STEERING COLUMN - TILT

1996 Toyota Supra

1995-96 STEERING
Steering Columns - Tilt Wheel - Cars

Supra

DESCRIPTION & OPERATION

Tilt steering columns incorporate a mainshaft, attached by a "U" joint to an intermediate steering shaft. These shafts are held in place by upper and lower column tubes. Tubes are pinned together so upper tube can move up or down. Upper tube is locked in place by pawl attached to lever. Steering columns are collapsible.

WARNING: To avoid injury from accidental air bag deployment, read and carefully follow all SERVICE PRECAUTIONS. Deactivate air bag system before performing any repairs. See DISABLING & ACTIVATING AIR BAG SYSTEM.

SERVICE PRECAUTIONS

Observe the following precautions when servicing SRS:

* Disable SRS before servicing any SRS or steering column component. Failure to do this could result in accidental air bag deployment and possible personal injury. Refer to DISABLING & ACTIVATING AIR BAG SYSTEM.

* Remove air bag sensor assembly/center air bag sensor and front air bag sensors if repairing the vehicle requires impacting (shocking) the vehicle.

* Replace dropped, cracked, dented or otherwise damaged components.

* DO NOT expose front air bag sensors, air bag sensor assembly/center air bag sensor or steering wheel pad (air bag module) directly to heat or flame.

* Information labels are attached to air bag components. Follow all notices on labels.

* After work on SRS is completed, check air bag warning light to ensure system is functioning properly. Refer to AIR BAG RESTRAINT SYSTEM - 1995 or AIR BAG RESTRAINT SYSTEM - 1996 article.

* Always wear safety glasses when servicing or handling an air bag.

* When placing a live air bag on a bench or other surface, always face air bag and trim cover upward, away from surface. This will reduce motion of module if it is accidentally deployed.

* Carry a live air bag module with trim cover (air bag) pointed away from your body to minimize injury in case of accidental deployment.

* If SRS is not fully functional for any reason, vehicle should not be driven until system is repaired and becomes

operational. DO NOT remove bulbs, modules, sensors or other components or in any way disable system from operating normally. If SRS is not functional, park vehicle until it is repaired and functions properly.

DISABLING & ACTIVATING AIR BAG SYSTEM

WARNING: Back-up power supply maintains SRS voltage for about 90 seconds after battery is disconnected. After disabling SRS, wait at least 90 seconds before servicing SRS to prevent accidental air bag deployment and possible personal injury.

Disabling System

Turn ignition switch to LOCK position. Disconnect and shield negative battery cable. Wait at least 90 seconds before working on system. Remove steering wheel pad (air bag module). See STEERING WHEEL & AIR BAG under REMOVAL & INSTALLATION.

Activating System

Install steering wheel pad. Reconnect negative battery cable. Perform system operation check. See appropriate article:

* AIR BAG RESTRAINT SYSTEM - 1995.
* AIR BAG RESTRAINT SYSTEM - 1996.

ADJUSTMENTS

SPIRAL CABLE

Spiral cable MUST be correctly adjusted to ensure proper air bag operation. Ensure front wheels are in straight-ahead position. Turn spiral cable (located on combination switch) counterclockwise by hand until it becomes difficult to turn. Turn spiral cable clockwise about 2 1/2-3 turns and ensure marks align and are visible through inspection hole. See Fig. 1.

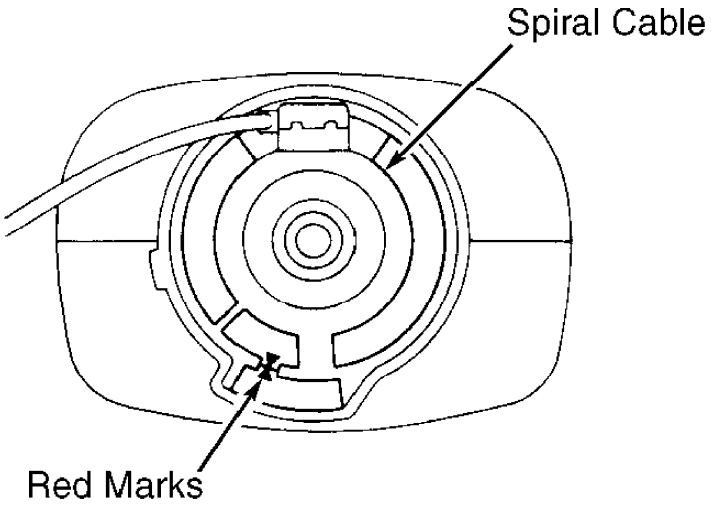

Fig. 1: Adjusting Air Bag Spiral Cable (Typical)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

