

2008 Scion xD

2008 SUSPENSION Suspension - xD

2008 SUSPENSION**Suspension - xD****SUSPENSION SYSTEM****PROBLEM SYMPTOMS TABLE**

Use the table below to help determine the cause of a problem. The likely causes of the problem are indicated in descending order. Check each suspected area in order. Repair or replace faulty parts or perform adjustments as necessary.

PROBLEM SYMPTOMS CHART

Symptom	Suspected Area	See
Vehicle unstable	Tires (Worn or improperly inflated)	<u>TIRE AND WHEEL SYSTEM</u>
	Front wheel alignment	<u>FRONT WHEEL ALIGNMENT</u>
	Rear wheel alignment	<u>REAR WHEEL ALIGNMENT</u>
	Hub bearing	<u>ON-VEHICLE INSPECTION</u>
	Front shock absorber with coil spring	<u>FRONT SHOCK ABSORBER WITH COIL SPRING</u>
	Rear shock absorber	<u>REAR SHOCK ABSORBER</u>
	Rear coil spring	<u>REAR COIL SPRING</u>
Bottoming	Vehicle (Overloaded)	-
	Front shock absorber with coil spring	<u>FRONT SHOCK ABSORBER WITH COIL SPRING</u>
	Rear shock absorber	<u>REAR SHOCK ABSORBER</u>
	Rear coil spring	<u>REAR COIL SPRING</u>
Swaying/pitching	Tires (Worn or improperly inflated)	<u>TIRE AND WHEEL SYSTEM</u>
	Front stabilizer bar	<u>FRONT STABILIZER BAR</u>
	Front shock absorber with coil spring	<u>FRONT SHOCK ABSORBER WITH COIL SPRING</u>
	Rear shock absorber	<u>REAR SHOCK ABSORBER</u>
	Rear coil spring	<u>REAR COIL SPRING</u>
Front wheel shimmy	Tires (Worn or improperly inflated)	<u>TIRE AND WHEEL SYSTEM</u>
	Wheels (Out of balance)	<u>TIRE AND WHEEL SYSTEM</u>
	Front wheel alignment	<u>FRONT WHEEL ALIGNMENT</u>
	Front suspension lower arm	<u>FRONT LOWER SUSPENSION ARM</u>
	Front shock absorber with coil spring	<u>FRONT SHOCK ABSORBER WITH COIL SPRING</u>
	Hub bearing	<u>ON-VEHICLE INSPECTION</u>

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Rear wheel shimmy	Tires (Worn or improperly inflated)	<u>TIRE AND WHEEL SYSTEM</u>
	Wheels (Out of balance)	<u>TIRE AND WHEEL SYSTEM</u>
	Rear wheel alignment	<u>REAR WHEEL ALIGNMENT</u>
	Rear axle beam	<u>REAR AXLE BEAM</u>
	Rear shock absorber	<u>REAR SHOCK ABSORBER</u>
	Rear coil spring	<u>REAR COIL SPRING</u>
	Hub bearing	<u>REAR AXLE HUB</u>
Abnormal tire wear	Tires (Worn or improperly inflated)	<u>TIRE AND WHEEL SYSTEM</u>
	Wheels (Out of balance)	<u>TIRE AND WHEEL SYSTEM</u>
	Front wheel alignment	<u>FRONT WHEEL ALIGNMENT</u>
	Rear wheel alignment	<u>REAR WHEEL ALIGNMENT</u>
Vehicle pull	Tires (Worn or improperly inflated)	<u>TIRE AND WHEEL SYSTEM</u>
	Front wheel alignment	<u>FRONT WHEEL ALIGNMENT</u>
	Rear wheel alignment	<u>REAR WHEEL ALIGNMENT</u>
	Brake (Dragging)	<u>INSTALLATION</u>
	Steering wheel (Off center)	-

FRONT WHEEL ALIGNMENT

ADJUSTMENT

NOTE: For vehicles equipped with VSC, if the wheel alignment has been adjusted, and if suspension or underbody components have been removed/installed or replaced, be sure to perform the following initialization procedure in order for the system to function normally:

1. Disconnect the negative battery terminal for more than 2 seconds.
2. Reconnect the negative battery terminal.
3. Perform zero point calibration of the yaw rate and acceleration sensor and test mode inspection.

(See **CALIBRATION**)

1. **INSPECT TIRES** (See **INSPECTION**)
2. **MEASURE VEHICLE HEIGHT**

Vehicle height (unloaded vehicle)

VEHICLE HEIGHT SPECIFICATIONS

Front A-B	Rear C-D
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91 mm (3.58 in.) | 26 mm (1.02 in.)

Measuring points:

A:

Ground clearance of front wheel center

B:

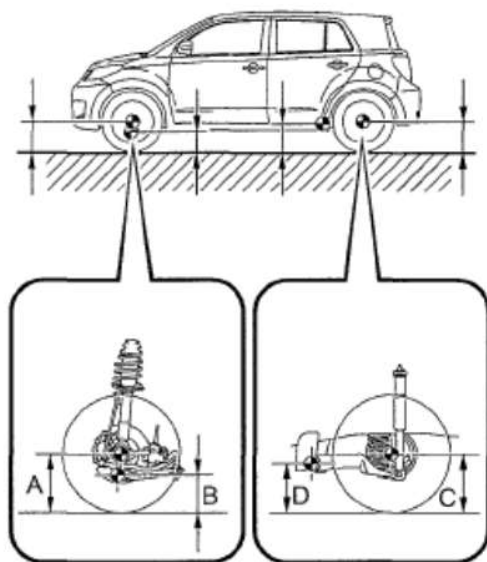
Ground clearance of front lower arm set front bolt center

C:

Ground clearance of rear wheel center

D:

Ground clearance of axle beam set bolt center



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Fig. 1: Identifying Vehicle Height

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Before inspecting the wheel alignment, check the vehicle height.

HINT:

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

3. INSPECT WHEEL TURNING ANGLE

- a. Fully turn the steering wheel left and right, and measure the wheel turning angle.

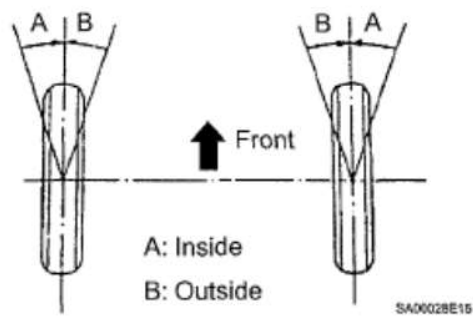


Fig. 2: Identifying Wheel Turning Angle
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Wheel turning angle (unloaded vehicle)

WHEEL TURNING ANGLE SPECIFICATIONS

Tire Size	Inside Wheel	Outside Wheel (Reference)
195/60R16 89H	32°38' +/- 2° (32.63° +/- 2°)	29°37' (29.62°)

If the right and left inside wheel angles are not within the specified range, check the right and left rack end lengths.

4. INSPECT CAMBER, CASTER AND STEERING AXIS INCLINATION

- a. Put the front wheel on the center of the alignment tester.

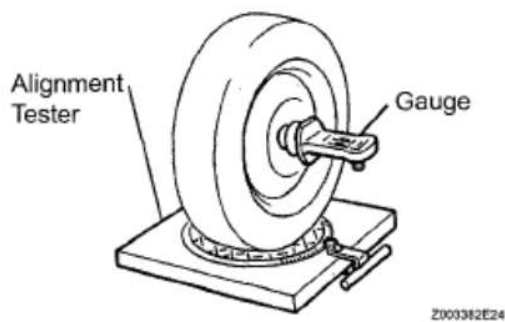


Fig. 3: Attaching Alignment Tester To Wheel
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the wheel cap.
- c. Set the camber-caster-steering axis inclination gauge at the center of the axle hub or drive shaft.

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- d. Inspect the camber, caster and steering axis inclination.

Camber, caster and steering axis inclination (unloaded vehicle)**CAMBER, CASTER AND STEERING AXIS INCLINATION SPECIFICATIONS**

Camber	Caster	Steering Axis Inclination (Reference)
-0°11' +/- 45' (-0.18° +/- 0.75°)	4°51' +/- 45' (4.85° +/- 0.75°)	11°22' (11.37°)

NOTE:

- Perform the inspection while the vehicle is empty (without a spare tire or tools on board).
- The tolerance for the difference between the left and right wheels is 30' (0.5°) or less for both the camber and caster.

- e. Remove the camber-caster-steering axis inclination gauge and attachment.
f. Install the wheel cap.

If the caster and steering axis inclination are not within the specified values after the camber has been correctly adjusted, recheck the suspension parts for damage and wear.

5. ADJUST CAMBER

NOTE: Inspect the toe-in after the camber has been adjusted.

- a. Remove the front wheel.
b. Remove the bolt and separate the speed sensor and flexible hose.

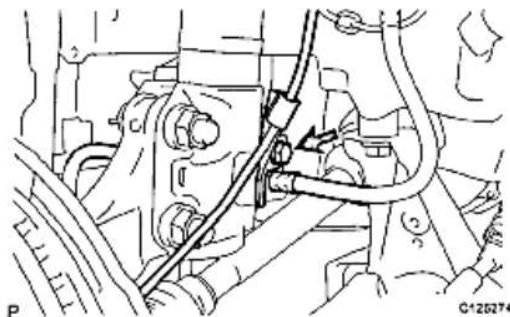


Fig. 4: Locating Bolt And Speed Sensor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the 2 nuts from the lower side of the shock absorber.

HINT:

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Keep the bolt from rotating while loosening and removing the nuts.



Fig. 5: Locating Nuts And Lower Side Of Shock Absorber
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Clean the installation surfaces of the shock absorber and steering knuckle.
- e. Provisionally install the 2 nuts (Step).
- f. Fully push or pull the axle hub in the direction of the required adjustment (Step a).

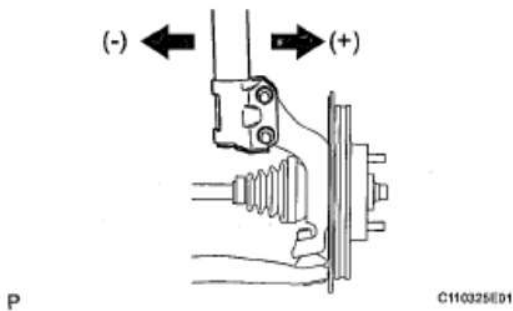


Fig. 6: Adjusting Axle Hub
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- g. Tighten the 2 nuts.

Torque: 164 N*m (1672 kgf*cm, 121 ft.*lbf)

HINT:

Keep the bolt from rotating while loosening and removing the nuts.

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Fig. 7: Locating Nuts

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- h. Install the flexible hose and speed sensor with the bolt.

Torque: 29 N*m (300 kgf*cm, 22 ft.*lbf)

NOTE: Install the flexible hose and speed sensor without twisting them.

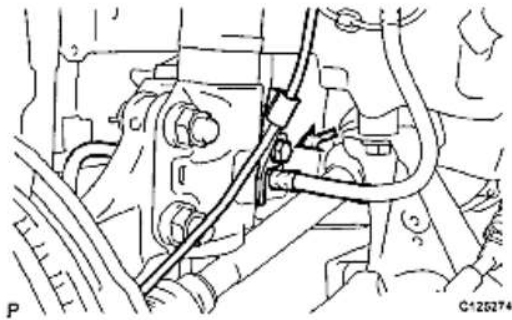


Fig. 8: Locating Bolt And Speed Sensor

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- i. Install the front wheel.

Torque: 103 N*m (1050 kgf*cm, 76 ft.*lbf)

- j. Check the camber.

If the measured value is not within the specifications, calculate the required adjustment amount using the formula below.

$$(\text{Camber adjustment amount}) = \text{Center of specified range} - \text{Measured value}$$

Check the combination of installed bolts. Select appropriate bolts from the table below to adjust the camber to within the specified range.

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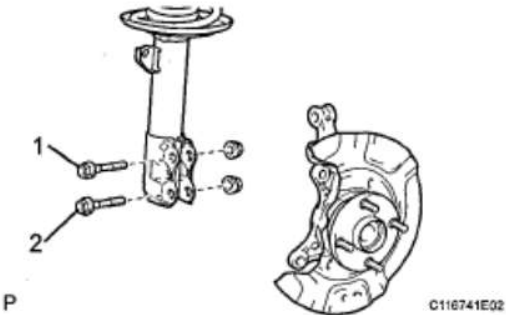


Fig. 9: Identifying Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

Try to adjust the camber to the center of the specified range.

CAMBER CHART

Move axle toward (+) in step (B)	Refer to Fig. 10
Move axle toward (-) in step (B)	Refer to Fig. 11

- k. Table (1) (Move the axle toward the positive side)

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Table (1) (Move the axle toward the positive side)

Installed Bolt Adjusting Value	1							
	2							
-1° 30' to -1° 15'								G
-1° 15' to -1° 00'							G	A
-1° 00' to -0° 45'						G	A	B
-0° 45' to -0° 30'					G	A	B	C
-0° 30' to -0° 15'				G	A	B	C	D
-0° 15' to 0°		G	A	B	C	D	E	
0° to 0° 15'	A	B	C	D	E	F		
0° 15' to 0° 30'	B	C	D	E	F			
0° 30' to 0° 45'	C	D	E	F				
0° 45' to 1° 00'	D	E	F					
1° 00' to 1° 15'	E	F						
1° 15' to 1° 30'	F							

Selected Bolt Combination

	A	B	C	D	E	F	G
1							
2							

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Fig. 10: Adjusting Value And Bolt Chart

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1. Table (2) (Move the axle toward the negative side).

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Table (2) (Move the axle toward the negative side)

Installed Bolt Adjusting Value	1							
	2							
-1° 30' to -1° 15'	F							
-1° 15' to -1° 00'	E	F						
-1° 00' to -0° 45'	D	E	F					
-0° 45' to -0° 30'	C	D	E	F				
-0° 30' to -0° 15'	B	C	D	E	F			
-0° 15' to 0°	A	B	C	D	E	F		
0° to 0° 15'		G	A	B	C	D	E	
0° 15' to 0° 30'			G	A	B	C	D	
0° 30' to 0° 45'				G	A	B	C	
0° 45' to 1° 00'					G	A	B	
1° 00' to 1° 15'						G	A	
1° 15' to 1° 30'							G	

Selected Bolt Combination

	A	B	C	D	E	F	G
1							
2							

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Fig. 11: Adjusting Value And Bolt Chart

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

The body and suspension may be damaged if the camber is not correctly adjusted in accordance with the above table.

NOTE: Replace the nut with a new one when replacing the bolt.

m. Repeat the steps mentioned above. At step (A), replace 1 or 2 selected bolts.

HINT:

Replace one bolt at a time when replacing 2 bolts.

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6. INSPECT TOE-IN

- a. Bounce the vehicle up and down at the corners to stabilize the suspension.
- b. Release the parking brake and move the shift lever to the neutral position.
- c. Push the vehicle straight ahead approximately 5 m (16.4 ft.). (*1)
- d. Put tread center marks on the rearmost points of the front wheels and measure the distance between the marks (dimension B).

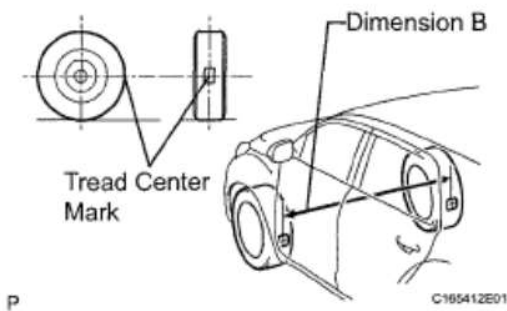


Fig. 12: Identifying Tread Centre Mark
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Slowly push the vehicle straight ahead to cause the front wheels to rotate 180° using the front tire valve as a reference point.

HINT:

Do not allow the wheels to rotate more than 180°. If the wheels rotate more than 180°, perform the procedure from (*1) again.

- f. Measure the distance between the tread center marks on the front side of the wheels (dimension A).

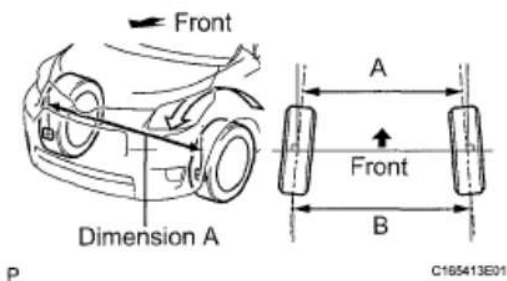


Fig. 13: Identifying Distance Between Tread Center Marks On Front Side Of Wheels
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Toe-in

TOE-IN SPECIFICATIONS

Item	Specified Condition
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Toe-in (total) | B-A: 1.4 +/- 2.0 mm (0.06 +/- 0.08 in.) |

If the toe-in is not within the specified value, adjust it at the rack ends.

7. ADJUST TOE-IN

- a. Measure the thread lengths of the right and left rack ends.

Standard:

Difference in thread length of 1.5 mm (0.059 in.) or less

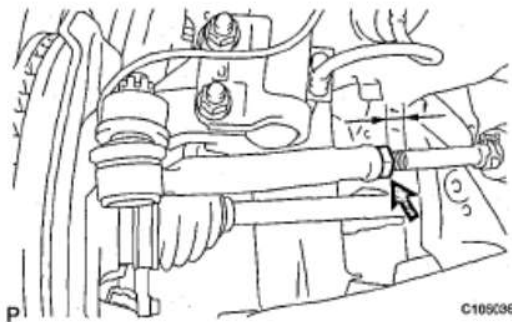


Fig. 14: Identifying Thread Lengths Of Right And Left Rack Ends
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the rack boot set clips.
- c. Loosen the tie rod end lock nuts.
- d. Adjust the rack ends if the difference in thread length between the right and left rack ends is not within the specified range.
 1. Extend the shorter rack end if the measured toe-in deviates toward the outer-side.
 2. Shorten the longer rack end if the measured toe-in deviates toward the inner-side.
- e. 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 range.

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

Toe-in:

1.4 +/- 1.0 mm (0.06 +/- 0.04 in.)

- g. Tighten the tie rod end lock nuts to the specified torque.

Torque: 75 N*m (760 kgf*cm, 55 ft.*lbf)

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NOTE: Provisionally tighten the lock nut while holding the hexagonal part of the steering rack end so that the lock nut and the steering rack end do not turn together. Hold the width across flat of the tie rod end and tighten the lock nut.

- h. Place the boots on the seats.
- i. Using pliers, install the clip as shown in the illustration.

NOTE: Make sure that the boots are not twisted.

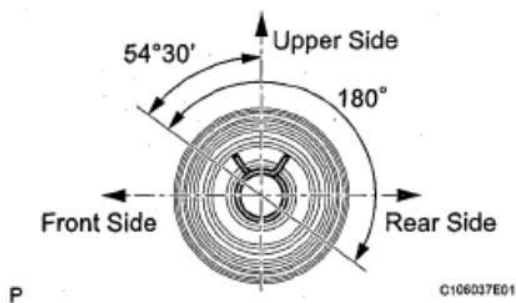


Fig. 15: Identifying Clip Angle

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. FRONT WHEELS FACING STRAIGHT AHEAD
9. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL (w/ VSC)

NOTE: Disconnect the negative battery terminal for more than 2 seconds.

10. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL (w/ VSC)
11. PERFORM YAW RATE SENSOR ZERO POINT CALIBRATION (w/VSC)

(See CALIBRATION)

12. CHECK STEERING ANGLE SENSOR ZERO POINT CALIBRATION (w/ VSC)

(See DTC C1290/66 STEERING ANGLE SENSOR ZERO POINT MALFUNCTION)

REAR WHEEL ALIGNMENT

INSPECTION

NOTE: For vehicles equipped with VSC, if wheel alignment has been adjusted, and if suspension or underbody components have been removed/installed or replaced, be sure to perform the following initialization procedure in order for the system to function normally:

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1. Disconnect the negative battery terminal for more than 2 seconds.
2. Reconnect the negative battery terminal.
3. Perform zero point calibration of the yaw rate and acceleration sensor and test mode inspection.

(See **CALIBRATION**)

1. **INSPECT TIRES** (See **INSPECTION**)
2. **MEASURE VEHICLE HEIGHT** (See **ADJUSTMENT**)
3. **INSPECT CAMBER**
 - a. Install the camber-caster-kingpin gauge and position the rear wheel on the alignment tester.
 - b. Inspect the camber.

Camber

CAMBER SPECIFICATIONS

Camber	Right - left error
-0°57' +/- 30' (-0.95° +/- 0.5°)	0°30' (0.5°)

NOTE: The tolerance for the difference between the left and right wheels is 30' (0.5°) or less for both cambers.

If the camber is not within the specified range, inspect the suspension parts and replace them if necessary.

4. **INSPECT TOE-IN**

Toe-in

TOE-IN SPECIFICATIONS

B-A
3.4 +/- 3 mm (0.13 +/- 0.11 in.)

If the toe-in is not within the specified range, inspect the suspension parts and replace them if necessary.

