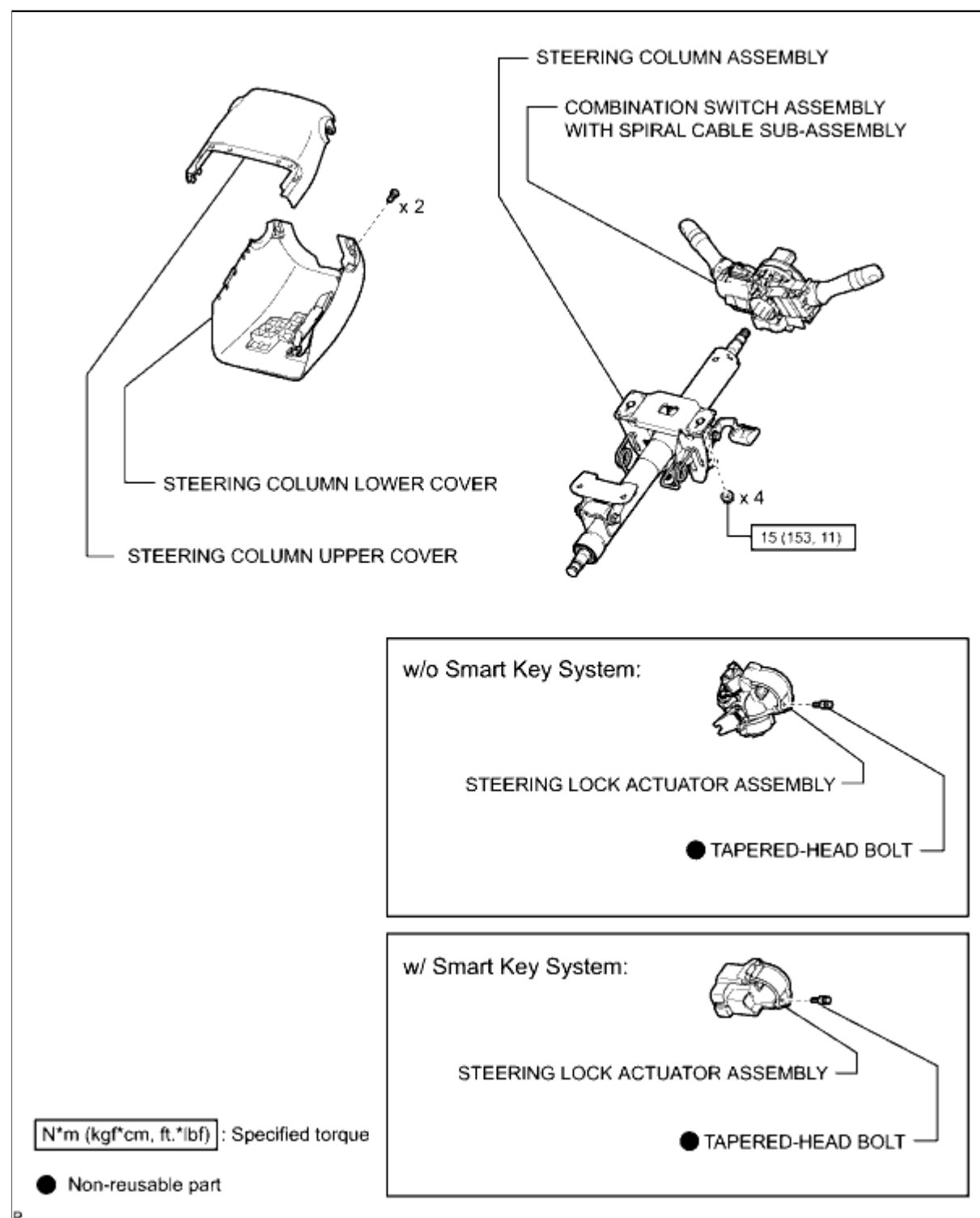


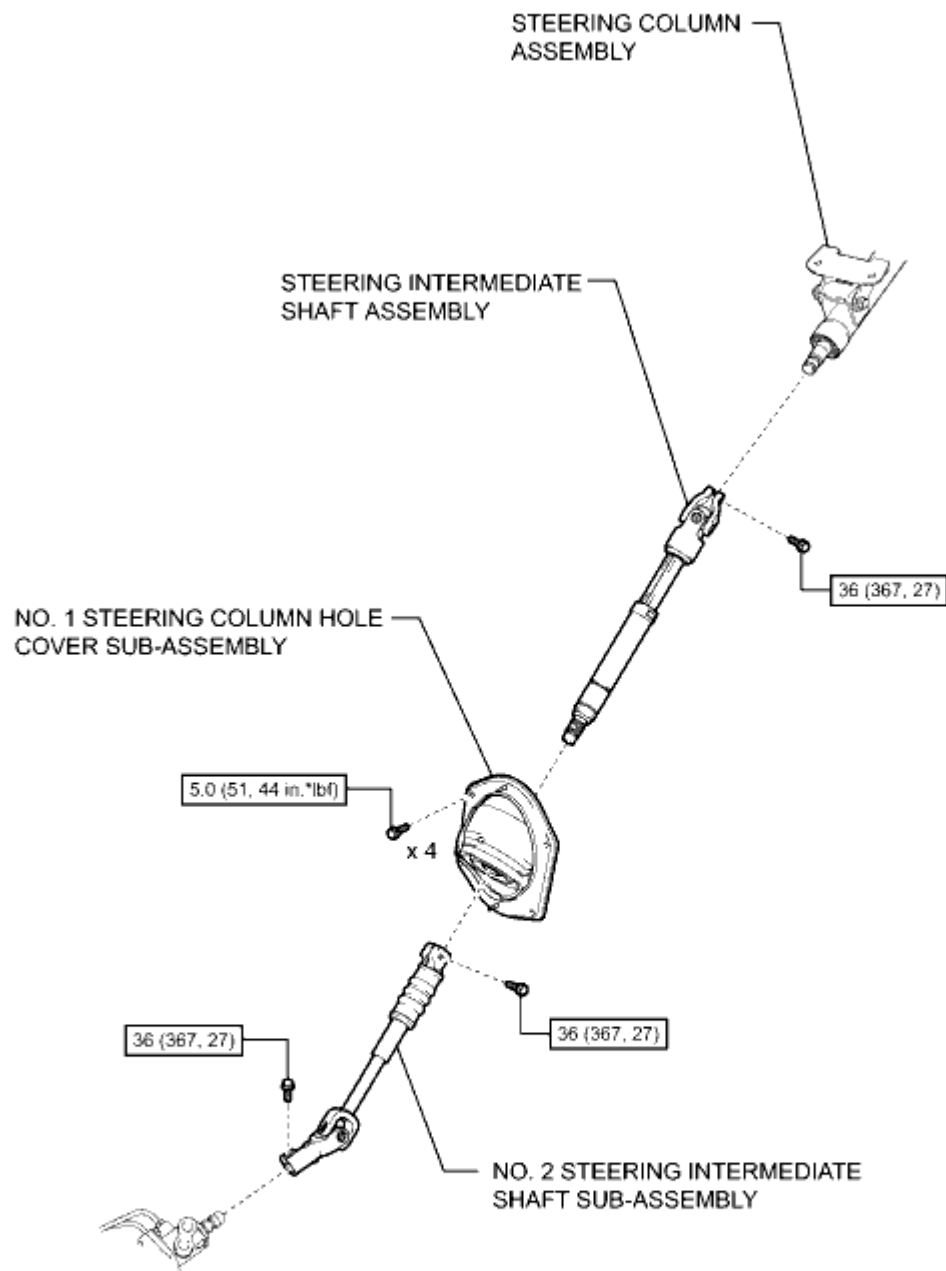
Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000039SH00IX
Title: STEERING COLUMN: STEERING COLUMN ASSEMBLY: COMPONENTS (2010 4Runner)		

COMPONENTS

ILLUSTRATION



ILLUSTRATION



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

P



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000039SI00HX
Title: STEERING COLUMN: STEERING COLUMN ASSEMBLY: REMOVAL (2010 4Runner)		

REMOVAL

CAUTION:

Some of these service operations affect the SRS airbag system. Read the precautionary notices concerning the SRS airbag system before servicing the steering column .

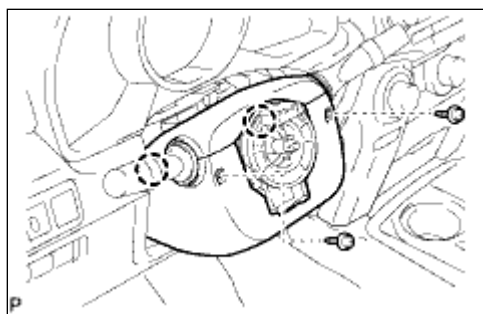
1. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

2. REMOVE FRONT WHEEL LH

3. REMOVE STEERING WHEEL ASSEMBLY

(a) Remove the steering wheel .

