

DESCRIPTION

CV JOINT IDENTIFICATION

Application	Joint Type
Millenia	Tripod
MPV	Tripod
Protege	Tripod
Tribute	Tripod
626	
Automatic Transaxle	Tripod
Manual Transaxle	DOJ

TROUBLE SHOOTING

NOTE: See **DRIVE AXLE NOISE DIAGNOSIS** article in **GENERAL INFORMATION**.

REMOVAL, DISASSEMBLY, REASSEMBLY & INSTALLATION

FWD AXLE SHAFT

CAUTION: Prior to separating lower control arm from knuckle, remove wheel speed sensor to avoid damage to sensor or wire harness.

Removal (Millenia & 626)

1. Raise vehicle on hoist or support vehicle with stands. Drain transaxle fluid. Remove wheel and tire assembly. Remove inner fender shield. Remove wheel speed sensor. Raise lock tab on axle shaft lock nut. Apply brakes and remove axle shaft lock nut.
2. Using Puller (49-T028-3A0), separate tie rod end from steering knuckle. Remove stabilizer bar from stabilizer link and remove stabilizer link from lower control arm. Remove lower control arm ball joint from steering knuckle. On Millenia, disconnect upper lateral link ball joint and suspend it from strut coil.
3. On 626, suspend engine using engine support bridge. Remove left crossmember. On all models, carefully insert pry bar between inner CV joint and transaxle or intermediate shaft so as not to damage boot or oil seal. Using hammer, lightly tap end of pry bar to unseat inner CV joint assembly from transaxle or intermediate shaft. See **Fig. 1**.
4. Remove axle shaft assembly from hub. If axle shaft is stuck to hub, reinstall axle shaft

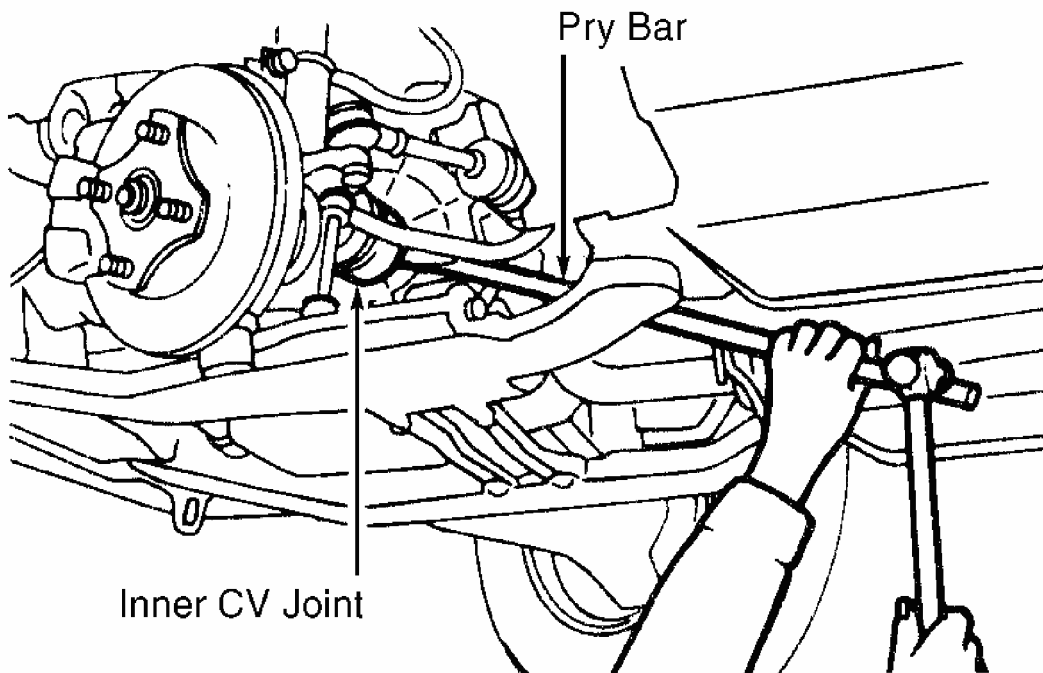
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lock nut until flush with end of axle shaft, and tap end of axle shaft with brass or plastic hammer. Install Side Gear Holder (49-G030-455) into transaxle.



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Fig. 1: Prying Drive Axle Shaft From Transaxle, Intermediate Shaft Or Differential
Courtesy of MAZDA MOTORS CORP.

NOTE: DO NOT disassemble outer CV joint. Replace outer axle shaft and CV joint as an assembly. Service outer boot only after Inner CV joint has been removed.

NOTE: Before disassembling right axle shaft assembly, measure and record dynamic damper position from axle shaft end. See Fig. 4 .

Removal (MPV, Protege)

1. Raise vehicle on hoist, or support vehicle with stands. Drain differential fluid. Remove wheel and tire assembly. Remove wheel speed sensor. Raise lock tab on axle shaft lock nut. Apply brakes and remove axle shaft lock nut. Separate tie rod end from steering knuckle using Puller (49-T028-3A0). Remove bolts holding lower control arm ball joint to lower control arm.
2. Carefully insert pry bar between inner CV joint and differential so as not to damage boot or oil seal. Using hammer, lightly tap end of pry bar to unseat inner CV joint assembly from differential. See Fig. 1 .

