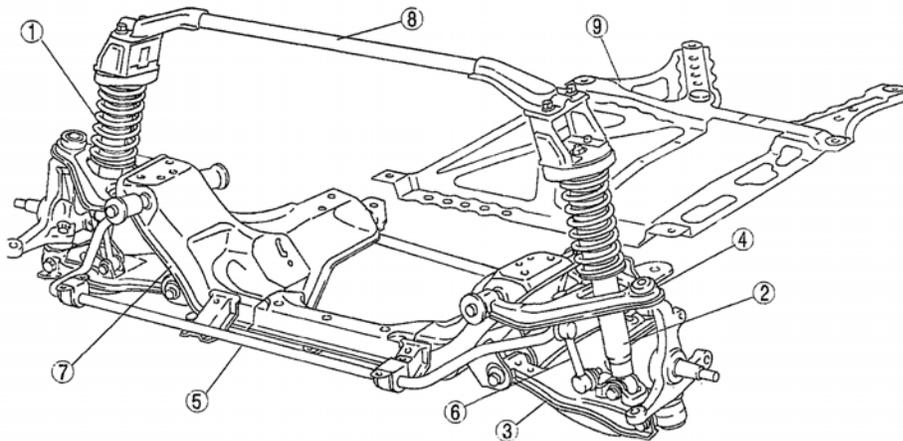


2005 SUSPENSION

Front Suspension - MX-5 Miata

FRONT SUSPENSION LOCATION INDEX



1	Front shock absorber and coil spring (See FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION)
2	Front shock absorber (See FRONT SHOCK ABSORBER INSPECTION) (See FRONT SHOCK ABSORBER DISPOSAL)
3	Front lower arm (See FRONT LOWER ARM REMOVAL/INSTALLATION) (See FRONT LOWER ARM INSPECTION)
4	Front upper arm (See FRONT UPPER ARM REMOVAL/INSTALLATION) (See FRONT UPPER ARM INSPECTION)

5	Front stabilizer (See FRONT STABILIZER REMOVAL/INSTALLATION)
6	Stabilizer control link (See STABILIZER CONTROL LINK INSPECTION)
7	Front crossmember (See FRONT CROSSMEMBER REMOVAL/INSTALLATION)
8	Front strut bar (See FRONT STRUT BAR REMOVAL/INSTALLATION [BP]) (See FRONT STRUT BAR REMOVAL/INSTALLATION [BP WITH TC])
9	Crossmember component (See CROSSMEMBER COMPONENT REMOVAL/INSTALLATION)

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Fig. 1: Identifying Front Suspension Location

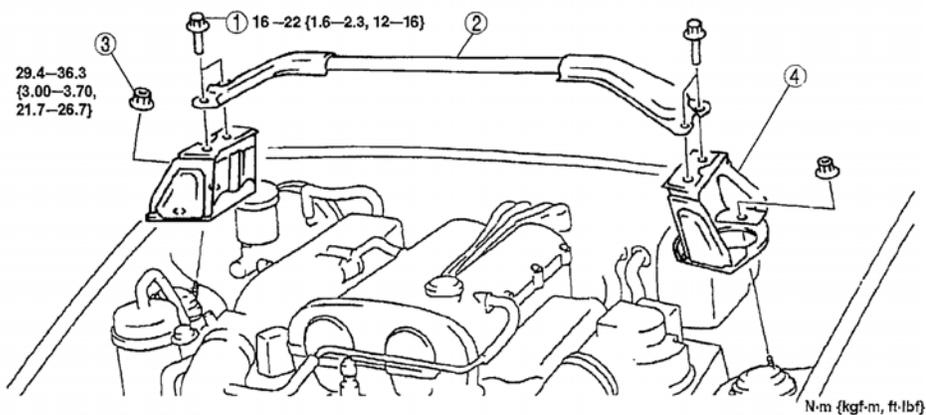
Courtesy of MAZDA MOTORS CORP.

FRONT STRUT BAR REMOVAL/INSTALLATION (BP)

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.

2005 Mazda MX-5 Miata

2005 SUSPENSION Front Suspension - MX-5 Miata



1	Bolt
2	Front strut bar

3	Nut
4	Strut bracket

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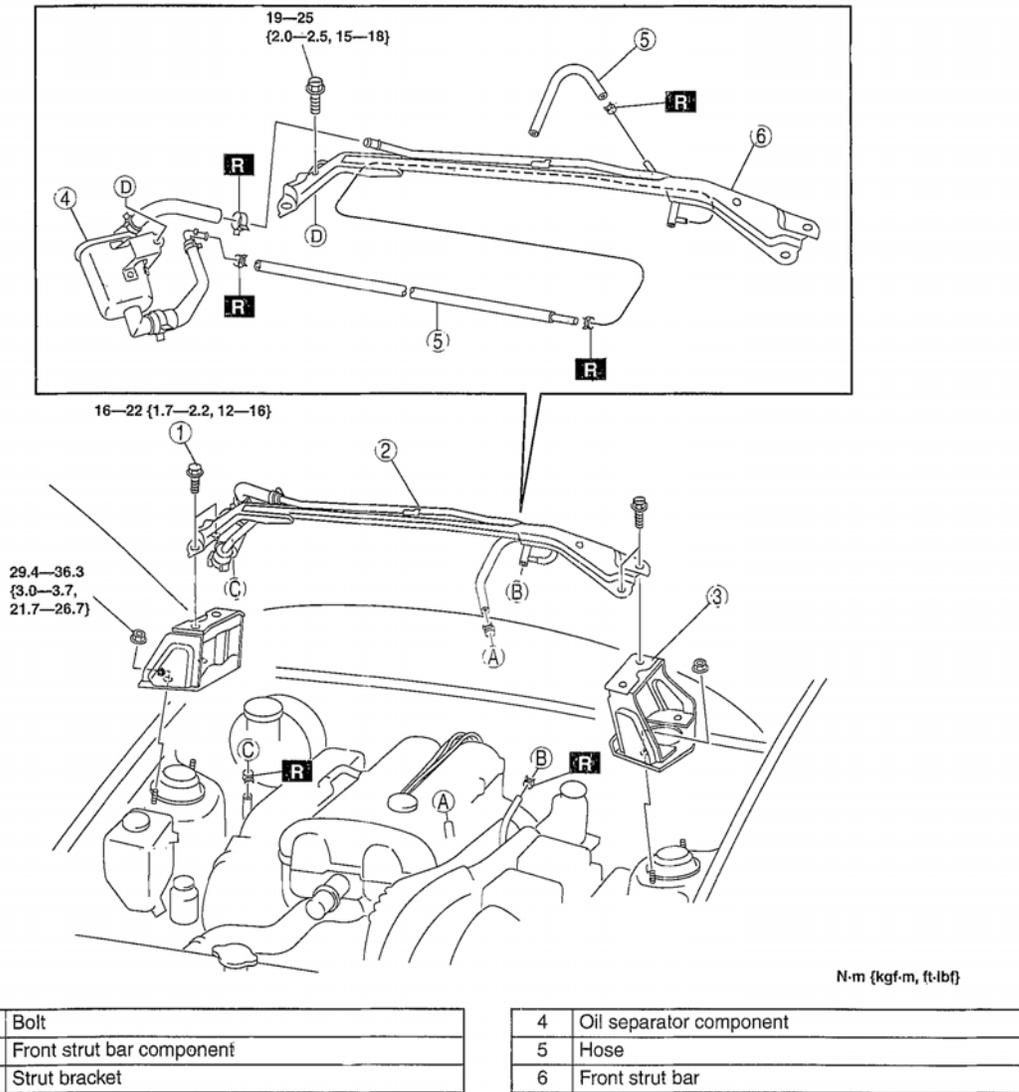
Fig. 2: View Of Front Strut Bar & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

FRONT STRUT BAR REMOVAL/INSTALLATION (BP WITH TC)

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.

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2005 SUSPENSION Front Suspension - MX-5 Miata



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Fig. 3: View Of Front Strut Bar & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION

CAUTION:

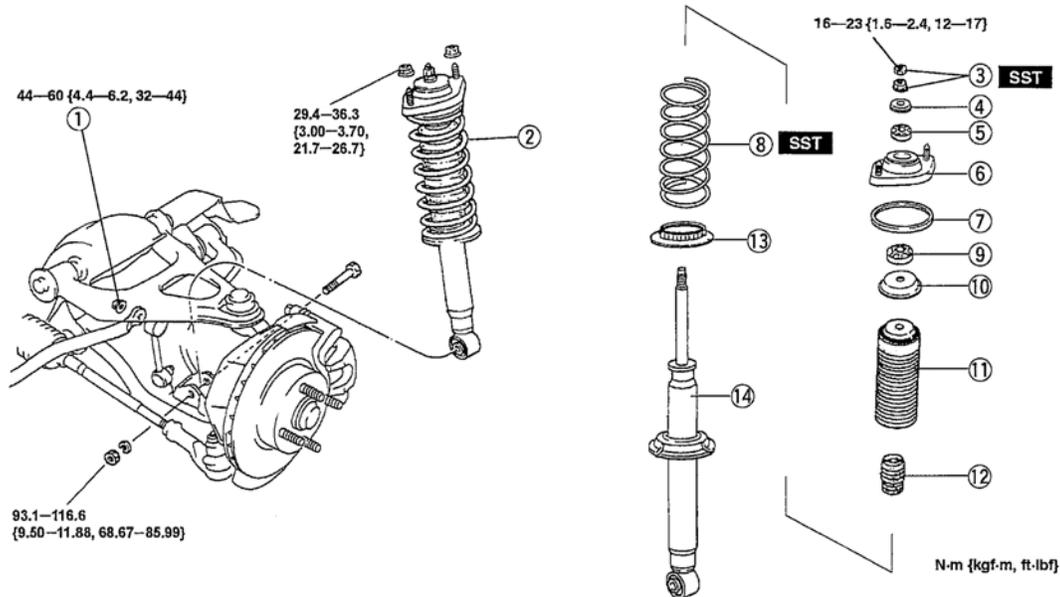
- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

1. Remove in the order indicated in the table.

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2005 SUSPENSION Front Suspension - MX-5 Miata

2. Install in the reverse order of removal.
3. Inspect the front wheel alignment.
 - If not as specified, adjust the front wheel alignment. (See **FRONT WHEEL ALIGNMENT** .)



1	Stabilizer control link nut
2	Front shock absorber and coil spring (See Front Shock Absorber and Coil Spring Removal Note) (See Front Shock Absorber and Coil Spring Installation Note)
3	Piston rod nut (See Piston Rod Nut Removal Note)
4	Retainer
5	Rubber bushing
6	Upper spring seat

7	Upper spring seat rubber
8	Coil spring (See Coil Spring Installation Note)
9	Rubber bushing
10	Stopper casing
11	Dust boot
12	Bound stopper (See Bound Stopper Installation Note)
13	Lower spring seat rubber
14	Front shock absorber

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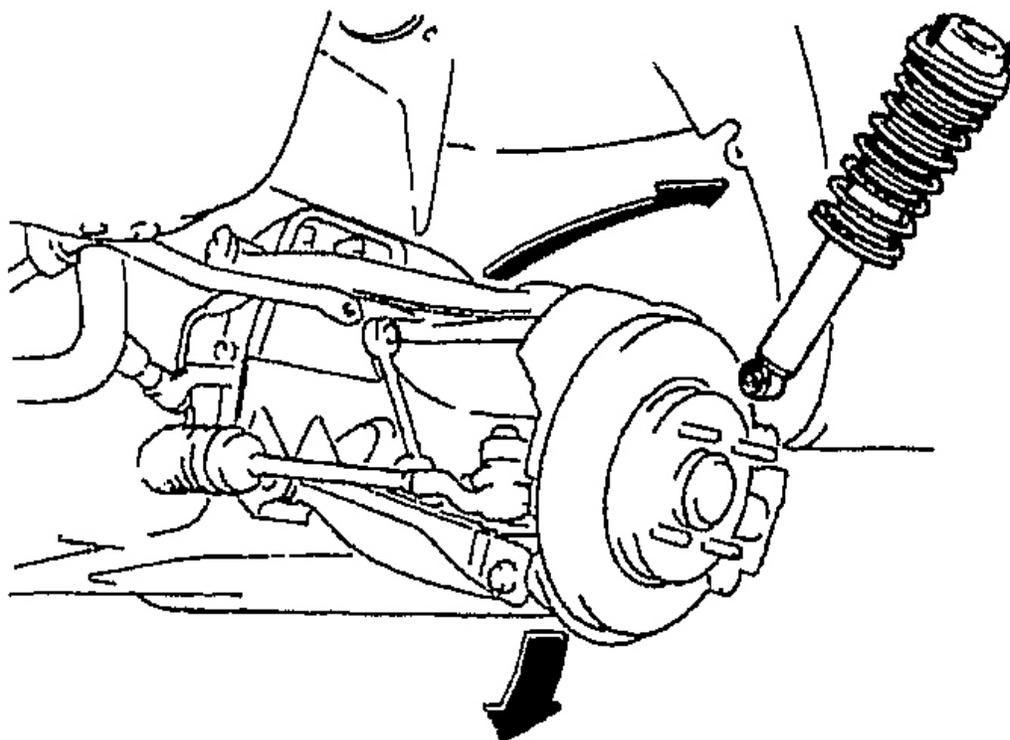
Fig. 4: Inspecting Front Wheel Alignment & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL NOTE

1. Disconnect the lower arm ball joint. (See **LOWER ARM BALL JOINT REMOVAL NOTE**.)
2. Loosen the lower arm bolts.
3. Lower the lower arm to remove the shock absorber.

