

Suspension System

GENERAL	SS -2
FRONT SUSPENSION SYSTEM	SS -8
REAR SUSPENSION SYSTEM	SS -16
TIRES/WHEELS	SS -21

GENERAL

SPECIFICATIONS

EHJB0015

Front suspension system	MacPherson strut type		
Coil spring free height and identification color			
Model	Free height mm (in.)	I.D. color	
SIRIUS 2.0 2WD M/T	398.7	Green - Red	
2.4 2WD M/T	↑	↑	
M/T A/C + S/R +ABS	407.6	Green - Yellow	
4WD M/T	↑	↑	
DELTA 2.7 4WD A/T	416.9	Green - White	

- o M/T : With manual transaxle
- o S/R : Sun roof
- o A/T : With automatic transaxle
- o ABS : Anti-lock brake system
- o A/C : Air conditioner

Shock absorber			
Type	Gas pressurized type		
Stroke mm (in.)	169 (6.65)		
Damping force at 0.3 m/s			
Expansion N(kg)	820 ± 130 (82 ± 13)		
Compression N(kg)	580 ± 110 (58 ± 11)		
Wheel and Tire			
Wheel type	Steel	Aluminum	
Wheel size	6J x 15	6.5J x 15	6.5J x 16
Tire size	215 / 70 R 15	215 / 70 R 15	225 / 70 R 16
Tire inflation pressure kPa (psi)	206 (30)	206 (30)	206 (30)

EHJB001C

Rear suspension system	Double wishbone type	
Coil spring free height and identification color		
	2WD	4WD
Free height mm (in.)	299.9 (11.8)	304.7 (12)
Identification color	Red - Yellow	Red - White
Shock absorber		
Type	Gas pressurized type	
Stroke mm (in.)	219 (8.62)	
Damping force at 0.3 m/s		
Expansion N (kg)	610 ± 100 (61 ± 10)	
Compression N (kg)	270 ± 60 (27 ± 6)	

EHJB001B

SERVICE STANDARD

EHJB0025

Standard value			
Toe-in	Front	0 ± 2 mm (0.008 in.) (Standard diameter of tire : ø702mm)	
	Rear	0 ± 2 mm (0.008 in.) (Standard diameter of tire : ø702mm)	
Camber	Front	0° ± 30' (Max. difference between LH and RH : 0°30')	
	Rear	0°30' ± 30' (Max. difference between LH and RH : 45')	
Caster	Front	2°30'±30' (Max. difference between LH and RH : 0°30')	
King pin angle	Front	12.59°	
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

EHJB0030


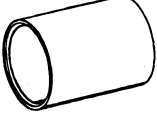
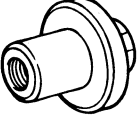

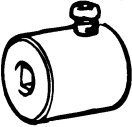

	Nm	Kg·cm	lb·ft
Wheel nut	90-110	900-1100	67-81
Lower arm ball joint self-locking nut	100-120	1000-1200	74-88
Lower arm bushing (A) to sub-frame mounting bolt	100-120	1000-1200	74-88
Lower arm bushing (G) to sub-frame mounting bolt	90-110	900-1100	66-81
Front strut lower mounting nut	100-120	1000-1200	74-88
Front strut upper mounting nut	40-50	400-500	30-37
Front strut self-locking nut	60-70	600-700	44-52
Stabilizer bar to front strut mounting nut	40-50	400-500	30-37
Sub-frame to body mounting bolt	160-200	1600-2000	118-148
Rear shock absorber complete upper mounting nut	20-30	200-300	15-22
Rear shock absorber complete lower mounting bolt	140-160	1400-1600	104-118
Rear suspension upper arm to crossmember mounting bolt	140-160	1400-1600	103-118
Rear suspension arm cam bolt	140-160	1400-1600	103-118
Crossmember to body mounting bolt	140-160	1400-1600	103-118
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

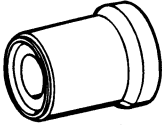
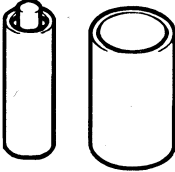
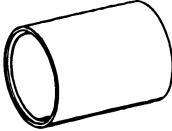
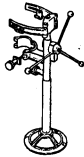
CAUTION

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

SPECIAL TOOLS

EHJB0040

Tool(Number and Name)	Illustration	Use
09216-21000 Mounting bushing remover and installer	 <p style="text-align: right;">B1621000</p>	Removal and installation of the front upper arm bushing and lower arm bushing (Use with 09551-31000)
09216-21300 Mounting bushing remover and installer	 <p style="text-align: right;">B1621300</p>	Removal and installation of the trailing arm bushing (Use with 09552-38100)
09529-21000 Wheel alignment gauge attachment	 <p style="text-align: right;">F2921000</p>	Measurement of the wheel alignment
09532-11600 Preload socket	 <p style="text-align: right;">F3211600</p>	Measurement of the stabilizer bar link ball joint preload (use with torque wrench)
09532-3A000 Preload socket	 <p style="text-align: right;">F323A000</p>	Measurement of the front lower arm ball joint preload (use with torque wrench)
09545-28100 Lower arm bushing remover and installer	 <p style="text-align: right;">E4528100</p>	Removal and installation of the rear upper arm bushing and lower arm bushing (Use with 09552-25000)

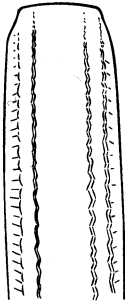
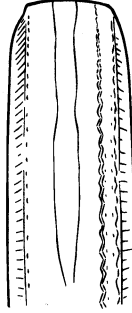
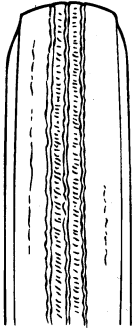
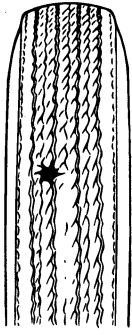
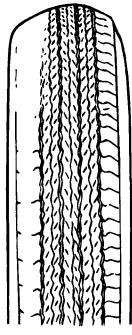
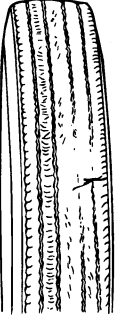
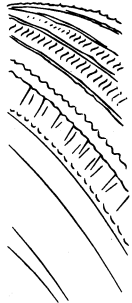
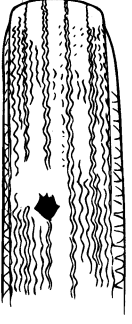
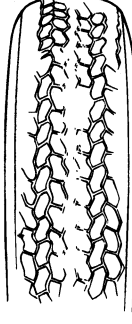

Tool(Number and Name)	Illustration	Use
09551-31000 Upper arm bushing remover and installer	 <p style="text-align: right;">E5131000</p>	Removal and installation of the front lower arm bushing (Use with 09216-21000)
09552-25000 Suspension bushing remover and installer	 <p style="text-align: right;">EHDA140H</p>	Removal and installation of the rear upper arm bushing and lower arm bushing (Use with 09545-28100)
09552-38100 Trailing arm bushing remover and installer	 <p style="text-align: right;">E5238100</p>	Removal and installation of rear trailing arm bushing (Use with 09216-21300)
09546-26000 Strut spring compressor	 <p style="text-align: right;">E4626000</p>	Compression of the coil spring

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
Poor ride quality	Improper front wheel alignment	Correct
	Damaged 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	Correct

