

# DRIVE AXLE - REAR SHAFTS

1991 Mazda Miata

1990-91 DRIVE AXLES  
RWD Axle Shafts

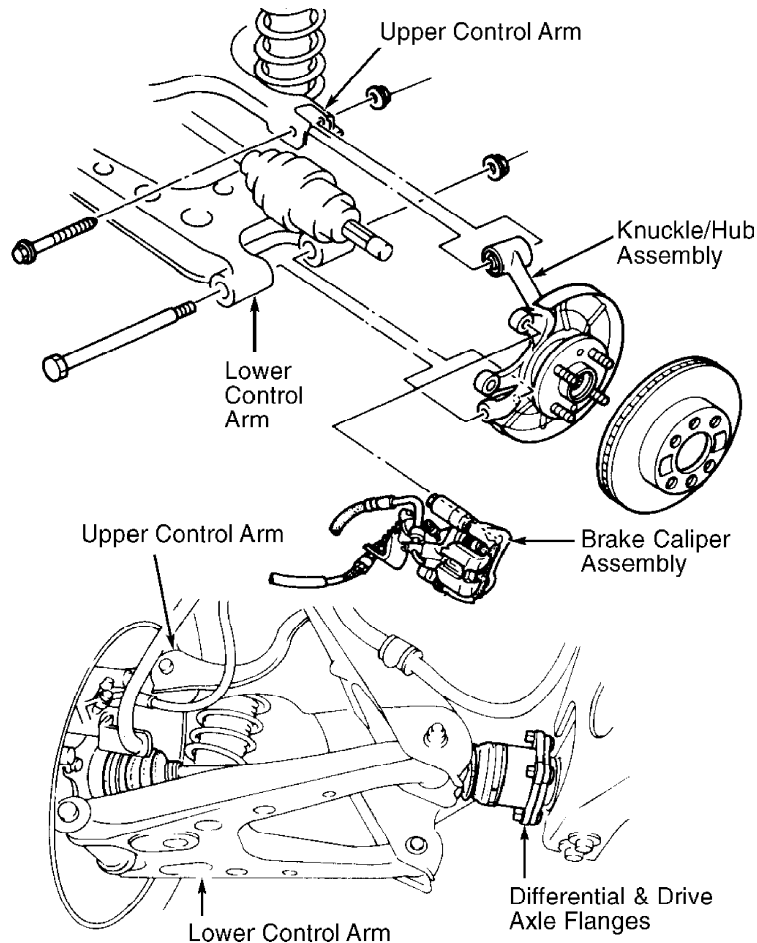
Miata, Protege 4WD, RX7, 929

NOTE: Information in this article only applies to models with independent rear suspension. For other models, see DIFFERENTIALS/AXLE SHAFTS article in the DRIVE AXLE Section.

## DRIVE AXLE SHAFTS R & I, DISASSEMBLY & REASSEMBLY

### REMOVAL (MIATA)

1) Raise vehicle and support with safety stands. Remove wheel assembly. Loosen axle lock nut until flush with end of axle. Mark differential and drive axle flanges for installation reference and remove flange nuts. See Fig. 1.



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Fig. 1: Removing Rear Drive Axle & Knuckle/Hub (Miata)  
Courtesy of Mazda Motors Corp.

2) Remove upper control arm bolt and pull knuckle/hub assembly outward. Remove inner CV joint from differential flange.

Using plastic or soft-faced hammer, tap axle from outer axle flange hub assembly. Remove axle lock nut and washer. If axle is stuck in axle flange hub, use puller and press to remove axle from hub.

## REMOVAL (PROTEGE 4WD)

1) Raise vehicle and support with safety stands. Remove wheel assembly. Loosen axle lock nut until flush with end of axle. Mark differential and drive axle flanges for installation reference and remove flange nuts.

2) Remove lower lateral links/control arm(s) bolt from knuckle/hub assembly. Remove trailing link mounting bolt from knuckle/hub assembly. Pull knuckle/hub assembly outward and remove inner CV joint from differential flange. Using soft-faced hammer, tap axle from outer axle flange hub assembly. Remove axle lock nut and washer. If axle is stuck in hub, use puller and press to remove axle from hub. See Fig. 2.

## REMOVAL (RX7 & 929)

1) Raise vehicle and support with safety stands. Remove wheel assembly. Loosen axle lock nut until flush with end of axle. Mark differential and drive axle flanges for installation reference and remove flange nuts. See Fig. 3 or 4.

2) Remove inner CV joint from differential flange by compressing CV joints and axle. Using soft-faced hammer, tap axle from axle flange hub assembly. Remove axle lock nut and washer. If axle is stuck in axle flange hub, use puller and press to remove axle from hub.

## DISASSEMBLY (ALL MODELS)

1) Place axle shaft assembly in a soft-jawed vise. Keep axle shaft clean during disassembly. Index mark all related parts with paint for reassembly to original position. Remove CV joint boot bands and slide boot away from CV joint housing. See Fig. 5.

2) Using screwdriver, remove inner circlip from CV joint housing. Remove race and cage assembly from CV joint housing. Remove balls from cage. Turn cage approximately 30 degrees to inner race and separate cage from race.

3) Using paint, index mark axle shaft and inner race. Remove snap ring and press inner race from shaft. Clean and inspect all parts. Ensure shaft is not bent, twisted or damaged. Check splines for wear. Inspect bearing inner race, cage and balls for abnormal wear. If required, replace as an assembly.

