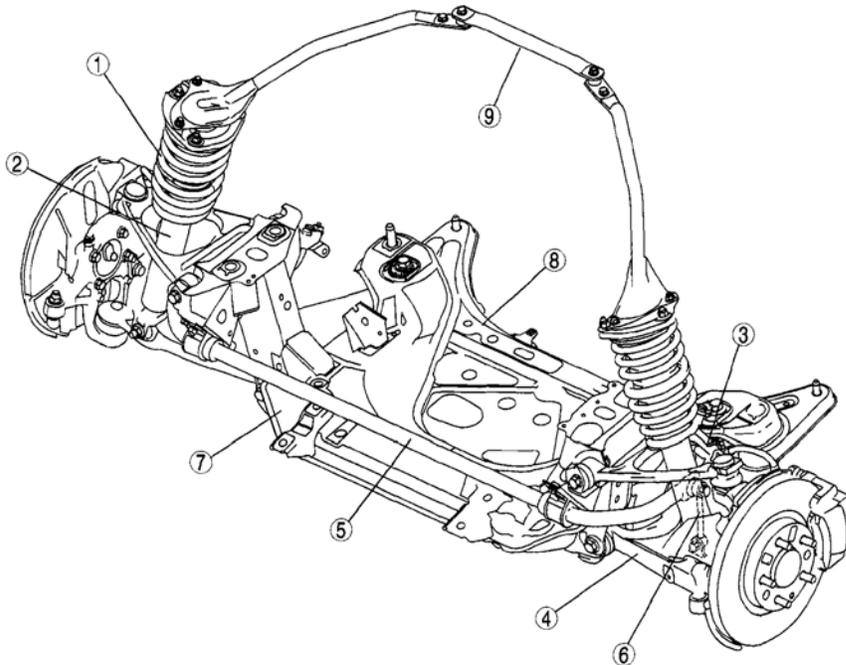


2008 SUSPENSION

Front Suspension - MX-5 Miata

FRONT SUSPENSION LOCATION INDEX



ESU213ZW5001

1	Front shock absorber and coil spring	5	Front stabilizer
2	Front shock absorber	6	Stabilizer control link
3	Front upper arm	7	Front crossmember
4	Front lower arm	8	Transverse member
		9	Front suspension tower bar

G04318109

Fig. 1: Identifying Location Of Front Suspension Components
 Courtesy of MAZDA MOTORS CORP.

FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION

CAUTION:

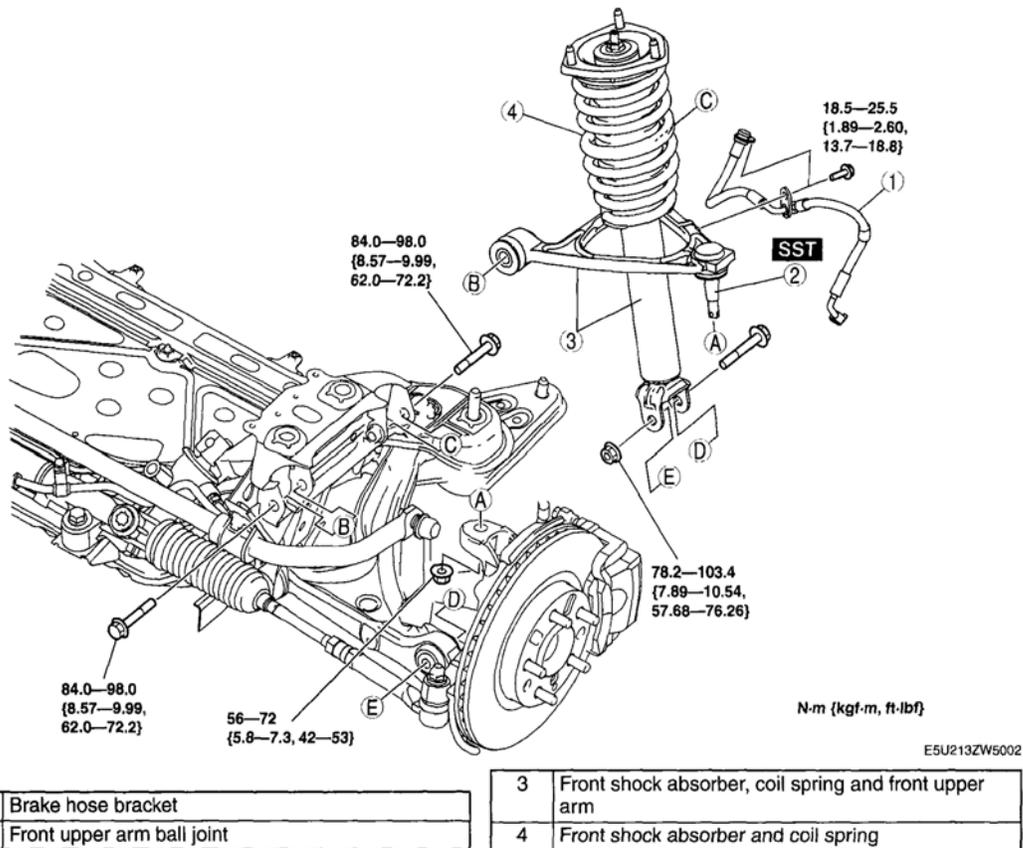
- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where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

1. Remove the front suspension tower bar. (See **FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION** .)

2008 Mazda MX-5 Miata Grand Touring

2008 SUSPENSION Front Suspension - MX-5 Miata

2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Inspect the front wheel alignment, and adjust it if necessary. (See **FRONT WHEEL ALIGNMENT** .)



G04318110

E5U213ZW5002

Fig. 2: Identifying Front Shock Absorber & Coil Spring Components (With Torque Specifications)
 Courtesy of MAZDA MOTORS CORP.

FRONT SHOCK ABSORBER AND COIL SPRING DISASSEMBLY/ASSEMBLY

WARNING:

- Removing/installing the shock absorber and coil spring is dangerous. The shock absorber and coil spring could fly off and cause serious injury or death, and damage the vehicle.

1. Remove the front shock absorber and coil spring. (See **FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION** .)
2. Remove in the order indicated in **Fig. 3** .
3. Install in the reverse order of removal.

2008 Mazda MX-5 Miata Grand Touring

2008 SUSPENSION Front Suspension - MX-5 Miata

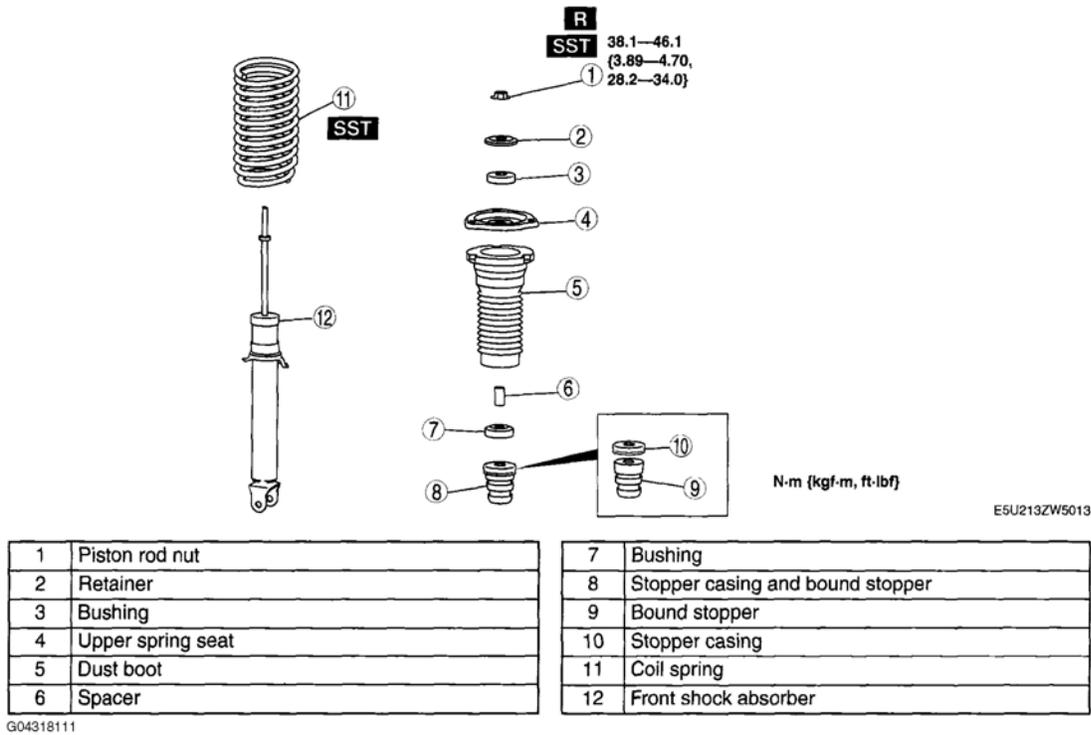


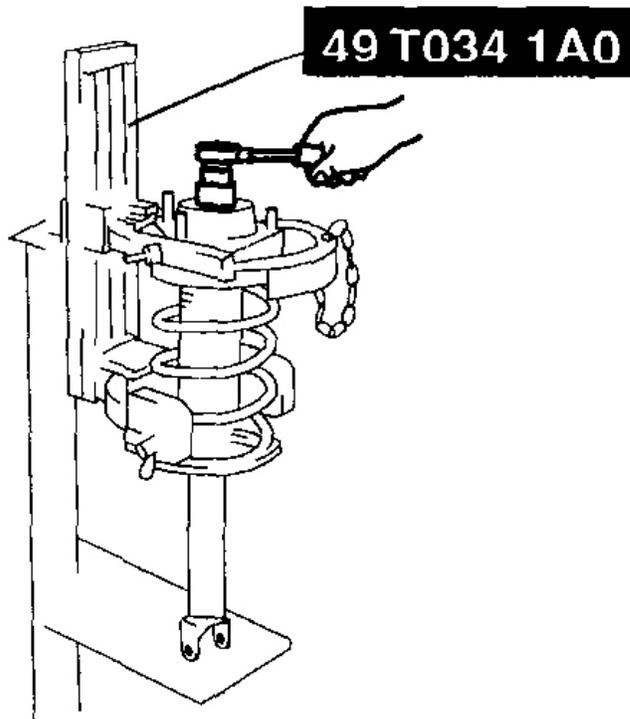
Fig. 3: Identifying Front Shock Absorber & Coil Spring Components (With Torque Specifications)
 Courtesy of MAZDA MOTORS CORP.

PISTON ROD NUT REMOVAL NOTE

WARNING:

- Before removing the piston rod nut, secure the shock absorber and spring in the SSTs. Otherwise, the shock absorber and spring could fly off under tremendous pressure and cause serious injury or death, or damage to vehicle parts.

1. Protect the coil spring from scratches using a piece of cloth and install the SSTs .
2. Compress the coil spring using the SSTs and remove the piston rod nut.



E5U213ZW5014

Fig. 4: Compressing Coil Spring Using SST's & Removing Piston Rod Nut
Courtesy of MAZDA MOTORS CORP.

COIL SPRING INSTALLATION NOTE

1. Protect the coil spring from scratches using a piece of cloth and install the SSTs .
2. Compress the coil spring using the SSTs .
3. Install the shock absorber so that the lower end of the coil spring is seated on the step of the lower spring seat.

