

STEERING

Steering Column (Preparation) - Sienna

STEERING COLUMN

SST

SST

	09950-50013	Puller C Set	
	(09951-05010)	Hanger 150	
	(09952-05010)	Slide Arm	
	(09953-05020)	Center Bolt 150	
	(09954-05070)	Claw No. 7	

RECOMMENDED TOOLS

RECOMMENDED TOOLS

	09080-1C110	Toyota Electrical Tester Set	
	09080-2C100	Test Lead Set	

EQUIPMENT

EQUIPMENT

Torque wrench	
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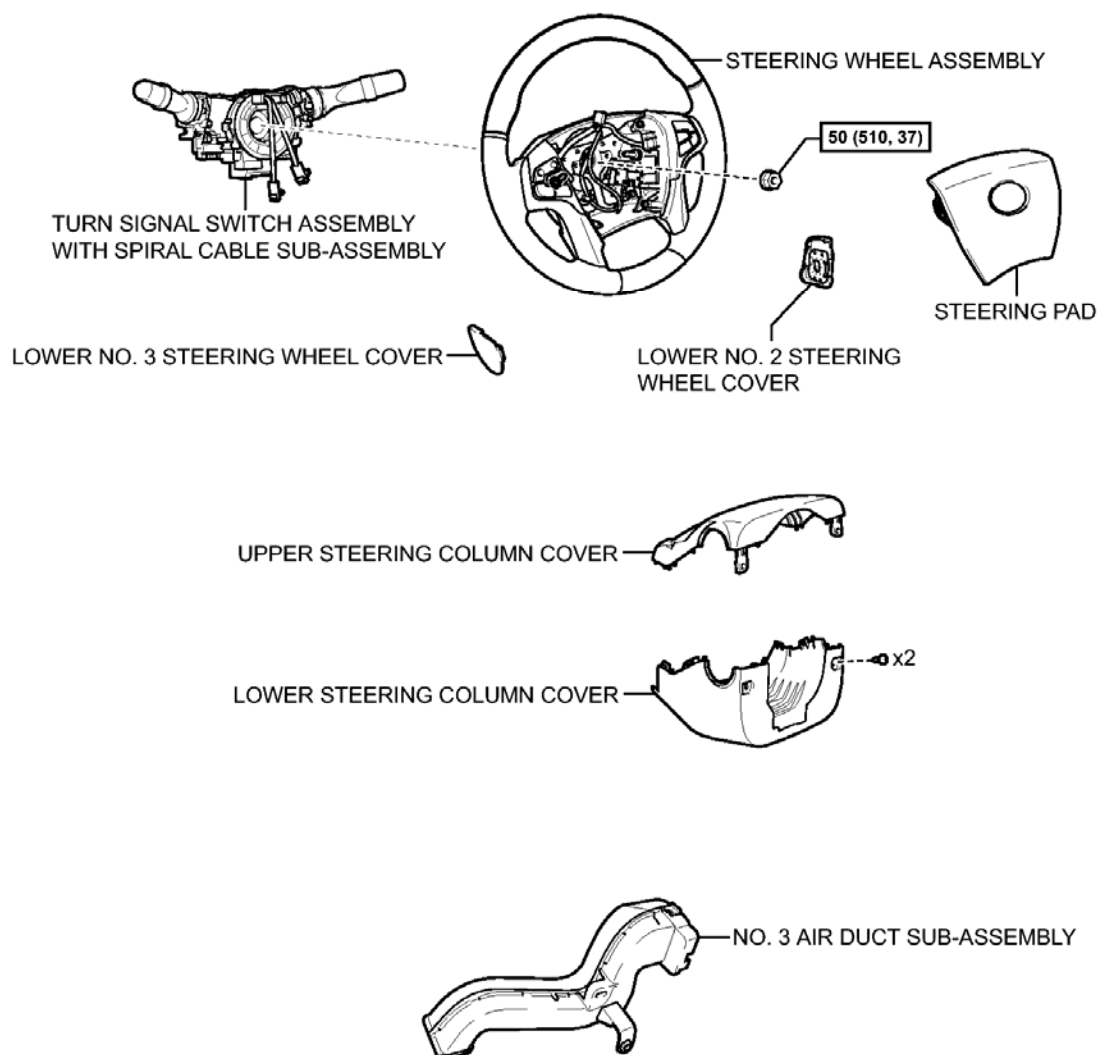
STEERING

Steering Column (Service Information) - Sienna

STEERING COLUMN ASSEMBLY

COMPONENTS

ILLUSTRATION



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

Fig. 1: Steering Column Assembly Replacement Components With Torque Specifications (1 of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION

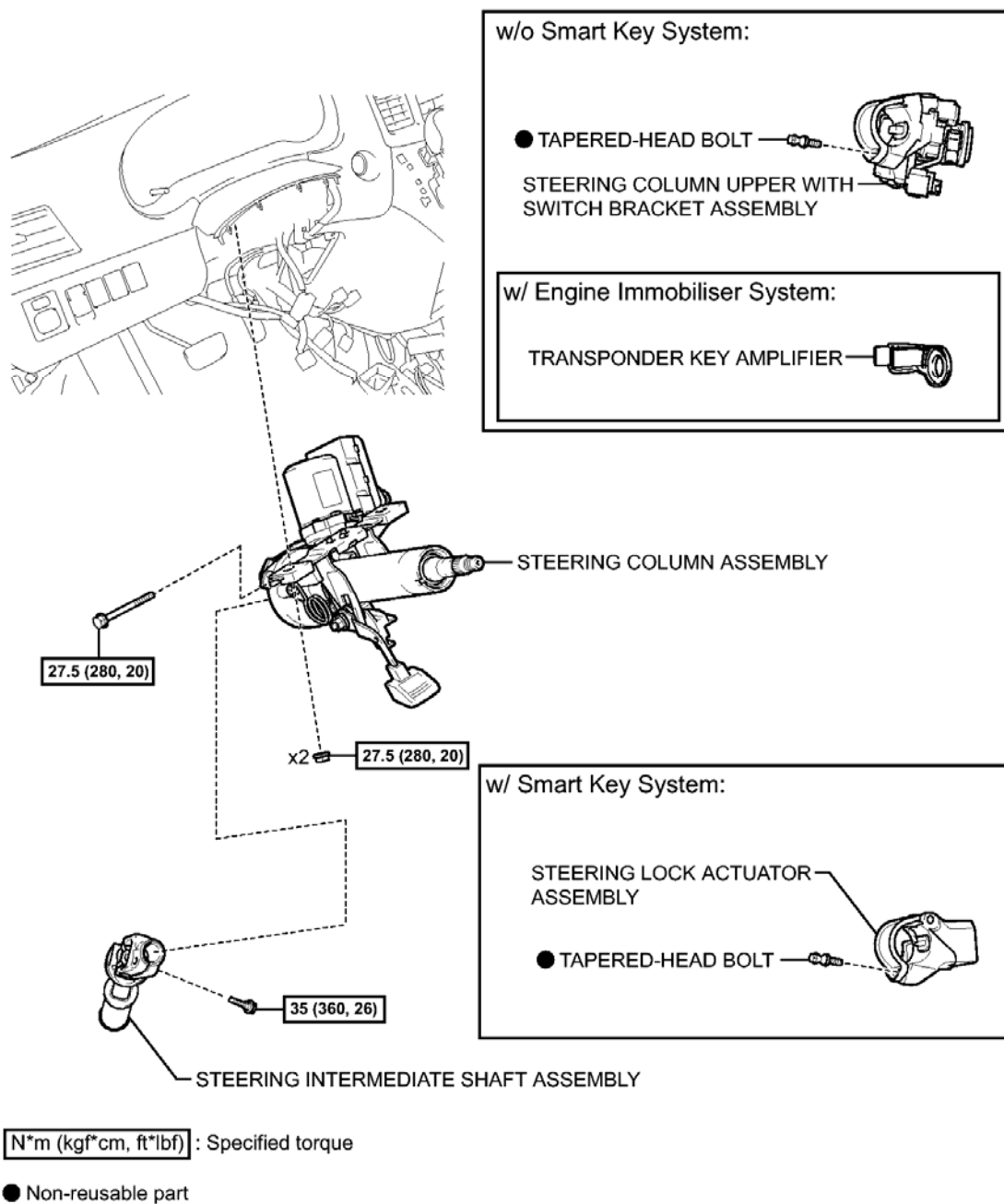
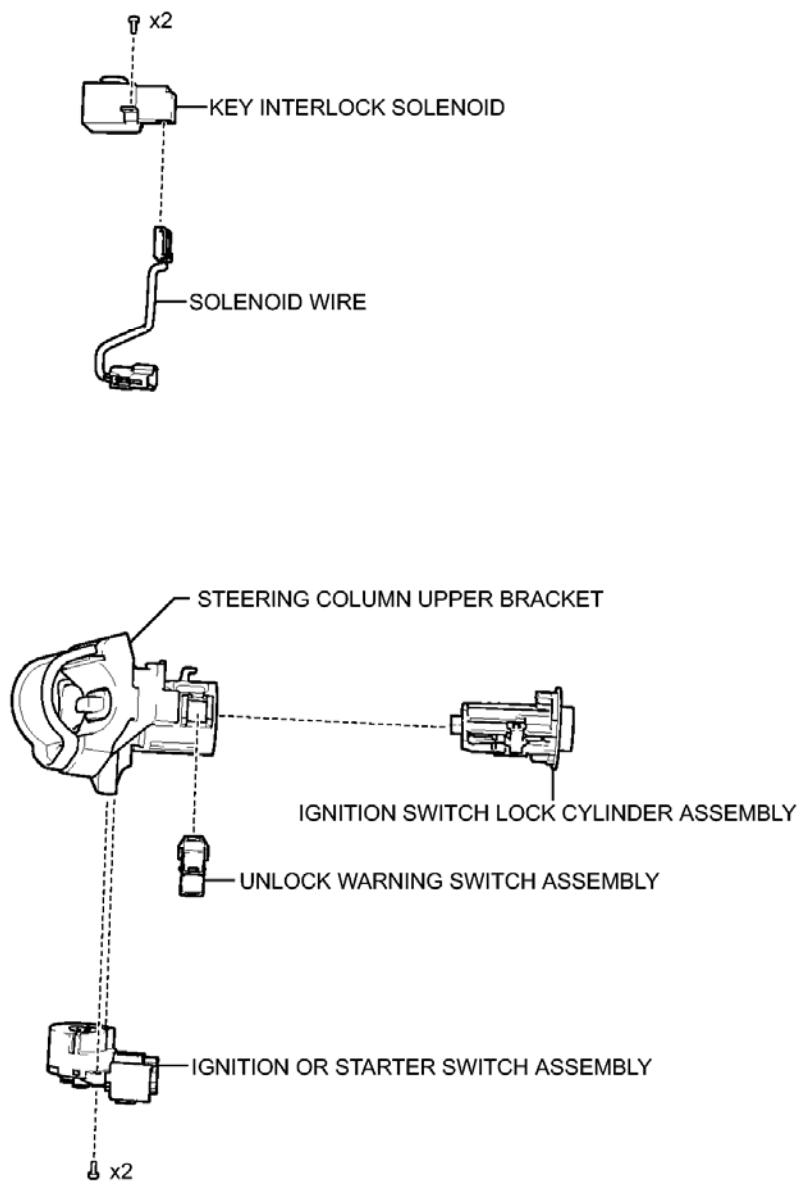


Fig. 2: Steering Column Assembly Replacement Components With Torque Specifications (2 of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION

w/o Smart Key System:



c

Fig. 3: Steering Column Assembly Replacement Components (w/o Smart Key System) (3 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

WARNING: Some of these service operations affect the SRS airbag system. Read the precautionary notices concerning the SRS airbag system before servicing the steering column. Refer to PRECAUTION .

1. PRECAUTION

Refer to PRECAUTION

2. TURN FRONT WHEELS TO FACE STRAIGHT AHEAD

3. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

WARNING: Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

NOTE: When disconnecting the cable, some systems need to be initialized after the cable is reconnected. Refer to INITIALIZATION .

4. REMOVE DRIVER SIDE KNEE AIRBAG ASSEMBLY

Refer to REMOVAL

5. REMOVE NO. 3 AIR DUCT SUB-ASSEMBLY . Refer to REMOVAL - Step 15

6. REMOVE LOWER NO. 3 STEERING WHEEL COVER . Refer to REMOVAL - Step 2

7. REMOVE LOWER NO. 2 STEERING WHEEL COVER . Refer to REMOVAL - Step 3

8. REMOVE STEERING PAD . Refer to REMOVAL - Step 4

9. REMOVE STEERING WHEEL ASSEMBLY See step 6

10. REMOVE LOWER STEERING COLUMN COVER

- a. Remove the 2 screws.

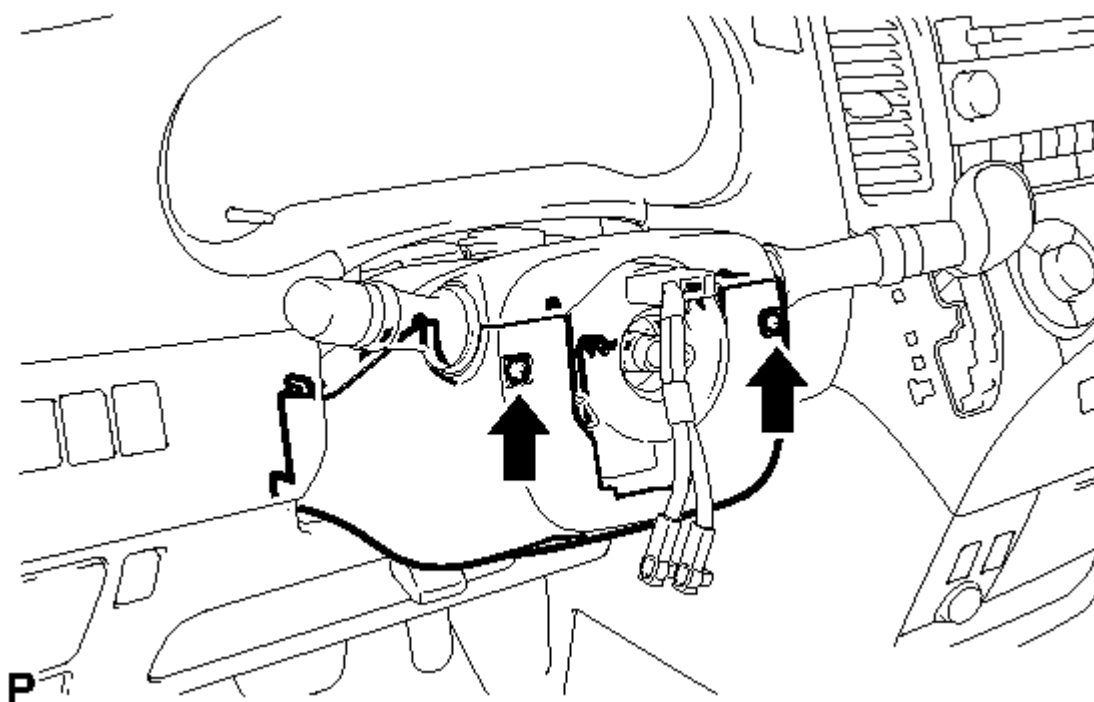


Fig. 4: Identifying Lower Steering Column Cover & Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Push the right and left sides of the lower steering column cover, and disengage the 4 claws.

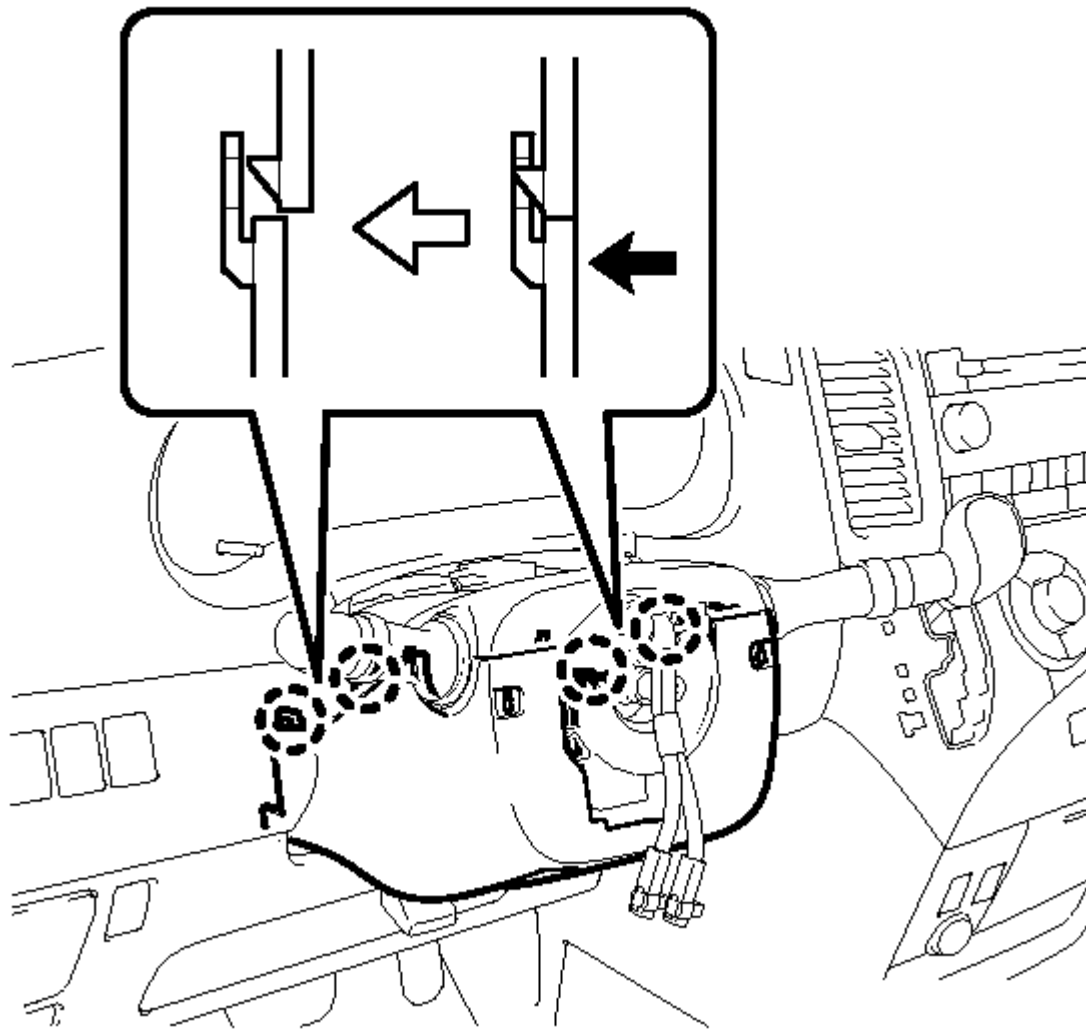
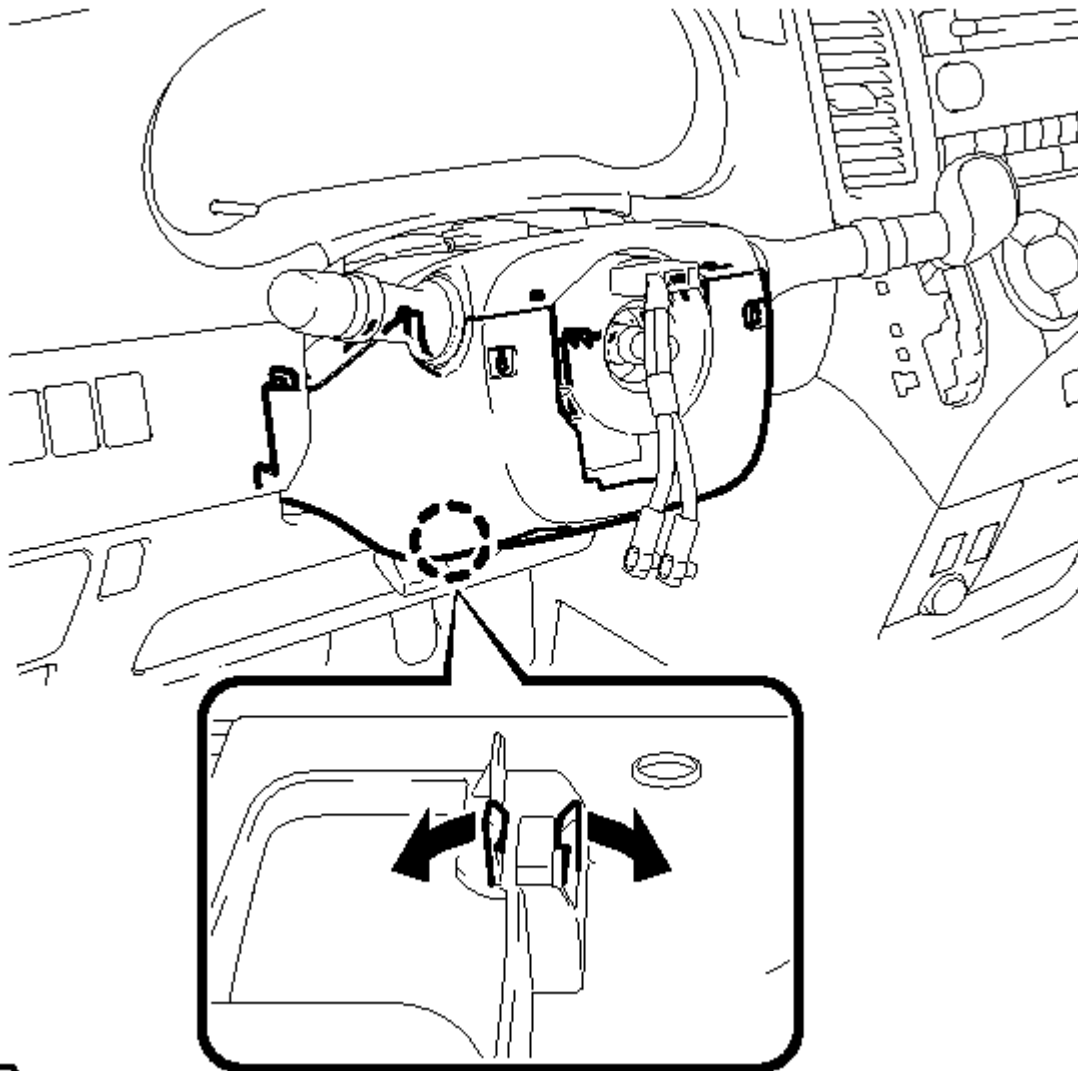


Fig. 5: Identifying Lower Steering Column Cover Claws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Insert fingers into the opening of the tilt lever of the lower steering column cover to detach the claw.



