STEERING COLUMN - TILT

1988 Toyota Celica

1988 STEERING
Toyota - Steering Column - Tilt

All Models

DESCRIPTION

Tilt steering wheels incorporate an upper steering shaft, attached by a "U" joint, with an intermediate steering shaft. These shafts are held in place by upper and lower brackets.

Brackets are pinned together so upper bracket can move up or down. Upper bracket is locked in place by pawl attached to lever. Steering columns are collapsible.

Some Cressida and Supra models use a Progressive Power Steering (PPS) system and/or a Toyota Electronically Modulated Suspension (TEMS). The steering sensor for either system is located under the steering column near the break-away bracket.

NOTE: For models without tilt wheel steering columns, see STEERING COLUMN - FIXED article in this section.

REMOVAL & INSTALLATION

STEERING COLUMN

Removal

1) Disconnect battery ground cable. Remove steering wheel. On Cressida, FWD Corolla, MR2 and Tercel models, remove fuse box cover, lower instrument trim panel and air duct from under steering column.

2) On all models, remove upper and lower steering column covers. Remove combination switch. Mark position of "U" joints and shaft for reassembly.

3) On models with "U" joints, remove "U" joint retaining bolt. On models with flexible joint, remove flexible joint retaining bolt.

NOTE: On 2WD Pickup models, remove steering column with intermediate shaft attached.

4) On all models, mark position of joint and pinion shaft for reassembly. Remove intermediate steering shaft.

5) Remove floor pan cover bolts. Remove tilt bracket-to-dashboard mounting bolts. Remove steering column toward inside of vehicle.

