

GROUP 22A

MANUAL

TRANSMISSION (FF)

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WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

WARNING

- *Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver and passenger (from rendering the SRS inoperative).*
- *Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.*
- *MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B - Supplemental Restraint System (SRS) before beginning any service or maintenance of any component of the SRS or any SRS-related component.*

NOTE

The SRS includes the following components: SRS air bag control unit, SRS warning light, front impact sensors, air bag module, clock spring, and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (*).

GENERAL INFORMATION

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The manual transmission come in two models, namely, F5M42 and W5M42.

Item		Specification		
Transmission model		F5M42 (2WD)	W5M42 (4WD)	
Engine model		4G63-DOHC-MPI		4G69-SOHC-MIVE C
Transmission type		5-speed forward, 1-speed reverse constant mesh		
Transmission gear ratio	1st	3.583		
	2nd	1.947		
	3rd	1.379		
	4th	1.030		
	5th	0.820		
	Reverse	3.363		
Final reduction ration (Differential gear ratio)		4.625	4.687	4.352
Speedmeter gear ratio		27/36		

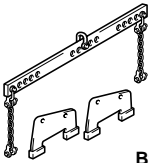
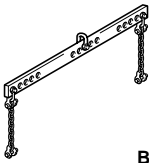
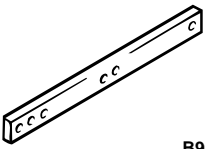
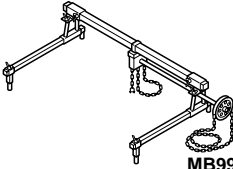
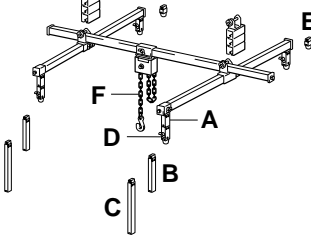
LUBRICANT

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Item	Specified lubricant	Quantity L	
Transmission oil	Gear oil API classification GL-4 SAE 75W-85W or 75W-90	2WD	2.2
		4WD	2.3
Transfer oil <4WD>	Hypoid gear oil API classification GL-5 SAE90	0.55	

SPECIAL TOOLS

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Tool	Number	Name	Use
 <p>B991453</p>	MB991453	Engine hanger assembly	<p>When the engine hanger is used: Supporting the engine assembly during removal and installation of the transmission assembly</p> <p><i>NOTE: Special tool MB991454 is a part of engine hanger attachment set MB991453.</i></p>
 <p>B991454</p>	MB991454	Engine hanger balancer	
 <p>B991527</p>	MB991527	Engine hanger	
 <p>MB991895</p>	MB991895	Engine hanger	
<p>Slide bracket (HI)</p>  <p>B991928</p>	<p>MB991928</p> <p>A: MB991929</p> <p>B: MB991930</p> <p>C: MB991931</p> <p>D: MB991932</p> <p>E: MB991933</p> <p>F: MB991934</p>	<p>Engine hanger</p> <p>A: Joint (50) ×2</p> <p>B: Joint (90) ×2</p> <p>C: Joint (140) ×2</p> <p>D: Foot (standard) ×4</p> <p>E: Foot (short) ×2</p> <p>F: Chain and hook assembly</p>	

TROUBLESHOOTING

INTRODUCTION

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The manual transmission can exhibit any of the following symptoms: noise or vibration is generated, oil leaks, shifting gears is hard or troublesome, or the transmission jumps out of gear.

The causes of these symptoms could come from: incorrect mounting, the oil level may be low, or a component of the transmission may be faulty.

TROUBLESHOOTING STRATEGY

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Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure that you have exhausted most of the possible ways to find a manual transmission fault.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by following the Symptom Chart.
4. Verify malfunction is eliminated.

SYMPTOM CHART

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SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Noise, Vibration	1	P.22A-4
Oil Leaks	2	P.22A-5
Hard Shifting	3	P.22A-6
Jumps Out of Gear	4	P.22A-7

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Noise, Vibration

DIAGNOSIS

STEP 1. Check the idle speed.

Q: Does the idle speed meet the standard values?

YES : Go to Step 2 .

NO : Refer to GROUP 11A <4G63

Engine>P.11A-11 , or GROUP 11C <4G69

Engine>P.11C-14 , On-vehicle Service –

Kerb Idle Speed Check.

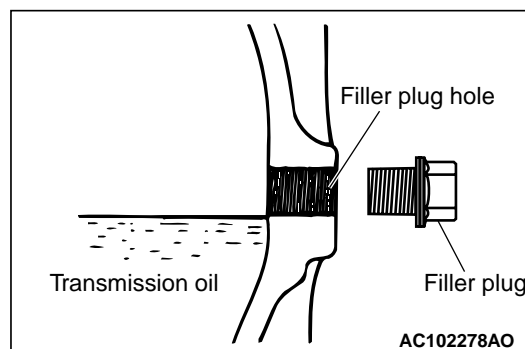
STEP 2. Check whether the transaxle and engine mount is loose or damaged.

Q: Are the transaxle and engine mount loose or damaged?

YES : Tighten or replace the part. Then go to Step 7 .

NO : Go to Step 3 .

STEP 3. Check that the oil level is up to the lower edge of the filler plug hole.



Q: Is the oil level up to the lower edge of the filler plug hole?

YES : Go to Step 4 .

NO : Refill gear oil API classification GL-4 SAE 75W–85W or 75W–90. Then go to Step 7 .

STEP 4. Check for the specified oil.

Q: Is the specified oil gear oil API classification GL-4 SAE 75W-85W or 75W-90?
YES : Go to Step 5 .
NO : If in doubt, replace the oil. Refer to [P.22A-8](#). Then go to Step 7 .

STEP 5. Remove the transmission. Check the end play of the input and output shafts.

Q: Does the end play of the input and output shafts meet the standard value?
YES : Go to Step 6 .
NO : Adjust the end play of the input and output shafts. Then go to Step 7 .

STEP 6. Disassemble the transmission. Check the gears for wear and damage.

Q: Are the gears worn or damaged?
YES : Replace the gears. Go to Step 7 .
NO : Go to Step 7 .

STEP 7. Retest the systems.

Q: Is the noise or vibration still there?
YES : Return to Step 1 .
NO : The procedure is complete.

