

MT-2

Manual Transaxle System

General Information

Specifications

Transaxle type		M5CF1
Engine type		Gasoline 1.6
Gear ratio	1st	3.615
	2nd	1.950
	3rd	1.370
	4th	1.036
	5th	0.839
	Reverse	3.545
Final gear ratio		4.267

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)	0.0019T-0.0039T(0.05T-0.10T)
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	5.5-6.5	36.2-47.0
Front roll support bracket bolt		50-65	5.5-6.5	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	to ENG. Block	43-55	4.3-5.5	31.1-39.8
	to Ladder frame	43-49	4.3-4.9	31.1-35.4

⚠ 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.

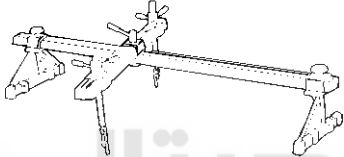
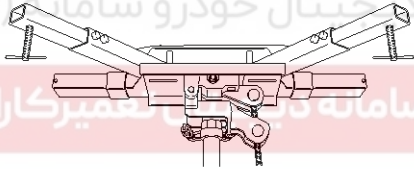
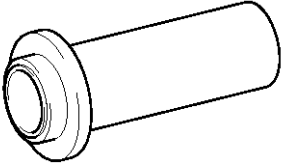
General Information

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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	1.9ℓ(2.0US qt, 1.67Imp 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
09452-21200 Oil seal installer	 Y45-006B	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

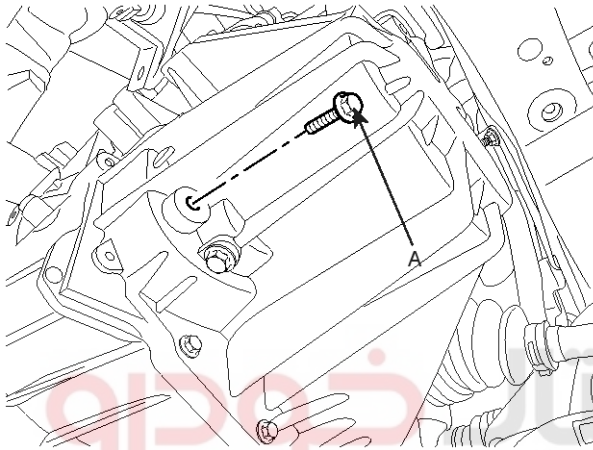
Inspection

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.

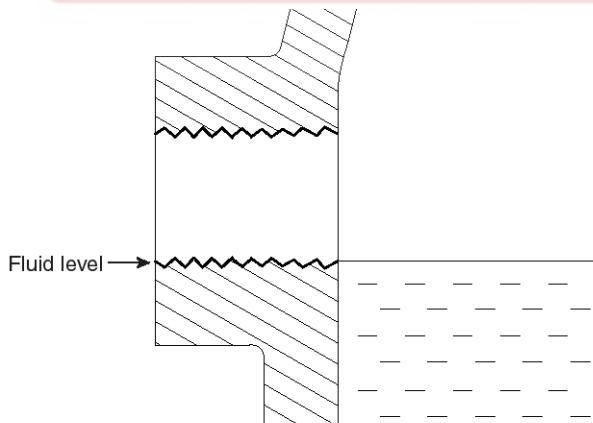
1. Remove oil filler plug(A).



SPAMT9011L

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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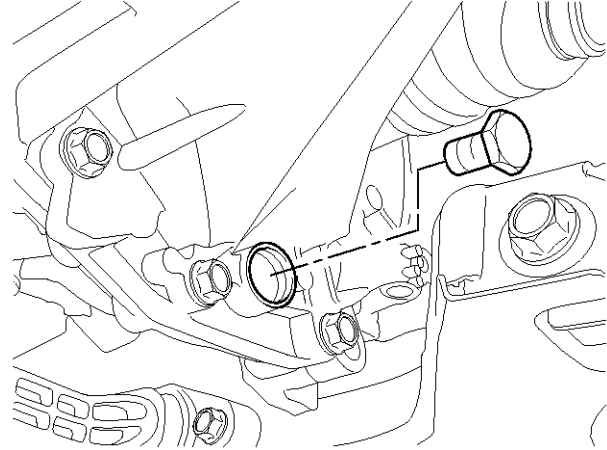
3. Install filler plug.

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.



SPBMB9021L

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)

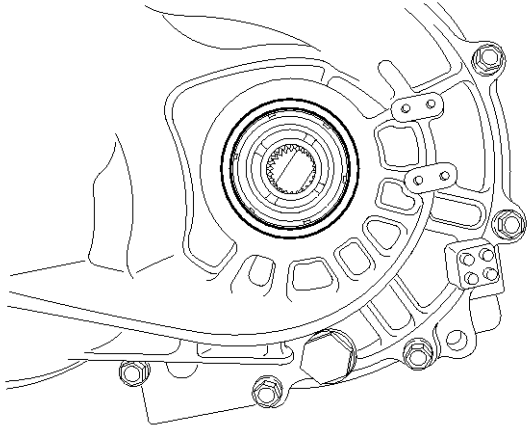
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Drive Shaft Oil Seal

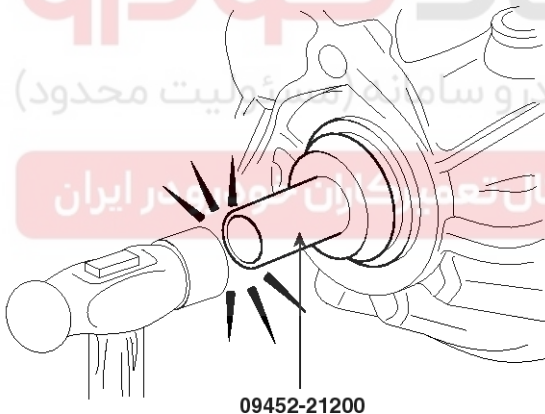
Replacement

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(09452-21200), tap the drive shaft oil seal into the transaxle.



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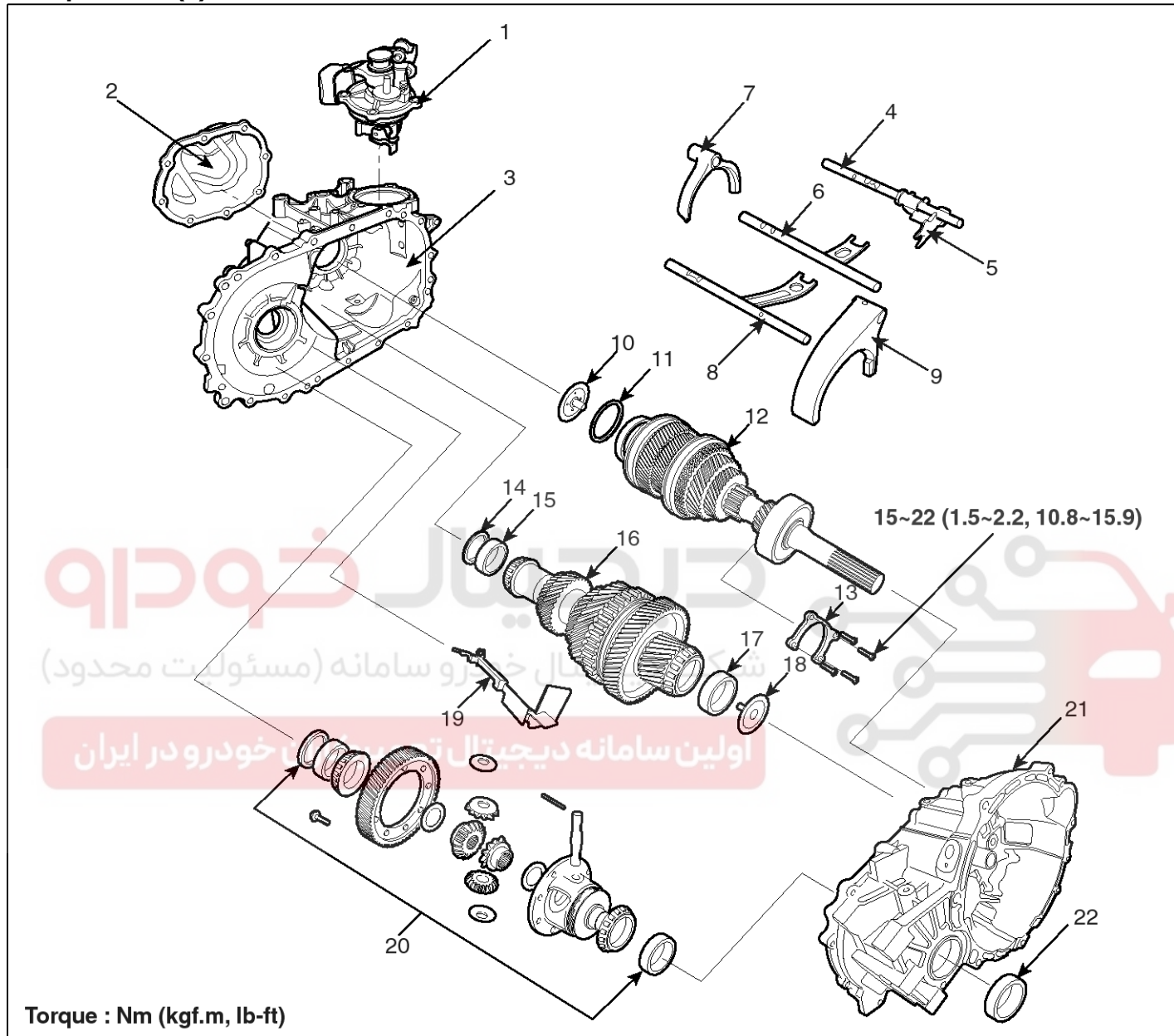


Manual Transaxle System

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Manual Transaxle

Components (1)