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3. Remove axle shaft assembly. If axle shaft is stuck to hub, reinstall axle shaft lock nut until flush with end of axle shaft, and tap end of axle shaft with brass or plastic hammer.

Removal (Tribute)

1. Remove wheel. Apply brakes and remove axle shaft lock nut. Remove brake caliper, anchor plate and rotor. See Appropriate DISC & DRUM article in BRAKES.
2. Remove nut from tie rod end. Using Tie Rod End Remover (211-105), separate tie rod end from steering knuckle. Remove lower control arm ball joint from steering knuckle. Using Front Hub Remover (205-D070), separate axle shaft from knuckle. Remove axle shaft assembly.

Disassembly (DOJ Type)

1. Place axle shaft assembly in soft-jaw vise. Keep axle shaft assembly clean during disassembly and reassembly. Remove CV joint boot bands and slide boot away from CV joint housing. Index mark CV joint housing, outer race, inner race and axle shaft for reassembly reference. Using screwdriver, remove large circlip from inner race groove in CV joint housing. See **Fig. 2** .
2. Remove CV joint housing from ball, inner race and cage assembly. Remove snap ring retaining ball, inner race and cage assembly to axle shaft. Remove ball, inner race and cage assembly from axle shaft. Insert screwdriver between inner race and cage, and remove balls. Index mark inner race and cage for reassembly reference. Turn cage about 30 degrees to inner race, and separate cage from inner race.
3. Wrap axle shaft end splines with tape. Remove inner CV joint boot. Remove outer CV joint boot bands and slide boot off inner CV joint end. Clean and inspect all parts. Ensure axle shaft is not bent, twisted or damaged. Check splines for wear. Inspect bearing inner race, cage and balls for abnormal wear and replace as an assembly, if necessary.

Disassembly (Tripod Type - Tribute)

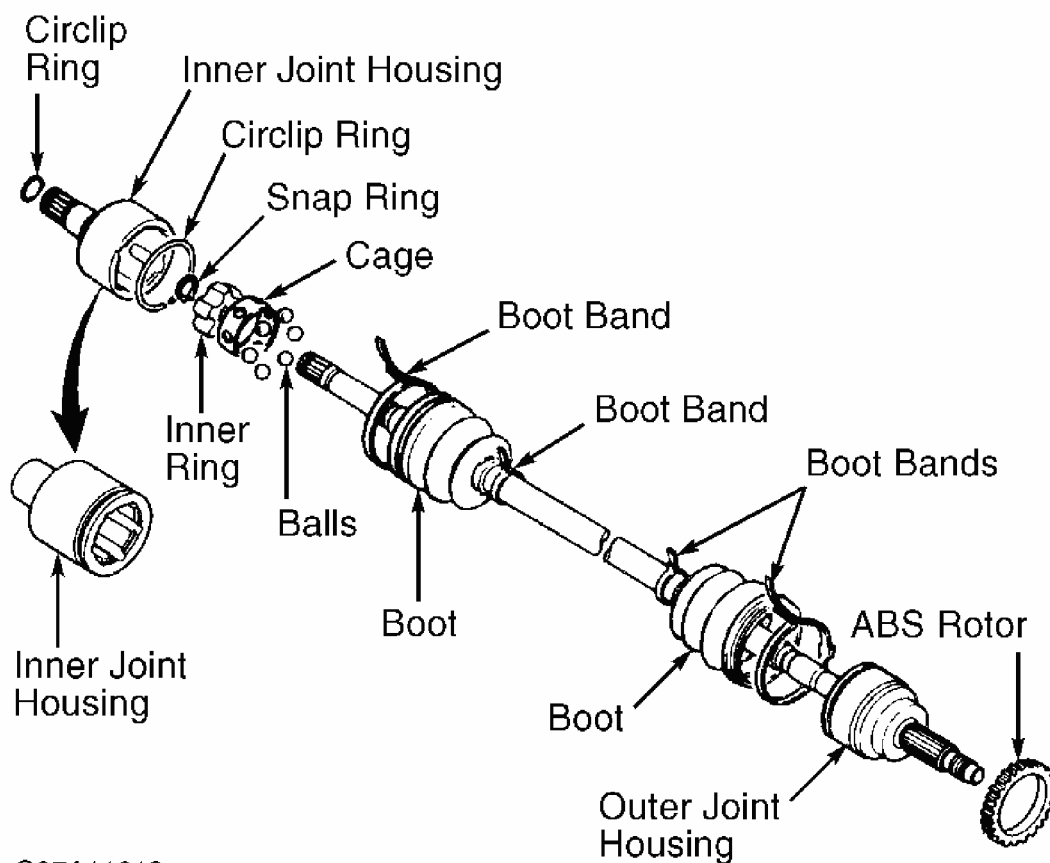
NOTE: Outer joint can be removed from axle with a soft hammer. DO NOT disassemble outer CV joint.

