
AUTOMATIC TRANSAXLE

AUTOMATIC TRANSAXLE SYSTEM

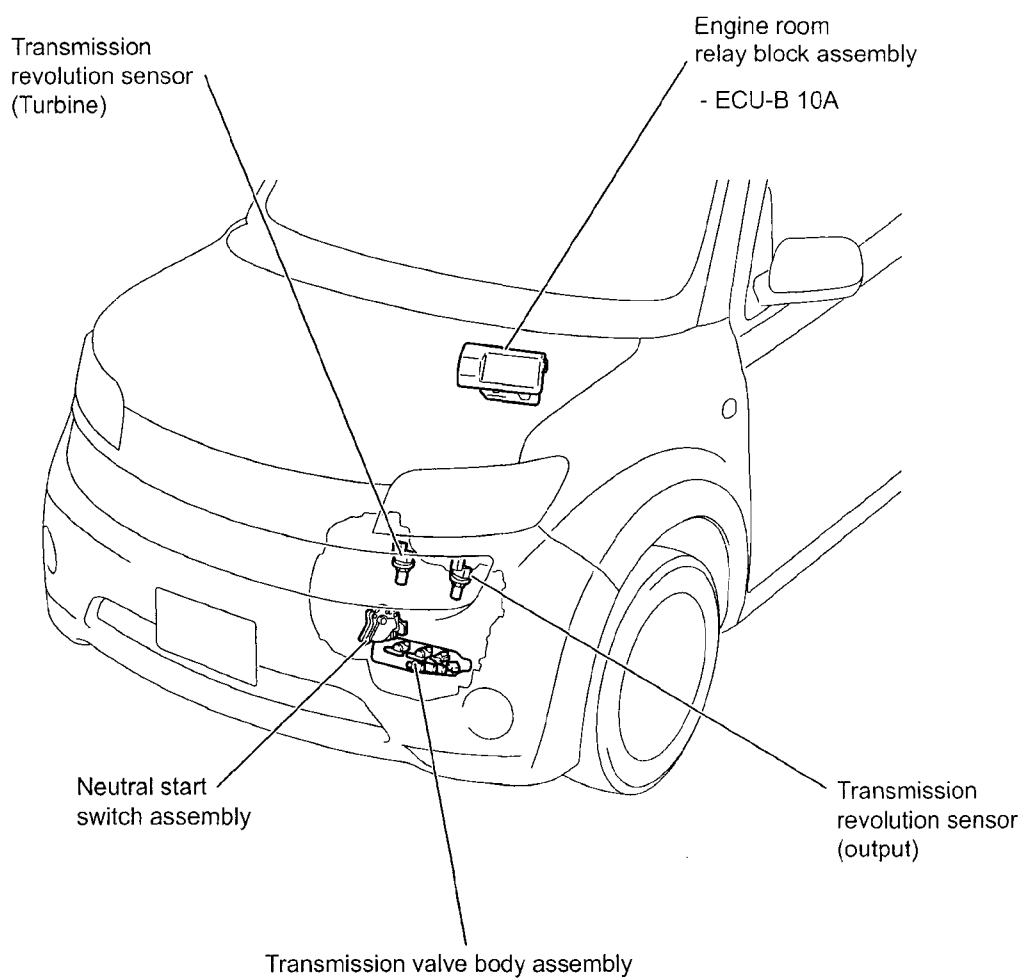
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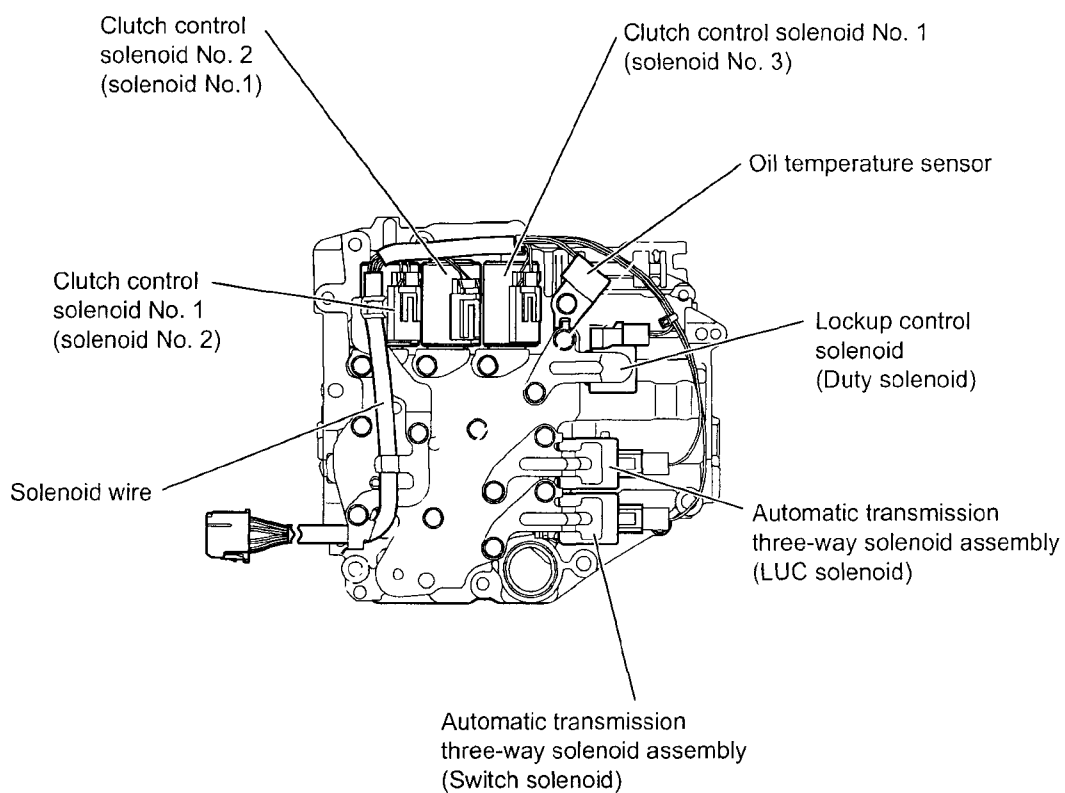
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AUTOMATIC TRANSAXLE SYSTEM

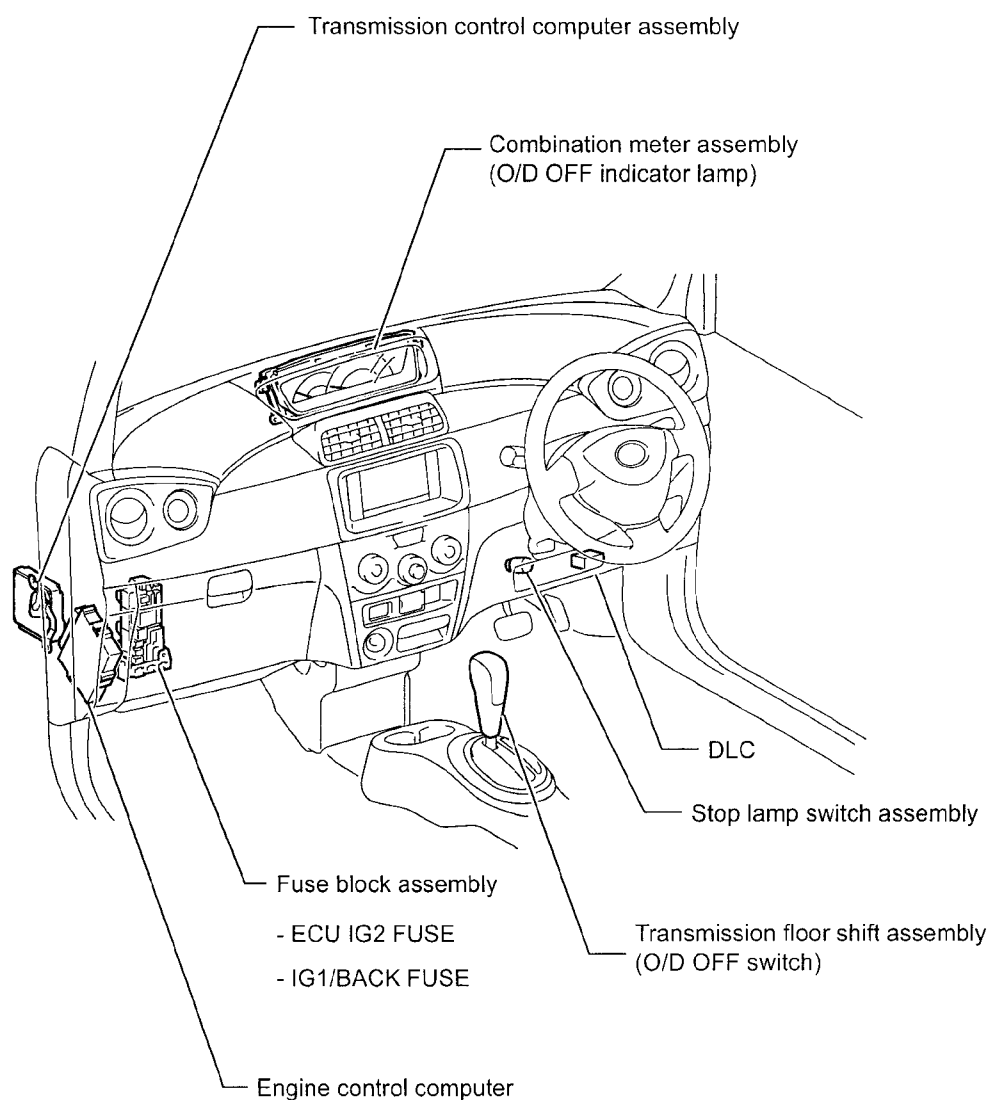
PART LAYOUT



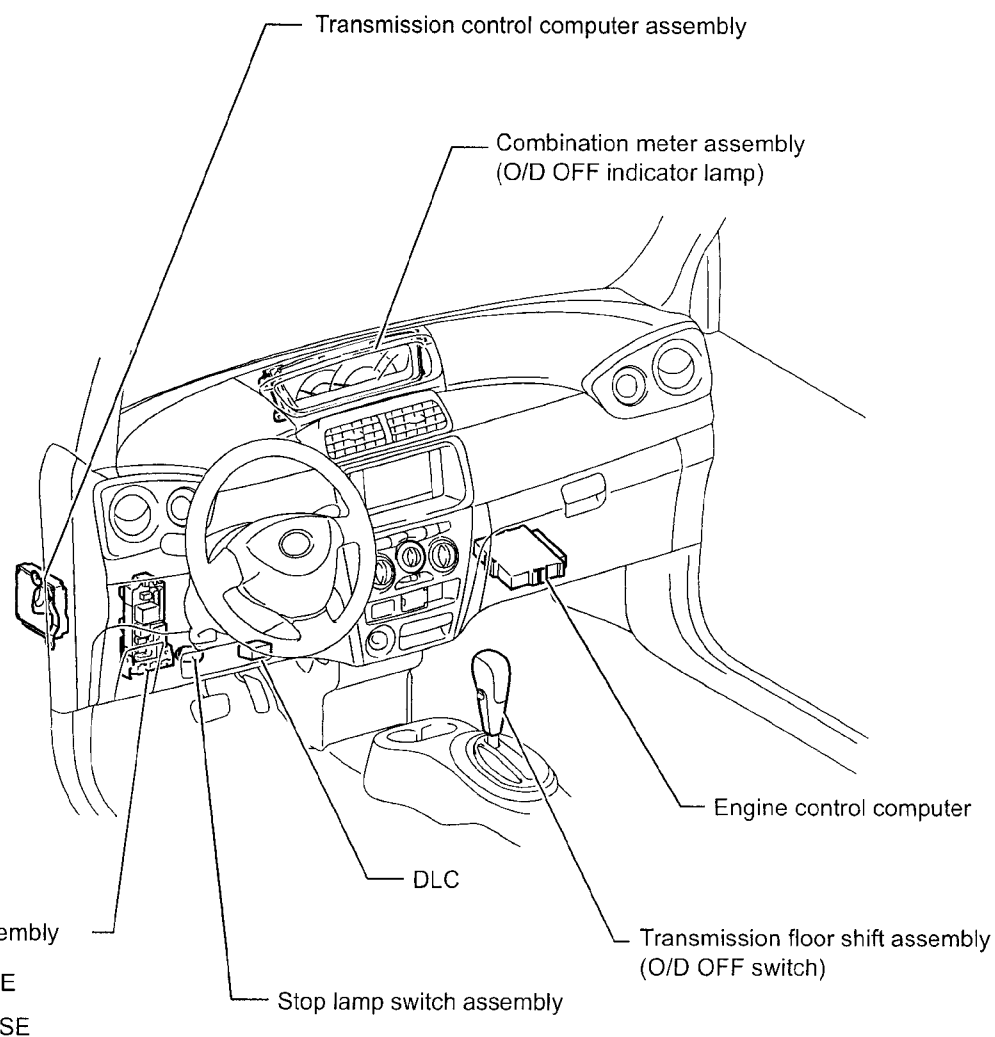
Transmission valve body assembly (bottom view):



RHD:



LHD:



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C159046J01

LIST OF DIAGNOSTIC TROUBLE CODE

Diagnostic trouble code	Diagnosis item	Warning lamp indication	Code memory	Reference page
P0705/55	Without neutral start switch input	×	×	26-28
P0705/56	Neutral start switch multiplexed input	○	○	26-28
P0725/86	Without engine revolution input	○	○	26-37
P0768/64	Duty solenoid circuit break or short circuit	○	○	26-43

Diagnostic trouble code	Diagnosis item	Warning lamp indication	Code memory	Reference page
P0773/65	LUC solenoid circuit break or short circuit	O	O	26-45
P1703/72	Lockup revolution mismatch	O	O	26-47
P1706/31	Engine torque error	O	×	26-49
P1711/41	Throttle sensor signal error	O	×	26-49
P1730/21	Battery system power supply error	O	O	26-50
P1731/22	Sensor system power supply error	O	O	26-52
P1780/66	Switch solenoid break or short circuit	O	O	26-54
U0100/82	EFI communication reception error	O	O	26-56
U1001/85	EFI communication send error	O	O	26-56
P0720/42	Without output revolution input	O	O	26-35
P0710/38	Oil temperature sensor break or short circuit	O	O	26-30
P0711/38	Oil temperature sensor characteristic error	O	O	26-30
P0715/37	Without turbine rotation input	O	O	26-33
P0753/61	Solenoid No. 1 circuit break or short circuit	O	O	26-39
P0758/62	Solenoid No. 2 circuit break or short circuit	O	O	26-39
P0763/63	Solenoid No. 3 circuit break or short circuit	O	O	26-39

LIST BY SYMPTOM

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Symptom	Part to be checked	Reference page
Does not shift up (Any one of the gears, first to third, does not shift up.)	Clutch control solenoid No. 2 (solenoid No. 1)	26-117
	Clutch control solenoid No. 1 (solenoid No. 3)	26-116
	Transmission control computer assembly	26-20
Does not shift up (from third to fourth).	Clutch control solenoid No. 2 (solenoid No. 1)	26-117
	Clutch control solenoid No. 1 (solenoid No. 2)	26-116
	Transmission control computer assembly	26-20
Does not shift down (from fourth to third)	Clutch control solenoid No. 2 (solenoid No. 1)	26-117
	Clutch control solenoid No. 1 (solenoid No. 2)	26-116
	Transmission control computer assembly	26-20
Does not shift down (Any of the gears, third to first, does not shift down.)	Clutch control solenoid No. 2 (solenoid No. 1)	26-117
	Clutch control solenoid No. 1 (solenoid No. 3)	26-116
	Transmission control computer assembly	26-20
No lockup ON or OFF	Lockup control solenoid (duty solenoid)	26-118
	Automatic transmission three-way solenoid assembly (LUC solenoid)	26-115
	Turbine rotation sensor system	26-33
	Stop lamp switch system	60-65
	Water temperature system	06-183
	Transmission control computer assembly	26-20
Speed change point error	Throttle position sensor system	06-169
	Automatic transmission three-way solenoid assembly (switch solenoid)	26-115
	Output speed sensor system	26-35
	Turbine rotation sensor system	26-33
	Neutral start switch assembly system	26-57
	Water temperature system	06-183
	Transmission control computer assembly	26-20

Symptom	Part to be checked	Reference page
Shifts up to fourth while engine is cool	Water temperature system	06-183
	Transmission control computer assembly	26-20
Heavy shift shock (N → D)	Automatic transmission three-way solenoid assembly (switch solenoid)	26-115
	Transmission control computer assembly	26-20
Heavy speed change shock (when any gear is changed)	Throttle position sensor system	06-169
	Automatic transmission three-way solenoid assembly (switch solenoid)	26-115
	Lockup control solenoid (duty solenoid)	26-118
	Turbine rotation sensor system	26-33
	Transmission control computer assembly	26-20
Heavy shock at lockup	Lockup control solenoid (duty solenoid)	26-118
	Automatic transmission three-way solenoid assembly (LUC solenoid)	26-115
	Output speed sensor system	26-35
	Turbine rotation sensor system	26-33
	Transmission control computer assembly	26-20
Inefficient acceleration	Automatic transmission three-way solenoid assembly (switch solenoid)	26-115
	Transmission control computer assembly	26-20
Engine stops when the shift lever is moved to D · R position after the engine is started, or when the vehicle stops.	Automatic transmission three-way solenoid assembly (switch solenoid)	26-115
	Transmission control computer assembly	26-20

FUNCTION DESCRIPTION

1. Diagnosis function

- (1) The O/D OFF indicator lamp flashes if an error occurs in the automatic transaxle system.

<CAUTION>

The indicator does not flash if the system recovers from the error.

- (2) The result of diagnosis when an error occurs is recorded in the transmission control computer.

<CAUTION>

Do not disconnect the battery terminals until the whole checking processing is completed; otherwise, the recorded data of the computer will be lost.

2. Fail-safe function

- (1) If one of the solenoid valve systems is short-circuited or breaks, the computer turns ON or OFF another solenoid. If all the solenoids fail, the system functionally operates only as a hydraulic circuit, requiring manual shifting. (If a solenoid breaks or is short-circuited, the computer stops energizing the solenoid that fails.)

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TROUBLESHOOTING PROCEDURE

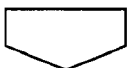
1 PUTTING THE CAR IN THE GARAGE



2 INQUIRY AND PHENOMENON CHECK

<HINT>

(See page 26-9)



3 CAN COMMUNICATION SYSTEM COMMUNICATION FUNCTION CHECK

<HINT>

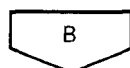
(See page 95-9)

- (1) Using DS-II, check the diagnostic trouble code by selecting [Diagnosis] to [Vehicle diagnosis/Communication error CAN bus diagnosis] to [Diagnosis function/Communication error diagnosis check].

Check result

Tester display	Go to
Diagnostic trouble code of CAN communication system is output.	To A
Diagnostic trouble code of CAN communication system is not output.	To B

A	TO CAN COMMUNICATION SYSTEM
---	-----------------------------



4	DIAGNOSTIC TROUBLE CODE CHECK
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<HINT>

(See page 26-15)

- (1) Diagnostic trouble code and freeze frame data check
 - (a) Record the diagnostic trouble code and freeze frame data.
- (2) Diagnostic trouble code and freeze frame data erase
- (3) Diagnostic trouble code recheck
 - (a) Based on the recorded diagnostic trouble code and freeze frame data, reproduce the trouble and check if the diagnostic trouble code is output again.

Check result

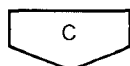
Check result	Go to
Error code is output.	To A
Diagnostic trouble code is normal and the trouble can neither be confirmed nor reproduced.	To B
Diagnostic trouble code is normal and the trouble can be confirmed and reproduced.	To C

<HINT>

- > Diagnostic trouble code list (See page 26-4) if diagnostic trouble code is output
- > See 01-29 for how to simulate the trouble.

A	TO STEP 7
---	-----------

B	TO TROUBLE SIMULATION
---	-----------------------



5	LIST BY SYMPTOM
---	-----------------

<HINT>

(See page 26-6)

Check result

Check result	Go to
Falls under the list by symptom.	To A
Does not fall under the list by symptom.	To B

A	TO STEP 7
---	-----------

B

6 TROUBLESHOOT AS FOLLOWS BASED ON THE SYMPTOM OF THE TROUBLE.

- (1) Data list (See page 26-23)
- (2) Active Test (See page 26-23)
- (3) Manual running test (See page 26-10)
- (4) ECU terminal sequence (See page 26-20)

7 ADJUST, REPAIR, OR REPLACE

- (1) If the place of a trouble can not be identified other than the transmission control computer assembly as a result of diagnosing in accordance with the check procedure, check the circuit again by referring to the descriptions of how to simulate the trouble and how to check the electric circuits.

<HINT>

- > See 01-29 for how to simulate the trouble.
- > See 01-32 for how to check electric circuits and to proceed the checking.

8 CHECK TEST

- (1) Initialize the AT learned value (See page 26-17)
- (2) After initialization, check if no trouble occurs.

END

INQUIRY SHEET

Customer's Name	First Registration Year	Year	Month
	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	____ Vehicle unable to move (____ All shift positions ____ A specific shift position [____ Position])
	____ Does not shift up (____ 1st → 2nd ____ 2nd → 3rd ____ 3rd → 4th)
	____ Does not shift down (____ 4th → 3rd ____ 3rd → 2nd ____ 2nd → 1st)
	____ Poor lock up
	____ Poor gear change
	____ Large gear change shock (N → D or R ____ Lock up ____ During gear change(s)
	____ Poor acceleration (Slipping etc.)
	____ Abnormal sound or vibration
	____ Others (_____)

MIL Condition	____ 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		

FUNCTION CHECK

1 TIME LAG CHECK

<CAUTION>

- > Be sure to check the time lag after checking and adjusting the engine.
- > Check the time lag at oil temperature (70 - 90°C) of the normal running state.
- > Turn off the air conditioner.
- (1) Operate the parking brake and use a sprag.
- (2) Start the engine.
- (3) While stepping down the brake pedal, move the shift lever from the N position to the D or R position while the engine is idling, and measure time until a slight shock is felt.

Specified value: N to D position 1.0 second or less

N to R position 1.0 second or less

<CAUTION>

- > Perform measurement several times and calculate the average value.
- > To successively measure time, provide an interval of 1 minute.

2 STALLED REVOLUTION CHECK

<CAUTION>

- > Be sure to check the time lag after checking and adjusting the engine.
- > Check the time lag at oil temperature (70 - 90°C) of the normal running state.
- > Turn off the air conditioner.
- > Do not check the number of revolutions continuously for 5 seconds and above.
- (1) Operate the parking brake and use a sprag.
- (2) Attach an engine revolution meter and start the engine.
- (3) Strongly step on the brake pedal with your left foot, move the shift lever to the D position, and fully step on the accelerator pedal, and quickly read the maximum number of engine revolutions.

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Specified value

Engine type	Transmission model	Stalled revolution [rpm]
3SZ-VE	A4B	1900 - 2400

3 LINE PRESSURE CHECK

<CAUTION>

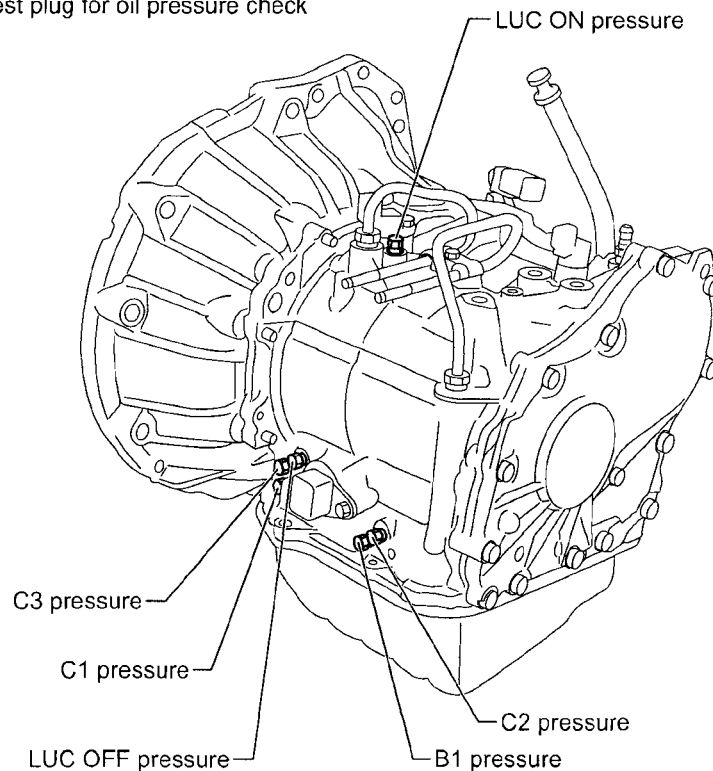
- > Be sure to check the time lag after checking and adjusting the engine.
- > Check the time lag at oil temperature (70 - 90°C) of the normal running state.
- > Turn off the air conditioner.
- > Clean the meters / hose with white gasoline or suchlike before and after measurement.
- > Use a new gasket for the meters.
- > Do not check the line pressure for 5 seconds and above continuously in case the engine stalls.
- > Do not use a test plug that has been used once again.

SST 09325-87201

- (1) Pressure gage attaching procedure

- (a) Operate the parking brake and use a sprag.
- (b) Attach the engine tachometer.
- (c) Remove the test plug and attach SST (A/T pressure gage No. 1 adapter) and pressure gage.

A4B: Positions of test plug for oil pressure check



C148468J01

- (d) Start the engine and warm up the transaxle (oil temperature: 70 - 90°C).
 - (e) After checking the oil pressure, attach a new test plug.
- Specified value: $T=9.8\text{N}\cdot\text{m}$ {100kgf*cm}

(2) C2 pressure check

- (a) Apply the parking brake and use a sprag.
- (b) Start the engine.
- (c) Strongly step on the brake pedal with your left foot, shift to the D position, operate the accelerator pedal with your right foot, and measure the oil pressure.

Specified value

C2 pressure

Measuring condition	Specified value kPa {kgf/cm ² }
At D position and revolution stalled	930 - 1130 {9.4 - 11.4}

(3) C1 pressure check

- (a) Apply the parking brake and use a sprag.
- (b) Start the engine.

- (c) Strongly step on the brake pedal with your left foot, shift to the R position, operate the accelerator pedal with your right foot, and measure the oil pressure.

Specified value

C1 pressure

Measuring condition	Specified value kPa {kgf/cm ² }
At R position and revolution stalled	1520 - 2110 {15.5 - 21.5}

(4) B1 pressure check

- (a) Lift up the vehicle.
(b) Start the engine.
(c) Shift to the D position, gradually step on the accelerator pedal, change to the second, and measure the oil pressure at the number of engine revolutions of 2000 rpm.

Specified value

B1 pressure

Measuring condition	Specified value kPa {kgf/cm ² }
At D position, second, and engine revolution of 2000 rpm	930 - 1130 {9.4 - 11.4}

(5) C3 pressure check

- (a) Lift up the vehicle.
(b) Start the engine.
(c) Shift to the D position, gradually step on the accelerator pedal, change to the third, and measure the oil pressure when the accelerator pedal is "OFF".

Specified value

C3 pressure

26

Measuring condition	Specified value kPa {kgf/cm ² }
At D position, third, and accelerator "OFF" (Lockup OFF)	440 - 640 {4.5 - 6.5}

(6) LUC OFF pressure

- (a) Lift up the vehicle.
(b) Start the engine.
(c) Shift to the D position and measure the oil pressure (oil pressure when lockup is OFF).
(d) Gradually step on the accelerator pedal and change to the fourth. Then gradually accelerate and measure the oil pressure when locked up (oil pressure when lockup is ON).

Specified value

LUC OFF pressure

Measuring condition	Specified value kPa {kgf/cm ² }
At D position, lockup OFF	590 - 750 {6.0 - 7.6}
At D position, lockup ON	20 {0.2} or less

<HINT>

Turn ON lockup at the fourth gear under conditions of a vehicle speed of 57 to 78 km/h and a throttle opening of 5 to 20%.

4	SPEED CHANGE TABLE
---	--------------------

<CAUTION>

- > Be sure to check the time lag after checking and adjusting the engine.
- > In normal running state and at AT oil temperature (70 - 90°C)
- > Turn off the air conditioner.

<HINT>

- > Do not change the gear to the fourth when AT oil temperature is 10°C or less.
- > Do not activate lockup control at an engine coolant temperature of less than 60°C or at an AT oil temperature of less than 20°C.
- > Do not activate lockup control at the 2 - L position.
- > When the throttle is fully closed or when the stop lamp switch is ON, lockup control is canceled.

Specified value

A4B (3SZ-VE)

Throttle opening	Shift position	Speed change	Vehicle speed (km/h)
100%	D position	1st → 2nd	46 - 61
		2nd → 3rd	93 - 108
		3rd → 4th	150 - 165
		4th → 3rd	143 - 158
		3rd → 2nd	87 - 102
		2nd → 1st	35 - 50
0%	D position	1st → 2nd	13 - 28
		2nd → 3rd	25 - 40
		3rd → 4th	38 - 53
		4th → 3rd	22 - 37
		3rd → 2nd	11 - 26
		2nd → 1st	11 - 26
Inhibit	D position	4th → 3rd	150 - 165
		3rd → 2nd	93 - 108
		2nd → 1st	46 - 61

Lockup

Throttle opening	Gear position	Lockup	Vehicle speed (km/h)
5 - 20%	3rd	ON	-
	3rd	OFF	-
	4th	ON	58 - 81
	4th	OFF	52 - 71

5	RUNNING TEST
---	--------------

<WARNING>

Conduct the test, thoroughly checking the road for safety.

<CAUTION>

- > Be sure to check the time lag after checking and adjusting the engine.
- > Check the time lag at oil temperature (70 - 90°C) of the normal running state.
- > Turn off the air conditioner.

<HINT>

Running test list

Item to be checked	Check and confirmation procedure
D position speed change function	Check if the speed changes between the first, second, third and fourth while the vehicle is running normally (on an ordinary city road).
Speed change shock level during running at D position	Check the shock level when the gear is shifted up each time while the vehicle is running normally.
Operation of O/D OFF switch	Turn the O/D OFF switch OFF and ON with the shift lever at the D position and in a speed region of the fourth gear, and check if the speed changes between the fourth and the third.
Kickdown function	> Perform a kickdown operation at each gear, and check if the speed shifts down. > Check the shock level during the kickdown operation.
Action of engine brake	> While the vehicle is running at the D position and at the third gear (approx. 40 to 50 km/h), shift from the D to the second position, and check the action of the engine brake at the second gear. > While the vehicle is running at the second position and at the second gear (approx. 20 to 30 km/h), shift from the second to the L position, and check the action of the engine brake at the first gear.
Speed change point when accelerator pedal is fully opened	Start the vehicle at the D position and by fully opening the accelerator pedal, and check if the shift-up speed from the first to the second matches the speed change point.
Lockup function	While the vehicle is running on a level surface at a constant speed in the lockup speed region, check if the number of engine revolutions does not substantially change when the accelerator pedal is lightly stepped on.
Operation of P position	Stop the vehicle on a slope (approx. 5° and above), shift to the P position, and release the parking brake. Check if the vehicle does not move.
Abnormal sound, vibration	Check abnormal sound and vibration while the vehicle is running and when the speed is changed.
Ascending/descending slope control function	> Check if shifting up to the fourth gear is prohibited while the vehicle is going up a slope. > Check if the gear shifts down to the third when the brake is applied while the vehicle is going down a slope at the fourth gear with the accelerator fully closed.
Oil leakage	Check each part for oil leakage after the running test.

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6

MANUAL RUNNING TEST

- (1) Disconnect the connector of the solenoid wire.
- (2) Check if the gear is changed in accordance with each position of the shift level while the vehicle is running.

Reference

Shift lever position	Position
D position (O/D OFF switch: ON)	Third
D position (O/D OFF switch: OFF)	Third
Second position	Third
L position	Third

DIAGNOSTIC TROUBLE CODE CHECK / ERASE

1 DIAGNOSTIC TROUBLE CODE CHECK BY DS-II

- (1) Using DS-II, display [OBD] to [A/T] screen in accordance with the instructions, and select [DTC].
- (2) Check the diagnostic trouble code.

<HINT>

If freeze frame data is recorded, [!] is displayed at the leftmost position, and the color of the row changes.

2 DS-II FREEZE FRAME DATA

- (1) Using DS-II, display [OBD] to [A/T] screen in accordance with the instructions, and select [DTC].
- (2) Select the diagnostic trouble code (indicated by !) for which freeze frame data is recorded.

<HINT>

- > The state of the automatic transaxle (ECU data) when the diagnostic trouble code is output can be learned.
- > Check the trouble information on the inquiry and the diagnostic trouble code list for matching.
- > After repair, conduct a test for confirmation by referring to the running state that could be confirmed above.

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3 DIAGNOSTIC TROUBLE CODE MEMORY ERASE BY DS-II

- (1) Using DS-II, display [OBD] to [A/T] screen in accordance with the instructions, and select [DTC].
- (2) Select [Clear] from the screen and erase the data.

<CAUTION>

A diagnostic trouble code and freeze frame data are erased at the same time.

4 CHECKING DIAGNOSTIC TROUBLE CODE BY O/D OFF INDICATOR LAMP

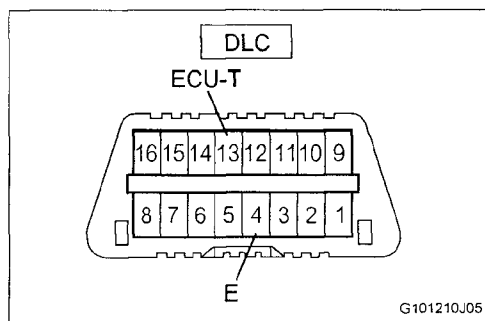
SST 09991-87403, 09991-87404

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

<CAUTION>

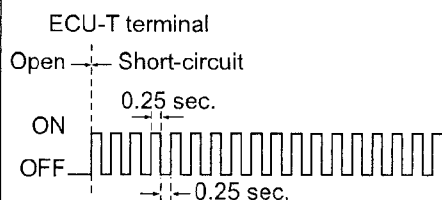
Never short circuit a wrong position as it causes a fault.

- (2) Turn IG on..

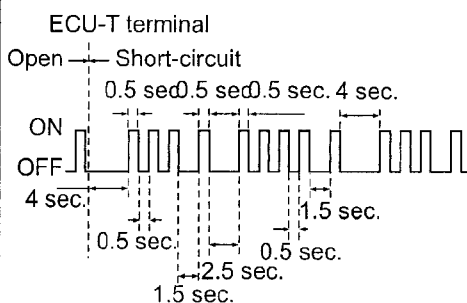


Code display pattern by O/D OFF code indicator lamp

Normal code



Malfunction code (Code "31" and "41")



C140224J02

- (3) Read the diagnostic trouble code (the number of times the O/D OFF indicator lamp flashes).

<HINT>

- > In the normal state, the indicator repeatedly lights for 0.25 seconds and goes out for 0.25 seconds.
- > If there is only one diagnostic trouble code, the same code is output at intervals of 4 seconds. If there are two or more diagnostic trouble codes, different codes are output at intervals of 2.5 seconds. When all the codes have been output, the codes are output again 4 seconds later.
- > Two or more code numbers are output starting from the one with the lowest code number.

- (4) Turn IG off.

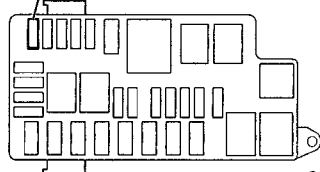
- (5) Release between terminals 13 (ECU-T) and 4 (E) of DLC.

5

DIAGNOSTIC TROUBLE CODE MEMORY ERASE BY PULLING OUT FUSE

Engine room relay block assembly

ECU-B fuse



C143883J01

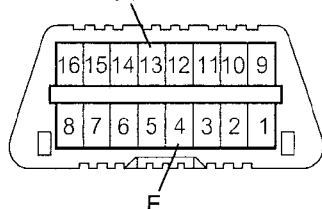
- (1) Remove the ECU-B fuse from the engine room relay block assembly, wait for 30 seconds or more, and then connect the fuse.

<CAUTION>

Until the cause of the diagnostic trouble code is made clear, do not erase the diagnostic trouble code by clearing the battery (i.e., pulling out the fuse).

DLC

ECU-T



G101210J05

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

<CAUTION>

Never short circuit a wrong position as it causes a fault.

SST 09991-87403, 09991-87404

- (3) Turn IG on.

- (4) Check if the normal code is output.

<CAUTION>

If an error code is output, make a repair again in accordance with the code.

FREEZE FRAME DATA

1. Freeze frame data list

- (1) Using DS-II, select [OBD] to [A/T] to [DTC] in accordance with the instructions on the screen, and select the diagnostic trouble code (indicated by "I") for which freeze frame data is recorded, from the screen.

<HINT>

- > Check the trouble information on the inquiry and the diagnostic trouble code list for matching.
- > After repair, conduct a test for confirmation by referring to the running state that could be confirmed above.

Item name	Abbreviation
Vehicle speed	SPD
Shift position	SHFT
SOL1 current	SOL1
SOL2 current	SOL2
SOL3 current	SOL3
DUTY solenoid	DUTY
LUC solenoid	LUC
Switch solenoid	SW
Battery voltage	VOLT
O/D OFF switch	O/D
Throttle opening	TANG
Oil temperature	OTMP
Gear position	GEAR
Gear ratio	RATO
Engine revolution speed	RENG
Turbine rotation speed	RTBN
Output revolution speed	ROPT

MEMORY-RELATED WORKS

<CAUTION>

- 26** > If any of the automatic transaxle assembly, transmission valve body assembly or solenoids has been replaced, initialize the AT learned value.

- > After initializing the AT learned value, perform AT initial learning.

<HINT>

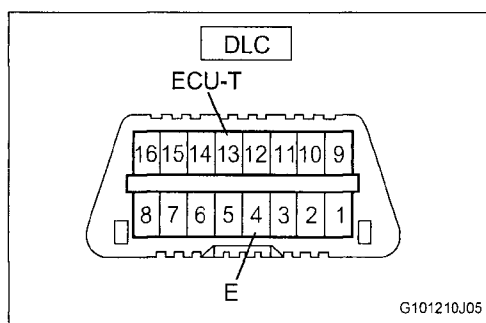
Mere removal of the battery does not automatically initialize learned values.

1 AT LEARNING VALUE INITIALIZATION (ERASE BY DS-II)

- (1) Connect DS-II to DLC.
- (2) Turn IG on (Do not start the engine).
- (3) Using DS-II and performing operations in accordance with the screen instructions, select [Utility] to [A/T] from the main menu.
- (4) Select [Reset Memory] and initialize the AT learned value.
- (5) Turn IG off.

2 AT LEARNING VALUE INITIALIZATION (ERASE BY DLC SHORT CIRCUIT)

SST 09991-87403, 09991-87404



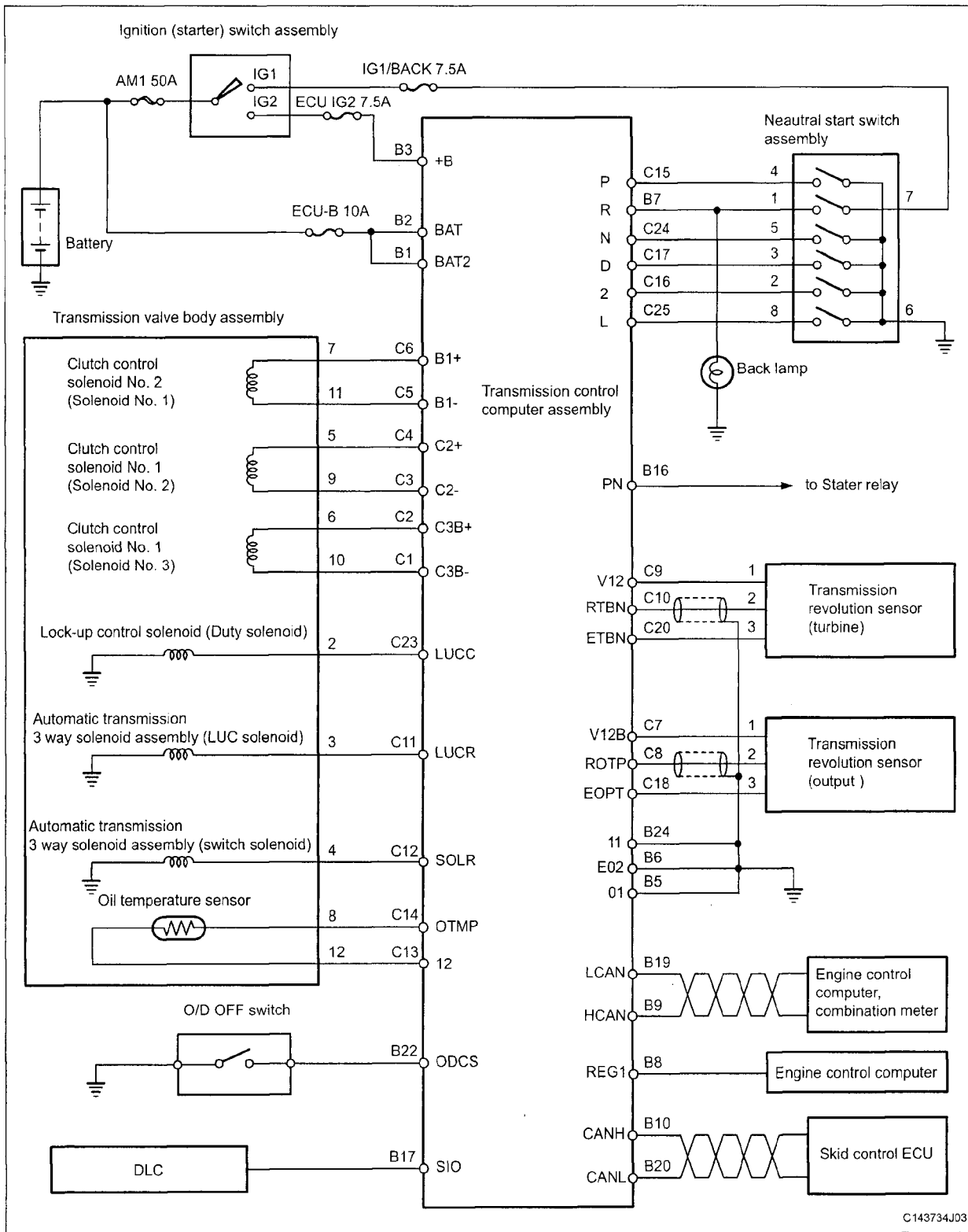
- (1) Short-circuit between the terminals 13 (ECU-T) and 4 (E) of DLC using SST.
<CAUTION>
Never short circuit a wrong position as it causes a fault.
- (2) Turn IG on (Do not start the engine). Step on the brake pedal within three seconds and hold it down until erasing is complete.
- (3) Move the shift lever from P to R to P within one second (The whole operation of moving from P to R to P should be complete within one second).
- (4) Repeat operation (3) above eight times (when erasing has been completed, the O/D OFF indicator lamp quickly flashes for 2.5 seconds).
- (5) Break the DLC short circuit.
- (6) Turn IG off.

3

AT INITIAL LEARNING

- (1) Start the engine and fully warm up the engine and the automatic transaxle.
<HINT>
AT initial learning begins when the transmission oil temperature reaches 50°C or above.
- (2) Implement initial learning (driving in an urban area for approx. 15 minutes) (Run through all gear changes and kickdown operations).

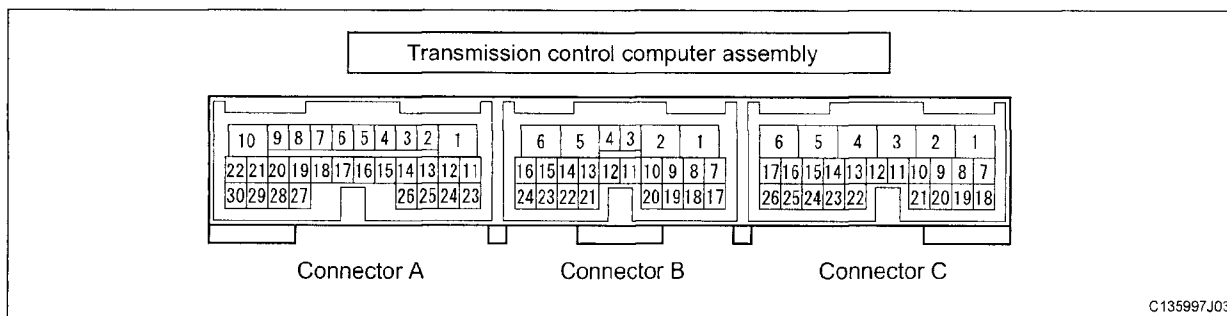
CIRCUIT DIAGRAM



C143734J03

ECU TERMINAL SEQUENCE

1. Transmission control computer assembly



<HINT>

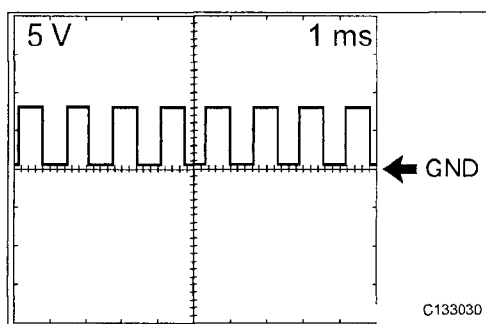
Connector A is not used.

Terminal layout

Terminal symbol [Terminal number]	Input/output	Item	Measuring condition	Specified value
RTBN ↔ 11 [C10 ↔ B24]	Input	Waveform	Engine idling	Waveform 1
ROTP ↔ 11 [C8 ↔ B24]	Input	Waveform	At vehicle speed of 20 km/h	Waveform 2
V12 ↔ 11 [C9 ↔ B24]	Output	Voltage	Engine stop, IG ON	9 - 14 V
V12B ↔ 11 [C7 ↔ B24]	Output	Voltage	Engine stop, IG ON	9 - 14 V
REG1 ↔ 11 [B8 ↔ B24]	Output	Waveform	Engine idling	Waveform 3
P ↔ 11 [C15 ↔ B24]	Input	Voltage	Shift lever at P position	0 - 1.5 V
			Shift lever not at P position	7.5 - 14 V
R ↔ 11 [B7 ↔ B24]	Input	Voltage	Shift lever at R position	7.5 - 14 V
			Shift lever not at R position	0 - 1.5 V
N ↔ 11 [C24 ↔ B24]	Input	Voltage	Shift lever at N position	0 - 1.5 V
			Shift lever not at N position	7.5 - 14 V
D ↔ 11 [C17 ↔ B24]	Input	Voltage	Shift lever at D position	0 - 1.5 V
			Shift lever not at D position	7.5 - 14 V
2 ↔ 11 [C16 ↔ B24]	Input	Waveform	Shift lever at 2nd position	0 - 1.5 V
			Shift lever not at 2nd position	7.5 - 14 V
L ↔ 11 [C25 ↔ B24]	Input	Voltage	Shift lever at L position	0 - 1.5 V
			Shift lever not at L position	7.5 - 14 V
OTMP ↔ 12 [C14 ↔ C13]	Input	Voltage	Transmission oil temperature: 20°C	3.4 V
			Transmission oil temperature: 80°C	1.1 V
B1+ ↔ B1- [C6 ↔ C5]	Output	Waveform	Engine idling	Waveform 4
C2+ ↔ C2- [C4 ↔ C3]	Output	Waveform	Engine idling	Waveform 5
C3B+ ↔ C3B- [C2 ↔ C1]	Output	Waveform	Engine idling	Waveform 6
LUCC ↔ E02 [C23 ↔ B8]	Output	Waveform	Engine idling	Waveform 7
LUCR ↔ E02 [C11 ↔ B6]	Output	Voltage	Engine idling	0 - 1.5 V → 9 - 14 V
SOLR ↔ E02 [C12 ↔ B6]	Output	Voltage	Engine idling	0 - 1.5 V → 9 - 14 V
+B ↔ E02 [B3 ↔ B6]	Output	Voltage	Engine stop, IG ON	11 - 14 V
HCAN ↔ 11 [B9 ↔ B24]	Input/output	Waveform	IG ON	Pulse generation

Terminal symbol [Terminal number]	Input/output	Item	Measuring condition	Specified value
LCAN ↔ 11 [B19 ↔ B24]	Input/output	Waveform	IG ON	Pulse generation
CANH ↔ 11 [B10 ↔ B24]	Input/output	Waveform	IG ON	Pulse generation
CANL ↔ 11 [B20 ↔ B24]	Input/output	Waveform	IG ON	Pulse generation
PN ↔ body earth [B16 ↔ body earth]	Input	Voltage	Shift position: P or N Starter ON	1 V and below
			Shift position: Other than P and N Starter ON	11 - 14 V
ODCS ↔ body earth [B22 ↔ body earth]	Input	Voltage	O/D OFF switch OFF → ON	11 - 14 V → 1 V and below
SIO ↔ body earth [B17 ↔ body earth]	Input/output	Waveform	While communication is established by connecting DS-II to DLC	Waveform 8
+B ↔ E02 [B3 ↔ B6]	Input	Voltage	IG ON	11 - 14 V
BAT ↔ E02 [B2 ↔ B6]	Input	Voltage	Continuously	11 - 14 V
BAT2 ↔ E02 [B1 ↔ B6]	Input	Voltage	Continuously	11 - 14 V
11 ↔ body earth [B24 ↔ body earth]	-	Electrical continuity	Continuously	With electrical continuity
ETBN ↔ body earth [C20 ↔ body earth]	-	Electrical continuity	Continuously	With electrical continuity
EOPT ↔ body earth [C18 ↔ body earth]	-	Electrical continuity	Continuously	With electrical continuity
E02 ↔ body earth [B6 ↔ body earth]	-	Electrical continuity	Continuously	With electrical continuity
01 ↔ body earth [B5 ↔ body earth]	-	Electrical continuity	Continuously	With electrical continuity

26



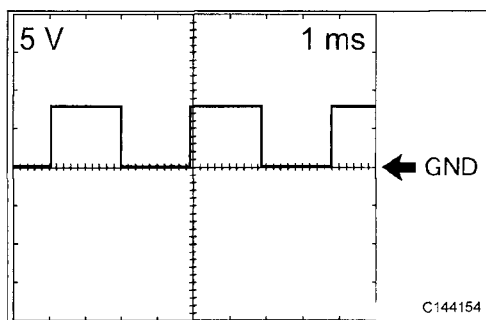
(1) Waveform 1 (turbine rotation sensor signal)

Item	Description
Measuring terminal (Terminal symbol)	C10 ↔ B24 (RTBN ↔ 11)
Measuring equipment set	5 V/DIV, 1 ms/DIV
Measuring condition	Engine idling

<HINT>

- > As the turbine rotation increases, the cycle shortens.
- > The waveform is measured at an engine revolution of 1360 rpm.

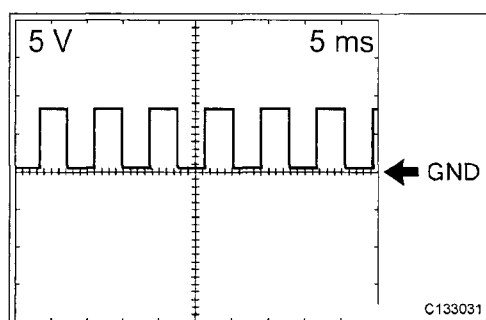
(2) Waveform 2 (output speed sensor signal)



Item	Description
Measuring terminal (Terminal symbol)	C8 ↔ B24 (ROPT ↔ 11)
Measuring equipment set	5 V/DIV, 1 ms/DIV
Measuring condition	At vehicle speed of 20 km/h

<HINT>

- As the output revolution (vehicle speed) increases, the cycle shortens.



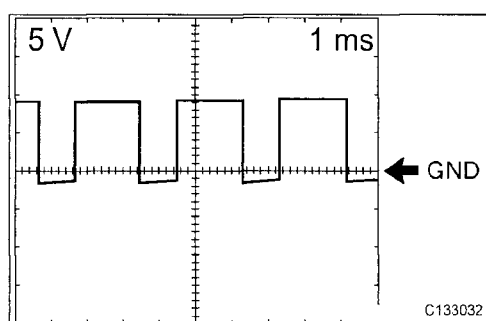
(3) Waveform 3 (engine revolution signal)

Item	Description
Measuring terminal (Terminal symbol)	B8 ↔ B24 (REG1 ↔ 11)
Measuring equipment set	5 V/DIV, 5 ms/DIV
Measuring condition	Engine idling

<HINT>

- > As the number of engine revolutions increases, the cycle shortens.
- > The waveform is measured at an engine revolution of 1100 rpm.

(4) Waveform 4 (solenoid No. 1)

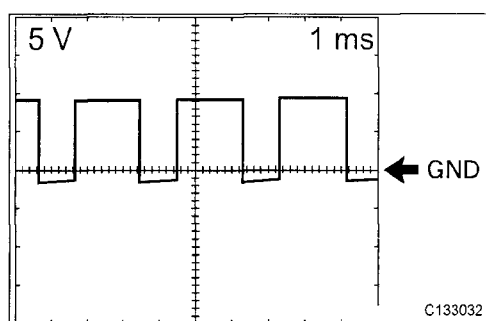


Item	Description
Measuring terminal (Terminal symbol)	C6 ↔ C5 (B1+ ↔ B1-)
Measuring equipment set	5 V/DIV, 1 ms/DIV
Measuring condition	When solenoid is applied current (D position, 2nd or 4th gear)

<HINT>

- > The duty ratio decreases during the gear shift transient period.
- > Waveform cycle is 300 Hz.

