

2002 STEERING

Steering Column - RAV4

TILT STEERING COLUMN
COMPONENTS

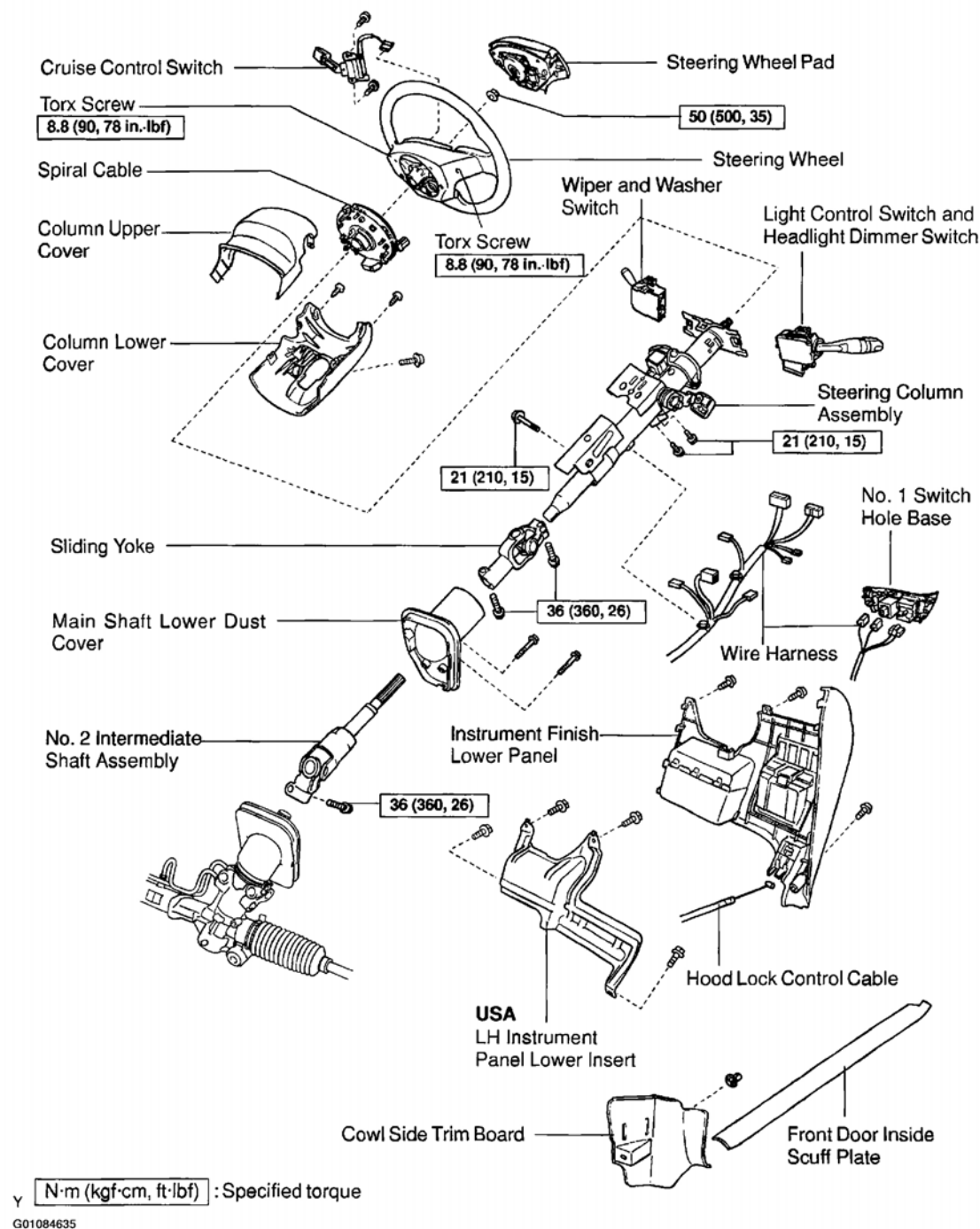
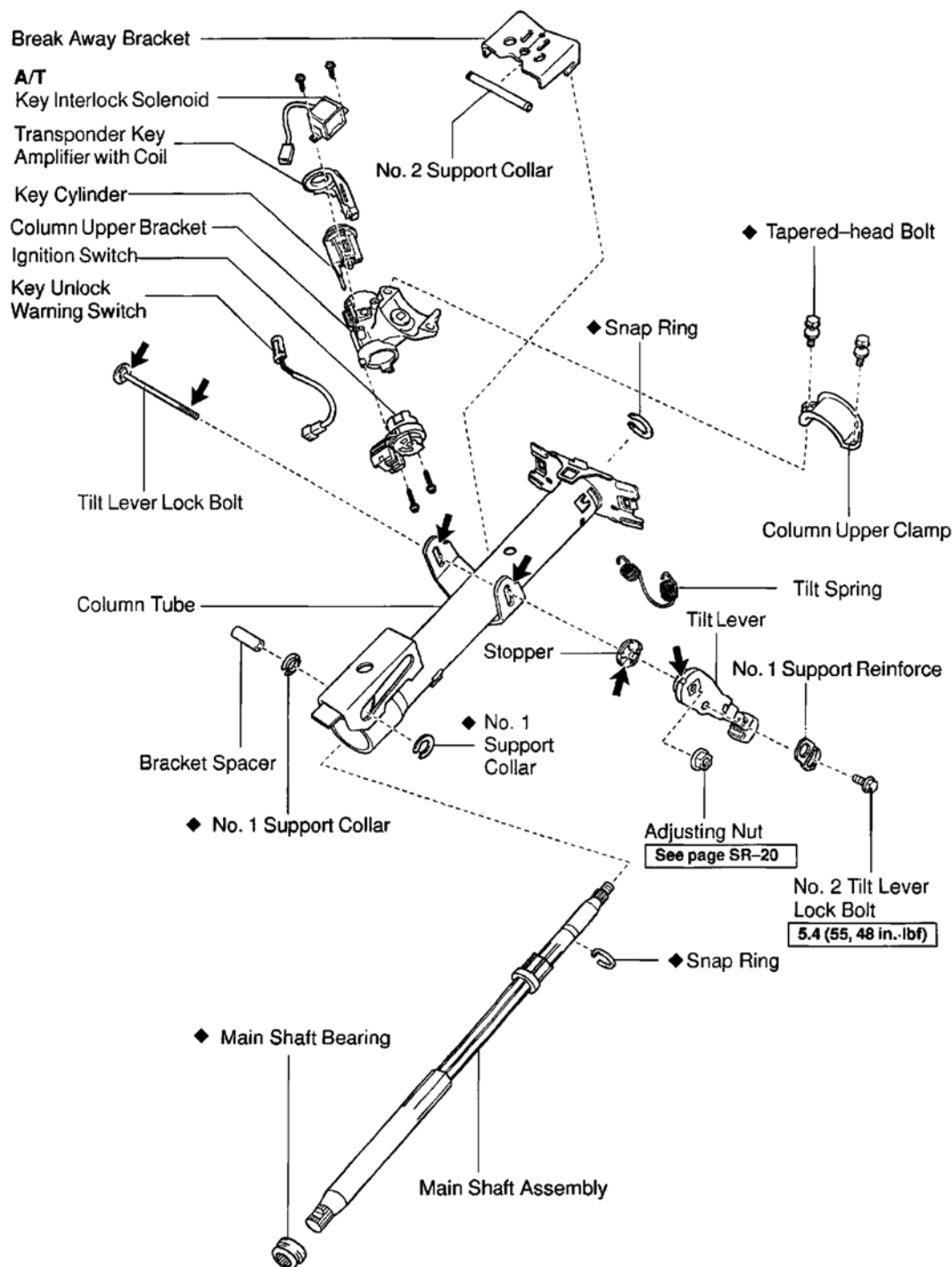


Fig. 1: Displaying Tilt Steering Column Components (1 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

➡ Molybdenum disulfide lithium base grease

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Fig. 2: Displaying Tilt Steering Column Components (2 Of 2)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. Remove steering wheel pad .

NOTE: If the airbag connector is disconnected with the ignition switch at ON, DTCs will be recorded.

- a. Place the front wheels facing straight ahead.
- b. Using a Torx socket wrench (T30), loosen the 2 Torx screws until the groove along the screw circumference catches on the screw case.

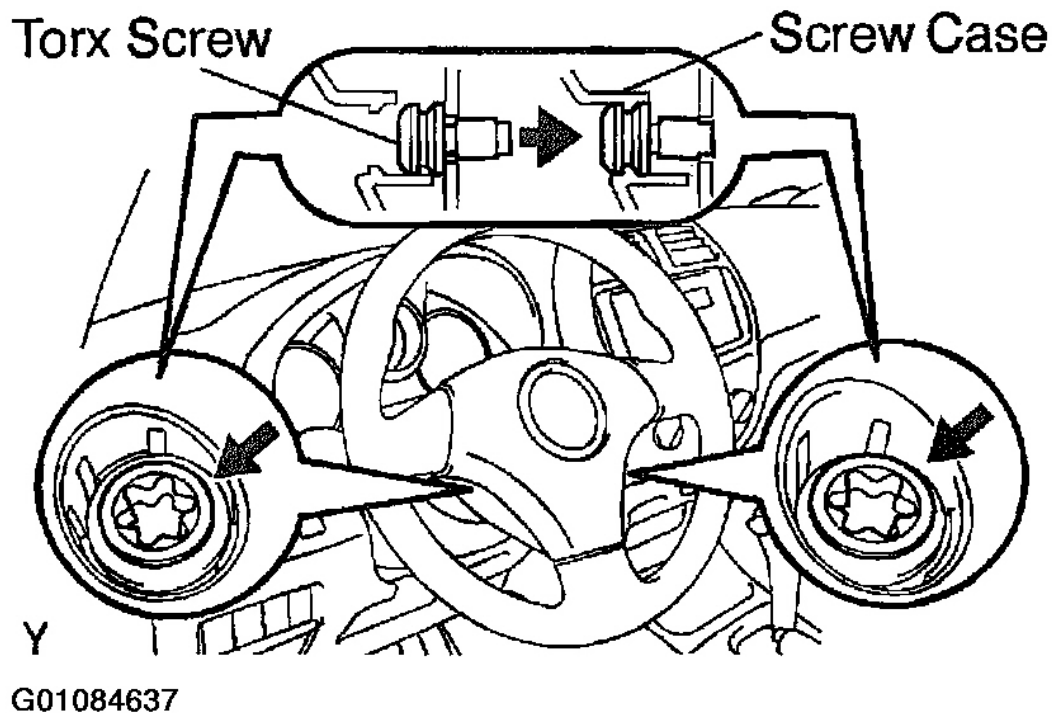
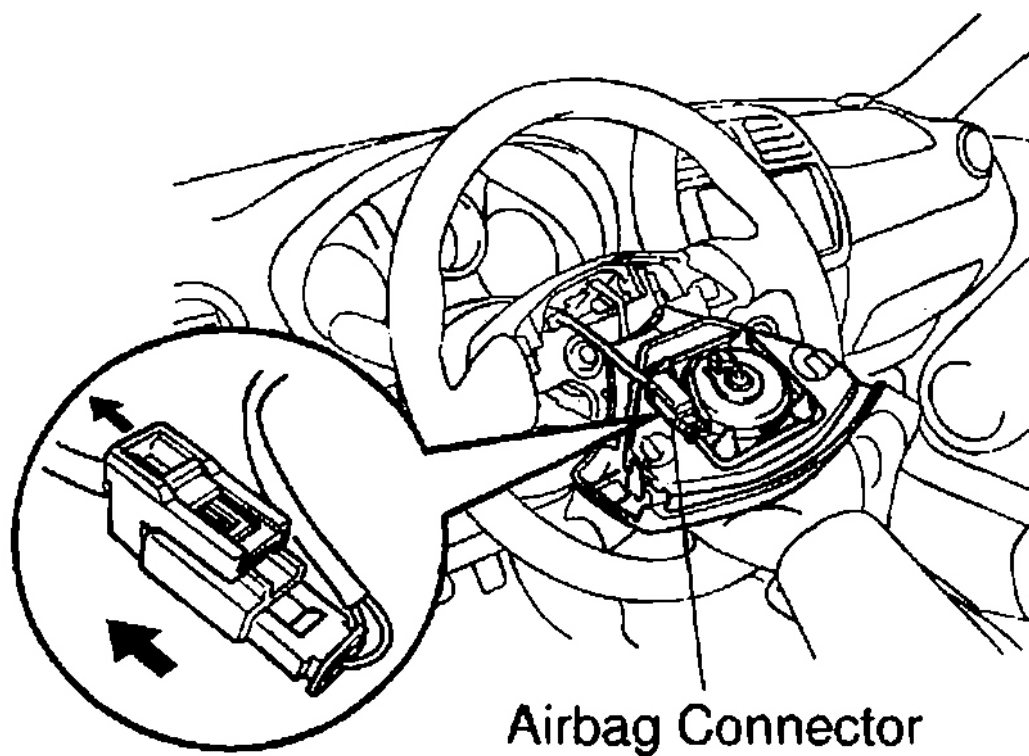
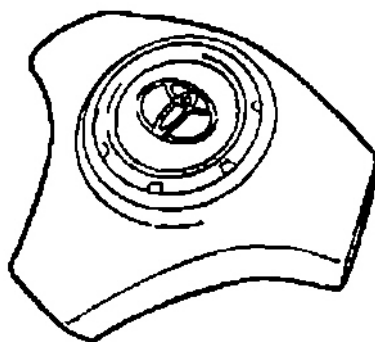


Fig. 3: Locating Torx Screw & Screw Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

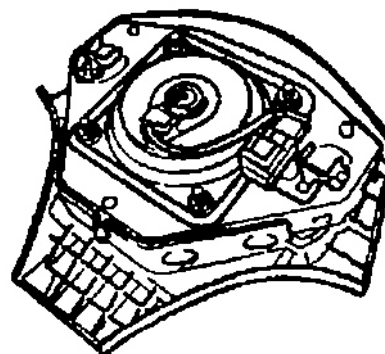
- c. Pull out the wheel pad from the steering wheel and disconnect the airbag connector.



