

# GROUP 22A

# MANUAL

# TRANSAXLE

## CONTENTS

<b>GENERAL DESCRIPTION.....</b>	<b>22A-2</b>	<b>TRANSAXLE CONTROL* .....</b>	<b>22A-9</b>
		REMOVAL AND INSTALLATION .....	22A-9
<b>MANUAL TRANSAXLE DIAGNOSIS .....</b>	<b>22A-4</b>	<b>SHIFT LEVER ASSEMBLY .....</b>	<b>22A-11</b>
INTRODUCTION.....	22A-4	DISASSEMBLY AND ASSEMBLY .....	22A-11
TROUBLESHOOTING STRATEGY .....	22A-4	<b>TRANSAXLE ASSEMBLY .....</b>	<b>22A-12</b>
SYMPTOM CHART.....	22A-4	REMOVAL AND INSTALLATION .....	22A-12
SYMPTOM PROCEDURES .....	22A-4	<b>SPECIFICATIONS .....</b>	<b>22A-17</b>
<b>SPECIAL TOOLS.....</b>	<b>22A-7</b>	FASTENER TIGHTENING	
<b>ON-VEHICLE SERVICE.....</b>	<b>22A-8</b>	SPECIFICATIONS.....	22A-17
TRANSAXLE OIL LEVEL CHECK .....	22A-8	SERVICE SPECIFICATION .....	22A-17
TRANSAXLE OIL REPLACEMENT .....	22A-8	LUBRICANT .....	22A-17

### 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

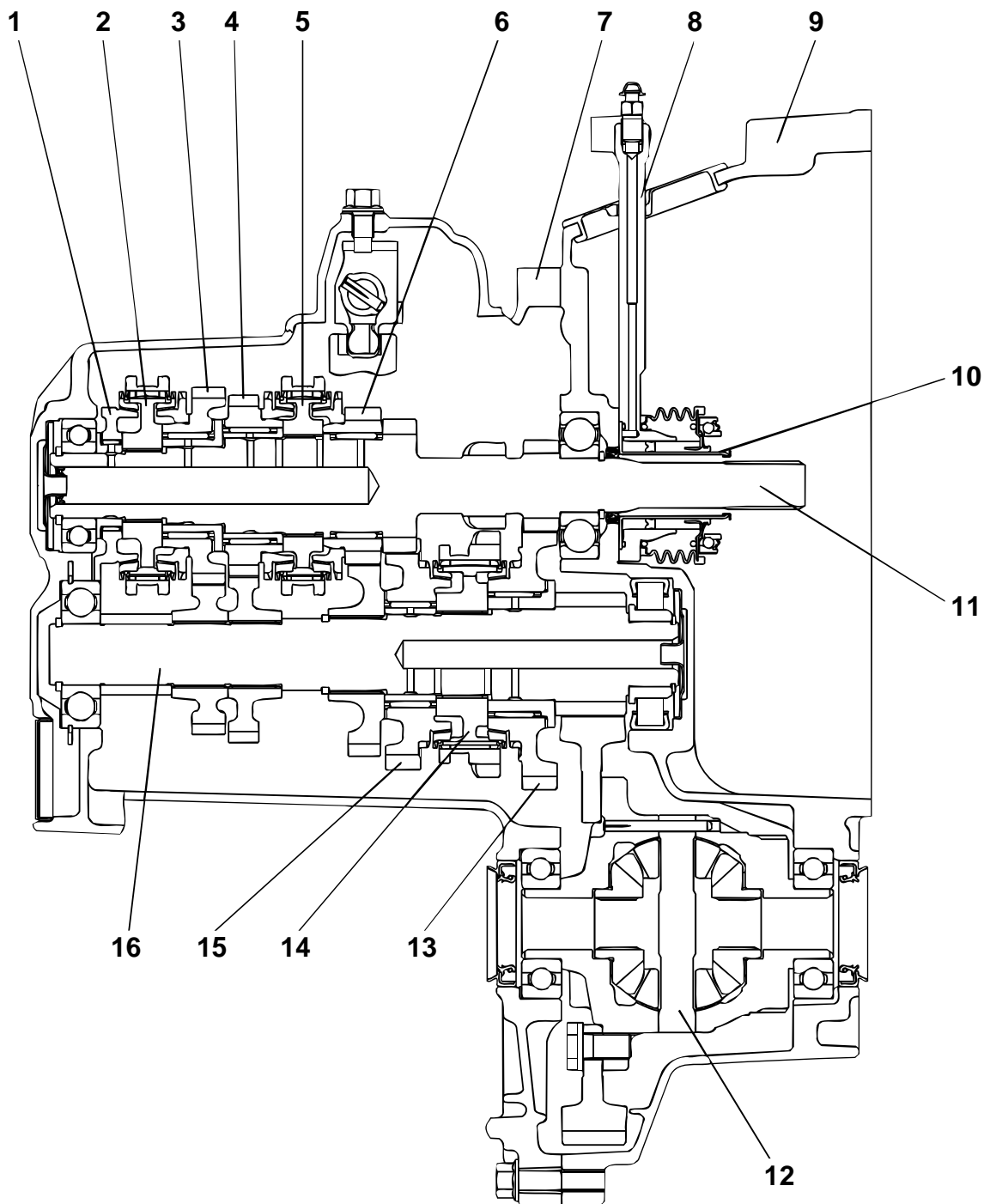
The SRS includes the following components: SRS air bag control unit, SRS warning light, front impact sensors, air bag module, clock spring, and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the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

