

# Manual Transaxle (M5CF2)

## GENERAL

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## MANUAL TRANSAXLE SYSTEM

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# GENERAL

## SPECIFICATIONS E1D2E0A9

Transaxle type		M5CF2
Engine type		U1.5 Diesel
Gear ratio	1st	3.615
	2nd	1.962
	3rd	1.257
	4th	0.905
	5th	0.702
	Reverse	3.583
Final gear ratio		3.471

## 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	0.001L-0.006L(0.025L-0.150L)

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

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

## TIGHTENING TORQUE

Standard value	Nm	kgf.cm	lb-ft
Release cylinder tube nut	13-17	130-170	9-12
Release cylinder tube bracket	15-22	150-220	10-16
Release cylinder bolt	15-22	150-220	10-16
Control shift complete bolt	30-35	300-350	21-25
Oil drain plug	60-80	600-800	43-58
Oil filler plug	60-80	600-800	43-58
Poppet ball	30-35	300-350	21-25
Clutch housing to transmission case	43-55	430-550	32-40
Speedometer driven gear	3-5	30-50	2-4
Reverse idler bolt	43-55	430-550	32-40
Reverse shift lever assembly bolt	15-22	150-220	10-16
Input shaft bearing retainer	15-22	150-220	10-16
Rear roll support bracket bolt	45-64	450-640	32-46
Rear roll stopper insulator bolt and nut	45-64	450-640	32-46
Transaxle mounting bracket bolts	60-80	600-800	43-58
Differential drive gear seal bolt	130-140	1300-1400	94-101
Clutch release lever fulcrum bolt	55-60	550-600	40-43
Transaxle upper mounting bolt(TM→ENG.)	60-80	600-800	43-58
Transaxle lower mounting bolt(ENG.→TM)	43-55	430-550	32-40

**⊗ WARNING**

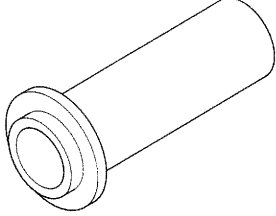
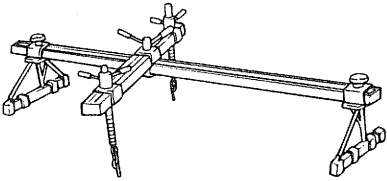
Always follow torque tightening levels. Failure to follow such levels can result in parts breaking if over-tightened or loosening if under-tightened.

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

## LUBRICATIONS

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 bleeder	MS721-38	As required
Transaxle housing	MS721-40 or MS721-38	As required
Surface of release fork and bearing	Grease (CASMOPLY L9508)	As required

**SPECIAL TOOL** E7765FCC

TOOL (Number and Name)	Illustration	Use
09452-21200 Oil seal installer	 <p style="text-align: right;">LKGF001L</p>	Installation of differential oil seal
09200-38001 Engine support fixture	 <p style="text-align: right;">LKGF001M</p>	Removal and installation of the transaxle

**TROUBLESHOOTING** EB4EEA9D

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.
	Weakened synchronizer spring	Replace synchronizer spring
	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

# MANUAL TRANSAXLE SYSTEM

## SERVICE ADJUSTMENT

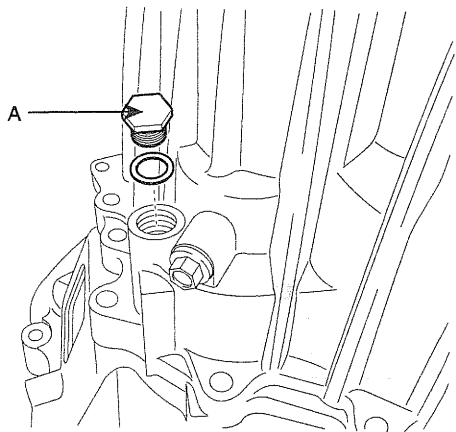
### PROCEDURE E87577AF

## TRANSAXLE GEAR OIL LEVEL

### INSPECTION

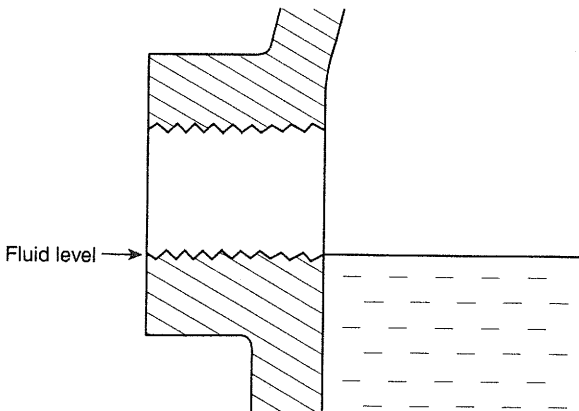
Inspect each component for evidence of leakage. Check the gear oil level by removing the filler plug. If the oil is contaminated, it is necessary to replace it with new oil.

1. Remove oil filler plug(A).



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2. Check level with finger.  
Oil level must be up to fill the hole, add oil until it runs over.



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3. Install filler plug.

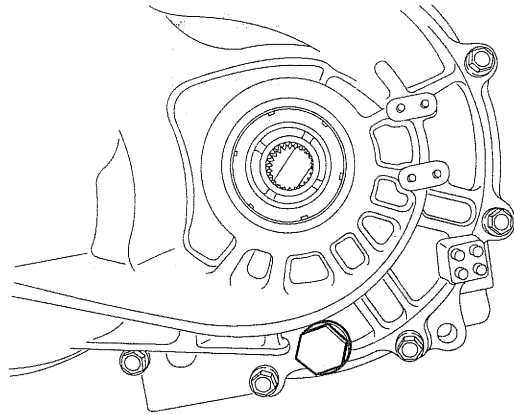
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Filler plug tightening torque :  
60-80 Nm (600-800 kgf.cm, 43-58 lb-ft)

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## REPLACEMENT

1. With the vehicle parked on a level surface, remove the drain plug.
2. Drain the transaxle oil.



LKGF002B

3. Install the drain plug with new washer.

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Drain plug tightening torque:  
60-80 Nm (600-800 kgf.cm, 43-58 lb-ft)

