FRONT SUSPENSION

CONTENTS

33AA–

 PWGE9004

SPECIFICATIONS

GENERAL SPECIFICATIONS

33CA--

Items	SOHC	DOHC
Suspension system	McPherson strut with coil spring and compression rod type	
Coil spring		
Wire dia×O.D.×free length mm (in.)	15.0×185.0×399 – MT (0.59×7.28×15.7) 15.2×185.2×403 – AT (0.59×7.29×15.9)	15.2×185.2×403 – MT (0.59×7.29×15.9) 15.4×185.4×400 – AT (0.61×7.30×15.7)
Coil spring identification colour	Yellow×2 – MT Light blue×1 – AT	Light blue×1 – MT Light blue×2 – AT
Spring constant N/mm (kg/mm, lbs./in.)	23 (2.3, 128)	23 (2.3, 128) – MT 25 (2.5, 138) – AT
Shock absorber		
Type	Hydraulic, cylindrical double-acting type	
Max. length mm (in.)	506 (19.92)	
Min. length mm (in.)	352 (13.86)	
Stroke mm (in.)	154 (6.06)	
Damping force		
[at 0.3 m/sec. (0.984 ft./sec)]		
Expansion N (lbs.)	950 (209)	
Contraction N (lbs.)	450 (99)	

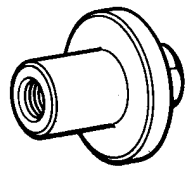
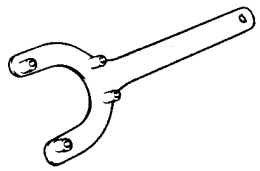
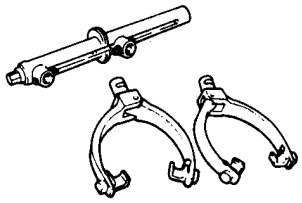
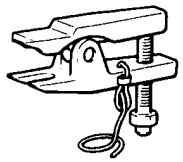
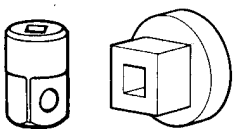
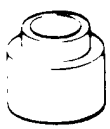
SERVICE SPECIFICATIONS

33CB--

Items	Specification
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°
Camber	0°±30′
Caster	2°45′±30′
Kingpin inclination	13°15′
Side slip mm (in.)	0±3 (0±0.12)
Lower arm ball joint starting torque Nm (kgcm, in.lbs.)	10–22 (100–220, 87–190)
Stabilizer link ball joint starting torque Nm (kgcm, in.lbs.)	1.7–3.2 (17–32, 15–28)

SPECIAL TOOLS

33DA--

Tool	Number	Name	Use
	MB991004	Wheel alignment gauge attachment	Measurement of the wheel alignment
	MB991176	Spring seat holder	Disassembly/assembly of the strut assembly
	MB991237 MB991238	Spring compressor body Arm set	Compression of the front coil spring
	MB991113 (MB990635)	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	
	MB990799	Ball joint remover and installer	Installation of the dust cover

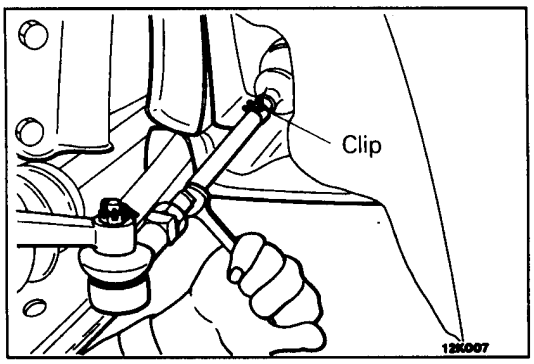
SERVICE ADJUSTMENT PROCEDURES
33FAAU

FRONT WHEEL ALIGNMENT INSPECTION AND ADJUSTMENT

TOE-IN

1. Measure the toe-in.

   Standard value:
   At the centre of tyre tread 0±3 mm (0±0.12 in.)
   Toe angle (per wheel) 0±9′



2. 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).
3. 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).