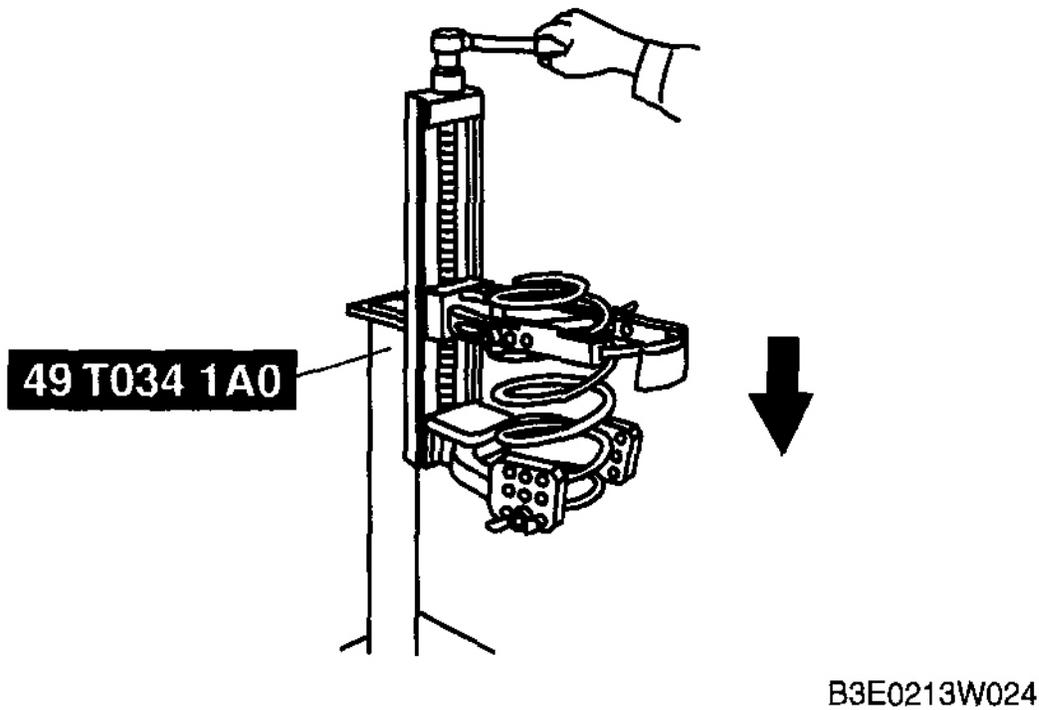
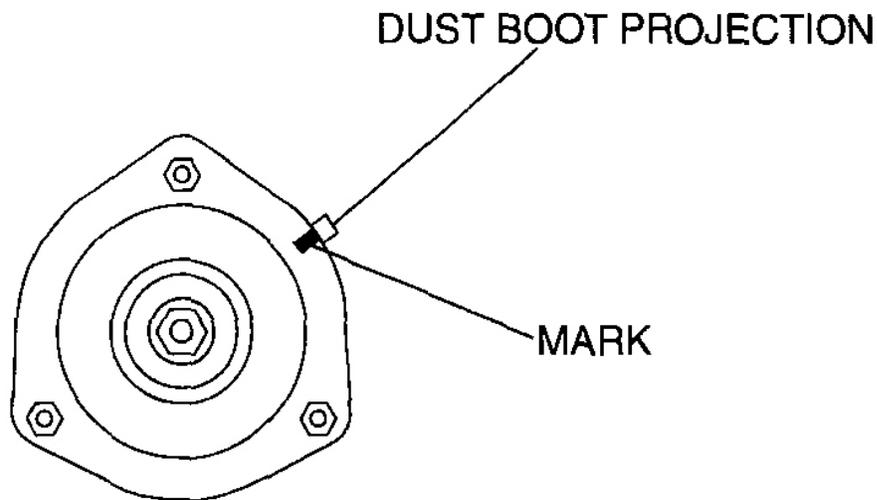


Fig. 5: Compressing Coil Spring Using SSTs
Courtesy of MAZDA MOTORS CORP.

UPPER SPRING SEAT INSTALLATION NOTE

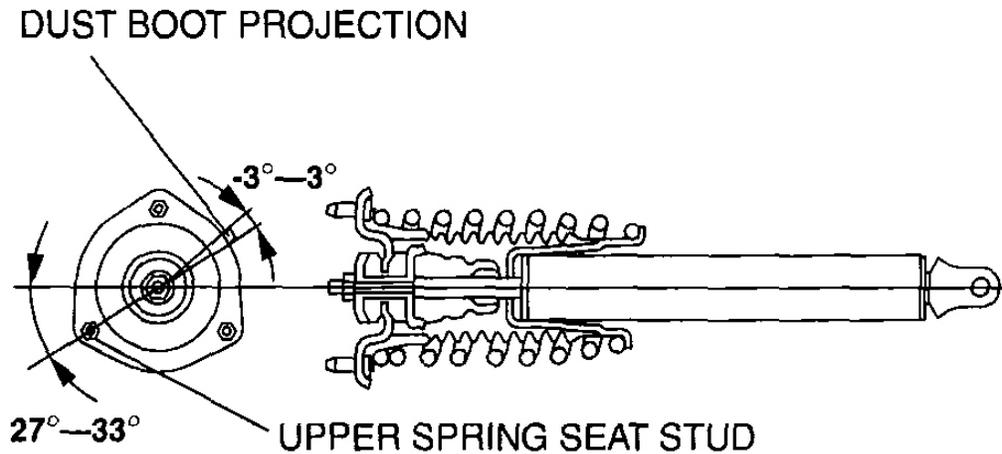
1. Align the mark on the upper spring seat with the dust boot projection.



CHU0213W028

Fig. 6: Aligning Mark On Upper Spring Seat With Dust Boot Projection
Courtesy of MAZDA MOTORS CORP.

2. Install the upper spring seat so that the upper spring seat stud is at a 27° - 33° angle to the shock absorber installation shaft (lower side).



CHU0213W003

Fig. 7: Identifying Upper Spring Seat Stud Angle
 Courtesy of MAZDA MOTORS CORP.

FRONT SHOCK ABSORBER INSPECTION

1. Remove the front shock absorber.
2. Inspect for damage and oil leakage.
3. Compress and extend the shock absorber piston rod at least three times at a steady speed. From the fourth compression stroke, verify that the operational force does not change and that there is no unusual noise.
 - If there is any malfunction, replace the shock absorber.

FRONT SHOCK ABSORBER DISPOSAL

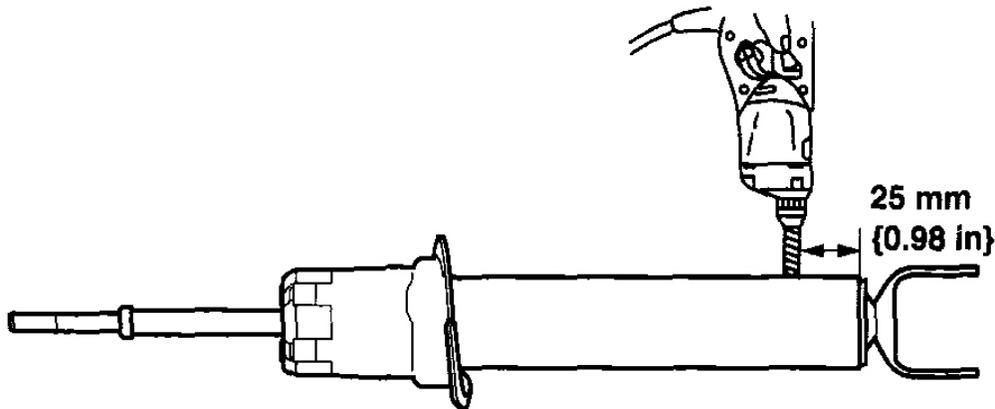
WARNING:

- **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 the shock absorber on a flat surface.
2. Drill a 2-3 mm {0.08-0.12 in} hole at a point 25 mm {0.98 in} from the bottom of the tube, so that the gas can escape.
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 waste oil according to local waste disposal law.

NOTE:

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



CHU0213W021

Fig. 8: Drilling Hole From Bottom Of Tube
Courtesy of MAZDA MOTORS CORP.

FRONT LOWER ARM REMOVAL/INSTALLATION

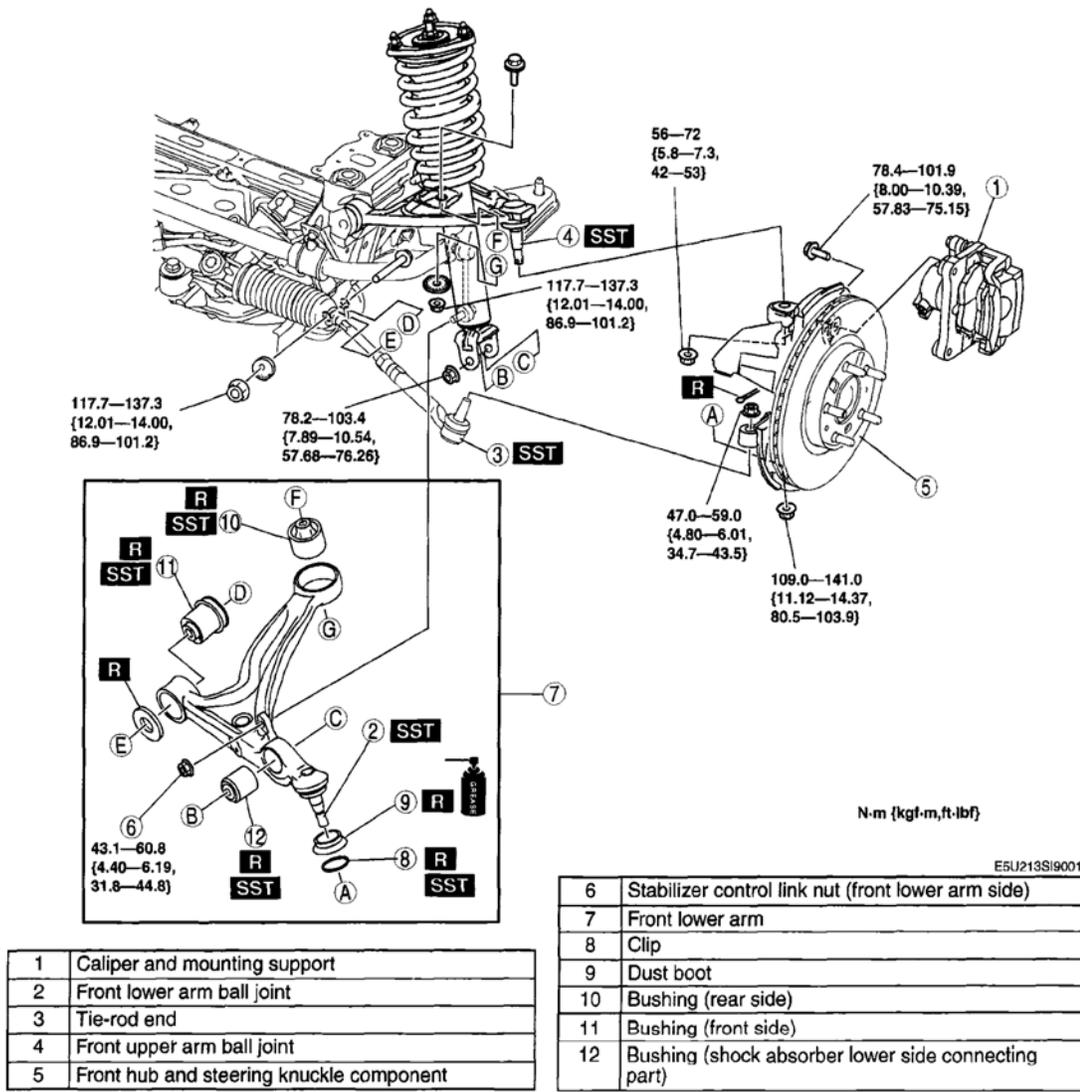
CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring 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 while servicing the vehicle.

1. Remove in the order indicated in **Fig. 9**.
2. Install in the reverse order of removal.

2008 Mazda MX-5 Miata Grand Touring

2008 SUSPENSION Front Suspension - MX-5 Miata



G04318120

Fig. 9: Identifying Front Lower Arm Components (With Torque Specifications)
 Courtesy of MAZDA MOTORS CORP.

