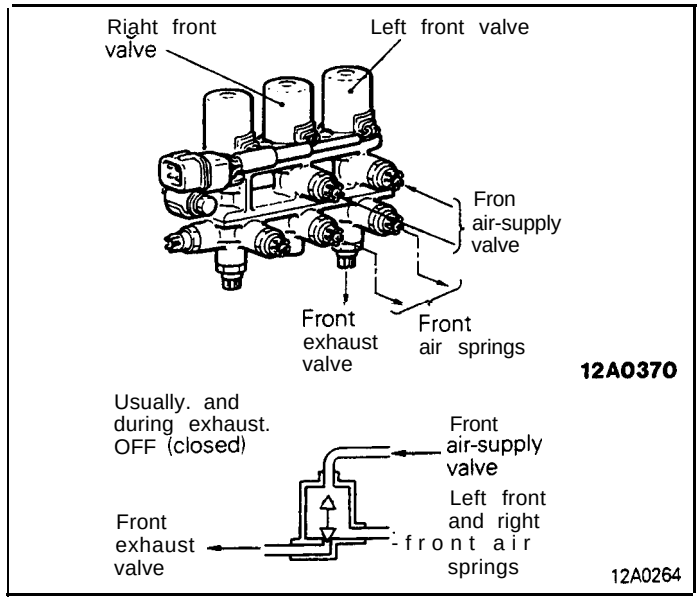
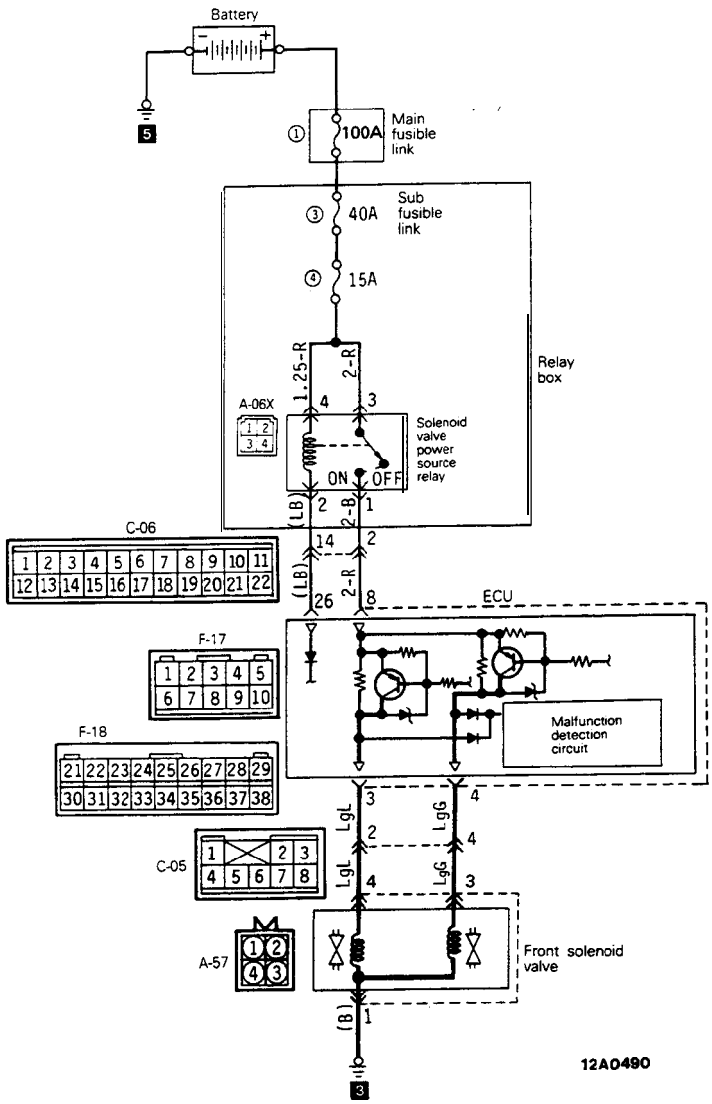
[25] LEFT FRONT/RIGHT FRONT VALVE ACTIVATION CIRCUIT







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Operation

The left front and right front valves are for switching the air intake and exhaust for the left front and right front strut air springs. These valves are usually, and during air intake, OFF (closed), and are ON (open) during exhaust.

Diagnostic

If there is damage or disconnection of the heavy-line circuit, or a malfunction of an output transistor within the ECU, the alarm light illuminates, and control is as described in the table below.
Note that the malfunction-detection circuit is the same for the left front and right front valves.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
52	Control stop	Held at MEDIUM	Control stop	Not accept			

Actuator compulsory activation

The left front and right front valves are activated by the following.

Code No.	Applicable operation
07	Vehicle height downward adjustment
09.10	Rolling control (left turning: left valve)/rolling control (right turning: right valve)

ECU terminal voltages (when connector is connected]

Terminal No	Signal	Condition	Terminal voltage
3	Left front valve activation signal	When the left/right front valves are ON	B+
		When the left/right front valves are OFF	ov
4	Right front valve activation signal	During fail-safe (for solenoid valve power source relay switch OFF)	ov

B+: Battery positive voltage

Checking the left front/right front valves activation circuit (with the connector disconnected)

Terminal No.	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
3	Left front valve	Resistance	3–ground	Constantly	Approx 10Ω
4	Right front valve	Resistance	4–ground	Constantly	Approx 10Ω

Troubleshooting hints (mechanical malfunctions)

Malfunction mode	Malfunction probable cause	Malfunction	Note
Stuck in the OFF (closed) position	Air cannot be discharged because the valve is stuck in the OFF (closed) due to corrosion, freezing, etc. caused by moisture penetration.	• The left front and right front vehicle height increases after rolling control. • Insufficient active control effect.	–
Stuck in the ON (open) position	Air cannot be taken in because the valve is stuck in the ON (open) due to corrosion. freezing, etc. caused by moisture penetration	• The left front and right front vehicle height decreases, and the body tilts to one side. • The return pump is activated too frequently.	Diagnostic trouble code No.56 is output.
Air leakage at valve seat	Valve seat is worn	When left as is, the front vehicle-height will decrease.	Diagnostic trouble code No.56 is output.
Air leakage to atmosphere	Wear, etc of the O-ring, etc	When left as is. the front vehicle-height will decrease.	Very slight leakages cannot be detected. Such leakage is detected a long time afterward by a decrease of the vehicle height

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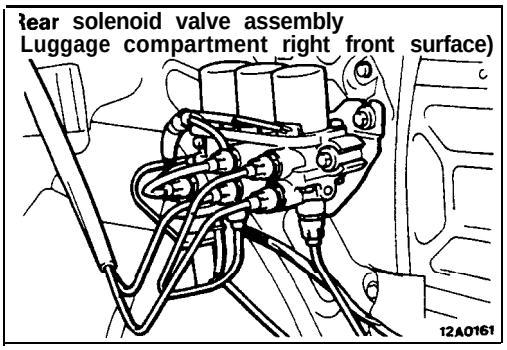
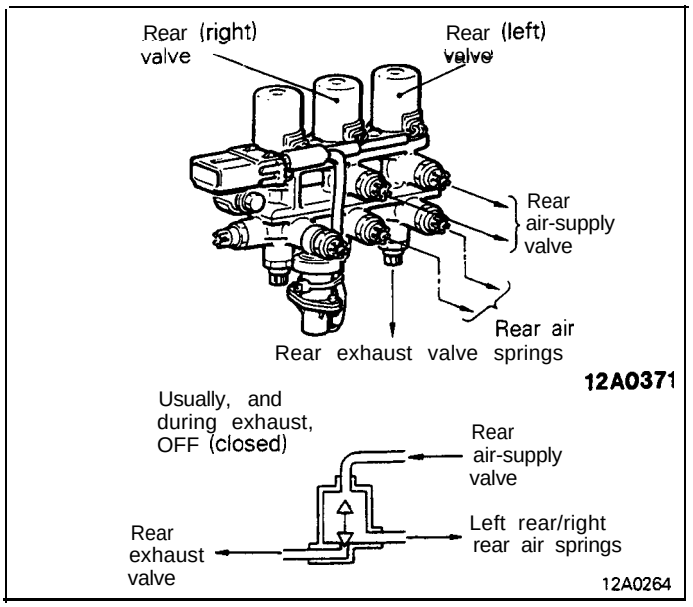
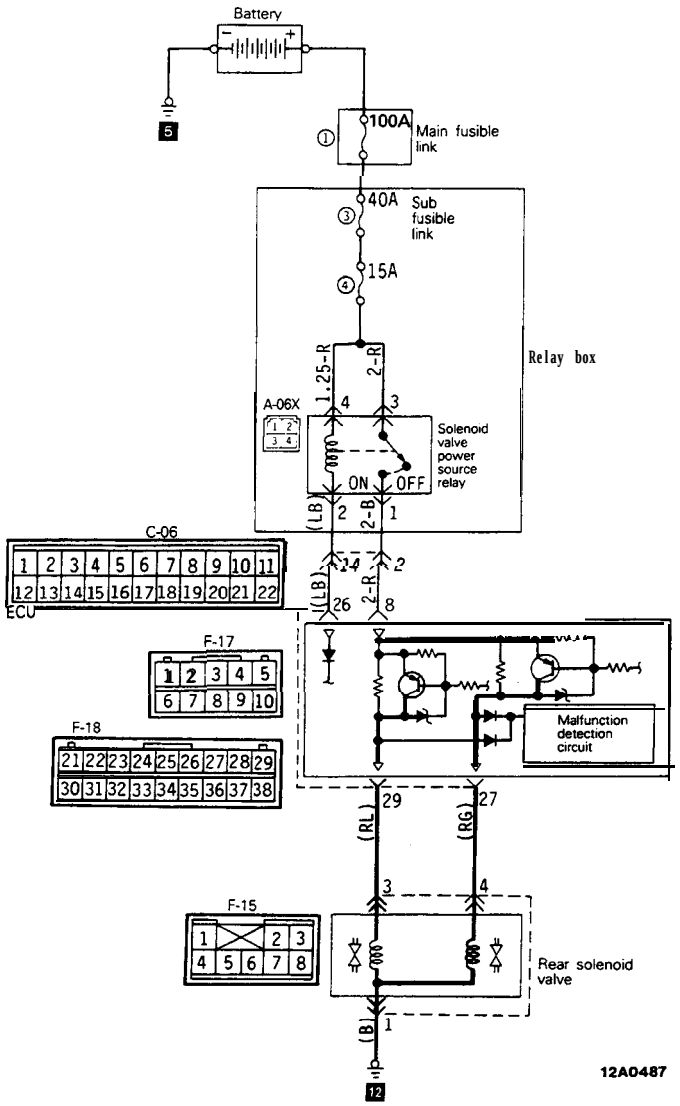
[26] LEFT REAR/RIGHT REAR VALVE ACTIVATION CIRCUIT







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Operation

The left rear and right rear valves are for switching the air supply and exhaust for the left rear and right rear shock absorber air springs. These valves are usually, and during air supply, OFF (closed), and are ON (open) during exhaust.

Diagnostic

If there is damage or disconnection of the heavy-line circuit, or a malfunction of an output transistor within the ECU, the alarm light illuminates, and control is as described in the table below.
Note that the malfunction-detection circuit is the same for the left rear and right rear valves.

Diagnostic No.	Attitude control	Damping force control	Vehicle-height control	Switch acceptance			
				HIGH	SPORT	AUTO	SOFT
53	Control stop	Held at MEDIUM	Control stop	Not accept			

Actuator compulsory activation

The left rear and right rear valves are activated by the following.

Code No.	Applicable operation
07	Vehicle height downward adjustment
09.10	Rolling control (left turning, left valve)/rolling control (right turning: right valve)

ECU terminal voltages (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
29	Left rear valve activation signal	When the left/right rear valves are ON	Battery positive voltage
		When the left/right rear valves are OFF	0V
27	Right rear valve activation signal	During fail-safe (for solenoid valve power source relay switch OFF)	0V

Checking the left rear/right rear valves activation circuit (with the connector disconnected)

Terminal No.	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
29	Left rear valve	Resistance	29–ground	Constantly	Approx 10Ω
27	Right rear valve	Resistance	27–ground	Constantly	Approx. 10Ω

Troubleshooting hints (mechanical malfunctions)

Malfunction mode	Malfunction probable cause	Malfunction	Note
Stuck in the OFF (closed) position	Air cannot be discharged because the valve is stuck in the OFF (closed) due to corrosion, freezing, etc. caused by moisture penetration.	• The left rear and right rear vehicle height increases after rolling control. • Insufficient active control effect.	
Stuck in the ON (open) position	Air cannot be taken in because the valve is stuck in the ON (open) due to corrosion, freezing, etc caused by moisture penetration.	• The left rear and right rear vehicle height decreases, and the body tilts to one side. • The return pump is activated too frequently	Diagnostic trouble code No.56 is output
Air leakage at valve seat	Valve seat is worn.	When left as is, the rear vehicle-height will decrease.	Diagnostic trouble code No.56 is output
Air leakage to atmosphere	Wear, etc. of the O-ring, etc.	When left as is, the rear vehicle-height will decrease.	Very slight leakages cannot be detected. Such leakage is detected a long time afterward by a decrease of the vehicle height.

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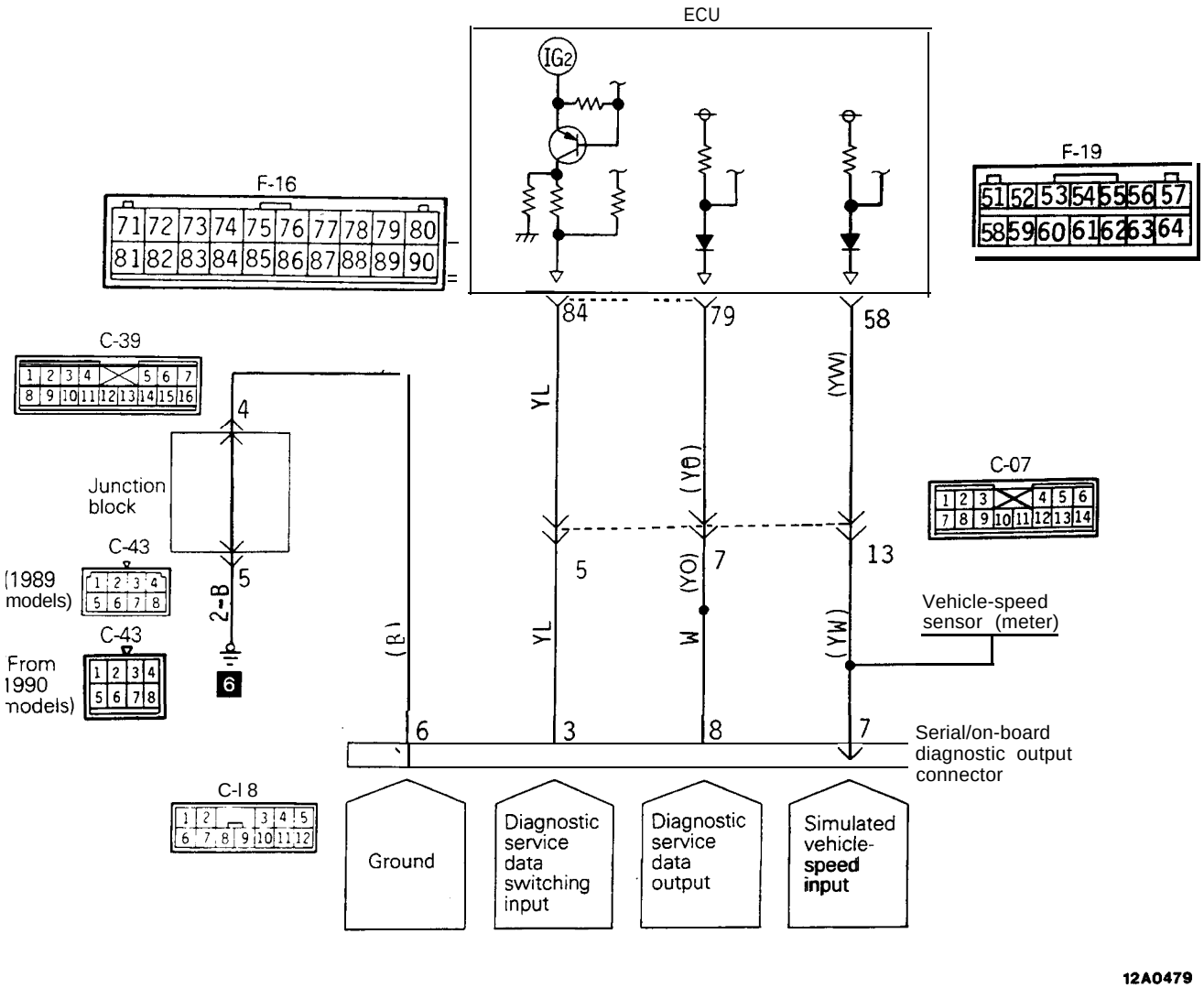
[27] ACTIVE-ECS RELATED DIAGNOSTIC/SERVICE DATA OUTPUT CIRCUIT



ECU terminal voltages (when connector is connected)

Terminal No.	Signal	Condition	Terminal voltage
79	Diagnostic/service data switching signal	When scan tool is connected	ov
		Usual	3.3V
84	Diagnostic/service data switching signal	Constantly	0V I Battery positive voltage

ACTIVE-ECS related diagnostic/service data output circuit (with the connector disconnected)

Terminal No.	Connection destination or measured part	Measurement	Tester connection	Check condition	Standard
79	Diagnostic/service data switching signal	Resistance	Diagnostic 79- concentrated connector	Constantly	Continuity
84	Harness for diagnostic/service data output	Resistance	Diagnostic 84- concentrated connector	Constantly	Continuity

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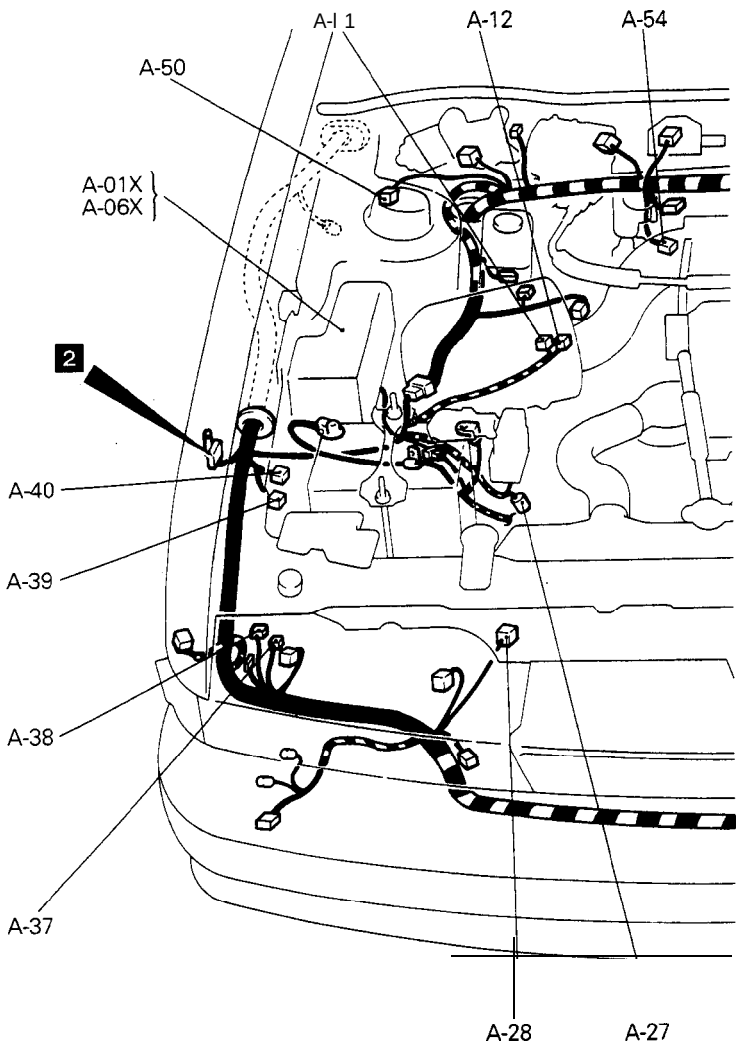
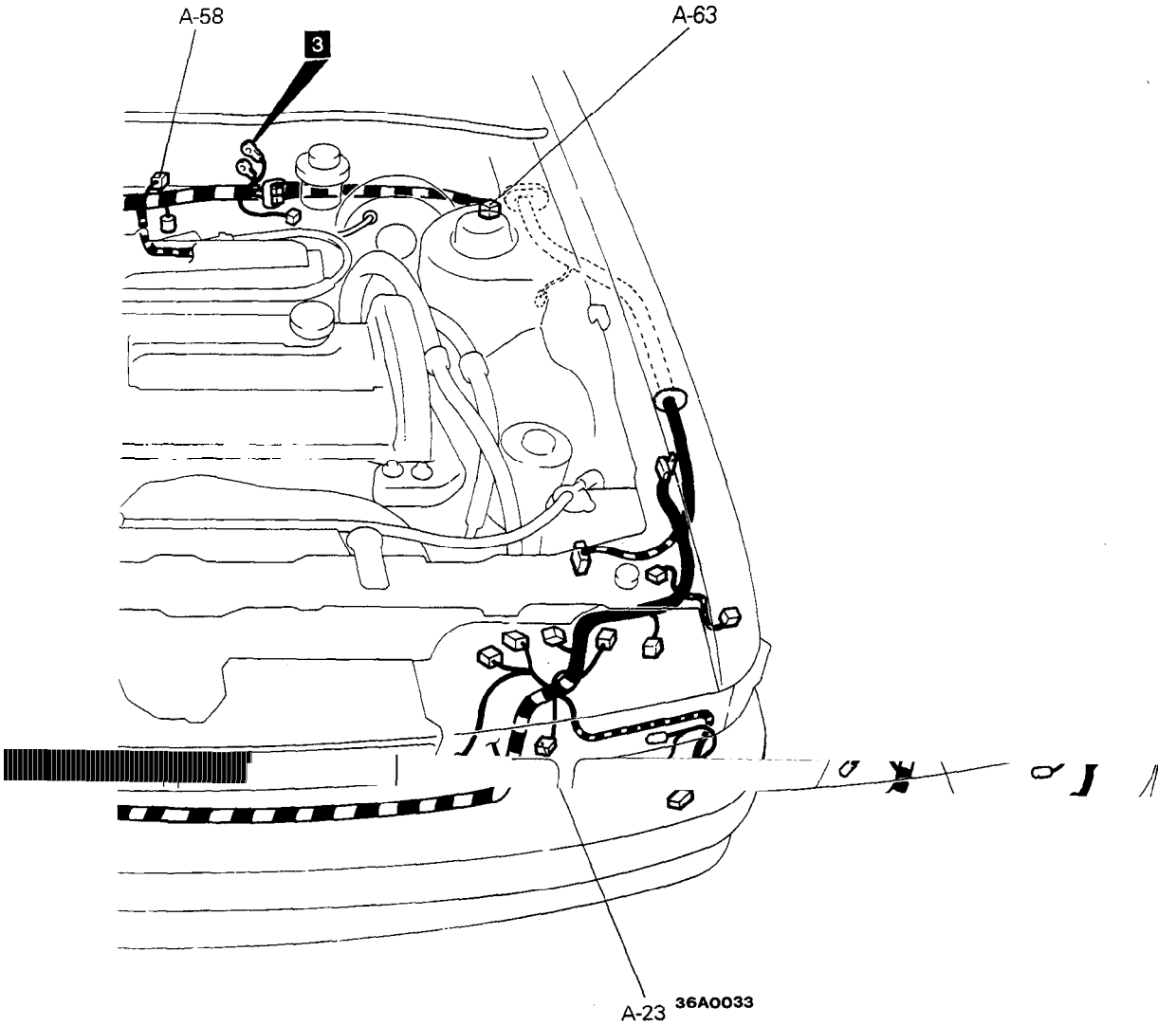
CONFIGURATION DIAGRAMS

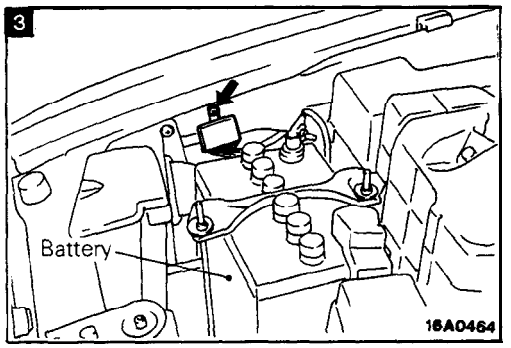
ENGINE ROOM

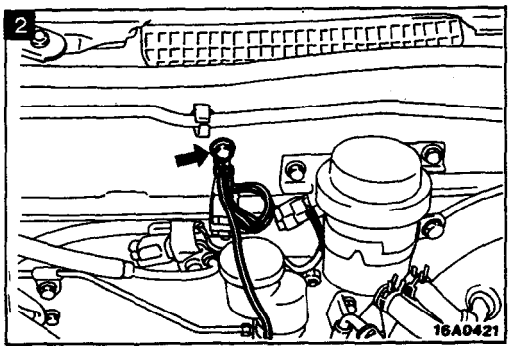


A-01X, A-06X } Refer to CENTRALIZED JUNCTION
A-I 1 ACTIVE-ECS exhaust solenoid valve
A-I 2 ACTIVE-ECS air compressor
A-23 ACTIVE-ECS G sensor
A-27 ACTIVE-ECS front vehicle height sensor
A-28 ACTIVE-ECS flow-control solenoid valve
A-37 ACTIVE-ECS return pump
A-38 ACTIVE-ECS pressure switch
A-39 ACTIVE-ECS air compressor relay
A-40 ACTIVE-ECS return pump relay
A-41 Front wiring harness and battery cable combination
A-50 ACTIVE-ECS front actuator
A-54 Throttle position sensor (1989 models)
A-58 ACTIVE-ECS front solenoid valve
A-63 ACTIVE-ECS front actuator

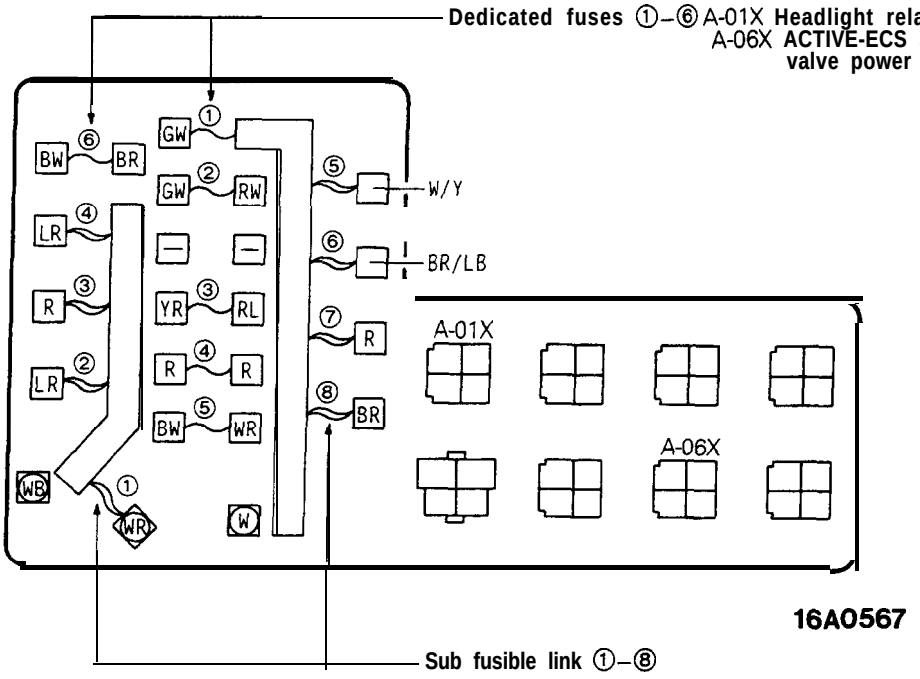


Ground point (detailed view)



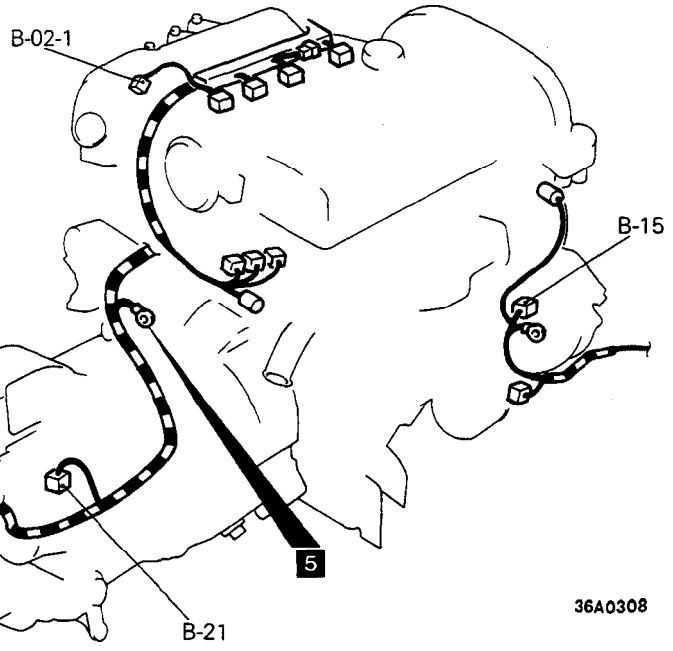


Concentrated junction

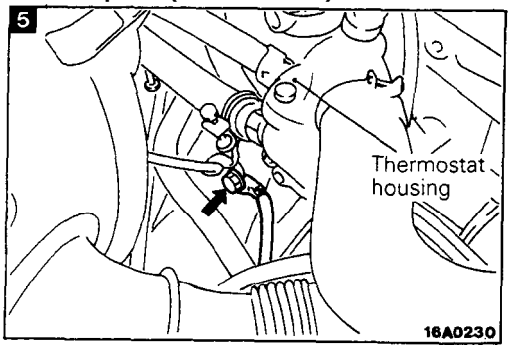


ENGINE AND TRANSAXLE

B-I 5 Alternator
B-21 **Backup light switch**
B-02-1 **Throttle** position **sensor (From 1990 models)**



Ground point (detailed view)



