Suspension System

GENERAL

SPECIFICATIONS EHMB0100

Front suspension system — Double wishbone torsion bar type

Shock absorber

Items	Specifications
Type	Gas pressurized type
Stroke (mm) mm (in.)	115 (4.53)
Damping force (0.3 m/sec)	
Expansion N (kg)	1650 (165)
Compression N (kg)	520 (52)
I·D color	White

Torsion bar

Items	2.5L Diesel	3.5L Gasoline
Length X Outer dia. mm (in.)	1273 X 27.3 (50.1 X 1.1)	1273 X 27.7 (50.1 X 1.1)
Torsional spring constand (kg·cm/deg)	598 ± 3%	631 ± 3%
I·D color	Left (LH) : Yellow 1 line Right (RH) : White 1 line	Left (LH) : Yellow 2 lines Right (RH) : White 2 lines

Rear suspension system — 5 link rigid axle (coil spring) type

Items	Specifications
Coil spring free height and identification color	
Free height mm (in.)	395.7 (15.6)
I·D color	Gray 2 lines
Shock absorber	
Type	Gas pressurized type
Stroke (mm) mm(in.)	198 (8)
Damping force (0.3 m/sec)	
Expansion N (kg)	1640 (164)
Compression N (kg)	470 (47)
I·D color	White

EHMB010A

SERVICE STANDARD EHMB0200

Front wheel alignment

Items		Standard values	Specifications
Toe-in	Front	3.5 ± 3.5 mm (0.138 ± 0.138 in.)	Individual toe is within 0-3.5 mm (0-0.138 in.)
	Rear	0	Do not adjust
Camber	Front	0° ± 30'	Difference between LH and RH : max. 30'
	Rear	0	Do not adjust
Caster		3° 5' ± 30'	Difference between LH and RH : max. 30'
King pin angle		13°	

Wheel size : 6J X 15 (Aluminum), 7J X 16 (Aluminun), 6J X 15 (steel)
Tire size : 235/75 R15, 255/65 R16
Tire inflation pressure KPa (pis) : 196 (29)

EHMB020A

TIGHTENING TORQUE EHMB0300

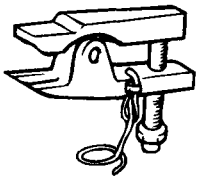
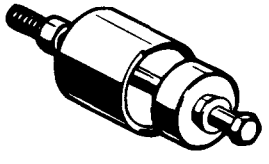
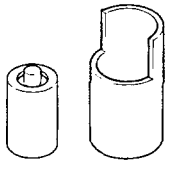
Items	Nm	kg·cm	lb·ft
Wheel nut	100-120	1000-1200	73-88
Shock absorber upper mounting nut	12-18	120-180	9-13
Shock absorber lower mounting nut	70-95	700-950	51-70
Knuckle to upper arm ball joint trghtening nut	60-90	600-900	44-66
Upper arm shaft to upper arm mounting	122-145	1220-1450	89-106
Upper arm shaft to body mounting bolt	100-120	1000-12000	73-88
Upper arm ball joint mounting nut	17-26	170-260	13-19
Rebound stopper mounting nut	8-12	80-120	6-9
Lower arm ball joint to knuckle mounting locking nut	120-180	1200-1800	88-131
Lower arm to body mounting bolt	140-160	1400-1600	103-117
Lower arm ball joint mounting nut	54-75	540-750	40-55
Anchor arm mounting nut	95-120	950-1200	70-88
Stabilizer bar link ball joint nut	100-120	1000-1200	73-88
Stabilizer bar mounting bracket	35-55	350-550	26-40
Tie rod end to knuckle mounting nut	40-50	400-500	29-37
Toe-in adjusting nut	65-80	650-800	48-58
Rear shock absorber lower mounting nut	90-120	900-1200	66-88
Rear upper link mounting nut	150-180	1500-1800	110-131
Rear lower link mounting nut	150-180	1500-1800	110-131

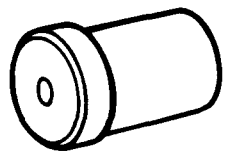
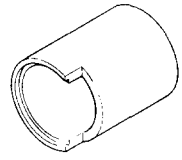
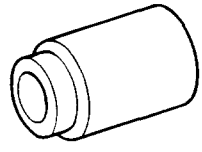
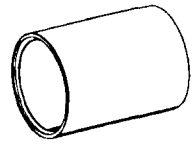
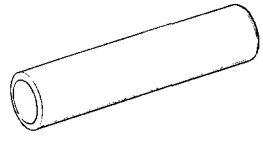
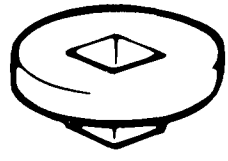
Items	Nm	kg·cm	lb·ft
Lateral rod mounting nut (Frame side)	150-180	1500-1800	110-131
Lateral rod mounting nut (Axle side)	180-240	1800-2400	132-175
Rear stabilizer bar link bushing mounting nut	19-28	190-280	14-21
Rear stabilizer bar bracket mounting bolt	30-40	300-400	22-29

⚠ ***CAUTION***

Replace the self-locking nuts with new ones after removal.

SPECIAL TOOLS EHMB0400

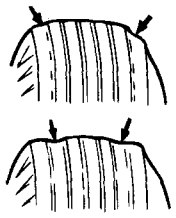
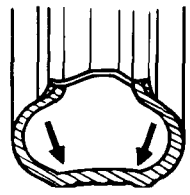
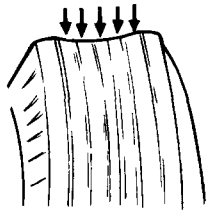
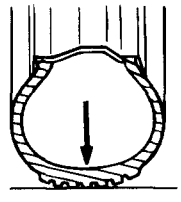
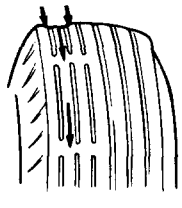
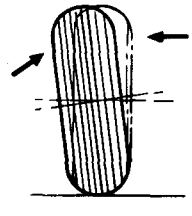
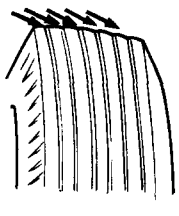
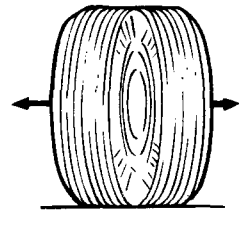
Tool (Number and Name)	Illustration	Usage
09568-34000 Ball joint puller	 KHMB040A	Removal of upper ball joint Removal of tie rod end ball joint
09624-34000 Trailing bushing remover/installer	 KHMB040B	Replacement of front lower arm bushing
09545-25000 Lower arm bushing remover/installer	 KHMB040C	Replacement of front lower arm (Use with 09624-34000)
09517-43001 Bearing puller	 KHMB040D	Removal of lower arm ball joint

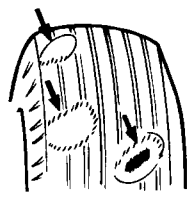
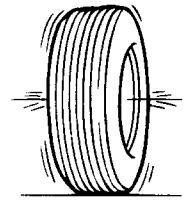
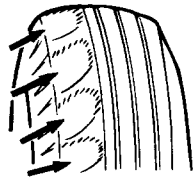
Tool (Number and Name)	Illustration	Usage
09495-33100 Center bearing remover/install	 KHMB040E	Replacement of lateral rod bushing (Use with 09545-24100)
09545-24100 Lower arm bushing remover/installer	 KHMB040F	Replacement of lateral rod bushing (Use with 09495-33100)
09455-21100 Bearing installer	 KHMB040G	Replacement of lateral rod bushing (Use with 09517-21200
09517-21200 Front axle base	 KHMB040H	Replacement of lateral rod bushing (Use with 09455-21100) Replacement of upper arm bushing (Use with 09455-33200)
09216-21300 Hub bearing installer	 KHMB040I	Replacement of rear lower arm bushing (Use with 09455-33200
09455-33200 Bearing installer	 KHMB040J	Replacement of rear lower arm bushing (Use with 09216-21300)
09532-11600 Preload socket	 KHMB040K	Measurement of stabilizer link ball joint starting torque (Use with torque wrench)

TROUBLESHOOTING EHMB0500

Symptoms	Possible causes	Remedy
Excessive vehicle rolling	Broken or deteriorated stabilizer	Replace
	Damaged shock absorber	Replace
Abnormal noise	Loose mounting parts	Retighten
	Broken or worn wheel bearing	Replace
	Shock absorber malfunction	Replace
	Damaged tire	Replace
Poor riding	Excessive tire inflation pressure	Adjust the tire inflation the pressure
	Shock absorber malfunction	Replace
	Loose wheel nut	Tighten to the specified torque
	Distorted or broken coil spring	Replace
	Damaged tire	Replace
	Worn bushing	Replace
Vehicle leans to one side	Deformed arm assembly	Replace
	Worn bushing	Replace
	Distorted or broken coil spring	Replace
	Improper torsion bar anchor bolt height adjustment	Adjust
Hard steering	Improper front wheel alignment	Repair
	Excessive turning resistance of lower arm ball joint	Replace
	Lack of tire inflation pressure	Adjust
	Power steering malfunction	Repair or Replace
Wandering	Improper front wheel alignment	Repair
	Worn or loose lower arm bushing	Retighten or Replace
Bottoming	Broken or worn coil spring	Replace