1. Place axle shaft assembly in soft-jaw vise. Keep axle shaft assembly clean during disassembly and reassembly. Remove CV joint boot bands and slide boot away from CV joint housing. Index mark CV joint housing, tripod joint and axle shaft for reassembly reference. See **Fig. 3** .
2. Remove CV joint housing from tripod assembly. Move inner snap ring away from tripod joint. Push tripod joint toward inner snap ring. Remove outer snap ring. Remove tripod joint, inner snap ring and CV boot.
3. Clean and inspect all parts. Ensure axle shaft is not bent, twisted or damaged. Check

splines for wear. Inspect tripod bearings for abnormal wear, excessive looseness, seizure, rust or other damage. Replace as necessary.

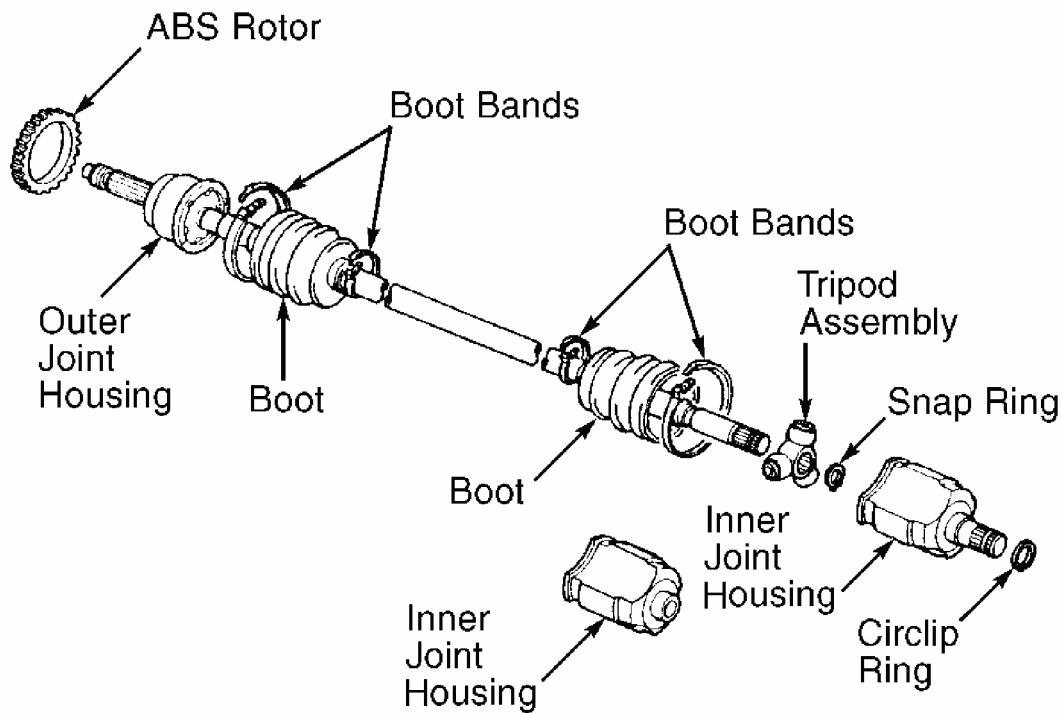
Disassembly (Tripod Type - Except Tribute)

1. Place axle shaft assembly in soft-jaw vise. Keep axle shaft assembly clean during disassembly and reassembly. Remove CV joint boot bands and slide boot away from CV joint housing. Index mark CV joint housing, tripod assembly and axle shaft for reassembly reference. See **Fig. 3**.
2. Remove CV joint housing from tripod assembly. Remove snap ring retaining tripod assembly to axle shaft. Using a hammer and soft drift, drive tripod assembly from axle shaft. Wrap axle shaft end splines with tape. Remove inner CV joint boot. Index mark and remove dynamic damper as necessary. Remove outer CV joint boot bands and slide boot off inner CV joint end.
3. Clean and inspect all parts. Ensure axle shaft is not bent, twisted or damaged. Check splines for wear. Inspect tripod bearings for abnormal wear, excessive looseness, seizure, rust or other damage. Replace as necessary.



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Fig. 2: Exploded View Of Axle Shaft Assembly (DOJ)



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Fig. 3: Exploded View Of Axle Shaft Assembly (Tripod)
Courtesy of MAZDA MOTORS CORP.

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.

Reassembly (DOJ Type)

1. Pack outer CV joint assembly with grease. Wrap tape around axle shaft end splines, and slide outer boot on axle shaft (if removed). Slide inner CV joint boot onto axle shaft.
2. Install inner race into cage and turn cage about 30 degrees to inner race aligning marks made during disassembly. Insert balls through cage, and seat in grooves of inner race. Pack ball, inner race and cage assembly with grease. Align marks on inner race and axle shaft. Install ball, inner race and cage assembly onto axle shaft, with large side of cage facing axle shaft end. Install snap ring.
3. Apply grease to CV joint housing. Align marks on inner race, axle shaft and CV joint housing. Position housing onto ball, inner race and cage assembly and install large circlip. Set axle shaft length. See **FRONT AXLE SHAFT LENGTHS** . Using a cloth-

covered screwdriver, lift small end of boot to allow air to escape. Install NEW boot bands. Position bands so when folded down, the direction is opposite axle shaft direction of rotation. Fold boot band back by pulling on end of band with pliers. Lock end of band by bending locking clip.