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°)

CAMBER, CASTER AND KINGPIN INCLINATION

Measure the camber, caster and kingpin inclination by using the special tool, a camber/caster/kingpin gauge and a turning radius gauge.

Standard value:

Camber	**0°±30′**
Caster	**2°45′±30′**
Kingpin inclination	**13°15′**

NOTE
1. Camber and caster are pre-set at the factory and cannot be adjusted.
2. If camber and caster are not within the standard value, replace bent or damaged parts.

SIDE SLIP

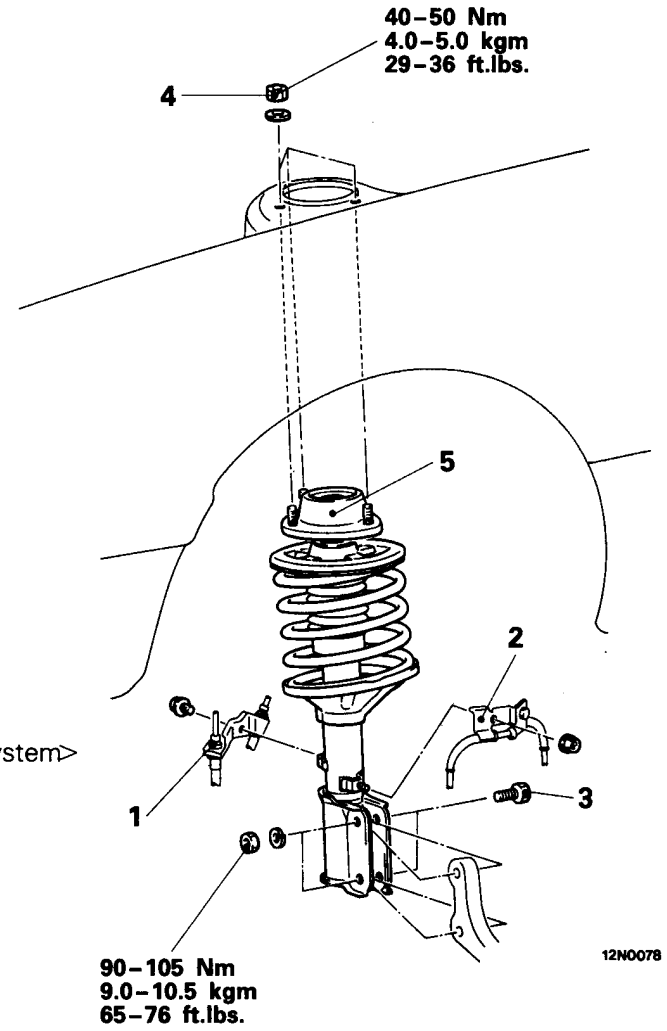
Measure the side slip with a side slip tester.

Standard value: 0±3 mm (0±0.12 in.)

STRUT ASSEMBLY

33LA–

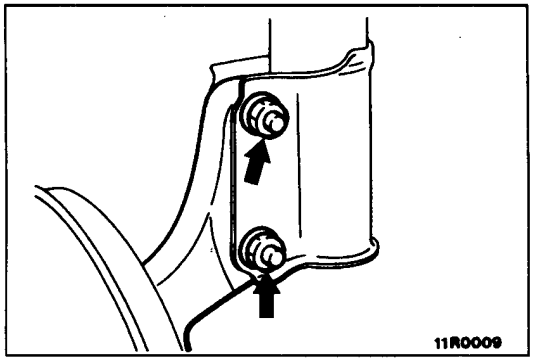
REMOVAL AND INSTALLATION



Removal steps

1. Brake hose and pipe bracket
2. Front speed sensor clamp
   <Vehicles with Anti-skid brake system>
3. Strut lower mounting bolts
4. Strut upper mounting nuts
5. Strut assembly

