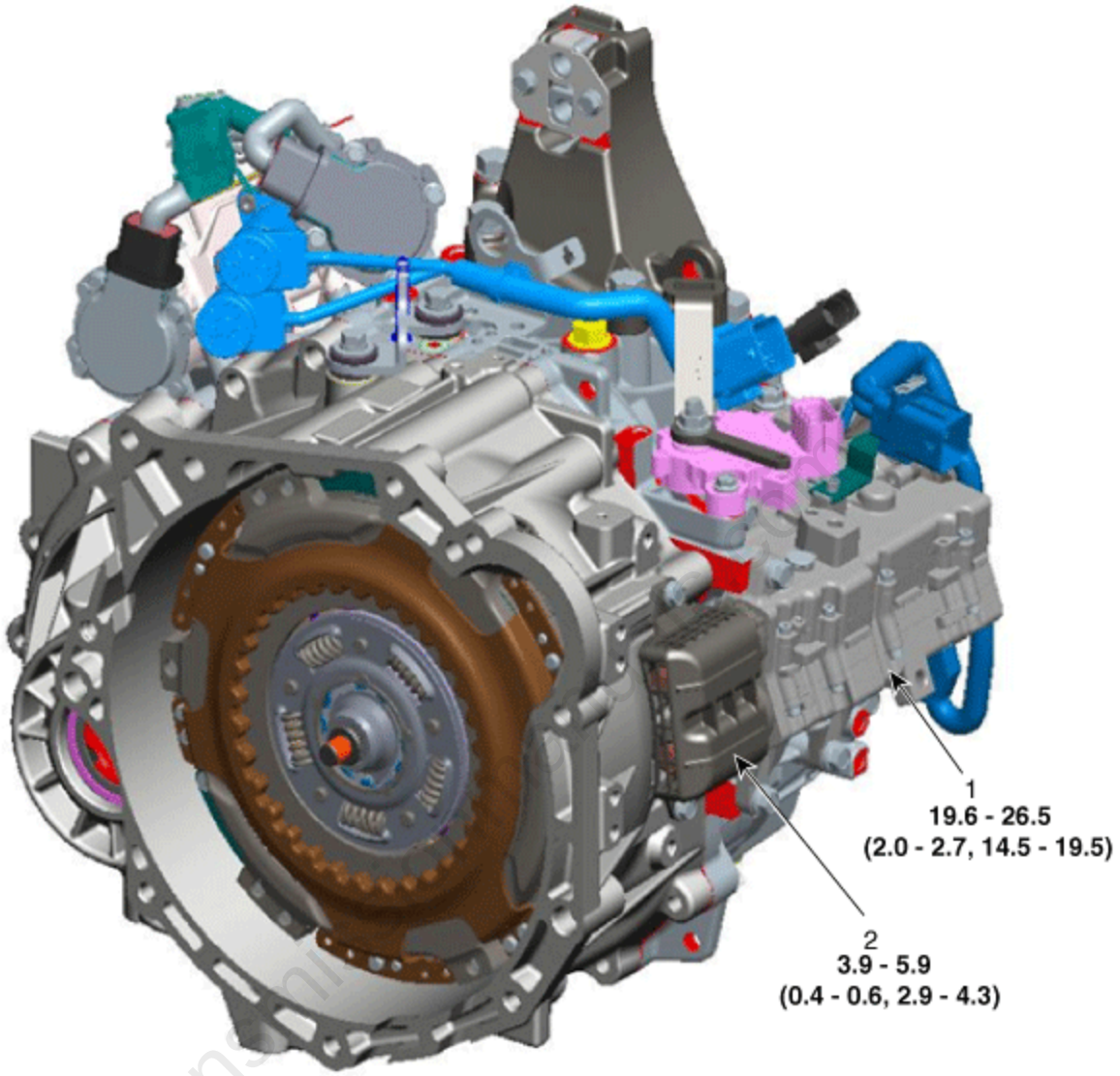
Dual Clutch Transmission Control System / Clutch Actuator Assembly

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Components and components location

Component Location



Torque: N·m (kgf·m, lb·ft)

1. Clutch actuator assembly
2. Fork cover

Specifications

Specification

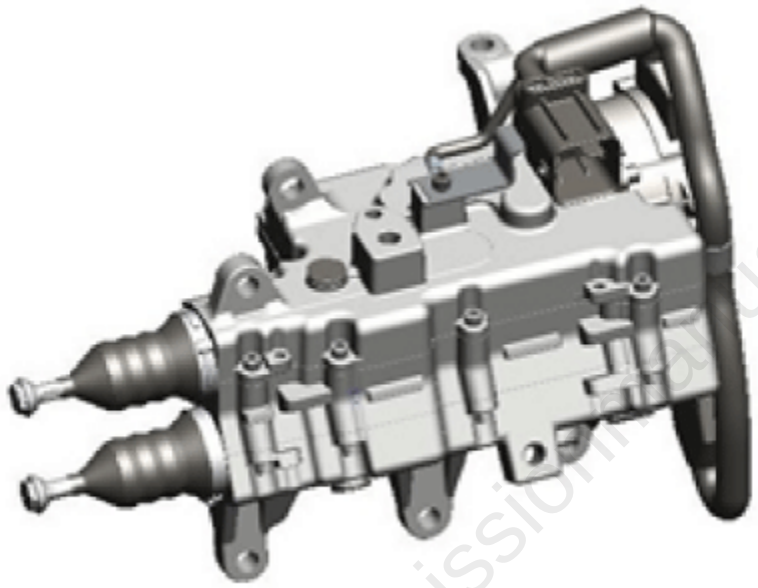
Item	Condition	Specification
Resistance (line to line)	Motor 1	60 mΩ ±10 %

	Motor 2	64 mΩ ± 10 %
Rated voltage		12 V
Operating condition		-40 to 257°F (- 40 to 125°C)

Description and operation

Description

The clutch actuator uses signals from the Transmission Control Module (TCM) to control the clutch.

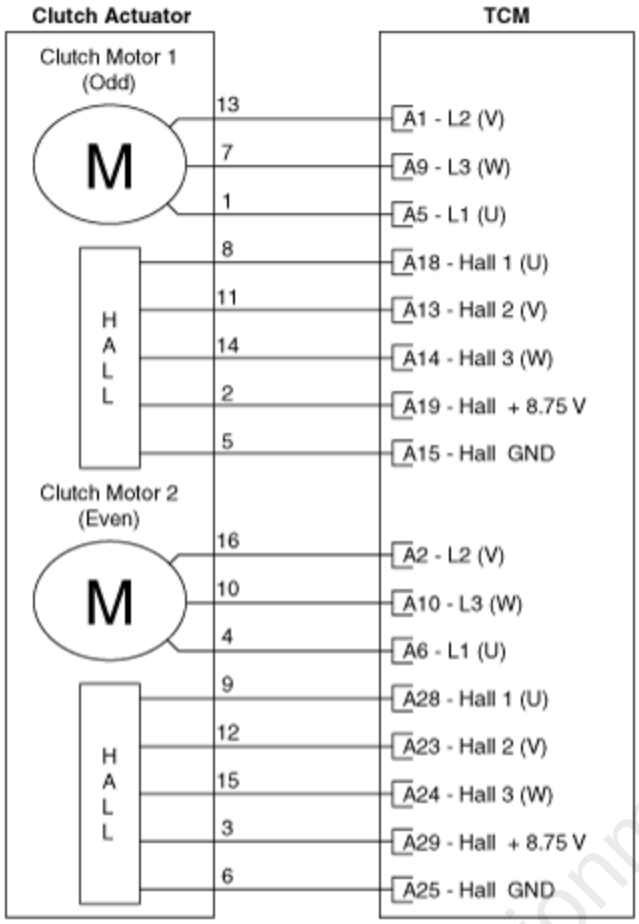


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Schematic diagrams

Circuit Diagram

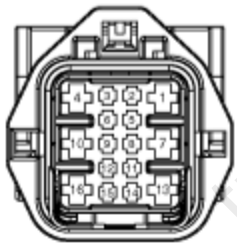
[Circuit Diagram]



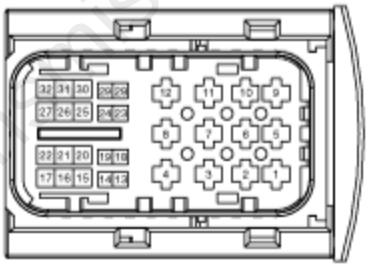
[Connection Information]

Terminal	Connected to	Function
1	TCM(A5)	Phase "U" (Cltuch 1)
2	TCM(A19)	Hall supply (Clutch 1)
3	TCM(A29)	Hall supply (Clutch 2)
4	TCM(A6)	Phase "U" (Cltuch 2)
5	TCM(A15)	Hall GND (Clutch 1)
6	TCM(A25)	Hall GND (Clutch 2)
7	TCM(A9)	Phase "W" (Cltuch 1)
8	TCM(A18)	Hall 1 (Cltuch 1)
9	TCM(A28)	Hall 1 (Cltuch 2)
10	TCM(A10)	Phase "W" (Cltuch 2)
11	TCM(A13)	Hall 2 (Cltuch 1)
12	TCM(A23)	Hall 2 (Cltuch 2)
13	TCM(A1)	Phase "V" (Cltuch 1)
14	TCM(A14)	Hall 3 (Cltuch 1)
15	TCM(A24)	Hall 3 (Cltuch 2)
16	TCM(A2)	Phase "V" (Cltuch 2)

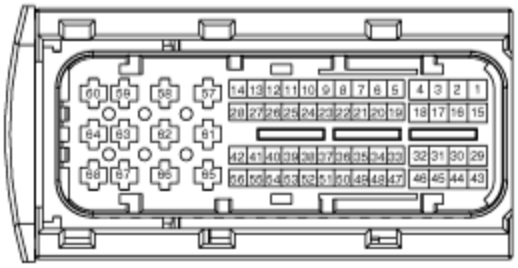
[Harness Connector]



Clutch Actuator Connector



Connector [A]
TCM



Connector [B]
TCM

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Video Clip



Dual Clutch actuator Rod Adjust (Dual Clutch Actuator Change)05:27

Removal

1. Remove the air cleaner assembly and air duct.

   (Refer to Engine Mechanical System - "Air cleaner")

2. Remove the battery and battery tray.

   (Refer to Engine Electrical System - "Battery")

3. Remove the inhibitor switch.

   (Refer to Dual Clutch Transmission Control System - "Inhibitor Switch")