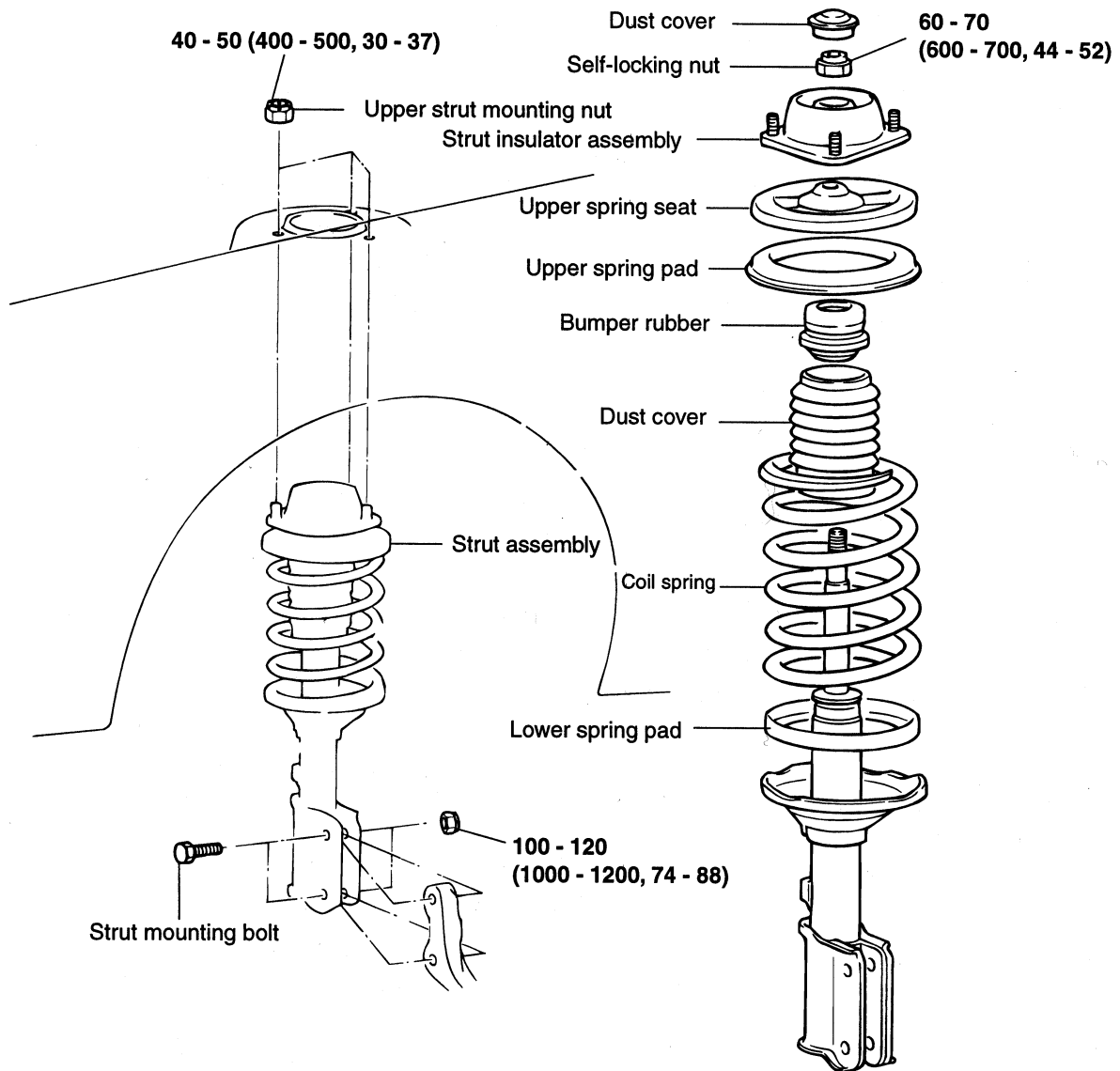
Trouble symptom	Probable cause	Remedy
Abnormal tire wear	Improper front wheel alignment	Correct
	Worn shock absorber	Replace
Wandering	Improper front wheel alignment	Correct
	Poor turning resistance of lower arm ball joint	Repair
	Loose or worn lower arm bushing	Replace
Vehicle pulls to one side	Improper front wheel alignment	Correct
	Excessive turning resistance of lower arm ball joint	Replace
	Broken or worn coil spring	Replace
	Bent lower arm	Replace
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
	Worn of shock absorber	Replace
	Broken or worn coil spring	Replace
Bottoming	Broken or worn spring	Replace
	Malfunction of shock absorber	Replace
Abnormal sound	Loose 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 *Rapid wear	*When a patch of tread has loosened, it is torn off the tire by centrifugal force at high speed	*Incorrect camber angle *Improper camber and toe-in *High-speed turns
FLAT SPOT	FEATHERING	BAD PLUGGING	UNEVEN TIRE WEAR	TOTALLY UNSAFE TIRE
				
EHA9150F	EHA9150G	EHA9150H	EHA9150I	EHA9150J
*Caused by high-speed braking hard enough to lock up the wheel	*Excessive Toe-in or Toe-out	*Using more than one plug in a leak 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 EHJB0050



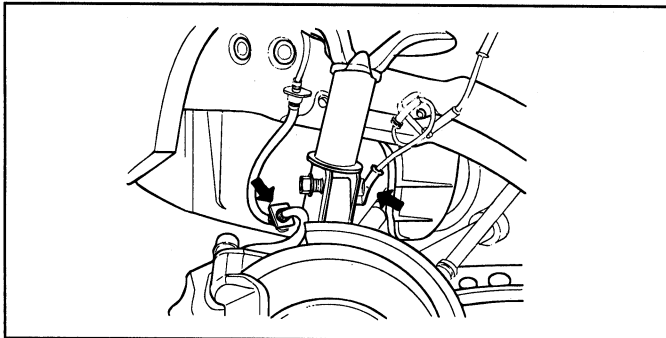
TORQUE : Nm (kg-cm, lb-ft)

REMOVAL EHJB0060

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.

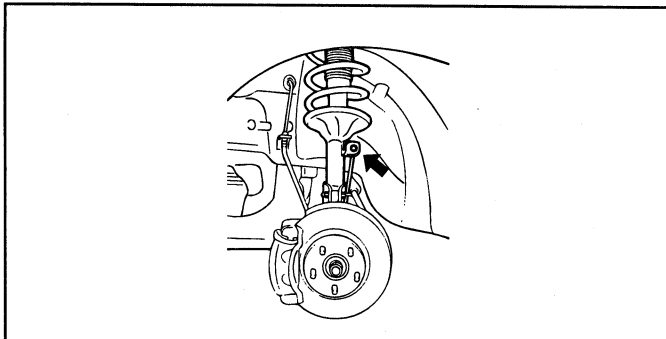
CAUTION

Be careful not to damage the wheel speed sensor.



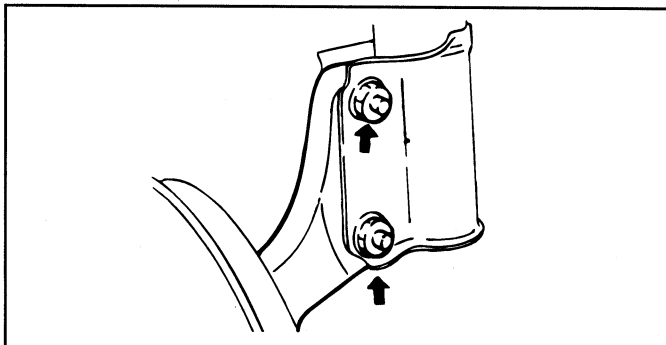
EHHA001A

4. Remove the stabilizer bar link.



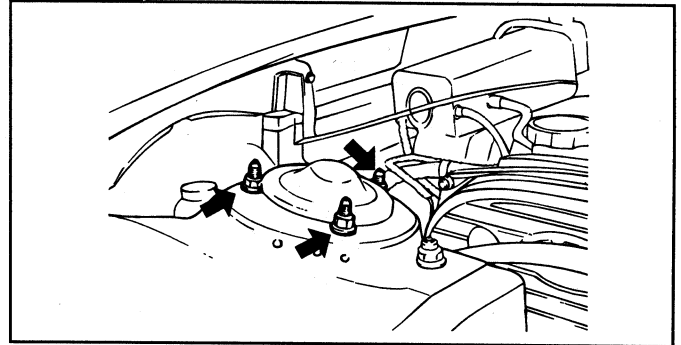
KSMS012A

5. Remove the knuckle from the strut assembly.



S5SS012B

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



EHA9201D

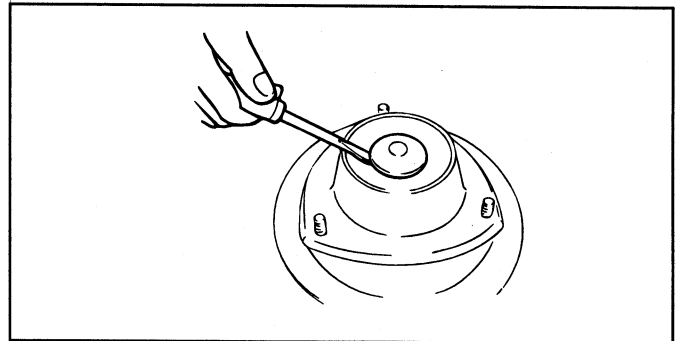
7. Remove the strut assembly.