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



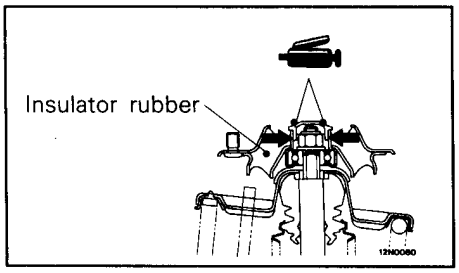
INSPECTION

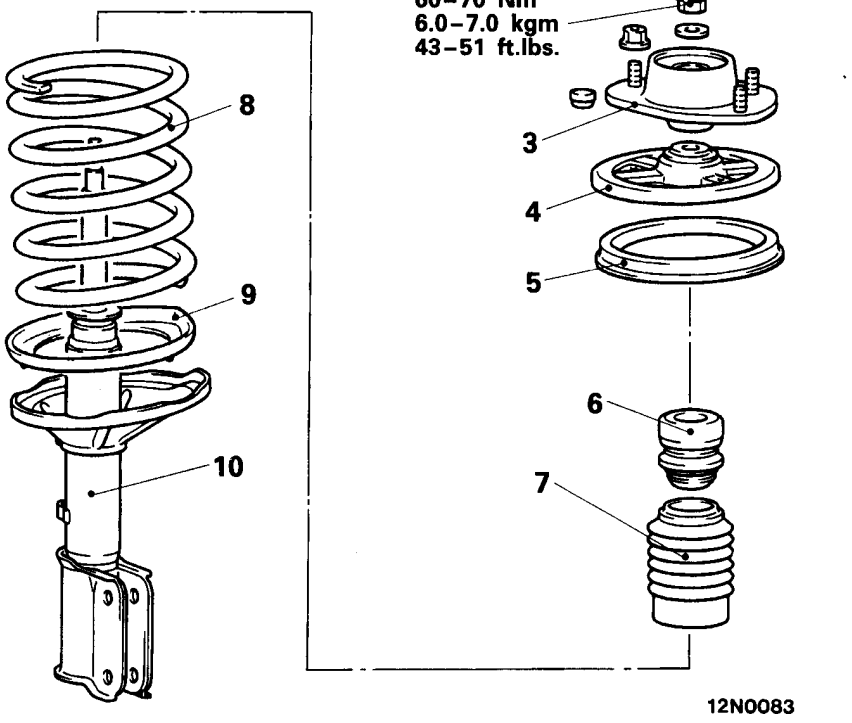
E33LCAC

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

DISASSEMBLY AND REASSEMBLY

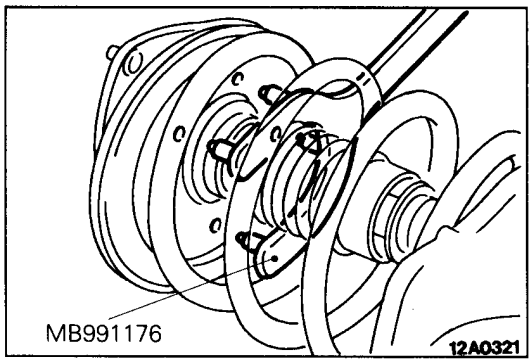
33LE--

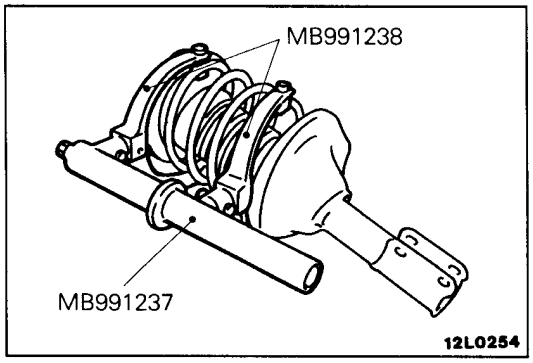




Disassembly steps

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. Spring seat, lower
10. Strut assembly





SERVICE POINTS OF DISASSEMBLY

E33LFAI

2. REMOVAL OF SELF-LOCKING NUT

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

Caution
(1) The self-locking nut should be loosened only, not removed.
(2) Do not use an air tool.