(5) Waveform 5 (solenoid No. 2)

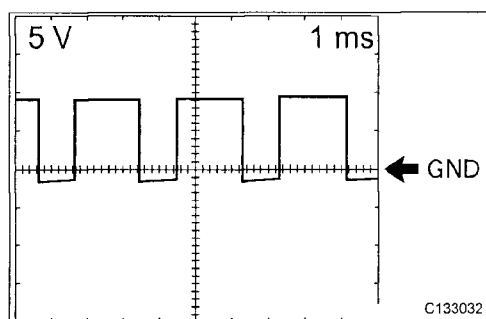


Item	Description
Measuring terminal (Terminal symbol)	C4 ↔ C3 (C2+ ↔ C2-)
Measuring equipment set	5 V/DIV, 1 ms/DIV
Measuring condition	When solenoid is applied current (P, N, R, D position, 4th gear)

<HINT>

- > The duty ratio decreases during the gear shift transient period.
- > Waveform cycle is 300 Hz.

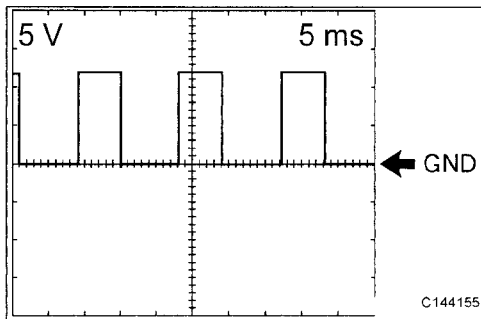
(6) Waveform 6 (solenoid No. 3)



Item	Description
Measuring terminal (Terminal symbol)	C2 ↔ C1 (C3B+ ↔ C3B-)
Measuring equipment set	5 V/DIV, 1 ms/DIV
Measuring condition	When solenoid is applied current (P, N, D position, 1st or 2nd gear)

<HINT>

- > The duty ratio decreases during the gear shift transient period or when the line pressure is adjusted.
- > Waveform cycle is 300 Hz.

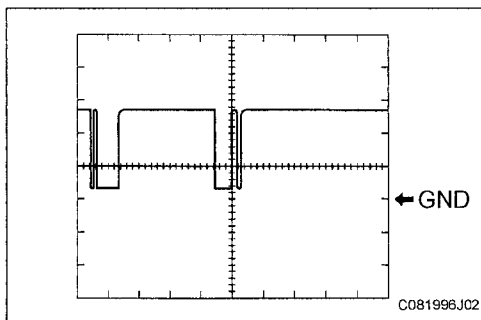


(7) Waveform 7 (duty solenoid)

Item	Description
Measuring terminal (Terminal symbol)	C23 ↔ B6 (LUCC ↔ E02)
Measuring equipment set	5 V/DIV, 5 ms/DIV
Measuring condition	At slip lockup

<HINT>

The duty ratio is 100% at direct lockup



(8) Waveform 8 (diagnosis communication line)

Item	Description
Measuring terminal (Terminal symbol)	B17 ↔ body earth (SIO ↔ body earth)
Measuring equipment set	5 V/DIV, 1 ms/DIV
Measuring condition	While communication is established by connecting DS-II to DLC

ECU DATA MONITOR/ACTIVE TEST

1	DATA LIST
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<CAUTION>

- > The computer data significantly vary due to small measurement error, difference in the measuring environment, deterioration of the vehicle with age and so on and it is difficult to indicate the clear basic value (criteria). Therefore, the value in the range of the reference value may not be accepted.
- > For a delicate phenomenon such as breathing and rough idle, it is necessary to use a technique to collect and compare data of vehicles of the same model under the same condition and to make comprehensive judgment, taking all the items of computer data into account.

- (1) Using DS-II, operate in accordance with the screen instructions and display the [OBD] to [A/T] to [Data List] screen, and check the computer data.

Item name [Symbol]	Item description	Check condition	Reference value	Check item in case of failure
Vehicle speed [SPD]	Indicates the vehicle speed. Display range: -255 km/h	When the vehicle stops	0 km/h	SPD signal
		When vehicle runs at constant speed	No significant change	

Item name [Symbol]	Item description	Check condition	Reference value	Check item in case of failure
Shift position [SHFT]	Indicates state of shift position	Without shift position input	No ind	Neutral start switch system
		Shift position At P position	P	
		Shift position At R position	R	
		Shift position At N position	N	
		Shift position At D position	D	
		Shift position At 2nd position	2	
		Shift position At L position	L	
SOL1 current [SOL1]	Indicates state of current application to solenoid No. 1. Display range: 0 to 2550 mA	Solenoid No. 1 OFF → ON	0 - 1000 mA*1	Solenoid No. 1
SOL2 current [SOL2]	Indicates state of current application to solenoid No. 2. Display range: 0 to 2550 mA	Solenoid No. 2 OFF → ON	0 - 1000 mA*1	Solenoid No. 2
SOL3 current [SOL3]	Indicates state of current application to solenoid No. 3. Display range: 0 to 2550 mA	Solenoid No. 3 OFF → ON	0 - 1000 mA*1	Solenoid No. 3
DUTY solenoid [DUTY]	Indicates operation state of duty solenoid. Display range: 0 to 100%	Duty solenoid OFF → ON	0 - 100%	Duty solenoid
LUC solenoid [LUC]	Indicates operation state of lockup solenoid.	Lockup solenoid OFF → ON	OFF → ON	LUC solenoid
Switch solenoid [SW]	Indicates operation state of switch solenoid.	Switch solenoid OFF → ON	OFF → ON	Switch solenoid
Battery voltage [VOLT]	Indicates battery voltage. Display range: 0 to 25.5 V	IG ON	-	Battery
O/D OFF switch [O/D]	Indicates state of O/D OFF switch.	O/D OFF switch ON → OFF	ON → OFF	O/D OFF switch
Steer mode selection SW [STR]	(Not used)	-	-	-
Upshift switch [UPSW]	(Not used)	-	-	-
Downshift switch [DNSW]	(Not used)	-	-	-

Item name [Symbol]	Item description	Check condition	Reference value	Check item in case of failure
Brake switch [BRKS]	Indicates state of stop lamp switch.	Brake pedal Release → Press on	OFF → ON	Engine control computer (Stop lamp switch signal)
Throttle opening [TANG]	Indicates opening of throttle. Display range: 0 to 100%	Accelerator pedal Fully closed Fully opened	Continuously changes depending on the operation of the accelerator pedal	Throttle position sensor
Oil temperature [OTMP]	Indicates ATF temperature. Display range: -50°C -205ÅãC	At low temperature, IG ON	Equivalent to outside air temperature	OTMP voltage
		After stall test	80°C	
		IG ON	205°C (Sensor short circuit)	
		IG ON	-50°C (Sensor disconnection)	
Gear position [GEAR]	Indicates to which position the transmission control computer assembly controls the gear.	Displays the present gear position while vehicle is running	N	Transmission control computer assembly
			1st	
			2nd	
			3rd	
			4th	
			Rev	
			2ndL (2nd, lockup)	
			3rdL (3rd, lockup)	
			4thL (4th, lockup)	
Gear ratio [RATO]	Indicates gear ratio. Display range: 0 to 4.000	-	-	-
Torque converter slip [SLIP]	Indicates the slip amount of the torque converter calculated from the number of engine revolutions and the number of turbine rotations (IG ON → IG OFF). Display range: -5120 to 5080 rpm	-	-	-
Gear indicator [GIND]	Indicates the gear position on the gear indicator.	Gear position selected while the vehicle is running	1st 2nd 3rd 4th	Transmission control computer assembly
Engine revolution speed [RENG]	Indicates the engine speed. Display: rpm	At engine stop (IG ON)	0 rpm	Engine control computer (N signal)
		At constant engine speed	No significant change	

Item name [Symbol]	Item description	Check condition	Reference value	Check item in case of failure
Turbine rotation speed [RTBN]	Indicates the input number of revolutions. Display: rpm	When the vehicle stops with shift lever at P / N position (When engine is idling)	Almost same as the number of engine revolutions during idling	RTBN signal
		When the vehicle stops with shift lever at D position	0 rpm	
		When vehicle runs at constant speed	Same as the number of engine revolutions	
Output revolution speed [ROPT]	Indicates the output number of revolutions. Display: rpm	When the vehicle stops	0 rpm	ROPT signal
		When vehicle runs at constant speed	No significant change	
Number of diagnosis codes [DIAG]	Indicates the number of diagnostic trouble codes recorded	-	-	-

*1: May exceed 1000 mA because of current feedback

2	ACTIVE TEST
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(1) Using DS-II, operate in accordance with the screen instructions, display the [OBD] to [A/T] to [Active Test] screen, and conduct an active test.

Item name	Test description	Restrictions
Solenoid No.1 [LS1C]	Turning ON (applied current: 1 A)/OFF (applied current: 0 A) solenoid No. 1	> Shift position: P position > Engine stop, IG ON > While vehicle stops > Throttle opening: Fully closed
Solenoid No.2 [LS2C]	Turning ON (applied current: 1 A)/OFF (applied current: 0 A) solenoid No. 2	> Shift position: P position > Engine stop, IG ON > While vehicle stops > Throttle opening: Fully closed
Solenoid No.3 [LS3C]	Turning ON (applied current: 1 A)/OFF (applied current: 0 A) solenoid No. 3	> Shift position: P position > Engine stop, IG ON > While vehicle stops > Throttle opening: Fully closed
DUTY solenoid [DS1 DUTY]	Turning ON (duty ratio: 100%)/OFF (duty ratio: 0%) duty solenoid	> Shift position: P position > Engine stop, IG ON > While vehicle stops > Throttle opening: Fully closed
LUC solenoid [LUCSOL]	Turning ON/OFF LUC solenoid (non-conduction)	> Shift position: P position > Engine stop, IG ON > While vehicle stops > Throttle opening: Fully closed
Switch solenoid [SWSOL]	Turning ON/OFF switch solenoid (non-conduction)	> Shift position: P position > Engine stop, IG ON > While vehicle stops > Throttle opening: Fully closed

FAIL-SAFE LIST

If any of the following diagnostic trouble codes is recorded in ECU, the fail-safe mode is set.

DTC No.	Fail-safe control description	Fail-safe control cancellation condition
P1730/21	Fixed to third gear	Turn IG off after recovery is made.
P1731/22	Fixed to third gear	Turn IG off after recovery is made.
P1706/31	> Keep the engine torque constant. > Change the gear to the third on detection of a fault, and then change the gear between the first to the third depending on the vehicle speed and the throttle opening.	Canceled with shift lever at P or N position and at vehicle speed of 0 km/h after recovery is made
P0715/37	Change the gear to the third on detection of a fault, and then change the gear between the first to the third depending on the vehicle speed and the throttle opening.	Canceled with shift lever at P or N position and at vehicle speed of 0 km/h after recovery is made
P0710/38	Change the gear to the third on detection of a fault, and then change the gear between the first to the third depending on the vehicle speed and the throttle opening.	Canceled with shift lever at P or N position and at vehicle speed of 0 km/h after recovery is made
P1711/41	> Change the gear to the third on detection of a fault, and then change the gear between the first to the third depending on the vehicle speed and the throttle opening. > Keep the throttle opening constant.	Canceled with shift lever at P or N position and at vehicle speed of 0 km/h after recovery is made
P0720/42	> The gear is held on detection of a fault if the fault is in the sensor system, and is shifted to the first once the vehicle has stopped. > The gear is fixed to the first in case of a fault in the A/T system.	> Canceled with shift lever at P or N position and at vehicle speed of 0 km/h after recovery is made, in case of a fault in the sensor system > Canceled by turning IG off after recovery is made, in case of a fault in the A/T system
P0705/55 P0705/56	Normal speed change control is performed with the shift lever at D position.	Canceled when recovery is made.
P0753/61 P0758/62 P0763/63 P0768/64 P0773/65 P1780/66	> Applying current to a solenoid that has been judged defective is prohibited. > When a solenoid is short-circuited, the speed is changed between the first and the third by using a normal solenoid. If solenoid No. 3 or switch solenoid is short-circuited, however, the gear is fixed to the third. > If a solenoid breaks or if two or more solenoids fail, the gear is fixed to the third.	Turn IG off after recovery is made.
P1703/72	Lockup is prohibited.	Canceled with shift lever at P or N position and at vehicle speed of 0 km/h after recovery is made
U0100/82	> The throttle opening and engine torque are held constant. > Change the gear to the third on detection of a fault, and then change the gear between the first to the third depending on the vehicle speed and the throttle opening.	Canceled with shift lever at P or N position and at vehicle speed of 0 km/h after recovery is made
U1001/85	> The throttle opening and engine torque are held constant. > Change the gear to the third on detection of a fault, and then change the gear between the first to the third depending on the vehicle speed and the throttle opening.	Canceled with shift lever at P or N position and at vehicle speed of 0 km/h after recovery is made
P0725/86	Change the gear to the third on detection of a fault, and then change the gear between the first to the third depending on the vehicle speed and the throttle opening.	Canceled with shift lever at P or N position and at vehicle speed of 0 km/h after recovery is made

DTC	P0705/55	NO INPUT FROM NEUTRAL START SWITCH
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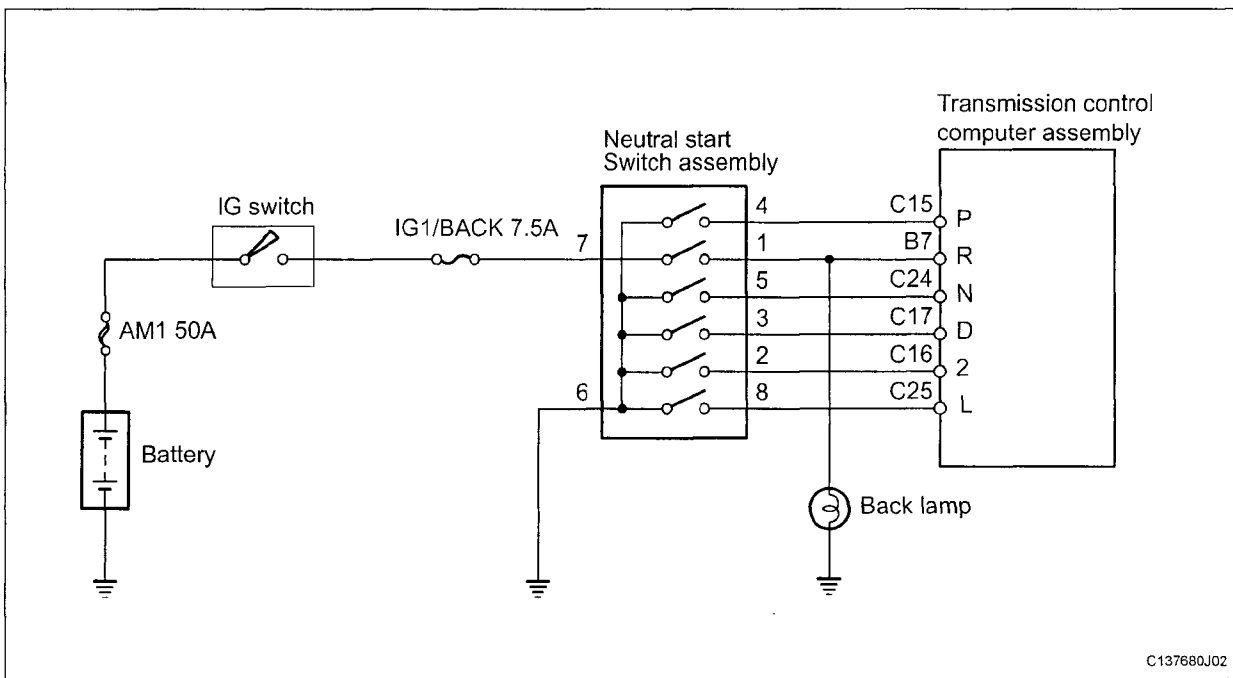
DTC	P0705/56	MULTIPLE INPUT FROM NEUTRAL START SWITCH
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Function description

The shift position is detected by inputting the signal from the neutral start switch assembly to the transmission control computer assembly.

DTC No.	Item to be detected 1. Diagnosis condition 2. Abnormal state 3. Duration of abnormality	Location of trouble
P0705/55	1. No conditions 2. When shift position signal is not input 3. 1 second or more	> Wire harness and connector > Neutral start switch assembly > Transmission control computer assembly
P0705/56	1. No conditions 2. When multiple shift position signals are input 3. 2 seconds or more	> Wire harness and connector > Neutral start switch assembly > Transmission control computer assembly

Circuit diagram



Check procedure

1 WIRE HARNESS AND CONNECTOR CHECK (POWER SUPPLY SYSTEM)

Neutral start switch assembly
W/H side connector



C135998J07

- (1) Disconnect the connector of the neutral start switch assembly.
- (2) Turn IG on, and check the voltage between the terminals of the connector of the vehicle side of the neutral start switch assembly body earth using the tester.

Specified value

Measuring terminal (terminal name)	Voltage
7 ↔ body earth	11 - 14 V

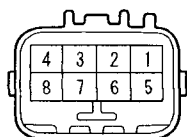
NG

POWER SUPPLY CHECK

OK

2 NEUTRAL START SWITCH ASSEMBLY UNIT CHECK

Neutral start switch assembly



C140223J05

- (1) Check the continuity between the terminals of the neutral start switch assembly using the tester.

Reference

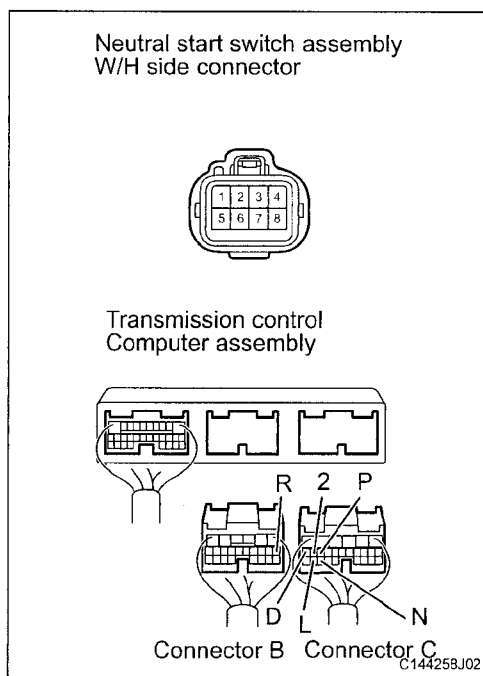
Shift position	Measuring terminal (terminal name)	Reference
P position	4 ↔ 6	There is electrical continuity and no short circuit between other terminals.
R position	1 ↔ 7	There is electrical continuity and no short circuit between other terminals.
N position	5 ↔ 6	There is electrical continuity and no short circuit between other terminals.
D position	3 ↔ 6	There is electrical continuity and no short circuit between other terminals.
Second position	2 ↔ 6	There is electrical continuity and no short circuit between other terminals.
L position	8 ↔ 6	There is electrical continuity and no short circuit between other terminals.

NG

NEUTRAL START SWITCH ASSEMBLY REPLACEMENT

OK

3 WIRE HARNESS AND CONNECTOR CHECK (NEUTRAL START SWITCH ASSEMBLY - TRANSMISSION CONTROL COMPUTER ASSEMBLY)



- (1) Disconnect the connector of the neutral start switch assembly.
- (2) Disconnect connectors B and C of the transmission control computer assembly.
- (3) Check the continuity between the connector terminals of the vehicle side of the neutral start switch assembly and the connector terminals of the transmission control computer assembly using the tester (See page 26-20 for the terminal sequence).

Reference

Measuring terminal (terminal name) Neutral start switch assembly ↔ transmission control computer assembly	Reference
1 ↔ B7 (R)	With electrical continuity
2 ↔ C16 (2)	With electrical continuity
3 ↔ C17 (D)	With electrical continuity
4 ↔ C15 (P)	With electrical continuity
5 ↔ C24 (N)	With electrical continuity
8 ↔ C25 (L)	With electrical continuity

- (4) Check the continuity between the connector terminals of the vehicle side of the neutral start switch assembly and body earth using the tester.

Reference

Measuring terminal (terminal name) Neutral start switch assembly ↔ body earth	Reference
6 ↔ body earth	With electrical continuity

NG

WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

OK

TRANSMISSION CONTROL COMPUTER ASSEMBLY REPLACEMENT

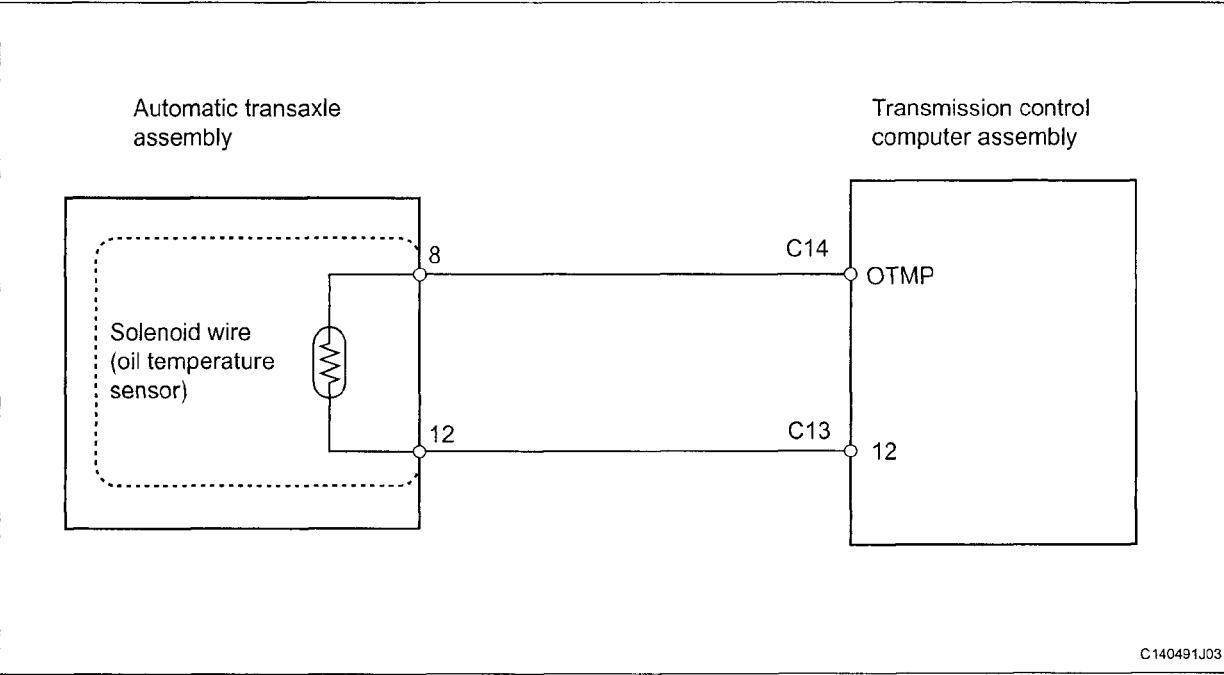
DTC	P0710/38	FLUID TEMPERATURE SENSOR SYSTEM OPEN/SHORT
DTC	P0711/38	FLUID TEMPERATURE SENSOR MALFUNCTION

Function description

The oil temperature sensor attached in the valve body detects the temperature of the oil in the transmission hydraulic control circuit, and inputs a signal according to the detected oil temperature to the transmission control computer assembly.

DTC No.	Diagnosis condition 1. Diagnosis condition 2. Abnormal state 3. Duration of abnormality	Checked portion
P0710/38	1. No conditions 2. Oil temperature sensor voltage: 0.15 V or below and 4.90 V or above 3. 0.5 second or more	> Wire harness and connector (oil temperature sensor system) > Solenoid wire (oil temperature sensor system) > Transmission control computer assembly
P0711/38	1. No conditions 2. Oil temperature sensor voltage: 0.15 V or below and 4.90 V or above 3. 0.5 second or more	> Wire harness and connector (oil temperature sensor system) > Solenoid wire (oil temperature sensor system) > Transmission control computer assembly

Circuit diagram



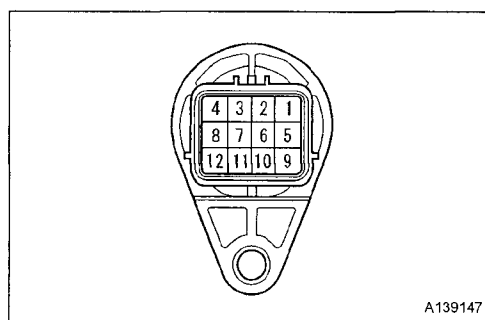
Check procedure

<HINT>

Using DS-II, read the freeze frame data. The freeze frame data records part of the operating state of the engine when a trouble occurs, and this information is useful for troubleshooting.

1	SOLENOID WIRE UNIT CHECK (OIL TEMPERATURE SENSOR SYSTEM)
---	--

(1) Disconnect the connector of the solenoid wire.



A139147

- (2) Check the resistance between the solenoid wire connector terminals using the tester.

Specified value

Measuring terminal (terminal name)	Oil temperature	Resistance
8 ↔ 12	20°C	2.186 - 2.618 kΩ
8 ↔ 12	80°C	0.294 - 0.332 kΩ

- (3) Check the resistance between the solenoid wire connector terminal and body earth using the tester.

Specified value

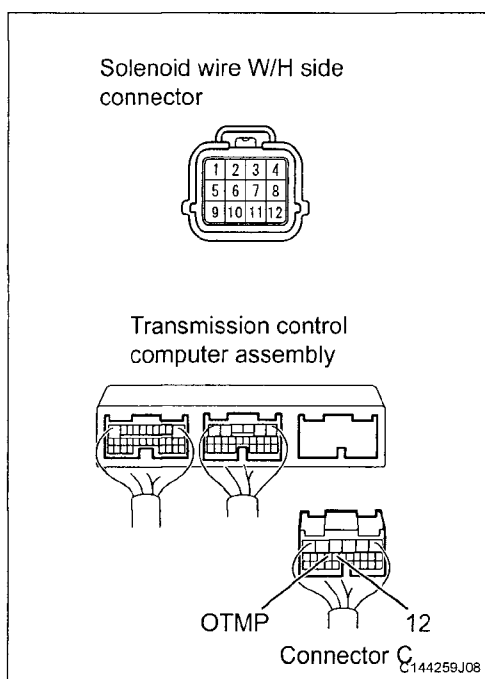
Measuring terminal (terminal name)	Resistance
8 ↔ body earth	1 MΩ and above

NG

SOLENOID WIRE REPLACEMENT

OK

2 WIRE HARNESS AND CONNECTOR CHECK (SOLENOID WIRE - TRANSMISSION CONTROL COMPUTER ASSEMBLY)



OK

- (1) Disconnect the connector of the solenoid wire.
 (2) Disconnect connector C of the transmission control computer assembly.
 (3) Check the continuity between the connector terminal of the vehicle side of the solenoid wire and the connector terminal of the vehicle side of the transmission control computer assembly using the tester (See page 26-20 for the terminal sequence).

Reference

Measuring terminal (terminal name)	Reference
Solenoid wire ↔ transmission control computer assembly	
8 ↔ C14 (OTMP)	With electrical continuity
12 ↔ C13 (12)	With electrical continuity

NG

WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

26

TRANSMISSION CONTROL COMPUTER ASSEMBLY REPLACEMENT

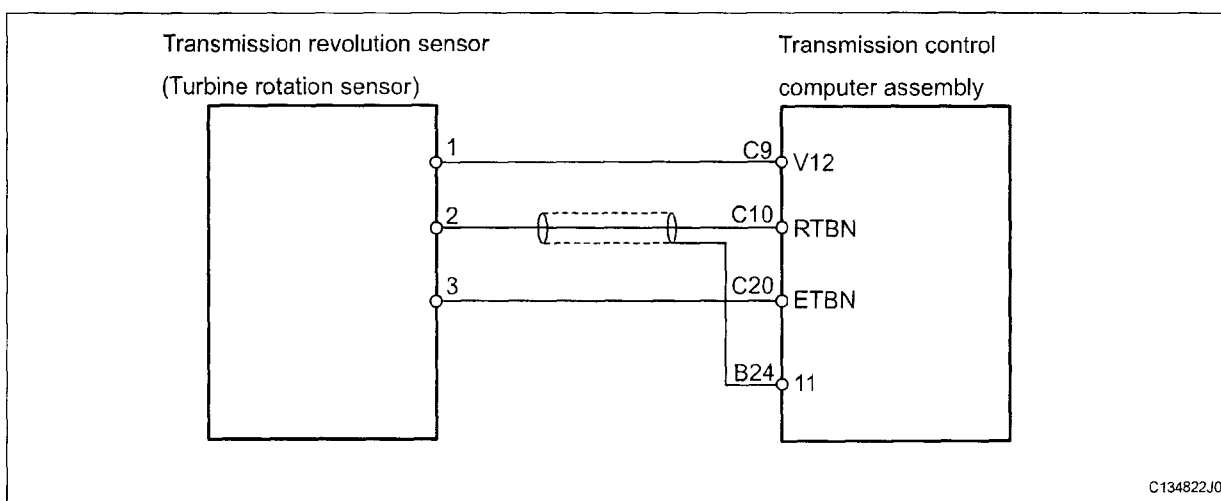
DTC	P0715/37	TURBINE SPEED SENSOR MALFUNCTION
-----	----------	----------------------------------

Circuit description

The transmission revolution sensor (turbine rotation sensor) outputs the number of revolutions of the input shaft to the transmission control computer assembly as a signal.

DTC No.	DTC detection condition 1. Diagnosis condition 2. Abnormal state 3. Duration of abnormality	Checked portion
P0715/37	1. During idling at P or N position or while running at D position 2. Turbine rotation signal is not input. 3. 2 seconds	> Transmission revolution sensor (turbine rotation sensor) > Wire harness and connector > Transmission control computer assembly

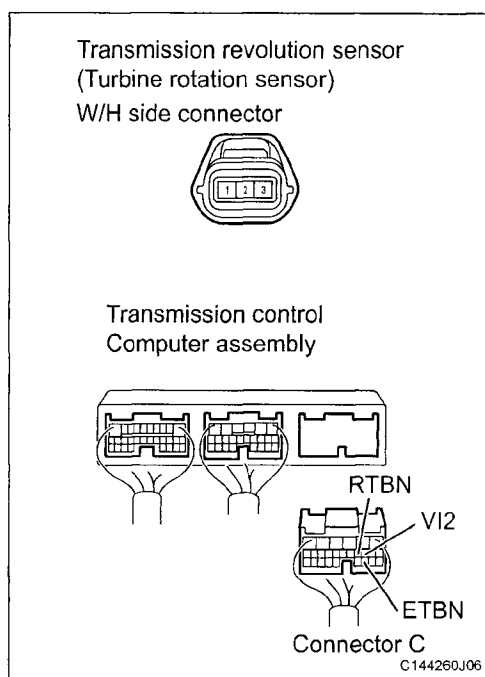
Circuit diagram



Check procedure

1	WIRE HARNESS AND CONNECTOR CHECK (TRANSMISSION REVOLUTION SENSOR (TURBINE ROTATION SENSOR) - TRANSMISSION CONTROL COMPUTER ASSEMBLY)
---	--

- (1) Disconnect the connector of the transmission revolution sensor (turbine rotation sensor).
- (2) Disconnect connector C of the transmission control computer assembly.



- (3) Check the continuity and short circuit between the connector terminal of the vehicle side of the transmission revolution sensor (turbine rotation sensor) and connector terminal C of the vehicle side of the transmission control computer assembly using the tester.

Reference

Measuring terminal (terminal name) Turbine rotation sensor ↔ transmission control computer	Reference
3 ↔ C20 (ETBN)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
2 ↔ C10 (RTBN)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
1 ↔ C9 (VI2)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.

NG

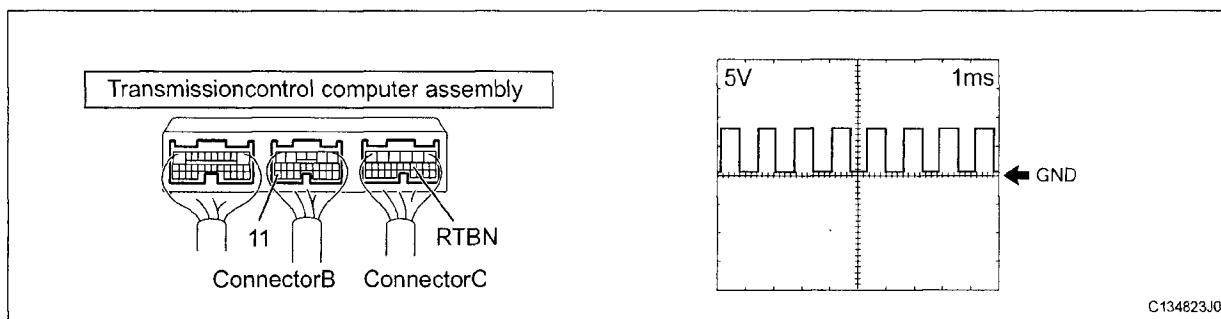
WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

OK

2 TRANSMISSION REVOLUTION SENSOR CHECK (TURBINE ROTATION SENSOR)

- (1) Using an oscilloscope, check if a pulse is generated between connector terminals C10 (RTBN) and B24 (11) of the transmission control computer assembly.

26



Item	Description
Measuring terminal (terminal name)	C10 (RTBN) ↔ B24 (11)
Measuring equipment set	5 V/DIV, 1 ms/DIV
Measuring condition	During idling after warming up

Reference: The pulse is generated.

<HINT>

As the turbine rotation increases, the cycle shortens.

NG

TRANSMISSION REVOLUTION SENSOR
REPLACEMENT (TURBINE ROTATION SENSOR).

OK

TRANSMISSION CONTROL COMPUTER ASSEMBLY REPLACEMENT

DTC

P0720/42

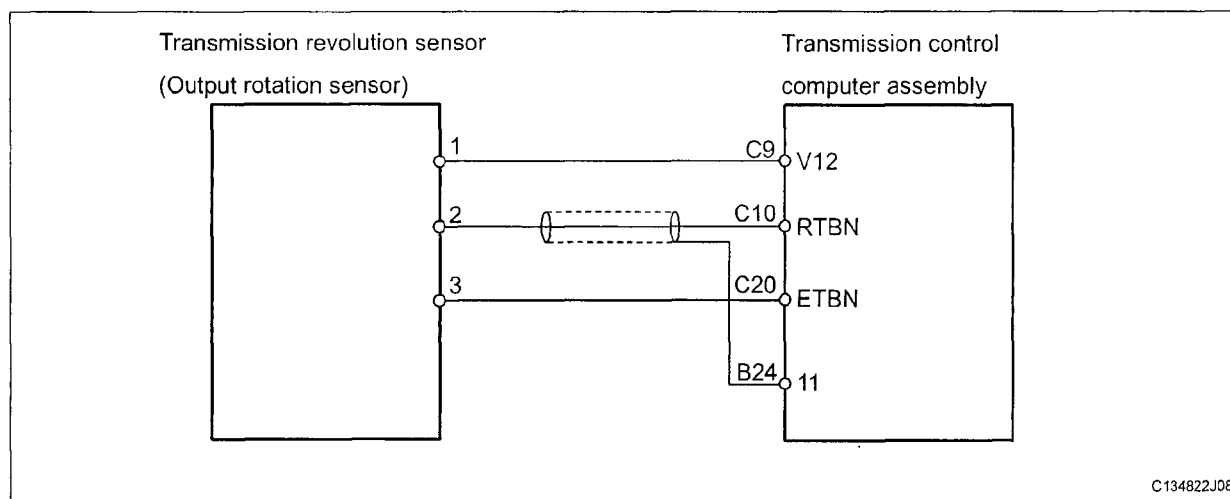
OUTPUT SPEED SENSOR MALFUNCTION

Circuit description

The transmission revolution sensor (output rotation sensor) outputs the number of revolutions of the transmission output shaft to the transmission control computer assembly as a signal.

DTC No.	DTC detection condition	Checked portion
	1. Diagnosis condition 2. Error state 1 3. Error state 2	
P0720/42	1. While running 2. Output revolution signal is not input for 1 second and above. 3. Ratio to the turbine rotation signal is abnormal for 5 seconds and above.	> Wire harness and connector > Transmission revolution sensor (output rotation sensor) > Transmission control computer assembly

Circuit diagram



Check procedure

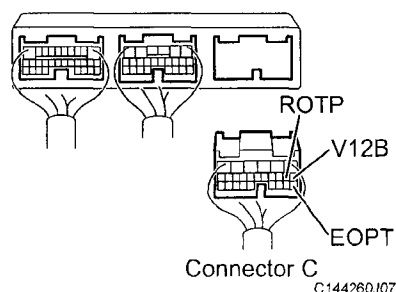
- | | |
|---|---|
| 1 | WIRE HARNESS AND CONNECTOR CHECK (TRANSMISSION REVOLUTION SENSOR (OUTPUT ROTATION SENSOR) - TRANSMISSION CONTROL COMPUTER ASSEMBLY) |
|---|---|

- (1) Disconnect the connector of the transmission revolution sensor (output rotation sensor).
- (2) Disconnect connector C of the transmission control computer assembly.

Transmission revolution sensor
(output sensor) W/H side connector



Transmission control computer
assembly



- (3) Check the continuity and short circuit between the connector terminal of the vehicle side of the transmission revolution sensor (output rotation sensor) and the connector terminal of the vehicle side of the transmission control computer assembly using the tester.

Reference

Measuring terminal (terminal name) Output rotation sensor ↔ transmission control computer	Reference
3 ↔ C18 (EOPT)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
2 ↔ C8 (ROTP)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
1 ↔ C7 (V12B)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.

NG

WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

OK

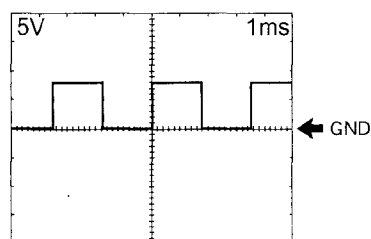
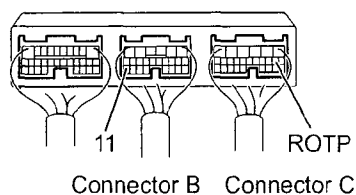
2

TRANSMISSION REVOLUTION SENSOR CHECK (OUTPUT ROTATION SENSOR)

- (1) Using an oscilloscope, check if a pulse is generated between terminals C8 (ROTP) and B24 (11) of the transmission control computer assembly.

26

Transmission control computer assembly



C134824J03

Item	Description
Measuring terminal (terminal name)	C8 (ROTP) ↔ B24 (11)
Measuring equipment set	5 V/DIV, 1 ms/DIV
Measuring condition	At vehicle speed of 20 km/h

Reference: The pulse is generated.

NG

TRANSMISSION REVOLUTION SENSOR
REPLACEMENT (OUTPUT ROTATION SENSOR)

OK

TRANSMISSION CONTROL COMPUTER ASSEMBLY REPLACEMENT

DTC

P0725/86

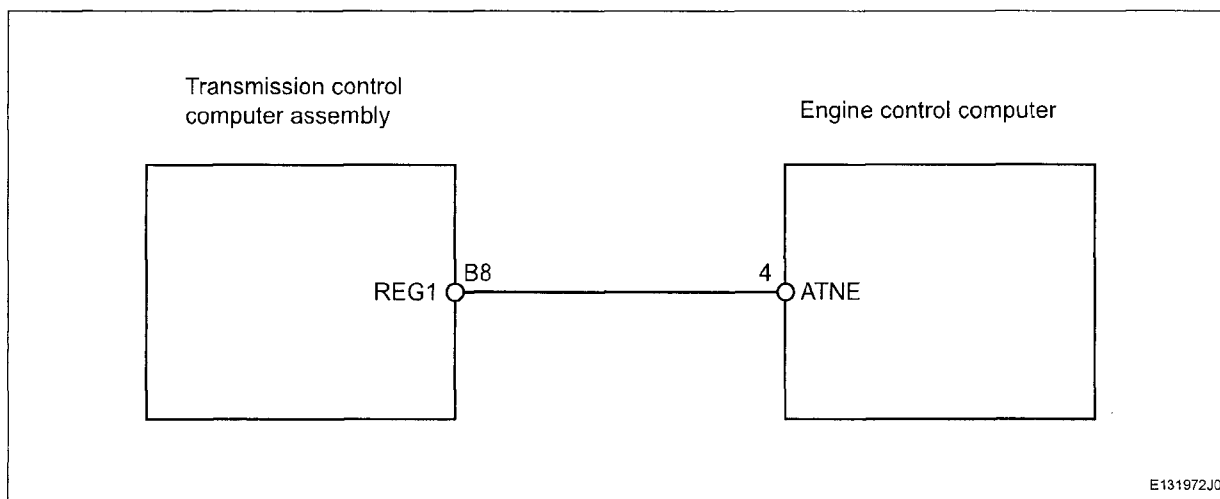
ENGINE SPEED INPUT SENSOR MALFUNCTION

Function description

The engine control computer outputs an engine revolution signal to the transmission control computer. If the engine revolution signal is not input to the transmission control computer assembly, code DTC P0725/86 is output.

DTC No.	DTC detection condition 1. Diagnosis condition 2. Abnormal state 3. Duration of abnormality	Checked portion
P0725/86	1. No conditions 2. When the engine revolution signal is not input from the engine control computer to the transmission control computer assembly 3. 0.5 second or more	> Wire harness and connector > Transmission control computer assembly > Engine control computer

Circuit diagram

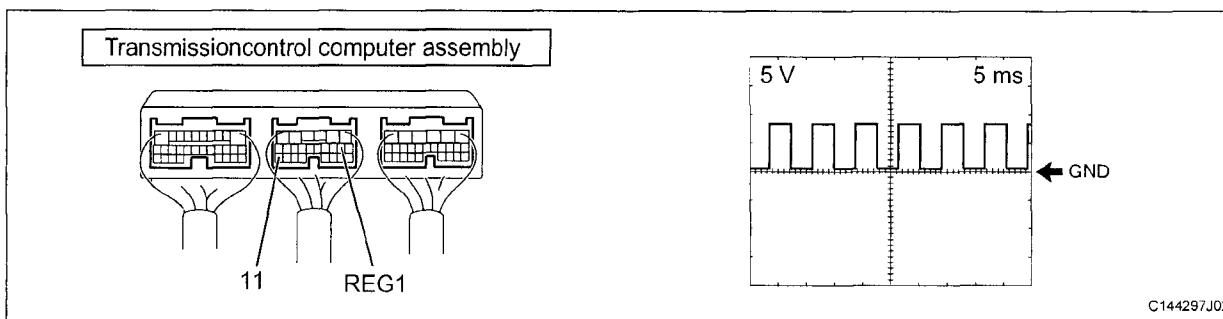


Check procedure

1

TRANSMISSION CONTROL COMPUTER ASSEMBLY UNIT CHECK (ENGINE REVOLUTION SIGNAL SYSTEM)

- (1) Connect an oscilloscope between connector terminals B8 (REG1) and B24 (11) of the transmission control computer assembly.
- (2) Start the engine.
- (3) Check if a pulse is generated between connector terminals B8 (REG1) and B24 (11) of the transmission control computer assembly.



Item	Description
Measuring terminal (terminal name)	B8 (REG1) ↔ B24 (11)
Measuring equipment set	5 V/DIV, 5 ms/DIV
Measuring condition	Engine idling

Reference: The pulse is generated.

<HINT>

The waveform cycle shortens as the number of engine revolutions increases.

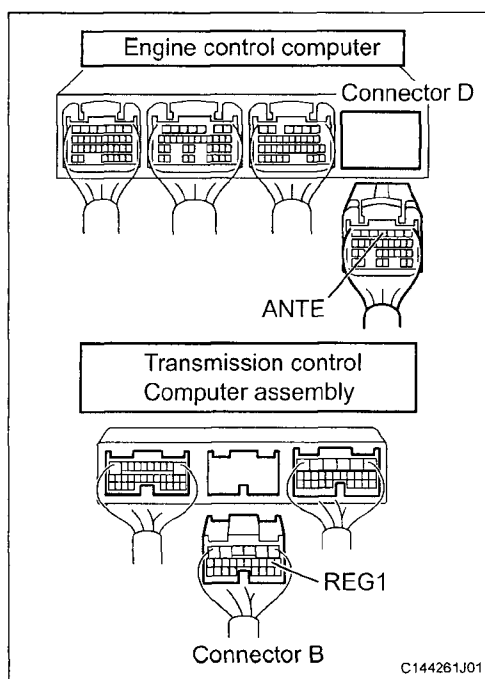
OK

TRANSMISSION CONTROL COMPUTER ASSEMBLY REPLACEMENT

NG

2 WIRE HARNESS AND CONNECTOR CHECK (ENGINE CONTROL COMPUTER - TRANSMISSION CONTROL COMPUTER ASSEMBLY)

26



- (1) Disconnect connector B of the transmission control computer assembly.
- (2) Disconnect connector D of the engine control computer.
- (3) Check the continuity and short circuit between connector terminal 4 (ANTE) of the vehicle side of the engine control computer and connector terminal B8 (REG1) of the vehicle side of the transmission control computer assembly.

Reference

Measuring terminal (terminal name) Engine control computer ↔ transmission control computer assembly	Reference
4 (ANTE) ↔ B8 (REG1)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.

NG

WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

OK

ENGINE CONTROL COMPUTER REPLACEMENT

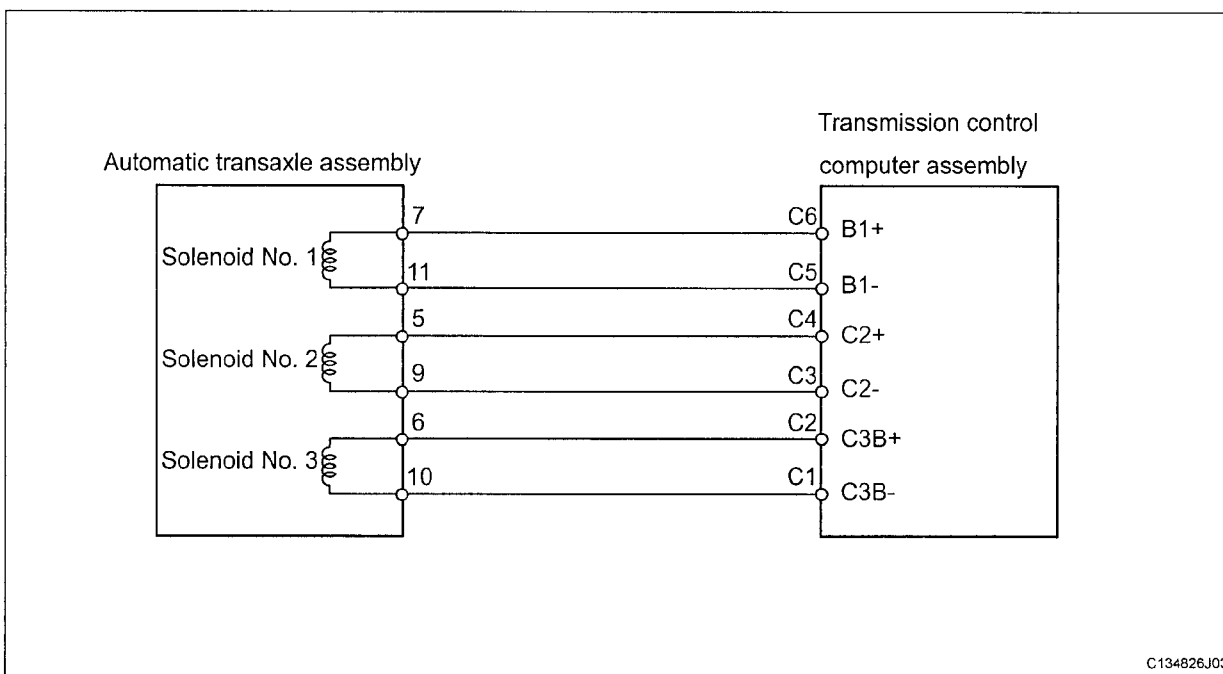
DTC	P0753/61	LINER SOLENOID NO.1 SYSTEM OPEN/SHORT
DTC	P0758/62	LINER SOLENOID NO.2 SYSTEM OPEN/SHORT
DTC	P0763/63	LINER SOLENOID NO.3 SYSTEM OPEN/SHORT

Function description

The transmission control computer assembly changes the gears from the first to the fourth by using ON-OFF combinations of solenoid Nos. 1, 2, and 3. As a fail-safe function, the transmission control computer assembly turns ON or OFF other normal solenoid valves if any of the solenoid valves breaks or is short-circuited. If all the solenoid valves fail, the function of only a mechanical hydraulic circuit is available, and shifting must be manually performed (in case of a disconnection or short circuit, the transmission control computer assembly stops applying current to the solenoid valve that has failed).

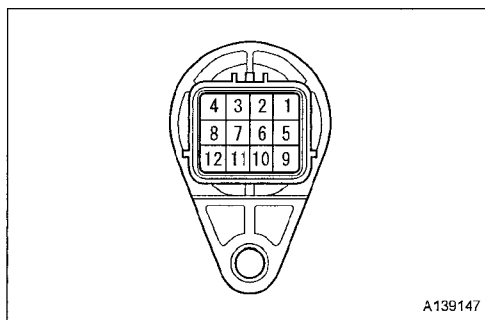
DTC No.	DTC detection condition 1. Diagnosis condition 2. Abnormal state 3. Duration of abnormality	Checked portion
P0753/61	1. When current applied to solenoid No. 1 2. Solenoid No. 1 circuit is short-circuited or breaks. 3. Continuous for 1 second and above	> Wire harness and connector (solenoid No. 1 signal system) > Solenoid wire (solenoid No. 1 system) > Clutch control solenoid No. 2 (solenoid No. 1) > Transmission control computer assembly
P0758/62	1. When current applied to solenoid No. 2 2. Solenoid No. 2 circuit is short-circuited or breaks. 3. Continuous for 1 second and above	> Wire harness and connector (solenoid No. 2 signal system) > Solenoid wire (solenoid No. 2 system) > Clutch control solenoid No. 1 (solenoid No. 2) > Transmission control computer assembly
P0763/63	1. When current applied to solenoid No. 3 2. Solenoid No. 3 circuit is short-circuited or breaks. 3. Continuous for 1 second and above	> Wire harness and connector (solenoid No. 3 signal system) > Solenoid wire (solenoid No. 3 system) > Clutch control solenoid No. 1 (solenoid No. 3) > Transmission control computer assembly

Circuit diagram



Check procedure

1	SOLENOID WIRE UNIT CHECK (SOLENOID NO. 1, SOLENOID NO. 2, AND SOLENOID NO. 3 SYSTEMS)
---	---



- (1) Disconnect the connector of the solenoid wire.
- (2) Check the resistance between solenoid wire connector terminals using the tester.

Specified value

Measuring terminal (terminal name)	Resistance
Solenoid No. 3 system 7 ↔ 11	5.1 - 5.5 Ω (20°C)
Solenoid No. 2 system 5 ↔ 9	5.1 - 5.5 Ω (20°C)
Solenoid No. 1 system 6 ↔ 10	5.0 - 5.6 Ω (20°C)

- (3) Check the insulation between the solenoid wire connector terminal and body earth using the tester.

Specified value

Measuring terminal (terminal name)	Resistance
Solenoid No. 3 system 7 ↔ body earth	1 MΩ and above
Solenoid No. 2 system 5 ↔ body earth	1 MΩ and above
Solenoid No. 1 system 6 ↔ body earth	1 MΩ and above

Check result

Check result	Go to
Solenoid No. 1 system error	To NG (A)
Solenoid No. 2 system error	To NG (B)
Solenoid No. 3 system error	To NG (C)

NG(A)	TO STEP 3
NG(B)	TO STEP 4
NG(C)	TO STEP 5

OK

2 WIRE HARNESS AND CONNECTOR CHECK (SOLENOID WIRE - TRANSMISSION CONTROL COMPUTER ASSEMBLY)

- (1) Disconnect the connector of the solenoid wire and connector C of the transmission control computer assembly.
- (2) Check the continuity between the connector terminal of the vehicle side of the solenoid wire connector and the connector terminal of the vehicle side of the transmission control computer assembly using the tester (See page 26-20 for the terminal sequence).

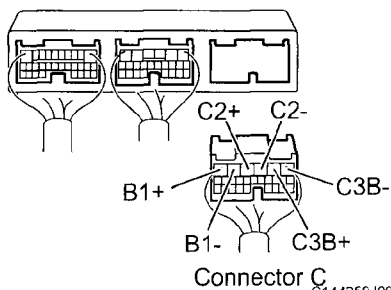
Reference

Measuring terminal (terminal name) Solenoid wire ↔ transmission control computer assembly	Reference
7 ↔ C6 (B1+)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
11 ↔ C5 (B1-)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
5 ↔ C4 (C2+)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
9 ↔ C3 (C2-)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
6 ↔ C2 (C3B+)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
10 ↔ C1 (C3B-)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.

Solenoid wire W/H side connector



Transmission control computer assembly



NG

WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

OK

TRANSMISSION CONTROL COMPUTER ASSEMBLY CHECK AND REPLACEMENT

3 CLUTCH CONTROL SOLENOID NO. 2 UNIT CHECK (SOLENOID NO. 1)

(1) Disconnect the connector of clutch control solenoid No. 2 (solenoid No. 1).

(2) Check the resistance between terminals using the tester.