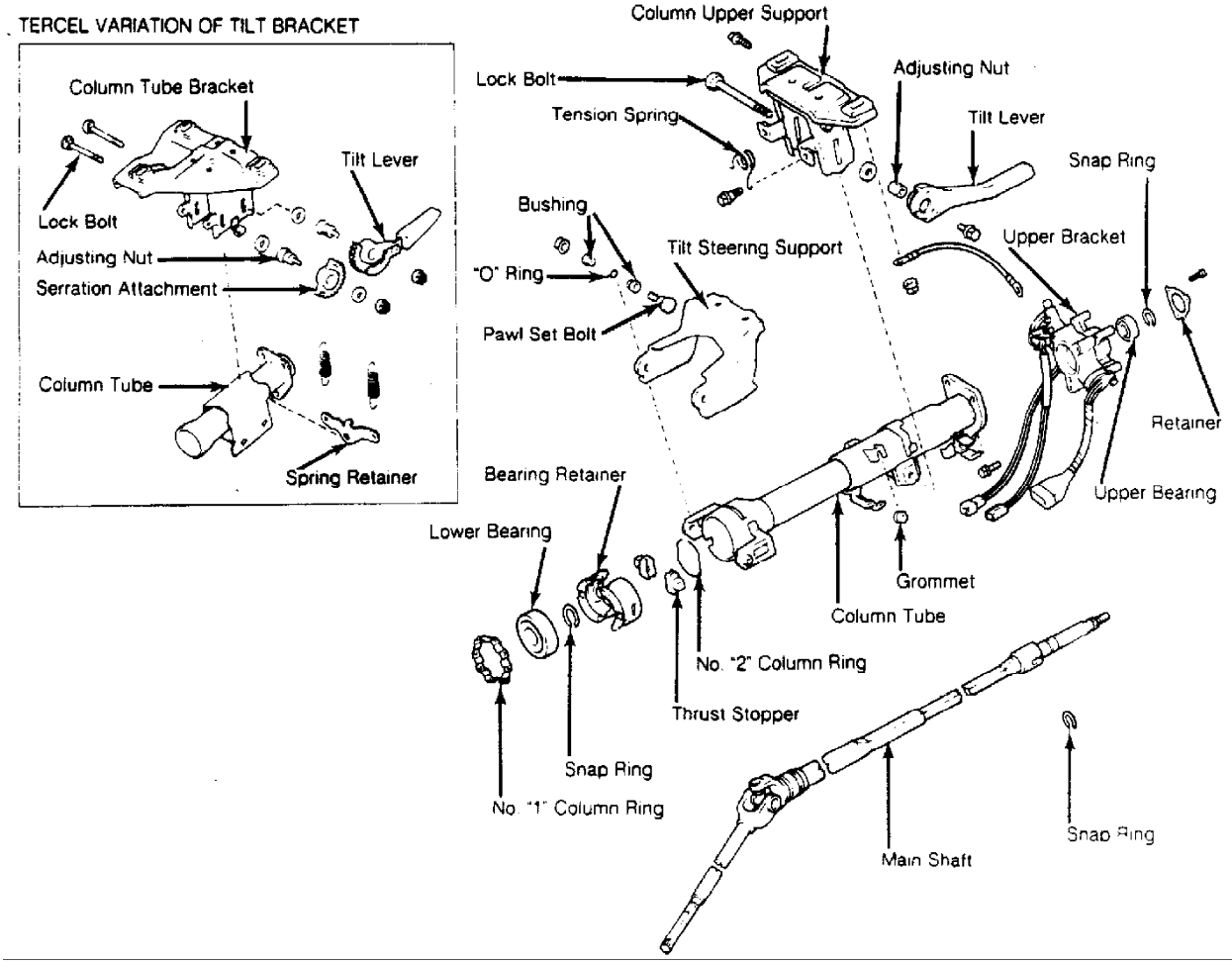

Fig. 1: Exploded View of Camry, Corolla, MR2 & Tercel Steering Column Assembly
Courtesy of Toyota Motor Sales, U.S.A., Inc.

