

1997-2000 SUSPENSION

Front - Miata

DESCRIPTION

NOTE: Mazda did not produce 1998 Miata models.

Front suspension is an independent, double wishbone design using upper and lower control arms. A spring over shock is mounted between lower control arm and upper fender panel. Upper and lower control arms pivot at crossmember and are connected by ball joints to steering knuckle. A stabilizer bar attaches to each lower control arm and frame. See **Fig. 1**. Upper coil over shock mount plate has been redesigned for 1999-2000. New design incorporates a urethane bumper and improves ride and cornering.

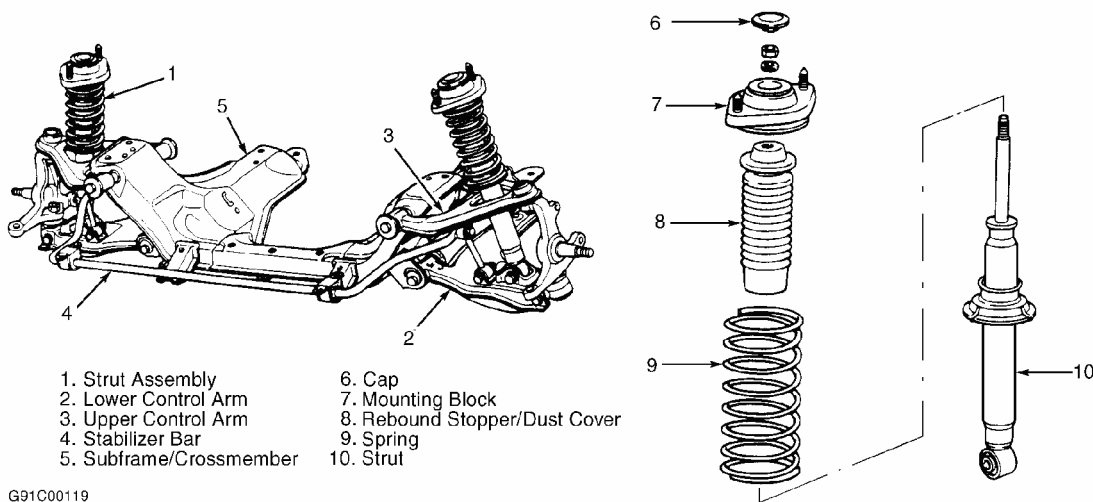


Fig. 1: Identifying Front Suspension Components
Courtesy of MAZDA MOTORS CORP.

ADJUSTMENTS

WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES

NOTE: See SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT.

WHEEL BEARING ADJUSTMENT

Raise and support vehicle. Remove wheel assembly. Remove brake caliper and ABS wheel speed sensor. Remove rotor. Attach dial indicator to axle hub, and measure bearing play. Check bearing axial play by rocking hub assembly by hand. Maximum axial play should

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be .002" (.05 mm). If play exceeds specification, check and adjust lock nut torque or replace hub and bearing assembly. See **TORQUE SPECIFICATIONS**.

INSPECTION

BALL JOINT CHECKING

Lower Ball Joint

Remove lower control arm. See **LOWER CONTROL ARM & BALL JOINT** under REMOVAL & INSTALLATION. Rotate ball joint stud 4-5 times. Install Preload Attachment (49-0180-510B) to ball joint stud. Measure ball joint preload using spring scale. See **LOWER BALL JOINT PRELOAD SPECIFICATIONS** table. If preload is not as specified, replace lower ball joint.

LOWER BALL JOINT PRELOAD SPECIFICATIONS

Application	Lbs. (kg)
1997	1.1-3.3 (0.5-1.5)
1999 & 2000	0.78-4.29 (0.35-1.95)

Upper Ball Joint

Remove upper control arm. See **UPPER CONTROL ARM & BALL JOINT** under REMOVAL & INSTALLATION. Rotate ball joint stud 4-5 times. Install Preload Attachment (49-0180-510B) to ball joint stud. Measure ball joint preload using spring scale. See **UPPER BALL JOINT PRELOAD SPECIFICATIONS** table. If preload is not as specified, replace upper control arm.

