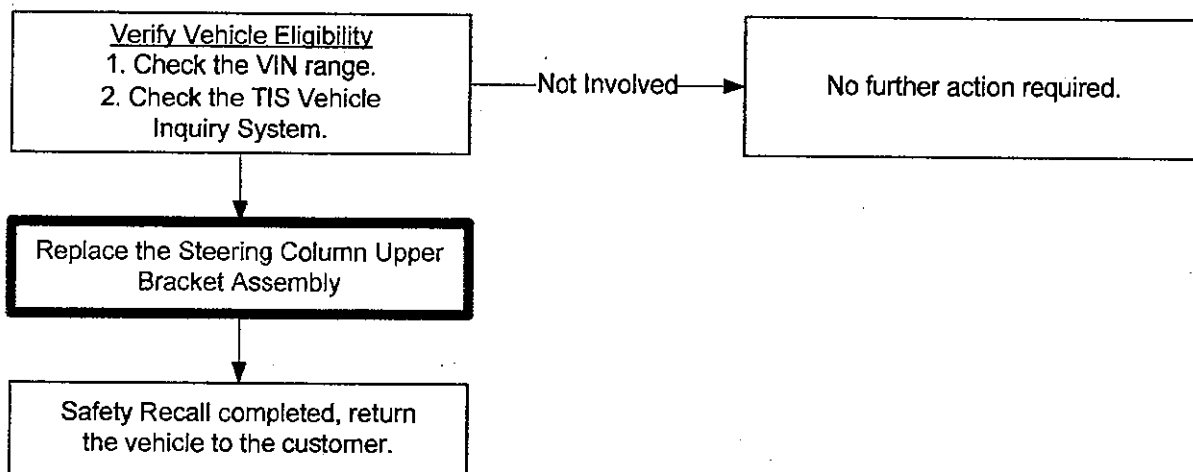


**TECHNICAL INSTRUCTIONS**  
**FOR**  
**SAFETY RECALL A0H**  
**STEERING COLUMN UPPER BRACKET ASSEMBLY REPLACEMENT**  
**2000 – 2004 MODEL YEAR AVALON**

## I. OPERATION FLOWCHART



## II. IDENTIFICATION OF AFFECTED VEHICLES

### A. AFFECTED VIN RANGE

Model	WMI	Year	VIN Range	
			VDS	Range
AVALON	4T1	2000	BF28B	U001015 – U114477
		2001	BF28B	U088593 – U196317
		2002	BF28B	U165562 – U267448
		2003	BF28B	U241036 – U339097
		2004	BF28B	U333766 – U391317

#### NOTE:

- Check the TIS Vehicle Inquiry System to confirm the VIN is involved in this Safety Recall, and that the campaign has not already been completed prior to dealer shipment or by another dealer.
- TMS warranty will not reimburse dealers for repairs conducted on vehicles that are not affected or were completed by another dealer.

## III. PREPARATION

### A. PARTS

Part Number	Part Description	Quantity
04000-45141	Steering Column Bracket Assembly Kit	1
<u>The kit above includes the following parts:</u> 45280-41040 = Steering Column Bracket Assembly Upper = Quantity 1 45897-12020 = Steering Lock Set Bolt = Quantity 2 90464-00551 = Clamp = Quantity 1		

### B. TOOLS & EQUIPMENT

- Torx® T30 Socket
- Torque Wrench
- Techstream
- Standard Hand Tools
- Pin Punch
- Protective Eyewear
- Protective Gloves
- Screw Extractor (M8) or an Equivalent Commercially Available Tool
- Nylon Pry Tools
- Drill & Drill Bits
- Special Service Tool (SST)
  - 09843-18040 – Diagnosis Check Wire 2
  - 09950-50013 – Universal Puller Set C
    - (09951-05010 – Hanger 150)
    - (09952-05010 – Slide Arm)
    - (09953-05020 – Center Bolt 150)
    - (09954-05020 – Claw No. 2)

### C. MATERIALS

- Marking Pen
- Protective tape
- Wood Pieces

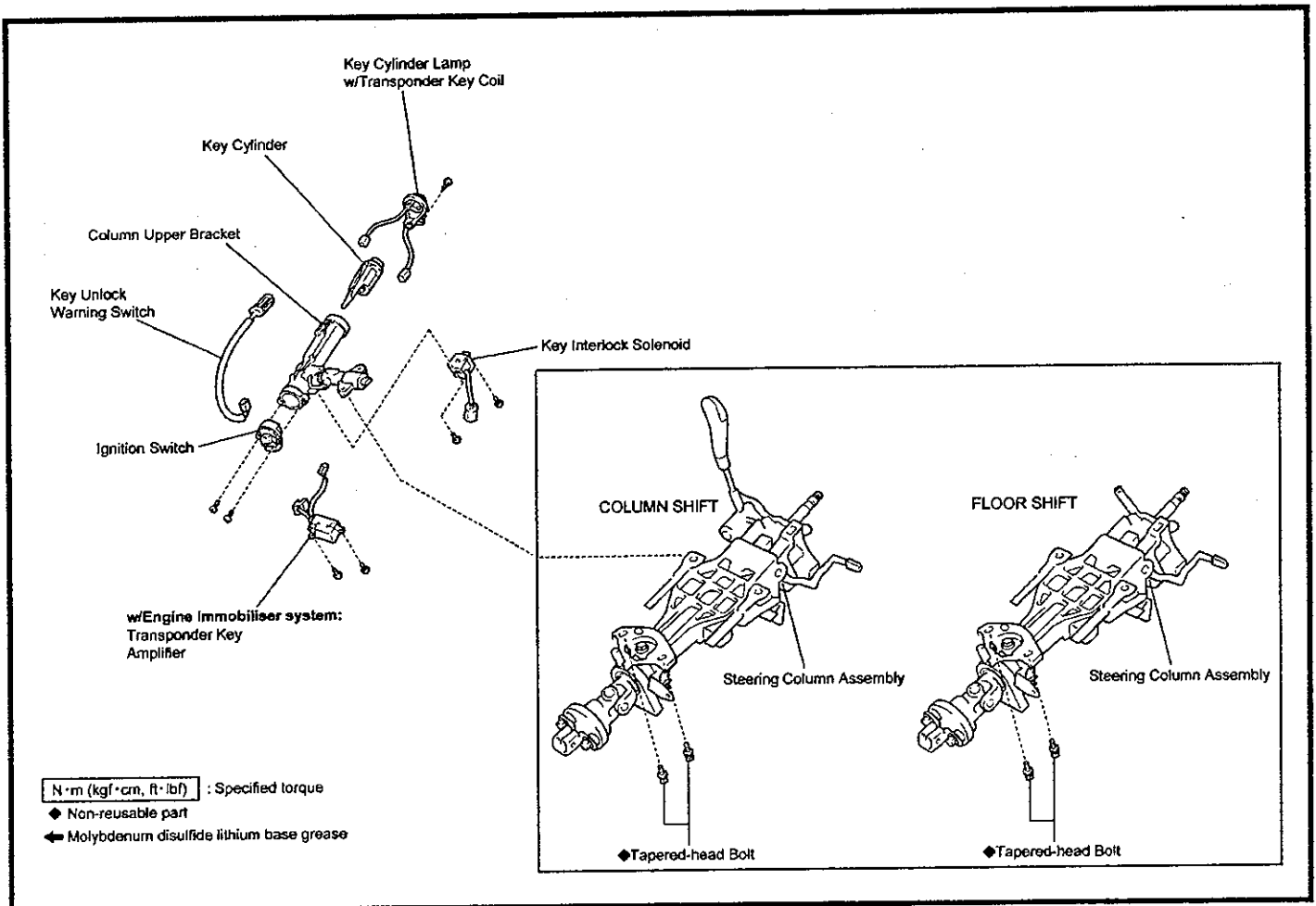
## IV. BACKGROUND

Due to the improper casting of the steering lock bar ("bar"), which is a component of the steering interlock system, there is a possibility that a minute crack may develop on the surface. Such a crack may expand over a long period of repeated lock and unlock operations, and eventually the bar could break. If this occurs, the interlock system may become difficult to unlock when stationary.