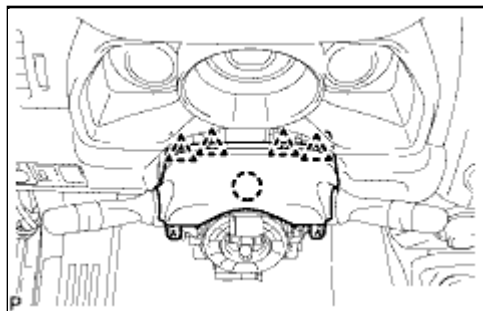
4. REMOVE STEERING COLUMN LOWER COVER



(a) Remove the 2 screws.

(b) Detach the 2 claws to remove the steering column lower cover.

5. REMOVE STEERING COLUMN UPPER COVER

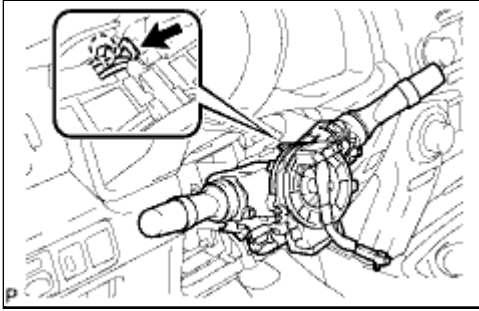


(a) Detach the 4 clips.

(b) Detach the claw to remove the steering column upper cover.


6. REMOVE COMBINATION SWITCH ASSEMBLY WITH SPIRAL CABLE SUB-ASSEMBLY

(a) Disconnect the connectors from the combination switch with spiral cable.



- (b) Use pliers to hold the clamp and raise the claw with a screwdriver. Remove the turn signal switch assembly with spiral cable sub-assembly from the steering column assembly.

7. REMOVE TRANSPONDER KEY AMPLIFIER (w/ Transponder Key)

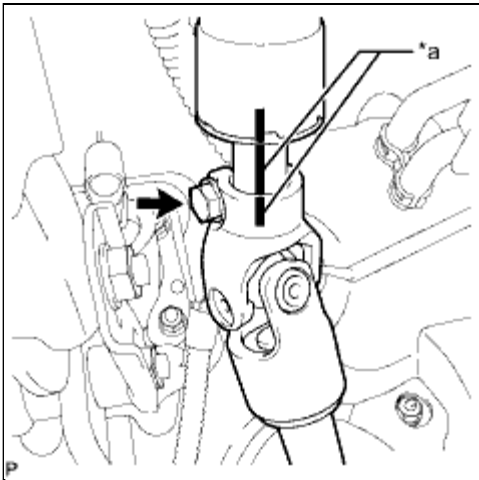
- (a) Remove the transponder key amplifier .

