

Last Modified: 10-5-2010	6.4 N	From: 200907
Model Year: 2010	Model: HS250H	Doc ID: RM00000227X00EX
Title: ALIGNMENT / HANDLING DIAGNOSIS: REAR WHEEL ALIGNMENT: ADJUSTMENT (2010 HS250H)		

ADJUSTMENT

NOTICE:

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:

- Perform zero point calibration of the yaw rate and acceleration sensor.

1. INSPECT TIRES_ [INFO](#)

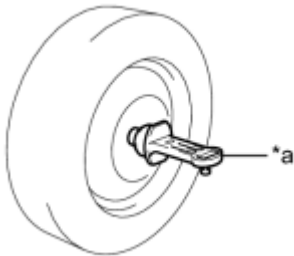
2. MEASURE VEHICLE HEIGHT_ [INFO](#)

3. INSPECT CAMBER

NOTICE:

Inspect while the vehicle is unloaded.

- (a) Install a camber-caster-kingpin gauge.



P

Text in Illustration	Camber-caster-kingpin Gauge
*a	

- (b) Inspect the camber.

Camber (Unloaded Vehicle):

Tire Size	Camber Inclination	Right-left Difference
P215/55R17	-1°01' +/- 0°45' (-1.02° +/- 0.75°)	0°45' (0.75°) or less
P225/45R18	-0°51' +/- 0°45' (-0.85° +/- 0.75°)	

HINT:

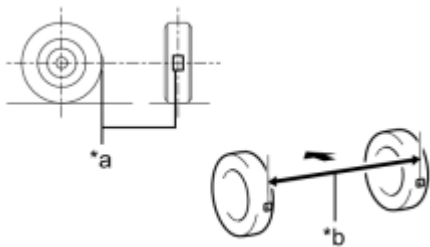
Camber is not adjustable. If the measurement is not within the specified range, inspect the suspension parts for damage and/or wear, and replace them if necessary.

4. INSPECT TOE-IN


NOTICE:

Inspect while the vehicle is unloaded.

- (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 N.
- (c) Push the vehicle straight ahead approximately 5 m (16.4 ft.). (Step A)
- (d) Put tread center marks on the rearmost points of the rear wheels and measure the distance between the marks (dimension B).



Text in Illustration

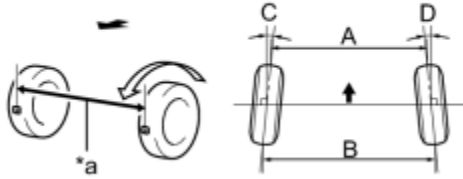
*a	Tread Center Mark
*b	Dimension B
	Front of the Vehicle

- (e) Slowly push the vehicle straight ahead to cause the rear wheels to rotate 180° using the rear 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 Step A again.

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



Text in Illustration

*a	Dimension A
➔	Front of the Vehicle

Toe-in (Unloaded Vehicle):

Specified Condition	Right-left Difference
C + D: 0°11' +/- 0°11' (0.19° +/- 0.19°)	0°05' (0.09°) or less
B - A: 2.0 +/- 2.0 mm (0.0787 +/- 0.0787 in.)	1.0 mm (0.0393 in.) or less

HINT:

Measure "B - A" only when "C + D" cannot be measured.

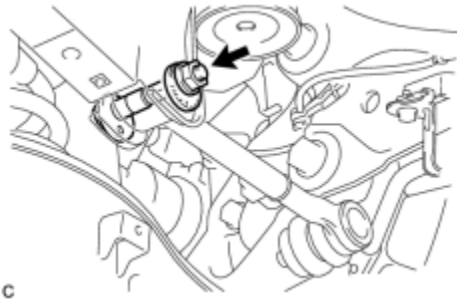
If the toe-in is not within the specified range, adjust it at the rear No. 1 suspension arms.

5. ADJUST TOE-IN (for Cam Type)

(a) Loosen the nut of the rear No. 1 suspension arm assembly (at the rear suspension member side).

NOTICE:

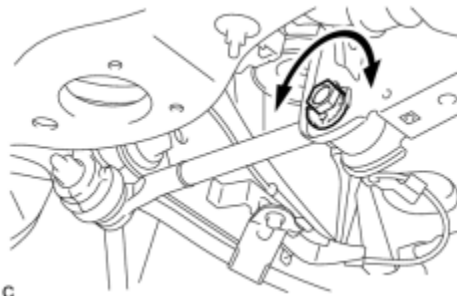
Hold the rear suspension toe adjust cam sub-assembly



while rotating the nut.

