

# STEERING

5002J-08

## PRECAUTION

### 1. HANDLING PRECAUTIONS ON STEERING SYSTEM

- (a) Care must be taken when replacing parts. Incorrect replacement they could affect the performance of the steering system and result in a driving hazard.

### 2. HANDLING PRECAUTIONS ON SRS AIRBAG SYSTEM

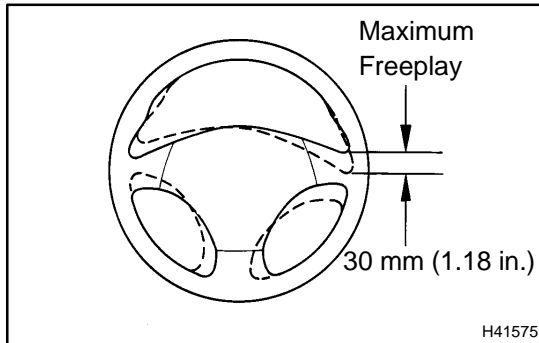
- (a) The LEXUS ES330 is equipped with SRS (Supplemental Restraint System) such as the driver airbag and front passenger airbag. Failure to carry out service operation in correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notice for the supplemental restraint system (See page [60-1](#) ).

## PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in the order shown. If necessary, repair or replace these parts.

Symptom	Suspect Area	See page
Hard steering	1. Tires (Improperly inflated)	<a href="#">28-1</a>
	2. Power steering fluid level (Low)	<a href="#">51-3</a>
	3. Drive belt (Loose)	<a href="#">51-3</a>
		<a href="#">51-3</a>
	4. Front wheel alignment (Incorrect)	<a href="#">26-5</a>
	5. Steering system joints (Worn)	-
	6. Suspension arm ball joints (Worn)	<a href="#">26-16</a>
	7. Steering column (Binding)	-
	8. Power steering vane pump	<a href="#">51-9</a>
	9. Power steering gear	<a href="#">51-21</a>
Poor return	1. Tires (Improperly inflated)	<a href="#">28-1</a>
	2. Front wheel alignment (Incorrect)	<a href="#">26-5</a>
	3. Steering column (Binding)	-
	4. Power steering gear	<a href="#">51-21</a>
Excessive play	1. Steering system joints (Worn)	-
	2. Suspension arm ball joints (Worn)	<a href="#">26-16</a>
	3. Intermediate shaft, Sliding yoke (Worn)	-
	4. Front wheel bearing (Worn)	<a href="#">30-19</a>
	5. Power steering gear	<a href="#">51-21</a>
Abnormal noise	1. Power steering fluid level (Low)	<a href="#">51-3</a>
	2. Steering system joints (Worn)	-
	3. Power steering vane pump	<a href="#">51-9</a>
	4. Power steering gear	<a href="#">51-21</a>

## ON-VEHICLE INSPECTION

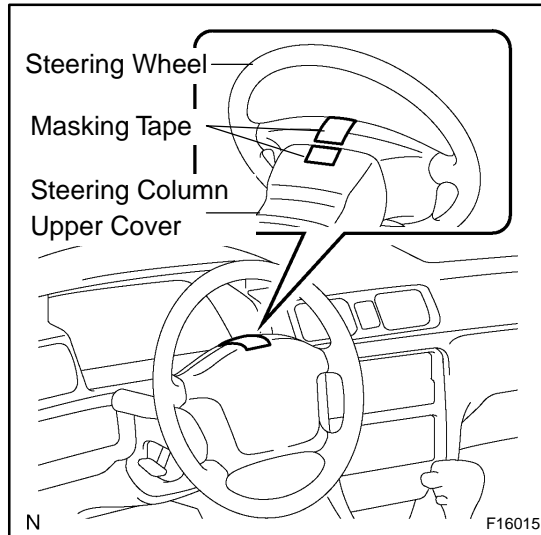


### 1. CHECK STEERING WHEEL FREEPLAY

- (a) Stop the vehicle and face the tires straight ahead.
- (b) Rock the steering wheel gently up and down with your hand, check the steering wheel freeplay.