Correct



Wrong



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Fig. 4: Locating Air Bag Connector

CAUTION:

- When storing the wheel pad, keep the upper surface of the pad facing upward.
- Never disassemble the wheel pad.

NOTE:

When removing the wheel pad, take care not to pull the airbag wire harness.

2. Remove steering wheel .

- a. Disconnect the connector.

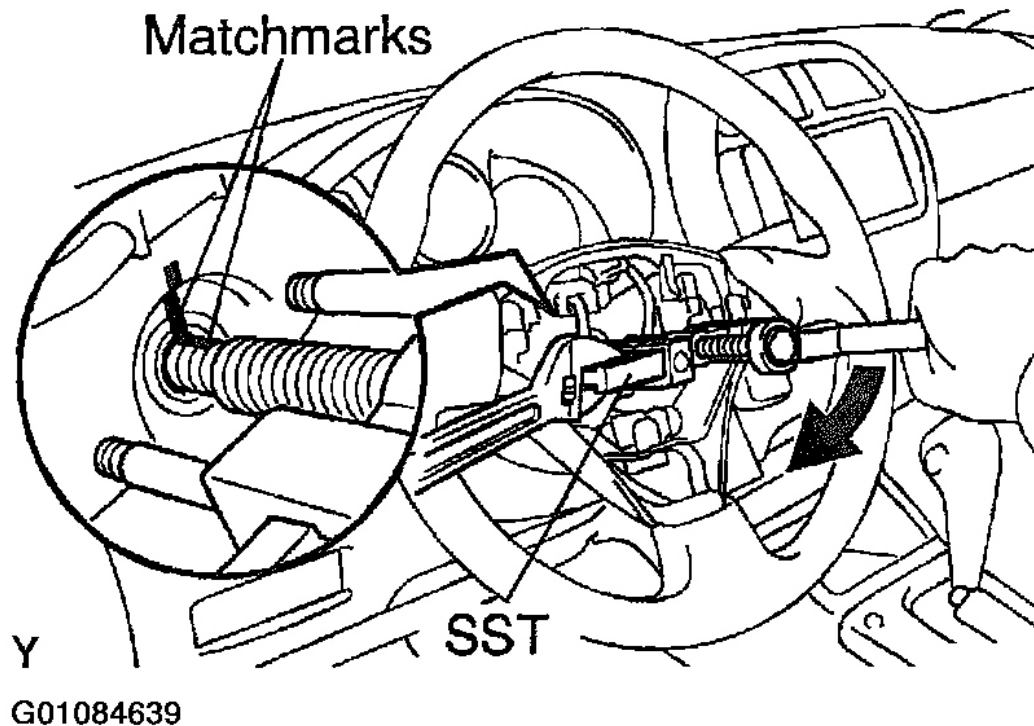


Fig. 5: Placing Matchmarks On Steering Wheel

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

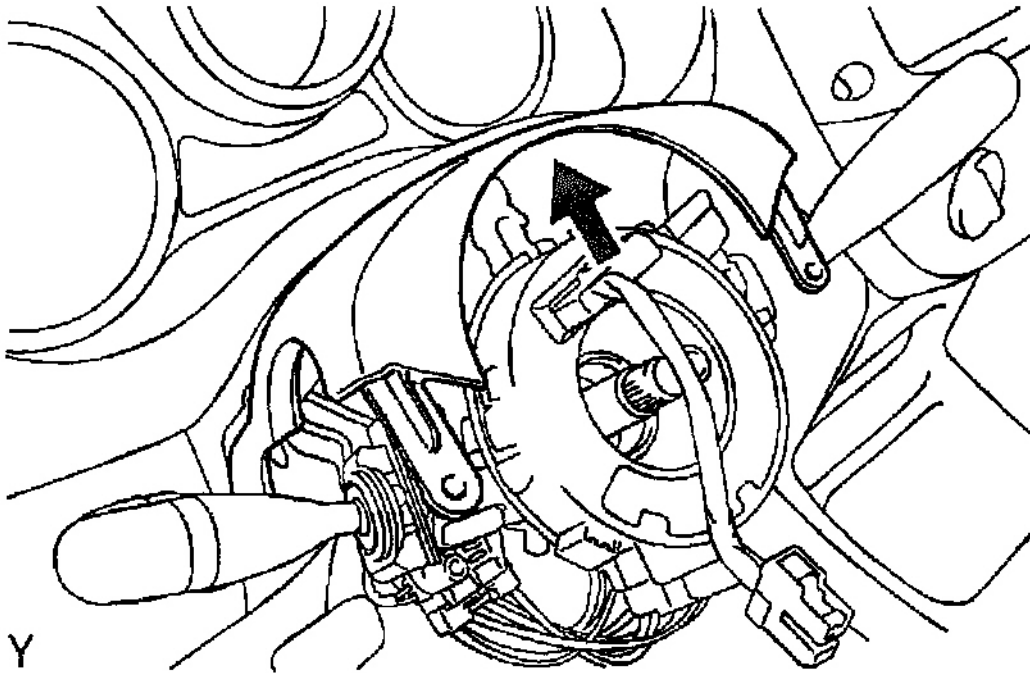
- b. Remove the steering wheel set nut.
- c. Place matchmarks on the steering wheel and main shaft assembly.
- d. Using SST, remove the steering wheel.

SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)

3. **Remove column lower cover .**

Remove the 3 screws and column lower cover.

4. **Disconnect column upper cover .**



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Fig. 6: Locating Upper Cover

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Disconnect the column upper cover from the column tube.

5. **Remove spiral cable, light control switch and headlight dimmer switch and wiper and washer switch .**
- Disconnect the airbag connector from the spiral cable.
 - Disconnect the 3 connectors from the spiral cable, light control switch and headlight dimmer switch and wiper and washer switch.
 - Release the 3 claws and remove the spiral cable.

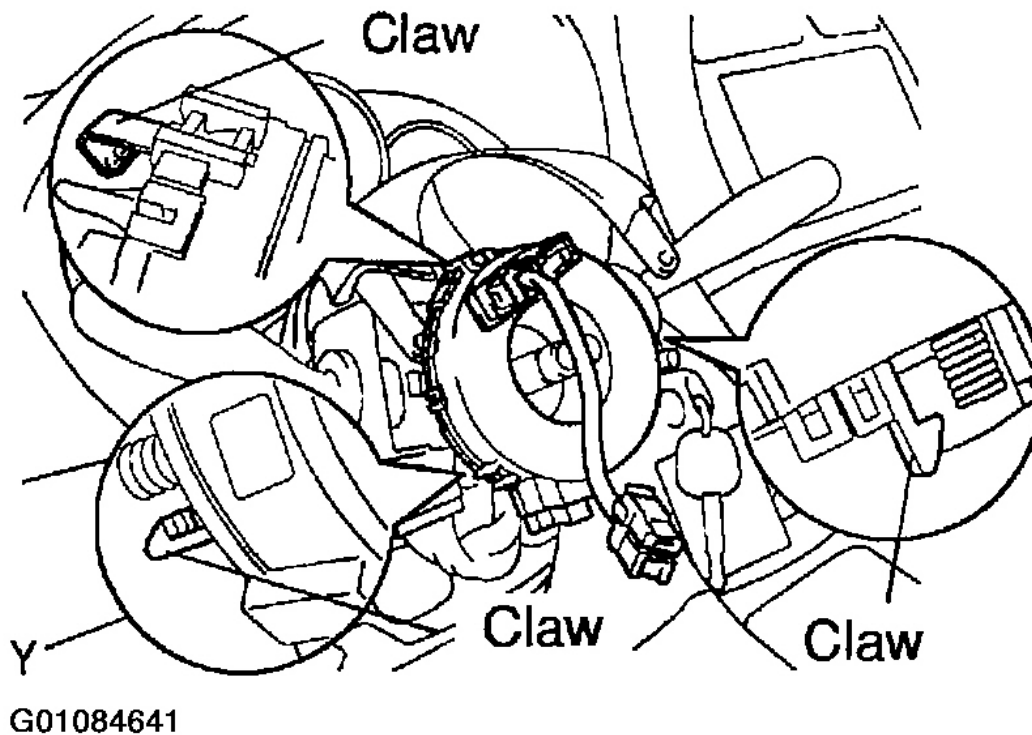


Fig. 7: Locating 3 Claws

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: **Do not disassemble the spiral cable or apply oil to it.**

- d. Push the claw and pull out the light control switch and headlight dimmer switch.
- e. Employ the same manner described above to the wiper and washer switch.

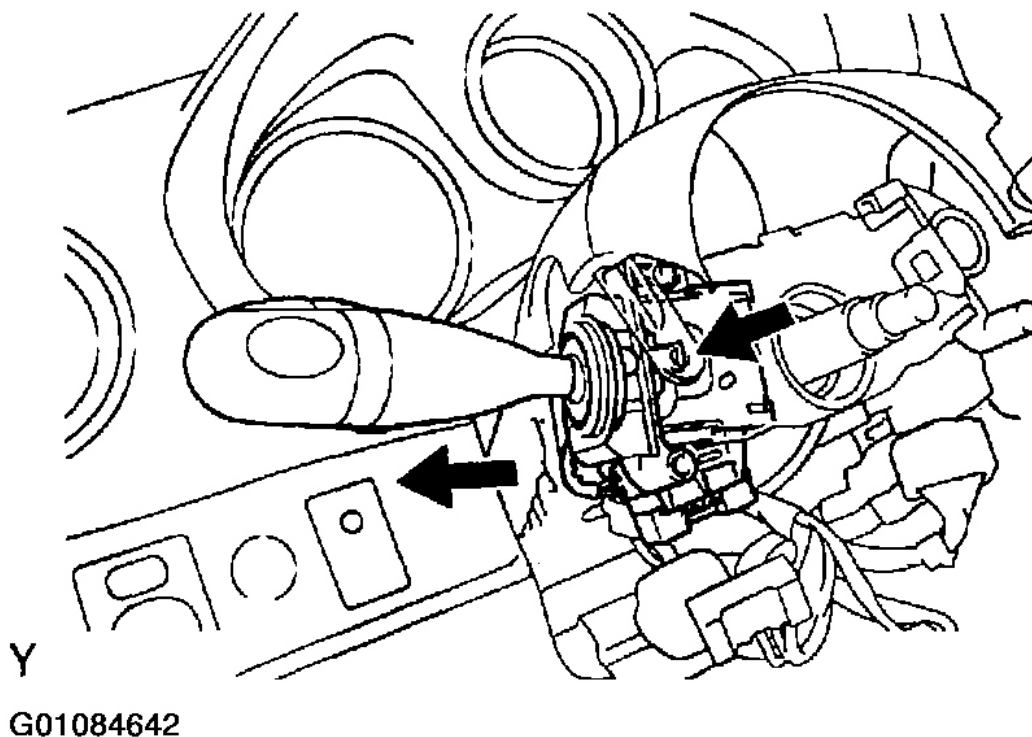
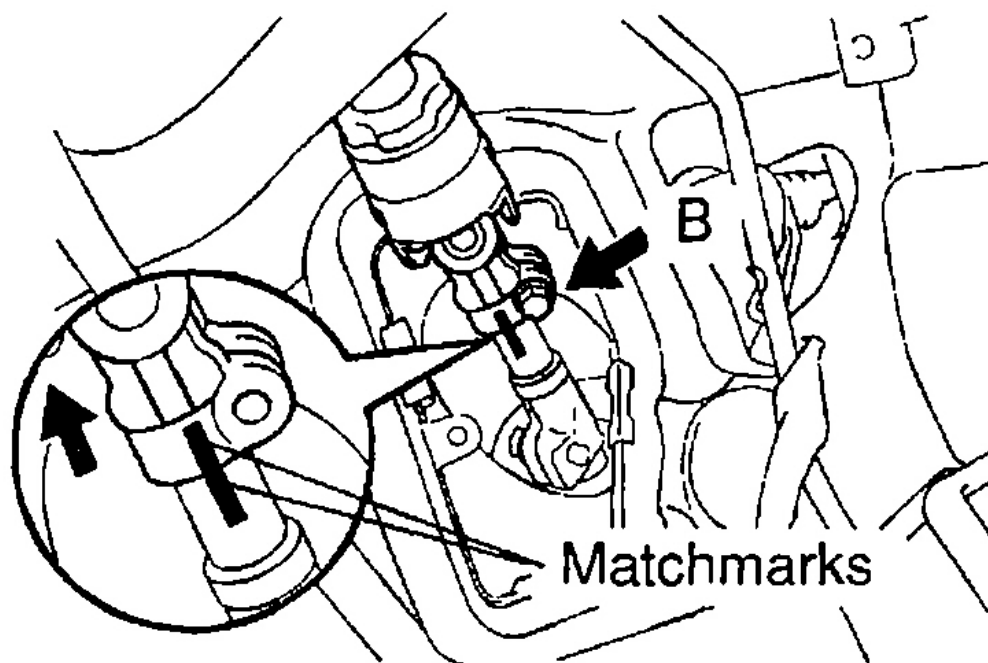
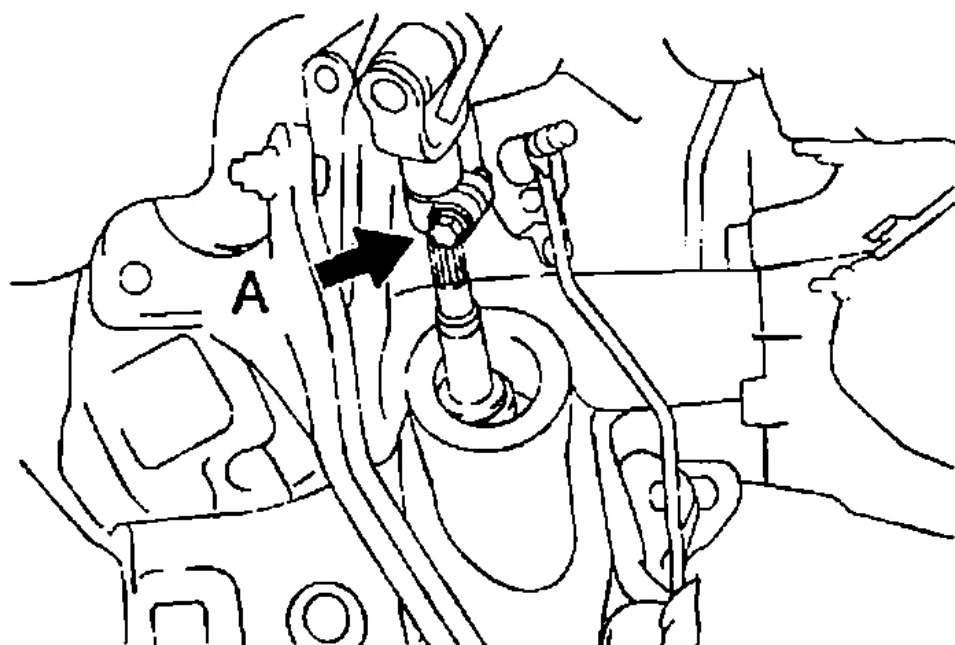