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

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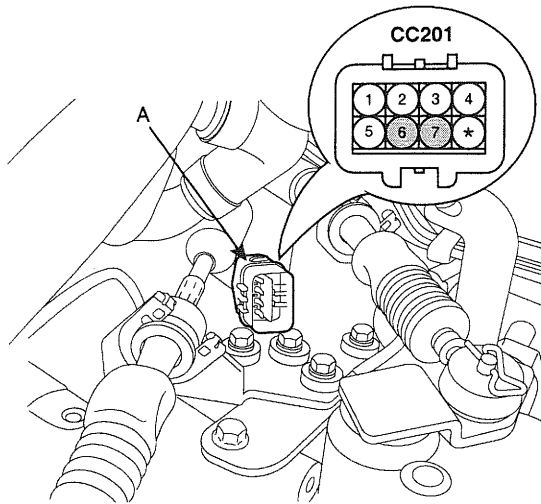
Standard oil SAE 75W/85, API GL-4  
Oil capacity: 2.0 liter (2.1 US qt, 1.76 imp qt)

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**BACKUP LAMP SWITCH**

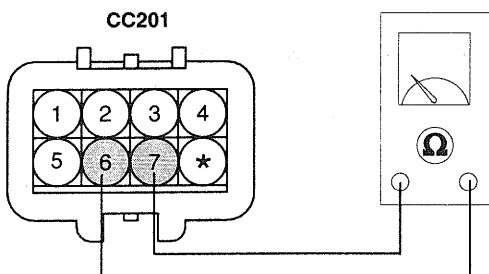
**INSPECTION**

1. Disconnect the common connector(A).



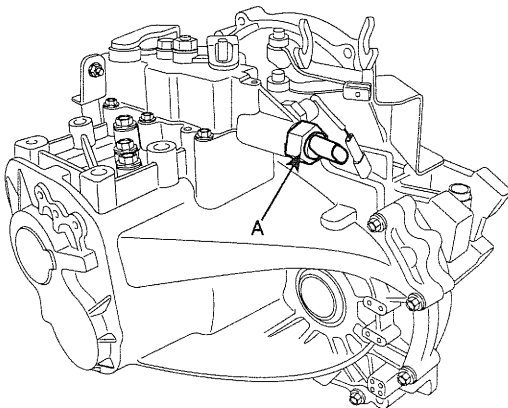
EMPG002A

2. Check the continuity between no. 6 and 7 terminals when the shift lever is in reverse. If there isn't continuity, go to next step.



EMPG002B

3. Disconnect the backup lamp switch(A).

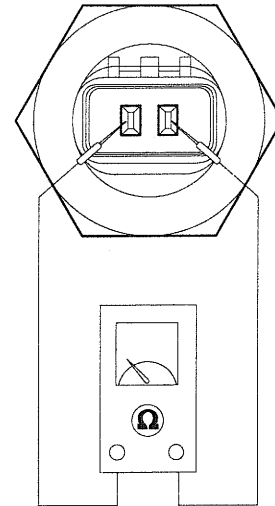


LKGF002C

4. 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
R Range	●	●
Other		

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



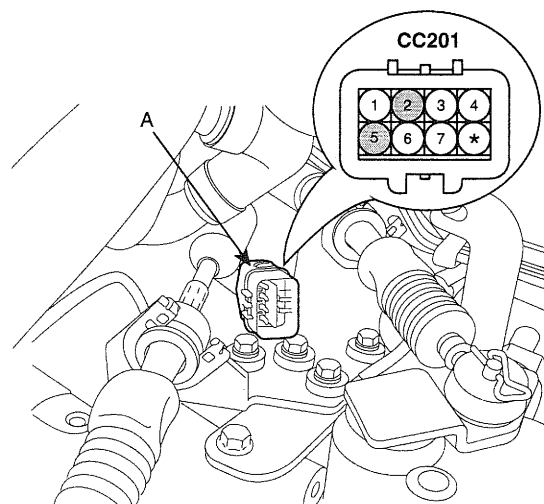
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5. If necessary, repair or replace the backup lamp switch.

**NEUTRAL SWITCH**

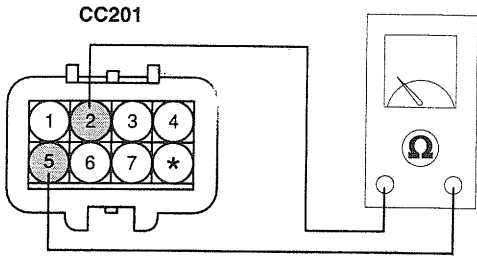
**INSPECTION**

1. Disconnect the common connector (A).



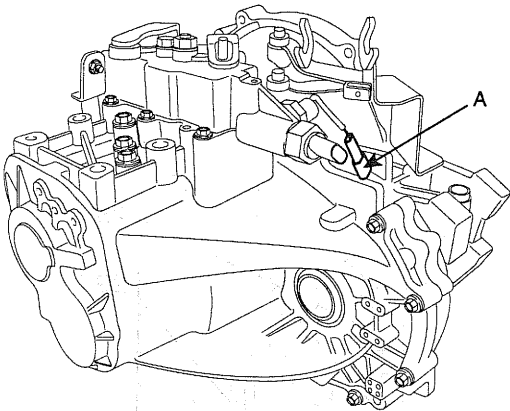
EMPG002C

- 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.



EMPG002D

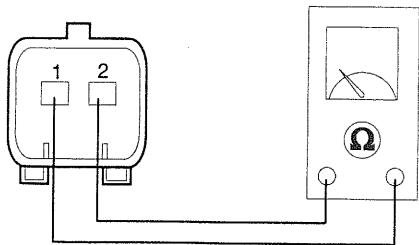
- Disconnect the neutral switch connector (A).



ANJF003B

- 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		



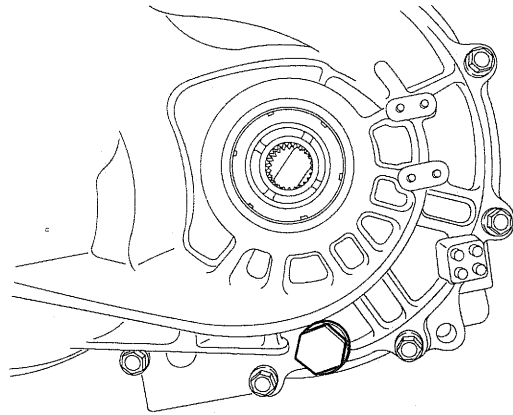
LMJF100B

- If necessary, repair or replace the neutral switch.