(b) Rotate the rear suspension toe adjust cam sub-assembly to adjust the toe-in.

Toe-in (Unloaded Vehicle):

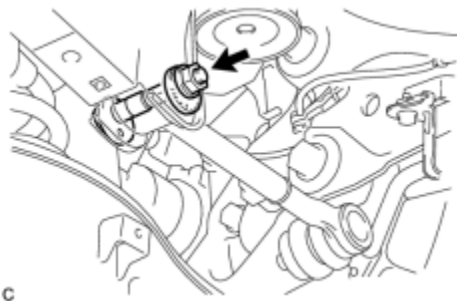


Specified Condition	Right-left Difference
C + D: 0°11' +/- 0°11' (0.19° +/- 0.19°)	0°05' (0.09°) or less
B - A: 2.0 +/- 2.0 mm (0.0787 +/- 0.0787 in.)	1.0 mm (0.0393 in.) or less

HINT:

Rotating the rear suspension toe adjust cam sub-assembly by one notch changes the toe by approximately 3.5 mm (1.38 in.).

(c) Tighten the nut of the rear No. 1 suspension arm assembly (at the rear suspension member side).



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

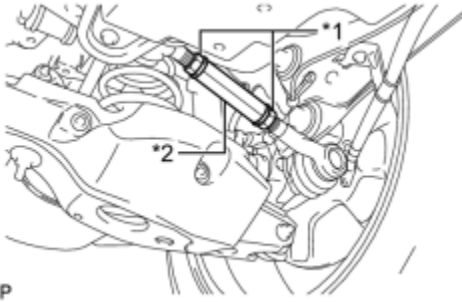
NOTICE:

- Hold the rear suspension toe adjust cam sub-assembly while rotating the nut.
- Make sure that all tires of the vehicle are on the ground and the vehicle is unloaded.

6. ADJUST TOE-IN (for Turnbuckle Type)

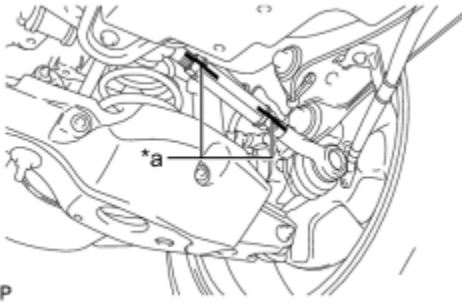
(a) Inspect the rear No. 1 suspension arm assembly.

(1) Inspect the nuts and adjusting tube for looseness



visually and by hand. (Step B)

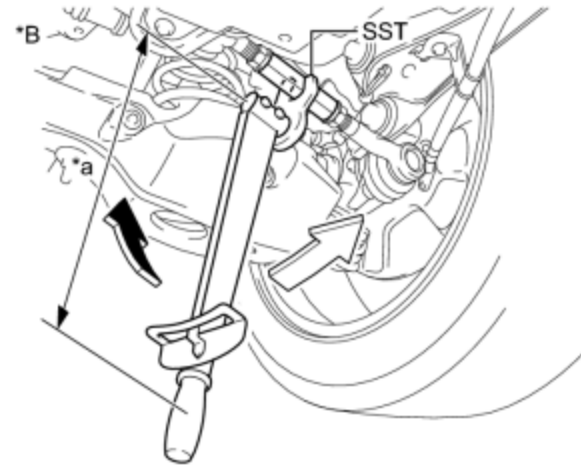
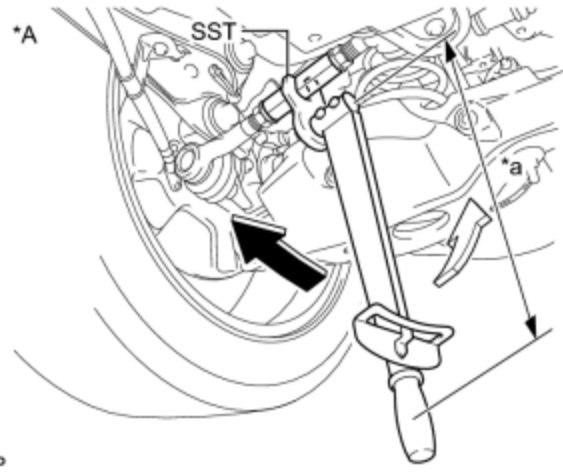
Text in Illustration	
*1	Nut
*2	Adjusting Tube



