

Suspension System

GENERAL	SS -2
FRONT SUSPENSION SYSTEM	SS -8
REAR SUSPENSION SYSTEM	SS -16
TIRES/WHEELS	SS -20



GENERAL

SPECIFICATIONS

EHHA1000

Front suspension system				Macpherson stabilizer bar	
Coil spring free height and identification color					
Model				Free height mm (in.)	I.D. color
2.0	GL	MT	(S/R)	340.6(13.4)	White - Yellow
		AT	7		
			9		
	GLS	MT	(S/R)		
		AT	6 (S/R)		
			7	353.1(13.9)	White - Red
			9		
2.0	GL	AT	9 (S/R)		
	GLS	AT	7 (S/R)		
			9 (S/R)		
2.7	GL	AT	(S/R)	353.1(13.9)	White - Red
	GLS	AT	(S/R)		

- o GL, GLS : Trim level
- o M/T : With manual T/M

- o A/T : With automatic T/M
- o S/R : With sun roof

Shock absorber		Gas pressurized type	
Type		173 (6.8)	
Stroke	mm (in)		
Damping force at 0.3 m/s		1510 ± 260 (151 ± 26)	
Expansion	N(kg)	380 ± 70 (38 ± 7)	
Compression	N(kg)		
Wheel and Tire			
Wheel type		Steel	Aluminum
Wheel size		6J x 15	6J x 15
Tire size		215 / 65 R 15	215 / 65 R 15
Tire inflation pressure	kPa (psi)	206 (30)	206 (30)

EHHA100A

Rear suspension system		Semi trailing arm type
Coil spring free height and Identification color		
Free height mm (in.)		345.7 (13.6)
Identification color		Blue
Shock absorber		
Type		Gas pressurized type
Stroke mm (in.)		119.5 (4.7)
Damping force at 0.3 m/s		
Expansion N (kg)		1230 ± 220 (123 ± 22)
Compression N (kg)		330 ± 60 (33 ± 6)

EHHA100B

SERVICE STANDARD

EHHA1100

Standard value			
Toe-in	Front	0± 3 mm (Standard diameter of tire : ø660mm)	
	Rear	3± 3 mm (Standard diameter of tire : ø660mm)	
Camber	Front	0° ± 30' (Max. difference between LH and RH : 0°30')	
	Rear	-0° ± 30' (Max. difference between LH and RH : 0°30')	
Caster	Front	3°4'±30'(Max. difference between LH and RH : 0°30')	
King pin angle	Front	3°4'	
Wheel runout		[Steel wheel]	[Aluminum wheel]
Radial	mm (in.)	0.6 (0.024) : Average of LH & RH	0.3 (0.012)
Axial	mm (in.)	1.0 (0.039)	0.3 (0.012)

TIGHTENING TORQUE

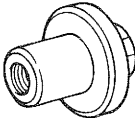
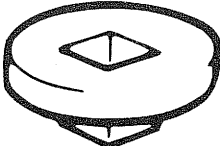
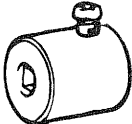
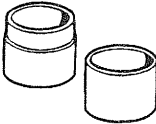
EHHA1200

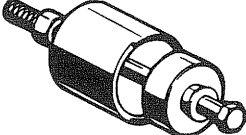
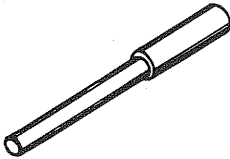
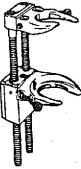
	Nm	Kg-cm	lb-ft
Wheel nut	90-110	900-1100	67-81
Lower arm ball joint self-locking nut	90-120	900-1100	74-88
Lower arm bushing (A) to sub-frame mounting bolt	100-120	1000-1200	74-88
Lower arm bushing (G) to sub-frame mounting bolt	100-120	1000-1200	74-88
Front strut lower mounting nut	110-130	1100-1300	81-96
Front strut upper mounting nut	40-50	400-500	30-37
Front strut self-locking nut	60-70	600-700	44-52
Stabilizer link mounting self-locking nut	100-120	1000-1200	74-88
Stabilizer bar bracket to sub-frame bolt	44-55	450-550	33-41
Rear shock absorber complete upper mounting nut	90-110	900-1100	66-81
Rear shock absorber complete lower mounting bolt	90-110	900-1100	66-81
Rear stabilizer bracket mounting	40-50	400-500	30-37

Rear suspension arm to crossmember bolt	140-160	1400-1600	103-118
Rear suspension arm to cam bolt	140-160	1400-1600	103-118
Crossmember to body mounting bolt	140-160	1400-1600	103-118
Crossmember stopper to body mounting bolt	40-50	400-500	30-37
Rubber bumper mounting bolt	18-25	180-250	13-18
Brake tube flare nut	13-17	130-170	10-13
Tie rod end castle nut	24-34	240-340	18-25
Tie rod end lock nut	50-55	500-550	37-41

SPECIAL TOOLS

EHHA1400

Tool(Number and Name)	Illustration	Use
09493-43000 Universal joint remover and installer	 E9343000	Installation of rear crossmember bushing
09529-21000 Wheel alignment gauge attachment	 F2921000	Measurement of the wheel alignment
09532-11600 Preload socket	 F3211600	Measurement of the stabilizer bar link ball joint starting torque (use with torque wrench)
09532-3A000 Preload socket	 F323A000	Measurement of the front lower arm ball joint starting torque (use with torque wrench)
09545-11000 Ball joint remover installer	 F4511000	Installation of the front lower arm ball joint and dust cover (use with 09545-21100)

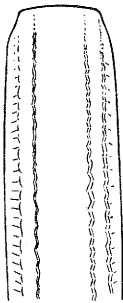
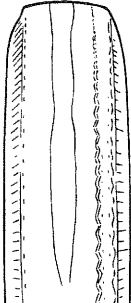
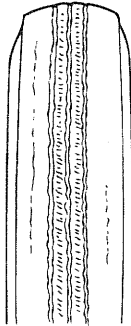
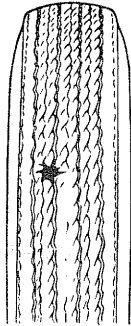
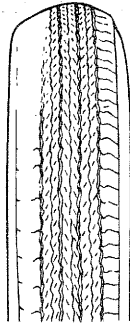
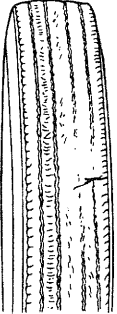
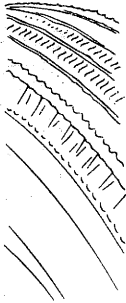
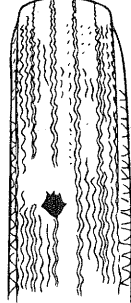
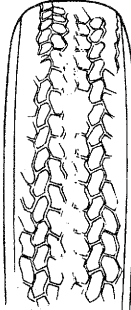
Tool(Number and Name)	Illustration	Use
09545-21100 Ball joint dust cover installer	 F4521100	Installation of the front lower arm ball joint and dust cover (use with 09545-11000)
09552-3A000 Lower arm bushing remover and installer	 G2434000	Removal and installation of rear arm bushing(G)
09554-M3000 Lower arm bushing arbor	 F54M3000	Removal and installation of rear crossmember bushing
A-40 Strut compressor adapter	 EHHA140I	Compression of the coil spring (use with J38402)
J38402 Strut spring compressor	 J38402	Compression of the coil spring (use with A-40)

