

MTB-2

Manual Transaxle System

General Information

Specifications

Engine type		Diesel 1.6
Transaxle type		M5CF3
Gear ratio	1st	3.636
	2nd	1.962
	3rd	1.189
	4th	0.844
	5th	0.660
	Reverse	3.583
Final gear ratio		3.941

Service Standard

Items	Standard value [in(mm)]
Input shaft rear bearing end play	0.00-0.0019L(0.00-0.05L)
Output shaft bearing end play (At 70kgf load)	0.00-0.0019T(0.00-0.05T)
Input shaft front bearing end play	0.00-0.0019L(0.00-0.05L)
Differential bearing end play (At 70kgf load)	0.0059T-0.0078T(0.15T-0.20T)
Differential pinion backlash	0.0039L MAX(0.1L MAX)

T: Indicate tightening of -(minus) direction of end play

L: Indicate loosening of +(plus) direction of end play

Tightening Torques

Standard value		Nm	kgf.m	lb-ft
Oil drain plug		60-80	6.0-8.0	43.4-57.8
Oil filler plug		60-80	6.0-8.0	43.4-57.8
Shift control cable bracket on transaxle side		20-27	2.0-2.7	14.5-19.5
Rear roll support bracket bolt		50-65	5.0-6.5	36.2-47.0
Front roll support bracket bolt		50-65	5.0-6.5	36.2-47.0
Transaxle support bracket bolts		60-80	6.0-8.0	43.4-57.8
Transaxle mounting bracket bolts		90-110	9.0-11.0	65.1-79.5
Clutch release lever fulcrum bolt		55-60	5.5-6.0	39.8-43.4
Transaxle upper mounting bolts		60-80	6.0-8.0	43.4-57.8
Transaxle lower mounting bolts	TM → ENG	43-55	4.3-5.5	31.1-39.8
	ENG → TM	35-50	3.5-5.0	25.3-36.2

⚠ WARNING

Always follow torque tightening levels. Failure to follow such levels can result in parts breaking if over-tightened or loosening if under-tightened. In

either case, serious personal injury or death could result to vehicle occupants.

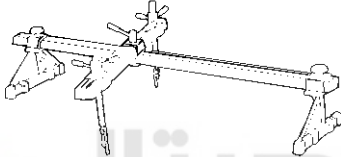
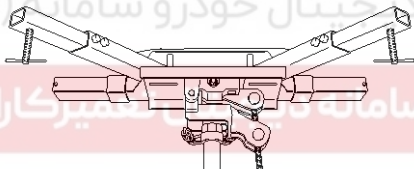
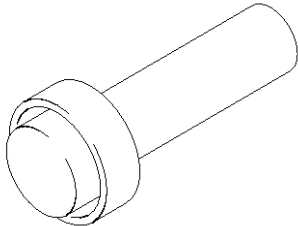
General Information

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Lubricants

Items	Recommend lubricant	Quantity
Transaxle gear oil	SAE 75W/85 API GL-4 TGO-7(MS517-14) ZIC G-F TOP 75W/85 HD GEAR OIL XLS 75W/85	2.0l(2.1US qt, 1.76Imp qt)
Air Breather	MS721-38	As required
Transaxle housing	MS721-40 or MS721-38	As required
Surface of release fork and bearing	Grease (CASMOLY L9508)	As required

Special Service Tools

Tool (Number and Name)	Illustration	Use
09200-38001 Engine support fixture	 D0038001	Removal and installation of the transaxle
09624-38000 Crossmember supporter	 EKBF005A	Supporting of crossmember
09453-2F300 Oil seal installer	 AKGF020D	Installation of differential oil seal

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Troubleshooting

Symptom	Probable cause	Remedy
Vibration, noise	Loose or damaged transaxle and engine mounts	Tighten or replace mounts
	Inadequate shaft end play	Correct end play
	Worn or damaged gears	Replace gears
	Inadequate grade of oil	Replace with specified oil
	Low oil level	Replenish
	Inadequate engine idle speed	Adjust idle speed
Oil leakage	Broken or damaged, oil seal or O-ring	Replace control cable oil seal or O-ring
Hard shift	Faulty control cable	Replace control cable
	Poor contact or wear of synchronizer ring and gear cone	Correct or replace
	Inadequate grade of oil	Replace with specified oil
Jumps out of gear	Worn gear shift fork or broken poppet spring	Replace shift fork or poppet spring
	Synchronizer hub-to-sleeve spline clearance too large	Replace synchronizer hub and sleeve

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



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Service Adjustment Procedure

Transaxle Gear Oil Level

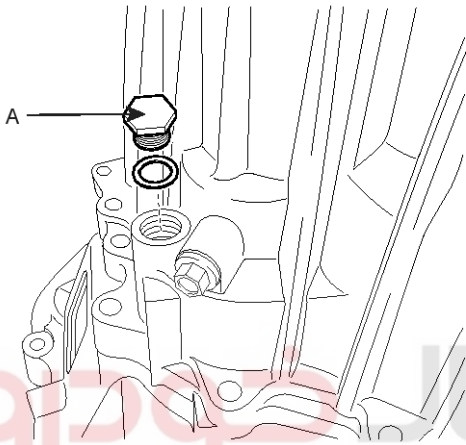
Inspection

Inspect each component for evidence of leakage.

Check the gear oil level by removing the filler plug.

If the oil is contaminated, it is necessary to replace it with new oil.

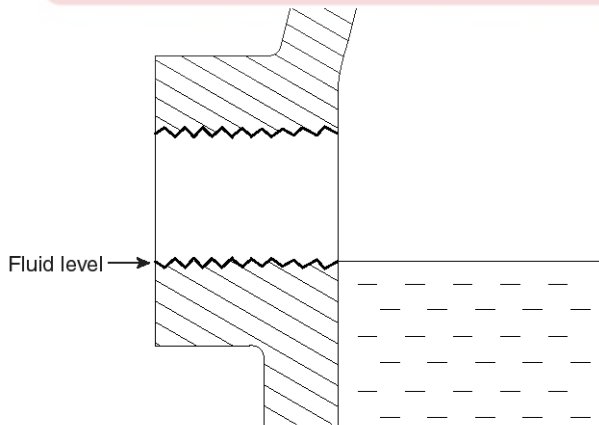
1. Remove oil filler plug(A).



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2. Check level with finger.

Oil level must be up to fill the hole, if not, add oil until it runs over.



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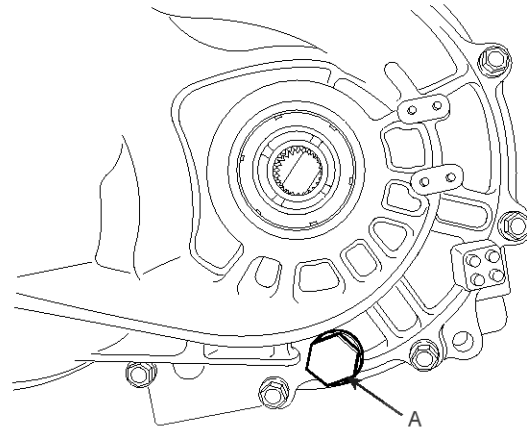
3. Install filler plug.

Tightening torque :

60-80 Nm (6.0-8.0 kgf.m, 43.4-57.8 lb-ft)

Replacement

1. With the vehicle parked on a level surface, remove the drain plug.
2. Drain the transaxle oil after loosening the drain plug(A).



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3. Install the drain plug with new washer.

Tightening torque :

60-80 Nm (6.0-8.0 kgf.m, 43.4-57.8 lb-ft)

4. Add new oil through the filler plug hole and, fill it just below the plug opening.

Standard oil SAE 75W/85, API GL-4

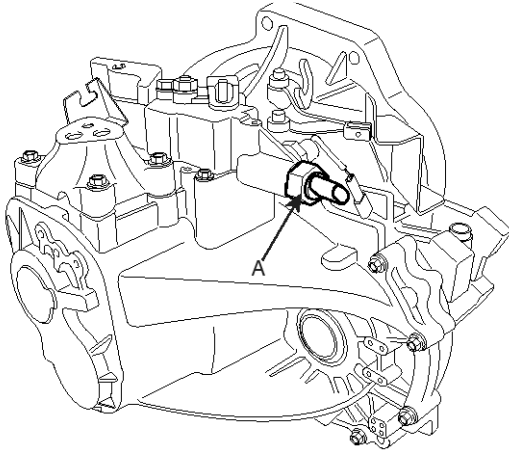
Oil capacity: 1.9 liter (2.0 US qt, 1.67 Imp qt)

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Backup Lamp Switch

Inspection

1. Disconnect the backup lamp switch(A).



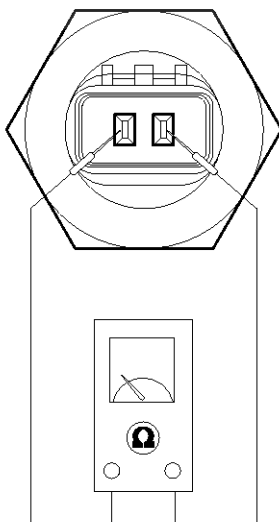
BMJF002C

2. Check the continuity between no. 1 and 2 terminals of backup lamp switch.

When the shift lever is in reverse, there should be continuity.

Condition	1	2
Reverse Range	●	●
Other Range		

*The back up Lamp "ON" shall keep over 0.5mm(0.02in) From ON-OFF point.



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Manual Transaxle System

3. If necessary, repair or replace the backup lamp switch.

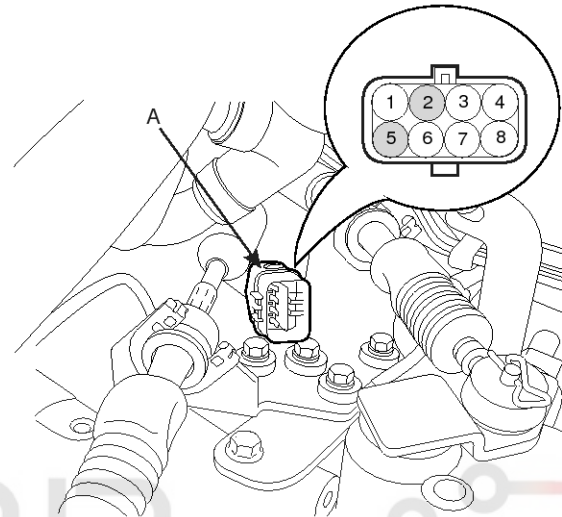
Tightening torque :

30-35 Nm (3.0-3.5 kgf.m, 21.7-25.3 lb-ft)

Neutral Switch

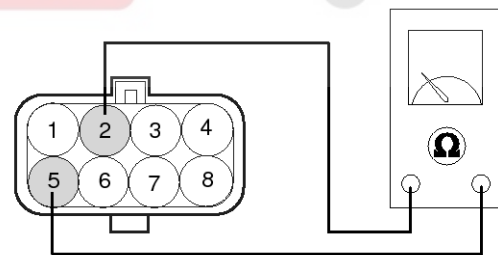
Inspection

1. Disconnect the common connector (A).



SEDMB7001L

2. Check the continuity between no. 2 and 5 terminals when the shift lever is in neutral position. If there isn't continuity, go to next step.

