

FRONT SUSPENSION SYSTEM

PROBLEM SYMPTOMS TABLE

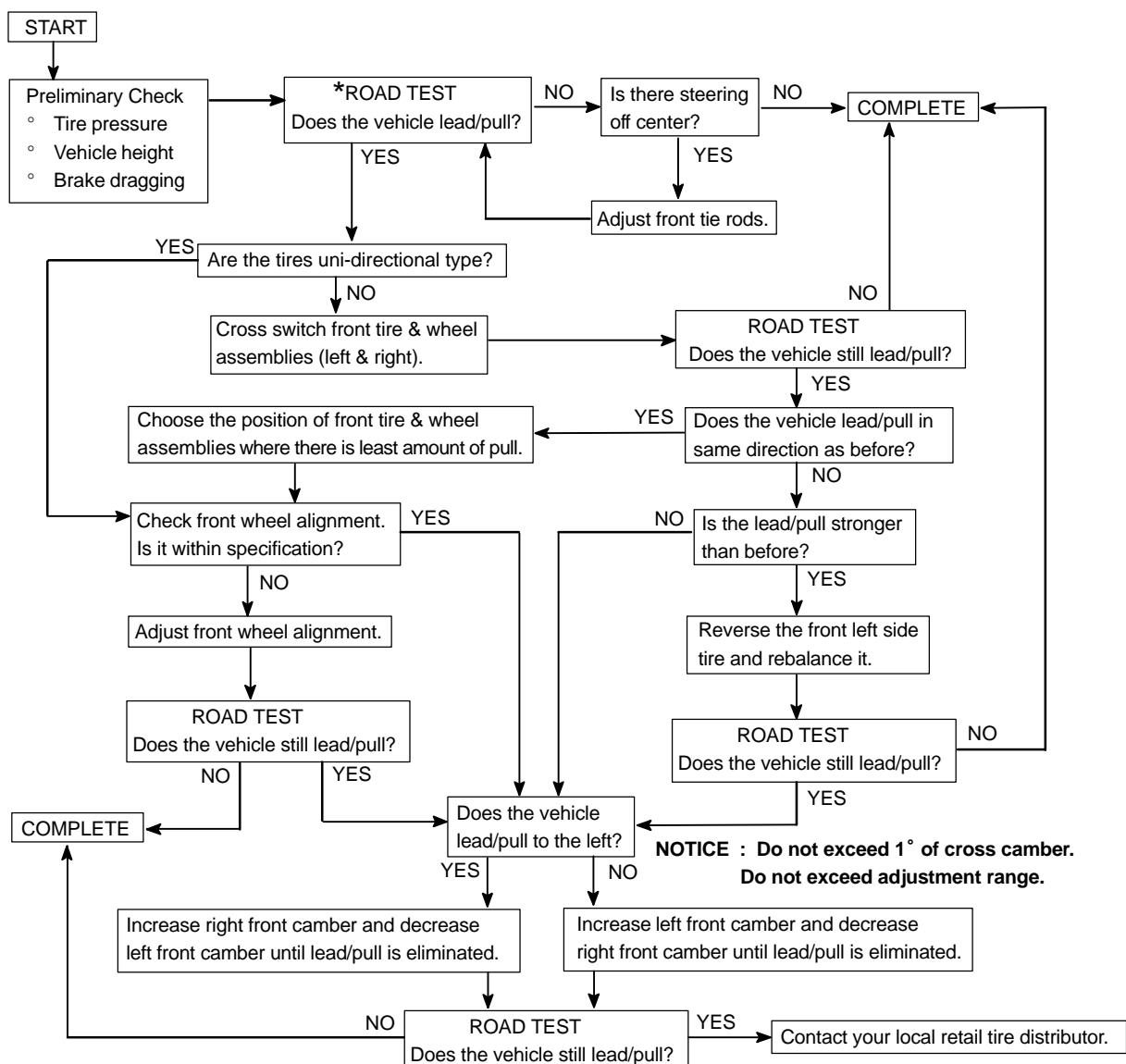
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area	See page
Bottoming	1. Vehicle (Overloaded) 2. Spring (Weak) 3. Shock absorber (Worn)	- 26-8 26-8
Sways/pitches	1. Tire (Worn or improperly inflated) 2. Stabilizer bar (Bent or broken) 3. Shock absorber (Worn)	28-1 26-8 26-8
Front wheel shimmy	1. Tire (Worn or improperly inflated) 2. Wheel (Out of balance) 3. Shock absorber (Worn) 4. Wheel alignment (Incorrect) 5. Ball joint (Worn) 6. Hub bearing (Worn) 7. Steering linkage (Loose or worn)	28-1 28-1 26-8 26-5 27-3 26-16 30-2 -
Abnormal tire wear	1. Tire (Worn or improperly inflated) 2. Wheel alignment (Incorrect) 3. Shock absorber (Worn) 4. Suspension parts (Worn)	28-1 26-5 27-3 26-8

REPAIR

HINT:

This is the repair procedure for vehicle pull.



*Select a flat road where the vehicle can be driven in a straight line for 100 meters at a constant speed of 35mph. Please confirm safety and set the steering wheel to its straight position. Drive the vehicle in a straight line for 100 meters at a constant speed of 35mph without holding the steering wheel.

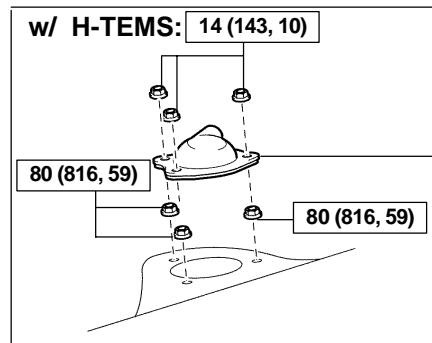
(1) The vehicle can keep straight but the steering wheel has some angle.
→ STEERING OFF CENTER (See page 50-4)

(2) The vehicle cannot keep straight.
→ STEERING PULL

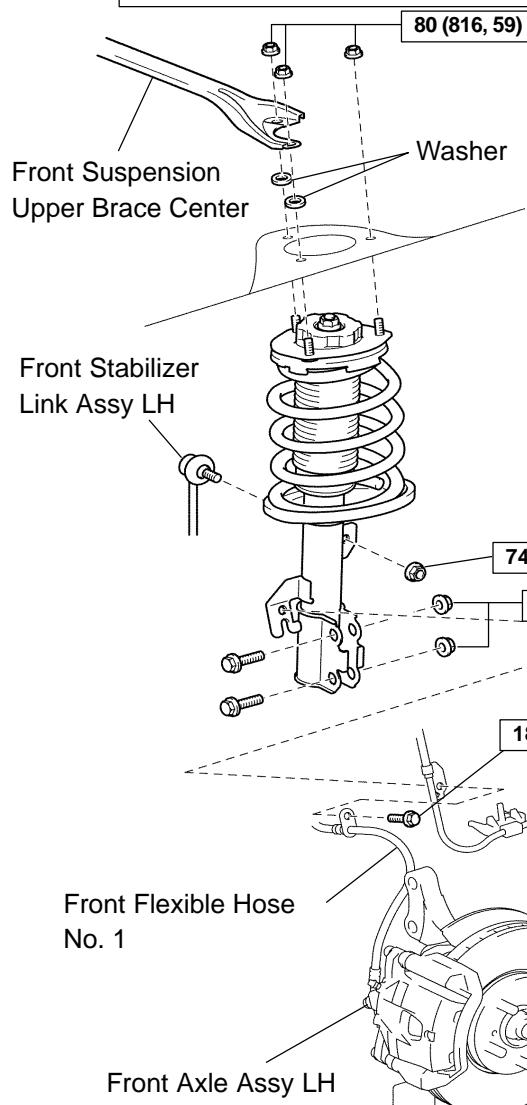
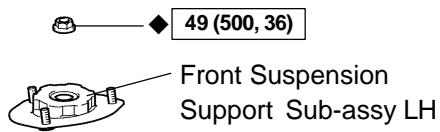
FRONT SUSPENSION (From July, 2003)

