

TRANSMISSION SECTION

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.

This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

CONTROL SYSTEMS

CS

AUTOMATIC TRANSMISSION

4AT

AUTOMATIC TRANSMISSION
(DIAGNOSTICS)

4AT(diag)

MANUAL TRANSMISSION AND
DIFFERENTIAL

5MT

MANUAL TRANSMISSION AND
DIFFERENTIAL

6MT

MANUAL TRANSMISSION AND
DIFFERENTIAL (DIAGNOSTICS)

6MT(diag)

CLUTCH SYSTEM

CL

MANUAL TRANSMISSION AND DIFFERENTIAL

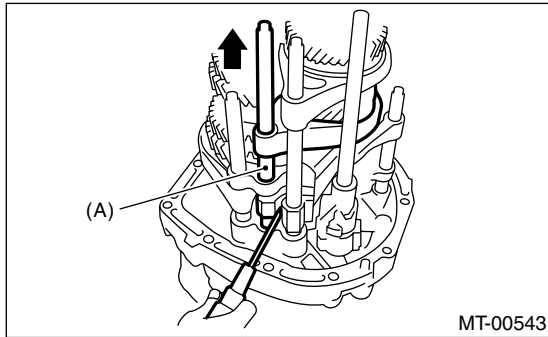
6MT

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19. Main Shaft Assembly

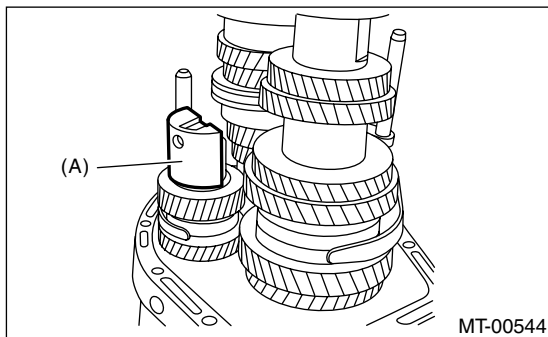
A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-36, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.>, <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.>, <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-66, REMOVAL, Transmission Case.>
- 9) Remove the striking rod.
- 10) Using a screwdriver, shift to 4th gear position.



(A) 3rd-4th shift rod

- 11) Remove the reverse idler holder.

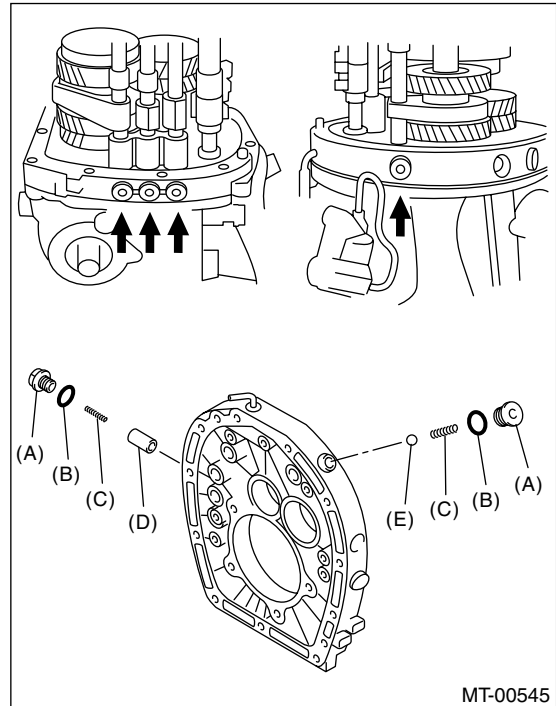


(A) Reverse idler holder

- 12) Remove all checking plug, gasket, checking spring, plunger and checking ball from adapter plate.

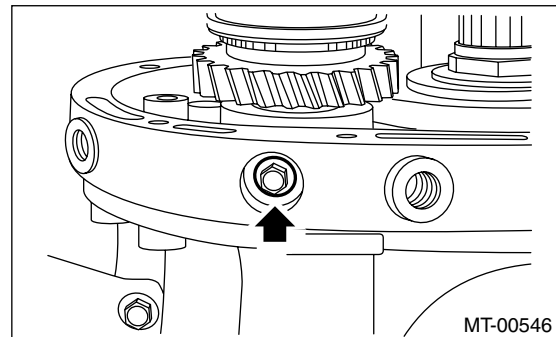
NOTE:

Do not reuse the gasket.



- (A) Checking plug
- (B) Gasket
- (C) Checking spring
- (D) Plunger
- (E) Checking ball

- 13) Remove the bolt and gasket installing reverse idler shaft.



- 14) Press the main shaft assembly, driven gear assembly, reverse idler gear and each shifter fork, then remove from the adapter plate at once.

NOTE:

Two people should do the work.

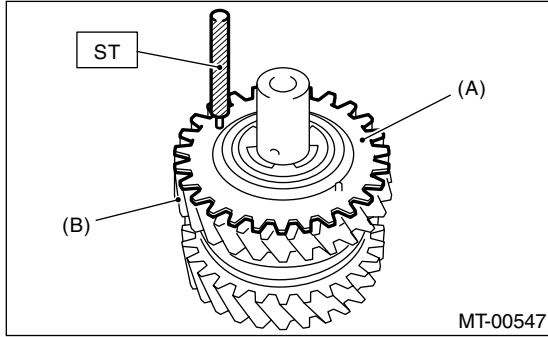
B: INSTALLATION

- 1) Adjust the 3rd-4th, and 5th-6th shifter fork rod. <Ref. to 6MT-116, ADJUSTMENT, Shifter Fork and Rod.>

Main Shaft Assembly

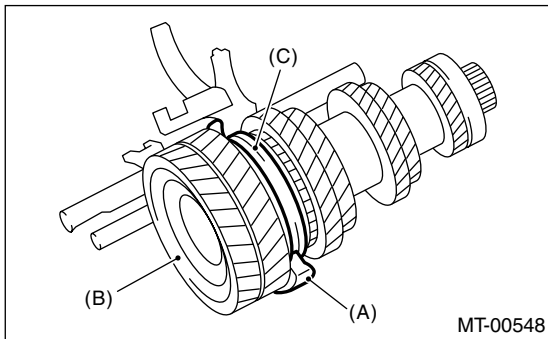
MANUAL TRANSMISSION AND DIFFERENTIAL

2) Turn the sub gear counterclockwise for approx. three teeth. Align the sub gear and reverse idler gear hole, then insert the ST.
ST 18757AA000 STRAIGHT PIN



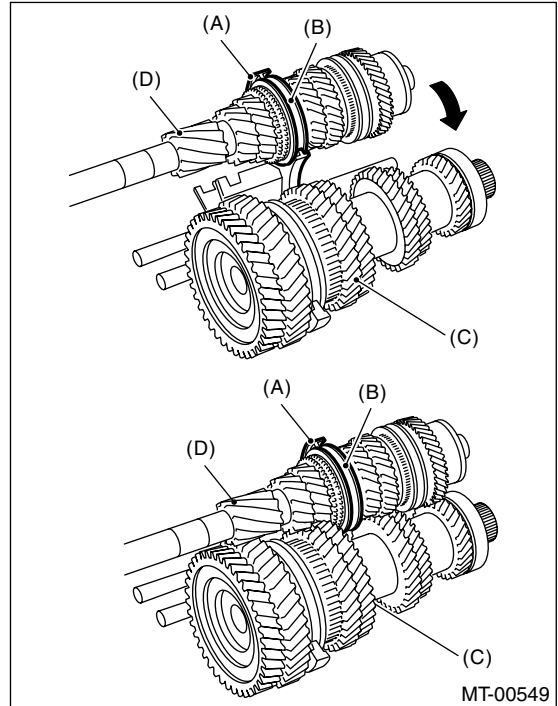
- (A) Sub gear
- (B) Reverse idler gear

3) Install the driven gear assembly to 1st-2nd shifter fork assembly.



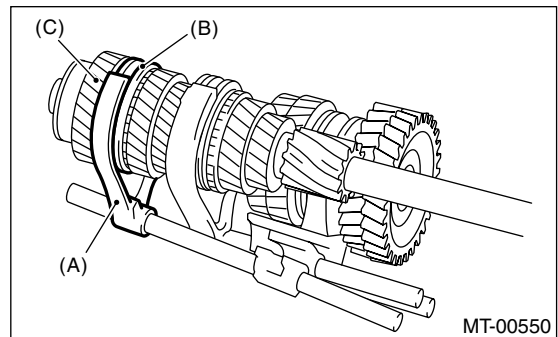
- (A) 1st-2nd shifter fork
- (B) Driven gear assembly
- (C) 1st-2nd sleeve

4) Install the main shaft assembly to 3rd-4th shifter fork, and then assemble to driven gear assembly.



- (A) 3rd-4th shifter fork
- (B) 3rd-4th sleeve
- (C) Driven gear assembly
- (D) Main shaft assembly

5) Install the 5th-6th shifter fork assembly to main shaft assembly.



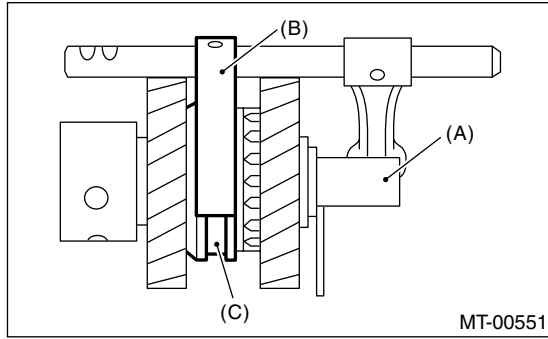
- (A) 5th-6th shifter fork
- (B) 5th-6th sleeve
- (C) Main shaft assembly

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

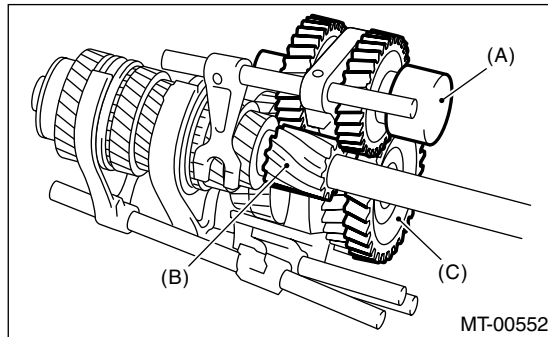
6) Install the reverse shifter fork assembly to reverse idler gear assembly.

Tightening torque:
37 N·m (3.8 kgf·m, 27.3 ft·lb)



- (A) Reverse idler gear assembly
- (B) Reverse shifter fork
- (C) Reverse sleeve

7) Install the reverse idler gear assembly.



- (A) Reverse idler gear assembly
- (B) 1st drive gear
- (C) Reverse gear

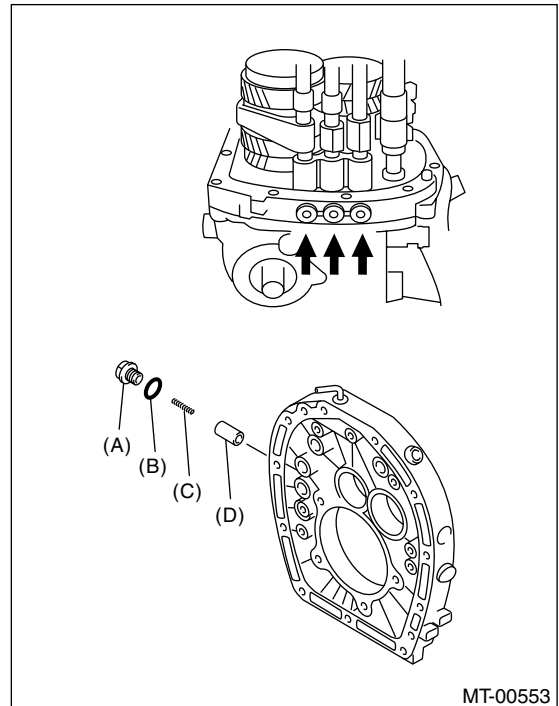
8) Install the thrust bearing of driven gear assembly.

9) Press each shifter fork, main shaft assembly, driven gear assembly and reverse idler gear assembly, then install to the adapter plate at once.

NOTE:

Two people should do the work.

10) Install the plunger, checking spring, new gasket and checking plug.



- (A) Checking plug
- (B) Gasket
- (C) Checking spring
- (D) Plunger

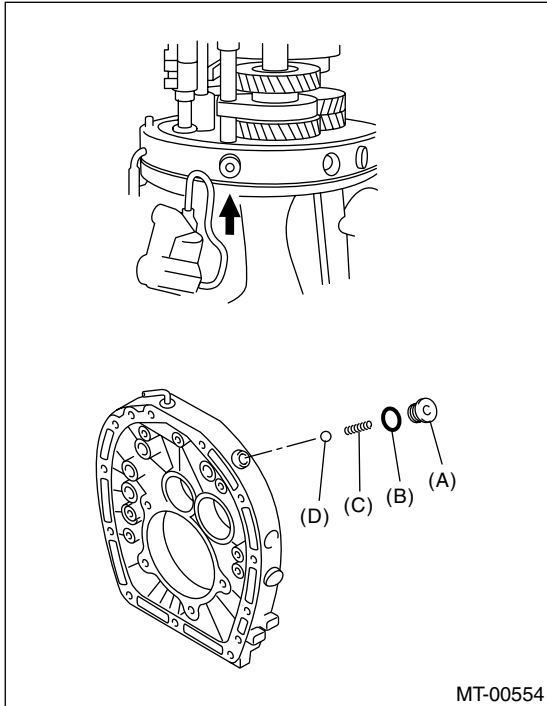
Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

11) Install the checking ball, checking spring, new gasket and checking plug.

Tightening torque:

37 N·m (3.8 kgf·m, 27.3 ft·lb)

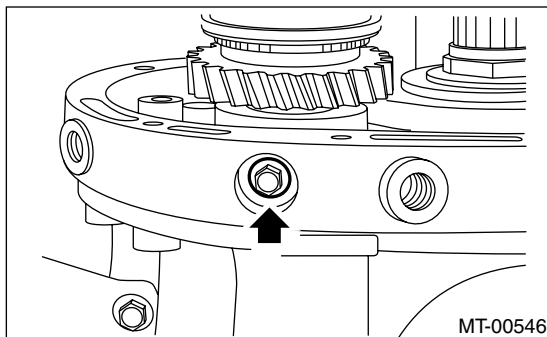


- (A) Checking plug
- (B) Gasket
- (C) Checking spring
- (D) Checking ball

12) Install the bolt and new gasket.

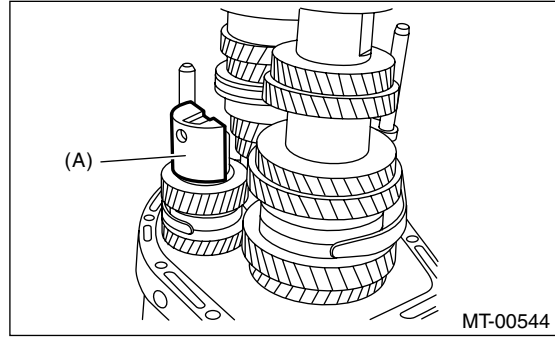
Tightening torque:

25 N·m (2.5 kgf·m, 18.1 ft·lb)



13) Using a screwdriver, shift to 4th gear position.

14) Install the reverse idler holder



(A) Reverse idler holder

15) Install the striking rod.

16) Install the transmission case. <Ref. to 6MT-67, INSTALLATION, Transmission Case.>

17) Install the selected main shaft snap ring and washer.

18) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>

19) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>

20) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>

21) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>

22) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.>, <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.>, <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>

23) Install the manual transmission assembly to vehicle. <Ref. to 6MT-38, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

NOTE:

Each sleeve and hub engage at a specified point. Mark an engagement point on the sleeve and hub before disassembly.

1) Secure the ST on workbench.

ST 18664AA000 BASE

2) Lift the caulking of lock nut.

3) Set the main shaft assembly on ST, then remove the lock nut and washer.

ST1 18665AA000 HOLDER

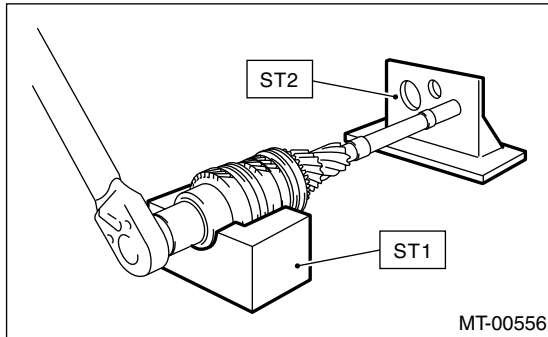
ST2 18664AA000 BASE

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

Use a 38 mm (1.50 in) socket wrench.



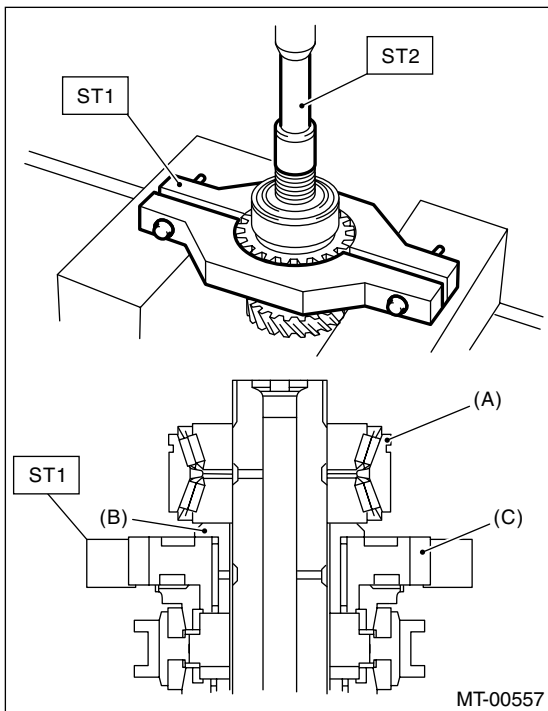
4) Remove the main shaft assembly from ST.

5) Set the ST1 on 6th drive gear, then remove the taper roller bearing, bush and 6th drive gear using press.

ST1 18722AA000 REMOVER
(TY856WX...model)

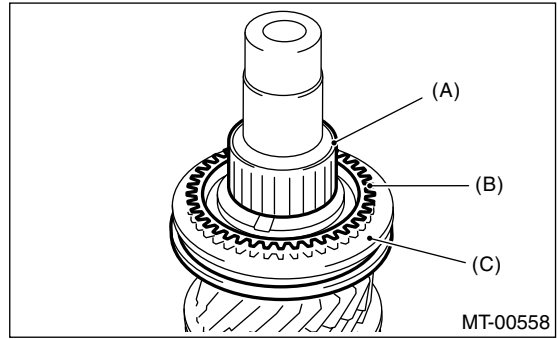
ST1 18722AA010 REMOVER
(TY856WN...model)

ST2 899864100 REMOVER



- (A) Taper roller bearing
- (B) Bush
- (C) 6th drive gear

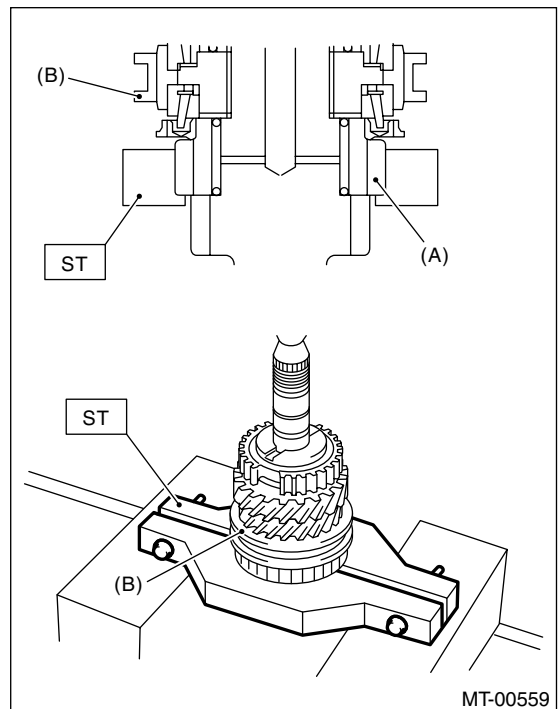
6) Remove the 5th-6th sleeve, 6th needle bearing and 6th baulk ring.



- (A) Needle bearing
- (B) 6th baulk ring
- (C) 5th-6th sleeve

7) Set the ST on 3rd drive gear, then remove each part using press.

ST 18720AA000 REMOVER



- (A) 3rd drive gear
- (B) 3rd-4th sleeve

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

D: ASSEMBLY

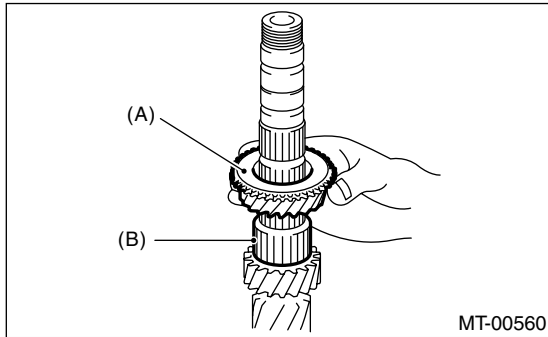
NOTE:

Replace the following parts as a set.

- Sleeve and hub
- Outer baulk ring, 3rd synchro cone and inner baulk ring
- Taper roller bearing

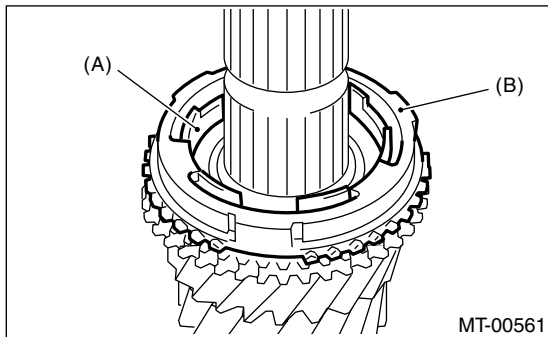
1) Sufficiently apply gear oil to the main shaft, 3rd needle bearing and inner periphery of 3rd drive gear.

2) Install the 3rd needle bearing and 3rd drive gear to main shaft.



- (A) 3rd needle bearing
(B) 3rd drive gear

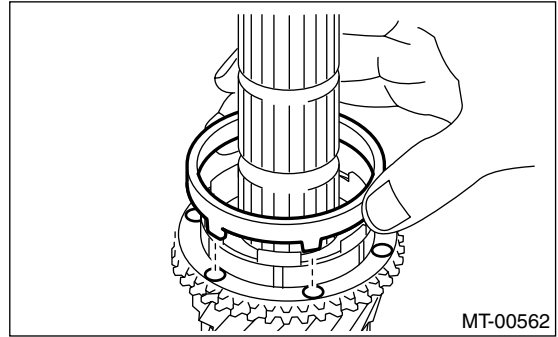
3) Install the inner baulk ring, 3rd synchro cone and outer baulk ring.



- (A) Inner baulk ring
(B) Outer baulk ring

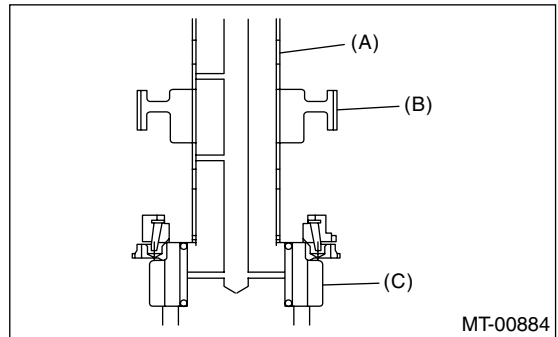
NOTE:

Install the 3rd synchro cone, by aligning protrusion portions of the 3rd synchro cone with 3rd drive gear hole portion.



4) Install the 3rd-4th hub and 4th bush.

(1) Set to the main shaft, taking care of 3rd-4th hub installing direction.

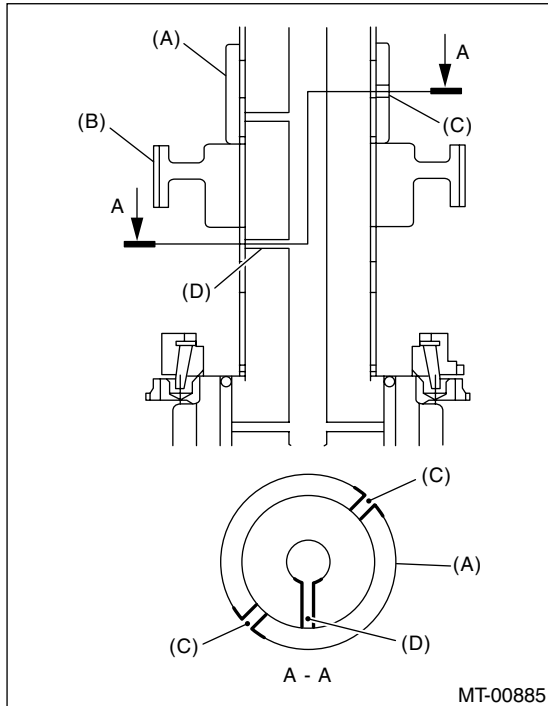


- (A) Main shaft
(B) 3rd-4th hub
(C) 3rd drive gear

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

(2) Set to the main shaft, taking care not to overlap the main shaft oil hole and 4th bush oil hole.



- (A) 4th bush
- (B) 3rd-4th hub
- (C) 4th bush oil hole
- (D) Main shaft oil hole

(3) Using the ST, press in the 3rd-4th hub and 4th bush at once.

ST1 18651AA000 INSTALLER

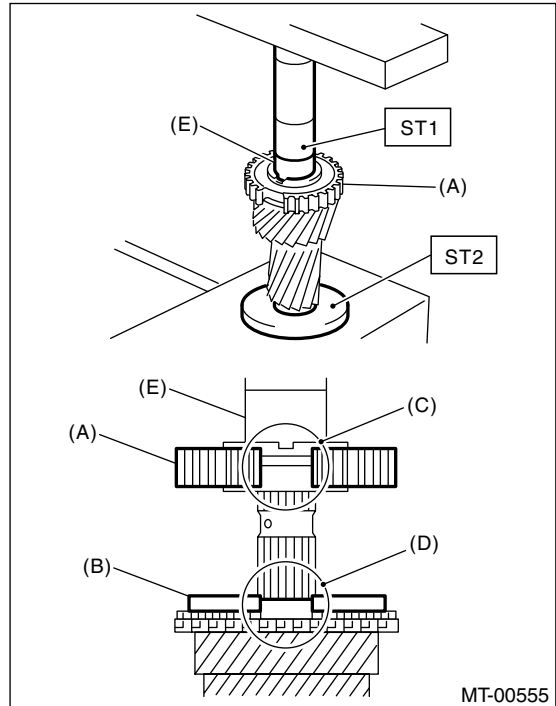
ST2 398177700 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:

When pressing in 3rd-4th hub and 4th bush, align the protrusion portion of outer baulk ring and cutout portion of 3rd-4th bush by moving the outer baulk ring.



- (A) 3rd-4th hub
- (B) Outer baulk ring
- (C) Cutout portion of 3rd-4th hub
- (D) Protrusion portion of outer baulk ring
- (E) 4th bush

5) Make sure the 3rd drive gear is smoothly turned by hand. If not, reassemble.

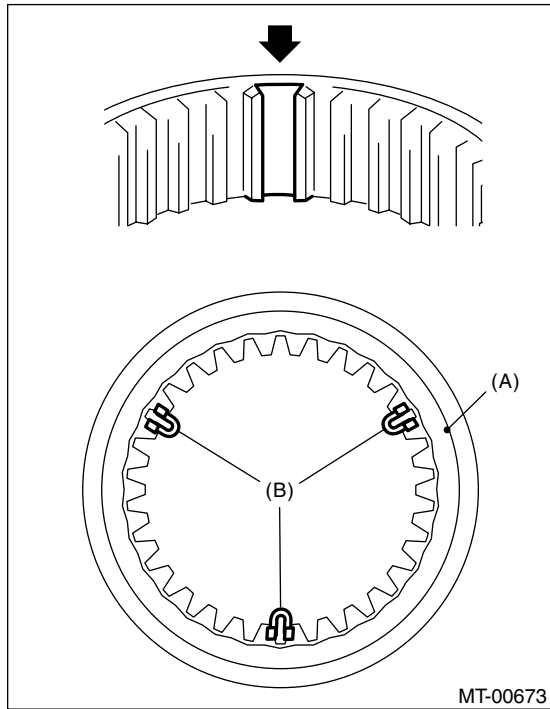
Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

6) Install the 3rd-4th shifting insert key in proper place of 3rd-4th sleeve.