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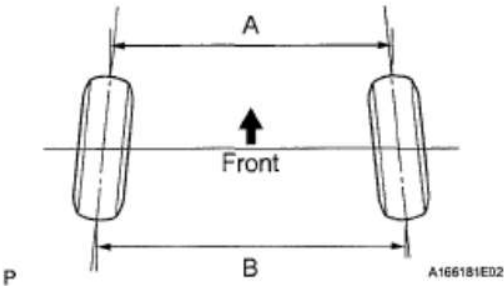
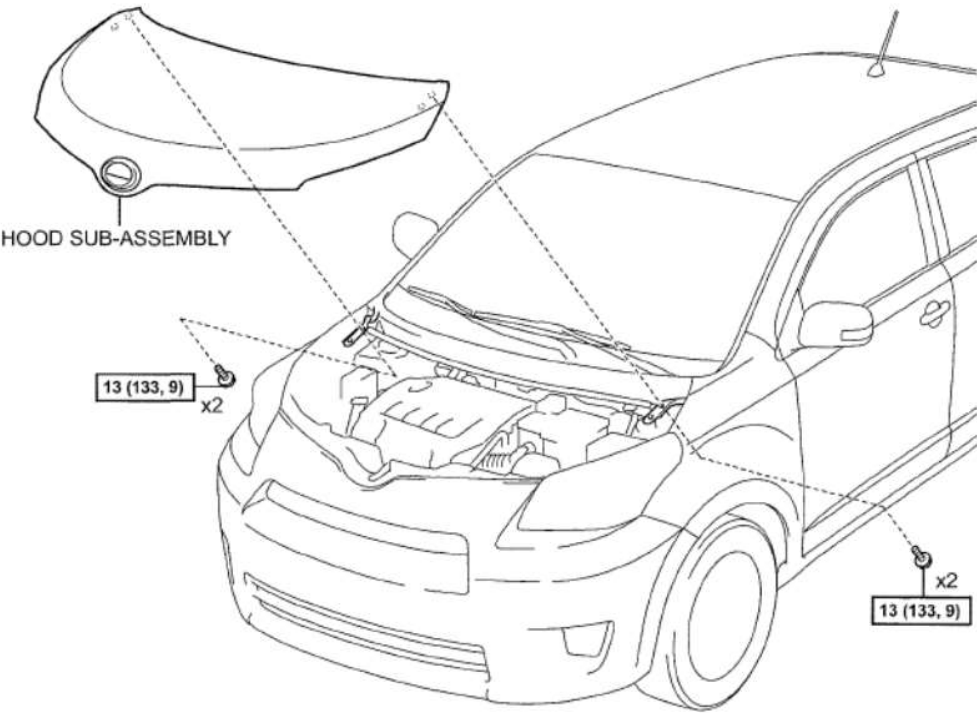


Fig. 16: Identifying Toe-In Angle
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

FRONT SUSPENSION MEMBER

COMPONENTS



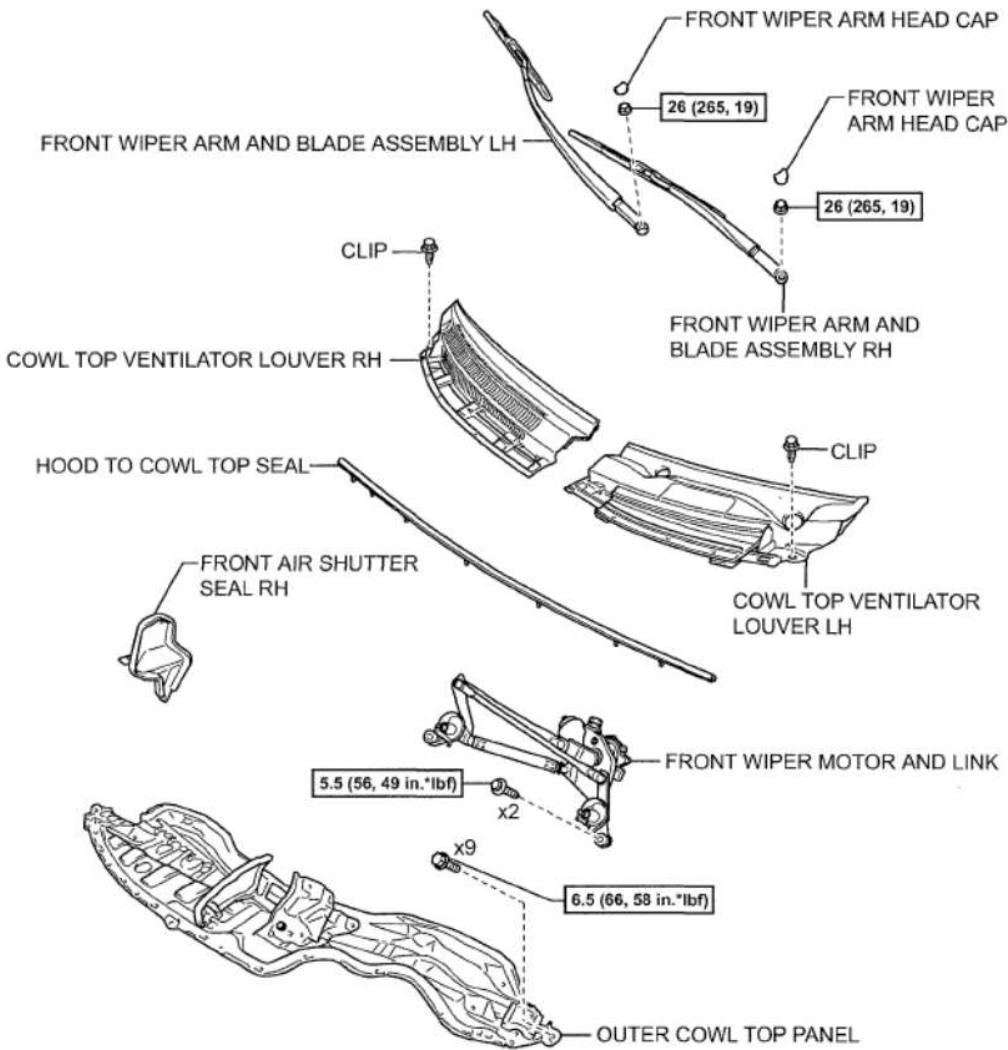
[N*m (kgf*cm, ft*lbf)] : Specified torque

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Fig. 17: Identifying Front Suspension Member Components And Torque Specifications (1 Of 4)
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N*m (kgf*cm, ft*lbf) : Specified torque

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Fig. 18: Identifying Front Suspension Member Components And Torque Specifications (2 Of 4)
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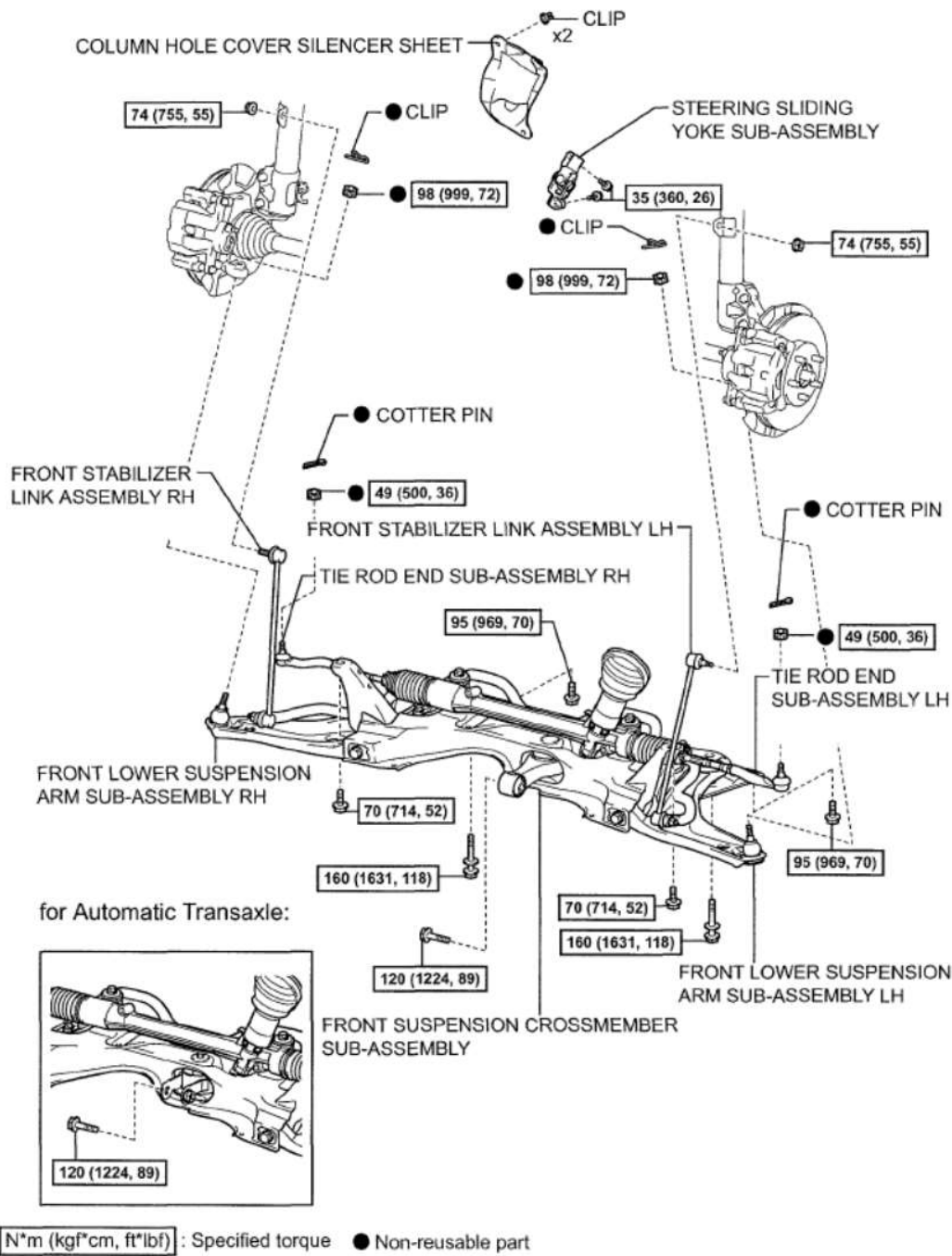


Fig. 19: Identifying Front Suspension Member Components And Torque Specifications (3 Of 4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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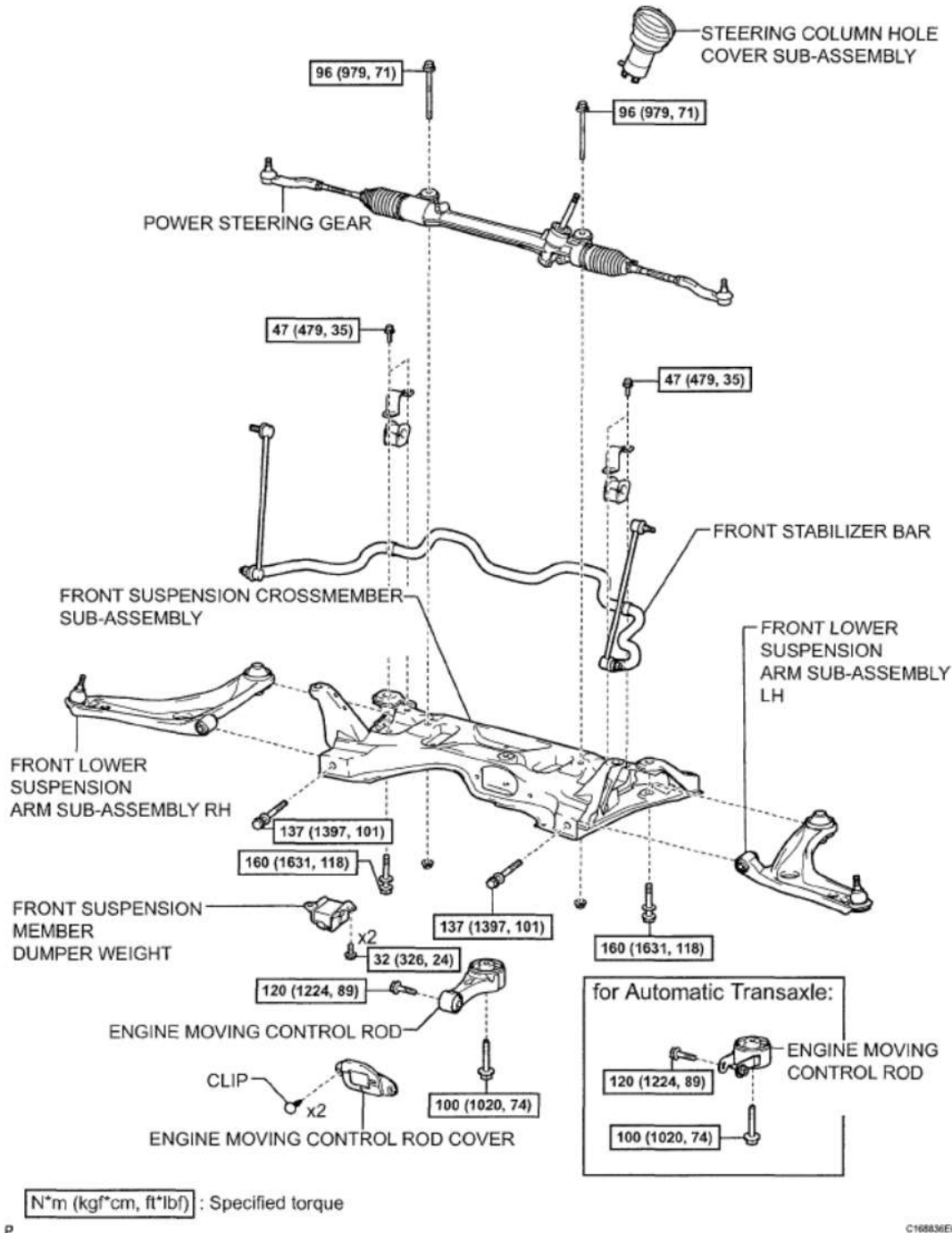


Fig. 20: Identifying Front Suspension Member Components And Torque Specifications (4 Of 4)
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REMOVAL

1. POSITION FRONT WHEELS FACING STRAIGHT AHEAD

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2. REMOVE HOOD SUB-ASSEMBLY

- a. Remove the 4 bolts and remove the hood.

3. REMOVE FRONT WIPER ARM HEAD CAP (See REMOVAL)

4. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH (See REMOVAL)

5. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH (See REMOVAL)

6. REMOVE HOOD TO COWL TOP SEAL (See REMOVAL)

7. REMOVE COWL TOP VENTILATOR LOUVER RH (See REMOVAL)

8. REMOVE COWL TOP VENTILATOR LOUVER LH (See REMOVAL)

9. REMOVE WINDSHIELD WIPER MOTOR AND LINK (See REMOVAL)

10. REMOVE FRONT AIR SHUTTER SEAL RH (See REMOVAL)

11. REMOVE OUTER COWL TOP PANEL (See REMOVAL)

12. REMOVE COLUMN HOLE COVER SILENCER SHEET

- a. Remove the floor carpet and 2 clips and remove the column hole cover silencer.

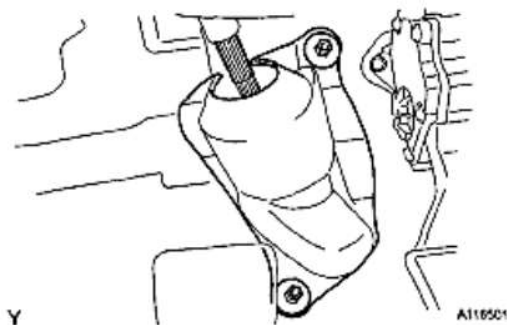


Fig. 21: Identifying Floor Carpet And Clips

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

13. SEPARATE STEERING SLIDING YOKE SUB-ASSEMBLY

- a. Use a seat belt to fix the steering wheel assembly, in order to avoid breakage of the spiral cable.

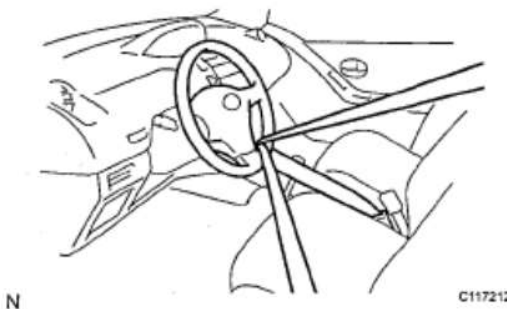


Fig. 22: Tying Seat Belt To Steering Wheel

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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- b. Place matchmarks on the sliding yoke of the steering intermediate shaft assembly and the power steering.

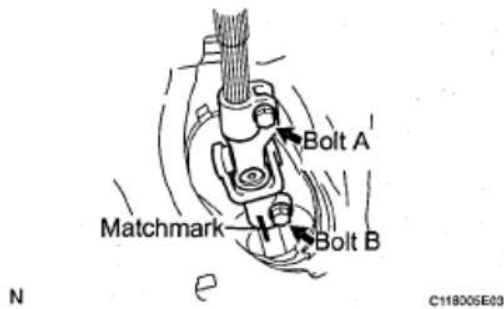


Fig. 23: Placing Matchmarks On Sliding Yoke Of Steering Intermediate Shaft Assembly And Power Steering

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Loosen bolt A, remove bolt B and separate the steering intermediate shaft assembly.
14. **REMOVE NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY**
 - a. Remove clip A, separate clip B from the body and separate No. 1 steering column hole cover.

NOTE: Do not damage clip B.

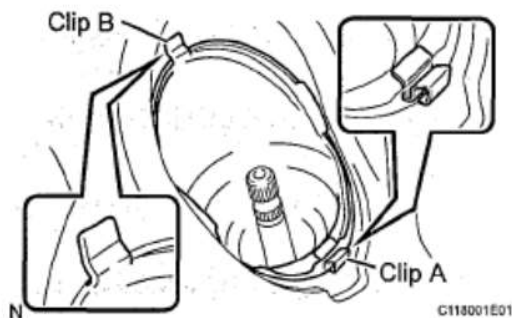


Fig. 24: Identifying Clip A And Clip B

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

15. **REMOVE FRONT WHEEL**
16. **SEPARATE TIE ROD END SUB-ASSEMBLY LH** (See REMOVAL)
17. **SEPARATE TIE ROD END SUB-ASSEMBLY RH**

HINT:

Use the same procedure for the RH side as for the LH side.

18. **SEPARATE FRONT STABILIZER LINK ASSEMBLY LH** (See REMOVAL)

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19. SEPARATE FRONT STABILIZER LINK ASSEMBLY RH

HINT:

Use the same procedure for the RH side as for the LH side.

20. SEPARATE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH (See REMOVAL)**21. SEPARATE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH**

HINT:

Use the same procedure for the RH side as for the LH side.

22. SUSPEND ENGINE ASSEMBLY

- a. Install the 2 hangers in the correct direction.
- b. Attach the engine chain hoist to the hangers.

CAUTION: Do not attempt to hang the engine by hooking the chain to any other part.

Parts No.:

Engine Hanger No. 1:12281-37020

Engine Hanger No. 2:12282-37010

Bolt:

91552-81050

Torque: 43 N*m (438 kgf*cm, 32 ft.*lbf)

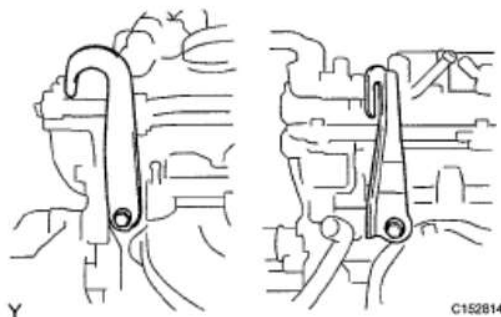


Fig. 25: Identifying Engine Hanger

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2008 Scion xD**2008 SUSPENSION Suspension - xD****23. REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSEMBLY**

- a. Remove the bolt and separate the engine moving control rod.
- b. Support the front suspension crossmember with a transmission jack.

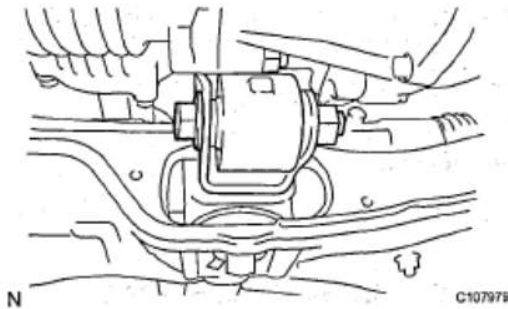


Fig. 26: Identifying Front Suspension Crossmember
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the 6 bolts and remove the suspension crossmember.

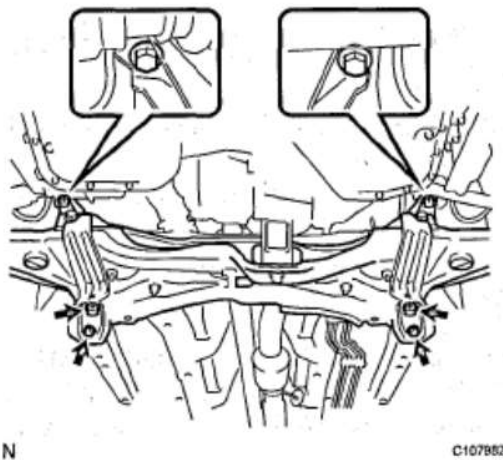


Fig. 27: Locating Bolts And Suspension Crossmember
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

24. REMOVE POWER STEERING GEAR

- a. Remove the 2 bolts and 2 nuts and remove the power steering gear from the suspension crossmember.

NOTE: Keep the nut from rotating while turning the bolt.

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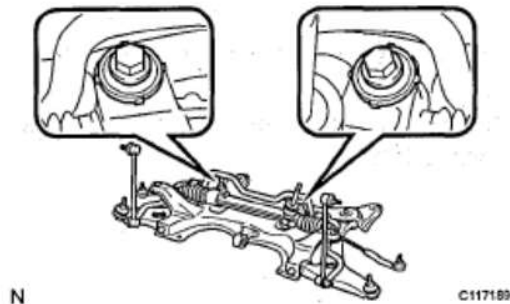


Fig. 28: Identifying Bolts, Nuts And Power Steering Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

25. **REMOVE FRONT STABILIZER NO. 1 BRACKET LH** (See **REMOVAL**)
26. **REMOVE FRONT STABILIZER NO. 1 BRACKET RH**

HINT:

Use the same procedure for the RH side as for the LH side.

27. **REMOVE FRONT STABILIZER BAR**
28. **REMOVE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH** (See **REMOVAL**)
29. **REMOVE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH**

HINT:

Use the same procedure for the RH side as for the LH side.

30. **REMOVE ENGINE MOVING CONTROL ROD COVER**
 - a. Remove the 2 clips and the engine mounting control rod cover.

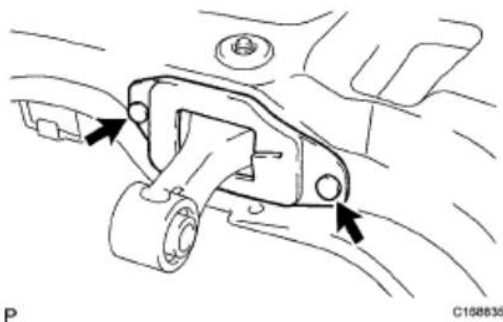


Fig. 29: Locating Clips And Engine Mounting Control Rod Cover
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

31. **REMOVE ENGINE MOVING CONTROL ROD (for Automatic Transaxle)**
 - a. Remove the bolt and the engine moving control rod.

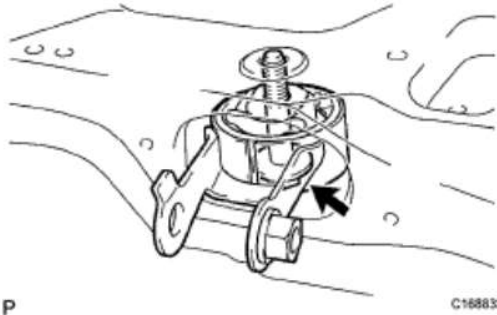
2008 Scion xD**2008 SUSPENSION Suspension - xD**

Fig. 30: Locating Bolt And Engine Moving Control Rod
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

32. REMOVE ENGINE MOVING CONTROL ROD (for Manual Transaxle)

- a. Remove the bolt and the engine moving control rod.

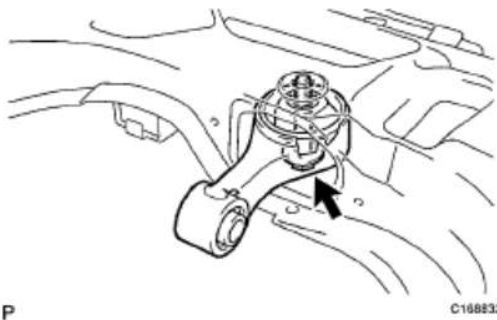


Fig. 31: Locating Bolt And Engine Moving Control Rod
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

33. REMOVE FRONT SUSPENSION MEMBER DUMPER WEIGHT

- a. Remove the 2 bolts and the front suspension member dumper weight.

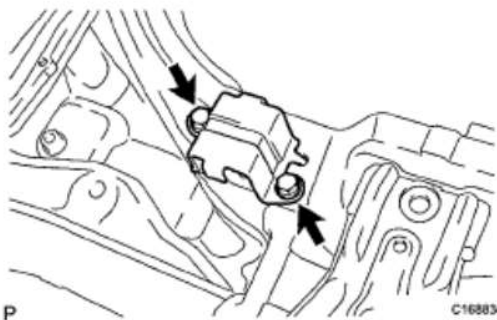


Fig. 32: Locating Bolts And Front Suspension Member Dumper Weight
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

2008 Scion xD**2008 SUSPENSION Suspension - xD****1. INSTALL FRONT SUSPENSION MEMBER DUMPER WEIGHT**

- a. Install the front suspension member dumper weight with the 2 bolts.

Torque: 32 N*m (326 kgf*cm, 24 ft.*lbf)

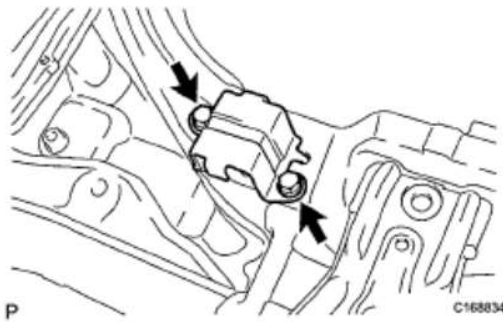


Fig. 33: Locating Bolts And Front Suspension Member Dumper Weight
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL ENGINE MOVING CONTROL ROD (for Automatic Transaxle)

- a. Install the engine moving control rod with the bolt.

Torque: 100 N*m (1020 kgf*cm, 74 ft.*lbf)

HINT:

Temporarily tighten the transaxle side, and then tighten the bolt to the specified torque.

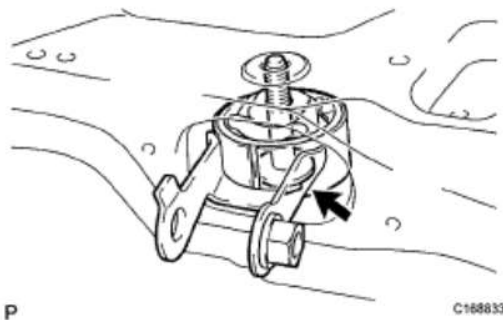


Fig. 34: Locating Bolt And Engine Moving Control Rod
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL ENGINE MOVING CONTROL ROD (for Manual Transaxle)

- a. Install the engine moving control rod with the bolt.