CALIPER AND MOUNTING SUPPORT REMOVAL NOTE

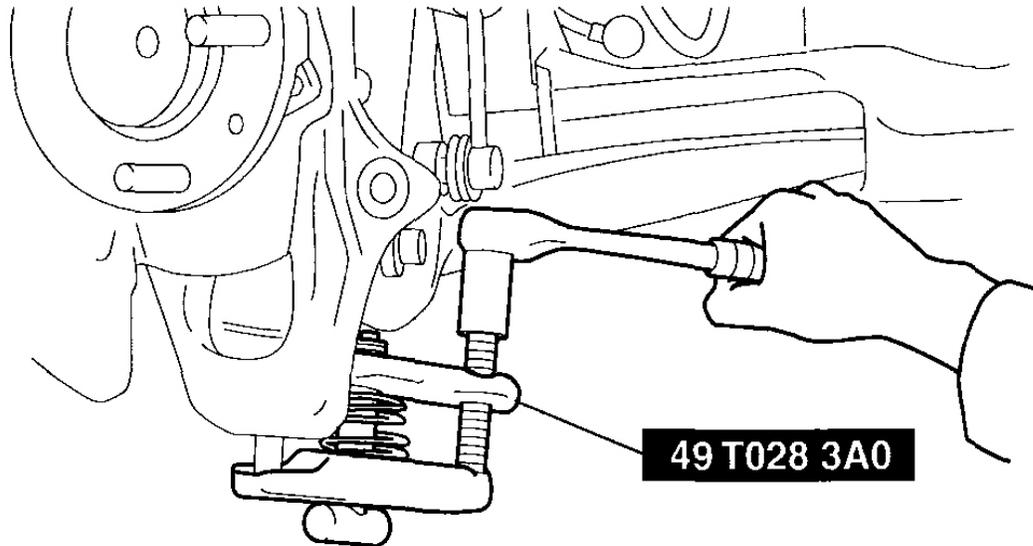
1. Remove the caliper and mounting support from the steering knuckle and suspend it with a cable in a location out of the way.

FRONT LOWER ARM BALL JOINT REMOVAL NOTE

1. Disconnect the front lower arm ball joint from the steering knuckle using the SST .

NOTE: • When removing the front lower arm ball joint, the steering knuckle

bushing may also come off. If it comes off, replace the steering knuckle.

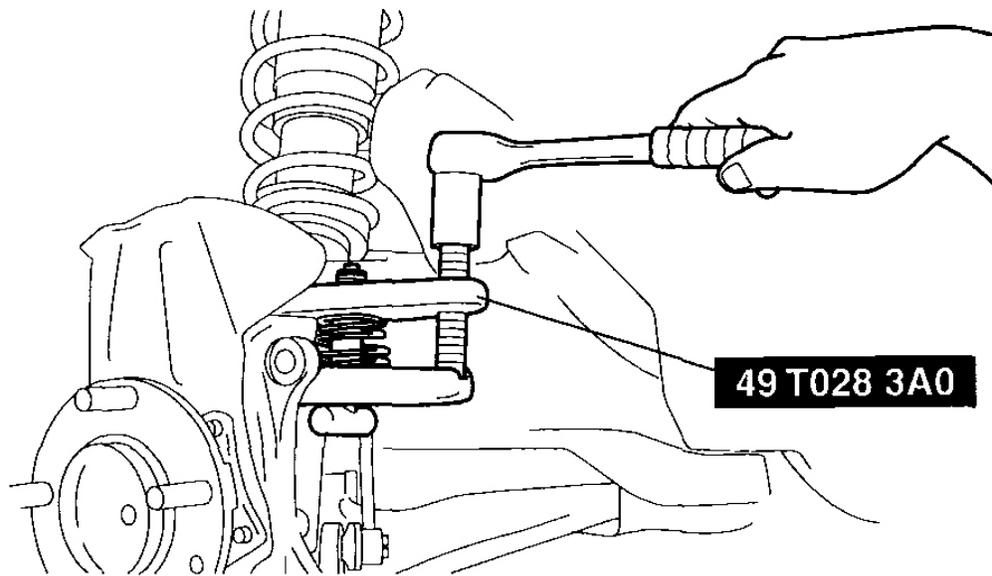


BHJ0213W502

Fig. 10: Disconnecting Front Lower Arm Ball Joint From Steering Knuckle Using SST
Courtesy of MAZDA MOTORS CORP.

FRONT UPPER ARM BALL JOINT REMOVAL NOTE

1. Loosen the bolts on the vehicle side.
2. Disconnect the upper arm ball joint using the SST .



BHJ0213W501

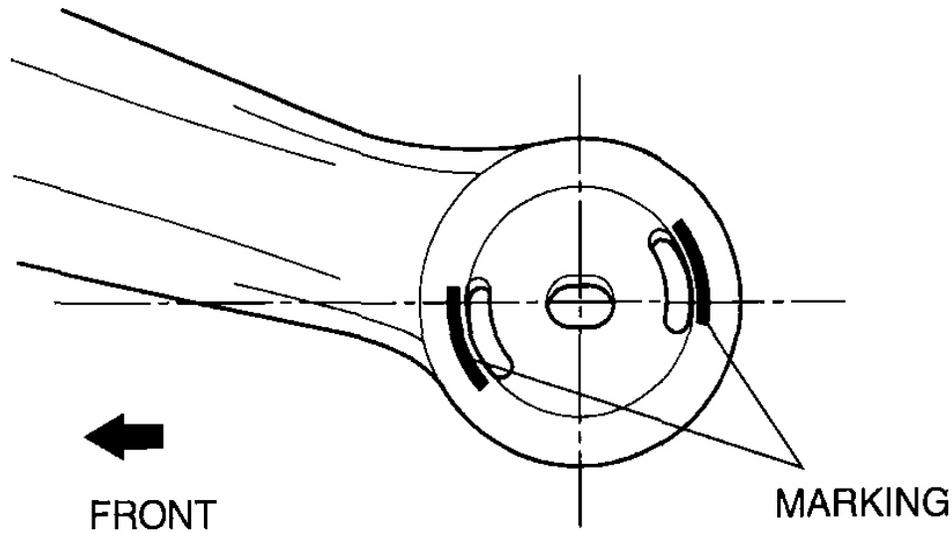
Fig. 11: Disconnecting Front Upper Arm Ball Joint Using SST
Courtesy of MAZDA MOTORS CORP.

BUSHING (REAR SIDE) REMOVAL NOTE

CAUTION:

- Be careful not to damage the front lower arm. If it is damaged, replace it.

1. Mark the front upper arm as shown in **Fig. 12** .



E5U213ZW5006

Fig. 12: Identifying Mark On Front Upper Arm
Courtesy of MAZDA MOTORS CORP.

2. Remove the bushing using the SSTs .

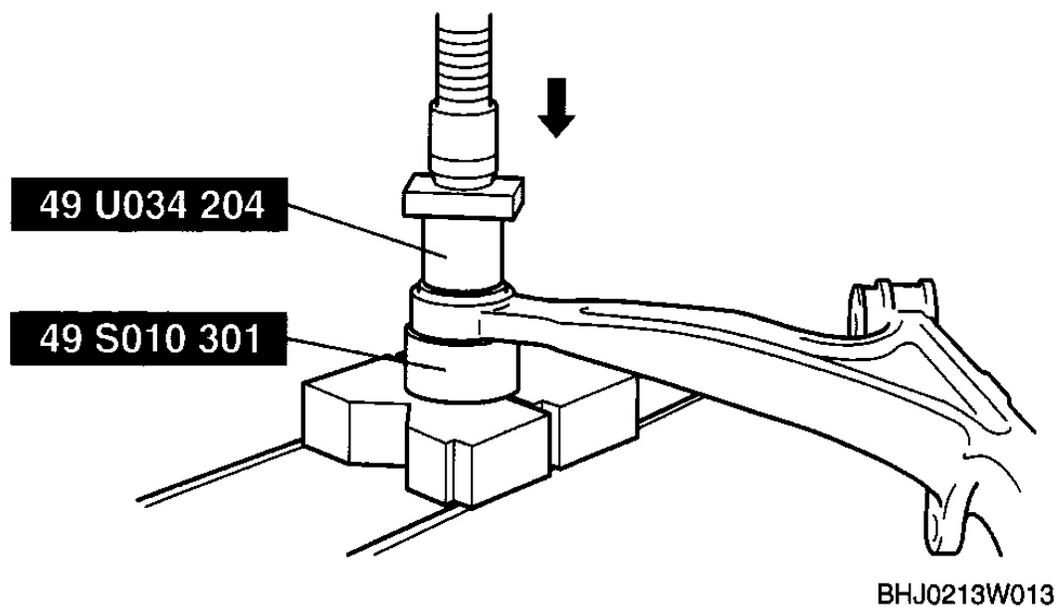


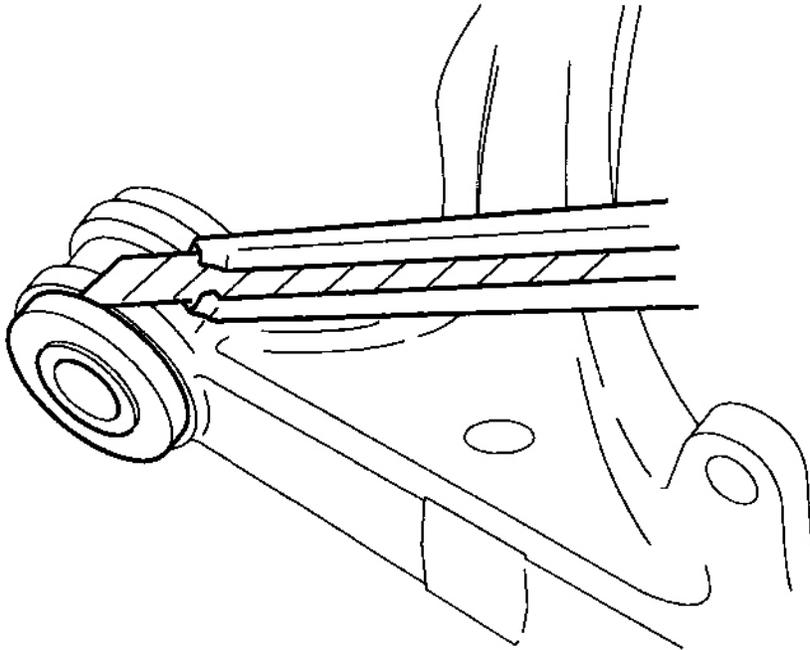
Fig. 13: Removing Bushing Using SST's
Courtesy of MAZDA MOTORS CORP.

BUSHING (FRONT SIDE) REMOVAL NOTE

CAUTION:

- Be careful not to damage the front lower arm. If it is damaged, replace it.

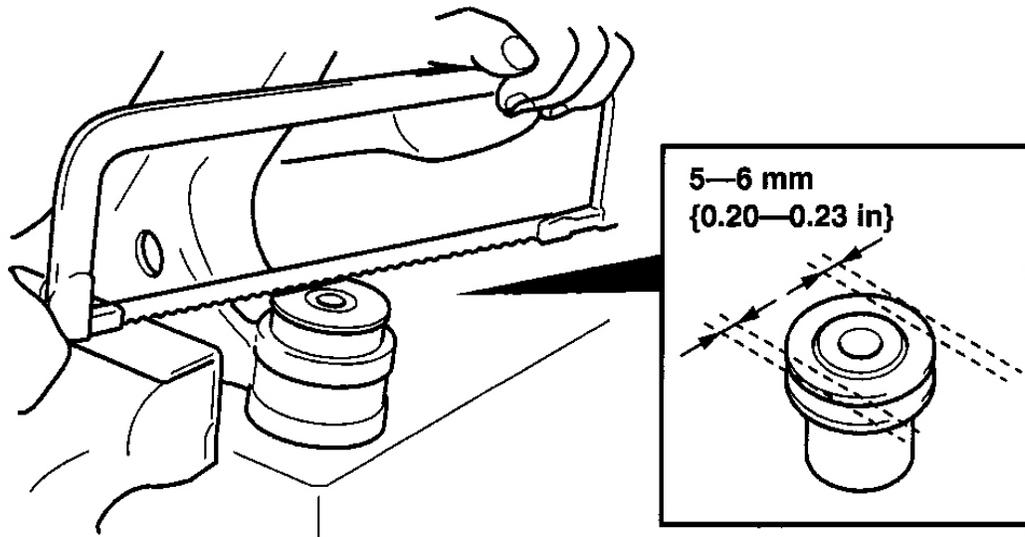
1. Cut off the stopper plate rubber using a razor.



BHJ0213W029

Fig. 14: Cutting Off Stopper Plate Rubber Using Razor
Courtesy of MAZDA MOTORS CORP.