INSTALLATION EHHA2020

1. Installation is the reverse of removal.

DISASSEMBLY EHJB0070

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

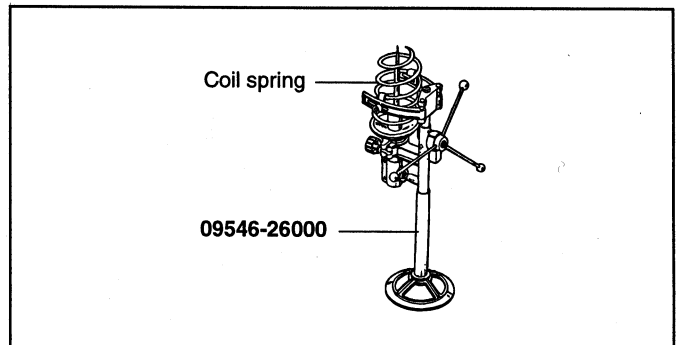


S5SS013A

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

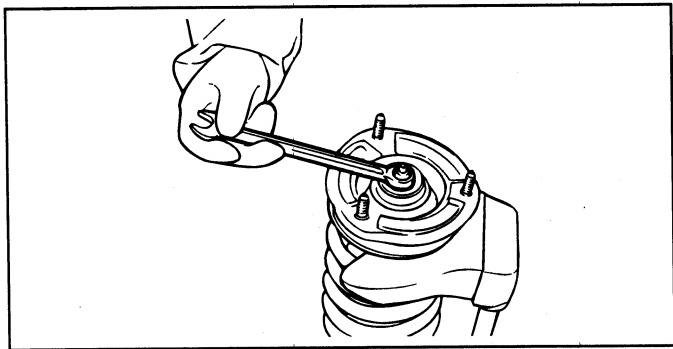
NOTE

Do not use an impact gun.



ASM040A

- Remove the self-locking nut.

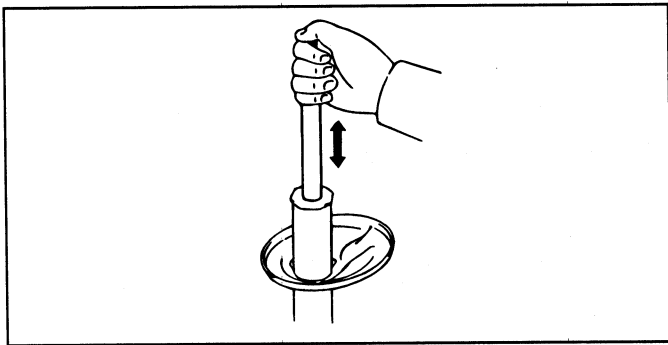


EHA9203B

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

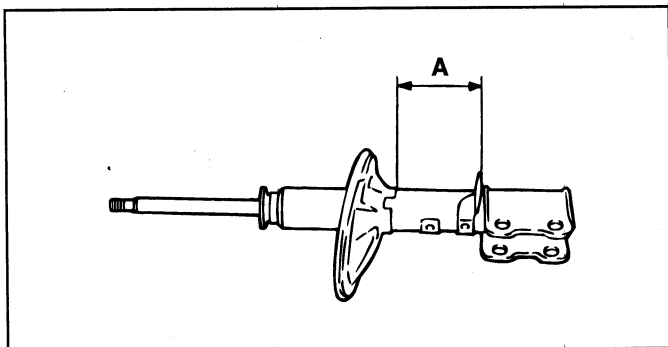
INSPECTION EHHA2040

- Check the rubber components for wear or damage.
- Check the spring for deformation or damage.
- Hold the shock absorber and push. Then pull it up and down for more than three times. Check for strange noises and irregular elasticity.
- Check the shock absorber for damage or leakage.



EHHA002A

DISPOSAL EHHA2050



EHHA003A

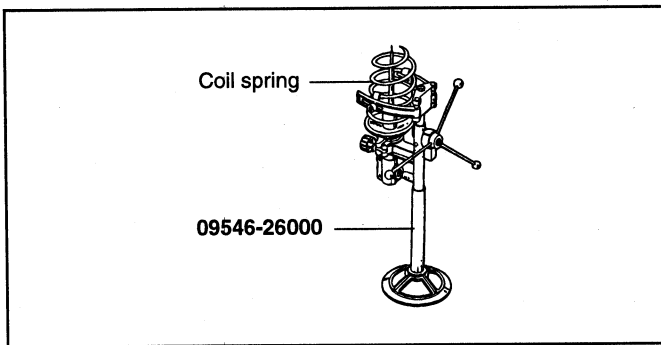
- Fully extend the shock absorber rod.
- Drill a hole on the A section to remove gas from the cylinder.

CAUTION

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

REASSEMBLY EHJB0080

- Using the spring compressor, compress the coil spring completely.



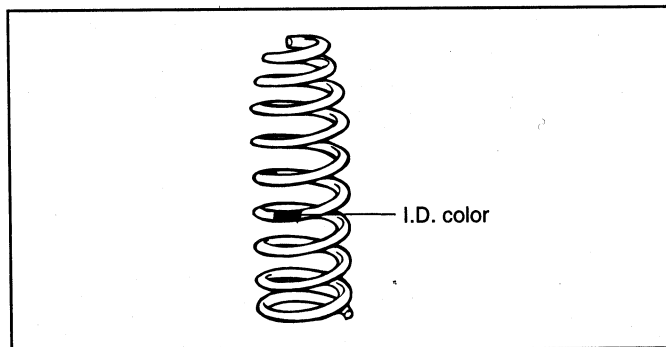
ASM040A

NOTE

- Do not use an impact gun.
- Coil spring installation chart by load classification.

LH spring		RH spring
Yellow	← →	Yellow
White	← →	White
Red	← →	Red

EHJB008A

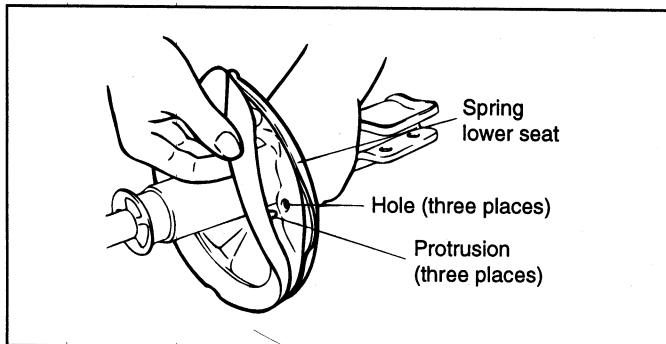


EHA9206B

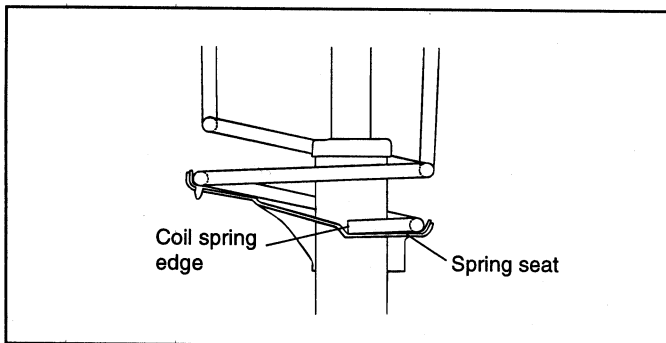
- Install the lower spring pad so that the protrusions fit in the holes of the spring lower seat.

