

GROUP 21A

CLUTCH

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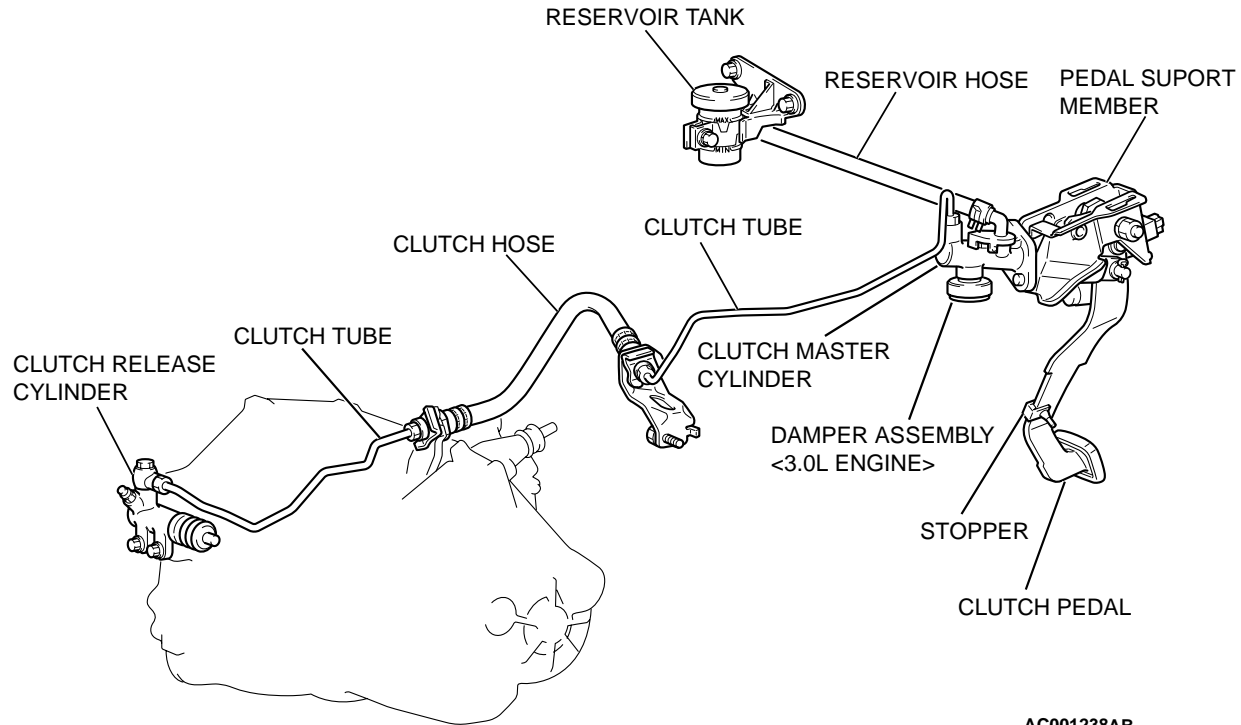
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GENERAL DESCRIPTION

M1211000100115

The clutch is a dry single-disc, diaphragm type; hydraulic pressure is used for the clutch control.

CONSTRUCTION DIAGRAM



AC001238AB

CLUTCH DIAGNOSIS

INTRODUCTION TO CLUTCH DIAGNOSIS

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A defective clutch causes a clutch slippage, resulting in poor torque transmission. The causes for this problem may be a faulty clutch line or disc, or a maladjustment of the clutch pedal.

CLUTCH DIAGNOSIS TROUBLESHOOTING STRATEGY

M1211003500101

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 clutch 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

M1211003600090

SYMPTOMS	INSPECTION PROCEDURE	REFERENCE PAGE
Clutch slips	1	P.21A-3
Gear shift malfunction	2	P.21A-4
Clutch noise	3	P.21A-4
Clutch pedal feels "heavy"	4	P.21A-5
When the clutch is engaged, abnormal vibration occurs.	5	P.21A-6

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Clutch Slips

DIAGNOSIS

Step 1. Check insufficient clutch pedal play.
Refer to [P.21A-7](#).

Q: Does the clutch pedal play meet the standard value?
YES : Go to Step 2.
NO : Adjust the clutch pedal play. Then go to Step 7.

Step 2. Check the hydraulic system for clogging.

Q: Is the hydraulic system clogged?
YES : Repair or replace the hydraulic system.
 Then go to Step 7.
NO : Go to Step 3.

Step 3. Check the clutch release fork for catching.

Q: Is the clutch release fork stuck?
YES : Repair or replace the clutch release fork.
 Then go to Step 7.
NO : Go to Step 4.