4. Disconnect the connectors (A, B ,C ,D) in the illustration below.

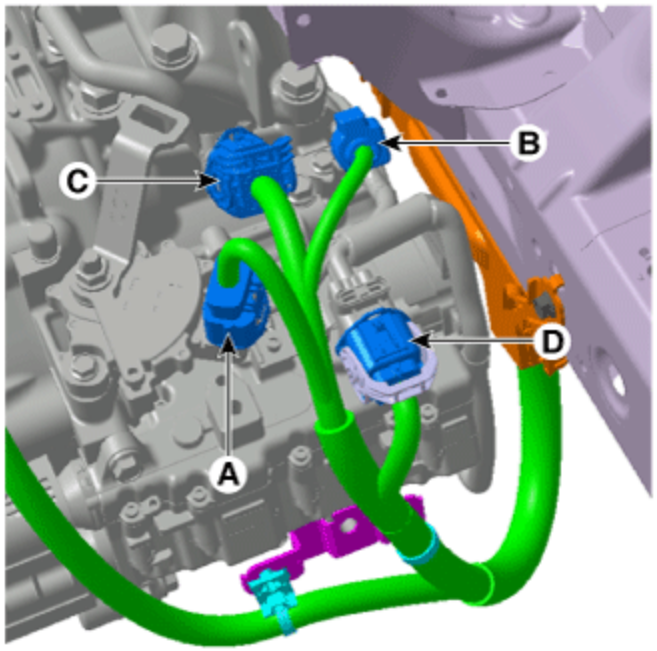
   A. Inhibitor switch connector

   B. Input shaft speed sensor connector

   C. Gear actuator solenoid connector

   D. Clutch actuator connector

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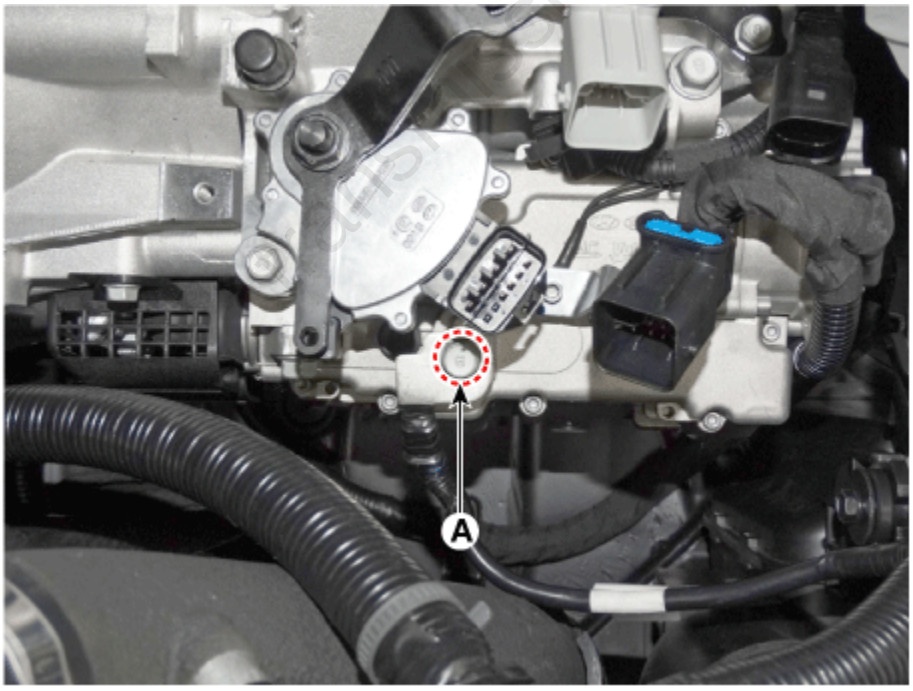


5.

Loosen the ground bolt (A).

Tightening torque :

9.8 - 11.8 N·m (1.0 - 1.2 kgf·m, 7.2 - 8.7 lb·ft)

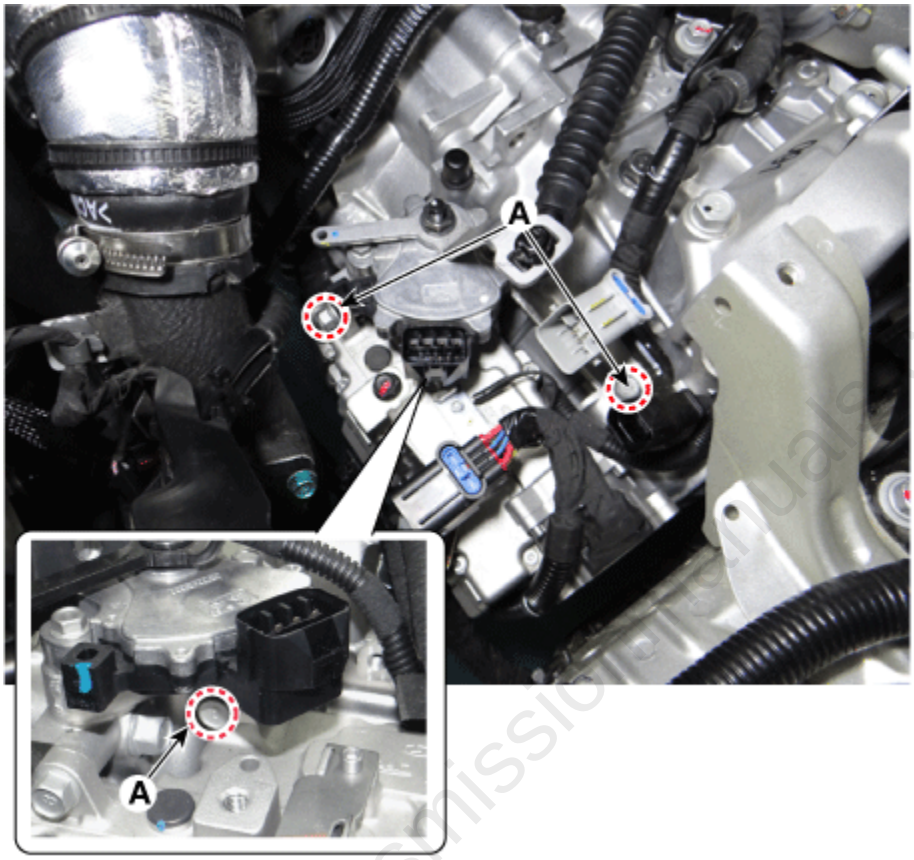


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6. Loosen the clutch actuator mounting bolts (A).

   Tightening torque :

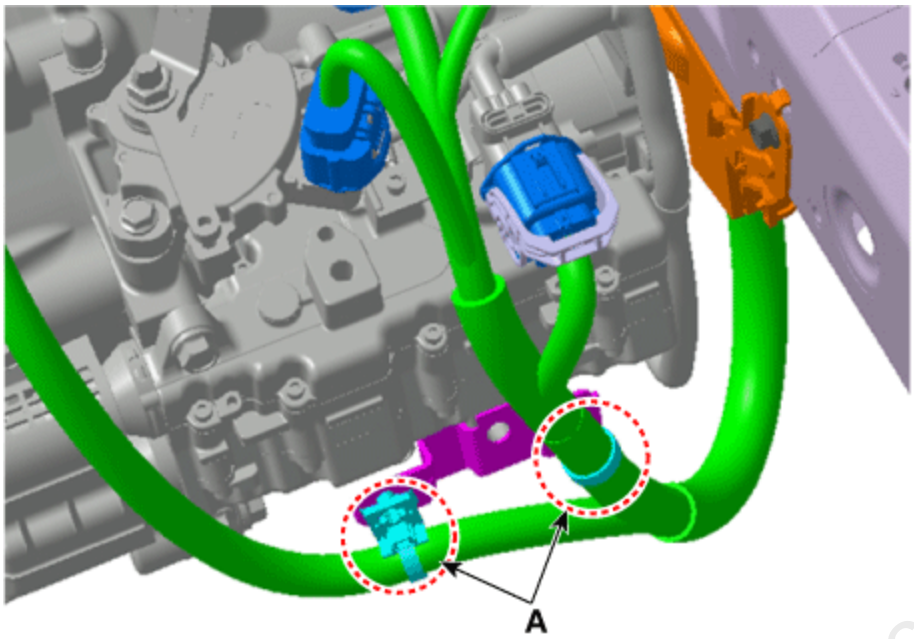
   19.6 - 26.5 N·m (2.0 - 2.7 kgf·m, 14.5 - 19.5 lb·ft)



7. Remove the under cover.

   (Refer to Engine Mechanical System - "Engine Room Under Cover")

8. Remove the wiring bracket mounting clips (A).



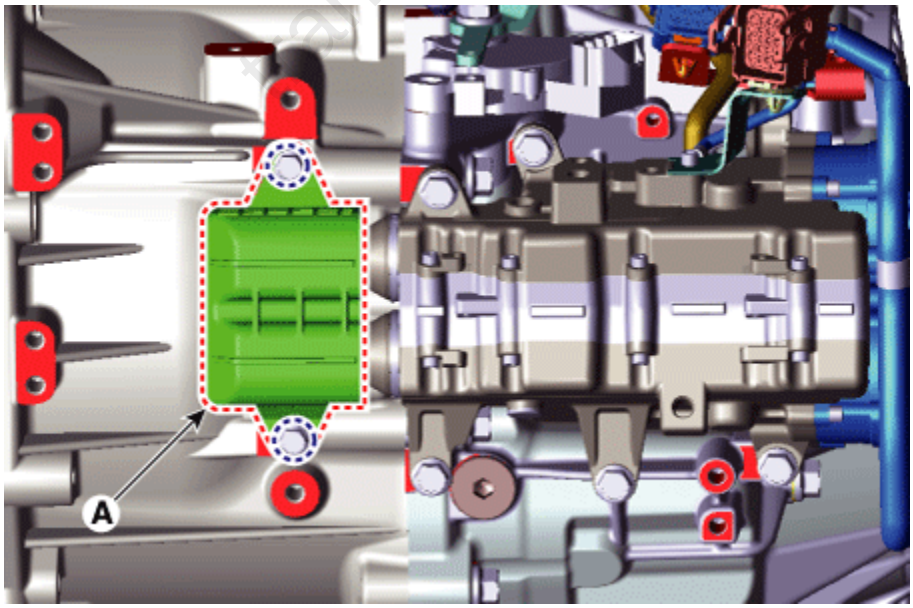
9. Remove the vacuum pump.

   (Refer to Brake System - "Vacuum Pump")

10. Remove the fork cover (A).

    Tightening torque :

    3.9 - 5.9 N·m (0.4 - 0.6 kgf·m, 2.9 - 4.3 lb·ft)



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11.

Install the special service tool (09430-A5100).

