
FRONT SUSPENSION

CONTENTS

E33AA--

SPECIFICATIONS	2	STRUT ASSEMBLY	6
General Specifications	2	LOWER ARM	9
Service Specifications	3	STABILIZER BAR	
SPECIAL TOOLS	3	<PETROL-POWERED VEHICLES>	11
SERVICE ADJUSTMENT PROCEDURES	4	STABILIZER BAR	
Front Wheel Alignment Inspection and Ad- justment	4	<DIESEL-POWERED VEHICLES>	13

SPECIFICATIONS

GENERAL SPECIFICATIONS

E33CA--

Items	Petrol-powered vehicles		Diesel-powered vehicles
	2WD	4WD	
Suspension system	McPherson strut with coil spring and compression rod type	McPherson strut with coil spring and compression rod type	McPherson strut with coil spring and compression rod type
Coil spring (Vehicles built up to May 1992)			
Wire. dia. × O.D. × free length mm (in.)	13.8 × 160.0 × 313.0 (0.543 × 6.299 × 12.323) – M/T 14.0 × 160.0 × 320.5 (0.551 × 6.299 × 12.618) – A/T	14.0 × 160.0 × 320.5 (0.551 × 6.299 × 12.618) – M/T 14.2 × 160.0 × 327.5 (0.559 × 6.299 × 12.894) – A/T	14.2 × 160.0 × 327.5 (0.559 × 6.299 × 12.894)
Coil spring identification colour	Light blue × 1 – M/T Light blue × 2 – A/T	Light blue × 2 – M/T Orange × 1 – A/T	Orange × 1
Spring constant N/mm (kg/mm, lbs./in.)	27 (2.7, 151)	27 (2.7, 151)	27 (2.7, 151)
Coil spring (Vehicles built from June 1992)			
Wire. dia. × O.D. × free length mm (in.)	13.8 × 160.0 × 313.0 (0.543 × 6.299 × 12.323) – M/T 14.0 × 160.0 × 320.5 (0.551 × 6.299 × 12.618) – A/T	14.0 × 160.0 × 320.5 (0.551 × 6.299 × 12.618) – M/T 14.3 × 160.0 × 335.0 (0.563 × 6.299 × 13.189) – A/T	14.2 × 160.0 × 327.5 (0.559 × 6.299 × 12.894) – SPACE RUNNER 14.3 × 160.0 × 335.0 (0.563 × 6.299 × 13.189) – SPACE WAGON
Coil spring identification colour	Light blue × 1 – M/T Light blue × 2 – A/T	Light blue × 2 – M/T Orange × 2 – A/T	Orange × 1 – SPACE RUNNER Orange × 2 – SPACE WAGON
Spring constant N/mm (kg/mm, lbs./in.)	27 (2.7, 151)	27 (2.7, 151)	27 (2.7, 151)
Shock absorber			
Type	Hydraulic, cylindrical, double-acting type	Hydraulic, cylindrical, double-acting type	Hydraulic, cylindrical, double-acting type
Maximum length mm(in.)	495 (19.5)	504 (19.8)	495 (19.5)
Compressed length mm(in.)	345 (13.6)	354 (13.9)	345 (13.6)
Stroke mm(in.)	150 (5.9)	150 (5.9)	150 (5.9)
Damping force [at 0.3 m/sec. (0.984 ft./sec)]			
Expansion N (kg, lbs.)	1150 (115, 254)	1150 (115, 254)	1150 (115, 254)
Contraction N (kg, lbs.)	580 (58, 128)	580 (58, 128)	580 (58, 128)

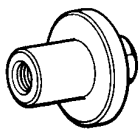
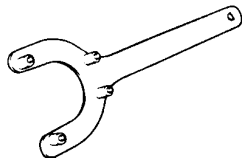
SERVICE SPECIFICATIONS

E33CB--

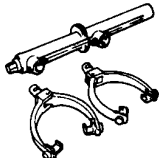
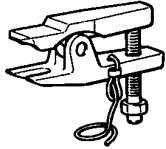



Items	Specifications
Standard value	
Toe-in	
At the centre of tyre tread	mm (in.) 0±3 (0±0.12)
Toe angle (per wheel)	0°±9'
Toe-out angle on turns (inner wheel when outer wheel at 20°)	22°
Steering angle	
Inner wheel	36°30'±2°
Outer wheel	30°30'
Camber	
2WD	0°20'±30'
4WD	0°40'±30'
Caster	
2WD	2°10'±40'
4WD	2°05'±40'
Kingpin inclination	
2WD	13°50'
4WD	13°25'
Lower arm ball joint starting torque	Nm (kgcm, in.lbs.) 2-9 (20-90, 17-78)
Stabilizer link ball joint starting torque	Nm (kgcm, in.lbs.) 1.7-3.2 (17-32, 15-28)

SPECIAL TOOLS

E33DA--

Tool	Number	Name	Use
	MB991004	Wheel alignment gauge attachment	Measurement of the wheel alignment
	MB991176	Spring seat holder	Disassembly/assembly of the strut assembly

33A-4 FRONT SUSPENSION – Special Tools/Service Adjustment Procedures

Tool	Number	Name	Use
	MB991237 MB991238	Spring compressor body Arm set	Compression of the front coil spring
	MB991113	Steering linkage puller	Removal of the lower arm ball joint
	MB990326	Preload socket	Measurement of the lower arm ball joint starting torque Measurement of the stabilizer link rotation-starting torque
	MB990968	Torque wrench	
	MB990800	Ball joint remover and installer	Installation of the dust cover

SERVICE ADJUSTMENT PROCEDURES

E33FAAY

FRONT WHEEL ALIGNMENT INSPECTION AND ADJUSTMENT

Measure the wheel alignment with the vehicle parked on a level surface.