**GENERAL DESCRIPTION**

M1221000100592

ITEM		SPECIFICATION
Transaxle model		F5M42
Engine model		4G94
Transaxle type		5-speed forward, 1-speed reverse constant mesh
Gear ratio	1st	3.583
	2nd	1.947
	3rd	1.379
	4th	1.030
	5th	0.767
	Reverse	3.363
Final gear ratio (Differential gear ratio)		3.722
Speedometer gear ratio		31/36

SECTIONAL VIEW



AC005869AB

1. REVERSE BRAKE CORE
2. 5TH SPEED SYNCHRONIZER HUB
3. 5TH SPEED GEAR
4. 4TH SPEED GEAR
5. 3RD-4TH SPEED SYNCHRONIZER HUB
6. 3RD SPEED GEAR
7. TRANSAXLE CASE
8. CLUTCH CYLINDER

9. CLUTCH HOUSING
10. REVERSE BEARING RETAINER
11. INPUT SHAFT
12. DIFFERENTIAL
13. 1ST SPEED GEAR
14. 1ST-2ND SPEED SYNCHRONIZER HUB
15. 2ND SPEED GEAR
16. OUTPUT SHAFT

# MANUAL TRANSAXLE DIAGNOSIS

## INTRODUCTION

The manual transaxle can exhibit any of the following symptoms: noise or vibration is generated, oil leaks, shifting gears is hard or troublesome, or the transaxle 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 transaxle may be faulty.

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## TROUBLESHOOTING STRATEGY

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 transaxle 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.

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## SYMPTOM CHART

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SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Noise, Vibration	1	<a href="#">P.22A-4</a>
Oil Leaks	2	<a href="#">P.22A-5</a>
Hard Shifting	3	<a href="#">P.22A-6</a>
Jumps Out of Gear	4	<a href="#">P.22A-7</a>

## 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 .

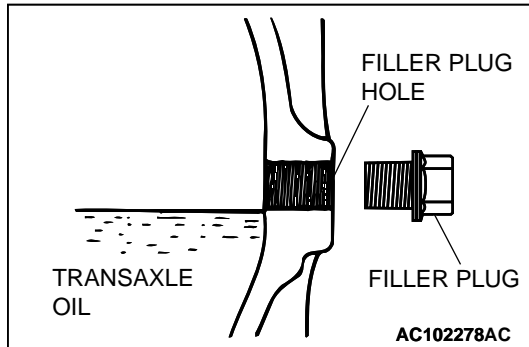
**NO :** Refer to GROUP 11A [P.11A-6](#), On-vehicle Service – Curb Idle Speed Check.

##### 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 SAE 75W – 90W or 75W – 85W conforming to API classification GL-4. Then go to Step 7 .

**STEP 4. Check for the specified oil.**

**Q: Is the specified oil gear oil SAE 75W – 90W or 75W – 85W conforming to API classification GL-4?**

**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 transaxle. 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 transaxle. 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 transaxle 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 leak(s) 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 transaxle. 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.

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**INSPECTION PROCEDURE 3: Hard Shifting**

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**DIAGNOSIS****STEP 1. Check the transaxle 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 transaxle 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 transaxle. 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, Transaxle [P.22A-8](#). 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 transaxle 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 transaxle. Check the poppet spring for breakage.

**Q: Is the poppet spring broken?**

**YES :** Replace the poppet spring. Refer to GROUP 22B, Transaxle P.22A-8. 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, Transaxle P.22A-8. 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, Transaxle P.22A-8. 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.22A-8, Output Shaft P.22A-8. Then go to Step 6 .

**NO :** Go to Step 6 .

STEP 6. Retest the system.

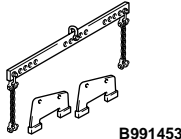
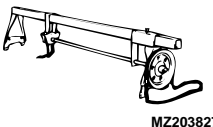
**Q: Does the transaxle still jump out of gear?**

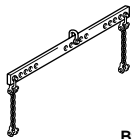
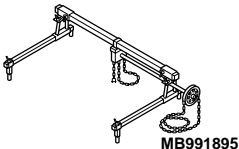
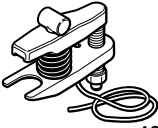
**YES :** Return to Step 1 .