TROUBLESHOOTING

EHHA1500

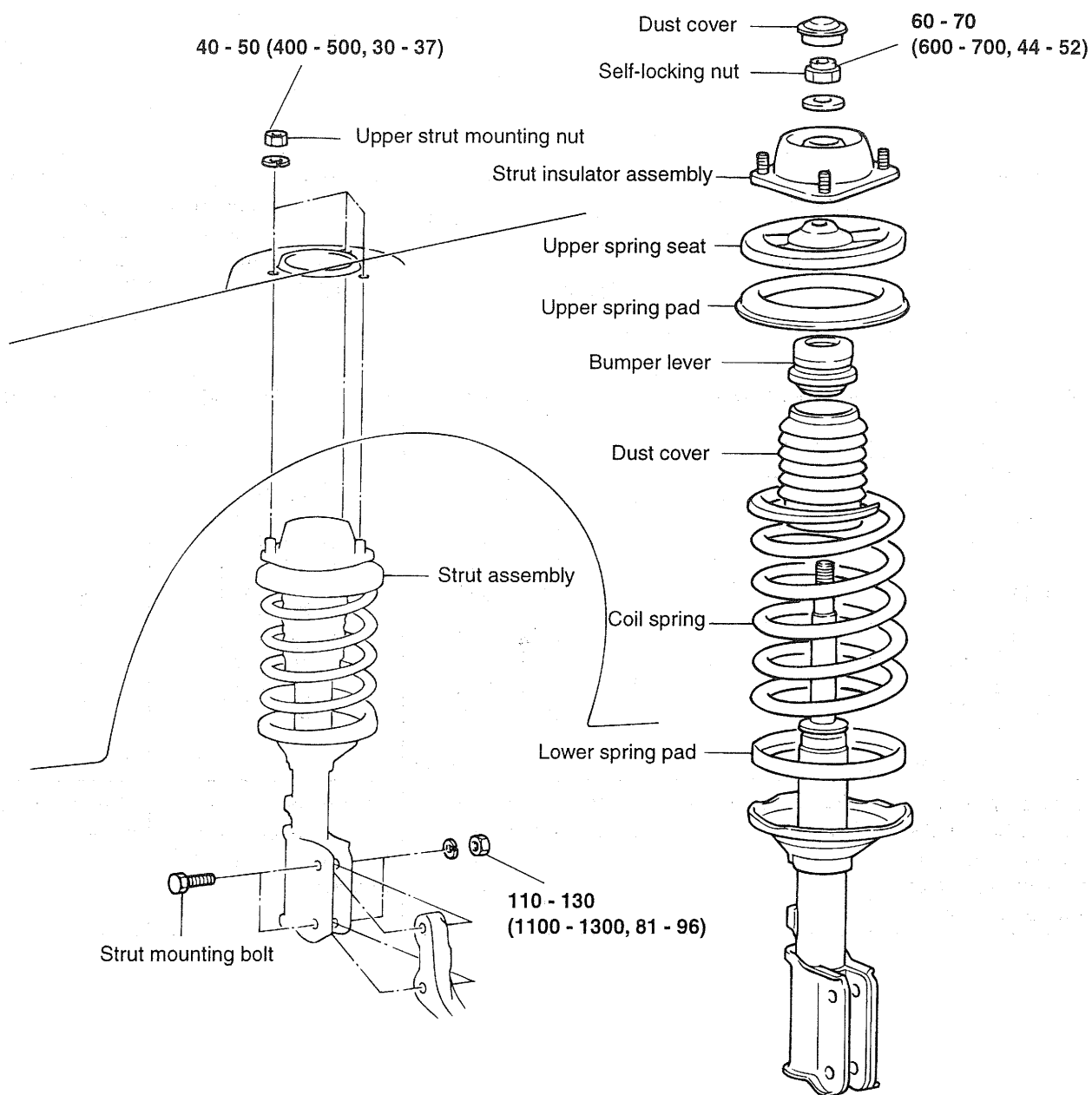
Trouble symptom	Probable cause	Remedy
Hard steering	Improper front wheel alignment	Correct
	Excessive turning resistance of lower arm ball joint	Replace
	Flat tire	Adjust
	No power assist	Repair or replace
Poor return of steering wheel to center	Improper front wheel alignment	Correct

Trouble symptom	Probable cause	Remedy
Poor riding	Improper front wheel alignment	Correct
	Malfunction of shock absorber	Repair or replace
	Broken or worn stabilizer	Replace
	Broken or worn coil spring	Replace
	Worn lower arm bushing	Replace
	Improper tire inflation pressure	Replace
Abnormal tire wear	Improper front wheel alignment	Correct
	Malfunction of shock absorber	Replace
Wandering	Improper front wheel alignment	Correct
	Poor turning resistance of lower arm ball joint	Repair
	Loose or worn lower arm bushing	Retighten or replace
Vehicle pulls to one side	Improper front wheel alignment	Correct
	Excessive turning resistance of lower arm ball joint	Replace
	Broken or worn coil spring	Replace
	Bent lower arm	Repair
Steering wheel shimmy	Improper front wheel alignment	Correct
	Excessive turning resistance of lower arm ball joint	Replace
	Broken or worn stabilizer	Replace
	Worn lower arm bushing	Replace
	Malfunction of shock absorber	Replace
	Broken or worn coil spring	Replace
Bottoming	Broken or worn spring	Replace
	Malfunction of shock absorber	Replace
Abnormal sound	Loose installation parts	Retighten
	Damaged or worn wheel bearings	Replace
	Faulty shock absorber	Replace damaged parts
	Defective tire	Replace
Poor ride control	Excessive tire pressure	Adjust pressure
	Faulty shock absorber	Replace
	Loose wheel nuts	Tighten to specified torque
	Sagging or broken coil spring	Replace
Vehicle body tilts to one side	Defective tire	Replace
	Worn bushing	Replace
	Deformation of driveshaft and arm assembly	Replace
	Sagging or broken coil spring	Replace

WHEEL AND TYPE DIAGNOSIS				
CENTER OF TREAD WORN		BOTH SIDES OF TREAD WORN	CHUNKING OF TIRE	ONE SIDE OF TIRE WORN
				
EHA9150A	EHA9150B	EHA9150C	EHA9150D	EHA9150E
*Over-Inflation	*Center-tread down to fabric due to excessive over-inflation	*Under-Inflation *Bulge at the shoulder *Wear rapidly	*When a patch of tread has loosened, it is torn off the tire by centrifugal force at high speed	*Incorrect camber angle *Inferiority of camber and Toe-in *Frequent sharp curve
FLAT SPOT	FEATHERING	BAD PLUGGING	UNEVEN TIRE WEAR	TOTALLY UNSAFE TIRE
				
EHA9150F	EHA9150G	EHA9150H	EHA9150I	EHA9150J
*Caused by heavy braking which makes the wheels lock and scrubs the tires along the road surface	*Excessive Toe-in Toe-out	*Using more than one plug distorts the tread, resulting in carcass failure	*Bad wheel balance, fault in suspension, and steering gear or bearing	*Tread worn below the limit

FRONT SUSPENSION SYSTEM

STRUT ASSEMBLY

COMPONENTS EHHA2000

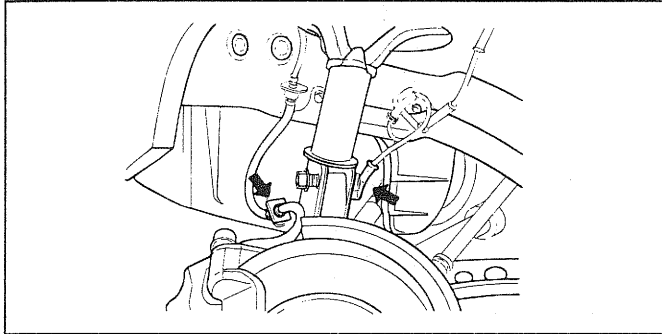
TORQUE : Nm (kg·cm, lb·ft)

REMOVAL EHHA2010

1. Remove the wheel and tire.
2. Detach the brake hose clip from the strut assembly mounting bracket.
3. Detach the wheel speed sensor harness from the front axle knuckle.

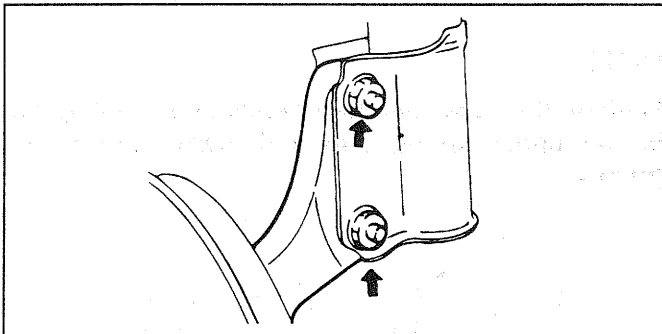
CAUTION

Be careful not to damage the wheel speed sensor.



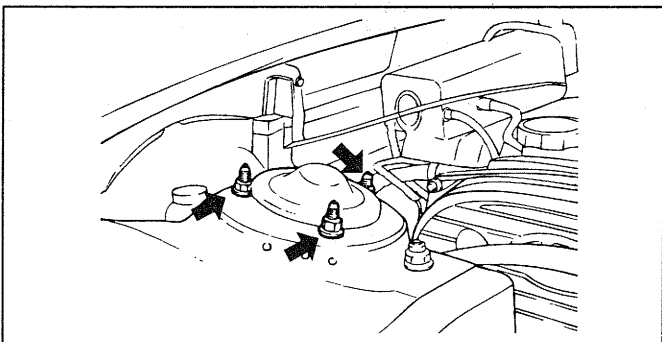
EHHA001A

4. Remove the knuckle from the strut assembly.



S5SS012B

5. Remove the upper mounting 3 nuts of the strut.



EHA9201D

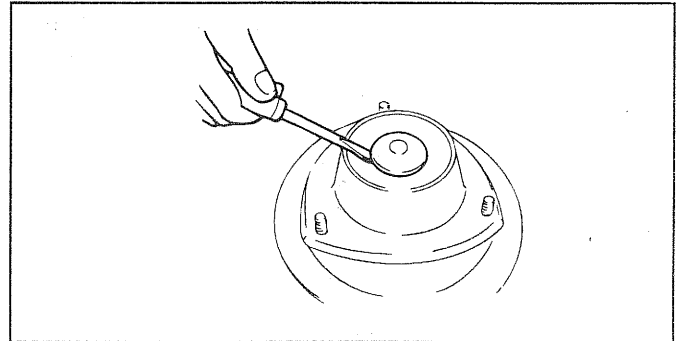
6. Remove the strut assembly.