**NOTE:** Inner and outer CV joint boots differ in design and/or diameter. Ensure correct boot is installed at proper end when reassembling axle shaft. See Fig. 5. See AXLE BOOT IDENTIFICATION TABLE.

1990 AXLE SHAFT LENGTHS TABLE

Application	Right Side In. (mm)	Left Side In. (mm)
Miata .....	(1) 25.957 (659.31) ... (1) 25.957 (659.31)	
	(2) 26.366 (669.69) ... (2) 26.366 (669.69)	
Protege 4WD .....	(1) 27.12 (689.0) ..... (2) 25.94 (659.0)	
RX7		
Turbo .....	25.10 (637.5) .....	25.10 (637.5)
Non-Turbo .....	25.43 (646.0) .....	25.43 (646.0)

With ABS .....	26.22 (666.0)	.....	26.72 (678.8)
Without ABS .....	24.65 (626.0)	.....	24.91 (632.8)

- (1) - Measurement of shaft length between pivot centers.  
(2) - Measurement of overall length of axle shaft. See Fig. 5.

1991 AXLE SHAFT LENGTHS TABLE

Application	Right Side In. (mm)	Left Side In. (mm)
Miata .....	25.87 (657.0)	25.87 (657.0)
Protege 4WD .....	27.12 (689.0)	25.94 (659.0)
RX7		
Turbo .....	25.10 (637.5)	25.10 (637.5)
Non-Turbo .....	25.43 (646.0)	25.43 (646.0)
929 .....	25.04 (636.0)	26.61 (676.0)

AXLE BOOT IDENTIFICATION TABLE

Application	Wheel Side Diameter In. (mm)	Diff. Side Diameter In. (mm)
Miata .....	3.575 (90.81)	3.441 (87.40)
Protege 4WD .....	3.35 (85.2)	3.54 (89.9)
RX7		
Turbo .....	3.98 (101)	3.94 (100)
Non-Turbo .....	3.88 (98.5)	3.76 (95.5)
929 .....	(1)	(1)

- (1) - Information not available from manufacturer.

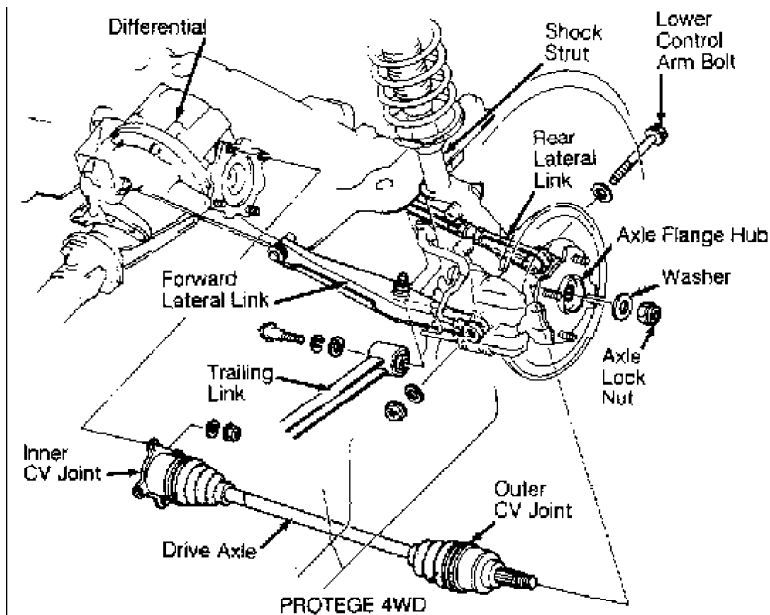


Fig. 2: Removing Rear Drive Axle (Protege 4WD)  
Courtesy of Mazda Motors Corp.

