



Technical Service Bulletin

SUBJECT:			No: TSB-15-23-004
CONTINUOUSLY VARIABLE TRANSMISSION OVERHAUL – SERVICE MANUAL REVISION			DATE: February, 2015
			MODEL: See below
CIRCULATE TO:	<input type="checkbox"/> GENERAL MANAGER	<input type="checkbox"/> PARTS MANAGER	<input checked="" type="checkbox"/> TECHNICIAN
<input checked="" type="checkbox"/> SERVICE ADVISOR	<input checked="" type="checkbox"/> SERVICE MANAGER	<input type="checkbox"/> WARRANTY PROCESSOR	<input type="checkbox"/> SALES MANAGER

PURPOSE

The TSB adds procedures for disassembly, assembly and cleaning transmission components.

AFFECTED VEHICLES

2008–2014 Lancer
 2009–2014 Lancer Sportback
 2008–2014 Outlander
 2011–2014 Outlander Sport

AFFECTED SERVICE MANUALS

2008–2014 Lancer
 2009–2014 Lancer Sportback
 2008–2014 Outlander
 2011–2014 Outlander Sport
 Group 23B Continuously Variable Transmission Overhaul > Pulley > Disassembly and Assembly
 Group 23B Continuously Variable Transmission Overhaul > Pulley > Cleaning

Please add the following procedures to the Affected Service Manuals listed on page 1:
Group 23B Continuously Variable Transmission Overhaul > Pulley > Disassembly and Assembly
Group 23B Continuously Variable Transmission Overhaul > Pulley > Cleaning

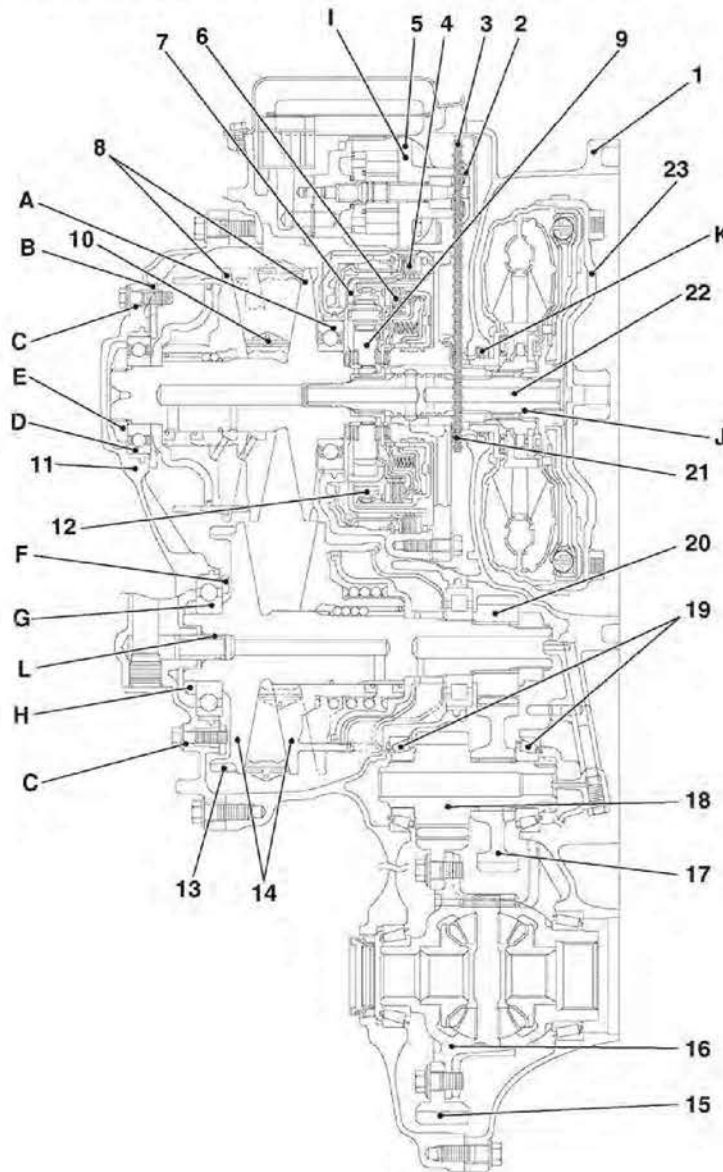
CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY

PULLEY

DISASSEMBLY AND ASSEMBLY

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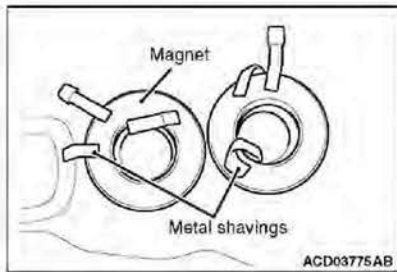
NOTE: How to disassemble and reassemble the CVT to replace the pulley bearing is explained as follows. For the other removal and installation procedures, refer to the relevant Service Manuals.



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**CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY**

- | | |
|--------------------------|----------------------|
| 1. Converter housing | 20. Output gear |
| 2. Driven sprocket | 21. Drive sprocket |
| 3. Chain | 22. Input shaft |
| 4. Reverse brake | 23. Torque converter |
| 5. Oil pump | Parts to be replaced |
| 6. Forward clutch | A. Ball bearing |
| 7. Planet carrier | B. Bearing retainer |
| 8. Primary pulley | C. O-ring |
| 9. Sun gear | D. Ball bearing |
| 10. Steel belt | E. Lock nut |
| 11. Side cover | F. Bearing retainer |
| 12. Internal gear | G. Ball bearing |
| 13. Parking gear | H. Lock nut |
| 14. Secondary pulley | I. Oil pump |
| 15. Final gear | J. O-ring |
| 16. Differential case | K. Oil seal |
| 17. Idler gear | L. O-ring |
| 18. Reduction gear | Control valve |
| 19. Taper roller bearing | |