(2) Place matchmarks on the arm, nuts and adjusting tube as shown in the illustration. (Step C)

Text in Illustration	
*a	Matchmark

(3) Using SST, apply the specified torque to the adjusting tube in the following order and check that the matchmarks are still aligned: 1) extend direction, 2) contract direction. (Step D)



Text in Illustration

*A	for RH Side	*B	for LH Side
*a	Fulcrum Length	-	-
	Extend Direction		Contract Direction

SST: 09612-24014

09617-24011

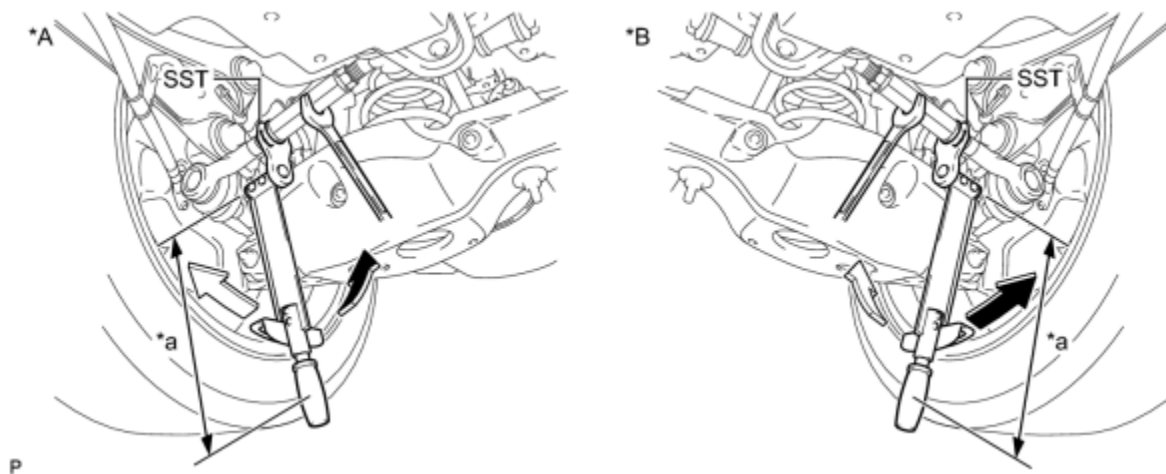
without SST - Torque: **20 N·m (204 kgf·cm, 15ft·lbf)**

with SST - Torque: **17 N·m (174 kgf·cm, 13ft·lbf)**

NOTICE:

- Use a torque wrench with a fulcrum length of 300 mm (11.8 in.).
- This torque value is effective when SST is parallel to the torque wrench.

(4) Hold the adjusting tube in place and, using SST, apply the specified torque to the nut on the ball joint side in the following order and check that the matchmarks are still aligned: 1) loosing direction, 2) tightening direction. (Step E)



Text in Illustration

*A	for RH Side	*B	for LH Side
*a	Fulcrum Length	-	-
➡	Loosing Direction	➡	Tightening Direction

SST: 09612-24014

09617-24011

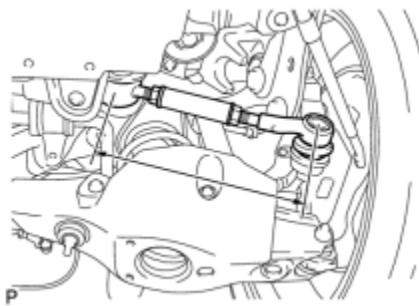
without SST - Torque: **20 N·m (204 kgf·cm, 15ft·lbf)**

with SST - Torque: **17 N·m (174 kgf·cm, 13ft·lbf)**

NOTICE:

- Use a torque wrench with a fulcrum length of 300 mm (11.8 in.).
- This torque value is effective when SST is parallel to the torque wrench.

(5) If the adjusting tube or either nut is determined to be loose when performing steps B to E, replace the rear No. 1 suspension arm assembly.



(b) Measure the length of the left and right rear No. 1 suspension arm assemblies.

Standard difference:

1.0 mm (0.0394 in.) or less

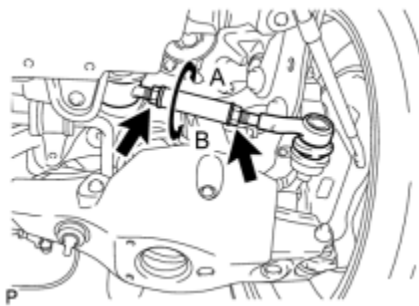
(c) Loosen the 2 nuts of the adjusting tube.