Reassembly (Tripod Type - Tribute)

1. Pack outer CV joint with high temperature CV joint grease. Install outer CV boot and NEW circlip onto axle. Using a soft-face hammer, tap CV joint onto axle. Position boot on CV joint. Using a cloth-covered screwdriver, lift small end of boot to allow air to escape. Using Boot Clamp (205-343), install NEW boot bands on outer CV joint.
2. Slide inner CV joint boot onto axle shaft. Position NEW inner snap ring past snap ring groove on axle. Align marks on tripod assembly and axle shaft. Install tripod assembly onto axle shaft. Install NEW outer snap ring. Slide tripod joint over outer snap ring. Seat inner snap ring. Lubricate tripod joint with high-temperature CV joint grease. Fill tripod joint housing with high temperature CV joint grease. Position housing over tripod joint. Position boot onto housing. Using Boot Clamp (205-343), install NEW boot bands on outer CV joint.

Reassembly (Tripod Type - Except Tribute)

1. Pack outer CV joint assembly with grease. Wrap tape around axle shaft end, and slide outer boot on axle shaft (if removed). Install dynamic damper and band (if removed). Slide inner CV joint boot on axle shaft.
2. Align marks on tripod assembly and axle shaft. Install tripod assembly onto axle shaft using hammer and soft drift. Install snap ring. Apply grease to CV joint housing. Align marks on tripod assembly, axle shaft and CV joint housing. Position housing onto tripod assembly. Set axle shaft length. See **FRONT AXLE SHAFT LENGTHS** .
3. Using a cloth-covered screwdriver, lift small end of boot to allow air to escape. Using Boot Clamp Crimper (49-T025-001), crimp NEW small band to .094-.110" (2.4-2.8 mm). Crimp NEW large band to .13" (3.2 mm).

NOTE: Before installing right axle shaft assembly, ensure dynamic damper is installed in proper position and at proper distance from CV joint end. See **DYNAMIC DAMPER POSITION** . See **Fig. 4** .

Installation (All Models)

1. Install NEW circlip ring onto inner end of axle shaft, with circlip end gap facing up. Inspect oil seals and sealing surfaces to ensure proper sealing. Replace seals as necessary.
2. Carefully install axle shaft assembly into transaxle, intermediate shaft or differential so as not to damage oil seal. Pull axle shaft assembly outward to ensure axle shaft assembly is properly seated in transaxle, intermediate shaft or differential. Pull outward

on hub assembly, and insert axle shaft into hub. On Tribute, seat axle shaft into hub using Front Hub Replacer (205-D069). Install NEW axle shaft lock nut.

- To complete assembly, reverse removal procedure. Tighten bolts and nuts to specification. See **TORQUE SPECIFICATIONS** . Apply brakes and tighten axle shaft lock nut to specification. Stake axle shaft lock nut. Add transaxle fluid or differential fluid as necessary. Inspect wheel alignment.

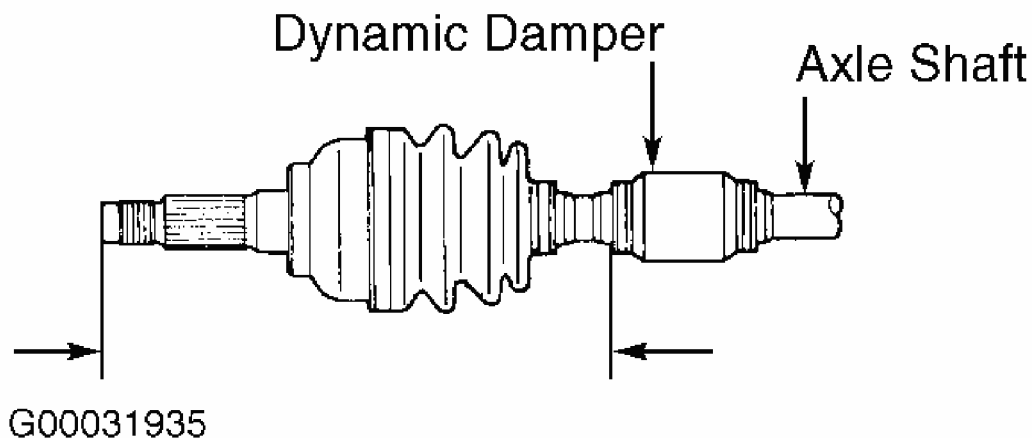


Fig. 4: Positioning Dynamic Damper
 Courtesy of MAZDA MOTORS CORP.

DYNAMIC DAMPER POSITION

Application	In. (mm)
Millenia	11.68-11.97 (296.7-304.0)
Protege	11.50-11.73 (292.0-298.0)
626	10.74-10.97 (272.7-278.7)

FRONT AXLE SHAFT LENGTHS ⁽¹⁾

Application	Right Side - In. (mm)	Left Side - In. (mm)
Millenia		
2.3L	24.13-24.52 (612.8-622.8)	26.28-26.67 (667.5-677.5)
2.5L	24.16-24.56 (613.7-623.7)	26.86-27.25 (682.2-692.2)
MPV		
2.5L	23.39-23.79 (594.2-604.2)	25.36-25.76 (644.2-654.2)
Protege		
1.6L		
A/T	23.93-24.33 (607.9-617.9)	24.67-25.07 (626.7-636.7)

