
POWER STEERING

POWER STEERING SYSTEM

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POWER STEERING SYSTEM

CAUTION

1. Cautions for handling/operation

(1) Handling electronic parts

- (a) Do not apply physical shock to electronic parts, such as a computer. If a considerable shock is applied to a part (e.g. bump or drop to the floor), replace it with a new one.
- (b) Do not expose electronic parts to a high temperature · high humidity.
- (c) Do not touch connector terminals to eliminate possible deformation or failure caused by static electricity.

(2) Handling power steering computer assembly

- (a) When the power steering computer assembly is replaced, be sure to replace it with a new one.

<CAUTION>

- Do not use a power steering computer assembly from other vehicle (e.g. vehicle on display).
- (b) After the power steering computer assembly is replaced with a new one, perform a torque sensor zero-point correction (See page 49-15).

(3) Handling steering column assembly

- (a) Do not apply a physical shock to the steering column assembly (specifically to the motor and the torque sensor). If a considerable shock was applied to it (e.g. bump or drop to the floor), replace it with a new one.
- (b) Do not pull the harness to carry the steering column assembly.
- (c) After the steering column assembly is replaced, clear the initialization of torque sensor zero-point correction signal, and then perform a torque sensor zero-point correction (See page 49-15).

(4) Precautions to follow when disconnecting and connecting connectors

- (a) When disconnecting connectors relating to the electronic power steering system, first set the steering wheel in a straight ahead position after turning IG on. Turn IG off, and then disconnect the connectors.
- (b) When connecting connectors relating to the electronic power steering system, first check that IG is turned off. Connect the connectors and turn IG on with the steering wheel set in a straight ahead position.

<CAUTION>

- Never turn IG on unless the steering wheel is in a straight ahead position.
- (c) If you don't follow the instruction above, the steering neutral position (0 point) deviates, and right and left steering force may differ from each other. If this is the case, perform torque sensor zero-point correction (See page 49-15)

2. Handling SRS air bag system · Precautions to follow for operation

<WARNING>

Some tasks in this operation affect SRS air bag. Be sure to check precautions for the SRS air bag before starting operation (See page 01-5).

3. Precautions in attaching, removing, and replacing electronic power steering components

- (1) When attaching/removing steering gear assembly, be sure to straighten the front wheels.
- (2) When disconnecting the sliding yoke of the steering column from the pinion shaft of the steering gear, be sure to put alignment marks on the sliding yoke and on the pinion shaft in advance.

FUNCTION CHECK

1. Steering torque check with vehicle at rest

<WARNING>

Some tasks in this maintenance operation affect SRS air bag. Be sure to check precautions for the SRS air bag before starting operation (See page 01-5).

- (1) Stop the vehicle on level paved road, and turn the steering wheel to the straight ahead position.
- (2) Disconnect the negative battery terminal.
- (3) Remove the horn button (See page 55-218).
- (4) Connect the negative battery terminal (See page 55-220).
- (5) Use a torque wrench to check if the steering wheel set nut is loosen.
Specified value: $T=34\text{N}\cdot\text{m}$ {347kgf*cm}
- (6) Start the engine to enable the power steering.
- (7) Turn the steering wheel one quarter turn to the right from the straight ahead position, and measure the torque during the turn.
Reference value: $T = 5.5\text{N}\cdot\text{m}$ {55 kgf*cm} or less
- (8) Perform the same check for the left turn.

- (9) Straighten the front wheels.
- (10) Disconnect the negative battery terminal.
- (11) Attach the horn button (See page 55-219).
- (12) Connect the negative battery terminal (See page 55-220).
- (13) Erase diagnostic trouble codes (See page 55-23).
- (14) Check the air bag warning lamp (See page 55-1).
- (15) Initialize each system (See page).

2. Steering wheel play check

- (1) Start the engine to enable the power steering.
- (2) Set the vehicle in a straight ahead position.
- (3) Move the steering wheel lightly with fingers to check play.

Reference: 0 - 10 mm

<HINT>

If the value is not a specified value, replace the sliding yoke or the steering column assembly with a new one.

PART LAYOUT

RHD:

Steering column assembly

- Power steering motor

- Torque sensor

Power steering
computer assembly

Engine room relay block assembly

- EPS 50A

Fuse block assembly

- ECU IG1 7.5A

Combination meter assembly

- EPS warning lamp

DLC

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LHD:

Steering column assembly

- Power steering motor
- Torque sensor

Power steering computer assembly

Engine room relay block assembly

- EPS 50A

Fuse block assembly

- ECU IG1 7.5A

Combination meter assembly

- EPS warning lamp

DLC

C159198J01

LIST OF DIAGNOSTIC TROUBLE CODE

<HINT>

The DTC C1557/57 motor (ECU) overheat protection record is a code that is output when the overheat-preventive control is performed for the motor and the ECU, but not a code that indicates an error.

Diagnostic trouble code	Diagnostic item	Lamp on	Code memory	Refer to page
C1511/11	Main torque sensor short to Vcc and short to earth	O	O	<\$attribute21
C1512/12	Sub torque sensor short to Vcc and short to earth	O	O	<\$attribute21
C1513/13	Torque sensor · Main-Sub difference excessive	O	O	<\$attribute21
C1514/14	Torque sensor power error	O	O	<\$attribute21
C1515/15	Torque sensor zero point not written	O	O	<\$attribute24
C1516/16	Torque sensor zero point written incompletely	O	O	<\$attribute25
C1523/23	Motor current deviation error	O	O	<\$attribute26
C1524/24	Motor terminal short to Vcc and short to earth	O	O	<\$attribute26
C1531/31	CPU system error	O	O	<\$attribute28
C1532/32	ECU internal error	O	O	<\$attribute29
C1533/33	Temperature sensor error	X	O	<\$attribute28
C1534/34	ECU internal nonvolatile ROM error	X	O	<\$attribute28
C1541/41	Vehicle speed sensor error (at rest)	O	O	<\$attribute30
C1544/44	Engine rotation signal error	O	O	<\$attribute34
C1551/51	IG voltage error detected (Signal system)	O	O	<\$attribute37
C1552/52	Power system power voltage error	O	O	<\$attribute39
C1554/54	Power relay adhesion, Open	O	O	<\$attribute39
C1555/55	Motor relay adhesion, Open	O	O	<\$attribute41

LIST BY SYMPTOM

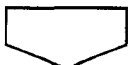
Part to be checked	Part to be checked	Refer to page
Steering operation is hard	Front tire (Improper air pressure, uneven wear)	42-5
	Improper front wheel alignment	42-5
	Front suspension (lower ball joint)	-
	Steering gear assembly	-
	Torque sensor (built in the steering column)	-
	Steering column assembly	-
	Power steering motor	-
	Battery and power source system	<\$attribute46
	Power steering computer power voltage	49-17
	Power steering computer assembly	49-17
	Whether steering wheel is turned with the vehicle at rest, high load is applied continuously	49-14
Steering force differs or is inconsistent between right and left.	Steering neutral position (zero point) recorded incompletely.	49-15
	Front tire (Improper air pressure, uneven wear)	42-5
	Improper front wheel alignment	42-5
	Front suspension (lower ball joint)	-
	Steering gear assembly	-
	Torque sensor (built in the steering column assembly)	-
	Steering column assembly	-
	Power steering motor	-
	Power steering computer assembly	49-17

49

Part to be checked	Part to be checked	Refer to page
Steering torque does not vary according to driving speed, or steering does not return to straight ahead position smoothly.	Front suspension (lower ball joint)	-
	Speed sensor (for manual transaxle / without ABS & VSC)	-
	Speed sensor (with VSC)	44-76
	Speed sensor (with ABS)	44-15
	Transmission revolution sensor (Output speed sensor) (for automatic transaxle / without ABS & VSC)	-
	Transmission control computer assembly (for automatic transaxle / without ABS & VSC)	26-20
	Skid control computer (with VSC)	44-81
	Skid control computer (with ABS)	44-18
	Combination meter assembly	63-19
	Engine rotation speed detection circuit	49-42
	Engine control computer	06-17
	Torque sensor (built in the steering column assembly)	-
	Power steering motor	-
When using power steering you can hear a noise when you turn the steering wheel	Power steering computer assembly	49-17
	Front suspension (lower ball joint)	-
	Steering column assembly	-
At low speed, steering wheel operation produces a friction noise	Steering gear assembly	-
	Power steering motor	-
Rotating the steering wheel slowly produces abnormal high-pitch sound (Squeaking noise).	Steering column assembly	-
	Power steering motor	-
When steering without driving, the steering wheel vibrates with an abnormal noise.	Steering column assembly	-
	Power steering motor	-
EPS warning lamp does not light up.	Fuse	-
	Power steering computer assembly	49-17
	Combination meter assembly	63-19
	Wire harness	-
EPS warning lamp lights up.	Power steering computer assembly	49-17
	Combination meter assembly	63-19
	Wire harness	-

TROUBLESHOOTING PROCEDURES

1 PUTTING THE CAR IN THE GARAGE



2 INQUIRY



3 CHECKING AND RECORDING DIAGNOSTIC TROUBLE CODES

(1) Check diagnostic trouble codes (See page 49-10).

<HINT>

Record or print diagnostic trouble codes as necessary.



4 DIAGNOSTIC TROUBLE CODE ERASE

- (1) Erase the diagnostic trouble code (See page 49-10).
 - (a) Go to A if diagnostic trouble codes can be erased.
 - (b) Go to B if diagnostic trouble codes cannot be erased.

B

TO STEP 7

49

A

5 DRIVING TEST BY PERFORMING TEST MODE CHECK

6 FUNCTION CHECK, ADVANCE CHECK

7 RECONFIRMING FAILURE SYMPTOM

- (1) Confirm a symptom to grasp a failure status.

8 DIAGNOSTIC TROUBLE CODE RECHECK

- (1) Check if a diagnostic trouble code is output again.
 - (a) Go to B if a failure recurs and a normal code is output.
 - (b) Go to A if a failure does not recur and a normal code is output.
 - (c) Go to A if an error code is output.

B

PERFORM TROUBLESHOOTING BY SYMPTOM, AND
GO TO STEP 10 (See page 49-5 FOR THE LIST BY
SYMPTOM).

A

9 PERFORMING TROUBLESHOOTING BY DIAGNOSTIC TROUBLE CODE

- (1) Perform a check giving emphasis on the harnesses of the system for which an error code is output during the first check (See page 49-4 for the diagnostic trouble code list).

10 DIAGNOSTIC TROUBLE CODE ERASE

- (1) Erase the diagnostic trouble code (See page 49-10).
 - (a) Go to A if normal.
 - (b) Go to B if an error code is output.

B

TO STEP 7

A

49

11

DRIVING TEST BY PERFORMING TEST MODE CHECK

- (1) Go to A if normal.
- (2) Go to B if an error code is output.

B

TO STEP 7

A

12

CHECK TEST

- (1) Make sure that a failure symptom is removed completely and correct operation is restored.
 - (a) Go to A if correct operation is restored.
 - (b) Go to B if correct operation is not restored.

B

TO STEP 7

A

END

INQUIRY SHEET

Power Steering System Check Sheet					
Customer's Name			License Plate No.		
			First Registration Year	Year	Month
Model			VIN		
Date Vehicle Brought In			Odometer Reading	km	
Weather		Clear Cloudy Rainy Snowy Others			
Temperature		Approximately			
Road Conditions					
Date Problem First Occured		Month ____	Day ____	(Engine: ____ Cold ____ Warm)	
Frequency Problem Occurs		Continuous		Intermittent (____ times a day)	
Symptoms	☐ Steering operating is hand				
	☐ Steering force differs or is inconsistent between right and left				
	☐ Steering torque does not vary according to driving speed				
	☐ Steering does not return to straight ahead position smoothly				
	☐ Vibration occurs or abnormal sound issues from steering column				
	☐ Condition malfunction occurred ____ When operating steering wheel while driving ____ when turning steering wheel with vehicle stopped ____ Always				
	☐ Others ()				
EPS Warning Lamp		☐ On () ☐ Off			
DTC Inspection	First time ____ Normal Code		Malfunction Code		
	Second time ____ Normal Code		Malfunction Code		
The first time a malfunction code is output, freeze frame data is also output.					
Freeze Frame Data					

PRE-CHECK

1. Before troubleshooting
 - (1) Check the battery voltage by using the tester.
Specified value: 11 - 14 V

- (2) Check the items that can be viewed, such as a blown-out fuse, wire harness breakage, short, and poor connection of connector etc.
- (3) Perform a check following the chart corresponding to the trouble symptom.

DIAGNOSTIC TROUBLE CODE CHECK / ERASE

1. Reading diagnostic trouble code

49

(1) When DS-II is used

- (a) Turn IG off.
- (b) Connect DS-II to DLC.
- (c) Turning IG on and following the DS-II display screen, select [OBD] to [EPS] to [DTC] to read diagnostic trouble codes.

<CAUTION>

If an error occurs, check the diagnostic trouble codes again after repair, and make sure that no error code is output.

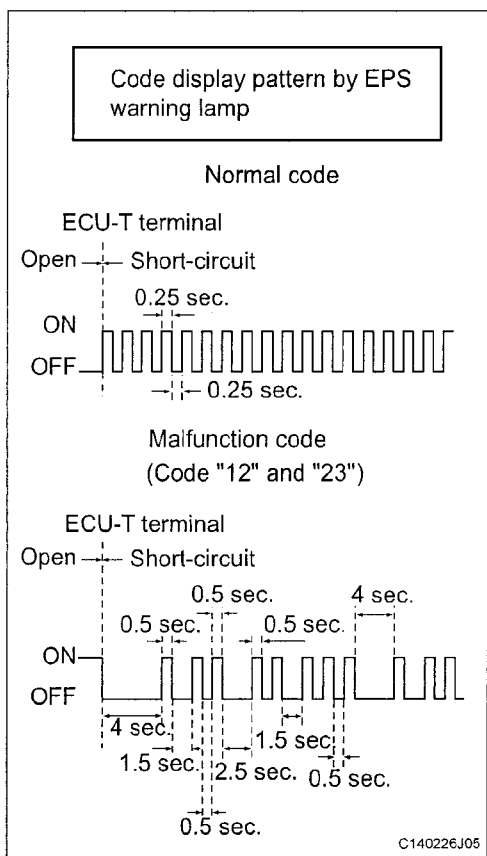
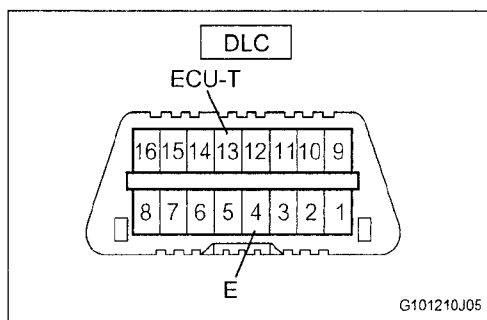
(2) When DS-II is not used

- (a) Turn IG off.
- (b) Use SST to short-circuit the DLC terminals 13 (ECU-T) and 4 (E).

SST 09991-87403, 09991-87404

<CAUTION>

Never confuse connection positions of the connector; otherwise, a failure may occur.



- (c) Turning IG on, read the number of times that the [EPS warning lamp] in the combination meter flashes.

<HINT>

- > In normal condition, it turns on for 0.25 seconds and turns off for 0.25 seconds repeatedly (flashing at 2Hz).
- > If the number of error codes is one, the same code is output at intervals of 4 seconds. If the number of error codes is 2 or more, each error code is output at intervals of 2.5 seconds until the last code is output, and then the codes are output again in 4 seconds.
- > If multiple codes are output, the code number is output in ascending order.

- (d) Open between terminals 13 (ECU-T) and 4 (E) of DLC.

<CAUTION>

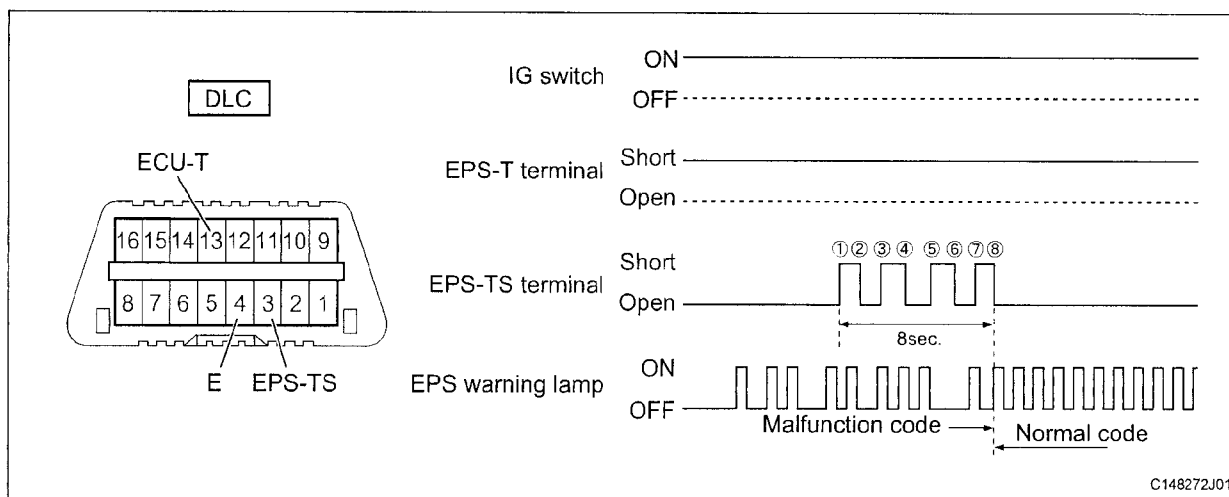
If an error occurs, check the diagnostic trouble codes again after repair, and make sure that no error code is output.

2. Erasing diagnostic trouble code memory

(1) When DS-II is used

- (a) Turn IG off.
- (b) Connect DS-II to DLC.

- (c) Turning IG on and following the DS-II display screen, select [OBD] to [EPS] to [DTC] to erase diagnostic trouble codes.
- (2) When DS-II is not used



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- (a) Turn IG off.
- (b) Use SST to short-circuit the DLC terminals 13 (ECU-T) and 4 (E).
- (c) Turn IG on.
- (d) With the DLC terminals 13 (ECU-T) and 4 (E) short-circuited, use SST to repeat a cycle of short-circuit and open between the DLC terminals 3 (EPS-TS) and 4 (E) 8 times or more within 8 seconds. This erases the diagnostic trouble codes.
- SST 09991-87403, 09991-87404
- <CAUTION>
- > Never confuse connection positions of the connector; otherwise, a failure may occur.
 - > Be sure to erase the diagnostic trouble codes while the vehicle at rest.
- <HINT>
- Diagnostic trouble codes cannot be erased until corresponding failure is resolved.

DETAIL INFORMATION ON FREEZE FRAME DATA / DIAGNOSTIC DETAIL INFORMATION

1. Freeze frame data

<HINT>

- > If the abnormal diagnostic trouble code is output, the freeze frame data at occurrence of the abnormal code is saved.
- > Normally, the freeze frame data that is memorized when an error diagnostic trouble code is output is not updated or erased until the memorized data is erased (diagnostic trouble code is erased).

- (1) Turn IG off.
- (2) Connect DS-II to DLC.
- (3) Display an error code on the diagnostic trouble code confirmation screen (See page 49-10).
- (4) Selecting diagnostic trouble codes showing "!" (with freeze frame data), check the freeze frame data.

List of freeze frame data

Item name (DS-II display)	Item description
Meter vehicle speed (SPD)	Indicates meter vehicle speed. Display range: 0 - 255 km/h
Engine revolution speed (ESPD)	Indicates engine rotation speed. Display range: 0 - 8160 r/mi
Motor actual current (MEC)	Indicates actual current flowing through the motor. Display range: -128 - 127 A
Instruction value current (MEC0)	Indicates the value of requested current flowing through the motor. Display range: -128 - 127 A
PIG power supply (PIG)	Indicates motor driving power voltage. Display range: 0 - 25.5 V

Item name (DS-II display)	Item description
IG power supply volt (IGV)	Indicates ECU power voltage. Display range: 0 - 25.5 V
Thermistor temperature (THT)	Indicates ECU board temperature. Display range: -50 - 205°C
Output of torque sensor 1 (TRQ1)	Indicates torque sensor 1 output status. Displayed range: 0 - 5 V
Output of torque sensor 2 (TRQ2)	Indicates torque sensor 2 output status. Displayed range: 0 - 5 V
Double output of torq sens (TRQ3)	Indicates torque value for assist control. Displayed range: 0 - 5 V
Torque SSR 1 (0-point val.) (OP1)	Indicates torque sensor 1 zero point value. Displayed range: 0 - 5 V
Torque SSR 2 (0-point val.) (OP2)	Indicates the torque sensor 2 zero point value. Displayed range: 0 - 5 V
Torq. sens ctrl value (at 0) (OP3)	Indicates the torque sensor zero point value. Displayed range: 0 - 5 V
Motor terminal voltage (+) (MV1)	Indicates the voltage of the motor terminal M1. Display range: 0 - 25.5 V
Motor terminal voltage (-) (MV2)	Indicates the voltage of the motor terminal M2. Display range: 0 - 25.5 V

TEST MODE

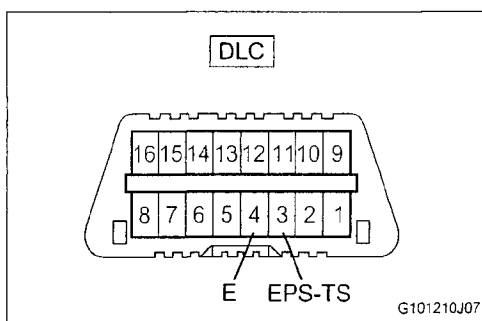
1. Test mode check

<HINT>

- > When the test mode is entered, test mode codes C1571/71 and C1573/73 are memorized, and then the memory of the codes that the computer determines as normal during a check is cleared.
- > In normal mode, all test mode codes are erased.
- > The EPS warning lamp flashes if the sensor exhibits an error.
- > If the lamp still flashes (test mode codes are still memorized) even after driving, repair the vehicle speed signal system and the engine rotation signal system to repair corresponding defective system.

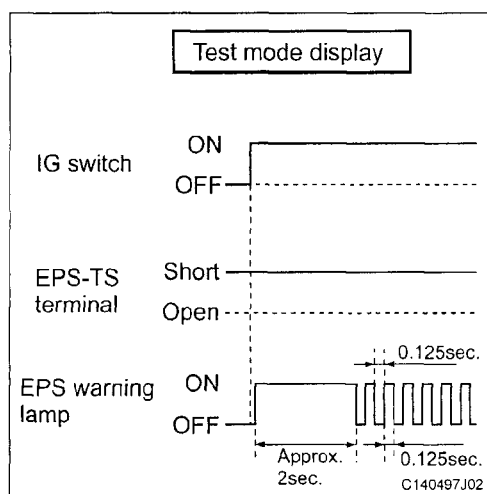
(1) How to start test mode (DS-II)

- (a) Turn IG off.
- (b) Connect DS-II to DLC.
- (c) Turn IG on.
- (d) Following the instruction on the DS-II screen, invoke the test mode.



(2) How to start the test mode (DLC short circuit)

- (a) Turn IG off.
- (b) Use SST to short-circuit the DLC terminals 3 (EPS-TS) and 4 (E).
SST 09991-87403, 09991-87404
- (c) Turn IG on.



(3) Test mode display check

- (a) Make sure that the EPS warning lamp stays on for about 2 seconds, and then starts flashing at intervals of 0.25 seconds to show that the test mode is entered.

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(4) Checking engine rotation signal

- (a) Start the engine.

- (b) Let the engine idle for at least 2 seconds.

<HINT>

Warning lamp indication does not change. If the engine rotation signal system is normal, and if the conditions are met during the test mode, the test terminates normally.

(5) Vehicle speed signal check

- (a) Moving the vehicle at least at 20 km/h for 2 seconds or more, make sure that the EPS warning lamp goes off.

<CAUTION>

- > When the vehicle speed signal check is started with the steering wheel turned and if a wheel spin occurs, the speed signal check may not terminate.
- > If the vehicle speed signal check is not finished, the EPS warning lamp flashes even while the vehicle is moving.

<HINT>

When the vehicle speed signal system check terminates normally, the EPS warning lamp goes off.

(6) End of the sensor check

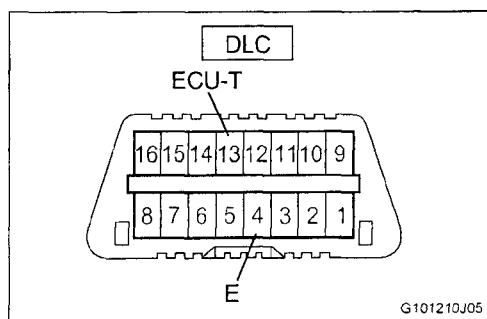
- (a) When the sensor check terminates normally, the EPS warning lamp stays off.

<CAUTION>

- > The lamp still flashes even while the vehicle is running if the engine rotation signal check and the vehicle speed signal check are not completed.
- > The lamp flashes if an engine rotation signal system error or vehicle speed signal system error occurs.
- > If the lamp still flashes (test mode codes are still memorized) even after driving, repair the vehicle speed signal system and the engine rotation signal system to repair corresponding defective system.

(7) Test mode code read (DS-II)

- (a) Read the test mode code in the test mode according to the DS-II display screen.



(8) Test mode code read (DLC short circuit)

- (a) Turn IG off.

- (b) Short circuit between terminals 13 (ECU-T) and 4 (E) of DLC by using SST.

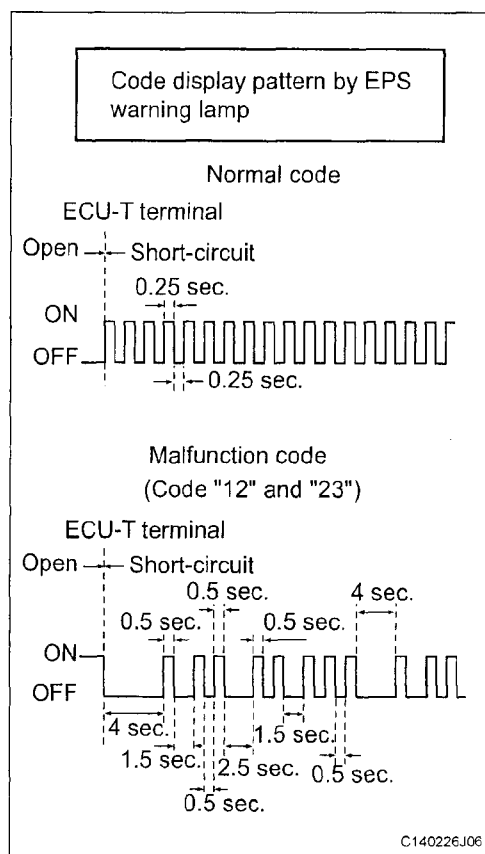
SST 09991-87403, 09991-87404

<CAUTION>

- > Connect the connector to the correct position to avoid failure.
- > This must be done while the vehicle is stopped.

- (c) Turn IG on.

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(d) Read the number of times that EPS warning lamp flashes.

<CAUTION>

- > If only a diagnostic trouble code is displayed, repair the defective part and erase the diagnostic trouble code. After erasing the code, make sure that the EPS warning lamp operates normally.
- > If only a test mode code is displayed, repair the defective part and erase the diagnostic trouble code, and perform a test mode check again.
- > If a diagnostic trouble code and a test mode code are displayed, repair the defective part and erase the diagnostic trouble code, and perform a test mode check again.

<HINT>

- > The test mode and the diagnostic trouble code are displayed.
- > If the case of normal, the lamp turns on and off alternately at intervals of 0.25 seconds.
- > In case of a single abnormal code, the same code is displayed at intervals of 4 seconds.
- > If multiple error codes are output, each code appears sequentially at intervals of 2.5 seconds. The same pattern appears after 4 seconds.
- > If multiple codes are output, the code number is output in ascending order.

(e) Open between terminals 13 (ECU-T) and 4 (E) of DLC.

(9) How to end the test mode (DS-II)

(a) Following the instruction on the DS-II screen, change the test mode to the normal mode.

(b) Turn IG off and remove DS-II.

2. List of test mode code

<HINT>

The "SAE" of the test mode code denotes an output code when the diagnostic tool DS-II is used, and the AgLampAh denotes an output code on the EPS warning display. (SAE: Society of Automotive Engineers)

EPS test mode code list

Code number SAE/lamp	Diagnosis	Conditions for erasing code	Check item
C1571/71	Vehicle speed sensor error	Vehicle speed signal of 20 km/h or higher is received for at least 2 seconds.	> Speed sensor system > Wire harness and connector > Brake actuator assembly > Combination meter assembly > Power steering computer assembly
C1573/73	Engine rotation error	Engine rotation signal of 387 rpm or higher is received for at least 2 seconds.	> Engine rotation speed detection circuit > Wire harness and connector > Engine control computer > Power steering computer assembly

SPECIAL OPERATION / CONTROL HISTORY

1. Turn IG off.
2. Connect DS-II to DLC.
3. Turning IG on, from DS-II screen, select [OBD] to [EPS] to [Utility] to [Abnormal Operation History], and check the history.

Abnormal Operation History

Item DS-II display	Item description
Motor Overheat Record	Indicates presence of Motor Overheat Record Description of display: Unrec / Rec

Item DS-II display	Item description
Motor Lo Power Record	Indicates presence of Motor Lo Power Record Description of display: Unrec / Rec

MEMORY RELATED WORK

1. Initializing torque sensor zero-point correction signal

<HINT>

After the steering column assembly (containing torque sensor) is replaced or if the steering force is different between right and left, first initialize the torque sensor zero-point correction signal of the power steering computer, and then correct the torque sensor zero-point correction.

(1) When DS-II is used

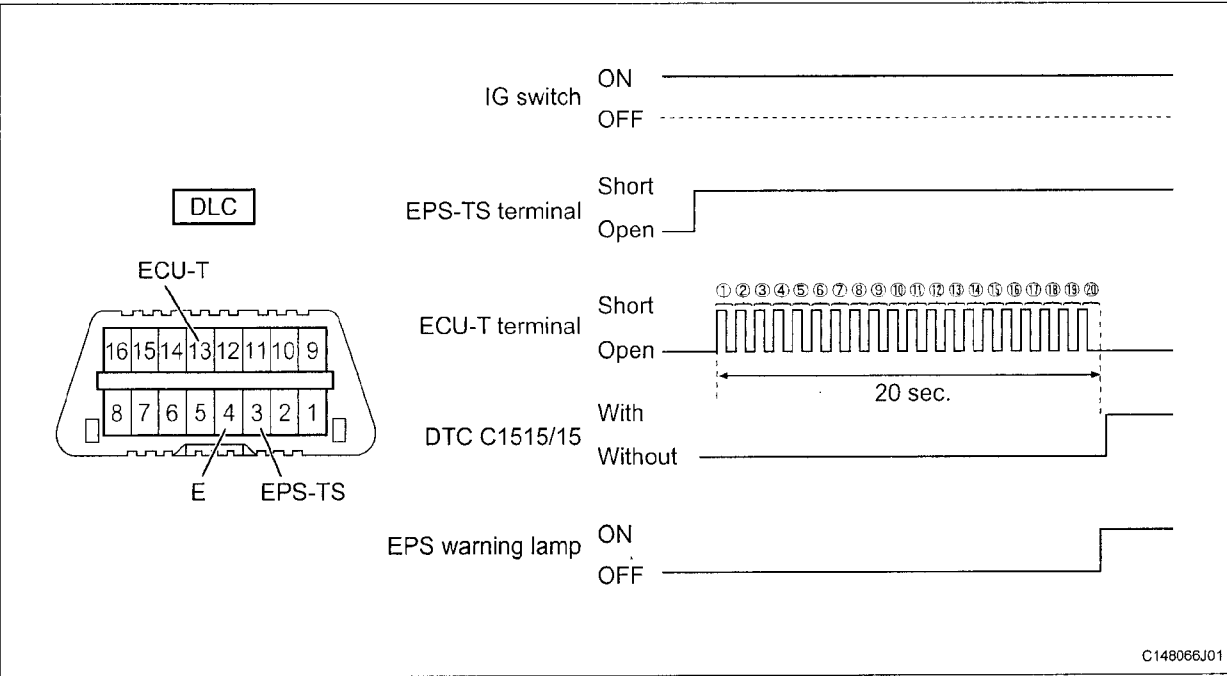
- (a) Park the vehicle on a flat surface, and set the steering wheel and the front tires in a straight ahead position.
- (b) Connect DS-II to DLC.
- (c) Turn IG on (with engine stopped), and select [OBD] to [EPS] to [Utility] to [Torque Sensor Adjustment] to initialize the power steering zero-point correction signal.
- <CAUTION>
 - > Do not start the engine; otherwise, initializing the zero-point correction signal is impossible.
 - > Do not touch the steering wheel with your hand while the zero-point correction signal is initialized.
- (d) After completing the initialization, correct the torque sensor zero-point following the instructions on the screen.

(2) When DS-II is not used

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- (a) Park the vehicle on a flat surface, and set the steering wheel and the front tires in a straight ahead position.
- (b) Turn IG off.
- (c) Turn IG on (with engine stopped), and leave the vehicle untouched for about 5 seconds.
- (d) Use SST to short-circuit the DLC connector terminals 3 (EPS-TS) and 4 (E).
- (e) Using SST, with the DLC connectors 3 (EPS-TS) and 4 (E) short-circuited, repeat a cycle of short-circuit and open between the terminals 13 (ECU-T) and (E) 20 times or more within 20 seconds.

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<CAUTION>

Never confuse connection positions of the connector; otherwise, a failure may occur.

- (f) Make sure that EPS warning lamp lights up, and the diagnostic trouble code C1515/15 has been memorized.
- (g) Turning IG off, perform the torque sensor zero-point correction.

<CAUTION>

The zero-point correction cannot be performed after the zero-point correction signal initialization unless IG is turned off.

2. Torque sensor zero-point correction

<CAUTION>

- > After the steering column assembly (containing torque sensor) is replaced or if the steering force is different between right and left, first initialize the torque sensor zero-point correction signal of the power steering computer assembly, and then perform a steering zero-point correction after turning off IG switch.
- > When the power steering computer is replaced with a new one, you should perform the following operation without fail to have the computer memorize the steering neutral position (torque sensor zero-point).

(1) When DS-II is used

- (a) Set the steering wheel and the front tires in a straight ahead position.
- (b) Connect DS-II to DLC.
- (c) Turning IG on, select [OBD] to [EPS] to [Utility] to [Torque Sensor Adjustment] to perform a power steering zero-point correction.

<CAUTION>

- > Do not start the engine.
- > Do not touch the steering wheel with your hand during a zero-point correction.