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

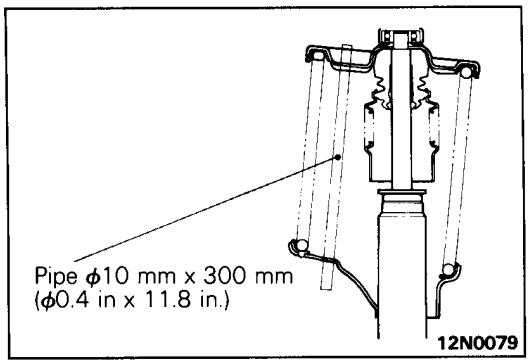
Caution
(1) Install the special tools evenly, and so that the maximum length will be attained within the installation range.
(2) Do not use an air tool to tighten the bolt of the special tool and to remove the self-locking nut.

SERVICE POINTS OF REASSEMBLY 33LHAM

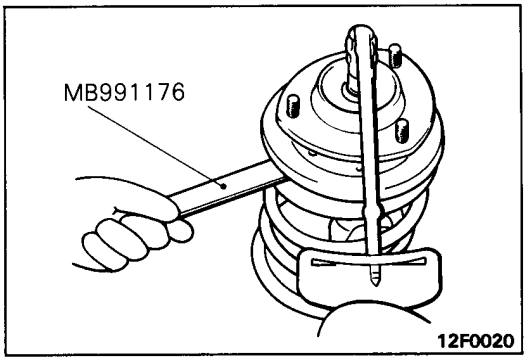
2. INSTALLATION OF SELF-LOCKING NUT

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

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

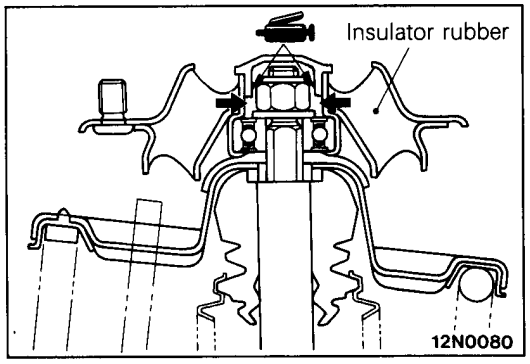


(2) Using the pipe, line up the holes in the strut assembly spring lower seat with the hole in the spring upper seat.
(3) Correctly align both ends of the coil spring with the grooves in the spring seat, and then loosen the special tools (MB991237 and MB991238).



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

Caution
Do not use an air tool.