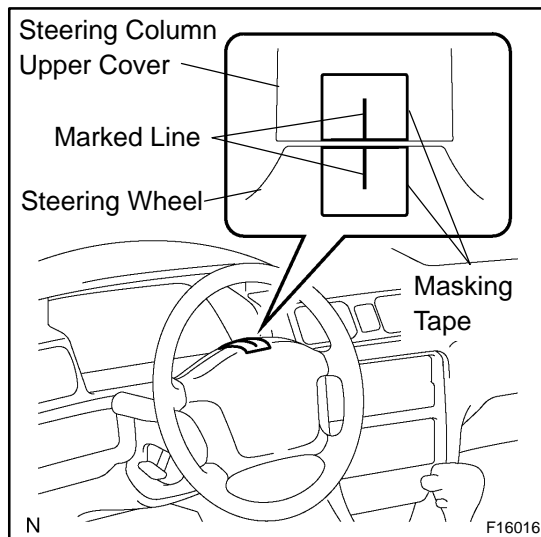
**Maximum freeplay: 30 mm (1.18 in.)**

# REPAIR

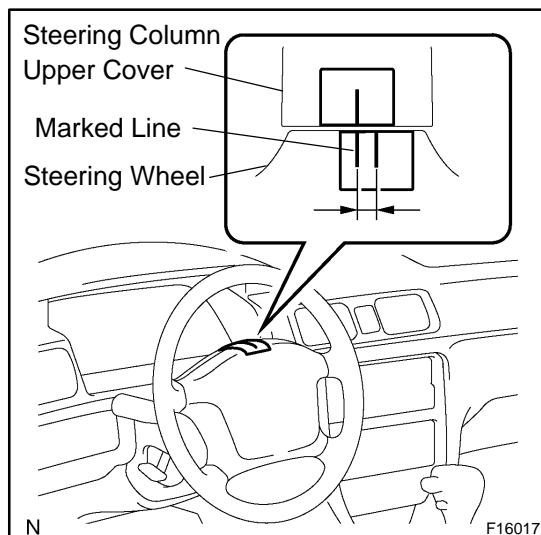


## 1. STEERING OFF CENTER REPAIR PROCEDURE

- (a) Inspect steering wheel off center.
  - (1) Apply masking tape on the top center of the steering wheel and steering column upper cover.
  - (2) Drive the vehicle in a straight line for 100 meters at a constant speed of 35 mph (56 km/h), and hold the steering wheel to maintain the course.



- (3) Draw a line on the masking tape as shown in the illustration.



- (4) Turn the steering wheel to its straight position.

### HINT:

Refer to the upper surface of the steering wheel, steering spoke and SRS airbag line for the straight position.

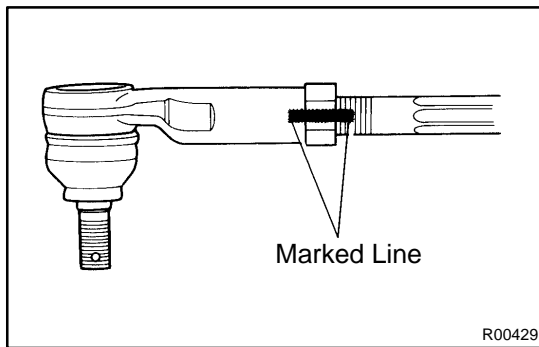
- (5) Draw a new line on the masking tape or the steering wheel as shown in the illustration.
- (6) Measure the distance between the 2 lines on the masking tape of the steering wheel.
- (7) Convert the measured distance to steering angle.

**Measured distance 1 mm (0.04 in.) = Steering angle approximately 1 deg.**

### HINT:

Make a note of the steering angle.

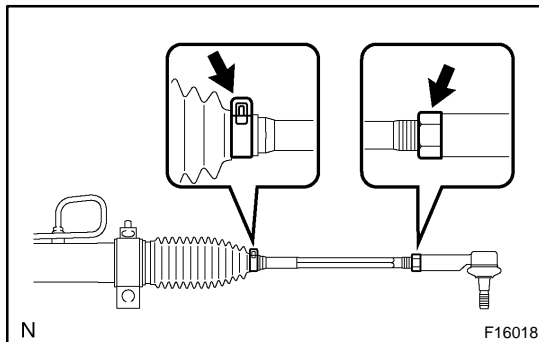
- (b) Adjust steering angle.



- (1) Draw a line on the RH and LH tie rod and rack ends where it can easily be seen.
- (2) Using a paper gauge, measure the distance from RH and LH tie rod ends to the rack end screws.

## HINT:

- Measure the RH side and LH side.
- Make a note of the measured values.



- (3) Remove the RH and LH boot clips from the rack boots.
- (4) Loosen the RH and LH lock nuts.
- (5) Turn the RH and LH rack end by the same amount (but in different directions) according to the steering angle.

**1 turn 360 deg. of rack end (1.5 mm (0.059 in.) horizontal movement) - 12 deg. of steering angle.**

- (6) Tighten the RH and LH lock nuts.