PRE-DISASSEMBLY OPERATION

1. Raise the vehicle or carry out road test to check that abnormal noise is heard from the CVT.
2. Drain the CVT fluid.
3. Remove the oil pan, and check metal shavings are not adhered to the magnet.
 - Foreign material adhered: Replace the CVT assembly
 - No foreign material: Disassemble and repair the CVT.
4. Remove the CVT assembly from the vehicle.
5. Remove the entire power train to clean the channels in the CVT.
6. Assemble the converter housing temporarily.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY

POST-ASSEMBLY OPERATION

1. Assemble the power train.
2. When the reduction gear assembly and the differential assembly are replaced, adjust the shim(s), and then assemble the converter housing.
3. Assemble the control valve.
4. Assemble the ancillary parts.
5. Mount the CVT assembly to the vehicle.
6. Connect the battery, and then initialize the learnt values stored in the CVT-ECU.
7. Initialize the CVT-ECU.

⚠ CAUTION

- Do not use an oil changer to extract the oil. Always drain it by removing the drain plug.
 - For vehicles with air-cooled oil cooler, follow how to flush the transaxle explained in the relevant Service Manual.
8. Flush the CVT using the CVT fluid.
 - a. Refill the specified amount of the new CVT fluid.
 - b. Road test the vehicle with the selector lever at D range for five minutes.
 - c. Remove the drain plug to drain the CVT fluid.

Road test conditions

 - Warming-up not required
 - Vehicle speed not specified
 - Road test with the vehicle raised is permitted.
 - d. Repeat steps a to c.
 9. Refill the specified amount of the new CVT fluid.
 10. Adapt the CVT-ECU to learn the CVT hydraulic pressure control.

DISASSEMBLY

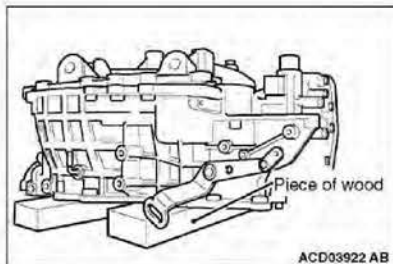
⚠ CAUTION

Be careful not to damage the other part(s). If you damage them, replace the CVT assembly.

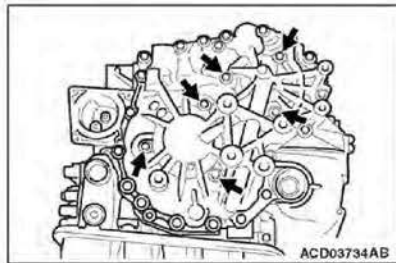
⚠ CAUTION

Place pieces of wood around the differential oil seal to protect it.

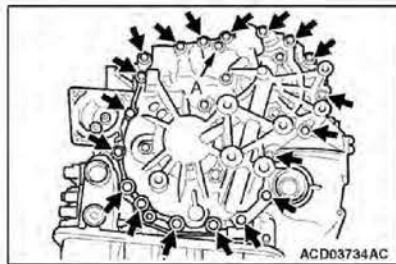
1. Place pieces of wood under the engine contacting surface with the side cover facing up.



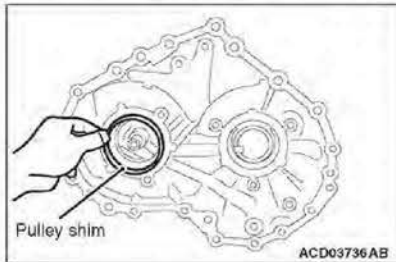
CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY



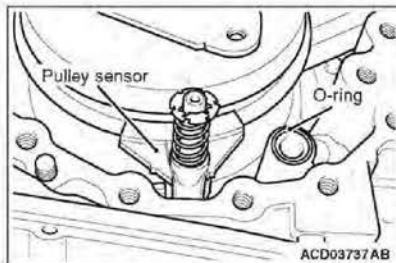
2. Remove the side cover bearing retainer mounting bolts as shown.



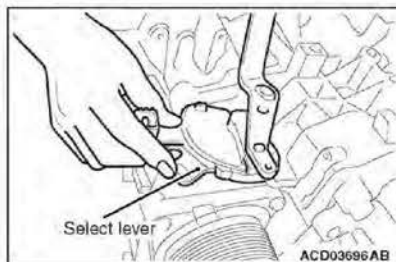
3. Remove the side cover mounting bolts.
4. If fitted, do not remove bolt A shown in the figure.
5. Pull up the side cover evenly to remove.



6. Remove the secondary pulley shim from the side cover.

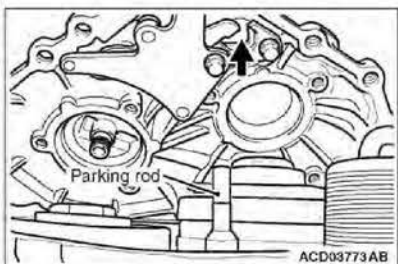


7. Remove the pulley sensor from the transaxle case.
8. Remove the O-ring from the transaxle case.

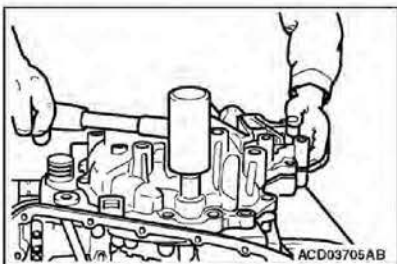


9. Move the selector lever to the P range to pull up the parking rod.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY



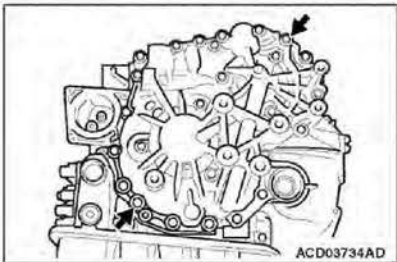
10. Insert the parking rod as shown with the parking rod pulled up.



