

F3 AUTOMATIC TRANSMISSION/AUTOMATIC TRANSAXLE

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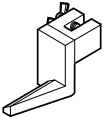
■ A4B

1 AUTOMATIC TRANSAXLE

1-1 BASIC CHECK AND ADJUSTMENT

1-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09302-87201-000	Gauge,neutral start switch adjust

Instrument

Torque wrench

1-1-2 PREPARATION PRIOR TO CHECKS

- 1.Park the vehicle on a flat space.
- 2.Confirm safety before and after the vehicle.

1-1-3 CHECK OF OIL LEVEL

(1) Check of oil level

- 1.Check of engine idling speed.
 - (1) Vehicle mounted with Type 1KR-FE engine
Refer to Page B1-9.

- (2) Vehicle mounted with Type K3-VE engine
Refer to Page B1-25.

- 2.Warm up the transmission until its oil temperature reaches to a fully warmed-up state (70 - 90°C).
- 3.Apply the parking brake.
- 4.Depress the brake pedal. With the engine idling, move the shift lever slowly through all ranges. Finally, return the lever to the **P** range.
- 5.With the engine idling, pull out the level gauge. Wipe out oil, using cloth, and blow air to remove lint. Then, insert the level gauge again to check whether the oil level is within the range of "H" of the level gauge.

NOTE

- In cases where it is necessary to conduct the check using a low oil temperature (20 - 30°C), for example, at time of oil change, first adjust up to the "C" range on the level gauge. Then, carry out the check in a fully warmed-up state.
If the level differs between the front and rear sides of the level gauge, use the side having the lower level.

LUBRICANT: ATF Dexron®III

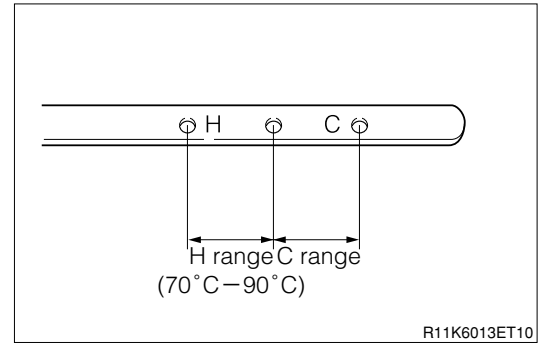
NOTE

- Total capacity: Approx. 5.0ℓ
Drain amount from oil pan: Approx. 2.2ℓ

TIGHTENING TORQUE: 24.5±4.9N·m {250±50kgf·cm}
(drain bolt)

CAUTION

- Never reuse the removed gasket.
- If the oil level is too low or too high, it could cause malfunctions."



(2) Check of oil leakage

1. Visually check the oil cooler, unions, transaxle main body, etc. to ensure that they exhibit no oil leakage.

1-1-4 CHECK OF SHIFT LEVER POSITION

1. Check the shift lock operation.
Refer to Page F3-36.

2. Shift the shift lever to each range. Here, check that the shift lever functions as indicated in the right figure and the shift lever moves freely to each range with a clear detent feeling.

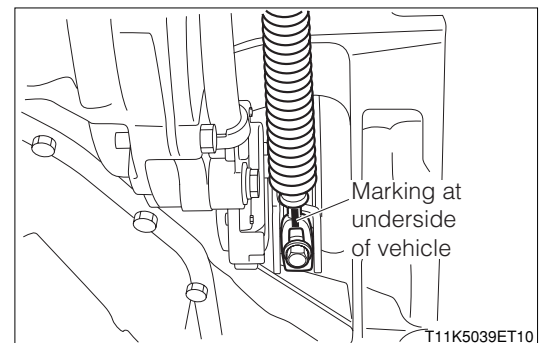
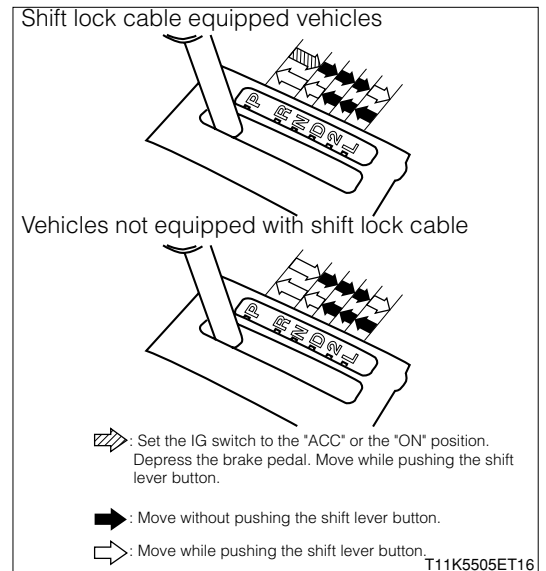
Furthermore, the LCD indication can be made accurately in each range. Check that the LCD range indication will not differ within the play of the shift lever. Also, check that there is no lighting of the frame only nor flashing.

3. Start the engine. Ensure that the vehicle moves forward when you move the shift lever to the **D**, **2** and **L** ranges, respectively. Make sure that the vehicle moves backward when you move the shift lever to the **R** range.

4. Turn ON the IG switch. When the shift is made up to **R**, check that the back-up lamp lights and the reverse warning buzzer is set off.

1-1-5 CHECK AND ADJUSTMENT OF CONTROL CABLE

1. Check the connecting section of the control cable and control shaft lever assembly for wear. Also, check other connecting sections for wear and deformation.
2. Put an up/bottom identification mark. Remove the retaining bolts of the control cable and control shaft lever Ay.



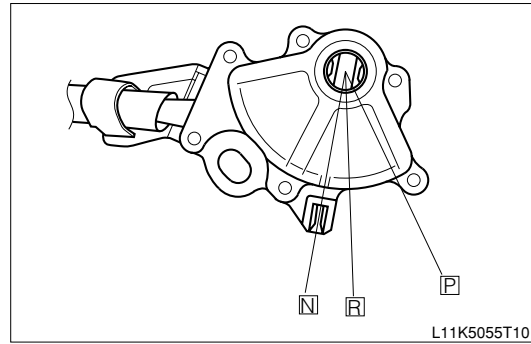
3. Turn the control shaft lever assembly counterclockwise, until it stops (P range). From this condition, back off the control shaft lever assembly 2 stages (N range).
4. Set the shift lever to the N range.
5. Install the control cable, with the slack taken up, to the transmission control shaft lever Ay.

TIGHTENING TORQUE: $8.4 \pm 1.4 \text{ N} \cdot \text{m}$ { $85 \pm 14 \text{ kgf} \cdot \text{cm}$ }

CAUTION

- Do not pull the end of the cable during installation.

6. After completion of the adjustment, check the operating feeling and operation.



1-1-6 CHECK AND ADJUSTMENT OF NEUTRAL START SWITCH

(1) Check of neutral start switch operation

1. Apply the parking brake and turn ON the ignition switch.
2. Depress the brake pedal and ensure that the engine starts only when the shift lever is shifted to the N or P range and should not start in any other range.
3. Ensure that the backup lamp goes on and the reverse warning buzzer is set off only when the shift lever is placed in the R range.
4. If there is a problem, perform the installation position check, adjustment, and continuity check for the neutral start switch.

(2) Check and adjustment of neutral start switch installation position

1. Set the shift lever to the N range.
2. Remove the bolts retaining the control cable to the control shaft lever assembly.
3. Remove the control shaft lever assembly.
4. Install the SST. Ensure that the gauge section of the SST is aligned with the line of the neutral start switch.
5. If not aligned, loosen the bolt and turn the switch section until an alignment is attained. After the adjustment, tighten the bolt to the specified torque.

TIGHTENING TORQUE: $18.2 \pm 3.4 \text{ N} \cdot \text{m}$
{ $185 \pm 35 \text{ kgf} \cdot \text{cm}$ }

CAUTION

- Do not use an impact wrench for tightening the securing bolt of the neutral start switch.

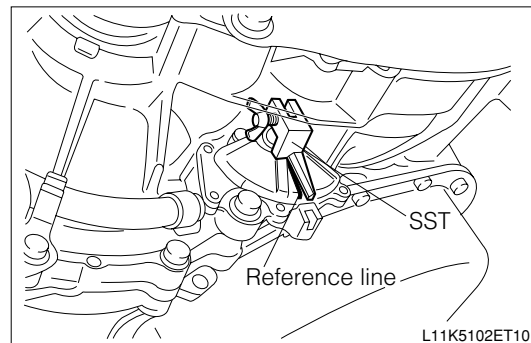
SST: 09302-87201-000

6. Remove the SST and install the control shaft lever assembly.

TIGHTENING TORQUE: $12.8 \pm 2.9 \text{ N} \cdot \text{m}$
{ $130 \pm 30 \text{ kgf} \cdot \text{cm}$ }

7. In cases where the operation in Step 5 has been carried out, confirm the operation of the control shaft lever, following the procedure given below.

- (1) Move the control shaft lever to the P range. Then, move the lever about 2 to 3 mm in the direction of the R range by hand. At this time, ensure that the lever returns to the P range fully.
- (2) If the full return can not be made, once loosen the retaining bolt of the neutral start switch and perform the adjustment and retighten again.



8. Install the control cable, with the slack taken up, to the transmission control shaft lever Ay.
 TIGHTENING TORQUE: $8.4 \pm 1.4 \text{ N} \cdot \text{m}$ { $85 \pm 14 \text{ kgf} \cdot \text{cm}$ }

CAUTION

- When installing, do not pull the tip-end of the control cable.

9. After the installation, check the position of the shift lever.
 Refer to Page F3-2.

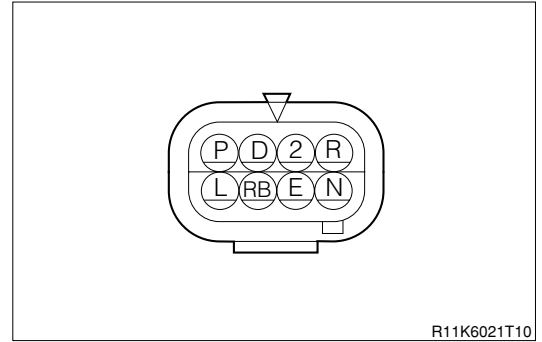
(3) Continuity check of neutral start switch

1. Disconnect the connector from the neutral start switch.
 Then, perform the continuity check according to the connection table.

○—○: Continuity should exist

Shift position	Terminal No.	E	R	RB	P	N	D	2	L
P		○			○				
R			○	○					
N		○				○			
D		○					○		
2		○						○	
L		○							○

R11K6110EL10



1-2 FUNCTION CHECK

1-2-1 ITEMS TO BE OBSERVED

1. Each test should be conducted after performing the basic inspection and adjustments.
2. The fluid should be at the normal running temperature. (70 - 90°C)
3. Be sure to turn OFF the air conditioner .

1-2-2 STALL TEST

1. Place chocks at the four wheels.
2. Install an engine tachometer and fully apply the parking brake.
3. Start the engine.
4. While depressing the brake pedal strongly by your left foot, move the shift lever from the **D** . Depress the accelerator pedal fully by your right foot. Quickly read the highest engine rpm at this time. Perform the same test in the **R** range.

CAUTION

- Do not conduct this test continuously for more than five seconds.
- Wait at least one minute before the switching is made from the **D** range to the **R** range.

SPECIFIED VALUE: Engine type K3-VE
Stall speed (rpm) 1900 - 2400

NOTE

- If the stall speed fails to conform to the specified value, most likely the following malfunctions are taking place.

If the stall speed is the same for both ranges (D , R) but lower than the specified value	<ul style="list-style-type: none"> · Lack of engine output · One-way clutch (At the stator section inside the torque converter) malfunctioning
If the stall speed is the same for both ranges (D , R) but higher than the specified value	<ul style="list-style-type: none"> · Lack of transmission fluid · Low line pressure · Slippage of forward clutch, direct clutch, one-way clutch and 1st & reverse brakes, or faulty operation of one-way clutch
If the stall speed at the D range is higher than the specified value.	<ul style="list-style-type: none"> · Low line pressure · Forward clutch slipping, one-way clutch malfunctioning
If the stall speed in the R range is higher than the specified value.	<ul style="list-style-type: none"> · Line pressure too low · Direct clutch slipping · First & reverse brake slipping

1-2-3 TIME LAG TEST

1. Apply the parking brake and place chocks at the four wheels.
2. Start the engine.
3. While depressing the brake pedal, move the shift lever from the **(N)** to the **(D)** range. Using a stopwatch, measure the time required from the lever shifting to the time when you feel a shock. In the same manner, measure the time lag when shifting is made from the **(N)** to **(R)** range.

CAUTION

- Be sure to allow one minute intervals between tests.
- Conduct the measurement three times and take the average value.

SPECIFIED VALUE: **(N)→(D)**: Not to exceed 1.0 second
(N)→(R): Not to exceed 1.0 second

NOTE

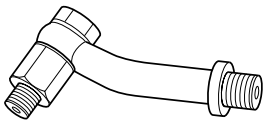
- If the time lag fails to conform to the specified value, most likely the following malfunctions are taking place.