CAUTION:

- Do not lower the arms excessively, doing so may damage the brake hose.

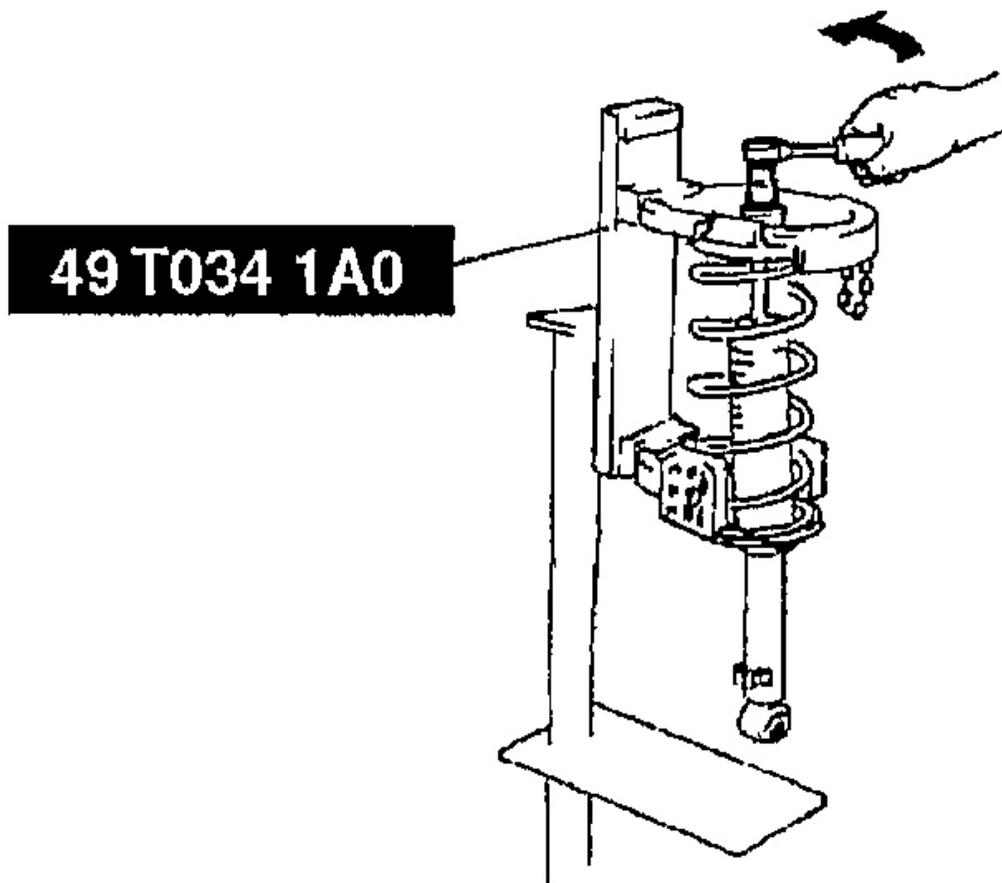


G03638042

Fig. 5: Disconnecting Lower Arm Ball Joint
Courtesy of MAZDA MOTORS CORP.

PISTON ROD NUT REMOVAL NOTE

1. Loosen the piston rod nut several turns, but do not remove the nut.
2. Secure the shock absorber in the SSTs.



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Fig. 6: Securing Shock Absorber
Courtesy of MAZDA MOTORS CORP.

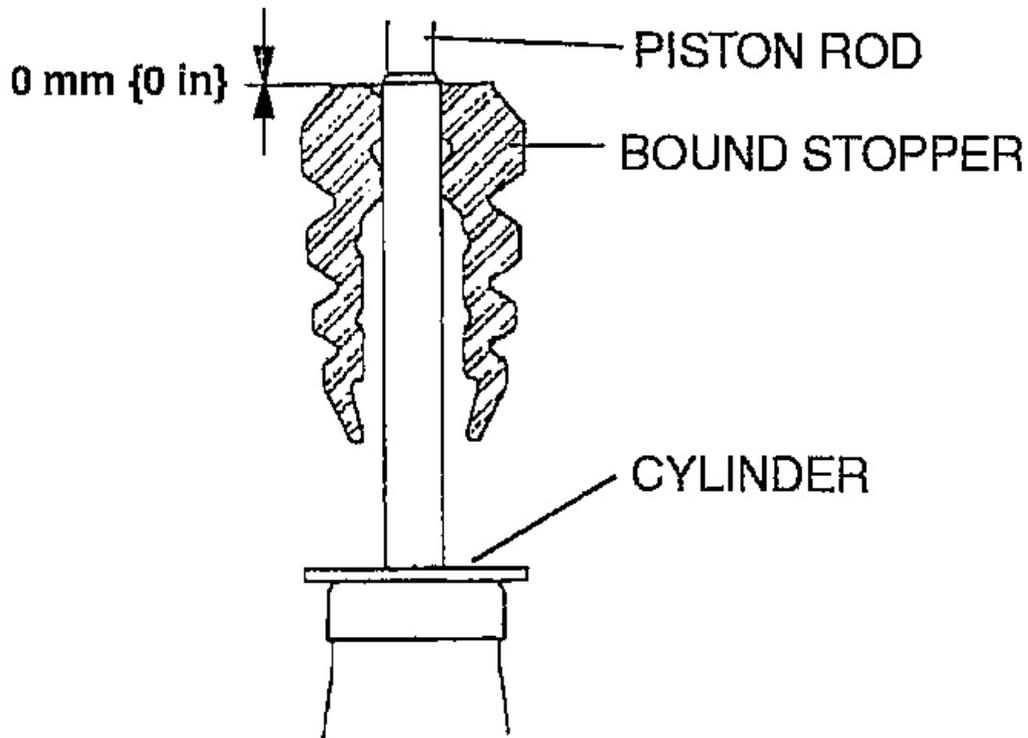
3. Compress the coil spring using the SSTs and remove the nut.

WARNING:

- Removing the piston rod nut is dangerous. The shock absorber and spring could fly off under tremendous pressure and cause serious injury or death. Secure the shock absorber in the SSTs before removing the coil spring nut.

BOUND STOPPER INSTALLATION NOTE

1. Install the bound stopper to the piston rod as shown.



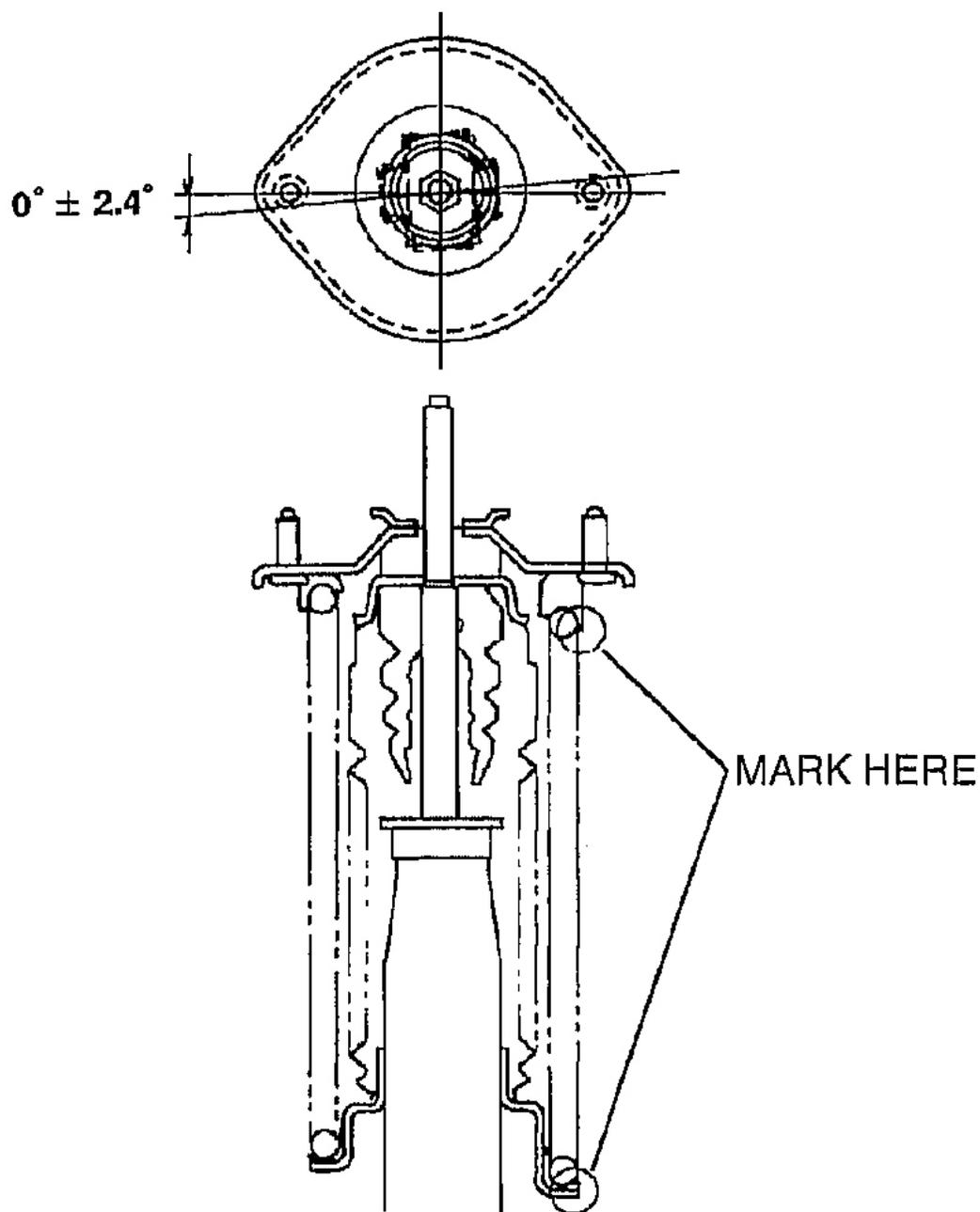
G03638044

Fig. 7: Installing Bound Stopper To Piston Rod.
Courtesy of MAZDA MOTORS CORP.