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M/T	23.93-24.33 (607.9-617.9)	25.30-25.69 (642.6-652.6)
2.0L		
A/T	23.80-24.20 (604.6-614.6)	24.72-25.11 (627.9-637.9)
M/T	23.97-24.37 (608.9-618.9)	25.24-25.63 (641.0-651.0)
Tribute ⁽²⁾		
626		
A/T		
(Tripod Type)		
2.0L	23.64-24.03 (600.4-610.4)	27.33-27.73 (694.3-704.3)
2.5L	23.64-24.03 (600.4-610.4)	25.49-26.59 (647.4-675.4)
M/T		
(DOJ Type)		
2.0L & 2.5L	23.71-24.02 (602-610.2)	25.56-25.95 (649.2-659.2)
(1) Measurement is overall length of axle shaft.		
(2) Axle shaft information not available for Tribute		

INTERMEDIATE SHAFT

Removal

Drain fluid from transaxle. Remove right axle shaft assembly. See **FWD AXLE SHAFT** . Carefully remove bearing bracket mounting bolts securing intermediate shaft. Pull intermediate shaft from transaxle without damaging seal in transaxle. See **Fig. 5** , **Fig. 6** or **Fig. 7** . Maintain intermediate shaft in horizontal position when removing.

Disassembly & Reassembly

NOTE: On Tribute, intermediate shaft is only serviced as an assembly.

Remove circlip from intermediate shaft, if equipped. See **Fig. 5** , **Fig. 6** or **Fig. 7** . Remove differential side dust cover, if equipped. Press intermediate shaft from bearing bracket. Remove bracket side dust cover, if equipped. Press intermediate shaft bearing and differential side oil seal from bearing bracket. Remove bracket axle shaft side oil seal. To assemble, reverse disassembly procedure.

Installation

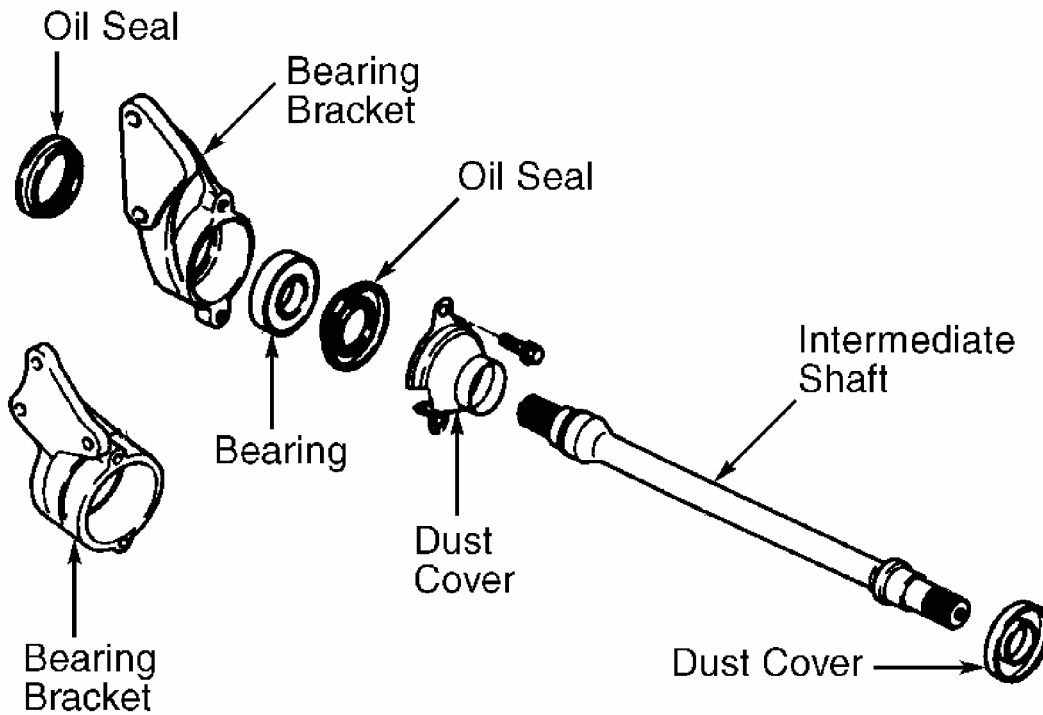
To install, reverse removal procedure. Tighten bearing bracket mounting bolts in sequence and to specification. See **Fig. 8** , **Fig. 9** , or **Fig. 10** . See **TORQUE SPECIFICATIONS** . On Millenia, tighten bearing bracket mounting bolt "A" last. See **Fig. 8** .