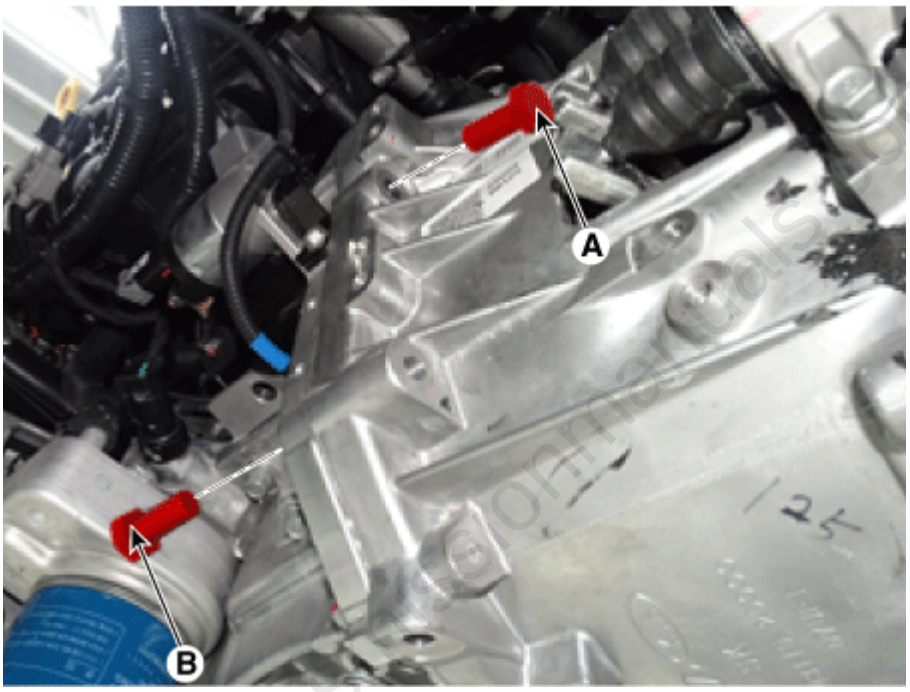
(1)

Loosen the starter mounting bolt (A) and the transmission mounting bolt (B).

Tightening torque :

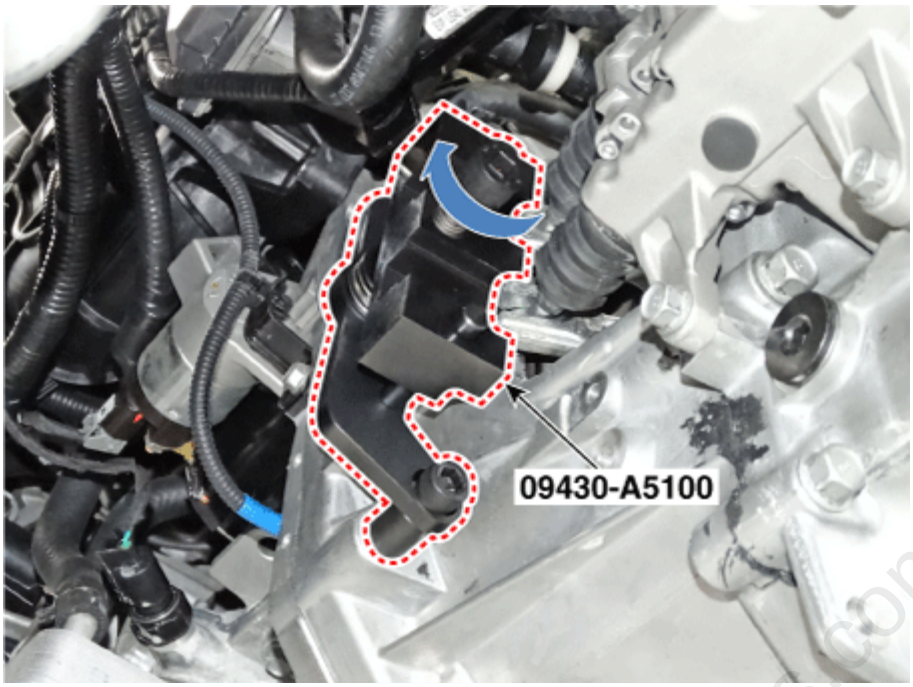
(A) 49.0 - 63.7 N·m (5.0 - 6.5 kgf·m, 36.2 - 47.0 lb·ft)

(B) 42.2 - 53.9 N·m (4.3 - 5.5 kgf·m, 31.1 - 39.8 lb·ft)



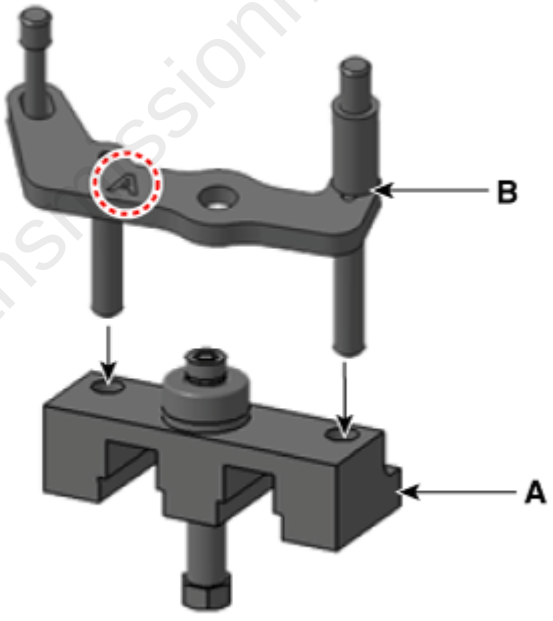
(2)

Fix the clutch fork by installing the special service tool (09430-A5100).



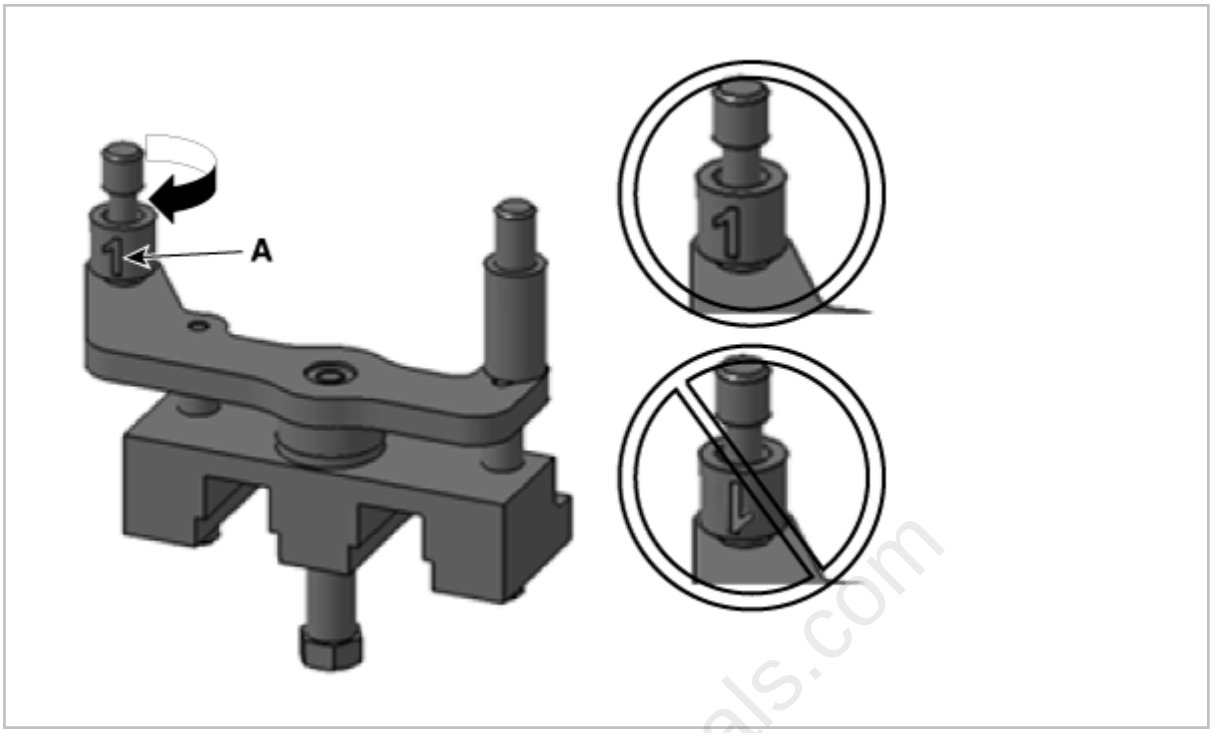
Information

1)
Assemble the adapter-A (B) to main body (A).



2)
Assemble the space bar-1 (A) to adapter after checking direction of spacer bar.

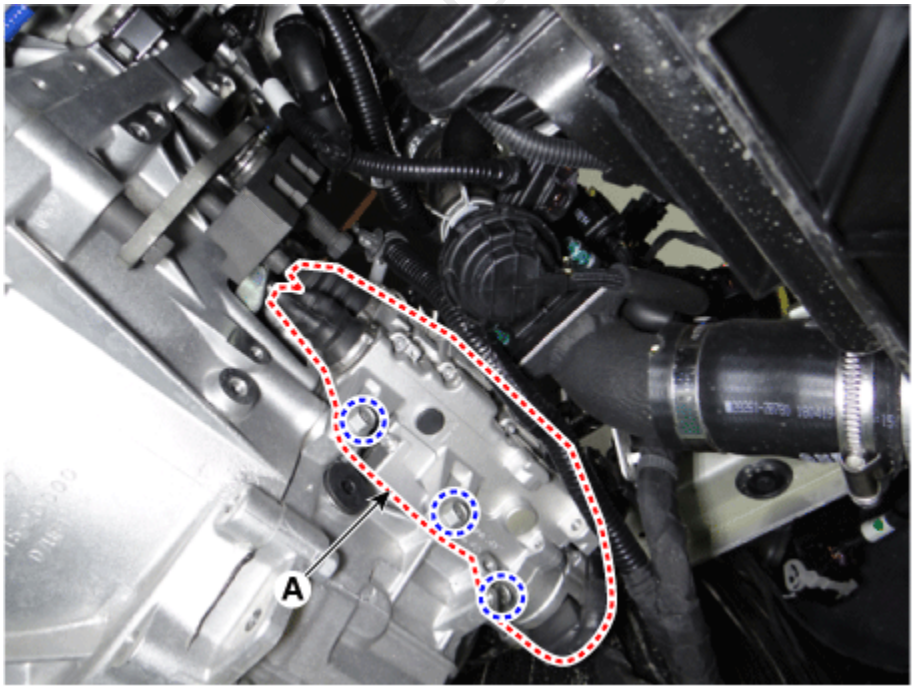
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12. Remove the clutch actuator assembly (A) after loosening the bolts.