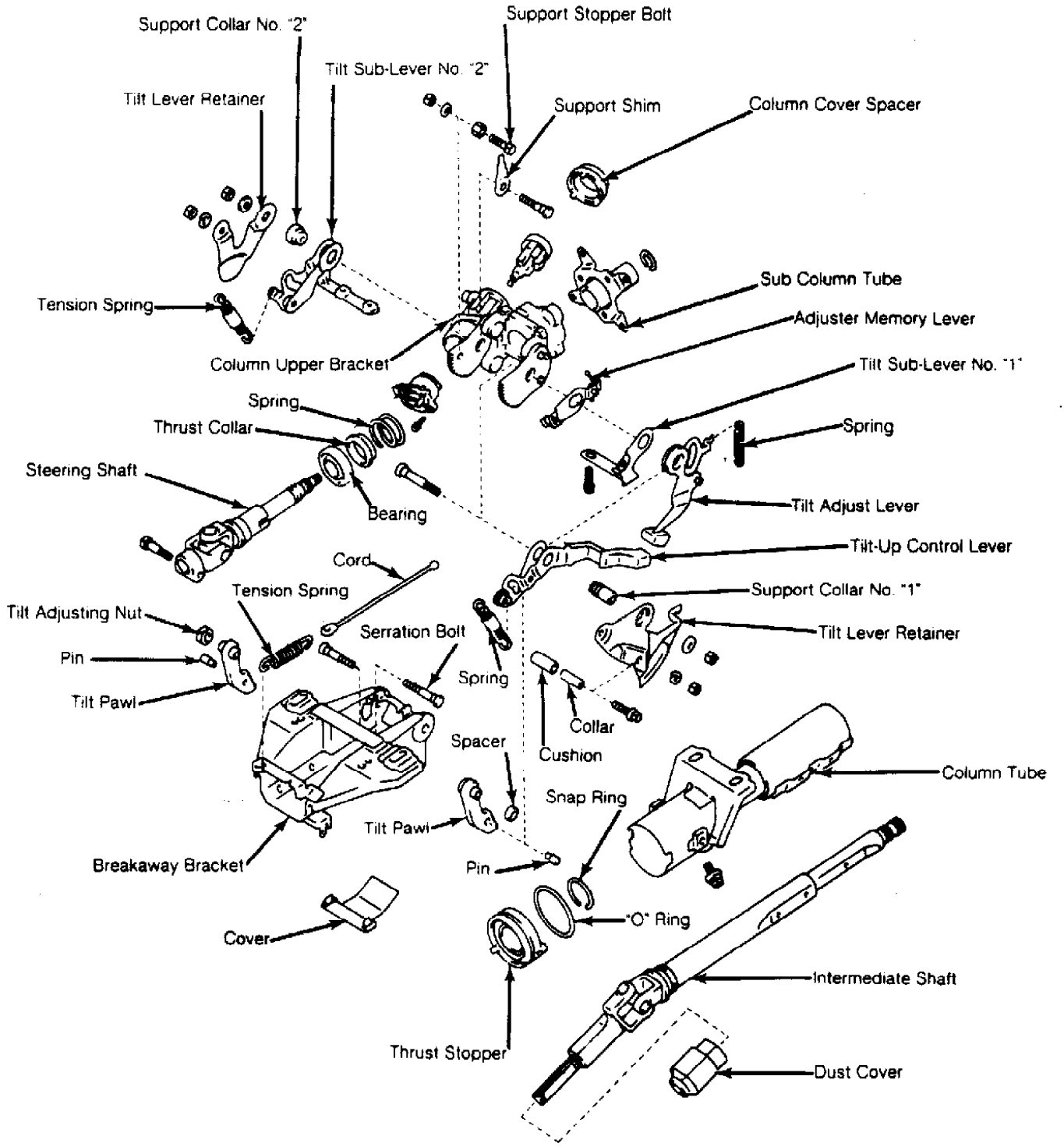

Fig. 2: Exploded View of Celica, Cressida & Supra Steering Column Assembly
Courtesy of Toyota Motor Sales, U.S.A., Inc.