Step 4. Check the clutch disc facing for excessive wear.

Refer to GROUP 21B, Clutch [P.21B-6](#).

Q: Is the clutch disc facing worn excessively?
YES : Replace the clutch disc. Then go to Step 7.
NO : Go to Step 5.

Step 5. Check the clutch disc facing for hardening and adhesion of oil.

Refer to GROUP 21B, Clutch [P.21B-6](#).

Q: Is the clutch disc facing hardened or contaminated with oil?
YES : Replace the clutch disc. Then go to Step 7.
NO : Go to Step 6.

Step 6. Check the diaphragm spring for weakness and damage.

Refer to GROUP 21B, Clutch [P.21B-6](#).

Q: Is the diaphragm spring weakened or damaged?
YES : Replace the clutch cover assembly. Then go to Step 7.
NO : Go to Step 7.

Step 7. Check the symptom.

Q: Is the symptom reproduced?
YES : Return to Step 1.
NO : This diagnosis is complete.

INSPECTION PROCEDURE 2: Gear Shift Malfunction

DIAGNOSIS

Step 1. Check the excessive clutch pedal play.
Refer to [P.21A-7](#).

Q: Does the clutch pedal play meet the standard value?
YES : Go to Step 2.
NO : Adjust the clutch pedal play. Then go to Step 9.

Step 2. Check the hydraulic system for leakage, air mix and clogging.
Refer to [P.21A-11](#).

Q: Is there a leakage, air mix or clogging on the hydraulic system?
YES : Repair or replace the hydraulic system.
Then go to Step 9.
NO : Go to Step 3.

Step 3. Check the clutch disc for distortion and excessive oscillation.
Refer to GROUP 21B, Clutch [P.21B-6](#).

Q: Is the clutch disc distorted or oscillated?
YES : Replace the clutch disc. Then go to Step 9.
NO : Go to Step 4.

Step 4. Check the clutch disc spline for wear and corrosion.
Refer to GROUP 21B, Clutch [P.21B-6](#).

Q: Is the clutch disc spline worn or corroded?
YES : Replace the clutch disc. Then go to Step 9.
NO : Go to Step 5.

Step 5. Check the clutch disc facing for peeling.

Q: Is clutch disc facing peeled?
YES : Replace the clutch disc. Then go to Step 9.
NO : Go to Step 6.

Step 6. Check the clutch cover assembly for wear.

Refer to GROUP 21B, Clutch [P.21B-6](#).

Q: Is the clutch cover assembly worn?
YES : Replace the clutch cover assembly. Then go to Step 9.
NO : Go to Step 7.

Step 7. Check the pressure plate and the flywheel for damage.

Q: Is the pressure plate or the flywheel damaged?
YES : Replace the clutch cover assembly or the flywheel. Then go to Step 9.
NO : Go to Step 8.

Step 8. Check the clutch release bearing for wear.
Refer to GROUP 21B, Clutch [P.21B-6](#).

Q: Is the clutch release bearing worn?
YES : Replace the clutch release bearing. Then go to Step 9.
NO : Go to Step 9.

Step 9. Check the symptom.

Q: Is the symptom reproduced?
YES : Return to Step 1.
NO : This diagnosis is complete.

INSPECTION PROCEDURE 3: Clutch Noise

DIAGNOSIS

Step 1. Check insufficient clutch pedal play.
Refer to [P.21A-7](#).

Q: Does the clutch pedal play meet the standard value?
YES : Go to Step 2.
NO : Adjust the clutch pedal play. Then go to Step 7.

Step 2. Check the clutch release bearing for wear.
Refer to GROUP 21B, Clutch [P.21B-6](#).

Q: Is the clutch release bearing worn?
YES : Replace the clutch release bearing. Then go to Step 7.
NO : Go to Step 3.

Step 3. Check the bearing sleeve sliding surface for insufficient lubrication.

Q: Is the lubrication of the bearing sleeve sliding surface sufficient?

YES : Go to Step 4.

NO : Repair the bearing sleeve sliding surface. Then go to Step 7.

Step 4. Check the clutch cover assembly for improper installation.

Refer to GROUP 21B, Clutch [P.21B-2](#).

Q: Is the clutch cover assembly installed properly?

YES : Go to Step 5.

NO : Install the clutch cover assembly properly. Then go to Step 7.

Step 5. Check the clutch disc facing for excessive wear.

Refer to GROUP 21B, Clutch [P.21B-6](#).

Q: Is the clutch disc facing assembly worn excessively?

YES : Replace the clutch disc. Then go to Step 7.

NO : Go to Step 6.

Step 6. Check the pilot bushing for damage.

Q: Is the pilot bushing damaged?