NOTE:

Angle of each shifting insert key is 120° apart.

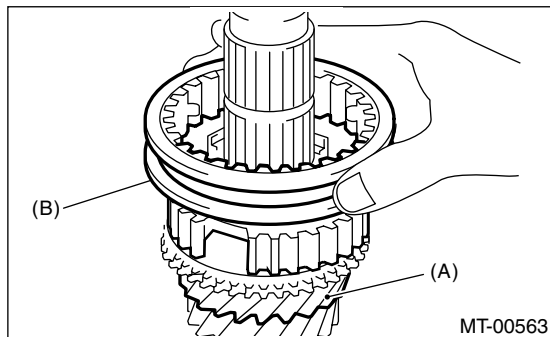


- (A) 3rd-4th sleeve
- (B) 3rd-4th shifting insert key

7) Install the 3rd-4th sleeve to 3rd-4th hub.

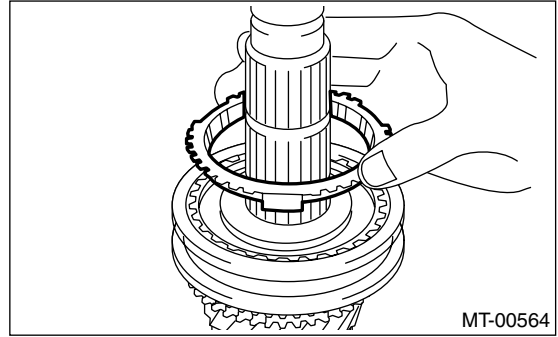
NOTE:

- 3rd-4th sleeve has a groove for identification.
- Install the 3rd-4th sleeve with groove facing to 3rd drive gear side.



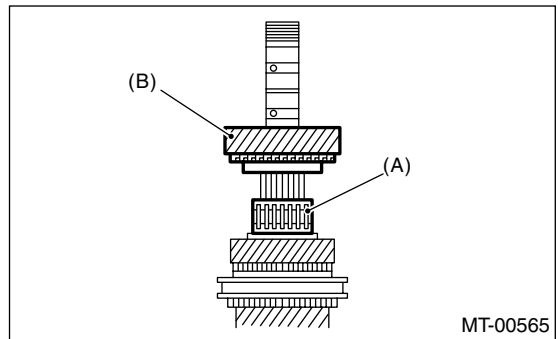
- (A) 3rd drive gear
- (B) Groove (1) for identification of 3rd-4th sleeve

8) Install the 4th baulk ring.



9) Sufficiently apply gear oil to the main shaft, 4th needle bearing and inner periphery of 4th drive gear.

10) Install the 4th needle bearing and 4th drive gear.



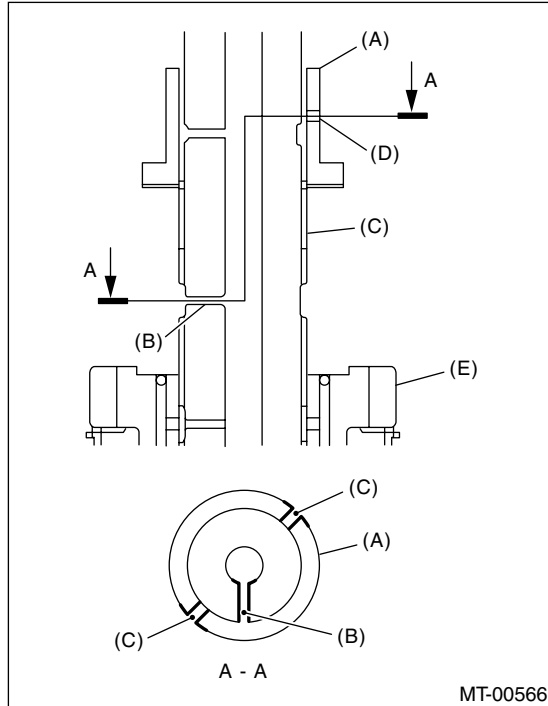
- (A) 4th needle bearing
- (B) 4th drive gear

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

11) Install the 5th bush.

(1) Set to the main shaft, taking care not to overlap the main shaft oil hole and 5th bush oil hole.



- (A) 5th bush
- (B) Main shaft oil hole
- (C) Main shaft
- (D) 5th bush oil hole
- (E) 4th drive gear

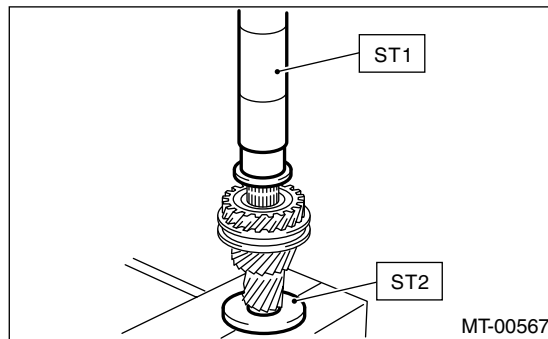
(2) Using the ST, press in the 5th bush.

ST1 18651AA000 INSTALLER

ST2 398177700 INSTALLER

CAUTION:

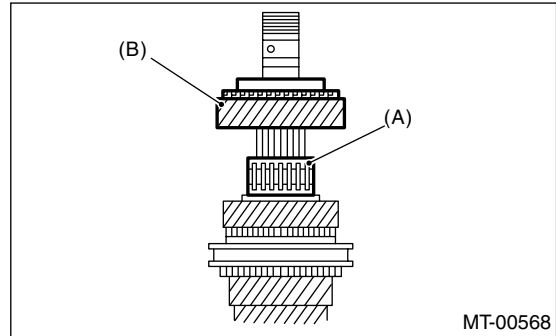
Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).



12) Make sure the 4th drive gear is smoothly turned by hand. If not, reassemble.

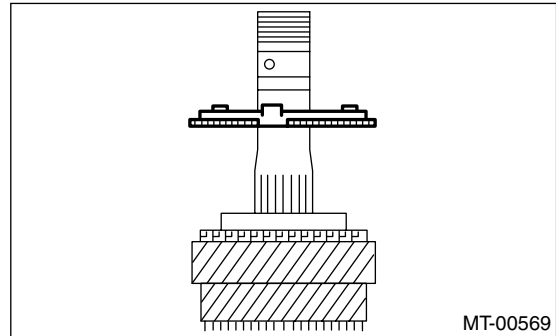
13) Sufficiently apply gear oil to the main shaft, 5th needle bearing and inner periphery of 5th drive gear.

14) Install the 5th needle bearing and 5th drive gear.



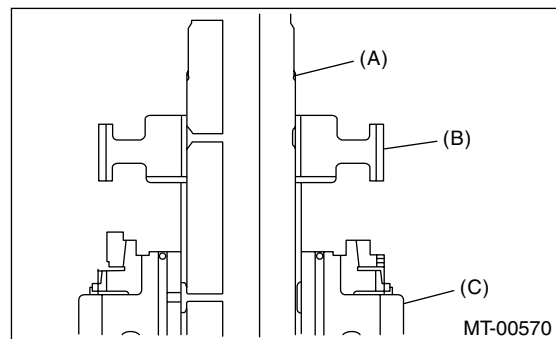
- (A) 5th needle bearing
- (B) 5th drive gear

15) Install the 5th baulk ring.



16) Install the 5th-6th hub.

(1) Set to the main shaft, taking care of 5th-6th hub installing direction.



- (A) Main shaft
- (B) 5th-6th hub
- (C) 5th drive gear

(2) Using the ST, press in the 5th-6th hub.

ST1 18651AA000 INSTALLER

ST2 398177700 INSTALLER

CAUTION:

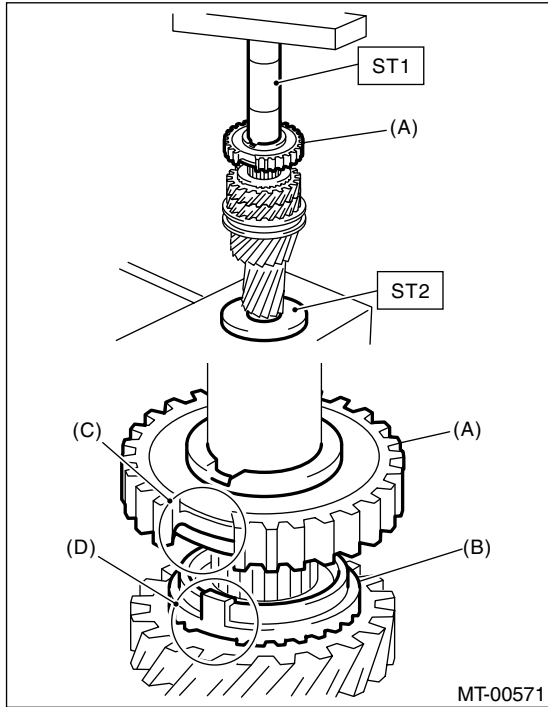
Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

When pressing in 5th-6th hub, align the protrusion portion of outer baulk ring and cutout portion of 5th-6th bush by moving the outer baulk ring.



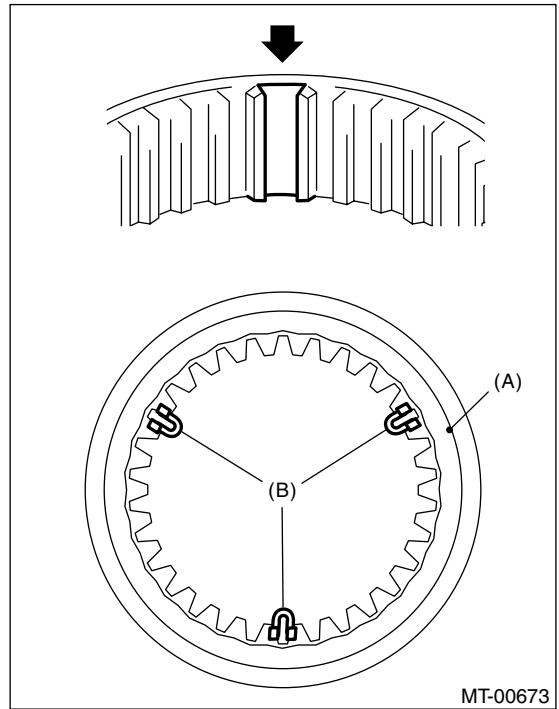
- (A) 5th-6th hub
- (B) Outer baulk ring
- (C) Cutout portion of 5th-6th hub
- (D) Protrusion portion of outer baulk ring

17) Make sure the 5th drive gear is smoothly turned by hand. If not, reassemble.

18) Install the 5th-6th shifting insert key in proper place of 5th-6th sleeve.

NOTE:

Angle of each shifting insert key is 120° apart.

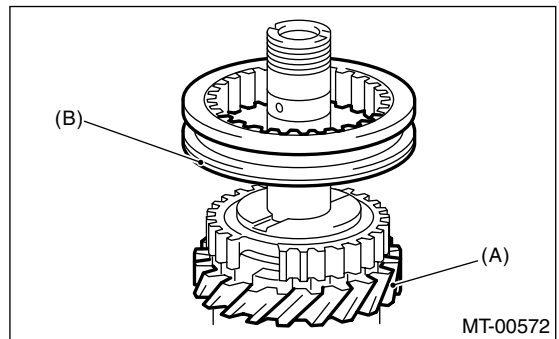


- (A) 5th-6th sleeve
- (B) Shifting insert key

19) Install the 5th-6th sleeve to 5th-6th hub.

NOTE:

- 5th-6th sleeve has two grooves for identification.
- Install the 5th-6th sleeve with the groove facing to 5th drive gear side.

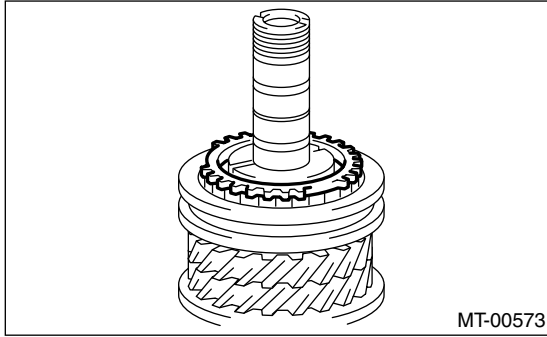


- (A) 5th drive gear
- (B) Groove (2) for identification of 5th-6th sleeve

Main Shaft Assembly

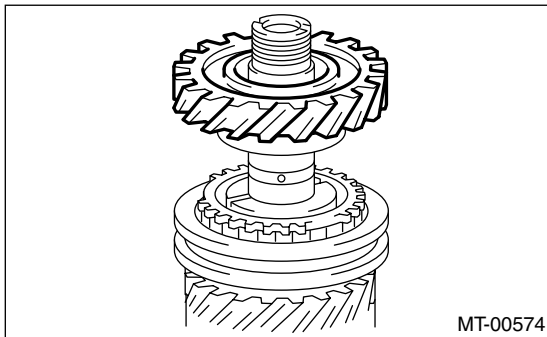
MANUAL TRANSMISSION AND DIFFERENTIAL

20) Install the 6th baulk ring.

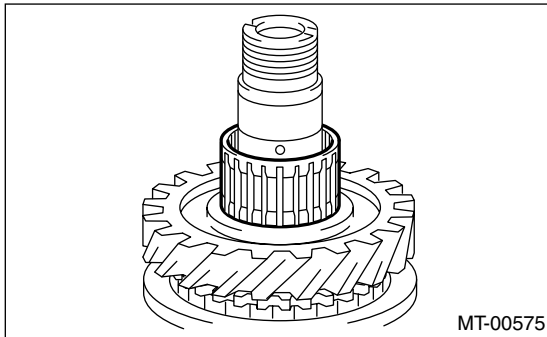


21) Sufficiently apply gear oil to the main shaft, 6th needle bearing and inner periphery of 6th drive gear.

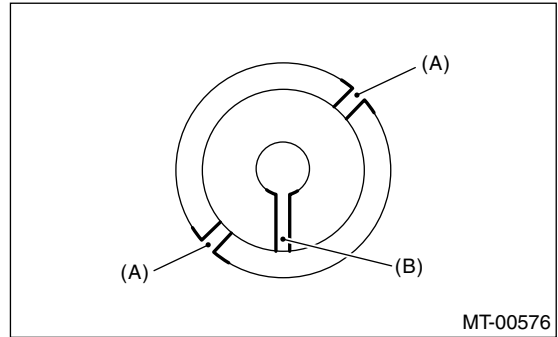
22) Install the 6th drive gear.



23) Install the 6th needle bearing.



24) Set the 6th bush to main shaft, taking care not to overlap the 6th bush oil hole and main shaft oil hole.



(A) 6th bush oil hole

(B) Main shaft oil hole

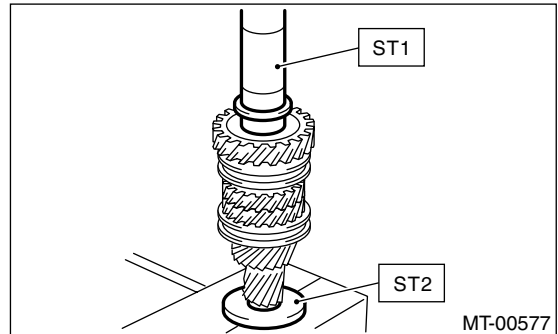
25) Using the ST, install the 6th bush.

ST1 18651AA000 INSTALLER

ST2 398177700 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).



26) Make sure the 6th drive gear is smoothly turned by hand. If not, reassemble.

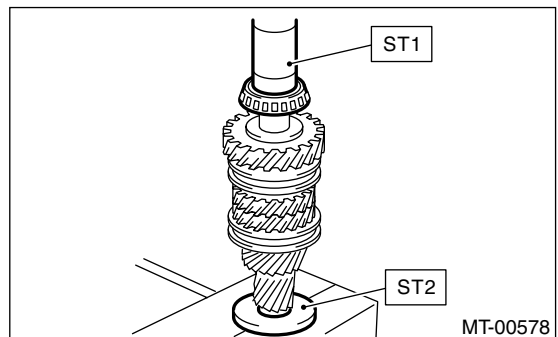
27) Using the ST, install the inner bearing inner race.

ST1 18651AA000 INSTALLER

ST2 398177700 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).



Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

28) Using the ST, install the retainer and outer bearing inner race.

ST1 18651AA000 INSTALLER

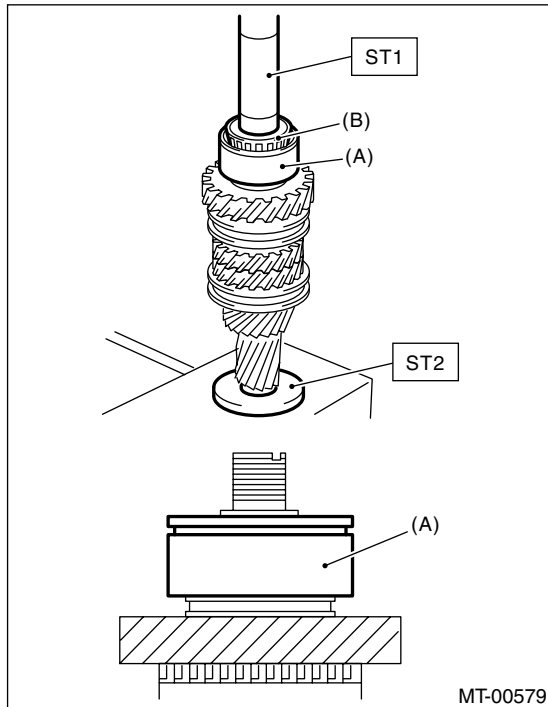
ST2 398177700 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:

- Make sure to install the retainer in proper direction.
- Press in until there is no backlash in retainer and where bearing is smoothly turned by hand.



(A) Retainer

(B) Outer bearing inner race

29) Make sure the taper roller bearing is smoothly turned by hand. If not, replace the taper roller bearing as a set and reassemble.

30) Install the lock washer and new lock nut.

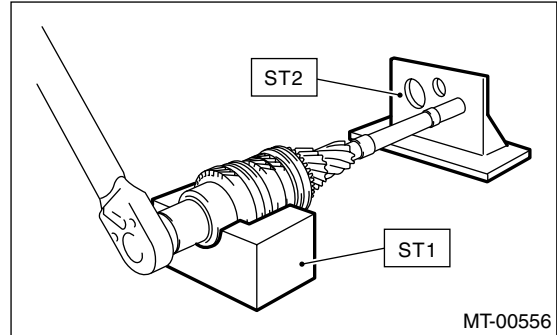
31) Set the main shaft assembly to ST, then tighten the lock nut.

ST1 18665AA000 HOLDER

ST2 18664AA000 BASE

Tightening torque:

392 N·m (40.0 kgf·m, 289 ft·lb)

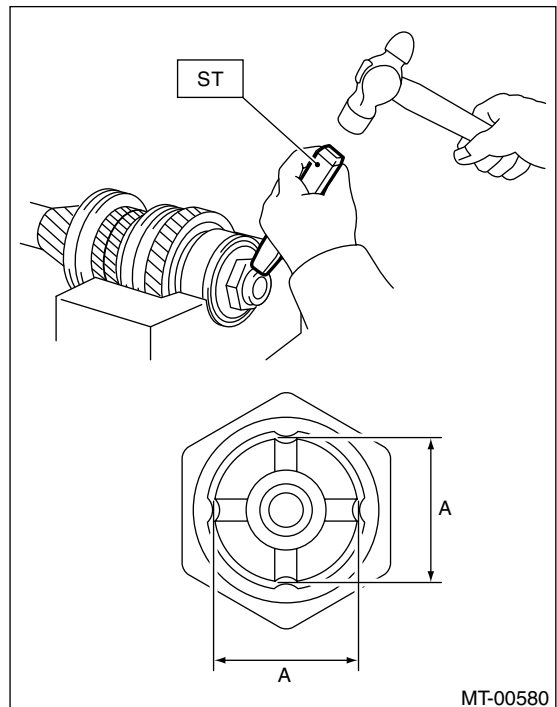


32) Using the ST, caulk four portions on the lock nut to obtain dimension A 27 ± 0.3 mm (1.06 ± 0.01 in).

ST 18668AA000 PUNCH

NOTE:

Do not crack the caulking part of lock nut.



Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

E: INSPECTION

Disassembled parts should be washed clean first and then inspected carefully.

1) Bearing

Replace the bearings in the following cases.

- Worn, rusted and damaged bearing
- Bearings that fail to turn smoothly or make abnormal noise when turned
- Bearings having other defects

2) Bushing (each gear)

Replace the bushings in the following case.

- When the sliding surface is damaged or abnormally worn.

3) Gears

Replace the gears in the following cases.

- Gear teeth surfaces are broken or excessively worn.
- Parts that contact the baulk ring is damaged.
- The inner surface of gear is damaged.

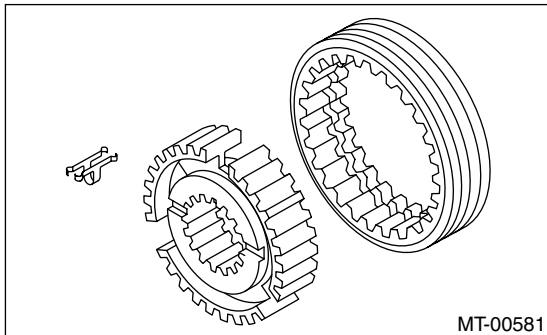
4) Baulk ring, synchro cone

Replace the baulk ring and synchro cone in the following case.

- Worn, rusted and damaged baulk ring

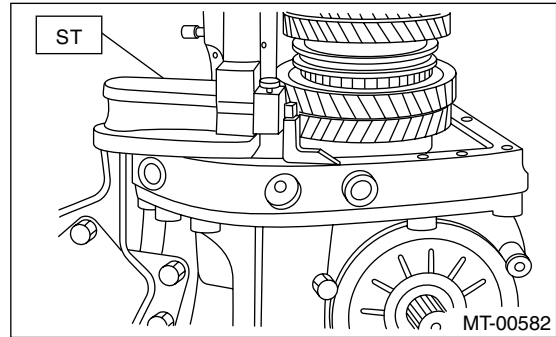
5) Shifting insert key

Replace the shifting insert key if deformed, excessively worn or defective in any way.



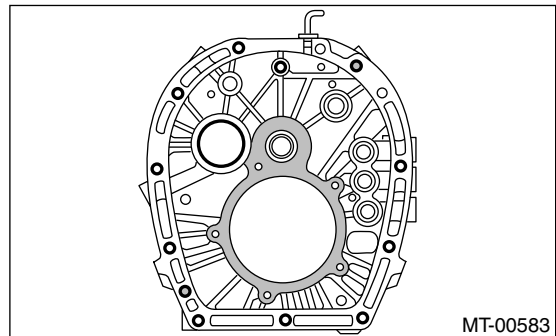
2) Set the height gauge to adapter plate. Lower the indicator of height gauge to mating surface of adapter plate and case, then set to zero point.

ST 18853AA000 HEIGHT GAUGE



NOTE:

- Remove the remaining gasket on edge surface with scraper, since the adapter plate is base point of measurement.
- Do not place the height gauge on shaded area in the figure during measurement.



F: ADJUSTMENT

1. SELECTION OF MAIN SHAFT SNAP RING AND WASHER

NOTE:

Perform the following procedures when.

- Replacing the 1st to 6th driven gear.
- Replacing the 1st and 2nd synchro ring assembly.
- Replacing the ball bearing.
- Replacing the adapter plate.
- Replacing the driven shaft.

1) Insert the drive pinion assembly in adapter plate.

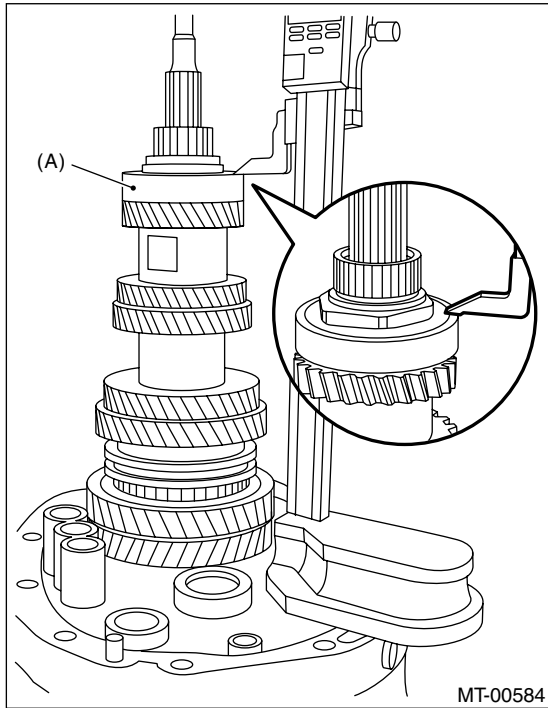
NOTE:

Make sure the thrust bearing outer race is not removed and drive pinion is not lift-up.

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

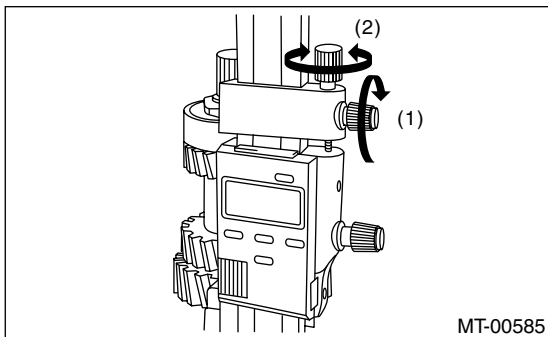
3) Measure the height to edge surface of ball bearing (height A1).



(A) Ball bearing

NOTE:

Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of bearing.



Measure five points of the ball bearing turning every approx. 120°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.

4) According to measurement value, select the snap ring and washer from the following table.

Snap ring

A1: mm (in)	Part No.	Thickness: mm (in)
270.83 — 271.40 (10.66 — 10.69)	805072010	1.65 (0.065)
271.41 — 271.98 (10.69 — 10.71)	805072011	1.95 (0.077)
271.99 — 272.56 (10.71 — 10.73)	805072012	2.25 (0.089)

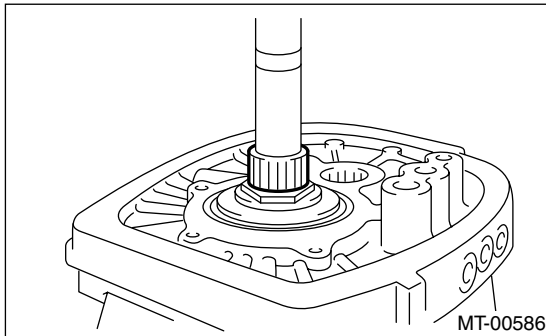
Washer

A1: mm (in)	Part No.	Thickness: mm (in)
270.83 — 271.40 (10.66 — 10.69)	803067012	1.6 (0.063)
271.41 — 271.98 (10.69 — 10.71)	803067011	1.3 (0.051)
271.99 — 272.56 (10.71 — 10.73)	803067010	1.0 (0.039)

20. Driven Gear Assembly

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-36, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.>, <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.>, <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-66, REMOVAL, Transmission Case.>
- 9) Remove the driven gear assembly. <Ref. to 6MT-71, REMOVAL, Main Shaft Assembly.>
- 10) Remove the 1st needle bearing.



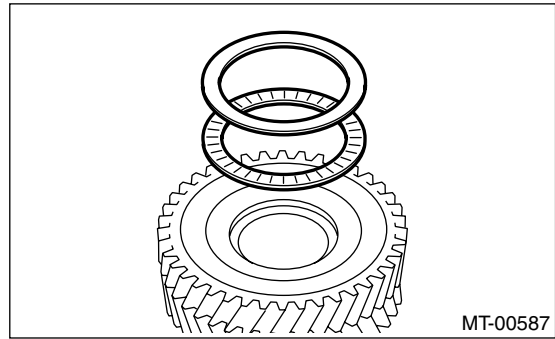
- 11) Remove the thrust needle bearing.

B: INSTALLATION

- 1) Adjust the main shaft snap ring. <Ref. to 6MT-83, ADJUSTMENT, Main Shaft Assembly.>
- 2) Adjust the 1st-2nd shifter rod. <Ref. to 6MT-116, ADJUSTMENT, Shifter Fork and Rod.>
- 3) Install the thrust needle bearing.

NOTE:

Make sure to install the thrust needle bearing in proper direction.