INSPECTION PROCEDURE 2: Oil Leaks

DIAGNOSIS

STEP 1. Visual check.

Raise the vehicle, and check for oil leaks. If oil leak is difficult to locate, steam clean the transmission and drive the vehicle for at 10 minutes. Then check the leak again.

Q: Is the oil leak(s) found?
YES : Go to Step 2 .
NO : Check for the oil leaks around the engine. Then go to Step 4 .

STEP 2. Visual check at the clutch housing.

Q: Do oil leaks appear around the joint between the engine and the clutch housing?

YES : Remove the transmission. Check the input shaft oil seal, and replace if necessary. Then go to Step 4 .
NO : Go to Step 3 .

STEP 3. Check the oil seal or O-ring for damage.

Q: Is the oil seal or O-ring damaged?
YES : Replace the oil seal or the O-ring. Then go to Step 4 .
NO : Go to Step 4 .

STEP 4. Retest the system.

Q: Is the oil still leaking?
YES : Return to Step 1 .
NO : The procedure is complete.

INSPECTION PROCEDURE 3: Hard Shifting

DIAGNOSIS

STEP 1. Check the transmission control

Q: Are the shift cable and the select cable in good condition?

YES : Go to Step 2 .

NO : Repair or replace the shift cable and the select cable. Refer to [P.22A-8](#). Then go to Step 7 .

STEP 2. Check the transmission oil.

Q: Is the oil dirty?

YES : Replace the oil. Refer to [P.22A-8](#). Then go to Step 7

NO : Go to Step 3 .

STEP 3. Check the clutch system.

Q: Is the clutch system normal?

YES : Go to Step 4 .

NO : Repair or replace the clutch system. Refer to [P.22A-8](#). Then go to Step 7 .

STEP 4. Remove and disassemble the transmission. Check the control housing.

Q: Is the control housing in good condition?

YES : Go to Step 5 .

NO : Repair or replace the control housing. Refer to GROUP 22B, Transmission [P.22B-43](#). Then go to Step 7 .

STEP 5. Check for poor meshing of worn synchronizer ring and gear cone.

Q: Is poor meshing or worn synchronizer ring and gear cone found?

YES : Repair or replace the synchronizer ring and gear cone. Then go to Step 7 .

NO : Go to Step 6 .

STEP 6. Check the synchronizer spring for weakness.

Q: Is the synchronizer spring weak?

YES : Replace the synchronizer spring. Then go to Step 7 .

NO : Go to Step 7 .

STEP 7. Retest the system.

Q: Is the shifting of the gears still hard?

YES : Return to Step 1 .

NO : The procedure is complete.

INSPECTION PROCEDURE 4: Jumps Out of Gear

DIAGNOSIS

STEP 1. Check the transmission control

Q: Are the shift cable and the select cable in good condition?

YES : Go to Step 2 .

NO : Repair or replace the shift cable and the select cable. Refer to [P.22A-8](#). Then go to Step 6 .

STEP 2. Remove and disassemble the transmission. Check the poppet spring for breakage.

Q: Is the poppet spring broken?

YES : Replace the poppet spring. Refer to GROUP 22B, Transmission [P.22B-14](#). Then go to Step 6 .

NO : Go to Step 3 .

STEP 3. Check the control housing.

Q: Is the control housing in good condition?

YES : Go to Step 4 .

NO : Repair or replace the control housing. Refer to GROUP 22B, Transmission [P.22B-14](#). Then go to Step 6 .

STEP 4. Check the gear shift forks for wear.

Q: Is the gear shift forks worn?

YES : Replace the gear shift fork. Refer to GROUP 22B, Transmission [P.22B-14](#). Then go to Step 6 .

NO : Go to Step 5 .

STEP 5. Check the clearance.

Q: Is the clearance between the synchronizer hub and sleeve excessive?

YES : Replace the synchronizer hub or sleeve. Refer to GROUP 22B, Input Shaft [P.22B-25](#), Output Shaft [P.22B-32](#). Then go to Step 6.

NO : Go to Step 6 .

STEP 6. Retest the system.

Q: Does the transmission still jump out of gear?

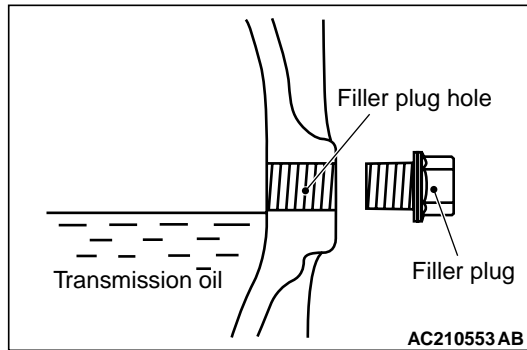
YES : Return to Step 1 .

NO : The procedure is complete.

ON-VEHICLE SERVICE

TRANSMISSION OIL LEVEL CHECK

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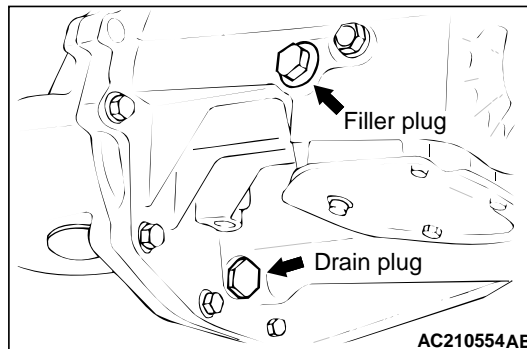


1. Remove the filler plug.
2. Check that the oil level is up to the lower edge of the filler plug hole.
3. Check that the oil is not noticeably dirty.
4. Tighten the filler plug to the specified torque.

Tightening torque: 32 ± 2 N·m

TRANSMISSION OIL REPLACEMENT

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1. Remove the filler plug.
2. Remove the drain plug and drain the oil.
3. Tighten the drain plug to the specified torque.

Tightening torque: 32 ± 2 N·m

4. Fill with gear oil API classification GL-4 SAE 75W-85W or 75W-90 until the level comes to the lower portion of filler plug hole.