COMPONENTS

2601C-06



Front Shock Absorber Cap LH



74 (755, 55)

210 (2,141, 155)

18.8 (192, 14)

Speed Sensor Front LH

Front Flexible Hose No. 1

Front Axle Assy LH

Front Stabilizer Link Assy LH

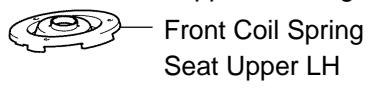
Front Flexible Hose No. 1

Front Stabilizer Link Assy LH

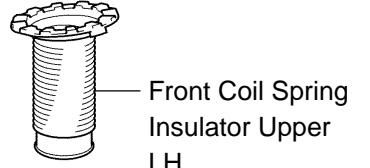


Front Suspension Support Sub-assy LH

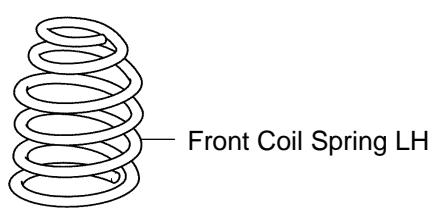
Front Suspension Support Bearing LH



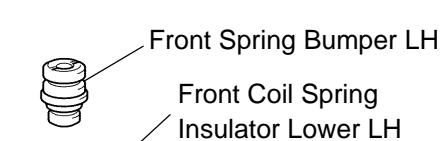
Front Coil Spring Seat Upper LH



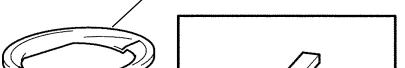
Front Coil Spring Insulator Upper LH



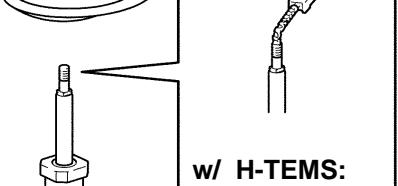
Front Coil Spring LH



Front Spring Bumper LH

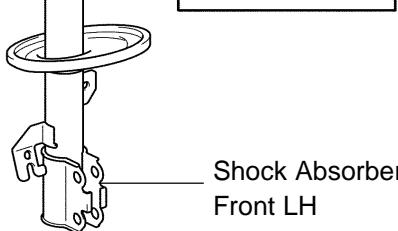


Front Coil Spring Insulator Lower LH



Speed Sensor Front LH

w/ H-TEMS:

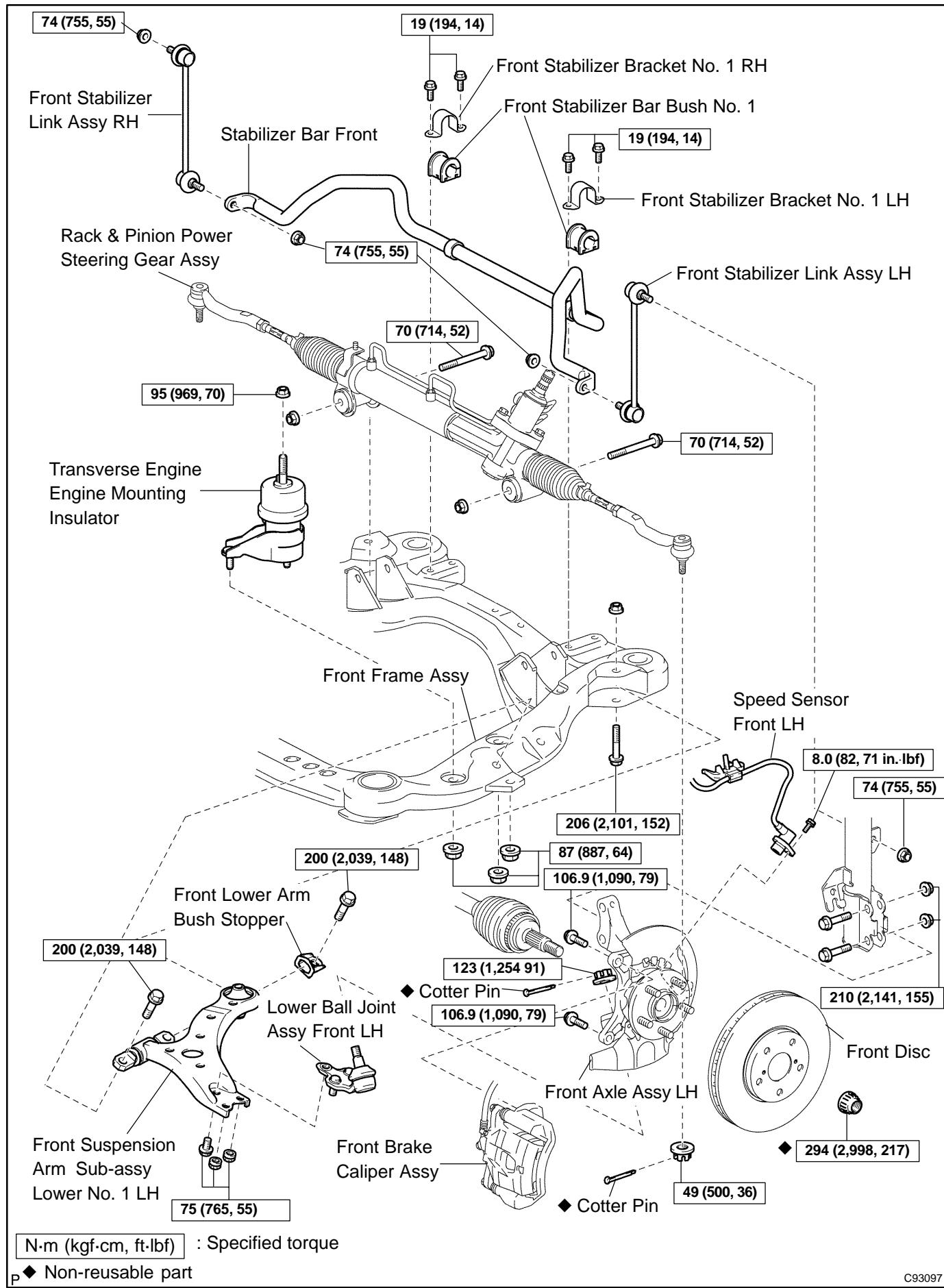


Shock Absorber Assy Front LH

N·m (kgf·cm, ft·lbf) : Specified torque

P◆ Non-reusable part

C93850



N·m (kgf·cm, ft·lbf) : Specified torque

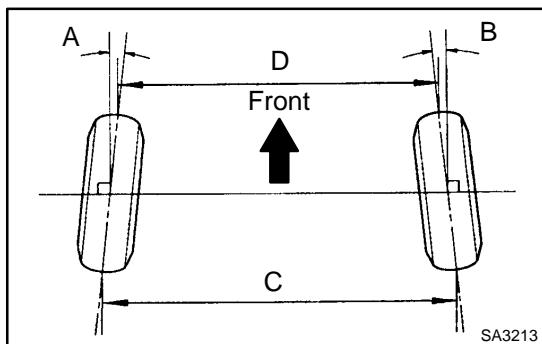
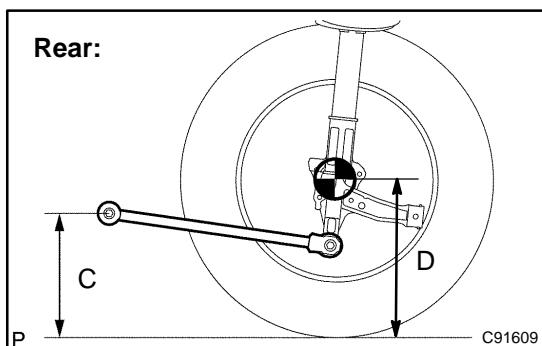
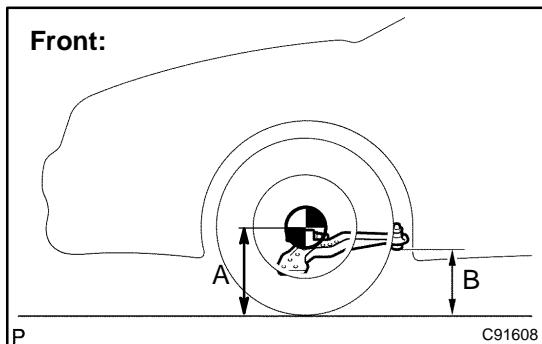
◆ Non-reusable part

C93097

FRONT WHEEL ALIGNMENT (From July, 2003)

ADJUSTMENT

1. INSPECT TIRE (See page 26-5)



2. MEASURE VEHICLE HEIGHT

Vehicle height:

Front	A - B: 120 mm (4.72 in.)
Rear	D - C: 52 mm (2.05 in.)

Measuring points:

A: Ground clearance of front wheel center

B: Ground clearance of lower suspension arm No. 2 set bolt center

C: Ground clearance of strut rod set bolt center

D: Ground clearance of rear wheel center

NOTICE:

Before inspecting the wheel alignment, adjust the vehicle height to the specified value.

HINT:

Bounce the vehicle at the corners up and down to stabilize the suspension and inspect the vehicle height.

3. INSPECT TOE-IN

Toe-in:

Toe-in (total)	A + B: $0^\circ \pm 12'$ ($0^\circ \pm 0.2^\circ$) C - D: 0 ± 2 mm (0 ± 0.08 in.)
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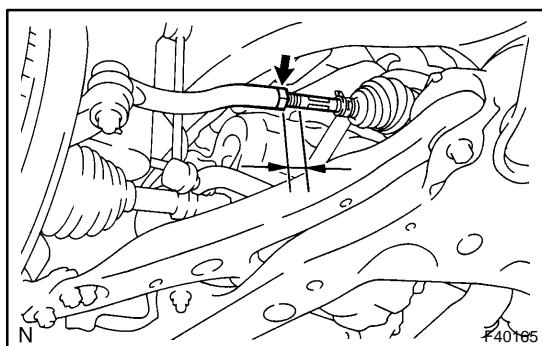
If the toe-in is not within the specified value, adjust it at the rack ends.

4. ADJUST TOE-IN

- Remove the rack boot set clips.
- Loosen the tie rod end lock nuts.
- Turn the right and left rack ends by an equal amount to adjust the toe-in.

HINT:

Try to adjust the toe-in to the center of the specified value.



- Make sure that the lengths of the right and left rack ends are the same.

- Torque the tie rod end lock nuts.

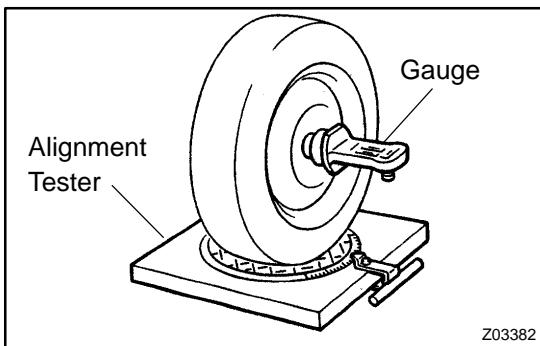
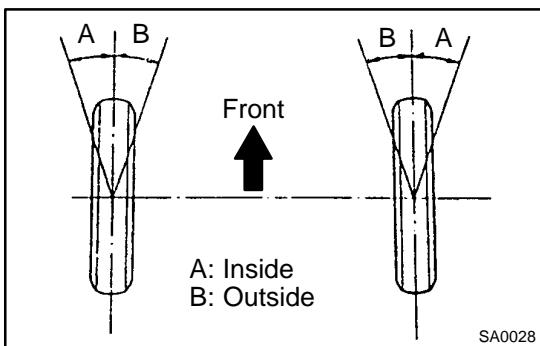
Torque: 74 N·m (755 kgf·cm, 55 ft-lbf)

- Place the boots on the seats and install the clips.

HINT:

Make sure that the boots are not twisted.

- Perform VSC system calibration. (See page 05-471)



5. INSPECT WHEEL ANGLE

(a) Turn the steering wheel fully left and right, and measure the turning angle.

Wheel turning angle:

Inside wheel	$36^{\circ}39' \pm 2^{\circ}$ ($36.65^{\circ} \pm 2^{\circ}$)
Outside wheel: Reference	$32^{\circ}11'$ (32.18°)

If the right and left inside wheel angles differ from the specified value, check the right and left rack end lengths.

6. INSPECT CAMBER, CASTER AND STEERING AXIS INCLINATION

(a) Put the front wheel on the center of the alignment tester.
 (b) Set the camber - caster - kingpin gauge at the center of the axle hub or drive shaft.

Camber, caster and steering axis inclination:

Camber	Left-right error	$-0^{\circ}43' \pm 45'$ ($-0.72^{\circ} \pm 0.75^{\circ}$) $45'$ (0.75°) or less
Caster	Left-right error	$2^{\circ}46' \pm 45'$ ($2.77^{\circ} \pm 0.75^{\circ}$) $45'$ (0.75°) or less
Steering axis inclination		$11^{\circ}27'$ (11.45°)

If the caster and steering axis inclination are not within the specification, after the camber has been correctly adjusted, recheck the suspension parts for damage and/or worn out parts.

7. ADJUST CAMBER

NOTICE:

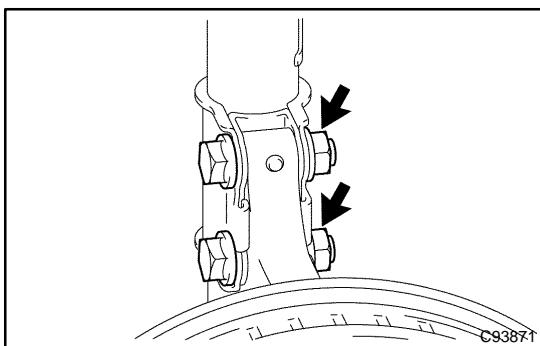
After the camber has been adjusted, inspect the toe-in.