2. Verify that the lower end of the bound stopper does not contact the cylinder.

COIL SPRING INSTALLATION NOTE

1. Temporarily install the upper spring seat, upper spring seat rubber and coil spring on the shock absorber as shown.

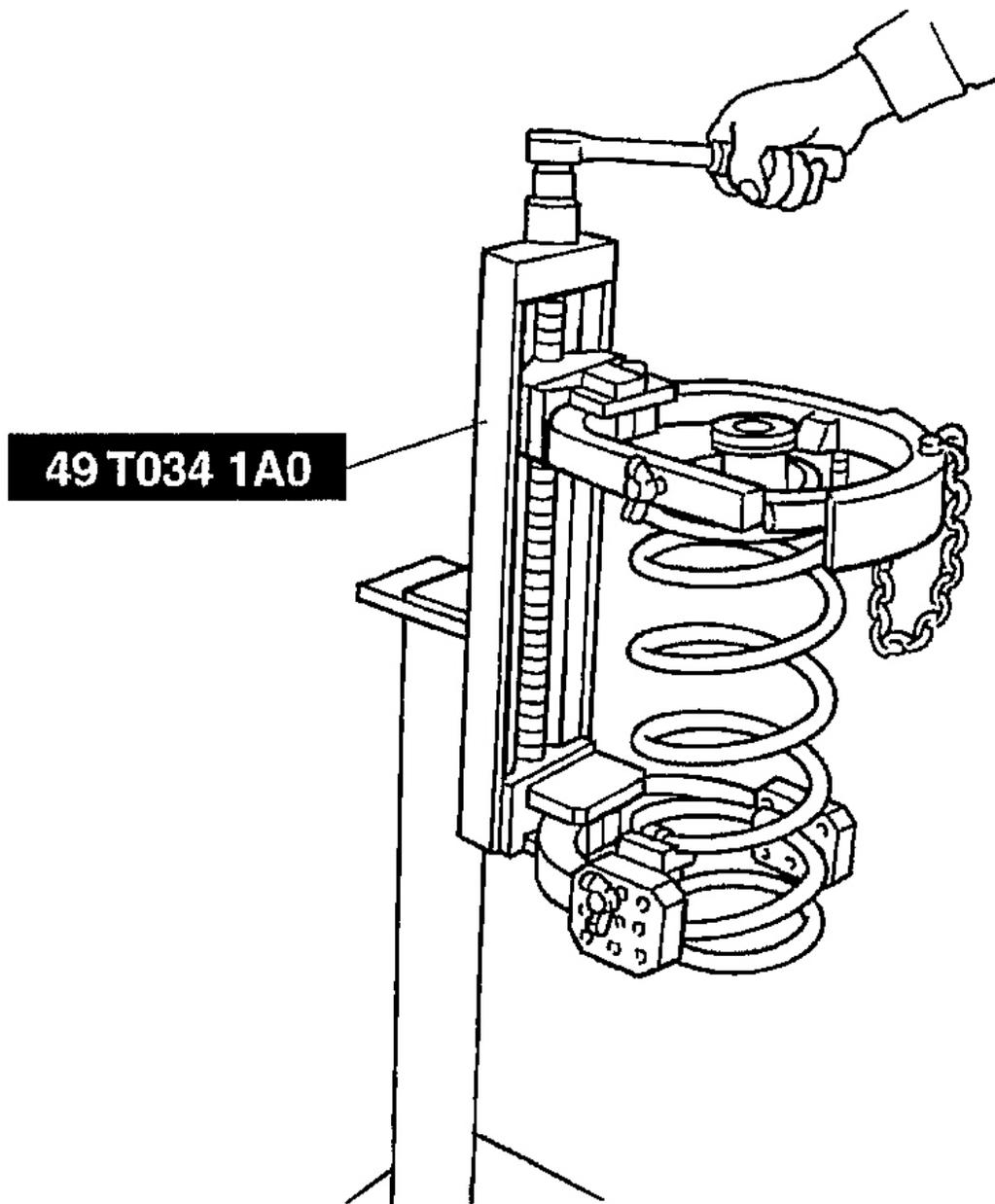


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Fig. 8: Identifying Coil Spring
Courtesy of MAZDA MOTORS CORP.

2. Mark the upper spring seat, shock absorber and coil spring for proper reassembly.

3. Align the marks of the upper spring seat and coil spring. Protect the upper spring seat and the coil spring with a piece of cloth, then assemble the SSTs.
4. Compress the spring using the SSTs.



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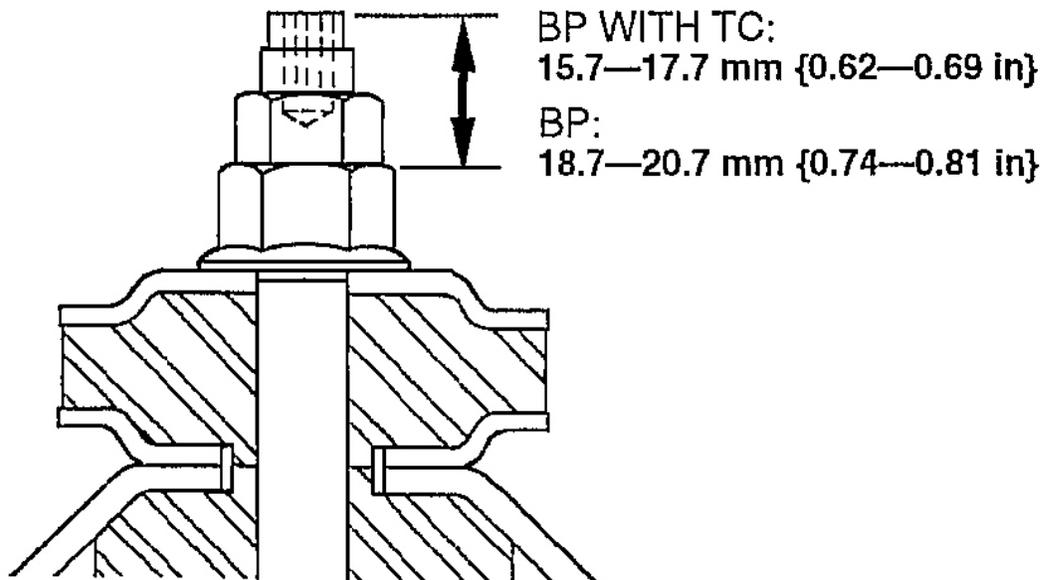
Fig. 9: Compressing Spring By SST

Courtesy of MAZDA MOTORS CORP.

5. Install the shock absorber, making sure that the marks on the shock absorber and coil spring are aligned.
6. Tighten the nut several turns.
7. Remove the SSTs.
8. Secure the shock absorber in a vise.

CAUTION: • Using an air tool will damage the piston rod thread. Do not use an air tool.

9. Apply an antirust penetrating oil lubricant to the piston rod thread and tighten the lower piston rod nut so that the exposed thread of the piston rod is **15.7-17.7 mm {0.62-0.69 in}** (BP with TC) or **18.7-20.7 mm {0.74-0.81 in}** (BP).
10. Tighten the upper nut to the specified torque.



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Fig. 10: Tightening Upper Nut
Courtesy of MAZDA MOTORS CORP.

Tightening torque

16-23 N.m {1.6-2.4 kgf.m, 12-17 ft.lbf}

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2005 SUSPENSION Front Suspension - MX-5 Miata

FRONT SHOCK ABSORBER AND COIL SPRING INSTALLATION NOTE

1. Install the front shock absorber and coil spring so that the ABS wheel-speed sensor bracket of the shock absorber faces the rear of the vehicle.

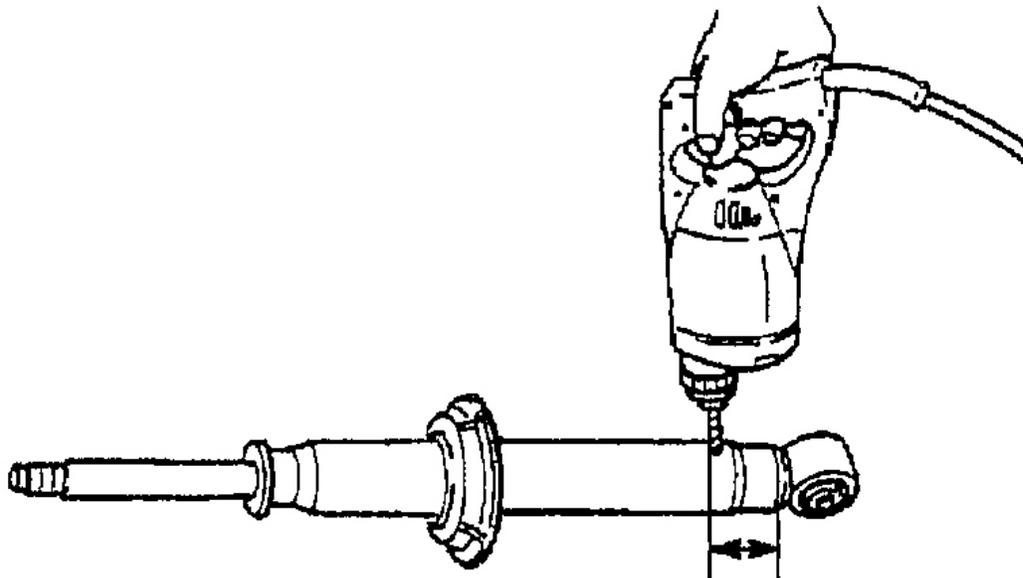
FRONT SHOCK ABSORBER INSPECTION

1. Inspect the following and replace as necessary.
 - Inspect for damage and oil leakage.
 - Inspect the rubber bushing for deterioration and wear.
 - Compress and extend the shock piston at least 3 times. Verify that the operational force does not change and that there is no unusual noise.
 - Compress the shock absorber piston and release it.
 - Verify that the piston extends fully at a normal speed.

FRONT SHOCK ABSORBER DISPOSAL

SHOWA SHOCK ABSORBER

1. Clamp a shock absorber flat or with the piston downwards.
2. Drill a **2-3 mm {0.08-0.11 in}** hole at a point **20-30 mm {0.79-1.18 in}** from the bottom of the tube, so that the gas can escape.



20—30 mm {0.79—1.18 in}

G03638048

Fig. 11: Drilling Hole In Shock Absorber
Courtesy of MAZDA MOTORS CORP.

WARNING:

- Whenever drilling into a shock absorber, wear protective eye wear. The gas in the shock absorber is pressurized, and could spray metal chips into the eyes and face when drilling.

3. Turn the hole downwards.
4. The oil can be collected by moving the piston rod several times up and down and cutting the tube at the end.
5. Dispose of the waste oil according to local waste disposal laws.

NOTE:

- Shock absorber gas is nitrogen gas.
- Shock absorber oil is mineral oil.

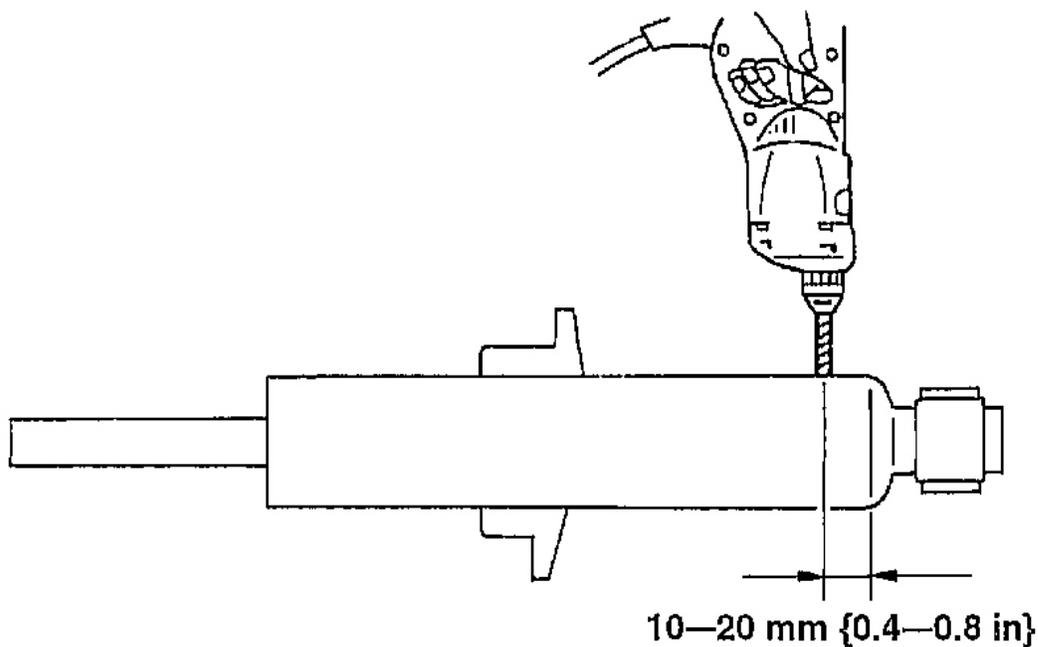
BILSTEIN SHOCK ABSORBER

WARNING:

- Whenever drilling into a shock absorber, wear protective eye wear. The gas in the shock absorber is pressurized, and could spray metal

chips into the eyes and face when drilling.