Quantity: 2.2 L <2WD>

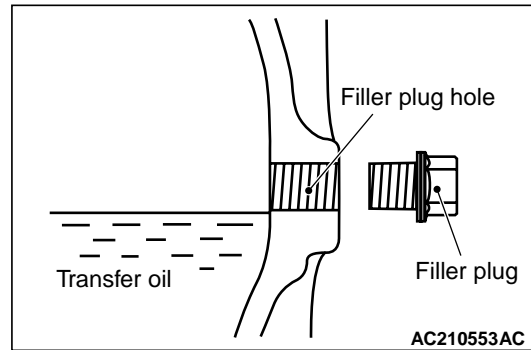
Quantity: 2.3 L <4WD>

5. Tighten the filler plug to the specified torque.

Tightening torque: 32 ± 2 N·m

TRANSFER OIL CHECK

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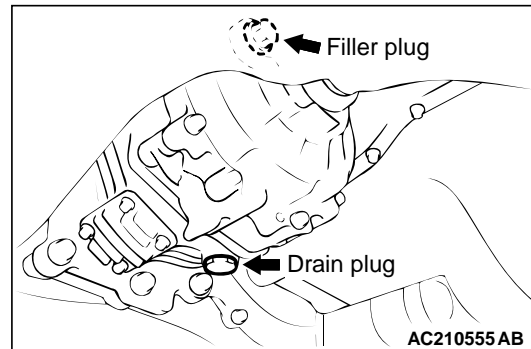


1. Remove the filler plug.
2. Check that the oil level is up to the lower edge of the filler plug hole.
3. Check that the oil is not noticeably dirty.
4. Tighten the filler plug to the specified torque.

Tightening torque: 32 ± 2 N·m

TRANSFER OIL REPLACEMENT

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1. Remove the filler plug.
2. Remove the drain plug and drain the oil.
3. Tighten the drain plug to the specified torque.

Tightening torque: 32 ± 2 N·m

4. Fill with hypoid gear oil API classification GL-5 SAE90 until the level comes to the lower portion of filler plug hole.

Quantity: 0.55 L

5. Tighten the filler plug to the specified torque.

Tightening torque: 32 ± 2 N·m

TRANSMISSION CONTROL

REMOVAL AND INSTALLATION

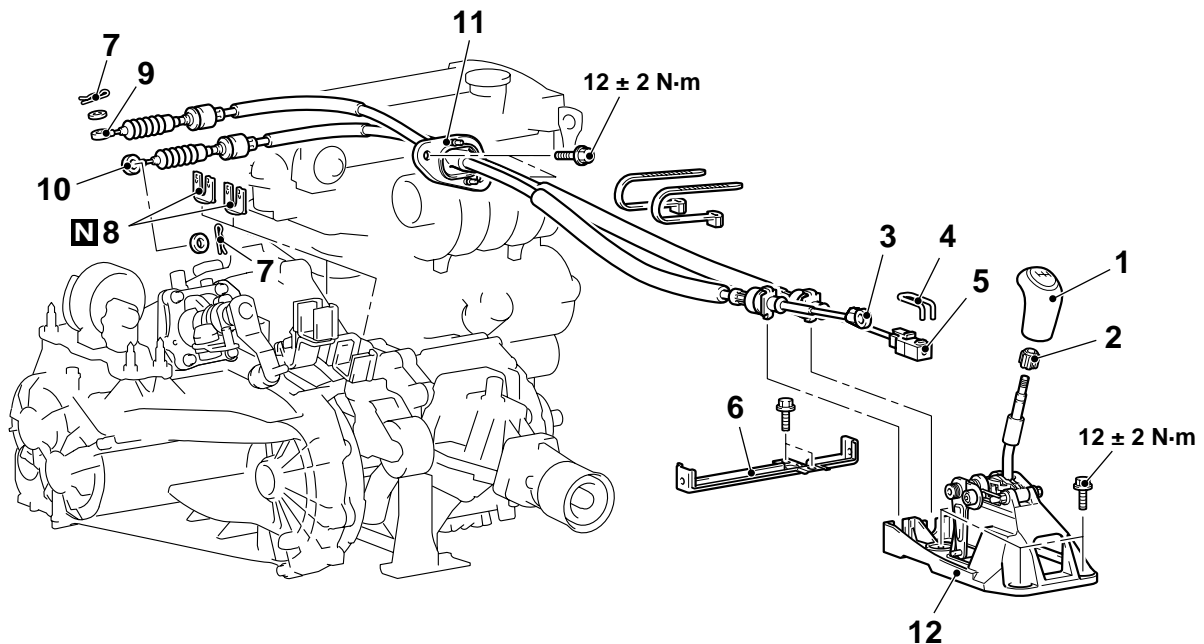
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WARNING

Be careful not to subject the SRS-ECU to any shocks during removal and installation of the shift cable and select cable assembly.

Pre-removal and Post-installation Operation

- Air Cleaner Assembly Removal and Installation (Refer to GROUP 15, Air Cleaner [P.15-3<4G63>](#), [P.15-4<4G69>](#)).
- Battery and Battery Tray Removal and Installation.



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Gearshift cable and select cable assembly removal steps

1. Gearshift lever knob
2. Sleeve
 - Front floor console (Refer to GROUP 52A [P.52A-14](#)).
3. Select cable connection (Gearshift lever side)
4. Gearshift cable clip
5. Gearshift cable connection (Gearshift lever side)
 - SRS-ECU (Refer to GROUP 52B [P.52B-178](#)).
6. Console side cover bracket
7. Snap pin
8. Gearshift link clip
9. Select cable connection (Transmission side)

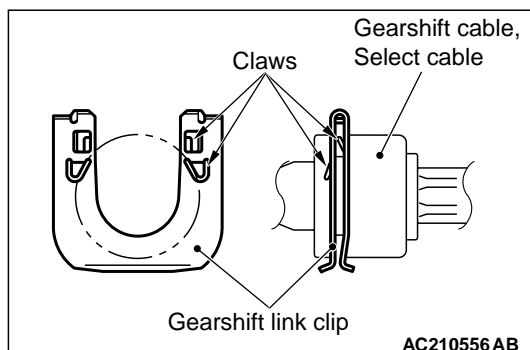
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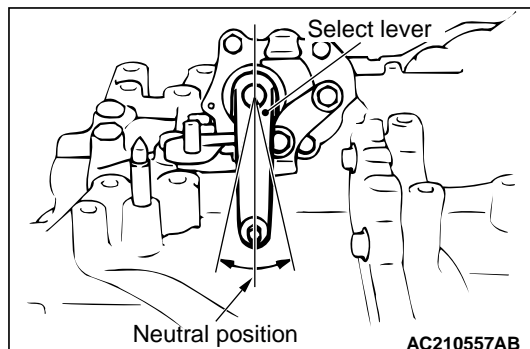
Gearshift cable and select cable assembly removal steps