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Fig. 6: Identifying Lower Steering Column Cover Tilt Lever & Claws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

Spread the claw to disengage it.

11. REMOVE UPPER STEERING COLUMN COVER

- a. Disengage the claw.

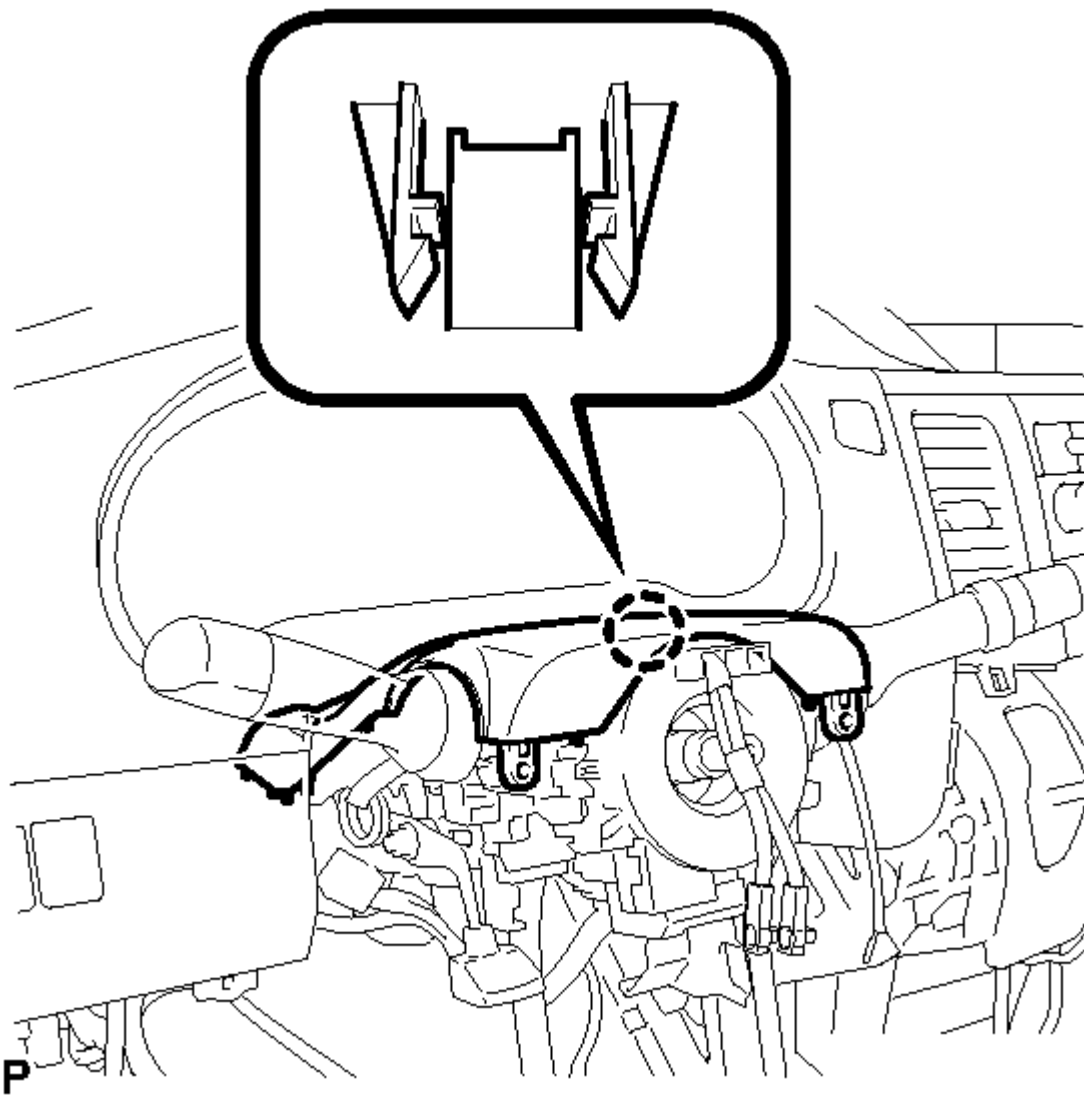
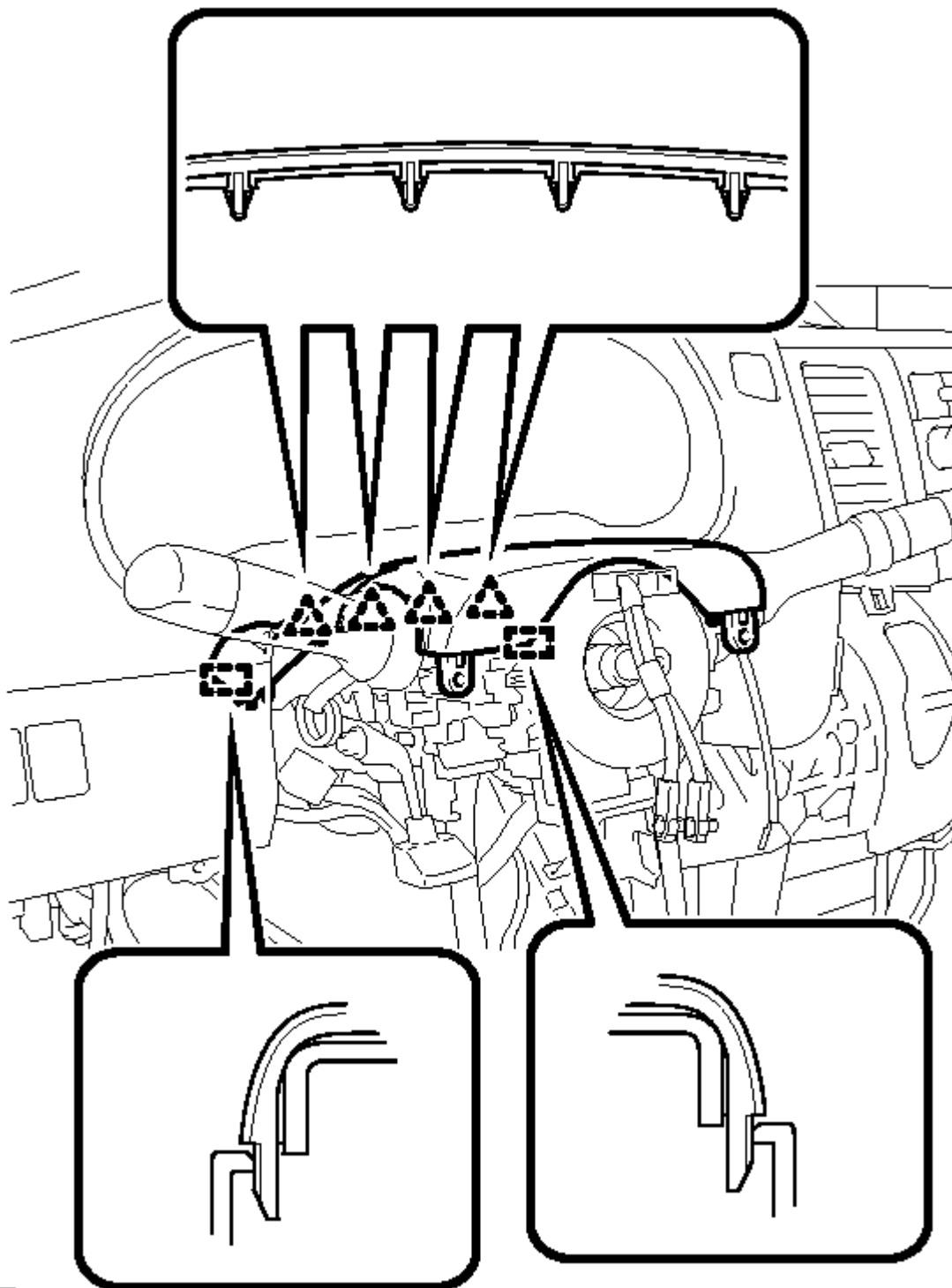


Fig. 7: Identifying Upper Steering Column Cover & Claw
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disengage the 4 clips and 2 guides to remove the upper steering column cover.

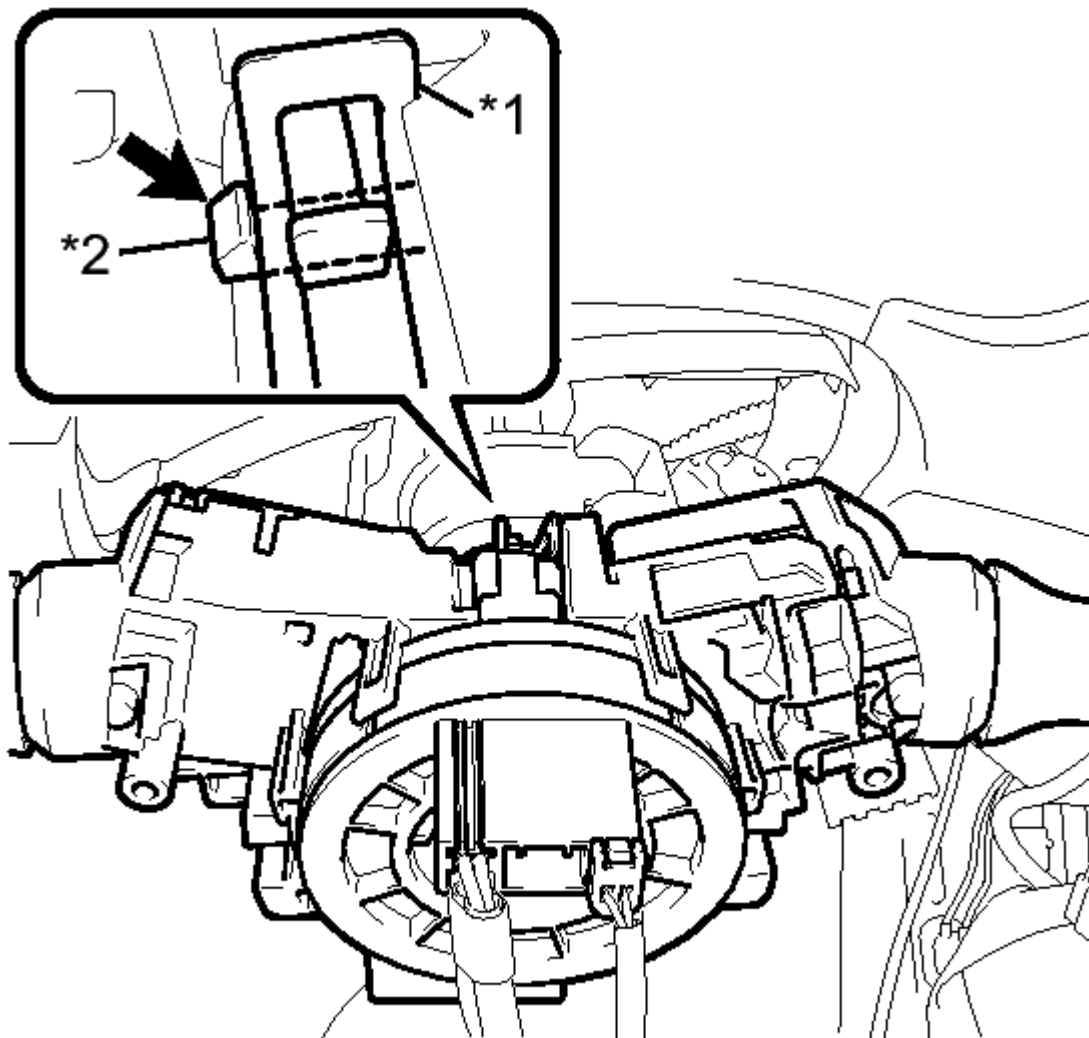


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Fig. 8: Identifying Upper Steering Column Cover Clips & Guides
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

12. **REMOVE TURN SIGNAL SWITCH ASSEMBLY WITH SPIRAL CABLE SUB-ASSEMBLY**
 - a. Disconnect the connectors from the turn signal switch assembly with spiral cable sub-assembly.

- b. Using pliers, expand the clamp.



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Fig. 9: Identifying Turn Signal Switch Assembly With Spiral Cable Sub-Assembly, Clamp & Claws

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

TEXT IN ILLUSTRATION

*1	Clamp
*2	Claw

- c. While holding the clamp expanded, raise the claw using a screwdriver to disengage it, and then remove the turn signal switch assembly with spiral cable sub-assembly from the steering column assembly.

NOTE:

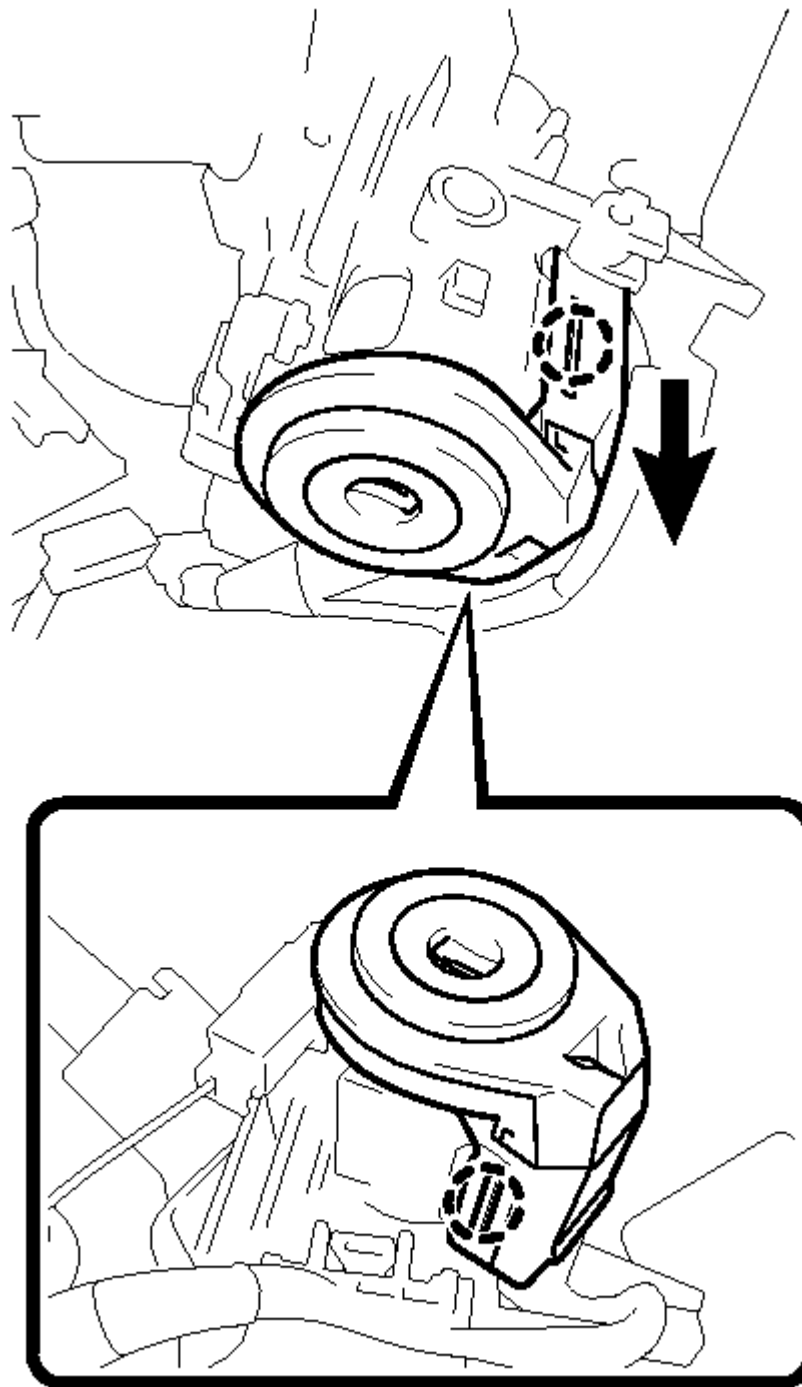
- Do not replace the spiral cable with the battery connected and

the ignition switch to ON.

- Do not rotate the spiral cable with the battery connected and the ignition switch to ON.
- Ensure that the steering wheel is installed and aligned straight when inspecting the steering sensor.
- Do not remove the steering sensor from the spiral cable.

13. REMOVE TRANSPONDER KEY AMPLIFIER (w/ Engine Immobilizer System)

- a. Slide the transponder key amplifier to disengage the 2 claws as shown in the illustration.

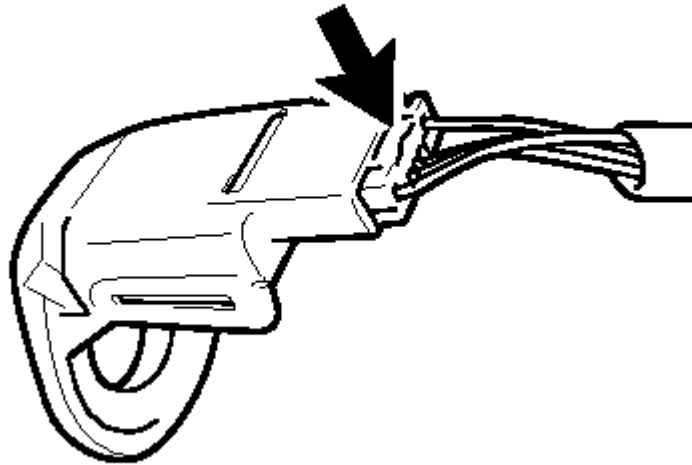


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Fig. 10: Sliding Transponder Key Amplifier

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

- b. Disconnect the connector and remove the transponder key amplifier.

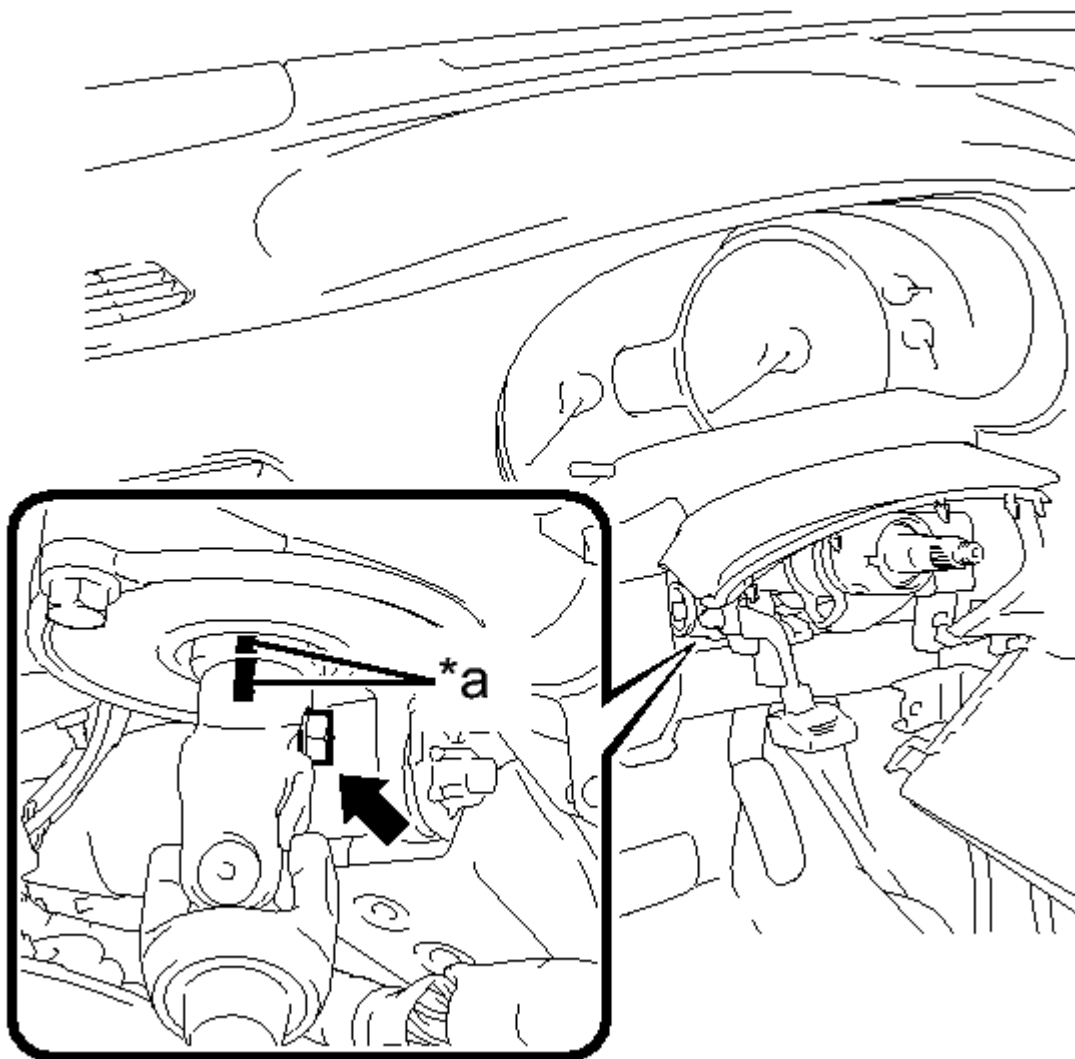


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Fig. 11: Identifying Transponder Key Amplifier Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

14. SEPARATE STEERING INTERMEDIATE SHAFT ASSEMBLY

- a. Put matchmarks on the steering intermediate shaft assembly and the power steering column assembly.