NOTE

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



EHDA204A

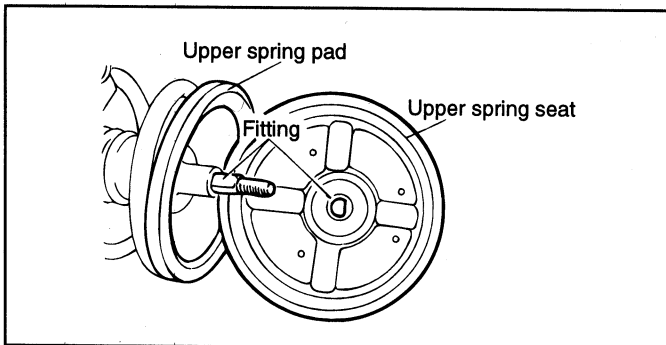


ESMSS44A

3. Install the upper spring seat on the piston rod.

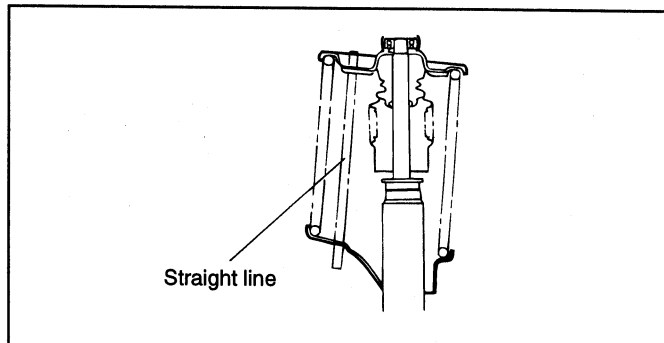
NOTE

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



EHDA204B

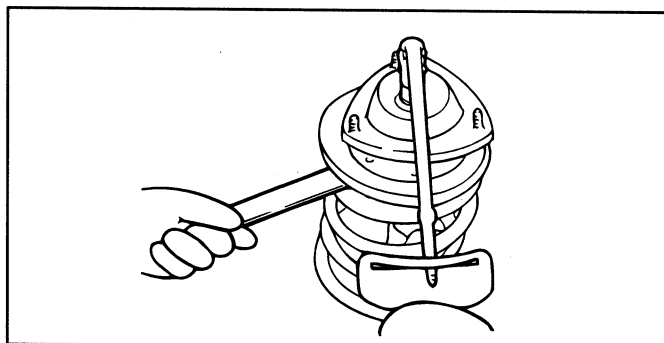
4. Place the bracket so the holes on the upper spring seat align with those on the lower spring seat in a straight line.



S5SS015E

5. Tighten the new self-locking nut temporarily.
6. Remove 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)



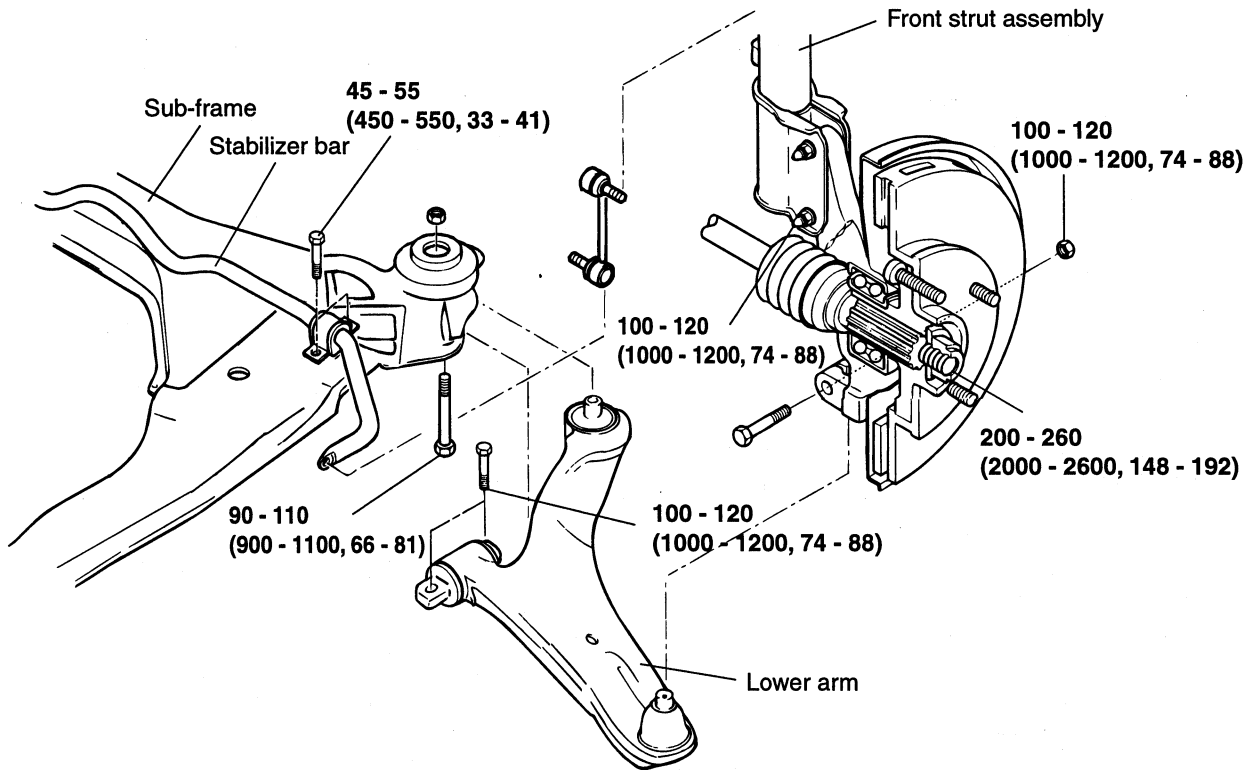
S5SS015F

CAUTION

Do not mar the piston rod with the tool.

LOWER ARM

COMPONENTS E HJB0090



TORQUE : Nm (kg·cm, lb·ft)

REMOVAL EHJB0100

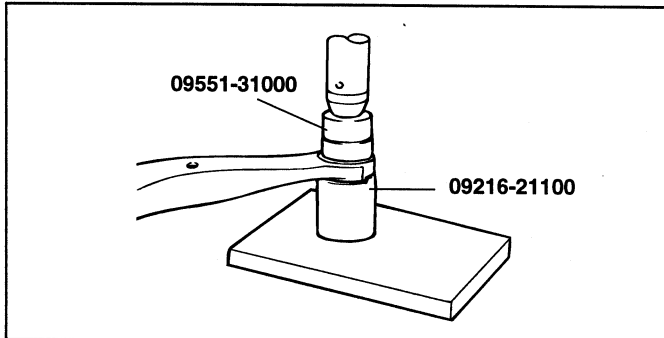
1. Remove the wheel.
2. Loosen the bolt mounting the knuckle and the lower arm ball joint.
3. Remove the sub frame and 3 bolts mounting the lower arm.

INSTALLATION EHHA2520

1. Installation is the reverse of removal.

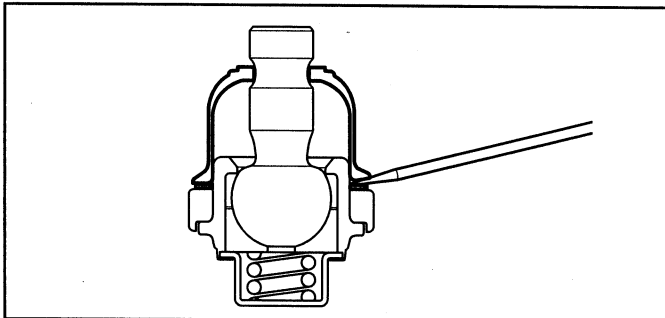
DISASSEMBLY EHJB0110

1. Using the special tool, remove the lower arm bushing.



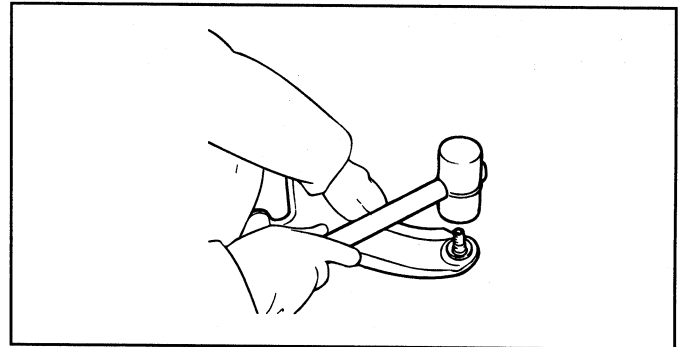
EHJB011A

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, remove the ball joint from the lower arm assembly.



