

Automatic Transaxle Workshop Manual Supplement FN4A-EL

FOREWORD

This manual explains the changes and/or additions relating to the disassembly, inspection, repair, and reassembly procedures for the above-indicated automatic transaxle.

In order to do these procedures safely, quickly, and correctly, you must first read this manual and any other relevant service materials carefully.

The information in this manual is current up to March, 2002. Any changes that occur after that time will not be reflected in this particular manual. Therefore, the contents of this manual may not exactly match the mechanism that you are currently serving.

**Mazda Motor Corporation
HIROSHIMA, JAPAN**

CONTENTS

Title	Section
General Information	GI
Mechanism and Operation	K
Overhaul	K1
Technical Data	TD
Special Tools	ST

There are explanations given only for the sections marked with shadow (■).

© 2002 Mazda Motor Corporation
PRINTED IN THE NETHERLANDS, MARCH 2002
1746-1E-02C

RELATED MATERIALS

Automatic Transaxle Workshop Manual FN4A-EL . . . 1623-10-98E

WARNING

Servicing a vehicle can be dangerous. If you have not received service-related training, the risks of injury, property damage, and failure of servicing increase. The recommended servicing procedures for the vehicle in this workshop manual were developed with Mazda-trained technicians in mind. This manual may be useful to non-Mazda trained technicians, but a technician with our service-related training and experience will be at less risk when performing service operations. However, all users of this manual are expected to at least to know general safety procedures.

This manual contains "Warnings" and "Cautions" applicable to risks not normally encountered in a general technician's experience. They should be followed to reduce the risk of injury and the risk that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that the "Warnings" and "Cautions" are not exhaustive. It is impossible to warn of all the hazardous consequences that might result from failure to follow the procedures.

The procedures recommended and described in this manual are effective methods of performing service and repair. Some require tools specifically designed for a specific purpose. Persons using procedures and tools which are not recommended by Mazda Motor Corporation must satisfy themselves thoroughly that neither personal safety nor safety of the vehicle will be jeopardized.

The contents of this manual, including drawings and specifications, are the latest available at the time of printing, and Mazda Motor Corporation reserves the right to change the vehicle designs and alter the contents of this manual without notice and without incurring obligation.

Parts should be replaced with genuine Mazda replacement parts or with parts which match the quality of genuine Mazda replacement parts. Persons using replacement parts of lesser quality than that of genuine Mazda replacement parts must satisfy themselves thoroughly that neither personal safety nor safety of the vehicle will be jeopardized.

Mazda Motor Corporation is not responsible for any problems which may arise from the use of this manual. The cause of such problems includes but is not limited to insufficient service-related training, use of improper tools, use of replacement parts of lesser quality than that of genuine Mazda replacement parts, or not being aware of any revision of this manual.

GENERAL INFORMATION

HOW TO USE THIS MANUAL	GI-2
RANGE OF TOPICS	GI-2
ABBREVIATIONS	GI-2
ABBREVIATIONS TABLE	GI-2

HOW TO USE THIS MANUAL , ABBREVIATIONS

HOW TO USE THIS MANUAL

RANGE OF TOPICS

- This manual indicates only changes/additions, as it is the supplemental for the related materials. Therefore it may not contain the necessary reference service procedures to perform the services indicated in this manual.

A6E20100001A01

ABBREVIATIONS

ABBREVIATIONS TABLE

A6E203000011A01

ATF	Automatic transaxle fluid
SST	Special service tool
1st GR	First gear
2nd GR	Second gear
3rd GR	Third gear
4th GR	Forth gear

OVERHAUL

OUTLINE	K1-2
SUPPLEMENTAL SERVICE INFORMATION ...	K1-2
AUTOMATIC TRANSAXLE	K1-3
AUTOMATIC TRANSAXLE DISASSEMBLY	K1-3
ACCUMULATORS	
DISASSEMBLY/ASSEMBLY	K1-16
CLUTCH COMPONENT	
DISASSEMBLY/ASSEMBLY	K1-18
DIFFERENTIAL DISASSEMBLY/ASSEMBLY ..	K1-26
AUTOMATIC TRANSAXLE ASSEMBLY	K1-29
AUTOMATIC TRANSAXLE INSPECTION.....	K1-49

K1

OUTLINE

<h2>OUTLINE</h2>

SUPPLEMENTAL SERVICE INFORMATION

A6E560201034A01

- The following changes have been made since publication of the Mazda Automatic Transaxle Workshop Manual (1623-10-98E.).

AUTOMATIC TRANSAXLE DISASSEMBLY

- Oil pressure switch has been added.

ACCUMULATORS DISASSEMBLY/ASSEMBLY

- Spring specification has been modified.

CLUTCH COMPONENT DISASSEMBLY/ASSEMBLY

- Assembly procedure has been modified.

DIFFERENTIAL DISASSEMBLY/ASSEMBLY

- Conclusion type of differential ring gear has been added.
- Assembly procedure has been modified.

AUTOMATIC TRANSAXLE ASSEMBLY

- Oil pressure switch has been added.

AUTOMATIC TRANSAXLE INSPECTION

- 3-4 Clutch clearance has been modified.

AUTOMATIC TRANSAXLE

AUTOMATIC TRANSAXLE

AUTOMATIC TRANSAXLE DISASSEMBLY

A6E561401030A01

Precaution

General notes

- The oil pan could contain small chips, shavings, and other particles which may be helpful in inspecting the condition of the transaxle and diagnosing certain problems.
To ensure that all foreign particles stay in the oil pan, make sure that the transaxle is never tipped completely over while the oil pan is still installed.
 1. Disassemble the transaxle in a clean area (dustproof work space) to prevent entry of dust into the mechanisms.
 2. Inspect the individual transaxle components in accordance with the QUICK DIAGNOSIS CHART during disassembly.
 3. Use only plastic hammers when applying force to separate the light alloy case joints.
 4. Never use rags during disassembly; they may leave particles that can clog fluid passage.
 5. Several parts resemble one another; arrange them so that they do not get mixed up.
 6. Disassemble the control valve component and thoroughly clean it when the clutch or brake band has burned or when the ATF has degenerated.

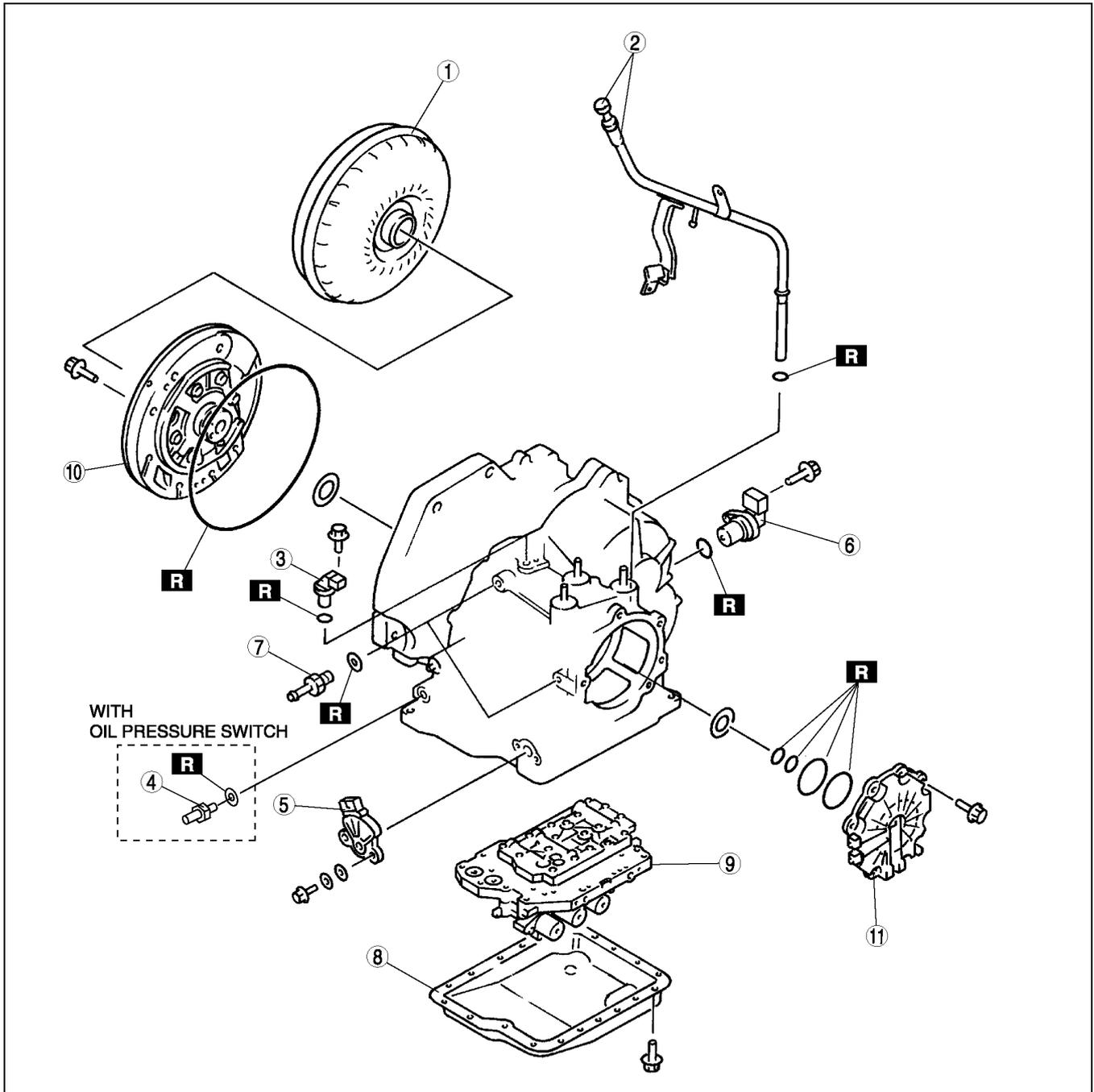
Warning

- **Although the stand has a self-locking brake system, there is a possibility that the brake may not hold when the transaxle is held in a lopsided position on the stand. This would cause the transaxle to turn suddenly, causing serious injury. Never keep the transaxle tilted to one side. Always hold the rotating handle firmly when turning the transaxle.**

K1

AUTOMATIC TRANSAXLE

Disassembly Components



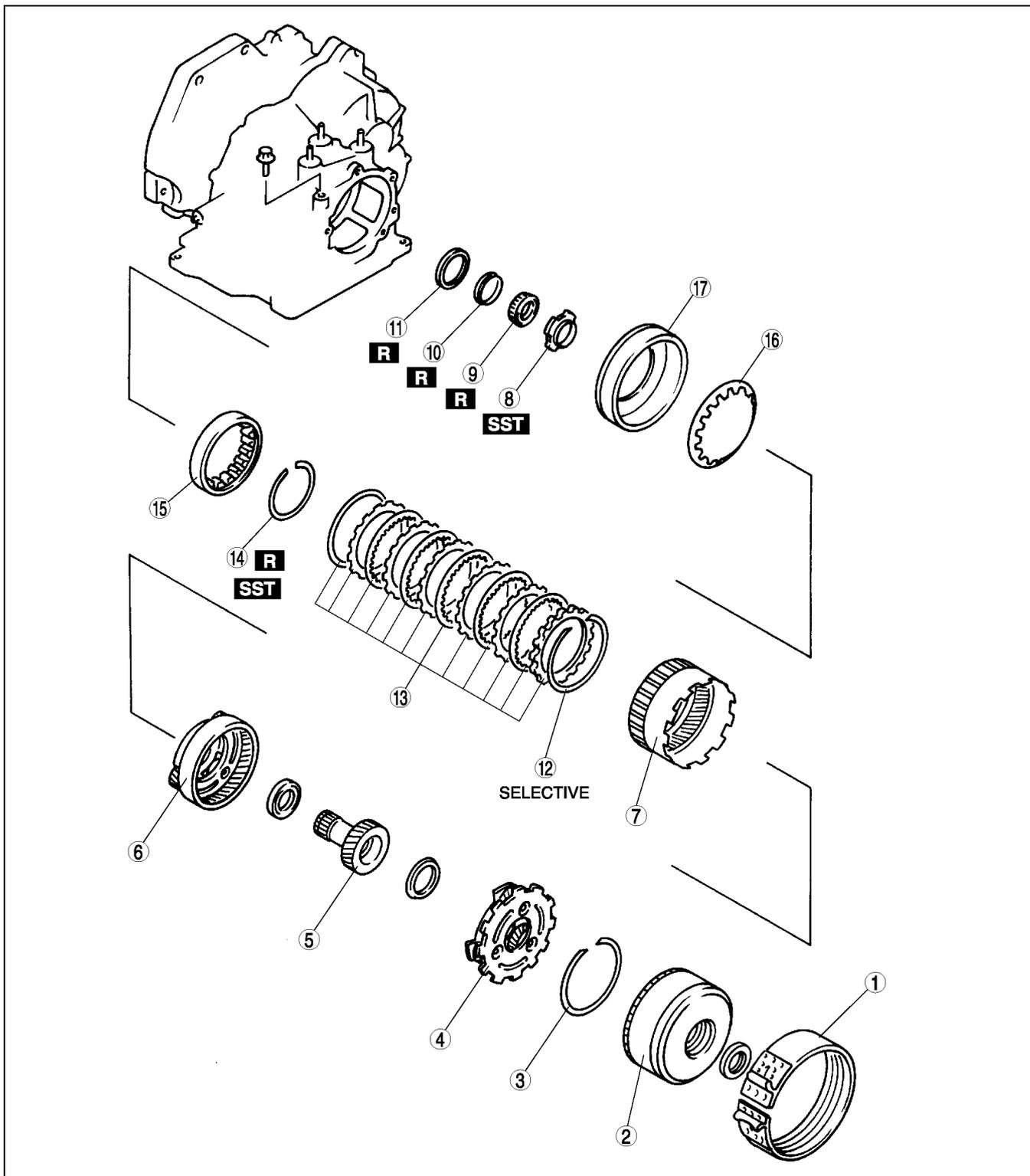
A6E5714A001

1	Torque converter
2	Oil dipstick and oil filler tube
3	Input/turbine speed sensor
4	Oil pressure switch
5	Transaxle range switch
6	Vehicle speed sensor

7	Connector pipe
8	Oil pan
9	Control valve body component
10	Oil pump
11	End cover

AUTOMATIC TRANSAXLE

K1

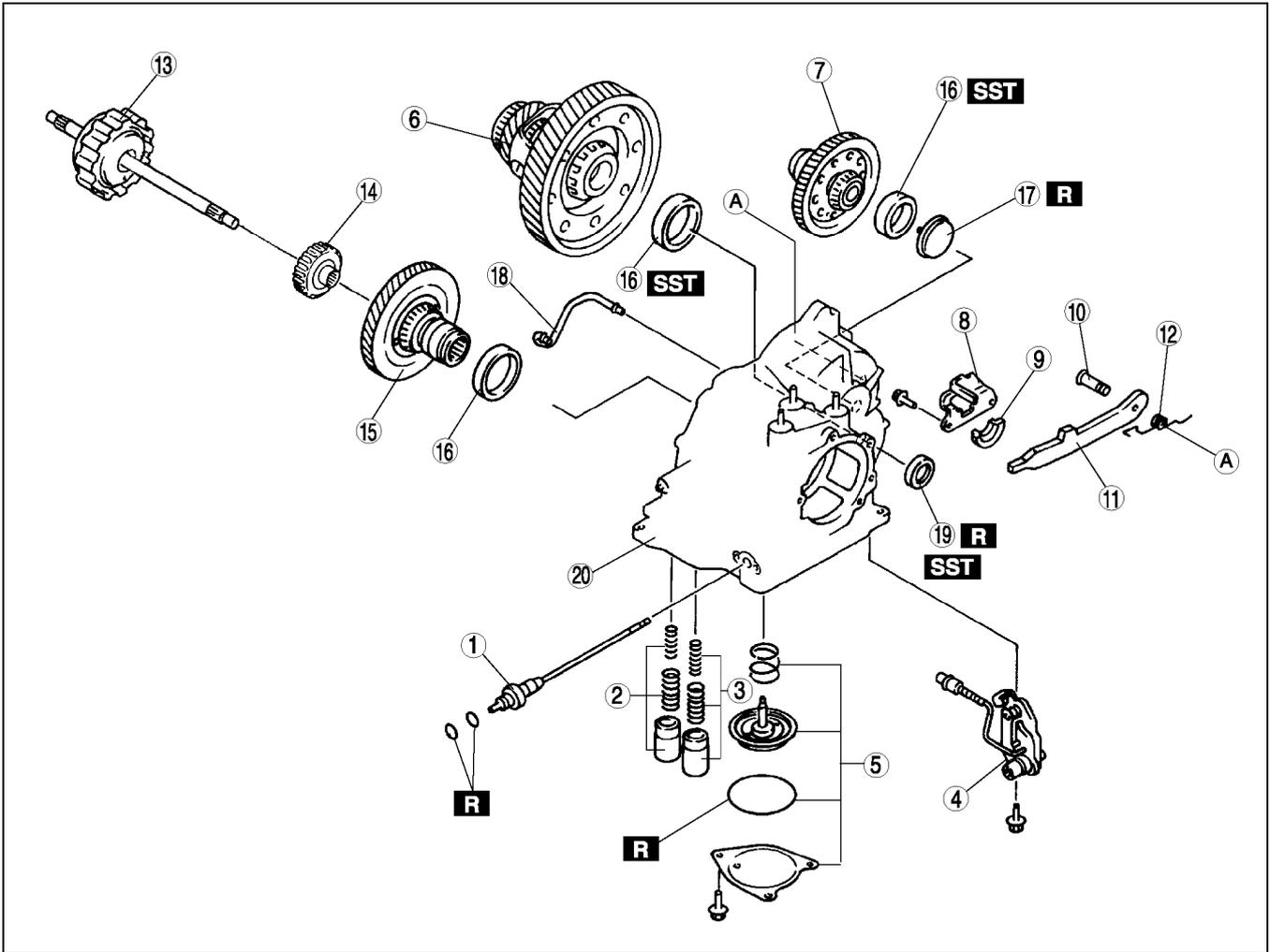


A6E5714A002

1	2-4 brake band
2	Clutch component
3	Snap ring
4	Rear planetary gear component
5	Front sun gear
6	Front planetary gear component
7	Front internal gear and one-way clutch
8	Lock nut
9	Bearing

10	Distance piece
11	Bearing race
12	Snap ring
13	Low and reverse brake
14	Snap ring
15	One-way clutch inner race
16	Piston return spring
17	Low and reverse brake piston

AUTOMATIC TRANSAXLE



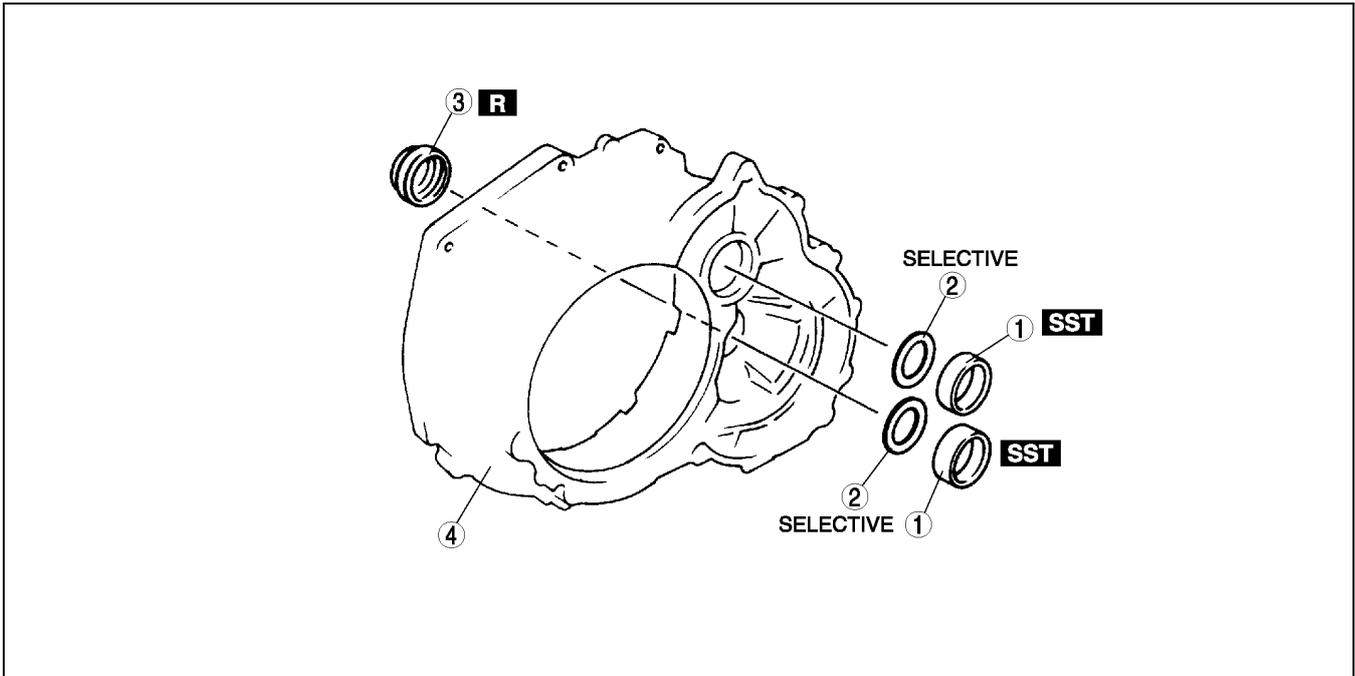
A6E5714A003

1	Manual shaft
2	Servo apply accumulator
3	Forward accumulator
4	Parking rod lever component
5	Band servo
6	Differential
7	Secondary gear and output gear
8	Actuator plate
9	Support actuator
10	Parking pawl shaft

11	Parking pawl
12	Pawl return spring
13	Forward clutch
14	Forward clutch hub
15	Primary gear
16	Bearing race
17	Funnel
18	Oil pipe
19	Oil seal
20	Transaxle case

AUTOMATIC TRANSAXLE

K1



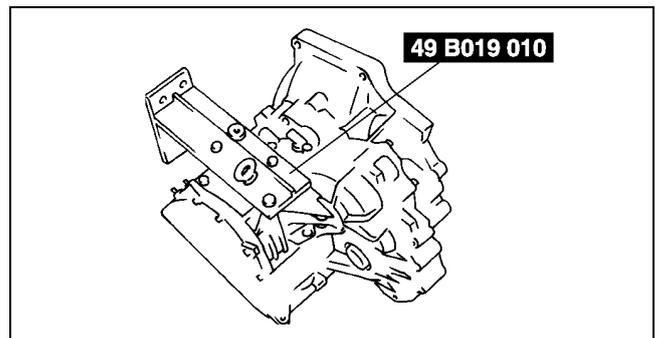
A6E5714A004

1	Bearing race
2	Adjustment shim

3	Oil seal
4	Converter housing

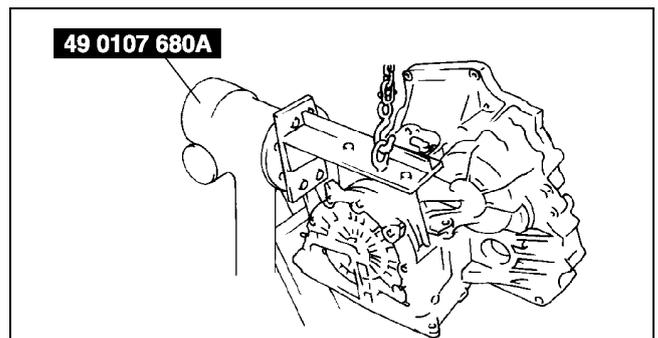
Disassembly procedure

1. Remove the torque converter, and immediately turn it so that the hole faces upward. This will help to keep any remaining fluid from spilling.
2. Remove the ATF dipstick and oil filler tube.
3. Remove the O-ring from the oil filler tube.
4. Remove the breather hose.
5. Assemble the **SST**.



A6E5714A005

6. Lift the transaxle and mount it on the **SST**.
7. Remove the input/turbine speed sensor.
8. Remove the O-ring from the input/turbine speed sensor.
9. Remove the oil pressure switch. (with oil pressure switch)
10. Remove the transaxle range switch.
11. Remove the vehicle speed sensor.
12. Remove the O-ring from the vehicle speedometer sensor.
13. Remove the connector pipe.



A6E5714A006

Warning

- Using compressed air can cause dirt and other particles to fly, out, causing injury to the eyes. Wear protective eye wear whenever using compressed air.

AUTOMATIC TRANSAXLE

Caution

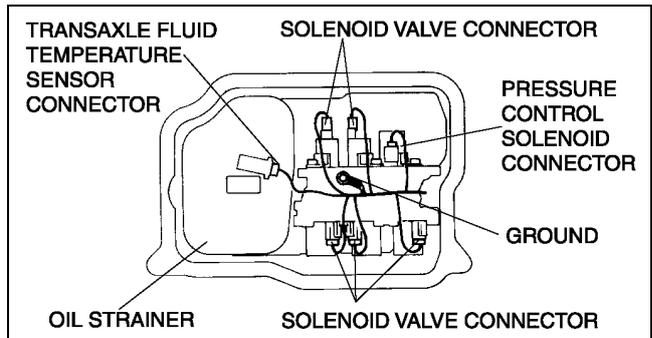
- Clean the transaxle exterior thoroughly with a steam cleaner or cleaning solvents before removal.
- If any old sealant gets into the transaxle during installation of the oil pan, trouble may occur in the transaxle. Remove any old sealant from the transaxle case and oil pan, and clean with cleaning fluids.

14. Remove the oil pan.

Examine any material found in the pan or on the magnet to determine the condition of the transaxle. If large amounts of material are found, replace the torque converter and carefully inspect the transaxle for the cause.

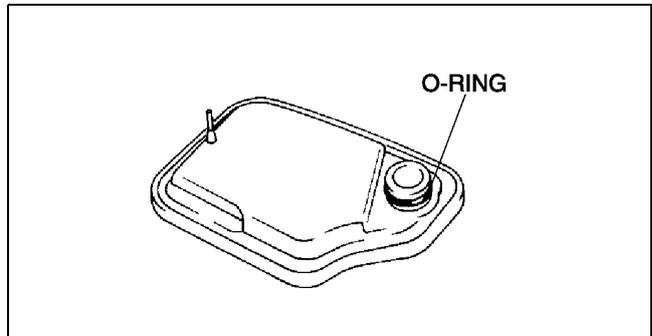
- (1) Clutch facing material
 - Drive plate and brake band wear
- (2) Steel (magnetic)
 - Bearing, gear, and driven plate wear
- (3) Aluminum (nonmagnetic)
 - Aluminum part wear

15. Disconnect the solenoid valve connector, ground, and transaxle fluid temperature sensor connector.
16. Remove the oil strainer.