Fig. 8: Pulling Out Light Control Switch & Headlight Dimmer Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. **Remove column upper cover .**
7. **Remove front door inside scuff plate .**
8. **Remove cowl side trim board .**
9. **Remove No. 1 switch hole base .**
 - a. Pull out the No. 1 switch hole base.
 - b. Disconnect the connectors.
10. **Remove instrument finish lower panel .**
 - a. Remove the 3 screws and instrument finish lower panel.
 - b. Disconnect the connectors.
 - c. Disconnect the hood lock control cable.
11. **USA: Remove LH instrument panel lower insert .**

Remove the 4 bolts and LH instrument panel lower insert.
12. **Disconnect No. 2 intermediate shaft assembly .**

- a. Remove the 2 bolts and disconnect the main shaft lower dust cover.
- b. Place matchmarks on the No. 2 intermediate shaft assembly and steering intermediate extension.
- c. Loosen the bolt A and remove the bolt B, then disconnect the No. 2 intermediate shaft assembly.
- d. Remove the main shaft lower dust cover.



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Fig. 9: Placing Matchmarks & Locating Bolts A & B
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

13. **Remove steering column assembly .**
- Disconnect the connectors and wire harness clamps.
 - Remove the 3 bolts and steering column assembly.

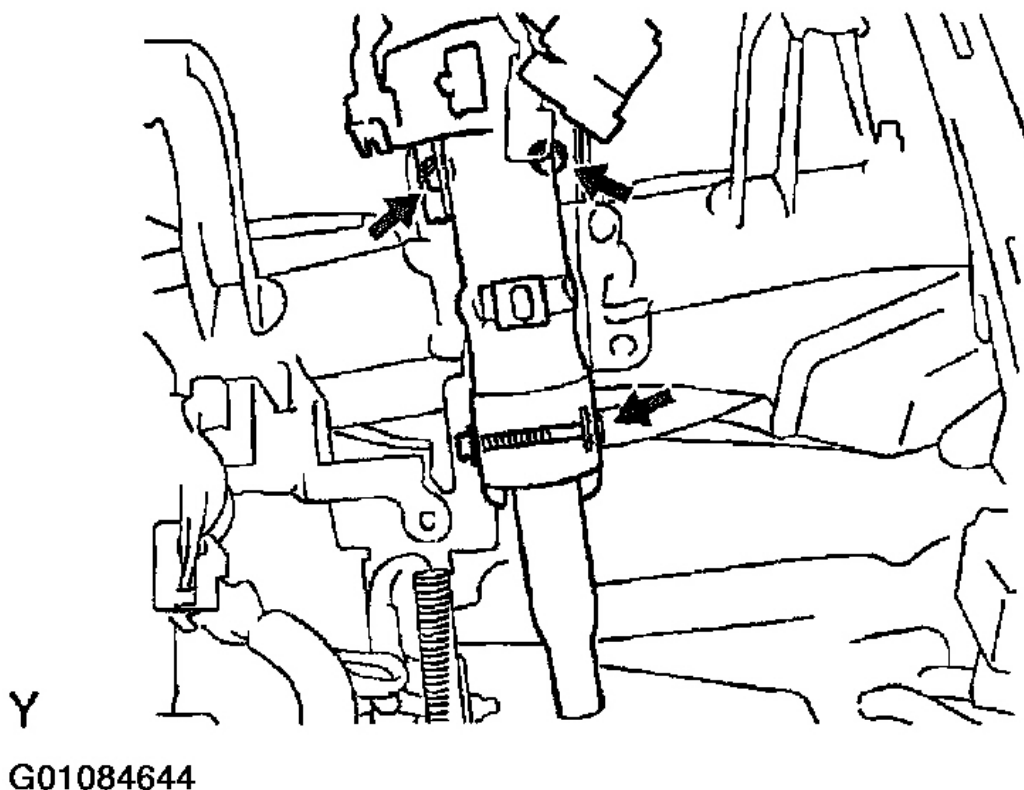


Fig. 10: Removing Steering Column Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

14. **Remove sliding yoke and No. 2 intermediate shaft assembly .**
- Place matchmarks on the sliding yoke and main shaft assembly.
 - Place matchmarks on the sliding yoke and No. 2 intermediate shaft.
 - Remove the bolt A and No. 2 intermediate shaft assembly.
 - Remove the bolt B and sliding yoke.

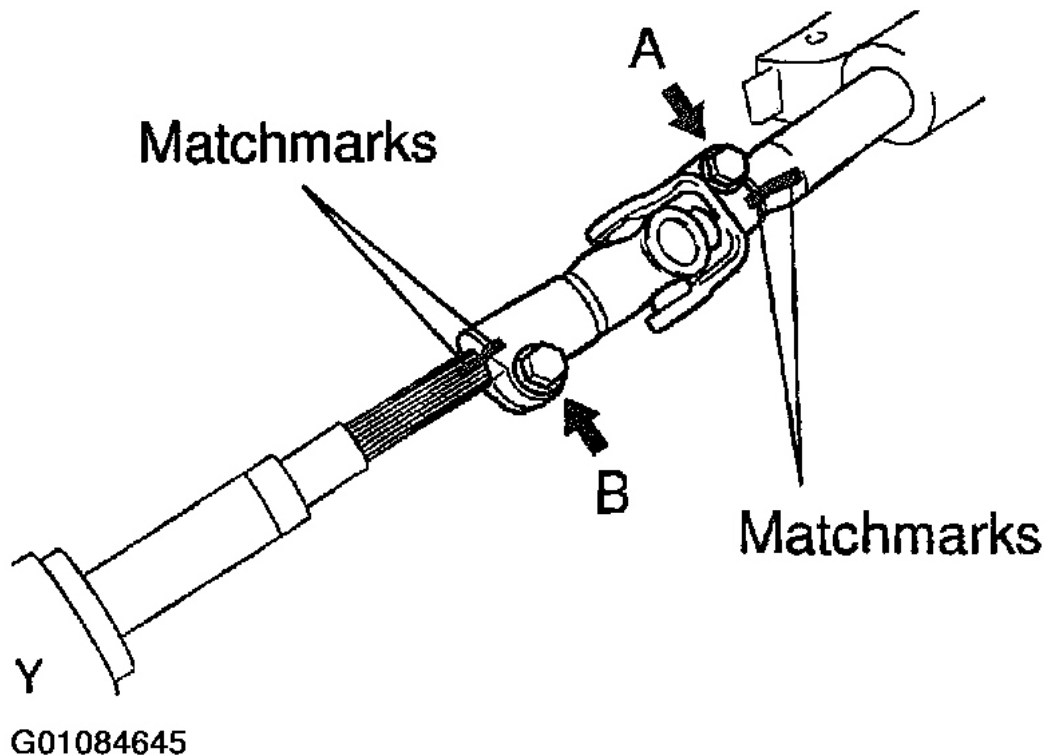


Fig. 11: Locating Matchmarks & Bolts A & B
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

15. Remove cruise control switch from steering wheel .

Remove the 2 screws and cruise control switch from the steering wheel.

DISASSEMBLY

NOTE: When using a vise, do not overtighten it.

1. Remove column upper bracket and column upper clamp .

- Using a centering punch, mark the center of the 2 tapered-head bolts.
- Using a 3 - 4 mm (0.12 - 0.16 in.) drill, drill into the 2 bolts.
- Using a screw extractor, remove the 2 bolts, column upper clamp and column upper bracket.

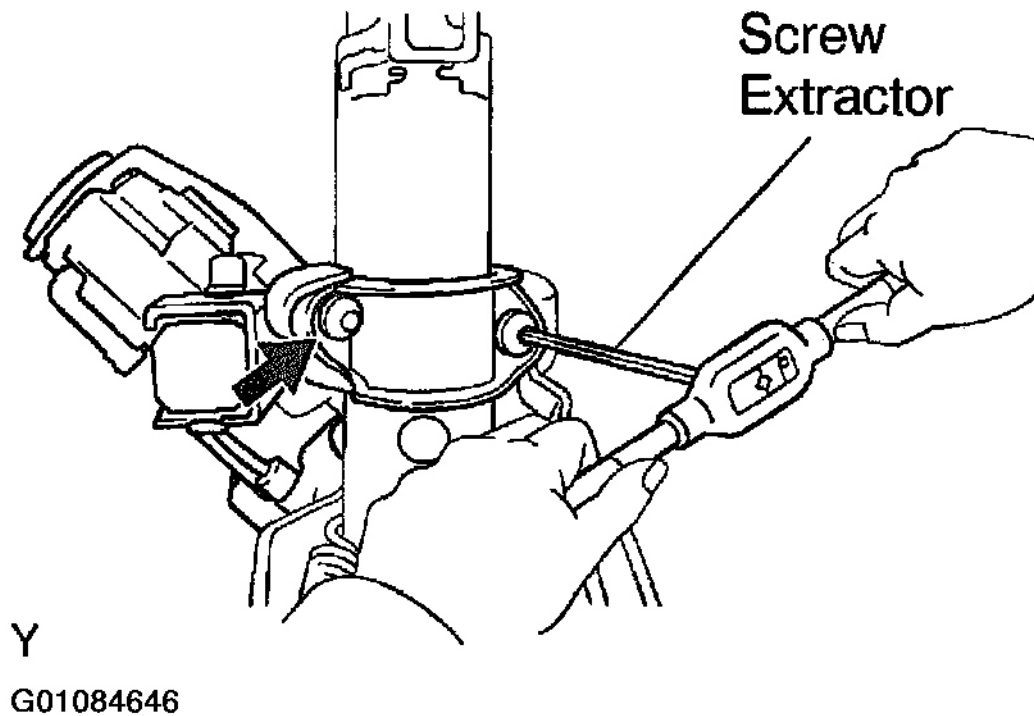


Fig. 12: Locating Screw Extractor & Head Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **Remove bracket spacer and No. 1 support collars .**
 - a. Using an extension bar and a hammer, tap out the bracket spacer.

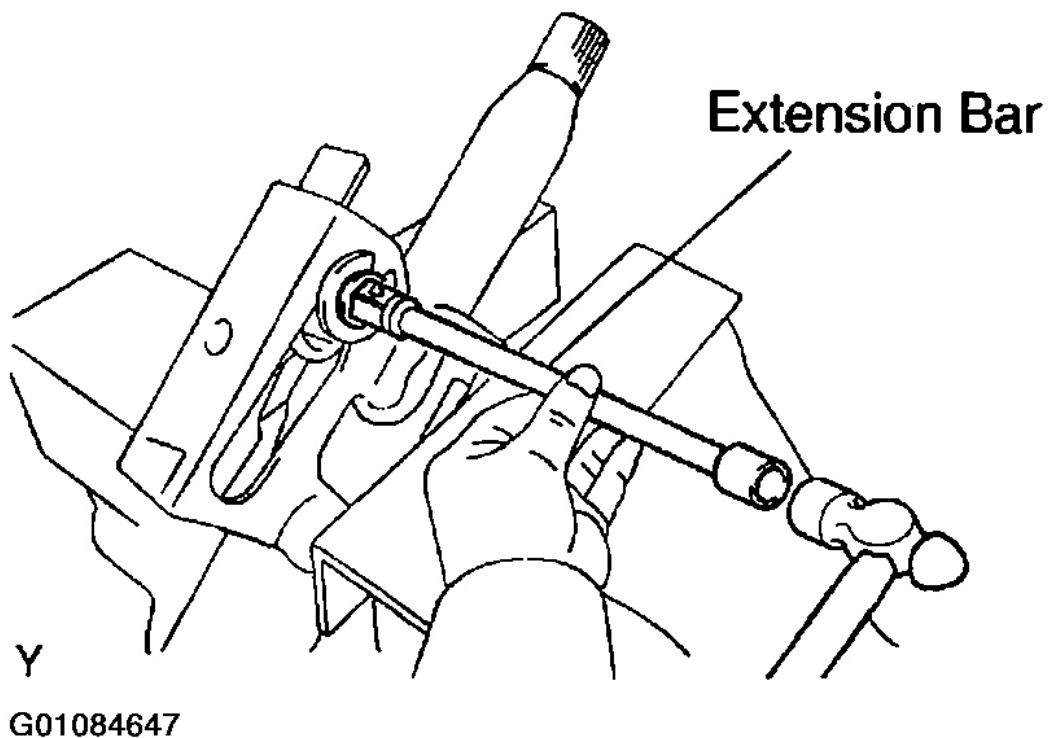


Fig. 13: Identifying Extension Bar
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a screwdriver, remove the 2 No. 1 support collars.