Torque: 100 N*m (1020 kgf*cm, 74 ft.*lbf)

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HINT:

Temporarily tighten the transaxle side, and then tighten the bolt to the specified torque.

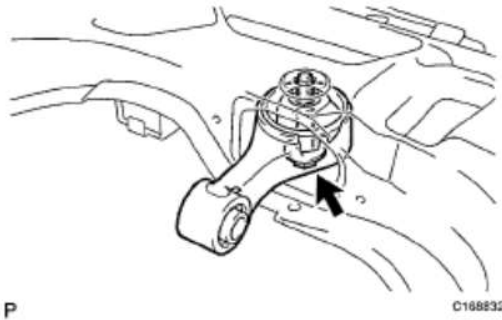


Fig. 35: Locating Bolt And Engine Moving Control Rod
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. **INSTALL ENGINE MOVING CONTROL ROD COVER**
 - a. Install the engine moving control rod cover with the 2 clips.

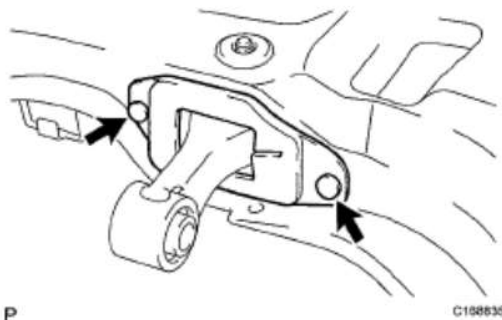


Fig. 36: Locating Clips And Engine Mounting Control Rod Cover
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. **TEMPORARILY TIGHTEN FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH (See REMOVAL)**
6. **TEMPORARILY TIGHTEN FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH**

HINT:

Use the same procedure for the LH side.

7. **INSTALL FRONT STABILIZER BAR**
8. **INSTALL FRONT STABILIZER BRACKET NO.1 LH**
9. **INSTALL FRONT STABILIZER BRACKET NO.1 RH**

HINT:

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Use the same procedure for the LH side.

10. INSTALL POWER STEERING GEAR

- a. Install the power steering gear onto the front suspension crossmember with the 2 bolts and 2 nuts.

Torque: 96 N*m (979 kgf*cm, 71 ft.*lbf)

NOTE: Keep the nut from rotating while turning the bolt.

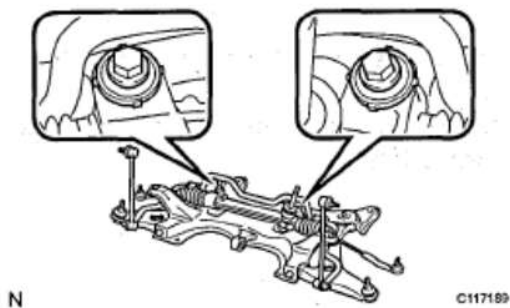


Fig. 37: Identifying Bolts, Nuts And Power Steering Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

11. INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSEMBLY

- a. Support the front suspension crossmember with a transmission jack.
- b. Provisionally install the front suspension crossmember onto the body with the 6 bolts.

BOLT UNDERHEAD LENGTH

Bolt	Underhead Length (mm)
A	38
B	99
C	41

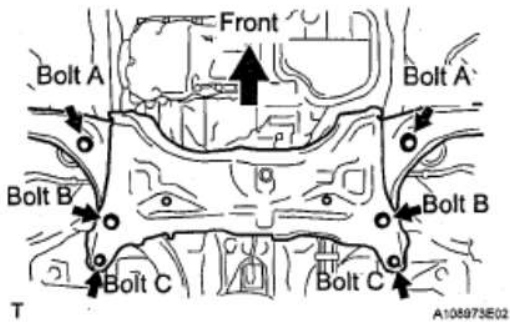


Fig. 38: Locating Front Suspension Crossmember Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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2008 SUSPENSION Suspension - xD

- c. By inserting SST into the datum holes in the front suspension crossmembers RH and LH alternately, tighten bolts A, B and C on both sides to the specified torque, in several steps.

SST 09670-00011

Torque: 70 N*m (714 kgf*cm, 52 ft.*lbf) for bolt A

160 N*m (1631 kgf*cm, 118 ft.*lbf) for bolt B

95 N*m (969 kgf*cm, 70 ft.*lbf) for bolt C

NOTE:

- Insert SST into the datum hole in a vertical orientation.
- If SST can not be inserted into the datum hole vertically, loosen all the bolts and then insert SST again.

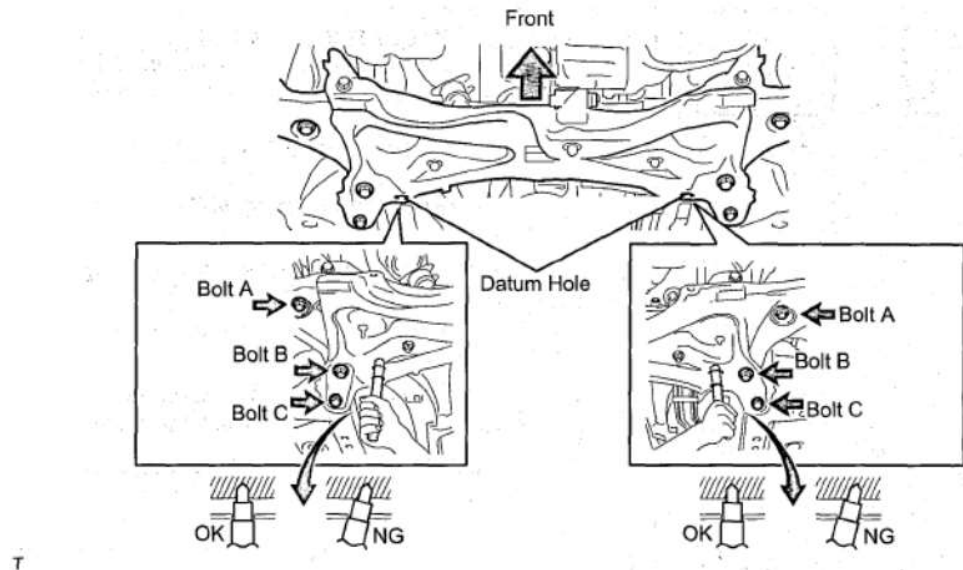


Fig. 39: Locating Front Suspension Crossmembers Bolts
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Install the engine moving control rod with the bolt.

Torque: 120 N*m (1224 kgf*cm, 89 ft.*lbf)

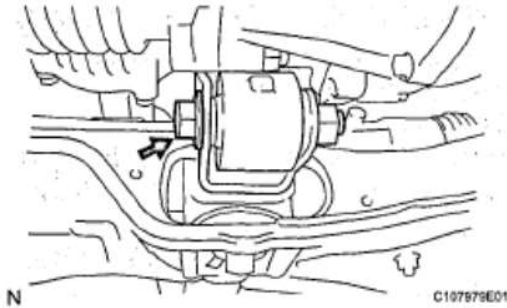
2008 Scion xD**2008 SUSPENSION Suspension - xD**

Fig. 40: Locating Engine Moving Control Rod And Bolt
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

12. **INSTALL FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH** (See INSTALLATION)
13. **INSTALL FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH**

HINT:

Use the same procedure for the LH side.

14. **INSTALL FRONT STABILIZER LINK ASSEMBLY LH** (See INSTALLATION)
15. **INSTALL FRONT STABILIZER LINK ASSEMBLY RH**

HINT:

Use the same procedure for the LH side.

16. **INSTALL TIE ROD END SUB-ASSEMBLY LH** (See INSTALLATION)
17. **INSTALL TIE ROD END SUB-ASSEMBLY RH**

HINT:

Use the same procedure for the LH side.

18. **INSTALL NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY**

- a. Install clip B onto the body portion and install steering column hole cover onto the body portion with clip A.

NOTE: Make sure that the lip portion of steering column hole cover is not damaged.

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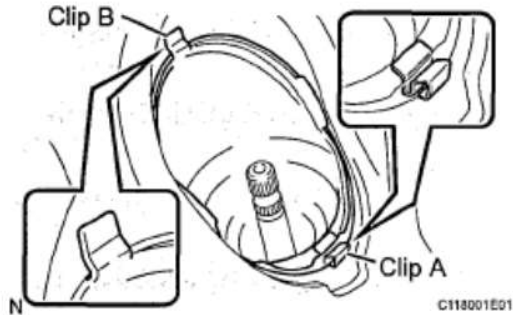


Fig. 41: Identifying Clip A And Clip B
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

19. INSTALL STEERING SLIDING YOKE SUB-ASSEMBLY

- Align the matchmarks and install the sliding yoke onto the intermediate shaft.

Torque: 35 N*m (360 kgf*cm, 26 ft.*lbf)

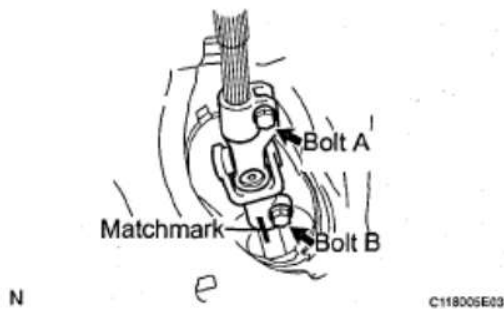


Fig. 42: Placing Matchmarks On Sliding Yoke Of Steering Intermediate Shaft Assembly And Power Steering
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Tighten bolt A.

Torque: 35 N*m (360 kgf*cm, 26 ft.*lbf)

20. INSTALL COLUMN HOLE COVER SILENCER SHEET

- Install the column hole cover silencer sheet with the 2 clips.

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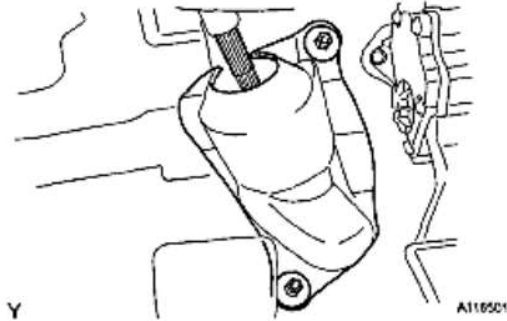


Fig. 43: Identifying Floor Carpet And Clips
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Install the floor carpet.

21. INSTALL FRONT WHEEL

Torque: 103 N*m (1050 kgf*cm, 76 ft.*lbf)

22. POSITION WHEELS FACING STRAIGHT AHEAD

23. STABILIZE SUSPENSION (See INSTALLATION)

24. FULLY TIGHTEN FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH (See INSTALLATION)

25. FULLY TIGHTEN FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH

26. INSTALL OUTER COWL TOP PANEL (See INSTALLATION)

27. INSTALL FRONT AIR SHUTTER SEAL RH (See INSTALLATION)

28. INSTALL WINDSHIELD WIPER MOTOR AND LINK (See INSTALLATION)

29. INSTALL COWL TOP VENTILATOR LOUVER LH (See INSTALLATION)

30. INSTALL COWL TOP VENTILATOR LOUVER RH (See INSTALLATION)

31. INSTALL HOOD TO COWL TOP SEAL (See INSTALLATION)

32. INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH (See INSTALLATION)

33. INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH (See INSTALLATION)

34. INSTALL FRONT WIPER ARM HEAD CAP (See INSTALLATION)

35. PROVISIONALLY TIGHTEN HOOD SUB-ASSEMBLY

a. Provisionally install the hood with the 4 bolts.

HINT:

Tighten the bolts to the specified torque after inspecting the hood.

36. INSPECT HOOD SUB-ASSEMBLY (See ADJUSTMENT)

37. ADJUST HOOD SUB-ASSEMBLY (See ADJUSTMENT)

38. POSITION FRONT WHEELS FACING STRAIGHT AHEAD

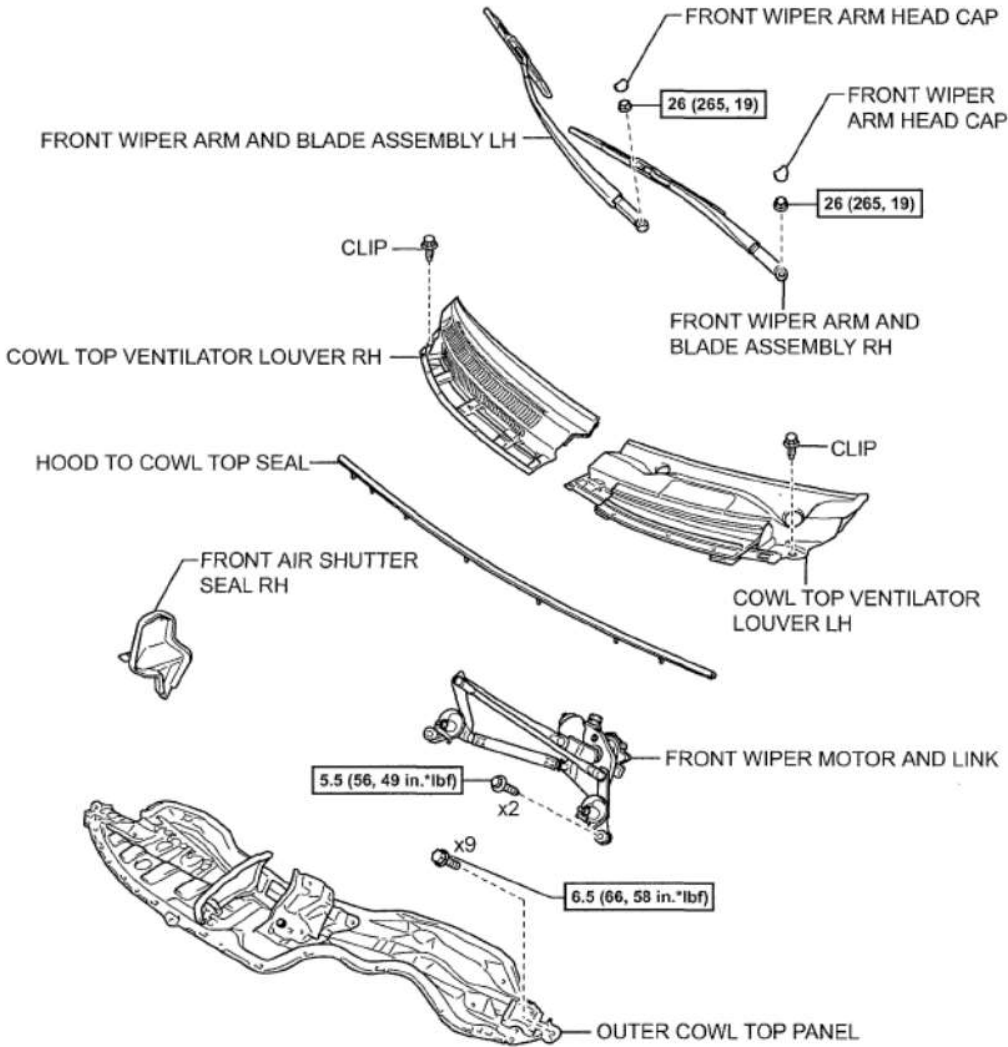
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39. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT(See ADJUSTMENT)**40. CHECK ABS SPEED SENSOR SIGNAL**(See TEST MODE PROCEDURE)**41. CHECK VSC SENSOR SIGNAL**(See TEST MODE PROCEDURE)**FRONT SHOCK ABSORBER WITH COIL SPRING****COMPONENTS**

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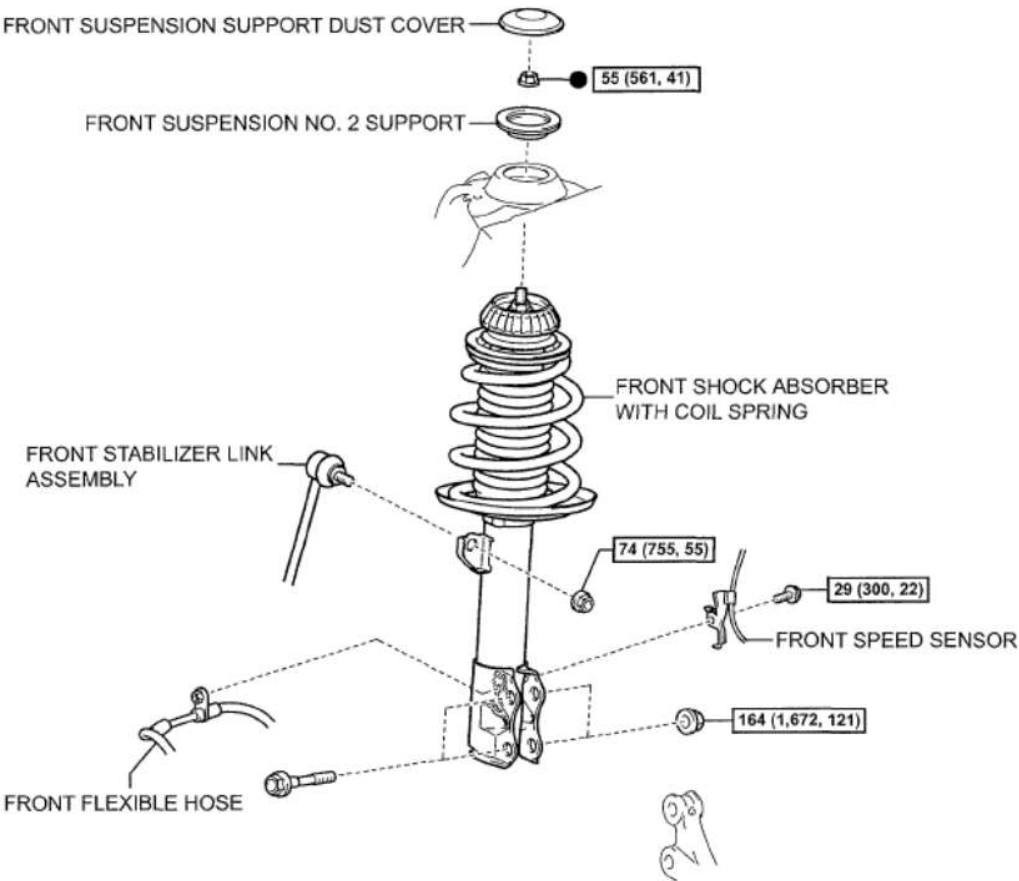
N*m (kgf*cm, ft*lbf) : Specified torque

Y A166187E04

Fig. 44: Identifying Front Shock Absorber With Coil Spring Components And Torque Specifications (1 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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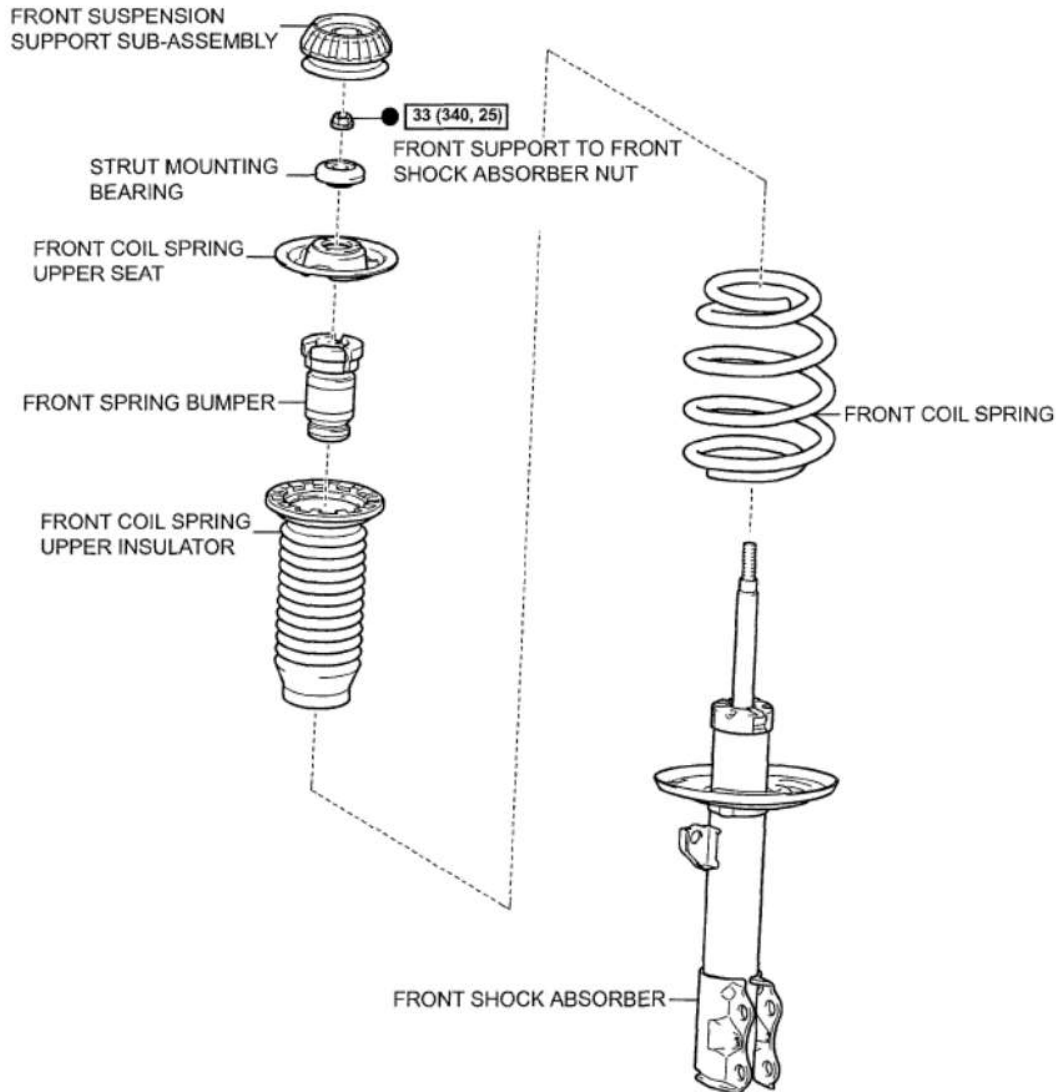
N*m (kgf*cm, ft*lb) : Specified torque

● Non-reusable part

P C121847E01

Fig. 45: Identifying Front Shock Absorber With Coil Spring Components And Torque Specifications (2 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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$\boxed{\text{N}\cdot\text{m (kgf}\cdot\text{cm, ft}\cdot\text{lbf)}}$: Specified torque

● Non-reusable part

P

C106043E01

Fig. 46: Identifying Front Shock Absorber With Coil Spring Components And Torque Specifications (3 Of 3)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE FRONT WIPER ARM HEAD CAP (See REMOVAL)
2. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH (See REMOVAL)
3. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH (See REMOVAL)

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4. **REMOVE HOOD TO COWL TOP SEAL** (See REMOVAL)
5. **REMOVE COWL TOP VENTILATOR LOUVER RH** (See REMOVAL)
6. **REMOVE COWL TOP VENTILATOR LOUVER LH** (See REMOVAL)
7. **REMOVE FRONT WIPER MOTOR AND LINK** (See REMOVAL)
8. **REMOVE FRONT AIR SHUTTER SEAL RH** (See REMOVAL)
9. **REMOVE OUTER COWL TOP PANEL** (See REMOVAL)
10. **REMOVE FRONT WHEEL**
11. **SEPARATE FRONT STABILIZER LINK ASSEMBLY**
 - a. Remove the nut and separate the stabilizer link from the shock absorber.

HINT:

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

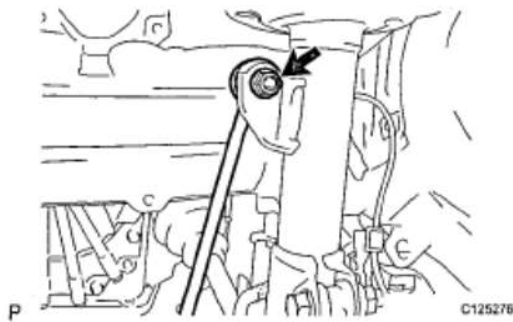


Fig. 47: Locating Nut And Stabilizer Link

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

12. **SEPARATE FRONT FLEXIBLE HOSE**
 - a. Remove the bolt and separate the speed sensor and flexible hose.