11. Install the side cover to the transaxle case by taping the cover with a plastic hammer lightly.

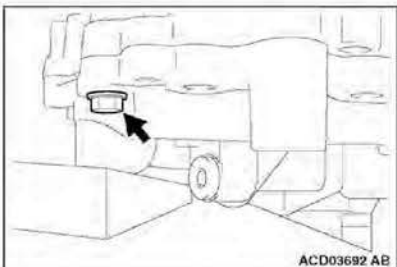
NOTE: If the side cover is not seated to the transaxle case easily, move the select lever to the N position.

NOTE: If the side cover is not seated to the transaxle case tightly, remove the side cover and repeat the installation procedure.

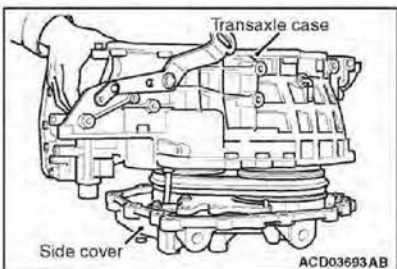


12. Tighten the mounting bolts as shown to install the side cover temporarily.

13. Place the transaxle case horizontally through pieces of wood on a workbench with the side cover facing down.

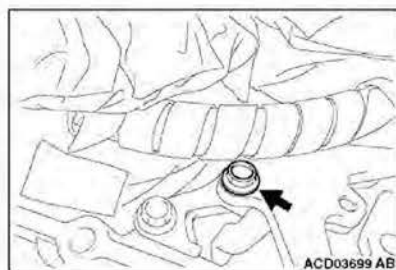
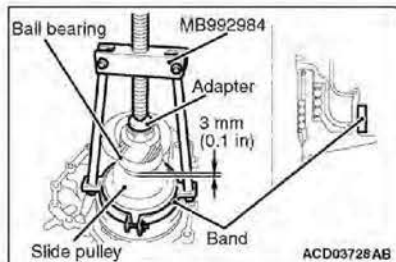
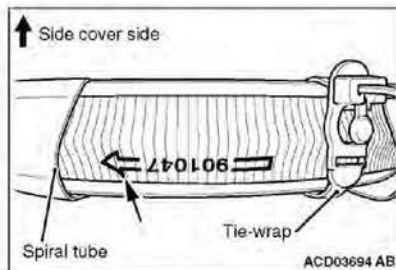
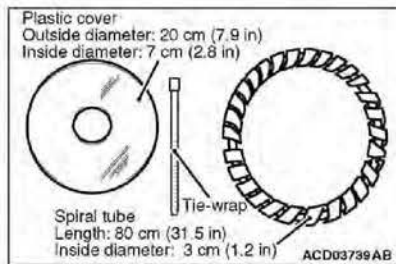


14. Remove the temporarily secured side cover bolts.



15. Remove the transaxle case from the side cover.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL PULLEY



16. Obtain commercially-available four plastic covers, one spiral tube and two cable tie wraps to avoid damage to the steel belt and the pulley assembly.

17. Tie the steel belt segments and the steel rings together at the two diagonal positions by using cable tie-wraps.

NOTE: Note the direction of the steel belt.

CAUTION

- Be careful that special tools do not hit against the steel belt and the pulley to avoid damage.
- Be careful that any foreign materials do not enter the oil channels.

18. Engage the special tool Secondary pulley piston compressor (MB992984) with the secondary pulley assembly. The band of the special tool should be placed as shown.

NOTE: Do not forget to install the adapter as shown, which is supplied with the special tool.

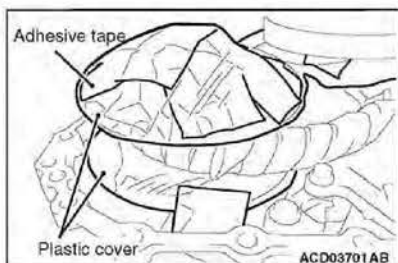
CAUTION

- The steel belt will be loosened when the slide pulley is pulled up. Be careful that the loosened steel belt does not touch the parking lock mounting bolt. If it touches, the belt may be damaged.
- Make sure that the band of the special tool does not slide. If so, retighten it.

19. Pull up the slide pulley by tightening the special tool Secondary pulley piston compressor (MB992984). Pull it up until the clearance between the ball bearing and the pulley reaches 3 mm (0.12 in).

20. Wrap the spiral tube around the steel belt to avoid damage to the pulley. The entire steel belt should be protected as possible.

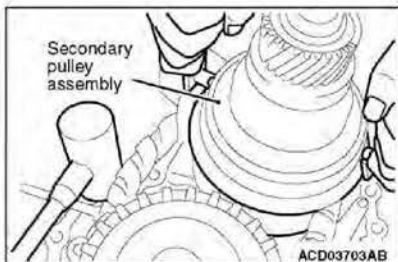
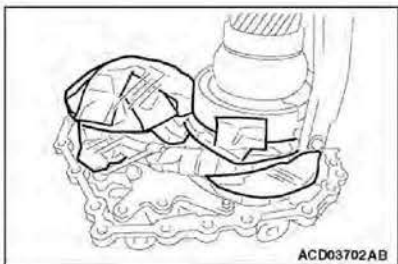
CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL PULLEY



21. Protect the steel belt sliding surfaces of the pulley at four positions with the plastic cover.

NOTE: Secure the upper plastic cover with adhesive tape.

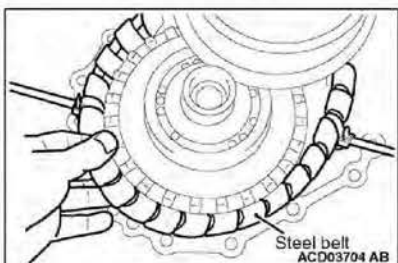
NOTE: Bend the lower plastic cover securely.