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Fig. 12: Identifying Steering Intermediate Shaft Assembly & Power Steering Column Assembly Matchmarks

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

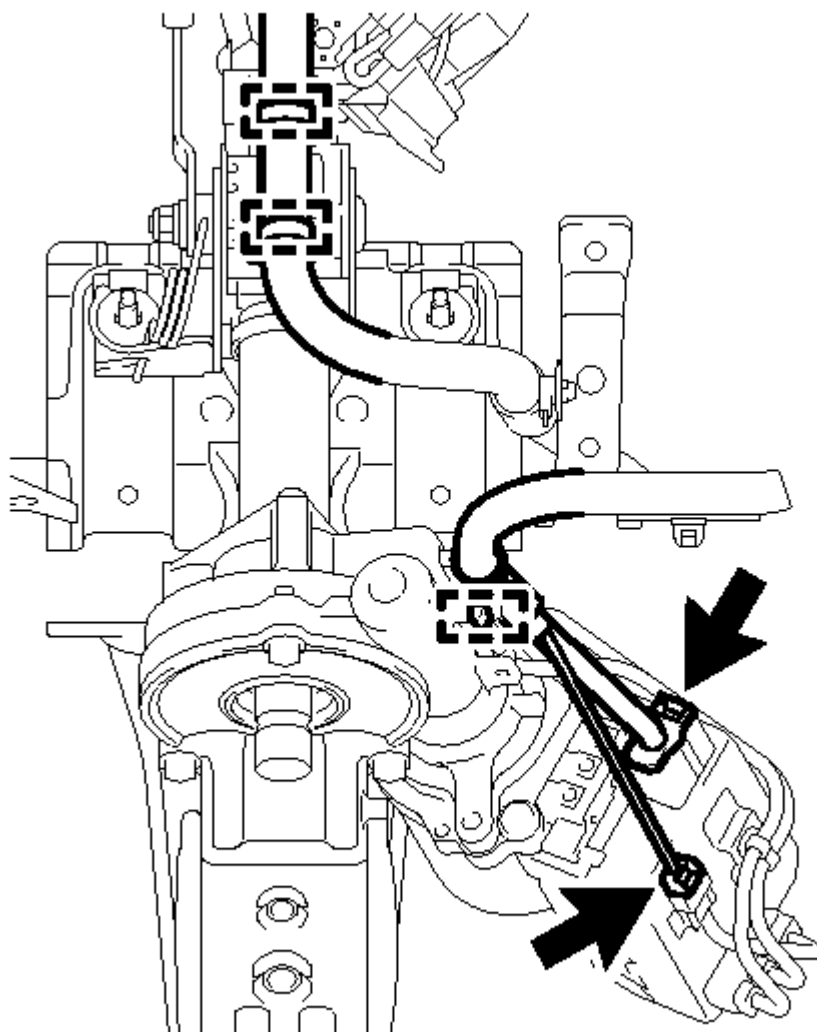
TEXT IN ILLUSTRATION

***a** Matchmark

- b. Remove the bolt.
- c. Separate the steering intermediate shaft assembly from the power steering column assembly.

15. REMOVE STEERING COLUMN ASSEMBLY

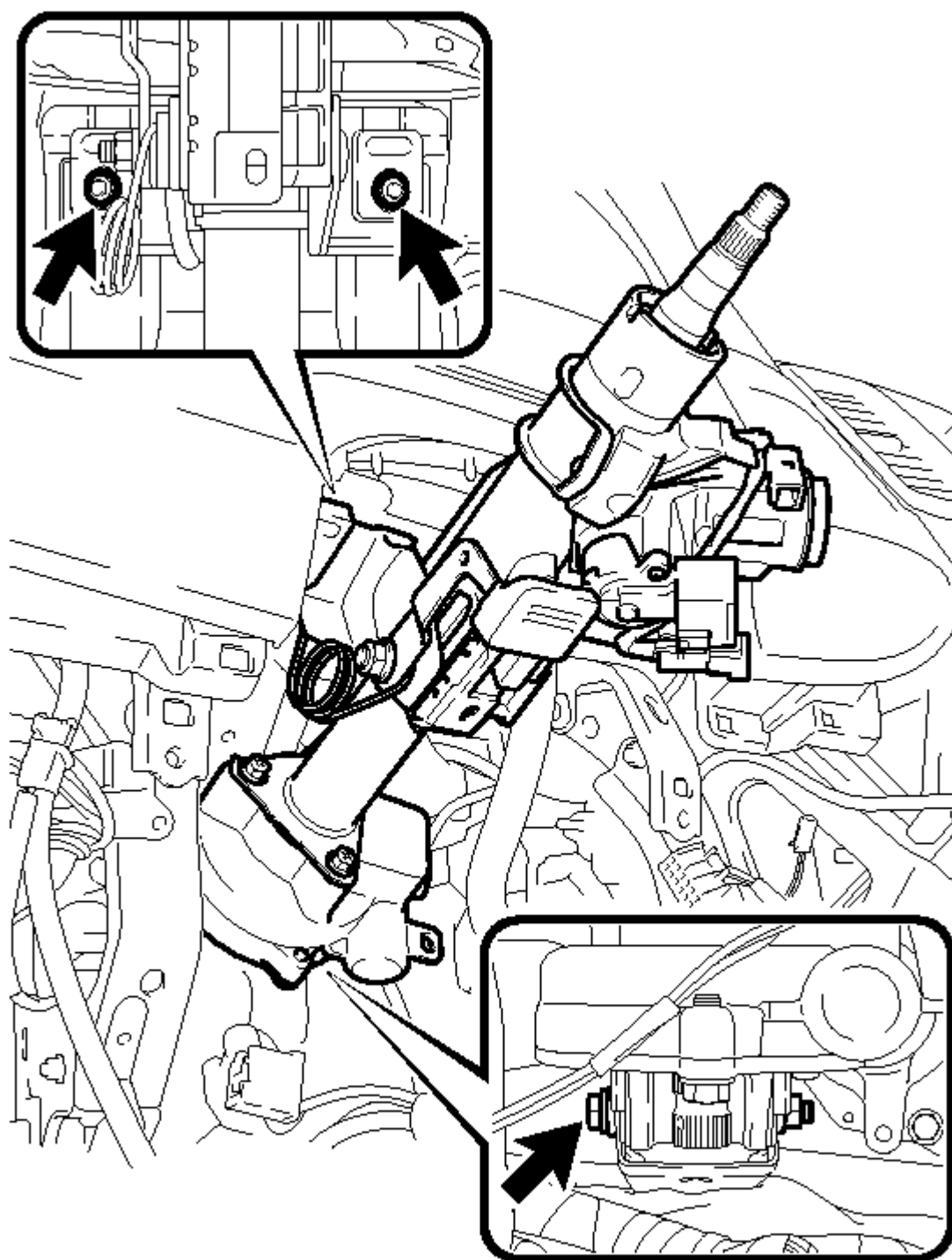
- a. Disconnect the 2 connectors and disengage the wire harness clamps from the steering column assembly.



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Fig. 13: Identifying Steering Column Assembly Connectors & Wire Harness Clamps
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the bolt and 2 nuts, and the steering column assembly.



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Fig. 14: Identifying Steering Column Assembly, Nuts & Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

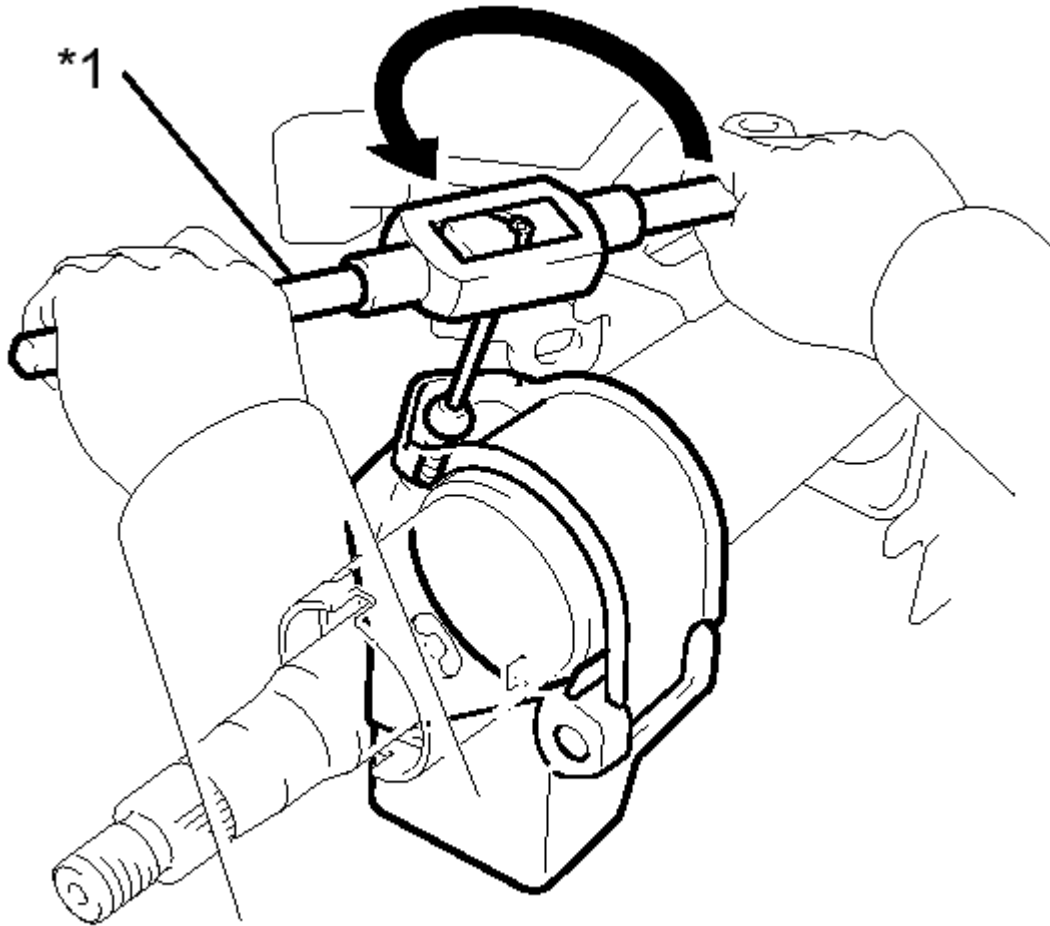
DISASSEMBLY

DISASSEMBLY

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

1. REMOVE STEERING LOCK ACTUATOR ASSEMBLY (w/ Smart Key System)

- a. Secure the steering column assembly in a vise.
- b. Using a center punch, mark the center of the tapered-head bolt.
- c. Using a 3 to 4 mm (0.118 to 0.157 in.) diameter drill bit, drill a hole in the tapered-head bolt.
- d. Using a screw extractor, remove the tapered-head bolt, and then remove the steering lock actuator assembly from the steering column assembly.



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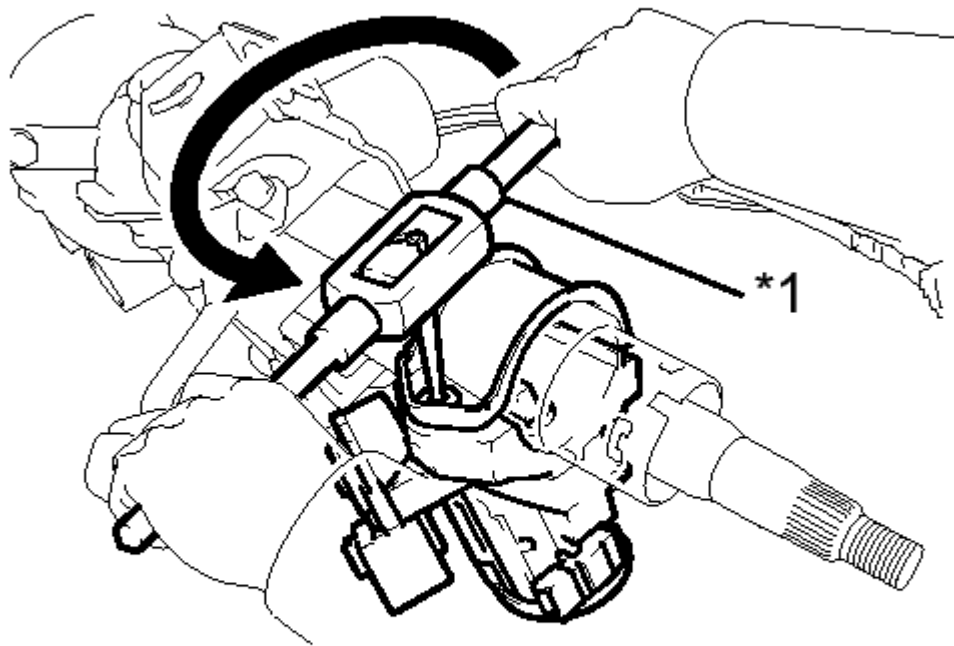
Fig. 15: Removing Steering Lock Actuator Assembly Screw Using A Screw Extractor (w/ Smart Key System)

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

TEXT IN ILLUSTRATION

*1	Screw Extractor
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2. **REMOVE STEERING COLUMN UPPER WITH SWITCH BRACKET ASSEMBLY (w/o Smart Key System)**
 - a. Secure the steering column assembly in a vise.
 - b. Using a center punch, mark the center of the tapered-head bolt.
 - c. Using a 3 to 4 mm (0.118 to 0.157 in.) diameter drill bit, drill a hole in the tapered-head bolt.
 - d. Using a screw extractor, remove the tapered-head bolt, and then remove the steering column upper with switch bracket assembly from the steering column assembly.



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Fig. 16: Removing Steering Lock Actuator Assembly Screw Using A Screw Extractor (w/o Smart Key System)

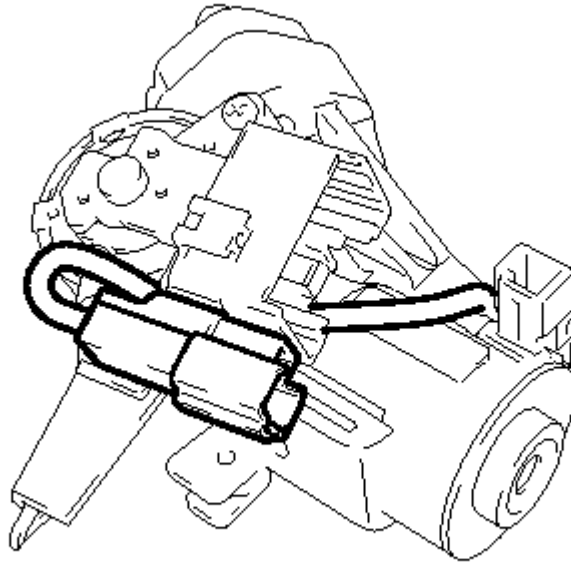
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Screw Extractor
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3. REMOVE IGNITION OR STARTER SWITCH ASSEMBLY (w/o Smart Key System)

- a. Remove the solenoid wire connector from the ignition or starter switch assembly.

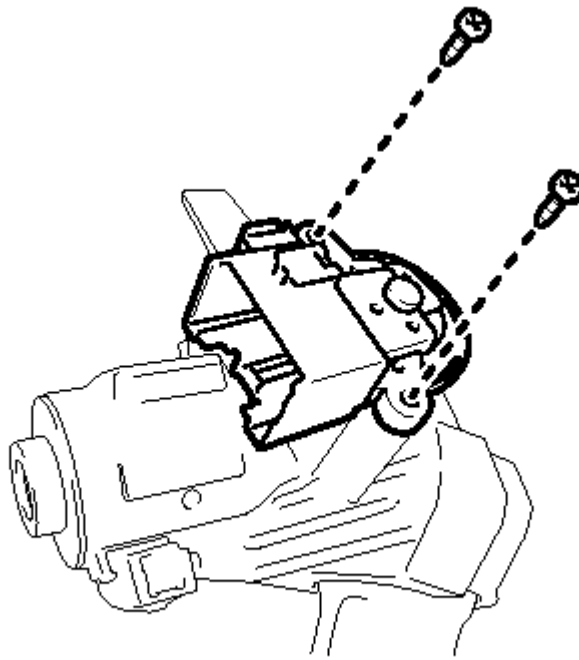


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Fig. 17: Identifying Solenoid Wire Connector

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

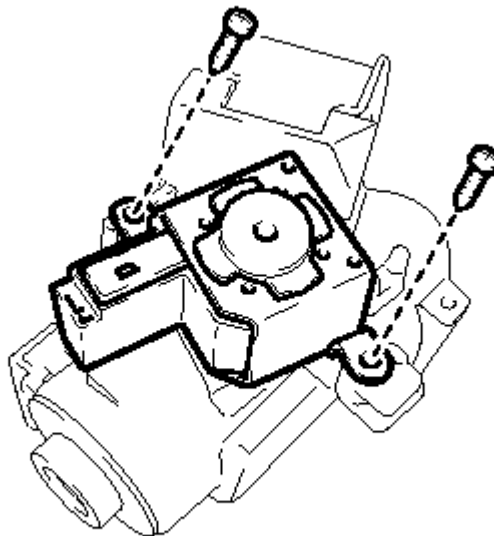
- b. Remove the 2 screws and the ignition or starter switch assembly from the steering column upper bracket.



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Fig. 18: Identifying Ignition Or Starter Switch Assembly Mounting Screws
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. **REMOVE KEY INTERLOCK SOLENOID (w/o Smart Key System)**
 - a. Remove the 2 screws and the key interlock solenoid from the steering column upper bracket.

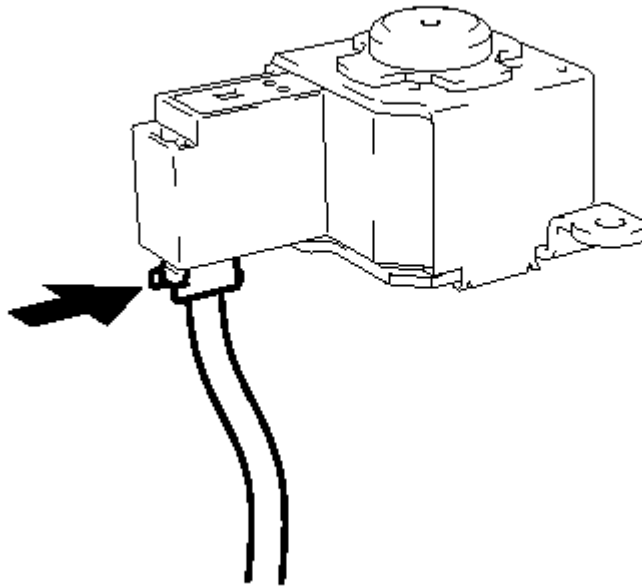


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Fig. 19: Identifying Key Interlock Solenoid Screws

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

- b. Disconnect the solenoid wire connector from the key interlock solenoid.

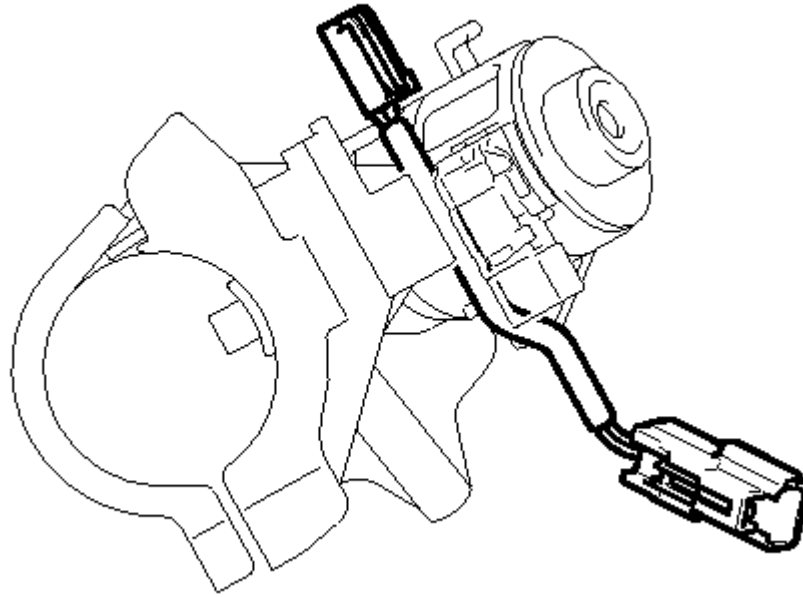


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Fig. 20: Locating Key Interlock Solenoid Wire Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. REMOVE SOLENOID WIRE (w/o Smart Key System)

- a. Remove the solenoid wire from the steering column upper bracket.