WHEEL AND TIRE DIAGNOSIS

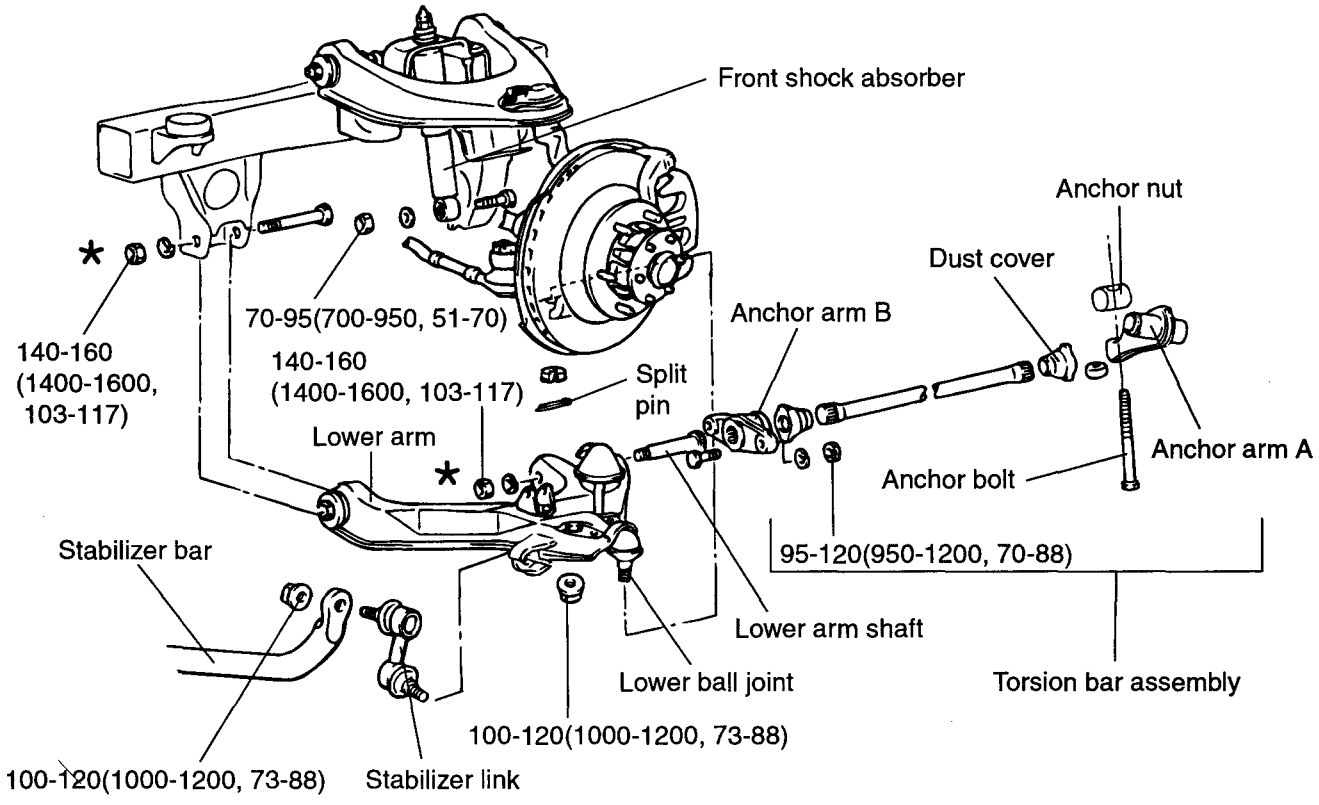
Symptoms	Possible causes	Remedy
Rapid wear at shoulders  EHPSS01A	Under-inflation or lack of rotation  EHPSS02A	Adjust the tire inflation pressure
Rapid wear at center  EHPSS04A	Over-inflation or lack of rotation  EHPSS03A	
Cracked treads  EHPSS20A	Under-inflation	
Wear on one side  EHPSS05A	Excessive camber  EHPSS06A	Inspect the camber
Feathered edge  EHPSS07A	Incorrect toe-in  EHPSS08A	Adjust the toe-in

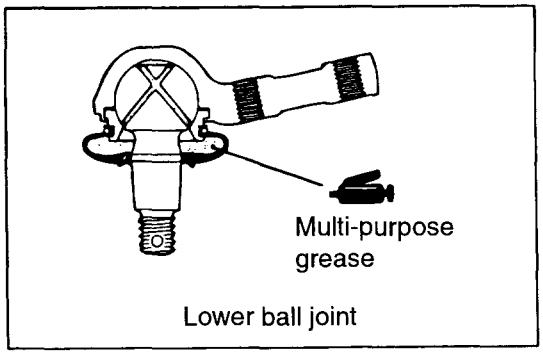
Symptoms	Possible causes	Remedy
Bald spots  EHPSS09A	Unbalanced wheel  EHPSS10A	Adjust the unbalanced wheels
Scalloped wear  EHPSS11A	Unbalanced wheel	Adjust
	Wheel bearing end play	Inspect end play Adjust preload
	Ball joint end play	Inspect
	Shock absorber malfunction	Inspect

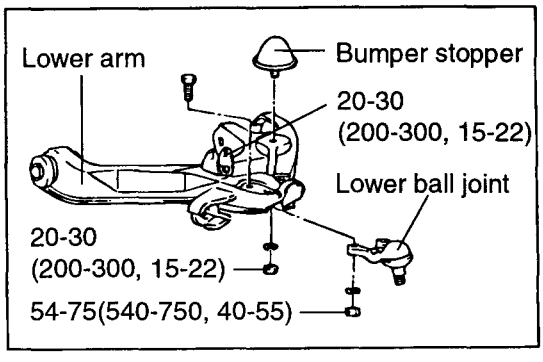
FRONT SUSPENSION SYSTEM

LOWER ARM

COMPONENTS EHMB0600







CAUTION
* Parts should be temporarily tightened, and then tightened to the speified torque with the vehicle on the ground in the unladen condition.

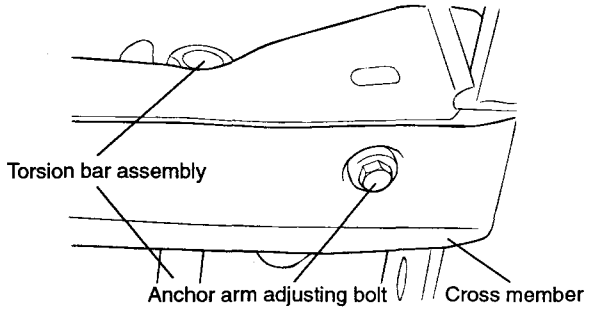
TORQUR : Nm (kg·cm, ft·lb)

REMOVAL EHMB0700

1. Loosen the anchor arm assembly adjusting bolt of torsion bar.

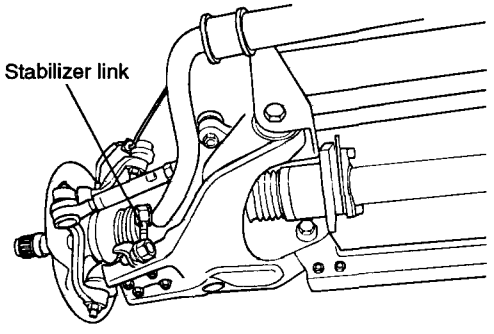
NOTE

Support the lower arm with a jack to easily loosen the anchor arm assembly adjusting bolt.



EHPSS77A

2. Disconnect the ABS speed sensor (Vehicle with ABS only).
3. Disconnect the stabilizer bar link.



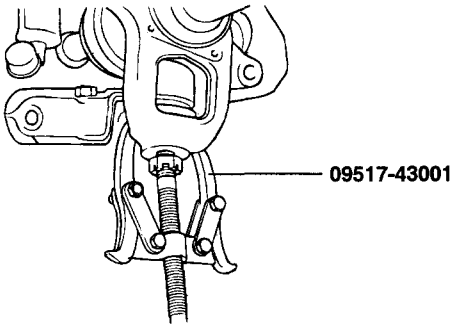
EHPSS13A

4. Remove the shock absorber lower mounting bolt/nut.
5. Remove the torsion bar anchor arm B and lower arm mounting bolt/nut.

NOTE

Press down the lower arm fully so as to remove bolt and nut easily.

6. Disconnect the knuckle from the lower arm ball joint using the special tool (09517-43001).



KHPSS14A

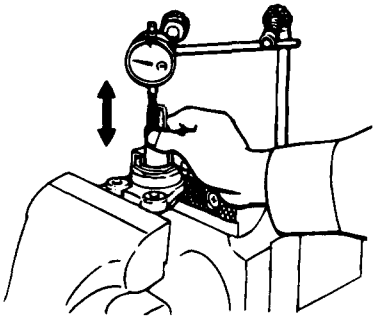
7. Remove the lower arm mounting bolt of the frame side.