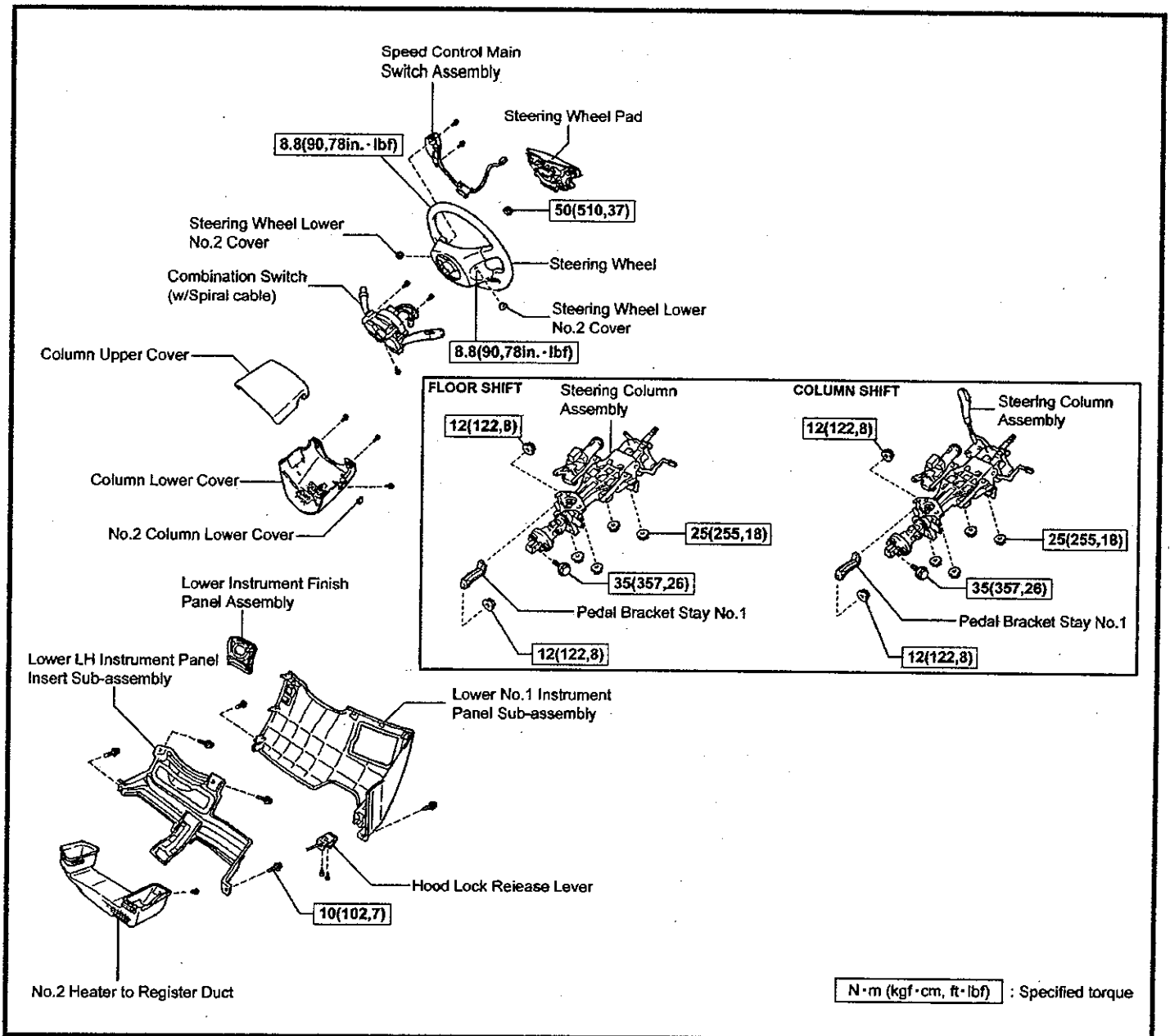
If the vehicle while being driven is steered to the right with sufficient lateral acceleration, a broken and loose lock bar may move toward the steering shaft. If the engagement hole in the shaft happens to line up at the specific time the broken lock bar has moved, this could cause the steering wheel lock bar to engage, locking the steering wheel, and increasing the risk of a crash.

## V. WORK PROCEDURE

### A. COMPONENTS



COMPONENTS CONTINUED...



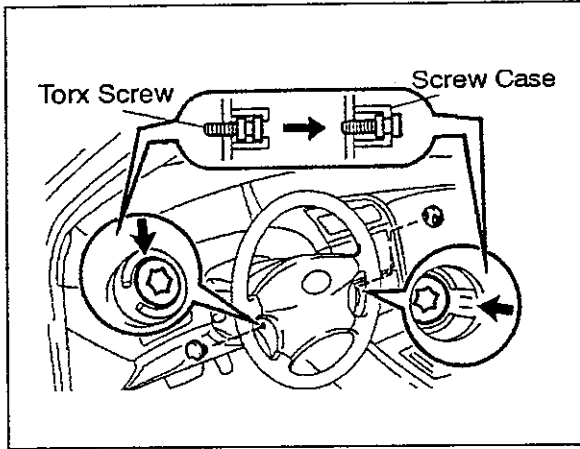
**B. REMOVE THE STEERING COLUMN ASSEMBLY**

**1. DISCONNECT THE NEGATIVE BATTERY CABLE**

- a) Record the radio station presets.
- b) Disconnect the negative battery cable and wait 90 seconds.

**NOTE:**

Wait 90 seconds after the negative battery cable is disconnected before starting work on the SRS system. The SRS is equipped with a backup power source, if work is started within 90 seconds after disconnecting the negative battery cable, the SRS may be deployed.

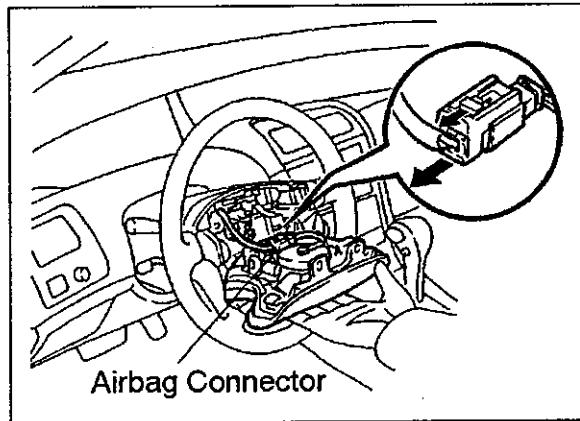


## 2. REMOVE THE STEERING WHEEL PAD (AIRBAG)

- Place the front wheels in a straight-ahead position.
- Using a nylon pry tool, disengage the claw and remove the left steering wheel lower cover No. 2.
- Using a nylon pry tool, disengage the claw and remove the right steering wheel lower cover No. 2. **If equipped** with a cruise control switch, remove the cover by disengaging the claw with a pocket screw driver.
- Loosen the 2 Torx® screws.

### NOTE:

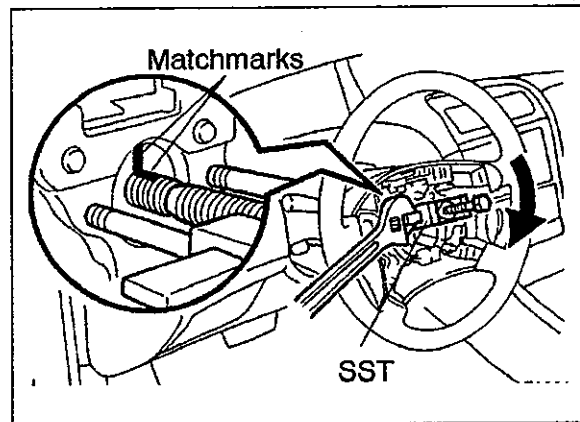
Loosen the Torx® screws until the groove along the circumference catches on the screw case as shown.



- Lower the wheel pad (airbag) and disconnect the airbag and horn connector.
- Remove the wheel pad (airbag).

### NOTE:

- When removing the wheel pad (airbag), take care not to pull on the horn and airbag wire harness.
- When storing the wheel pad (airbag), keep the front surface facing upwards.
- Never disassemble the wheel pad (airbag).



## 3. REMOVE THE STEERING WHEEL

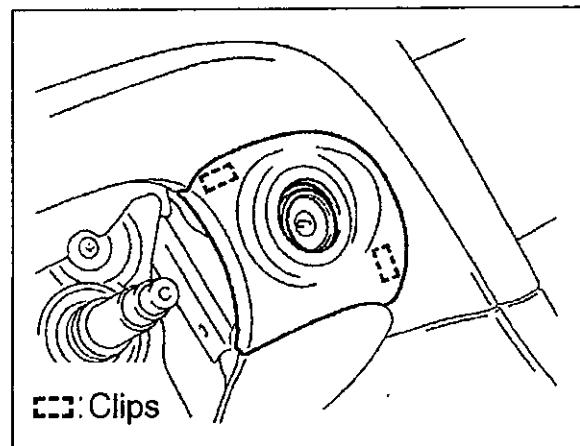
- Disconnect the connector.
- Remove the steering wheel nut.
- Place matchmarks on the steering wheel and main shaft assembly.
- Remove the steering wheel using the SST listed.

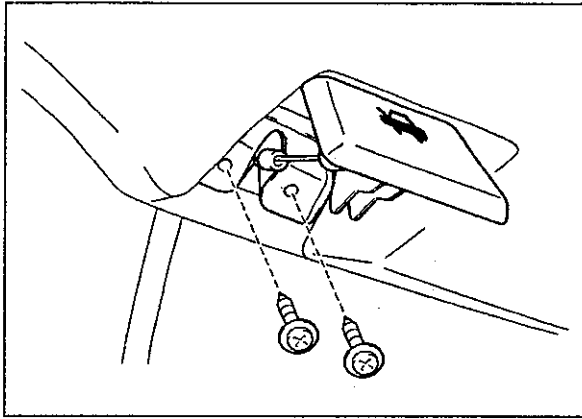
### SST:

- 09951-05010 – Hanger 150
- 09952-05010 – Slide Arm
- 09953-05020 – Center Bolt 150
- 09954-05020 – Claw No. 2

## 4. REMOVE THE LOWER INSTRUMENT FINISH PANEL ASSEMBLY

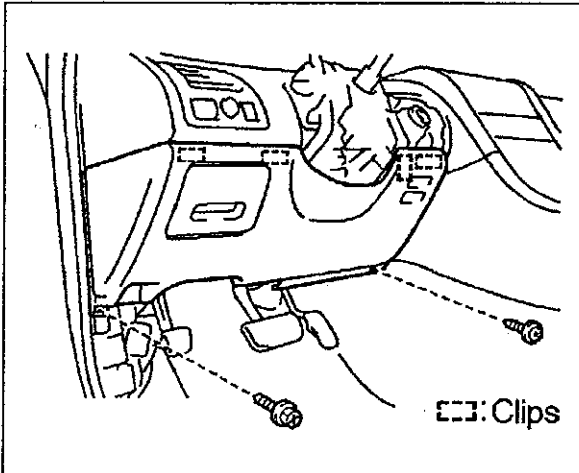
- Using a nylon pry tool, disengage the 2 clips and remove the finish panel assembly.