<HINT>

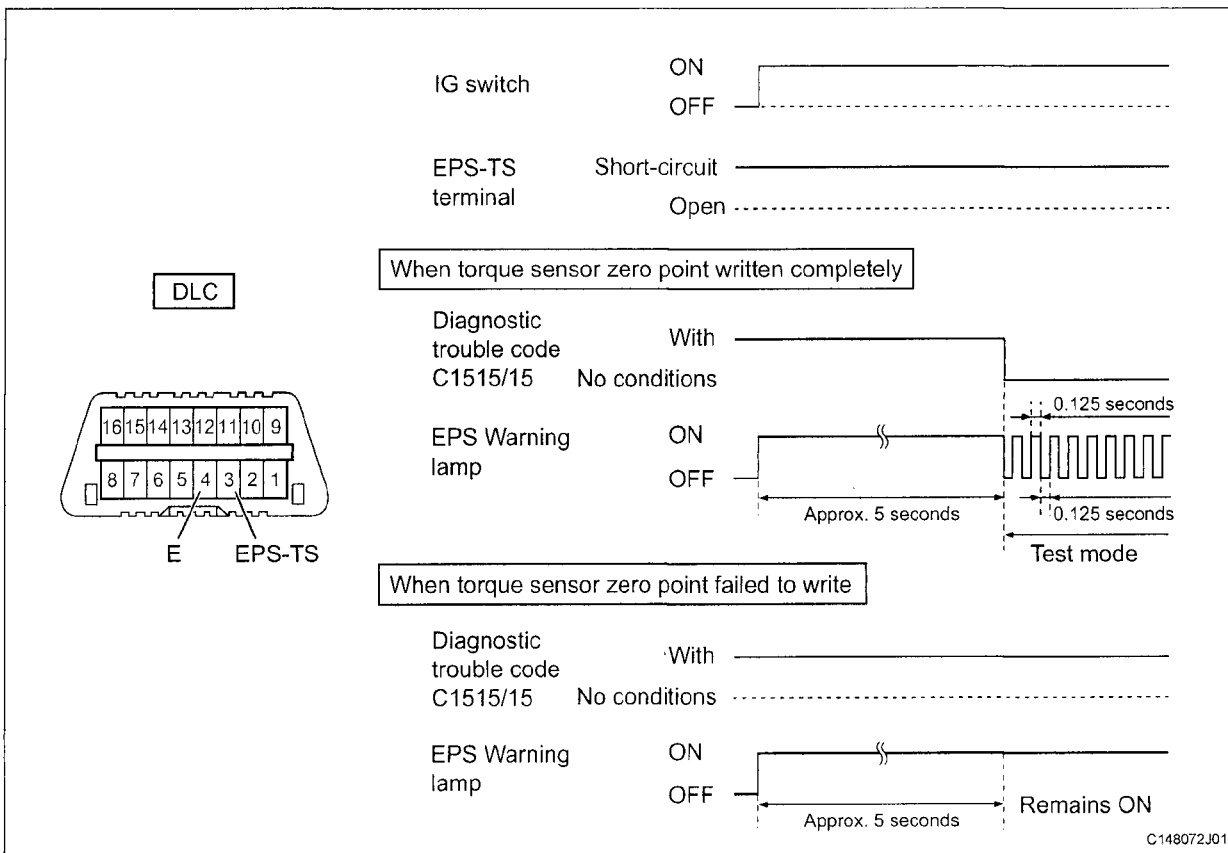
After a torque sensor zero-point correction is started, the EPS warning lamp flashes until it goes off when the correction is terminated.

(2) When DS-II is not used

- (a) Set the steering wheel and the front tires in a straight ahead position.
- (b) Use SST to short-circuit the DLC connector terminals 3 (EPS-TS) and 4 (E).

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<CAUTION>

- > Do not start the engine.

- > Never confuse connection positions of the connector; otherwise, a failure may occur.
- > Do not touch the steering wheel with your hand during and for approx. 5 seconds after transition to the test mode.
- > Although EPS warning lamp lights up, no error occurs.

<HINT>

- > As a result of transition to the test mode, a torque sensor zero-point correction is performed.
- > When the test mode is entered, the EPS warning lamp lights up. After the torque sensor zero-point correction is finished normally in about 5 seconds, the EPS warning lamp starts to turn on for 0.125 seconds and off for 0.125 repeatedly (flashing at 4 Hz).
- > If the torque sensor zero-point correction is not completed normally, the diagnostic trouble code C1515/15 is not erased, and the EPS warning lamp remains to be lit.

- (c) Make sure that the torque sensor zero-point correction has been completed by viewing flashing of EPS warning lamp, and terminate the test mode.

(3) Diagnostic trouble code check

<CAUTION>

After performing a torque sensor zero-point correction, check if the diagnostic trouble codes are correct.

(4) When a diagnostic trouble code C1515/15 is output

<HINT>

The diagnostic trouble code C1515/15 is output if a torque sensor zero-point correction has not been completed or is performed incorrectly.

- (a) Perform a torque sensor zero-point correction.

<CAUTION>

If a diagnostic trouble code C1515/15 is still output even after the torque sensor zero-point correction was performed 3 times or more, replace the steering column assembly with a new one.

- (b) Check if the diagnostic trouble code is no longer output after the operation.

(5) When diagnostic trouble code C1516/16 is output

<HINT>

The diagnostic trouble code C1516/16 is output if a torque sensor zero-point correction is performed incorrectly.

- (a) Erase the diagnostic trouble code.

- (b) Initialize the torque sensor zero-point correction signal.

- (c) Perform a torque sensor zero-point correction again.

<CAUTION>

If a diagnostic trouble code C1516/16 is still output even after [Diagnostic trouble code erase] to [Initialization of torque sensor zero-point correction signal] to [Torque sensor zero-point correction] are repeated 3 times or more, replace the steering column assembly with a new one.

(6) When diagnostic trouble code C1534/34 is output

<HINT>

The diagnostic trouble code C1534/34 is output if a torque sensor zero-point correction is performed incorrectly due to an ECU internal error.

- (a) Replace the power steering computer assembly with a new one.

- (b) Perform a torque sensor zero-point correction.

- (c) Check if the diagnostic trouble code is no longer output after the operation.

ECU TERMINAL SEQUENCE

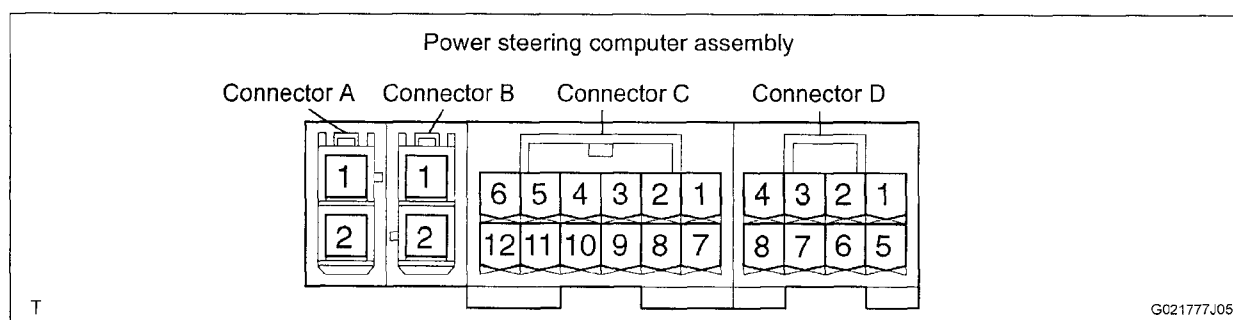
1. Use a tester and an oscilloscope to make a measurement between the terminals, and between each terminal and the body earth.

<CAUTION>

Check the connector from its back side while it is connected to the computer.

<HINT>

If [Pulse generation] is indicated in this standard list, a oscilloscope waveform is shown after the list.



Connector A

Terminal number	Terminal symbol	Input/output	Measuring item	Measuring condition	Reference
1	BAT + (Motor power) ↔ Body earth	Input	Voltage	IG ON	10 - 16 V
2	GND (Power GND) ↔ Body earth	-	Electrical continuity	Always	With electrical continuity

Connector B

Terminal number	Terminal symbol	Input/output	Measuring item	Measuring condition	Reference
1	M1 (Motor output 1) ↔ Body earth	Output	Voltage	Steering wheel left turn ↔ right turn	Voltage drop ↔ Voltage rise
2	M2 (Motor output 2) ↔ Body earth	Output	Voltage	Steering wheel left turn ↔ right turn	Voltage rise ↔ Voltage drop

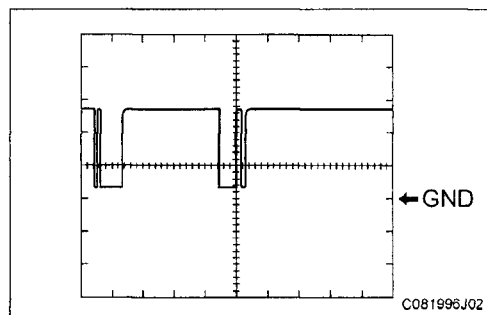
Connector C

Terminal number	Terminal symbol	Input/output	Measuring item	Measuring condition	Reference
2	SIO (Diagnosis communication signal) ↔ Body earth	Input/output	Waveform	Communication is established by connecting DS-II to DLC.	Pulse generation (Waveform 1)
4	T (Diagnosis signal) ↔ Body earth	Input	Voltage	IG ON Short-circuit between ECU-T ↔ E terminals in DLC	2 V or less
				IG ON Open-circuit between ECU-T ↔ E terminals in DLC	9 - 16 V
5	SPD (Vehicle speed signal) ↔ Body earth	Input	Waveform	When the vehicle is driving	Pulse generation (Waveform 2)
6	IG (IG power) ↔ Body earth	Input	Voltage	IG ON	10 - 16 V
8	IDUP (Idle-up request signal) ↔ Body earth	Output	Voltage	EPS is in operation No steering → Steering with vehicle at rest	9 - 16 V → 2 V or less
9	W (EPS warning lamp lights up Signal) ↔ Body earth	Output	Voltage	IG OFF → IG ON	When lamp is on: 2 V or less When lamp is off: 9 - 16 V
11	TEST (Test mode terminal) ↔ Body earth	Input	Voltage	IG ON Short-circuit between EPS-TS ↔ E terminals of DLC	2 V or less
				IG ON Open-circuit between EPS-TS ↔ E terminals of DLC	9-16 V
12	REV (Engine revolution signal) ↔ Body earth	Input	Waveform	Engine is in rotation	Pulse generation (Waveform 3)

Connector D

Terminal number	Terminal symbol	Input/output	Measuring item	Measuring condition	Reference
5	TRQ1 (Torque sensor signal 1) ↔ Body earth	Input	Voltage	1. Steering neutral position 2. Steering right turn 3. Steering left turn	1. 2.2 - 2.8 V 2. 2.2 - 4.85 V 3. 0.15 - 2.8 V
6	TRQV (Torque sensor power) ↔ Body earth	Input	Voltage	IG ON	7.5 - 8.5 V

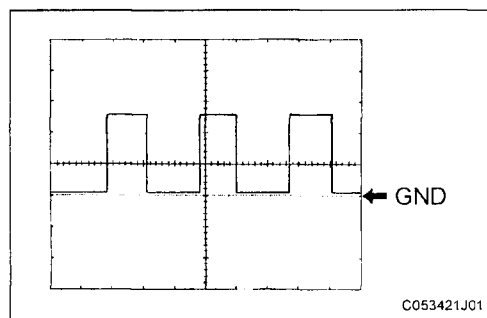
Terminal number	Terminal symbol	Input/output	Measuring item	Measuring condition	Reference
7	TRQ2 (Torque sensor signal 2) ↔ Body earth	Input	Voltage	1. Steering neutral position 2. Steering right turn 3. Steering left turn	1. 2.2 - 2.8 V 2. 2.2 - 4.85 V 3. 0.15 - 2.8 V
8	TRQG (Torque sensor GND) ↔ Body earth	-	Electrical continuity	Always	With electrical continuity



(1) Diagnosis communication signal

Waveform 1

Item	Description
Measuring terminal (Terminal name)	C2 ↔ Body earth (SIO ↔ Body earth)
Measuring instrument set	5 V/DIV, 1 ms/DIV
Measuring condition	When communication is established by connecting DS-II to DLC



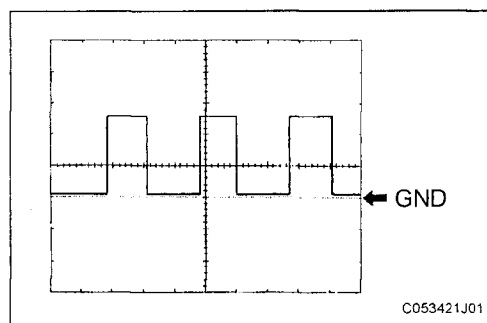
(2) Meter vehicle speed signal

Waveform 2

Item	Description
Measuring terminal (Terminal name)	C5 ↔ Body earth (SPD ↔ Body earth)
Measuring instrument set	5 V/DIV, 20 ms/DIV
Measuring condition	Vehicle speed approx. 20 km/h

<HINT>

The period becomes shorter as the vehicle speed increases



(3) Engine rotation speed signal

Waveform 3

Item	Description
Measuring terminal (Terminal name)	C12 ↔ Body earth (REV ↔ Body earth)
Measuring instrument set	5 V/DIV, 10 ms/DIV
Measuring condition	When engine is idled

<HINT>

Period becomes shorter as engine rotation speed rises.

ECU DATA MONITOR / ACTIVE TEST

<CAUTION>

Since Data List values vary widely depending on slight difference in measurement, on measuring environment, and on vehicle deterioration with age, it is difficult to present clear standard values (criteria). Therefore, a value within a standard value may cause a problem.

1. Connect DS-II to DLC.
2. Turn IG on and check the Data List following the instruction on the DS-II screen.

Data List

Item name (Symbol)	Item description	Check condition	Reference value
Output of torque sensor 1 (TRQ1)	Indicates main torque sensor output status Displayed range: 0 - 5 V	1. No load on steering 2. Right steering turn with vehicle at rest 3. Left steering turn with vehicle at rest	1. 2.2 - 2.8 V 2. 2.2 - 4.85 V 3. 0.15 - 2.8 V

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Item name (Symbol)	Item description	Check condition	Reference value
Output of torque sensor 2 (TRQ2)	Indicates sub torque sensor output status Displayed range: 0 - 5 V	1. No load on steering 2. Right steering turn with vehicle at rest 3. Left steering turn with vehicle at rest	1. 2.2 - 2.8 V 2. 2.2 - 4.85 V 3. 0.15 - 2.8 V
Double output of torq sens (TRQ3)	Indicates torque value for assist control. Displayed range: 0 - 5 V	1. No load on steering 2. Right steering turn with vehicle at rest 3. Left steering turn with vehicle at rest	1. 2.2 - 2.8 V 2. 2.2 - 4.85 V 3. 0.15 - 2.8 V
Meter vehicle speed (SPD)	Indicates vehicle speed input from meter Display range: 0 - 255 km/h	1. When the vehicle is stopped 2. When the vehicle runs at the certain speed	1. 0 km/h 2. No major change
Engine revclution speed (ESPD)	Indicates engine rotation speed. Display range: 0 - 8150 r/mi	Engine is rotating at a constant speed	No major change
Motor actual current (MEC)	Indicates current flowing through a motor Display range: -128 - 127 A	Power steering is in operation	Display varies in proportion to steering force.
Instruction value current (MEC0)	Indicates the value of requested current flowing through the motor. Display range: -128 - 127 A	Power steering is in operation	Display varies in proportion to steering force.
Thermistor temperature (THT)	Indicates ECU board temperature. Display range: -50 - 205 °C	-	-
PIG power supply (PIG)	Indicates motor-driving power voltage Display range: 0 - 25.5 V	Power steering is in operation	10 - 16 V
IG power supply volt (IGV)	Indicates the ECU power supply state. Display range: 0 - 25.5 V	IG ON	10 - 16 V
Torque SSR 1 (0-point val.) (OP1)	Indicates a torque sensor (zero-point value). Displayed range: 0 - 5 V	No load on steering	2.2 - 2.8 V
Torque SSR 2 (0-point val.) (OP2)	Indicates a torque sensor (zero-point value). Displayed range: 0 - 5 V	No load on steering	2.2 - 2.8 V
Torq. sens ctrl value (at 0) (OP3)	Indicates a torque sensor control value (zero-value). Displayed range: 0 - 5 V	No load on steering	2.2 - 2.8 V
No. of diagnosis codes (DIAG)	Freeze frame data of diagnostic trouble code	-	-
Motor Overheat Record (REC1)	Indicates presence of a record of continuous overheat preventive control.	-	1. N. prov 2. Provid
Motor Lo Power Record (REC2)	Indicates presence of history of PIG power voltage drop	-	1. N. prov 2. Provid
Motor terminal voltage (+) (MV1)	Indicates the voltage of the motor terminal M1. Display range: 0 - 25.5 V	1. Right steering turn 2. Left steering turn	1. Voltage rise 2. Voltage drop
Motor terminal voltage (-) (MV2)	Indicates the voltage of the motor terminal M2. Display range: 0 - 25.5 V	1. Right steering turn 2. Left steering turn	1. Voltage drop 2. Voltage rise
Test mode state (MODE)	Indicates whether the mode is normal mode or test mode.	1. Normal mode 2. Normal mode	1. NORM 2. TEST

FAIL SAFE LIST

- When detecting an error, the power steering computer assembly stops or degrades steering power assist to protect the system.

Error description	Failsafe
> Torque sensor error > Power steering motor error > ECU error	Power assist is stopped.
> Speed sensor system error > ABS ECU communication error	Assist amount is fixed to the amount when the failure occurred.

Error description	Failsafe
> High temperature history inside ECU > History of power voltage drop (without failure)	Amount of power assist is decreased little by little.

<HINT>

When you turn steering wheel frequently while driving slowly, or if you turn the steering wheel fully and hold it in that position for a long time, the amount of power assist may be decreased so that overheating of the motor and computer can be eliminated. In this case, normal assist can be restored by leaving the steering wheel untouched for about 10 minutes with the engine at idle.

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DTC	C1511/11	MAIN TORQUE SENSOR POWER/GROUND ABNORMAL
DTC	C1512/12	SUB TORQUE SENSOR POWER/GROUND ABNORMAL
DTC	C1513/13	TORQUE SENSOR MAIN/SUB EXCESS DEVIATION
DTC	C1514/14	ABNORMAL TORQUE SENSOR POWER SOURCE

Function description

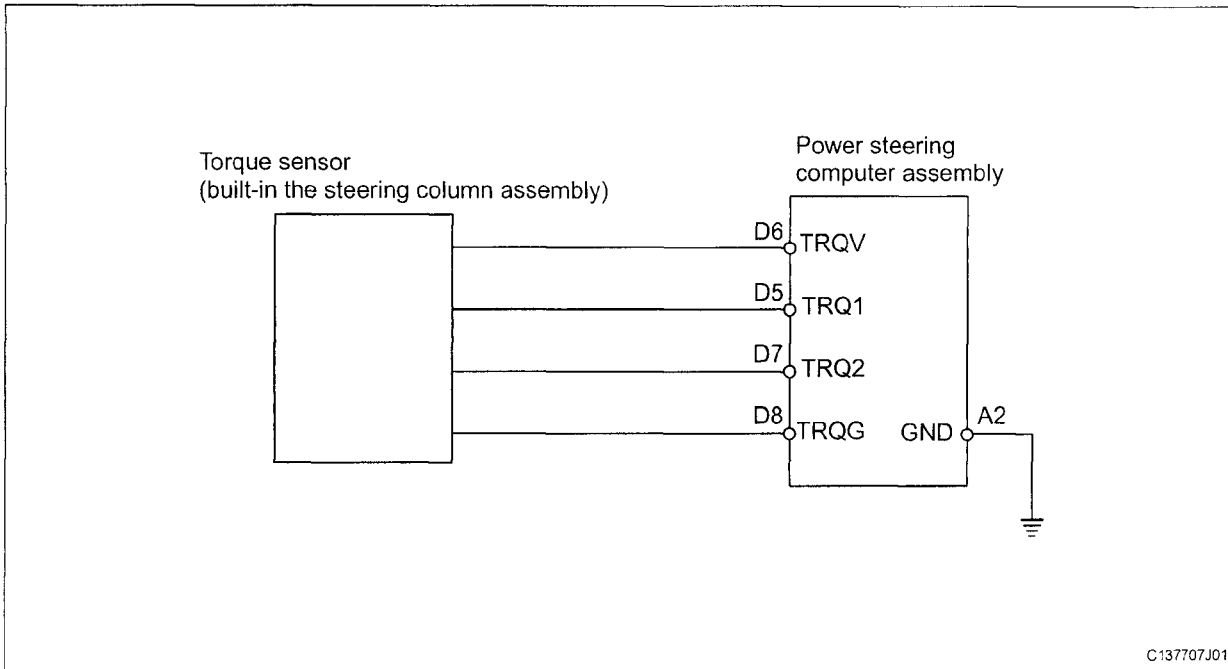
The power steering computer assembly detects steering force by means of input signal from the torque sensor.

As a fail-safe function, power assist is stopped while a torque sensor system error is detected.

DTC No.	Detection condition	Component causing failure
C1511/11	Torque sensor (TRQ1) signal error or stoppage	> Torque sensor (built in the steering column assembly) > Power steering computer assembly
C1512/12	Torque sensor (TRQ2) signal error or stoppage	> Torque sensor (built in the steering column assembly) > Power steering computer assembly
C1513/13	When deviation between torque sensors TRQ1 and TRQ2 goes out of a base value	> Torque sensor (built in the steering column assembly) > Power steering computer assembly
C1514/14	Torque sensor power voltage error	> Torque sensor (built in the steering column assembly) > Power steering computer assembly

Circuit diagram

49



Check procedure

1	DATA LIST CHECK (TORQUE SENSORS 1 AND 2 OUTPUT)
---	---

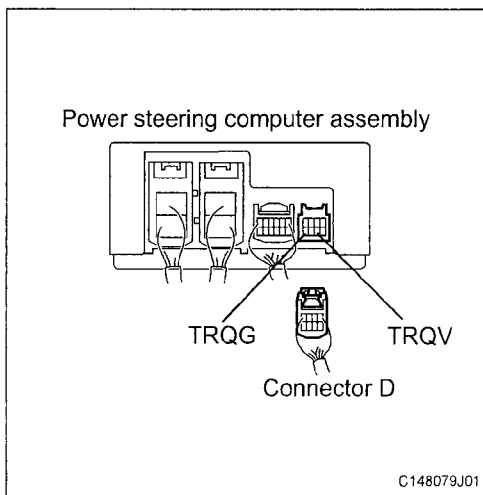
- (1) Connect DS-II to DLC.
- (2) Turn IG on and check [Output of torque sensor 1] and [Output of torque sensor 2] with the steering at neutral position (No load on steering) by referring to the Data List using DS-II.
Specified value: 2.2 - 2.8 V
- (3) Check the difference between [Output of torque sensor 1] and [Output of torque sensor 2] with the steering at neutral position (No load on steering).
Specified value: Within 0.3 V
- (4) Turn IG on and check the torque sensor output with steering operated by referring to the Data List using DS-II.
 - (a) Turn the steering wheel to the full right stop from the neutral position, and check the values of [Output of torque sensor 1] and [Output of torque sensor 2] in the Data List.
Specified value: Varies within a range from 2.2 to 4.85 V.
 - (b) Turn the steering wheel to the full left stop from the neutral position, and check the values of [Output of torque sensor 1] and [Output of torque sensor 2] in the Data List.
Specified value: Varies within a range from 0.15 to 2.8 V.
 - (c) Check the difference between [Output of torque sensor 1] and [Output of torque sensor 2].
Specified value: Within 0.3 V

OK

TO TROUBLE SYMPTOM SIMULATION METHOD

NG

2 TORQUE SENSOR POWER VOLTAGE CHECK AT COMPUTER SIDE (TRQV - TRQG)



OK

- (1) Disconnect the connector D of the power steering computer assembly.
- (2) Turn IG on.
- (3) Check the voltage between the terminals D6 (TRQV) and D8 (TRQG) of the connector at power steering computer assembly side using the tester.

Specified value: 7.5 - 8.5 V

<CAUTION>

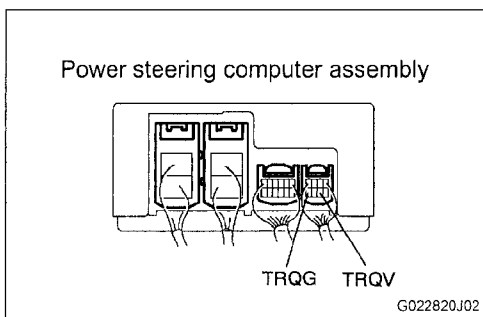
If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

NG

REPLACING POWER STEERING COMPUTER ASSEMBLY

49

3 TORQUE SENSOR POWER VOLTAGE CHECK AT STEERING COLUMN SIDE (TRQV - TRQG)



OK

- (1) Connect the connector D of the power steering computer assembly.
- (2) Turn IG on.
- (3) Check the voltage between the terminals D6 (TRQV) and D8 (TRQG) of the connector at power steering computer assembly side using the tester.

Specified value: 7.5 - 8.5 V

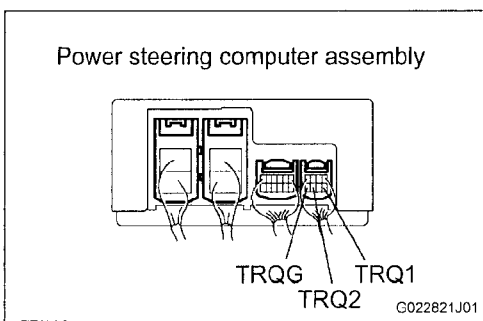
<CAUTION>

If the steering column assembly is replaced, initialize the torque sensor zero-point correction signal and perform a torque sensor zero-point correction after the replacement (See page 49-15).

NG

REPAIRING OR REPLACING STEERING COLUMN ASSEMBLY

4 STEERING COLUMN ASSEMBLY CHECK (TRQ1, TRQ2 - TRQG)



- (1) Turn IG on.
- (2) Check the voltage between the terminals D8 (TRQG) and D5 (TRQ1) and D7 (TRQ2) of the power steering computer assembly connector using the tester while the steering wheel is turned with the torque sensor connector is connected.

Specified value

Steering position	Voltage [V]
Neutral position	2.2 - 2.8 V
During right turn	2.2 - 4.85 V
During left turn	0.15 - 2.8 V

<CAUTION>

- > If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).
- > If the steering column assembly is replaced, initialize the torque sensor zero-point correction signal and perform a torque sensor zero-point correction after the replacement (See page 49-15).

NG

REPAIRING OR REPLACING STEERING COLUMN ASSEMBLY

49

OK

POWER STEERING COMPUTER ASSEMBLY CHECK AND REPLACEMENT

DTC

C1515/15

NOT MEMORIZE THE ZERO POINT OF TORQUE SENSOR

Function description

When it is determined that a torque sensor zero-point correction of the power steering computer assembly has not been completed, a diagnostic trouble code C1515/15 is output.

DTC No.	Detection condition	Items to be performed
C1515/15	Torque sensor zero-point correction has not been performed.	Perform a torque sensor zero-point correction. If no diagnostic trouble code is output, no failure occurs.

Check procedure

1

TORQUE SENSOR ZERO-POINT CORRECTION

- (1) Perform a torque sensor zero-point correction (See page 49-15).

2

DIAGNOSTIC TROUBLE CODE RECHECK

- (1) Recheck the diagnostic trouble code (See page 49-10).

Reference normal code output

<HINT>

- > DTC C1515/15 is erased when the torque sensor zero-point correction is completed normally.
- > If the diagnostic trouble code is still output even if torque sensor zero-point correction is performed 3 times or more, replace the steering column assembly.

<CAUTION>

If steering column assembly is replaced, initialize the torque sensor zero-point correction signal after the replacement, and perform a torque sensor zero-point correction (See page 49-15).

OK

NO ABNORMALITY

NG

REPLACING STEERING COLUMN ASSEMBLY

DTC	C1516/16	MEMORIZE THE ZERO POINT OF TORQUE SENSOR FAILED
-----	----------	---

Function description

The power steering computer assembly outputs a diagnostic code C1516/16 when it determines that the torque sensor zero-point correction is incomplete.

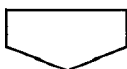
49

DTC No.	Detection condition	Items to be performed
C1516/16	Torque sensor zero-point correction could not be performed normally because, for example, the steering wheel was touched.	Erase the diagnostic trouble code, initialize the torque sensor zero-point, and perform a torque sensor zero-point correction. If no diagnostic trouble code is output, no failure occurs.

Check procedure

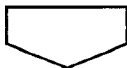
1	DIAGNOSTIC TROUBLE CODE ERASE
---	-------------------------------

- (1) Connect DS-II to DLC.
- (2) Turning IG on and following the instruction on the DS-II screen, erase the diagnostic trouble code (See page 49-10).



2	INITIALIZING TORQUE SENSOR ZERO-POINT
---	---------------------------------------

- (1) Initialize the torque sensor zero-point (See page 49-15).



3	TORQUE SENSOR ZERO-POINT CORRECTION
---	-------------------------------------

- (1) Perform a torque sensor zero-point correction (See page 49-15).



4	DIAGNOSTIC TROUBLE CODE RECHECK
---	---------------------------------

- (1) Connect DS-II to DLC.
- (2) Turning IG on and following the instruction on the DS-II screen, check the diagnostic trouble code (See page 49-10).

Reference: Normal code output

<HINT>

If the diagnostic trouble code is still output even if torque sensor zero-point correction is performed 3 times or more, replace the steering column assembly.

<CAUTION>

If the steering column assembly is replaced, initialize the torque sensor zero-point correction signal after the replacement, and perform a torque sensor zero-point correction (See page 49-15).

OK	NO ABNORMALITY
----	----------------

NG

REPLACING STEERING COLUMN ASSEMBLY

49

DTC	C1523/23	MOTOR CURRENT ABNORMAL DEVIATION
-----	----------	----------------------------------

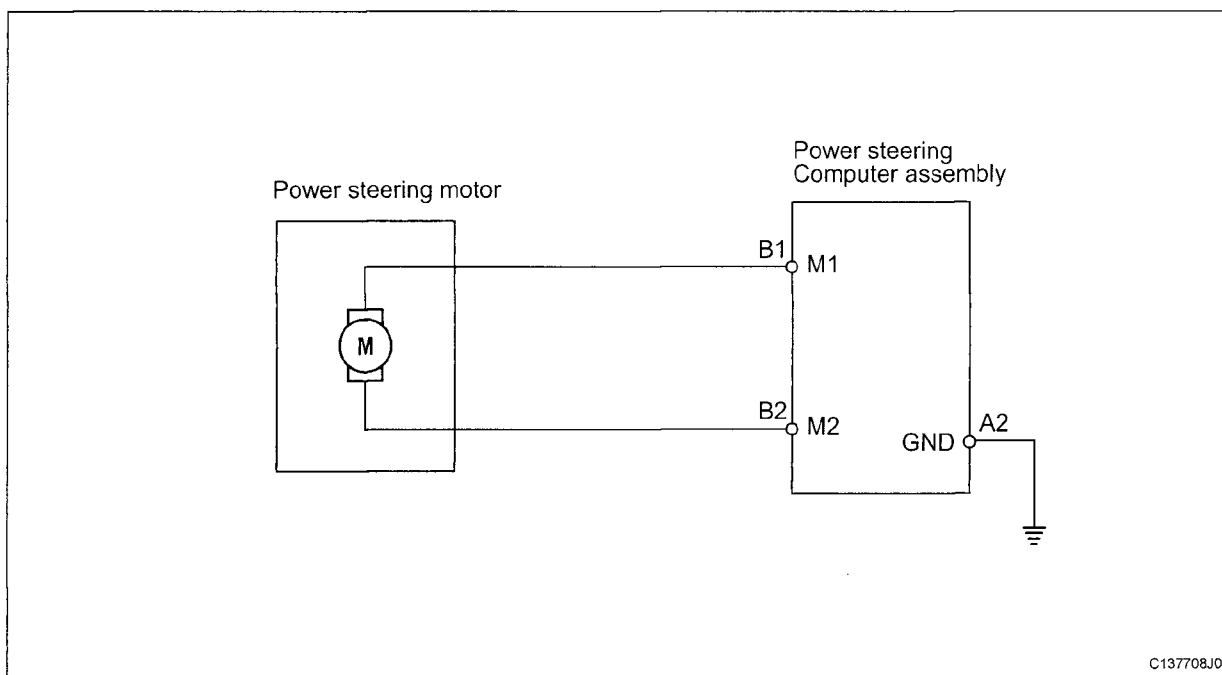
DTC	C1524/24	MOTOR TERMINAL POWER/GROUND ABNORMAL
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Function description

As a fail-safe function, the power assist is stopped while the motor error diagnostic trouble code is output.

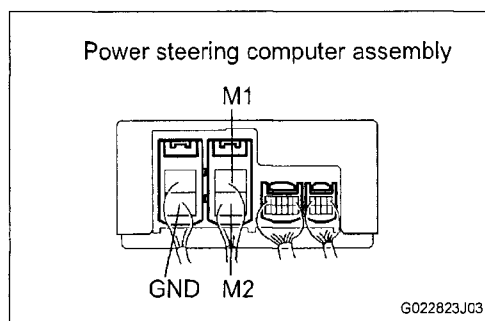
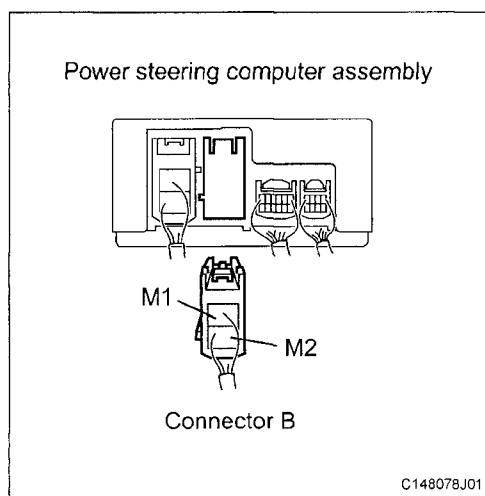
DTC No.	Detection item	Defective component
C1523/23	Excessive current deviation error	> Power steering motor > Power steering computer assembly
C1524/24	Voltage error between motor terminals	> Power steering motor > Power steering computer assembly

Circuit diagram



Check procedure

1 POWER STEERING COMPUTER ASSEMBLY CHECK (M1, M2 - GND)



- (1) Disconnect connector B of the power steering computer assembly.
- (2) Check the continuity between the terminals B1 (M1) and B2 (M2) of the vehicle-side connector of the power steering computer assembly using the tester.