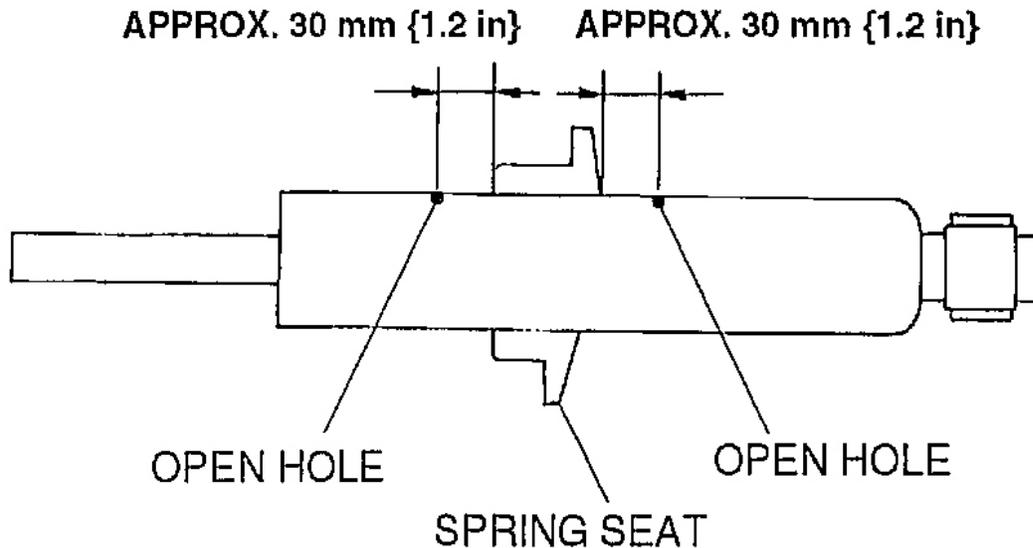
1. Clamp a shock absorber on a flat surface or with the piston pointing downwards.
2. Drill a 2-3 mm {0.08-0.11 in} hole at a point 10-20 mm {0.4-0.8 in} shown in **Fig. 12**, so that the gas can escape.



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Fig. 12: Drilling A Shock Absorber On A Flat Surface Or With Piston Pointing
Courtesy of MAZDA MOTORS CORP.

3. Drill two 2-3 mm {0.08-0.11 in} holes at points as shown in **Fig. 13**, so that the oil can escape.



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Fig. 13: Drilling Two Holes

Courtesy of MAZDA MOTORS CORP.

4. Turn the hole downwards.
5. The oil can be collected by moving the piston rod several times up and down and drain the oil through the hole.
6. Dispose of waste oil according to the waste disposal law.

NOTE:

- Shock absorber gas is nitrogen gas.
- Shock absorber oil is mineral oil.

FRONT LOWER ARM REMOVAL/INSTALLATION**CAUTION:**

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

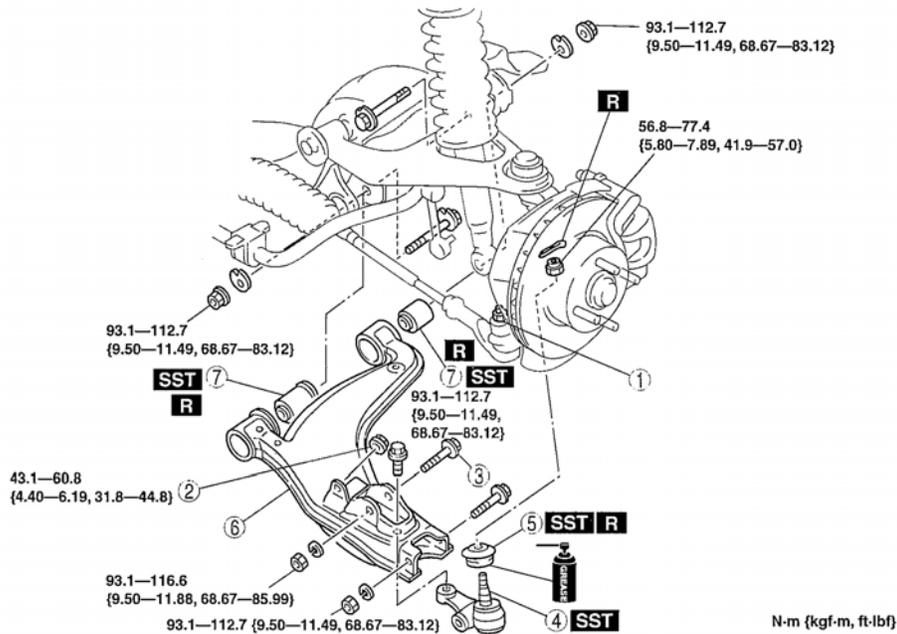
1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.

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3. Inspect the front wheel alignment.

- If not as specified, adjust the front wheel alignment. (See **FRONT WHEEL ALIGNMENT** .)



1	Tie-rod end ball joint (See Tie-rod End Ball Joint Removal Note)
2	Stabilizer control link nut
3	Shock absorber bolt
4	Lower arm ball joint (See Lower Arm Ball Joint Removal Note)

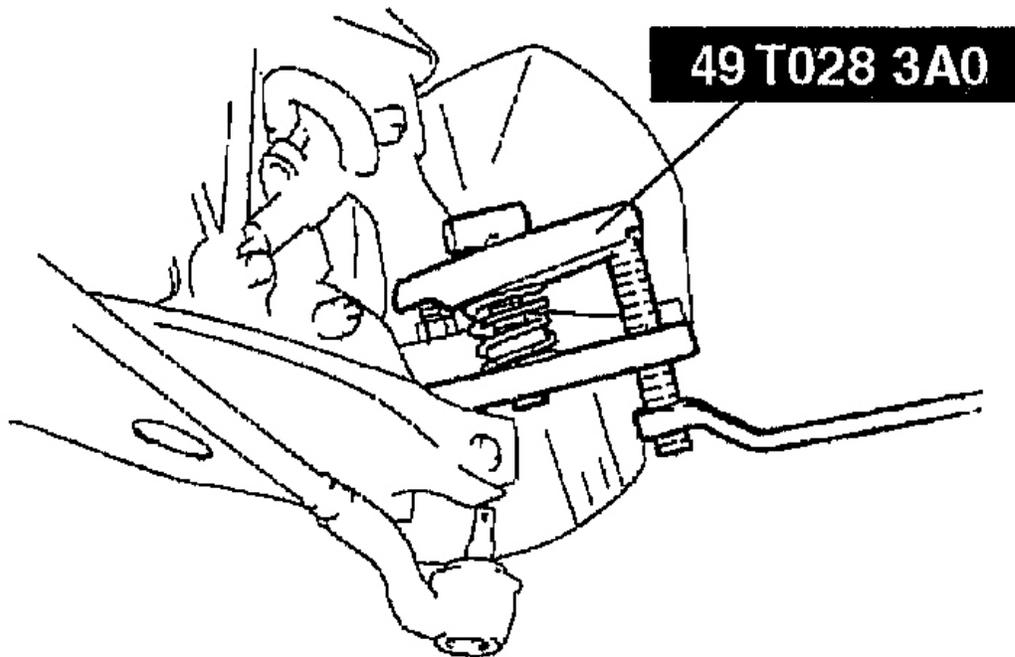
5	Dust boot (See Dust Boot Removal Note) (See Dust Boot Installation Note)
6	Lower arm
7	Lower arm bushing (front and rear) (See Lower Arm Bushing (Front and Rear) Removal Note) (See Lower Arm Bushing (Front and Rear) Installation Note)

G03638051

Fig. 14: View Of Front Lower Arm & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

LOWER ARM BALL JOINT REMOVAL NOTE

1. Separate the ball joint from the knuckle using the **SST**.

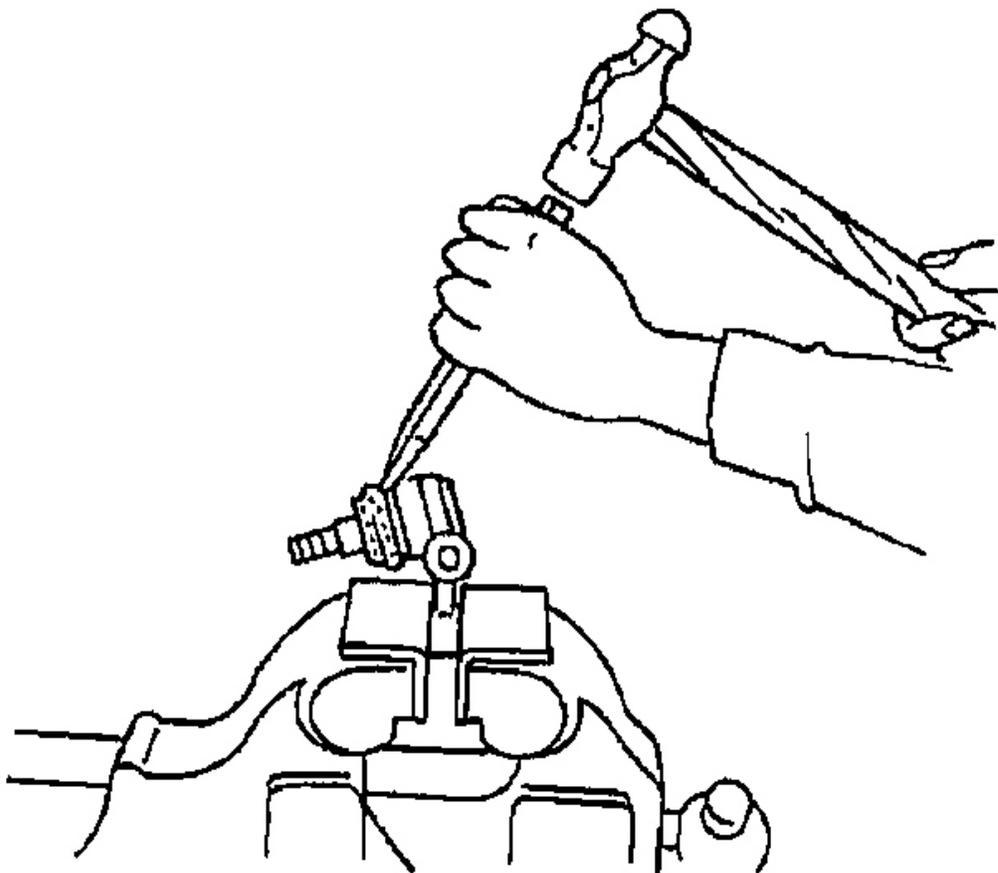


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Fig. 15: Separate Ball Joint From Knuckle Using SST
Courtesy of MAZDA MOTORS CORP.