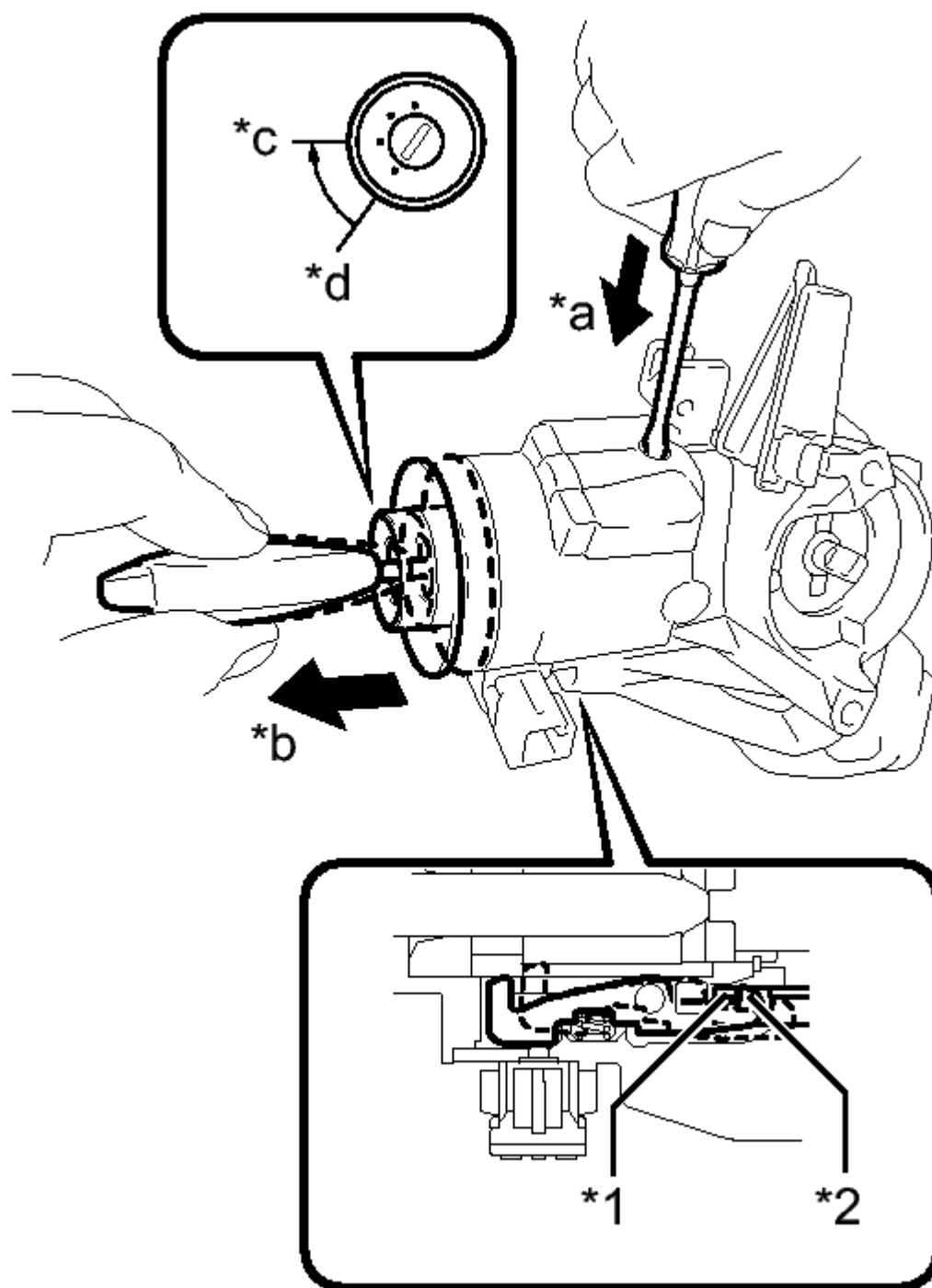


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Fig. 21: Identifying Solenoid Wire

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

6. **REMOVE IGNITION SWITCH LOCK CYLINDER ASSEMBLY (w/o Smart Key System)**
 - a. Turn the ignition switch lock cylinder assembly to the ACC position.
 - b. Insert a screwdriver into the hole of the steering column upper with switch bracket assembly as shown in the illustration. Pull the ignition switch lock cylinder assembly until its claw contacts the stopper of the steering column upper with switch bracket assembly.



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Fig. 22: Remove Ignition Switch Lock Cylinder Assembly With Screwdriver (w/o Smart Key System)

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

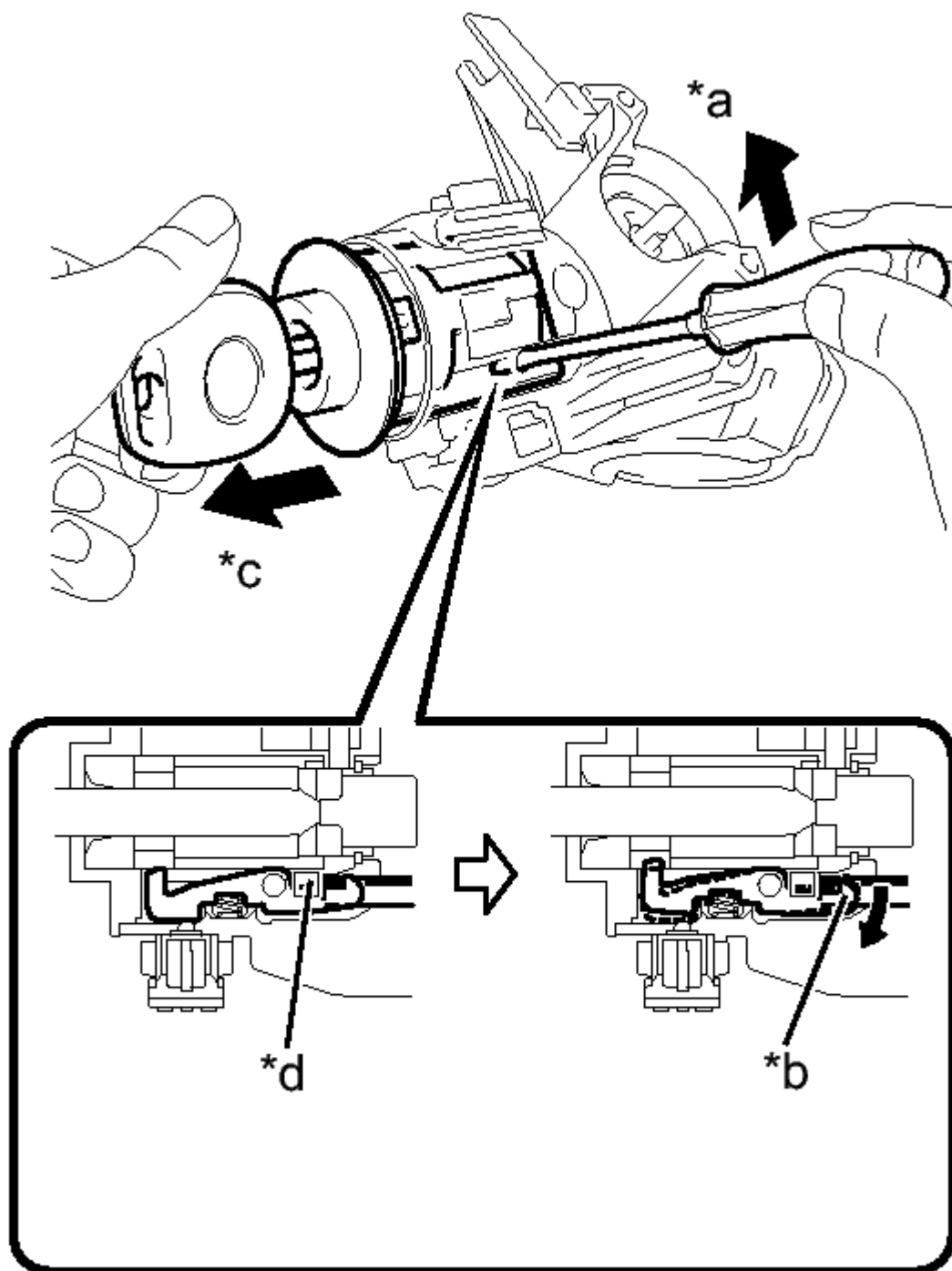
TEXT IN ILLUSTRATION



*1	Stopper
*2	Claw
*a	Push
*b	Pull
*c	ACC
*d	LOCK

NOTE: **Make sure to pull the ignition switch lock cylinder assembly until its claw contacts the stopper of the steering column upper with switch bracket assembly. Failure to do so will affect later work operations.**

- c. Insert a screwdriver into the hole of the steering column upper with switch bracket assembly. Tilt the screwdriver as shown in the illustration to disengage the claw of the ignition switch lock cylinder assembly, and pull out the ignition switch lock cylinder assembly.



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Fig. 23: Identifying Direction of Removing Ignition Switch Lock Cylinder Assembly (w/o Smart Key System)

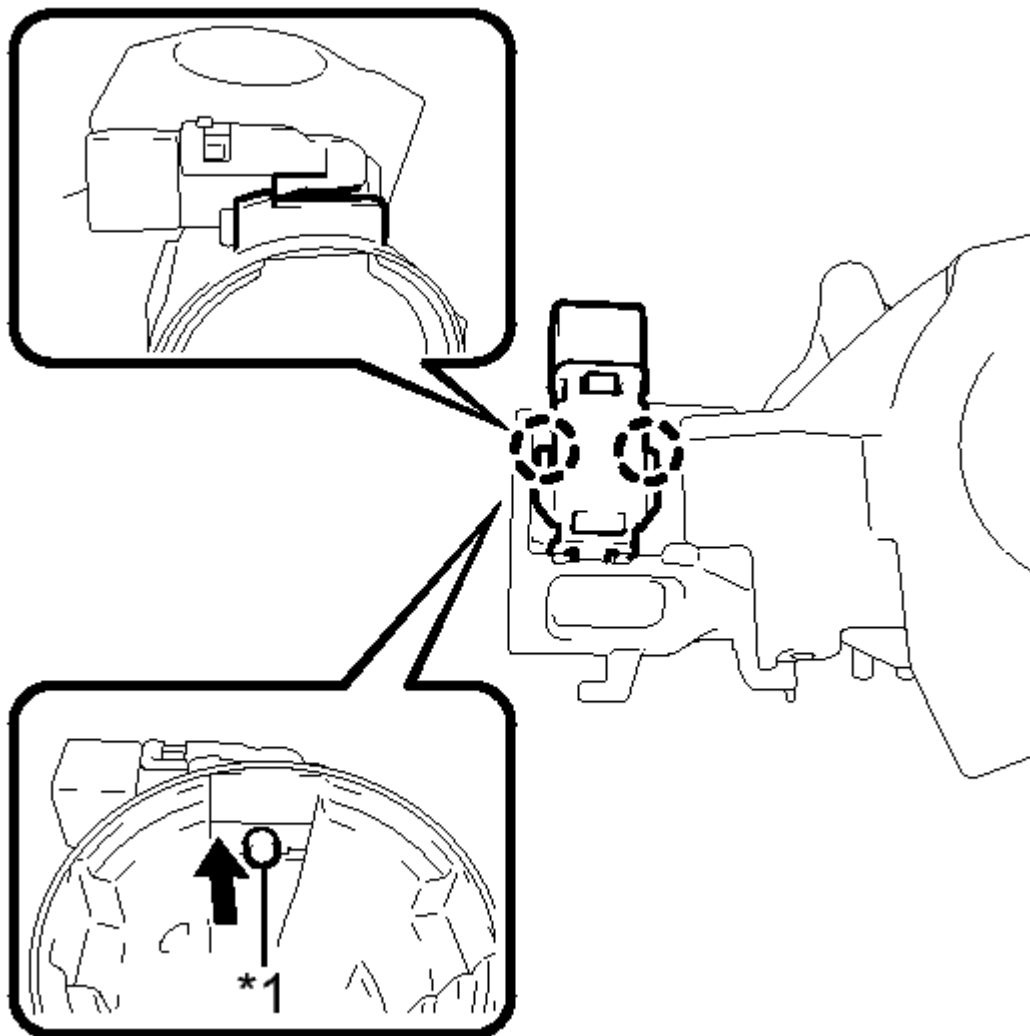
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Tilt
*b	Claw is Disengaged
*c	Pull Out
*d	Screwdriver Insertion Hole

7. REMOVE UNLOCK WARNING SWITCH ASSEMBLY (w/o Smart Key System)

- a. Remove the unlock warning switch assembly by pushing up the center part and releasing the 2 claws.



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Fig. 24: Identifying Unlock Warning Switch Assembly Claws
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Center Part
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INSPECTION

INSPECTION

1. INSPECT PRELOAD

- a. Secure the steering column assembly in a vise.

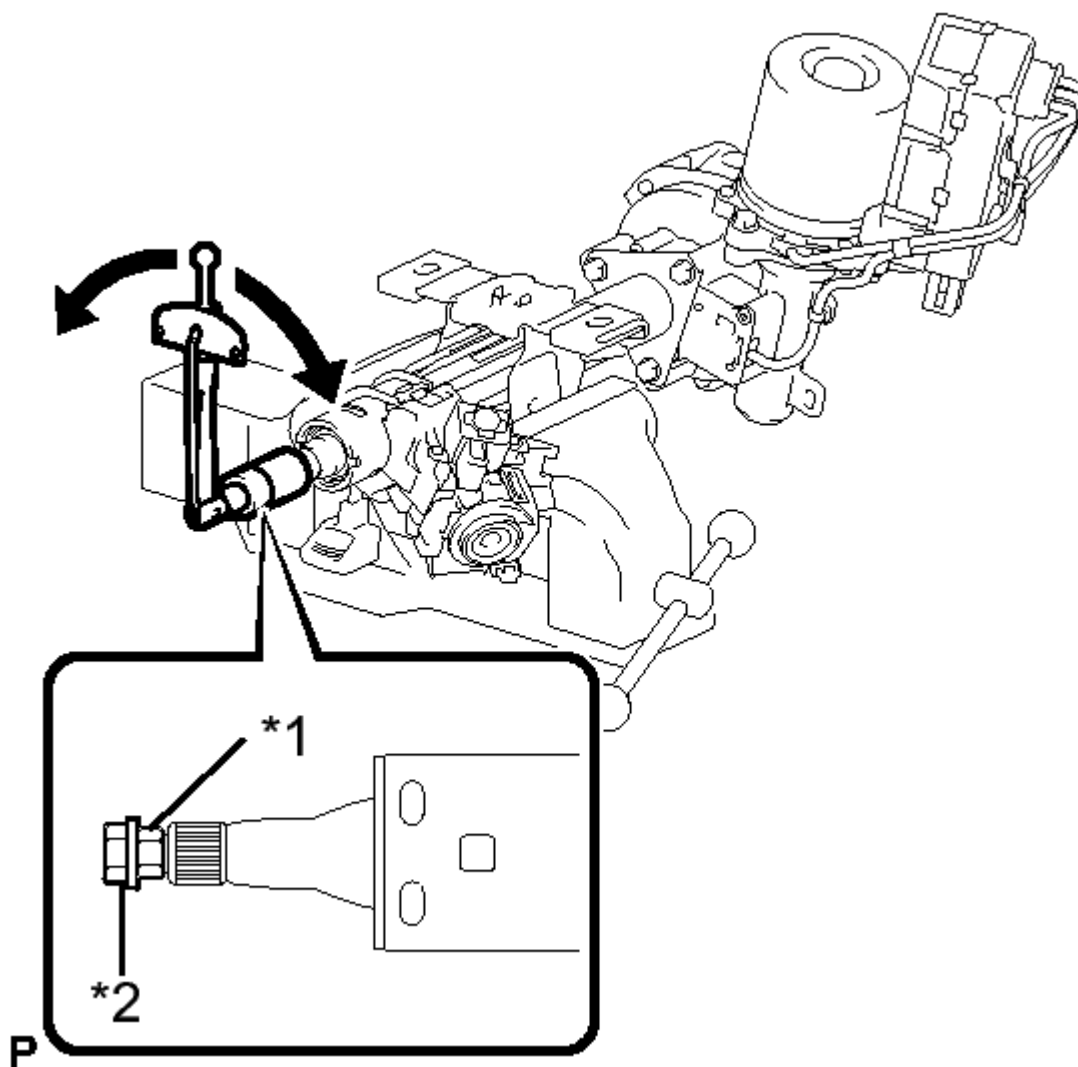


Fig. 25: Identifying Steering Wheel Assembly Set Nut & Service Nut For Preload Inspection
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

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*1	Service Nut
*2	Steering Wheel Assembly Set Nut

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

- b. Install a service nut to the steering main shaft.

Recommended service nut

Thread diameter

12.0 mm (0.472 in.)

Thread pitch

1.25 mm (0.0492 in.)

- c. Install the steering wheel assembly set nut to the steering main shaft.
- d. Lock the steering wheel assembly set nut using the service nut.
- e. Using a torque wrench, turn the main shaft and measure the preload.

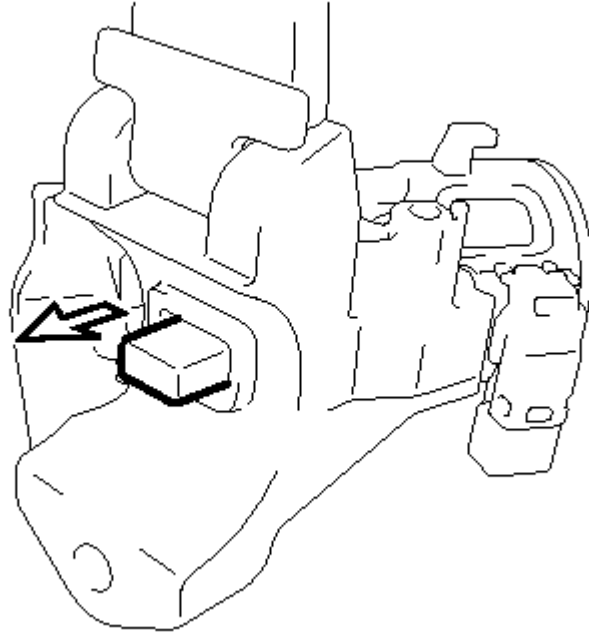
Preload

Torque: 0.98 to 1.58 N*m (10 to 16 kgf*cm, 9 to 13 in.*lbf)

If the preload is not as specified, replace the steering column assembly.

2. INSPECT STEERING LOCK OPERATION (w/o Smart Key System)

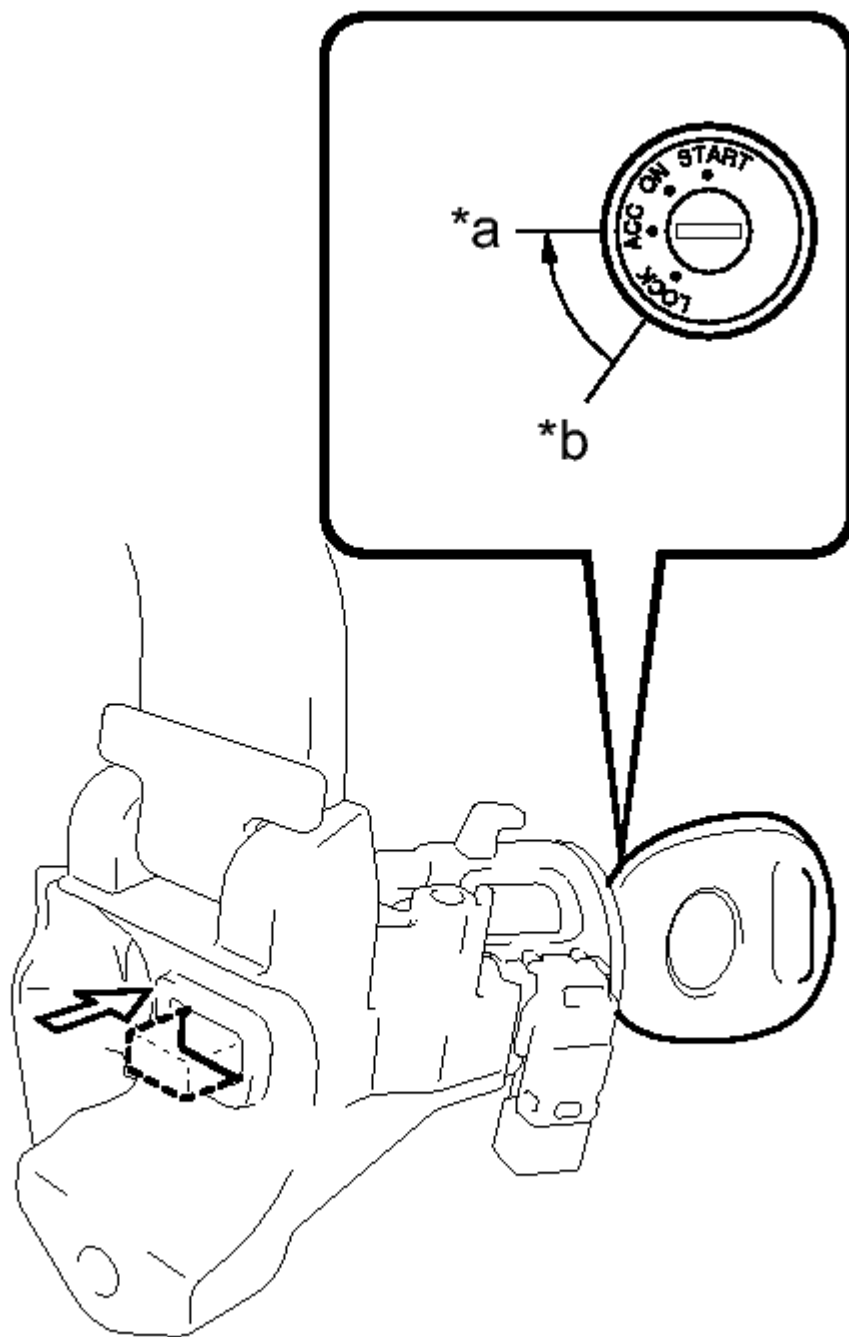
- a. Check that the steering lock mechanism is activated when the key is removed.