- 4) Install the 1st needle bearing.
- 5) Install the driven gear assembly. <Ref. to 6MT-71, INSTALLATION, Main Shaft Assembly.>
- 6) Install the transmission case. <Ref. to 6MT-67, INSTALLATION, Transmission Case.>
- 7) Adjust backlash at axial direction of driven gear assembly. <Ref. to 6MT-92, ADJUSTMENT, Driven Gear Assembly.>
- 8) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>
- 9) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>
- 10) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>
- 11) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 12) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.>, <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.>, <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>
- 13) Install the manual transmission assembly to vehicle. <Ref. to 6MT-38, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

NOTE:

Each sleeve and hub engage at a specified point. Mark an engagement point on the sleeve and hub before disassembly.

- 1) Secure the ST on workbench.
ST 18664AA000 BASE
- 2) Lift the caulking of lock nut.

Driven Gear Assembly

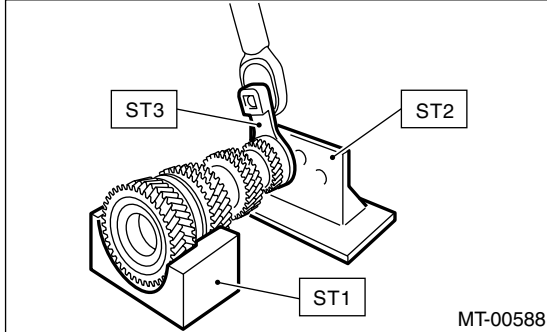
MANUAL TRANSMISSION AND DIFFERENTIAL

3) Install the ST3 to lock nut, set the driven gear assembly on ST, then remove the lock nut and washer.

ST1 18666AA000 HOLDER

ST2 18664AA000 BASE

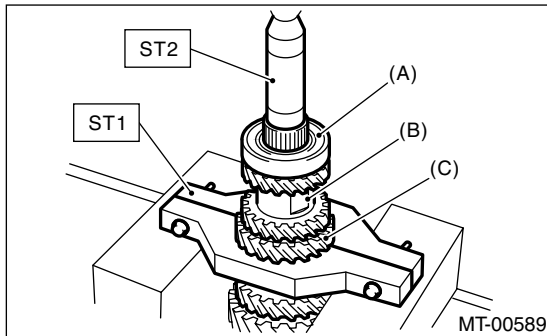
ST3 18620AA000 ADAPTER WRENCH



4) Install the ST1 to 4th gear, then remove the ball bearing, 5th-6th driven gear and 3rd-4th driven gear.

ST1 18723AA000 REMOVER

ST2 499877000 REMOVER

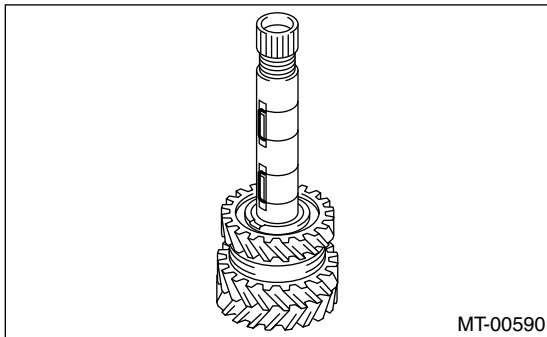


(A) Ball bearing

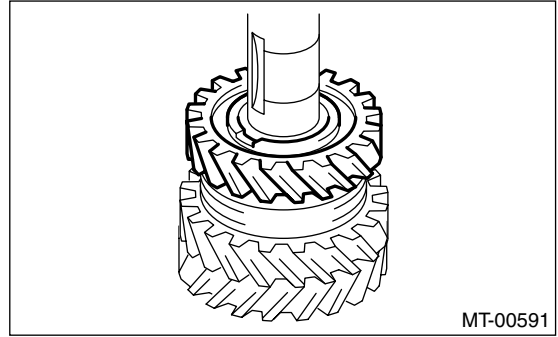
(B) 5th-6th driven gear

(C) 3rd-4th driven gear

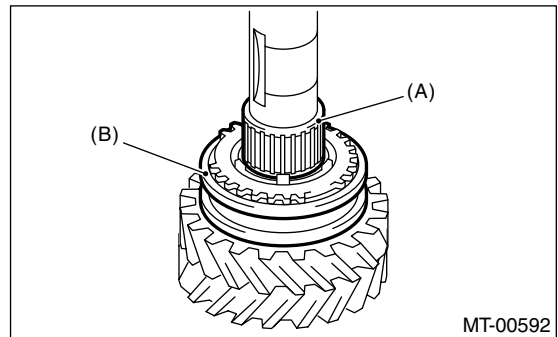
5) Remove the driven gear key.



6) Remove the 2nd gear.



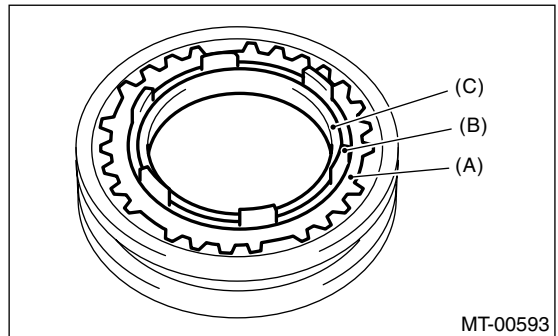
7) Remove the needle bearing and 1st-2nd sleeve.



(A) Needle bearing

(B) 1st-2nd sleeve

8) Remove the outer baulk ring, 2nd synchro cone and inner baulk ring.



(A) Outer baulk ring

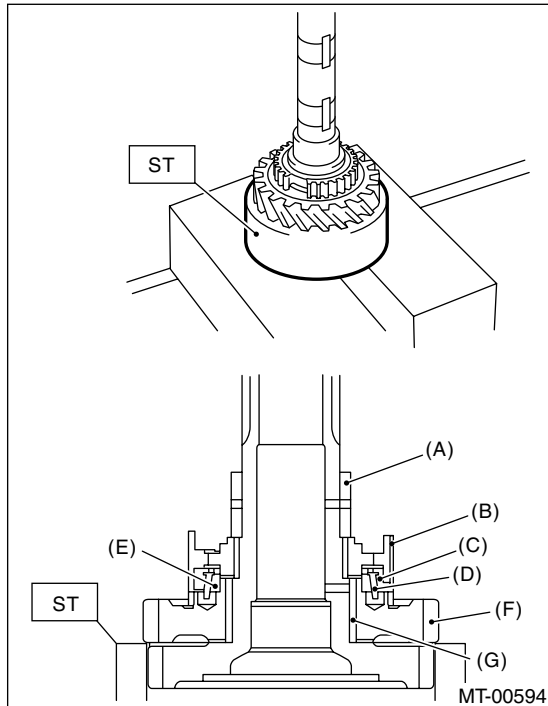
(B) 2nd synchro cone

(C) Inner baulk ring

Driven Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

9) Using the ST, remove each parts.
ST 18754AA000 REMOVER



- (A) 2nd bush
- (B) 1st-2nd hub
- (C) Outer baulk ring
- (D) 1st synchro cone
- (E) Inner baulk ring
- (F) 1st driven gear
- (G) 1st needle bearing

D: ASSEMBLY

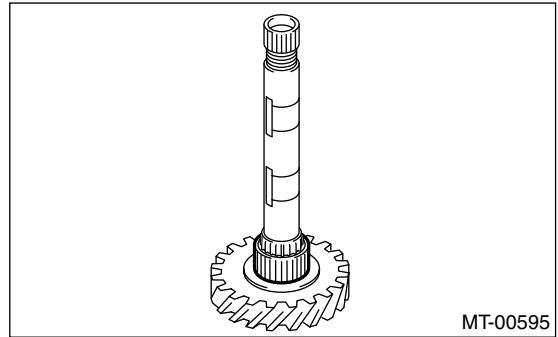
NOTE:

Replace the following parts as a set.

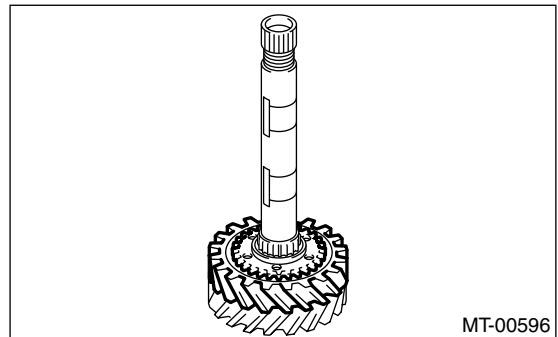
- Sleeve and hub
- Outer baulk ring, 1st synchro cone, inner baulk ring
- Outer baulk ring, 2nd synchro cone, inner baulk ring

1) Sufficiently apply gear oil to the drive shaft, 1st needle bearing and inner periphery of 1st driven gear.

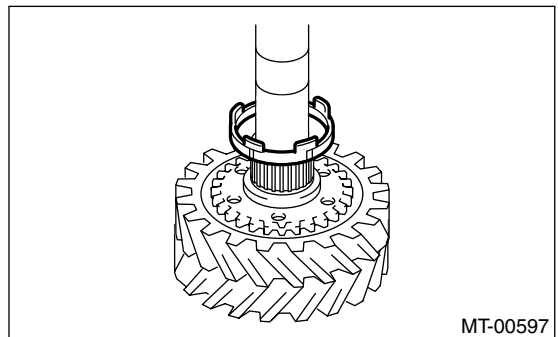
2) Install the 1st needle bearing.



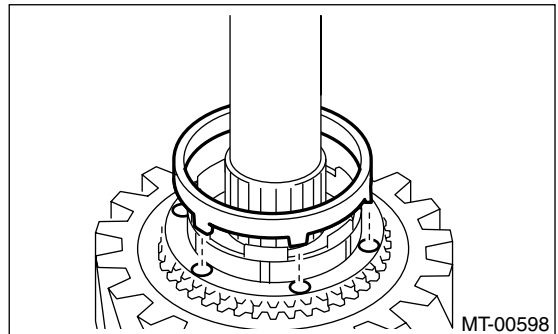
3) Install the 1st driven gear to driven shaft.



4) Install the inner baulk ring.



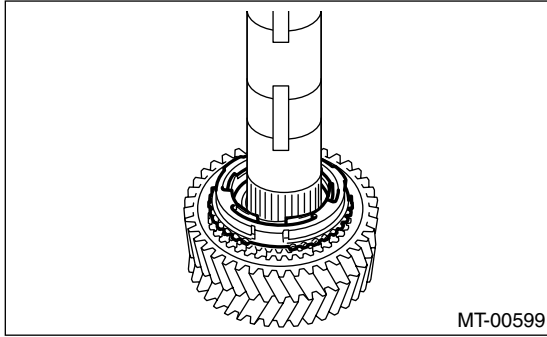
5) Align protrusion portions of the 1st synchro cone to the holes of 1st drive gear to install.



Driven Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

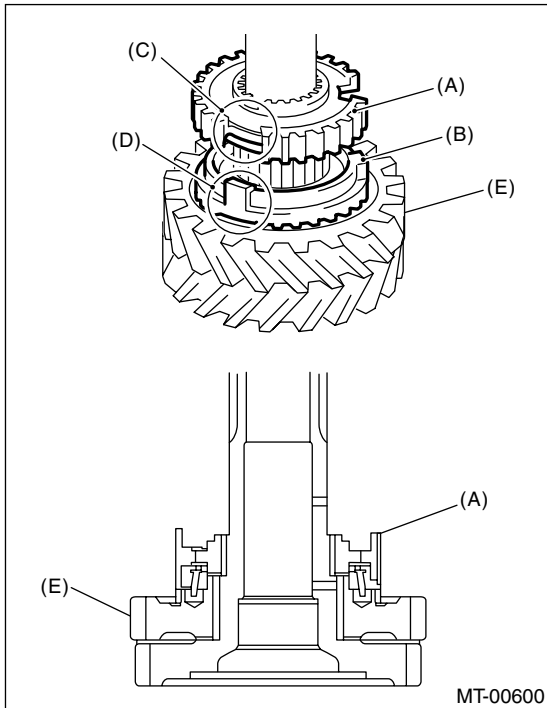
6) Install the outer baulk ring.



7) Install the 1st-2nd hub.

NOTE:

- Align the protrusion portion of outer baulk ring and cutout portion of 1st-2nd hub, then install.
- Make sure to install the 1st-2nd hub in proper direction.

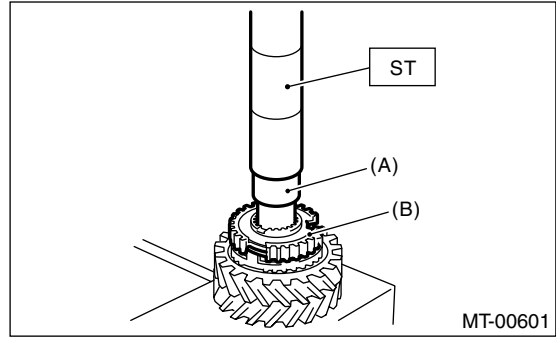


- (A) 1st-2nd hub
- (B) Outer baulk ring
- (C) Cutout portion of 1st-2nd hub
- (D) Protrusion portion of outer baulk ring
- (E) 1st driven gear

8) Using the ST, install the 2nd hub.
ST 18654AA000 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).



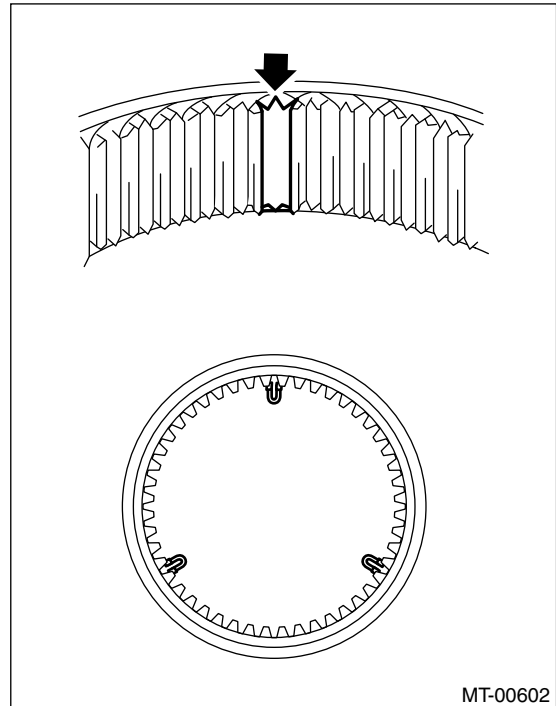
- (A) 2nd bush
- (B) 1st-2nd hub

9) Make sure the 1st drive gear is smoothly turned by hand. If not, reassemble.

10) Install the shifting insert key in proper place of 1st-2nd sleeve.

NOTE:

Angle of each shifting insert key is 120° apart.



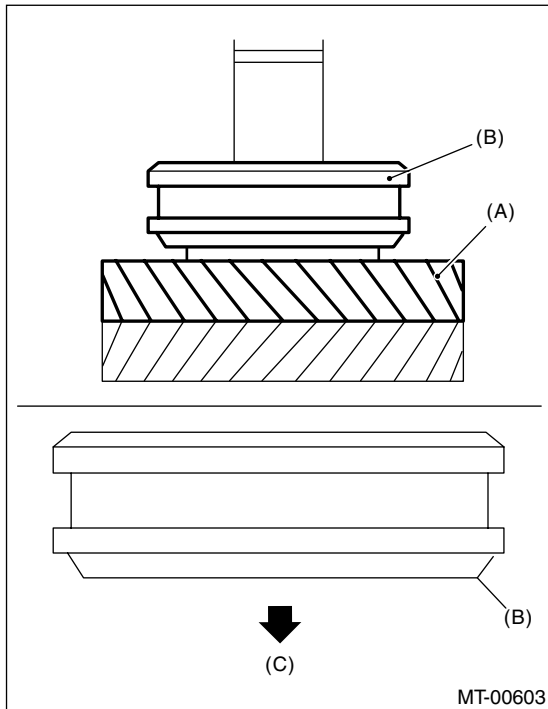
Driven Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

11) Install the 1st-2nd sleeve to 1st-2nd hub.

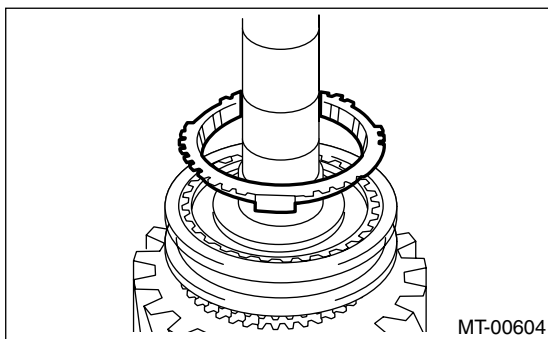
NOTE:

Make sure to install the 1st-2nd sleeve in proper direction.

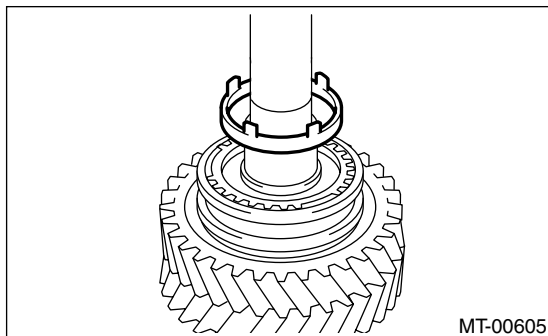


- (A) 1st driven gear
- (B) 1st-2nd sleeve
- (C) 1st driven gear side

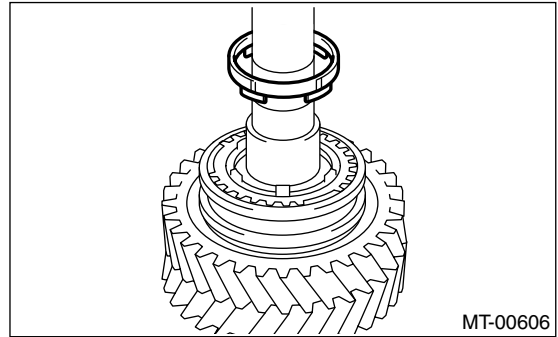
12) Install the outer baulk ring.



13) Install the 2nd synchro cone.



14) Install the inner baulk ring.

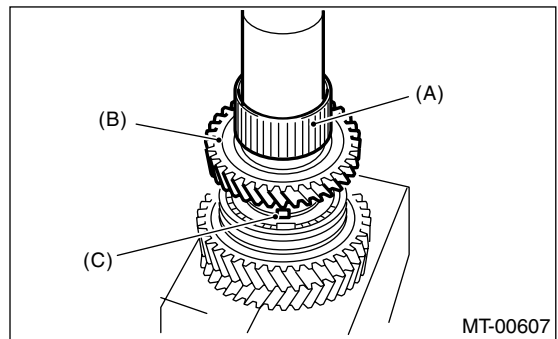


15) Sufficiently apply gear oil to the bush, 2nd needle bearing and inner periphery of 2nd drive gear.

16) Install the 2nd needle bearing and 2nd driven gear.

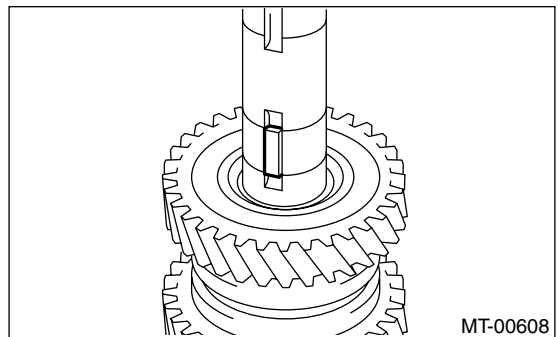
NOTE:

Align the protrusion portion of 2nd synchro cone with 2nd driven gear hole, then install.



- (A) 2nd needle bearing
- (B) 2nd driven gear
- (C) Protrusion portion of 2nd synchro cone

17) Install the key.



Driven Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

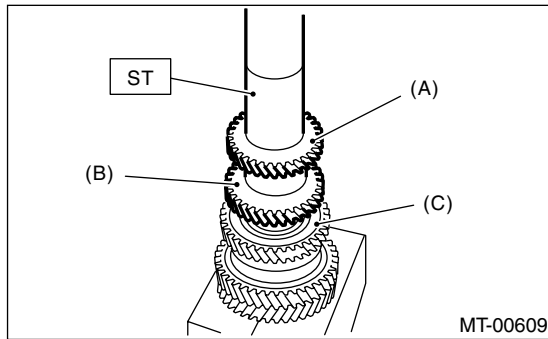
18) Using the ST, install the 3rd-4th driven gear.
ST 18654AA000 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:

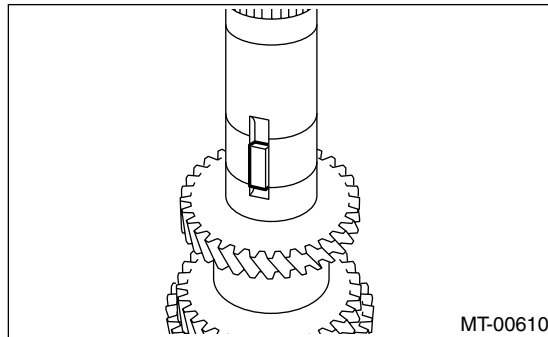
- Make sure to install the 3rd-4th driven gear in proper direction.
- Align the groove of 3rd-4th driven gear with key.



- (A) 4th gear
- (B) 3rd gear
- (C) 2nd gear

19) Make sure the 2nd driven gear is smoothly turned by hand. If not, reassemble.

20) Install the key.



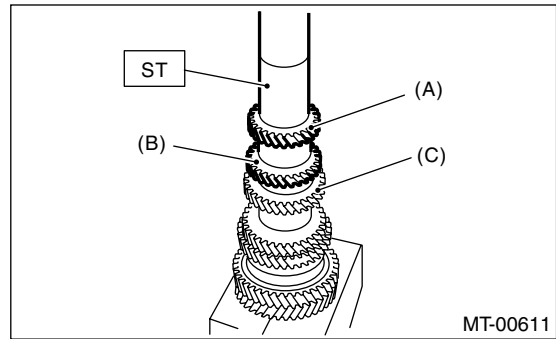
21) Using the ST, install the 5th-6th driven gear.
ST 18654AA000 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:

- Make sure to install the 5th-6th driven gear in proper direction.
- Align the groove of 5th-6th driven gear with key.



- (A) 6th gear
- (B) 5th gear
- (C) 4th gear

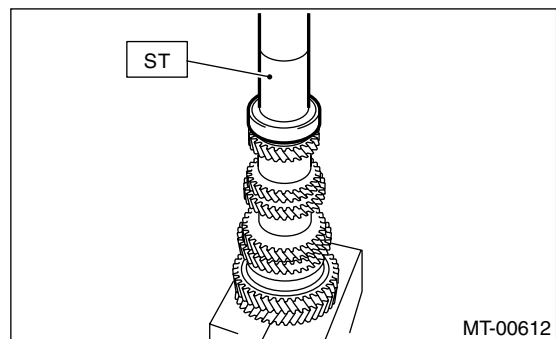
22) Using the ST, install the ball bearing.
ST 18654AA000 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:

Make sure to install the ball bearing in proper direction.



23) Make sure the ball bearing is smoothly turned by hand. If not, reassemble.

24) Install a new lock nut.

Driven Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

25) Install the ST3 to lock nut, then install the ST to driven gear assembly and tighten lock nut.

ST1 18666AA000 HOLDER

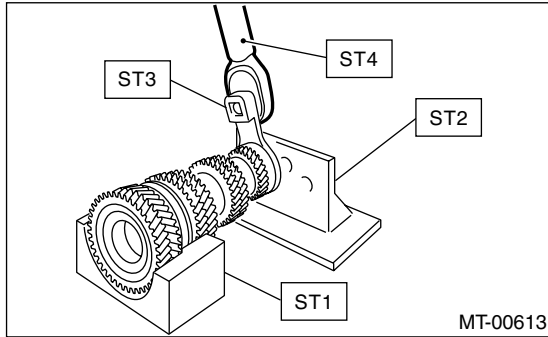
ST2 18664AA000 BASE

ST3 18620AA000 ADAPTER WRENCH

ST4 18852AA000 TORQUE WRENCH

Tightening torque:

530 N·m (54.0 kgf·m, 391 ft·lb)



NOTE:

If torque wrench except ST4 is used, calculate the following equation, then tighten the lock nut.

$$T = L1 / (0.1 + L1) \times 570$$

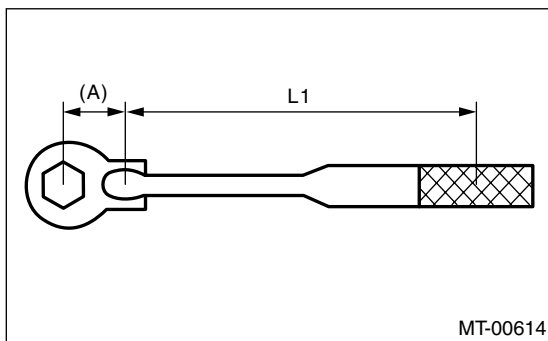
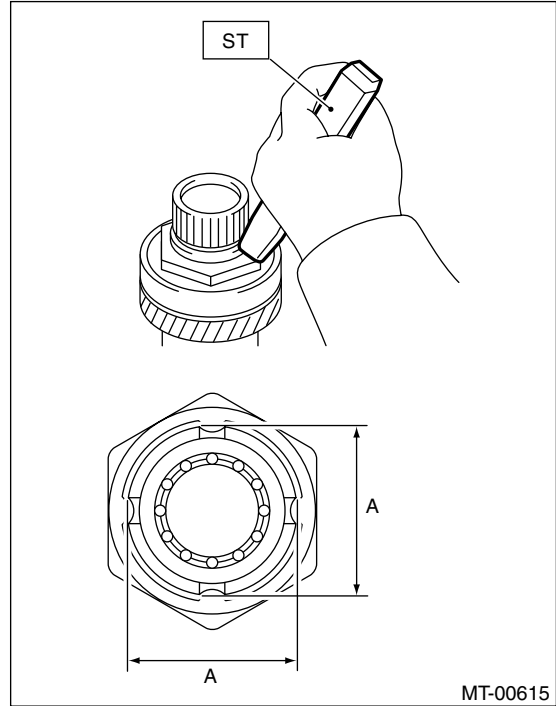
T	N·m (kgf·m, ft·lb)	Setting value of torque wrench
L1	m (in)	Torque wrench length
0.1 m (3.94 in)		ST length
570 N·m (58.1 kgf·m, 420 ft·lb)		Tightening torque of lock nut

26) Using the ST, caulk four portions on the lock nut to obtain dimension A 44 ± 0.5 mm (1.73 ± 0.02 in).

ST1 18669AA000 PUNCH DRIVEN SHAFT

NOTE:

Do not crack the caulking part of lock nut.



(A) 0.1 m (3.94 in)

Driven Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

E: INSPECTION

Disassembled parts should be washed clean first and then inspected carefully.

1) Bearing

Replace the bearings in the following cases.

- Worn, rusted and damaged bearing
- Bearings that fail to turn smoothly or make abnormal noise when turned
- Bearings having other defects

2) Bushing (each gear)

Replace the bushings in the following case.

- When the sliding surface is damaged or abnormally worn.

3) Gears

Replace the gears in the following cases.

- Gear teeth surfaces are broken or excessively worn.
- Parts that contact the baulk ring is damaged.
- The inner surface of gear is damaged.

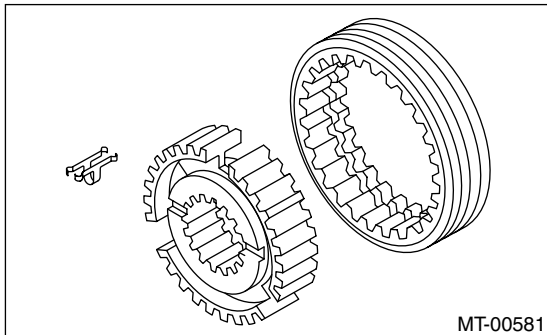
4) Baulk ring, synchro cone

Replace the baulk ring and synchro cone in the following case:

- Worn, rusted and damaged baulk ring

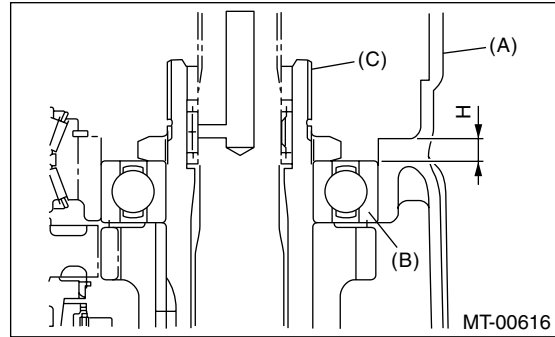
5) Shifting insert key

Replace the shifting insert key if deformed, excessively worn or defective in any way.