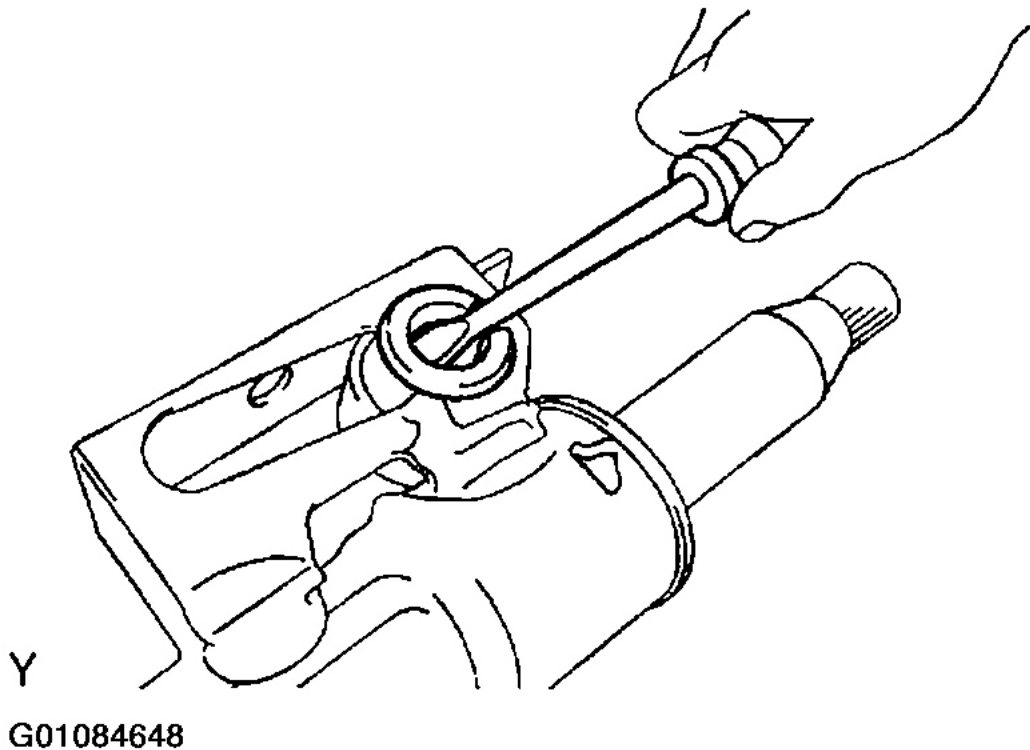
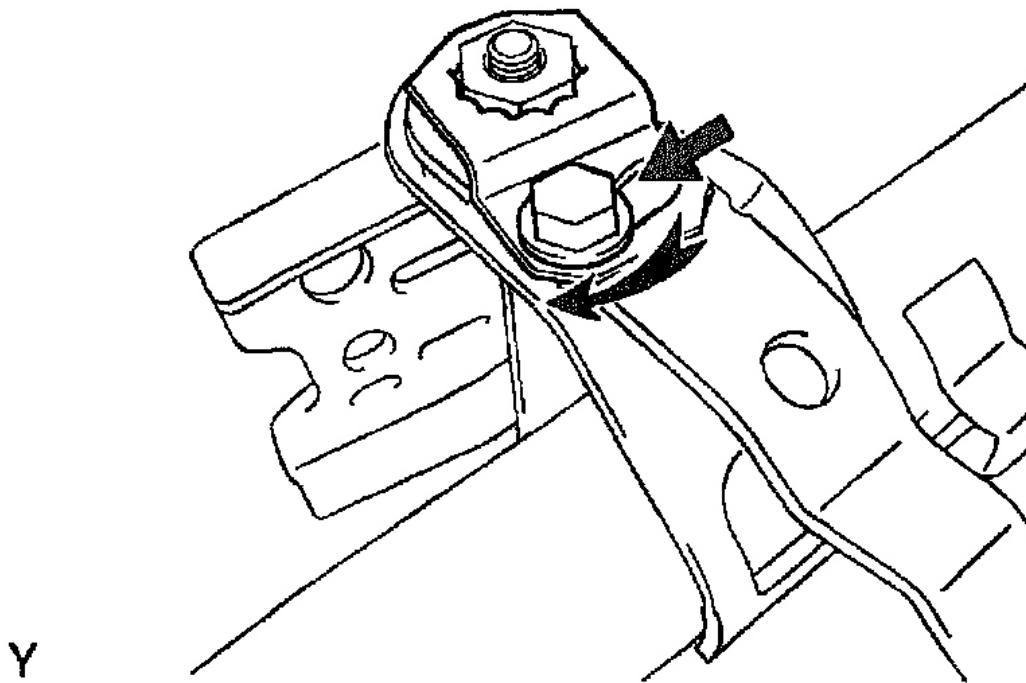


Fig. 14: Displaying Screw Driver Removal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. **Remove tilt lever and break away bracket .**
 - a. Remove the tilt spring.
 - b. Remove the No. 2 tilt lever lock bolt and No. 1 support reinforce.



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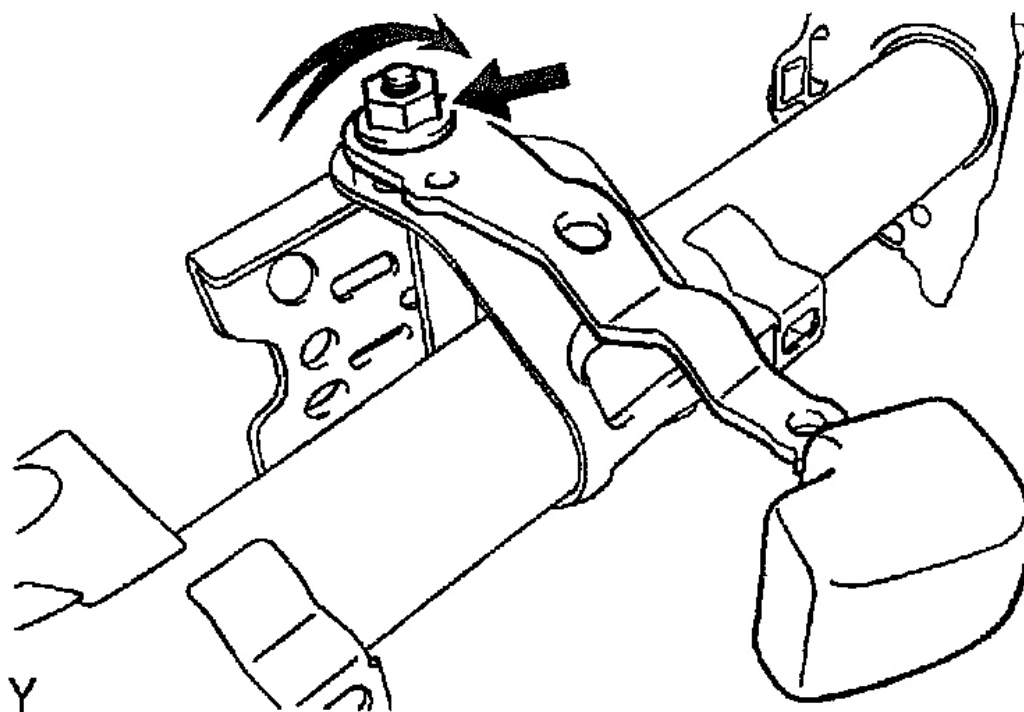
Fig. 15: Displaying Bolt & Support Removal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: **This bolt is left-handed one.**

- c. Remove the adjusting nut, tilt lever, stopper, tilt lever lock bolt and break away bracket.

NOTE: **This nut is left-handed one.**

- d. Remove the No. 2 support collar from the break away bracket.



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Fig. 16: Displaying Tilt Lever & Break Away Bracket
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. **Remove main shaft assembly and main shaft bearing .**
 - a. Using a snap ring expander, remove the snap ring on the upper side.

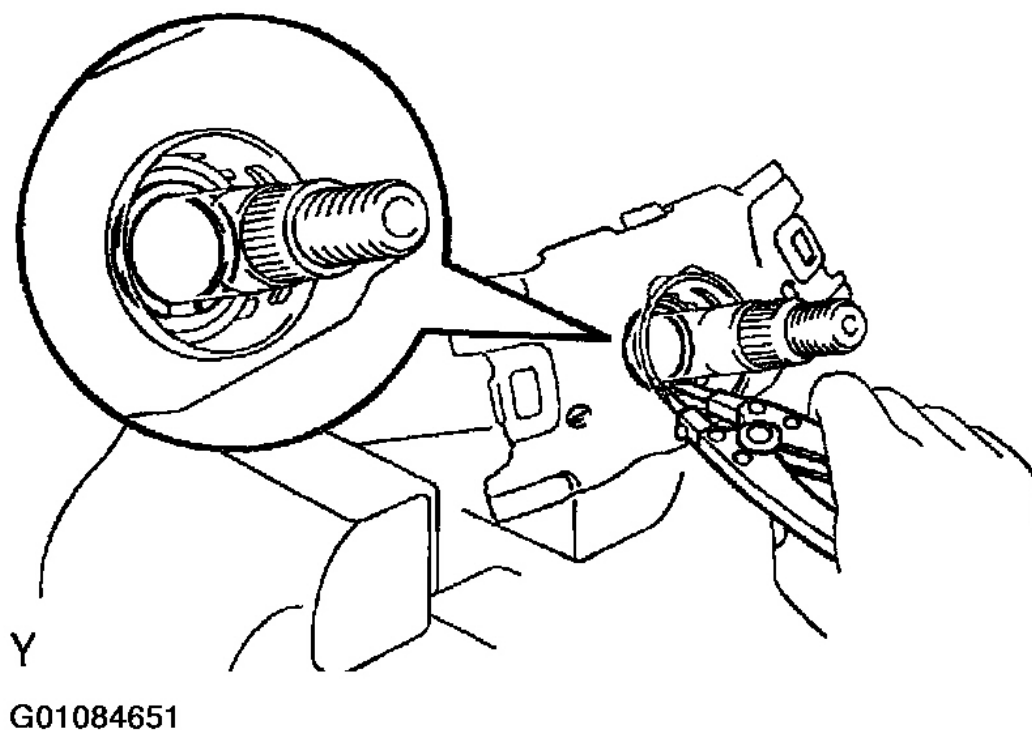


Fig. 17: Displaying Snap Ring Removal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Pull out the main shaft assembly and main shaft bearing.

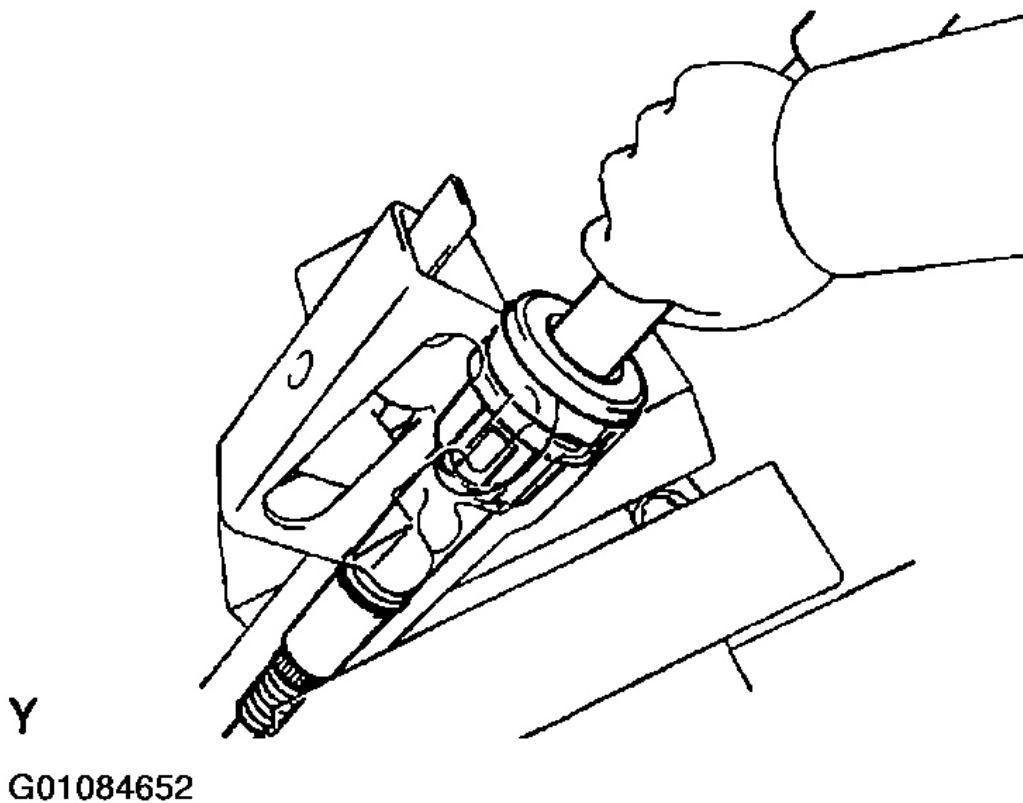


Fig. 18: Removing Main Shaft & Bearing Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a snap ring expander, remove the snap ring on the lower side.

INSPECTION

1. w/ A/T: **Inspect key interlock solenoid (See KEY INTERLOCK SOLENOID) .**
2. w/ A/T: **If necessary, replace key interlock solenoid .**
 - a. Remove the 2 screws and key interlock solenoid.
 - b. Install a new interlock solenoid with the 2 screws.
3. **Inspect transponder key amplifier with coil (See HOW TO PROCEED WITH TROUBLESHOOTING) .**
4. **If necessary, replace transponder key amplifier with coil .**
 - a. Widen the claw hung on the upper bracket by approx. 1.0 mm (0.039 in.) using a screwdriver.