22. A second mechanic is required for this operation. One mechanic must lift the secondary pulley assembly and the special tool Secondary pulley piston compressor (MB992984) with both hands. The other mechanic must grasp the belt with one hand, and tap the side cover around the secondary pulley assembly with a plastic hammer if necessary to pull out the secondary pulley assembly from the side cover.

⚠ CAUTION

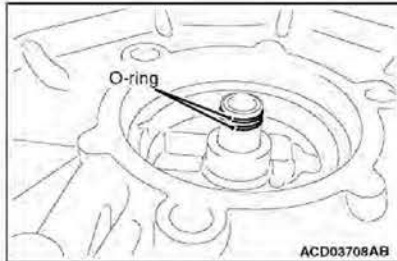
- Make sure that the hammer does not touch the steel belt to avoid damage to the belt.
- Place the removed secondary pulley assembly and the steel belt on a paper towel to avoid damage.
- Do not bend the steel belt.



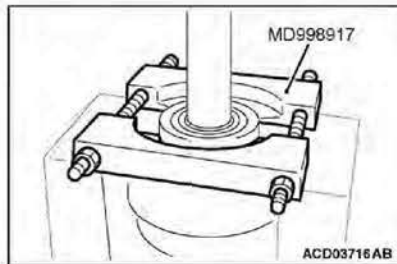
23. One mechanic must slide the special tool Secondary pulley piston compressor (MB992984) toward the primary pulley with both hands with the compressor lifted. The other mechanic must grasp the steel belt to remove it from the secondary pulley assembly.

24. Remove the primary pulley assembly from the side cover.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY



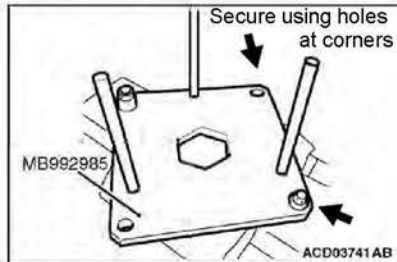
25. Remove the O-rings from the side cover as shown.



CAUTION

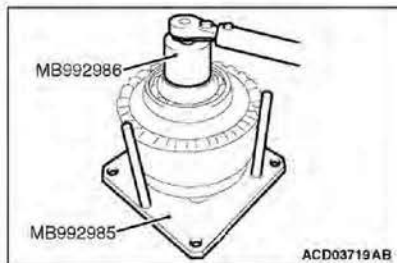
- Be careful not to engage the remover with the C-ring by mistake. Make sure that the bearing is installed securely.
- After the ball bearing is removed, the primary pulley assembly should be stored with its front side facing down to prevent tilting.

26. Use the following special tool Bearing remover (MD998917) to drive out the front ball bearing of the primary pulley assembly from the primary pulley with a press.



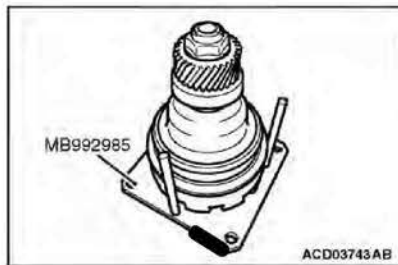
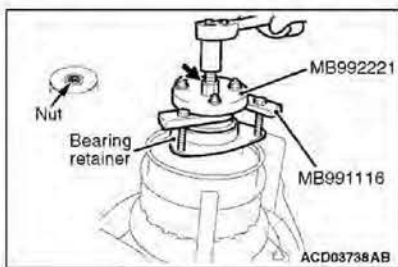
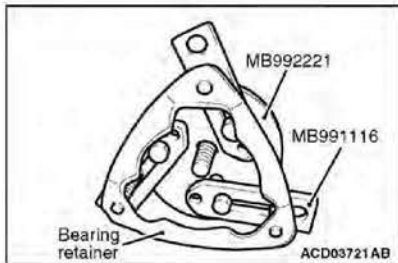
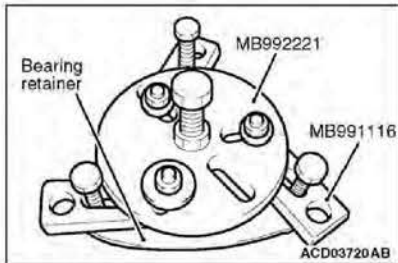
27. Secure the special tool Pulley clamp base (MB992985) by using the four holes.

28. Engage the lock nut of the primary pulley assembly with the hexagonal opening at the center of the special tool Pulley clamp base (MB992985).



29. Use the special tool Primary pulley holder (MB992986) to remove the rear lock nut of the primary pulley assembly.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY



CAUTION

Use an old bolt as the bolt securing the special tool to the bearing retainer may be bent.

30. Install the following special tools to the bearing retainer side of the primary pulley assembly with nuts and bolts.

- Puller set (MB992221)
- Working base adapter (MB991116)

31. To avoid damage to the primary pulley assembly, install a nut (width across flat; 8 mm (0.3 in)) to the top end.

32. Adjust the bearing retainers so that they depress the bearing evenly.

CAUTION

- Store the bearing retainers so that the primary one is not confused with the secondary one.
- After the ball bearing is removed, the primary pulley assembly should be stored with its front side facing down to prevent tilting.

33. Apply a ring spanner to the hexagonal portion of the special tool Puller set (MB992221) to counterhold the assembly.

34. Remove the ball bearing and the bearing retainers by tightening the center bolt.

35. Secure the special tool Pulley clamp base (MB992985) by using the four holes.

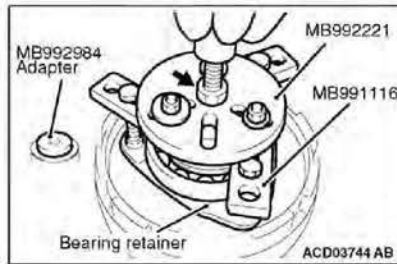
36. Place the secondary pulley assembly on the special tool Pulley clamp base (MB992985).