YES : Replace the pilot bushing. Then go to Step 7.

NO : Go to Step 7.

Step 7. Check the symptom.

Q: Is the symptom reproduced?

YES : Return to Step 1.

NO : This diagnosis is complete.

INSPECTION PROCEDURE 4: Clutch Pedal Feels "Heavy"

DIAGNOSIS

Step 1. Check the clutch pedal clevis pin for insufficient lubrication.

Q: Is the lubrication of the clutch pedal clevis pin sufficient?

YES : Go to Step 2.

NO : Repair the clutch pedal. Then go to Step 4.

Step 2. Check the clutch disc spline for insufficient lubrication.

Refer to GROUP 21B, Clutch [P.21B-6](#).

Q: Is the lubrication of the clutch disc spline sufficient?

YES : Go to Step 3.

NO : Replace the clutch disc. Then go to Step 4.

Step 3. Check the insufficient lubrication of bearing sleeve sliding surface.

Q: Is the lubrication of the bearing sleeve sliding surface sufficient?

YES : Go to Step 4.

NO : Repair the bearing sleeve sliding surface. Then go to Step 4.

Step 4. Check the symptom.

Q: Is the symptom reproduced?

YES : Return to Step 1.

NO : This diagnosis is complete.

INSPECTION PROCEDURE 5: When the Clutch is Engaged, Abnormal Vibration Occurs.

DIAGNOSIS

Step 1. Check the engine and transaxle mounting for loosening and damage.

- Q: Is the engine and transaxle mounting loosened or damaged?**
YES : Tighten or replace the engine and transaxle mounting. Then go to Step 6.
NO : Go to Step 2.

Step 2. Check the diaphragm spring for uneven height.

- Q: Is the diaphragm spring even height?**
YES : Go to Step 3.
NO : Replace the clutch cover assembly. Then go to Step 6.

Step 3. Check the pressure plate and flywheel for damage.

- Q: Is the pressure plate or flywheel damaged?**
YES : Repair the clutch cover assembly or flywheel. Then go to Step 6.
NO : Go to Step 4.

Step 4. Check the clutch disc facing for wear and damage.

Refer to GROUP 21B, Clutch [P.21B-6](#).

- Q: Is the clutch disc facing worn or damaged?**
YES : Replace the clutch disc. Then go to Step 6.
NO : Go to Step 5.

Step 5. Check for grease or oil on the clutch disc facing.

Refer to GROUP 21B, Clutch [P.21B-6](#).

- Q: Is there grease or oil on the clutch disc facing?**
YES : If the clutch disc facing is contaminated with grease or oil, check that greases is applied to the clutch disc spline. (Refer to GROUP 21B, Clutch [P.21B-2](#).) Then check the clutch housing input shaft oil seal (Refer to GROUP 22B, Clutch Housing [P.22B-56](#).) and the crank shaft rear oil seal (2.4L ENGINE: Refer to GROUP 11A, Crankshaft Rear Oil Seal [P.11A-26](#), 3.0L ENGINE: Refer to GROUP 11C, Crankshaft Rear Oil Seal [P.11C-32](#).) for leakage, and replace the oil seal(s). Replace the clutch disc. Then go to Step 6.
NO : Go to Step 6.

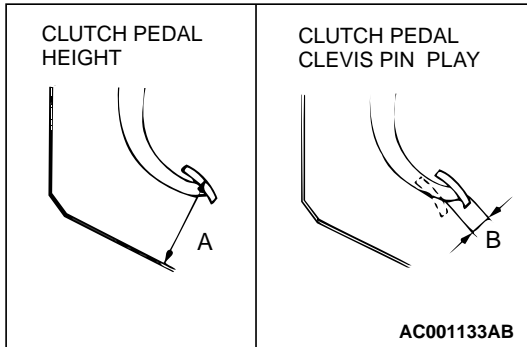
Step 6. Check the symptom.

- Q: Is the symptom reproduced?**
YES : Return to Step 1.
NO : This diagnosis is complete.

ON-VEHICLE SERVICE

CLUTCH PEDAL CHECK AND ADJUSTMENT

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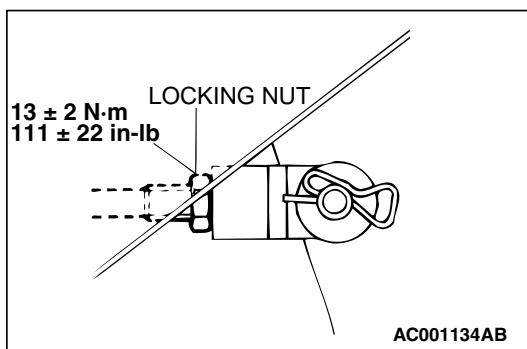


1. Turn back the carpet etc. under the clutch pedal.
2. Measure the clutch pedal height. If the height is outside the standard value, go to step 4.