INSTALLATION EHHA2020

1. Installation is the reverse of removal.

DISASSEMBLY EHHA2030

1. Remove the dust cover with a flat-tip screw driver.

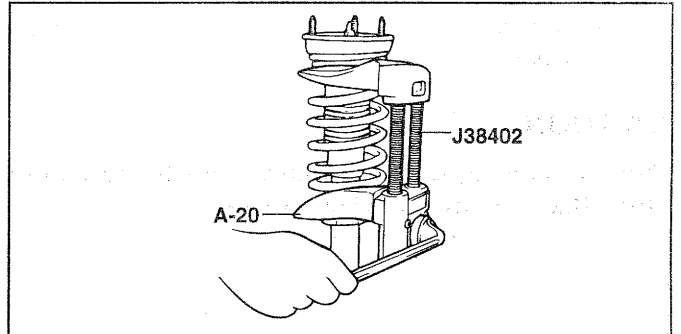


S5SS013A

2. Using the special tool, compress the coil spring until there is only a little tension on the strut.

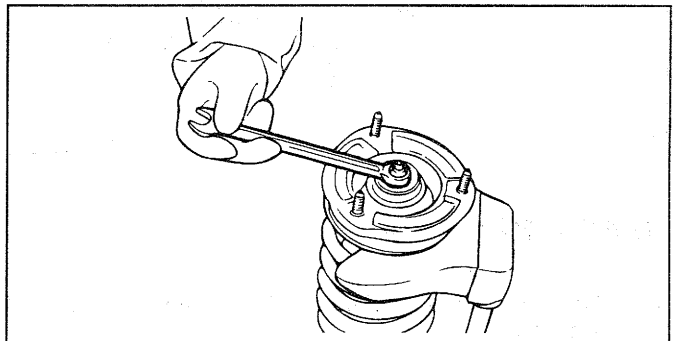
NOTE

Do not use an impact gun.



EHHA203A

3. Remove the self-locking nut.



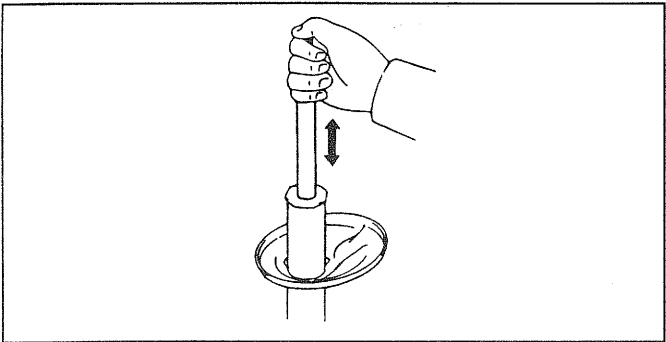
EHA9203B

4. Remove the washer, strut insulator assembly, upper spring seat, upper spring pad, bumper rubber, dust cover, coil spring and lower spring pad.

INSPECTION EHHA2040

1. Check whether the rubber components for wear or damage.
2. Check the spring for deformation or damage.

- 3. Hold the shock absorber and push. Then pull it up and down for more than three times. Check for strange noise and irregular elasticity.
- 4. Check the shock absorber for damage or leakage.



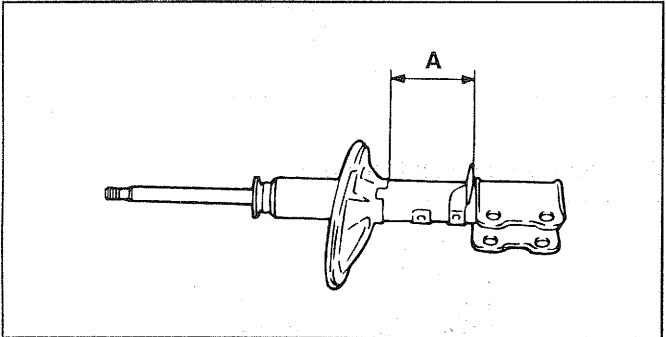
EHHA002A

DISPOSAL EHHA2050

- 1. Fully extend the shock absorber rod.
- 2. Drill a hole on the A dimension to remove gas from the cylinder.

CAUTION

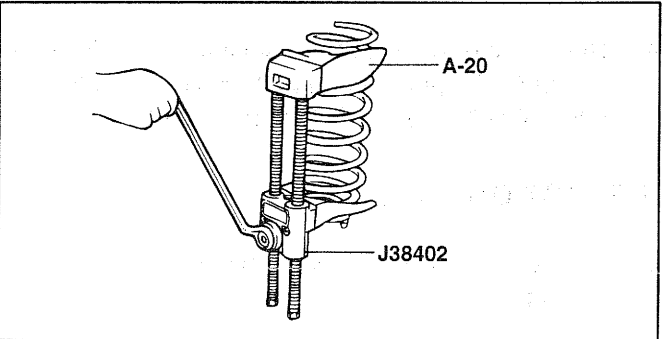
The gas coming out is harmless, but be careful of chips that may fly out when drilling.



EHHA003A

REASSEMBLY EHHA2060

- 1. Using a special tool, compress the coil spring perfectly.



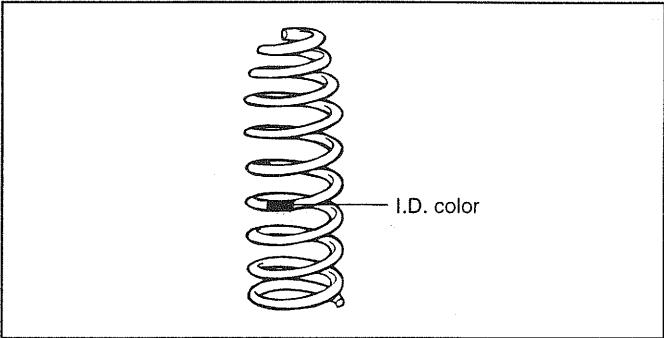
EHHA206B

NOTE

- 1. Do not use an impact gun.
- 2. Coil spring installation chart to load classification.

LH spring		RH spring
Blue	← →	Blue
White	← →	White
Red	← →	Red

EHHA206A

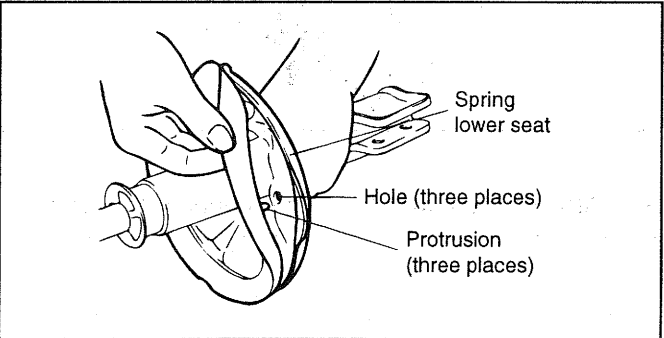


EHA9206B

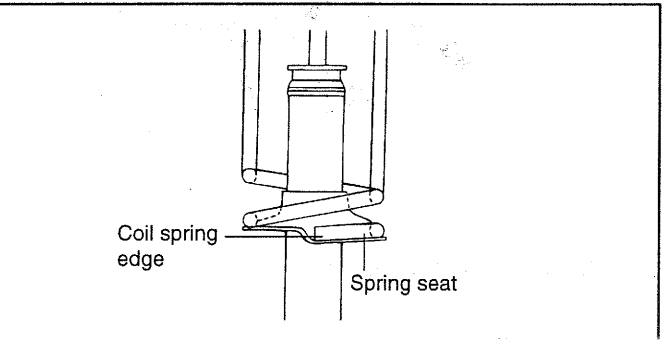
- 2. Install the lower spring pad so that the protrusions may fit in the holes of the spring lower seat.

NOTE

Position the upper and lower ends of the coil spring in the upper spring pad and lower spring seat groove.



EHDA204A

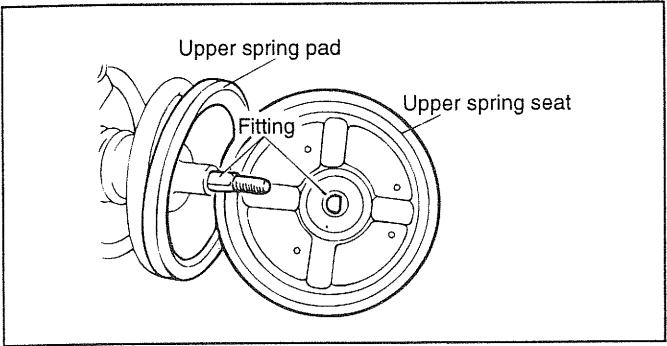


EHDA204C

- 3. Install the upper spring seat to the piston rod.