EHDA253A

INSPECTION EHJB0120

1. Check the bushing for wear and deterioration.
2. Check the lower arm for bends and other damage.
3. Check the ball joint dust cover for cracks. If there is a crack on the dust cover, replace the ball joint assembly.
4. Check the lower arm connecting bolt.
5. Shake the ball joint stud several times to test for looseness.
6. Check lower arm ball joint for rotating starting torque.

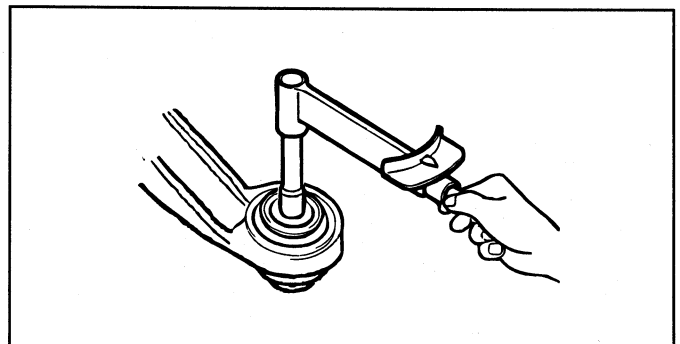
Standard value :

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.

- a. When the starting torque is above the standard value, replace the ball joint assembly.
- b. When the starting torque is less than the standard value, the ball joint may be used again if there is no wear in the ball joint.



KSMS003A

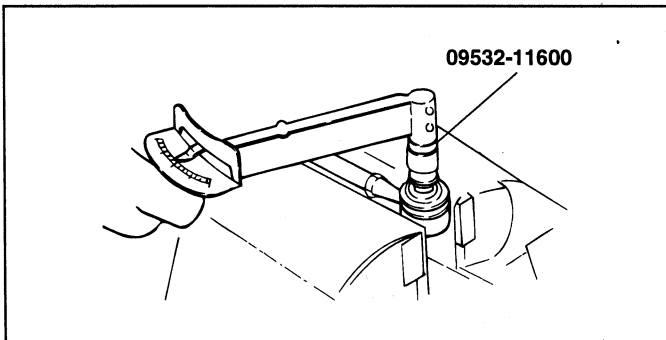
7. Check the stabilizer bar link ball joint for rotation starting torque.
- If there is a crack on the dust cover, replace the ball joint dust cover and apply grease.
 - Shake the stabilizer link ball joint several times to test for looseness.
 - Install the self locking nut on the ball joint and measure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

Standard value :

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

NOTE

- After 24 hours of assembly rotate the ball joint stud to the left and right five times.
 - After that, measure the turning torque around the range of 2 rpm at room temperature.
- When the starting torque is above the standard value, replace the stabilizer link.
 - 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

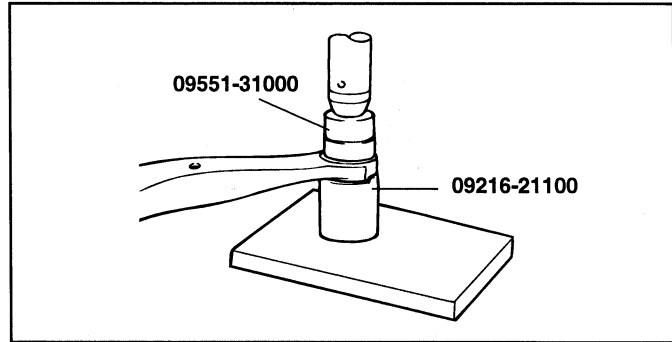
REASSEMBLY

EHJB0130

1. Using the special tool, press-fit the lower arm bushing.

NOTE

The standard pull-out force for the bushing : more than 50 N [500 kg(f), 1103 lb(f)].

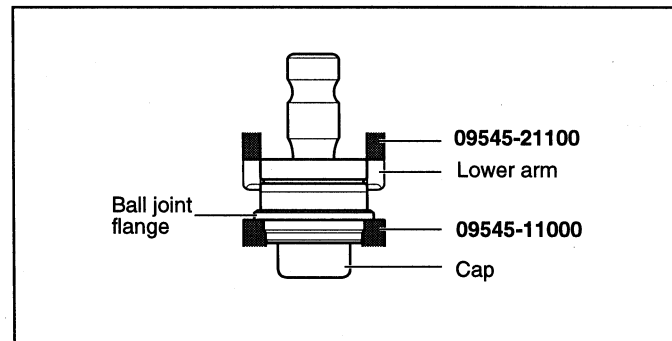


EHJB011A

2. Supporting the ball joint flange, press down the lower arm bushing until the flange touches the lower arm surface.

NOTE

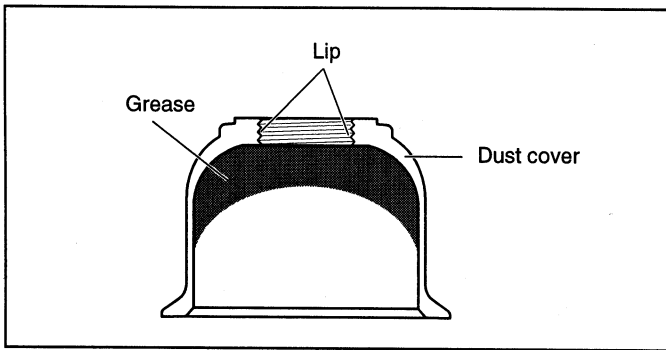
Do not press the ball joint cap.



KGX6030A

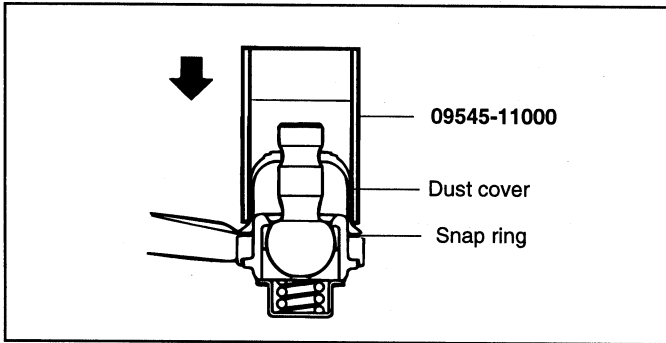
3. Using a snap ring pliers, install the snap ring. Keep the amount of the snap ring expansion as small as possible.
4. Apply multi-purpose grease to the dust cover lip and inside the cover.