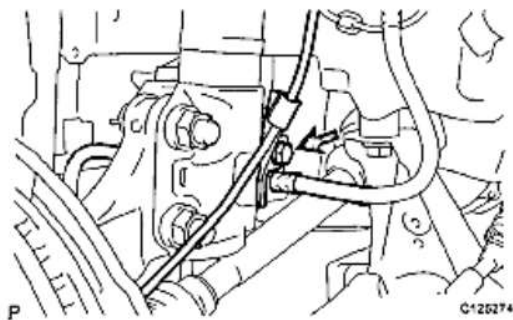


Fig. 48: Locating Bolt And Speed Sensor

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

13. **REMOVE FRONT SUSPENSION SUPPORT DUST COVER**

2008 Scion xD**2008 SUSPENSION Suspension - xD****14. REMOVE FRONT SHOCK ABSORBER WITH COIL SPRING**

- a. Remove the 2 nuts and 2 bolts and separate the shock absorber with coil spring from the steering knuckle.

HINT:

Keep the bolt from rotating while loosening and removing the nuts.



Fig. 49: Locating Nuts And Bolts

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a socket hexagon wrench 6, fix the shock absorber rod and remove the nut.

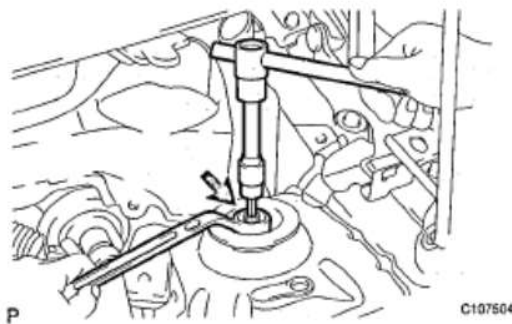


Fig. 50: Removing Shock Absorber Rod Nut

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the No. 2 suspension support.
- d. Remove the front shock absorber with coil spring from the vehicle.

DISASSEMBLY**1. REMOVE FRONT SUSPENSION SUPPORT SUB-ASSEMBLY****2. REMOVE FRONT SUPPORT TO FRONT SHOCK ABSORBER NUT**

- a. Using a socket hexagon wrench 6, fix the shock absorber rod and loosen the nut.

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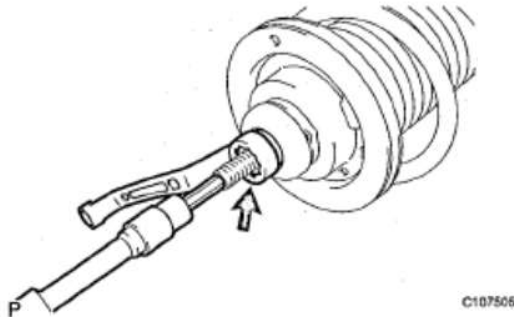


Fig. 51: Identifying Shock Absorber Rod Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST, compress the coil spring.

SST 09727-30021 (09727-00010, 09727-00021, 09727-00031)

NOTE: Do not use an impact wrench. It will damage SST.

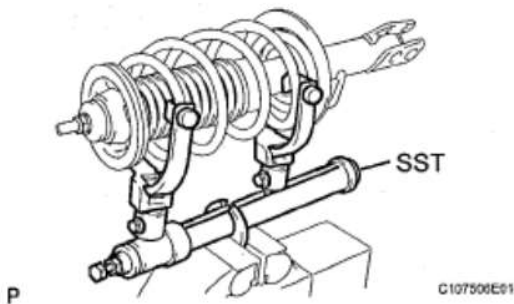


Fig. 52: Compressing Coil Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the nut.
3. **REMOVE FRONT COIL SPRING UPPER SEAT**
 - a. Remove the coil spring seat upper with the strut mounting bearing and spring bumper from the shock absorber.
4. **REMOVE FRONT SPRING BUMPER**
 - a. Remove the spring bumper from the coil spring seat upper.
5. **REMOVE FRONT COIL SPRING UPPER INSULATOR**
6. **REMOVE FRONT COIL SPRING**
7. **REMOVE STRUT MOUNTING BEARING**
 - a. Using a brass bar and press, remove the strut mounting bearing from the coil spring seat upper.

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2008 SUSPENSION Suspension - xD

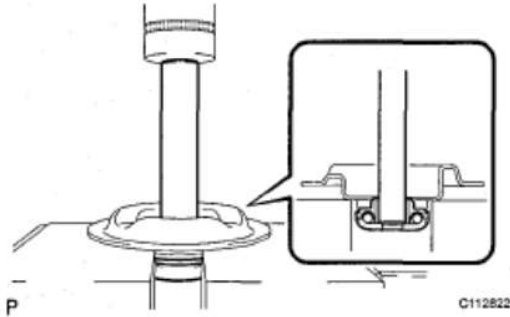


Fig. 53: Pressing Strut Mounting Bearing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

1. INSPECT FRONT SHOCK ABSORBER

- Compress and extend the shock absorber rod and check that there is no abnormal resistance or abnormal sound during the operation. If there is any abnormality, replace the shock absorber with a new one.

NOTE: When disposing of the shock absorber, see DISPOSAL.)

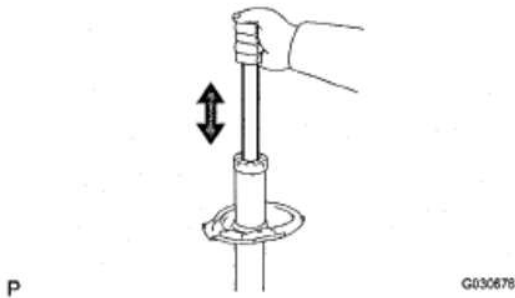


Fig. 54: Inspecting Front Shock Absorber
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REASSEMBLY

1. INSTALL STRUT MOUNTING BEARING

- Using a brass bar and press, install the strut mounting bearing onto the coil spring seat upper.

NOTE: The strut mounting bearing must be securely installed.

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2008 SUSPENSION Suspension - xD

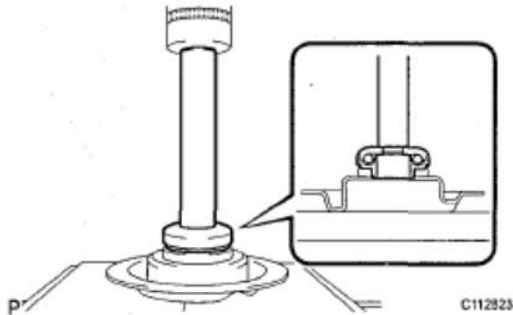


Fig. 55: Pressing Strut Mounting Bearing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL FRONT COIL SPRING

- Using SST, compress the coil spring.

SST 09727-30021 (09727-00010, 09727-00021, 09727-00031)

NOTE: Do not use an impact wrench. It will damage SST.

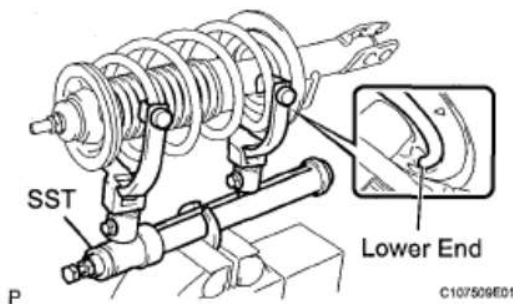


Fig. 56: Compressing Coil Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Install the coil spring onto the shock absorber.

NOTE: A spring of a smaller diameter should be installed in the upward direction.

HINT:

Fit the lower end of the coil spring into the gap of the absorber lower seat.

3. INSTALL FRONT COIL SPRING UPPER INSULATOR

4. INSTALL FRONT SPRING BUMPER

- Install the spring bumper onto the coil spring seat upper with the air discharge groove of the spring bumper and the rib portion of the coil spring seat upper aligned.

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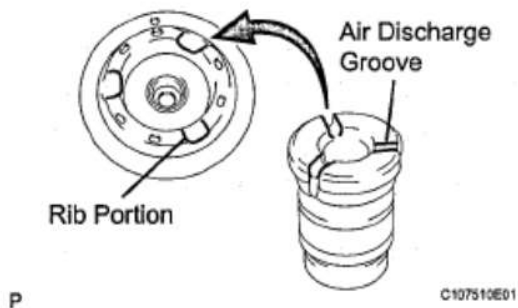


Fig. 57: Identifying Rib Portion Of Coil Spring Seat Upper
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Securely insert the spring bumper into the coil spring seat upper.

5. INSTALL FRONT COIL SPRING UPPER SEAT

- Install the coil spring seat upper with the strut mounting bearing and spring bumper onto the shock absorber.

6. INSTALL FRONT SUPPORT TO FRONT SHOCK ABSORBER NUT

- Provisionally tighten a new nut.
- Remove SST from the front coil spring.

NOTE: Do not use an impact wrench. It will damage SST.

- Using a socket hexagon wrench 6, fix the shock absorber rod and tighten the nut.

Torque: 33 N*m (340 kgf*cm, 25 ft.*lbf)

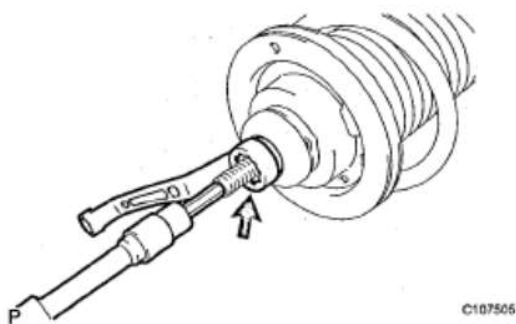


Fig. 58: Identifying Shock Absorber Rod Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. INSTALL FRONT SUSPENSION SUPPORT SUB-ASSEMBLY

INSTALLATION

2008 Scion xD

2008 SUSPENSION Suspension - xD

1. TEMPORARILY TIGHTEN FRONT SHOCK ABSORBER WITH COIL SPRING

- a. Provisionally tighten a new nut through No. 2 suspension support.

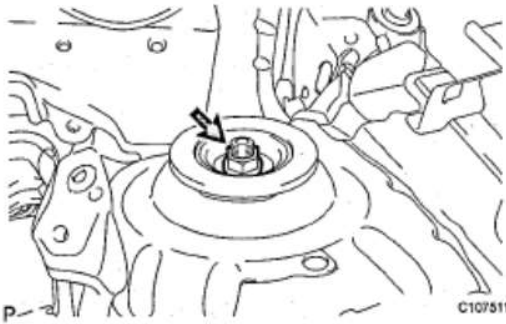


Fig. 59: Locating No. 2 Suspension Support Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the front shock absorber with coil spring onto the steering knuckle.
- c. Install the 2 bolts and 2 nuts.

Torque: 164 N*m (1672 kgf*cm, 121 ft.*lbf)

HINT:

Keep the bolt from rotating while loosening and removing the nuts.



Fig. 60: Locating Nuts And Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL FRONT FLEXIBLE HOSE

- a. Install the flexible hose and speed sensor with the bolt.

Torque: 29 N*m (300 kgf*cm, 22 ft.*lbf)

NOTE: Install the flexible hose and speed sensor without twisting them.

2008 Scion xD

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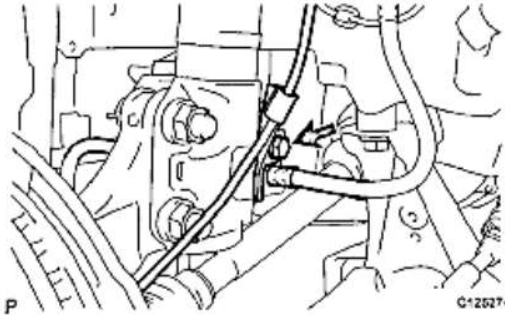


Fig. 61: Locating Bolt And Speed Sensor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL FRONT STABILIZER LINK ASSEMBLY

- a. Install the stabilizer link 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 socket hexagon wrench 6 to hold the stud.



Fig. 62: Locating Nut And Stabilizer Link
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. INSTALL FRONT WHEEL

Torque: 103 N*m (1050 kgf*cm, 76 ft.*lbf)

5. FULLY TIGHTEN FRONT SHOCK ABSORBER WITH COIL SPRING

- a. Using a socket hexagon wrench 6, fix the shock absorber rod and tighten the nut.

Torque: 55 N*m (561 kgf*cm, 41 ft.*lbf)

2008 Scion xD

2008 SUSPENSION Suspension - xD

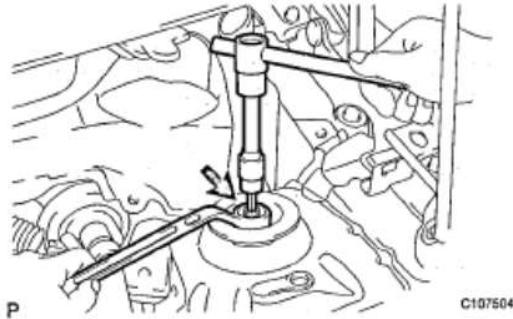


Fig. 63: Tightening Shock Absorber Rod Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. **INSTALL FRONT SUSPENSION SUPPORT DUST COVER**
7. **INSTALL OUTER COWL TOP PANEL** (See INSTALLATION)
8. **INSTALL FRONT AIR SHUTTER SEAL RH** (See INSTALLATION)
9. **INSTALL FRONT WIPER MOTOR AND LINK** (See INSTALLATION)
10. **INSTALL COWL TOP VENTILATOR LOUVER LH** (See INSTALLATION)
11. **INSTALL COWL TOP VENTILATOR LOUVER RH** (See INSTALLATION)
12. **INSTALL HOOD TO COWL TOP SEAL** (See INSTALLATION)
13. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH** (See INSTALLATION)
14. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH** (See INSTALLATION)
15. **INSTALL FRONT WIPER ARM HEAD CAP** (See INSTALLATION)
16. **INSPECT AND ADJUST FRONT WHEEL ALIGNMENT**

(See ADJUSTMENT)

DISPOSAL

1. DISPOSE OF FRONT SHOCK ABSORBER

- a. Fully extend the shock absorber piston rod, and fix it at an angle in a vise or similar tool.
- b. Using a drill or similar tool, slowly make a hole in the area (A-B) shown in the illustration to discharge the gas inside.

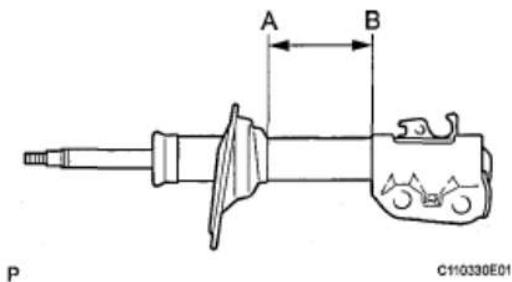


Fig. 64: Identifying Shock Absorber Dimension

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Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

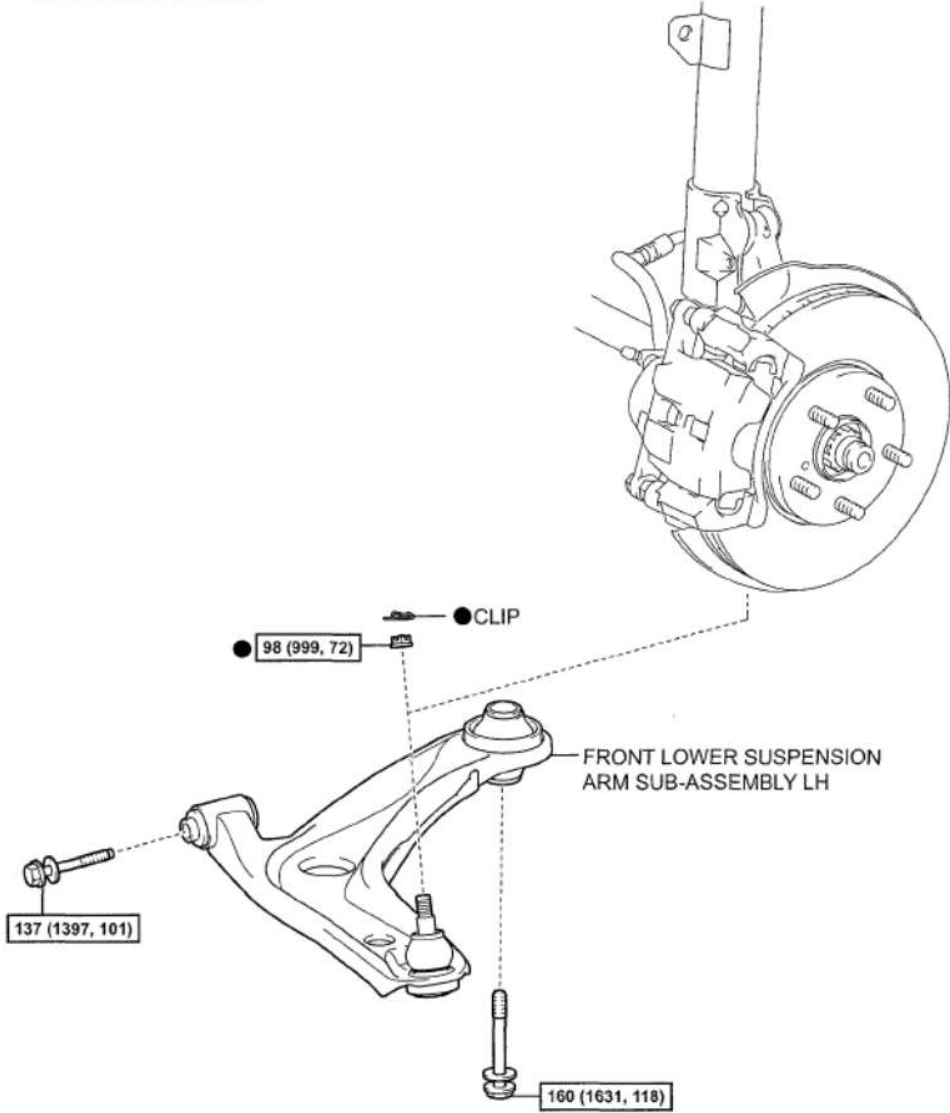
- The gas is colorless, odorless and harmless.
- Since the discharging gas may cause chips to scatter, cover the drill with a shop rag or piece of cloth when making the hole.

FRONT LOWER SUSPENSION ARM**COMPONENTS**

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for Manual transaxle:



N*m (kgf*cm, ft*lb) : Specified torque

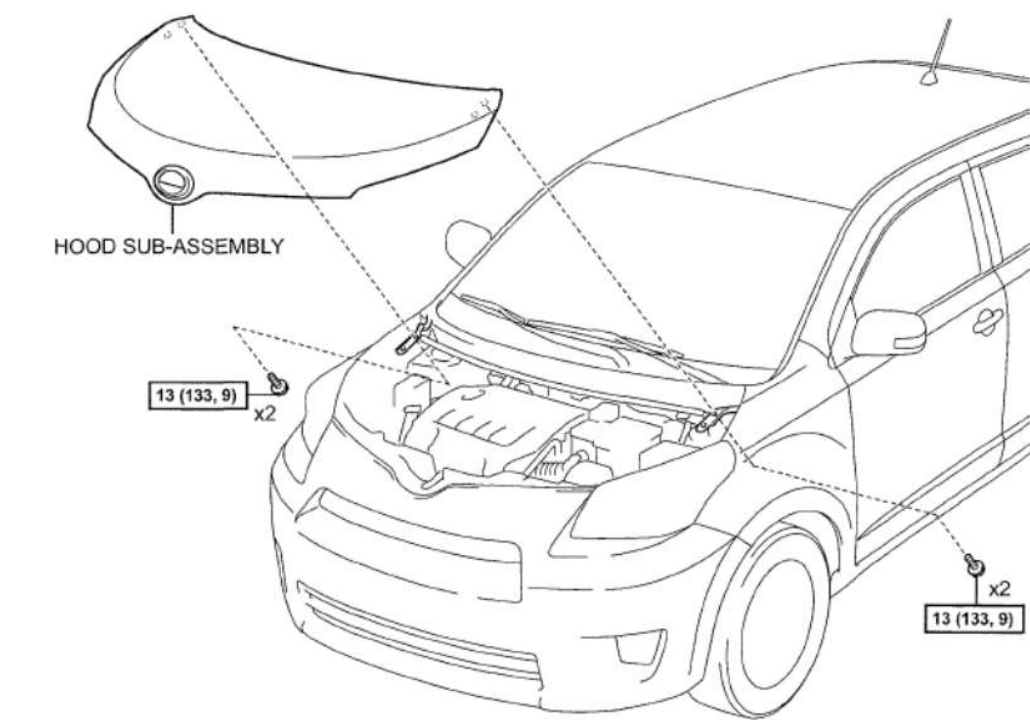
● Non-reusable part

P C165410E01

Fig. 65: Identifying Front Lower Suspension Arm Components And Torque Specifications (1 Of 4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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2008 SUSPENSION Suspension - xD



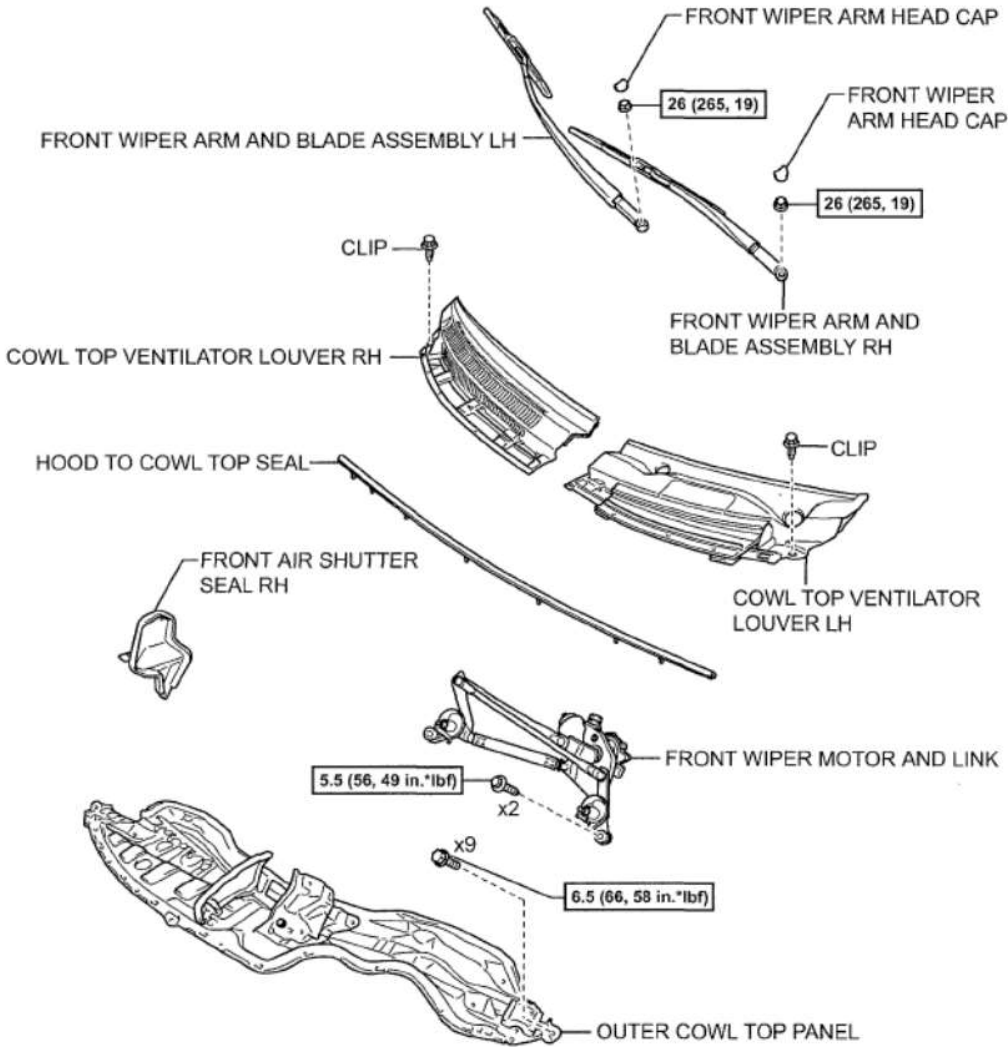
N*m (kgf*cm, ft*lbf) : Specified torque

P C185408E01

Fig. 66: Identifying Front Lower Suspension Arm Components And Torque Specifications (2 Of 4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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2008 SUSPENSION Suspension - xD