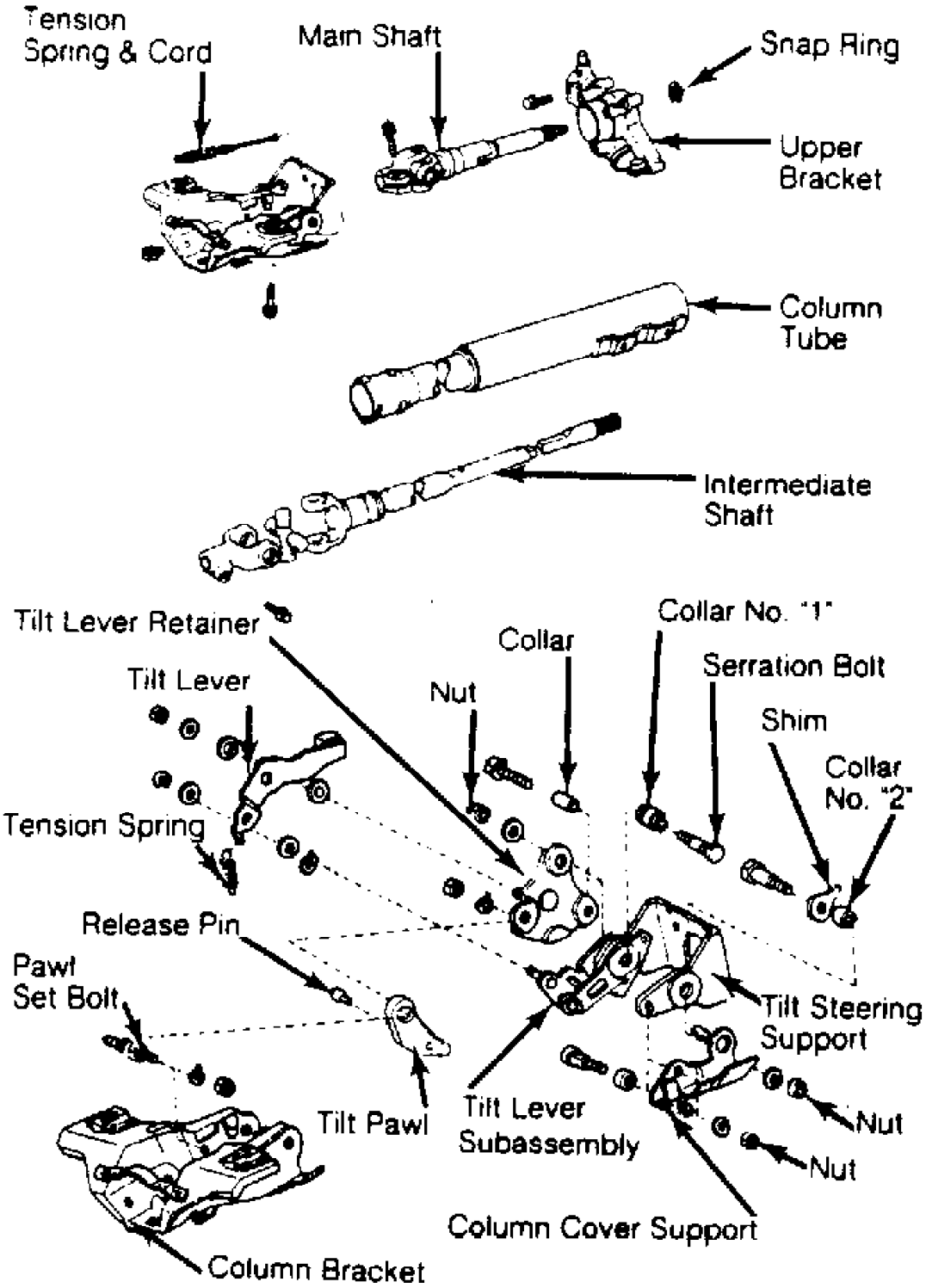

Fig. 3: Exploded View of Land Cruiser, Pickup, Van & 4Runner Steering Column Assembly
Courtesy of Toyota Motor Sales, U.S.A., Inc.

Installation

1) To install steering columns, reverse disassembly procedure. Grease main steering shaft and all bearings.

2) Ensure marks made to flexible couplings and to "U" joints are aligned. Ensure steering column and shafts do not bind after installation.

OVERHAUL

STEERING COLUMN

NOTE: Camry, Corolla, MR2 and Tercel steering columns are similar. Some of the following procedures will not pertain to all models.

Disassembly (Camry, Corolla, MR2 & Tercel)

1) Remove torsion springs, grommets and screws from tilt bracket. Remove tilt lever reverse-thread set bolt. Remove column upper support lock bolt.

2) Remove tilt steering support bolts and pawl set bolts. Place bushings and "O" rings aside and keep them clean. Remove ignition lock cylinder.

3) Using a screwdriver, push 2 thrust stoppers into bearing retainers. Pull out shaft from column. Remove the No. 1 column ring, bearing retainer, thrust stoppers and No. 2 column ring from shaft.

4) Remove snap ring and lower bearing from shaft. Remove bearing inner snap ring. Remove upper bracket retaining bolts and ground strap. Separate upper bracket from column.

Inspection

1) Check that steering lock mechanism operates properly. Check upper bearing for smooth rotation or excessive noise. Replace upper bearing (if necessary).

2) Using Drift (09631-00020) and Adapter (09627-30010), drive bearing from upper bracket. Pack new bearing with grease. Using the same drift and adapter used in removal, drive new bearing into upper bracket.

3) Inspect lower bearing for smooth rotation or excessive noise. If lower bearing shows signs of wear or damage, replace with a new one.

Reassembly

1) Install upper bracket onto column. Install ground strap. Tighten retaining bolts to 14 ft. lbs. (19 N.m). Install inner snap ring on shaft groove nearest to center of shaft.

2) Install lower bearing and lower bearing snap ring. Place No. 2 column ring into position next to bearing on side nearest center of shaft. See Fig. 4.

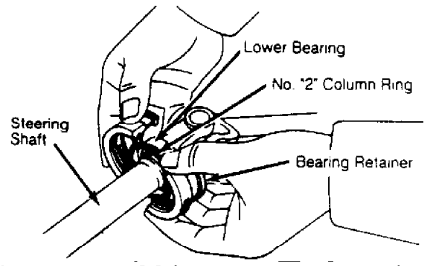

Fig. 4: Installing Lower Bearing Assembly
Courtesy of Toyota Motor Sales, U.S.A., Inc.