#### 5. REMOVE THE HOOD LOCK RELEASE LEVER

- a) Remove the 2 screws and the hood lock release lever.
- b) Remove the hood lock cable from the release lever.

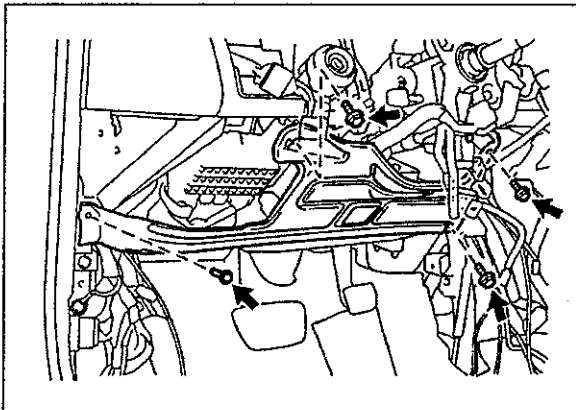


#### 6. REMOVE THE LOWER NO. 1 INSTRUMENT PANLE SUB-ASSEMBLY

- a) Remove the bolt and screw.
- b) Using a nylon pry tool disengage the 4 clips.
- c) Disconnect the power outlet switch and traction control switch (*if equipped*) connectors.
- d) *If equipped* with a room temperature sensor, disconnect the connector and hose.
- e) Remove the lower instrument finish panel.

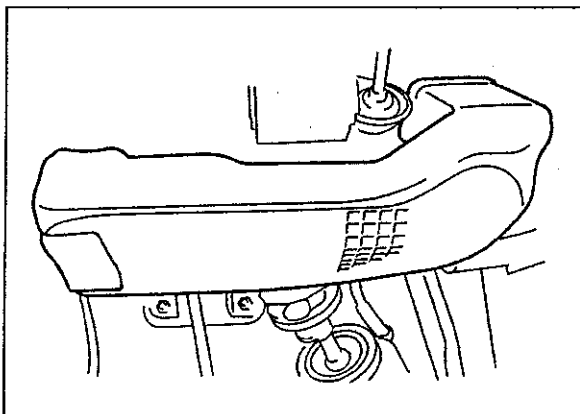
#### NOTE:

**DO NOT** damage the room temperature sensor when disconnecting the hose.



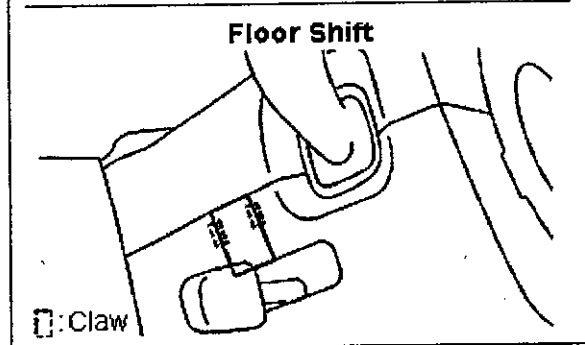
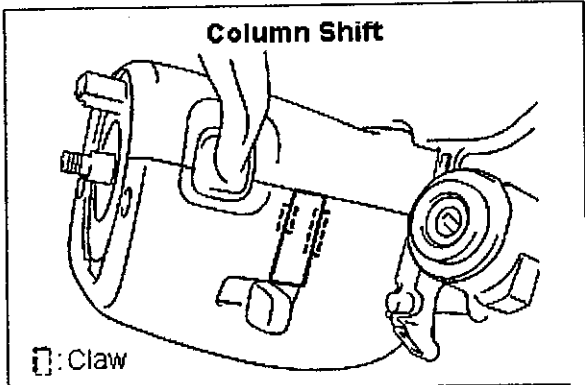
#### 7. REMOVE THE LOWER LH INSTRUMENT PANEL INSERT SUB-ASSEMBLY

- a) Remove the DLC connector by disengaging the 2 claws.
- b) Remove the 4 bolts and the Instrument panel insert sub-assembly.



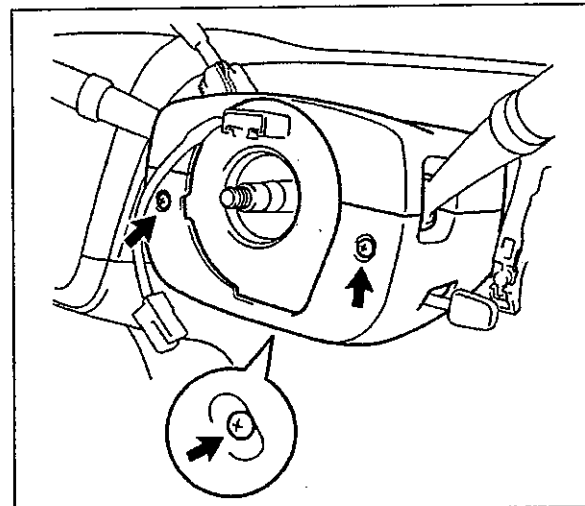
#### 8. REMOVE THE NO. 2 HEATER TO REGISTER DUCT

- a) Remove the clip and the heater to register duct.

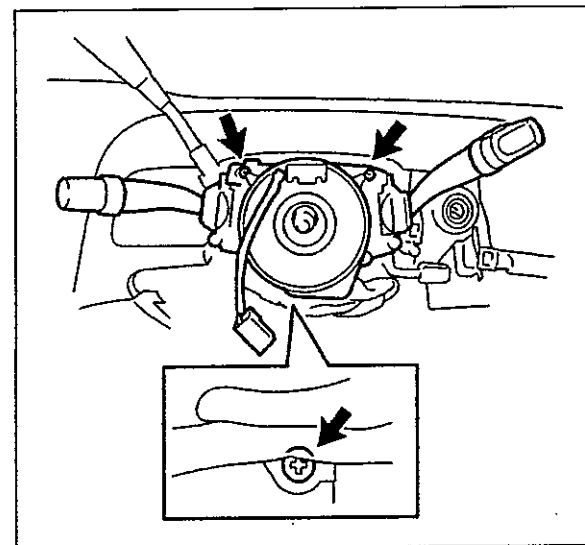


**9. REMOVE THE NO. 2 COLUMN LOWER COVER**

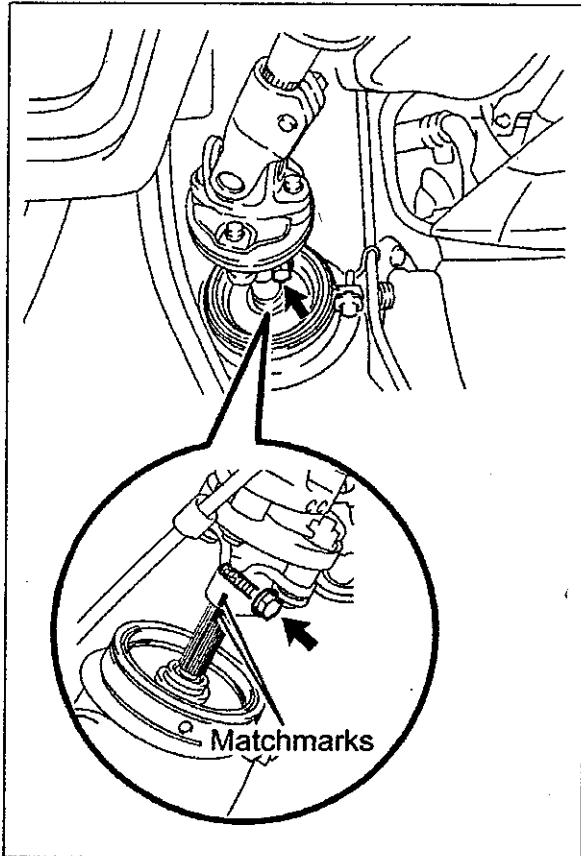
- a) Using a nylon pry tool, disengage the 2 claws and remove the column lower cover.



- a) Remove the 3 screws.
- b) Remove the upper and lower steering column covers.

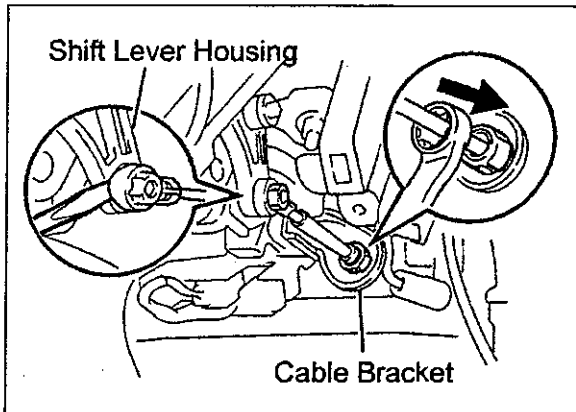


- a) Disconnect the 4 connectors.
- b) Remove the 3 screws and the combination switch with spiral cable.