Grease : Sunlight MB-2 or equivalent



KGX6032A

5. Using the special tool, install the dust cover until it is completely seated on the snap ring.

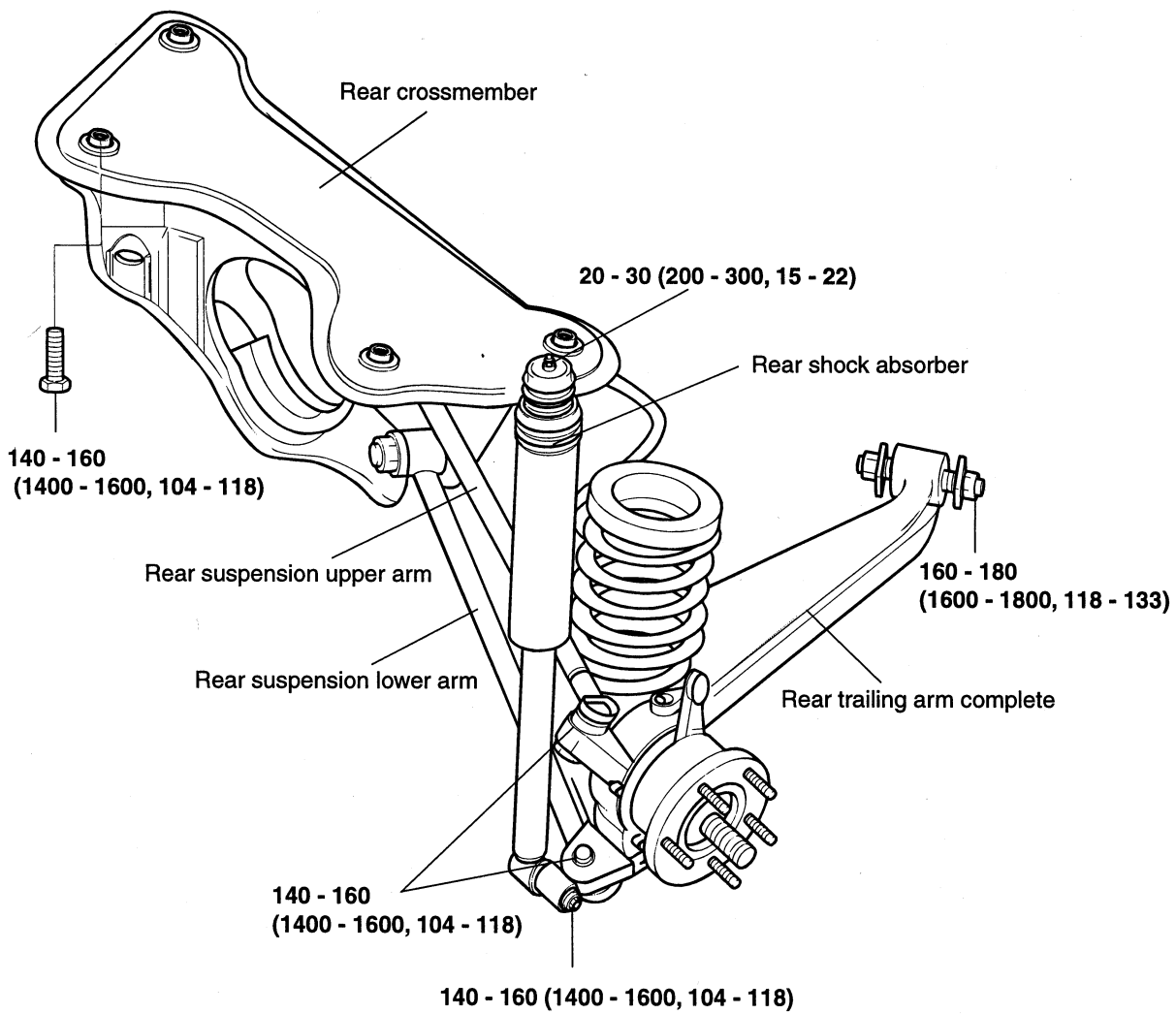


KGX6033A

REAR SUSPENSION SYSTEM

REAR SUSPENSION ARM

COMPONENTS EHB0140



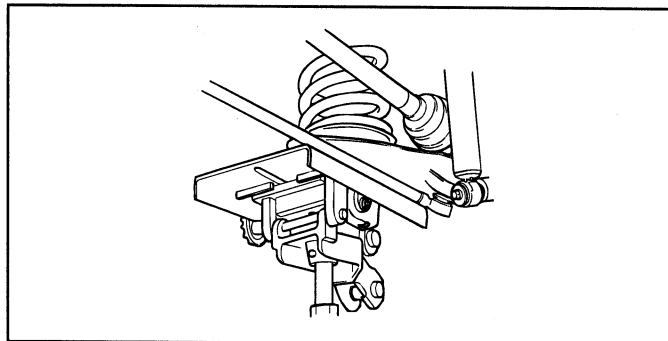
TORQUE : Nm (kg-cm, lb-ft)

REMOVAL EHJB0150

1. Remove the wheel and tire.
2. Remove the flange nut and the brake caliper assembly.
3. Detach the parking brake system.
4. Detach the wheel speed sensor and the parking brake cable.
5. Remove the rear shock absorber assembly.

NOTE

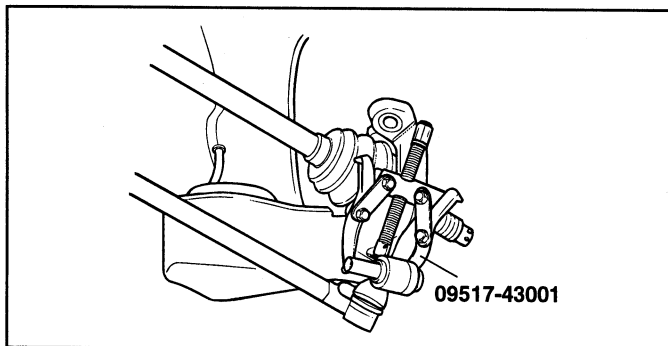
- When the rear shock absorber is removed, remove the rear shock absorber mounting bolt. Support the trailing arm with a jack.



KSMS007C

- If the rear shock absorber is removed, the rear coil spring is easy to remove.

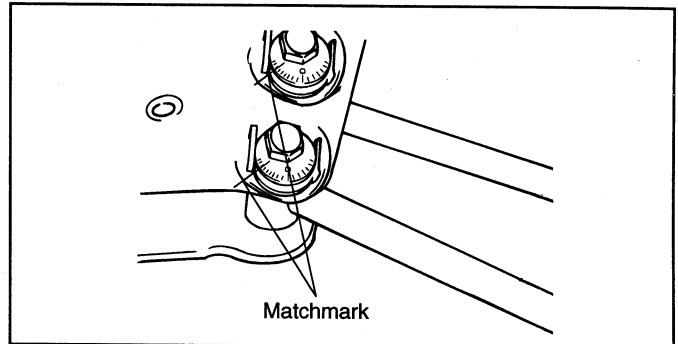
6. Remove the rear driveshaft from the rear axle assembly.
7. Using the special tool, remove the rear suspension upper and lower arm.



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NOTE

Make matchmarks on the crossmember and the cams.



ASMS009A

8. Remove the trailing arm complete.
9. Remove the propeller shaft.

NOTE

Refer to the removal procedure of propeller shaft, page DS-9.

10. Loosen the muffler to ease access.

NOTE

When the crossmember is removed, you can prevent interference between the muffler and the crossmember page.

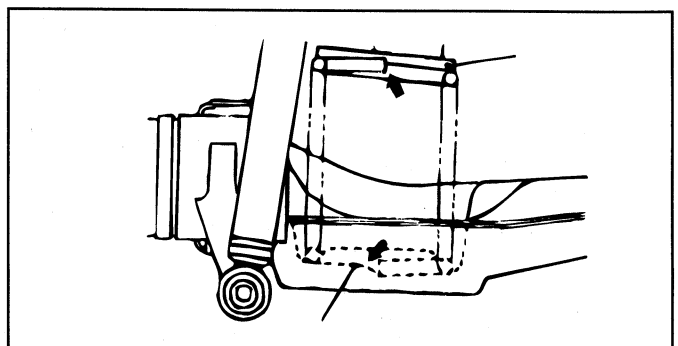
11. Remove the crossmember. Provide clearance between the fuel tank and differential carrier.

NOTE

First, remove the 2 differential and crossmember mounting bolts and then remove the 4 body and crossmember mounting bolts.

INSTALLATION EHJB0160

1. To install, reverse the removal procedure.
2. Align the upper and lower ends of the spring with the grooves of the spring seat and install.



EHHA013A

3. After installing, replenish with brake fluid, and bleed the system.
4. Verify the wheel alignment.

INSPECTION EHJB0170

1. Check the bushing for wear and deterioration.
2. Check the rear suspension lower arm and upper arm for bending or breakage.
3. Check the ball joint dust cover for cracks.
4. Check all bolts.
5. Check the upper and lower arm ball joint for rotating torque.
 - a. If there is a crack in the dust cover, replace the ball joint assembly.
 - b. Shake the ball joint stud several times to check for looseness.
 - c. Measure the ball joint rotating torque.