DUST BOOT REMOVAL NOTE

1. Remove the dust boot using a chisel, being careful not to damage the ball joint and the arm.



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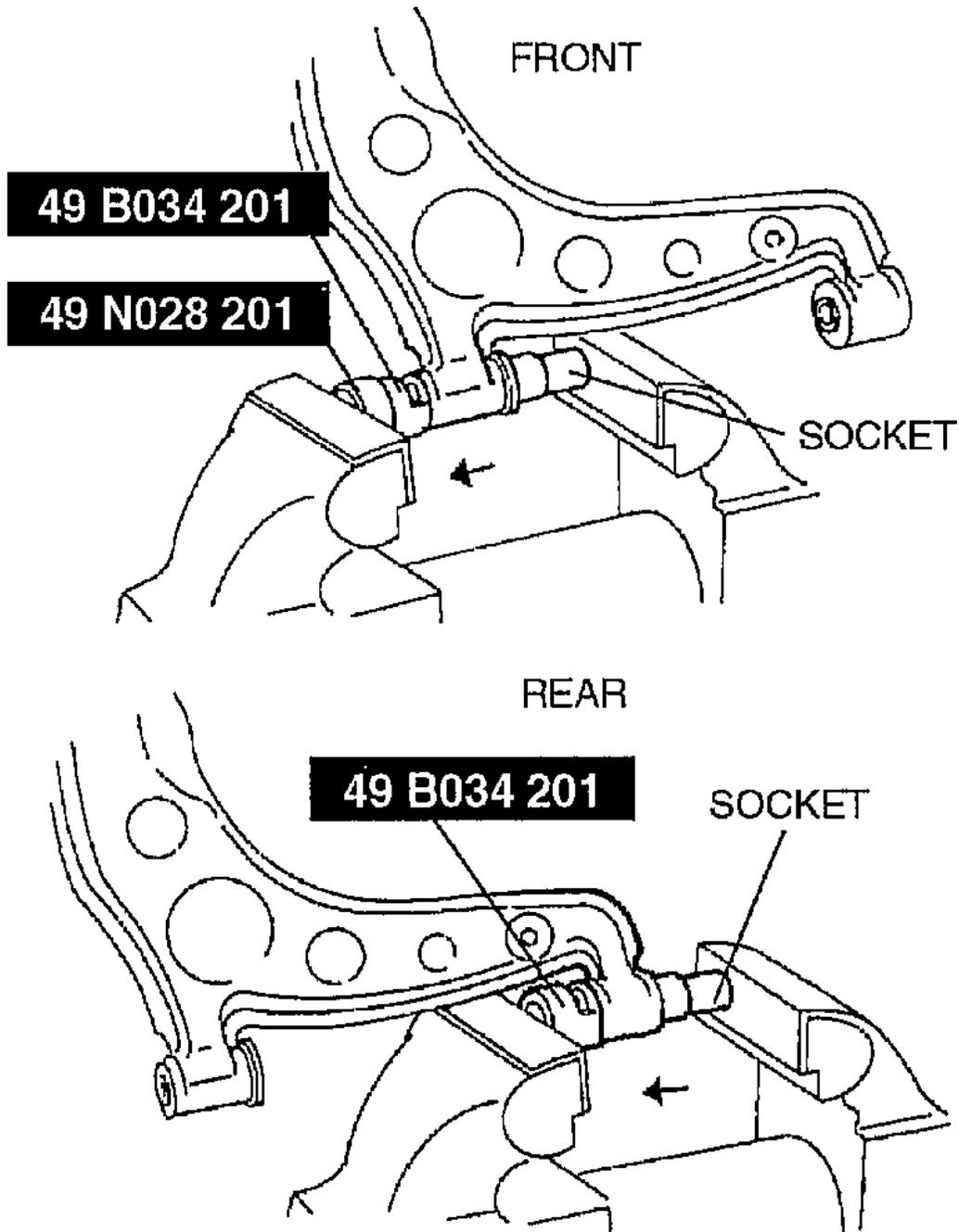
Fig. 16: Removing Dust Boot Using A Chisel
Courtesy of MAZDA MOTORS CORP.

LOWER ARM BUSHING (FRONT AND REAR) REMOVAL NOTE

1. Press the lower arm bushing out using the SSTs and a socket as shown.

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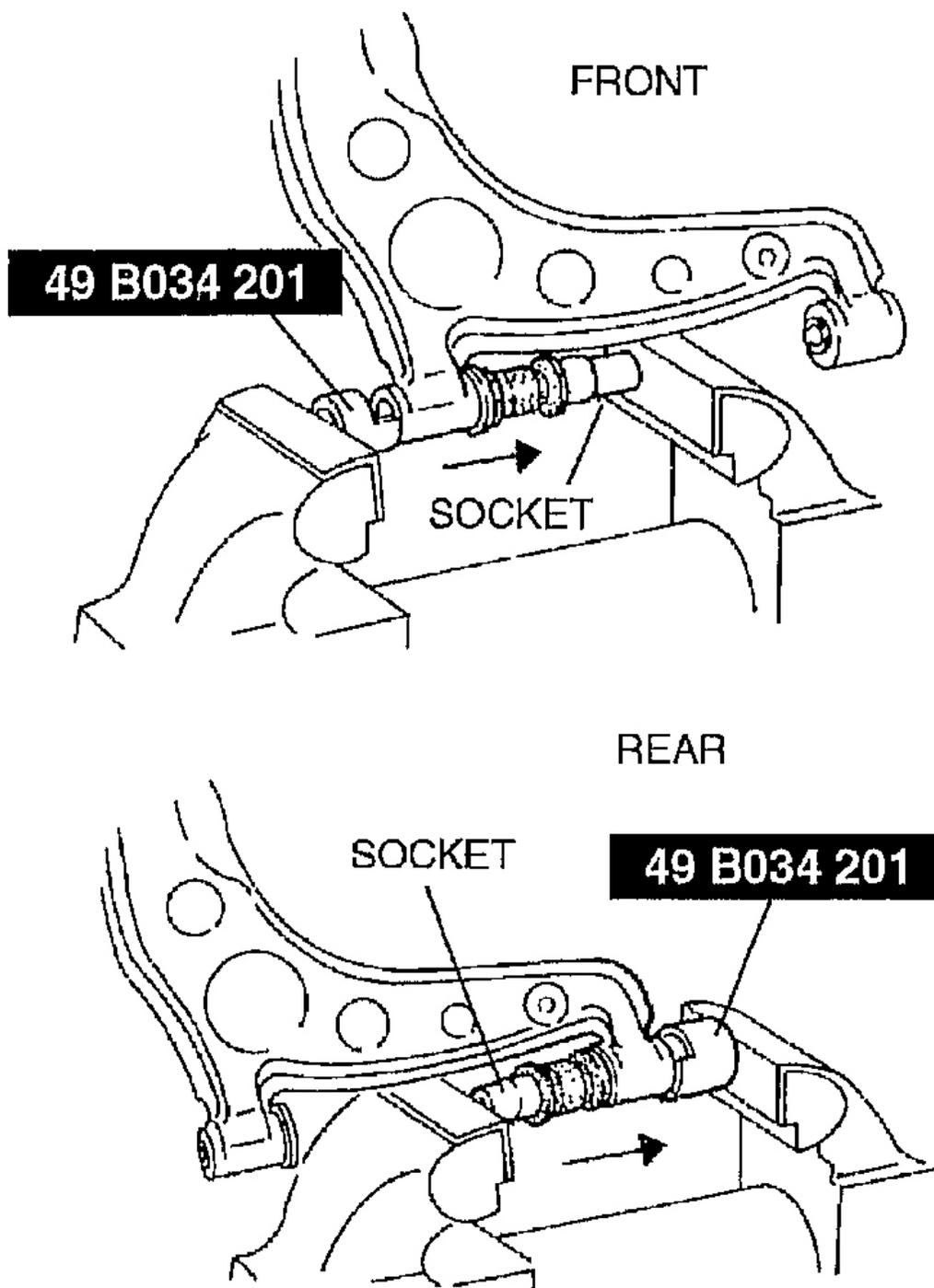
Fig. 17: Pressing Lower Arm Bushing Out Using SSTs And A Socket
Courtesy of MAZDA MOTORS CORP.

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LOWER ARM BUSHING (FRONT AND REAR) INSTALLATION NOTE

1. Apply soapy water to the lower arm bushing.
2. Press the bushing in using the **SST** and a socket in the direction of the arrow.



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Fig. 18: Installing Lower Arm Bushing

Courtesy of MAZDA MOTORS CORP.

DUST BOOT INSTALLATION NOTE

1. Wipe the grease off the ball joint.
2. Fill the inside of the new dust boot with grease.
3. Press the dust boot onto the ball joint using the SST.

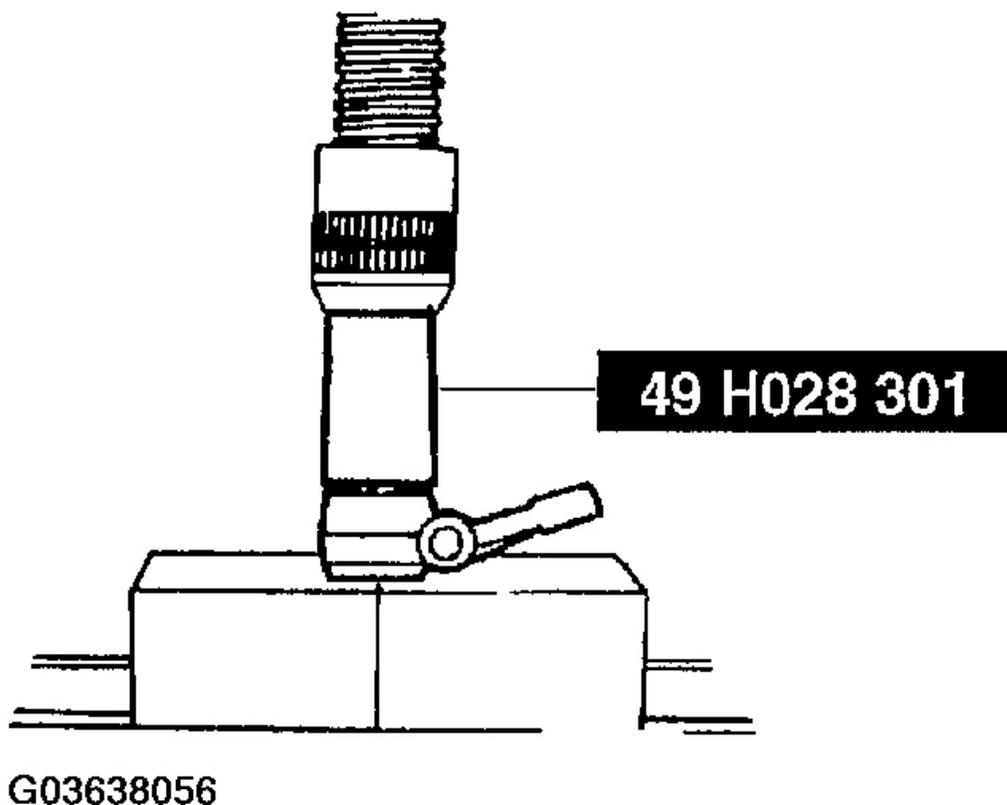


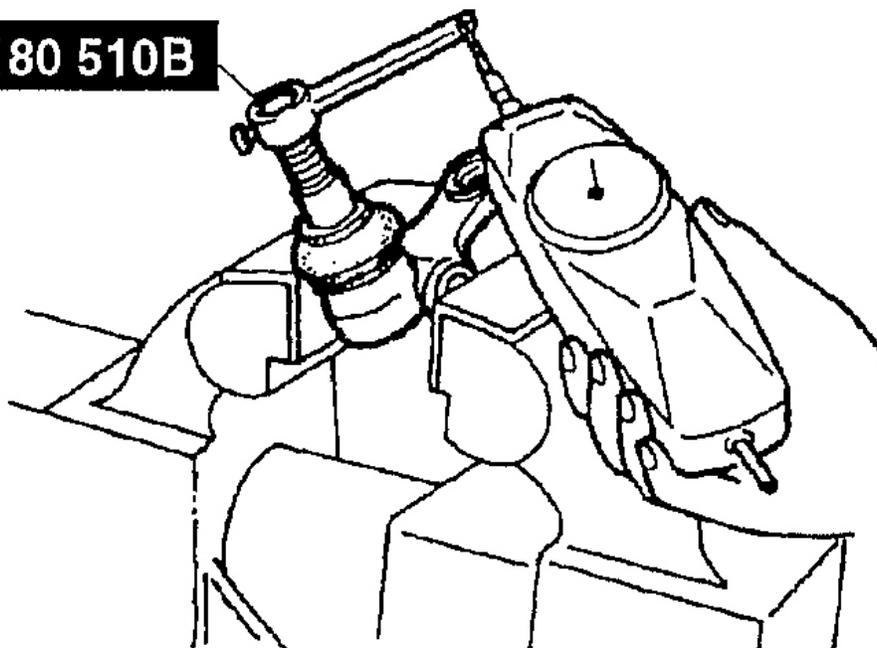
Fig. 19: Pressing Dust Boot Onto Ball Joint
Courtesy of MAZDA MOTORS CORP.