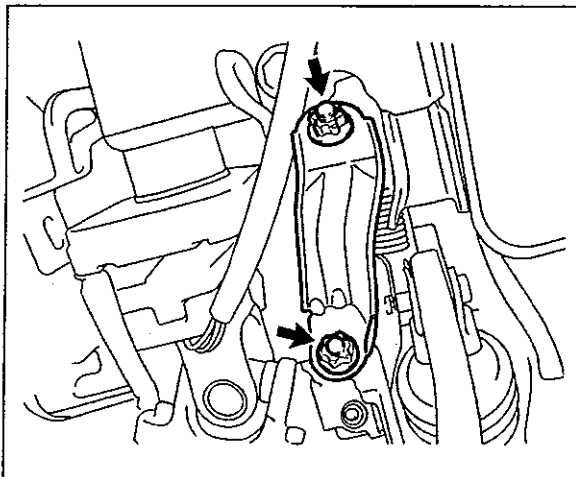
**12. LOOSEN THE INTERMEDIATE SHAFT SUB-ASSEMBLY**

- a) Place matchmarks on the intermediate shaft sub-assembly and joint shaft.
- b) Remove the bolt.



**13. DISCONNECT THE TRANSMISSION CONTROL CABLE (COLUMN SHIFT ONLY)**

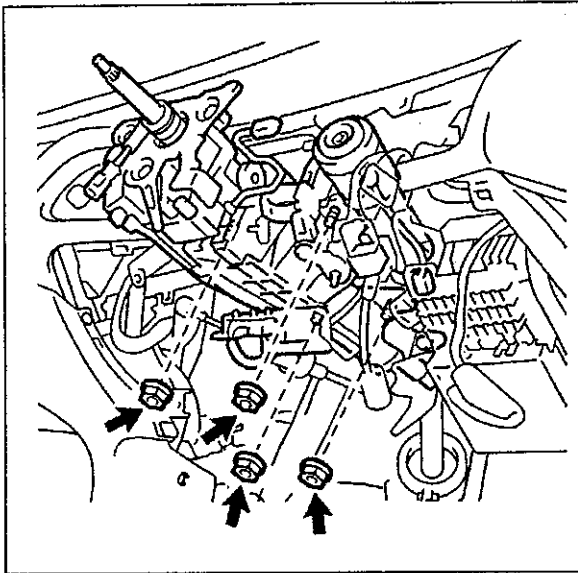
- a) Using a screwdriver, disconnect the transmission control cable from the shift lever housing.
- b) Using an offset wrench, disconnect the transmission control cable from the column tube bracket.



**14. REMOVE THE STEERING COLUMN ASSEMBLY**

- a) Remove the 2 nuts and the pedal bracket stay No. 1.



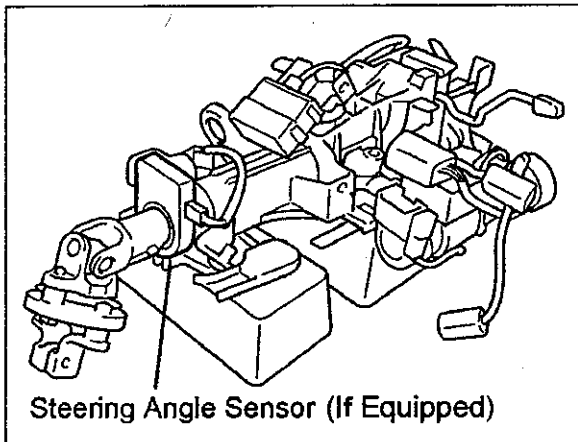


- b) Disconnect the 5 connectors.
- c) Disconnect the 3 wire harness clamps.
- d) Remove the 4 nuts and the steering column assembly.

**NOTE:**

Make sure to wear protective gloves when removing the steering column assembly, as there may be sharp edges on the surrounding components.

**C. REPLACE THE STEERING COLUMN UPPER BRACKET**

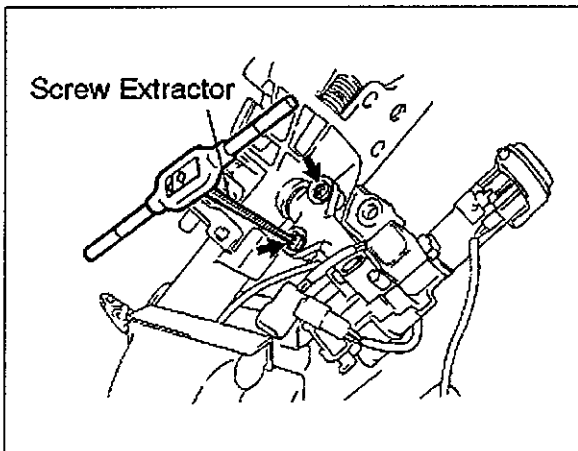


**1. REMOVE THE STEERING COLUMN UPPER BRACKET**

- a) Place the steering column assembly on pieces of wood as shown.

**NOTE:**

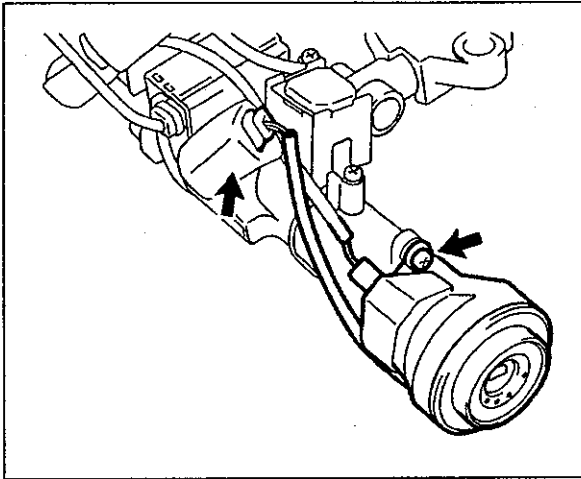
Placing the steering column assembly on pieces of wood will prevent the steering angle sensor (if equipped) from getting damage, during the removal process.



- b) Using a center punch, mark the center of the 2 steering column upper bracket bolt heads.
- c) Using a 3 – 4 mm (0.12 – 0.16 in.) bit, drill a hole 10 mm deep into the 2 bolt heads.
- d) Clean up any metal debris.
- e) Remove the 2 bolts with a screw extractor (M8) or an equivalent commercially available tool.
- f) Remove the steering column upper bracket.

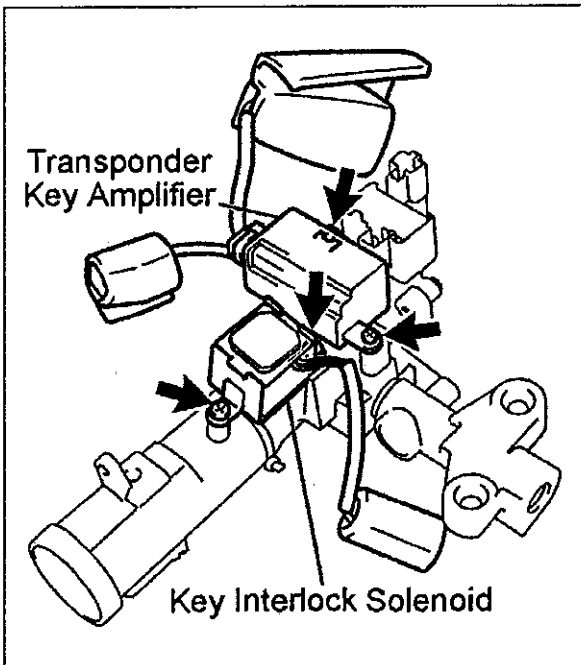
**NOTE:**

- Make sure the hole is centered on the bolt heads.
- DO NOT damage the threads of the steering column when drilling the bolt heads.
- Make sure to wear protective eyewear when drilling.



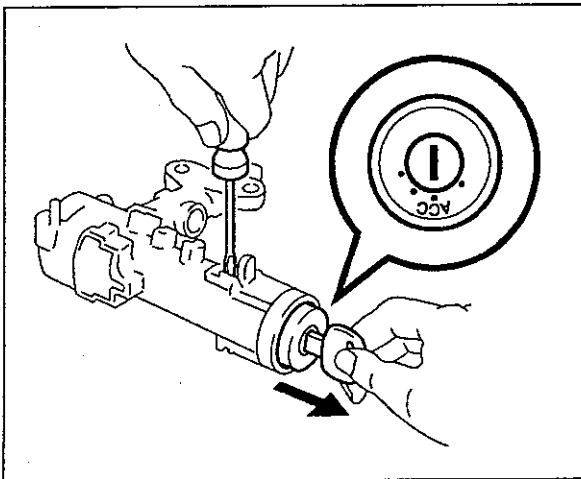
## 2. REMOVE THE KEY CYLINDER LAMP ASSEMBLY

- a) Disconnect the transponder key amplifier connector (if equipped).
- b) Remove the screw and key cylinder lamp assembly.