If the (N)→(D) time lag is longer than the specified value.	· Slippage of forward clutch · Low line pressure
If the (N)→(R) time lag is longer than the specified value.	· Slippage of direct clutch · Slippage of 1st & reverse brakes · Low line pressure

1-2-4 HYDRAULIC TEST

(1) Articles to be prepared

SST

Shape	Part No.	Part name
	09325-87201-000	Adapter, A/T pressure gauge No. 1

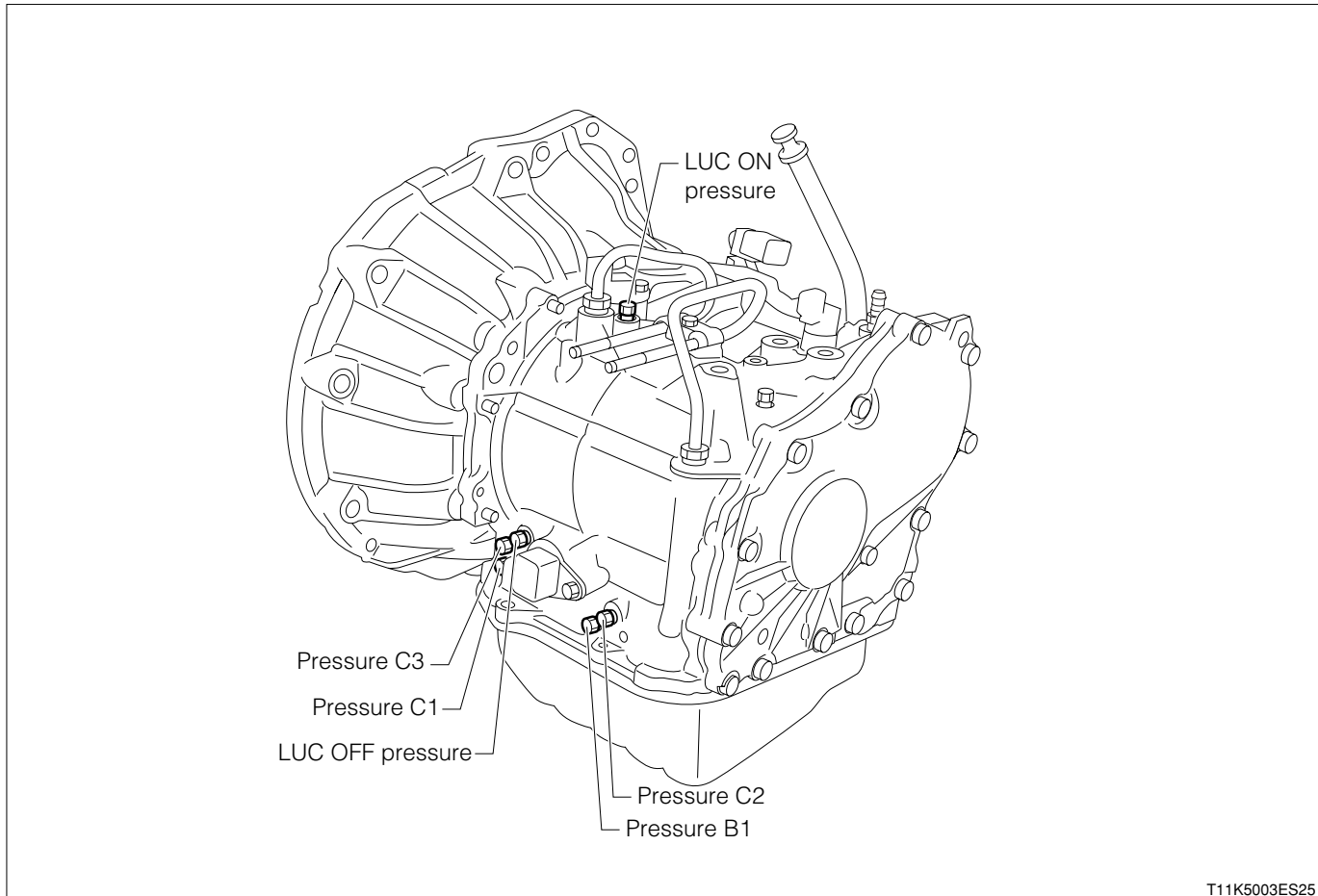
Instrument

Oil pressure gauge

Lubricant, adhesive, others

ATF Dexron®III

(2) Position of the hydraulic pressure test plug



T11K5003ES25

(3) Pressure gauge installation procedure

CAUTION

- Be sure to use new gasket for the SST and instrument.
- The test plug is a non-reusable part.

1. Remove the battery and battery carrier.

Refer to Page J5-3.

2. Remove the test plug and install the Pressure gauge.

SST: 09325-87201-000

3. Install the battery and battery carrier.

Refer to Page J5-3.

4. After completing the hydraulic test, remove the pressure gauge and replace the test plug.

TIGHTENING TORQUE: $9.8 \pm 2.9 \text{ N} \cdot \text{m}$ { $100 \pm 30 \text{ kgf} \cdot \text{cm}$ }

5. The ABS memorizes diagnosis codes. Therefore, first confirm the code output and ensure that there exist only abnormality codes related to the rear wheel system. Then, erase the diagnosis codes.

(1) ABS-equipped vehicles

Refer to Page E3-19.

(4) Hydraulic pressure measuring procedure

① **Pressure C2**

1. Apply the parking brake and place chocks at the four wheels.
2. Start the engine.
3. Strongly depress the brake pedal with your left foot. Move the shift lever to the **D** range, operate the accelerator pedal with your right foot so as to measure the hydraulic pressure.

② **Pressure C1**

1. Apply the parking brake and place chocks at the four wheels.
2. Start the engine.
3. Strongly depress the brake pedal with your left foot. Move the shift lever to the **R** range and operate the accelerator pedal with your right foot so as to measure each hydraulic pressure.

③ **Pressure B1**

1. Jack up the four wheels. Support the vehicle with rigid racks.
2. Start the engine.
3. Move the shift lever to the **D** range and gradually depress the accelerator pedal until the transmission may be shifted to the 2nd gear. Measure the hydraulic pressure with the engine speed set to 2000 rpm.

④ **Pressure C3**

1. Jack up the four wheels. Support the vehicle with rigid racks.
2. Start the engine.
3. Move the shift lever to the **D** range and gradually depress the accelerator pedal until the transmission may be shifted to the 3rd gear. When the accelerator pedal is released, measure the hydraulic pressure.

⑤ **LUC OFF pressure**

1. Jack up the four wheels. Support the vehicle with rigid racks.
2. Start the engine.
3. Move the shift lever to the **D** range and measure the hydraulic pressure. (Hydraulic pressure at the time of lock-up OFF)
4. Gradually depress the accelerator pedal until the transmission may be shifted to the 4th gear. Then, continue gradual acceleration. When the lock up takes place, measure the hydraulic pressure. (Hydraulic pressure at the time of lock-up ON)

NOTE

- Under conditions of a vehicle speed of 57 to 78 km/h and a throttle opening of 5 to 20 %, the 4th lock-up turns ON.

SPECIFIED VALUE:

Detected item	Condition		Specified value{kPa{kg/cm ² }
	Range	Running condition	
C2	D	Stall revolving condition	930 - 1130{9.4 - 11.4}
C1	R	Stall revolving condition	1520 - 2110{15.5 - 21.5}
C3	D	3rd gear, accelerator pedal "OFF" (at the time of lock-up OFF)	440 - 640{4.5 - 6.5}
B1	D	2nd gear · Engine speed 2000rpm	930 - 1130{9.4 - 11.4}
LUC OFF pressure	D	At the time of lock-up OFF	590 - 750{6.0 - 7.6}
		At the time of lock-up ON	20{0.2} or less



1-2-5 ROAD TEST

(1) Items to be observed






CAUTION

- Thoroughly confirm the safety on the road during the tests.
- The fluid should be at the normal running temperature. (70 - 90°C)




(2) range test

1. Start off the vehicle, using the  range. Check to see if the upshift or downshift takes place as follows. 1st⇌2nd, 2nd⇌3rd, 3rd⇌4th(O/D). Furthermore, the gear shift points of 1st⇌2nd and 2nd⇌3rd meet the requirements. Also, ensure that there are no abnormal shocks, slippage, etc.
2. Perform kickdown operations while the vehicle is running in the 4th(O/D), 3rd and 2nd gears using the  range. Check to see if the kickdown takes place as follows. 4th(O/D)→3rd, 3rd→2nd, 2nd→1st gears. Furthermore, the kickdown possible vehicle speed limits for 3rd→2nd and 2nd→1st gears meet the requirements. Also, ensure that there are no abnormal shocks, slippage, etc.
3. While the vehicle is running in the 4th (O/D) gear, turn OFF the O/D switch. Ensure that the gear downshift takes place from the 4th (O/D) to the 3rd gear.

(3) range test

1. Start off the vehicle, using the  range. Check to see if the upshift or downshift takes place between 1st⇌2nd gears. Furthermore, the gear shift point meets the requirements. Also, ensure that there are no abnormal shocks, slippage, etc.
2. Start off the vehicle in the  range. Check that the upshift takes place from 1st→2nd gear, but, no upshift to the 3rd gear takes place.
3. While the vehicle is running in the  range / 2nd gear, perform the kickdown operation. Check that the kickdown takes place from the 2nd→1st gear. Furthermore, the kickdown possible vehicle speed limit meets the requirement. Also, ensure that there are no abnormal shocks, slippage, etc.
4. While the vehicle is running in the  range / 3rd gear, perform a downshift to the  range. Check that a downshift takes place from the 3rd to 2nd gear and engine braking is applied. Furthermore, ensure that the shift point meets the requirement.

(4) range test

1. Start off the vehicle in the  range. Check that no upshift to the 2nd gear takes place.
2. While the vehicle is running in the  range / 3rd gear, perform a downshift to  range. Check that downshifts of 3rd→2nd→1st gear take place and the engine braking is applied. Furthermore, ensure that the shift point meets the requirement.

(5) Lock-up test

1. While the vehicle is running in the 3rd gear, gradually accelerate the vehicle. Check that the lock-up is turned ON. Ensure that the vehicle speed at which the engine speed starts to drop meets the specified lock-up ON timing. Furthermore, check that the engine speed will not change significantly when the accelerator pedal is depressed lightly.
2. Conduct the same check in the 4th gear.

(6) P range test

1. Stop the vehicle on an upgrade (Approx. 5 degrees or more). Shift the shift lever to the P range and release the parking brake lever. At this time, check that the parking lock mechanism functions and the vehicle will not move.
2. In cases where the vehicle is stopped on a downgrade, perform the check, following the same procedure.
3. Under the condition above, shift the shift lever from the P range to other range. At this time, check that the vehicle moves.

SPECIFIED VALUE:

Gear shifting vehicle speed (Type K3-VE engine-mounted vehicle)

Throttle opening degree	Range	Gear shifting	Vehicle speed (km/h)
100%	D	1st→2nd	51 - 66
		2nd→3rd	93 - 108
		3rd→4th	159 - 174
		4th→3rd	150 - 165
		3rd→2nd	83 - 98
		2nd→1st	37 - 52
0%	D	1st→2nd	13 - 28
		2nd→3rd	25 - 40
		3rd→4th	38 - 53
		4th→3rd	22 - 37
		3rd→2nd	8 - 23
		2nd→1st	8 - 23
0 - 100%	D→2·L	4th→3rd	159 - 174
		3rd→2nd	93 - 108
		2nd→1st	51 - 66

· The gear shifting vehicle speed for the 1st→2nd gear in the 2 range and in the throttle opening of 100%·0% is the same as with the D range.

SPECIFIED VALUE:

Lock-up vehicle speed (Type K3-VE engine-mounted vehicle)

Throttle opening degree	Gear position	Lock up	Vehicle speed (km/h)
5 - 20%	3rd	ON	82 - 97
	4th	ON	58 - 76
	3rd	OFF	40 - 55
	4th	OFF	52 - 67

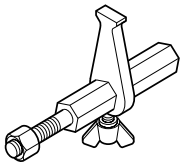
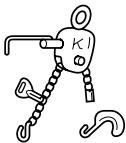
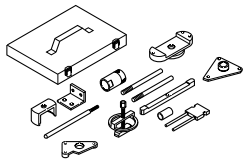
NOTE: Be sure to gradually depress the accelerator pedal.

2 AUTOMATIC TRANSAXLE AY

2-1 REMOVAL AND INSTALLATION

2-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09210-87701-000	Holder, fly wheel
	09090-04020-000 (09090-04010-000)	Device, engine sling
	09350-87202-000	Tool set, automatic transmission

Tool

Low transmission jack

Instrument

Torque wrench, Dial gauge

Lubricant, adhesive, others

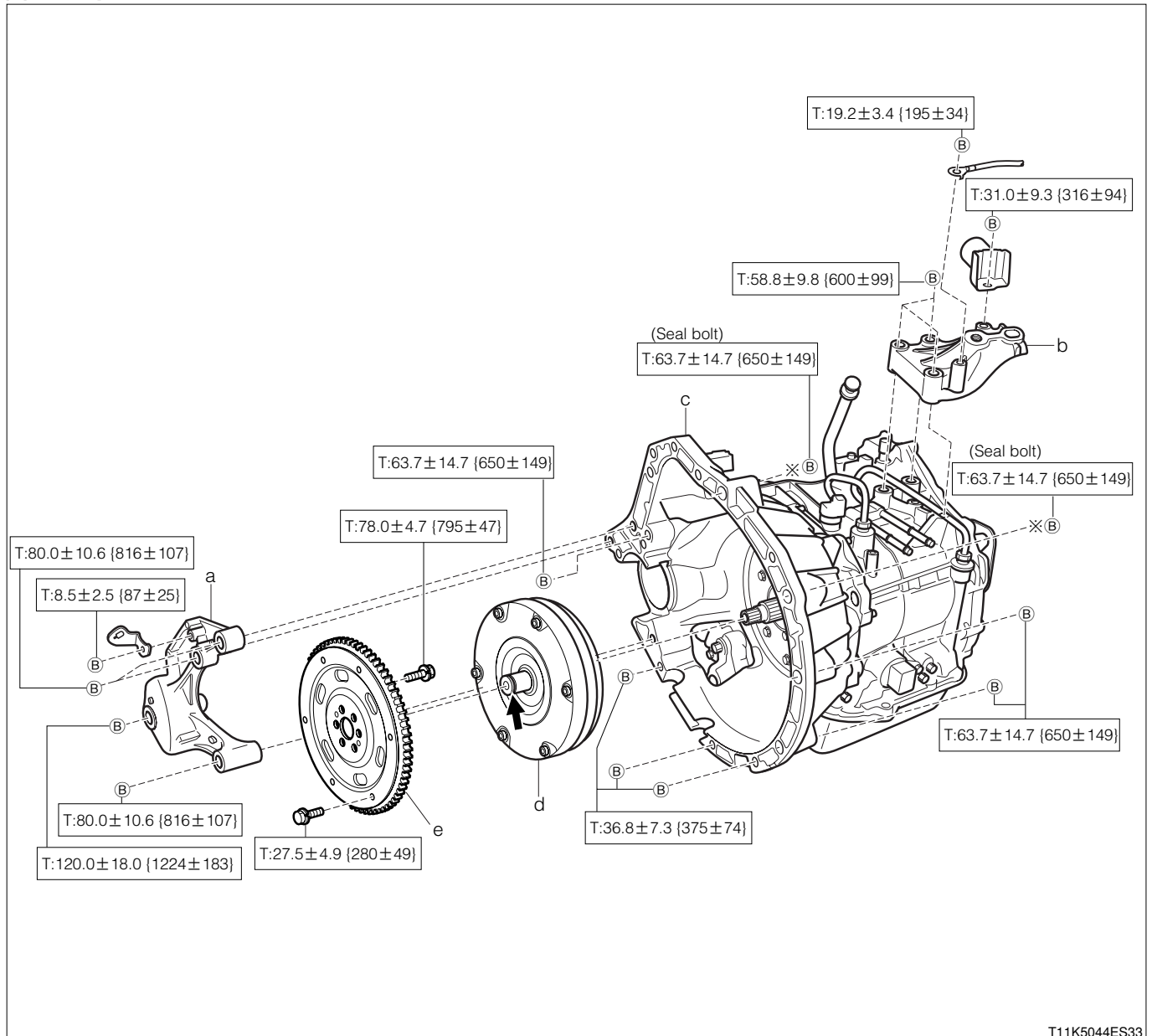
ATF Dexron®III, MP grease, Engine hanger No.1 (Replacement parts), Engine hanger No.2 (Replacement parts)

2-1-2 OPERATION BEFORE REMOVAL

1. Remove the battery and battery carrier.
Refer to Page J5-3.
2. Drain the automatic transaxle fluid.
3. Remove the pipe exhaust.
Refer to Page B4-3.
4. Remove the Oil cooler hose.
Refer to Page E3-20.
5. Remove the drive shaft.
Refer to Page D2-8.
6. Disconnect the control cable at the transaxle side.
Refer to Page F3-33.
7. Remove the starter.
Refer to Page B11-2.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11K5044ES33