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Fig. 26: Checking Steering Lock Mechanism (Key Removed)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Check that the steering lock mechanism is deactivated when the key is inserted and turned to the ACC position.



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Fig. 27: Identifying Steering Lock Mechanism Operation (Key Inserted)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	ACC
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***b|LOCK|**

If there is any abnormality, replace the ignition switch lock cylinder assembly or steering column upper bracket assembly.

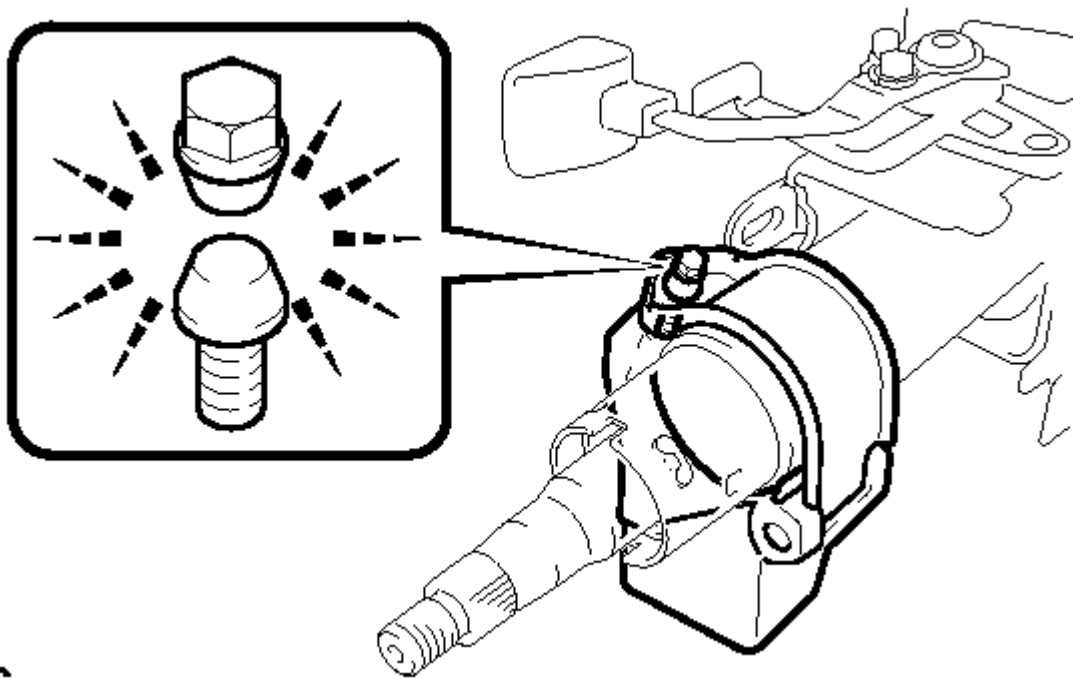
REASSEMBLY

REASSEMBLY

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

1. INSTALL STEERING LOCK ACTUATOR ASSEMBLY (w/ Smart Key System)

- a. Secure the steering column assembly in a vise.
- b. Temporarily install the steering lock actuator assembly to the steering column assembly with a new tapered-head bolt.



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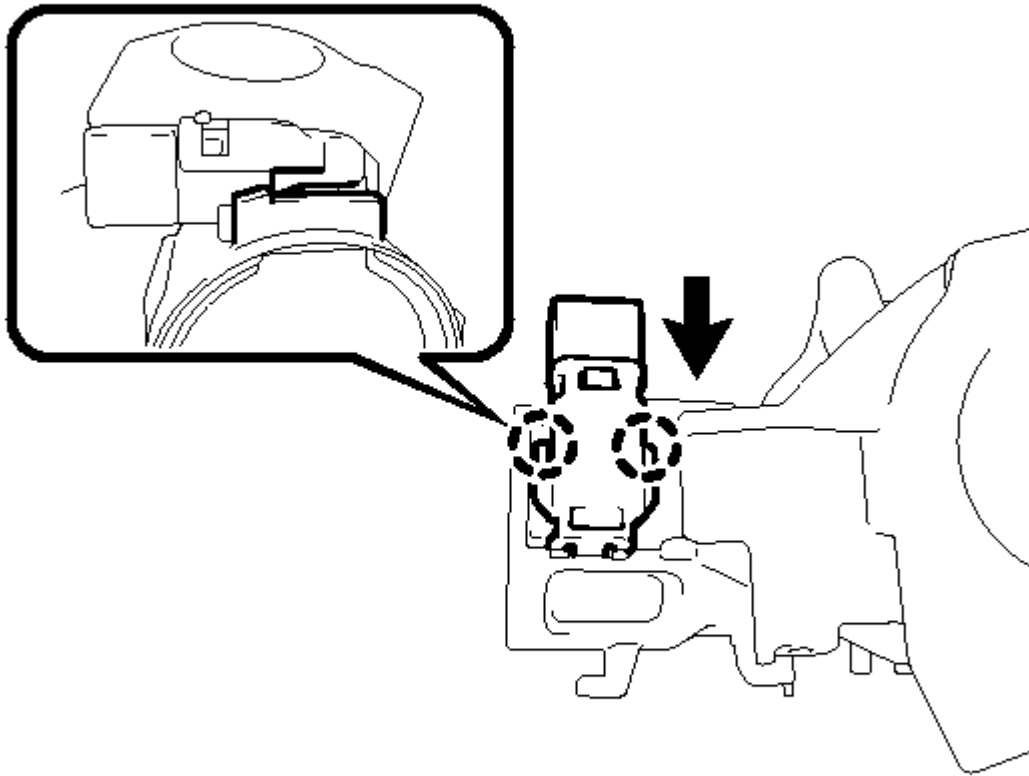
Fig. 28: Identifying Steering Lock Actuator Assembly Tapered-Head Bolt
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Be sure to use a new tapered-head bolt.

- c. Tighten the tapered-head bolt until the bolt head breaks off.

2. INSTALL UNLOCK WARNING SWITCH ASSEMBLY (w/o Smart Key System)

- a. Engage the 2 claws to install the unlock warning switch onto the steering column upper bracket.



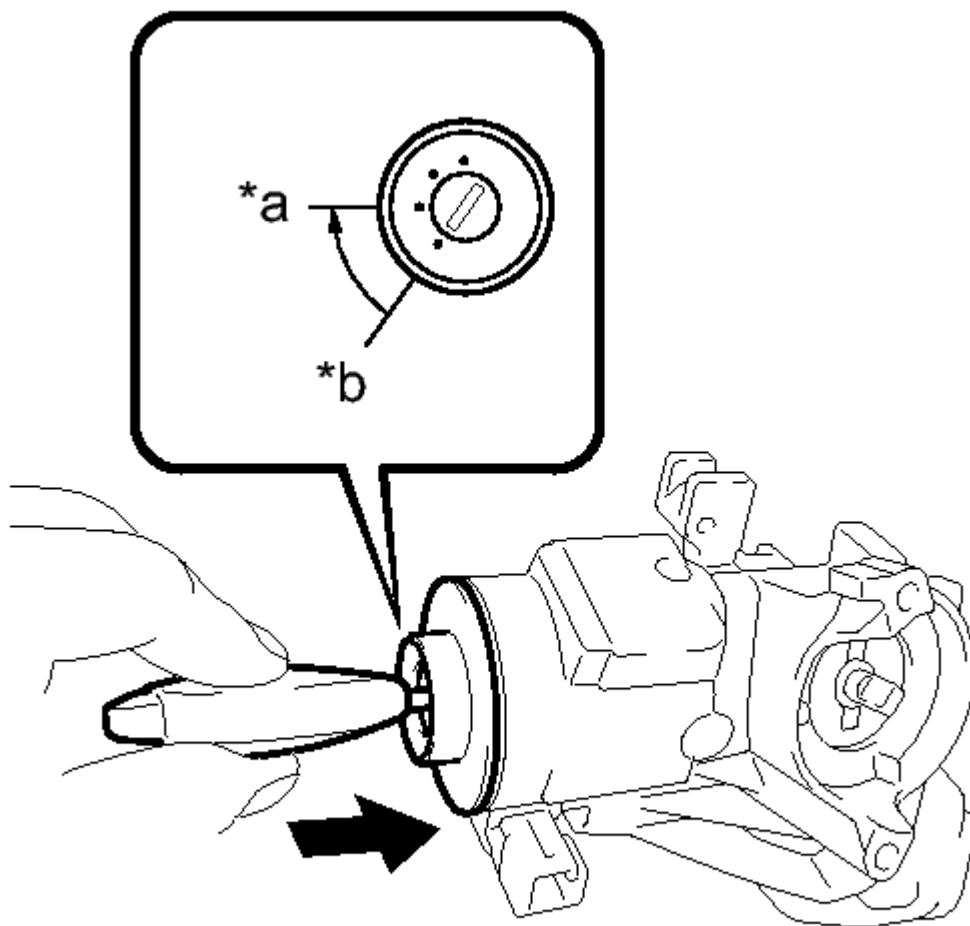
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Fig. 29: Installing Ignition Switch Lock Cylinder Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

Slide the unlock warning switch in the direction shown by the arrow in the illustration to install it.

3. **INSTALL IGNITION SWITCH LOCK CYLINDER ASSEMBLY (w/o Smart Key System)**
 - a. Make sure that the ignition switch lock cylinder assembly is in the ACC position.



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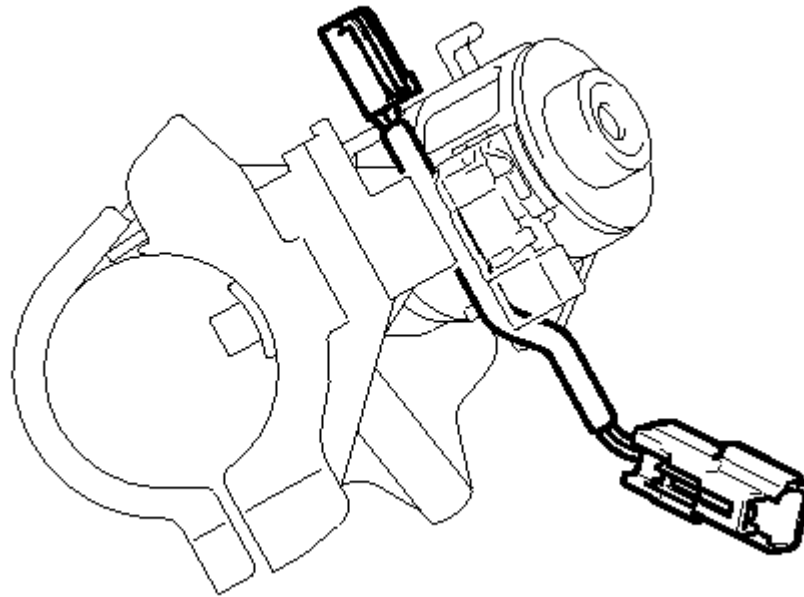
Fig. 30: Installing Ignition Switch Lock Cylinder Assembly In ACC Position (w/o Smart Key System)

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

TEXT IN ILLUSTRATION

*a	ACC
*b	LOCK

- b. Install the ignition switch lock cylinder assembly to the steering lock sub-assembly.
 - c. Make sure that the ignition switch lock cylinder assembly is securely installed.
- 4. INSTALL SOLENOID WIRE (w/o Smart Key System)**
- a. Install the solenoid wire to the steering column upper bracket.

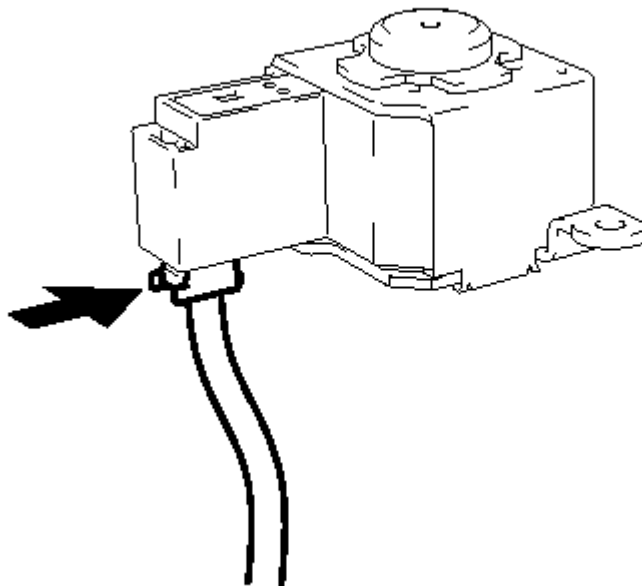


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Fig. 31: Identifying Solenoid Wire

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

5. **INSTALL KEY INTERLOCK SOLENOID (w/o Smart Key System)**
 - a. Connect the solenoid wire connector to the key interlock solenoid.

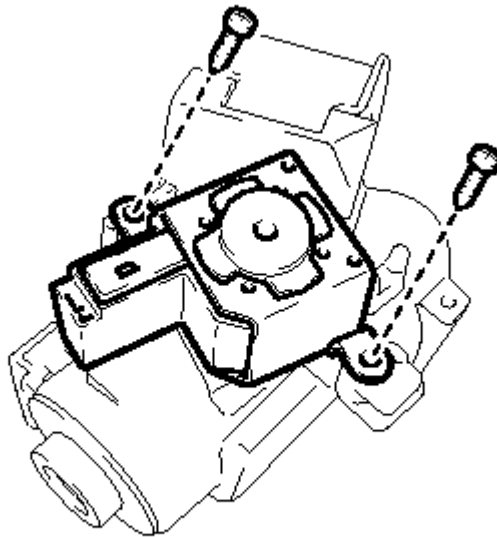


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Fig. 32: Locating Key Interlock Solenoid Wire Connector

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

- b. Install the key interlock solenoid to the steering column upper bracket with the 2 screws.



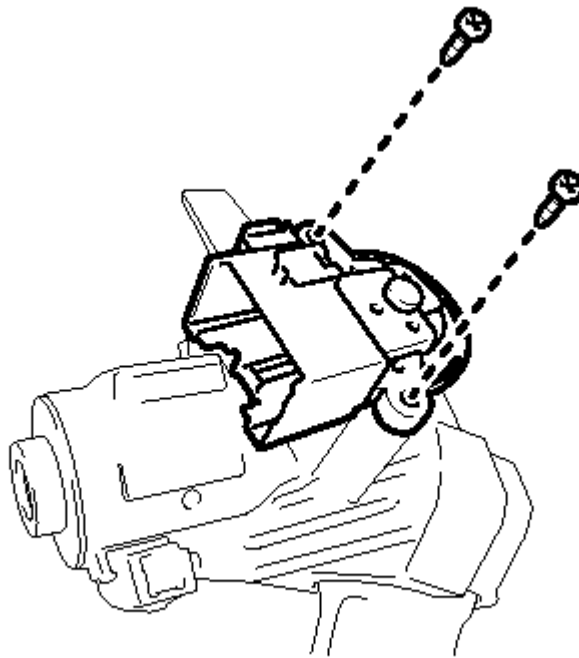
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Fig. 33: Identifying Key Interlock Solenoid Screws

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

6. INSTALL IGNITION OR STARTER SWITCH ASSEMBLY (w/o Smart Key System)

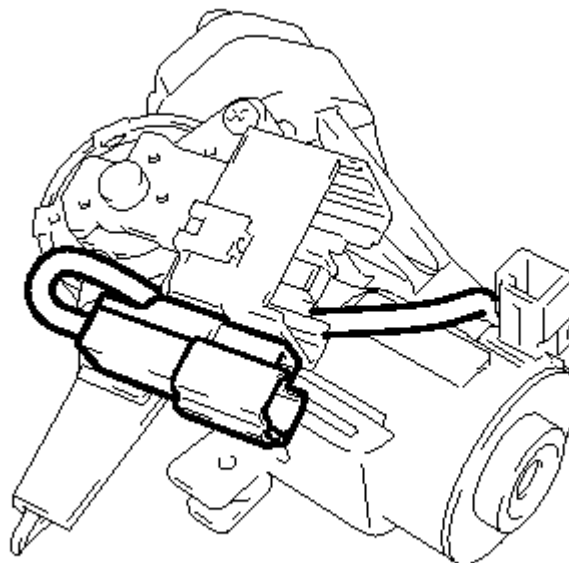
- a. Install the ignition or starter switch assembly to the steering column upper bracket with the 2 screws.



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Fig. 34: Identifying Ignition Or Starter Switch Assembly Mounting Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

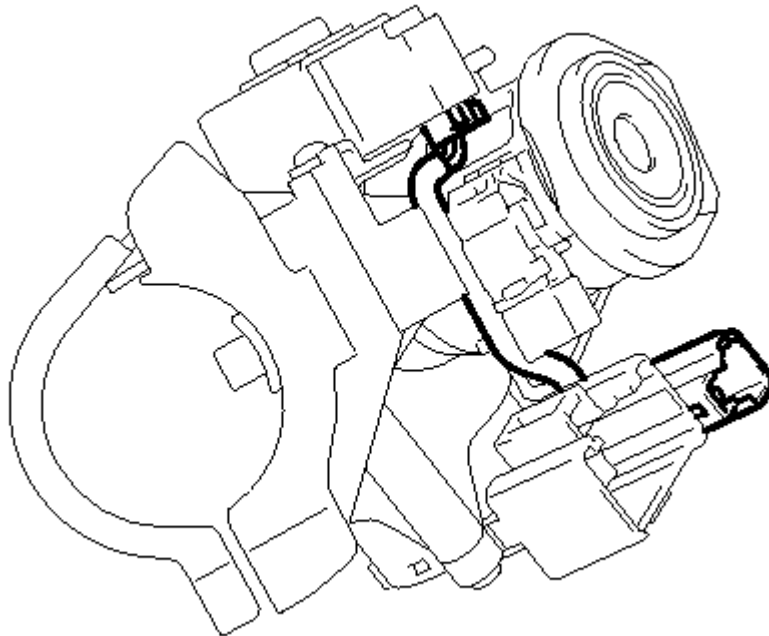
- b. Install the solenoid wire connector to the ignition or starter switch assembly.



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Fig. 35: Identifying Solenoid Wire Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Make sure that the solenoid wire runs securely through the gap of the steering column upper bracket as shown in the illustration.

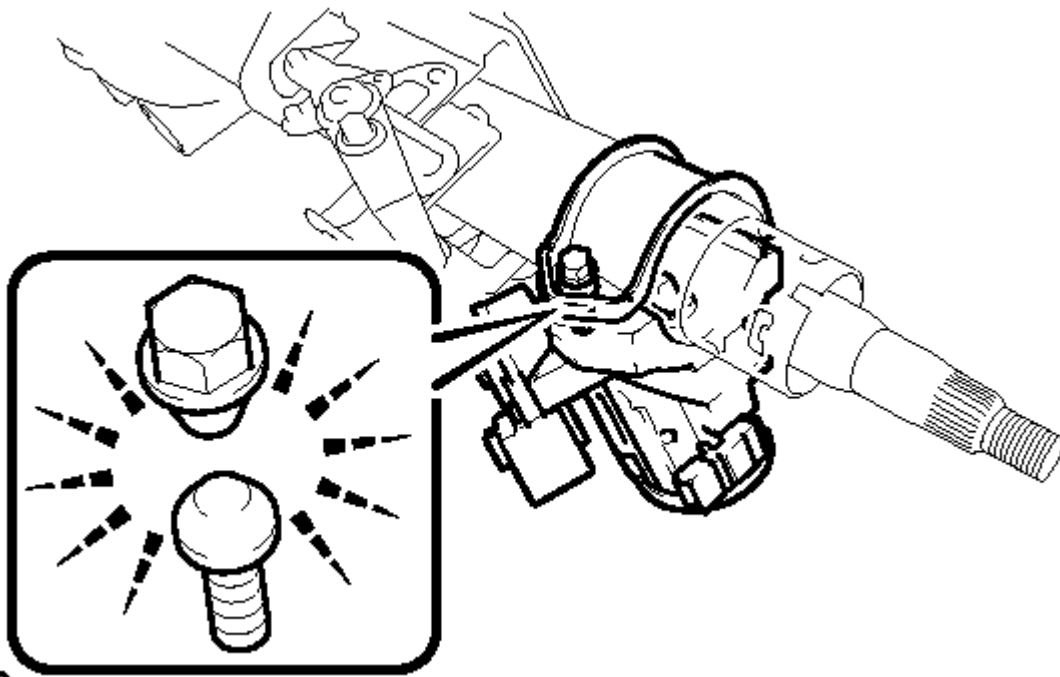


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Fig. 36: Identifying Solenoid Wire Position

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

7. **INSPECT STEERING LOCK OPERATION (w/o Smart Key System)** See step 2
8. **INSTALL STEERING COLUMN UPPER WITH SWITCH BRACKET ASSEMBLY (w/o Smart Key System)**
 - a. Secure the steering column assembly in a vise.
 - b. Temporarily install the steering column upper with switch bracket assembly to the steering column assembly with a new tapered-head bolt.