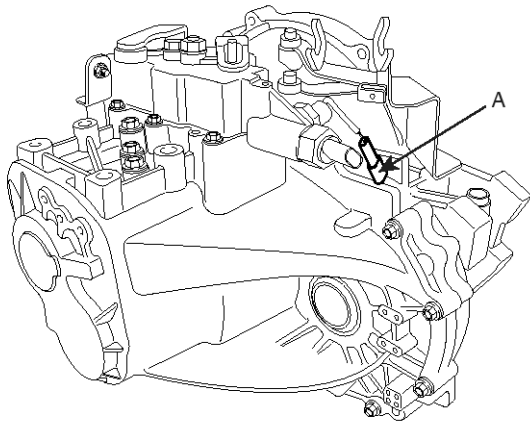


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Manual Transaxle System

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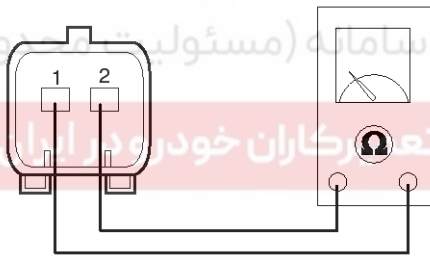
3. Disconnect the neutral switch connector (A).



ANJF003B

4. Check the continuity between no. 1 and 2 terminals of neutral switch, when the shift lever is in neutral position, there should be continuity.

Condition	1	2
Neutral	●	●
Other		



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5. If necessary, repair or replace the neutral switch.

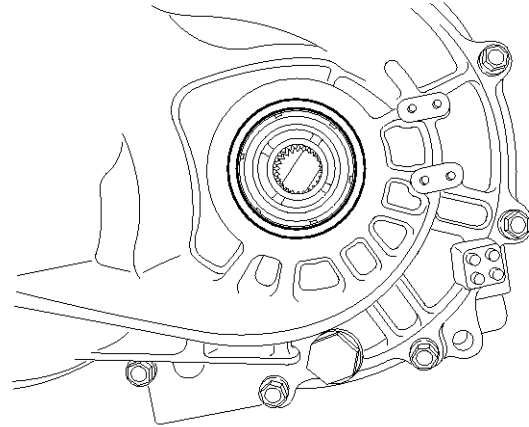
Tightening torque :

35-42 Nm (3.5-4.2 kgf.m, 25.3-30.3 lb-ft)

Drive Shaft Oil Seal

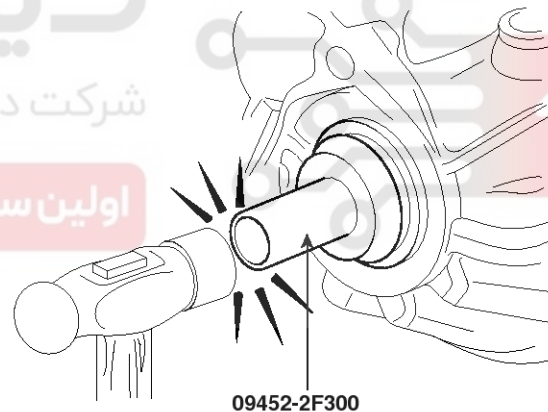
Replacement

1. Disconnect the drive shaft from the transaxle. (refer to Drive shaft in DS group)
2. Using a flat-tip screwdriver, remove the oil seal.



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3. Using the special tool(09453-2F300), tap the drive shaft oil seal into the transaxle.



09452-2F300

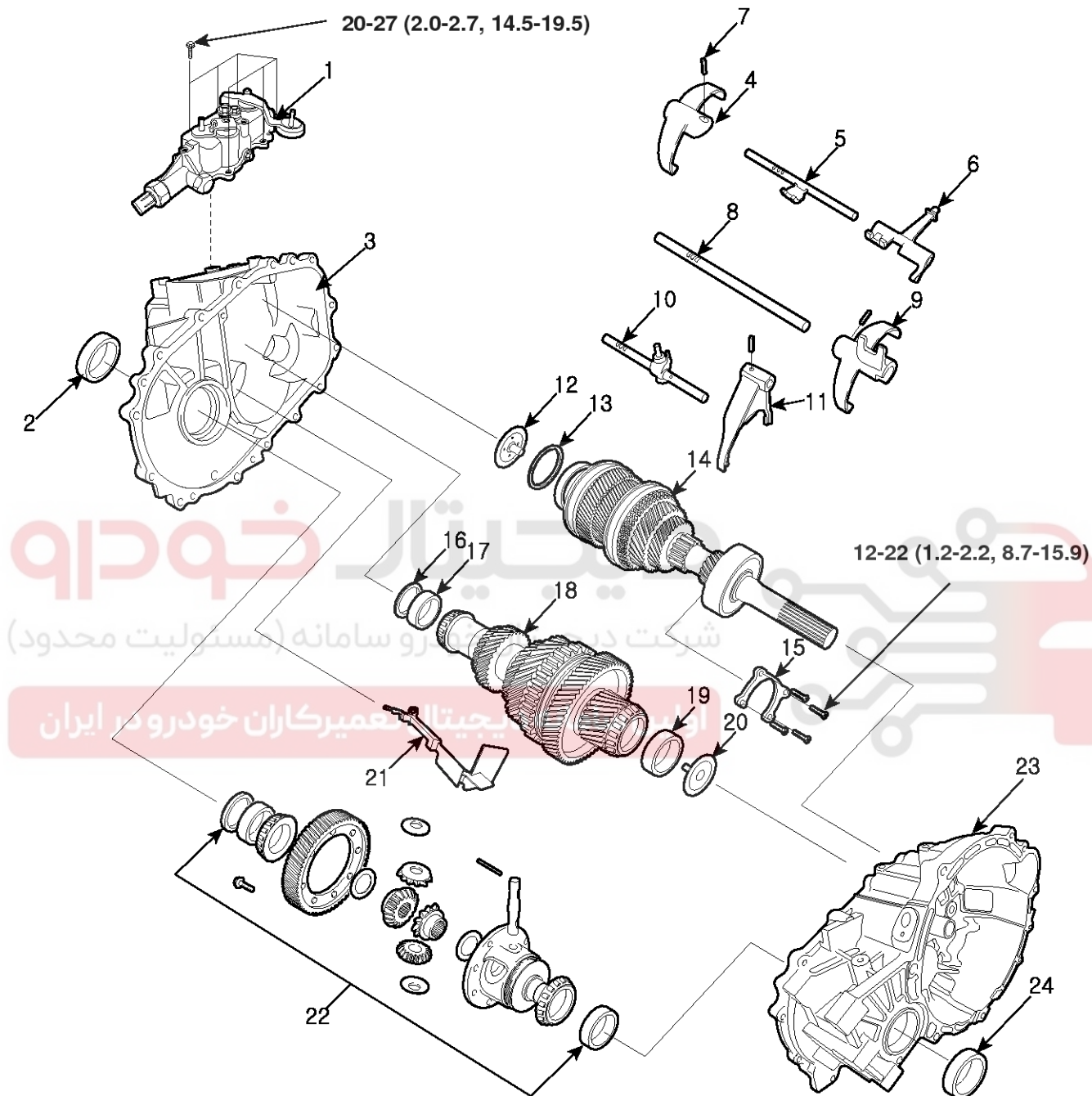
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Manual Transaxle

Components



TORQUE:Nm(kgf.m, lb-ft)

- | | | |
|---------------------------|----------------------------------|------------------------------------|
| 1. Control shaft complete | 9. 3rd & 4th shift lug and fork | 17. Output shaft rear outer racer |
| 2. Oil seal (LH) | 10. 1st & 2nd shift rail | 18. Output shaft assembly |
| 3. Transaxle case | 11. 1st & 2nd shift fork | 19. Output shaft front outer racer |
| 4. 5th shift fork | 12. Input shaft oil guide | 20. Output shaft oil guide |
| 5. 5th shift rail | 13. Snap ring | 21. Oil guide |
| 6. Reverse shift lug | 14. Input shaft assembly | 22. Differential assembly |
| 7. Spring pin | 15. Input shaft bearing retainer | 23. Clutch housing |
| 8. 3rd & 4th shift rail | 16. Spacer | 24. Oil seal (RH) |

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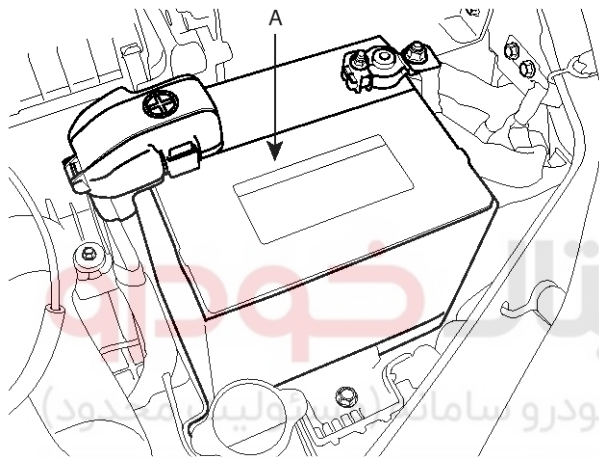
Removal

⚠ CAUTION

- Use fender covers to avoid damaging painted surfaces.
- To avoid damage, unplug the wiring connectors carefully while holding the connector portion.

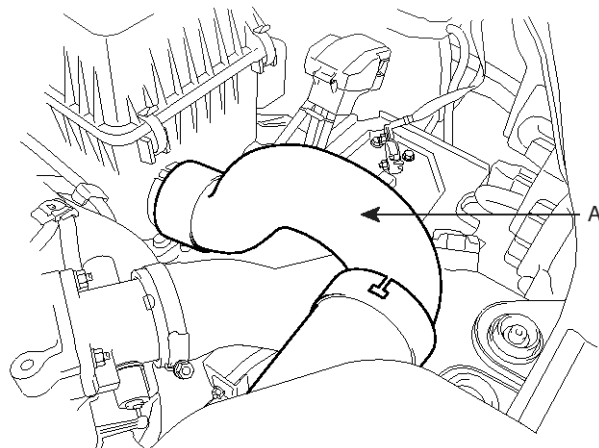
📖 NOTICE

- Mark all wiring and hoses to avoid misconnection.
1. Remove the engine cover. (refer to Engine and Transaxle Assembly in EM group)
 2. Remove the battery (A) after removing the battery terminal.



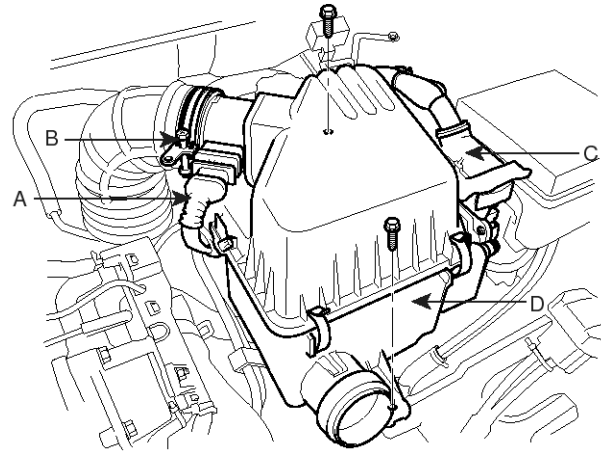
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3. Remove the air duct (A).