DRIVE SHAFT OIL SEAL

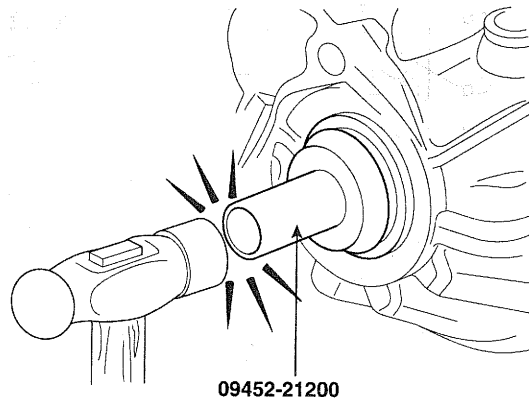
REPLACE

- Disconnect the drive shaft from the transaxle. (see "DS" group)
- Using a flat-tip screwdriver, remove the oil seal.



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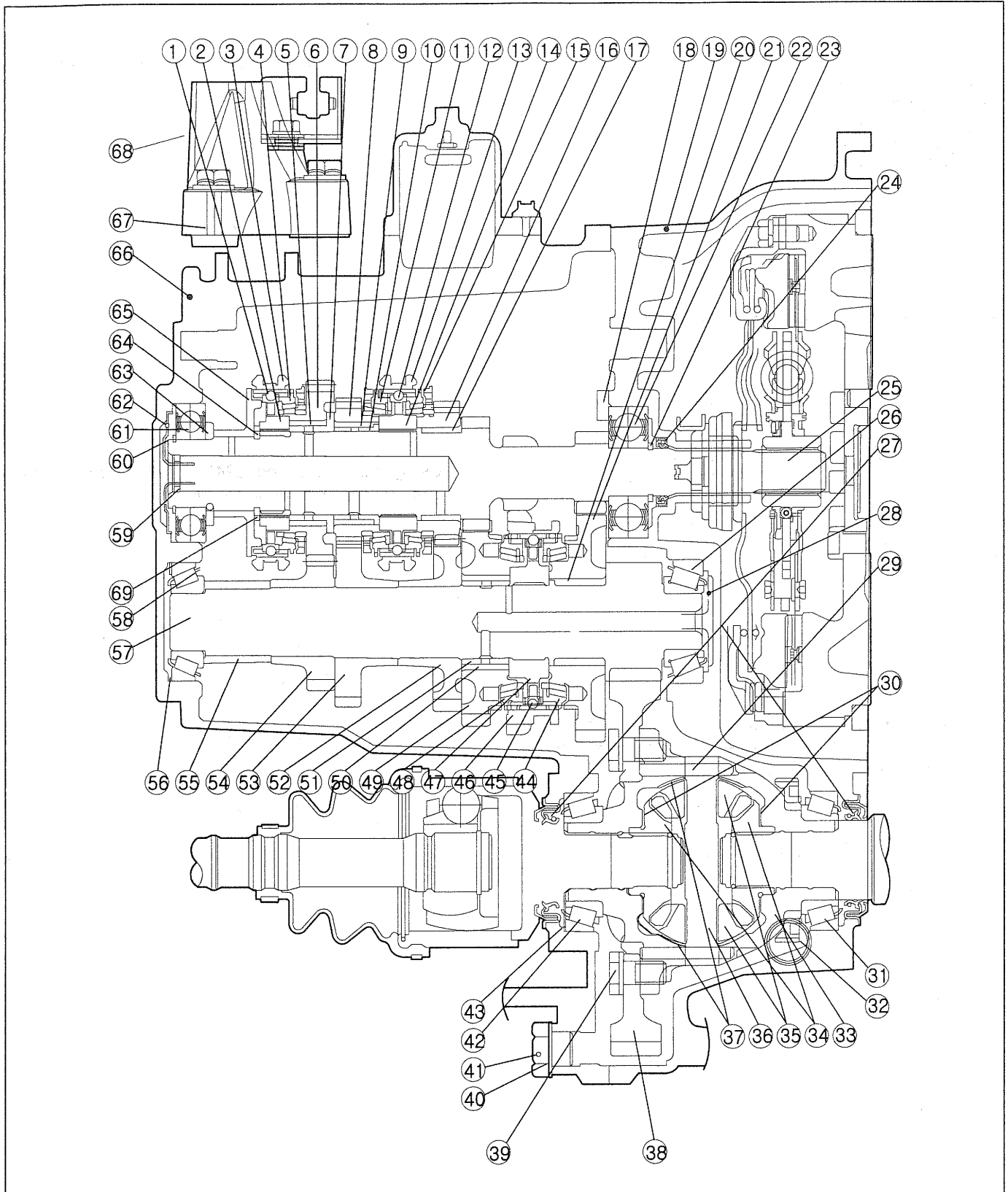
- Using the special tool(09452-21200), tap the drive shaft oil seal into the transaxle.