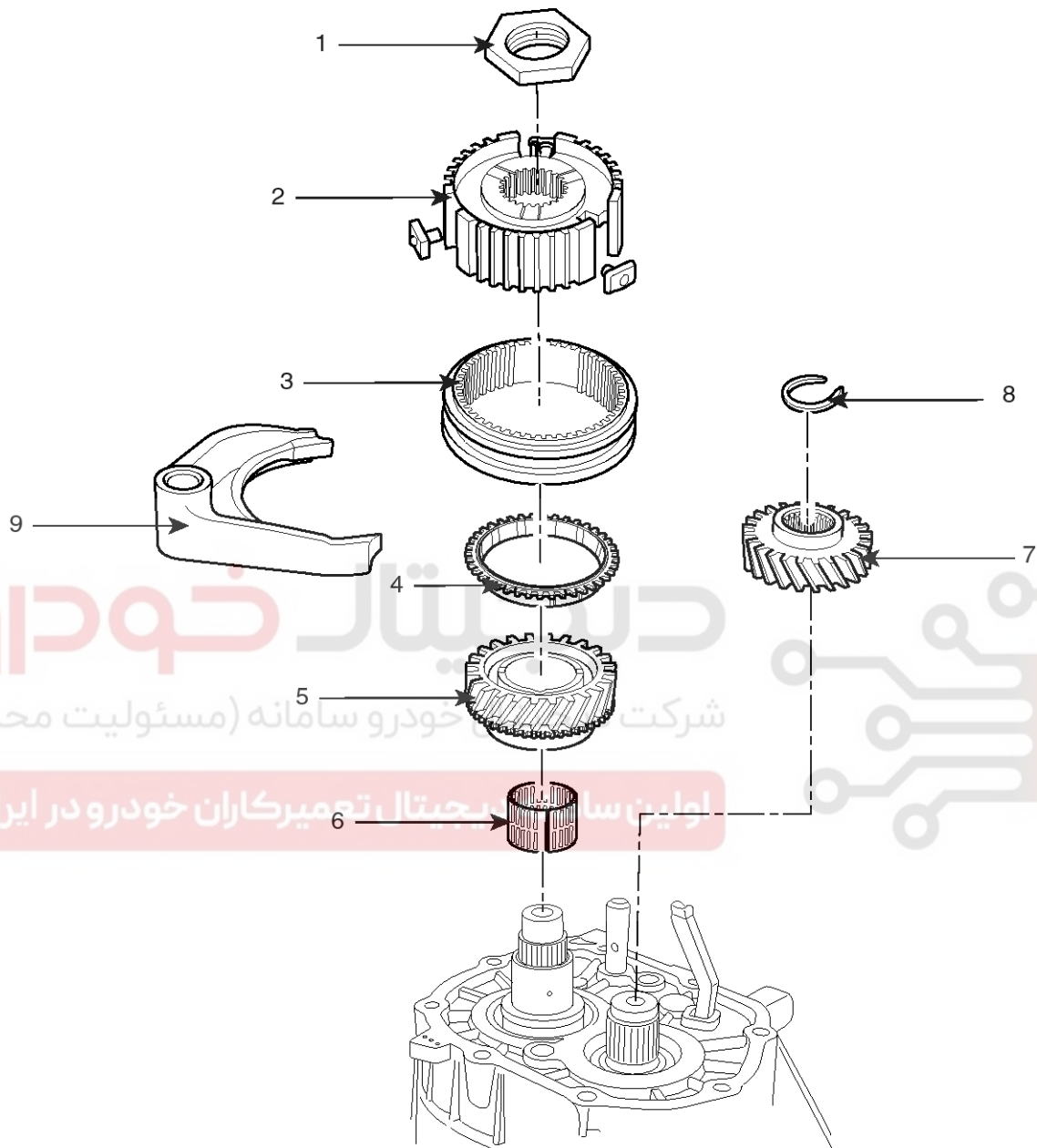
S227M9001L

- | | | |
|---------------------------|----------------------------------|-----------------------------------|
| 1. Control shaft complete | 9. 1&2nd shift fork | 17. Output shaft front outer race |
| 2. Rear cover | 10. Input shaft oil guide | 18. Output shaft oil guide |
| 3. Transaxle case | 11. Snap ring | 19. Oil guide |
| 4. 5th shift rail | 12. Input shaft assembly | 20. Differential assembly |
| 5. Reverse shift rug | 13. Input shaft bearing retainer | 21. Clutch housing |
| 6. 3&4th shift rail | 14. Spacer | 22. Oil seal |
| 7. 3&4th shift fork | 15. Output shaft rear outer race | |
| 8. 1&2nd shift rail | 16. Output shaft assembly | |

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Components (2)



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1. Lock nut
2. 5th synchronizer hub
3. 5th synchronizer sleeve
4. 5th synchronizer ring
5. 5th gear (input)

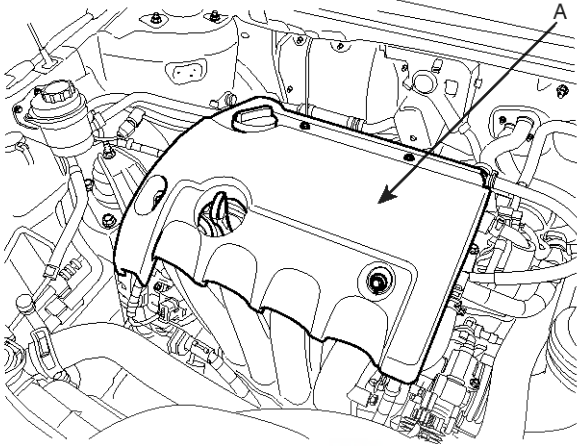
6. Needle roller bearing
7. 5th gear (output)
8. Snap ring
9. 5th shift fork

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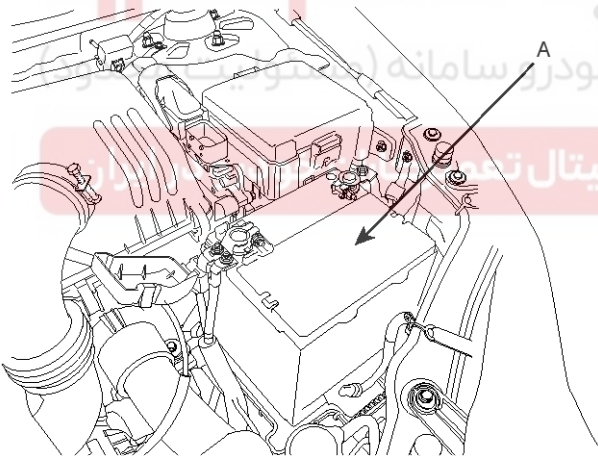
Removal

- Use fender covers to avoid damaging painted surfaces.
 - To avoid damage, unplug the wiring connectors carefully while holding the connector portion.
 - Mark all wiring and hoses to avoid misconnection.
1. Remove the engine cover(A).



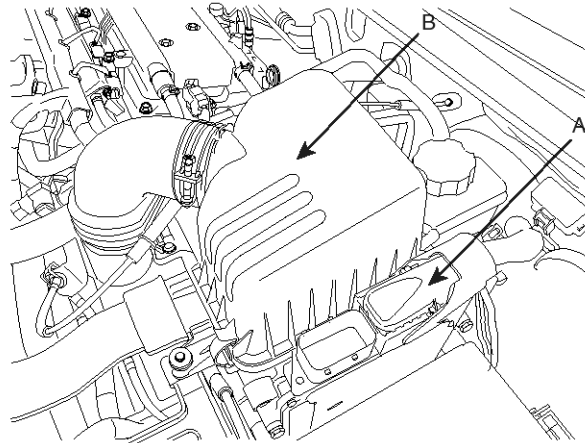
STDMT9001D

2. Remove the battery(A).



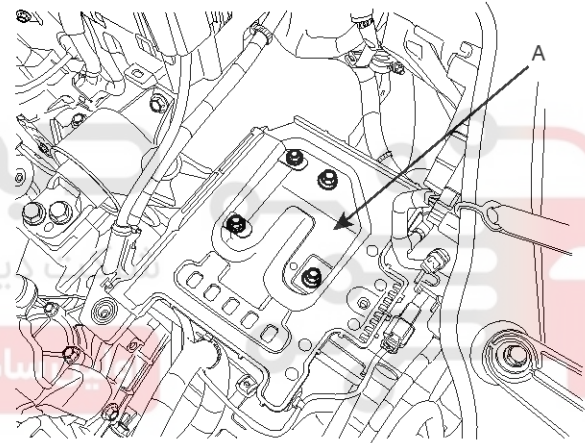
STDMT9002D

3. After disconnecting the PCM connector (A), remove air cleaner (B).



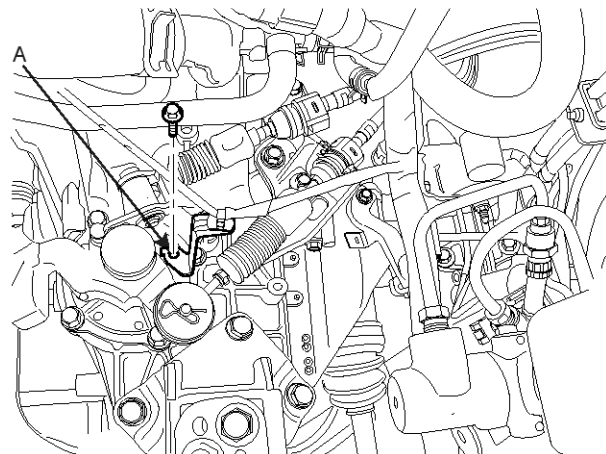
STDMT9003D

4. Remove the battery tray(A).



STDMT9004D

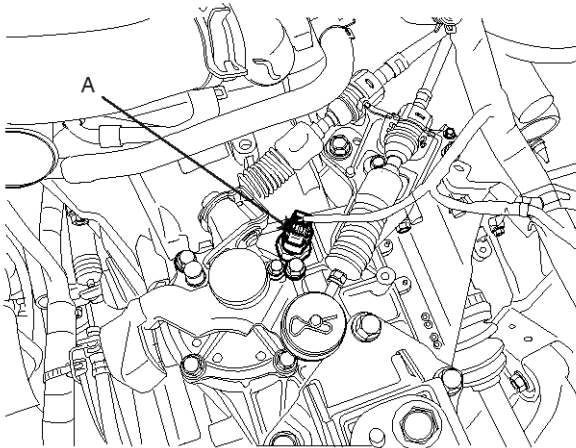
5. Remove the wire bracket(A).