F: ADJUSTMENT

1) Measure length "H", which is from transmission case and oil pump cover mating surface to ball bearing edge.



- (A) Transmission case
- (B) Ball bearing
- (C) Driven gear assembly

2) Using the following equation, calculate the washer thickness of driven gear assembly.

$$T = H - \{5.8 \pm 0.05 \text{ mm (} 0.23 \pm 0.002 \text{ in)}\} - \{0.1 \text{ to } 0.3 \text{ mm (} 0.0039 \text{ to } 0.0118 \text{ in)}\}$$

t	Thickness of washer
H	Length from transmission case and oil pump cover mating surface to ball bearing edge
5.8±0.05 mm (0.23±0.002 in)	Thickness of collar
0.1 to 0.3 mm (0.0039 to 0.0118 in)	Backlash specification at axial direction of driven gear assembly

3) Select 0 to 3 washers from the following table to adjust backlash closest to specification.

Backlash specification at axial direction of driven gear assembly:

$$0.1 - 0.3 \text{ mm (} 0.0039 - 0.0118 \text{ in)}$$

Washer	
Part No.	Thickness t mm (in)
803072030	0.15 (0.0059)
803072031	0.30 (0.0118)
803072032	0.45 (0.0177)
803072033	0.60 (0.0236)

Reverse Idler Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

21.Reverse Idler Gear Assembly

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-36, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.>, <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.>, <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-66, REMOVAL, Transmission Case.>
- 9) Remove the reverse idler gear assembly. <Ref. to 6MT-71, REMOVAL, Main Shaft Assembly.>

B: INSTALLATION

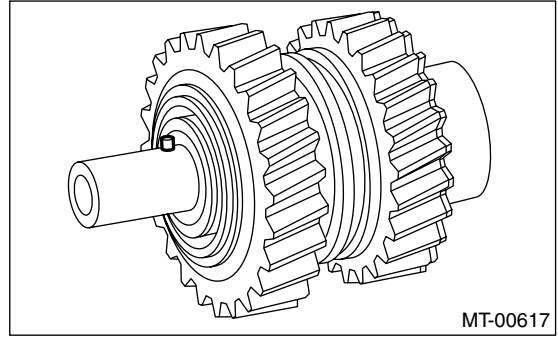
- 1) Select the reverse fork rod. <Ref. to 6MT-116, ADJUSTMENT, Shifter Fork and Rod.>
- 2) Install the reverse idler gear assembly. <Ref. to 6MT-71, INSTALLATION, Main Shaft Assembly.>
- 3) Install the transmission case. <Ref. to 6MT-67, INSTALLATION, Transmission Case.>
- 4) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>
- 5) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>
- 6) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>
- 7) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 8) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.>, <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.>, <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>
- 9) Install the manual transmission assembly to vehicle. <Ref. to 6MT-38, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

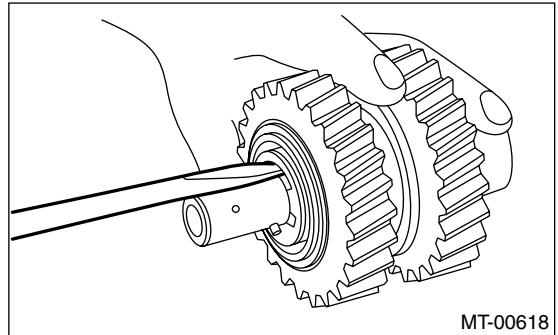
NOTE:

The sleeve and reverse gear engage at a specified point. Mark an engagement point on the sleeve and hub before disassembly.

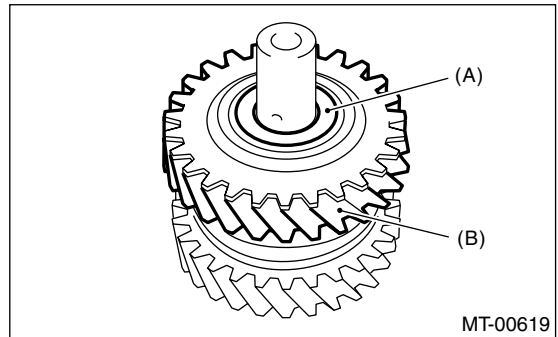
- 1) Remove the spring pin.



- 2) Remove the snap ring.

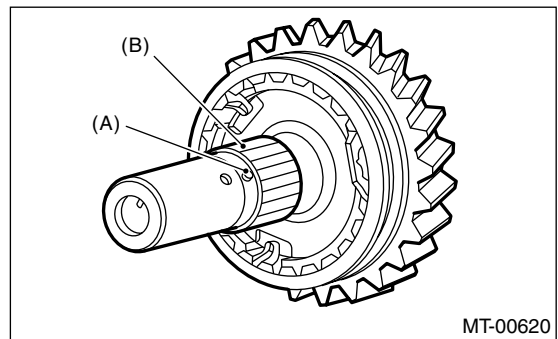


- 3) Remove the washer and reverse idler gear.



- (A) Washer
(B) Reverse idler gear

- 4) Remove the knock pin and reverse idler gear needle bearing.



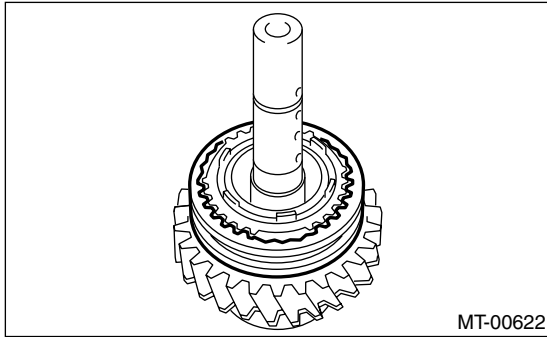
- (A) Knock pin
(B) Reverse idler gear needle bearing

Reverse Idler Gear Assembly

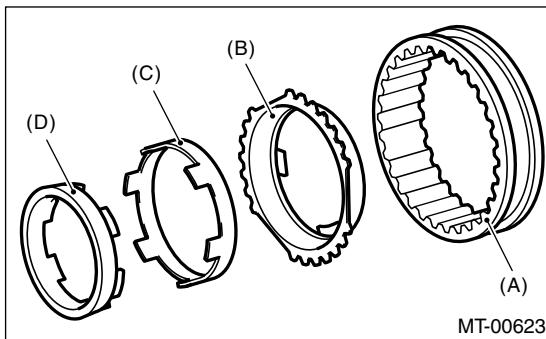
MANUAL TRANSMISSION AND DIFFERENTIAL

5) Remove the collar.

6) Remove the reverse sleeve.

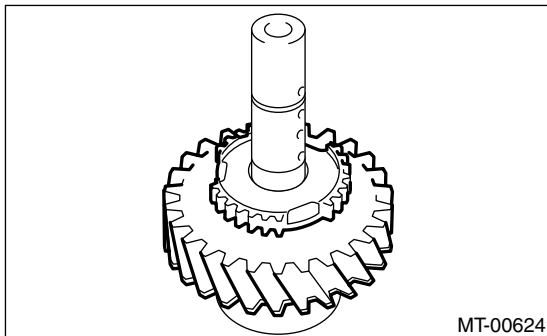


7) Remove the outer baulk ring, reverse synchro cone and inner baulk ring from reverse sleeve.

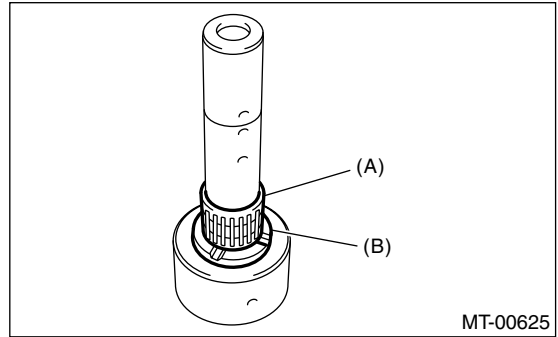


- (A) Reverse sleeve
- (B) Outer baulk ring
- (C) Reverse synchro cone
- (D) Inner baulk ring

8) Remove the reverse idler gear No. 2.

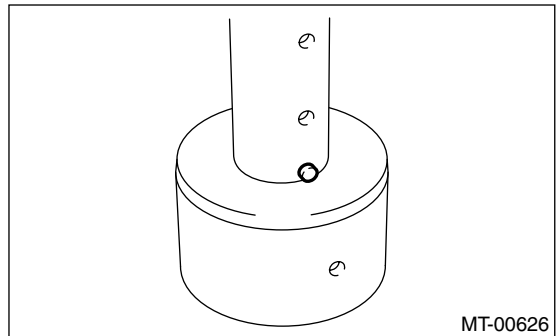


9) Remove the washer and needle bearing.

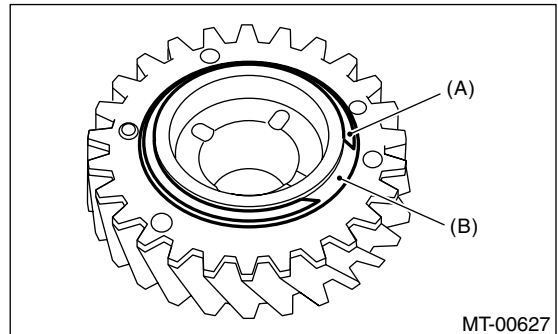


- (A) Needle bearing
- (B) Washer

10) Remove the knock pin.



11) Remove the snap ring and friction plate from reverse gear.

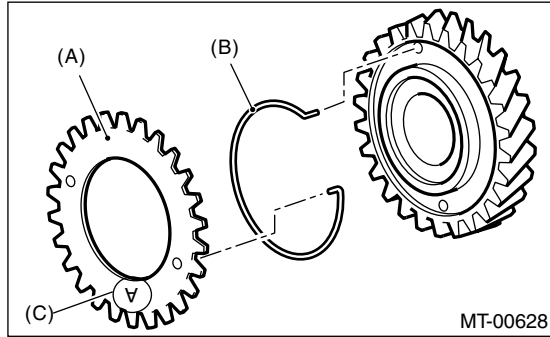


- (A) Snap ring
- (B) Friction plate

Reverse Idler Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

12) Remove the sub gear and spring.



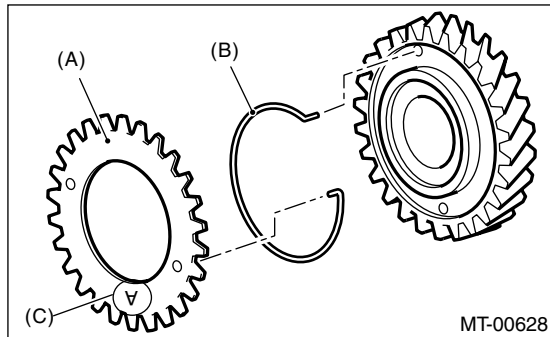
- (A) Sub gear
- (B) Spring
- (C) Punch mark (mark A)

D: ASSEMBLY

1) Install the sub gear and spring.

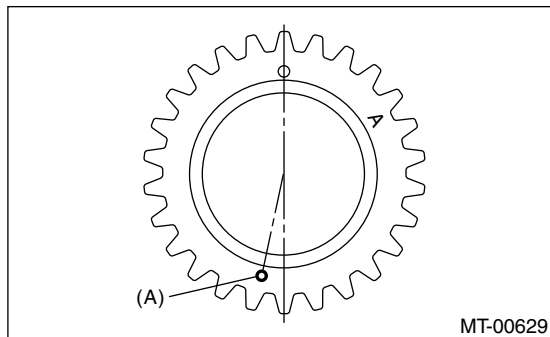
NOTE:

- Install the spring with white marking on hook part facing to sub gear side.
- Install the sub gear with punch mark (mark A) facing outside.



- (A) Sub gear
- (B) Spring
- (C) Punch mark (mark A)

- Install the spring and sub gear, taking care to install the sub gear installation hole in proper direction.

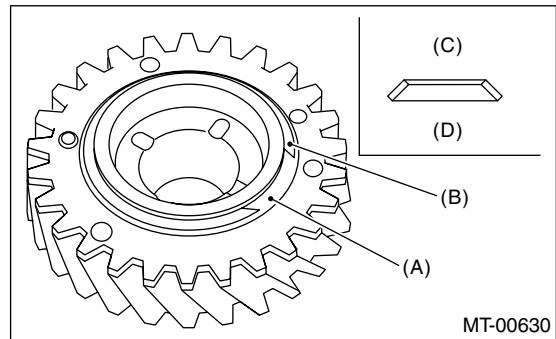


- (A) Installation hole

2) Install the friction plate and snap ring.

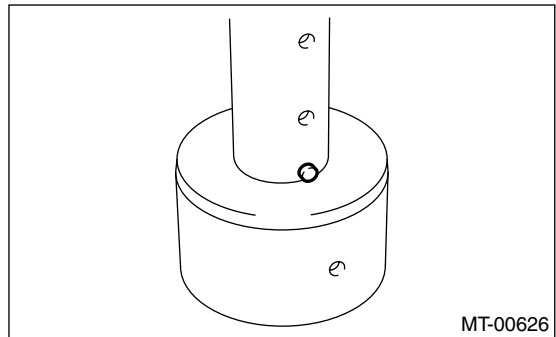
NOTE:

Make sure to install the friction plate in proper direction.



- (A) Friction plate
- (B) Snap ring
- (C) Snap ring side
- (D) Sub gear side

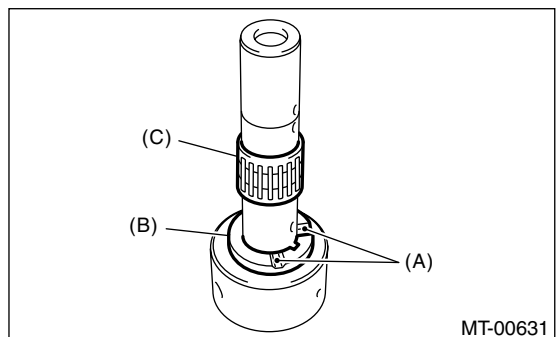
- 3) Sufficiently apply gear oil to the shaft, needle bearing and inner periphery of reverse drive gear.
- 4) Install the knock pin.



5) Install the washer and needle bearing.

NOTE:

Install the washer with groove facing to reverse idler gear.

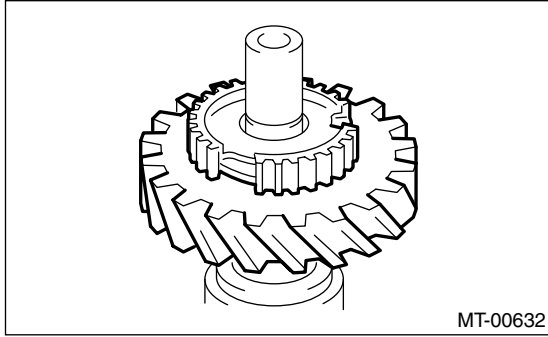


- (A) Groove
- (B) Washer
- (C) Needle bearing

Reverse Idler Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

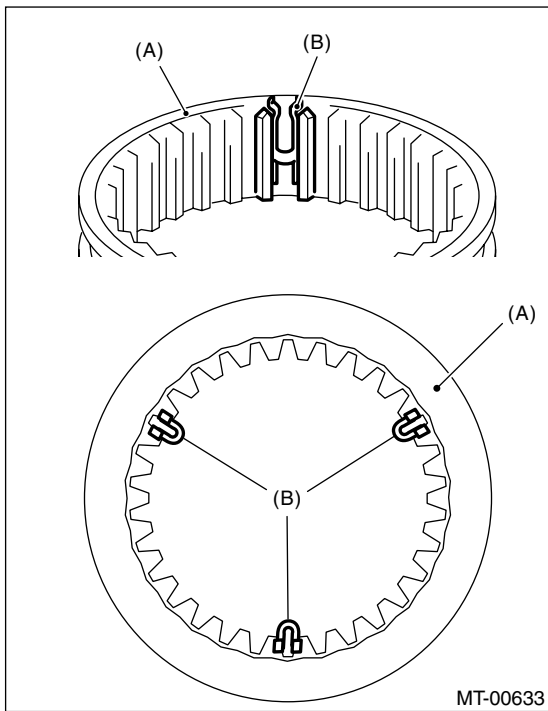
6) Install the reverse idler gear No. 2.



7) Install the shifting insert key in proper place of reverse sleeve.

NOTE:

Angle of each shifting insert key is 120° apart.

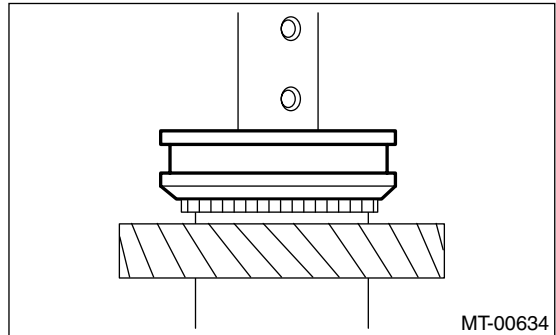


- (A) Reverse sleeve
- (B) Shifting insert key

8) Install the reverse sleeve to reverse idler gear No. 2.

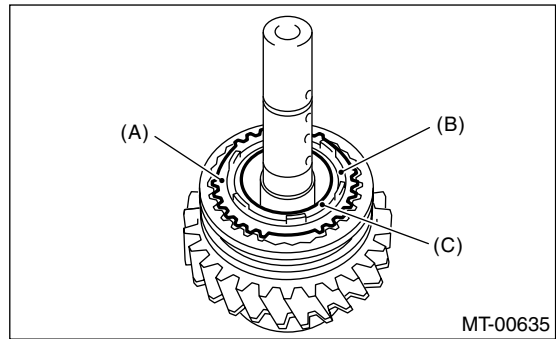
NOTE:

Make sure to install the reverse sleeve in proper direction.



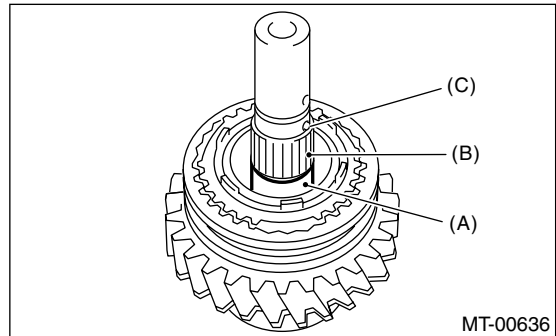
9) Sufficiently apply gear oil to the collar, needle bearing and inner periphery of reverse drive gear.

10) Install the outer baulk ring, reverse synchro cone and inner baulk ring.



- (A) Outer baulk ring
- (B) Reverse synchro cone
- (C) Inner baulk ring

11) Install the collar and needle bearing, then install the knock pin.

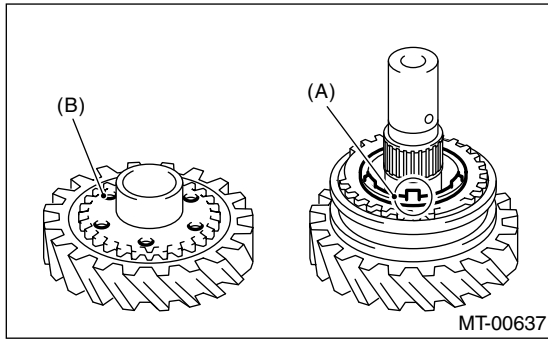


- (A) Collar
- (B) Needle bearing
- (C) Knock pin

Reverse Idler Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

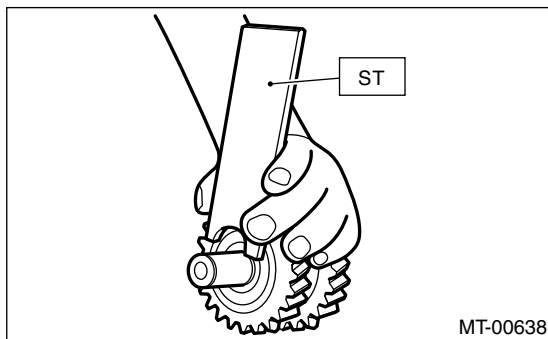
12) Align the protrusion portion of reverse synchro cone with reverse idler gear hole, then install the reverse idler gear.



- (A) Protrusion portion of reverse synchro cone
- (B) Reverse idler gear hole

13) Install the washer with groove facing to reverse idler gear.

14) Using the ST, install the snap ring.
ST 18672AA000 GUIDE CLIP



15) Inspect and adjust the clearance between snap ring and washer. <Ref. to 6MT-97, INSPECTION, Reverse Idler Gear Assembly.>

16) Install a new spring pin.

E: INSPECTION

Disassembled parts should be washed clean first and then inspected carefully.

1) Bearings

Replace the bearings in the following cases.

- Worn, rusted and damaged bearing
- Bearings that fail to turn smoothly or make abnormal noise when turned
- Bearings having other defects

2) Bushing (each gear)

Replace the bushings in the following case:

- When the sliding surface is damaged or abnormally worn.

3) Gears

Replace the gears in the following cases:

- The gear teeth surfaces are broken or excessively worn.
- The parts that contact the baulk ring is damaged.
- The inner surface of gear is damaged.

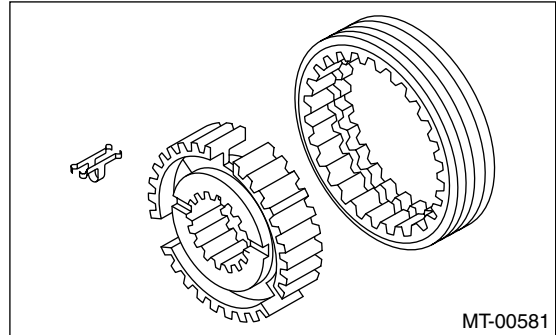
4) Baulk ring, synchro cone

Replace the baulk ring and synchro cone in the following case:

- Worn, rusted and damaged baulk ring

5) Shifting insert key

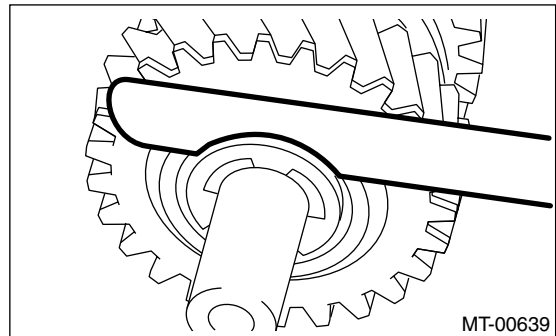
Replace the shifting insert key if deformed, excessively worn or defective in any way.



6) Inspect the clearance between snap ring and washer.

Specification of clearance:

0.1 — 0.3 mm (0.0039 — 0.0118 in)



Select and replace the snap ring from the following table if clearance is out of specification.

Snap ring		
Parts No.	Thickness	mm (in)
031319000	1.50	(0.059)
805019030	1.60	(0.062)
805019010	1.72	(0.068)

Inspect the clearance again after replacing snap ring.

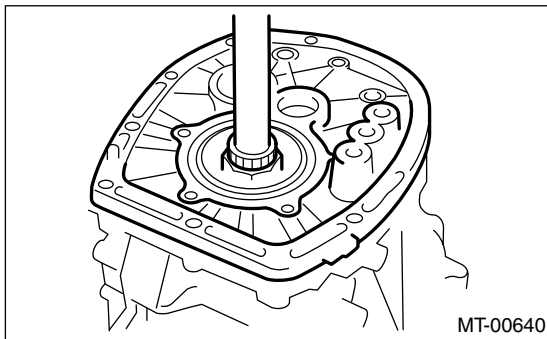
Drive Pinion Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

22. Drive Pinion Shaft Assembly

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-36, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.>, <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.>, <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-66, REMOVAL, Transmission Case.>
- 9) Remove each gear assembly. <Ref. to 6MT-71, REMOVAL, Main Shaft Assembly.>
- 10) Remove the drive pinion shaft assembly.

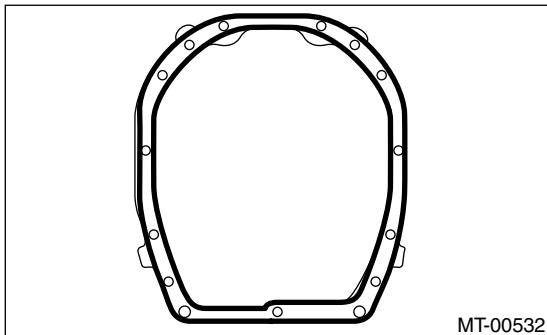


B: INSTALLATION

- 1) Completely remove the remaining gasket on drive plate and clutch housing.
- 2) Apply liquid gasket to the clutch housing.

Liquid gasket:

THREE BOND 1215



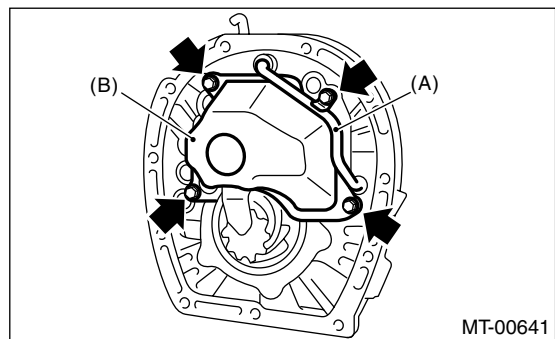
- 3) Install each gear assembly. <Ref. to 6MT-71, INSTALLATION, Main Shaft Assembly.>
- 4) Install the transmission case. <Ref. to 6MT-67, INSTALLATION, Transmission Case.>
- 5) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>
- 6) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>
- 7) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>
- 8) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 9) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.>, <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.>, <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>
- 10) Install the manual transmission assembly to vehicle. <Ref. to 6MT-38, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

NOTE:

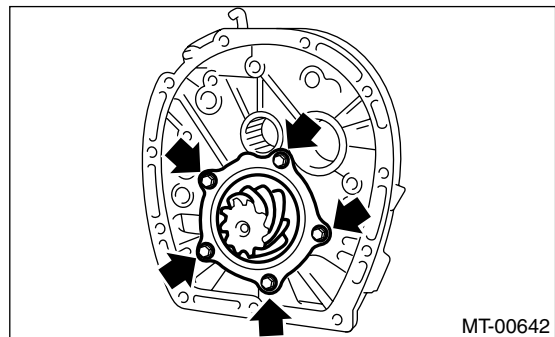
Replace the drive pinion shaft as a set with hypoid driven gear.

- 1) Remove the pipe and oil chamber.



- (A) Pipe
- (B) Oil chamber

- 2) Remove the drive pinion shaft and shim from adapter plate.



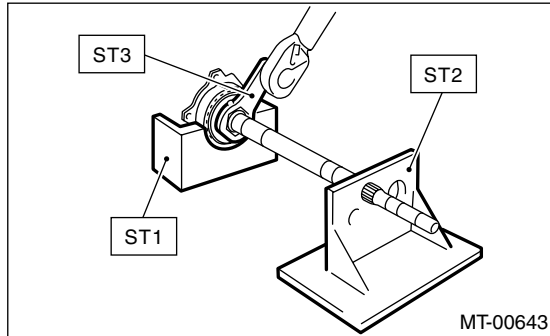
- 3) Secure the ST on workbench.
ST 18664AA000 BASE

Drive Pinion Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

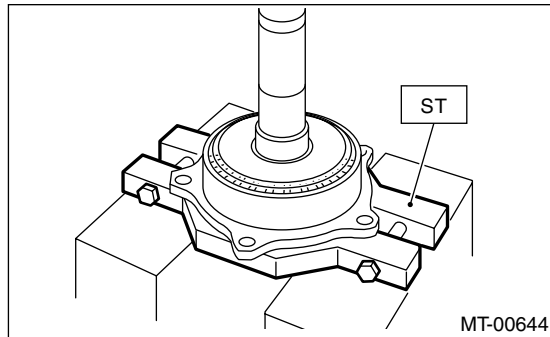
- 4) Lift the caulking of lock nut.
- 5) Install the ST3 to lock nut, then set drive pinion shaft to ST. Remove the lock nut and washer.

ST1 18667AA000 HOLDER
ST2 18664AA000 BASE
ST3 18621AA000 ADAPTER WRENCH



- 6) Using the ST, remove the taper roller bearing assembly.