NOTICE:

If either nut is abnormally tight when loosening it (90 N*m (918 kgf*cm, 66 ft.*lbf) or more), or if either nut does not rotate smoothly by hand after loosening it, replace the rear No. 1 suspension arm assembly.

HINT:

Loosen the 2 nuts of the adjusting tube on the other side using the same procedure.



(d) If the difference between the length of the left and right rear No. 1 suspension arm assemblies is not within the specification, adjust the value to within the specification using the method below.

(1) If the toe-in value deviates towards the inside, turn the adjusting tube of the shorter rear No. 1 suspension arm assembly in the direction which increases arm length until the difference between the left and right suspension arms is within the specification.

(2) If the toe-in value deviates towards the outside, turn the adjusting tube of the longer rear No. 1 suspension arm assembly in the direction which decreases arm length until the difference

between the left and right suspension arms is within the specification.

(3) Measure the toe-in again.

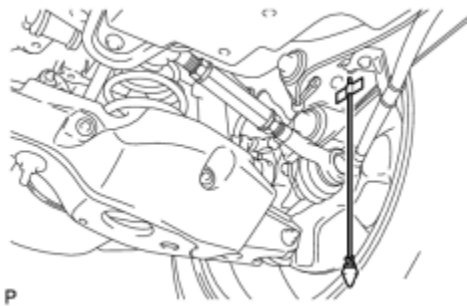
(e) Turn the left and right adjusting tubes in the same direction by the same amount to adjust the toe-in.

Toe-in (Unloaded Vehicle):

Specified Condition	Right-left Difference
C + D: $0^{\circ}11' \pm 0^{\circ}11'$ ($0.19^{\circ} \pm 0.19^{\circ}$)	$0^{\circ}05'$ (0.09°) or less
B - A: 2.0 \pm 2.0 mm (0.0787 \pm 0.0787 in.)	1.0 mm (0.0393 in.) or less

HINT:

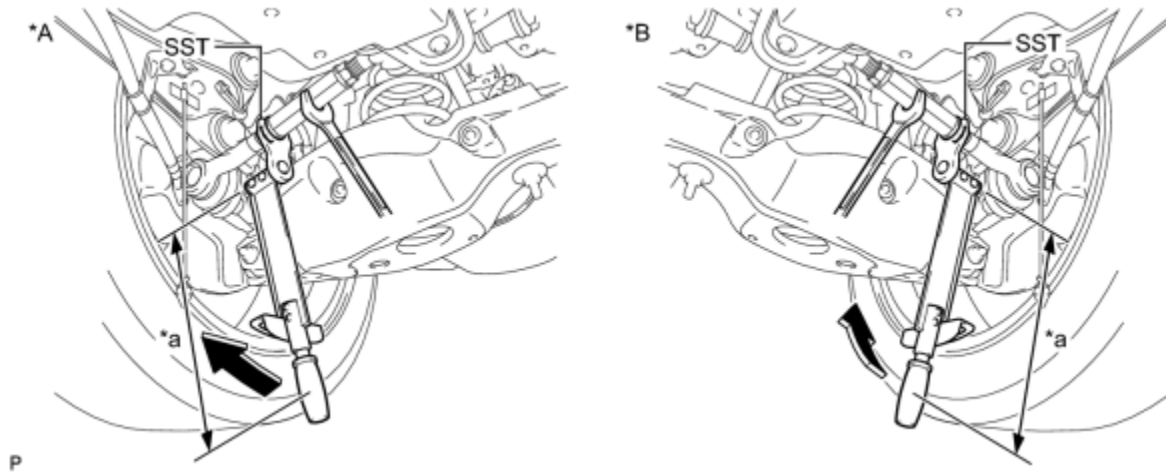
- When the adjusting tube of the rear No. 1 suspension arm assembly LH is turned one revolution in the direction of A in the illustration, the toe-in changes to the inside by approximately 8.8 mm (0.346 in.).
- When the adjusting tube of the rear No. 1 suspension arm assembly LH is turned one revolution in the direction of B in the illustration, the toe-in changes to the outside by approximately 8.8 mm (0.346 in.).



(f) Attach a string and weight to the vehicle as shown in the illustration.

(g) Place the vehicle on a level surface, and then check that the string and weight are perpendicular to the vehicle body.

