This file is available for free download at http://www.iluvmyrx7.com

This file is fully text-searchable – select Edit and Find and type in what you're looking for. This file is intended more for online viewing than printing out so some graphics may not print 100% legibly, you can zoom in on them if you need to.

www.iluvmyrx7.com

STEERING COLUMN
Article Text
1993 Mazda RX7
For www.iluvmyrx7.com

Wednesday, August 22, 2001 07:04AM

ARTICLE BEGINNING

1993 STEERING
Mazda - Steering Columns

RX7

DESCRIPTION & OPERATION

Steering columns are designed to be collapsible upon impact. The steering column consists of solid steering shaft with a lower joint assembly. Some models are equipped with tilt steering. Turn signal, headlight, ignition and windshield washer/wiper switches are mounted on column. Switches can be serviced by removing steering wheel and column covers. RX7 is equipped with air bag restraint system consisting of an air bag module and clockspring connector assembly located in the steering column.

AIR BAG DISABLING & ACTIVATING

WARNING: Wait about 10 minutes after disabling air bag system before servicing. Air bag system voltage is maintained for about 10 minutes after system is disabled. Failure to wait 10 minutes before servicing system may cause accidental air bag deployment and possible personal injury.

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle.

Disabling System
1) Obtain radio code from customer and deactivate audio anti-theft function. Turn ignition off. Disconnect and shield negative battery cable. Wait at least 10 minutes for back-up power supply to be depleted. Remove cover panel below left side of instrument panel.
2) Disconnect Orange and Blue clockspring connectors located at base of steering column.

Activating System
Reconnect clockspring connectors. Reinstall cover panel. Reconnect negative battery cable. Turn ignition on. Check AIR BAG warning indicator light to ensure system is operating properly.

REMOVAL & INSTALLATION

STEERING WHEEL & HORN PAD

CAUTION: DO NOT strike steering shaft with a hammer as it may collapse.

WARNING: Before servicing RX7 disconnect and shield negative battery

cable. Use caution when working around steering column as air bag could deploy.

WARNING: Wait about 10 minutes after disabling air bag system before servicing. Air bag system voltage is maintained for about 10 minutes after system is disabled. Failure to wait 10 minutes before servicing system may cause accidental air bag deployment and possible personal injury.

Removal & Installation

1) Disconnect negative battery cable. Remove 4 air bag module nuts from underside of steering wheel. Disconnect electrical connector and remove air bag module. See AIR BAG RESTRAINT SYSTEM article in the ACCESSORIES/SAFETY EQUIPMENT section.

2) Remove steering wheel lock nut. Using a puller, remove steering wheel. To install, reverse removal procedure. Tighten steering wheel lock nut and air bag module nuts.

COMBINATION SWITCH

Removal

Remove steering wheel. See STEERING WHEEL & HORN PAD under REMOVAL & INSTALLATION. Remove upper and lower column covers. Disconnect combination switch connectors. Remove screws, and remove combination switch with clockspring assembly.

Installation

1) Install combination switch and clockspring assembly. Before installing steering wheel, center clockspring. To center clockspring, set front wheels straight ahead. Turn clockspring connector clockwise until it stops. DO NOT force clockspring.

2) Rotate connector 2 3/4 turns (counterclockwise). Rotate clockspring connector further (as necessary) to align marks on connector and outer housing. See Fig. 1.

3) Install steering wheel. Tighten steering wheel lock nut to specification. See TORQUE SPECIFICATION table at the end of this article. Install air bag module. See AIR BAG RESTRAINT SYSTEM article in the ACCESSORIES/SAFETY EQUIPMENT section.

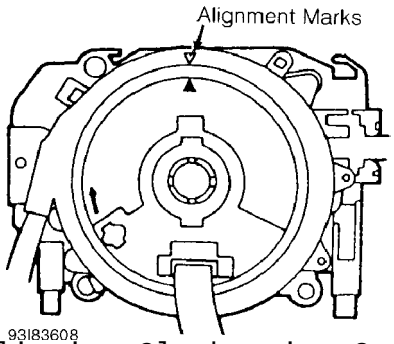


Fig. 1: Aligning Clockspring Connector Alignment Marks
Courtesy of Mazda Motors Corp.

IGNITION SWITCH/STEERING LOCK ASSEMBLY

Removal & Installation

1) Remove steering wheel and combination switch. See STEERING WHEEL & HORN PAD and COMBINATION SWITCH. Disconnect ignition switch connectors. Remove key interlock cable from ignition switch/steering lock assembly (if equipped).

2) Using a hammer and chisel, make a groove in ignition switch/steering lock assembly shear screws. Remove 2 shear screws with screwdriver. Remove ignition switch/steering lock assembly. To install, reverse removal procedure. Tighten NEW shear screws until heads break off.

STEERING COLUMN

CAUTION: Excessive pressure or impact to steering shaft assembly during service may cause column to collapse.

Removal & Installation

1) Remove steering wheel and combination switch. See STEERING WHEEL & HORN PAD and COMBINATION SWITCH under REMOVAL & INSTALLATION. See Fig. 2. Remove ignition switch/steering lock assembly. See IGNITION SWITCH/STEERING LOCK ASSEMBLY under REMOVAL & INSTALLATION.

2) Remove lower panel. Remove air duct (if equipped). Remove "U" joint dust boot (if equipped). Remove steering shaft assembly-to-intermediate shaft "U" joint bolt. Remove lower steering shaft assembly-to-firewall nuts. Separate steering shaft from intermediate shaft. Remove steering column upper bracket bolts. Remove steering column.

3) To install, reverse removal procedure. Tighten bolts and nuts to specification. See TORQUE SPECIFICATION table at the end of this article.

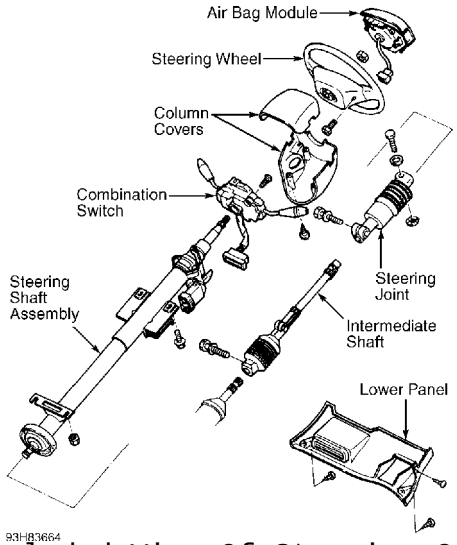


Fig. 2: Exploded View Of Steering Column
Courtesy of Mazda Motors Corp.

OVERHAUL

STEERING COLUMN

Disassembly

Remove steering wheel and combination switch. See STEERING WHEEL & HORN PAD and COMBINATION SWITCH under REMOVAL & INSTALLATION. See Figs. 2. Remove ignition switch/steering lock assembly. See IGNITION SWITCH/STEERING LOCK ASSEMBLY under REMOVAL & INSTALLATION. Remove steering column. See STEERING COLUMN under REMOVAL & INSTALLATION. Turn steering shaft to remove.

Inspection

Inspect all components for damage and wear. Check steering shaft for bends, damage or sheared plastic pins. Check bearings for excessive play. Replace components as necessary. Measure length of steering shaft. See Fig. 3.

Reassembly

To reassemble, reverse disassembly procedure. Grease steering shaft, bushings and bearings. Use NEW shear screws.