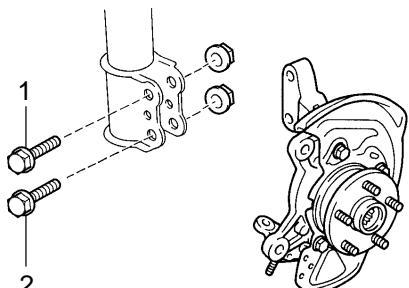
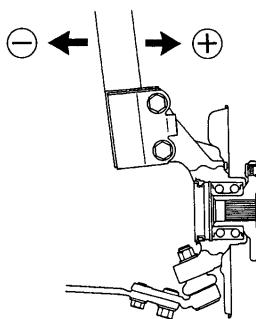
(a) Remove the front wheel.
 (b) Remove the 2 nuts on the lower side of the shock absorber.

HINT:

When removing nuts, stop the bolt from rotating and loosen the nut.

(c) Clean the installation surfaces of the shock absorber and the steering knuckle.
 (d) Temporarily install the 2 nuts.





C93869

(e) Adjust the camber by pushing or pulling the lower side of the shock absorber in the direction in which the camber adjustment is required.

(f) Tighten the nuts.

Torque: 210 N·m (2,141 kgf·cm, 155 ft·lbf)

NOTICE:

When installing the nuts, keep the bolts from rotating and then torque the nut.

(g) Install the front wheel.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(h) Check the camber.

HINT:

- ◆ Try to adjust the camber to the center of the specified value.
- ◆ Adjusting value for the set bolts is 6' to 30' (0.1° to 0.5°). If the camber is not within the specified value, estimate how much additional camber adjustment will be required, and select the camber adjusting bolt.

NOTICE:

Tighten the adjusting bolt with a new nut.

Bolt Adjusting Value	Set Bolt		Adjusting Bolt					
	90105-17008		90105-17009	90105-17010		90105-17011		
	1 Dot		2 Dots		3 Dots			
15'	11		11	11	11	11		
30'	●				●		●	
45'	●							●
1°00'			●					●
1°15'				●			●	
1°30'						●	●	

(i) Do the steps mentioned above again. At step (b), replace 1 or 2 selected bolts.

HINT:

When replacing the 2 bolts, replace 1 bolt for each time.

FRONT SHOCK ABSORBER WITH COIL SPRING

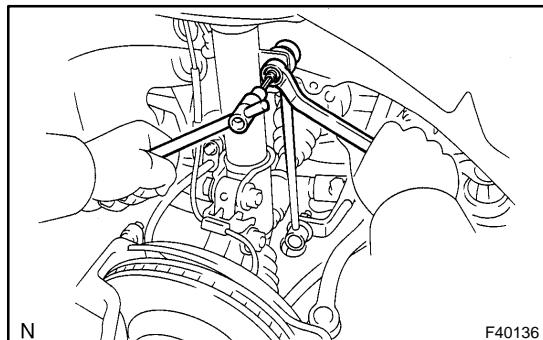
OVERHAUL

2606S-02

HINT:

COMPONENTS: See page 26-3 .

1. REMOVE FRONT WHEEL

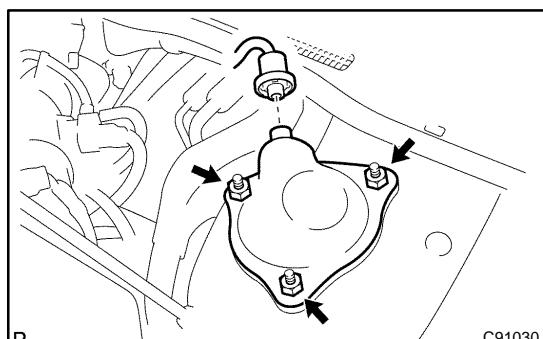


2. DISCONNECT FRONT STABILIZER LINK ASSY LH

(a) Remove the nut and disconnect the front stabilizer link assy LH from the shock absorber assy front LH.

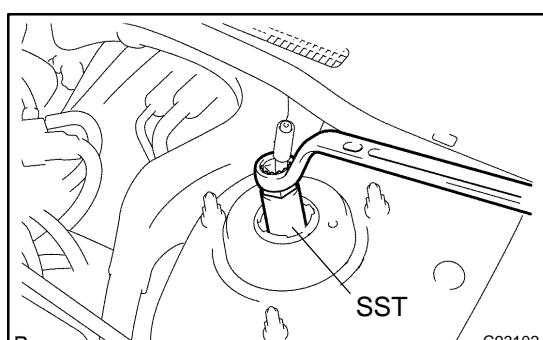
HINT:

If the ball joint turns together with the nut, use a hexagon (6 mm) wrench to hold the stud.



3. REMOVE FRONT SHOCK ABSORBER CAP LH (H-TEMS SUSPENSION)

(a) Disconnect the connector.
(b) Remove the 3 nuts, harness clamp and the front shock absorber cap LH.



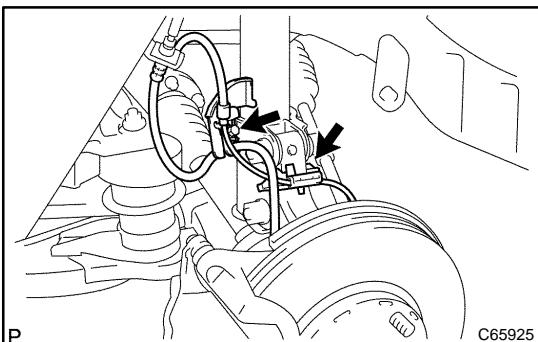
4. REMOVE FRONT SHOCK ABSORBER WITH COIL SPRING

(a) w/ H-TEMS:
Using SST, loosen the lock nut.
SST 09817-33190

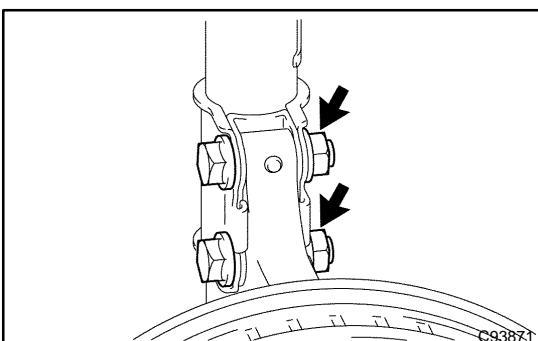
(b) w/o H-TEMS:
Loosen the lock nut.

NOTICE:

- ◆ Do not loosen except for the case with disassembling the shock absorber assy front LH with coil spring.
- ◆ Do not remove the lock nut.



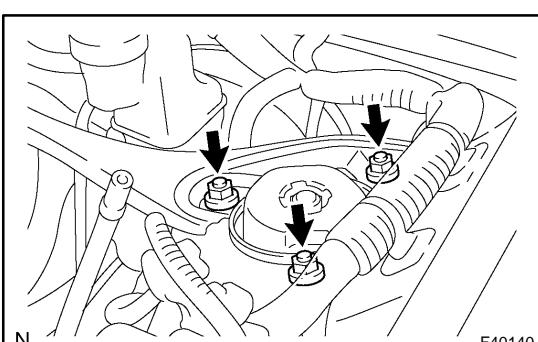
(c) Remove the bolt, disconnect the front flexible hose No. 1 and speed sensor front LH.



(d) Remove the 2 nuts and 2 bolts on the lower side of front shock absorber with coil spring.