**NO :** The procedure is complete.

SPECIAL TOOLS

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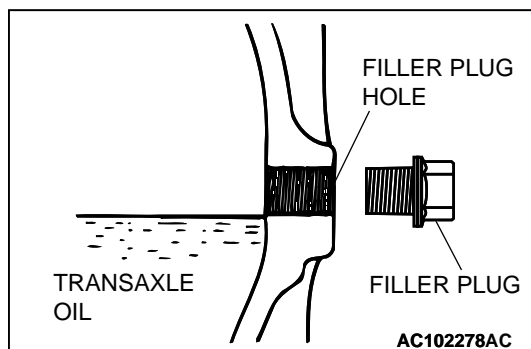
TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
	MB991453 Engine hanger assembly	MZ203827-01	When an engine lifter is used: Supporting the engine assembly during removal and installation of the transaxle
	GENERAL SERVICE TOOL MZ203827 Engine lifter	MZ203827-01	

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
 B991454	MB991454 Engine hanger balancer	MZ203827-01	When the engine hanger is used: Supporting the engine assembly during removal and installation of the transaxle assembly <i>NOTE: Special tool MB991454 is a part of engine hanger attachment set MB991453.</i>
 MB991895	MB991895 Engine hanger	—	
 AC106827	MB991897 Ball joint remover	MB991113-01, MB990635-01 or general service tool	Knuckle and tie rod end ball joint breakaway torque check <i>NOTE: Steering linkage puller(MB990635 or MB991113)is also used to disconnect knuckle and tie rod end ball joint.</i>

## ON-VEHICLE SERVICE

### TRANSAXLE OIL LEVEL CHECK

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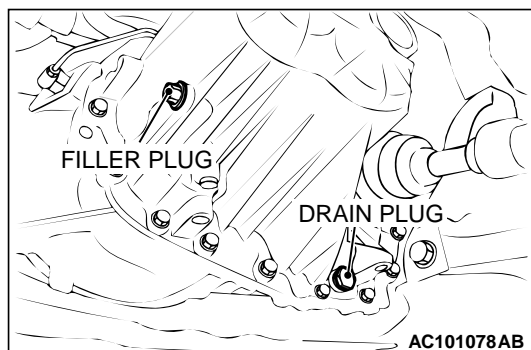


1. Remove the filler plug.
2. Check that the oil level is up to the lower edge of the filler plug hole.
3. Check that the oil is not noticeably dirty.
4. Tighten the filler plug to the specified torque.

**Tightening torque: 32 ± 2 N·m (24 ± 1 ft-lb)**

### TRANSAXLE OIL REPLACEMENT

M1221001000327



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 (24 ± 1 ft-lb)**
4. Fill with gear oil SAE 75W – 90W or 75W – 85W conforming to API classification GL-4 until the level comes to the lower portion of filler plug hole.

**Quantity: 2.2 dm<sup>3</sup> (2.3 quarts)**

5. Tighten the filler plug to the specified torque.

**Tightening torque: 32 ± 2 N·m (24 ± 1 ft-lb)**



# TRANSAXLE CONTROL

## REMOVAL AND INSTALLATION

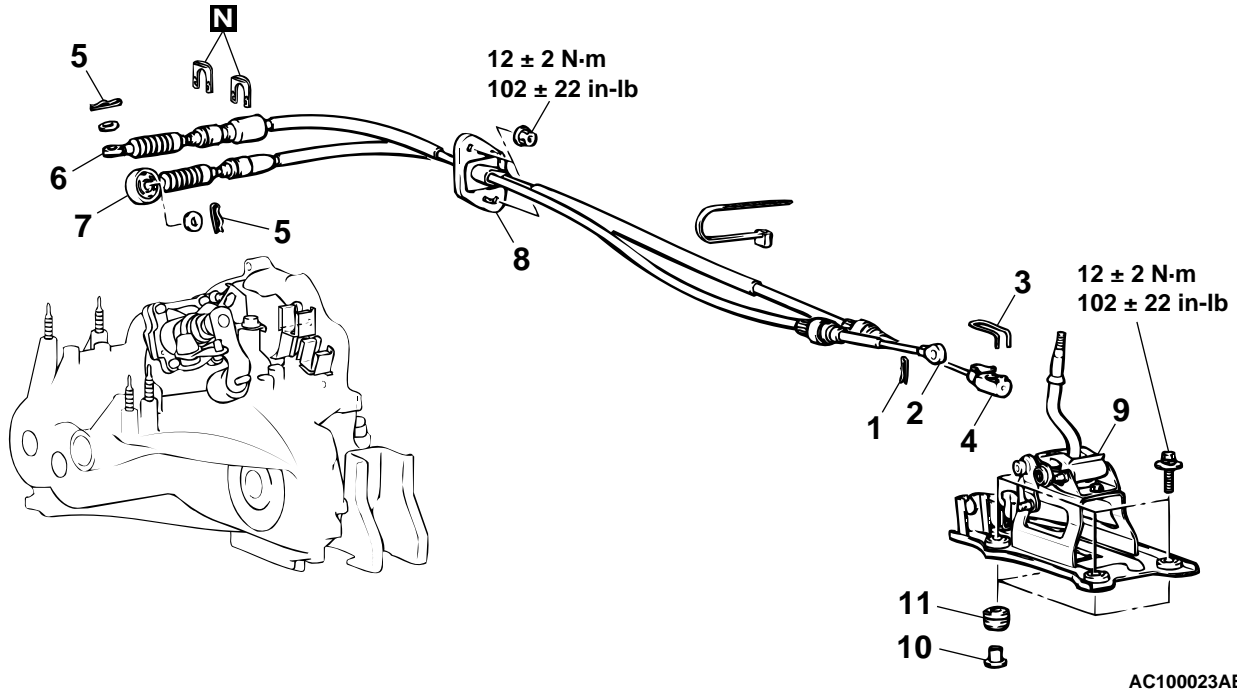
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### **⚠ WARNING**