8. REMOVE NO. 1 INSTRUMENT LOWER PANEL AIRBAG ASSEMBLY

- (a) Remove the instrument lower panel airbag assembly .

9. REMOVE STEERING COLUMN ASSEMBLY

- (a) Detach the claws to remove the wire harness protector and wire harness.



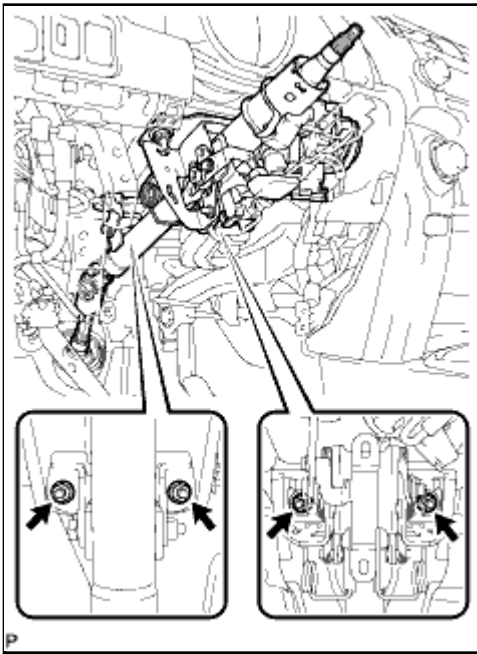
- (b) Put matchmarks on the steering intermediate shaft and steering column.

Text in Illustration

*a	Matchmark
----	-----------

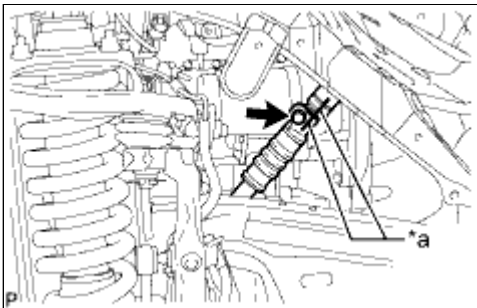
- (c) Remove the bolt.

- (d) Remove the 4 nuts and steering column.



10. REMOVE NO. 1 FRONT FENDER APRON TO FRAME SEAL LH INFO

11. DISCONNECT STEERING INTERMEDIATE SHAFT ASSEMBLY



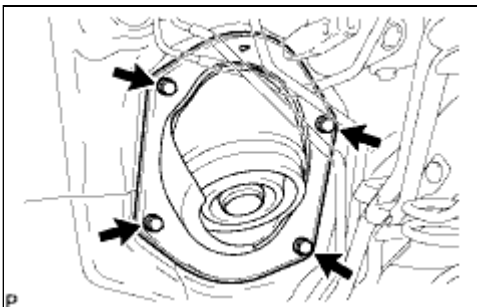
(a) Put matchmarks on the steering intermediate shaft and No. 2 steering intermediate shaft.

Text in Illustration

* a	Matchmark
-----	-----------

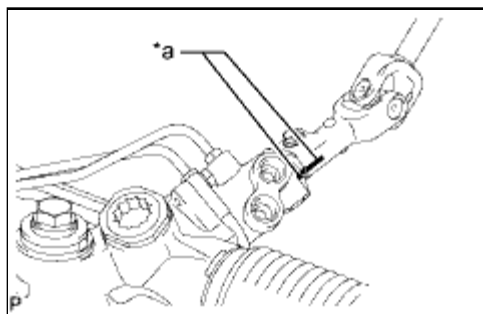
(b) Remove the bolt, and then pull out the intermediate shaft toward the inside of the vehicle.

12. REMOVE NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY



(a) Remove the 4 bolts and steering column hole cover from the vehicle.

13. DISCONNECT NO. 2 STEERING INTERMEDIATE SHAFT SUB-ASSEMBLY



(a) Put matchmarks on the No. 2 steering intermediate shaft and power steering gear.

Text in Illustration

*a	Matchmark
----	-----------

(b) Remove the bolt and No. 2 steering intermediate shaft from the power steering gear.

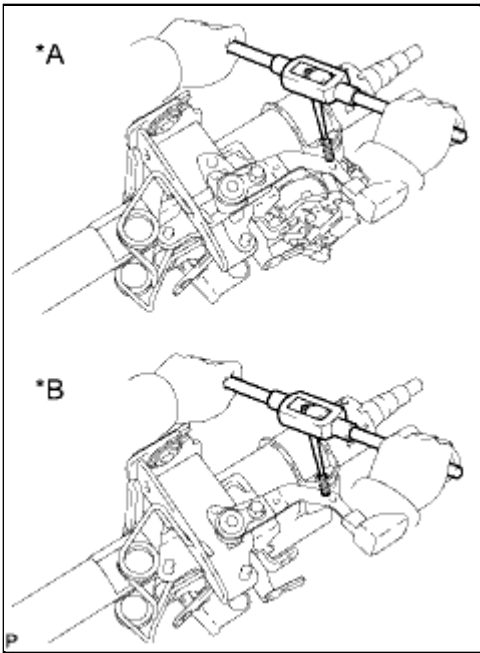


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000039SJ00CX
Title: STEERING COLUMN: STEERING COLUMN ASSEMBLY: DISASSEMBLY (2010 4Runner)		

DISASSEMBLY

1. REMOVE STEERING LOCK ACTUATOR ASSEMBLY

- (a) Using a center punch, mark the center of the tapered-head bolt.
- (b) Using a 3 to 4 mm (0.118 to 0.157 in.) drill, drill a hole in the 2 bolts.