NOTICE:

When removing bolt, stop the bolt from rotating and loosen the nut.

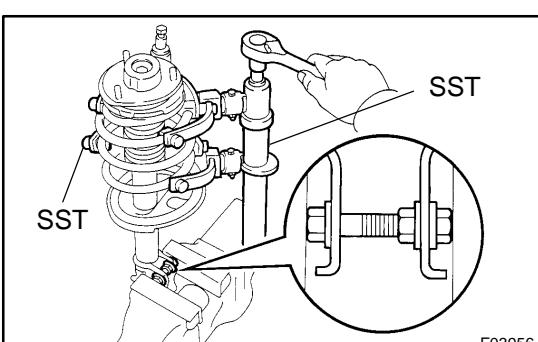


(e) Remove the 3 nuts on the upper side of the front shock absorber with coil spring.

(f) Remove the front shock absorber with the coil spring.

NOTICE:

Be careful not to drop the 2 washers in the case that there is front suspension upper brace center.



5. FIX FRONT SHOCK ABSORBER WITH COIL SPRING

(a) Install 2 nuts and a bolt to the bracket at the lower side of the front shock absorber with coil spring and secure it in a vise.

6. REMOVE SHOCK ABSORBER ASSY FRONT LH

(a) Using SST, compress the front coil spring LH.
SST 09727-30021

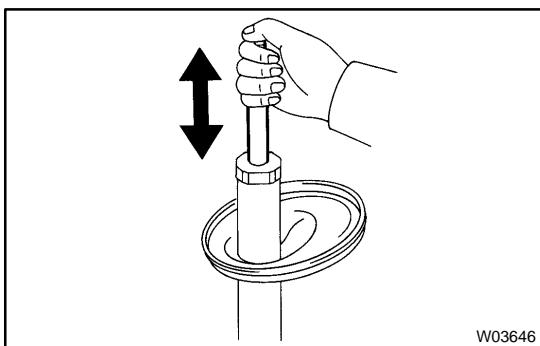
NOTICE:

Do not use an impact wrench. It will damage the SST.

HINT:

Use 2 of the same type of SST.

(b) Remove the front suspension support sub-assy LH, front suspension support bearing LH, front coil spring seat upper LH, front coil spring insulator upper LH, front coil spring LH, front spring bumper LH and front coil spring insulator upper LH.



7. INSPECT SHOCK ABSORBER ASSY FRONT LH

(a) Compress and extend the shock absorber rod and check that there is no abnormal resistance or unusual sound during operation.

If there is any abnormality, replace the shock absorber assy front LH with a new one.

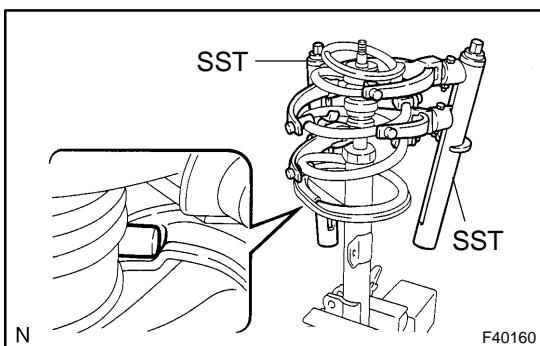
NOTICE:

When disposing of the shock absorber assy front LH, see DISPOSAL on page 26-13 .

8. INSTALL SHOCK ABSORBER ASSY FRONT LH

(a) Install the front coil spring insulator lower LH onto the shock absorber assy front LH.

(b) Install the front spring bumper LH to the piston rod.



(c) Using SST, compress the front coil spring LH.

SST 09727-30021

NOTICE:

Do not use an impact wrench. It will damage the SST.

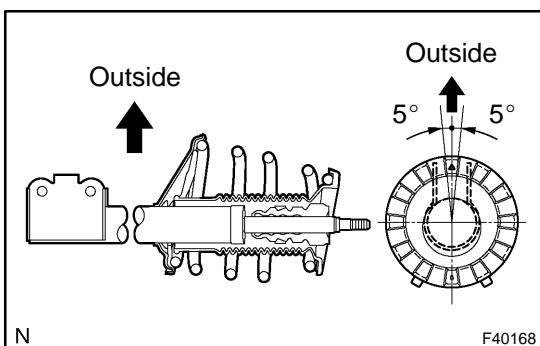
HINT:

Use 2 of the same type of SST.

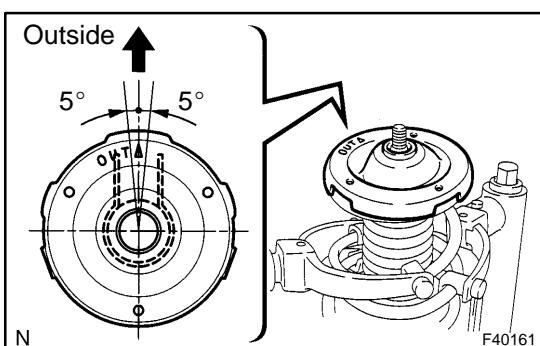
(d) Install the front coil spring LH to the shock absorber assy front LH.

HINT:

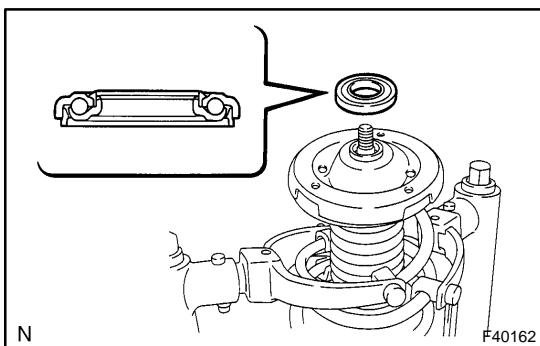
Fit the lower end of the front coil spring LH into the gap of the spring lower seat.



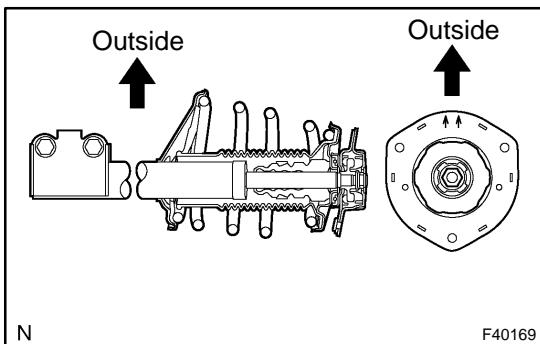
(e) Install the front coil spring insulator upper LH as shown in the illustration.



(f) Install the front coil spring seat upper LH to the shock absorber assy front LH with the mark facing to the outside of the vehicle.



(g) Install a new front suspension support bearing LH.

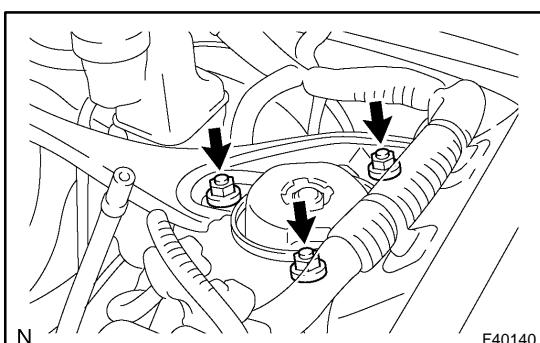


(h) Install the front suspension support sub-assy LH with the mark facing to the outside of the vehicle.