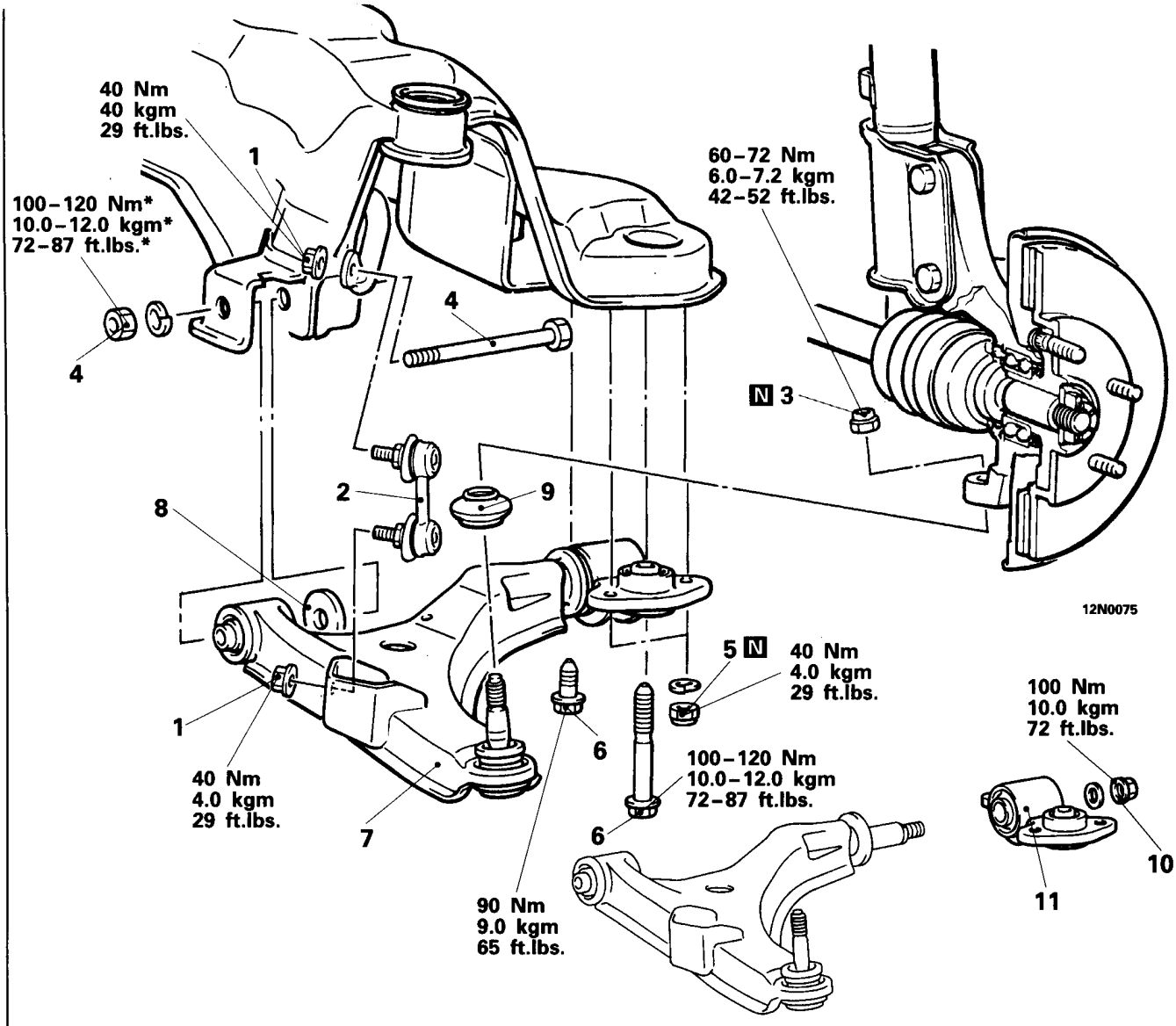
(5) Apply multipurpose grease to the bearing part of the strut insulator, and install the insulator cap.

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

LOWER ARM

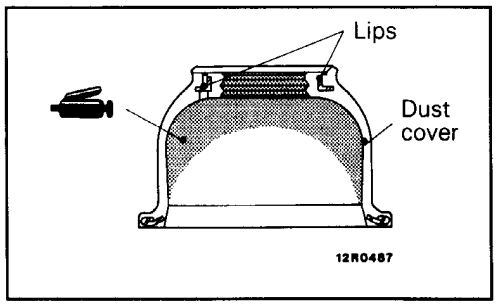
REMOVAL AND INSTALLATION

33OA--



Removal steps

1. Stabilizer link mounting nuts
2. Stabilizer link
3. Self-locking nut
4. Lower arm mounting nut and bolt
5. Self-locking nuts
6. Bolts
7. Lower arm assembly
8. Stopper
9. Ball joint dust cover
10. Self-locking nut
11. Clamp