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# MANUAL TRANSAXLE

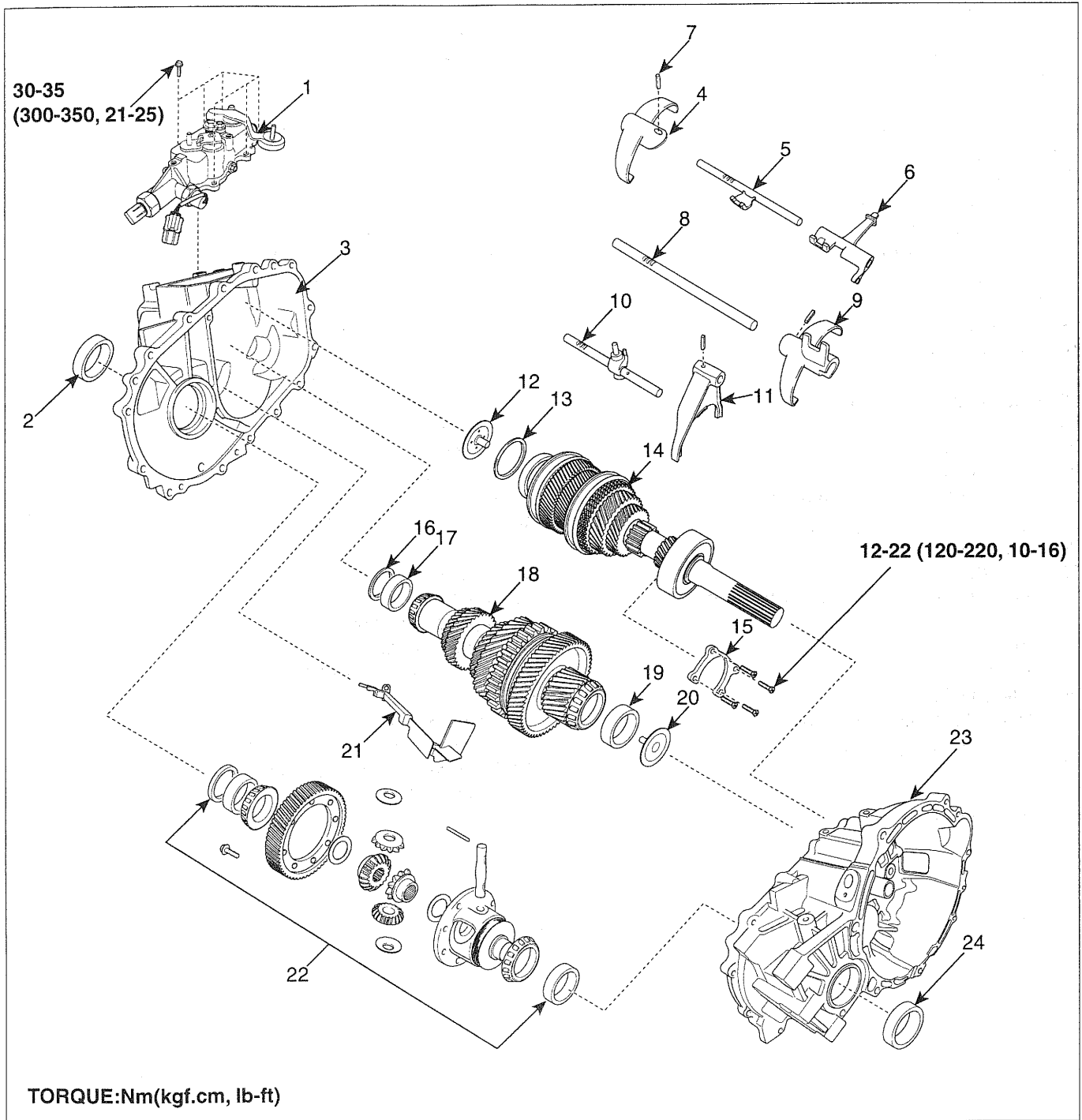
## COMPONENTS (1) EA57FDA4





1. 5th synchronizer key assembly
2. 5th synchronizer hub
3. 5th synchronizer sleeve
4. 5th synchronizer ring
5. Needle roller bearing
6. 5th speed gear
7. 5th speed gear sleeve
8. 4th speed gear
9. Needle roller bearing
10. 4th speed gear sleeve
11. 4th synchronizer ring
12. 4th synchronizer key assembly
13. 3rd & 4th synchronizer sleeve
14. 3rd & 4th synchronizer hub
15. 3rd double cone assembly
16. 3rd speed gear
17. Needle roller bearing
18. Input shaft bearing retainer
19. Clutch housing
20. Needle roller bearing
21. 1st speed gear
22. Input shaft front ball bearing
23. Input shaft front snap ring
24. Input shaft front oil seal
25. Input shaft
26. Output shaft front taper roller bearing
27. Differential oil seal
28. Output shaft oil guide
29. Lock pin
30. Differential gear spacer
31. Differential taper roller bearing
32. Speedometer drive gear
33. Differential case
34. Differential side gear
35. Differential pinion gear
36. Pinion shaft
37. Washer
38. Differential drive gear
39. Differential gear seal bolt
40. Gasket
41. Drain plug
42. Differential taper roller bearing
43. Spacer
44. 1st tripple cone assembly
45. 1st synchronizer key
46. 1st & 2nd synchronizer sleeve
47. 1st & 2nd synchronizer hub
48. 2nd tripple cone assembly
49. 2nd speed gear
50. Needle roller bearing
51. 2nd speed gear sleeve
52. 3rd speed output gear
53. 4th speed output gear
54. 5th speed output gear
55. Spacer
56. Output bearing spacer
57. Output shaft
58. Output shaft rear taper roller bearing
59. Oil guide ring
60. Input shaft rear snap ring
61. Input shaft rear ball bearing
62. Input shaft oil guide
63. Thrust washer
64. Input shaft 5th snap ring
65. Spacer
66. Transaxle case
67. Transaxle support bracket bolt
68. Transaxle support bracket
69. O-ring

COMPONENTS (2)



- 1. Control shift complete
- 2. Oil seal
- 3. Transaxle case
- 4. 5th shift fork
- 5. 5th shift rail
- 6. Reverse shift lug
- 7. Spring pin
- 8. 3rd & 4th shift rail

- 9. 3rd & 4th shift lug and fork
- 10. 1st & 2nd shift rail
- 11. 1st & 2nd shift fork
- 12. Input shaft oil guide
- 13. Snap ring
- 14. Input shaft assembly
- 15. Input shaft bearing retainer
- 16. Spacer

- 17. Output shaft rear outer racer
- 18. Output shaft assembly
- 19. Output shaft front outer racer
- 20. Output shaft oil guide
- 21. Oil guide
- 22. Differential assembly
- 23. Clutch housing
- 24. Oil seal

REMOVAL EFE759CF

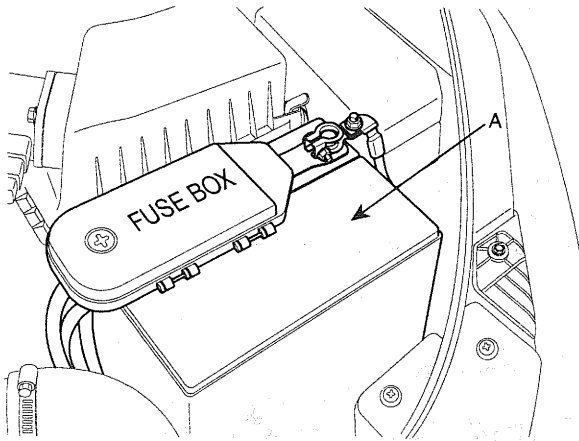
**CAUTION**

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

**NOTE**

- Mark all wiring and hoses to avoid misconnection.