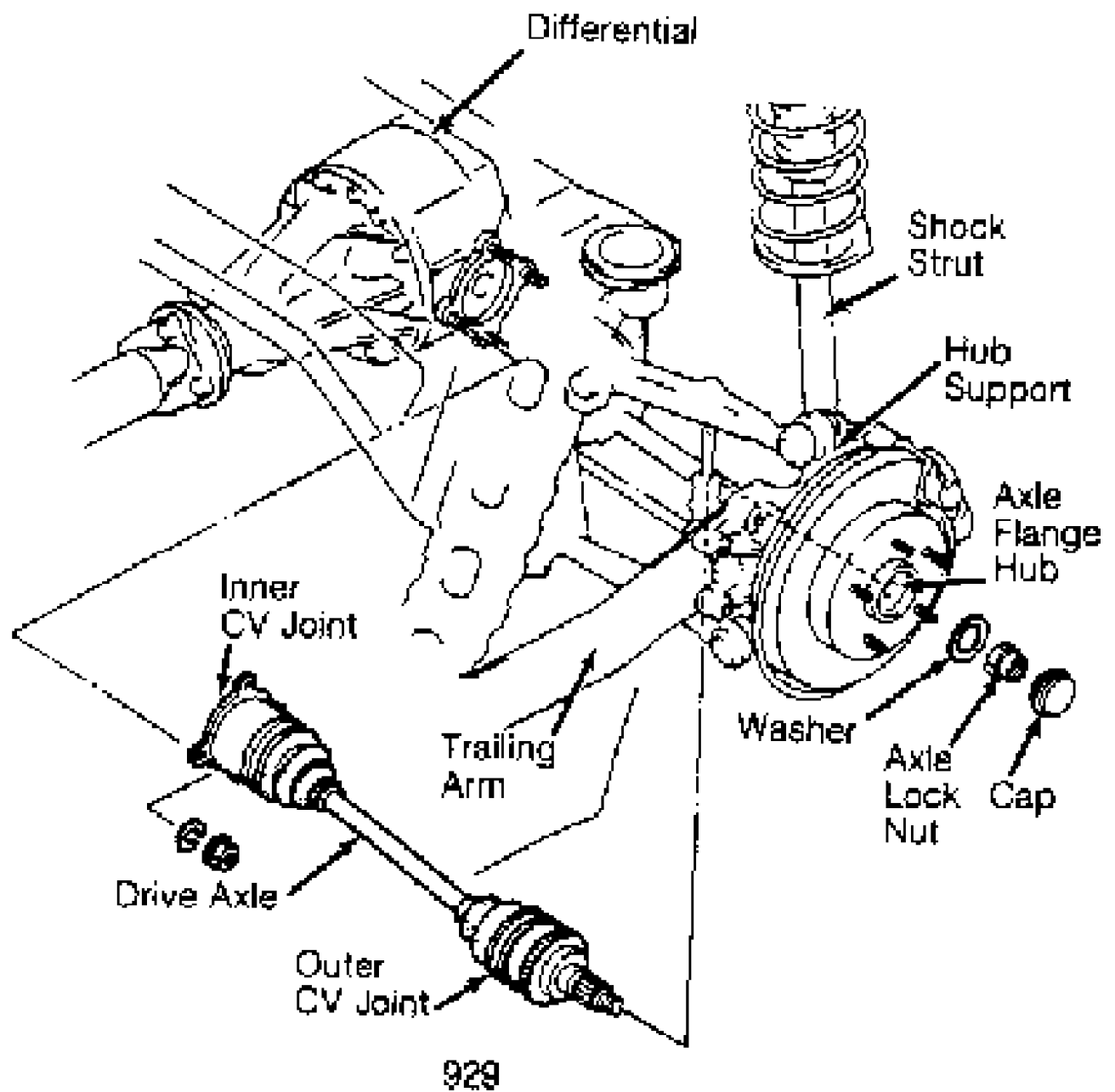


Fig. 3: Removing Rear Drive Axle (929)  
Courtesy of Mazda Motors Corp.

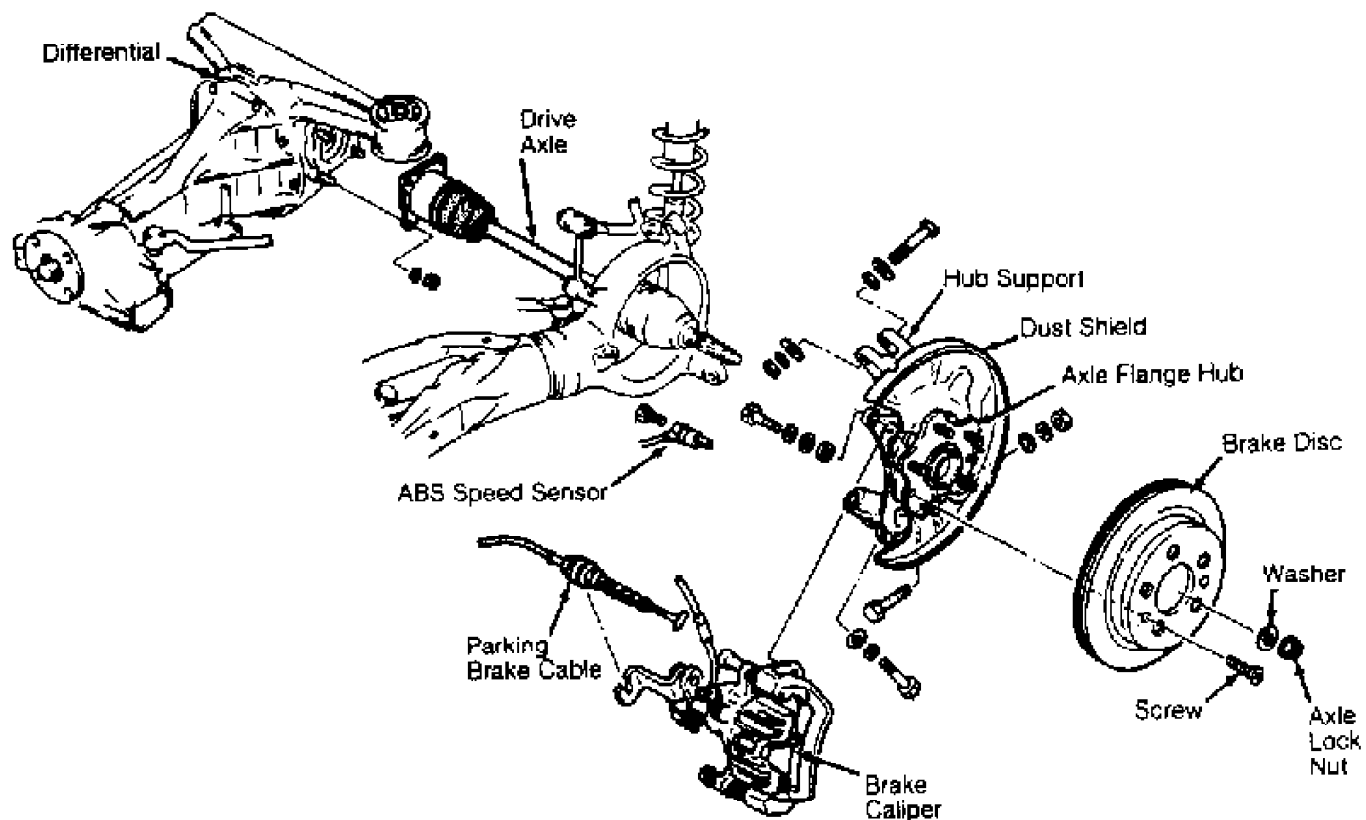


Fig. 4: Removing Rear Drive Axle (RX7)  
Courtesy of Mazda Motors Corp.