**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.15-4.](#))
- Battery and Battery Tray Removal and Installation.



AC100023AB

#### SHIFT CABLE AND SELECT CABLE ASSEMBLY REMOVAL STEPS

1. SNAP PIN
2. SELECT CABLE CONNECTION (SHIFT LEVER SIDE)
- >>A<< 3. CLIP
4. SHIFT CABLE CONNECTION (SHIFT LEVER SIDE)
  - SRS-ECU (REFER TO GROUP 52B, [P.52Ba-25.](#))
  - AIR CLEANER ASSEMBLY (REFER TO GROUP 15, [P.15-4.](#))
5. SNAP PIN
6. SELECT CABLE CONNECTION (TRANSAXLE SIDE)

#### SHIFT CABLE AND SELECT CABLE ASSEMBLY REMOVAL STEPS (Continued)

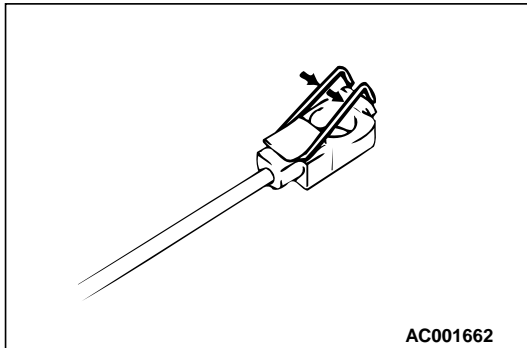
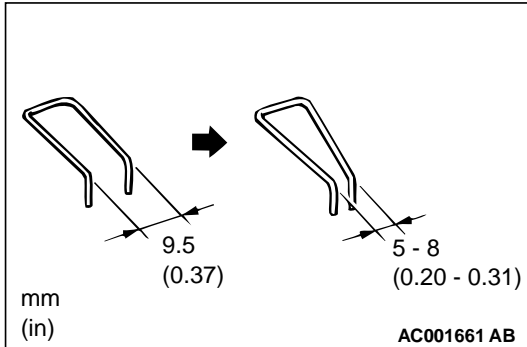
7. SHIFT CABLE CONNECTION (TRANSAXLE SIDE)
8. SHIFT CABLE AND SELECT CABLE ASSEMBLY
- SHIFT LEVER ASSEMBLY REMOVAL STEPS

1. SNAP PIN
2. SELECT CABLE CONNECTION (SHIFT LEVER SIDE)
- >>A<< 3. CLIP
4. SHIFT CABLE CONNECTION (SHIFT LEVER SIDE)
9. SHIFT LEVER ASSEMBLY
10. SPACER
11. BUSHING

## INSTALLATION SERVICE POINT

>>A<< SHIFT CABLE CONNECTION (SHIFT LEVER SIDE)  
INSTALLATION

1. Make sure that there is no excessive play at the shift cable end clip. If there is excessive play or the clip is disengaged from the shift cable end, check the clip opening gap. If the gap is more than 9.5 mm (0.37 inch), squeeze the clip until the relaxed gap reaches 5 to 8 mm (0.20 to 0.31 inch).

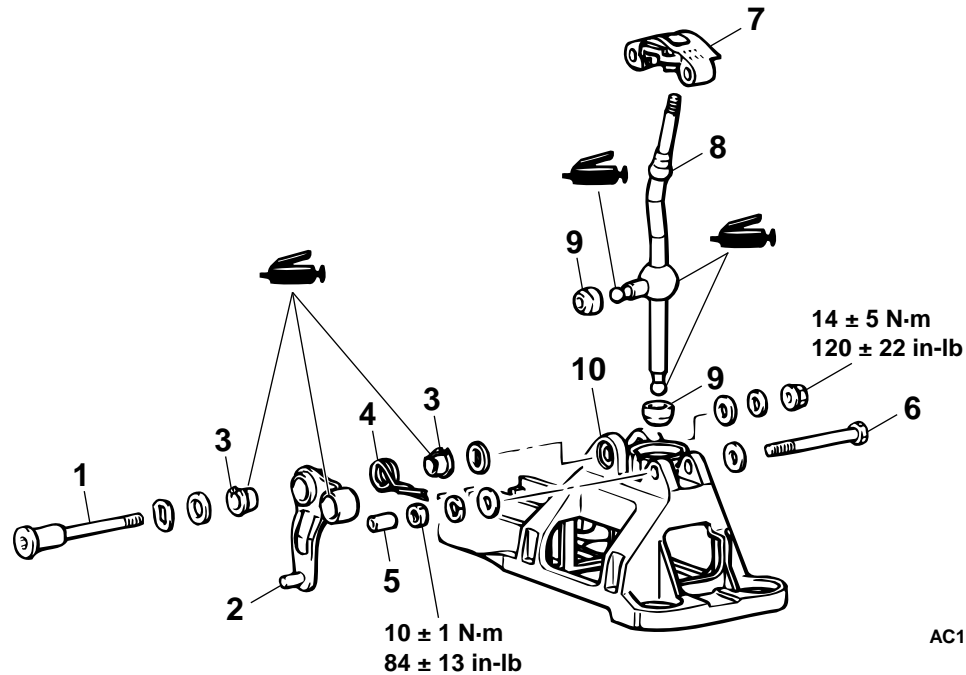


2. Engage the clip with the shift cable hook securely, and push the clip with your thumbs until it clicks in place.
3. Install the shift cable to the shift lever.