**Torque: 74 N·m (755 kgf·cm, 55 ft·lbf)**

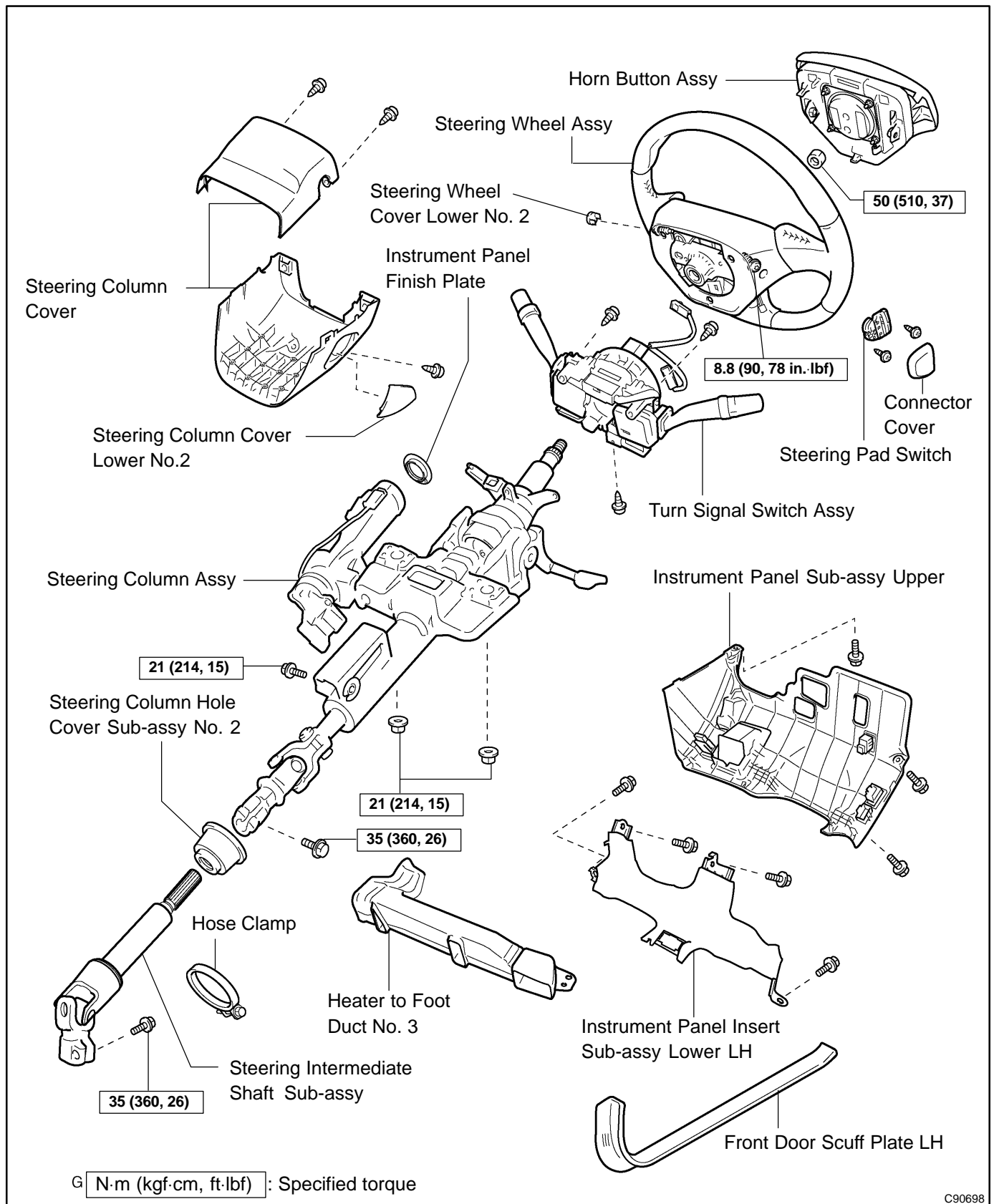
## NOTICE:

**Make sure that the difference in length between RH and LH tie rod ends and rack end screws are within 1.5 mm (0.059 in.).**