STEERING SHAFT DIMENSIONS TABLE (1)

Application	Length - In. (mm)
RX7	30.69-30.76 (779.5-781.5)

(1) - For measuring points, see illustration. See Fig. 3.

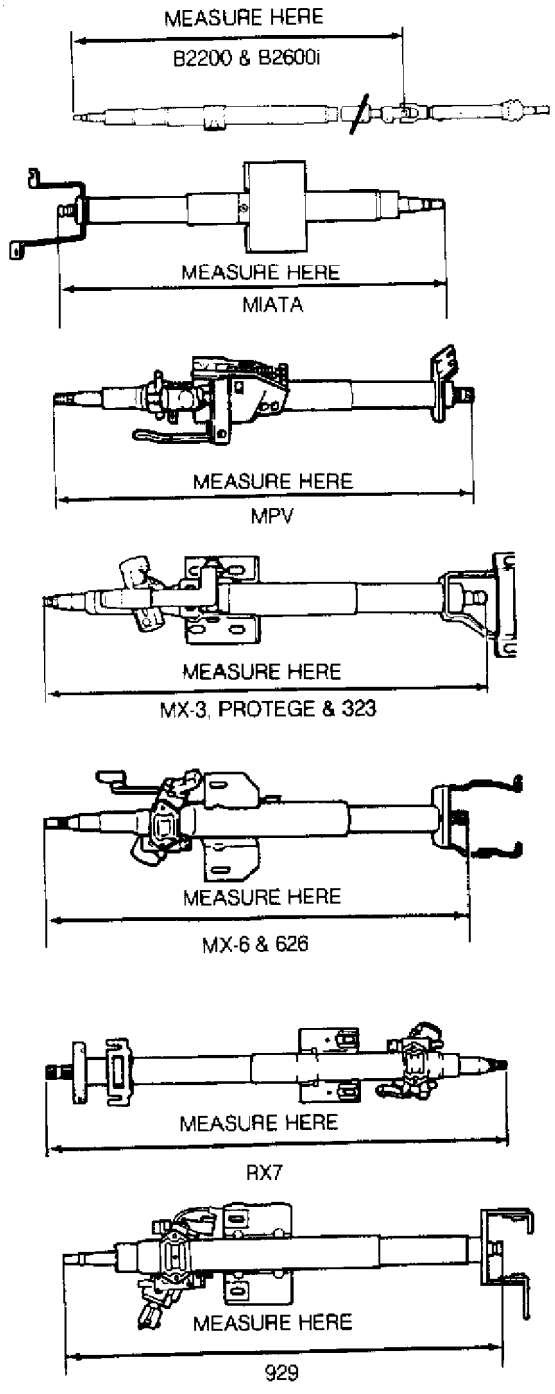


Fig. 3: Measuring Steering Shaft Dimensions
Courtesy of Mazda Motors Corp.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Column Upper Bracket Mounting Bolts	12-17 (16-23)
Steering Shaft Assembly-To-Firewall Nuts	13-20 (18-27)
Steering Shaft "U" Joint Bolts	13-20 (18-27)
Steering Wheel Lock Nut	29-36 (39-49)
	INCH Lbs. (N.m)
Key Interlock Cable Bolt	35-53 (4-6)

END OF ARTICLE

STEERING SYSTEM - POWER RACK & PINION
Article Text

1993 Mazda RX7
For www.iluvmyrx7.com

Wednesday, August 22, 2001 07:05AM

ARTICLE BEGINNING

1993 STEERING
Mazda - Power Rack & Pinion

RX7

DESCRIPTION

Steering system is a power-assisted rack and pinion. The system consists of a rack and pinion steering gear and power-assist pump/reservoir. The steering gear and pump/reservoir are connected by flexible lines.

LUBRICATION

CAPACITY

POWER STEERING FLUID CAPACITY TABLE

Application	Qts. (L)
RX7	1.01 (.96)

FLUID TYPE

Dexron-II or M-III are recommended for all models.

FLUID LEVEL CHECK

Check fluid level on oil pump dipstick (if equipped) or reservoir. Fluid should be between marks on level gauge dipstick (if equipped) or reservoir. If fluid level is low, fill as necessary. Recheck fluid level. DO NOT overfill.

HYDRAULIC SYSTEM BLEEDING

1) Raise and support front of vehicle. With ignition off, turn steering wheel from lock to lock several times. Check fluid level. Add fluid as necessary. Repeat procedure until fluid level no longer decreases.
2) Start engine and operate at idle. Turn steering wheel from lock to lock 5 times. Check fluid level. Add fluid as necessary. Continue procedure until fluid is clear of air bubbles and does not decrease in level.

ADJUSTMENTS

NOTE: On-vehicle adjustment procedures are not available from manufacturer. For belt adjustment specifications, see POWER

STEERING PUMP BELT.

POWER STEERING PUMP BELT

BELT ADJUSTMENT SPECIFICATIONS TABLE

Application	(1) Deflection In. (mm)
New Belt	.14-.15 (3.5-4.0)
Used Belt	.18-.19 (4.5-5.0)

(1) - Belt deflection is measured at midpoint between idler pulley and pump, with 22 lbs. (10 kg.) of pressure applied.

TESTING

HYDRAULIC SYSTEM PRESSURE TEST

Pump Fluid Pressure Test

1) Disconnect pressure line from steering gear and steering pump. Connect pressure gauge/valve between steering pump and steering gear. See Fig. 1. Bleed air from system.

2) Completely open valve. Start engine and operate at idle. Turn steering wheel from lock to lock to increase fluid temperature to 122-140øF (50-60øC). To measure pump fluid pressure, close gauge valve completely.

3) Increase engine speed to 1000-1500 RPM. Measure oil pump fluid pressure. Ensure pump pressure is within specification. See HYDRAULIC SYSTEM FLUID PRESSURE SPECIFICATIONS table. If pressure is not within specification, replace pump.

CAUTION: DO NOT leave gauge valve closed for more than 15 seconds, or pump may be damaged.

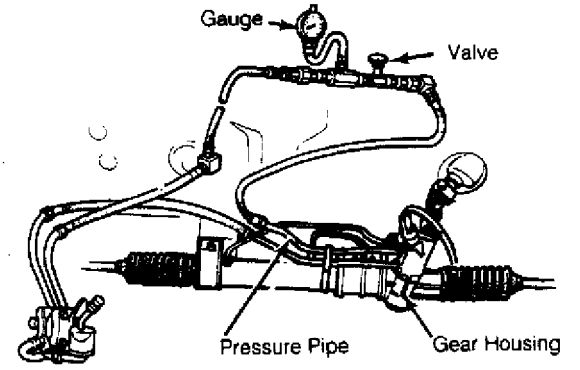


Fig. 1: Connecting Pressure Gauge/Valve
Courtesy of Mazda Motors Corp.

Gear Fluid Pressure Test

1) Ensure steering pump pressure is within specification. To measure steering gear fluid pressure, open gauge valve completely. Increase engine speed to 1000-1500 RPM.

2) Turn steering wheel from lock to lock. Measure steering gear fluid pressure. Ensure gear pressure is within specification. See HYDRAULIC SYSTEM FLUID PRESSURE SPECIFICATIONS table. If pressure is not within specification, replace gear.