ST 18723AA000 REMOVER



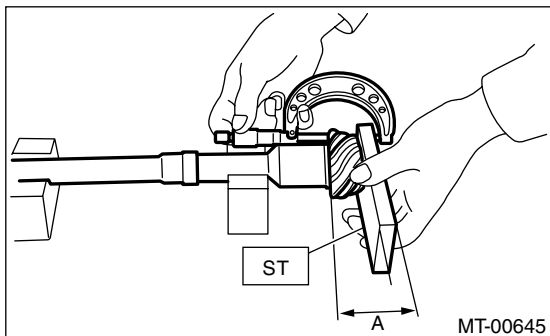
D: ASSEMBLY

- 1) Using the ST, measure dimension A of drive pinion.

NOTE:

Note dimension A for selection of drive pinion shim.

ST 398643600 GAUGE

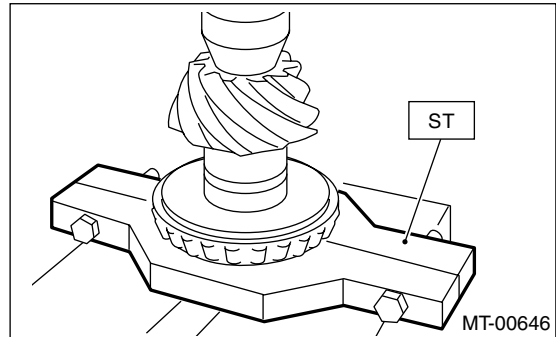


- 2) Install the inner bearing inner race to drive pinion shaft using ST and press.

ST 18723AA000 REMOVER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

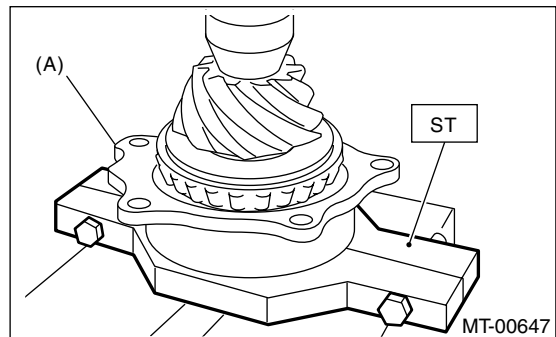


- 3) Install the retainer and outer bearing inner race to drive pinion shaft using ST and press.

ST 18723AA000 REMOVER

NOTE:

Press to the point where bearing is turned smoothly without slack.



(A) Retainer

- 4) Install the washer and new lock nut.

- 5) Set the ST to drive pinion, then tighten the lock nut.

ST1 18667AA000 HOLDER
ST2 18664AA000 BASE
ST3 18621AA000 ADAPTER WRENCH
ST4 18852AA000 TORQUE WRENCH

NOTE:

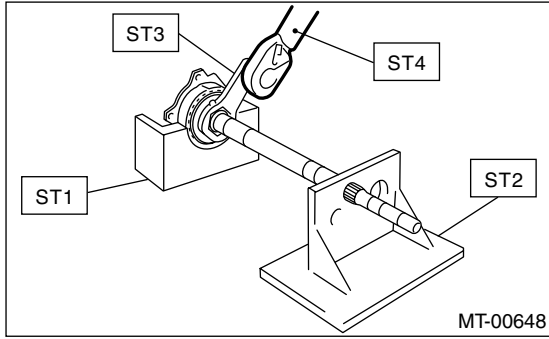
Tighten with the ST and torque wrench straight-lined.

Drive Pinion Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

Tightening torque:

265 N·m (27.0 kgf·m, 195 ft·lb)

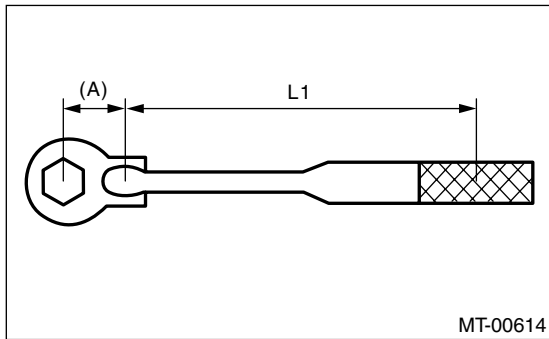


NOTE:

- If torque wrench except ST4 is used, calculate the following equation, then tighten the lock nut. Tighten with the ST and torque wrench straight-lined.

$$T = L1 / (0.1 + L1) \times 285$$

T	N·m (kgf·m, ft·lb)	Setting value of torque wrench
L1	m (in)	Torque wrench length
0.1 m (3.94 in)		ST length
285 N·m (29.0 kgf·m, 210 ft·lb)		Tightening torque of lock nut



(A) 0.1 m (3.94 in)

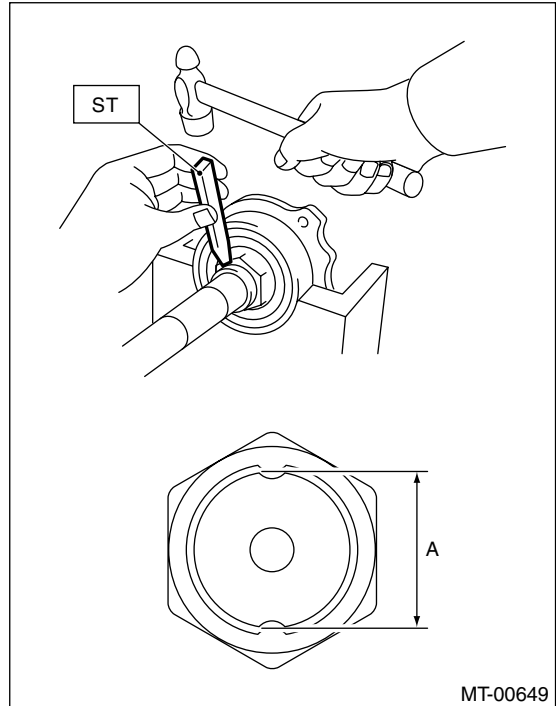
6) Measure the starting torque. <Ref. to 6MT-101, INSPECTION, Drive Pinion Shaft Assembly.>

7) Using the ST, caulk two portions on the lock nut to obtain dimension A 37 ± 0.5 mm (1.46 ± 0.02 in).

ST 18670AA000 PUNCH

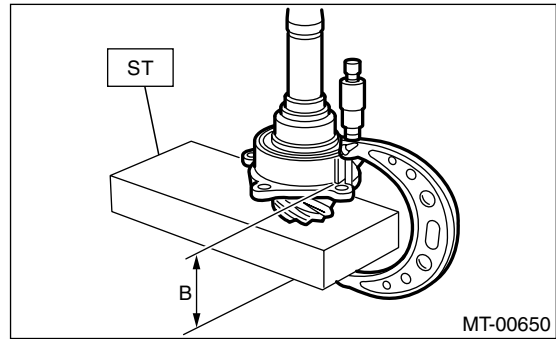
NOTE:

Do not crack the caulking part of lock nut.



8) Using the ST, measure dimension B of the drive pinion.

ST 398643600 GAUGE



Drive Pinion Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

9) Calculate the following equation, then select one or two pieces of drive pinion shim from the table below.

$$6.5 \pm 0.0625 \text{ mm} - (B - A) [0.26 \pm 0.0025 \text{ in} - (B - A)]$$

NOTE:

A: Measured value from step 1).

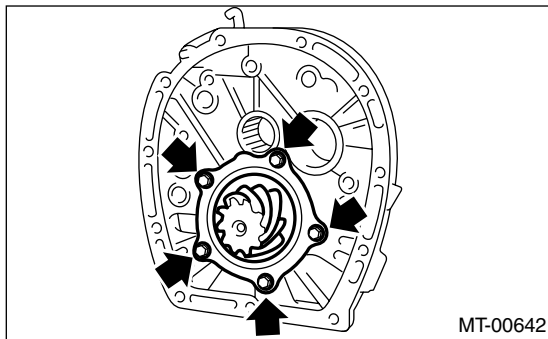
B: Measured value from step 8).

Drive pinion shim	
Part No.	Thickness mm (in)
32295AA270	0.15 (0.0059)
32295AA280	0.175 (0.0069)
32295AA290	0.20 (0.0079)
32295AA300	0.225 (0.0089)
32295AA310	0.25 (0.0098)
32295AA320	0.275 (0.0108)

10) Apply gear oil to the side face of taper roller bearing, then install the drive pinion shaft and selected shim to adapter plate.

Tightening torque:

54 N·m (5.5 kgf·m, 40 ft·lb)

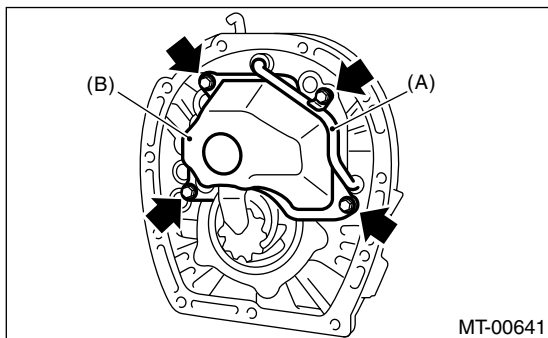


MT-00642

11) Install the oil chamber and pipe.

Tightening torque:

6.4 N·m (0.65 kgf·m, 4.7 ft·lb)



MT-00641

(A) Pipe

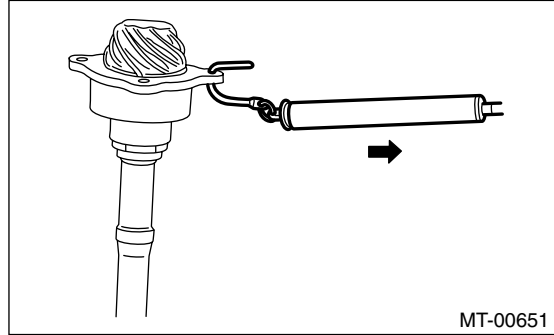
(B) Oil chamber

E: INSPECTION

1) Using the spring balancer, measure the starting torque. If the starting torque is out of specification, replace the taper roller bearing.

Starting torque:

0 — 0.95 N (0 — 0.097 kgf, 0 — 0.21 lb)



MT-00651

2) Gears

Replace the gears in the following case.

- Gear teeth surfaces are broken or excessively worn.

3) Bearings

Replace the bearings in the following cases.

- Worn, rusted and damaged bearing
- Bearings that fail to turn smoothly or make abnormal noise when turned

4) Adapter plate

Replace the adapter plate in the following cases.

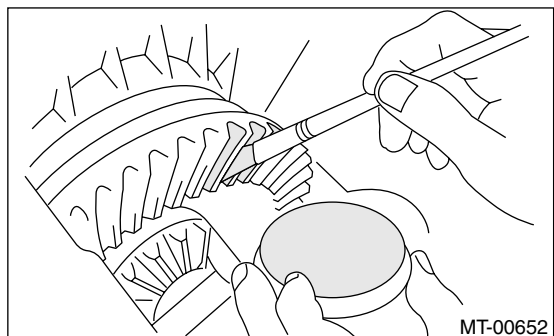
- Worn, rusted and damaged bearing
- Damaged adapter plate

5) Make sure the pipe and pipe chamber is not damaged or clogged. Repair or replace if damaged or clogged.

F: ADJUSTMENT

1) Inspect and adjust the backlash between hypoid driven gear and drive pinion. <Ref. to 6MT-108, HYPOID GEAR BACKLASH, ADJUSTMENT, Front Differential Assembly.>

2) Apply a uniform thin coat of red lead on both teeth surfaces of three or four teeth of the hypoid driven gear.



MT-00652

3) Install the drive pinion shaft assembly to clutch housing, then tighten at least four bolts.

Drive Pinion Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

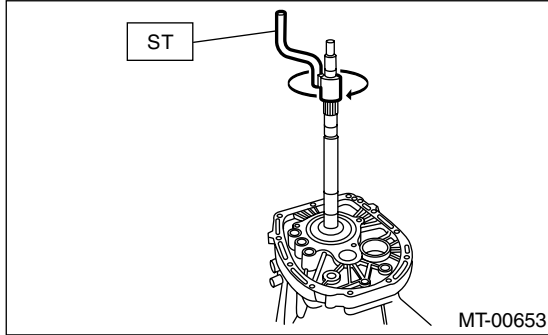
NOTE:

Install with the liquid gasket remaining to prevent the mating surface of clutch housing and adapter plate from damaging.

Tightening torque:

50 N·m (5.1 kgf·m, 36.9 ft·lb)

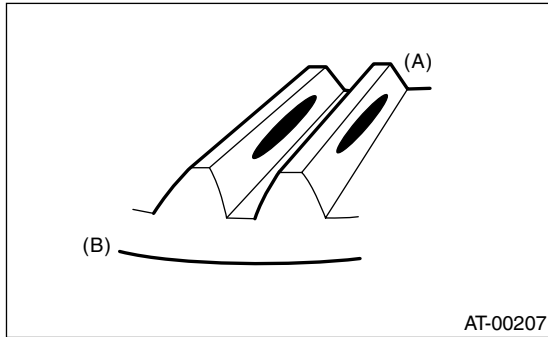
4) Using the ST, rotate several times.
ST 18631AA000 HANDLE



5) Remove the drive pinion shaft assembly, and then check tooth contact. If it is inaccurate, adjust the backlash or thickness of shim.

- Tooth contact

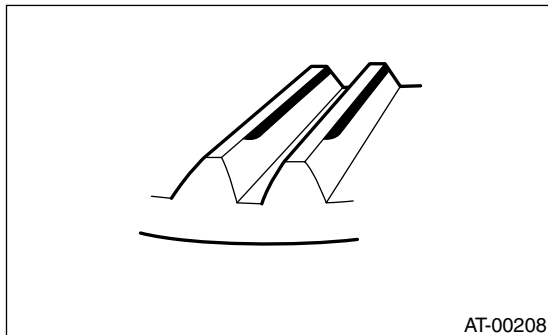
Checking item: Tooth contact pattern is slightly shifted toward to toe side under no-load rotation. [When loaded, contact pattern moves toward heel.]



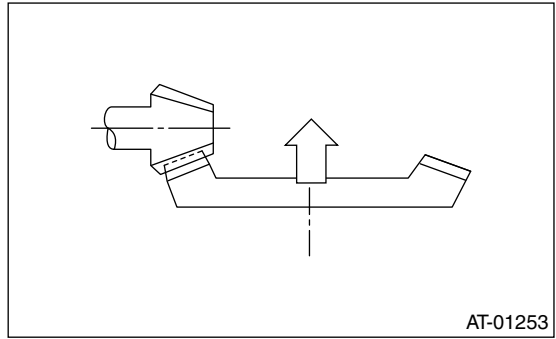
- (A) Toe side
- (B) Heel side

- Face contact

Checking item: Backlash is too large.
Contact pattern

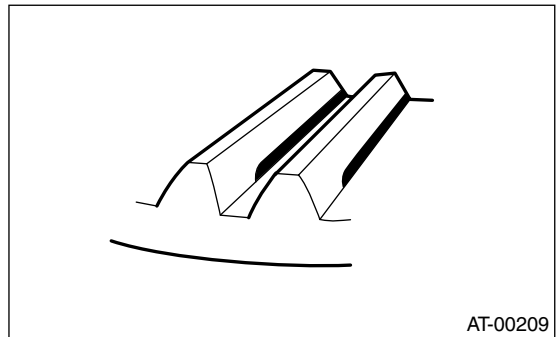


Corrective action: Verify the backlash again, and then adjust it.

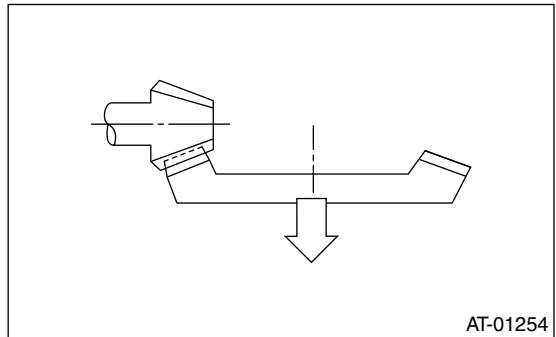


- Flank contact

Checking item: Backlash is too small.
Contact pattern

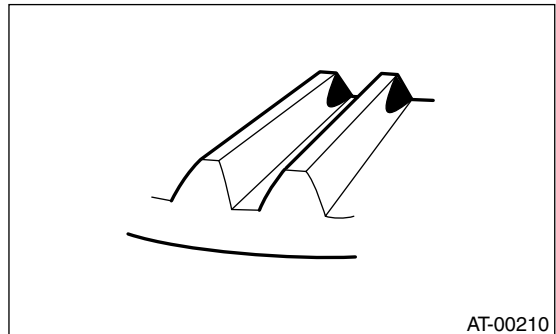


Corrective action: Verify the backlash again, and then adjust it.



- Toe contact (Inside end contact)

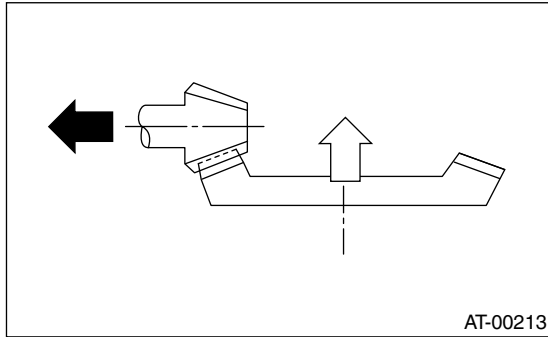
Checking item: Contact areas is small.
Contact pattern



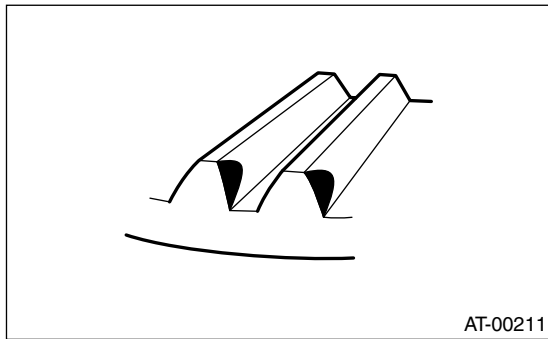
Drive Pinion Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

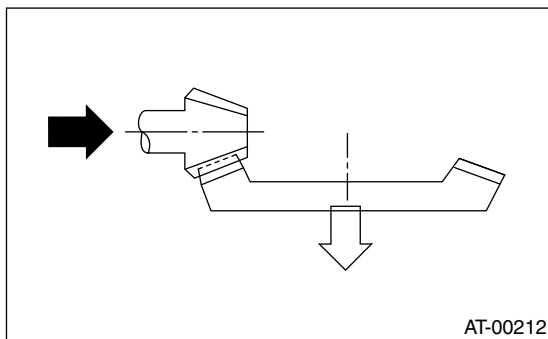
Corrective action: Reduce thickness of drive pinion shim in order to move drive pinion away from crown gear.



- Heel contact (Outside end contact)
- Checking item: Contact areas is small.**
Contact pattern



Corrective action: Increase thickness of drive pinion shim in order to bring drive pinion close to crown gear.



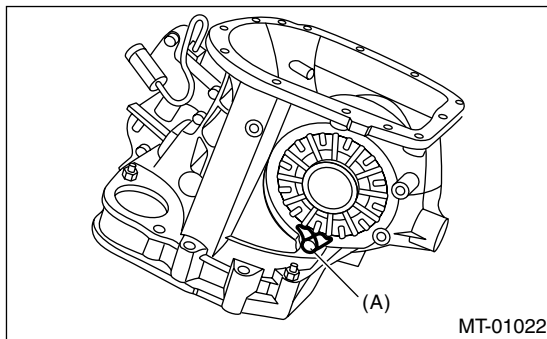
Front Differential Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

23. Front Differential Assembly

A: REMOVAL

- 1) Remove the manual transmission assembly. <Ref. to 6MT-36, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.>, <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.>, <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-66, REMOVAL, Transmission Case.>
- 9) Remove each gear assembly. <Ref. to 6MT-71, REMOVAL, Main Shaft Assembly.>
- 10) Remove the drive pinion shaft assembly. <Ref. to 6MT-98, REMOVAL, Drive Pinion Shaft Assembly.>
- 11) Remove the lock plates on both side.



(A) Lock plate

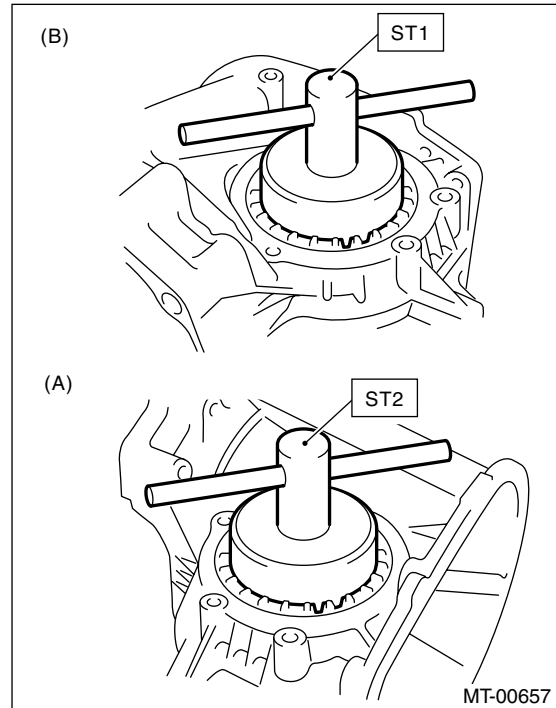
- 12) Using the ST, remove the differential side retainer on both side.

ST1 499787000 WRENCH ASSY (RIGHT SIDE)

ST2 18630AA000 WRENCH ASSY (LEFT SIDE)

NOTE:

Be careful not to damage the part of clutch case where the retainer is to be installed.



(A) Left side

(B) Right side

- 13) Remove the front differential.

B: INSTALLATION

- 1) Install the differential assembly into clutch housing.
- 2) Apply oil to the threaded portion part of side retainer.
- 3) Remove the O-ring from side retainer of both side.
- 4) Using the ST, install the differential side retainer to both side.

ST1 499787000 WRENCH ASSY (RIGHT SIDE)

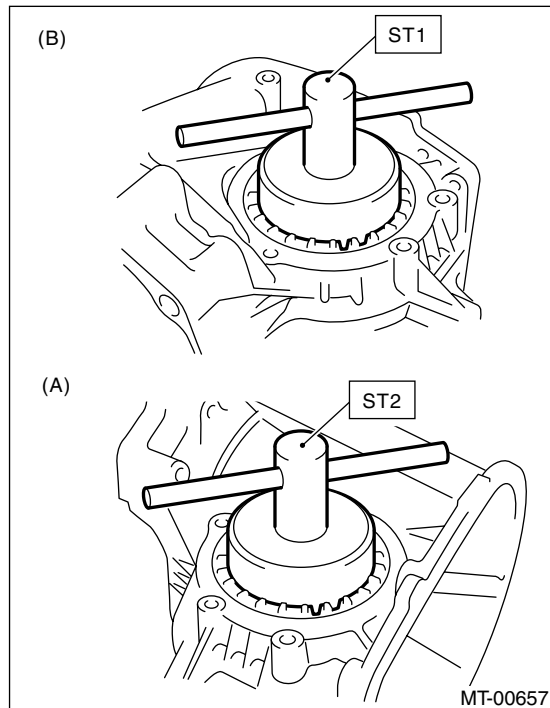
ST2 18630AA000 WRENCH ASSY (LEFT SIDE)

Front Differential Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

Be careful not to damage the oil seal.

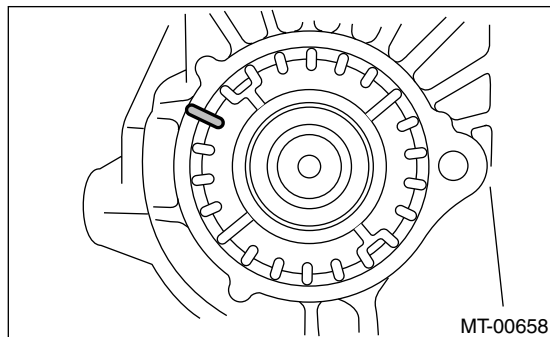


- (A) Left side
- (B) Right side

5) Check and adjust the hypoid gear backlash. <Ref. to 6MT-108, HYPOID GEAR BACKLASH, INSPECTION, Front Differential Assembly.>

6) Check and adjust the tooth contact. <Ref. to 6MT-101, ADJUSTMENT, Drive Pinion Shaft Assembly.>

7) Mark an engagement point on the right and left side retainer and clutch housing.



8) Remove the differential side retainer from both side.

NOTE:

Note the rotating number of time till removal, when removing the side retainer.

9) Install a new O-ring to side retainer of both side.

10) Install the differential side retainer to both side.

NOTE:

Install the side retainer by screwing in the same rotating number of time till removal, and then align the mark.

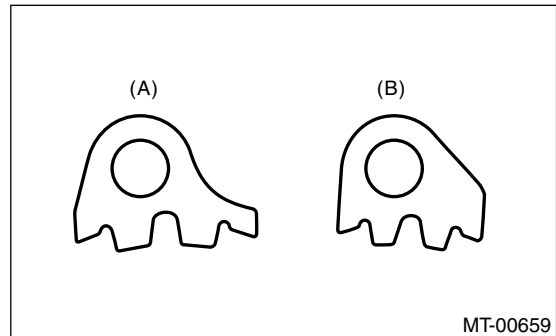
11) Install the lock plate.

Tightening torque:

25 N·m (2.5 kgf·m, 18.1 ft·lb)

NOTE:

Be careful not to confuse right and left lock plate.



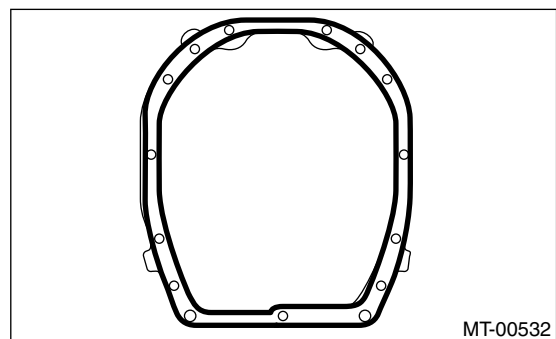
- (A) Left
- (B) Right

12) Completely remove the remaining gasket from the clutch housing and adapter plate.

13) Apply liquid gasket to the clutch housing.

Liquid gasket:

THREE BOND 1215



14) Install the drive pinion shaft assembly. <Ref. to 6MT-98, INSTALLATION, Drive Pinion Shaft Assembly.>

15) Install each gear assembly at once. <Ref. to 6MT-71, INSTALLATION, Main Shaft Assembly.>

16) Install the transmission case. <Ref. to 6MT-67, INSTALLATION, Transmission Case.>

17) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>

18) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>

19) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>

Front Differential Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

20) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>

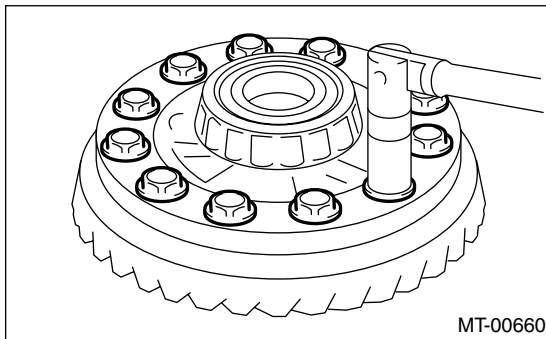
21) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.>, <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.>, <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>

22) Install the manual transmission assembly to vehicle. <Ref. to 6MT-38, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

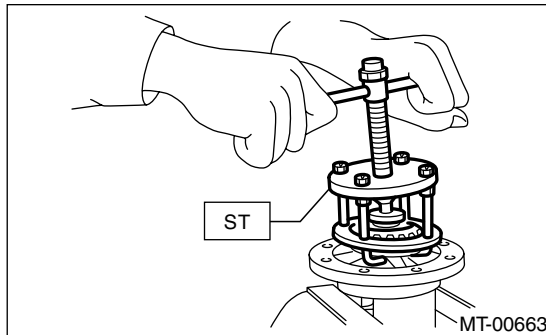
1. DIFFERENTIAL CASE

1) Secure the differential assembly on a vise, and then remove the hypoid driven gear.



2) Using the ST, remove the hypoid driven gear side bearing.