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Fig. 37: Identifying Steering Column Upper With Switch Bracket Assembly Tapered-Head Bolt

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

NOTE: Be sure to use a new tapered-head bolt.

- c. Tighten the tapered-head bolt until the bolt head breaks off.

INSTALLATION

INSTALLATION

1. INSTALL STEERING COLUMN ASSEMBLY

- a. Install the steering column assembly with the bolt and 2 nuts.

Torque: 27.5 N*m (280 kgf*cm, 20 ft.*lbf)

NOTE: Do not line up the bolt hole by prying on the collar or bushings. Only install the bolt in straight, without applying any force to the bushings.

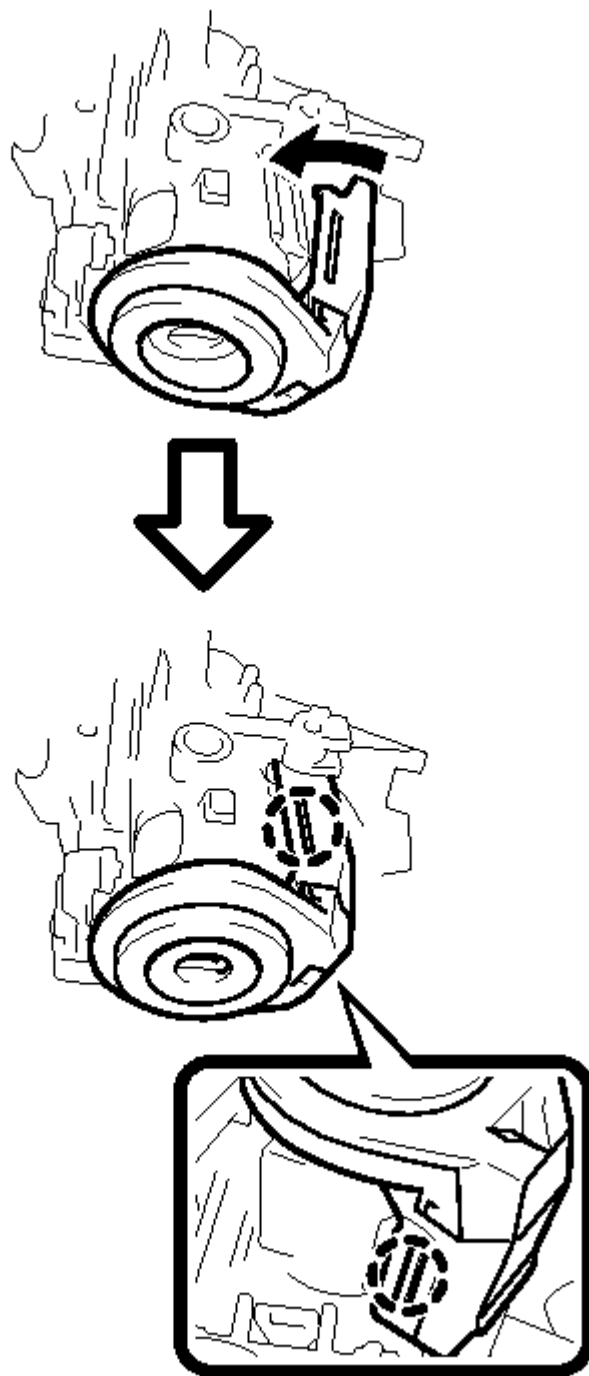
- b. Connect the connectors and engage the wire harness clamps to the steering column assembly.

2. CONNECT STEERING INTERMEDIATE SHAFT ASSEMBLY

- a. Align the matchmarks on the steering intermediate shaft assembly and the power steering column assembly.
- b. Install the bolt.

Torque: 35 N*m (360 kgf*cm, 26 ft.*lbf)

3. **INSTALL NO. 3 AIR DUCT SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 19**
4. **INSTALL TRANSPONDER KEY AMPLIFIER (w/ Engine Immobilizer System)**
 - a. Connect the connector to the transponder key amplifier.
 - b. Align the transponder key amplifier with the steering column upper bracket. Tilt the amplifier slightly and slide it into position.
 - c. Push the transponder key amplifier, and engage the 2 claws to install the transponder key amplifier to the steering column upper bracket.



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Fig. 38: Installing Transponder Key Amplifier To Steering Column Upper Bracket
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. **INSTALL TURN SIGNAL SWITCH ASSEMBLY WITH SPIRAL CABLE SUB-ASSEMBLY**
 - a. Using pliers, expand the clamp.

- b. While holding the clamp expanded, install the turn signal switch assembly with spiral cable sub-assembly to the steering column assembly and engage the claw.
- c. Return the clamp to its original position.
- d. Connect the connectors to the turn signal switch assembly with spiral cable sub-assembly.

6. INSTALL UPPER STEERING COLUMN COVER

- a. Engage the 4 clips and 2 guides to install the upper steering column cover onto the instrument panel cluster finish panel.
- b. Engage the claw to install the upper steering column cover.

7. INSTALL LOWER STEERING COLUMN COVER

- a. Engage the 2 claws to install the lower steering column cover.
- b. Install the 2 screws.

8. INSTALL DRIVER SIDE KNEE AIRBAG ASSEMBLY

Refer to **INSTALLATION**

9. TURN FRONT WHEELS TO FACE STRAIGHT AHEAD

10. ADJUST SPIRAL CABLE . Refer to **INSTALLATION - Step 4**

11. INSTALL STEERING WHEEL ASSEMBLY See step 12

12. INSTALL STEERING PAD . Refer to **INSTALLATION - Step 1**

13. INSTALL LOWER NO. 3 STEERING WHEEL COVER . Refer to **INSTALLATION - Step 2**

14. INSTALL LOWER NO. 2 STEERING WHEEL COVER . Refer to **INSTALLATION - Step 3**

15. INSPECT STEERING WHEEL CENTER POINT

16. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

NOTE:

- Connect the cable to the negative (-) battery terminal with the front wheels facing straight ahead.
- When disconnecting the cable, some systems need to be initialized after the cable is reconnected. Refer to **INITIALIZATION** .

17. INSPECT STEERING PAD . Refer to **ON-VEHICLE INSPECTION - Step 1**

18. KEY REGISTRATION (w/ Smart Key System)

HINT:

When replacing the steering lock actuator assembly, perform the key registration. Refer to **REGISTRATION - Step 4** .

19. INSPECT SRS WARNING LIGHT

Refer to **DIAGNOSIS SYSTEM**

20. PERFORM ASSIST MAP WRITING

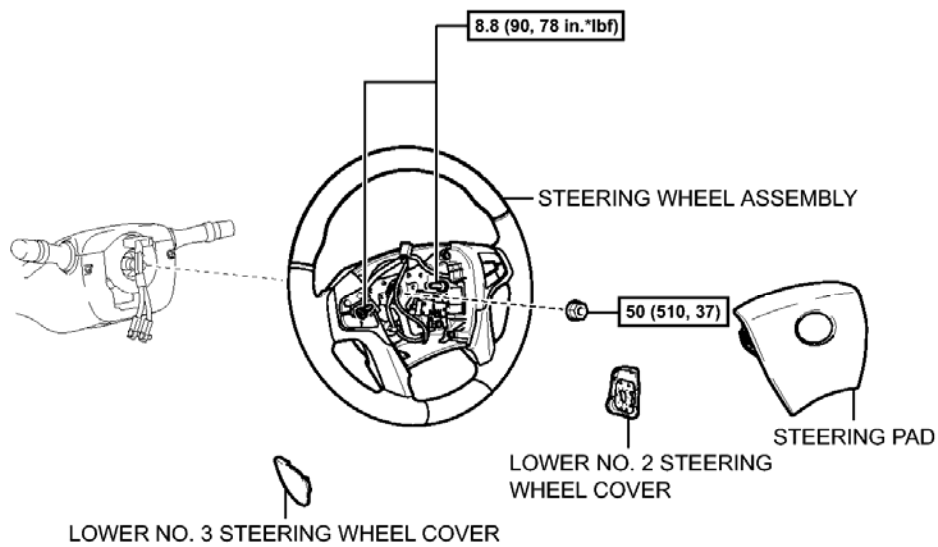
HINT:

When replacing the steering column assembly, perform the assist map writing. Refer to **REGISTRATION**.

STEERING WHEEL

COMPONENTS

ILLUSTRATION

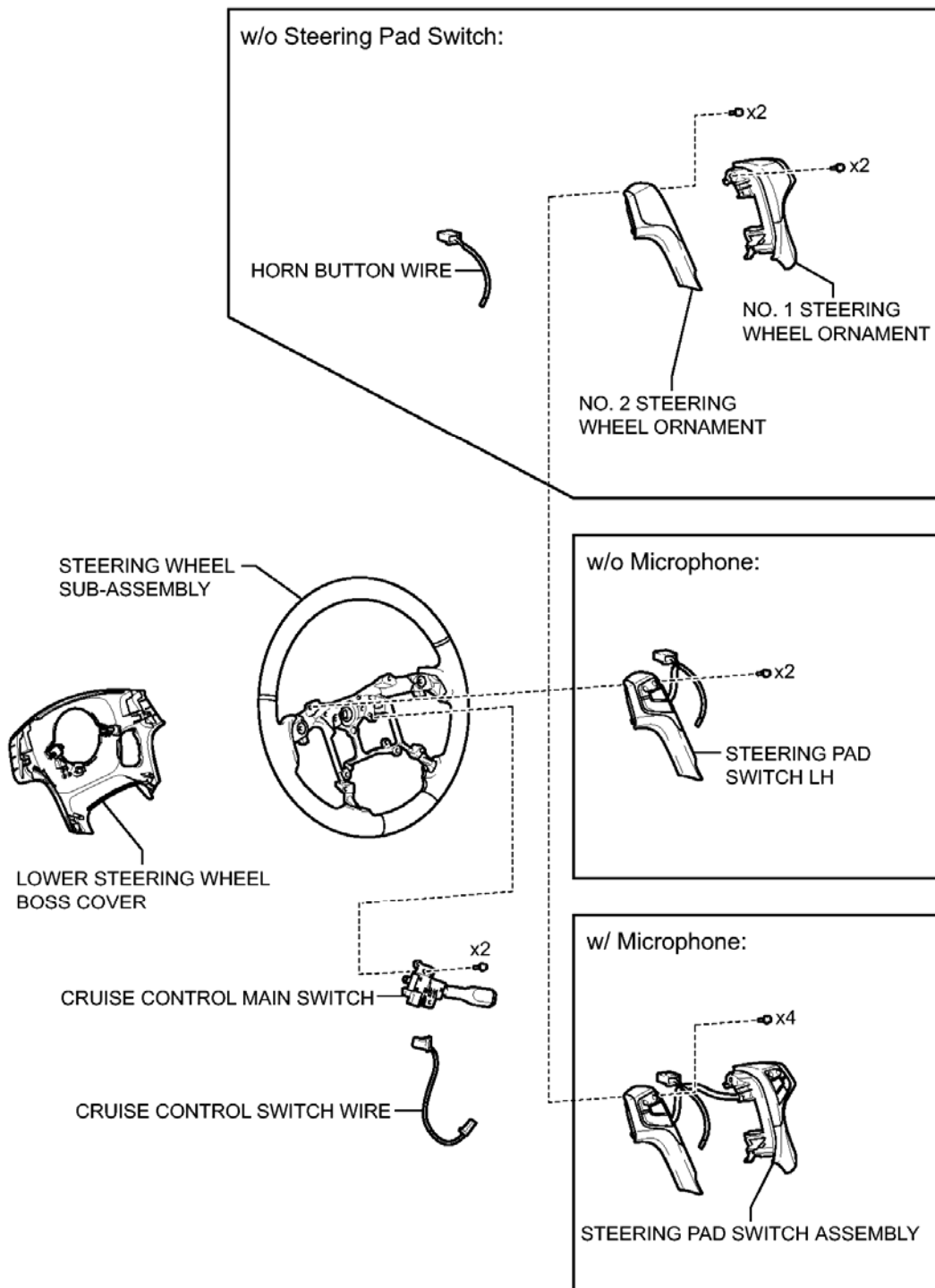


N*m (kgf*cm, ft*lbf) : Specified torque

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Fig. 39: Steering Wheel Replacement Components With Torque Specifications (1 of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



P

Fig. 40: Steering Wheel Replacement Components With Torque Specifications (2 of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

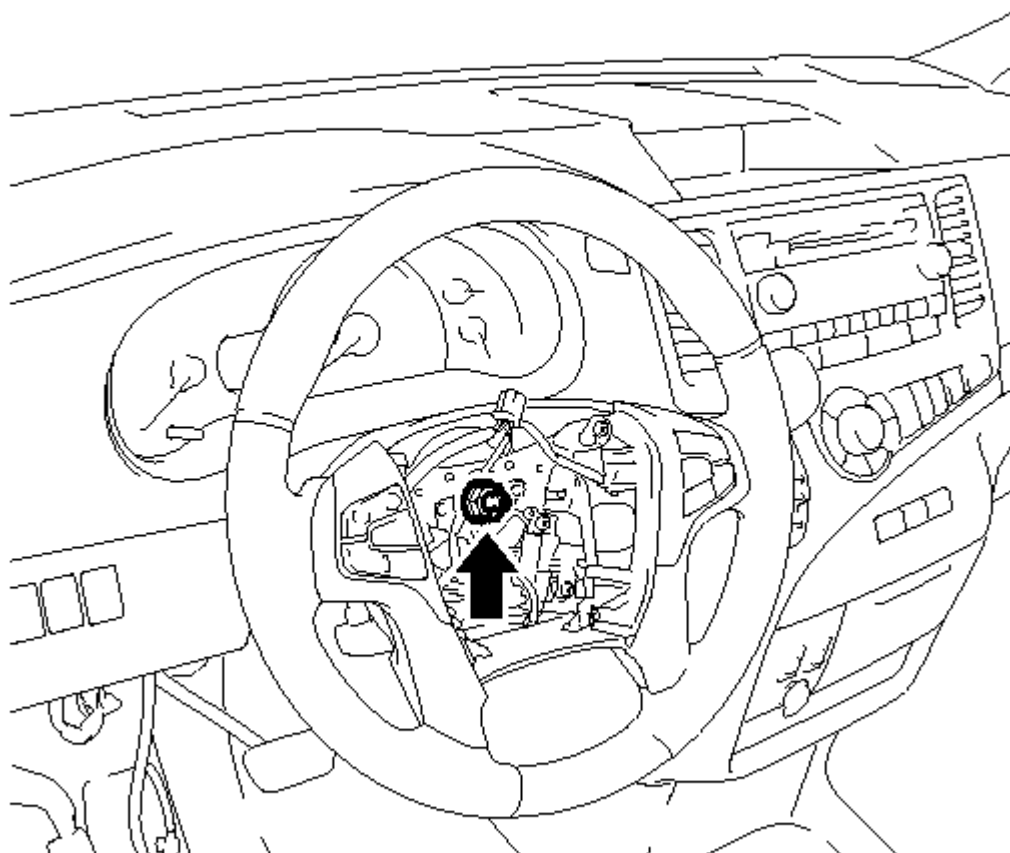
WARNING: Some of these service operations affect the SRS airbag system. Read the precautionary notices concerning the SRS airbag system before servicing the steering wheel. Refer to PRECAUTION .

1. **TURN FRONT WHEELS TO FACE STRAIGHT AHEAD**
2. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**

WARNING: Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

NOTE: When disconnecting the cable, some systems need to be initialized after the cable is reconnected. Refer to INITIALIZATION .

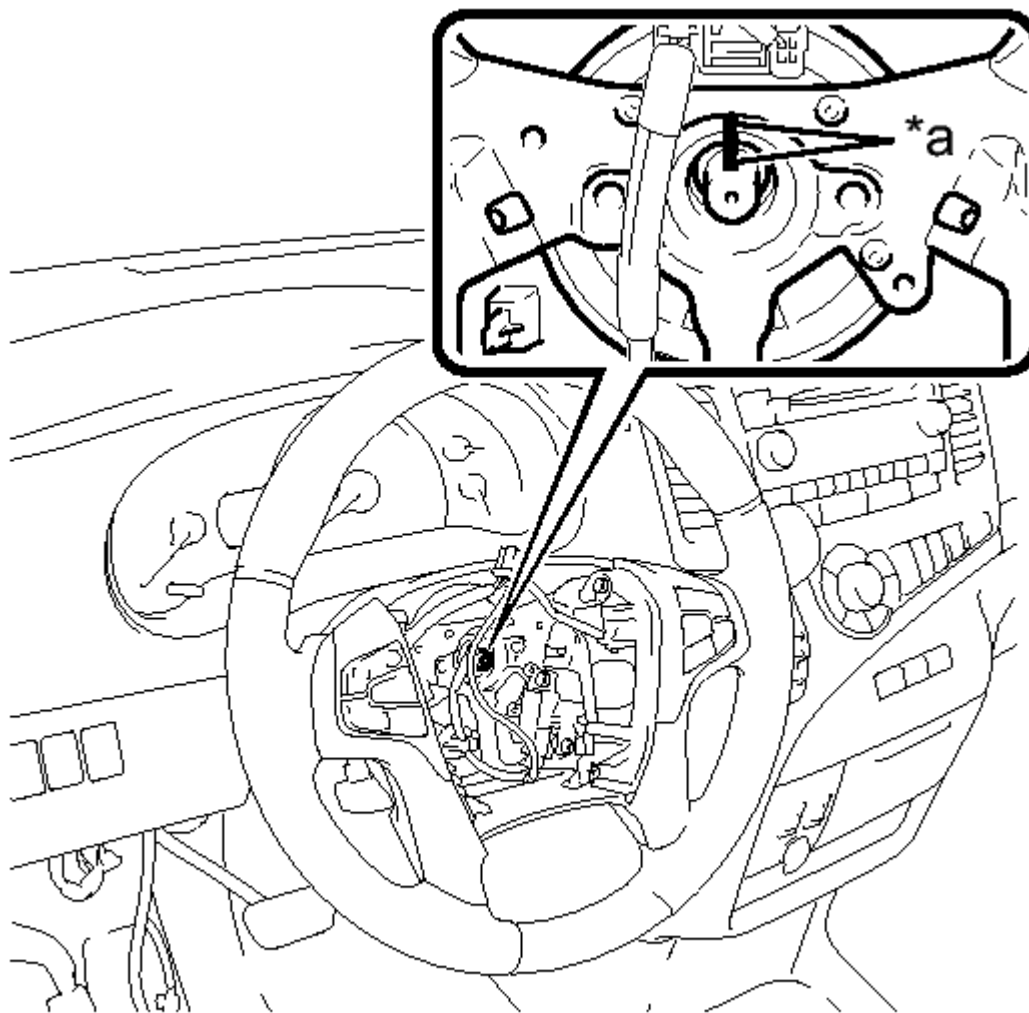
3. **REMOVE LOWER NO. 3 STEERING WHEEL COVER** . Refer to REMOVAL - Step 2
4. **REMOVE LOWER NO. 2 STEERING WHEEL COVER** . Refer to REMOVAL - Step 3
5. **REMOVE STEERING PAD** . Refer to REMOVAL - Step 4
6. **REMOVE STEERING WHEEL ASSEMBLY**
 - a. Remove the steering wheel assembly set nut.



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Fig. 41: Identifying Steering Wheel Assembly Set Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Put matchmarks on the steering wheel assembly and the steering main shaft.