3) With thrust stoppers installed in the bearing retainers,

place bearing retainers over lower bearing. Install No. 1 column ring over the 2 bearing retainer grooves to secure bearing retainers.

4) Insert shaft into column. Align thrust stoppers with notches at bottom of column. Holding thrust stoppers in with a screwdriver, insert shaft into column until snap ring nearest center of shaft bottoms.

5) Turn bearing retainers to seat thrust stoppers in column slots (if necessary). Install snap ring on shaft at upper bracket end of shaft. Replace ignition lock cylinder. Insert key and turn to "ACC" position. Insert cylinder into upper bracket.

6) Install tilt steering support. See Fig. 5. Apply lithium grease to bushings and "O" rings. Install bushings to column. Install tilt steering support and pawl set bolts with bushings and "O" rings in place. Tighten nuts to 108 INCH lbs. (13 N.m).

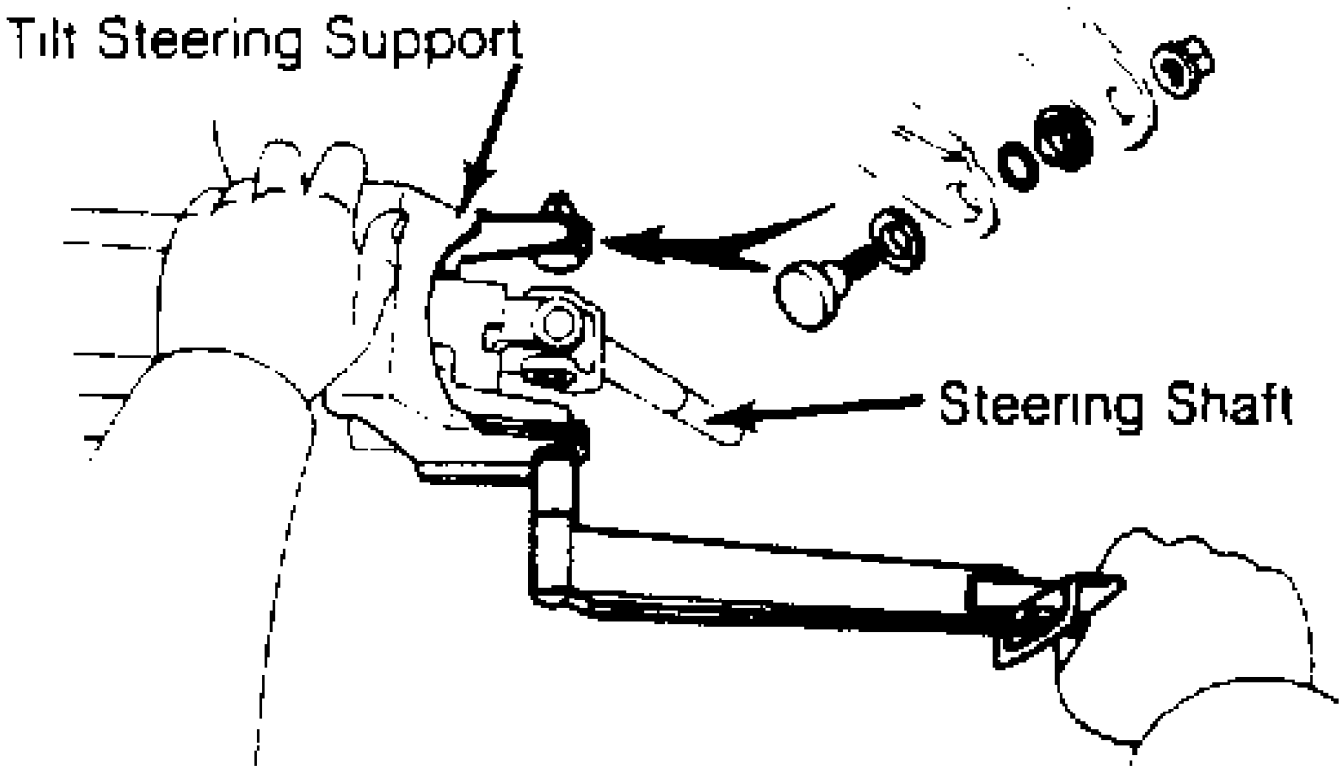

Fig. 5: Installing Tilt Steering Support
Courtesy of Toyota Motor Sales, U.S.A., Inc.