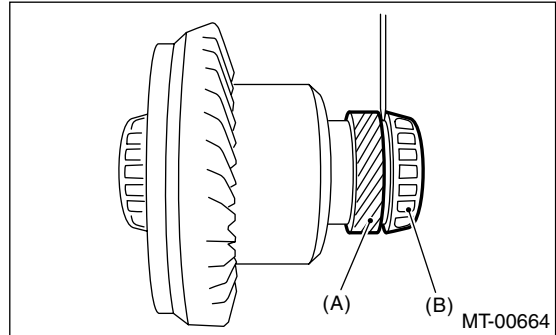
ST 399527700 PULLER SET



3) Using a screw driver, make clearance of 2 — 3 mm (0.079 — 0.118 in) between the speedometer drive gear and roller bearing.

NOTE:

Be careful not to damage the differential case.

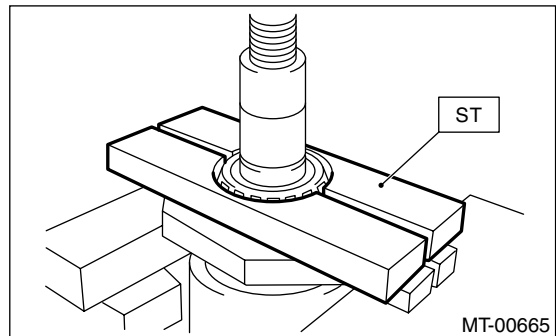


(A) Speedometer drive gear

(B) Roller bearing

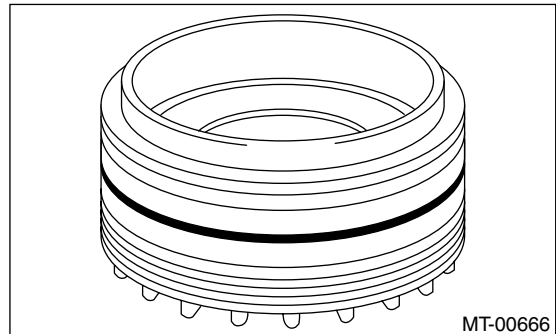
4) Using the ST, remove the roller bearing.

ST 498077000 REMOVER

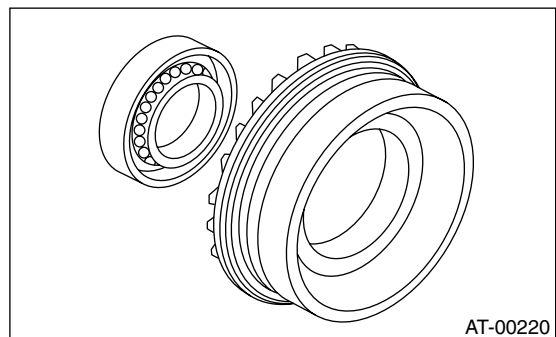


2. SIDE RETAINER

1) Remove the O-ring from side retainer.



2) Remove the oil seal from side retainer.

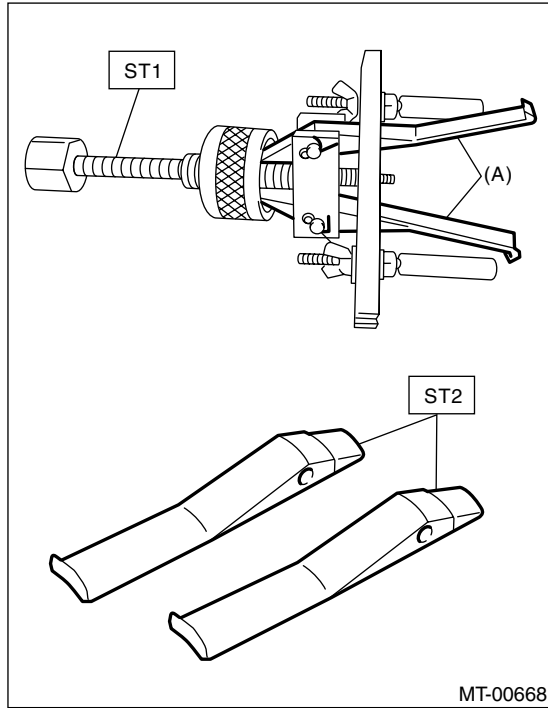


Front Differential Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

3) Remove the claw of ST1, and then install the claw of ST2.

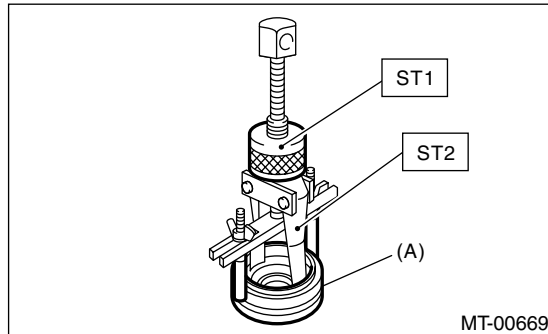
ST1 398527700 PULLER ASSY
ST2 18760AA000 CLAW



(A) Claw

4) Remove the bearing outer race from side retain-

er.
ST1 398527700 PULLER ASSY
ST2 398527705 CLAW



(A) Side retainer

D: ASSEMBLY

1. DIFFERENTIAL CASE

1) Using the ST, install a new speedometer drive gear and right and left side bearing inner race to differential case.

ST1 398437700 INSTALLER

ST2 398497701 SEAT

CAUTION:

Do not apply pressure in excess of 20 kN (2.0 ton, 2.2 US ton, 2.0 Imp ton).

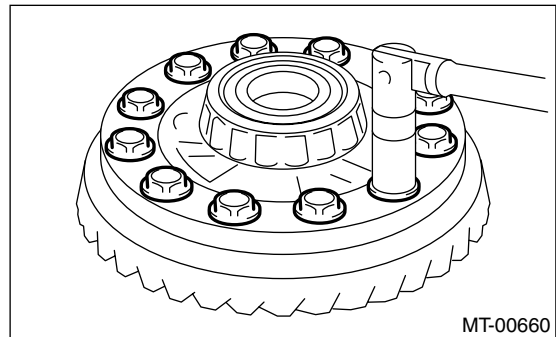
NOTE:

Always replace the inner race and outer race as a set.

2) Install the hypoid driven gear to differential case.

Tightening torque:

69 N·m (7.0 kgf·m, 50.9 ft·lb)



2. SIDE RETAINER

NOTE:

Install the oil seal and O-ring of side retainer after the adjustment of backlash and tooth contact.

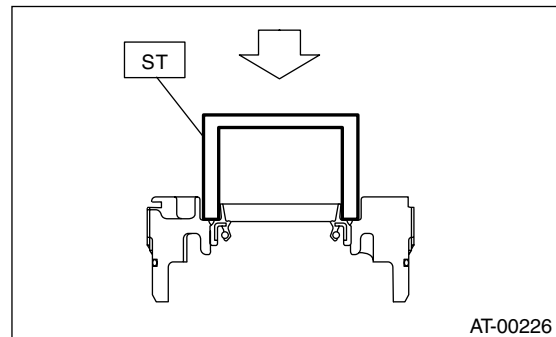
1) Install the bearing outer race to side retainer.

2) Fit a new oil seal using ST.

ST 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER

NOTE:

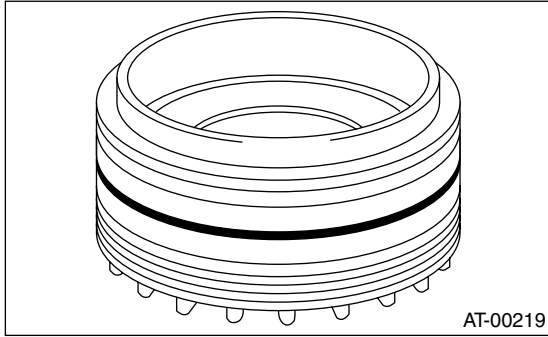
Apply oil to the oil seal lips.



Front Differential Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

3) Install a new O-ring.



E: INSPECTION

Repair or replace the front differential in following cases.

- Each gear is damaged, seized, or excessively worn.
- Sliding surfaces of the differential case is damaged, seized or excessively worn.
- Bearings and bearings part is damaged, rusted or worn.
- Bearings that fail to turn smoothly or make abnormal noise when turned.

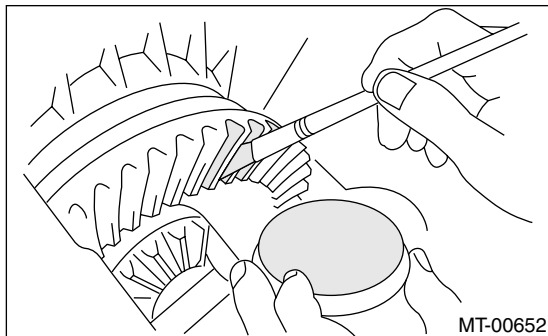
1. HYPOID GEAR BACKLASH

Check the hypoid gear backlash. If it is not within specifications, adjust it. <Ref. to 6MT-108, HYPOID GEAR BACKLASH, Front Differential Assembly.>

2. TOOTH CONTACT OF HYPOID GEAR

1) Be sure the hypoid gear backlash is within specifications. If it is not within specifications, adjust it. <Ref. to 6MT-108, HYPOID GEAR BACKLASH, Front Differential Assembly.>

2) Apply a uniform thin coat of red lead on both tooth surfaces of three or four teeth of the hypoid driven gear.



3) Install the drive pinion shaft assembly, and then secure with four bolts.

NOTE:

Use the old gasket and washer to prevent the mating surface of housing from damaging.

Tightening torque:

50 N·m (5.0 kgf-m, 36.9 ft-lb)

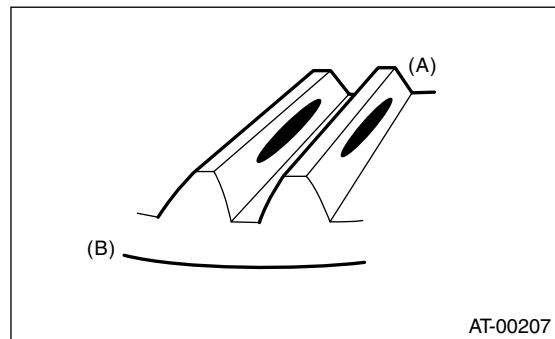
4) Rotate the drive pinion shaft to right and left for several times.

5) Remove the drive pinion shaft assembly, and then check tooth contact. If tooth contact is inaccurate, adjust it. <Ref. to 6MT-101, ADJUSTMENT, Drive Pinion Shaft Assembly.>

- Correct tooth contact.

NOTE:

Under no load, tooth contacts 50—60% from center to toe side (tooth contact shifts to heel side when driving).



(A) Toe side

(B) Heel side

F: ADJUSTMENT

1. HYPOID GEAR BACKLASH

1) Install the right and left side retainer.

ST1 499787000 WRENCH ASSY (RIGHT SIDE)

ST2 18630AA000 WRENCH ASSY (LEFT SIDE)

NOTE:

Screw in the right side retainer a bit further than left side.

2) Install the drive pinion shaft assembly, and then secure with four bolts.

NOTE:

Use the old gasket and washer to prevent the mating surface of housing from damaging.

Tightening torque:

50 N·m (5.0 kgf-m, 36.9 ft-lb)

3) Using the ST, screw in the left side retainer until the drive pinion and hypoid driven gear contacts lightly. Then loosen the right side retainer.

ST1 499787000 WRENCH ASSY (RIGHT SIDE)

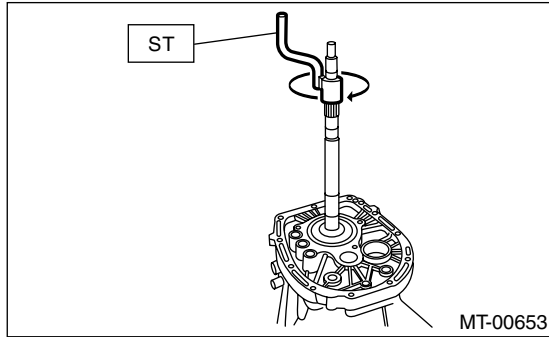
ST2 18630AA000 WRENCH ASSY (LEFT SIDE)

4) Using the ST, rotate the drive pinion shaft several times.

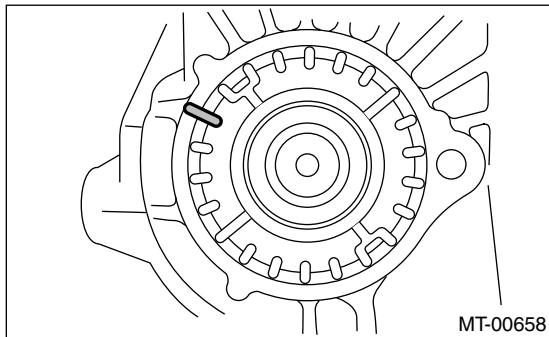
Front Differential Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

ST 18631AA000 HANDLE

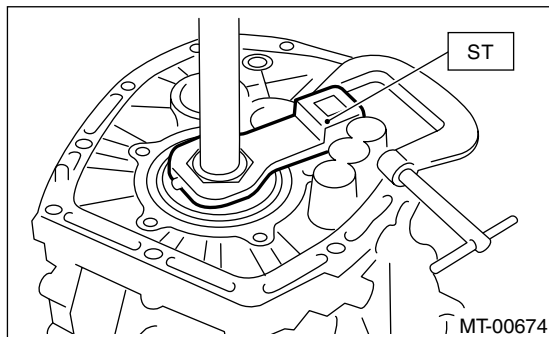


- 5) Repeat step 3) and 4) until the left side retainer can not be rotated. For the right side retainer, screw in until the inner race and outer race contacts lightly. This condition is "0" backlash.
- 6) Mark an engagement point on the right and left side retainer and clutch housing.



- 7) Return the left side retainer for three teeth, and screw in the right side retainer for three teeth.
- 8) Using the ST, secure the drive pinion shaft.

ST 18621AA000 ADAPTER WRENCH



- 9) Install the SUBARU genuine axle shafts to both sides of front differential.

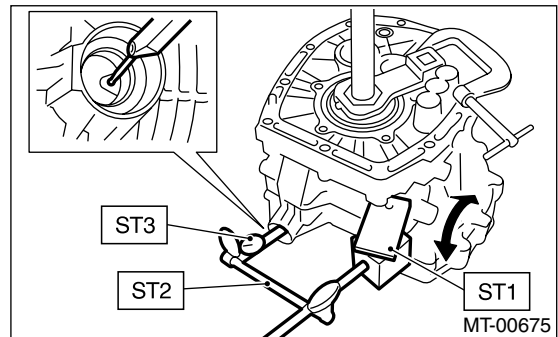
Parts No. 38415AA000 AXLE SHAFT

- 10) After rotating the drive pinion shaft several times, measure the hypoid gear backlash using the ST.

ST1 498255400 PLATE
ST2 498247001 MAGNET BASE
ST3 498247100 DIAL GAUGE

Hypoid gear backlash:

0.13 — 0.18 mm (0.0051 — 0.0071 in)



- 11) If the backlash is out of specification, adjust it by turning the right and left side retainers.
- 12) Screw in the right side retainer for further 1.75 teeth.

2. TOOTH CONTACT OF HYPOID GEAR

Refer to the section of drive pinion shaft for checking of tooth contact. <Ref. to 6MT-108, TOOTH CONTACT OF HYPOID GEAR, INSPECTION, Front Differential Assembly.>

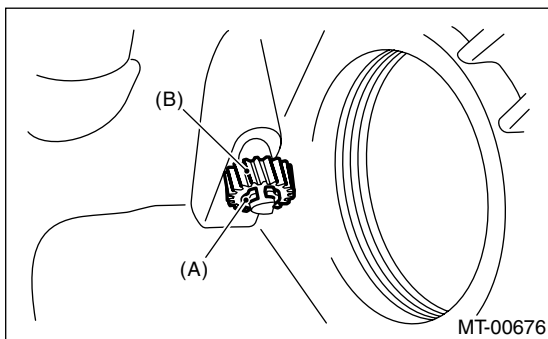
Speedometer Gear

MANUAL TRANSMISSION AND DIFFERENTIAL

24.Speedometer Gear

A: REMOVAL

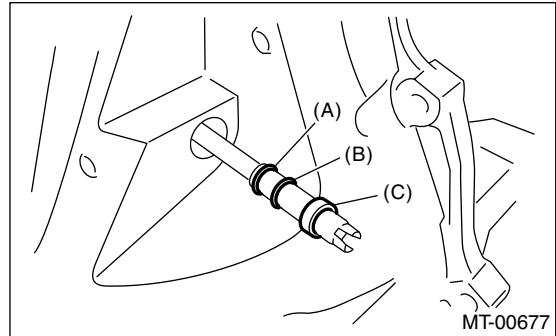
- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-36, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.>, <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.>, <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-66, REMOVAL, Transmission Case.>
- 9) Remove each gear assembly. <Ref. to 6MT-71, REMOVAL, Main Shaft Assembly.>
- 10) Remove the drive pinion shaft assembly. <Ref. to 6MT-98, REMOVAL, Drive Pinion Shaft Assembly.>
- 11) Remove the front differential assembly. <Ref. to 6MT-104, REMOVAL, Front Differential Assembly.>
- 12) Remove the vehicle speed sensor. <Ref. to 6MT-33, REMOVAL, Vehicle Speed Sensor.>
- 13) Remove the snap ring, and then remove the speedometer driven gear.



- (A) Snap ring
- (B) Speedometer driven gear

- 14) Remove the speedometer shaft from clutch housing.

- 15) Remove the oil seal, speedometer shaft and washer.



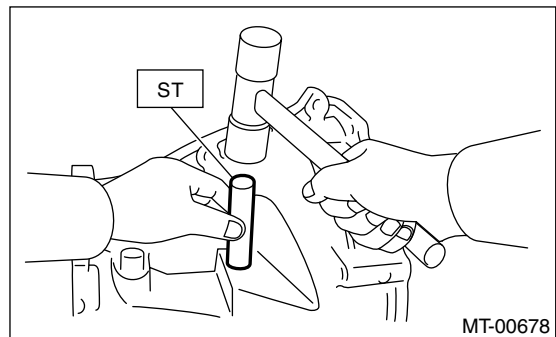
- (A) Washer
- (B) Snap ring
- (C) Oil seal

- 16) Remove the snap ring from speedometer shaft.

B: INSTALLATION

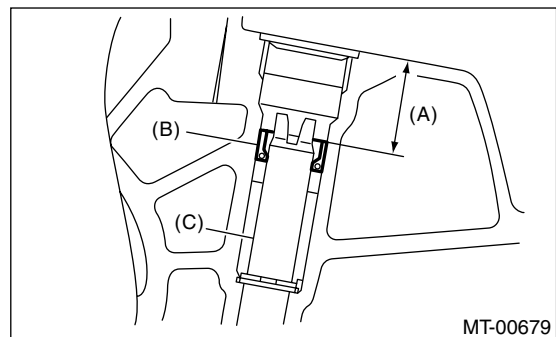
- 1) Install the oil seal, washer and snap ring to speedometer shaft.
- 2) Insert the speedometer shaft. Using the ST, press the oil seal.

ST 899824100 or 499827000 PRESS



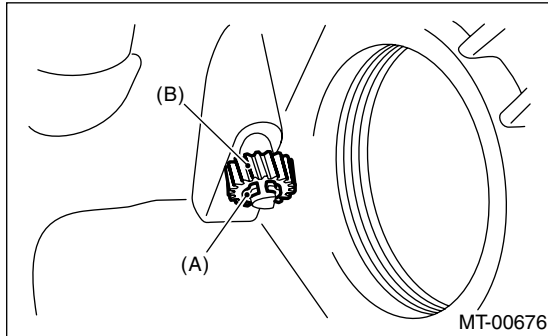
NOTE:

- Replace the oil seal with a new one.
- Insert the oil seal approx. 24 mm (0.94 in) from the edge of clutch case.



- (A) Approx. 24 mm (0.94 in)
- (B) Oil seal
- (C) Speedometer shaft

3) Install the speedometer driven gear and snap ring.



- (A) Snap ring
- (B) Speedometer driven gear

4) Install the vehicle speed sensor. <Ref. to 6MT-33, INSTALLATION, Vehicle Speed Sensor.>

5) Install the front differential assembly. <Ref. to 6MT-104, INSTALLATION, Front Differential Assembly.>

6) Install the drive pinion shaft assembly. <Ref. to 6MT-98, INSTALLATION, Drive Pinion Shaft Assembly.>

7) Install each gear assembly at once. <Ref. to 6MT-71, INSTALLATION, Main Shaft Assembly.>

8) Install the transmission case. <Ref. to 6MT-67, INSTALLATION, Transmission Case.>

9) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>

10) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>

11) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>

12) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>

13) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.>, <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.>, <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>

14) Install the manual transmission assembly to vehicle. <Ref. to 6MT-38, INSTALLATION, Manual Transmission Assembly.>

Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

25. Shifter Fork and Rod

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-36, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.>, <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.>, <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-66, REMOVAL, Transmission Case.>
- 9) Remove each gear assembly. <Ref. to 6MT-71, REMOVAL, Main Shaft Assembly.>

B: INSTALLATION

- 1) Install each gear assembly at once. <Ref. to 6MT-71, INSTALLATION, Main Shaft Assembly.>
- 2) Install the transmission case. <Ref. to 6MT-67, INSTALLATION, Transmission Case.>
- 3) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>
- 4) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>
- 5) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>
- 6) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 7) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.>, <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.>, <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>
- 8) Install the manual transmission assembly to vehicle. <Ref. to 6MT-38, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

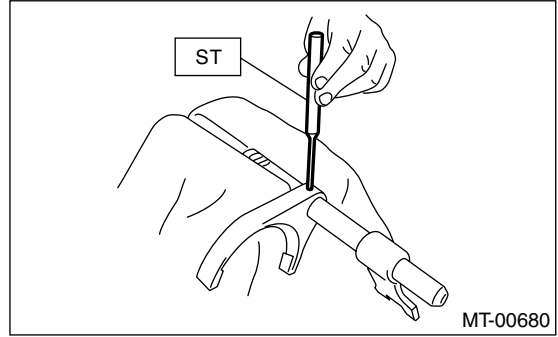
NOTE:

Discard the removed spring pin and replace with a new one.

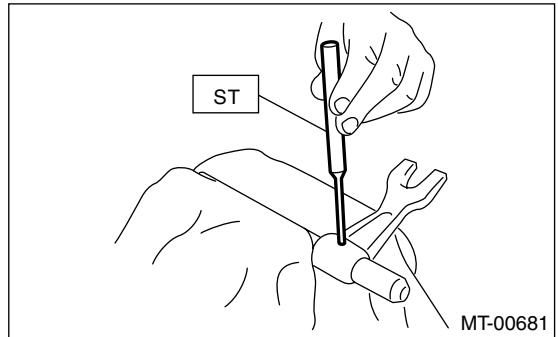
1. REVERSE SHIFTER FORK

- 1) Using the ST, remove the reverse fork.

ST 398791700 REMOVER

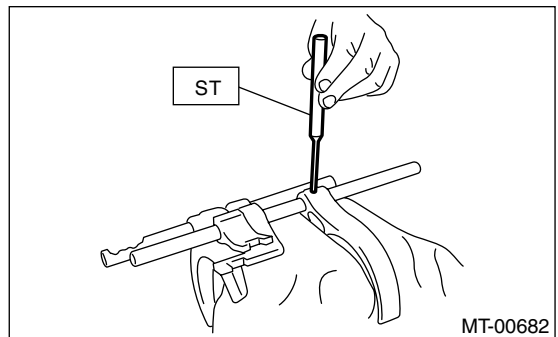


- 2) Using the ST, remove the reverse shifter arm.
ST 398791700 REMOVER

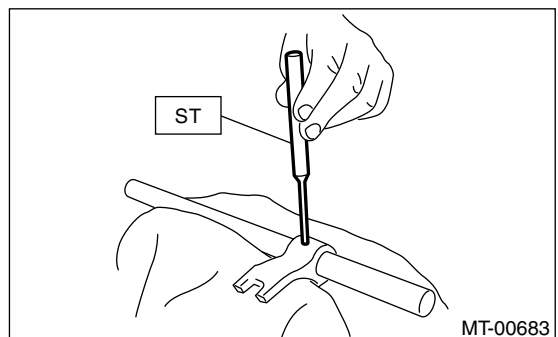


2. 1st-2nd, 3rd-4th SHIFTER FORK

- 1) Using the ST, remove the 3rd-4th shifter fork.
ST 398791700 REMOVER



- 2) Using the ST, remove the 3rd-4th shifter arm.
ST 398791700 REMOVER

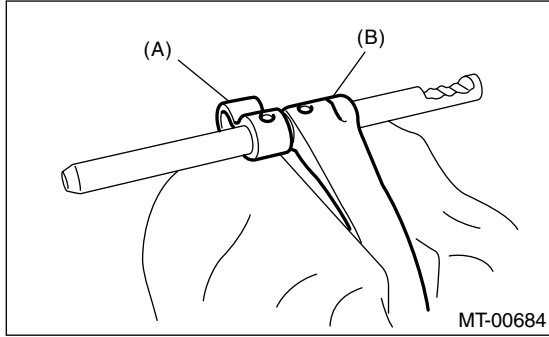


- 3) Using the ST, remove the 1st-2nd shifter arm and 1st-2nd shifter fork.

Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

ST 398791700 REMOVER

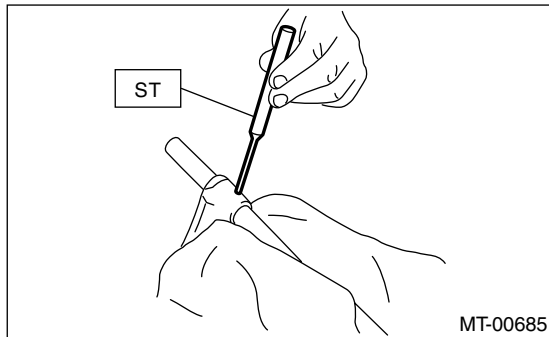


- (A) 1st-2nd shifter arm
- (B) 1st-2nd shifter fork

3. 5th-6th SHIFTER FORK

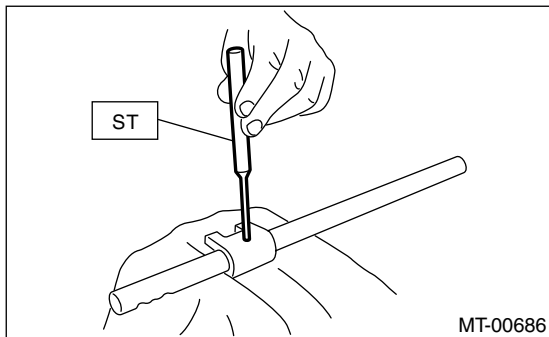
1) Using the ST, remove the 5th-6th shifter fork.

ST 398791700 REMOVER



2) Using the ST, remove the 5th-6th shifter arm.

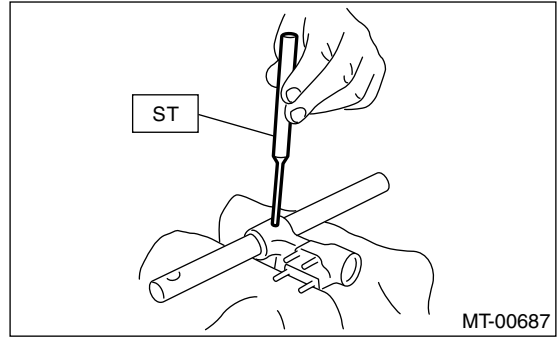
ST 398791700 REMOVER



4. SHIFT ARM SHAFT

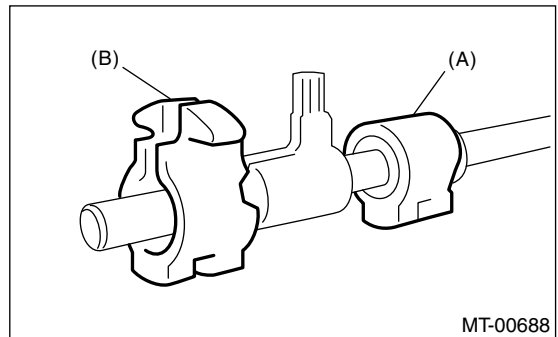
Using the ST, remove the selector arm.