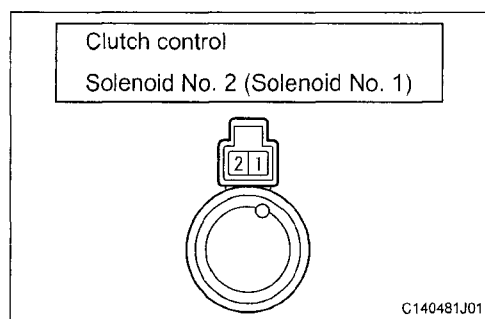
Specified value: 5.0 - 5.6 Ω (20°C)

<CAUTION>

After replacing clutch control solenoid No. 2 (solenoid No. 1), initialize the AT learned value and execute AT initial learning (See page 26-17).

NG

CLUTCH CONTROL SOLENOID NO. 2 REPLACEMENT (SOLENOID NO. 1)



OK

SOLENOID WIRE REPLACEMENT

26

4 CLUTCH CONTROL SOLENOID NO. 1 UNIT CHECK (SOLENOID NO. 2)

(1) Disconnect the connector of clutch control solenoid No. 1 (solenoid No. 2).

(2) Check the resistance between terminals using the tester.

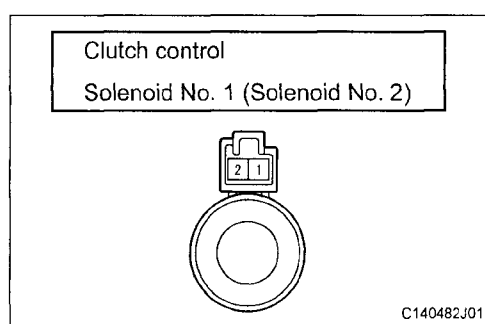
Specified value: 5.1 - 5.5 Ω (20°C)

<CAUTION>

After replacing clutch control solenoid No. 1 (solenoid No. 2), initialize the AT learned value and execute AT initial learning (See page 26-17).

NG

CLUTCH CONTROL SOLENOID NO. 1 REPLACEMENT (SOLENOID NO. 2)

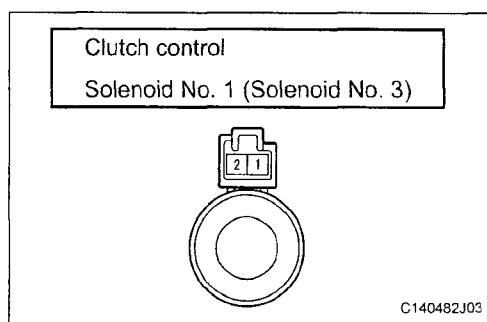


OK

SOLENOID WIRE REPLACEMENT

5 CLUTCH CONTROL SOLENOID NO. 1 UNIT CHECK (SOLENOID NO. 3)

(1) Disconnect the connector of clutch control solenoid No. 1 (solenoid No. 3).



(2) Check the resistance between terminals using the tester.

Specified value: 5.1 - 5.5 Ω (20°C)

<CAUTION>

After replacing clutch control solenoid No. 1 (solenoid No. 3), initialize the AT learned value and execute AT initial learning (See page 26-17).

NG

CLUTCH CONTROL SOLENOID No. 1 REPLACEMENT
(SOLENOID NO. 3)

OK

SOLENOID WIRE REPLACEMENT

DTC	P0768/64	DUTY SOLENOID CIRCUIT OPEN/SHORT
-----	----------	----------------------------------

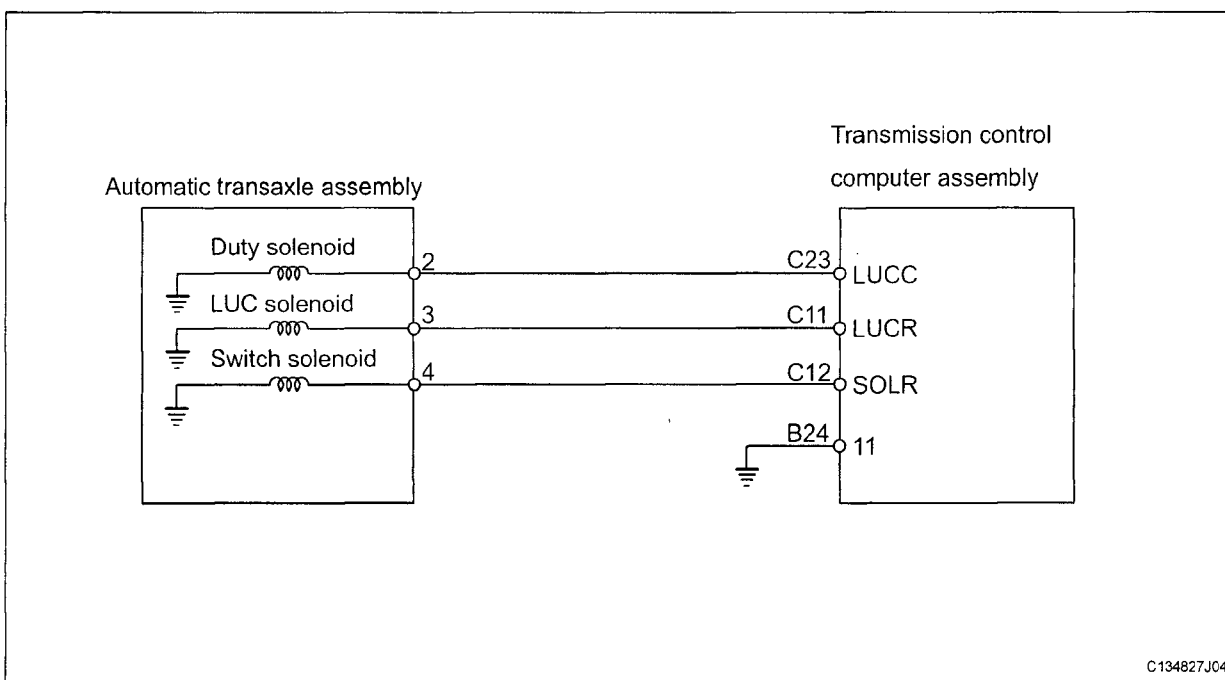
Function description

The transmission control computer assembly controls the lockup control solenoid (duty solenoid) to a predetermined duty ratio.

DTC No.	DTC detection condition	Checked portion
P0768/64	1. Diagnosis condition 2. Abnormal state 3. Duration of abnormality	
	1. When current applied to duty solenoid 2. Duty solenoid circuit is short-circuited or breaks. 3. 0.33 seconds	> Wire harness and connector (duty solenoid signal system) > Solenoid wire (duty solenoid system) > Lockup control solenoid (duty solenoid) > Transmission control computer assembly

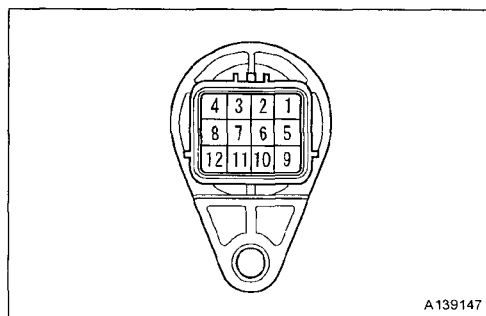
26

Circuit diagram



Check procedure

1 SOLENOID WIRE UNIT CHECK (DUTY SOLENOID SYSTEM)



- (1) Disconnect the connector of the solenoid wire.
- (2) Check the resistance between the solenoid wire connector terminal and body earth using the tester.

Specified value

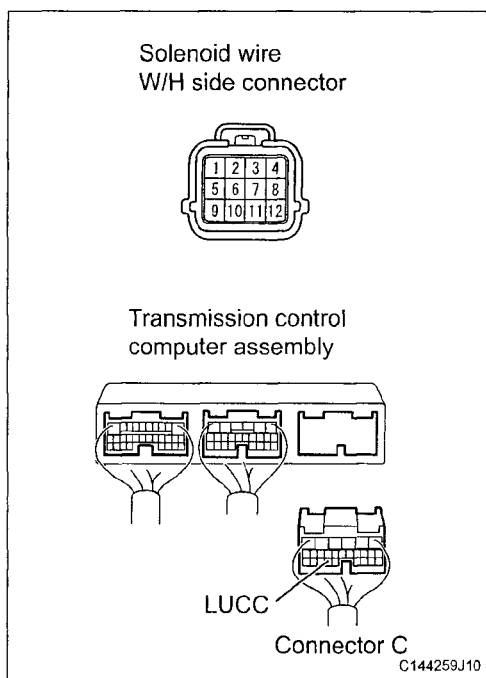
Measuring terminal (terminal name)	Resistance
2 ↔ body earth	11 - 13 Ω (20°C)

NG

TO STEP 3

OK

2 WIRE HARNESS OR CONNECTOR CHECK (SOLENOID WIRE - TRANSMISSION CONTROL COMPUTER ASSEMBLY)



- (1) Disconnect the connector of the solenoid wire and connector C of the transmission control computer assembly.
- (2) Check the continuity and short circuit between the connector terminal of the vehicle side of the solenoid wire and the connector terminal of the vehicle side of the transmission control computer assembly using the tester (See page 26-20 for the terminal sequence).

Reference

Measuring terminal (terminal name)	Reference
Solenoid wire ↔ transmission control computer assembly	
2 ↔ C23 (LUCC)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.

NG

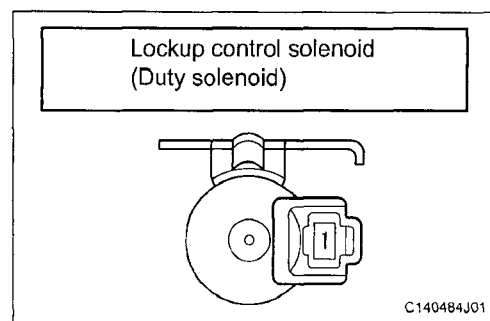
WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

OK

TRANSMISSION CONTROL COMPUTER ASSEMBLY CHECK AND REPLACEMENT

3 LOCKUP CONTROL SOLENOID UNIT CHECK (DUTY SOLENOID)

- (1) Disconnect the connector of the lockup control solenoid (duty solenoid).



- (2) Check the resistance between the solenoid terminal and solenoid body using the tester.

Specified value: 11 - 13 Ω (20°C)

<CAUTION>

After replacing the lockup control solenoid (duty solenoid), initialize the AT learned value and execute AT initial learning (See page 26-17).

NG

LOCKUP CONTROL SOLENOID REPLACEMENT (DUTY SOLENOID)

OK

SOLENOID WIRE REPLACEMENT

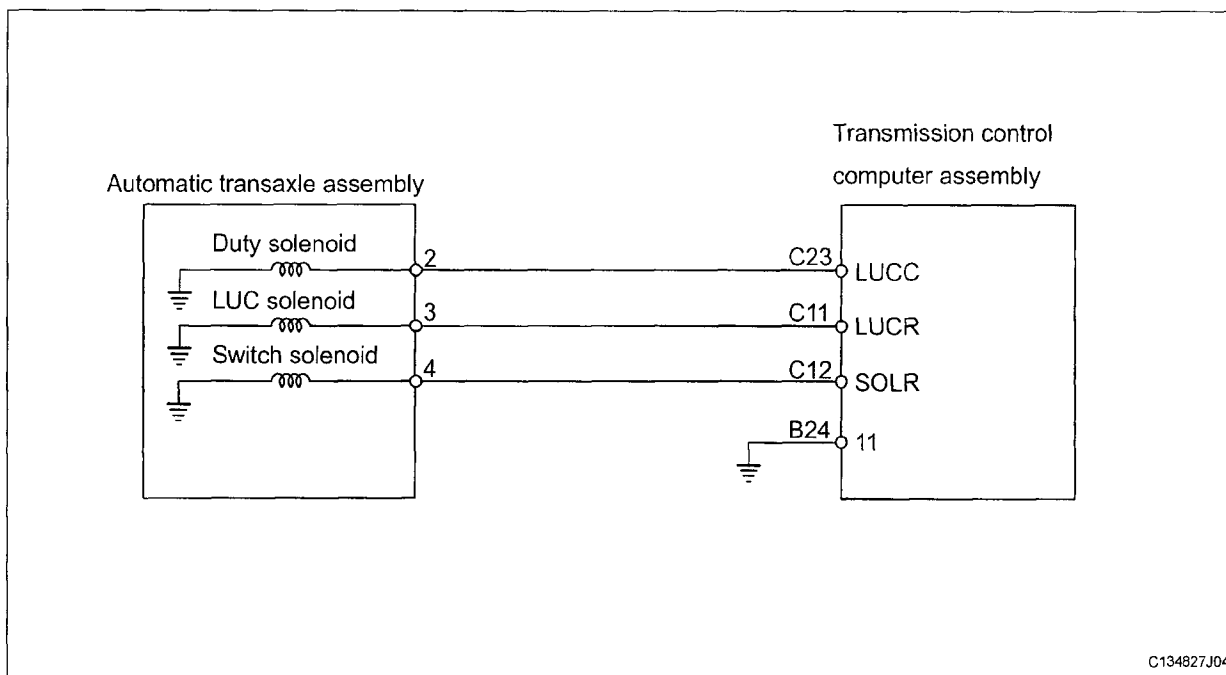
DTC	P0773/65	LUC SOLENOID CIRCUIT OPEN/SHORT
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Function description

The transmission control computer assembly controls the LUC solenoid to a predetermined duty ratio for lockup.

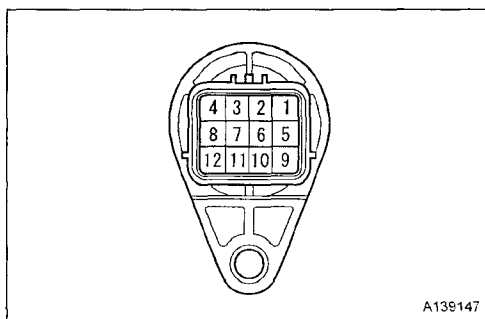
DTC No.	DTC detection condition 1. Diagnosis condition 2. Abnormal state 3. Duration of abnormality	Checked portion
P0773/65	1. When current applied to LUC solenoid 2. LUC solenoid circuit is short-circuited or breaks. 3. 0.04 second	> Wire harness and connector (LUC solenoid signal system) > Solenoid wire (LUC solenoid system) > Automatic transmission three-way solenoid assembly (LUC solenoid) > Transmission control computer assembly

Circuit diagram



Check procedure

1 SOLENOID WIRE UNIT CHECK (LUC SOLENOID SYSTEM)



- (1) Disconnect the connector of the solenoid wire.
- (2) Check the resistance between the solenoid wire connector terminal and body earth using the tester.

26

Specified value

Measuring terminal (terminal name)	Resistance
3 ↔ body earth	14 - 18 Ω (20°C)

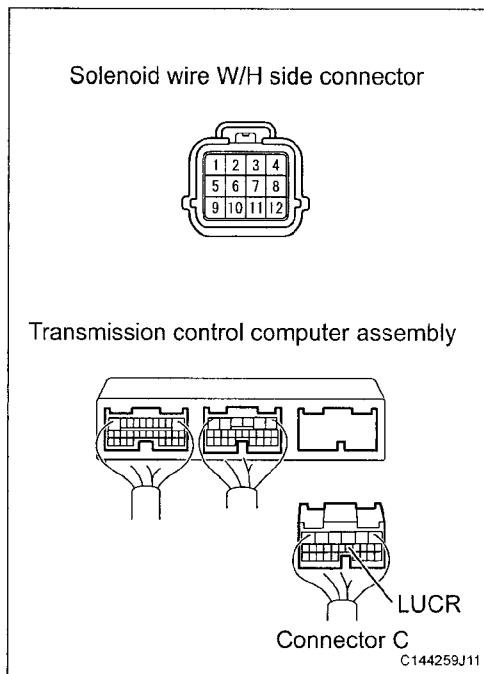
NG

TO STEP 3

OK

2 WIRE HARNESS AND CONNECTOR CHECK (SOLENOID WIRE - TRANSMISSION CONTROL COMPUTER ASSEMBLY)

- (1) Disconnect the connector of the solenoid wire and connector C of the transmission control computer assembly.



- (2) Check the continuity between the connector terminal of the vehicle side of the solenoid wire and the connector terminal of the vehicle side of the transmission control computer assembly using the tester (See page 26-20 for the terminal sequence).

Reference

Measuring terminal (terminal name) Solenoid wire ↔ transmission control computer assembly	Reference
3 ↔ C11 (LUCR)	There must be electrical continuity and no short circuit between any terminal and body earth.

NG

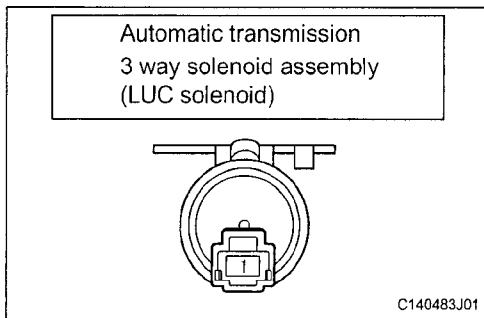
WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

OK

TRANSMISSION CONTROL COMPUTER ASSEMBLY REPLACEMENT

26

3 AUTOMATIC TRANSMISSION THREE-WAY SOLENOID ASSEMBLY UNIT CHECK (LUC SOLENOID)



- (1) Disconnect the connector of the automatic transmission three-way solenoid assembly (LUC solenoid).

- (2) Check the resistance between the solenoid terminal and solenoid body using the tester.

Specified value: 14 - 18 Ω (20°C)

<CAUTION>

After replacing the automatic transmission three-way solenoid assembly (LUC solenoid), initialize the AT learned value and execute AT initial learning (See page 26-17).

NG

AUTOMATIC TRANSMISSION THREE-WAY SOLENOID ASSEMBLY REPLACEMENT (LUC SOLENOID)

OK

SOLENOID WIRE REPLACEMENT

DTC

P1703/72

LOCK-UP REVOLUTION SPEED NOT COINCIDENT

Function description

When direct lockup is in operation, the diagnostic trouble code is output if the number of engine revolutions is substantially different from the number of lockup revolutions.

DTC No.	DTC detection condition 1. Diagnosis condition 2. Abnormal state 3. Duration of abnormality	Checked portion
P1703/72	1. When direct lockup is in operation 2. The number of engine revolutions is substantially different from the number of lockup revolutions. 3. 2 seconds	> Valve body assembly > Torque converter assembly > Automatic transaxle assembly

Check procedure

1	LINE PRESSURE CHECK (LUC ON PRESSURE, LUC OFF PRESSURE)
---	---

- (1) Attach an oil pressure gage (See page 26-10).
- (2) Lift up the vehicle.
- (3) Start the engine.
- (4) Move the shift lever to the D position, gradually step on the accelerator pedal, and change the gear to the third. Gradually accelerate further, and check the LUC ON and LUC OFF pressures when direct lockup is in operation.

Reference: 617 - 715 kPa (6.5 - 7.3 kgf/cm) (LUC ON pressure - LUC OFF pressure)

<HINT>

To measure the oil pressure again after a warning is displayed, stop the engine, move the shift lever to the N position (to cancel the fail-safe function) and then back to the D position again, and start measurement.

<CAUTION>

After replacing the transmission valve body assembly, initialize the AT learned value and execute AT initial learning (See page 26-17)

NG

TRANSMISSION	VALVE	BODY	ASSEMBLY
REPLACEMENT			

OK

2	TORQUE CONVERTER ASSEMBLY CHECK
---	---------------------------------

<HINT>

See page 26-92 for how to check the torque converter assembly.

<CAUTION>

After replacing the automatic transmission assembly, initialize the AT learned value and execute AT initial learning (See page 26-17).

NG

TORQUE CONVERTER ASSEMBLY REPLACEMENT

OK

AUTOMATIC TRANSMISSION ASSEMBLY REPAIR OR REPLACEMENT

DTC	P1706/31	ENGINE TORQUE ABNORMAL
-----	----------	------------------------

Function description

DTC No.	Item to be detected	Location of trouble
P1706/31	When a signal indicating an error is received from the engine control computer	> Vacuum sensor system > VVT system > Crank angle sensor system > Knock sensor system

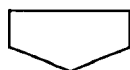
Check procedure

1	ENGINE CONTROL SYSTEM CHECK
---	-----------------------------

- (1) Using DS-II, check if a diagnostic trouble code of the EFI system is not output (See page 06-11).

<HINT>

See page 06-4 for the list of the diagnostic trouble codes of the EFI system.



TO EFI SYSTEM (DIAGNOSTIC TROUBLE CODE LIST)
--

DTC	P1711/41	TURBINE SPEED SENSOR MALFUNCTION
-----	----------	----------------------------------

26

Function description

DTC No.	Item to be detected	Location of trouble
P1711/41	When a signal indicating an error is received from the engine control computer	Throttle position sensor system

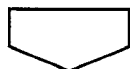
Check procedure

1	ENGINE CONTROL SYSTEM CHECK
---	-----------------------------

- (1) Using DS-II, check if a diagnostic trouble code of the EFI system is not output (See page 06-11).

<HINT>

See page 06-4 for the list of the diagnostic trouble codes of the EFI system.



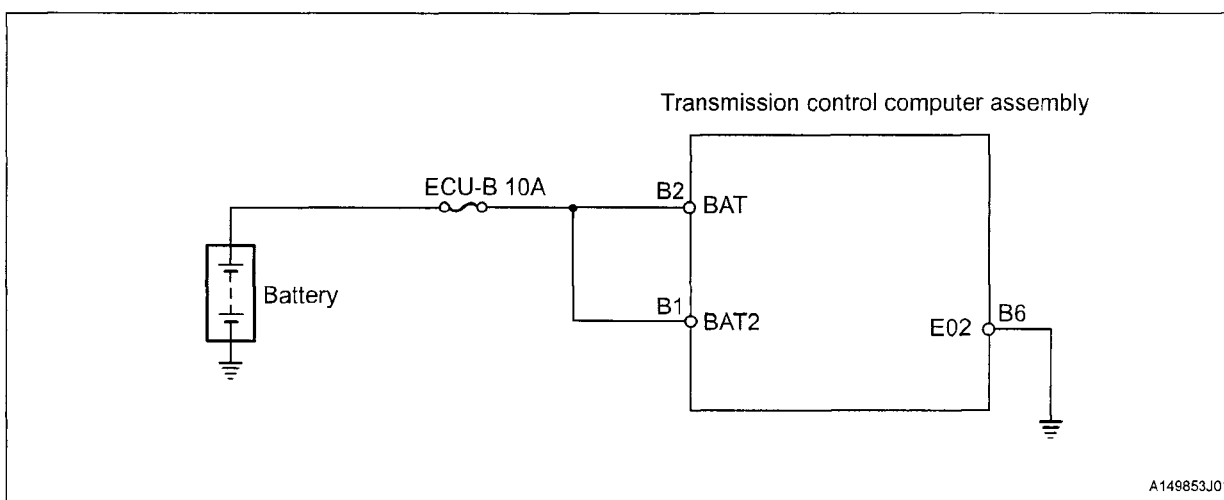
TO EFI SYSTEM (DIAGNOSTIC TROUBLE CODE LIST)
--

DTC	P1730/21	SOLENOID SYSTEM VOLTAGE ABNORMAL
-----	----------	----------------------------------

Circuit description

DTC No.	DTC detection condition	Checked portion
	1. Diagnosis condition 2. Abnormal state 3. Duration of abnormality	
P1730/21	1. Continuously 2. Battery system power supplies (BAT and BAT2) are shut off. 3. 0.1 seconds	> Wire harness and connector > Fuse > Transmission control computer assembly

Circuit diagram



26

Check procedure

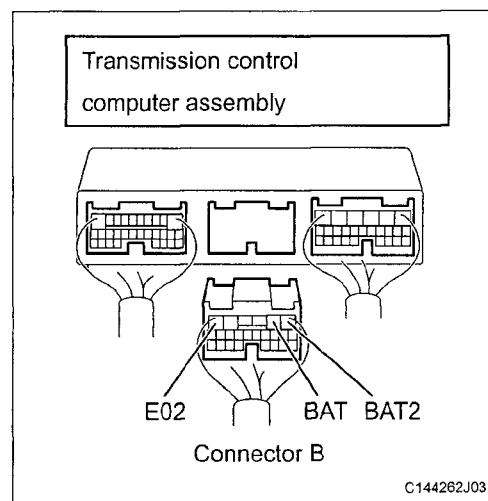
1	TRANSMISSION CONTROL COMPUTER ASSEMBLY CHECK
---	--

- (1) Disconnect connector B of the transmission control computer assembly.
- (2) Measure the voltage between the connector terminals of the vehicle side of the transmission control computer assembly using the tester.

Reference

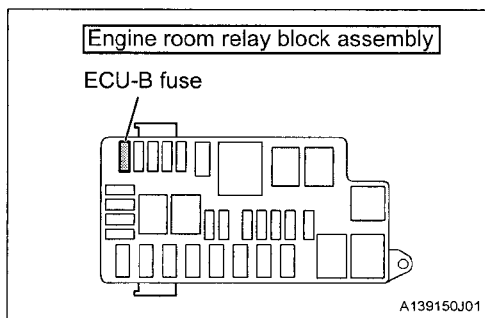
Measuring terminal (terminal name)	Specified value
B2 (BAT) ↔ B6 (E02)	11 - 14 V
B1 (BAT2) ↔ B6 (E02)	11 - 14 V

OK

TRANSMISSION CONTROL COMPUTER ASSEMBLY
REPLACEMENT

NG

2 FUSE CHECK (ECU-B)



- (1) Remove the ECU-B fuse from the engine room relay block assembly.
- (2) Check if the ECU-B fuse has electrical continuity using the tester.

Reference: With electrical continuity

NG

FUSE REPLACEMENT

OK

3 WIRE HARNESS AND CONNECTOR CHECK (TRANSMISSION CONTROL COMPUTER ASSEMBLY - ENGINE ROOM RELAY BLOCK ASSEMBLY)

- (1) Disconnect connector B of the transmission control computer assembly.
- (2) Remove the ECU-B fuse from the engine room relay block.
- (3) Check the continuity and short circuit between the connector terminal of the vehicle side of the transmission control computer assembly and the ECU-B fuse holder of the engine room relay block assembly using the tester.

Reference

Measuring terminal (terminal name) Transmission control computer assembly ↔ ECU-B fuse holder	Reference
B2 (BAT) ↔ 2	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
B1 (BAT2) ↔ 2	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.

<CAUTION>

In case of measurement applying a test rod, avoid applying the rod too hard because the holder part may be damaged.

<HINT>

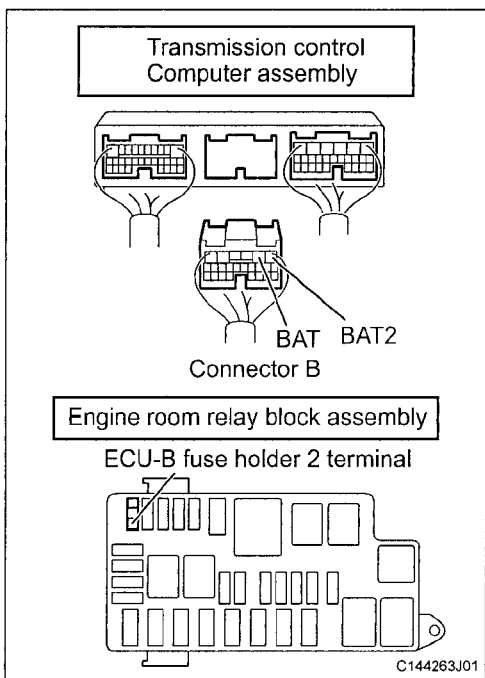
See page 01-29 for how to simulate trouble symptoms.

NG

WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

OK

TO TROUBLE PHENOMENON SIMULATION

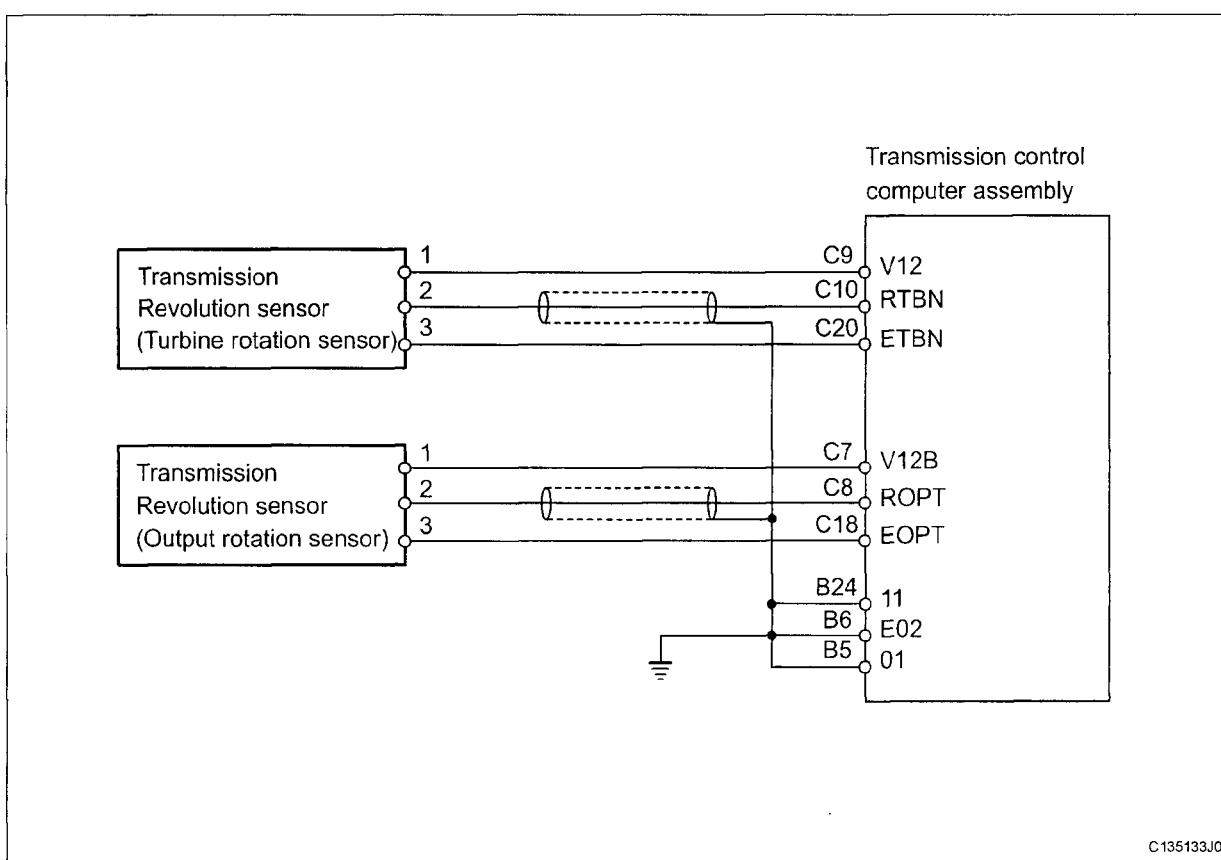


DTC	P1731/22	SENSOR SYSTEM VOLTAGE ABNORMAL
-----	----------	--------------------------------

Circuit description

DTC No.	DTC detection condition 1. Detection condition 2. Abnormal state 3. Duration of abnormality	Checked portion
P1731/22	1. Continuously 2. Short circuit of turbine rotation sensor power supply (V12) or output rotation sensor power supply (V12B) 3. 0.1 seconds	> Wire harness and connector > Transmission revolution sensor (turbine rotation sensor) > Transmission revolution sensor (output rotation sensor)

Circuit diagram

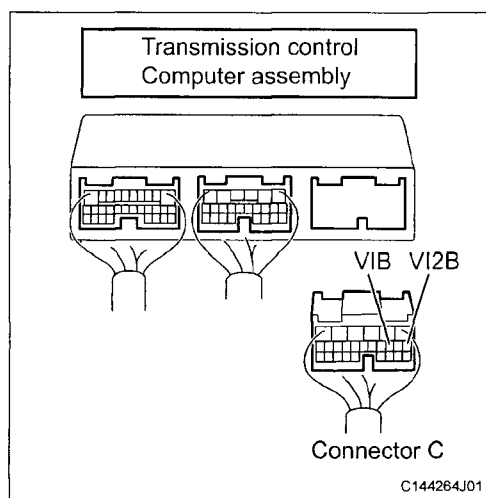


26

Check procedure

1	WIRE HARNESS AND CONNECTOR CHECK (TRANSMISSION CONTROL COMPUTER ASSEMBLY - BODY EARTH)
---	--

- (1) Disconnect connector C of the transmission control computer assembly.



OK

- (2) Check the continuity between the transmission revolution sensor and the connector terminal of the vehicle side of the transmission control computer assembly using the tester.

Reference

Measuring terminal (terminal name)	Reference
C9 (V12) ↔ body earth	Without continuity
C7 (V12B) ↔ body earth	Without continuity

NG

WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

2 TRANSMISSION REVOLUTION SENSOR CHECK (TURBINE ROTATION SENSOR)

- (1) Connect DS-II to DLC.
 (2) Turn IG on and check the diagnostic trouble code in accordance with the instructions on the screen of DS-II.
 (3) Check if diagnostic trouble code P1731/22 is erased when the connector of the vehicle side of the transmission revolution sensor (turbine rotation sensor) is disconnected.

Reference: Diagnostic trouble code P1731/22 is erased.

<HINT>

Note that diagnostic trouble code P0715/37 is displayed when the connector of the vehicle side of the transmission revolution sensor (turbine rotation sensor) is disconnected.

OK

TRANSMISSION REVOLUTION SENSOR REPLACEMENT (TURBINE ROTATION SENSOR).

NG

3 TRANSMISSION REVOLUTION SENSOR CHECK (OUTPUT ROTATION SENSOR)

- (1) Connect DS-II to DLC.
 (2) Turn IG on and check the diagnostic trouble code in accordance with the instructions on the screen of DS-II.
 (3) Check if diagnostic trouble code P1731/22 is erased when the connector of the vehicle side of the transmission revolution sensor (output rotation sensor) is disconnected.

Reference: Diagnostic trouble code P1731/22 is erased.

<HINT>

Note that diagnostic trouble code P0720/42 is displayed when the connector of the vehicle side of the transmission revolution sensor (output rotation sensor) is disconnected.

OK

TRANSMISSION REVOLUTION SENSOR REPLACEMENT (OUTPUT ROTATION SENSOR)

NG

TRANSMISSION CONTROL COMPUTER ASSEMBLY REPLACEMENT

DTC

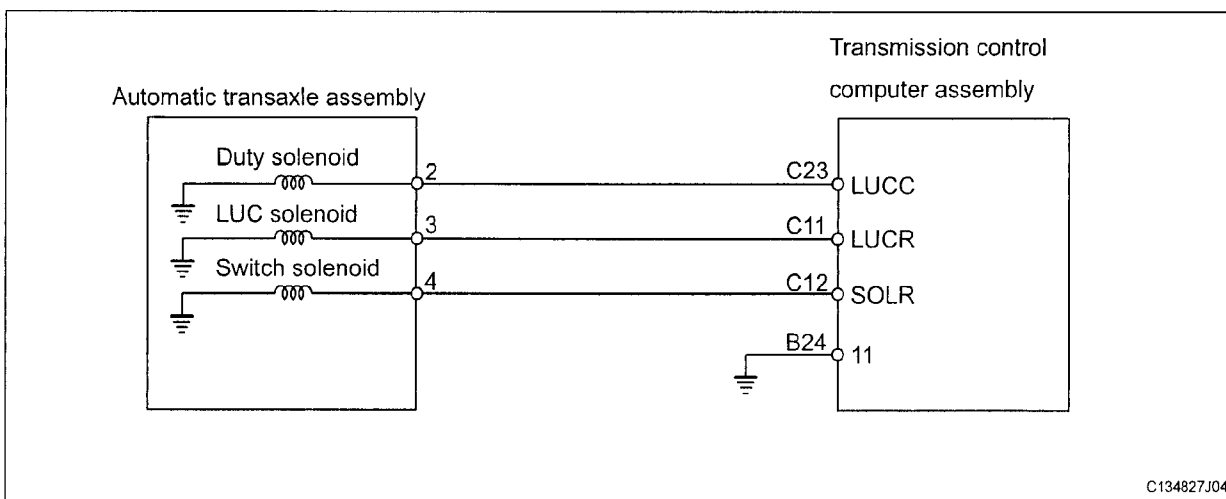
P1780/66

SWITCH SOLENOID OPEN/SHORT

Circuit description

DTC No.	DTC detection condition 1. Diagnosis condition 2. Abnormal state 3. Duration of abnormality	Checked portion
P1780/66	1. When current applied to switch solenoid 2. Switch solenoid breaks or is short-circuited 3. 0.04 second	> Solenoid wire (switch solenoid system) > Wire harness and connector > Automatic transmission three-way solenoid assembly (switch solenoid) > Transmission control computer assembly

Circuit diagram



26

Check procedure

1

SOLENOID WIRE CHECK (SWITCH SOLENOID SYSTEM)

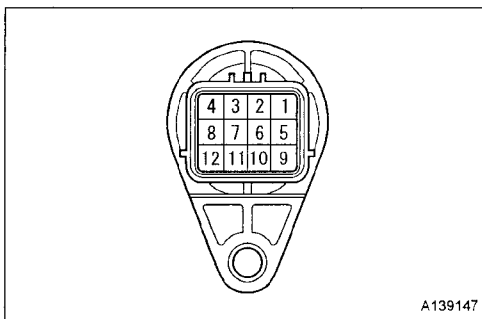
- (1) Disconnect the solenoid wire connector.
- (2) Check the resistance between the solenoid wire connector terminal and body earth using the tester.

Specified value

Measuring terminal (terminal name)	Resistance
4 ↔ body earth	14 - 18Ω (20°C)

NG

TO STEP 3



OK

2 WIRE HARNESS AND CONNECTOR CHECK (SOLENOID WIRE - TRANSMISSION CONTROL COMPUTER ASSEMBLY)

- (1) Disconnect the connector of the solenoid wire.
- (2) Disconnect connector C of the transmission control computer assembly.
- (3) Check the continuity between the connector terminal of the vehicle side of the solenoid wire and the connector terminal of the transmission control computer assembly using the tester.

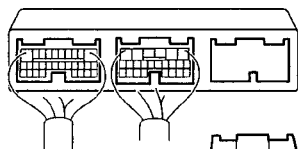
Specified value

Measuring terminal (terminal name) Solenoid wire ↔ transmission control computer assembly	Reference
4 ↔ C12 (SOLR)	There must be electrical continuity and no short circuit between any terminal and body earth.

NG

WIRE HARNESS AND CONNECTOR REPAIR AND
REPLACEMENT

Solenoid wire W/H side connector

Transmission control
computer assembly

SOLR

Connector C

C144259J12

26

OK

TRANSMISSION CONTROL COMPUTER ASSEMBLY REPLACEMENT

3 AUTOMATIC TRANSMISSION THREE-WAY SOLENOID ASSEMBLY UNIT CHECK (SWITCH SOLENOID)

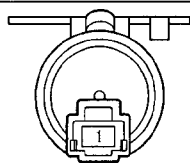
- (1) Disconnect the connector of the automatic transmission three-way solenoid assembly (switch solenoid).
- (2) Check the resistance between the solenoid terminal and solenoid body using the tester.

Specified value: 14 - 18 Ω (20°C)

<CAUTION>

After replacing automatic transmission three-way solenoid assembly (switch solenoid), initialize the AT learned value and execute AT initial learning (See page 26-17).

NG

AUTOMATIC TRANSMISSION THREE-WAY SOLENOID
ASSEMBLY REPLACEMENT (SWITCH SOLENOID)Automatic transmission
3 way solenoid assembly
(Switch solenoid)

C140483J02

OK

SOLENOID WIRE REPLACEMENT

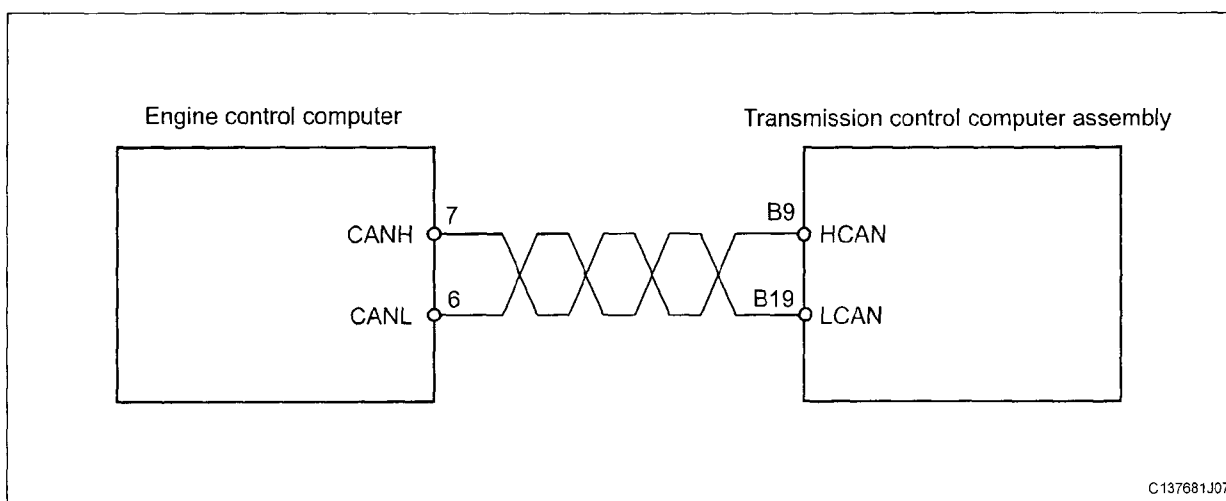
DTC	U0100/82	COMMUNICATION WITH EFI (RECEIVE)
DTC	U1001/85	COMMUNICATION WITH EFI (SEND)

Circuit description

The transmission control computer transmits data with the engine control computer by CAN communication.

DTC No.	DTC detection condition	Checked portion
U0100/82	When a signal can not be received from the engine control computer for 0.95 seconds and above	> Wire harness and connector > Transmission control computer assembly > Engine control computer
U1001/85	When a signal indicating an error is received from the engine control computer	> Wire harness and connector > Transmission control computer assembly > Engine control computer

Circuit diagram



26

Check procedure

1	READING DIAGNOSTIC TROUBLE CODE
---	---------------------------------

- (1) Read the diagnostic trouble code using DS-II (See page 26-15).

<HINT>

If a diagnostic trouble code of an error of the CAN communication system and a diagnostic trouble code of an error of a sensor related to the communication system are simultaneously output, troubleshoot the code indicating a sensor error after a recovery from the error of CAN communication is made.



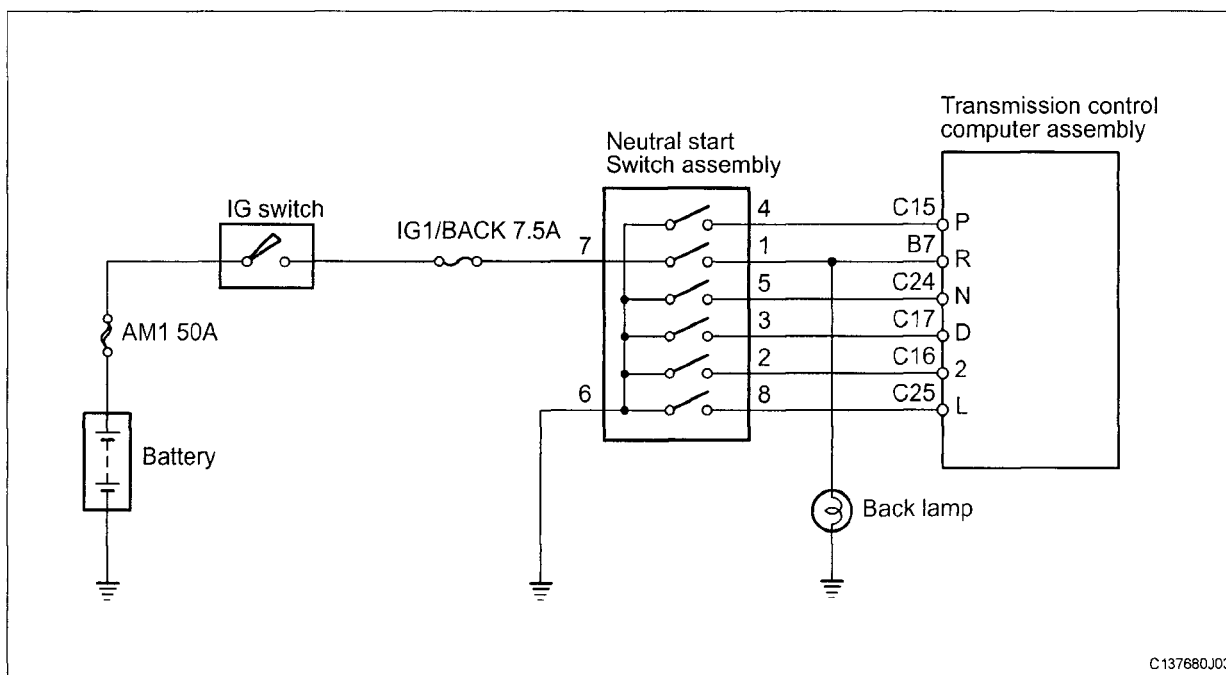
TO CAN COMMUNICATION SYSTEM

NEUTRAL START SWITCH ASSEMBLY SYSTEM

Function description

The shift position is detected by inputting a signal from the neutral start switch assembly to the transmission control computer assembly.

Circuit diagram



Check procedure

1	DATA LIST DATA READING (SHIFT POSITION)
---	---

- (1) Use DS-II and operate according to the screen display to display the [Data List] screen and check the computer data.

Item name [Symbol]	Item description	Check condition	Tester display	Check item in case of failure
Shift position [SHFT]	Indicates P position.	Shift lever position: P	P	Neutral start switch (P) signal
	Indicates R position.	Shift lever position: R	R	Neutral start switch (R) signal
	Indicates N position.	Shift lever position: N	N	Neutral start switch (N) signal
	Indicates D position.	Shift lever position: D	D	Neutral start switch (D) signal
	Indicates second position.	Shift lever position: 2	2	Neutral start switch (2) signal
	Indicates L position.	Shift lever position: L	L	Neutral start switch (L) signal

Check result

Tester display	Go to
Error of P, N, D, 2, or L	A
Error of R	B

B

TO STEP 6

A

2 NEUTRAL START SWITCH ASSEMBLY INSTALLATION CHECK

- (1) Check the installation state of the neutral start switch assembly.

Reference: The sensor is attached properly.

<HINT>

Neutral start switch assembly installation and adjustment (See page 26-66).

NG

CORRECT THE INSTALLATION STATE OF OR
REPLACE THE NEUTRAL START SWITCH ASSEMBLY.

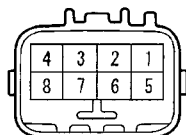
OK

3 NEUTRAL START SWITCH ASSEMBLY UNIT CHECK (P, N, D, 2, AND L SYSTEMS)

- (1) Disconnect the connector of the neutral start switch assembly.
- (2) Check the continuity between the connector terminals of the neutral start switch assembly when the shift lever is operated using the tester.

Reference

Neutral start switch assembly



C140223J06

Measuring terminal (Terminal name)	Measuring condition	Reference
4 ↔ 6	Shift lever P position	With electrical continuity
	Shift lever Other than P position	Without continuity
5 ↔ 6	Shift lever N position	With electrical continuity
	Shift lever Other than N position	Without continuity

Measuring terminal (Terminal name)	Measuring condition	Reference
3 ↔ 6	Shift lever D position	With electrical continuity
	Shift lever Other than D position	Without continuity
2 ↔ 6	Shift lever Second position	With electrical continuity
	Shift lever Other than 2 position	Without continuity
8 ↔ 6	Shift lever L position	With electrical continuity
	Shift lever Other than L position	Without continuity

NG

NEUTRAL START SWITCH ASSEMBLY REPLACEMENT

OK

4 WIRE HARNESS AND CONNECTOR CHECK (NEUTRAL START SWITCH ASSEMBLY - TRANSMISSION CONTROL COMPUTER ASSEMBLY)

- (1) Disconnect the connector of the neutral start switch assembly and connector C of the transmission control computer assembly.
- (2) Check the continuity and short circuit between the connector terminal of the vehicle side of the neutral start switch assembly and the connector terminal of the vehicle side of the transmission control computer assembly using the tester.

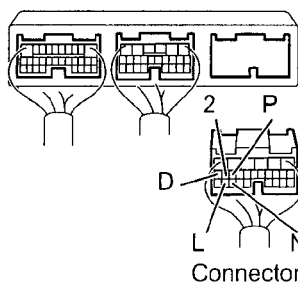
Reference

Measuring terminal (terminal name) Neutral start switch assembly ↔ transmission control computer assembly	Reference
4 ↔ C15 (P)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
5 ↔ C24 (N)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
3 ↔ C17 (D)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
2 ↔ C16 (2)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.
8 ↔ C25 (L)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.

Neutral start switch assembly
W/H side connector



Transmission control
Computer assembly



C144266J02

NG

WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

OK

5 WIRE HARNESS AND CONNECTOR CHECK (NEUTRAL START SWITCH ASSEMBLY - BODY EARTH)

Neutral start switch assembly
W/H side connector

C135998J08

- (1) Disconnect the connector of the neutral start switch assembly.
- (2) Check the continuity between the connector terminals of the vehicle side of the neutral start switch assembly and body earth using the tester.

Reference

Measuring terminal	Reference
6 ↔ body earth	With electrical continuity

NG

WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

OK

TRANSMISSION CONTROL COMPUTER ASSEMBLY REPLACEMENT

6 FUSE CHECK (IG1/BACK)

- (1) Remove the IG1/BACK fuse from the fuse block assembly.
- (2) Check the IG1/BACK fuse for electrical continuity using the tester.

Reference: With electrical continuity

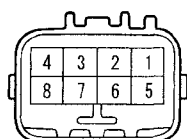
NG

FUSE REPLACEMENT

OK

7 NEUTRAL START SWITCH ASSEMBLY UNIT CHECK (R system)

Neutral start switch assembly



C140223J06

- (1) Disconnect the connector of the neutral start switch assembly.
- (2) Check the continuity between the connector terminals of the neutral start switch assembly when the shift lever is operated using the tester.

Reference

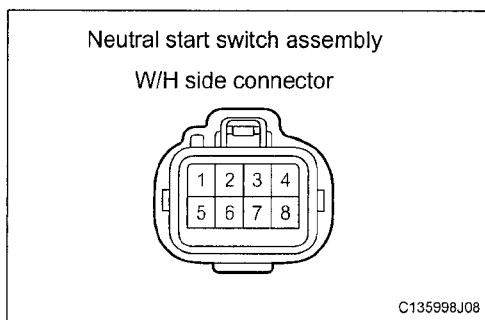
Measuring terminal (Terminal name)	Measuring condition	Reference
7 ↔ 1	Shift lever R position	With electrical continuity
	Shift lever Position other than R	Without continuity

NG

NEUTRAL START SWITCH ASSEMBLY REPLACEMENT

OK

8 WIRE HARNESS AND CONNECTOR CHECK (NEUTRAL START SWITCH ASSEMBLY - BODY GROUND)



- (1) Disconnect the connector of the neutral start switch assembly.
- (2) Check the voltage between the connector terminal of the vehicle side of the neutral start switch assembly and body earth using the tester.

Reference

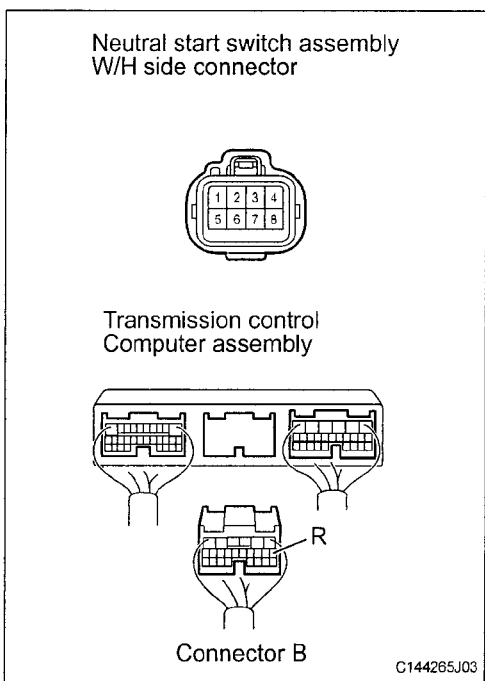
Measuring terminal	Measuring condition	Reference
7 ↔ body earth	IG ON	11 - 14 V

NG

WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

OK

9 WIRE HARNESS AND CONNECTOR CHECK (NEUTRAL START SWITCH ASSEMBLY - TRANSMISSION CONTROL COMPUTER ASSEMBLY)



- (1) Disconnect the connector of the neutral start switch assembly and connector B of the transmission control computer assembly.
- (2) Check the continuity and short circuit between the connector terminal of the vehicle side of the neutral start switch assembly and the connector terminal of the vehicle side of the transmission control computer assembly using the tester.

Reference

Measuring terminal (terminal name) Neutral start switch assembly ↔ transmission control computer assembly	Reference
1 ↔ B7 (R)	There is electrical continuity and no short circuit between other terminals and between the terminals and the body earth.