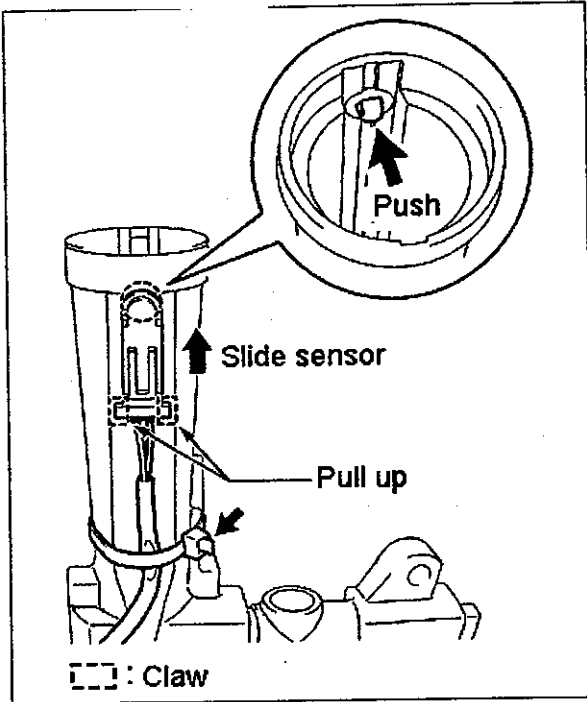
## 3. REMOVE THE TRANSPONDER KEY AMPLIFIER AND KEY INTERLOCK SOLENOID

- a) Remove the 2 screws and the transponder key amplifier.
- b) Remove the 2 screws and the key interlock solenoid.



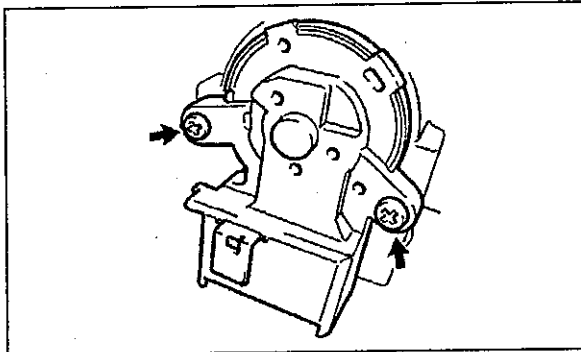
## 4. REMOVE THE KEY CYLINER

- a) Insert the ignition key and turn it to the ACC position..
- b) Push the stop pin down with a screwdriver and pull out the key cylinder.



## 5. REMOVE THE KEY UNLOCK WARNING SWITCH

- Remove the unlock warning switch connector from the ignition switch.
- Cut the clamp (wire tie) holding the key unlock warning switch wire harness.
- Push in the key unlock warning switch (inside the lock cylinder) while pulling up on the 2 claws, then slide the assembly up to remove it.



## 6. REMOVE THE IGNITION SWITCH

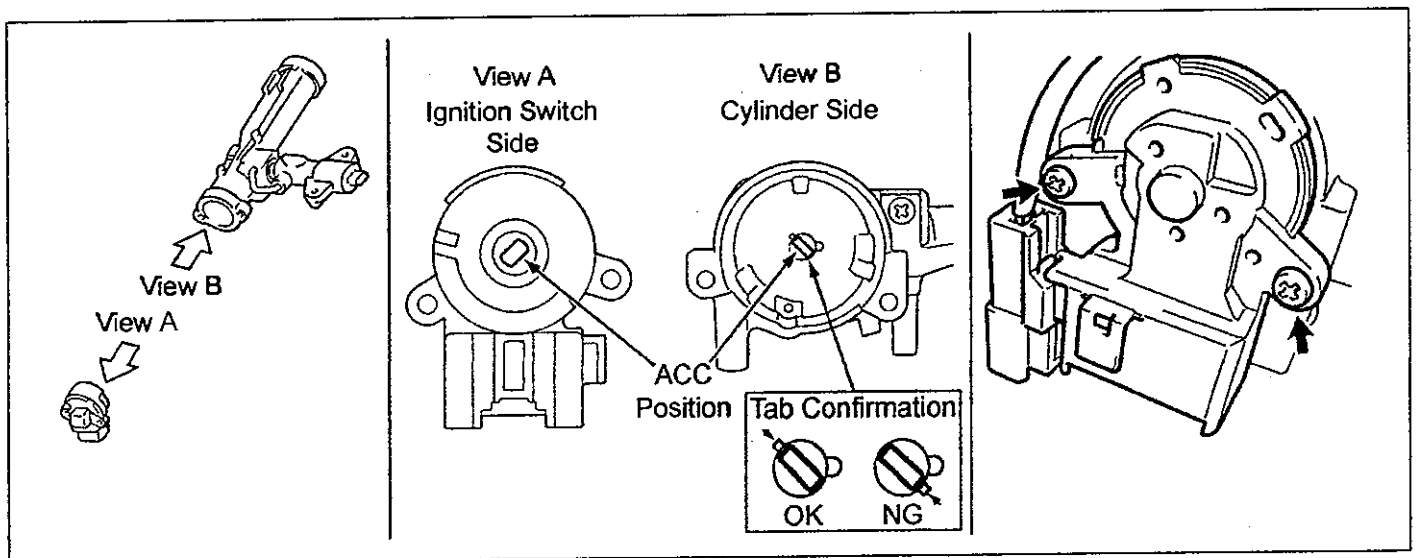
- Remove the 2 screws and the ignition switch.
- Place a mark on the original steering column upper bracket and discard it.

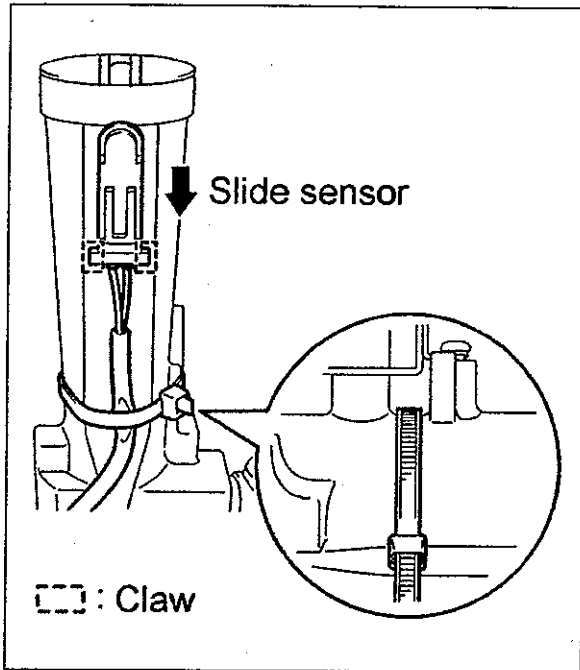
### NOTE:

As required by Federal Regulations, please make sure all recalled parts (original parts) removed from the vehicle are disposed of in a manner in which they will not be reused, **unless requested for parts recovery return.**

## 7. REINSTALL THE IGNITION SWITCH

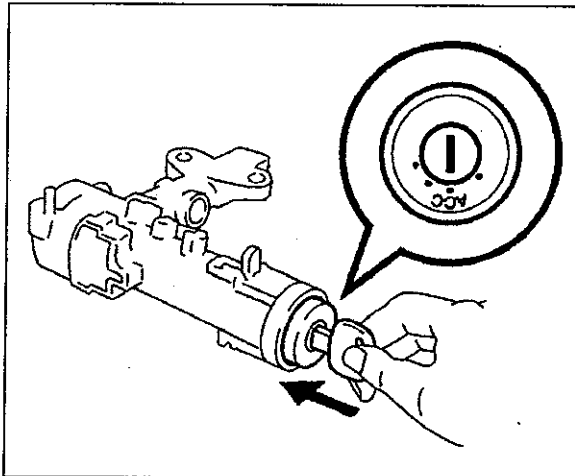
- Place the **NEW** steering column upper bracket cylinder shaft in the ACC position, while making sure the tab is in the correct location as shown.
- Reinstall the ignition switch to the **NEW** steering column upper bracket with the 2 screws.





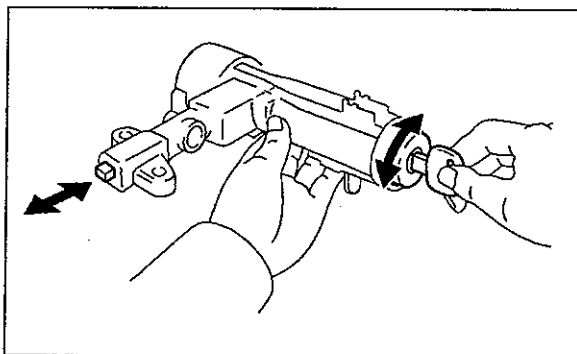
## 8. REINSTALL THE KEY UNLOCK WARNING SWITCH

- Reinstall the key unlock warning switch assembly by sliding it down onto the **NEW** steering column upper bracket, making sure the 2 claws engage.
- Resecure the wire harness to the **NEW** steering column upper bracket with a **NEW** clamp (wire tie).
- Reinstall the unlock warning switch connector to the ignition switch.



## 9. REINSTALL THE KEY CYLINDER

- Make sure the key cylinder is in the ACC position.
- Insert the key cylinder assembly into the **NEW** steering column upper bracket assembly.
- Confirm the key cylinder assembly is firmly fixed.



## 10. INSPECT THE STEERING LOCK OPERATION

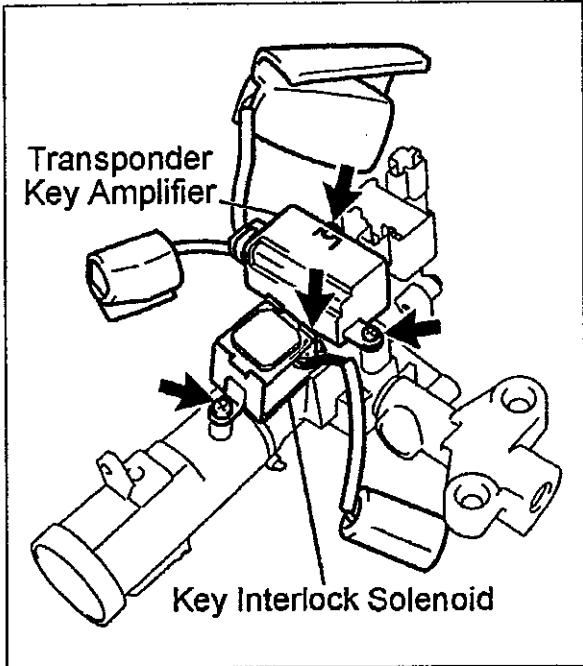
- Confirm the steering lock mechanism operates properly.