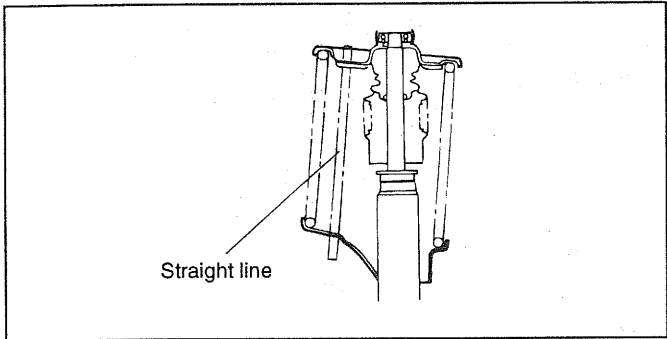
NOTE

Align the D-shaped hole in the upper spring seat assembly with the indentation on the piston rod.



EHDA204B

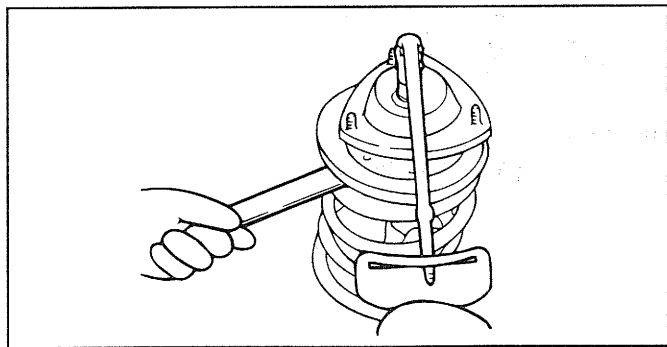
4. Place the bracket to align the holes on the upper spring seat and lower spring seat in a straight line.



S5SS015E

5. Tighten the new self-locking nut lightly.
6. Loosen the special tool.
7. While holding the piston rod, tighten the new self-locking nut to the specified torque.

Tightening torque	Nm (kg·cm, lb·ft)
Piston rod to bracket nut	60-70 (600-700, 44-52)

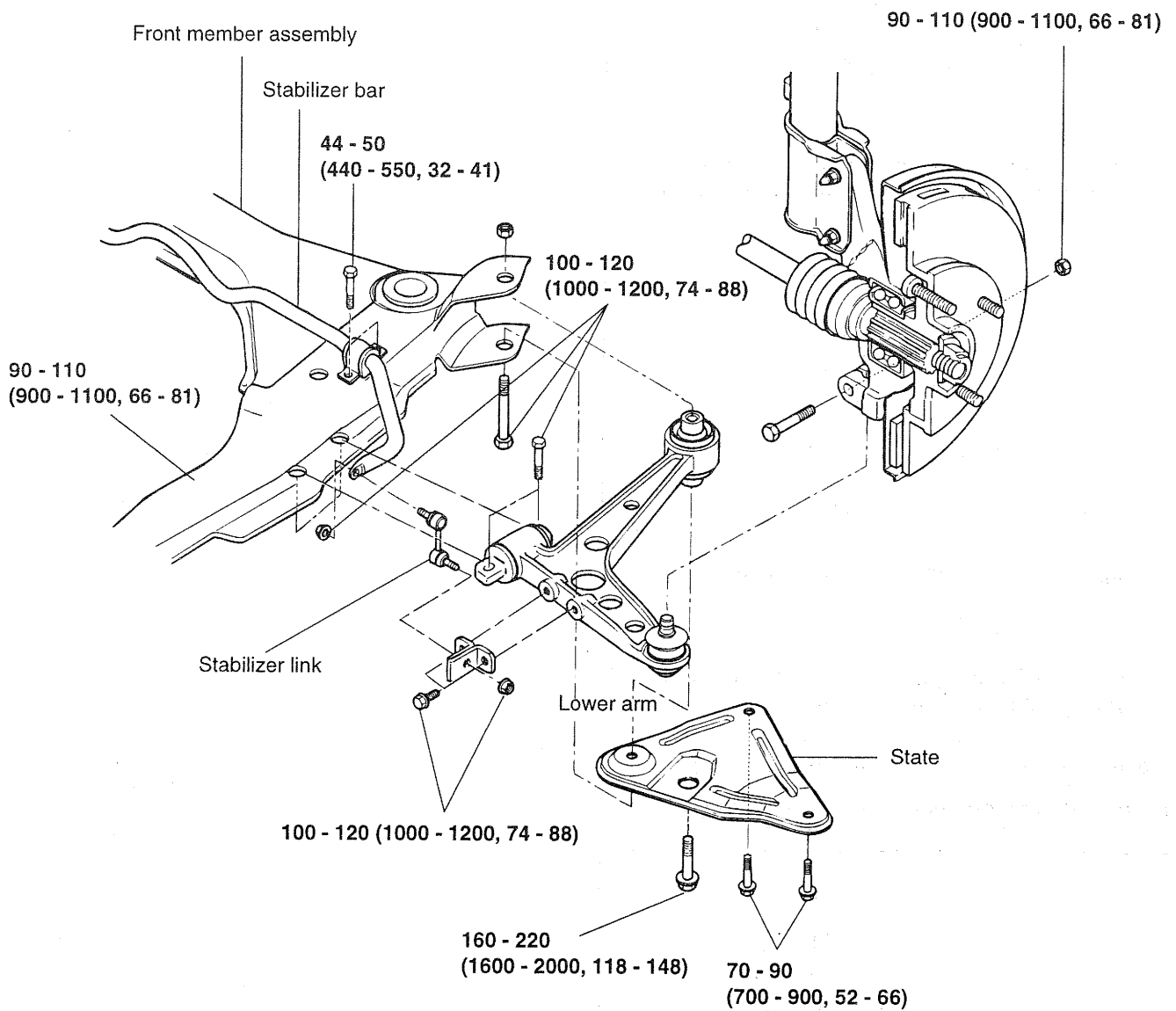


S5SS015F

LOWER ARM

COMPONENTS

EHHA2500



TORQUE : Nm (kg-cm, lb-ft)

REMOVAL EHHA2510

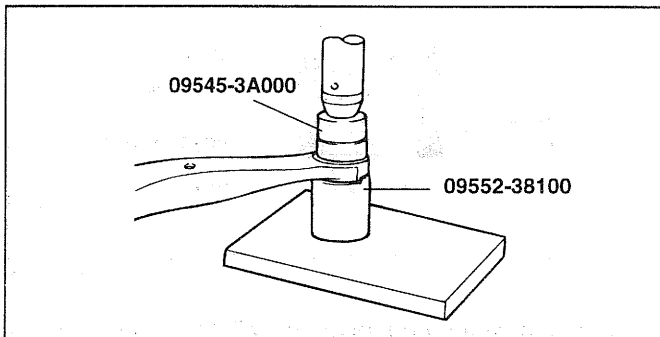
1. Remove the wheel.
2. Loosen the knuckle to the lower arm ball joint mounting bolt.
3. Remove the stabilizer link from the lower arm.
4. Remove the sub frame and 3 mounting bolts of lower arm.
5. Raising the stabilizer, remove the lower arm assembly.

INSTALLATION EHHA2520

1. Installation is the reverse of removal.

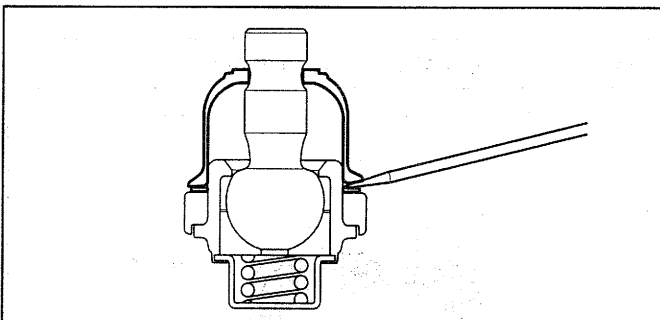
DISASSEMBLY EHHA2530

1. Using the special tool, remove the lower arm bushing (G).



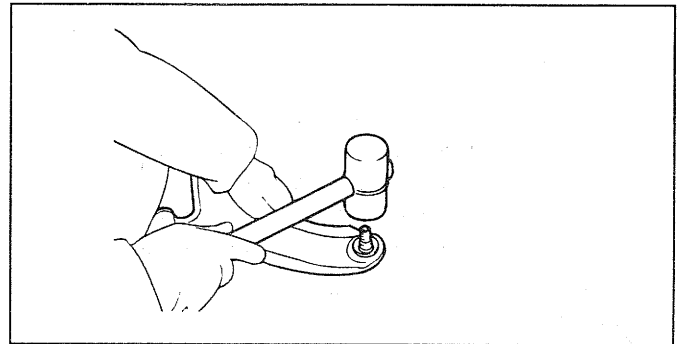
EHHA253B

2. Using a screwdriver, remove the dust cover from the lower arm ball joint.



KGX6028A

3. Remove the snap ring.
4. Using a plastic hammer, disconnect the ball joint from the lower arm assembly.



EHDA253A

INSPECTION EHHA2540

1. Check the bushing for wear and deterioration.
2. Check the lower arm for bend and damage.
3. Check the ball joint dust cover for cracks.
4. Check the lower arm connecting bolt.
5. Check lower arm ball joint for rotating starting torque.
 - a. If there is a crack on the dust cover, replace the ball joint dust cover.
 - b. Shake the ball joint stud several times.
 - c. Measure the ball joint rotation starting torque.