※: Non-reusable parts

➔: MP grease

Unit: N·m{kgf·cm}

(2) Removal and installation procedures

- ▼ ▲ 1 a Bracket, engine mounting, rear
- ▼ ▲ 2 b Bracket, engine mounting, LH
- ▼ ▲ 3 c Transaxle Ay, automatic
- ▲ 4 d Converter Ay, torque
- ▼ ▲ 5 e Plate, pump impeller drive

F3-13

2-1-4 POINTS OF REMOVAL

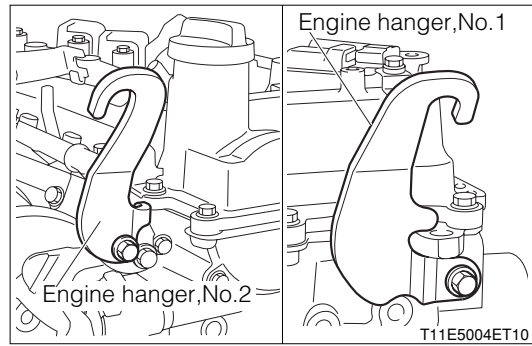
(1) Bracket, engine mounting, rear

1. Install the engine hanger at a point in the figure.

(1) Type K3-VE engine-mounted vehicles

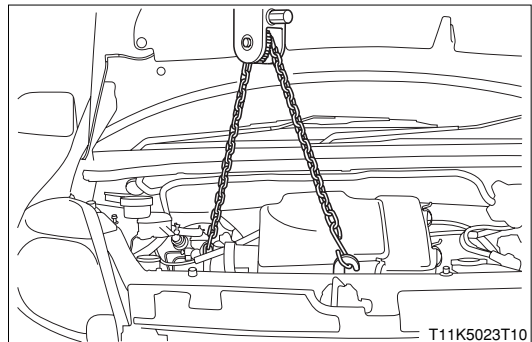
NOTE

- Part number of engine hanger No.1:12281-97401-000
- Part number of engine hanger No.2:12282-97403-000



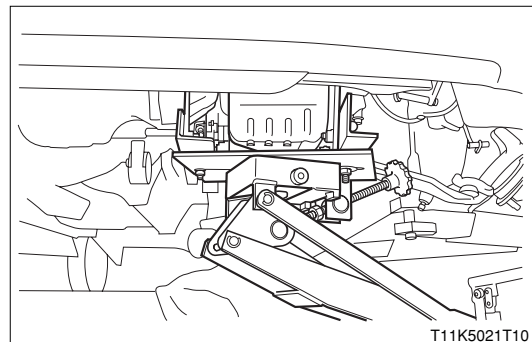
2. Suspend the engine Ay with a chain block and engine sling device.

SST: 09090-04020-000



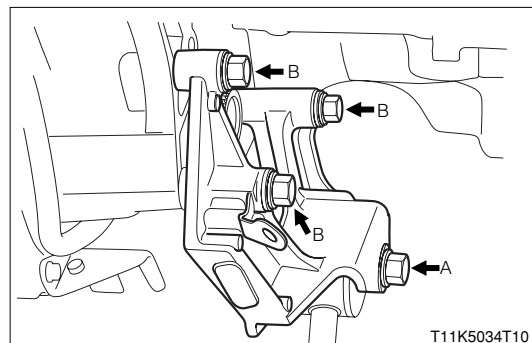
3. Support the transaxle Ay, using a low transmission jack.

TOOL: Low transmission jack



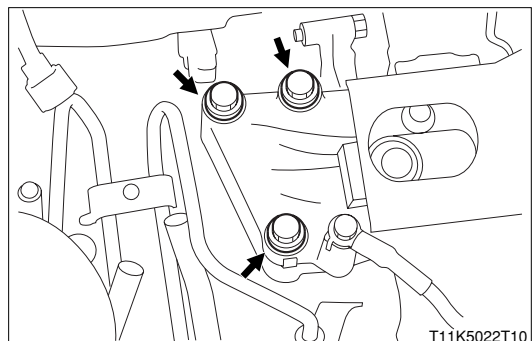
4. Remove the connecting bolt (A) that connects the engine mounting control rod S/A with the bracket.

5. Remove the retaining bolt (B) of the bracket.



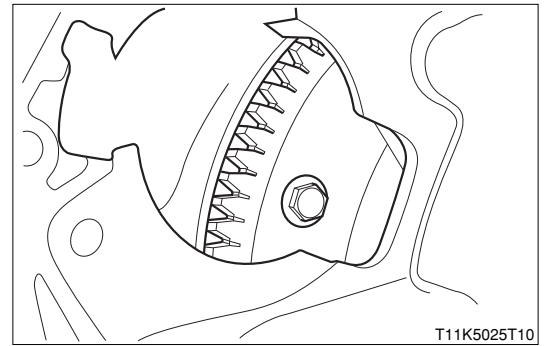
(2) Bracket, engine mounting, LH

1. Remove the retaining bolt of the bracket.

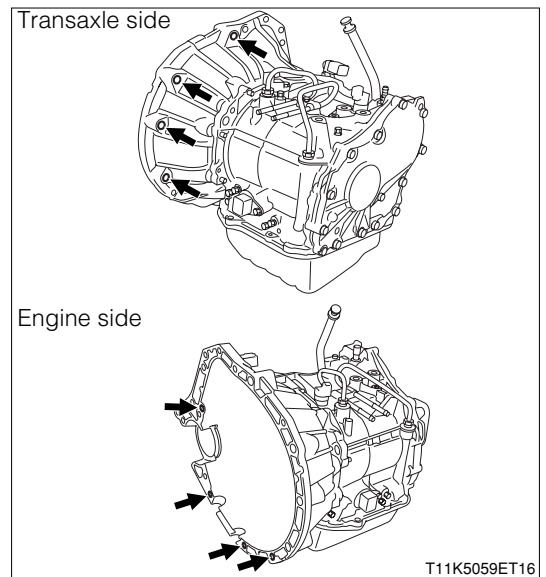


(3) Transaxle Ay, automatic

1. Through the starter Ay retaining hole, remove the bolt (Plate, pump impeller drive × converter Ay, torque).



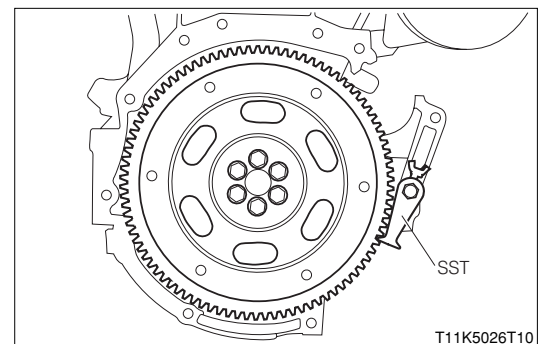
2. Remove the connecting bolts that connect the transaxle Ay with the engine Ay so as to separate the transaxle Ay from the engine Ay.



(4) Plate, pump impeller drive

1. While preventing rotation, using the SST, remove the drive plate.

SST: 09210-87701-000



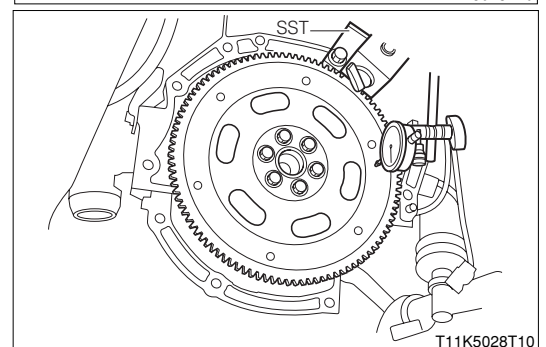
2-1-5 INSPECTION

1. Using the SST and instruments, check the runout of the drive plate.

SST: 09351-87210-000 [09351-87210-000]

SPECIFIED VALUE: 0.25mm

2. Install the torque converter Ay to the drive plate.

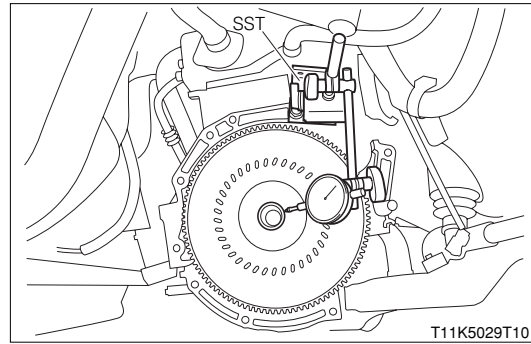


F3-15

3. Using the SST and instruments, check the runout of the shaft.

SST: 09351-87210-000 [09351-87210-000]

SPECIFIED VALUE: 0.30mm

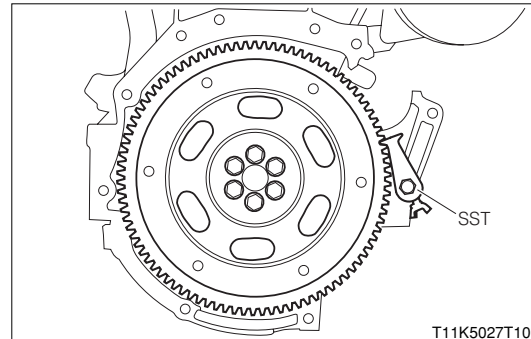


2-1-6 POINTS OF INSTALLATION

(1) Plate, pump impeller drive

1. While preventing rotation, using the SST, install the drive plate.

SST: 09210-87701-000



(2) Converter Ay, torque

1. Install the torque converter.

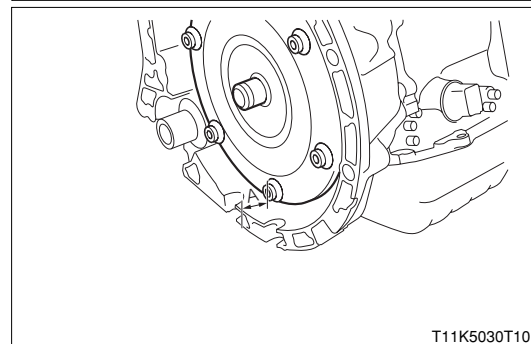
(1) Insert the torque converter into the transaxle assembly while turning it. Ensure that the torque converter is inserted positively.

SPECIFIED VALUE: Dimension A at least 16.5 mm

(The dimension A is a distance from the edge surface of the housing to the drive plate attaching surface of the torque converter.)

(2) Apply MP grease to the tip end of the torque converter.

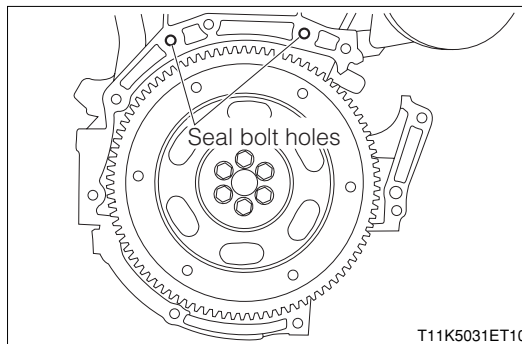
LUBRICANT: MP grease



(3) Transaxle Ay, automatic

1. Connect the transaxle Ay to the engine Ay.

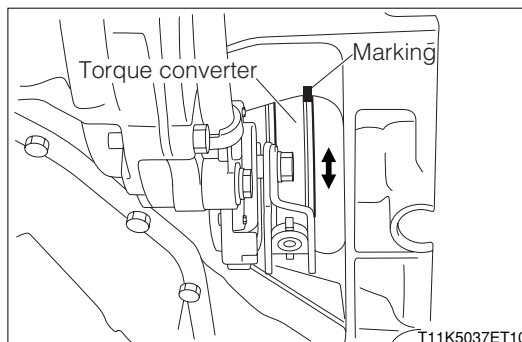
(1) Clean the seal bolt holes of the engine block.



(2) Mark the edge position of the torque converter on the transaxle case. While confirming that the position is not deviated, connect the transaxle assembly to the engine block.

NOTE

- If the position is out of place, remove the transaxle and recheck how far the torque converter should be inserted.



2. While ensuring that the torque converter Ay turns lightly, tighten the connecting bolts of the transaxle Ay and engine Ay.

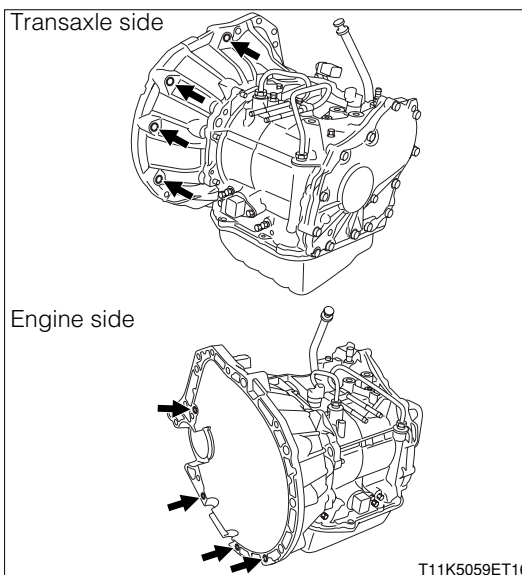
NOTE

- If the torque converter does not turn easily, the torque converter is not in the specified position, so remove the transaxle Ay and check how far the torque converter should be inserted.

If the connection bolts are tightened when the torque converter is not in the correct position, the oil pump could be damaged.

CAUTION

- If the connecting bolts are tightened with the torque converter Ay deviated from the specified position, there is the possibility that the starter shaft & oil pump Ay may be damaged.

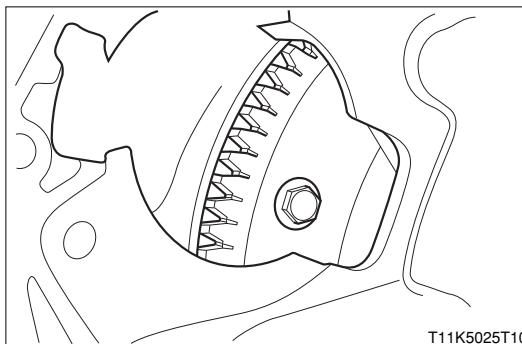


3. Through the starter Ay retaining hole, tighten the bolt (Plate, pump impeller drive × converter Ay, torque).

(1) Tighten first the reference bolt (Silver color) of the pump impeller drive plate.

CAUTION

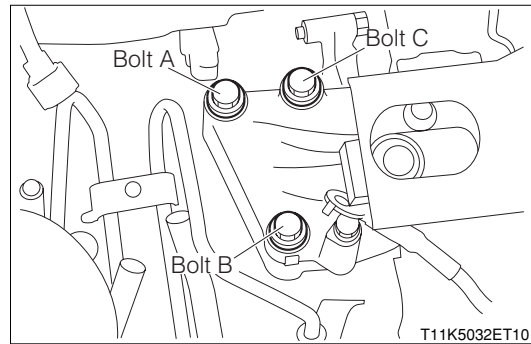
- Never use bolts other than the specified bolts. (If bolts other than the specified bolts are used, it will cause poor tightening or deform the converter inner shape, resulting in curtailed performance.)