(i) Temporarily tighten the new lock nut.

9. INSTALL FRONT SHOCK ABSORBER WITH COIL SPRING

(a) Install the front shock absorber with coil spring as shown in the illustration.

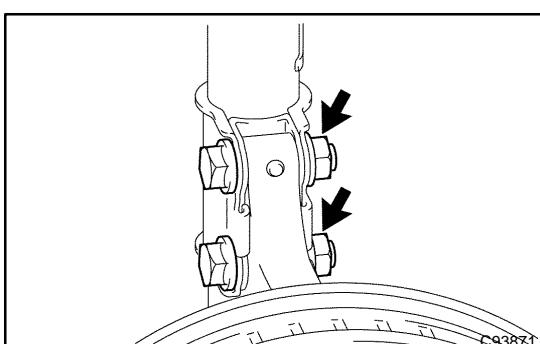


(b) Install the 3 nuts to the upper side of front shock absorber with coil spring.

Torque: 80 N·m (816 kgf·cm, 59 ft·lbf)

NOTICE:

Be careful not to drop the 2 washers in the case that there is front suspension upper brace center.

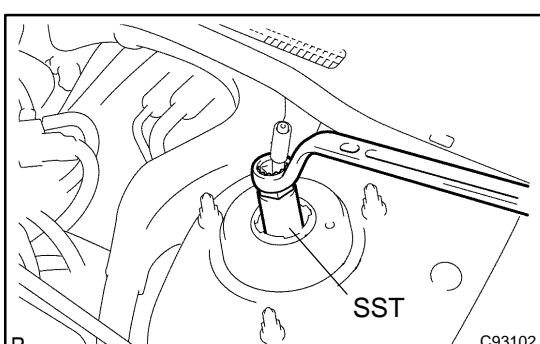


(c) Install the 2 bolts and 2 nuts to the lower side of front shock absorber with coil spring.

Torque: 210 N·m (2,141 kgf·cm, 155 ft·lbf)

NOTICE:

When installing bolt, stop the bolt from rotating and torque the nut.



(d) w/ H-TEMS:

Using SST, fully tighten the lock nut.

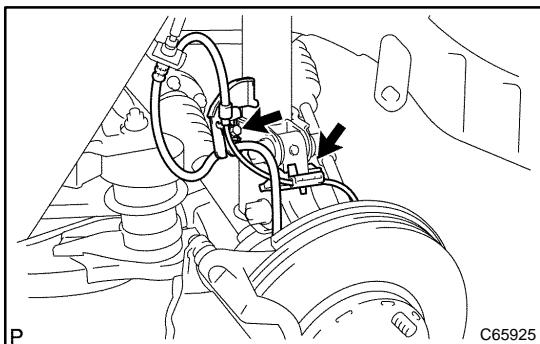
SST 09817-33190

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

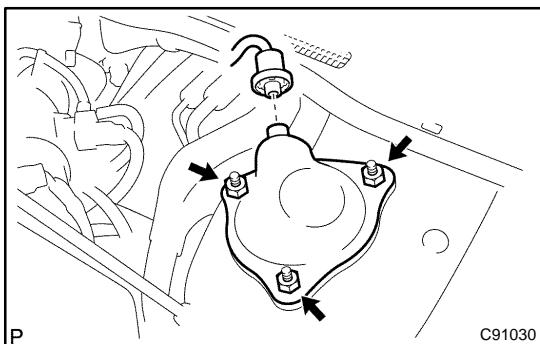
(e) w/o H-TEMS:

Fully tighten the lock nut.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)



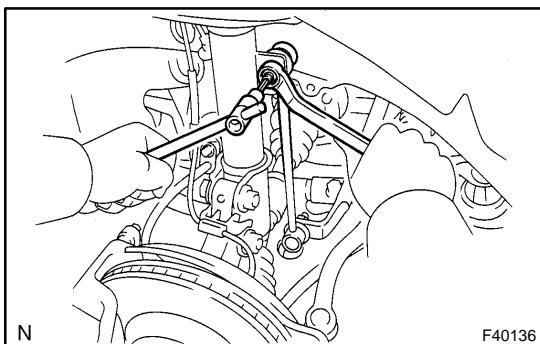
(f) Install the front flexible hose No. 1 and speed sensor front LH with the bolt.
Torque: 18.8 N·m (192 kgf·cm, 14 ft·lbf)



10. INSTALL FRONT SHOCK ABSORBER CAP LH (H-TEMS SUSPENSION)

(a) Install the front shock absorber cap LH with the 3 nuts.
Torque: 14 N·m (143 kgf·cm, 10 ft·lbf)

(b) Disconnect the connector, install the harness clamp.



11. INSTALL FRONT STABILIZER LINK ASSY LH

(a) Install the front stabilizer link assy LH with the nut.
Torque: 74 N·m (755 kgf·cm, 55 ft·lbf)

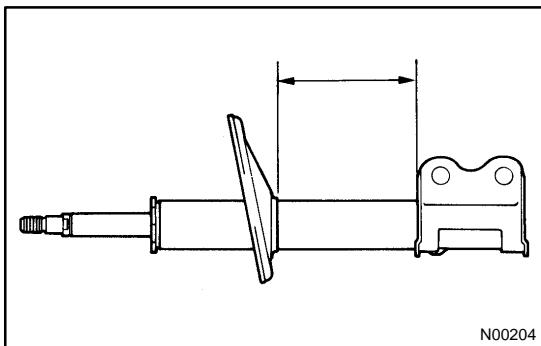
HINT:

If the ball joint turns together with the nut, use a hexagon (6 mm) wrench to hold the stud.

12. INSTALL FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

13. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT (See page 26-5)



DISPOSAL

HINT:

Dispose the RH side by the same procedures with the LH side.

1. DISPOSE OF SHOCK ABSORBER ASSY FRONT LH

- (a) Fully extend the shock absorber rod. 2601G-11
- (b) Using a drill, make a hole in the cylinder as shown in the illustration to discharge the gas inside.

CAUTION:

- ◆ When drilling, chips may fly out, work carefully.
- ◆ The gas is colorless, odorless and non-poisonous.

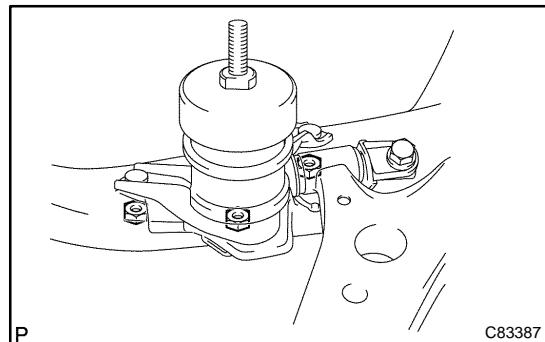
FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH (From July, 2003)

REPLACEMENT

HINT:

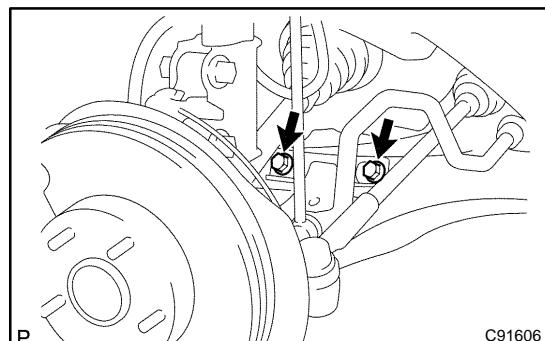
COMPONENTS: See page [26-3](#) .

1. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE (See page [14-29](#))



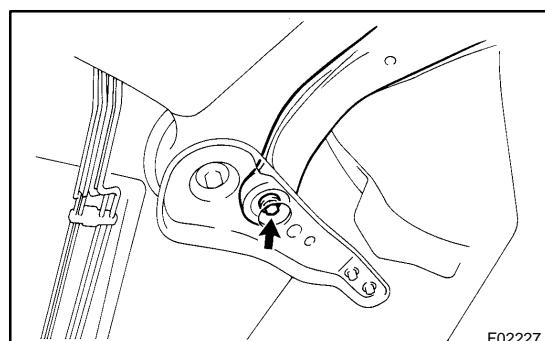
2. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Remove the 3 nuts and the transverse engine engine mounting insulator.



3. REMOVE FRONT SUSPENSION ARM SUB- ASSY LOWER NO.1 LH

(a) Remove the 2 bolts on the front side of the front suspension arm sub-assy lower No. 1 LH.



(b) Remove the bolt and nut on the rear side of the front suspension arm sub-assy lower No. 1 LH.

(c) Remove the front suspension arm sub-assy lower No. 1 LH.

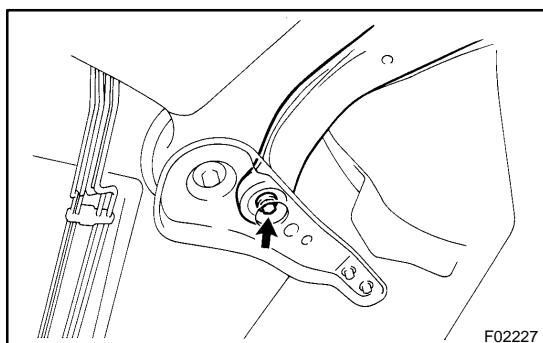
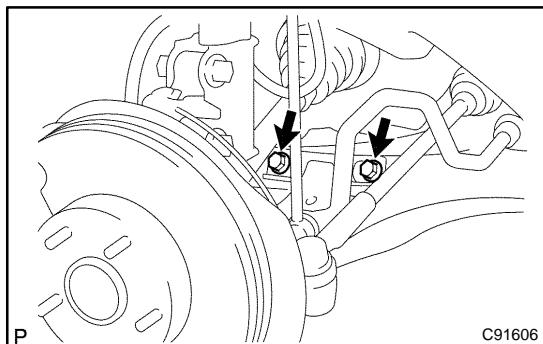
(d) Remove the front lower arm bush stopper from the front suspension arm sub-assy lower No. 1 LH.

2601H-09

4. INSTALL FRONT SUSPENSION ARM SUB- ASSY LOWER NO.1 LH

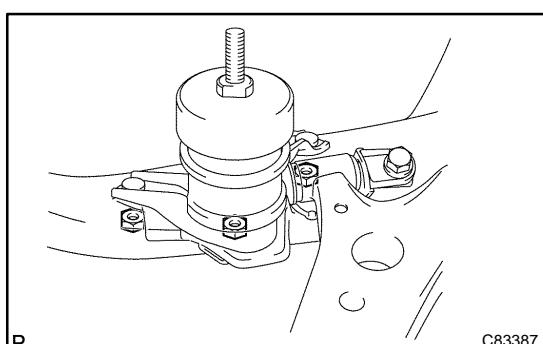
- (a) Install the front lower arm bush stopper to the front suspension arm sub-assy lower No. 1 LH.
- (b) Install the front suspension arm sub-assy lower No. 1 LH with the 2 bolts to the front side.

Torque: 200 N·m (2,039 kgf·cm, 148 ft·lbf)



- (c) Install the front suspension arm sub-assy lower No. 1 LH with the bolt and nut to the rear side.

Torque: 206 N·m (2,101 kgf·cm, 152 ft·lbf)

**5. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR**

- (a) Install the transverse engine engine mounting insulator with the 3 nuts.

Torque: 87 N·m (887 kgf·cm, 64 ft·lbf)

6. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE (See page 14-29)

LOWER BALL JOINT ASSY FRONT LH

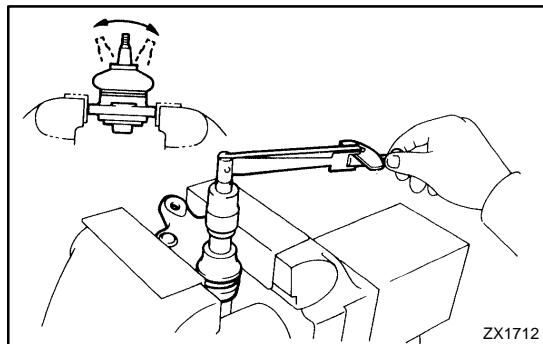
26011-09

REPLACEMENT

HINT:

COMPONENTS: See page 26-3.

1. REMOVE FRONT WHEEL
2. REMOVE FRONT AXLE HUB LH NUT (See page 30-8)
SST 09930-00010
3. DISCONNECT SPEED SENSOR FRONT LH (See page 30-8)
4. DISCONNECT FRONT DISC BRAKE CALIPER ASSY LH (See page 30-19)
5. REMOVE FRONT DISC
6. DISCONNECT TIE ROD ASSY LH (See page 30-8)
SST 09628-62011
7. DISCONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH (See page 30-8)
8. REMOVE FRONT AXLE ASSY LH (See page 30-19)
9. REMOVE LOWER BALL JOINT ASSY FRONT LH (See page 30-19)
SST 09628-62011



10. INSPECT LOWER BALL JOINT ASSY FRONT LH
 - (a) As shown in the illustration, flip the ball joint stud back and forth 5 times, before installing the nut.
 - (b) Using a torque wrench, turn the nut continuously at a rate of 3 - 5 seconds per 1 turn and take the torque reading on the 5th turn.

Turning torque:
0.98 - 3.43 N·m (10 - 35 kgf·cm, 8.7 - 30 in.-lbf)

11. INSTALL LOWER BALL JOINT ASSY FRONT LH (See page 30-19)
12. INSTALL FRONT AXLE ASSY LH (See page 30-19)
13. INSTALL FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH (See page 30-8)
14. INSTALL TIE ROD ASSY LH (See page 30-8)
15. INSTALL FRONT DISC
16. INSTALL FRONT DISC BRAKE CALIPER ASSY LH (See page 30-19)
17. INSTALL SPEED SENSOR FRONT LH (See page 30-8)
18. INSTALL FRONT AXLE HUB LH NUT (See page 30-8)
19. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
20. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT (See page 26-5)
21. CHECK ABS SPEED SENSOR SIGNAL
 - w/ VSC (See page 05-471)
 - w/o VSC (See page 05-420)

STABILIZER BAR FRONT

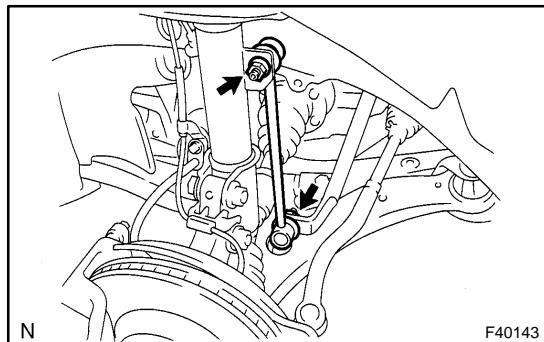
REPLACEMENT

2601J-17

HINT:

COMPONENTS: See page 26-3 .