STDMT9005D

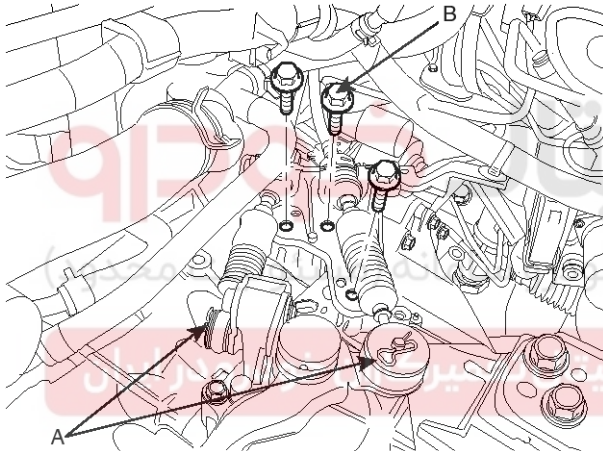
MT-10

6. Remove the back up lamp switch connector(A).



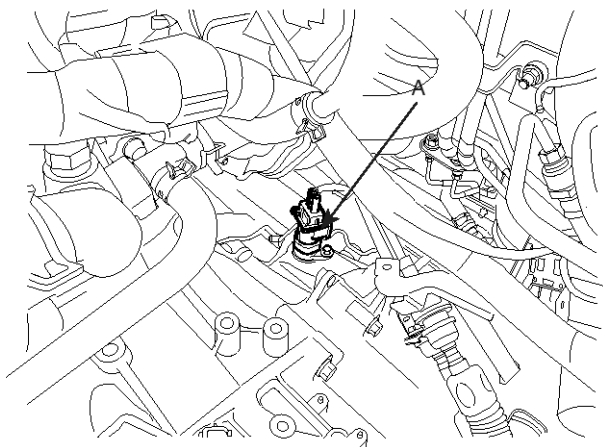
STDMT9006D

7. Remove the snap pin(A) and control cable bracket bolts(B-3ea).



STDMT9007D

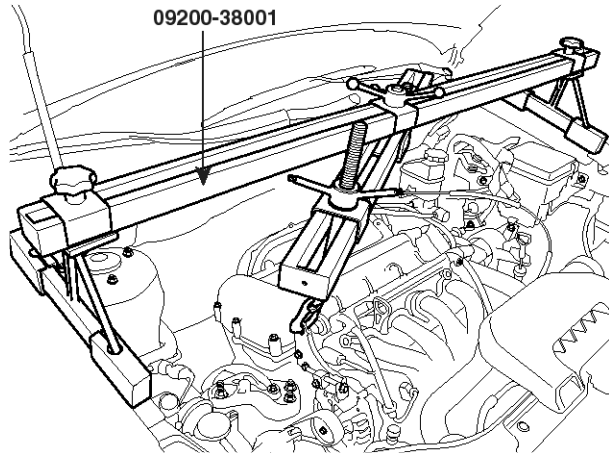
8. Disconnect the vehicle speed sensor(A).



STDMT9008D

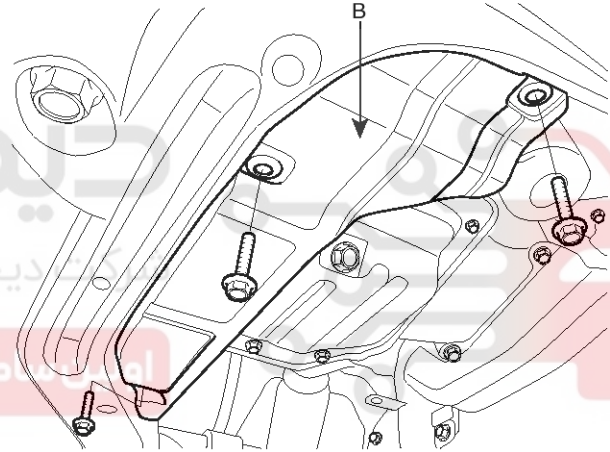
Manual Transaxle System

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



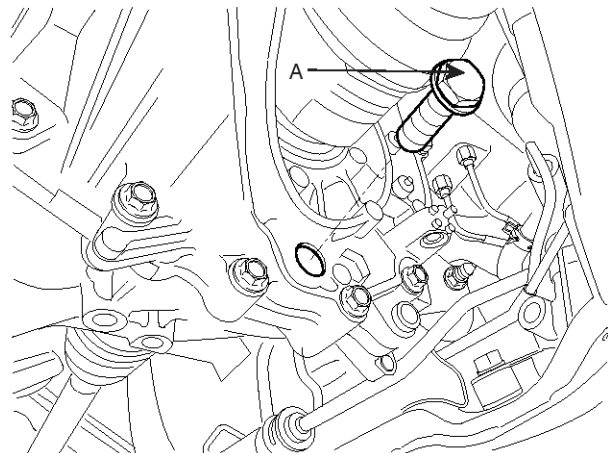
SHDAT6012D

10. Remove the under cover(B).



SHDAT6016D

11. Drain the manual transaxle fluid after removing the transaxle drain plug(A).

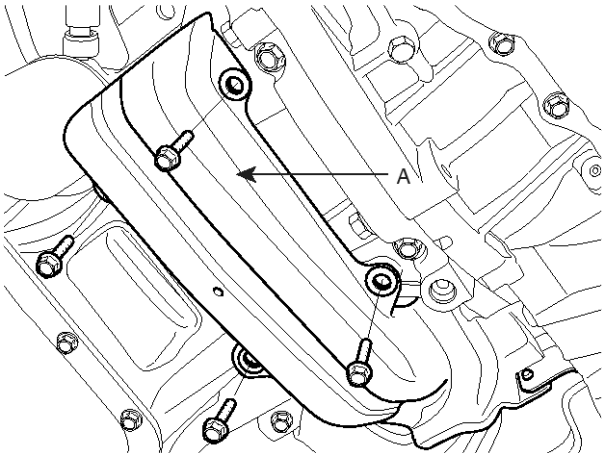


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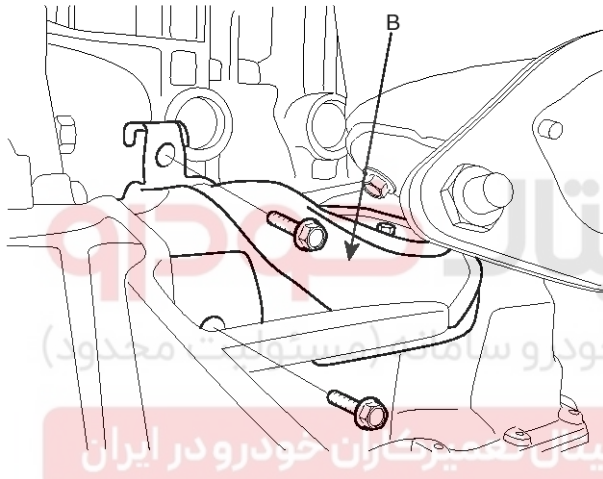
Manual Transaxle System

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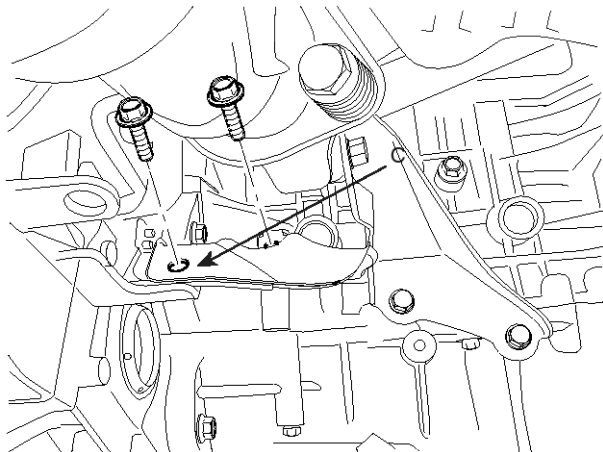
12.Remove the brackets. (A,B,C)



SHDAT6022D

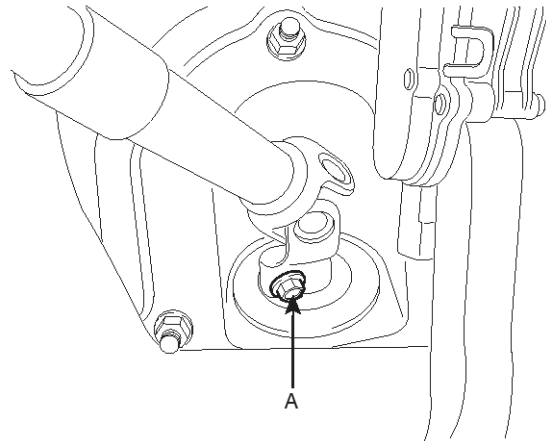


SHDAT6023D



STDMT9010D

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



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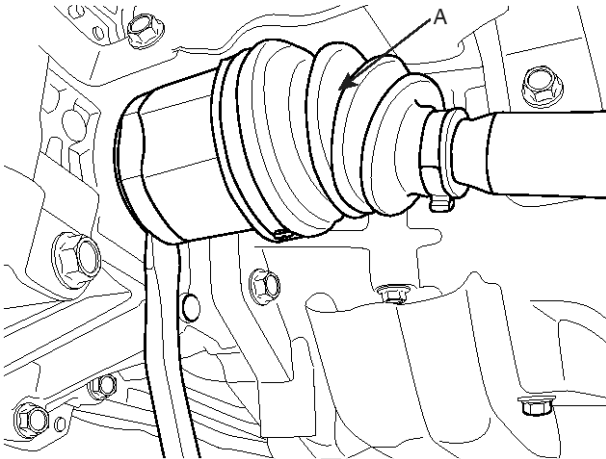
14.Remove the front wheels and tires

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)