4. Wipe away the excess grease.

FRONT LOWER ARM INSPECTION

1. Shake the ball joint stud 5 times.
2. Connect the SST to the ball stud, and measure the rotation torque using a pull scale.

49 0180 510B



G03638057

Fig. 20: Connecting SST To Ball Stud
Courtesy of MAZDA MOTORS CORP.

- Replace if it is not within the specification.

Rotation torque

0.4-1.9 N.m {3.5-19.5 kgf.cm, 3.1-16.9 in.lbf}

Pull scale reading

3.5-19.1 N {0.35-1.95 kgf, 0.78-4.29 lbf}

FRONT UPPER ARM REMOVAL/INSTALLATION

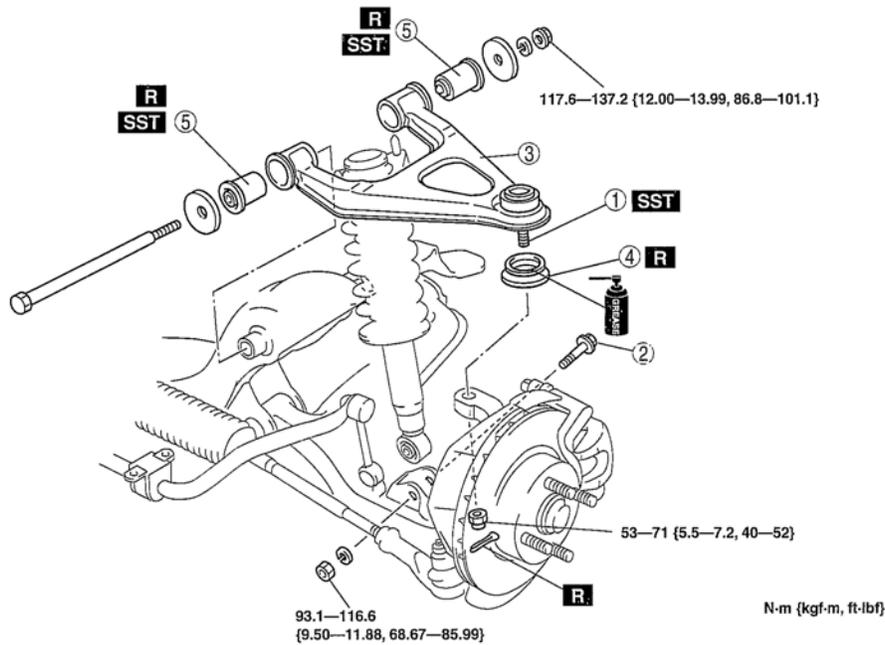
CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

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1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the front wheel alignment.
 - If not as specified, adjust the front wheel alignment. (See **FRONT WHEEL ALIGNMENT** .)



1	Upper arm ball joint (See Upper Arm Ball Joint Removal Note)
2	Shock absorber bolt
3	Upper arm

4	Dust boot (See Dust Boot Removal Note) (See Dust Boot Installation Note)
5	Upper arm bushing (front and rear) (See Upper Arm Bushing (Front and Rear) Removal Note) (See Upper Arm Bushing (Front and Rear) Installation Note)

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Fig. 21: View Of Front Upper Arm & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

UPPER ARM BALL JOINT REMOVAL NOTE

1. Separate the upper arm ball joint from the knuckle using the **SST**.

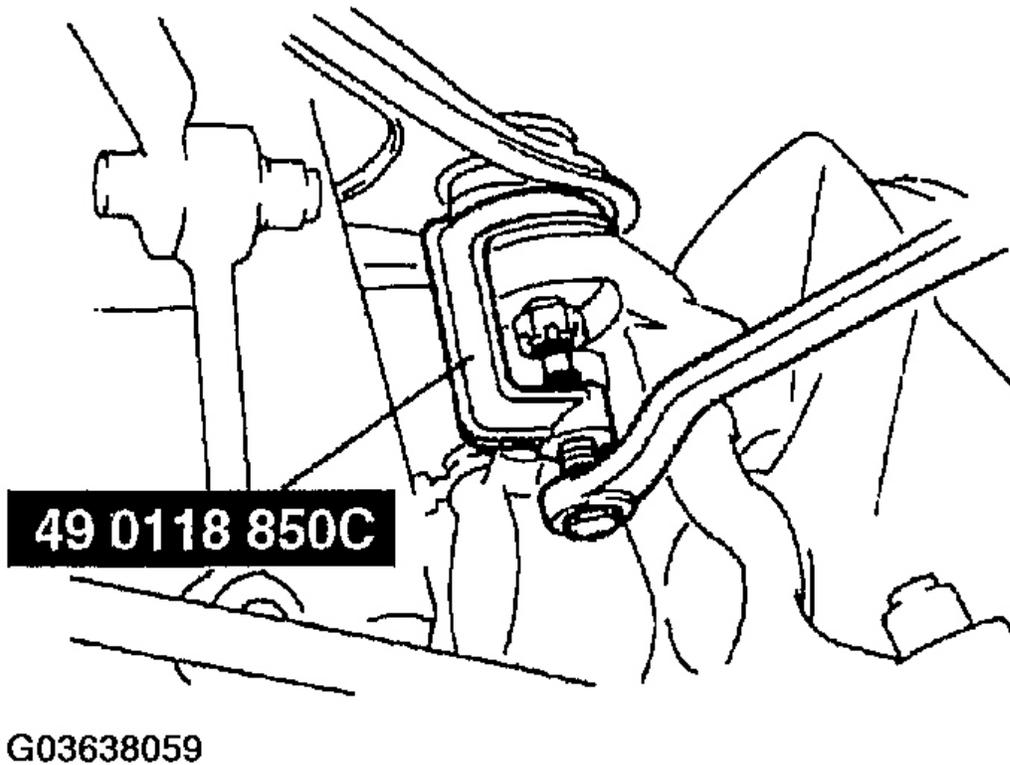
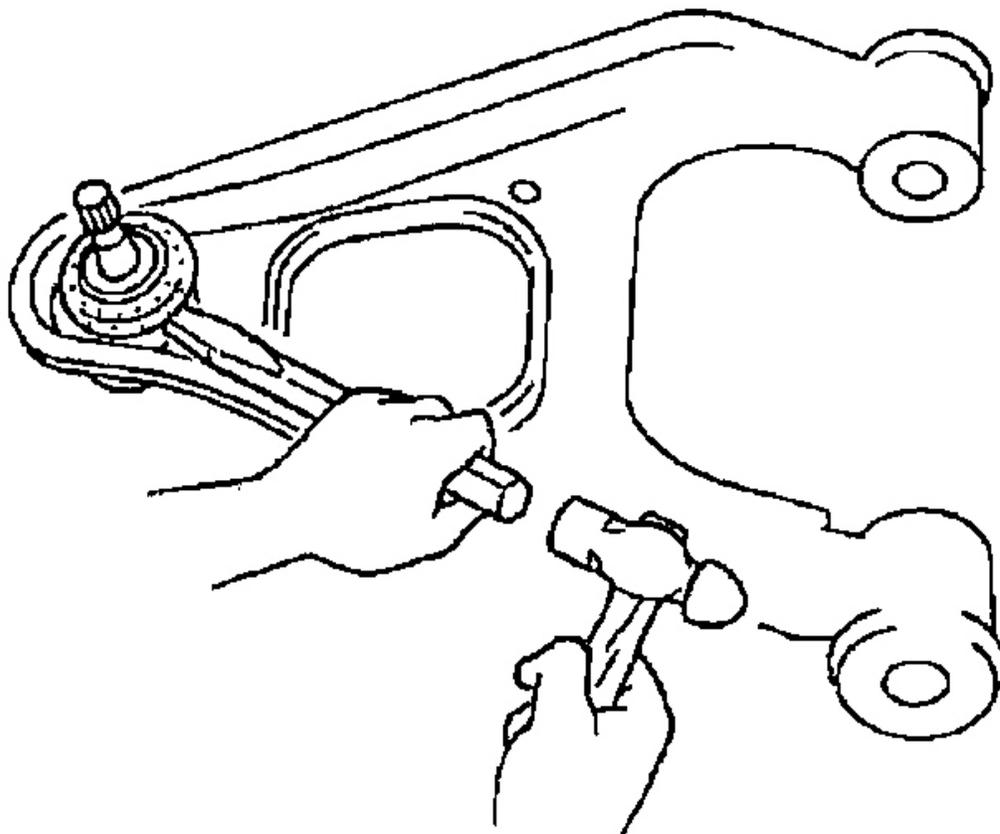


Fig. 22: Identifying Upper Arm Ball Joint From Knuckle
Courtesy of MAZDA MOTORS CORP.

DUST BOOT REMOVAL NOTE

1. Remove the dust boot using a chisel, being careful not to damage the ball joint and the arm.

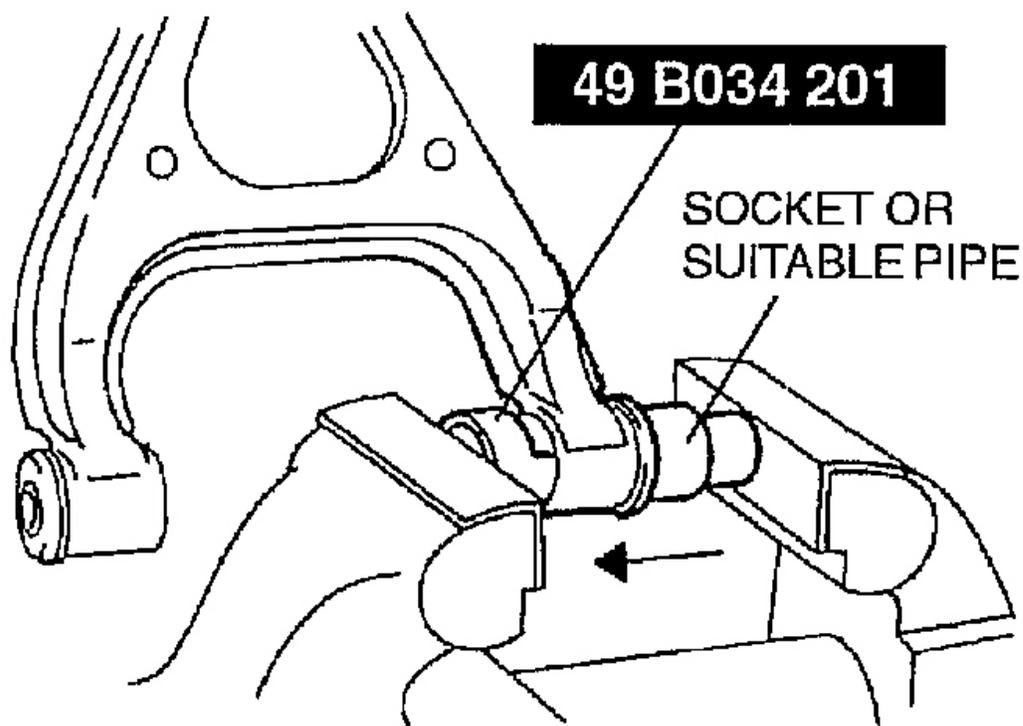


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Fig. 23: Removing Dust Boot Using A Chisel
Courtesy of MAZDA MOTORS CORP.

UPPER ARM BUSHING (FRONT AND REAR) REMOVAL NOTE

1. Press the upper arm bushing out using the SST and a socket as shown.



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Fig. 24: Pressing Upper Arm Bushing Out Using SST And A Socket
Courtesy of MAZDA MOTORS CORP.

UPPER ARM BUSHING (FRONT AND REAR) INSTALLATION NOTE

1. Apply soapy water to the upper arm bushing.
2. Press the bushing in using the **SST** and a socket in the direction of the arrow.