- (c) Using a screw extractor, remove the bolt and steering lock actuator assembly from steering column assembly.

Text in Illustration

*A	w/o Smart Key System
*B	w/ Smart Key System

Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000039SG00HX
Title: STEERING COLUMN: STEERING COLUMN ASSEMBLY: INSTALLATION (2010 4Runner)		

INSTALLATION

1. CONNECT NO. 2 STEERING INTERMEDIATE SHAFT SUB-ASSEMBLY

- (a) Align the matchmarks on the No. 2 steering intermediate shaft and power steering gear.
- (b) Install the bolt.

Torque: 36 N·m (367 kgf·cm, 27ft·lbf)

2. INSTALL NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY

- (a) Install the 4 bolts.

Torque: 5.0 N·m (51 kgf·cm, 44in·lbf)

NOTICE:

Do not fold back the boot part of the steering hole cover or extend it excessively. If it is extended excessively, return it to its original position.

3. CONNECT STEERING INTERMEDIATE SHAFT ASSEMBLY

- (a) Align the matchmarks on the No. 2 steering intermediate shaft assembly and steering intermediate shaft assembly.

HINT:

Install the steering intermediate shaft from the inside of the vehicle.

- (b) Install the bolt.

Torque: 36 N·m (367 kgf·cm, 27ft·lbf)

4. INSTALL NO. 1 FRONT FENDER APRON TO FRAME SEAL LH

5. INSTALL STEERING COLUMN ASSEMBLY

- (a) Align the matchmarks on the steering intermediate shaft and steering column.
- (b) Install the steering column with the 4 nuts.

Torque: 15 N·m (153 kgf·cm, 11ft·lbf)

- (c) Install the bolt.

Torque: 36 N·m (367 kgf·cm, 27ft·lbf)

- (d) Attach the claws to connect the wire harness.

6. INSTALL NO. 1 INSTRUMENT LOWER PANEL AIRBAG ASSEMBLY

- (a) Install the instrument lower panel airbag assembly .

7. INSTALL TRANSPONDER KEY AMPLIFIER (w/ Transponder Key)

- (a) Install the transponder key amplifier .

8. INSTALL COMBINATION SWITCH ASSEMBLY WITH SPIRAL CABLE SUB-ASSEMBLY

- (a) Using pliers, grip the claws of the clamp and install the combination switch assembly with spiral cable sub-assembly to the steering column assembly with the clamp.

(b) Connect the connectors to the combination switch with spiral cable.

9. INSTALL STEERING COLUMN UPPER COVER

(a) Attach the claw to install the steering column upper cover.


(b) Attach the 4 clips to install the steering column upper cover to the instrument cluster finish panel.

10. INSTALL STEERING COLUMN LOWER COVER

(a) Attach the 2 claws to install the steering column lower cover.

(b) Install the 2 screws.

11. INSTALL STEERING WHEEL ASSEMBLY

(a) Install the steering wheel assembly .

12. CHECK FRONT WHEELS FACING STRAIGHT AHEAD


13. INSTALL FRONT WHEEL LH

14. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable, some systems need to be initialized after the cable is reconnected .

15. CHECK SRS WARNING LIGHT

(a) Check the SRS warning light .

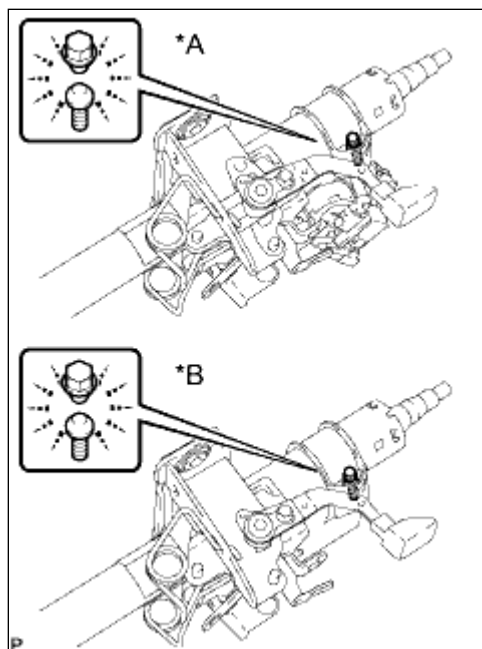


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000039SK00CX
Title: STEERING COLUMN: STEERING COLUMN ASSEMBLY: REASSEMBLY (2010 4Runner)		

REASSEMBLY

1. INSTALL STEERING LOCK ACTUATOR ASSEMBLY

- (a) Temporarily install the steering lock actuator assembly with a new tapered-head bolt.



- (b) Tighten the tapered-head bolt until the bolt head breaks off.

Text in Illustration

*A	w/o Smart Key System
*B	w/ Smart Key System




Last Modified: 5-10-2010	6.4 L	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000039RQ00BX
Title: STEERING COLUMN: STEERING SYSTEM: PRECAUTION (2010 4Runner)		

PRECAUTION

1. HANDLING PRECAUTIONS FOR STEERING SYSTEM

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

2. HANDLING PRECAUTIONS FOR SRS AIRBAG SYSTEM

- (a) The vehicle is equipped with an SRS (Supplemental Restraint System). Failure to carry out service operations in the correct sequence could cause the SRS to unexpectedly deploy during servicing. This may cause a serious accident. Before servicing (including inspection, replacement, removal and installation of parts), be sure to read the precautionary notices for the Supplemental Restraint System  .