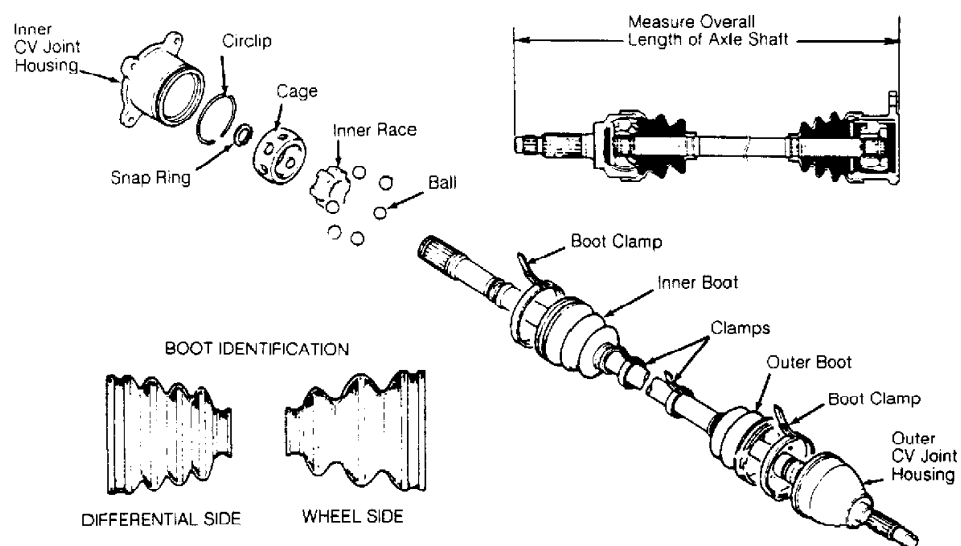


Fig. 5: Measuring Axle & Identifying Boots  
Courtesy of Mazda Motors Corp.

REASSEMBLY (ALL MODELS)

1) Reverse disassembly procedure to reassemble axle shaft components. Ensure boot does not get cut or scored during installation by wrapping vinyl tape around splines before installing boot to shaft. Align all index marks. Pack CV joint housing assembly and boot with required amount of CV joint grease (molybdenum disulfide grease).

2) Using new boot clamps, position clamps so, when folded down, the direction is opposite rotation of axle shaft. Fold boot clamp back by pulling on end of clamp with pliers. Lock end of clamp by bending locking clip.

## **INSTALLATION (ALL MODELS)**

To install, reverse removal procedure. With vehicle weight on wheels, perform final tightening of suspension links, stabilizer links, trailing arms and lower shock absorber bolt. Check rear wheel alignment. See appropriate article in the ALIGNMENT SPECIFICATIONS article in the WHEEL ALIGNMENT Section. Tighten all bolts to specification. See TORQUE SPECIFICATIONS TABLE at end of article.

## **REAR HUB ASSEMBLY R & I DISASSEMBLY & REASSEMBLY**

### **REMOVAL & DISASSEMBLY (MIATA)**

1) Raise vehicle and support with safety stands. Remove wheel assembly. Remove axle lock nut and washer. Remove brake caliper. Mark brake disc and hub for reassembly reference and remove disc from hub. See Fig. 1.