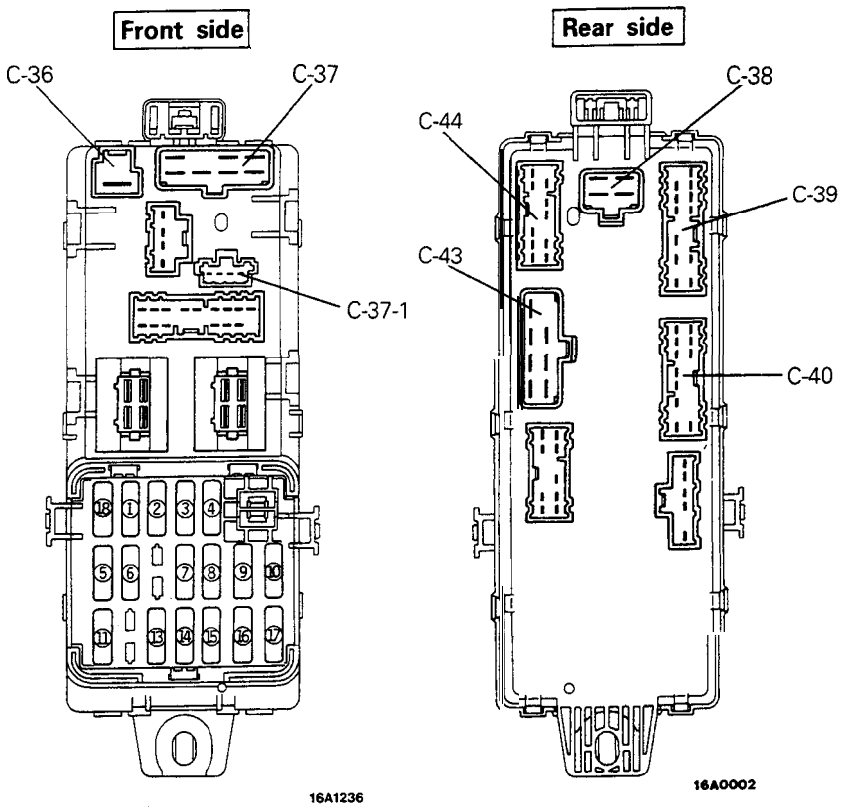
TSB Revision

DASHBOARD PANEL

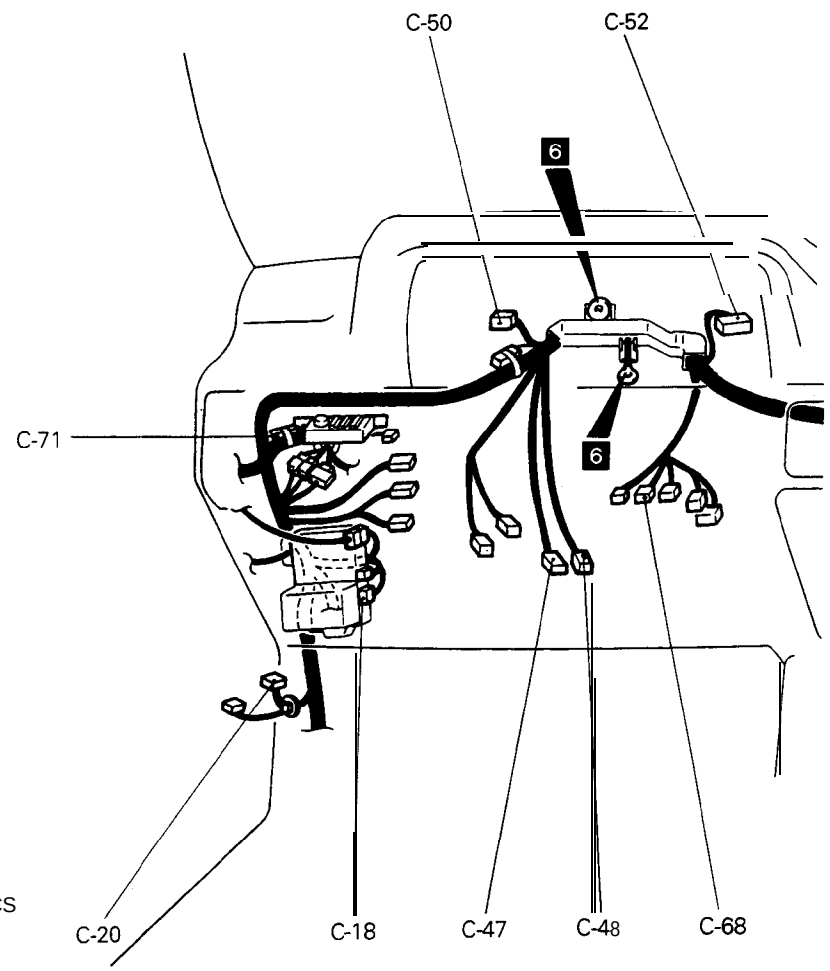
Junction block

C-36, C-37, C-37-1: Front harness and junction block coupling

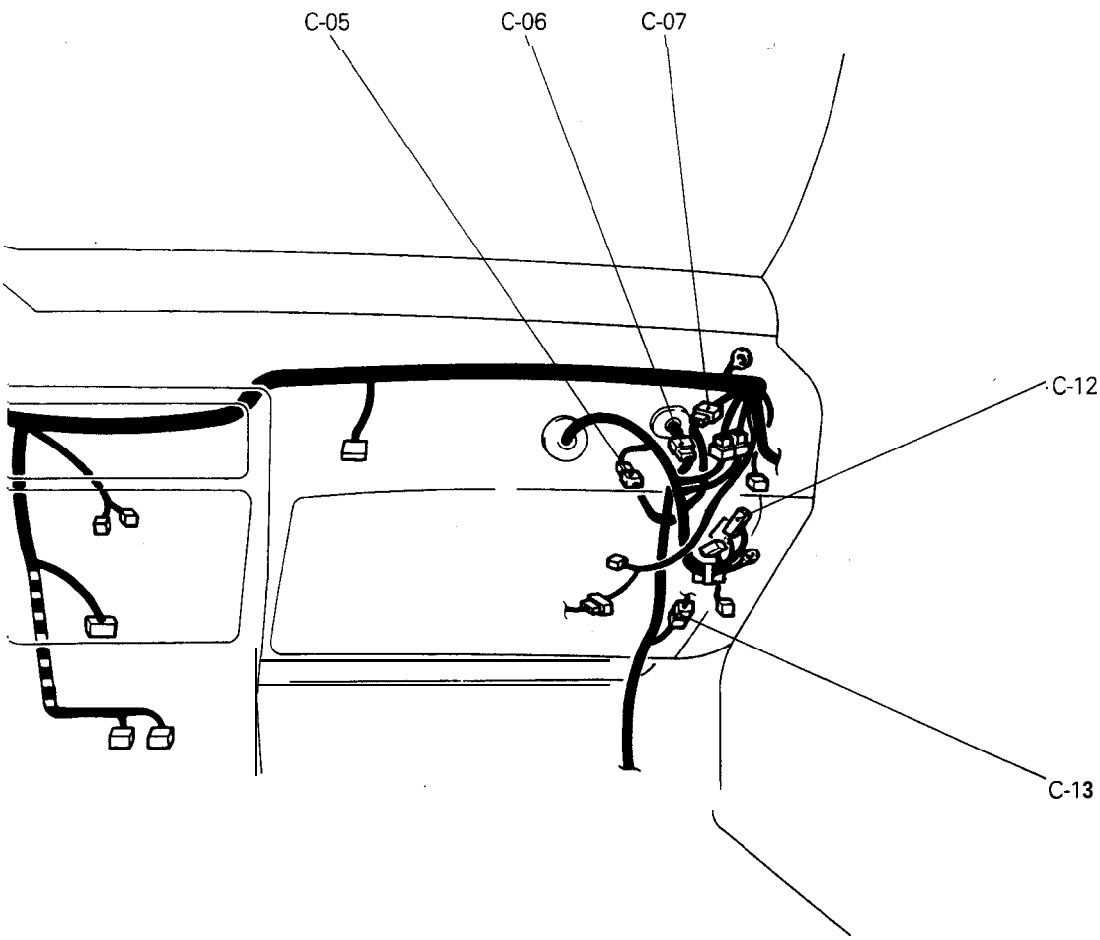
C-38, C-39, C-40, C-43, C-44: Body harness and junction block coupling



DASHBOARD PANEL



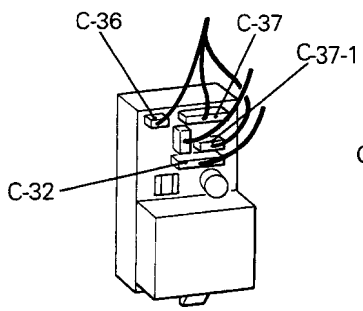
C-05 Control wiring harness and ACTIVE-ECS wiring harness combination
C-06 Front wiring harness and ACTIVE-ECS wiring harness combination
C-07 Body wiring harness and ACTIVE-ECS wiring harness combination
C-12 Engine control module
C-13 ACTIVE-ECS wiring harness and instrument wiring harness combination
C-I 8 Data link connector
C-20 ACTIVE-ECS relay
C-32 Instrument wiring harness and junction block combination
C-36, C-37, C-37-1 } Front wiring harness and junction block combination
C-38, C-39, C-40, C-43, C-44 } Body wiring harness and junction block combination
C-47 Stop light switch (2-pin)
C-48 Stop light switch (4-pin)
C-50, C-52 } Combination meter
C-68 Column switch
C-71 Diode (for ACTIVE-ECS Circuit)



36A0035

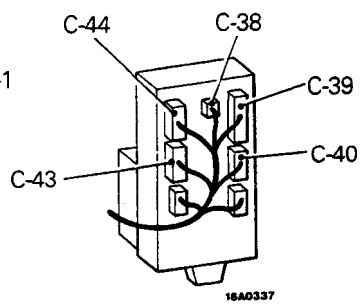
Junction block

Front side

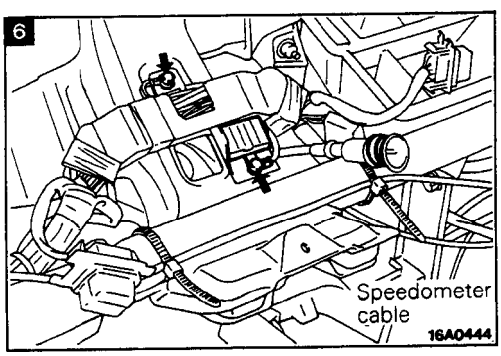


16A1264

Rear side



16A0337



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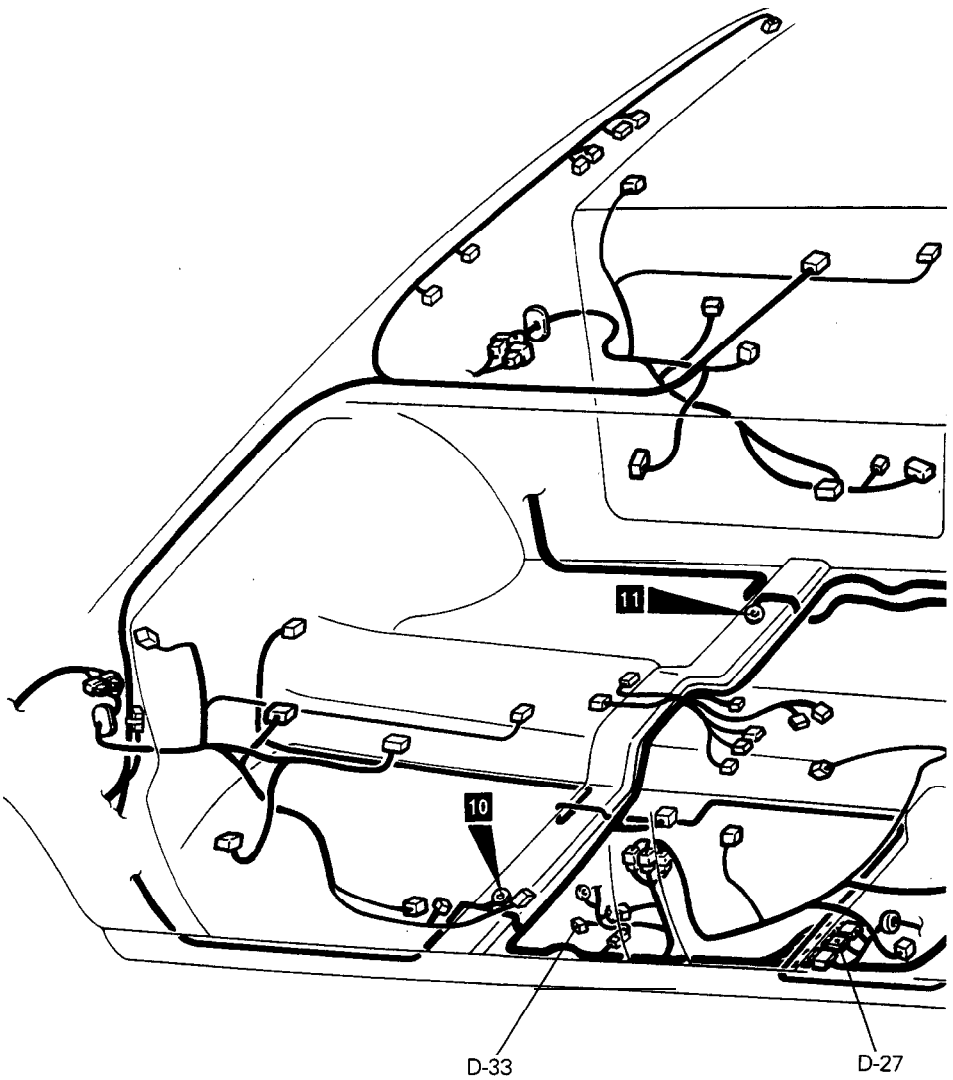
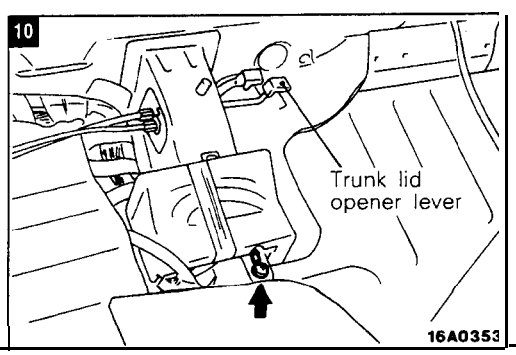
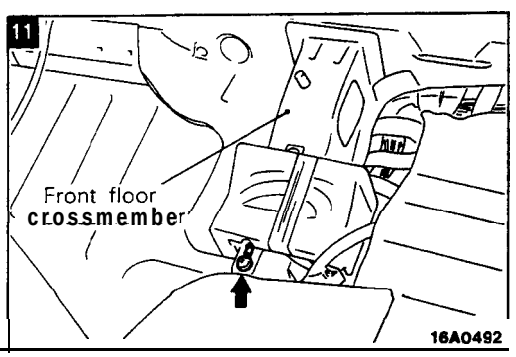
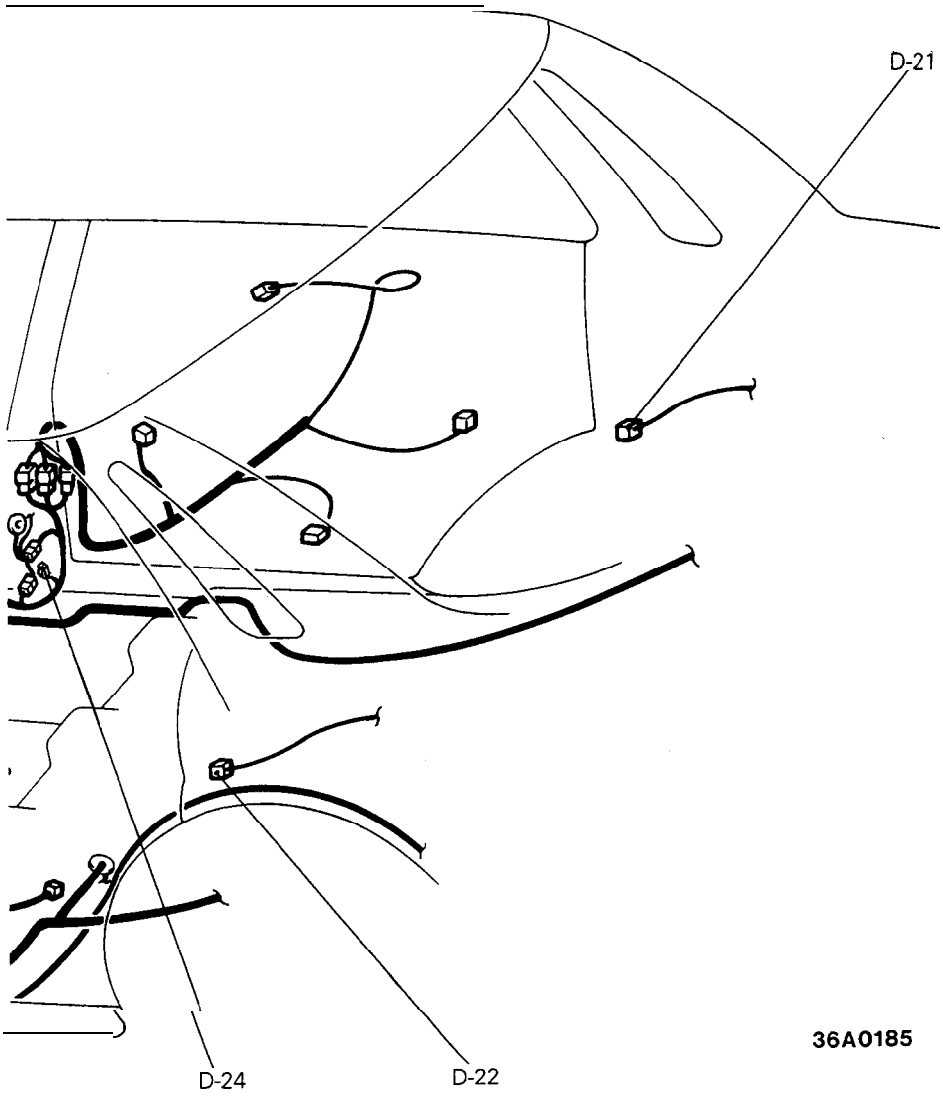
INTERIOR


11
10
D-33
D-27

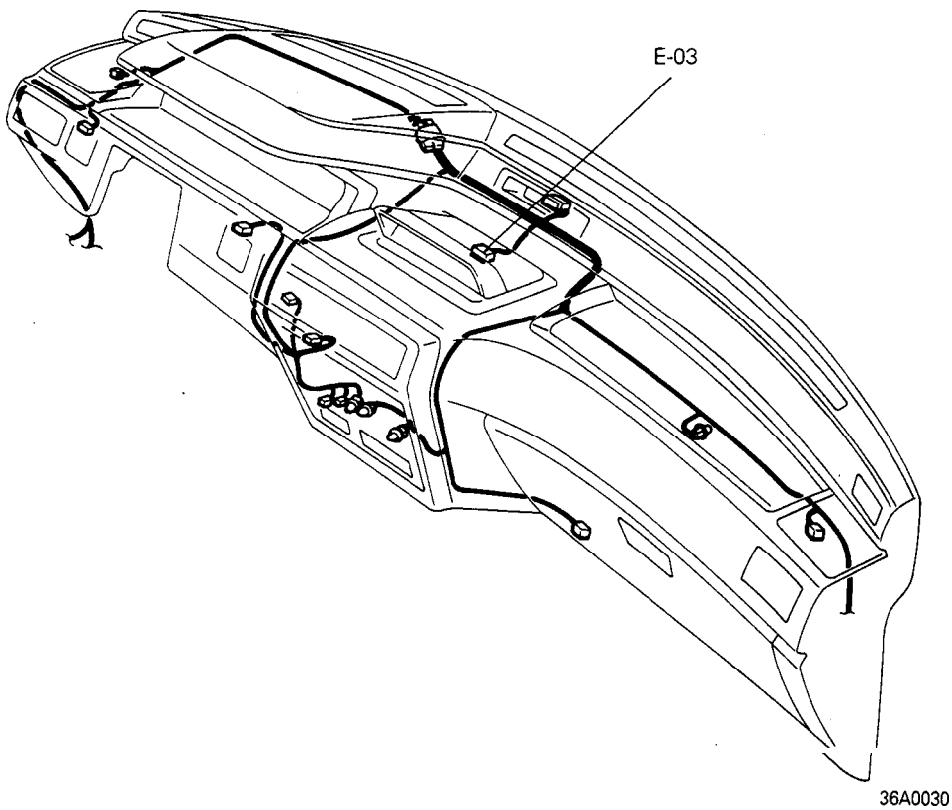

10
Trunk lid
opener lever
16A0353


11
Front floor
crossmember
16A0492



D-21 Door switch (Rear, R.H.)
D-22 Door switch (Rear, L.H.)
D-24 Door switch (Front, R.H.)
D-27 Body wiring harness and fuel wiring harness combination
D-33 Door switch (Front, L.H.)

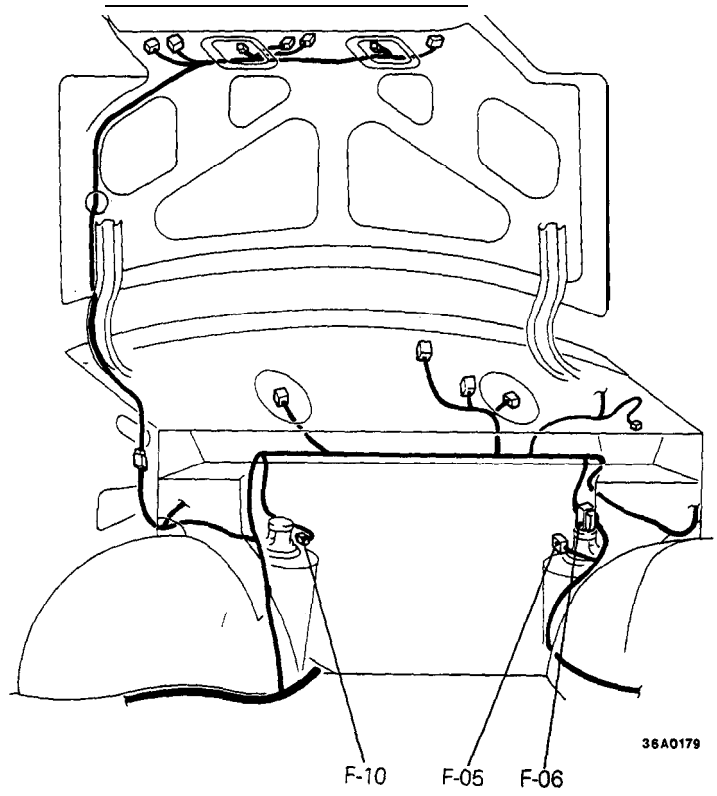
INSTRUMENT PANEL

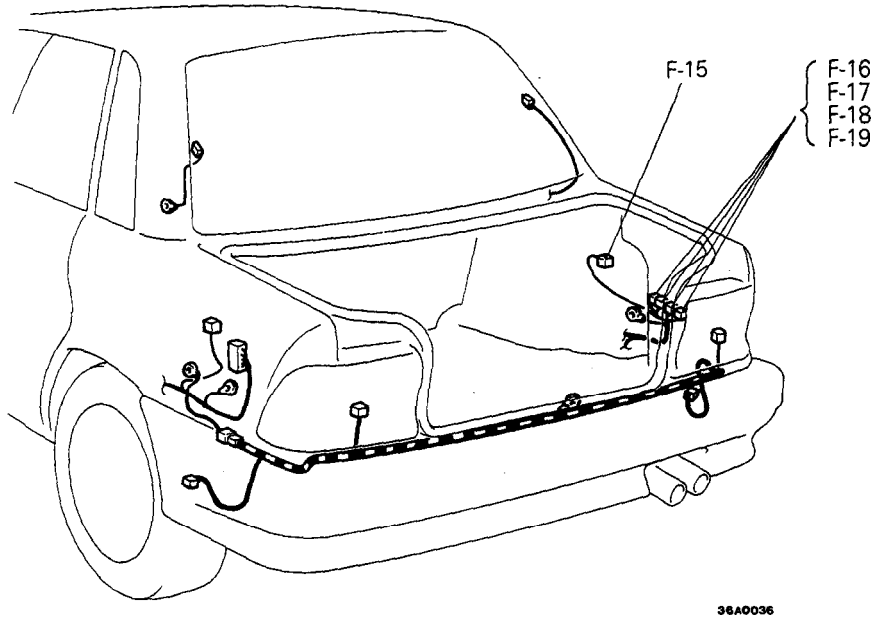


E-03 ACTIVE-ECS indicator

LUGGAGE COMPARTMENT

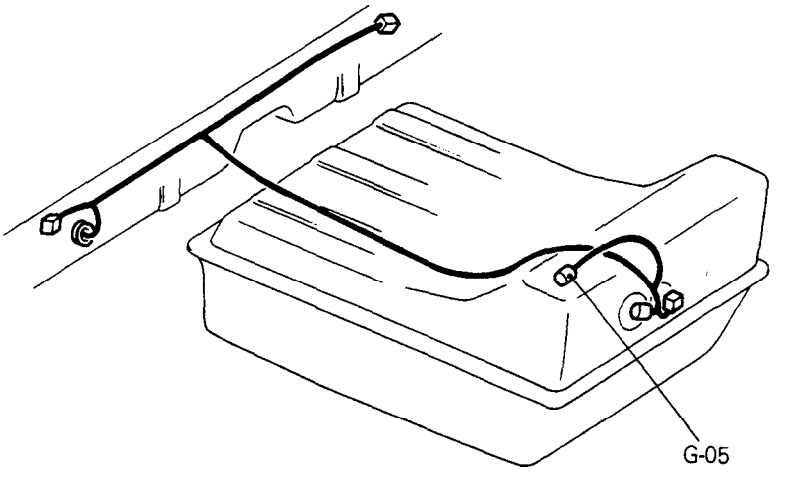
F-05 **ACTIVE-ECS rear actuator** (R.H.)
F-06 **ACTIVE-ECS wiring harness and body wiring harness combination**
F-10 **ACTIVE-ECS rear actuator** (L.H.)
F-15 **ACTIVE-ECS rear solenoid valve**
F-16, F-17, F-18, F-19 **ACTIVE-ECS electronic control unit**



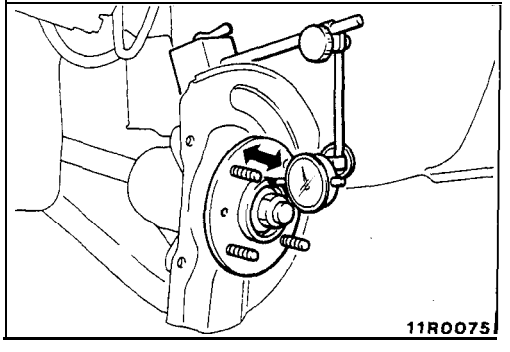


REAR UNDER FLOOR

G-05 ACTIVE-ECS rear vehicle-height sensor



16A0266



SERVICE ADJUSTMENT PROCEDURES

M33FAAA

HUB END PLAY INSPECTION

1. Jack up the vehicle and remove the front wheels.
2. Remove the disc brake caliper and suspend it with a wire. Refer to GROUP 26 FRONT AXLE-Service Adjustment Procedures.
3. Attach a dial indicator as shown in the illustration, and then measure the axial play while moving the hub back and forth.

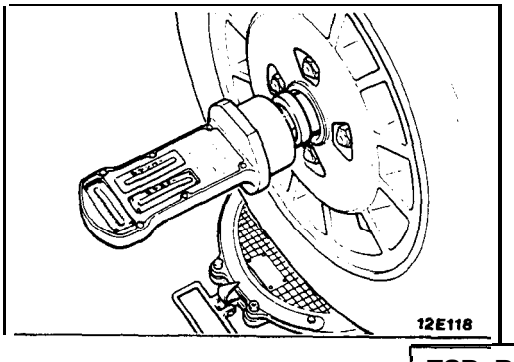
   Limit: 0.2 mm (.008 in.) or less

   NOTE
   Secure the brake disc and hub by the wheel nut so that the brake disc won't come of the hub.
4. If axial play exceeds the limit, disassemble and check parts.

FRONT WHEEL ALIGNMENT

M33FBAD

NOTE
The front suspension assembly must be free of worn, loose or damaged parts prior to measurement of front wheel alignments.
Measure wheel alignment by using the tool.



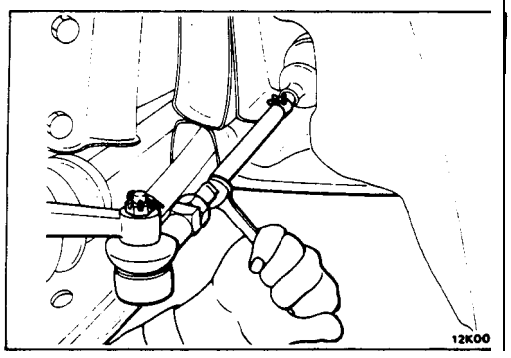
CAMBER AND CASTER

Standard value: Camber 22′±30
Caster 2°±30

Camber and caster are pre-set at the factory and cannot be adjusted.

NOTE
If camber and caster are not within specifications, replace bent or damaged parts.

TSB Revision



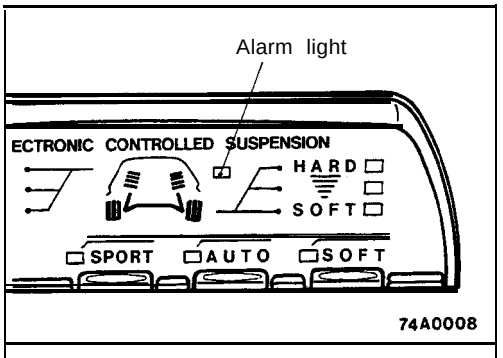
TOE-IN

Standard value: 0±3 mm (0±.12 in.)

1. Adjust the toe-in by undoing the clips and turning the left and right tie rod turnbuckles by the same amount (in opposite directions).
2. The toe will move out as the left turnbuckle is turned toward the front of the vehicle and the right turnbuckle is turned toward the rear of the vehicle.
3. For each half turn of the left and right tie rods, the toe-in will be adjusted by 6 mm (.24 in.).
4. After making the adjustments, use a turning radius gage to confirm that the steering wheel turning angle is within the standard value range. (Refer to GROUP 37A POWER STEERING-Service Adjustment Procedures.)

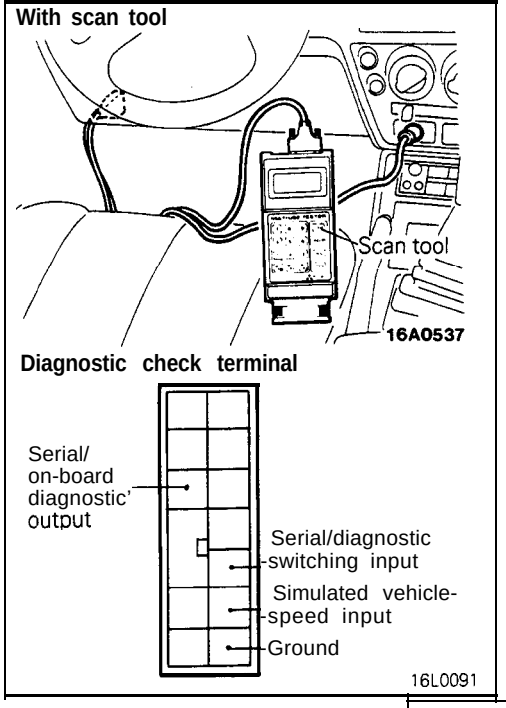
WHEEL BEARING ADJUSTMENT M33FCAA

Bearing preload is pre-set to the specified value by design and therefore can not be adjusted.



ALARM LIGHT CHECK M33FHAC

The bulb of the alarm light can be checked by whether or not it is illuminated for approximately 0.5 of a second by the Electronic Control Suspension control unit when the ignition key is turned ON, and, after the engine is started.



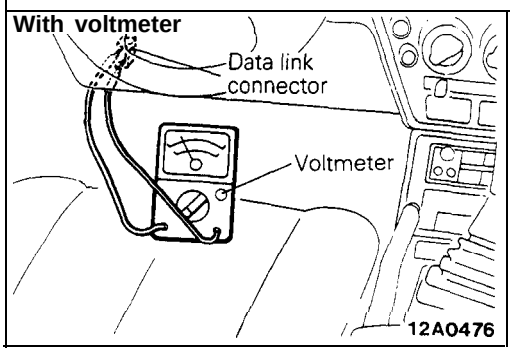
SYSTEM CHECKING BY USING ALARM LIGHT

1. After checking the alarm light bulb to be sure it has not failed, let the engine idle for approximately 4 minutes or more to check to be sure that the alarm light does not illuminate.
2. While the alarm light is on, connect the scan tool or a voltmeter to the data link connector of the wiring harness and check the on-board diagnostic output code.
3. Use the output pattern for troubleshooting (Refer to P.33B-11.)

NOTE*
Although the alarm light illuminates under the following circumstances, there is no actual malfunction if, after the following procedures have been followed and then the alarm light does not illuminate after waiting about four minutes or more.

1. When there is an overload
   Stop the engine, unload the cargo, and then restart the engine.
2. When the vehicle is stopped (with the engine running) on a steep hill or slope.
   Move the vehicle to a horizontal place and stop; then stop the engine and restart it.

TSB **Revision**



3. When vehicle-height adjustments are made frequently After stopping the engine, open the hood and allow the compressor to cool; then restart the engine.
4. When the vehicle is driven on winding roads in the mountains continuously for 18 minutes or longer. To protect the return pump from damage, stop the engine and then restart it.

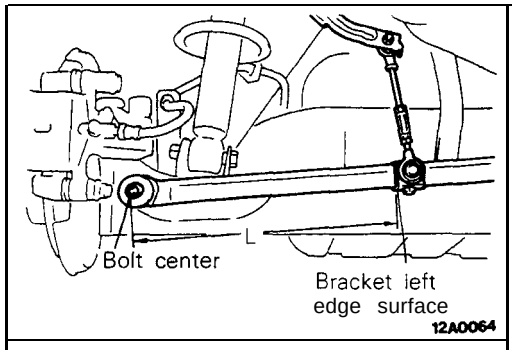
*: Applicable to 1989 models only.

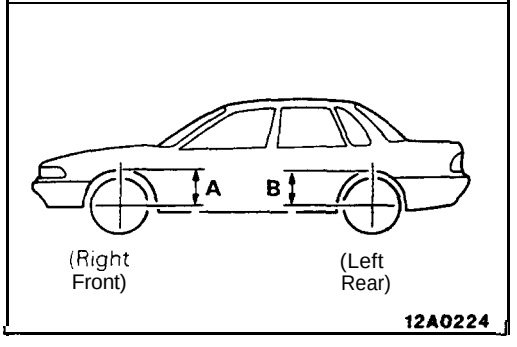
CHECKING BY ON-BOARD DIAGNOSTIC

1. Regardless of whether or not the alarm light is illuminated, check the diagnostic output codes at the diagnostic terminal.
2. If a malfunction code is output to the diagnostic terminal, perform the troubleshooting procedures according to the output code.

NOTE

Diagnostic trouble codes are entered into the memory, even if the ignition is at the OFF position, so that it is possible to check for the existence of malfunctions that occurred previously.





NORMAL VEHICLE HEIGHT CHECK AND ADJUSTMENT

1. Park the vehicle on a flat surface.
2. Measure dimension L (in the illustration) of the rear height sensor mounting bracket installation location.

   Rear height sensor mounting bracket installation length:

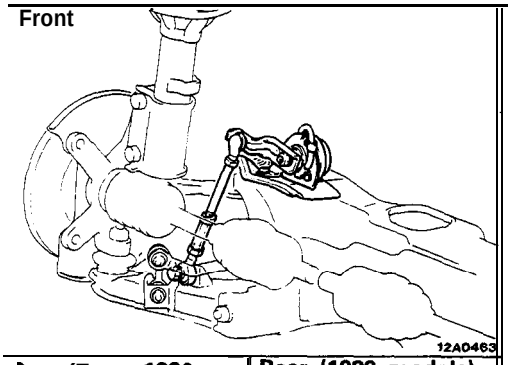
   Standard value (L): 314-316 mm (12.36–12.44 in.)
3. If dimension is not within the standard value, loosen the bracket mounting bolt and make the adjustment to within the standard value.
4. With the vehicle unloaded, start the engine and let it run for 3 minutes, Then check to be sure that, after the vehicle height adjustment is completed, the NORM vehicle height indicator light illuminates (indicating that the vehicle height adjustment is finished).
5. Measure the distance between the wheel arch and the centre of the axle for both the right front and left rear.