Last Modified: 5-10-2010	6.4 T	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000039RR00BX
Title: STEERING COLUMN: STEERING SYSTEM: PROBLEM SYMPTOMS TABLE (2010 4Runner)		

PROBLEM SYMPTOMS TABLE

HINT:

Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

Steering System

SYMPTOM	SUSPECTED AREA	SEE PAGE
Hard steering	Tires (Improperly inflated)	INFO
	Power steering fluid level (Low) (for 1GR-FE)	INFO
	Power steering fluid level (Low) (for 2TR-FE)	INFO
	Drive belt (Loose) (for 1GR-FE)	INFO
	Drive belt (Loose) (for 2TR-FE)	INFO
	Front wheel alignment (Incorrect)	INFO
	Steering system joints (Worn)	-
	Suspension arm ball joints (Worn)	INFO
	Steering column (Binding)	-
	Power steering vane pump	INFO
	Power steering gear	INFO
Poor return	Tires (Improperly inflated)	INFO
	Front wheel alignment (Incorrect)	INFO
	Steering column (Binding)	-
	Power steering gear	INFO
Excessive play	Steering system joints (Worn)	-
	Suspension arm ball joints (Worn)	INFO
	Intermediate shaft, sliding yoke (Worn)	-
	Front wheel bearing (Worn)	INFO
	Power steering gear	INFO
Abnormal noise	Power steering fluid level (Low) (for 1GR-FE)	INFO

SYMPTOM	SUSPECTED AREA	SEE PAGE
	Power steering fluid level (Low) (for 2TR-FE)	INFO
	Steering system joints (Worn)	-
	Power steering vane pump (for 1GR-FE)	INFO
	Power steering vane pump (for 2TR-FE)	INFO
	Power steering gear	INFO

Last Modified: 5-10-2010	6.4 N	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000001R4402BX
Title: STEERING COLUMN: STEERING SYSTEM: ADJUSTMENT (2010 4Runner)		

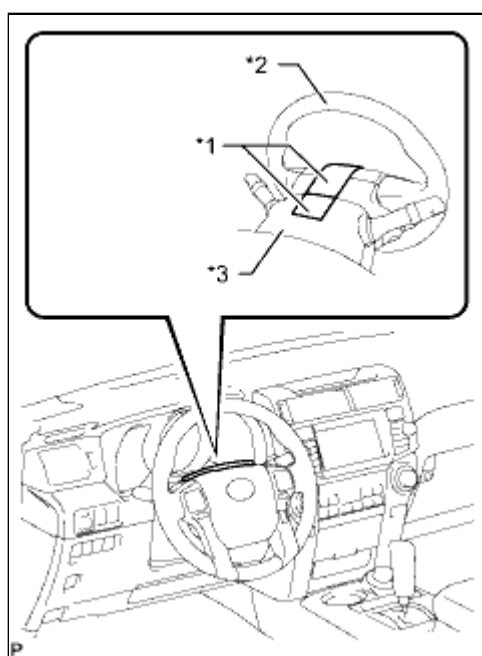
ADJUSTMENT

1. STEERING OFF CENTER ADJUSTMENT PROCEDURE

HINT:

This is the adjustment procedure for when the steering is off center.

(a) Check if the steering wheel is off center.



(1) Apply masking tape to the top center of the steering wheel and steering column upper cover.

Text in Illustration

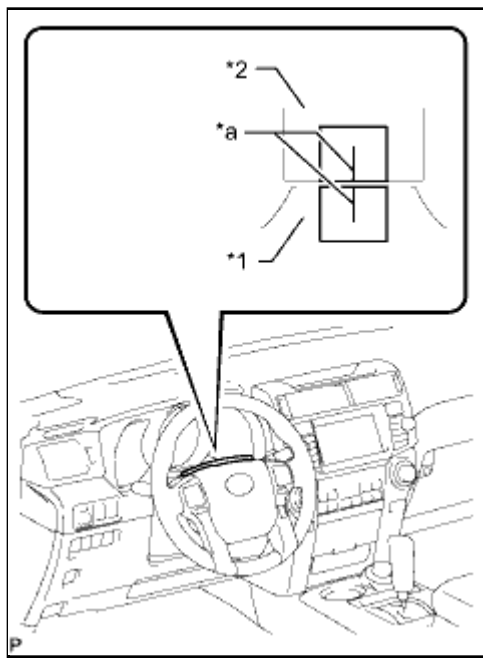
* 1	Masking Tape
* 2	Steering Wheel
* 3	Steering Column Upper Cover

(2) Drive the vehicle in a straight line for 100 m (328 ft.) at a constant speed of 56 km/h (35 mph) and hold the steering wheel to maintain course.

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

Text in Illustration

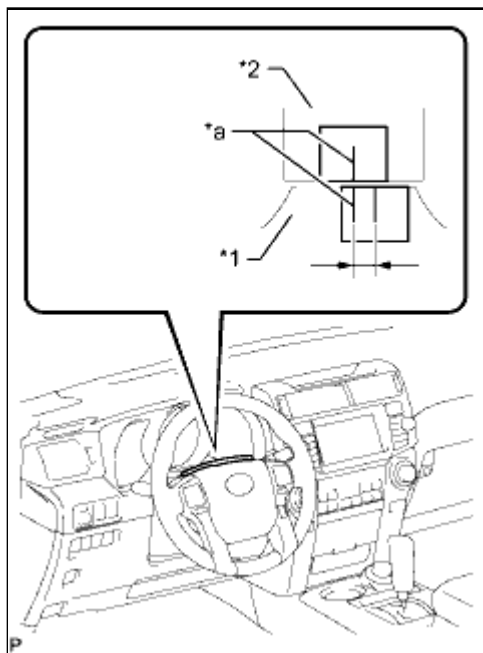
* a	Marked Line
* 1	Steering Wheel
* 2	Steering Column Upper Cover



(4) Turn the steering wheel to the center position.

HINT:

Look at the upper surface of the steering wheel, steering spoke and SRS airbag line to find the center position.



(5) Draw a new line on the masking tape on the steering wheel as shown in the illustration.