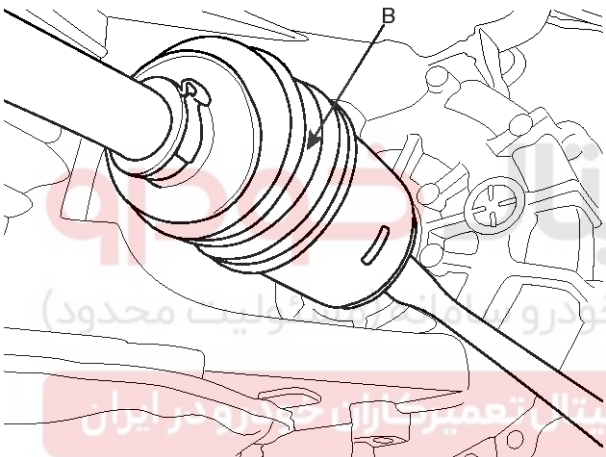
MT-12

Manual Transaxle System

16. Disconnect the drive shafts (A,B) from the transaxle.(refer to DS group)

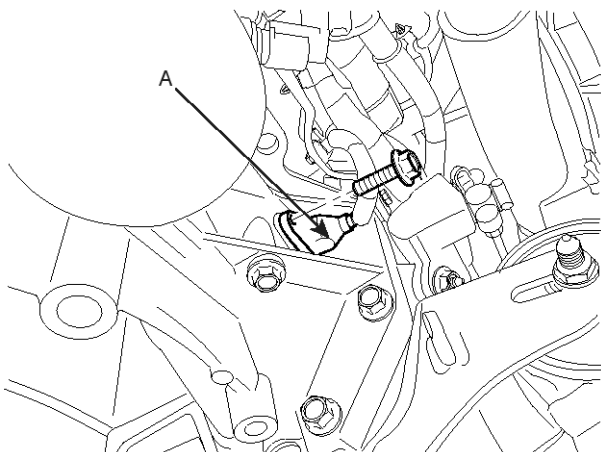


SHDAT6020D



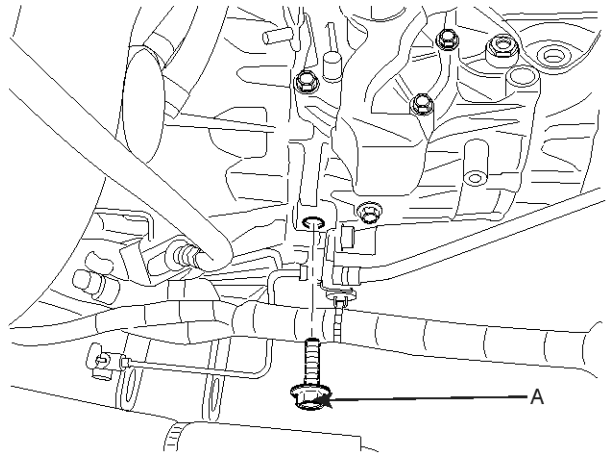
SHDAT6021D

17. Disconnect the CKP sensor connector(A).



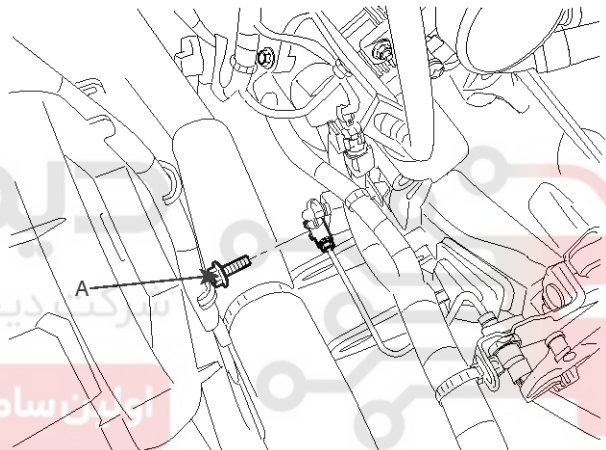
STDMT9011D

18. Remove the clutch hose bracket bolt(A).



STDMT9012D

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

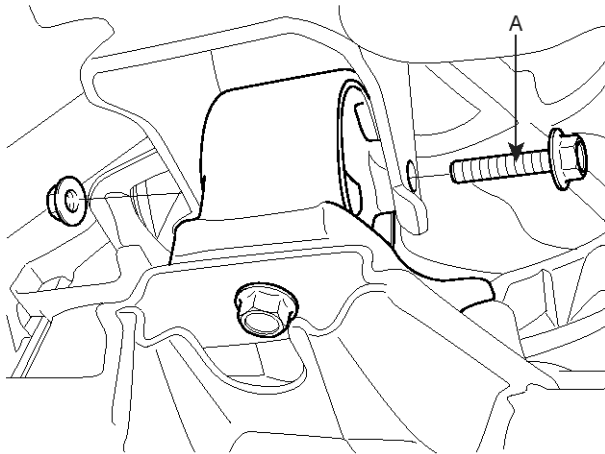


STDMT9013D

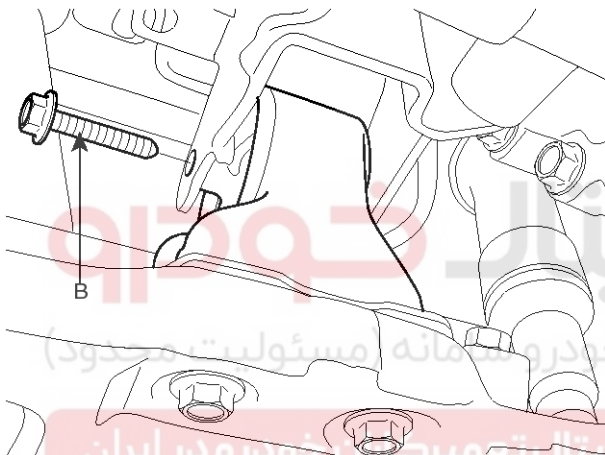
Manual Transaxle System

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20. Remove the roll stopper bracket bolts. (A,B)

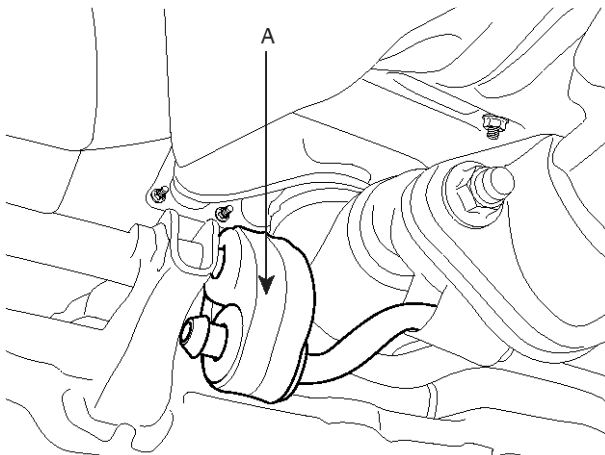


SHDAT6017D



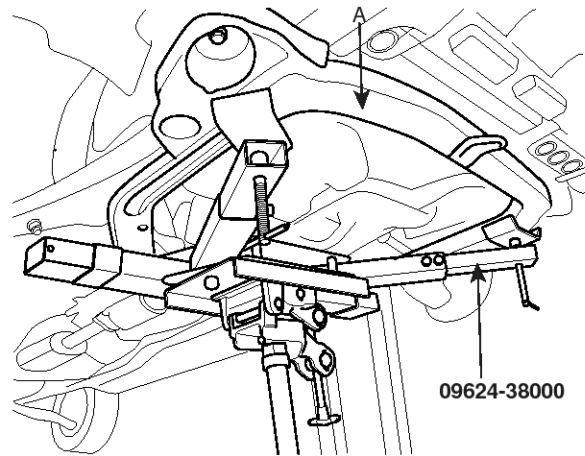
SHDAT6018D

21. Disconnect the muffler hanger rubber (A)



SHDAT6019D

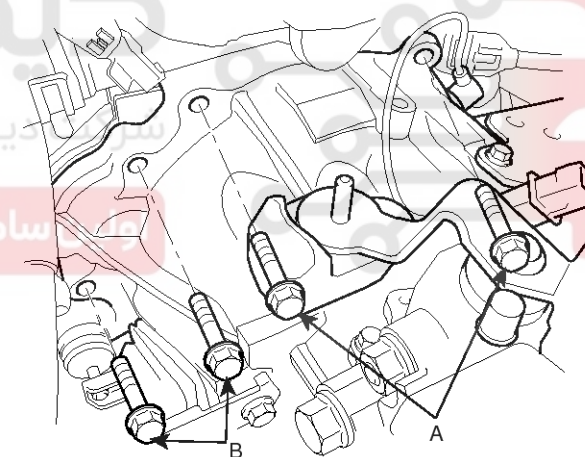
22. Supporting the sub frame (A) with a jack and the Special tool (09624-38000), remove the mounting bolts.(refer to SS group)



SHDAT6051D

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

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

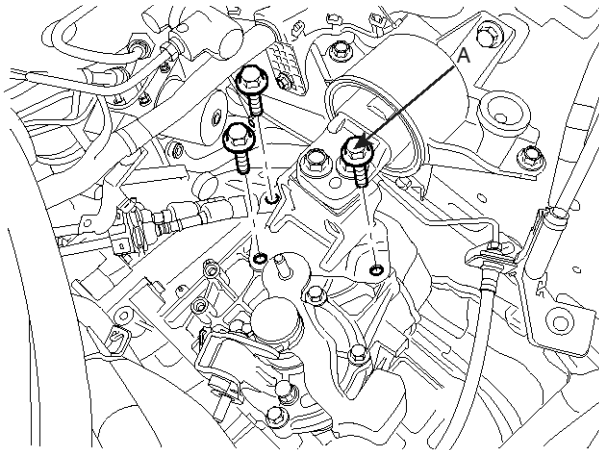


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MT-14

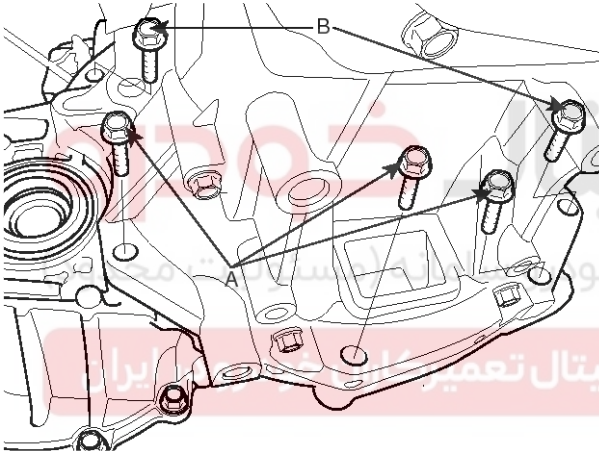
Manual Transaxle System

25. Remove the transaxle support bracket bolts(A).



STDMT9014D

26. Supporting the transaxle with a jack, remove the transaxle lower mounting bolts(A-3ea, B-2ea)



SHDMT6207D

27. Lowering the jack slowly, remove the transaxle.

⚠ CAUTION

When removing the transaxle assembly, be careful not to damage any surrounding parts or body components.

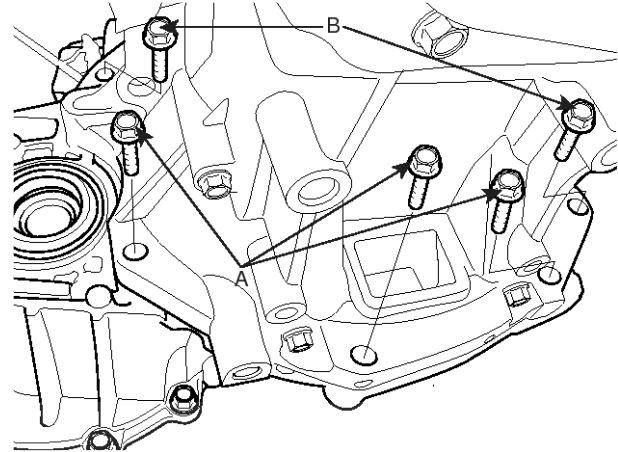
Installation

1. Install the transaxle lower mounting bolts (A-3ea, B-2ea) after fitting the transaxle assembly into the engine assembly.