10. Gearshift cable connection (Transmission side)
 11. Gearshift cable and select cable assembly
- #### Gearshift lever assembly removal steps
1. Gearshift lever knob
 2. Sleeve
 - Front floor console (Refer to GROUP 52A [P.52A-14](#)).
 3. Select cable connection (Gearshift lever side)
 4. Gearshift cable clip
 5. Gearshift cable connection (Gearshift lever side)
 12. Gearshift lever assembly

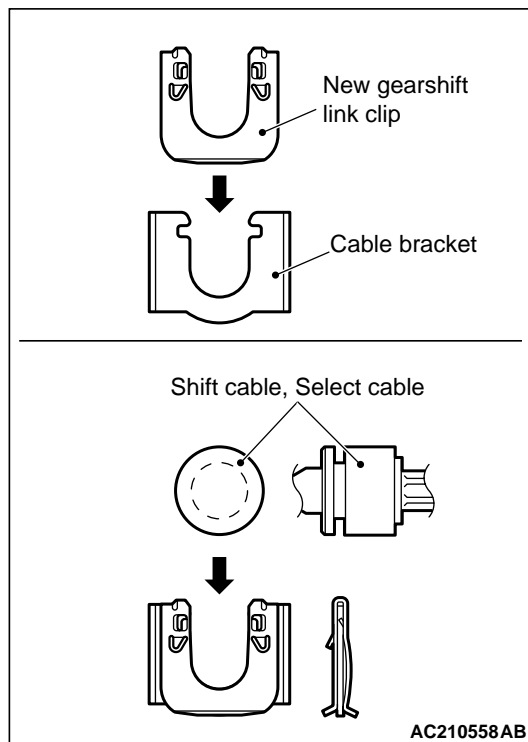
>>B<<

REMOVAL SERVICE POINTS**<<A>> GEARSHIFT LINK CLIP/SELECT CABLE CONNECTION (TRANSMISSION SIDE)/GEAR SHIFT CABLE CONNECTION (TRANSMISSION SIDE) REMOVAL**

Push up the claws of the gearshift link clip using a screwdriver, etc., and then remove the gearshift link clip from the bracket together with the cables.

INSTALLATION SERVICE POINTS**>>A<< GEARSHIFT CABLE AND SELECT CABLE ASSEMBLY/GEARSHIFT CABLE CONNECTION (TRANSMISSION SIDE)/SELECT CABLE CONNECTION (TRANSMISSION SIDE)/GEARSHIFT LINK CLIP INSTALLATION**

1. Set the transmission side shift lever and the passenger compartment side shift lever to the neutral position.
2. Install the painted part of the shift cable end (transmission side) and painted part of the select cable (transmission side) facing the snap pin.

CAUTION

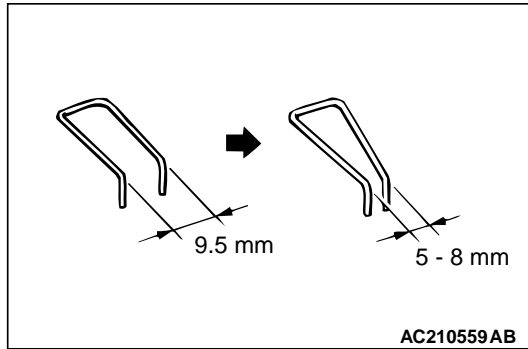
Insert thoroughly the gearshift link clip, shift cable and select cable until they click in place.

3. After installing the new gearshift link clip to the cable bracket of the transmission, install the shift cable and select cable to the cable bracket.

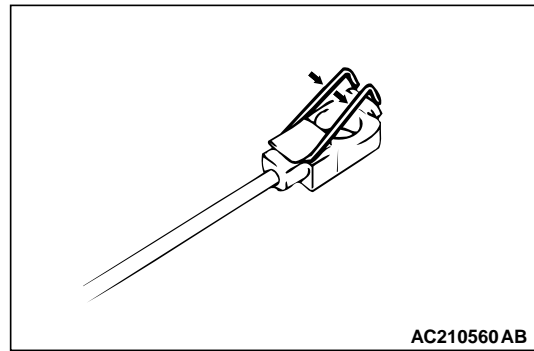
NOTE: The clip is reversible.

4. Move the shift lever to all positions and check that the operation is smooth.

>>B<< GEAR SHIFT CABLE CLIP INSTALLATION



1. Make sure that there is no excessive play at the shift cable end gearshift cable clip. If there is excessive play or the gearshift cable clip is disengaged from the shift cable end, check the clip opening gap. If the gap is more than 9.5 mm, squeeze the gearshift cable clip until the relaxed gap reaches 5 to 8 mm.