INSPECTION EHMB0800

LOWER ARM BALL JOINT END PLAY MEASUREMENT

1. Using a dial gauge, measure the lower arm ball joint end play.

Limit value : 0.03 mm (0.0012 in.) or less



KHPS055A

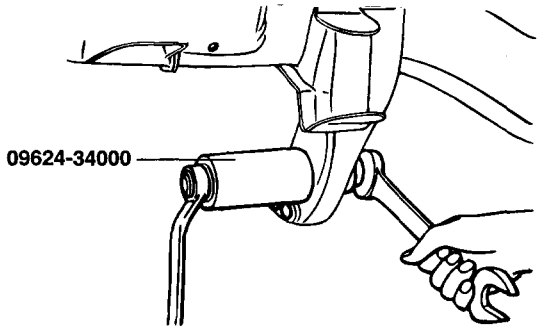
2. When the lower arm ball joint end play is above the limit value, replace the lower arm ball joint.

LOWER ARM BUSHING (A) REPLACEMENT

1. Use the special tool (09624-34000) to replace the bushing (A).

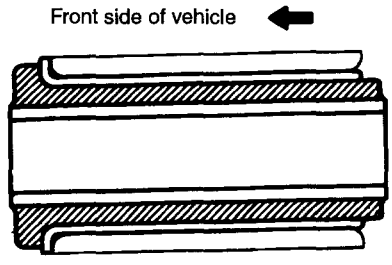
   NOTE

   When removing the left side bushing (A), remove the differential carrier.



KHPSS15A

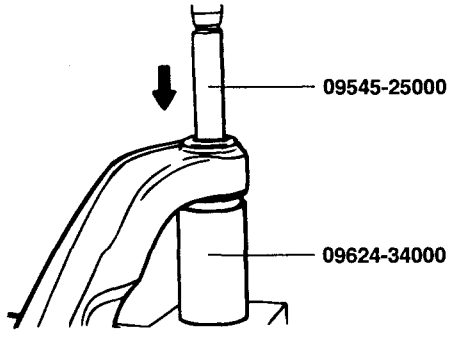
2. Install the bushing to the direction shown in the illustration.



EHPSS16A

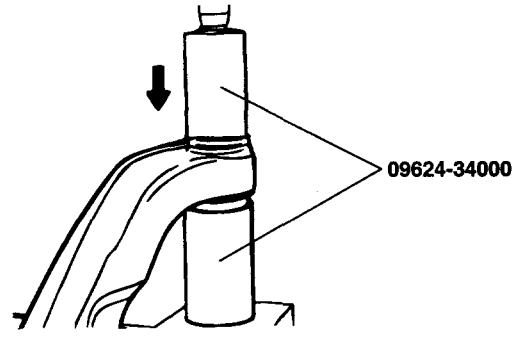
LOWER ARM BUSHING (B) REPLACEMENT EHMB0900

1. Use the special tool (09624-34000, 09545-25000) to remove the bushing (B).



KHPSS17A

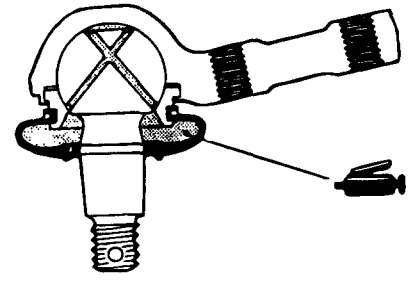
2. Use the special tool (09624-34000) to install the bushing (B).



KHPSS18A

LOWER ARM BALL JOINT DUST COVER REPLACEMENT

1. Remove the lower arm dust cover.
2. Apply multi-purpose grease to the inside of the lower arm dust cover and the lower ball joint.

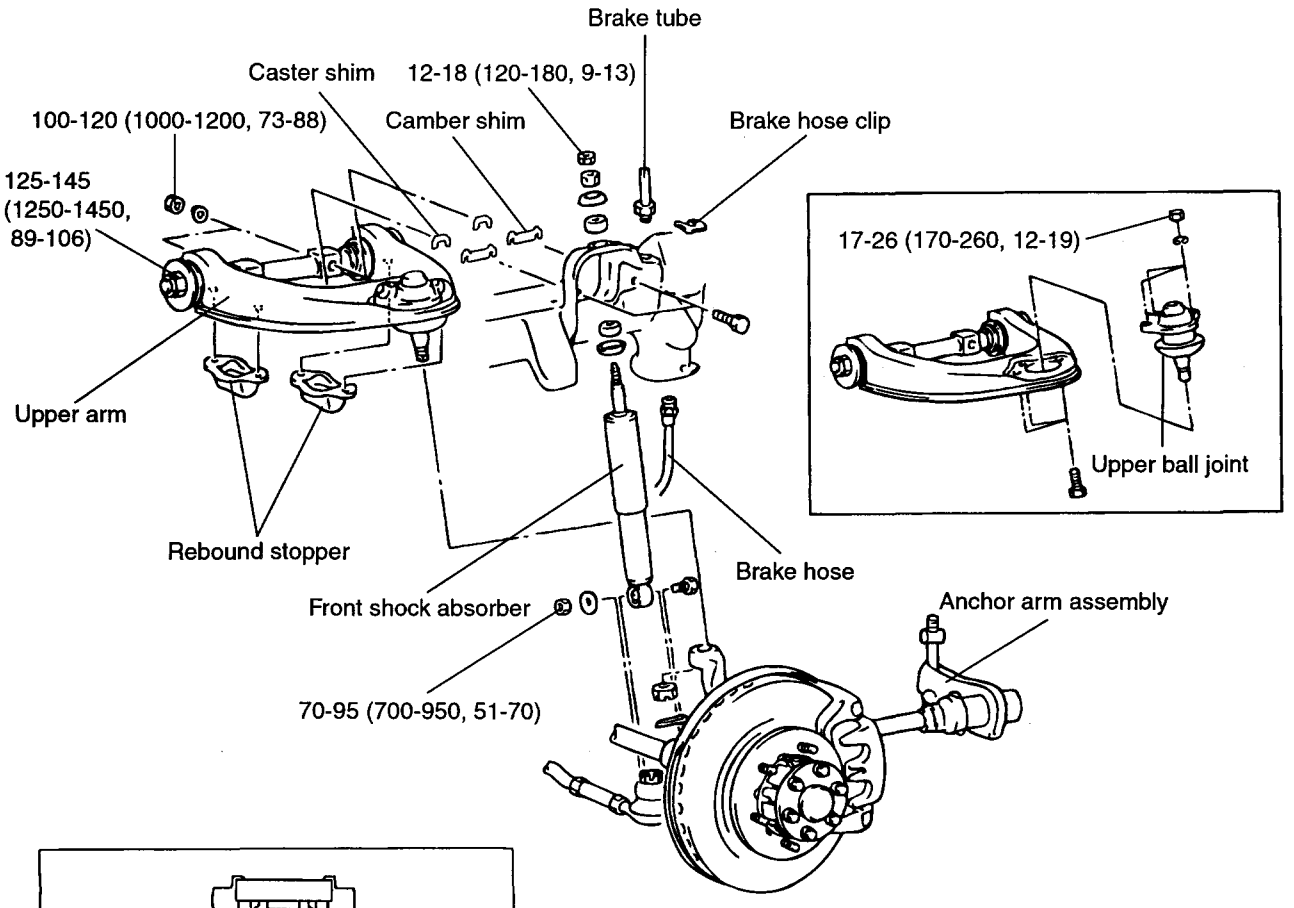


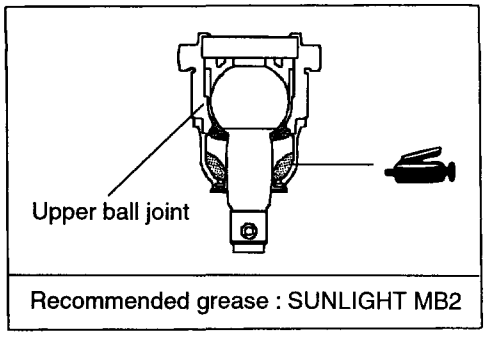
KHPSS19A

3. Install the dust cover to the ball joint.

UPPER ARM

COMPONENTS EHMB1000





TORQUR : Nm (kg·cm, lb·ft)

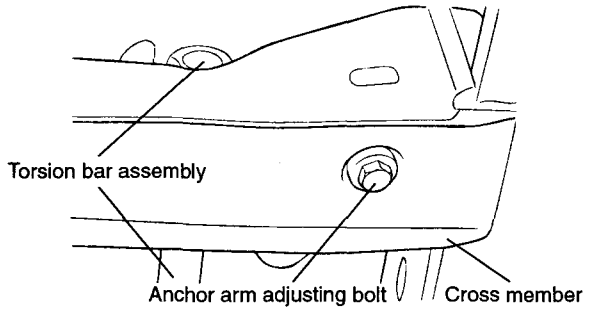
EHMB100A

REMOVAL EHMB1100

1. Loosen the anchor arm assembly adjusting bolt of torsion bar.

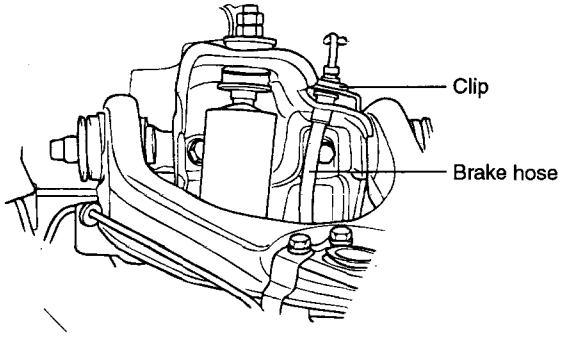
NOTE

Support the lower arm with a jack to easily loosen the anchor arm assembly adjusting bolt.