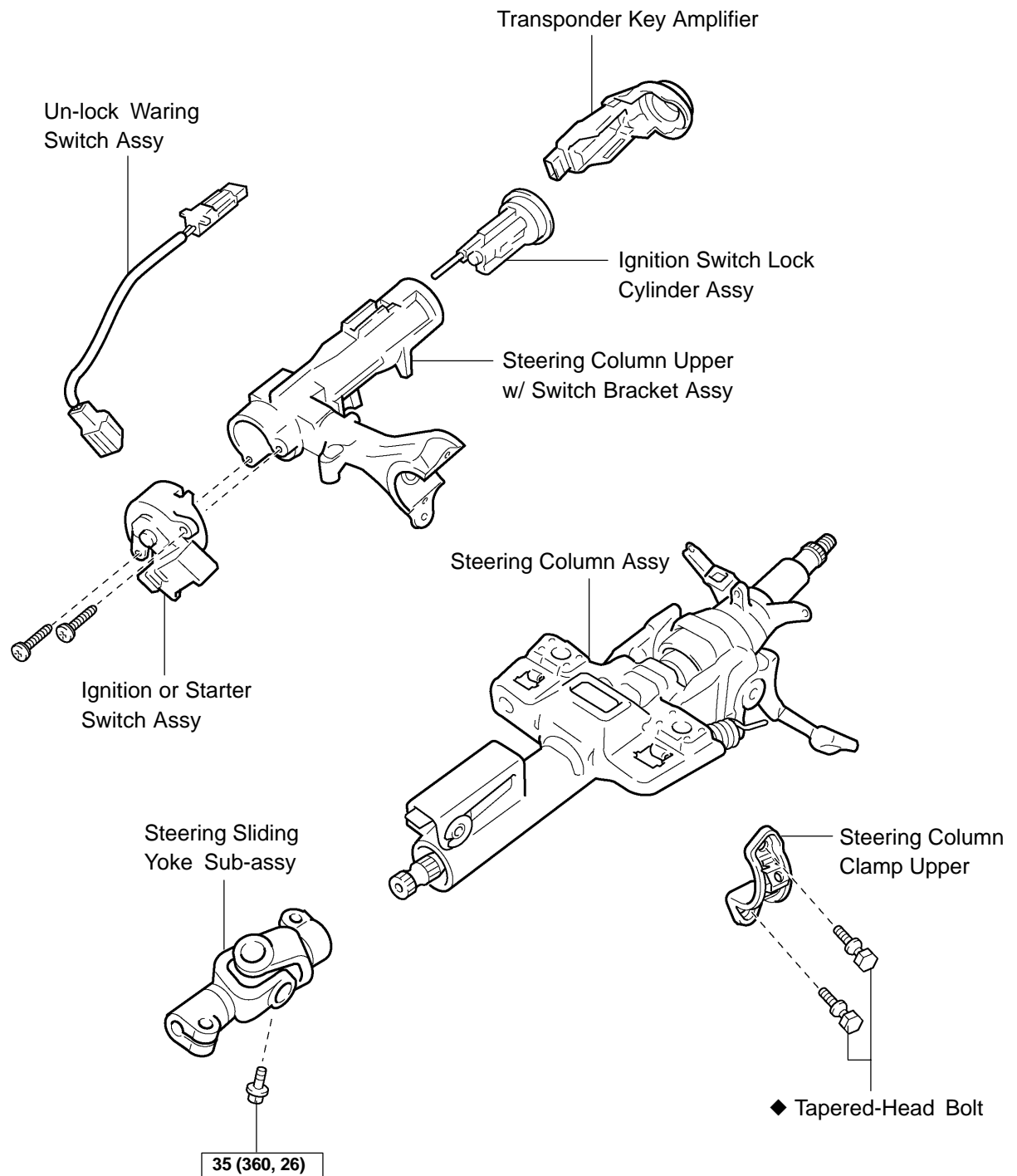
- (7) Install the RH and LH boot clips.

# STEERING COLUMN ASSY COMPONENTS

5002H-02



C90698



G

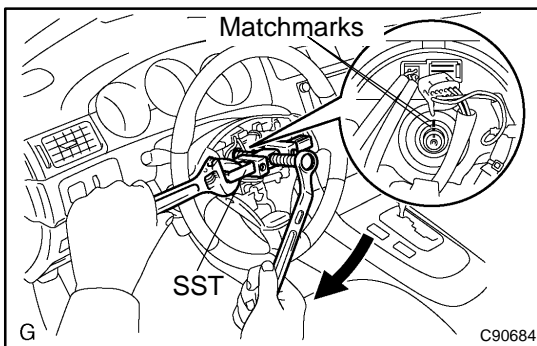
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

C92308

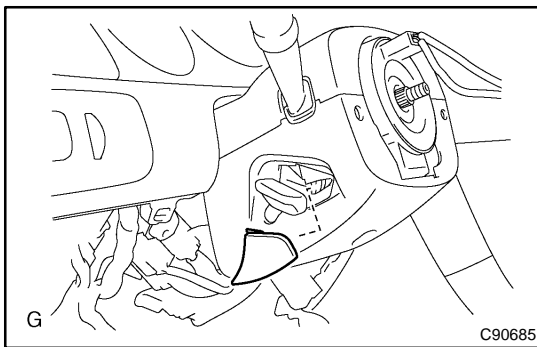
## OVERHAUL

1. **PRECAUTION**(See page 60-1 )
2. **DISCONNECT BATTERY NEGATIVE TERMINAL**(See page 60-1 )
3. **PLACE FRONT WHEELS FACING STRAIGHT AHEAD**
4. **REMOVE STEERING WHEEL COVER LOWER NO.2**
5. **REMOVE CONNECTOR COVER**
6. **REMOVE STEERING PAD SWITCH**
  - (a) Remove the 2 screws.
  - (b) Disconnect the connector and remove the steering pad switch.
7. **REMOVE HORN BUTTON ASSY**(See page 60-22 )
8. **REMOVE STEERING WHEEL ASSY**
  - (a) Remove the steering wheel assy set nut.