F3-17

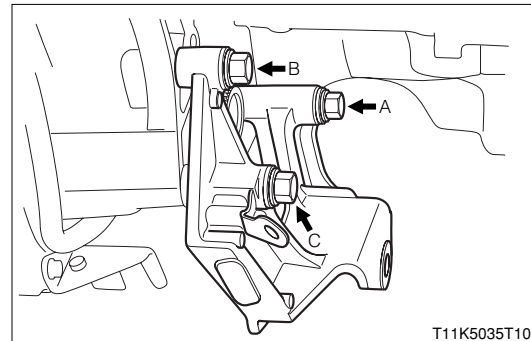
(4) Bracket, engine mounting, LH

1. Temporarily tighten the bracket, using the bolt C indicated in the right figure.
2. Securely tighten the bolts A, B and C in this order.



(5) Bracket, engine mounting, rear

1. Temporarily install the bracket on the automatic transaxle Ay by tightening the bolts (B) and (A) in this order as shown in the right figure.
2. Securely tighten the bolts (B), (C) and A in this order.
3. Install the connecting bolt that connects the engine mounting control rod S/A with the bracket.



2-1-7 OPERATION AFTER INSTALLATION

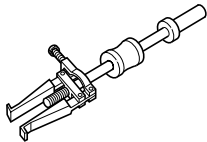
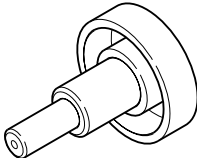
1. Install the starter.
Refer to Page B11-2.
2. Install the transmission control cable Ay at the transaxle side.
Refer to Page F3-33.
3. Install the drive shaft.
Refer to Page D2-8.
4. Install the Oil cooler hose.
Refer to Page F3-20.
5. Install the pipe exhaust.
Refer to Page B4-3.
6. Install the battery and battery carrier.
Refer to Page J5-3.
7. Fill automatic transaxle fluid.
Refer to Page F3-1.
8. Carry out the basic check and adjustments.
Refer to Page F3-1.
9. When the automatic transaxle Ay has been replaced, erase the learning values of the A/T ECU (Transmission control computer).
Refer to Page F5-17.

3 DIFFERENTIAL SIDE OIL SEAL

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09308-00010-000	Puller,oil seal
	09518-87709-000	Replacer,oil seal No.8

Lubricant,adhesive,others

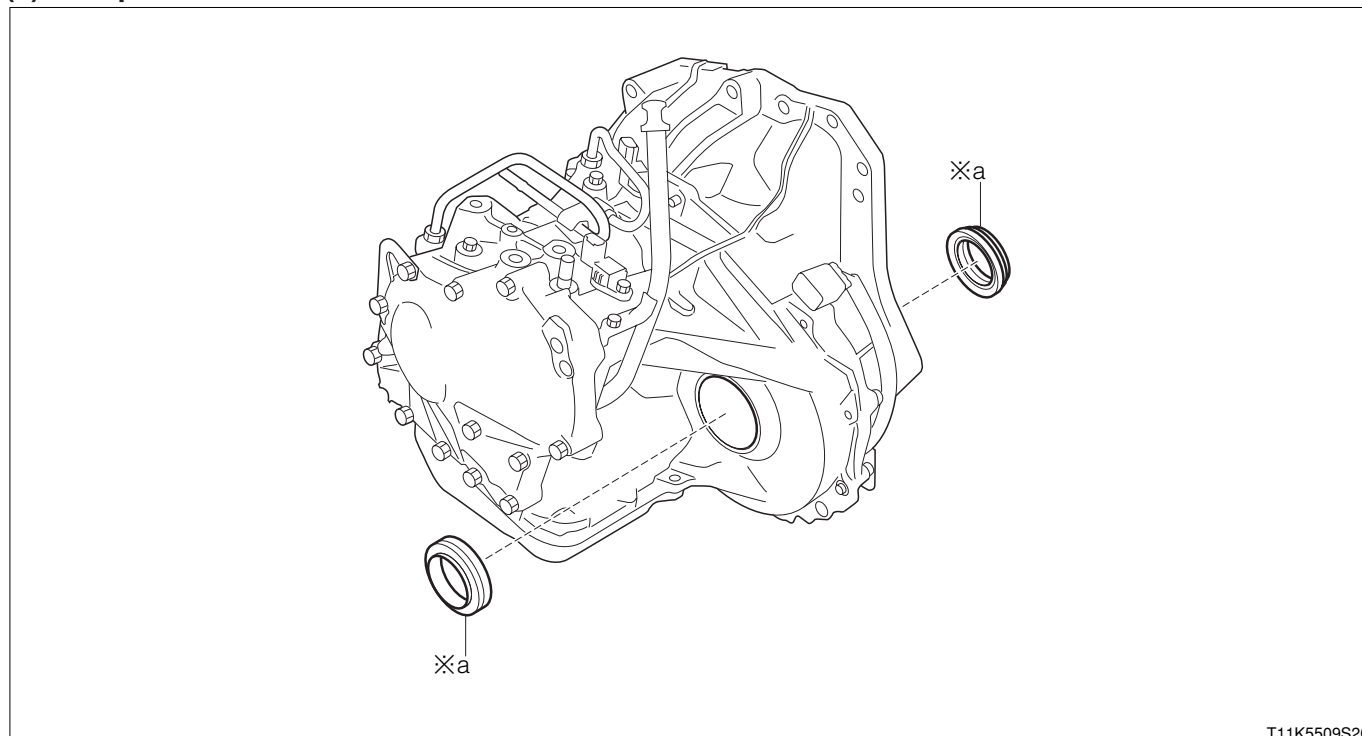
ATF Dexron®III

3-1-2 OPERATION BEFORE REMOVAL

- 1.Remove the drive shaft.
Refer to Page D2-8.

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11K5509S20

※:Non - reusable parts

(2) Removal and installation procedures

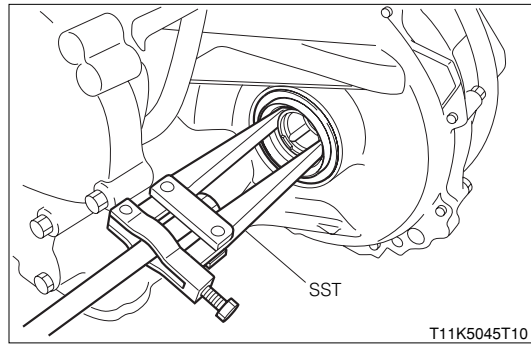
- ▼ ▲ 1 a Seal, type T oil

F3-19

3-1-4 POINTS OF REMOVAL

(1) Seal, type T oil

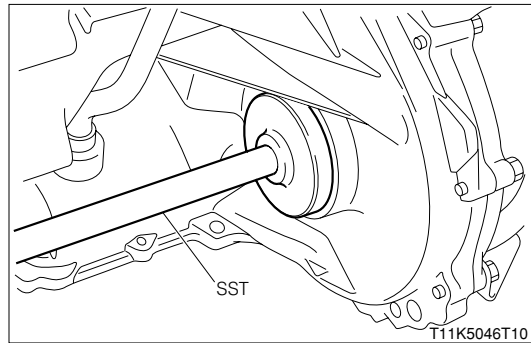
1. Remove the seal, using the SST.
- SST: 09308-00010-000



3-1-5 POINTS OF INSTALLATION

(1) Seal, type T oil

1. Drive the seal into place, using the SST.
- SST: 09518-87709-000



3-1-6 OPERATION AFTER INSTALLATION

1. Install the drive shaft.
- Refer to Page D2-8.

4 OIL COOLER HOSE

4-1 REMOVAL AND INSTALLATION

4-1-1 ARTICLES TO BE PREPARED

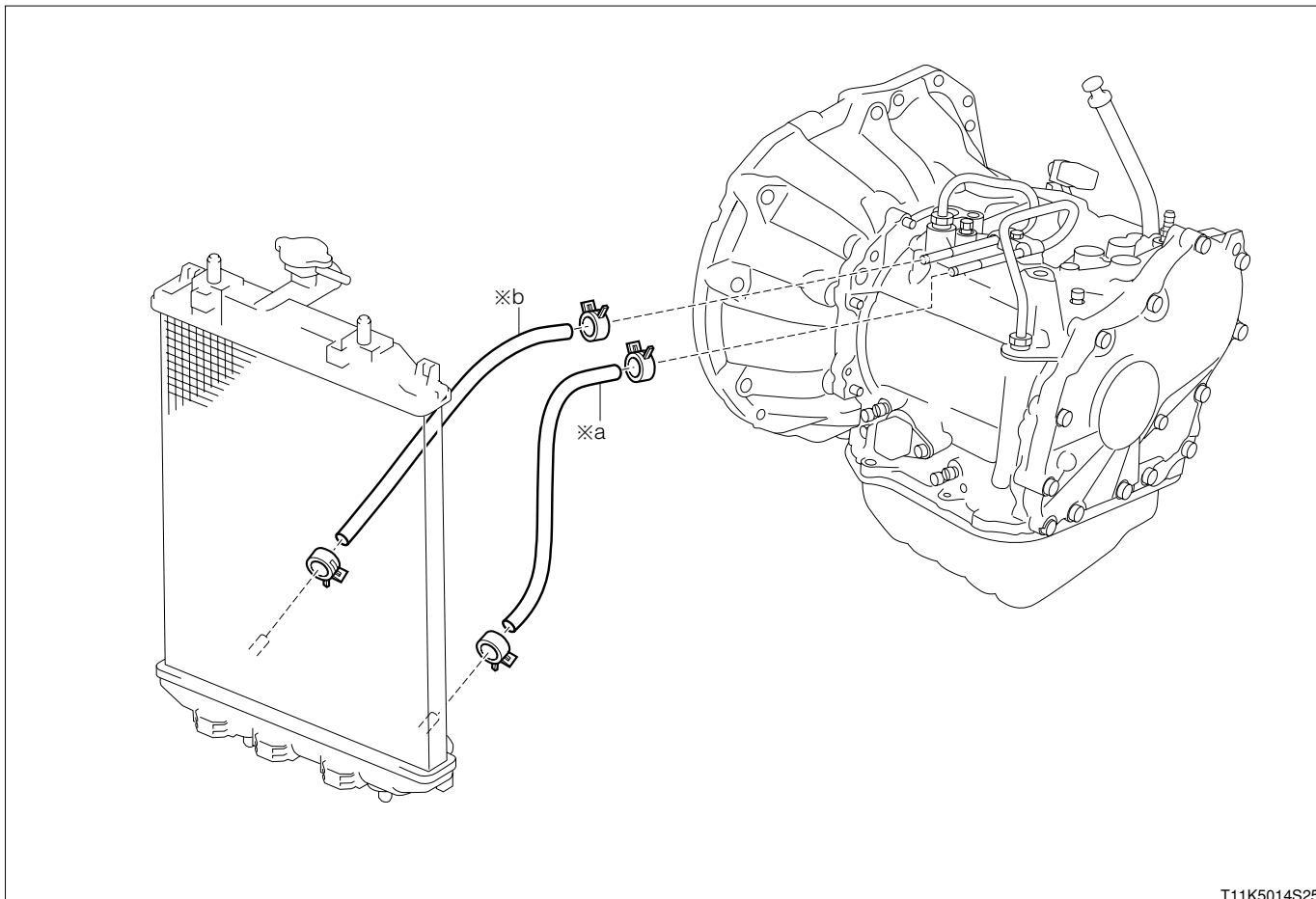
4-1-2 OPERATION BEFORE REMOVAL

1.Remove the battery and battery carrier.

Refer to Page J5-3.

4-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11K5014S25

※:Non - reusable parts

(2) Removal and installation procedures

- ▲ 1 a Hose, oil cooler inlet
- ▲ 2 b Hose, oil cooler outlet

4-1-4 POINTS OF INSTALLATION

(1) Hose, oil cooler inlet / Hose, oil cooler outlet

1.Clean the oil cooler union at the radiator side and the tube at the transaxle side, using white gasoline.

F3-21

2. Install the inlet hose and outlet hose at the radiator side.

- (1) With the marking at the hose facing toward the lower side of the vehicle, insert the hose up to the second spool of the union at the radiator side.
- (2) Install the clip with the protrusion of the clip facing toward the lower side of the vehicle and aligning with the marking position.

CAUTION

- Care must be exercised so that the hose may not be overlapped on the second spool.

3. Install the inlet hose and outlet hose at the transaxle side.

- (1) With the marking at the hose facing toward the upper side of the vehicle, insert the hose up to the second spool of the union at the transaxle side.
- (2) Install the clip with the protrusion of the clip facing toward the upper side of the vehicle and aligning with the marking position.

CAUTION

- Care must be exercised so that the hose may not be overlapped on the second spool.

4. Ensure that each hose is not twisted, not interfering with other parts, and not having extremely small gaps with other parts.

4-1-5 OPERATION AFTER INSTALLATION

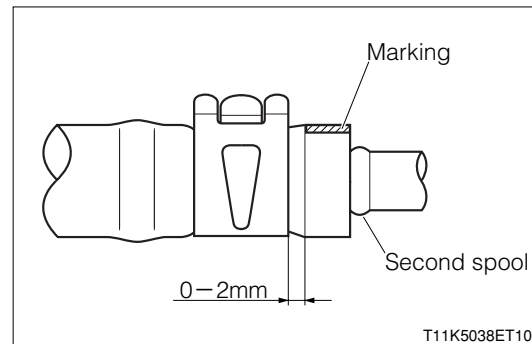
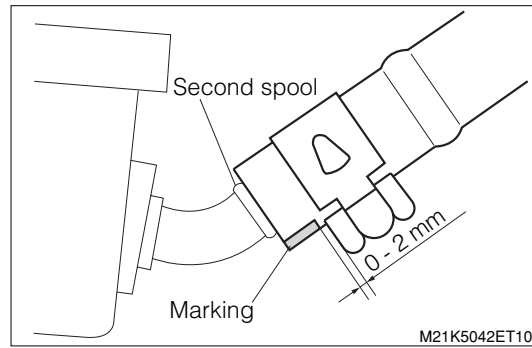
1. Install the batty and battery carrier.

Refer to Page J5-3.

2. Start the engine. Check that there is no fluid leakage from the automatic transaxle.

3. Check the fluid level. If the fluid level is too low, replenish.

Refer to Page F3-1.