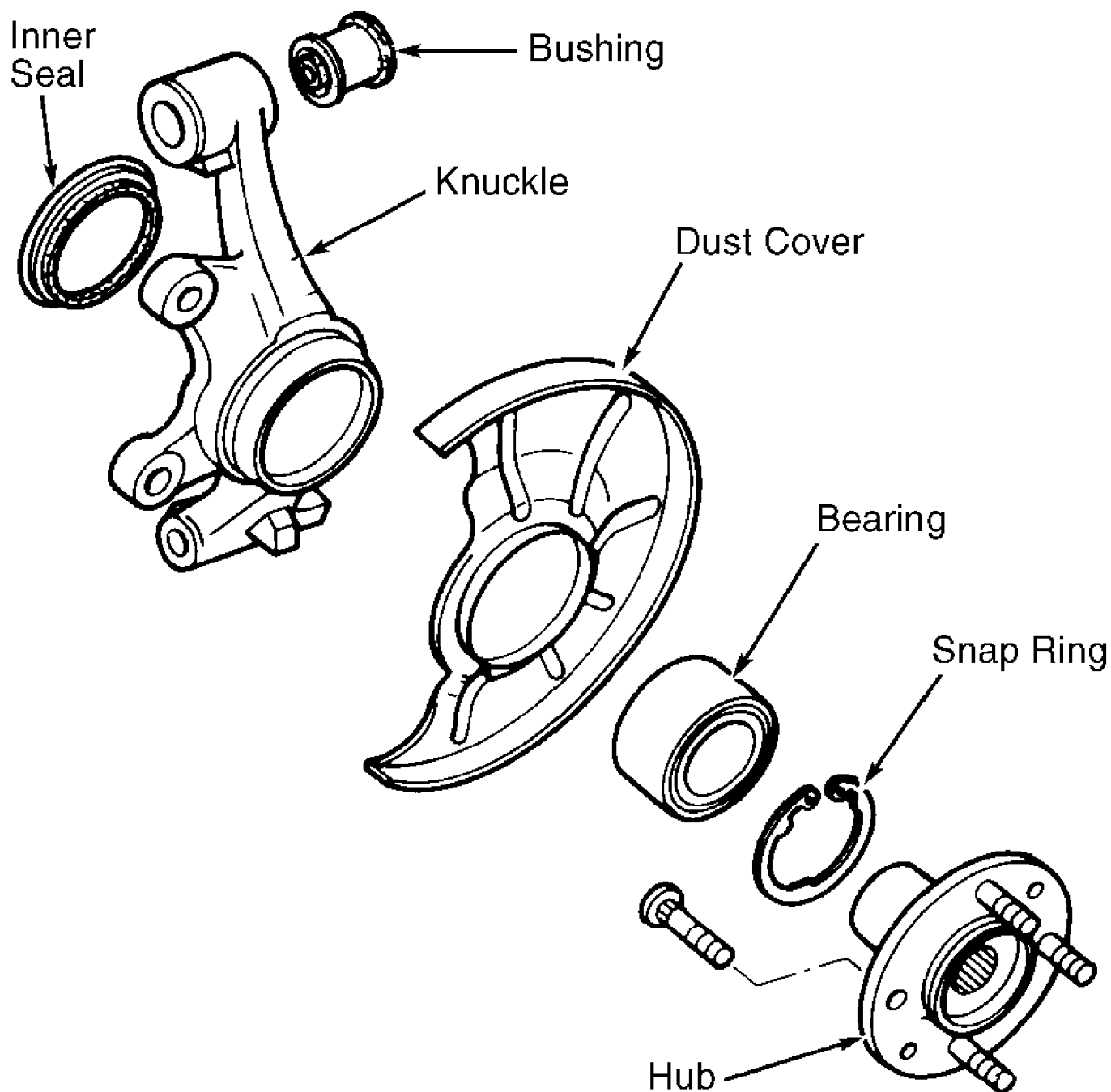
2) Using dial indicator on axle hub flange, measure axle bearing play by pulling and pushing on axle hub flange. Axle bearing play should be maximum of .002" (0.05 mm).

3) Remove upper and lower control arm bolts retaining knuckle/hub assembly. Using plastic or soft-faced hammer, tap axle from outer hub assembly. If axle is stuck in hub, use puller and press axle from outer hub assembly. Remove knuckle/hub assembly from vehicle.

4) Pry inner seal from knuckle/hub assembly. Using press, remove axle flange hub from knuckle/hub assembly. Remove inner bearing race from axle flange hub using arbor press and Press Collar Clamp (49-0636-145).

5) Remove snap ring retaining bearing and press bearing from knuckle/hub. See Fig. 6. DO NOT reuse wheel bearing. Inspect all components for cracks, wear or damage. Replace as required. Dust cover cannot be reinstalled if removed. If replacing dust cover, mark location on hub and original dust cover for new dust cover installation reference.

**NOTE:** NEVER press or chisel brake dust cover from knuckle/hub unless replacing cover. DO NOT reuse wheel bearing if removed from knuckle/hub.



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Fig. 6: Exploded View of Rear Knuckle/Hub Assembly (Miata)  
Courtesy of Mazda Motors Corp.

#### REASSEMBLY & INSTALLATION

1) Press bearing into knuckle and install snap ring. Press new dust cover onto knuckle aligning reference marks made from original dust cover. Press hub into knuckle and install seal. Lube seal lip. Reverse removal procedure to install knuckle/hub assembly to suspension.

2) With vehicle weight on wheels, perform final tightening of

suspension arms, stabilizer link and lower shock absorber bolt. Check rear wheel alignment. See ALIGNMENT SPECIFICATIONS article in the WHEEL ALIGNMENT Section. Tighten all bolts to specification. See TORQUE SPECIFICATIONS TABLE at end of article. Stake axle lock nut.

## REMOVAL & DISASSEMBLY (PROTEGE 4WD)

1) Raise vehicle and support with safety stands. Remove wheel assembly. Remove axle lock nut and washer. Remove brake caliper. Mark brake disc and hub for reassembly reference and remove disc from hub. See Fig. 2.

2) Using dial indicator on axle hub flange, measure axle bearing play by pulling and pushing on axle hub flange. Axle bearing play should be maximum of .002" (0.05 mm). Remove lower lateral control arm(s) bolt from knuckle/hub assembly. Remove trailing link mounting bolt from knuckle/hub assembly. Remove shock strut mounting bolts from knuckle/hub. Using plastic or soft-faced hammer, tap axle from outer hub assembly. If axle is stuck in hub, use puller and press axle from hub to remove. Remove knuckle/hub assembly from vehicle.

3) Pry inner seal from knuckle/hub. Using press, remove axle flange hub from knuckle/hub assembly. Remove inner bearing race from axle flange hub using arbor press and Press Collar Clamp (49-H027-002).

4) Remove snap ring retaining bearing and press bearing from knuckle/hub. See Fig. 7. DO NOT reuse wheel bearing. Inspect all components for cracks, wear or damage. Replace as required. Dust cover cannot be reinstalled if removed. If replacing dust cover, mark location on hub and original dust cover for new dust cover installation reference.