Tightening torque :

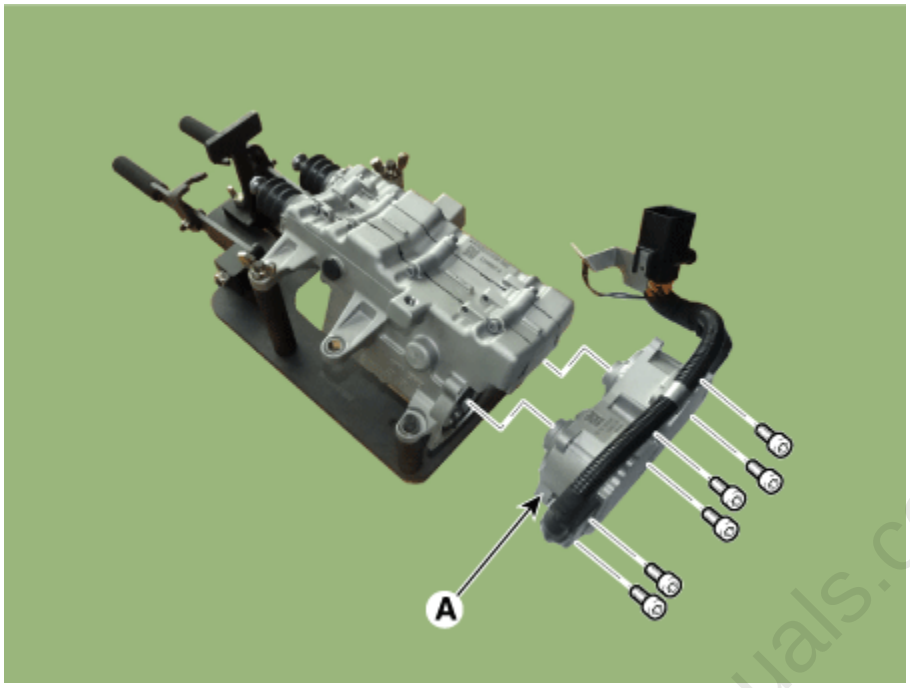
19.6 - 26.5 N·m (2.0 - 2.7 kgf·m, 14.5 - 19.5 lb·ft)



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13.

Remove the clutch actuator motor (A) if it is needed.



Information

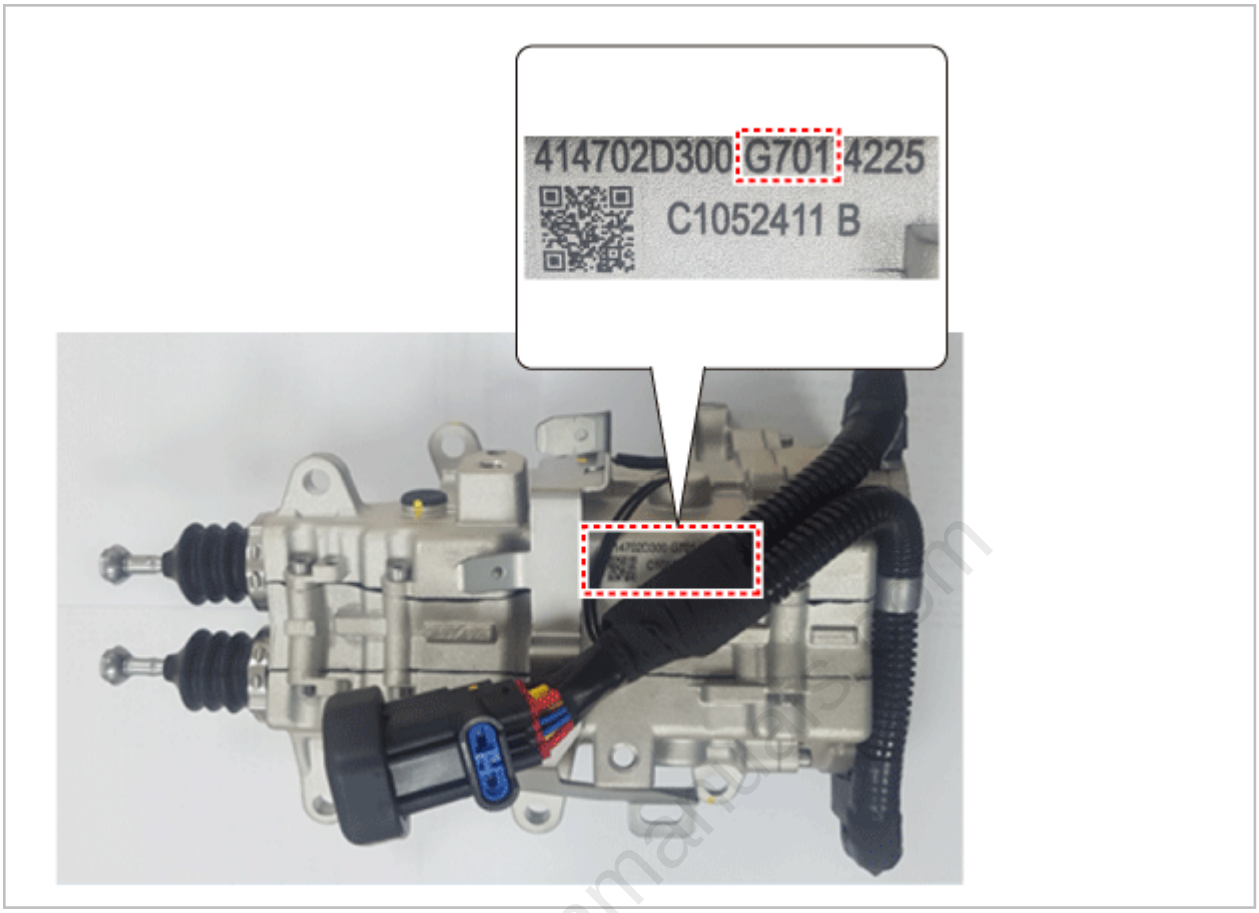
- Check the date of production to define if it is objective vehicle or not when the replacement of clutch actuator motor.
- Date of production : 15.8/17 ~
- The way to find the date of production

– The year of production : F : 2015, G : 2016, H : 2017, I : 2018, J : 2019…

– The month of production : 1 : January, 2 : February, 3 : March, 4 : April, 5 : May, 6 : June, 7 : July, 8 : August, 9 : September, 10 : October, 11 : November, 12 : December

– The day of production : 01 : 1st, 02 : 2nd, 03 : 3rd~ 31 : 31st

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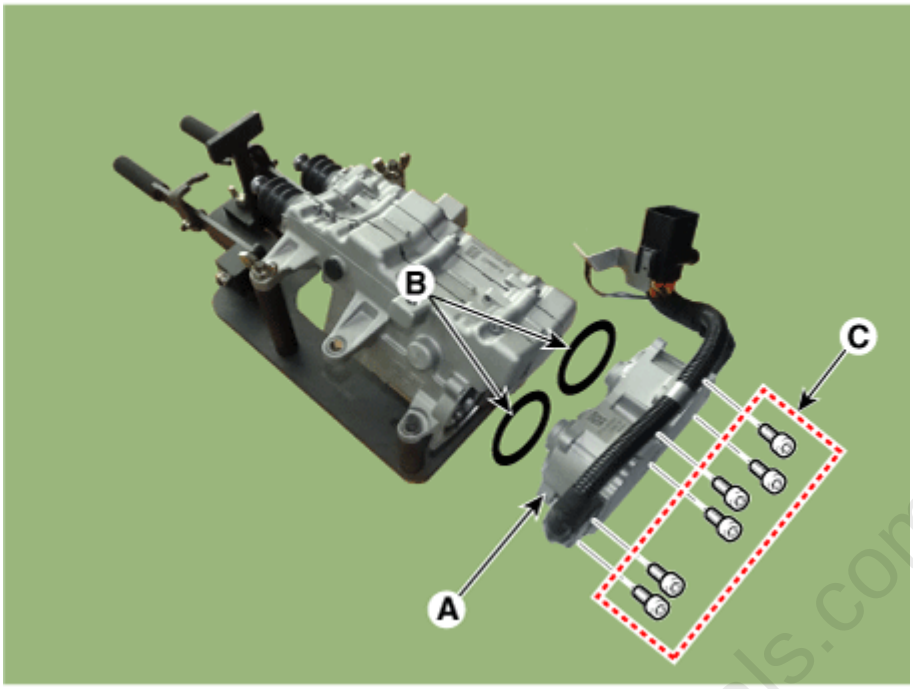
Installation

1. Install in the reverse order of removal.

NOTICE

- The existing O-rings (B) and seal bolts (C) must be replaced with a new one while installing the clutch actuator motor (A). (Do not reuse it)

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- If clutch actuator needs replacement, measure the pull rod length of the old clutch actuator to determine if clutch waer compensation reset is needed.

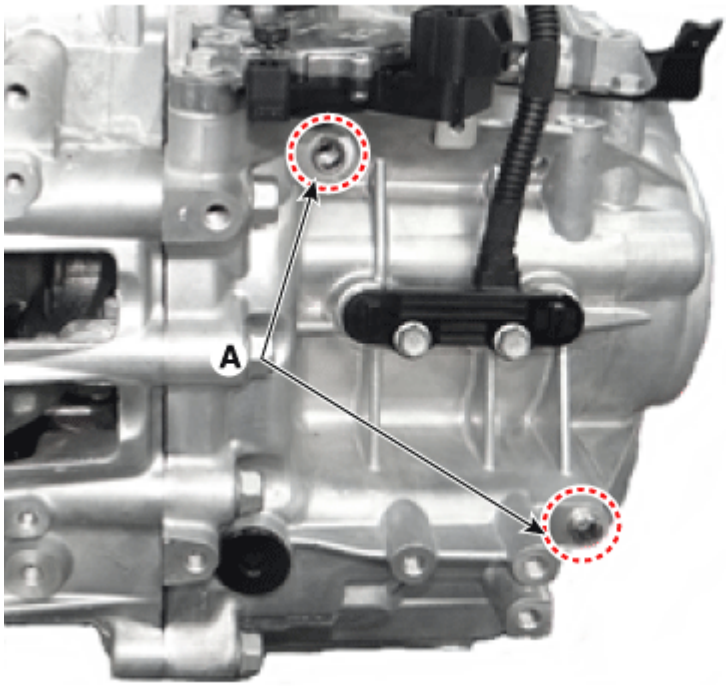
  (Refer to Clutch Actuator Assembly - "Adjusment")

- If needed, perform clutch actuator clutch waer compensation reset .