Reference: With electrical continuity

49

- (3) Connect connector B of the power steering computer assembly.
- (4) Check the voltage between the terminals B1 (M1) and A2 (GND) of the power steering computer assembly using the tester.
 - (a) During steering wheel left turn
Reference: Voltage drops.
 - (b) During steering wheel right turn
Reference: Voltage rises.
- (5) Check the voltage between the terminals B2 (M2) and A2 (GND) of the power steering computer assembly using the tester.
 - (a) During steering wheel left turn
Reference: Voltage rises.
 - (b) During steering wheel right turn
Reference: Voltage drops.

<CAUTION>

If the steering column assembly is replaced, initialize the torque sensor zero-point correction signal after the replacement, and perform a torque sensor zero-point correction (See page 49-15).

OK

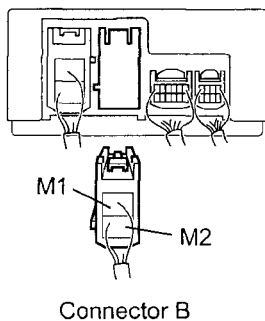
NG

REPLACING STEERING COLUMN ASSEMBLY

2 STEERING COLUMN ASSEMBLY CHECK (M1, M2 - GND)

49

Power steering computer assembly



C148078J01

- (1) Disconnect connector B of the power steering computer assembly.
- (2) Short-circuit check inside motor
 - (a) Check the continuity between the body earth, and terminals B1 (M1) and B2 (M2) of the vehicle-side connector of the power steering computer assembly using the tester.

Reference: Without electrical continuity

<CAUTION>

- > If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).
- > If the steering column assembly is replaced, initialize the torque sensor zero-point correction signal after the replacement, and perform a torque sensor zero-point correction (See page 49-15).

OK

REPLACING POWER STEERING COMPUTER ASSEMBLY

NG

REPLACING STEERING COLUMN ASSEMBLY

DTC

C1531/31

CPU SYSTEM ABNORMALITY

DTC

C1533/33

CIRCUIT BOARD TEMPERATURE SENSOR ABNORMAL

DTC

C1534/34

ECU INSIDE NONVOLATILE EEPROM ABNORMAL

Function description

As a fail-safe function, the power assist is stopped while an error diagnostic trouble code of the ECU system is output. However, the power assist is continued without stop if only C1534/34 is output.

DTC No.	Detection item	Defective component
C1531/31	ECU internal error is detected.	Power steering computer assembly
C1533/33	ECU internal temperature error is detected.	Power steering computer assembly
C1534/34	ECU internal error is detected.	Power steering computer assembly

Check procedure

1 REPLACING POWER STEERING COMPUTER ASSEMBLY

<CAUTION>

If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

END

DTC	C1532/32	ECU INSIDE ERROR
-----	----------	------------------

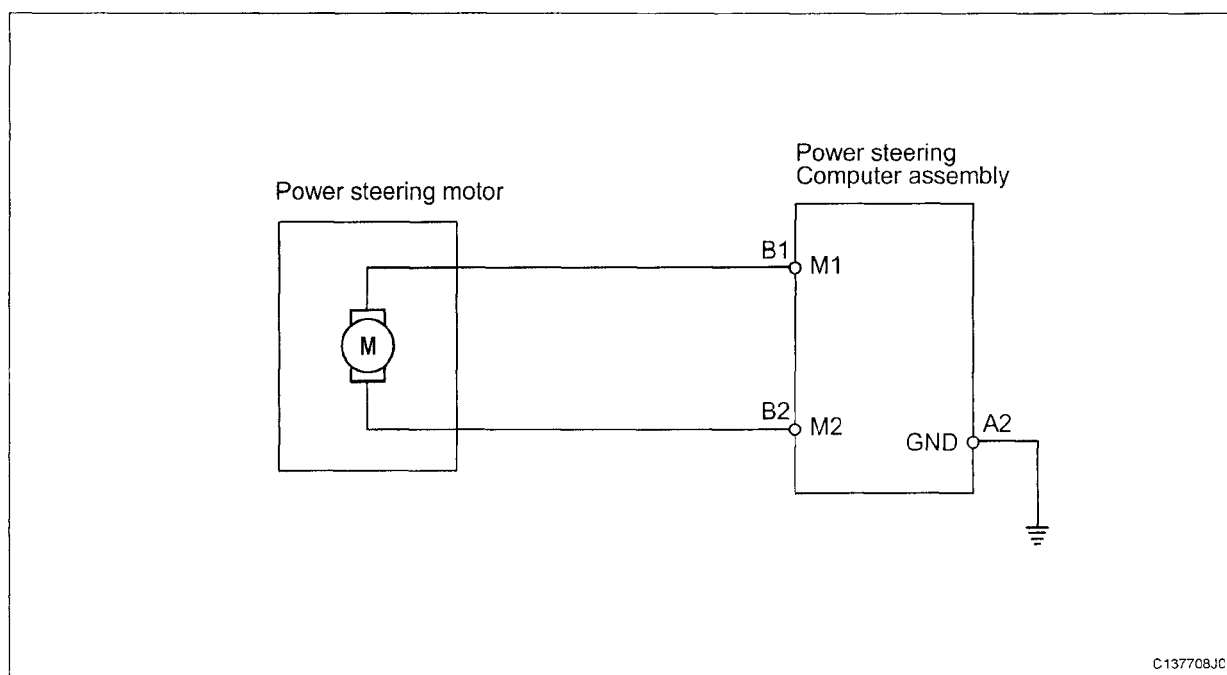
Function description

As a fail-safe function, the assist is stopped while an error diagnostic trouble code for ECU system is output.

DTC No.	Detection item	Defective component
C1532/32	ECU internal circuit error, motor circuit error	Power steering motor Power steering computer assembly

49

Circuit diagram

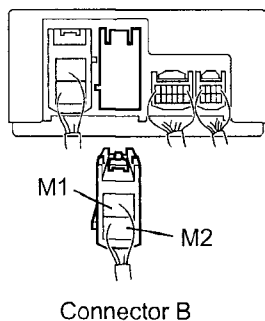


Check procedure

1 STEERING COLUMN ASSEMBLY CHECK (MOTOR OPERATION VOLTAGE)

49

Power steering computer assembly



- (1) After turning IG off, disconnect connector B of the power steering computer assembly.
- (2) Check the voltage between the terminals B1 (M1) and B2 (M2) of the vehicle-side connector of the power steering computer assembly during steering using the tester.

Reference: Voltage varies according to steering speed.

<HINT>

If performed with IG turned on, a diagnostic trouble code irrelevant to the failure is memorized.

<CAUTION>

If steering column assembly is replaced, a torque sensor zero-point correction is performed after the torque sensor zero-point correction signal is initialized (See page 49-15).

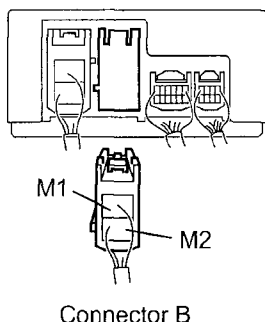
NG

REPLACING STEERING COLUMN ASSEMBLY

OK

2 STEERING COLUMN ASSEMBLY CHECK (M1, M2 - GND)

Power steering computer assembly



- (1) Disconnect connector B of the power steering computer assembly.
- (2) Check the continuity between the body earth, and terminals B1 (M1) and B2 (M2) of the vehicle-side connector of the power steering computer assembly using the tester.

Reference: Without electrical continuity

<CAUTION>

- > If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).
- > If the steering column assembly is replaced, initialize the torque sensor zero-point correction signal after the replacement, and perform a torque sensor zero-point correction (See page 49-15).

NG

REPLACING STEERING COLUMN ASSEMBLY

OK

REPLACING POWER STEERING COMPUTER ASSEMBLY

DTC

C1541/41

VEHICLE SPEED SENSOR ABNORMAL (DURING STOP)

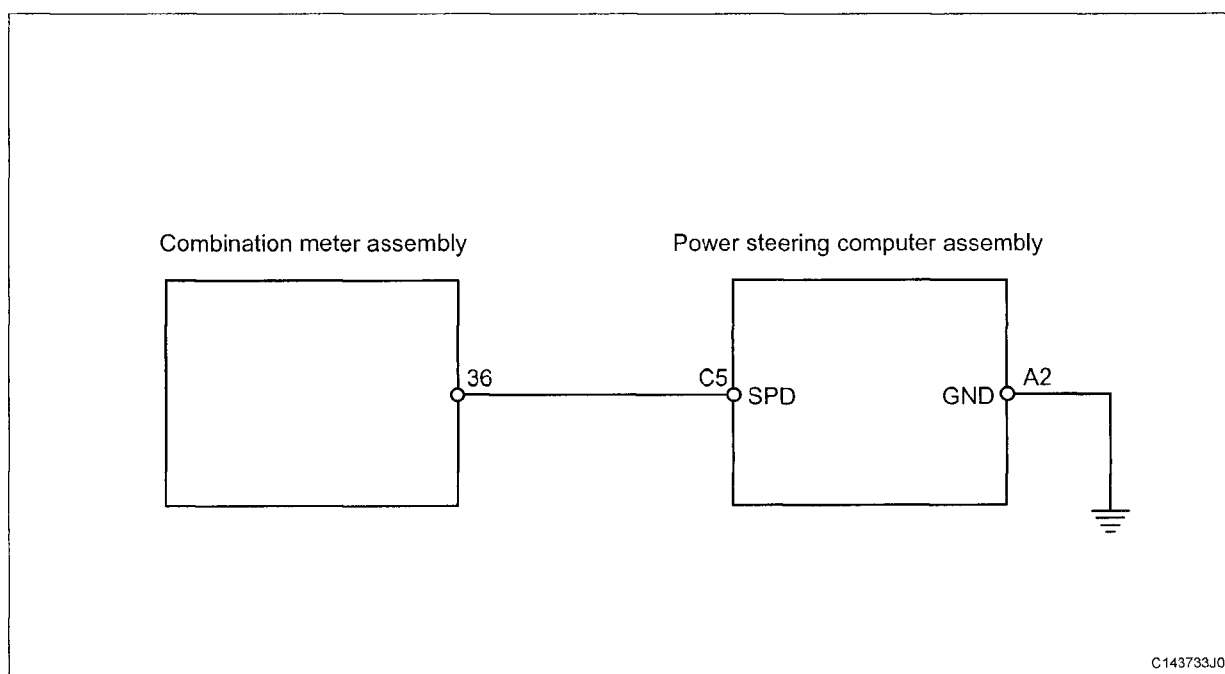
Function description

Power steering computer assembly controls the amount of power assist based on the vehicle speed signal input from the combination meter assembly.

DTC No.	Detection item	Defective component
C1541/41	Vehicle speed signal error	> Speed sensor circuit > Skid control computer assembly (with ABS & VSC) > Transmission control computer assembly (for automatic transaxle / without ABS & VSC) > Combination meter assembly > Power steering computer assembly > Wire harness

49

Circuit diagram



<HINT>

For manual transaxle vehicle without ABS & VSC, perform the check from step 2.

Check Procedure

1	DIAGNOSTIC TROUBLE CODE OUTPUT CHECK (ABS SYSTEM)
---	---

- (1) For automatic transaxle vehicle without ABS & VSC, diagnostic trouble codes for automatic transaxle system are output.
- (2) For vehicles with ABS & VSC, diagnostic trouble codes for ABS or VSC system are output.

Reference

Check result	Next step
Normal code output	OK
Diagnostic trouble codes for automatic transaxle system are output (for automatic transaxle / without ABS & VSC)	NG (A)

Check result	Next step
Diagnostic trouble codes for ABS or VSC system are output (with ABS & VSC)	NG (B)

NG(A) → TO AUTOMATIC TRANSAXLE SYSTEM

NG(B) → TO ABS OR VSC SYSTEM

OK

2 DATA LIST CHECK (METER VEHICLE SPEED [SPD])

(1) Check if a speed value is output according to the vehicle speed by referring to the Data List [Meter vehicle speed (SPD)] using DS-II.

Data List

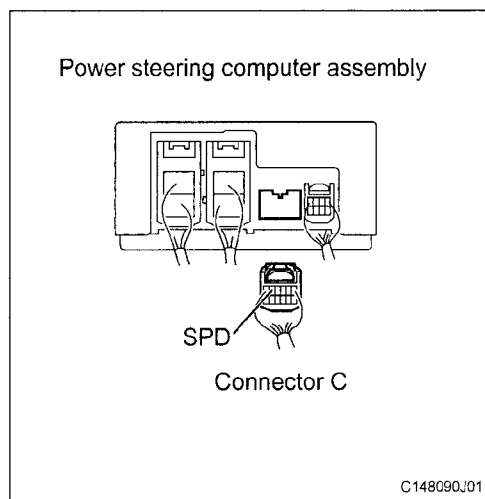
Item name (Symbol)	Item description	Check condition	Reference
Meter vehicle speed (SPD)	Indicates a speed value from meter.	When the vehicle is stopped	0 km/h
		When the vehicle runs at the certain speed	No major change

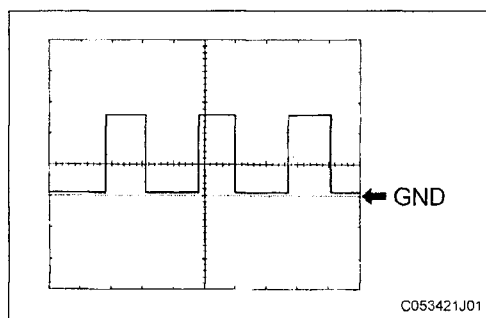
OK → POWER STEERING COMPUTER ASSEMBLY CHECK AND REPLACEMENT

NG

3 COMBINATION METER OUTPUT SIGNAL CHECK (VEHICLE SPEED SIGNAL OUTPUT)

(1) Disconnect connector C of the power steering computer assembly





- (2) Check if a waveform is output between terminal C5 (SPD) of the vehicle side connector of the power steering computer assembly and the body earth while the vehicle is running using an oscilloscope.

Item	Description
Measuring terminal (Terminal name)	C5 ↔ Body earth (SPD ↔ Body earth)
Measuring instrument set	5 V/DIV, 20 ms/DIV
Measuring condition	Vehicle speed approx. 20 km/h

49

<HINT>

- > Waveform period becomes short as a vehicle speed increases.
- > The oscilloscope waveform shown in the diagram is for reference. Waveforms of noise and chattering etc are omitted.

Reference: Waveform is output.

NG

TO STEP 5

OK

4

TEST MODE CHECK

- (1) Use a test mode check to check test mode code output (See page 49-12).

Reference: Test mode code C1571/71 can be erased at a vehicle speed of 20 km/h.

<CAUTION>

If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

NG

REPLACING POWER STEERING COMPUTER ASSEMBLY

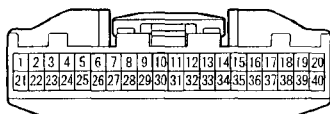
OK

SYSTEM IS NORMAL. (IT SEEMS THAT AN ERROR WAS DETECTED BECAUSE THE ENGINE WAS RACED.)

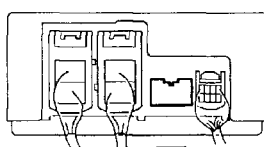
5 SYSTEM IS NORMAL. (IT SEEMS THAT AN ERROR WAS DETECTED BECAUSE THE ENGINE WAS RACED.)

49

Combination meter assembly
W/H side connector



Power steering computer assembly



SPD
Connector C

C144235J03

- (1) Disconnect the combination meter assembly connector and the power steering computer assembly connector C.
- (2) Check the continuity and short-circuit between terminal C5 (SPD) of the vehicle-side connector of the power steering computer assembly and terminal 36 of the vehicle-side connector of the combination meter assembly using the tester.

Reference

Measuring terminal (terminal name) Power steering computer assembly ↔ Combination meter assembly	Reference
C5 (SPD) ↔ 36	There must be electrical continuity and no short circuit between other terminal and body earth.

<CAUTION>

If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

NG

REPAIR OR REPLACEMENT OF THE WIRE HARNESS
OR THE CONNECTOR

OK

TO METER AND GAGE SYSTEM

DTC

C1544/44

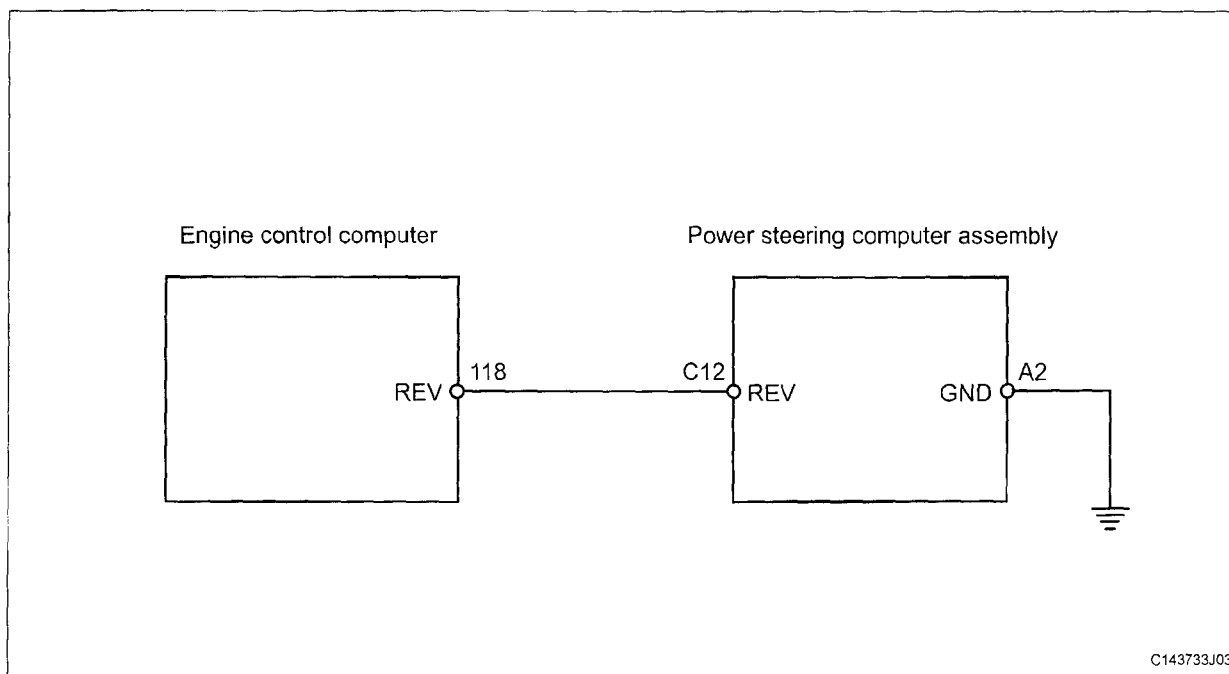
ENGINE SPEED SIGNAL ABNORMAL

Function description

The power steering computer assembly fixes the power assist amount to a certain value when it detects an engine rotation signal error.

DTC No.	Detection item	Check part
C1544/44	Engine rotation signal error	> Engine control computer > Power steering computer assembly > Wire harness and connector

Circuit diagram



49

Check procedure

1	DIAGNOSTIC TROUBLE CODE OUTPUT CHECK
---	--------------------------------------

- (1) Diagnostic trouble codes for EFI system are output.
Reference: Normal code is output.

NG

TO RELEVANT DIAGNOSTIC TROUBLE CODE CHART

OK

2	DATA LIST CHECK (ENGINE REVOLUTION SPEED [ESPD])
---	--

- (1) Connect DS-II to DLC.
(2) Start the engine, and check the idle speed indication by referring to the [Engine revolution speed] in the Data List.
(3) Operating the axle pedal, check if the indication of the [Engine revolution speed] in the Data List matches actual engine revolution.

OK

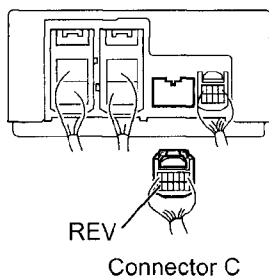
POWER STEERING COMPUTER ASSEMBLY CHECK AND REPLACEMENT

NG

3 ENGINE CONTROL COMPUTER OUTPUT SIGNAL CHECK (ENGINE REVOLUTION OUTPUT)

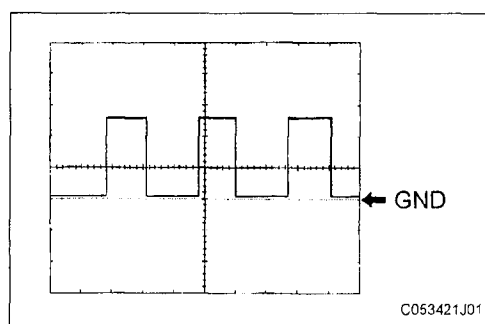
49

Power steering computer assembly



C148090J02

- (1) Disconnect connector C of the power steering computer assembly



- (2) Check if a waveform is output between terminal C12 (REV) of the vehicle side connector of the power steering computer assembly and the body earth using an oscilloscope.

Item	Description
Measuring terminal (Terminal name)	C12 ↔ Body earth (REV ↔ Body earth)
Measuring instrument set	5 V/DIV, 10 ms/DIV
Measuring condition	When engine is idled

<HINT>

The oscilloscope waveform shown in the diagram is for reference.
Waveforms of noise and chattering etc are omitted.

Reference: Waveform is output.

NG

TO STEP 5

OK

4 TEST MODE CHECK

- (1) Perform a test mode check to see if a test mode code C1573/73 is output (See page 49-12).

Reference: Test mode code C1573/73 can be erased when engine is idled.

<CAUTION>

If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

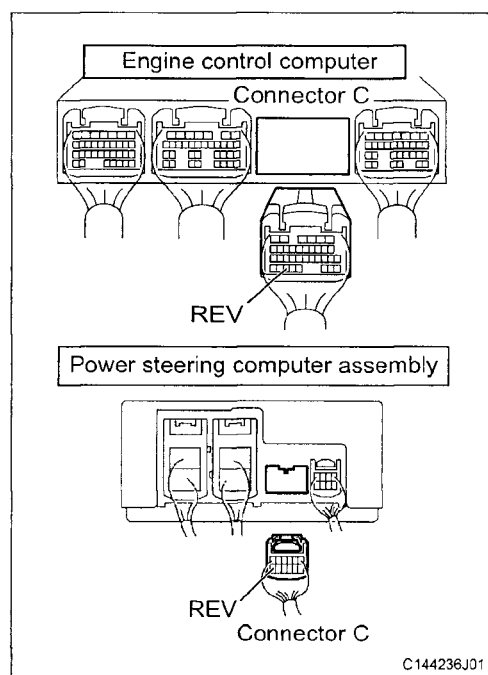
OK

SYSTEM IS NORMAL. (IT SEEMS THAT AN ERROR WAS DETECTED DUE TO ENGINE STOP.)

NG

REPLACING POWER STEERING COMPUTER ASSEMBLY

5 WIRE HARNESS AND CONNECTOR CHECK (POWER STEERING COMPUTER ASSEMBLY - ENGINE CONTROL COMPUTER)



- (1) Disconnect the power steering computer assembly connector C and the engine control computer connector C.
- (2) Check the continuity and short-circuit between terminal C12 (REV) of the vehicle-side connector of the power steering computer assembly and terminal 118 (REV) of the vehicle-side connector of the engine control computer using the tester.

Reference

Measuring terminal (terminal name) power steering computer assembly ↔ engine control computer	Reference
C12 (REV) ↔ 118 (REV)	There must be electrical continuity and no short circuit between other terminal and body earth.

<CAUTION>

If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

NG

REPAIR OR REPLACEMENT OF THE WIRE HARNESS
OR THE CONNECTOR

OK

TO EFI SYSTEM

DTC	C1551/51	IG POWER SUPPLY VOLTAGE ABNORMAL DETECT (SIGNAL SYSTEM)
-----	----------	--

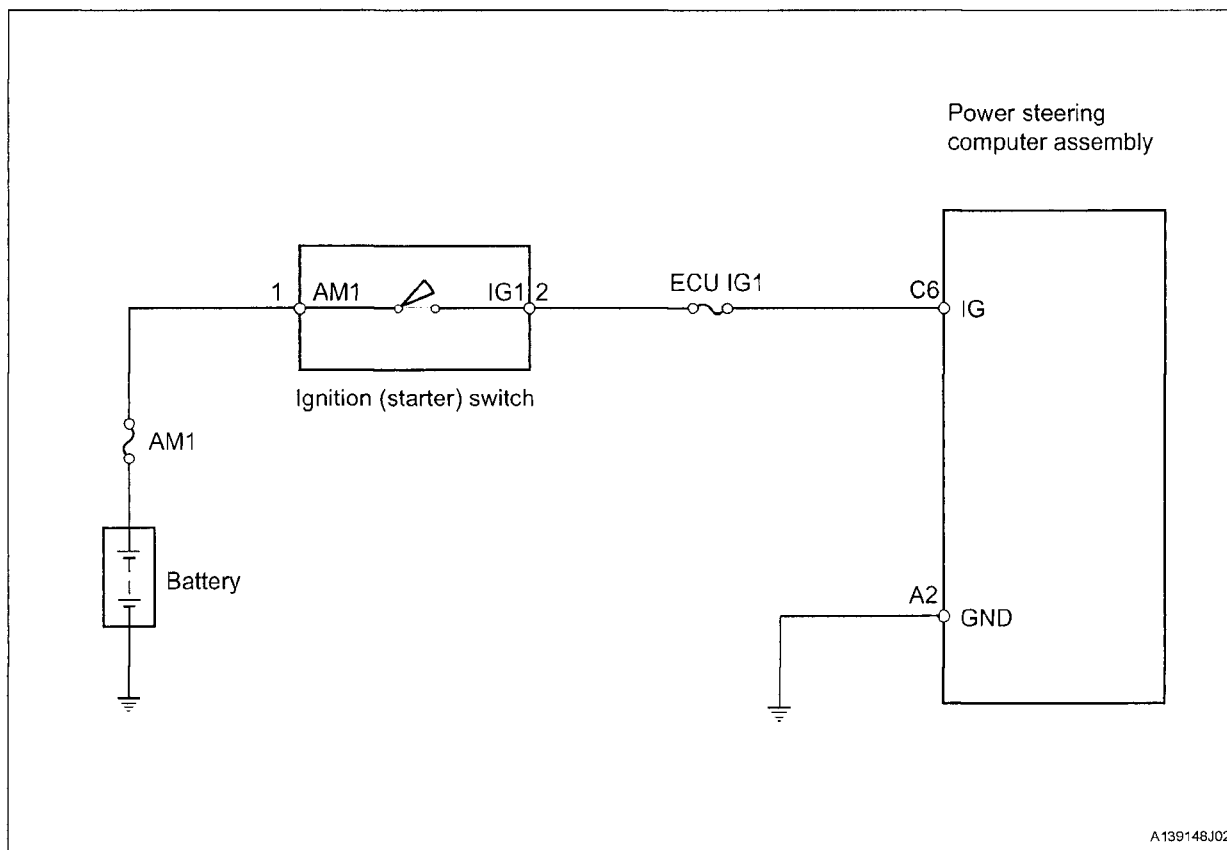
Function description

As a fail-safe function, the power assist is stopped while a power system error is exhibited.

DTC No.	Detection item	Defective component
C1551/51	Line break and short-circuit in IG power circuit	> Power steering computer assembly > Power system > ECU IG1 fuse > Wire harness

Circuit diagram

49



Check procedure

1 FUSE CHECK (ECU IG1)

- (1) Remove the ECU IG1 fuse from the fuse block assembly.
 - (2) Check the continuity of the ECU IG1 fuse using the tester.
- Reference: With electrical continuity

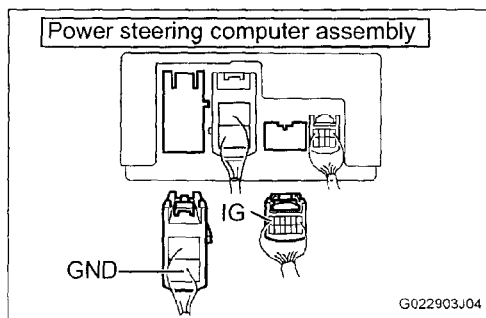
NG

FUSE REPLACEMENT

OK

2 WIRE HARNESS AND CONNECTOR CHECK (IG POWER AND BODY EARTH)

- (1) Disconnect power steering computer assembly connector A and connector C.
- (2) Turn IG on.



- (3) Check the voltage between C6 (IG) terminal of the vehicle-side connector of the power steering computer assembly and the body earth using the tester.

Specified value

Measuring terminal (terminal name)	Specified value
C6 (IG) ↔ Body earth	10 - 16 V

49

- (4) Turn IG off.

- (5) Check the continuity between terminal A2 (GND) of the harness-side connector of the power steering computer assembly and the body earth.

Reference

Measuring terminal (terminal name)	Reference
A2 (GND) ↔ Body earth	With electrical continuity

<CAUTION>

If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

NG

REPAIR OR REPLACEMENT OF THE WIRE HARNESS OR THE CONNECTOR

OK

REPLACING POWER STEERING COMPUTER ASSEMBLY

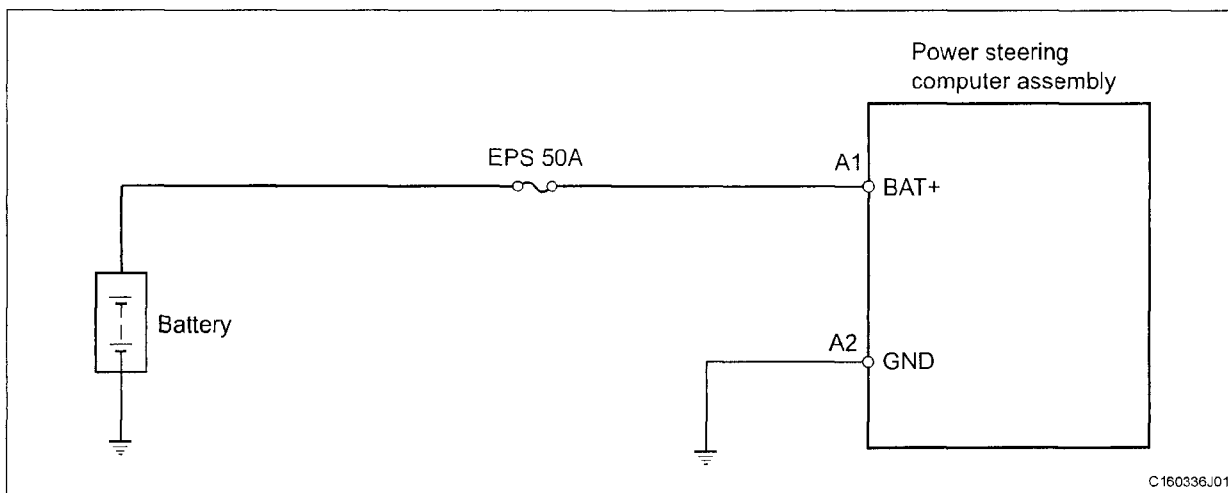
DTC	C1552/52	MOTOR POWER SUPPLY VOLTAGE ABNORMAL
DTC	C1554/54	POWER SUPPLY RELAY WELD/OPEN ABNORMAL

Function description

As a fail-safe function, power assist is stopped while a PIG power or power relay system error occurs.

DTC No.	Detection item	Check part
C1552/52	PIG power voltage error	> EPS fuse > Power steering computer assembly > Wire harness and connector
C1554/54	Power relay error	> EPS fuse > Power steering computer assembly > Wire harness and connector

Circuit diagram



Check procedure

1 FUSE CHECK (EPS)

- (1) Remove the EPS fuse from the engine room relay block assembly.
- (2) Check the continuity of the EPS fuse using the tester.

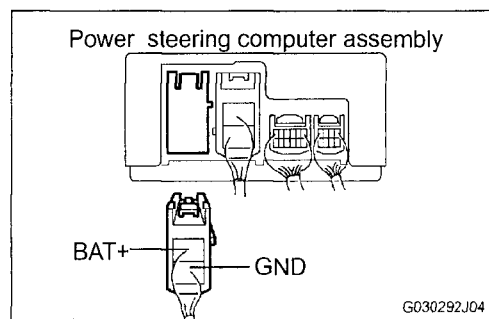
Reference: With electrical continuity

NG

FUSE REPLACEMENT

OK

2 WIRE HARNESS AND CONNECTOR CHECK (BAT+ - GND VOLTAGE)



- (1) Disconnect connector A of the power steering computer assembly.
- (2) Turn IG on, and check the voltage between the terminals A1 (BAT+) and A2 (GND) of the vehicle-side connector of the power steering computer assembly using the tester.

Specified value

Measuring terminal (terminal name)	Specified value
A1 (BAT+) ↔ A2 (GND)	10-16 V

<CAUTION>

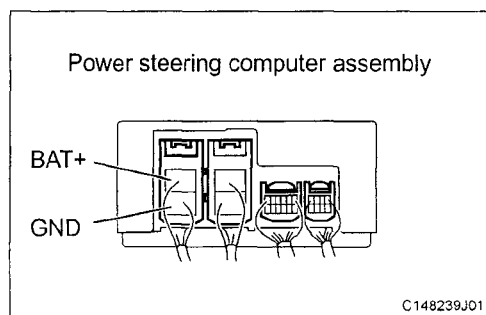
If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

NG

REPAIR OR REPLACEMENT OF THE WIRE HARNESS OR THE CONNECTOR

OK

3 POWER STEERING COMPUTER ASSEMBLY CHECK (BAT+ - GND)



- (1) Start the engine.
- (2) Check the voltage between the terminals A1 (BAT+) and A2 (GND) of the connector at the power steering computer assembly side using the tester.

Specified value

Measuring terminal (terminal name)	Measuring condition	Specified value
A1 (BAT+) ↔ A2 (GND)	While engine is in operation and steering is turned.	10 - 16 V

<CAUTION>

If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

NG

REPAIR OR REPLACEMENT OF THE WIRE HARNESS
OR THE CONNECTOR

OK

REPLACING POWER STEERING COMPUTER ASSEMBLY

DTC

C1555/55

MOTOR RELAY WELD/OPEN ABNORMAL

Function description

As a fail-safe function, the power assist is stopped while the motor relay system error occurs.