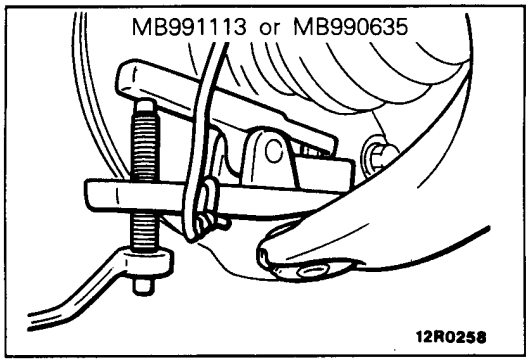


Caution

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

Post-installation Operation

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



SERVICE POINTS OF REMOVAL 33OBAK

3. 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 33OCAI

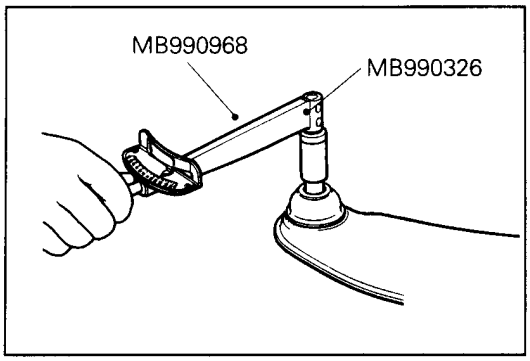
- Check the bushing for wear and deterioration.
- Check the lower arm for bend or breakage.
- Check the clamp for deterioration or damage.
- Check the ball joint dust cover for cracks.
- Check all bolts for condition and straightness.

CHECKING OF BALL JOINT FOR STARTING TORQUE

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

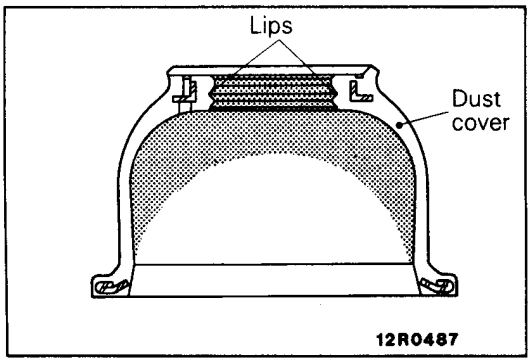
Standard value: 10–22 Nm
(100–220 kgcm, 87–190 in.lbs.)

(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.

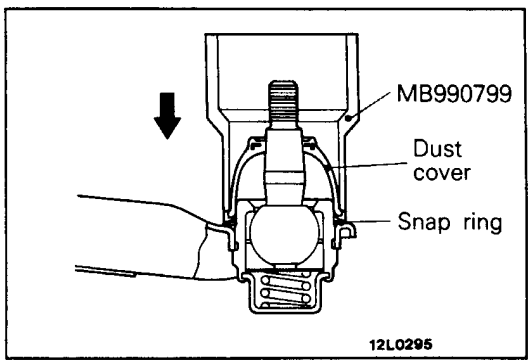


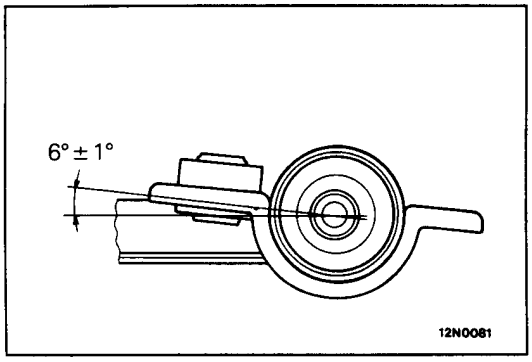
BALL JOINT DUST COVER REPLACEMENT E33ODAD1

(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.