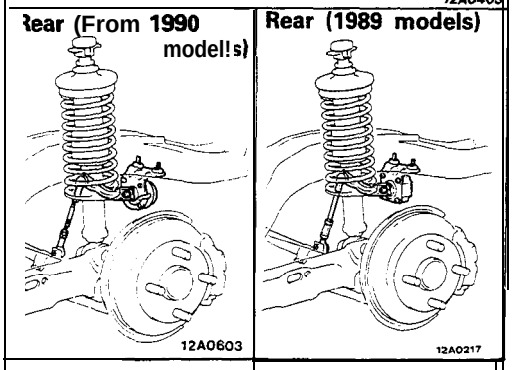
   Standard value:

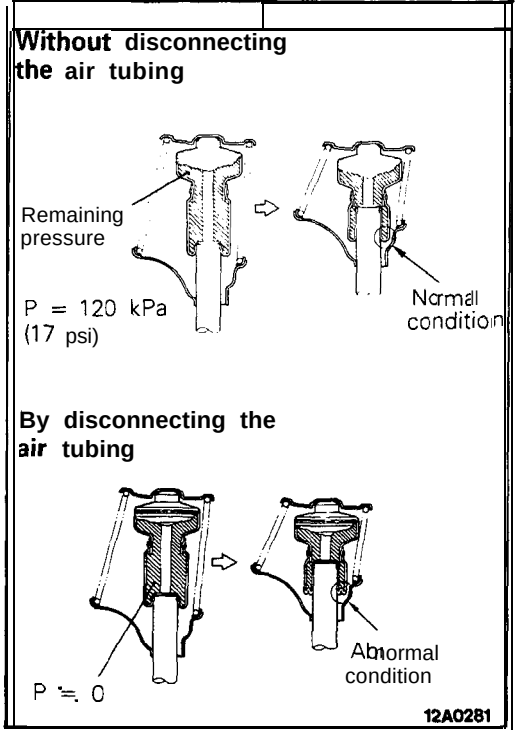
A (Front)	**381–391 mm (15.0–15.4 in.)**
B (Rear)	**357-367 mm (14.1-14.4 in.)**

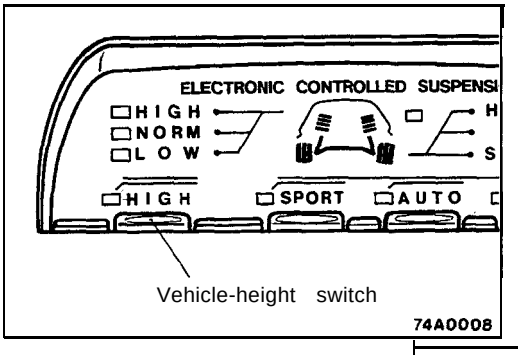
Caution

Check to be sure that the mounted dimension of the rear height sensor mounting bracket is within the standard value.









6. If the vehicle height is not within the standard value, loosen the turnbuckles of the front and rear height sensor rods, and then make the adjustment by changing the length of the rods. The vehicle height becomes higher when the rods are lengthened.

Caution

1. Both the front and rear heights must be checked, because, even though only the front or the rear is adjusted, the other height (rear or front) is also changed.

2. The adjustments of the vehicle height must be made while the engine is idling (vehicle stopped).

ROLLING DIAPHRAGM CHECK

Under normal conditions, the rolling diaphragm is as shown in the "normal condition" half of the figure. If, however, the vehicle is jacked up while there is no air in the air springs and then let down suddenly, the diaphragm may become double folded, as shown in the "abnormal condition" half of the illustration.

If the vehicle is driven in abnormal condition, the diaphragm will soon be damaged, so the procedure below should be followed to prevent this.

Checking method

Front: Jack the front end up and check visually or feel the diaphragm.

Rear: Check to be sure that movement is smooth when the rear part of the body is bounced up and down.

Repair method

1. Jack up the vehicle and start the engine.
2. Press the HIGH vehicle-height switch for two seconds or longer.
3. Supply air to each air spring so as to return the diaphragm to the normal form.

NOTE

Air should be introduced to the rear air springs and front air springs, in that sequence, for five seconds each.

The diaphragm will return easily if a solution of soap and water is applied to the diaphragm.

Caution

In order to prevent double-folding of the diaphragm, be sure, if the air tubing is disconnected in the course of servicing, to follow step 2 above after connecting the tubing in order to introduce air into the air springs.

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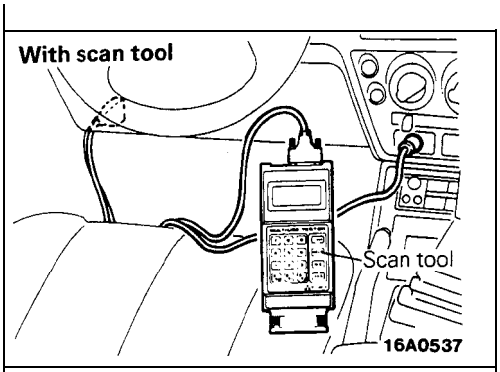
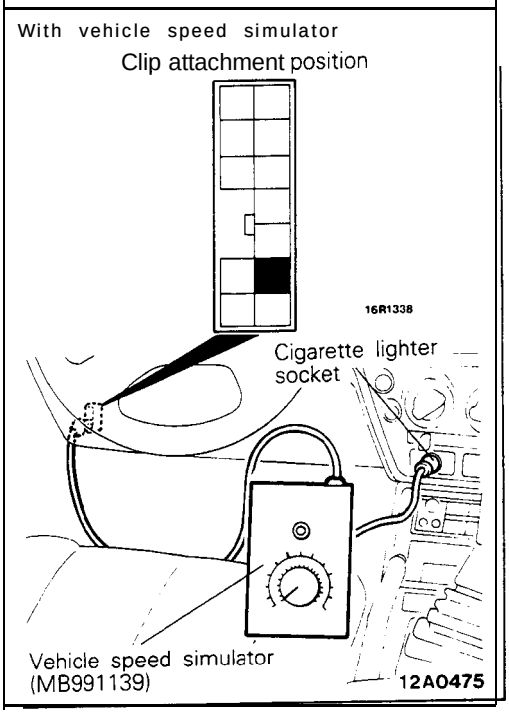




SYSTEM OPERATION CHECK

The checking procedures described below are for the purpose of actually activating the system so as to verify whether or not the system's function is normal.

Caution

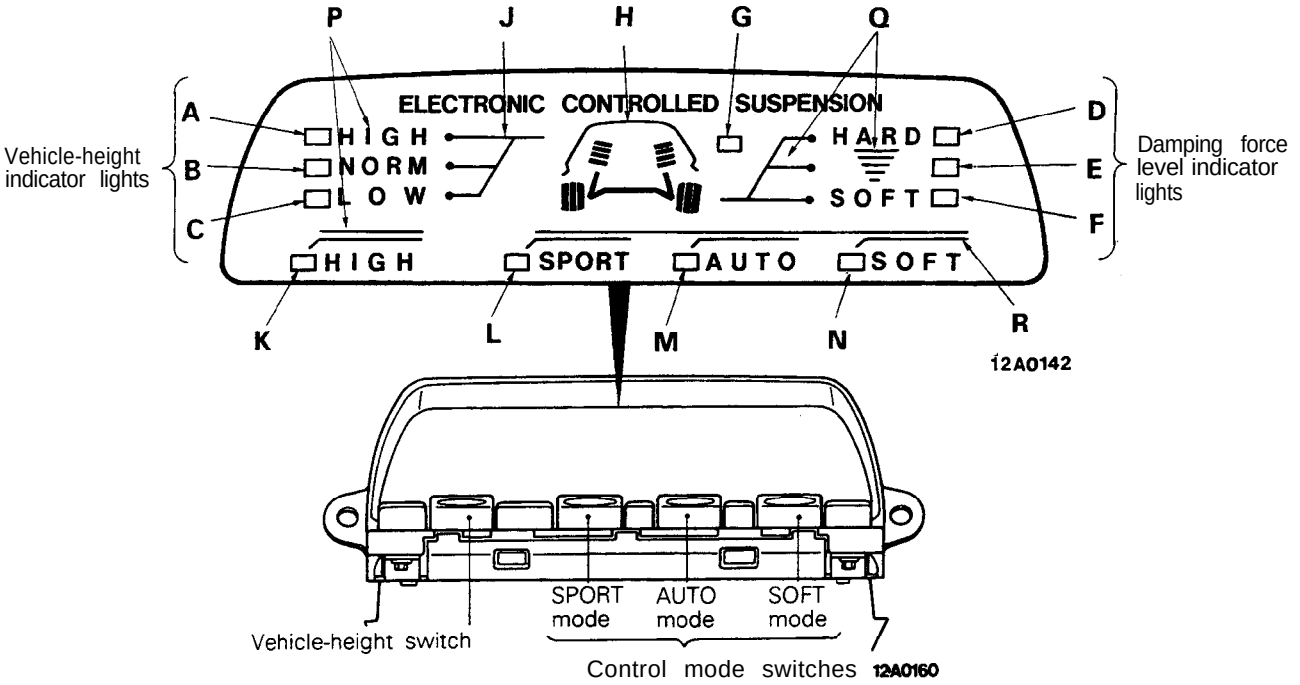
1. **For checks conducted by an actual road test, do so in a safe place and observe the speed limit.**
   For tests that require high-speed driving, such tests can be conducted while the vehicle is stopped by using the special tool (scan tool), or the special tool (vehicle speed simulator) and the special tool (adapter harness) to input simulated vehicle-speed signals.
2. **Never drive the vehicle while the simulated vehicle-speed signals are still being used.**

TSB Revision

Indicator lights that illuminate for 0.5 second after ECU power ON	
Control mode	AUTO mode indicator
Damping force level	SOFT (one light ON)
Vehicle-height level	NORM

CHECKING THE ACTIVE-ECS INDICATOR LIGHTS

1. Check to be sure that the lights listed at the left illuminate when the ignition key is turned to the ON position, and for approximately 0.5 second after the engine is started, and that thereafter they indicate the control mode entered in the memory.
2. Check to be sure that the nighttime illumination light illuminates when the lighting switch is switched ON, and that the indicator lights become dimmer.



Symbol	Function	Illumination color	Nighttime dim	Symbol	Function	Illumination color	Nighttime dim
A	HIGH vehicle-height indicator light	Orange	Yes	J	ELECTRONIC CONTROL SUSPENSION	Green*	—
B	NORMAL vehicle-height indicator light	Orange	Yes	K	HIGH (vehicle-height) switch indicator light	Orange	Yes
C	LOW vehicle-height indicator light	Orange	Yes	L	SPORT mode indicator light	Orange	Yes
D	Illuminates during HARD	Orange	Yes	M	AUTO mode indicator light	Orange	Yes
E	Illuminates during HARD or MEDIUM	Orange	Yes	N	SOFT mode indicator light	Orange	Yes
F	Illuminates during HARD, MEDIUM or SOFT	Orange	Yes	P	Nighttime illumination light	Green*	—
G	Alarm light	Red	Yes	Q			
H	ECS symbol	Green*	—	R			

NOTE
The illumination color indicated by the * symbol indicates the nighttime illumination color (letters or lines only illuminate).

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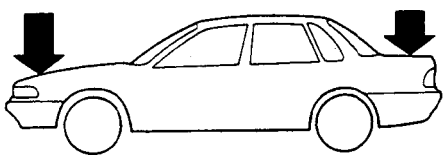
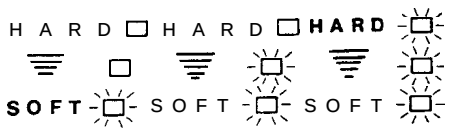
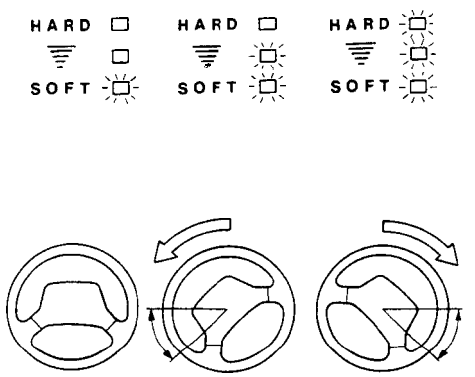


12A0279



12A0271



16A0460

CHECKING THE DAMPING FORCE

1. Move the wheels to the straight-ahead position.
2. Start the engine.
3. Set to the AUTO mode (normal vehicle height).
4. Press the control mode switches, and check the illumination of the damping force level indicator lights when the modes shown below are selected.
   In addition, check to be sure that there is a difference of the damping force for each control mode when the vehicle is moved up and down at a rate of twice per second.

Control mode	Damping force level indicator lights	Damping force
SOFT	One indicator light ON	SOFT
AUTO	One indicator light ON	AUTO-SOFT*1
MEDIUM-AUTO*2	Two indicator lights ON	MEDIUM
SPORT	Three indicator lights ON	HARD*3

NOTE
- *1: 1989 models
  SOFT for 1990, 1991, 1992, 1993 models.
- *2: 1989 models
  Not applicable for 1990, 1991, 1992, 1993 models.
- *3: 1989 models
  MEDIUM for 1990, 1991, 1992, 1993 models.

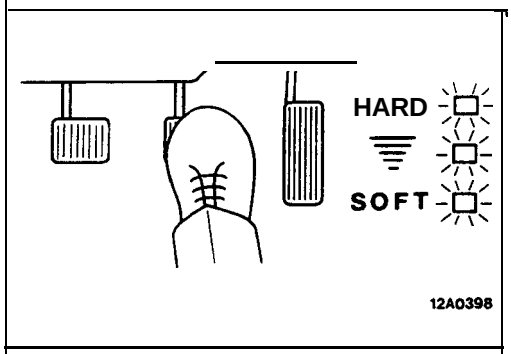
CHECKING THE ANTI-ROLLING FUNCTION

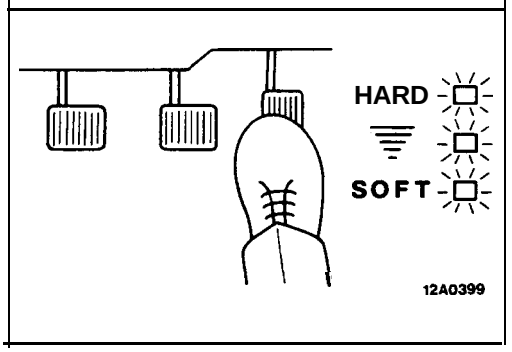
1. Move the wheels to the straight-ahead position.
2. Turn the ignition key to ON.
3. When simulated vehicle-speed signals of 35 km/h (22 mph) or higher are input and the steering wheel is turned 45" or more, the damping force characteristic indicator light will change to MEDIUM or HARD, depending on the speed at which the steering wheel is turned.
   Check to be sure that this sensitivity increases (for each control mode) as the vehicle speed increases.

NOTE
The damping force characteristic will return to its previous level about tow seconds*4 after the change to MEDIUM or HARD.

- *4: 1989 models
  For 1990, 1991, 1992, 1993 models: one second

TSB Revision





CHECKING THE ANTI-DIVE FUNCTION

1. Turn the ignition key to ON.
2. input a simulated vehicle-speed signal of 3 km/h (2 mph) or more.
3. Select the AUTO or SOFT control mode.
4. With the brake pedal depressed (the stop lights ON), check that the damping force characteristic level indicator lights change to the HARD indication when the simulated vehicle-speed input signal is suddenly decreased from 100 km/h (62 mph) or higher, and that there is air supply at the front and exhaust at the rear.

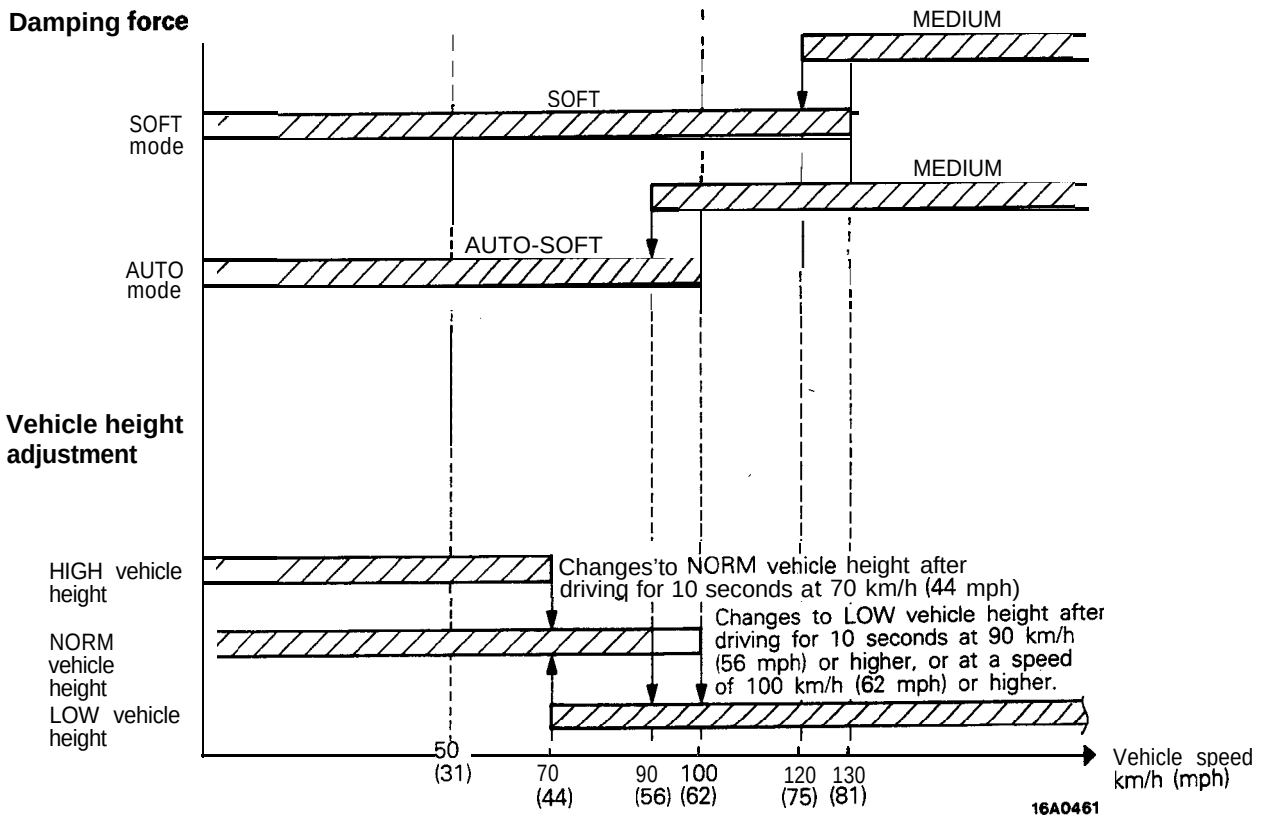
CHECKING THE ANTI-SQUAT FUNCTION

1. Turn the ignition key to ON.
2. Input a simulated vehicle-speed signal that is 3 km/h (2 mph) or higher and is less than 100 km/h (62 mph).
3. Select the AUTO or SOFT control mode.
4. Check that the damping force characteristic level indicator lights change to the HARD indication when the accelerator pedal is suddenly depressed, and that there is air exhaust at the front and supply at the rear.

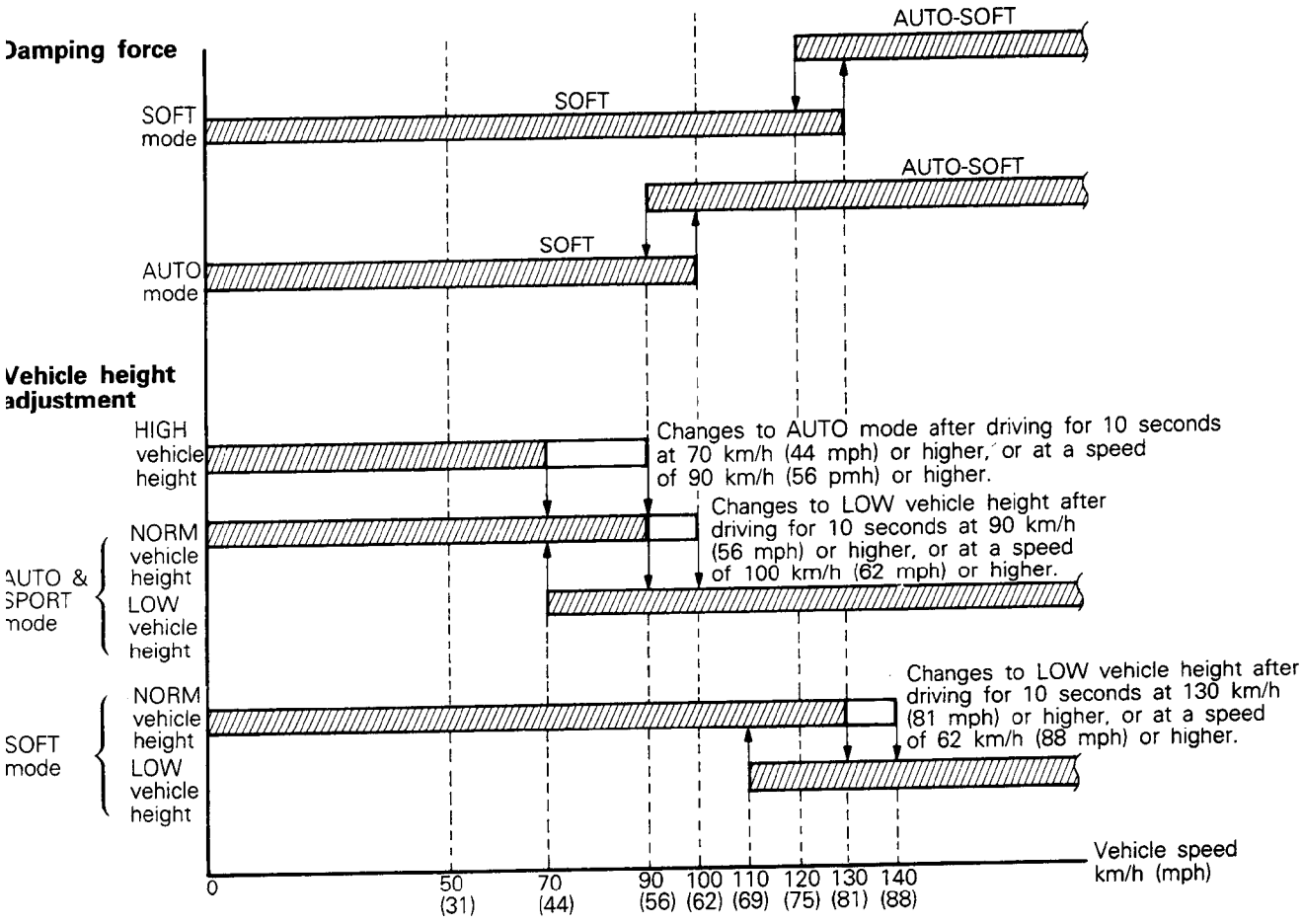
[1989 models]

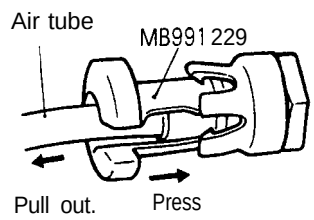
CHECKING THE VEHICLE-SPEED RESPONSE FUNCTION

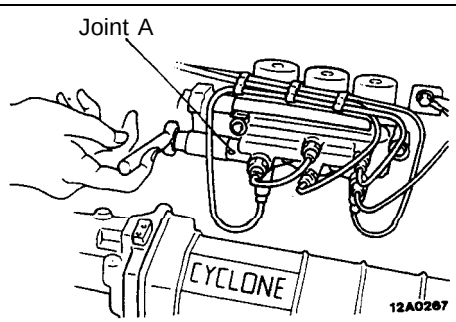
1. Start the engine.
2. Input simulated vehicle-speed signals and check whether or not there are changes of the damping force and of the vehicle height (as shown in the diagram below) according' to changes in the vehicle speed.



[From 1990 models]





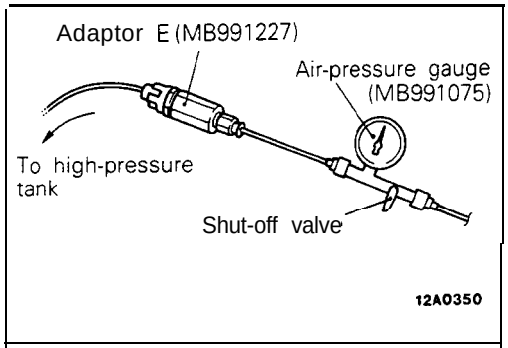


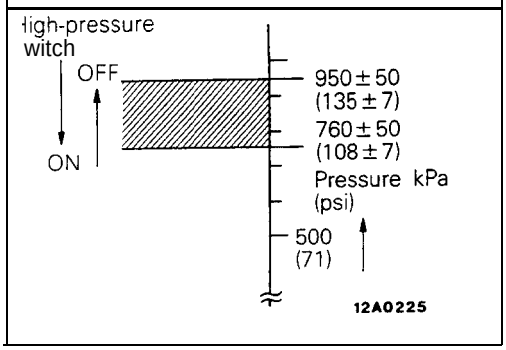
HIGH-PRESSURE SWITCH (HIGH-PRESSURE TANK SIDE) ACTUATION PRESSURE CHECK

1. Remove joint A of the yellow-marked air tube (for the front air-supply valves) of the front solenoid valve assembly.

NOTE
Removal is easier if the special tool is used to pull the air tube out, and then a socket wrench is used for removal.

TSB Revision





2. Connect the gauge side air tubes of the special tool (air-pressure gauge) to the disconnected air tube and joint, connecting them via the special tube (adaptor E).

   NOTE
   The shut-off valve of the air-pressure gauge should be closed.

3. Start the engine and activate the compressor.

   NOTE
   If the system is in normal condition, the compressor will be activated after the engine is started, because the pressure within the high-pressure tank has decreased.

4. After activation of the compressor, the pressure within the high-pressure tank will increase; check whether or not the pressure is the standard value when the compressor is stopped.

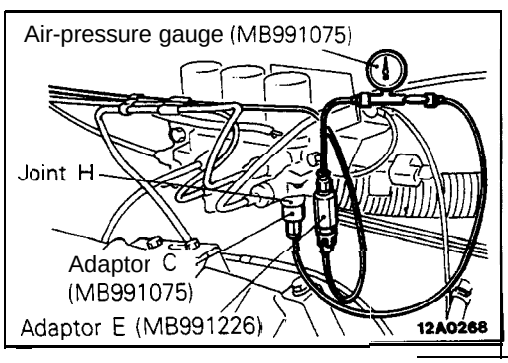
   Standard value: 900 kPa (128 psi) or higher

5. Gradually open the shut-off valve of the air-pressure gauge while watching the indicator of the air-pressure gauge; check whether or not the pressure that actuates the compressor's operation (when the pressure within the high-pressure tank has dropped) is within the standard value range.

   Standard value: 710–810 kPa (101–115 psi)

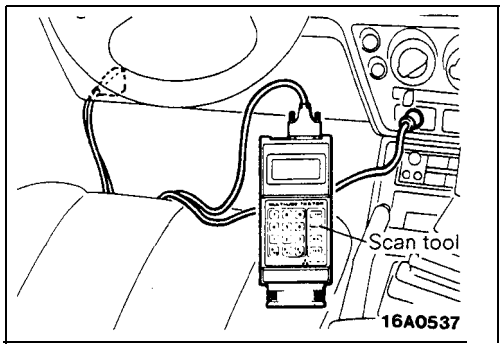
   NOTE
   The ON/OFF status of the high-pressure switch at this time can be checked by the special tool MB991269 (1989 models), MB991341 (1990, 1991, 1992 models).
   (Refer to P.33B-18.)

6. If the pressure within the high-pressure tank is not within the standard value range when the compressor is stopped (high-pressure switch OFF) or the compressor is activated (high-pressure switch ON), remove the reserve tank assembly and replace the high-pressure switch.



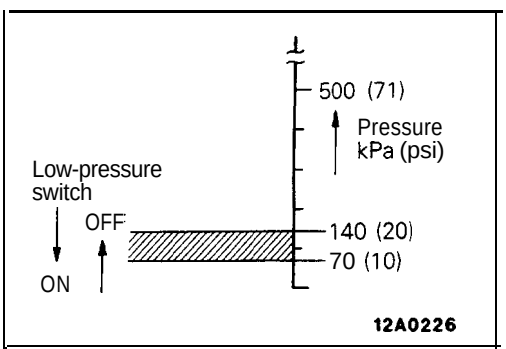
LOW-PRESSURE SWITCH (LOW-PRESSURE TANK SIDE) ACTUATION PRESSURE CHECK

1. Remove joint H of the blue-marked air tube (for the left front valve) of the front solenoid valve assembly.
2. Connect the special tool (air-pressure gauge) between the disconnected air tube and the front solenoid valve assembly by using the special tools (adaptors E and C).

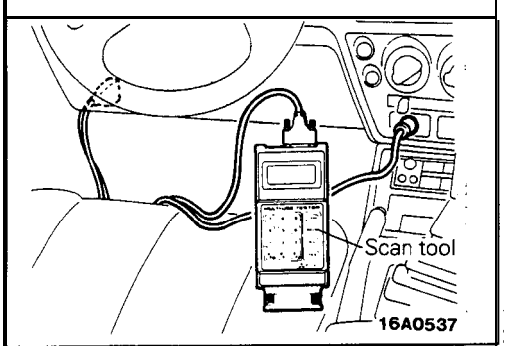


3. Connect the scan tool, start the engine, and wait until the compressor stops (the high-pressure switch is OFF).
4. Input simulated vehicle-speed signals [3 km/h (2 mph) or higher].
5. With the simulated vehicle-speed signals still being input. conduct actuator test No. 09 (left turn) or No. 10 (right turn) so as to increase the pressure within the low-pressure tank chamber.
6. During the actuator test, monitor the pressure gauge indication and check whether or not the pressure when the return pump activation starts (i.e., the maximum gauge reading) and the pressure when the return pump stops are both within the standard value.

Standard value:
Return pump actuation pressure
100–180 kPa (14-26 psi)
Return pump cut-off pressure
50 kPa (7 psi) or lower



7. If the internal pressure of the low-pressure tank is not within the standard values when the return pump operation is actuated (i.e., the low-pressure switch is OFF) or when the operation of the return pump is stopped (low-pressure switch ON), remove the reserve tank assembly and replace the low-pressure switch.



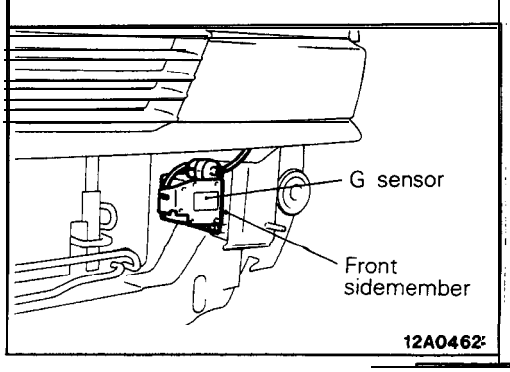
G-SENSOR OUTPUT VOLTAGE CHECK

1. Unload the vehicle and move it to a horizontal surface.
2. Connect the special tool (scan tool) and start the engine.
3. Check whether the G-sensor output voltage is within the **standard value range when the vehicle-height is the** NORMAL vehicle-height.

Standard value: 2.5 ± 0.16V

4. If the G-sensor output voltage is not within the standard value range, check the installation condition of the G sensor; if there is bolt loose, deformation of the body, etc., repair it. If the problem is not repairable, replace the G sensor.

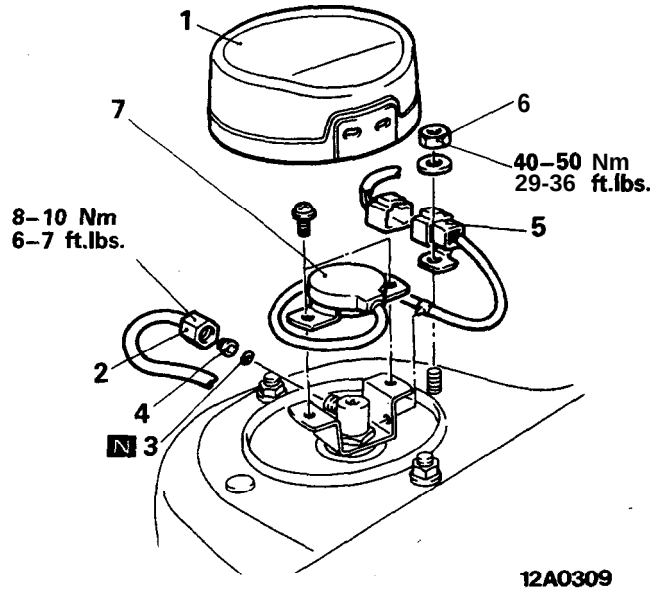
NOTE
If the G-sensor installation surface is at an angle (tilted) due to body deformation or some other cause, a washer(s) or shim(s) may be used to make an adjustment so that the output voltage is within the standard value range.