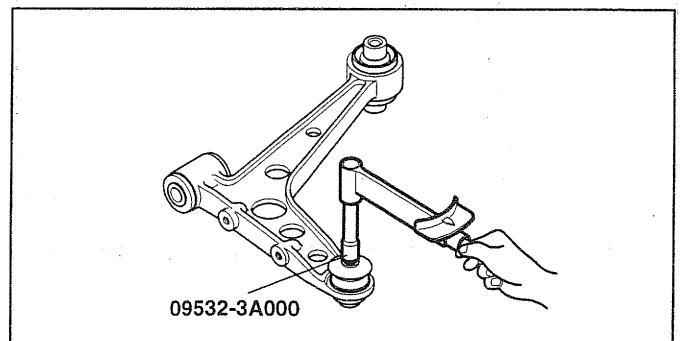
Standard value :

1.5 - 3.5 Nm [15 - 35kg·cm, 1.1 - 2.6 lb·ft]

NOTE

Measure at the range of 0.5–2rpm after vibrating 3° at room temperature after approx.24 hours from assembly.

- d. When the starting torque is above standard value, replace the ball joint.
- e. When the starting torque is less than standard value, the ball joint may be used again if there is no ball joint rubbing or excessive gap.



KGX6027A

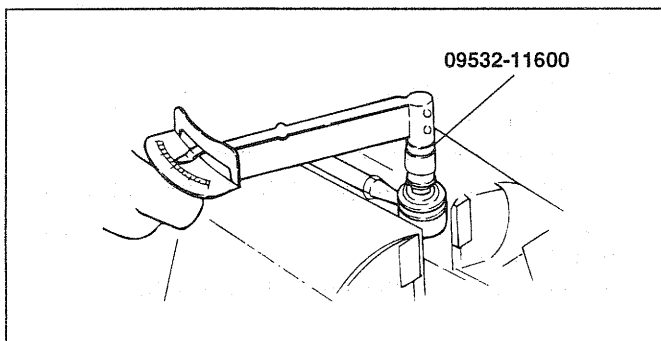
6. Check the stabilizer bar link ball joint for rotation starting torque.
 - a. If there is a crack on the dust cover, replace the ball joint dust cover and apply grease.
 - b. Shake stabilizer link ball joint several times.
 - c. Install the self locking nut on the ball joint and measure the ball joint turning motion torque.

Standard value :
0.7 - 2 Nm [7 - 20kg·cm, 0.52 - 1.5 lb·ft]

NOTE

Measure at the range of 0.5–2rpm after vibrating 3° and turning 30° at room temperature after approx.24 hours from assembly.

- d. When the starting torque is above standard value, replace stabilizer link.
- e. Even if the rotation starting torque is less than the standard value, the ball joint may be used again if there is ball joint abnormal wear or excessive gap.

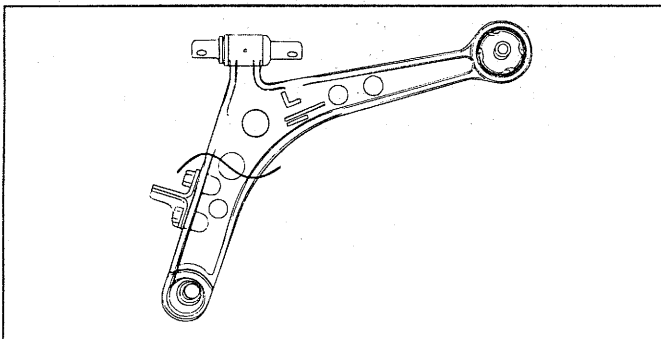


S5SS021A

REASSEMBLY

EHHA2550

1. Position the lower arm bushing (G) at an angle indicated in the illustration.

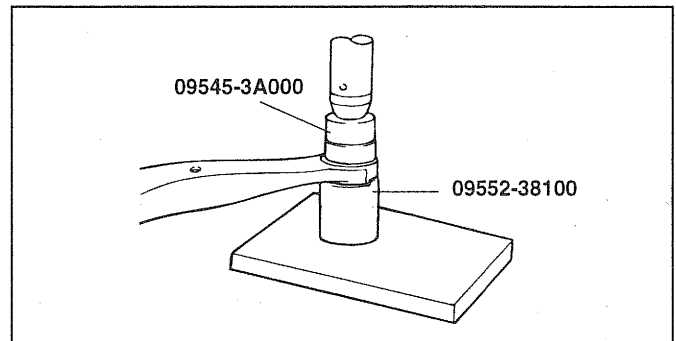


EHHA006A

2. Using the special tool, press-fit the lower arm bushing (G).

NOTE

The standard pull out force for the bushing : more than 100 N [1000 kg(f), 2205 lb(f)].

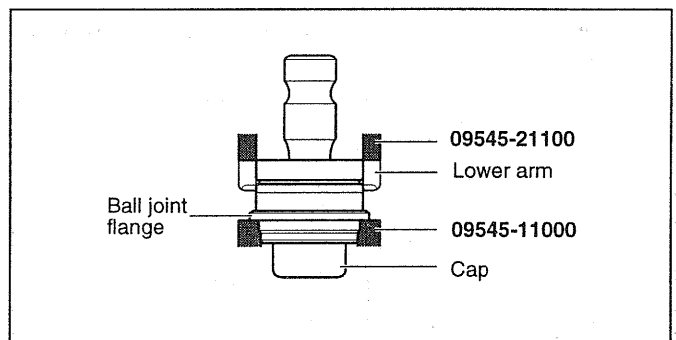


EHHA253B

3. Supporting the ball joint flange, press down the lower arm until the flange is placed on the lower arm surface.

NOTE

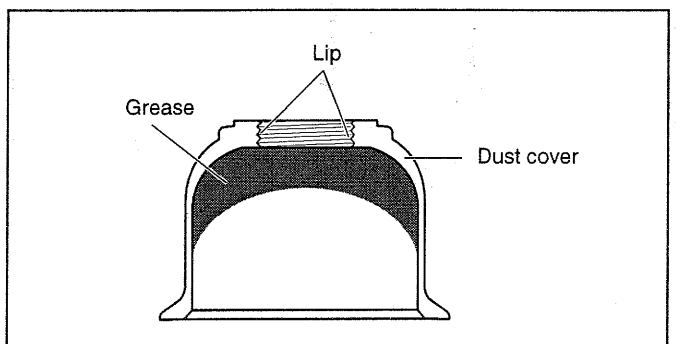
Do not press the ball joint cap.



KGX6030A

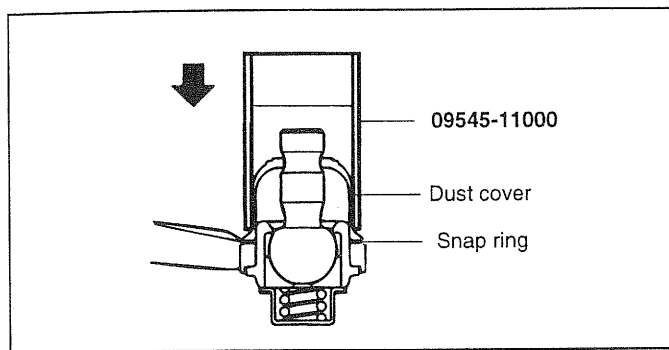
4. Using a snap ring plier, install the snap ring by keeping the amount of the snap ring expansion as small as possible.
5. Apply multi-purpose grease at the dust cover lip and inside.