UPPER BALL JOINT PRELOAD SPECIFICATIONS

Application	Lbs. (kg)
1997	0.9-3.9 (0.4-1.8)
1999 & 2000	0.7-5.0 (0.3-2.3)

REMOVAL & INSTALLATION

NOTE: Refer to illustration during removal and installation. See **Fig. 1**.

WHEEL BEARING

NOTE: Wheel bearing is not serviceable. If bearing is defective, replace hub and bearing assembly as a unit.

Removal

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Raise and support vehicle. Remove wheel assembly. Remove brake caliper and ABS wheel speed sensor, and wire aside. Remove grease cap and axle lock nut. Remove brake rotor. Remove hub and bearing assembly. Remove wheel speed sensor rotor from hub.

Inspection

Check for damage, excessive wear and signs of bearing seizure. Inspect steering knuckle and hub for cracks, scoring and rust. Check for damaged dust cover and poor fit with steering knuckle. Replace components as necessary.

Installation

To install, reverse removal procedure. Adjust wheel bearing preload. See **WHEEL BEARING ADJUSTMENT** under ADJUSTMENTS. Stake axle nut.

LOWER CONTROL ARM & BALL JOINT

Removal

1. Raise and support vehicle. Remove wheel assembly. Remove engine splash shield (if equipped). Separate tie rod end from steering knuckle (as necessary). Remove stabilizer bar from lower control arm.
2. Remove shock lower mounting bolt and separate lower shock from lower control arm. Remove lower control arm ball joint cotter pin and nut. Separate lower control arm ball joint stud from knuckle using Puller (49 T028 3A0). Remove lower control arm pivot bolts and remove lower control arm.

Inspection

Check lower control arm for damage or cracks. Check bushings for deterioration and excessive wear. Check ball joint for excessive wear. Examine dust boot for damage. Replace components as necessary.

Bushing Replacement

Cut or press old bushing from control arm. Coat NEW bushing with paraffin-based oil. Press new bushing into control arm.

Installation (All Models)

To install, reverse removal procedure. Tighten lower control arm-to-frame bolts to specification with vehicle resting on ground and suspension unloaded. See **TORQUE SPECIFICATIONS** .

UPPER CONTROL ARM & BALL JOINT

Removal

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Raise and support vehicle. Remove wheel assembly. Remove engine splash shield. Remove wheel speed sensor harness band. Remove shock lower mounting bolt, and separate lower shock from lower control arm. Remove upper control arm ball joint cotter pin and nut. Separate upper control arm ball joint stud from knuckle using Puller (49-0118-850C). Remove upper control arm pivot bolts and remove upper control arm.

Inspection

Check upper control arm for damage or cracks. Check bushings for deterioration and excessive wear. Check ball joint for excessive wear. Examine dust boot for damage. Replace components as necessary.

Bushing Replacement

Cut or press old bushing from control arm. Coat new bushing with paraffin-based oil. Press new bushing into control arm.

Installation (All Models)

To install, reverse removal procedure. Tighten upper control arm pivot bolts to specification with vehicle resting on ground and suspension unloaded. See **TORQUE SPECIFICATIONS** .

SHOCK ASSEMBLY

Removal (1997)

Raise and support vehicle. Remove wheel assembly. Remove engine splash shield. Remove wheel speed sensor harness band. Remove stabilizer link bolt. Remove upper control arm ball joint cotter pin and nut. Separate upper control arm ball joint stud from knuckle using Puller (49-0118-850C). Loosen lower control arm pivot bolts. Remove shock upper mount nuts and lower bolt. Move lower control arm just enough to remove shock assembly. DO NOT damage brake line.