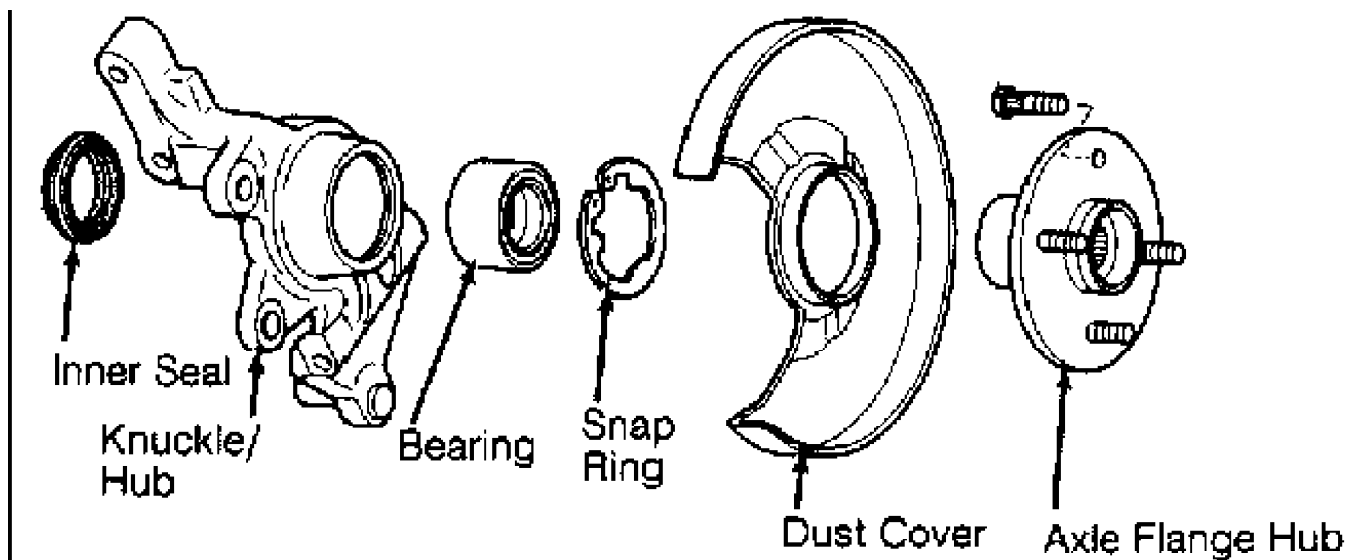


Fig. 7: Exploded View of Rear Hub Assembly (Protege 4WD)  
Courtesy of Mazda Motors Corp.

NOTE: NEVER press or chisel brake dust cover from hub support unless replacing. DO NOT reuse wheel bearing if removed from knuckle/hub.

## REASSEMBLY & INSTALLATION

1) Press bearing into knuckle and install snap ring. Press new dust cover onto knuckle aligning reference marks made from



original dust cover removal. Press axle flange hub into knuckle and install seal. Lube seal lip. Reverse removal procedure to install knuckle/hub assembly to suspension.

2) With vehicle weight on wheels, perform final tightening of suspension links, trailing link and strut shock bolts. Check rear wheel alignment. See ALIGNMENT SPECIFICATIONS article in the WHEEL ALIGNMENT Section. Tighten all bolts to specification. See TORQUE SPECIFICATIONS TABLE at end of article. Stake axle lock nut.

## REMOVAL & DISASSEMBLY (RX7)

1) Raise vehicle and support with safety stands. Remove wheel assembly. Remove axle lock nut and washer. Disconnect parking brake cable. Remove brake caliper assembly. Remove brake disc.

2) Using dial indicator on axle hub flange, measure axle bearing play by pulling and pushing on axle flange hub. Axle bearing play should be maximum of .004" (0.1 mm). Remove ABS speed sensor from rear of hub support. Using plastic or soft-faced hammer, tap axle from axle flange hub assembly. If axle is stuck in axle flange hub, use puller and press axle from hub to remove. Remove hub support from rear suspension assembly. Loosen brake dust shield. Using press, remove axle flange hub from hub support. See Fig. 8.