DTC No.	Detection item	Defective component
C1555/55	Motor relay error	Power steering computer assembly

Check procedure

1 REPLACING POWER STEERING COMPUTER ASSEMBLY

<CAUTION>

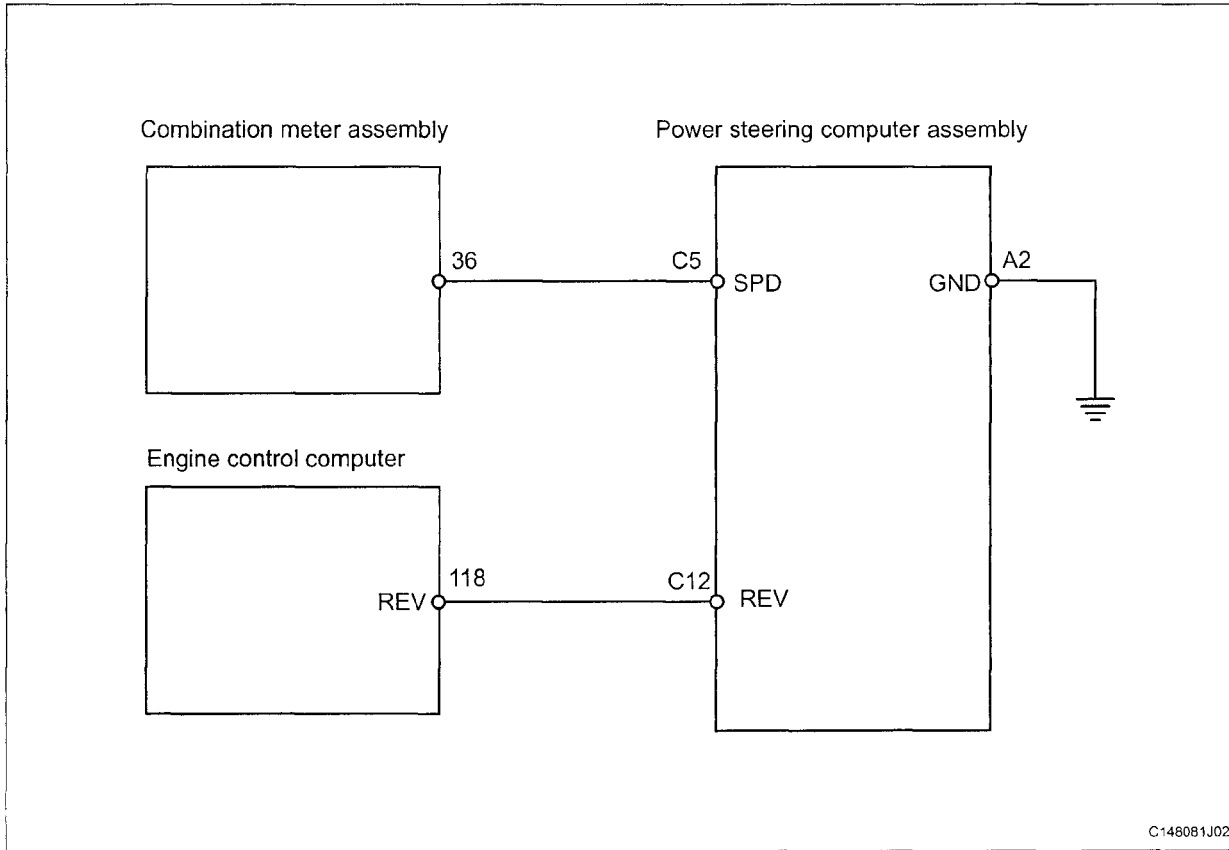
If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

END

VEHICLE SPEED SIGNAL, ENGINE REVOLUTION SIGNAL SYSTEM

Circuit diagram

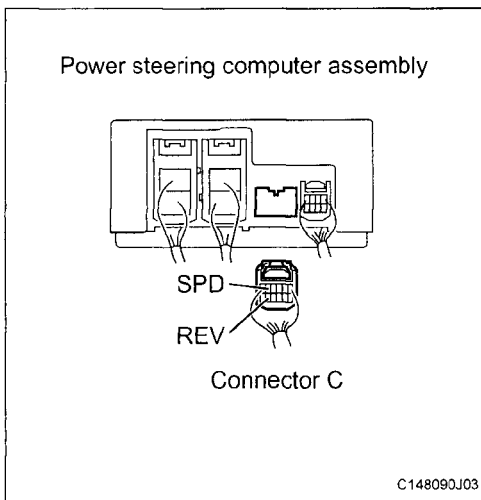
49

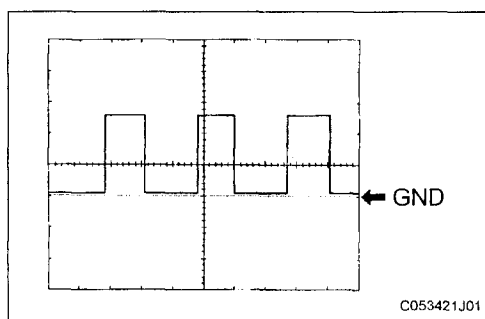


Check procedure

- 1 POWER STEERING COMPUTER CHECK (VEHICLE SPEED SIGNAL, ENGINE REVOLUTION SIGNAL)

(1) Disconnect connector C of the power steering computer assembly.





- (2) Check if a waveform is output between terminal C5 (SPD) of the vehicle side connector of the power steering computer assembly and the body earth while the vehicle is running using an oscilloscope.

Item	Description
Measuring terminal (terminal name)	C5 ↔ Body earth (SPD ↔ Body earth)
Measuring instrument set	5 V/DIV, 20 ms/DIV
Measuring condition	Approx. 20 km/h

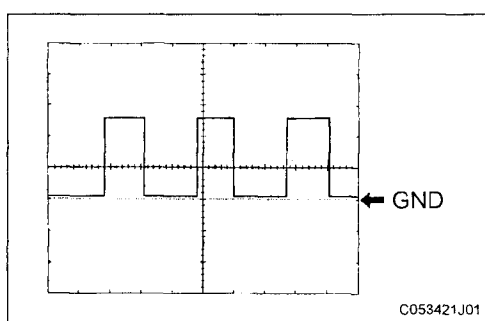
49

<HINT>

- > Waveform period becomes short as a vehicle speed increases.
- > The oscilloscope waveform shown in the diagram is for reference. Waveforms of noise and chattering etc are omitted.

Reference: Waveform is output.

- (3) Check if a waveform is output between terminal C12 (REV) of the vehicle side connector of the power steering computer assembly and the body earth using an oscilloscope.



Item	Description
Measuring terminal (terminal name)	C12 ↔ Body earth (REV ↔ Body earth)
Measuring instrument set	5 V/DIV, 20 ms/DIV
Measuring condition	When engine is idled

<HINT>

The oscilloscope waveform shown in the diagram is for reference. Waveforms of noise and chattering etc are omitted.

Reference: Waveform is output.

Check result

Check result	Next step
Vehicle signal system error	NG (A)
Engine revolution signal system error	NG (B)

NG(A)

TO STEP 3

NG(B)

TO STEP 4

OK

2

TEST MODE CHECK

- (1) Perform a test mode check, and check the test mode code (See page 49-12).

Reference: Test mode code C1571/71 can be erased at a vehicle speed of 20 km/h. Test mode code 1573/73 can be erased when engine is idled.

<CAUTION>

If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

OK

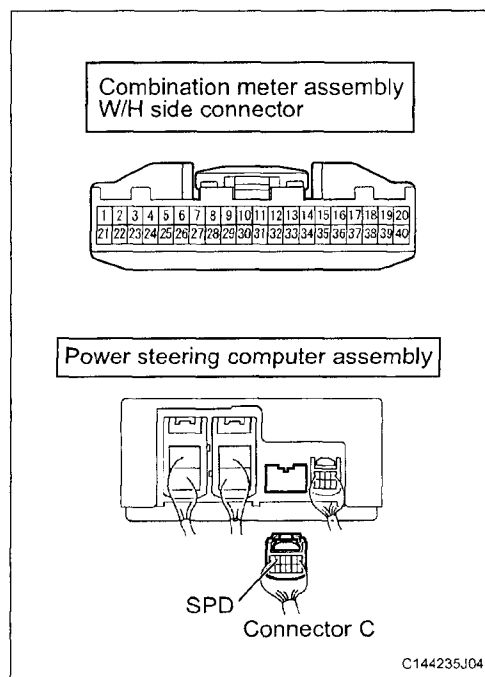
NORMAL RECOVERY (CHECKING OF OTHER PARTS)

NG

REPLACING POWER STEERING COMPUTER ASSEMBLY

49

3 WIRE HARNESS AND CONNECTOR CHECK (POWER STEERING COMPUTER ASSEMBLY - COMBINATION METER ASSEMBLY)



- (1) Disconnect the combination meter assembly connector and the power steering computer assembly connector C.
- (2) Check the continuity and short-circuit between terminal C5 (SPD) of the vehicle-side connector of the power steering computer assembly and terminal 36 of the vehicle-side connector of the combination meter assembly using the tester.

Measuring terminal Power steering computer assembly ↔ Combination meter assembly	Reference
C5 (SPD) ↔ 36	There must be electrical continuity and no short circuit between other terminal and body earth.

<CAUTION>

If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

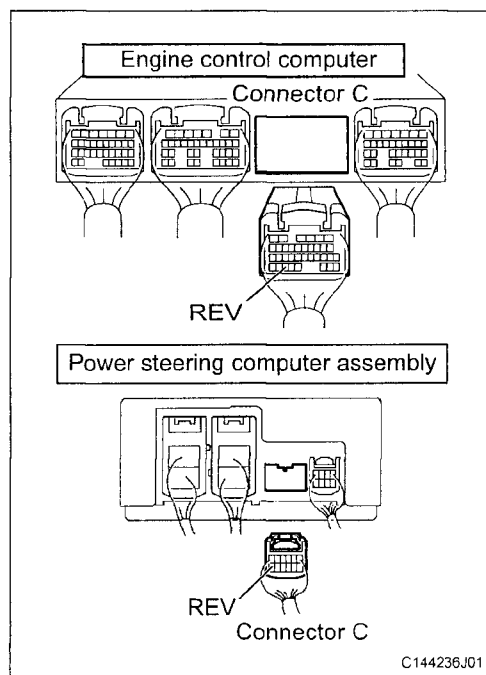
NG

REPAIR OR REPLACEMENT OF THE WIRE HARNESS OR THE CONNECTOR

OK

TO METER AND GAGE SYSTEM

4 WIRE HARNESS AND CONNECTOR CHECK (POWER STEERING COMPUTER ASSEMBLY - ENGINE CONTROL COMPUTER)



- (1) Disconnect the power steering computer assembly connector C and the engine control computer connector C.
- (2) Check the continuity and short-circuit between terminal C12 (REV) of the vehicle-side connector of the power steering computer assembly and terminal 118 (REV) of the vehicle-side connector of the engine control computer using the tester.

49

Measuring terminal (terminal name) power steering computer assembly ↔ engine control computer	Reference
C12 (REV) ↔ 118 (REV)	There must be electrical continuity and no short circuit between other terminal and body earth.

<CAUTION>

If power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

NG

REPAIR OR REPLACEMENT OF THE WIRE HARNESS
OR THE CONNECTOR

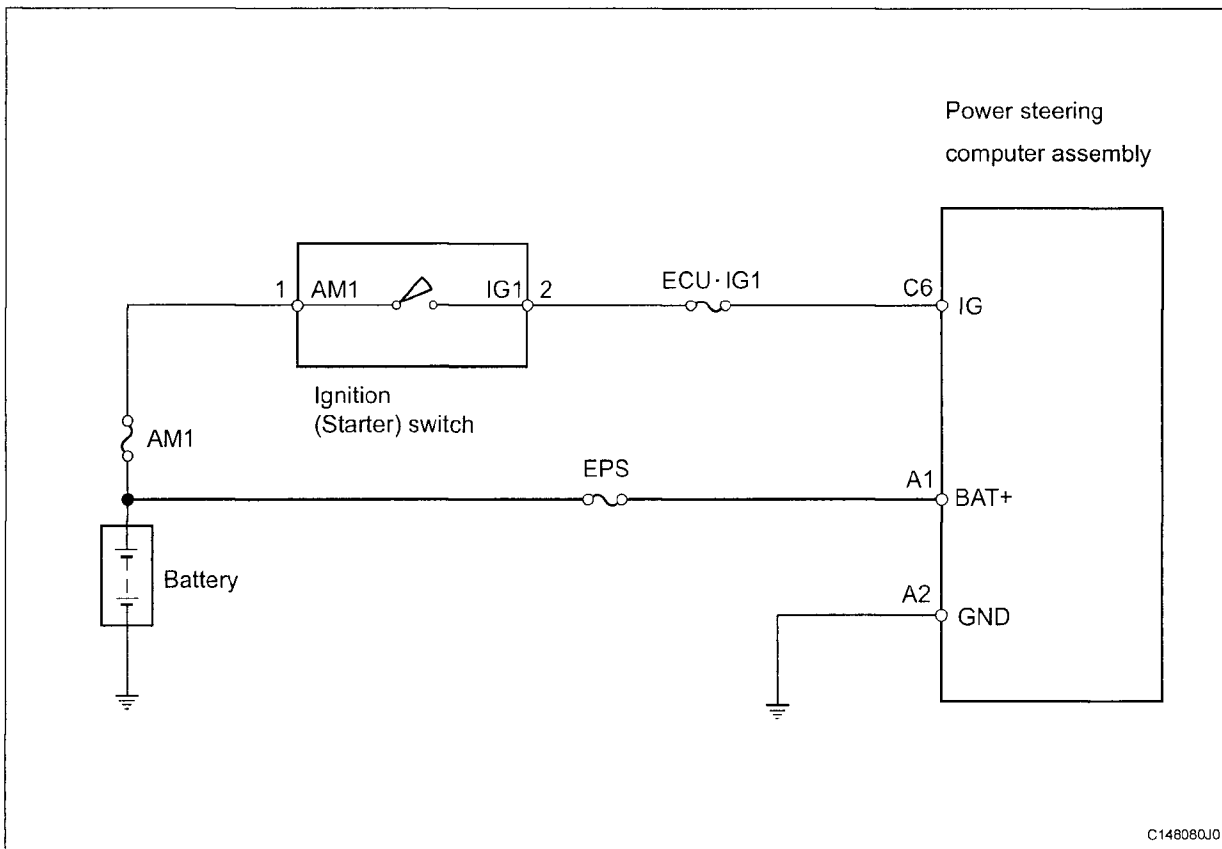
OK

TO EFI SYSTEM

POWER SYSTEM

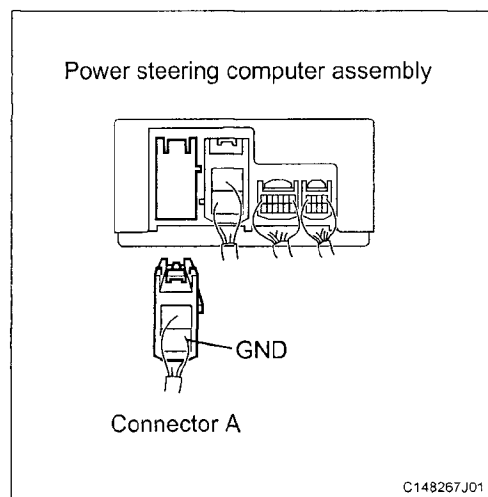
Circuit diagram

49



Check procedure

1 WIRE HARNESS AND CONNECTOR CHECK (GND)



- (1) Disconnect connector A of the power steering computer assembly.
- (2) Check the continuity between the body earth and terminal A2 (GND) of the vehicle-side connector of the power steering computer assembly using the tester.

Reference

Measuring terminal (terminal name)	Reference
A2 (GND) ↔ Body earth	With electrical continuity

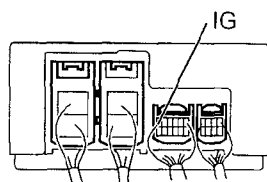
NG

REPAIR OR REPLACEMENT OF THE WIRE HARNESS OR THE CONNECTOR

OK

2 WIRE HARNESS AND CONNECTOR CHECK (IG)

Power steering computer assembly



C148239J02

- (1) Turn IG on.
- (2) Check the voltage between the body earth and terminal C6 (IG) of the connector at the power steering computer assembly side using the tester.

Specified value

Measuring terminal (terminal name)	Specified value
C6 (IG) ↔ Body earth	10 - 16 V

NG

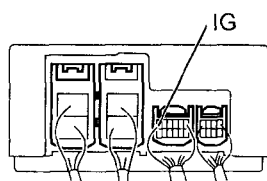
TO STEP 5

49

OK

3 WIRE HARNESS AND CONNECTOR CHECK (IG)

Power steering computer assembly



C148239J02

- (1) Start the engine.
- (2) Check the voltage between the body earth and terminal C6 (IG) of the connector at the power steering computer assembly side using the tester.

Specified value

Measuring terminal (terminal name)	Measuring condition	Specified value
C6 (IG) ↔ Body earth	Engine is in operation.	10 - 16 V

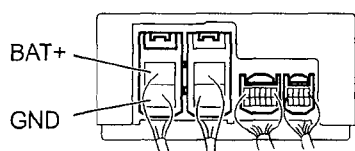
NG

ALTERNATOR CHECK AND REPLACEMENT

OK

4 WIRE HARNESS AND CONNECTOR CHECK (BAT+ - GND)

Power steering computer assembly



C148239J01

- (1) Start the engine.
- (2) Check the voltage between the terminals A1 (BAT+) and A2 (GND) of the connector at the power steering computer assembly side using the tester.

Specified value

Measuring terminal (terminal name)	Measuring condition	Specified value
A1 (BAT+) ↔ A2 (GND)	While engine is in operation and steering is turned	10 - 16 V

NG

TO STEP 7

OK

NORMAL RECOVERY (CHECKING OF OTHER PARTS)

5 POWER VOLTAGE CHECK

(1) Check the battery voltage by using the tester.

Specified value: 10 - 14 V

NG

BATTERY REPLACEMENT

OK

6 FUSE CHECK (ECU IG)

(1) Remove the ECU IG fuse from the fuse block assembly.

(2) Check the continuity of the ECU IG fuse using the tester.

Reference: With electrical continuity

NG

FUSE REPLACEMENT

OK

REPAIR OR REPLACEMENT OF THE WIRE HARNESS OR THE CONNECTOR

7 POWER VOLTAGE CHECK

(1) Check the battery voltage by using the tester.

Specified value: 10 - 14 V

NG

BATTERY REPLACEMENT

OK

8 FUSE CHECK (EPS)

(1) Remove the EPS fuse from the engine room relay block assembly.

(2) Check the continuity of the EPS fuse using the tester.

Reference: With electrical continuity

NG

FUSE REPLACEMENT

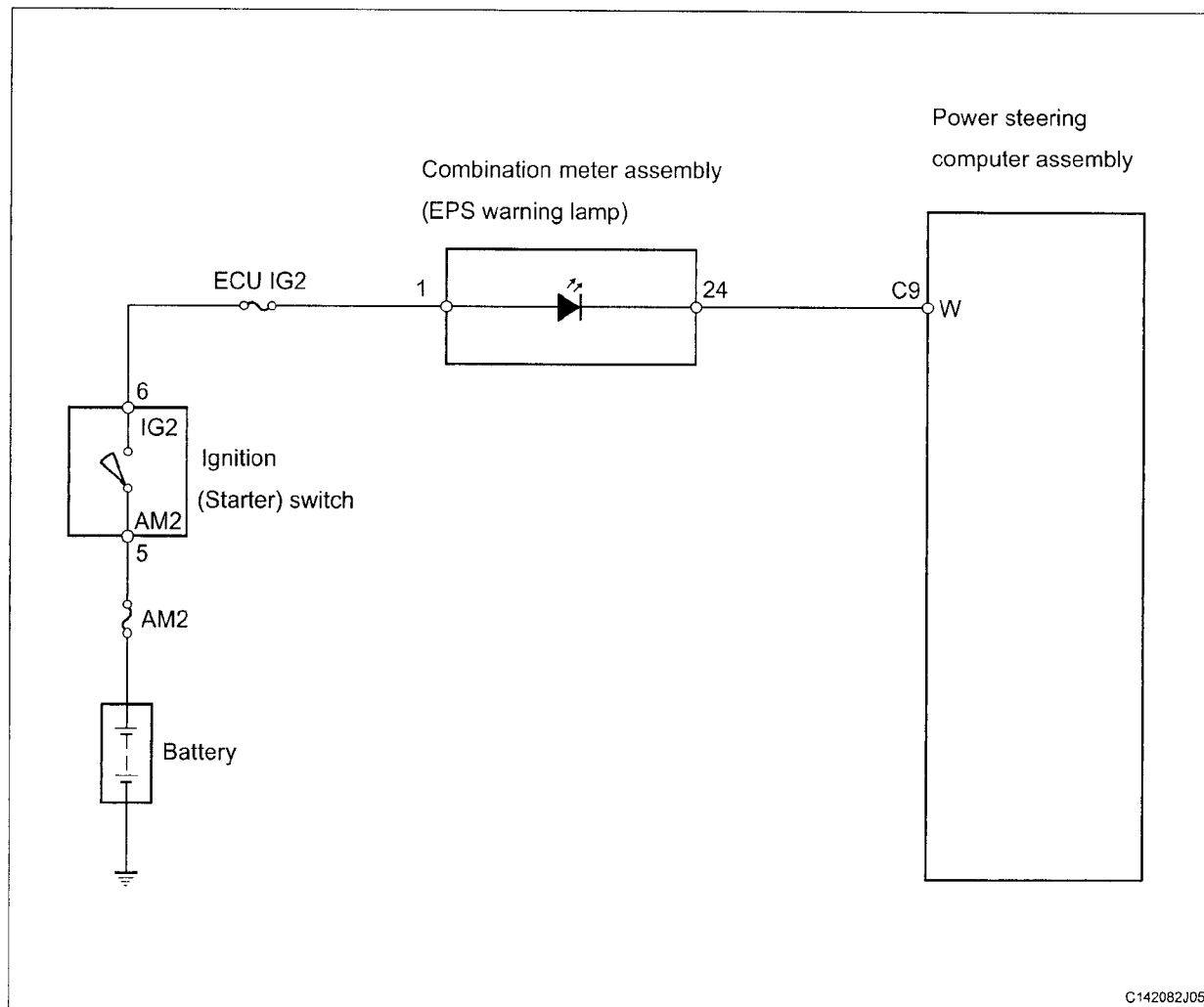
OK

REPAIR OR REPLACEMENT OF THE WIRE HARNESS OR THE CONNECTOR

49

EPS WARNING LAMP SYSTEM

Circuit diagram



49

Check procedure

1 EPS WARNING LAMP LIGHTING CHECK

- (1) Check that the EPS warning lamp lights up for about 2 seconds when the IG is turned on from off.

Reference: The EPS warning lamp lights up for about 2 seconds.

NG

TO STEP 7

OK

2 EPS WARNING LAMP TURNING-OFF CHECK

- (1) Check if the EPS warning lamp lights up for about 2 seconds and then goes off when the IG is turned on from off.

Reference: EPS warning lamp lit up for about 2 seconds, and then went off.

OK → NORMAL RETURN

NG

49

3 EPS WARNING LAMP LIGHTING CHECK

(1) With IG turned off, disconnect connector C of the power steering computer assembly.

(2) Turn IG on, and check if the EPS warning lamp lights up.

Reference: EPS warning lamp lights up.

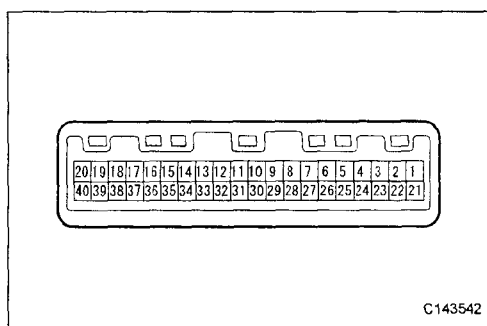
NG → TO STEP 6

OK

4 COMBINATION METER ASSEMBLY CHECK

(1) Check the voltage between the body earth and terminal 24 of the combination meter assembly connector using the tester.

Specified value



Measuring terminal (terminal name)	Measuring condition	Specified value
24 ↔ body earth	IG ON	9 - 14 V

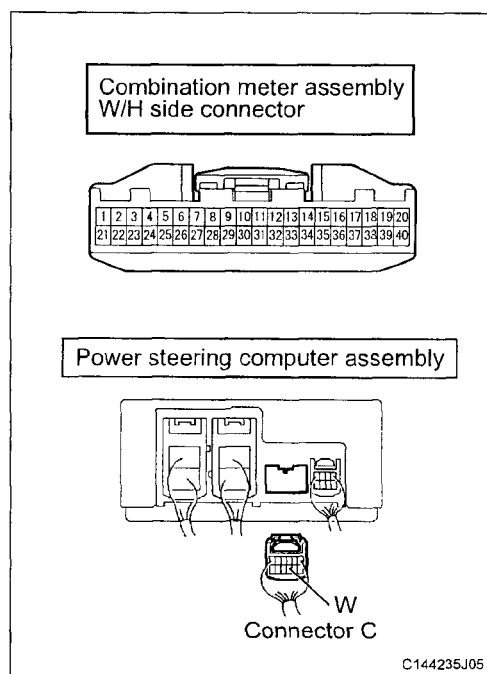
<CAUTION>

If the combination meter assembly is replaced, set CAN Communication Destination Information after the replacement (See page 63-13).

NG → COMBINATION METER ASSEMBLY REPLACEMENT

OK

5 WIRE HARNESS AND CONNECTOR CHECK (COMBINATION METER ASSEMBLY - POWER STEERING COMPUTER ASSEMBLY)



OK

- (1) Disconnect the combination meter assembly connector and the power steering computer assembly connector C.
- (2) Check the continuity and short-circuit between terminal 24 of the vehicle-side connector of the combination meter assembly and terminal C9 (W) of the vehicle-side connector of the power steering computer assembly using the tester.

Reference

Measuring terminal (terminal name) Combination meter assembly ↔ Power steering computer assembly	Reference
24 ↔ C9 (W)	There must be electrical continuity and no short circuit between other terminal and body earth.

<CAUTION>

If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

NG

REPAIR OR REPLACEMENT OF THE WIRE HARNESS
OR THE CONNECTOR

49

REPLACING POWER STEERING COMPUTER ASSEMBLY

6 DIAGNOSTIC TROUBLE CODE OUTPUT CHECK

- (1) Check if a diagnostic trouble code is output using DS-II.
Check result

Tester indication	Next step
Diagnostic trouble code is output.	NG
Diagnostic trouble code is not output.	OK

NG

TO DIAGNOSTIC TROUBLE CODE LIST (See page 49-4).

OK

REPLACING POWER STEERING COMPUTER ASSEMBLY

7 FUSE CHECK (ECU IG)

- (1) Check the continuity of the fuse (ECU IG).
Reference: With electrical continuity

NG → FUSE REPLACEMENT

OK

49

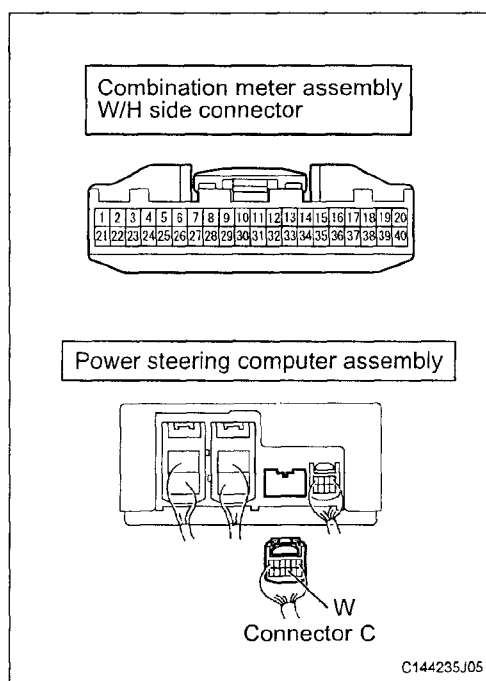
8 WARNING LAMP BULB CHECK

- (1) Check for a burn-out warning lamp bulb
Reference: Bulb is not burn out.

NG → WARNING LAMP BULB REPLACEMENT

OK

9 WIRE HARNESS AND CONNECTOR CHECK (COMBINATION METER ASSEMBLY - POWER STEERING COMPUTER ASSEMBLY)



- (1) Disconnect the combination meter assembly connector and the power steering computer assembly connector C.
(2) Check the continuity and short-circuit between terminal 24 of the vehicle-side connector of the combination meter assembly and terminal C9 (W) of the vehicle-side connector of the power steering computer assembly using the tester.

Reference

Measuring terminal (terminal name) Combination meter assembly ↔ Power steering computer assembly	Reference
24 ↔ C9 (W)	There must be electrical continuity and no short circuit between other terminal and body earth.

<CAUTION>

If the power steering computer assembly is replaced, perform a torque sensor zero-point correction after the replacement (See page 49-15).

NG → REPAIR OR REPLACEMENT OF THE WIRE HARNESS OR THE CONNECTOR

OK

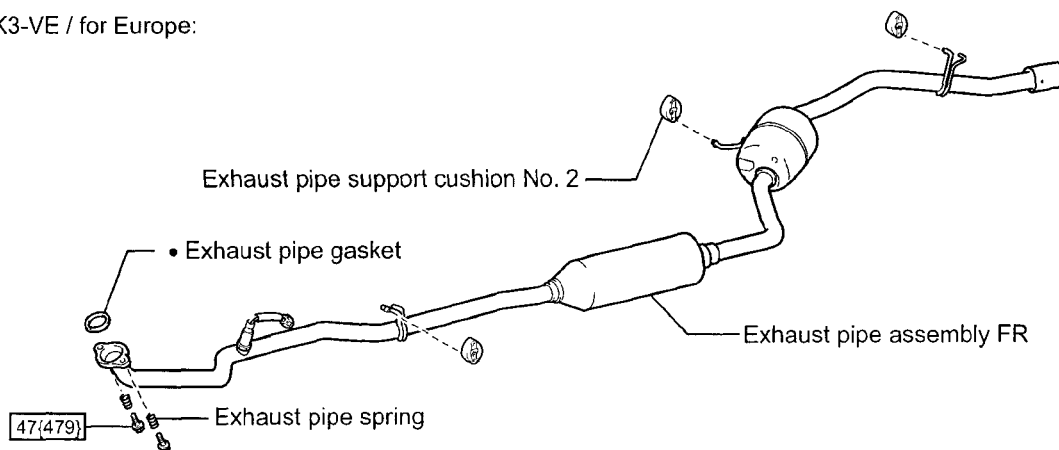
REPLACING POWER STEERING COMPUTER ASSEMBLY

STEERING GEAR ASSEMBLY (FF / RHD)

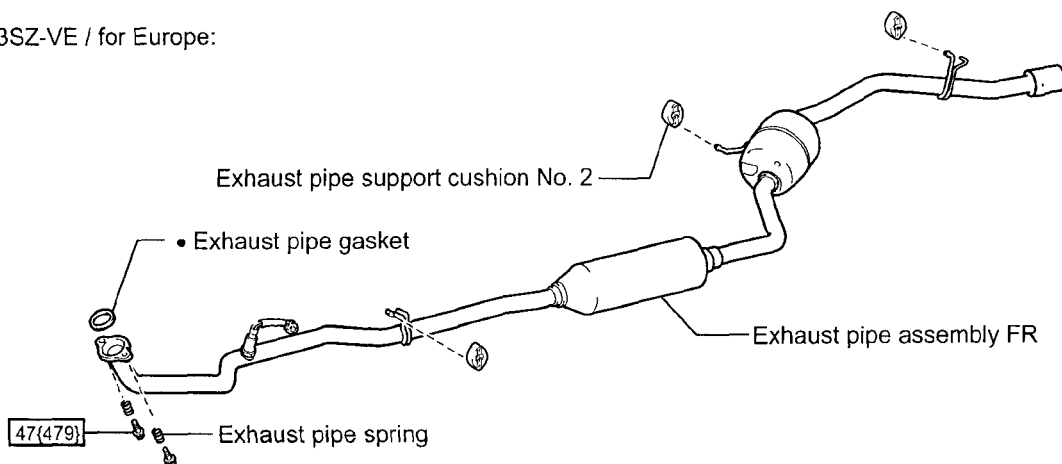
COMPONENTS

49

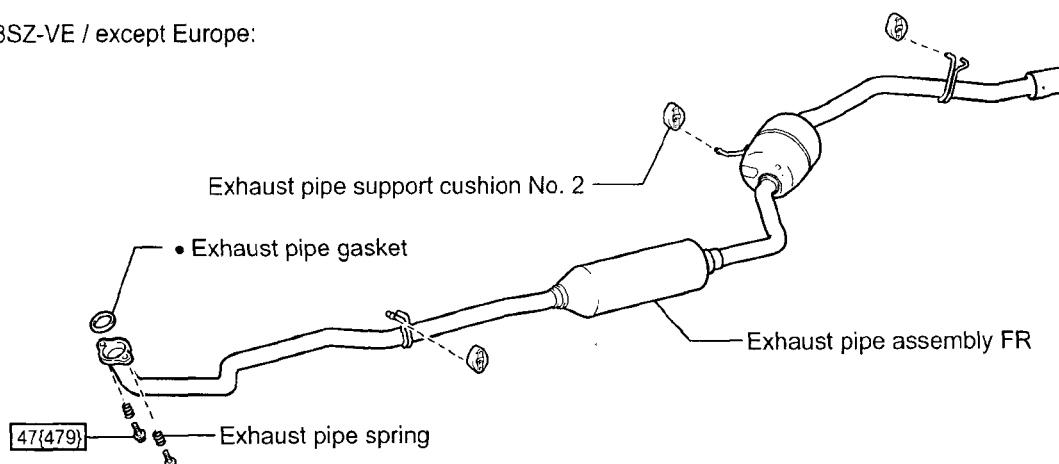
K3-VE / for Europe:



3SZ-VE / for Europe:



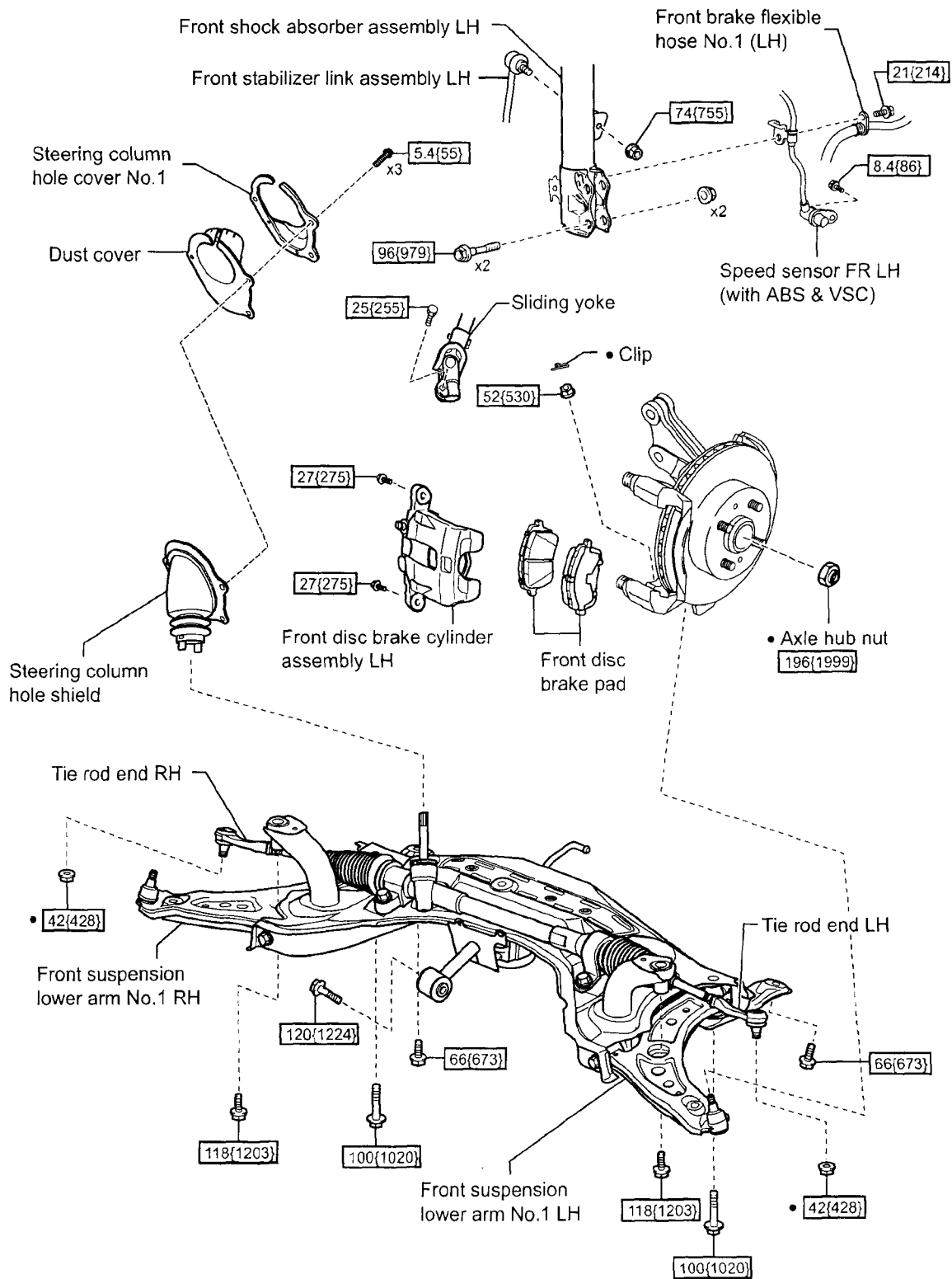
3SZ-VE / except Europe:



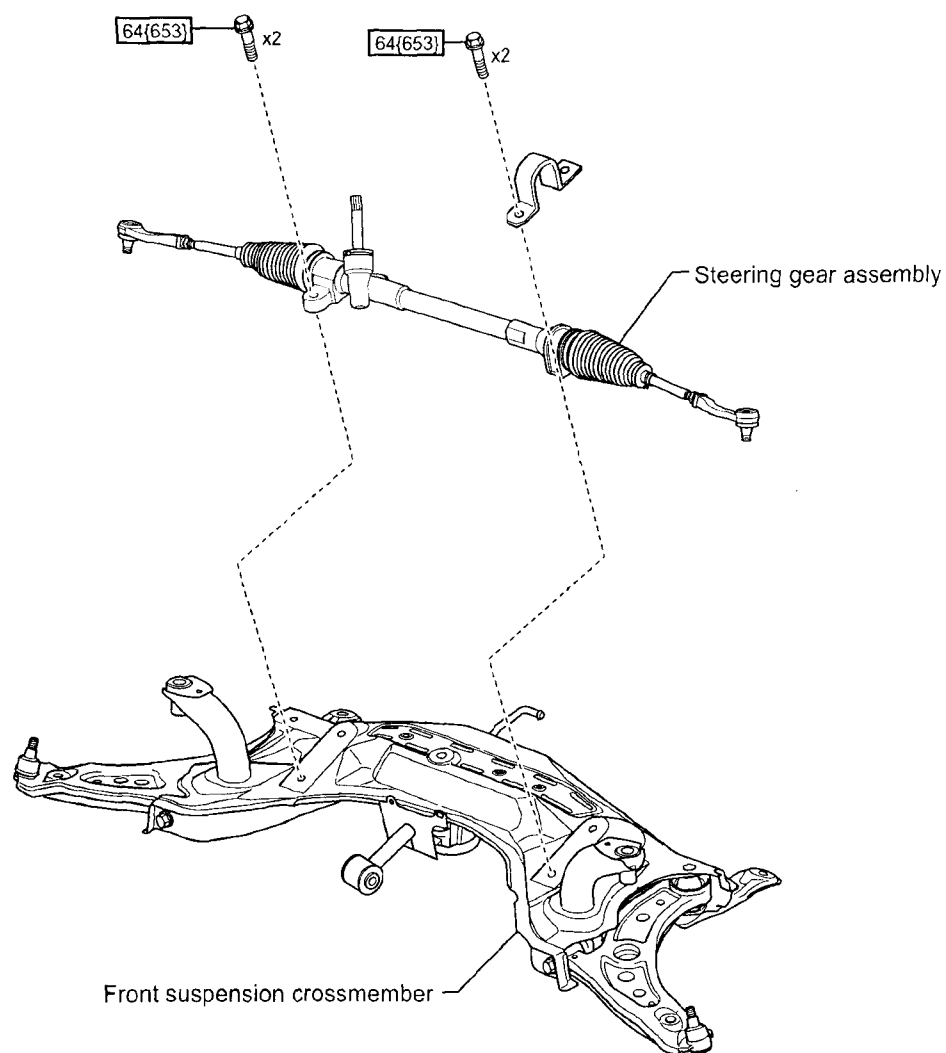
N*m {kgf*cm} : Specified torque • Non-reusable part

A159483J01

49

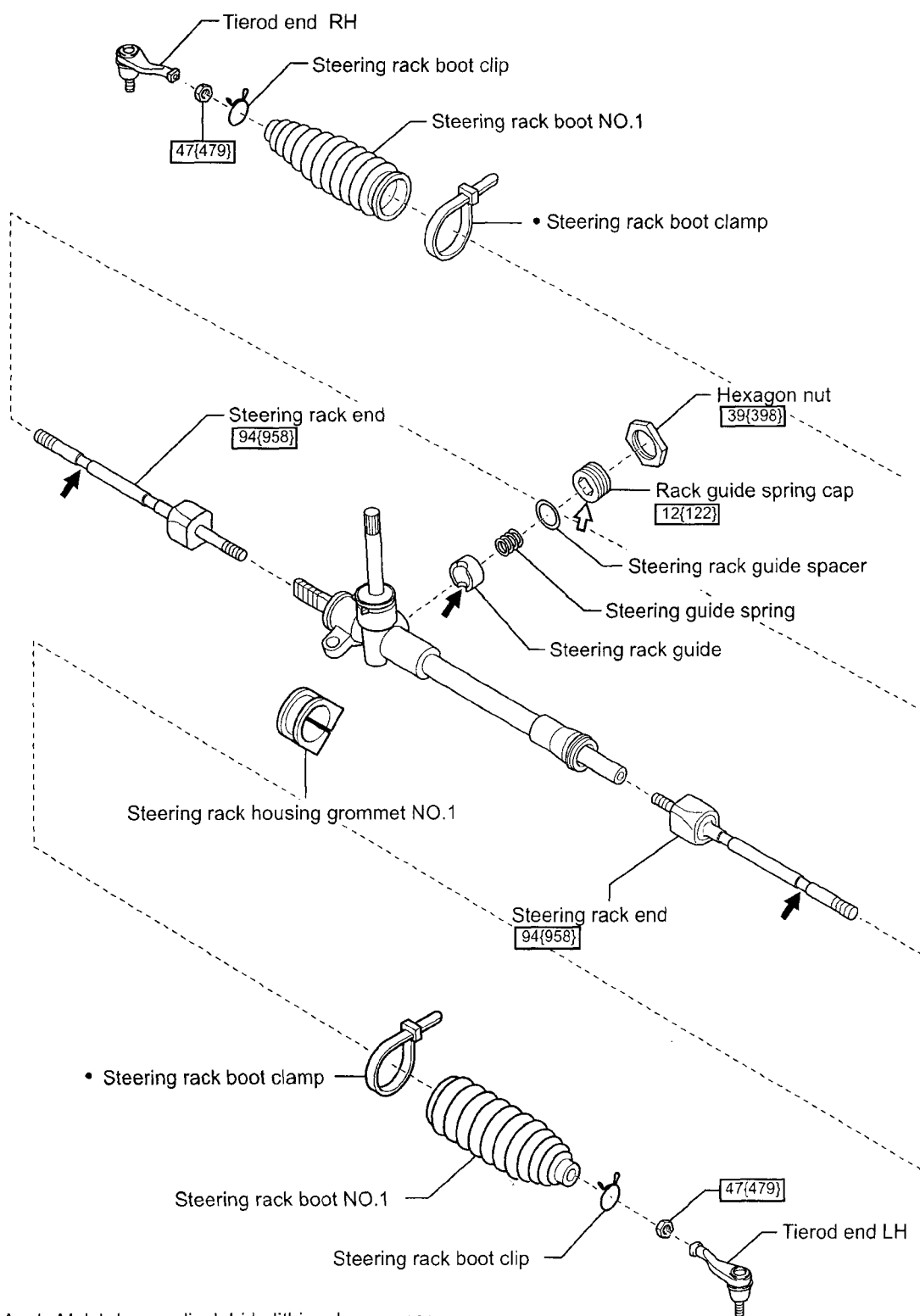


[N*m (kgf*cm)] : Specified torque • Non-reusable part



N*m (kgf*cm) : Specified torque

49



← Apply Molybdenum disulphide lithium base grease

↔ Apply EP grease

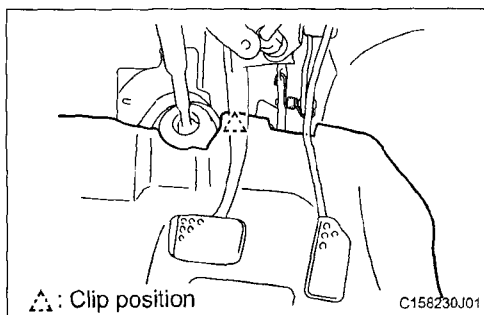
[N*m (kgf*cm)]: Specified torque

• Non-reusable part

C145824J02

REMOVAL

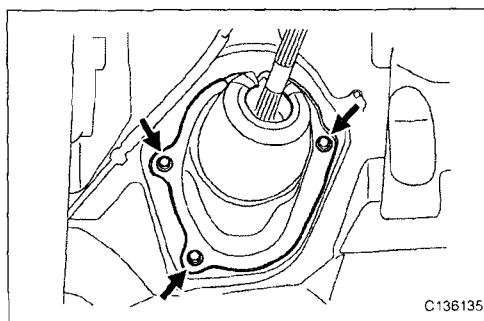
1. Front tire straight-ahead status
2. Battery Minus Terminal Disconnection



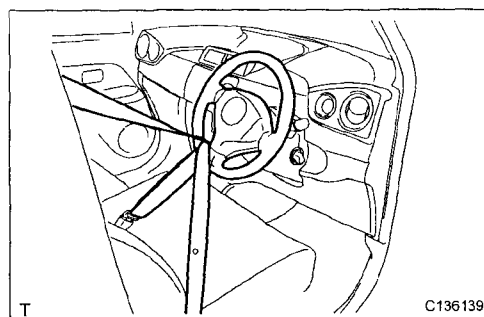
3. Steering column hole cover No. 1 removal
 - (1) Remove a clip, and turn out the floor carpet.

49

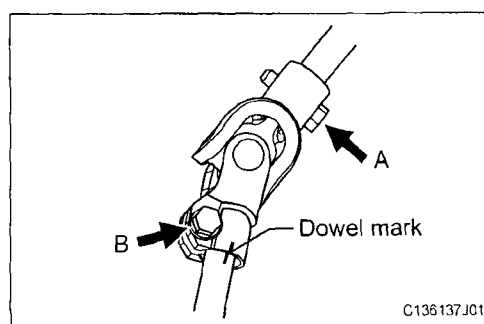
- (2) Remove 3 bolts, and remove the column hole cover No. 1.



4. Steering column assembly disconnection
 - (1) For the purpose of spiral cable breakage prevention, put a seat belt through the steering wheel assembly to fix the wheel to eliminate rotation.

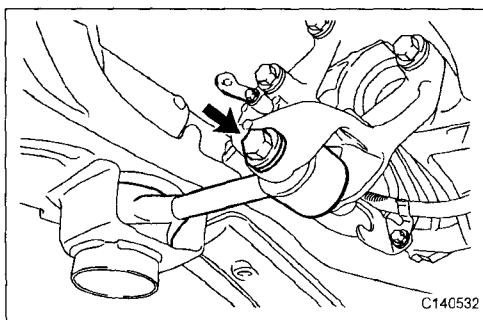


- (2) Put alignment marks on the steering gear assembly and the sliding yoke.
 - (3) Loosen bolt A, and remove bolt B to disconnect the steering column assembly.



5. Shift lever knob removal (for Manual transaxle) (See page 29-54)
6. Rear console box removal (for Manual transaxle) (See page 29-54)
7. Console box carpet removal (for Manual transaxle) (See page 29-54)
8. Console box assembly removal (for Manual transaxle) (See page 29-54)
9. Transmission floor shift assembly removal (for Manual transaxle) (See page 29-55)
10. Front tire removal
11. Exhaust pipe assembly FR removal (See page 11-15)

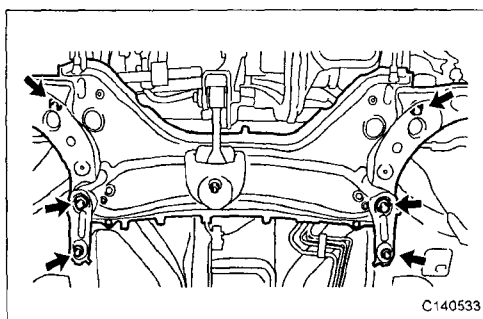
12. Front brake flexible hose No. 1 (LH) disconnection (without ABS & VSC) (See page 36-7)
13. Front brake flexible hose No. 1 (RH side) disconnection (without ABS & VSC)
<HINT>
Disconnect as LH side.
14. Speed sensor FR LH disconnection (with ABS & VSC) (See page 36-7)
15. Speed sensor FR RH disconnection (with ABS & VSC)
<HINT>
Disconnect as LH side.
16. Front disc brake cylinder assembly LH removal (See page 36-8)
17. Front disc brake cylinder assembly RH removal
<HINT>
Remove it using the same procedure as the LH side.
18. Axle hub nut removal (LH) (See page 36-8)
19. Axle hub nut removal (RH)
<HINT>
Remove it using the same procedure as the LH side.
20. Engine undercover LH removal (See page 07-52)
21. Engine undercover RH removal
<HINT>
Remove it using the same procedure as the LH side.
22. Front stabilizer link assembly LH disconnection (See page 36-8)
23. Front stabilizer link assembly RH disconnection
<HINT>
Disconnect as LH side.
24. Front stabilizer bar removal (See page 42-16)
25. Front suspension cross member LH removal (See page 07-53)
26. Front suspension cross member RH removal
<HINT>
Remove it using the same procedure as the LH side.
27. Tie rod end LH disconnection (See page 36-8)
28. Tie rod end RH disconnection
<HINT>
Disconnect as LH side.
29. Front suspension lower arm No. 1 LH disconnection (See page 38-5)
30. Front suspension lower arm No. 1 RH disconnection
<HINT>
Disconnect as LH side.
31. Steering knuckle LH disconnection (See page 36-9)
32. Steering knuckle RH disconnection
<HINT>
Disconnect as LH side.
33. Front shock absorber assembly LH disconnection (See page 36-9)
34. Front shock absorber assembly RH disconnection
<HINT>
Disconnect as LH side.
35. Transmission control cable assembly removal (automatic transaxle vehicle) (See page 26-138)



36. Front suspension cross member removal

- (1) Remove the bolt, and disconnect the engine moving control rod at the engine side.
- (2) Support the front suspension cross member with a mission jack or something.

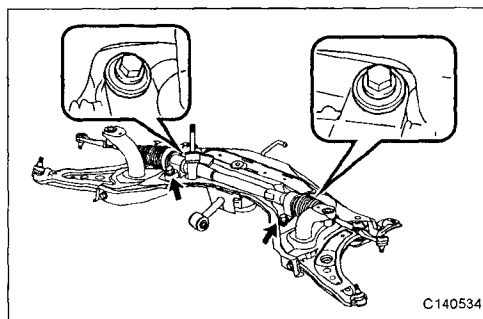
49



- (3) Remove 6 bolts and remove the suspension cross member.

37. Steering column hole shield removal

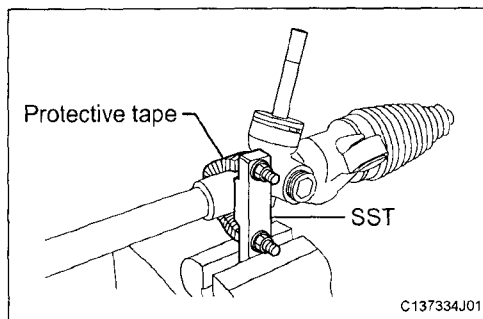
- (1) Remove the steering column hole shield from the steering gear assembly.



38. Steering gear assembly removal

- (1) Remove 4 bolts and remove the steering gear assembly from the suspension cross member.

DISASSEMBLY



1. Fixing steering gear assembly in place

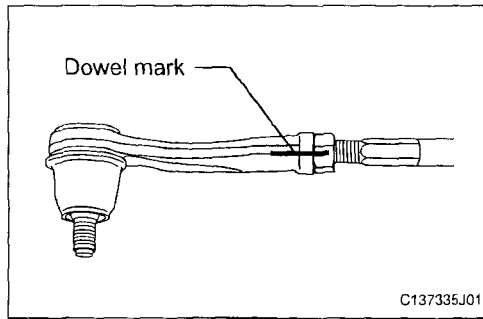
- (1) Use SST around which protective tape is wound to fix the steering assembly in a vice.

<HINT>

Attach or remove SST as necessary.

SST 09612-00012

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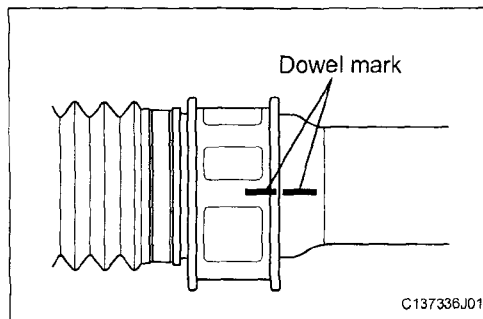
2. Tie rod end LH removal

- (1) Put alignment marks on the tie rod end LH and on the rack end.
- (2) Remove the tie rod end LH and the lock nut.

3. Tie rod end RH removal

<HINT>

Remove it using the same procedure as the LH side.



4. Steering rack housing grommet No. 1 removal

- (1) Put an alignment mark on the steering rack housing.
- (2) Remove the steering rack housing grommet No. 1.

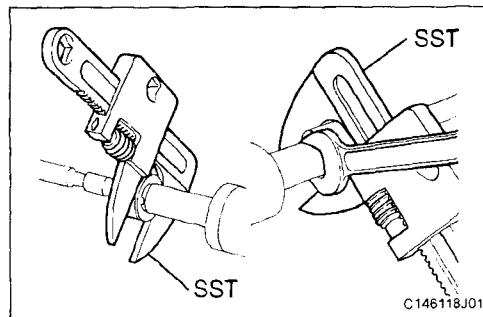
5. Steering rack boot No. 1 (LH) removal

- (1) Remove the steering rack boot clip and the steering rack boot clump and remove the steering rack boot No. 1.

6. Steering rack boot No. 1 (RH) removal

<HINT>

Remove it using the same procedure as the LH side.



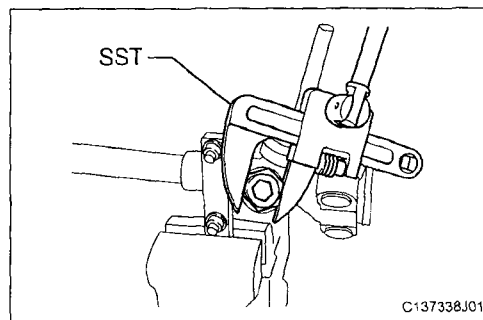
7. Steering rack end removal

- (1) Use SST and spanner wrench to remove left and right rack ends.

SST 09922-10010

<CAUTION>

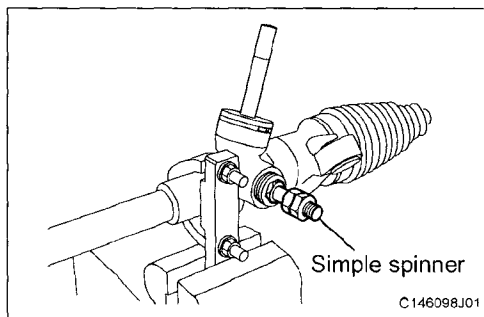
- > Do not confuse the rotating direction of SST.
- > Hold the steering rack with SST securely.



8. Steering rack guide removal

- (1) Use SST to remove the hexagon nut.

SST 09922-10010



- (2) Use a simple spinner to remove the steering rack guide spring cap from the steering rack housing.

<HINT>

Simple spinner Two nuts of double-face width 17 mm are attached to the bolt and tighten each other so that they are fixed to the bolt.

- (3) Remove the steering rack guide spring and the steering guide spacer from the steering rack housing.
 (4) Remove the steering rack guide from the steering rack housing.

49

INSPECTION

1. Tie rod end LH check

- (1) Hold the tie rod end LH at the ball joint portion in the vice through aluminum plates.

<CAUTION>

Do not vise it too tightly.

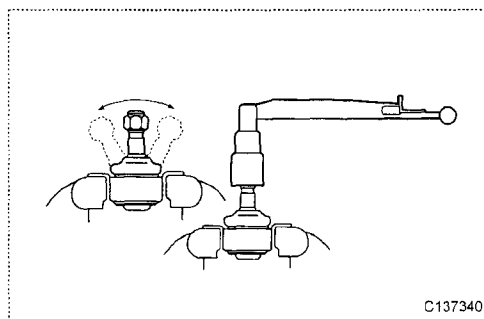
- (2) Check if the tie rod end LH boot is not broken, and the ball joint operates smoothly.

<HINT>

If any abnormality is observed, replace it with a new tie rod end assembly LH.

- (3) Attach a nut to the stud bolt.

- (4) Rotate the ball joint back-and-forth 5 times or more.



- (5) Put a torque wrench on the nut, and rotate the ball joint continuously at a speed of 1 rotation/second to check if there is any problem such as a backlash.

Reference: Rotates smoothly without splash etc.

<HINT>

If applicable criteria are not satisfied, replace the tie rod end assembly with a new one.

2. Tie rod end RH check

<HINT>

Perform the same procedure as that of LH

3. Steering rack housing grommet No. 1 check

- (1) Check if the steering rack housing grommet No. 1 has cracking or damage.

<HINT>

If any abnormality is observed, replace it with a new grommet.

4. Steering rack boot No. 1 check

- (1) Check if the steering rack boot No. 1 has cracking, damage or aging.

<HINT>

If any abnormality is observed, replace it with a new boot.

5. Steering rack end check

- (1) Check the following items:

- (a) Backlash and malfunction of steering rack end ball
- (b) Foreign particle attached to the steering rack end, and discoloration of grease
- (c) Bend and cracking at the tie rod end of the steering rack end

<HINT>

If any abnormality is observed, replace it with a new rack end.

6. Steering rack guide check

- (1) Check if the sliding surface of the steering rack guide has abnormal wear.

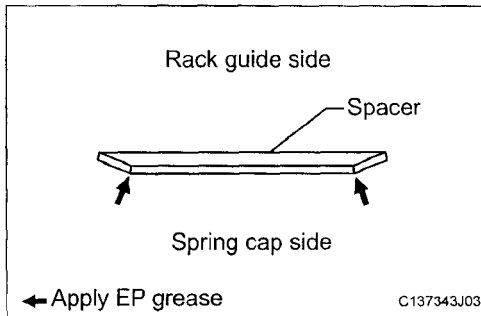
<HINT>

If any abnormality is observed, replace it with a new rack guide.

REASSEMBLY

1. Steering rack guide installation

- (1) Apply Molybdenum disulphide lithium base grease to the contact surface of steering rack and rack housing.
- (2) Attach the steering rack guide to the rack housing.

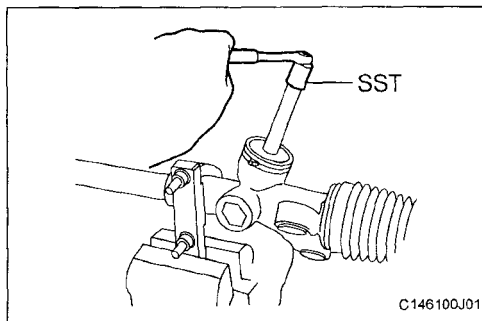


2. Steering rack guide spacer installation

- (1) Attach the steering rack guide spacer to the rack housing so that the spacer is positioned in the direction shown in the diagram.
- (2) Apply EP grease to the surface contacting the steering rack guide spring cap.
- (3) Attach the steering rack guide spring to the rack housing, and temporarily tighten the steering rack guide spring cap.

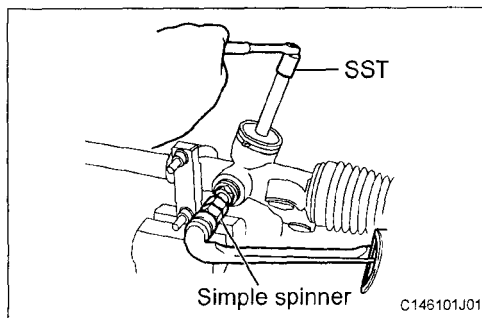
3. General preload adjustment

- (1) Use a simple spinner to tighten the steering rack guide spring cap with a specified torque.
Specified value: $T=12\text{N}\cdot\text{m}$ {122kgf*cm}
- (2) Use a simple spinner to loosen the steering rack guide spring cap approx. 45°.
- (3) Temporarily attach the steering rack end to the steering rack.



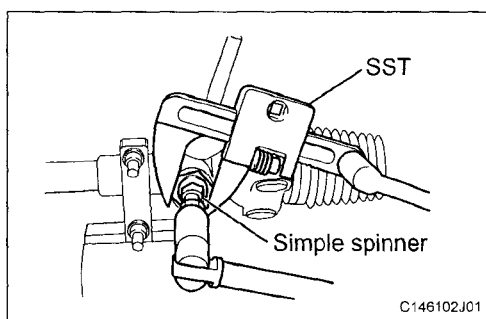
- (4) Use SST to move the steering rack back-and-forth fully once or twice for smoothen operation.
SST 09616-87701

- (5) Use a simple spinner to loosen the steering rack guide spring cap until the rack guide spring becomes no longer effective.



- (6) Tighten the steering rack guide spring cap little by little using SST so that the preload during rotation becomes a base value when the steering pinion is rotated.
SST 09616-87701
Specified value: $T=0.78-1.28\text{N}\cdot\text{m}$ {8-13kgf*cm}
(During rotation)

- (7) Clean the thread of the hexagon nut.



- (8) Use SST and simple spinner to attach a hexagon nut.

Specified value: $T=39\text{N}\cdot\text{m}$ {398kgf*cm}

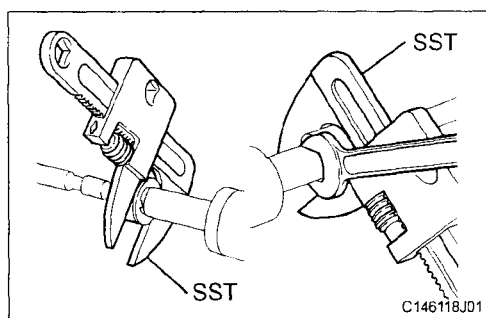
<HINT>

If you use a torque wrench with an SST or tool to tighten it with extended overall length, calculate the torque wrench reading with the specified calculation formula. (See page 01-5)

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4. Steering rack end installation

- (1) Temporarily attach right and left steering rack ends.



- (2) Use SST and spanner wrench to tighten right and left steering rack ends.

SST 09922-10010

Specified value: $T=94\text{N}\cdot\text{m}$ {958kgf*cm}

<CAUTION>

> Do not confuse the rotating direction of SST.

> Hold the steering rack with SST securely.

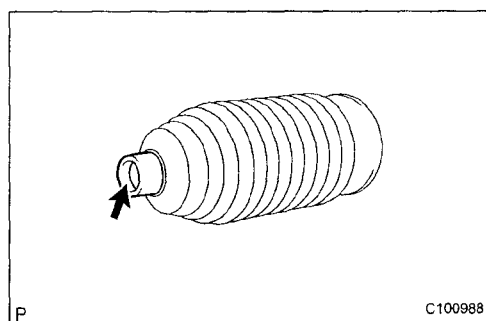
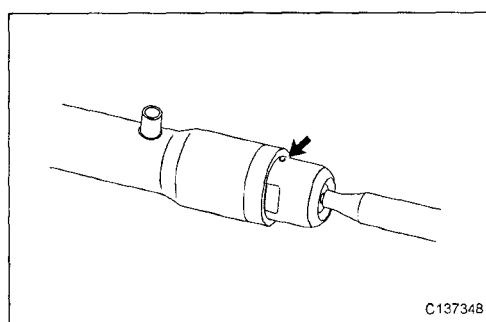
<HINT>

If you use a torque wrench with an SST or tool to tighten it with extended overall length, calculate the torque wrench reading with the specified calculation formula. (See page 01-5)

- (3) Insert a wire with a length of 50 mm and an outer diameter of 2 mm into the ventilation hole of the rack end to check if it is not clogged.

<HINT>

The ventilation hole serves to equalize the air pressures inside the right and left rack boots. If it is clogged, the rack boot may be deformed or broken due to a change in the air pressure inside the rack boot when the steering wheel is rotated.



5. Steering rack boot No. 1 installation (LH)

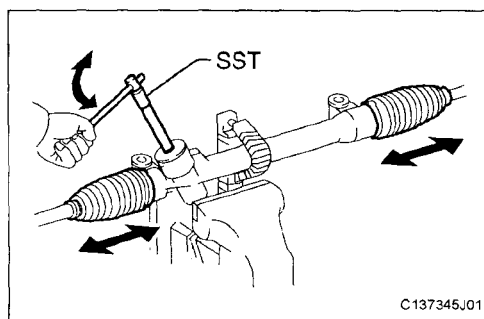
- (1) Apply Molybdenum disulphide lithium base grease to the surface inside the smaller end of the rack boot No. 1.
- (2) Insert a boot clump over the rack end, and attach the rack boot No. 1 to the slot of the rack housing.
- (3) Attach a steering rack boot clip and a new clump.

6. Steering rack boot No. 1 installation (RH)

<HINT>

Attach it using the same procedure as the LH side.

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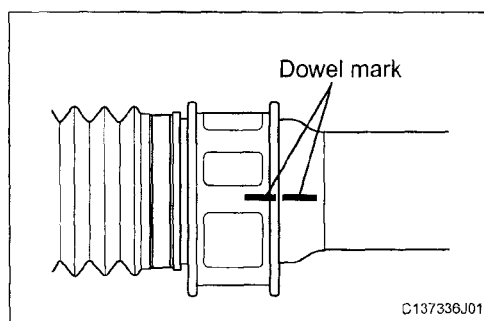
7. Steering gear check

- (1) Use SST to rotate the pinion shaft to make sure that the right and left rack boots extend and contract smoothly.

SST 09616-87701

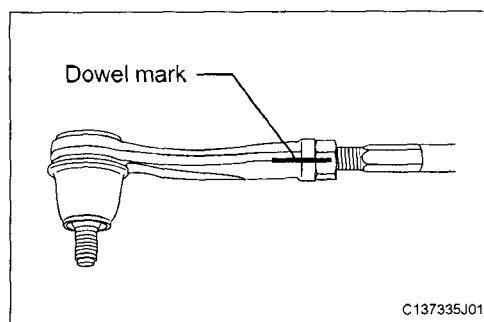
<HINT>

If the rack boot does not extend or contract smoothly, attach the rack boot again using a new rack boot clump.



8. Steering rack housing grommet No. 1 installation

- (1) Aligning the alignment marks, attach the steering rack housing grommet No. 1 to the rack housing.



9. Attaching tie rod end LH

- (1) Attach the lock nut and the tie rod end LH to the position of the alignment mark, temporarily tighten the lock nut.

<HINT>

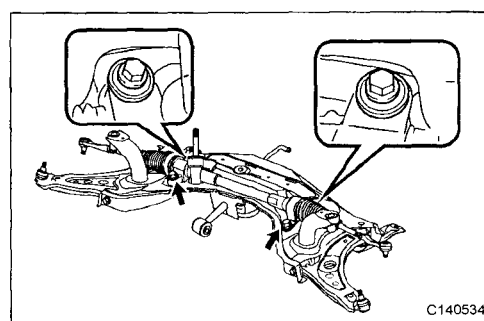
- > Fully tighten the lock nut after toe-in adjustment.
- > After toe-in adjustment, the tie rod end should be positioned almost at the middle of the allowed joint rotation angle.

10. Attaching tie rod end RH

<HINT>

Attach it using the same procedure as the LH side.

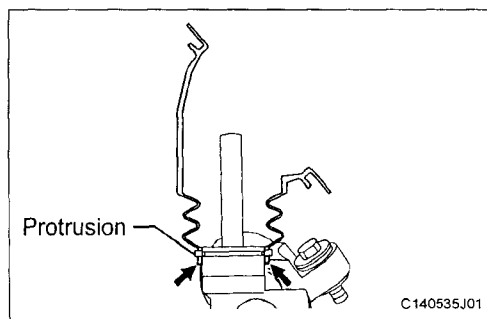
INSTALLATION



1. Steering gear assembly installation

- (1) Use 4 bolts to attach the steering gear assembly to the front suspension cross member.

Specified value: $T=64\text{N}\cdot\text{m}$ {653kgf*cm}



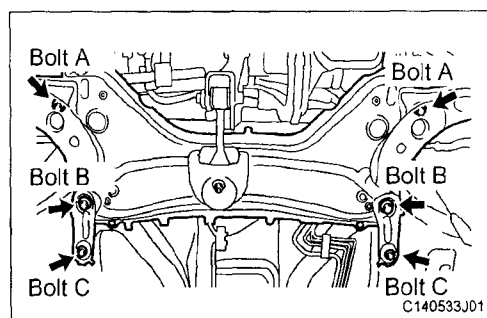
2. Steering column hole shield installation

- (1) Aligning the steering column hole shield with the protrusion on the steering gear assembly, attach the hole shield to the steering gear assembly.