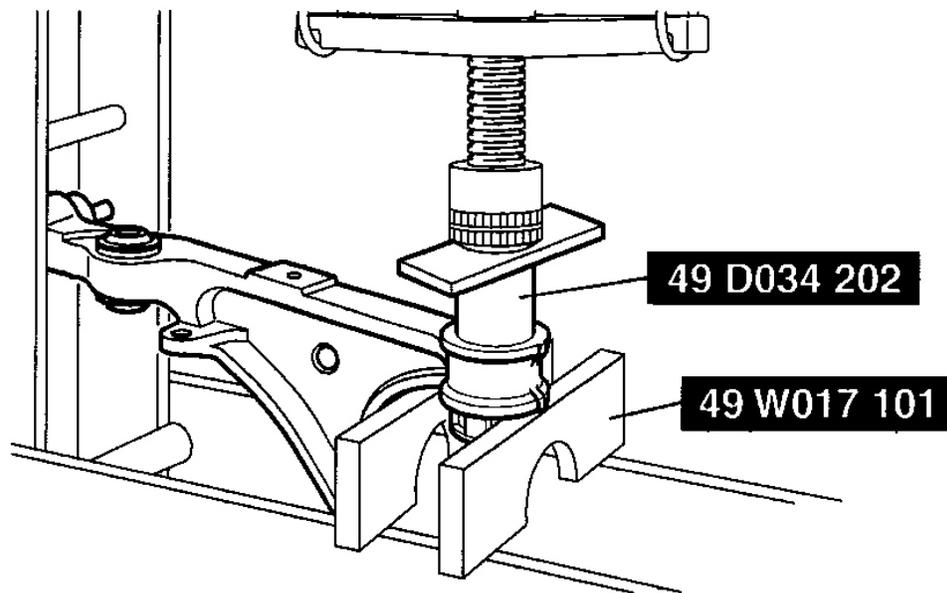
2. Cut off **5-6 mm {0.20-0.23 in}** from each side of the knob end of the bushing using a hacksaw.



CHU0213W010

Fig. 15: Cutting Off From Each Side Of Knob End Of Bushing Using Hacksaw
Courtesy of MAZDA MOTORS CORP.

3. Remove the bushing using the SSTs .



E5U213ZW5020

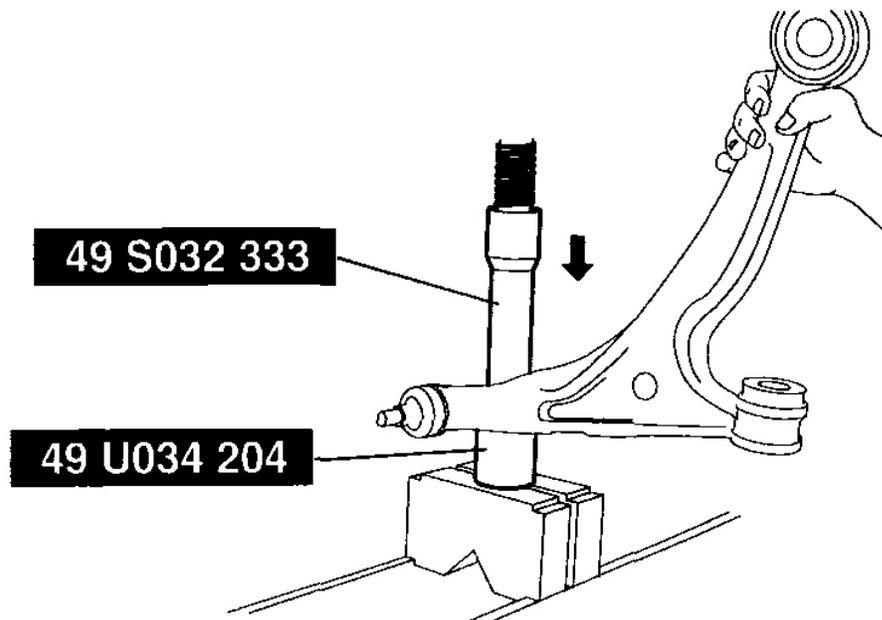
Fig. 16: Removing Bushing Using SST's
Courtesy of MAZDA MOTORS CORP.

BUSHING (SHOCK ABSORBER LOWER SIDE CONNECTING PART) REMOVAL NOTE

CAUTION:

- Be careful not to damage the front lower arm. If it is damaged, replace it.

1. Remove the bushing using the SSTs .



BHJ0213W012

Fig. 17: Removing Bushing Using SSTs
Courtesy of MAZDA MOTORS CORP.

BUSHING (SHOCK ABSORBER LOWER SIDE CONNECTING PART) INSTALLATION NOTE

1. Compress the bushing using the SSTs .

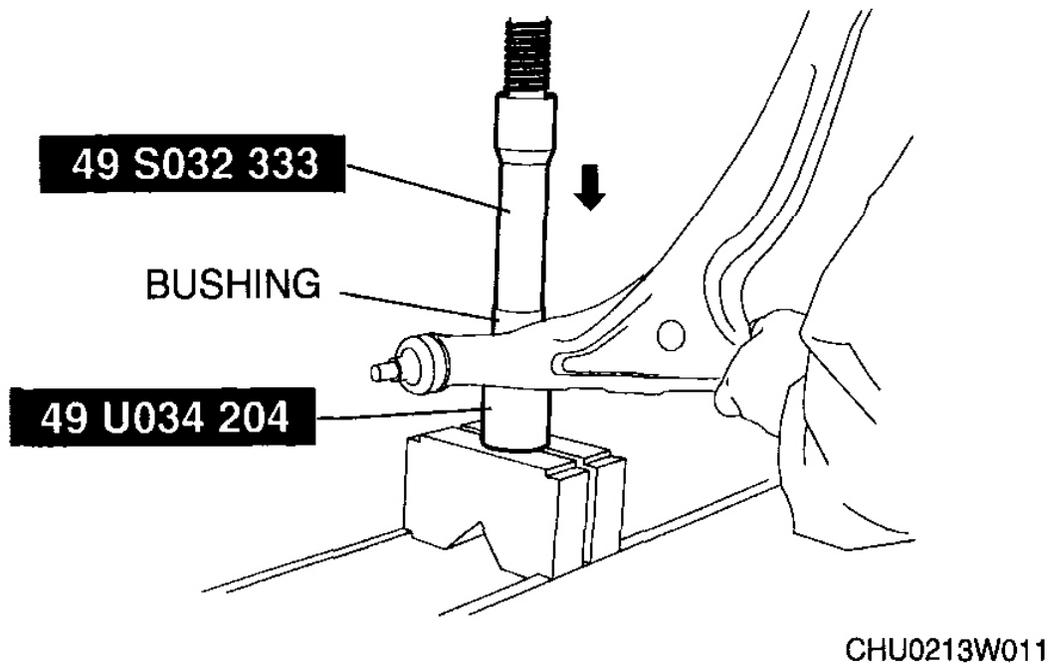


Fig. 18: Compressing Bushing Using SSTs
Courtesy of MAZDA MOTORS CORP.

BUSHING (FRONT SIDE) INSTALLATION NOTE

1. Press the bushing in using the SSTs .

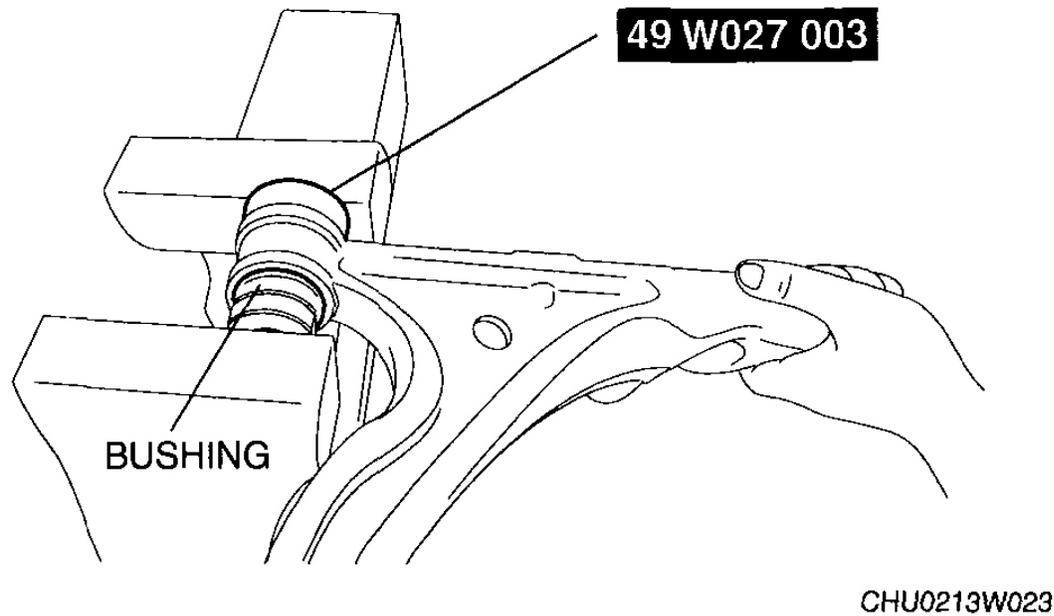


Fig. 19: Pressing Bushing In Using SSTs
Courtesy of MAZDA MOTORS CORP.

2. Insert the stopper plate rubber into the inner pipe of the bushing (front side).

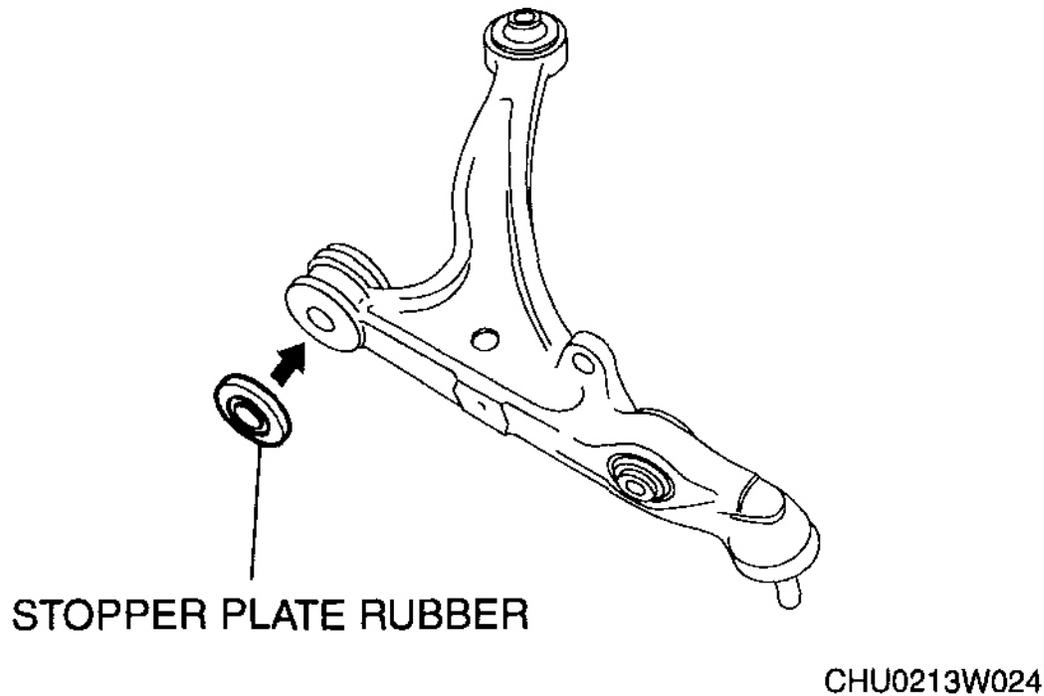
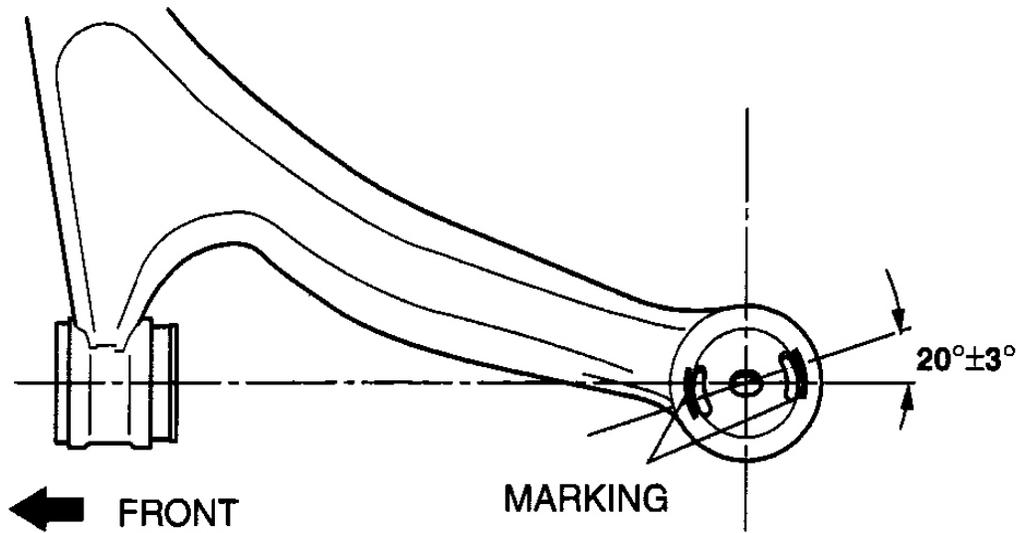


Fig. 20: Inserting Stopper Plate Rubber Into Inner Pipe Of Bushing (Front Side)
Courtesy of MAZDA MOTORS CORP.