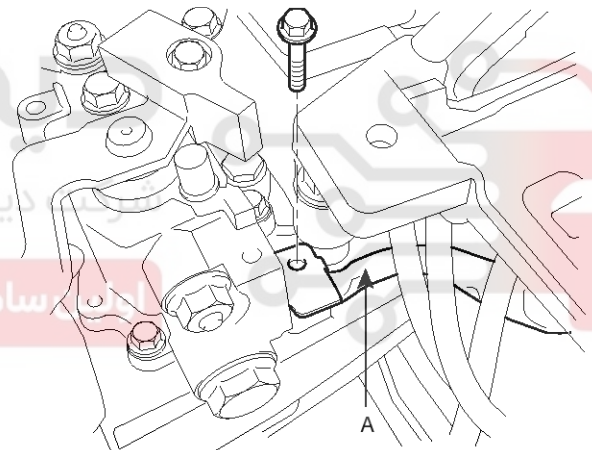
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4. Remove the air cleaner assembly (D) by disconnecting the AFS (Air flow sensor) connector (A), the clamp (B), and the ECM connector (C).



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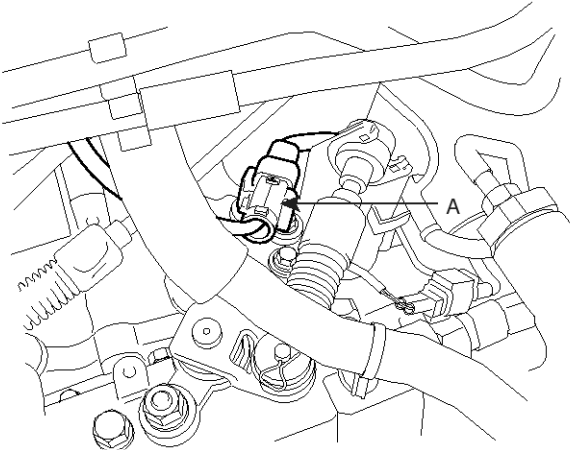
5. Remove the ground cable from transaxle (A).



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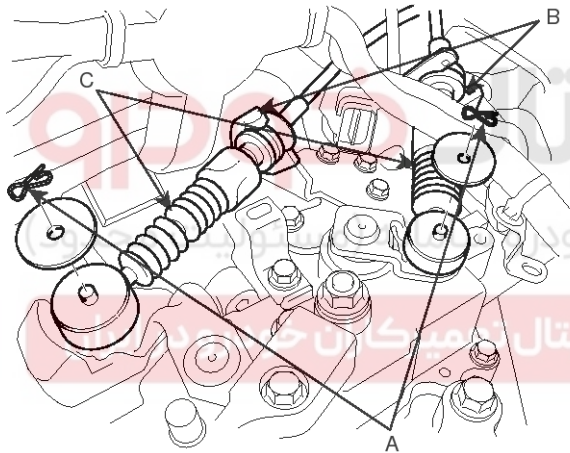
MTB-10

6. Disconnect the vehicle speed sensor and the back lamp switch integrated connector (A).



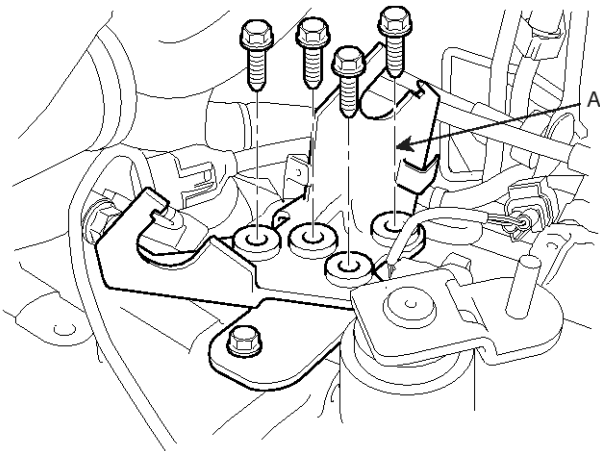
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7. Remove the control cable assembly (C) by removing the snap pins (A) and clips (B).



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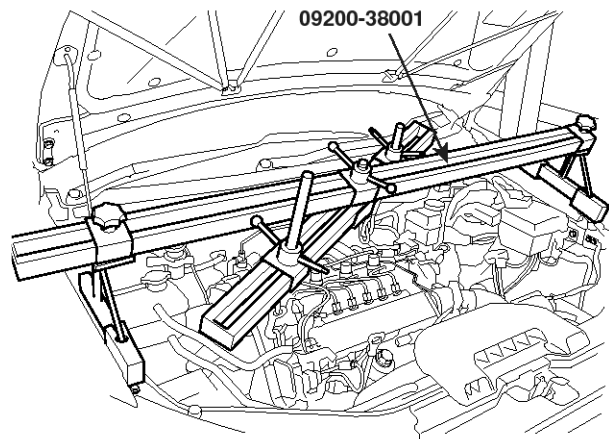
8. Remove the shift control cable bracket (A).



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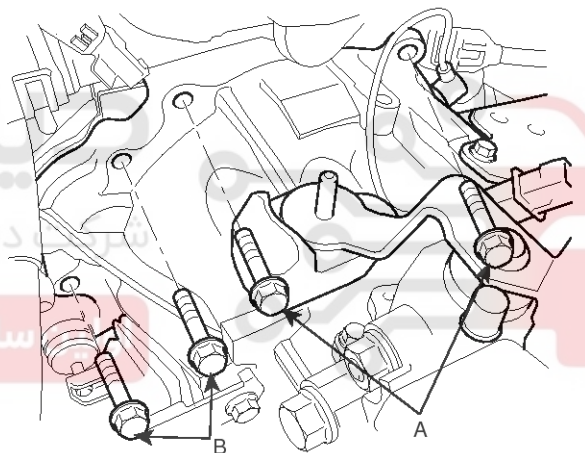
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9. Using the special tool (09200-38001), support the engine assembly safely.



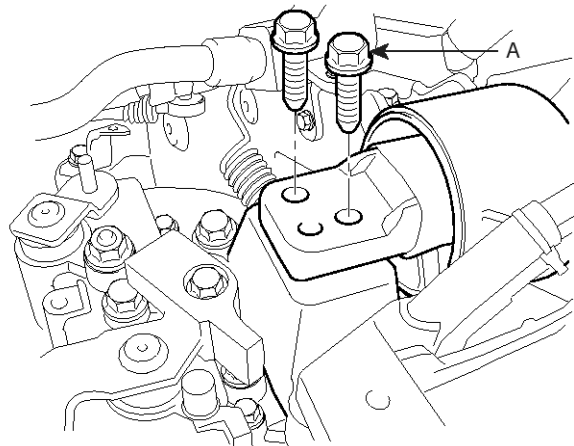
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10. Remove the transaxle upper mounting bolts (A-2ea) and the starter motor mounting bolts (B-2ea).



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11. After removing the four bolts, take the transaxle insulator mounting bracket (A) off.

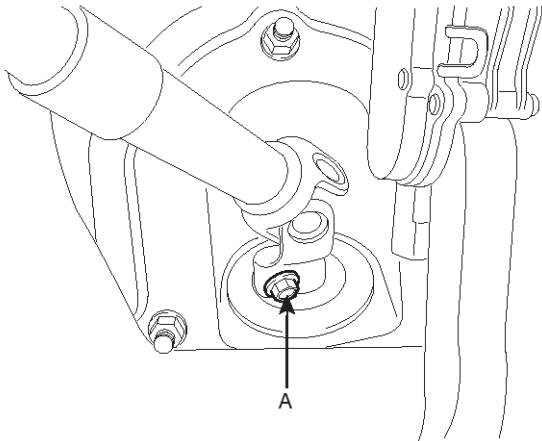


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MTB-11

12. Remove the steering joint assembly bolt. (refer to Steering column/shaft in ST group)



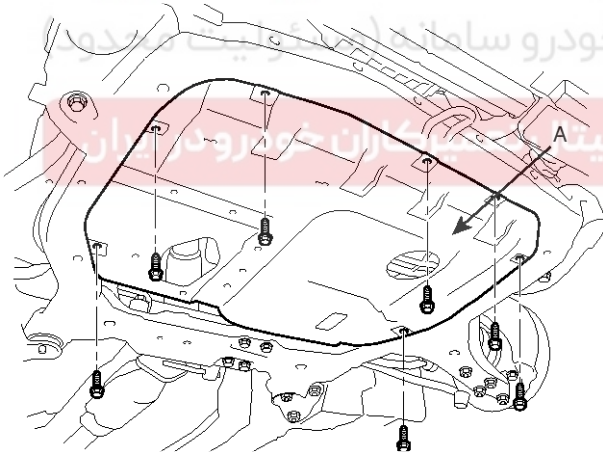
AKGF032S

13. Lifting up the vehicle.

14. Remove the front wheels and tires.

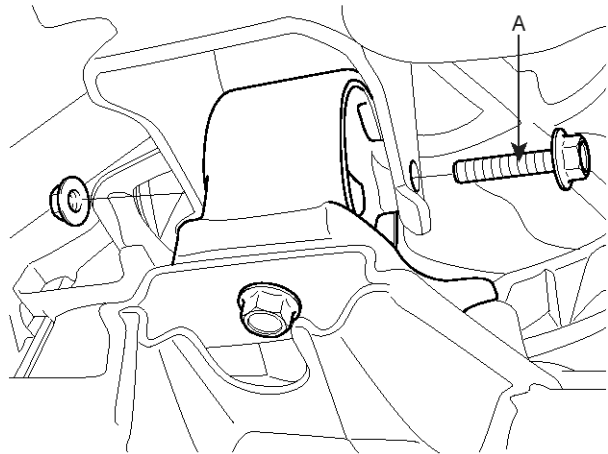
15. Remove the lower arm ball joint mounting nut, the stabilizer link mounting nut, and the tie rod end mounting nut from the front knuckles. (refer to Front suspension system in SS group)

16. Remove the under shield cover (A).

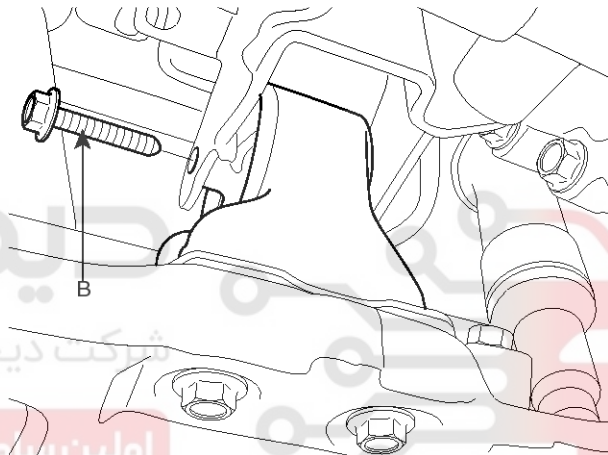


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17. Remove the roll stopper mounting bolts (A,B).