A6E5714A007

17. Remove the O-ring from the oil strainer.

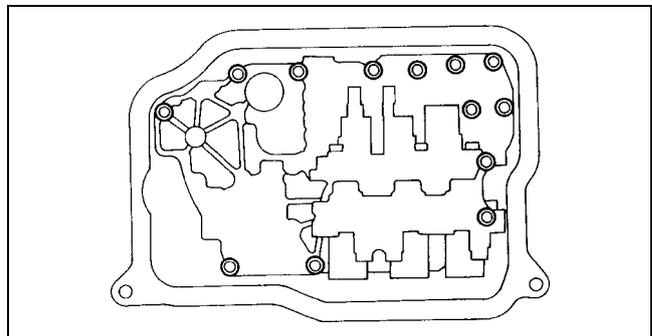


A6E5714A008

18. Remove the bolts as shown in the figure.

Note

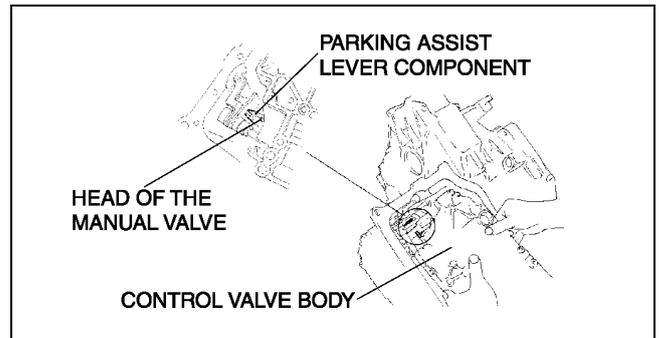
- Remove the control valve body by removing the head of the manual valve from the port of the parking assist lever component.



X3U517AA8

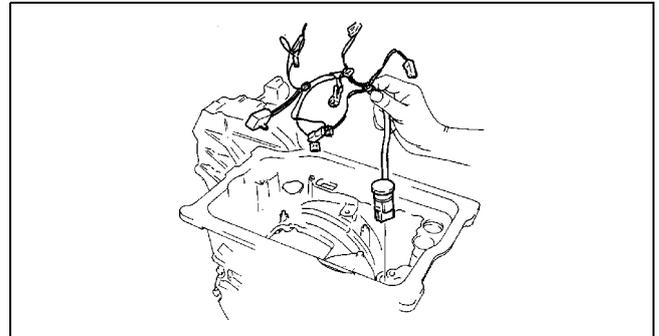
AUTOMATIC TRANSAXLE

19. Remove the control valve body.



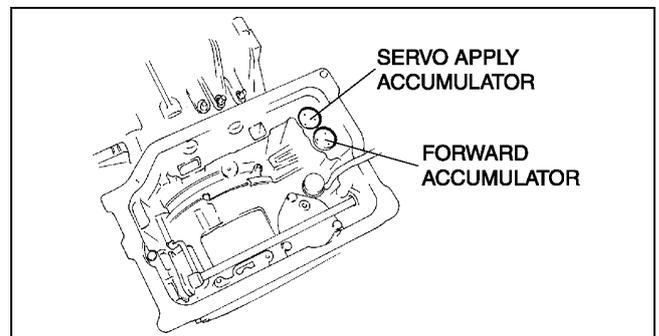
A6E5714A009

20. Remove the coupler component.



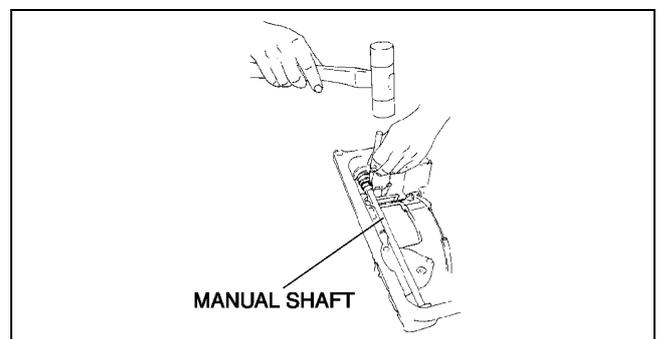
X3U517AAA

21. Remove the accumulator component.
22. Remove the manual shaft.



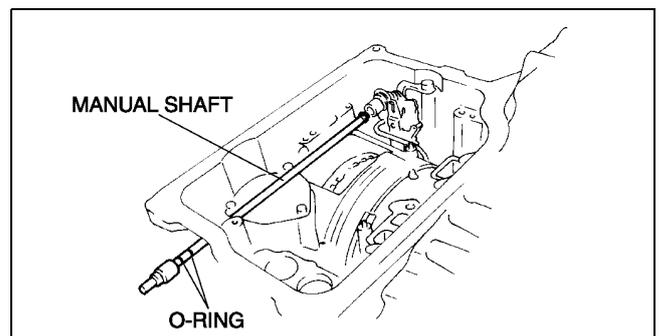
A6E5714A010

(1) Remove the roll pin using a pin punch.
(2) Remove the manual shaft.



A6E5714A011

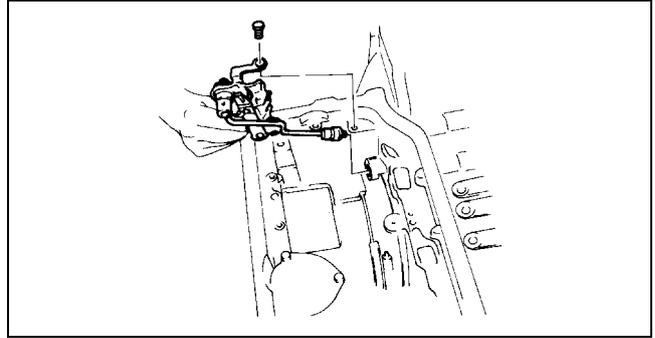
(3) Remove the O-ring from the manual shaft.



A6E5714A012

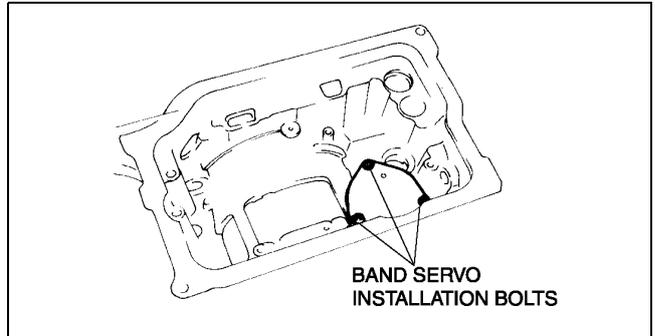
AUTOMATIC TRANSAXLE

23. Remove the parking rod lever component.



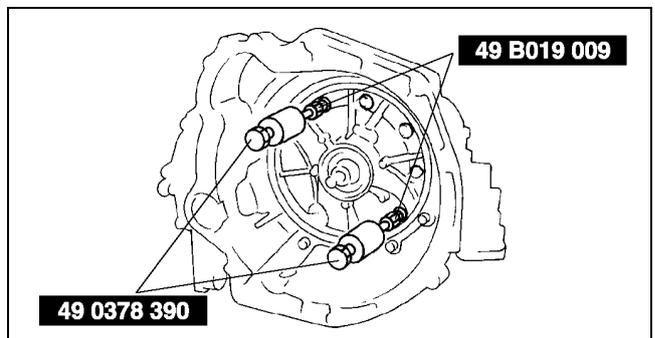
X3U517AAE

24. Remove the band servo component.



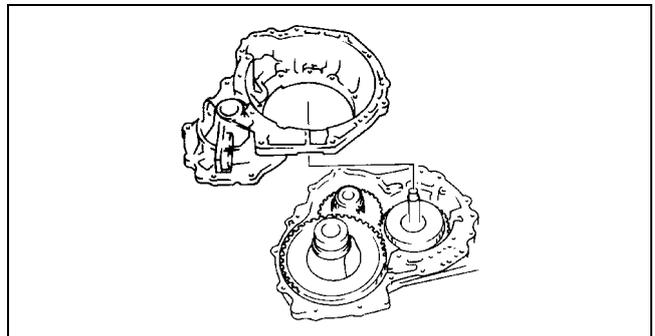
A6E5714A013

25. Remove the oil pump using the **SST**.



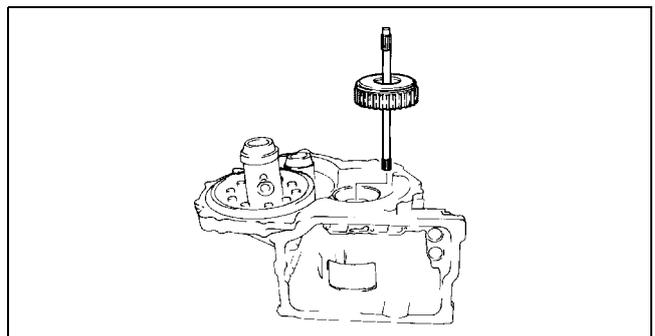
A6E5714A014

26. Remove the converter housing by tapping lightly with a plastic hammer.



X3U517AAH

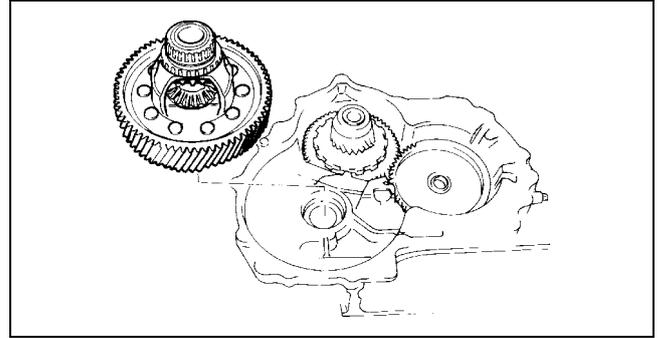
27. Remove the forward clutch component.



X3U517AAJ

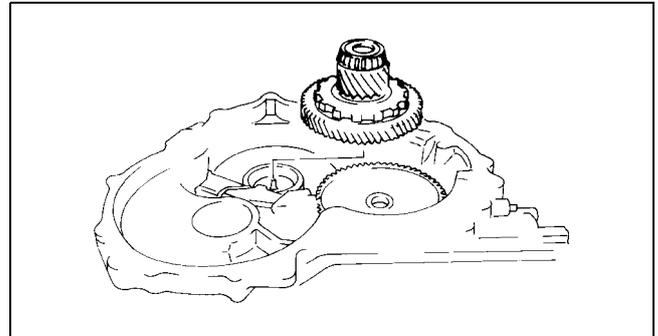
AUTOMATIC TRANSAXLE

28. Remove the differential.



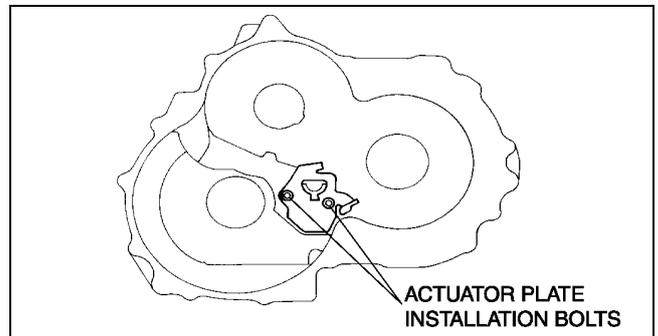
X3U517AAK

29. Remove the secondary gear and output gear.



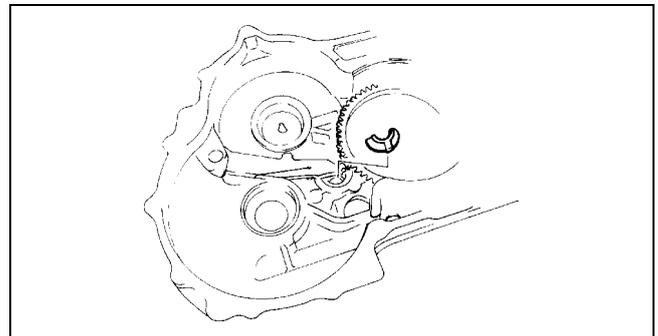
X3U517AAL

30. Remove the actuator plate.



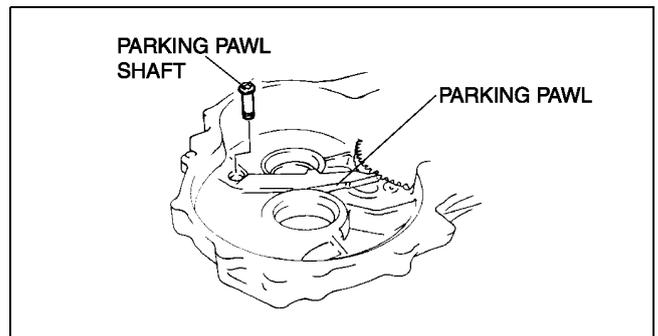
A6E5714A015

31. Remove the support actuator.



X3U517AAN

32. Pull out the parking pawl shaft.
33. Remove the parking pawl.

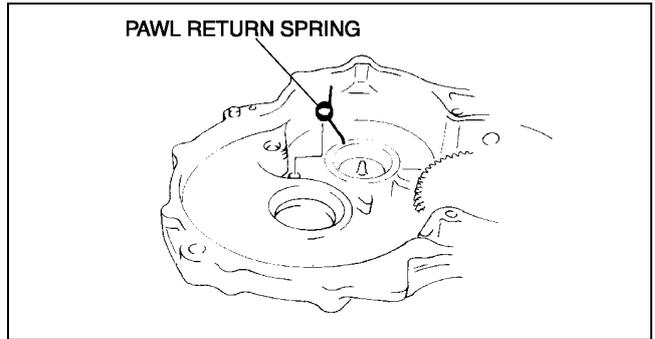


A6E5714A016

K1

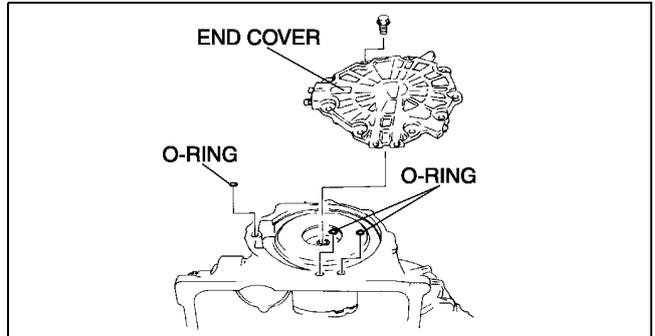
AUTOMATIC TRANSAXLE

34. Remove the pawl return spring.
35. Remove the end cover.



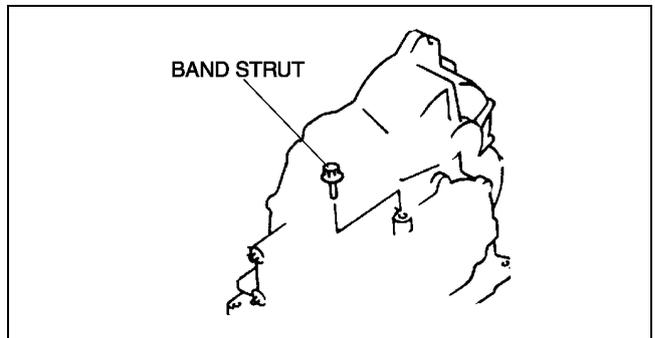
A6E5714A017

36. Remove the O-ring from the transaxle case.



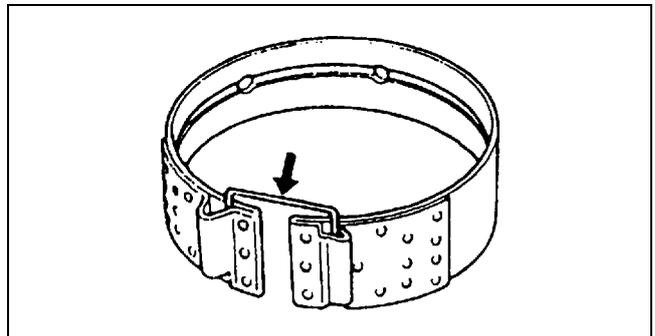
A6E5714A018

37. Remove the band strut.



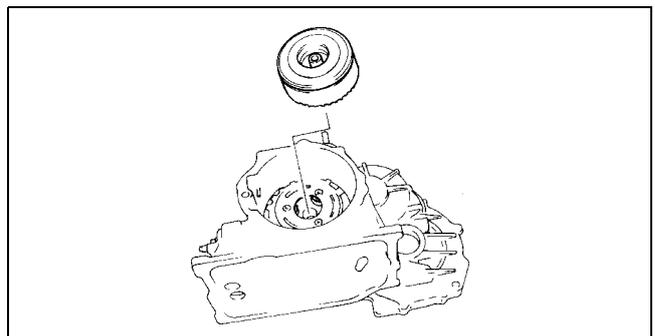
A6E5714A019

38. Remove the 2-4 brake band, and hold it together using a piece of wire as shown in the figure.



X3U517AAT

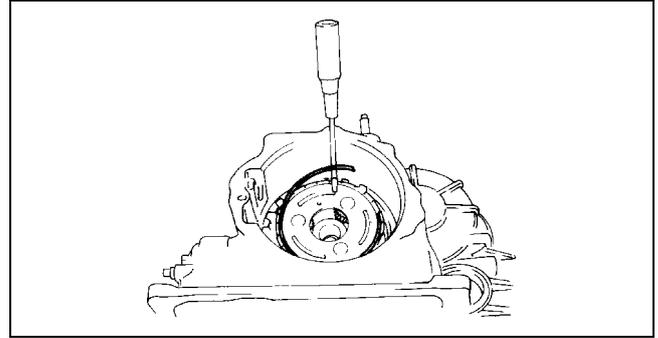
39. Remove the clutch component.



X3U517AAU

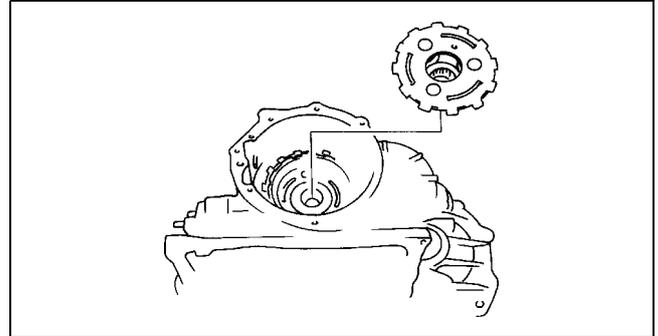
AUTOMATIC TRANSAXLE

40. Remove the snap ring.



X3U517AAV

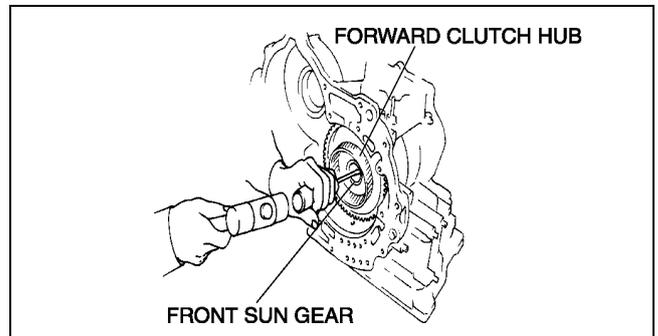
41. Remove the rear planetary gear component.



X3U517AAW

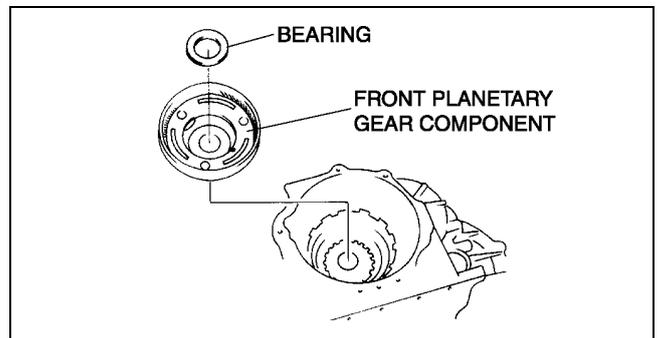
42. Remove the front sun gear by tapping its end with a flathead screwdriver, etc. as shown in the figure.

43. Remove the forward clutch hub.



A6E5714A020

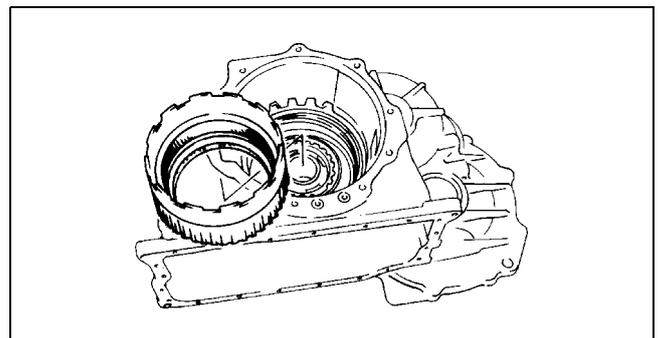
44. Remove the front planetary gear component.



A6E5714A021

45. Remove the front internal gear and one-way clutch component.

46. Remove the locknut.

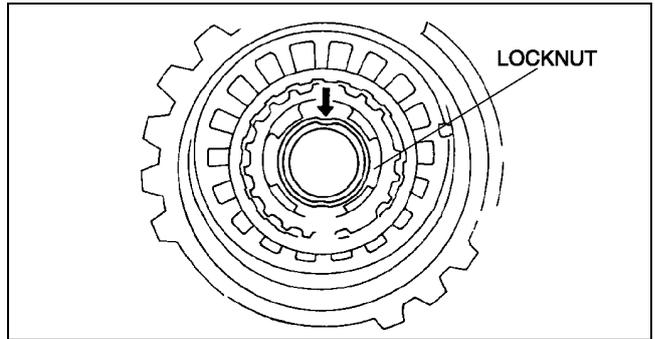


X3U517AAZ

K1

AUTOMATIC TRANSAXLE

- (1) Knock the crimped portion of the locknut outward by using a small chisel and a hammer.

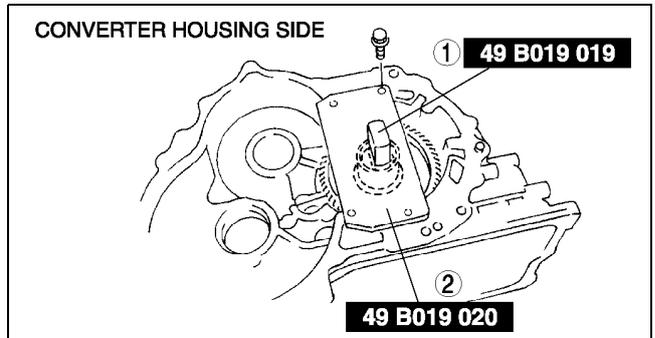


A6E5714A022

- (2) Install the **SST** to the primary gear in the order shown.

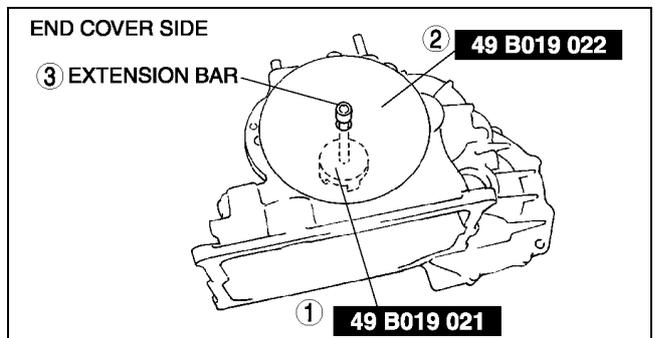
Tightening torque

19—25 N·m {1.9—2.6 kgf·m, 14—18 ft·lbf}



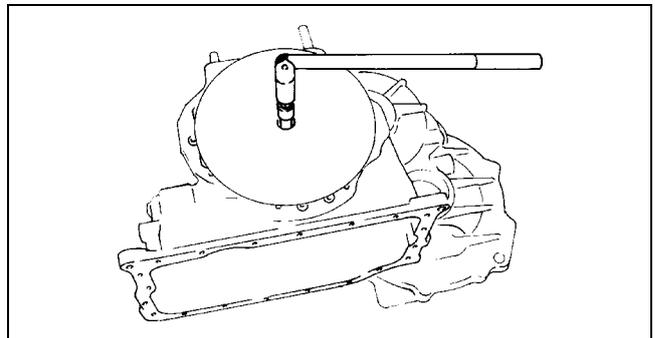
A6E5714A023

- (3) Install the **SST** to the locknut in the order shown.



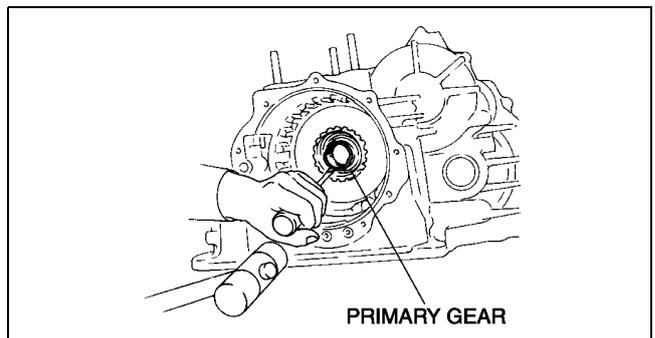
A6E5714A024

- (4) Remove the locknut.



X3U517AB3

47. Remove the primary gear by tapping it with a flathead screwdriver, etc. as shown in the figure.



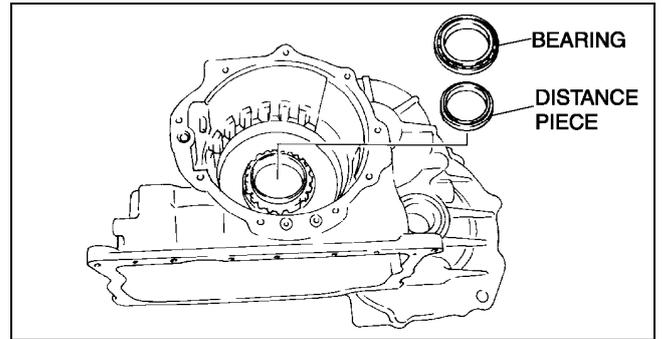
A6E5714A025

AUTOMATIC TRANSAXLE

48. Remove the bearing and distance piece.

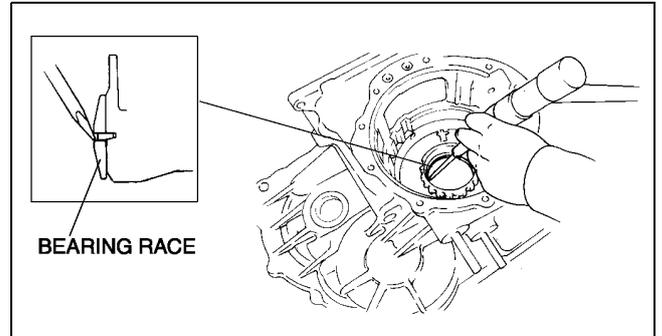
Caution

- Removing the bearing race using a flathead screwdriver can damage the inside of the bearing race. Handle the flathead screwdriver carefully.