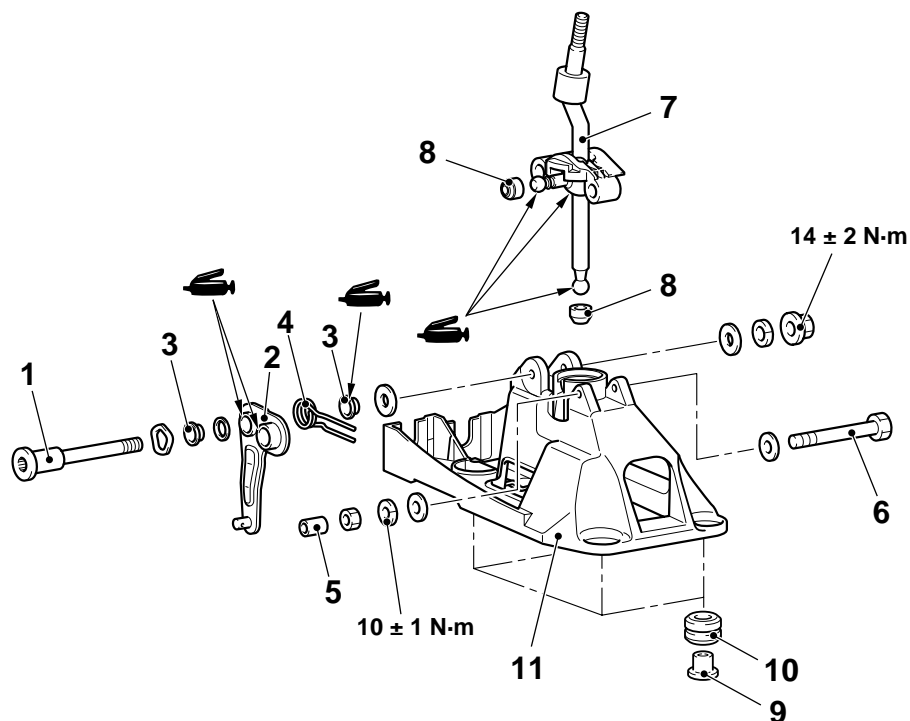


2. Engage the gearshift cable clip with the shift cable hook securely, and push the gearshift cable clip with your thumbs until it clicks in place.
3. Install the shift cable to the shift lever.

SHIFT LEVER ASSEMBLY

DISASSEMBLY AND REASSEMBLY

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Disassembly steps

1. Gearshift link bolt
2. Gearshift select lever
3. Gearshift link bushing
4. Gearshift lever spring
5. Gearshift link collar
6. Bolt

Disassembly steps (Continued)

7. Gearshift lever
8. Gearshift link bushing
9. Gearshift lever bracket distance piece
10. Gearshift link bushing
11. Gearshift lever bracket

TRANSFER ASSEMBLY

REMOVAL AND INSTALLATION

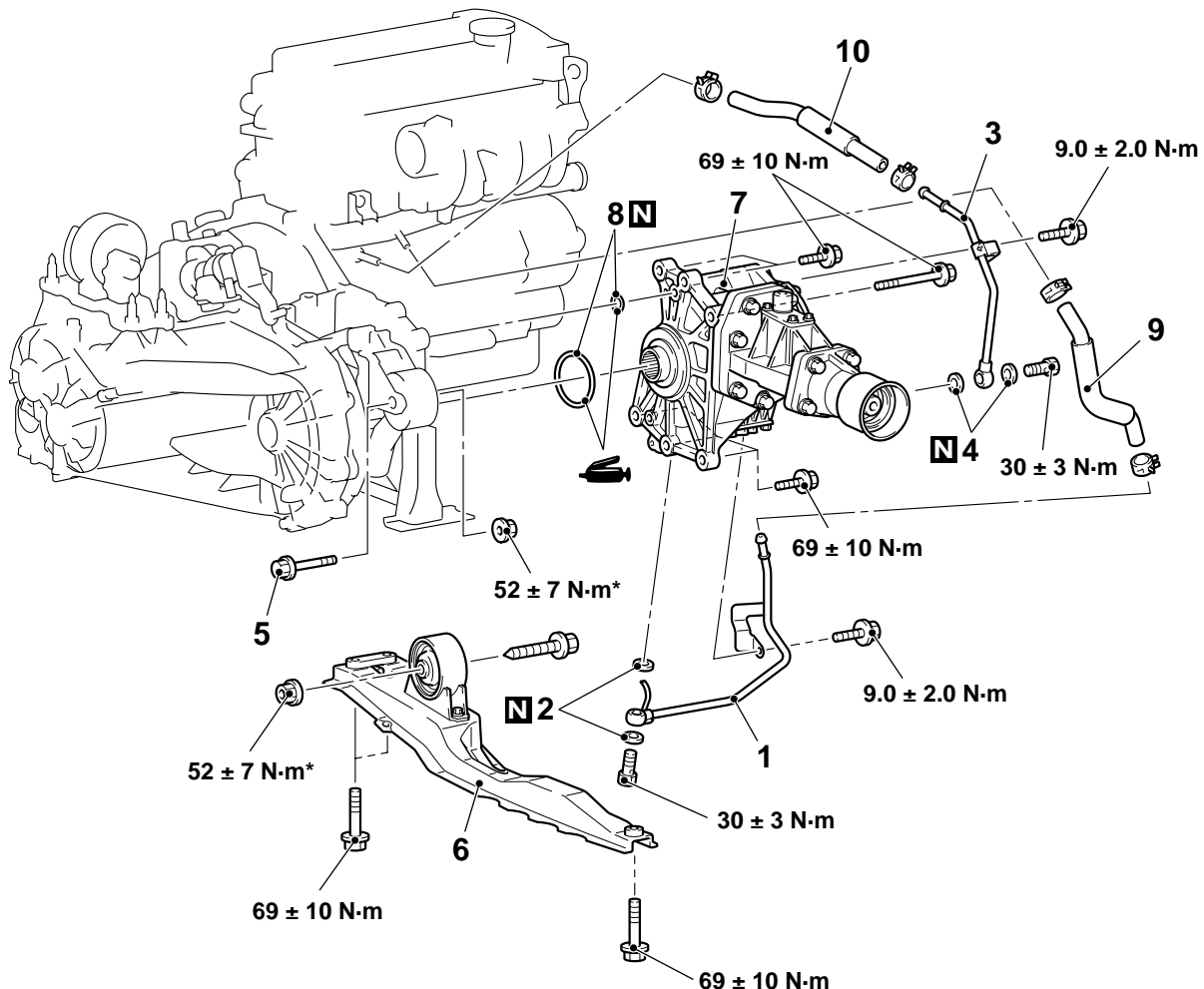
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CAUTION

∗: Indicates parts which should be temporarily tightened, and then fully tightened after installing the engine into the vehicle.

Pre-removal and Post-installation Operation

- Front Under Cover Removal and Installation (Refer to GROUP 51, Front Bumper P.51-3).
- Side Under Cover Removal and Installation (Refer to GROUP 51, Front Bumper P.51-3).
- Engine Coolant Draining and Supplying (Refer to GROUP 14, On-vehicle Service P.14-17).
- Transfer Oil Draining and Supplying (Refer to P.22A-8).
- Drive Shaft, Output Shaft Removal and Installation (Refer to GROUP 26 P.26-15).
- Front Exhaust Pipe Removal and Installation (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-13).
- Propeller Shaft Removal and Installation (Refer to GROUP 25 P.25-3).