  (Refer to Clutch Actuator Assembly - "Adjusment")

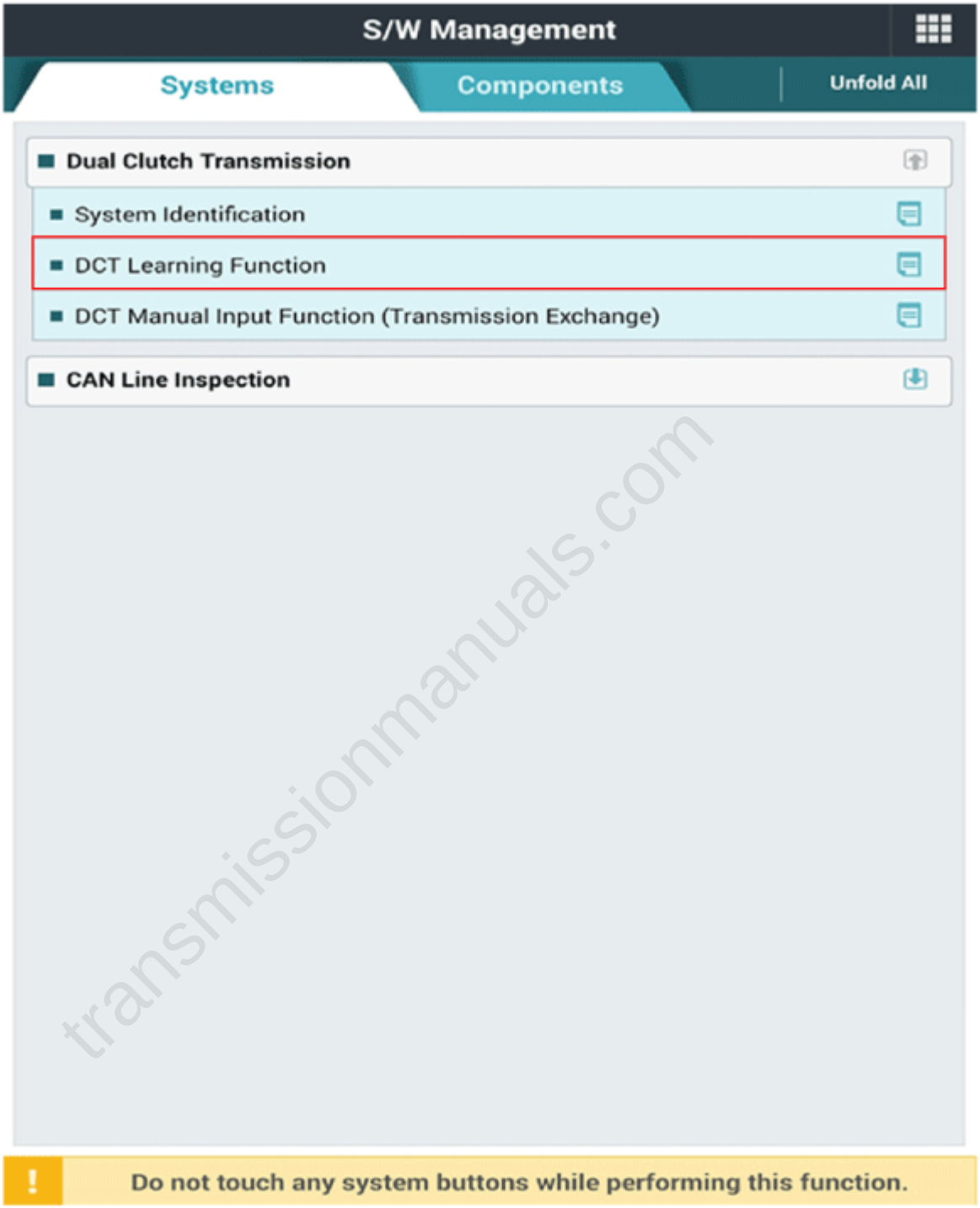
- Check the assembled state of the dowel pins (A) before installing the clutch actuator assembly.

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- Perform the clutch touch point learning procedure using the KDS after replacing the clutch actuator assembly.

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Adjustment

(Refer to the video clip)

NOTICE

Make sure to proceed compensate wear procedure referring to table below incase of a dual clutch aseembly or a clutch actuator replacement.

	Replacement part	Remedy
A	If only 'clutch actuator' has been replaced	Need to rewind rod length
B	If only 'double clutch assembly' has been replaced	Need to initialize rod length
C	If 'double clutch assembly' and 'clutch actuator' both have been replaced	Need to initialize rod length

A. Rewinding rod length (if replacing a clutch actuator only)

NOTICE

Make sure to perform rewinding rod length procedure if replacing a clutch actuator only and reusing a dual clutch assembly.

This procedure is to adjust length of a new clutch actuator rod as an old clutch actuator rod length.

1. Remove the clutch actuator.

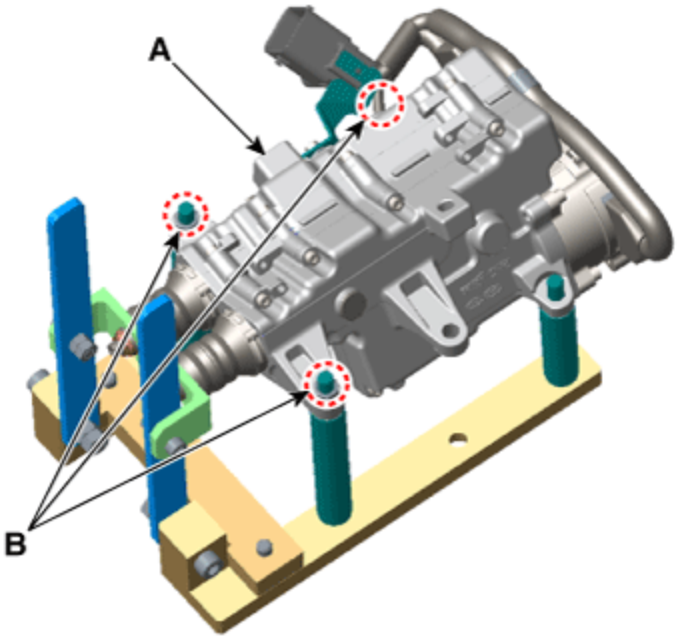
   (Refer to Clutch Actuator Assembly - "Removal")

   Information

   Measure the length of the existing clutch actuator rod which had been installed referring to step 2~3.

2. Fix the clutch actuator (A) which had been removed from vehicle with nut (B) after installing on SST (09430-C1302).

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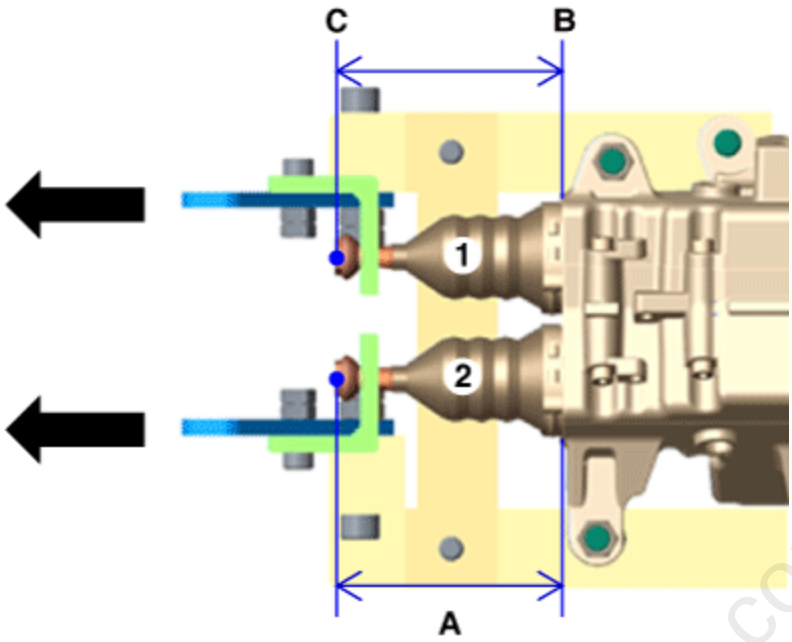
3. Measure and write down length of the old rod in condition of pulling clutch actuator lever.

Old rod length (A) : length from the base surface (C) to the end of the rod (B).

1) Clutch Actuator rod 1

2) Clutch Actuator rod 2

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NOTICE

Replace all of double clutch assembly, clutch actuator and engagement bearing if the rod length is shorter than 46mm / 1.81 in.

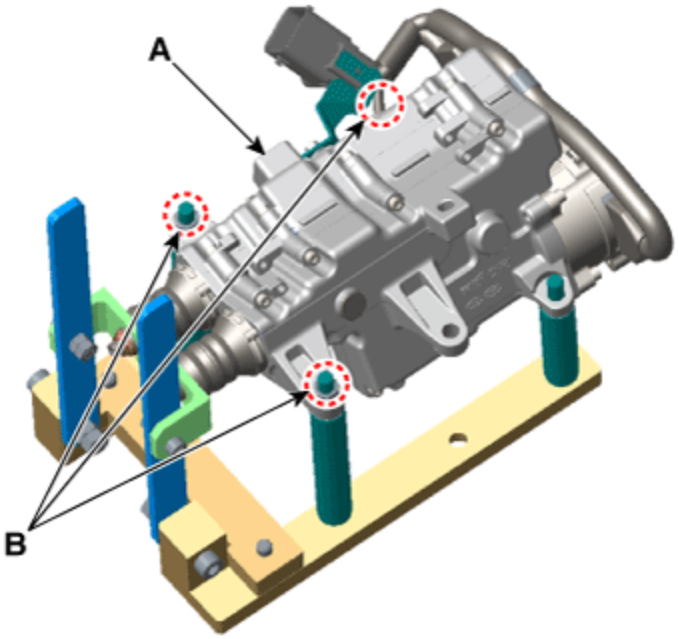
4. Remove the clutch actuator from SST (09430-C1302).

Information

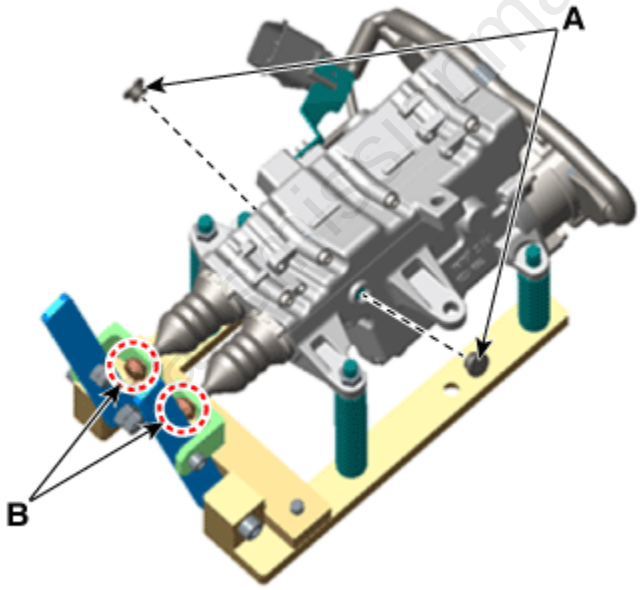
Adjust length of the new clutch actuator rod referring to the procedure 4~16.

5. Fix with nut (B) after installing the new clutch actuator (A) on SST (09430-C1302).

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6. Fix the rod on hook (B) after removing sealing rubber (A).