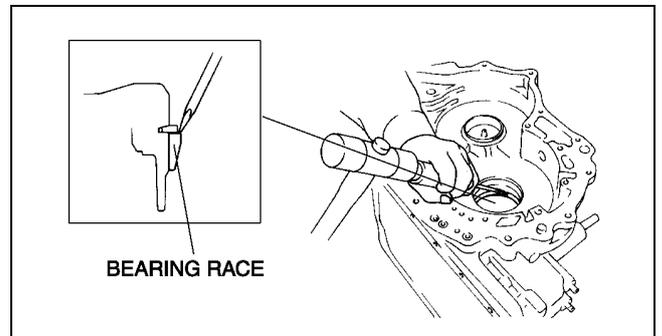
A6E5714A026

49. Remove the bearing race indicated in the figure from the end cover side using a flathead screwdriver, etc.



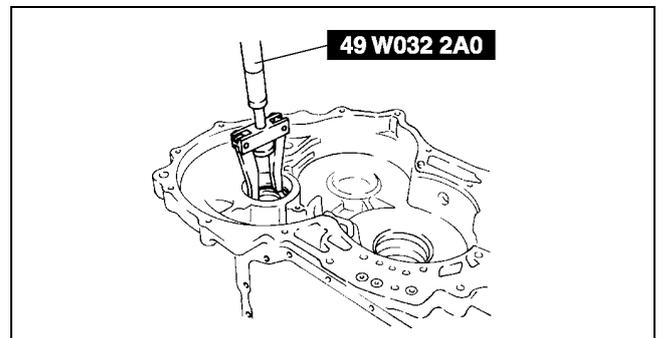
A6E5714A027

50. Remove the bearing race indicated in the figure from the converter housing side using a flathead screwdriver, etc.



A6E5714A028

51. Remove the bearing race using the **SST** as shown in the figure.



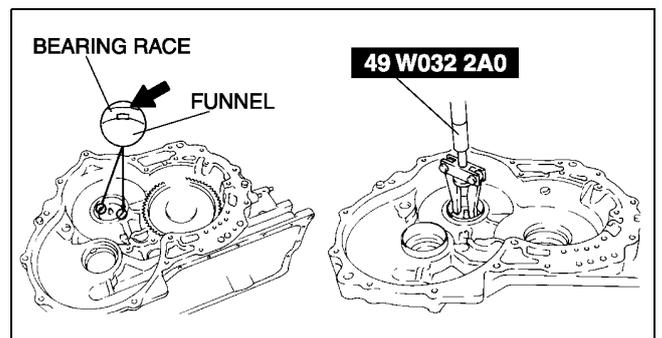
A6E5714A029

52. Tap the funnel at the areas indicated in the figure using a flathead screwdriver, etc. to make gaps big enough to installing the **SST**. Then remove the bearing race.

53. Remove the funnel

Caution

- Removing the oil pipe using a flathead screwdriver can damage the oil pipe. Handle the flathead screwdriver carefully.

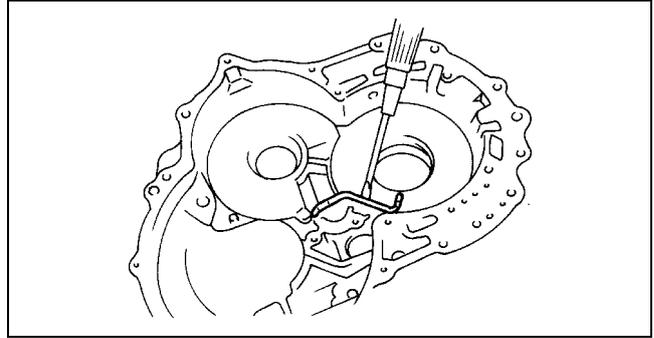


A6E5714A030

K1

AUTOMATIC TRANSAXLE

54. Remove the oil pipe.



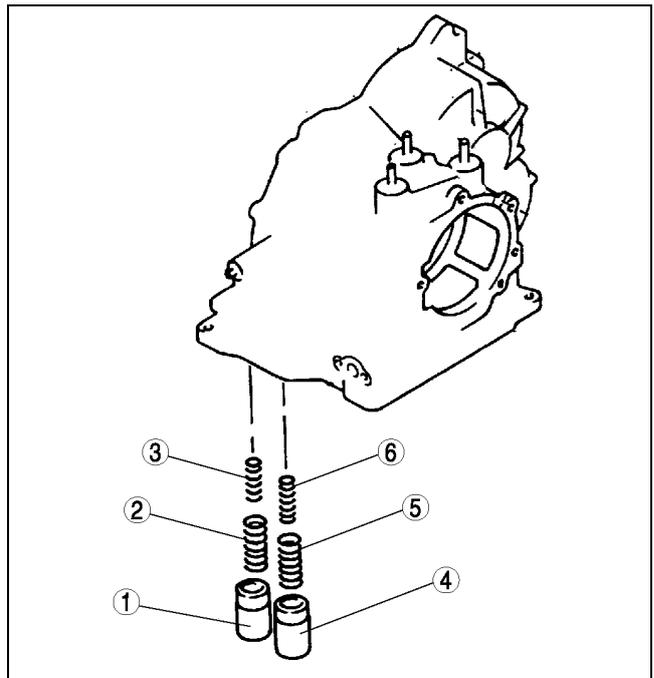
X3U517ABB

ACCUMULATORS DISASSEMBLY/ASSEMBLY

A6E561419200A01

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

1	Servo apply accumulator
2	Servo apply accumulator large spring
3	Servo apply accumulator small spring
4	Forward accumulator
5	Forward accumulator large spring
6	Forward accumulator small spring



A6E5714A032

Assembly Procedure

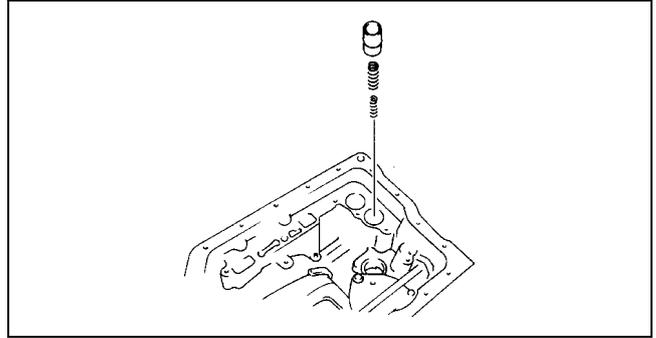
1. Measure the spring free length.

Spring	Outer diameter mm {in}	Free length mm {in}	No. of coils	Wire diameter mm {in}
Servo apply accumulator large spring	21.0 {0.827}	67.8 {2.669}	10.3	3.5 {0.138}
Servo apply accumulator small spring	13.0 {0.512}	67.8 {2.669}	17.1	2.2 {0.087}
Forward accumulator large spring	21.0 {0.827}	75.0 {2.953}	10.7	2.3 {0.091}
Forward accumulator small spring	15.6 {0.614}	49.0 {1.929}	7.7	2.4 {0.094}

2. If not as specified, replace the spring.

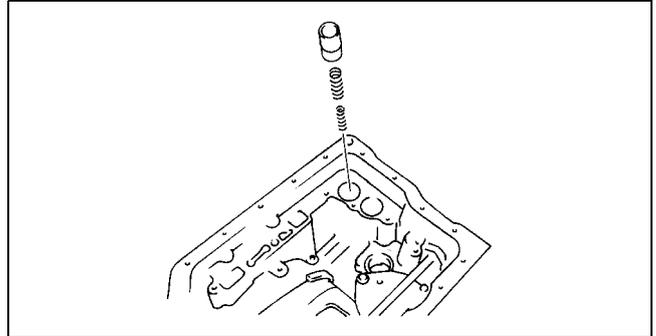
AUTOMATIC TRANSAXLE

3. Install the forward accumulator small spring, forward accumulator large spring and forward accumulator.



X3U517ABD

4. Install the servo apply accumulator small spring, servo apply accumulator large spring and servo apply accumulator.



X3U517ABE

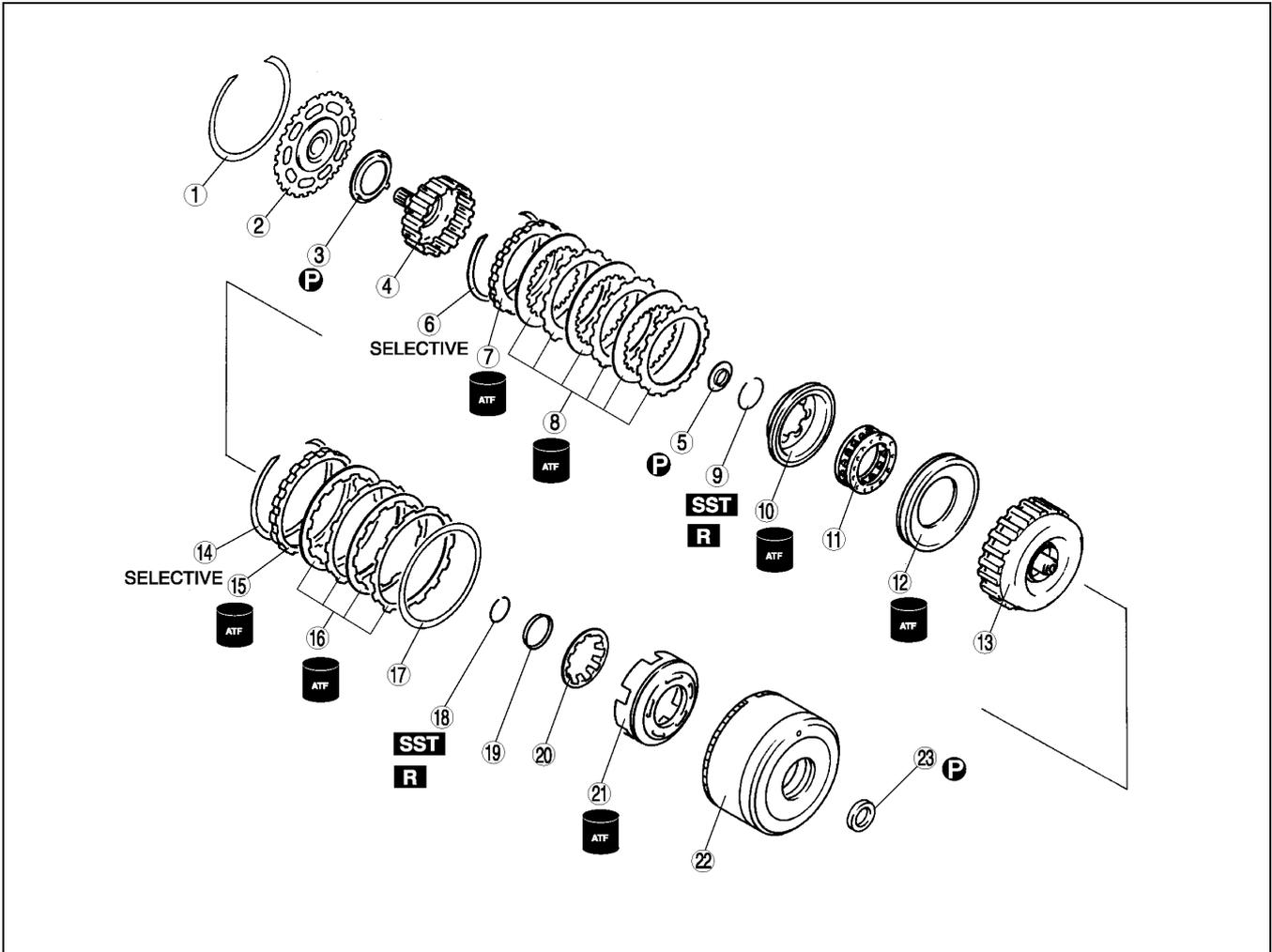
K1

AUTOMATIC TRANSAXLE

CLUTCH COMPONENT DISASSEMBLY/ASSEMBLY

A6E561419500A01

1. Carry out the preinspection before disassembly. (See [K1-50 Clutch Component Preinspection.](#))
2. Disassemble in the order indicated in the table.
3. Assemble in the reverse order of disassembly.



A6E5714A033

1	Snap ring
2	Rear sun gear plate
3	Bearing
4	3-4 clutch hub
5	Bearing
6	Snap ring
7	Retaining plate
8	Drive and driven plate
9	Snap ring (See K1-19 Snap Ring (3-4 clutch) Disassembly Note)
10	Seal plate
11	Spring and retainer component
12	3-4 clutch piston (See K1-19 3-4 Clutch Piston Disassembly Note)

13	3-4 clutch drum
14	Snap ring
15	Retaining plate
16	Drive and driven plate
17	Dish plate
18	Snap ring (See K1-19 Snap Ring (Reverse clutch) Disassembly Note)
19	Reverse return stopper
20	Piston return spring
21	Reverse piston (See K1-20 Reverse Piston Disassembly Note)
22	2-4 brake drum
23	Bearing

AUTOMATIC TRANSAXLE

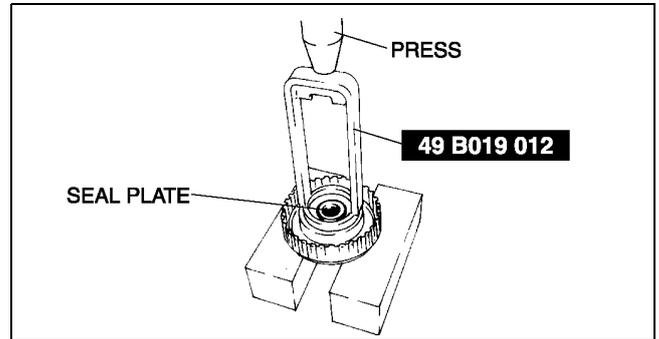
Snap Ring (3-4 clutch) Disassembly Note

1. Install the **SST** as shown.

Caution

- Depress the seal plate only enough to remove the snap ring. Overpressing will damage the seal plate assembly edges.

2. Compress the seal plate.
3. Remove the snap ring.
4. Remove the **SST**, then remove the seal plate and spring and retainer component.



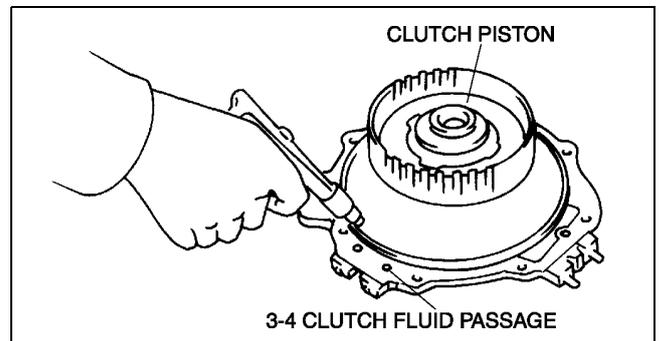
A6E5714A034

3-4 Clutch Piston Disassembly Note

1. Set the 3-4 clutch drum onto the end cover.
2. Remove the 3-4 clutch piston from the 3-4 clutch drum by applying compressed air through the fluid passage.

Air pressure

392 kPa {4.0 kgf/cm², 57 psi} max.



A6E5714A035

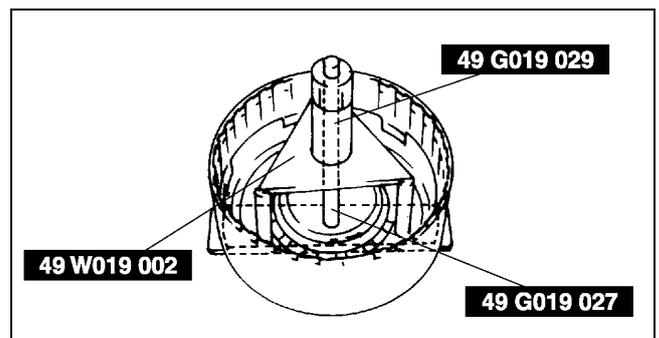
Snap Ring (Reverse clutch) Disassembly Note

1. Install the **SSTs** as shown.

Caution

- Depress the piston return spring only enough to remove the snap ring. Overpressing will damage the piston return spring assembly edges.

2. Compress the piston return spring.
3. Remove the snap ring.
4. Remove the **SSTs**, then remove the reverse return stopper and return spring.



A6E5714A036

K1

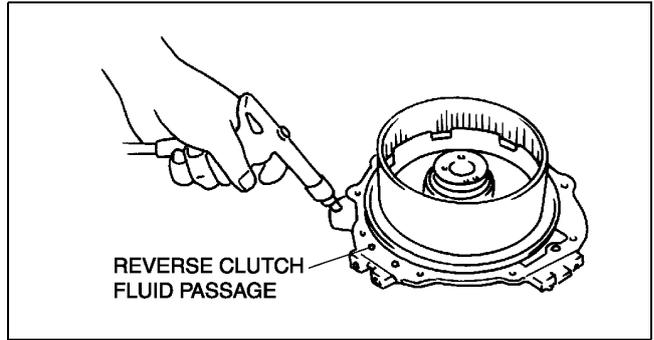
AUTOMATIC TRANSAXLE

Reverse Piston Disassembly Note

1. Set the 2-4 brake drum onto the end cover.
2. Remove the reverse piston from the 2-4 brake drum by applying compressed air through the fluid passage.

Air pressure

392 kPa {4.0 kgf/cm², 57 psi} max.



A6E5714A037

Assembly Procedure

1. Measure the facing thickness in three places and calculate the average value.

Drive plate part number: FN11 19 370

Standard: 1.60 mm {0.063 in}

Minimum: 1.45 mm {0.057 in}

Drive plate part number: FNE1 19 370

Standard: 2.55 mm {0.100 in}

Minimum: 2.40 mm {0.094 in}

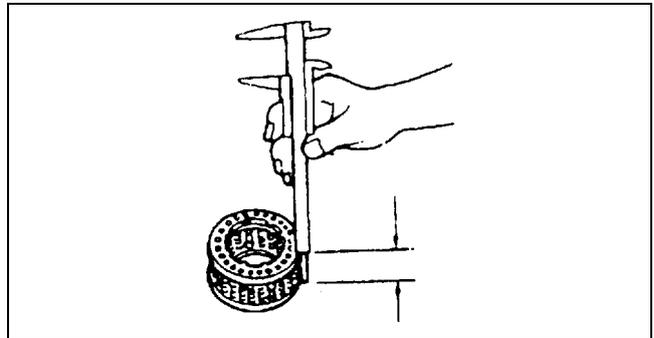
2. If not within the specification, replace the drive plates.
3. Measure the free length of the spring and inspect for deformation.

Spring free length

Standard: 17.0 mm {0.669 in}

Minimum: 15.0 mm {0.591 in}

4. If not within the specification, replace the spring and retainer.



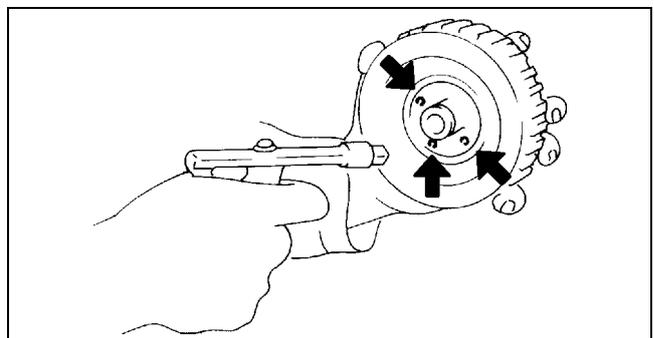
X3U517AC8

5. Verify that there is airflow when applying compressed air through the fluid passage of 3-4 clutch drum.

Air pressure

392 kPa {4.0 kgf/cm², 57 psi} max.

6. Replace the 3-4 clutch drum if damaged or malfunctioning.



X3U517AC9

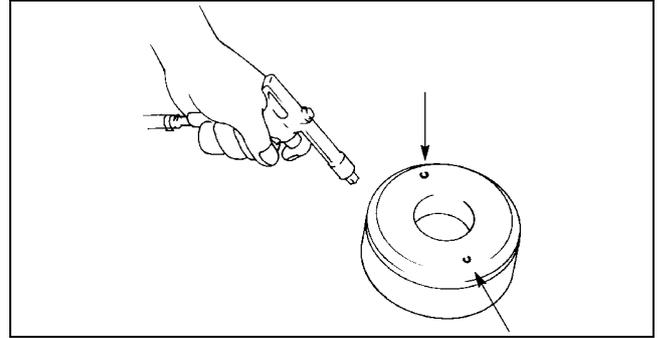
AUTOMATIC TRANSAXLE

7. Verify that there is airflow when applying compressed air through the fluid passage of 2-4 brake drum.

Air pressure

392 kPa {4.0 kgf/cm², 57 psi} max.

8. Replace the 2-4 brake drum if damaged or malfunctioning.



X3U517ACA

9. Measure the bushing of the rear sun gear.

Bushing inner diameter

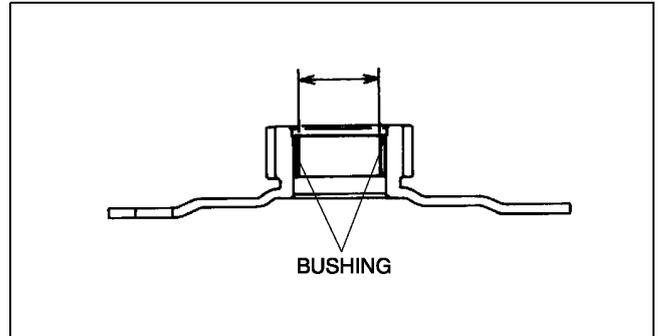
Standard:

26.400—26.421 mm {1.03937—1.04019 in}

Maximum: 26.441 mm {1.04098 in}

10. If not as specified, replace the rear sun gear plate.

11. Install the reverse clutch.

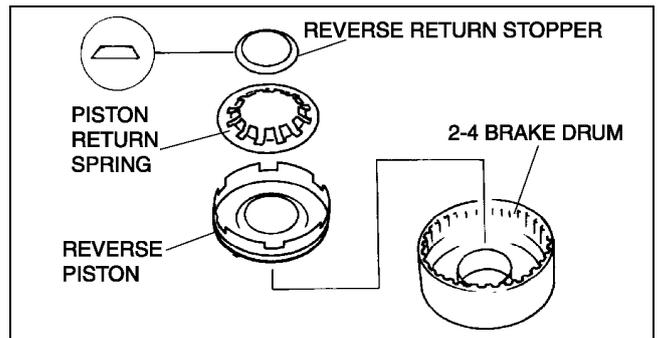


A6E5714A038

Caution

- **Installing the reverse clutch piston may damage its seal. Carefully install the reverse clutch piston by pushing evenly around the circumference.**

- (1) Apply ATF to the circumference of the reverse clutch piston seal, and install the piston into the 2-4 brake drum.
- (2) Install the piston return spring and reverse return stopper to the reverse piston.



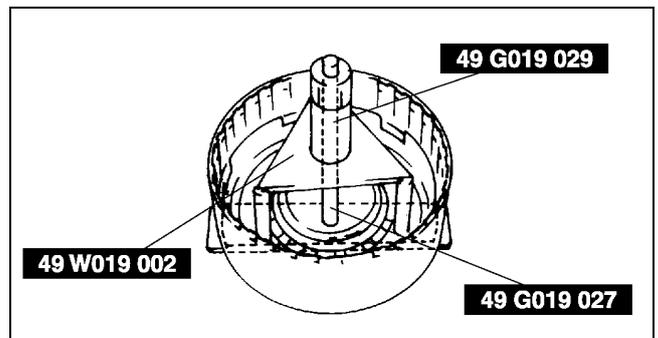
A6E5714A039

- (3) Install the snap ring and the **SSTs** to the 2-4 brake drum as shown.

Caution

- **Depress the piston return spring only enough to install the snap ring. Overpressing will damage the piston return spring assembly edges.**

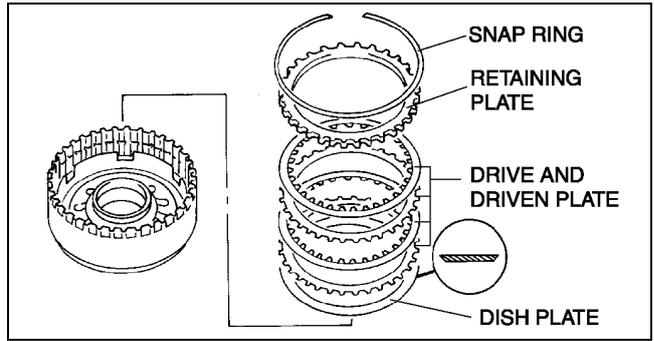
- (4) Compress the piston return spring.
- (5) Install the snap ring.
- (6) Remove the **SSTs**.
- (7) Install the dish plate.
- (8) Install the drive and driven plates in the following order.
Driven-Drive-Driven-Drive



A6E5714A036

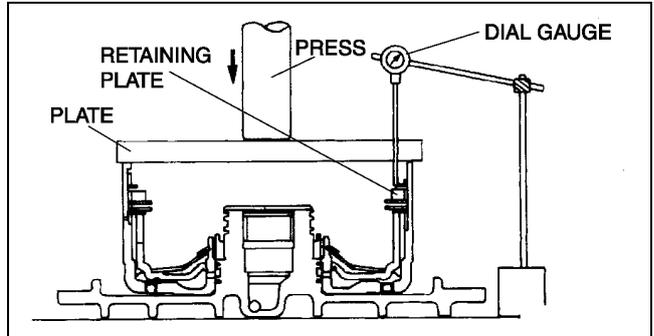
AUTOMATIC TRANSAXLE

- (9) Install the retaining plate.
12. Measure the reverse clutch clearance.
- (1) Install the reverse clutch into the end cover, and set the dial gauge.



A6E5714A040

- (2) Secure the reverse clutch by lightly pressing down with a press, etc.



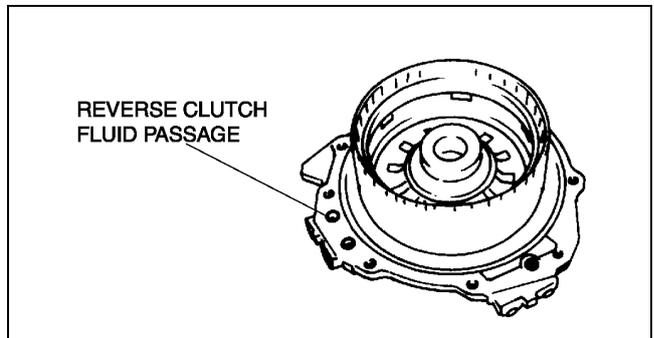
A6E5714A041

- (3) Apply compressed air to the part indicated in the figure and let the reverse clutch piston stroke three times.

Air pressure

392—441 kPa {4.0—4.5 kgf/cm², 57—63 psi}

- (4) Apply compressed air and operate the reverse clutch piston. Read the value when the indicator of the dial gauge stops.
- (5) Release the compressed air and read the dial gauge when the reverse clutch piston is not operating.
- (6) Calculate the reverse clutch clearance according to the following formula:
step (4) value – step (5) value = Reverse clutch clearance.
- (7) Measure the clearances at four locations (90° apart) by following the steps from (3) to (6). Verify that the average value is within the specification below.