Grease : Sunlight MB-2 or equivalent



KGX6032A

6. Compress the dust cover until it is placed on the snap ring using the special tool.

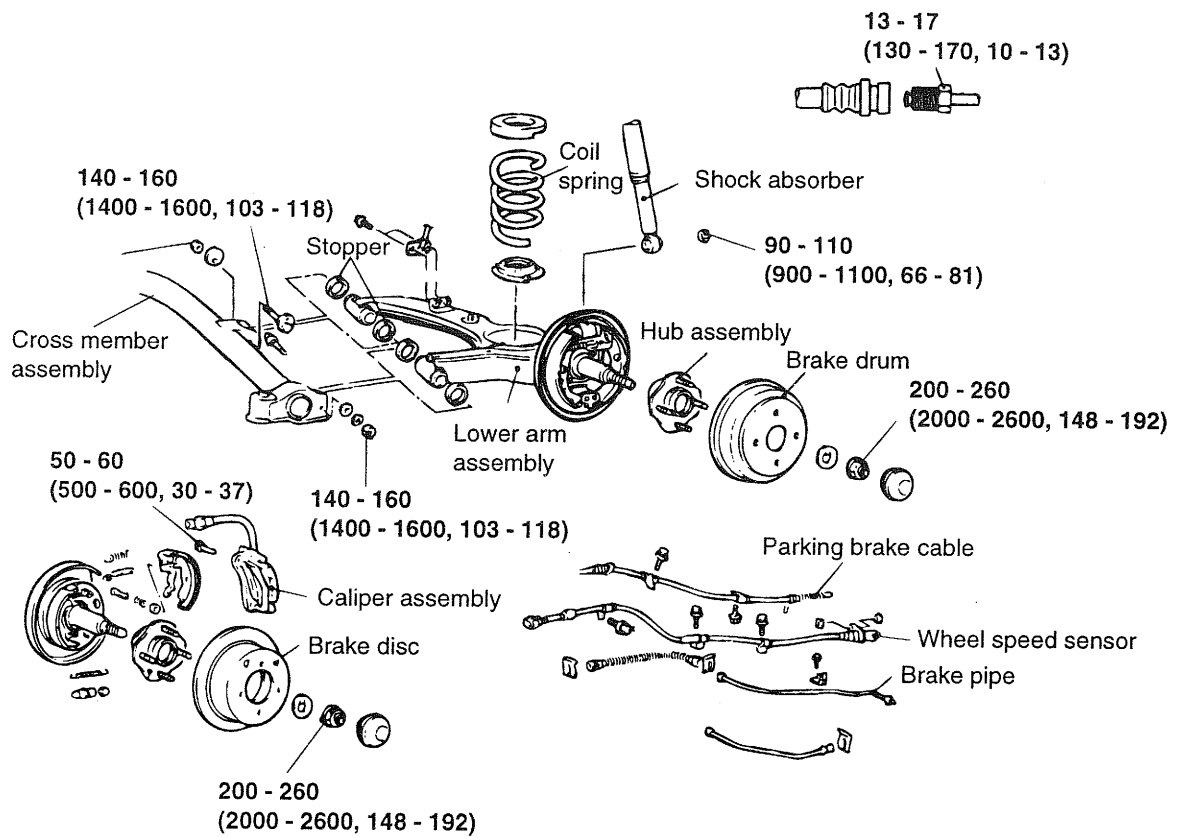


KGX6033A

REAR SUSPENSION SYSTEM

REAR SUSPENSION ARM

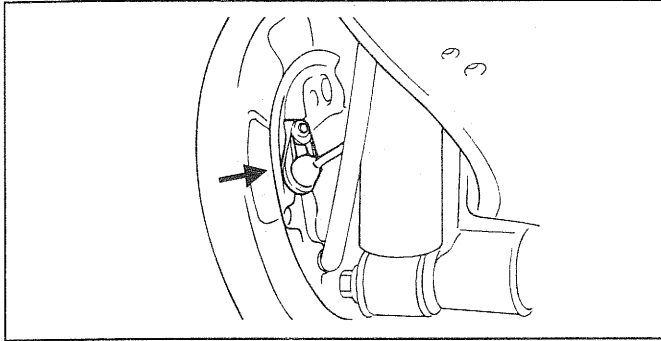
COMPONENTS EHHA5000



TORQUE : Nm (kg·cm, lb·ft)

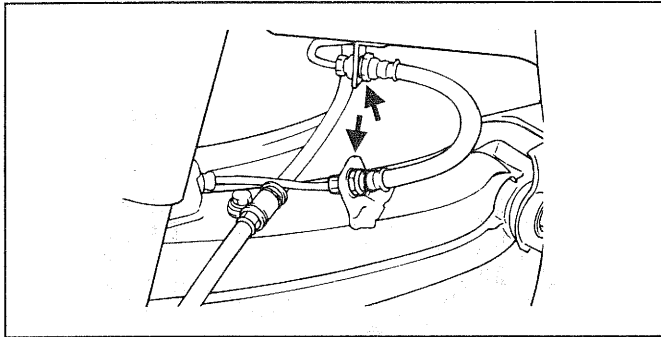
REMOVAL EHHA5010

1. Remove the wheel and tire.
2. Remove the wheel speed sensor harness.



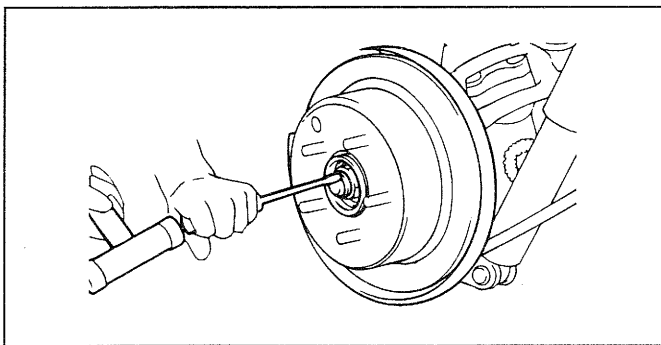
EHHA008A

3. After removing the bleeder screw, drain brake oil.
4. After removing the clip, remove the brake hose and caliper.



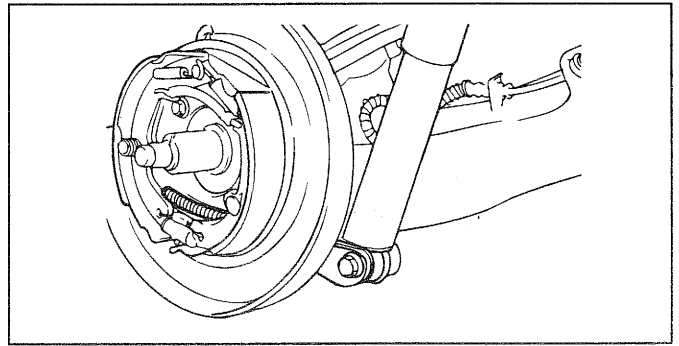
EHHA009A

5. Remove the rear axle hub cap and stretch the caulking part in grooves of the lock nut with a chisel and then remove the lock nut.



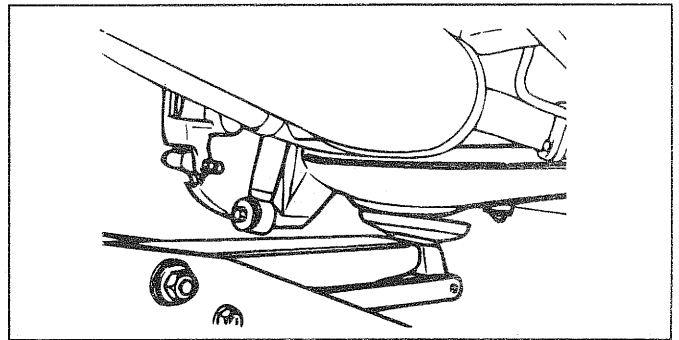
EHHA010A

6. Remove the brake disc and axle hub.
7. After removing the pin, disconnect the parking brake cable.
8. Remove brake assembly.