EHPSS77A

2. Remove the brake hose clip and disconnect the brake hose connecting part.

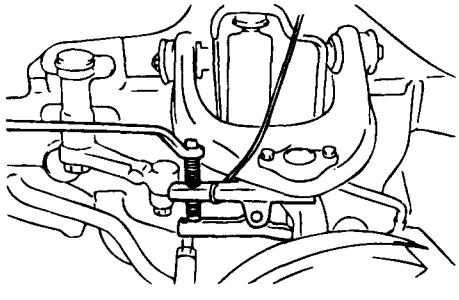


EHMB110A

3. Use the special tool (09568-34000) to disconnect the upper ball joint.

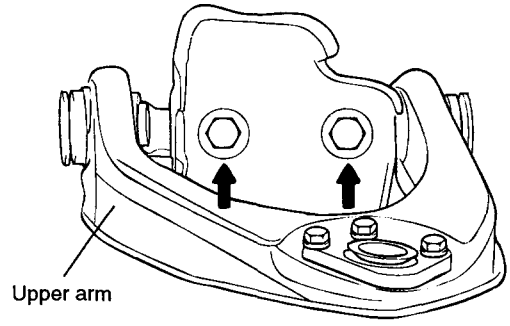
NOTE

- *Only loosen the nut, do not remove it.*
- *Support the special tool with a cord not to be separated.*



KHPSS08A

4. Remove the shock absorber.
5. After loosening the upper arm shaft mounting bolt, remove the camber and cast adjusting shim.

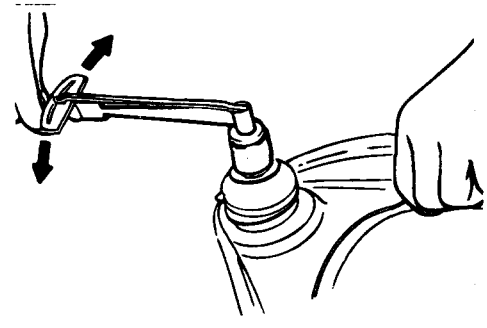


EHMB110B

INSPECTION EHMB1200

1. Check the upper arm for crack and deformation.
2. Check the upper arm shaft for crack and distortion.
3. Measure the upper ball joint starting torque.
   1) After shaking the ball joint stud several times, measure the starting torque using the special tool (09532-11600).

Standard Value : 0.8-3.5 Nm (8-35 kg·cm, 0.59-2.59 lb·ft)



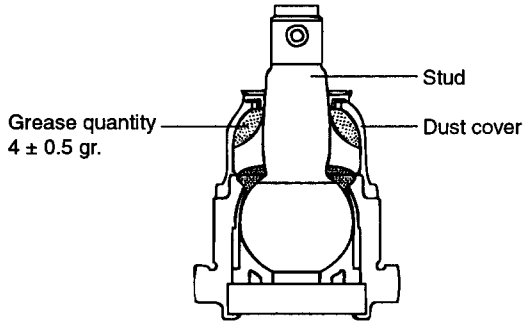
KHPS409A

   2) If the upper ball joint starting torque exceeds the standard value, replace the upper ball joint.

BALL JOINT DUST COVER REPLACEMENT EHMB1300

1. Remove the dust cover.
2. Apply multi-purpose grease to the inside of the dust cover and the upper ball joint.

Recommended grease : SUNLIGHT MB2
Quantity : 4 ± 0.5 gr.

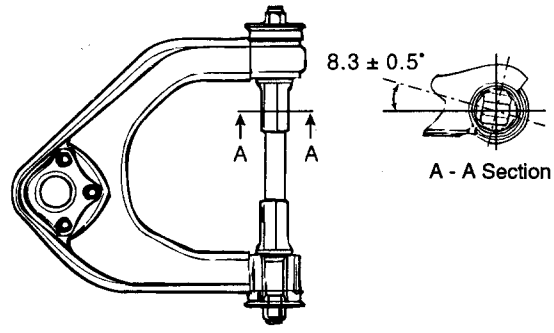


EHMB130A

3. Install the dust cover to the ball joint.

INSTALLATION EHMB1400

1. Install the upper arm shaft at the specified value 8.3 ± 0.5° shown in the illustration.



EHMB140A

2. Tighten the following parts to the specified torque.

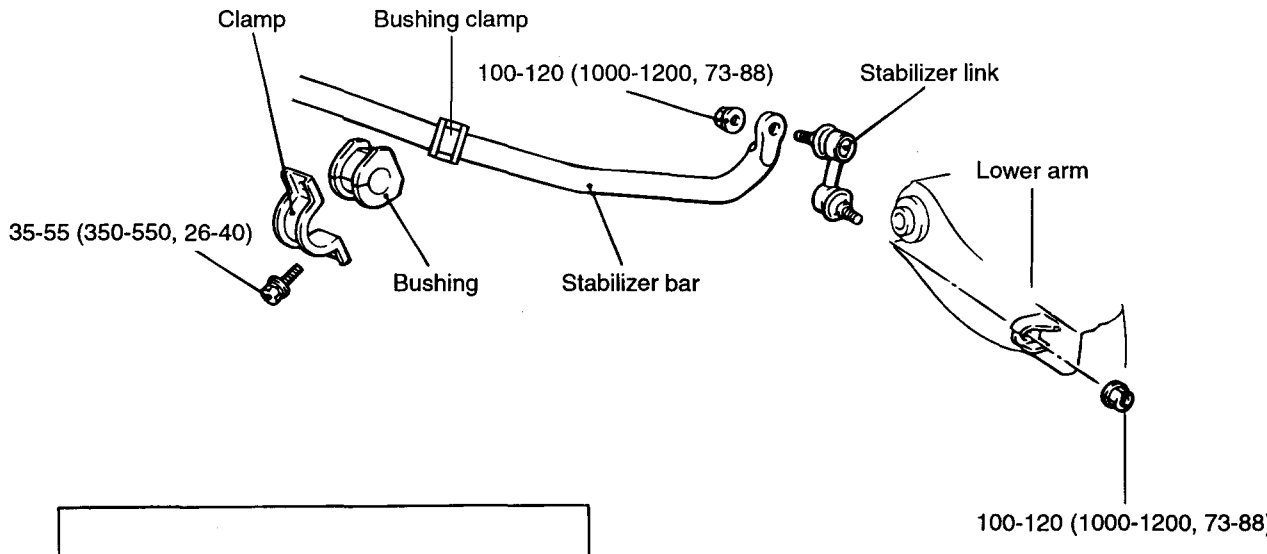
Items	Nm	kg·cm	ft·lb
Upper arm shaft to upper arm mounting self-locking flange nut	122-145	1220-1450	89-106
Rebound stopper mounting bolt	8-12	80-120	6-9
Upper ball joint to upper arm mounting net	17-26	170-260	13-19
Upper arm to body mounting bolt	100-120	1000-1200	73-88
Shock absorber upper mounting nut	12-18	120-180	9-13
Shock absorber lower mounting	70-95	700-950	51-70

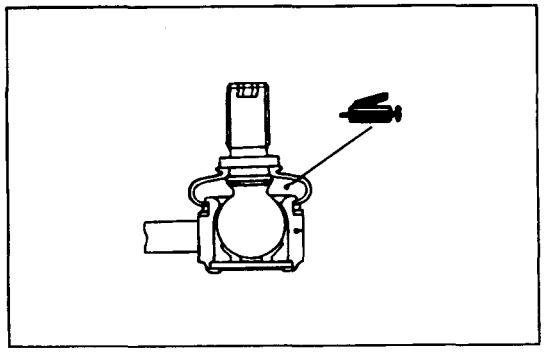
⚠ ***CAUTION***

Replace the self-locking nuts with new ones after removal.