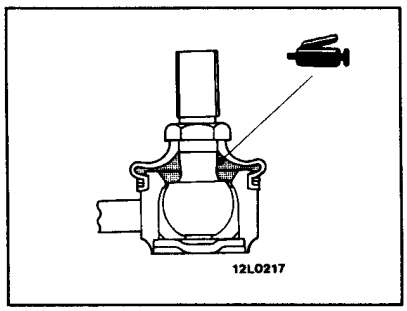
SERVICE POINTS OF INSTALLATION 33OEAJ

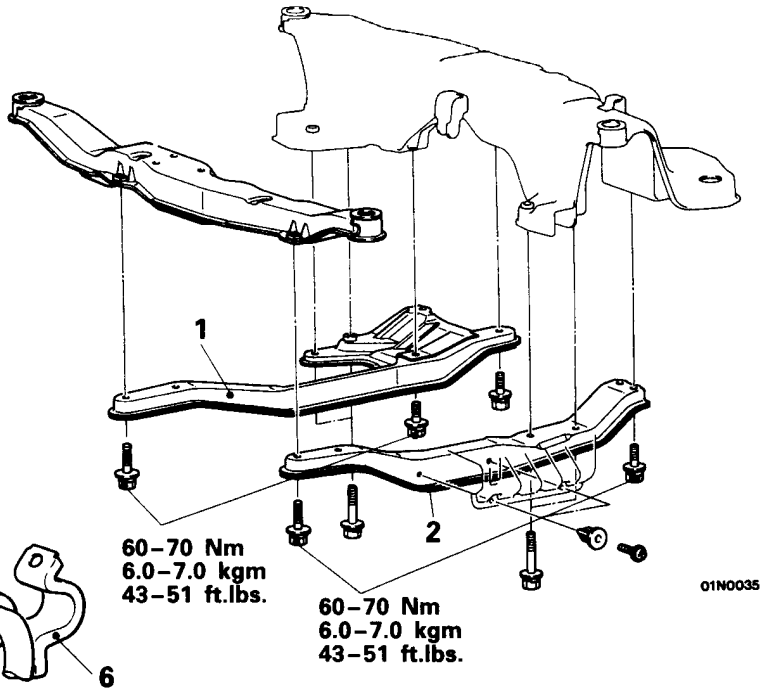
10. INSTALLATION OF SELF LOCKING NUT

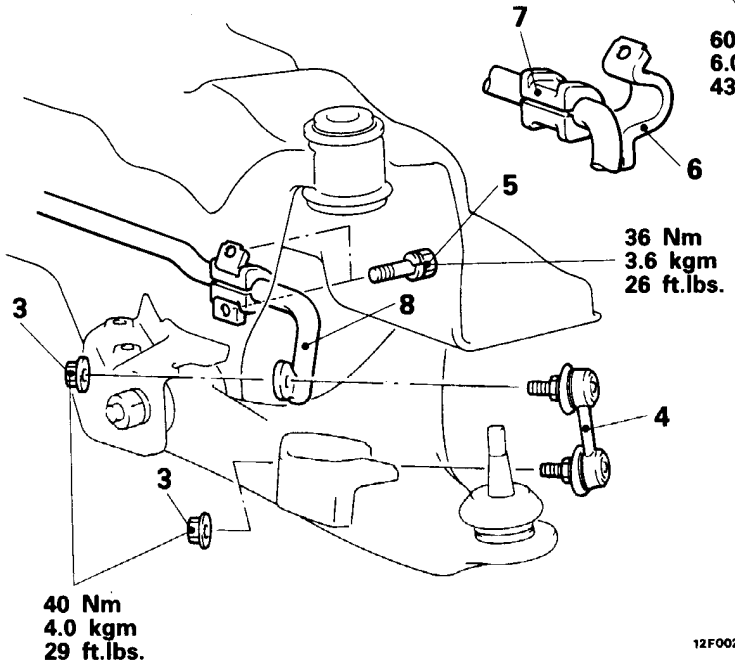
After positioning the clamp at the angle indicated in the illustration, install the self-locking nut.