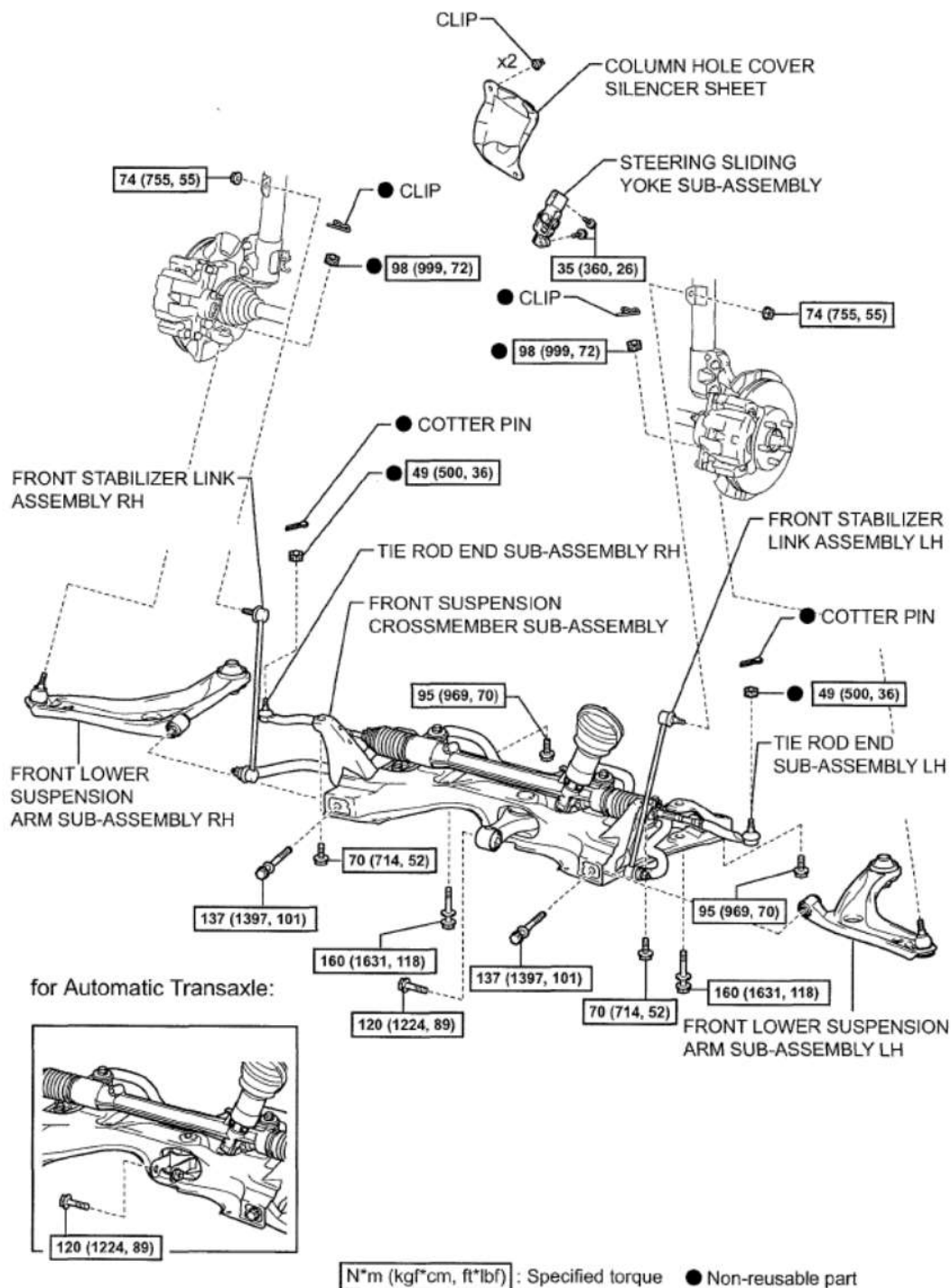
N*m (kgf*cm, ft*lbf) : Specified torque

Y A166187E04

Fig. 67: Identifying Front Lower Suspension Arm Components And Torque Specifications (3 Of 4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2008 Scion xD

2008 SUSPENSION Suspension - xD



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C165429E01

Fig. 68: Identifying Front Lower Suspension Arm Components And Torque Specifications (4 Of 4)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

2008 Scion xD**2008 SUSPENSION Suspension - xD**

1. **REMOVE FRONT WHEEL**
2. **REMOVE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH (for Manual Transaxle)**
 - a. Remove the clip and castle nut.

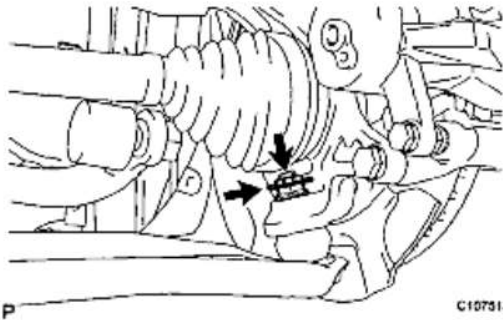


Fig. 69: Locating Clip And Castle Nut

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install SST (spacer B) to the threaded section of the lower ball joint.

SST 09960-20010 (09961-02060)

NOTE: Make sure the upper ends of the threaded section of the lower ball joint and SST (spacer B) are aligned.

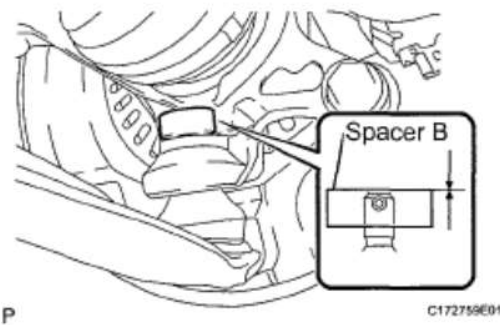


Fig. 70: Identifying SST (Spacer B) Between Threaded Section Of Lower Ball Joint (1 Of 2)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using SST, separate the lower arm.

SST 09960-20010 (09961-02010)

2008 Scion xD

2008 SUSPENSION Suspension - xD

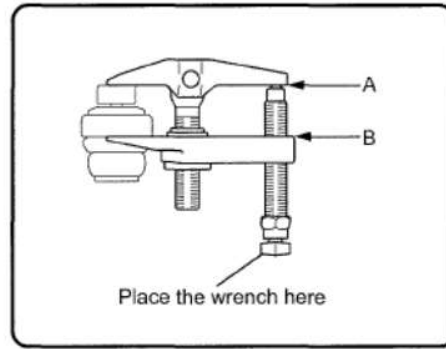
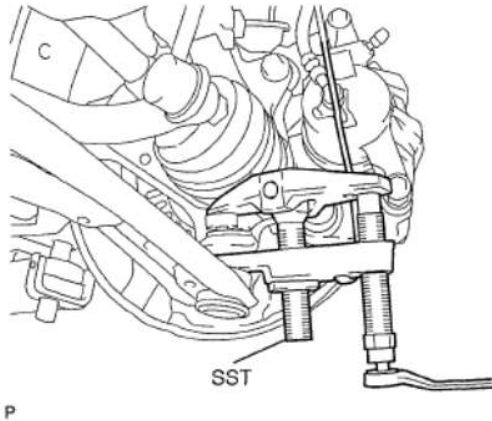


Fig. 71: Identifying SST (Spacer B) Between Threaded Section Of Lower Ball Joint (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- Make sure to tie the string of SST to the vehicle to prevent SST from dropping.
- Install SST so that A and B are parallel.
- Be sure to place the wrench on the part indicated in the illustration.
- Do not damage the lower ball joint dust cover.
- Do not damage the drive shaft outboard joint boots.
- Do not damage the front disc brake dust cover.

d. Remove the 2 bolts and lower arm.

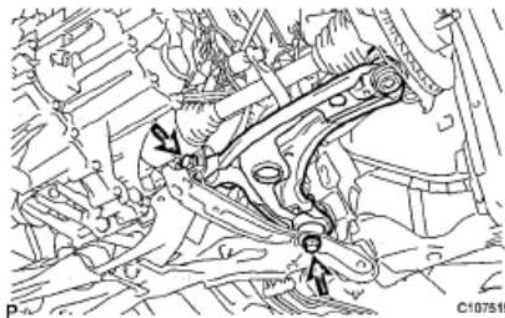


Fig. 72: Locating Bolts And Lower Arm
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. REMOVE HOOD SUB-ASSEMBLY
4. REMOVE FRONT WIPER ARM HEAD CAP (See REMOVAL)
5. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH (See REMOVAL)
6. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH (See REMOVAL)

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2008 SUSPENSION Suspension - xD

7. **REMOVE HOOD TO COWL TOP SEAL** (See REMOVAL)
8. **REMOVE COWL TOP VENTILATOR LOUVER RH** (See REMOVAL)
9. **REMOVE COWL TOP VENTILATOR LOUVER LH** (See REMOVAL)
10. **REMOVE FRONT WIPER MOTOR AND LINK** (See REMOVAL)
11. **REMOVE FRONT AIR SHUTTER SEAL RH** (See REMOVAL)
12. **REMOVE OUTER COWL TOP PANEL** (See REMOVAL)
13. **POSITION WHEELS FACING STRAIGHT AHEAD**
14. **REMOVE COLUMN HOLE COVER SILENCER SHEET** (See REMOVAL)
15. **REMOVE STEERING SLIDING YOKE SUB-ASSEMBLY** (See REMOVAL)
16. **REMOVE NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY** (See REMOVAL)
17. **SEPARATE TIE ROD END SUB-ASSEMBLY LH** (See REMOVAL)
18. **SEPARATE TIE ROD END SUB-ASSEMBLY RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

19. **SEPARATE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH** (See REMOVAL)
20. **SEPARATE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

21. **SEPARATE FRONT STABILIZER LINK ASSEMBLY LH** (See REMOVAL)
22. **SEPARATE FRONT STABILIZER LINK ASSEMBLY RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

23. **SUSPEND ENGINE ASSEMBLY** (See REMOVAL)
24. **REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSEMBLY** (See REMOVAL)
25. **REMOVE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH**
 - a. Remove the bolt and lower arm.

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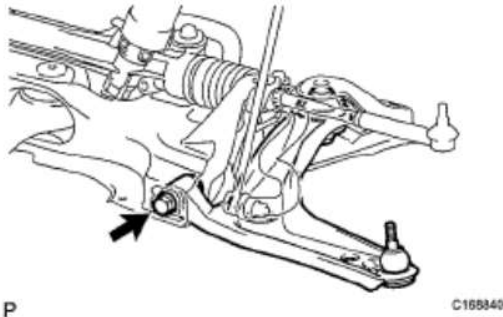


Fig. 73: Locating Bolt And Lower Arm

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

26. REMOVE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH

HINT:

The removal procedure for the RH side is the same as that for the LH side.

INSPECTION

1. INSPECT FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY

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

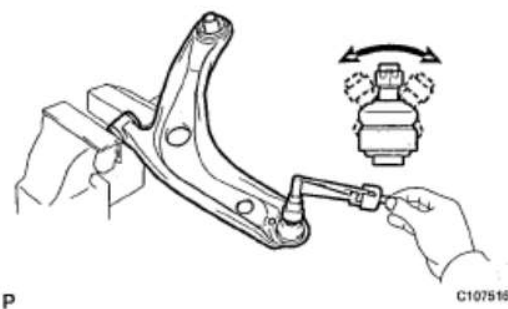


Fig. 74: Checking Turning Torque

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque: 0.78 to 3.43 N*m (8 to 35 kgf*cm, 6.9 to 30 in.*lbf)

- Check for any cracks and grease leakage on the ball joint dust cover.

INSTALLATION

1. TEMPORARILY TIGHTEN FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH

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- a. Install the lower arm onto the crossmember and provisionally tighten the bolt.

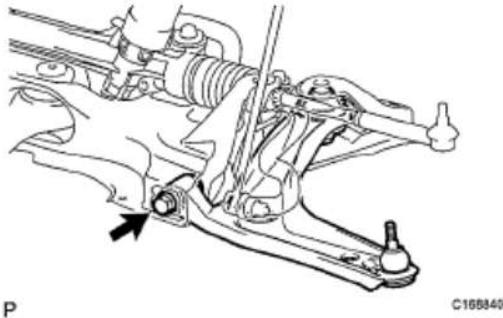


Fig. 75: Locating Bolt And Lower Arm

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. TEMPORARILY TIGHTEN FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH

HINT:

Perform the same procedure as for the LH side.

3. **INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSEMBLY** (See INSTALLATION)
4. **INSTALL FRONT STABILIZER LINK ASSEMBLY LH** (See INSTALLATION)
5. **INSTALL FRONT STABILIZER LINK ASSEMBLY RH**

HINT:

The installation procedure for the RH side is the same as that for the LH side.

6. **INSTALL FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH** (See INSTALLATION)
7. **INSTALL FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH**

HINT:

The installation procedure for the RH side is the same as that for the LH side.

8. **INSTALL TIE ROD END SUB-ASSEMBLY LH** (See INSTALLATION)
9. **INSTALL TIE ROD END SUB-ASSEMBLY RH**

HINT:

The installation procedure for the RH side is the same as that for the LH side.

10. **INSTALL NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY** (See INSTALLATION)

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11. **INSTALL STEERING SLIDING YOKE SUB-ASSEMBLY** (See **INSTALLATION**)
12. **INSTALL COLUMN HOLE COVER SILENCER SHEET** (See **INSTALLATION**)
13. **TEMPORARILY TIGHTEN FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH** (for Manual Transaxle)
 - a. Provisionally tighten the lower arm with the 2 bolts.

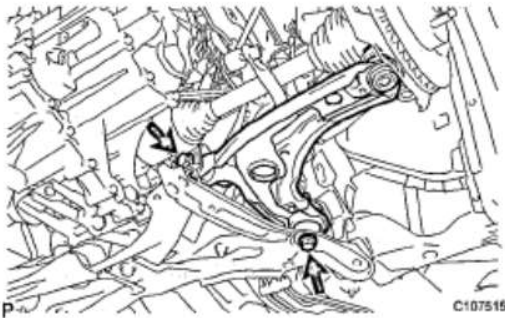


Fig. 76: Locating Bolts And Lower Arm
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the lower arm onto the steering knuckle with a new castle nut.

Torque: 98 N*m (999 kgf*cm, 72 ft.*lbf)

NOTE: If the holes for the clip are not aligned, tighten the nut by a further turn of up to 60°.

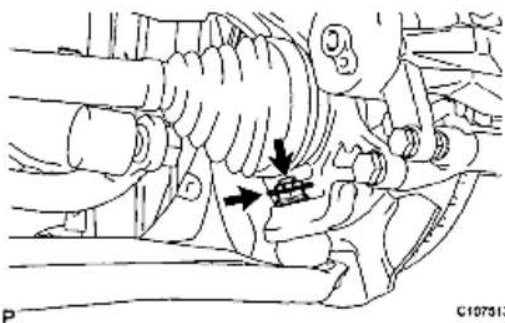


Fig. 77: Locating Clip And Castle Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install a new clip.
14. **INSTALL FRONT WHEEL**

Torque: 103 N*m (1050 kgf*cm, 76 ft.*lbf)
15. **POSITION WHEELS FACING STRAIGHT AHEAD**

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2008 SUSPENSION Suspension - xD

16. STABILIZE SUSPENSION

- a. Lower the vehicle from the jack.
- b. Bounce the vehicle up and down several times to stabilize the suspension.

17. FULLY TIGHTEN FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH

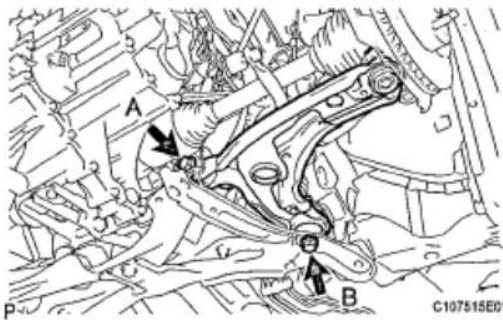
- a. Fully tighten the 2 bolts.

Torque: Bolt A

137 N*m (1397 kgf*cm, 101 ft.*lbf)

Bolt B

160 N*m (1631 kgf*cm, 118 ft.*lbf)

**Fig. 78: Locating Bolts**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

18. FULLY TIGHTEN FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH**HINT:**

Perform the same procedure as for the LH side.

19. **INSTALL OUTER COWL TOP PANEL** (See INSTALLATION)
20. **INSTALL FRONT AIR SHUTTER SEAL RH** (See INSTALLATION)
21. **INSTALL FRONT WIPER MOTOR AND LINK** (See INSTALLATION)
22. **INSTALL COWL TOP VENTILATOR LOUVER LH** (See INSTALLATION)
23. **INSTALL COWL TOP VENTILATOR LOUVER RH** (See INSTALLATION)
24. **INSTALL HOOD TO COWL TOP SEAL** (See INSTALLATION)
25. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH** (See INSTALLATION)
26. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH** (See INSTALLATION)
27. **INSTALL FRONT WIPER ARM HEAD CAP** (See INSTALLATION)
28. **INSPECT HOOD SUB-ASSEMBLY** (See ADJUSTMENT)

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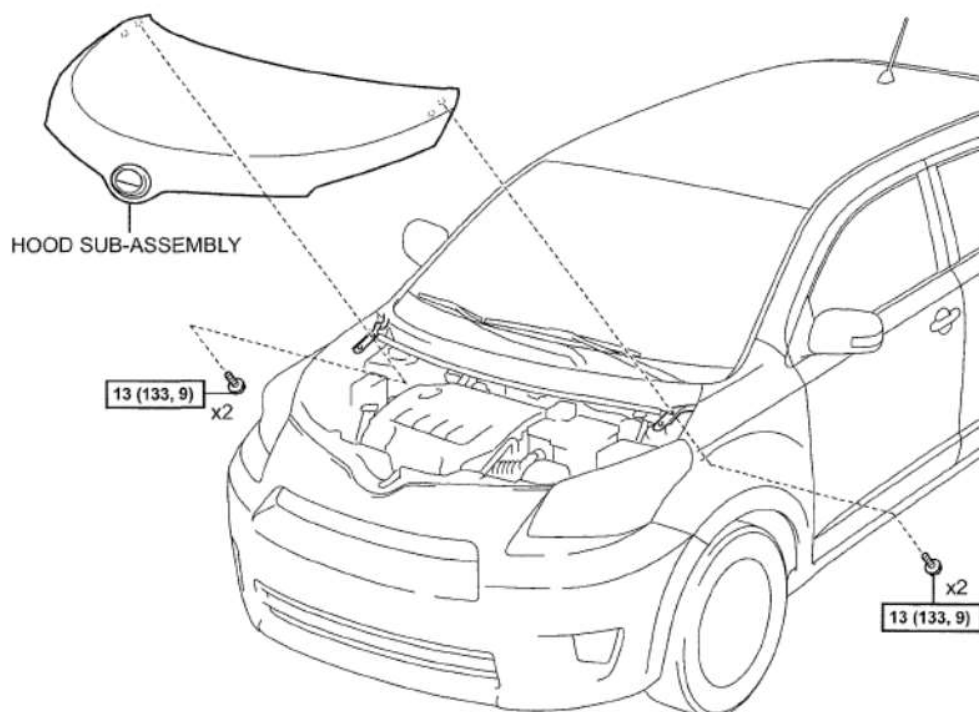
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29. **ADJUST HOOD SUB-ASSEMBLY** (See ADJUSTMENT)
30. **INSPECT AND ADJUST FRONT WHEEL ALIGNMENT**

(See ADJUSTMENT)

FRONT STABILIZER BAR

COMPONENTS



N*m (kgf*cm, ft*lb) : Specified torque

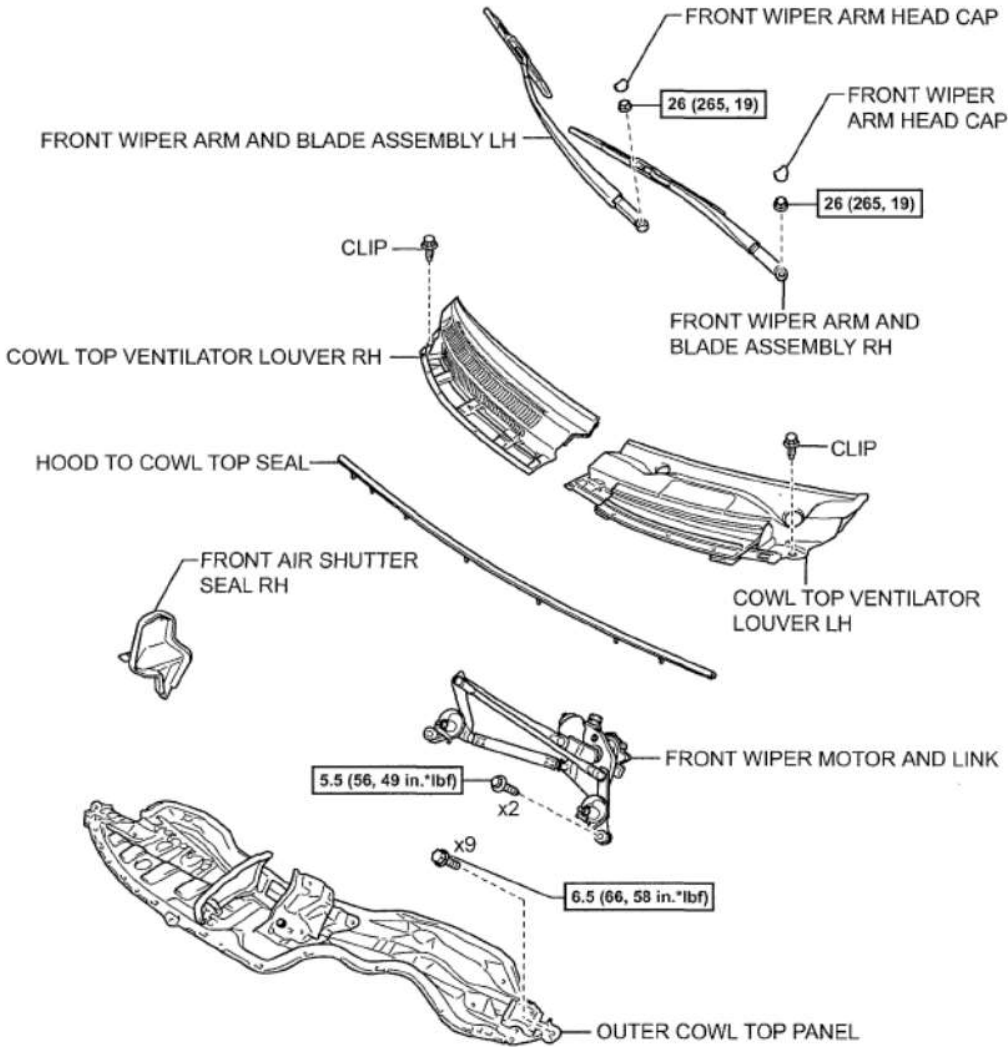
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Fig. 79: Identifying Front Stabilizer Bar Components And Torque Specifications (1 Of 4)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Y A166187E04