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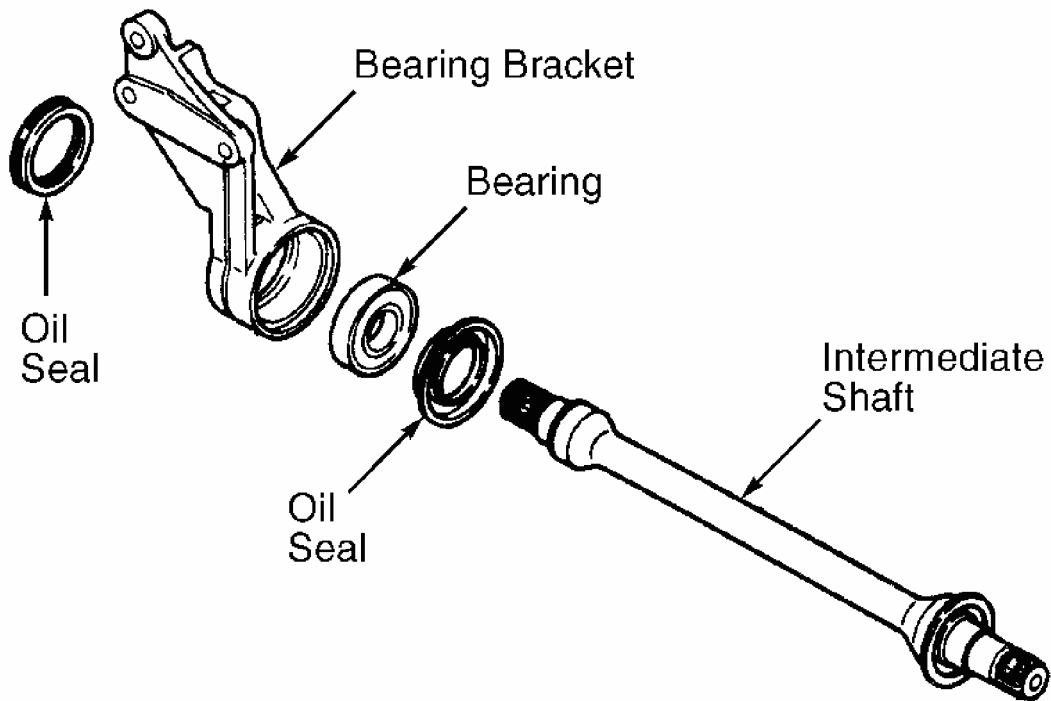
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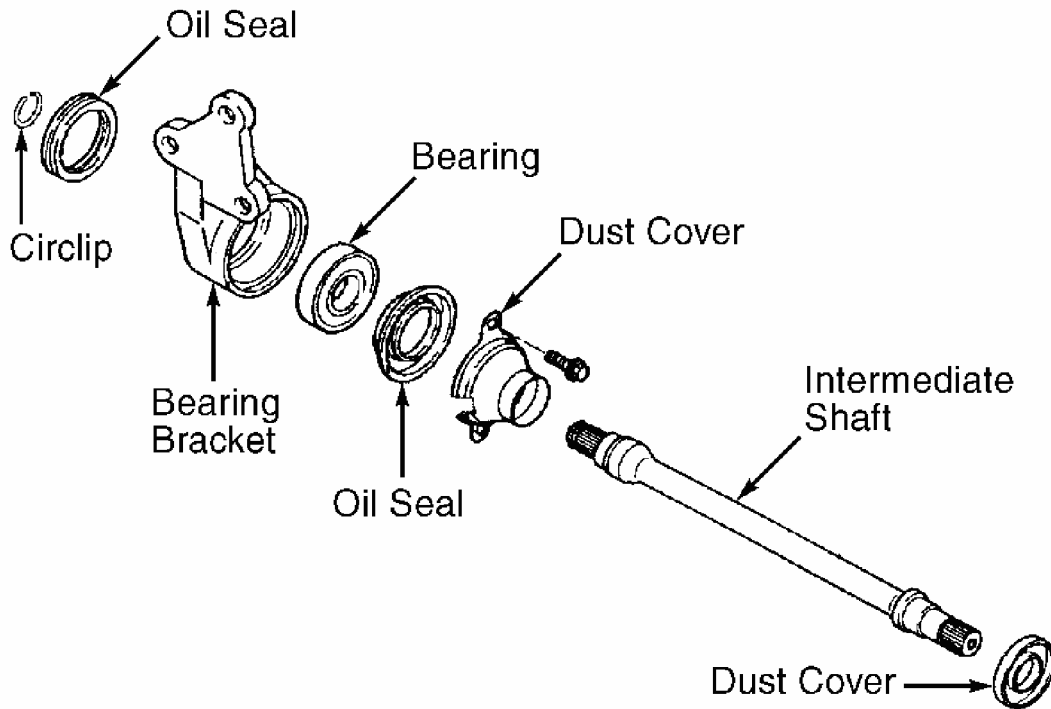
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Fig. 5: Exploded View Of Intermediate Shaft (Millenia)
Courtesy of MAZDA MOTORS CORP.



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Fig. 6: Exploded View Of Intermediate Shaft (Protege)
Courtesy of MAZDA MOTORS CORP.



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Fig. 7: Exploded View Of Intermediate Shaft (626)
Courtesy of MAZDA MOTORS CORP.