(h) Hold the adjusting tube in place and, using SST, tighten the nut on the ball joint side. (Step F)



Text in Illustration

*A	for RH Side	*B	for LH Side
*a	Fulcrum Length	-	-

SST: 09612-24014

09617-24011

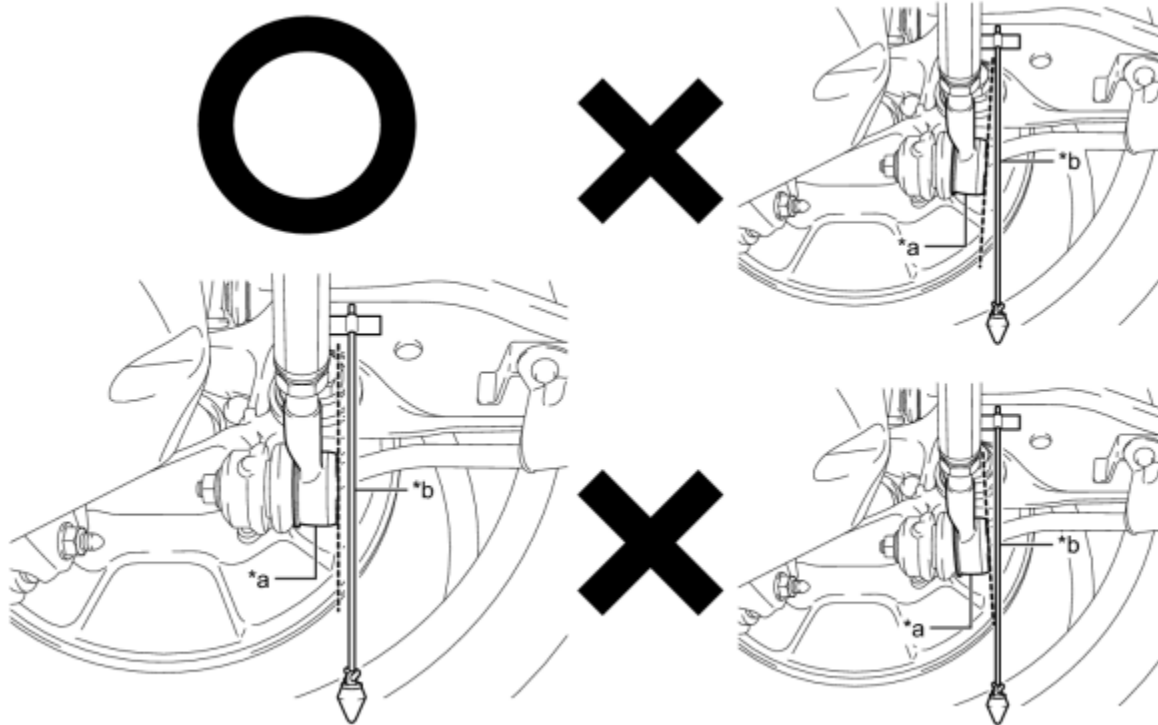
without SST - Torque: **20 N·m (204 kgf·cm, 15ft·lbf)**

with SST - Torque: **17 N·m (174 kgf·cm, 13ft·lbf)**

NOTICE:

- Use a torque wrench with a fulcrum length of 300 mm (11.8 in.).
- This torque value is effective when SST is parallel to the torque wrench.

(i) Turn the adjusting tube so that the ball joint socket is parallel to the string as shown in the illustration. (Step G)