5 OIL PAN

5-1 REMOVAL AND INSTALLATION

5-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant, adhesive, others

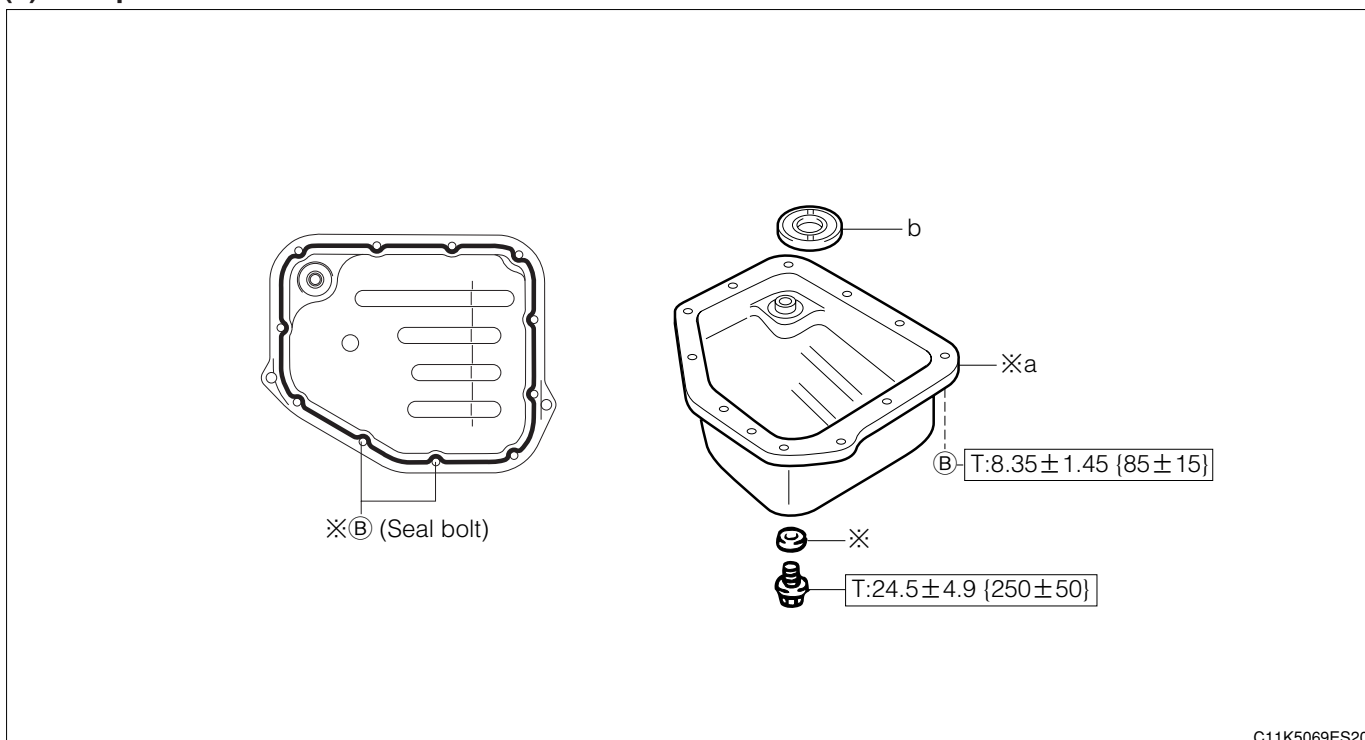
ATF Dexron®III, Three Bond1281B

5-1-2 OPERATION BEFORE REMOVAL

1. Drain the automatic transaxle fluid.

5-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



C11K5069ES20

※: Non - reusable parts

Unit: N·m {kgf·cm}

(2) Removal and installation procedures

- ▼ ▲ 1 a Pan S/A, transaxle oil
- 2 b Magnet, transmission

5-1-4 POINTS OF REMOVAL

(1) Pan S/A, transaxle oil

1. After removing the pan S/A retaining bolts, remove the pan S/A by tapping lightly the flange section of it with a plastic hammer, while holding the pan S/A by hand.

CAUTION

- Oil is remaining in the pan S/A. Therefore, be very careful not to allow the oil to spill over.

F3-23

5-1-5 POINTS OF INSTALLATION

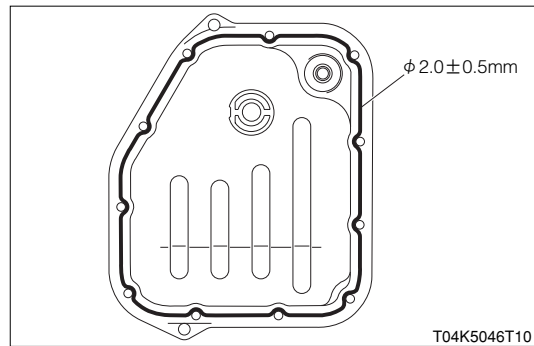
(1) Pan S/A, transaxle oil

1. Clean and degrease the mating surface. Apply liquid gasket to the areas indicated in the right figure.

ADHESIVE: Three Bond1281B

CAUTION

- Do not apply the liquid gasket too much. (If a great quantity of liquid gasket is mixed into ATF, ATF will be deteriorated.)



5-1-6 OPERATION AFTER INSTALLATION

1. Fill automatic transaxle fluid.
Refer to Page F3-1.
2. Check that no oil leakage is present.

6 OIL STRAINER

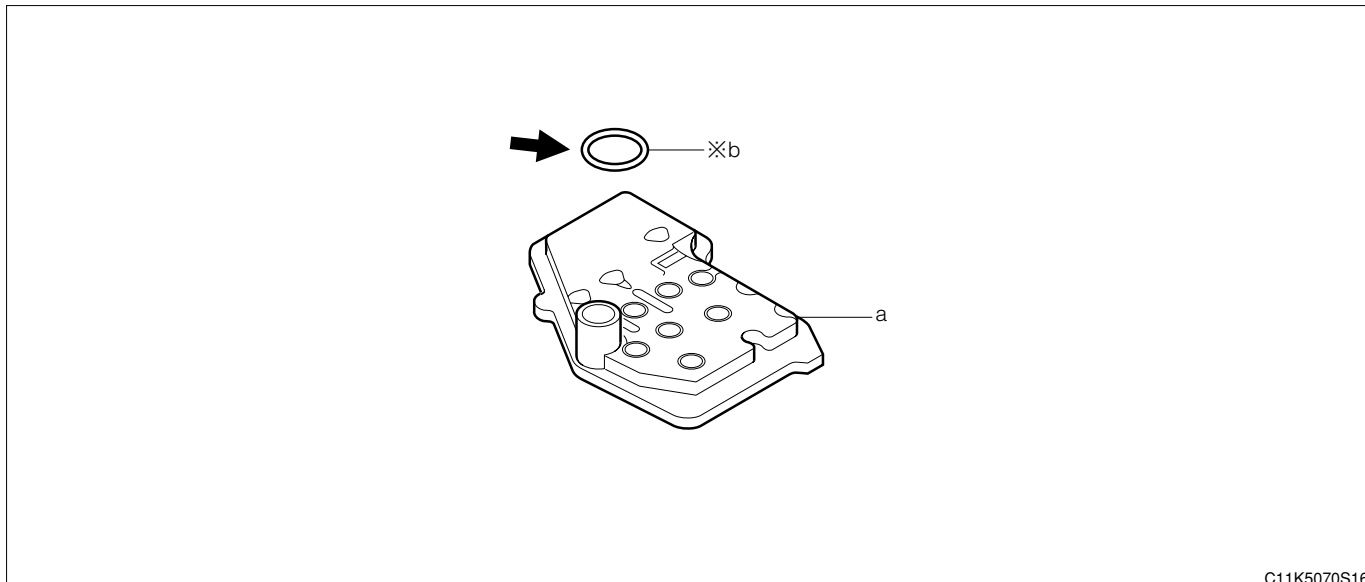
6-1 REMOVAL AND INSTALLATION

6-1-1 OPERATION BEFORE REMOVAL

1. Remove the oil pan.
Refer to Page F3-22.

6-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



➔: Apply ATF.

※: Non-reusable parts

(2) Removal and installation procedures

- ▼ ▲ 1 a Strainer S/A, oil
2 b Ring, o

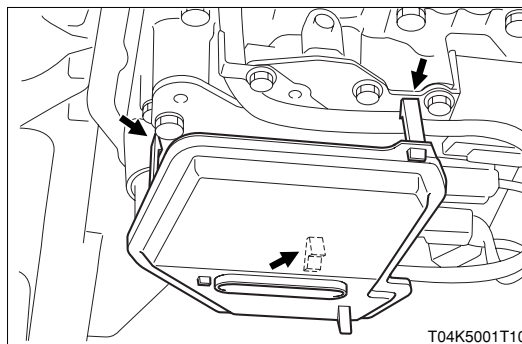
6-1-3 POINTS OF REMOVAL

(1) Strainer S/A, oil

1. Remove the oil strainer.

CAUTION

- The strainer S/A is attached to the transmission valve body Ay with pawls indicated in the figure. Therefore, carefully remove the strainer S/A, while expanding the pawls, and paying attention not to apply undue force to the strainer S/A.



6-1-4 POINTS OF INSTALLATION

(1) Strainer S/A, oil

1. Apply ATF to the strainer S/A and assemble the O-ring.

6-1-5 OPERATION AFTER INSTALLATION

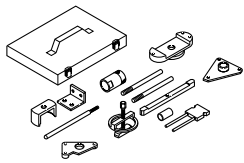
1. Install the oil pan.
Refer to Page F3-22.

7 VALVE BODY

7-1 REMOVAL AND INSTALLATION

7-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09350-87202-000	Tool set,automatic transmission

Instrument

Torque wrench

Lubricant,adhesive,others

ATF Dexron®III

7-1-2 OPERATION BEFORE REMOVAL

1.Remove the oil pan.
Refer to Page F3-22.

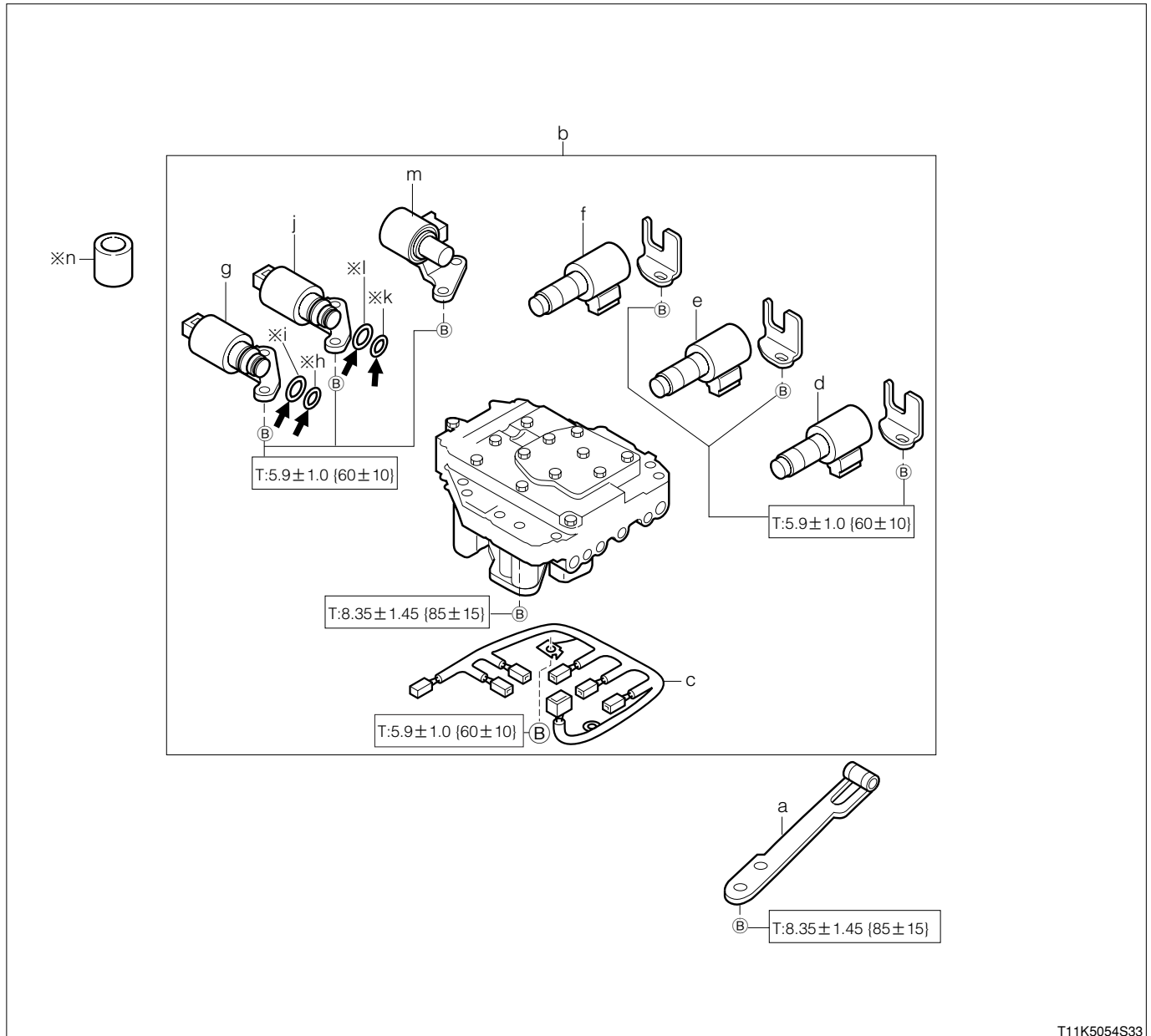
2.Remove the oil strainer.
Refer to Page F3-24.

7-1-3 REMOVAL AND INSTALLATION PROCEDURES

CAUTION

- Prior to the operations, be sure to completely remove sands and mud that have adhered to the external of the transmission so that no foreign matters enter the transmission.
- Perform the operations at a clean place free of dirt and dust.
- Perform the operations with bare hands or by wearing vinyl gloves. Do not use working gloves nor cloth to prevent admission of lint. (Use nylon cloth, or paper cloth.)
- Place removed parts in order at all times. Keep them away from dust.
- Thoroughly wash the removed parts before assembling. After drying, apply ATF. However, do not wash aluminum and rubber parts with alkali chemicals. Never wash rubber parts, such as O-rings, gaskets, oil seals, with cleaning solvent (White gasoline or the like)
- Do not use parts that have undergone impacts, such as ones dropped. (In particular, the characteristics of the solenoid valves may be changed.)

(1) Components



T11K5054S33

➔: Apply ATF.

※: Non-reusable parts

Unit: N·m{kgf·cm}

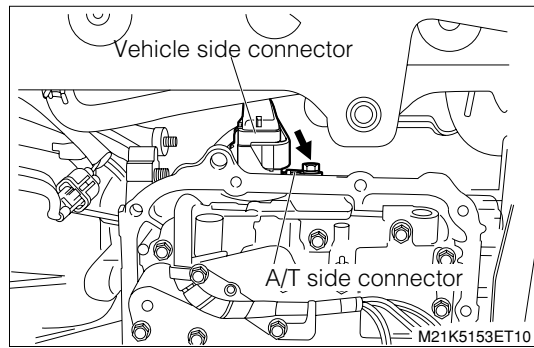
(2) Removal and installation procedures

- | | | | |
|-------|---|--------|---|
| ▲ 1 | a Spring S/A, manual detent | 8 | h Ring, o |
| ▼ ▲ 2 | b Body Ay, transmission valve | 9 | i Ring, o |
| ▼ ▲ 3 | c Wire Ay, solenoid | 10 | j Solenoid Ay, transmission 3way (LUC solenoid) |
| 4 | d Solenoid Ay, clutch control No.1 (Solenoid No.2)
(Connector white) | 11 | k Ring, o |
| 5 | e Solenoid Ay, clutch control No.2 (Solenoid No.1)
(Connector black) | 12 | l Ring, o |
| 6 | f Solenoid Ay, clutch control No.1 (Solenoid No.3)
(Connector white) | 13 | m Solenoid Ay, lock up control (Duty solenoid) |
| 7 | g Solenoid Ay, transmission 3way (switch solenoid) | ▼ ▲ 14 | n Seal, 2nd & 4th brake cylinder |

7-1-4 POINTS OF REMOVAL

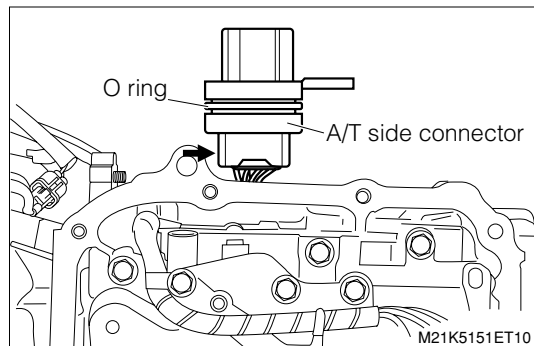
(1) Wire Ay, solenoid

- 1.Remove the vehicle side wire Ay.
- 2.Remove the retaining bolt of the A/T side connector.
- 3.Remove the A/T side connector from the A/T. Remove the connector (White).