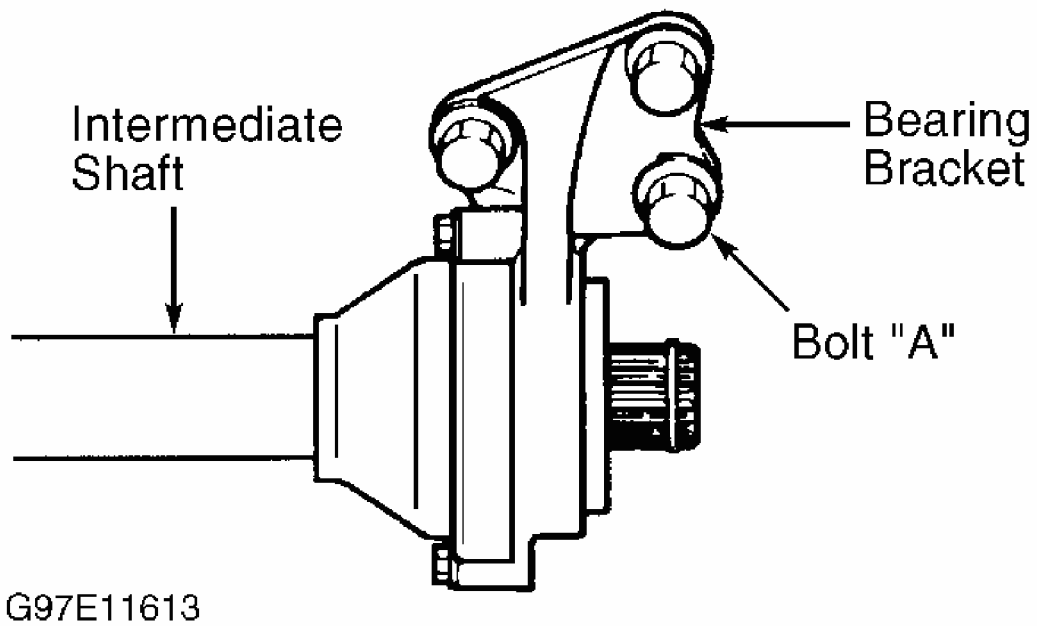


Fig. 8: Bearing Bracket Mounting Bolts Tightening Sequence (Millenia)
Courtesy of MAZDA MOTORS CORP.

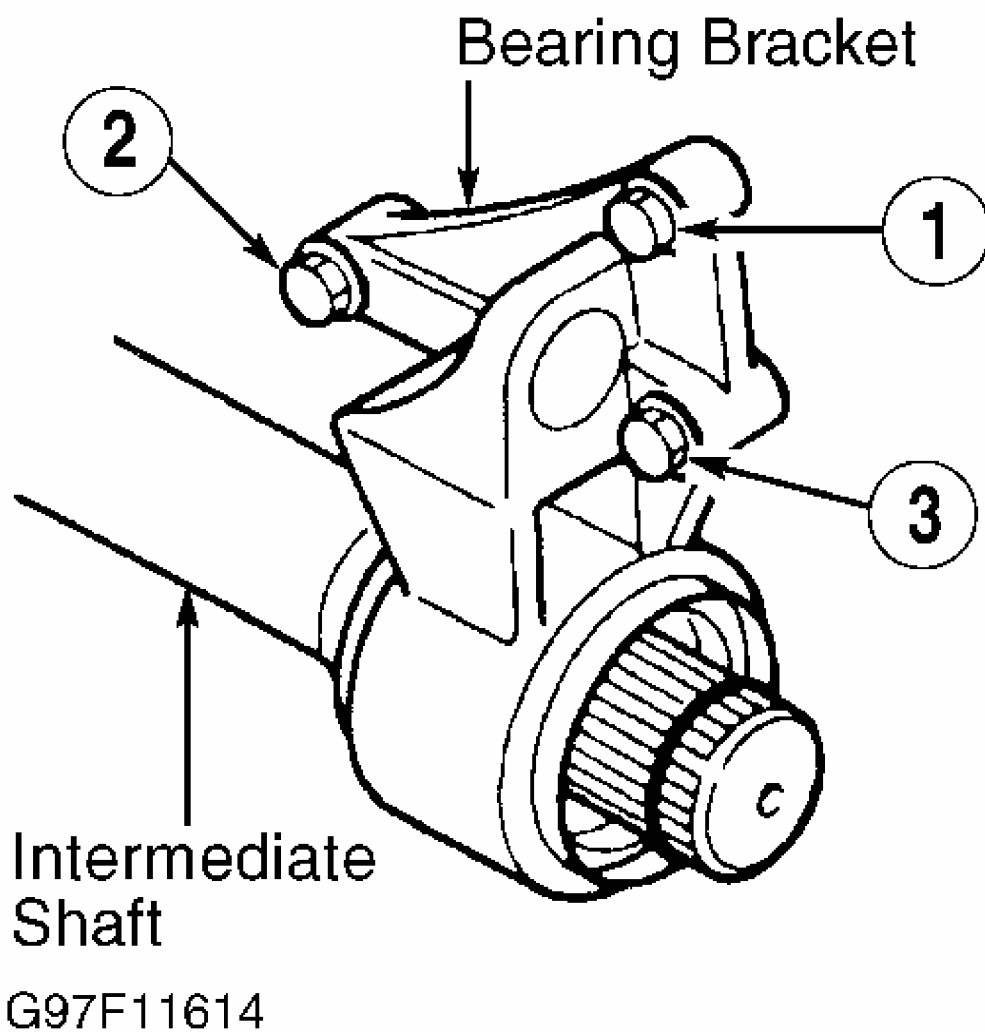


Fig. 9: Bearing Bracket Mounting Bolts Tightening Sequence (Protege)
Courtesy of MAZDA MOTORS CORP.