NG

WIRE HARNESS AND CONNECTOR REPAIR AND REPLACEMENT

OK

TRANSMISSION CONTROL COMPUTER ASSEMBLY REPLACEMENT

AUTOMATIC TRANSAXLE ASSEMBLY

PRECAUTION

1. Before disassembling the automatic transaxle assembly, wash away sand and mud collecting outside the transaxle, so that they do not enter inside the assembly while it is disassembled.
2. Do not face the oil pan upward until it is removed because a foreign particle may get into the valve body.
3. To disassemble a light alloy part such as a case, do not twist it with a screwdriver but apply a slight shock to it by lightly tapping it with a plastic hammer.
4. Remove and disassemble the assembly with bare hands or by wearing vinyl gloves. Do not use cloth gloves and waste cloths because thread and yarn may get into the assembly.
5. Put the disassembled parts in order and protect them from dust.
6. Thoroughly clean, dry, and apply DEXRON III to each part before attaching it. However, do not clean aluminum and rubber parts with an alkaline solvent. Never clean the rubber parts of the O-ring, gasket, and oil seal with treated oil (such as white gasoline).
7. Apply DEXRON III to the wiping and rotating surfaces of parts when attaching the parts.
8. Sufficiently apply DEXRON III to the O-ring and oil seal ring to protect them from damages when attaching them.
9. Exercise care not to damage the matching surfaces of a case. Otherwise, the oil may leak.
10. Exercise care not to attach the O-ring and snap ring at a wrong location. Leave not parts left unattached.
11. Use DEXRON III as the fluid to be injected.

AUTOMATIC TRANSAXLE FLUID

INSPECTION

1. Automatic transaxle fluid quantity check

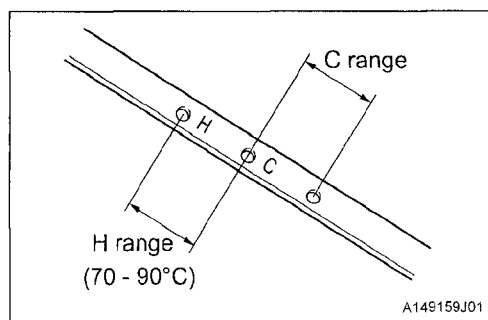
<CAUTION>

- > Too much or too little oil may cause a trouble.
- > Check the automatic transaxle fluid quantity after checking the idle speed.
- > Stop the vehicle on a flat surface.
- > Check the fluid quantity after the transaxle is completely warmed up (AT oil temperature: 70 to 80°C).
- > Use DEXRON III as the fluid to be injected.

(1) Apply the parking brake.

(2) Step on the brake pedal and start the engine.

(3) Slowly move the shift lever to each position, P to L, while the engine is idling, and then move it back to the P position.



(4) Pull out the level gage while the engine is idling, wipe off the oil with a waste cloth or suchlike, and insert the level gage again to check if the oil is in the range of 'H' of the level gage.

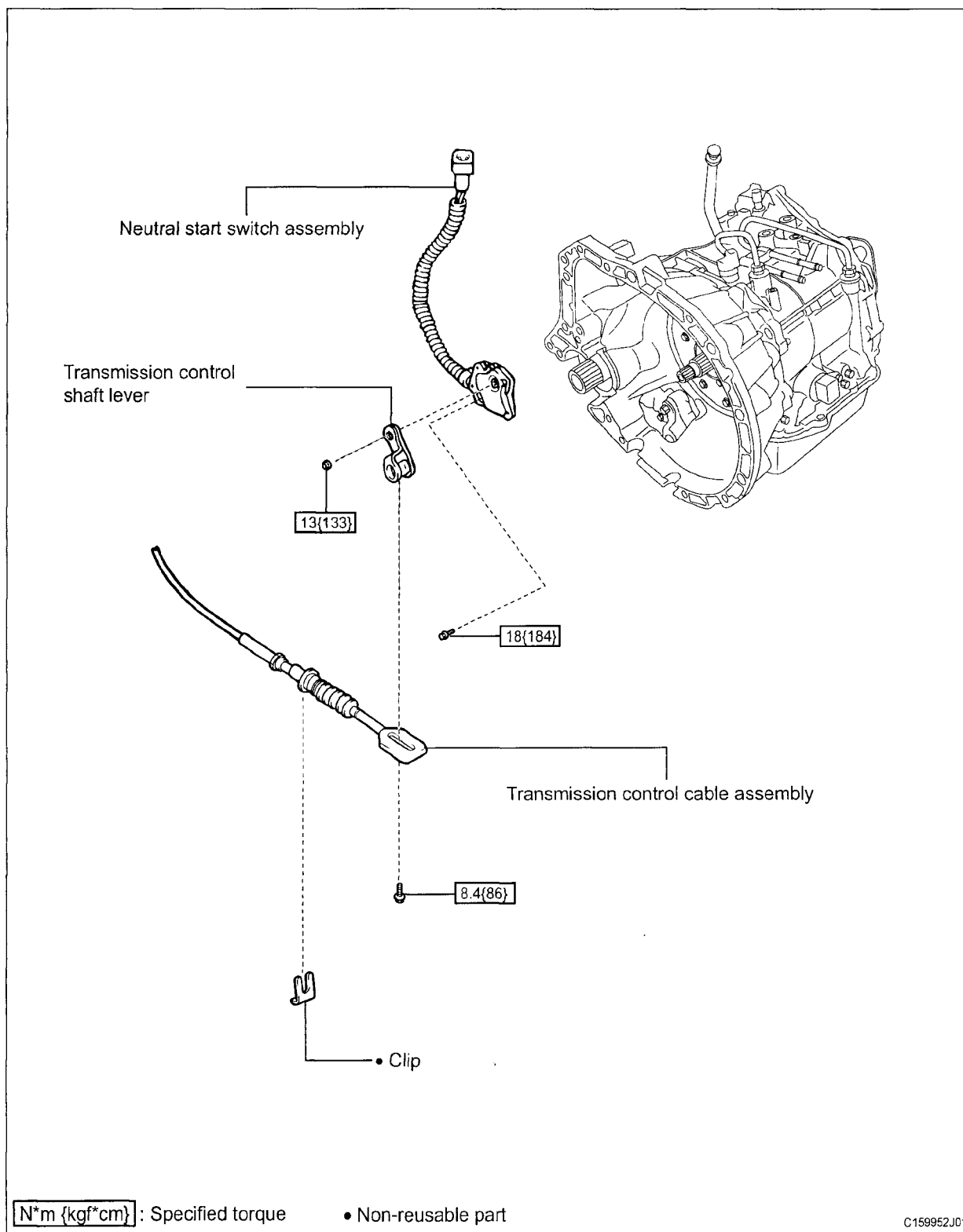
<CAUTION>

- > When the oil temperature is low (20 to 30°C) such as when the oil is replaced, adjust the fluid level in a range of 'C' of the level gage, and then check the fluid level again when the transaxle has been completely warmed up.
- > When inserting the oil level gage, check if no foreign particles collect on the oil level gage.

(5) If the quantity of the oil is less than that specified, check oil leakage.

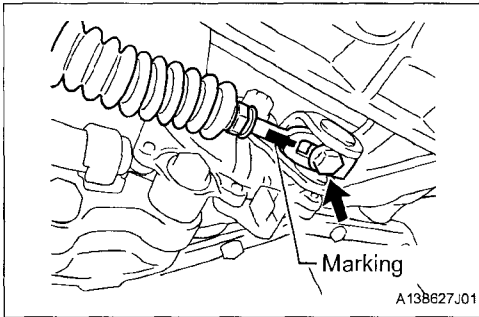
NEUTRAL START SWITCH ASSEMBLY

COMPONENTS



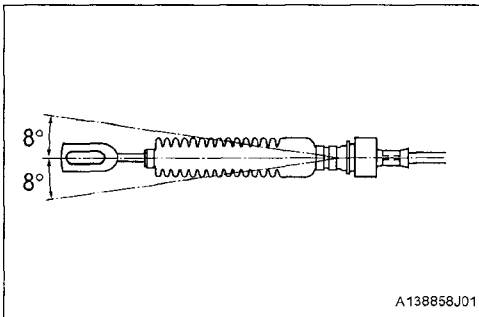
REMOVAL

1. Battery minus terminal disconnection



2. Transmission control cable assembly disconnection

- (1) Put a marking for identifying the top and bottom on the end of the transaxle side of the transmission control cable assembly.



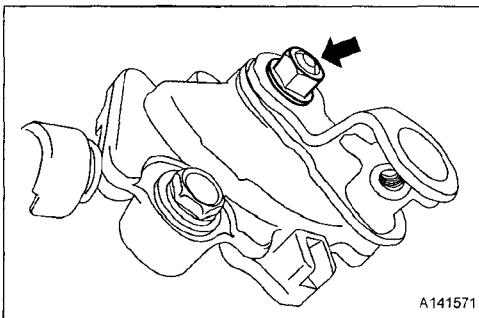
- (2) Remove the bolt and disconnect the transmission control cable.

<CAUTION>

- > Do not vibrate the end of the transmission cable at 8° and above.
- > Do not apply a load to the end of the transmission control cable assembly.

3. Transmission control shaft lever removal

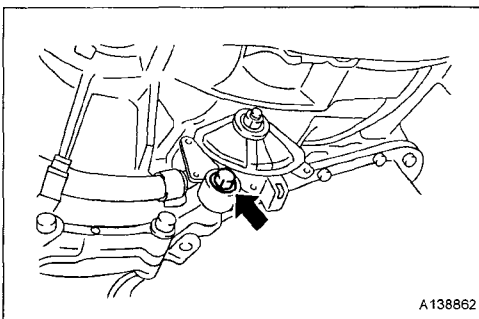
- (1) Remove the nut and then the transmission control shaft lever.



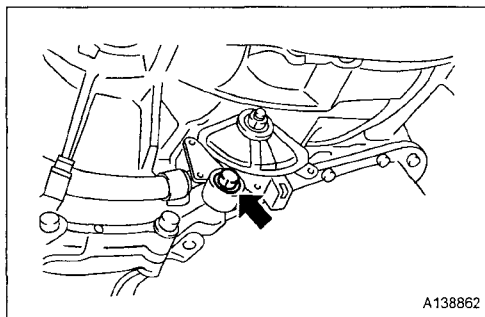
4. Neutral start switch assembly removal

- (1) Disconnect the connector of the wire harness of the vehicle side of the neutral start switch assembly.
- (2) Remove a tab fitting and remove the connector of the neutral start switch assembly from the bracket.

- (3) Remove the bolt and then the neutral start switch assembly.



INSTALLATION

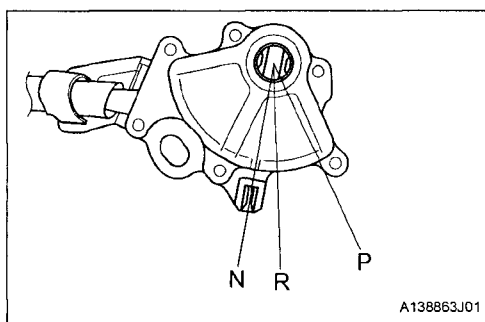


1. Neutral start switch assembly installation
 - (1) Temporarily attach the neutral start switch assembly with a bolt.
 - (2) Fit tabs and attach the connector of the neutral start switch assembly to the bracket.
 - (3) Connect the connector of the wire harness of the vehicle side of the neutral start switch assembly.

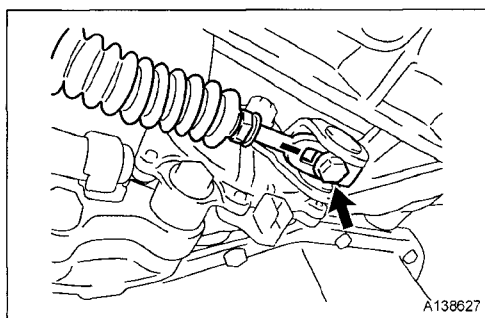
2. Neutral start switch assembly adjustment (See page 26-67)

3. Transmission control cable assembly connection

- (1) Hold the shift lever at the N position (pushed toward the R position).



- (2) Rotate the transmission control shaft lever until it stops in the forward direction of the vehicle (P position), and then move the shaft lever 2 positions back (N position).



- (3) Facing down the top-and-bottom identification marking on the cable end, and connect the transmission control cable assembly with a bolt.

Specified value: $T=8.4N \cdot m$ {86kgf*cm}

<CAUTION>

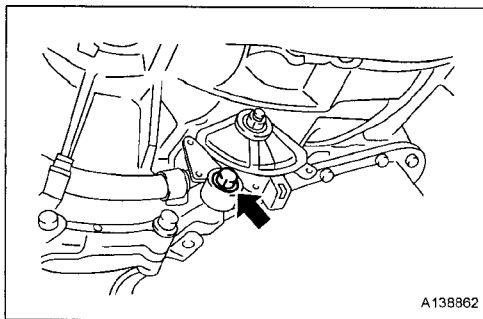
Exercise care that backlash of the transmission control cable is not one-sided.

26

4. Battery minus terminal connection
Specified value: $T=6.4N \cdot m$ {65kgf*cm}

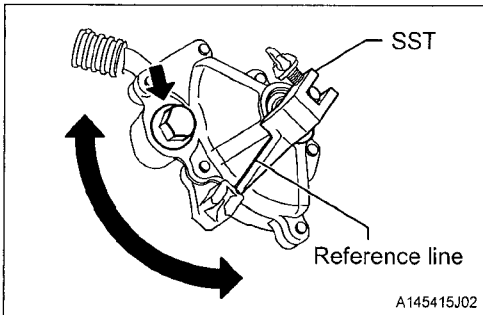
ADJUSTMENT

1. Fixing shift lever
 - (1) Hold the shift lever at the N position.
2. Transmission control cable assembly disconnection (See page 26-65)
3. Transmission control shaft lever removal (See page 26-65)



4. Neutral start switch assembly adjustment

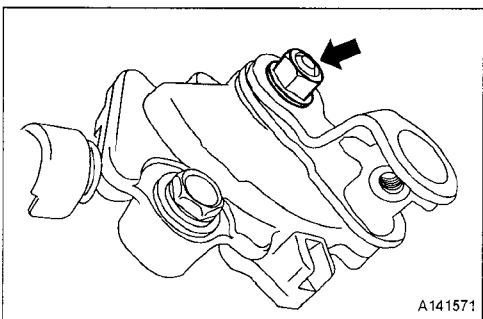
- (1) Loosen the bolt and make the neutral start switch assembly movable.



- (2) Attach SST to the transmission control shaft, rotate the switch so that the reference lines on the gage of SST and that of the neutral start switch assembly match, and make adjustments. Then tighten the bolt with the specified torque.

SST 09302-87201

Specified value: $T=18N \cdot m$ {184kgf $\cdot$ cm}



- (3) Attach the transmission control shaft lever with a nut.

Tool: Head replaceable preset torque wrench
{Tonichi (CL25NX10D-MH) or equivalent}

Ring gear head {Tonichi (RH10DX12) or equivalent}

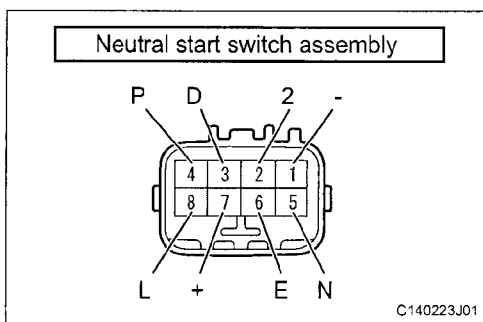
Specified value: $T=13N \cdot m$ {133kgf $\cdot$ cm}

<HINT>

- > Move the transmission control shaft lever 2 to 3 mm from the position of the P range toward the R range, and check if it completely returns to the P range.
- > If it does not return completely, loosen the mounting bolt of the neutral start switch assembly once, and adjust the position of the neutral start switch assembly again.

5. Transmission control cable assembly connection (See page 26-66)

INSPECTION



1. Conductivity check

- (1) Check the continuity between the connector terminals of the neutral start switch assembly when the shift lever is operated using the tester.

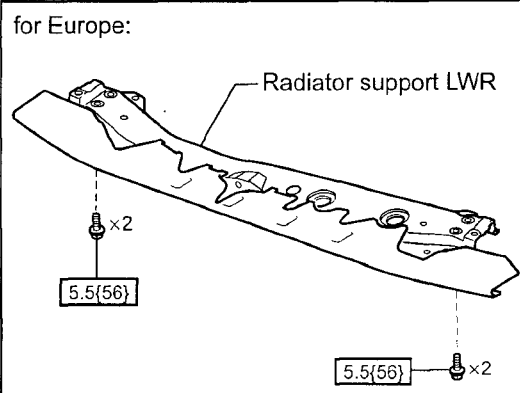
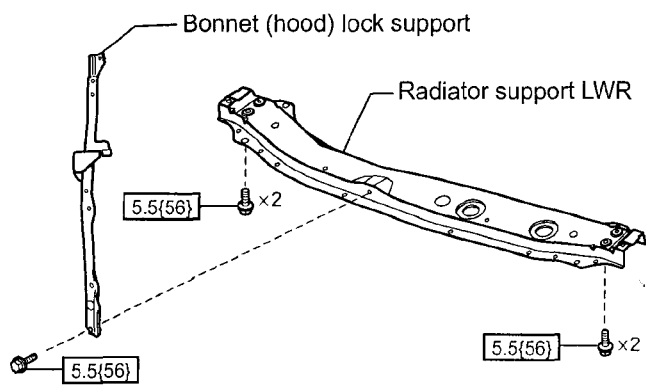
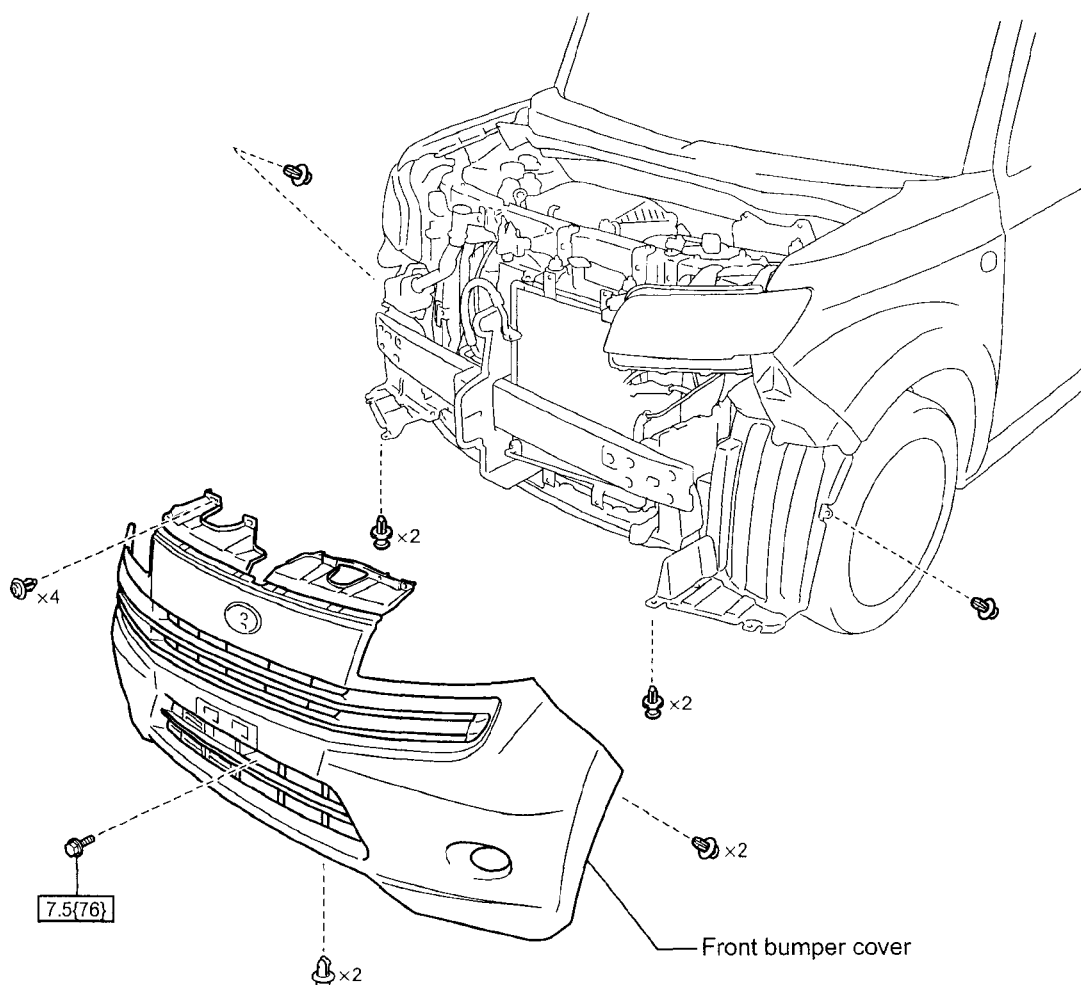
Reference

Measuring terminal (terminal name)	Measuring condition	Reference
4 (P) ↔ 6 (E)	Shift lever at P position	With electrical continuity
	Shift lever not at P position	Without continuity
5 (N) ↔ 6 (E)	Shift lever at N position	With electrical continuity
	Shift lever not at N position	Without continuity
1 (-) ↔ 7 (+)	Shift lever at R position	With electrical continuity
	Shift lever not at R position	Without continuity

Measuring terminal (terminal name)	Measuring condition	Reference
3 (D) ↔ 6 (E)	Shift lever at D position	With electrical continuity
	Shift lever not at D position	Without continuity
2 (2) ↔ 6 (E)	Shift lever at 2nd position	With electrical continuity
	Shift lever not at 2nd position	Without continuity
8 (L) ↔ 6 (E)	Shift lever at L position	With electrical continuity
	Shift lever not at P position	Without continuity

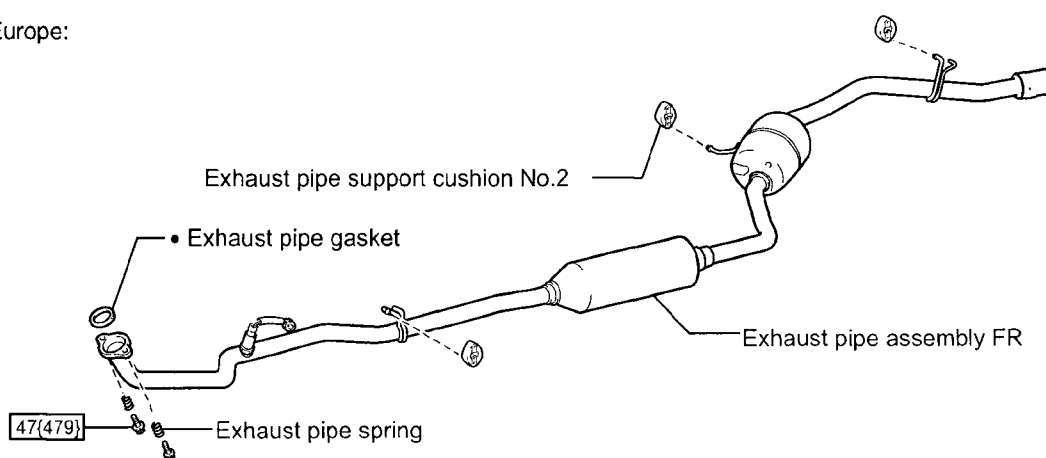
TRANSAXLE ASSEMBLY (ATM)

COMPONENTS

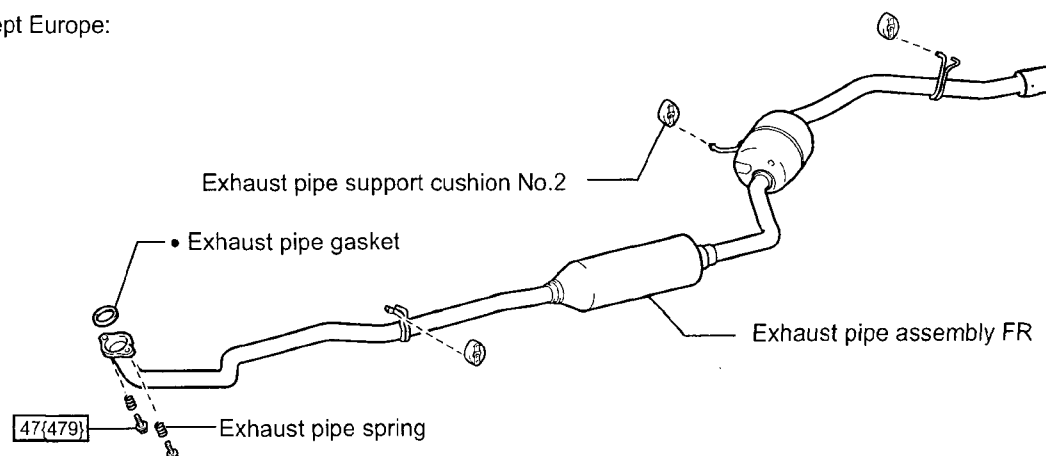


[N*m {kgf*cm}] : Specified torque

for Europe:

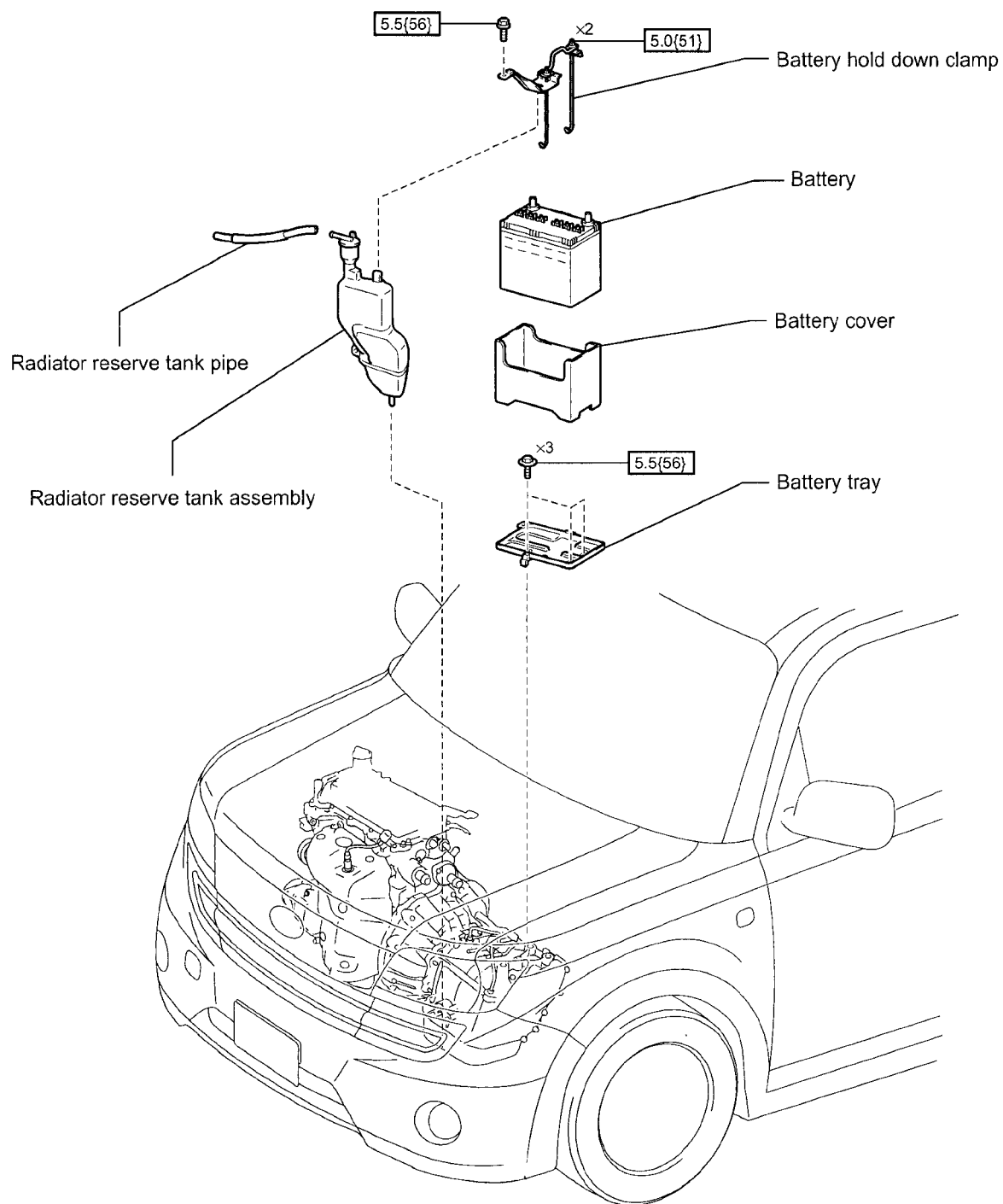


except Europe:



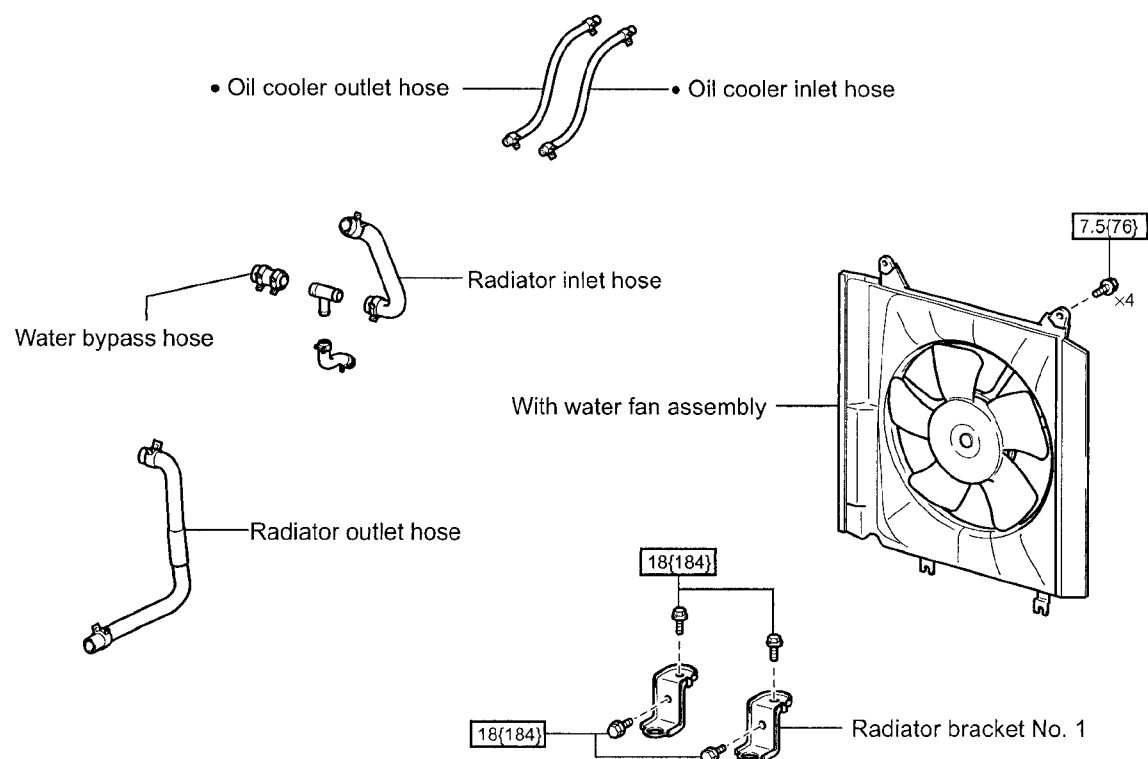
26

$\boxed{\text{N}^*\text{m} \{\text{kgf}^*\text{cm}\}}$: Specified torque • Nonreusable part

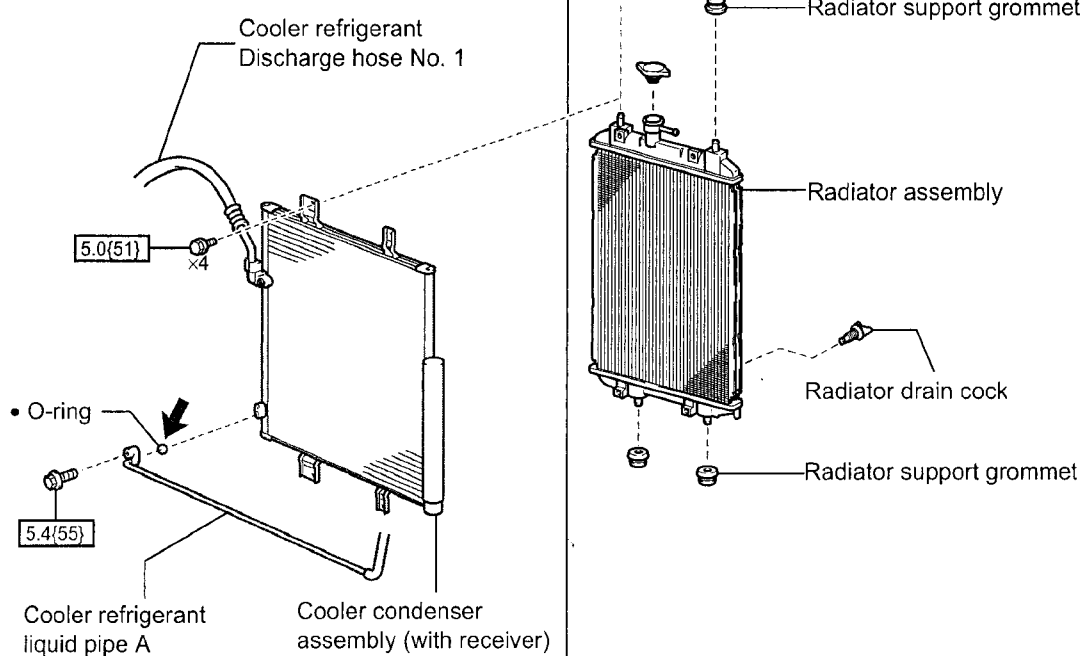


$\text{N}\cdot\text{m} \{ \text{kgf}\cdot\text{cm} \}$: Specified torque

A145460J01



with Air conditioning system:

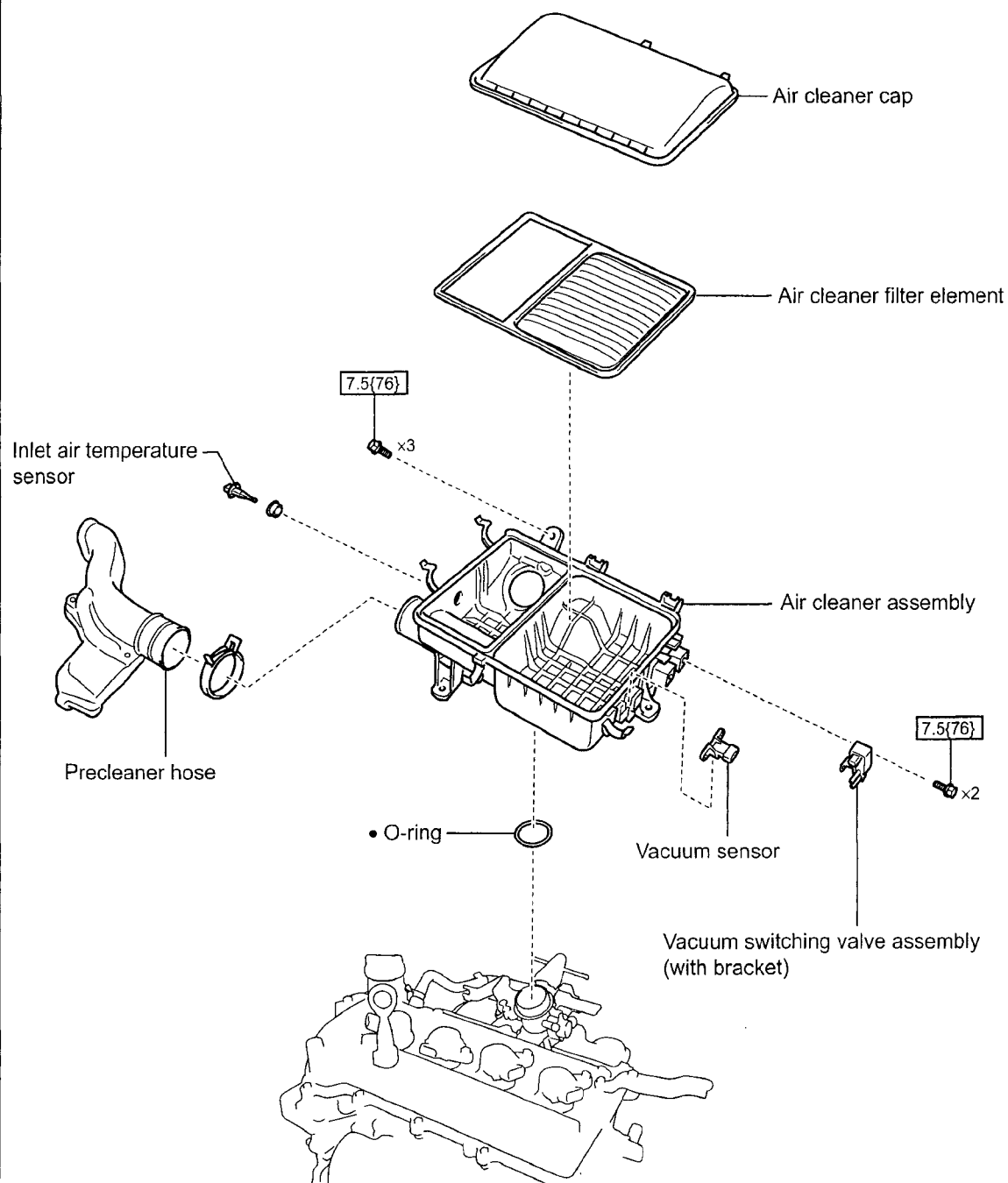


N·m {kgf·cm} : Specified torque • Nonreusable part

◀ Compressor oil ND-OIL8 application

C160992J01

26

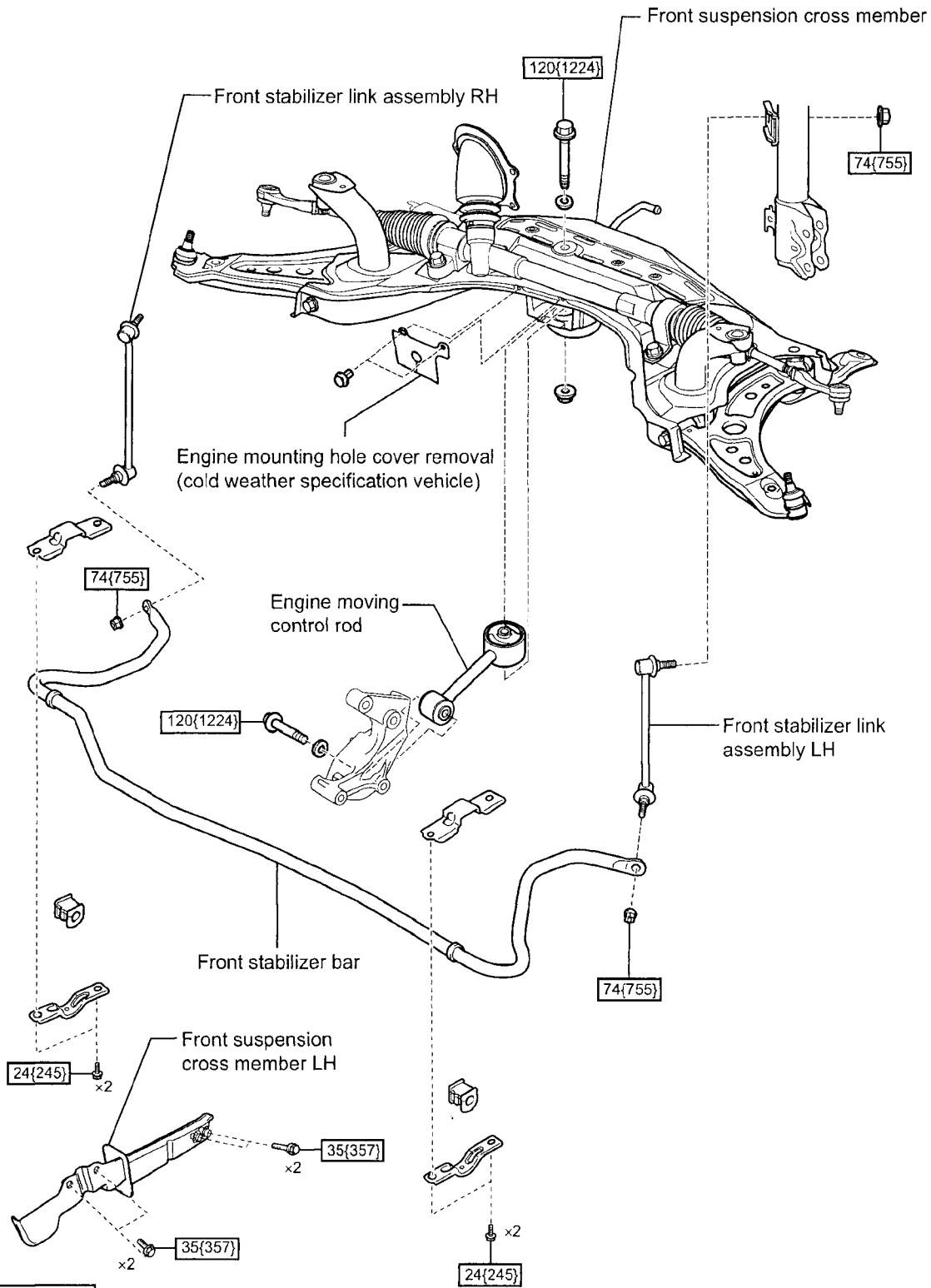


[N*m {kgf*cm}] : Specified torque

• Non-reusable part

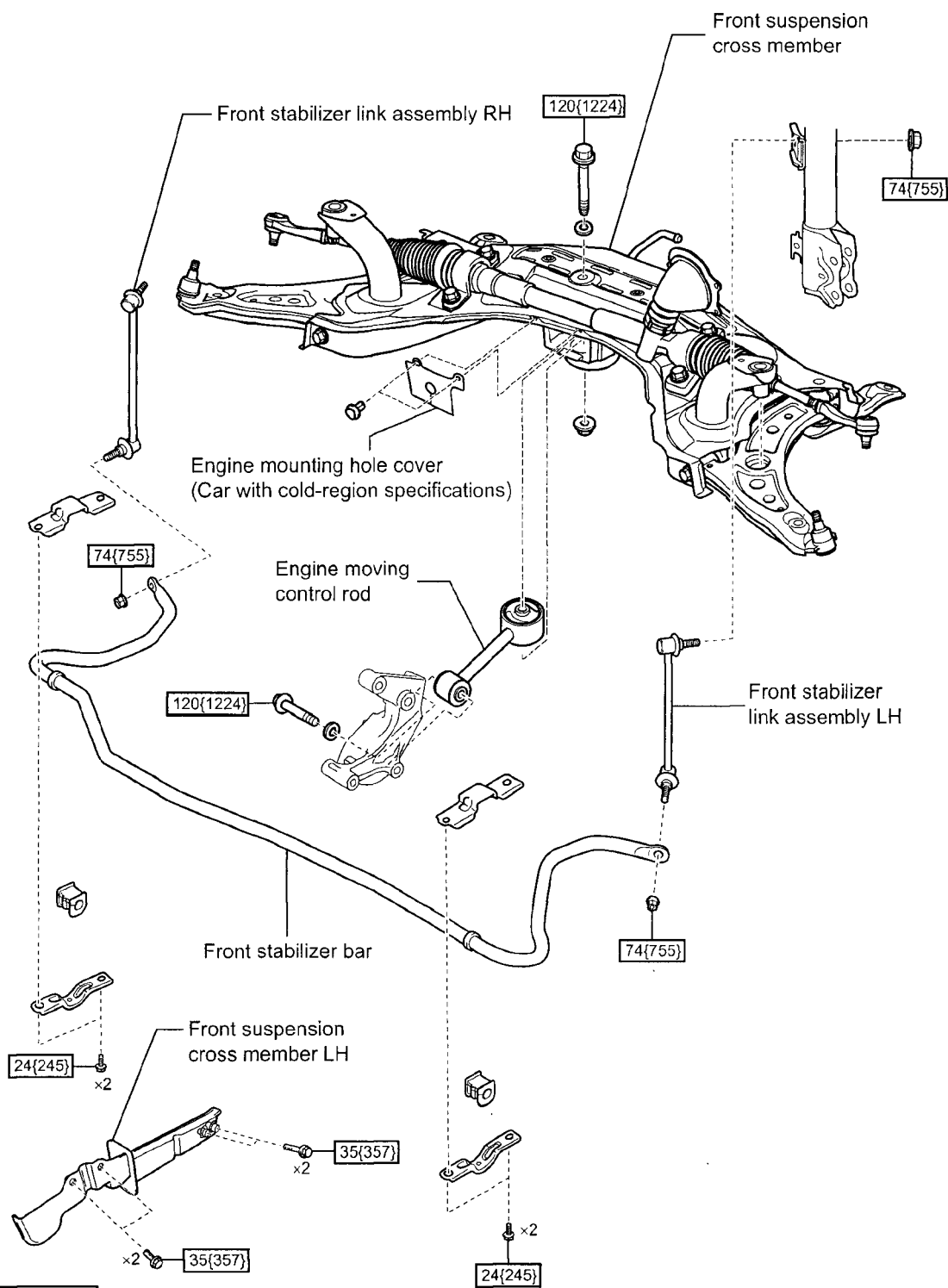
A145486J01

RHD:

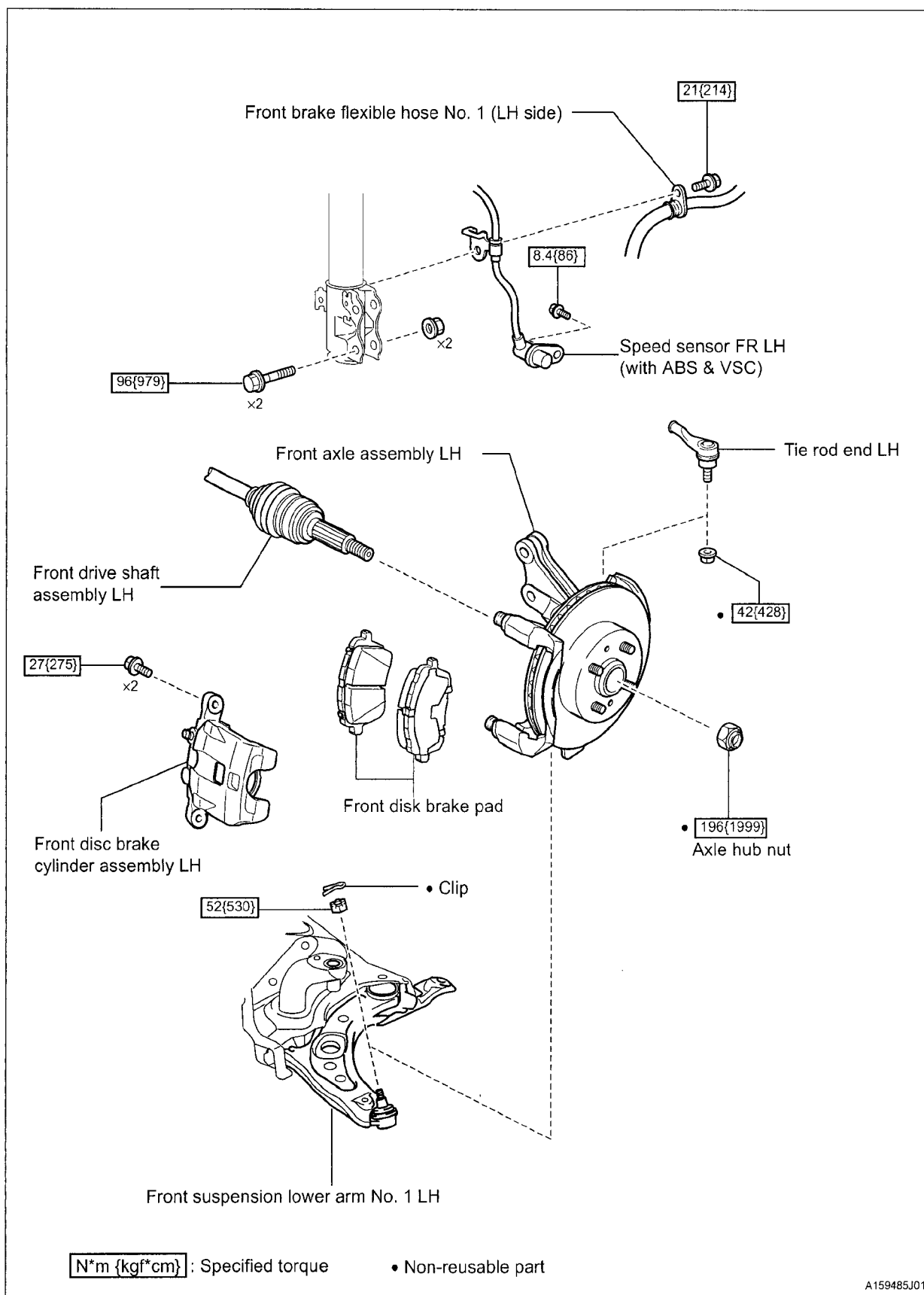


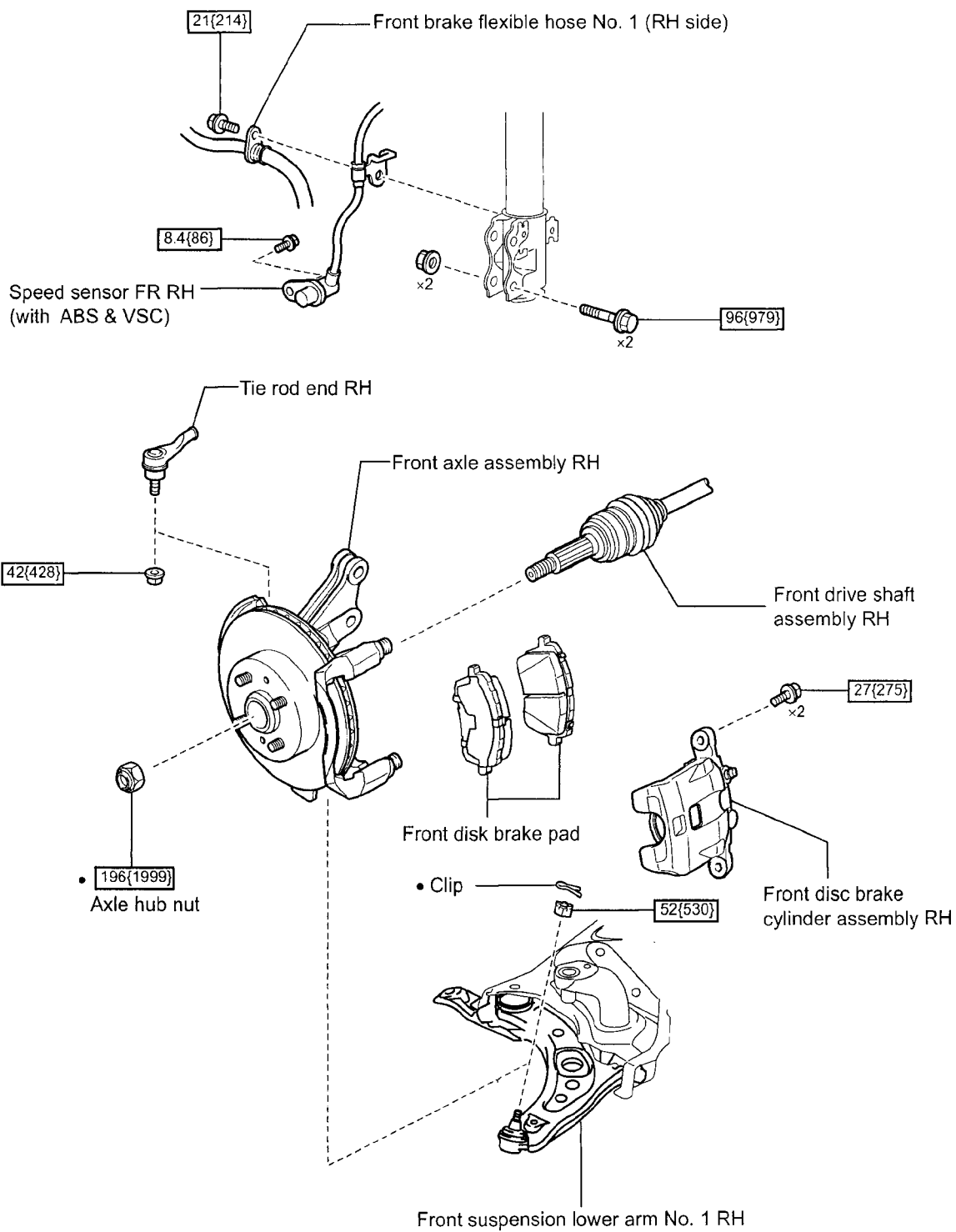
N*m {kgf*cm}: Specified torque

LHD:



A161687J01

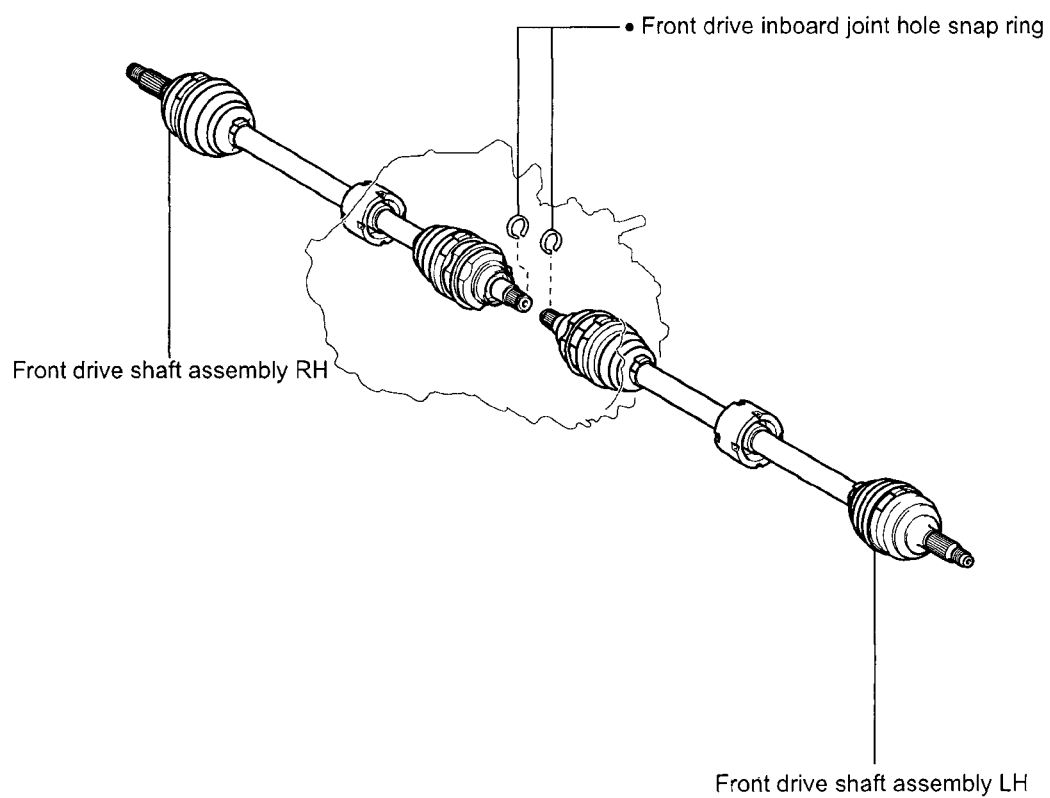




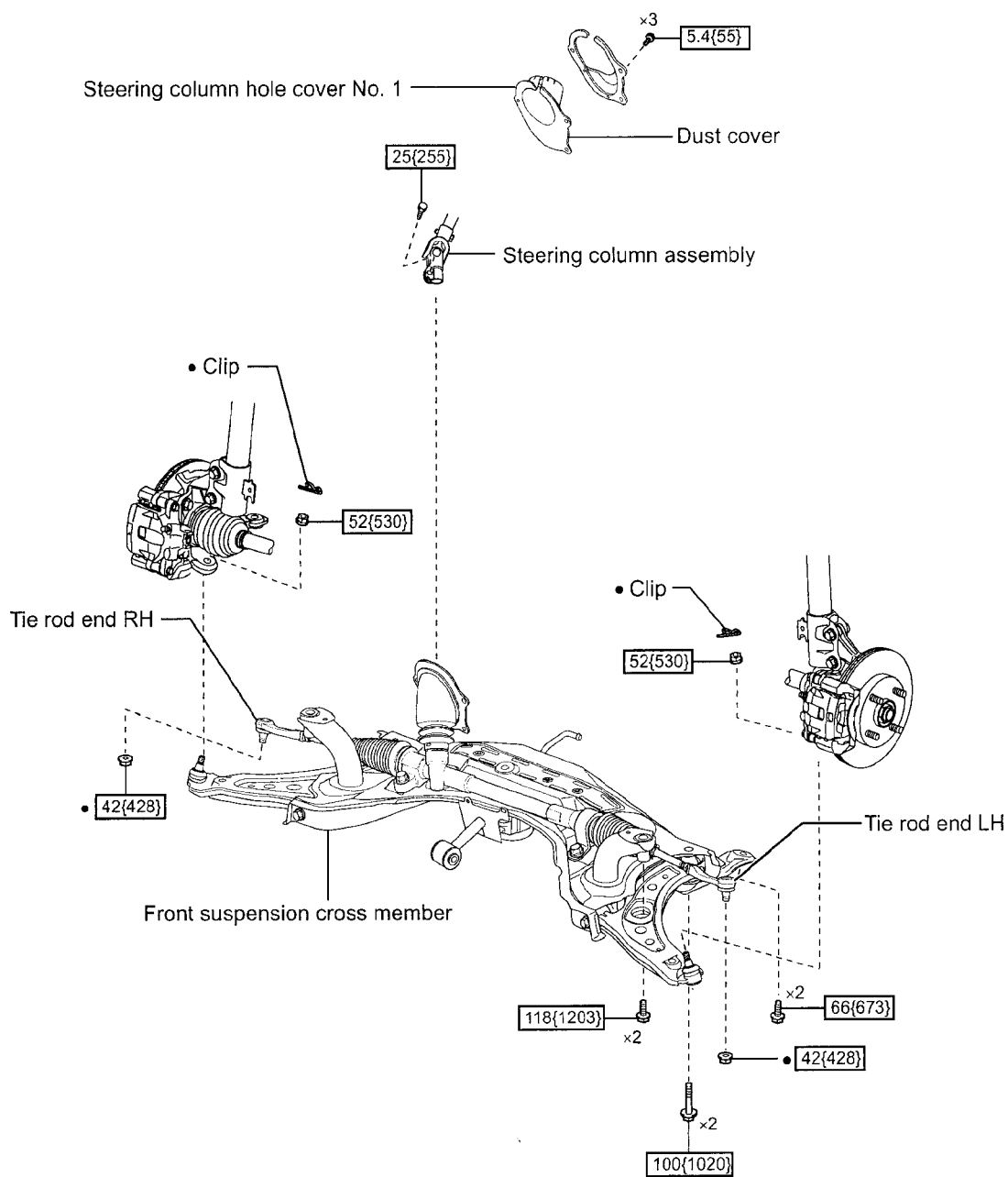
N*m {kgf*cm} : Specified torque

• Non-reusable part

A159486J01



RHD:

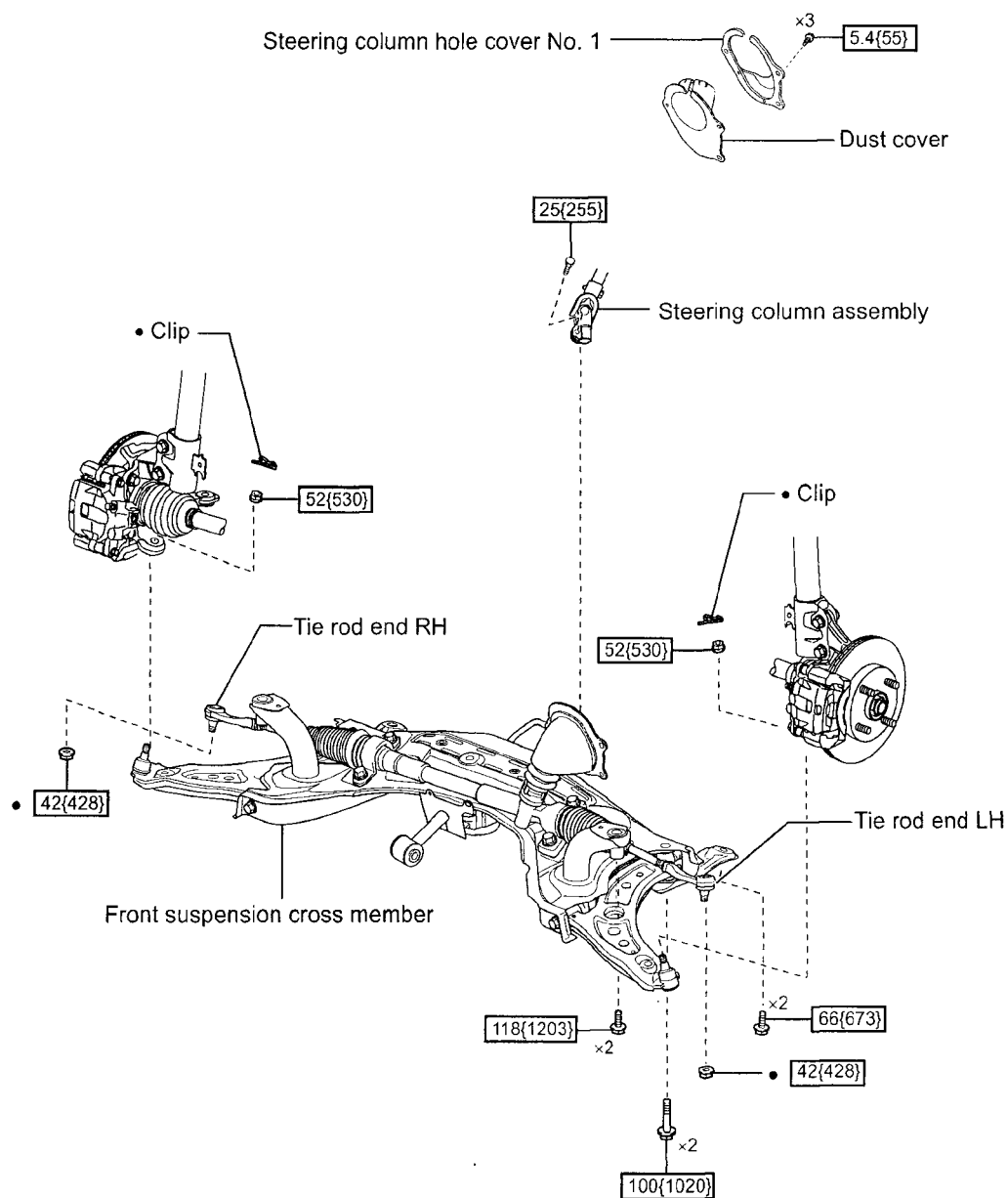


N*m {kgf*cm}: Specified torque

• Non-reusable part

A159532J01

LHD:

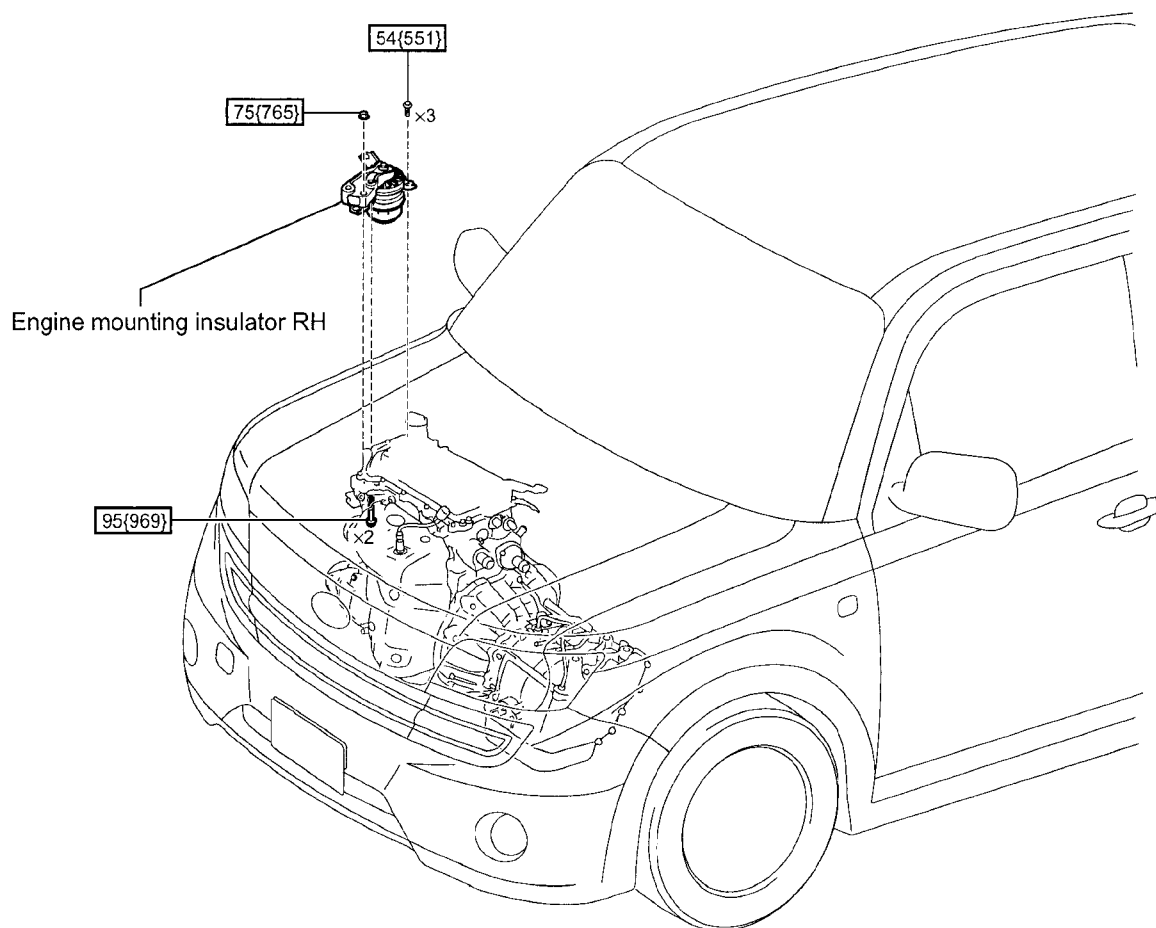


26

$\boxed{N \cdot m \{kgf \cdot cm\}}$: Specified torque

• Non-reusable part

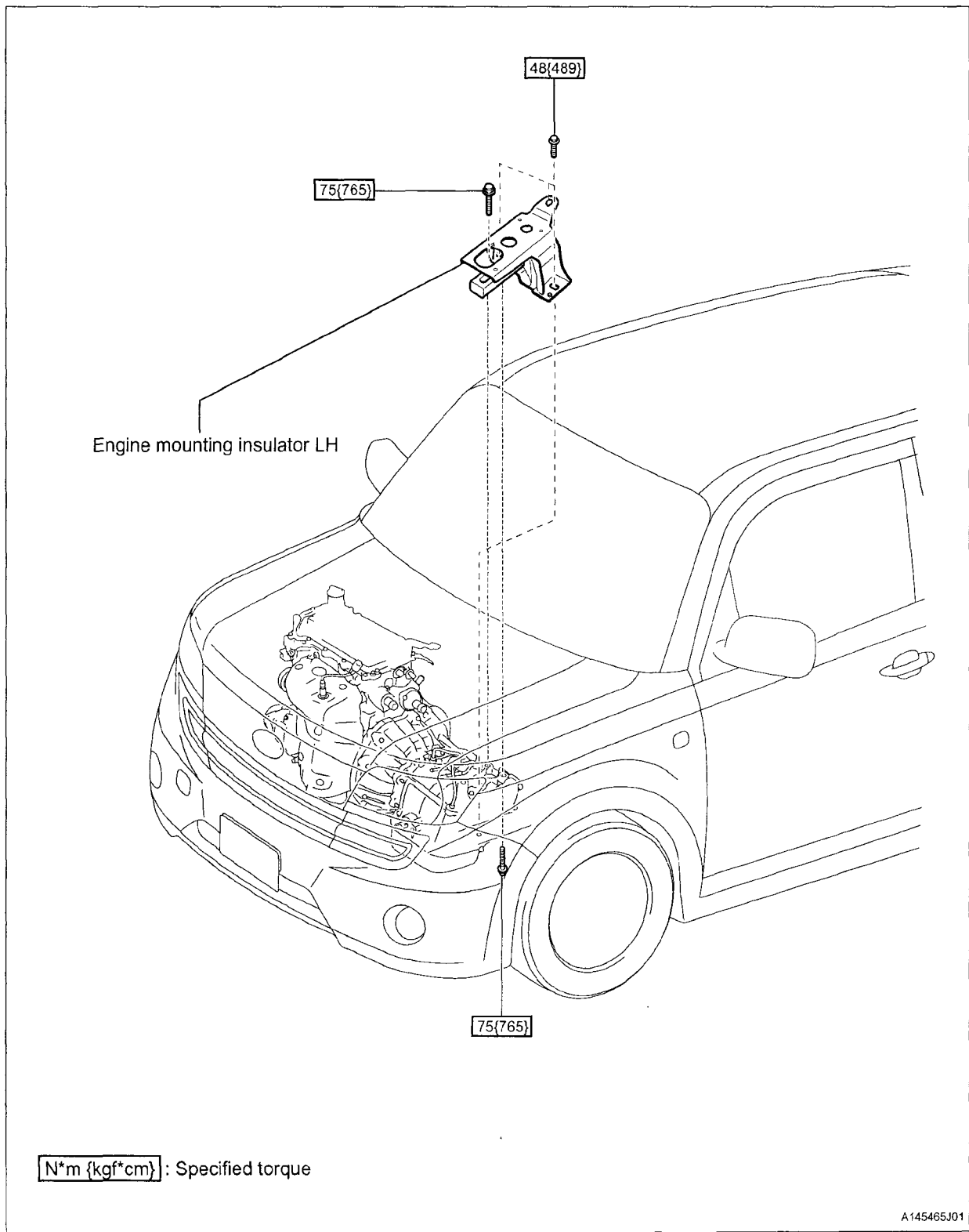
A161696J01

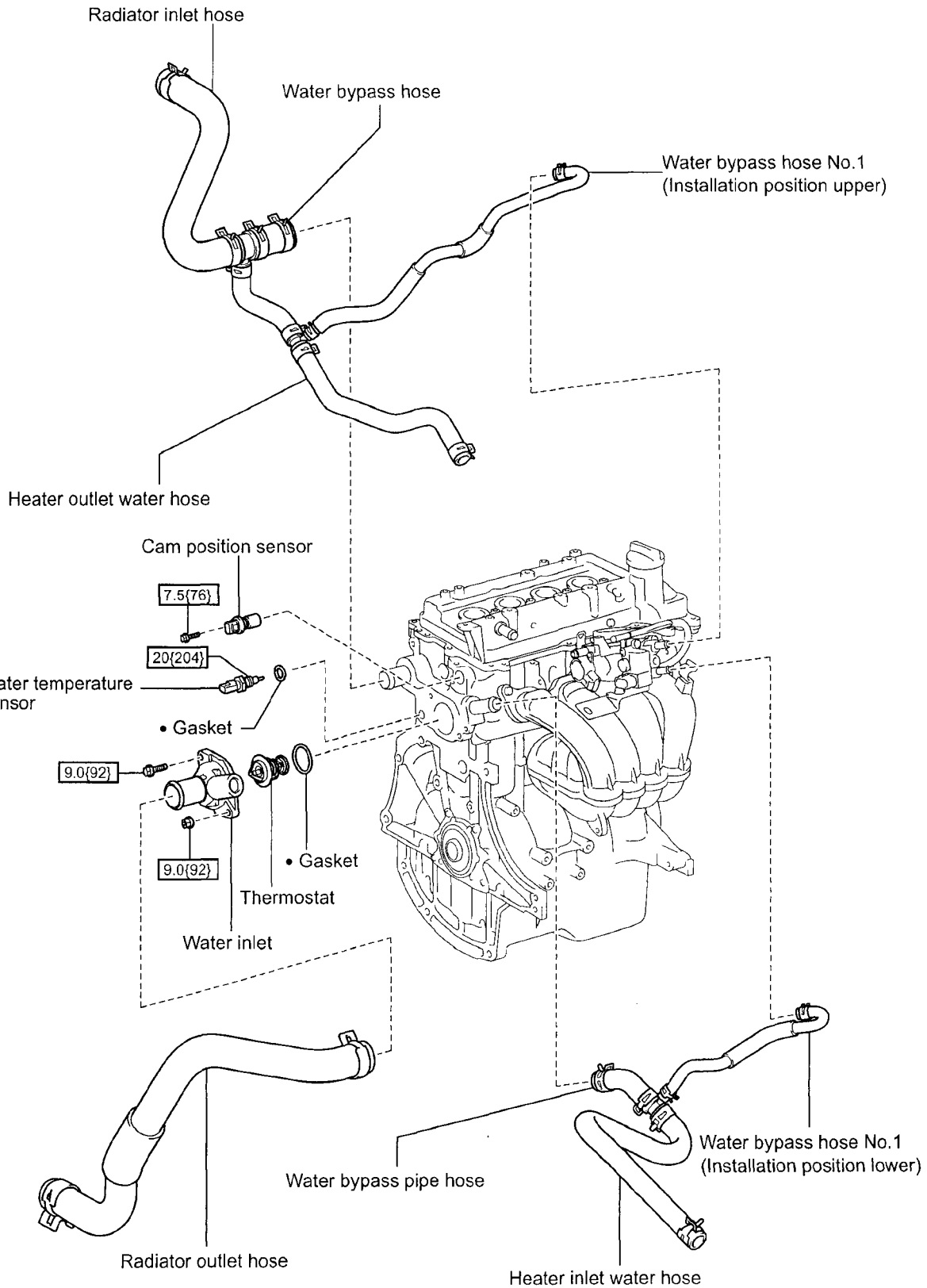


26

[N*m {kgf*cm}] : Specified torque

A145462J01



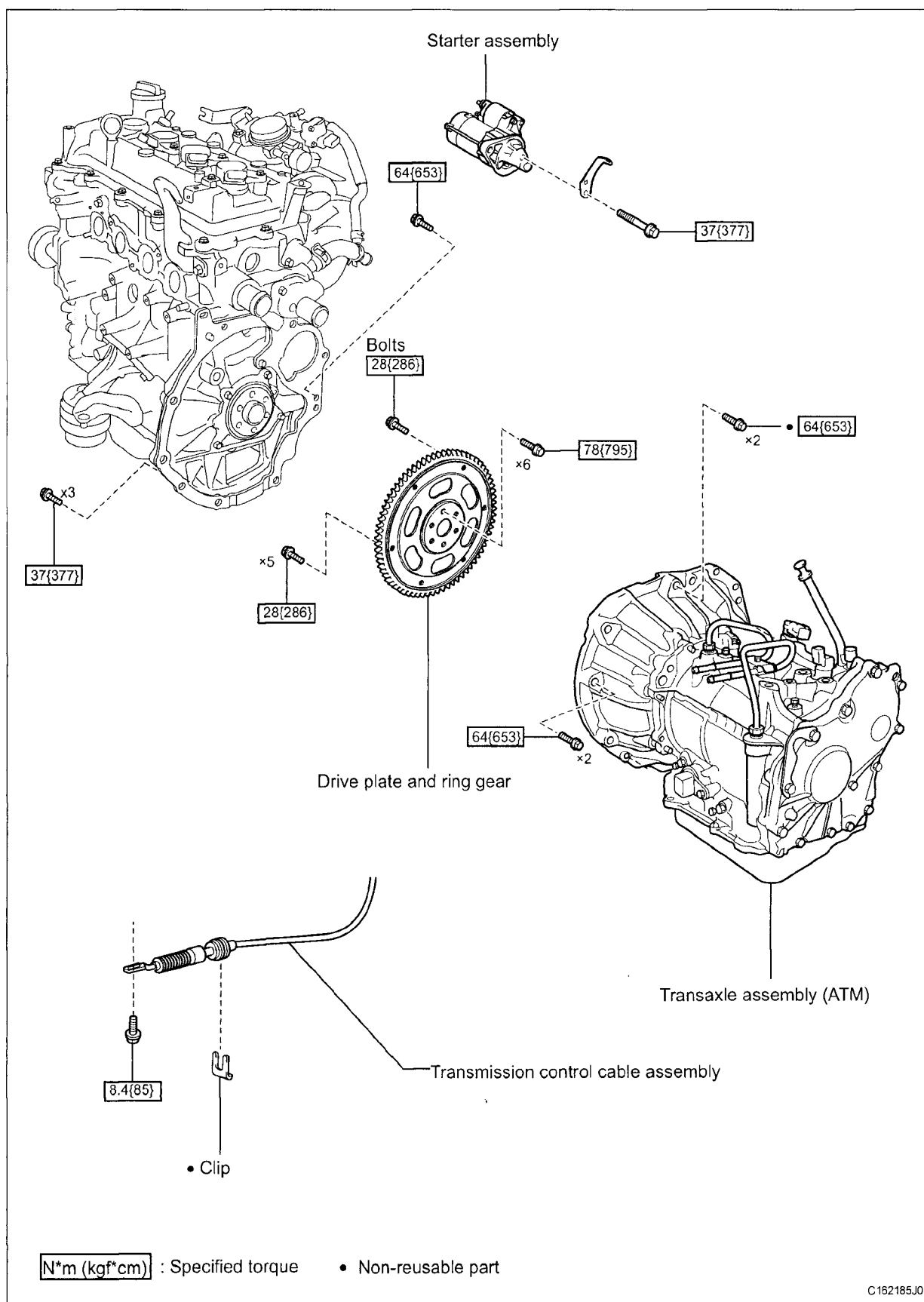


26

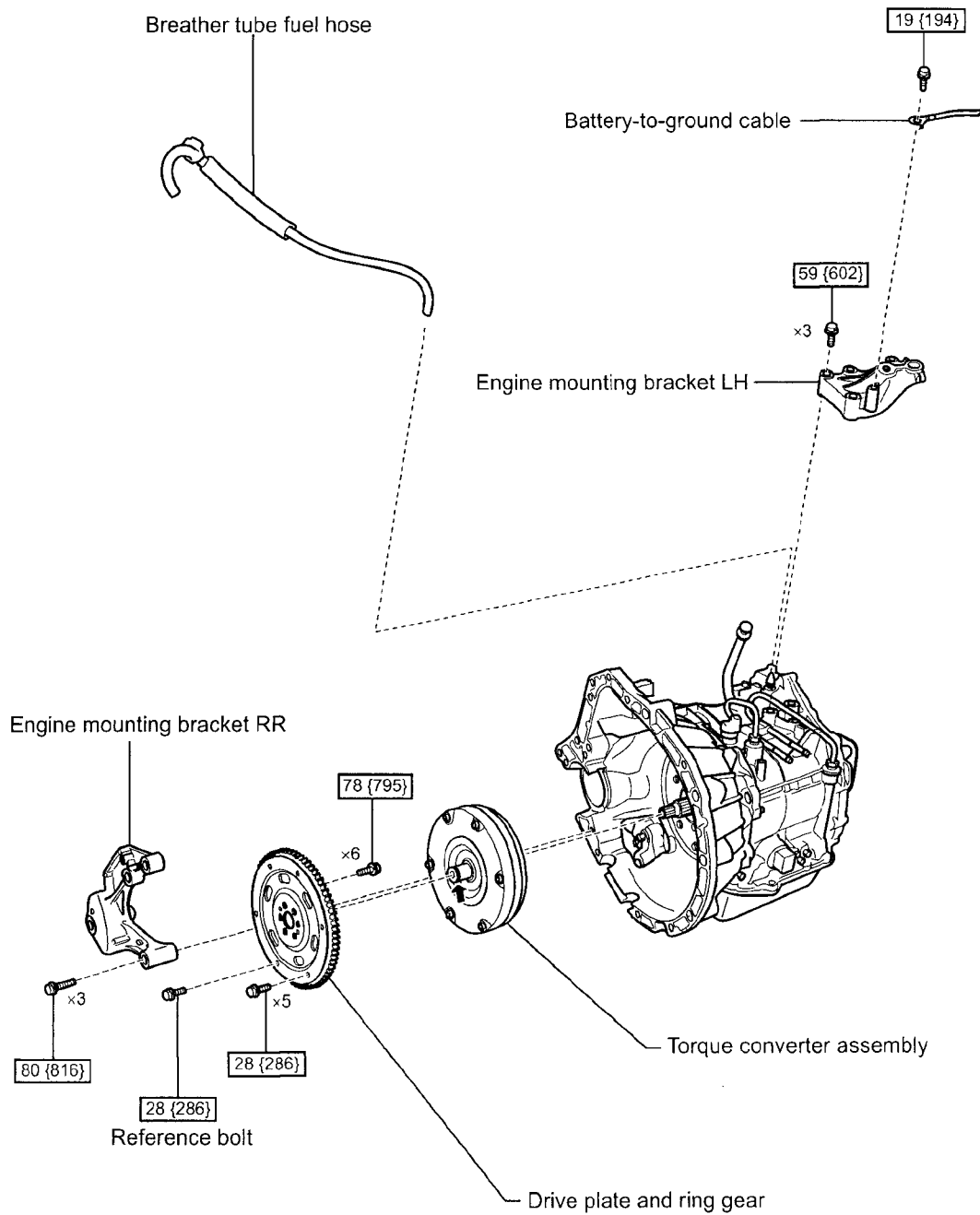
N*m (kgf*cm) : Specified torque

• Non-reusable part

A141464J02



26



[N*m {kgf*cm}]: Specified torque

↖ Apply MP Grease

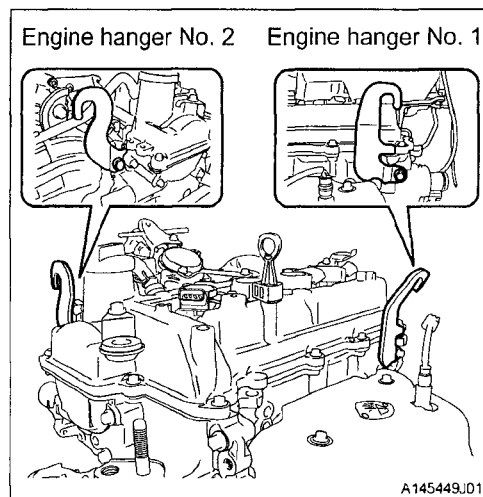
A149651J01

REMOVAL

1. Fuel spill prevention work (See page 07-48)
2. Battery minus terminal disconnection
3. Cooling fluid drainage (See page 12-6)
4. Refrigerant HFC-134a (R134a) evacuate (with Air conditioning system) (See page 52-42)
5. Front tire removal
6. Engine oil drainage
7. Automatic transaxle fluid drainage (See page 26-102)
8. Exhaust pipe assembly FR removal (See page 11-15)
9. Battery hold down clamp removal (See page 07-48)
10. Radiator reserve tank assembly removal (See page 07-48)
11. Battery cover removal
12. Battery removal
13. Battery tray removal (See page 07-48)
14. Air cleaner cap removal
15. Air cleaner filter element removal
16. Vacuum sensor disconnection (See page 06-136)
17. Vacuum switching valve assembly (with Bracket) disconnection (RHD) (See page 06-136)
18. Vacuum switching valve assembly (with Bracket) disconnection (LHD) (See page 06-136)
19. Inlet air temperature sensor disconnection (See page 06-136)
20. Precleaner hose removal (See page 06-137)
21. Air cleaner assembly removal (See page 06-137)
22. Radiator inlet hose disconnection (See page 12-10)
23. Water bypass hose disconnection (See page 12-10)
24. Radiator outlet hose disconnection (See page 12-10)
25. With water fan assembly removal (See page 12-11)
26. Oil cooler outlet hose removal (See page 26-98)
27. Oil cooler inlet hose removal (See page 26-98)
28. Heater inlet water hose disconnection (RHD) (See page 52-73)
29. Heater inlet water hose disconnection (LHD) (See page 52-164)
30. Heater outlet water hose disconnection (RHD) (See page 52-73)
31. Heater outlet water hose disconnection (LHD) (See page 52-164)
32. Front bumper cover removal (See page 82-5)
33. Fan & alternator V belt removal (See page 07-6)
34. Cooler refrigerant suction hose No. 1 disconnection (with Air conditioning system) (See page 52-131)
35. Cooler refrigerant discharge hose No. 1 disconnection (with Air conditioning system) (See page 52-136)
36. Compressor assembly with magnet clutch removal (with Air conditioning system) (See page 52-131)
37. Cooler refrigerant liquid pipe A disconnection (with Air conditioning system) (See page 52-136)
38. Radiator assembly removal (See page 07-49)
39. Fuel hose disconnection (See page 07-49)
40. Accelerator control cable assembly disconnection (RHD) (See page 07-50)
41. Accelerator control cable assembly disconnection (LHD) (See page 07-50)
42. Ground cable disconnection (See page 07-51)
43. Vacuum hose assembly disconnection (See page 07-51)
44. Engine room main wire disconnection (See page 07-51)
45. Engine wire disconnection (See page 07-51)
46. Steering column hole cover No.1 removal (RHD) (See page 48-6)
47. Steering column hole cover No.1 removal (LHD) (See page 48-15)

48. Steering column assembly disconnection (RHD) (See page 49-56)
49. Steering column assembly disconnection (LHD) (See page 49-70)
50. Engine undercover LH removal (See page 07-52)
51. Engine undercover RH removal (See page 07-52)
52. Front stabilizer link assembly LH removal (See page 07-53)
53. Front stabilizer link assembly RH removal (See page 07-53)
54. Front stabilizer bar removal (See page 42-16)
55. Front suspension cross member LH removal (See page 07-53)
56. Front suspension cross member RH removal (See page 07-53)
57. Front brake flexible hose No. 1 LH disconnection (without ABS & VSC) (See page 36-7)
58. Front brake flexible hose No. 1 RH disconnection (without ABS & VSC) (See page 36-7)
59. Speed sensor FR LH disconnection (with ABS & VSC) (See page 36-7)
60. Speed sensor FR RH disconnection (with ABS & VSC) (See page 36-7)
61. Front disc brake cylinder assembly LH removal (See page 36-8)
62. Front disc brake cylinder assembly RH removal (See page 36-8)
63. Axle hub nut removal (LH) (See page 36-8)
64. Axle hub nut removal (RH) (See page 36-8)
65. Tie rod end LH disconnection (See page 36-8)
66. Tie rod end RH disconnection (See page 36-9)
67. Front shock absorber assembly LH disconnection (See page 07-53)
68. Front shock absorber assembly RH disconnection (See page 07-53)
69. Front drive shaft assembly LH removal (See page 07-54)
70. Front drive shaft assembly RH removal (See page 07-54)
71. Steering knuckle LH removal (See page 07-54)
72. Steering knuckle RH removal (See page 07-54)
73. Radiator support LWR removal (See page 07-54)
74. Transmission control cable assembly disconnection (See page 07-55)
75. Engine assembly with transaxle removal (See page 07-55)
76. Front suspension cross member removal (See page 07-56)
77. Breather tube fuel hose removal (See page 07-57)
78. Starter assembly removal (See page 07-57)
79. Torque converter set bolt removal (See page 07-57)

26



80. Transaxle assembly (ATM) removal

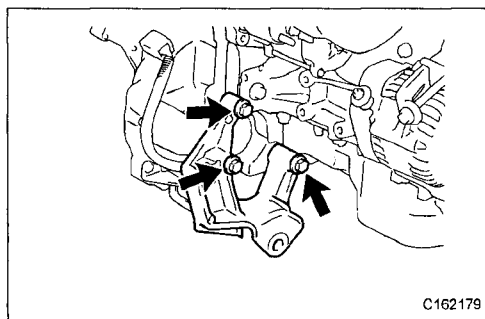
- (1) Attach the engine hangers No.1 and No.2 to the locations shown in the diagram.

Engine hanger No. 1	12281-97401
Engine hanger No. 2	12282-97403
Bolts	91671-80820

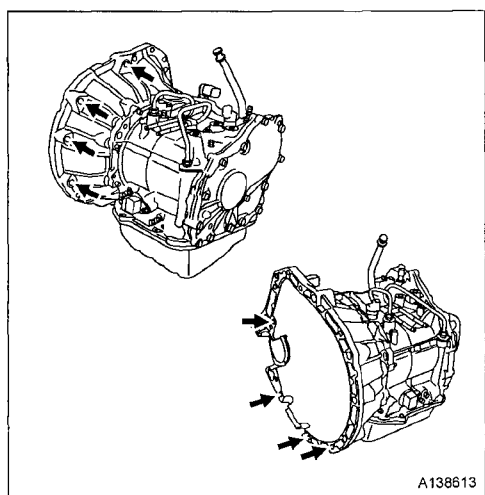
<HINT>

The engine hangers No.1 and No.2 and the bolts are supply parts.
Specified value: $T=20N \cdot m$ {204kgf*cm}

- (2) Use the engine sling device and the chain block to hang the engine assembly With transaxle.



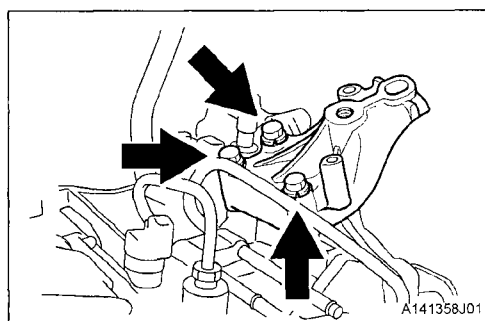
(3) Remove 3 bolts and then the engine mounting bracket RR.



(4) Remove 8 bolts and then the transaxle assembly (ATM).

81. Torque converter assembly removal

(1) Remove the torque converter assembly from the automatic transaxle assembly.

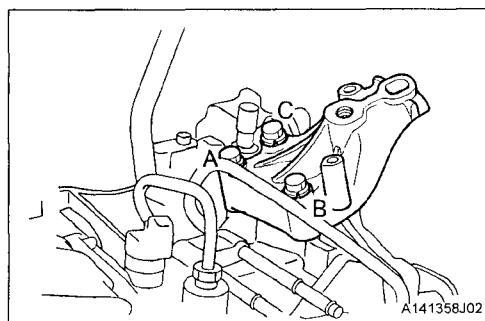


82. Engine mounting bracket LH removal

(1) Remove 3 bolts and the engine mounting bracket LH.

26

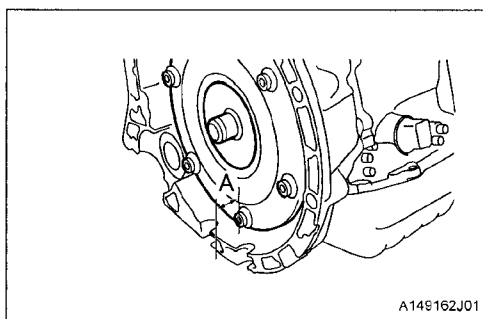
INSTALLATION



1. Engine mounting bracket LH installation

(1) Temporarily tighten bolt C, and securely tighten bolts A, B, and C, in that order.

Specified value: $T=59\text{N}\cdot\text{m}$ {602kgf*cm}



2. Torque converter assembly installation

- (1) Insert, while rotating, the torque converter assembly to the automatic transaxle.

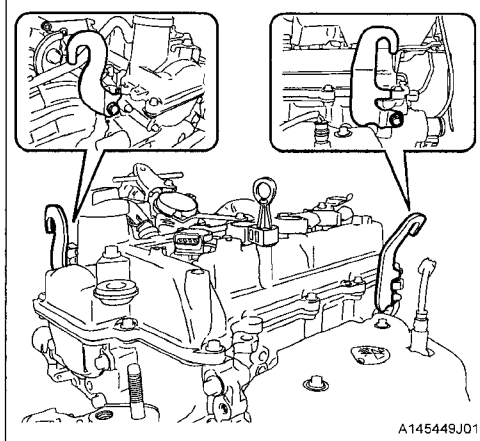
<CAUTION>

Make sure that the torque converter assembly has been securely inserted.

- (a) Measure the distance A from the edge of the housing to the mounting position of the drive plate of the torque converter assembly.

Reference: 16.5 mm and above

Engine hanger No. 2 Engine hanger No. 1



3. Transaxle assembly (ATM) installation

- (1) Attach the engine hangers No.1 and No.2 to the locations shown in the diagram.

Engine hanger No.1	12281-97401
Engine hanger No.2	12282-97403
Bolts	91671-80820

<HINT>

The engine hangers No.1 and No.2 and the bolts are supply parts.
Specified value: $T=20N \cdot m$ {204kgf*cm}

- (2) Use the engine sling device and the chain block to hang the engine assembly with transaxle.
- (3) Use a transmission jack to support the transaxle assembly (ATM).

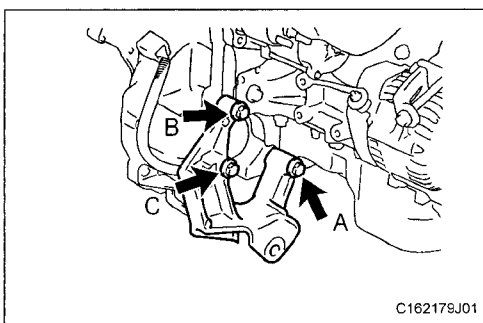
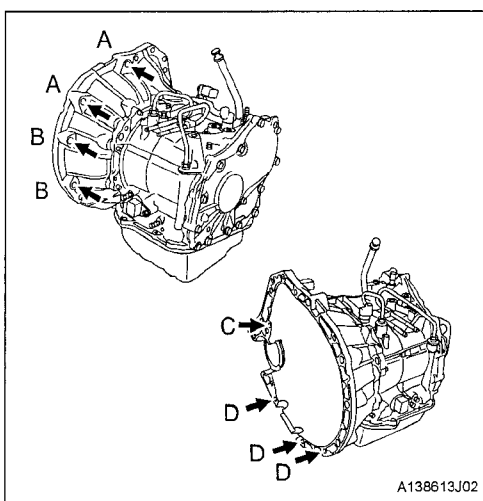
- (4) Attach the transaxle assembly (ATM) with 2 new seal bolts (A) and 6 bolts (B, C, and D).

Specified value: $T=64N \cdot m$ {653kgf*cm} (Bolt A)

$T=64N \cdot m$ {653kgf*cm} (Bolt B)

$T=64N \cdot m$ {653kgf*cm} (Bolt C)

$T=37N \cdot m$ {377kgf*cm} (Bolt D)



- (5) Tighten the engine mounting bracket RR with 3 bolts and attach it in the specified sequence.

Specified value: $T=80N \cdot m$ {816kgf*cm}

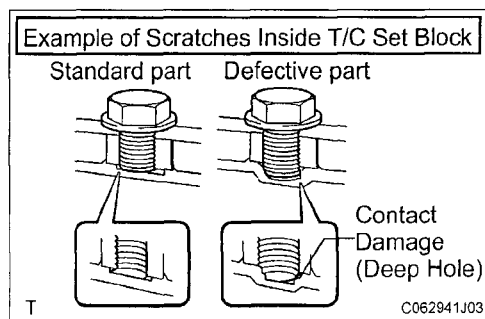
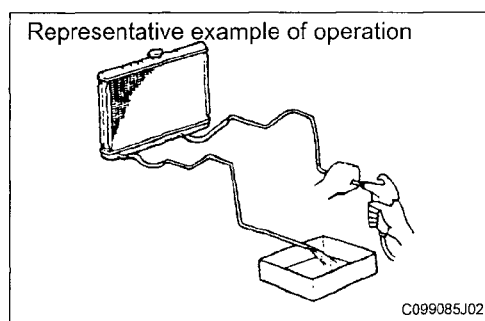
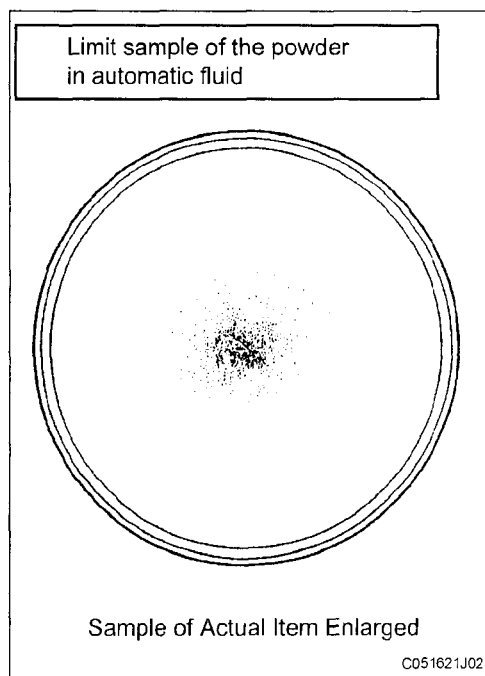
- (a) Temporarily tighten bolt B.
- (b) Temporarily tighten bolt A.
- (c) Tighten bolts B and C (in any order).
- (d) Tighten bolt A.

4. Torque converter set bolt installation
5. Starter assembly installation (See page 07-80)
6. Breather tube fuel hose installation (See page 07-81)
7. Front suspension cross member installation (See page 07-81)
8. Engine assembly with transaxle installation (See page 07-81)
9. Transmission control cable assembly installation (See page 07-83)
10. Radiator support LWR installation (See page 07-83)
11. Steering knuckle LH installation (See page 07-83)
12. Steering knuckle RH installation (See page 07-83)
13. Front drive shaft assembly LH installation (See page 07-84)
14. Front drive shaft assembly RH installation (See page 07-84)
15. Front shock absorber assembly LH installation (See page 36-16)
16. Front shock absorber assembly RH installation (See page 36-16)
17. Tie rod end LH installation (See page 36-16)
18. Tie rod end RH installation (See page 36-16)
19. Axle hub nut installation (LH) (See page 36-16)
20. Axle hub nut installation (RH) (See page 36-16)
21. Front disc brake cylinder assembly LH installation (See page 36-16)
22. Front disc brake cylinder assembly RH installation (See page 36-17)
23. Speed sensor FR LH installation (with ABS & VSC) (See page 36-17)
24. Speed sensor FR RH installation (with ABS & VSC) (See page 36-17)
25. Front brake flexible hose No.1 (LH) installation (without ABS & VSC) (See page 36-18)
26. Front brake flexible hose No.1 (RH) installation (without ABS & VSC) (See page 36-18)
27. Front suspension cross member LH installation (See page 07-84)
28. Front suspension cross member RH installation (See page 07-84)
29. Front stabilizer bar installation (See page 07-84)
30. Engine undercover LH installation (See page 07-85)
31. Engine undercover RH installation (See page 07-85)
32. Steering column assembly connection (RHD) (See page 49-65)
33. Steering column assembly connection (LHD) (See page 49-79)
34. Steering column hole cover No.1 installation (RHD) (See page 48-10)
35. Steering column hole cover No.1 installation (LHD) (See page 48-18)
36. Engine wire connection (See page 07-86)
37. Engine room main wire connection (See page 07-86)
38. Vacuum hose assembly connection (See page 07-87)
39. Ground cable connection (See page 07-87)
40. Accelerator control cable assembly connection (RHD) (See page 07-87)
41. Accelerator control cable assembly connection (LHD) (See page 07-88)
42. Fuel hose connection (See page 07-89)
43. Radiator assembly installation (See page 07-89)
44. Cooler refrigerant liquid pipe A connection (with Air conditioning system) (See page 52-137)
45. Compressor assembly with magnet clutch installation (with Air conditioning system) (See page 52-134)
46. Cooler refrigerant discharge hose No. 1 connection (with Air conditioning system) (See page 52-138)
47. Cooler refrigerant suction hose No. 1 connection (with Air conditioning system) (See page 52-134)
48. Fan & alternator V belt installation (See page 07-6)
49. Front bumper cover installation (See page 82-15)
50. Heater outlet water hose connection (RHD) (See page 52-87)
51. Heater outlet water hose connection (LHD) (See page 52-177)

52. Heater inlet water hose connection (RHD) (See page 52-87)
53. Heater inlet water hose connection (LHD) (See page 52-178)
54. Oil cooler inlet hose installation (See page 26-99)
55. Oil cooler outlet hose installation (See page 26-100)
56. With water fan assembly installation (See page 12-13)
57. Radiator outlet hose connection (See page 12-14)
58. Water bypass hose connection (See page 12-14)
59. Radiator inlet hose connection (See page 12-14)
60. Air cleaner assembly installation (See page 06-145)
61. Precleaner hose installation (See page 06-145)
62. Inlet air temperature sensor connection (See page 06-146)
63. Vacuum switching valve assembly (with Bracket) connection (RHD) (See page 06-146)
64. Vacuum switching valve assembly (with Bracket) connection (LHD) (See page 06-146)
65. Vacuum sensor connection (See page 06-146)
66. Air cleaner filter element installation
67. Air cleaner cap installation
68. Battery tray installation (See page 07-90)
69. Battery installation
70. Battery cover installation
71. Radiator reserve tank assembly installation (See page 07-90)
72. Battery hold down clamp installation (See page 07-90)
73. Exhaust pipe assembly FR installation (See page 11-16)
74. Battery minus terminal connection (See page 07-90)
75. Cooling fluid replenishment (See page 12-6)
76. Engine oil replenishment
77. Automatic transaxle fluid replenishment (See page 26-103)
78. Automatic transaxle fluid check (See page 26-63)
79. Shift lever position check (See page 07-90)
80. Cooling fluid leakage check (See page 12-6)
81. Cooling fluid amount check
82. Oil leakage check
83. Fuel leakage check (See page 08-7)
84. Exhaust gas leakage check (See page 11-16)
85. Engine idle-speed check (See page 07-4)
86. Ignition timing check (See page 07-2)
87. CO and HC level check (See page 07-4)
88. Refrigerant HFC-134a (R134a) filling (with Air conditioning system) (See page 52-42)
89. Front tire installation (See page 07-91)
90. Front wheel alignment check ,adjustment (See page 07-91)
91. Test mode check (Speed sensor circuit) (See page 07-91)

TORQUE CONVERTER & DRIVE PLATE

INSPECTION



1. Torque converter assembly check

(1) Torque converter assembly check

- (a) If the result of checking the torque converter falls under the description of the criteria, replace the torque converter.

Reference: Metallic sound is heard from the torque converter during stall test or with the shift lever at the neutral position.

Both the one-way clutches are free or locked.

Fine powder is mixed in automatic fluid, exceeding the limit of the sample (See the limit sample).

<HINT>

- > The limit sample of the powder in automatic fluid is 25 mL (equivalent to one 35-mm film case) of the automatic fluid discharged from the removed torque converter that is put in a Petri dish.

(2) Automatic fluid replacement in torque converter

- (a) If the automatic fluid smells strange or discolors, sufficiently stir the automatic fluid in the torque converter, and discharge the automatic fluid with the mounting side of the torque converter facing up.

(3) Oil cooler and oil pipeline cleaning and check

- (a) When the torque converter has been checked or the automatic fluid has been replaced, clean the oil cooler and pipeline.

<HINT>

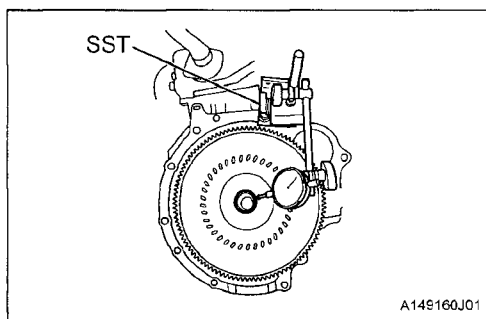
- > Blow compressed air of 196 kPa {2 kgf/cm²} from the inlet hose for cleaning.
- > If a large quantity of powder is mixed in the automatic fluid, inject new automatic fluid with a bucket pump and then clean the oil cooler and pipeline again.

- (b) If the automatic fluid turns opaque white, check the oil cooler (radiator).

(4) Torque converter deformation prevention and oil pump gear damage prevention

- (a) If there is a trace of interference at the front end of the torque converter mounting bolt and at the bottom of the torque converter mounting hole, replace the bolt and torque converter.

- (b) The length of all the mounting bolts must be the same (within 0.5 mm).



(5) Torque converter assembly vibration check

- (a) Attach the torque converter assembly to the drive plate and ring gear with one reference bolt and six specified bolts.

Specified value: $T=28\text{N}\cdot\text{m}$ {286kgf*cm}

<HINT>

Begin by tightening the reference bolt (silver).

<CAUTION>

Be sure to use specified bolts. Use of other bolts may cause tightening failure or deformation of the inside shape of the converter, resulting in converter malfunction.

- (b) Using SST and meters, check the shaft vibration.

SST : 09350-87202 , 09351-87210

Specified value: Within 0.30 mm

2. Drive plate and ring gear check

- (1) Drive plate check

- (a) Using SST and meters, check the vibration of the drive plate.

SST : 09350-87202 , 09351-87210

Specified value: Within 0.25 mm

<HINT>

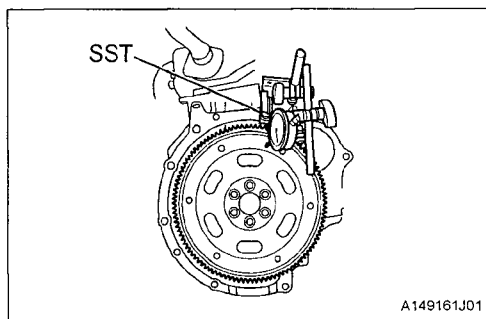
In case of a value other than the basic value, replace the drive plate and ring gear.

- (2) Ring gear check

- (a) Check for damage of the ring gear.