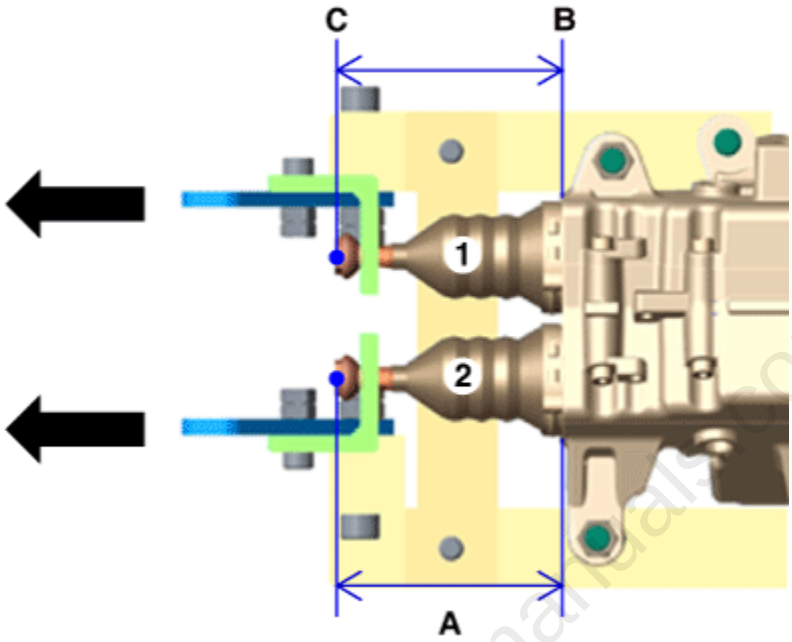


7. Write down after measureing each length of the new rod (A) in condition of pulling the new clutch actuator lever.

New rod length (A) : length from the base surface (C) to the end of the rod (B).

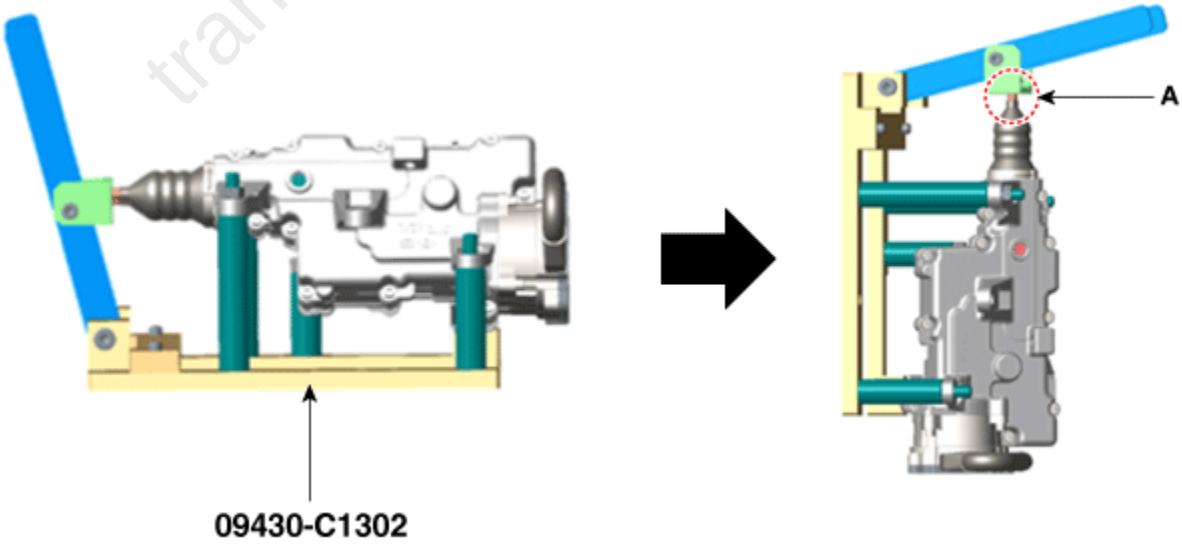
1)
Clutch Actuator rod 1

2)
Clutch Actuator rod 2



8. Stand clutch actuator vertically which is installed with SST (09430-C1302).

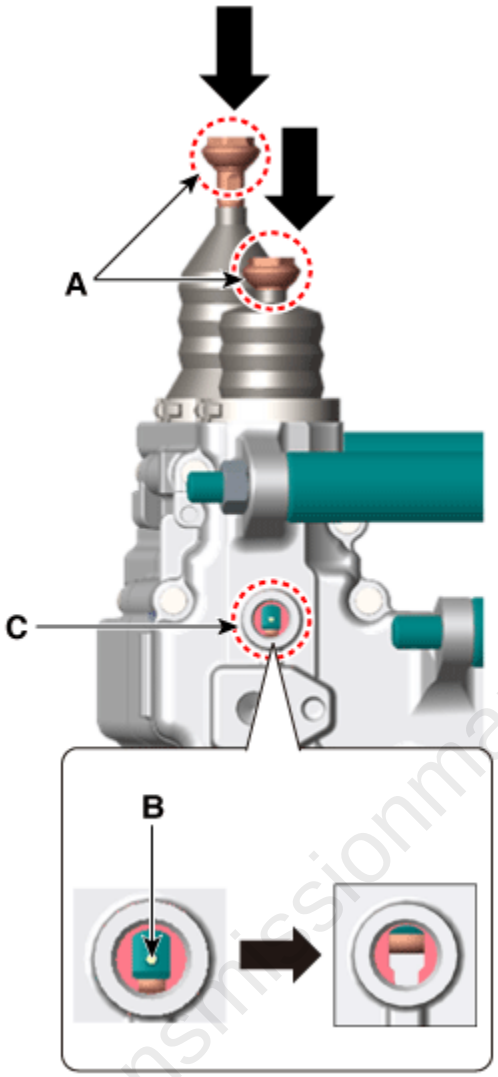
9. Disassemble the clutch actuator hook (A) from the lever of SST.



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10.

Press the end part of rod (A) and release the pressing force when you see the nut bump (B).



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Information

- Light inside of the hole and check the bump inside of it.
- Repeat the operation if the nut bump (B) does not come down to the assembly hole position.
- The nut bump (B) can be moved up a little by sealing boot if the pressing force is released.

Extend length of rod (+) : counterclockwise rotation / 1 rotation (+0.25 mm / +0.009 in)

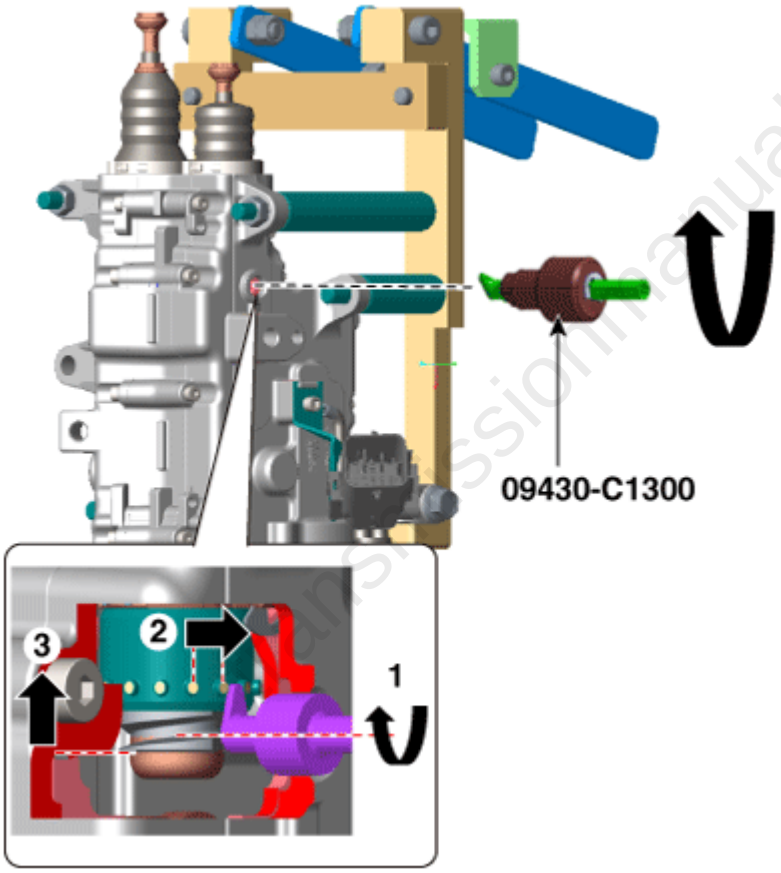
Shorten length of rod (-) : clockwise rotation / 1 rotation (-0.25 mm / -0.009 in)

11. Put SST (09430-C1300) into sealing rubber hole.

Adjust length of a new clutch actuator rod by rotating SST counterclockwise to 'an old rod length' which measured in procedure number 3.

Extend length of rod (+) : counterclockwise rotation / 1 rotation (+0.25 mm / +0.009 in)

Shorten length of rod (-) : clockwise rotation / 1 rotation (-0.25 mm / -0.009 in)



Information

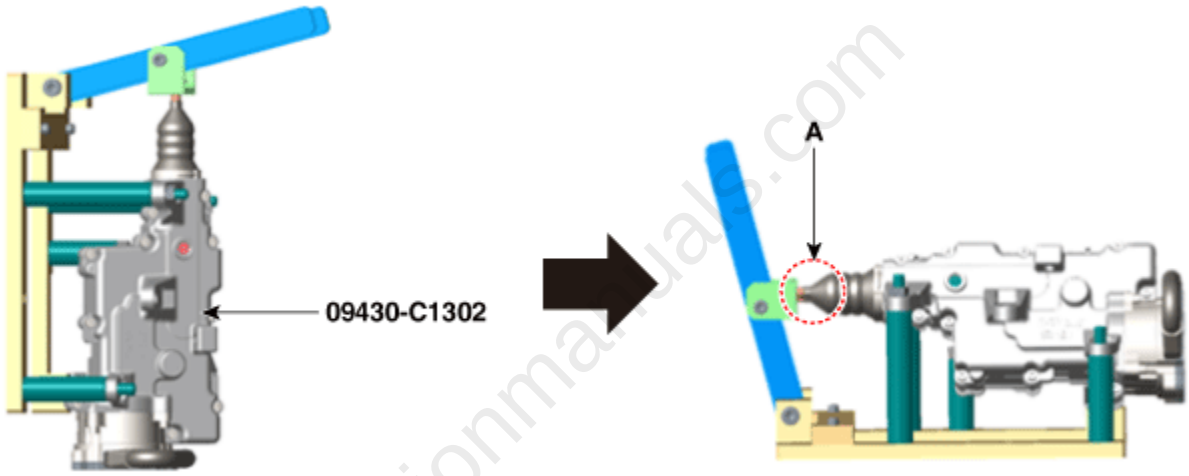
Perform same procedure on opposite side rod.

NOTICE

- It can be a cause of impossiblility to drive or transmission shock of DCT if 'length of the new clutch actuator rod' has not been adjusted same as 'length of the old clutch actuator rod' which is measured in procedure number 3.