1. REMOVE FRONT WHEEL



2. REMOVE FRONT STABILIZER LINK ASSY LH

- (a) Remove the 2 nuts and front stabilizer link assy LH.

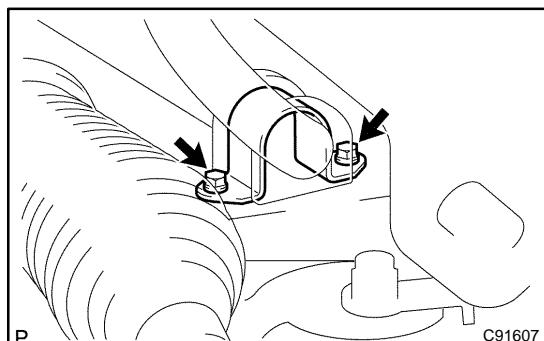
HINT:

If the ball joint turns together with the nut, use a hexagon (6 mm) wrench to hold the stud.

3. REMOVE FRONT STABILIZER LINK ASSY RH

HINT:

Remove the RH side by the same procedures with the LH side.



4. REMOVE FRONT STABILIZER BRACKET NO.1 LH

- (a) Remove the 2 bolts and 2 front stabilizer brackets No. 1 LH.

5. REMOVE FRONT STABILIZER BRACKET NO.1 RH

HINT:

Remove the RH side by the same procedures with the LH side.

6. DISCONNECT TIE ROD ASSY LH (See page 30-8)

SST 09628-6201 1

7. DISCONNECT TIE ROD ASSY RH

SST 09628-6201 1

HINT:

Separate the RH side by the same procedures with the LH side.

8. DISCONNECT STEERING GEAR OUTLET RETURN TUBE (See page 51-21)

SST 09023-00101

9. DISCONNECT PRESSURE FEED TUBE ASSY (See page 51-21)

SST 09023-00101

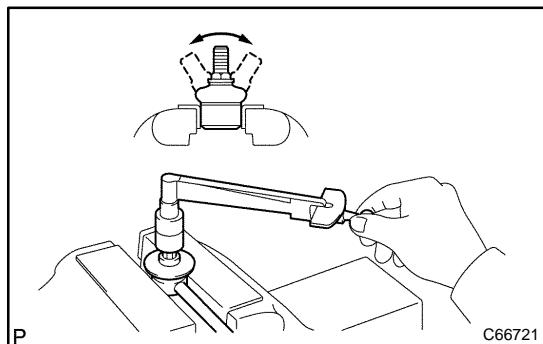
10. DISCONNECT STEERING INTERMEDIATE SHAFT SUB-ASSY (See page 51-21)

11. REMOVE RACK & PINION POWER STEERING GEAR ASSY (See page 51-21)

2005 LEXUS ES330 REPAIR MANUAL (RM1124U)

12. REMOVE STABILIZER BAR FRONT

13. REMOVE FRONT STABILIZER BAR BUSH NO.1

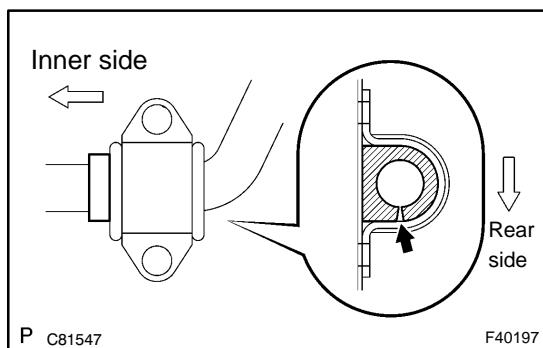


14. INSPECT FRONT STABILIZER LINK ASSY LH

- (a) As shown in the illustration, flip the ball joint stud back and forth 5 times, before installing the nut.
- (b) Using a torque wrench, turn the nut continuously at a rate of 2 - 4 seconds per 1 turn and take the torque reading on the 5th turn.

Turning torque:

0.05 - 1.96 N·m (0.5 - 20 kgf·cm, 0.4 - 17.4 in.·lbf)



15. INSTALL FRONT STABILIZER BAR BUSH NO.1

HINT:

Install the bushing to the inner side of the bushing stopper on the stabilizer bar.

16. INSTALL STABILIZER BAR FRONT

17. INSTALL RACK & PINION POWER STEERING GEAR ASSY (See page 51-21)

18. INSTALL STEERING INTERMEDIATE SHAFT SUB-ASSY (See page 51-21)

19. INSTALL PRESSURE FEED TUBE ASSY (See page 51-21)

SST 09023-00101

20. INSTALL STEERING GEAR OUTLET RETURN TUBE (See page 51-21)

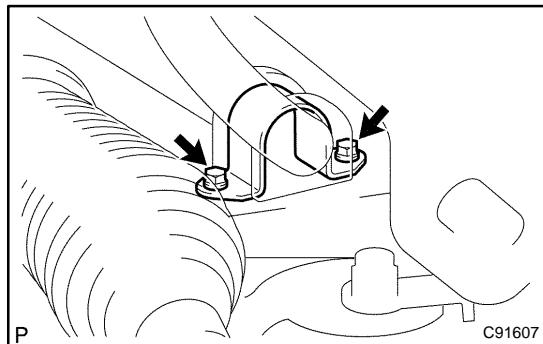
SST 09023-00101

21. INSTALL TIE ROD ASSY LH (See page 30-8)

22. INSTALL TIE ROD ASSY RH

HINT:

Install the RH side by the same procedures with the LH side.



23. INSTALL FRONT STABILIZER BRACKET NO.1 LH

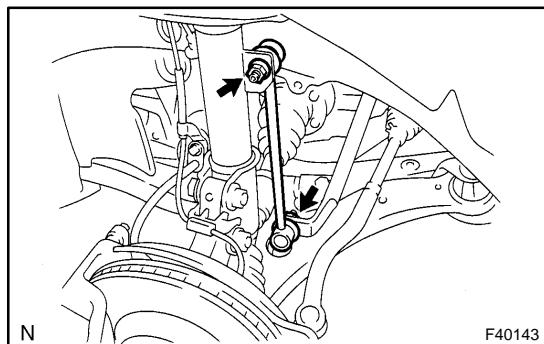
- (a) Install the 2 front stabilizer brackets No. 1 LH with the 2 bolts.

Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)

24. INSTALL FRONT STABILIZER BRACKET NO.1 RH

HINT:

Install the RH side by the same procedures with the LH side.

**25. INSTALL FRONT STABILIZER LINK ASSY LH**

(a) Install the front stabilizer link assy LH with the 2 nuts.

Torque: 74 N·m (755 kgf·cm, 55 ft·lbf)

HINT:

If the ball joint turns together with the nut, use a hexagon (6 mm) wrench to hold the stud.

26. INSTALL FRONT STABILIZER LINK ASSY RH

HINT:

Install the RH side by the same procedures with the LH side.

27. INSTALL FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

28. BLEED POWER STEERING FLUID (See page 51-3)**29. CHECK POWER STEERING FLUID LEAKAGE****30. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT (See page 26-5)**