CAUTION

Note that the rear lock nut is tightened to 310 N·m (229 ft-lb).

37. Use a socket wrench (width across flat; 40 mm (1.6 in)) to remove the rear lock nut of the secondary pulley assembly.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY



CAUTION

After the ball bearing and the bearing retainers are removed, the secondary pulley assembly should be stored with its rear side facing down to prevent tilting.

38. Assemble the following special tools to the rear bearing retainer of the secondary pulley assembly.
 - Puller set (MB992221)
 - Working base adapter (MB991116)
39. Insert the adapter supplied with special tool Secondary pulley piston compressor (MB992984) to prevent the center bolt from touching the secondary pulley assembly directly.
40. Apply a ring spanner to the hexagonal portion of the special tool Puller set (MB992221) to counterhold the assembly.

CAUTION

Store the bearing retainers so that the primary one is not confused with the secondary one.

41. Remove the ball bearing and the bearing retainers by tightening the center bolt.

CAUTION

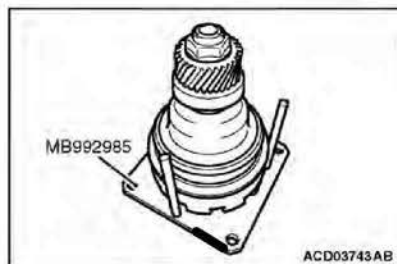
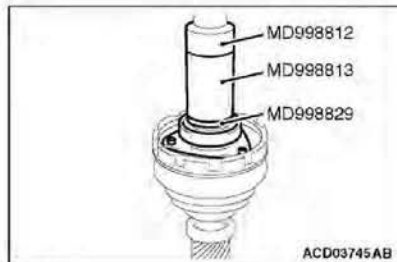
On completion, clean the power train, the pulley assembly and the steel belt.

ASSEMBLY

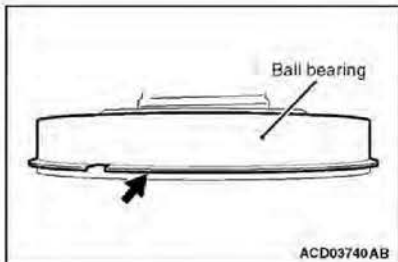
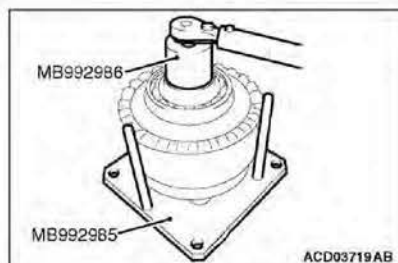
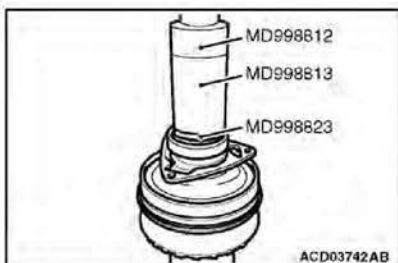
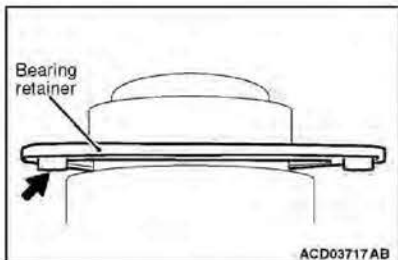
CAUTION

Be careful not to damage the other part(s). If you damage them, replace the CVT assembly.

1. Install the new bearing retainer together with the ball bearing to the secondary pulley with the retainer projection facing up.
2. Use the following special tools to drive the rear ball bearing into the secondary pulley with a press.
 - Installer cap (MD998812)
 - Installer-100 (MD998813)
 - Installer adapter (MD998829)
3. Install the lock nut to the secondary pulley assembly by hand.
4. Secure the special tool Pulley clamp base (MB992985) by using the four holes.
5. Engage the temporarily installed rear lock nut with the hexagonal opening of the special tool Pulley clamp base (MB992985).
6. Use a socket wrench (width across flat; 40 mm (1.6 in)) to tighten the front lock nut of the secondary pulley assembly to the specified torque (310 N·m (229 ft·lb)).



CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY



CAUTION

Make sure that the primary pulley assembly is separated.

7. Install the new bearing retainer together with the ball bearing to the primary pulley assembly with the retainer projection facing down.

8. Use the following special tools to drive the rear ball bearing into the primary pulley with a press.

- Installer cap (MD998812)
- Installer-100 (MD998813)
- Installer adapter (MD998823)

9. Install the lock nut to the primary pulley assembly by hand.

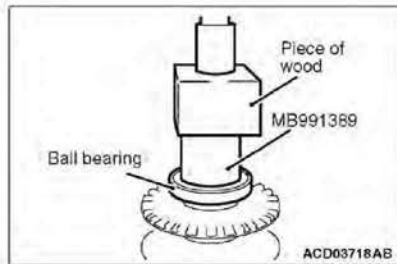
10. Secure the special tool Pulley clamp base (MB992985) by using the four holes.

11. Engage the temporarily installed rear lock nut with the hexagonal opening of the special tool Pulley clamp base (MB992985).

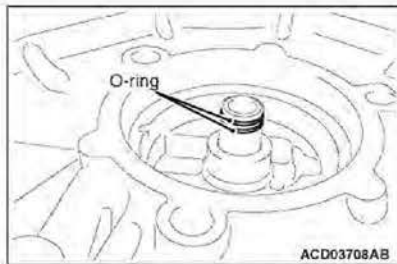
12. Use the special tool Primary pulley holder (MB992986) to tighten the front lock nut of the primary pulley assembly to the specified torque (130 N·m (96 ft·lb)).