HYDRAULIC SYSTEM FLUID PRESSURE SPECIFICATIONS TABLE (1)

Application	psi (kg/cmý)
RX7	1110-1209 (78-85)

(1) - Specifications are measured at 1000-1500 RPM, with fluid temperature at 122-140øF (50-60øC).

REMOVAL & INSTALLATION

STEERING GEAR

NOTE: Use a suitable container or rags to collect fluid when disconnecting pressure and return lines.

Removal & Installation

1) Disconnect negative battery cable. Raise and support front of vehicle. Remove front wheel assemblies. Remove engine undercover. Remove cotter pins and castle nuts from tie rod ends. Using Puller (49-0118-850C), separate tie rod ends from steering knuckles.

2) Remove stabilizer bar-to-frame bolts and brackets. Disconnect pressure and return line connections from steering gear. Remove steering column intermediate shaft-to-steering gear pinion shaft bolt. Remove steering gear mounting bolts. Support crossmember with jack and remove crossmember nuts and bolts. Slowly lower jack and remove steering gear and linkage from vehicle.

3) To install, reverse removal procedure. Tighten bolts and nuts to specification. See TORQUE SPECIFICATIONS table at the end of this article. Tighten steering gear mounting bolts in sequence: left rear, right rear, left front, right front. Fill and bleed system. Check and adjust front wheel alignment. See WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in the WHEEL ALIGNMENT section.

POWER STEERING PUMP

NOTE: Use a suitable container or rags to collect fluid when disconnecting pressure and return lines.

Removal & Installation

1) Remove drive belt. Remove idler pulley lock nut and remove

idler pulley from pump. On all models, disconnect power steering pressure switch electrical connector (if equipped). Place reference marks on steering pump and pressure line fitting for reassembly. Disconnect pressure and return line connections from steering pump. Remove pump-to-bracket bolts and nuts. Remove pump from vehicle.

2) To install, reverse removal procedure. Tighten bolts and nuts to specification. See TORQUE SPECIFICATIONS table at the end of this article. Adjust belt tension. See POWER STEERING PUMP BELT under ADJUSTMENTS. Bleed air from system. Inspect system for leaks.

OVERHAUL

STEERING GEAR

NOTE: See Fig. 2 for exploded view of rack and pinion steering gears.

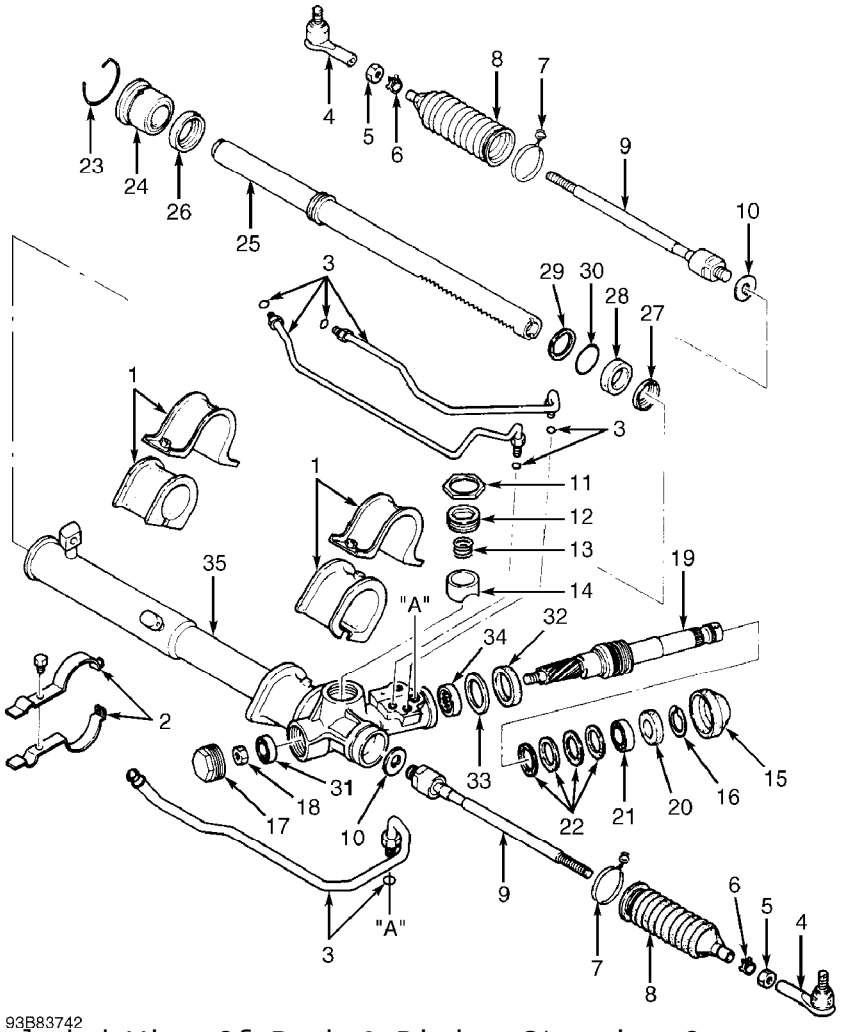
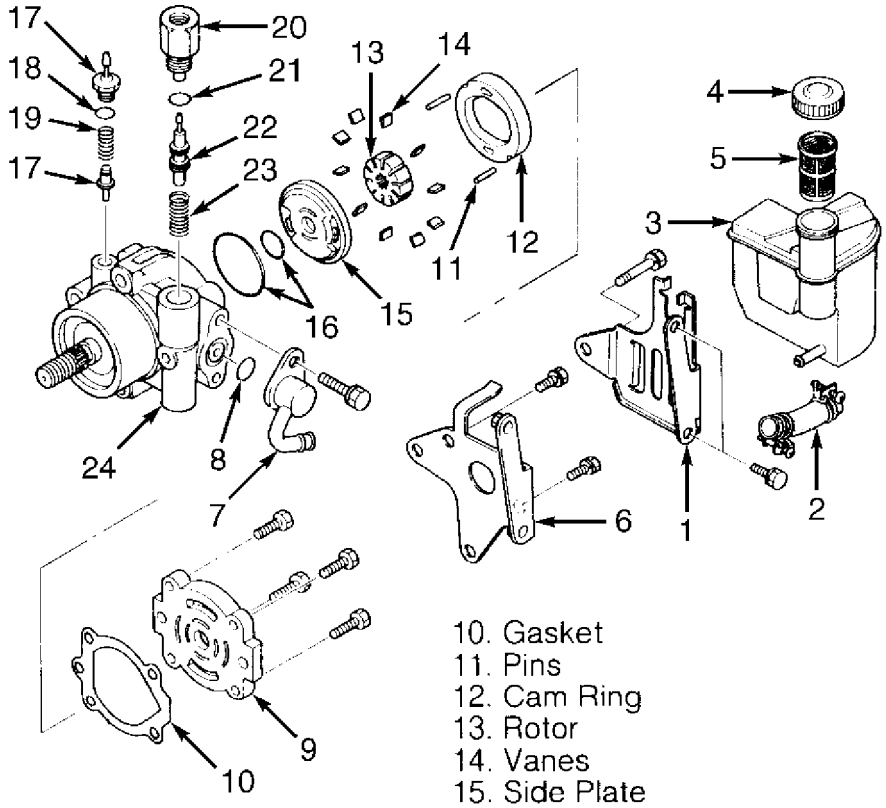


Fig. 2: Exploded View Of Rack & Pinion Steering Gear
Courtesy of Mazda Motors Corp.