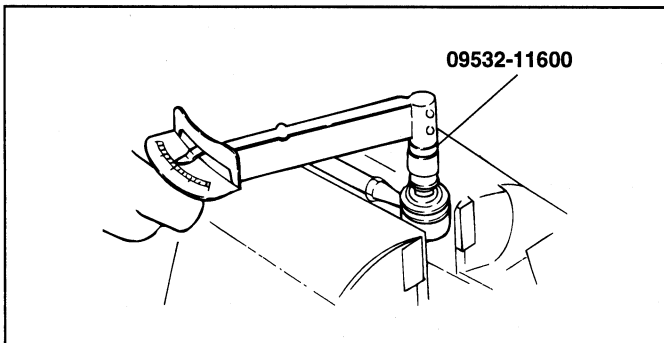
Standard value :

1-3.5 Nm, (10-35 kg·cm, 0.74-2.59 ft·lb)

NOTE

After the unit has been assembled for 24 hours, at room temperature, turn the ball joint 30° and then back and forth 3°. Then, measure the ball joint rotating torque.

- d. If the rotating torque is above the upper limit of the standard value, replace the ball joint assembly.
- e. If the rotating torque is below the lower limit of the standard value, the ball joint may be reused unless it has drag and excessive play.

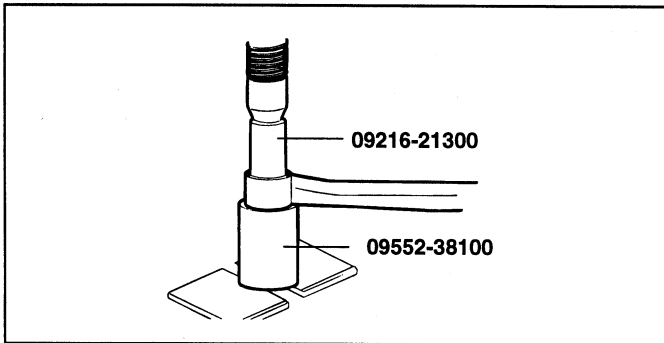


S5SS021A

UPPER ARM, LOWER ARM AND ASSIST LINK

REPLACEMENT OF TRAILING ARM COMPLETE BUSHING EHJB0180

1. Using the special tool, press-fit the trailing arm bushing.



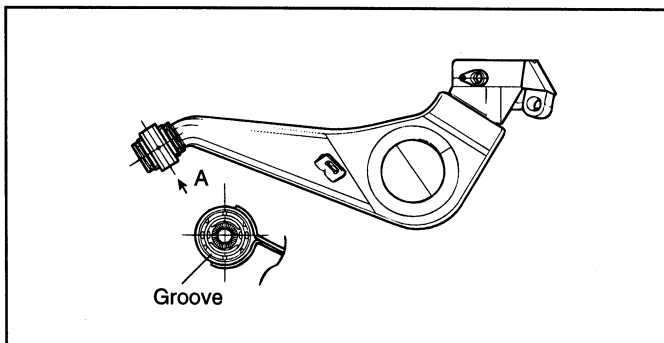
KSMS010A

NOTE

Position the groove in the trailing arm bushing so it is aligned as shown in illustration. Then, press-fit the bushing.

Deviation of rotational direction : $\pm 3^\circ$ or less

Pull-out force for the bushing :
150N [15000 kg(f), 22.5 lb(f)]

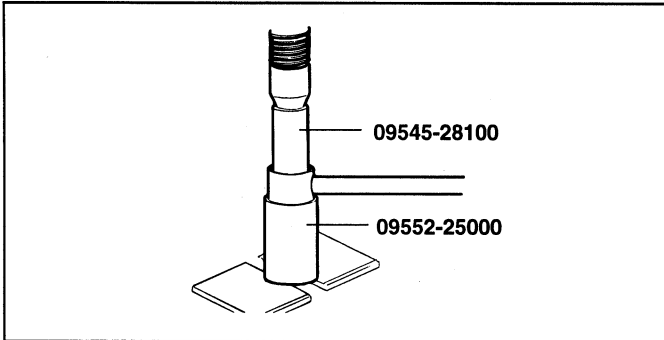


ASMS013A

TRAILING ARM

**REPLACEMENT OF REAR SUSPENSION
LOWER ARM BUSHING AND UPPER ARM
BUSHING** EHB0190

1. Using the special tool, replace the rear suspension lower and upper arm bushing.

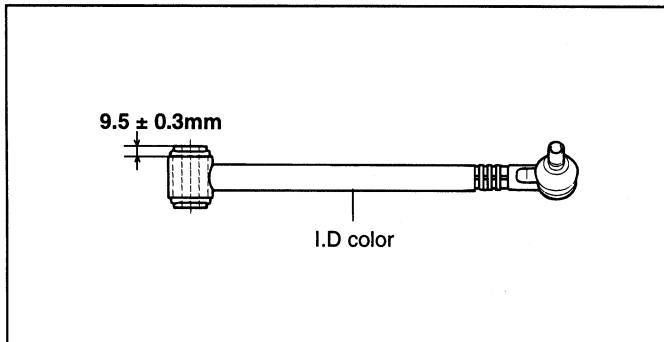


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NOTE

- Install the bushings as shown in the illustration.
- Install the arm following the ID color shown in the chart.

Part name	LH	RH
Lower arm	Yellow	Blue
Upper arm		



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TIRES/WHEELS

TIRE

FRONT WHEEL ALIGNMENT

EHJB0200

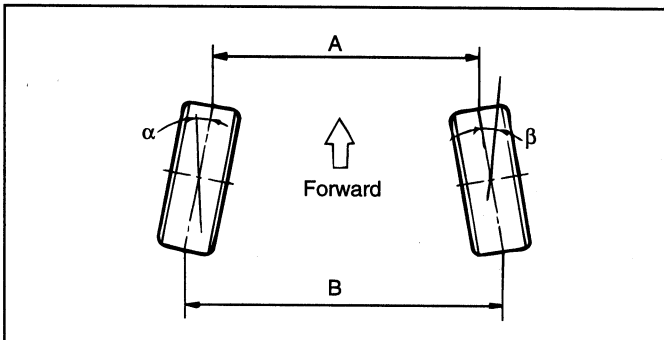
When using a wheel alignment tester to inspect the front wheel alignment, always position the car on a level surface with the front wheels facing straight ahead. Prior to inspection, make sure that the front suspension and steering system are in normal operating condition and that the wheels and tires face straight ahead, and the 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-in change is adjusted by turning the tie rod for the right and left wheels simultaneously at the same amount as follows:

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

0 ± 2 mm (0 ± 0.08 in.)



EHHA850A

ADJUSTMENT OF SIDE SLIP AND WHEEL STEERING ANGLE

1. Side slip is adjusted by rotating the tie rod within 0 ± 3 mm/m with the vehicle holding one person.
2. Steering angle is adjusted to the standard value by turning the right and left tie rods in opposite directions for the same amount.

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

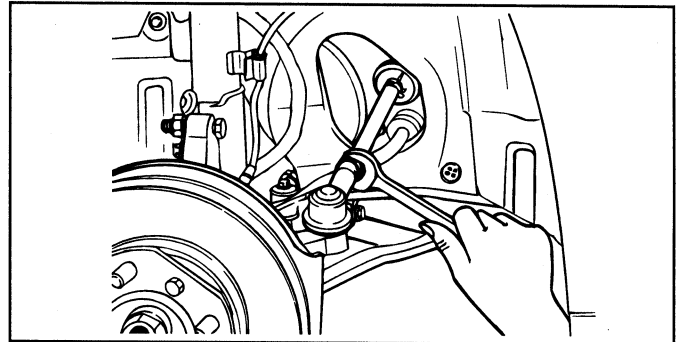
Inner wheel steering angle (difference between right and left should be within 2°) : $37^{\circ}41' \pm 2^{\circ}$

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

NOTE

- Remove the clip holding the bellows before rotating the tie rod.
- Check the bellows for twists after setting the steering angle, then reassemble it.