ST 398791700 REMOVER



5. STRIKING ROD

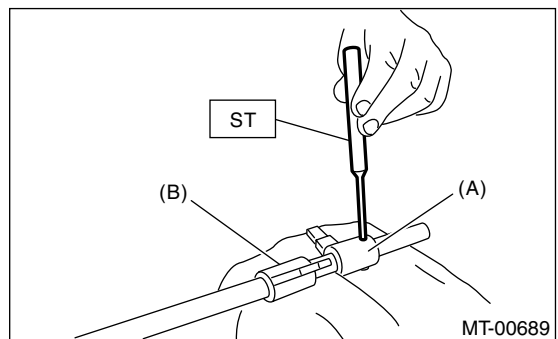
1) Remove the reverse interlock block and interlock block from striking rod.



- (A) Reverse interlock block
- (B) Interlock block

2) Using the ST, remove the reverse interlock arm.

ST 398791700 REMOVER



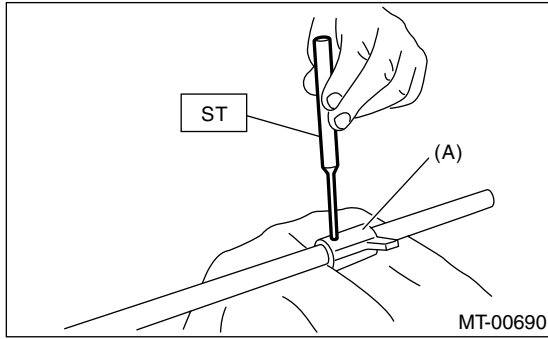
- (A) Reverse interlock arm
- (B) Interlock arm

3) Using the ST, remove the interlock arm.

Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

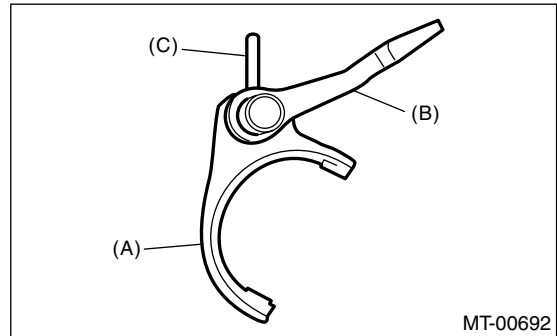
ST 398791700 REMOVER



(A) Interlock arm

NOTE:

Make sure to install the reverse arm and rod in proper direction.



- (A) Reverse arm
- (B) Reverse rod
- (C) Spring pin

D: ASSEMBLY

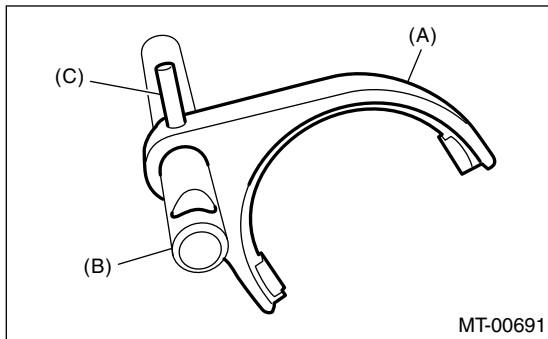
1. REVERSE SHIFTER FORK

1) Using the ST, install the reverse fork.

ST 398791700 REMOVER

NOTE:

Make sure to install the reverse fork and rod in proper direction.



- (A) Reverse fork
- (B) Reverse rod
- (C) Spring pin

2) Using the ST, install the reverse arm.

ST 398791700 REMOVER

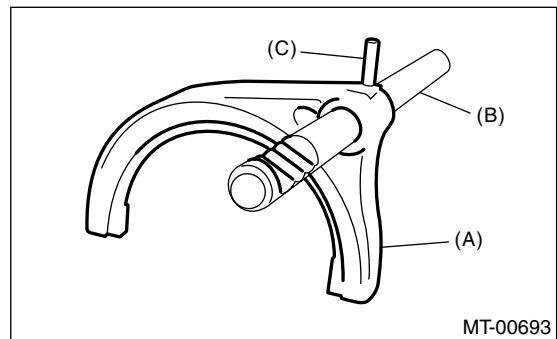
2. 1st-2nd, 3rd-4th SHIFTER FORK

1) Using the ST, install the 1st-2nd shifter fork.

ST 398791700 REMOVER

NOTE:

Make sure to install the 1st-2nd shifter fork and rod in proper direction.



- (A) 1st-2nd shifter fork
- (B) 1st-2nd shifter rod
- (C) Spring pin

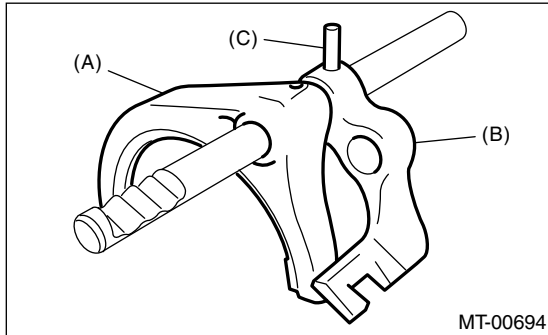
Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

2) Using the ST, install the 1st-2nd shifter arm.
ST 398791700 REMOVER

NOTE:

Make sure to install the 1st-2nd shifter arm and fork in proper direction.

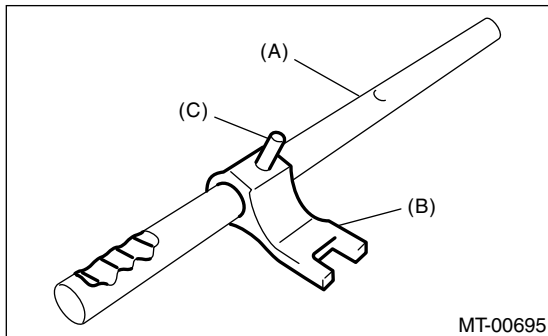


- (A) 1st-2nd shifter fork
- (B) 1st-2nd shifter arm
- (C) Spring pin

3) Using the ST, install the 3rd-4th shifter arm.
ST 398791700 REMOVER

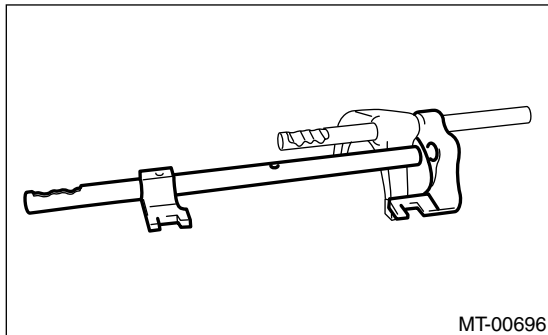
NOTE:

Make sure to install the 3rd-4th shifter arm and rod in proper direction.



- (A) 3rd-4th shifter rod
- (B) 3rd-4th shifter arm
- (C) Spring pin

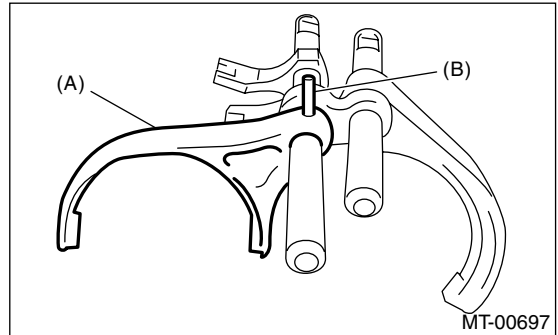
4) Install the 3rd-4th fork rod into 1st-2nd shifter arm.



5) Using the ST, install the 3rd-4th shifter fork.
ST 398791700 REMOVER

NOTE:

Make sure to install the 3rd-4th shifter fork in proper direction.



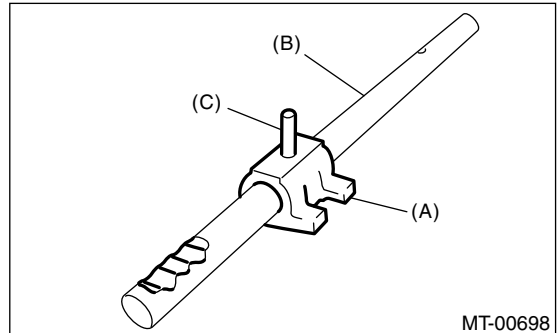
- (A) 3rd-4th shifter fork
- (B) Spring pin

3. 5th-6th SHIFTER FORK

1) Using ST, install the 5th-6th shifter arm.
ST 398791700 REMOVER

NOTE:

Make sure to install the 5th-6th shifter arm and rod in proper direction.



- (A) 5th-6th shifter arm
- (B) 5th-6th shifter rod
- (C) Spring pin

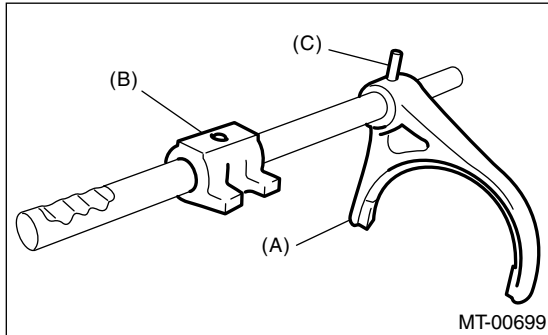
Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

2) Using the ST, install the 5th-6th shifter fork.
ST 398791700 REMOVER

NOTE:

Make sure to install the 5th-6th shifter fork and arm in proper direction.



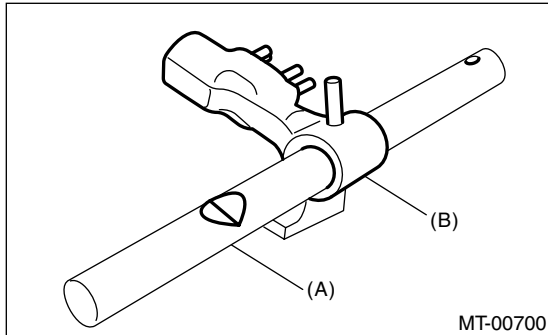
- (A) 5th-6th shifter fork
- (B) 5th-6th shifter arm
- (C) Spring pin

4. SHIFT ARM SHAFT

Using the ST, install the selector arm.
ST 398791700 REMOVER

NOTE:

Make sure to install the selector arm and rod in proper direction.



- (A) Selector rod
- (B) Selector arm

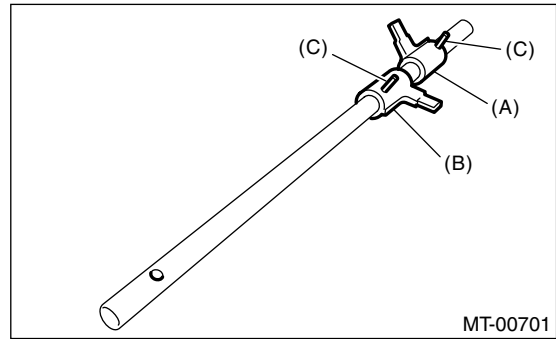
5. STRIKING ROD

1) Using the ST, install the reverse interlock arm and interlock arm.
ST 398791700 REMOVER

NOTE:

• Make sure to install the reverse interlock arm and rod in proper direction.

• Make sure to install the interlock arm and rod in proper direction.

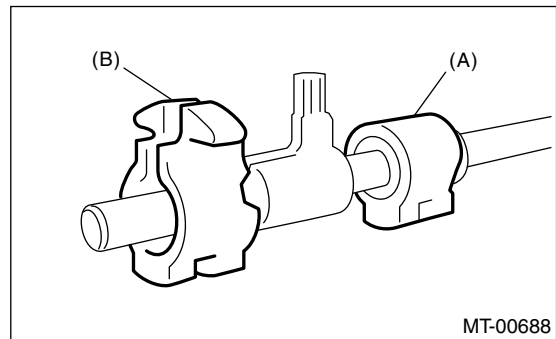


- (A) Reverse interlock arm
- (B) Interlock arm
- (C) Spring pin

2) Install the reverse interlock block and interlock block to striking rod.

NOTE:

Make sure to install the reverse interlock block and interlock block in proper direction.



- (A) Reverse interlock block
- (B) Interlock block

E: INSPECTION

- 1) Check the shift shaft and shift rod for damage. Replace if damaged.
- 2) Repair or replace the gearshift mechanism if excessively worn, bent, or defective in any way.

F: ADJUSTMENT

1. SELECTION OF 1st-2nd FORK ROD

NOTE:

Perform the following procedures when:

- Replacing the 1st, 2nd driven gear.
- Replacing the 1st, 2nd synchro ring assembly.
- Replacing the adapter plate.
- Replacing the driven shaft.
- Replacing the 1st-2nd hub, sleeve assembly.

Shifter Fork and Rod

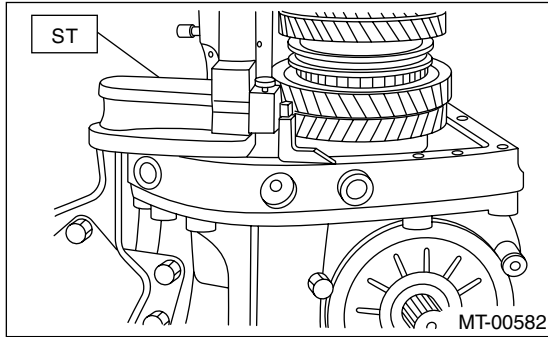
1) Insert the drive pinion assembly in adapter plate.

NOTE:

Make sure the thrust bearing outer race is not removed and drive pinion is not lift-up.

2) Set the height gauge to adapter plate. Lower the indicator of height gauge to mating surface of adapter plate and case, then set to zero point.

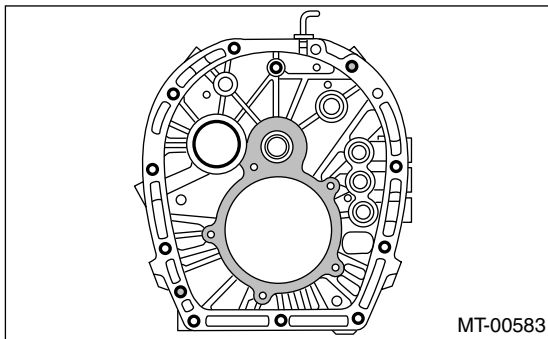
ST 18853AA000 HEIGHT GAUGE



NOTE:

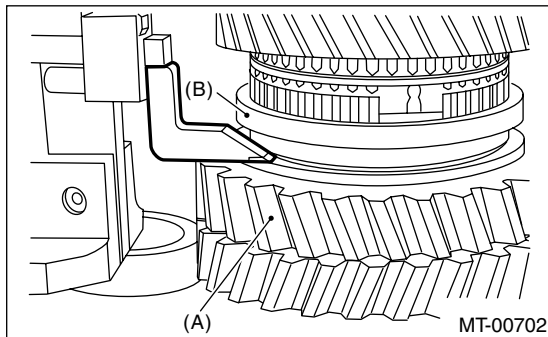
- Remove the remaining gasket on edge surface with scraper, since the adapter plate is base point of measurement.

- Do not place the height gauge on shaded area in the figure during measurement.



3) Select the main shaft snap ring. <Ref. to 6MT-83, ADJUSTMENT, Main Shaft Assembly.>

4) Shift the 1st-2nd sleeve to 1st driven gear side, then press down to the stopper and measure "B1".

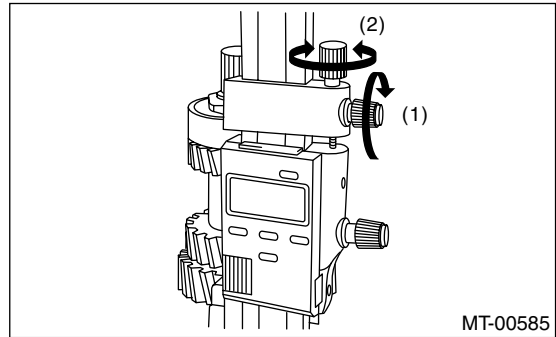


- (A) 1st driven gear
- (B) 1st-2nd sleeve

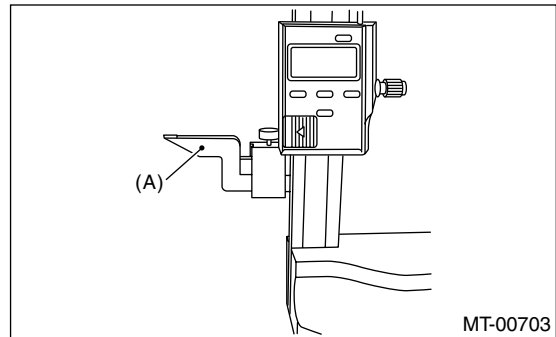
NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of sleeve 1st side.

- Measure five points of the sleeve turning every approx. 72°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.

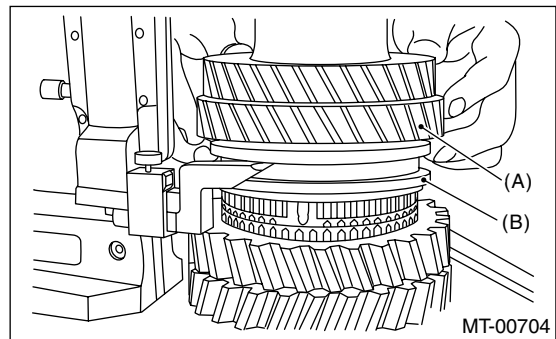


5) Set the height gauge indicator upside down.



- (A) Indicator

6) Shift the 1st-2nd sleeve to 2nd driven gear side, then press up to the stopper and measure "B2".



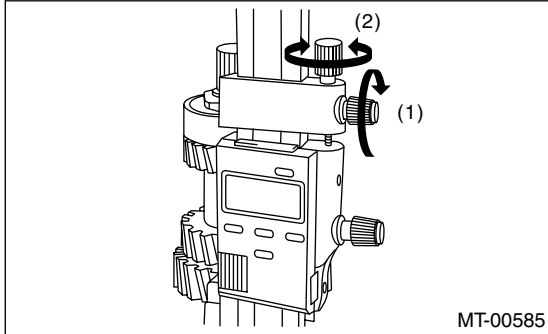
- (A) 2nd driven gear
- (B) 1st-2nd sleeve

Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of sleeve 2nd side.
- Perform the measuring procedure with two people, and measure the sleeve lifted up straight.
- Measure five points of the sleeve turning every approx. 72° apart. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.



7) According to both measurements, calculate the 1st-2nd sleeve neutral position. Select the fork rod which applies to the calculated value from following equation.

Equation: $T = (B1 + B2) / 2$

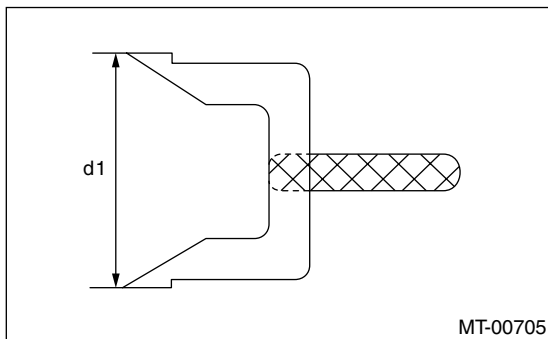
T: 1st-2nd sleeve center position

B1: Height from adapter plate edge to sleeve edge when shifted to 1st gear.

B2: Height from adapter plate edge to sleeve edge when shifted to 2nd gear. [measurement value + 55 mm (2.17 in)]

NOTE:

The indicator is installed upside down compared to the setting procedure of zero point. Add d1 [fixing value: 55 mm (2.17 in)] from the following figure to "B2", to obtain measurement value of "B2".



T	mm (in)	Lot No. (Mark)
62.93 — 63.23 (2.4776 — 2.4894)		32801AA111 (1)
63.23 — 63.53 (2.4894 — 2.5012)		32801AA131 (None)
63.53 — 63.83 (2.5012 — 2.5130)		32801AA141 (2)

2. SELECTION OF 3rd-4th FORK ROD

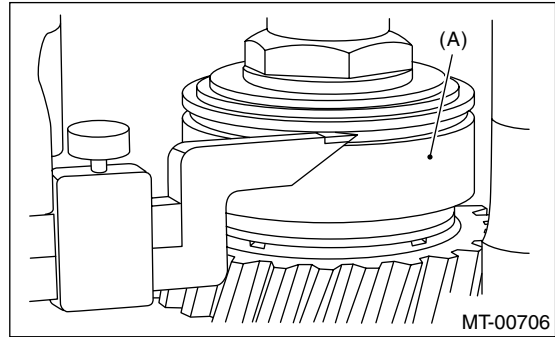
NOTE:

Perform the following procedures when:

- Replacing the main shaft.
- Replacing the 3rd, 3rd to 6th drive gear and bush.
- Replacing the 3rd, 3rd to 6th synchro assembly.
- Replacing the 3rd-4th hub, sleeve assembly.

- 1) Insert the main shaft assembly in adapter plate.
- 2) Set the height gauge to adapter plate. Lower the indicator of height gauge to upper surface of snap ring groove, on the upper side of main rear bearing, then set to zero point.

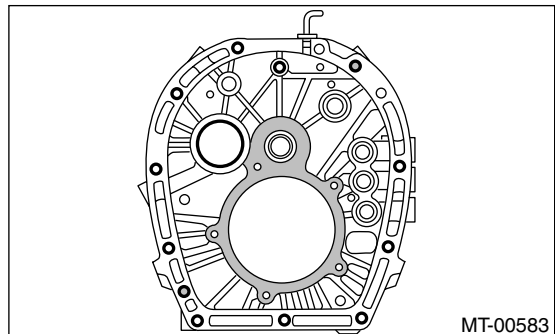
ST 18853AA000 HEIGHT GAUGE



(A) Ball bearing

NOTE:

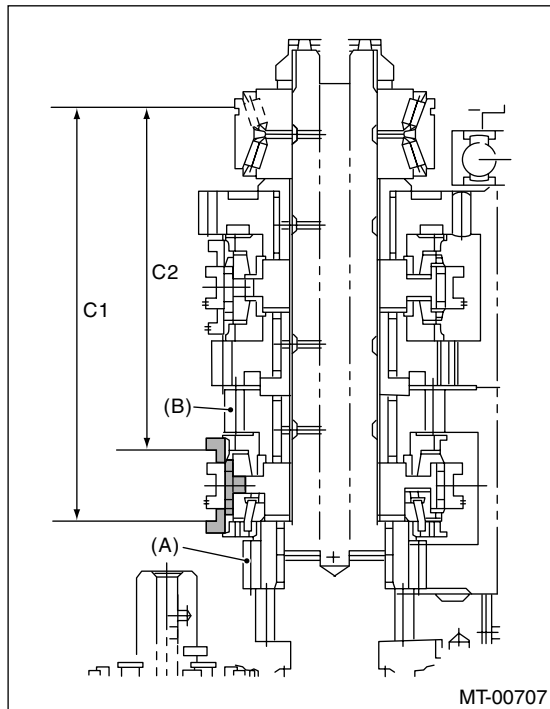
- Remove the remaining gasket on edge surface with scraper, since the height gauge is set on adapter plate during measurement.
- Do not put the height gauge on shaded area in the figure during the measurement.



Shifter Fork and Rod

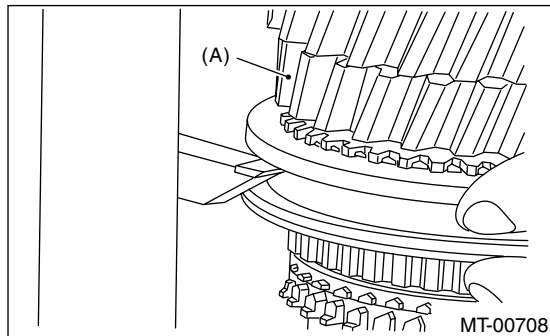
MANUAL TRANSMISSION AND DIFFERENTIAL

3) Using the height gauge, measure “C1” and “C2” shown in the figure.



- (A) 3rd drive gear
- (B) 4th drive gear

(1) Shift the 3rd-4th sleeve to 4th gear side, then press up to the stopper and measure “C2”.

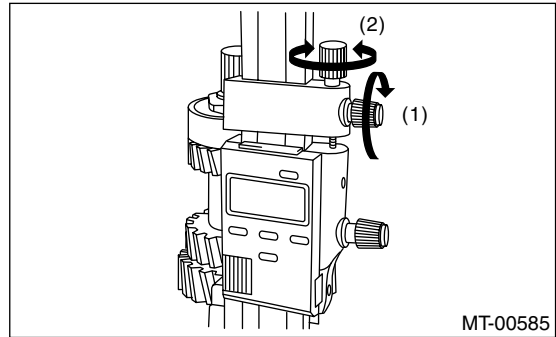


- (A) 4th drive gear

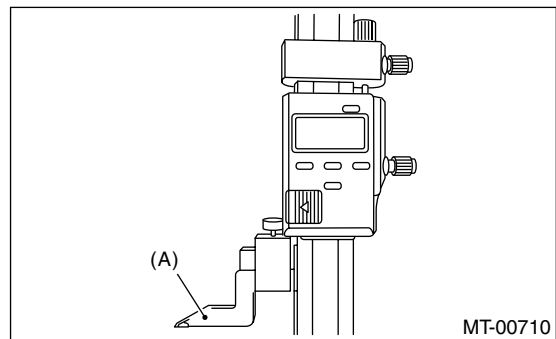
NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure.
- Turn dial (2) to set the indicator to edge surface of sleeve 4th side.
- Perform the measuring procedure with two people, and measure the sleeve lifted up straight.

- Measure five points of the sleeve turning every approx. 72°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.

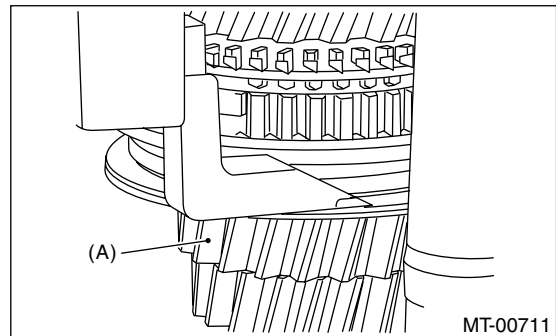


(2) Set the height gauge indicator upside down.



- (A) Indicator

(3) Shift the 3rd-4th sleeve to 3rd drive gear side, then press down to the stopper and measure “C1”.



- (A) 3rd drive gear

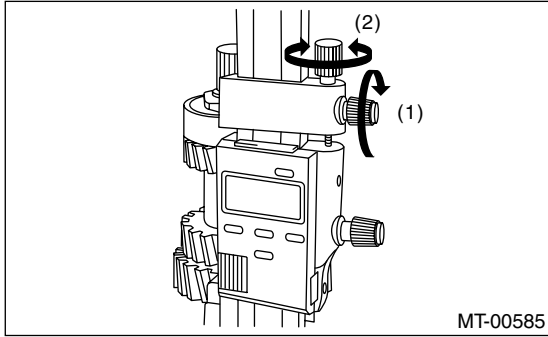
NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of sleeve 3rd side.

Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

- Measure five points of the sleeve turning every approx. 72°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.



4) According to both measurements, calculate the 3rd-4th sleeve neutral position. Select the fork rod which applies to the calculated value from following equation.

Equation: $T = (C1 + C2) / 2$

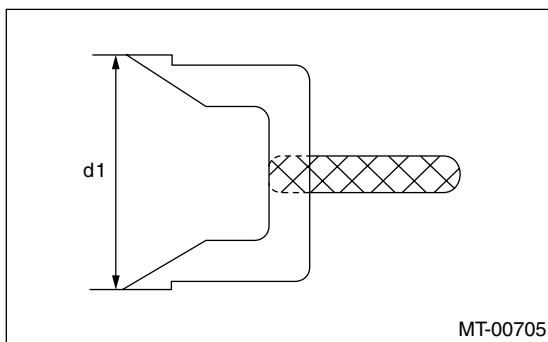
T: 3rd-4th sleeve center position

C1: Length from main shaft rear bearing snap ring groove to sleeve edge when shifted to 3rd gear. [measurement value +55 mm (2.17 in)]

C2: Length from main shaft rear bearing snap ring groove to sleeve edge when shifted to 4th gear.

NOTE:

The indicator is installed upside down compared to the setting procedure of zero point. Add d1 [fixing value: 55 mm (2.17 in)] from the following figure to "C1", to obtain measurement value of "C1".