The front suspension, steering system, and wheels should be serviced to normal condition prior to measurement of wheel alignment.

TOE-IN

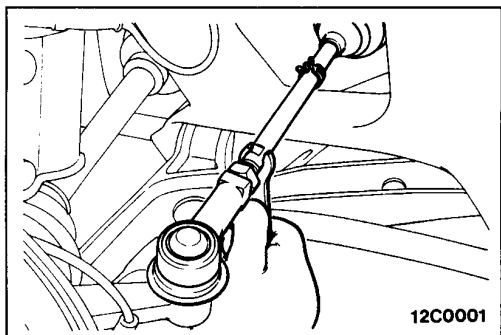
Standard value:

At the centre of tyre tread

0 ± 3 mm (0 ± 0.12 in.)

Toe angle (per wheel)

0° ± 9'



1. If the toe-in is not within the standard value, 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. For each half turn of the left and right tie rods, the toe-in will be adjusted by approx. 6 mm (0.24 in.).

Caution

The difference between the left and right tie rods shall not exceed 5 mm (0.21 in.).

TOE-OUT ANGLE ON TURNS

To check the steering linkage, especially after the vehicle has been involved in an accident or if an accident is presumed, it is advisable to check the toe-out angle on turns in addition to the wheel alignment.

Conduct this test on the left turn as well as on the right turn.

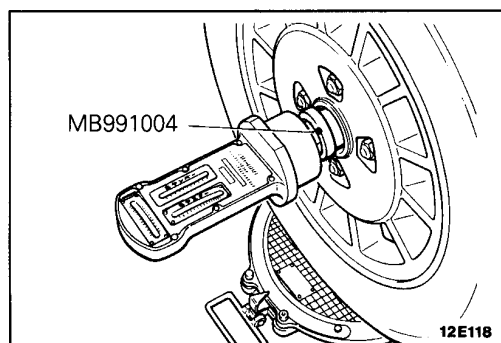
Standard value:

22° (inner wheel when outer wheel at 20°)

STEERING ANGLE

Standard value:

Inner wheel	36°30' ± 2°
Outer wheel	30°30'



CAMBER, CASTER AND KINGPIN INCLINATION

Standard value:

Camber	<2WD>	0°20' ± 30'
	<4WD>	0°40' ± 30'
Caster	<2WD>	2°10' ± 40'
	<4WD>	2°05' ± 40'
Kingpin inclination	<2WD>	13°50'
	<4WD>	13°25'

NOTE

1. Camber and caster are pre-set at the factory and cannot be adjusted.
2. If camber is not within the standard value, check and replace bent or damaged parts.
3. For vehicles with aluminium type wheels, attach the camber/caster/kingpin gauge to the drive shaft by using the special tool. Tighten the special tool to the same torque [200–260 Nm (20–26 kgm, 145–188 ft.lbs.)] as the drive shaft nut.

Caution

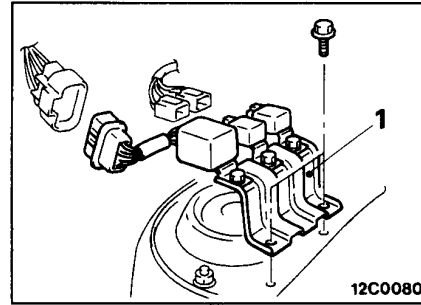
Never subject the wheel bearings to the vehicle load when the drive shaft nuts are loosened.