Standard value (A): 175.3 – 178.3 mm (6.90 – 7.02 inches) [From the surface of melting sheet (Floor board shield) to the face of pedal pad]

3. Measure the clutch pedal clevis pin play. If the play is outside the standard value, go to step 5.

Standard value (B): 1 – 3 mm (0.04 – 0.12 inch)

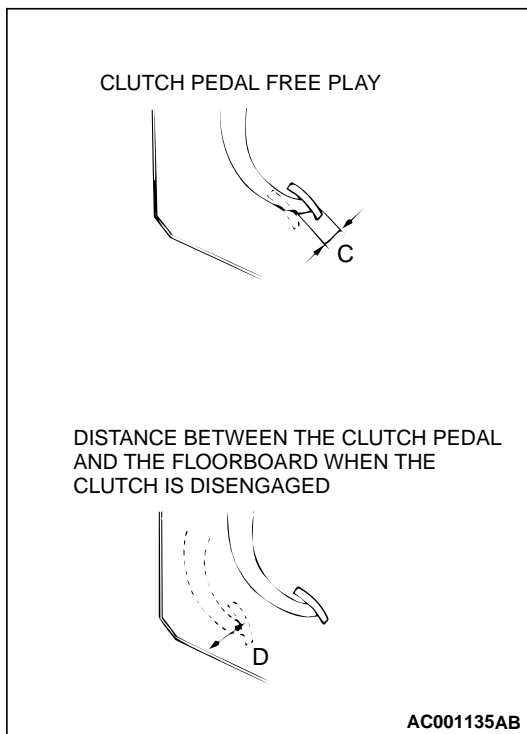


4. If the height of the clutch pedal is not within the standard value, loosen the locking nut and adjust the pedal height to the standard value using the adjusting bolt or push rod.

⚠ CAUTION

Do not push in the master cylinder push rod at this time.

5. If the clutch pedal play is not within the standard value, loosen the locking nut and move the push rod to adjust.



6. After the adjustments, confirm that the clutch pedal free play (measured at the face of the pedal pad) and the distance between the clutch pedal (the face of the pedal pad) and the floorboard when the clutch is disengaged are within the standard value ranges.

Standard value (C): 6 – 13 mm (0.2 – 0.5 inch)

Standard value (D): 76.4 mm (3.0 inches) or more

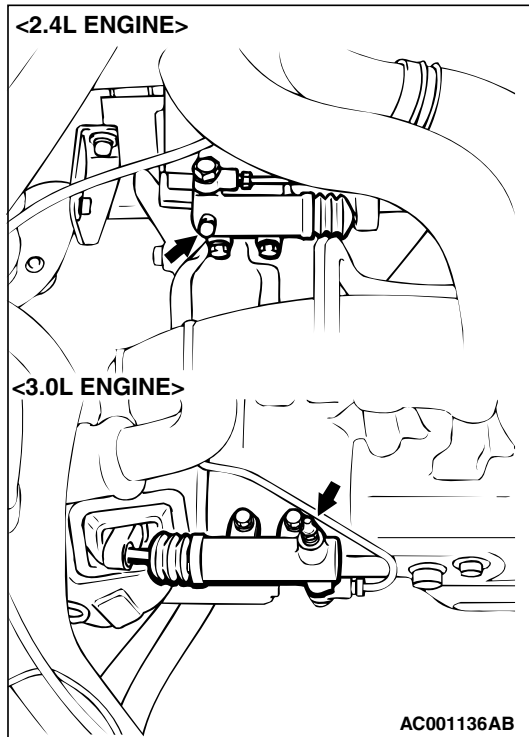
7. If the measured free play and distance do not agree with the standard value ranges, it is probably the result of either air in the hydraulic system or a faulty master cylinder or clutch. Bleed the air, or disassemble and inspect the master cylinder or clutch.
8. Reinstall the carpet, etc.

CLUTCH BLEEDING

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CAUTION

Use the specified brake fluid. Do not mix brake fluid.
Specified fluid: Brake Fluid DOT 3 or DOT 4



CLUTCH PEDAL POSITION SWITCH CHECK

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Refer to GROUP 17, Auto-cruise Control System – On-vehicle Service – Auto-cruise Control Component Check [P.17-83](#).