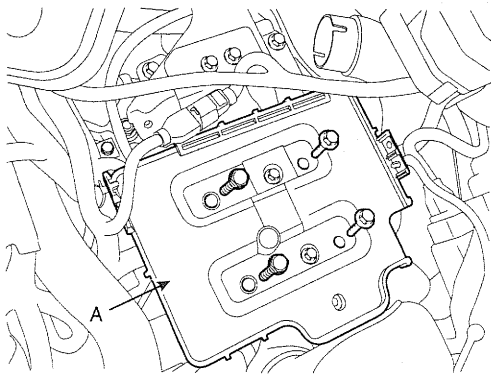
1. Remove the battery terminal and the battery(A).



ALJF003A

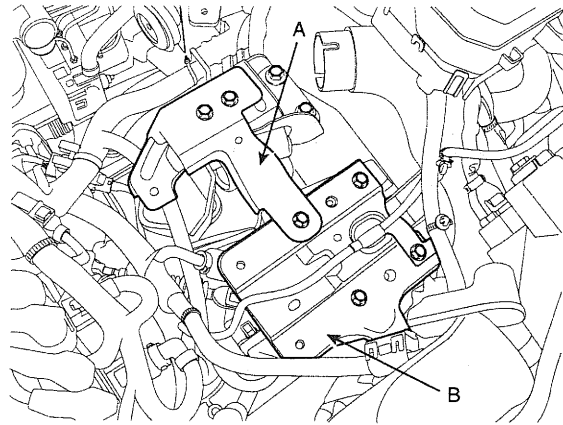
2. Disconnect the wire harness installed to the battery tray.

3. Remove the battery tray(A) (Bolt: 4EA).



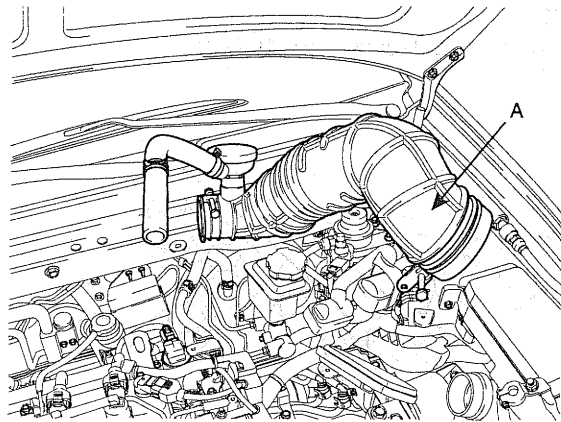
EMPG001A

4. Remove the air cleaner bracket(A) and the battery tray bracket(B) (Bolt: 5EA).



EMPG001B

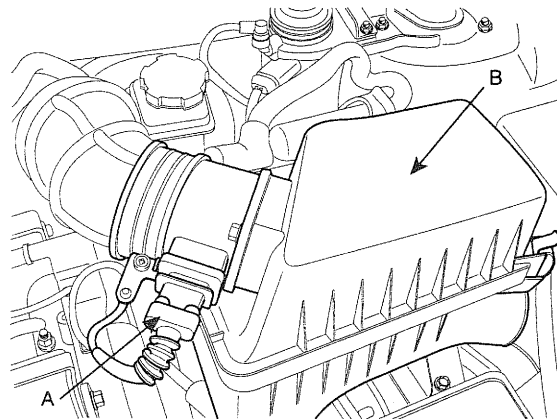
5. Remove the intake air hose(A).



ALJF003D

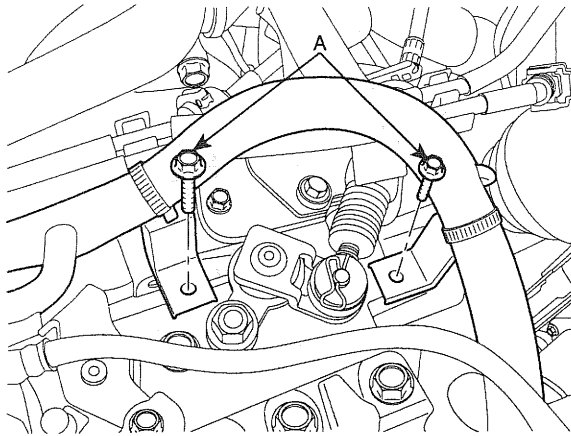
6. Remove the air flow sensor(AFS) connector(A).

7. Remove the air cleaner assembly(B).(Bolt:3EA)



ALJF003B

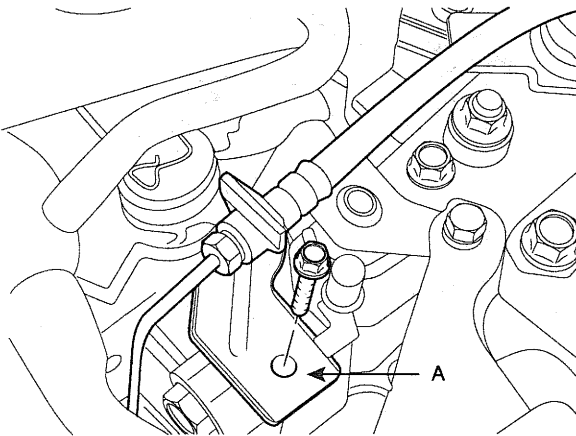
8. Remove the fuel hose from transaxle after loosening the fuel hose fixing bracket bolt(A).