STRUT ASSEMBLY

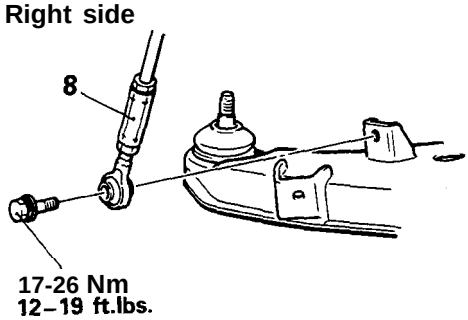
M33ZOAC

REMOVAL AND INSTALLATION

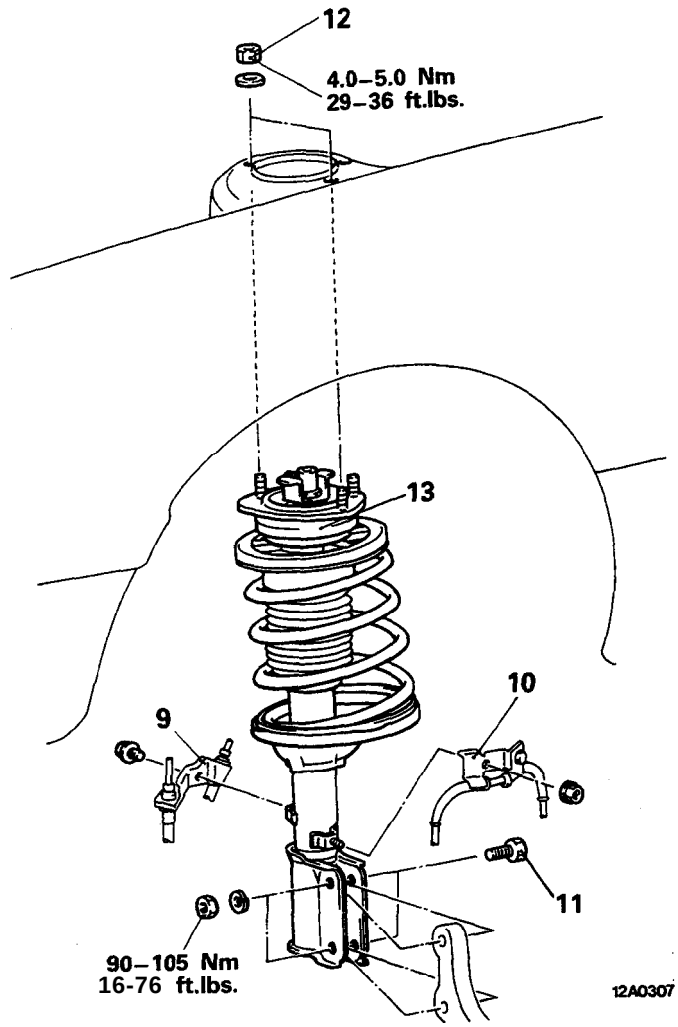


12A0309

Right side



12A0230

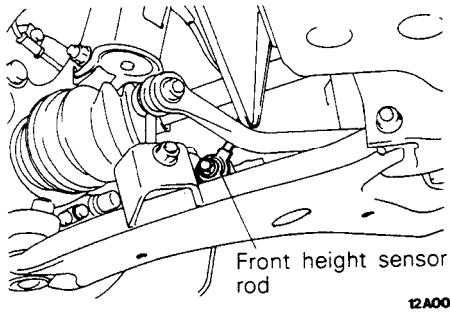


12A0307

Removal steps

- 1. Dust cover
- ● + 2. Air tube
- 3. O-ring
- 4. Bush
- 5. Actuator connector
- 6. Front strut upper mounting nut
- 7. Actuator
- ◆◆ 8. Front height sensor rod
- ◆◆ 9. Brake hose and tube clamp
- 10. Front speed sensor clamp <Vehicles with A.B.S.>
- ◆◆ 11. Front strut lower mounting bolts
- 12. Front strut upper mounting nuts
- ◆◆ 13. Strut assembly

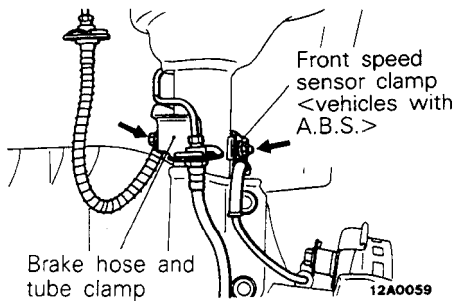
TSB Revision



SERVICE POINTS OF REMOVAL M33LBAE

8. REMOVAL OF FRONT HEIGHT SENSOR ROD

When removing the right strut assembly and knuckle union, always first remove the lower arm and front height sensor rod union.

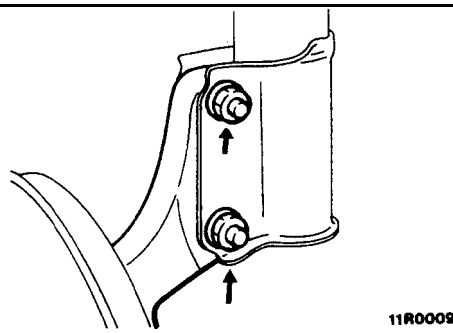


9. REMOVAL OF BRAKE HOSE AND TUBE CLAMP

Remove the brake hose and tube without prying them.

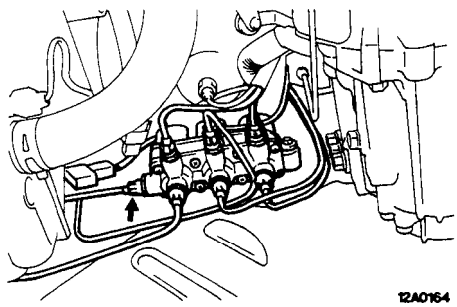
10. REMOVAL OF FRONT SPEED SENSOR CLAMP

Remove the front speed sensor clamp; be sure the front speed sensor harness doesn't stretch.



11. REMOVAL OF FRONT STRUT LOWER MOUNTING BOLTS

After the strut and knuckle union have been removed, jack up the lower arm, then hold the knuckle with wire, etc. not to pull on the brake hose and tube, the speed sensor wiring harness and the drive shaft.

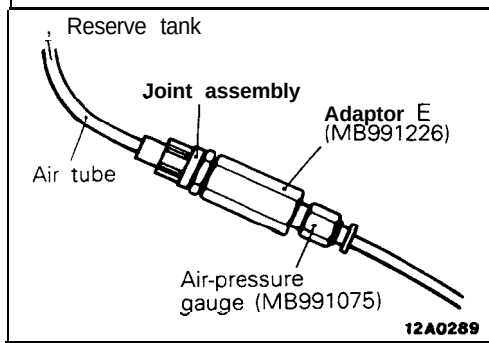


INSPECTION M33LCAC

CHECKING FOR STRUT ASSEMBLY AIR LEAKAGE

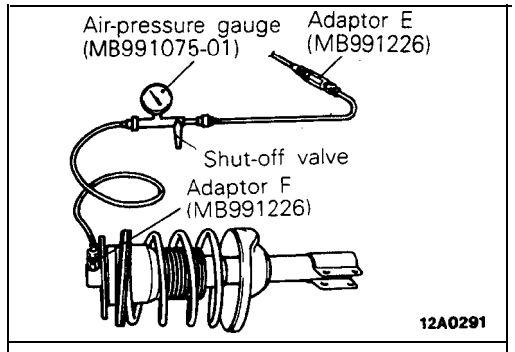
(1) Disconnect the flow-control solenoid valve's air tube (connected to the high-pressure side of the reservoir tank) shown in the illustration, and then take off the joint assembly.

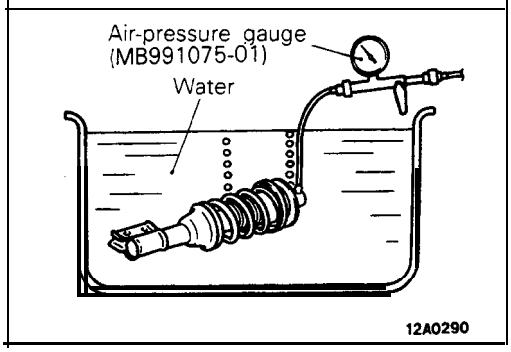
NOTE
This air tube is connected, via the reservoir tank and the dryer, to the compressor assembly.



(2) Install the removed joint assembly to the special tool (adaptor set) and then connect to the disconnected air tube.

TSB Revision





(3) Connect the air tube at the shut-off valve side of the special tool (air-pressure gauge) to the air tube side, and the other one to the strut assembly.
The installation at the strut side is done by using the special tool (adaptor set).

Caution
To prevent the entry of moisture during the strut assembly air leak check, utilize air from the dryer.

(4) Remove the compressor connector, then operate it by connecting it directly to the battery.

NOTE
Refer to P.33B-126 for compressor connector array.

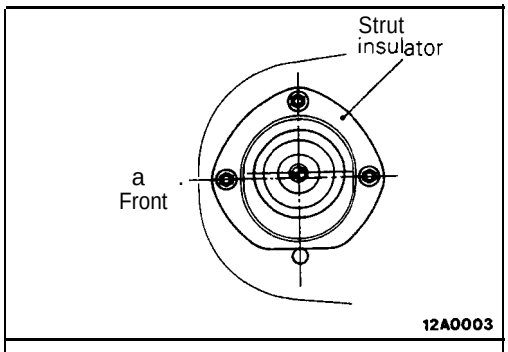
(5) Insert the strut assembly into a water tank and check for air leakage at a pressure of about 500 kPa (71 psi).

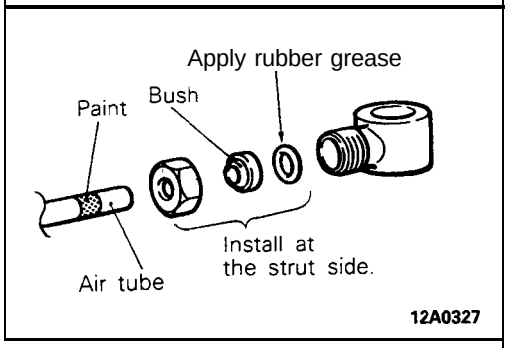
Caution
1. **Don't mistake the rise of bubbles attached to the outside of the strut for air leakage.**
2. **Dry the strut with an air blower after the check has been completed.**

(6) When air leakage is found, check the strut assembly and replace it as necessary.

CHECKING THE ACTUATOR

For detailed information concerning the checking of the actuator, refer to the troubleshooting guide and to the service adjustment procedures section.





SERVICE POINTS OF INSTALLATION M33LDAB

13. INSTALLATION OF STRUT ASSEMBLY

Install the strut assembly so that the strut insulator is in the direction shown in the figure.

NOTE
Be sure to check to be sure that the installation direction is correct, because if it is not the wheel alignment will be incorrect.

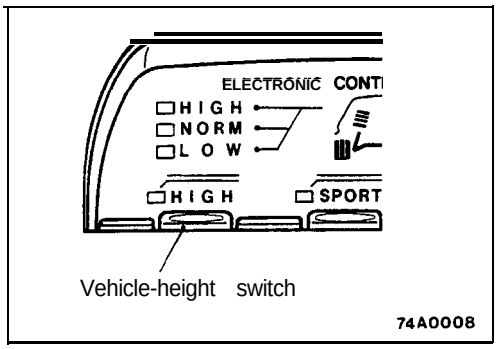
2. INSTALLATION OF AIR TUBE

(1) After coating the O-ring with rubber grease, install the O-ring, bush and flare nut to the strut assembly.

Caution
1. **The O-ring may be damaged if it is installed at the air tube side when the connection is made.**
2. **The bush must be installed so that the projection part is facing in the direction indicated in the illustration.**

(2) First insert the air tube until resistance is felt, and then push the tube in until the painted place on the air tube.

Caution
Air leakage may occur if the air tube connection is not complete and secure.

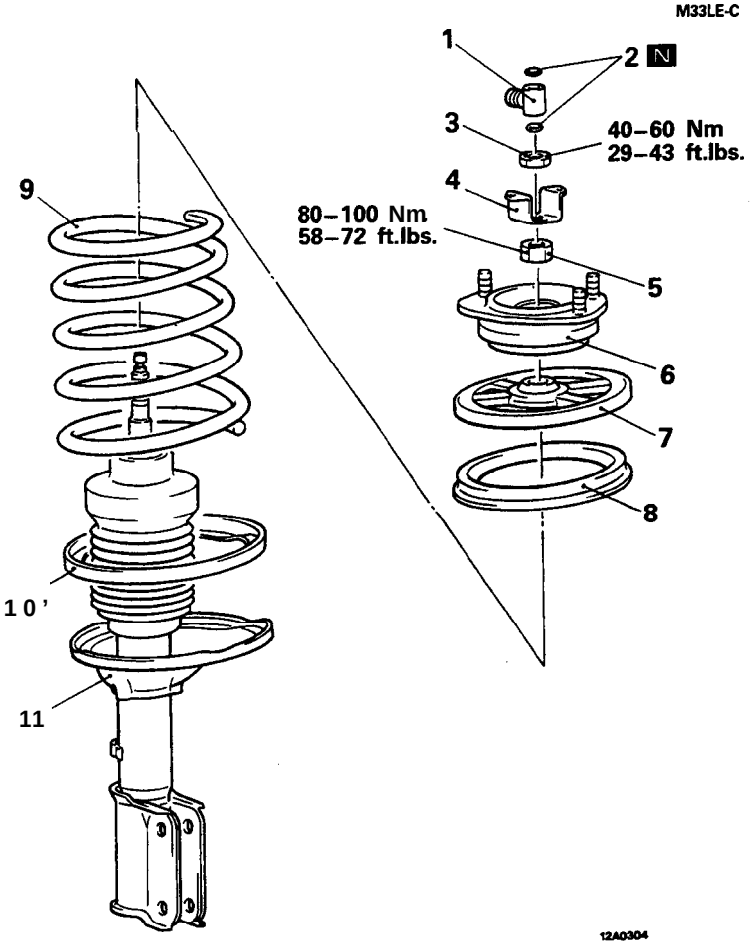


(3) In order to prevent double-folding of the air spring diaphragm after reconnection of the air tube, the vehicle-height switch should be pressed (with the vehicle lifted) two seconds or more so as to supply air to the air spring.

NOTE
By using the switch as described above, air should be introduced to the rear air springs and front air springs, in that sequence, for five seconds each.

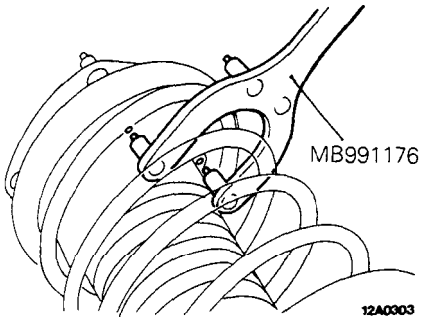
DISASSEMBLY AND REASSEMBLY

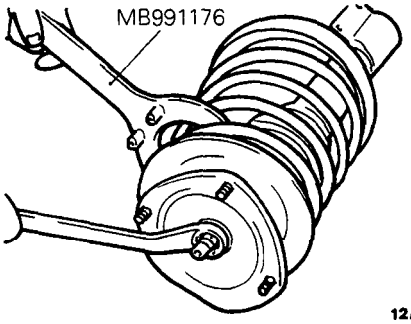
M33LE-C

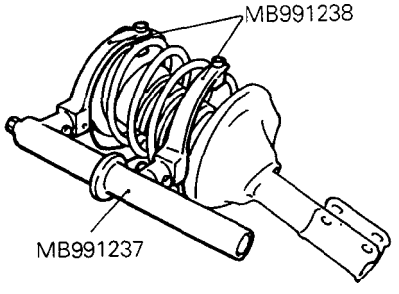


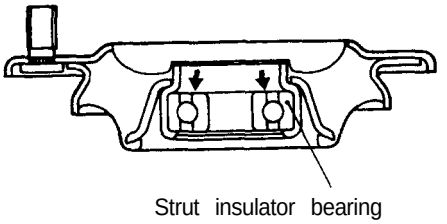
Disassembly steps

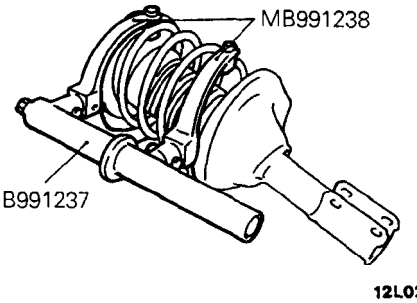
- ◆◆ 1. Joint
- ● + 2. O-ring
- 3. Actuator bracket mounting nut
- 4. Actuator bracket
- ● *● * 5. Strut insulator mounting nut
- 6. Strut insulator
- ◆◆ 7. Upper spring seat
- 8. Upper spring pad
- ● * 9. Coil spring
- 10. Lower spring pad
- 11. Strut assembly











SERVICE POINTS OF DISASSEMBLY M33LFAD

5. REMOVAL OF STRUT INSULATOR MOUNTING NUT

(1) Using the special tool, loosen (but do not remove) the strut insulator installation nut while holding the spring seat (upper).

Caution
Take care: Do not remove the nut.

(2) Using the special tool, compress the coil spring and then remove the strut insulator installation nut.

Cautions for coil spring compression during disassembly

(1) Place the strut assembly on a flat floor and attach the special tool.
(2) Install the arms of the special tool uniformly and so that, within the installation rang of the special tool, the length is maximum.
(3) Be careful that the position of attachment of the special tool's arm is not too deep or too shallow, and that the coil spring does not bend improperly during compression.

NOTE
The reinstallation of the coil spring will be made easier if, when the special tool is removed from the coil spring, a mark is made (by using a white felt pen or similar method) at the set position of the arm.

INSPECTION M33LGAC

- Check the rubber parts for damage or deterioration.
- Check the coil spring for deformation, deterioration or damage.
- Check the strut insulator bearing for wear.
- Check the shock absorber for deformation.

SERVICE POINTS OF REASSEMBLY M33LHAB

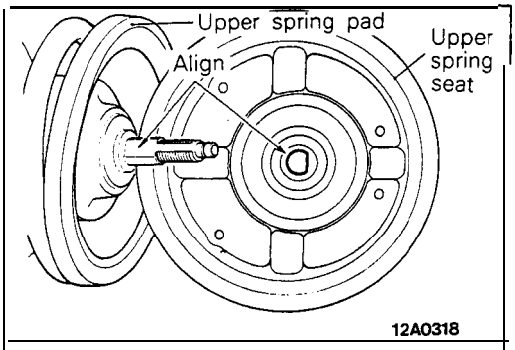
9. INSTALLATION OF COIL SPRING

Attach the special tool to the coil spring and compress the spring, and then install to the strut.

Caution for coil spring compression during reassembly

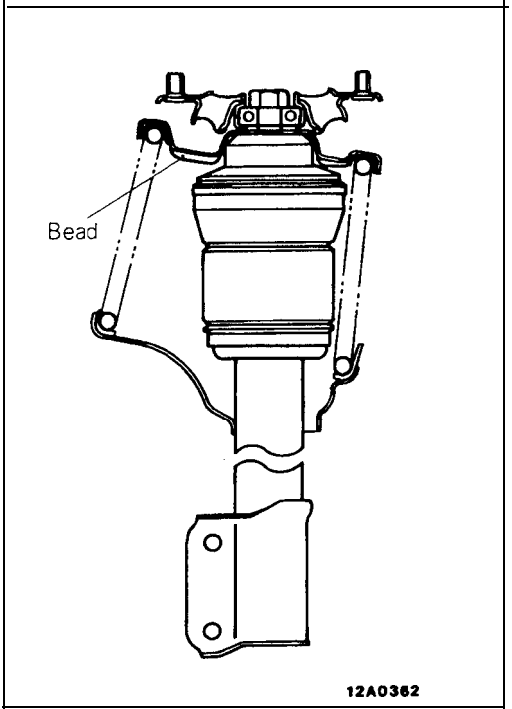
Insert the special tool from the direction opposite from the end of the coil spring, and set so that the arm's tab is at the approximate center of the coil spring's diameter.

NOTE
If the position of attachment of the arm of the special tool is too deep or too shallow, the coil spring will bend improperly during compression and will be difficult to fit to the spring seat.

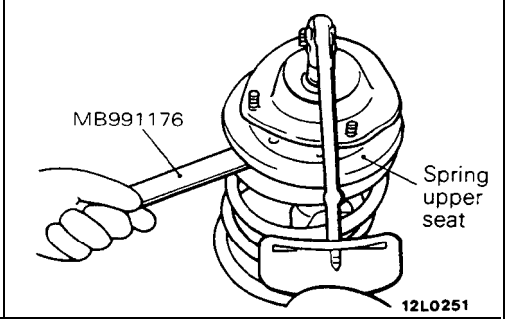


7. INSTALLATION OF UPPER SPRING SEAT

(1) Install the spring upper seat to the piston rod, and align the notched part of the piston rod and the hole in the spring seat.



(2) Align the bead of the spring upper seat and the facing direction of the knuckle bracket.



5. INSTALLATION OF STRUT INSULATOR MOUNTING NUT

Nut tightening

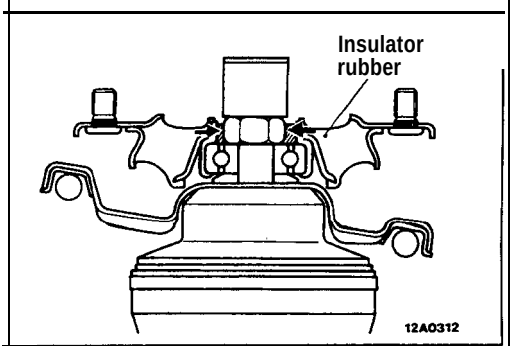
(1) **Loosely attach the strut insulator installation nut** to the strut assembly.

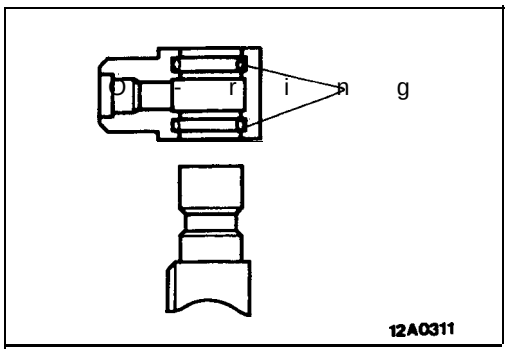
(2) Correctly align both ends of the coil spring with the groove in the spring seat, and then loosen the special tool.

(3) Using the special tool, hold the spring upper seat in place and tighten the strut insulator installation nut. Spring upper seat

(4) Apply a coating of multipurpose grease to the insulator bearing channel.

Caution
When coating with grease, take care that the grease does not adhere to the insulator rubber part.





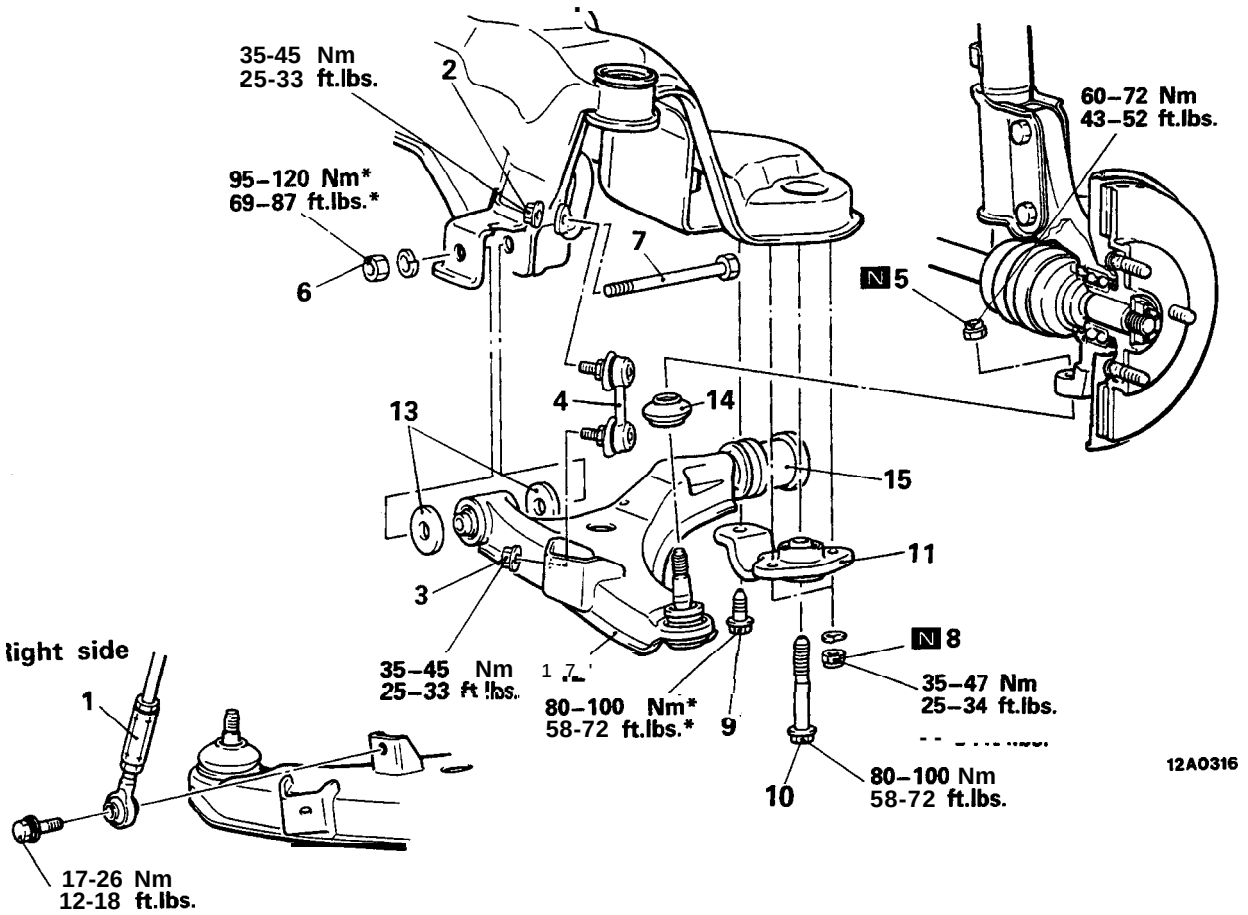
2. INSTALLATION OF O-RING/I. JOINT

Apply a coating of rubber grease to the O-ring, install it to the joint, and then install to the piston rod.

LOWER ARM

M33NA-A

REMOVAL AND INSTALLATION

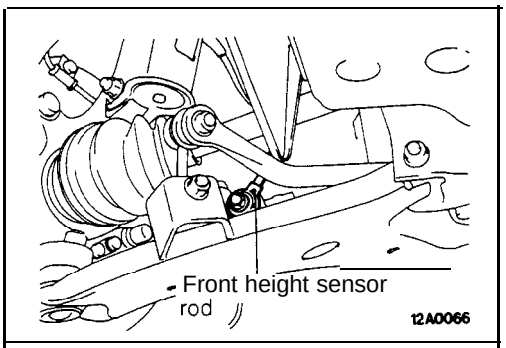


Removal steps

- ◆◆ 1. Front height sensor rod
- ◆◆ ◆◆ 2. Stabilizer link mounting nut (Stabilizer bar side)
- ◆◆ ◆◆ 3. Stabilizer link mounting nut (Lower arm side)
- 4. Stabilizer link
- ◆◆ 5. Lower arm ball-joint and knuckle coupling self-locking nut
- 6. Lower arm mounting nut
- 7. Lower arm mounting bolt
- 8. Clamp mounting self locking nut
- 9. Clamp mounting bolt (small)
- 10. Clamp mounting bolt (large)
- 11. Lower arm mounting clamp
- 12. Lower arm
- 13. Stopper
- 14. Dust cover
- 15. Rod bushing

NOTE

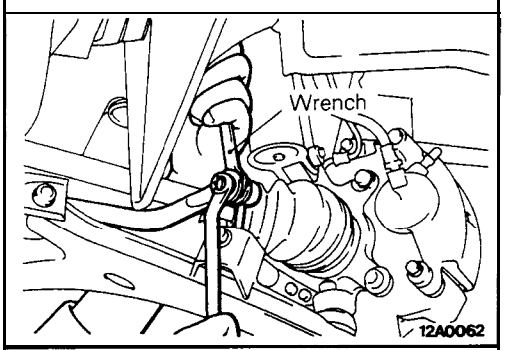
* : Indicates parts which should be temporarily tightened, and then fully tightened with the **vehicle** in the unladen condition.



SERVICE POINTS OF REMOVAL M33NBAC

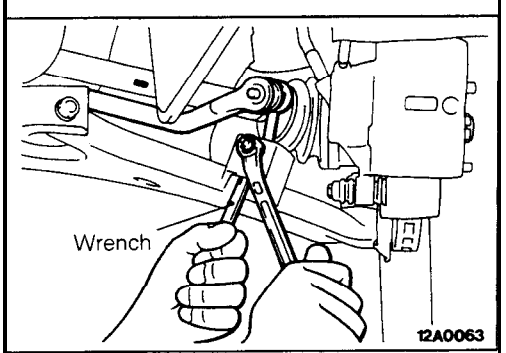
1. REMOVAL OF FRONT HEIGHT SENSOR ROD

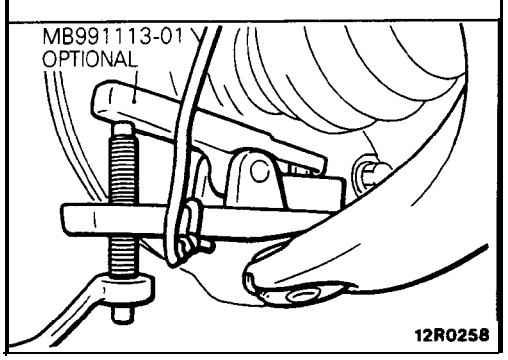
When removing the right strut assembly and knuckle union, always first remove the lower arm and front height sensor rod union.



2./3. REMOVAL OF STABILIZER LINK MOUNTING NUT

Use wrench or similar tool to secure the ball stud part at both ends of the stabilizer link, and then remove the nut.





5. REMOVAL OF LOWER ARM BALL JOINT

Using the special tool, disconnect the lower arm ball joint from the knuckle.

NOTE
(1) Always tie the cord of the special tool to the nearby part.
(2) Loosen the nut but do not remove it.

INSPECTION M33NCAB

- Check the lower arm for bend or breakage.
- Check the clamp for deterioration or damage.
- Check the bushing for wear and deterioration.
- Check the ball joint dust cover for cracks.
- Check all bolts for condition and straightness.

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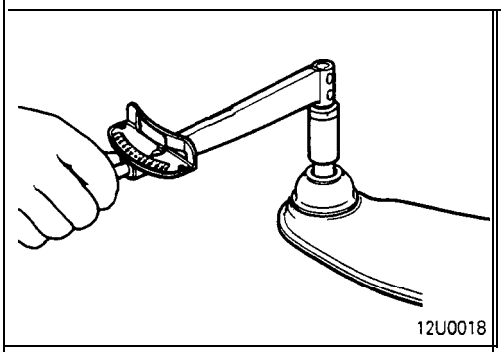
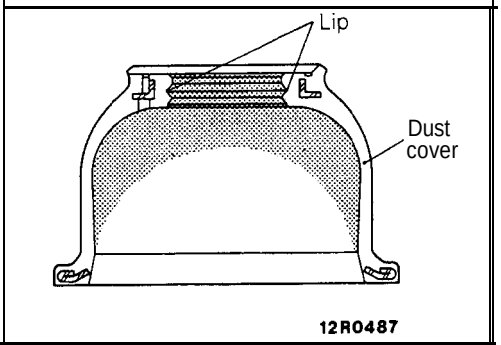


BALL JOINT CHECKING FOR STARTING TORQUE

(1) If a crack is noted in the dust cover, replace it, adding grease.
(2) Turn side to side the ball joint stud several times.
(3) Mount two nuts on the ball joint, and then measure the ball joint starting torque.

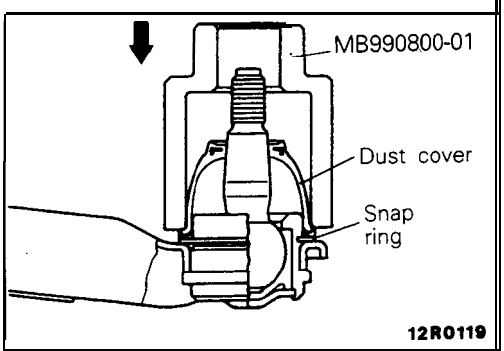
Standard value: 3–10 Nm (26-87 in.lbs.)

(4) If the starting torque exceeds the upper limit of standard value, replace the lower arm assembly.
Even if the starting torque is below the lower limit of the standard value, the ball joint may be reused unless it has drag and excessive play.



BALL JOINT DUST COVER REPLACEMENT M33NEAC

(1) Remove the dust cover.
(2) Apply multipurpose grease to the lip and inside of the dust cover.

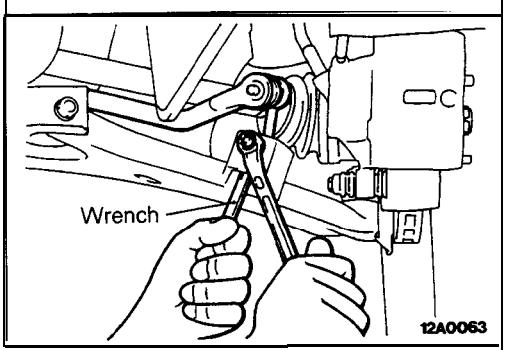


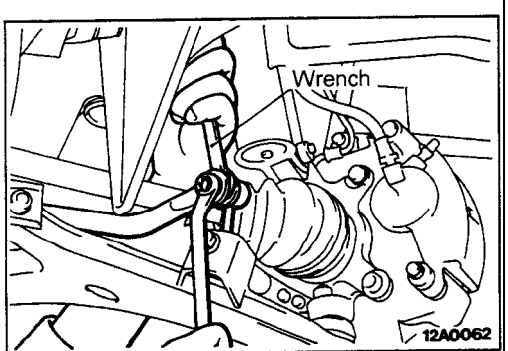
(3) Drive in the dust cover with special tool until it is fully seated.