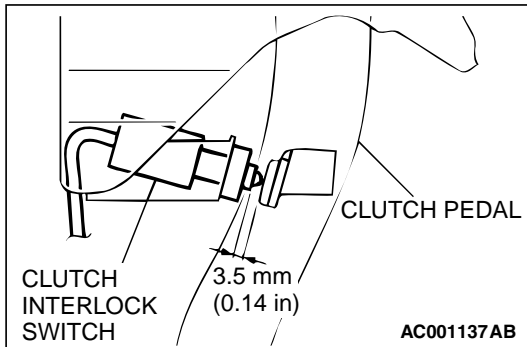
CLUTCH INTERLOCK SWITCH OPERATING CHECK

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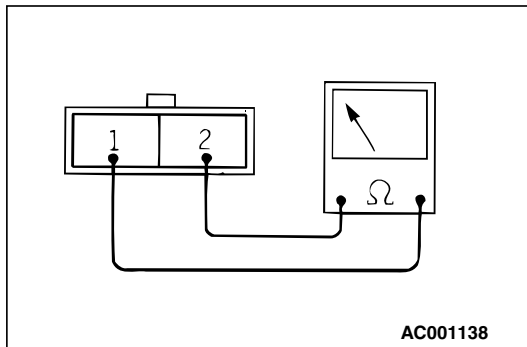
1. Lock the front wheels, apply the parking brake.
2. After normally adjusting the clutch pedal, check the interlock switch operation as follows:
 - (1) The engine should not start even if the ignition switch is turned to the "START" position with the clutch pedal released. If the engine should start, check the interlock switch and the harness.
 - (2) The engine should start after the clutch pedal is depressed and the ignition switch turned to the "START" position. If the engine should start before the clutch is disengaged or the engine does not start even if the clutch pedal is depressed, check and adjust the interlock switch.

CLUTCH INTERLOCK SWITCH CHECK AND ADJUSTMENT

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1. Check to be sure that the interlock switch is as shown in the illustration when the clutch pedal is depressed at its full stroke 130 mm (5.1 inches). If not at the specified dimension, loosen the clutch interlock switch 1/4 turn counterclockwise. Then slide the switch to the specified dimension, and turn the switch 1/4 turn clockwise to lock.



2. Connect an ohmmeter to the interlock switch connector, and then check for continuity when the clutch pedal is fully depressed and when it is released outward. If the interlock switch is not as it should be, replace it.

TESTER CONNECTION	PEDAL POSITION	SPECIFIED CONDITION
1 – 2	FULLY DEPRESSED	No Continuity
	RELEASED	Continuity

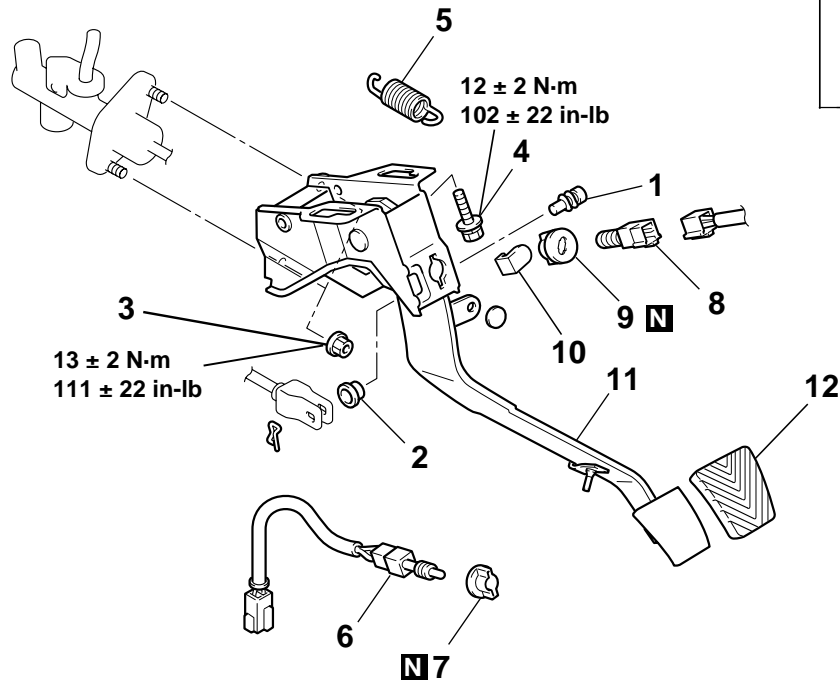
CLUTCH PEDAL

REMOVAL AND INSTALLATION

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Post-installation Operation

- Clutch Pedal Adjustment (Refer to P.21A-7.)
- Clutch Interlock Switch Adjustment (Refer to P.21A-9.)