EMPG001C

9. Remove the tube bracket(A).

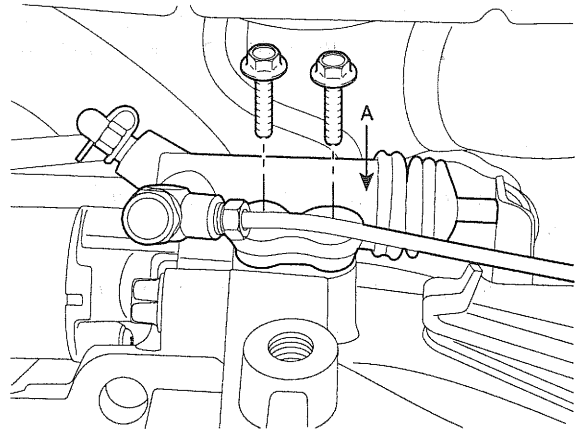
**TORQUE:**  
15~22Nm (150~220kgf.cm, 10~16lb-ft)



EMPG001D

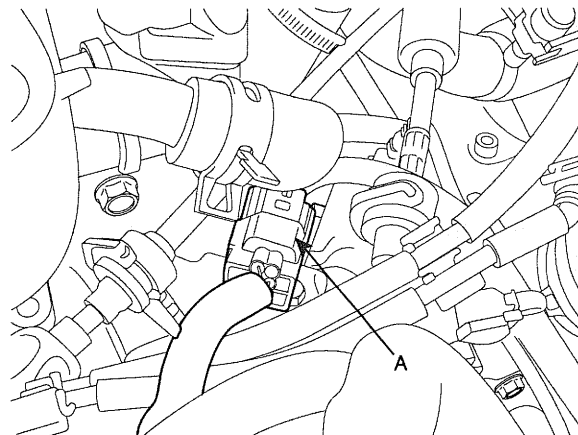
10. Remove the clutch release cylinder(A).

**TORQUE:**  
15~22Nm (150~220kgf.cm, 10~16lb-ft)



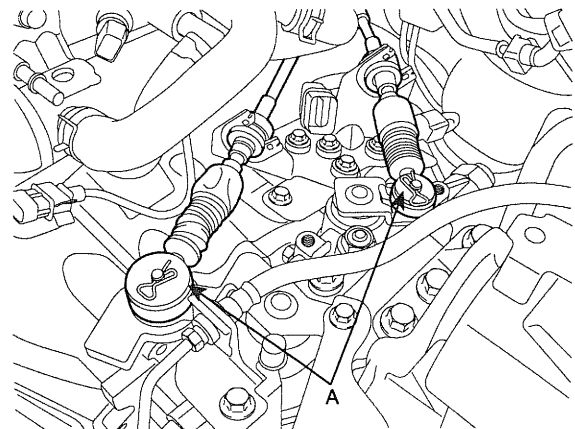
EMPG001E

11. Disconnect the common connector(A) of the back lamp switch connector, neutral switch connector and output speed sensor connector.



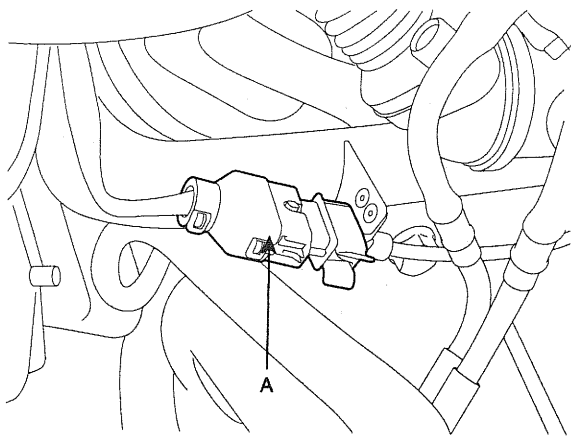
EMPG001F

12. Remove the transaxle control cable(A).

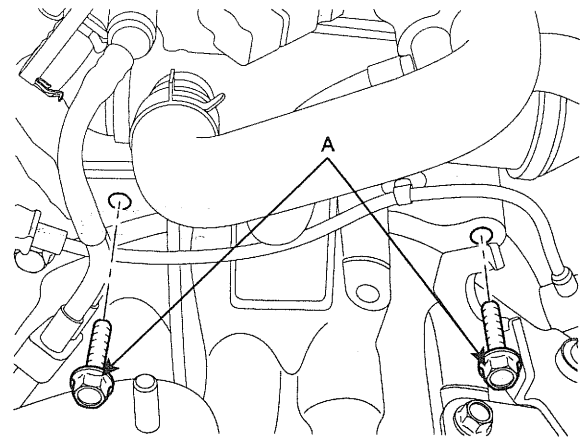


EMPG001G

13. Disconnect the crank shaft position sensor connector(A).



ANJF001C

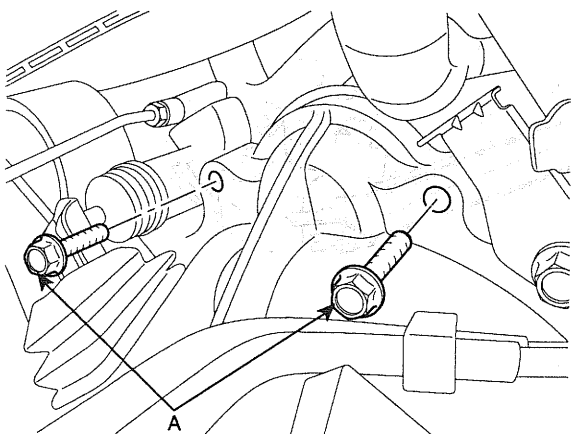


ANJF001F

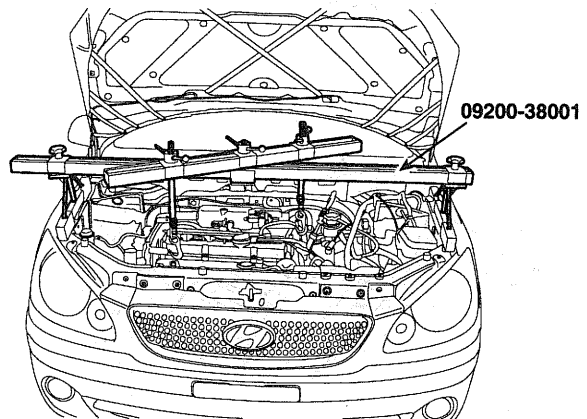
16. Install the SST(09200-38001), the engine support fixture and the adapter, on the engine and transaxle assembly.