EHHA011A

9. Remove the stabilizer bar.
10. Support the lower arm not to sag and remove the shock absorber.



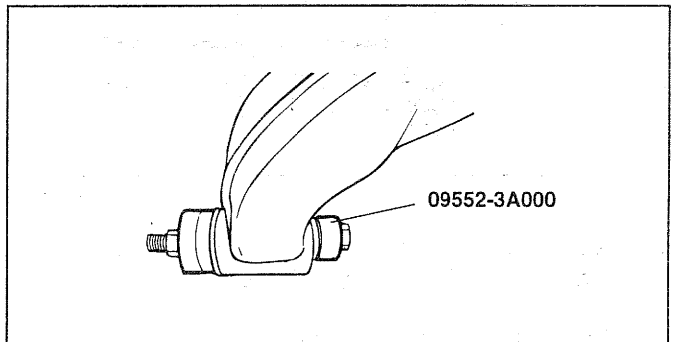
EHHA012A

11. Remove the rear suspension arm.
12. Remove the cross member.

UPPER ARM, LOWER ARM, AND ASSIST LINK EHHA5020

REAR LOWER ARM BUSHING REPLACEMENT

1. Using the special tool, remove the bushing.

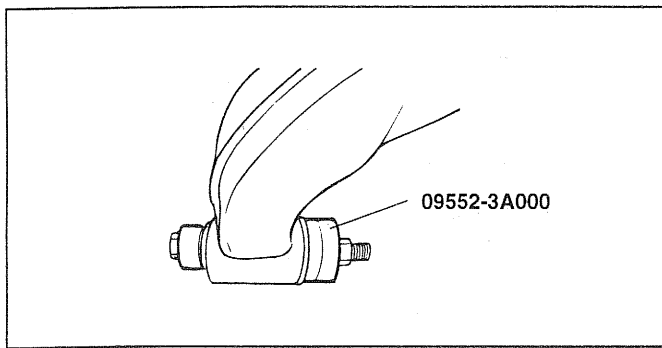


EHHA019A

2. Using the special tool, press fit the bushing.

NOTE

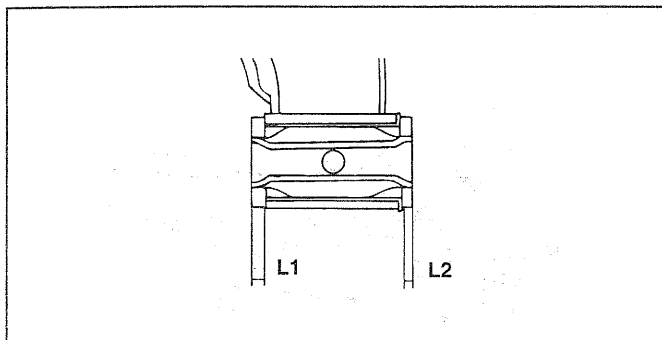
The standard pull out force for the bushing : More than 100 N(f) [1000 kg(f), 22.5 lb(f)].



EHHA020A

3. After press-fitting the bushing, the specified value should be satisfied as below:

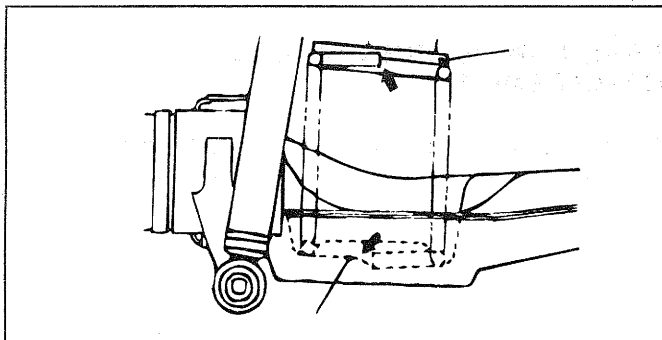
$L1 - L2 = 1\text{mm or less}$



EHHA021A

INSTALLATION EHHA5030

1. To install, reverse the removal operation process.
2. Install to align the upper and lower end of the spring with grooves of the spring seat.

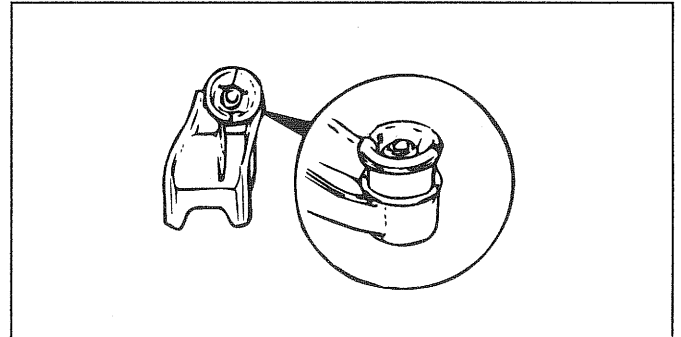


EHHA013A

3. After installing, replenish with brake fluid, and bleed the system. (Refer to the "Brake")
4. Check the wheel alignment.

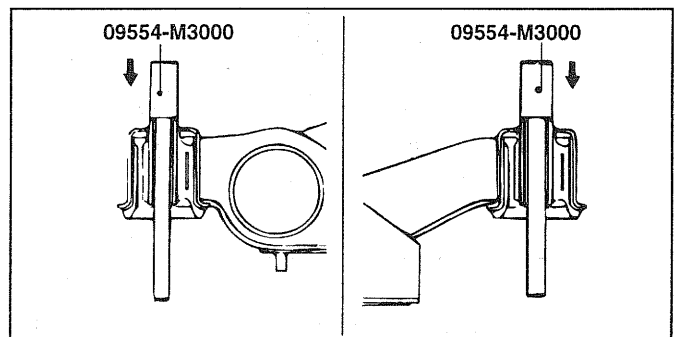
SUSPENSION CROSSMEMBER BUSHING REPLACEMENT

1. Make a mark on the crossmember bracket to match the slits on the old bushing, and use these marks to position the new bushing.



EHHA014A

2. Insert a flat-tipped screwdriver between the old bushing and the crossmember bracket and lever around the bushing to break the seal.
3. Use the special tool, tap out the bushing from the crossmember bracket.

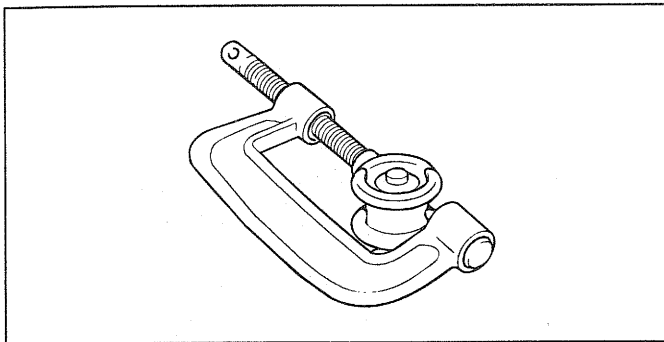


EHHA015A

REAR CROSS MEMBER

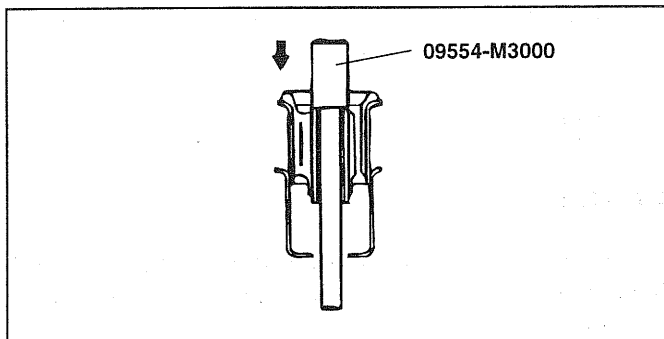
REASSEMBLY EHHA7100

1. Align the slits on the new bushing with the mating marks on the crossmember bracket.
2. Use the special tool to reduce the size of the rear end of the bushing.



EHHA016A

3. Use the special tool to press-fit the bushing until the outside case of the bushing is fitted securely in the crossmember flange.



EHHA017A

TIRES/WHEELS

TIRE

FRONT WHEEL ALIGNMENT

EHHA8500

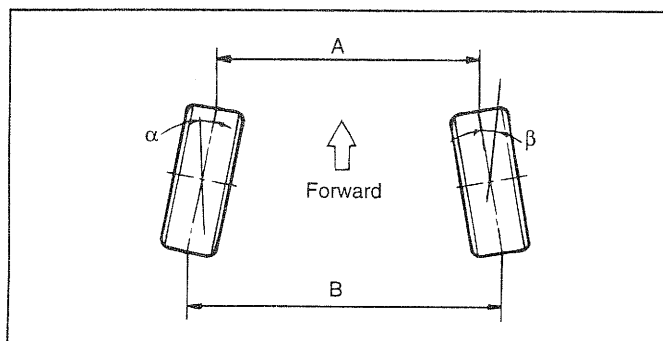
When using a wheel alignment tester to inspect the front wheel alignment, always position the car on a levelled surface with the front wheels facing straight ahead. Prior to inspection, make sure that the front suspension and steering system are in normal operating conditions and that the wheels and tires are free of deflection and tires are inflated to specification.

TOE-IN

Toe-in (B-A or angle $\alpha + \beta$) is adjusted by turning the tie rod turnbuckles. Toe-in on the left front wheel can be reduced by turning the tie rod toward the rear of the car. Toe change is achieved by turning the tie for the right and left wheels simultaneously the same amount as follows:

Toe-in (B-A) mm (in.) [Standard value] :

0 ± 3 mm (0 ± 0.12 in.)



EHHA850A

SIDE SLIP AND WHEEL STEERING ANGLE ADJUSTMENT

1. Side slip shall be adjusted within 0 ± 3 mm/m loading one person, by rotation the tie rod.
2. Steering angle shall be adjusted by turning the right and left tie rods each toward the opposite direction for the same amount.