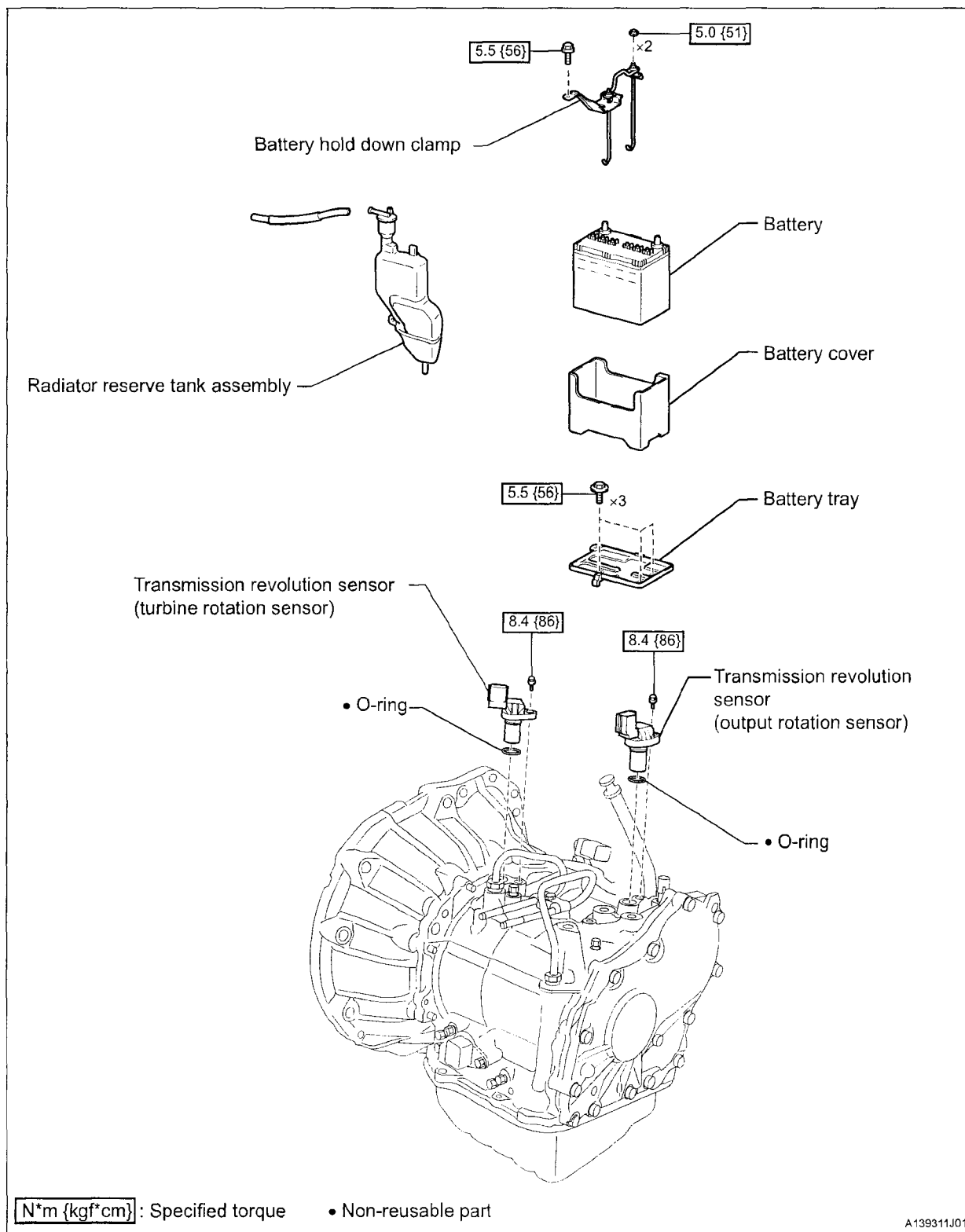
<HINT>

If the ring gear is damaged, replace the drive plate and ring gear.



TRANSMISSION REVOLUTION SENSOR

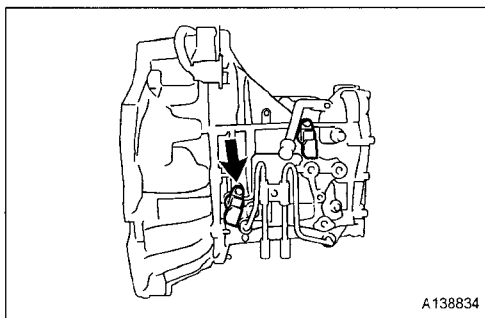
COMPONENTS



REMOVAL

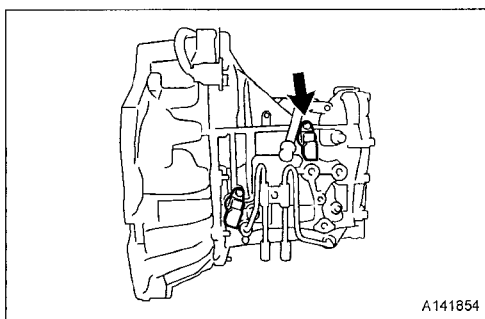
1. Battery minus terminal disconnection

2. Battery hold down clamp removal(See page 07-48)
3. Radiator reserve tank assembly removal(See page 07-48)
4. Battery cover removal
5. Battery removal
6. Battery tray removal(See page 07-48)
7. Transmission revolution sensor removal (Turbine rotation sensor)
 - (1) Disconnect the transmission revolution sensor connector.



- (2) Remove the bolt and then the transmission revolution sensor.

8. Transmission revolution sensor removal (Output rotation sensor)
 - (1) Disconnect the transmission revolution sensor connector.



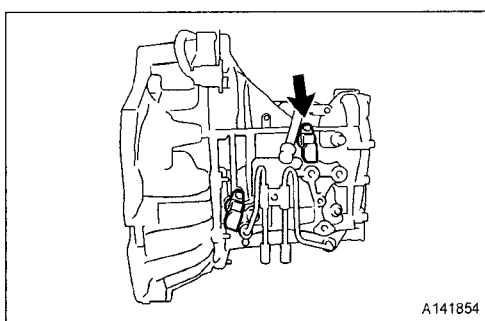
- (2) Remove the bolt and then the transmission revolution sensor.

26

INSTALLATION

1. Transmission revolution sensor installation (Output rotation sensor)

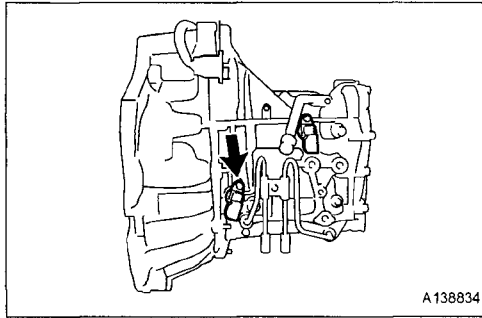
- (1) Apply ATF to the circumference of a new O-ring, and attach the O-ring to the transmission revolution sensor.



- (2) Attach the transmission revolution sensor to the transaxle case with a bolt.
Specified value: $T=8.4\text{N}\cdot\text{m}$ {86kgf*cm}

2. Transmission revolution sensor installation (Turbine rotation sensor)

- (1) Apply ATF to the circumference of a new O-ring, and attach the O-ring to the transmission revolution sensor.



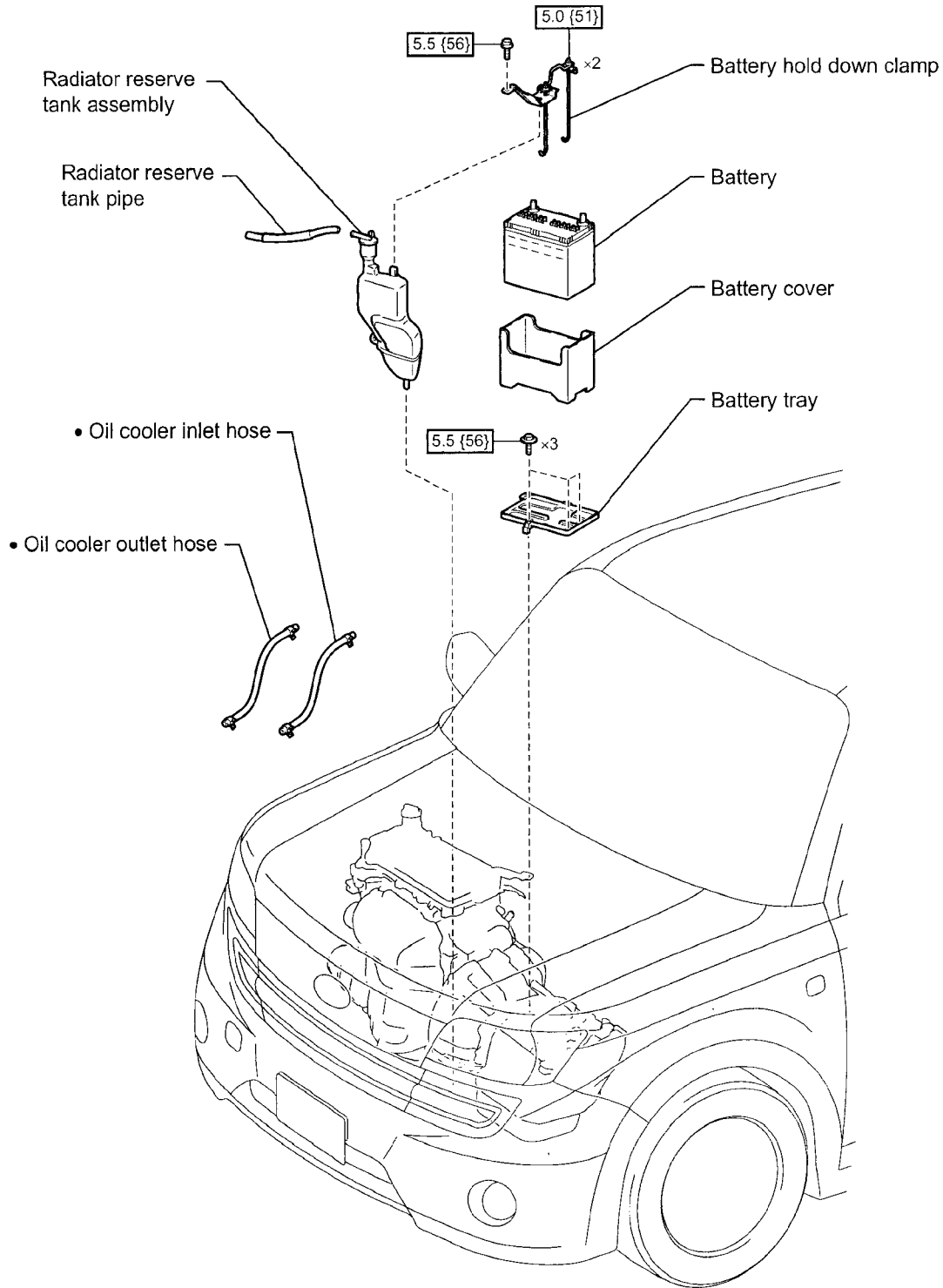
- (2) Attach the transmission revolution sensor to the transaxle case with a bolt.
Specified value: $T=8.4\text{N}\cdot\text{m}$ {86kgf*cm}

(3) Connect the transmission revolution sensor connector.

3. Battery tray installation(See page 07-90)
4. Battery installation
5. Battery cover installation
6. Radiator reserve tank assembly installation(See page 07-90)
7. Battery hold down clamp installation(See page 07-90)
8. Battery minus terminal connection
Specified value: $T=6.4\text{N}\cdot\text{m}$ {65kgf*cm}
9. DS-II-ECU data monitor
(See page 26-23)

OIL COOLER HOSE

COMPONENTS



26

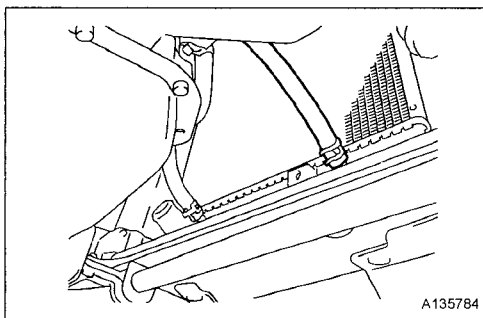
[N*m {kgf*cm}] : Specified torque

• Nonreusable part

A145859J01

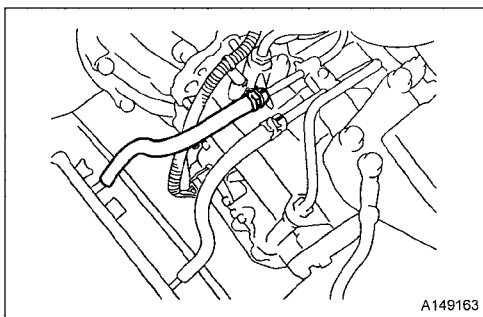
REMOVAL

1. Battery minus terminal disconnection
2. Battery hold down clamp removal(See page 07-49)
3. Radiator reserve tank assembly removal(See page 07-48)
4. Battery cover removal
5. Battery removal
6. Battery tray removal(See page 07-48)

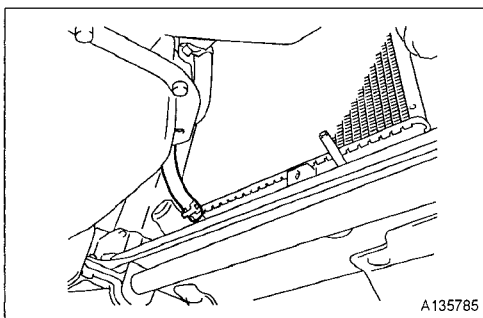


7. Oil cooler outlet hose removal

- (1) Loosen the clip and disconnect the oil cooler outlet hose.

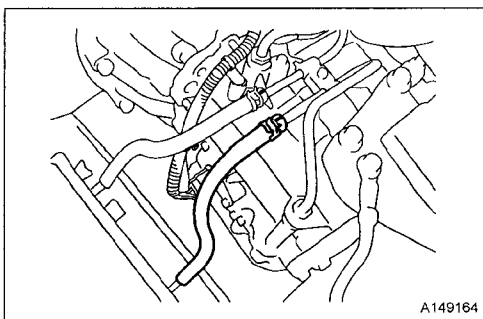


- (2) Loosen the clip and remove the oil cooler outlet hose.



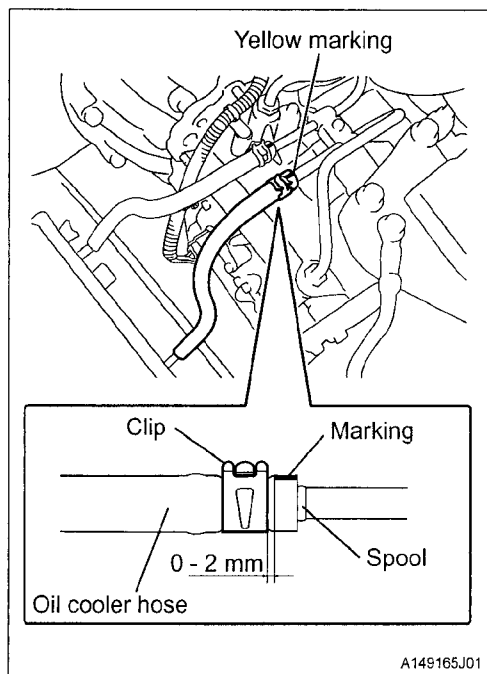
8. Oil cooler inlet hose removal

- (1) Loosen the clip and disconnect the oil cooler inlet hose.



- (2) Loosen the clip and remove the oil cooler inlet hose.

INSTALLATION

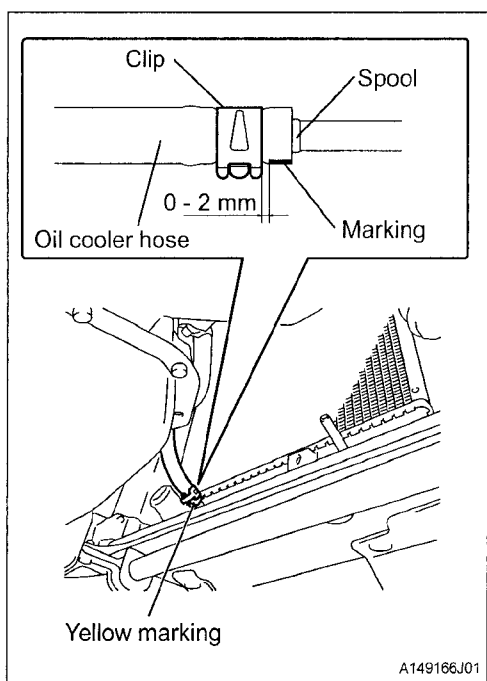


1. Oil cooler inlet hose installation

- (1) Adjust the marking and clip knob to the upper side of the vehicle and attach a new oil cooler inlet hose.

<HINT>

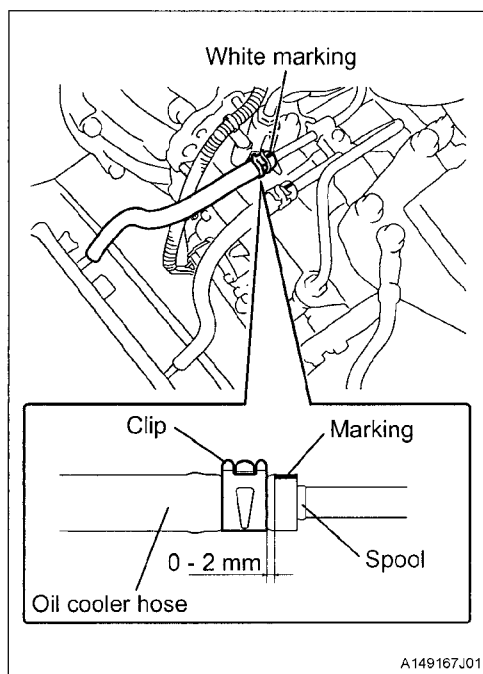
Attach the oil cooler inlet hose and clip as shown in the diagram.



- (2) Adjust the marking and clip knob to the lower side of the vehicle and connect a new oil cooler inlet hose.

<HINT>

Attach the oil cooler inlet hose and clip as shown in the diagram.

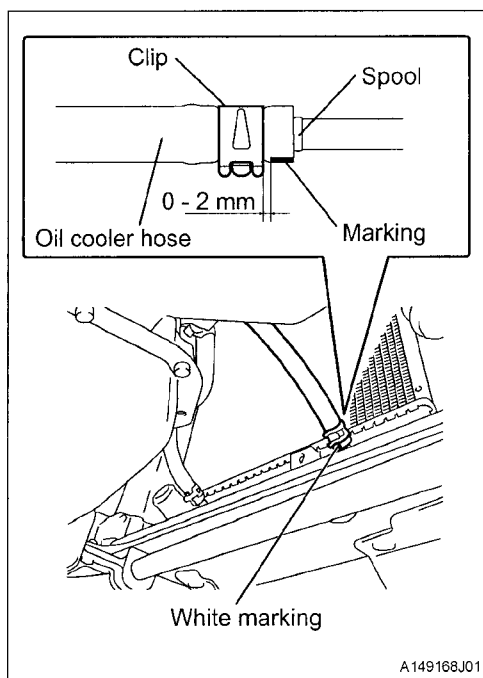


2. Oil cooler outlet hose installation

- (1) Adjust the marking and clip knob to the upper side of the vehicle and attach a new oil cooler outlet hose.

<HINT>

Attach the oil cooler outlet hose and clip as shown in the diagram.



- (2) Adjust the marking and clip knob to the lower side of the vehicle and connect a new oil cooler outlet hose.

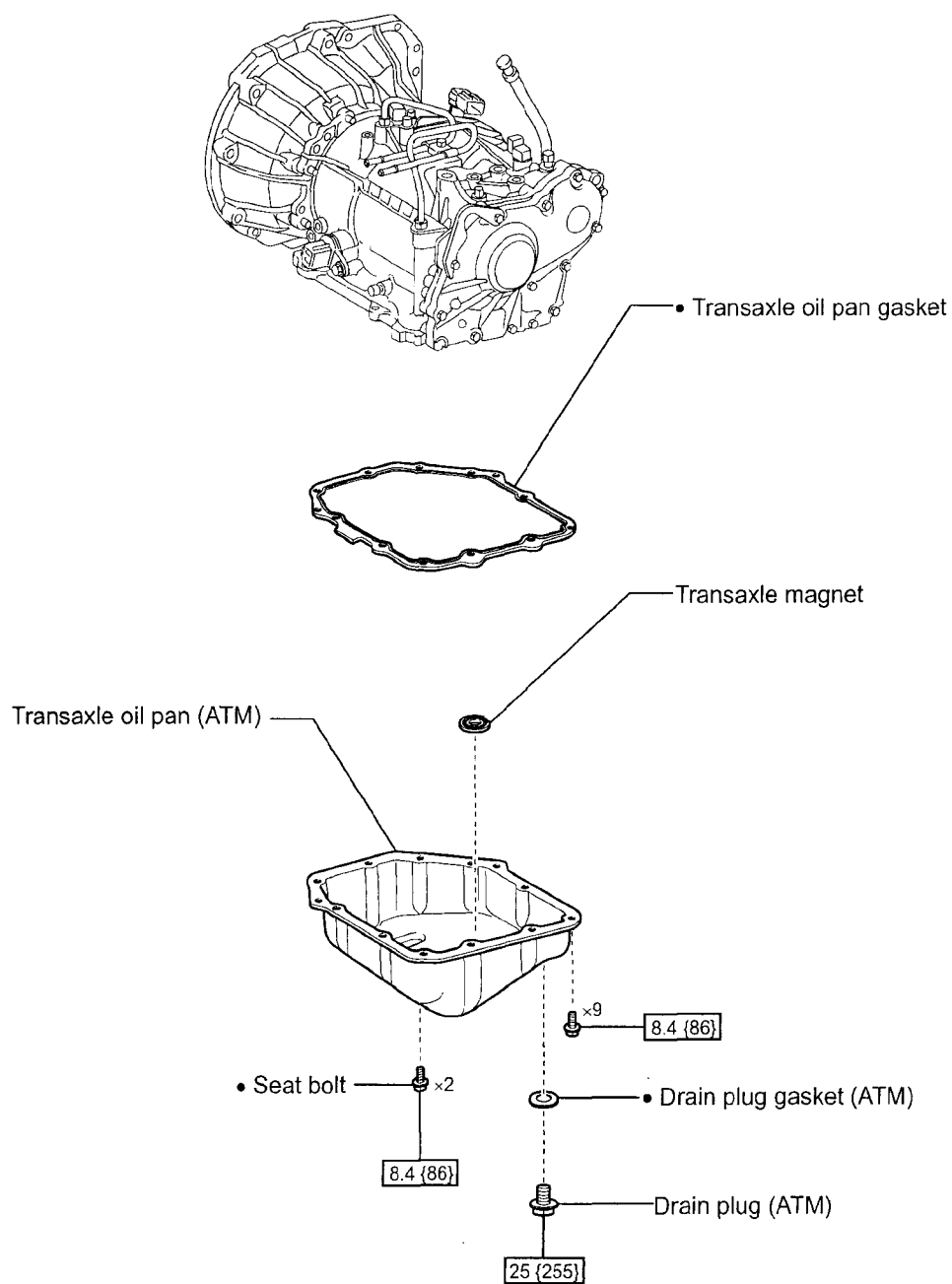
<HINT>

Attach the oil cooler outlet hose and clip as shown in the diagram.

3. Battery tray installation(See page 07-91)
4. Battery installation
5. Battery cover installation
6. Radiator reserve tank assembly installation(See page 07-90)
7. Battery hold down clamp installation(See page 07-90)
8. Battery minus terminal connection
Specified value: $T=6.4\text{N}\cdot\text{m}$ {65kgf*cm}
9. Automatic transaxle fluid quantity check (See page 26-63)

TRANSAXLE OIL PAN (ATM)

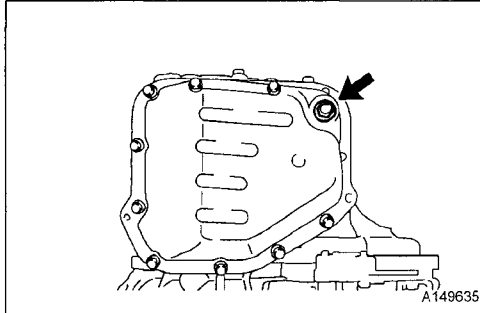
COMPONENTS



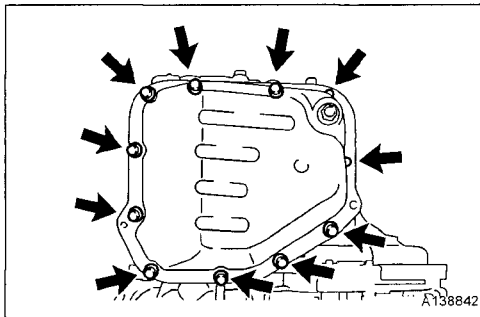
N*m {kgf*cm}: Specified torque

• Nonreusable part

REMOVAL

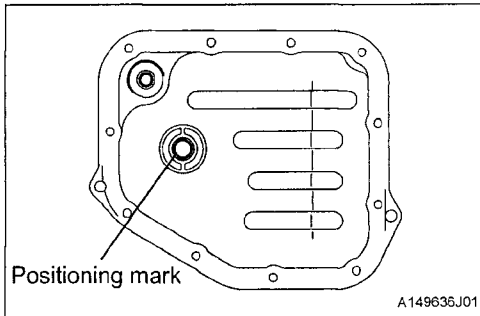


1. Automatic transaxle fluid drainage
 - (1) Remove the drain plug (ATM) and drain plug gasket (ATM), and drain the automatic transaxle fluid.



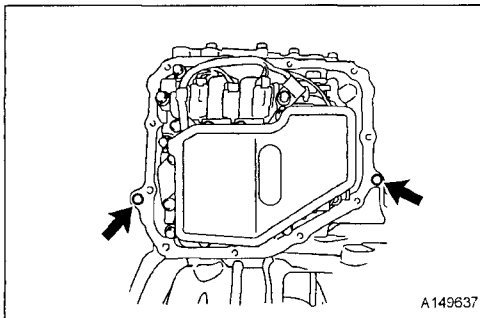
2. Transaxle oil pan (ATM) removal
 - (1) Remove 11 bolts and then the transaxle oil pan (ATM).
 - (2) Remove the transaxle oil pan gasket.
 - (3) Remove the transaxle magnet.

INSTALLATION

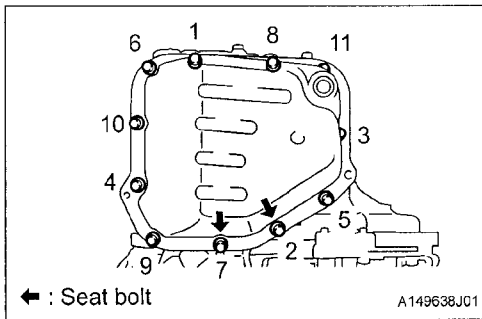


1. Transaxle oil pan (ATM) installation
 - (1) Attach the transaxle magnet, matching its position with the positioning mark of the transaxle oil pan (ATM).
 - (2) Clean and degrease the matching surfaces of the transaxle oil pan (ATM) and transaxle case.

26



- (3) Attach a new transaxle oil pan gasket, matching its position with the positioning pin of the transaxle case.

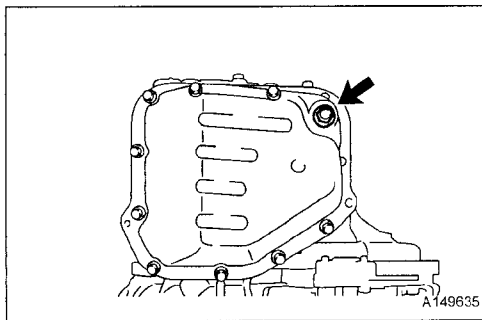


- (4) Attach the transaxle oil pan (ATM) with 2 new seal bolts and 9 bolts.

Specified value: $T=8.4\text{N}\cdot\text{m}$ {86kgf*cm}

<HINT>

Tighten 11 bolts in the order shown in the diagram.



2. Automatic transaxle fluid replenishment

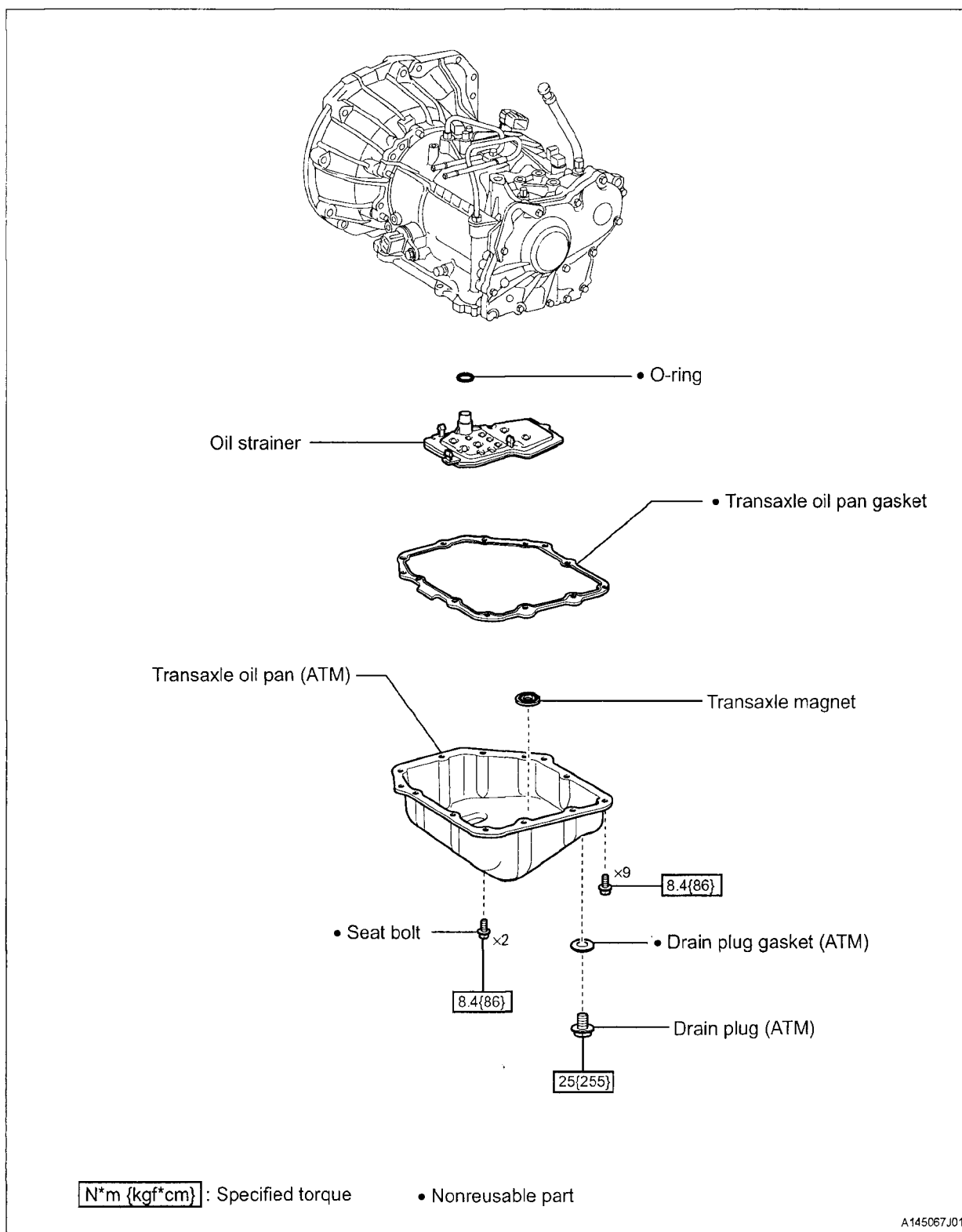
- (1) Attach the drain plug (ATM) via a new drain plug gasket (ATM).

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

- (2) Replenish the automatic transaxle fluid.

3. Automatic transaxle fluid check (See page 26-63)

OIL STRAINER COMPONENTS

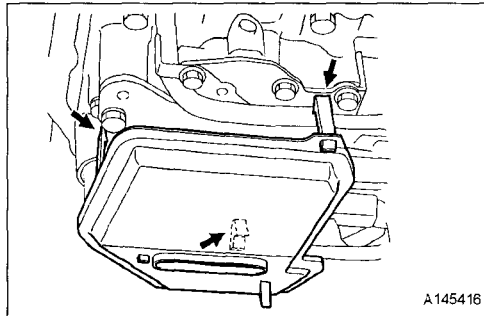


26

REMOVAL

1. Automatic transaxle fluid drainage (See page 26-102)

2. Transaxle oil pan (ATM) removal (See page 26-102)



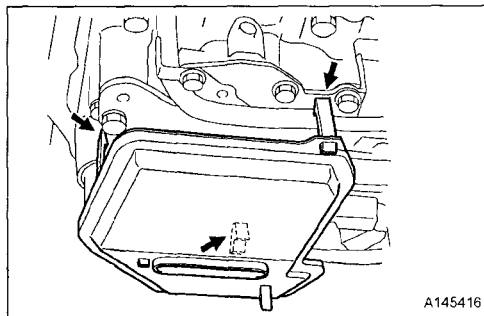
3. Oil strainer removal

- (1) Remove 3 tab fittings and then the oil strainer.
- (2) Remove the O-ring.

INSTALLATION

1. Oil strainer installation

- (1) Apply ATF to the circumference of a new oil strainer O-ring and attach the O-ring to the oil strainer.
- (2) Fit 3 tabs and attach the oil strainer.



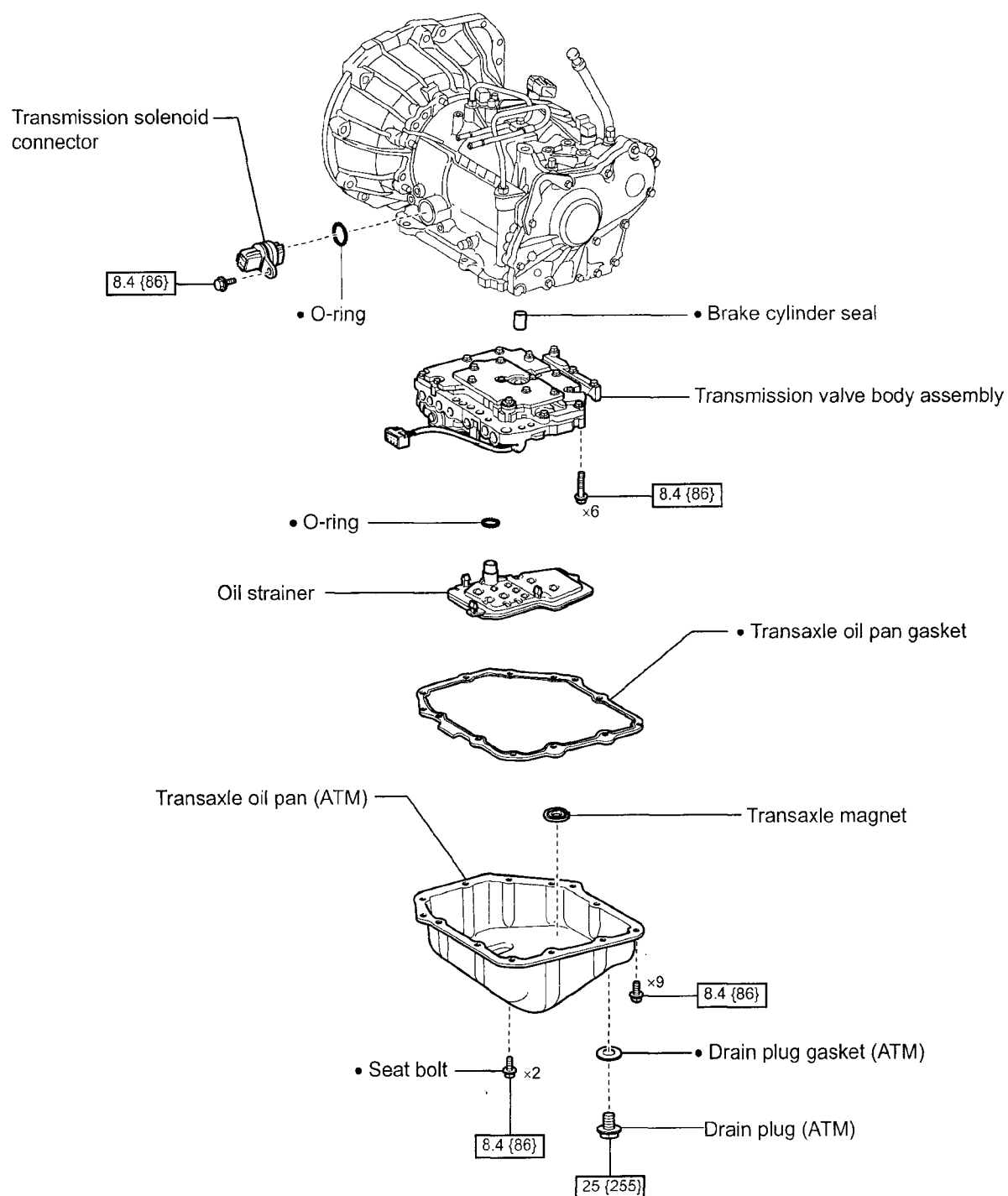
2. Transaxle oil pan (ATM) installation (See page 26-102)

3. Automatic transaxle fluid replenishment (See page 26-103)

4. Automatic transaxle fluid check (See page 26-63)

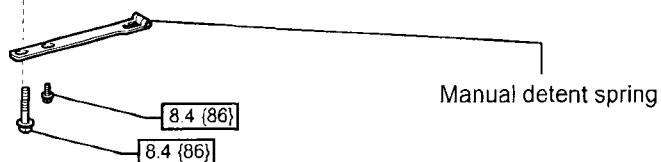
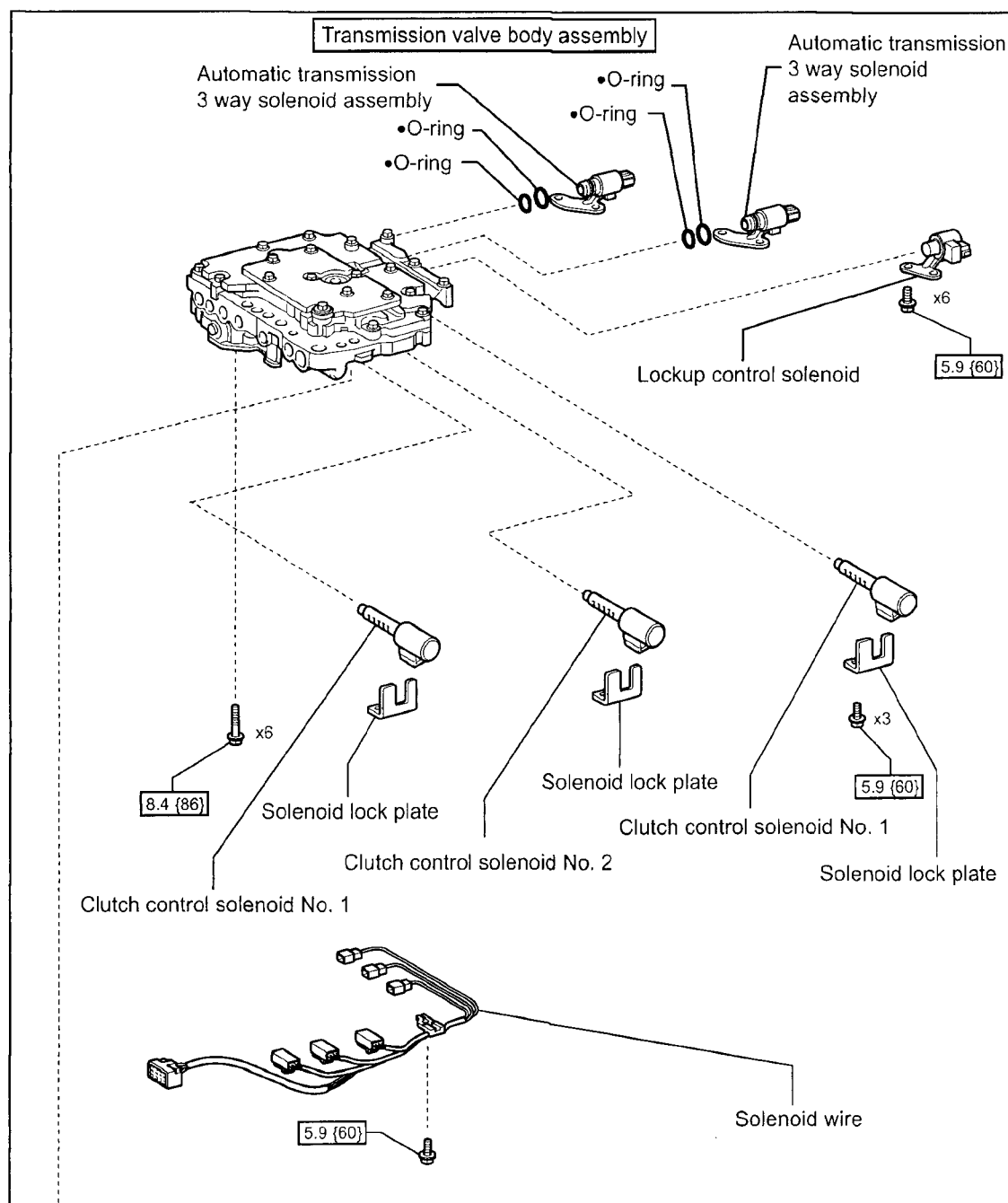
SOLENOID WIRE

COMPONENTS



[N*m {kgf*cm}]: Specified torque

• Nonreusable part



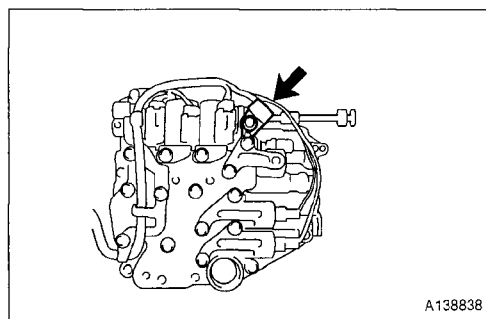
N*m {kgf*cm} : Specified torque

• Non-reusable part

A139313J01

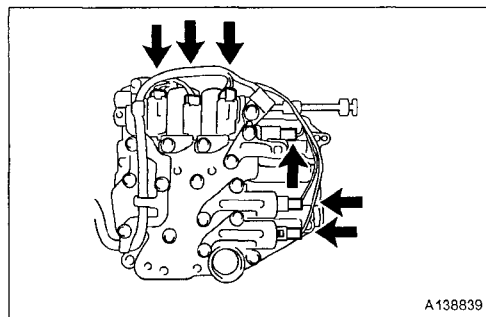
REMOVAL

1. Battery minus terminal disconnection
2. Automatic transaxle fluid drainage (See page 26-102)
3. Transaxle oil pan (ATM) removal (See page 26-102)
4. Oil strainer removal (See page 26-105)
5. Transmission valve body assembly removal (See page 26-112)
6. Brake cylinder seal removal (See page 26-112)

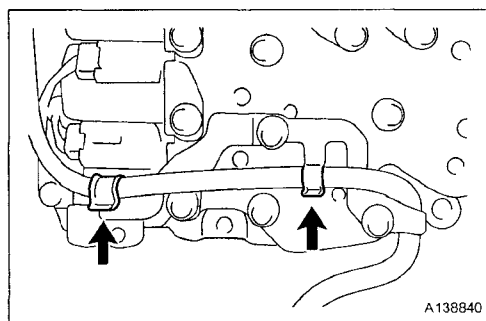


7. Solenoid wire removal

- (1) Remove the bolt and disconnect the oil temperature sensor from the transmission valve body assembly.



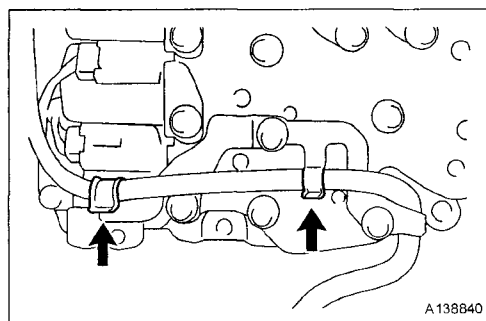
- (2) Disconnect six connectors from each solenoid.



- (3) Remove the solenoid wire from the transmission valve body assembly.

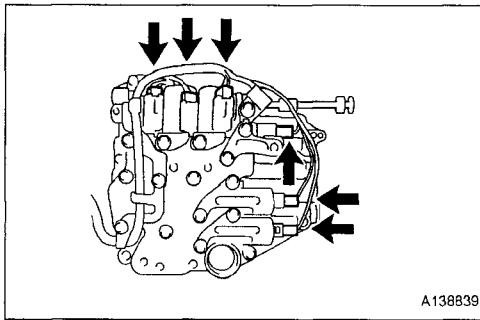
26

INSTALLATION

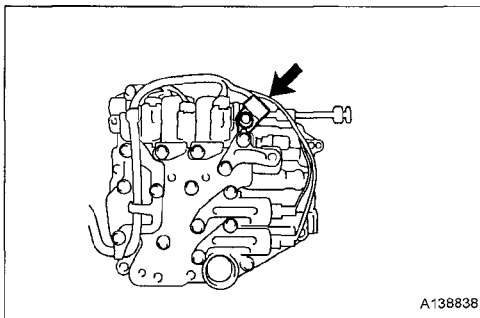


1. Solenoid wire installation

- (1) Attach the solenoid wire to the transmission valve body assembly.



(2) Connect 6 connectors of each solenoid.



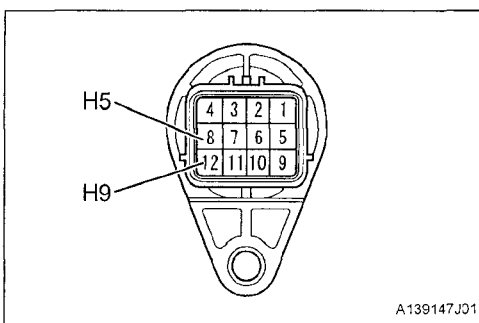
(3) Attach the oil temperature sensor to the transmission valve body assembly with a bolt.

Specified value: $T=5.9N \cdot m$ {60kgf*cm}

2. Brake cylinder seal installation (See page 26-113)
3. Transmission valve body assembly installation (See page 26-113)
4. Oil strainer installation (See page 26-105)
5. Transaxle oil pan (ATM) installation (See page 26-102)
6. Battery minus terminal connection
Specified value: $T=6.4N \cdot m$ {65kgf*cm}
7. Automatic transaxle fluid replenishment (See page 26-103)
8. Automatic transaxle fluid check (See page 26-63)
9. AT learning value initialization
(See page 26-17)

26

INSPECTION



1. Solenoid wire (oil temperature sensor) check

(1) Resistance check

(a) Check the resistance between terminals using the tester.

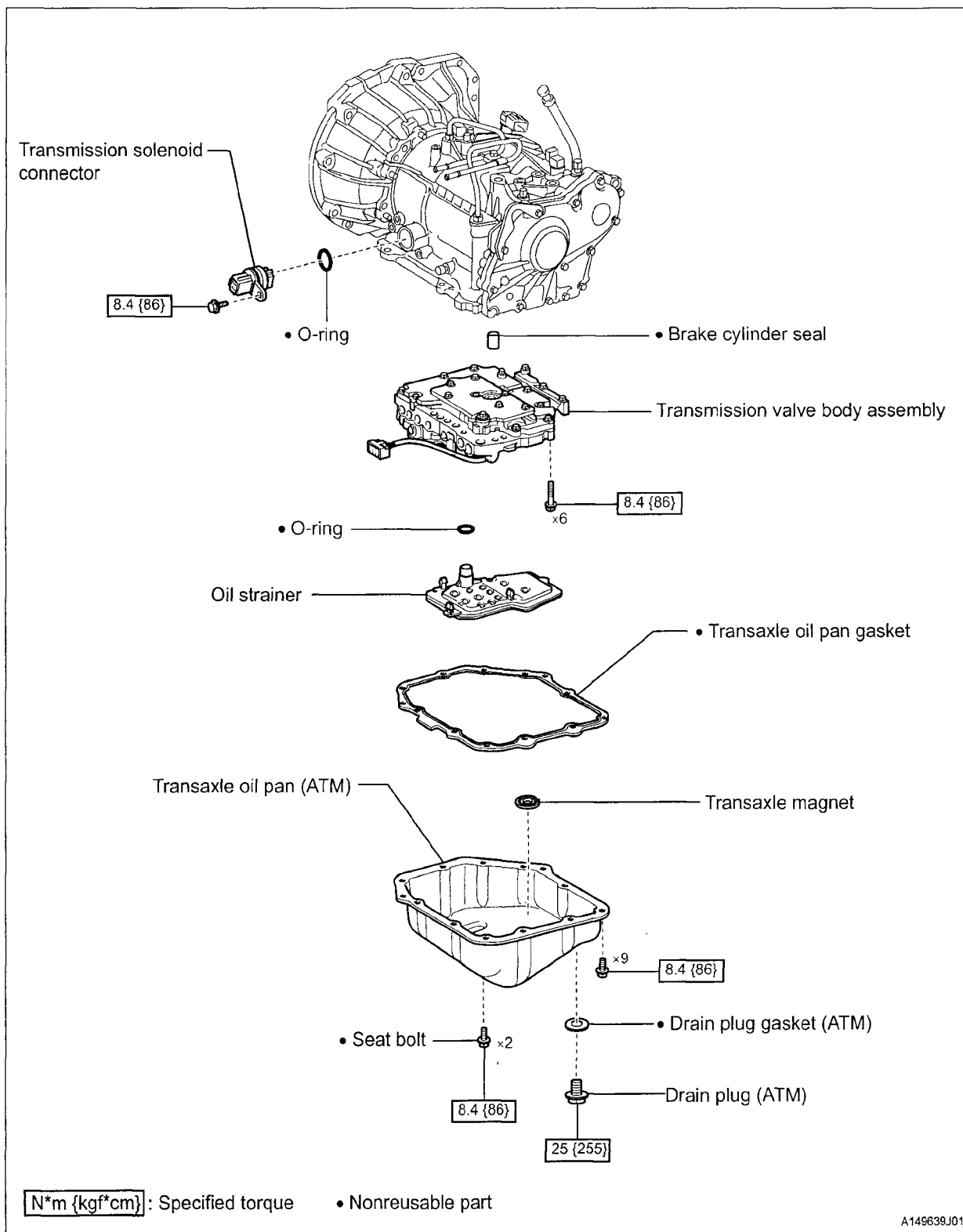
Specified value

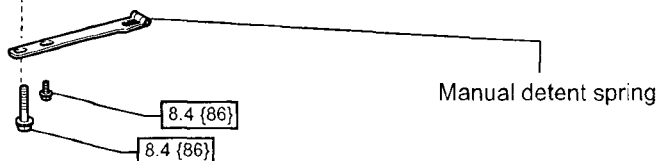
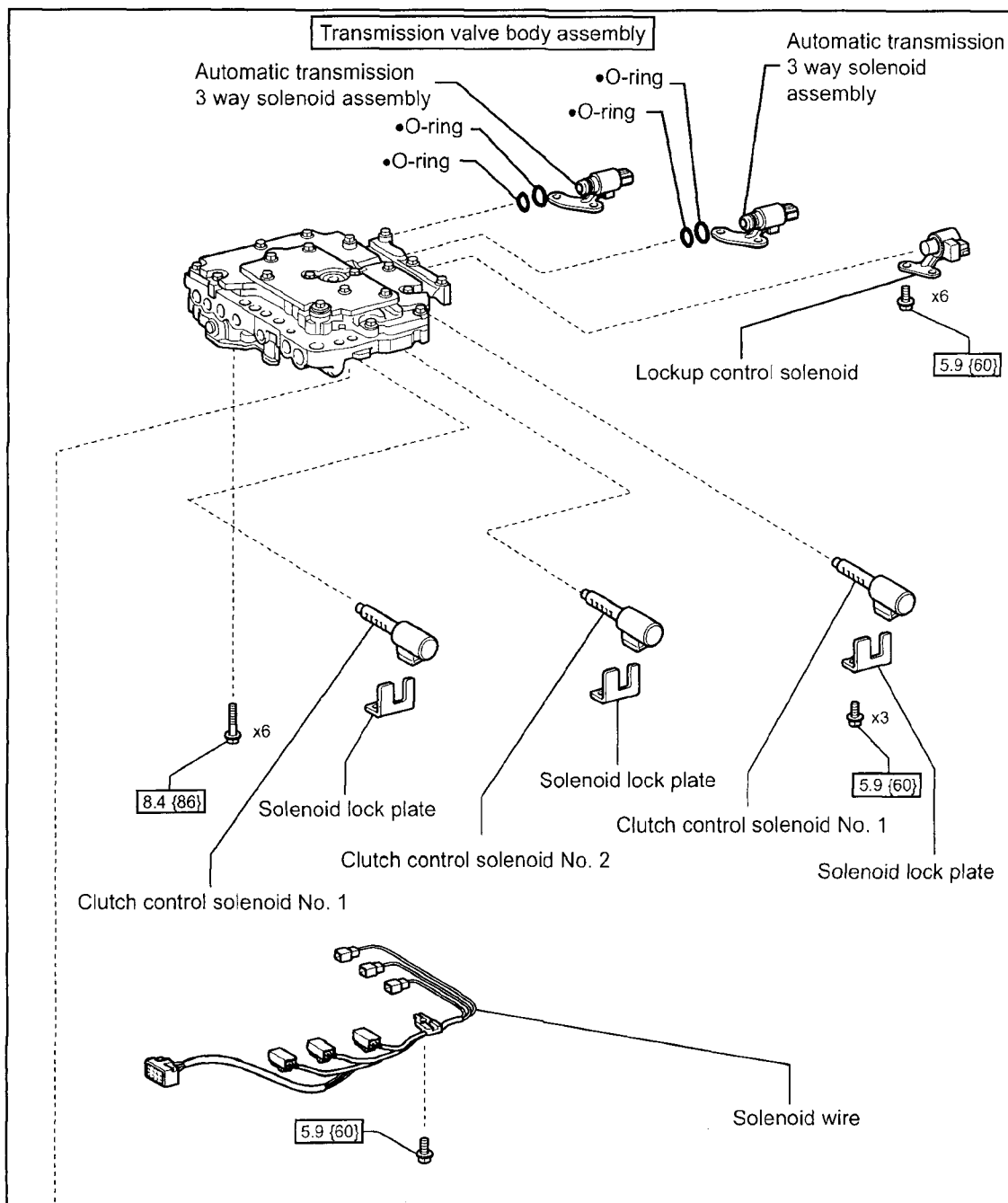
Terminal number (terminal symbol)	Oil temperature (°C)	Resistance (kΩ)
8(H5) - 12(H9)	20	2.186 - 2.618
8(H5) - 12(H9)	80	0.294 - 0.332

In case of a value other than the basic value, replace the solenoid wire.