Removal (1999 & 2000)

Raise and support vehicle. Remove wheel assembly. Remove engine splash shield. Remove wheel speed sensor. Remove stabilizer link bolt. Separate lower control arm ball joint stud from knuckle using Puller (49-T028-3A0). Loosen lower control arm pivot bolts. Inside engine compartment, on 1999 models, remove strut bar. See **FRONT STRUT BAR (1999)** . On 2000 models, remove shock upper mount nuts. On all models, under car, remove lower bolt. Move lower control arm just enough to remove shock assembly. DO NOT damage brake line.

Disassembly

Clamp upper shock mount in vise. Loosen piston lock nut 2 turns only. Compress coil spring

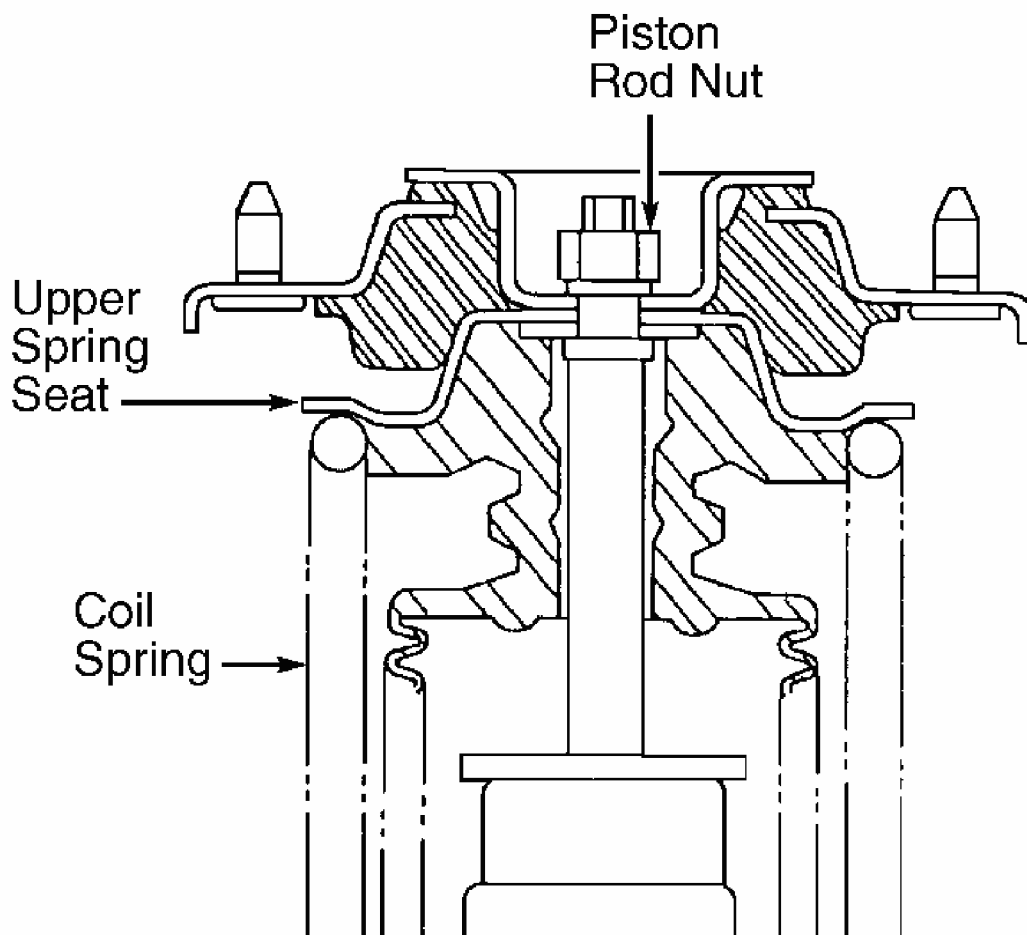
using coil spring compressor. Remove piston lock nut. Slowly release compressor tension. Remove components. Remove coil spring. Remove shock from vise.