STABILIZER BAR 33RA–

REMOVAL AND INSTALLATION







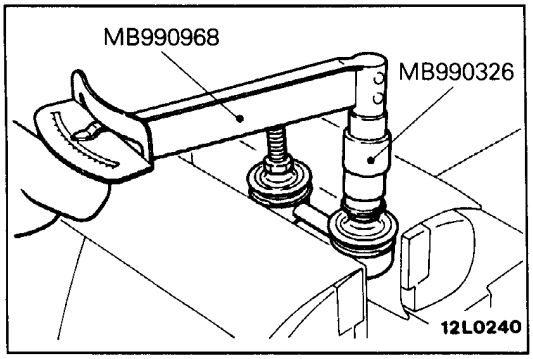
Removal steps

- Removal of front exhaust pipe (Refer to GROUP 15 – Exhaust Pipe)

1. Right member
2. Left member
3. Stabilizer link installation nuts
4. Stabilizer link
5. Stabilizer bar bracket installation bolt
6. Stabilizer bar bracket
7. Bushing
8. Stabilizer bar

INSPECTION E33RCAC

- 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

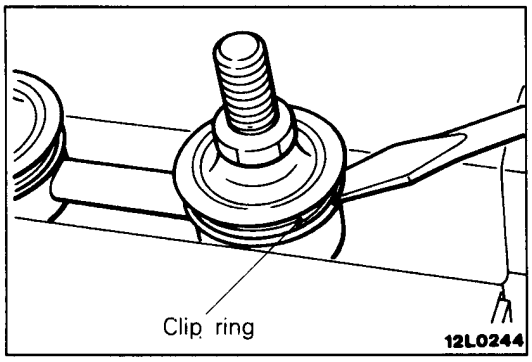
(1) If a crack is noted in the dust cover, replace it, adding grease.
(2) Shake the stabilizer link ball joint stud several times.
(3) Mount two nuts on the ball joint, and then measure the ball joint starting torque.

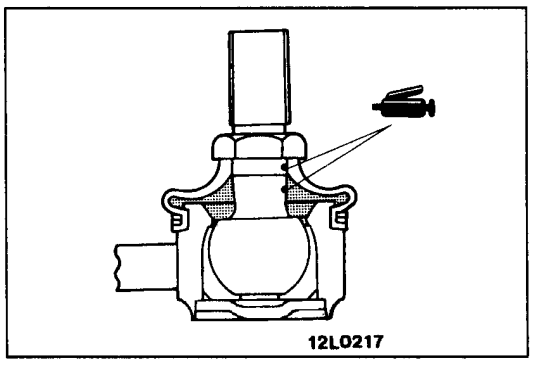
Standard value : 1.7–3.2 Nm
(17–32 kgcm, 15–28 in.lbs.)

(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.

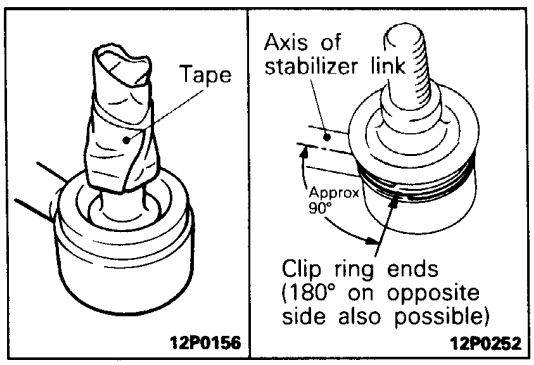
BALL JOINT DUST COVER REPLACEMENT 33REAE

(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 ring.

NOTE
When installing the clip ring, align it so that its ends are located at a 90° angle from the axis of the stabilizer link