SERVICE POINTS OF INSTALLATION M33NFAB

3./2. INSTALLATION OF STABILIZER LINK MOUNTING NUT

Use wrench or similar tool to secure the ball stud part at **both ends of the stabilizer link, and then tighten the nut.**

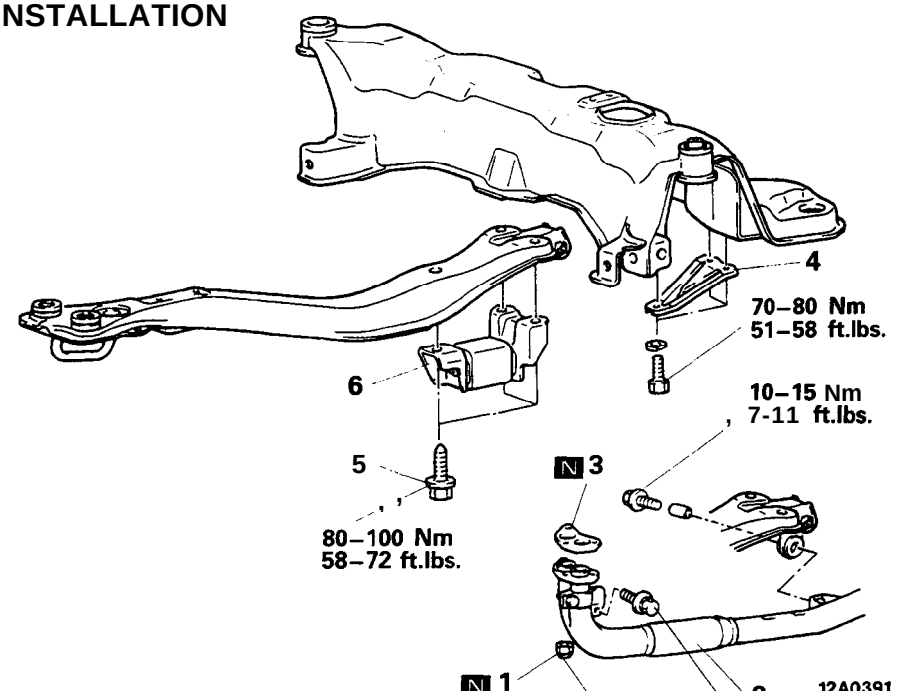




STABILIZER BAR

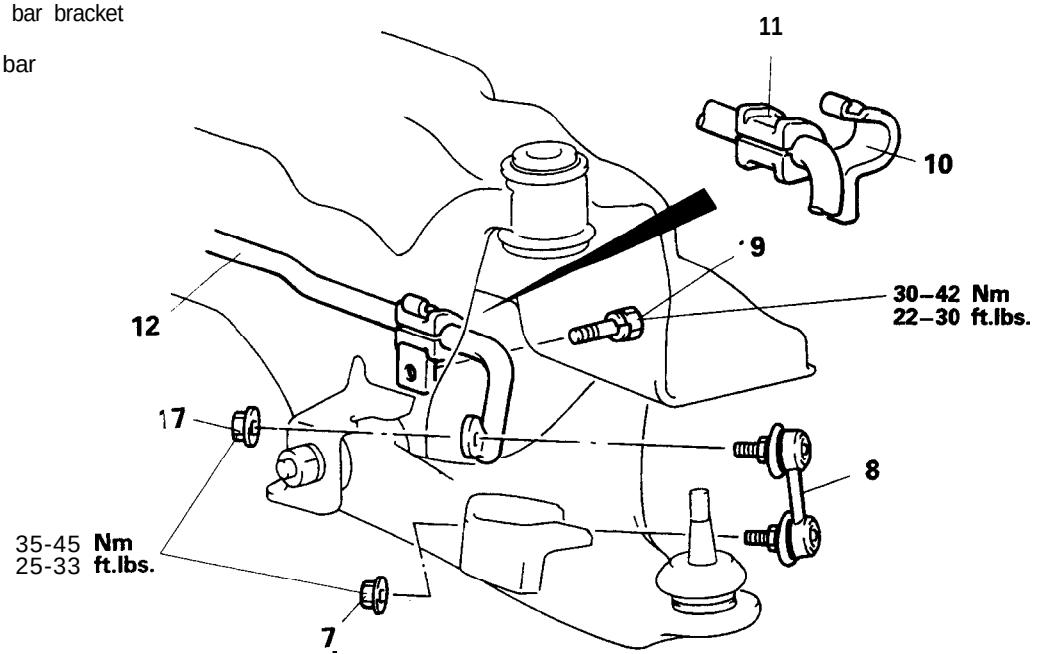
M33TA-A

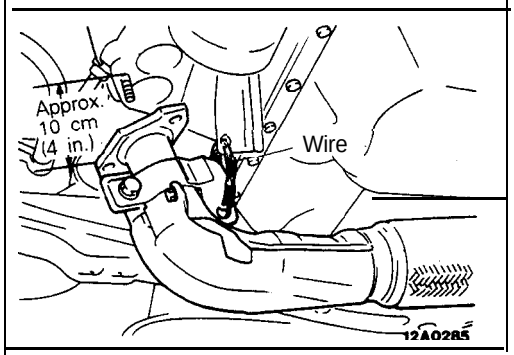
REMOVAL AND INSTALLATION



Removal steps

1. Self locking nuts
◆◆ 2. Front exhaust pipe
3. Gasket
4. Stay
5. Centermember rear installation bolts
6. Dynamic damper
◆◆ ◆◆ 7. Stabilizer link mounting nuts
8. Stabilizer link
9. Stabilizer bar bracket mounting bolt
● +10. Stabilizer bar bracket
11. Bushing
◆◆ 12. Stabilizer bar





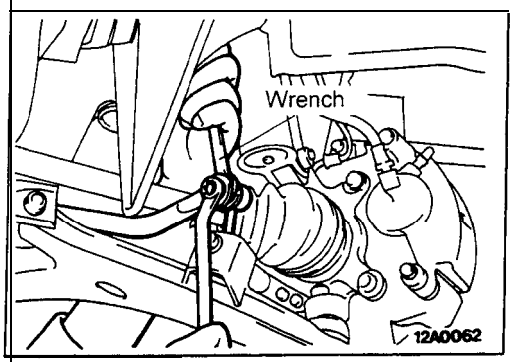
SERVICE POINTS OF REMOVAL

M33TBAAa

2. REMOVAL OF FRONT EXHAUST PIPE

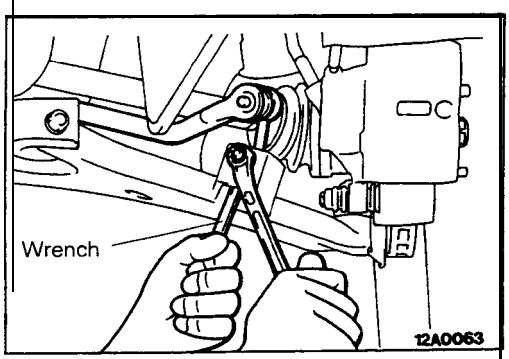
After disconnection of the front exhaust pipe assembly and the exhaust manifold, use wire, etc. to hang the front exhaust pipe down.

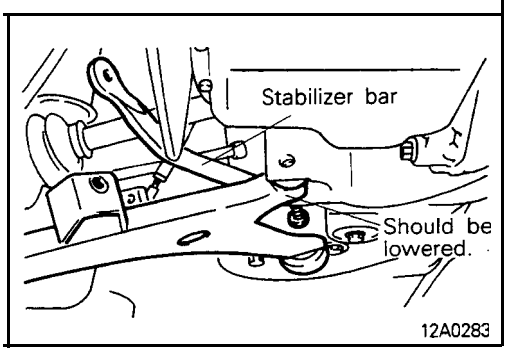
Caution
Do not bend the flexible joint more than shown in the figure, because there is danger the inside may be damaged if it is bent too much.



7. REMOVAL OF STABILIZER LINK MOUNTING NUTS

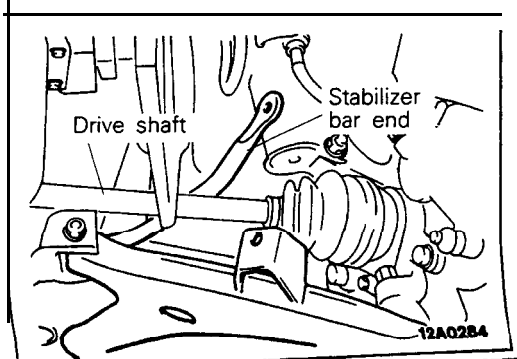
Using a wrench or similar tool to secure the ball studs at both ends of the stabilizer link, remove the mounting nuts.





12. REMOVAL OF STABILIZER BAR

(1) Disconnect either the left or right lower arm from the crossmember, and slightly lower the installation part.



(2) Pull out both ends of the stabilizer bar to the rear of the drive shaft.

NOTE
First pass the end of the stabilizer bar (at the side at which the lower arm was not lowered) under the drive shaft, and then pull out toward the rear.

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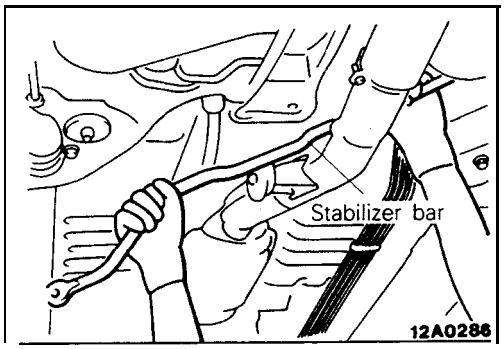


(3) Move either the left or right stabilizer bar until the end of the stabilizer bar clears the lower arm.
(4) With the end that has cleared the lower arm, pull out the stabilizer bar diagonally.

INSPECTION M33TCAH

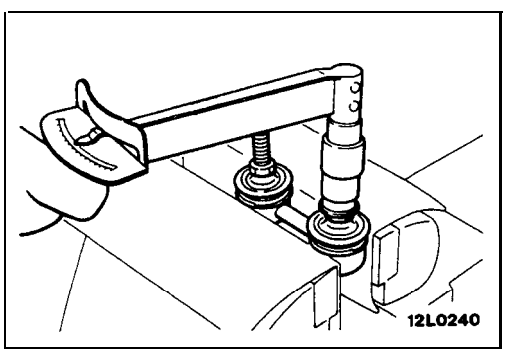
- Check the bushing for wear and deterioraton.
- Check the stabilizer bar for deterioration or damage.
- Check the stabilizer link bail joint dust cover for cracks.
- Check all bolts for condition and straightness.

CHECKING OF STABILIZER LINK BALL JOINT FOR STARTING TORQUE

(1) If a crack is noted in the dust cover, replace it, adding grease.
(2) Turn side to side the stabilizer link ball joint stud several times.
(3) Mount two nuts on the ball joint, and then measure the ball joint starting torque.

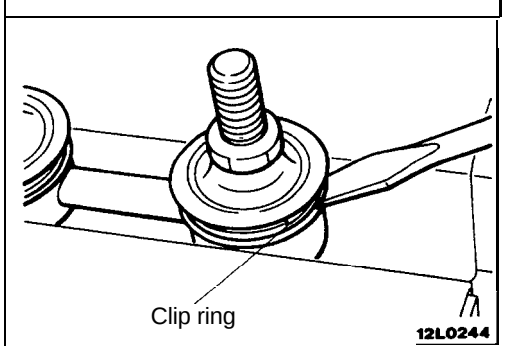
Standard value: 1.7-3.2 Nm (15-28 in.lbs.)

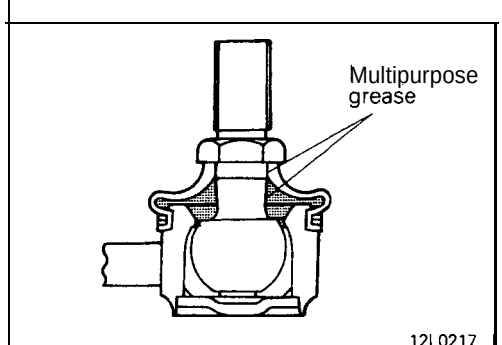
(4) If the starting torque exceeds the upper limit of standard value, replace the stabilizer link.
(5) Even if the starting torque is below the lower limit of the standard value, the ball joint may be reused unless it has drag and excessive play.



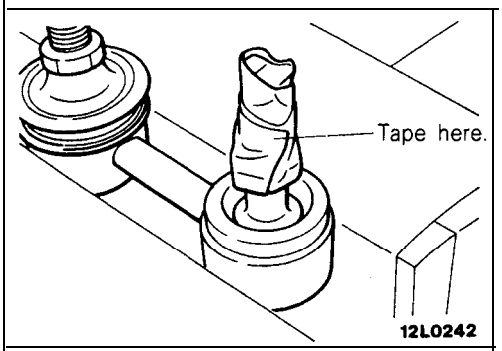
BALL JOINT DUST COVER REPLACEMENT M33TEAC

(1) Remove the clip ring and the dust cover.

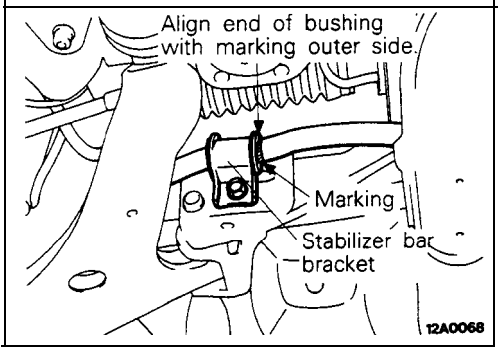




(2) Apply multipurpose grease to the lip and inside of the dust cover.



(3) Use vinyl tape to tape the stabilizer link where shown in the illustration, and then install the dust cover to the stabilizer link.
(4) Secure the dust cover by the clip link.

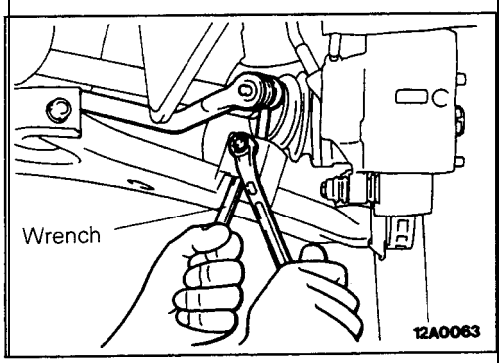


SERVICE POINTS OF INSTALLAION M33TDAN

10. INSTALLATION OF STABILIZER BAR BRACKET

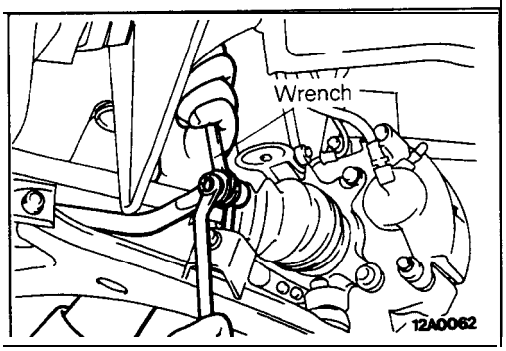
(1) Provisionally tighten the stabilizer bar bracket.
(2) Align the bushing end with the marked part of the stabilizer bar, and then fully tighten the stabilizer bar bracket.
(3) Provisionally tighten the removed lower arm installation part to the crossmember.

Caution
Make the final tightening with the vehicle in the unladen condition; the tightening should be at the specified tightening torque.



7. INSTALLATION OF STABILIZER LINK MOUNTING NUTS

Using a wrench or similar tool to secure the ball studs at both ends of the stabilizer link, tighten the mounting nuts.



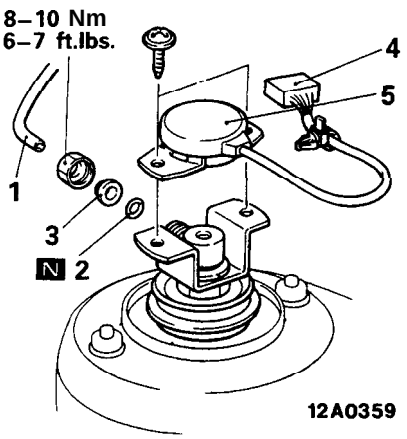
SHOCK ABSORBER ASSEMBLY

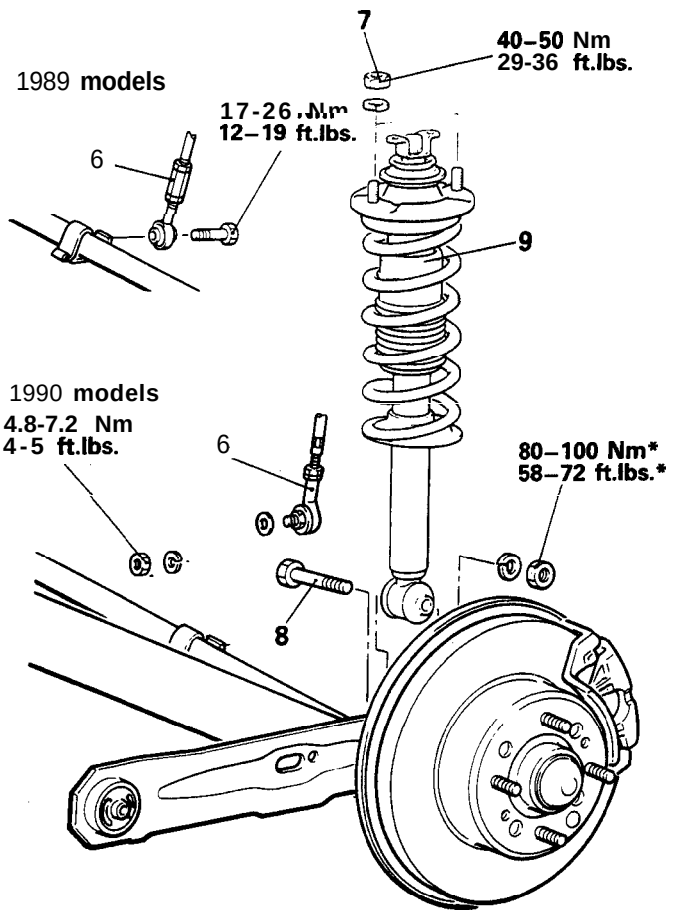
M33MA-A

REMOVAL AND INSTALLATION

Pre-removal Operation
- Removal of Trunk Room Side Trim (Refer to GROUP 52–Trims)

Post-installation Operation
- Installation of Trunk Room Side Trim (Refer to GROUP 52–Trims.)

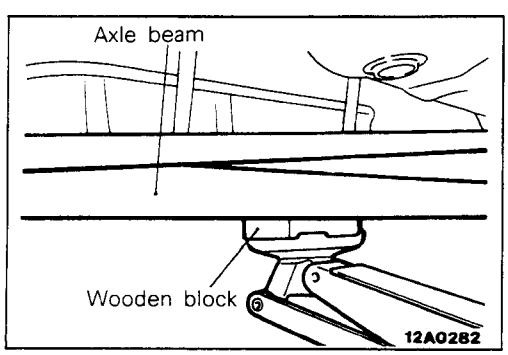




Removal steps

- ◗ ☒ 1. Air tube
  2. O-ring
  3. Bush
  4. Actuator connector
  5. Actuator
  6. Rear height sensor rod
  7. Shock absorber upper mounting nuts
  8. Shock absorber lower mounting bolts
- ◗ ☒ 9. Shock absorber assembly

NOTE
*: Points marked with an asterisk should first be tightened provisionally, then tightened fully when the vehicle is empty.



SERVICE POINTS OF REMOVAL

M33MBAI

9. REMOVAL OF SHOCK ABSORBER ASSEMBLY

(1) Jack up the torsional axle and arm assembly and keep it lifted up to some degree.

Caution
1. **Always insert a wooden block between the jack receptacle and the axle beam and place the jack at the centre of the axle beam.**
2. **Make sure that the jack does not contact the lateral rod.**

TSB Revision

(2) Remove the shock absorber upper mounting nuts and the lower mounting bolts, and then remove the shock absorber assembly.

INSPECTION M33MCAB

CHECKING FOR SHOCK ABSORBER ASSEMBLY AIR LEAKAGE

For information concerning checking for air leakage of the shock absorber assembly, refer to the section concerning the strut assembly (P.33B-98.)

CHECKING ACTUATOR

For information concerning the checking of the actuator, refer to the troubleshooting guide and the service adjustment procedures section.

SERVICE POINTS OF INSTALLATION M33MEAF

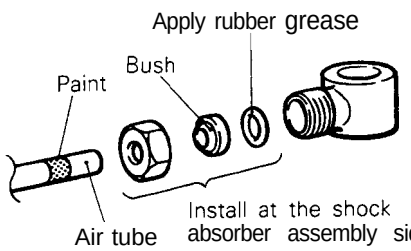
1. CONNECTION OF AIR TUBE

(1) After applying a coating of rubber grease to the O-ring, install the O-ring, bush and joint at the shock absorber assembly side.

Caution

1. The O-ring might be damaged if it is installed at the air tube side and then the insertion is made.

2. The bush must be installed so that the projection part is facing in the direction indicated in the illustration.



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(2) First insert the air tube until resistance is felt, and then push in the tube until the painted place on the air tube.

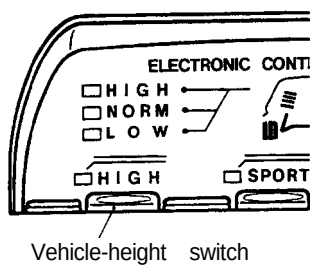
Caution

Air leakage may occur if the air tube connection is not complete and secure.

(3) In order to prevent double-folding of the air spring diaphragm after reconnection of the air tube. the vehicle-height switch should be pressed (with the vehicle lifted) two seconds or more so as to supply air to the air spring.

NOTE

By using the switch as described above, air should be introduced to the rear air springs and front air springs, in that sequence, for five seconds each.



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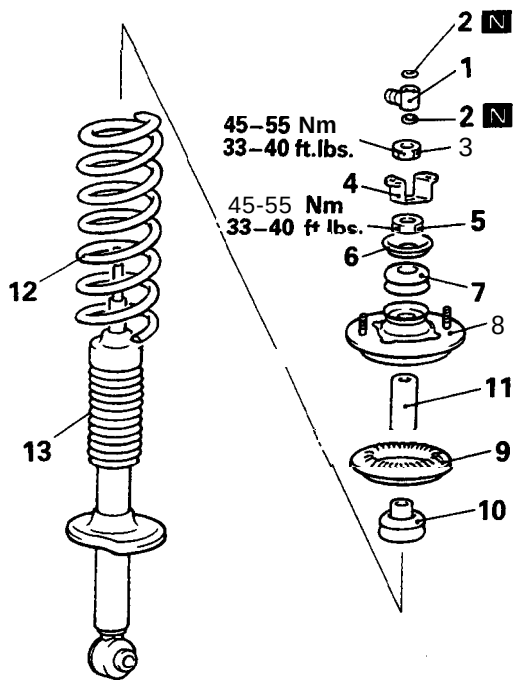
DISASSEMBLY AND REASSEMBLY

M33MU-A

Disassembly steps

- ● + 1. Joint
- ◆◆ 2. O-ring
- 3. Actuator bracket mounting nut
- 4. Actuator bracket
- ◆◆◆◆ 5. Piston rod tightening nut
- 6. Washer
- 7. Upper bushing (A)
- ◆◆ 8. Bracket assembly
- 9. Spring pad
- 10. Upper bushing (B)
- 11. Collar
- ● a 12. Coil spring
- 13. Shock absorber



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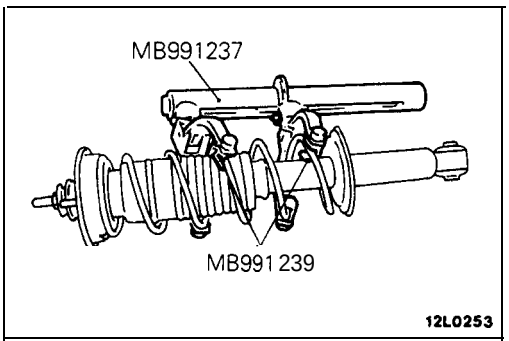

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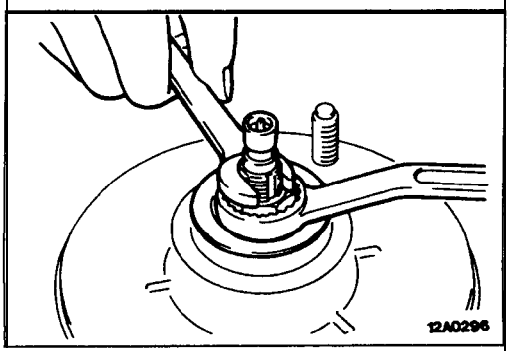

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SERVICE POINTS OF DISASSEMBLY

M33MVAB

5. REMOVAL OF PISTON ROD TIGHTENING NUT

(1) Compress the coil spring using the special tool.

Caution
Do not use an air tool to tighten the bolt of the special tool.

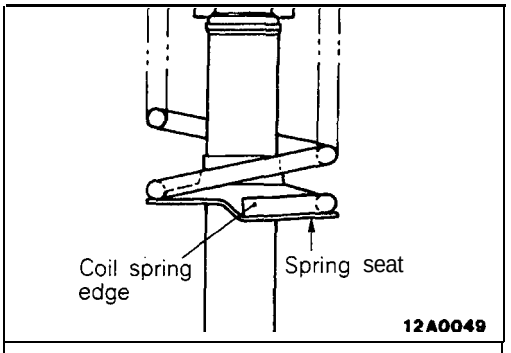
(2) While holding the piston rod, remove the piston rod tightening nut.

TSB Revision

INSPECTION

M33MQAB

- Check the rubber parts for damage.
- Check the coil springs for crack, damage or deterioration.
- Check the shock absorber for oil leakage malfunction and abnormal sound.

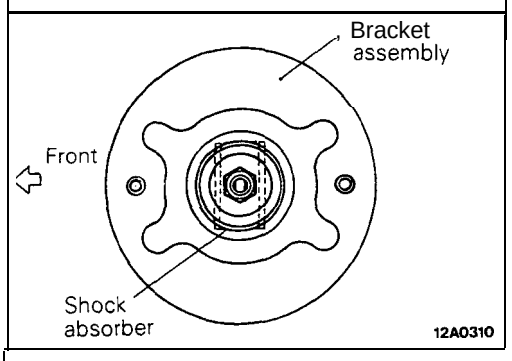


SERVICE POINTS OF REASSEMBLY

M33MWAB

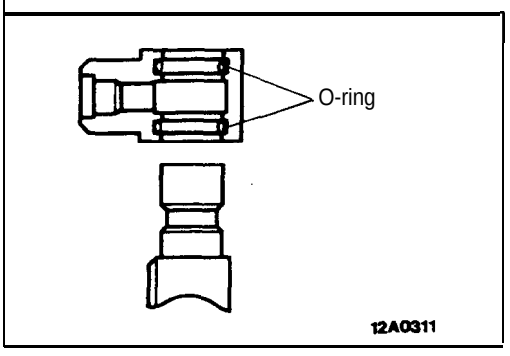
12. INSTALLATION OF COIL SPRING

(1) Use the special tool (MB991237 and MB991239) to compress the coil spring and insert it in the shock absorber.
(2) Align the edge of the coil spring to the position of the shock absorber spring seat as shown.



8. INSTALLATION OF BRACKET ASSEMBLY/5. PISTON ROD TIGHTENING NUT

(1) With the position of the bracket assembly as shown in the figure, tighten the tightening nut to the specified torque.
(2) Install the coil spring so that the lower edge fits into the spring seat groove and the upper edge fits into the spring pad groove, then remove the special tool (MB991237 and MB991239).



2. INSTALLATION OF O-RING/1. JOINT

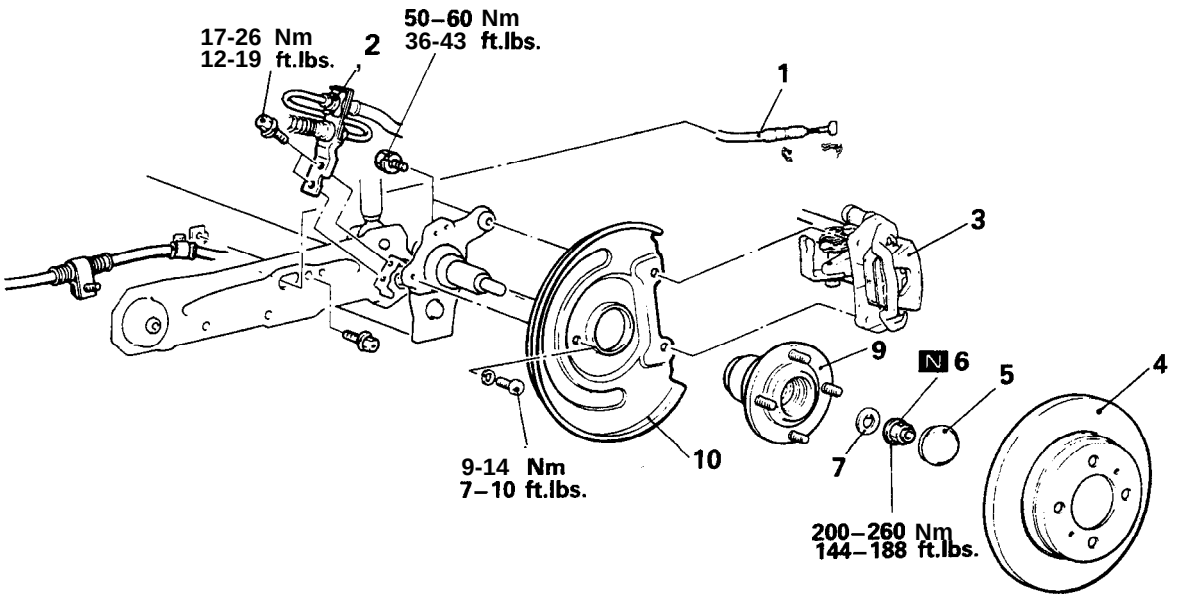
Apply a coating of rubber grease to the O-ring, install it to the joint, and then install to the piston rod.

TSB Revision

REAR SUSPENSION ASSEMBLY

M33GA-A

REMOVAL AND INSTALLATION



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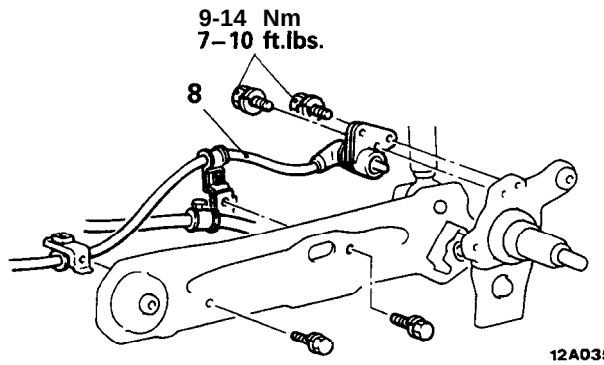
Vehicles with A.B.S.



12A0356

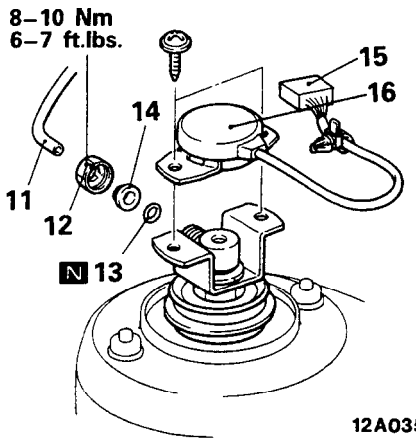
Pre-removal Operation
- Removal of Trunk Room Side Trim (Refer to GROUP 52–Trims.)

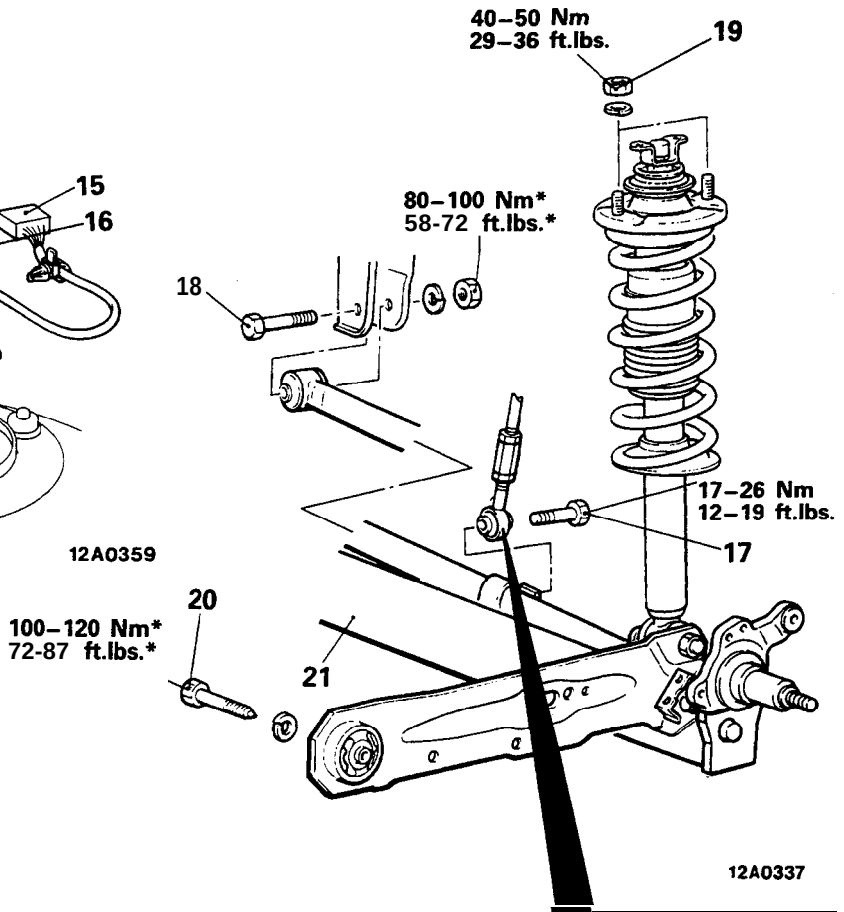
Removal steps

1. Parking brake cable
2. Brake tube and hose bracket
3. Rear disc brake
4. Brake disc
5. Hub cap
- \+ 6. Flange nut
7. Washer
8. Speed sensor <Vehicles with A.B.S.>
9. Rear axle assembly
10. Dust shield

Post-installation Operation
- installation of Trunk Room Side Trim. (Refer to GROUP 52–Trims.)
- Check the Brake Disc Runout, and Adjust. (Refer to GROUP 35–Service Adjustment. Procedures.)
- Check the Rear Disc Brakes Dragging Torque, and Adjust. (Refer to GROUP 35–Service Adjustment Procedures.)
- Checking Parking Brake Lever Stroke. (Refer to GROUP 36–Service Adjustment Procedures.)
- Check the Rolling Diaphragm for Double-folding. (Refer to P.33B-89.)