FRONT STABILIZER BAR

COMPONENTS EHMB1500





TORQUR : Nm (kg·cm, lb·ft)

EHMB150A

REMOVAL EHMB1600

1. Disconnect the stabilizer bar link from the lower arm.
2. Remove the stabilizer bar bushing bracket.

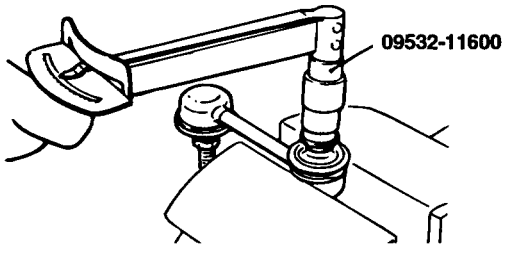
INSPECTION EHMB1700

1. Check the bushing for deformation and wear.
2. Check the stabilizer bar for deformation and damage.
3. Check the stabilizer link ball joint dust cover for cracks.
4. Inspect the stabilizer link ball joint rotating torque.

⚠ ***CAUTION***

After shaking the stabilizer link ball joint stud several times, measure the starting torque.

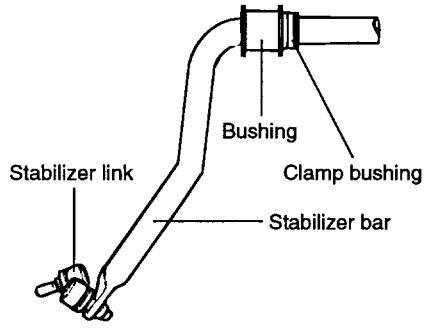
Specified value : 0.7-2 Nm (7-20 kg·cm, 0.51-1.5 lb·ft)



H7FS0330

INSTALLATION EHMB1800

1. Installation is the reverse of removal.
2. While installing, place the yellow mark on the stabilizer link to the right side.
3. Press-fit the clamp bushing to the inside of the stabilizer bushing.



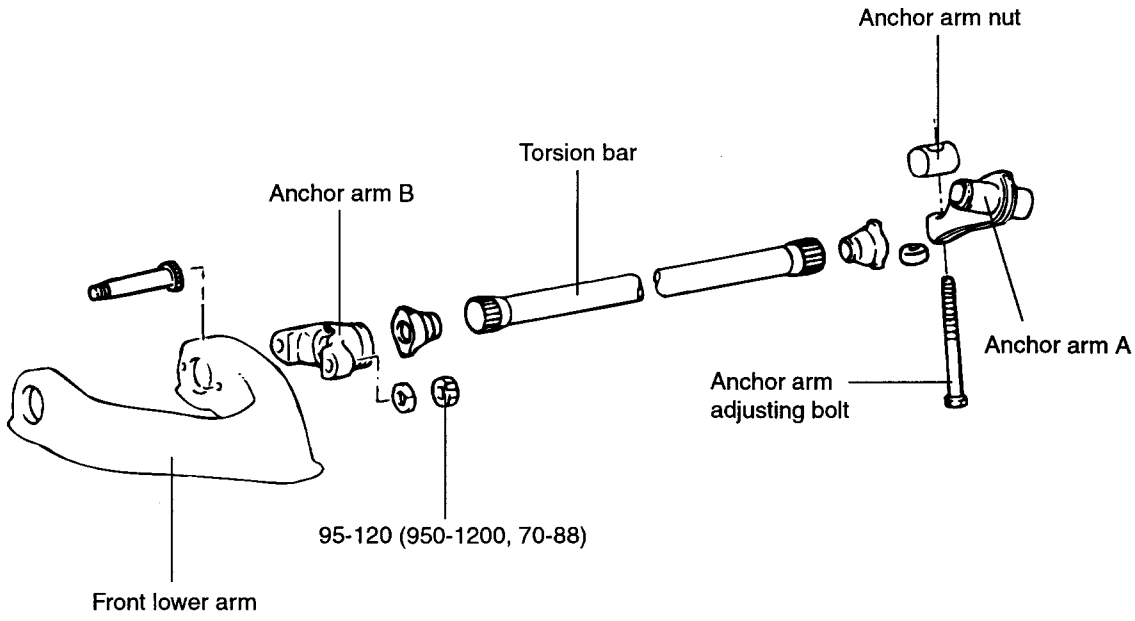
EHPSS21A

4. Install the stabilizer bar to the specified torque as follows.

Items	Spcified torque Nm (kg·cm, lb·ft)
Stabilizer bushing bracket mounting	35-55 (350-550, 26-40)
Stabilizer link self-locking nut	100-120 (1000-1200, 73-88)

TORSION BAR

COMPONENTS EHMB1900

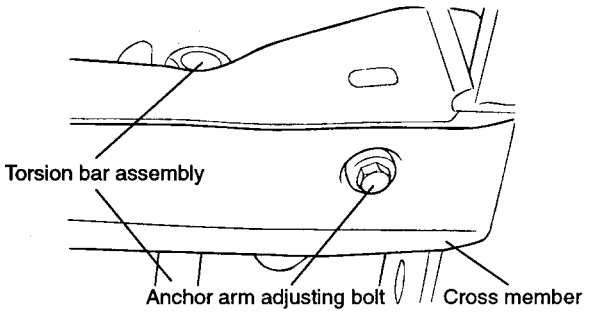


TORQUE : Nm (kg·cm, lb·ft)

EHPSS22A

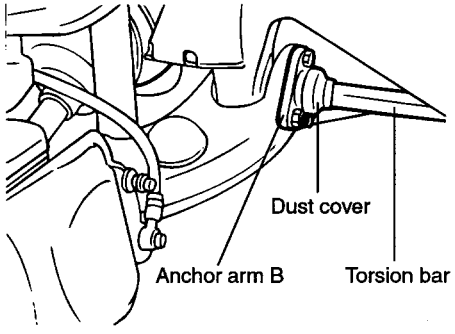
REMOVAL EHMB2000

1. Removal the anchor arm adjusting bolt.



EHPSS77A

2. Removal the torsion bar from the anchor arm B located in the lower arm. At this time place the dust cover to the torsion bar side.



EHPSS23A

INSPECTION EHMB2300

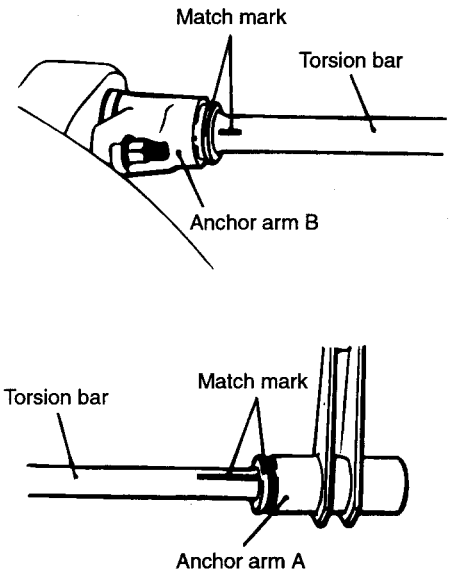
1. Check the torsion for deformation and the dust cover for tear and damagem and then replace them if necessary.
2. Check the anchor bolt and abjusting nut for wear.

INSTALLATION EHMB2200

1. Installation is the reverse of removal.
2. Make sure of the identification color on the torsion bar.

2.5 Diesel	3.5 Gasoline
Left (LH) : Yellow 1 line	Left (LH) : Yellow 2 line
Right (RH) : White 1 line	Right (RH) : White 2 line

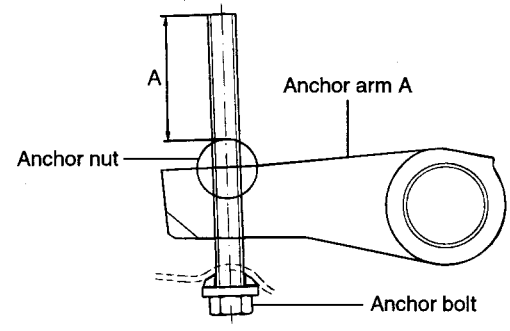
3. While installing, align the match marks on the anchor arm (A/B) with torsion bar.



EHPSS88A

4. Tighten the adjusting nut until the protruding length of the anchor bolt becomes as below.

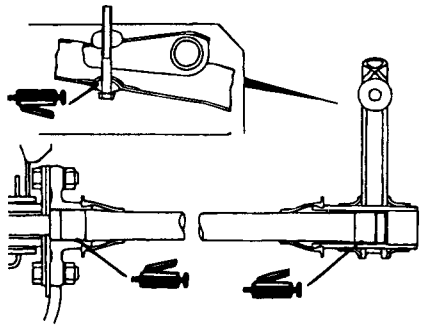
Protruding length (A)	Left (LH)	Left (RH)
2.5 Diesel	48 mm (1.89 in.)	46 mm (1.81 in.)
3.5 Gasoline	51 mm (2.01 in.)	47 mm (1.85 in.)



EHPSS83A

⚠ ***CAUTION***

When tightening the anchor bolt, apply grease to the threaded.