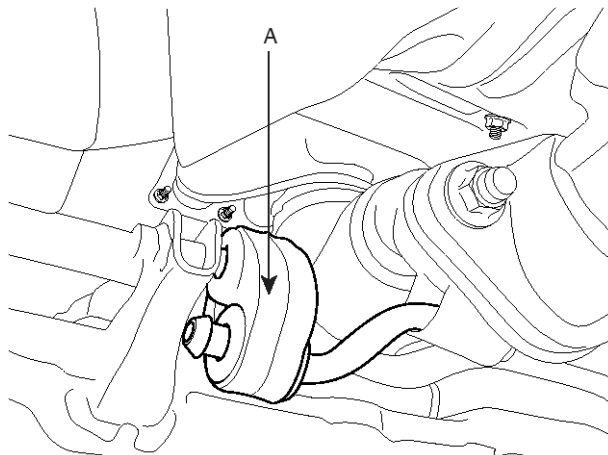


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SHDAT6018D

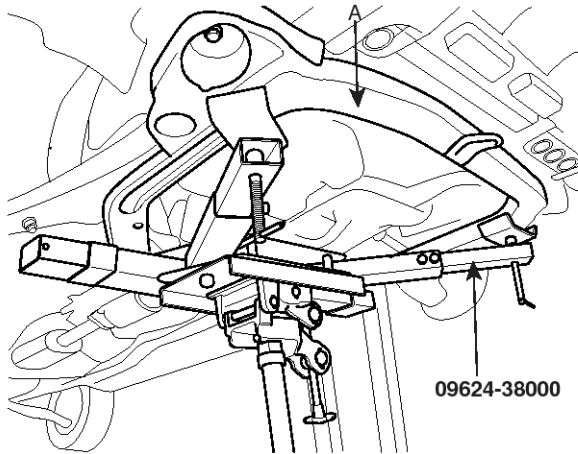
18. Disconnect the muffler hanger rubber (A)



SHDAT6019D

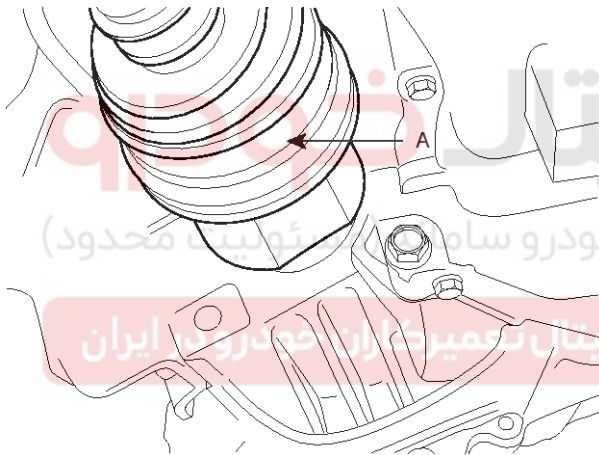
MTB-12

19. Supporting the sub frame (A) with a jack and the Special tool (09624-38000), remove the mounting bolts.(refer to Stabilizer removal in SS group)

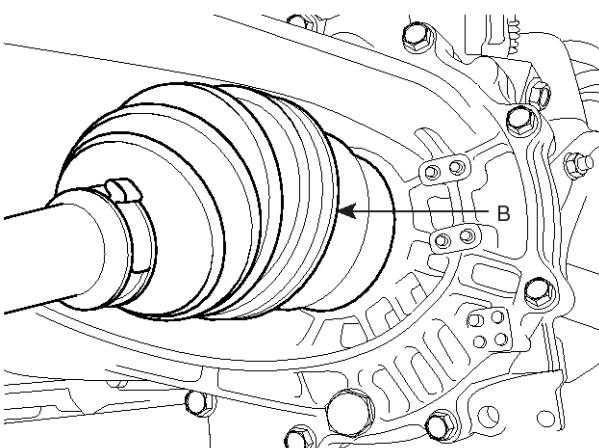


SHDAT6051D

20. Disconnect the drive shafts (A,B) from the transaxle.



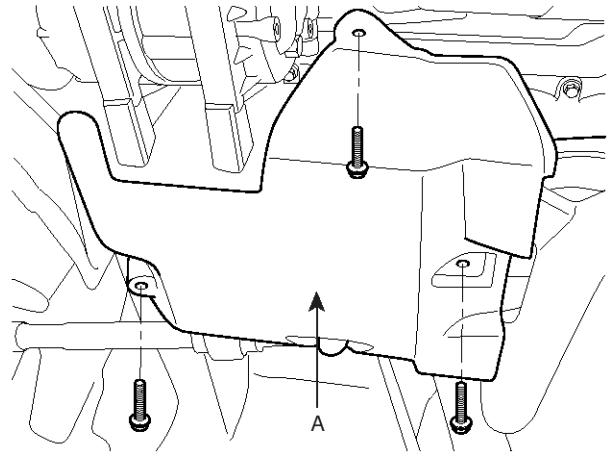
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SEDMA7004L

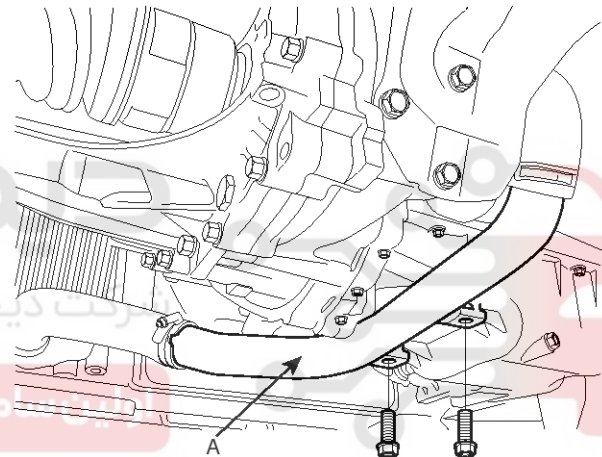
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21. Remove the oil pan protecting cover (A).



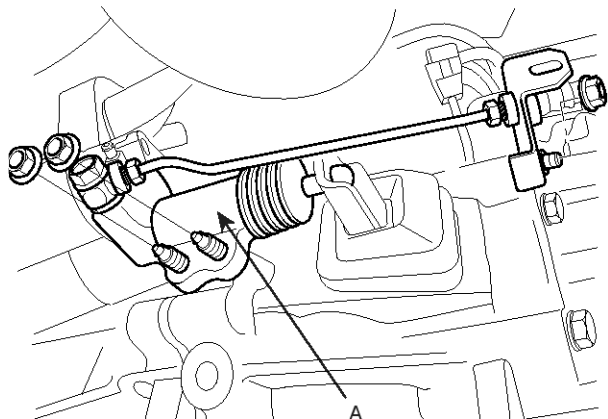
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22. Remove the intercooler hose (A).



SHDMB6015D

23. Remove the clutch release cylinder assembly (A).

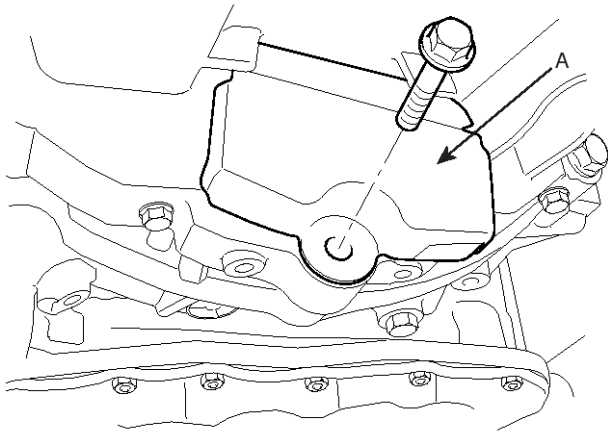


SFDMT8002L

Manual Transaxle System

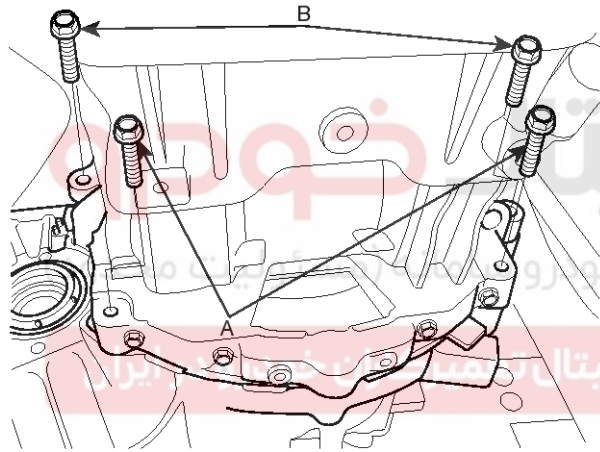
MTB-13

24. Remove the transaxle housing guide (A).



SHDAA6004D

25. Supporting the transaxle with a jack, remove the transaxle lower mounting bolts (A-2ea, B-2ea).



SFDMB8001L

26. Lowering the jack slowly, remove the transaxle.

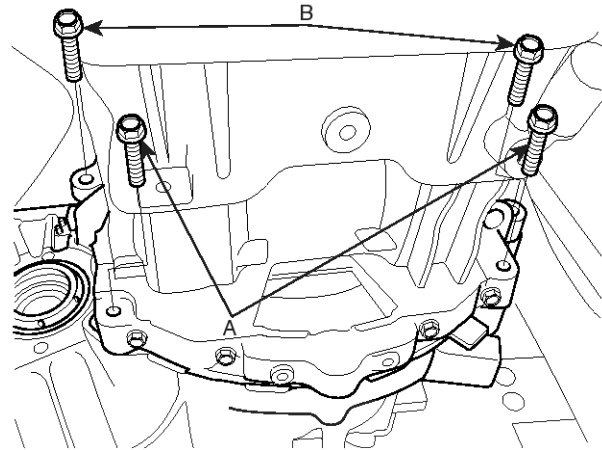
Installation

1. Install the transaxle lower mounting bolts (A-2ea, B-2ea) after fitting the transaxle assembly into the engine assembly.