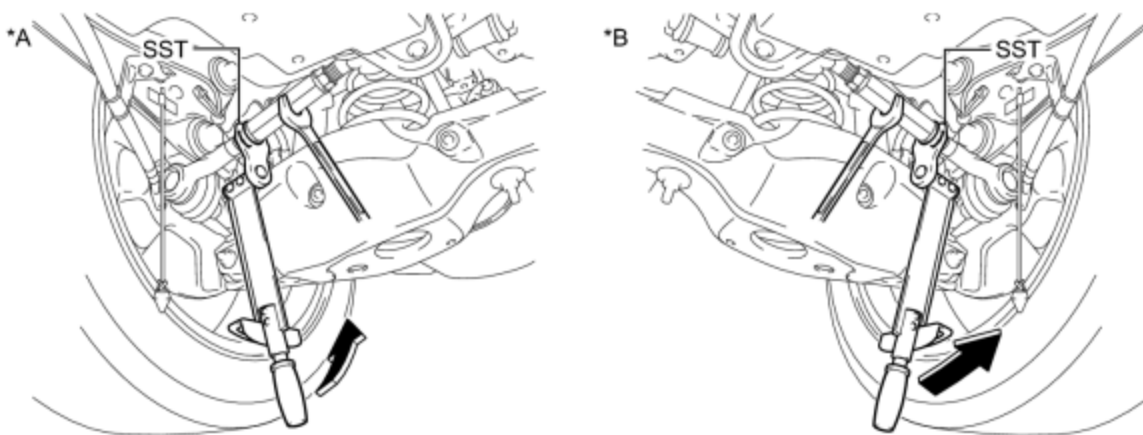


P

Text in Illustration

*a	Ball Joint Socket	*b	String
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(j) Hold the adjusting tube in place and, using SST, loosen the nut on the ball joint side. (Step H)



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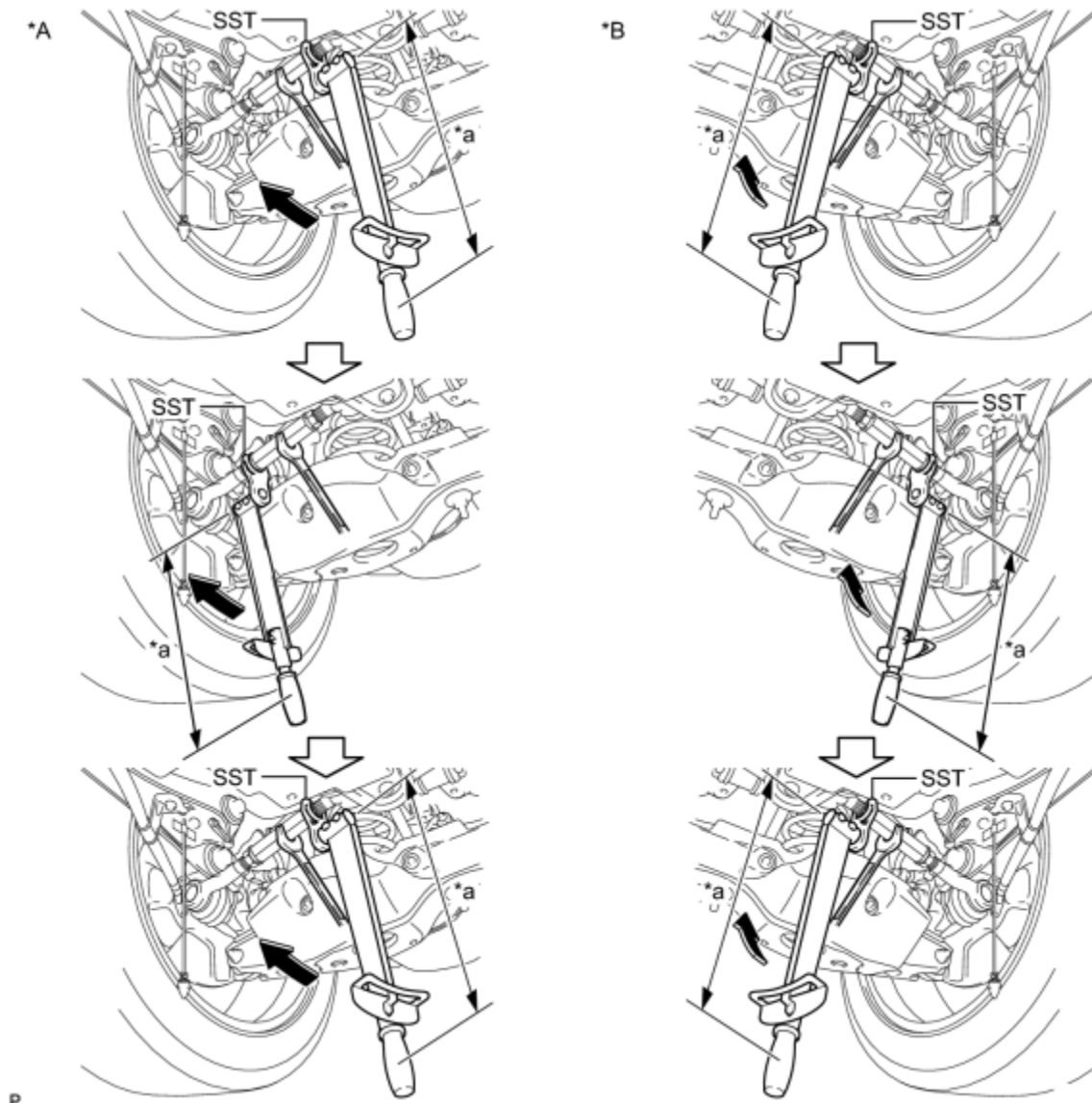
Text in Illustration