REMOVAL & INSTALLATION

STEERING WHEEL & AIR BAG

NOTE: See DISABLING & ACTIVATING AIR BAG SYSTEM.

Removal (All Models)

1) Ensure front wheels are in straight-ahead position. Turn ignition off. Disconnect and shield negative battery cable.

2) Remove screw covers, screws and lower instrument cluster trim panel(s). Loosen steering wheel pad Torx screws until groove along screw circumference catches on screw case. See Fig. 2.

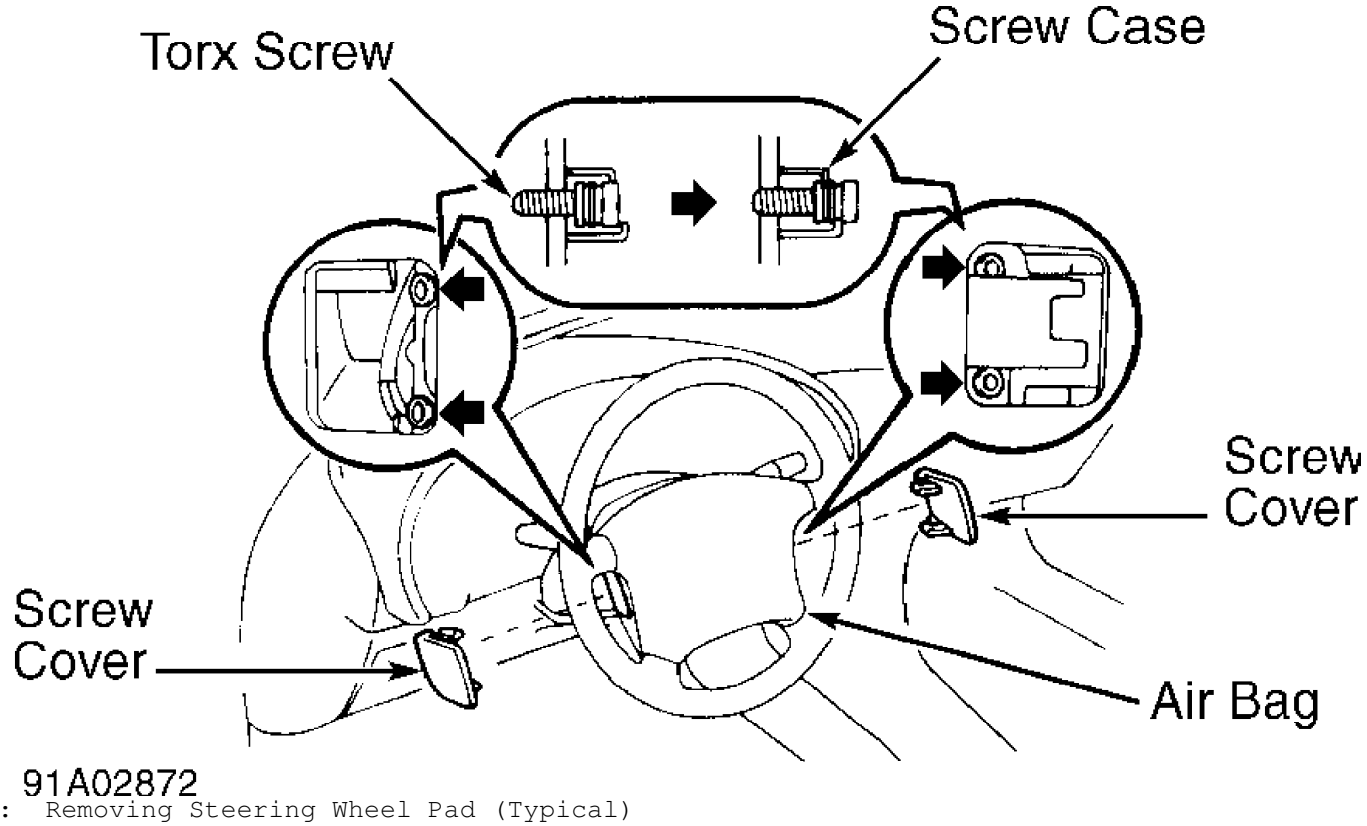

Fig. 2: Removing Steering Wheel Pad (Typical)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

3) Pull steering wheel pad from steering wheel and disconnect air bag. Remove steering wheel pad assembly. Place steering wheel pad assembly on a flat surface with pad cover facing upward.

WARNING: Place steering wheel pad assembly on workbench. Pad surface MUST face up. If assembly is stored face down, accidental air bag deployment could propel assembly and cause serious bodily injury.

4) Place a mark on steering wheel and mainshaft for installation reference. Remove steering wheel nut. Using steering wheel puller, remove steering wheel.

Installation

1) To install, reverse removal procedure. Before installing steering wheel, ensure spiral cable is properly aligned. See SPIRAL CABLE under ADJUSTMENTS. Tighten steering wheel nut and Torx screws to specification. See TORQUE SPECIFICATIONS.

2) After steering wheel and steering wheel pad are installed, ensure proper operation of air bag system by turning ignition switch to ACC or ON position. AIR BAG warning light should illuminate, then turn off after about 6 seconds.

3) If AIR BAG warning light remains illuminated for more than 6 seconds, air bag system is malfunctioning and needs repair. If AIR BAG warning light illuminates with ignition off, a short circuit may be present in AIR BAG warning light circuit.

COMBINATION SWITCH

Removal & Installation

1) Remove steering wheel. See STEERING WHEEL & AIR BAG. Remove instrument panel lower finish panel. Remove upper and lower steering column covers. Locate and disconnect combination switch and spiral cable electrical connector(s).

2) On models equipped with cruise control switches on steering wheel, disconnect cruise control electrical connector(s) from slip ring. Remove slip ring from combination switch.