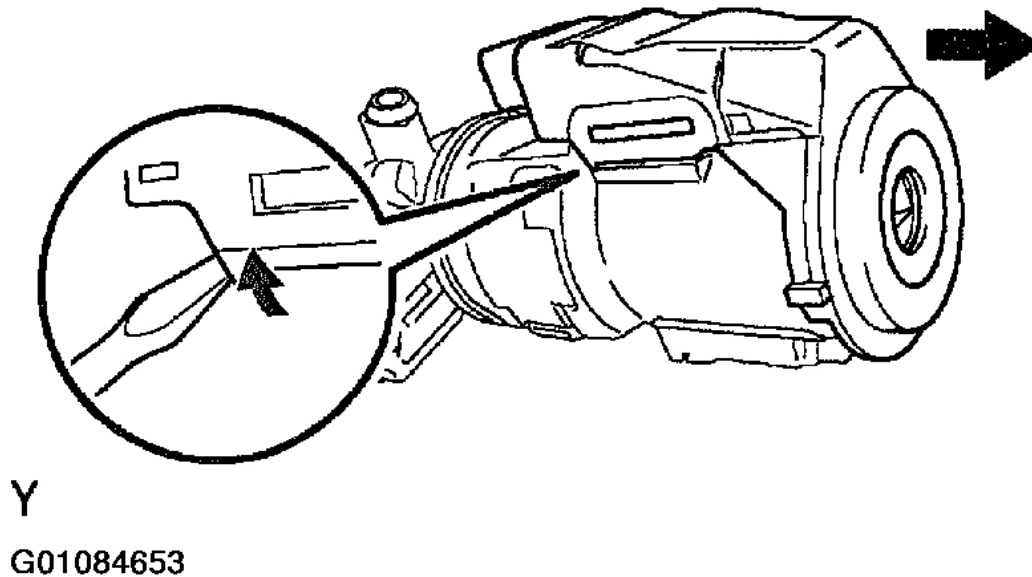
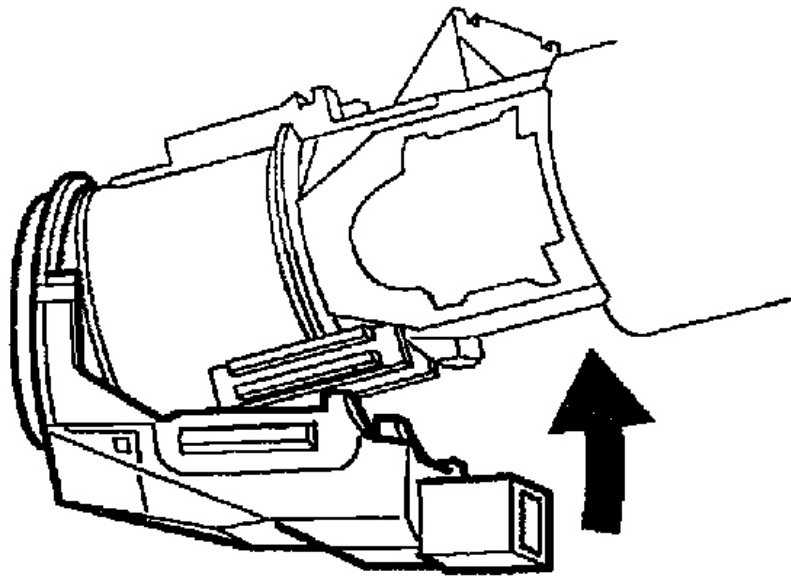


Fig. 19: Displaying Claw Widening
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Pull the transponder key amplifier toward the rear of the vehicle with the claw open.

NOTE: **Take care not to use excessive force to prevent the case from being damaged.**

- c. Align a new transponder key amplifier with the installation position of the upper bracket with the amplifier inclined.



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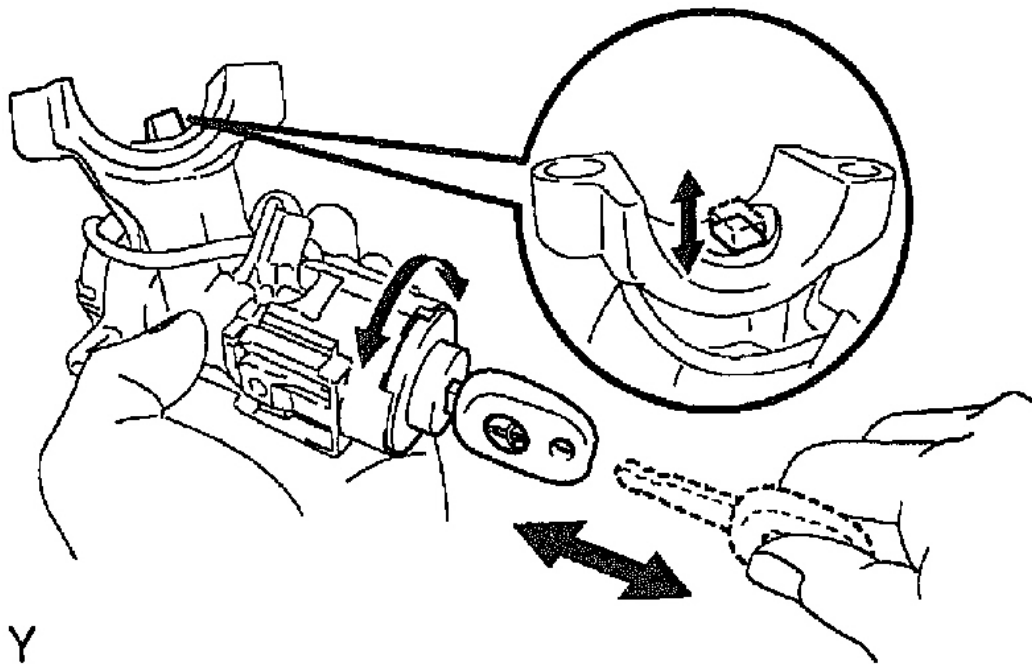
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Fig. 20: Pushing Transponder Key Amplifier
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Push the transponder key amplifier up and connect it to the upper bracket.

NOTE: Take care not to push the amplifier up with excessive force to prevent it from being damaged.

5. Inspect steering lock operation .



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Fig. 21: Inspecting Steering Lock Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

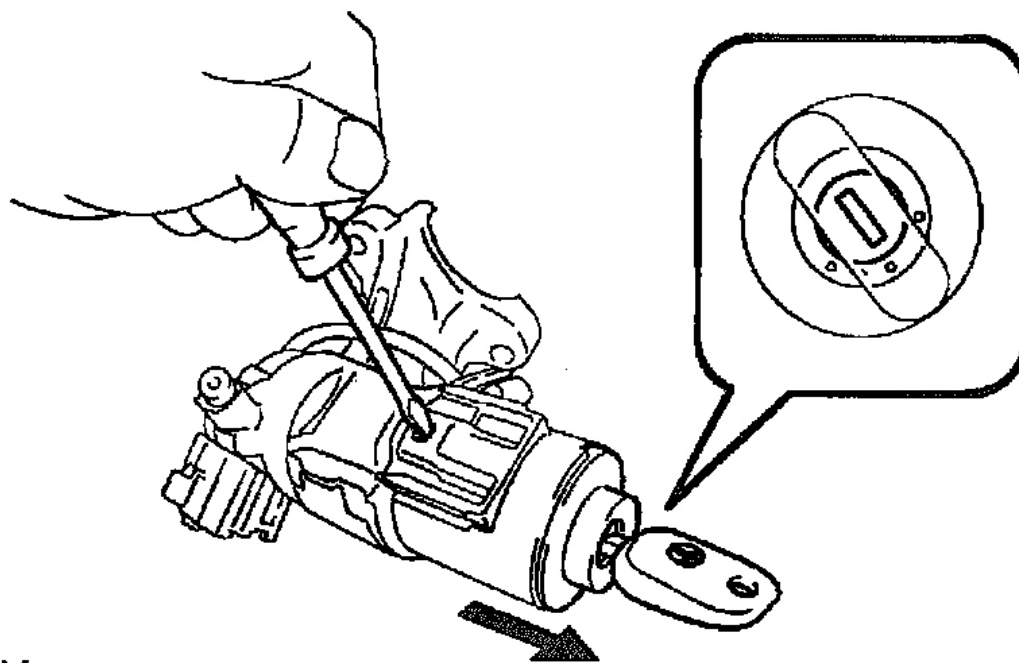
Check that the steering lock mechanism operates properly.

6. **If necessary, replace key cylinder .**
 - a. Place the ignition key at the ACC position.
 - b. Push down the stop pin with a screwdriver, and pull out the cylinder.
 - c. Install a new cylinder.

NOTE: Make sure the key is at the ACC position.

7. **Inspect key unlock warning switch (See INSPECTION) .**
8. **If necessary, replace key unlock warning switch .**
 - a. Slide the key unlock warning switch out of the column upper bracket.
 - b. Slide a new key unlock warning switch in the column upper bracket.
9. **Inspect ignition switch (See INSPECTION) .**
10. **If necessary, replace ignition switch .**
 - a. Remove the 2 screws and ignition switch from the column upper bracket.

- b. Install a new ignition switch with the 2 screws.



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Fig. 22: Pulling Out Cylinder

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

11. Inspect bearing

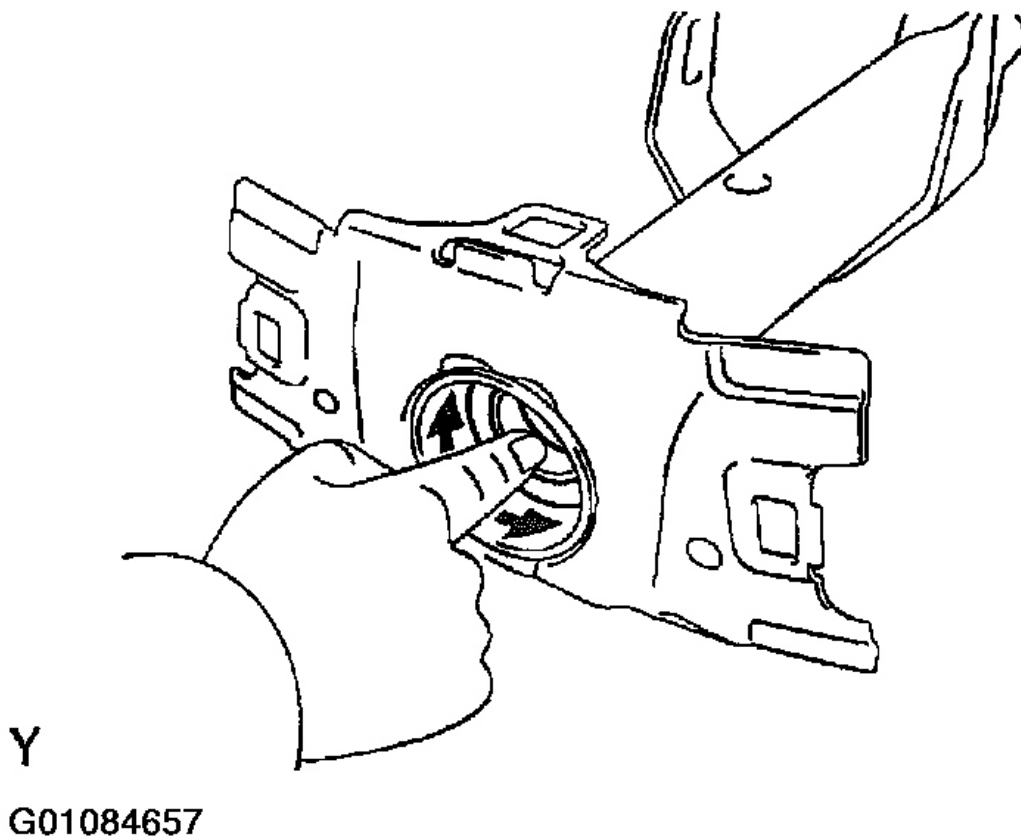


Fig. 23: Inspecting Bearing

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Check the bearing rotation condition and check for abnormal noise.

If the bearing is worn or damaged, replace the column tube.

REASSEMBLY

NOTE: When using a vise, do not overtighten it.

1. **Coat parts indicated by arrows with molybdenum disulfide lithium base grease (See COMPONENTS) .**
2. **Install main shaft assembly .**
 - a. Using a snap ring expander, install a new snap ring on the lower side.
 - b. Install the main shaft assembly.

- c. Using a snap ring expander, install a new snap ring on the upper side.

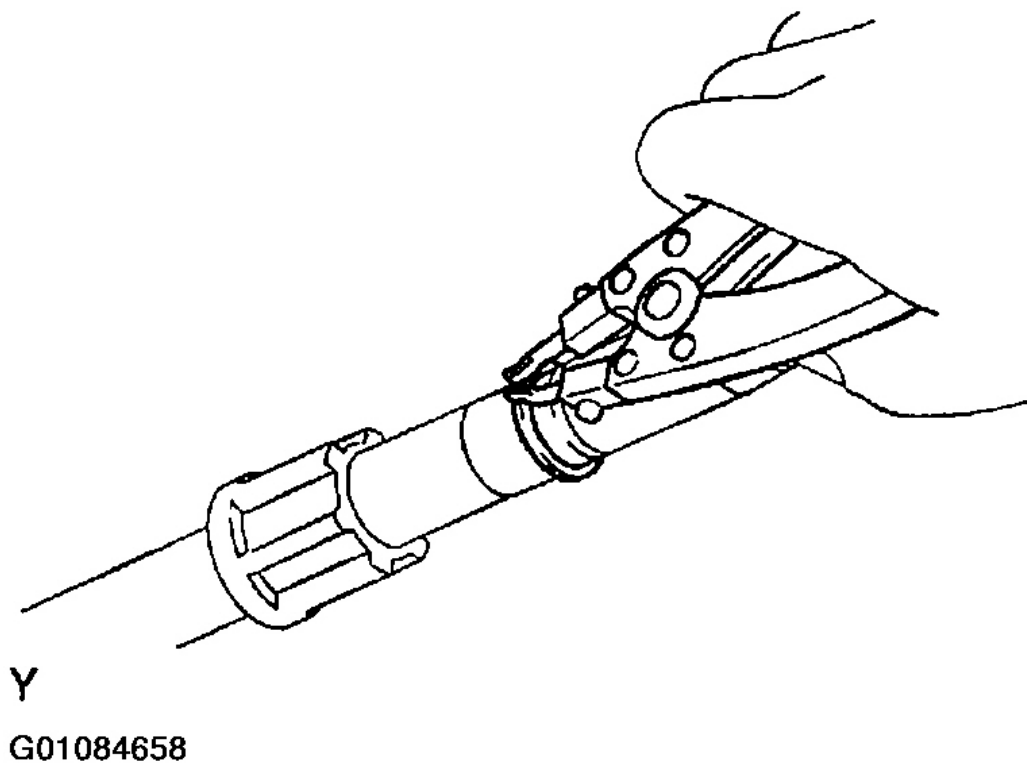


Fig. 24: Installing New Ring

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Install main shaft bearing .