Outer wheel steering angle : $32^\circ 73' \pm 2$

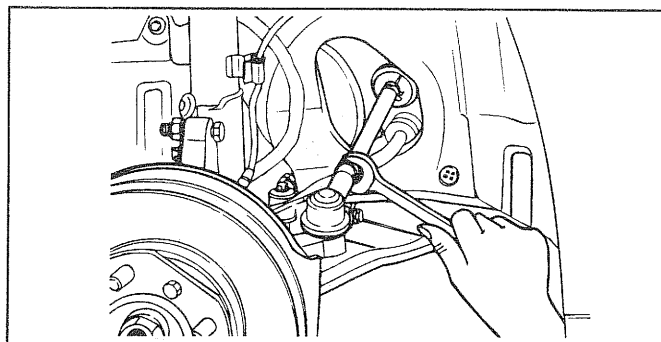
Inner wheel steering angle (difference between right and left should be within 2°) : $37^\circ 41' \pm 2^\circ$

Inner wheel steering angle variation per tie rod revolution : 0.65°

NOTE

- Remove the clip before rotating the tie rod and do not to twist the bellows.
- Check the bellows for twists after setting the steering angle and reassemble it correctly.

Tie rod end lock nut tightening torque :
50-55 Nm [500-550kg-cm, 37-41 lb-ft]



EHHA850B

CAMBER

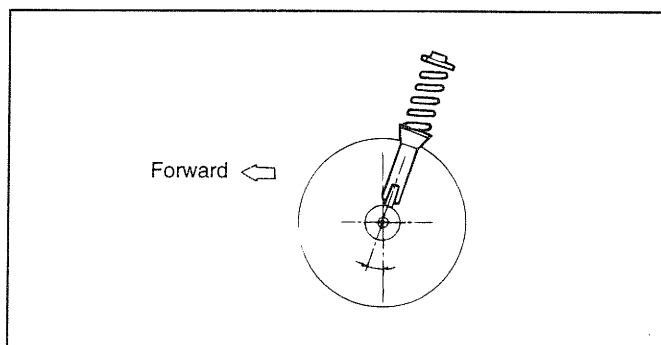
The steering knuckle which is integral with the strut assembly is preadjusted to the specified camber at the factory and requires no adjustment.

Camber : $0^\circ \pm 30'$

CASTER

Caster is pre-set at the factory and can not be adjusted. If caster is not within standard value, replace the bent or damaged parts.

Caster : $3^\circ 4' \pm 30'$

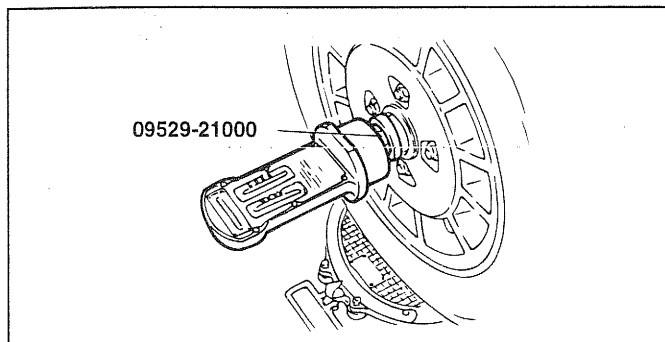


EHHA850C

NOTE

1. The front suspension assembly must be free of being worn out, loose or damaged parts prior to measuring front wheel alignment.
2. Measure wheel alignment by using the special tool (09529-21000).

3. Camber and caster are pre-set at the factory and cannot be adjusted.
4. If camber and caster are not within specifications, replace bent or damaged parts.



EHA850D

REAR WHEEL ALIGNMENT

TOE-IN

Standard value mm (in.) : $3 \pm 3 (0.12 \pm 0.12)$

NOTE

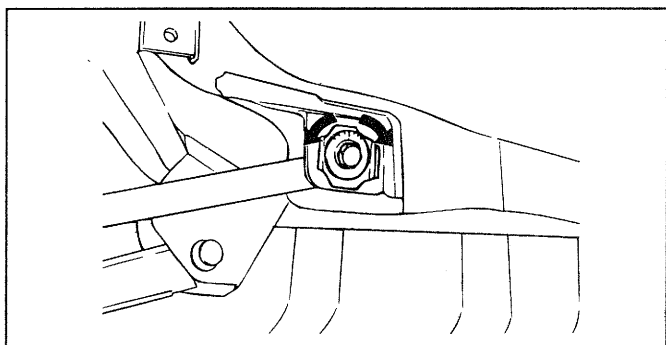
The assist arm mounting bolt (crossmember side) should be turned an equal amount at both sides when adjusting.

Inside direction of the vehicle : toe-in

Outside direction of the vehicle : toe-out

The scale has gradations of approximately 3.6 mm (0.14 in.)

(single side toe angle equivalent to 37')



EHA9851A

CAMBER

Standard value : $-0^{\circ}30' \pm 30'$

NOTE

1. The rear suspension assembly must be free of being worn out, loose or damaged parts prior to measuring rear wheel alignment.

2. Camber is pre-set at the factory and cannot be adjusted.
3. If camber is not within the specifications, replace bent or damaged parts.

TIRE WEAR

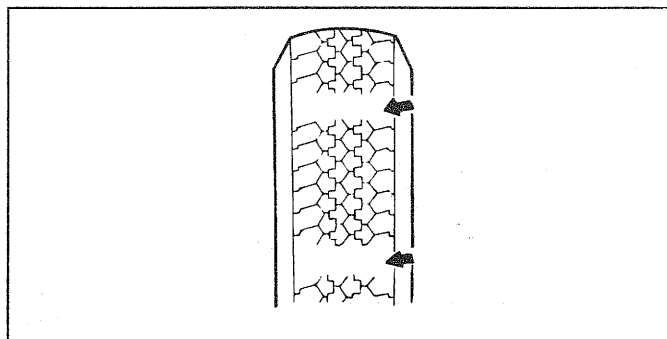
1. Measure the tread depth of the tires.

Tread depth of tire [Limit] : 1.6 mm (0.06 in.)

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

NOTE

When the tread depth of the tires is reduced to 1.6 mm (0.06 in.) or less, the wear indicators will appear.



EHA9850E

WHEEL

WHEEL RUNOUT EHHA9000

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

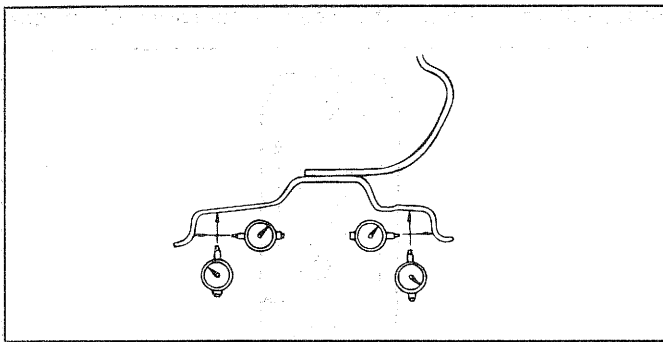
Wheel run-out [Limit]

Steel wheel : Rdial - 0.6mm (0.024 in)

Axial - 1.0mm (0.039 in)

Aluminum wheel : Radial - 0.3mm (0.012 in)

Axial - 0.3mm (0.012 in)



EHHA900A

WHEEL NUT TIGHTENING

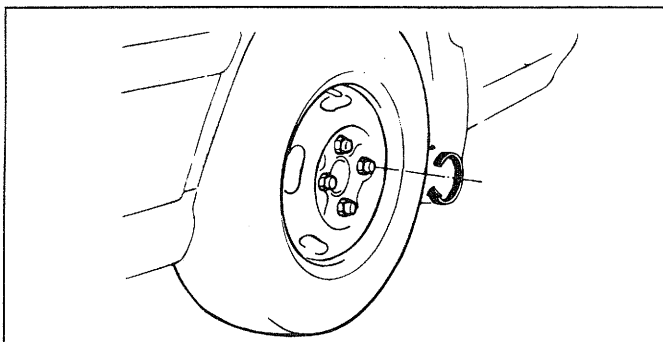
1. Tightening torque

Aluminum wheel :

90-110 Nm [900-1100kg·cm, 66-81 lb·ft]

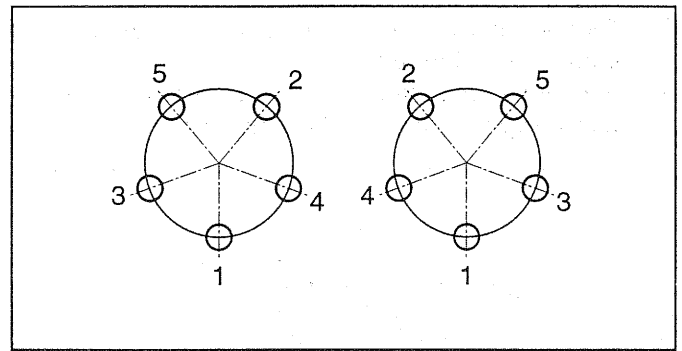
NOTE

When using an impact gun, ensure to use the correct tightening torque.



Y54-010A

2. Tighten up all wheel nuts in the order illustrated.



KFW6020A