13. Set the front ball bearing to the primary pulley as shown.

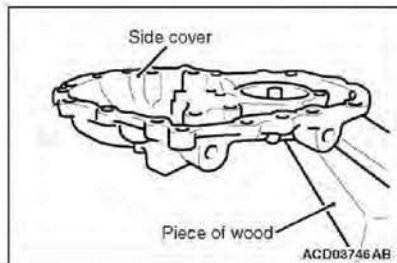
CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY



14. Use the special tool Bush remover base (MB991389) to drive the front ball bearing into the primary pulley with a press.

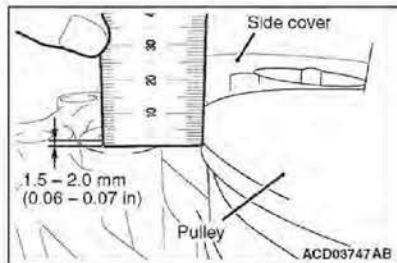


15. Install the O-rings to the side cover as shown.



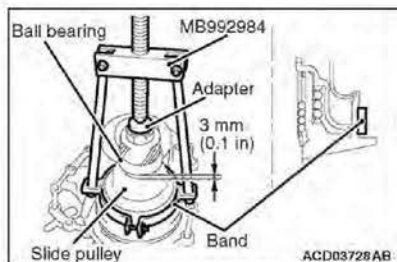
16. Use pieces of wood to place the pulley assembly so that its installation surface is horizontal.

NOTE: If it is not horizontal, you cannot install the pulley assembly easily.



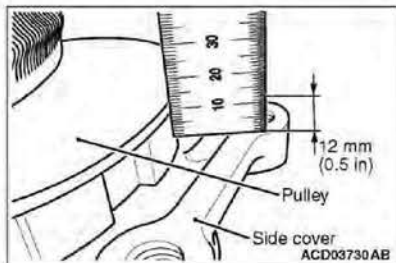
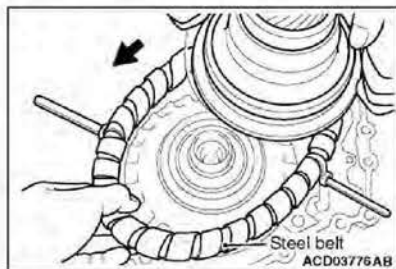
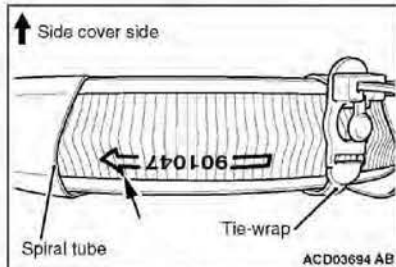
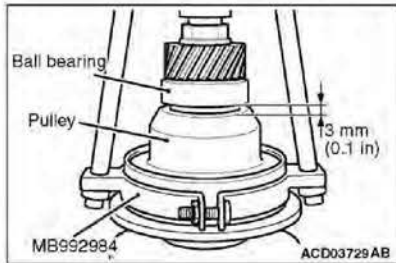
17. Install the primary pulley assembly to the side cover. The shown dimension should reach 1.5 - 2.0 mm (0.06 - 0.07 in).

Set the special tools to the secondary pulley assembly.



18. Engage the special tool Secondary pulley piston compressor (MB992984) with the secondary pulley assembly. The band of the special tool should be placed as shown.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL PULLEY



CAUTION

- Counterhold the special tools securely.
- Make sure that the band of the special tool does not slide. If so, retighten it.
- When pulling up the special tool, the clearance between the ball bearing and the pulley should not exceed 3 mm (0.1 in).

19. Pull up the slide pulley by tightening the special tool Secondary pulley piston compressor (MB992984). Pull it up until the clearance between the ball bearing and the pulley reaches 3 mm (0.1 in).

20. The other mechanic should check the rotation direction of the steel belt to apply the belt to the secondary pulley assembly.

21. Lift the secondary pulley assembly and the steel belt as a set, and slide the assembly toward the primary pulley to apply the steel belt to the primary pulley.

22. Install the secondary pulley assembly to the side cover.

NOTE: If the ball bearing is engaged into the insertion hole, seat the secondary pulley assembly by tapping the side cover lightly with a plastic hammer.

23. The shown dimension should be approx. 12 mm (0.5 in).

CAUTION

Be careful not to damage the steel belt and the pulley.

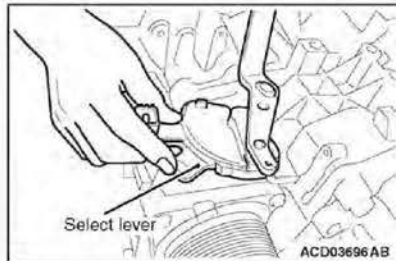
24. Remove the plastic cover from the pulley sliding surface. Then detach the spiral tube from the steel belt.

25. Pull down the slide pulley which has been lifted by the special tool Secondary pulley piston compressor (MB992984).

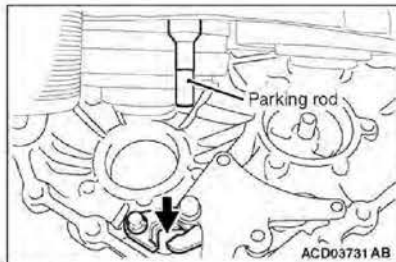
26. Remove the Secondary piston pulley compressor (MB992984) from the secondary pulley assembly.