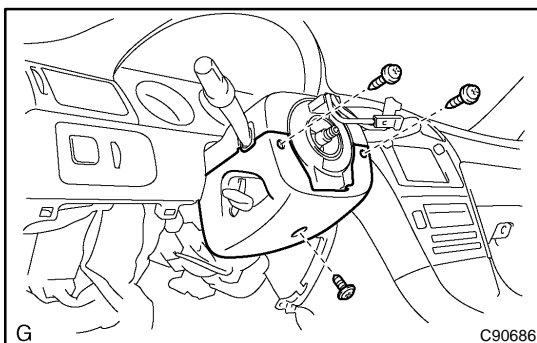


- (b) Place matchmarks on the steering wheel assy and steering main shaft assy.
- (c) Using SST, remove the steering wheel assy.  
SST 09950- 50013 (09951- 05010, 09952- 05010, 09953-05020, 09954-05021)

9. **REMOVE FRONT DOOR SCUFF PLATE LH**(See page 71-1 1)
10. **REMOVE INSTRUMENT PANEL SUB-ASSY UPPER**(See page 71-1 1)
11. **REMOVE INSTRUMENT PANEL INSERT SUB-ASSY LOWER LH**(See page 71-1 1)
12. **REMOVE HEATER TO FOOT DUCT NO.3**(See page 71-1 1)



13. **REMOVE STEERING COLUMN COVER LWR NO.2**
  - (a) Remove the steering column cover lwr No.2.

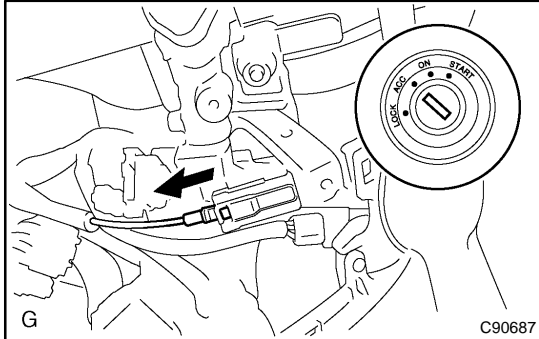


14. **REMOVE STEERING COLUMN COVER**
  - (a) Remove the 3 screws and steering column cover.

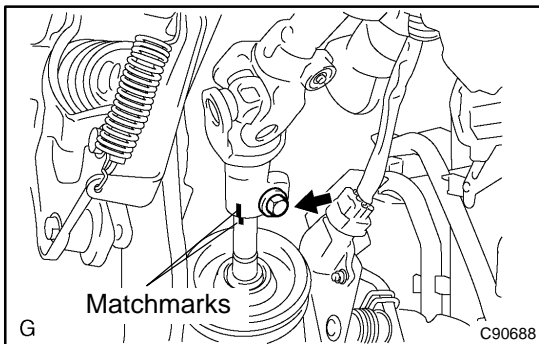


**15. REMOVE TURN SIGNAL SWITCH ASSY**

- (a) Disconnect the 3 connectors.
- (b) Disconnect the airbag connector.
- (c) Remove the 3 screws and turn signal switch assy.

**16. REMOVE INSTRUMENT PANEL FINISH PLATE(See page 71-1 1)****17. DISCONNECT FLOOR SHIFT PARKING LOCK CABLE ASSY**

- (a) Place the ignition switch lock cylinder assy at the key ACC position.
- (b) Remove the cable cap claw from the key interlock and pull out the floor shift parking lock cable assy.

**18. DISCONNECT STEERING SLIDING YOKE SUB-ASSY**

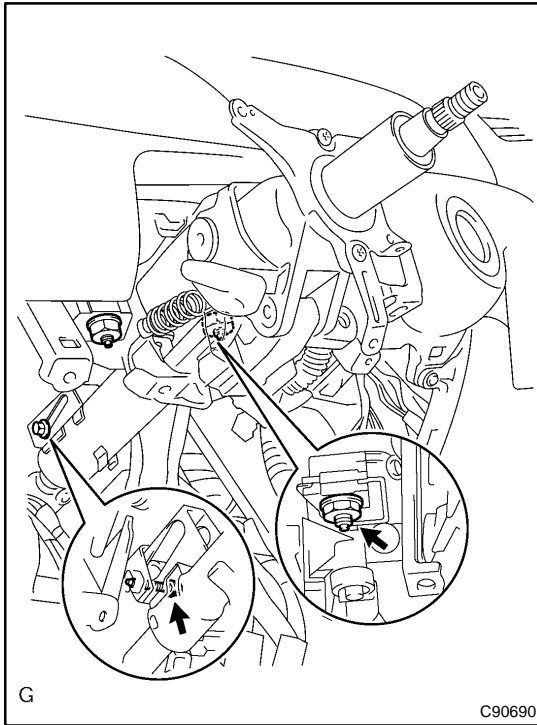
- (a) Place the matchmarks on the steering sliding yoke sub-assy and intermediate shaft sub-assy.
- (b) Remove the bolt and disconnect the steering sliding yoke sub-assy .