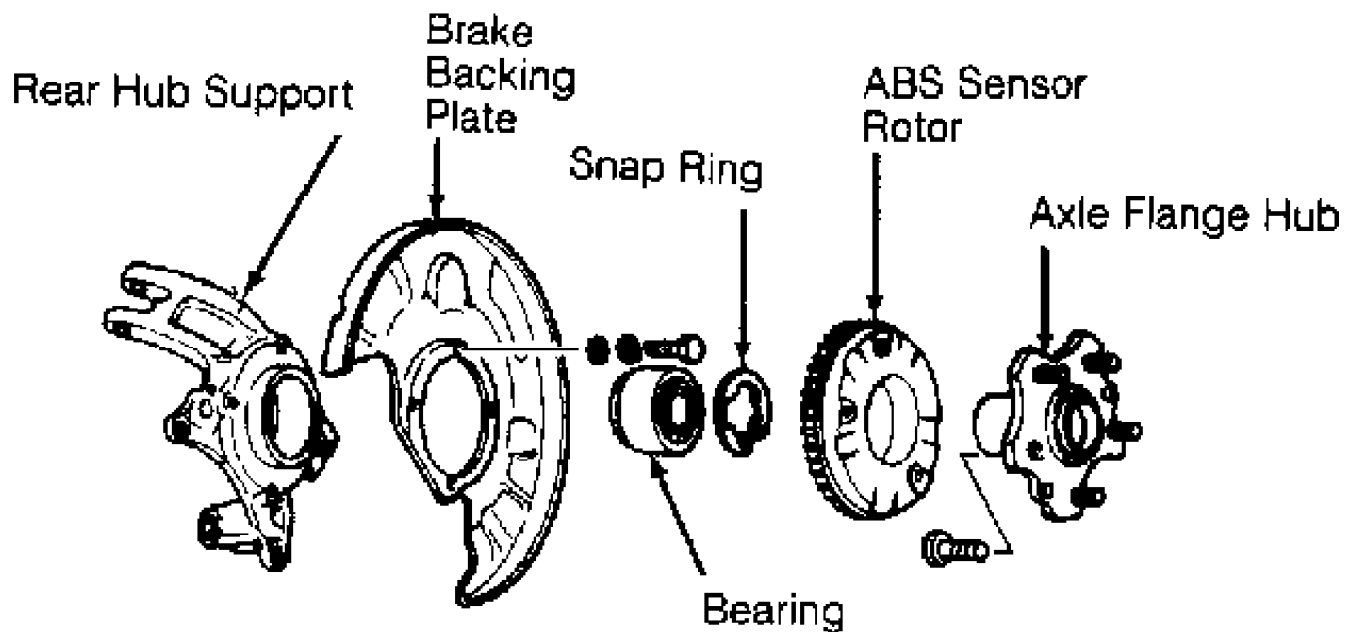


Fig. 8: Exploded View of Rear Hub Assembly (RX7)  
Courtesy of Mazda Motors Corp.

3) Remove ABS sensor rotor from axle flange hub. Remove dust shield from hub support. Remove snap ring from hub support. Press bearing from hub support. DO NOT reuse wheel bearing. Check all components for cracks, wear or damage.

## REASSEMBLY & INSTALLATION

1) Press bearing into hub support and install snap ring. Install dust cover and tighten bolts to 12-17 ft. lbs. (16-23 N.m). Press axle flange hub into hub support bearing. Install seal and lubricate seal lip. To complete installation, reverse removal procedure.

2) On vehicles equipped with ABS, clearance measurement

between sensor pick-up and sensor rotor on hub should be .016-.039" (.4-1.0 mm). With vehicle weight on wheels, perform final tightening of suspension links and lower shock absorber bolt. Check rear wheel alignment. SEE ALIGNMENT SPECIFICATIONS ARTICLE in the WHEEL ALIGNMENT SECTION. Tighten all bolts to specification. See TORQUE SPECIFICATIONS TABLE at end of article. Stake axle lock nut.

## REMOVAL & DISASSEMBLY (929)

1) Raise vehicle and support with safety stands. Remove wheel assembly. Remove axle lock nut and washer. Remove brake caliper. See Fig. 9.

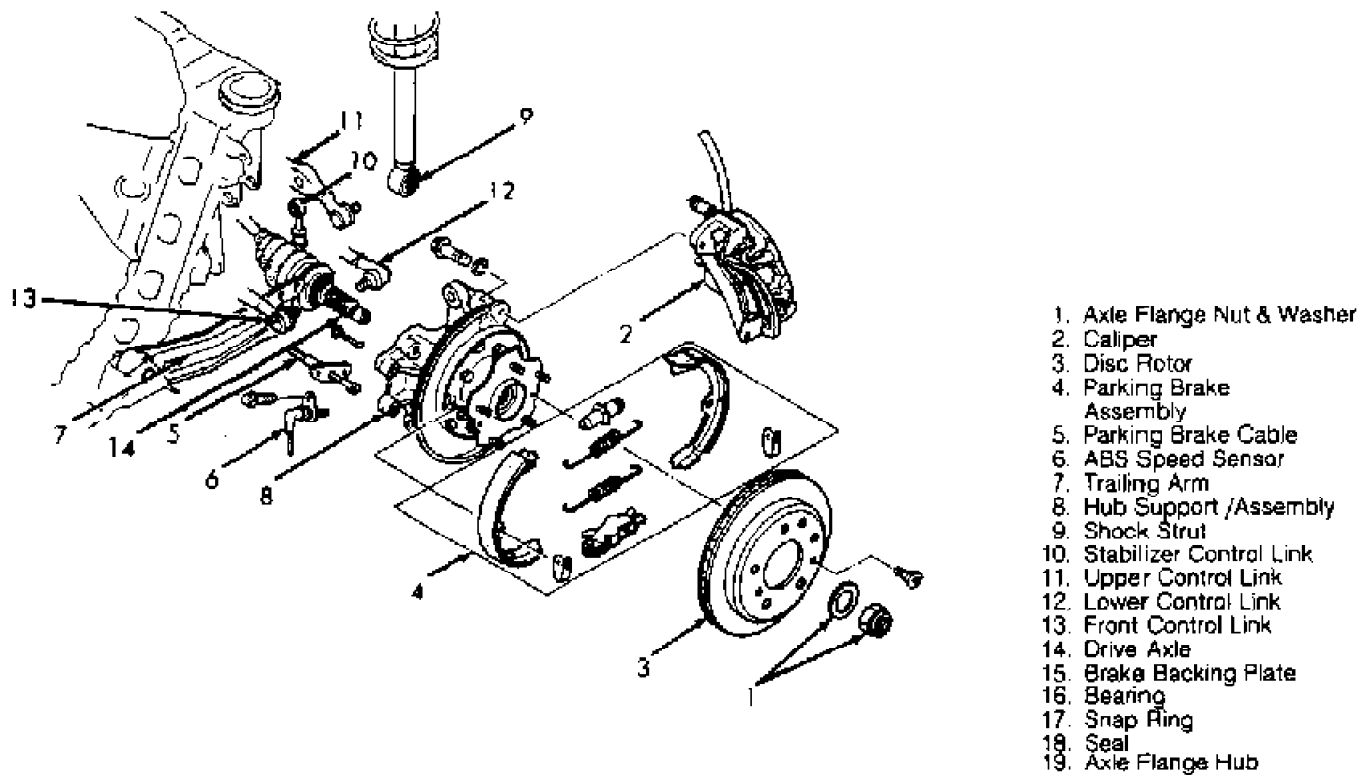


Fig. 9: Exploded View Of Rear Hub Assembly (929) (1 of 2)  
Courtesy of Mazda Motors Corp.