12. Lay the clutch actuator horizontally with SST (09320-C1302) installed.

13. Put the clutch actuator hook (A) into the SST lever.



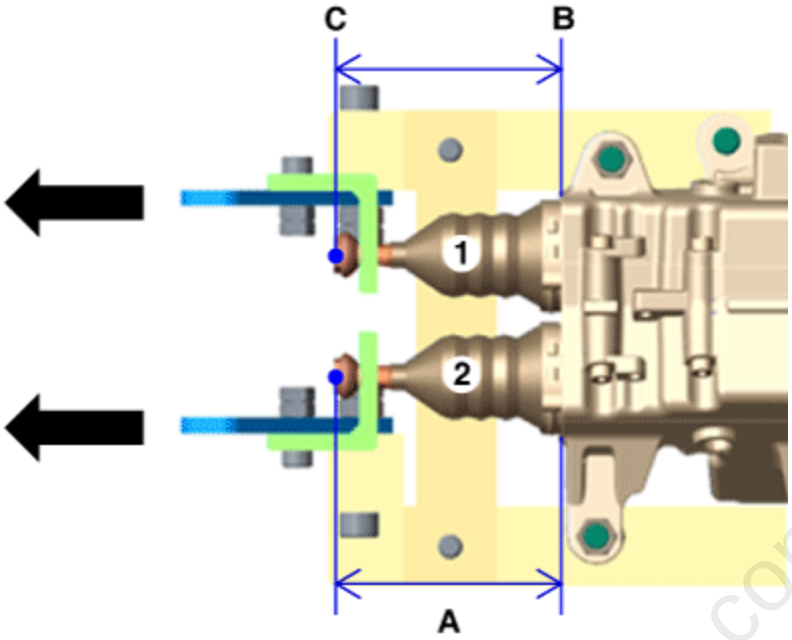
14. Check if 'rod length of the clutch actuator', which is done with adjusting in state of pulling its lever, and 'rod length of the old clutch actuator', which is measured in step number 3, are same.

Rod length (A) : length from the base surface (C) to the end of the rod (B).

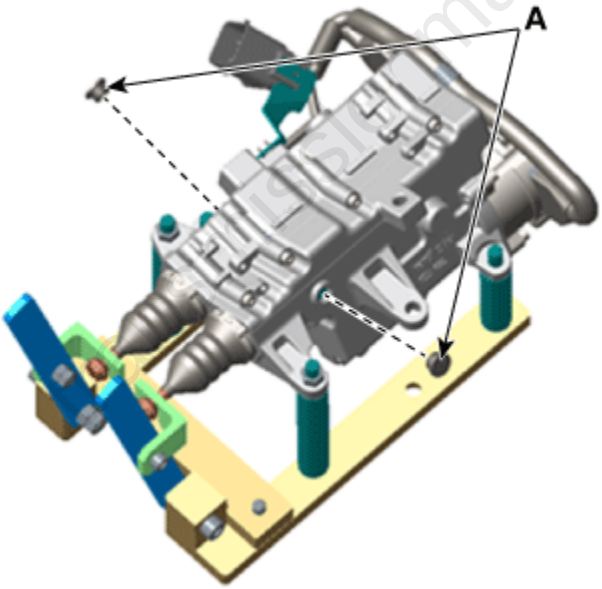
1) Clutch Actuator rod 1

2) Clutch Actuator rod 2

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15.
Install sealing rubber (A).



16.
Remove the clutch actuator from SST (09430-C1302)

B. Rod length initialization (when replace only dual clutch assembly)

NOTICE

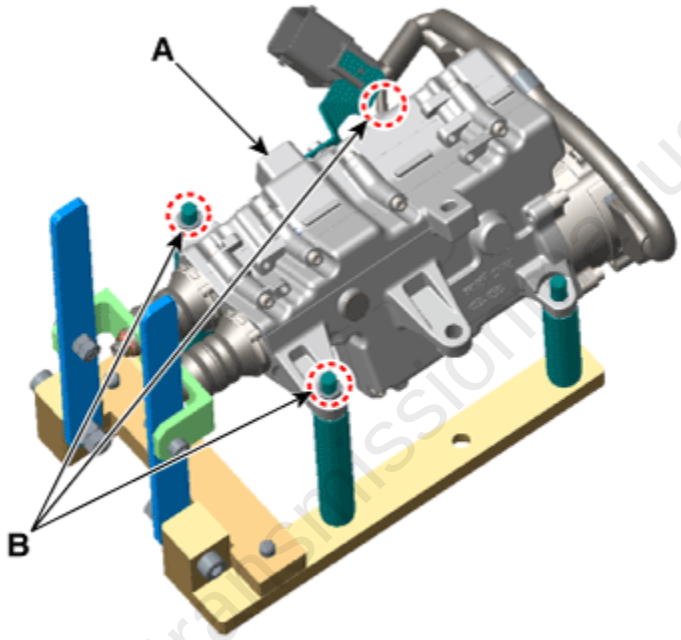
Make sure to perform this procedure if replacing only dual clutch assembly but reusing clutch actuator.

This procedure is adjusting changed existing clutch actuator rod length to a new product rod length.

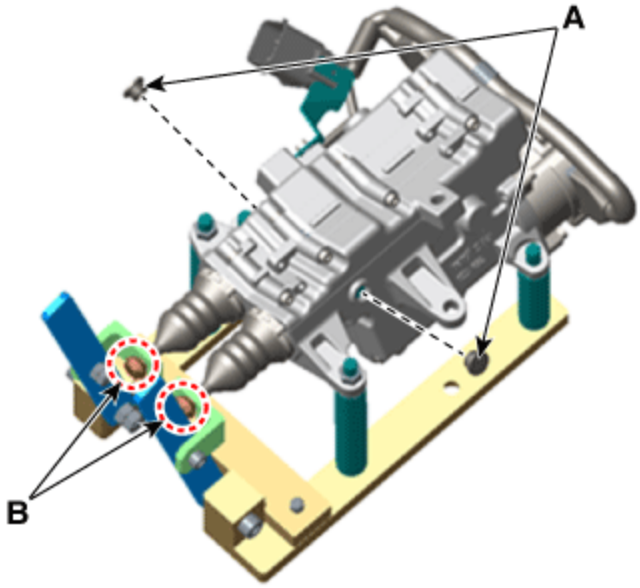
1. Remove the clutch actuator.

   (Refer to Clutch Actuator Assembly - "Removal")

2. Fix the clutch actuator (A) which had been removed from vehicle with nut (B) after installing on SST (09430-C1302).



3. Fix the rod to hook after removing sealing cover (A).



4.

Initialization procedure will be needed if the measure value of each rod length, which measured in state of pulling lever on removed clutch actuator from vehicle, is shorter than initializing length specification.

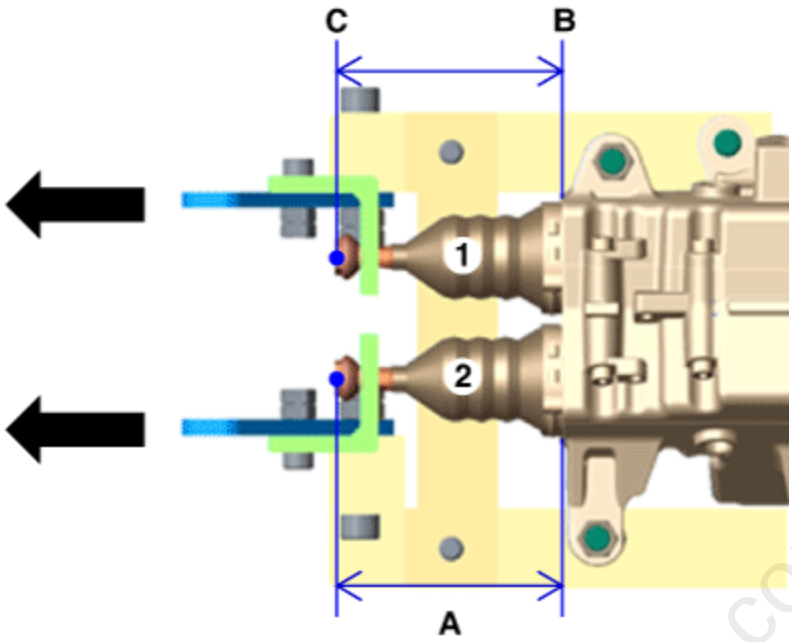
Rod length (A) : length from the base surface (C) to the end of the rod (B).

(initialization length : 71.5 ~ 72.5 mm / 2.81 ~ 2.85 in)

1) Clutch Actuator rod 1

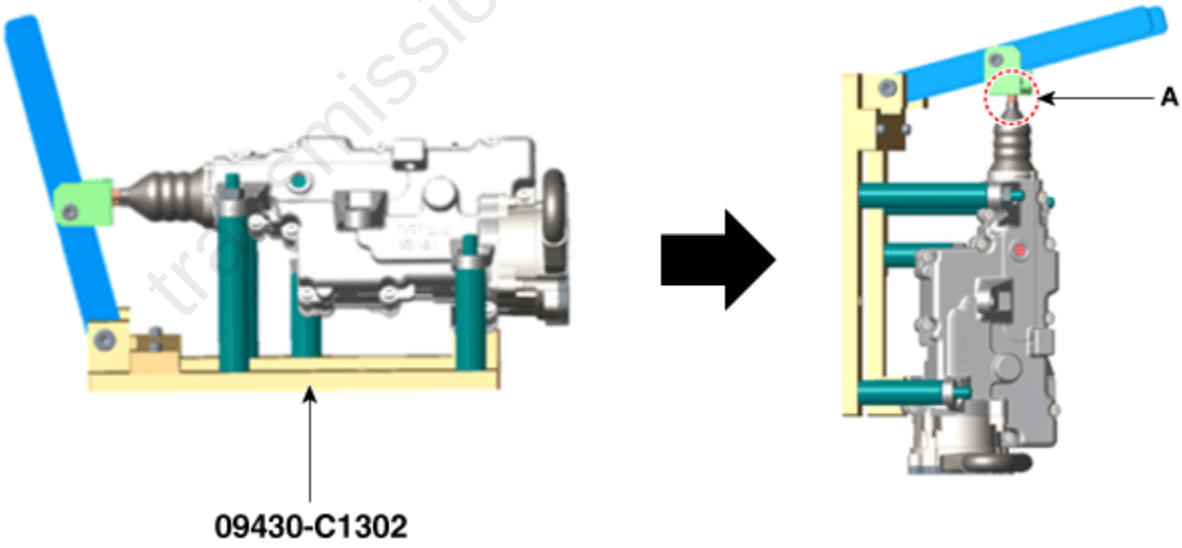
2) Clutch Actuator rod 2

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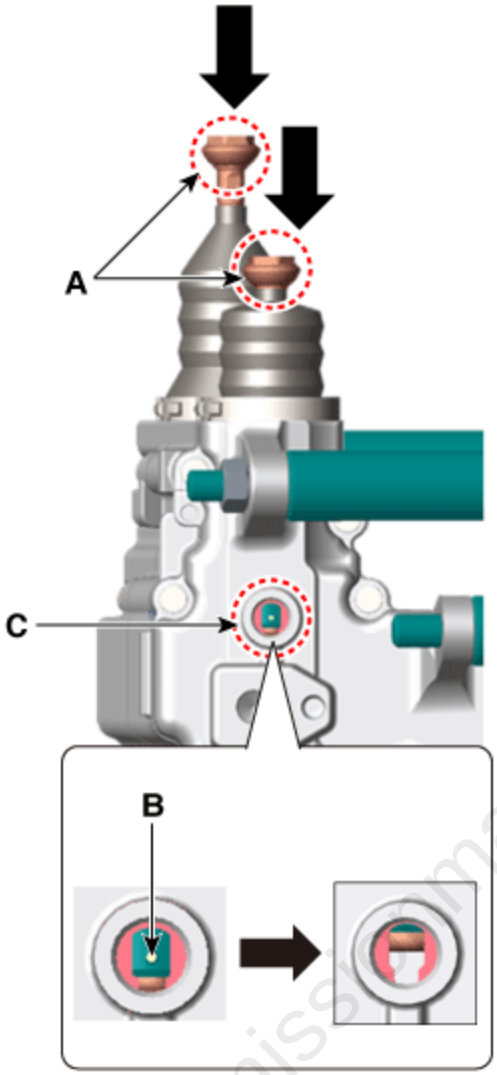
5. Stand the clutch actuator vertically with SST (09430-C1302) installed.