POWER STEERING PUMP

NOTE: See Fig. 3 for exploded view of power steering pump.



1. Bracket
2. Suction Hose
3. Reservoir
4. Cap
5. Filter
6. Bracket
7. Suction Pipe
8. "O" Ring
9. Rear Pump Body
10. Gasket
11. Pins
12. Cam Ring
13. Rotor
14. Vanes
15. Side Plate
16. "O" Ring
17. Pressure Switch Assembly
18. "O" Ring
19. Spring
20. Connector
21. "O" Ring
22. Control Valve
23. Spring
24. Front Pump Body

93F83746

Fig. 3: Exploded View Of Power Steering Pump
Courtesy of Mazda Motors Corp.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Idler Pulley Lock Nut	29-43 (39-58)
Intermediate Shaft-To-Pinion Shaft Bolt	13-19 (18-26)
Pinion Housing Lock Nut	36-51 (49-69)
Pinion Shaft Lock Nut	14-22 (19-30)

Power Steering Pump Mounting Bolts/Nuts	12-17 (16-23)
Pressure Line Fitting-To-Power Steering Pump	17-26 (23-36)
Pressure Line Fitting-To-Steering Gear	12-17 (16-23)
Steering Gear Mounting Bolts/Nuts	27-38 (37-52)
Steering Rack-To-Tie Rod	58-72 (79-98)
Tie Rod Castle Nuts	21-32 (28-43)
Tie Rod End-To-Tie Rod Lock Nut	26-36 (35-49)

END OF ARTICLE

SUSPENSION - FRONT
Article Text
1993 Mazda RX7
For www.iluvmyrx7.com

Wednesday, August 22, 2001 07:05AM

ARTICLE BEGINNING

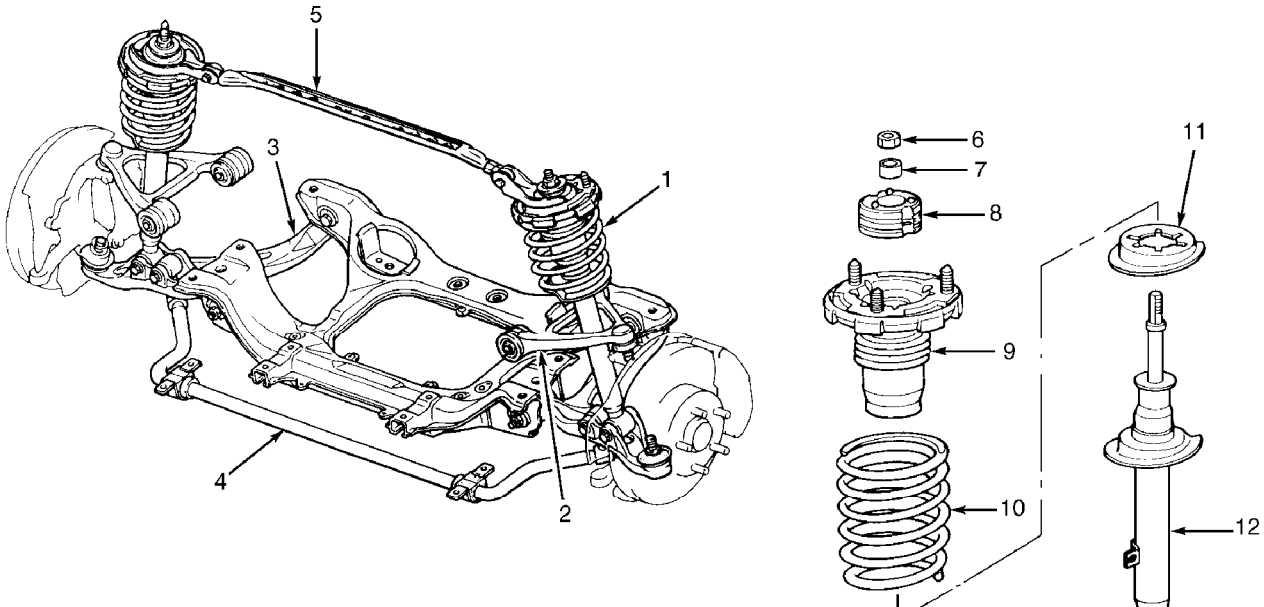
1993 SUSPENSION
Mazda Front Suspension

RX7

DESCRIPTION

An independent front suspension with MacPherson-type struts is used on all models. RX7 uses double wishbone design upper and lower control arms with struts mounted between lower control arm and upper fender panel. See Fig. 1.

Lower control arm pivots at crossmember and is connected by ball joint to steering knuckle. All models are equipped with a stabilizer bar which attaches to each lower control arm and frame. See Fig. 1.



1. Strut Assembly
2. Upper Control Arm
3. Lower Control Arm
4. Stabilizer Bar
5. Front Strut Bar
6. Lock Nut
7. Spacer
8. Mounting Block
9. Rebound Stopper/ Dust Cover
10. Spring
11. Lower Spring Seat
12. Strut

Fig. 1: Identifying Front Suspension Components
Courtesy of Mazda Motors Corp.

ADJUSTMENTS & INSPECTION

WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES

NOTE: See WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in the WHEEL ALIGNMENT section.

WHEEL BEARING

Raise and support vehicle. Remove wheel assembly. Remove brake caliper and wire aside. Attach dial indicator to rotor and axle hub assembly. Measure bearing play. Check bearing axial play by rocking hub assembly by hand. Maximum axial play should be .002" (.05 mm). If play exceeds specification, check and adjust hub and bearing assembly.

BALL JOINT CHECKING

Lower Ball Joint
Remove lower control arm. Rotate ball joint stud 3-4 times. Install Preload Attachment (49-0180-510B) to ball joint stud. Measure ball joint preload using spring scale. Preload should be 1.1-3.3 lbs. (0.5-1.5 kg).

Upper Ball Joint
Remove upper control arm. Rotate ball joint stud 3-4 times. Install Preload Attachment (49-0180-510B) to ball joint stud. Measure ball joint preload using spring scale. Preload should be 0.9-2.6 lbs. (0.4-1.2 kg).

REMOVAL & INSTALLATION

NOTE: Refer to Fig. 1 during removal and installation.

WHEEL BEARING

NOTE: Replace hub and bearing assembly as a unit.

Removal
Raise and support vehicle. Remove wheel assembly. Remove brake caliper 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
Wash all disassembled components before 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 under ADJUSTMENTS & INSPECTION.

LOWER CONTROL ARM & BALL JOINT

Removal

1) Raise and support vehicle. Remove wheel assembly. Remove engine splash shield (if equipped). Remove brake caliper and wire aside (as necessary). Remove compression rod or tension rod (if equipped). Separate tie rod end from knuckle (as necessary). Remove stabilizer bar from lower control arm.

2) Remove strut lower mounting bolt and separate lower strut from lower control arm or knuckle. Remove lower control arm ball joint cotter pin and nut. Separate lower control arm ball joint stud from knuckle. 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 away front bushing inner collar. Using a vise and Remover/Installer (49-F034-2A0), push out front bushing. Press out rear bushing using Remover/Installer (49-F034-2A0). To install front bushing, apply soapy water to bushing and use remover/installer to press in. Always install bushing from outer side of arm. Press in bushing until collar contacts arm. To install rear bushing, align arrows on bushing with marks on lower arm and use remover/installer to press in.