Inspection

Check shock tube for damage, oil leakage and abnormal noise. Check rubber components for deterioration or damage. Inspect coil spring for signs of fatigue or damage. Replace components as necessary.

Reassembly (1997)

Clamp shock in vise. Install coil spring and components in reverse order of disassembly. Ensure coil spring is well seated in upper and lower spring seats. See **Fig. 2** . Tighten piston rod nut. See **TORQUE SPECIFICATIONS** .



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Fig. 2: Cross-Sectional View Of Upper Coil Over Shock Assembly (1997)

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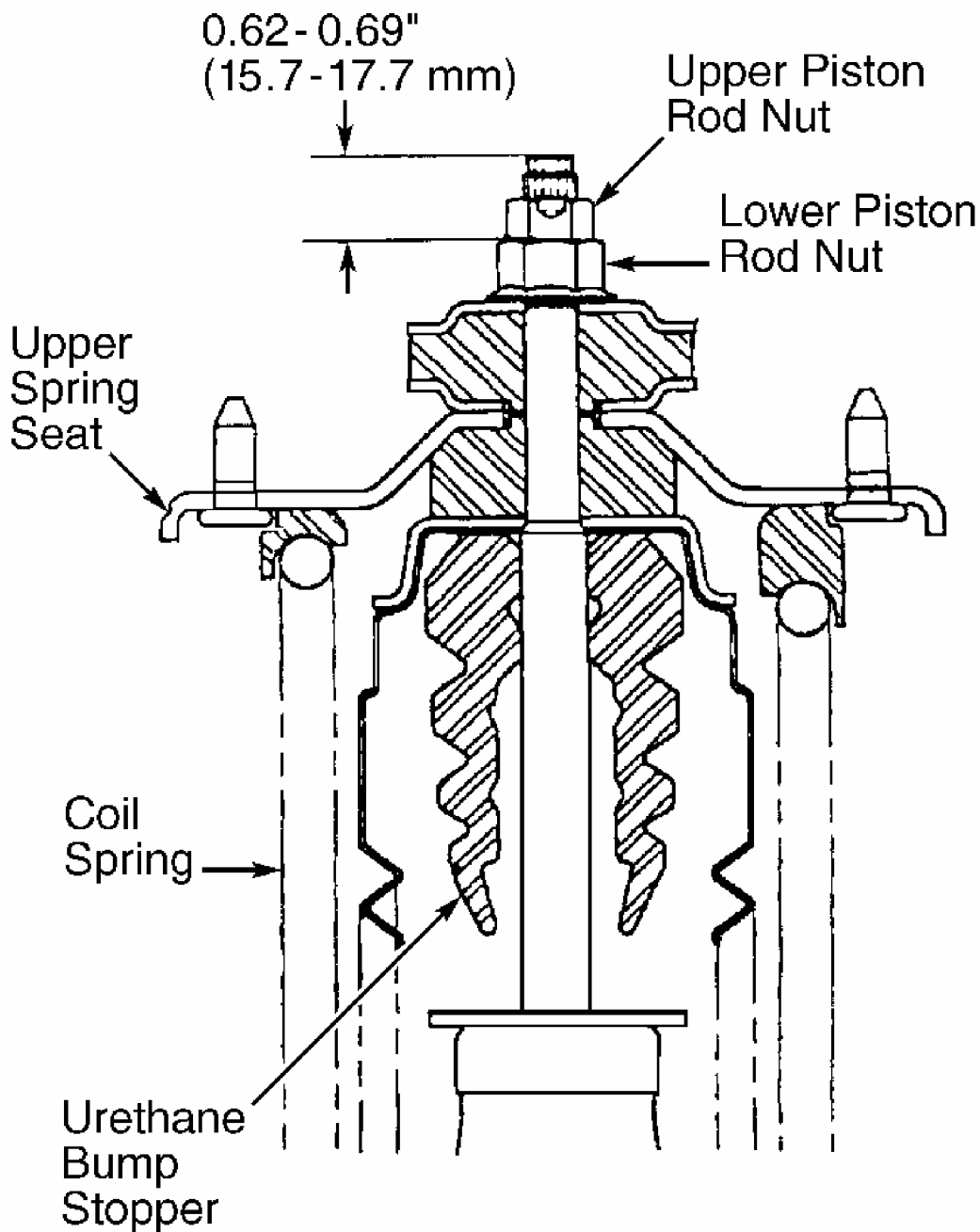
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Courtesy of MAZDA MOTORS CORP.