**19. REMOVE STEERING COLUMN HOLE COVER SUB-ASSY NO.2**

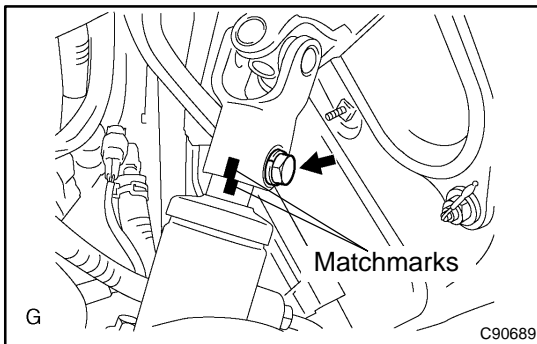
- (a) Remove the hose clamp.
- (b) Remove the steering column hole cover sub-assy No.2.

**20. REMOVE STEERING COLUMN ASSY**

- (a) Disconnect the connectors and wire harness clamps.
- (b) Disconnect the driver side junction block.

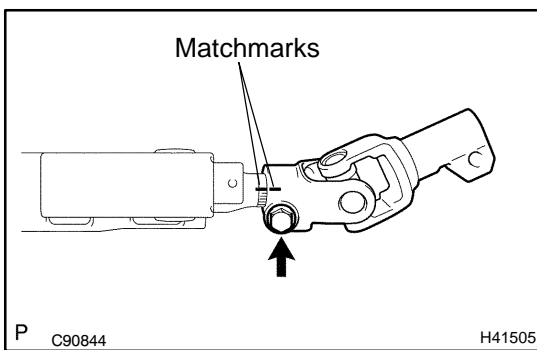


- (c) Remove the 2 nuts, bolt and steering column assy from the instrument panel reinforcement assy.



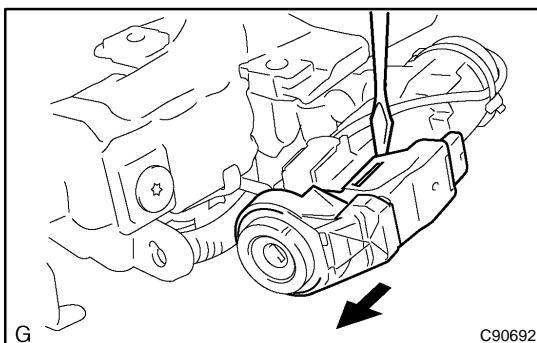
## 21. REMOVE STEERING INTERMEDIATE SHAFT SUB-ASSY

- (a) Place the matchmarks on the steering intermediate shaft sub-assy and steering gear assy.  
(b) Remove the bolt and steering intermediate shaft sub-assy.



## 22. REMOVE STEERING SLIDING YOKE SUB-ASSY

- (a) Place the matchmarks on the steering sliding yoke sub-assy and steering main shaft assy.  
(b) Remove the bolt and steering yoke sub-assy.

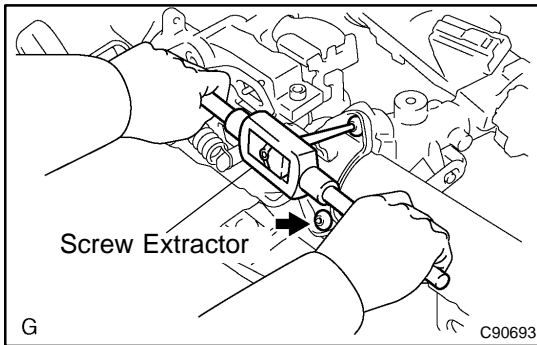


## 23. REMOVE TRANSPONDER KEY AMPLIFIER

- (a) Widen the claw hung on the upper bracket by approx. 1.0 mm (0.039 in.) using a screwdriver.  
(b) Pull the transponder key amplifier toward the rear of the vehicle with the claw open.

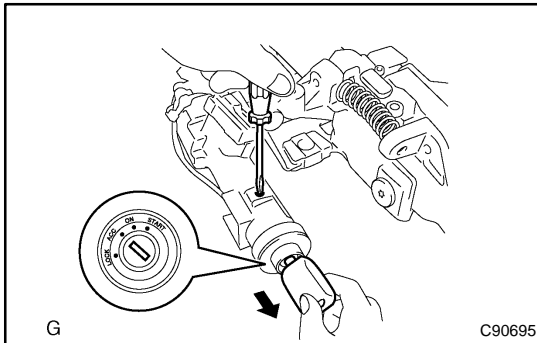
### NOTICE:

Take care not to use excessive force to prevent the case from being damage.



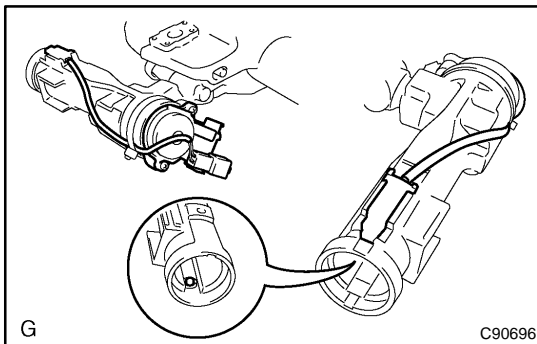
## 24. REMOVE STEERING COLUMN UPPER W/SWITCH BRACKET ASSY

- 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 in to the 2 bolts.
- Using a screw extractor, remove the 2 bolts and steering column upper w/switch bracket assy.