- a. Coat a new bearing with molybdenum disulfide lithium base grease.
- b. Using SST and a hammer, tap in the main shaft bearing.

SST 09608-04031

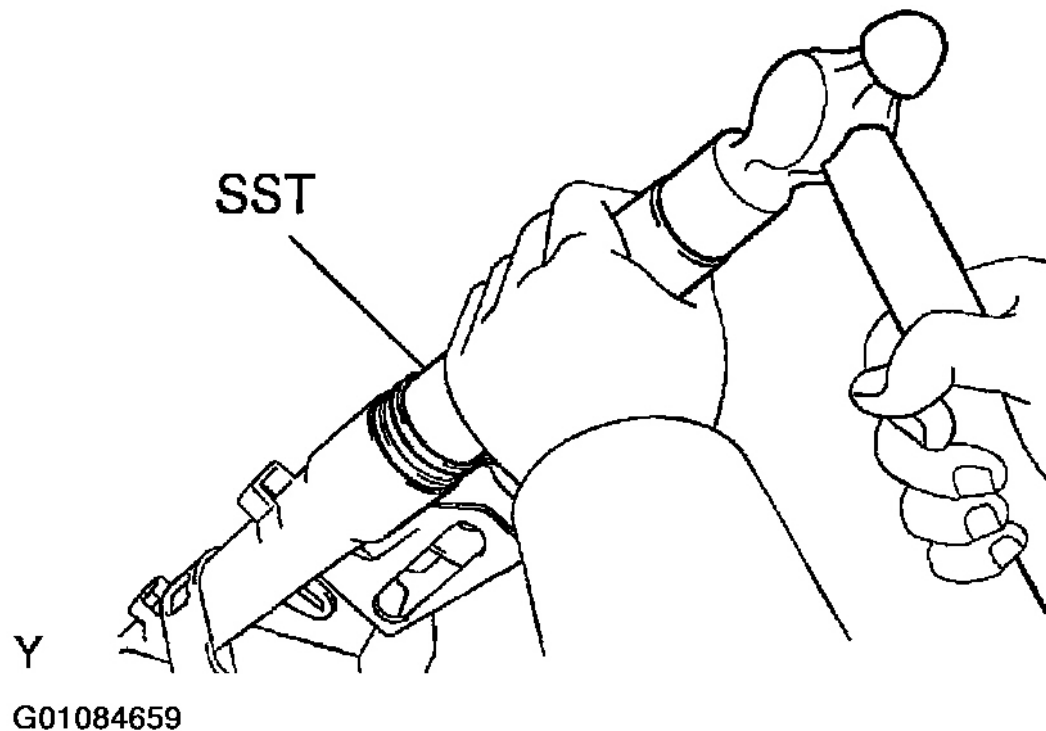


Fig. 25: Installing Main Shaft Bearing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

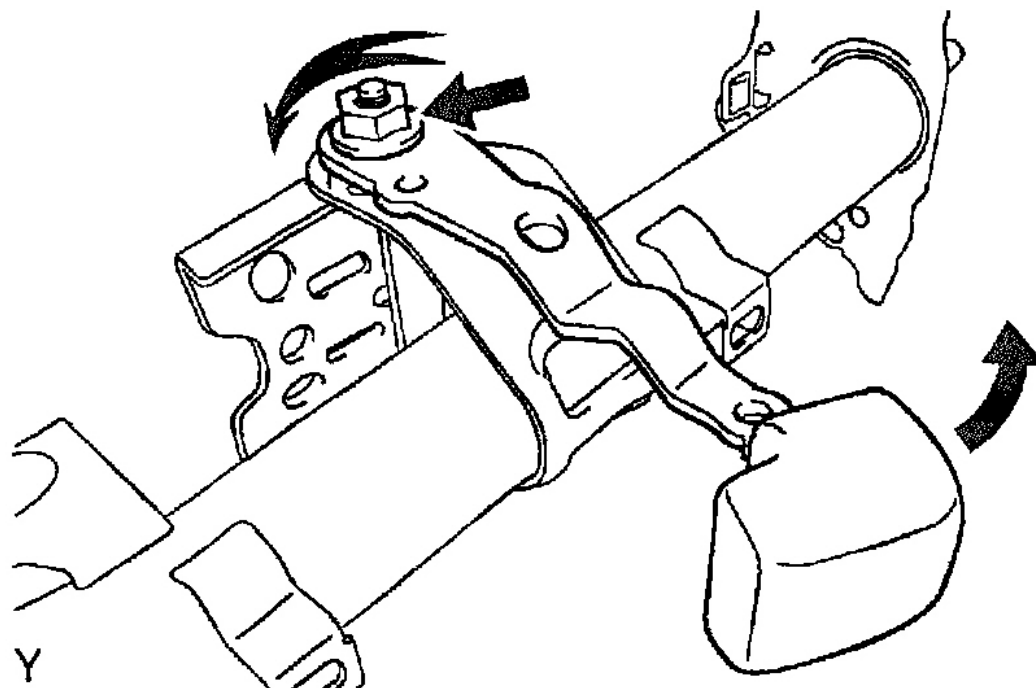
4. Install break away bracket and tilt lever .

- a. Install the No. 2 support collar to the break away bracket.
- b. Install the break away bracket, tilt lever lock bolt, stopper and tilt lever.

NOTE: **Align the holes in the column tube with the projections of the tilt lever lock bolt and stopper.**

- c. Install the adjusting nut by rotating it counterclockwise in the specified torque so that the locking load (load applied to when a knob is operated) of the tilt lever will be 43 - 91 N (4.4 - 9.3 kgf, 9.7 - 20.5 lbf).

Torque: 9 N.m - 14 N.m (90 kgf.cm - 145 kgf.cm, 80 in.lbf - 10 ft.lbf)



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Fig. 26: Installing Adjusting Nut

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Install the No. 1 support reinforce with the No. 2 tilt lever lock bolt by turning it counterclockwise.
Torque: 5.4 N.m (55 kgf.cm, 48 in.lbf)

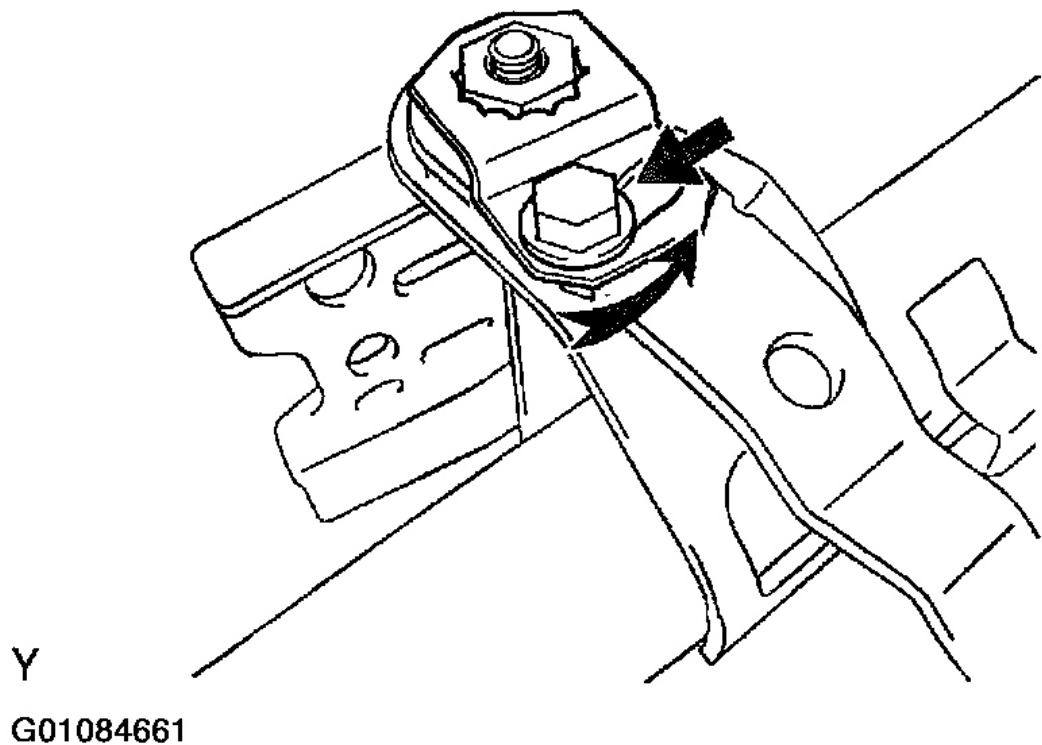


Fig. 27: Installing No.1 Support
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Align the No. 1 support reinforce with the nut to eliminate looseness by turning the No. 1 support reinforce counterclockwise a little, then torque the No. 2 tilt lever lock bolt.

- e. Install the tilt spring.

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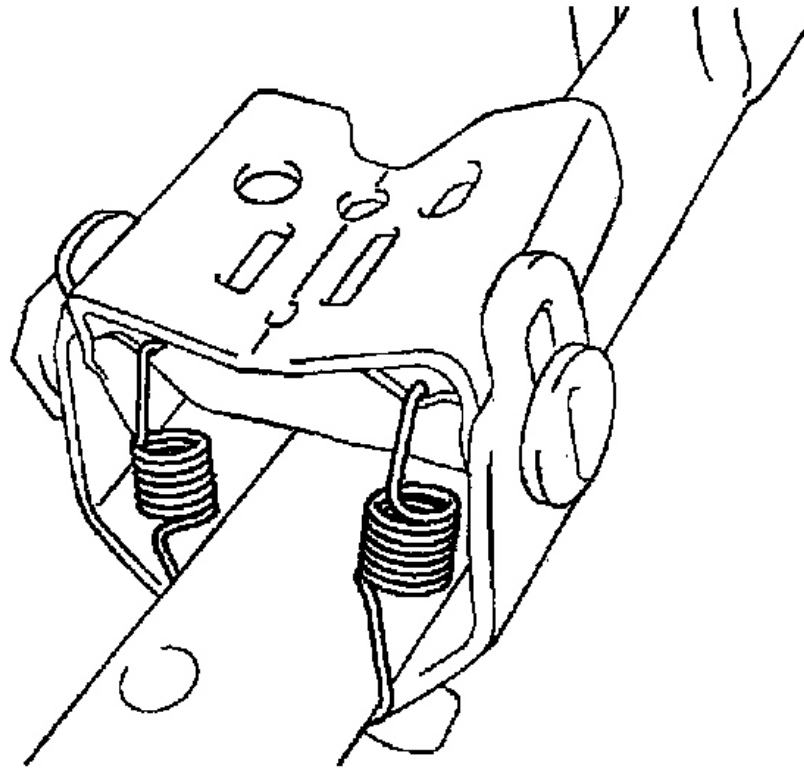


Fig. 28: Displaying Tilt Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. **Install No. 1 support collars and bracket spacer .**
 - a. Install 2 new No. 1 support collars.

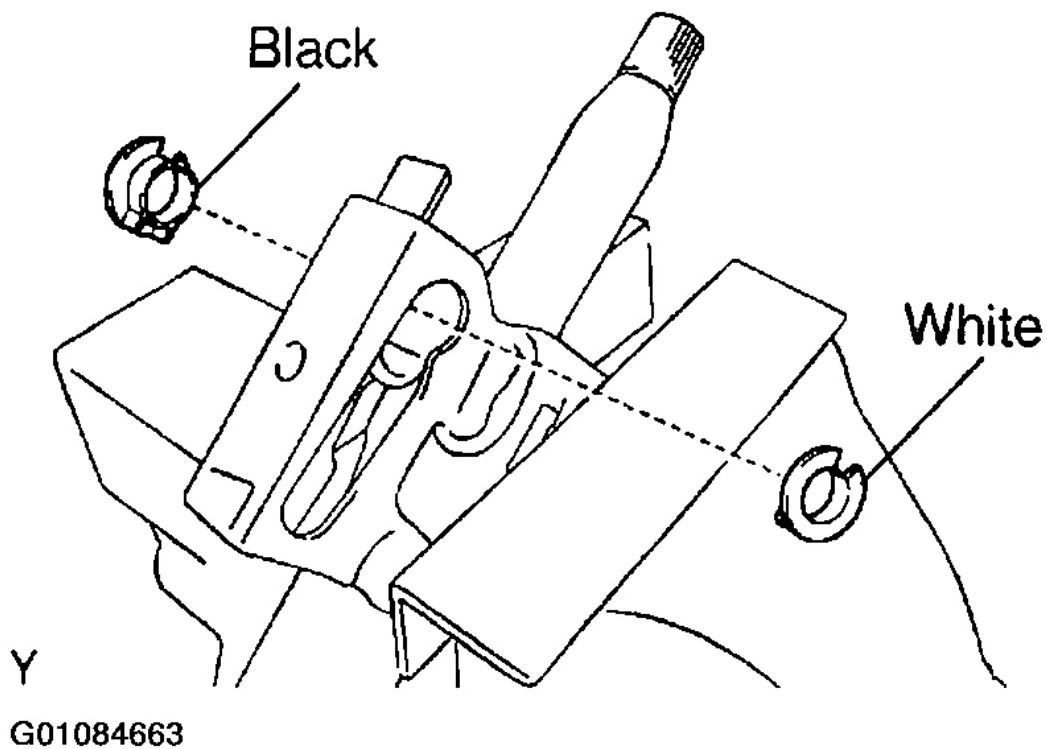


Fig. 29: Installing Black & White No.1 Support Collars
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Install the white support collar to the RH side, black support collar to the LH side.

- b. Using an extension bar and a hammer, drive in the bracket spacer.