Removal steps

1. Water return tube assembly
2. Gasket

Removal steps (Continued)

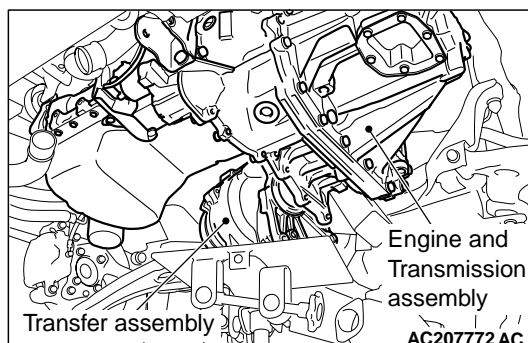
3. Water feed tube assembly
4. Gasket

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<<A>>

Removal steps (Continued)

5. Rear roll stopper connection bolt
6. Centre member assembly
7. Transfer assembly
8. O-ring
9. Water return hose
10. Water feed hose

REMOVAL SERVICE POINT**<<A>> TRANSFER ASSEMBLY REMOVAL**

With the engine mount and transmission assembly towards the front of the vehicle, and remove the transfer assembly from between the engine block and crossmember.

TRANSMISSION ASSEMBLY

REMOVAL AND INSTALLATION

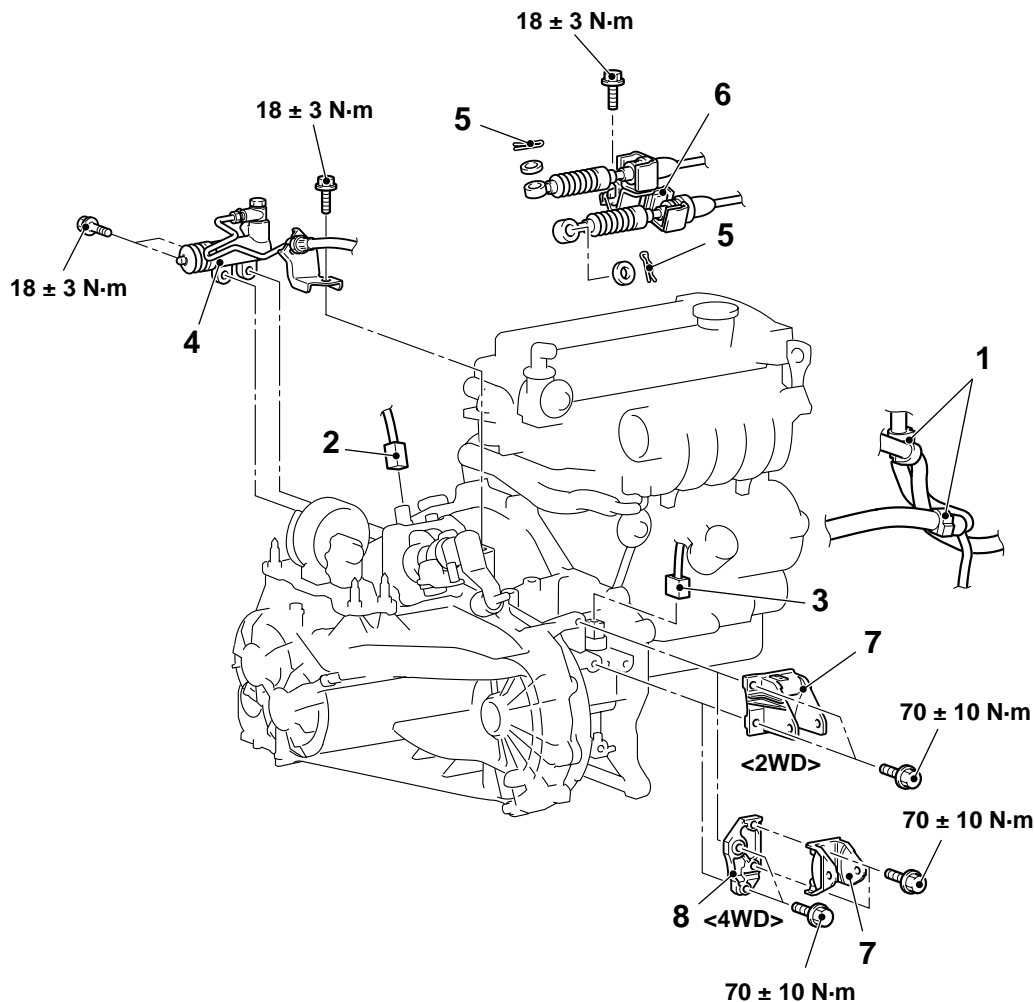
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CAUTION

∗: Indicates parts which should be temporarily tightened, and then fully tightened after installing the engine into the vehicle.

Pre-removal and Post-installation Operation

- Air Cleaner assembly, Air Cleaner Bracket Removal and Installation (Refer to GROUP 15, Air Cleaner [P.15-3](#)<4G63>, [P.15-4](#)<4G69>).
- Battery and Battery Tray Removal and Installation.
- Front Under Cover Removal and Installation (Refer to GROUP 51, Front Bumper [P.51-3](#)).
- Side Under Cover Removal and Installation (Refer to GROUP 51, Front Bumper [P.51-3](#)).
- Transfer Oil Draining and Supplying <4WD> (Refer to [P.22A-8](#)).
- Drive Shaft Removal and Installation (Refer to GROUP 26 [P.26-15](#)).
- Output Shaft Removal and Installation <4WD> (Refer to GROUP 26 [P.26-15](#)).
- Front Exhaust Pipe Removal and Installation (Refer to GROUP 15, Exhaust Pipe and Main Muffler [P.15-13](#)).
- Propeller Shaft Removal and Installation <4WD> (Refer to GROUP 25 [P.25-3](#)).