*A	for RH Side	*B	for LH Side
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SST: 09612-24014

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(k) Hold the adjusting tube in place and, using SST, tighten the nut on the rubber bush side and nut on the ball joint side in the following order: 1) rubber bush side, 2) ball joint side, 3) rubber bush side. (Step I)



Text in Illustration

*A	for RH Side	*B	for LH Side
*a	Fulcrum Length	-	-

SST: 09612-24014

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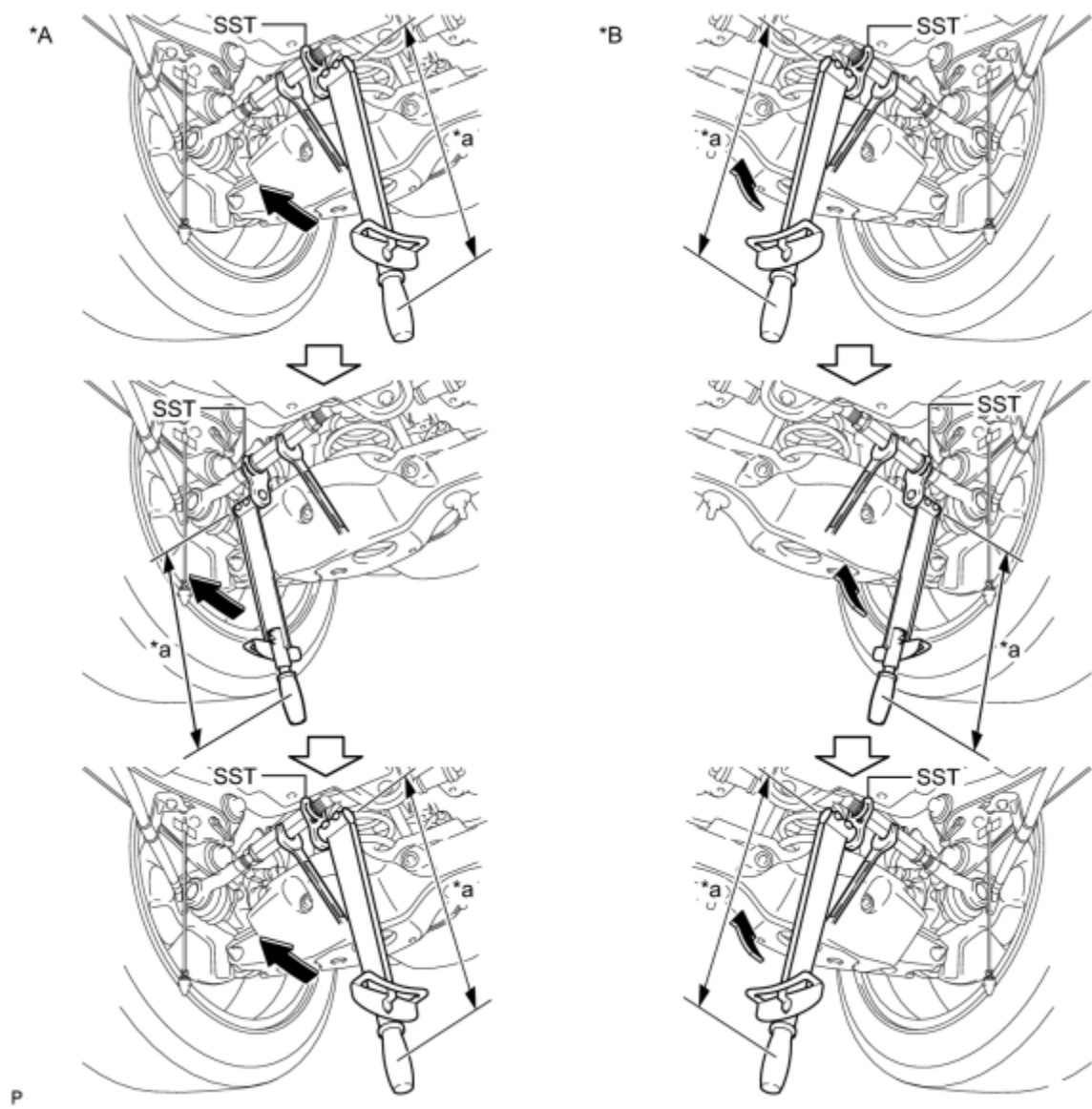
without SST - Torque: **56 N·m (571 kgf·cm, 41ft·lbf)**

with SST - Torque: **49 N·m (498 kgf·cm, 40ft·lbf)**

NOTICE:

- Use a torque wrench with a fulcrum length of 345 mm (1.13 ft.).
- This torque value is effective when SST is parallel to the torque wrench.