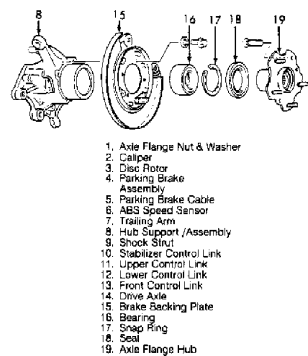


Fig. 10: Exploded View Of Rear Hub Assembly (929) (2 of 2)  
Courtesy of Mazda Motors Corp.

2) Using dial indicator on axle flange hub, measure axle

bearing play by pulling and pushing on axle flange hub. Axle bearing play should be maximum of .08" (0.2 mm). Remove ABS speed sensor from rear of hub support (if equipped). Remove brake disc rotor retaining screws. Remove brake disc rotor. Remove parking brake shoes and mechanism. Remove parking brake cable. Remove trailing arm-to-hub support assembly mounting bolts.

3) Remove shock absorber lower mounting bolt. Remove stabilizer control link. Remove upper, lower and front control links from hub support assembly. Using plastic or soft-faced hammer, tap axle from outer hub assembly. If axle is stuck in axle flange hub, use puller to press axle flange hub from hub support assembly. Remove hub support assembly from vehicle.

4) Loosen brake backing plate. Using press, remove axle flange hub support. See Fig. 9. Remove brake backing plate from hub support. Remove seal and snap ring from hub support. Press bearing from hub support. DO NOT reuse wheel bearing. Check all components for cracks, wear or damage. If inner bearing race remains on hub, grind inner race down until approximately .0197" (.5 mm) thick. Tap race with chisel and hammer to break race and remove.

## REASSEMBLY & INSTALLATION

1) To reassemble and install, reverse disassembly and removal procedure. Use a press to install bearing into hub support and install snap ring. Press axle flange hub into bearing. Lubricate seal lips prior to installation.

2) With vehicle weight on wheels, perform final tightening of suspension links, stabilizer link and lower shock absorber bolt. Check rear wheel alignment. See ALIGNMENT SPECIFICATIONS article the WHEEL ALIGNMENT Section. Tighten all bolts to specification. See TORQUE SPECIFICATIONS TABLE at end of article. Stake axle lock nut.

## TORQUE SPECIFICATIONS

### TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
<b>Miata</b>	
Axle Lock Nut .....	159-217 (216-294)
Brake Caliper Mounting Bolts .....	36-51 (49-69)
Brake Caliper Mounting Bolts .....	25-29 (54-649)
Differential-to-Drive Axle Nut (4) ..	40-47 (54-64)
Lower Control Arm Bolt .....	46-55 (62-75)
Upper Control Arm Bolt .....	34-49 (46-66)
Wheel Lug Nuts .....	65-87 (88-118)
<b>Protege 4WD</b>	
Axle Lock Nut .....	173-235 (235-319)
Brake Caliper Mounting Bolts .....	33-44 (45-60)
Differential-to-Drive Axle Nut (4) ..	40-47 (54-64)
Lower Lateral Links/ Control Arm Bolt .....	63-86 (85-117)
Strut Shock-to-Knuckle/Hub Bolt ....	69-93 (94-126)
Trailing Link-to-Knuckle/Hub Bolt ..	69-93 (94-126)
Wheel Lug Nuts .....	65-87 (88-118)
<b>RX7</b>	
ABS Speed Sensor Bolt .....	12-17 (16-23)
Axle Lock Nut .....	174-231 (236-313)
Brake Caliper Mounting Bolt .....	33-40 (45-54)
Brake Dust Cover Bolt .....	12-17 (16-23)

Differential-to-Drive Axle Nut (4) ..	40-47	(54-64)
Hub Support-to-Rear Suspension		
Forward Bolt .....	82-111	(111-150)
Top & Bottom Bolts .....	46-69	(62-94)
Parking Brake Cable Nut .....	14-21	(19-28)
Wheel Lug Nuts .....	65-87	(88-118)

929

ABS Speed Sensor Bolt .....	12-17	(16-23)
Axle Lock Nut .....	174-231	(236-313)
Body Side Upper &		
Lower Control Link Nuts .....	69-86	(94-117)
Brake Caliper Mounting Bolt .....	33-50	(45-68)
Control Links-to-Hub		
Support Nuts (3) .....	40-55	(54-75)
Differential-to-Drive Axle Nut (4) ..	40-47	(54-64)
Parking Brake		
Cable End Bolt .....	34-39	(46-53)
Cable Mounting Flange Bolt .....	40-50	(54-68)
Shock Absorber Bolt (Lower) .....	54-69	(74-94)
Stabilizer Control Link Nut .....	27-38	(37-52)
Trailing Arm-to-Hub Support Bolt ...	69-86	(93-117)
Wheel Lug Nuts .....	65-87	(88-118)

(1) - 1990 Model.

(2) - 1991 Model.

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