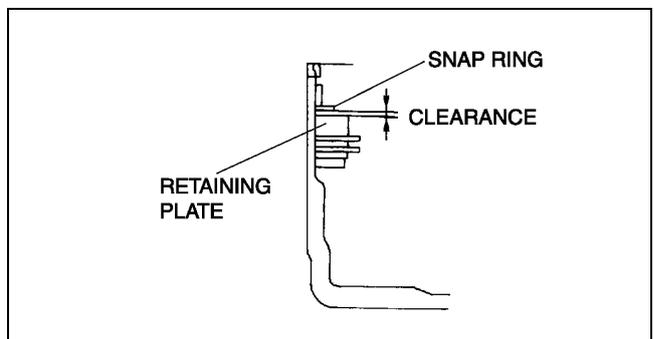


A6E5714A042

Reverse clutch clearance

1.00—1.03 mm {0.039—0.051 in}

- (8) If not as specified, remove the snap ring and measure its thickness.
- (9) Add the thickness to the average value calculated in step (7), and select the snap ring whose range includes the value.



A6E5714A043

Snap ring sizes

Range mm {in}	Snap ring sizes mm {in}
2.250—2.450 {0.089—0.096}	1.2 {0.047}
2.450—2.650 {0.096—0.104}	1.4 {0.055}
2.650—2.850 {0.104—0.112}	1.6 {0.063}
2.850—3.050 {0.112—0.120}	1.8 {0.071}
3.050—3.250 {0.120—0.128}	2.0 {0.079}
3.250—3.450 {0.128—0.136}	2.2 {0.087}

AUTOMATIC TRANSAXLE

(10) Install the selected snap ring and perform steps (2) to (7) again. Verify that the calculated value satisfies the clearance specification.

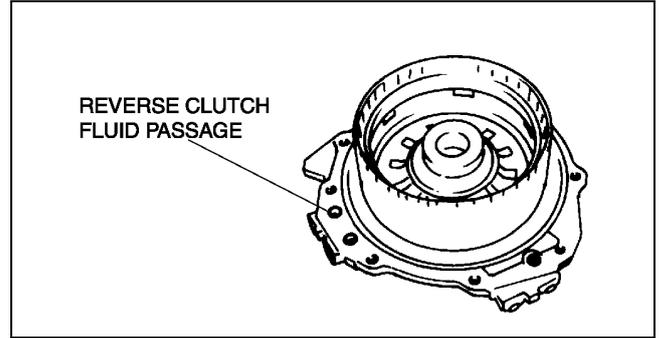
13. Inspect the reverse clutch operation.
- (1) Install the 2-4 brake drum to the end cover.
 - (2) Inspect the reverse clutch operation by applying compressed air as shown.

Air pressure
392—441 kPa {4.0—4.5 kgf/cm², 57—63 psi}

14. Install the 3-4 clutch.

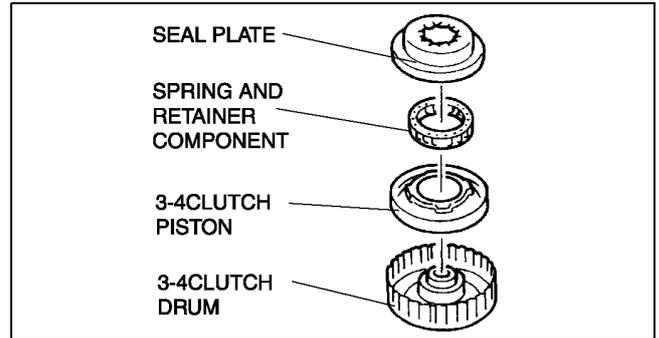
Caution

- **Installing the 3-4 clutch piston may damage its seal. Carefully install the 3-4 clutch piston by pushing evenly around the circumference.**



K1

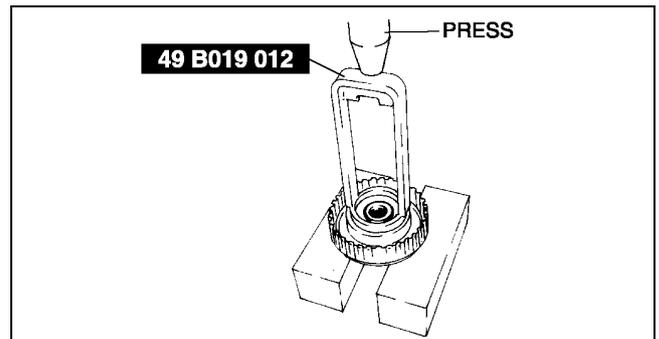
- (1) Apply ATF to the circumference of the 3-4 clutch piston seal, and install the piston in to the 3-4 clutch drum.
- (2) Install the spring and retainer.
- (3) Apply ATF to the 3-4 seal plate, and install it onto the 3-4 clutch drum.



- (4) Install the **SST** as shown.

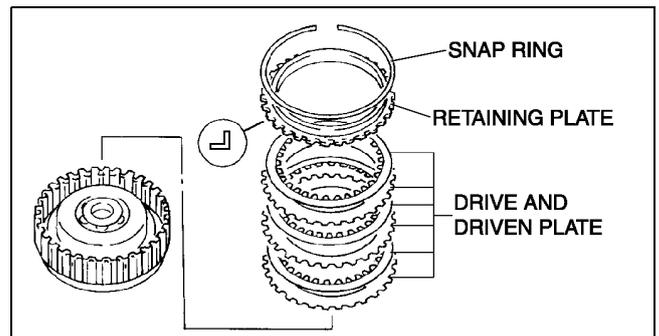
Caution

- **Depress the 3-4 seal plate only enough to install the snap ring. Overpressing will damage the 3-4 seal plate assembly edges.**



- (5) Compress the spring and retainer component and 3-4 seal plate.
- (6) Install the snap ring.
- (7) Remove the **SST**.
- (8) Install the drive and driven plates in the following order.
 Driven-Drive-Driven-Drive-Driven-Drive
- (9) Install the retaining plate.

DRIVE PLATE PART NUMBER:FN11 19 370

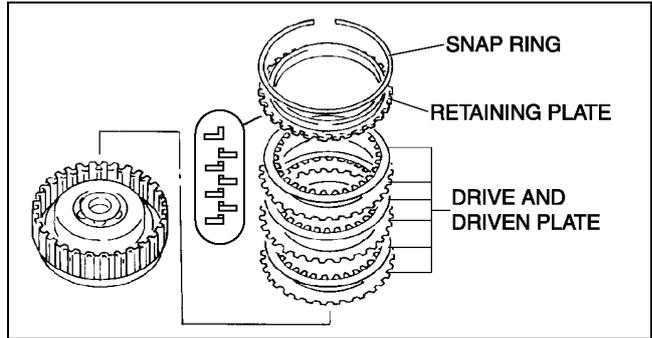


AUTOMATIC TRANSAXLE

DRIVE PLATE PART NUMBER:FNE1 19 370

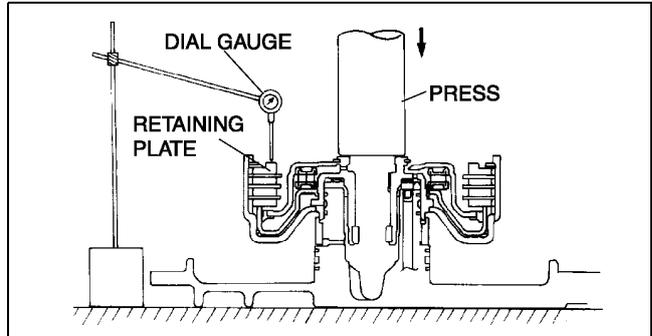
15. Measure the 3-4 clutch clearance.

- (1) Install the 3-4 clutch in the end cover, and set the dial gauge.



A6E5714A108

- (2) Secure the 3-4 clutch by lightly pressing down with a press, etc.



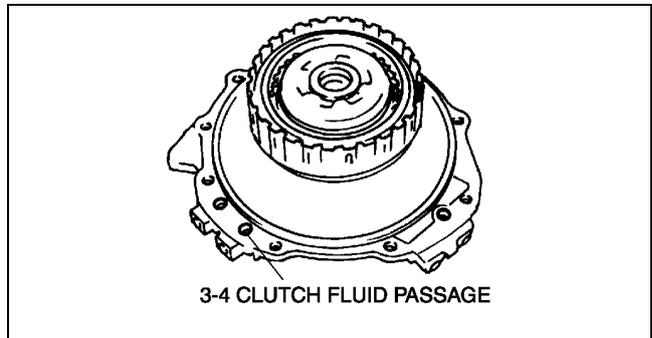
A6E5714A047

- (3) Apply compressed air to the part indicated in the figure and let the 3-4 clutch piston stroke three times.

Air pressure

392—441 kPa {4.0—4.5 kgf/cm², 57—63 psi}

- (4) Apply compressed air and operate the 3-4 clutch piston. Read the value when the indicator of the dial gauge stops.
- (5) Release the compressed air and read the dial gauge when the 3-4 clutch piston is not operating.
- (6) Calculate the 3-4 clutch clearance according to the following formula:
step (4) value – step (5) value = 3-4 clutch clearance.
- (7) Measure the clearances at four locations (90° apart) by following the steps from (3) to (6). Verify that the average value is within the specification below.



A6E5714A048

3-4 clutch clearance

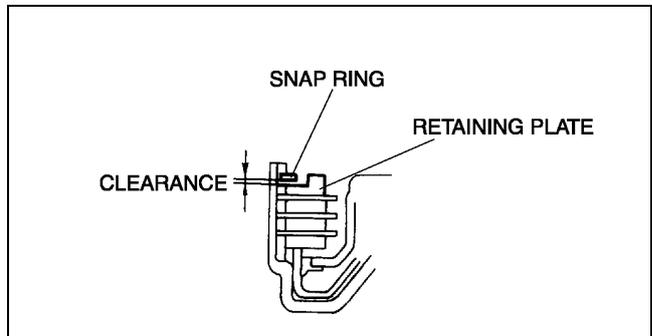
Drive plate part number : FN11 19 370

1.00—1.30 mm {0.039—0.051 in}

Drive plate part number : FNE1 19 370

1.10—1.40 mm {0.043—0.055 in}

- (8) If not as specified, remove the snap ring and measure its thickness.
- (9) Add the thickness to the average value calculated in step (7), and select the snap ring whose range includes the value.



A6E5714A049

AUTOMATIC TRANSAXLE

Snap ring sizes

Range mm {in}		Snap ring sizes mm {in}
Drive plate part number:FN11 19 370	Drive plate part number:FNE1 19 370	
2.250—2.450 {0.089—0.096}	2.350—2.550 {0.093—0.100}	1.2 {0.047}
2.450—2.650 {0.096—0.104}	2.550—2.750 {0.100—0.108}	1.4 {0.055}
2.650—2.850 {0.104—0.112}	2.750—2.950 {0.108—0.116}	1.6 {0.063}
2.850—3.050 {0.112—0.120}	2.950—3.150 {0.116—0.124}	1.8 {0.071}
3.050—3.250 {0.120—0.128}	3.150—3.350 {0.124—0.132}	2.0 {0.079}
3.250—3.450 {0.128—0.136}	3.350—3.550 {0.132—0.140}	2.2 {0.087}

(10) Install the selected snap ring and perform steps (2) to (7) again. Verify that the calculated value satisfies the clearance specification.

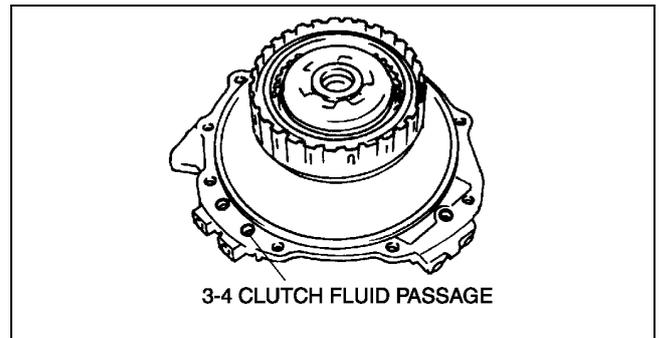
16. Inspect the 3-4 clutch operation.

- (1) Install the 3-4 clutch drum to the end cover.
- (2) Inspect the 3-4 clutch operation by applying compressed air as shown.

Air pressure

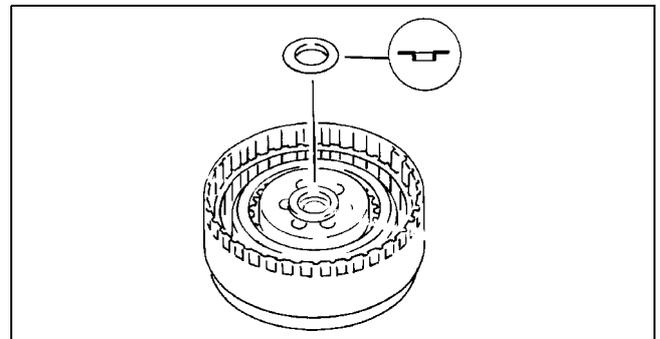
392—441 kPa {4.0—4.5 kgf/cm², 57—63 psi}

17. Install the 3-4 clutch component to the 2-4 brake drum.



A6E5714A048

18. Apply petroleum jelly to the bearing, and secure it onto the 3-4 clutch component.



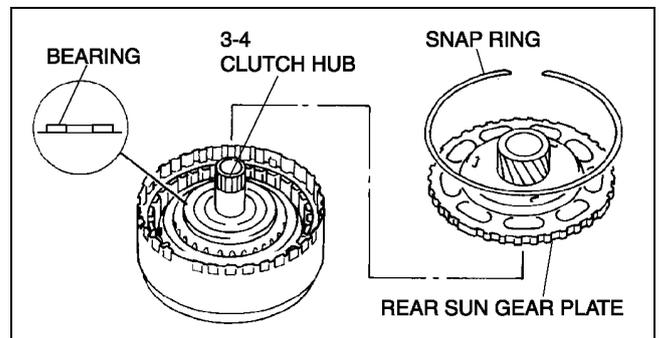
X3U517ACS

19. Install the 3-4 clutch hub.

20. Apply petroleum jelly to the bearing, and secure it onto the 3-4 clutch hub as shown in the figure.

21. Install the rear sun gear plate onto the 2-4 brake drum.

22. Install the snap ring.



A6E5714A050

AUTOMATIC TRANSAXLE

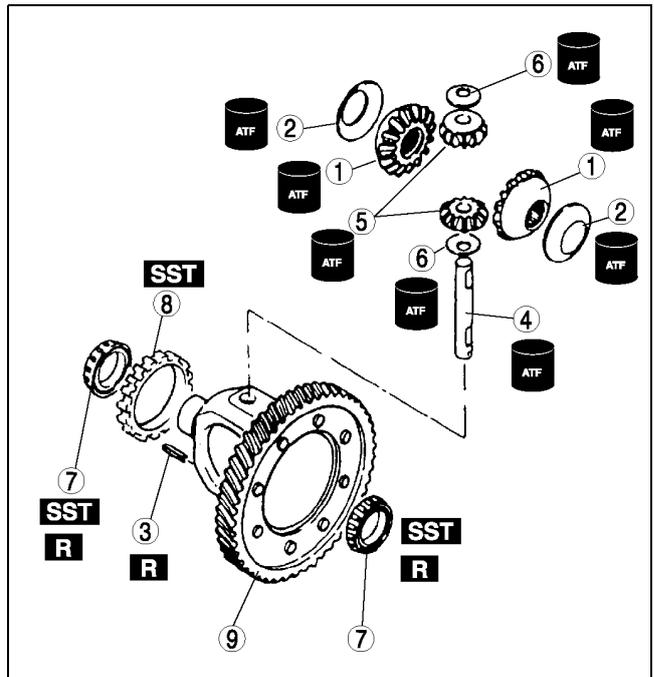
DIFFERENTIAL DISASSEMBLY/ASSEMBLY

A6E561427100A01

1. Carry out the preinspection before disassembly. (See [K1-54 Differential Preinspection](#).)
2. Disassemble in the order indicated in the table.
3. Assemble in the reverse order of disassembly.

RIVET FIXED TYPE

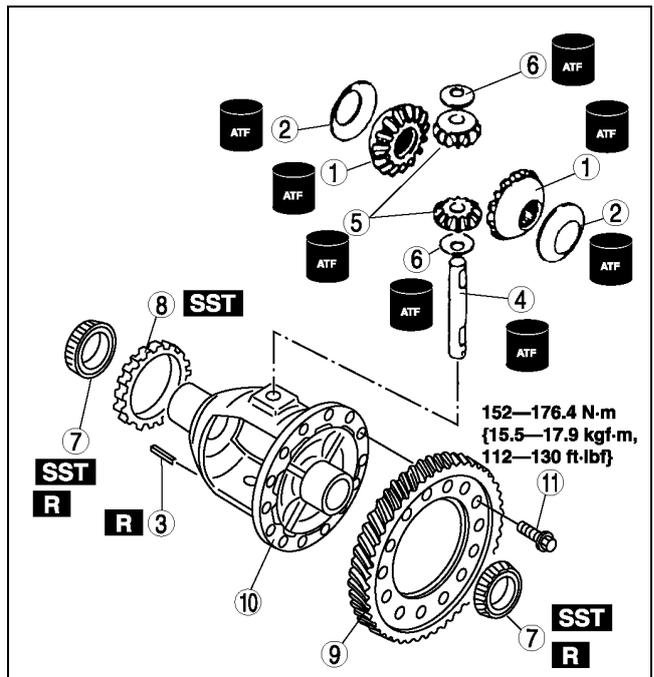
1	Side gear
2	Thrust washer
3	Roll pin (See K1-27 Roll Pin Disassembly Note)
4	Pinion shaft
5	Pinion gear
6	Thrust washer
7	Bearings (See K1-27 Bearings Disassembly Note)
8	Sensor rotor (See K1-27 Sensor Rotor Disassembly Note)
9	Ring gear and gear case



A6E5714A051

BOLT FIXED TYPE

1	Side gear
2	Thrust washer
3	Roll pin (See K1-27 Roll Pin Disassembly Note)
4	Pinion shaft
5	Pinion gear
6	Thrust washer
7	Bearings (See K1-27 Bearings Disassembly Note)
8	Sensor rotor (See K1-27 Sensor Rotor Disassembly Note)
9	Ring gear
10	Gear case
11	Bolt

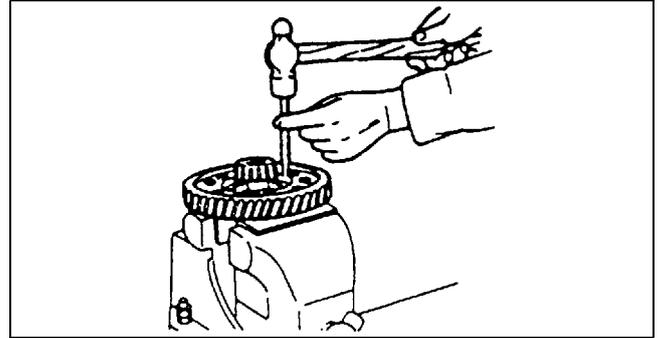


A6E5714A052

AUTOMATIC TRANSAXLE

Roll Pin Disassembly Note

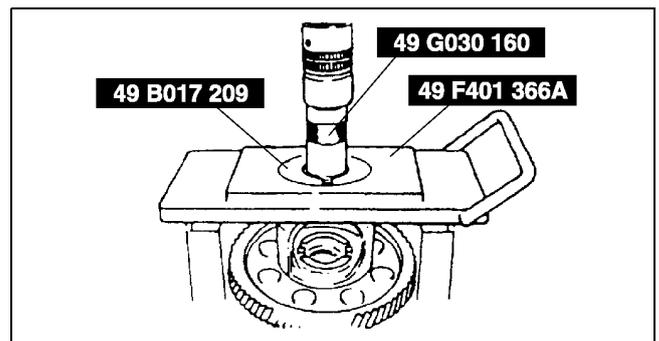
1. Place the gear case in a vise.
2. Insert a **2.0 mm {0.07 in}** punch into the roll pin hole from the ring gear side, and remove the roll pin.



X3U517AEQ

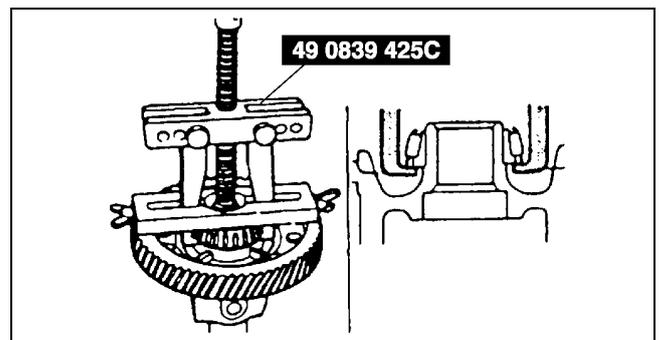
Bearings Disassembly Note

1. Remove the bearing (speedometer drive gear side) from the gear case using the **SSTs**.



A6E5714A053

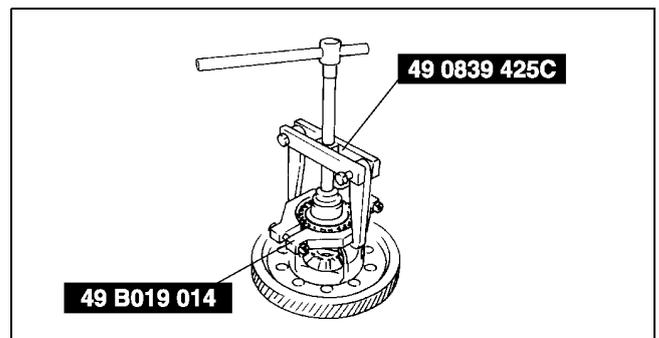
2. Remove the bearing (ring gear side) from the gear case using the **SST**.



A6E5714A054

Sensor Rotor Disassembly Note

- Remove the sensor rotor from the gear case using the **SSTs**.



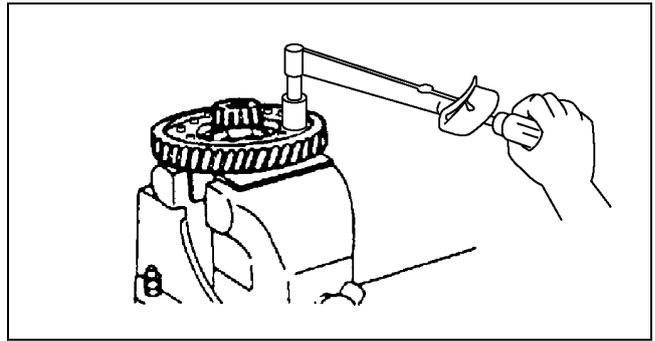
A6E5714A055

K1

AUTOMATIC TRANSAXLE

Assembly Procedure

1. Install the ring gear to the gear case. (bolt fixed type)



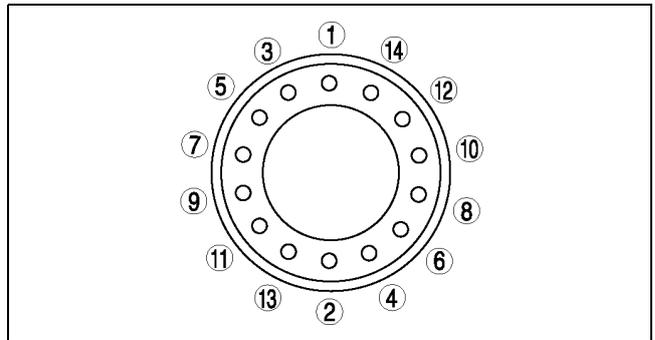
A6E5714A056

2. Tighten the bolts evenly and gradually in the order shown. (bolt fixed type)

Tightening torque

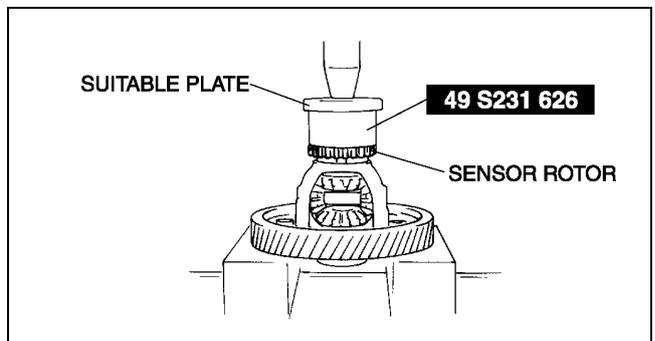
152—176.5 N·m

{15.5—17.9 kgf·m, 112—130 ft·lbf}



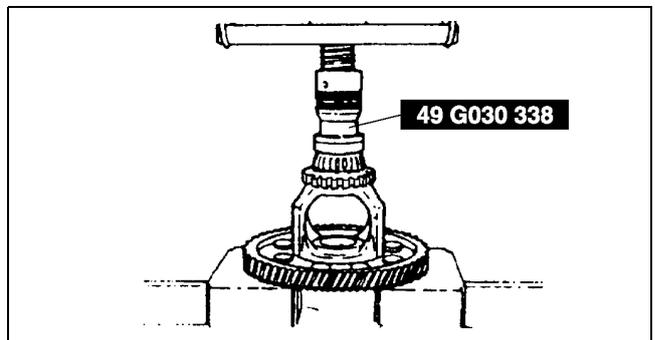
A6E5714A057

3. Install the sensor rotor to the gear case using the **SST** and suitable plate.
4. Install a new bearing.
 - (1) Press the new bearing (speedometer drive gear side) onto the gear case using the **SST**.



A6E5714A058

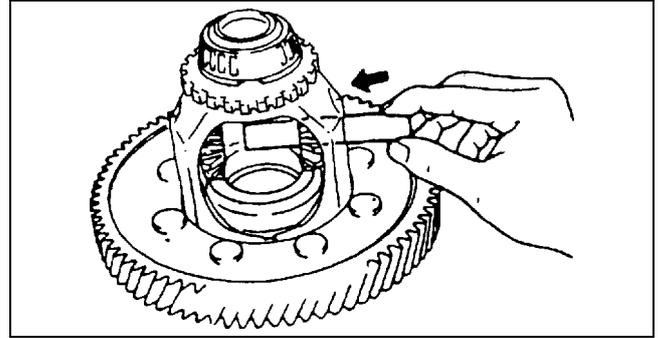
- (2) Press on the other new bearing (ring gear side) in the same manner.
5. Apply ATF to the thrust washers and pinion shaft.
6. Install the pinion gear and thrust washers into the gear case.



A6E5714A059

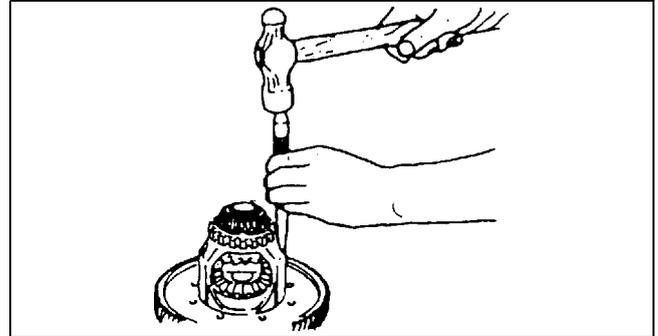
AUTOMATIC TRANSAXLE

7. Install the pinion shaft.



X3U517AEW

8. Install the roll pin, and crimp it to prevent it from coming out of the gear case.
9. Apply ATF to the thrust washers.
10. Install the thrust washers and side gears into the gear case, then turn the side gears and align them with the drive shaft holes.
11. Measure the backlash of the side gears as follows:
(1) Install the left and right drive shafts in the differential.
(2) Support the drive shafts on V-blocks.