Fig. 80: Identifying Front Stabilizer Bar Components And Torque Specifications (2 Of 4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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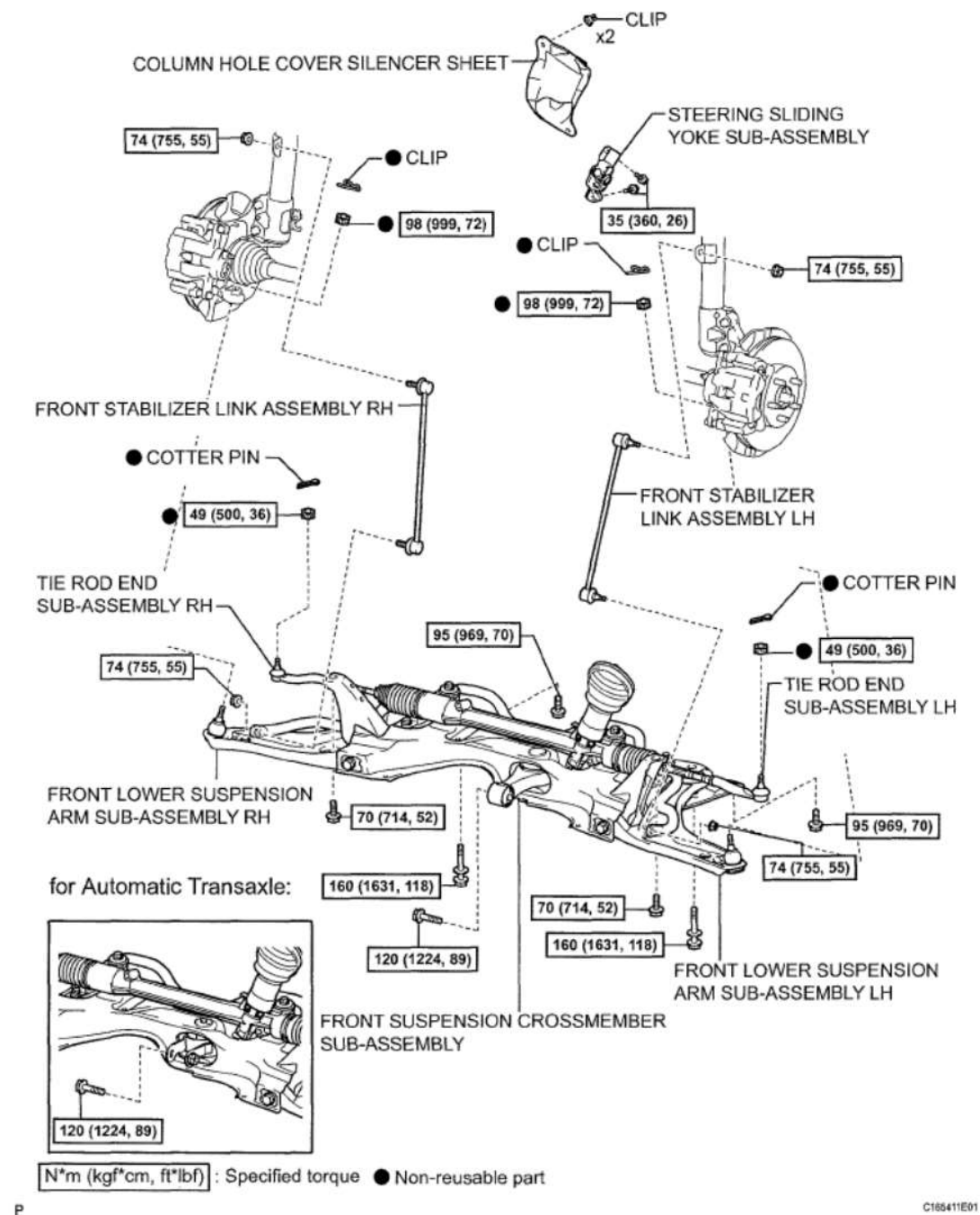
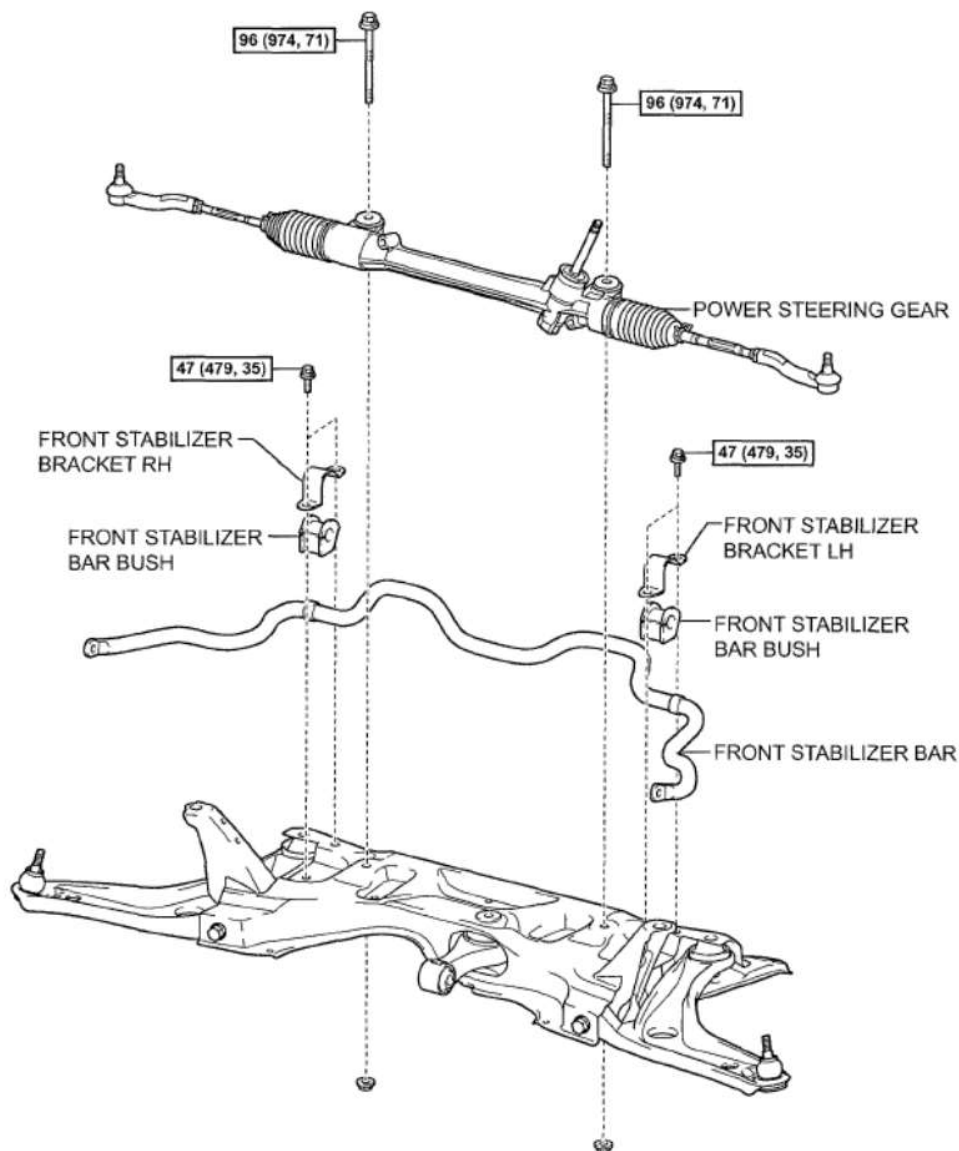


Fig. 81: Identifying Front Stabilizer Bar Components And Torque Specifications (3 Of 4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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$\boxed{\text{N}^*\text{m (kgf}^*\text{cm, ft}^*\text{lbf)}}$: Specified torque

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Fig. 82: Identifying Front Stabilizer Bar Components And Torque Specifications (4 Of 4)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE HOOD SUB-ASSEMBLY
2. REMOVE FRONT WIPER ARM HEAD CAP (See REMOVAL)

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3. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH** (See REMOVAL)
4. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH** (See REMOVAL)
5. **REMOVE HOOD TO COWL TOP SEAL** (See REMOVAL)
6. **REMOVE COWL TOP VENTILATOR LOUVER RH** (See REMOVAL)
7. **REMOVE COWL TOP VENTILATOR LOUVER LH** (See REMOVAL)
8. **REMOVE FRONT WIPER MOTOR AND LINK** (See REMOVAL)
9. **REMOVE FRONT AIR SHUTTER SEAL RH** (See REMOVAL)
10. **REMOVE OUTER COWL TOP PANEL** (See REMOVAL)
11. **POSITION WHEELS FACING STRAIGHT AHEAD**
12. **REMOVE FRONT WHEEL**
13. **REMOVE COLUMN HOLE COVER SILENCER SHEET** (See REMOVAL)
14. **REMOVE STEERING SLIDING YOKE SUB-ASSEMBLY** (See REMOVAL)
15. **REMOVE NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY** (See REMOVAL)
16. **SEPARATE TIE ROD END SUB-ASSEMBLY LH** (See REMOVAL)
17. **SEPARATE TIE ROD END SUB-ASSEMBLY RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

18. **SEPARATE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH** (See REMOVAL)
19. **SEPARATE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

20. **REMOVE FRONT STABILIZER LINK ASSEMBLY LH**
 - a. Remove the 2 nuts and stabilizer link

HINT:

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

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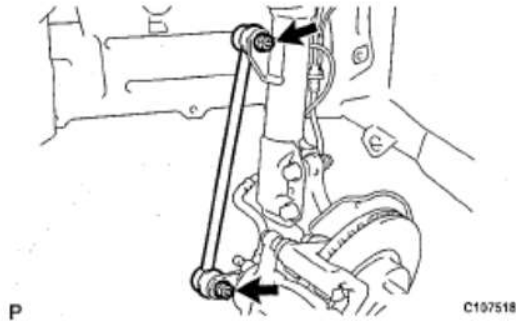


Fig. 83: Locating Nuts And Stabilizer Link
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

21. REMOVE FRONT STABILIZER LINK ASSEMBLY RH

HINT:

The removal procedure for the RH side is the same as that for the LH side.

22. **SUSPEND ENGINE ASSEMBLY** (See REMOVAL)
23. **REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSEMBLY** (See REMOVAL)
24. **REMOVE POWER STEERING GEAR** (See REMOVAL)
25. **REMOVE FRONT STABILIZER NO. 1 BRACKET LH**
 - a. Remove the 2 bolts and the stabilizer bracket.



Fig. 84: Locating Bolts And Stabilizer Bracket
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

26. **REMOVE FRONT STABILIZER NO. 1 BRACKET RH**
 - a. Remove the 2 bolts and the stabilizer bracket.
27. **REMOVE FRONT STABILIZER BAR**
28. **REMOVE FRONT STABILIZER BAR NO. 1 BUSH**

INSPECTION

2008 Scion xD

2008 SUSPENSION Suspension - xD

1. INSPECT FRONT STABILIZER LINK ASSEMBLY

- As shown in the illustration, flip the ball joint stud back and forth 5 times before installing the nut.
- Using a torque wrench, turn the nut continuously at a rate of 3 to 5 seconds per turn and take the torque reading on the 5th turn.

Torque: 0.05 to 1.96 N*m (0.51 to 19.99 kgf*cm, 0.44 to 17.35 in.*lbf)

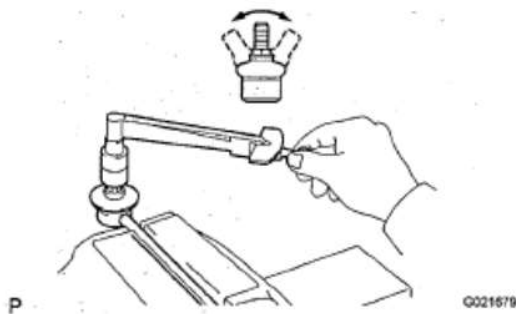


Fig. 85: Checking Front Stabilizer Link Turning Torque
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Check for any cracks and grease leakage on the ball joint dust cover.

INSTALLATION

1. INSTALL FRONT STABILIZER BAR NO. 1 BUSH

- Install the stabilizer bar bush onto the stabilizer bar.

HINT:

- Install the bush onto the stabilizer so that the bush stopper of the stabilizer bar faces the outside of the vehicle.
- Install the bush with its cutout facing the front of the vehicle.

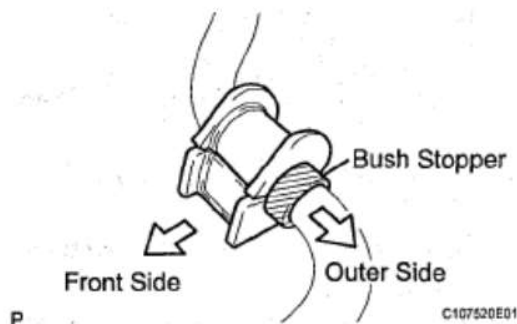


Fig. 86: Identifying Stabilizer Bar Bush Onto Stabilizer Bar
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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2008 SUSPENSION Suspension - xD

2. INSTALL FRONT STABILIZER BAR

- Install the stabilizer onto the crossmember with the paint mark on the left side of the vehicle.

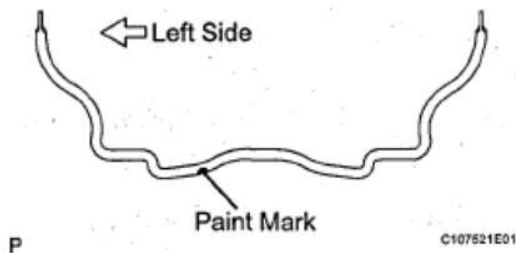


Fig. 87: Identifying Stabilizer Paint Mark
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL FRONT STABILIZER NO. 1 BRACKET LH

- Provisionally tighten bolt A.
- Tighten the bolts to the specified torque, in the order of B then A.

Torque: 47 N*m (479 kgf*cm, 35 ft.*lbf)

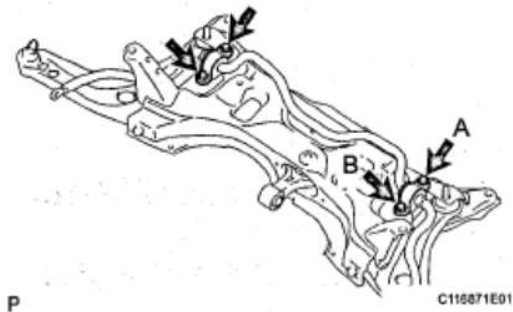


Fig. 88: Locating Front Stabilizer No. 1 Bracket Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. INSTALL FRONT STABILIZER NO. 1 BRACKET RH

HINT:

The installation procedure for the RH side is the same as that for the LH side.

- INSTALL POWER STEERING GEAR** (See INSTALLATION)
- INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSEMBLY** (See INSTALLATION)
- INSTALL FRONT STABILIZER LINK ASSEMBLY LH**
 - Install the stabilizer link with the 2 nuts.

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

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2008 SUSPENSION Suspension - xD

HINT:

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

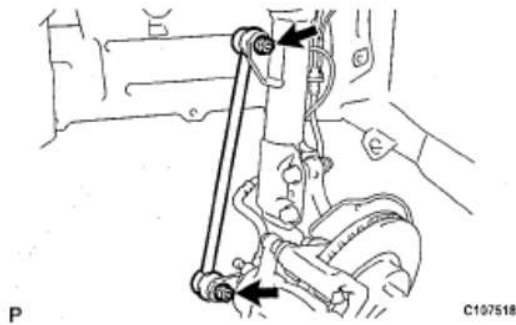


Fig. 89: Locating Nuts And Stabilizer Link
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. INSTALL FRONT STABILIZER LINK ASSEMBLY RH

HINT:

The installation procedure for the RH side is the same as that for the LH side.

9. INSTALL FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH (See INSTALLATION)

10. INSTALL FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH

HINT:

The installation procedure for the RH side is the same as that for the LH side.

11. INSTALL TIE ROD END SUB-ASSEMBLY LH (See INSTALLATION)

12. INSTALL TIE ROD END SUB-ASSEMBLY RH

HINT:

The installation procedure for the RH side is the same as that for the LH side.

13. INSTALL STEERING COLUMN NO. 1 HOLE COVER SUB-ASSEMBLY (See INSTALLATION)

14. INSTALL STEERING SLIDING YOKE SUB-ASSEMBLY (See INSTALLATION)

15. INSTALL COLUMN HOLE COVER SILENCER SHEET (See INSTALLATION)

16. INSTALL FRONT WHEEL

Torque: 103 N*m (1050 kgf*cm, 76 ft.*lbf)

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2008 SUSPENSION Suspension - xD

17. **POSITION WHEELS FACING STRAIGHT AHEAD**
18. **INSTALL OUTER COWL TOP PANEL** (See INSTALLATION)
19. **INSTALL FRONT AIR SHUTTER SEAL RH** (See INSTALLATION)
20. **INSTALL FRONT WIPER MOTOR AND LINK** (See INSTALLATION)
21. **INSTALL COWL TOP VENTILATOR LOUVER LH** (See INSTALLATION)
22. **INSTALL COWL TOP VENTILATOR LOUVER RH** (See INSTALLATION)
23. **INSTALL HOOD TO COWL TOP SEAL** (See INSTALLATION)
24. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH** (See INSTALLATION)
25. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH** (See INSTALLATION)
26. **INSTALL FRONT WIPER ARM HEAD CAP** (See INSTALLATION)
27. **INSPECT HOOD SUB-ASSEMBLY** (See ADJUSTMENT)
28. **ADJUST HOOD SUB-ASSEMBLY** (See ADJUSTMENT)
29. **INSPECT AND ADJUST FRONT WHEEL ALIGNMENT**

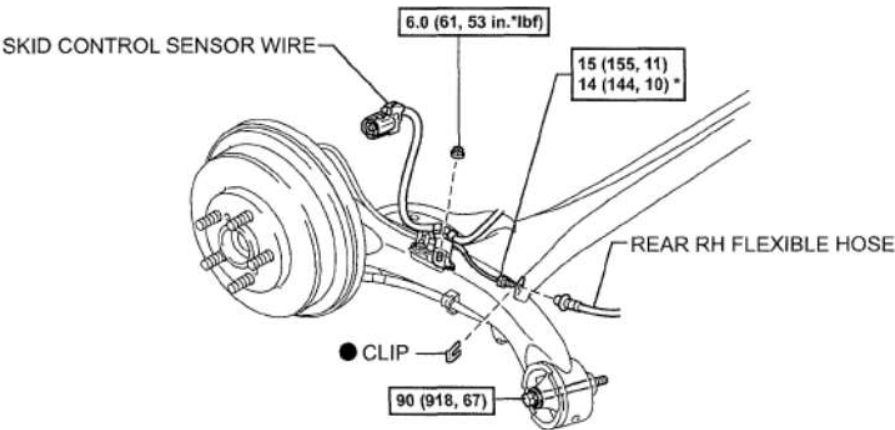
(See ADJUSTMENT)

REAR COIL SPRING**COMPONENTS**

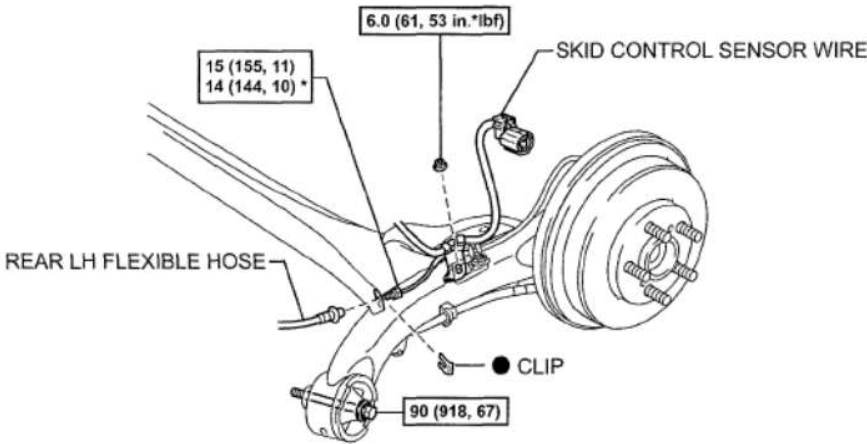
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2008 SUSPENSION Suspension - xD

RH Side:



LH Side:



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

* For use with union nut wrench ● Non-reusable part

N

C165403E01

Fig. 90: Identifying Rear Coil Spring Components And Torque Specifications (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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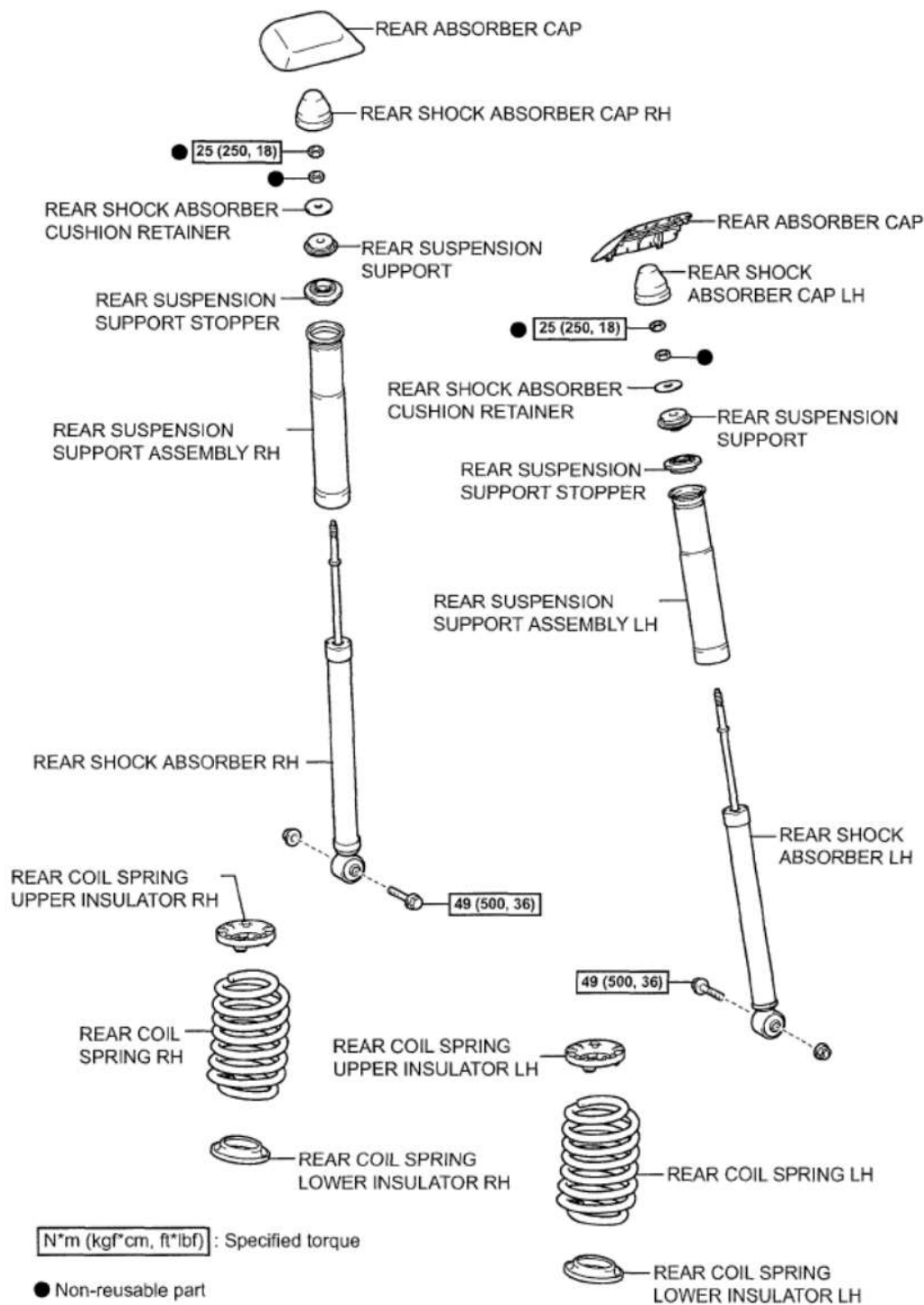


Fig. 91: Identifying Rear Coil Spring Components And Torque Specifications (2 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

2008 Scion xD**2008 SUSPENSION Suspension - xD**

1. **REMOVE REAR WHEEL**
2. **DRAIN BRAKE FLUID**

NOTE: Immediately wash off any brake fluid that comes into contact with any painted surfaces.

3. **SEPARATE SKID CONTROL SENSOR WIRE**

- a. Using a screwdriver, remove the claw of the connector lock portion and disconnect the skid control sensor wire connector.

NOTE: Do not remove the connector cover from the connector because the skid control sensor wire may be damaged.