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



EHHA850B

CAMBER

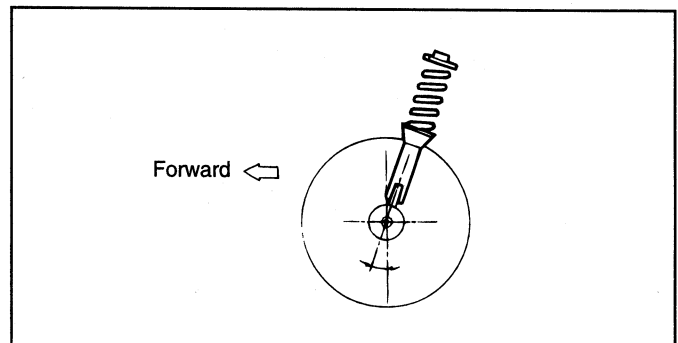
The steering knuckle which is installed with the strut assembly is pre-set to the specified camber at the factory and cannot be adjusted.

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

CASTER

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

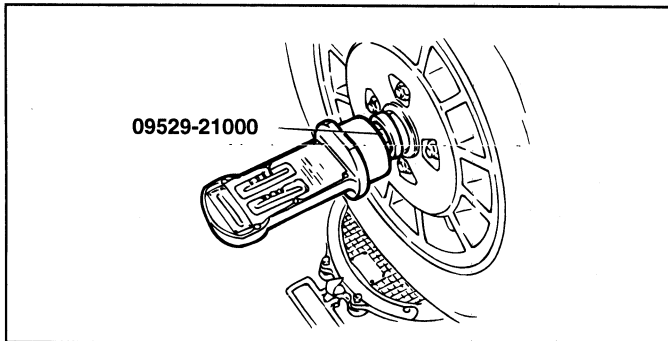
Caster : $2^{\circ}30' \pm 30'$



EHHA850C

NOTE

1. The worn, loose or damaged parts of the front suspension assembly must be replaced 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.



EHH850D

REAR WHEEL ALIGNMENT**TOE-IN**

 Standard value : 0 ± 2 mm (0 ± 0.08 in.)

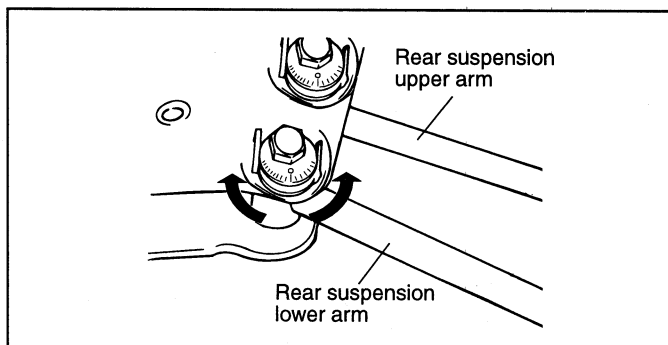
NOTE

1. The rear suspension lower arm mounting cam bolt should be turned an equal amount on both sides during adjustment.

 Right wheel : Clockwise direction : toe-out

 Left wheel : Clockwise direction : ton-in

2. The cam bolt should be adjusted within a 90° range left and right from the center position.



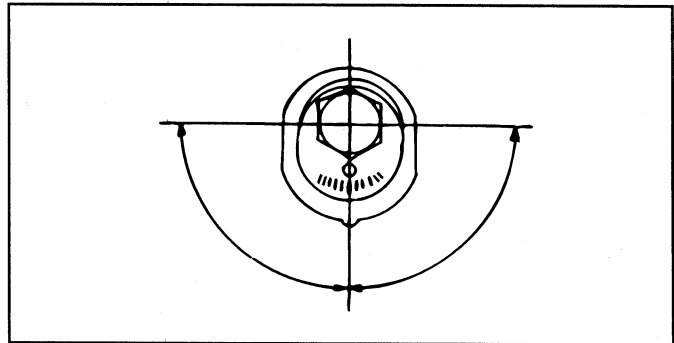
ASMSS19A

CAMBER

 Standard value : $0^\circ 30' \pm 30'$

NOTE

1. The rear suspension upper arm mounting cam bolt should be turned an equal amount on both sides during adjustment.
2. Install the left and right springs using the same ID color.
3. The cam bolt should be adjusted within a 90° range left and right from the center position.



KSMSS20A

TIRE WEAR

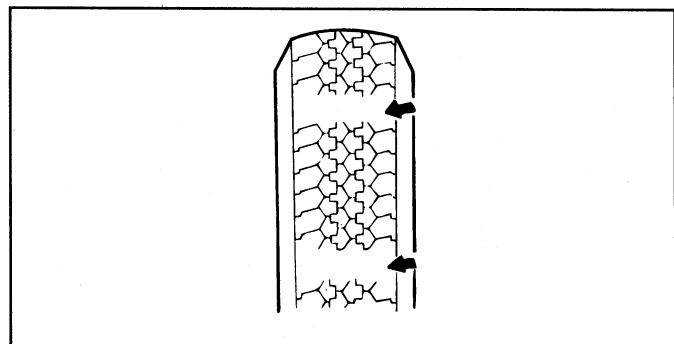
1. Measure the tread depth of the tires.

 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 tire is reduced to 1.6 mm (0.06 in.) or less, the wear indicators will appear.

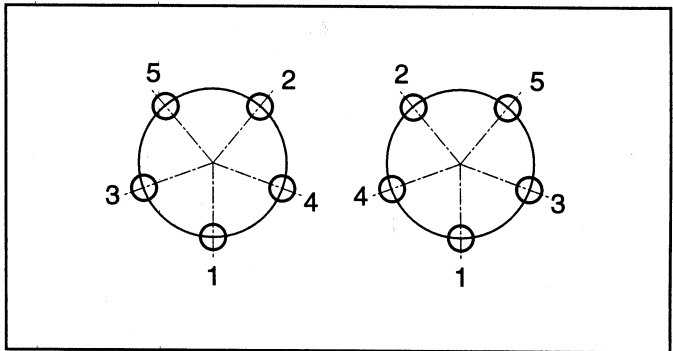


EHA9850E

WHEEL

WHEEL RUNOUT EHJB0215

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.



KFW6020A

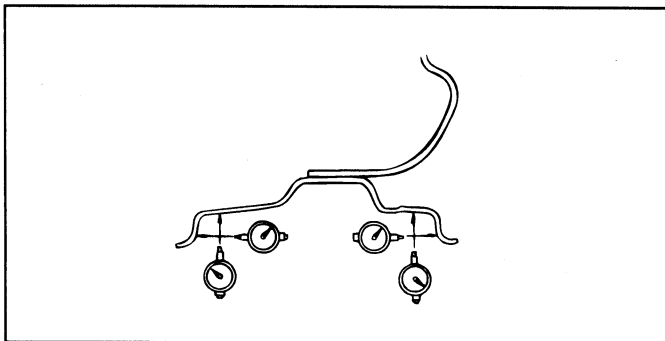
Wheel runout [Limit]

Steel wheel : Radial - 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

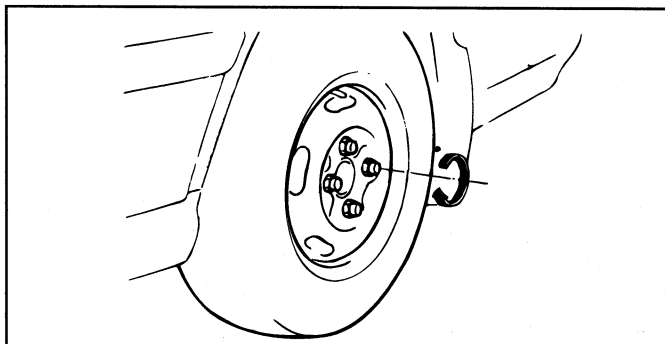
TIGHTENING WHEEL NUT

1. Tightening torque

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

NOTE

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



Y54-010A

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