TRANSMISSION VALVE BODY ASSEMBLY

COMPONENTS

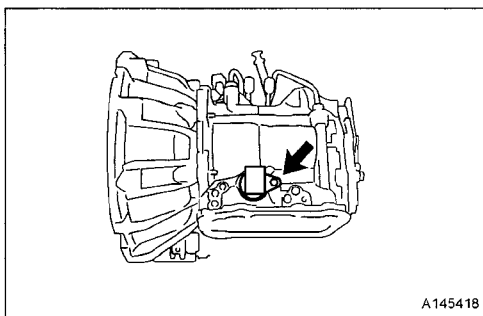




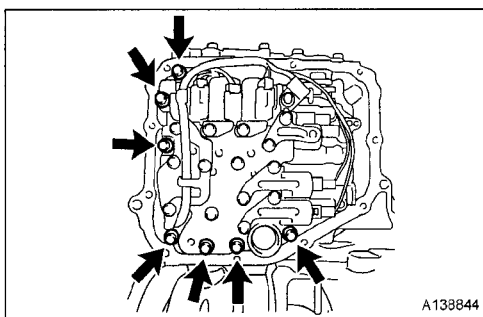
N*m {kgf*cm} : Specified torque • Non-reusable part

REMOVAL

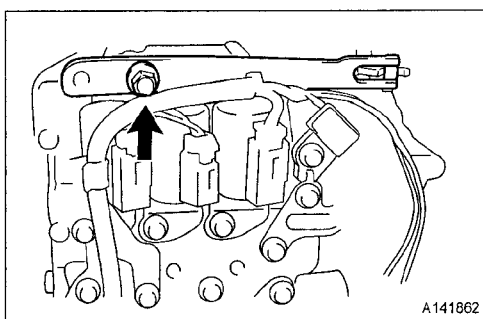
1. Battery minus terminal disconnection
2. Automatic transaxle fluid drainage (See page 26-102)
3. Transaxle oil pan (ATM) removal (See page 26-102)
4. Oil strainer removal (See page 26-105)



5. Transmission valve body assembly removal
 - (1) Remove the bolt and then the transmission solenoid connector.
 - (2) Disconnect the transmission solenoid connector and solenoid wire connector.

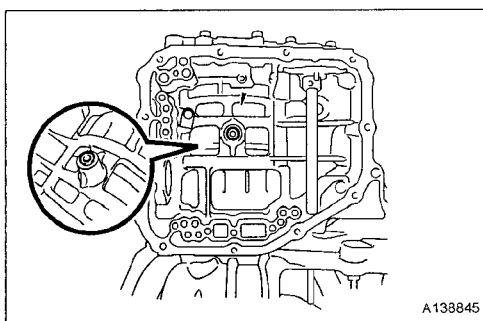


- (3) Remove 7 bolts and then the transmission valve body assembly.
 <CAUTION>
 Because the bolts are different in length from one another, make the mounting position of each clear.



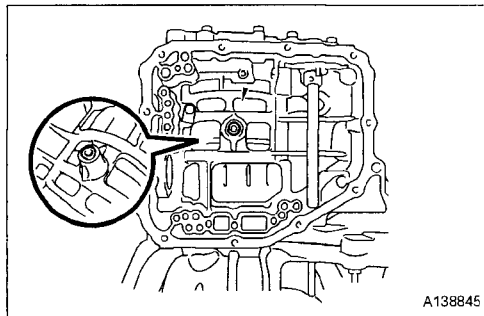
- (4) Remove the bolt and then the manual detent spring.

26

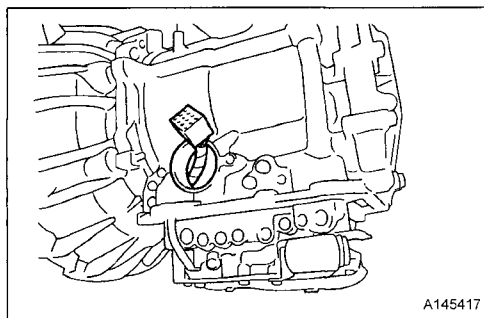


6. Brake cylinder seal removal
 - (1) Remove the brake cylinder seal.

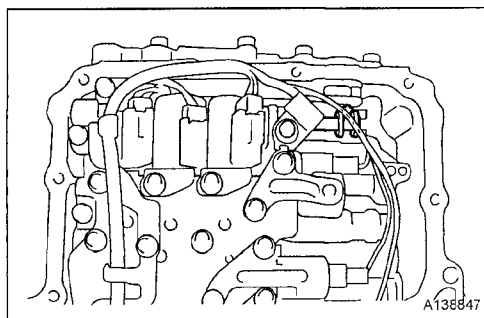
INSTALLATION



1. Brake cylinder seal installation
 - (1) Attach a new brake cylinder seal.



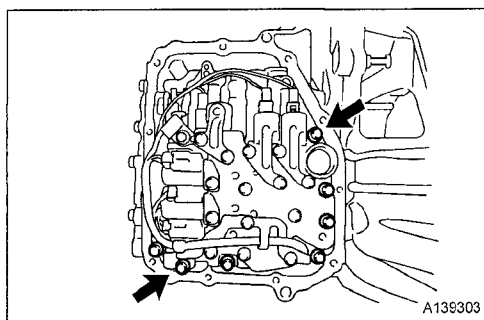
2. Transmission valve body assembly installation
 - (1) Pass the solenoid wire connector through the mounting hole of the transmission solenoid connector.



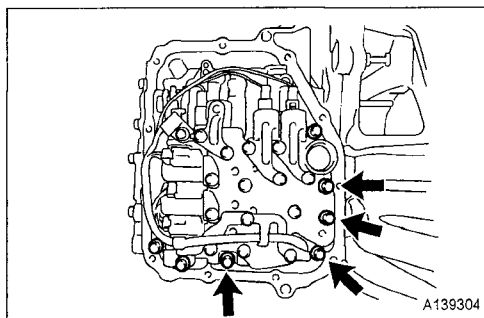
- (2) Match the projection of the manual valve lever with the groove of the manual valve, and attach the transmission valve body to the transaxle case.

<CAUTION>

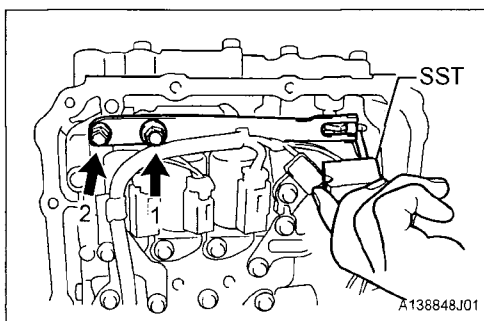
Attach the manual valve lever, tilting it in the L range direction.



- (3) Temporarily tighten 6 mounting bolts of the transmission valve body, and tighten the reference bolt in 2 locations.
Specified value: $T=8.4\text{N}\cdot\text{m}$ {86kgf*cm}



- (4) Tighten 4 bolts.
Specified value: $T=8.4\text{N}\cdot\text{m}$ {86kgf*cm}

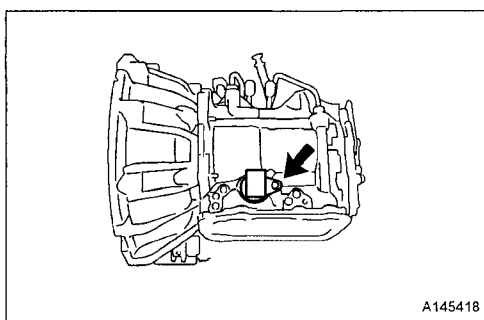


- (5) Using SST and matching the groove of the manual valve and the hole of the transmission valve body (N range position), attach the manual detent spring.

SST 09350-87202, 09351-87211

- (a) Tighten the bolts in the order shown in the diagram.

Specified value: $T=8.4\text{N}\cdot\text{m}$ $\{86\text{kgf}\cdot\text{cm}\}$



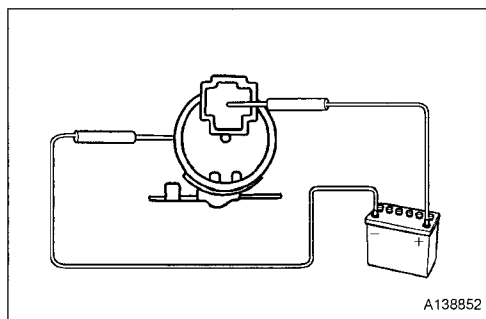
- (6) Attach a new trans connector O-ring to the transsolonoid connector, connect the connector to the solenoid wire connector, and attach it to the transaxle case with a bolt.

Specified value: $T=8.4\text{N}\cdot\text{m}$ $\{86\text{kgf}\cdot\text{cm}\}$

3. Oil strainer installation (See page 26-105)
4. Transaxle oil pan (ATM) installation (See page 26-102)
5. Battery terminal connection
Specified value: $T=6.4\text{N}\cdot\text{m}$ $\{65\text{kgf}\cdot\text{cm}\}$
6. Automatic transaxle fluid replenishment (See page 26-103)
7. Automatic transaxle fluid check (See page 26-63)
8. AT learning value initialization
(See page 26-17)

AUTOMATIC TRANSMISSION 3 WAY SOLENOID ASSEMBLY

INSPECTION



1. Operation check

- (1) Check if the plunger in the solenoid moves when the plus terminal of the battery is connected to the solenoid terminal and the minus terminal of the battery is connected to the solenoid body.

Reference: The valve operates.

<HINT>

Replace the automatic transmission three-way solenoid if it is outside the reference values.

<CAUTION>

- > The valve of the automatic transmission three-way solenoid assembly does not have a return spring. To operate the valve again once it has operated, return the valve position by shaking the automatic transmission three-way solenoid assembly or pushing the ball.
- > To return the valve position on vehicle, start the engine with the shift lever at the P position.

2. Resistance check

- (1) Measure the resistance between the solenoid terminal and solenoid body using the tester.

Reference: 14 - 18 Ω (20°C)

<HINT>

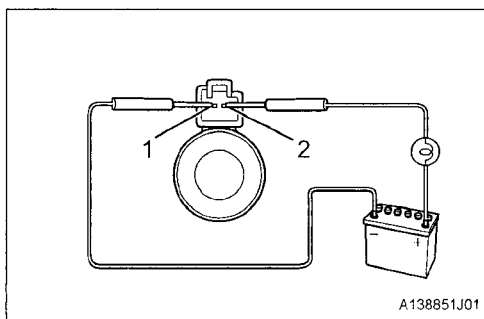
Replace the automatic transmission three-way solenoid if it is outside the reference values.

3. AT learning value initialization

(See page 26-17)

CLUTCH CONTROL SOLENOID NO. 1

INSPECTION



1. Operation check

- (1) Check if the bulb in the solenoid operates when the plus terminal of the battery is connected to terminal 2 via bulb of 12 V - 21 W and the minus terminal of the battery is connected to terminal 1.
Reference: The bulb operates.

<HINT>

Replace clutch control solenoid No. 1 if it is outside the reference values.

<CAUTION>

- > Do not directly apply the battery voltage (do not flow a current of 1 A and above).
- > Check the operation via specified bulb (resistor).
- > If a current of 1 A and above is allowed to flow, the characteristics of the solenoid are changed.

2. Resistance check

- (1) Check the resistance between terminals using the tester.

Specified value: 5.0 - 5.6 W (20°C)

<HINT>

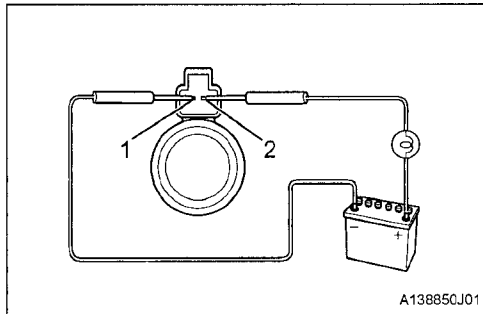
Replace clutch control solenoid No. 1 if it is outside the reference values.

3. AT learning value initialization

(See page 26-17)

CLUTCH CONTROL SOLENOID NO. 2

INSPECTION



1. Operation check

- (1) Check if the bulb in the solenoid operates when the plus terminal of the battery is connected to terminal 2 via bulb of 12 V - 21 W and the minus terminal of the battery is connected to terminal 1.

Reference: The bulb operates.

<HINT>

Replace clutch control solenoid No. 2 if it is outside the reference values.

<CAUTION>

- > Do not directly apply the battery voltage (do not flow a current of 1 A and above).
- > Check the operation via specified bulb (resistor).
- > If a current of 1 A and above is allowed to flow, the characteristics of the solenoid are changed.

2. Resistance check

- (1) Check the resistance between terminals using the tester.

Specified value: 5.1 - 5.5 Ω (20°C)

<HINT>

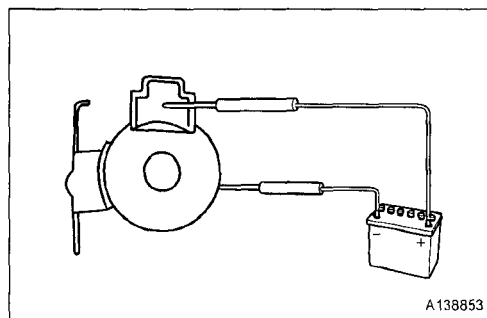
Replace clutch control solenoid No. 2 if it is outside the reference values.

3. AT learning value initialization

(See page 26-17)

LOCKUP CONTROL SOLENOID

INSPECTION



1. Operation check

- (1) Check if the valve in the solenoid moves when the plus terminal of the battery is connected to the solenoid terminal and the minus terminal of the battery is connected to the solenoid body.

Reference: The valve operates.

<HINT>

Replace the lockup control solenoid if it is outside the reference values.

2. Resistance check

- (1) Measure the resistance between the solenoid terminal and solenoid body using the tester.

Reference: 11 - 13 W (20°C)

<HINT>

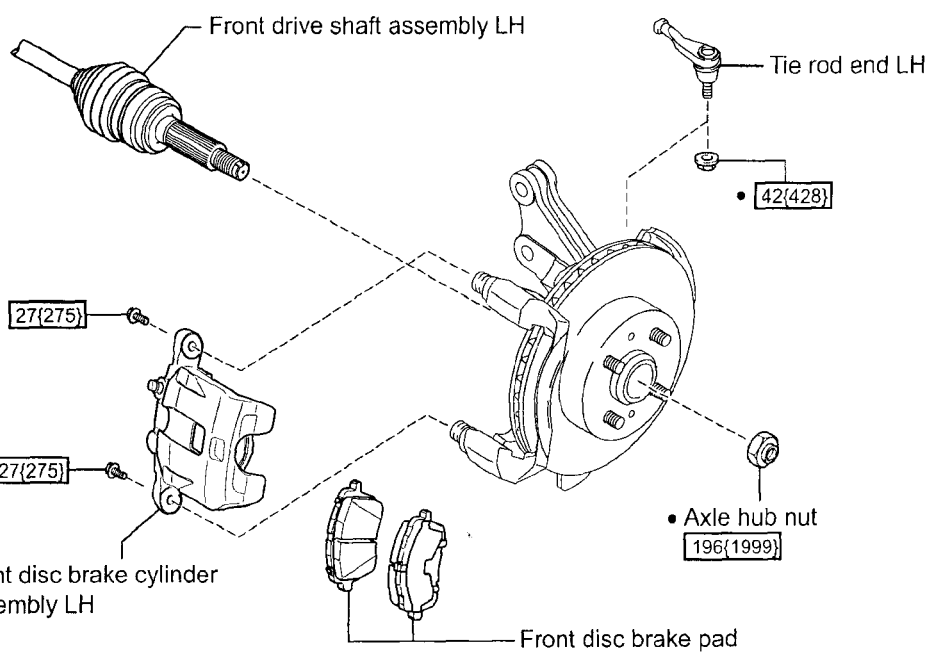
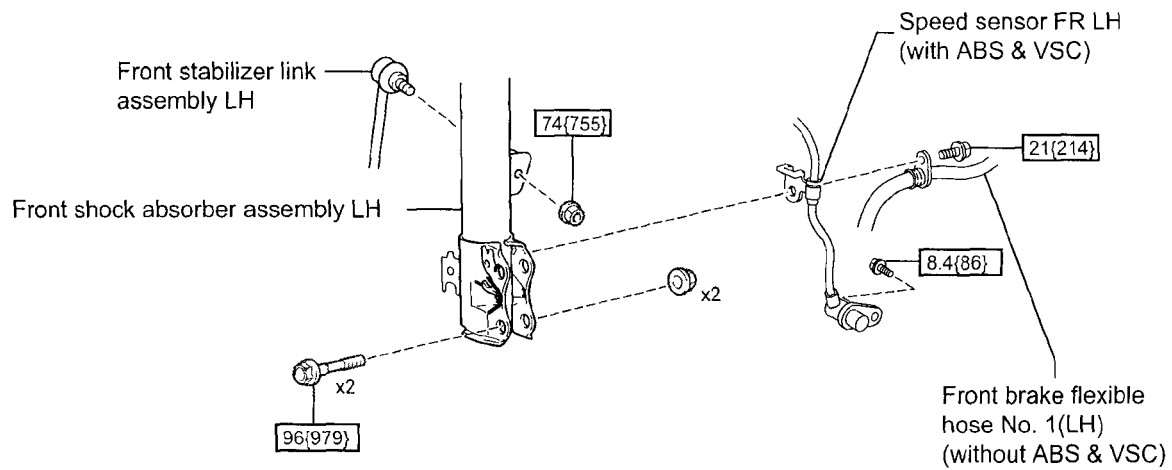
Replace the lockup control solenoid if it is outside the reference values.

3. AT learning value initialization

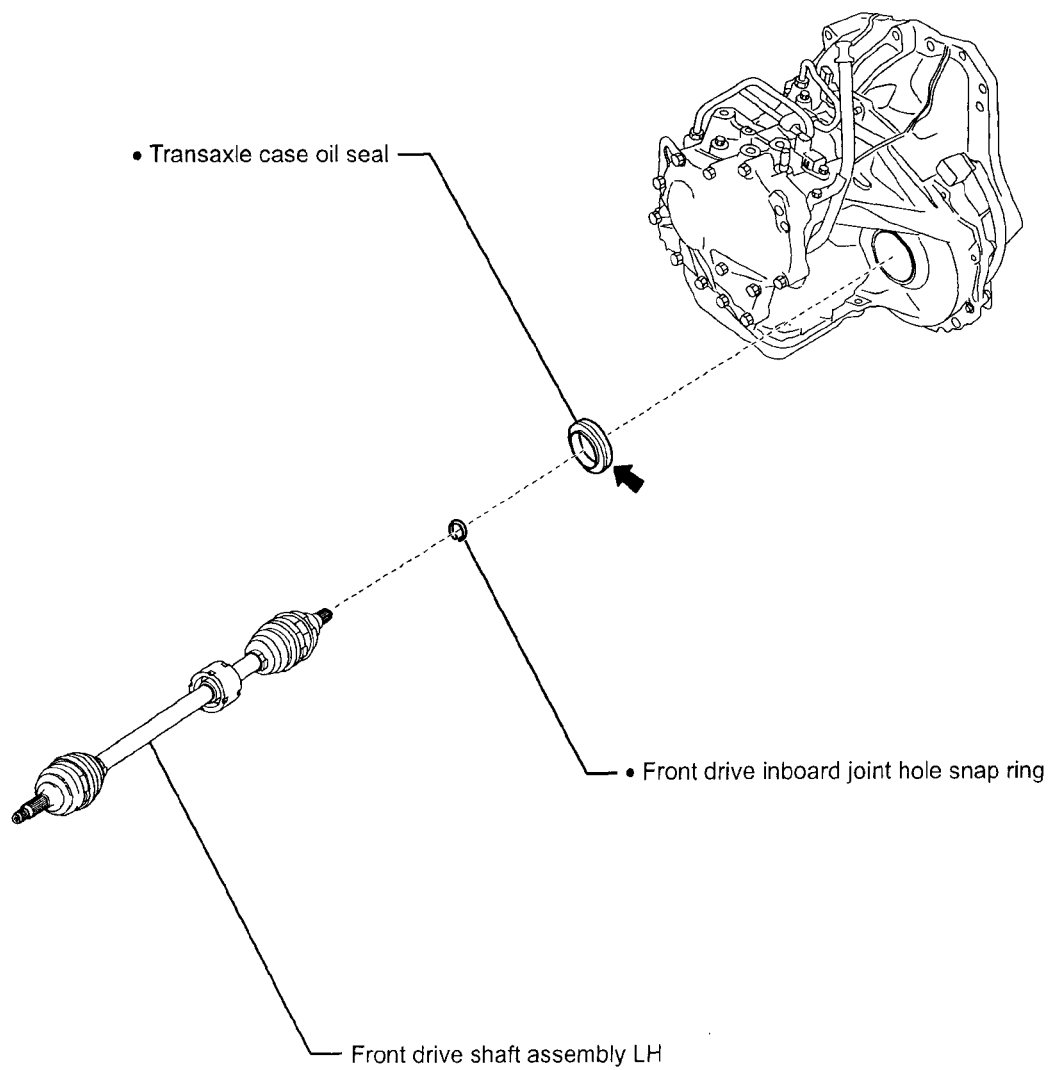
(See page 26-17)

TRANSAXLE CASE OIL SEAL

COMPONENTS



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



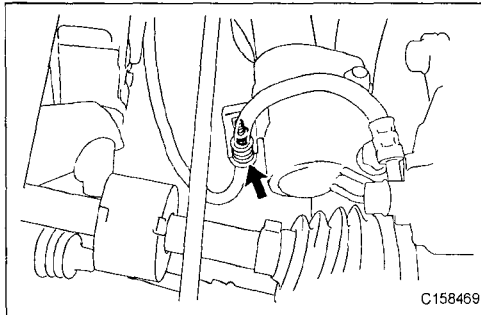
26

← Apply MP Grease • Nonreusable part

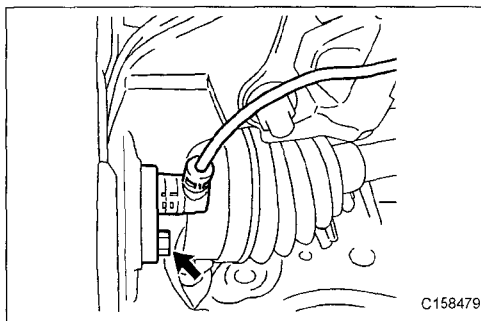
A149642J01

REMOVAL

1. Battery minus terminal disconnection
2. Automatic transaxle fluid drainage (See page 26-102)
3. Front tire removal
4. Front brake flexible hose No. 1 (LH) disconnection (without ABS & VSC)(See page 36-7)



5. Speed sensor FR LH disconnection (with ABS & VSC)
 - (1) Remove the bolt and disconnect the speed sensor wire and flexible hose from the front shock absorber assembly LH.

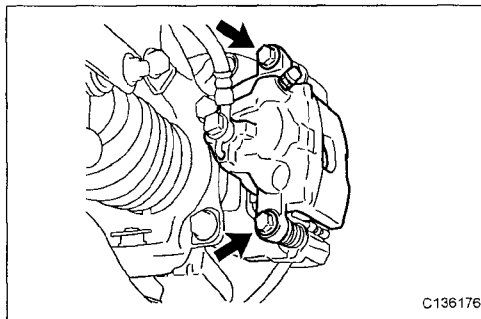


- (2) Remove the bolt and disconnect speed sensor FR LH from the steering knuckle.

<CAUTION>

 - > Do not allow any foreign particle to collect on the front end and mounting side of the speed sensor FR LH.
 - > Pull out speed sensor FR LH straight, without rotating it.
 - > Do not pull the harness of speed sensor FR LH.

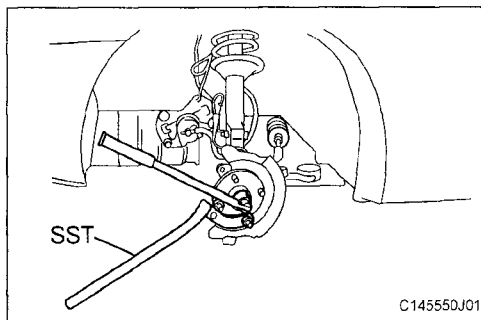
26



6. Front disc brake cylinder assembly LH removal
 - (1) Fix the front disk brake cylinder slide pin with a spanner to remove 2 bolts and remove the front disc brake cylinder assembly LH.

<CAUTION>

Hang the cylinder with a wire or suchlike.
 - (2) Remove the front disc brake pad.

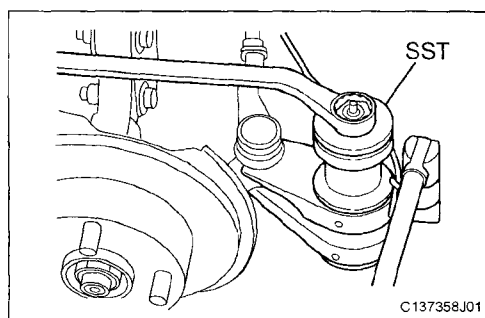


7. Axle hub nut removal (LH)
 - (1) Using a chisel and a hammer, remove the caulking of the axle hub nut.
 - (2) Using SST, remove the axle hub nut.

SST 09511-87202

<CAUTION>

 - > When removing the axle hub nut, completely remove the caulking.
 - > Do not damage the thread of the front drive shaft assembly LH.



8. Tie rod end LH disconnection

- (1) Remove the nut.
- (2) Using SST, disconnect the tie rod end LH from steering knuckle LH.

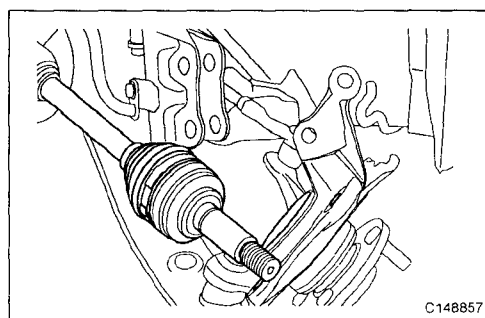
SST 09628-00011

<CAUTION>

- > Do not damage the dust cover LH of the tie rod end LH.
- > When setting SST, attach a dummy nut to the screw of the tie rod end to protect the screw from damages.

9. Front shock absorber assembly LH disconnection

- (1) Remove 2 bolts and 2 nuts, and disconnect the front shock absorber assembly LH and steering knuckle LH.

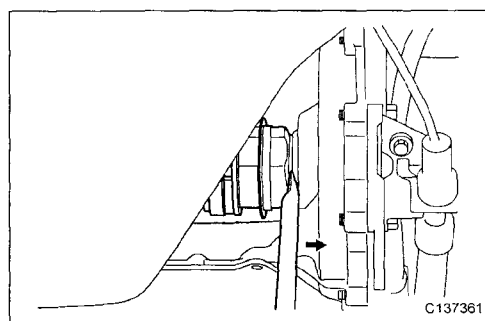


10. Front drive shaft assembly LH removal

- (1) Use a plastic hammer to lightly hit the end portion of the front drive shaft assembly LH and pull the front drive shaft assembly LH out of the steering knuckle LH.

<CAUTION>

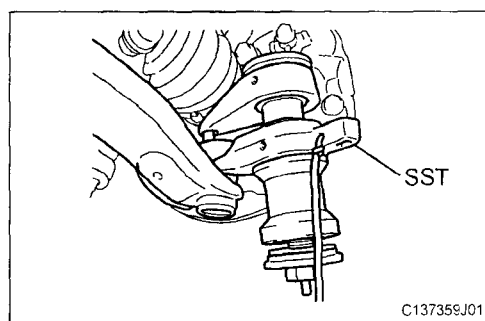
- > Avoid damaging the drive shaft outboard joint boot.
- > Avoid damaging the speed sensor rotor.



- (2) Put the end portion of the hub nut wrench on the front drive shaft inboard joint and remove the front drive shaft assembly LH.

<CAUTION>

- > Avoid damaging the oil seal.
- > Avoid damaging the boot of the front drive shaft assembly LH.
- > Be sure not to drop the front drive shaft assembly LH.



11. Steering knuckle LH removal

- (1) Remove the clip and the nut.
- (2) Disconnect the lower arm ball joint from the steering knuckle by using SST.

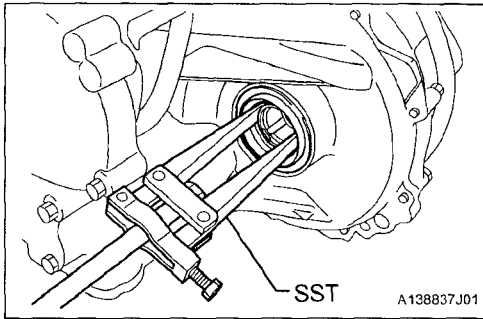
SST 09628-00011

<CAUTION>

- > Avoid damaging the dust cover LH of the front suspension lower arm No. 1 LH.
- > Keep SST hung on a string.

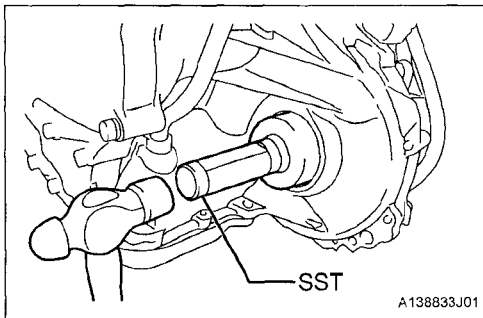
12. Front drive inboard joint hole snap ring removal (LH)

- (1) Remove the front drive inboard joint hole snap ring.



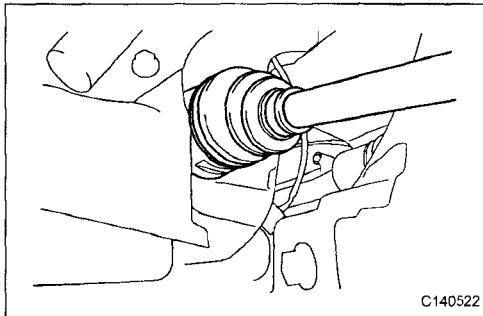
13. Transaxle case oil seal removal
Using SST, remove the transaxle case oil seal.
SST 09308-00010

INSTALLATION



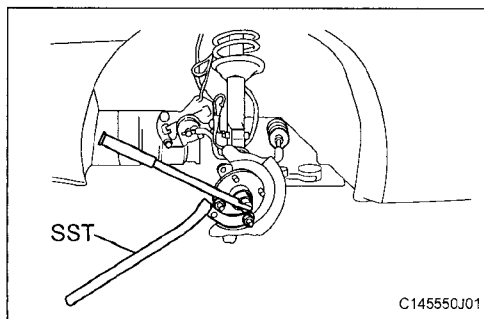
1. Transaxle case oil seal installation
(1) Using SST and a hammer, hit in a new transaxle case oil seal.
SST 09518-87709
(2) Apply MP grease to the lip of the oil seal.

2. Front drive inboard joint hole snap ring installation (LH)
(1) Attach a new front drive inboard joint hole snap ring.
3. Steering knuckle LH installation
(1) Attach the steering knuckle LH to the front suspension lower arm No.1 LH and tighten the nut.
Specified value: $T=52N \cdot m$ {530kgf $\cdot$ cm}
(2) Attach a new clip.



4. Front drive shaft assembly LH installation
(1) Fit the spline of the inboard joint assembly LH and insert the front drive shaft assembly LH.
<CAUTION>
> Avoid damaging the oil seal.
> Avoid damaging the drive shaft boot.
(2) Fit the spline of the front drive shaft assembly LH in the steering knuckle LH and insert it.
<CAUTION>
> Avoid damaging the drive shaft outboard joint boot.
> Make sure that there is any foreign particle attached to the speed sensor rotor and the insertion area.
> Avoid damaging the speed sensor rotor.
> Avoid damaging the oil seal.

5. Front shock absorber assembly LH installation
(1) Attach the steering knuckle LH to the front shock absorber assembly LH, insert 2 bolts from the front of the vehicle, and attach a nut and tighten the bolt side.
Specified value: $T=96N \cdot m$ {979kgf $\cdot$ cm}
6. Tie rod end LH installation
(1) Attach the tie rod end LH to the steering knuckle LH, and tighten it with a new nut.
Specified value: $T=42N \cdot m$ {428kgf $\cdot$ cm}
<CAUTION>
Protect the screw and tapered parts from being stained with oil.

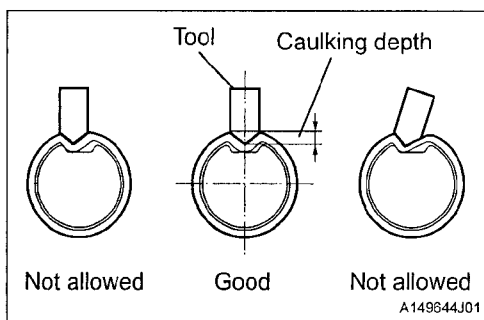


7. Axle hub nut installation (LH)

- (1) Using SST and a socket wrench (30 mm), attach a new axle hub nut.

SST 09511-87202

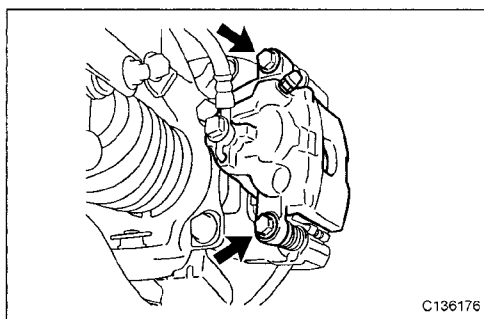
Specified value: $T=196\text{N}\cdot\text{m}$ {1999kgf*cm}



- (2) Using a chisel and a hammer, caulk the axle hub nut.

<HINT>

- > Caulk the axle hub nut at right angles to the center of the front drive shaft assembly.
- > Caulking depth is 3 to 5 mm.



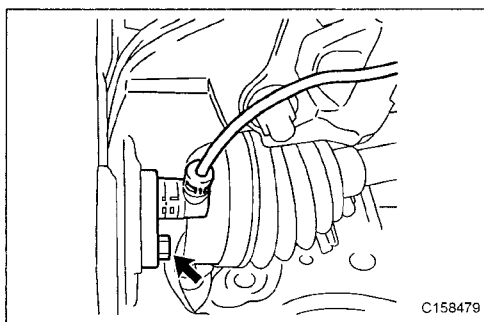
8. Front disc brake cylinder assembly LH installation

- (1) Attach the front disc brake pad.

- (2) Use 2 bolts to attach the front disc brake cylinder assembly LH.

Specified value: $T=27\text{N}\cdot\text{m}$ {275kgf*cm}

26



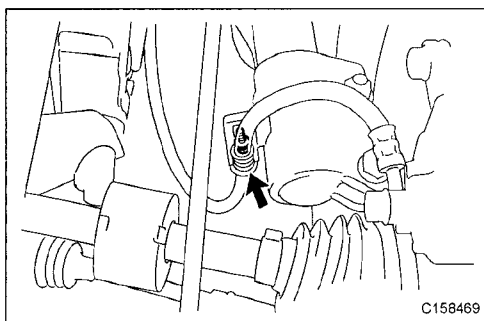
9. Speed sensor FR LH installation (with ABS & VSC)

- (1) Use bolts to attach the speed sensor FR LH to the steering knuckle.

Specified value: $T=8.4\text{N}\cdot\text{m}$ {86kgf*cm}

<CAUTION>

- > Check if no foreign particles collect on the front end and mounting part of the speed sensor FR LH.
- > Do not twist the speed sensor FR LH when attaching it.



- (2) Use bolts to attach the speed sensor wire and flexible hose to the front shock absorber assembly LH.

Specified value: $T=21\text{N}\cdot\text{m}$ {214kgf*cm}

<CAUTION>

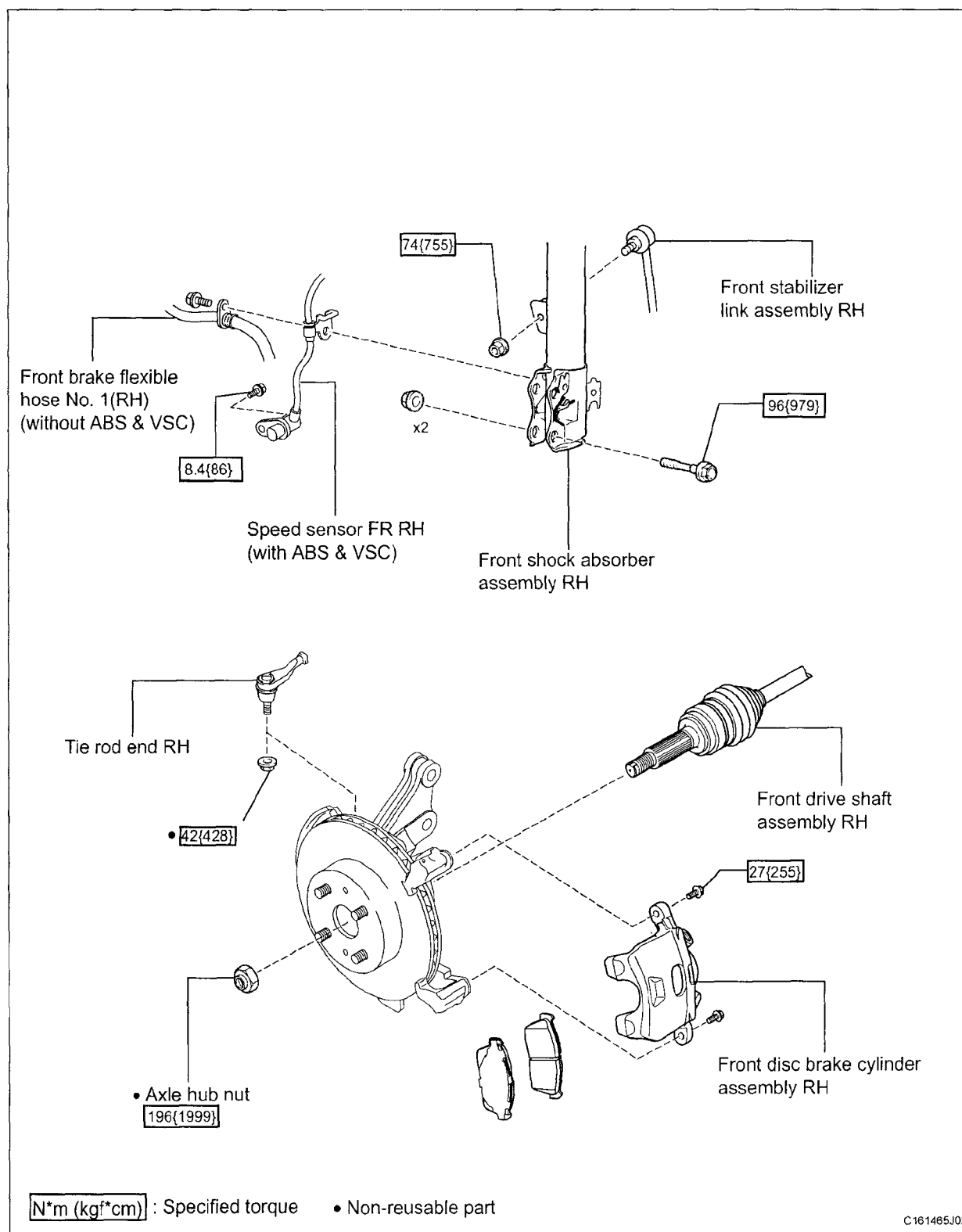
Do not apply any load to the speed sensor wire when attaching it.

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

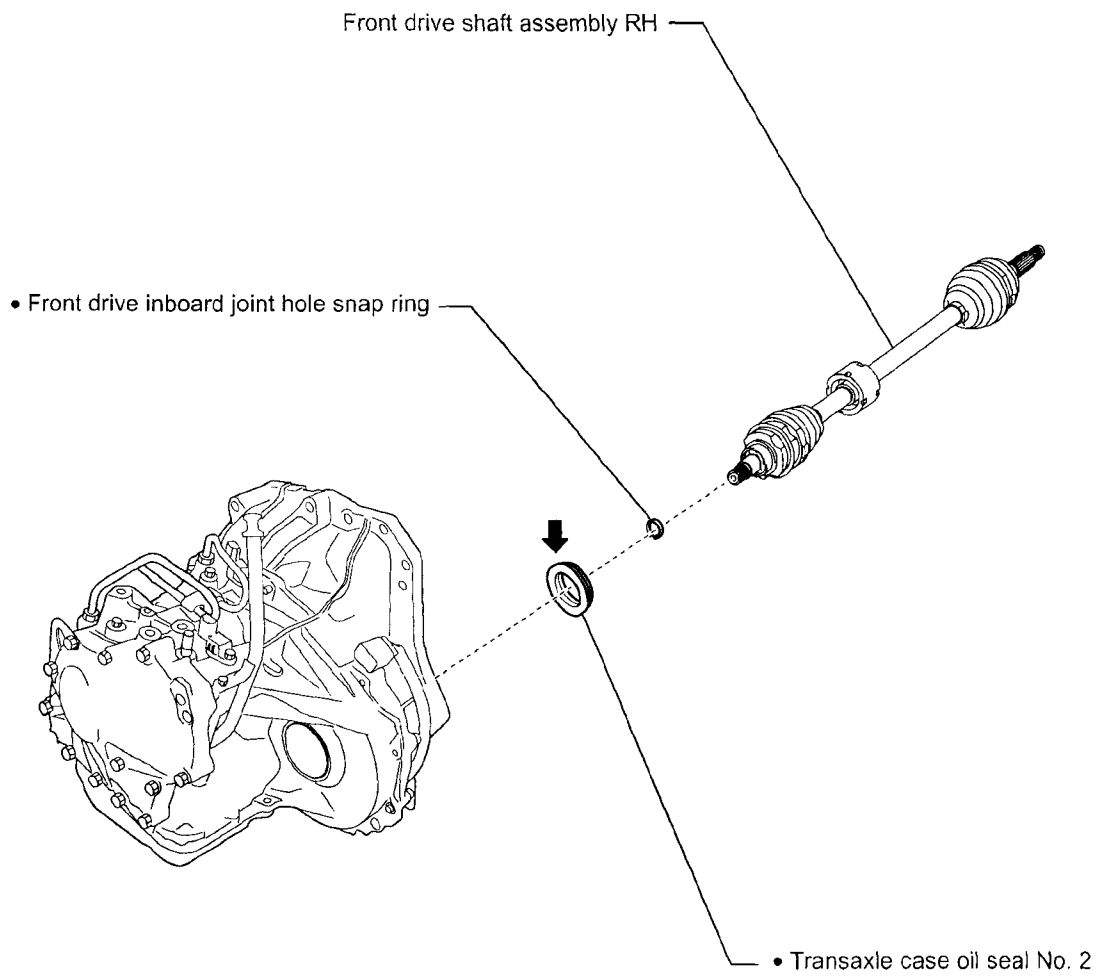
11. Front tire installation
Specified value: $T=103\text{N}\cdot\text{m}$ {1050kgf*cm}
12. Battery minus terminal connection
Specified value: $T=6.4\text{N}\cdot\text{m}$ {65kgf*cm}
13. Automatic transaxle fluid replenishment (See page 26-103)
14. Automatic transaxle fluid check (See page 26-63)
15. Front wheel alignment check · adjustment
(See page 42-5)
16. Test mode check (speed sensor system)
with ABS: (See page 44-15)
with VSC: (See page 44-73)

TRANSAXLE CASE OIL SEAL NO. 2

COMPONENTS



26



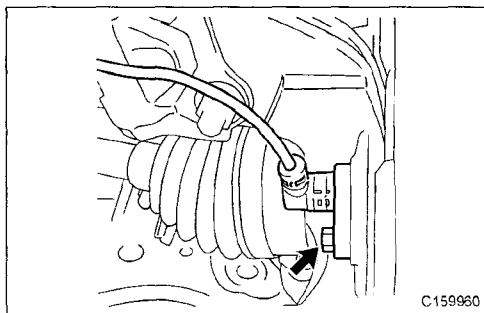
← Apply MP Grease

• Non-reusable part

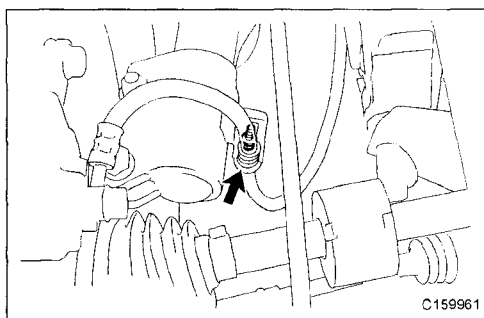
A149643J01

REMOVAL

1. Battery minus terminal disconnection
2. Automatic transaxle fluid drainage (See page 26-102)
3. Front tire removal
4. Front brake flexible hose No. 1 (RH) disconnection (without ABS & VSC)



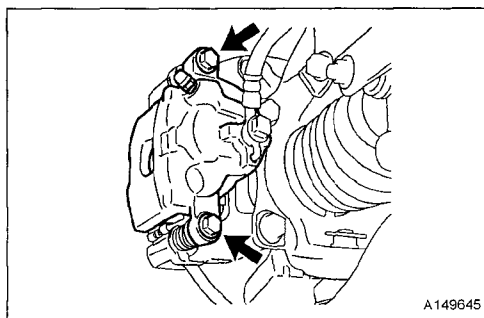
5. Speed sensor FR RH disconnection (with ABS & VSC)
 - (1) Remove the bolt and disconnect the speed sensor wire and flexible hose from the front shock absorber assembly RH.



- (2) Remove the bolt and disconnect the speed sensor FR RH from the steering knuckle.

<CAUTION>

 - > Do not allow any foreign particle to collect on the front end and mounting part of the speed sensor FR RH.
 - > Pull out the speed sensor FR RH straight, without rotating it.
 - > Do not pull the harness of the speed sensor FR RH.



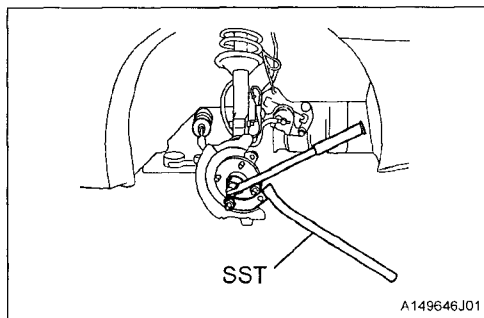
6. Front disc brake cylinder assembly RH removal
 - (1) Fix the front disc brake cylinder slide pin with a spanner to remove 2 bolts and remove the front disc brake cylinder assembly RH.

<CAUTION>

Hang the cylinder with a wire or suchlike.
 - (2) Remove the front disc brake pad.

26

7. Axle hub nut removal (RH)
 - (1) Using a chisel and a hammer, remove the caulking of the axle hub nut.

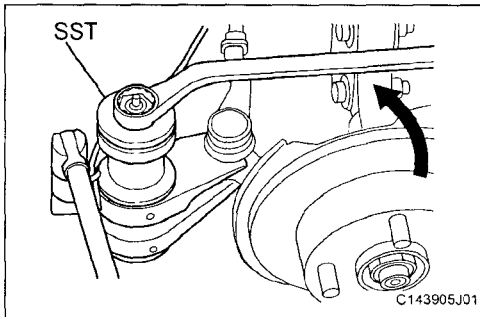


- (2) Using SST and a socket wrench (30 mm), remove the axle hub nut.

SST 09511-87202

<CAUTION>

 - > When removing the axle hub nut, completely remove the caulking.
 - > Do not damage the thread of the front drive shaft assembly RH.



8. Tie rod end RH disconnection

- (1) Remove the nut.
- (2) Using SST, disconnect the tie rod end RH from the steering knuckle RH.

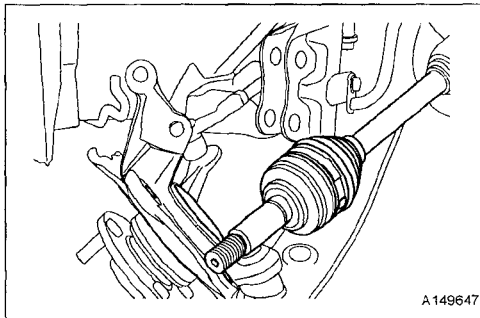
SST 09628-00011

<CAUTION>

- > Do not damage the dust cover RH of the tie rod end RH.
- > When setting SST, attach a dummy nut to the screw of the tie rod end to protect the screw from damages.

9. Front shock absorber assembly RH disconnection

- (1) Remove 2 bolts and 2 nuts, and disconnect the front shock absorber assembly RH and steering knuckle RH.



10. Front drive shaft assembly RH removal

- (1) Using a plastic hammer, lightly hit the front end of the front drive shaft assembly RH, and remove the front drive shaft assembly RH from the steering knuckle RH.

<CAUTION>

- > Avoid damaging the drive shaft outboard joint boot.
- > Avoid damaging the speed sensor rotor.

- (2) Remove the front drive shaft assembly RH, touching the front drive shaft inboard joint with the front end of the hub nut wrench.

<CAUTION>

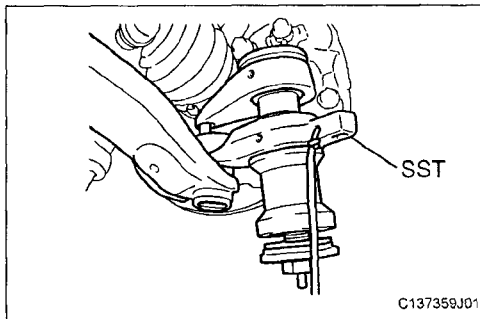
- > Avoid damaging the oil seal.
- > Do not damage the boots of the front drive shaft assembly RH.
- > Do not drop the front drive shaft assembly RH.

11. Front drive inboard joint hole snap ring removal (RH)

- (1) Remove the clip and the nut.

12. Steering knuckle RH removal

- (1) Remove the clip and the nut.



- (2) Disconnect the lower arm ball joint from the steering knuckle by using SST.

SST 09628-00011

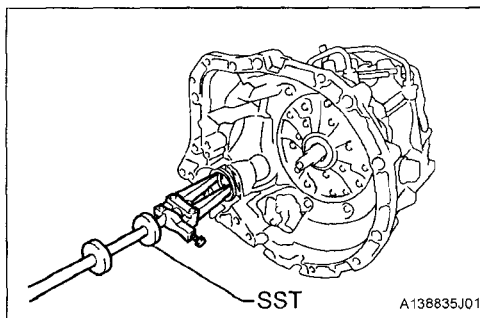
<CAUTION>

- > Do not damage the dust cover of the front suspension lower arm No. 1 RH.
- > Keep SST hung on a string.

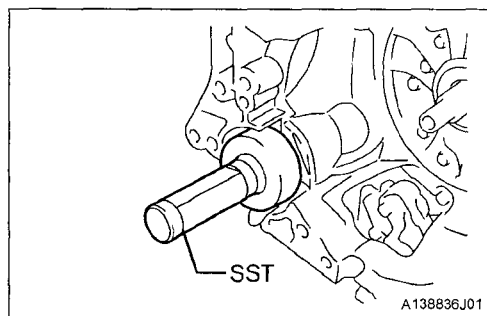
13. Transaxle case oil seal No. 2 removal

- (1) Using SST, remove transaxle case oil seal No. 2.

SST 09308-00010

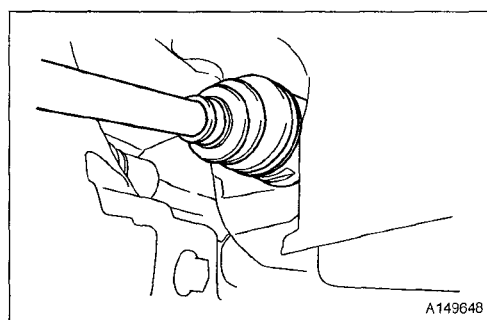


INSTALLATION

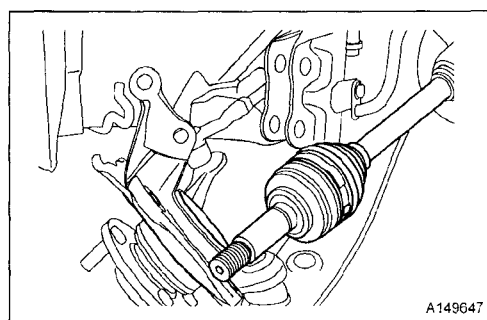


1. Transaxle case oil seal No. 2 installation
 - (1) Using SST and a hammer, hit in a new transaxle case oil seal No. 2.
SST 09518-87709
 - (2) Apply MP grease No. 2 to the lip of the oil seal.

2. Steering knuckle RH installation
 - (1) Attach the steering knuckle RH to front suspension lower arm No. 1 RH and tighten it with a nut.
Specified value: $T=52N \cdot m$ {530kgf $\cdot$ cm}
 - (2) Attach a new clip.
3. Front drive inboard joint hole snap ring installation (RH)
 - (1) Attach a new front drive inboard joint hole snap ring.