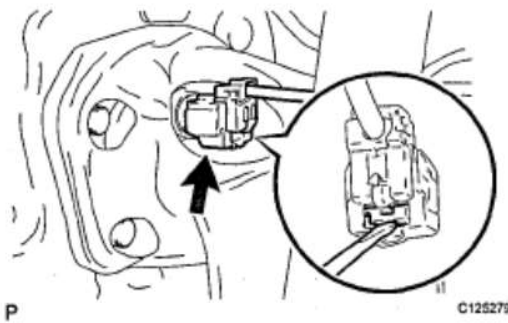


Fig. 92: Disconnecting Skid Control Sensor Wire Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the nut and separate the skid control sensor wire.

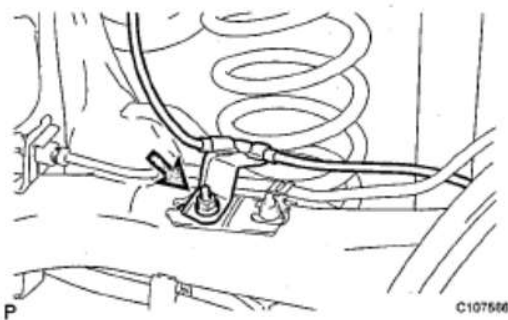


Fig. 93: Locating Nut And Skid Control Sensor Wire
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. **SEPARATE REAR LH FLEXIBLE HOSE**

- a. Using a union nut wrench, separate the brake tube from the flexible hose.

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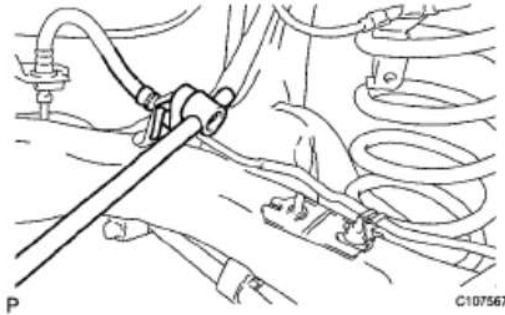


Fig. 94: Separating Brake Tube From Flexible Hose
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the clip and disconnect the flexible hose from the axle beam.

5. SEPARATE REAR RH FLEXIBLE HOSE

HINT:

The removal procedure for the RH side is the same as that for the LH side.

6. LOOSEN REAR AXLE BEAM

- a. Loosen the 2 bolts.

NOTE: Do not remove the bolts.

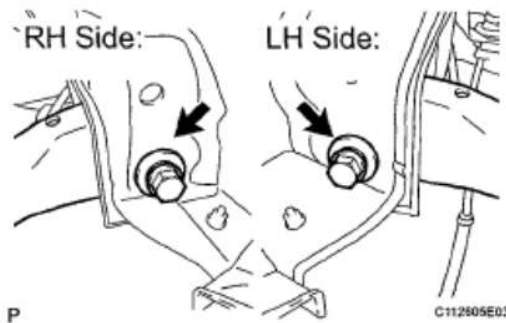


Fig. 95: Locating Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. REMOVE REAR ABSORBER CAP
8. REMOVE REAR ABSORBER CAP
9. REMOVE REAR SHOCK ABSORBER CAP LH
10. REMOVE REAR SHOCK ABSORBER CAP RH
11. REMOVE REAR SHOCK ABSORBER LH (See REMOVAL)
12. REMOVE REAR SHOCK ABSORBER RH

2008 Scion xD**2008 SUSPENSION Suspension - xD**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

13. REMOVE REAR COIL SPRING LH

- a. Lower the jacks slowly.
- b. Remove the coil spring, coil spring insulator upper and coil spring insulator lower.

14. REMOVE REAR COIL SPRING RH

HINT:

The removal procedure for the RH side is the same as that for the LH side.

INSTALLATION**1. INSTALL REAR COIL SPRING LH**

- a. Install the coil spring insulator lower onto the axle beam.
- b. Install the coil spring insulator upper so that its gap fits onto the end of coil spring.

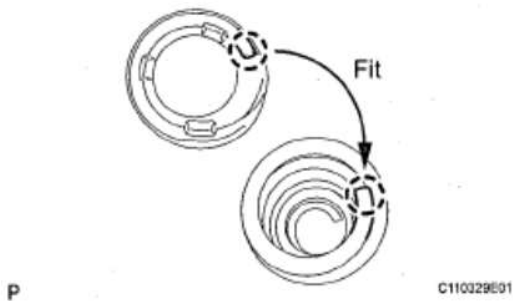


Fig. 96: Identifying End Of Coil Spring

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install the coil spring onto the axle beam.

NOTE: The paint mark of the coil spring should be towards the underside and rear side of the vehicle.

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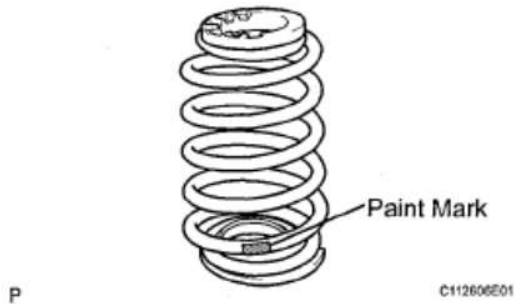


Fig. 97: Identifying Paint Mark On Coil Spring
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL REAR COIL SPRING RH

HINT:

The installation procedure for the RH side is the same as that for the LH side.

3. **TEMPORARILY TIGHTEN REAR SHOCK ABSORBER LH** (See **INSTALLATION**)
4. **TEMPORARILY TIGHTEN REAR SHOCK ABSORBER RH**

HINT:

The installation procedure for the RH side is the same as that for the LH side.

5. **INSTALL REAR SHOCK ABSORBER CAP LH**
6. **INSTALL REAR SHOCK ABSORBER CAP RH**
7. **INSTALL REAR ABSORBER CAP**
8. **INSTALL REAR ABSORBER CAP**
9. **INSTALL REAR LH FLEXIBLE HOSE**

- a. Connect the flexible hose onto the axle beam with a new clip.

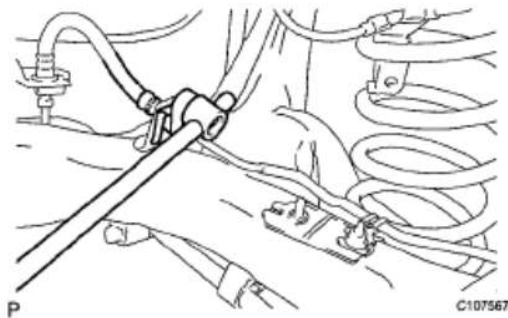


Fig. 98: Separating Brake Tube From Flexible Hose
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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2008 SUSPENSION Suspension - xD

- b. Using a union nut wrench, install the brake tube.

Torque: without union nut wrench

15 N*m (155 kgf*cm, 11 ft.*lbf)

with union nut wrench

14 N*m (144 kgf*cm, 10 ft.*lbf)

NOTE:

- This torque value can be obtained by using a torque wrench with a fulcrum length of 300 mm (11.8 in.) and a union nut wrench with a fulcrum length of 22 mm (0.866 in.) (See REPAIR INSTRUCTION).
- This torque value is effective when union nut wrench is parallel to a torque wrench.

10. INSTALL REAR RH FLEXIBLE HOSE

HINT:

The installation procedure for the RH side is the same as that for the LH side.

11. INSTALL SKID CONTROL SENSOR WIRE

- a. Install the skid control sensor wire onto the axle beam with the nut.

Torque: 6.0 N*m (61 kgf*cm, 53 in.*lbf)

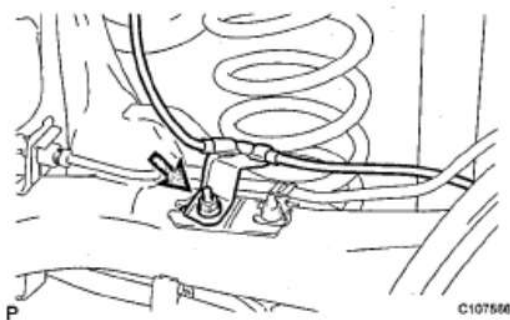


Fig. 99: Locating Nut And Skid Control Sensor Wire
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the skid control sensor wire connector.

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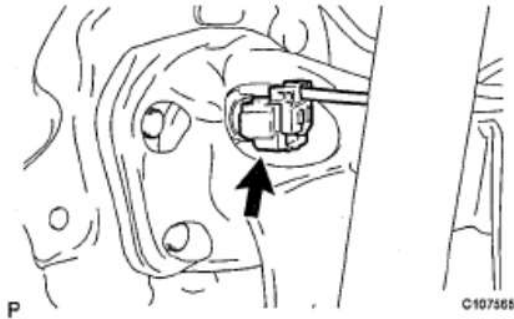


Fig. 100: Locating Skid Control Sensor Wire Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

12. INSTALL REAR WHEEL

Torque: 103 N*m (1050 kgf*cm, 76 ft.*lbf)

13. STABILIZE SUSPENSION

- a. Lower the vehicle from the jack.
- b. Bounce the vehicle up and down several times to stabilize the suspension.

14. FULLY TIGHTEN REAR AXLE BEAM (See INSTALLATION)

15. FULLY TIGHTEN REAR SHOCK ABSORBER LH (See INSTALLATION)

16. FULLY TIGHTEN REAR SHOCK ABSORBER RH

HINT:

The installation procedure for the RH side is the same as that for the LH side.

17. FILL RESERVOIR WITH BRAKE FLUID (See ON-VEHICLE INSPECTION)

18. BLEED MASTER CYLINDER (See ON-VEHICLE INSPECTION)

19. BLEED BRAKE LINE (See REPLACEMENT)

20. BLEED BRAKE ACTUATOR (w/ VSC) (See REPLACEMENT)

21. CHECK FLUID LEVEL IN RESERVOIR (See REPLACEMENT)

22. CHECK FOR BRAKE FLUID LEAKAGE

23. INSPECT REAR WHEEL ALIGNMENT

(See INSPECTION)

24. CHECK ABS SENSOR SIGNAL (w/o VSC)

(See TEST MODE PROCEDURE)

25. CHECK VSC SENSOR SIGNAL (w/ VSC)

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(See **TEST MODE PROCEDURE**)

REAR SHOCK ABSORBER

COMPONENTS

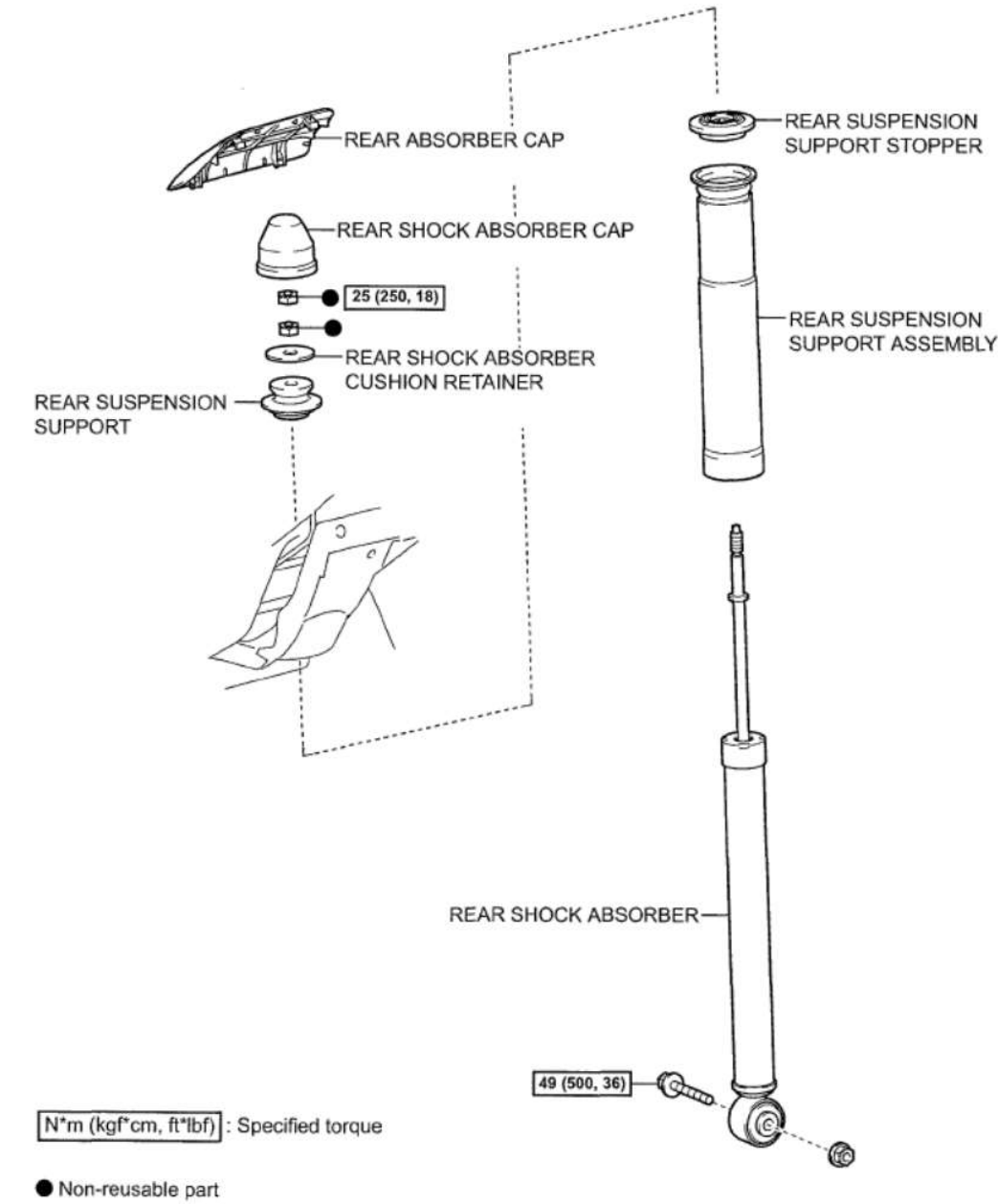


Fig. 101: Identifying Rear Shock Absorber Components And Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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REMOVAL

1. REMOVE REAR WHEEL
2. REMOVE REAR ABSORBER CAP
3. REMOVE REAR SHOCK ABSORBER CAP
4. REMOVE REAR SHOCK ABSORBER
 - a. Support the axle beam with a jack. Insert a wooden block between the jack and the rear axle spring seat to prevent damage.
 - b. Remove the 2 nuts while keeping the piston rod from rotating.

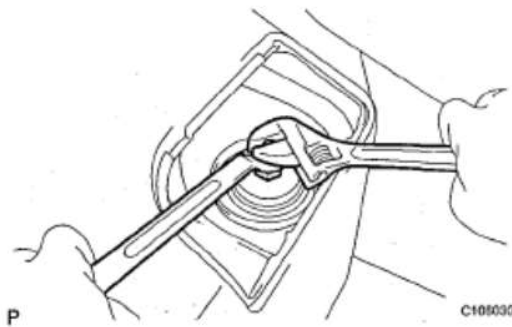


Fig. 102: Removing Piston Rod Nuts

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the cushion retainer and suspension support.
- d. Remove the bolt while keeping the nut from rotating and remove the shock absorber.

NOTE: Remove the nut from the bolt side because the one on the lower side is a jam nut.

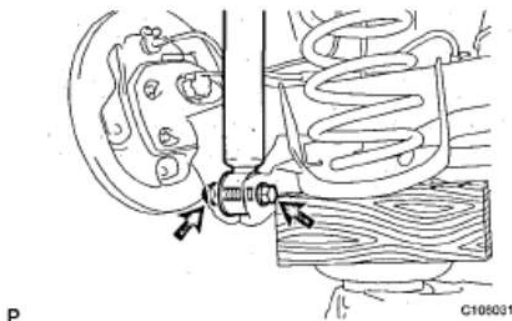


Fig. 103: Locating Shock Absorber Bolts

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. REMOVE REAR SUSPENSION SUPPORT STOPPER
6. REMOVE REAR SUSPENSION SUPPORT ASSEMBLY

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INSPECTION

1. INSPECT REAR SHOCK ABSORBER

- Compress and extend the shock absorber rod and check that there is no abnormal resistance or abnormal sound during the operation. If there is any abnormality, replace the shock absorber with a new one.

NOTE: When disposing of the shock absorber rear, see **DISPOSAL**. (See **INSTALLATION**)

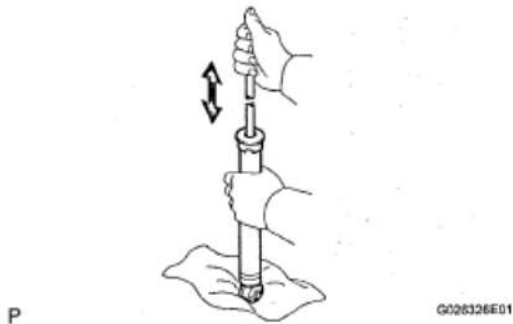


Fig. 104: Inspecting Rear Shock Absorber
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

- INSTALL REAR SUSPENSION SUPPORT ASSEMBLY
- INSTALL REAR SUSPENSION SUPPORT STOPPER
- TEMPORARILY TIGHTEN REAR SHOCK ABSORBER

- Support the axle beam with a jack. Insert a wooden block between the jack and the rear axle spring seat to prevent damage.
- Jack up the axle beam slowly, and provisionally install the shock absorber (lower side) with the bolt and nut onto the axle beam.

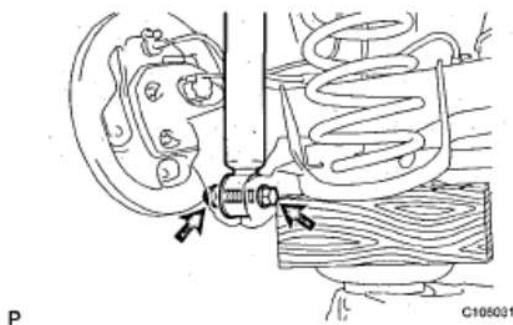


Fig. 105: Locating Shock Absorber Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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- c. Install the suspension support and cushion retainer.
- d. While holding the piston rod, install a new nut (lower nut) to the specified standard.

Standard:

15 to 18 mm (0.591 to 0.709 in.)

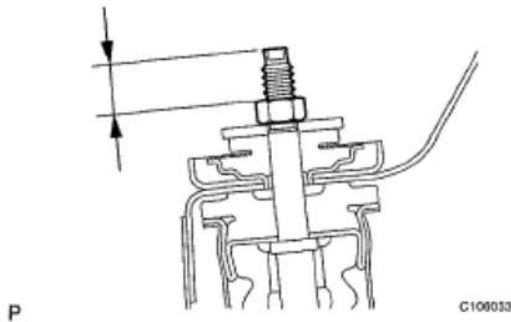


Fig. 106: Identifying Piston Rod Dimension

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. While holding the piston rod, tighten a new nut (upper nut).

Torque: 25 N*m (250 kgf*cm, 18 ft.*lbf)

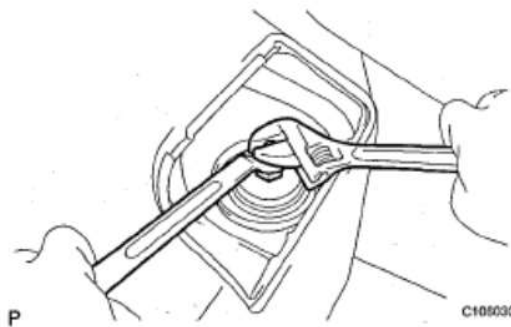


Fig. 107: Tightening Piston Rod Nuts

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. **INSTALL REAR SHOCK ABSORBER CAP**
5. **INSTALL REAR ABSORBER CAP**
6. **INSTALL REAR WHEEL**

Torque: 103 N*m (1050 kgf*cm, 76 ft.*lbf)

7. **STABILIZE SUSPENSION**

- a. Lower the vehicle from the jack.

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- b. Bounce the vehicle up and down several times to stabilize the suspension.

8. FULLY TIGHTEN REAR SHOCK ABSORBER

- a. Fully tighten the shock absorber (lower side) with the bolt.

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

9. INSPECT REAR WHEEL ALIGNMENT

(See **INSPECTION**)

DISPOSAL

1. DISPOSE OF REAR SHOCK ABSORBER

- Fully extend the shock absorber piston rod.
- Using a drill or similar tool, slowly make a hole in the area (A-B) shown in the illustration to discharge the gas inside.

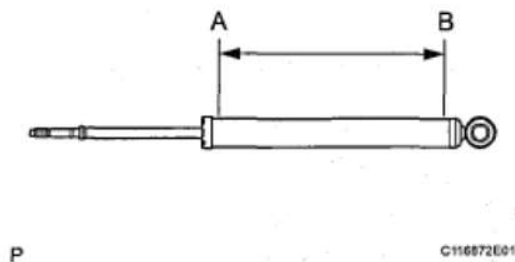


Fig. 108: Identifying Shock Absorber Piston Rod Dimension
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- The gas is colorless, odorless and harmless.
- Since the discharging gas may cause chips to scatter, cover the drill with a shop rag or piece of cloth when making the hole.