## 25. REMOVE IGNITION SWITCH LOCK CYLINDER ASSY

- Place the ignition switch lock cylinder assy at the ACC position.
- Push down the stop pin with a screwdriver, and pull out the ignition switch lock cylinder assy.



## 26. REMOVE UN-LOCK WARNING SWITCH ASSY

- Disconnect the un-lock warning switch assy connector from the ignition or starter switch assy.
- Remove the un-lock warning switch assy by pushing up the center part and releasing the 2 screws.

## 27. REMOVE IGNITION OR STARTER SWITCH ASSY

- Remove the 2 screws and ignition or starter switch assy from the steering column upper w/switch bracket assy.

## 28. INSTALL IGNITION OR STARTER SWITCH ASSY

- Install the ignition switch assy to the steering column upper w/switch bracket assy with the 2 screws.

## 29. INSTALL UN-LOCK WARNING SWITCH ASSY

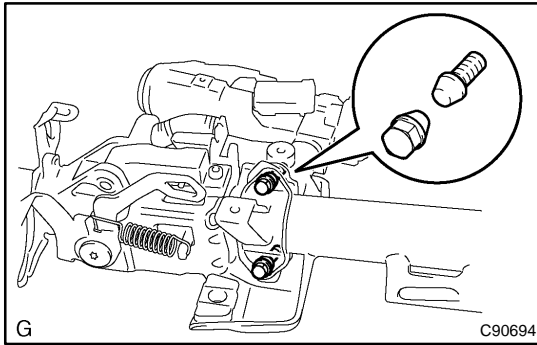
- Install the un-lock warning switch assy.
- Connect the un-lock warning switch assy connector to the ignition or starter switch assy.

## 30. INSTALL IGNITION SWITCH LOCK CYLINDER ASSY

- Make sure the ignition switch lock cylinder assy at the ACC position.
- Install the ignition switch lock cylinder assy.

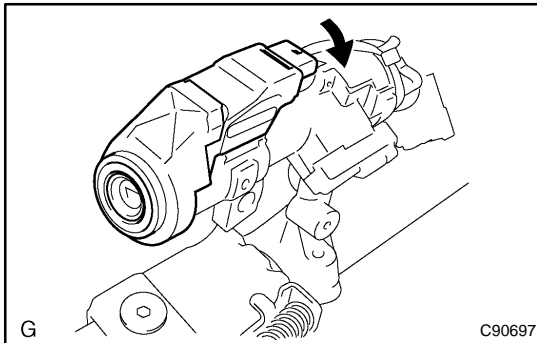
## 31. INSPECT STEERING LOCK OPERATION

- Check that the steering lock mechanism is activated when removing the key.
- Check that the steering lock mechanism is deactivated when inserting the key and turning it to ACC position.



### 32. INSTALL STEERING COLUMN UPPER W/SWITCH BRACKET ASSY

- Temporarily install the steering column upper w/switch bracket assy and steering column upper clamp with 2 new tapered-head bolts.
- Tighten the 2 tapered-head bolts until the bolt heads break off.

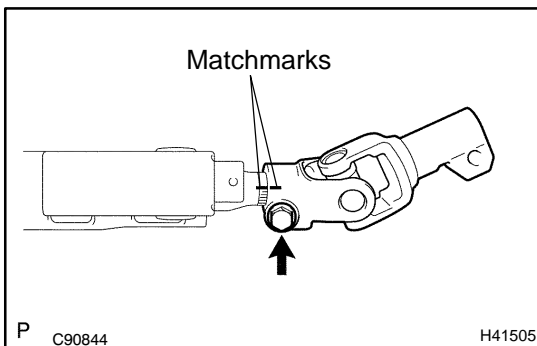


### 33. INSTALL TRANSPONDER KEY AMPLIFIER

- Align the transponder key amplifier with the installation position of the upper bracket with the amplifier inclined.
- Push the transponder key amplifier up and connect it to the upper bracket.

#### NOTICE:

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

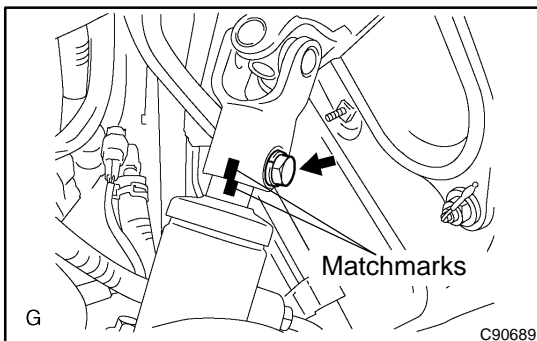


### 34. INSTALL STEERING SLIDING YOKE SUB-ASSY

- Align the matchmarks on the steering sliding yoke sub-assy and steering main shaft assy.
- Install the steering sliding yoke sub-assy with the bolt.  
**Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)**