AC001615 AC

REMOVAL STEPS

1. CLEVIS PIN
2. BUSHING
3. NUT
4. BOLT
5. RETURN SPRING
6. CLUTCH INTERLOCK SWITCH
7. CLIP

REMOVAL STEPS (Continued)

8. CLUTCH PEDAL POSITION SWITCH
9. CLIP
10. PEDAL STOPPER
11. CLUTCH PEDAL AND PEDAL SUPPORT MEMBER
12. PEDAL PAD

INSPECTION

- Check the bushing for wear.
- Check the clutch pedal for bending or twisting.
- Check the return spring for damage or deterioration.
- Check the pedal pad for damage or wear.

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CLUTCH CONTROL

REMOVAL AND INSTALLATION

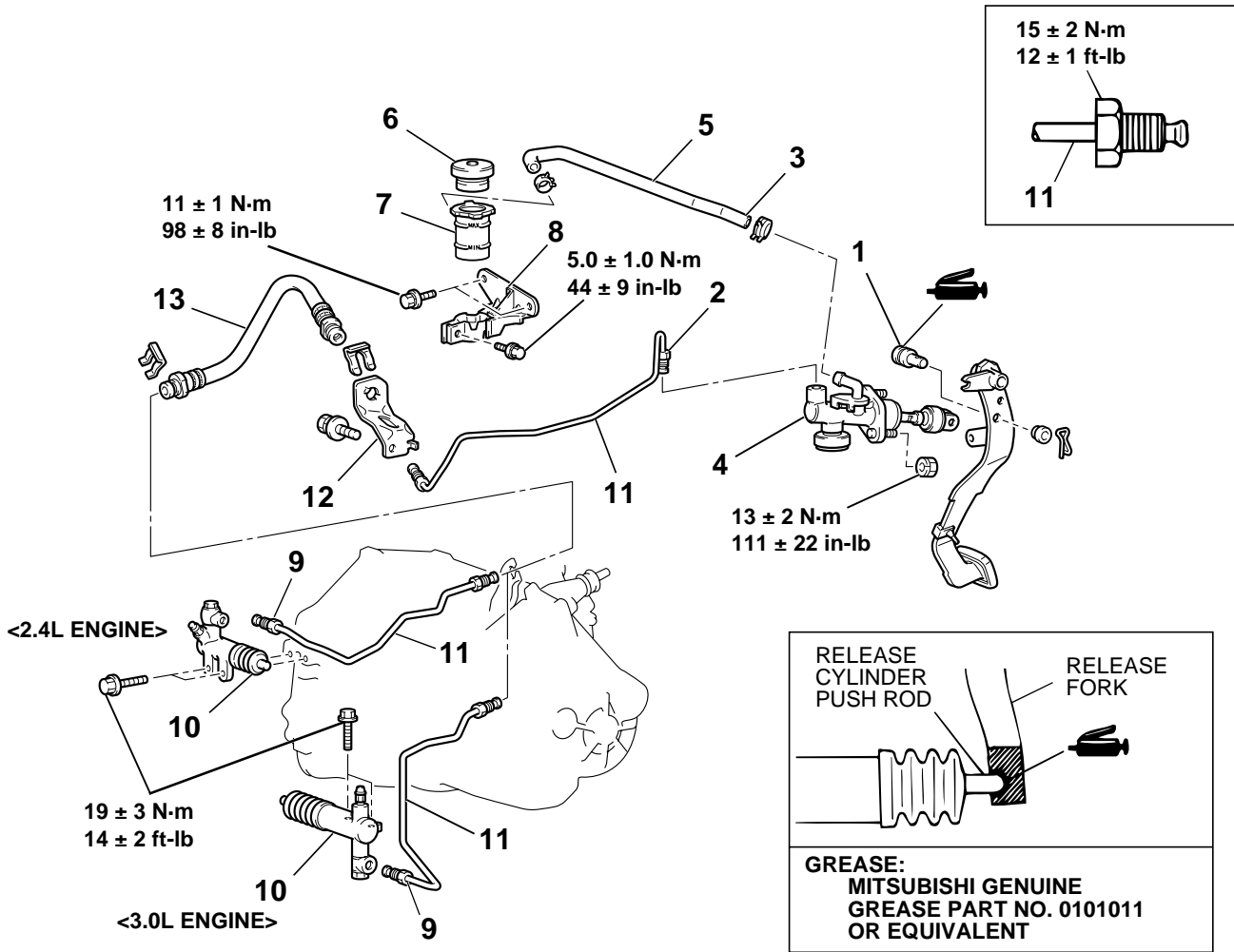
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Pre-removal Operation

Clutch Fluid Draining

Post-installation Operation

- Clutch Fluid Supplying
- Clutch Line Bleeding (Refer to P.21A-8.)
- Clutch Pedal Adjustment (Refer to P.21A-7.)