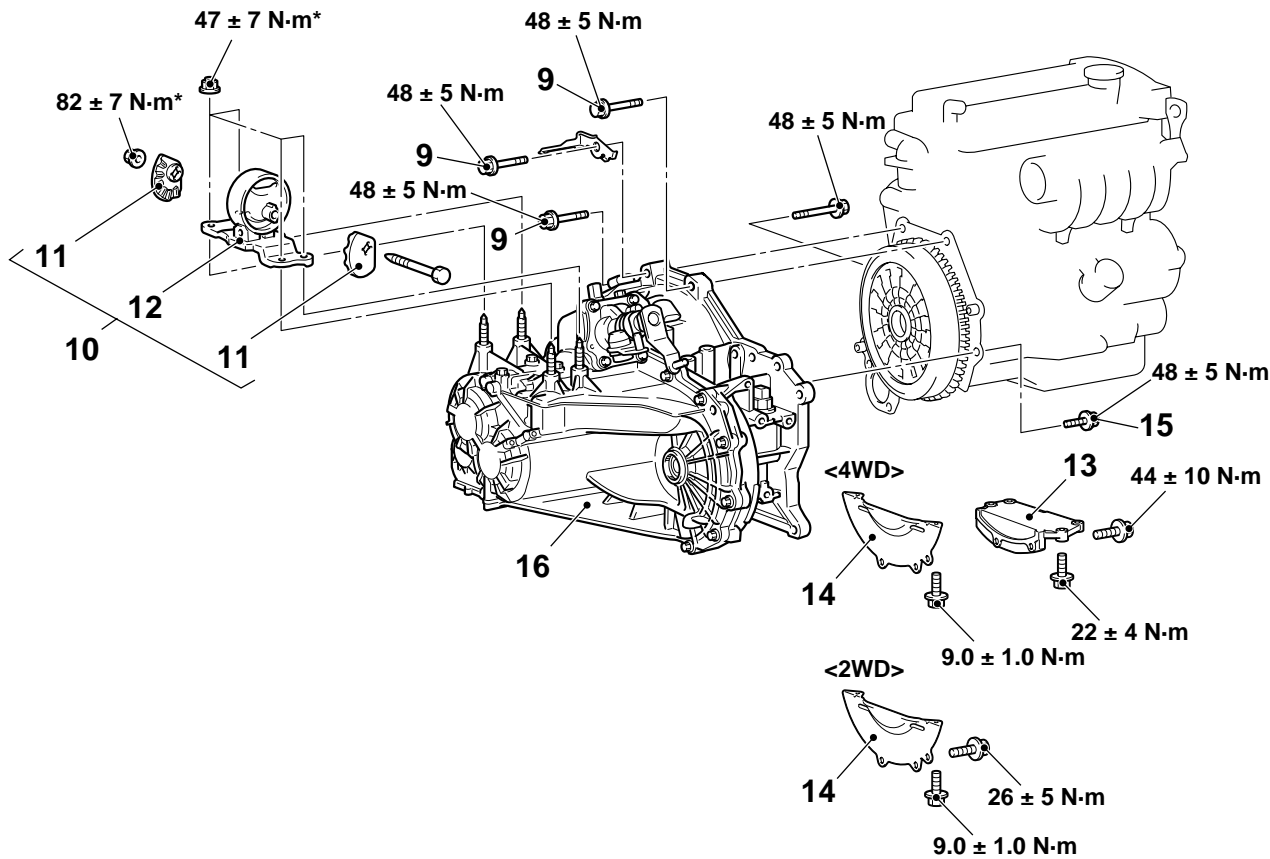
Removal steps

- 1. Transmission harness clamp
- 2. Back-up lamp switch connector
- 3. Vehicle speed sensor connector
- 4. Clutch release cylinder and clutch oil pipe
- 5. Snap pin
- 6. Cable bracket and cable assembly <Transmission side>

<<A>>

Removal steps (Continued)

- Transfer assembly (Refer to P.22A-13).
- 7. Rear roll mount bracket
- 8. Rear roll mount adapter bracket <4WD>
- Engine and transmission assembly supporting



Removal steps

- 9. Transmission assembly upper part coupling bolts
- Starter coupling bolts (Refer to GROUP 16 P.16-22<4G63>, P.16-23<4G69>).
- 10. Transmission mounting assembly
- 11. Transmission mounting stopper
- 12. Transmission mounting

<>

<<C>>

>>A<<

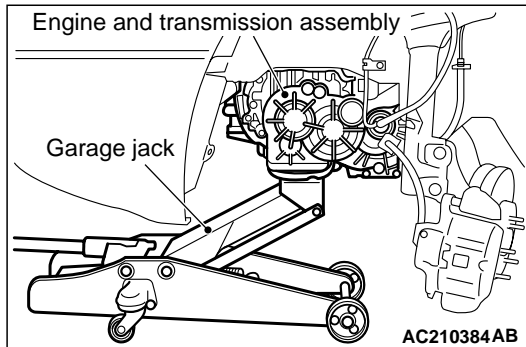
Removal steps (Continued)

- Engine assembly supporting
- Clutch release bearing connection
- 13. Transmission housing front lower cove stay <4WD>
- 14. Flywheel housing front lower cover
- 15. Transmission assembly lower part coupling bolts
- 16. Transmission assembly

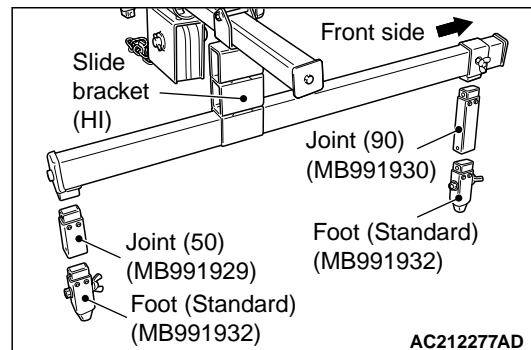
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REMOVAL SERVICE POINTS

<<A>> ENGINE AND TRANSMISSION ASSEMBLY SUPPORTING/TRANSMISSION MOUNT ASSEMBLY REMOVAL

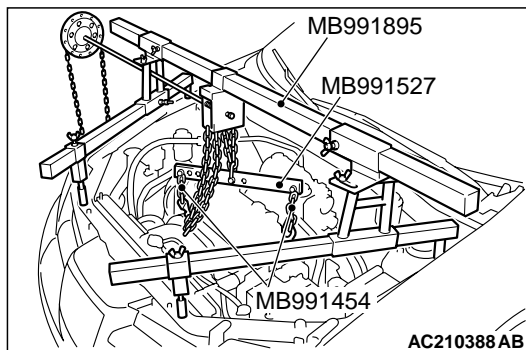
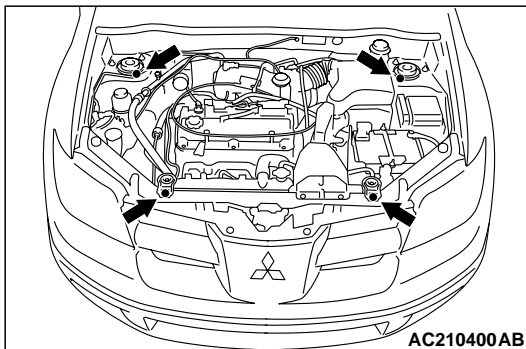


While supporting the engine and transmission assembly with a garage jack, remove the transmission mount assembly.