7) Lubricate and install tilt lever lock bolt, washer and adjusting nut. See Fig. 6. Hand tighten adjusting nut. Adjust upper column support so that lock bolt is in center of oval and that support bracket is parallel with column, as seen from the side of upper column support.

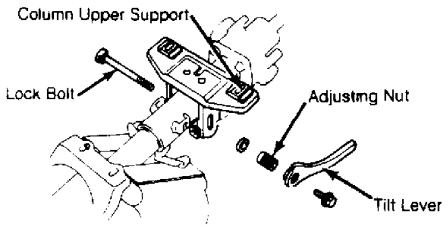

Fig. 6: Installing Upper Column Support
Courtesy of Toyota Motor Sales, U.S.A., Inc.

8) Tighten adjusting nut to 96 INCH lbs. (11 N.m). Install tilt lever. Tighten reverse thread set bolt to 25 ft. lbs. (33 N.m). Install 2 screws with washers to tilt bracket. Install torsion springs and grommets.

NOTE: The Celica, Cressida and Supra steering columns are similar. Some of the following procedures will not pertain to all models.

Disassembly (Celica, Cressida & Supra)

1) On Cressida and Supra, remove steering sensor cover and sensor. Keep sensor clean. On all models, remove column cover. Remove combination switch.

2) Move tilt steering column to full up position. Remove mainshaft retaining bolt. Remove 4 column bracket retaining bolts. Pull column with intermediate shaft from column bracket.

3) On Cressida, push 2 thrust stoppers into bearing retainers. Pull out intermediate shaft from column. Remove No. 1 column ring, bearing retainer, thrust stoppers and No. 2 column ring from shaft.

4) Remove snap ring, lower bearing and next snap ring from shaft. Remove dust seal from column. With tilt bracket tilted up fully, remove springs and cords from tilt bracket with a screwdriver.

5) Using Steering Shaft Retainer (09950-20016), tighten steering mainshaft against the upper bracket. Take care not to overtighten the steering shaft retainer. Remove snap ring. Remove steering mainshaft.

6) On Celica, remove 2 thrust stopper set bolts. Remove intermediate shaft. Remove 4 tilt bracket retainer bolts. Remove column from tilt bracket.

7) With tilt bracket tilted up fully, remove springs and cords from tilt bracket with a screwdriver. Remove snap ring. Remove mainshaft. Remove spring and collar from mainshaft.

8) On Supra, with tilt bracket tilted up fully, remove springs and cords from tilt bracket with a screwdriver. Remove 4 tilt mechanism bolts. Separate tilt mechanism from column.

9) Remove tilt bracket support reinforcement from tilt steering support. Remove 3 bracket-to-support attaching bolts. Remove snap ring. Remove mainshaft from upper bracket.

10) On all models, remove 2 tilt lever springs from side of column. Remove all bracket attaching nuts and bolts. Remove tilt lever retainer. Remove release pin from pawl.

11) Temporarily install nut on serrated bolt to protect threads. Using a light soft mallet, drive out serrated bolt. Remove nut from serrated bolt. Remove column cover support. Remove tilt bracket nut and bolt.

12) Separate tilt bracket and upper bracket. Place parts in order of removal: 2 bushings, tilt control lever, shim, tilt adjust lever, memory cover and memory lever.

13) Remove pawl set bolt. Remove ignition key/lock cylinder by pushing lock pin in and removing cylinder (if necessary). Using Drift (09631-00020), Adapter (09627-30010) and Sleeve (09636-20010), drive bearing from upper bracket.