Installation

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 table at the end of this article.

UPPER CONTROL ARM & BALL JOINT

Removal

Raise and support vehicle. Remove wheel assembly. Disconnect brake line from strut assembly. Remove wheel speed sensor harness band. Remove strut lower mounting bolt and separate lower strut from lower control arm. Remove upper control arm ball joint bolt. Separate upper control arm ball joint stud from knuckle. 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 away front and rear bushing inner collars. Using a vise and Remover/Installer (49-F034-2A0), push out front and rear bushings. To install front and rear bushings, apply soapy water to bushings and use remover/installer to press in. Always install bushings from outer

side of arm. Press in bushings until collar contacts arm.

Installation

To install, reverse removal procedure. Tighten upper control arm pivot bolts to specification with vehicle resting on ground and suspension unloaded. See TORQUE SPECIFICATIONS table at the end of this article.

STRUT ASSEMBLY

Removal

Raise and support vehicle. Remove wheel assembly. Disconnect brake line from strut assembly. Remove wheel speed sensor harness band and sensor. Remove upper control arm pivot bolts. Remove cap, nut and rubber stopper from upper strut. Remove strut upper mount nuts and remove strut plate. Remove insulator from upper strut. Remove strut lower bolt. Move upper control arm just enough to remove strut assembly.

NOTE: Prior to removing strut-to-steering knuckle bolts, make an alignment mark for reassembly reference. Note position of mounting mark on top of strut assembly before removing strut.

Disassembly

Clamp upper strut 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 strut from vise.

Inspection

Check strut 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

Clamp strut in vise. Install coil spring and components in reverse order of disassembly. Ensure coil spring is well seated in upper and lower spring seats.

Installation

To install, reverse removal procedure. Fully tighten all bolts with vehicle resting on ground and suspension unloaded. See TORQUE SPECIFICATIONS table at the end of this article. For checks and adjustments, see WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in the WHEEL ALIGNMENT section.

STABILIZER BAR

Removal & Installation

1) Raise and support vehicle. Remove engine splash shield (if equipped). Remove mounting hardware and stabilizer bar. Note position

of frame bushing seam.

2) Remove steering gear mounting bracket nuts and remove steering gear. Support crossmember with jack and remove bolts and nuts. Slowly lower crossmember and remove stabilizer bar. On all models, inspect all components for wear, bends or damage. Replace components as necessary.

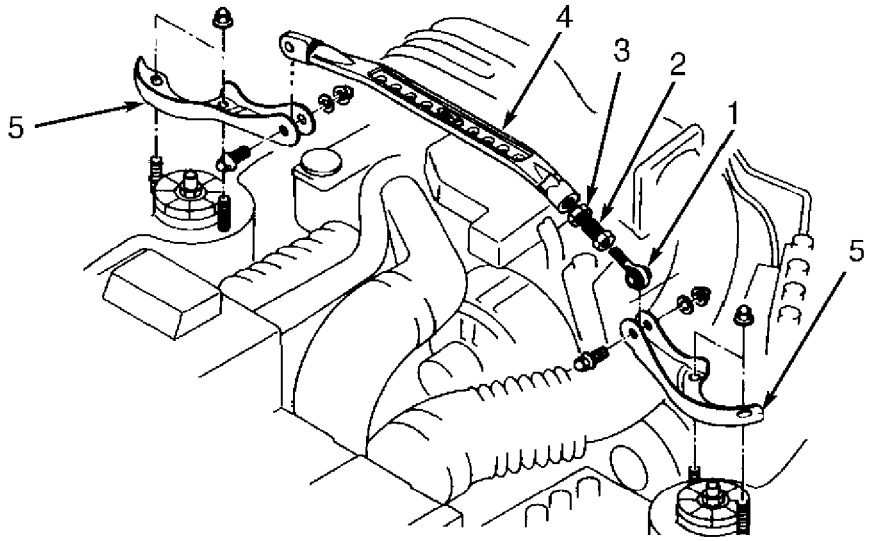
3) To install, reverse removal procedure. Ensure frame bushing is aligned with White line on stabilizer bar. Ensure seam faces front of vehicle. Fully tighten all bolts with vehicle resting on ground and suspension unloaded. See TORQUE SPECIFICATIONS table at the end of this article.

FRONT STRUT BAR

Removal & Installation

1) Strut bar is located in engine compartment mounted on top of strut assembly. See Fig. 2. Remove nut, washer and bolt retaining strut bar to strut plate. Remove strut bar from vehicle. Loosen lock nut and remove joint "A" and joint "B" from strut bar.

2) To install, reverse removal procedure. Rotate joint "B" counterclockwise to 3.5-5.2 INCH lbs. (.4-.6 N.m) to set tension. Tighten lock nut to 87-121 INCH lbs. (10-14 N.m). Tighten strut bar-to-strut plate nut. See TORQUE SPECIFICATIONS table at the end of this article.



1. Joint "A"
2. Joint "B"
3. Lock Nut
4. Strut Bar
5. Strut Plate

93E83455

Fig. 2: Removing Front Strut Bar
Courtesy of Mazda Motors Corp.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Brake Caliper Bracket Bolts	58-72 (78-98)
Drive Axle Lock Nut	130-175 (177-235)
Front Strut Bar-To-Strut Plate Nut	24-33 (32-46)
Lower Ball Joint-To-Knuckle Nut	58-80 (78-108)
Lower Control Arm-To-Frame Bolt/Nut	69-86 (93-117)
Stabilizer Bar Bracket-To-Frame Bolts	13-19 (18-26)
Stabilizer Bar-To-Stabilizer Link Nut	27-40 (36-54)
Stabilizer Link-To-Lower Control Arm Nut	44-54 (59-73)
Strut Assembly Lock Nut	12-17 (16-23)
Strut Assembly-To-Body Nuts (Strut Plate)	34-46 (46-63)
Strut Assembly-To-Body Shaft Nut	24-33 (32-46)
Strut Assembly-To-Lower Control Arm Bolt	69-86 (93-117)
Tie Rod-To-Knuckle Nut	22-32 (30-44)
Upper Ball Joint-To-Knuckle Bolt	27-39 (37-53)
Upper Control Arm Pivot Bolt/Nut	44-54 (59-73)
Wheel Lug Nuts	65-87 (88-118)
Wheel Speed Sensor Bolt	12-17 (16-23)

END OF ARTICLE

SUSPENSION - REAR
Article Text
1993 Mazda RX7
For www.iluvmyrx7.com

Wednesday, August 22, 2001 07:06AM

ARTICLE BEGINNING

1993 SUSPENSION
Mazda Rear

RX7

DESCRIPTION

Rear suspension consists of MacPherson type struts, double wishbone design upper control arm, I-arm, trailing link and toe-control link. A stabilizer bar with stabilizer link mounts to frame and upper control arms. A rear strut bar is mounted between tops of each strut assembly.

Upper control arm and "I"-arm mount to crossmember and knuckle/hub assembly. Trailing link mounts to "I"-arm and crossmember. Toe-control link mounts to crossmember and knuckle/hub assembly. Rear wheel camber alignment is adjusted using bolt and cam plate on upper control arm, and toe-in is adjusted using toe-control link. See Fig. 1.