14. Remove the starter motor mounting bolts(A). (Bolt:2EA)

**TORQUE:**  
43~55Nm (430~550kgf.cm, 32~40lb-ft)



ANJF001E



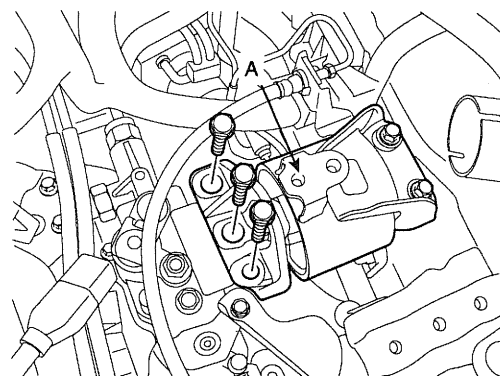
EMPG001H

17. Remove the transaxle mounting support bracket(A).

**TORQUE:**  
60~80Nm (600~800kgf.cm, 43~58lb-ft)

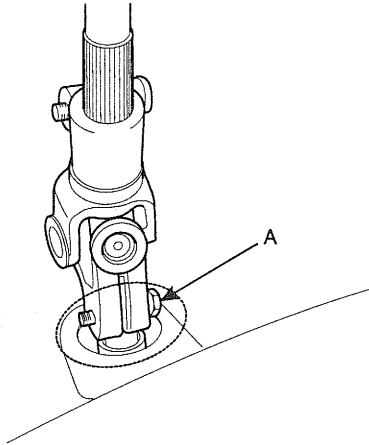
15. Remove the transaxle upper mounting bolts(A) from engine. (Bolt:2EA)

**TORQUE:**  
60~80Nm (600~800kgf.cm, 43~58lb-ft)



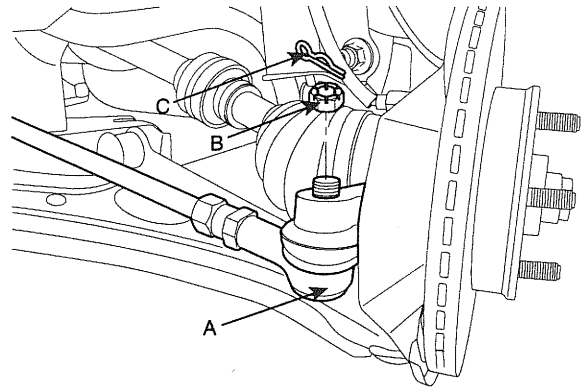
EMPG001I

18. Remove the steering column shaft bolt(A).



ANJF001M

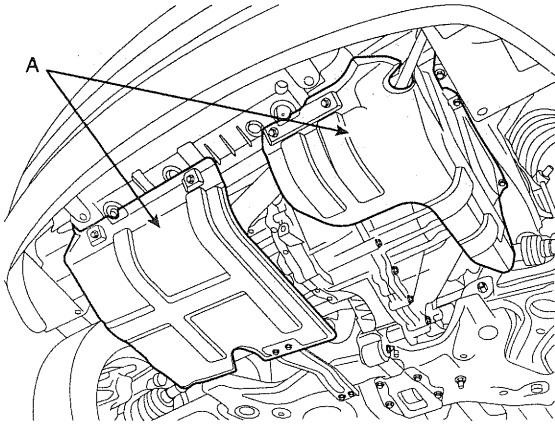
23. Remove the tie rod end(A) pin(B) and nut(C), then remove the tie rod end.



EMPG001K

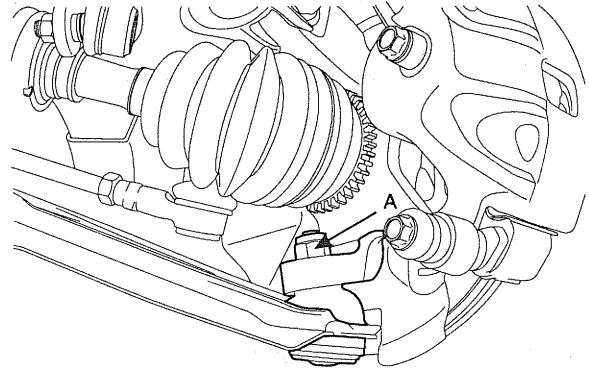
19. Lift the vehicle.

20. Remove the under cover(A).



EMPG001J

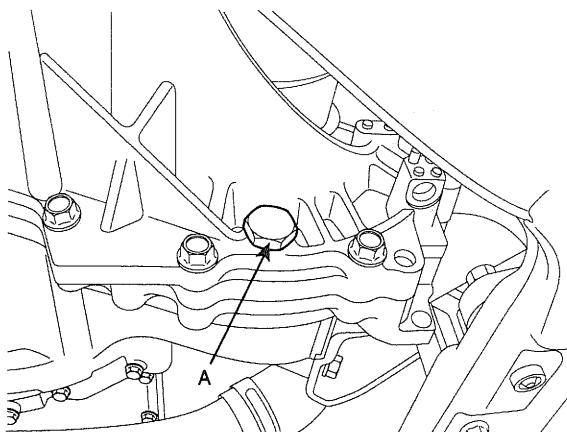
24. Remove the lower arm fixing bolt(A) from the knuckle.



EMPG001L

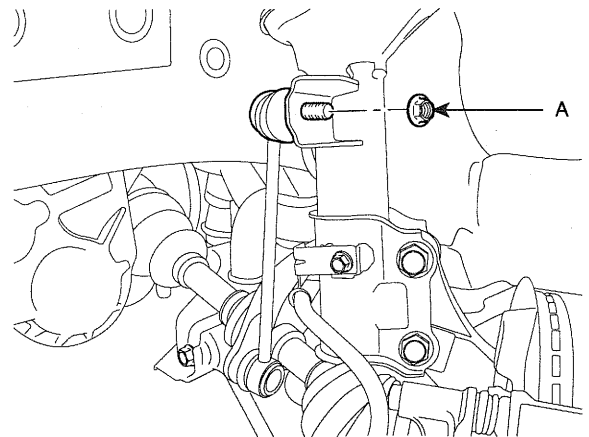
21. Remove the front tires.