### 35. INSTALL STEERING COLUMN HOLE COVER SUB-ASSY NO.2

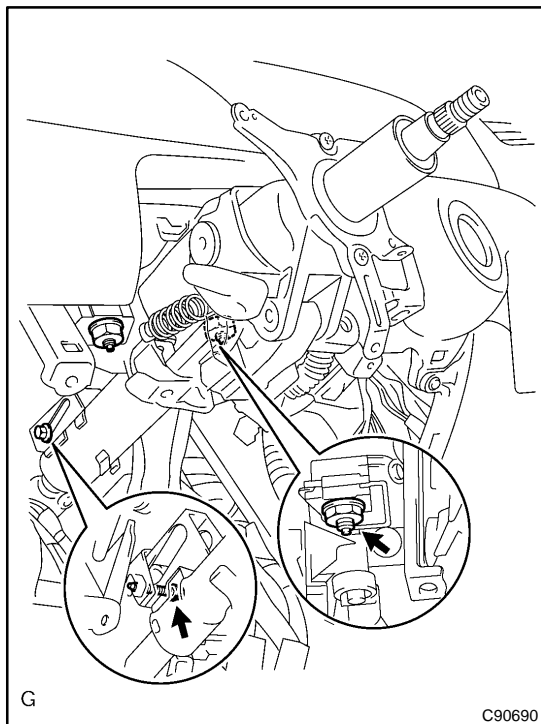
- Install the steering column hole cover sub-assy No.2.
- Install the hose clamp.



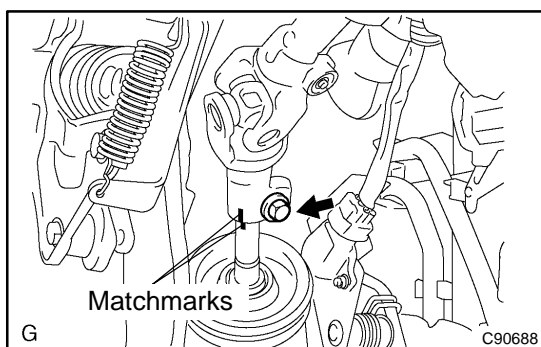
### 36. INSTALL STEERING INTERMEDIATE SHAFT SUB-ASSY

- Align the matchmarks on the intermediate shaft sub-assy and steering gear assy.
- Install the steering intermediate shaft sub-assy with the bolt.

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

**37. INSTALL STEERING COLUMN ASSY**

- (a) Install the steering column assy with the 2 nuts and bolt.  
**Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)**
- (b) Connect the driver side junction block.
- (c) Connect the connectors and wire harness clamps.

**38. CONNECT STEERING SLIDING YOKE SUB-ASSY**

- (a) Align the matchmarks on the steering sliding yoke sub-assy and steering intermediate shaft sub-assy.
- (b) Connect the steering sliding yoke sub-assy with the bolt.  
**Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)**

**39. CONNECT FLOOR SHIFT PARKING LOCK CABLE ASSY**

- (a) Place the ignition switch lock cylinder assy at the key ACC position.
- (b) Install the floor shift parking lock cable assy.

**40. INSPECT CHECK KEY INTERLOCK OPERATION(See page 40-31 )****41. INSTALL INSTRUMENT PANEL FINISH PLATE(See page 71-1 1)****42. INSTALL TURN SIGNAL SWITCH ASSY**

- (a) Install the turn signal switch assy with the 3 screws.
- (b) Connect the airbag connector.
- (c) Connect the 3 connectors.

**43. INSPECT SPIRAL CABLE SUB-ASSY(See page 60-31 )****44. INSTALL STEERING COLUMN COVER**

- (a) Install the steering column cover with the 3 screws.

**45. INSTALL STEERING COLUMN COVER LWR NO.2****46. INSTALL HEATER TO FOOT DUCT NO.3(See page 71-1 1)****47. INSTALL INSTRUMENT PANEL INSERT SUB-ASSY LOWER LH****48. INSTALL INSTRUMENT PANEL SUB-ASSY UPPER****49. INSTALL FRONT DOOR SCUFF PLATE LH****50. PLACE FRONT WHEELS FACING STRAIGHT AHEAD**

**51. INSTALL STEERING WHEEL ASSY**

- (a) Align the matchmarks on the steering wheel assy and steering main shaft assy.
- (b) Install the steering wheel assy set nut.

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

**52. INSPECT HORN BUTTON ASSY(See page [60-22](#) )****53. INSTALL HORN BUTTON ASSY(See page [60-22](#) )****54. INSTALL STEERING PAD SWITCH**

- (a) Connect the connector.
- (b) Install the steering pad switch with the 2 screws.

**55. INSTALL CONNECTOR COVER****56. INSTALL STEERING WHEEL COVER LOWER NO.2****57. INSPECT SRS WARNING LIGHT(See page [05-818](#) )**