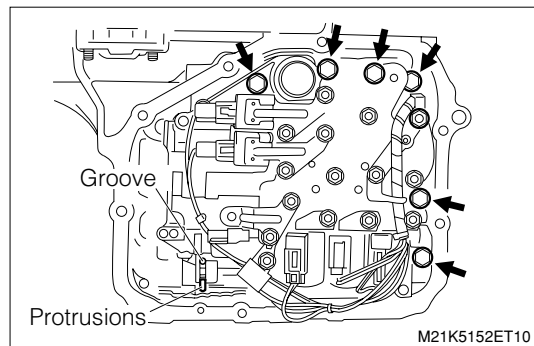
CAUTION

- The O-ring of the A/T side connector can not be re-used.

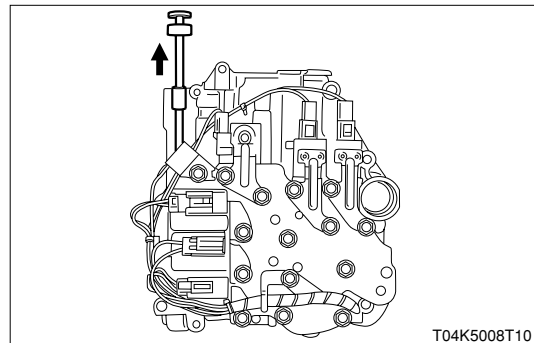


(2) Body Ay, transmission valve

- 1.Remove the body Ay by loosening the six bolts evenly.

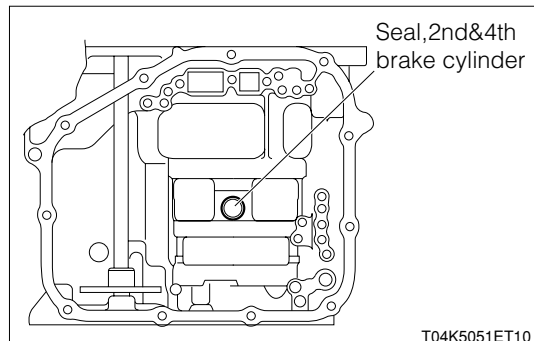


- 2.Remove gently the manual valve from the valve body Ay.



(3) Seal, 2nd & 4th brake cylinder

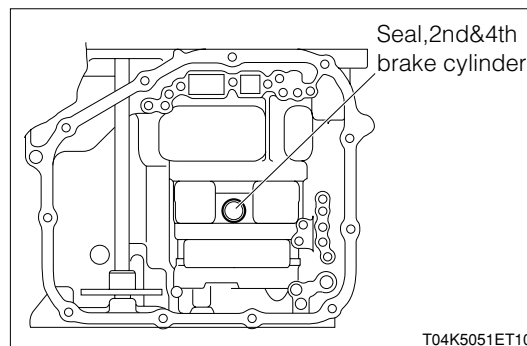
- 1.Remove the seal.



7-1-5 POINTS OF INSTALLATION

(1) Seal, 2nd & 4th brake cylinder

1. Install the seal.

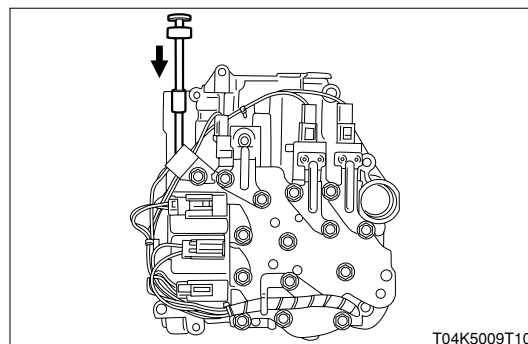


(2) Body Ay, Transmission valve

1. Apply ATF to the manual valve. Slowly assemble the manual valve by its own weight into the body Ay. After the assembling, lightly move the body Ay in a fore-and-aft direction. Check that there is no abnormal binding.

LUBRICANT: AFT Dexron®III

2. Pass the connector through the transmission case hole.



3. While aligning the protrusion of the manual valve lever S/A with the groove of the manual valve, assemble the valve body assembly to the transaxle case.

NOTE

- Tilt the manual valve lever S/A toward the L range direction.

4. After the six bolts have been installed temporarily, tighten the two reference bolts (The ✕ marked one in the figure) to the specified torque.

NOTE

- The bolt (A) has a nominal length of 65 mm. Other bolts have a nominal length of 35 mm.

CAUTION

- Before assembling, clean the bolts with compressed air.

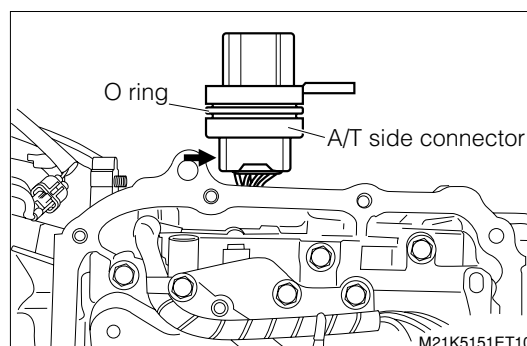
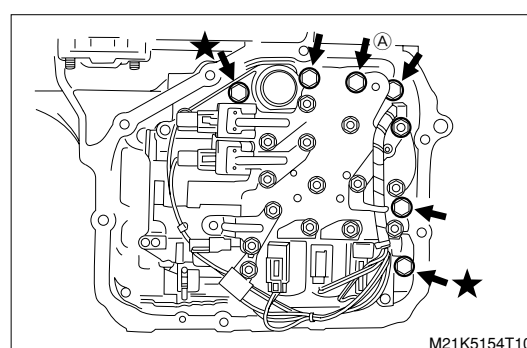
5. Tighten the remaining bolts up to the specified torque.

(3) Wire Ay, solenoid

1. After a new O-ring has been installed to the A/T side connector, install the connector (White).

CAUTION

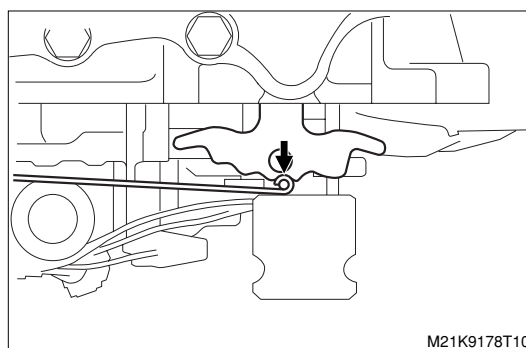
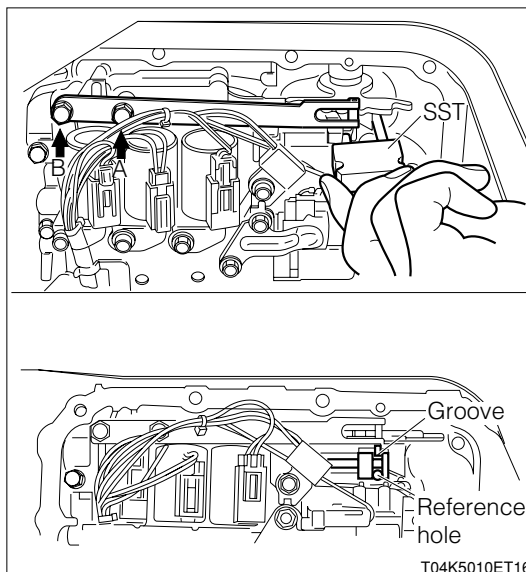
- The O-ring of the A/T side connector can not be re-used.



(4) Spring S/A, manual detent

1. Using the SST, align the manual valve groove with transmission valve body hole (N range position) and assemble the spring S/A. Tighten the bolt A (Nominal length 12 mm) and bolt B (Nominal length 35 mm) in this order.

SST: 09351-87211-000 [09351-87211-000]



CAUTION

- When tightening the bolt A, ensure that the roller located at the end of the spring S/A is properly positioned in the hollow of the manual valve lever S/A shown in the illustration.

7-1-6 OPERATION AFTER INSTALLATION

1. Install the oil strainer.

Refer to Page F3-24.

2. Install the oil pan.

Refer to Page F3-22.

3. When the valve body Ay or the solenoid valve has been replaced, erase the learning values of the A/T ECU.

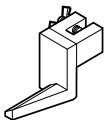
Refer to Page F5-17.

8 NEUTRAL START SWITCH

8-1 REMOVAL AND INSTALLATION

8-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09302-87201-000	Gauge,neutral start switch adjust

Instrument

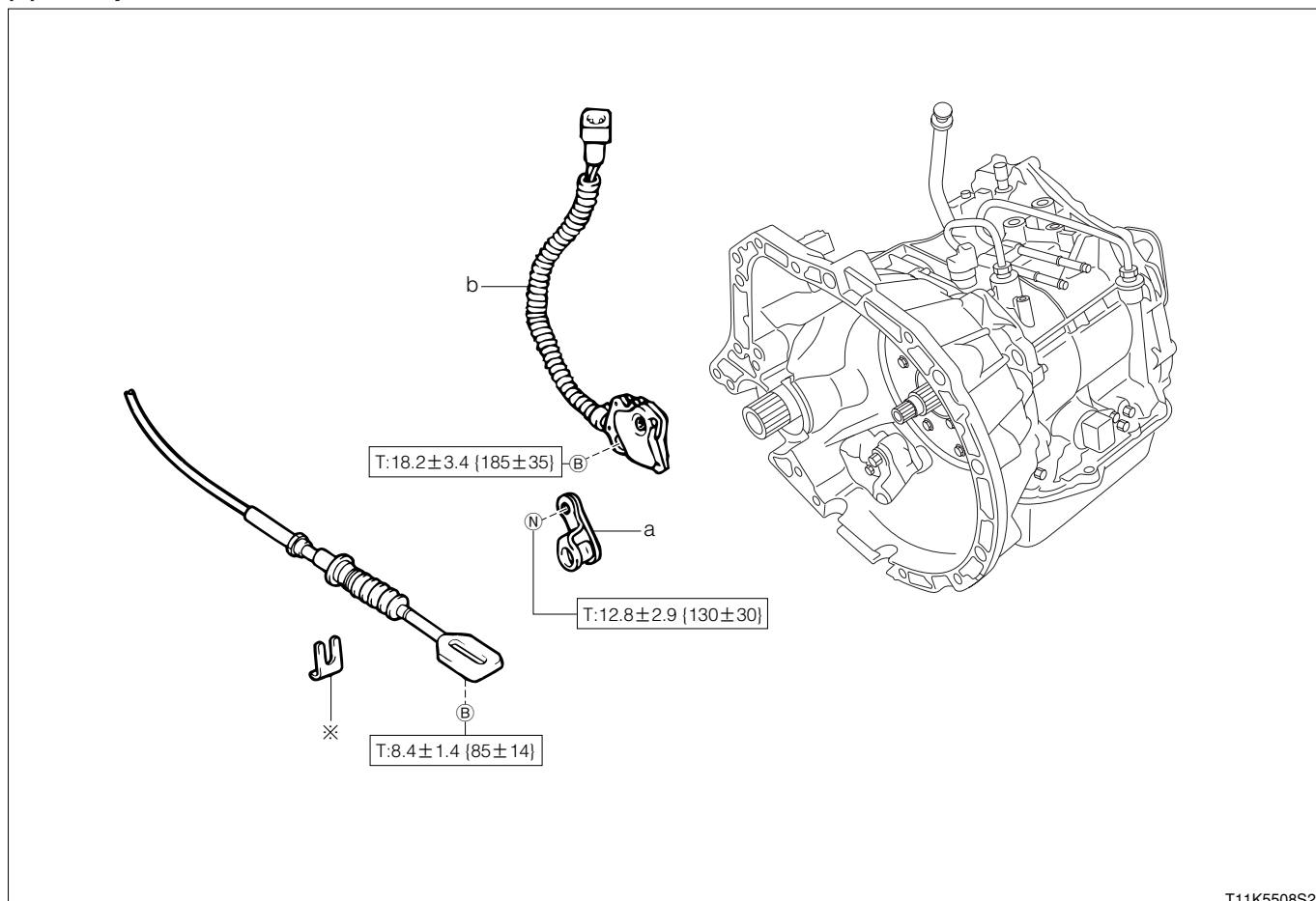
Torque wrench

8-1-2 OPERATION BEFORE REMOVAL

1. Disconnect the control cable at the transaxle side.
Refer to Page F3-33.

8-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non - reusable parts

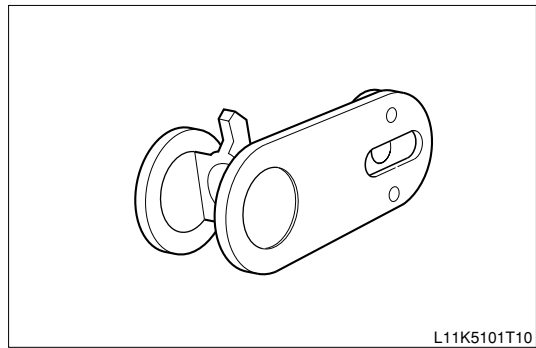
Unit:N·m{kgf·cm}

(2) Removal and installation procedures

- 1 a Lever S/A, transmission control shaft
- ▲ 2 b Switch Ay, neutral start

8-1-4 INSPECTION

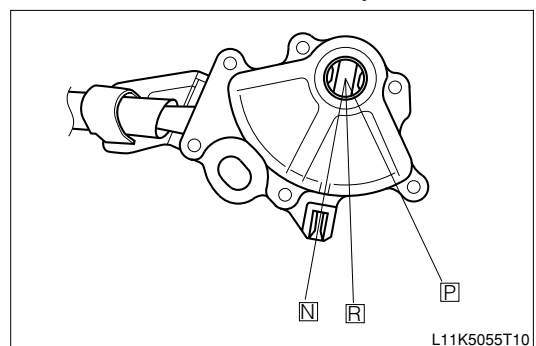
1. Check that the cable installation section (The resin section) of the transmission control shaft lever assembly can be turned lightly. Also, ensure that it does not exhibit any damage.



8-1-5 POINTS OF INSTALLATION

(1) Switch Ay, neutral start

1. Install the neutral start switch.
 - (1) Temporarily install the neutral start switch assembly and control shaft lever assembly.
 - (2) Turn the transmission control shaft lever S/A counter-clockwise, until it stops (P range). From this condition, back off the control shaft lever S/A two stages (N range).