AC001614AC

CLUTCH MASTER CYLINDER REMOVAL STEPS

1. CLEVIS PIN
2. CLUTCH TUBE CONNECTION
3. RESERVOIR HOSE CONNECTION
4. CLUTCH MASTER CYLINDER

CLUTCH RESERVOIR TANK REMOVAL STEPS

5. RESERVOIR HOSE
6. RESERVOIR CAP
7. RESERVOIR TANK

CLUTCH RESERVOIR TANK REMOVAL STEPS (Continued)

8. RESERVOIR BRACKET
- ### CLUTCH RELEASE CYLINDER REMOVAL STEPS
9. CLUTCH TUBE CONNECTION
 10. CLUTCH RELEASE CYLINDER
- ### CLUTCH LINE REMOVAL STEPS
11. CLUTCH TUBE
 12. BRACKET
 13. CLUTCH HOSE

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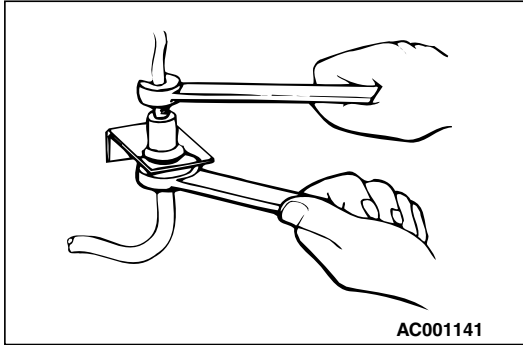
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REMOVAL SERVICE POINT

<<A>> CLUTCH HOSE REMOVAL

Holding the nut at the clutch hose side, loosen the flare nut on the clutch tube.



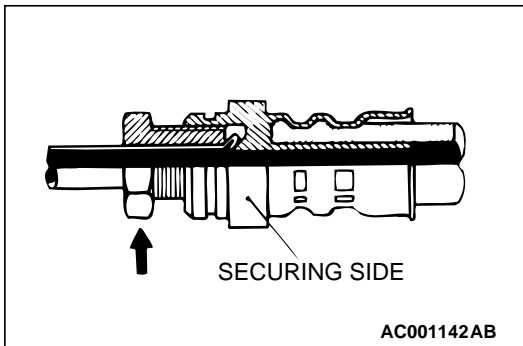
INSTALLATION SERVICE POINT

>>A<< CLUTCH HOSE/CLUTCH TUBE INSTALLATION

1. Temporarily tighten the clutch tube flare nut by hand, and then tighten it to the specified torque, being careful that the clutch hose does not become twisted.

Tightening torque: 15 ± 2 N·m (12 ± 1 ft·lb)

2. After tightening the clutch tube flare nut, check to be sure there is no leakage of the clutch fluid.



INSPECTION

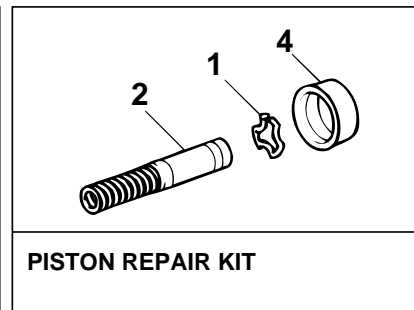
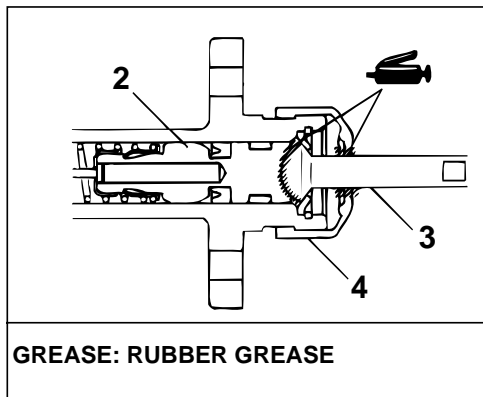
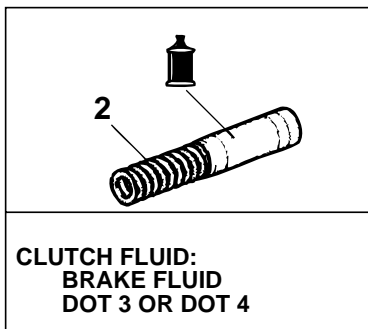
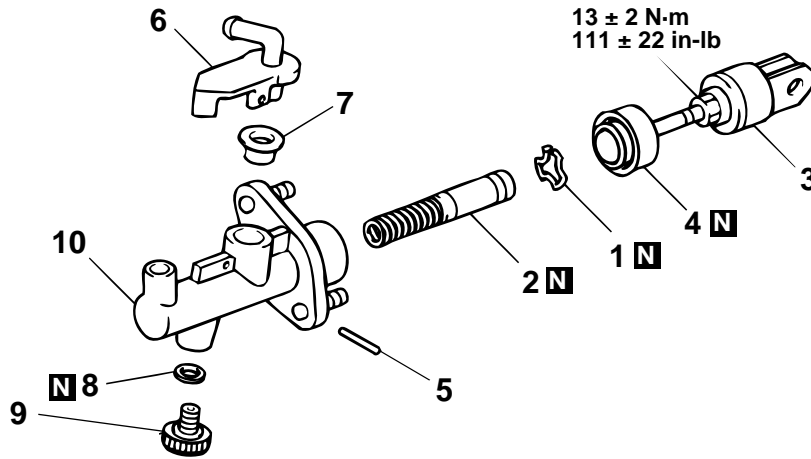
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- Check the master cylinder or clutch hose for fluid leakage.
- Check the clutch hose or tube for cracks or clogging.