27. Remove the cable tie-wraps from the steel belt.

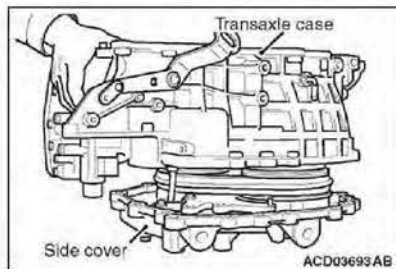
CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY



28. Move the selector lever to the P range to pull up the parking rod.



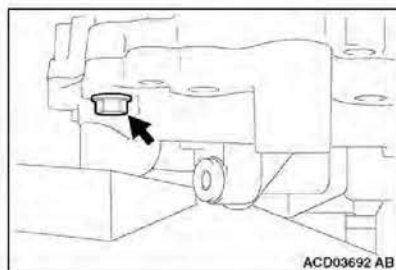
29. Insert the parking rod as shown with the parking rod pulled up.



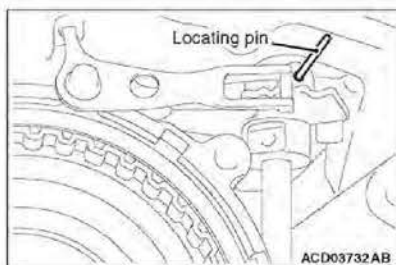
30. Install the transaxle case to the side cover.

NOTE: If the side cover is not seated to the transaxle case easily, move the select lever to the N position.

NOTE: If the side cover is not seated to the transaxle case tightly, remove the side cover and repeat the installation procedure.

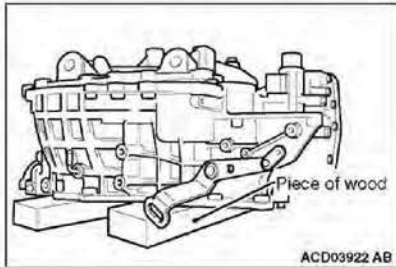


31. Tighten the mounting bolts as shown to install the side cover temporarily.



32. Check that the manual shaft locating pin has not fallen out.

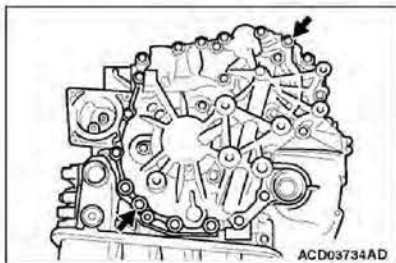
CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY



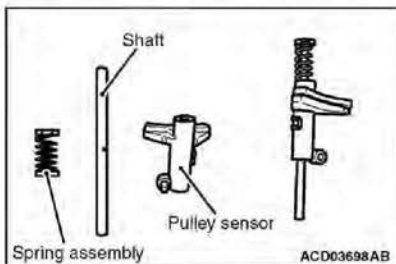
CAUTION

Place pieces of wood around the differential oil seal to protect it.

33. Place the transaxle case with its engine mounting surface facing down via pieces of wood.

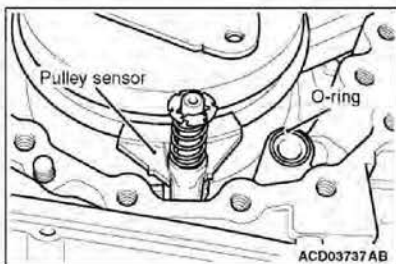


34. Remove the temporarily tightened bolt from the side cover, and pull away the side cover evenly.

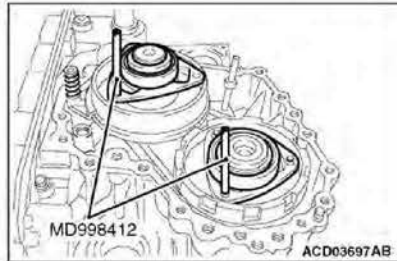


35. Install the pulley sensor, the shaft and spring assembly to the transaxle case in that order.

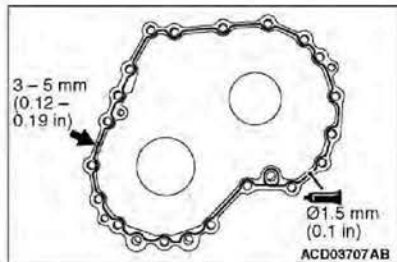
36. Install the O-ring to the transaxle case.



CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY



37. Install the special tool Guide (MD998412) to the bearing retainers of the primary pulley assembly and the secondary pulley assembly as shown.



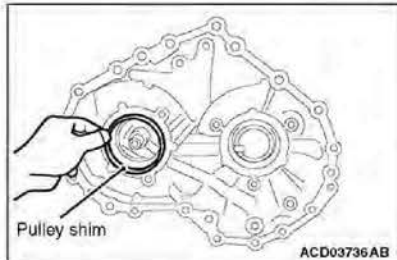
CAUTION

- The sealant application surface should be free of humidity, oil or residual sealant.
- The ends of the sealant should be midway between the bolts.

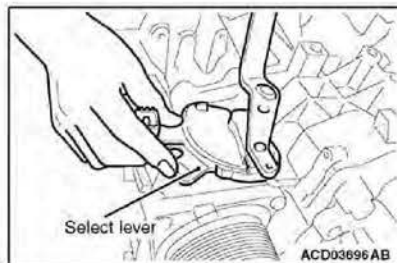
38. Apply a 5 mm (0.2 in)-diameter bead of sealant to the transaxle case mounting surface on the side cover. The ends of the sealant bead should overlap by 3 - 5 mm (0.12 - 0.19 in).

SEALANTS

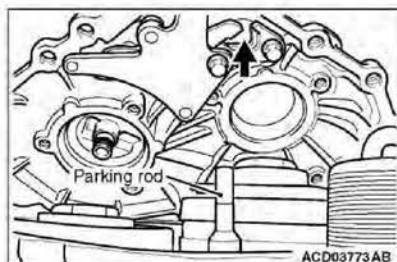
Brand name: Loctite 509



39. Apply petroleum jelly to the pulley shim, and install it to the side cover.



40. Move the selector lever to the P range to pull up the parking rod.



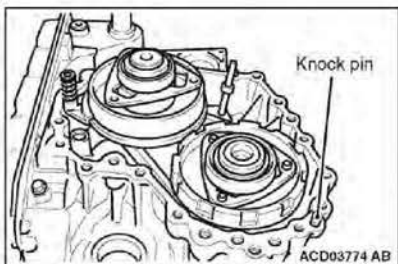
CAUTION

When installing the side cover, make sure that the sealant bead is not broken.