STRUT ASSEMBLY

REMOVAL AND INSTALLATION

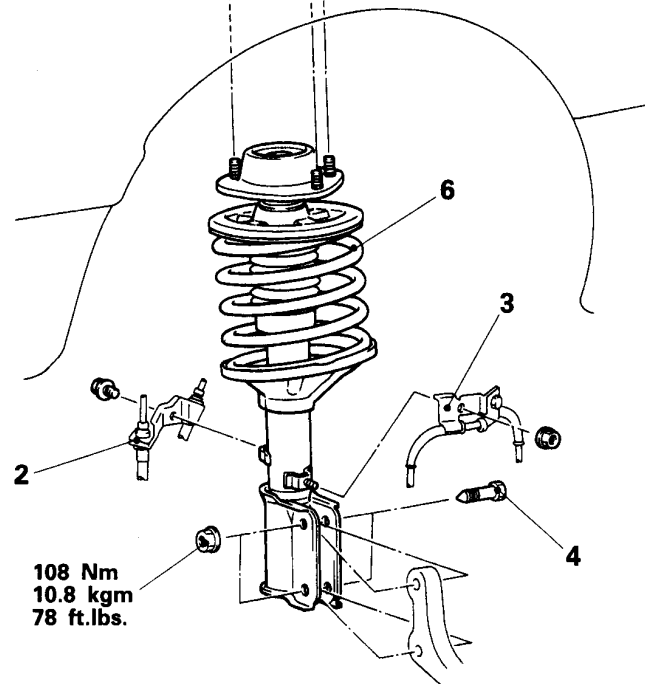
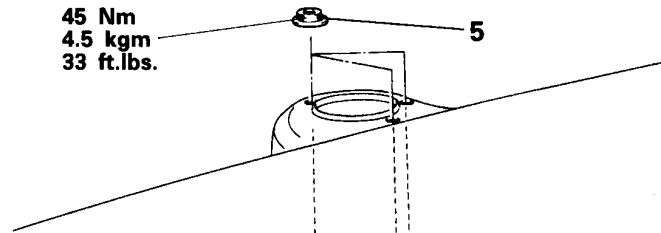
Post-installation Operation

- Front Wheel Alignment Adjustment (Refer to P.33A-4.)



E33LA--

45 Nm
4.5 kgm
33 ft.lbs.

**Removal steps**

1. Daytime running lamp relay and control unit
2. Brake pipe clamp
3. Front speed sensor clamp
<Vehicles with ABS>
4. Bolts
5. Flange nut
6. Strut assembly



12C0065

SERVICE POINTS OF REMOVAL

E33LBAL

4. REMOVAL OF BOLTS

- (1) Suspend the lower arm from the vehicle with wire.
- (2) Remove the strut and knuckle connection.

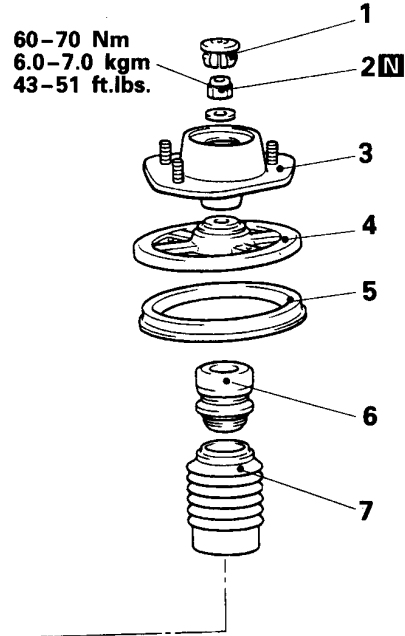
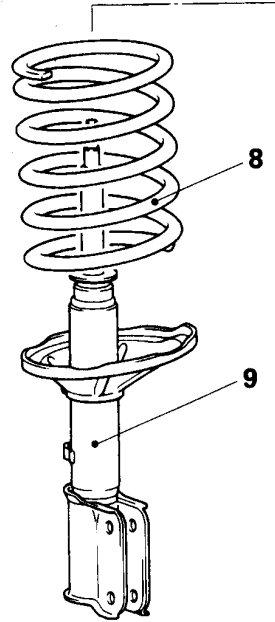
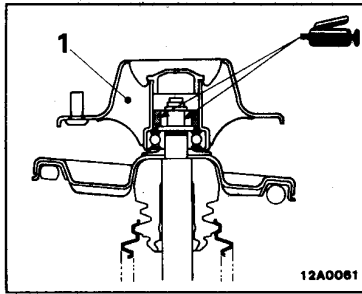
INSPECTION

E33LCAC

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

DISASSEMBLY AND REASSEMBLY

E33LE--

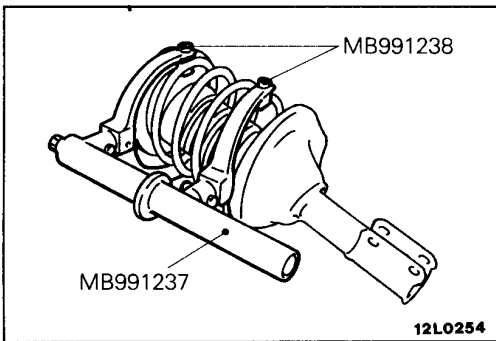


Disassembly steps



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

12A0528



SERVICE POINTS OF DISASSEMBLY

E33LFAM

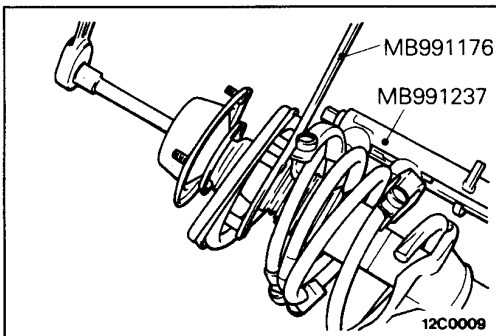
2. REMOVAL OF SELF-LOCKING NUT

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

Caution

1. Install the special tools evenly, and so that the maximum length will be attained within the installation range.
2. The self-locking nut should be loosened only, not removed.
3. Do not use any air tools to tighten the bolt of the special tool or remove the self-locking nut.