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3. Front suspension cross member installation

- (1) Support the front suspension cross member with a mission jack.



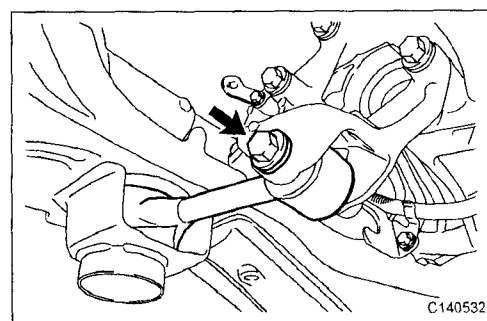
- (2) Use 6 bolts to attach the front suspension cross member to the vehicle temporarily.

- (3) Adjusting the position, tighten the RH and LH side bolts A, B, and C with the specified torque by tightening each bolt in small steps.

Specified value: $T=118\text{N}\cdot\text{m}$ {1203kgf*cm} (Bolt A)

$T=100\text{N}\cdot\text{m}$ {1020kgf*cm} (Bolt B)

$T=66\text{N}\cdot\text{m}$ {673kgf*cm} (Bolt C)



- (4) Connect the engine moving control rod with a bolt.
Specified value: $T=120\text{N}\cdot\text{m}$ {1224kgf*cm}

4. Transmission control cable assembly installation (for Automatic transaxle) (See page 26-140)

5. Steering knuckle LH installation (See page 38-8)

6. Steering knuckle RH installation

<HINT>

Attach it using the same procedure as the LH side.

7. Front shock absorber assembly LH installation (See page 36-16)

8. Front shock absorber assembly RH installation

<HINT>

Attach it using the same procedure as the LH side.

9. Axle hub nut installation (LH) (See 38-16)

10. Front shock absorber assembly RH installation

<HINT>

Attach it using the same procedure as the LH side.

11. Tie rod end LH installation (See page 36-16)

12. Tie rod end RH installation

<HINT>

Attach it using the same procedure as the LH side.

13. Front suspension cross member LH installation (See page 07-84)

14. Front suspension cross member RH installation

<HINT>

Attach it using the same procedure as the LH side.

15. Front stabilizer bar installation (See page 42-16)

16. Front stabilizer link assembly LH installation (See page 36-17)

17. Front stabilizer link assembly RH installation

<HINT>

Attach it using the same procedure as the LH side.

18. Front disc brake cylinder assembly LH installation (See page 36-16)

19. Front disc brake cylinder assembly RH installation

<HINT>

Attach it using the same procedure as the LH side.

20. Speed sensor FR LH installation (with ABS & VSC) (See page 36-17)

21. Speed sensor FR RH installation (with ABS & VSC)

<HINT>

Attach it using the same procedure as the LH side.

22. Front brake flexible hose No. 1 (LH) installation (without ABS & VSC) (See page 36-18)

23. Front brake flexible hose No. 1 (RH) installation (without ABS & VSC)

<HINT>

Attach it using the same procedure as the LH side.

24. Engine undercover LH installation (See page 07-85)

25. Engine undercover RH installation

<HINT>

Attach it using the same procedure as the LH side.

26. Exhaust pipe assembly FR installation (See page 11-16)

27. Front tire installation

Specified value: $T=103N \cdot m$ {1050kgf $\cdot$ cm}

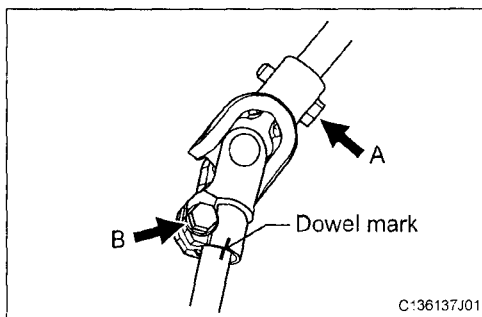
28. Transmission floor shift assembly installation (for Manual transaxle) (See page 29-55)

29. Console box assembly installation (for Manual transaxle) (See page 29-56)

30. Console box carpet installation (for Manual transaxle) (See page 29-56)

31. Rear console box installation (for Manual transaxle) (See page 29-57)

32. Shift lever knob installation (for Manual transaxle) (See page 29-57)



33. Steering column assembly connection

(1) Align the alignment marks and attach the sliding yoke and the steering gear assembly.

(2) Fully tighten the bolt B, and then the bolt A.

Specified value: $T=25N \cdot m$ {255kgf $\cdot$ cm}

<CAUTION>

> Make sure that there is no grease on the steering gear assembly pinion shaft serration part.

> Insert the steering column joint until the pinion shaft serration enters completely (as far as it will go).

34. Steering column hole cover No.1 installation (See page 48-10)

35. Battery minus terminal connection

Specified value: $T=6.4N \cdot m$ {65kgf $\cdot$ cm}

36. Exhaust gas leakage check

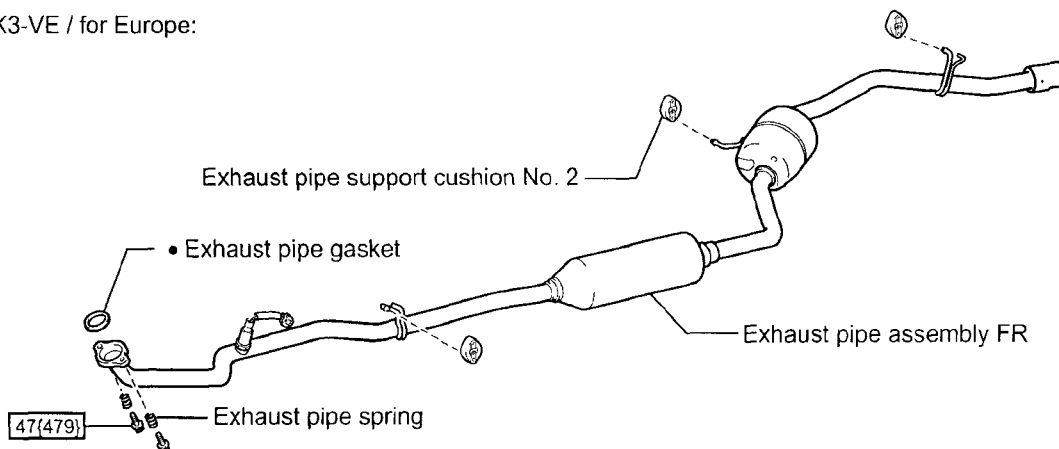
- 37. Front tire straight-ahead status
- 38. Front wheel alignment check/adjustment
(See page 42-5)
- 39. Test mode check (Speed sensor circuit)
 - with ABS: (See page 44-15)
 - with VSC: (See page 44-76)

STEERING GEAR ASSEMBLY (FF / LHD)

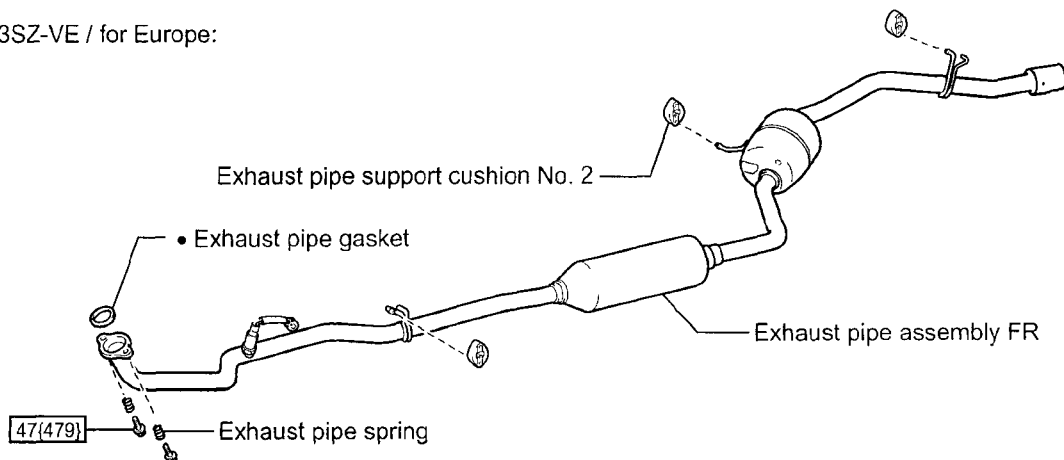
COMPONENTS

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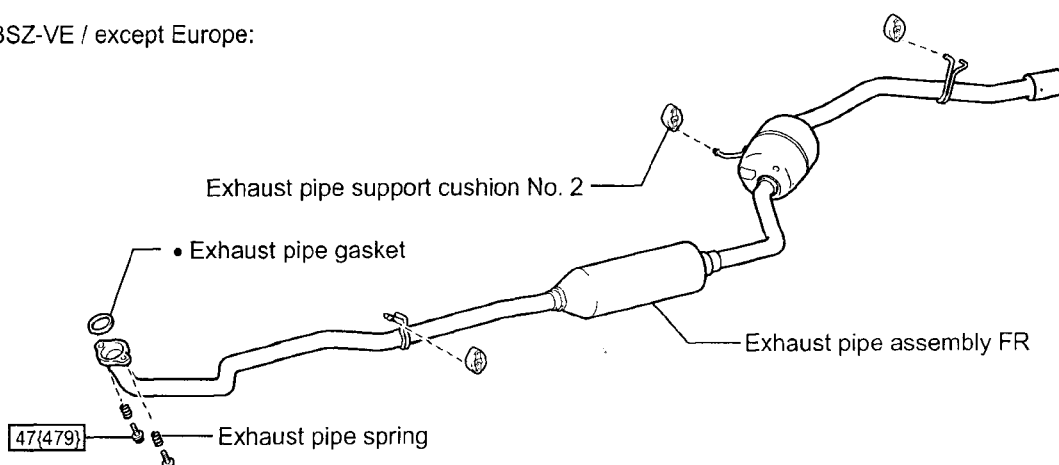
K3-VE / for Europe:



3SZ-VE / for Europe:



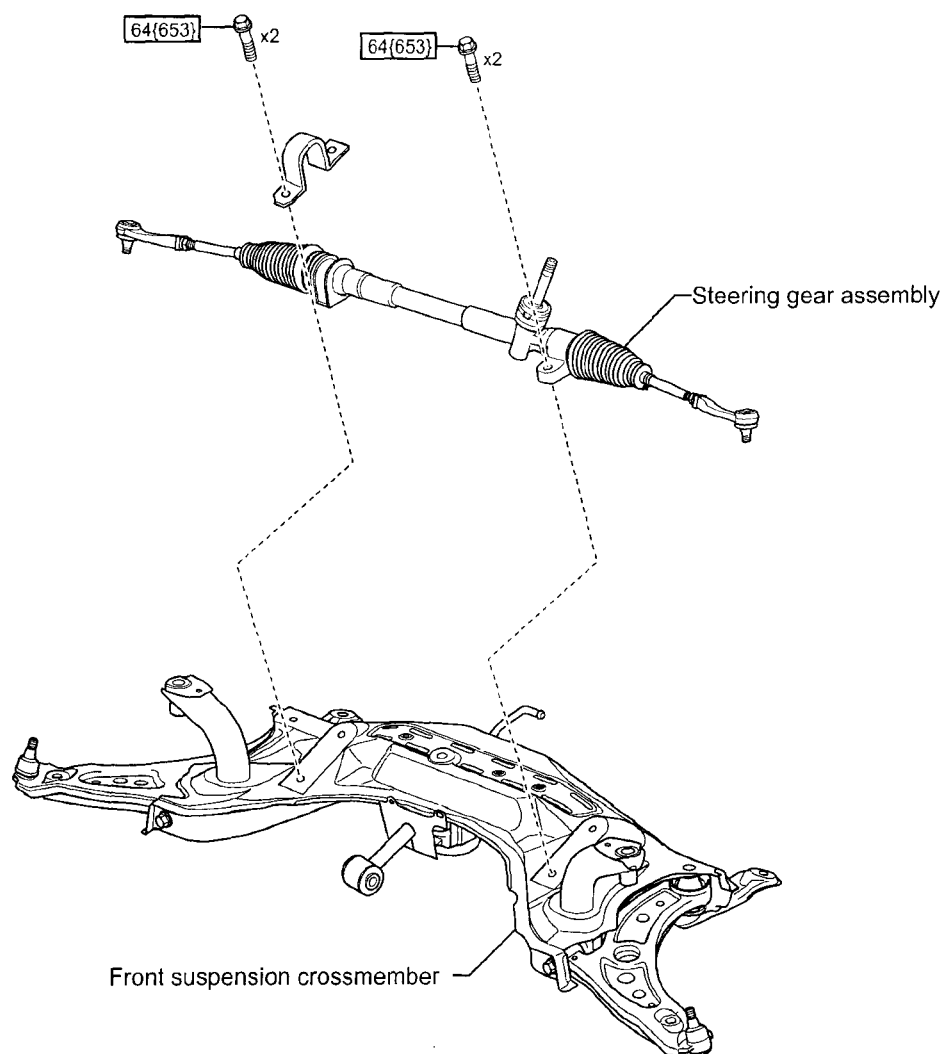
3SZ-VE / except Europe:



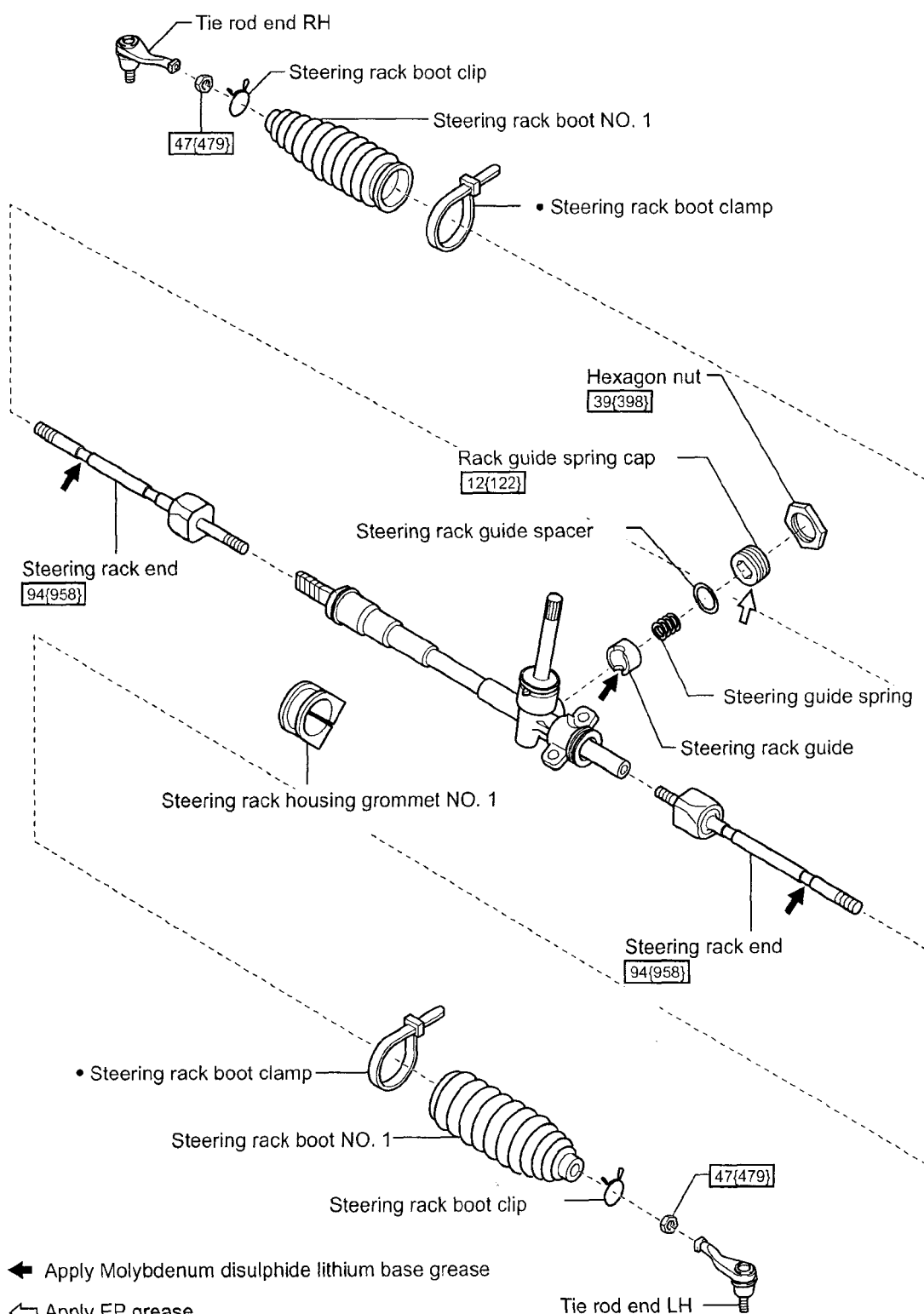
N*m {kgf*cm} : Specified torque

• Non-reusable part

A159483J01



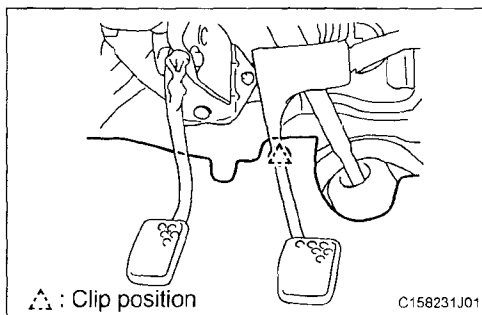
N*m (kgf*cm) : Specified torque



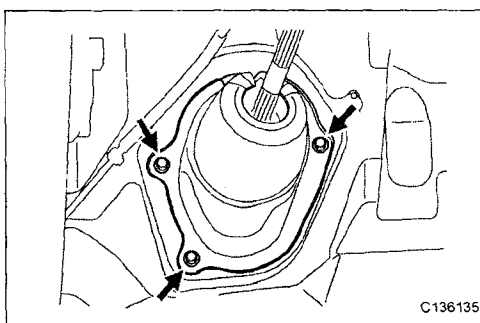
REMOVAL

1. Front tire straight-ahead status
2. Battery minus terminal disconnection

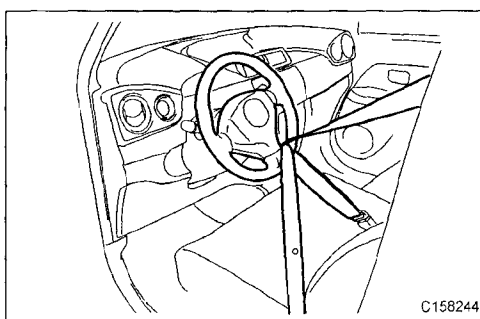
49



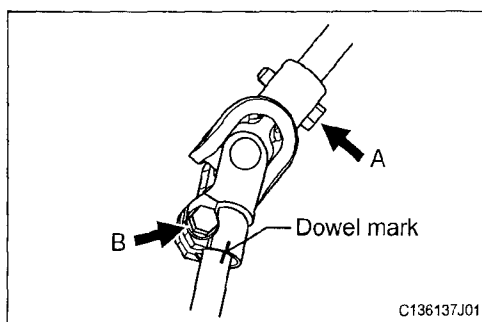
3. Steering column hole cover No. 1 removal
 - (1) Remove a clip, and turn out the floor carpet.



- (2) Remove 3 bolts, and remove the column hole cover No. 1.



4. Steering column assembly disconnection
 - (1) For the purpose of spiral cable breakage prevention, put a seat belt through the steering wheel assembly to fix the wheel to eliminate rotation.

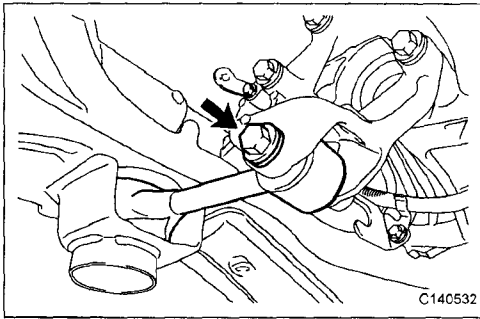


- (2) Put alignment marks on the steering gear assembly and the sliding yoke.
 - (3) Loosen bolt A, and remove bolt B to disconnect the steering column assembly.

5. Shift lever knob removal (for Manual transaxle) (See page 29-54)
6. Rear console box removal (for Manual transaxle) (See page 29-54)
7. Console box carpet removal (for Manual transaxle) (See page 29-54)
8. Console box assembly removal (for Manual transaxle) (See page 29-54)
9. Transmission floor shift assembly removal (for Manual transaxle) (See page 29-55)
10. Front tire removal
11. Exhaust pipe assembly FR removal (See page 11-15)

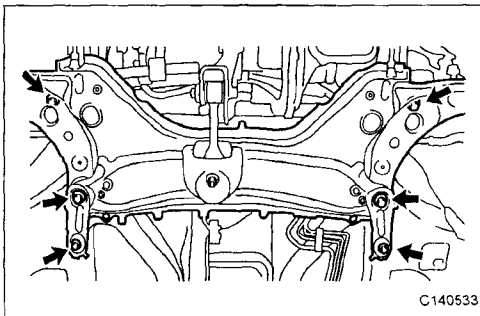
12. Front brake flexible hose No. 1 (LH) disconnection (without ABS & VSC) (See page 36-7)
13. Front brake flexible hose No. 1 (RH) disconnection (without ABS & VSC)
<HINT>
Disconnect as LH side.
14. Speed sensor FR LH disconnection (with ABS & VSC) (See page 36-7)
15. Speed sensor FR RH disconnection (with ABS & VSC)
<HINT>
Disconnect as LH side.
16. Front disc brake cylinder assembly LH removal (See page 36-8)
17. Front disc brake cylinder assembly RH removal
<HINT>
Remove it using the same procedure as the LH side.
18. Axle hub nut removal (LH) (See page 36-8)
19. Axle hub nut removal (RH)
<HINT>
Remove it using the same procedure as the LH side.
20. Engine undercover LH removal (See page 07-52)
21. Engine undercover RH removal
<HINT>
Remove it using the same procedure as the LH side.
22. Front stabilizer link assembly LH disconnection (See page 36-8)
23. Front stabilizer link assembly RH disconnection
<HINT>
Disconnect as LH side.
24. Front stabilizer bar removal (See page 42-16)
25. Front suspension cross member LH removal (See page 07-53)
26. Front suspension cross member RH removal
<HINT>
Remove it using the same procedure as the LH side.
27. Tie rod end LH disconnection (See page 36-8)
28. Tie rod end RH disconnection
<HINT>
Disconnect as LH side.
29. Front suspension lower arm No. 1 LH disconnection (See page 38-5)
30. Front suspension lower arm No. 1 RH disconnection
<HINT>
Disconnect as LH side.
31. Steering knuckle LH disconnection (See page 36-9)
32. Steering knuckle RH disconnection
<HINT>
Disconnect as LH side.
33. Front shock absorber assembly LH disconnection (See page 36-9)
34. Front shock absorber assembly RH disconnection
<HINT>
Disconnect as LH side.
35. Transmission control cable assembly removal (with Automatic transaxle) (See page 26-138)

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36. Front suspension cross member removal

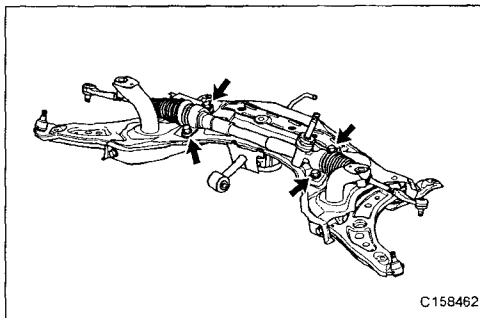
- (1) Remove the bolt, and disconnect the engine moving control rod at the engine side.
- (2) Support the front suspension cross member with a mission jack or something.



- (3) Remove 6 bolts and remove the suspension cross member.

37. Steering column hole shield removal

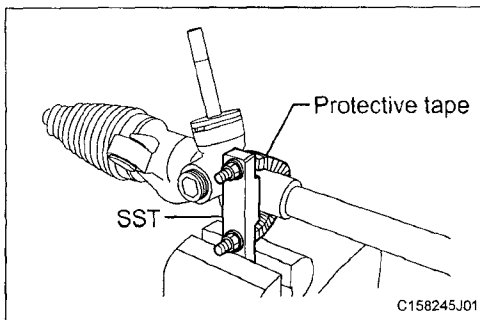
- (1) Remove the steering column hole shield from the steering gear assembly.



38. Steering gear assembly removal

- (1) Remove 4 bolts and remove the steering gear assembly from the suspension cross member.

DISASSEMBLY



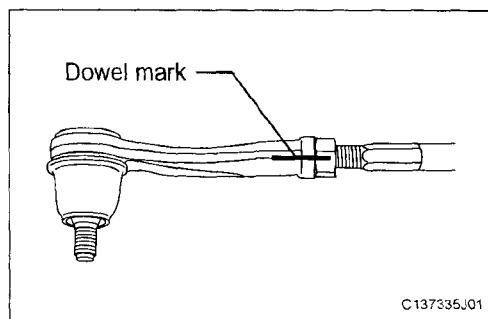
1. Fixing steering gear assembly in place

- (1) Use SST around which protective tape is wound to fix the steering assembly in a vice.

SST 09612-00012

<HINT>

Attach or remove SST as necessary.



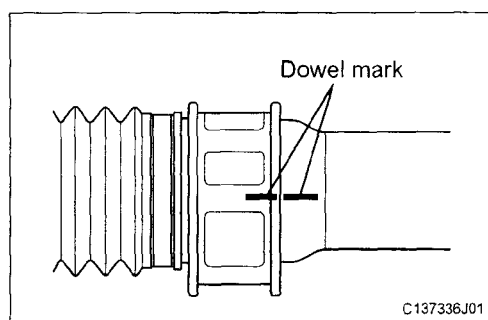
2. Tie rod end LH removal

- (1) Put alignment marks on the tie rod end LH and on the rack end.
- (2) Remove the tie rod end LH and the lock nut.

3. Tie rod end RH removal

<HINT>

Remove it using the same procedure as the LH side.



4. Steering rack housing grommet No. 1 removal

- (1) Put an alignment mark on the steering rack housing.
- (2) Remove the steering rack housing grommet No. 1.

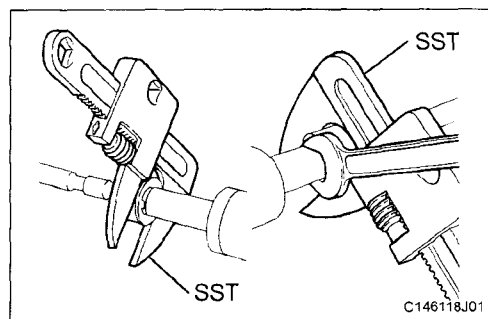
5. Steering rack boot No. 1 (LH) removal

- (1) Remove the steering rack boot clip and the steering rack boot clump and remove the steering rack boot No. 1.

6. Steering rack boot No. 1 (RH) removal

<HINT>

Remove it using the same procedure as the LH side.



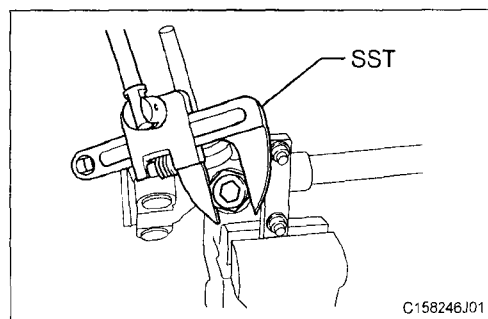
7. Steering rack end removal

- (1) Use SST and spanner wrench to remove left and right rack ends.

SST 09922-10010

<CAUTION>

- > Do not confuse the rotating direction of SST.
- > Hold the steering rack with SST securely.

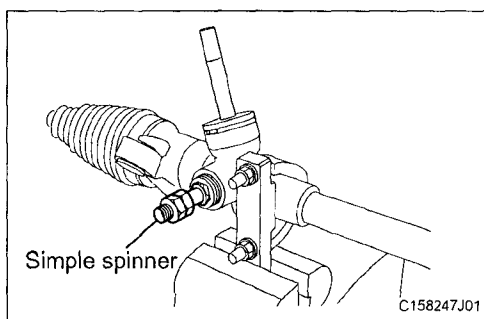


8. Steering rack guide removal

- (1) Use SST to remove the hexagon nut.

SST 09922-10010

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- (2) Use a simple spinner to remove the steering rack guide spring cap from the steering rack housing.

<HINT>

Simple spinner Two nuts of double-face width 17 mm are attached to the bolt and tighten each other so that they are fixed to the bolt.

- (3) Remove the steering rack guide spring and the steering guide spacer from the steering rack housing.
- (4) Remove the steering rack guide from the steering rack housing.

INSPECTION

1. Tie rod end LH check

- (1) Hold the tie rod end LH at the ball joint portion in the vice through aluminum plates.

<CAUTION>

Do not vise it too tightly.

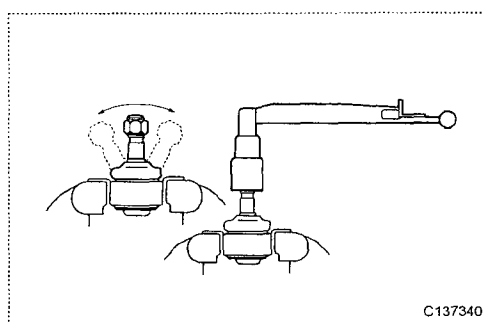
- (2) Check if the tie rod end LH boot is not broken, and the ball joint operates smoothly.

<HINT>

If any abnormality is observed, replace it with a new tie rod end assembly.

- (3) Attach a nut to the stud bolt.

- (4) Rotate the ball joint back-and-forth 5 times or more.



- (5) Put a torque wrench on the nut, and rotate the ball joint continuously at a speed of 1 rotation/second to check if there is any problem such as a backlash.

Reference: Rotates smoothly without splash etc.

<HINT>

If applicable criteria are not satisfied, replace the tie rod end assembly with a new one.

2. Tie rod end RH check

<HINT>

Perform the same procedure as that of LH

3. Steering rack housing grommet No. 1 check

- (1) Check if the steering rack housing grommet No. 1 has cracking or damage.

<HINT>

If any abnormality is observed, replace it with a new grommet.

4. Steering rack boot No. 1 check

- (1) Check if the steering rack boot No. 1 has cracking, damage or aging.

<HINT>

If any abnormality is observed, replace it with a new boot.

5. Steering rack end check

- (1) Check the following items:

(a) Backlash and malfunction of steering rack end ball

(b) Foreign particle attached to the steering rack end, and discoloration of grease

<HINT>

If any abnormality is observed, replace it with a new rack end.

Bend and cracking at the tie rod end of the steering rack end

6. Steering rack guide check

- (1) Check if the sliding surface of the steering rack guide has abnormal wear.

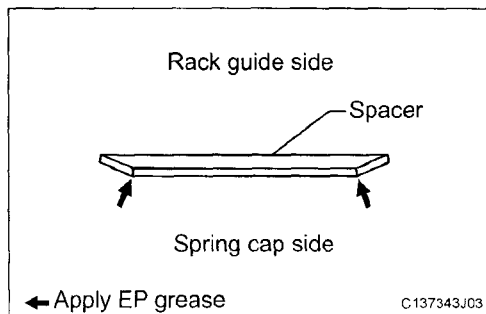
<HINT>

If any abnormality is observed, replace it with a new rack guide.

REASSEMBLY

1. Steering rack guide installation

- (1) Apply Molybdenum disulphide lithium base grease to the contact surface of steering rack and rack housing.
- (2) Attach the steering rack guide to the rack housing.



2. Steering rack guide spacer installation

- (1) Attach the steering rack guide spacer to the rack housing so that the spacer is positioned in the direction shown in the diagram.
- (2) Apply EP grease to the surface contacting the steering rack guide spring cap.
- (3) Attach the steering rack guide spring to the rack housing, and temporarily tighten the steering rack guide spring cap.

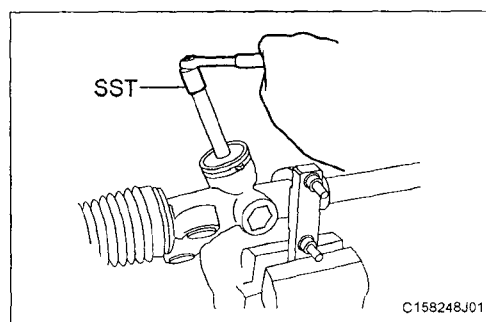
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3. General preload adjustment

- (1) Use a simple spinner to tighten the steering rack guide spring cap with a specified torque.

Specified value: $T=12N \cdot m$ {122kgf*cm}

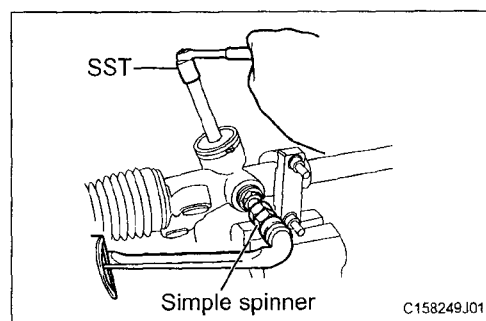
- (2) Use a simple spinner to loosen the steering rack guide spring cap approx. 45°.
- (3) Temporarily attach the steering rack end to the steering rack.



- (4) Use SST to move the steering rack back-and-forth fully once or twice for smoothen operation.

SST 09616-87701

- (5) Use a simple spinner to loosen the steering rack guide spring cap until the rack guide spring becomes no longer effective.



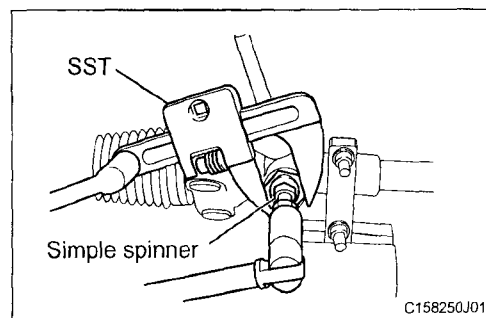
- (6) Tighten the steering rack guide spring cap little by little using SST so that the preload during rotation becomes a base value when the steering pinion is rotated.

SST 09616-87701

Specified value: $T=0.78-1.28N \cdot m$ {8-13kgf*cm}

(During rotation)

- (7) Clean the thread of the hexagon nut.



- (8) Use SST and simple spinner to attach a hexagon nut.