TSB Revision

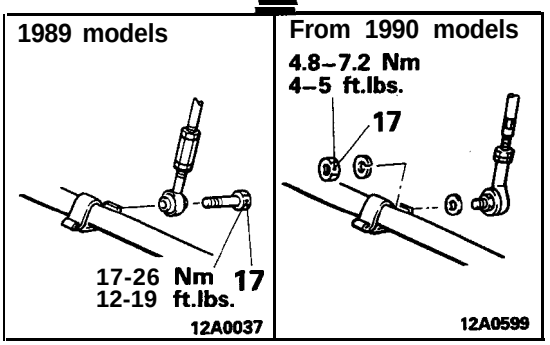


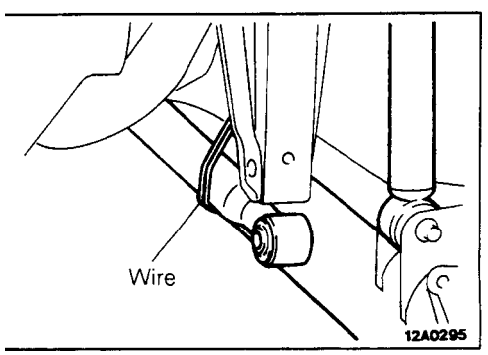


Removal steps

- Air tube
- 12. Joint
- 13. O-ring
- 14. Bush
- 15. Actuator connector
- 16. Actuator
- 17. Rear heiaht sensor rod mounting bolt (1989 models)
- 17-1. Rear height sensor rod mounting nut (From 1990 models)
- ◆◆ 18. Lateral rod mounting bolt (body side)
- ◆◆ 19. Shock absorber upper mounting nuts
- ◆◆ 20. Trailling arm mounting bolts
- ◆◆ 21. Rear suspension assembly

NOTE
*: Points marked with an asterisk shoud first be tightened provisionally, then tightened fully when the vehicle is empty.



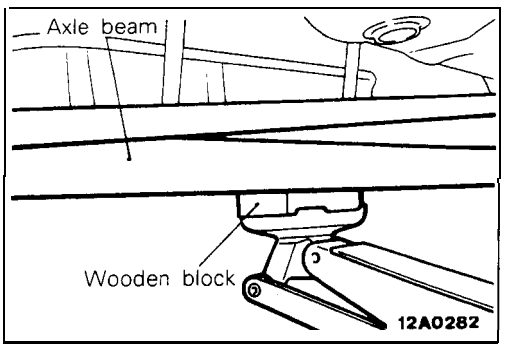


SERVICE POINTS OF REMOVAL M33GBBE

18. REMOVAL OF LATERAL ROD MOUNTING BOLT (BODY SIDE)

(1) Remove the lateral rod from the body.
(2) Secure and hold the lateral rod to the axle beam with wire, etc.

TSB Revision



19. REMOVAL OF SHOCK ABSORBER UPPER MOUNTING NUTS/20. TRAILING ARM MOUNTING BOLTS/21. REAR SUSPENSION ASSEMBLY

(1) Jack up the torsion axle and arm assembly in order to raise it slightly.

Caution

1. Always insert a wooden block between the jack receptacle and the axle beam and place the jack at the centre of the axle beam.

2. Make sure that the jack does not contact the lateral rod.

(2) Remove the shock absorber mounting bolts and the trailing arm mounting bolts.

(3) Lower the jack slowly, and then remove the rear suspension assembly.

INSPECTION M33GCBC

- Check the trailing arm and axle beam for deformation or damage.
- Check the torsion bar for damage.
- Check the lateral rod for damage or deformation.
- Check the bushings for cracking, deterioration, or unusual wear.

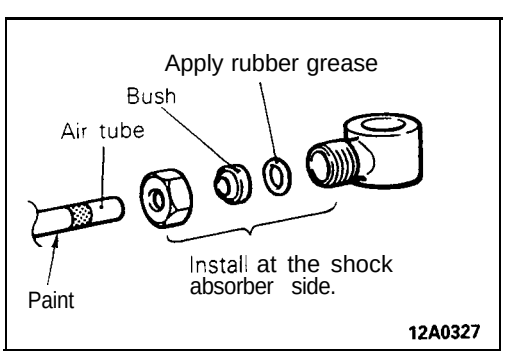
BUSHING REPLACEMENT

TRAILING ARM BUSHING

Refer to P.33B-121.

LATERAL ROD BUSHING

Refer to P.33B-118.



SERVICE POINTS OF INSTALLATION M33GDBC

11. CONNECTION OF AIR TUBE

(1) After applying a coating of rubber grease to the O-ring, install the O-ring, bush and joint at the shock absorber assembly side.

Caution

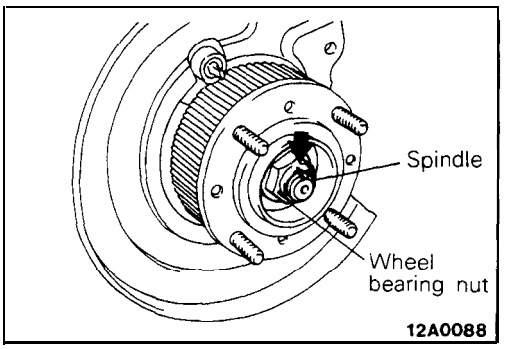
1. The O-ring may be damaged if it is installed at the air tube side when the connection is made.

2. The bush must be installed so that the projection part is facing in the direction indicated in the illustration.

(2) First insert the air tube until resistance is felt, and then push in the tube until the painted place on the air tube.

Caution

Air leakage may occur if the air tube connection is not complete and secure.



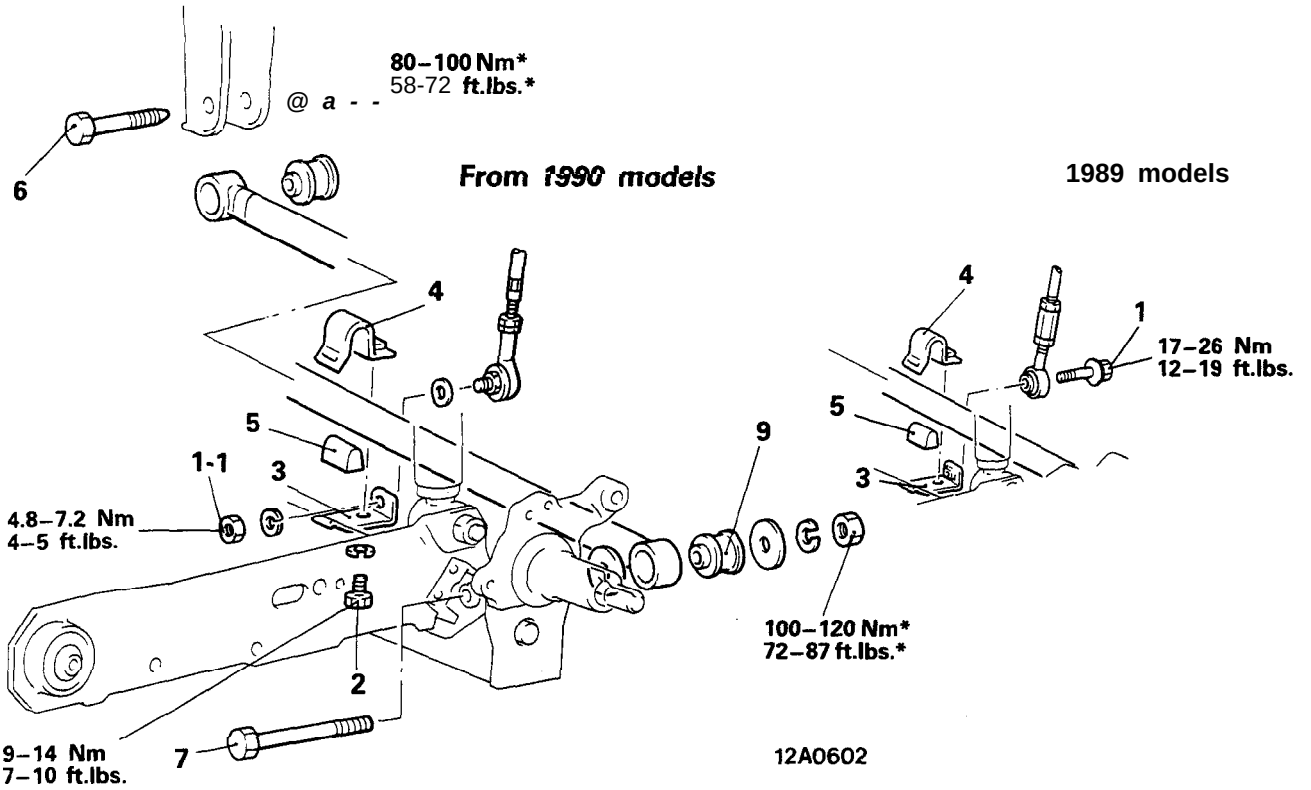
6. INSTALLATION OF THE FLANGE NUT

After tightening the flange nut, align with the indentation in the spindle, and crimp.

LATERAL ROD

REMOVAL AND INSTALLATION

M33UA-A



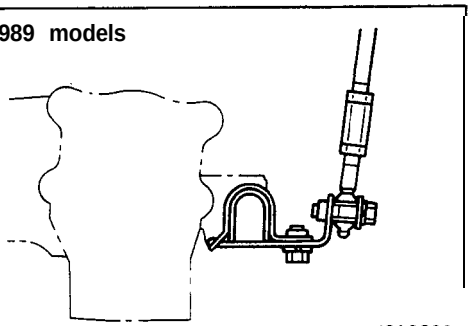
Removal steps

◆◆ 1. Rear height sensor rod mounting bolt (1989 models)
1-1. Rear height sensor rod mounting nut (From 1990 models)
● +2. Rear height sensor bracket mounting bolt
3. Rear height sensor bracket B
4. Rear heigh sensor bracket A
5. Spacer
6. Lateral rod mounting bolt (body side)
◆◆ 7. Lateral rod mounting bolt (axle beam side)
Lateral rod
9. Lateral rod bushing

NOTE
*: Points marked with an asterisk should first be tightened provisionally, then tightened fully when the vehicle is empty.

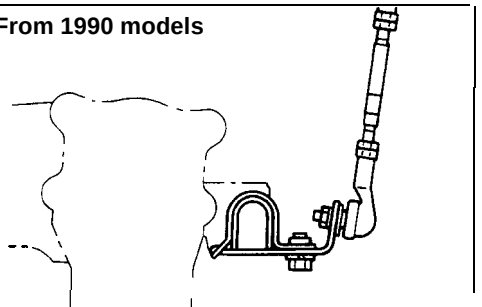
TSB Revision

1989 models

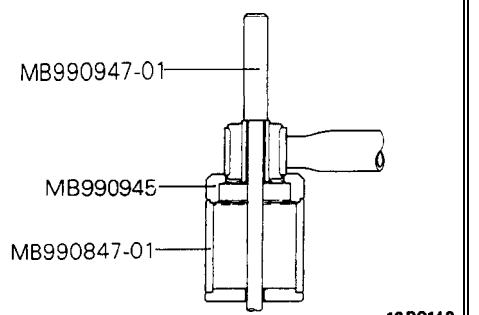


12A0600

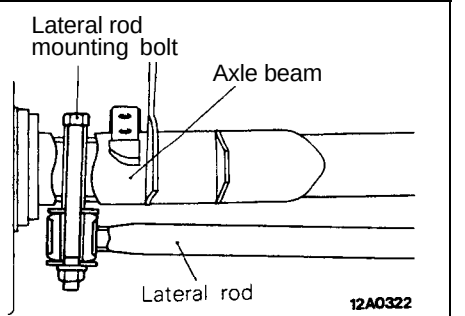
From 1990 models



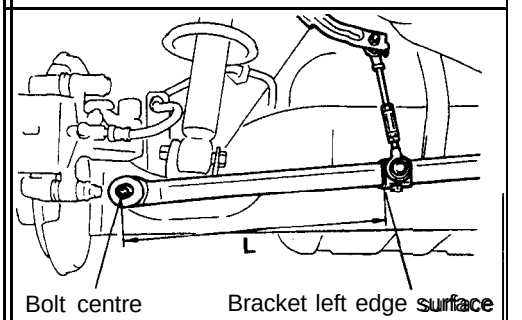
12A0601



12R0142



12A0322



12A0064

SERVICE POINTS OF REMOVAL M33UBBA

1. REMOVAL OF REAR HEIGHT SENSOR ROD

NOTE

If anything other than the rear height sensor rod mounting bolt are removed, the height sensor installation dimension must be readjusted so remove other parts only when absolutely necessary.

INSPECTION M33UCAA

- Check lateral rod for damage and deformation.
- Check each bushing for cracks, deterioration and wear.

LATERAL ROD BUSHING REPLACEMENT M33UEAA

(1) Drive out the lateral rod bushing using the special tools.
(2) Press in the bushing using the special tools so that the amount of projection is equal at the left and right.

SERVICE POINTS OF INSTALLATION M33UDAA

7. INSTALLATION OF LATERAL ROD MOUNTING BOLT (AXLE BEAM SIDE)

Install the lateral rod mounting bolt from the direction shown in the illustration.

2. ADJUSTMENT OF REAR HEIGHT SENSOR BRACKET MOUNTING BOLT

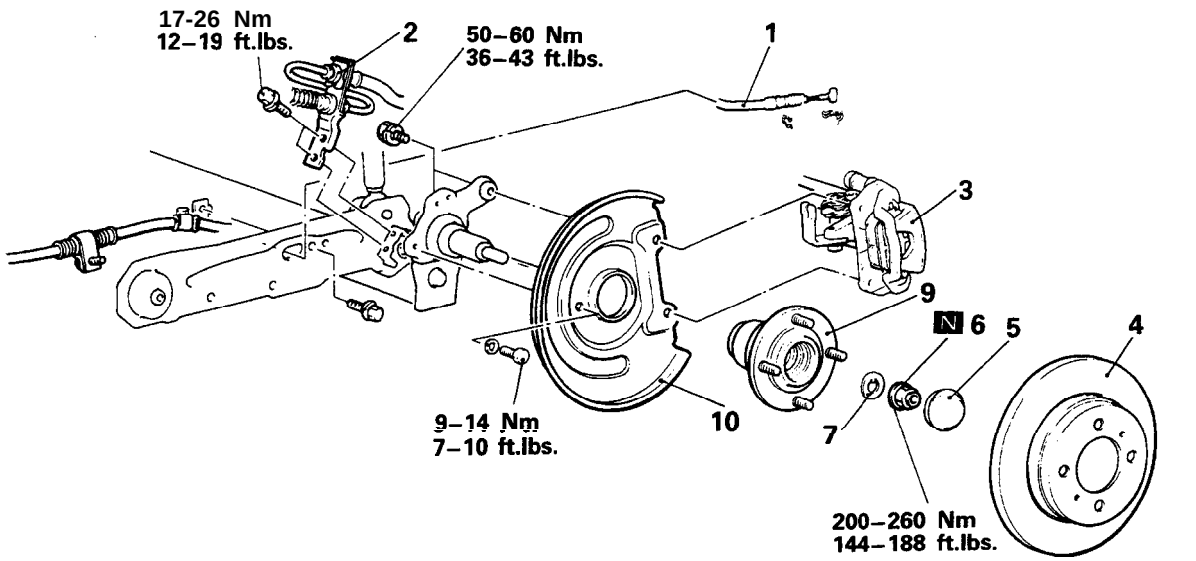
Move the height sensor bracket so that the display dimensions assume the standard values, then secure the bracket in place with the height sensor bracket mounting bolts.

Standard value (L): 315 ± 1 mm (12.4 ± .04 in.)

TORSION AXLE AND ARM ASSEMBLY

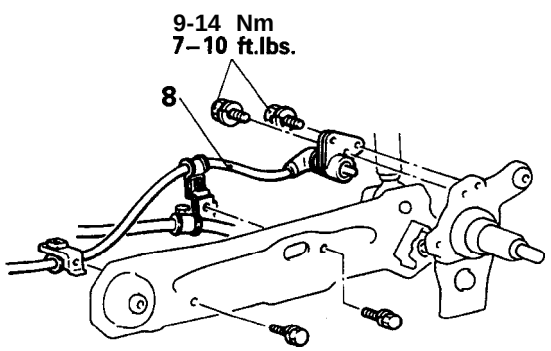
M33PA-A

REMOVAL AND INSTALLATION



12A0355

Vehicles with A.B.S.



12A0356

Removal steps

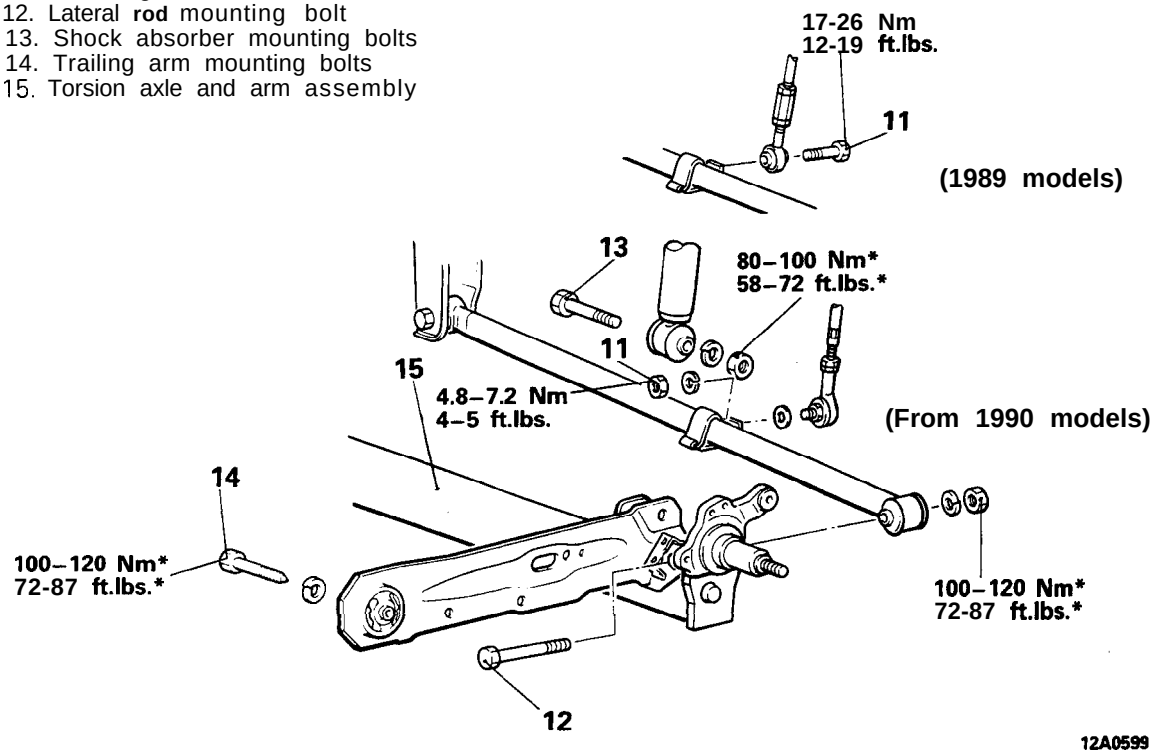
1. Parking brake cable
2. Brake hose and tube bracket
3. Rear disc brake
4. Rear brake disc
5. Hub cap
- ◆◆ 6. Flange nut
7. Washer
8. Speed sensor <vehicles with A.B.S.>
9. Rear axle assembly
10. Dust shield

Post-installation Operation

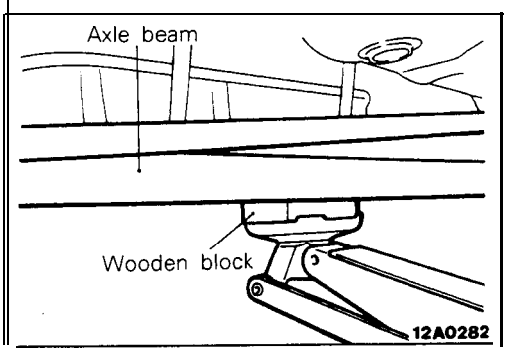
- Check the Brake Disc Runout, and Adjust. (Refer to GROUP 35–Service Adjustment Procedures.)
- Check the Rear Disc Brakes Dragging Torque, and Adjust. (Refer to GROUP 35–Service Adjustment Procedures.)
- Checking for Parking Brake Lever Stroke. (Refer to GROUP 35–Service Adjustment Procedures.)

TSB Revision

11. Rear height sensor rod mounting bolt or nut
◆◆ 12. Lateral **rod** mounting bolt
◆◆ 13. Shock absorber mounting bolts
◆◆ 14. Trailing arm mounting bolts
◆◆ 15. Torsion axle and arm assembly



VOTE
*: Points marked with an asterisk should first be tightened provisionally, then tightened fully when the vehicle is empty.



SERVICE POINTS OF REMOVAL M33PBAF

13. REMOVAL OF SHOCK ABSORBER MOUNTING BOLTS/14. TRAILING ARM MOUNTING BOLTS/15. TORSION AXLE AND ARM ASSEMBLY

(1) Jack up the torsion axle and arm assembly in order to raise it slightly.

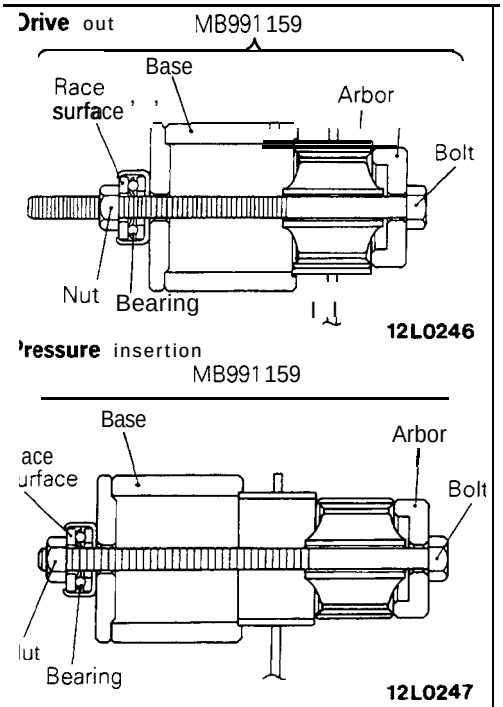
Caution
1. **Always insert a wooden block between the jack receptacle and the axle beam and place the jack at the centre of the axle beam.**
2. **Make sure that the jack does not contact the lateral rod.**

(2) Remove the shock absorber mounting bolts and the trailing arm mounting bolts.
(3) Lower the jack slowly, and then remove the torsion axle and arm assembly.

INSPECTION M33PCAE

- Check the trailing arm and axle beam for deformation or damage.
- Check the torsion bar for damage.

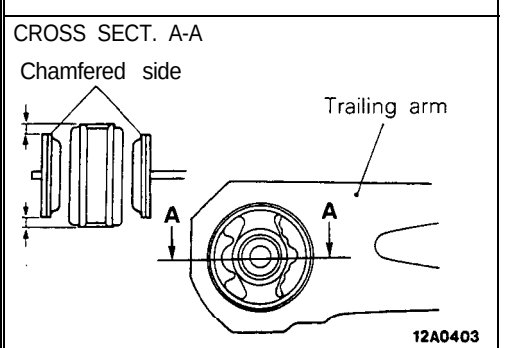
TSB Revision



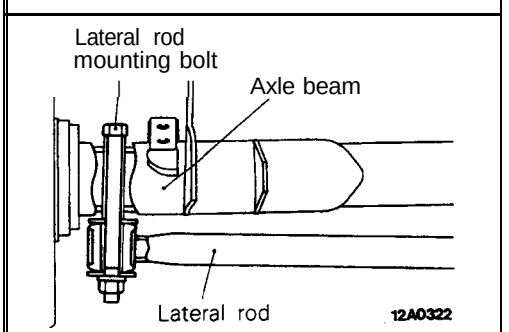
TRAILING ARM BUSHING REPLACEMENT M33PEAA

(1) Drive out and press in the arm bushing using the special tool.

Caution
Mount the bearing of the special tool so that the race surface faces toward the nut.



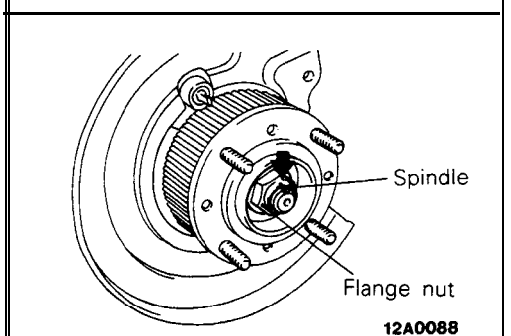
(2) Press in the bushing from the chamfered side onto the trailing arm so that the hole is in position as shown.
(3) Press in the bushing so that the amount of projection is uniform throughout.



SERVICE POINTS OF INSTALLATION M33PDAB

12. INSTALLATION OF LATERAL ROD MOUNTING BOLT

Install the lateral rod mounting bolt from the direction shown in the illustration.



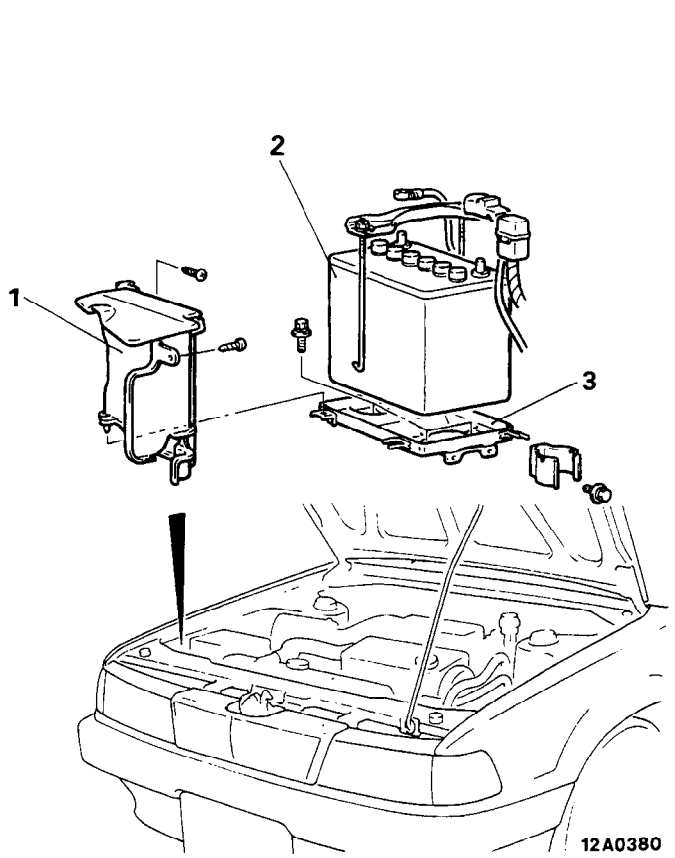
6. INSTALLATION OF THE FLANGE NUT

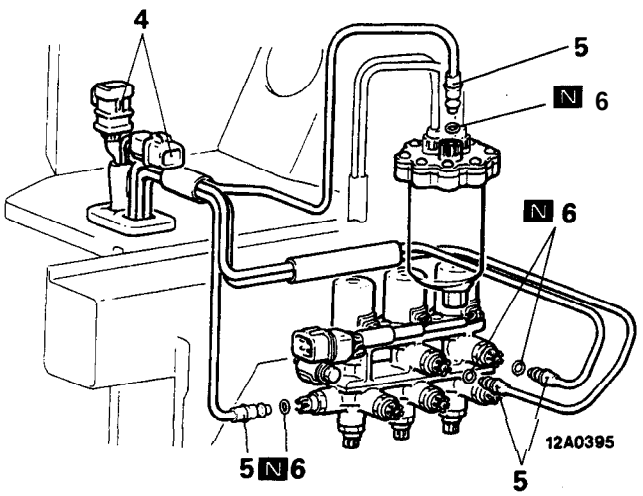
After tightening the flange nut, align with the indentation in the spindle, and crimp.

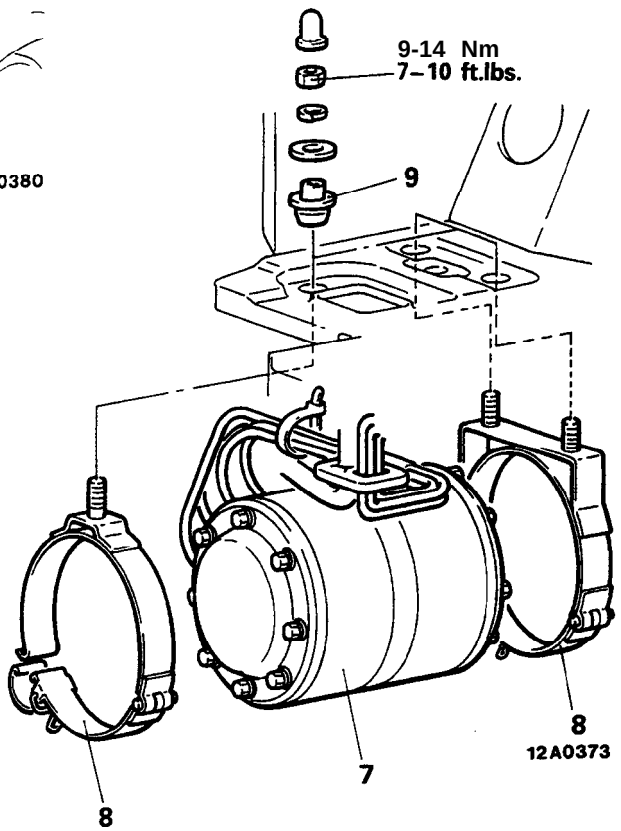
RESERVE TANK

M33ASAC

REMOVAL AND INSTALLATION

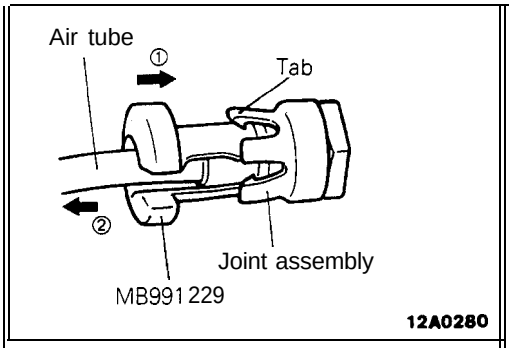


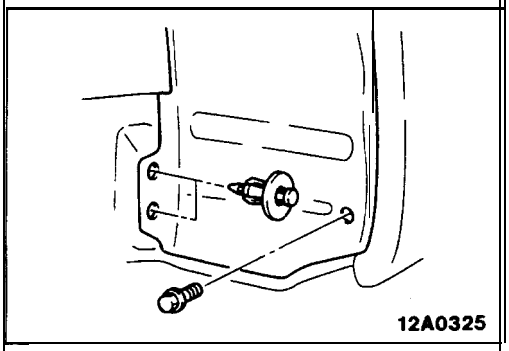


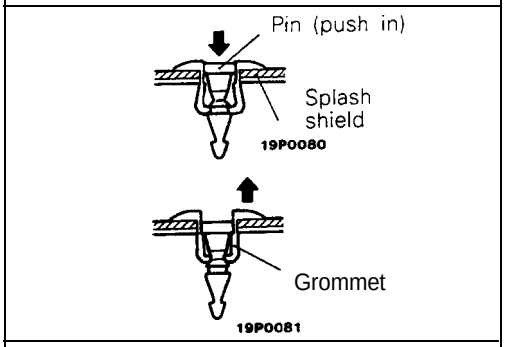


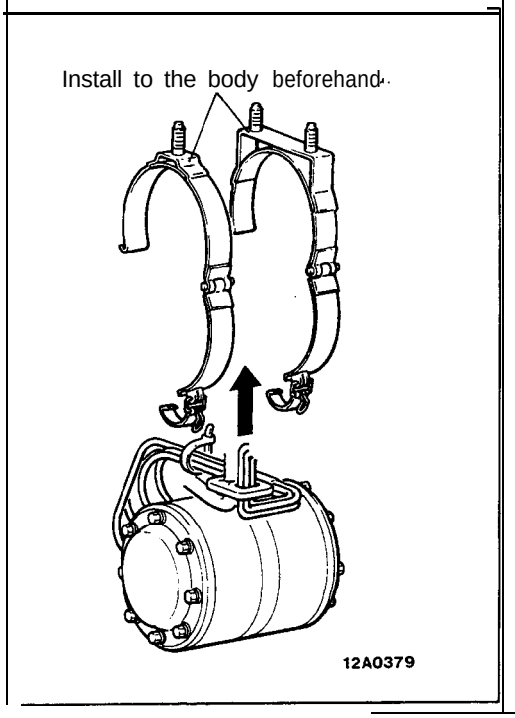
Removal steps

1. Air intake shield panel
2. Battery
3. Battery tray
4. Reserve tank connector
5. Air tubes
6. O-ring
7. Reserve tank
8. Tank holders
9. Bushes









SERVICE POINTS OF REMOVAL

5. REMOVAL OF AIR TUBES

(1) Push the special tool inward, in direction ① shown in the figure, in order to expand the tabs of the joint.
(2) Pull out the air tube, together with the special tool, in direction ②.