BUSHING (REAR SIDE) INSTALLATION NOTE

1. Align the marks placed during removal and install the bushing.



E5U213ZW5007

Fig. 21: Aligning Match Marks
Courtesy of MAZDA MOTORS CORP.

2. Press the bushing in using the SSTs .

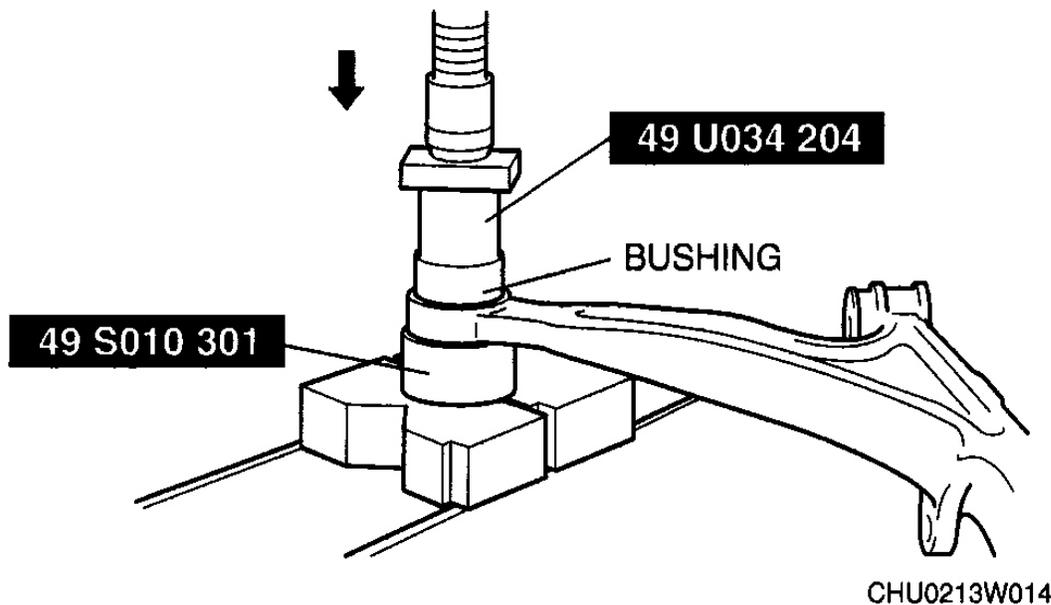
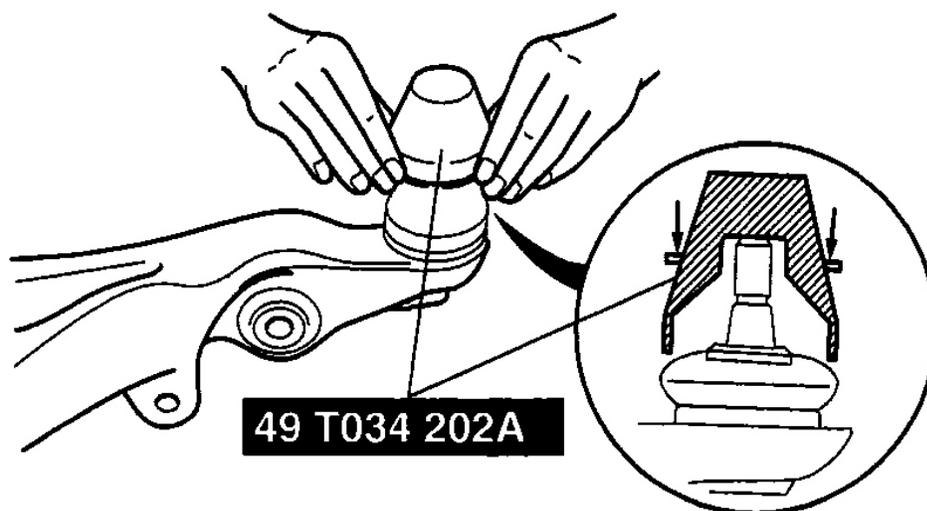


Fig. 22: Pressing Bushing In Using SSTs
Courtesy of MAZDA MOTORS CORP.

CLIP INSTALLATION NOTE

1. Wipe the grease off the ball joint stud.
2. Fill the inside of the new dust boot with grease.
3. Install the dust boot to the ball joint.
4. Install the clip using the **SST**.
5. Verify that the clip is installed securely to the groove.



BHJ0213W018

Fig. 23: Installing Dust Boot To Ball Joint
Courtesy of MAZDA MOTORS CORP.

6. Wipe off any excess grease.

FRONT LOWER ARM INSTALLATION NOTE

1. Install the front lower arm rear side bushing part horizontally.
2. Install the front lower arm front side bushing part.

FRONT LOWER ARM INSPECTION

1. Remove the front lower arm from the vehicle. (See **FRONT LOWER ARM**

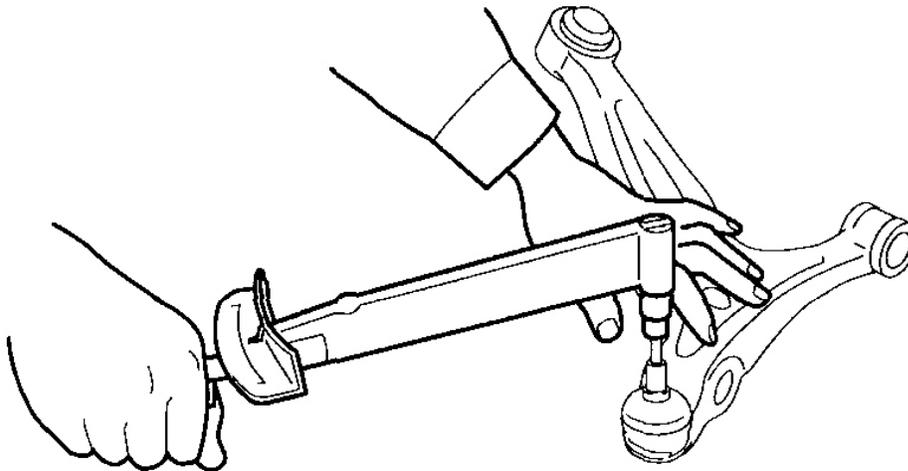
REMOVAL/INSTALLATION .)

2. Inspect the front lower arm for bending or damage. If there is any malfunction, replace it.
3. Inspect the ball joint for excessive play. If there is any malfunction, replace the front lower arm.
4. Rotate the ball joint **5 times** .
5. Measure the ball-joint rotational torque using an Allen wrench and a torque wrench.

Front lower arm ball joint rotational torque

0.4-2.9 N.m {5-29 kgf.cm, 4-25 in.lbf}

- If not within the specification, replace the front lower arm. (See **FRONT LOWER ARM REMOVAL/INSTALLATION** .)



BHJ0213W024

Fig. 24: Measuring Ball-Joint Rotational Torque
Courtesy of MAZDA MOTORS CORP.

FRONT UPPER ARM INSPECTION

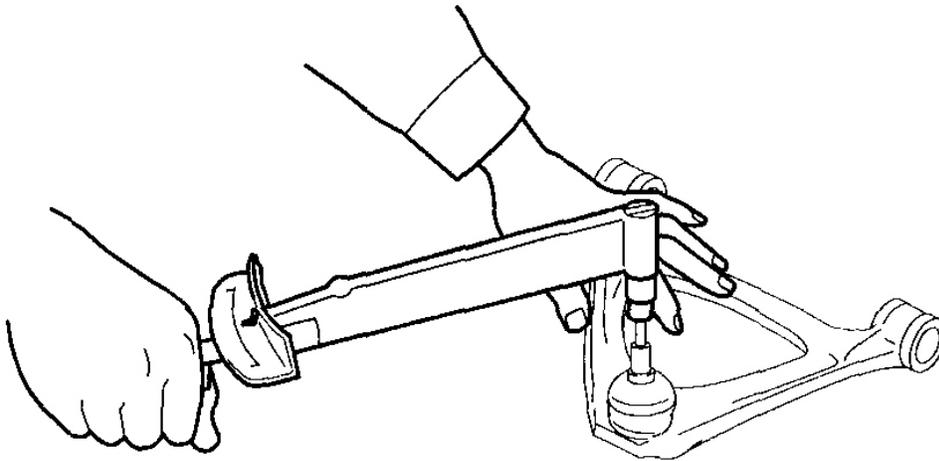
1. Remove the front upper arm from the vehicle. (See **FRONT UPPER ARM REMOVAL/INSTALLATION** .)
2. Inspect the front upper arm for bending or damage. If there is any malfunction, replace it.
3. Inspect the ball joint for excessive play, and if there is any malfunction, replace the front upper arm.
4. Rotate the ball joint **5 times** .

5. Measure the ball-joint rotational torque using an Allen wrench and a torque wrench.

Front upper arm ball joint rotational torque

0.3-2.2 N.m {4-22 kgf.cm, 3-19 in.lbf}

- If not within the specification, replace the front upper arm. (See **FRONT UPPER ARM REMOVAL/INSTALLATION** .)



BHJ0213W023

Fig. 25: Measuring Ball-Joint Rotational Torque Using Allen Wrench & Torque Wrench
Courtesy of MAZDA MOTORS CORP.

FRONT UPPER ARM REMOVAL/INSTALLATION

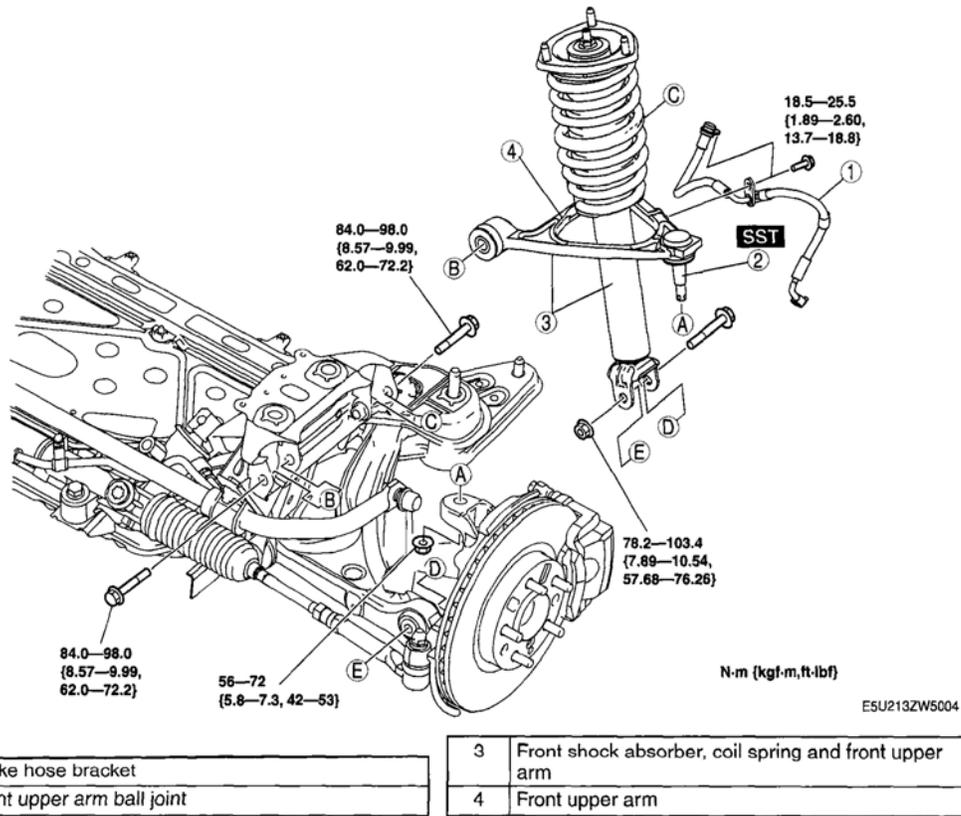
CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring 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 while servicing the vehicle.