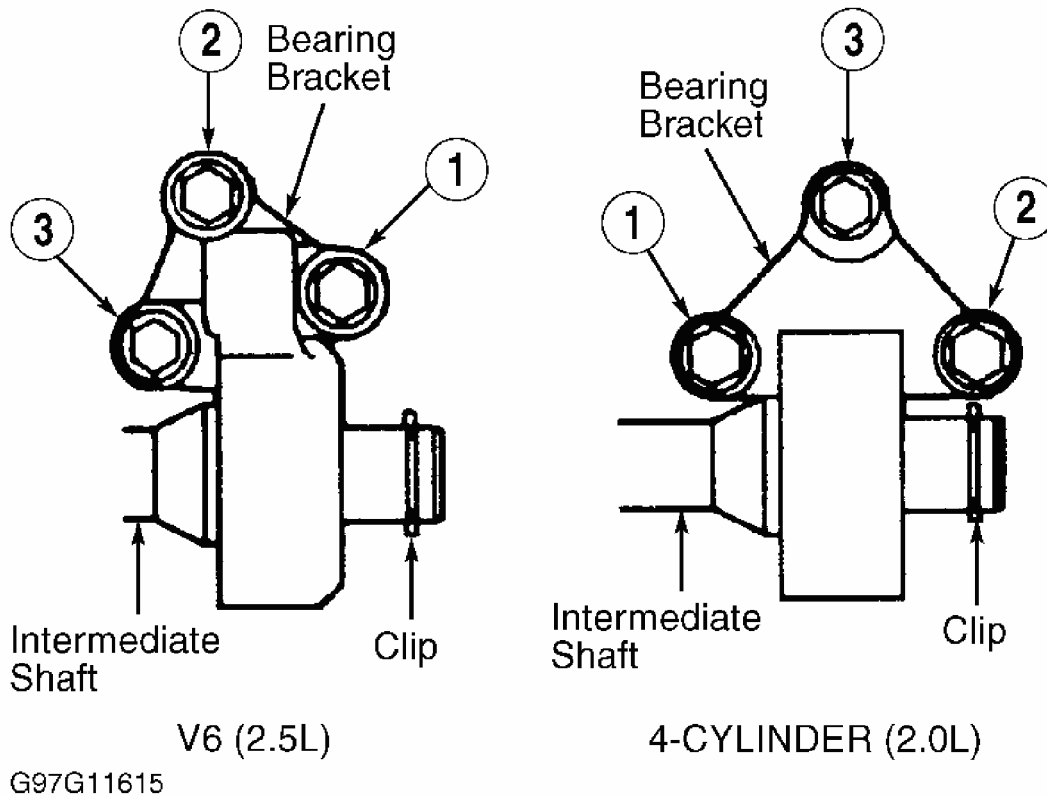


Fig. 10: Bearing Bracket Mounting Bolts Tightening Sequence (626)
 Courtesy of MAZDA MOTORS CORP.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
626	
Axle Shaft Lock Nut	174-235 (236-319)
Intermediate Shaft Bearing Bracket Bolts	32-45 (43-61)
Lower Control Arm Ball Joint-To-Steering Knuckle Nut	86-115 (117-156)
Stabilizer Link Nut	27-39 (37-53)
Tie Rod End Nut	24-32 (32-43)
Wheel Lug Nut	66-86 (89-117)
Millenia	
Axle Shaft Lock Nut	174-235 (236-319)
Intermediate Shaft Bearing Bracket Bolts	32-45 (43-61)
Lower Control Arm-To-Ball Joint Bolt	58-86 (79-117)
Stabilizer Link Nut	27-39 (37-53)

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Tie Rod End Nut	41-59 (55-80)
Upper Lateral Link Ball Joint Nut	41-59 (55-80)
Wheel Lug Nut	66-86 (89-117)
MPV	
Axle Shaft Lock Nut	174-231 (236-314)
Ball Joint-To-Control Arm Bolt	32-43 (43-58)
Engine Undercover Bolts	12-17 (16-23)
Stabilizer Link Nut	32-44 (44-60)
Tie Rod End Nut	24-32 (33-43)
Wheel Lug Nuts	66-86 (89-117)
Protege	
Axle Shaft Lock Nut	174-235 (236-319)
Intermediate Shaft Bearing Bracket Bolts	31-46 (42-62)
Lower Control Arm Ball Joint-To-Steering Knuckle Nut	32-43 (43-58)
Stabilizer Bar Nut	(1)
Tie Rod End Nut	31-42 (42-57)
Wheel Lug Nuts	65-87 (88-118)
Tribute	
Axle Shaft Lock Nut	158 (214)
Ball Joint-To-Control Arm Bolt	52 (70)
Brake Caliper Anchor Plate Bolt	111 (150)
Brake Caliper Bolt	26 (35)
Intermediate Shaft Bearing Bracket Bolts	20 (27)
Tie Rod End Nut	41 (55)
Wheel Lug Nuts	98 (133)
INCH Lbs. (N.m)	
Inner Fender Shield Bolts (All Models)	69-95 (7.8-11)
(1) Tighten stabilizer bolt until distance from top of bolt to top of nut is .67-.75" (17.0-19.0 mm).	