Reassembly (1999 & 2000)

Clamp shock in vise. Install spring and upper spring retainer in original orientation to shock. Tighten lower piston rod nut so that exposed thread of piston rod is 0.62-0.69" (15.7-17.7mm). See **Fig. 3** . Tighten upper nut to 12-17 ft. lbs. (16-23 N.m).

CAUTION: Using air tool will damage piston rod thread. DO NOT use air tool.



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Fig. 3: Cross-Sectional View Of Upper Coil Over Shock Assembly (1999-2000)
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Installation

To install, reverse removal procedure. Fully tighten all bolts with vehicle resting on ground

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and suspension unloaded. See **TORQUE SPECIFICATIONS** . Check front wheel alignment. See SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT.

STABILIZER BAR

Removal & Installation

Raise and support vehicle. Remove engine splash shield. Remove frame brackets and bushings. Remove stabilizer control links. Align bushing with installation mark on stabilizer. Reverse removable procedure for installation. See **TORQUE SPECIFICATIONS** .

FRONT STRUT BAR (1999)

Removal & Installation

1. To remove strut bar located in engine compartment mounted on top of shock towers, loosen lock nuts on joint bolt and loosen joint bolt. Remove nut, washer and bolt retaining strut bar to strut plate. Remove strut bar from vehicle.
2. To install, reverse removal procedure. Rotate joint bolt counterclockwise to 3.5-5.2 INCH lbs. (.4-.6 N.m) to set tension. Tighten lock nuts to 87-121 INCH lbs. (10-14 N.m). Tighten strut bar-to-strut plate nut. See **TORQUE SPECIFICATIONS** .

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Axle Lock Nut	123-159 (167-215)
Brake Caliper Bracket Bolts	37-50 (50-68)
Lower Ball Joint-To-Knuckle Nut	42-57 (57-77)
Lower Ball Joint-To-Lower Control	
1997	54-69 (73-94)
1999 & 2000	
Bolt & Nut	69-86 (94-117)
Bolt	54-69 (73-94)
Lower Control Arm-To-Frame	
1997	
Front Adjusting Bolt Lock Nut	69-83 (94-112)
Rear Adjusting Bolt Lock Nut	62-75 (84-102)
1999 & 2000	69-83 (94-112)
Shock Assembly-To-Lower Control Arm Bolt/Nut	
1997	54-68 (73-93)
1999 & 2000	69-86 (94-117)
Shock Piston Rod Nut	

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1997	24-33 (32-46)
Shock Upper Mount Nuts	22-26 (30-36)
Stabilizer Bar Bracket-To-Frame Bolts	14-19 (19-26)
Stabilizer Link Bolts	
1997	27-39 (37-53)
1999 & 2000	32-44 (43-60)
Tie Rod-To-Knuckle Nut	
1997	22-32 (30-43)
1999 & 2000	32-41 (43-56)
Upper Ball Joint-To-Knuckle Nut	31-44 (42-60)
Upper Control Arm Pivot Bolt/Nut	87-101 (118-137)
Wheel Lug Nuts	66-86 (89-117)
Wheel Speed Sensor Bolt	
1997	12-16 (16-22)
1999 & 2000	14-18 (19-25)