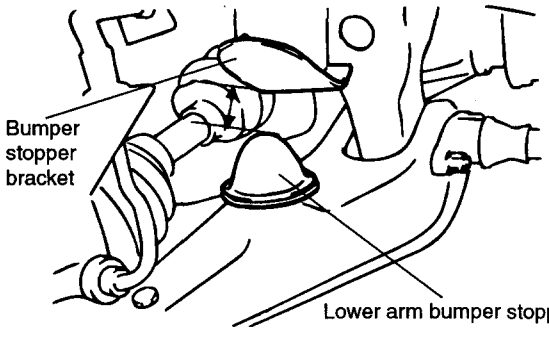


KHPSS24A

5. With the vehicle in an unladen condition, measure the distance from the lower arm bumper stopper to the bumper stopper bracket.

Standard value : 20 mm (0.79 in.)

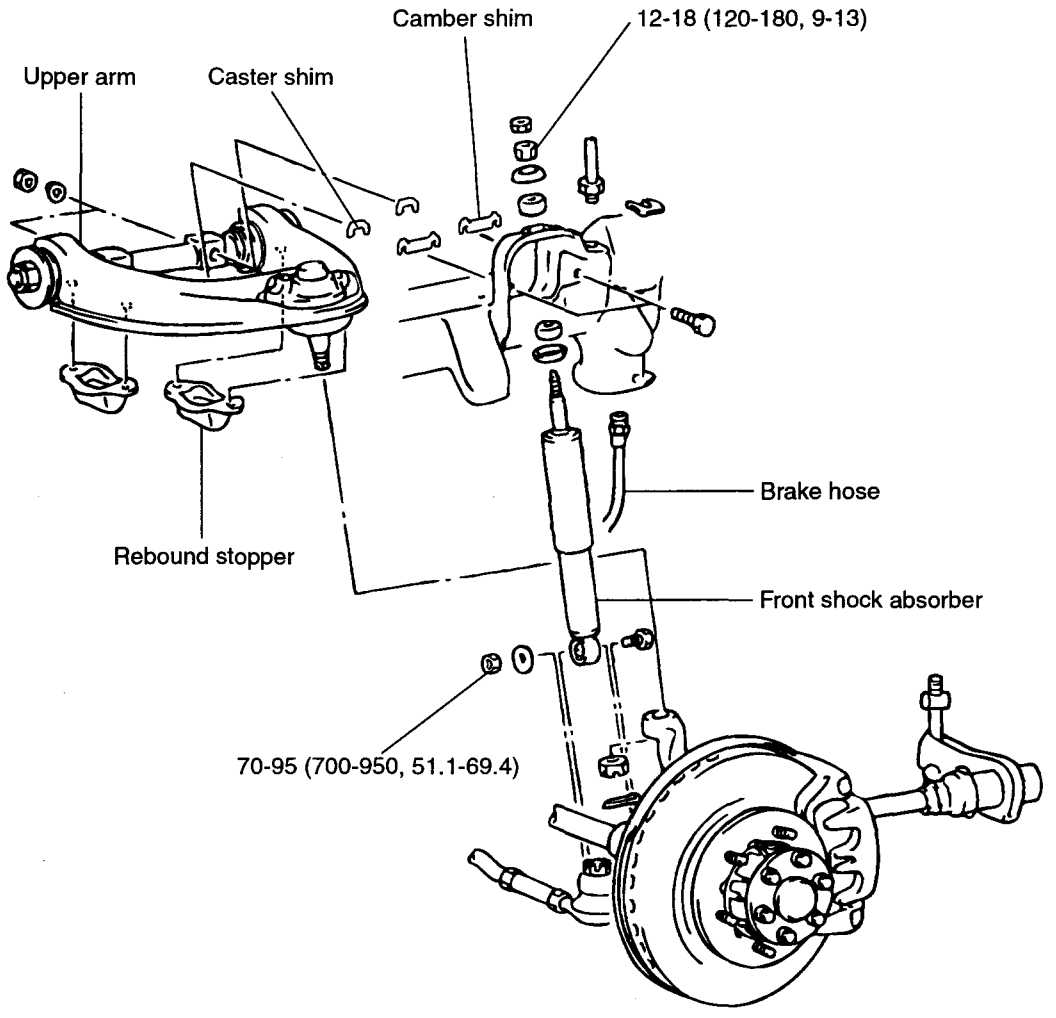
If the distance is out of the standard value, adjust the anchor bolt for proper distance.



EHPSS50A

FRONT SHOCK ABSORBER

COMPONENTS EHMB2300

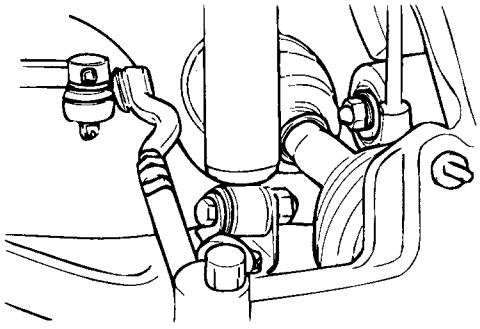


TORQUE : Nm (kg·cm, lb·ft)

EHMB230A

REMOVAL EHMB2400

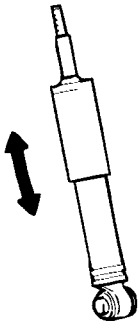
1. Remove the wheel and tire.
2. Remove the shock absorber mounting nut.



KHPSS51A

INSPECTION EHMB2500

1. Check the ruber parts for detrioration and damage.
2. Check the shock absorber for damange or oil leakage.
3. Inspect the shock absorber for abnormal resistance and noise.



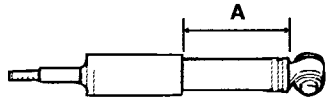
KHPSS03A

DISPOSAL EHMB2600

1. Fully extend the shock absorber.
2. Drill a hole on the section A to drain gas from the cylinder.

⚠ ***CAUTION***

The gas coming out is harmless, but be careful of chips that may fly up during drilling.



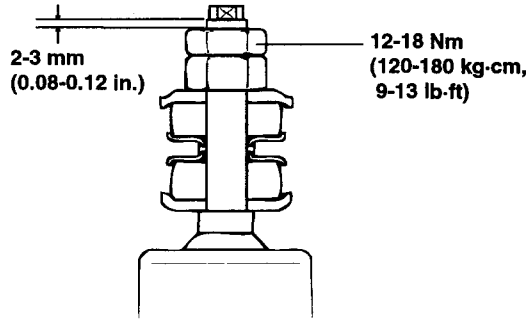
KHMB090A

INSTALLATION EHMB2700

1. Tighten the below parts to the specified torque.

Items	Spcified torque Nm (kg·cm, lb·ft)
Shock absorber upper mounting nut	12-18 (120-180, 9-13)
Shock absorber lower mounting nut	70-95 (700-9500, 51-70)

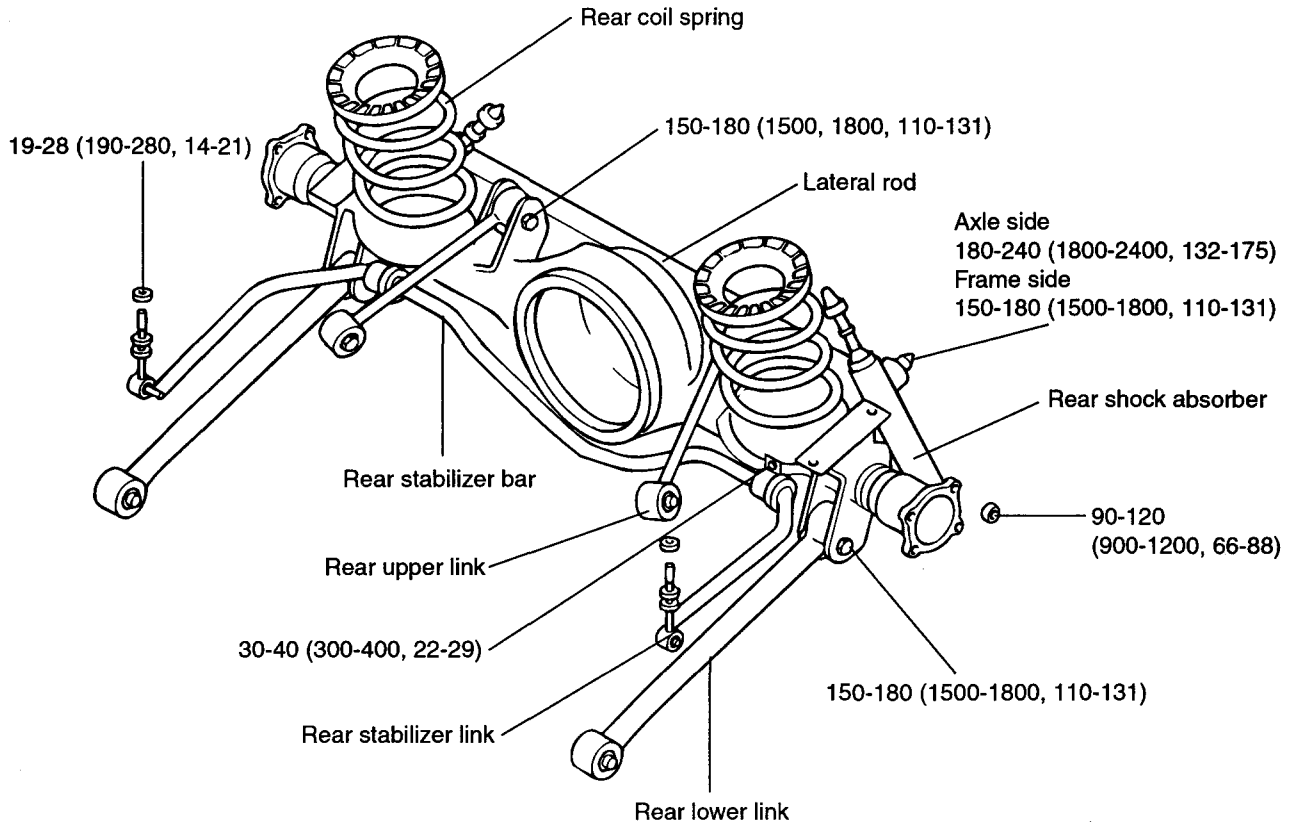
2. When installing the shock absorber upper mounting nut, tighten the mounting nut as shown in the illustration.