Tightening torque :

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

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

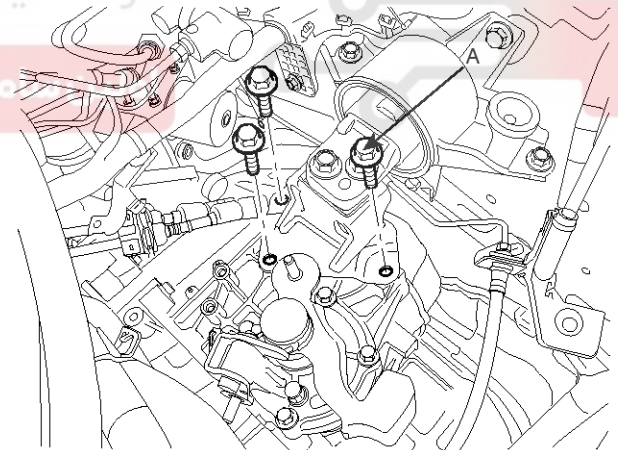


SHDMT6207D

2. Install the transaxle support bracket bolts(A).

Tightening torque :

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



STDMT9014D

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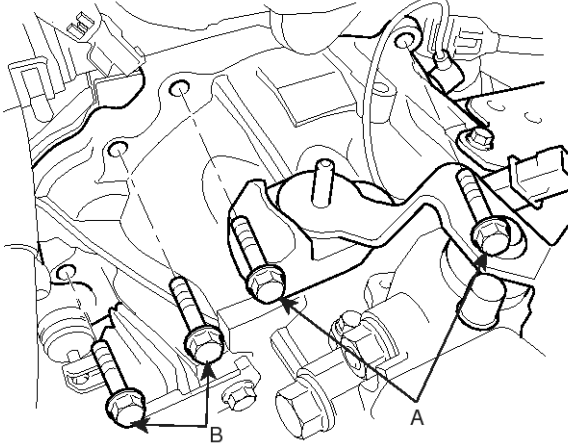
MT-15

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

Tightening torque :

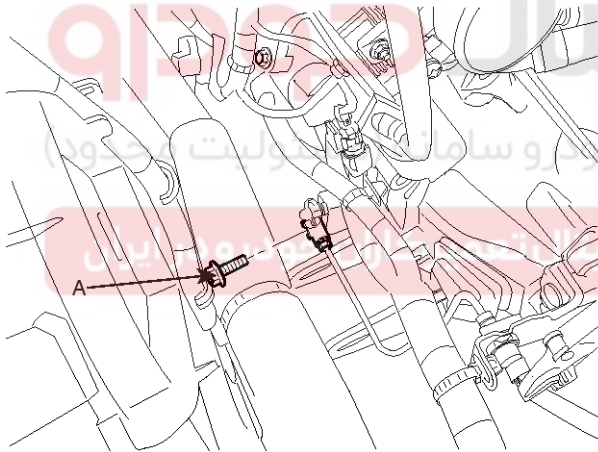
[A] 60~80Nm (6.0~8.0kgf.m, 43.4~57.8lb-ft)

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



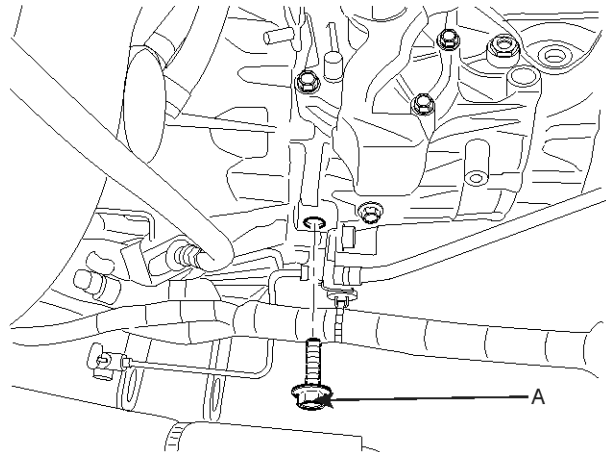
SHDMB6007D

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



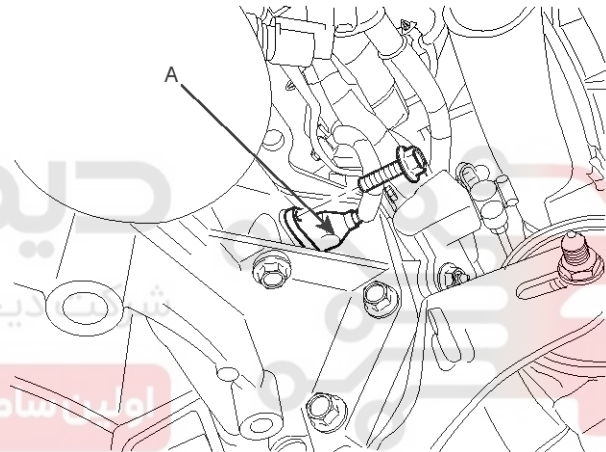
STDMT9013D

5. Install the clutch hose bracket bolt(A).



STDMT9012D

6. Connect the CKP sensor connector(A).



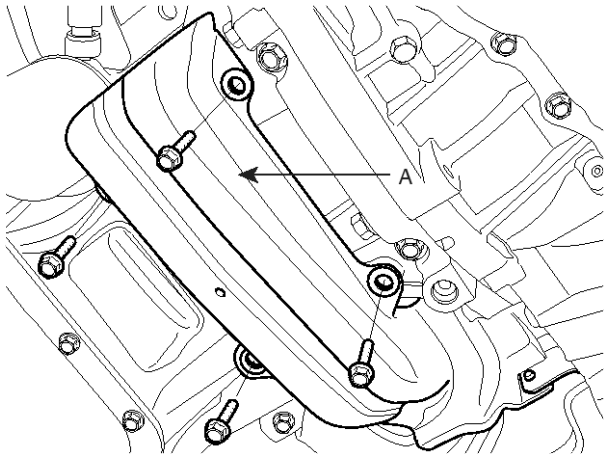
STDMT9011D

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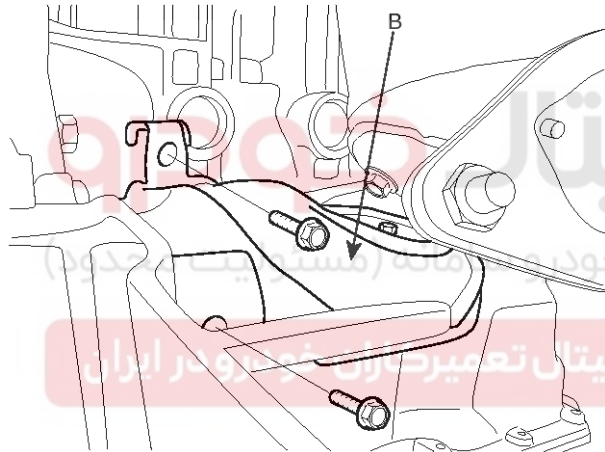
7. Install the bracket (A,B,C)

Tightening torque :

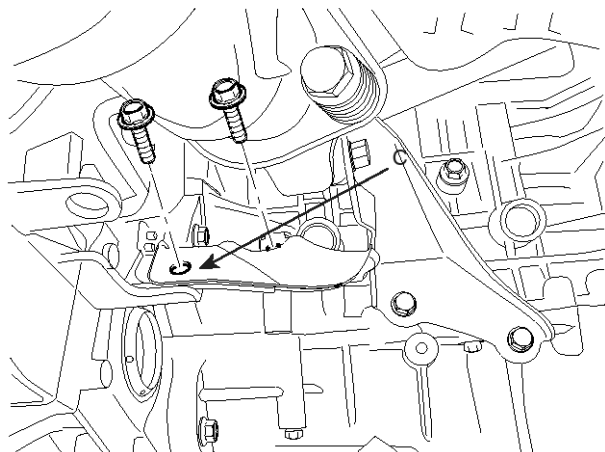
46~53Nm (4.6~5.3kgf.m,33.3~38.3lb-ft)



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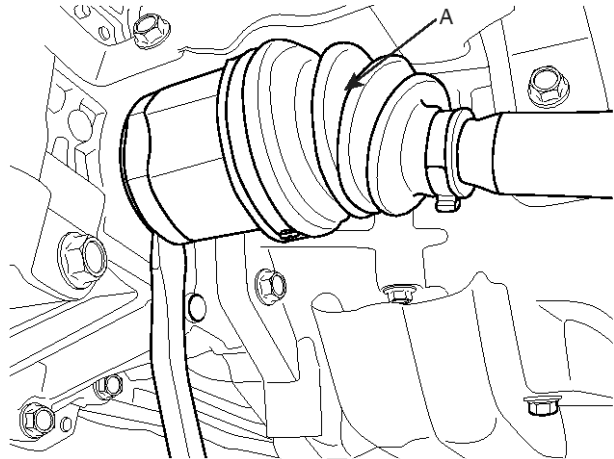
SHDAT6023D



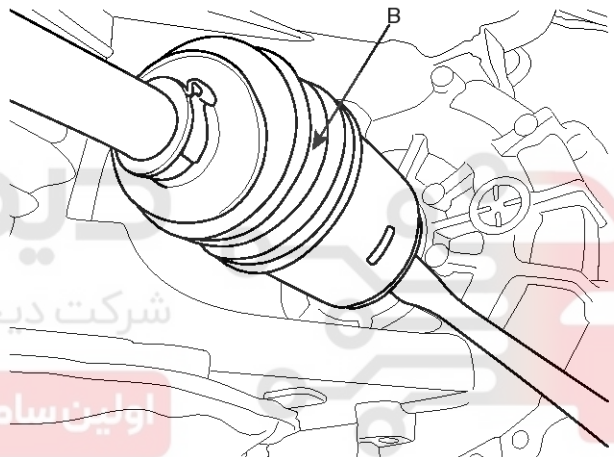
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8. Connect the drive shafts (A,B) from the transaxle.(refer to DS group)



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SHDAT6021D

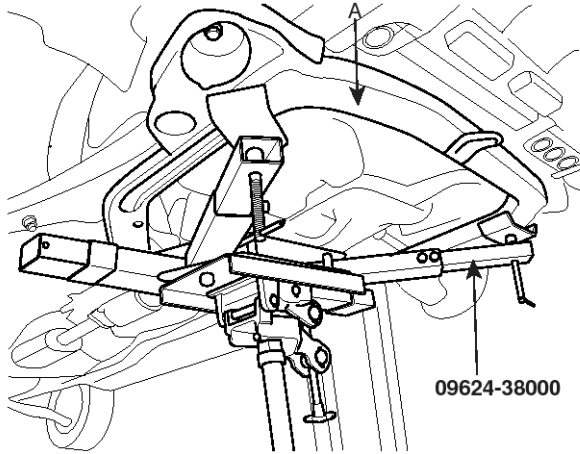
Manual Transaxle System

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9. Supporting the sub frame (A) with a jack and the Special tool(09624-38000), install themounting bolts. (refer to SS group)

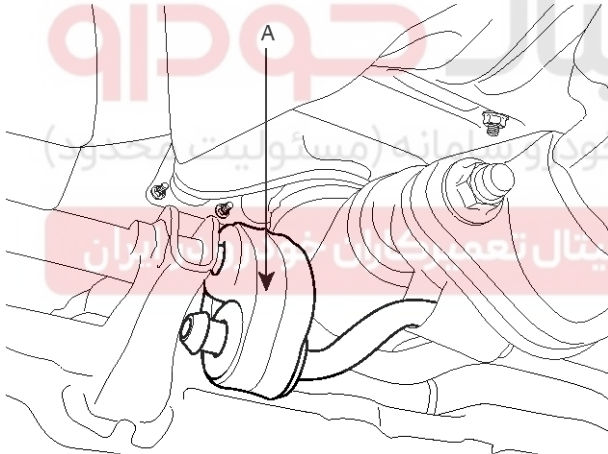
Tightening torque :