Caution
To prevent dust, dirt and other foreign material from getting into the air tubes, dryer or solenoid valve openings, use vinyl tape or similar material to cover these openings.

7. REMOVAL OF RESERVE TANK

(1) Remove the splash shield's installation clips (shown in the figure) and the bolt.
Note that the clips should be removed by the procedures described below.
① Using a cross-point (+) screwdriver or similar tool, push the pin at the center of the pin inward about 2 mm (.08 in.).
② Pull the clip outward to remove it.

NOTE
Do not push the pin in more than necessary, because the grommet may be damaged or the pin may fall inside if pushed too much.

(2) Remove the reserve tank installation nut, and then, taking care not to damage the air tube, remove the reserve tank.

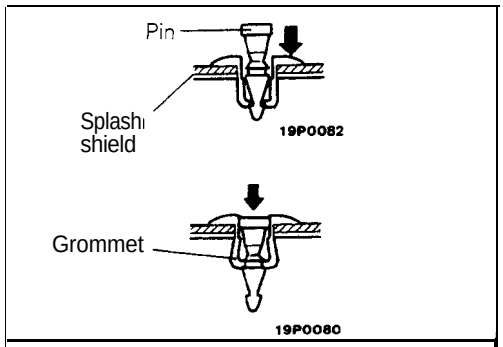
INSPECTION

For detailed information concerning the checking of the return pump, the high-pressure switch and the low-pressure switch, refer to the troubleshooting guide and service adjustment procedures section.

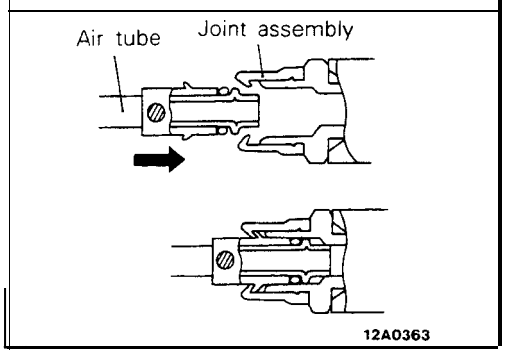
SERVICE POINTS OF INSTALLATION

7. INSTALLATION OF RESERVE TANK

(1) Install the tank holders to the body.
(2) Install the reserve tank to the tank holders, taking care not to damage the air tube.



(3) Install the splash shield's installation clips and the bolt. Note that the installation clips should be installed by the procedures described below.
① With the pin pulled out, insert the clip into the hole in the splash shield.
② Push the pin inward until its head is flush with the surface of the grommet.
③ Check to be sure that the splash shield is securely fixed.

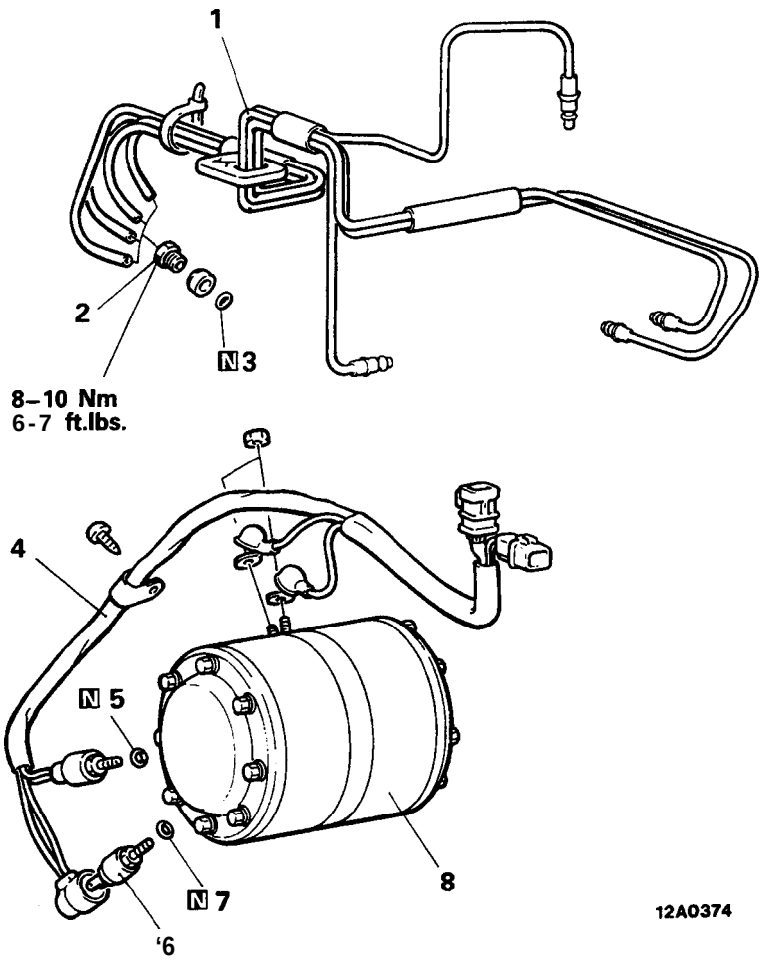


5. INSTALLATION OF AIR TUBES

Push the air tube' inward to the joint assembly at the device side until a "click" is heard, and then check to be sure that the tabs of the joint assembly are securely affixed to the air tube.

DISASSEMBLY AND REASSEMBLY

M33ZVAA



Disassembly steps

- a 1. Air tubes
  2. Joint assembly
  3. O-ring
  4. Wiring harness (incorporated with high pressure switch)
  5. O-ring
  6. Low pressure switch
  7. O-ring
  8. Reserve tank

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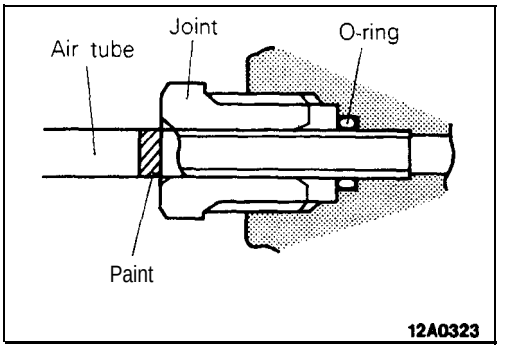


SERVICE POINTS OF REASSEMBLY

1. CONNECTION OF AIR TUBE

Connect the air tube securely, all the way to the painted mark.

Caution

Be sure that the connection is secure; if it is not, an air leak may result.

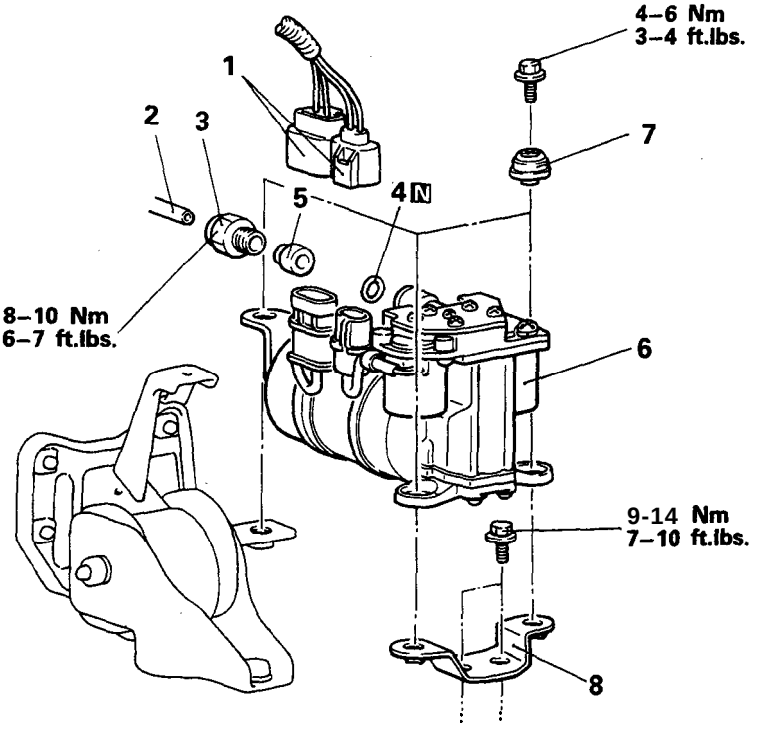
AIR COMPRESSOR

M33ZRAC

REMOVAL AND INSTALLATION

Pre-removal Operation
- Removal of Air Cleaner
(Refer to GROUP 15–Air cleaner.)

Post-installation Operation
- Installation of Air Cleaner
(Refer to GROUP 15–Air cleaner.)



Removal steps

1. Front wiring harness connector
◆■► ►◆ 2. Air tube
3. Joint
4. O-ring
5. Connector
6. Air compressor assembly
7. Compressor mounting rubberes
8. Compressor mount bracket

TSB Revision

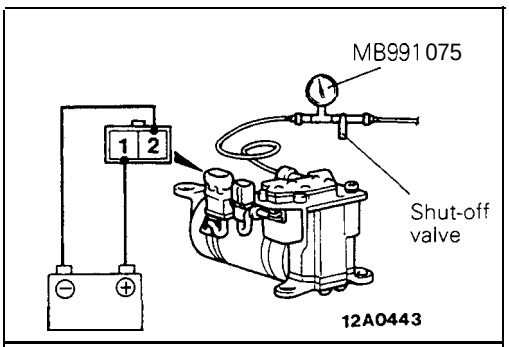
SERVICE POINTS OF REMOVAL

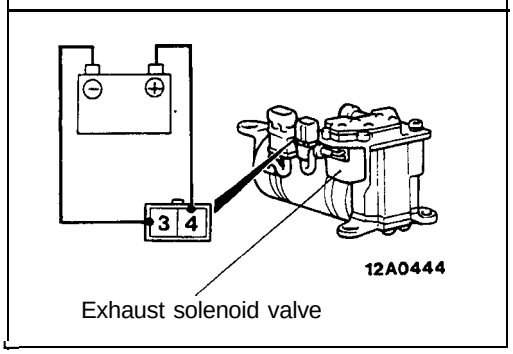
2. REMOVAL OF AIR TUBE

Caution

1. In order to prevent dust, dirt and other foreign material from getting into the air tube and air compressor openings, cover these opening with vinyl tape or similar material.

2. Be careful not to bend the air tubes.





INSPECTION

(1) Using special tool (adaptor C), connect the air tube on the gauge side of the special tool to the air compressor.

(2) Apply battery voltage (12V) between terminals (1) and (2) compressor.

(3) Check whether the relief pressure of the air compressor is the standard value.

Standard value: 1,000–1,300 kPa (142-185 psi)

NOTE

Because of pulsation caused by the opening and closing of the exhaust solenoid valve combined with the relief valve, the gauge's indicator will show a reading which fluctuates within a range of 200–300 kPa (29-43 psi). Use the mid-point of this fluctuation to make the gauge reading.

(4) Stop the air compressor and, with the pressure held, apply battery voltage (12V) between air compressor terminals (3) and (4). At this time, check to be sure that the exhaust solenoid valve makes a "click" sound and the pressure is gradually decreasing.

(5) If air compressor relief pressure is not within the standard value, or if there is a malfunction of the exhaust solenoid valve, replace the air compressor.

Caution

When the air compressor is replaced, first check to be **sure that there is no air leakage at air tube joints, no poor contacts of wiring, and that the thermo switch is not in operation.**

SERVICE POINTS OF INSTALLATION

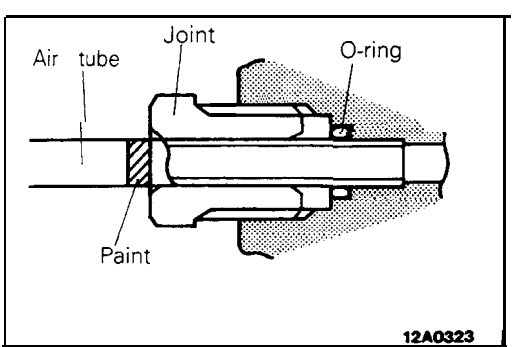
2. INSTALLATION OF AIR TUBE

(1) First insert the air tube at the lower part of the dryer until resistance is felt, and then press the tube further inward to the paint mark on the air tube.

Caution

Air leakage may occur if the air tube connection is not complete and secure.

(2) Connect air tubes correctly to the air compressor. Apply a soap-and-water solution to the air tube connections to check to be sure that there is no air leakage.

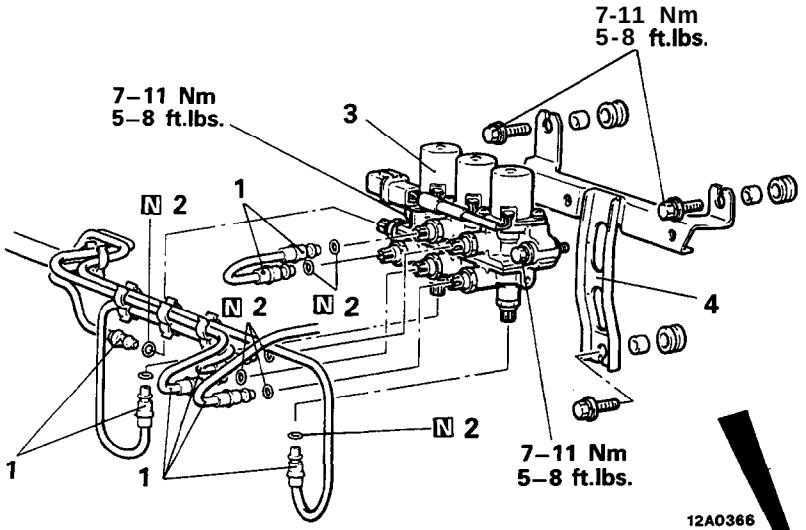


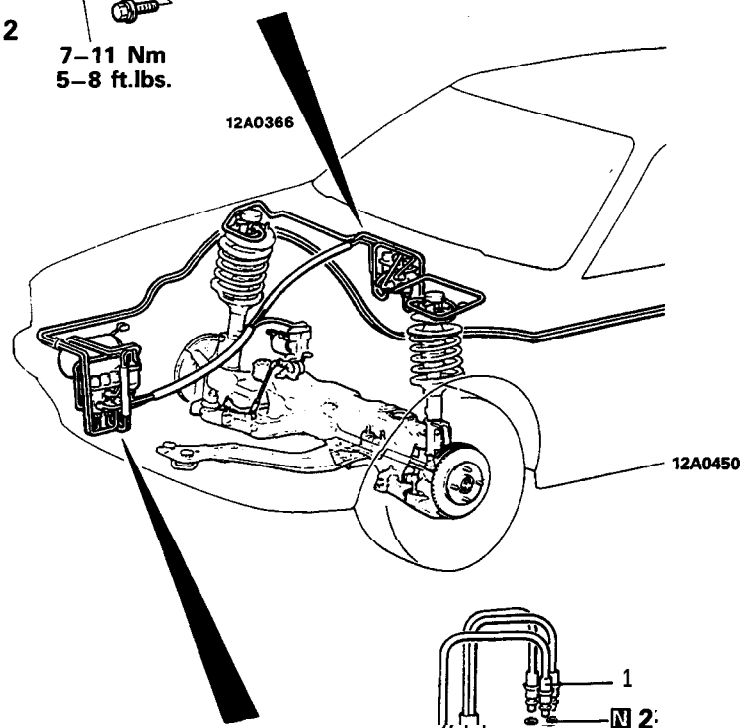
TSB Revision

SOLENOID VALVE AND DRYER

M33ZPAC

REMOVAL AND INSTALLATION





Front solenoid valve removal steps

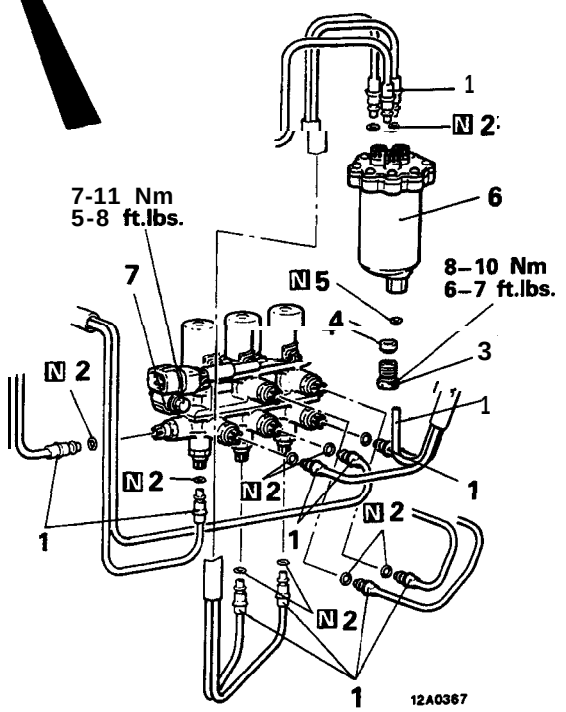
◆■► ►◆ 1. Air tubes
2. O-rings
3. Front solenoid valve assembly
4. Front solenoid valve bracket

Dryer removal steps

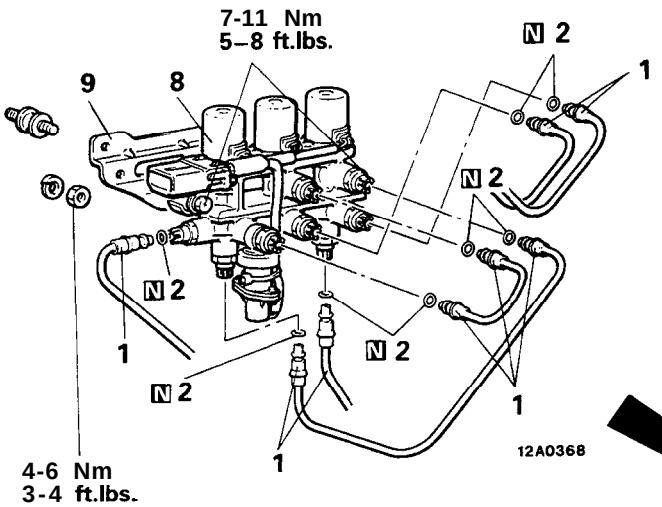
◆■► ►◆ 1. Air tubes
2. O-rings
3. Joint assembly
4. Bush
5. O-ring
6. Dryer

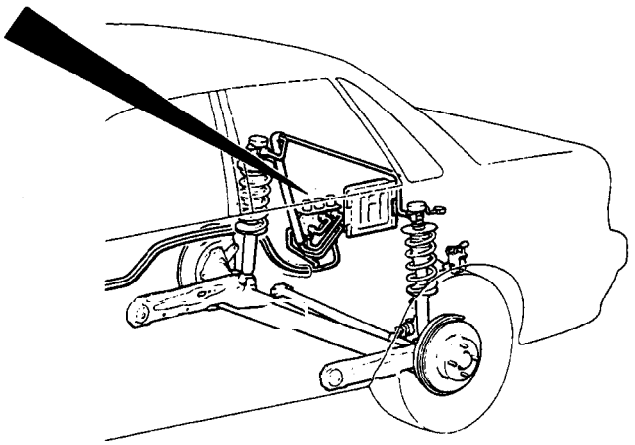
Flow control solenoid valve assembly removal steps

◆■► ● + 1. Air tubes
2. O-rings
7. Flow control solenoid valve assembly



TSB Revision



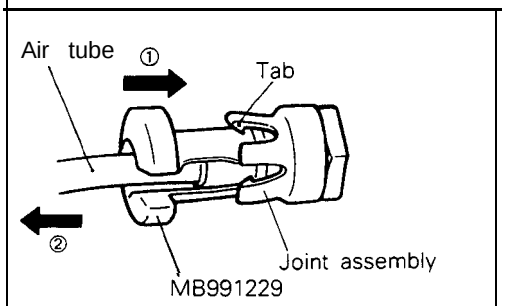


Pre-removal Operation
- Removal of Trunk Room Side Trim (Refer to GROUP 52–Trims.)

Rear solenoid valve removal steps

◆■▶ ▶◆ 1. Air tubes
2. O-rings
8. Rear solenoid valve assembly
9. Rear solenoid valve bracket

12A0450



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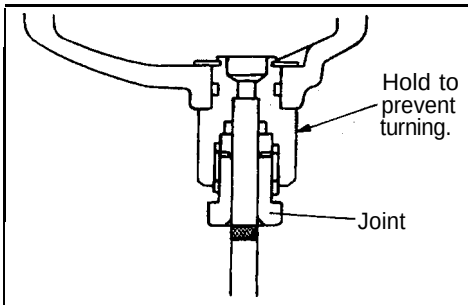


12A0278

SERVICE POINTS OF REMOVAL

1. REMOVAL OF AIR TUBES

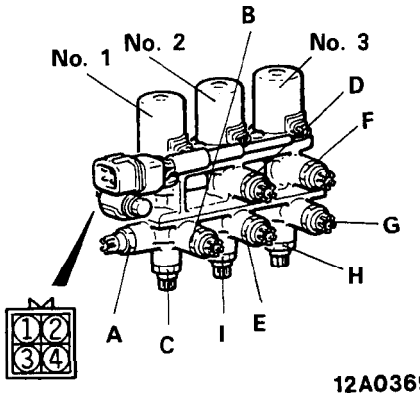
(1) Push the special tool inward, in direction ① shown in the figure, in order to expand the tabs of the joint.
(2) Pull out the air tube, together with the special tool, in direction ②.

Caution
In order to prevent dust, dirt and other foreign material from getting into the air tube, solenoid valve and dryer openings. Cover these openings with vinyl tape or similar material.

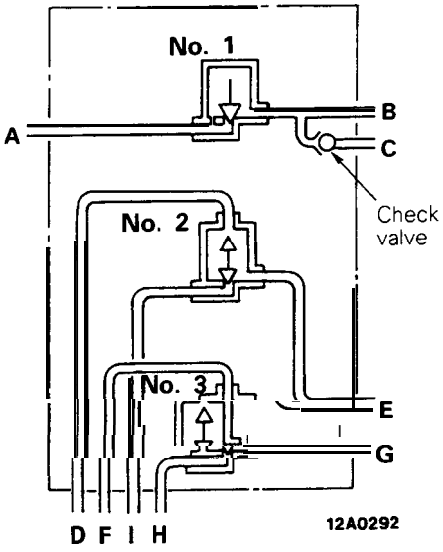
(3) For the air tube at the lower part of the dryer, loosen the joint, and then pull off.

NOTE
When loosening the joint, use a spanner at the hexagonal part of the joint installation part so as to prevent it from turning.

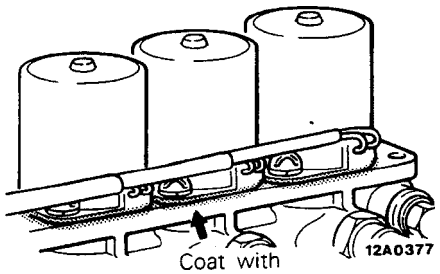
TSB Revision



12A0369



12A0292



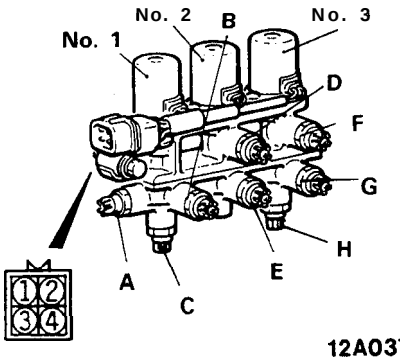
12A0377

INSPECTION

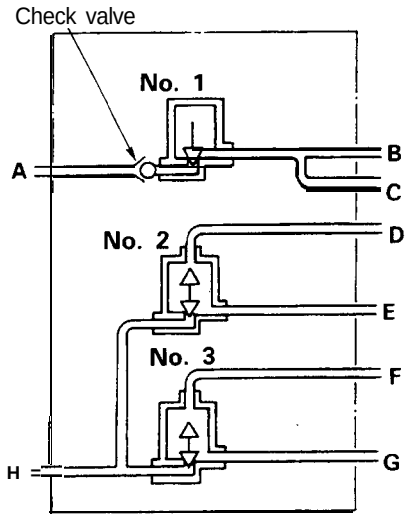
1. FLOW CONTROL SOLENOID VALVE

Check the No. 1–3 solenoid valves shown in the figure for correct operation and air leakage.

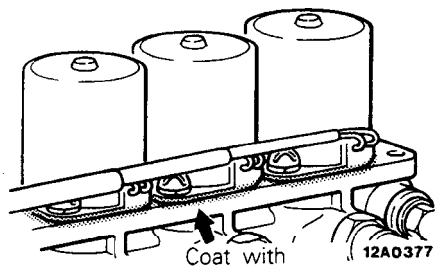
Check item	Condition	Result
Inject air from Part A and apply battery voltage to terminal ②, and then earth terminal ①.	A "click" noise will be heard, and the volume of air blown out from joints B and C will become greater.	Good
	Other than as described above.	Malfunction of No. 1 solenoid valve
Blow air in at joint E, apply battery voltage (12V) to terminal ③, and then earth terminal ①.	A "click" noise will be heard, and the air being blown out will change from joint D to joint I.	Good
	Other than as described above	Malfunction of No. 2 solenoid valve
inject air from part G and apply battery voltage (12V) to terminal ④, and then earth terminal ①.	A "click" noise will be heard, and the air being blown out will change from joint F to joint H.	Good
	Other than as described above.	Malfunction of No. 3 solenoid valve
Inject air from part C.	Air is not blown out.	Good
	Air is blown out from joint B.	Malfunction of check valve
With an air pressure of 1,000 kPa (142 psi) from parts B, H and I, apply a soap-and-water solution where shown in the illustration.	No air leakage	Good
	Air leakage	Malfunction of solenoid valve seal



12A0370



12A0293



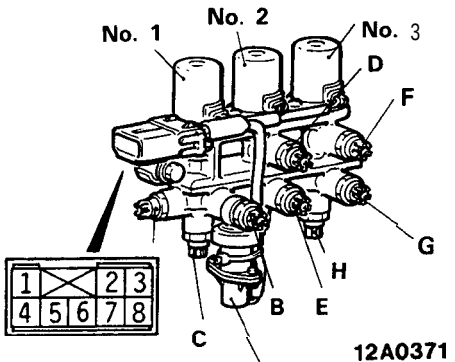
Coat with soap-and-water solution.

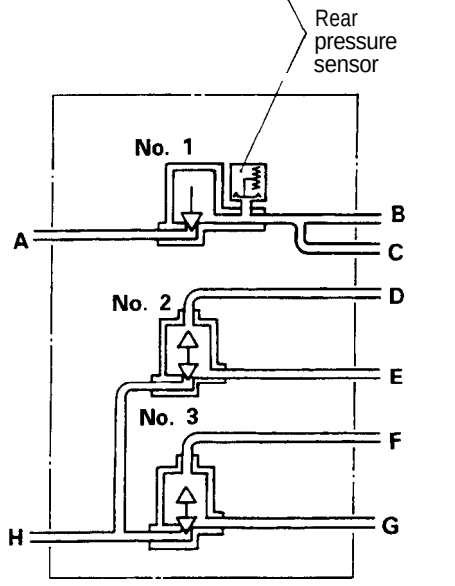
12A0377

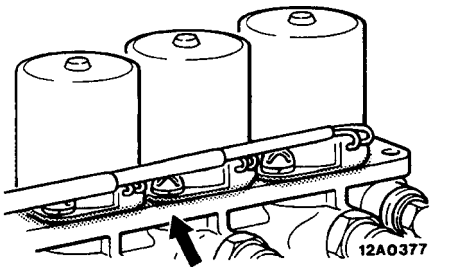
2. FRONT SOLENOID VALVE

Check the No. 1–3 solenoid valves shown in the figure for correct operation and air leakage.

Check item	Condition	Result
Inject air from Part A and apply battery voltage to terminal ②, and then earth terminal ①.	A "click" noise will be heard, and the volume of air blown out from joints B and C will become greater.	Good
	Other than as described above.	Malfunction of No. 1 solenoid valve
Blow air in at joint E, apply battery voltage (12V) to terminal ③, and then earth terminal ①.	A "click" noise will be heard, and the air being blown out will change from joint D to joint H.	Good
	Other than as described above	Malfunction of No. 2 solenoid valve
Inject air from part G and apply battery voltage (12V) to terminal ④, and then earth terminal ①.	A "click" noise will be heard, and the air being blown out will change from joint F to joint H.	Good
	Other than as described above.	Malfunction of No. 3 solenoid valve
Apply battery voltage (12V) to terminal ② and, with terminal ① earthed, blow air in at joint B or C.	Air is not blown out from joint A	Good
	Air is blown out from joint A.	Malfunction of check valve
With an air pressure of 1,000 kPa(142 psi) from parts B, H and I, apply a soap-and-water solution where shown in the illustration.	No air leakage	Good
	Air leakage	Malfunction of solenoid valve seal







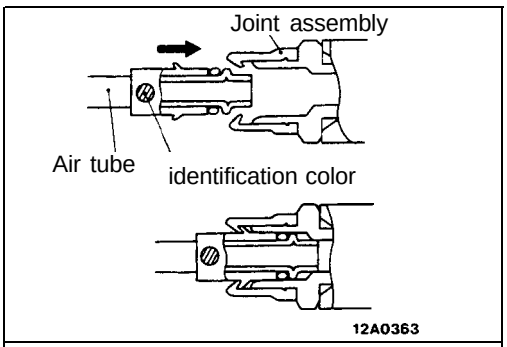
Coat with soap-and-water solution.

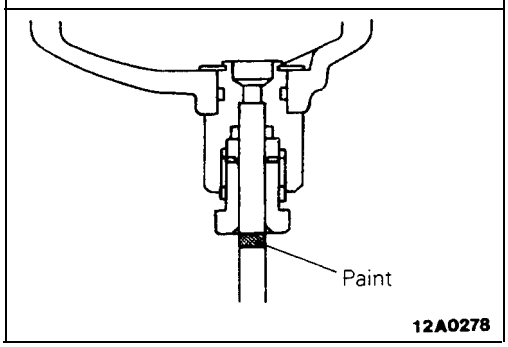
3. REAR SOLENOID VALVE

Check the No. 1–3 solenoid valves shown in the figure for correct operation and air leakage.

Check item	Condition	Result
Inject air from Part A and apply battery voltage (12V) to terminal ②, and then earth terminal ①.	A "click" noise will be heard, and the air will be blown out from joints B and C.	Good
	Other than as described above.	Malfunction of No. 1 solenoid valve
Blow air in at joint E, apply battery voltage (12V) to terminal ③, and then earth terminal ①.	A "click" noise will be heard, and the air being blown out will change from joint D to joint H.	Good
	Other than as described above	Malfunction of No. 2 solenoid valve
Inject air from part G and apply battery voltage (12V) to terminal ④, and then earth terminal ①.	A "click" noise will be heard, and the air being blown out will change from joint F to joint H.	Good
	Other than as described above.	Malfunction of No. 3 solenoid valve
With an air pressure of 1,000 kPa (142 psi) from parts A and H, apply a soap-and-water solution where shown in the illustration.	No air leakage	Good
	Air leakage	Malfunction of solenoid valve seal

TSB Revision





SERVICE POINTS OF INSTALLATION

1. INSTALLATION OF AIR TUBES

(1) For the one-touch type of air tube, press in to the joint assembly at the device side until a “click” is heard, and then check that the tabs of the joint assembly are securely affixed to the air tube.

Caution
Before connecting the air tube, check that the identification color of the tube and the color at the joint agree.

(2) First insert the air tube at the lower part of the dryer until resistance is felt, and then press the tube further inward to the paint mark on the air tube.