REAR AXLE BEAM

COMPONENTS

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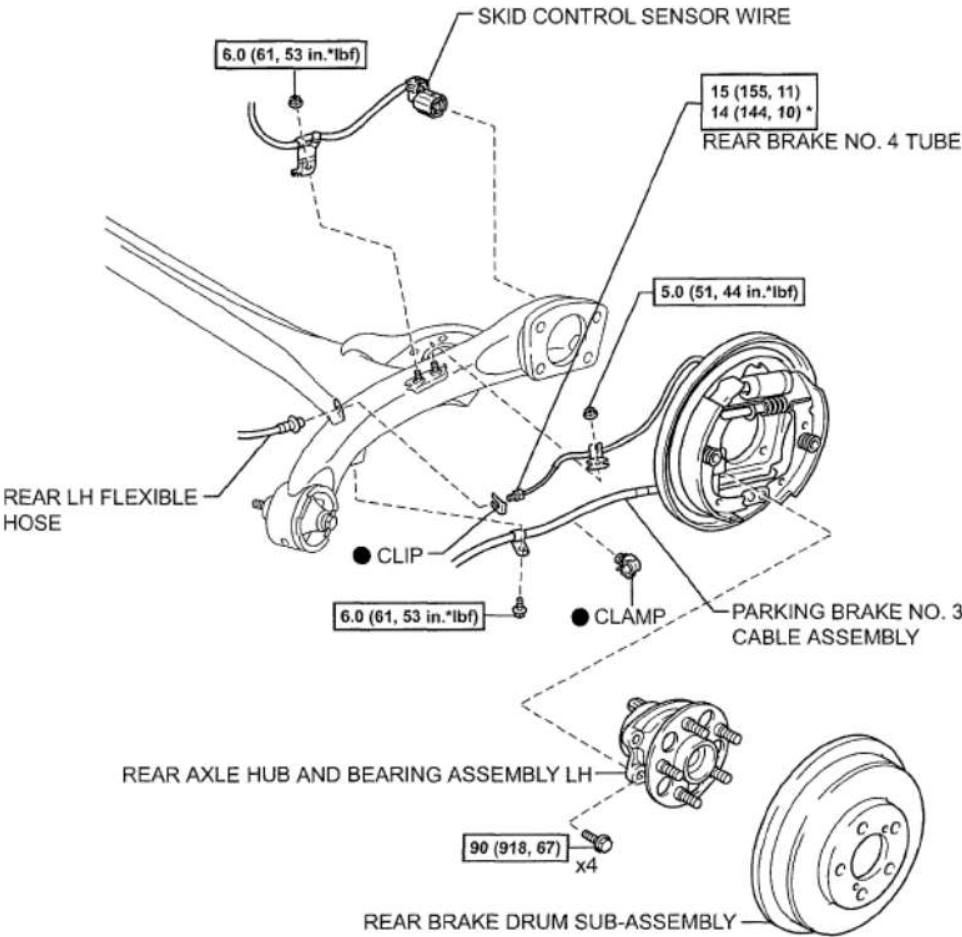


Fig. 109: Identifying Rear Axle Beam Components And Torque Specifications (1 Of 4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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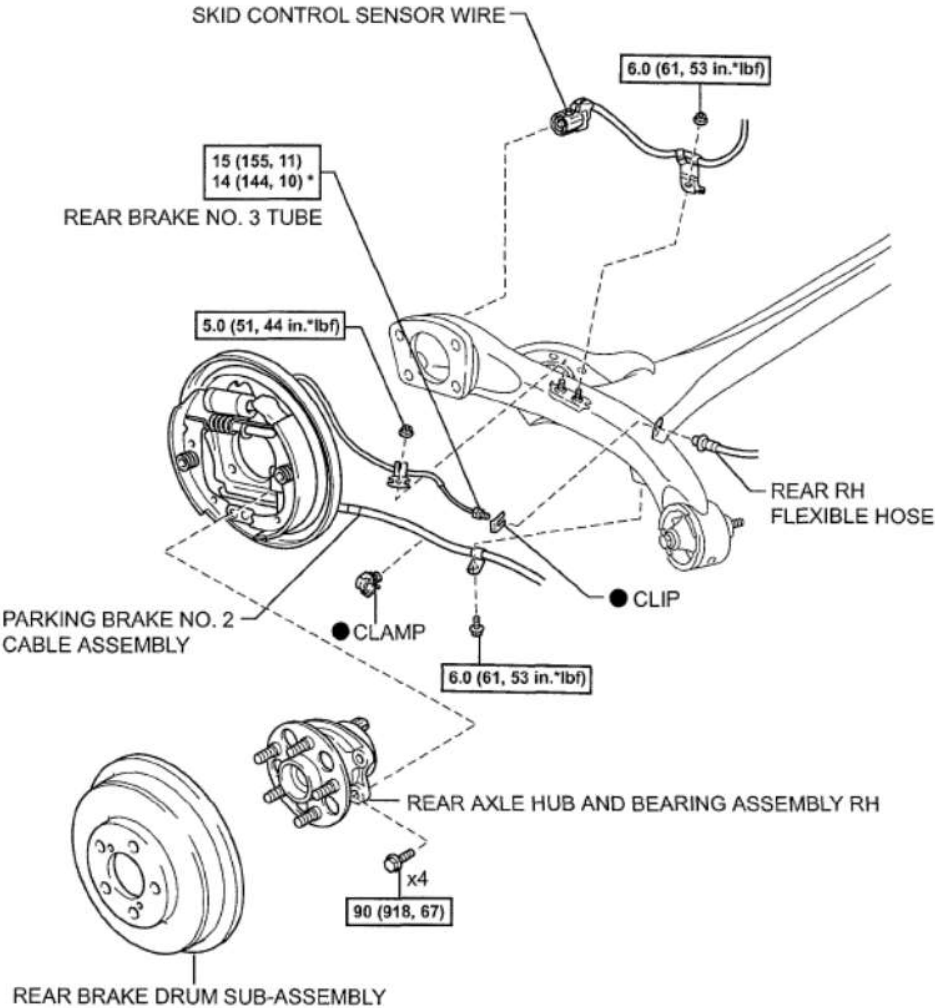


Fig. 110: Identifying Rear Axle Beam Components And Torque Specifications (2 Of 4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

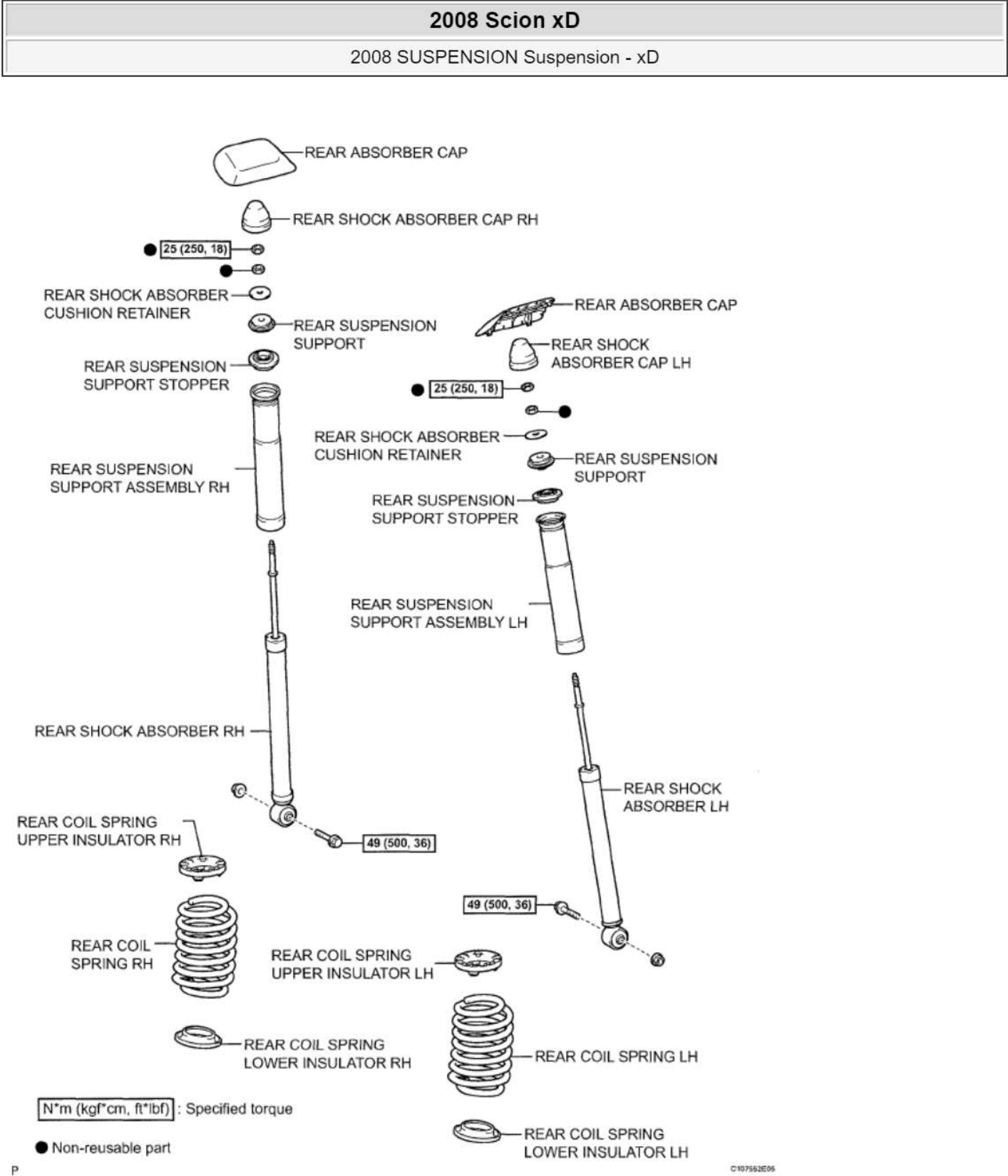


Fig. 111: Identifying Rear Axle Beam Components And Torque Specifications (3 Of 4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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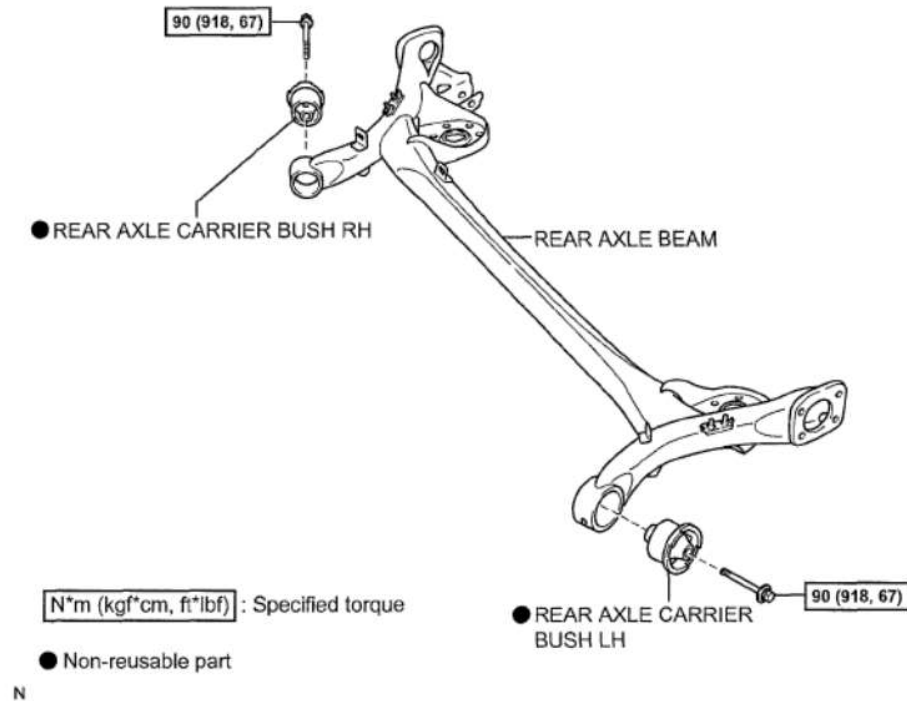


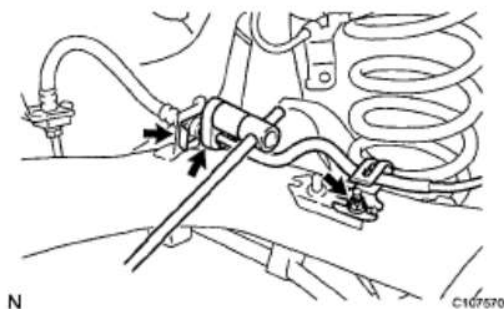
Fig. 112: Identifying Rear Axle Beam Components And Torque Specifications (4 Of 4)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE REAR WHEEL
2. DRAIN BRAKE FLUID

NOTE: Immediately wash off any brake fluid that comes into contact with any painted surfaces.

3. SEPARATE SKID CONTROL SENSOR WIRE (See REMOVAL)
4. SEPARATE REAR BRAKE NO. 4 TUBE
 - a. Using a union nut wrench, separate the brake tube from the flexible hose.



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Fig. 113: Separating Brake Tube From Flexible Hose
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the clip and disconnect the flexible hose from the axle beam.
- c. Remove the nut and separate the brake tube.

5. SEPARATE REAR BRAKE NO. 3 TUBE

HINT:

The removal procedure for the RH side is the same as that for the LH side.

6. SEPARATE PARKING BRAKE NO. 3 CABLE ASSEMBLY

- a. Break the cable clamp to remove it.

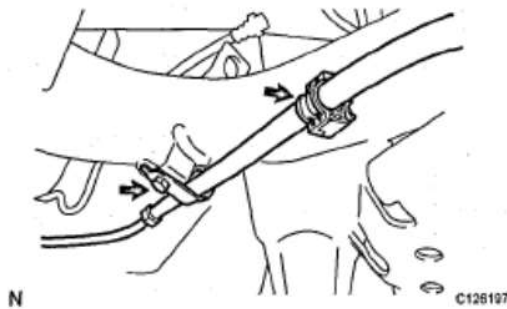


Fig. 114: Locating Cable Clamp
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the bolt and separate the parking brake cable.

7. SEPARATE PARKING BRAKE NO. 2 CABLE ASSEMBLY

HINT:

The removal procedure for the RH side is the same as that for the LH side.

- 8. **REMOVE REAR BRAKE DRUM SUB-ASSEMBLY** (See REMOVAL)
- 9. **REMOVE REAR AXLE HUB AND BEARING ASSEMBLY LH** (See REMOVAL)
- 10. **REMOVE REAR AXLE HUB AND BEARING ASSEMBLY RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

- 11. **LOOSEN REAR AXLE BEAM** (See REMOVAL)
- 12. **REMOVE REAR ABSORBER CAP**
- 13. **REMOVE REAR ABSORBER CAP**

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14. **REMOVE REAR SHOCK ABSORBER CAP LH**
15. **REMOVE REAR SHOCK ABSORBER CAP RH**
16. **REMOVE REAR SHOCK ABSORBER LH (See REMOVAL)**
17. **REMOVE REAR SHOCK ABSORBER RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

18. **REMOVE REAR COIL SPRING LH (See REMOVAL)**
19. **REMOVE REAR COIL SPRING RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

20. **REMOVE REAR AXLE BEAM**
 - a. Remove the 2 bolts and remove the axle beam.

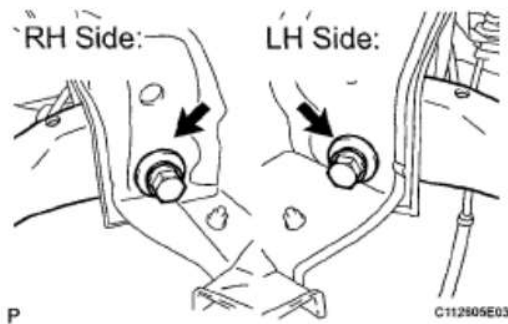


Fig. 115: Locating Bolts

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REPLACEMENT

1. **REMOVE REAR AXLE CARRIER BUSH LH**
 - a. Place a matchmark on the axle beam with it aligned with the bush mark.
 - b. Using a chisel and hammer, bend the 2 portions of the bush rib.

NOTE: **Bend the bush rib until the claw of SST can be suspended.**

- c. Using SST, remove the bush from the axle beam.

SST 09950-40011 (09951-04020, 09952-04010, 09953-04030, 09954-04020, 09955-04011, 09957-04010, 09958-04011), 09612-30012, 09950-60010 (09951-00590)

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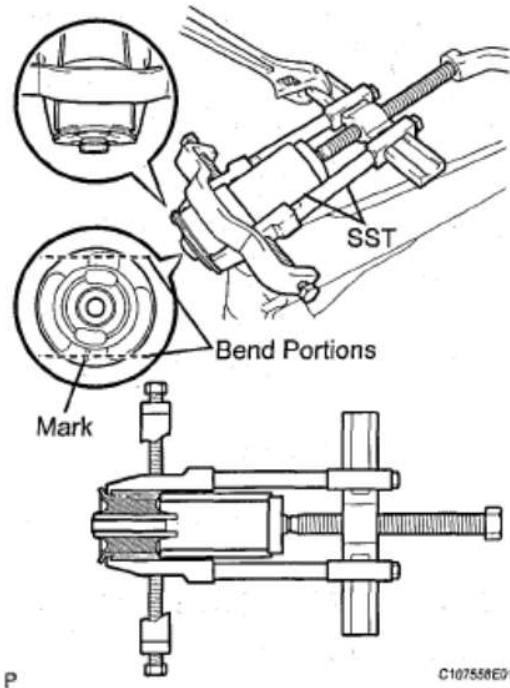


Fig. 116: Removing Bush From Axle Beam

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Apply paint to any scratches on the rear axle beam.

2. REMOVE REAR AXLE CARRIER BUSH RH

HINT:

The removal procedure for the RH side is the same as that for the LH side.

3. INSTALL REAR AXLE CARRIER BUSH LH

- a. Align the matchmarks on a new bush and the axle beam and provisionally install the bush onto the axle beam, as shown in the illustration.

NOTE: Install the new bush in the same orientation as the old one was prior to removal, because they are directional.

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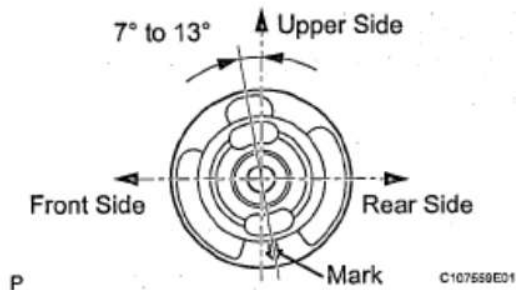


Fig. 117: Aligning Matchmarks On Bush And Axle Beam
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST, install the bush onto the axle beam.

SST 09950-40011 (09951-04020, 09952-04010, 09953-04030, 09954-04030, 09955-04051, 09957-04010, 09958-04011), 09950-60020 (09951-00810, 09387-02010), 09223-15020

NOTE: Do not damage the rubber portion when installing the bush.

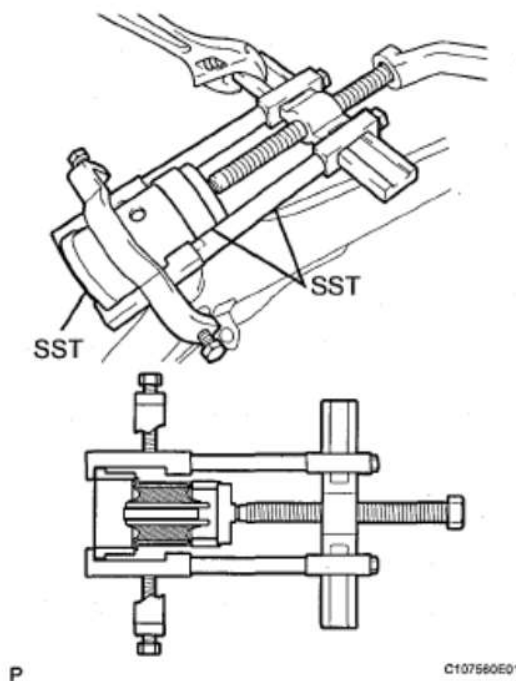


Fig. 118: Installing Bush Onto Axle Beam
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. INSTALL REAR AXLE CARRIER BUSH RH

HINT:

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The installation procedure for the RH side is the same as that for the LH side.

INSTALLATION

1. TEMPORARILY TIGHTEN REAR AXLE BEAM

- a. Support the rear axle beam with a jack.
- b. Install the axle beam onto the vehicle and provisionally tighten the 2 bolts.

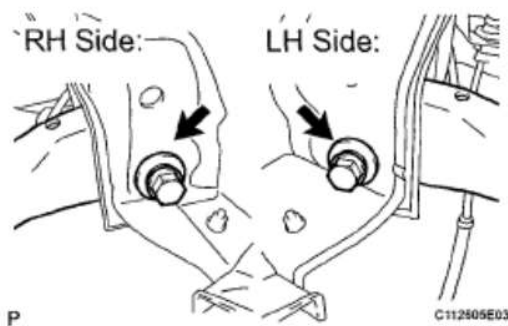


Fig. 119: Locating Bolts

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **INSTALL REAR COIL SPRING LH** (See INSTALLATION)
3. **INSTALL REAR COIL SPRING RH**

HINT:

The installation procedure for the RH side is the same as that for the LH side.

4. **TEMPORARILY TIGHTEN REAR SHOCK ABSORBER LH** (See INSTALLATION)
5. **TEMPORARILY TIGHTEN REAR SHOCK ABSORBER RH**

HINT:

The installation procedure for the RH side is the same as that for the LH side.

6. **INSTALL REAR SHOCK ABSORBER CAP LH**
7. **INSTALL REAR SHOCK ABSORBER CAP RH**
8. **INSTALL REAR ABSORBER CAP**
9. **INSTALL REAR ABSORBER CAP**
10. **INSTALL REAR AXLE HUB AND BEARING ASSEMBLY LH** (See INSTALLATION)
11. **INSTALL REAR AXLE HUB AND BEARING ASSEMBLY RH**

HINT:

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The installation procedure for the RH side is the same as that for the LH side.

12. **INSPECT REAR AXLE HUB BEARING** (See ON-VEHICLE INSPECTION)
13. **INSTALL REAR BRAKE DRUM SUB-ASSEMBLY**
14. **ADJUST REAR DRUM BRAKE SHOE CLEARANCE** (See INSTALLATION)
15. **INSTALL PARKING BRAKE NO. 3 CABLE ASSEMBLY**
 - a. Install the parking brake cable with the bolt and a new clamp.

Torque: 6.0 N*m (61 kgf*cm, 53 in.*lbf)

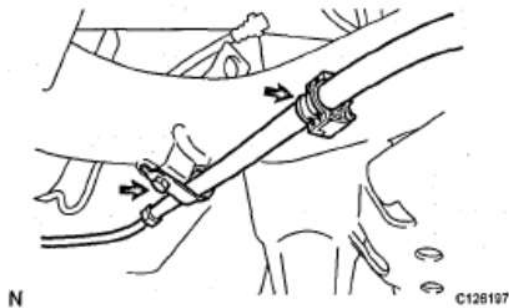


Fig. 120: Locating Cable Clamp

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

16. **INSTALL PARKING BRAKE NO. 2 CABLE ASSEMBLY**

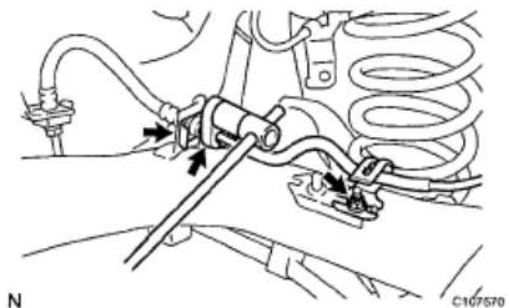
HINT:

The installation procedure for the RH side is the same as that for the LH side.

17. **INSTALL REAR BRAKE NO. 4 TUBE**
 - a. Install the brake tube onto the axle beam with the nut.

Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)

 - b. Connect the flexible hose to the axle beam with a new clip.



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Fig. 121: Connecting Flexible Hose To Axle Beam

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a union nut wrench, install the brake tube onto the flexible hose.

Torque: without union nut wrench**15 N*m (155 kgf*cm, 11 ft.*lbf)****with union nut wrench****14 N*m (144 kgf*cm, 10 ft.*lbf)****NOTE:**

- This torque value can be obtained by using a torque wrench with a fulcrum length of 300 mm (11.8 in.) and a union nut wrench with a fulcrum length of 22 mm (0.866 in.) (See REPAIR INSTRUCTION).
- This torque value is effective when union nut wrench is parallel to a torque wrench.

18. INSTALL REAR BRAKE NO. 3 TUBE**HINT:**

The installation procedure for the RH side is the same as that for the LH side.

19. INSTALL SKID CONTROL SENSOR WIRE (See INSTALLATION)**20. INSTALL REAR WHEEL****Torque: 103 N*m (1050 kgf*cm, 76 ft.*lbf)****21. STABILIZE SUSPENSION**

- Lower the vehicle from the jack.
- Bounce the vehicle up and down several times to stabilize the suspension.

22. FULLY TIGHTEN REAR AXLE BEAM

- Suspend the jack on the rear axle spring seat and adjust the length of the shock absorber to the reference value.

Length of shock absorber:**220 mm (8.7 in.)**

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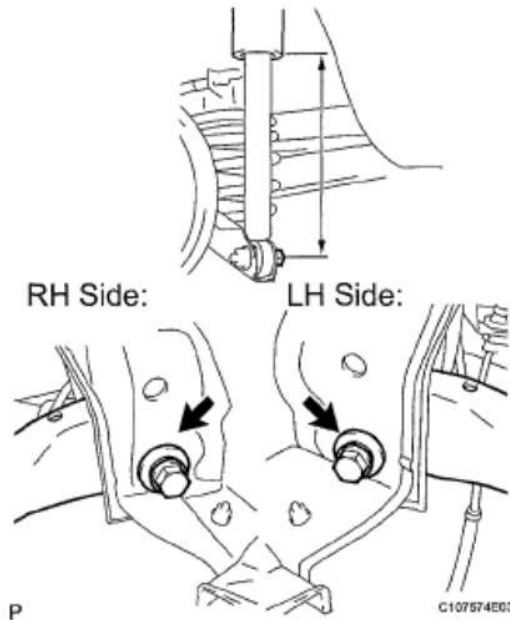


Fig. 122: Identifying Length Of Shock Absorber
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Fully tighten the 2 bolts.

Torque: 90 N*m (918 kgf*cm, 67 ft.*lbf)

23. **FULLY TIGHTEN REAR SHOCK ABSORBER LH** (See INSTALLATION)
24. **FULLY TIGHTEN REAR SHOCK ABSORBER RH**

HINT:

The installation procedure for the RH side is the same as that for the LH side.

25. **FILL RESERVOIR WITH BRAKE FLUID** (See ON-VEHICLE INSPECTION)
26. **BLEED MASTER CYLINDER** (See ON-VEHICLE INSPECTION)
27. **BLEED BRAKE LINE** (See REPLACEMENT)
28. **BLEED BRAKE ACTUATOR (w/ VSC)** (See REPLACEMENT)
29. **CHECK FLUID LEVEL IN RESERVOIR** (See REPLACEMENT)
30. **CHECK FOR BRAKE FLUID LEAKAGE**
31. **INSPECT REAR WHEEL ALIGNMENT**

(See INSPECTION)

32. **CHECK ABS SENSOR SIGNAL (w/o VSC)**

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(See **TEST MODE PROCEDURE**)

33. **CHECK VSC SENSOR SIGNAL (w/ VSC)**

(See **TEST MODE PROCEDURE**)