Text in Illustration

*a	Marked Line
*1	Steering Wheel
*2	Steering Column Upper Cover

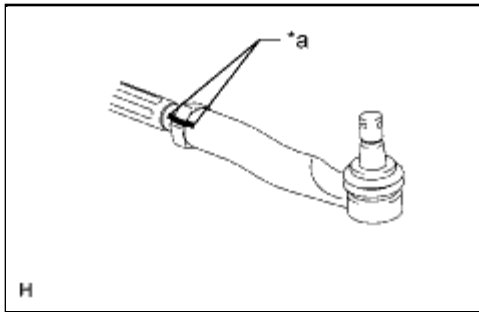
(6) Measure the distance between the 2 lines on the masking tape on the steering wheel.

(7) Convert the measured distance to a steering angle value.

HINT:

- Measured distance 1 mm (0.0394 in.) = Steering angle of approximately 1°.
- Make a note of the steering angle value.

(b) Adjust the steering angle.



(1) Place matchmarks on the RH and LH tie rod ends and rack ends respectively where it can be easily seen.

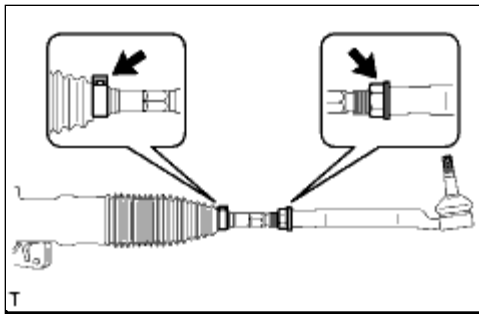
Text in Illustration

*a	Matchmark
----	-----------

(2) Using a paper gauge, measure the distance from the RH and LH tie rod ends to the rack end screws.

HINT:

- Measure both the RH and LH sides.
- 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 ends by the same amount (but in different directions) according to the steering angle value.

HINT:

One 360° turn of a rack end (1.5 mm (0.0591 in.) horizontal movement) is equal to a 12° change in steering angle.

(6) Tighten the RH and LH lock nuts to the specified torque.

Torque: 88 N·m (897 kgf·cm, 65ft·lbf)

NOTICE:

Make sure that the difference in length between the RH and LH tie rod ends and rack end screws is within 1.5 mm (0.0591 in.).

(7) Install the RH and LH boot clips.

Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000039RS00BX
Title: STEERING COLUMN: STEERING SYSTEM: ON-VEHICLE INSPECTION (2010 4Runner)		

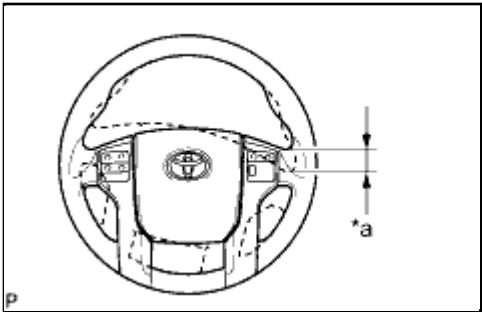
ON-VEHICLE INSPECTION

1. INSPECT STEERING WHEEL FREE PLAY

(a) Stop the vehicle and align the tires so that they face straight ahead.

(b) Gently turn the steering wheel right and left by hand and check the steering wheel free play.

Maximum free play:
30 mm (1.18 in.)



Text in Illustration

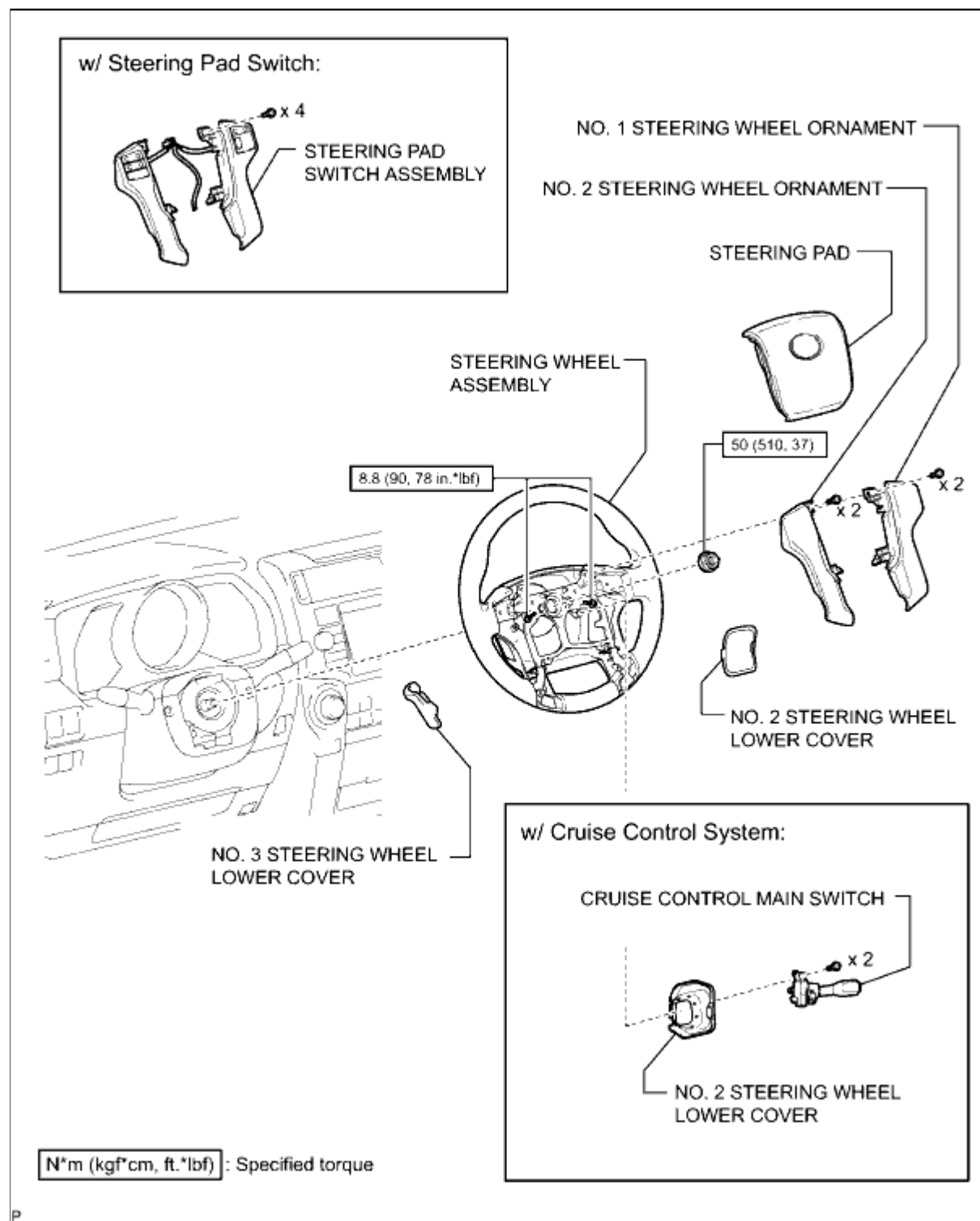
*a	Maximum Free Play
----	-------------------