3) On all models, remove wire ties securing combination switch wiring harness to column. Remove screws securing combination switch and spiral cable to steering column. Remove combination switch with spiral cable. To install, reverse removal procedure. Tighten steering wheel nut to specification. See TORQUE SPECIFICATIONS.

IGNITION SWITCH & LOCK CYLINDER

Removal

1) Remove steering wheel and combination switch (if necessary). See STEERING WHEEL & AIR BAG and COMBINATION SWITCH. Disconnect ignition switch harness connectors. If shear bolt studs are accessible, use a hacksaw to cut slots into exposed studs.

2) Remove studs using a screwdriver. If shear bolt studs are recessed or hard to reach with hacksaw, use a center punch on studs. Using a drill bit and screw extractor, remove studs. Place key in ACC position and remove ignition switch and lock cylinder.

Installation

To install, reverse removal procedure. Install NEW shear bolts. Tighten shear bolts finger tight. Ensure proper operation of ignition switch and lock cylinder. Tighten shear bolts until heads break off. Install combination switch, upper and lower steering column covers and steering wheel (if removed). Tighten steering wheel nut and Torx screws to specification. See TORQUE SPECIFICATIONS.

STEERING COLUMN

Removal & Installation

1) Disconnect and shield negative battery cable. Wait at least 90 seconds before starting work to prevent air bag deployment. Remove steering wheel pad. Mark steering shaft and steering wheel for installation reference. Remove steering wheel.

2) Remove upper and lower column covers. Remove combination switch and spiral cable (if equipped). Remove all necessary instrument finish panels. Remove air duct from under steering column. Mark "U" joint, steering gear shaft, intermediate shaft and mainshaft for installation reference. Remove bolt(s) and disconnect "U" joint from steering gear shaft. Disconnect intermediate shaft from mainshaft.

3) Disconnect steering column harness connectors. Remove steering column bolts and steering column. To install, reverse removal procedure. Tighten bolts and nuts to specification. See TORQUE SPECIFICATIONS.