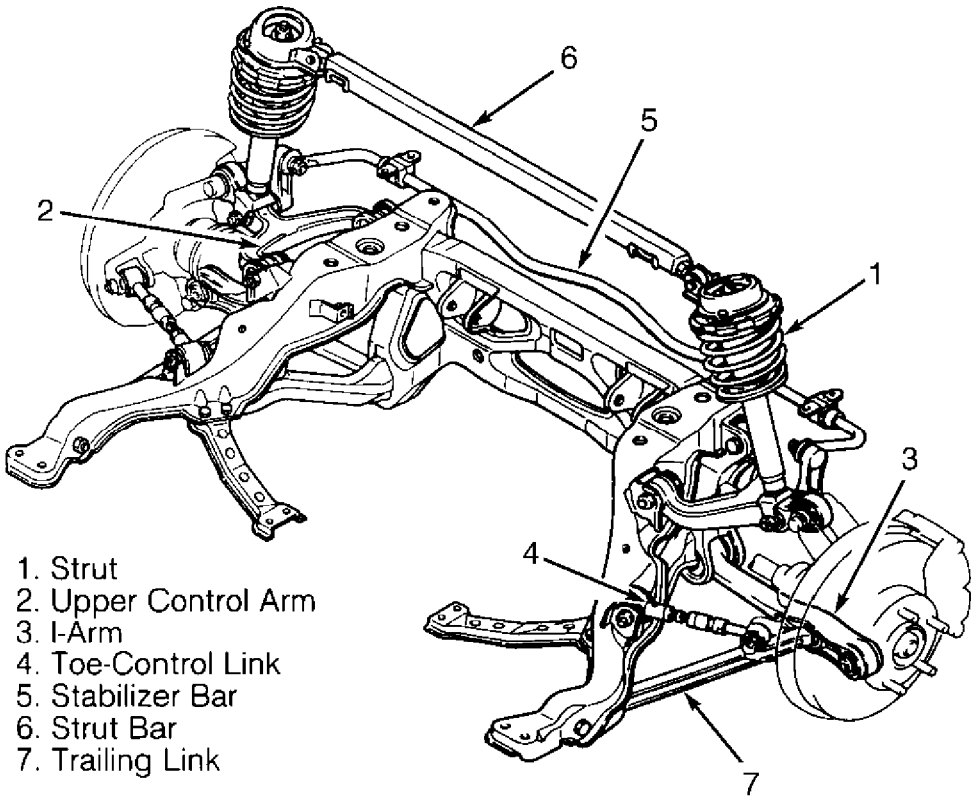


Fig. 1: Identifying Rear Suspension Components
Courtesy of Mazda Motors Corp.

ADJUSTMENTS & INSPECTION

WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES

NOTE: See WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in the WHEEL ALIGNMENT section.

WHEEL BEARING

Raise and support vehicle. Remove wheel assembly. Remove brake caliper and wire aside. Remove brake 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 be .002" (.05 mm). If axial play exceeds specification, check drive axle lock nut torque or replace wheel bearing.

REMOVAL & INSTALLATION

WHEEL BEARING

Removal

1) Raise and support vehicle. Remove wheel assembly. Remove drive axle lock nut. Remove brake caliper and wire aside. Remove brake rotor. Disconnect ABS speed sensor. Remove I-arm-to-knuckle/hub bolt. Remove toe-control link-to-knuckle/hub bolt. Remove upper control arm-to-knuckle/hub bolt. Remove knuckle/hub assembly from vehicle.

2) Using Handle (49-G033-102), Attachment (49-G033-105) and Puller (49-F026-103), remove hub from knuckle. Remove snap ring from knuckle. If bearing race remains on hub, grind race until approximately .02" (.50 mm) thick and remove using chisel. Using Attachment (49-F027-005) and Support Block (49-H034-201), remove wheel bearing from hub.

Inspection

Check wheel hub and knuckle for cracks and damage. Check backing plate for deformation. Check bearing for excessive wear and seizure.

Installation

Press NEW wheel bearing into knuckle using Attachment (49-F027-004) and Support Block (49-H034-201). Press hub into knuckle using Adapter (49-F027-005). To install, reverse removal procedure. Perform final tightening of trailing link with vehicle resting on ground and suspension unloaded. Tighten drive axle lock nut to specification. See TORQUE SPECIFICATIONS table at the end of this article. Stake drive axle lock nut. Check axial play. See WHEEL BEARING under ADJUSTMENTS & INSPECTION.

STRUT ASSEMBLY

Removal & Disassembly

1) Raise and support vehicle. Remove wheel assembly. Remove stabilizer link-to-upper control arm nut. Remove stabilizer link from

upper control arm. Separate lower strut from upper control arm. Remove suspension tower cover from top of rear strut bar located in rear hatch compartment. Remove rear strut bar from top of strut assembly.

2) Remove upper strut assembly-to-body nut and rubber stopper. Remove strut assembly and gasket. Clamp strut securely in soft-jawed vise. Loosen upper strut shaft nut several turns, but DO NOT remove nut. Compress coil spring, then remove nut. Remove remaining components, noting order for reassembly reference.

Inspection

Check strut 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 & Installation

To reassemble, reverse disassembly procedure. Ensure coil spring is seated in lower seat. To install, reverse removal procedure. Ensure paint mark on lower strut mount faces rearward. Tighten nuts to specification. See TORQUE SPECIFICATIONS table at the end of this article. Check rear wheel alignment. See appropriate WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in the WHEEL ALIGNMENT section.

UPPER CONTROL ARM

Removal

Raise and support vehicle. Remove wheel assembly. Remove stabilizer link-to-upper control arm nut. Remove stabilizer link from upper control arm. Separate lower strut from upper control arm. Remove upper control arm-to-crossmember nuts and bolts. Remove upper control arm-to-knuckle/hub assembly nut and bolt. Remove upper control arm.

Inspection

Inspect upper control arm for cracks and deformation. Check bushings for damage and excessive wear. Check pillow ball for excessive play. Replace components as necessary.

Bushing Replacement

Mount upper control arm in a soft-jawed vise. Remove old bushings using components from Bushing Replacer Set (49-F034-2A0). To install, apply soapy water to NEW bushings. Using components from Bushing Replacer Set (49-F034-2A0), install NEW bushings into upper control arm.

Pillow Ball Replacement

1) Mount upper control arm in a soft-jawed vise. Using screwdriver, remove rubber seals. Remove snap ring. Remove pillow ball using components from Bushing Replacer Set (49-F034-2A0). To install, coat diameter of NEW pillow ball with multipurpose grease.

2) Using components from Bushing Replacer Set (49-F034-2A0), install NEW pillow ball into upper control arm. Ensure step side of

pillow ball is facing into upper control arm. Install snap ring. Fill space between pillow ball and rubber seals with grease. Install rubber seals into upper control arm.

Installation

To install, reverse removal procedure. Tighten nuts and bolts to specification. See TORQUE SPECIFICATIONS table at the end of this article. Check rear wheel alignment. See in the appropriate WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in the WHEEL ALIGNMENT section.

TRAILING LINK & I-ARM

Removal

Raise and support vehicle. Remove wheel assembly. Remove trailing link-to-"I"-arm bolt. Remove trailing link-to-crossmember bolt and nut. Remove trailing link. Mark cam plate-to-crossmember position for installation reference. Remove I-arm-to-crossmember cam bolt, cam plate and nut. Remove I-arm-to-knuckle/hub assembly bolt and nut. Remove I-arm.