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



SERVICE POINTS OF REASSEMBLY

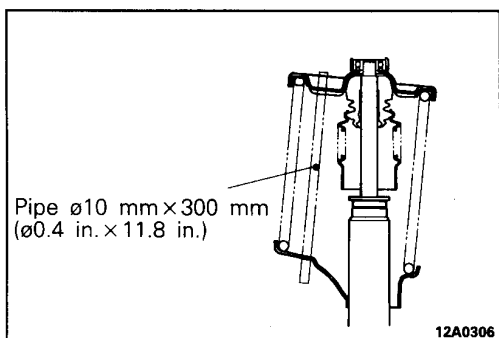
E33LHAP

2. INSTALLATION OF SELF-LOCKING NUT

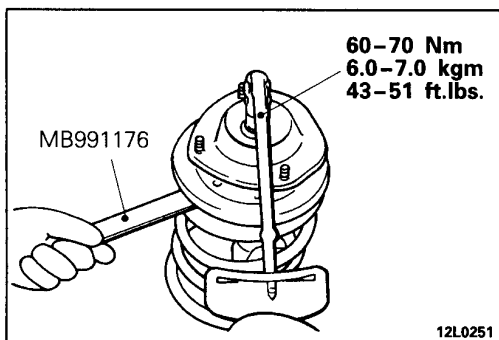
- (1) With the coil spring compressed by the special tools (MB991237 and MB991238), temporarily tighten the self-locking nut.

Caution

Do not use any air tool to tighten the bolt of the special tools.



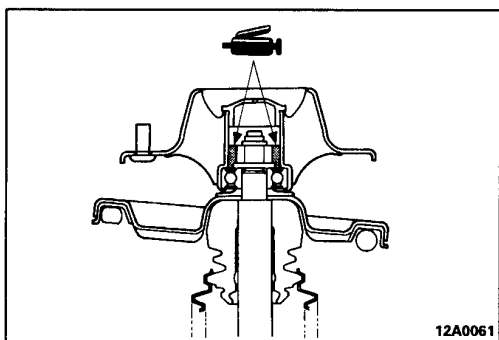
- (2) Using a pipe line up the holes in the strut assembly spring lower seat with the hole in the spring upper seat.
- (3) Correctly align both ends of the coil spring with the grooves in the spring seat, and then loosen the special tools (MB991237 and MB991238)



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

Caution

Do not use any air tools.



- (5) Apply multipurpose grease to the bearing part of the strut insulator.

Caution

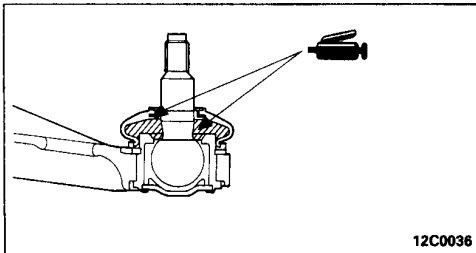
When applying the grease, take care that grease does not adhere to the insulator's rubber part.

LOWER ARM

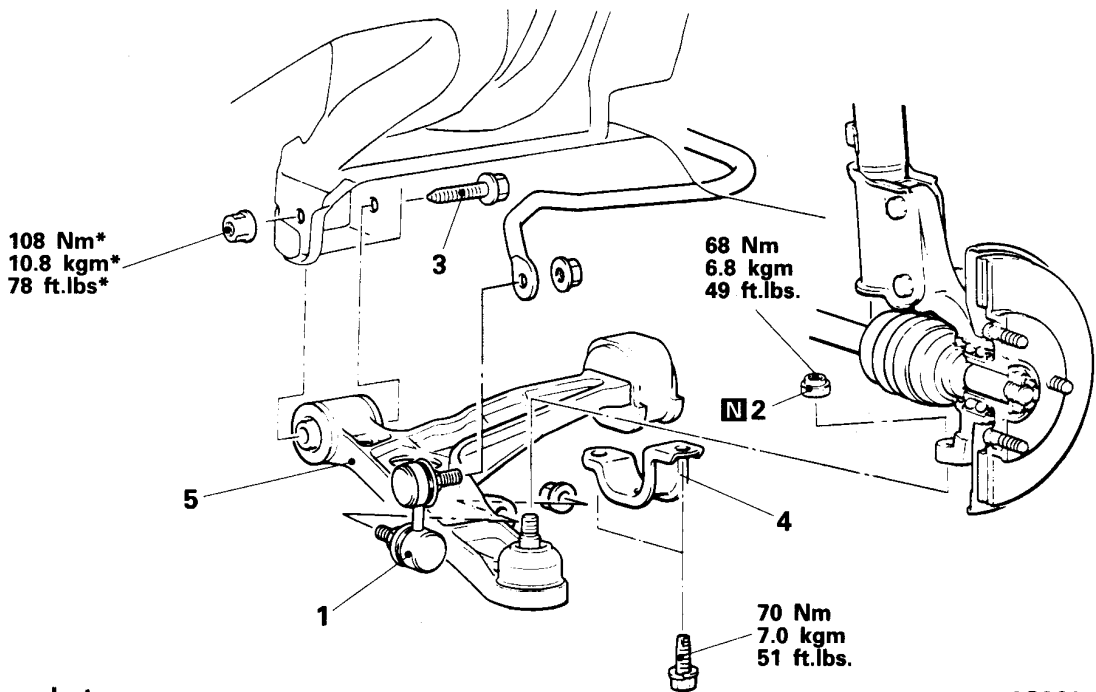
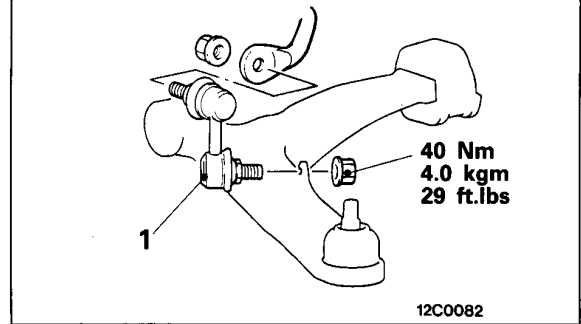
REMOVAL AND INSTALLATION