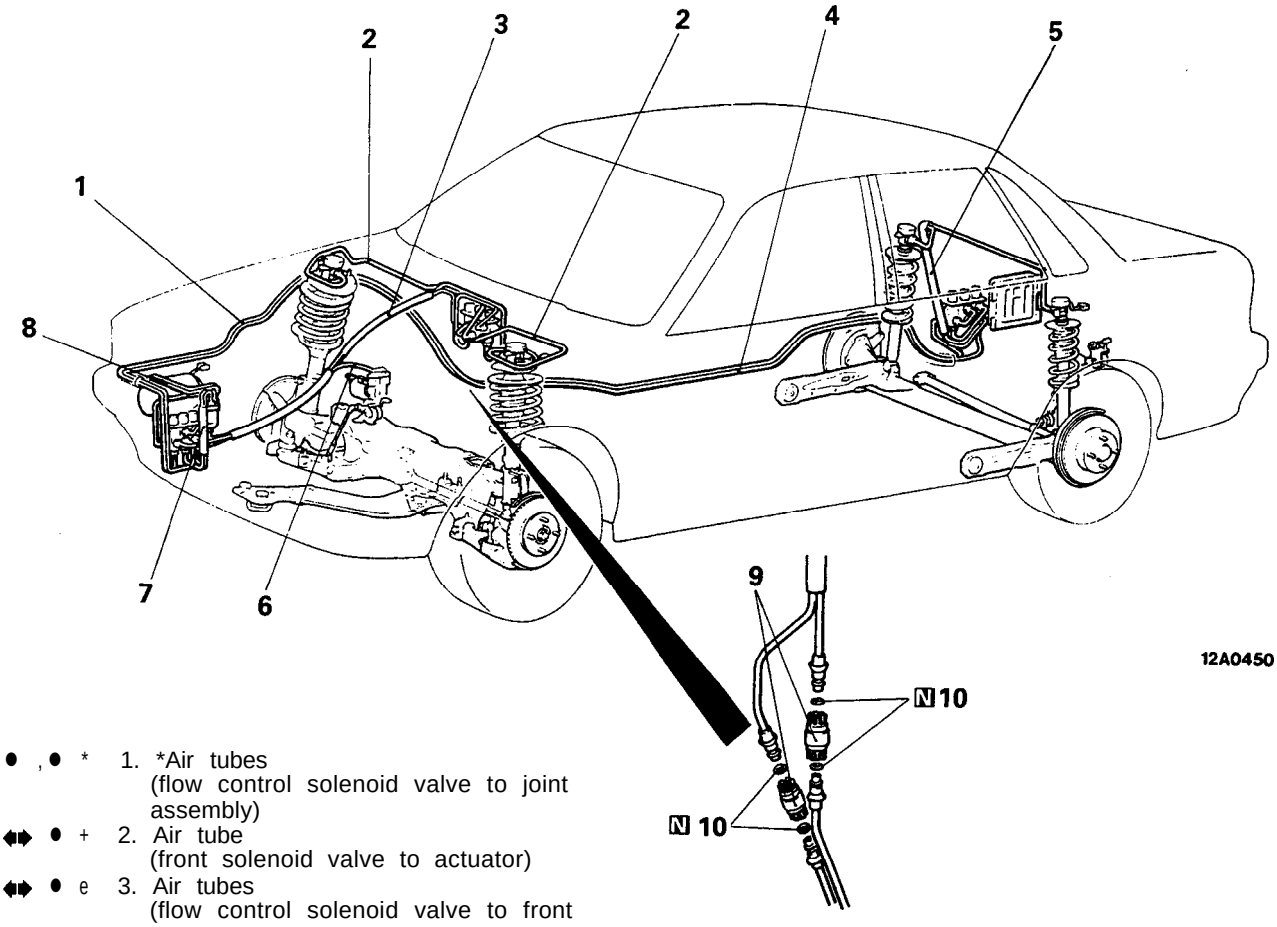
Caution
Air leakage may occur if the air tube connection is not complete and secure.

(3) After connection of the air tube, check for double-folding of the rolling diaphragm. (Refer to P.33B-89.)

AIR TUBE

M33ZOAC

REMOVAL AND INSTALLATION



12A0450

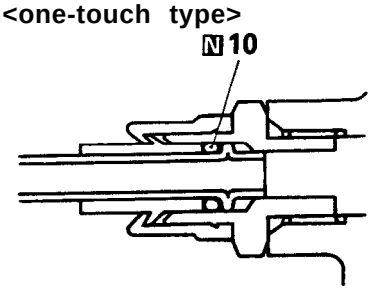
12A0378

- 1. *Air tubes (flow control solenoid valve to joint assembly)
- 2. Air tube (front solenoid valve to actuator)
- 3. Air tubes (flow control solenoid valve to front solenoid valve)
- 4. *Air tubes (joint assembly to rear solenoid valve)
- 5. Air tube (rear solenoid valve to actuator)
- 6. Air tube (flow control solenoid valve to air compressor)
- 7. Air tubes (dryer to flow control solenoid valve)
- 8. Air tubes (to reserve tank)
- 9. Joint assembly
- 10. O-rings
- 11. Joint
- 12. Bush

NOTE
(1) Connections within ( ) are air tube connections.
(2) Air tubes indicated by the • symbol are interwound with the harness.

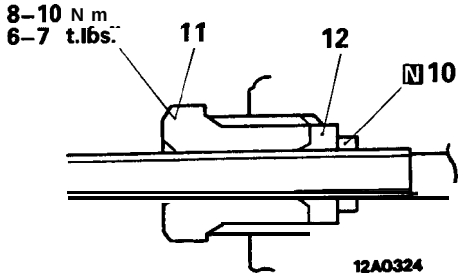
Cross-section of air tube joint

<one-touch type>

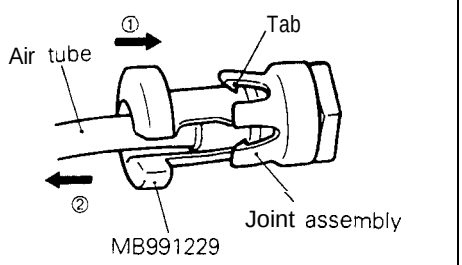


12A0173

<flare-nut type>



12A0324

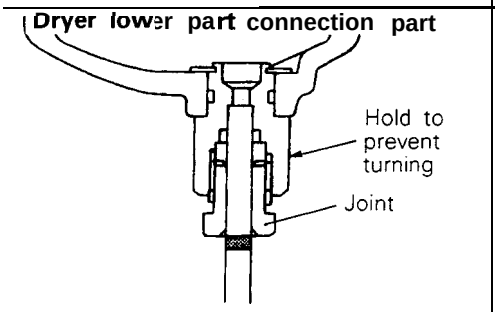


SERVICE POINTS OF REMOVAL

REMOVAL OF AIR TUBES

One-touch type

(1) Push the special tool inward, in direction ① shown in the figure, in order to expand the tabs of the joint.
(2) Pull out the air tube, together with the special tool, in direction ②.



Flare-nut type

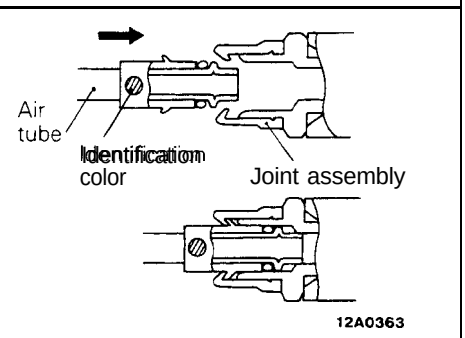
Loosen the joint and pull out the air tube.

NOTE

When loosening the joint at the lower part of the dryer, use a spanner to hold the hexagonal part of the joint installation part to prevent it from turning.

Caution

In order to prevent the entry of dust, foreign material, etc., use vinyl tape or similar material to close the end of the air tube and the opening at the device side.



SERVICE POINTS OF INSTALLATION

INSTALLATION OF AIR TUBES

One-touch type

Push the air tube in the joint assembly at the device side until a “click” is heard, and then check to be sure that the tabs of the joint assembly are securely affixed to the air tube.

Caution

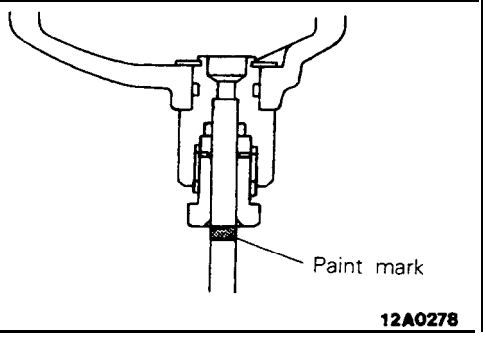
Before connecting the air tube, check to be sure that the identification color of the tube and the color at the joint agree.

Flare-nut type

First insert the air tube until resistance is felt, and then press the tube further inward to the paint mark on the air tube.

Caution

Air leakage may occur if the air tube connection is not complete and secure.



INSPECTION AFTER AIR TUBE INSTALLATION

(1) Check for double-folding at the rolling diaphragm. (Refer to P.33B-89.)
(2) Apply a soap-and-water solution to the joint part to check for air leakage; also visually check the air tube for breakage, crushing, pinching, etc.

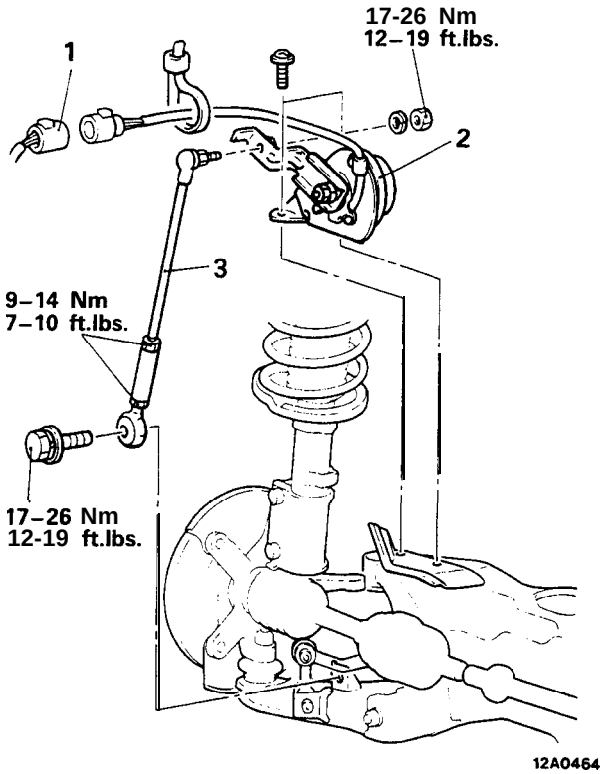
TSB Revision

HEIGHT SENSOR

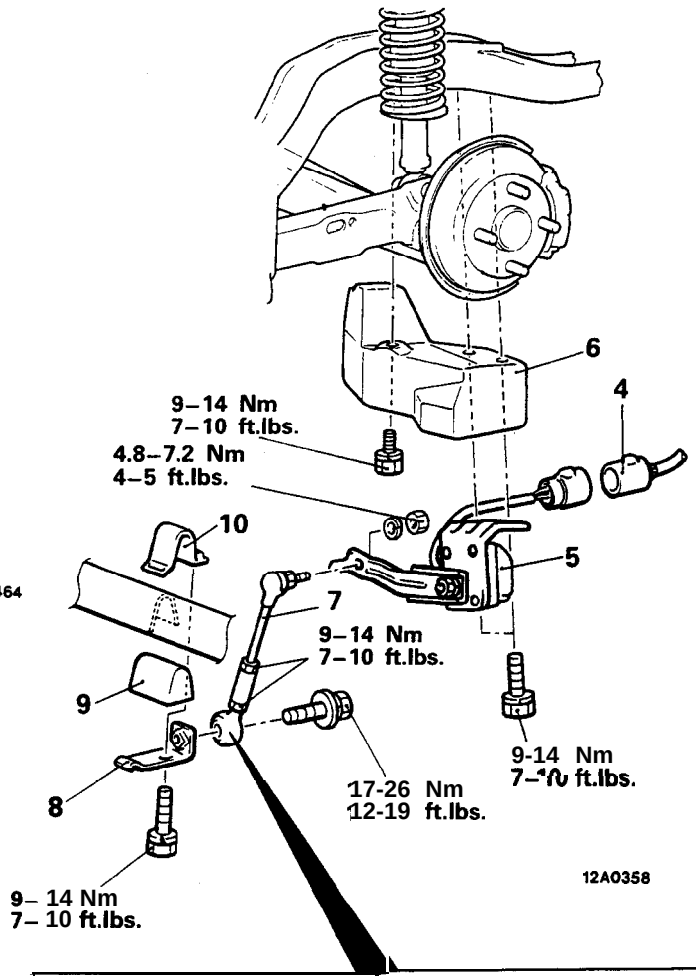
M33ZTAE

REMOVAL AND INSTALLATION

Front height sensor



Rear height sensor



Pre-removal Operation
- Removal of Air Compressor for Front Height Sensor (Refer to P.33B-125.)

Post-installation Operation
- Checking and Adjustment of the NORMAL Vehicle-height (Refer to P.33B-88.)

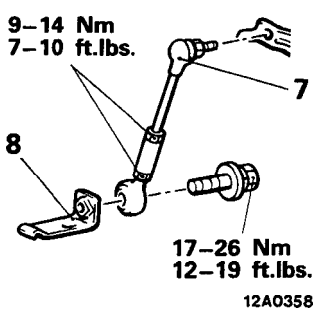
Front height sensor removal steps

1. Front wiring harness connector
- 2. Front height sensor
◆◆ 3. Front rod assembly

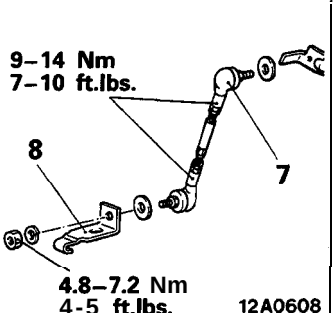
Rear height sensor removal steps

4. Body wiring harness connector
5. Rear height sensor
6. Protector
- a 7. Rear rod assembly
8. Rear height sensor bracket (B)
9. Spacer
10. Rear height sensor bracket (A)

1989 models



From 1990 models



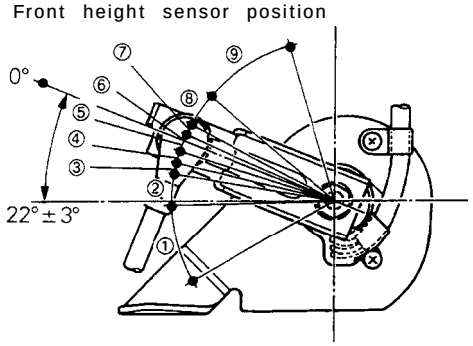
TSB Revision

Front height sensor connector terminal array

12R0185

No. 1 Sensor A
No. 2 Sensor B
No. 3 Sensor C
No. 4 Ground
No. 5 Sensor D
No. 6 Sensor power supply (+5V)

Front height sensor position



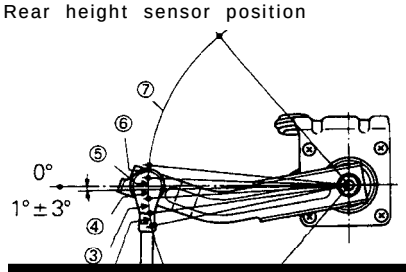
12A0465

Rear height sensor connector terminal array

12R0185

No. 1 Sensor A
No. 2 Sensor B
No. 3 Sensor C
No. 4 Ground
No. 6 Sensor power supply (+5V)

Rear height sensor position



INSPECTION

- Check the rod and link plate for bending or damage.
- Check the rod adjustment lock nut for looseness.

CHECKING THE SENSOR TERMINAL VOLTAGE

Connect the height sensor to the body harness and then check that each terminal voltage changes as shown in the table below when, with the ignition key at the ON position, the sensor's link plate is turned.

NOTE
To check the sensor terminal voltage, one method which can be used is to move the rod up and down while the sensor is installed to the chassis.

Front Height Sensor Terminal Voltages

(V)

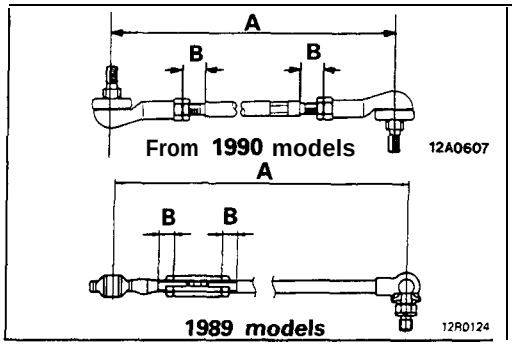
Vehicle height level	Sensor link position	Terminal No.			
		1	2	3	5
Maximum level	①	0–0.5	4.5-5	0–0.5	4.5–5
Higher than HIGH	②				
HIGH (target height)	③			4.5-5	
Higher than NORMAL	④		0–0.5		
NORMAL (target height)	⑤	4.5-5		0–0.5	0–0.5
Lower than NORMAL	⑥				
LOW (target height)	⑦		4.5-5		
Lower than LOW	⑧			4.5-5	
Minimum level	⑨				4.5–5

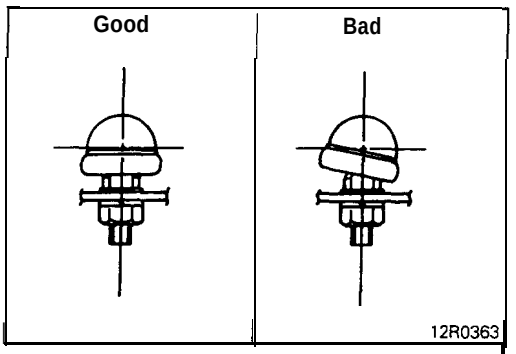
Rear Height Sensor Terminal Voltages

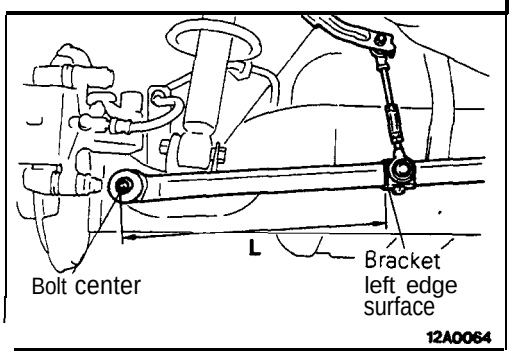
(V)

Vehicle height level	Sensor link position	Terminal No.		
		1	2	3
Higher than HIGH	①	0–0.5	4.5–5	0–0.5
HIGH (target height)	②			4.5–5
Higher than NORMAL	③		0–0.5	
NORMAL (target height)	④			0–0.5
Lower than NORMAL	⑤	4.5-5		
LOW (target height)	⑥		4.5–5	
Lower than LOW	⑦			4.5–5

TSB Revision







SERVICE POINTS OF INSTALLATION

7. INSTALLATION OF REAR ROD ASSEMBLY / 3. FRONT ROD ASSEMBLY

(1) Adjust the front and rear height sensors so that dimension A of the rod in the illustration is within specification.

Rod assembly length (A)

Front	**254-255 mm (9.9–10.0 in.)**
Rear	**149.5–150.5 mm (5.89–5.93 in.)**

Caution

1. **When adjusting the length of the rod, adjust so that dimension B is uniform**
2. **Height sensors must be installed so that the ball joint at the rod end is at rocking centre.**

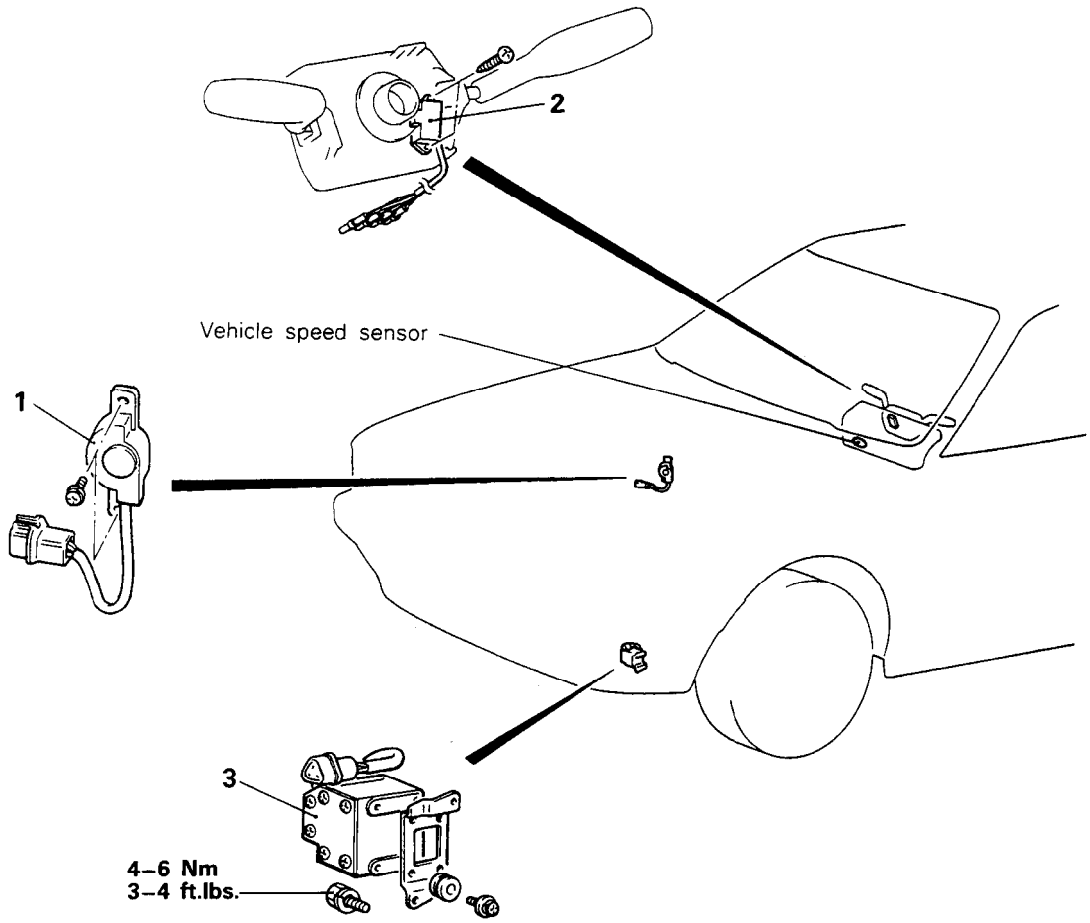
(2) When installing the rear rod assembly, install the rear height sensor brackets so that the dimension L in the illustration. is the standard value.

Standard value (L): 314-316 mm (12.3–12.4 in.)

ACTIVE-ECS SENSOR

M33ZUAC

REMOVAL AND INSTALLATION



12A0449

Pre-removal Operation
*Removal of Steering Wheel and Column Cover for Steering Wheel Angular-velocity Sensor (Refer to GROUP 37A–Steering Column and Shaft.)
- Removal of Column Switch for Steering Wheel Angular-velocity Sensor (Refer to GROUP 54–Column Switch.)
- Removal of front bumper for G sensor (Refer to GROUP 51–Bumper.)

Post-installation Operation
- Adjustment of the Throttle-position Sensor (Refer to GROUP 13–Service Adjustment Procedures.)
- Checking of the G-sensor Output Voltage (Refer to P.33B-96.)

1. Throttle position sensor
2. Steering wheel angular-velocity sensor
3. G sensor

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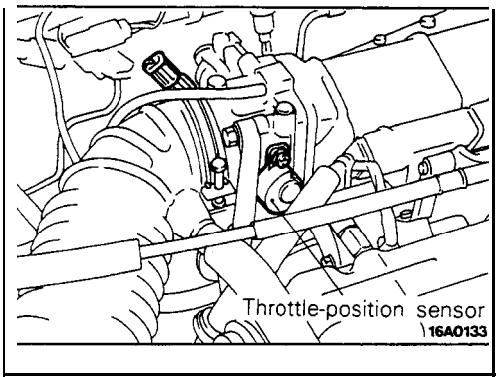
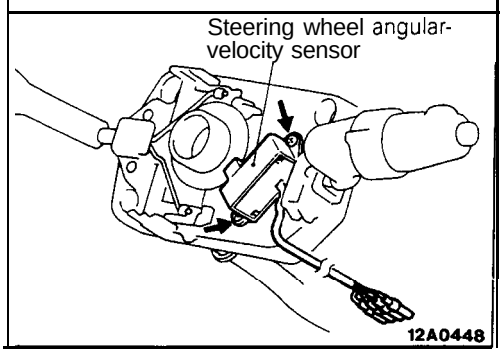


SERVICE POINTS OF REMOVAL

1. REMOVAL OF THROTTLE POSITION SENSOR

Disconnect the harness connector, then remove the throttle position sensor from the throttle body.

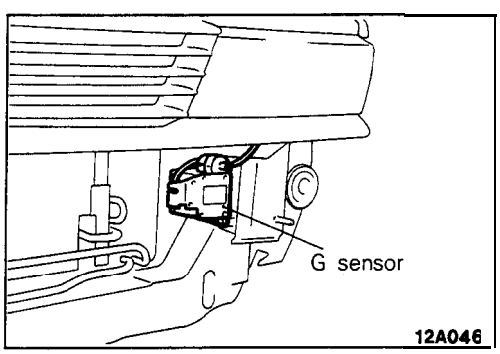


2. REMOVAL OF STEERING WHEEL ANGULAR-VELOCITY SENSOR

Remove the pin terminal from the column switch connector, then remove the steering wheel angular-velocity sensor from the column switch.

Caution

1. **The steering wheel angular-velocity sensor utilizes a photo coupler and care should be paid to ensure that no dust or grease are allowed to come into contact with it.**
2. **Be careful and ensure that the column switch side slit panel is not bent nor oil allowed to come into contact with it.**



3. REMOVAL OF G SENSOR

Disconnect the connection of the harness connector, and then remove the G sensor.

Caution

When removing the G sensor, take care not to drop it or subject it to severe impact.

INSPECTION

For information concerning the procedures for checking each sensor, refer to the service adjustment procedures section and to the troubleshooting guide.

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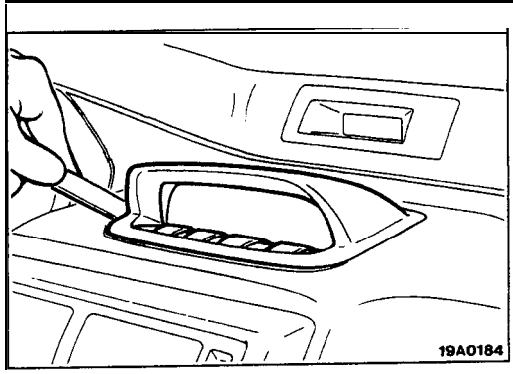


INDICATOR ASSEMBLY

SERVICE POINTS OF REMOVAL

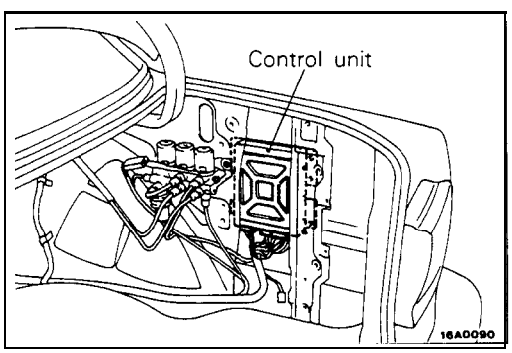
(1) Using a plastic trim tool, remove the indicator assembly from the instrument panel.
(2) Disconnect the connector and remove the indicator assembly.

INSPECTION

(1) Indicator light does not light (the circuit, light bulb, or LED have failed).

NOTE
Operate the ECS and check to see that the light bulbs and LED light.

(2) Do the lights loose intensity when the lighting switch is placed at ≡D and ≡D . For procedures for other inspections, refer to the troubleshooting section.



CONTROL UNIT

SERVICE POINTS OF REMOVAL

(1) Remove the trunk side trim.
(Refer to GROUP 52–Trims.)
(2) Remove the installation bolts and connectors, and then remove the control unit.

INSPECTION

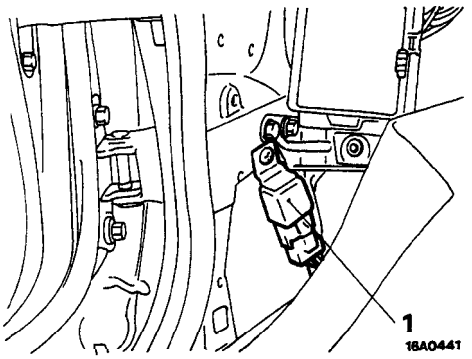
Referring to the troubleshooting section, check whether there is terminal voltage.

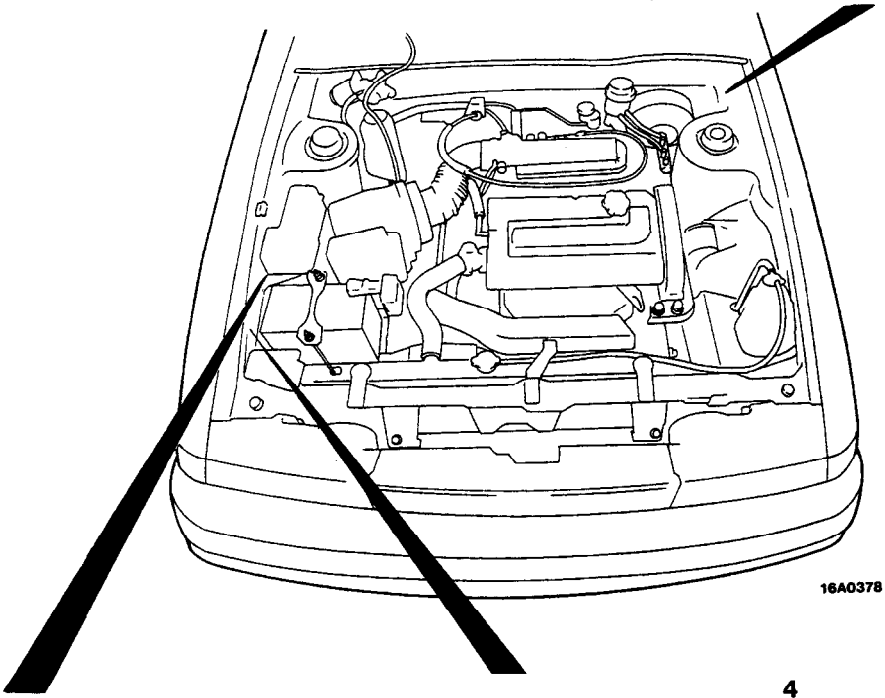
ACTIVE-ECS RELAY

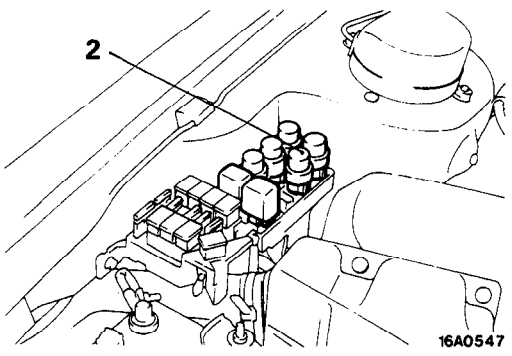
M33VA-A

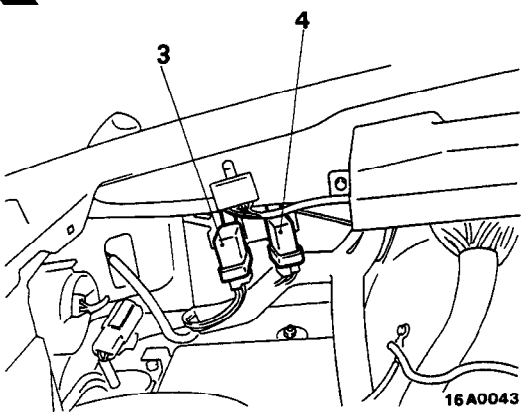
REMOVAL AND INSTALLATION

1. Power relay
2. Solenoid valve power relay
3. Compressor relay
4. Return pump relay

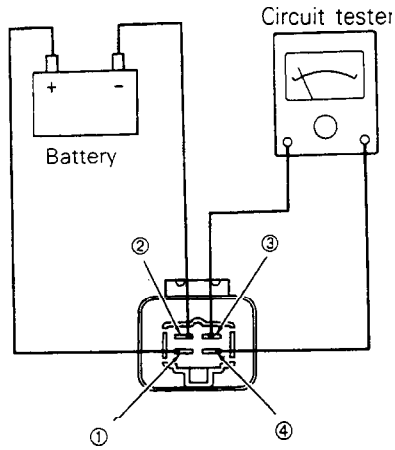








Power relay



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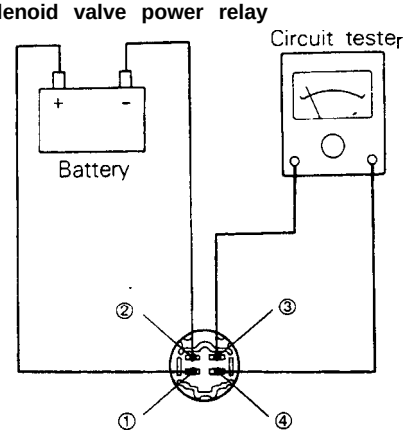
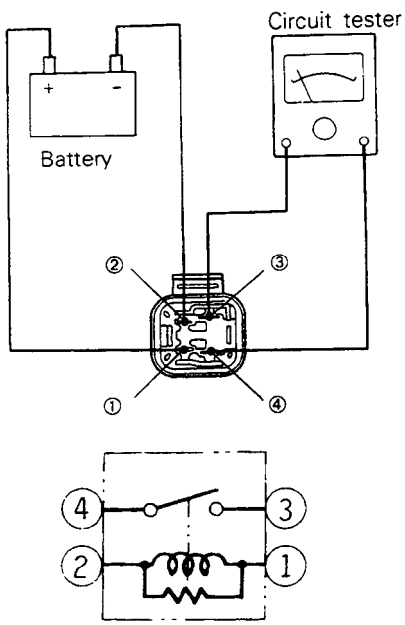
Solenoid valve power relay



12A0276

Compressor relay, Return pump relay



12A0277

INSPECTION

Connect battery power source to terminal 1. Check circuit between terminals with terminal 2 grounded.

Power is supplied	Between 3-4 terminals	Continuity
Power is not supplied	Between 1–2 terminals	Continuity
	Between 3–4 terminals	No continuity

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