T mm (in)	Lot No. (Mark)		
	M.SFT Snap ring 805072010 [t=1.65 mm (0.065 in)]	M.SFT Snap ring 805072011 [t=1.95 mm (0.077 in)]	M.SFT Snap ring 805072012 [t=2.25 mm (0.089 in)]
137.22 — 137.52 (5.4024 — 5.4142)	32809AA171 (None)	32809AA181 (2)	32809AA191 (4)
137.52 — 137.82 (5.4142 — 5.4260)	32809AA161 (1)	32809AA171 (None)	32809AA181 (2)
137.82 — 138.12 (5.4260 — 5.4379)	32809AA141 (3)	32809AA161 (1)	32809AA171 (None)

T = Thickness

3. SELECTION OF 5th-6th FORK ROD

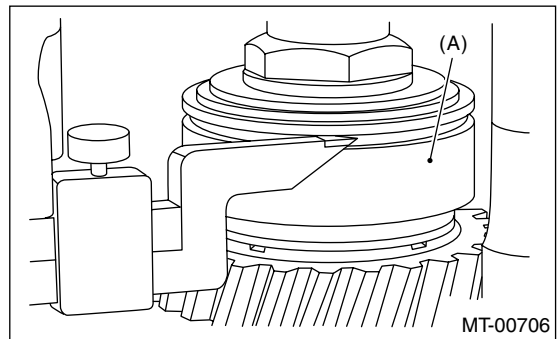
NOTE:

Perform the following procedures when:

- Replacing the main shaft.
- Replacing the 3rd to 6th drive gear and bush.
- Replacing the 3rd to 6th synchro ring assembly.
- Replacing the 3rd-4th hub, sleeve assembly.
- Replacing the 5th-6th hub, sleeve assembly.

- 1) Insert the main shaft assembly in adapter plate.
- 2) Set the height gauge to adapter plate. Lower the indicator of height gauge to upper surface of snap ring groove, or the upper side of main rear bearing. Then set to zero point.

ST 18853AA000 HEIGHT GAUGE



(A) Ball bearing

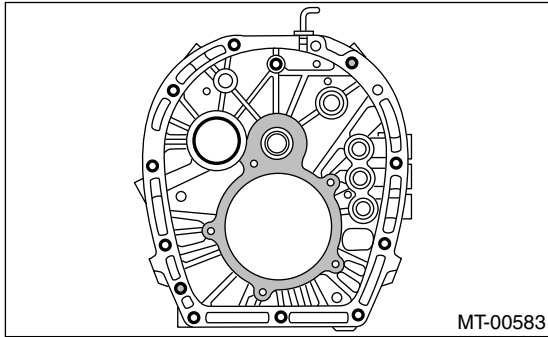
NOTE:

- Remove the remaining gasket on edge surface with scraper, since the height gauge is set on adapter plate during measurement.

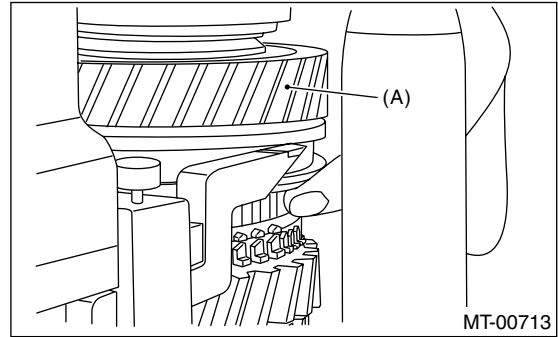
Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

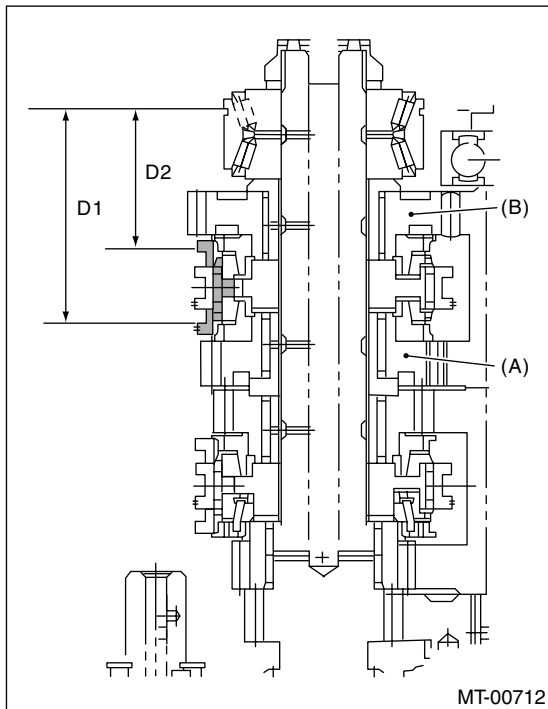
- Do not place the height gauge on shaded area in the figure during the measurement.



- Shift the 5th-6th sleeve to 6th main gear side, then press up to the stopper and measure "D2".



- Using the height gauge, measure "D1" and "D2" shown in the figure.

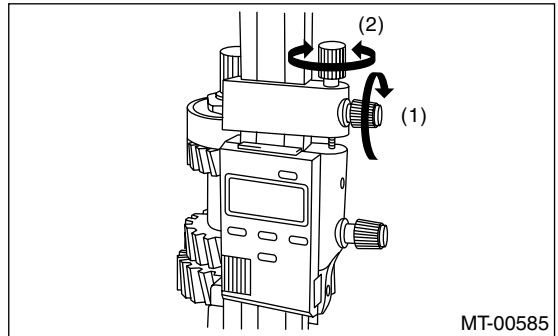


- (A) 5th main gear
- (B) 6th main gear

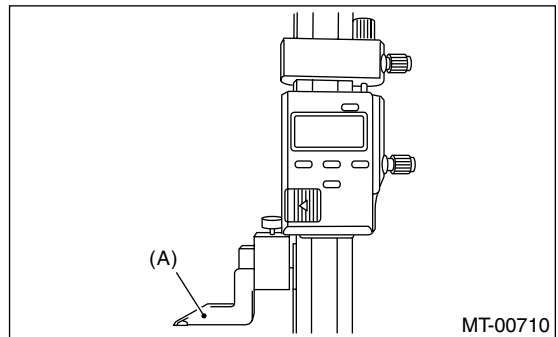
- (A) 6th main gear

NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of sleeve 6th side.
- Perform the measuring procedure with two people, and measure the sleeve lifted up straight.
- Measure five points of the sleeve turning every approx. 72°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.



- Set the height gauge indicator upside down.

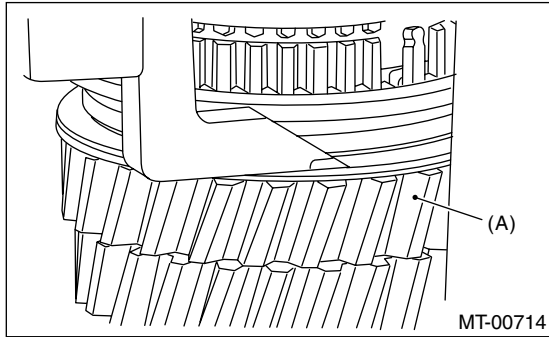


- (A) Indicator

Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

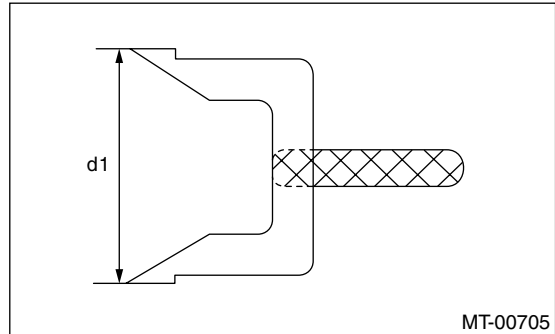
(3) Shift the 5th-6th sleeve to 5th main gear side, then press down to the stopper and measure "D1".



(A) 5th main gear

NOTE:

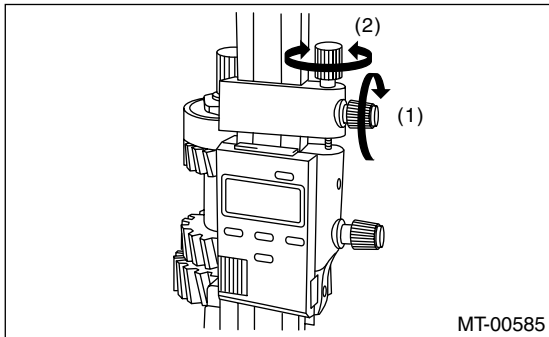
The indicator is installed upside down compared to the setting procedure of zero point. Add d1 [fixing value: 55 mm (2.17 in)] from the following figure to "D1", to obtain measurement value of "D1".



MT-00705

NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of sleeve 5th side.
- Measure five points of the sleeve turning every approx. 72°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.



MT-00585

T mm (in)	Lot No. (Mark)		
	M.SFT Snap ring 805072010 [t=1.65 mm (0.065 in)]	M.SFT Snap ring 805072011 [t=1.95 mm (0.077 in)]	M.SFT Snap ring 805072012 [t=2.25 mm (0.089 in)]
64.12 — 64.42 (2.5244 — 2.5362)	32945AA021 (None)	32945AA031 (2)	32945AA041 (4)
64.42 — 64.72 (2.5362 — 2.5480)	32945AA011 (1)	32945AA021 (None)	32945AA031 (2)
64.72 — 65.02 (2.5480 — 2.5598)	32945AA001 (3)	32945AA011 (1)	32945AA021 (None)

T = Thickness

4) According to both measurements, calculate the 5th-6th sleeve neutral position. Select the fork rod, which applies to the calculated value from following equation.

Equation: $T = (D1 + D2) / 2$

T: 5th-6th sleeve center position

D1: Length from the shaft rear bearing snap ring groove to sleeve groove edge when shifted to 5th gear. [measurement value + 55 mm (2.17 in)]

D2: Length from main shaft rear bearing snap ring groove to sleeve groove edge when shifted to 6th gear.

4. SELECTION OF REVERSE FORK ROD

NOTE:

Perform the following procedures when.

- Replacing the reverse idler gear.
- Replacing the reverse idler gear No. 2.
- Replacing the adapter plate.
- Replacing the base.

1) Insert the reverse idler gear assembly in adapter plate.

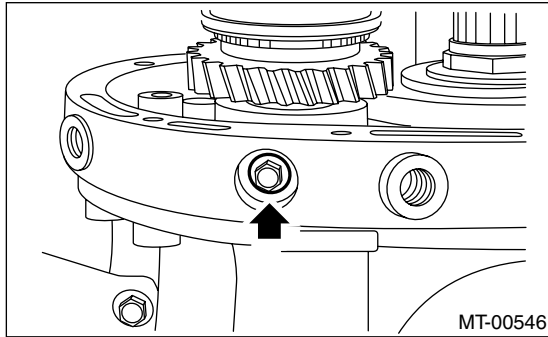
Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

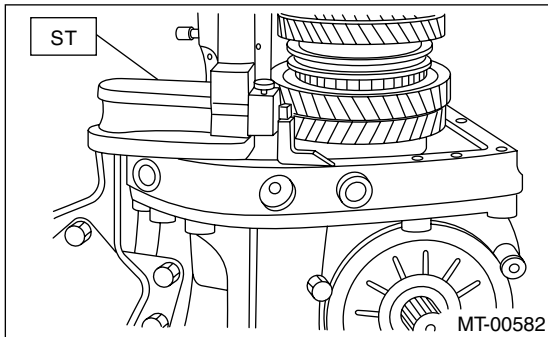
2) Tighten the base COMPL fixing bolt.

Tightening torque:

25 N·m (2.5 kgf·m, 18.1 ft·lb)

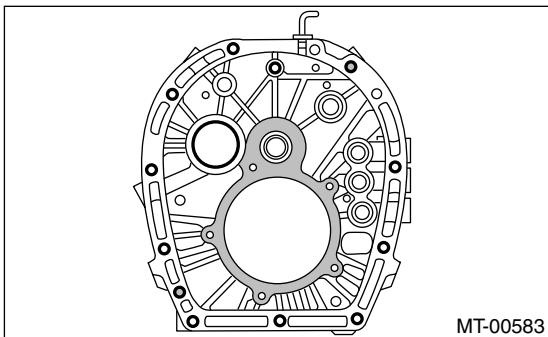


3) Set the height gauge to adapter plate. Lower the indicator of height gauge to mating surface of adapter plate and case, then set to zero point.
ST 18853AA000 HEIGHT GAUGE

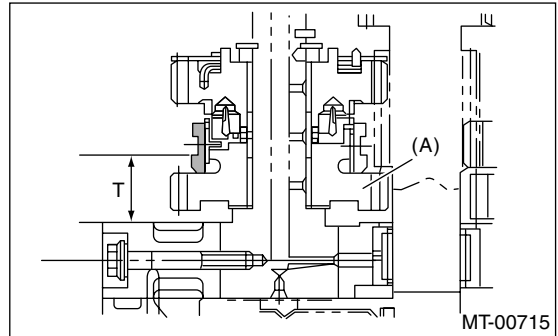


NOTE:

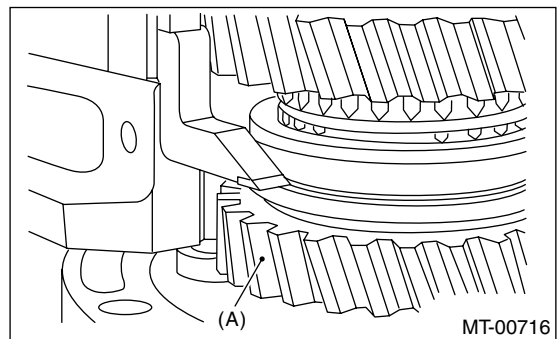
- Remove the remaining gasket on edge surface with scraper, since the adapter plate is base point of measurement.
- Do not place the height gauge on shaded area in the figure during measurement.



4) Press the reverse sleeve to reverse side idler gear No. 2, then measure "T".



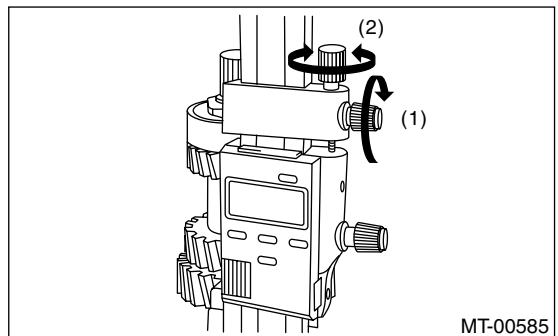
(A) Reverse idler gear No. 2



(A) Reverse idler gear No. 2

NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of reverse sleeve side.
- Measure five points of the sleeve turning every approx. 72°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.



Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

5) According to measurement, calculate the reverse sleeve neutral position. Select the fork rod which applies to the calculated value from following equation.

Equation: $T + 4.8 \text{ mm (0.189 in)}$

T + 4.8 mm (0.189 in) mm (in)	Lot No. (Mark)
33.50 — 33.80 (1.3189 — 1.3307)	32816AA110 (1)
33.80 — 34.10 (1.3307 — 1.3425)	32816AA130 (None)
34.10 — 34.40 (1.3425 — 1.3543)	32816AA140 (2)

T = Thickness

26. Clutch Housing

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-36, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.>, <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.>, <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-66, REMOVAL, Transmission Case.>
- 9) Remove each gear assembly. <Ref. to 6MT-71, REMOVAL, Main Shaft Assembly.>
- 10) Remove the drive pinion shaft assembly. <Ref. to 6MT-98, REMOVAL, Drive Pinion Shaft Assembly.>
- 11) Remove the front differential assembly. <Ref. to 6MT-104, REMOVAL, Front Differential Assembly.>
- 12) Remove the vehicle speed sensor. <Ref. to 6MT-33, REMOVAL, Vehicle Speed Sensor.>
- 13) Remove the speedometer gear. <Ref. to 6MT-110, REMOVAL, Speedometer Gear.>

B: INSTALLATION

- 1) Install the pitching stopper bracket.

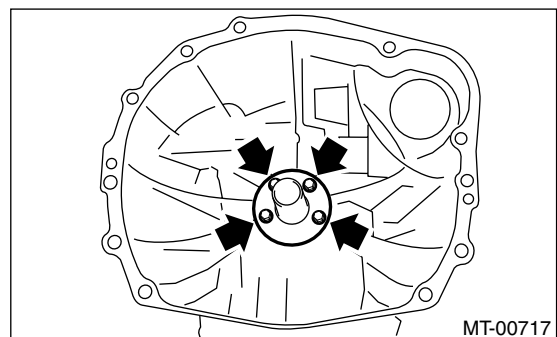
Tightening torque:

41 N·m (4.2 kgf-m, 30.2 ft-lb)

- 2) Install the speedometer gear. <Ref. to 6MT-110, INSTALLATION, Speedometer Gear.>
- 3) Install the vehicle speed sensor. <Ref. to 6MT-33, INSTALLATION, Vehicle Speed Sensor.>
- 4) Install the front differential assembly. <Ref. to 6MT-104, INSTALLATION, Front Differential Assembly.>
- 5) Install the drive pinion shaft assembly. <Ref. to 6MT-98, INSTALLATION, Drive Pinion Shaft Assembly.>
- 6) Install each gear assembly at once. <Ref. to 6MT-71, INSTALLATION, Main Shaft Assembly.>
- 7) Install the transmission case. <Ref. to 6MT-67, INSTALLATION, Transmission Case.>
- 8) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>
- 9) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>
- 10) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>
- 11) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 12) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.>, <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.>, <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>
- 13) Install the manual transmission assembly to vehicle. <Ref. to 6MT-38, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

- 1) Remove the clutch release bearing guide.



Clutch Housing

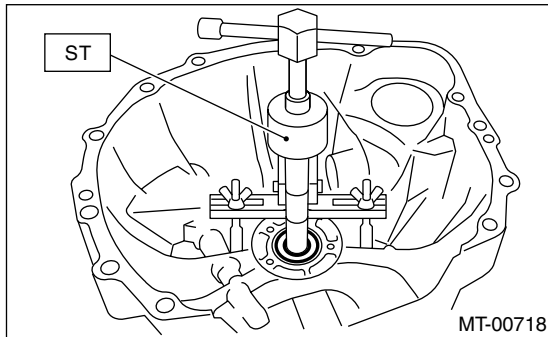
MANUAL TRANSMISSION AND DIFFERENTIAL

2) Remove the oil seal.

ST 398527700 PULLER ASSY

NOTE:

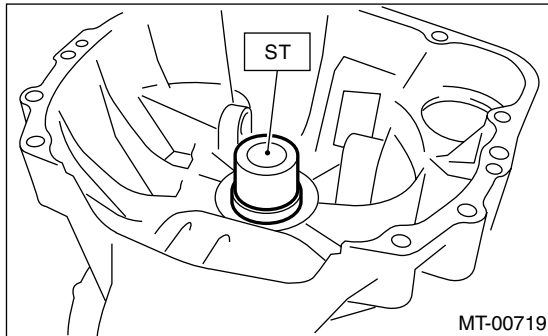
Do not reuse the oil seal.



D: ASSEMBLY

1) Install the oil seal into clutch housing without damaging.

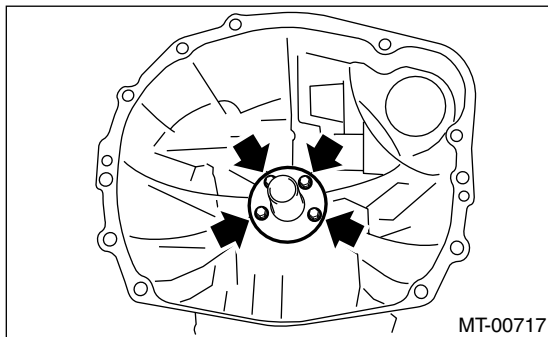
ST 399513600 INSTALLER



2) Install the clutch release bearing guide.

Tightening torque:

6.4 N·m (0.65 kgf·m, 4.7 ft·lb)



E: INSPECTION

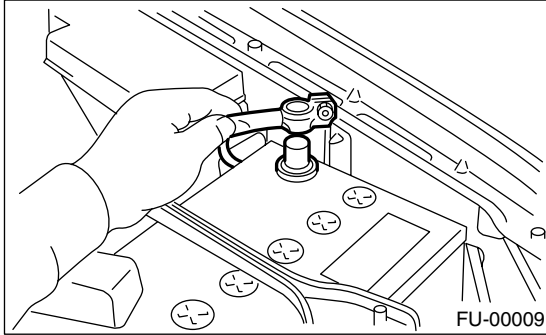
1) Make sure there is no damage or crack on the clutch housing. Replace the clutch housing with a new one if there is excessive damage.

2) Check the clutch housing for gear oil leakage. If there is oil leakage, repair or replace the leakage part.

27.G Sensor

A: REMOVAL

1) Disconnect the ground cable from battery.



2) Remove the console cover.

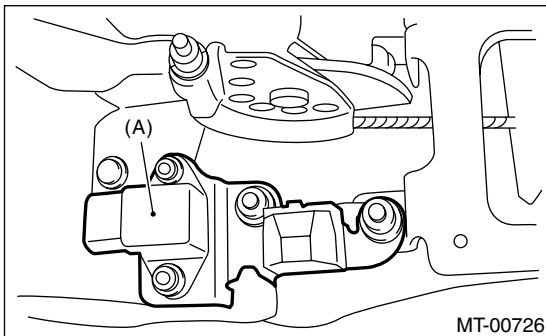
<Ref. to EI-42, Console Box.>

3) Disconnect the connector from G sensor.

4) Remove the G sensor from body.

CAUTION:

Do not drop or bump the G sensor.



(A) G sensor

B: INSTALLATION

Install in the reverse order of removal.

CAUTION:

Do not drop or bump the G sensor.

Tightening torque:

18 N·m (1.8 kgf-m, 13.0 ft-lb)

G Sensor

MANUAL TRANSMISSION AND DIFFERENTIAL

C: INSPECTION

	Step	Check	Yes	No
1	CHECK G SENSOR. 1) Turn the ignition switch to OFF. 2) Remove the G sensor from vehicle. 3) Connect the connector to G sensor. 4) Turn the ignition switch to ON. 5) Measure the voltage between G sensor connector terminals. Connector & terminal (B338) No. 2 (+) — No. 3 (-):	Is the voltage 2.3 ± 0.2 V when G sensor is horizontal?	Go to step 2.	Replace the G sensor.
2	CHECK G SENSOR. Measure the voltage between G sensor connector terminals. Connector & terminal (B338) No. 2 (+) — No. 3 (-):	Is the voltage 3.9 ± 0.2 V when G sensor is inclined forwards to 90° ?	Go to step 3.	Replace the G sensor.
3	CHECK G SENSOR. Measure the voltage between G sensor connector terminals. Connector & terminal (B338) No. 2 (+) — No. 3 (-):	Is the voltage 0.7 ± 0.2 V when G sensor is inclined backwards to 90° ?	G sensor is normal.	Replace the G sensor.

28. Driver's Control Center Differential Control Module

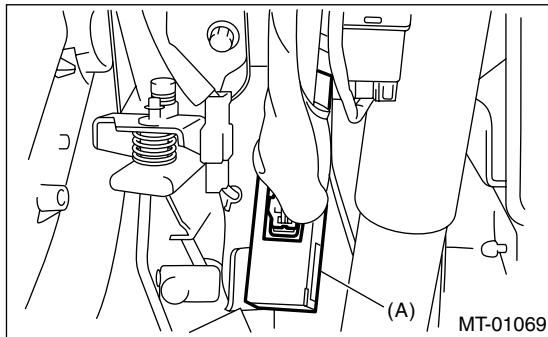
A: REMOVAL

1. LHD MODEL

- 1) Remove the ground cable from battery.
- 2) Remove the glove box.
<Ref. to EI-48, REMOVAL, Rear Quarter Trim.>
- 3) Disconnect the connector after removing the bolt from the inside of glove box, and then remove the control module.

2. RHD MODEL

- 1) Remove the ground cable from battery.
- 2) Remove the instrument panel lower cover.
<Ref. to EI-43, REMOVAL, Instrument Panel Assembly.>
- 3) Remove the driver's control center differential control module.



(A) Driver's control center differential control module

B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:

18 N·m (1.8 kgf·m, 13.3 ft·lb)

General Diagnostic Table

MANUAL TRANSMISSION AND DIFFERENTIAL

29. General Diagnostic Table

A: INSPECTION

1. MANUAL TRANSMISSION

Symptom	Possible cause	Remedy
1. Gears are difficult to intermesh. NOTE: The cause for difficulty in shifting gears can be classified into two kinds: one is malfunction of the gear shift system and the other is malfunction of the transmission. However, if the operation is heavy and engagement of the gears is difficult, defective clutch disengagement may also be responsible. Check whether the clutch is correctly functioning, before checking the gear shift system and transmission.	(a) Worn, damaged or burred chamfer of internal spline of sleeve and reverse driven gear	Replace.
	(b) Worn, damaged or burred chamfer of spline of gears	Replace.
	(c) Worn or scratched bushings	Replace.
	(d) Incorrect contact between synchronizer ring and gear cone or wear	Correct or replace.
2. Gear slips out. • Gear slips out when coasting on rough road. • Gear slips out during acceleration.	(a) Defective pitching stopper adjustment	Adjust.
	(b) Loose engine mounting bolts	Tighten or replace.
	(c) Worn fork shifter, broken shifter fork rail spring	Replace.
	(d) Worn or damaged ball bearing	Replace.
	(e) Excessive clearance between splines of synchronizer hub and synchronizer sleeve	Replace.
	(f) Worn tooth step of synchronizer hub (responsible for slip-out of 3rd gear)	Replace.
	(g) Worn 1st driven gear, needle bearing and race	Replace.
	(h) Worn 2nd driven gear, needle bearing and race	Replace.
	(i) Worn 3rd drive gear and bushing	Replace.
	(j) Worn 4th drive gear and bushing	Replace.
	(k) Worn 5th drive gear and bushing	Replace.
	(l) Worn 6th drive gear and bushing	Replace.
	(m) Worn reverse idler gear and bushing	Replace.
3. Unusual noise comes from transmission. NOTE: If an unusual noise is heard when the vehicle is parked with its engine idling and if the noise ceases when the clutch is disengaged, it may be considered that the noise comes from the transmission.	(a) Insufficient or improper lubrication	Lubricate or replace with specified oil.
	(b) Worn or damaged gears and bearings NOTE: If the trouble is only wear of the tooth surfaces, merely a high roaring noise will occur at high speeds, but if any part is broken, rhythmical knocking sound will be heard even at low speeds.	Replace.

General Diagnostic Table

MANUAL TRANSMISSION AND DIFFERENTIAL

2. DIFFERENTIAL

Symptom	Possible cause	Remedy
<p>1. Broken differential (case, gear, bearing, etc.)</p> <p>NOTE: Abnormal noise will develop and finally it will become impossible to continue to run due to broken pieces obstructing the gear revolution.</p>	(a) Insufficient or improper oil	Disassemble differential and replace broken components and at the same time check other components for any trouble, and replace if necessary.
	(b) Use of vehicle under severe conditions such as excessive load and improper use of clutch	Readjust bearing preload and backlash and face contact of gears.
	(c) Improper adjustment of taper roller bearing	Adjust.
	(d) Improper adjustment of drive pinion and hypoid driven gear	Adjust.
	(e) Excessive backlash due to worn differential side gear, washer or differential pinion vehicle under severe operating conditions.	Add recommended oil to specified level. Do not use vehicle under severe operating conditions.
	(f) Loose hypoid driven gear clamping bolts	Tighten.
<p>2. Differential and hypoid gear noises</p> <p>Troubles of the differential and hypoid gear always appear as noise problems. Therefore noise is the first indication of the trouble. However noises from the engine, muffler, tire, exhaust gas, bearing, body, etc. are easily mistaken for the differential noise. Pay special attention to the hypoid gear noise because it is easily confused with other gear noises. There are the following four kinds of noises.</p> <ul style="list-style-type: none"> • Gear noise when driving: If noise increases as the vehicle speed increases it may be due to insufficient gear oil, incorrect gear engagement, damaged gears, etc. • Gear noise when coasting: Damaged gears due to maladjusted bearings and incorrect shim adjustment • Bearing noise when driving or when coasting: Cracked, broken or damaged bearings • Noise which mainly occurs when turning: Unusual noise from the differential side gear, differential pinion, differential pinion shaft, etc. 	(a) Insufficient oil	Lubricate.
	(b) Improper adjustment of hypoid driven gear and drive pinion	Check tooth contact.
	(c) Worn teeth of hypoid driven gear and drive pinion	Replace as a set. Readjust bearing preload.
	(d) Loose roller bearing	Readjust hypoid driven gear to drive pinion backlash and check tooth contact.
	(e) Distorted hypoid driven gear or differential case	Replace.
	(f) Worn washer and differential pinion shaft	Replace.

General Diagnostic Table

MANUAL TRANSMISSION AND DIFFERENTIAL