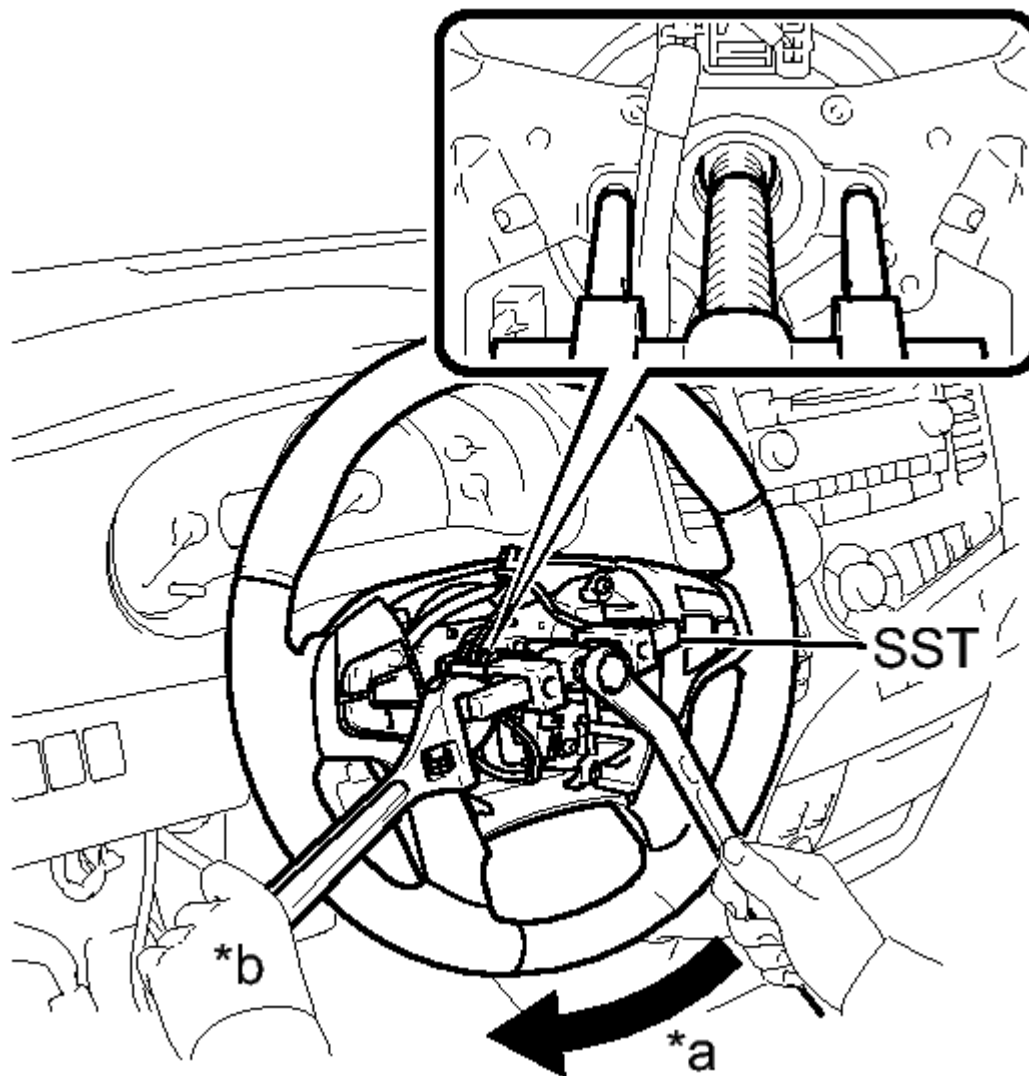
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Fig. 42: Identifying Steering Wheel Assembly & Steering Main Shaft Matchmarks
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

***a** Matchmark

- c. Disconnect the connectors from the spiral cable.
- d. Using SST, remove the steering wheel assembly.



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Fig. 43: Removing Steering Wheel Assembly With SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Turn
*b	Hold

- **SST: 09950-50013**
09951-05010
09952-05010
09953-05020
09954-05070

NOTE:

- Apply a small amount of grease to the threads and tip of SST

(09953-05020) before use.

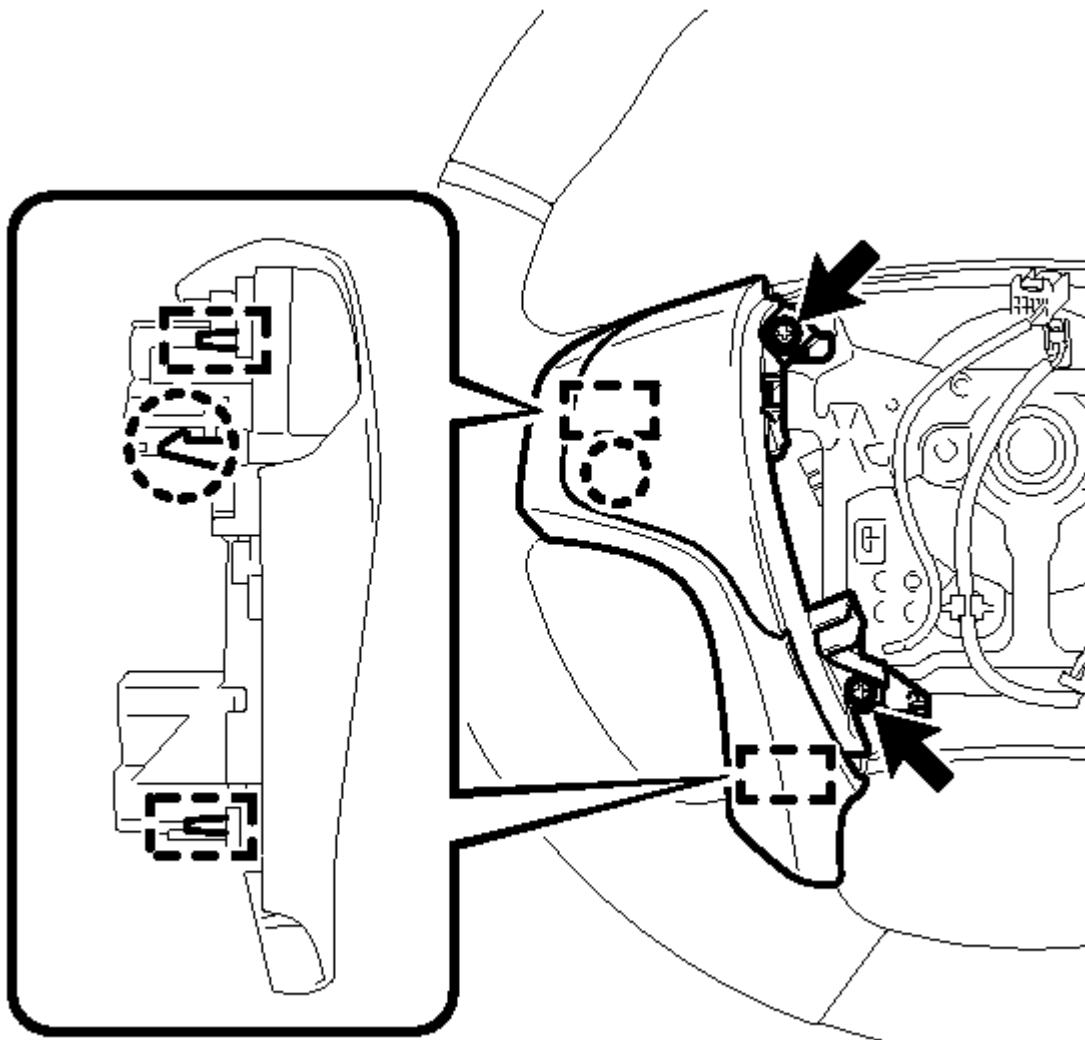
- Do not rotate the spiral cable with the battery connected and the ignition switch to ON.
- Ensure that the steering wheel is installed and aligned straight when inspecting the steering sensor.

7. **REMOVE CRUISE CONTROL MAIN SWITCH** . Refer to **REMOVAL - Step 5**

8. **REMOVE CRUISE CONTROL SWITCH WIRE**

9. **REMOVE NO. 2 STEERING WHEEL ORNAMENT (w/o Steering Pad Switch)**

- a. Remove the 2 screws.



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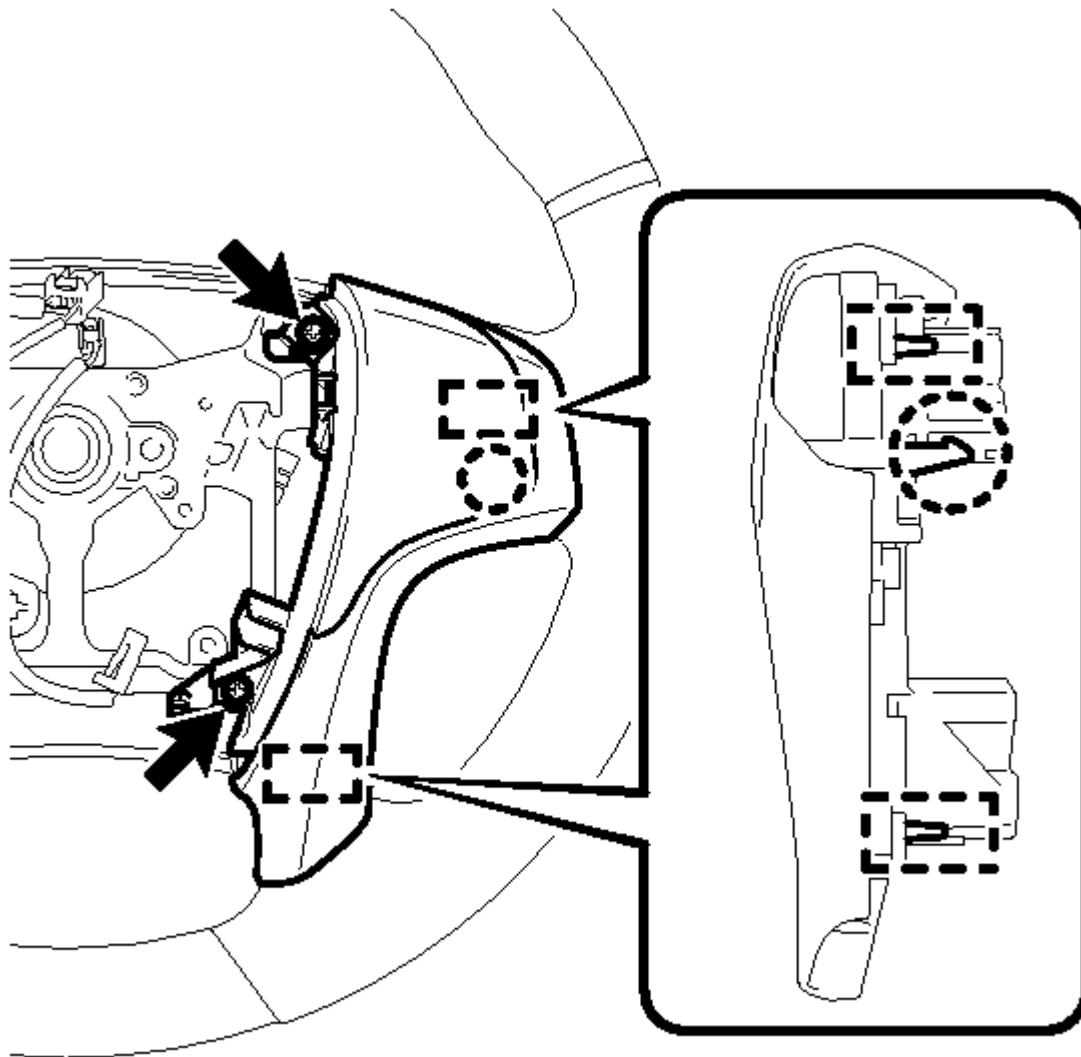
Fig. 44: Identifying No. 2 Steering Wheel Ornament, Pins & Claws (w/o Steering Pad Switch)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disengage the claw and 2 pins to remove the No. 2 steering wheel ornament from the steering

wheel sub-assembly.

10. REMOVE NO. 1 STEERING WHEEL ORNAMENT (w/o Microphone)

- a. Remove the 2 screws.



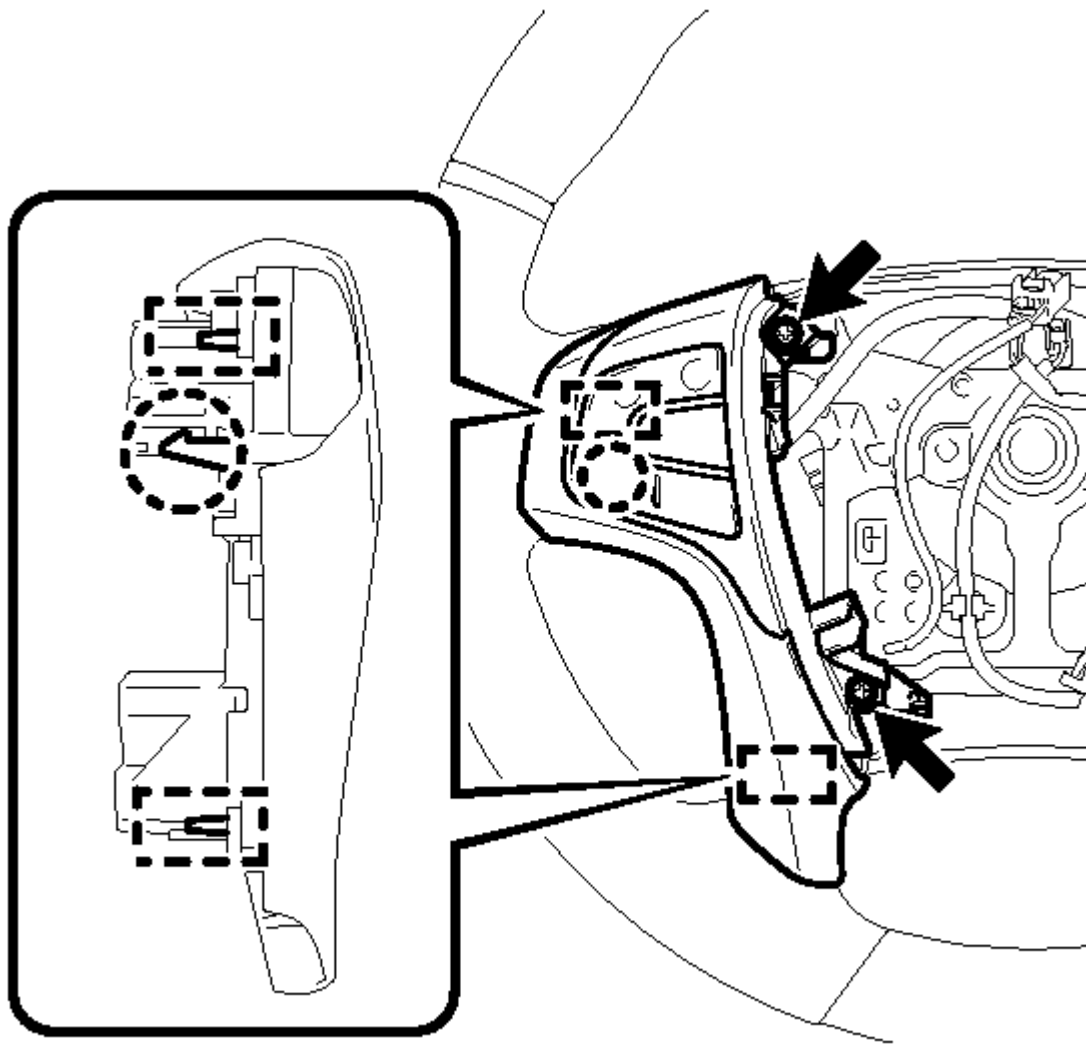
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Fig. 45: Identifying No. 1 Steering Wheel Ornament, Pins & Claws (w/o Microphone)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disengage the claw and 2 pins to remove the No. 1 steering wheel ornament from the steering wheel sub-assembly.

11. REMOVE STEERING PAD SWITCH LH (w/o Microphone)

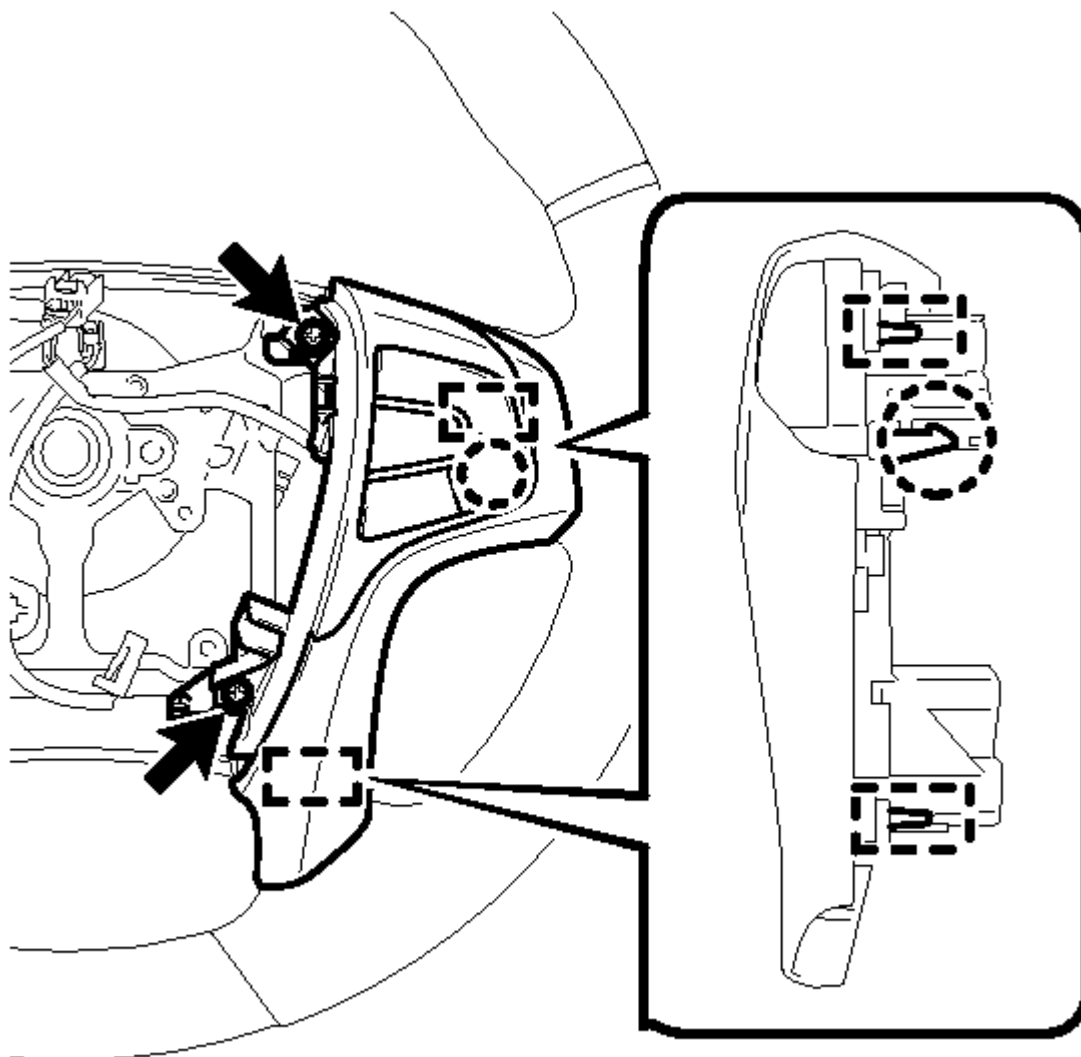
- a. Remove the 2 screws.



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Fig. 46: Identifying Steering Pad Switch LH, Pins & Claws (w/o Microphone)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

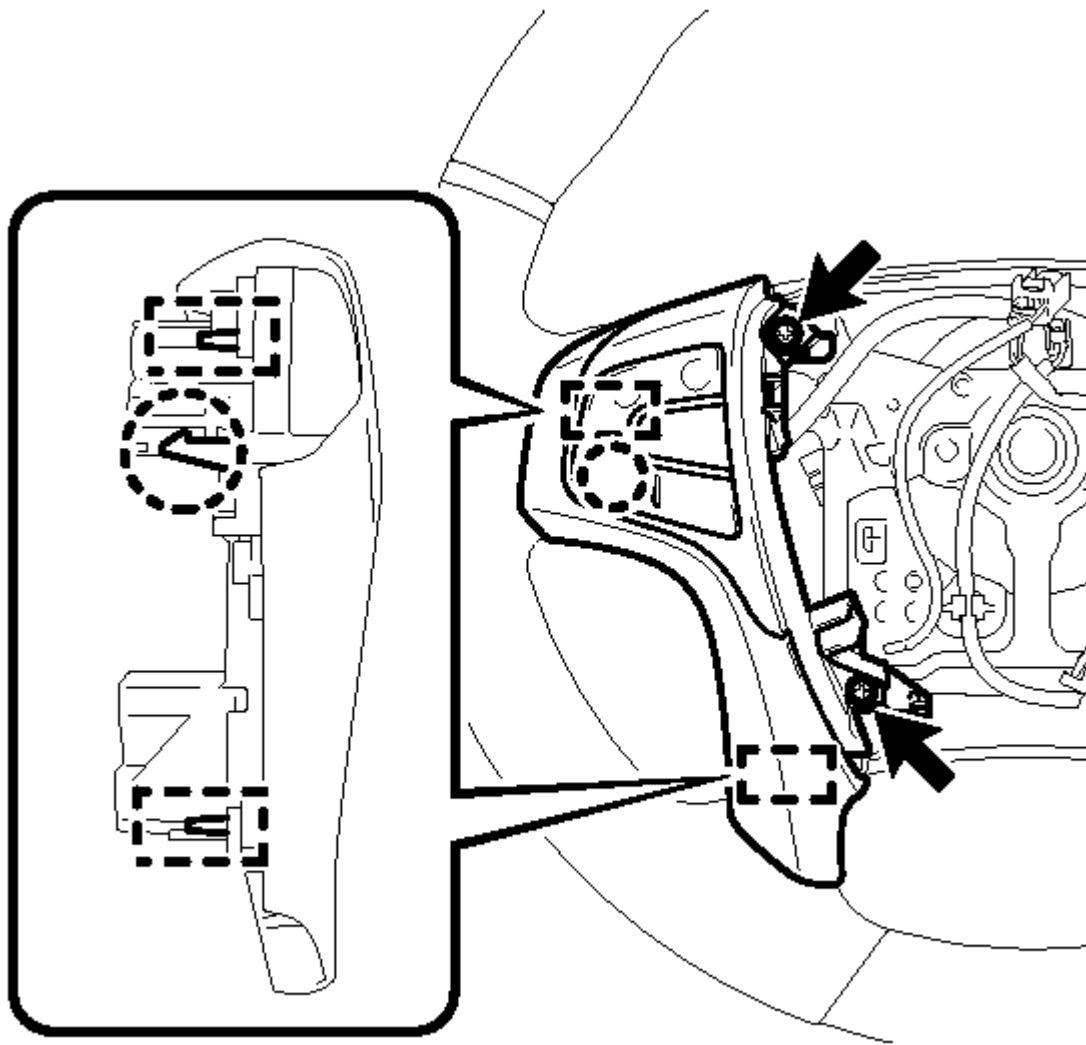
- b. Disengage the claw and 2 pins to remove the steering pad switch LH from the steering wheel sub-assembly.
12. **REMOVE STEERING PAD SWITCH ASSEMBLY (w/ Microphone)**
- a. Remove the 2 screws.