Tightening torque :

[A] 35-50Nm (3.5-5.0kgf.m, 25.3-36.2lb-ft)

[B] 43-55Nm (4.3-5.5kgf.m, 31.1-39.8lb-ft)

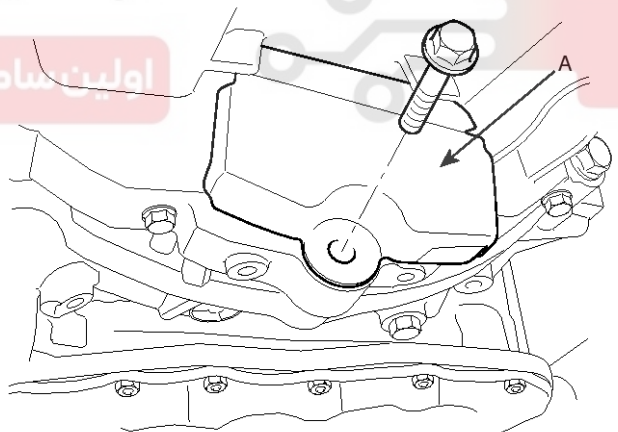


SFDMB8001L

2. Install the transaxle housing guide (A).

Tightening torque :

30-42Nm (3.0-4.2kgf.m, 21.7-30.4lb-ft)



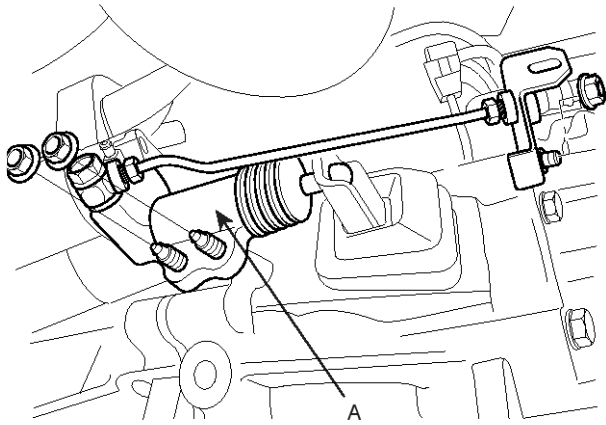
SHDAA6004D

MTB-14

3. Install the clutch release cylinder assembly (A).

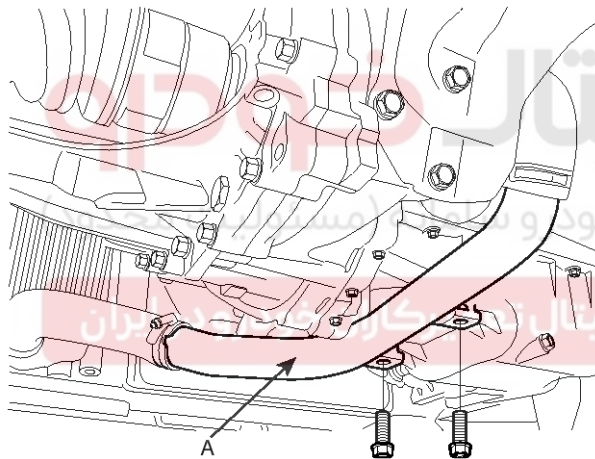
Tightening torque :

15-22Nm (1.5-2.2kgf.m, 10.8-15.9lb-ft)



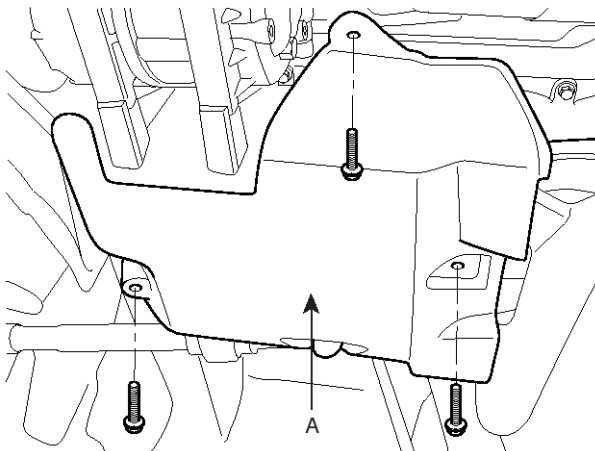
SFDMT8002L

4. Install the inter cooler hose (A).



SHDMB6015D

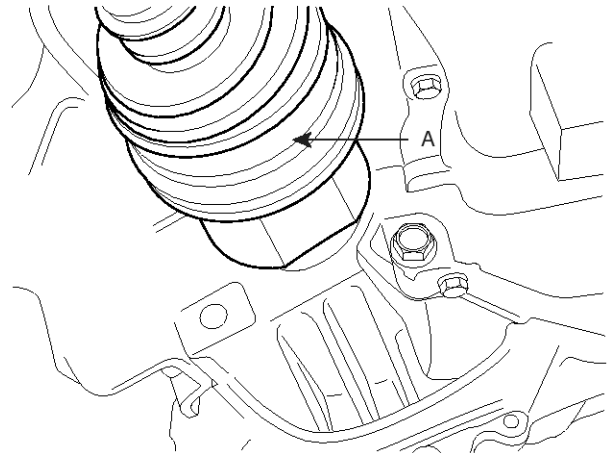
5. Install the oil pan protecting cover (A).



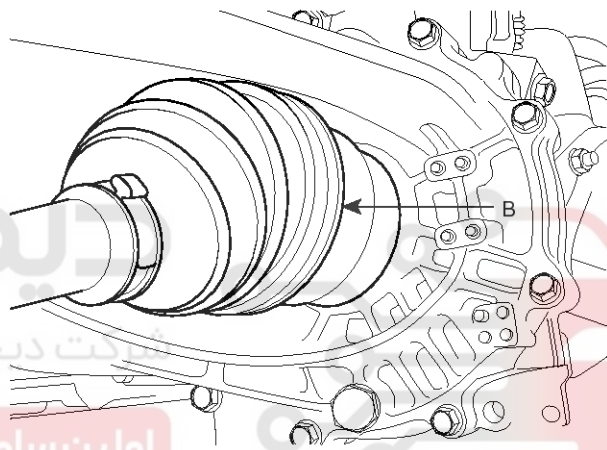
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6. Connect the drive shafts (A,B) to the transaxle.



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SEDMA7004L

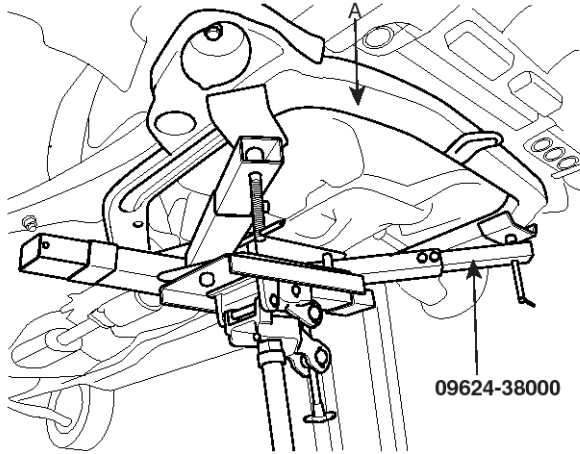
Manual Transaxle System

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7. Supporting the sub frame (A) with a jack and the Special tool(09624-38000), install the mounting bolts. (refer to Stabilizer installation in SS group)

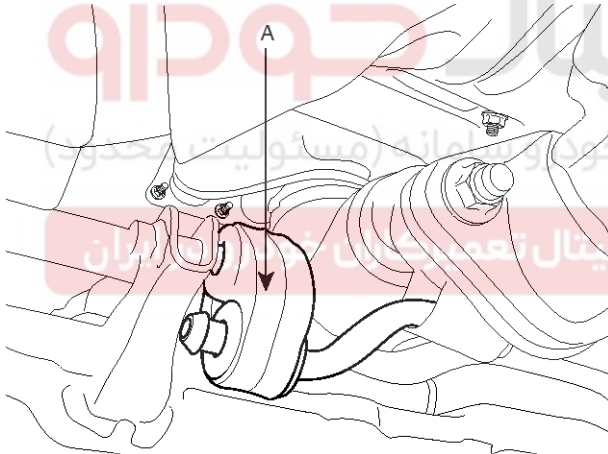
Tightening torque :

140-160Nm (14-16kgf.m, 101-118lb-ft)



SHDAT6051D

8. Install the muffler hanger rubber (A).

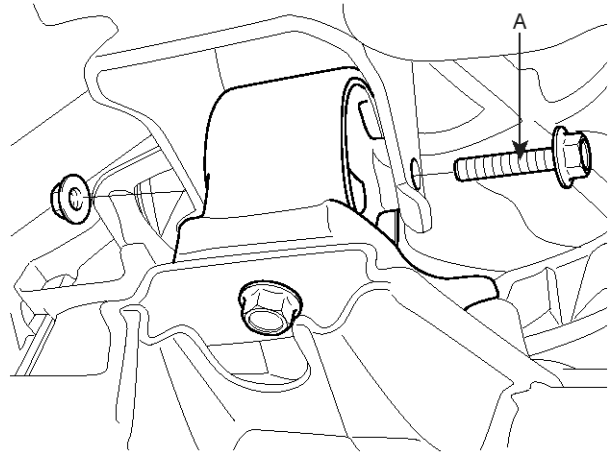


SHDAT6019D

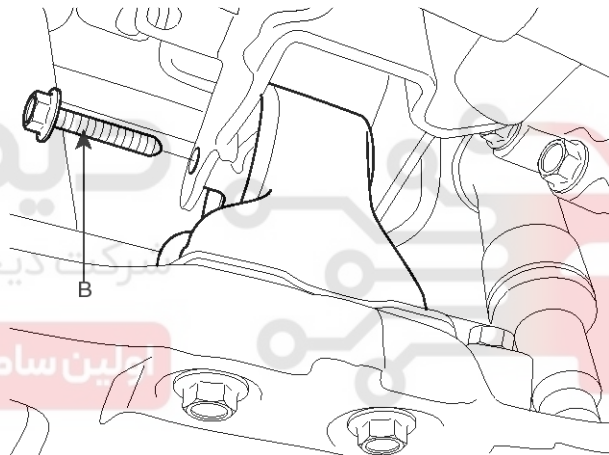
9. Install the roll stopper bracket bolts. (A,B)

Tightening torque :

50-65Nm (5-6.5kgf.m, 36.2-47.0lb-ft)

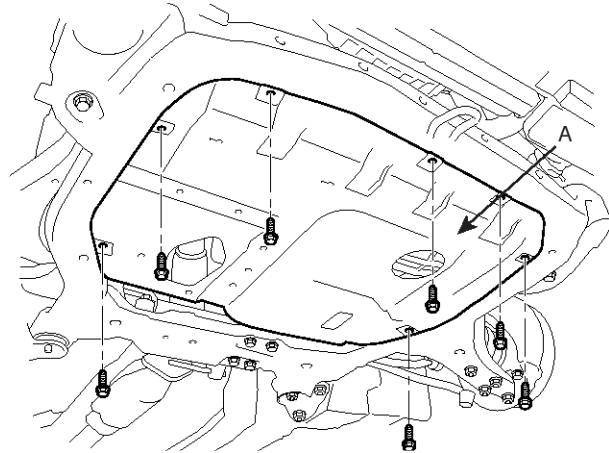


SHDAT6017D



SHDAT6018D

10. Install the under shield cover (A).



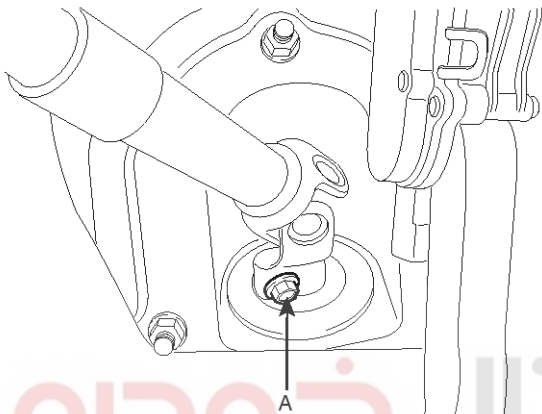
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MTB-16

11. Install the lower arm ball joint mounting nut, the stabilizer link mounting nut, and the tie rod end mounting nut to the front knuckles. (refer to Front suspension system in SS group)
12. Install the front wheels and tires. (refer to installation in SS group)
13. Install the steering joint assembly bolt (A). (refer to Steering column/shaft in ST group)