X3U517AEX

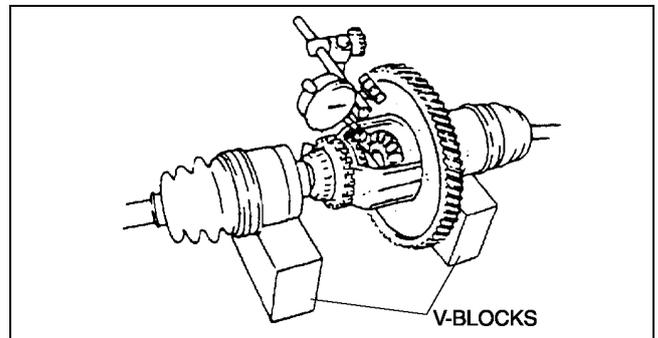
- (3) Measure the backlash of both side gears.

Backlash

Standard: 0.05—0.15 mm {0.002—0.005 in}

Maximum: 0.5 mm {0.020 in}

12. If the backlash is not within the specification, replace the differential.



A6E5714A060

AUTOMATIC TRANSAXLE ASSEMBLY

A6E561401030A02

Precaution

General notes

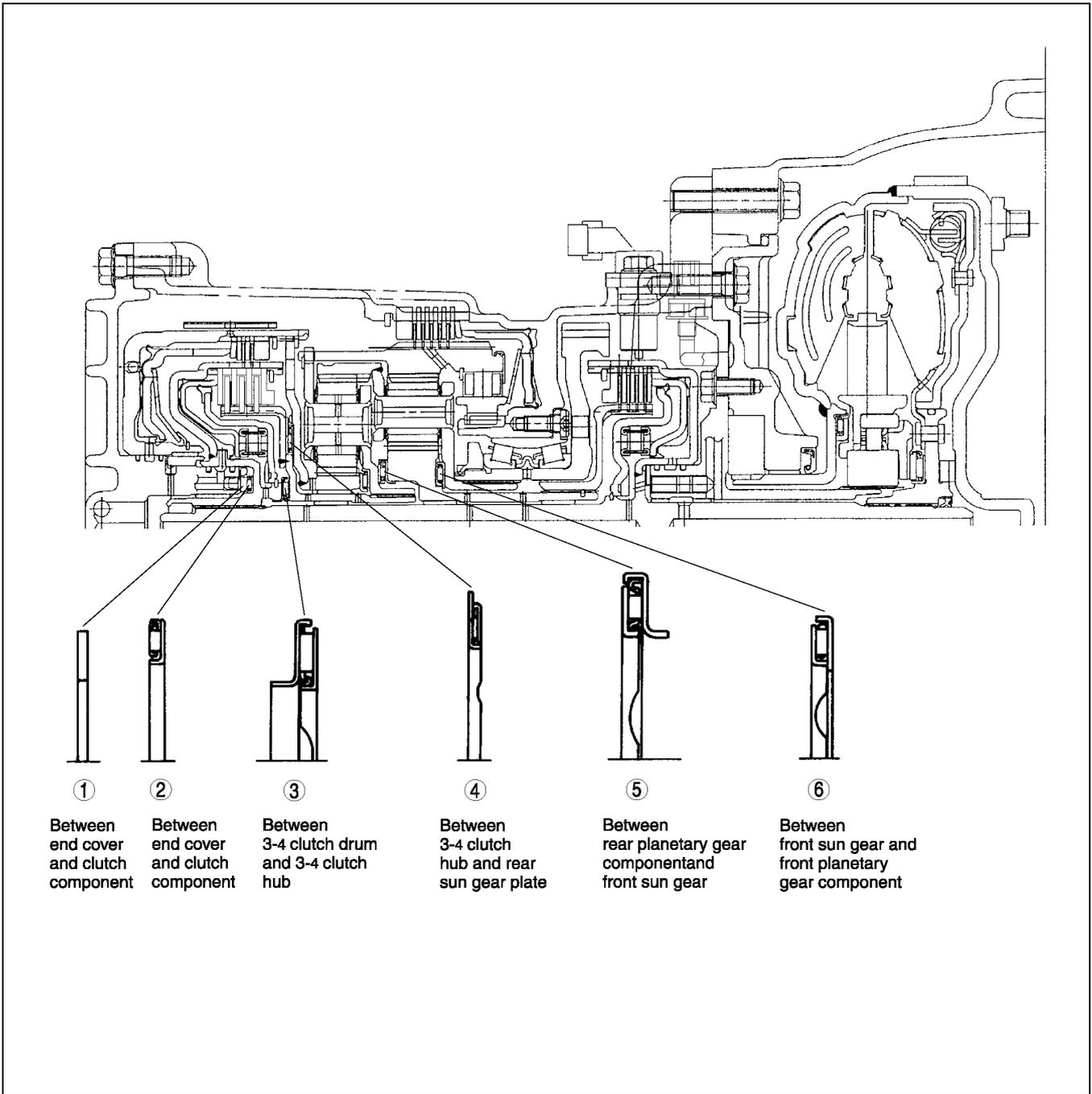
1. Select the adjustment shims, referring to **Bearing Preload**.
2. If the drive plates or 2-4 brake band are replaced with new ones, soak the new part in ATF for at least two hours before installation.
3. Before assembly, apply ATF to all seal rings, rotating parts, O-rings, and sliding parts.
4. All O-rings, seals, and gaskets must be replaced with the new ones included in the overhaul kit.
5. Use petroleum jelly, not grease, when assembling again.
6. When it is necessary to replace a bushing, replace the subassembly that includes that bushing.
7. Assemble the housing within 10 minutes after applying sealant, and allow it to cure for at least 30 minutes after assembly before filling the transaxle with ATF.

Warning

- Although the stand has a self-locking brake system, there is a possibility that the brake may not hold when the transaxle is held in a lopsided position on the stand. This would cause the transaxle to turn suddenly, causing serious injury. Never keep the transaxle tilted to one side. Always hold the rotating handle firmly when turning the transaxle.

AUTOMATIC TRANSAXLE

Assembly Bearing and race locations



A6E5714A107

Note

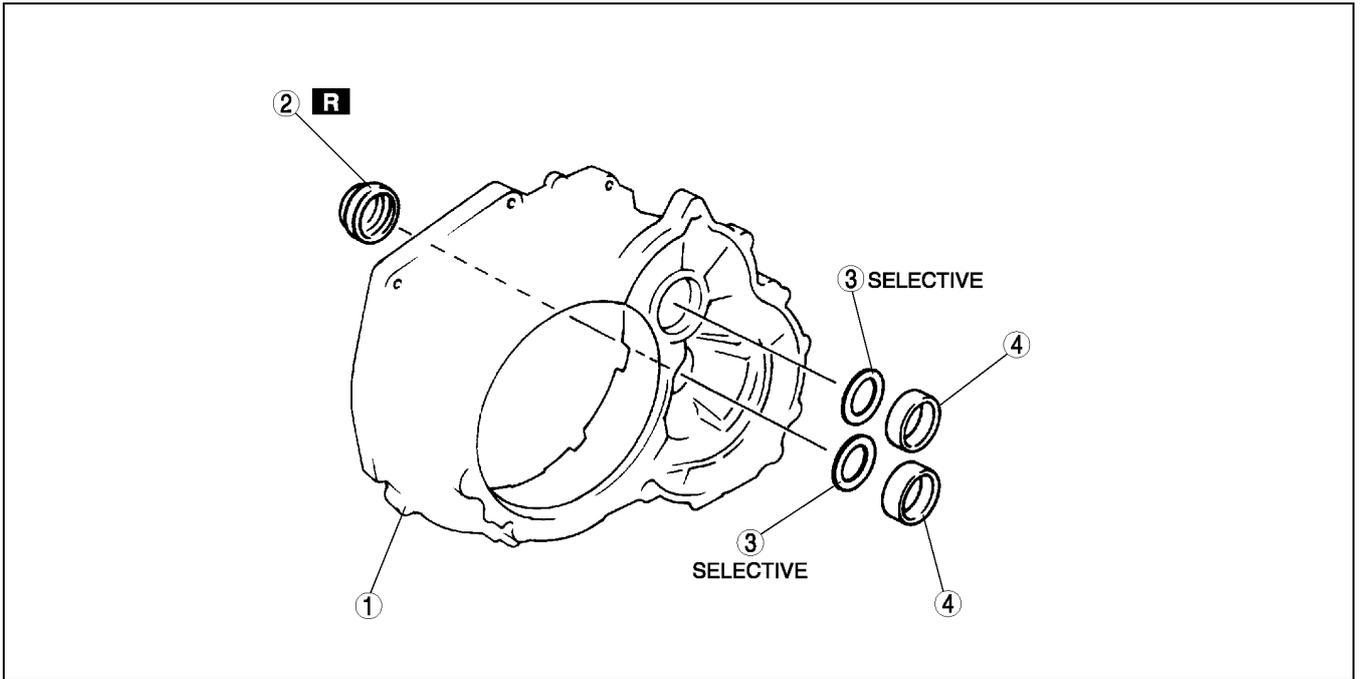
- The bearing and race at locations 2, 3, 4, 5, and 6 are one-piece units.

Outer diameter of bearing and race

	1	2	3	4	5	6
Bearing (mm {in})	40.0 {1.57}	40.0 {1.57}	39.0 {1.54}	78.2 {3.08}	52.0 {2.05}	50.0 {1.97}
Race (mm {in})	40.2 {1.58}	—	—	—	—	—

AUTOMATIC TRANSAXLE

Components



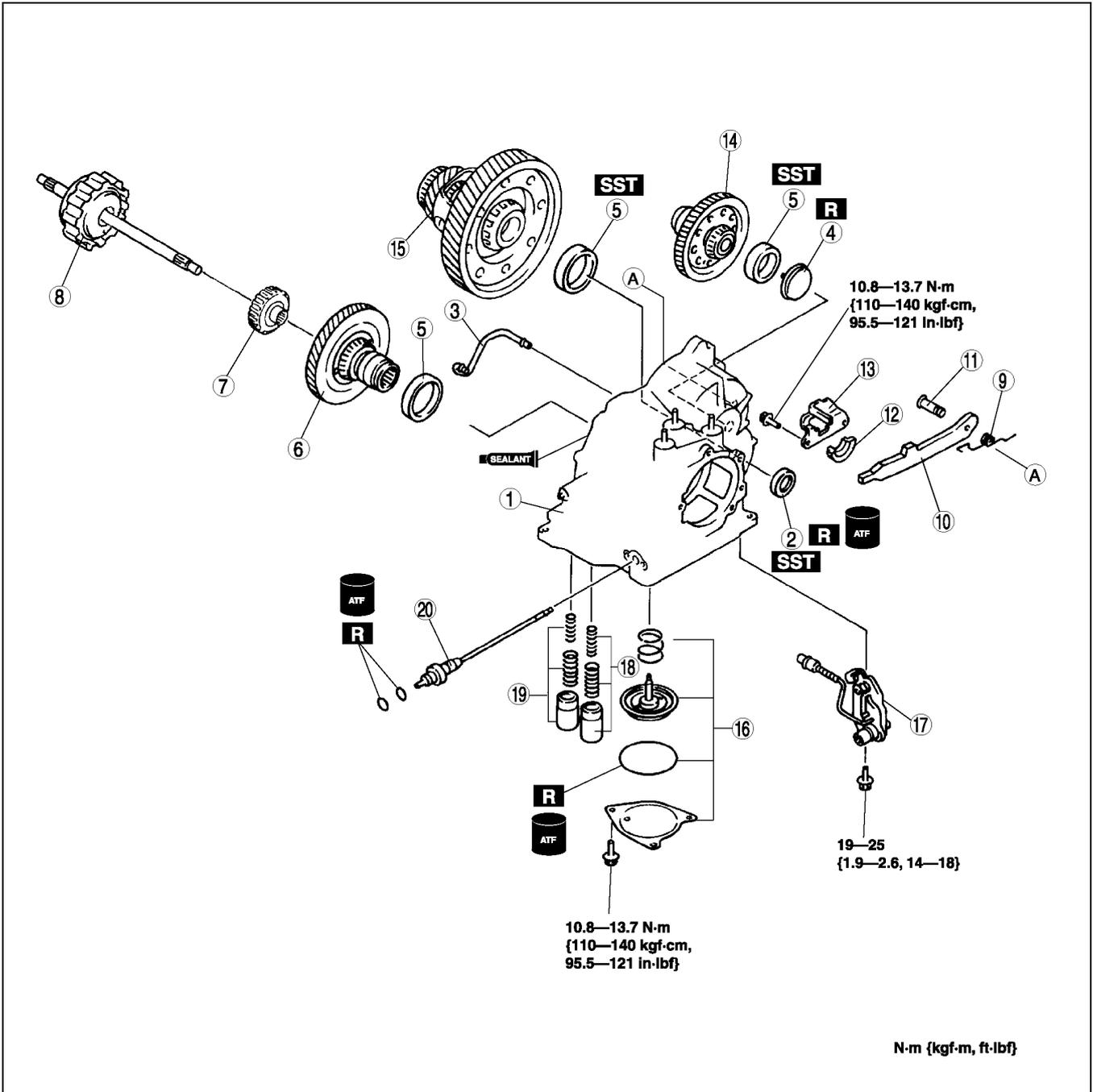
A6E5714A061

1	Converter housing
2	Oil seal

3	Adjustment shim
4	Bearing race

K1

AUTOMATIC TRANSAXLE



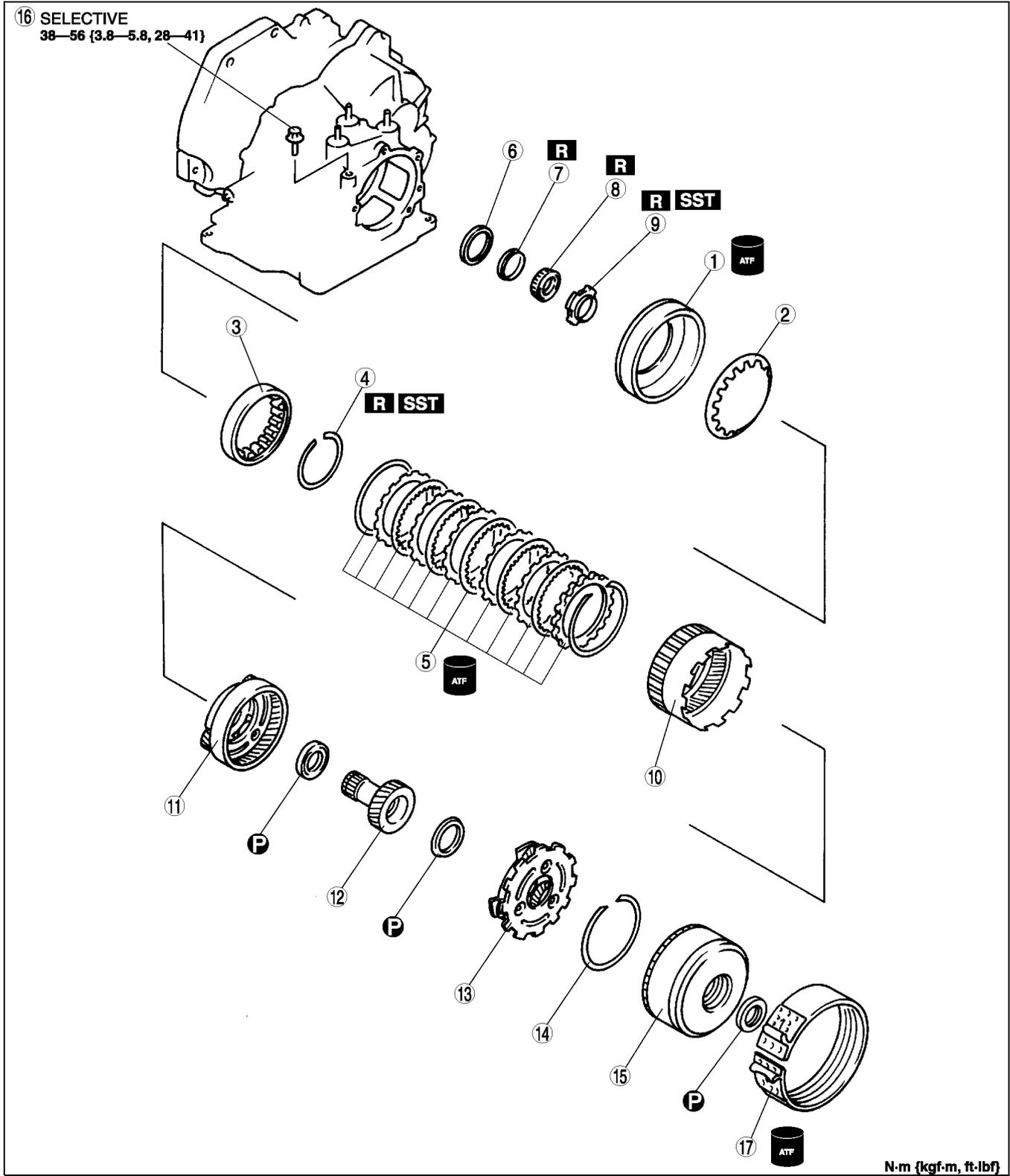
A6E5714A062

1	Transaxle case
2	Oil seal
3	Oil pipe
4	Funnel
5	Bearing race
6	Primary gear
7	Forward clutch hub
8	Forward clutch
9	Pawl return spring
10	Parking pawl

11	Parking pawl shaft
12	Support actuator
13	Actuator plate
14	Secondary gear and output gear
15	Differential
16	Band servo
17	Parking rod lever component
18	Forward accumulator
19	Servo apply accumulator
20	Manual shaft

AUTOMATIC TRANSAXLE

K1

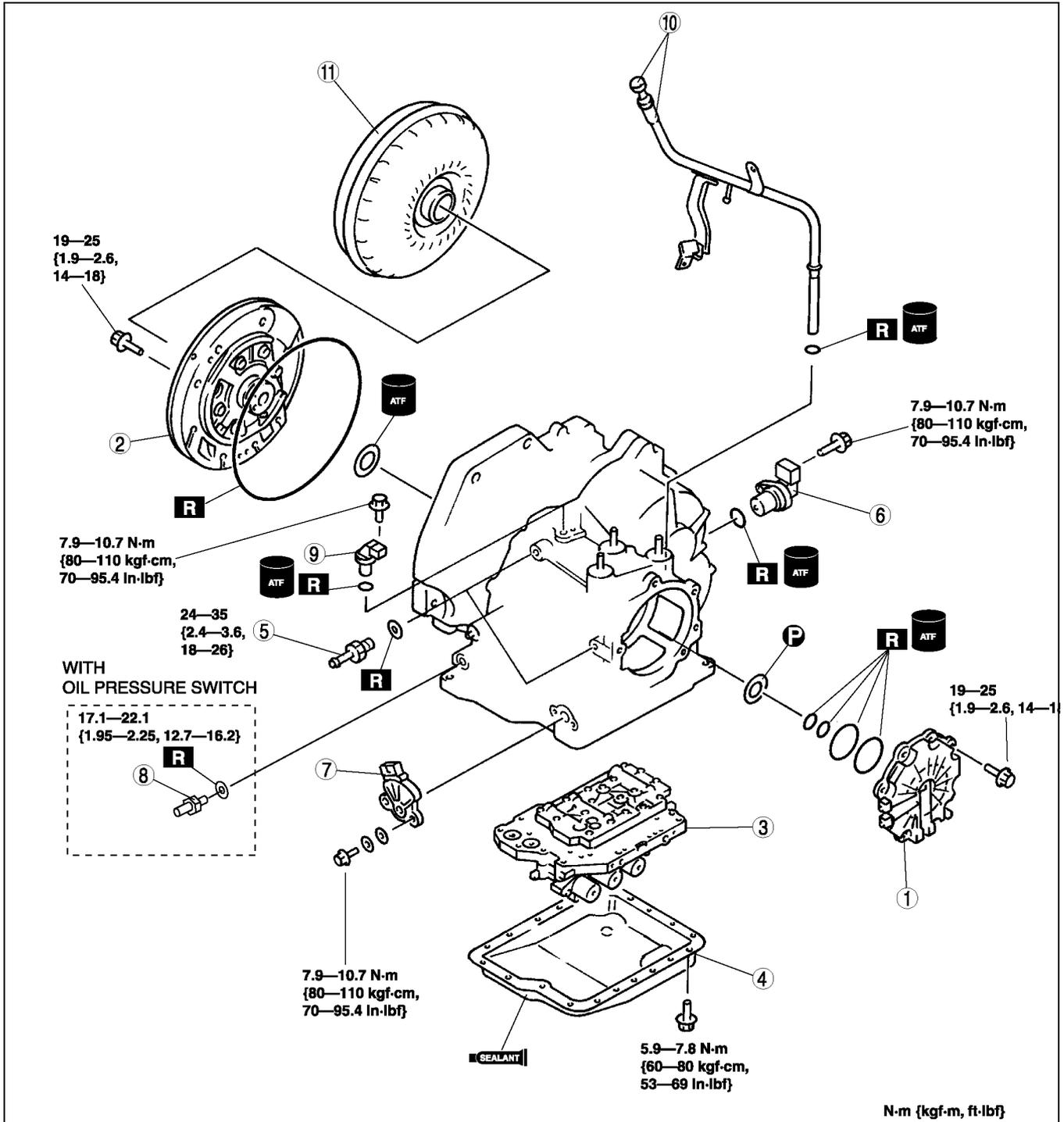


N·m (kgf·m, ft·lbf)
A6E5714A063

1	Low and reverse brake piston
2	Low and reverse brake return spring
3	One-way clutch inner race
4	Snap ring
5	Low and reverse brake
6	Bearing race
7	Distance piece
8	Bearing
9	Locknut

10	Front internal gear and one-way clutch
11	Front planetary gear component
12	Front sun gear
13	Rear planetary gear component
14	Snap ring
15	Clutch component
16	Band strut
17	2-4 brake band

AUTOMATIC TRANSAXLE



A6E5714A064

1	End cover
2	Oil pump
3	Control valve body
4	Oil pan
5	Connector pipe
6	Vehicle speed sensor

7	Transaxle range switch
8	Oil pressure switch
9	Input/turbine speed sensor
10	Oil dipstick and oil filler tube
11	Torque converter

AUTOMATIC TRANSAXLE

Assembly procedure

1. Measure the bushing of the front sun gear.

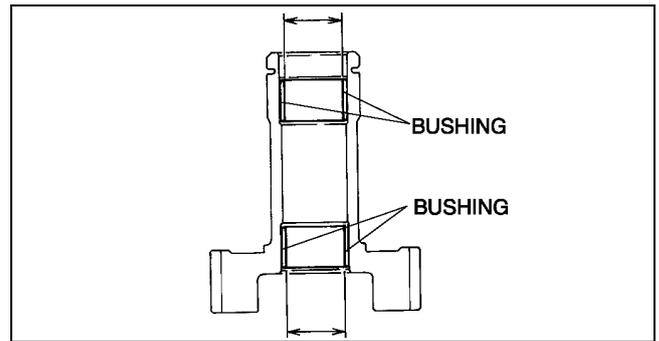
Bushing inner diameter

Standard: 18.000—18.018 mm

{0.70866—0.70936 in}

Maximum: 18.038 mm {0.71016 in}

2. If not as specified, replace the front sun gear.



A6E5714A065

3. Measure the bushing of the end cover.

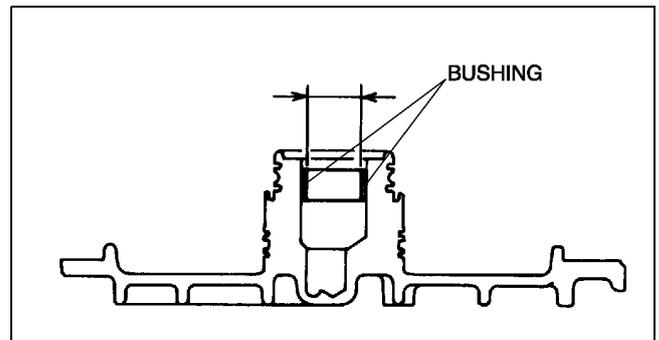
Bushing inner diameter

Standard: 23.600—23.621 mm

{0.92913—0.92995 in}

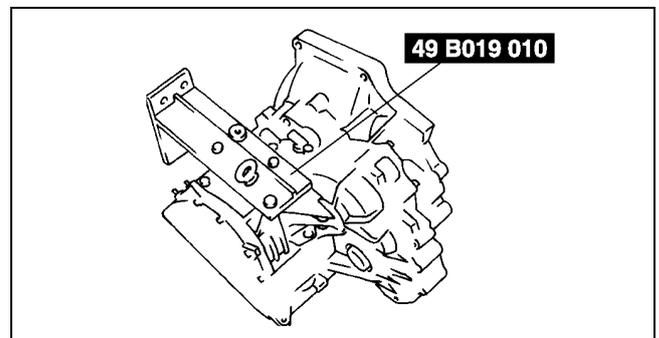
Maximum: 23.641 mm {0.93075 in}

4. If not as specified, replace the end cover.



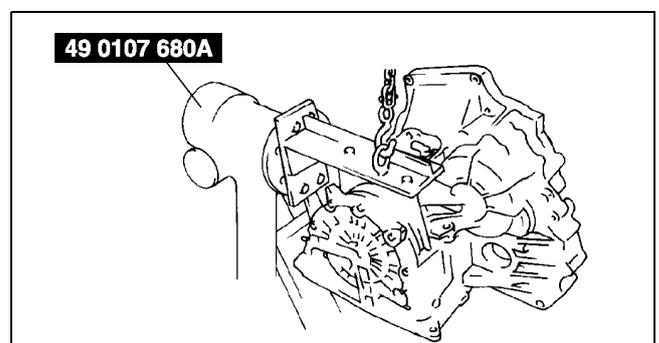
A6E5714A066

5. Assemble the **SST**.



A6E5714A005

6. Lift the transaxle case and mount it on the **SST**.
7. Install the oil pipe.

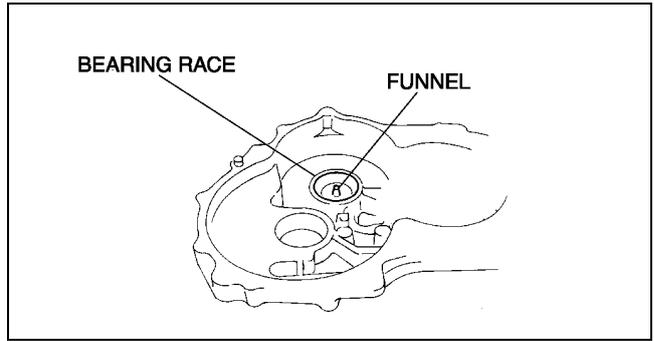


A6E5714A006

K1

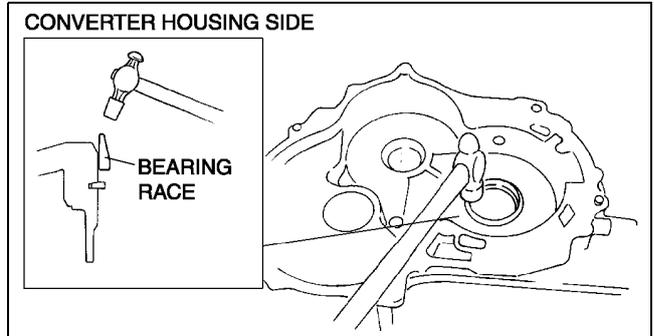
AUTOMATIC TRANSAXLE

8. Install a new funnel and bearing race.

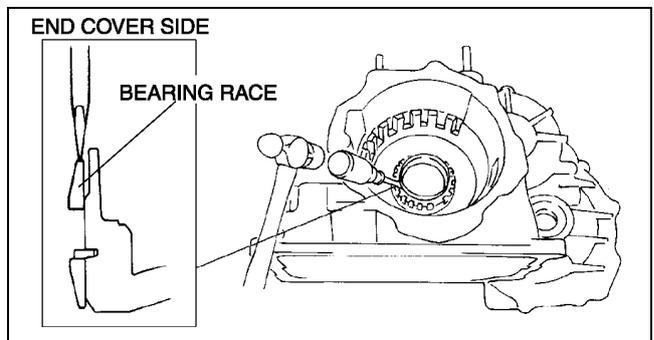


A6E5714A068

9. Install the bearing race as shown in the figure.

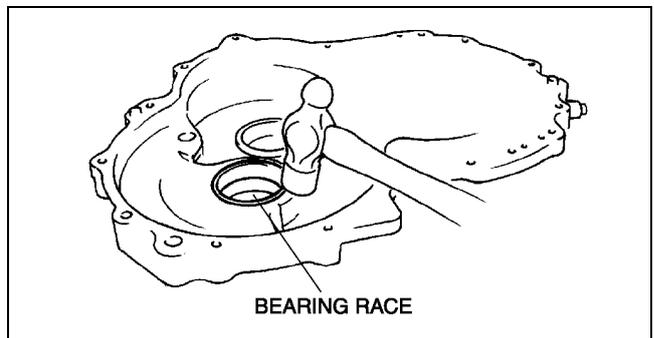


A6E5714A069



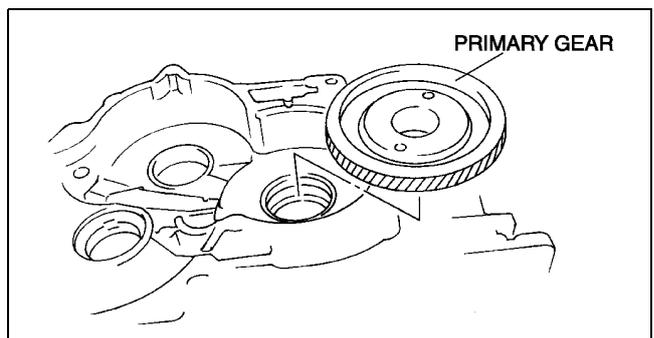
A6E5714A070

10. Install the bearing race to the transaxle case.
11. Install the locknut.



A6E5714A071

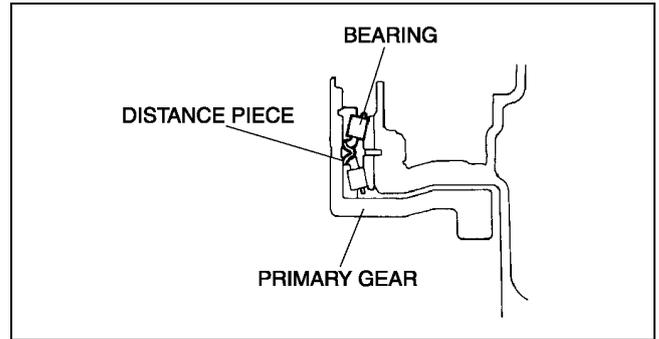
(1) Set the primary gear.