1. Remove in the order indicated in **Fig. 26** .
2. Install in the reverse order of removal.
3. Inspect the front wheel alignment and adjust it if necessary. (See **FRONT WHEEL ALIGNMENT** .)

2008 Mazda MX-5 Miata Grand Touring

2008 SUSPENSION Front Suspension - MX-5 Miata

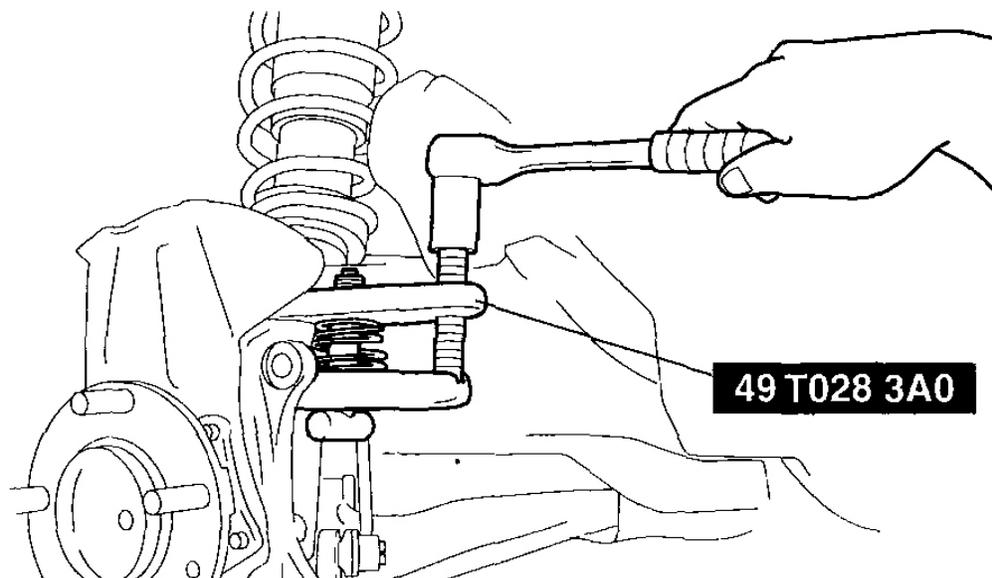


G04318117

Fig. 26: Identifying Front Upper Arm Components (With Torque Specifications)
 Courtesy of MAZDA MOTORS CORP.

FRONT UPPER ARM BALL JOINT REMOVAL NOTE

1. Remove the front upper arm ball joint from the steering knuckle using the SST .



BHJ0213W501

Fig. 27: Removing Front Upper Arm Ball Joint From Steering Knuckle Using SST
Courtesy of MAZDA MOTORS CORP.

FRONT SHOCK ABSORBER, COIL SPRING AND FRONT UPPER ARM REMOVAL NOTE

1. Loosen the shock absorber upper nuts.
2. Remove the front shock absorber lower bolt and nut.

FRONT UPPER ARM REMOVAL NOTE

1. Remove the front upper arm bolts.
2. Push down the front lower arm, and then remove the front upper arm from the gap between the shock absorber lower end and the front lower arm.

FRONT STABILIZER REMOVAL/INSTALLATION

CAUTION:

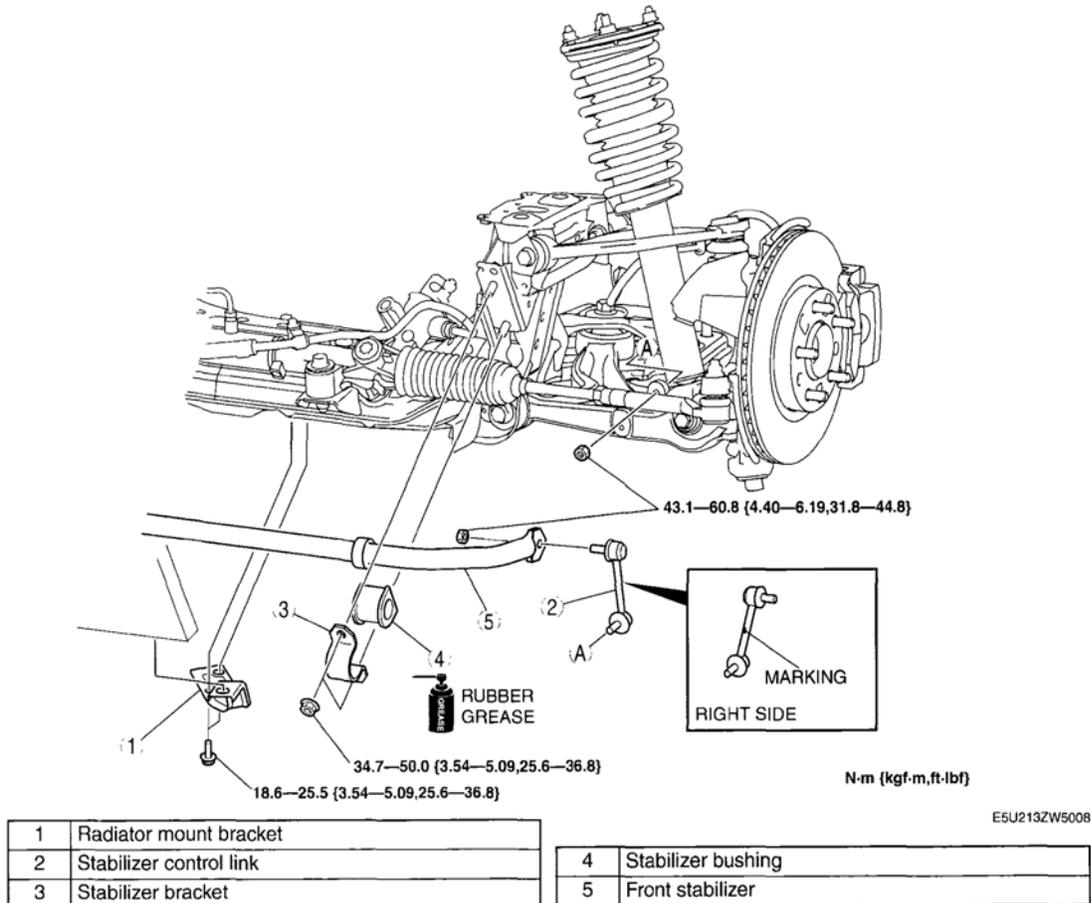
- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where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

1. Remove in the order indicated in the table.

2008 Mazda MX-5 Miata Grand Touring

2008 SUSPENSION Front Suspension - MX-5 Miata

2. Install in the reverse order of removal.



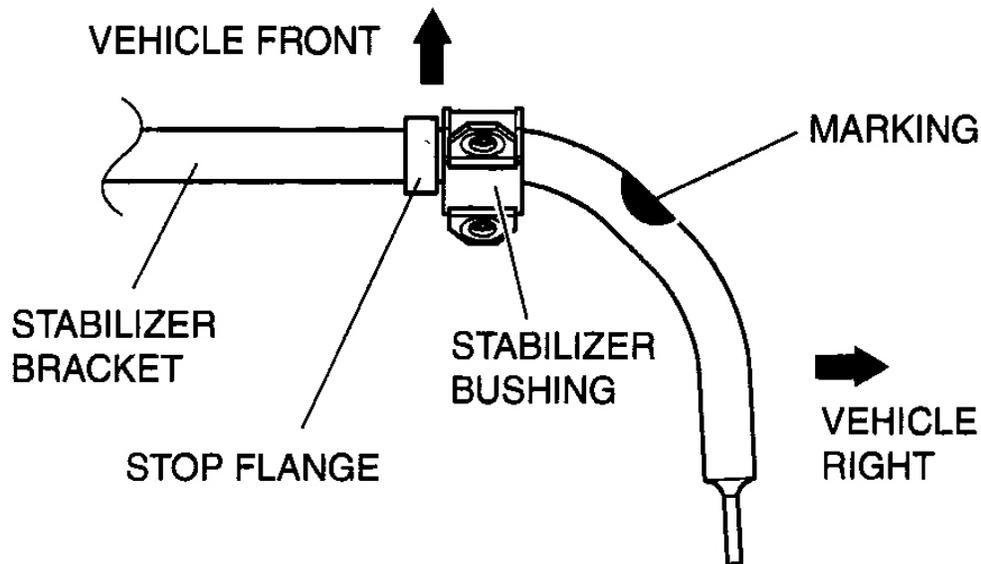
G04318136

E5U213ZW5008

Fig. 28: Identifying Front Stabilizer Components (With Torque Specifications)
 Courtesy of MAZDA MOTORS CORP.

STABILIZER BRACKET INSTALLATION NOTE

1. Apply rubber grease to the inner side of the stabilizer bushing.
2. Align the outer side of the stabilizer slide stopper with the stabilizer bushing.



E5U213ZW5009

Fig. 29: Aligning Outer Side Of Stabilizer Slide Stopper With Stabilizer Bushing
Courtesy of MAZDA MOTORS CORP.

3. Install the stabilizer bracket.

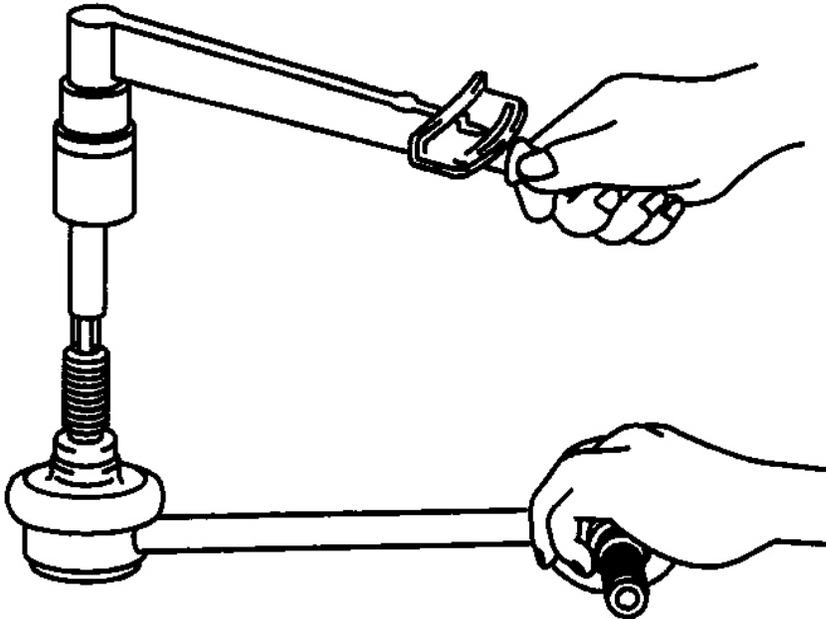
FRONT STABILIZER CONTROL LINK INSPECTION

1. Remove the stabilizer control link from the vehicle. (See **FRONT STABILIZER REMOVAL/INSTALLATION** .)
2. Inspect the stabilizer control link for bending or damage. If there is any malfunction, replace it.
3. Rotate the ball joint stud **10 times** , and then rock it side to side **10 times** .
4. Measure the ball-joint rotational torque using an Allen wrench and a torque wrench.