E330A--

<Petrol-powered vehicles>



<Diesel-powered vehicles>



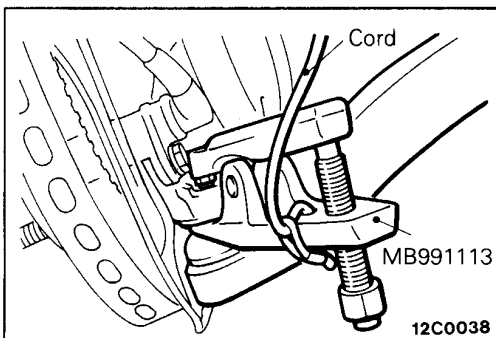
Removal steps



1. Stabilizer link
2. Self-locking nut
3. Bolt
4. Clamp
5. Lower arm

NOTE

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



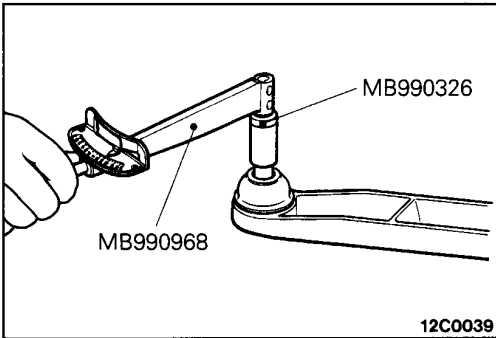
SERVICE POINTS OF REMOVAL

E330BAM

2. REMOVAL OF SELF-LOCKING NUT

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.



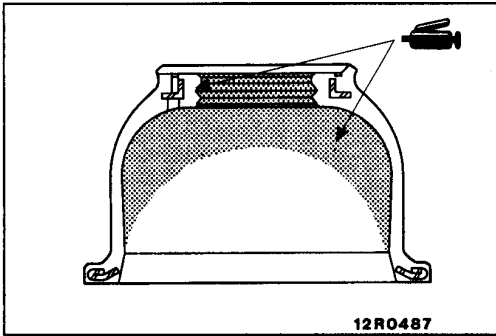
INSPECTION

E330CAJ

- 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

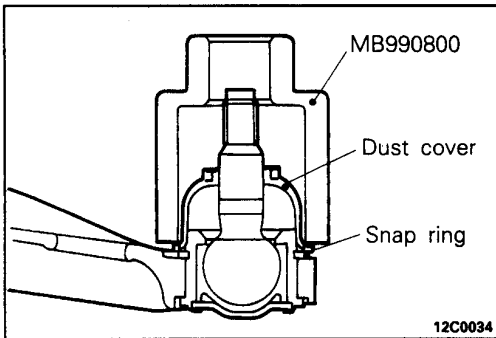
**Standard value: 2-9 Nm
(20-90 kgcm, 17-78 in.lbs.)**



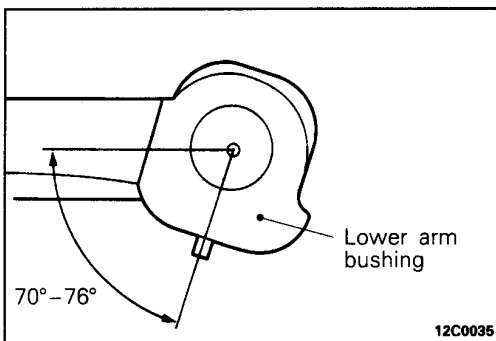
BALL JOINT DUST COVER REPLACEMENT

E330DAD1

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



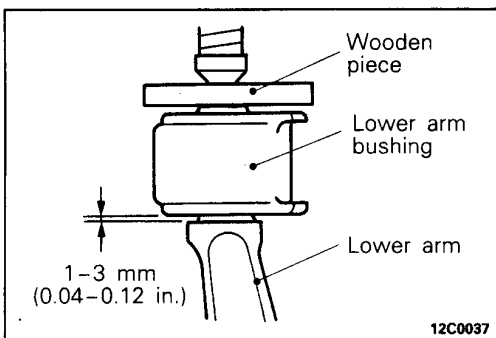
- (3) Drive in the dust cover with special tool until it is fully seated.