OVERHAUL

STEERING COLUMN

NOTE: On Supra, to reduce steering wheel vibration at high speeds, manufacturer has designed a steering damper, which is attached to the turn signal bracket.

Disassembly

1) Remove ignition key illumination assembly. Remove sliding yoke bolt. Turn thrust stopper (if equipped) and place mating marks on sliding yoke and mainshaft. Remove yoke and thrust stopper. Remove lower column cover. See Fig. 6.

2) Drill out shear bolt studs. Using a screw extractor, remove column bracket bolts. Remove bracket and column upper clamp. Remove wiring harness clamp and column protector. Remove compression spring and bushings. Remove 3 tension springs. Remove steering damper (if equipped) and turn signal bracket.

3) Remove right tilt lever retainer. Remove left tilt lever retainer bolts, nuts, "E" ring and spacer. Remove tilt lever retainer and collar. Remove right tilt pawl, stopper and tilt lever. Remove left pawl, stopper, sub-lever, lever assembly and lock shaft. Using hex wrench, remove memory bolt and nut (if equipped).

4) Install nut (10 mm x 1.25 mm), washer (36-mm outside diameter), and bolt (10 mm x 1.25 mm x 50 mm) to upper column tube tilt steering bolt. Using a slide hammer, remove steering column tube tilt bolts. Remove upper column tube from lower column tube. See Fig. 3. Remove collar and bushing stopper from mainshaft (if equipped).

5) Using a press, compress spring on mainshaft. Remove snap ring. Remove mainshaft from column tube. Remove spring, thrust collar and bearing.

Inspection

Ensure lock mechanism operates properly. Check mainshaft upper bearing for rotating smoothness. Check steering shafts for bending, damaged splines or damaged "U" joints. Check column tube for bending or other damage. Repair or replace components as necessary.

Reassembly

1) To reassemble, reverse disassembly procedure. Apply molybdenum disulfide lithium base grease to tilt lever assembly, lock bolt, mainshaft and steering bolt pivot points. Install steering column tube tilt bolts.

2) If upper column tube mark is "1", install hollow tipped thread bolt. If upper column tube mark is "2", install plain thread bolt. See Fig. 4. With tilt pawl and ratchet engaged, install 2 pawl stoppers. Ensure alignment marks on tilt pawl and stopper align when stopper is rotated to pawl side. See Fig. 5. If alignment marks do not align, select a different size pawl stopper. See TILT PAWL STOPPER SELECTION table.

TILT PAWL STOPPER SELECTION TABLE

Mark Tilt Lever Side	Mark Tilt Sub Lever Side	In. (mm)
1	A	.499-.502 (12.68-12.74)
2	B	.497-.499 (12.61-12.67)
3	C	.494-.496 (12.54-12.60)
4	D	.491-.493 (12.47-12.53)
5	E	.488-.491 (12.40-12.46)

6	.....	F	.....	.485-.488 (12.33-12.39)
7	.....	G	.....	.483-.485 (12.26-12.32)