Inspection

Inspect trailing link and "I"-arm for cracks and deformation. Check bushings for damage and excessive wear. Check pillow balls for excessive play. Replace components as necessary.

Bushing Replacement (I-Arm)

Mount "I"-arm in a soft-jawed vise. Carefully cut away outer flange of bushing. Remove old bushing using components from Bushing Replacer Set (49-F034-2A0). To install, apply soapy water to NEW bushing. Using components from Bushing Replacer Set (49-F034-2A0), install NEW bushing into I-arm.

Bushing Replacement (Trailing Link)

Mount trailing link in a soft-jawed vise. Remove old bushing using components from Bushing Replacer Set (49-F034-2A0). To install, apply soapy water to NEW bushing. Using components from Bushing Replacer Set (49-F034-2A0), install NEW bushing into trailing link.

Pillow Ball Replacement

1) Mount "I"-arm in a soft-jawed vise. Using screwdriver, remove rubber seals. Remove snap rings. Remove pillow balls using components from Bushing Replacer Set (49-F034-2A0). To install, coat diameter of NEW pillow balls with multipurpose grease.

2) Using components from Bushing Replacer Set (49-F034-2A0), install NEW pillow balls into I-arm. Ensure step side of pillow ball is facing into I-arm. Install snap rings. Fill space between pillow ball and rubber seals with grease. Install rubber seals into I-arm.

Installation

To install, reverse removal procedure. Perform final tightening of trailing link with vehicle resting on ground

and suspension unloaded. See TORQUE SPECIFICATIONS table at the end of this article. Check rear wheel alignment. See WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in the WHEEL ALIGNMENT section.

TOE-CONTROL LINK

Removal

Raise and support vehicle. Remove wheel assembly. Remove ABS speed sensor harness bracket from toe-control link. Remove toe-control link-to-crossmember bolt and nut. Remove toe-control link-to-knuckle/hub assembly bolt and nut. Remove toe-control link.

Inspection

Inspect toe-control link for cracks and deformation. Check bushings for damage and excessive wear. Replace components as necessary.

Installation

To install, reverse removal procedure. Ensure paint mark on toe-control link faces upward after installation. Tighten nuts and bolts to specification. See TORQUE SPECIFICATIONS table at the end of this article. Check rear wheel alignment. See appropriate WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in the WHEEL ALIGNMENT section.

STABILIZER BAR & LINK

Removal & Installation

1) Raise and support vehicle. Remove wheel assembly. Remove stabilizer link-to-upper control arm nut. Remove stabilizer bar-to-frame mounting bolts and brackets. Remove stabilizer bar from vehicle. Remove stabilizer bar-to-stabilizer link nut. Separate stabilizer link from stabilizer bar.

2) To install, reverse removal procedure. Ensure bushing is aligned with stopper or White paint mark on stabilizer bar. Check marks on stabilizer links and ensure stabilizer links are installed on correct side of stabilizer bar. Tighten nuts and bolts to specification. See TORQUE SPECIFICATIONS table at the end of this article.

REAR STRUT BAR

Removal

Remove suspension tower cover from top of rear strut bar located in rear hatch compartment. Remove nuts retaining strut plate to upper strut assembly. Remove rear strut bar assembly from vehicle. Remove strut plate-to-strut bar bolt, nut and washer. Loosen lock nut and remove joint "A", nut and washer from strut bar. Inspect strut bar for bends or damage.

Installation

To install, reverse removal procedure. Install joint "A" onto strut bar and tighten lock nut to 87-121 INCH lbs. (10-14 N.m). Tighten strut bar-to-strut plate nut and strut plate-to-upper strut assembly nut. See TORQUE SPECIFICATIONS table at the end of this article.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
ABS Speed Sensor Bolt	14-18 (19-24)
ABS Speed Sensor Bracket Bolt	14-18 (19-24)
Brake Caliper Bolts	34-49 (46-66)
Drive Axle Lock Nut	174-231 (235-313)
I-Arm-To-Crossmember Pivot Bolt/Nut	69-86 (93-117)
I-Arm-To-Knuckle/Hub Bolt/Nut	44-54 (59-73)
Rear Strut Bar-To-Strut Plate Bolt/Nut	14-19 (19-26)
Stabilizer Bar Bracket-To-Frame Bolts	14-19 (19-26)
Stabilizer Bar-To-Stabilizer Link Nut	40-56 (54-76)
Stabilizer Link-To-Upper Control Arm Nut	69-81 (93-110)
Strut Assembly-To-Body Nuts (Strut Plate)	34-46 (46-63)
Strut Assembly-To-Body Shaft Nut	24-33 (33-45)
Strut Piston Rod Lock Nut	12-17 (16-23)
Toe-Control Link-To-Crossmember Bolt/Nut	44-54 (59-73)
Toe-Control Link-To-Knuckle/Hub Bolt/Nut	48-57 (65-77)
Trailing Link-To-Crossmember Bolt/Nut	69-86 (93-117)
Trailing Link-To-"I"-arm Bolt	44-54 (59-73)
Upper Control Arm-To-Crossmember Pivot Bolt/Nut	44-54 (59-73)
Upper Control Arm-To-Knuckle/Hub Bolt/Nut	44-54 (59-73)
Wheel Lug Nuts	65-87 (88-118)

END OF ARTICLE

JACKING & HOISTING
Article Text
1993 Mazda RX7
For www.iluvmyrx7.com

Wednesday, August 22, 2001 07:06AM

ARTICLE BEGINNING

1993 WHEEL ALIGNMENT
Mazda Jacking & Hoisting

RX7

*** PLEASE READ THIS FIRST ***

NOTE: Prior to performing wheel alignment, perform preliminary visual and mechanical inspection of wheels, tires and suspension components. See PRE-ALIGNMENT INSTRUCTIONS in WHEEL ALIGNMENT THEORY/OPERATION article in the GENERAL INFORMATION section.

JACKING & HOISTING

NOTE: Illustrations are not intended to represent exact structure of each vehicle's frame, underbody or body outline. They are presented only to give a point of reference.

FLOOR JACK & HOIST

Following illustrations indicate areas (parts) of underbody and frame which may be used to raise and support vehicle using either floor jack or hoist. These points are indicated by shaded areas on frame. See Fig. 1.

CAUTION: DO NOT interfere with shock absorber mounting brackets or stabilizer bar mounting brackets.

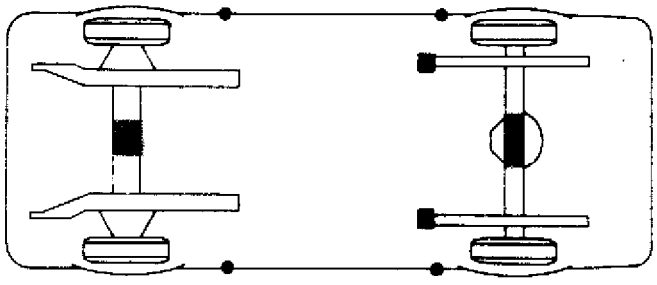


Fig. 1: Identifying Jacking & Hoisting Points (RX7)
Courtesy of Mazda Motors Corp.

EMERGENCY JACKING

Points designated on outline of body were specifically designed to facilitate use of vehicle's own jack. Jacking points are indicated by circular dots on outline of body. See Fig. 1.
If using floor jack or hoist, use extreme care to avoid

damaging outer body shell.