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



SHDAT6051D

10. Install the muffler hanger rubber (A).

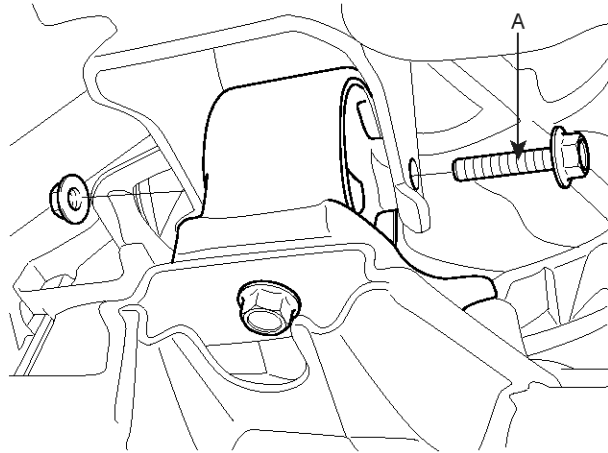


SHDAT6019D

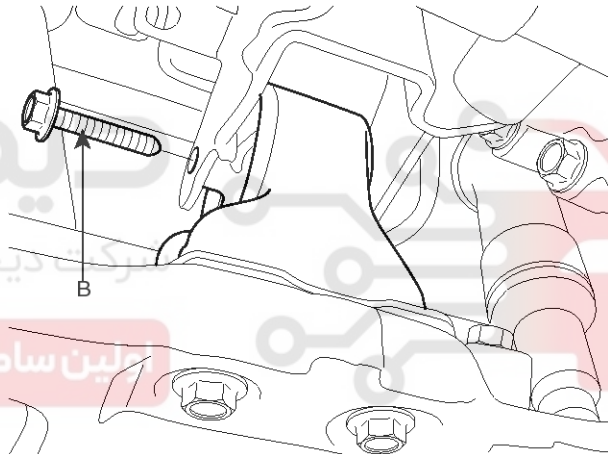
11. Install the roll stopper insulator mounting bolts.(A,B)

Tightening torque :

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

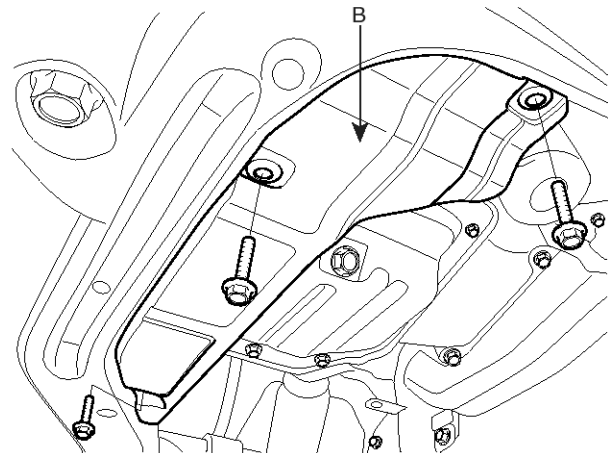


SHDAT6017D



SHDAT6018D

12. Install the under cover. (B)



SHDAT6016D

MT-18

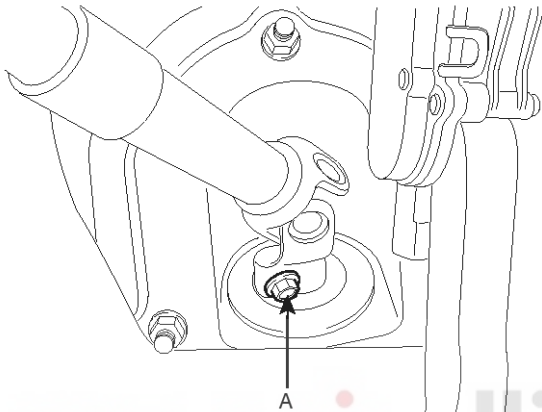
13. Install the lower arm ball joint mounting nut, the stabilizer link mounting nut, and the tie rod end mounting nut to the front knuckles. (refer to Front suspension system in SS group)

14. Install the front wheels and tires.

15. 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)

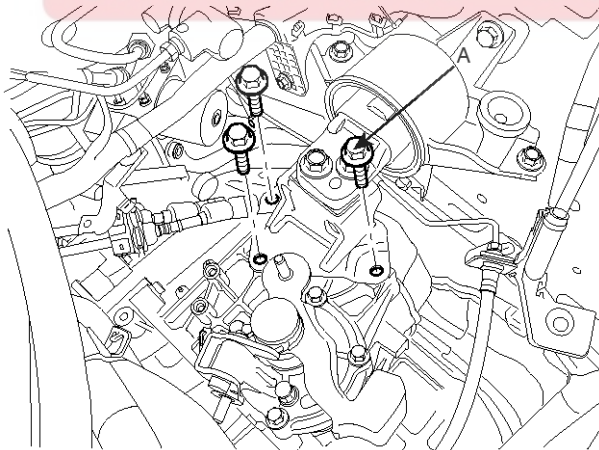


AKGF032S

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

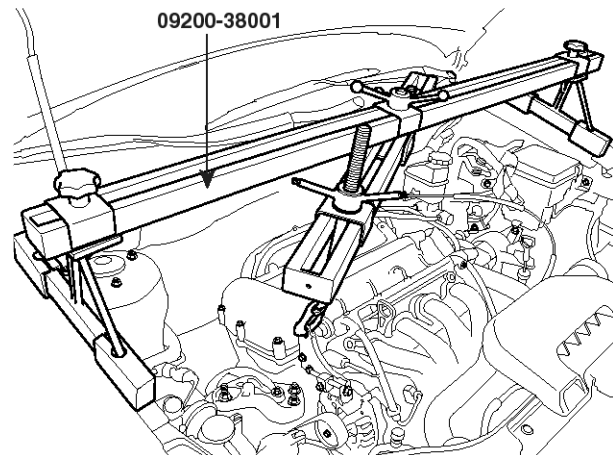
Tightening torque :