## SHIFT LEVER ASSEMBLY

### DISASSEMBLY AND ASSEMBLY

M1221004000133



#### DISASSEMBLY STEPS

1. BOLT
2. SELECT LEVER
3. BUSHING
4. RETURN SPRING
5. COLLAR

#### DISASSEMBLY STEPS

6. BOLT
7. CAP
8. SHIFT LEVER
9. SHIFT LEVER BUSHING
10. BASE BLOCK

## TRANSAXLE ASSEMBLY

## REMOVAL AND INSTALLATION

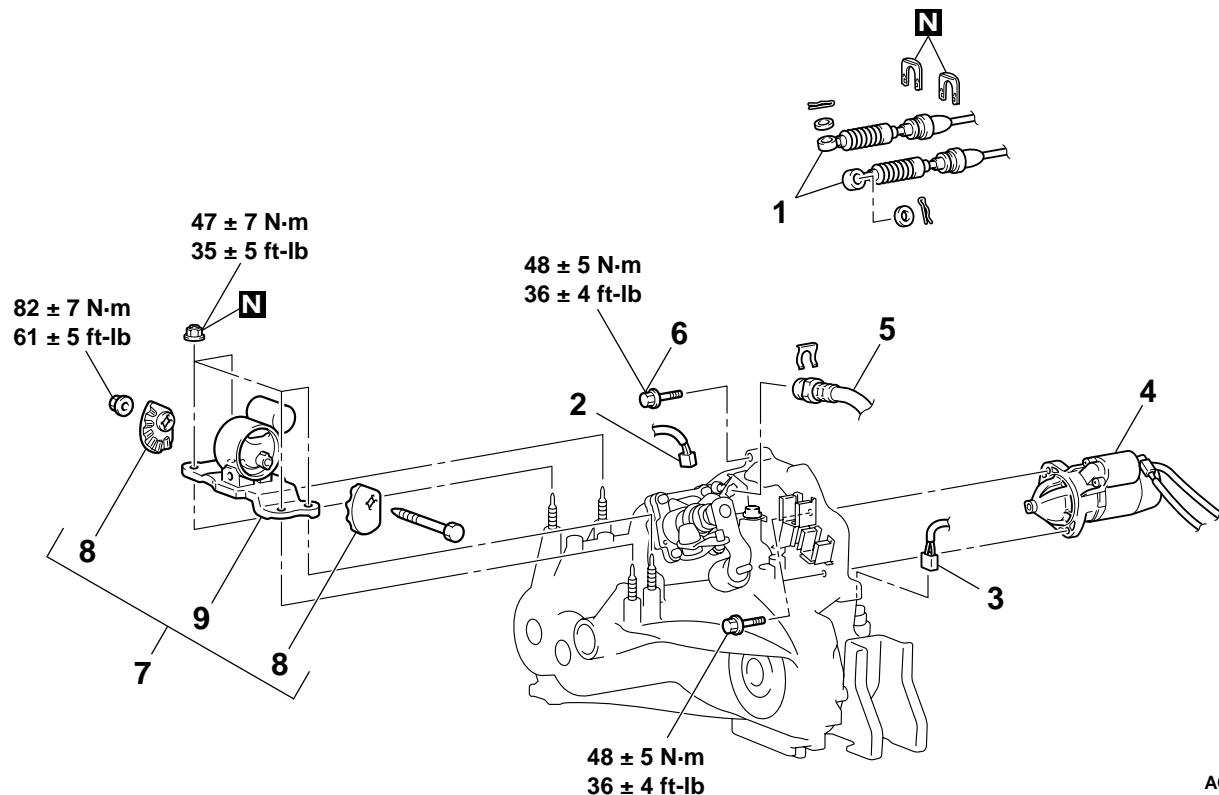
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**⚠ CAUTION**

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

**Pre-removal and Post-installation Operation**

- Under Cover Removal and Installation.
- Canister Removal and Installation (Refer to GROUP 17, Evaporative Emission Canister and Fuel Tank Pressure Relief Valve [P.17-120.](#))
- Battery and Battery Tray Removal and Installation.
- Transmission Fluid Draining and Supply (Refer to GROUP 00, Maintenance Service – Manual Transaxle [P.00-42.](#))
- Clutch Fluid Supply. <Post-installation Only>
- Clutch Line Bleeding <Post-installation Only> (Refer to GROUP 21A, On-vehicle Service [P.21A-7.](#))
- Shift Lever Operation Check <Post-installation Only> (Refer to [P.22A-8.](#))
- Front Wheel Alignment Check and Adjustment <Post-installation Only> (Refer to GROUP 33, On-vehicle Service – Front Wheel Alignment Check and Adjustment [P.33A-6.](#))

**REMOVAL STEPS**

1. SHIFT CABLE AND SELECT CABLE CONNECTION (REFER TO [P.22A-9.](#))
2. BACKUP LIGHT SWITCH CONNECTOR
3. VEHICLE SPEED SENSOR CONNECTOR

&lt;&lt;A&gt;&gt;.