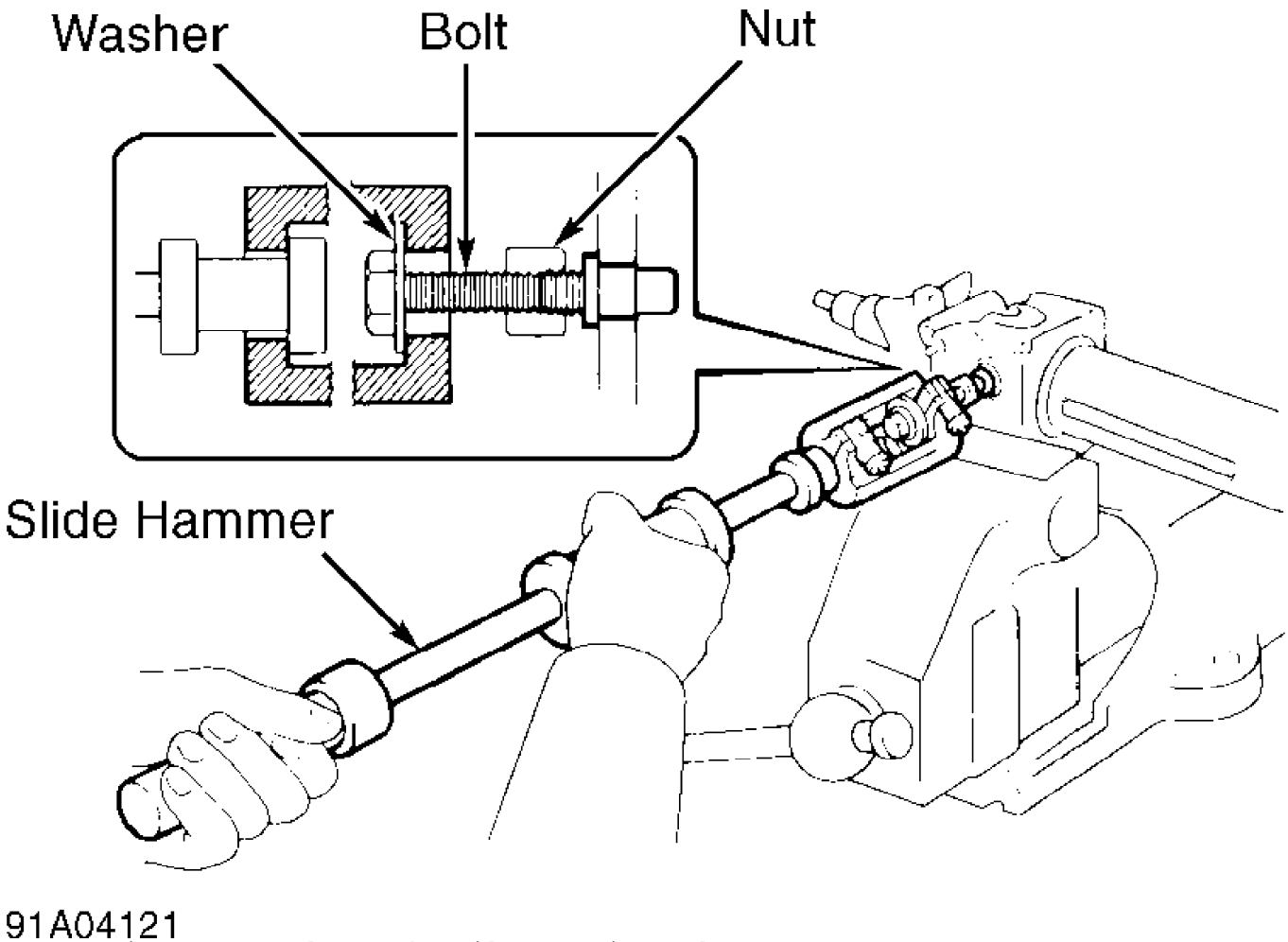

Fig. 3: Removing Upper Column Tube Tilt Steering Bolts
Courtesy of Toyota Motor Sales, U.S.A., Inc.

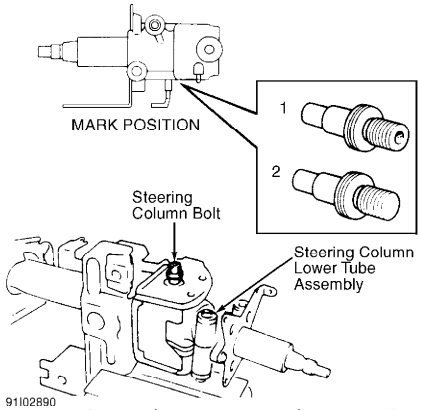

Fig. 4: Selecting Steering Bolt
Courtesy of Toyota Motor Sales, U.S.A., Inc.