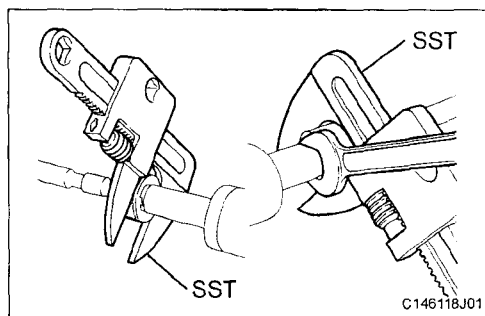
Specified value: $T=39N \cdot m$ {398kgf*cm}

<HINT>

If you use a torque wrench with an SST or tool to tighten it with extended overall length, calculate the torque wrench reading with the specified calculation formula. (See page 01-5)

4. Steering rack end installation

(1) Temporarily attach right and left steering rack ends.



(2) Use SST and spanner wrench to tighten right and left steering rack ends.

SST 09922-10010

Specified value: $T=94\text{N}\cdot\text{m}$ {958kgf*cm}

<CAUTION>

> Do not confuse the rotating direction of SST.

> Hold the steering rack with SST securely.

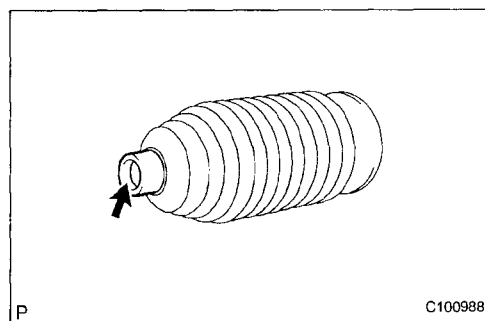
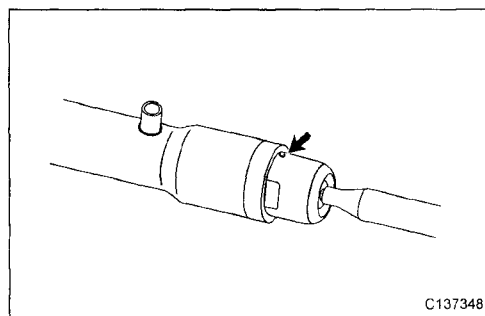
<HINT>

If you use a torque wrench with an SST or tool to tighten it with extended overall length, calculate the torque wrench reading with the specified calculation formula. (See page 01-5)

(3) Insert a wire with a length of 50 mm and an outer diameter of 2 mm into the ventilation hole of the rack end to check if it is not clogged.

<HINT>

The ventilation hole serves to equalize the air pressures inside the right and left rack boots. If it is clogged, the rack boot may be deformed or broken due to a change in the air pressure inside the rack boot when the steering wheel is rotated.



5. Steering rack boot No. 1 installation (LH)

(1) Apply Molybdenum disulphide lithium base grease to the surface inside the smaller end of the rack boot No. 1.

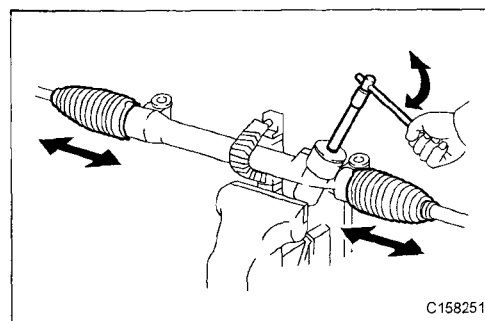
(2) Insert a boot clump over the rack end, and attach the rack boot No. 1 to the slot of the rack housing.

(3) Attach a steering rack boot clip and a new clump.

6. Steering rack boot No. 1 installation (RH)

<HINT>

Attach it using the same procedure as the LH side.



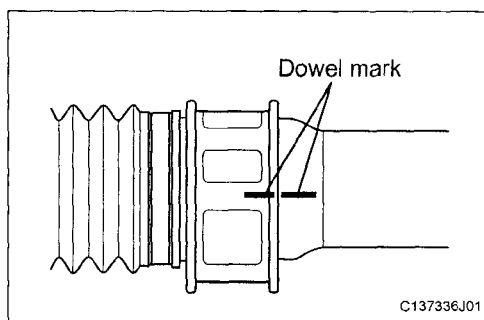
7. Steering gear check

(1) Use SST to rotate the pinion shaft to make sure that the right and left rack boots extend and contract smoothly.

SST 09616-87701

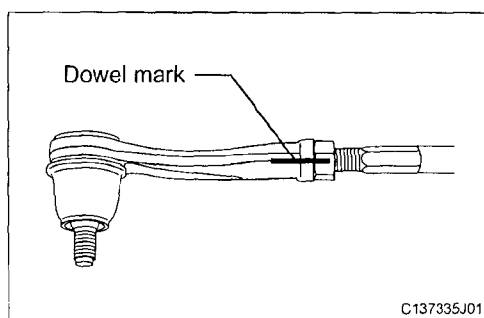
<HINT>

If the rack boot does not extend or contract smoothly, attach the rack boot again using a new rack boot clump.



8. Steering rack housing grommet No. 1 installation

- (1) Aligning the alignment marks, attach the steering rack housing grommet No. 1 to the rack housing.



9. Attaching tie rod end LH

- (1) Attach the lock nut and the tie rod end LH to the position of the alignment mark, temporarily tighten the lock nut.

<HINT>

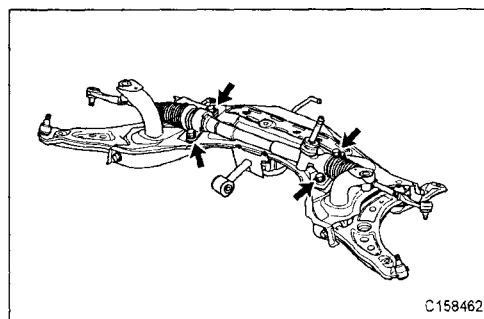
- > Fully tighten the lock nut after toe-in adjustment.
- > After toe-in adjustment, the tie rod end should be positioned almost at the middle of the allowed joint rotation angle.

10. Attaching tie rod end RH

<HINT>

Attach it using the same procedure as the LH side.

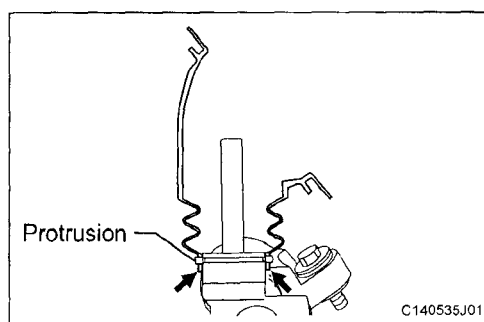
INSTALLATION



1. Steering gear assembly installation

- (1) Use 4 bolts to attach the steering gear assembly to the front suspension cross member.

Specified value: $T=64\text{N}\cdot\text{m}$ {653kgf*cm}

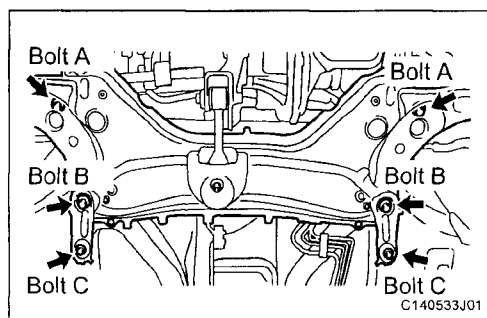


2. Steering column hole shield installation

- (1) Aligning the steering column hole shield with the protrusion on the steering gear assembly, attach the hole shield to the steering gear assembly.

3. Front suspension cross member installation

- (1) Support the front suspension cross member with a mission jack.



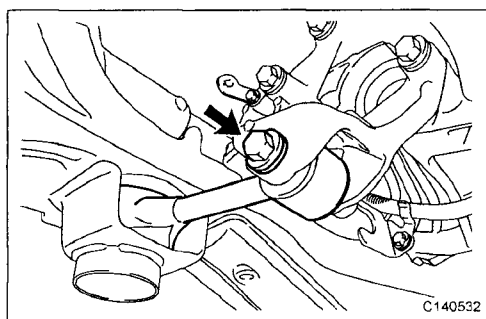
- (2) Use 6 bolts to attach the front suspension cross member to the vehicle temporarily.

- (3) While adjusting the position, tighten the bolts A, B, and C both at RH and LH in several steps alternately to a specified torque.

Specified value: $T=118\text{N}\cdot\text{m}$ {1203kgf*cm} (Bolt A)

$T=100\text{N}\cdot\text{m}$ {1020kgf*cm} (Bolt B)

$T=66\text{N}\cdot\text{m}$ {673kgf*cm} (Bolt C)



- (4) Connect the engine moving control rod with a bolt.
Specified value: $T=120\text{N}\cdot\text{m}$ {1224kgf*cm}

4. Transmission control cable assembly installation (for Automatic transaxle) (See page 26-140)

5. Steering knuckle LH installation (See page 38-8)

6. Steering knuckle RH installation

<HINT>

Attach it using the same procedure as the LH side.

7. Front shock absorber assembly LH installation (See page 36-16)

8. Front shock absorber assembly RH installation

<HINT>

Attach it using the same procedure as the LH side.

9. Axle hub nut installation (LH) (See page 36-16)

10. Axle hub nut installation (RH)

<HINT>

Attach it using the same procedure as the LH side.

11. Tie rod end LH installation (See page 36-16)

12. Tie rod end RH installation

<HINT>

Attach it using the same procedure as the LH side.

13. Front suspension cross member LH installation (See page 07-84)

14. Front suspension cross member RH installation

<HINT>

Attach it using the same procedure as the LH side.

15. Front stabilizer bar installation (See page 42-16)

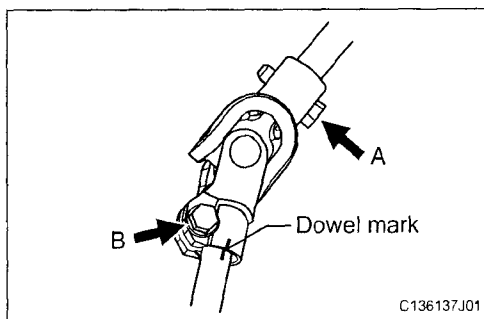
16. Front stabilizer link assembly LH installation (See page 36-17)

17. Front stabilizer link assembly RH installation

<HINT>

Attach it using the same procedure as the LH side.

18. Front disc brake cylinder assembly LH installation (See page 36-16)
19. Front disc brake cylinder assembly RH installation
<HINT>
Attach it using the same procedure as the LH side.
20. Speed sensor FR LH installation (with ABS & VSC) (See page 36-17)
21. Speed sensor FR RH installation (with ABS & VSC)
<HINT>
Attach it using the same procedure as the LH side.
22. Front brake flexible hose No. 1 (LH) installation (without ABS & VSC) (See page 36-18)
23. Front brake flexible hose No. 1 (RH) installation (without ABS & VSC)
<HINT>
Attach it using the same procedure as the LH side.
24. Engine undercover LH installation (See page 07-85)
25. Engine undercover RH installation
<HINT>
Attach it using the same procedure as the LH side.
26. Exhaust pipe assembly FR installation (See page 11-16)
27. Front tire installation
Specified value: $T=103N*m$ {1050kgf*cm}
28. Transmission floor shift assembly installation (for Manual transaxle) (See page 29-55)
29. Console box assembly installation (for Manual transaxle) (See page 29-56)
30. Console box carpet installation (for Manual transaxle) (See page 29-56)
31. Rear console box installation (for Manual transaxle) (See page 29-57)
32. Shift lever knob installation (for Manual transaxle) (See page 29-57)



33. Steering column assembly connection

- (1) Align the alignment marks and attach the sliding yoke and the steering gear assembly.
- (2) Fully tighten the bolt B, and then the bolt A.
Specified value: $T=25N*m$ {255kgf*cm}

<CAUTION>

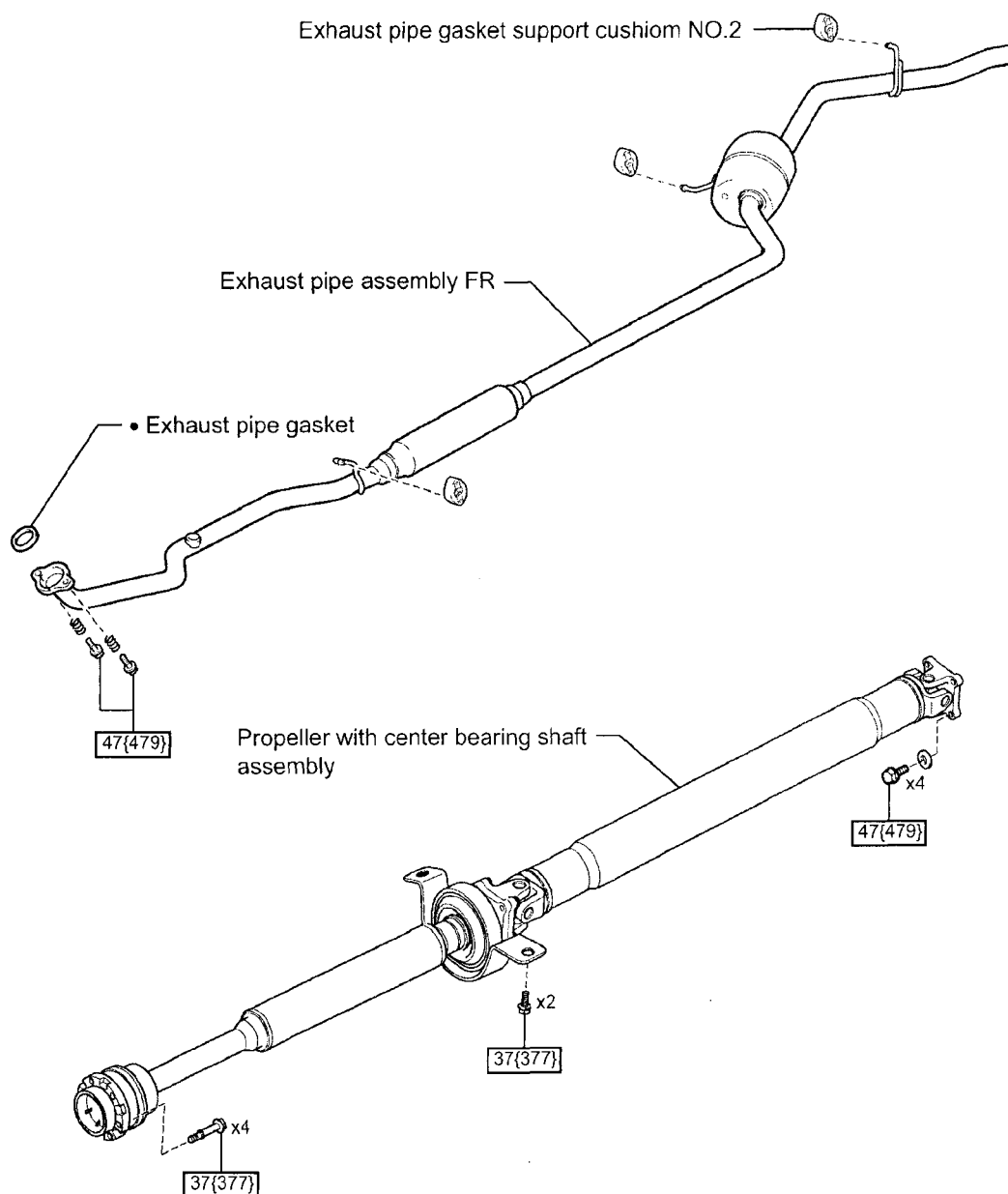
- > Make sure that there is no grease on the steering gear assembly pinion shaft serration part.
- > Insert the steering column joint until the pinion shaft serration enters completely (as far as it will go).

34. Steering column hole cover No. 1 installation (See page 48-18)
35. Battery minus terminal connection
Specified value: $T=6.4N*m$ {65kgf*cm}
36. Exhaust gas leakage check
37. Front tire straight-ahead status
38. Front wheel alignment check/adjustment
(See page 42-5)
39. Test mode check (Speed sensor circuit)
with ABS: (See page 44-15)
with VSC: (See page 44-76)

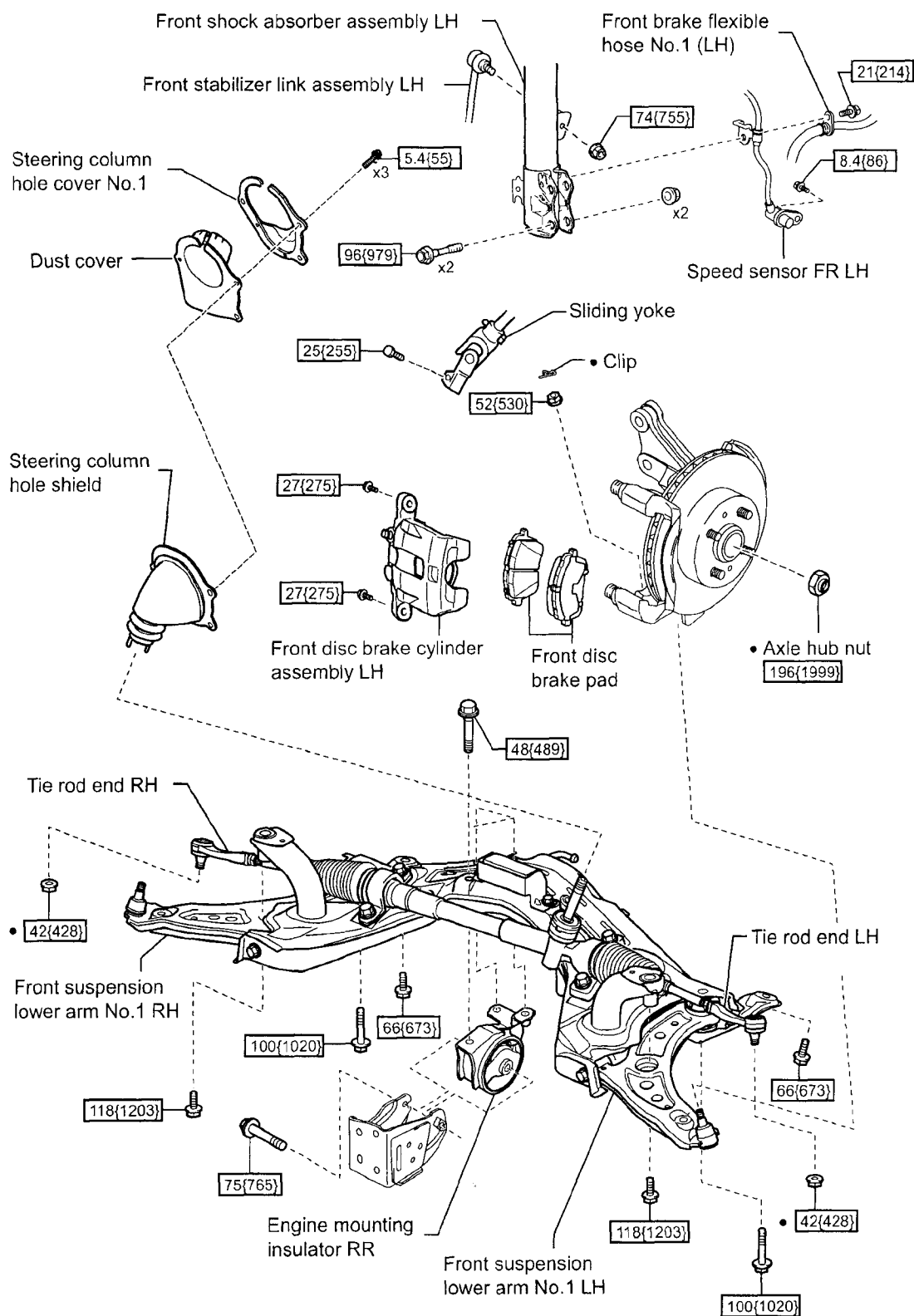
STEERING GEAR ASSEMBLY (4WD)

COMPONENTS

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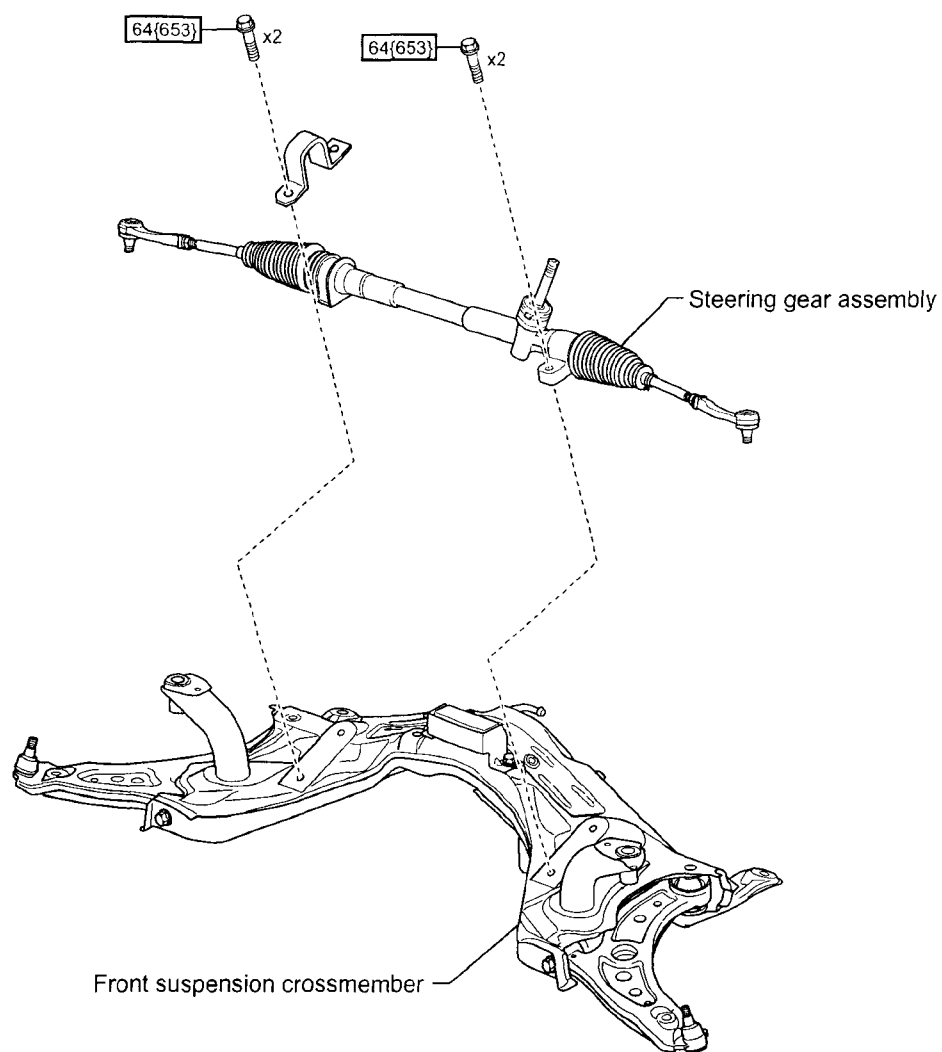


N*m (kgf*cm) : Specified torque • Non-reusable part

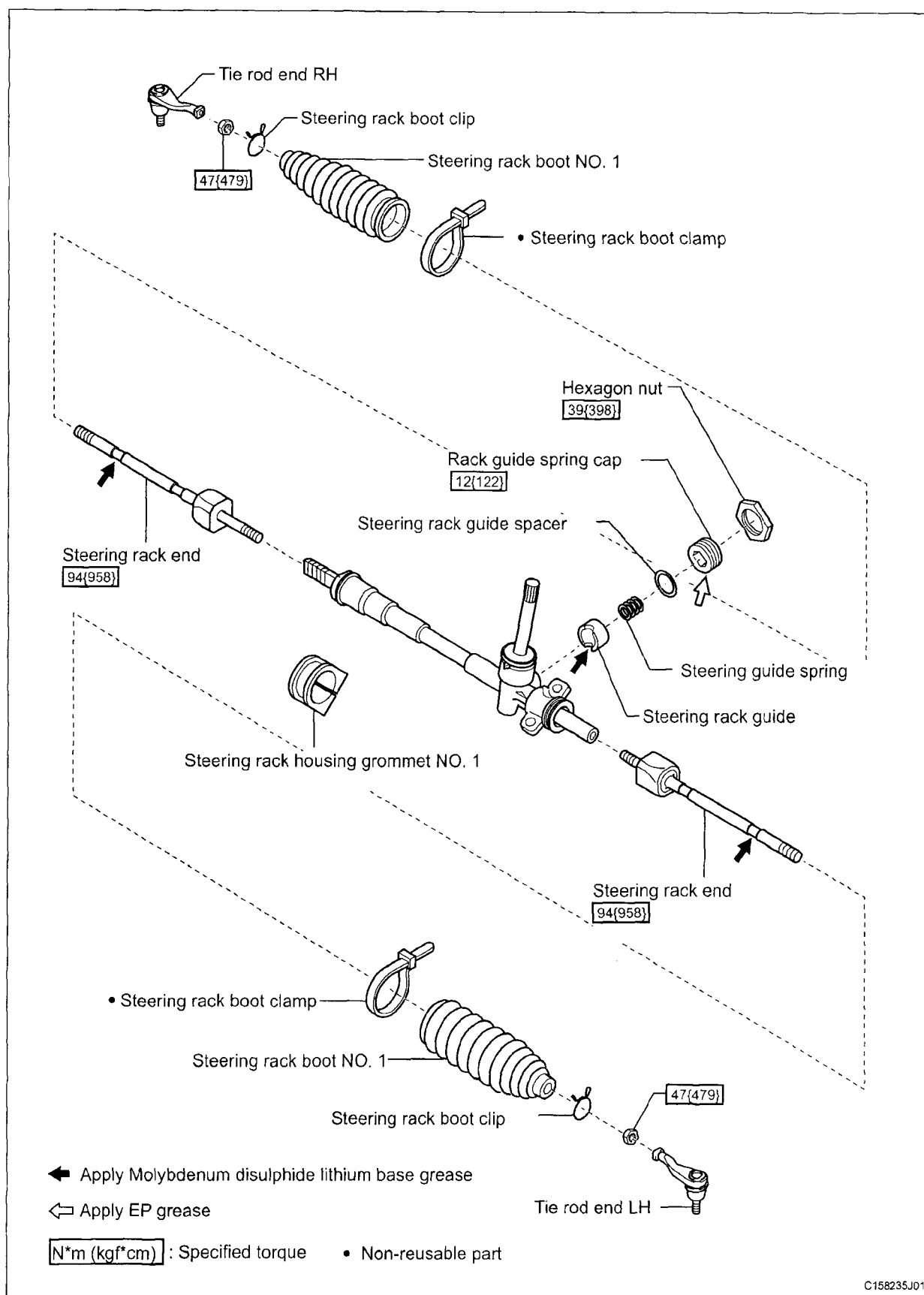


N*m (kgf*cm) : Specified torque • Non-reusable part

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N*m (kgf*cm) : Specified torque



REMOVAL

1. Front tire straight-ahead status
2. Battery minus terminal disconnection
3. Front tire removal
4. Exhaust pipe assembly FR removal (See page 11-15)
- 49** 5. Removing propeller with a center bearing shaft assembly. (See page 35-3)
6. Manual transaxle oil discharge (See page 29-37)
7. Steering column hole cover No. 1 removal (See page 49-72)
8. Steering column assembly disconnection (See page 49-72)
9. Shift lever knob removal (See page 29-59)
10. Rear console box removal (See page 29-59)
11. Console box carpet removal (See page 29-59)
12. Console box assembly removal (See page 29-59)
13. Transmission floor shift assembly removal (See page 29-60)
14. Engine undercover LH removal (See page 07-116)
15. Engine undercover RH removal
<HINT>
Remove it using the same procedure as the LH side.
16. Speed sensor FR LH disconnection (See page 36-7)
17. Speed sensor FR RH removal
<HINT>
Disconnect as LH side.
18. Front disc brake cylinder assembly LH removal (See page 36-8)
19. Front disc brake cylinder assembly RH removal
<HINT>
Remove it using the same procedure as the LH side.
20. Axle hub nut removal (LH) (See page 36-8)
21. Axle hub nut removal (RH)
<HINT>
Remove it using the same procedure as the LH side.
22. Front stabilizer link assembly LH disconnection (See page 36-8)
23. Front stabilizer link assembly RH removal
<HINT>
Remove it using the same procedure as the LH side.
24. Front stabilizer bar removal (See page 42-16)
25. Front suspension cross member LH removal (See page 07-117)
26. Front suspension cross member RH removal
<HINT>
Remove it using the same procedure as the LH side.
27. Tie rod end LH disconnection (See page 36-8)
28. Tie rod end RH disconnection
<HINT>
Disconnect as LH side.
29. Front suspension lower arm No. 1 LH disconnection (See page 38-5)
30. Front suspension lower arm No. 1 RH disconnection
<HINT>
Disconnect as LH side.
31. Steering knuckle LH disconnection (See page 36-9)

32. Steering knuckle RH disconnection

<HINT>

Disconnect as LH side.

33. Front shock absorber assembly LH disconnection (See page 36-9)

34. Front shock absorber assembly RH disconnection

<HINT>

Disconnect as LH side.

35. Front drive shaft assembly LH removal (See page 36-9)

36. Front drive shaft assembly RH removal

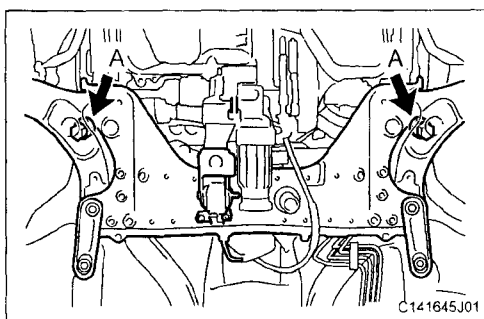
<HINT>

Remove it using the same procedure as the LH side.

37. Front suspension cross member disconnection

38. Engine mounting insulator RR removal (See page 07-119)

39. Transfer assembly removal (See page 07-121)

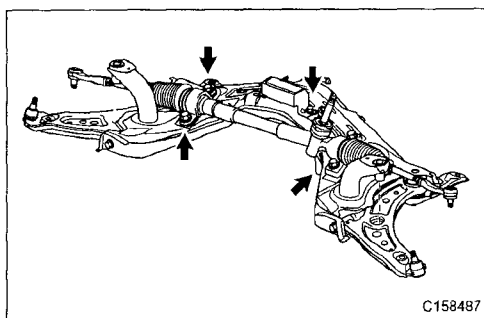


40. Front suspension cross member removal

- (1) Remove bolt A, and remove the front suspension cross member.

41. Steering column hole shield removal

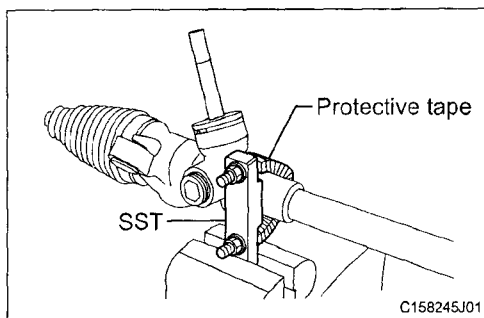
- (1) Remove the steering column hole shield from the steering gear assembly.



42. Steering gear assembly removal

- (1) Remove 4 bolts and remove the steering gear assembly from the suspension cross member.

DISASSEMBLY



1. Fixing steering gear assembly in place

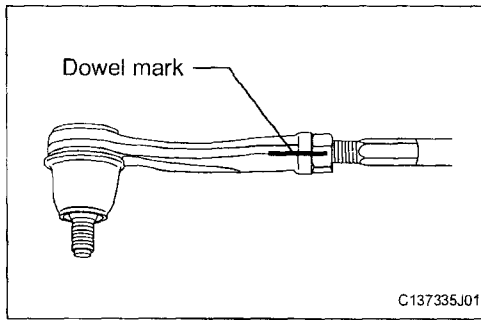
- (1) Use SST around which protective tape is wound to fix the steering assembly in a vice.

SST 09612-00012

<HINT>

Attach or remove SST as necessary.

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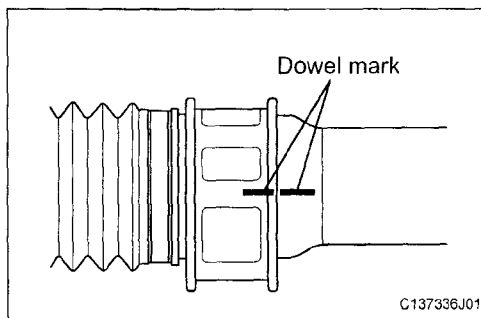
2. Tie rod end LH removal

- (1) Put alignment marks on the tie rod end LH and on the rack end.
- (2) Remove the tie rod end LH and the lock nut.

3. Tie rod end RH removal

<HINT>

Remove it using the same procedure as the LH side.



4. Steering rack housing grommet No. 1 removal

- (1) Put an alignment mark on the steering rack housing.
- (2) Remove the steering rack housing grommet No. 1.

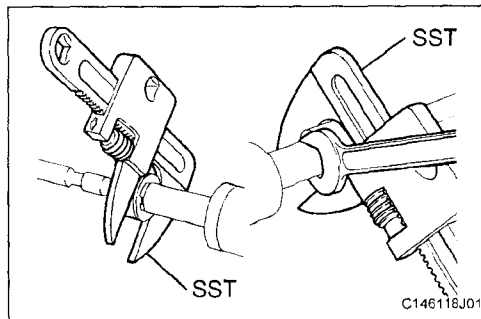
5. Steering rack boot No. 1 (LH) removal

- (1) Remove the steering rack boot clip and the steering rack boot clump and remove the steering rack boot No. 1.

6. Steering rack boot No. 1 (RH) removal

<HINT>

Remove it using the same procedure as the LH side.



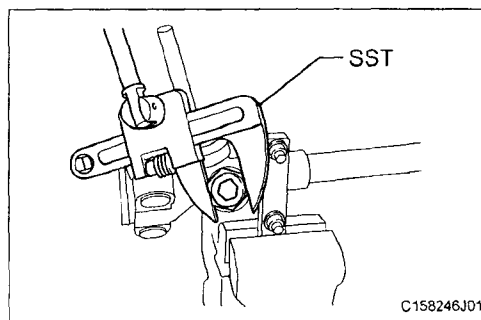
7. Steering rack end removal

- (1) Use SST and spanner wrench to remove left and right rack ends.

SST 09922-10010

<CAUTION>

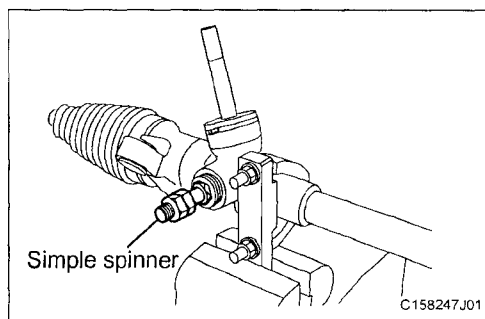
- > Do not confuse the rotating direction of SST.
- > Hold the steering rack with SST securely.