### Locked

Turn the ignition switch to the LOCK position and remove the key, the lock mechanism should extend out 9 mm.

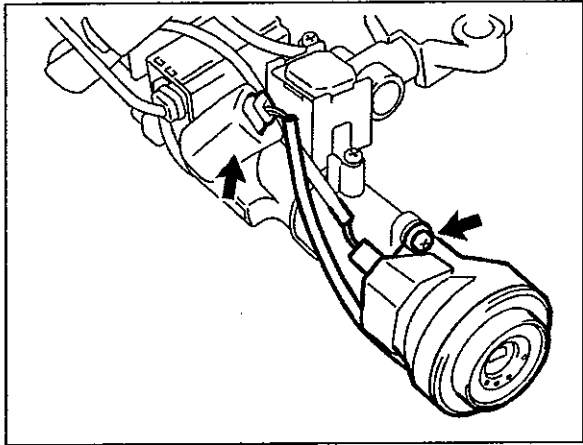
### Unlocked

Insert the key and turn the ignition switch to the ON position, the lock mechanism should retract.



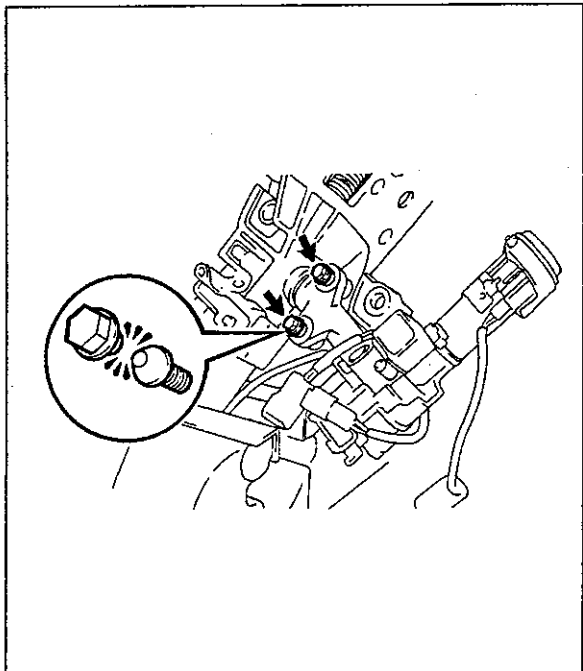
**15. REINSTALL THE KEY INTERLOCK SOLENOID AND TRANSPONDER KEY AMPLIFIER TO THE NEW STEERING COLUMN UPPER BRACKET**

- a) Reinstall the key interlock solenoid to the **NEW** steering column upper bracket with the 2 screws.
- b) Reinstall the transponder key amplifier to the **NEW** steering column upper bracket with the 2 screws.



**11. REINSTALL THE KEY CYLINDER LAMP ASSEMBLY**

- a) Reinstall the key cylinder lamp assembly.
- b) Reinstall the screw.
- c) Reconnect the transponder key amplifier connector (*if equipped*).



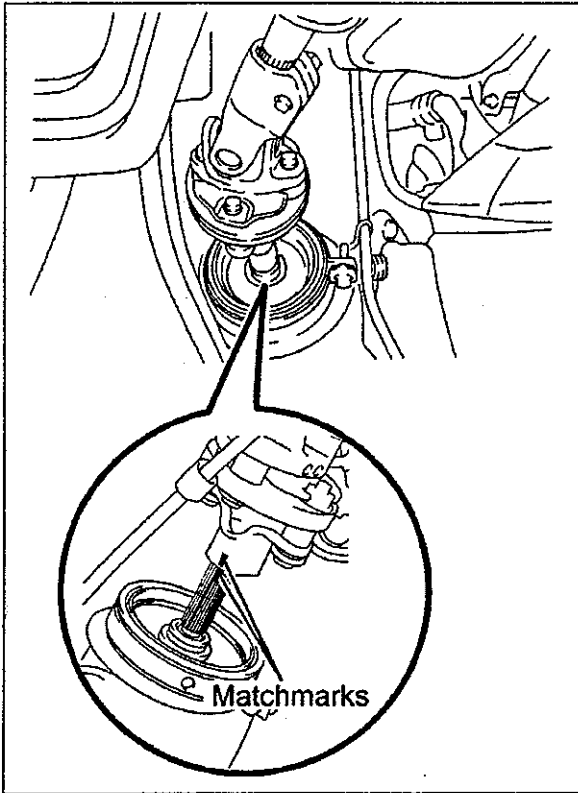
**12. INSTALL THE NEW STEERING COLUMN UPPER BRACKET**

- a) Place the steering column assembly on pieces of wood.
- b) Inspect the attachment threads for debris or damage from the drilling process.
- c) Install the **NEW** upper bracket to the steering column assembly with 2 **NEW** bolts.
- d) Tighten the bolts until the heads break off.
- e) Confirm the **NEW** upper bracket is securely fastened to the steering column assembly.

**NOTE:**

- **Placing the steering column assembly on pieces of wood will prevent the steering angle sensor (*if equipped*) from getting damage, during the installation process.**
- **If the upper bracket cannot be securely fastened due to attachment thread damage on the steering column, please contact your Region representative for further instruction.**

## D. REINSTALL THE STEERING COLUMN ASSEMBLY

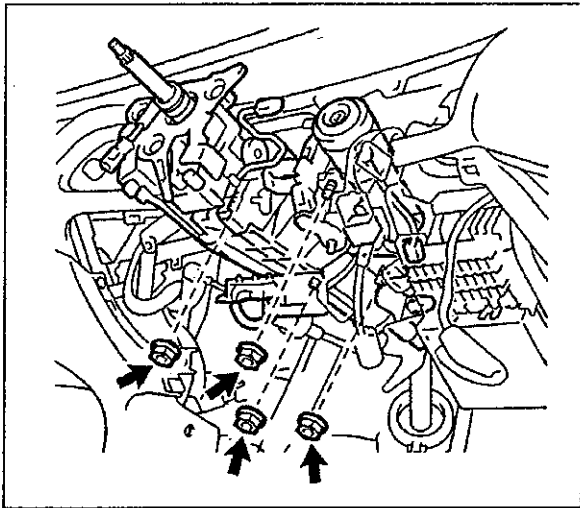


### 1. REINSTALL THE STEERING COLUMN ASSEMBLY

- a) Utilizing the matchmarks, reconnect the intermediate shaft sub-assembly to the joint shaft.

**NOTE:**

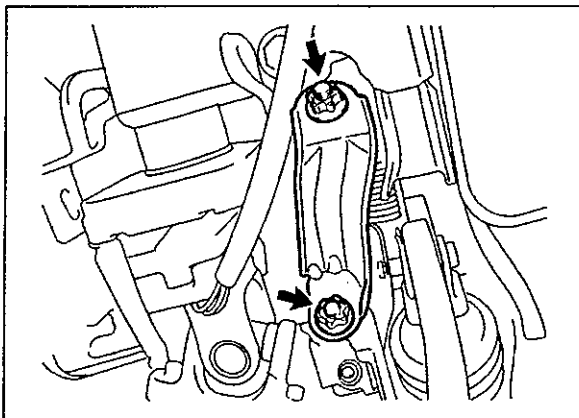
**Make sure to wear protective gloves when reinstalling the steering column assembly, as there may be sharp edges on the surrounding components.**



- b) Reinstall the steering column assembly with the 4 nuts and torque to spec.

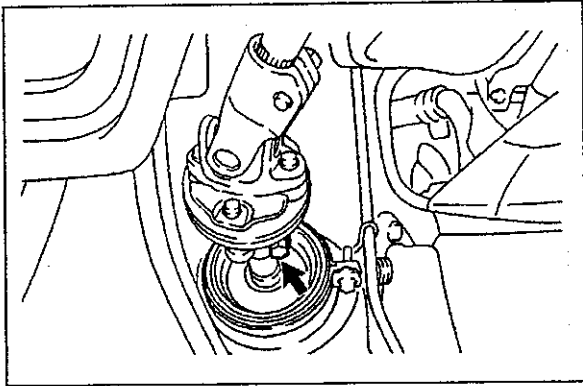
**Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)**

- c) Reconnect the 3 wire harness clamps.
- d) Reconnect the 5 connectors.



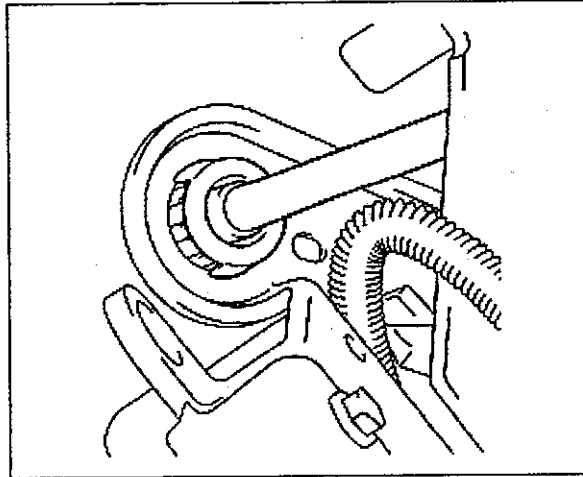
- e) Reinstall the pedal bracket stay No. 1 with the 2 nuts and torque to spec.