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Fig. 47: Identifying Steering Pad Switch Assembly RH, Pins & Claws (w/ Microphone)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

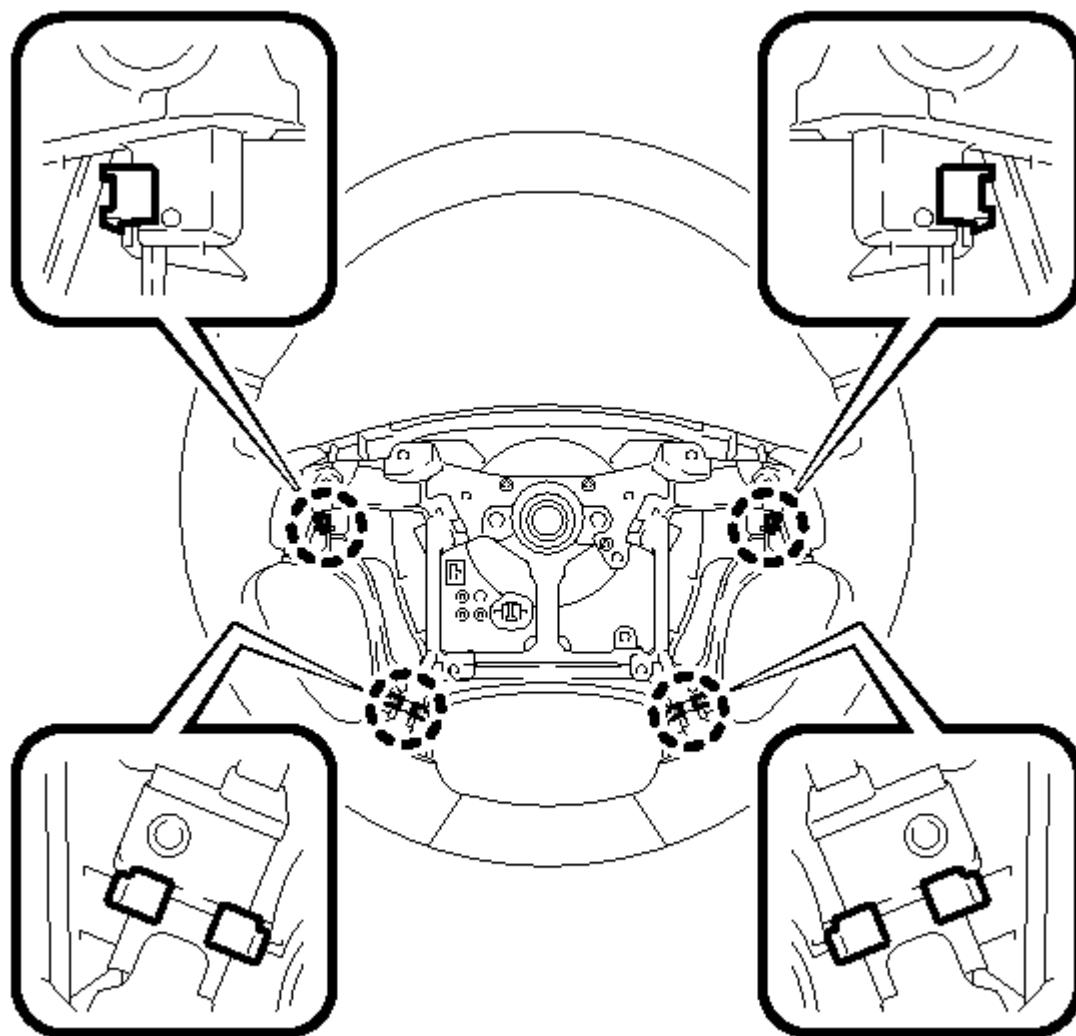
- b. Disengage the claw and 2 pins to remove the steering pad switch assembly (RH side) from the steering wheel sub-assembly.
- c. Remove the 2 screws.



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Fig. 48: Identifying Steering Pad Switch LH, Pins & Claws (w/o Microphone)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Disengage the claw and 2 pins to remove the steering pad switch assembly (LH side) from the steering wheel sub-assembly.
- 13. **REMOVE HORN BUTTON WIRE (w/o Steering Pad Switch)**
- 14. **REMOVE LOWER STEERING WHEEL BOSS COVER**
 - a. Disengage the 6 claws to remove the lower steering wheel boss cover from the steering wheel sub-assembly.

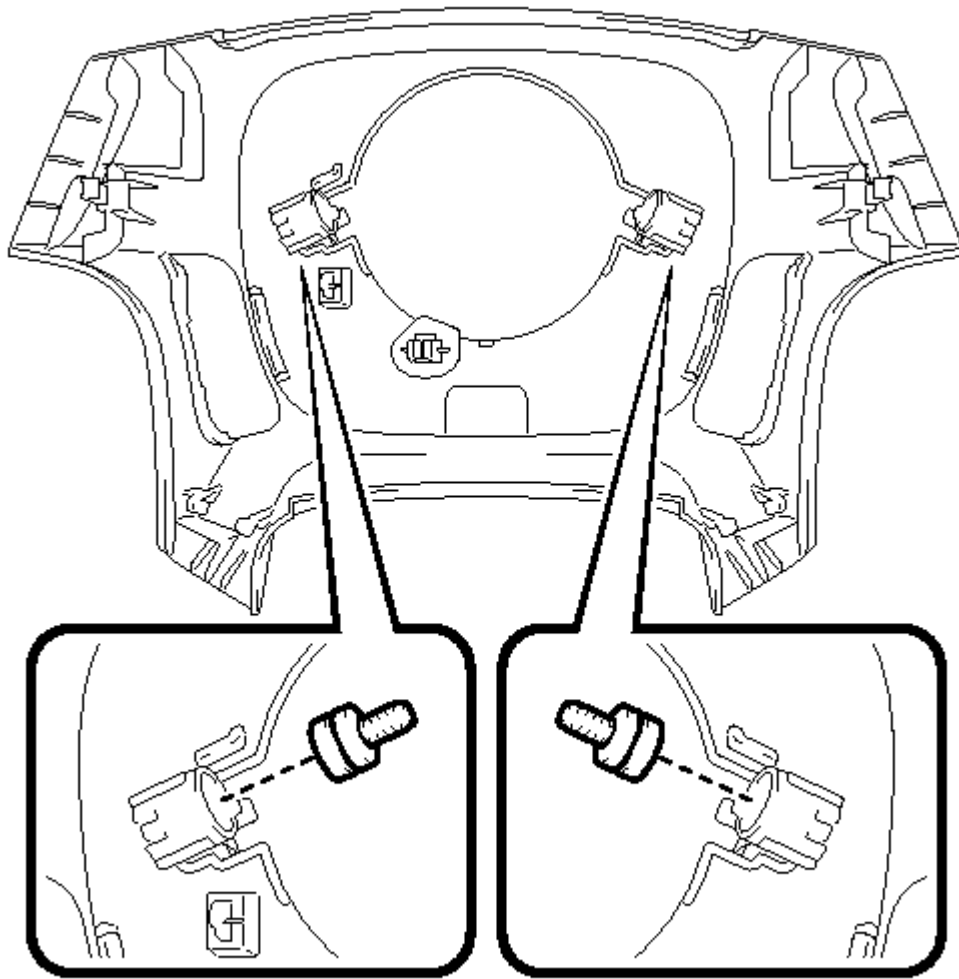


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Fig. 49: Identifying Lower Steering Wheel Boss Cover & Claws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

15. REMOVE STEERING PAD ATTACHING SCREW

- a. Remove the 2 steering pad attaching screws from the lower steering wheel boss cover.



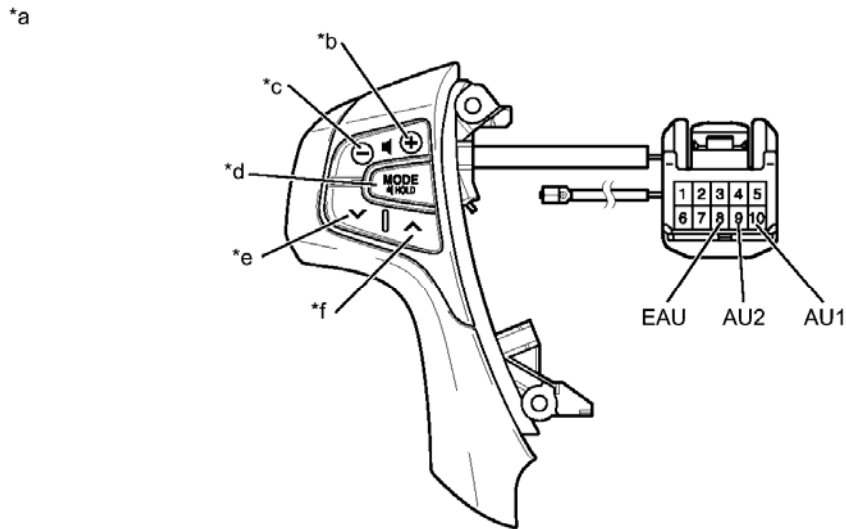
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Fig. 50: Identifying Steering Pad Attaching Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

INSPECTION

- 1. INSPECT STEERING PAD SWITCH LH**
 - a. Disconnect the steering pad switch LH connector.



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Fig. 51: Measuring Steering Pad Switch LH Resistance
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Component without harness connected (Steering Pad Switch LH)	*b	Volume+
*c	Volume-	*d	MODE
*e	Seek-	*f	Seek+

- b. Measure the resistance according to the values in the table below.

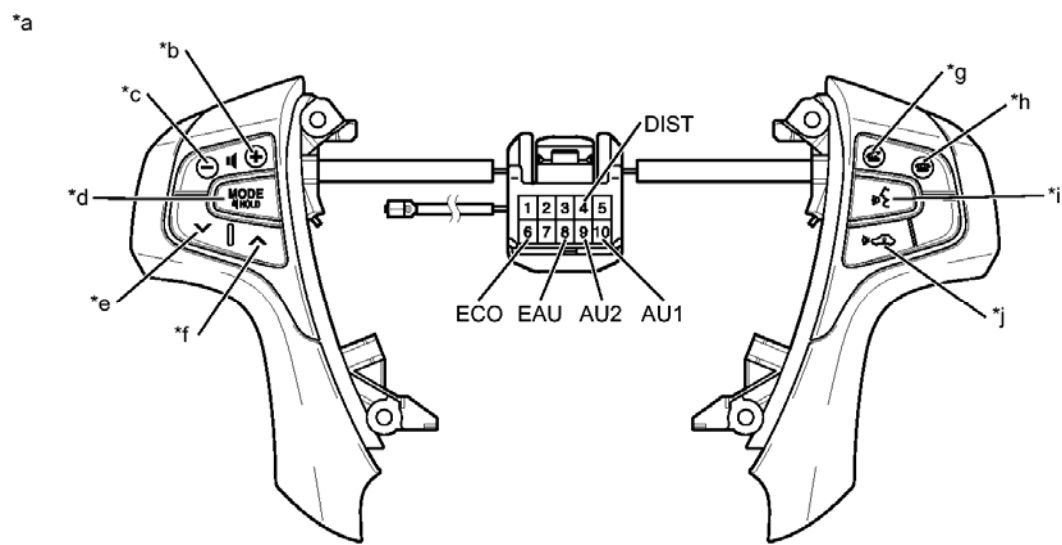
Standard Resistance

Tester Connection	Switch Condition	Specified Condition
10 (AU1) - 8 (EAU)	No switch is pushed	95 to 105 kohms
	Seek+ switch: pushed	Below 2.5 ohms
	Seek- switch: pushed	313 to 345 ohms
	Volume+	950 to

	switch:	1050
	pushed	ohms
	Volume-	2955 to
	switch:	3266
9 (AU2) - 8 (EAU)	pushed	ohms
	No switch	95 to 105
	is pushed	kohms
	MODE	Below 2.5
	switch:	ohms
	pushed	

2. INSPECT STEERING PAD SWITCH ASSEMBLY

- a. Disconnect the steering pad switch assembly connector.



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Fig. 52: Measuring Steering Pad Switch Resistance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Component without harness connected (Steering Pad Switch Assembly)	*b	Volume+
*c	Volume-	*d	MODE
*e	Seek-	*f	Seek+
*g	Off hook	*h	On hook
*i	Voice	*j	ACC

- b. Measure the resistance according to the values in the table below.

Standard Resistance

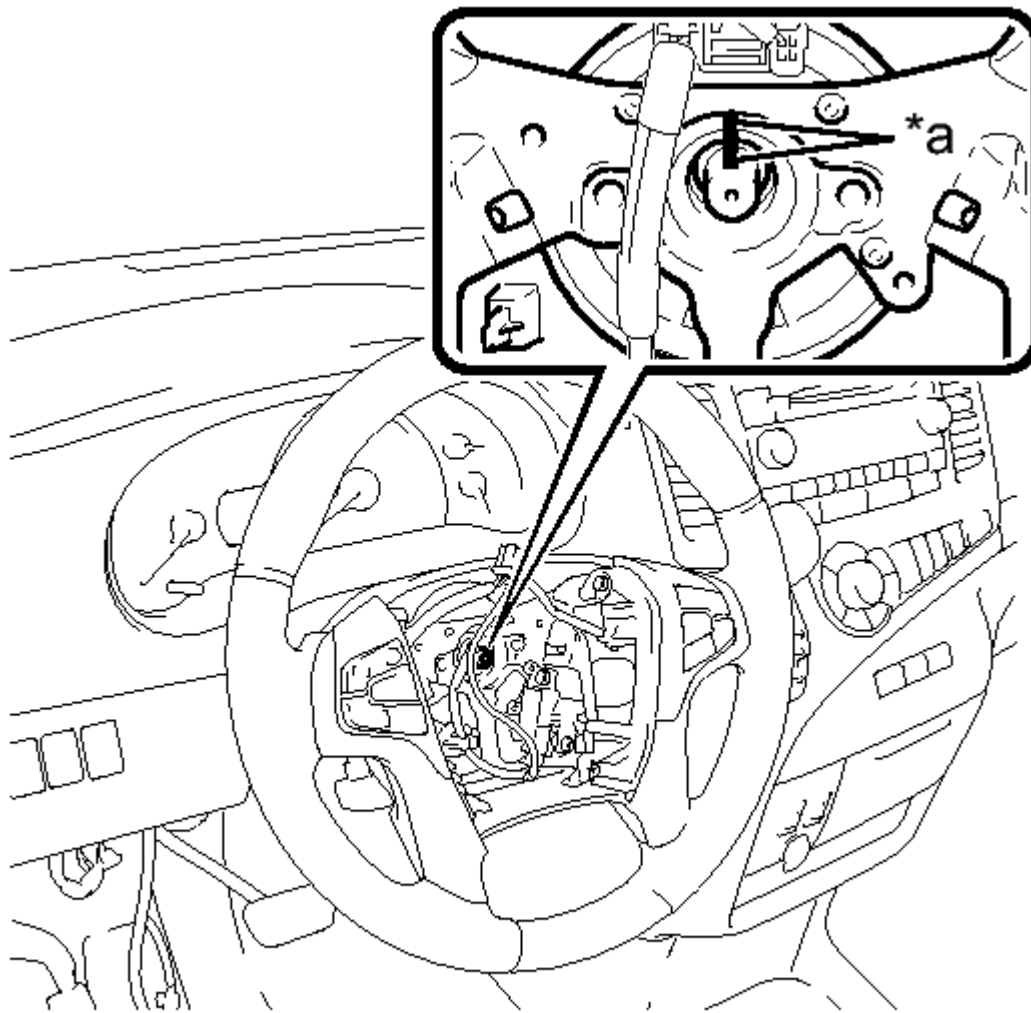
Tester Connection	Switch Condition	Specified Condition
10 (AU1) - 8 (EAU)	No switch is pushed	95 to 105 kohms
	Seek+ switch: pushed	Below 2.5 ohms
	Seek- switch: pushed	313 to 345 ohms
	Volume+ switch: pushed	950 to 1050 ohms
	Volume- switch: pushed	2955 to 3266 ohms
9 (AU2) - 8 (EAU)	No switch is pushed	95 to 105 kohms
	MODE switch: pushed	Below 2.5 ohms
	Voice switch: pushed	2955 to 3266 ohms
	On hook switch: pushed	313 to 345 ohms
	Off hook switch: pushed	950 to 1050 ohms
4 (DIST) - 6 (ECO)	No switch is pushed	10 kohms or higher
	ACC switch: pushed	Below 2.5 ohms

INSTALLATION

INSTALLATION

1. INSTALL STEERING PAD ATTACHING SCREW

- a. Install the 2 steering pad attaching screws to the lower steering wheel boss cover.
- 2. **INSTALL LOWER STEERING WHEEL BOSS COVER**
 - a. Engage the 6 claws to install the lower steering wheel boss cover to the steering wheel sub-assembly.
- 3. **INSTALL HORN BUTTON WIRE (w/o Steering Pad Switch)**
- 4. **INSTALL NO. 2 STEERING WHEEL ORNAMENT (w/o Microphone)**
 - a. Engage the claw and 2 pins to install the No. 2 steering wheel ornament to the steering wheel sub-assembly.
 - b. Install the 2 screws.
- 5. **INSTALL NO. 1 STEERING WHEEL ORNAMENT (w/o Microphone)**
 - a. Engage the claw and 2 pins to install the No. 1 steering wheel ornament to the steering wheel sub-assembly.
 - b. Install the 2 screws.
- 6. **INSTALL STEERING PAD SWITCH LH (w/o Microphone)**
 - a. Engage the claw and 2 pins to install the steering pad switch LH to the steering wheel sub-assembly.
 - b. Install the 2 screws.
- 7. **INSTALL STEERING PAD SWITCH ASSEMBLY (w/ Microphone)**
 - a. Engage the claw and 2 pins to install the steering pad switch assembly (RH side) to the steering wheel sub-assembly.
 - b. Install the 2 screws.
 - c. Engage the claw and 2 pins to install the steering pad switch assembly (LH side) to the steering wheel sub-assembly.
 - d. Install the 2 screws.
- 8. **INSTALL CRUISE CONTROL SWITCH WIRE**
- 9. **INSTALL CRUISE CONTROL MAIN SWITCH** . Refer to **INSTALLATION - Step 1**
- 10. **TURN FRONT WHEELS TO FACE STRAIGHT AHEAD**
- 11. **ADJUST SPIRAL CABLE** . Refer to **INSTALLATION - Step 4**
- 12. **INSTALL STEERING WHEEL ASSEMBLY**
 - a. Align the matchmarks on the steering wheel assembly and steering main shaft.



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Fig. 53: Identifying Steering Wheel Assembly & Steering Main Shaft Matchmarks
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

***a Matchmark**

- b. Install the steering wheel assembly set nut.

Torque: 50 N*m (510 kgf*cm, 37 ft.*lbf)

- c. Connect the connectors to the spiral cable sub-assembly.

13. **INSTALL STEERING PAD** . Refer to **INSTALLATION - Step 1**
14. **INSTALL LOWER NO. 3 STEERING WHEEL COVER** . Refer to **INSTALLATION - Step 2**
15. **INSTALL LOWER NO. 2 STEERING WHEEL COVER** . Refer to **INSTALLATION - Step 3**
16. **INSPECT STEERING WHEEL CENTER POINT**

17. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

NOTE:

- Connect the cable to the negative (-) battery terminal with the front wheels facing straight ahead.
- When disconnecting the cable, some systems need to be initialized after the cable is reconnected. Refer to INITIALIZATION .

18. INSPECT STEERING PAD . Refer to ON-VEHICLE INSPECTION - Step 1

19. INSPECT SRS WARNING LIGHT

Refer to DIAGNOSIS SYSTEM

STEERING

Steering Column (Service Specifications) - Sienna

STEERING COLUMN

SERVICE DATA

SERVICE DATA

STEERING SYSTEM

Steering free play	Maximum	30 mm (1.18 in.)
Steering main shaft preload	Standard	0.98 to 1.58 N*m (10 to 16 kgf*cm, 9 to 13 in.*lbf)

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Rack end rock nut	88	897	65
Steering column assembly set bolt	27.5	280	20
Steering column assembly set nut	27.5	280	20
Steering intermediate shaft assembly x Steering column assembly	35	360	26
Steering wheel assembly set nut	50	510	37
Battery terminal	5.4	55	48 in.*lbf