8. Steering rack guide removal

- (1) Use SST to remove the hexagon nut.

SST 09922-10010



- (2) Use a simple spinner to remove the steering rack guide spring cap from the steering rack housing.

<HINT>

Simple spinner Two nuts of double-face width 17 mm are attached to the bolt and tighten each other so that they are fixed to the bolt.

- (3) Remove the steering rack guide spring and the steering guide spacer from the steering rack housing.
- (4) Remove the steering rack guide from the steering rack housing.

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INSPECTION

1. Tie rod end LH check

- (1) Hold the tie rod end LH at the ball joint portion in the vice through aluminum plates.

<CAUTION>

Do not vise it too tightly.

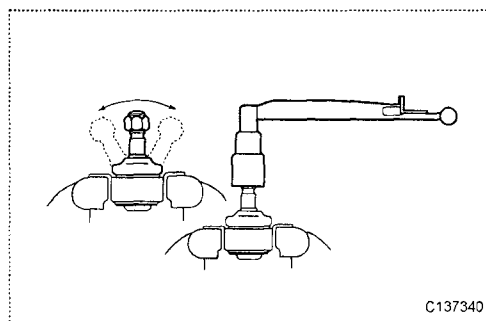
- (2) Check if the tie rod end LH boot is not broken, and the ball joint operates smoothly.

<HINT>

If any abnormality is observed, replace it with a new tie rod end assembly.

- (3) Attach a nut to the stud bolt.

- (4) Rotate the ball joint back-and-forth 5 times or more.



- (5) Put a torque wrench on the nut, and rotate the ball joint continuously at a speed of 1 rotation/second to check if there is any problem such as a backlash.

Reference: Rotates smoothly without splash etc.

<HINT>

If applicable criteria are not satisfied, replace the tie rod end assembly with a new one.

2. Tie rod end RH check

<HINT>

Perform the same procedure as that of LH

3. Steering rack housing grommet No. 1 check

- (1) Check if the steering rack housing grommet No. 1 has cracking or damage.

<HINT>

If any abnormality is observed, replace it with a new grommet.

4. Steering rack boot No. 1 check

- (1) Check if the steering rack boot No. 1 has cracking, damage or aging.

<HINT>

If any abnormality is observed, replace it with a new rack end.

5. Steering rack end check

- (1) Check the following items:

- (a) Backlash and malfunction of steering rack end ball
- (b) Foreign particle attached to the steering rack end, and discoloration of grease
- (c) Bend and cracking at the tie rod end of the steering rack end

<HINT>

If any abnormality is observed, replace it with a new rack guide.

6. Steering rack guide check

- (1) Check if the sliding surface of the steering rack guide has abnormal wear.

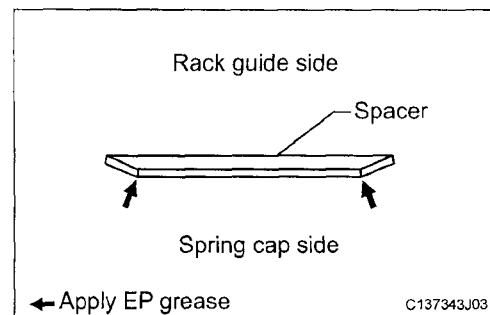
<HINT>

If any abnormality is observed, replace it with a new rack guide.

REASSEMBLY

1. Steering rack guide installation

- (1) Apply Molybdenum disulphide lithium base grease to the contact surface of steering rack and rack housing.
- (2) Attach the steering rack guide to the rack housing.

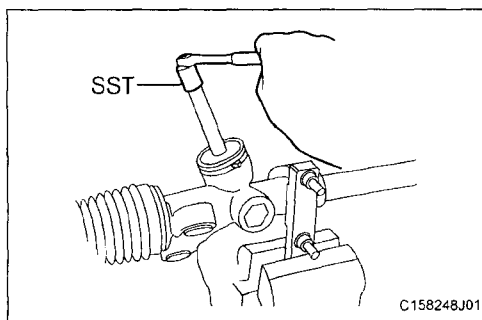


2. Steering rack guide spacer installation

- (1) Attach the steering rack guide spacer to the rack housing so that the spacer is positioned in the direction shown in the diagram.
- (2) Apply EP grease to the surface contacting the steering rack guide spring cap.
- (3) Attach the steering rack guide spring to the rack housing, and temporarily tighten the steering rack guide spring cap.

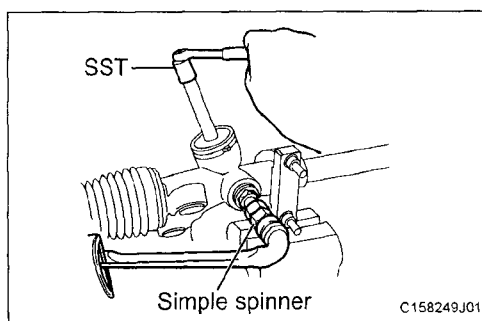
3. General preload adjustment

- (1) Use a simple spinner to tighten the steering rack guide spring cap with a specified torque.
Specified value: $T=12\text{N}\cdot\text{m}$ {122kgf*cm}
- (2) Use a simple spinner to loosen the steering rack guide spring cap approx. 45°.
- (3) Temporarily attach the steering rack end to the steering rack.



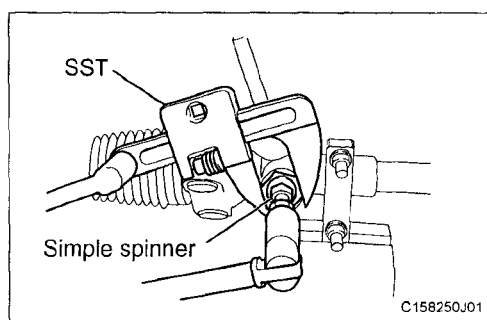
- (4) Use SST to move the steering rack back-and-forth fully once or twice for smoothen operation.
SST 09616-87701

- (5) Use a simple spinner to loosen the steering rack guide spring cap until the rack guide spring becomes no longer effective.



- (6) Tighten the steering rack guide spring cap little by little using SST so that the preload during rotation becomes a base value when the steering pinion is rotated.
SST 09616-87701
Specified value: $T=0.78-1.28\text{N}\cdot\text{m}$ {8-13kgf*cm}
(During rotation)

- (7) Clean the thread of the hexagon nut.



- (8) Use SST and simple spinner to attach a hexagon nut.

Specified value: $T=39\text{N}\cdot\text{m}$ {398kgf*cm}

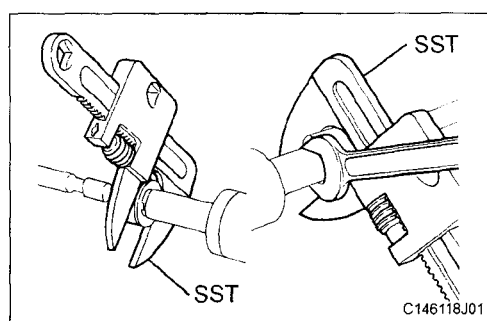
<HINT>

If you use a torque wrench with an SST or tool to tighten it with extended overall length, calculate the torque wrench reading with the specified calculation formula. (See page 01-5)

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4. Steering rack end installation

- (1) Temporarily attach right and left steering rack ends.



- (2) Use SST to tighten the right and left steering rack ends.

SST 09922-10010

Specified value: $T=94\text{N}\cdot\text{m}$ {958kgf*cm}

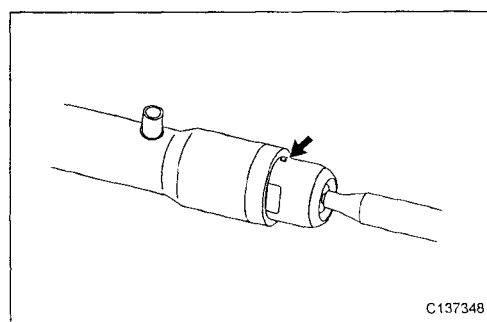
<CAUTION>

> Do not confuse the rotating direction of SST.

> Hold the steering rack with SST securely.

<HINT>

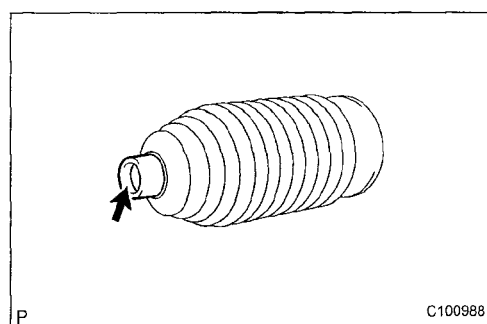
If you use a torque wrench with an SST or tool to tighten it with extended overall length, calculate the torque wrench reading with the specified calculation formula. (See page 01-5)



- (3) Insert a wire with a length of 50 mm and an outer diameter of 2 mm into the ventilation hole of the rack end to check if it is not clogged.

<HINT>

The ventilation hole serves to equalize the air pressures inside the right and left rack boots. If it is clogged, the rack boot may be deformed or broken due to a change in the air pressure inside the rack boot when the steering wheel is rotated.



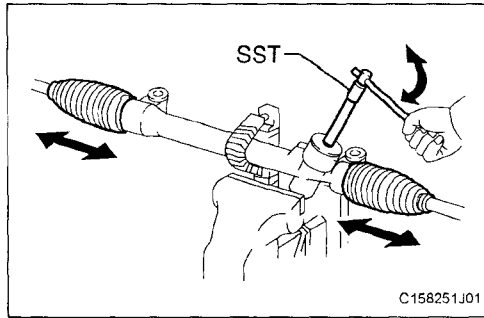
5. Steering rack boot No. 1 installation (LH)

- (1) Apply Molybdenum disulphide lithium base grease to the surface inside the smaller end of the rack boot No. 1.
- (2) Insert a boot clump over the rack end, and attach the rack boot No. 1 to the slot of the rack housing.
- (3) Attach a steering rack boot clip and a new clump.

6. Steering rack boot No. 1 installation (RH)

- (1) Attach it using the same procedure as the LH side.

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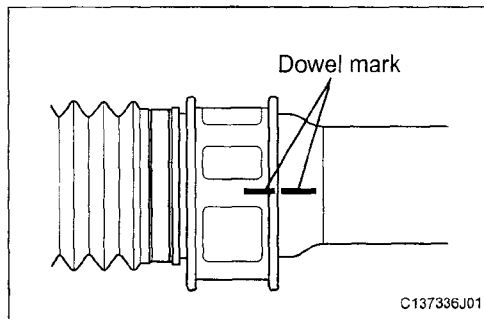
7. Steering gear check

- (1) Use SST to rotate the pinion shaft to make sure that the right and left rack boots extend and contract smoothly.

SST 09616-87701

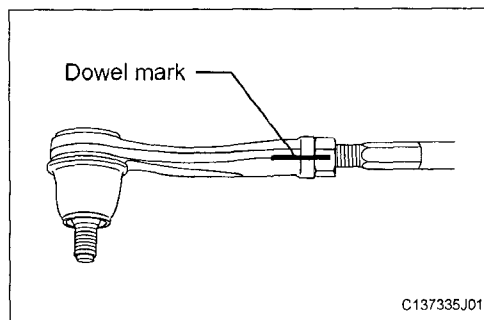
<HINT>

If the rack boot does not extend or contract smoothly, attach the rack boot again using a new rack boot clump.



8. Steering rack housing grommet No. 1 installation

- (1) Aligning the alignment marks, attach the steering rack housing grommet No. 1 to the rack housing.



9. Attaching tie rod end LH

- (1) Attach the lock nut and the tie rod end LH to the position of the alignment mark, temporarily tighten the lock nut.

<HINT>

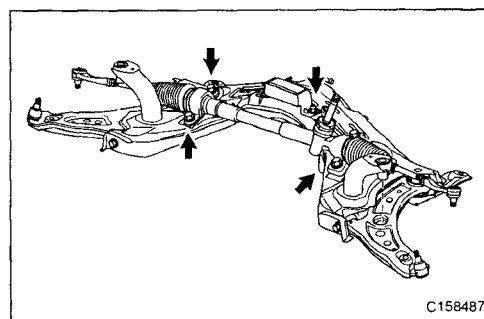
- > Fully tighten the lock nut after toe-in adjustment.
- > After toe-in adjustment, the tie rod end should be positioned almost at the middle of the allowed joint rotation angle.

10. Attaching tie rod end RH

<HINT>

Attach it using the same procedure as the LH side.

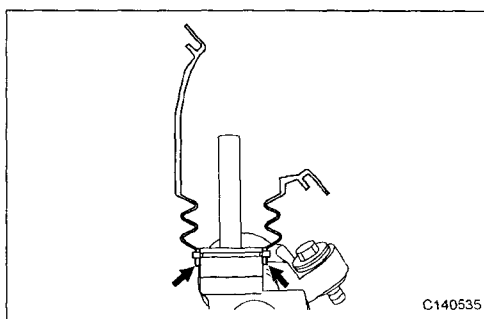
INSTALLATION



1. Steering gear assembly installation

- (1) Use 4 bolts to attach the steering gear assembly to the front suspension cross member.

Specified value: $T=64\text{N}\cdot\text{m}$ {653kgf*cm}



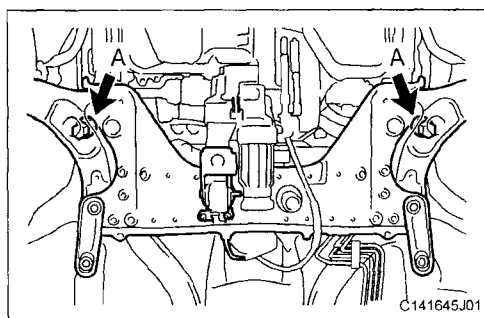
2. Steering column hole shield installation

- (1) Aligning the steering column hole shield with the protrusion on the steering gear assembly, attach the hole shield to the steering gear assembly.

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3. Front suspension cross member temporary tightening

- (1) Support the front suspension cross member with a jack.



- (2) Attach bolt A to a depth of approx. 5mm, and attach the front suspension cross member to the vehicle temporarily.

4. Transfer assembly installation (See page 07-138)
5. Engine mounting insulator RR installation (See page 07-139)
6. Front suspension cross member installation (See page 07-139)
7. Front drive shaft assembly LH installation (See page 36-15)
8. Front drive shaft assembly RH installation
<HINT>
Attach it using the same procedure as the LH side.
9. Steering knuckle LH installation (See page 38-8)
10. Steering knuckle RH installation
<HINT>
Attach it using the same procedure as the LH side.
11. Front shock absorber assembly LH installation (See page 36-16)
12. Front shock absorber assembly RH installation
<HINT>
Attach it using the same procedure as the LH side.
13. Axle hub nut installation (LH) (See page 36-16)
14. Axle hub nut installation (RH)
<HINT>
Attach it using the same procedure as the LH side.
15. Tie rod end LH installation (See page 36-16)
16. Tie rod end RH installation
<HINT>
Attach it using the same procedure as the LH side.
17. Front suspension cross member LH installation (See page 07-141)
18. Front suspension cross member RH installation
<HINT>
Attach it using the same procedure as the LH side.
19. Front stabilizer bar installation (See page 42-16)
20. Front stabilizer link assembly LH installation (See page 36-17)

21. Front stabilizer link assembly RH installation

<HINT>

Attach it using the same procedure as the LH side.

22. Front disc brake cylinder assembly LH installation (See page 36-16)

23. Front disc brake cylinder assembly RH installation

<HINT>

Attach it using the same procedure as the LH side.

24. Speed sensor FR LH installation (See page 36-17)

25. Speed sensor FR RH installation

<HINT>

Attach it using the same procedure as the LH side.

26. Engine undercover LH installation (See page 07-142)

27. Engine undercover RH installation

<HINT>

Attach it using the same procedure as the LH side.

28. Transmission floor shift assembly installation (See page 29-60)

29. Console box assembly installation (See page 29-61)

30. Console box carpet installation (See page 29-61)

31. Rear console box installation (See page 29-62)

32. Shift lever knob installation (See page 29-62)

33. Steering column assembly connection (See page 49-81)

34. Steering column hole cover No. 1 installation (See page 48-10)

35. Temporarily tightening propeller with a center bearing shaft assembly (See page 35-5)

36. Fully tightening propeller with a center bearing shaft assembly (See page 35-5)

37. Exhaust pipe assembly FR installation (See page 11-16)

38. Manual transaxle oil replenishment (See page 29-45)

39. Oil leakage check

40. Exhaust gas leakage check

41. Front tire installation

Specified value: $T=103N \cdot m$ {1050kgf $\cdot$ cm}

42. Front tire straight-ahead status

43. Front wheel alignment check/adjustment

(See page 42-5)

44. Test mode check (speed sensor system check)

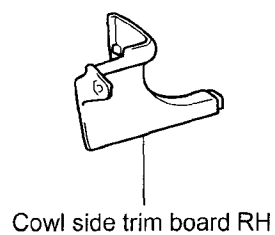
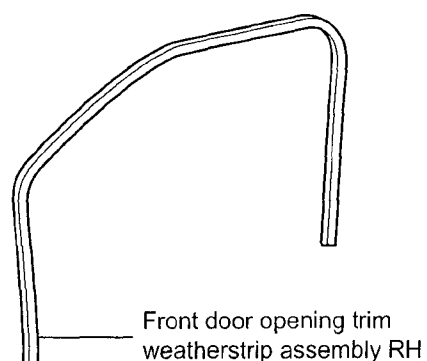
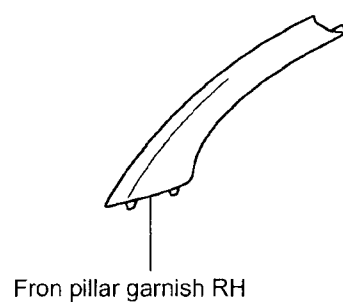
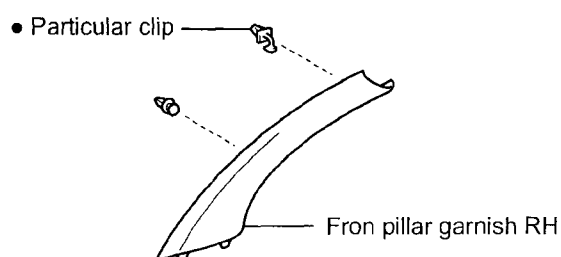
(See page 44-15)

POWER STEERING COMPUTER ASSEMBLY (RHD)

COMPONENTS

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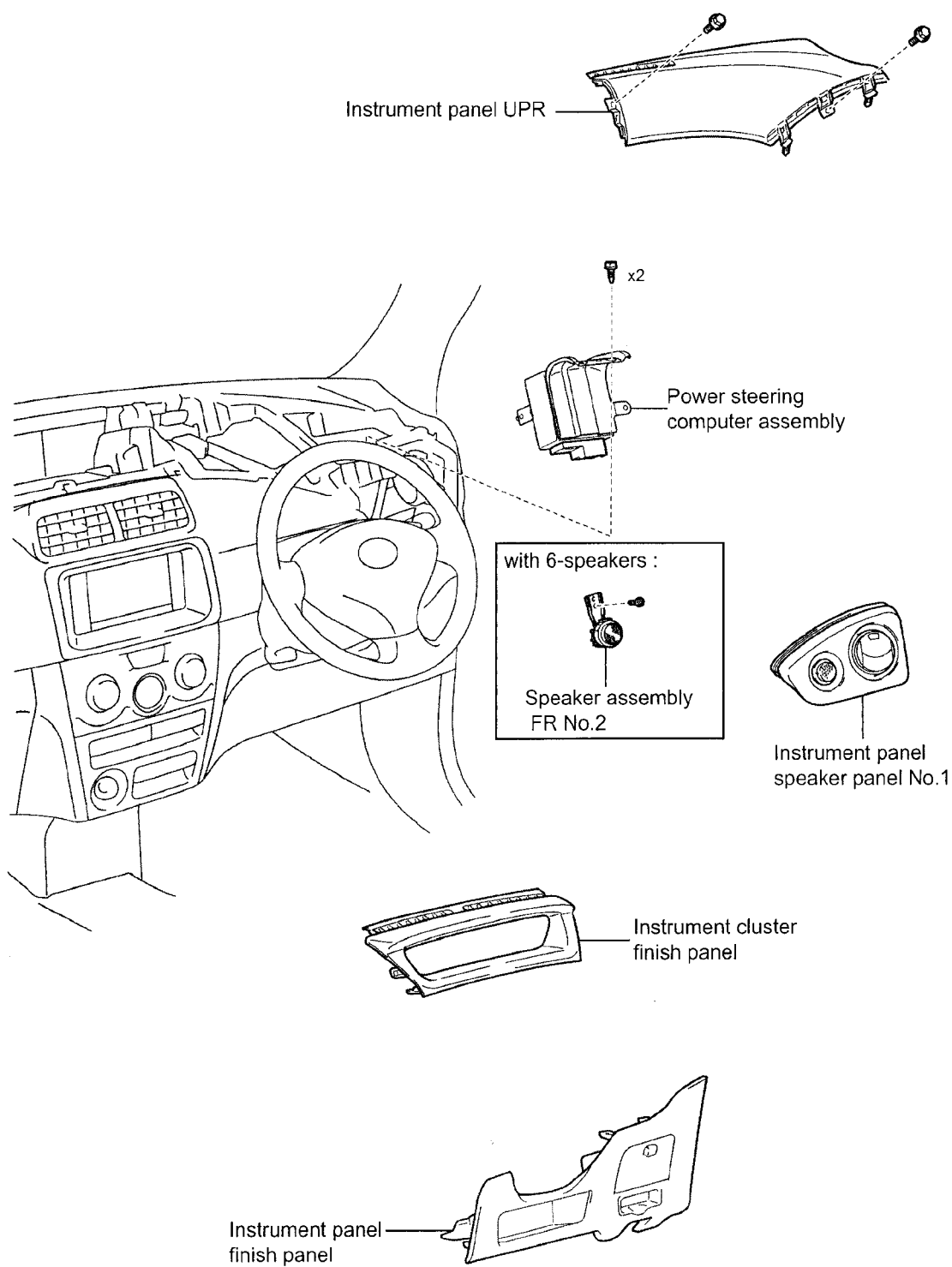
with Curtain shield airbag:



$\boxed{\text{N*m (kgf*cm)}}$: Specified torque • Non-reusable part

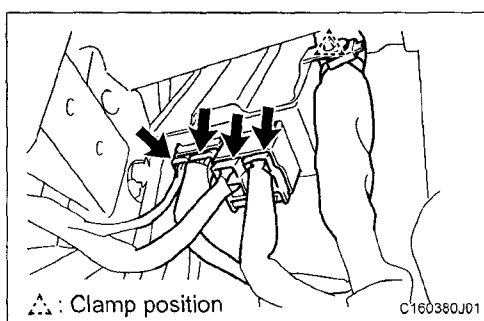
C146117J02

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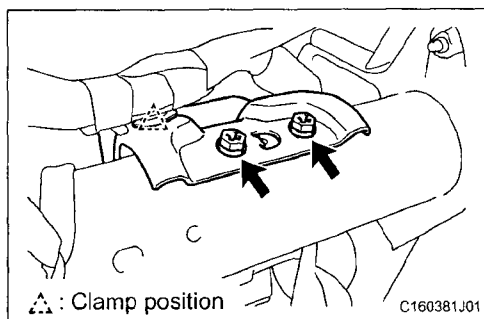
REMOVAL

1. Battery minus terminal disconnection
2. Instrument panel speaker panel No. 1 removal (See page 78-19)
3. Speaker assembly FR No. 2 removal (with 6-speakers) (See page 64-20)
4. Instrument cluster finish panel removal (See page 78-19)
5. Front door scuff plate RH removal (See page 83-14)
6. Cowl side trim board RH removal (See page 83-15)
7. Front door opening trim weather strip assembly RH removal (See page 83-18)
8. Front pillar garnish RH removal (without Curtain shield air bag) (See page 83-21)
9. Front pillar garnish RH removal (with Curtain shield air bag) (See page 83-22)
10. Instrument panel UPR removal (RH) (See page 78-20)
11. Instrument panel finish panel LWR removal (See page 78-22)



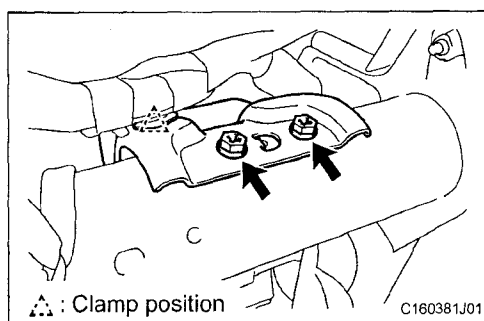
12. Power steering computer assembly removal

- (1) Disconnect the wire harness clump.
- (2) Disconnect 4 connectors from the power steering computer assembly.



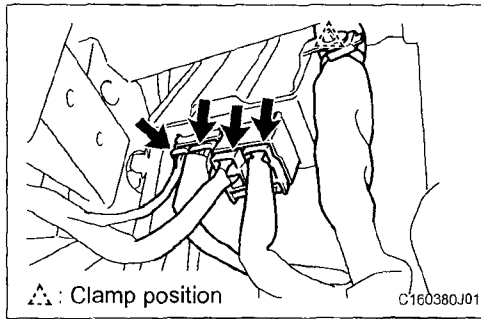
- (3) Remove the clump, and disconnect the wire harness.
- (4) Remove 2 screws, and remove the power steering computer assembly.

INSTALLATION



1. Power steering computer assembly installation

- (1) Use 2 screws to attach the power steering computer assembly.
- (2) Attach the wire harness clump to the power steering computer assembly.



(3) Connect 4 connectors.

(4) Attach the wire harness clamp.

<CAUTION>

Make sure that connected wire harness is not leaning against a surface.

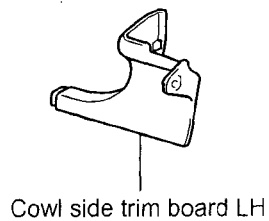
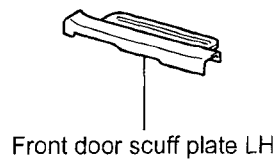
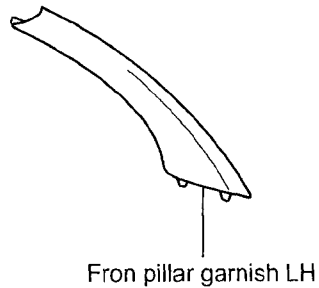
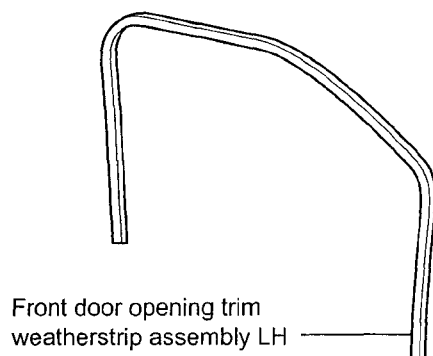
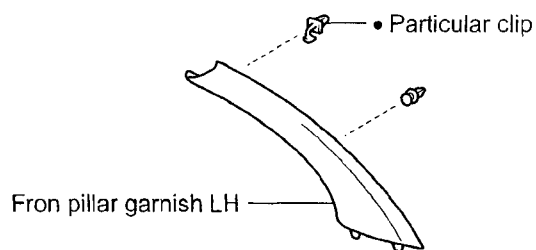
2. Instrument panel finish panel LWR installation (See page 78-31)
3. Instrument panel UPR installation (RH) (See page 78-31)
4. Front pillar garnish RH installation (without Curtain shield air bag) (See page 83-30)
5. Front pillar garnish RH installation (with Curtain shield air bag) (See page 83-31)
6. Front door opening trim weather strip assembly RH installation (See page 83-35)
7. Cowl side trim board RH installation (See page 83-38)
8. Front door scuff plate RH installation (See page 83-39)
9. Instrument cluster finish panel installation (See page 78-33)
10. Speaker assembly FR No. 2 installation (with 6-speakers) (See page 64-21)
11. Instrument panel speaker panel No. 1 installation (See page 78-33)
12. Battery minus terminal connection
Specified value: $T=6.4\text{N}\cdot\text{m}$ {65kgf*cm}
13. Steering zero-point correction signal initialization
(See page 49-15)
14. Steering zero-point correction
(See page 49-15)

POWER STEERING COMPUTER ASSEMBLY (LHD)

COMPONENTS

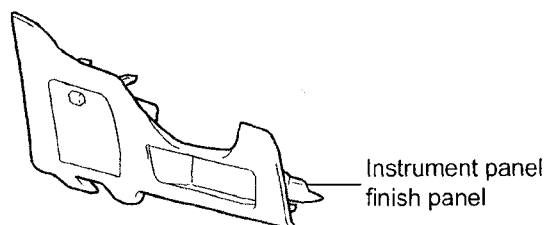
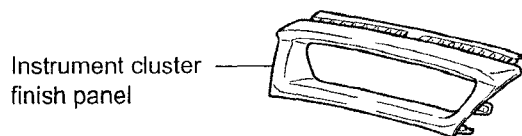
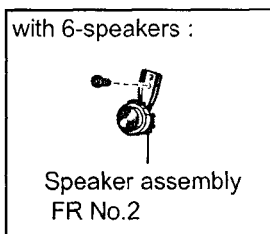
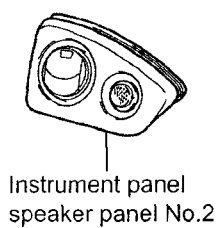
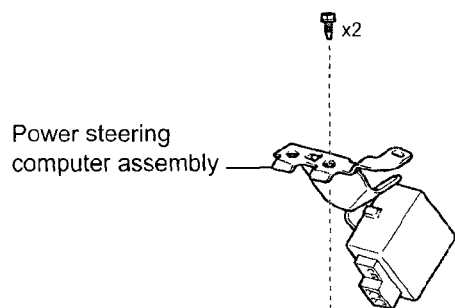
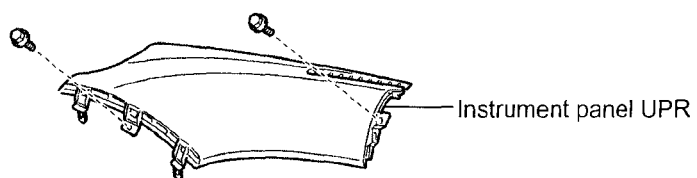
49

with Curtain shield airbag:



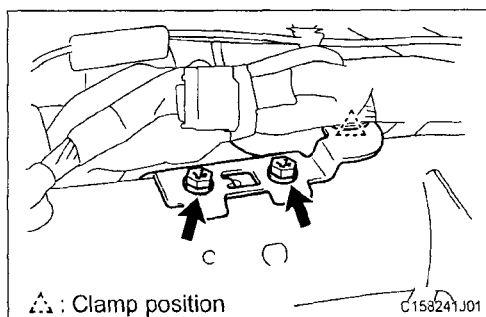
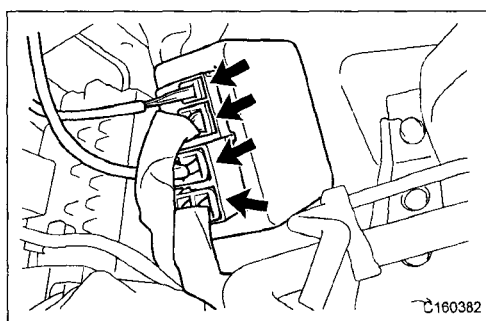
• Non-reusable part

49



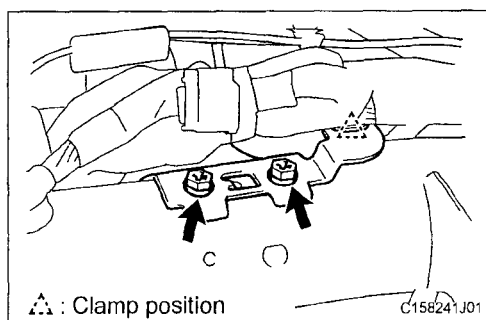
REMOVAL

1. Battery minus terminal disconnection
2. Instrument panel speaker panel No. 2 removal (See page 78-19)
3. Speaker assembly FR No. 2 removal (with 6-speakers) (See page 64-20)
4. Instrument cluster finish panel removal (See page 78-19)
5. Front door scuff plate LH removal (See page 83-14)
6. Cowl side trim LH removal (See page 83-15)
7. Front door opening trim weather strip assembly LH removal (See page 83-19)
8. Front pillar garnish LH removal (with Curtain shield air bag) (See page 83-22)
9. Front pillar garnish LH removal (without Curtain shield air bag) (See page 83-23)
10. Instrument panel UPR removal (LH) (See page 78-20)
11. Instrument panel finish panel LWR removal (See page 27-13)
12. Power steering computer assembly removal
 - (1) Disconnect the wire harness clump.
 - (2) Disconnect 4 connectors from the power steering computer assembly.

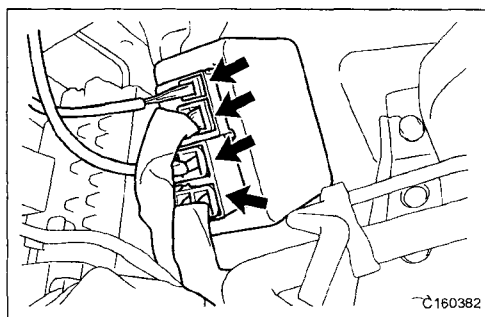


- (3) Remove the clump, and disconnect the wire harness.
- (4) Remove 2 screws, and remove the power steering computer assembly.

INSTALLATION



1. Power steering computer assembly installation
 - (1) Use 2 screws to attach the power steering computer assembly.
 - (2) Attach a wire harness clump to the power steering computer assembly.



- (3) Connect 4 connectors.
- (4) Attach the wire harness clamp.

<CAUTION>

Make sure that connected wire harness is not leaning against a surface.

2. Instrument panel finish panel LWR installation (See page 27-13)
3. Instrument panel UPR installation (LH) (See page 78-32)
4. Front pillar garnish LH installation (without Curtain shield air bag) (See page 83-31)
5. Front pillar garnish LH installation (with Curtain shield air bag) (See page 83-32)
6. Front door opening trim weather strip assembly LH installation (See page 83-35)
7. Cowl side trim LH installation (See page 83-39)
8. Front door scuff plate LH installation (See page 83-39)
9. Instrument cluster finish panel installation (See page 78-33)
10. Speaker assembly FR No. 2 installation (with 6-speakers) (See page 64-21)
11. Instrument panel speaker panel No. 2 installation (See page 78-33)
12. Battery minus terminal connection
Specified value: $T=6.4N \cdot m$ {65kgf*cm}
13. Steering zero-point correction signal initialization
(See page 49-15)
14. Steering zero-point correction
(See page 49-15)