**Torque: 12 N·m (122 kgf·cm, 8 ft·lbf)**



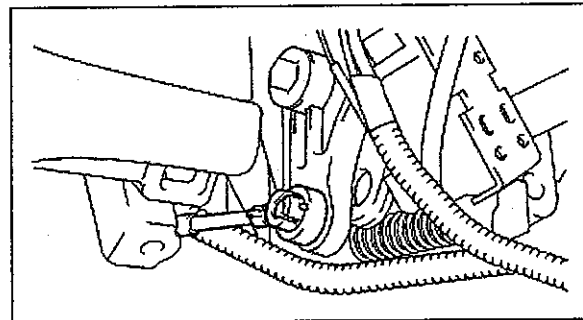
- f) Reinstall the bolt to the intermediate shaft sub-assembly and torque to spec.

**Torque: 35 N·m (357 kgf·cm, 26 ft·lbf)**

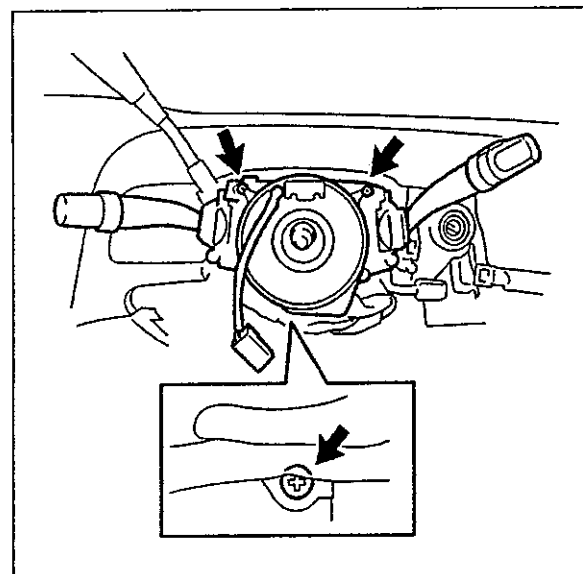


## 2. RECONNECT THE TRANSMISSION CONTROL CABLE (COLUMN SHIFT ONLY)

- a) Reconnect the transmission control cable to the column tube bracket.

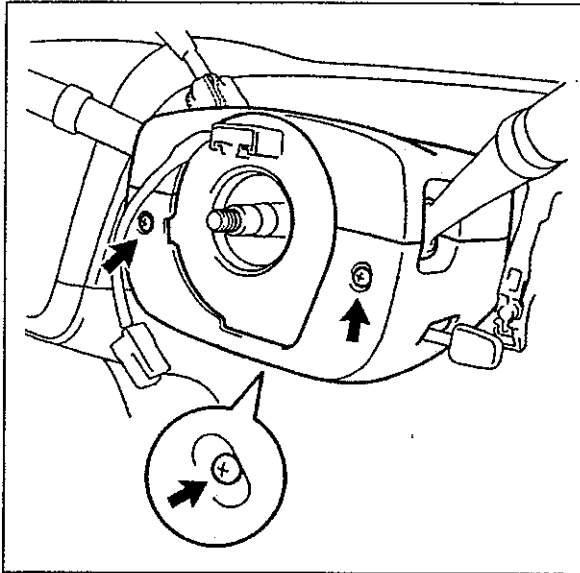


- b) Reconnect the transmission control cable to the shift lever housing.



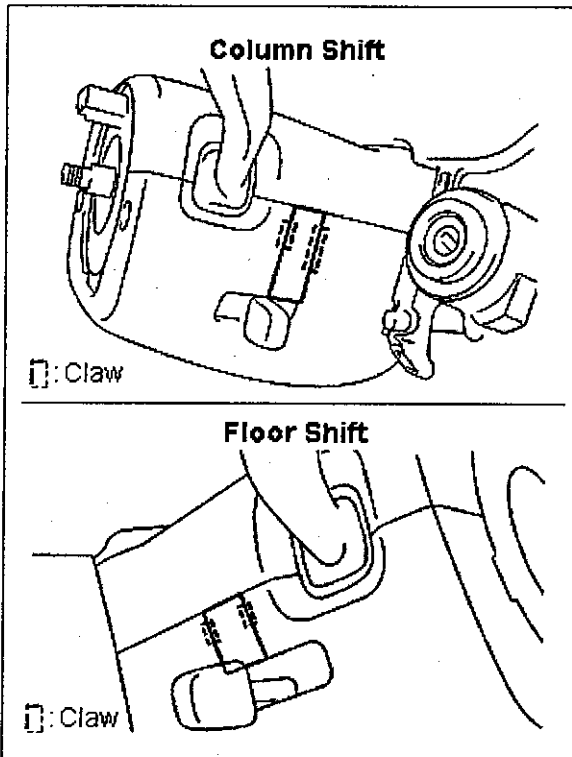
## 3. REINSTALL THE COMBINATION SWITCH WITH SPIRAL CABLE

- a) Reinstall the combination switch with spiral cable using the 3 screws.
- b) Reconnect the 4 connectors.



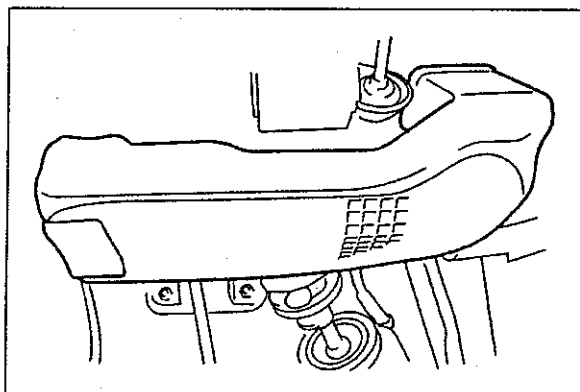
#### 4. REINSTALL THE STEERING COLUMN COVERS

- a) Reinstall lower and upper steering column covers.
- b) Reinstall the 3 screws.



#### 5. REINSTALL THE NO. 2 COLUMN LOWER COVER

- a) Reinstall the column lower cover by engaging the 2 claws.



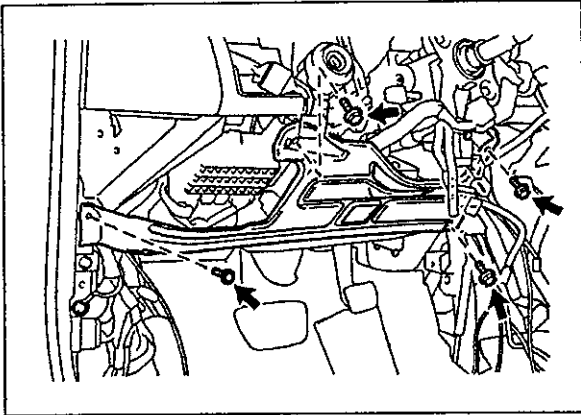
#### 6. REINSTALL THE NO. 2 HEATER TO REGISTER DUCT

- a) Reinstall the heater to register duct with the clip.

**NOTE:**

- **DO NOT** deform the duct when reinstalling.
- **Make sure** the duct is firmly installed.



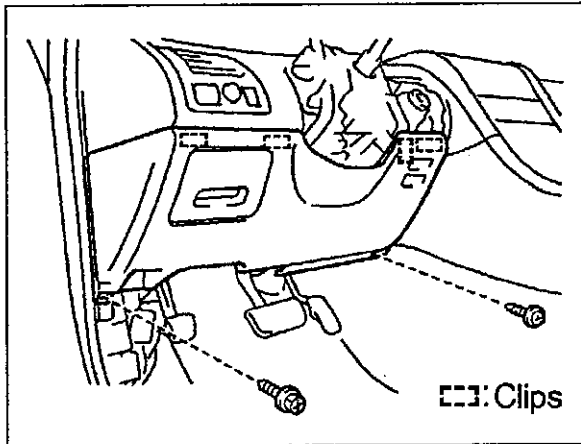


**7. REINSTALL THE LOWER LH INSTRUMENT PANEL INSERT SUB-ASSEMBLY**

- a) Reinstall the Instrument panel insert sub-assembly with the 4 bolts and torque to spec.

**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**

- b) Reconnect the DLC connector by engaging the 2 claws.

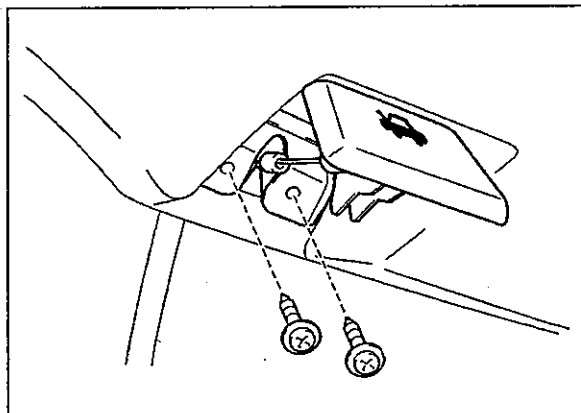


**8. REINSTALL THE LOWER NO. 1 INSTRUMENT PANEL SUB-ASSEMBLY**

- a) *If equipped* with a room temperature sensor, reconnect the hose and connector.
- b) Reconnect the power outlet switch and traction control switch (*if equipped*) connectors.
- c) Reinstall the instrument panel sub-assembly by engaging the 4 clips.
- d) Reinstall the screw and bolt.