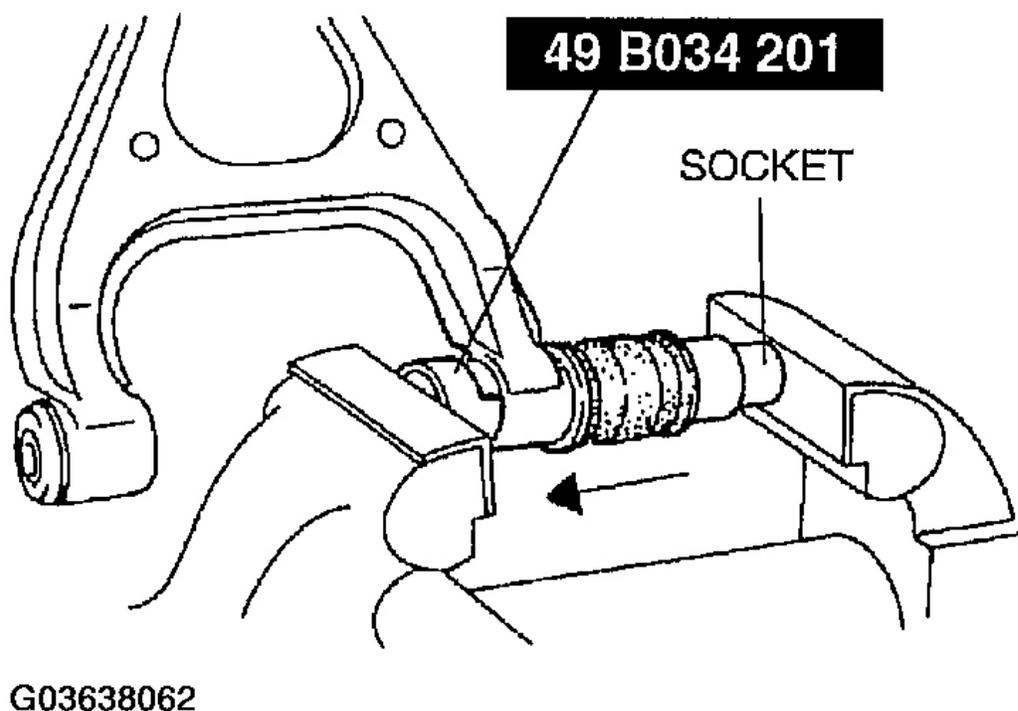


Fig. 25: Installing Upper Arm Bushing
Courtesy of MAZDA MOTORS CORP.

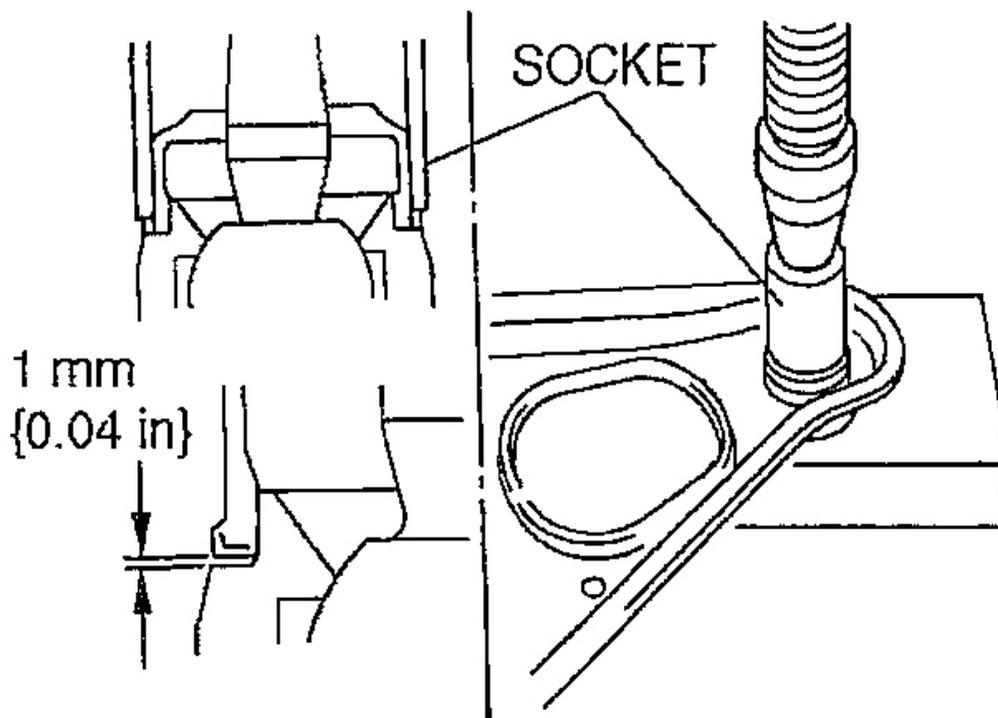
DUST BOOT INSTALLATION NOTE

1. Fill the inside of the new dust boot with grease.
2. Press the dust boot on using a **30 mm {1.18 in}** socket until the dust boot contacts the seat.

CAUTION:

- **Install the dust boot squarely and do not press excessively. The inner metal ring will be deformed if not done correctly.**

3. Verify that the clearance between the boot and the seat is less than **1 mm {0.04 in}**.



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Fig. 26: Installing Dust Boot
Courtesy of MAZDA MOTORS CORP.

FRONT UPPER ARM INSPECTION

1. Shake the ball joint stud 5 times.
2. Connect the SST to the ball stud, and measure the rotation torque using a pull scale.
 - Replace if it is not within the specification.

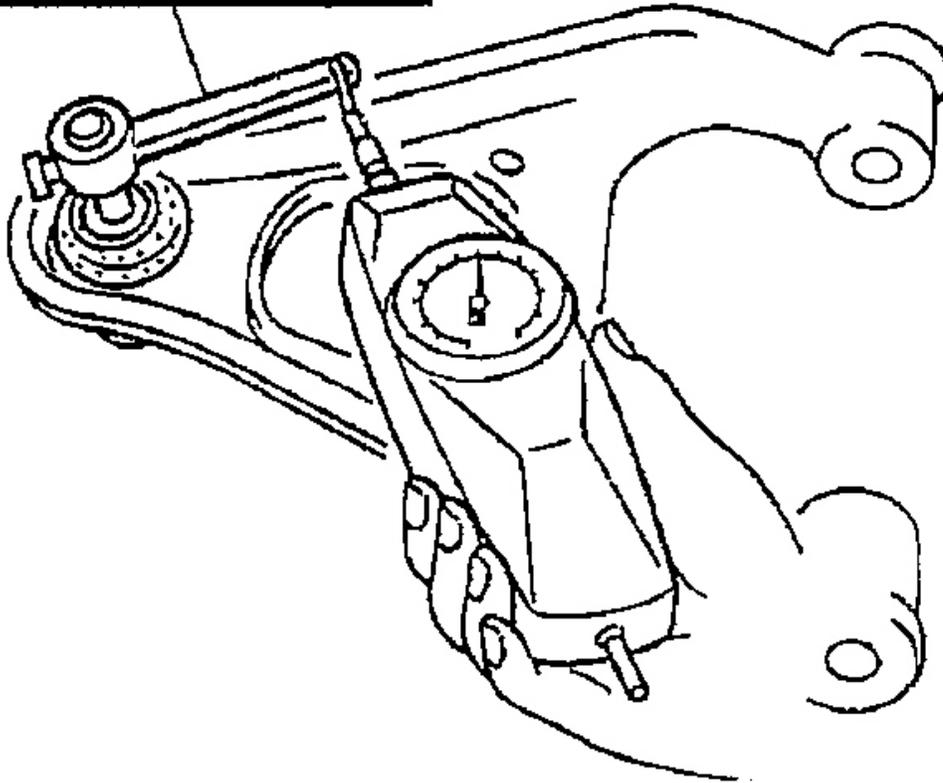
Rotation torque

0.3-2.2 N.m {2.8-23.4 kgf.cm, 2.5-20.3 in.lbf}

Pull scale reading

3.0-22.5 N {0.3-2.3 kgf, 0.7-5.0 lbf}

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Fig. 27: Shaking Ball Joint Stud
Courtesy of MAZDA MOTORS CORP.

FRONT STABILIZER REMOVAL/INSTALLATION

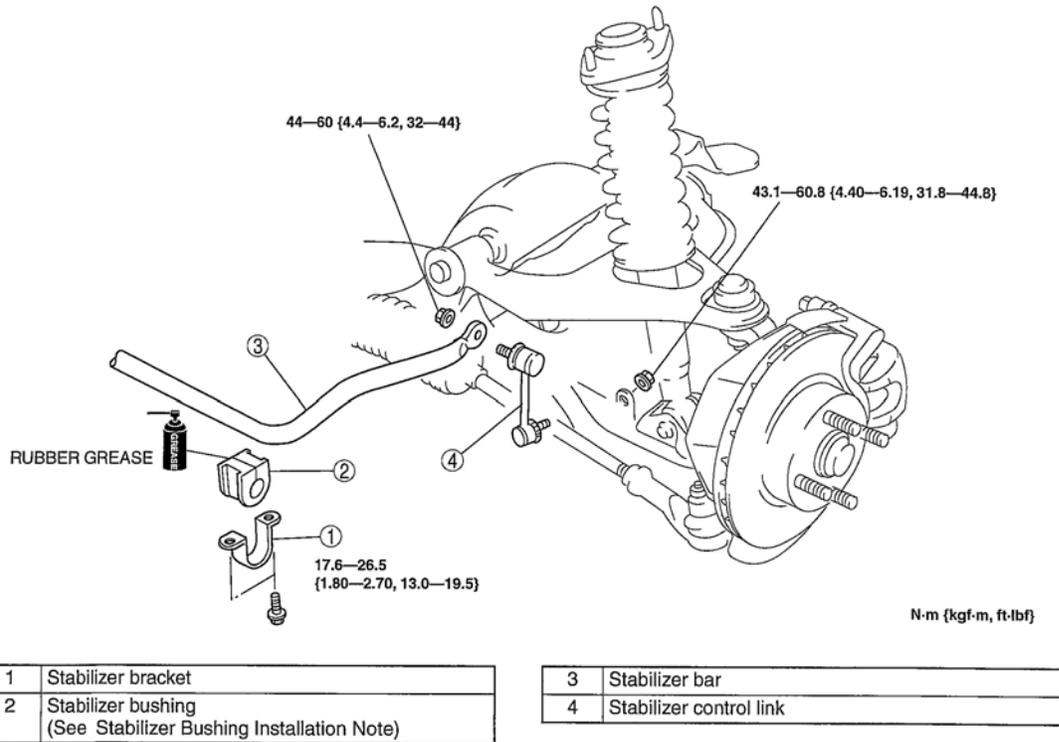
- CAUTION:**
- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

1. Remove in the order indicated in the table.

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2. Install in the reverse order of removal.