LOWER ARM BUSHING (A) REPLACEMENT

E330FAD

- (1) Apply soapy water between the shaft and old bushing, and pry up bushing using a screwdriver.
- (2) Apply soapy water to the shaft and new bushing and install new bushing into the shaft at the angle shown in the illustration.



- (3) Press in the bushing as illustrated.

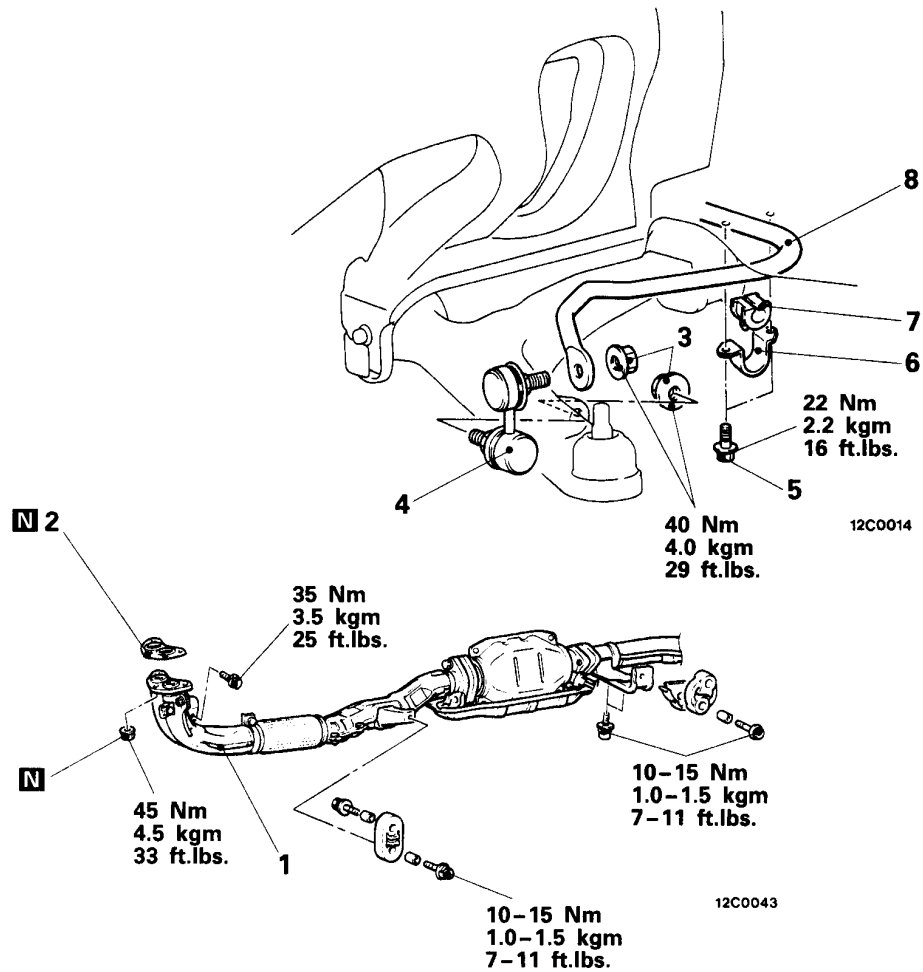
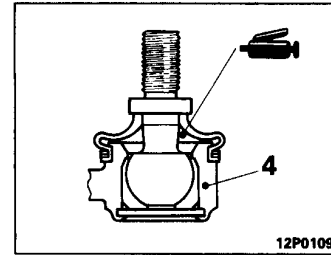
STABILIZER BAR <PETROL-POWERED VEHICLES>

REMOVAL AND INSTALLATION

E33RA--

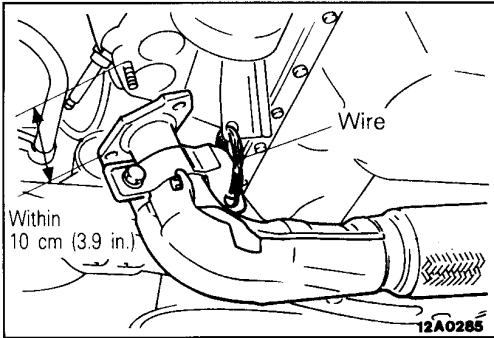
Pre-removal and Post-installation Operation

- Removal and Installation of Propeller Shaft
(Refer to GROUP 25 – Propeller Shaft.)