&lt;&lt;B&gt;&gt;.

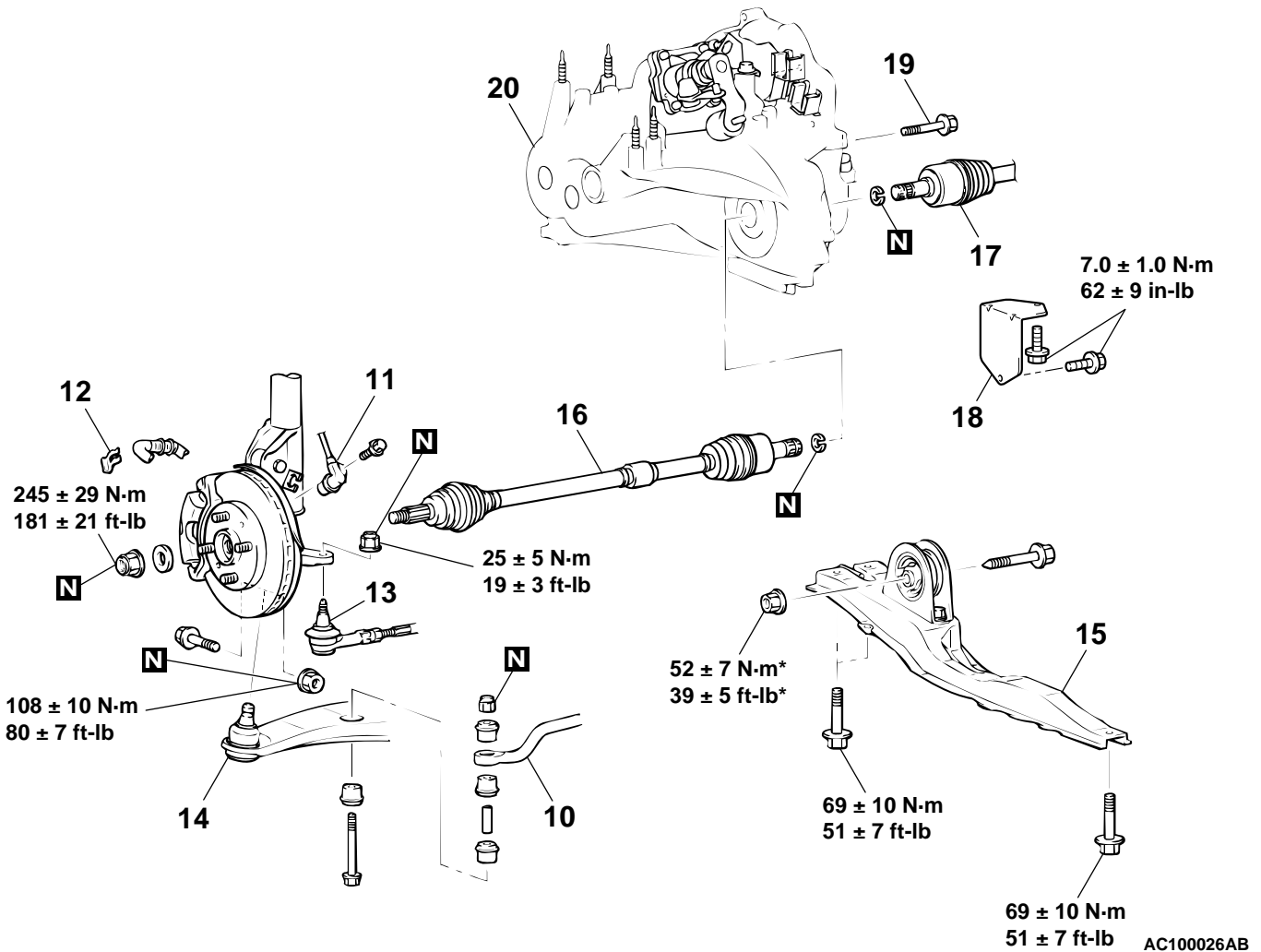
&gt;&gt;B&lt;&lt;

**REMOVAL STEPS (Continued)**

4. STARTER MOTOR
5. CLUTCH HOSE CONNECTION
6. TRANSAXLE ASSEMBLY UPPER PART COUPLING BOLTS
7. TRANSAXLE MOUNT ASSEMBLY
8. TRANSAXLE MOUNT STOPPER

**REMOVAL STEPS (Continued)**

- <<C>>.
- 9. TRANSAXLE MOUNT BRACKET
  - ENGINE ASSEMBLY SUPPORT



**REMOVAL STEPS**

- >>A<<
- RAISE THE VEHICLE
  - 10. STABILIZER BAR CONNECTION
  - 11. WHEEL SPEED SENSOR CABLE CONNECTION <VEHICLES WITH ABS>
  - 12. BRAKE HOSE CLAMP
  - 13. TIE ROD END CONNECTION
  - 14. LOWER ARM CONNECTION
  - 15. CENTERMEMBER ASSEMBLY
- <<D>>.
- <<D>>.