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



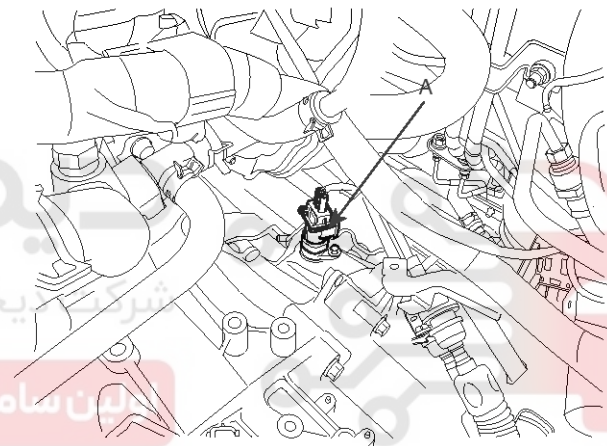
STDMT9014D

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



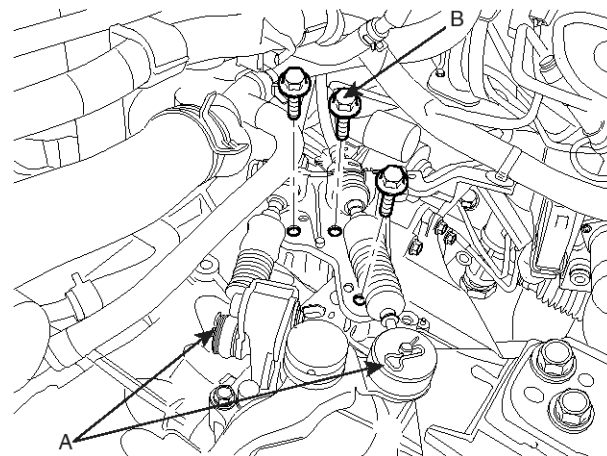
SHDAT6012D

18. Connect the vehicle speed sensor(A).



STDMT9008D

19. Install the snap pin(A) and control cable bracket bolts(B-3ea).

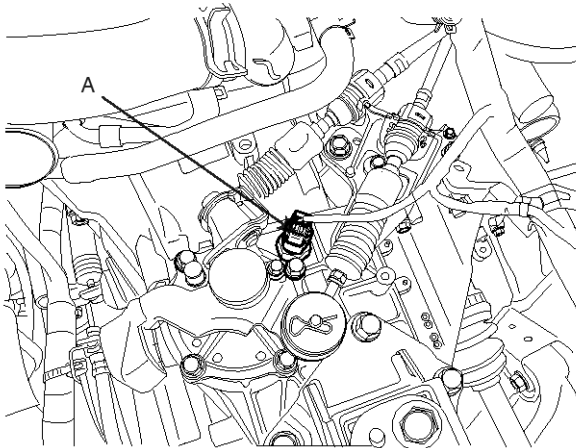


STDMT9007D

Manual Transaxle System

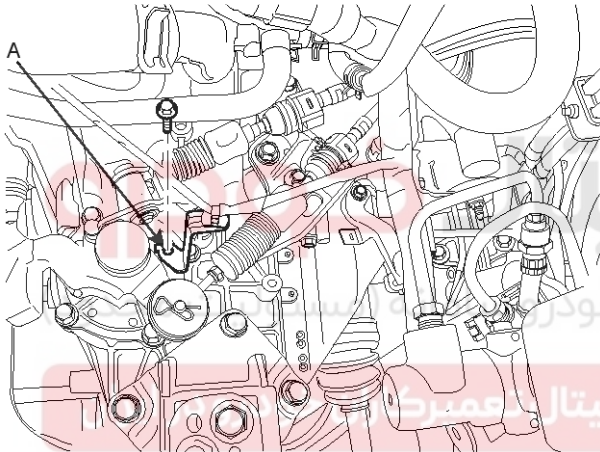
MT-19

20. Connect the back lamp switch connector (A).



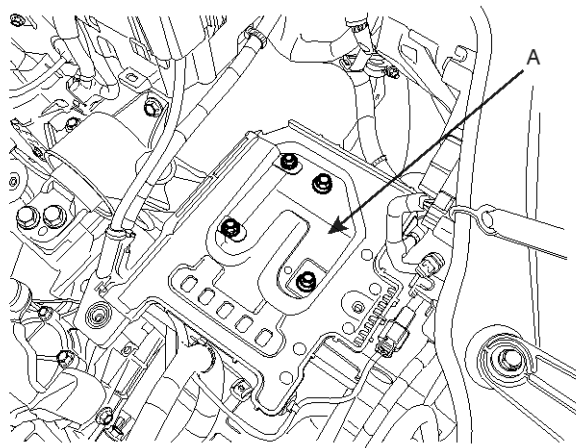
STDMT9006D

21. Install the wire bracket(A).



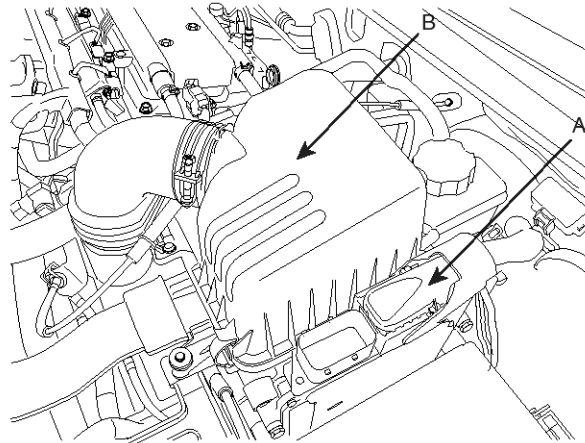
STDMT9005D

22. Install the battery tray(A).



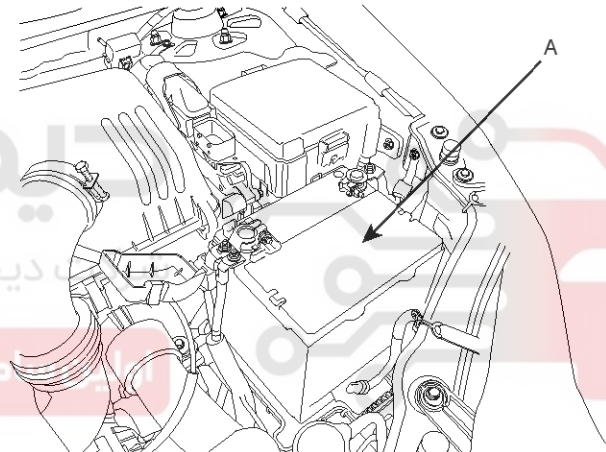
STDMT9004D

23. Install the air cleaner assembly(B) and connect the PCM connector(A).



STDMT9003D

24. Install the battery(A).

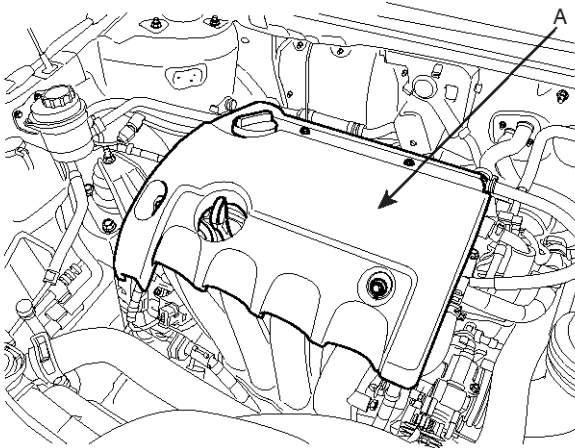


STDMT9002D

MT-20

Manual Transaxle System

25. Install the engine cover(A).



STDMT9001D

26. After completing the installation perform the following procedure;

- Adjust the shift cable.
- Refill the transaxle fluid.
- Clean the battery posts and cable terminals with sandpaper and grease them to prevent corrosion before installing.

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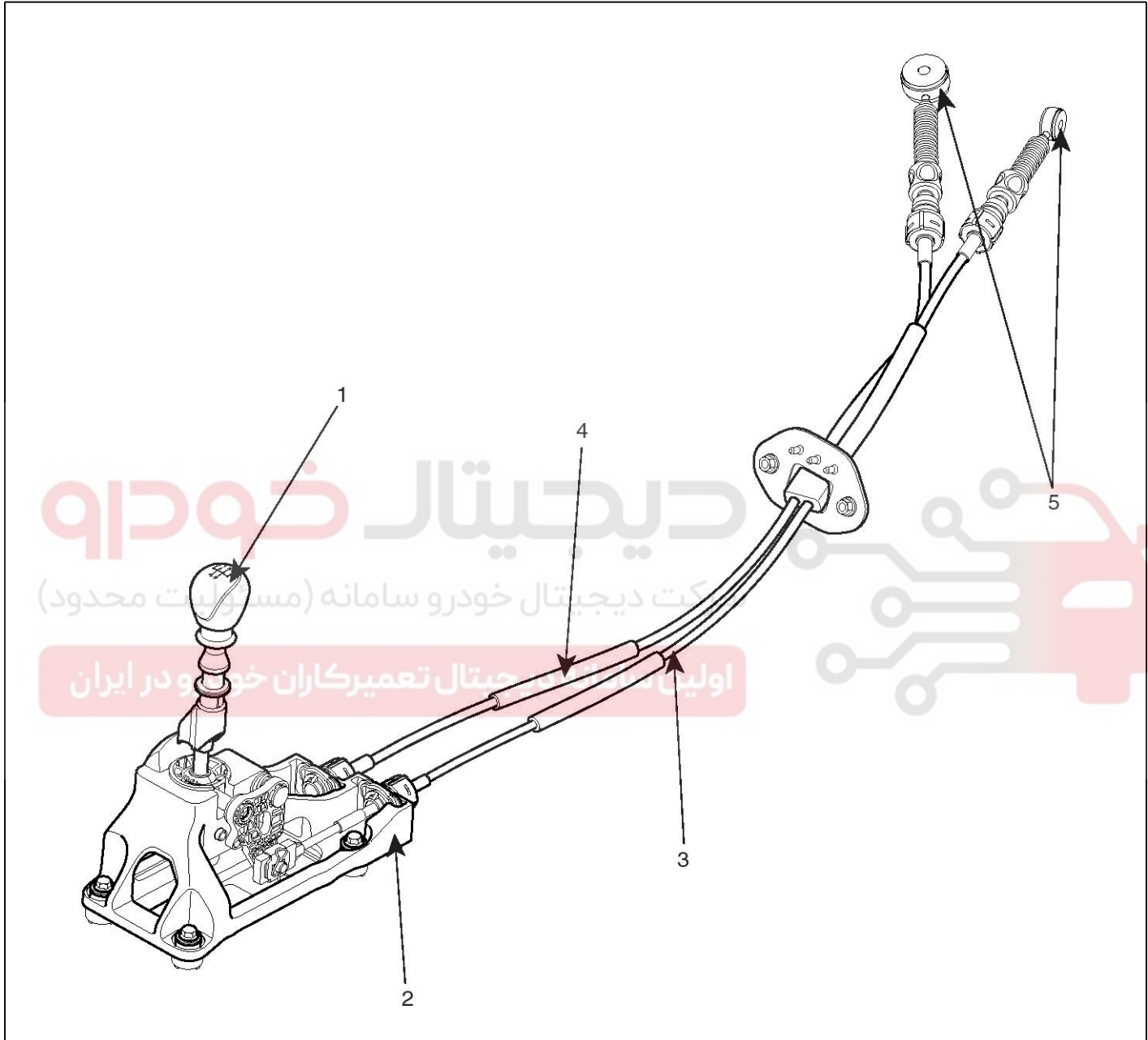
Manual Transaxle Control System

MT-21

Manual Transaxle Control System

Shift Lever

Components



STDMT9016D

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

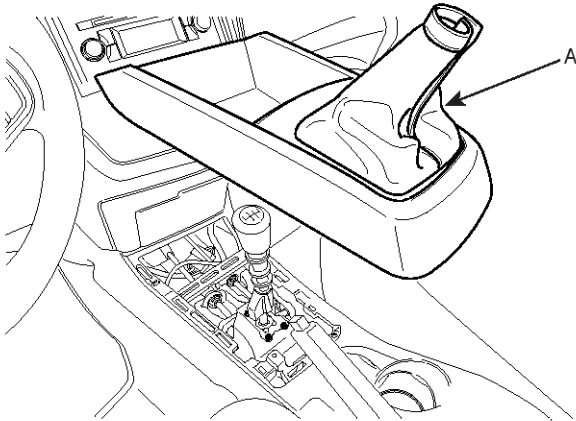
4. Shift cable assembly
5. Shift lever assembly(Manual Transaxle Side)

MT-22

Manual Transaxle System

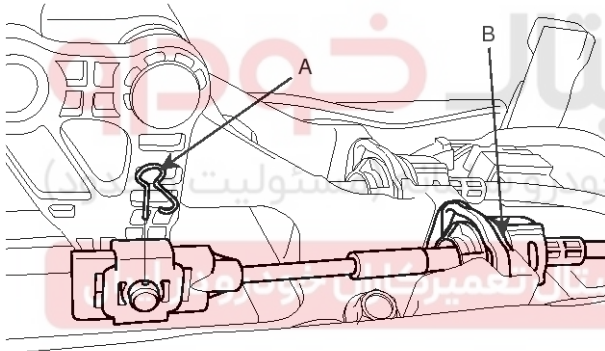
Removal

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



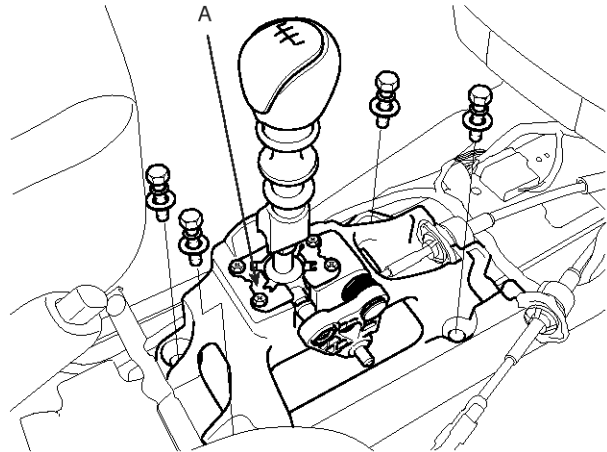
SFDMT8001L

2. Remove the center console. (refer to Console in BD group)
3. Remove the snap pin (A) and the clips (B).



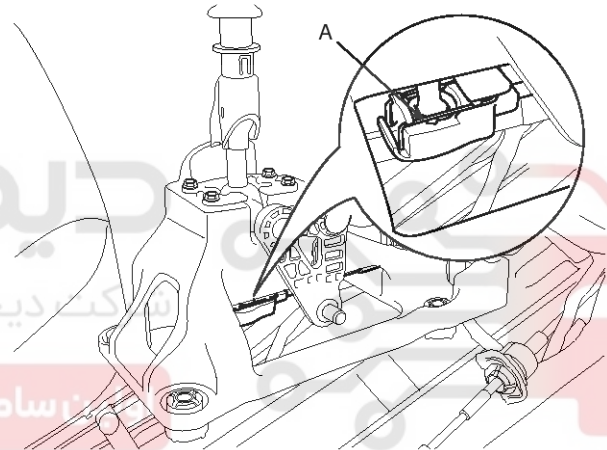
SEDMT7005L

4. Remove the shift lever assembly (A).



SHDMT6204D

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



SHDMT6205D

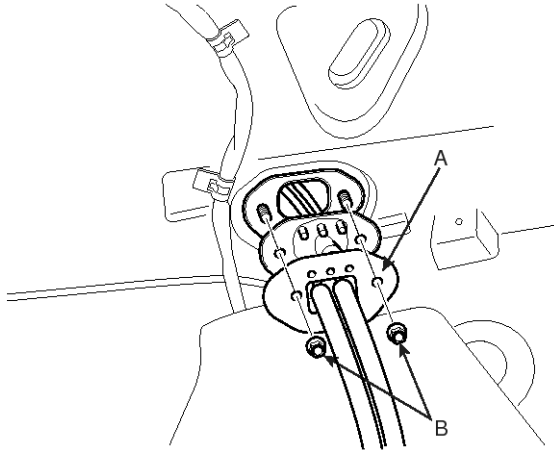
Manual Transaxle Control System

MT-23

- 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

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

Inspection

- Check the select cable for proper operation and for damage.
- Check the shift cable for proper operation and for damage.
- Check the boots for damage.
- Check the boots for wear, abrasion, sticking, restricted movement or damage.
- Check for the weak or damaged spring.