Stabilizer control link ball joint rotational torque

0.2-2.0 N.m {3-20 kgf.cm, 2-17 in.lbf}

- If not within the specification, replace the stabilizer control link. (See **FRONT STABILIZER REMOVAL/INSTALLATION** .)



BHJ0213W033

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

FRONT CROSSMEMBER REMOVAL/INSTALLATION

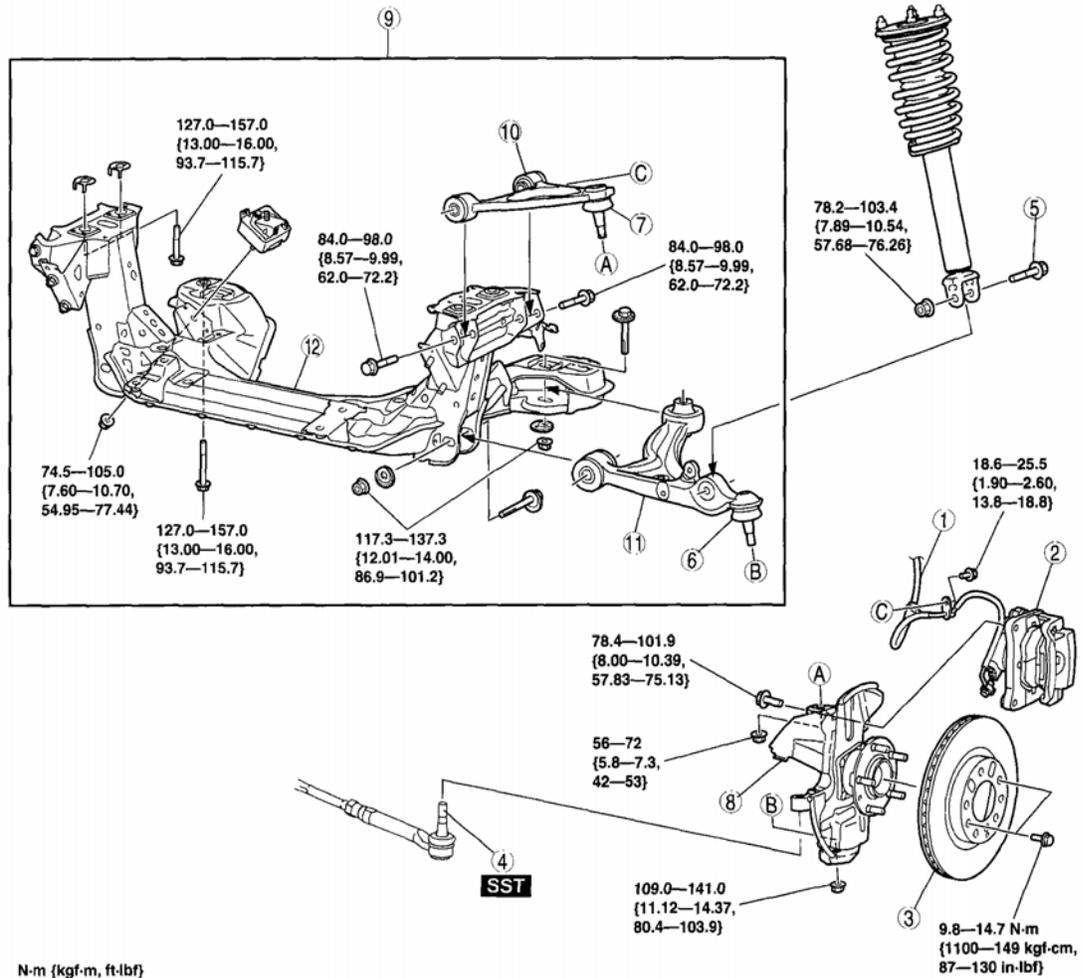
CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring 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 while servicing the vehicle.

1. Remove the front suspension tower bar. (See **FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION** .)
2. Remove the front stabilizer (See **FRONT STABILIZER REMOVAL/INSTALLATION** .)
3. Remove the transverse members (See **TRANSVERSE MEMBER REMOVAL/INSTALLATION** .)
4. Remove the steering gear and linkage, and suspend it using a cable.
5. Remove in the order indicated in **Fig. 31** .
6. Install in the reverse order of removal.
7. Inspect the front wheel alignment. (See **FRONT WHEEL ALIGNMENT** .)

2008 Mazda MX-5 Miata Grand Touring

2008 SUSPENSION Front Suspension - MX-5 Miata



N-m {kgf-m, ft-lbf}

ESU213ZW5010

1	Brake hose
2	Caliper and mounting support
3	Disc plate
4	Tie-rod end
5	Shock absorber bolt (lower)
6	Front lower arm bolt joint

7	Front upper arm ball joint
8	Axle and hub component
9	Front crossmember component
10	Front upper arm
11	Front lower arm
12	Front crossmember

G04318139

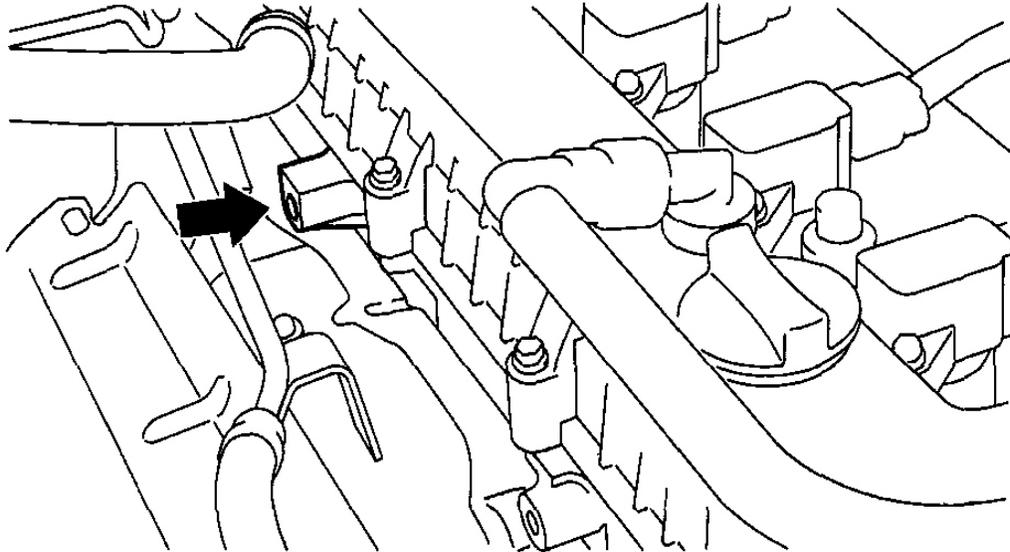
Fig. 31: Identifying Front Crossmember Components (With Torque Specifications)
Courtesy of MAZDA MOTORS CORP.

AXLE AND HUB COMPONENT REMOVAL NOTE

1. Loosen the front upper arm inner bolts.
2. Remove the axle and hub component.

FRONT CROSSMEMBER COMPONENT REMOVAL NOTE

1. Secure the chain to install the SST to the position shown in **Fig. 32** using the bolts (M10 x 1.5 , length 30 mm {1.18 in}).



E5U213ZW5019

Fig. 32: Identifying Chain Bolt Location
Courtesy of MAZDA MOTORS CORP.

2. Suspend the engine.

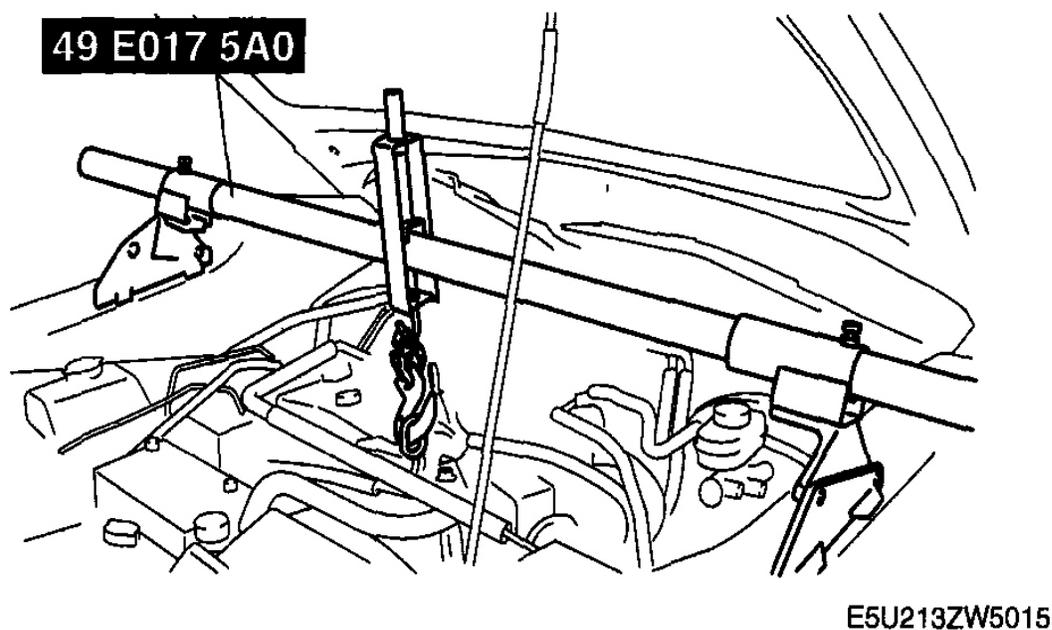


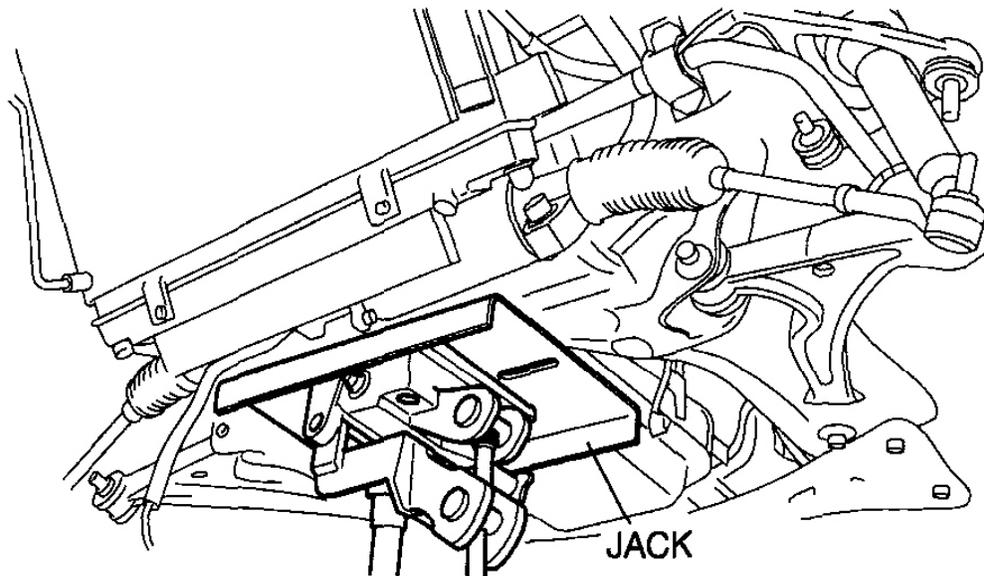
Fig. 33: Suspending Engine
Courtesy of MAZDA MOTORS CORP.

3. Support the front crossmember using a jack.

WARNING:

- Verify that the crossmember component is securely supported by a jack. If the crossmember component falls, it could cause serious injury or death, or damage to the vehicle.

4. Lower the front crossmember component slightly.
5. Remove the engine mounting rubber, pipes and hoses installed to the front crossmember.
6. Remove the front crossmember component.