If the free play is more than the maximum, check the steering column, steering intermediate shaft, steering sliding yoke and steering gear.

Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000039S900BX
Title: STEERING COLUMN: STEERING WHEEL: COMPONENTS (2010 4Runner)		

COMPONENTS

ILLUSTRATION



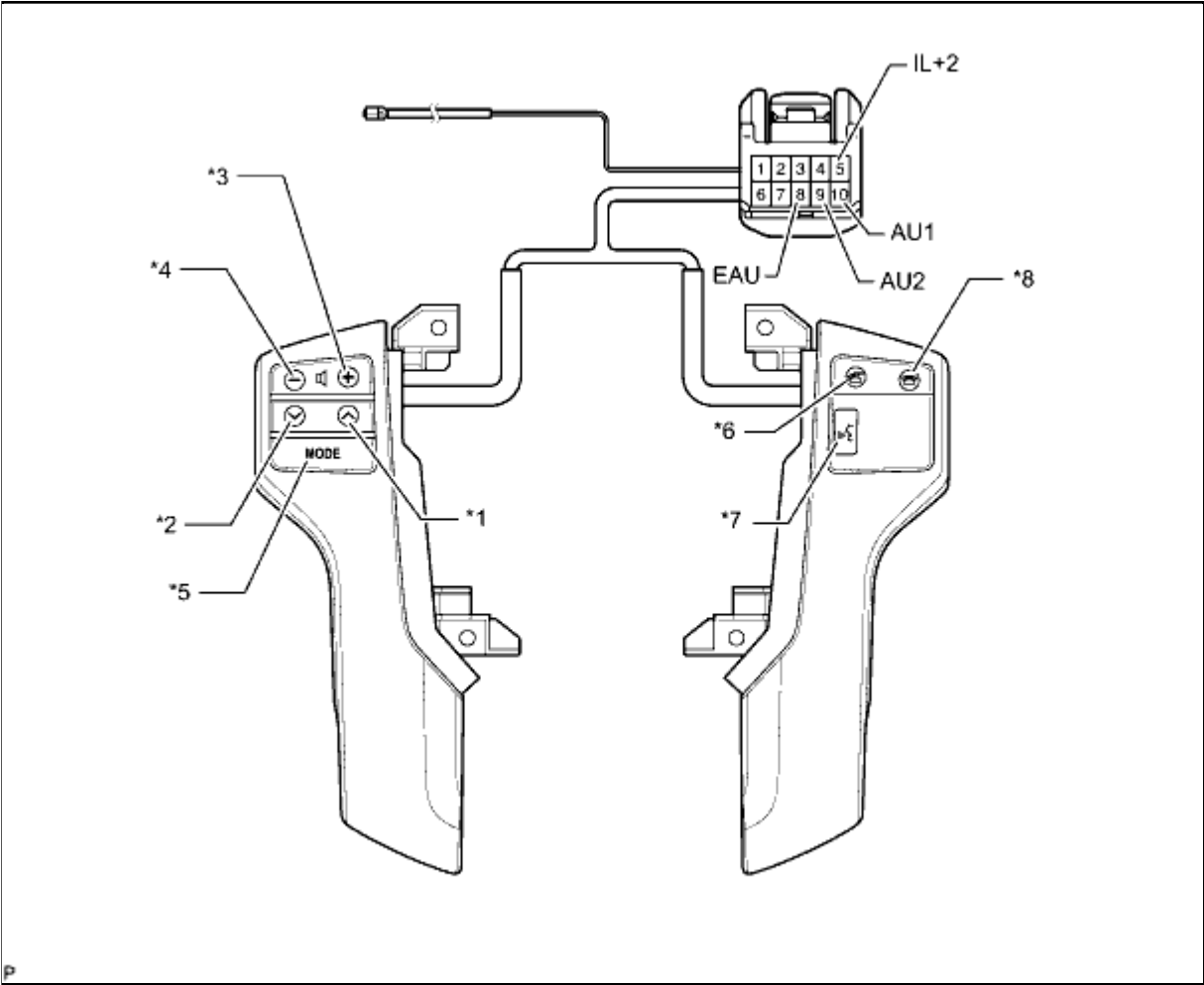


Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000003C4V00CX
Title: STEERING COLUMN: STEERING WHEEL: INSPECTION (2010 4Runner)		

INSPECTION

1. INSPECT STEERING PAD SWITCH ASSEMBLY

- (a) Inspect the steering pad switch.
- (1) Disconnect the switch connector.