A6E5714A072

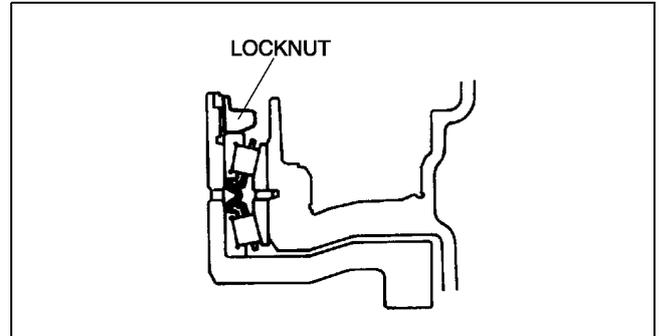
AUTOMATIC TRANSAXLE

(2) Set the distance piece and bearing.



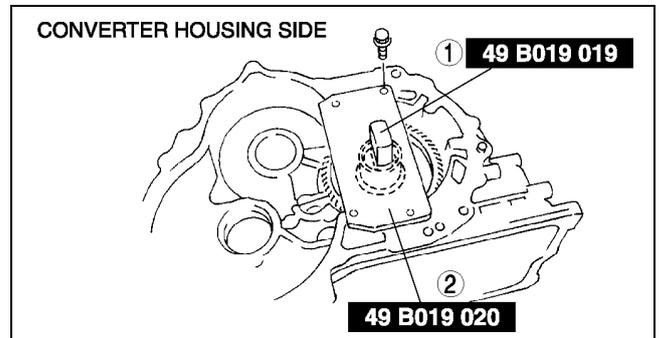
A6E5714A073

(3) Loosely tighten the locknut.

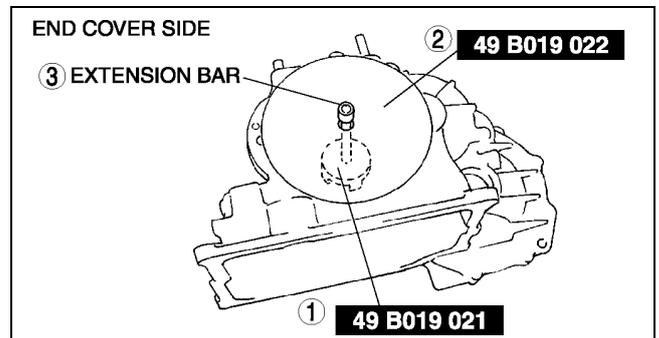


A6E5714A074

(4) Set the **SSTs** in the order shown.



A6E5714A023



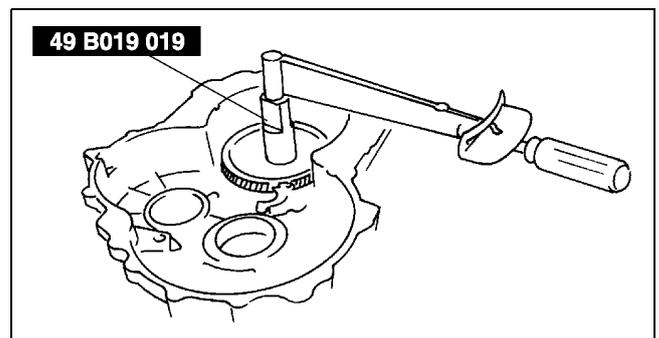
A6E5714A024

(5) Tighten the locknut from the end cover side to adjust the preload within the specification.

Preload

0.50—0.90 N·m

{5.10—9.17 kgf·cm, 4.42—7.96 in·lbf}

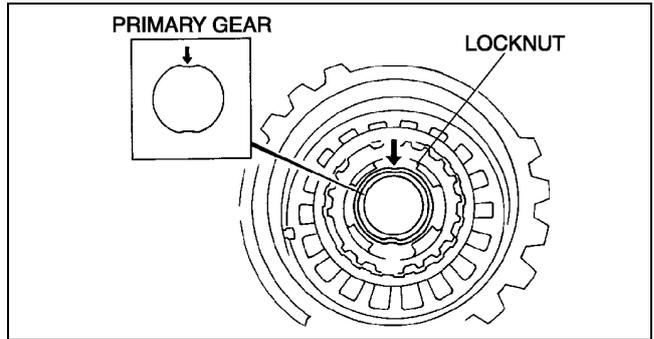


A6E5714A075

K1

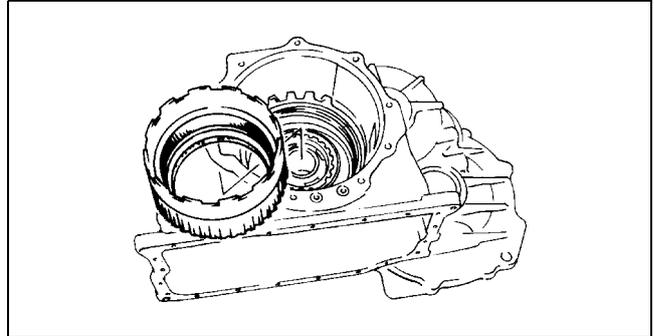
AUTOMATIC TRANSAXLE

- (6) Stake the locknut.
- (7) Remove the **SST**



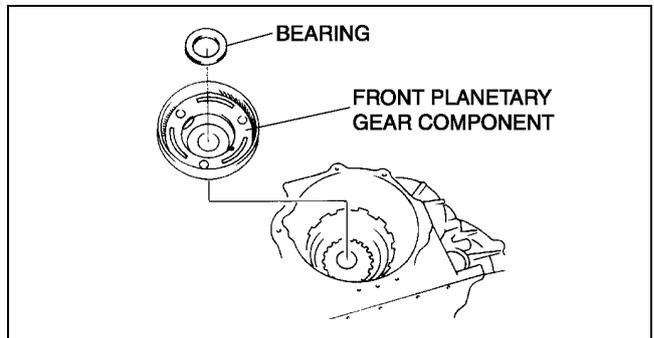
A6E5714A076

12. Install the front internal gear and one-way clutch.
13. Apply petroleum jelly to the bearing, and secure it to the front planetary gear component.



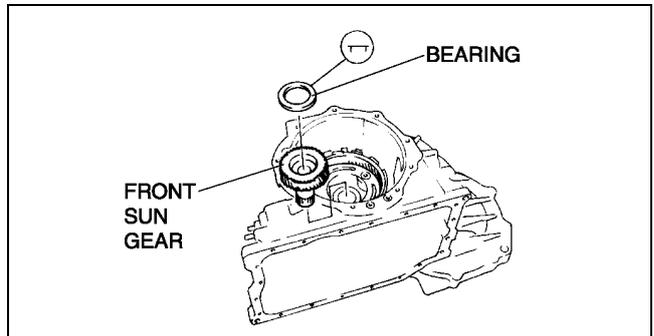
X3U517AAZ

14. Install the front planetary gear component.
15. Apply petroleum jelly to the bearing, and secure it to the front sun gear.



A6E5714A021

16. Install the front sun gear.

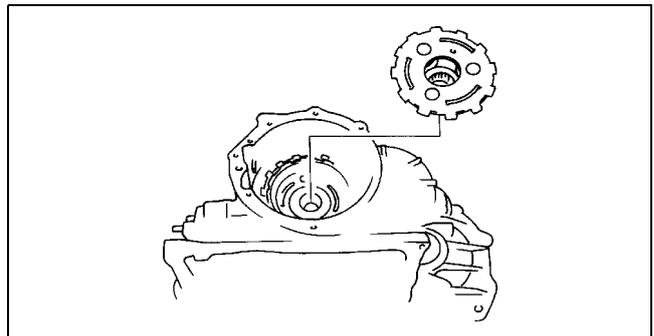


A6E5714A077

17. Install the rear planetary gear.

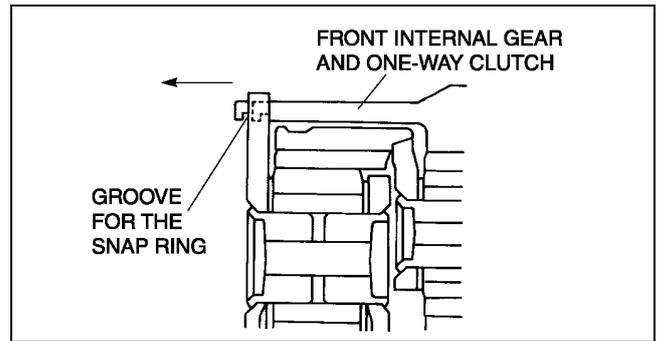
Note

- Rotate the engine stand so that the oil pan faces downward. Pull the front internal gear and one-way clutch component a little until the groove for the snap ring appears, then install the snap ring.



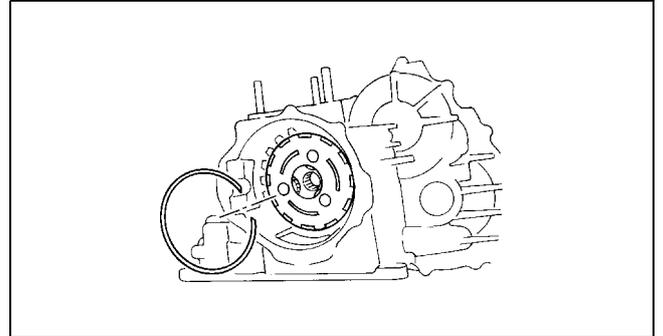
X3U517AAW

AUTOMATIC TRANSAXLE



A6E5714A078

18. Install the snap ring.
19. Rotate the engine stand so that the end cover faces upward, and verify that the snap ring is installed accurately.
20. Install the band servo component.
 - (1) Install the servo return spring and servo piston.
 - (2) Apply ATF to the O-ring, and install it to the transaxle case.



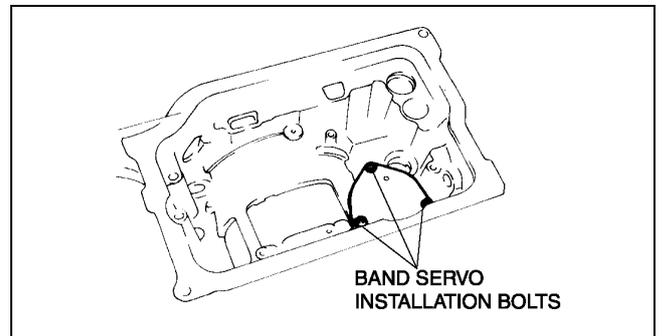
X3U517AGF

- (3) Install the servo retainer.

Tightening torque

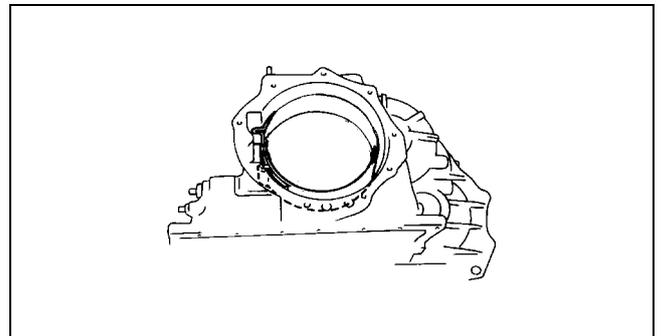
10.8—13.7 N·m

{110—140 kgf·cm, 95.5—121 in·lbf}



A6E5714A013

21. Install the 2-4 brake band.
22. Apply petroleum jelly to the bearing, and secure it to the clutch component.

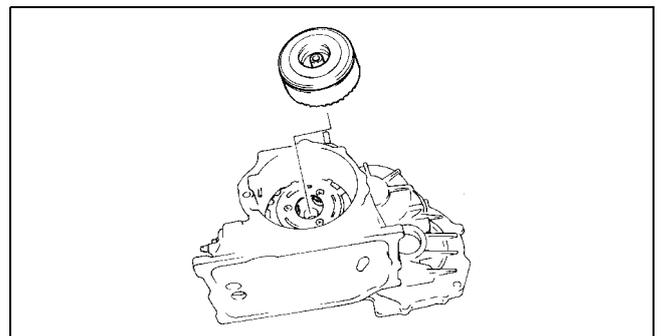


X3U517AGH

23. Install the clutch component.
24. Select the band strut.
 - (1) Find an appropriate bolt (under head length: 60—70 mm {2.36—2.75 in}), and tighten the 2-4 brake band with the bolt.

Tightening torque

4.9 N·m {50 kgf·cm, 43 in·lbf}

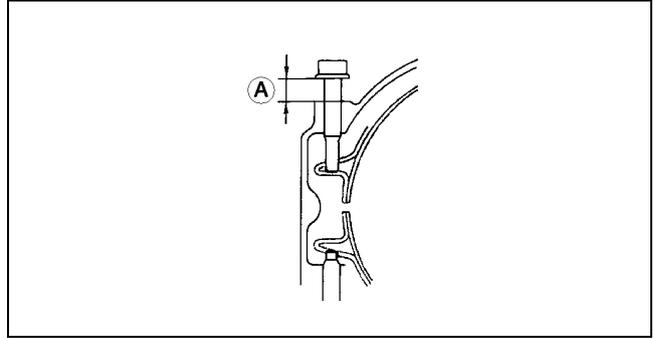


X3U517AAU

K1

AUTOMATIC TRANSAXLE

- (2) Measure the dimension A shown in the figure.
- (3) Remove the bolt.



A6E5714A079

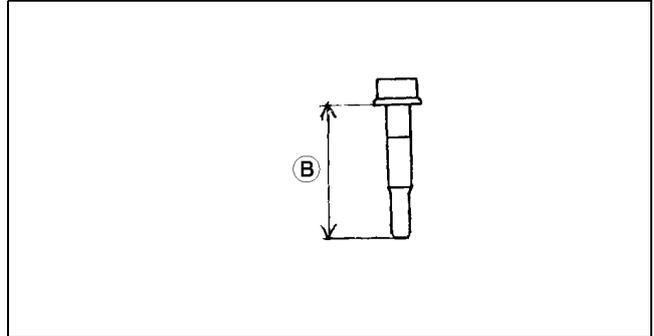
- (4) Measure the dimension B shown in the figure.
- (5) Calculate according to the formula below.

B - A = C (The middle of the under head length)

C - 4 = D (The lower limit of under head length)

C - 4.7 = E (The upper limit of under head length)

- (6) Select a band strut whose length should be between D and E.



A6E5714A080

Band strut length

mm {in}

36.0 {1.417}	36.5 {1.437}	37.0 {1.457}
37.5 {1.476}	38.0 {1.496}	38.5 {1.516}
39.0 {1.535}	-	-

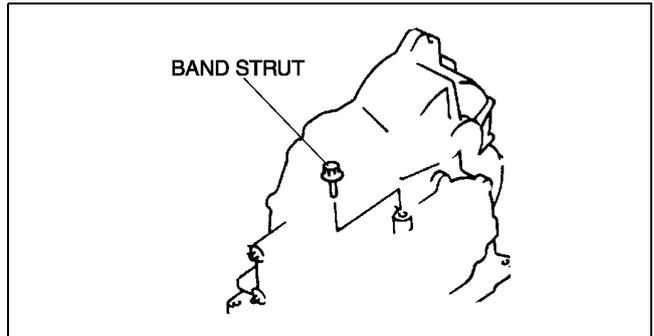
- (7) Install the selected band strut.

Tightening torque

37—52 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf}

25. Use the following procedure to adjust the total end play.

- (1) Install the thickest bearing race (**2.6 mm {0.102 in}**) to the end cover.
- (2) Install the end cover to the clutch component.



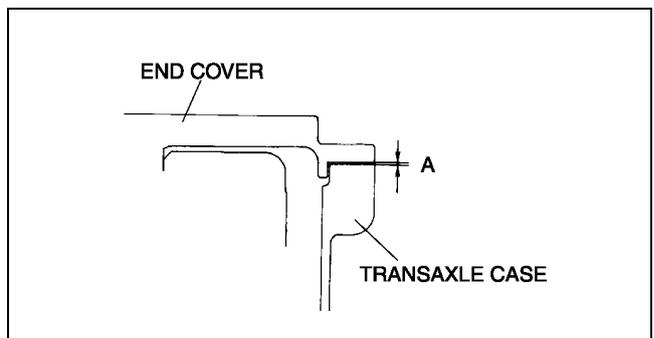
A6E5714A019

- (3) Measure the clearance A between transaxle case and end cover.
- (4) Calculate according to the formulas below. Select an appropriate bearing race whose bearing thickness matches the calculated limits.

A - 2.6 mm {0.102} (Bearing thickness) = B

B - 0.25 = C (The lower limit of bearing thickness)

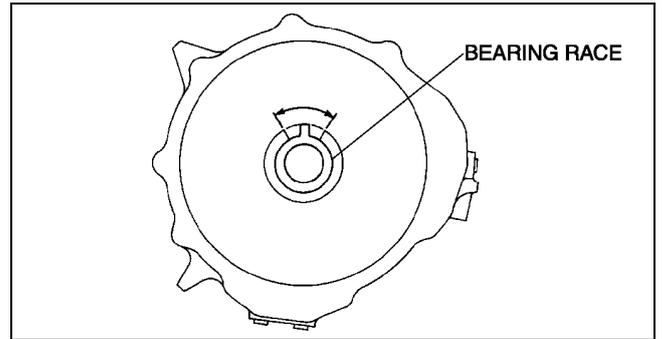
B - 0.50 = D (The upper limit of bearing thickness)



A6E5714A081

AUTOMATIC TRANSAXLE

- (5) Select a bearing race whose thickness is between D mm {in} and C mm {in}.



A6E5714A082

Bearing race sizes

1.8 {0.071}	2.0 {0.079}	2.2 {0.087}
2.4 {0.094}	2.6 {0.102}	—

mm {in}

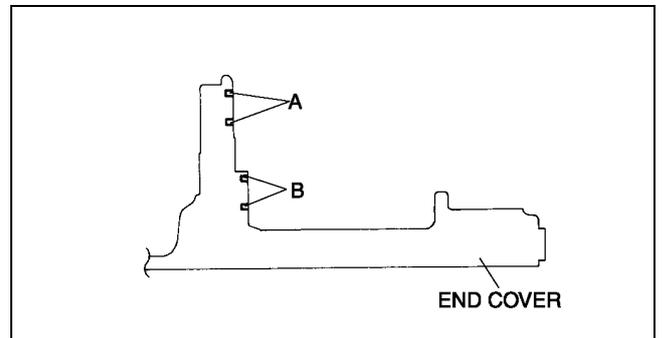
Caution

- The bearing race and end cover may be damaged if the end cover is not installed correctly to the transaxle case. Align the projection of the bearing race within the area of the arrows shown in the figure, and then install the end cover to the transaxle case.

- (6) Remove the end cover, apply petroleum jelly to the selected bearing race, then install it to the end cover.
 26. Apply ATF to new seal ring, and install it to the end cover.

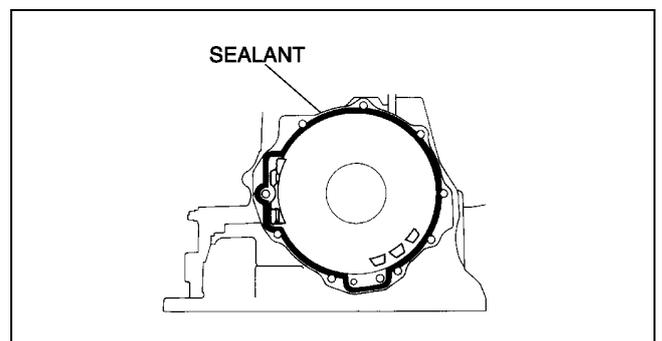
Seal ring inner diameter

- A: 47.1 mm {1.854 in}
- B: 55.8 mm {2.197 in}



A6E5714A083

27. Apply a light coat of silicone sealant to the contact surfaces of the transaxle case and the end cover.
 28. Apply ATF to the O-ring and install it to the transaxle case.

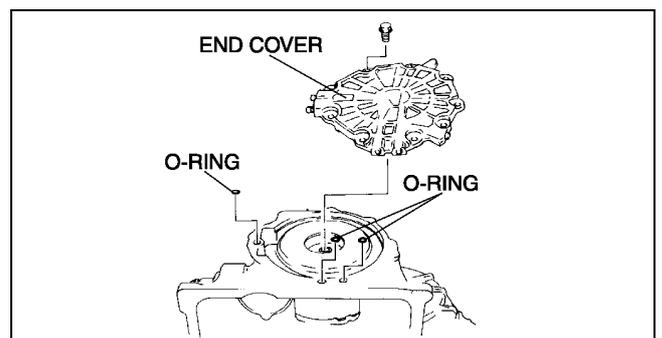


A6E5714A084

29. Install the end cover to the transaxle case.

Tightening torque

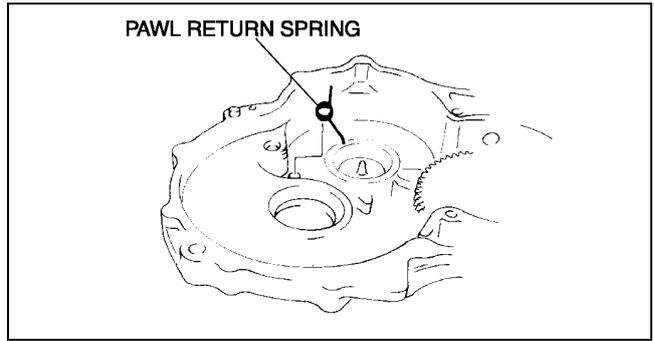
- 19—25 N·m {1.9—2.6 kgf·m, 14—18 ft·lbf}



A6E5714A018

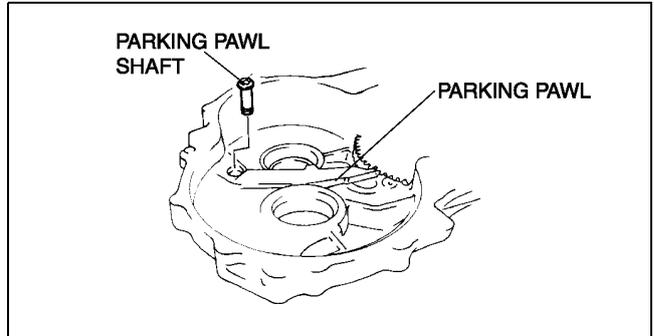
AUTOMATIC TRANSAXLE

30. Install the pawl return spring to the transaxle case.



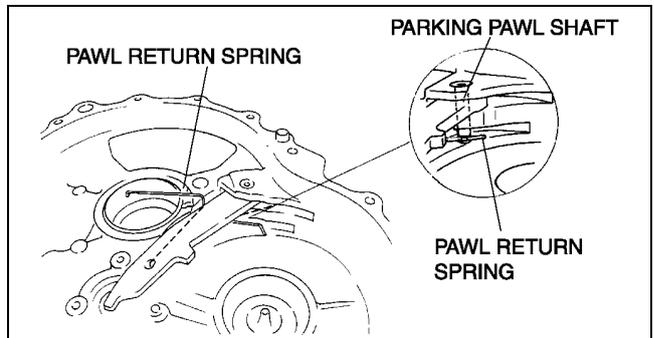
A6E5714A017

31. Install the parking pawl and parking pawl shaft to the transaxle case.



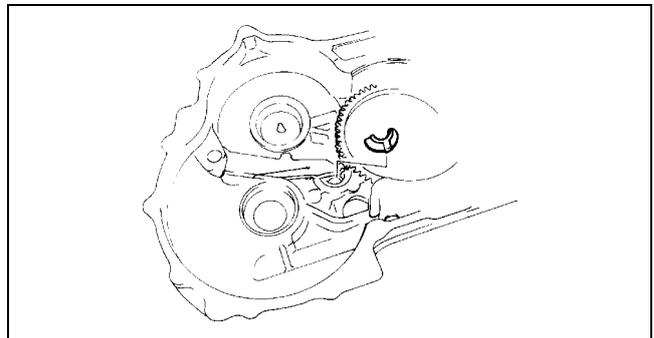
A6E5714A016

32. Install the pawl return spring to the parking pawl and parking pawl shaft.



A6E5714A085

33. Install the support plate to the transaxle case.

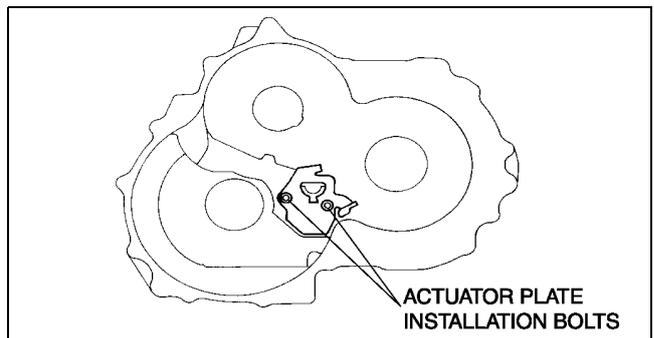


X3U517AAN

34. Install the actuator plate to the transaxle case.

Tightening torque
10.8—13.7 N·m
{110—140 kgf·cm, 95.5—121 in·lbf}

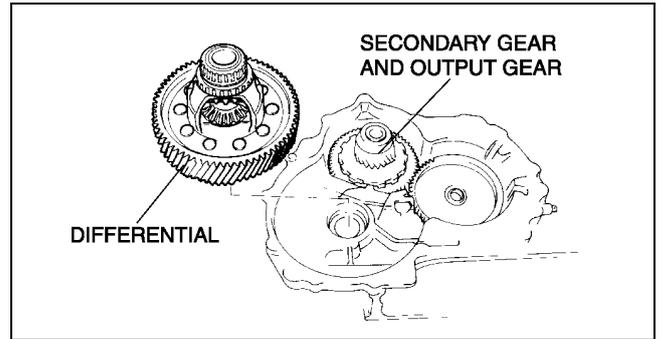
35. Install the secondary gear and output gear.