Tightening torque :

18-25Nm (1.8-2.5kgf.m, 13.0-18.1lb-ft)

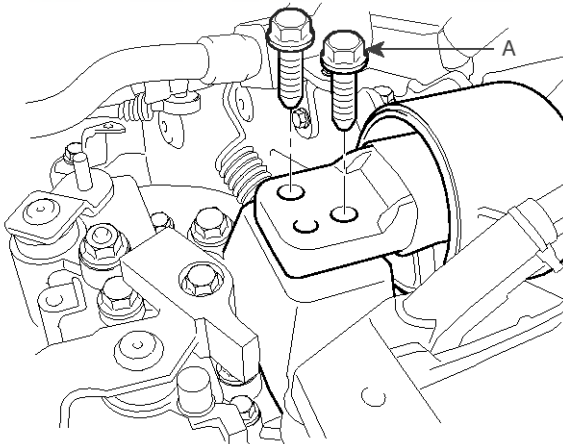


AKGF032S

14. Install the transaxle insulator mounting bracket bolts (A).

Tightening torque :

90-110Nm (9.0-11.0kgf.m, 65.1-79.5lb-ft)



SHDMB6009D

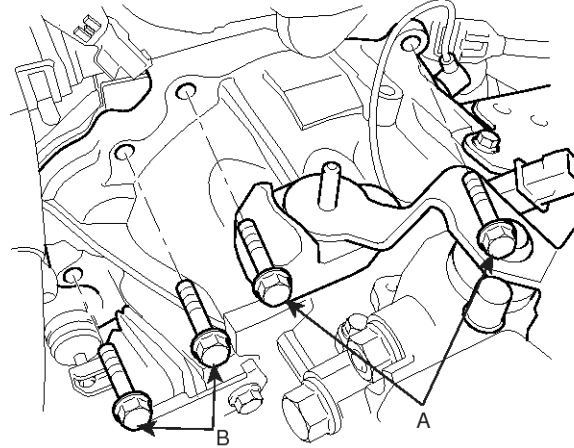
Manual Transaxle System

15. Install the transaxle upper mounting bolts (A-2ea) the starter motor mounting bolts. (B-2ea)

Tightening torque :

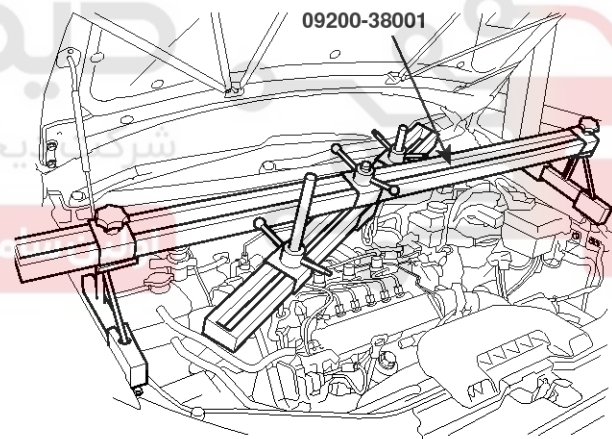
[A] 60-80Nm (6.0-8.0kgf.m, 43.4-57.9lb-ft)

[B] 39-60Nm (3.9-6.0kgf.m, 28.2-43.4lb-ft)



SHDMB6007D

16. Remove the special tool (09200-38001).



SHDMB6008D

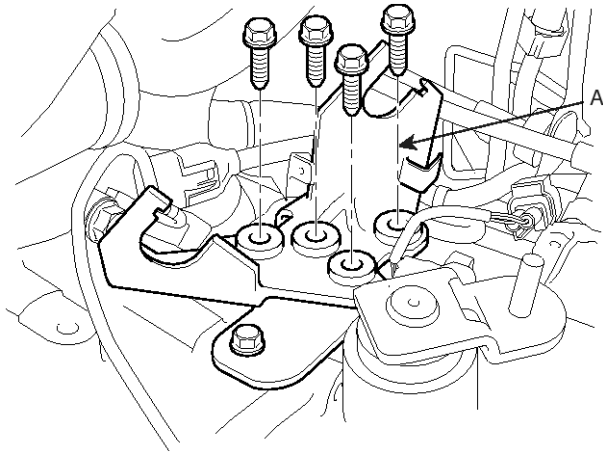
Manual Transaxle System

MTB-17

17. Install the control cable bracket (A).

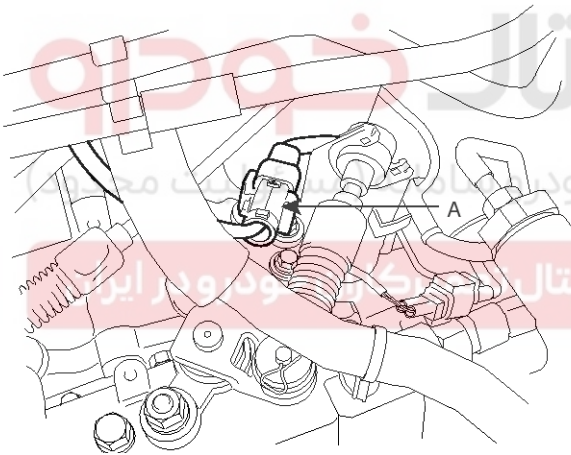
Tightening torque :

15-22Nm (1.5-2.2 kgf.m, 10.8-15.9lb-ft)



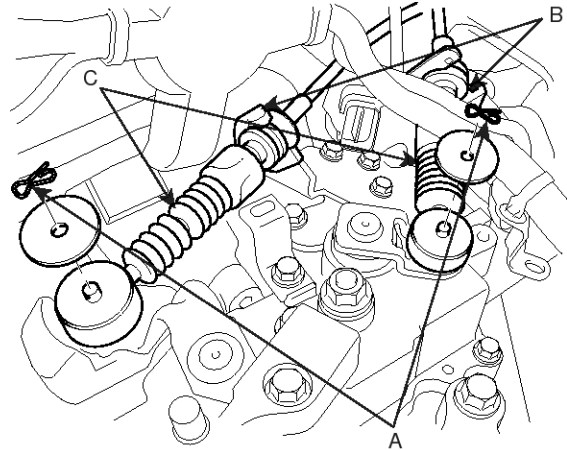
SHDMB6006D

18. Connect the vehicle speed sensor and the back lamp switch integrated connector (A).



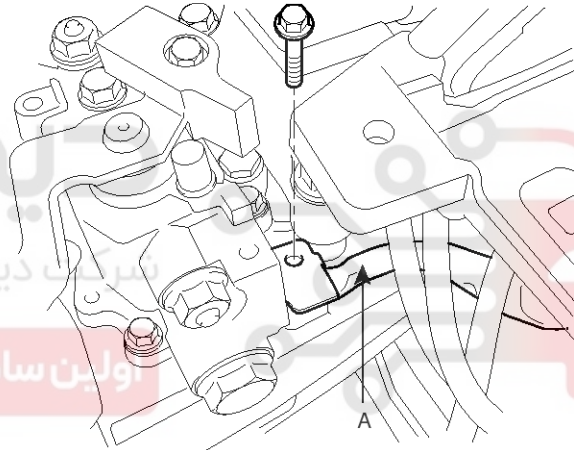
SHDMB6005D

19. Install the control cable assembly (A) by installing the clips (B) and pins (C).



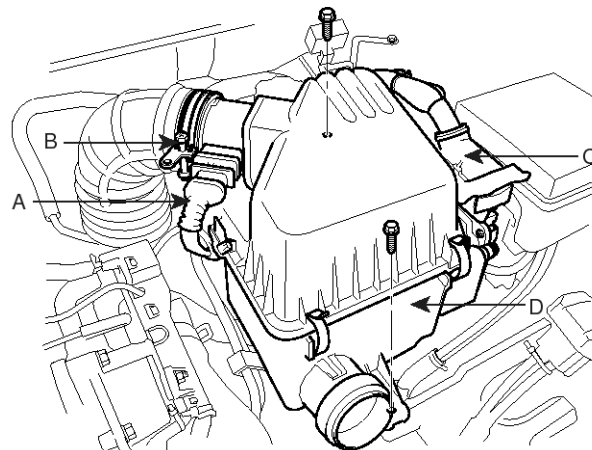
SHDMA6003D

20. Install the ground cable (A) to transaxle.



SHDMB6004D

21. Install the air cleaner assembly (D) by connecting the AFS (Air flow sensor) connector (A), the clamp (B), and the ECM connector (C).