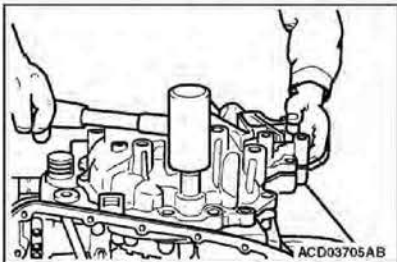
41. Install the side cover to the transaxle case. Insert the parking rod as shown with the parking rod pulled up.

42. Make sure that the parking rod is inserted slightly. Then move the select lever to the neutral position.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY

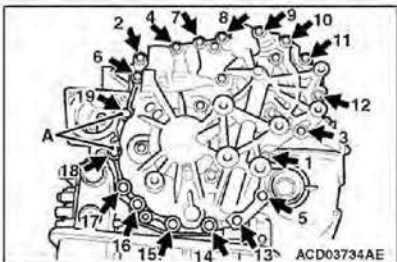


43. The pulley sensor shaft, the two ball bearings and the two knock pins should be aligned with the corresponding recesses on the side cover.



44. Tap the entire perimeter of the side cover with a plastic hammer to engage it into the transaxle case.

NOTE: If the side cover is not seated to the transaxle case tightly, remove the side cover and repeat the installation procedure.



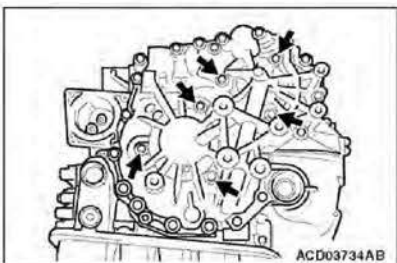
45. Tighten the side cover mounting bolts in the order shown to 45 N·m (33 ft·lb).

Bolt shank length

A: 35 mm (1.4 in)

The others: 30 mm (1.2 in)

46. Replace the O-rings of the bearing retainer mounting bolts.



47. Tighten the bearing retainer mounting bolts to 28 N·m (21 ft·lb) as shown.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY

CLEANING

M1233202100016

Clean the power train, the pulley assemblies and the steel belt with CVT fluid.

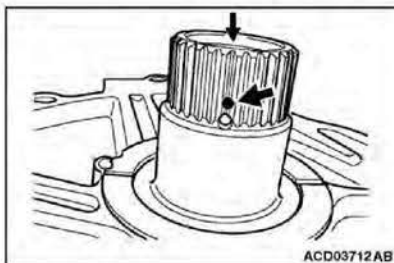
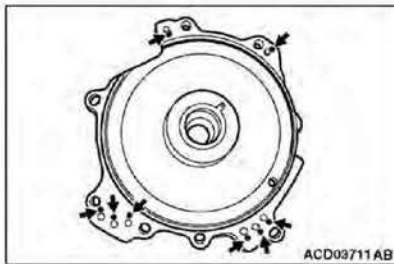
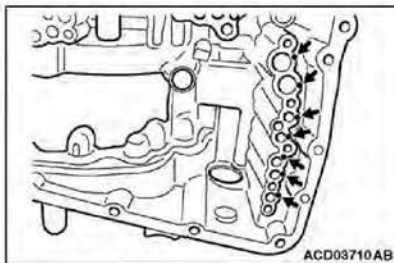
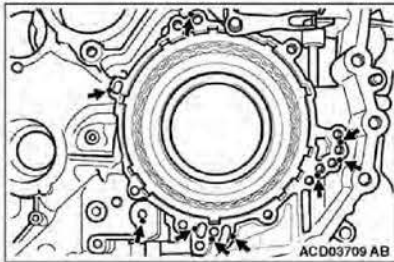
CAUTION

Wear safety goggles to protect your eyes from dust thrown off by compressed air.

1. Clean the oil channels with compressed air.

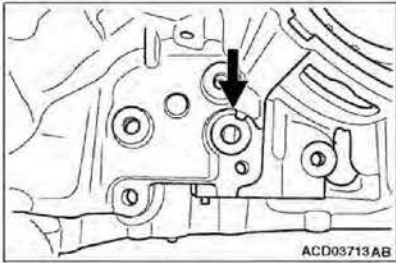
CAUTION

- Protect your eyes from dust thrown off by compressed air.
 - Do not stand against the control valve opening as compressed air comes out.
2. Spray a commercial-available cleaner to the shown positions of the transaxle case, and then clean them with compressed air.

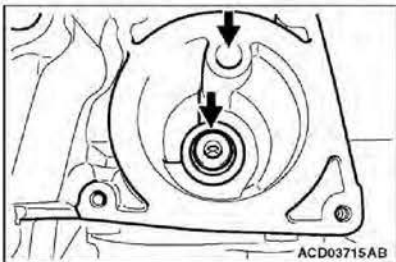
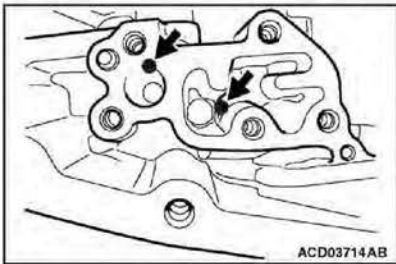


3. Spray a commercial-available cleaner to the shown positions of the dummy cover, and then clean them with compressed air.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
PULLEY



4. Spray a commercial-available cleaner to the shown positions of the oil pump, and then clean the oil channels with compressed air.



5. Spray a commercial-available cleaner to the shown positions of the warmer, and then clean the oil channels with compressed air.