14) Pack new bearing with grease. Using Bearing Collar (09527-20011) and a press, drive lower bearing from shaft.

15) Place intermediate shaft in a soft-jawed vise. Remove sensor ring from intermediate shaft. Remove bearing snap ring. Tap bearing from shaft.

Inspection

1) Check that steering lock mechanism operates properly. Check upper bearing for smooth rotation or excessive noise. Replace

upper bearing (if necessary).

2) Inspect lower bearing for smooth rotation or excessive noise. If damaged, replace bearing. Check PPS sensor ring and intermediate shaft bearing for wear or damage.

Reassembly

1) Pack new bearing with grease. Place bearing over intermediate shaft. Place intermediate shaft in a soft-jawed vise with bearing at "U" joint end of shaft.

2) Using Sleeve (09612-22011) and Bearing Plates (09237-00010) and vise, drive new bearing onto shaft. Using a plastic hammer, tap the shaft toward the vise to drive bearing onto the larger section of the shaft. Install snap ring.

3) Using a press and Collar (09515-21010), press a NEW PPS sensor ring onto shaft with lettering facing away from "U" joint.

4) Using the same drift and adapter used in removal, place upper bracket on block of wood and drive new bearing into upper bracket. Coat all moving, rubbing or sliding parts with grease.

5) Use new "O" rings where needed. Install adjuster memory cover to upper bracket. Install pawl set bolt. Tighten pawl set bolt or nut (if equipped) to 14 ft. lbs. (19 N.m). See Fig. 2.

6) Install tilt lever and tilt control lever over the mounting pin. Use a bushing that will eliminate all play between tilt adjust lever, tilt control lever and the mounting pin.

7) Bushings are available in sizes between .7087-.7100" (18.001-18.034 mm) in .0002" (.005 mm) increments. Install tilt steering pawl over pawl pivot pin. Aligning holes, install release pin.

8) Install tilt lever retainer. Install retainer attaching nut and bolt. Tighten to 14 ft. lbs. (19 N.m). Using a drift and hammer, drive serrated bolt into tilt bracket. Check that bolt collar is firmly installed into pivot of control lever inside plate.

9) Install nut onto serrated bolt. Tighten to 14 ft. lbs. (19 N.m). Select bushing for opposite side of tilt bracket that will eliminate all play. Bushings are available in sizes between .7089-.7100" (18.006-18.034 mm) in .0005" (.013 mm) increments.

10) Select a shim or shims that will fit snugly between pivot points of upper bracket. Shims are available in sizes between .0067-.0728" (.17-1.85 mm) in increments of .011" (.28 mm).

11) Install selected bushing and shim(s) into upper bracket pivot. Install bolt with a new nut. Tighten to 14 ft. lbs. (19 N.m). Install column cover support. Install stopper bolt and a new nut. Tighten to 96 INCH lbs. (11 N.m).

12) Install 2 springs to side of tilt bracket. Install collar and spring over mainshaft. Turn ignition to "ACC" position. Insert mainshaft assembly into upper bracket.

13) Using Steering Shaft Retainer (09950-20016), tighten steering mainshaft against the upper bracket. Take care not to overtighten steering shaft retainer. Install snap ring. Remove steering shaft retainer.

14) Connect tilt bracket springs to cords. Install spring/cord assemblies into top of tilt bracket. Install dust seal to column. Install column tube to breakaway bracket. Tighten bolts to 14 ft. lbs. (19 N.m).

15) With thrust stoppers installed in bearing retainers, place bearing retainers over lower bearing. Install No. 1 column ring over the 2 bearing retainer grooves to secure bearing retainers.

16) Insert shaft into column. Align thrust stoppers with notches at bottom of column. Holding thrust stoppers in with a screwdriver, insert intermediate shaft into column until snap ring nearest center of shaft bottoms.

17) Turn bearing retainers to seat thrust stoppers in column slots (if necessary). Connect main shaft-to-intermediate shaft "U"

joint. Tighten attaching bolt to 19 ft. lbs. (26 N.m).