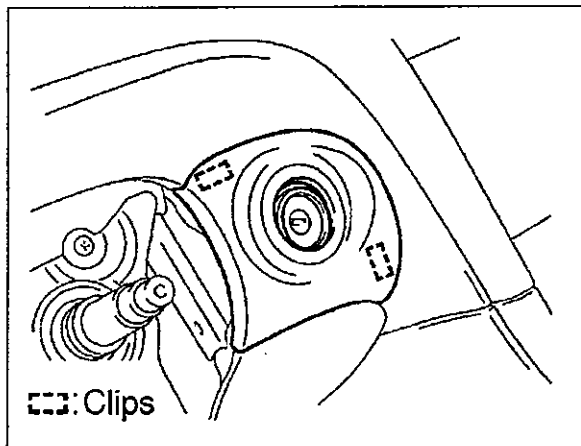
**NOTE:**

**DO NOT** damage the room temperature sensor when disconnecting the hose.



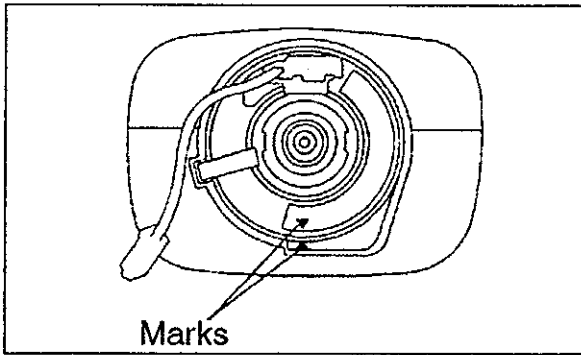
**9. REINSTALL THE HOOD LOCK RELEASE LEVER**

- a) Reinstall the hood lock cable to the release lever.
- b) Reinstall the hood lock release lever with the 2 screws.



**10. REINSTALL THE LOWER INSTRUMENT FINISH PANEL ASSEMBLY**

- a) Reinstall the finish panel assembly by engaging the 2 clips.

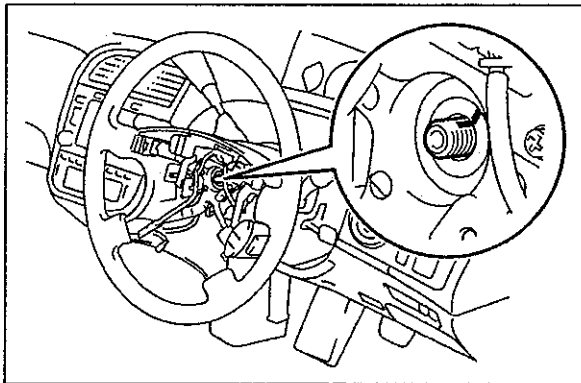


#### 11. CENTER THE SPIRAL CABLE

- a) Confirm the front wheels are in a straight-ahead position.
- b) Turn the spiral cable counterclockwise by hand until it becomes hard to turn.
- c) Then rotate the spiral cable clockwise about 2.5 turns to align the marks.

**NOTE:**

The spiral cable will rotate approximately 2.5 turns to the left or right from its center position.

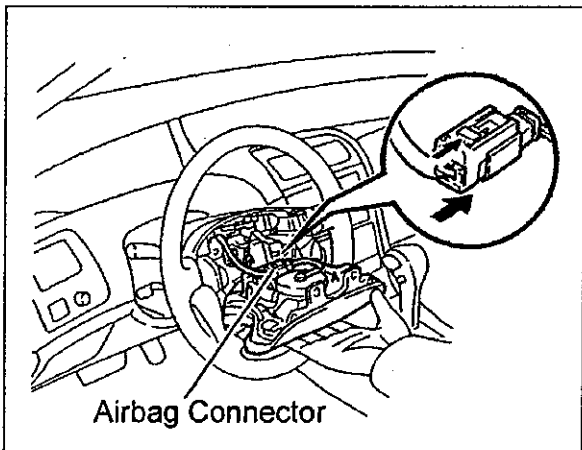


#### 12. REINSTALL THE STEERING WHEEL

- a) Utilizing the matchmarks, reinstall the steering wheel to the main shaft assembly.
- b) Reinstall the steering wheel nut and torque to spec.

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

- c) Reconnect the connector.



#### 13. REINSTALL THE STEERING WHEEL PAD (AIRBAG)

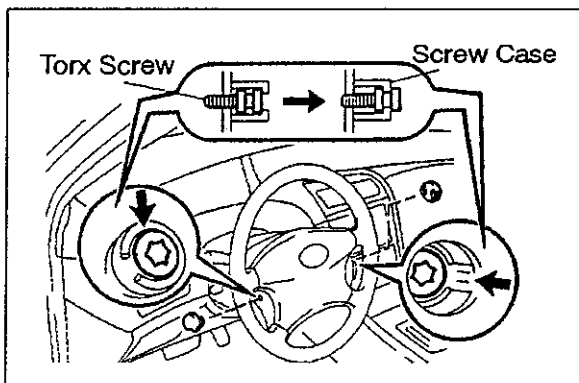
- a) Reconnect the horn and airbag connector.
- b) Reinstall the wheel pad (airbag) to the steering wheel.

**NOTE:**

- Never use airbag parts from another vehicle. Always use NEW parts when replacement is required.
- If the wheel pad (airbag) was been dropped, has cracks, dents or other defects on the case or connector replace it with a NEW one.
- When installing the wheel pad (airbag), make sure the wires are not pinched between or interfere with surrounding parts.

- c) Reinstall the 2 Torx® screws and torque to spec.

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



- d) Reinstall the left steering wheel lower covers No. 2 by engaging the claw.
- e) Reinstall the right steering wheel lower cover No. 2 or cruise control switch cover (*if equipped*) by engaging the claw.

#### 14. RECONNECT THE NEGATIVE BATTERY CABLE

- a) Reconnect the negative battery cable.
- b) Set the radio station presets and the clock.

## 15. INSPECT THE FOLLOWING

- Airbag Warning Light Operation
  - a) With the ignition ON, confirm the warning light turns on and turns off approximately 6 seconds later.

### NOTE:

If the SRS light stays on after 6 seconds diagnose the system as outlined in the repair manual on TIS.

- Headlight and Turn Signal Switch
- Hood Lock Release Lever
- Horn
- Key Interlock Operation
  - a) Turn the ignition switch ON.
  - b) Move the shift lever out of P while depressing the brake pedal.
  - c) Check that the ignition switch cannot be turned OFF.
  - d) Move the shift lever to P and check that the key can be removed after the ignition switch is turned OFF.
- Shift Lever Position Operation (Column Shift Only)
  - a) Check that the indicator and shifter position match.
- Shift Lock Operation
  - a) With the shift lever in P and the ignition switch OFF, confirm the shift lever cannot be moved out of P.
  - b) Turn the ignition switch ON and confirm the shift lever can be moved out of P with the brake pedal applied.
- Steering Wheel is Centered
- Steering Wheel Lock Operation
  - a) With the key removed from the ignition switch, turn the steering wheel until it locks into place.
- Wiper / Washer Switch

## 16. STEERING ANGLE SENSOR ZERO POINT CALIBRATION (WITH VSC)

Follow the “Steering Angle Sensor Zero Point Calibration” outlined in the “Pre-Check: ABS With EBD & BA & TRAC & VSC System: Pre-check” section of the repair manual on TIS for the vehicle you are working on.

## 17. INSPECT FOR DTC

- CAMPAIGN COMPLETE -

## 15. INSPECT THE FOLLOWING

- Airbag Warning Light Operation
  - a) With the ignition ON, confirm the warning light turns on and turns off approximately 6 seconds later.

**NOTE:**

**If the SRS light stays on after 6 seconds diagnose the system as outlined in the repair manual on TIS.**

- Headlight and Turn Signal Switch
- Hood Lock Release Lever
- Horn
- Key Interlock Operation
  - a) Turn the ignition switch ON.
  - b) Move the shift lever out of P while depressing the brake pedal.
  - c) Check that the ignition switch cannot be turned OFF.
  - d) Move the shift lever to P and check that the key can be removed after the ignition switch is turned OFF.
- Shift Lever Position Operation (Column Shift Only)
  - a) Check that the indicator and shifter position match.
- Shift Lock Operation
  - a) With the shift lever in P and the ignition switch OFF, confirm the shift lever cannot be moved out of P.
  - b) Turn the ignition switch ON and confirm the shift lever can be moved out of P with the brake pedal applied.
- Steering Wheel is Centered
- Steering Wheel Lock Operation
  - a) With the key removed from the ignition switch, turn the steering wheel until it locks into place.
- Wiper / Washer Switch

## 16. STEERING ANGLE SENSOR ZERO POINT CALIBRATION (*WITH VSC*)

Follow the "Steering Angle Sensor Zero Point Calibration" outlined in the "Pre-Check: ABS With EBD & BA & TRAC & VSC System: Pre-check" section of the repair manual on TIS for the vehicle you are working on.

## 17. INSPECT FOR DTC

- CAMPAIGN COMPLETE -