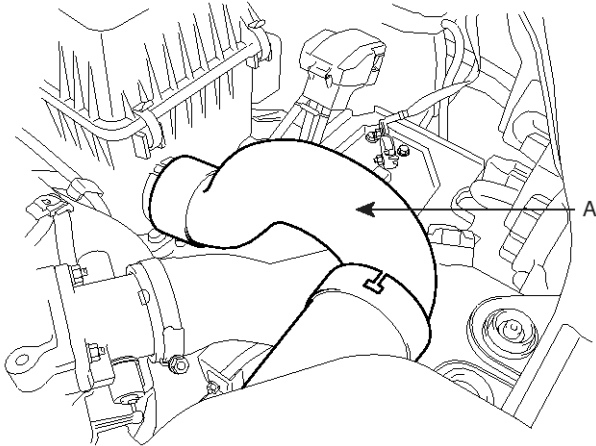


SHDMB6003D

MTB-18

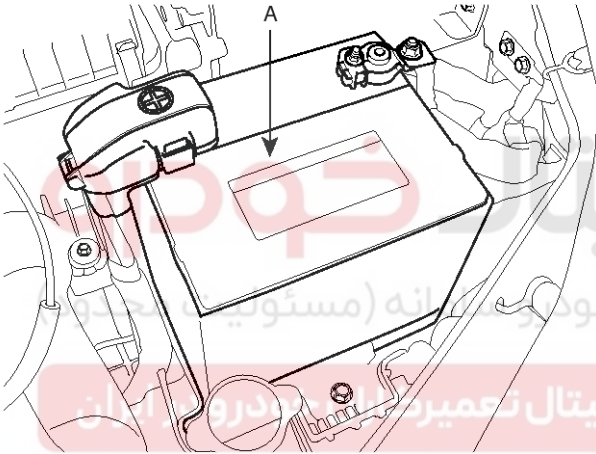
Manual Transaxle System

22. Install the air duct (A).



SHDMB6002D

23. Install the battery (A) and the battery terminal.



SHDAT6002D

24. Install the engine cover. (refer to Engine and Transaxle Assembly in EM group)



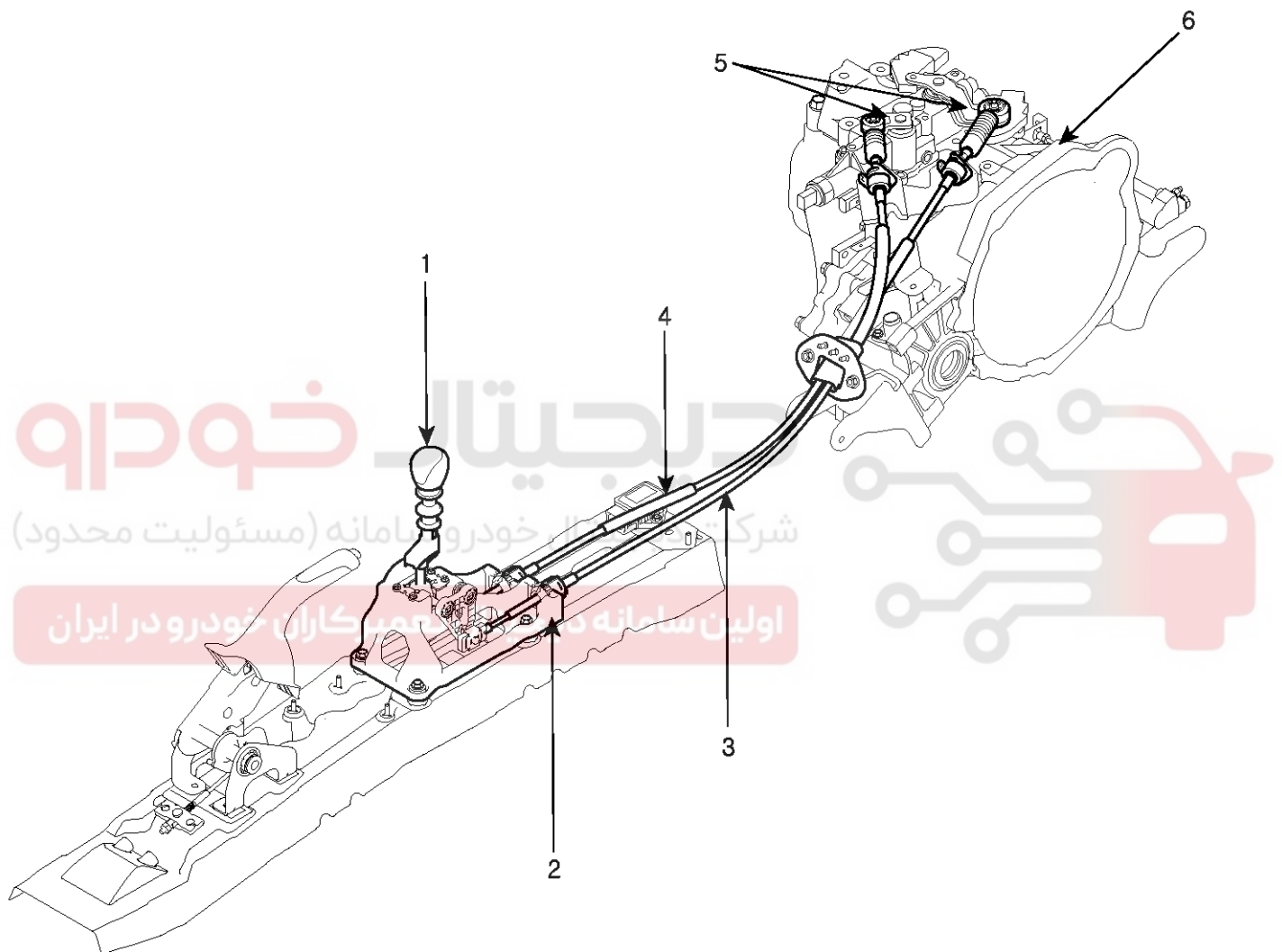
Manual Transaxle Control System

MTB-19

Manual Transaxle Control System

Manual Transaxle Shift Control

Components(1)



1. Shift lever knob
2. Shift lever assembly
3. Select cable assembly

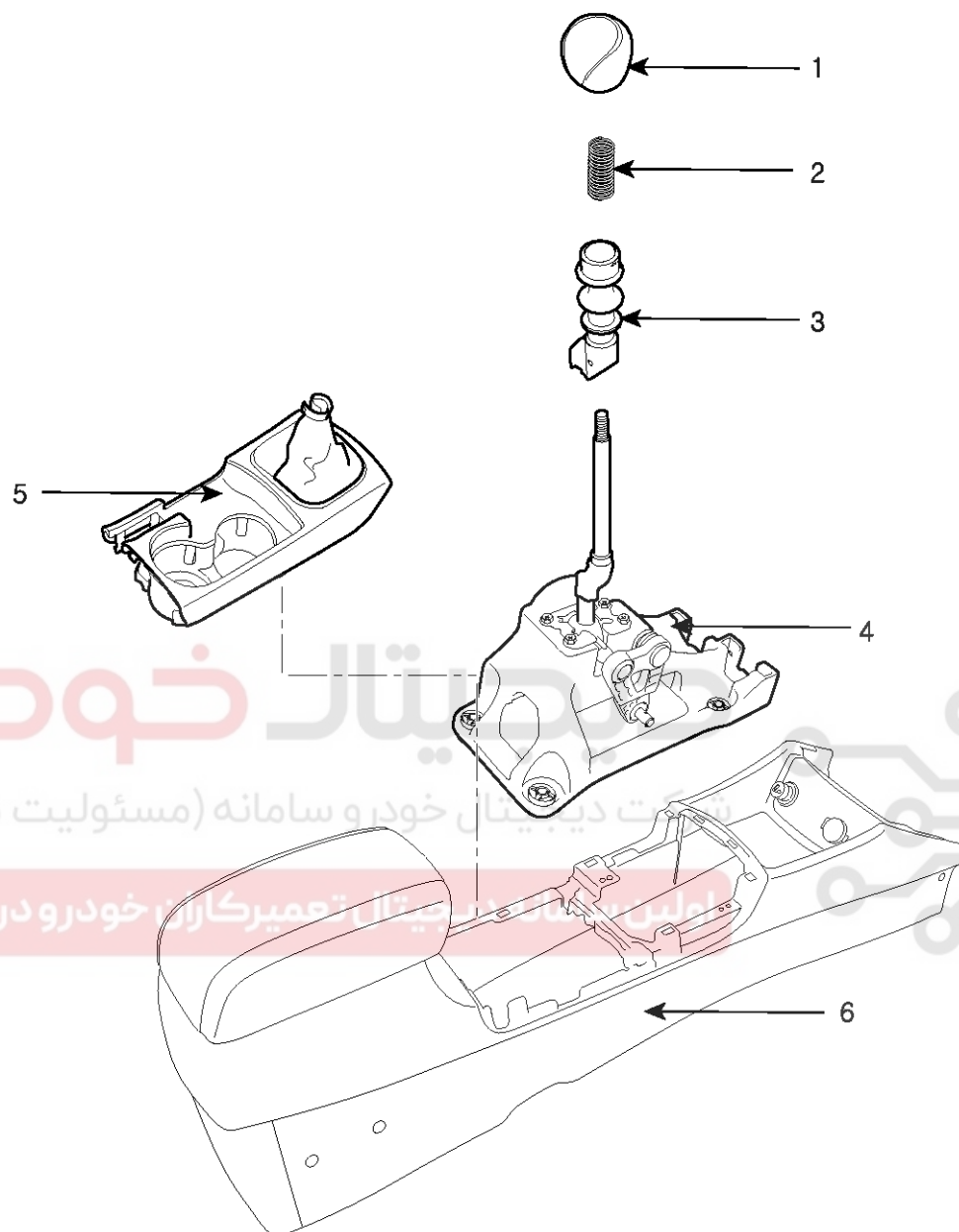
4. Shift cable assembly
5. Shift lever assembly(Manual Transaxle Side)
6. Manual transaxle assembly

SHDMT6001L

MTB-20

Manual Transaxle System

Components(2)