Text in Illustration

* 1	Seek+ Switch	* 2	Seek- Switch
* 3	Volume+ Switch	* 4	V olume- Switch
* 5	MODE Switch	* 6	O ff Hook Switch
* 7	Voice Switch	* 8	O n Hook Switch

- (2) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
10 (AU1) - 8 (EAU)	No switch pushed	95 to 105 k Ω
	Seek+ switch pushed	Below 2.5 Ω
	Seek- switch pushed	313 to 345 Ω
	Volume+ switch pushed	950 to 1050 Ω
	Volume- switch pushed	2950 to 3265 Ω
9 (AU2) - 8 (EAU)	No switch pushed	95 to 105 k Ω
	MODE switch pushed	Below 2.5 Ω
	On Hook switch pushed	313 to 345 Ω
	Off Hook switch pushed	950 to 1050 Ω
	Voice switch pushed	2950 to 3265 Ω

If the result is not as specified, replace the steering pad switch assembly.

(b) Check the illumination.

(1) Connect the battery positive (+) lead to terminal IL+2 and the negative (-) lead to terminal EAU of the steering pad switch assembly connector.

(2) Check that the switch illumination comes on.

OK:

Steering pad switch illumination comes on.

If the result is not as specified, replace the steering pad switch assembly.



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000039SA00BX
Title: STEERING COLUMN: STEERING WHEEL: REMOVAL (2010 4Runner)		

REMOVAL

CAUTION:

Some of these service operations affect the SRS airbag system. Read the precautionary notices concerning the SRS airbag system before servicing the steering wheel .




1. PLACE FRONT WHEELS FACING STRAIGHT AHEAD
2. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

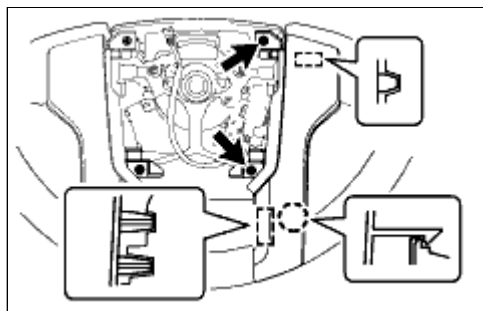
CAUTION:

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

NOTICE:

When disconnecting the cable, some systems need to be initialized after the cable is reconnected .

3. REMOVE NO. 3 STEERING WHEEL LOWER COVER 
4. REMOVE NO. 2 STEERING WHEEL LOWER COVER 
5. REMOVE STEERING PAD 
6. REMOVE NO. 1 STEERING WHEEL ORNAMENT



(a) Remove the 2 bolts.

(b) Detach the claw and remove the ornament.

7. REMOVE NO. 2 STEERING WHEEL ORNAMENT

- (a) Remove the 2 bolts.
- (b) Detach the claw and remove the ornament.

HINT:

Refer to "Remove No. 1 Steering Wheel Ornament".

8. REMOVE STEERING PAD SWITCH ASSEMBLY (w/ Steering Pad Switch)

- (a) Disconnect the connector.

- (b) Remove the 4 bolts.
- (c) Detach the claw and remove the steering pad switch assembly.

HINT:

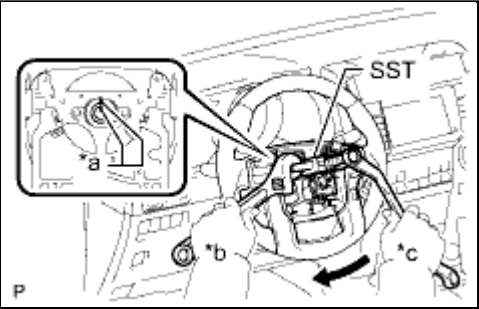
Refer to "Remove No. 1 Steering Wheel Ornament".

9. REMOVE CRUISE CONTROL MAIN SWITCH (w/ Cruise Control System)



10. REMOVE STEERING WHEEL ASSEMBLY

- (a) Remove the steering wheel set nut.
- (b) Put matchmarks on the steering wheel and main shaft.



Text in Illustration

* a	Matchmark
* b	Hold
* c	Turn

- (c) Using SST, remove the steering wheel assembly.

SST: 09950-50013

- 09951-05010
- 09952-05010
- 09953-05020
- 09954-05011

Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000039S700BX
Title: STEERING COLUMN: STEERING WHEEL: INSTALLATION (2010 4Runner)		

INSTALLATION

1. INSTALL STEERING WHEEL ASSEMBLY

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

Torque: 50 N·m (510 kgf·cm, 37ft·lbf)

2. INSTALL CRUISE CONTROL MAIN SWITCH (w/ Cruise Control System)

3. INSTALL NO. 1 STEERING WHEEL ORNAMENT

- (a) Attach the claw to install the ornament.
- (b) Install the 2 screws

4. INSTALL NO. 2 STEERING WHEEL ORNAMENT

- (a) Attach the claw to install the ornament.
- (b) Install the 2 screws

5. INSTALL STEERING PAD SWITCH ASSEMBLY (w/ Steering Pad Switch)

- (a) Attach the claw to install the steering pad switch assembly.
- (b) Install the 4 screws
- (c) Connect the connector.

6. INSTALL STEERING PAD

7. INSTALL NO. 2 STEERING WHEEL LOWER COVER

8. INSTALL NO. 3 STEERING WHEEL LOWER COVER

9. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable, some systems need to be initialized after the cable is reconnected  .

10. CHECK SRS WARNING LIGHT

- (a) Check the SRS warning light  .