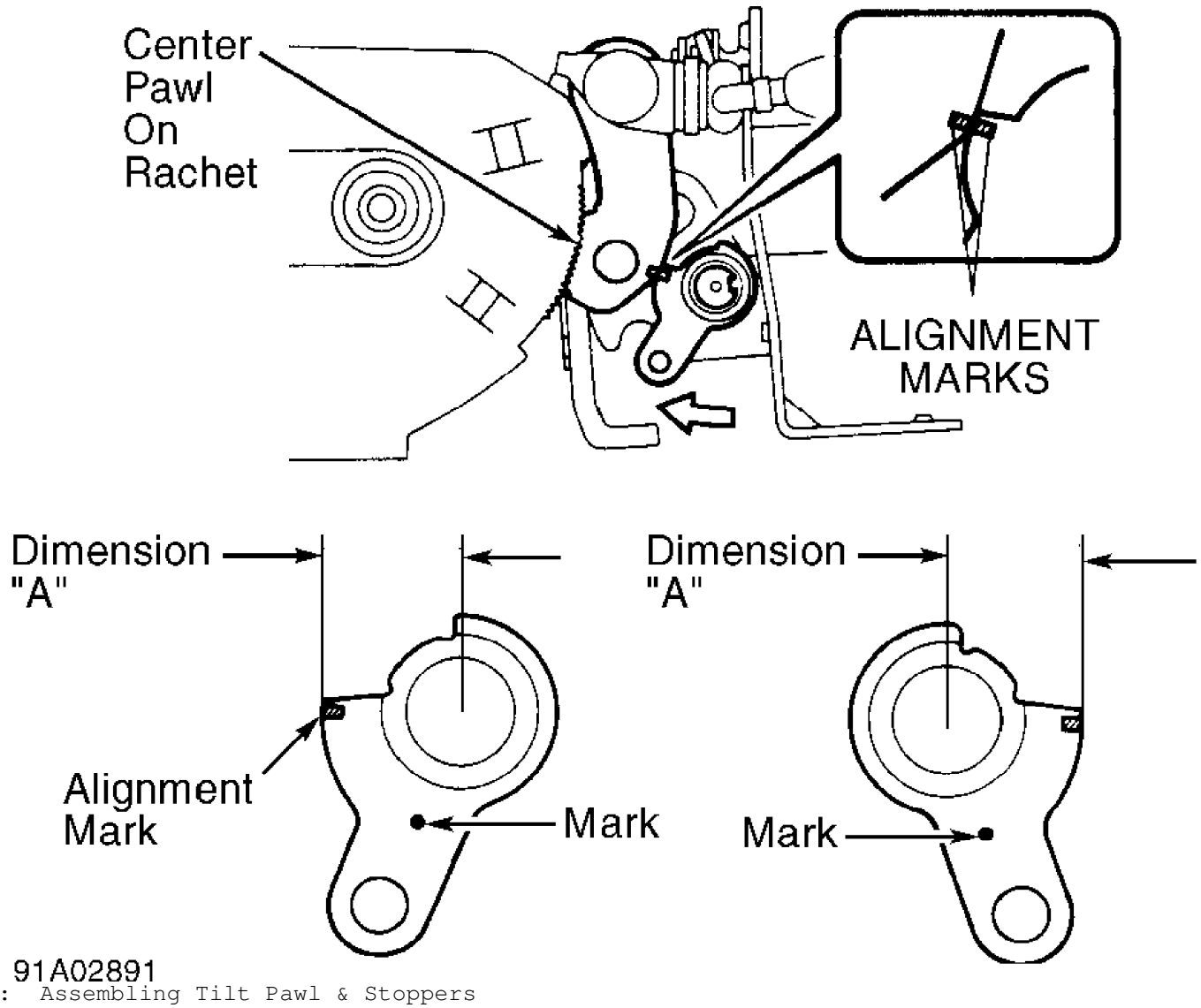

Fig. 5: Assembling Tilt Pawl & Stoppers
Courtesy of Toyota Motor Sales, U.S.A., Inc.