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Fig. 28: View Of Front Stabilizer & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

STABILIZER BUSHING INSTALLATION NOTE

1. Align the bushing with the positioning bushing on the stabilizer.

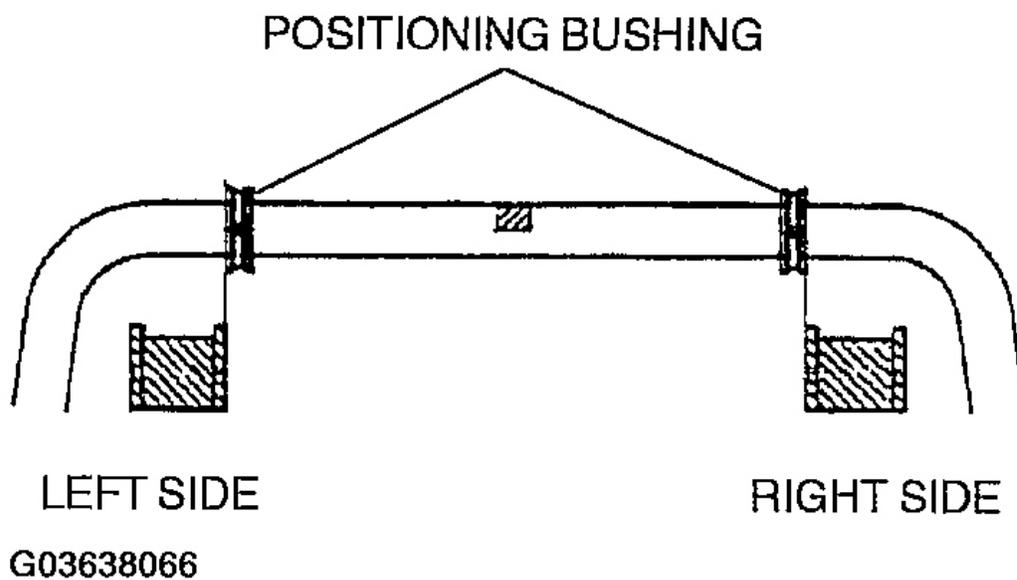
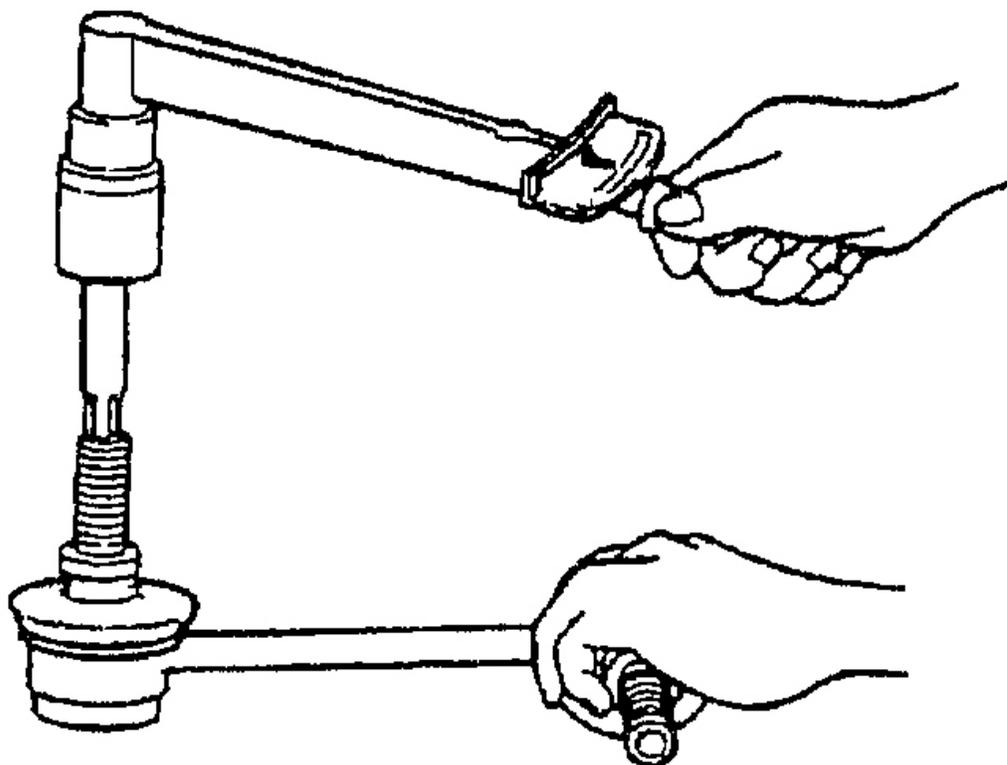


Fig. 29: Aligning Bushing With Positioning Bushing On Stabilizer
Courtesy of MAZDA MOTORS CORP.

STABILIZER CONTROL LINK INSPECTION

1. Remove the stabilizer control link from the vehicle.
2. Inspect for bending and damage.
3. Measure the ball joint starting torque.



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Fig. 30: Measuring Ball Joint Starting Torque
Courtesy of MAZDA MOTORS CORP.

1. Rock the ball joint stud side to side 10 times.
2. Rotate the ball joint stud 10 times.
3. Measure the starting torque using a suitable Allen socket and a torque wrench.
 - Replace if it is not within the specification.

Starting torque

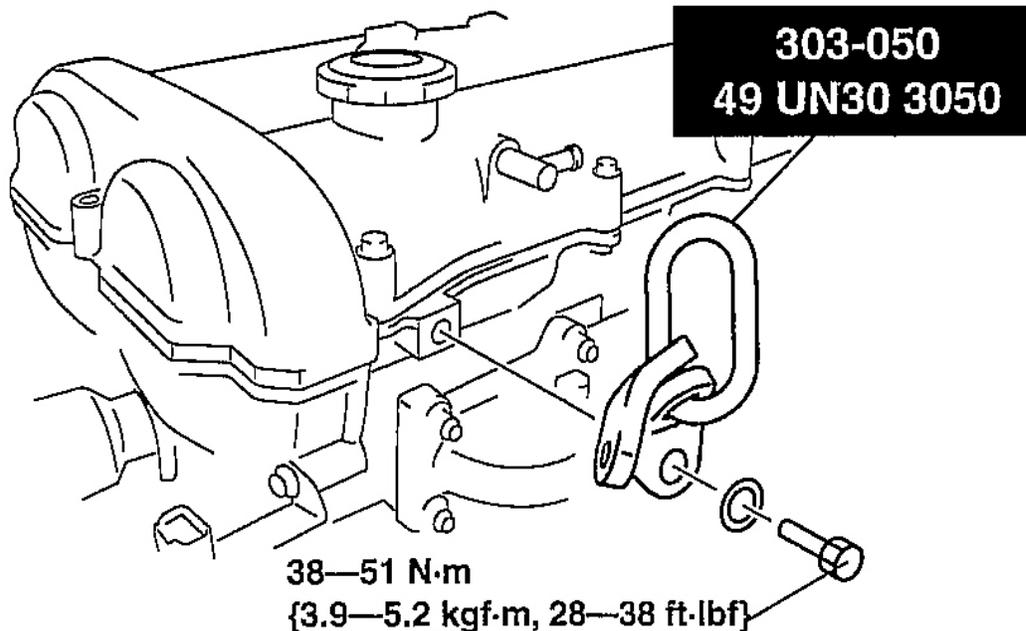
0.2-2.7 N.m {1.4-27 kgf.cm, 1.3-23.4 in.lbf}

FRONT CROSSMEMBER REMOVAL/INSTALLATION

CAUTION: • Performing the following procedures without first removing the ABS

wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

1. Remove the air cleaner, MAF sensor, air hose No.2, air hose No.1, air pipe No.1, air bypass valve. (BP with TC) (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION (BP WITH TC)** .)
2. Install the **SST** to the position shown in **Fig. 31** using the suitable washer and air pipe No.1 installation bolt. (BP with TC)



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Fig. 31: Installing SST To Position
Courtesy of MAZDA MOTORS CORP.

3. Support the engine with a hoist or baby crane.
4. Remove the steering gear and linkage. (See **STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION** .)
5. Remove the steering knuckles. (See **WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION** .)
6. Remove the front stabilizer. (See **FRONT STABILIZER REMOVAL/INSTALLATION**.)
7. Remove the front lower arms. (See **FRONT LOWER ARM REMOVAL/INSTALLATION**.)

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8. Remove the front upper arms. (See **FRONT UPPER ARM REMOVAL/INSTALLATION.**)
9. Remove in the order indicated in the table.
10. Install in the reverse order of removal.
11. Inspect the front wheel alignment.
 - If not as specified, adjust the front wheel alignment. (See **FRONT WHEEL ALIGNMENT .**)

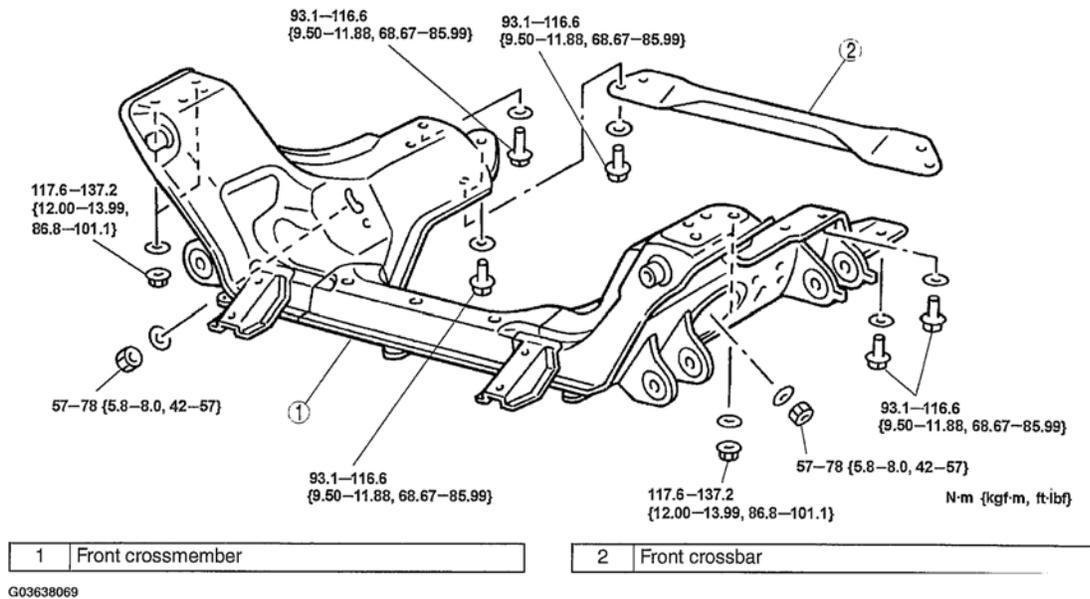
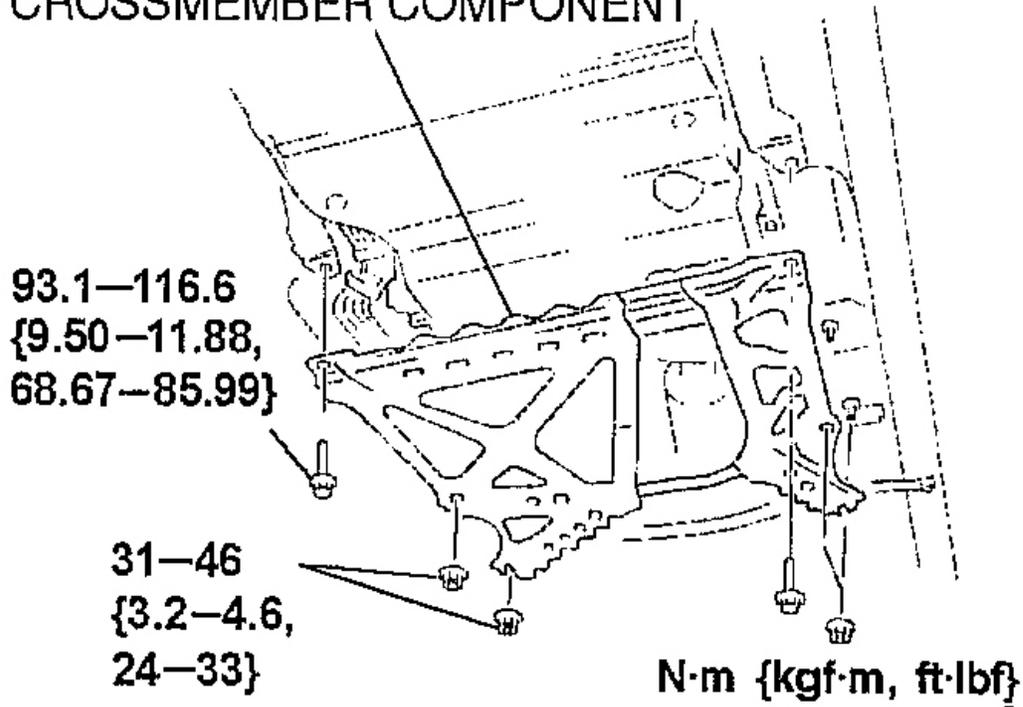


Fig. 32: View Of Front Crossmember & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

CROSSMEMBER COMPONENT REMOVAL/INSTALLATION

1. Remove the crossmember component.
2. Install the crossmember component.

CROSSMEMBER COMPONENT



G03638070

Fig. 33: Installing Crossmember Component & Torque Specifications
Courtesy of MAZDA MOTORS CORP.