EHMB270A

REAR SUSPENSION SYSTEM

COMPONENTS EHMB2800



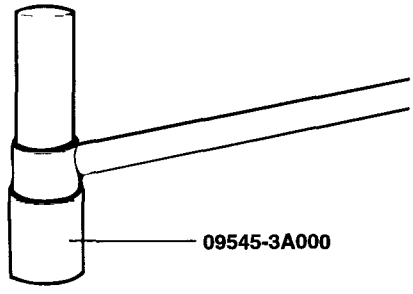
TORQUE : Nm (kg·cm, lb·ft)

EHMB280A

UPPER ARM, LOWER ARM AND ASSIST LINK

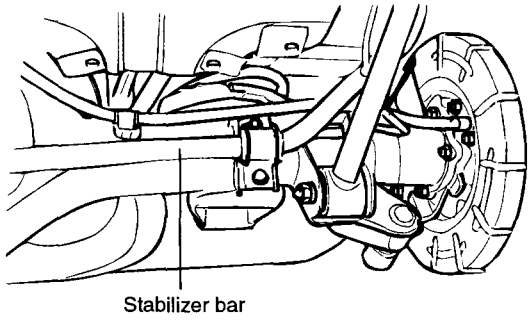
REAR LOWER LINK REPLACEMENT EHMB2900

1. Support the bottom of the rear differential carrier with a jack and remove the lower link.
2. Use the special (09545-3A000) to replace the bushing.



KHPSS30B

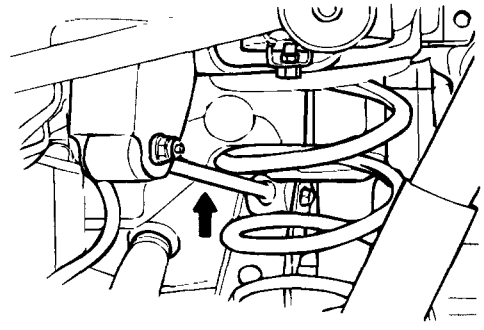
3. Install the rear lower link.



EHPSS31A

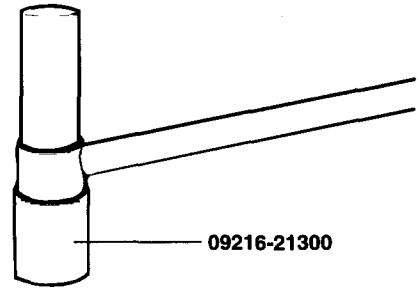
REAR UPPER LINK REPLACEMENT EHMB3000

1. Support the bottom of the rear differential carrier with jack and remove the rear upper link.



KHPSS32A

2. Use the special (09216-21300) to replace the bushing.



KHPSS30C

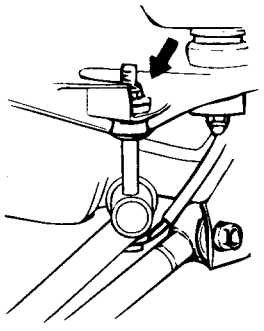
3. Install the upper link.

REAR STABILIZER BAR

REAR STABILIZER BAR

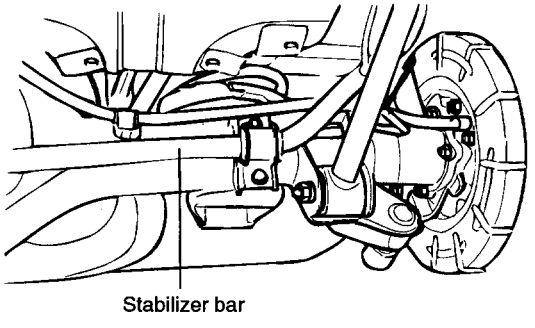
REPLACEMENT EHMB3100

1. Support the bottom of the rear differential carrier with a jack.
2. Remove the stabilizer link mounting nut.



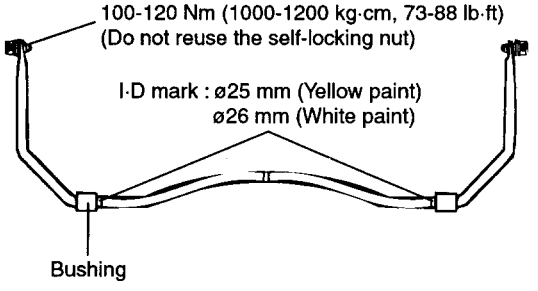
EHPSS36A

3. Remove the stabilizer bar bushing bracket.



EHPSS31A

4. Align the identification mark white paint on stabilizer bar with bushing and install the stabilizer bar bushing bracket.

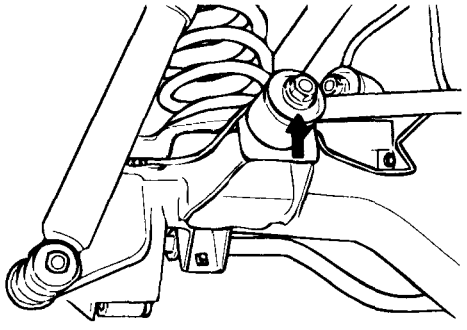


EHPSS38A

LATERAL ROAD

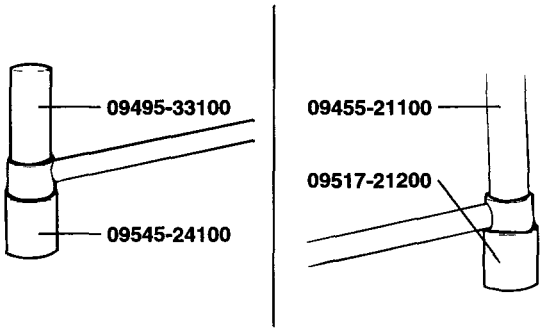
LATERAL ROD REPLACEMENT EHMB3200

1. Support the bottom of the rear differential carrier with a jack and remove the lateral rod.



KHPSS28A

2. Use the special tools to replace the bushing.



KHPSS29A

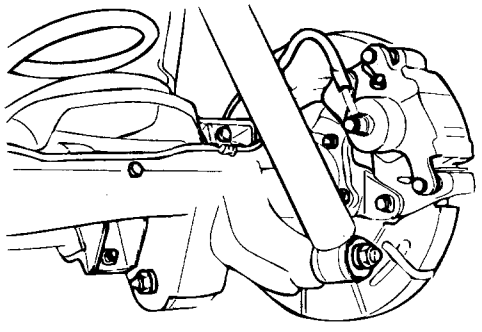
3. Install the lateral rod.

Tigtening torque :
Axle side :
180-240 Nm (1800-2400 kg·cm, 132-175 lb·ft)
Frame side :
150-180 Nm (1500-1800 kg·cm, 110-131 lb·ft)

REAR SHOCK ABSORBER

REMOVAL EHMB3300

1. Remove the rear shock absor lower.

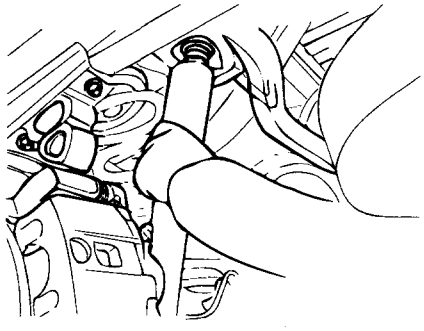


KHPSS26A

2. After holding the upper mounting nut, remove the shock absorber turning by hand.

⚠ ***CAUTION***

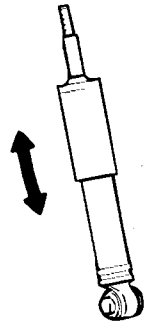
If the shock absorber is not removed by hand, try again after fixing it with chain or rubber.



KHPSS27A

INSPECTION EHMB3400

1. Check the shock absorber for damage and oil leakage.
2. Check the shock absorber for irregular nose or abnormal operation.