Removal steps

- ↔ 1. Front exhaust pipe
- 2. Gasket
- 3. Nut
- 4. Stabilizer link
- ↔ 5. Bolt
- 6. Fixture
- 7. Stabilizer bushing
- 8. Stabilizer bar



SERVICE POINTS OF REMOVAL

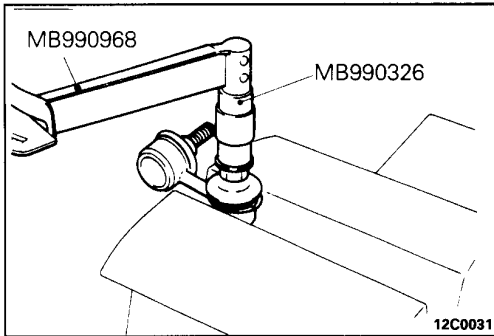
E33RBAI

1. REMOVAL OF FRONT EXHAUST PIPE

Remove the front exhaust pipe assembly and exhaust manifold connection, and suspend the front exhaust pipe with wire.

Caution

If the flexible joint is bent too much, the inside could become damaged, so do not bend further than shown in the illustration.



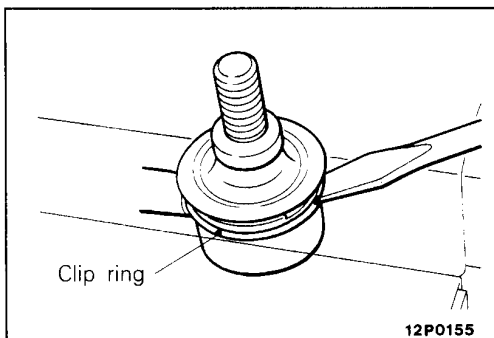
INSPECTION

E33RCAG

- 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

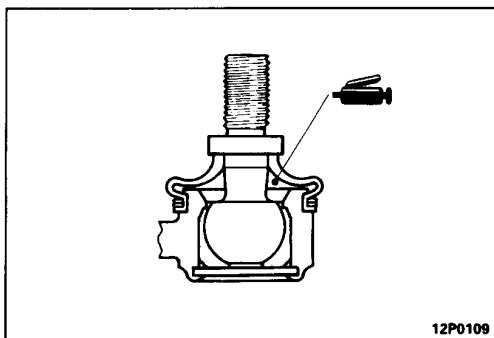
Standard value: 1.7–3.2 Nm
(17–32 kgcm, 15–28 in.lbs.)



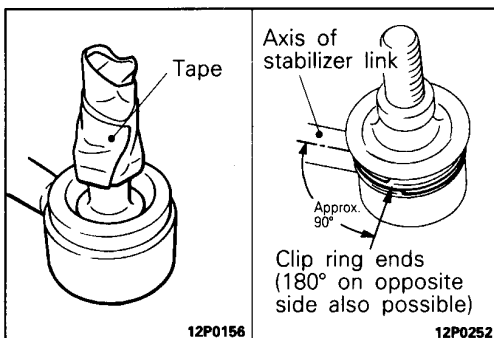
BALL JOINT DUST COVER REPLACEMENT

E33REAF

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



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



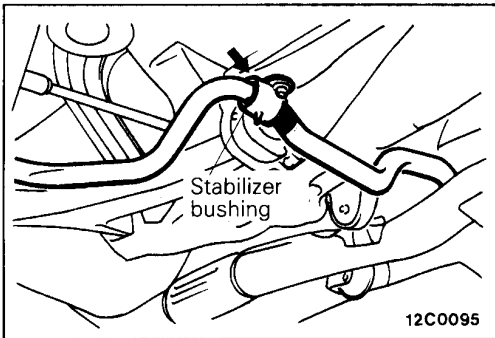
- (3) Use vinyl tape to tape the stabilizer link where shown in the illustration, and then install the dust cover to the stabilizer link.
- (4) Secure the dust cover by the clip ring. When installing the clip ring, align it so that its ends are located at a 90° angle from the axis of the stabilizer link.