Installation

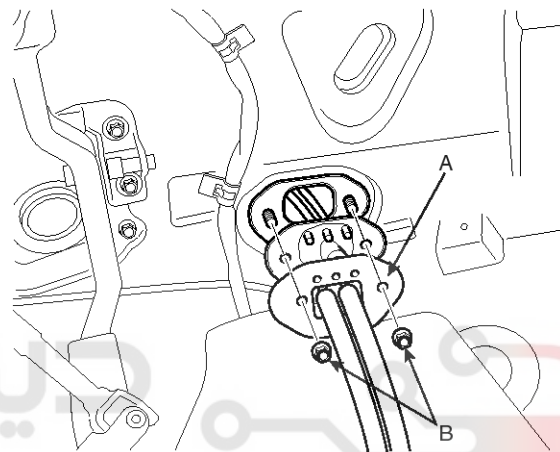
- Install the cable assembly placing the select and shift lever in neutral position.(refer to Manual Transaxle's installation)
- Install the retainer(A) and nuts(B).

Tightening torque :

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

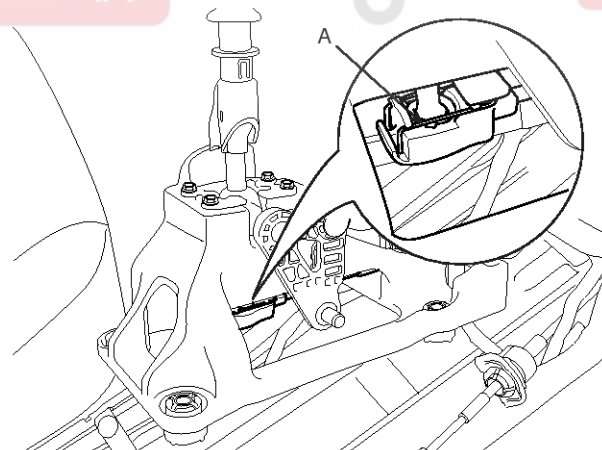
NOTICE

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



AMJF500A

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



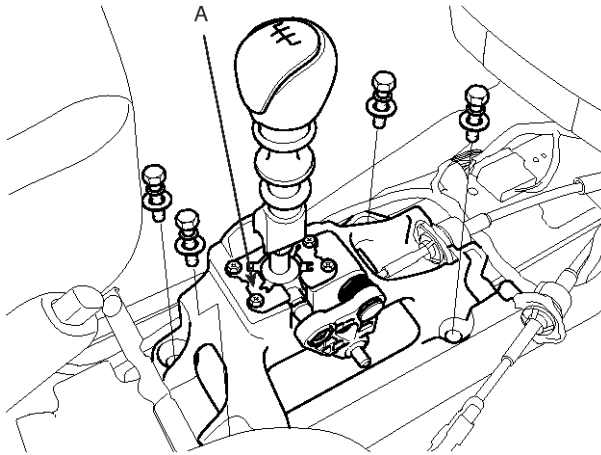
SHDMT6205D

MT-24

4. Install the shift lever assembly (A).

Tightening torque :

9~14Nm(0.9~1.4kgf.m, 6.5~10.1lb-ft)

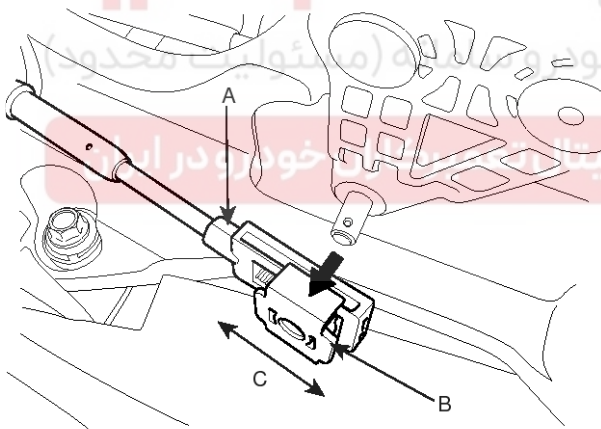


SHDMT6204D

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

NOTICE

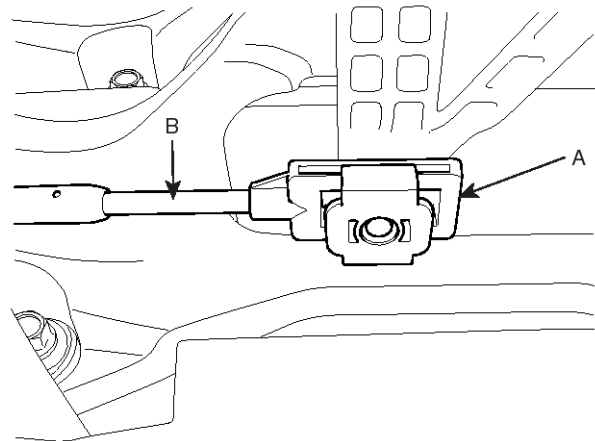
Adjust the slide clip fit into the select lever moving the slide clip in the direction.



AMLF005A

Manual Transaxle System

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

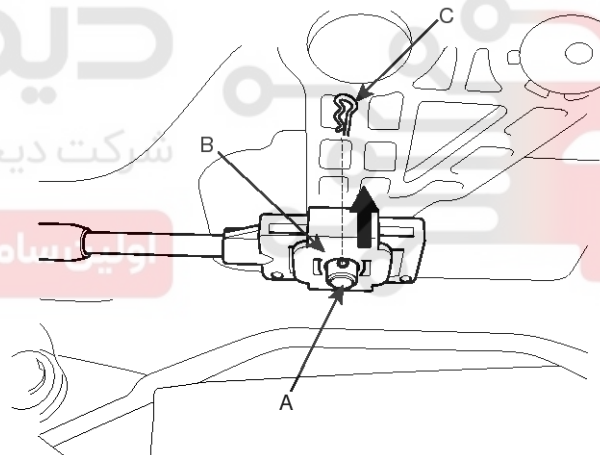


AMLF006A

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.



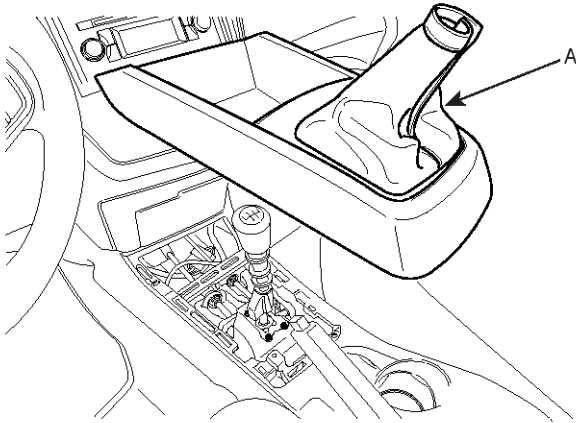
SHDMT6003L

8. Install the center console. (refer to Console in BD group)

Manual Transaxle Control System

MT-25

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



SFDMT8001L

دیجیتال خودرو

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MT-26

Manual Transaxle System

Back-up Lamp Switch

Description

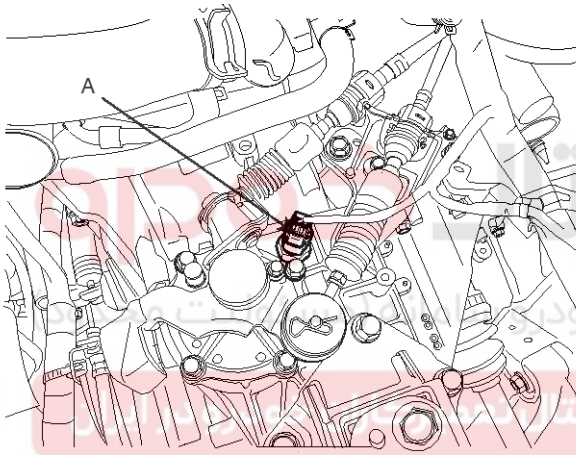
Back up lamp switch is pushed by the reverse lug sliding when shifting reverse, and switches the back up lamp.

Specificaitons

1. Current voltage : 12V
2. Working voltage : 10~15V
3. Operating force : 1.0 kg +0.2kg Max. (at 2mm stroke position)
4. Voltage drop : Max 0.15V with rated load before test, Max 0.24V with rated load after test
5. Working temperature : -30℃ ~ 80℃

Inspection

1. Disconnect the back up lamp switch connector (A).



STDMT9006D

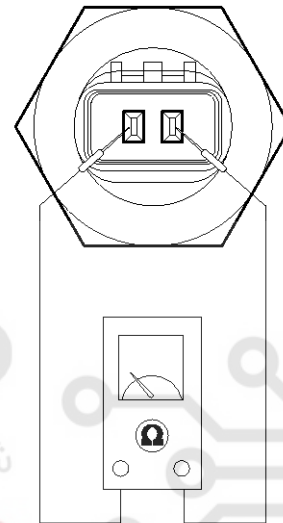
2. Check the continuity between no. 1 and 2 terminals of backup lamp switch.

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

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

Condition	1	2
Reverse Range	●	●
Other Range		

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



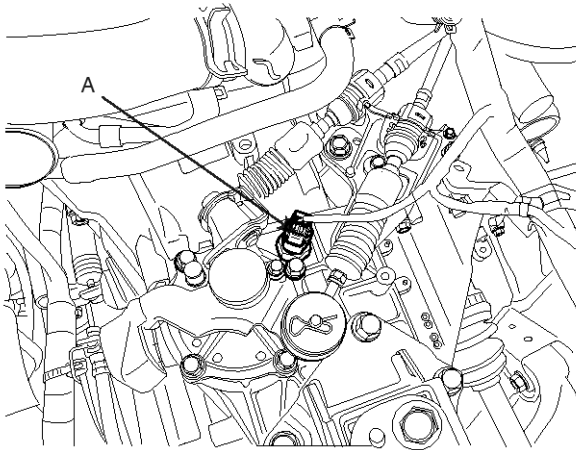
LMJF003B

Manual Transaxle Control System

MT-27

Replacement

1. Disconnect the back up lamp switch connector (A).



STDMT9006D

2. Remove the back up lamp switch.
3. Replace a new one and install the back up lamp switch, then connect the connector.

Tightening torque :

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



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