KHPSS03A

INSPECTION EHMB3500

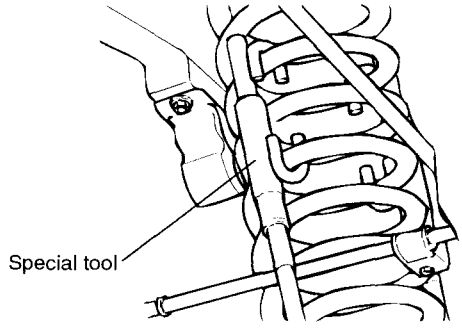
Installation is the reverse of removal.

COIL SPRING

REAR COIL SPRING

REPLACEMENT EHMB3600

1. Use a suitable special tool to compress the coil spring.



EHPSS34A

2. Remove the coil spring.

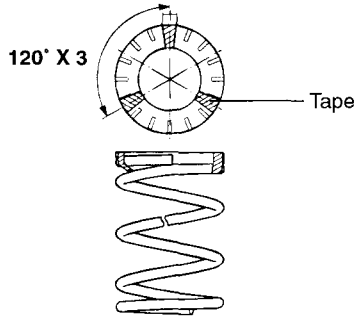
NOTE

When removing the coil spring, remove the left side (LH) at the vehicle' s rear side and the right side (RH) at the vehicle' s front side.

3. Install the coil spring in the compressed condition using the special tool.

CAUTION

Align the spring end with the groove of the spring pad and fix the spring and the spring pad by adhering the 3 parts with tape.



EHPSS35A

TIRES/WHEELS

TIRE

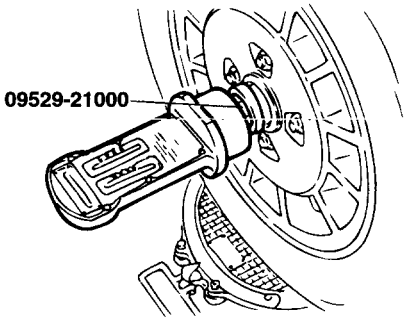
FRONT WHEEL ALIGNMENT EHMB3700

1. Measure the wheel alignment always positioning the car on a level surface with the front wheels facing straight ahead.
2. Before measurement, make sure that the front suspension, steering system, wheels and tires are in normal operating conditions.

TOE-IN

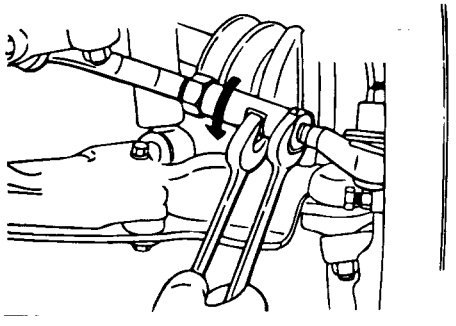
1. Measure the toe-in.

Standard value : 3.5 ± 3.5 mm (0.138 ± 0.138 in.)



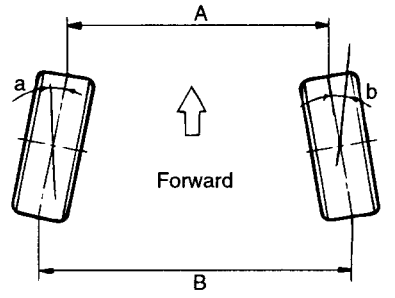
E4ZR0030

2. Toe-in is adjusted by rotating the tie rod turnbuckles. Left front wheel toe-in is reduced by rotating the tie rod toward the rear of the vehicle. Adjust toe-in in the same amount by turning the left and right wheel tie rod.



KHPSS39A

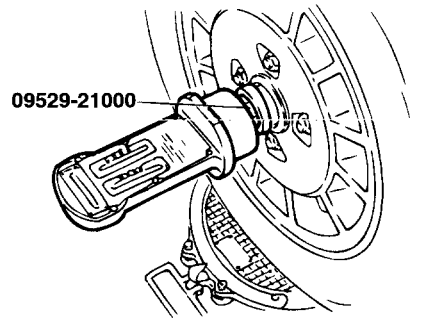
3. Calculate the toe-in value (B-A).



E4ZR0010

CAMBER

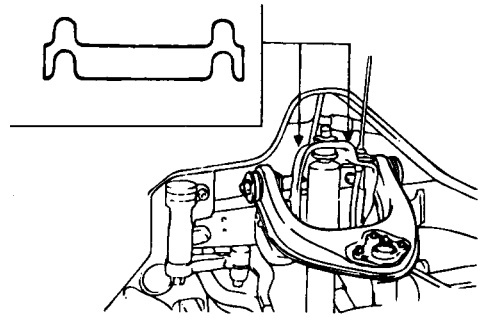
1. Measure the camber using a camber/caster/king pin gauge.



E4ZR0030

2. Adjust the camber by varying the thickness of the adjusting shim between upper arm shaft and crossmember.

Standard value : 0° ± 30′



KHPSS40A

NOTE

- *Thickness of the adjusting should be 4 mm (0.157 in.) or less.*
- *Never use the adjusting shim more than 3 pieces.*

CAMBER ADJUSTING SHIM THICKNESS

Parts number	Shim thickness
MB176288A	1.0 mm (0.039 in.)
MB176289A	2.0 mm (0.079 in.)

CASTER

1. Measure the caster using a camber/caster/king pin gauge and a turning radius gauge.

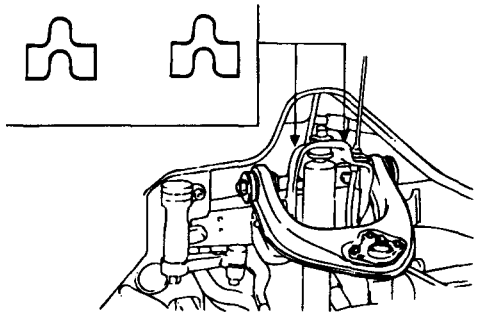
Standard value : 3° 5 ± 30′

NOTE

Available range of caster adjustment between left and right: within 30 or less.

2. If the caster is not within the standard value, adjust the caster by inserting or removing the caster adjusting shim between upper arm shaft and crossmember.

Shim thickness	Inserting a piece (Front)	Removing a piece (Rear)
1 mm (0.039 in.)	Gains 28′	Loses 28′
2 mm (0.079 in.)	Gains 56′	Loses 56′



KHPSS41A

NOTE

- *According to the diffences of the caster adjusting shim thickness, camber's angle is changed as follows.*

Shim thickness	Inserting a piece (Front)	Removing a piece (Rear)
1 mm (0.039 in.)	Loses 10′	Loses 3′
2 mm (0.079 in.)	Loses 20′	Loses 6′

- *Thickness of the adjusting shim should be 2 mm or less.*
- *Never use the adjusting shim more than 1 piece.*

TIRE WEAR

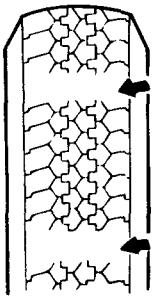
1. Measure the tread depth of the tire.

Tread depth of tire (Limit) : 1.6 mm (0.0630 in.)

2. If the tread depth is less than the limit, replace the tire.

NOTE

When the tread depth of the tire is reduced to 1.6 mm (0.0630 in.) or less, the wear indicators will appear.



E4ZR0050

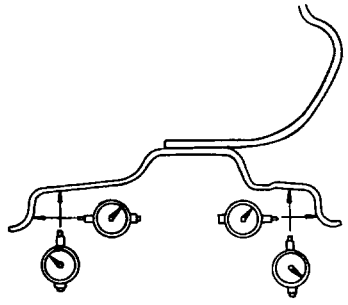
WHEEL

WHEEL RUNOUT EHMB3800

1. Jack up the vehicle and support it with jack stands.
2. Measure wheel runout with a dial indicator.
3. Replace the wheel if wheel runout exceeds the limit.

WHEEL RUNOUT [LIMIT]

	Aluminum wheel	Steel wheel
Radial	0.3 mm (0.012 in.)	1.0 mm (0.039 in.)
Axial	0.3 mm (0.012 in.)	1.2 mm (0.222 in.)



KHMB350A

WHEEL NUT TIGHTENING

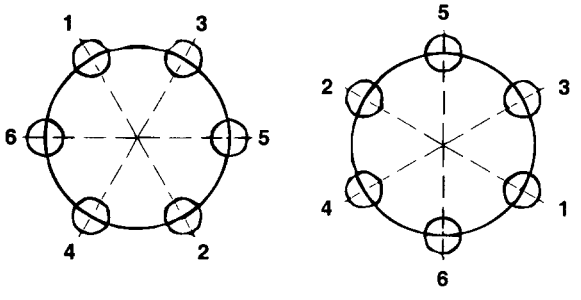
1. Tightening torque.

Specified torque : 100-120 (1000-1200, 73-88)

CAUTION

When using an impact-wrench, adjust the tightening torque completely.

2. Tighten all the wheel nut according to the order shown in the illustration until they are all tight.



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