18) On Cressida and Supra, install steering sensor to bottom of column. Check that sensor does not touch sensor ring by turning steering shaft and listening for rubbing sound. Install sensor cover.

19) On all models, check that tilt mechanism locks in all 8 positions. With mainshaft in neutral position, pull the tilt lever and check that the mainshaft rises to the uppermost position.

20) Check for smooth operation of all shafts and "U" joints. Install combination switch, steering wheel, column covers and horn pad.

Disassembly (Land Cruiser, Pickup, Van & 4Runner)

1) Remove ignition key cylinder. Mark intermediate shaft and "U" joints for reassembly reference. Remove "U" joint retaining bolts. Disconnect intermediate shaft from mainshaft.

2) Remove upper tension springs and cords. Remove bracket from column. Press in ignition cylinder retaining pin. Pull out ignition cylinder. Remove upper bracket retaining bolts. Remove upper bracket.

3) Remove mainshaft retaining snap ring. Remove mainshaft from upper bracket. Remove tilt lever side tension springs, "E" clip, bushings, nut and washer.

4) Remove tilt lever retaining bolt, nuts and washers. Remove tilt lever retainer and bushing. Remove tilt lever. Remove release pin. Remove serrated bolt.

5) Remove tilt pawl. Remove column cover support nuts, bolts, bushings, washers and shims. Remove column cover support. Remove tilt steering support with tilt lever subassembly. Remove pawl set bolt.

Inspection

1) Inspect all components for wear or damage. Check bearings for smooth operation. Check steering shafts for collision damage. Check steering lock mechanism for proper operation. Inspect "U" joints for excessive play. Replace components as necessary.

2) If replacing pin and bearing blocks, make sure new bearing blocks have the small anti-rattle rubber inserts installed before assembling intermediate shaft to main steering shaft.

Reassembly

1) Lubricate all moving parts with multipurpose grease before reassembly. Install pawl set bolt. Tighten pawl set bolt to 13 ft. lbs. (18 N.m).

2) Assemble tilt lever assembly. Select a bushing to eliminate all play. Bushings are available in sizes between .7086-.7100" (17.998-18.034 mm) in increments of .0003" (.008 mm).

3) Install tilt pawl. Install tilt steering support-to-column bracket. Using a drift and hammer, drive in serrated bolt. Install shim and bolt to tilt pawl. Select a shim to eliminate all play.

4) Shims are available in thicknesses between .0078-.0711" (.198-1.806 mm) in increments of .00117" (.030 mm). Install column cover support. Install release pin to tilt pawl.

5) Install tilt lever retainer attaching bolt, nuts and washers. Tighten bolt and nuts to 13 ft. lbs. (18 N.m). Install tilt lever. Install tilt lever tension spring, "E" clip, bushings, nut and washer.

6) Install mainshaft to upper bracket. Install snap ring. Install ignition switch. Install upper bracket to column bracket.

7) Apply a thread locking compound and tighten upper bracket-to-column bracket bolts to 65 INCH lbs. (7.4 N.m). Install steering column to column bracket. Tighten bolts to 14 ft. lbs. (19 N.m).

8) Aligning marks made during disassembly, connect intermediate shaft. Tighten to 19 ft. lbs. (25 N.m). Install tension springs and cords.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Column Bracket-to-Instrument Panel Bolts	19 (26)
Column Bracket-to-Instrument Panel Nuts	21 (28)
Flexible Coupling Bolts	15-22 (20-30)
Floorboard Bracket Bolts Van	14 (19)
Steering Column-to-Column Bracket Bolt	14 (19)
Steering Column-to-Tilt Bracket Bolt	13 (18)
Steering Wheel Nut	25 (34)
"U" Joint Bolts	22-33 (30-45)
	INCH Lbs. (N.m)
Column Bracket-to-Upper Bracket Bolt	65 (7.4)
Floorboard Bracket Bolts Land Cruiser	108 (13)
Floorboard Bracket Bolts Pickup & 4Runner	69 (7.8)