**REMOVAL STEPS (Continued)**

- <<E>>.
- <<E>>.
- 16. DRIVESHAFT <LH> CONNECTION
  - 17. DRIVESHAFT <RH> CONNECTION
  - 18. COVER
  - 19. TRANSAXLE ASSEMBLY LOWER PART COUPLING BOLTS
  - 20. TRANSAXLE ASSEMBLY

**Required Special Tools:**

- MB991453: Engine Hanger Assembly
- MZ203827: Engine Lifter
- MB991454: Engine Hanger Balancer (a part of MB991453 Engine Hanger Assembly)
- MB991895: Engine Hanger
- MB991897: Ball Joint Remover

**REMOVAL SERVICE POINTS****<<A>> STARTER MOTOR REMOVAL**

Remove the starter motor with the starter motor harness still connected and secure it inside the engine compartment.

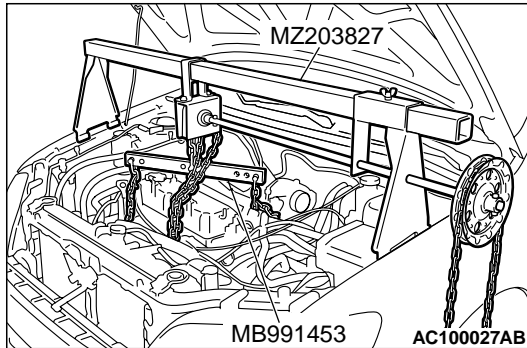
**<<B>> TRANSAXLE MOUNT ASSEMBLY REMOVAL**

Jack up the transaxle assembly gently with a garage jack, and then remove the transaxle mount bracket.

**<<C>> ENGINE ASSEMBLY SUPPORT**

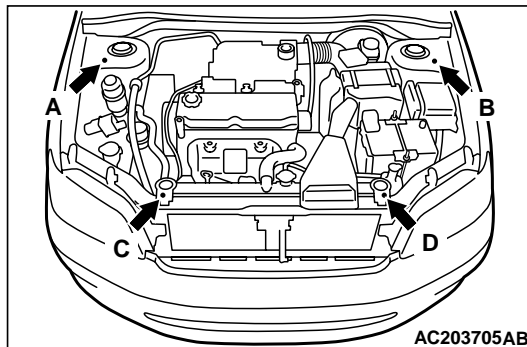
<Engine lifter MZ2073827 is used>

Set special tools MB991453 and MZ203827 to the vehicle to support the engine assembly.

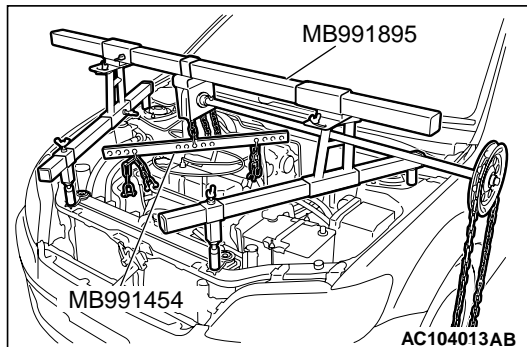


<Engine hanger MB991895 is used>

1. Set special tool MB991895 to the strut assembly mounting nuts (A and B) and the radiator support upper insulator mounting bolts (C and D), which are located in the engine compartment, as shown.



2. Set special tool MB991454 to hold the engine/transaxle assembly.

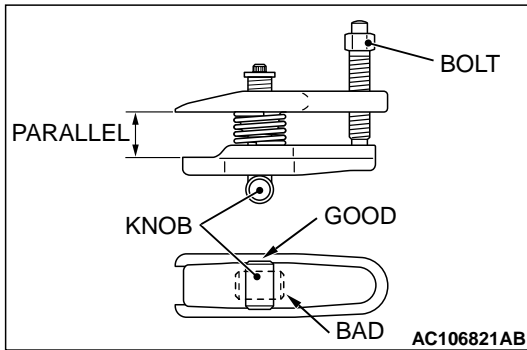
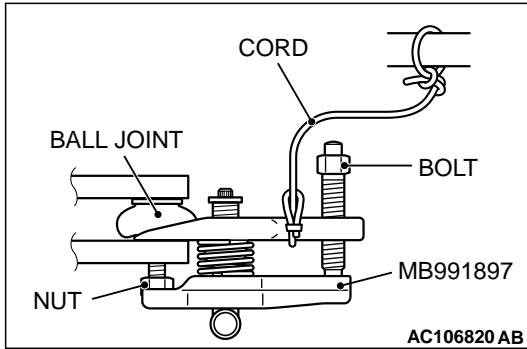


## <<D>> TIE ROD END/LOWER ARM BALL JOINT DISCONNECTION

### ⚠ CAUTION

- Do not remove the nut from ball joint. Loosen it and use special tool MB991897 to avoid possible damage to ball joint threads.
- Hang special tool MB991897 with cord to prevent them from falling.

1. Install the special tool MB991897 as shown in the figure.



2. After turning the bolt and knob to adjust the insert arms of the special tool MB991897 in parallel, tighten the bolt by hand and confirm that the insert arms are parallel.