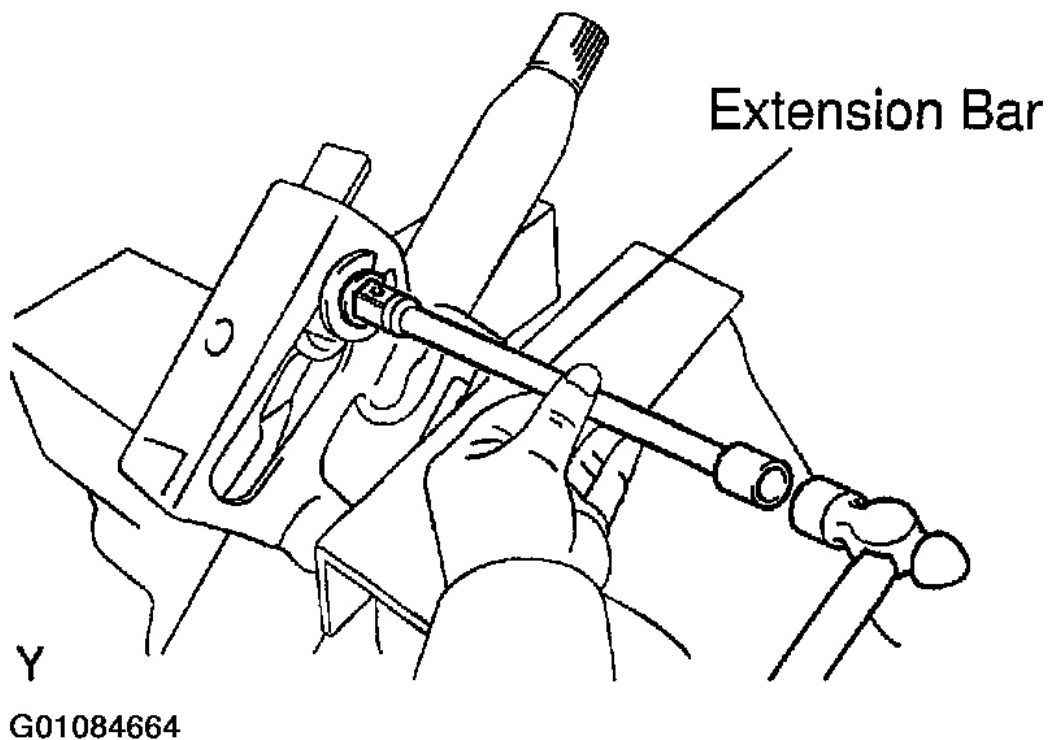


Fig. 30: Identifying Extension Bar
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. **Install column upper bracket and column upper clamp .**
 - a. Install the column upper bracket and column upper clamp with 2 new tapered- head bolts.

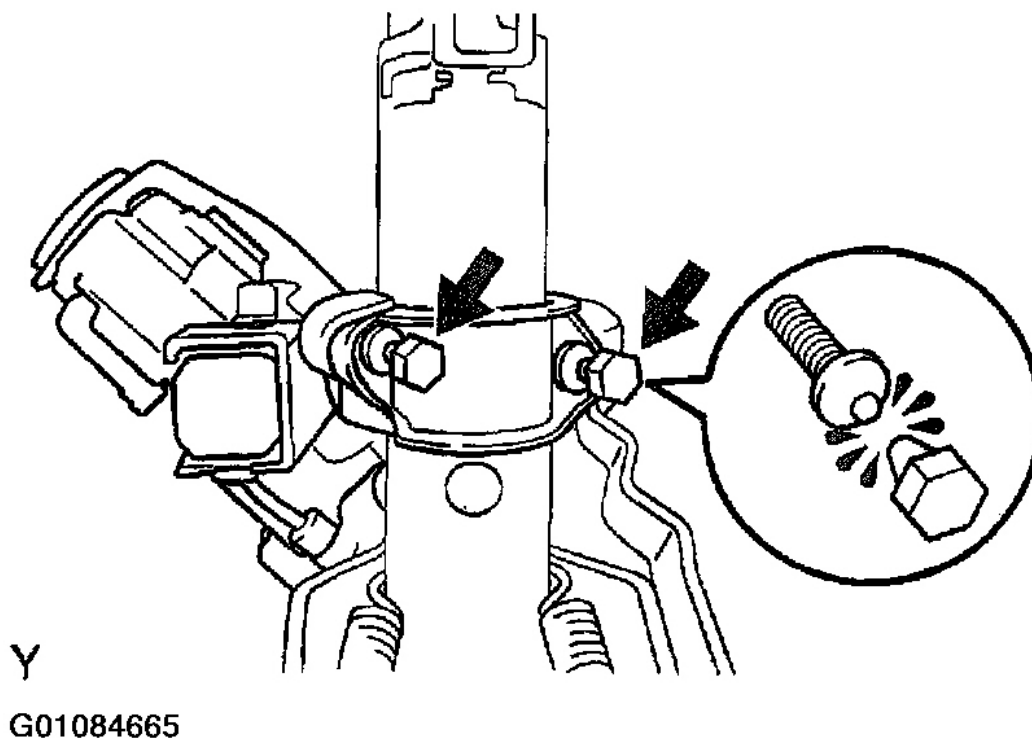


Fig. 31: Installing Column Upper Bracket & Column Upper Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Tighten the 2 tapered-head bolts until the bolt heads break off.

INSTALLATION

1. **Install cruise control switch to steering wheel .**

Install the cruise control switch to the steering wheel with the 2 screws.

2. **Install sliding yoke and No. 2 intermediate shaft .**

- a. Align the matchmarks on the sliding yoke and main shaft assembly.

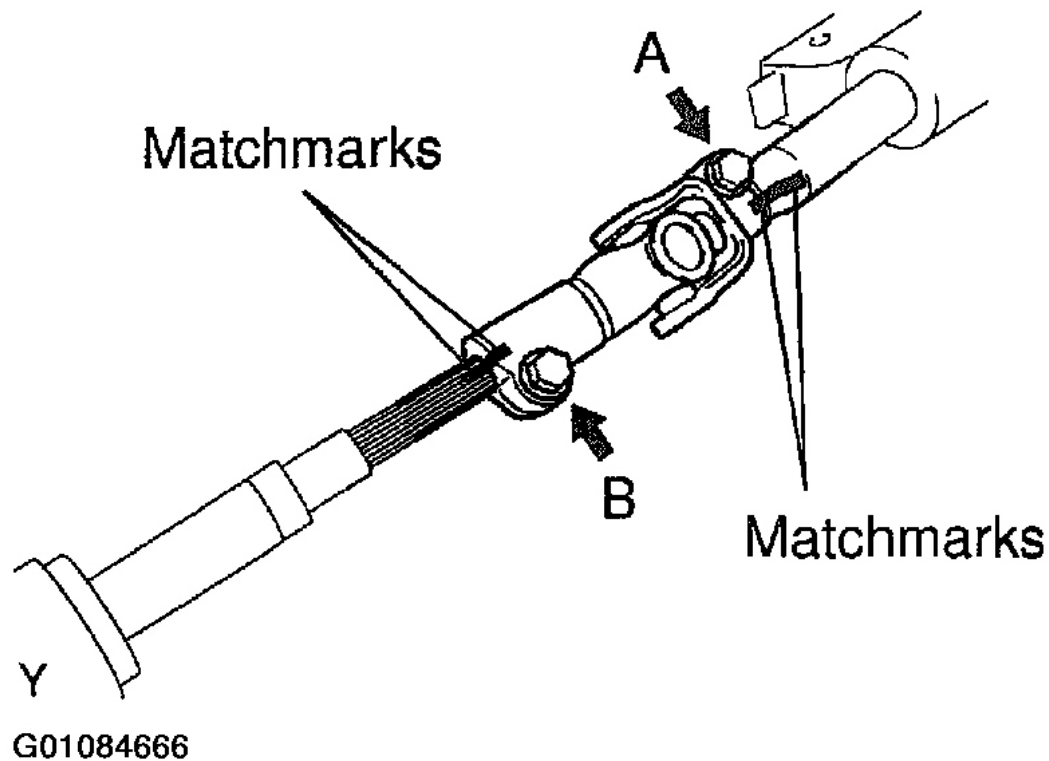


Fig. 32: Aligning Matchmarks & Locating Bolt A & B
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the sliding yoke with the bolt A.

Torque: 36 N.m (360 kgf.cm, 26 ft.lbf)

- c. Align the matchmarks on the No. 2 intermediate shaft and sliding yoke.
- d. Temporarily install the No. 2 intermediate shaft assembly with the bolt B.

3. Install steering column assembly .

- a. Install the steering column assembly with the 3 bolts.

Torque: 21 N.m (210 kgf.cm, 15 ft.lbf)

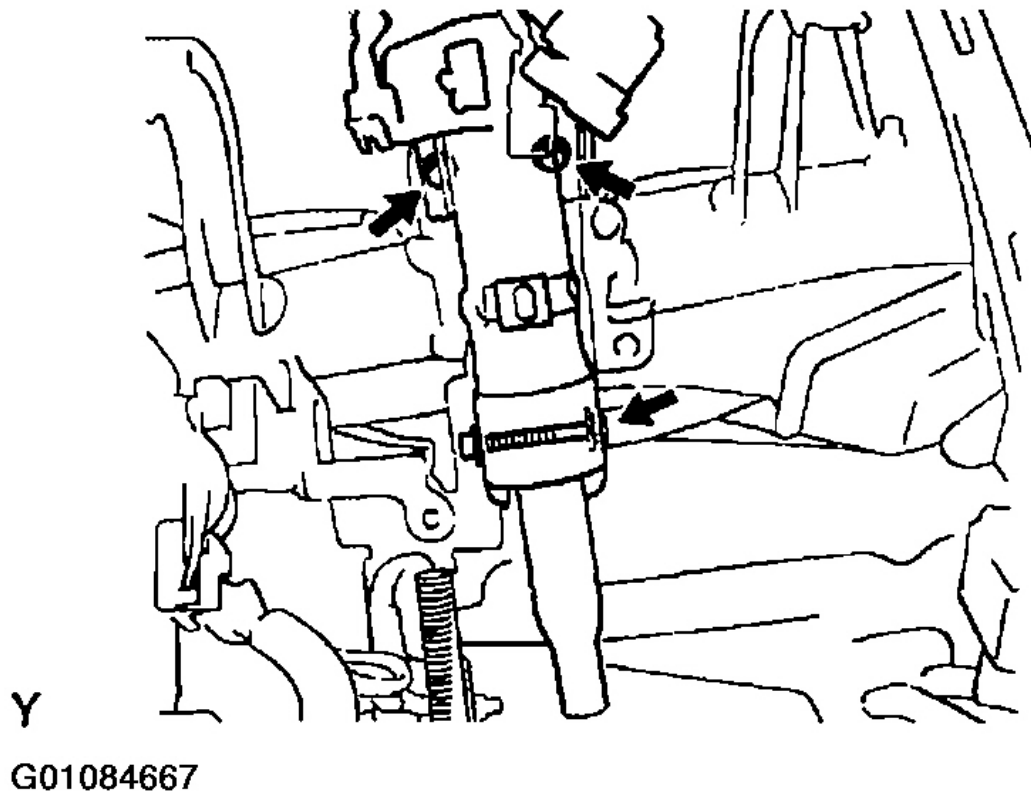
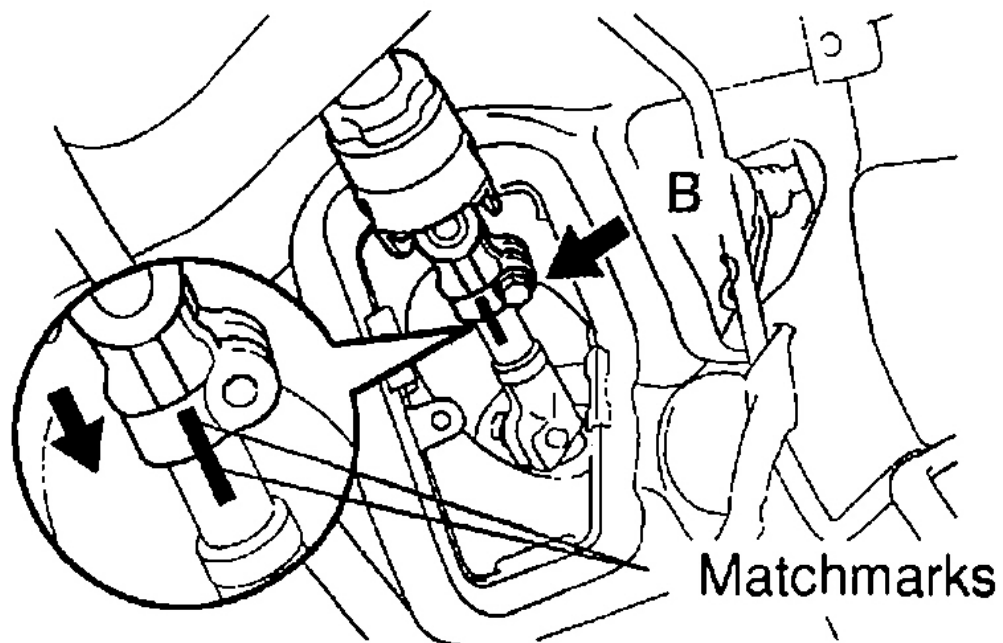
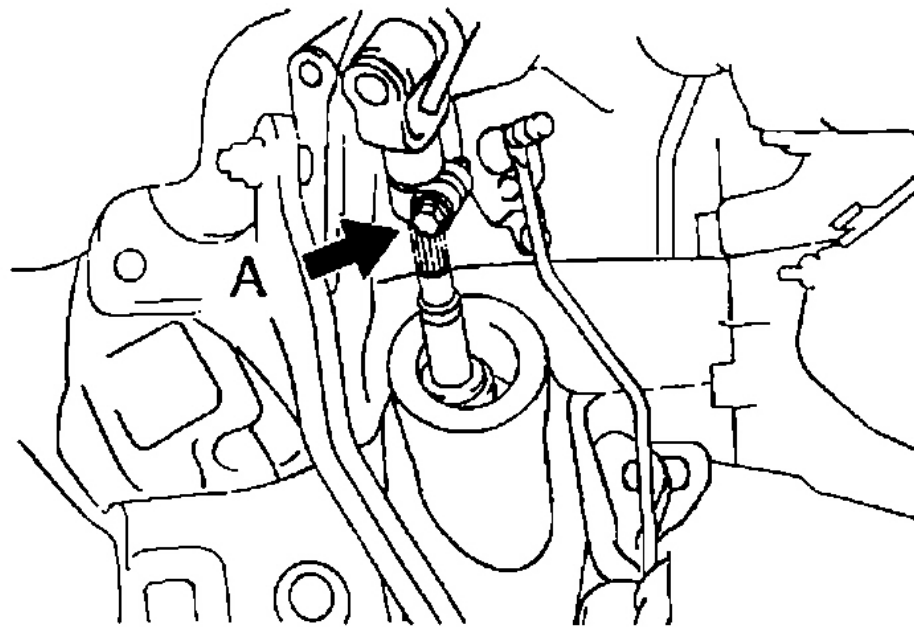


Fig. 33: Installing Steering Column Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the connectors and wire harness clamps.
- 4. **Connect No. 2 intermediate shaft assembly .**
 - a. Put the main shaft lower dust cover to the No. 2 intermediate shaft.
 - b. Align the matchmarks on the No. 2 intermediate shaft assembly and steering intermediate extension.