CHU0213W026

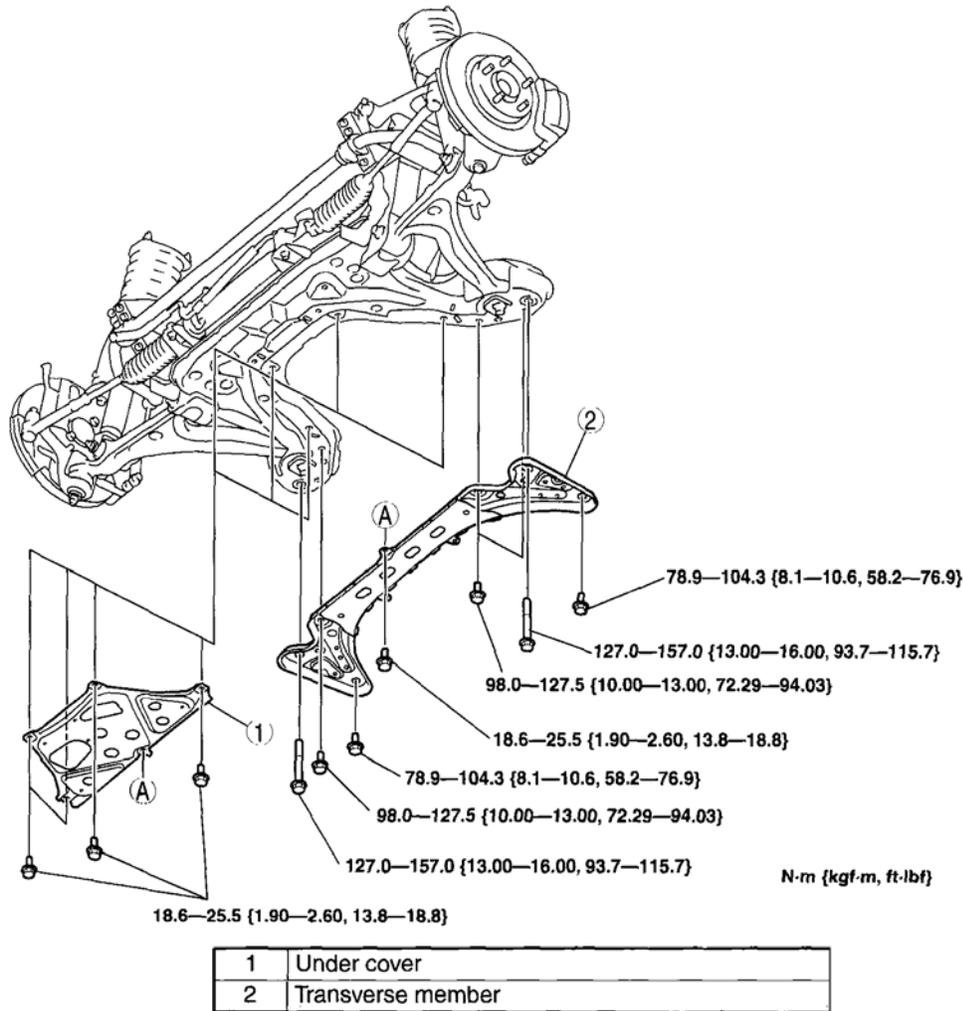
Fig. 34: Supporting Front Crossmember Using Jack
Courtesy of MAZDA MOTORS CORP.

TRANSVERSE MEMBER REMOVAL/INSTALLATION

1. Remove in the order indicated in **Fig. 35**.
2. Install in the reverse order of removal.

2008 Mazda MX-5 Miata Grand Touring

2008 SUSPENSION Front Suspension - MX-5 Miata



ESU213ZW5011

G04318143

Fig. 35: Identifying Transverse Member And Under Cover (With Torque Specifications)
 Courtesy of MAZDA MOTORS CORP.

TRANSVERSE MEMBER REMOVAL NOTE

1. Support the crossmember using a jack.
2. Remove the transverse member.

UNDER COVER INSTALLATION NOTE

1. Align projection A with the transverse member opening to temporarily support the under cover.

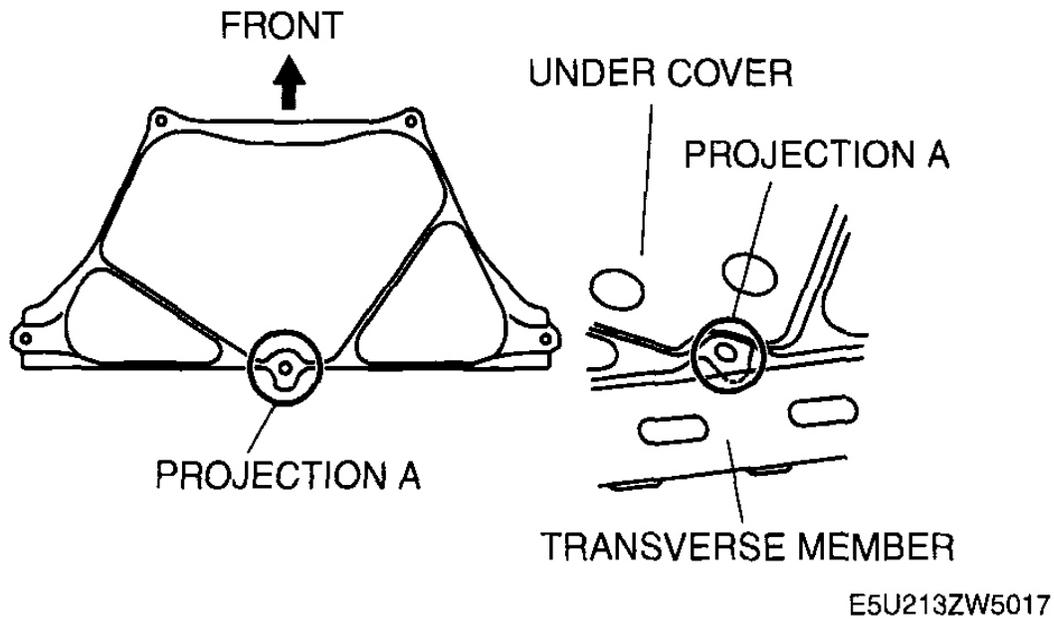
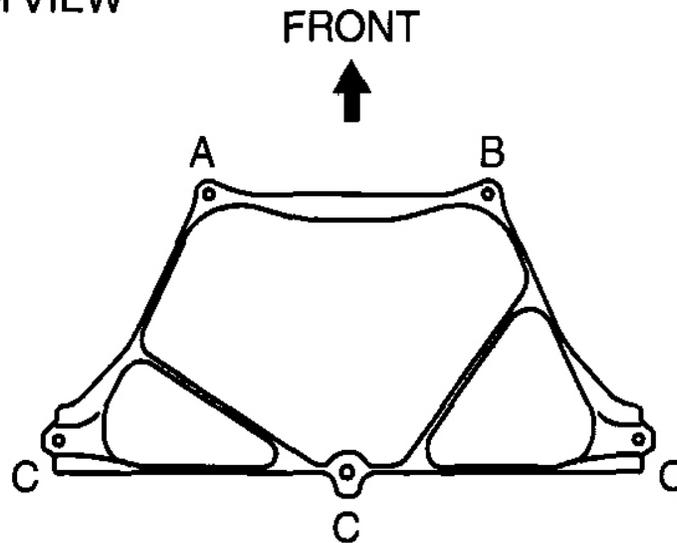


Fig. 36: Aligning Projection A With Transverse Member
Courtesy of MAZDA MOTORS CORP.

2. Tighten the bolts in the order of A, B and C.

BOTTOM VIEW



E5U213ZW5018

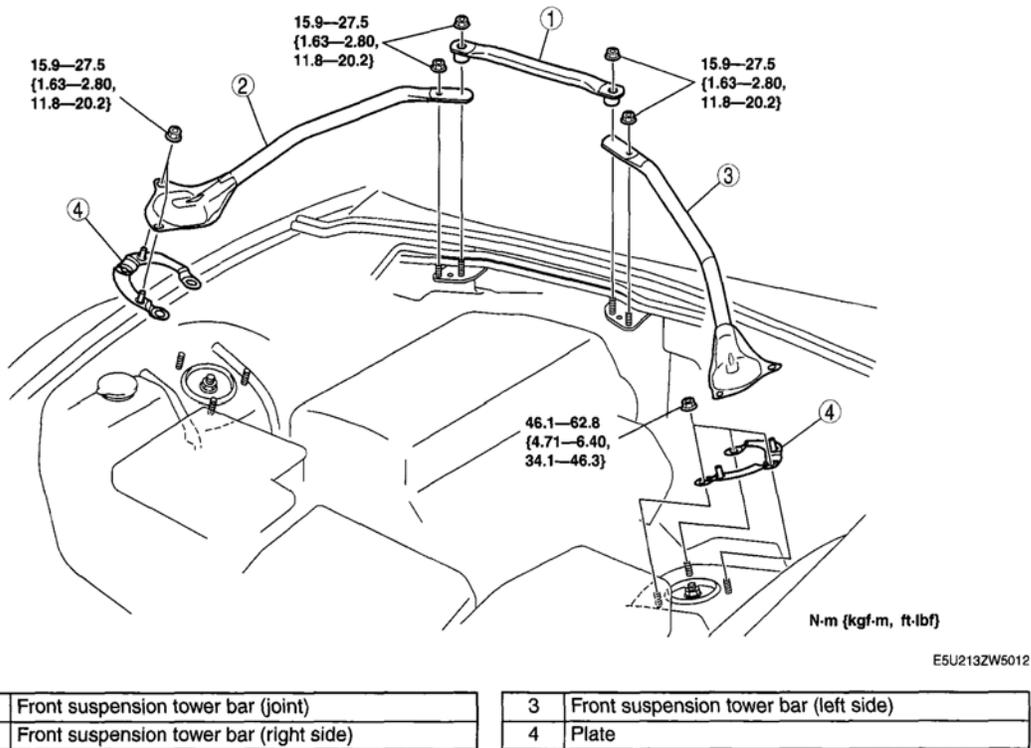
Fig. 37: Tightening Transverse Member Bolts In Sequence
Courtesy of MAZDA MOTORS CORP.

FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION

1. Remove in the order indicated in **Fig. 38**.
2. Install in the reverse order of removal.

2008 Mazda MX-5 Miata Grand Touring

2008 SUSPENSION Front Suspension - MX-5 Miata

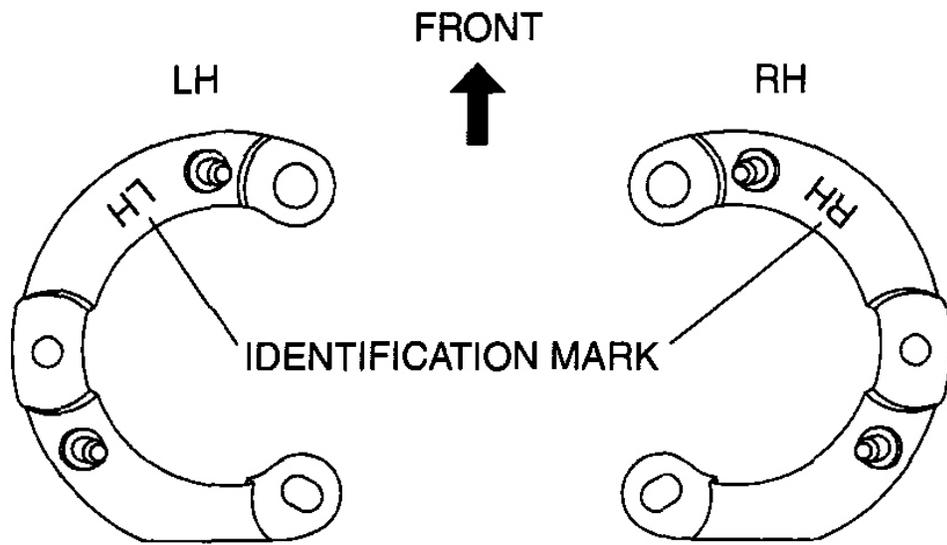


G04318146

Fig. 38: Identifying Front Suspension Tower Bar Components (With Torque Specifications)
Courtesy of MAZDA MOTORS CORP.

PLATE INSTALLATION NOTE

1. Install the plates with the identification marks facing upward.



CHU0213W027

Fig. 39: Identifying Plate Identification Marks
Courtesy of MAZDA MOTORS CORP.