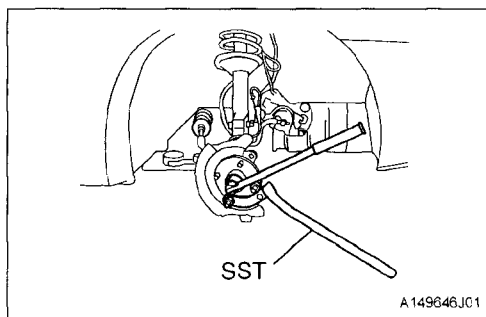
4. Front drive shaft assembly RH installation
 - (1) Fit the spline of the inboard joint assembly RH and insert the front drive shaft assembly RH.
<CAUTION>
 - > Avoid damaging the oil seal.
 - > Avoid damaging the drive shaft boot.



- (2) Fit and insert the spline of the front driver shaft assembly RH to the steering knuckle RH.
<CAUTION>
 - > Avoid damaging the drive shaft outboard joint boot.
 - > Make sure that there is any foreign particle attached to the speed sensor rotor and the insertion area.
 - > Avoid damaging the speed sensor rotor.
 - > Avoid damaging the oil seal.

5. Front shock absorber assembly RH installation
 - (1) Attach the steering knuckle RH to the front shock absorber assembly RH, insert 2 bolts from the front of the vehicle, and attach nuts and tighten the bolt side.
Specified value: $T=96N \cdot m$ {979kgf $\cdot$ cm}
6. Tie rod end RH installation
 - (1) Attach the tie rod end RH to the steering knuckle RH and tighten it with a new nut.
Specified value: $T=42N \cdot m$ {428kgf $\cdot$ cm}

<CAUTION>
Protect the screw and tapered parts from being stained with oil.

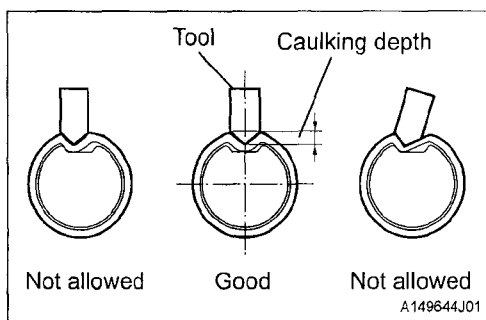


7. Axle hub nut installation (RH)

- (1) Using SST and a socket wrench (30 mm), attach a new axle hub nut.

SST 09511-87202

Specified value: $T=196\text{N}\cdot\text{m}$ {1999kgf*cm}



- (2) Using a chisel and a hammer, caulk the axle hub nut.

<HINT>

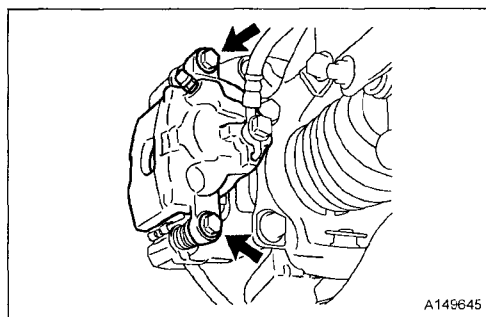
- > Caulk the axle hub nut at right angles to the center of the front drive shaft assembly.
- > Caulking depth is 3 to 5 mm.

8. Front disc brake cylinder assembly RH installation

- (1) Attach the front disc brake pad.

- (2) Use 2 bolts to attach the front disc brake cylinder assembly RH.

Specified value: $T=27\text{N}\cdot\text{m}$ {275kgf*cm}



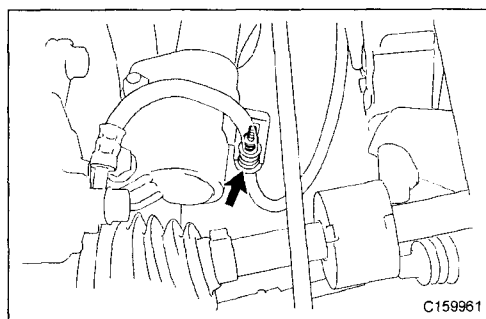
9. Speed sensor FR RH installation (with ABS & VSC)

- (1) Use bolts to attach the speed sensor FR RH to the steering knuckle.

Specified value: $T=8.4\text{N}\cdot\text{m}$ {86kgf*cm}

<CAUTION>

- > Check if no foreign particles collect on the front end and mounting part of the speed sensor FR RH.
- > Do not twist the speed sensor FR RH when attaching it.

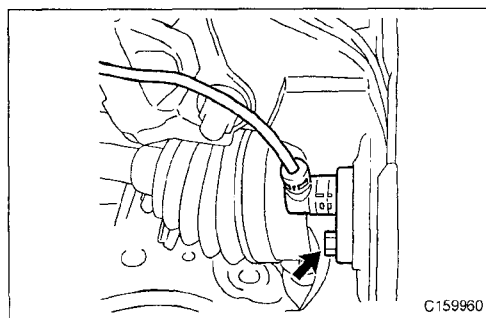


- (2) Use bolts to attach the speed sensor wire and flexible hose to the front shock absorber assembly RH.

Specified value: $T=21\text{N}\cdot\text{m}$ {214kgf*cm}

<CAUTION>

- > Do not apply any load to the speed sensor wire when attaching it.

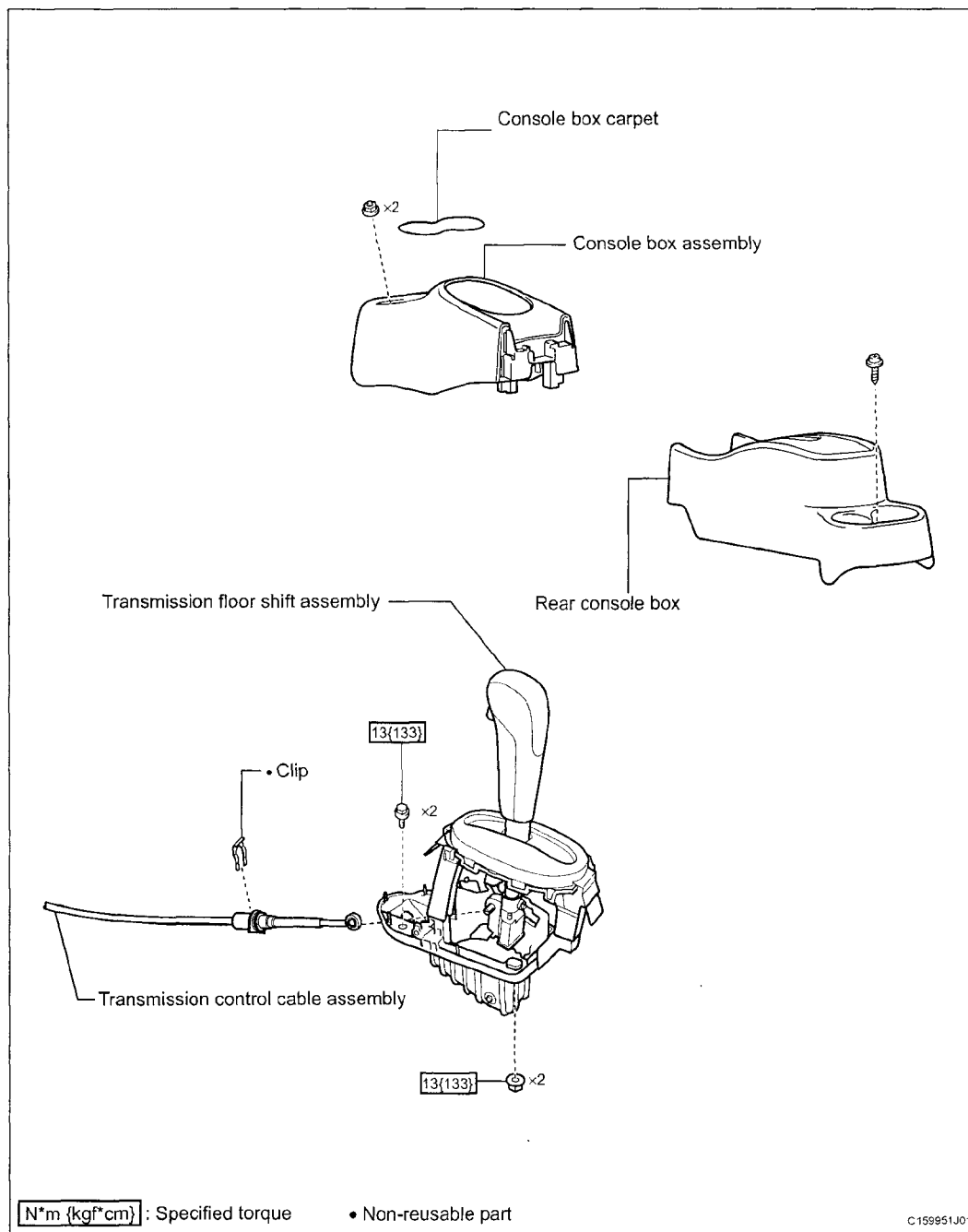


10. Front brake flexible hose No. 1 (RH) installation (without ABS & VSC)

11. Front tire installation
Specified value: $T=103\text{N}\cdot\text{m}$ {1050kgf*cm}
12. Battery minus terminal connection
Specified value: $T=6.4\text{N}\cdot\text{m}$ {65kgf*cm}
13. Automatic transaxle fluid replenishment (See page 26-103)
14. Automatic transaxle fluid check (See page 26-63)
15. Front wheel alignment check - adjustment
(See page 42-5)
16. Test mode check (Speed sensor circuit)
ABS installed car: (See page 44-15)
VSC installed car (See page 44-73)

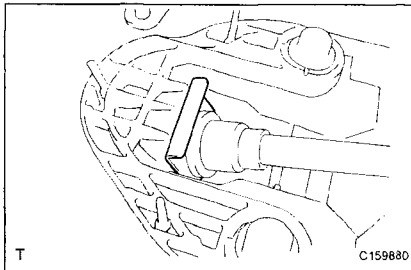
-133

FLOOR SHIFT ASSEMBLY COMPONENTS

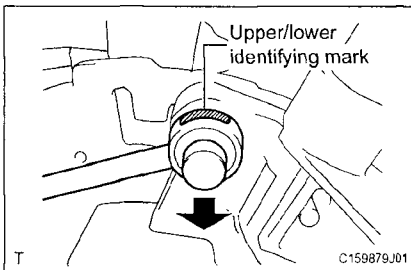


REMOVAL

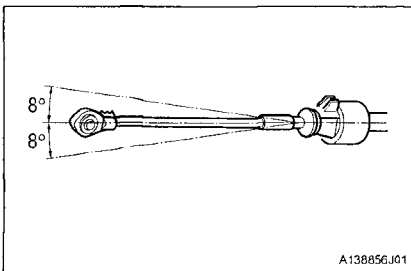
1. Rear console box removal (See page 26-138)
2. Console box carpet removal (See page 26-138)
3. Console box assembly removal (See page 26-138)
4. Transmission control cable assembly removal
 - (1) Move the shift lever to the N position.



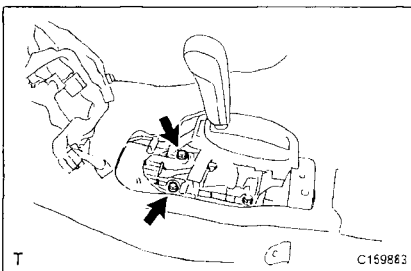
- (2) Remove the clip.



- (3) Disconnect the eye end of the transmission control cable assembly from the transmission floor shift assembly.

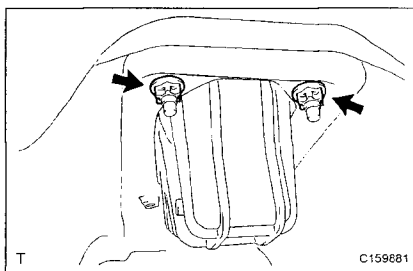
**<CAUTION>**

- > Do not vibrate one side of the eye end of the transmission control cable assembly at 8° and above
- > Do not apply a load to the eye end of the transmission control cable assembly.

26

5. Transmission floor shift assembly removal
 - (1) Remove 2 bolts.

-135

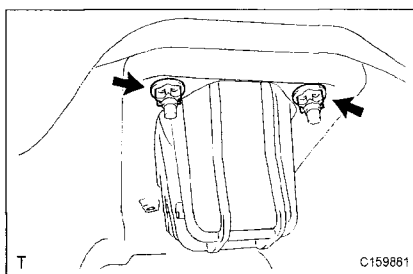


- (2) Lift up the vehicle, and remove 2 nuts from the bottom part of the floor.
- (3) While pulling out the transmission control cable assembly, remove the transmission floor shift assembly.

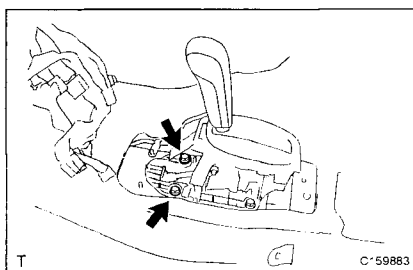
INSTALLATION

1. Transmission floor shift assembly installation

- (1) Move the shift lever to the N position.

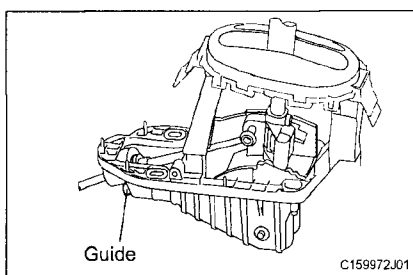


- (2) Lift up the vehicle and attach the transmission floor shift assembly with 2 nuts from the bottom part of the floor.
Specified value: $T=13N \cdot m$ {133kgf*cm}



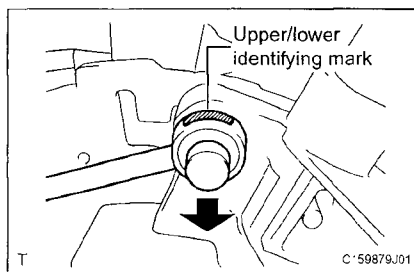
- (3) Attach 2 bolts.
Specified value: $T=13N \cdot m$ {133kgf*cm}

26



2. Transmission control cable assembly installation

- (1) Insert the transmission control cable assembly with the flat part of the casing cap going along the guide of the transmission floor shift assembly.



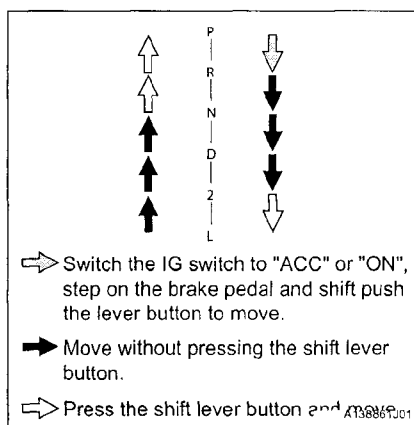
- (2) Attach the transmission control cable assembly to the transmission floor shift assembly with the top-bottom identification marking on the eye end of the transmission control cable assembly facing up.

- (3) Fix the transmission control cable assembly with a new clip.

<CAUTION>

Make sure that the shift lever is at the N position.

3. Console box assembly installation (See page 26-141)
4. Console box carpet installation (See page 26-141)
5. Rear console box installation (See page 26-142)



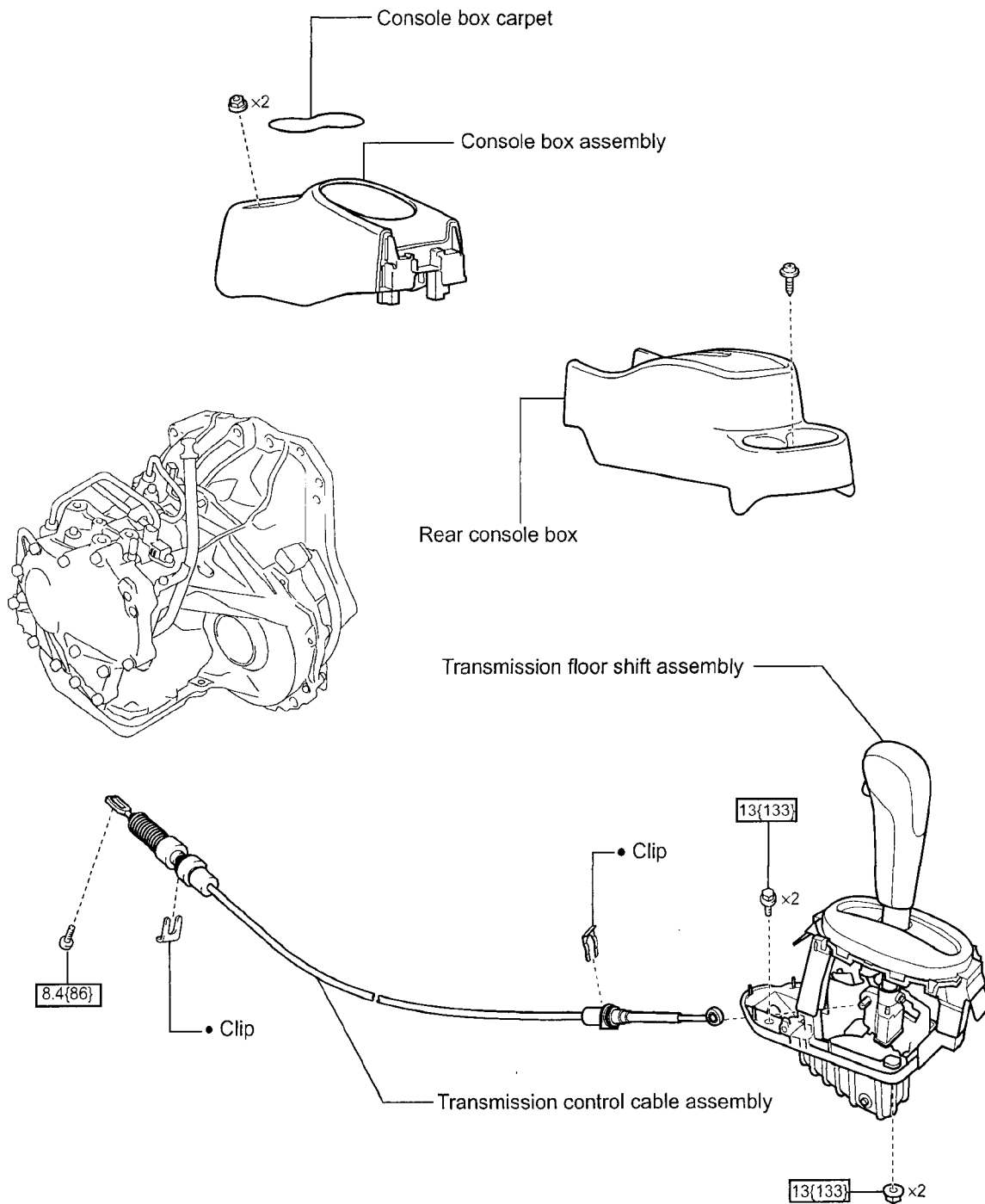
6. Shift lever position check

<HINT>

- > Check if the shift lever can be smoothly and accurately moved to each position.
- > When the shift lever is moved to a position, check if the shift position indicator accurately lights, and if indication of the indicator does not change and only the frame does not light or flash within a range of the play of the shift lever.
- > Start the engine, and check if the vehicle moves forward when the shift lever is at the D, 2nd, and L positions, and backward when it is at the R position.
- > Check if the back-up lamp lights and the reverse warning buzzer sounds when the IG switch is turned on and the shift lever is moved to the R position.

TRANSMISSION CONTROL CABLE ASSEMBLY COMPONENTS

26

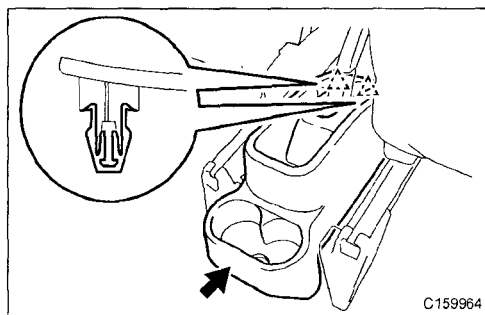


N*m {kgf*cm} : Specified torque

• Non-reusable part

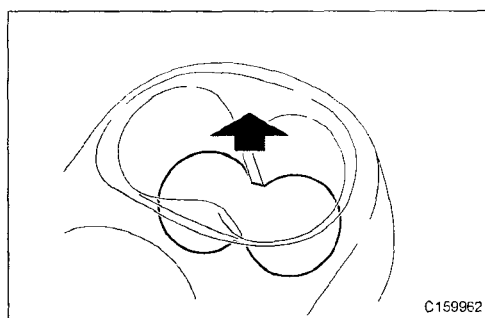
C159878J01

REMOVAL



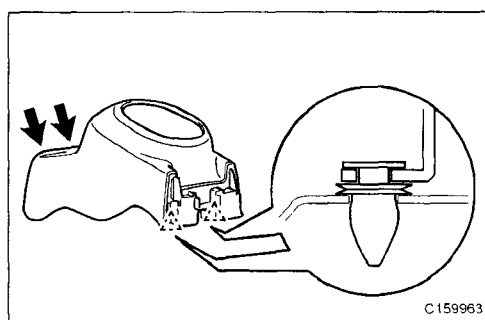
1. Rear console box removal

- (1) Remove the screws and clips in 2 locations, and remove the rear console box.



2. Console box carpet removal

- (1) Remove the console box carpet.

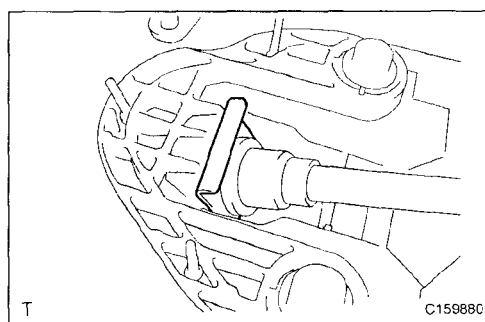


3. Console box assembly removal

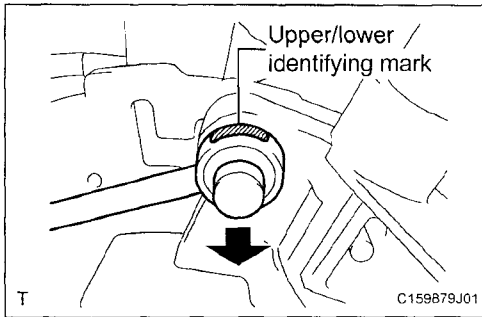
- (1) Remove 2 nuts and 2 clips, and remove the console box assembly.

4. Transmission control cable assembly removal

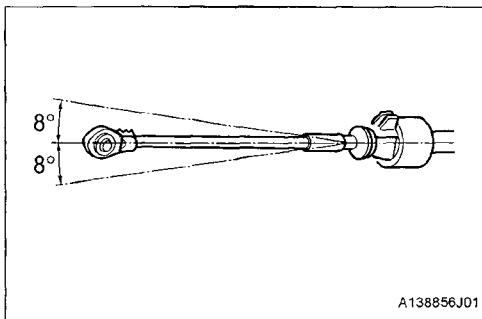
- (1) Move the shift lever to the N position.



- (2) Remove the clip.

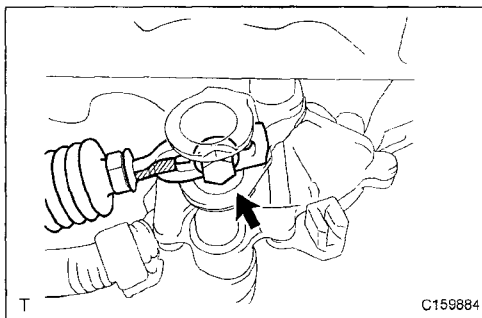


- (3) Disconnect the eye end of the transmission control cable assembly from the transmission floor shift assembly.

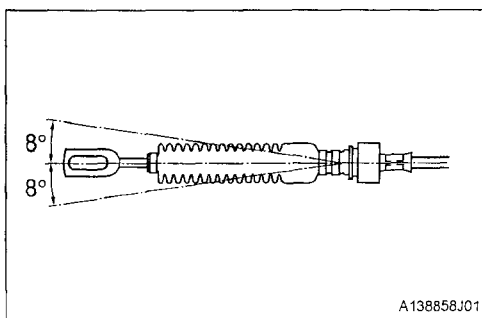


<CAUTION>

- > Do not vibrate one side of the eye end of the transmission control cable assembly at 8° and above.
- > Do not apply a load to the eye end of the transmission control cable assembly.

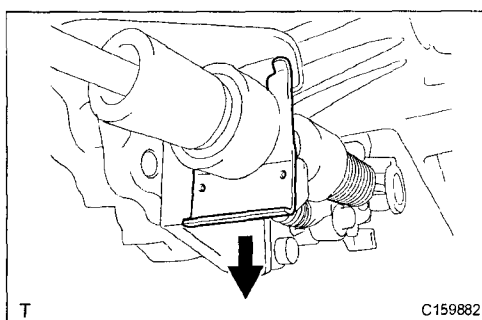


- (4) Check if it has the marking for top-bottom identification, and disconnect the transmission control cable assembly from the neutral start switch assembly.



<CAUTION>

- > Do not vibrate one side of the eye end of the transmission control cable assembly at 8° and above.
- > Do not apply a load to the eye end of the transmission control cable assembly.



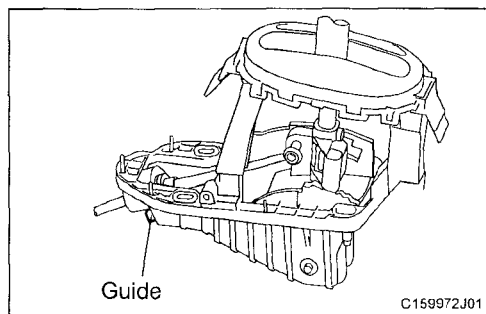
- (5) Remove the clip and remove the transmission control cable assembly down the floor.

INSTALLATION

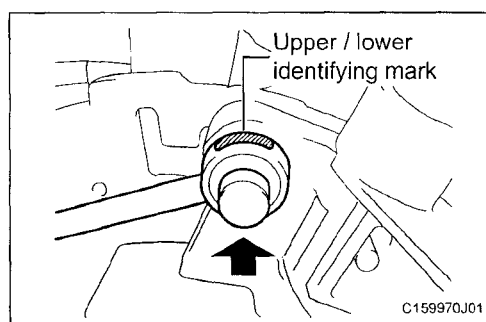
1. Transmission control cable assembly installation

(1) Move the shift lever to the N position.

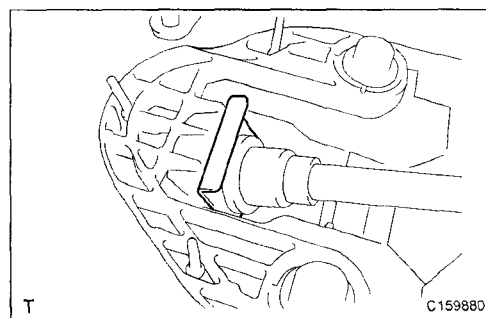
(2) Pass the transmission control cable assembly to the transmission floor shift assembly from the bottom of the floor.



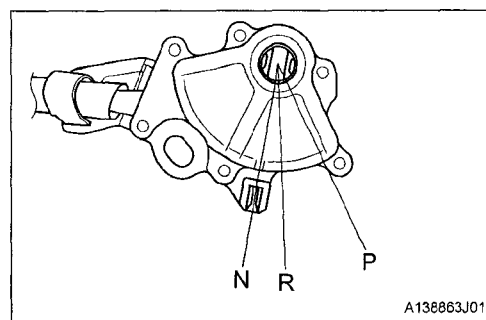
(3) Insert the transmission control cable assembly with the flat part of the casing cap going along the guide of the transmission floor shift assembly.



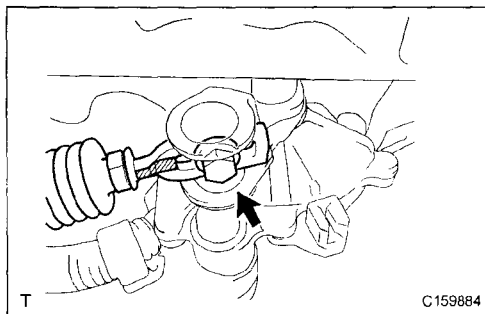
(4) Attach the transmission control cable assembly to the transmission floor shift assembly with the top-bottom identification marking on the eye end of the transmission control cable assembly facing up.



(5) Fix the transmission control cable assembly with a new clip.



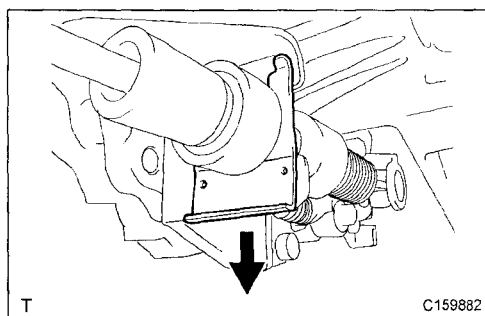
(6) Rotate the control shaft lever toward the front of the vehicle until it stops (P position), and return it 2 positions (N position).



- (7) With the marking for top-bottom identification facing down, temporarily fix the transmission control cable assembly to the neutral start switch assembly with a bolt.

<CAUTION>

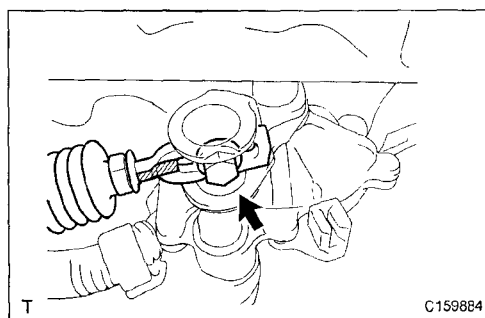
Check if the transmission control cable assembly is not twisted.



- (8) Fix the transmission control cable assembly with a new clip.

<CAUTION>

Check if the transmission control cable assembly is not loose.



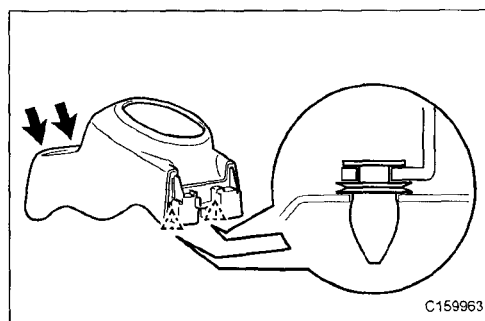
- (9) Tighten the bolt at the end of transmission control cable assembly at the neutral start switch assembly side.

Specified value: $T=8.4\text{N}\cdot\text{m}$ {86kgf*cm}

<CAUTION>

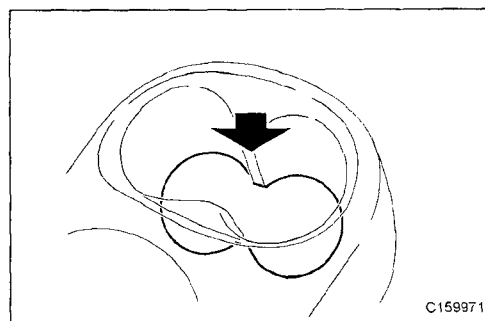
Check if the transmission control cable assembly and boots are not twisted.

26



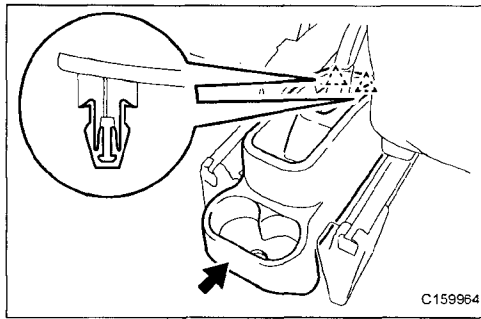
2. Console box assembly installation

- (1) Fit 2 nuts and 2 clips, and attach the console box assembly.



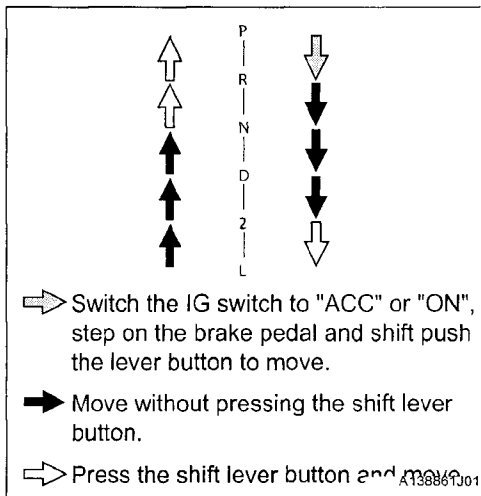
3. Console box carpet installation

- (1) Attach the console box carpet.



4. Rear console box installation

- (1) Fit the screws and clips in 2 locations, and attach the rear console box.



5. Shift lever position check

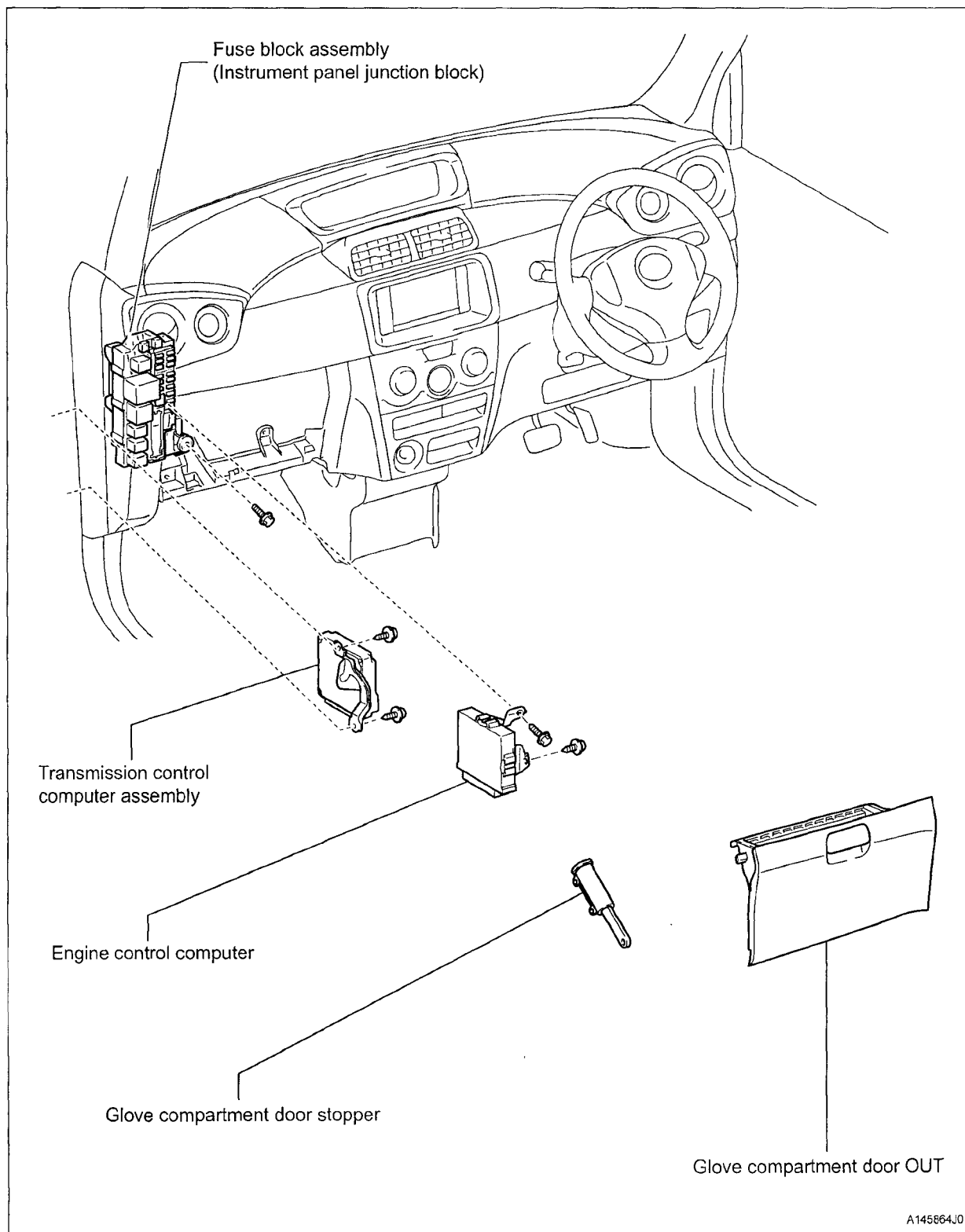
<HINT>

- > Check if the shift lever can be smoothly and accurately moved to each position.
- > Check if the back-up light lights and the reverse warning buzzer sounds when the IG switch is turned on and the shift lever is moved to the R position.
- > When the shift lever is moved to a position, check if the shift position indicator accurately lights, and if indication of the indicator does not change and only the frame does not light or flash within a range of the play of the shift lever.
- > Start the engine, and check if the vehicle moves forward when the shift lever is at the D, 2nd, and L positions, and backward when it is at the R position.
- > Check if the back-up lamp lights and the reverse warning buzzer sounds when the IG switch is turned on and the shift lever is moved to the R position.

TRANSMISSION CONTROL CABLE ASSEMBLY

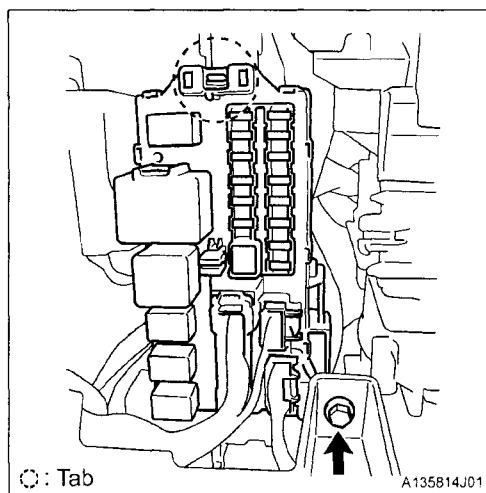
COMPONENTS

26

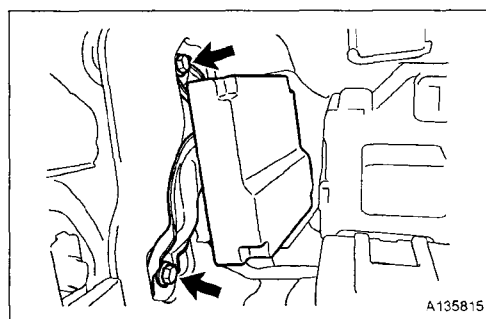


REMOVAL

1. Battery minus terminal disconnection
2. Glove compartment door OUT removal(See page 78-15)
3. Glove compartment door stopper removal(See page 78-15)
4. Engine control computer removal (See page 78-22)



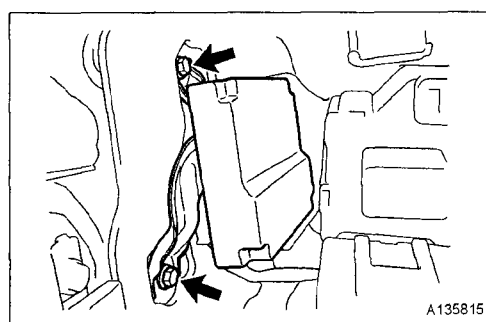
5. Fuse block assembly disconnection
 - (1) Remove tab fitting and bolt, and disconnect the fuse block assembly.



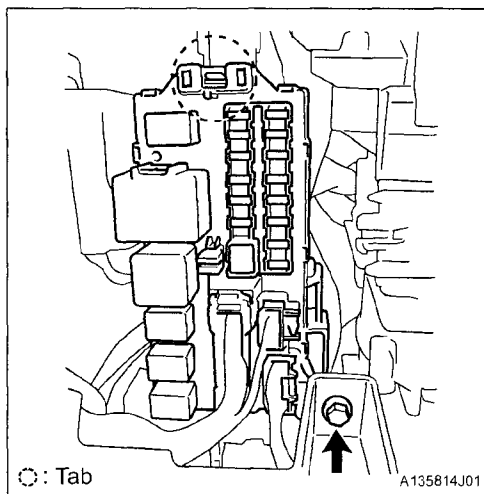
6. Transmission control computer assembly removal
 - (1) Disconnect the connector of the transmission control computer assembly.
 - (2) Remove 2 bolts and the transmission control computer assembly.

26

INSTALLATION



1. Transmission control computer assembly installation
 - (1) Use 2 bolts to attach the transmission control computer assembly.
 - (2) Connect the connector of the transmission control computer assembly.

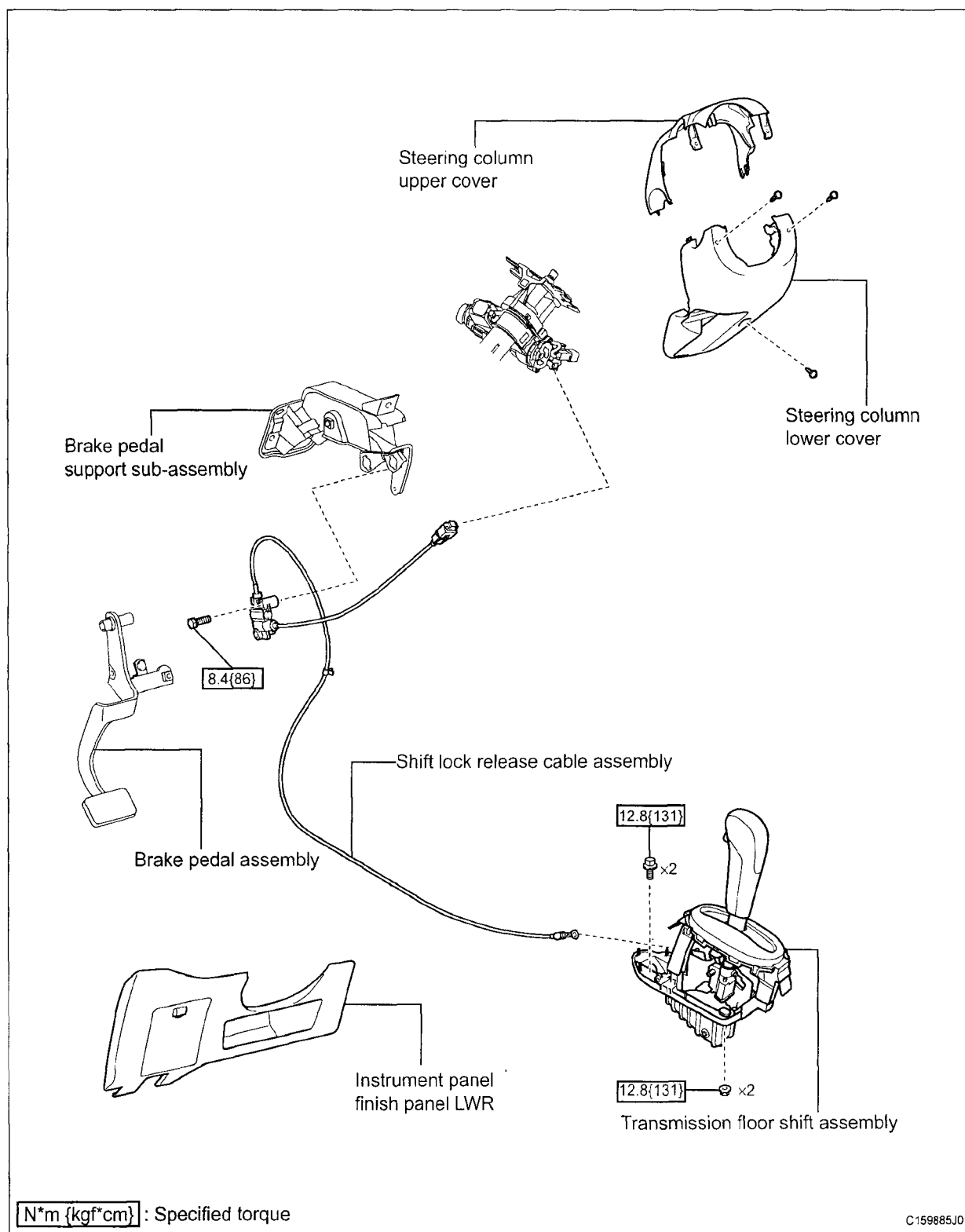


2. Fuse block assembly installation

(1) Fit tab and attach the fuse block assembly with bolt.

3. Engine control computer installation (See page 78-30)
4. Glove compartment door stopper installation(See page 78-37)
5. Glove compartment door OUT installation(See page 78-37)
6. Battery minus terminal connection
Specified value: $T=6.4\text{N}\cdot\text{m}$ {65kgf*cm}
7. DS-II AT learning value initialization
(See page 26-17)

SHIFT LOCK RELEASE CABLE ASSEMBLY COMPONENTS

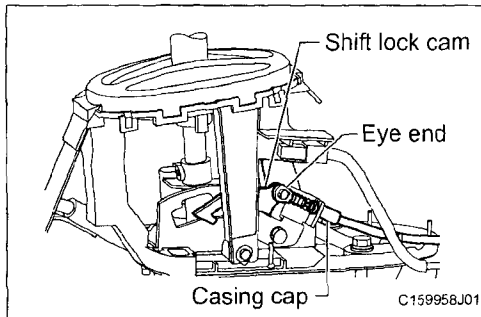


26

REMOVAL

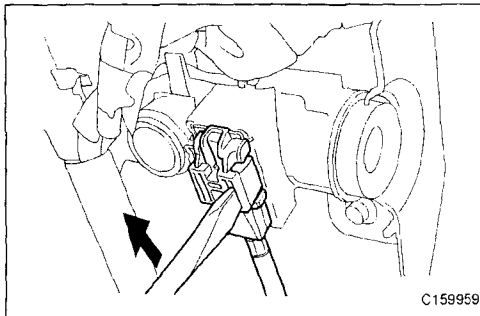
1. Battery minus terminal disconnection

2. Rear console box removal (See page 26-138)
3. Console box carpet removal (See page 26-138)
4. Console box assembly removal (See page 26-138)
5. Instrument panel finish panel LWR removal (See page 27-13)



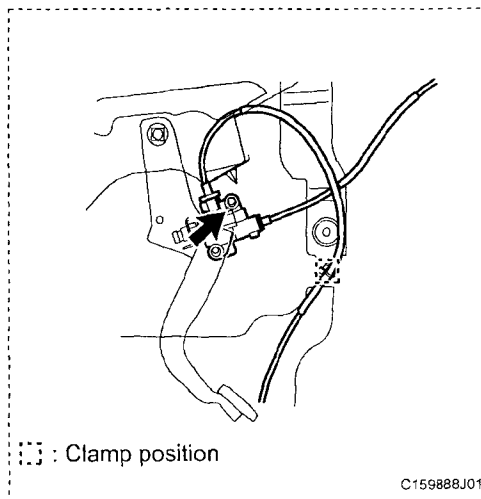
6. Shift lock release cable assembly removal

- (1) Shift the shift lever to the P position.
- (2) Disconnect the casing cap (floor shift side) of the shift lock release cable assembly from the notch portion of the cable bracket of the transmission floor shift assembly.
- (3) Remove the end of the shift lock release cable assembly from the shift lock cam of the transmission floor shift assembly.
- (4) Set the IG switch to "ACC" or "ON" position.
- (5) Remove the tab of the end portion of the shift lock release cable assembly in 2 locations and disconnect the assembly from the protrusion of the steering column bracket.

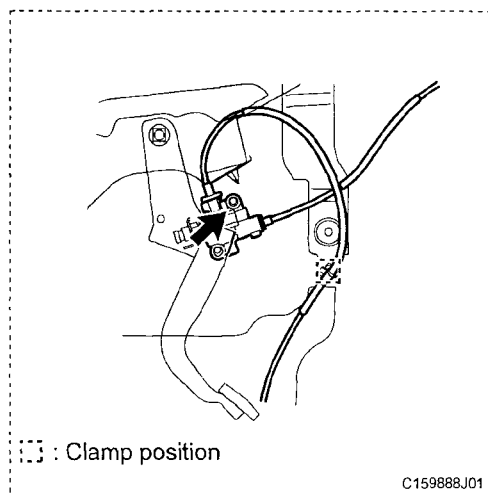


- (6) Remove the bolt and clamp, and the shift lock release cable assembly.

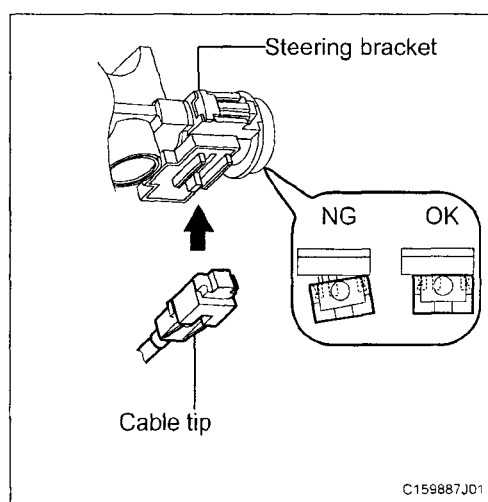
26



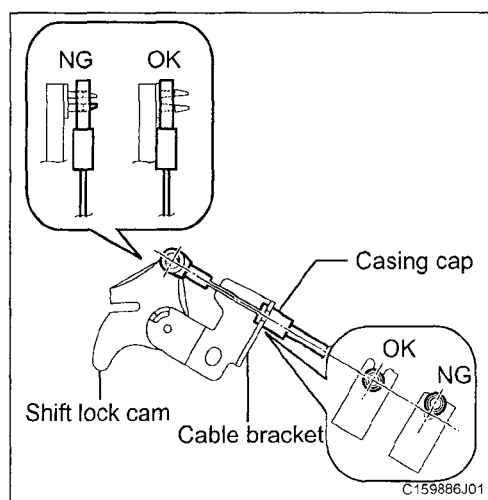
INSTALLATION



1. Shift lock release cable assembly installation
 - (1) Use bolts to attach the shift lock release cable assembly to the brake pedal bracket.
Specified value: $T=8.4N \cdot m$ {86kgf $\cdot$ cm}
 - (2) Fix a clamp.
 - (3) Set the IG switch to "ACC" or "ON" position.



- (4) Slide the protrusion of the steering column bracket fully toward the front side of the vehicle and hold it there. Fit 2 tabs and attach the shift lock release cable assembly to the steering column bracket.

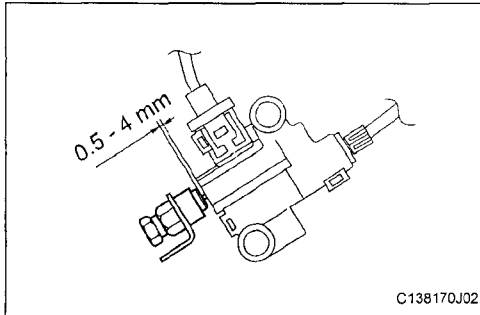


- (5) Attach the end of the shift lock release cable assembly to the shift lock cam of the transmission floor shift assembly.
- (6) Attach the casing cap (floor shift side) of the shift lock release cable assembly to the notch portion of the cable bracket of the transmission floor shift assembly.

2. Instrument panel finish panel LWR installation (See page 27-19)
3. Console box carpet installation (See page 26-141)
4. Console box assembly installation (See page 26-141)
5. Rear console box installation (See page 26-142)

6. Battery minus terminal connection
Specified value: $T=6.4\text{N}\cdot\text{m}$ {65kgf*cm}

ADJUSTMENT

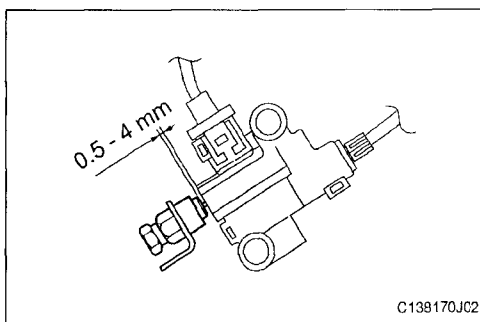


1. Shift lock release cable assembly adjustment
 - (1) Loosen the nut and make adjustments so that the protrusion of the lock mechanism is 0.5 to 4 mm when the brake pedal is not stepped on, and fix it with a nut.
Reference: 0.5 to 4 mm (protrusion of lock mechanism)
<CAUTION>
Exercise care that the height of the brake pedal does not change because the adjust nut is tightened too much.

ON-VEHICLE INSPECTION

1. Shift lock release cable assembly function check
 - (1) Check if the cable is unnaturally bent.
 - (2) Move the ignition switch to ACC and check if the shift lever can be moved when the brake pedal is stepped on.
 - (3) Move the ignition switch to ACC and check if the shift lever can not be moved to a position other than the P position while the brake pedal is released.
 - (4) Move the ignition switch to LOCK and check if the shift lever can not be moved to a position other than the P position when the brake pedal is stepped on.
 - (5) Check if the ignition switch can not be returned to the LOCK position when the shift lever is moved to a position other than the P position.
2. Shift lock release cable assembly check
 - (1) Move the ignition switch to ACC and the shift lever to the P position.

26



- (2) Check if the protrusion of the lock mechanism is in a range of 0.5 to 4 mm while the brake pedal is not stepped on.
Reference: 0.5 to 4 mm (protrusion of lock mechanism)
<CAUTION>
Exercise care that the height of the brake pedal does not change because the adjust nut is tightened too much.