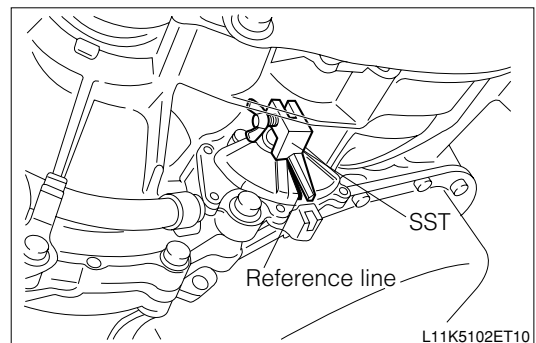


- (3) Using the SST, turn the switch section in such a way that the gauge section of the SST is aligned with the reference line of the switch Ay. Then, tighten the bolt to the specified torque

SST: 09302-87201-000

2. After completion of the installation of the transmission control lever S/A, confirm the operation of the transmission control shaft lever S/A, following the procedure given below.

- (1) Move the transmission control shaft lever S/A to the P range. Then, move the lever S/A about 2 to 3 mm in the direction of the R range by hand. At this time, ensure that the lever fully returns to the P range.
- (2) If the lever fails to return fully, once loosen the retaining bolt of the switch Ay and carry out the adjusting operation. Then, retighten the bolt.



8-1-6 OPERATION AFTER INSTALLATION

1. Connect the control cable at the transaxle side.

Refer to Page F3-33.

2. Check the shift lever position and perform the check of the neutral start switch.

Refer to Page F3-1.

9 SHIFT LEVER(FLOOR SHIFT)

9-1 REMOVAL AND INSTALLATION

9-1-1 ARTICLES TO BE PREPARED

Instrument

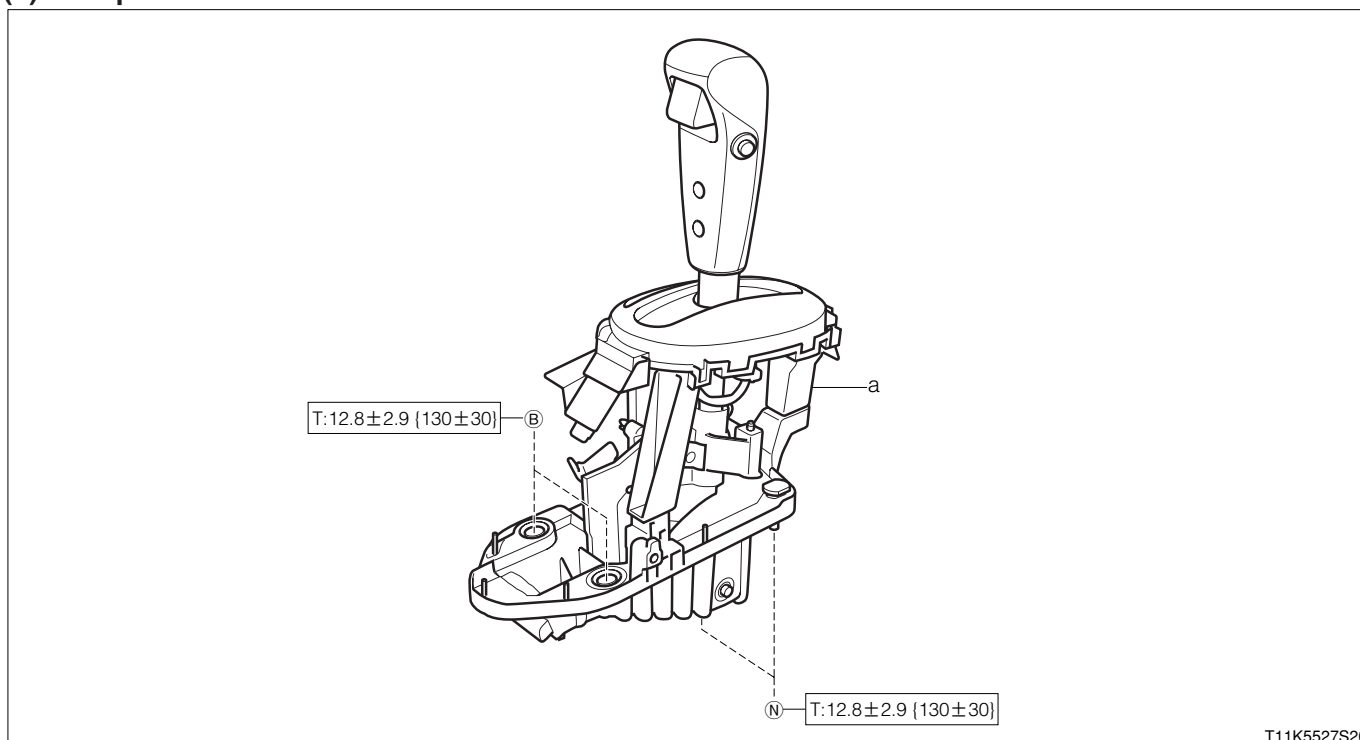
Torque wrench

9-1-2 OPERATION BEFORE REMOVAL

- 1.Remove the transmission floor shift Ay side of the shift lock release cable Ay.
Refer to Page F3-37.
- 2.Remove the transmission floor shift Ay side of the transmission control cable Ay.
Refer to Page F3-33.

9-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit:N·m{kgf·cm}

(2) Removal and installation procedures

- 1 a Floor shift Ay, transmission

9-1-4 OPERATION AFTER INSTALLATION

- 1.Install the transmission floor shift Ay side of the transmission control cable Ay.
Refer to Page F3-33.
- 2.Install the transmission floor shift Ay side of the shift lock release cable Ay.
Refer to Page F3-37.

Check the shift lever position.

Refer to Page F3-1.

10 CONTROL CABLE(FLOOR SHIFT)

10-1 REMOVAL AND INSTALLATION

10-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

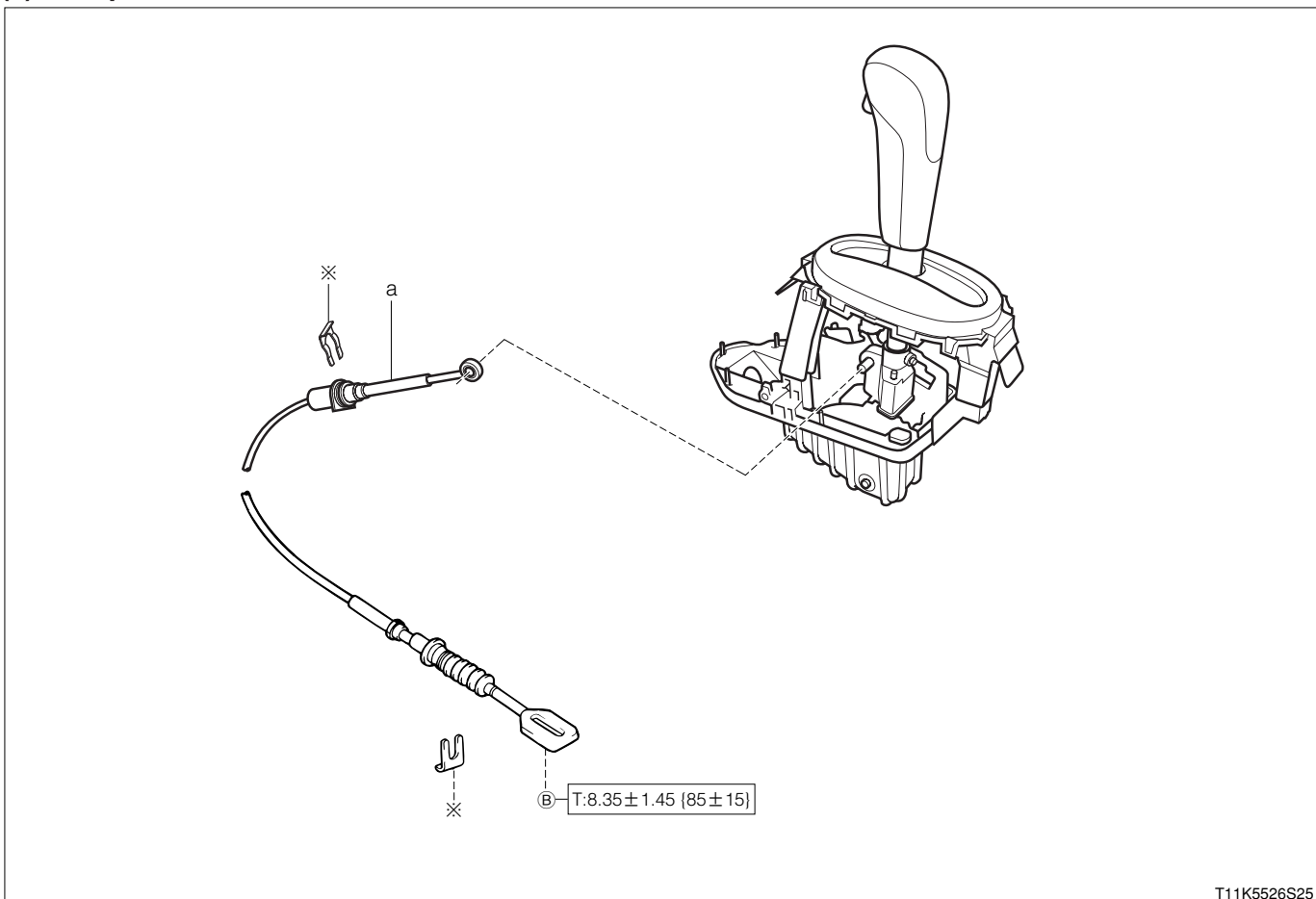
10-1-2 OPERATION BEFORE REMOVAL

1.Remove the front console box S/A.

Refer to Page I2-31.

10-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non - reusable parts

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

▼ ▲ 1 a Cable Ay, transmission control

10-1-4 POINTS OF REMOVAL

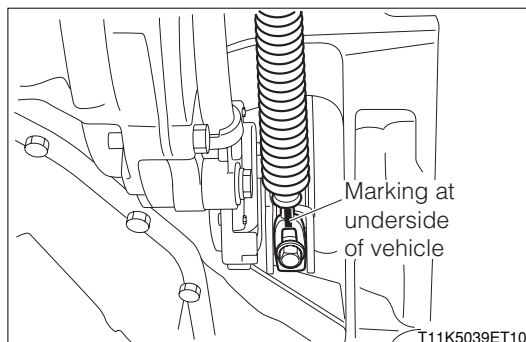
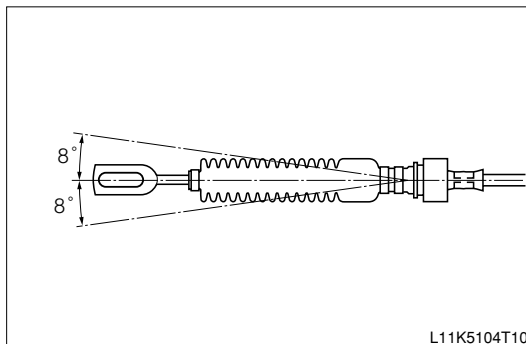
(1) Cable Ay, transmission control

CAUTION

- Do not apply load to the end of the cable Ay (Both the shift lever and the transmission sides), or swing it more than 8 degrees.

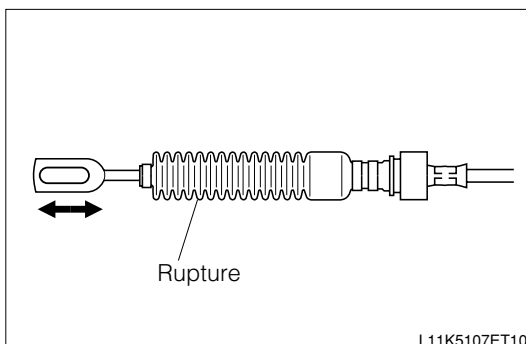
1. Set the shift lever to the **N** range.

2. Mark the end of the transaxle side of the cable Ay to identify upper and lower sides, and then remove the cable Ay.



10-1-5 INSPECTION

1. Check that the inner cable of the cable Ay slides smoothly and that the boot is free from any damage or deformation.



10-1-6 POINTS OF INSTALLATION

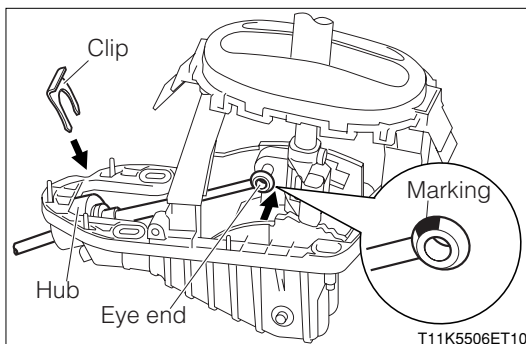
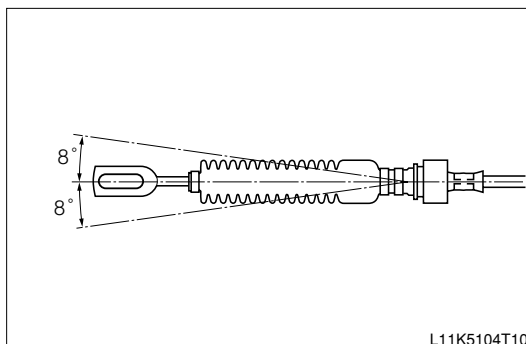
(1) Cable Ay, transmission control

CAUTION

- Do not apply load to the end of the cable Ay (Both the shift lever and the transmission sides), or swing it more than 8 degrees.

1. Install the shift lever side of the cable Ay.

- Insert the clip into the slot of the cable Ay to secure the hub.
- Install the eye end in such a way that the marking of the eye end faces toward the upper side of the vehicle.

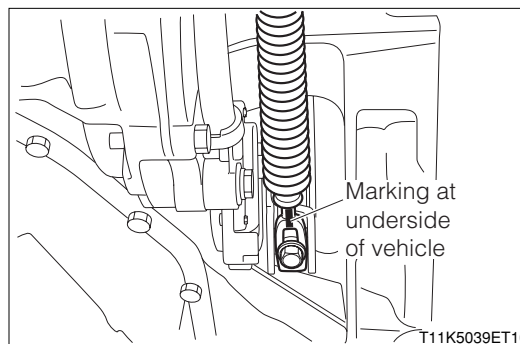


F3-35

2.Ensure that upper/lower identification marking of the transaxle side of the cable Ay faces down and that there is no sagging in the cable. Then install the cable Ay to the transmission control shaft lever S/A.

CAUTION

- Check that the boot is not twisted.



10-1-7 OPERATION AFTER INSTALLATION

1.Check the shift lever position.

Refer to Page F3-1.

2.Install the front console box S/A.

Refer to Page I2-31.

11 SHIFT LOCK WITH KEY-INTERLOCKING (MECHANICAL TYPE)

11-1 FUNCTION CHECK

11-1-1 CHECK THE SHIFT LOCK OPERATION

1. Set the IG switch to the "ACC" or "ON" position.
2. Move the shift lever to the **P** range and release the shift lever button.
3. Confirm that it is impossible to push-in the shift lever button and shifting can not be made to ranges other than the **P** range when the brake pedal is not depressed.
4. Confirm that it is possible to push-in the shift lever button when the brake pedal is depressed and shifting can be made to ranges other than the **P** range.
5. Move the shift lever to the **P** range and release the shift lever button.
6. Set the IG switch to the "LOCK" position.
7. Confirm that the shift lever button can not be pushed-in whether the brake pedal is depressed or not and shifting can not be made to ranges other than the **P** range.