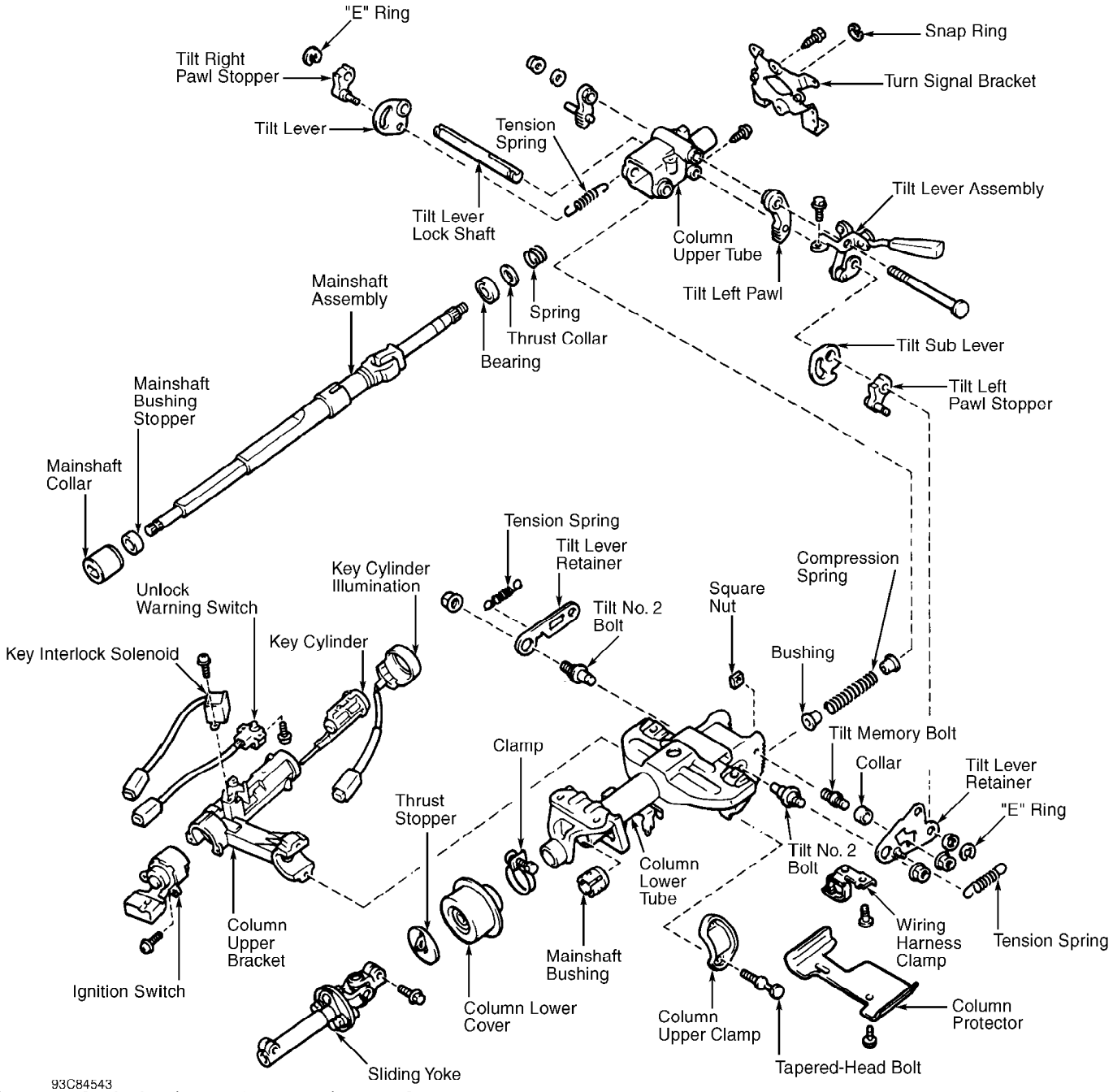

Fig. 6: Exploded View Of Steering Column
Courtesy of Toyota Motor Sales, U.S.A., Inc.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Column-To-Instrument Panel Nut	18 (25)
Steering Wheel Nut	26 (35)
Tilt Lever Retainer Nut	11 (14)

"U" Joint Clamp Bolt	26 (35)

	INCH Lbs. (N.m)
Compression Spring Torx Screw	57 (6.4)
Steering Damper Bolt	69 (7.8)
Steering Wheel Pad Torx Screw	63 (7.1)
Tilt Lever Screw	42 (4.7)
Tilt Memory Bolt	57 (6.4)
Tilt Pawl Nut	52 (5.9)
Turn Signal Bracket Bolt	78 (8.8)