A6E5714A015

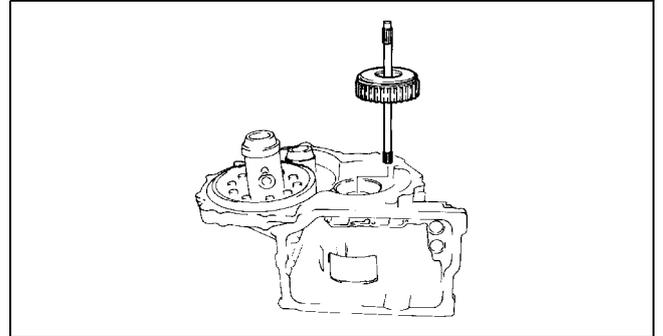
AUTOMATIC TRANSAXLE

36. Install the differential.



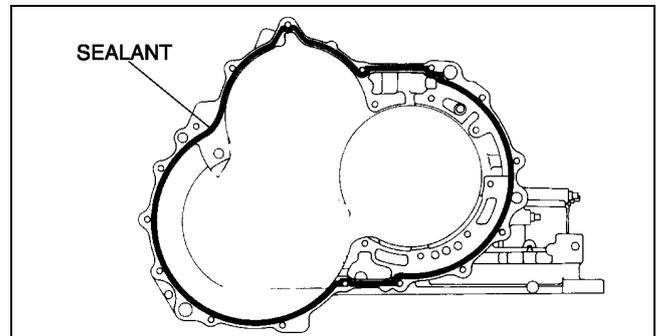
A6E5714A086

37. Install the forward clutch component.



X3U517AAJ

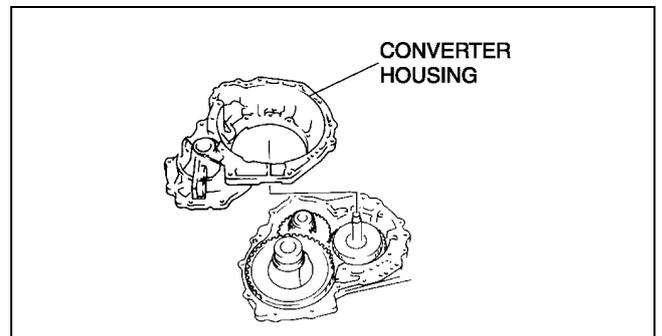
38. Apply a light coat of silicone sealant to the contact surfaces of the converter housing and the transaxle case.



A6E5714A087

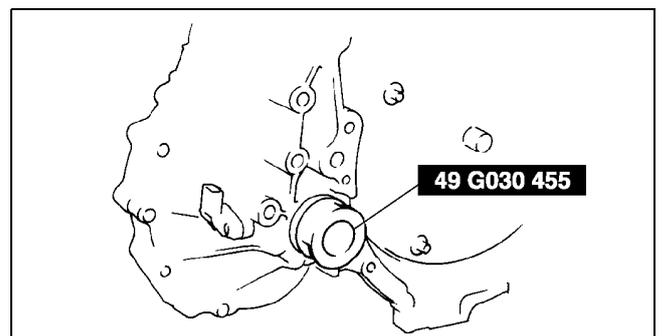
39. Install the converter housing.

Tightening torque
19—25 N·m {1.9—2.6 kgf·m, 14—18 ft·lbf}



A6E5714A088

40. Install the **SST** into the differential side gears.
41. Apply ATF to the new O-ring and install it to the oil pump.



A6E5714A089

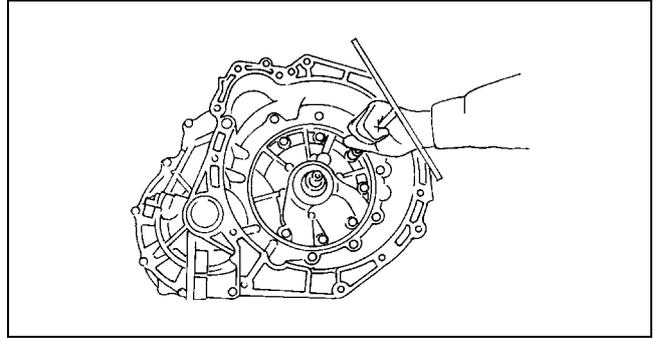
K1

AUTOMATIC TRANSAXLE

42. Install the oil pump.

Tightening torque

19—25 N·m {1.9—2.6 kgf·m, 14—18 ft·lbf}



A6E5714A110

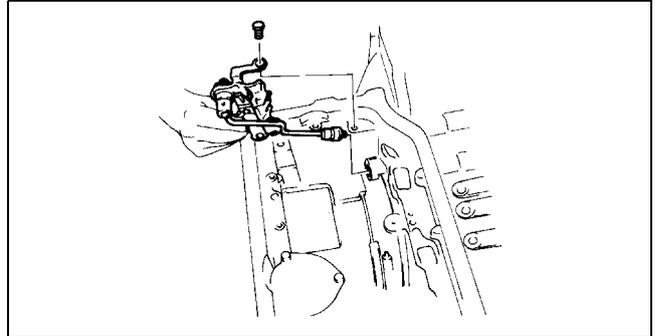
43. Install the parking rod lever component.

Tightening torque

19—25 N·m {1.9—2.6 kgf·m, 14—18 ft·lbf}

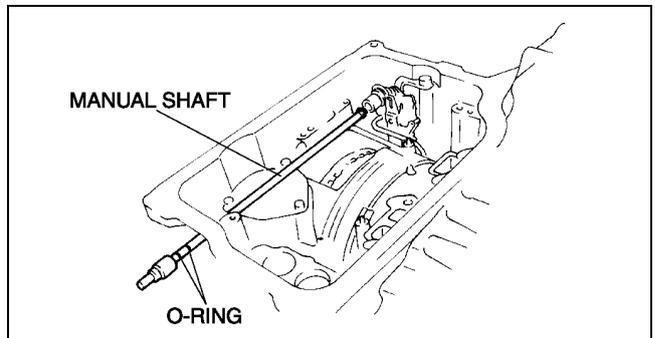
44. Apply ATF to the new O-ring and install it to the manual shaft.

45. Install the manual shaft.



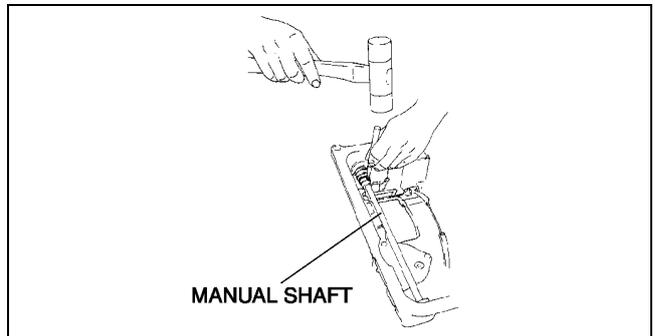
X3U517AAE

(1) Install the manual shaft to the manual plate and detent bracket component.



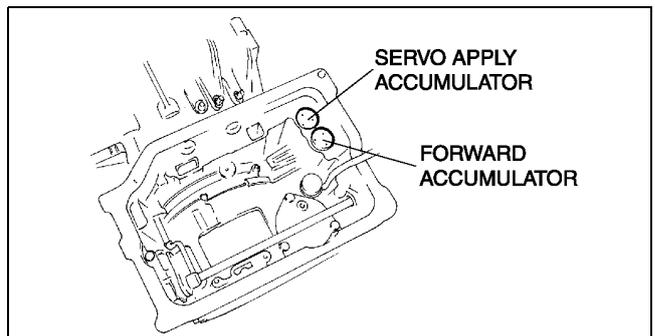
A6E5714A012

(2) Install the knock pin.



A6E5714A011

46. Install the accumulator component.



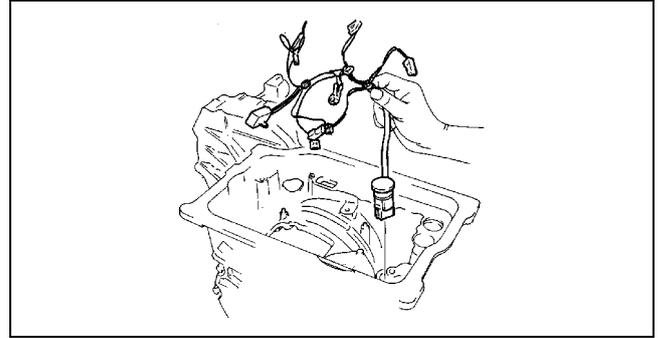
A6E5714A010

AUTOMATIC TRANSAXLE

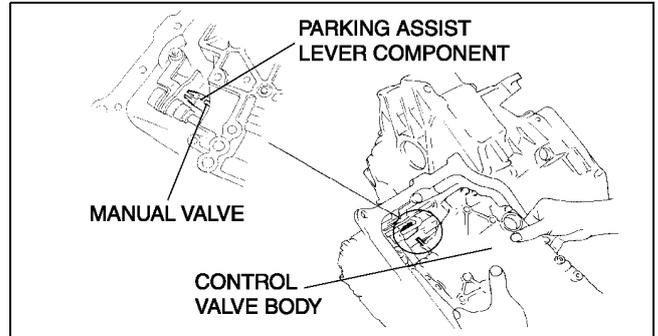
47. Install the coupler component.

Caution

- Make sure that the head of the manual valve and the parking rod are assembled properly. If they are not, the ranges cannot be changed.



X3U517AAA



A6E5714A090

48. Install the control valve body.

Tightening torque

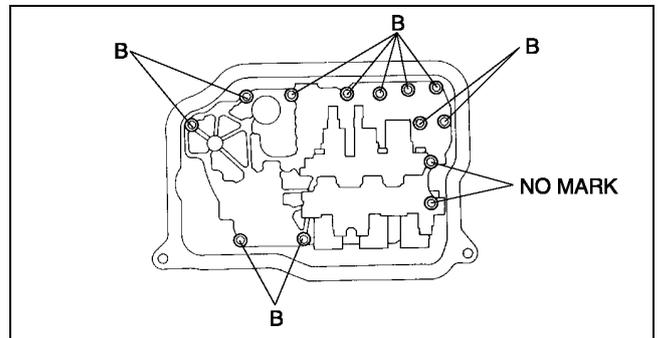
7.9—10.7 N·m

{80—110 kgf·cm, 70—95.4 in·lbf}

Bolt length (measured from below the head)

B: 40 mm {1.575 in}

No mark: 70 mm {2.756 in}

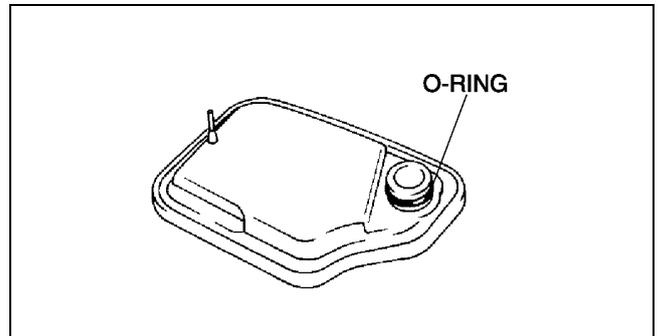


A6E5714A091

49. Apply ATF to the new O-ring and install it to the oil strainer.

50. Install the oil strainer.

51. Match the harness colors, then connect the solenoid connector and transaxle fluid temperature sensor connector.



A6E5714A008

Solenoid valve	Color of connector (harness side)
Pressure control solenoid	Black
Shift solenoid A	White
Shift solenoid B	Blue
Shift solenoid C	Green
Shift solenoid D	White
Shift solenoid E	Black

AUTOMATIC TRANSAXLE

52. Install the ground.

Tightening torque

7.9—10.7 N·m

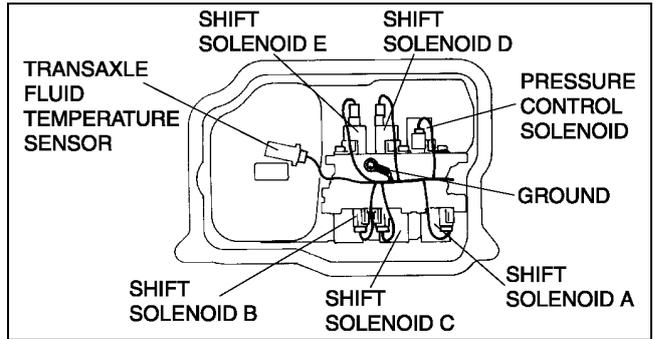
{80—110 kgf·cm, 70—95.4 in·lbf}

Warning

- Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eye wear whenever using compressed air.

Caution

- Clean the transaxle exterior thoroughly with a steam cleaner or cleaning solvents before removal.
- If any old sealant gets into the transaxle during installation of the oil pan, trouble may occur in the transaxle case and oil pan, and clean with cleaning fluids.



A6E5714A092

53. Apply a light coat of silicone sealant to the contact surfaces of oil pan and transaxle case.

54. Install the oil pan.

Tightening torque

5.9—7.8 N·m

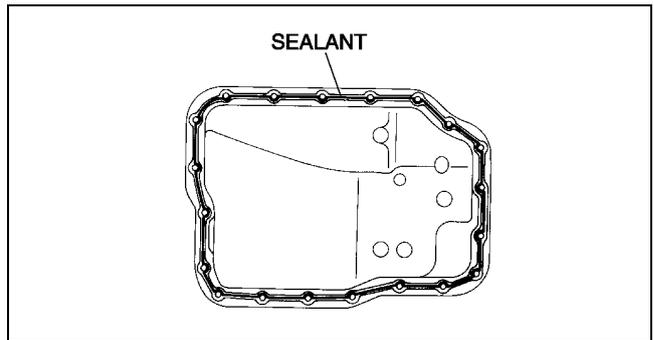
{60—80 kgf·cm, 53—69 in·lbf}

55. Install the oil pipe.

Tightening torque

24—35 N·m

{2.4—3.6 kgf·cm, 18—26 in·lbf}



A6E5714A093

56. Apply ATF to the new O-ring and install it to the vehicle speed sensor.

57. Install the vehicle speed sensor.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 70—95.4 in·lbf}

58. Apply ATF to the new O-ring and install it to the input/turbine speed sensor.

59. Install the oil pressure switch.

Tightening torque

17.1—22.1 N·m

{1.75—2.25 kgf·m, 12.7—16.2 ft·lbf}

60. Install the input/turbine speed sensor.

Tightening torque

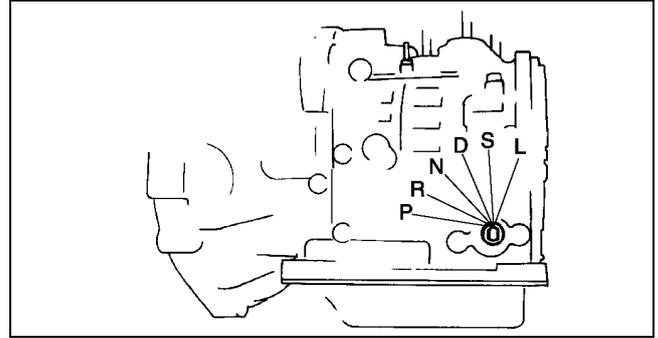
7.9—10.7 N·m

{80—110 kgf·cm, 70—95.4 in·lbf}

61. Install the transaxle range switch.

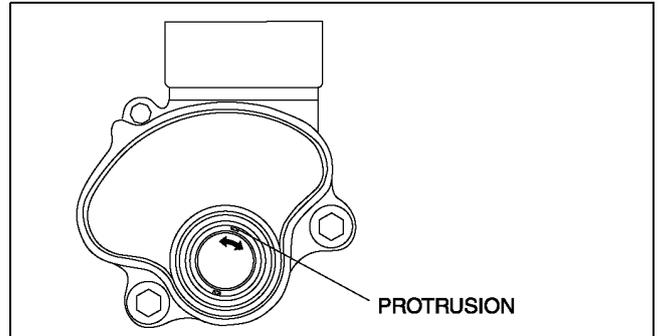
AUTOMATIC TRANSAXLE

- (1) Rotate the manual shaft to the N position.



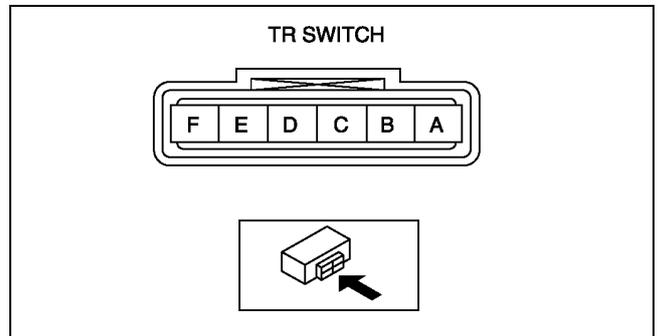
A6E5714A094

- (2) Turn the protrusion a resistance between the terminals B and C become **750 ohms**.



A6E5614W014

- (3) Install the TR switch while aligning the protrusion and groove as shown.
 (4) hand- tighten the TR switch mounting bolts.



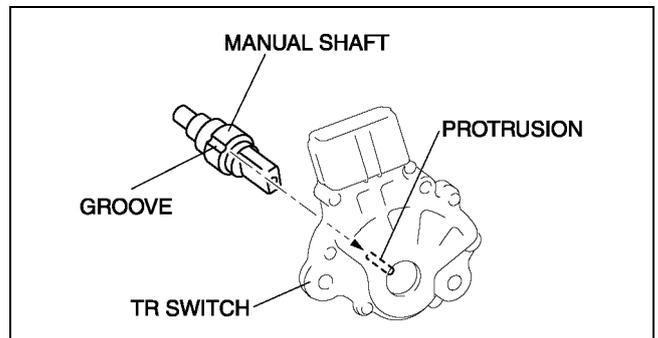
A6E5614W010

- (5) Inspect the resistance between the terminals B and C.
 • If not as specified, readjust the TR switch.

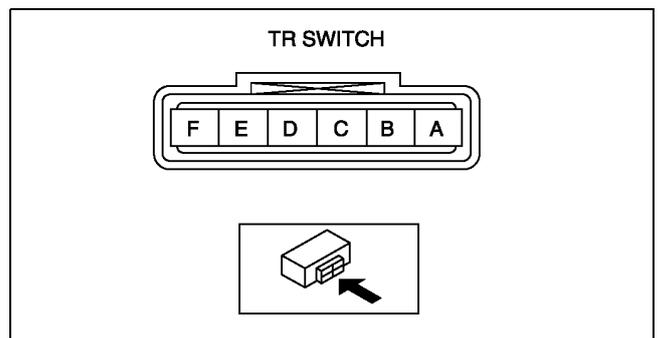
Resistance
750 ohms

- (6) Tighten the TR switch mounting bolts

Tightening torque
8—11 N·m
{82—112 kgf·cm, 71—97 in·lbf}



A6E5614W016



A6E5614W010

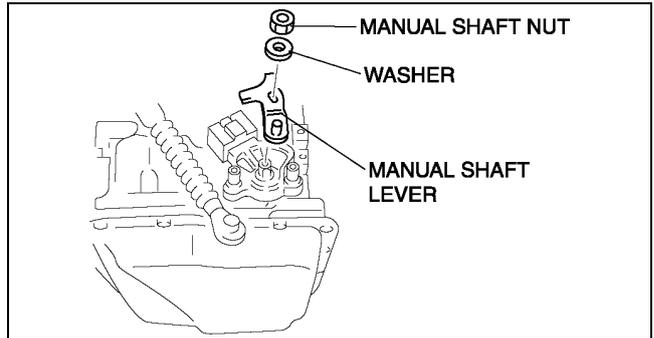
K1

AUTOMATIC TRANSAXLE

Caution

- Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, or the transaxle may be damaged.

(7) Install the manual shaft lever and the washer.



A6E5614W012

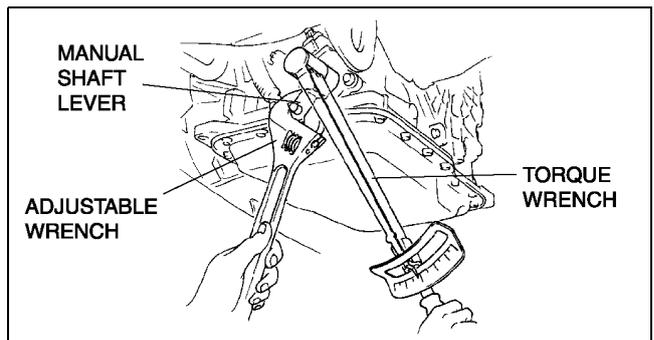
(8) Set the adjustable wrench as shown to hold the manual shaft lever, and tighten the manual shaft nut.

Tightening torque

32—46 N·m

{3.2—4.7 kgf·m, 24—33 ft·lbf}

62. Remove the transaxle from the **SST**.
63. Apply ATF to the new O-ring and install it to the oil filler tube.
64. Install the oil dipstick and oil filler tube to the transaxle.



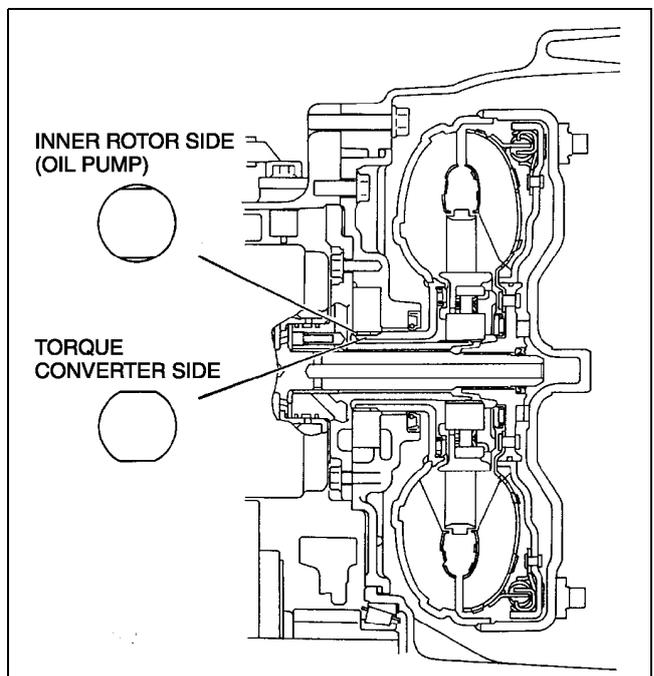
A6E5614W101

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 70—95.4 in·lbf}

65. Drain any ATF remaining in the torque converter.
66. Pour in solvent (**approx. 0.5 L {0.53 US qt, 0.44 Imp qt}**),
67. Shake the torque converter to clean the inside.
68. Pour out the solvent.
69. Pour the ATF.
70. Install the torque converter by aligning its gap to the oil pump inner rotor gap as shown in the figure.

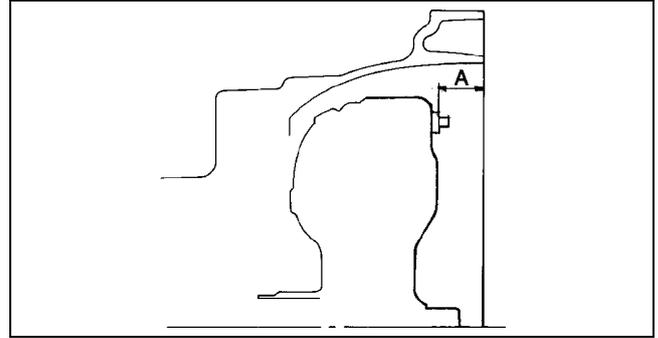


A6E5714A095

AUTOMATIC TRANSAXLE

71. To ensure that the torque converter is installed accurately, measure distance A between the end of the torque converter and the end of the converter housing.

**(A): 15.5 mm {0.609 in} (ZL, ZM)
21.5 mm {0.846 in} (FP, LF, L3)**



A6E5714A096

K1

AUTOMATIC TRANSAXLE INSPECTION

A6E561401030A03

Torque Converter Inspection

1. Inspect the outer surface of the torque converter for damage or cracks, and replace it if necessary.
2. Inspect for rust on the pilot hub of the torque converter or on the boss. If there is any, remove the rust completely.