END OF ARTICLE

PRE-ALIGNMENT CHECKS
Article Text

1993 Mazda RX7

For www.iluvmyrx7.com

Wednesday, August 22, 2001 07:06AM

ARTICLE BEGINNING

Wheel Alignment
PRE-ALIGNMENT INSPECTION PROCEDURES

PRE-ALIGNMENT CHECKS

Before making wheel alignment adjustment, perform the following checks:

1) Tires should be equal in size and runout must not be excessive. Tires and wheels should be in balance, and inflated to manufacturer's specifications.
2) Wheel bearings must be properly adjusted. Steering linkage and suspension must not have excessive looseness. Check for wear in tie rod ends and ball joints.
3) Steering gear box must not have excessive play. Check and adjust to manufacturer's specifications.
4) Vehicle must be at curb height with full fuel load and spare tire in vehicle. No extra load should be on vehicle.
5) Vehicle must be level with floor and with suspension settled. Jounce front and rear of vehicle several times and allow it to settle to normal curb height.
6) If steering wheel is not centered with front wheels in straight-ahead position, correct by shortening one tie rod adjusting sleeve and lengthening opposite sleeve equal amounts.
7) Ensure wheel lug nuts are tightened to torque specifications.

END OF ARTICLE

RIDING HEIGHT ADJUSTMENT
Article Text

1993 Mazda RX7
For www.iluvmyrx7.com

Wednesday, August 22, 2001 07:07AM

ARTICLE BEGINNING

1993 WHEEL ALIGNMENT
Mazda Ride Height Adjustment

All Models Except Navajo and MPV

*** PLEASE READ THIS FIRST ***

NOTE: Prior to performing wheel alignment, perform preliminary visual and mechanical inspection of wheels, tires and suspension components. See PRE-ALIGNMENT INSTRUCTIONS in WHEEL ALIGNMENT THEORY/OPERATION article in the GENERAL INFORMATION section.

RIDE HEIGHT ADJUSTMENT

NOTE: Ride height specifications are not available. Specifications are given for side-to-side or front-to-rear height tolerance. If vehicle is not within side-to-side or front-to-rear specifications replace damaged or worn components as necessary.

NOTE: On vehicles with electronic chassis controls, all systems should be functional before attempting ride height or wheel alignment adjustment.

Before adjusting alignment, check ride height. Ride height must be checked with vehicle on level floor and tires properly inflated. Bounce vehicle several times and allow suspension to settle.

Visually inspect vehicle for signs of abnormal height from front to rear or side to side. Remove any extra heavy items from passenger and luggage compartments. Measure from center of wheel to lip of wheel arch. Refer to RIDE HEIGHT SPECIFICATIONS table.

RIDE HEIGHT SPECIFICATIONS TABLE

Application	Front In. (mm)	Rear In. (mm)
All Models (1) (2) (3)	.39 (10)	.39 (10)

(1) - Allowable difference in height from left to right side.
(2) - On Miata, allowable difference in height from front to rear is .93" (30.0 mm).
(3) - On RX7, allowable difference in height from front to rear is .59" (15.0 mm).

END OF ARTICLE

WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES
Article Text
1993 Mazda RX7
For www.iluvmyrx7.com

Wednesday, August 22, 2001 07:07AM

ARTICLE BEGINNING

1993 WHEEL ALIGNMENT
Mazda Specifications & Procedures

RX7

NOTE: Prior to performing wheel alignment, perform preliminary visual and mechanical inspection of wheels, tires and suspension components. See PRE-ALIGNMENT INSTRUCTIONS in WHEEL ALIGNMENT THEORY/OPERATION article in the GENERAL INFORMATION section.

WHEEL ALIGNMENT PROCEDURES

CAMBER ADJUSTMENT (FRONT)

1) Camber is adjusted by turning front and rear adjusting cam bolts at lower control arm. Loosen left and right cam adjusting lock nuts. To increase camber on left side, turn front cam counterclockwise or rear cam clockwise. To decrease camber on left side, turn front cam clockwise or rear cam counterclockwise.
2) To increase camber on right side, turn front cam clockwise or rear cam counterclockwise. To decrease camber on right side, turn front cam counterclockwise or rear cam clockwise. Tighten lock nuts to specification. See TORQUE SPECIFICATIONS table at the end of this article.

CAMBER ADJUSTMENT (REAR)

1) Camber is adjusted by turning adjusting cam bolt at I-arm. Loosen left and right cam adjusting lock nuts. To increase camber on left side, turn cam clockwise. To decrease camber on left side, turn cam counterclockwise.
2) To increase camber on right side, turn cam counterclockwise. To decrease camber on right side, turn cam clockwise. Tighten lock nuts to specification. See TORQUE SPECIFICATIONS table at the end of this article.

CASTER ADJUSTMENT

1) Caster is adjusted by turning front and/or rear adjusting cam bolts at lower control arm. Loosen left and right cam adjusting lock nuts. To increase caster on left side, turn front and/or rear cam counterclockwise. To decrease caster on left side, turn front and/or rear cam clockwise.
2) To increase caster on right side, turn front and/or rear cam clockwise. To decrease caster on right side, turn front and/or rear cam counterclockwise. Tighten lock nuts to specification. See TORQUE SPECIFICATIONS table at the end of this article.

TOE-IN ADJUSTMENT (FRONT)

NOTE: Both left and right tie rods have right-hand threads. To increase toe-in, turn right tie rod toward front of vehicle and turn left tie rod same amount toward rear of vehicle.

Loosen left and right tie rod lock nuts. Turn left and right tie rod sleeves by equal amounts until toe-in is within specification.

TOE-IN ADJUSTMENT (REAR)

1) Loosen left and right tie rod lock nuts or lateral link lock nuts. Turn left and right tie rod sleeves or lateral link adjustment link until toe-in is within specification.
2) Loosen left and right adjusting cam lock nuts. To increase toe-in on left side, turn front and/or rear cam counterclockwise. To decrease toe-in on left side, turn front and/or rear cam clockwise.
3) To increase toe-in on right side, turn front and/or rear cam clockwise. To decrease toe-in on right side, turn front and/or rear cam counterclockwise. Tighten lock nuts to specification. See TORQUE SPECIFICATIONS table at the end of this article.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
RX7	
Adjusting Cam Lock Nut	69-86 (94-117)
Tie Rod Lock Nut (Front)	23-36 (31-49)
Toe Control Link Nut (Rear)	41-47 (56-63)
Wheel Lug Nut	65-87 (88-118)

WHEEL ALIGNMENT SPECIFICATIONS

WHEEL ALIGNMENT SPECIFICATIONS TABLE

Application	Preferred	Range
RX7		
Camber (1)		
Front	0.10	-0.65 To 0.85
Rear	-1.22	-1.97 To 0.47
Caster (1)	6.08	5.08 To 7.08
Toe-In (2)		
Front	0.04 (1.0)	-0.07 To 0.15 (-2.0 To 4.0)
Rear	0.08 (2.0)	-0.03 To 0.19 (-1.0 To 5.0)
Toe-In (1)		
Front	0.10	-0.17 To 0.37
Rear	0.17	-0.10 To 0.43
Toe-Out On Turns (1)		

Inner	36	
Outer	32	
Steering Axis Inclination (SAI) (1)	13.92	

(1) - Measurement in degrees.
(2) - Measurement in inches (mm).

END OF ARTICLE