6. Remove the clutch actuator hook (A) from SST lever.



7. Press the end part of rod (A) and release the pressing force when you see the nut bump (B).

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Information

- Light inside of the hole and check the bump inside of it.
- Repeat the operation if the nut bump (B) does not come down to the assembly hole position.
- The nut bump (B) can be moved up a little by sealing boot if the pressing force is released.

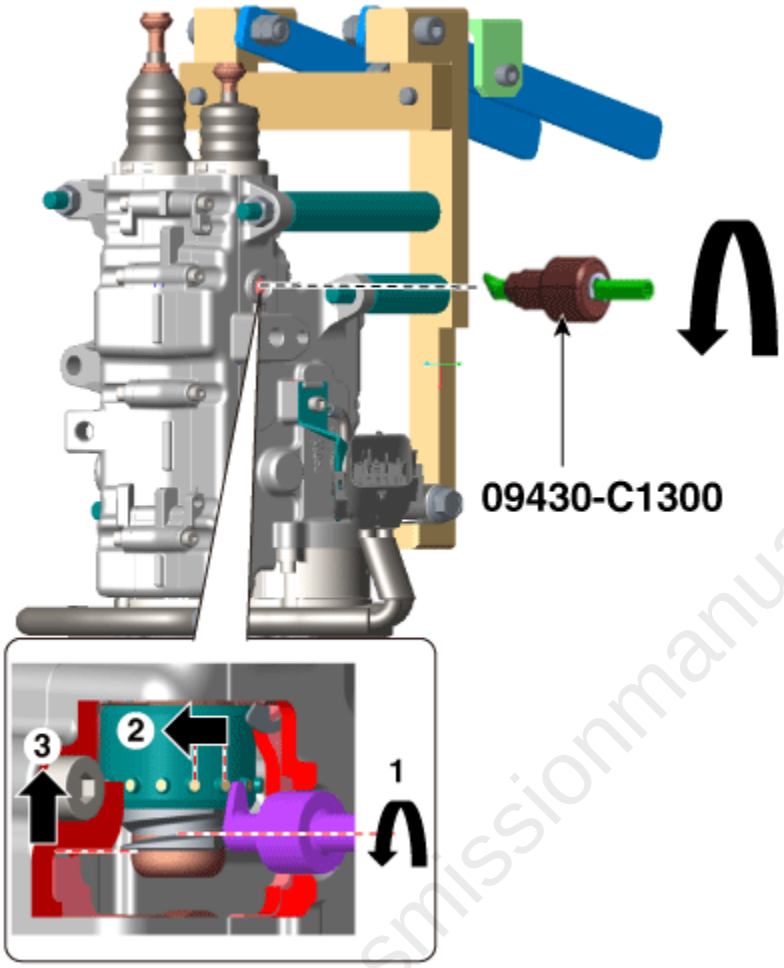
8. Put SST (09302-C1300) into sealing rubber hole.

   Adjust length of the clutch actuator rod by rotating SST counterclockwise.

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Extend length of rod (+) : counterclockwise rotation / 1 rotation (+0.25 mm / +0.009 in)

Shorten length of rod (-) : clockwise rotation / 1 rotation (-0.25 mm / -0.009 in)



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Information

Perform same procedure on opposite side rod.

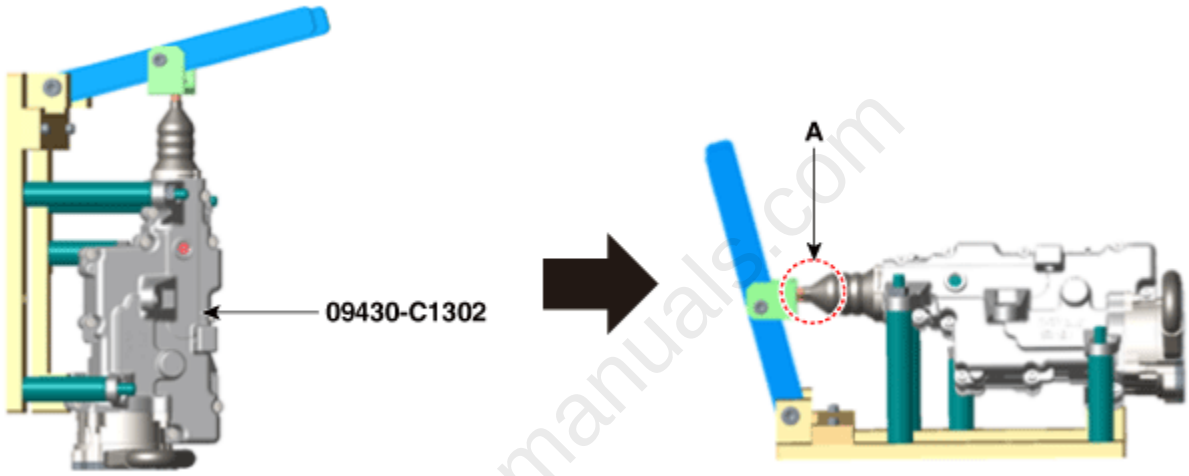
NOTICE

- Be aware not to break the clutch actuator caused by break away inner parts when the SST over rotates counterclockwise.
- It can be a cause of impossiblility to drive or transmission shock of DCT if the rod length is not initialized to (71.5 ~ 72.5 mm / 2.81 ~ 2.85 in) when the initialization of compensate

wear procedure.

9. Lay clutch actuator horizontally with SST (09320-C1302) installed.

10. Put clutch actuator hook (A) into SST lever.



11. Check if 'clutch actuator rod length', which is finally done with adjustment, and 'clutch actuator rod initialization length' are same while pulling clutch actuator lever.

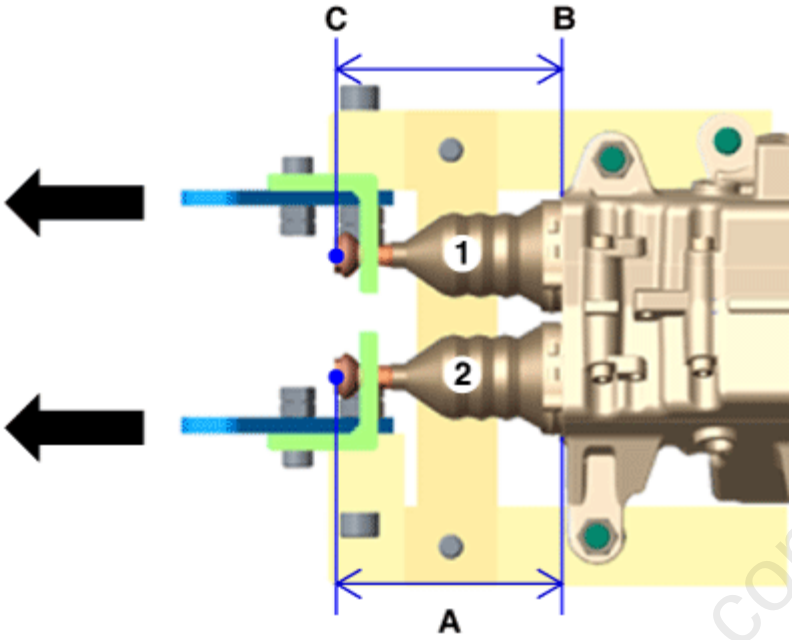
Rod length (A) : length from the base surface (C) to the end of the rod (B).

(initialization length : 71.5 ~ 72.5 mm / 2.81 ~ 2.85 in)

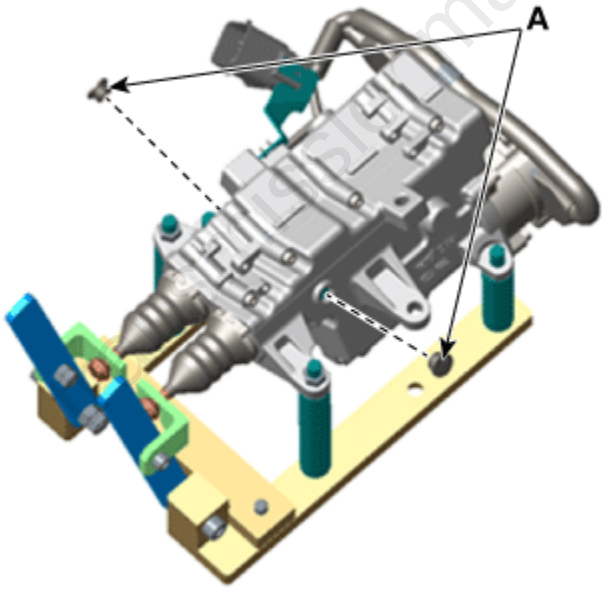
1) Clutch Actuator rod 1

2) Clutch Actuator rod 2

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12.
Install sealing rubber (A).



13.
Remove the clutch actuator from SST (09430-C1302).

DCT Control Module (TCM)
Schematic diagrams TCM Connector TCM

Gear Actuator Assembly
Components and components location

Terminal Function Connector [A] Pin Description Pin Description ...

Component Location 1. Gear actuator assembly 2. Shift motor (Even) 3. Shift motor (Odd) 4. Select solenoid (Even) 5. S ...

Other information:

Kia Forte 2019-2023 (BD) Owners Manual: Winter driving

Severe weather conditions in the winter result in greater wear and other problems. To minimize the problems of winter driving, you should follow these suggestions: Snowy or icy conditions To drive your vehicle in deep snow, it may be necessary to use snow tires on your tires. If snow t ...

Kia Forte 2019-2023 (BD) Service Manual: Heater Unit

Components and components location Component Location 1. Heater unit assembly Compoents [LH] 1. Mode actuator 2. Temperature control actuator [LH] 3. Heater core cover 4. Heater core ...

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