Oil Pump Preinspection

1. Measure the bushing of the oil pump.

Bushing inner diameter

Torque converter side

Standard: 40.015—40.040 mm

{1.57539—1.57637 in}

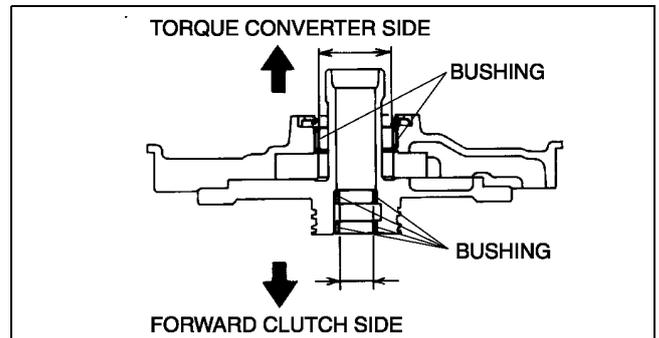
Maximum: 40.060 mm {1.57716 in}

Forward clutch side

Standard: 19.000—19.021 mm

{0.74803—0.74885 in}

Maximum: 19.041 mm {0.74964 in}



A6E5714A097

2. If not as specified, replace the oil pump housing and oil pump cover. (See Section K.)

Forward Clutch Preinspection

Clutch operation

1. Set the forward clutch onto the oil pump.

Caution

- Applying compressed air to the assembled clutch pack for longer than 3 seconds at a time will damage the seal.

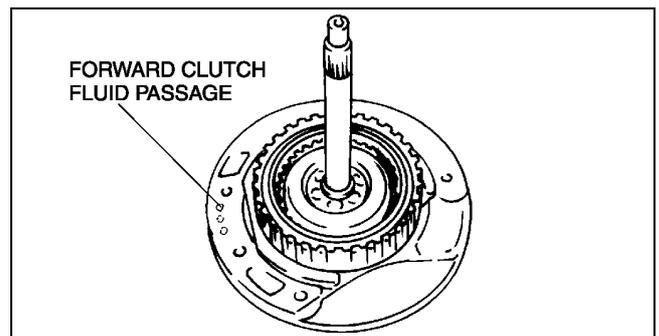
Do not apply compressed air for more than the aforementioned time when testing the system.

2. Inspect the clutch operation by applying compressed air through the fluid passages shown.

Air pressure

392 kPa {4.0 kgf/cm², 57 psi} max.

3. If not as specified, replace parts as necessary. (See Section K.)



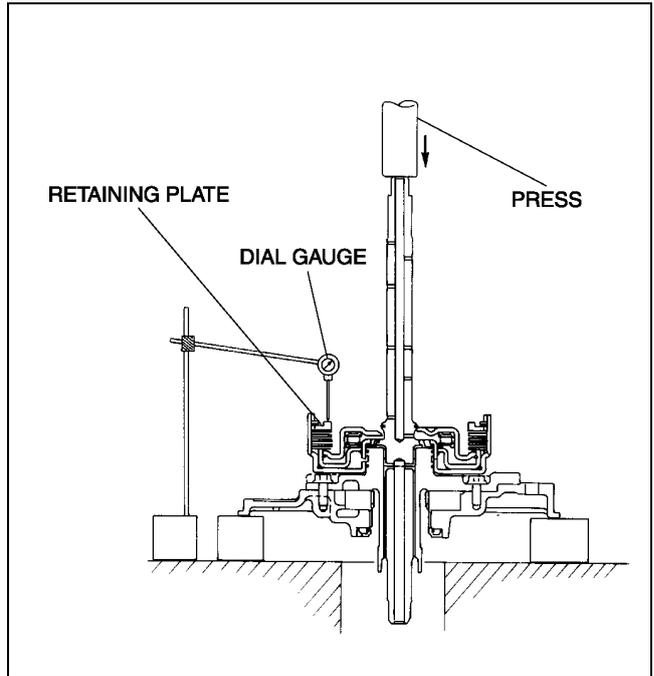
A6E5714A098

AUTOMATIC TRANSAXLE

Clutch clearance

1. Measure the forward clutch clearance.

- (1) Install the forward clutch in the oil pump, and set the dial gauge.
- (2) Secure the forward clutch by lightly pressing down with a press, etc.



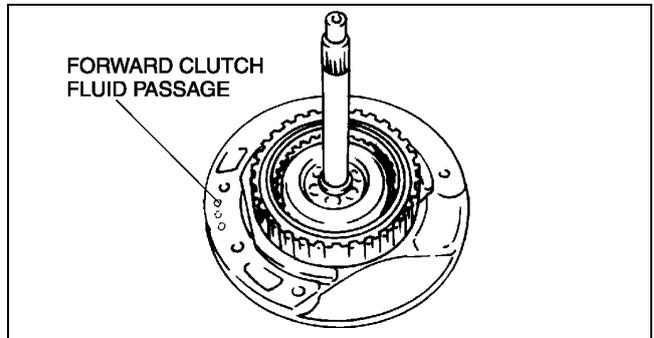
A6E5714A099

- (3) Apply compressed air to the part indicated in the figure and let the forward clutch piston stroke three times.

Air pressure

392—441 kPa {4.0—4.5 kgf/cm², 57—63 psi}

- (4) Apply compressed air and operate the forward clutch piston. Read the value when the indicator of the dial gauge stops.
- (5) Release the compressed air and read the dial gauge when the forward clutch piston is not operating.
- (6) Calculate the forward clutch clearance according to the following formula:
Step (4) value – Step (5) value = Forward clutch clearance.
- (7) Measure the clearances at four locations (90° apart) by following the steps from (3) to (6). Verify that the average value is within the specification below.

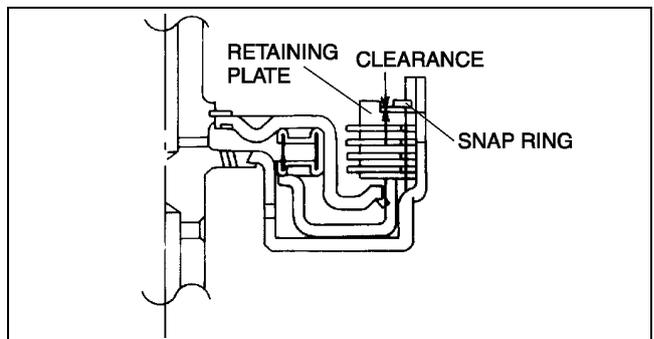


A6E5714A098

Forward clutch clearance

1.50—1.80 mm {0.059—0.071 in}

2. If not as specified, replace parts as necessary. (See Section K.)



A6E5714A100

Clutch Component Preinspection

Clutch operation

1. Set the clutch component onto the end cover.

Caution

- Applying compressed air to the assembled clutch pack for longer than 3 seconds at a time will damage the seal.
Do not apply compressed air for more than the aforementioned time when testing the system.

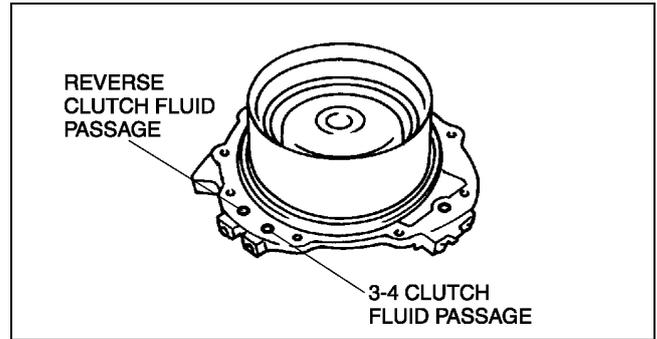
AUTOMATIC TRANSAXLE

2. Inspect the clutch operation by applying compressed air as shown.

Air Pressure

392 kPa {4.0 kgf/cm², 57 psi} max.

3. If not as specified, replace parts as necessary. (See [K1-18 CLUTCH COMPONENT DISASSEMBLY/ASSEMBLY](#).)

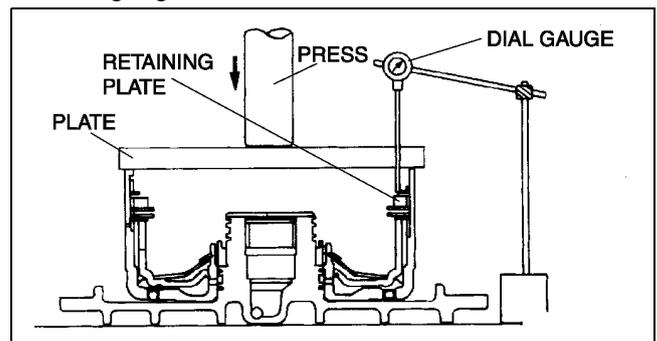


A6E5714A01

K1

Reverse clutch clearance

1. Measure the reverse clutch clearance.
 - (1) Install the reverse clutch into the end cover, and set the dial gauge.
 - (2) Secure the reverse clutch by lightly pressing down with a press, etc.



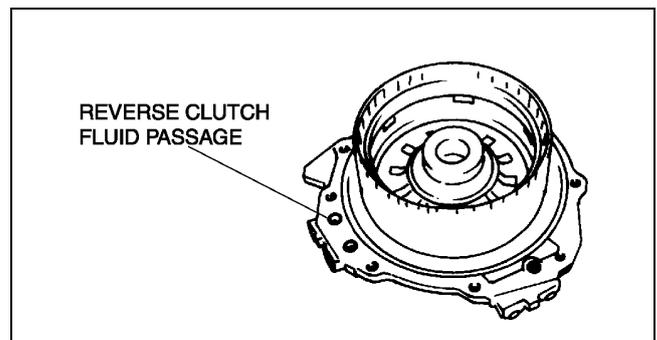
A6E5714A041

- (3) Apply compressed air to the part indicated in the figure and let the reverse clutch piston stroke three times.

Air Pressure

392—441 kPa {4.0—4.5 kgf/cm², 57—63 psi}

- (4) Apply compressed air and operate the reverse clutch piston. Read the value when the indicator of the dial gauge stops.
- (5) Release the compressed air and read the dial gauge when the reverse clutch piston is not operating.
- (6) Calculate the reverse clutch clearance according to the following formula: Step (4) value – Step (5) value = Reverse clutch clearance.
- (7) Measure the clearances at four locations (90° apart) by following the steps from (3) to (6). Verify that the average value is within the specification below.

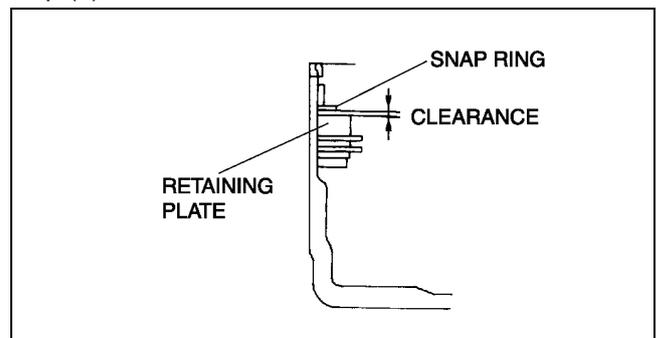


A6E5714A042

Reverse clutch clearance

1.00—1.30 mm {0.039—0.051 in}

2. If not as specified, replace parts as necessary. (See [K1-18 CLUTCH COMPONENT DISASSEMBLY/ASSEMBLY](#).)

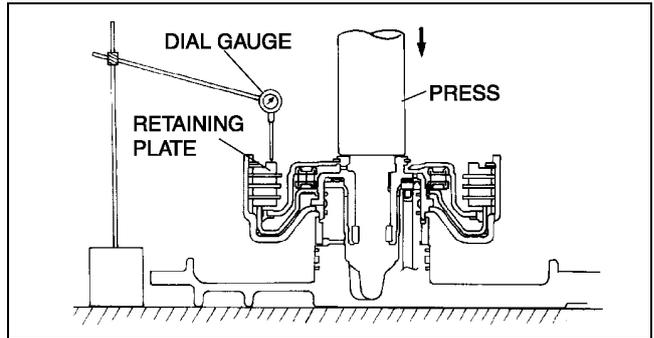


A6E5714A043

AUTOMATIC TRANSAXLE

3-4 clutch clearance

1. Measure the 3-4 clutch clearance.
 - (1) Install the 3-4 clutch in the end cover and set the dial gauge.
 - (2) Secure the 3-4 clutch by lightly pressing down with a press, etc.



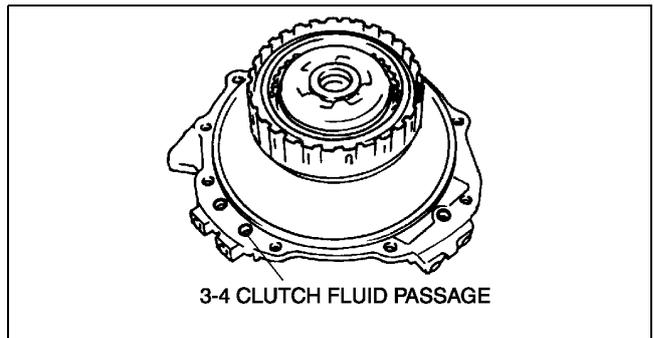
A6E5714A047

- (3) Apply compressed air to the part indicated in the figure and let the 3-4 clutch piston stroke three times.

Air pressure

392—441 kPa {4.0—4.5 kgf/cm², 57—63 psi}

- (4) Apply compressed air and operate the 3-4 clutch piston. Read the value when the indicator of the dial gauge stops.
- (5) Release the compressed air and read the dial gauge when the 3-4 clutch piston is not operating.
- (6) Calculate the 3-4 clutch clearance according to the following formula:
Step (4) value – Step (5) value = 3-4 clutch clearance.
- (7) Measure the clearances at four locations (90° apart) by following the steps from (3) to (6). Verify that the average value is within the specification below.



A6E5714A048

3-4 clutch clearance

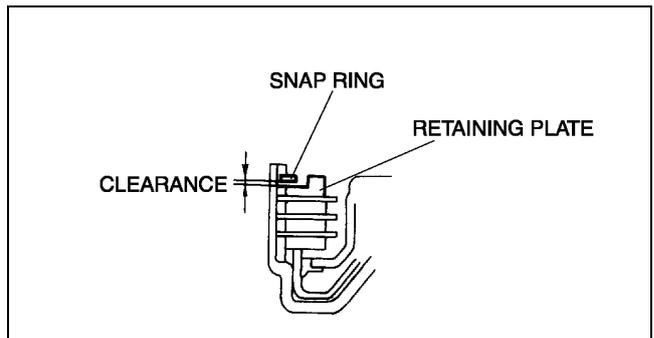
Drive plate part number:FN11 19 370

1.00—1.30 mm {0.039—0.051 in}

Drive plate part number:FNE1 19 370

1.10—1.40 mm {0.043—0.055 in}

2. If not as specified, replace parts as necessary.(See [K1-18 CLUTCH COMPONENT DISASSEMBLY/ASSEMBLY.](#))



A6E5714A049

Bushing inner diameter inspection

1. Measure the bushing of the 3-4 clutch hub.

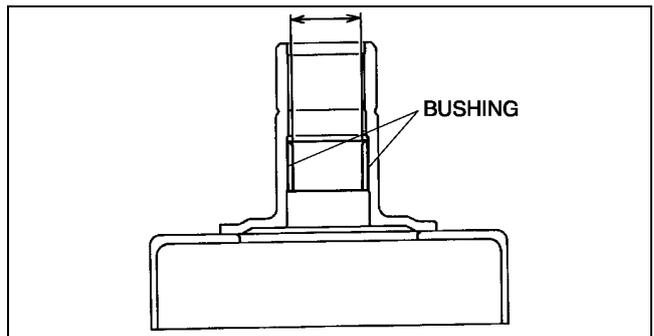
Bushing inner diameter

Standard: 18.000—18.018 mm

{0.70866—0.70936 in}

Maximum: 18.038 mm{0.71016 in}

2. If not as specified, replace the 3-4 clutch hub.(See [K1-18 CLUTCH COMPONENT DISASSEMBLY/ASSEMBLY.](#))



A6E5714A102

AUTOMATIC TRANSAXLE

3. Measure the bushing of the 2-4 brake drum.

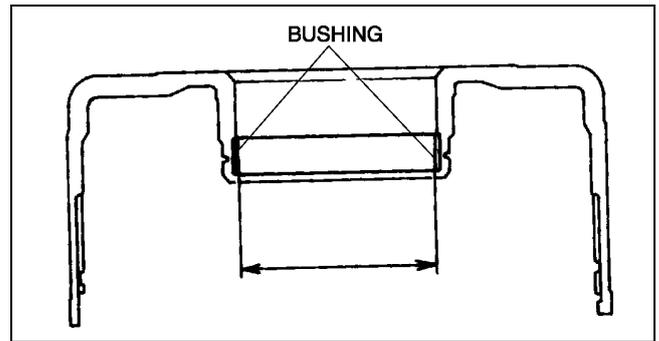
Bushing inner diameter

Standard: 55.000—55.030 mm

{2.16535—2.16653 in}

Maximum: 55.050 mm {2.16732 in}

4. If not as specified, replace the 2-4 brake drum. (See [K1-18 CLUTCH COMPONENT DISASSEMBLY/ASSEMBLY](#).)

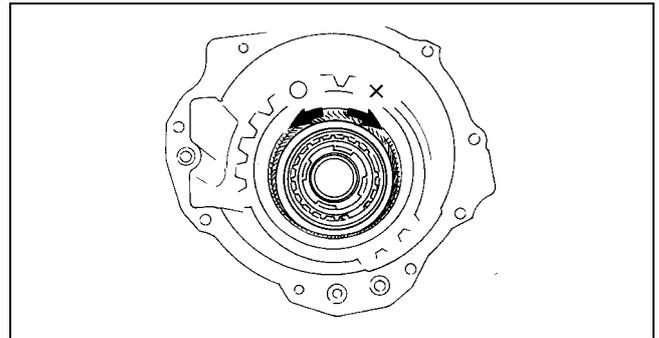


A6E5714A103

K1

Front Internal Gear and One-Way Clutch Component Preinspection

1. Set the front internal gear and one-way clutch component to the one-way clutch inner race. Verify that the one-way clutch rotates smoothly when turned counterclockwise and locks when turned clockwise.
2. If not as specified, replace parts as necessary. (See Section K.)



X3U517AHY

Low and Reverse Brake Preinspection Clutch operation

Caution

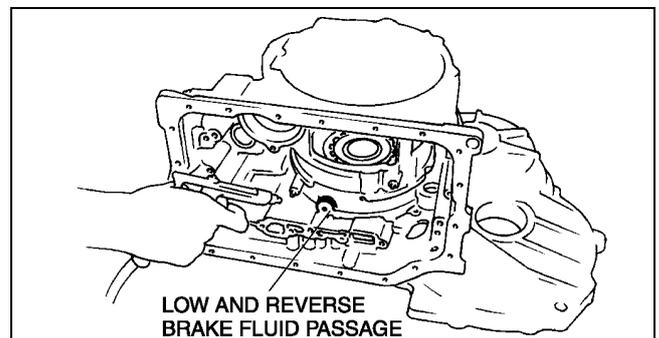
- Applying compressed air to the assembled clutch pack for longer than 3 seconds at a time will damage the seal.
Do not apply compressed air for more that the aforementioned time when testing the system.

1. Inspect the clutch operation by applying compressed air as shown.

Air pressure

392 kPa {4.0 kgf/cm², 57 psi} max.

2. If not as specified, replace parts as necessary. (See Section K.)

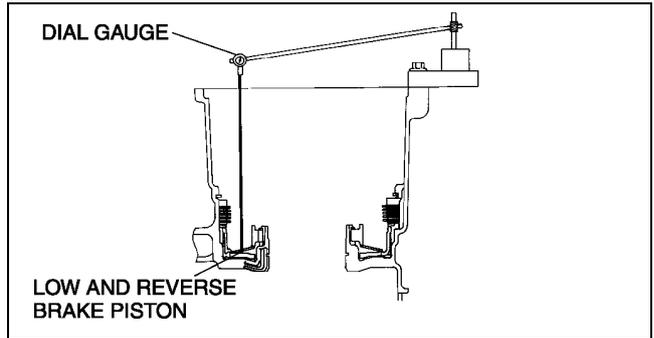


A6E5714A104

AUTOMATIC TRANSAXLE

Clutch clearance

1. Measure the low and reverse brake clearance.
 - (1) Set the dial gauge to the low and reverse brake.
 - (2) Set the measuring point of the dial gauge to the low and reverse brake piston.



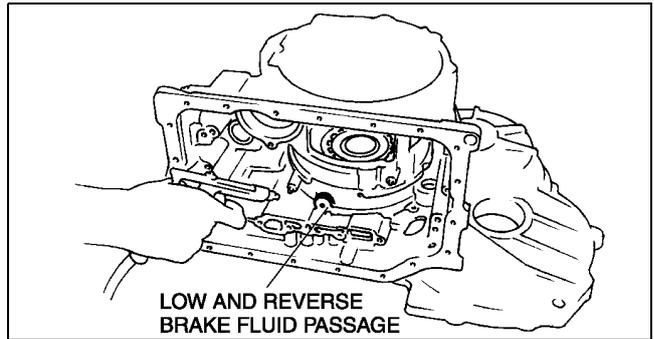
A6E5714A105

- (3) Apply compressed air to the part indicated in the figure and let the low and reverse brake piston stroke three times.

Air pressure

98.1 kPa {1.0 kgf/cm², 14 psi}

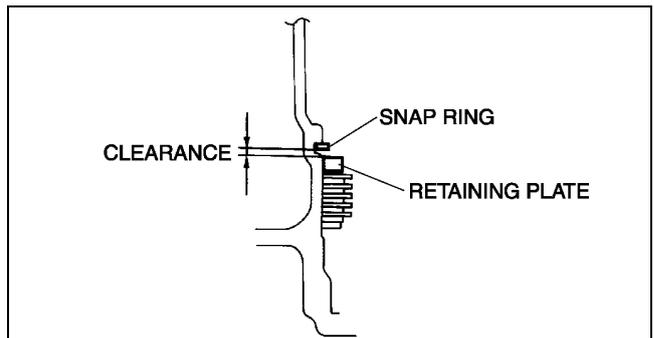
- (4) Apply compressed air and operate the low and reverse brake piston. Read the value when the indicator of the dial gauge stops.
- (5) Release the compressed air and read the dial gauge when the low and reverse brake piston is not operating.
- (6) Calculate the low and reverse brake clearance according to the following formula:
Step (4) value – Step (5) value = low and reverse brake clearance.
- (7) Measure the clearances at four locations (90° apart) by following the steps from (3) to (6). Verify that the average value is within the specification below:



A6E5714A104

Low and reverse brake clearance
2.20—2.50 mm {0.087—0.098 in}

2. If not as specified, replace parts as necessary. (See Section K.)



A6E5714A106

Differential Preinspection

Backlash

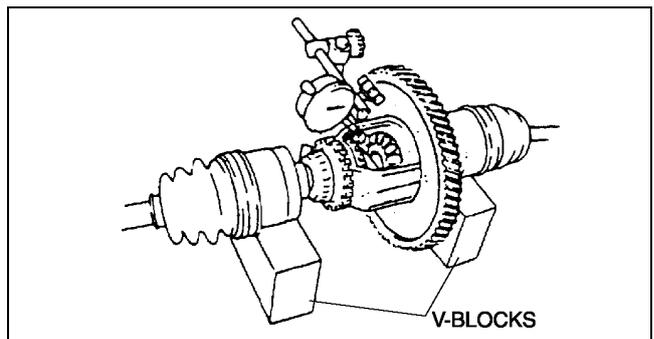
1. Measure the backlash of the side gear.

Backlash

Standard: 0.05—0.15 mm {0.002—0.005 in}

Maximum: 0.5 mm {0.020 in}

2. If not specified, replace the differential. (See [K1–26 DIFFERENTIAL DISASSEMBLY/ASSEMBLY](#).)



A6E5714A060

TECHNICAL DATA

TECHNICAL DATA TD-2
AUTOMATIC TRANSAXLE
TECHNICAL DATA TD-2

TD

TECHNICAL DATA

TECHNICAL DATA

AUTOMATIC TRANSAXLE TECHNICAL DATA

A6E931001030A01

Item			Drive plate part number	
			FN11 19 370	FNE1 19 370
3-4 clutch	Drive plate thickness (mm {in})	Standard	1.60 {0.063}	2.55 {0.100}
		Minimum	1.45 {0.057}	2.40 {0.094}
	3-4 clutch clearance(mm {in})			1.00—1.30 {0.039—0.051}

Spring name	Item			
	Outer diameter (mm {in})	Free length (mm {in})	No. of coils	Wire diameter (mm {in})
Accumulators				
Forward accumulator small spring	15.6 {0.614}	49.0 {1.929}	7.7	2.4 {0.094}

SPECIAL TOOLS

SPECIAL TOOLS	ST-2
AUTOMATIC TRANSAXLE.....	ST-2

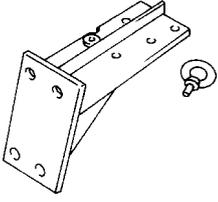
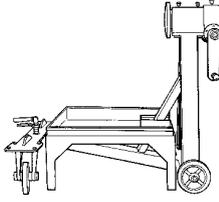
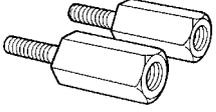
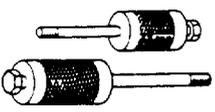
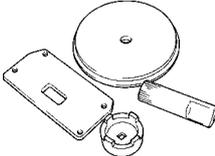
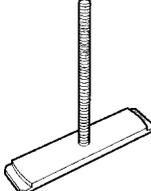
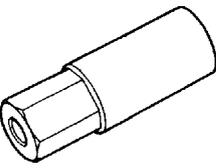
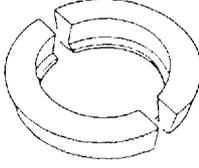
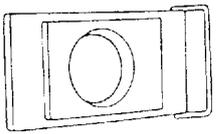
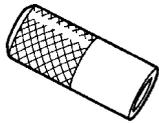
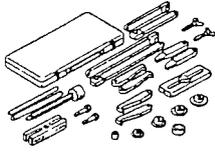
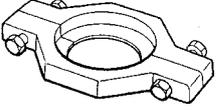
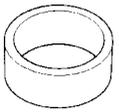
ST

SPECIAL TOOLS

SPECIAL TOOLS

AUTOMATIC TRANSAXLE

A6E941001024A01

<p>49 B019 010</p> <p>Transmission Hanger</p> 	<p>49 0107 680A</p> <p>Engine Stand</p> 	<p>49 B019 009</p> <p>Adapter</p> 
<p>49 0378 390</p> <p>Oil Pump Puller</p> 	<p>49 B019 0A1</p> <p>Lock Nut Remover Set</p> 	<p>49 W032 2A0</p> <p>Bearing Remover Set</p> 
<p>49 B019 012</p> <p>Return Spring Compressor</p> 	<p>49 G019 027</p> <p>Attachment A</p> 	<p>49 G019 029</p> <p>Nut</p> 
<p>49 W019 002</p> <p>Body</p> 	<p>49 B017 209</p> <p>Attachment J</p> 	<p>49 F401 366A</p> <p>Plate</p> 
<p>49 G030 160</p> <p>Valve Seal Pusher</p> 	<p>49 0839 425C</p> <p>Bearing Puller Set</p> 	<p>49 B019 014</p> <p>Removing Plate</p> 
<p>49 S231 626</p> <p>Support Block</p> 	<p>49 G030 338</p> <p>Attachment E</p> 	<p>49 G030 455</p> <p>Diff. Side Gear Holder</p> 