E33RDAI

SERVICE POINTS OF INSTALLATION

5. INSTALLATION OF BOLT

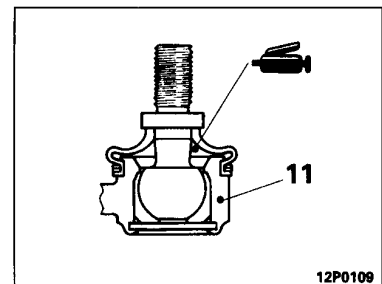
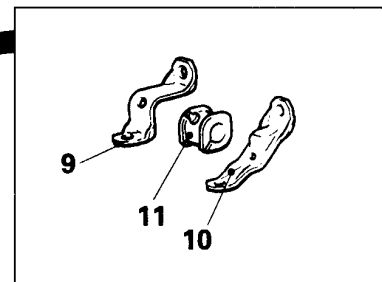
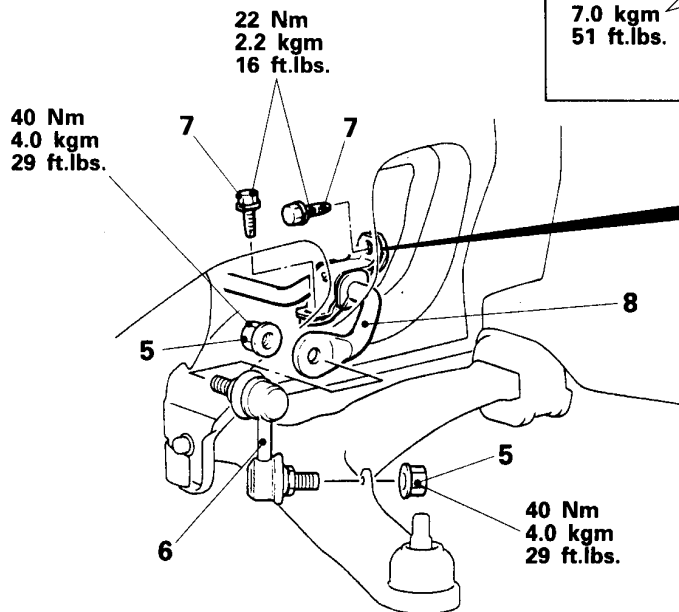
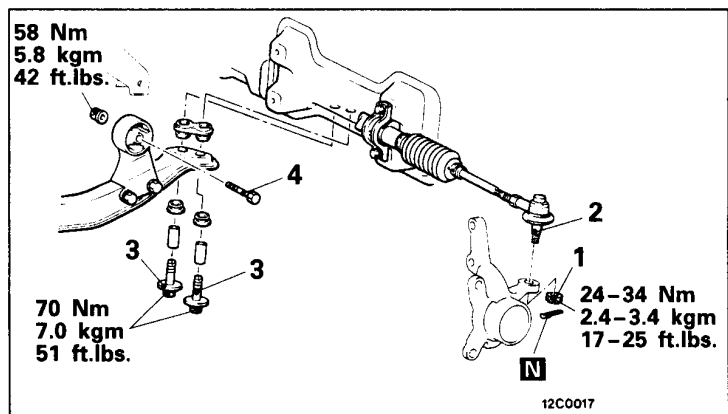
Position the stabilizer bar so that the left end of the stabilizer bar marking and the edge of the stabilizer bushing are aligned, and then tighten the stabilizer bar mounting bolt.



STABILIZER BAR <DIESEL-POWERED VEHICLES>

E33RA--

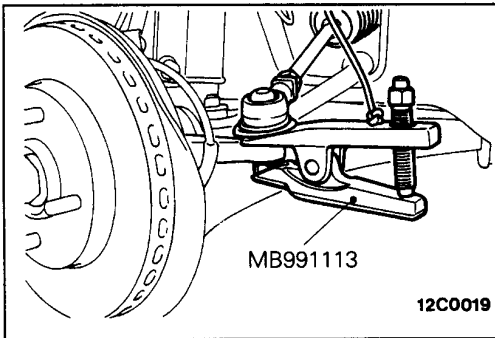
REMOVAL AND INSTALLATION



Removal steps

- 1. Castle nut
- 2. Tie rod end
- 3. Bolt
- 4. Bolt
- 5. Nut
- 6. Stabilizer link
- 7. Bolt
- 8. Stabilizer bar
- 9. Upper fixture
- 10. Lower fixture
- 11. Stabilizer bushing

33A-14 FRONT SUSPENSION – Stabilizer Bar <Diesel-powered Vehicles>



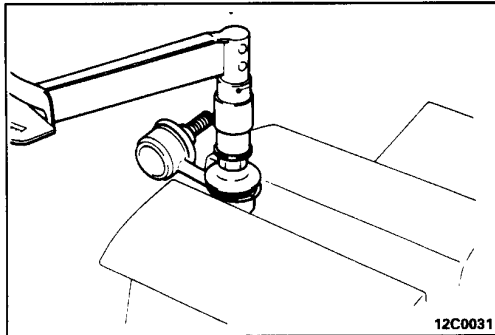
SERVICE POINTS OF REMOVAL

E33RBAJ

2. REMOVAL OF TIE ROD END

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

E33RCAG

- 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.

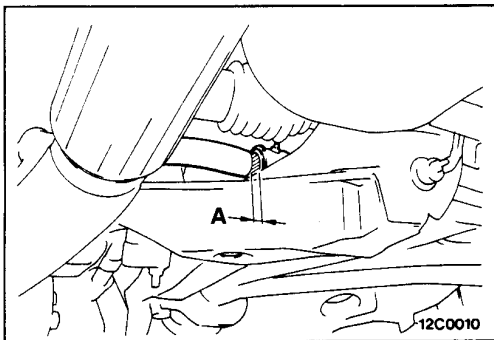
CHECKING OF STABILIZER LINK BALL JOINT FOR STARTING TORQUE

Standard value: 1.7–3.2 Nm
(17–32 kgcm, 15–28 in.lbs.)

BALL JOINT DUST COVER REPLACEMENT

E33REAF

Refer to P.33A-12.



SERVICE POINTS OF INSTALLATION

E33RDAJ

7. INSTALLATION OF BOLT

Position the stabilizer bar so that the projecting lengths of the marking from the fixture are at the reference value, and then tighten the stabilizer bar mounting bolt.

Reference value (A): approx. 7 mm (0.27 in.)