22. Loosen the drain plug(A) and drain the transaxle gear oil.



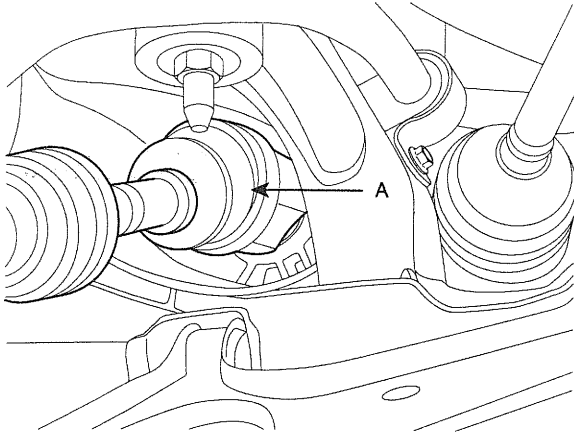
ANJF001G

25. Remove the stabilizer control link nut(A).



EMPG001M

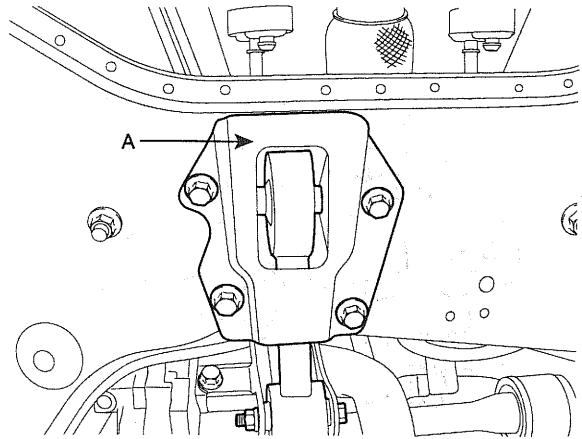
26. Remove the drive shaft(A) from the transaxle.



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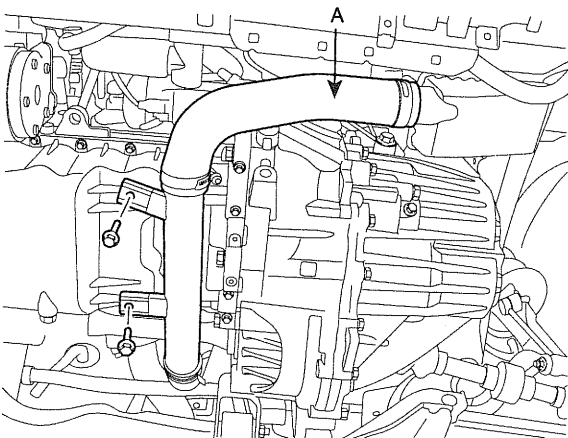
29. Remove the transaxle rear mounting bracket(A) (Bolt: 4EA).

TORQUE:  
45~64Nm (450~640kgf.cm, 32~46lb-ft)



EMPG001Q

27. Remove the intercooler lower hose (A). (Bolt: 2EA)



EMPG001O

30. Using a floor jack, support the transaxle assembly.



**NOTE**

After removing the sub frame mounting bolts, the transaxle assembly may fall downward, and so support them securely with floor jack.

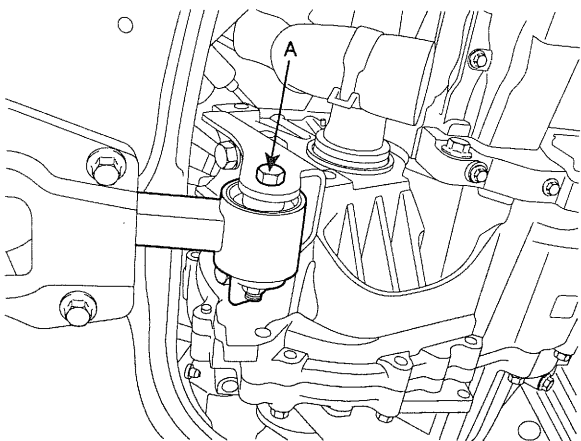
Verify that the hoses and connectors are disconnected before removing the transaxle assembly.

31. Remove the bell housing cover (A) and the lower mounting bolts of the transaxle (Bolt: 3EA)

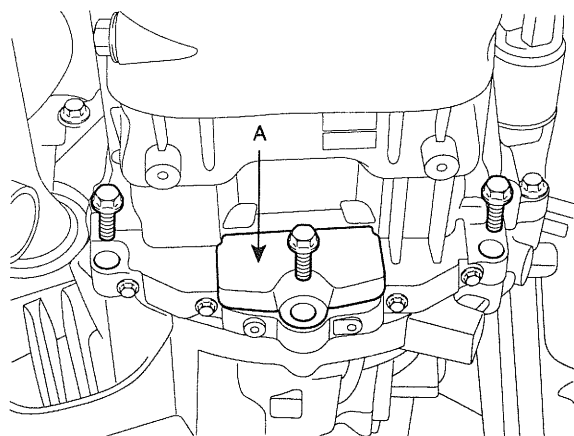
TORQUE:  
43~55Nm (430~550kgf.cm, 32~40lb-ft)

28. Remove the rear roll stopper insulator bolt (A).

TORQUE:  
45~64Nm (450~640kgf.cm, 32~46lb-ft)



EMPG001P

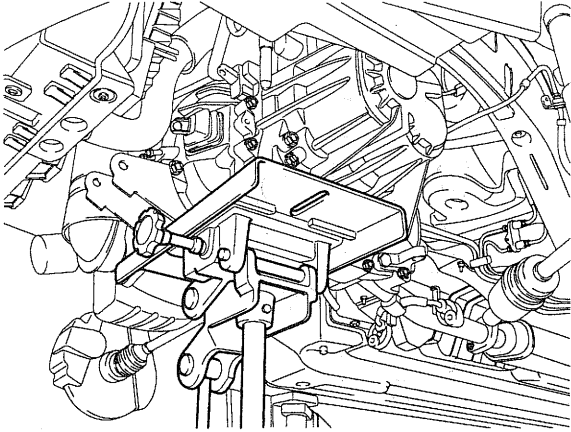


EMPG001R

32. Remove the transaxle assembly by lifting vehicle.

 **CAUTION**

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



KMNF0030

## INSTALLATION EEBE4ECF

Installation is in the reverse order of removal.

Perform the following :

- Adjust the shift cable and the select cable.
- Refill the transaxle with fluid.
- Clean the battery posts and cable terminals with sandpaper assemble them, and then apply grease to prevent corrosion.