(1) Hold the adjusting tube in place and, using SST, tighten the nut on the rubber bush side and nut on the ball joint side in the following order: 1) rubber bush side, 2) ball joint side, 3) rubber bush side. (Step J)



Text in Illustration

*A	for RH Side	*B	for LH Side
*a	Fulcrum Length	-	-

SST: 09612-24014

09617-24011

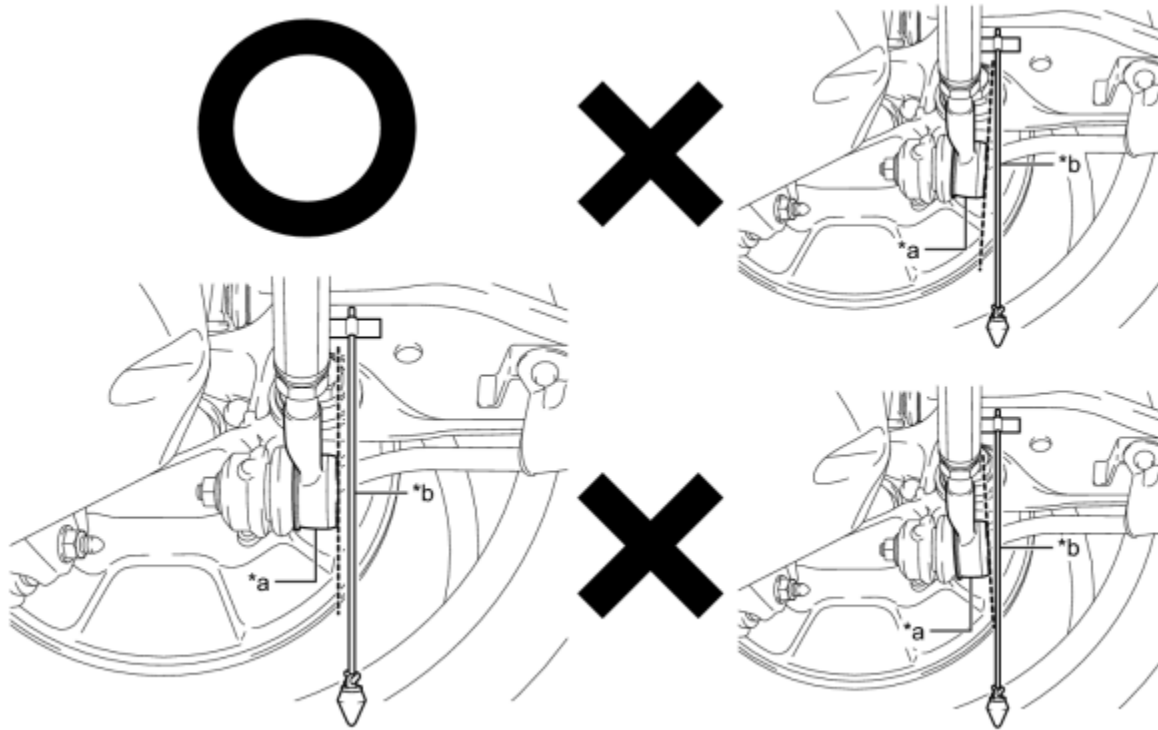
without SST - Torque: **45 N·m (459 kgf·cm, 33ft·lbf)**

with SST - Torque: **38 N·m (392 kgf·cm, 28ft·lbf)**

NOTICE:

- Use a torque wrench with a fulcrum length of 300 mm (11.8 in.).
- This torque value is effective when SST is parallel to the torque wrench.

(m) Check that the ball joint socket is parallel to the string.



P

Text in Illustration

*a	Ball Joint Socket	*b	String
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NOTICE:

If the ball joint socket is at an angle of 5° or more with respect to the string, perform steps F to J again.

(n) Remove the string and weight from the vehicle.

7. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

8. PERFORM YAW RATE AND ACCELERATION SENSOR CALIBRATION

INFO