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Fig. 34: Locating Bolts A & B

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install the bolt B.

Torque: 36 N.m (360 kgf.cm, 26 ft.lbf)

- d. Torque the bolt A.

Torque: 36 N.m (360 kgf.cm, 26 ft.lbf)

- e. Install the main shaft lower dust cover with the 2 bolts.

5. USA: Install LH instrument panel lower insert .

Install the LH instrument panel lower insert with the 4 bolts.

6. Install instrument finish lower panel .

- a. Connect the hood lock control cable.
- b. Connect the connectors.
- c. Install the instrument finish lower panel with the 3 screws.

7. Install No. 1 switch hole base .

Connect the connectors and install the No. 1 switch hole base.

8. Install cowl side trim board .

9. Install front door inside scuff plate .

10. Place column upper cover to steering column assembly .

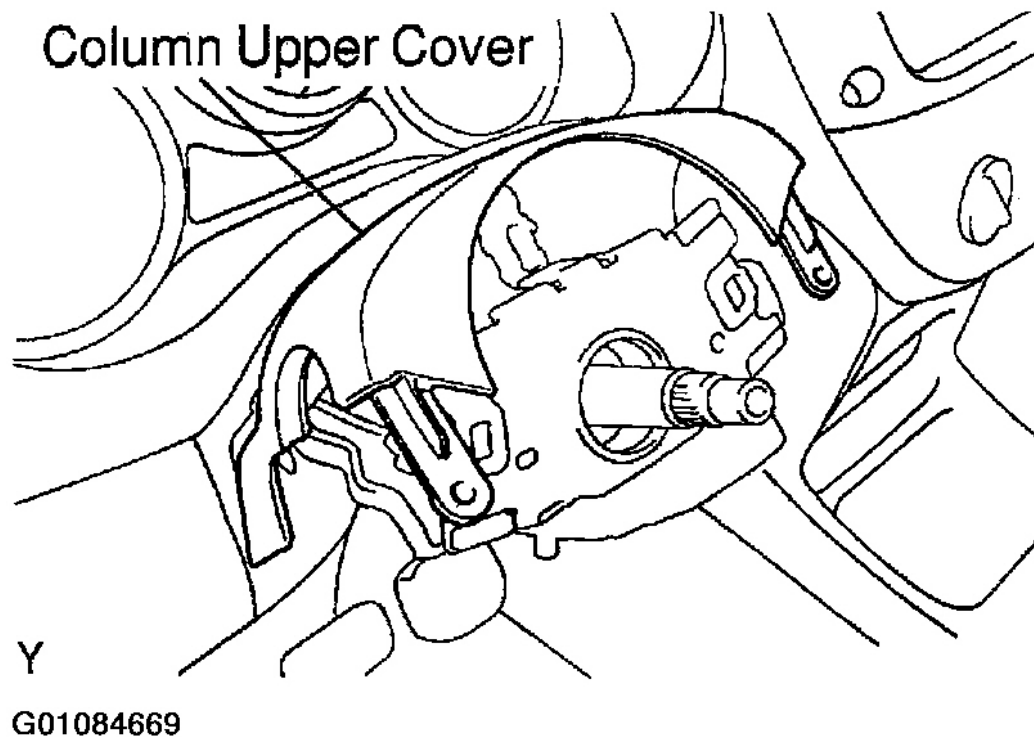


Fig. 35: Identifying Column Upper Cover
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

11. **Install light control switch and headlight dimmer switch, wiper and washer switch and spiral cable .**
 - a. Push into the light control switch and headlight dimmer switch until the claw is latched.

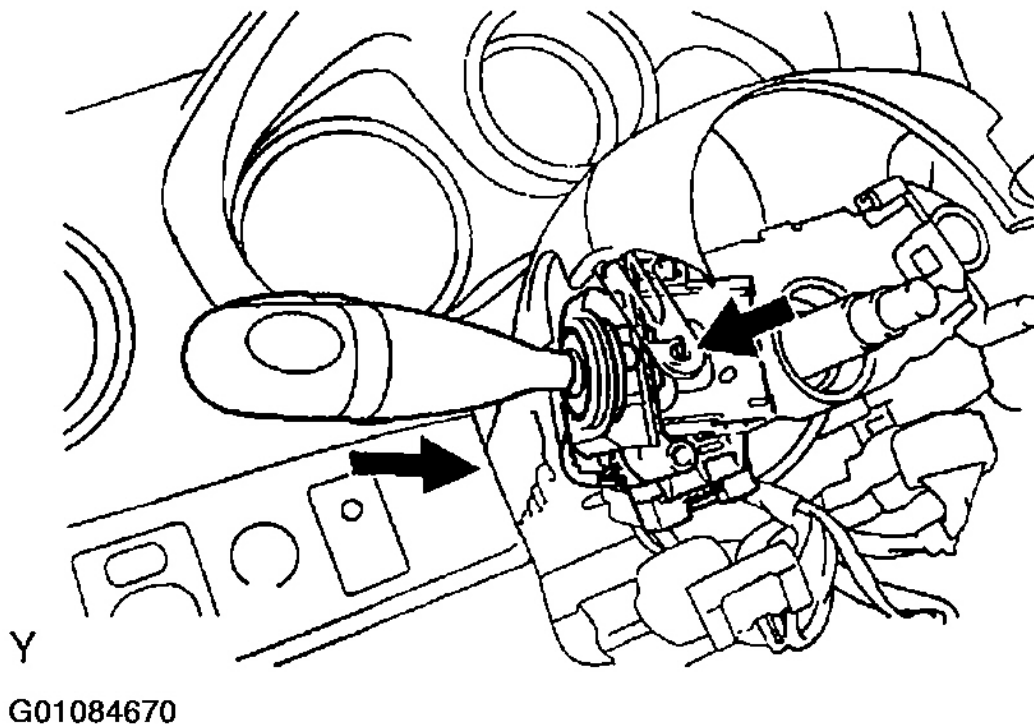


Fig. 36: Installing Light Control Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Employ the same manner described above to the wiper and washer switch.
 - c. Install the spiral cable.
 - d. Connect the 3 connectors to the spiral cable, light control switch and headlight dimmer switch and wiper and washer switch.
 - e. Connect the airbag connector to the spiral cable.
12. **Install column upper and lower covers .**
- Install the column upper and lower covers with the 3 screws.
13. **Center spiral cable .**
- a. Check that the front wheels are facing straight ahead.
 - b. Turn the cable counterclockwise by hand until it becomes harder to turn.
 - c. Then rotate the cable clockwise about 2.5 turns to align the marks.

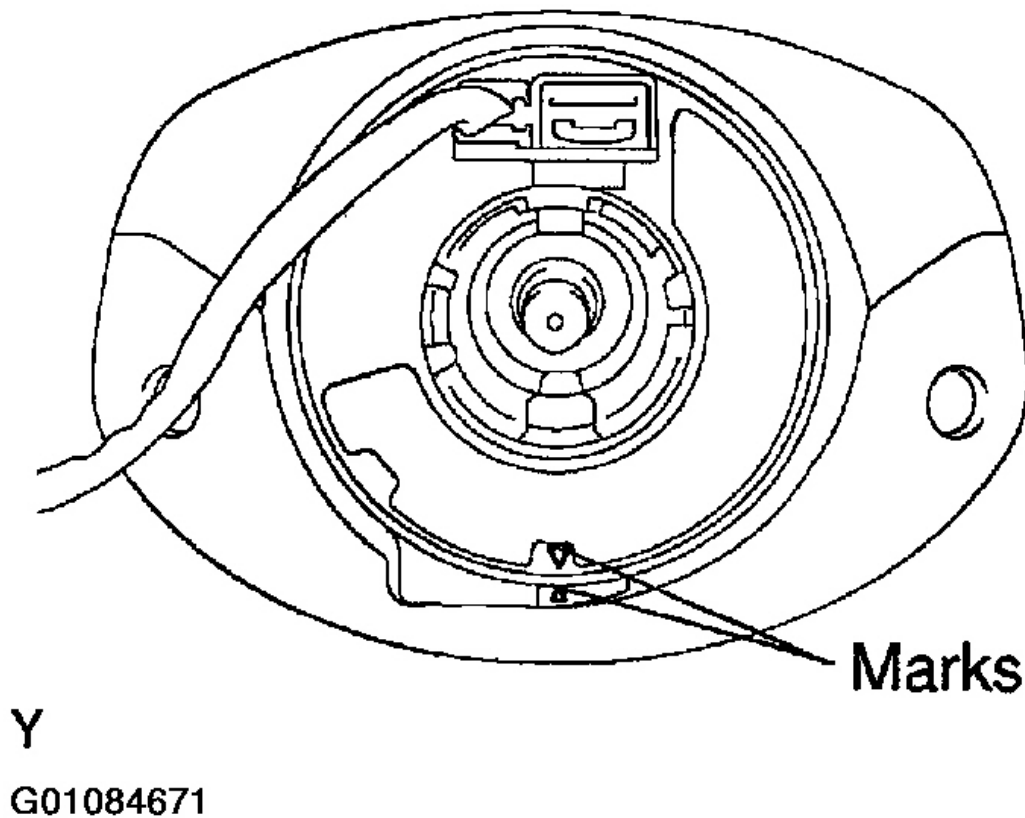


Fig. 37: Checking Spiral Cable
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: The cable will rotate about 2.5 turns to either left or right of the center.

14. **Install steering wheel .**
 - a. Align the matchmarks on the steering wheel and main shaft assembly.
 - b. Install the steering wheel set nut.

Torque: 50 N.m (500 kgf.cm, 35 ft.lbf)
 - c. Connect the connector.

15. **Install steering wheel pad .**

NOTE:

- Never use airbag parts from another vehicle. When replacing parts, replace with new ones.
- Make sure the wheel pad is installed with the specified torque.

- If the wheel pad has been dropped, or there are cracks, dents or other defects in the case or connector, replace the wheel pad with a new one.
 - When installing the wheel pad, take care that the wiring does not interfere with other parts and that they are not pinched between other parts.
- a. Connect the airbag connector.
 - b. Install the steering wheel pad after confirming that the circumference groove of the Torx screws is caught on the screw case.

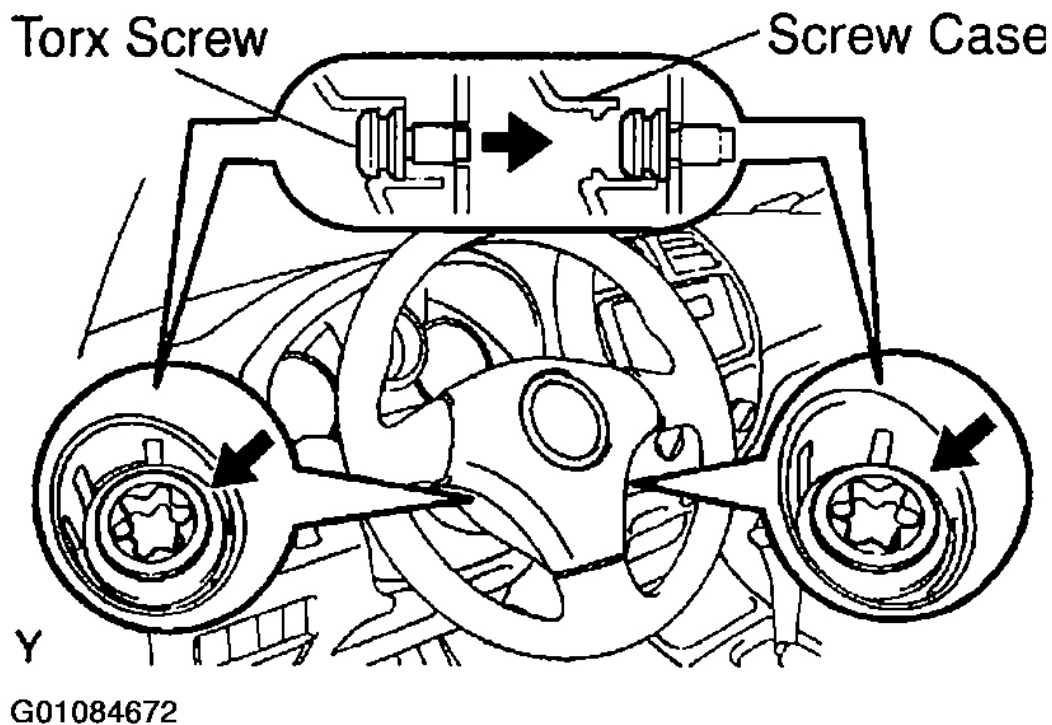


Fig. 38: Locating Screw Case & Torx Screw
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a Torx socket wrench (T30), torque the 2 screws.

Torque: 8.8 N.m (90 kgf.cm, 78 in.lbf)

16. Check steering wheel center point .