11-1-2 CHECK OF KEY-INTERLOCKING MECHANISM

1. Set the IG switch to the "ACC" position.
2. Depress the brake pedal and move the shift lever to ranges other than the **P** range.
3. Confirm that the IG switch can not be set to the "LOCK" position.
4. Move the shift lever to the **P** range.
5. Confirm that the IG switch can be set to the "LOCK" position and the key can be pulled out.

11-2 BASIC CHECK AND ADJUSTMENT

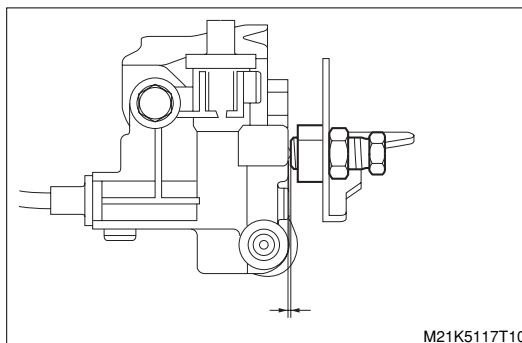
11-2-1 AJUSTMENT OF SHIFT LOCK RELEASE CABLE AY MOUNTING POSITION(FLOOR SHIFT)

1. Loosen the nut and adjust the amount of the projection of the lock mechanism to 1.5 ± 0.5 mm when the brake pedal is not depressed. Then secure with the nut.
2. Ensure that play of the brake pedal is within the specified value.

Refer to Page E1-2.

SPECIFIED VALUE: 1.5 ± 0.5 mm (Amount of projection of the lock mechanism)

TIGHTENING TORQUE: 24.5 ± 5.9 N · m
{ 250 ± 59 kgf · cm}



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12 SHIFT LOCK RELEASE CABLE(FLOOR SHIFT)

12-1 REMOVAL AND INSTALLATION

12-1-1 ARTICLES TO BE PREPARED

Instrument

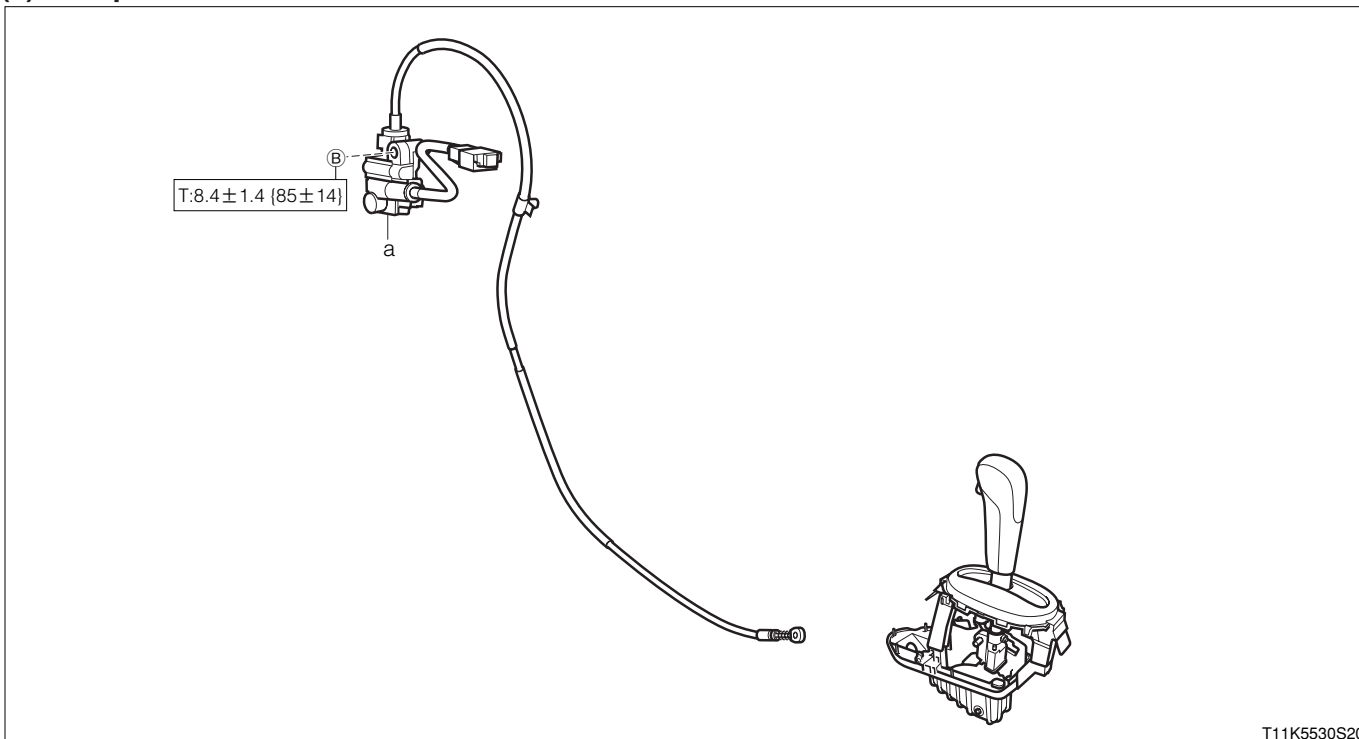
Torque wrench

12-1-2 OPERATION BEFORE REMOVAL

- 1.Remove the front console box S/A.
Refer to Page I2-31.
- 2.Remove the lower instrument panel finish panel S/A.
Refer to Page I2-23.
- 3.Remove the lower steering column cover.
Refer to Page G1-5.
- 4.Remove the front floor carpet Ay. (Driver's side only)
Refer to Page I2-57.

12-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N·m{kgf·cm}

(2) Removal and installation procedures

- ▼ ▲ 1 a Cable Ay, shift lock release

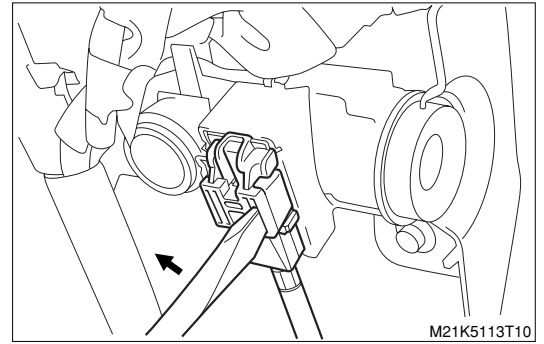
12-1-4 POINTS OF REMOVAL

(1) Cable Ay, shift lock release

- 1.Set the shift lever to the P range.
- 2.Set the ignition key to the "ACC" position.

3. Remove the steering column bracket side of the cable Ay.

- (1) Insert a flat screwdriver or the like into the hole of the cable Ay end portion and pry lightly in the direction shown by the arrow in the illustration, and remove the cable Ay.



4. Remove the shift lever side of the cable Ay.

- (1) Remove the eye end first, and then remove the casing cap.

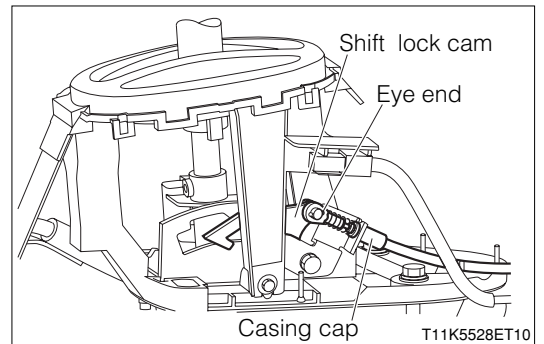
CAUTION

- If removed in the reverse order, excess force may be applied to the casing cap, resulting in damage.

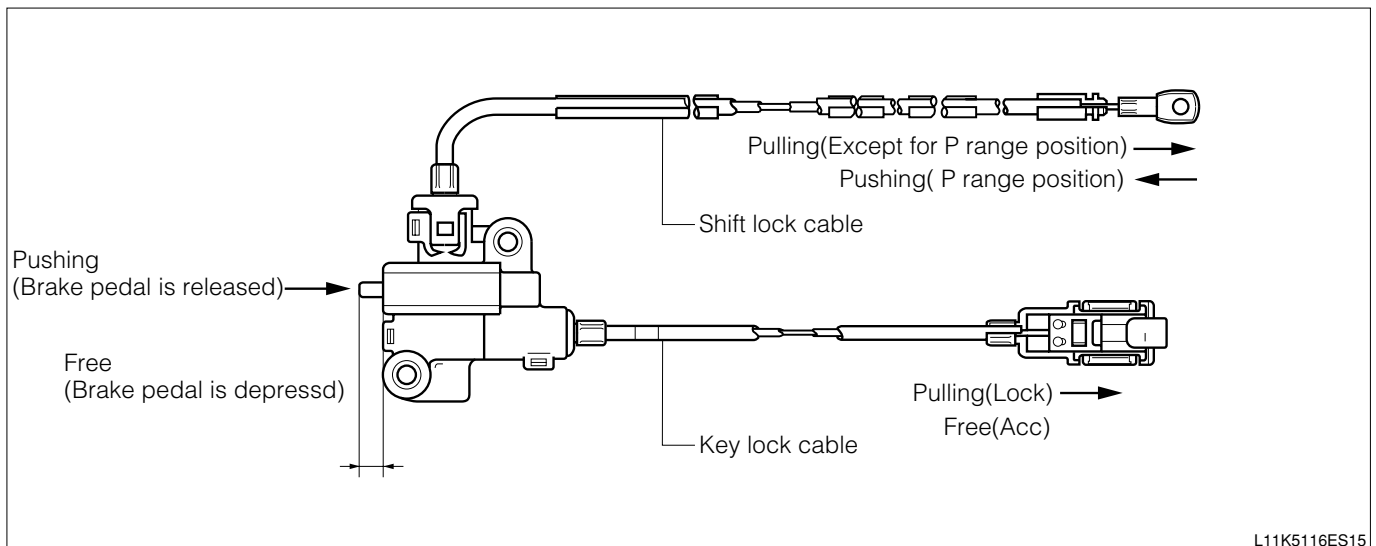
5. Remove the cable assembly.

CAUTION

- Do not bend the cable more than is necessary.



12-1-5 INSPECTION



F3-39

1. Check that there is no unnatural bending in each cable.
2. Ensure that the brake lock actuator moves smoothly, with strokes of about 8 mm.
3. Check that the key lock cable functions as specified in the operation table according to each state of the shift lock cable.

Key lock cable operation table

State of the shift lock cable	State of the key lock cable
Push	Able to pull.
Pull	Unable to pull.

4. Check that the shift lock cable functions as specified in the operation table according to each state of the key lock cable and brake lock actuator.

Shift lock cable operation table

Key lock cable		State of the shift lock cable
State of the brake actuator		
Key lock cable	Free	Able to push and pull.
Brake actuator	Free	
Key lock cable	Free	Able to push (only once). Unable to pull after locked.
Brake actuator	Push	
Key lock cable	Pull	Unable to pull.
Brake actuator	Free	
Key lock cable	Pull	Unable to pull.
Brake actuator	Push	

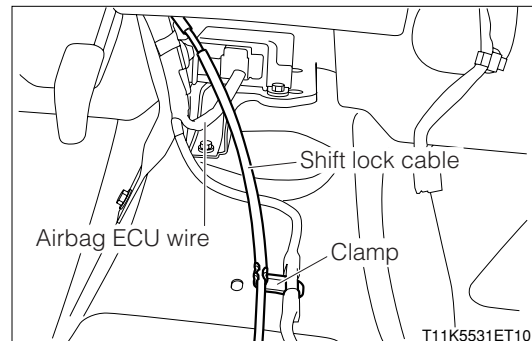
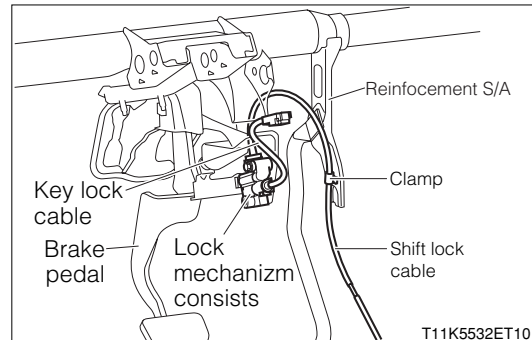
12-1-6 POINTS OF INSTALLATION

(1) Cable Ay, shift lock release

1. Install the cable assembly.

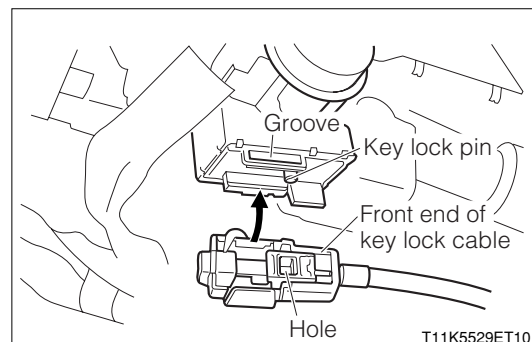
CAUTION


- Do not bend the cable more than is necessary.
- (1) Install the lock mechanism to the pedal bracket Ay.
 - (2) Securely insert the clamp of the shift lock cable into the square hole of the reinforcement S/A.
 - (3) Root the shift lock cable so that it may pass the vehicle right side of the airbag ECU harness.

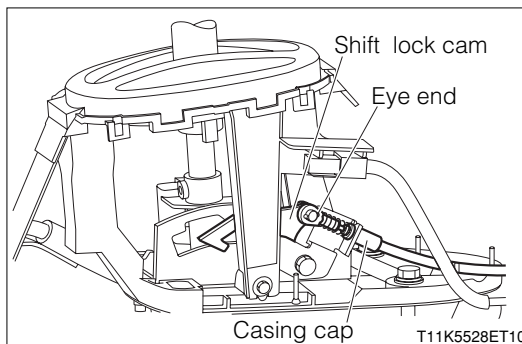


2. Install the steering column bracket side of the cable Ay.

- (1) Set the ignition key to the ACC position and position the key lock pin as shown in the illustration.
- (2) Match the hole of the key lock cable end with the key lock pin, and securely insert into the slot of the steering column bracket.



3. Install the shift lever side of the cable Ay.
 - (1) Set the shift lever to the  range.
 - (2) Install the eye end into the shift lock cam.
 - (3) Insert the casing cap into the notch of the bracket.



12-1-7 OPERATION AFTER INSTALLATION

1. Adjust the mounting position of the shift lock release cable Ay.
Refer to Page F3-36.
2. Check the shift lock operation and the key interlocking operation.
Refer to Page F3-36.
3. Install the front floor carpet Ay. (Driver's side only)
Refer to Page I2-57.
4. Install the lower steering column cover.
Refer to Page G1-5.
5. Install the lower instrument panel finish panel S/A.
Refer to Page I2-23.
6. Install the front console box S/A.
Refer to Page I2-31.