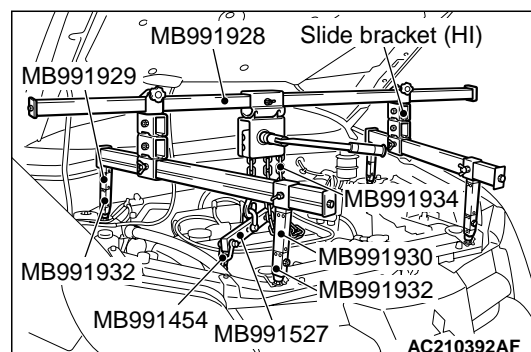
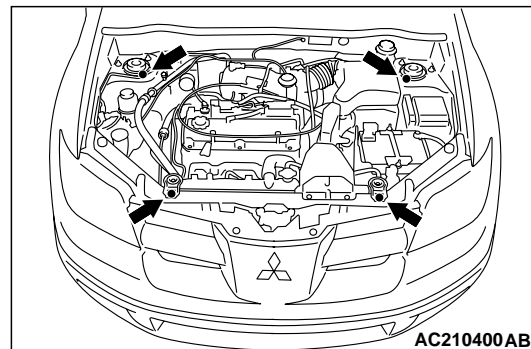


2. <Engine hanger (special tool MB991928) is used>
 - (1) Assemble the engine hanger (special tool MB991928). Set following parts to the base hanger.
 - Slide bracket (HI)
 - Foot (standard) (MB991932)
 - Joint (90) (MB991930)
 - Joint (50) (MB991929)

<> ENGINE ASSEMBLY SUPPORT

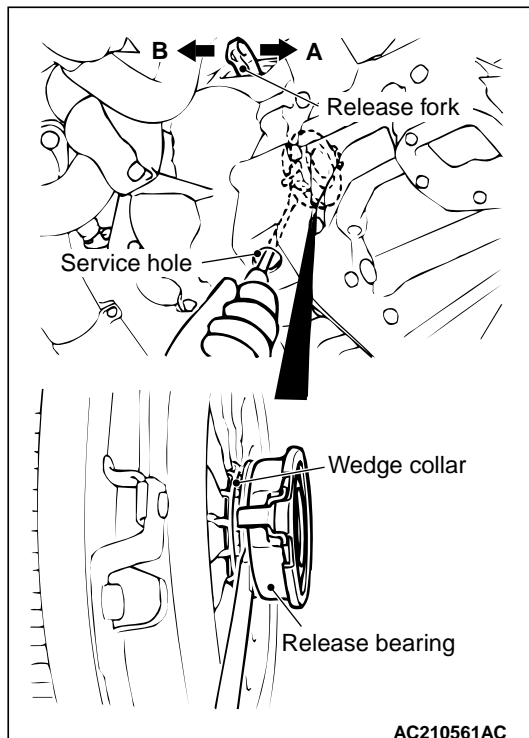


1. <Engine hanger (special tool MB991895) is used>
 - (1) Set special tool MB991895 to the strut mounting nuts and the radiator support upper insulator mounting bolts, which are located in the engine compartment, as shown.
 - (2) Set special tools MB991454 to hold the engine/transmission assembly.



- (2) Set the engine hanger (special tool MB991928) to the strut mounting nuts and the radiator support upper insulator mounting bolts, which are located in the engine compartment, as shown.

NOTE: Adjust the engine hanger balance by sliding the slide bracket (HI).
- (3) Set special tools MB991454 to hold the engine/transmission assembly.

<<C>> CLUTCH RELEASE BEARING
SEPARATION**⚠ CAUTION**

If it is hard to turn the screwdriver (to pry off the release bearing), remove the screwdriver once and repeat the below procedure after pushing the release fork fully in the direction a two or three times. Forcibly prying can cause the release bearing to be damaged.

1. Remove the cover from the service hole in the clutch housing.
2. While pushing the release fork by hand in the direction A, insert a flap-tip screwdriver between the release bearing and the wedge collar.

⚠ CAUTION

Be sure to push the release fork in the direction **A** before inserting a screwdriver.

3. Separate the release bearing from the wedge collar by prying with the screwdriver (turning the screwdriver grip 90°).

NOTE: The release fork is forced to move fully in the direction B by the return spring as soon as it is separated from the wedge collar.

INSTALLATION SERVICE POINTS>>A<< TRANSMISSION HOUSING FRONT
LOWER COVER STAY INSTALLATION

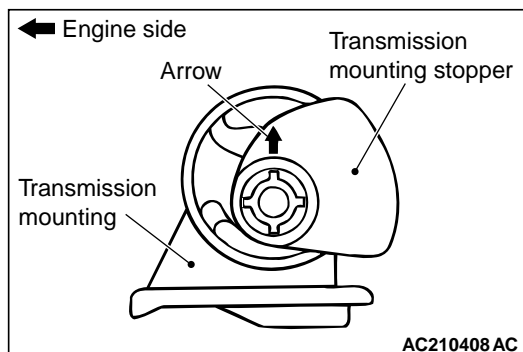
Install the transmission housing front lower cove stay as below.

1. Tighten the engine-side bolts to the specified torque.

Tightening torque: 22 ± 4 N·m

2. Tighten the transmission-side bolts to the specified torque.

Tightening torque: 44 ± 10 N·m

>>B<< TRANSMISSION MOUNTING STOPPER
INSTALLATION

Install the transmission mounting stopper so that the arrow points as shown in the illustration.