1. Shift lever knob
2. Spring
3. Skirt

4. Shift lever assembly
5. Console upper cover
6. Centor console

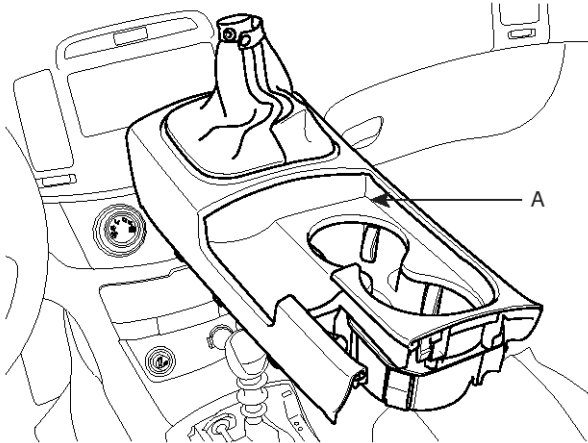
SHDMT6002L

Manual Transaxle Control System

MTB-21

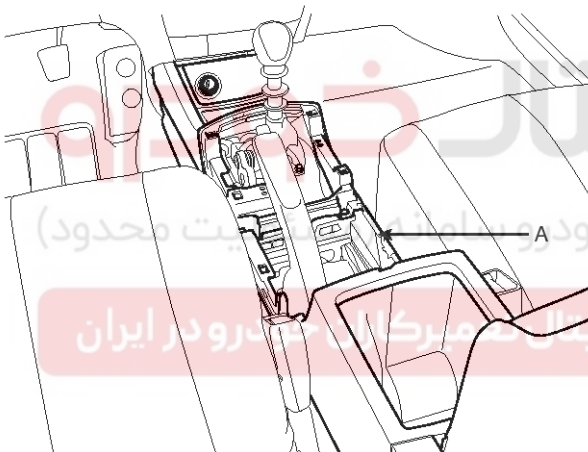
Removal

1. Remove the upper cover (A) from the center console.



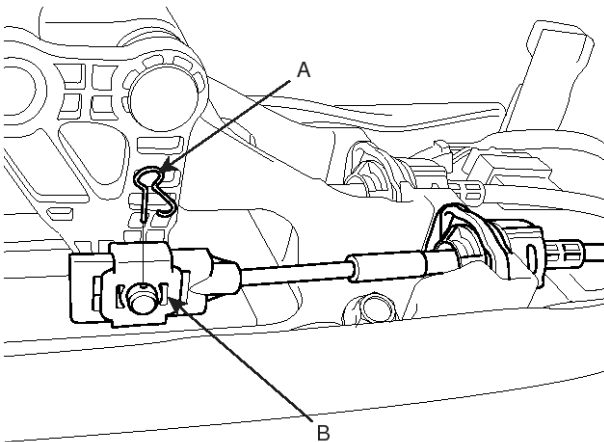
SHDMT6201D

2. Remove the center console. (refer to Console in BD group)



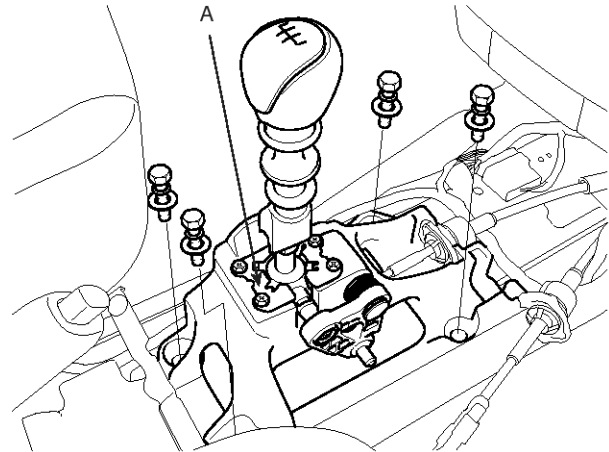
SHDMT6202D

3. Remove the snap pin (A) and the clips (B).



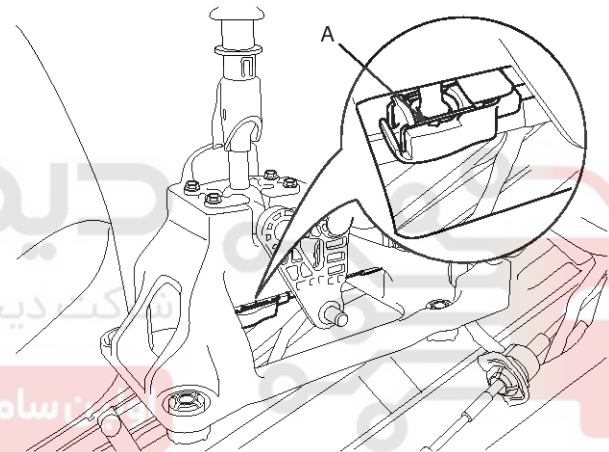
SHDMT6203D

4. Remove the shift lever assembly (A).



SHDMT6204D

5. Remove the clip (A) from the shift cable.



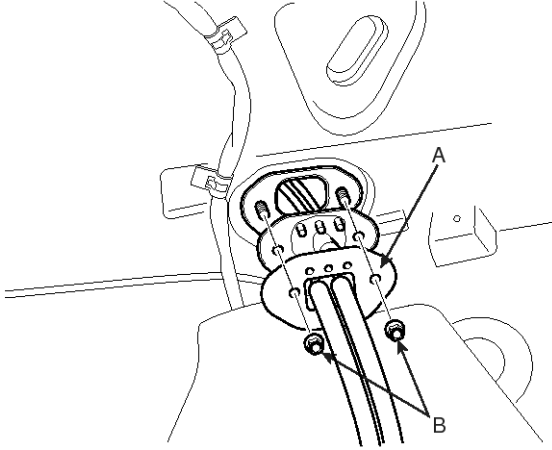
SHDMT6205D

MTB-22

6. Remove the retainer (A) and the nuts (B).

NOTICE

*In case, remove the crush pad and cowl cross bar.
(refer to Crush pad in BD group and Heater unit in
HA group)*



SHDMT6208D

7. Remove the cable assembly from the transaxle.
(refer to Manual Transaxle's removal)
8. Remove the select and shift cable assemblies.

Manual Transaxle System

Installation

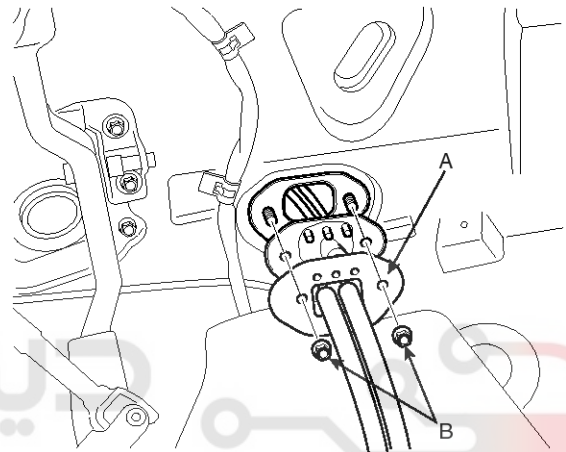
1. Install the cable assembly placing the select and shift lever in neutral position.(refer to Manual Transaxle's installation)
2. Install the retainer (A) and nuts(B).

Tightening torque :

12-15Nm (1.2-1.5kgf.m, 8.7-10.8lb-ft)

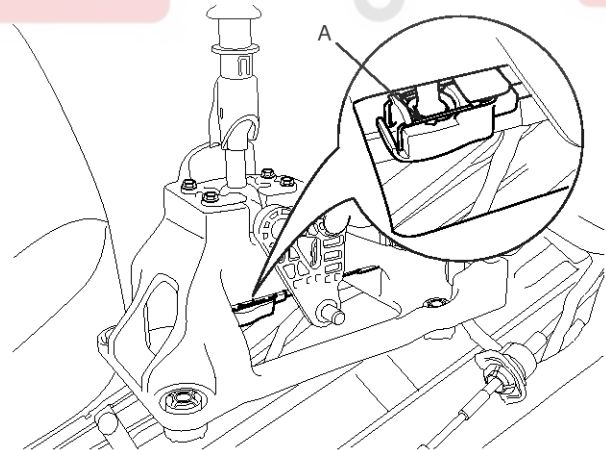
NOTICE

*In case, install the crush pad and cowl cross bar.
(refer to Crush pad in BD group and Heater unit in
HA group)*



AMJF500A

3. Install the clip (A) connecting the shift cable and the shift lever.



SHDMT6205D

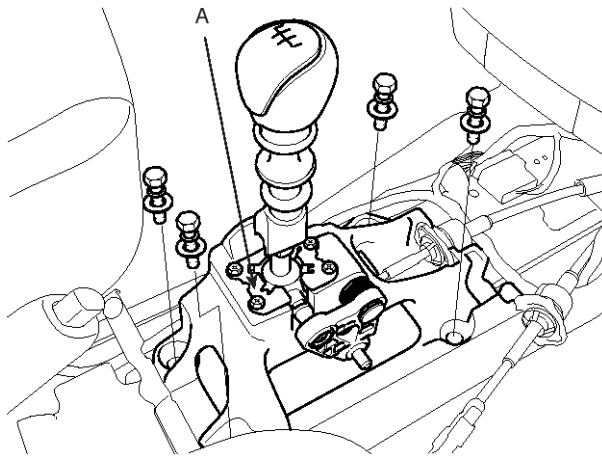
Manual Transaxle Control System

MTB-23

4. Install the shift lever assembly (A).

Tightening torque :

9~14Nm(0.9~1.4kgf.m, 6~9.5lb-ft)

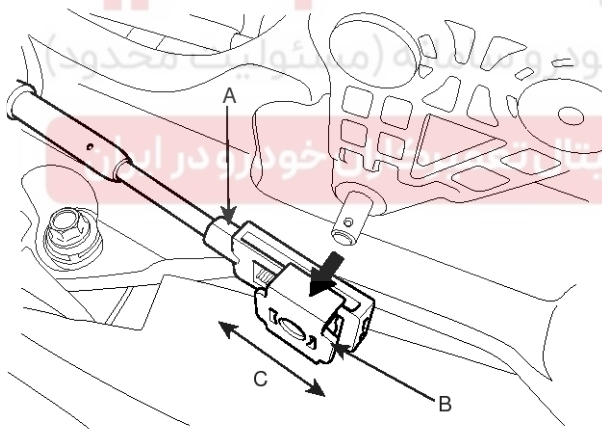


SHDMT6204D

5. Move the slide clip (B) of guide member (A) in the direction as shown in the illustration.

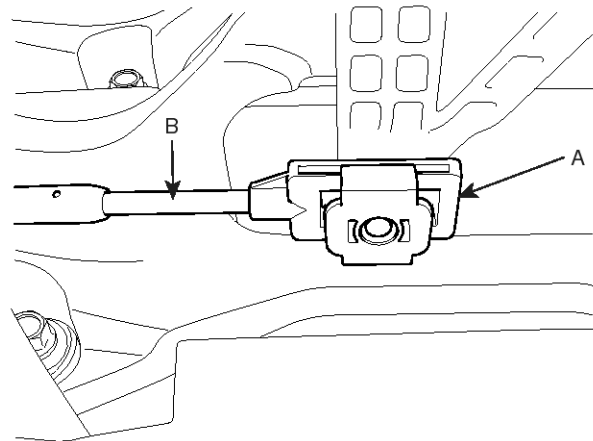
NOTICE

Adjust the slide clip fit into the select lever moving the slide clip in the direction.



AMLF005A

6. Install the guide member (A) of the select cable (B).

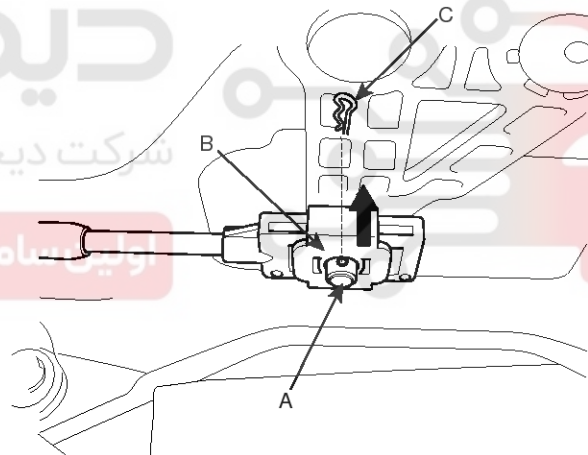


AMLF006A

7. Adjust the slide clip (B) to fit it into the select lever pin (A) and install the snap pin (C).

NOTICE

Insert the slide clip in the direction as shown in the illustration.

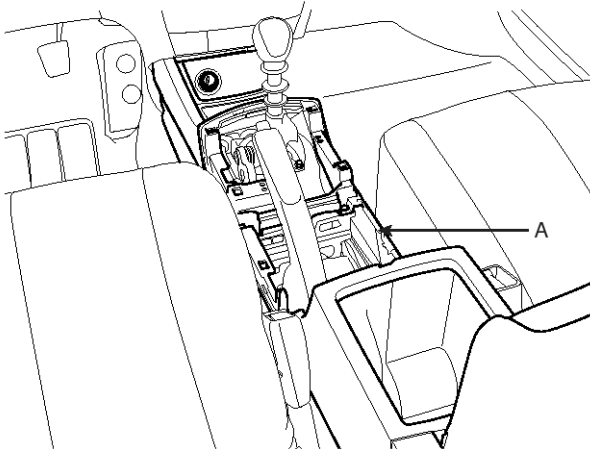


SHDMT6003L

MTB-24

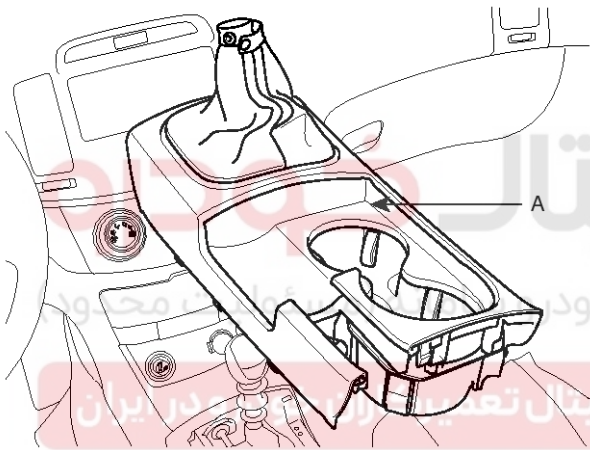
Manual Transaxle System

8. Install the center console (A).



SHDMT6202D

9. Install the upper cover (A) to the center console.



SHDMT6201D

Inspection

1. Check the select cable for proper operation and for damage.
2. Check the shift cable for proper operation and for damage.
3. Check the boots for damage.
4. Check the boots for wear, abrasion, sticking, restricted movement or damage.
5. Check for the weak or damaged spring.