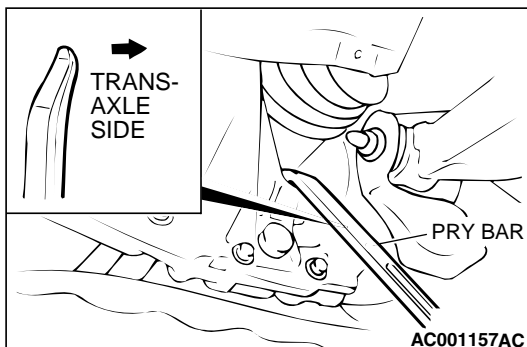
*NOTE: When adjusting the insert arms in parallel, turn the knob in the direction shown in the figure.*

## <<E>> DRIVESHAFT <LH>/DRIVESHAFT <RH> DISCONNECTION

### ⚠ CAUTION

- Do not pull on the driveshaft; doing so will damage the TJ; be sure to use a pry bar.
- Do not insert a pry bar so deep as to damage the oil seal.
- Do not damage the transaxle oil seal with the spline of the driveshaft.

1. Insert a pry bar between the transaxle case and the driveshaft as shown to remove the driveshaft.
2. Suspend the removed driveshaft with a wire so that there are no sharp bends in any of the joints.
3. Use a shop towel to cover the transaxle case to avoid getting any foreign material get into it.

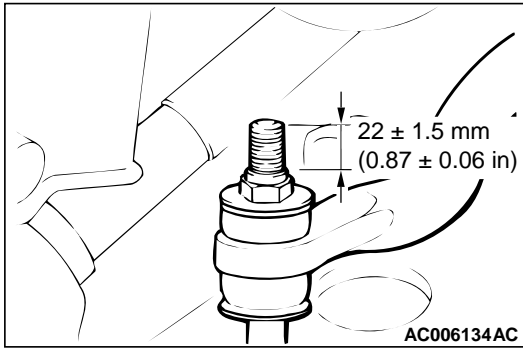


## INSTALLATION SERVICE POINTS

## &gt;&gt;A&lt;&lt; STABILIZER BAR INSTALLATION

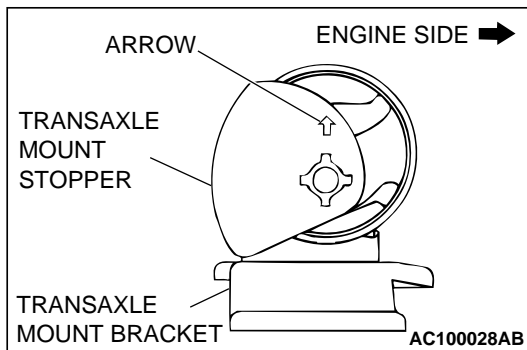
Tighten the self-locking nut so that the stabilizer bar mounting bolt protrudes as shown.

**Standard value (A):  $22 \pm 1.5$  mm ( $0.87 \pm 0.06$  in)**



## &gt;&gt;B&lt;&lt; TRANSAXLE MOUNT STOPPER INSTALLATION

Install the transaxle mount stopper so that the arrow points as shown in the illustration.





# SPECIFICATIONS

## FASTENER TIGHTENING SPECIFICATIONS

M1221006600120

ITEM	SPECIFICATION
<b>Transaxle assembly</b>	
Center member attaching bolt	69 ± 10 N·m (51 ± 7 ft-lb)
Cover	7.0 ± 1.0 N·m (62 ± 9 ft-lb)
Driveshaft connecting nut	245 ± 29 N·m (181 ± 21 ft-lb)
Front roll stopper bracket retainer nut	52 ± 7 N·m (39 ± 5 ft-lb)
Lower arm connecting nut	108 ± 10 N·m (80 ± 7 ft-lb)
Starter motor attaching bolt	48 ± 5 N·m (36 ± 4 ft-lb)
Tie rod end connecting nut	25 ± 5 N·m (19 ± 3 ft-lb)
Transaxle assembly upper part coupling bolt	48 ± 5 N·m (36 ± 4 ft-lb)
Transaxle mount bracket attaching nut	47 ± 7 N·m (35 ± 5 ft-lb)
Transaxle mount stopper attaching nut	82 ± 7 N·m (61 ± 5 ft-lb)
Transmission oil drain plug	32 ± 2 N·m (24 ± 1 ft-lb)
Transmission oil filler plug	32 ± 2 N·m (24 ± 1 ft-lb)
<b>Transaxle control</b>	
Select lever retainer nut	10 ± 1 N·m (84 ± 13 in-lb)
Shift cable and select cable assembly attaching bolt	12 ± 2 N·m (102 ± 22 in-lb)
Shift lever base bracket attaching bolt	12 ± 2 N·m (102 ± 22 in-lb)
Shift lever retainer nut	14 ± 5 N·m (120 ± 22 in-lb)

## SERVICE SPECIFICATION

M1221000300057

ITEM	STANDARD VALUE
Protruding length of stabilizer bar mounting bolt mm (in)	22 ± 1.5 (0.87 ± 0.06)

## LUBRICANT

M1221000400139

ITEM	SPECIFIED LUBRICANTS	QUANTITY
Transmission oil dm <sup>3</sup> (qt)	Gear oil SAE 75W-90W or 75W-85W conforming to API classification GL-4	2.2 (2.3)

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## NOTES