**CLUTCH MASTER CYLINDER
DISASSEMBLY AND ASSEMBLY**

⚠ CAUTION

Do not disassemble the piston assembly.



AC001143 AC

DISASSEMBLY STEPS

- >>A<<
1. PISTON STOPPER RING
 2. PISTON ASSEMBLY
 3. DAMPER AND PUSHROD
 4. BOOT
 5. SPRING PIN
 6. NIPPLE

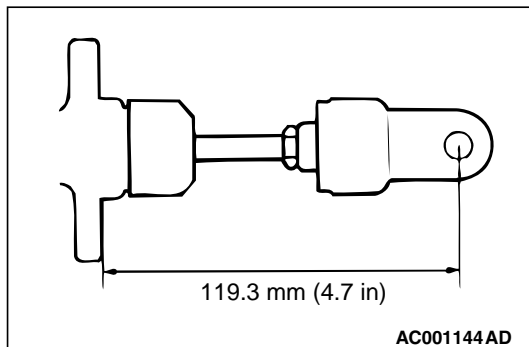
DISASSEMBLY STEPS

7. RESERVOIR SEAL
8. GASKET <3.0L ENGINE>
9. DAMPER ASSEMBLY <3.0L ENGINE>
10. CLUTCH MASTER CYLINDER ASSEMBLY

ASSEMBLY SERVICE POINT

>>A<< DAMPER AND PUSHROD INSTALLATION

Set the length of the push rod assembly to the dimension shown to make the adjustment of the clutch pedal easier.



INSPECTION

M1211002200099

- Check inside the cylinder body for rust and scars.
- Check the piston cup for wear and deformation.
- Check the piston for rust and scars.
- Check the pipe connection for clogging.

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1211003300118

ITEMS		SPECIFICATIONS
Clutch control	Clutch master cylinder mounting nut	13 ± 2 N·m (111 ± 22 in-lb)
	Clutch release cylinder mounting bolt	19 ± 3 N·m (14 ± 2 ft-lb)
	Clutch tube flare nut	15 ± 2 N·m (12 ± 1 ft-lb)
	Push rod jam nut	13 ± 2 N·m (111 ± 22 in-lb)
	Reservoir bracket bolt	5.0 ± 1.0 N·m (44 ± 9 in-lb)
	Reservoir bracket mounting bolt	11 ± 1 N·m (98 ± 8 in-lb)
Clutch pedal	Clutch master cylinder mounting nut	13 ± 2 N·m (111 ± 22 in-lb)
	Pedal support member mounting bolt	12 ± 2 N·m (102 ± 22 in-lb)

GENERAL SPECIFICATION

M1211000200101

ITEM	SPECIFICATION
Clutch master cylinder ID mm (in)	15.87 (5/8)

SERVICE SPECIFICATIONS

M1211000300108

ITEMS	STANDARD VALUE
Clutch pedal height mm (in)	175.3 – 178.3 (6.90 – 7.02)
Clutch pedal clevis pin play mm (in)	1 – 3 (0.04 – 0.12)
Clutch pedal free play mm (in)	6 – 13 (0.2 – 0.5)
Distance between the clutch pedal and the floorboard when the clutch pedal is released mm (in)	76.4 (3.0) or more

LUBRICANTS

M1211000400097

ITEMS	SPECIFIED LUBRICANTS	QUANTITY
Clutch fluid	Brake Fluid DOT 3 or DOT 4	As required
Push rod assembly	Rubber grease	As required
Boot	Rubber grease	As required
Release cylinder push rod	MITSUBISHI genuine grease Part No. 0101011 or equivalent	As required