

Main Shaft Assembly for Single-range

MANUAL TRANSMISSION AND DIFFERENTIAL

15. Main Shaft Assembly for Single-range

A: REMOVAL

- 1) Remove the manual transmission assembly from the vehicle. <Ref. to 5MT-24, REMOVAL, Manual Transmission Assembly.>
- 2) Remove the transfer case together with the extension case assembly. <Ref. to 5MT-36, REMOVAL, Transfer Case and Extension Case Assembly.>
- 3) Remove the transmission case. <Ref. to 5MT-48, REMOVAL, Transmission Case.>
- 4) Remove the drive pinion shaft assembly. <Ref. to 5MT-57, REMOVAL, Drive Pinion Shaft Assembly.>
- 5) Remove the main shaft assembly for single-range.

B: INSTALLATION

- 1) Install the needle bearing and oil seal to the front of the transmission single-range main shaft assembly.

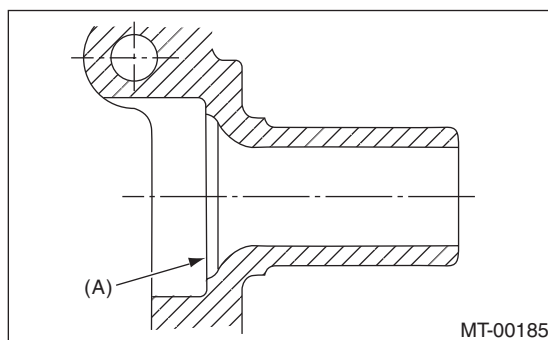
NOTE:

- Wrap the clutch splined section with vinyl tape to prevent damage to the oil seal.
- Apply grease (UNILUBE #2 or equivalent) to the sealing lip of the oil seal.
- Use a new oil seal.

- 2) Install the transmission case knock pin into the knock pin hole of the needle bearing outer race.

NOTE:

Align the end face of the seal with surface (A) when installing the oil seal.



- 3) Install the drive pinion assembly. <Ref. to 5MT-57, INSTALLATION, Drive Pinion Shaft Assembly.>
- 4) Install the transmission case. <Ref. to 5MT-49, INSTALLATION, Transmission Case.>
- 5) Install the transfer case together with the extension case assembly. <Ref. to 5MT-36, INSTALLATION, Transfer Case and Extension Case Assembly.>

- 6) Install the manual transmission assembly to the vehicle. <Ref. to 5MT-26, INSTALLATION, Manual Transmission Assembly.>

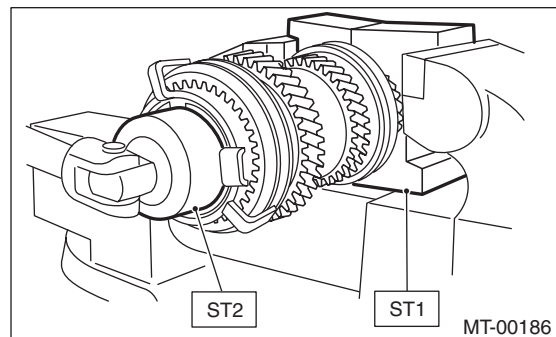
C: DISASSEMBLY

- 1) Put vinyl tape around main shaft spline to protect the oil seal from damage. Then pull out the oil seal and needle bearing by hand.
- 2) Remove the lock nut from transmission main shaft assembly for single range.

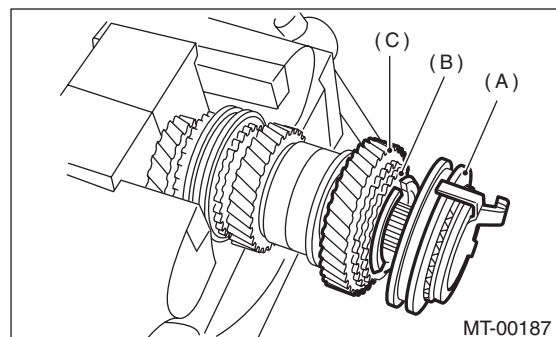
NOTE:

Straighten the crimp before removing the lock nut.

- | | | |
|-----|-----------|---------------------|
| ST1 | 498937000 | TRANSMISSION HOLDER |
| ST2 | 499987003 | SOCKET WRENCH (35) |



- 3) Remove the 5th-Rev sleeve & hub assembly, baulk ring, 5th drive gear & needle bearing.

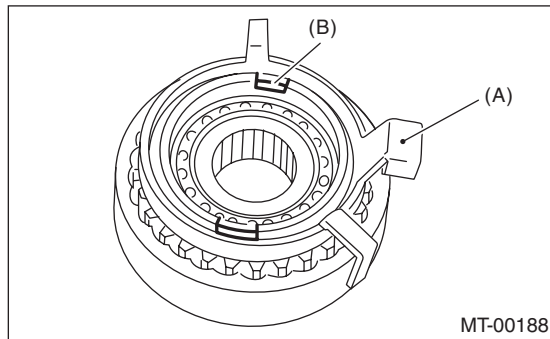


- | | |
|-----|---------------------------|
| (A) | 5th-Rev sleeve & hub ASSY |
| (B) | Baulk ring |
| (C) | 5th drive gear |

Main Shaft Assembly for Single-range

MANUAL TRANSMISSION AND DIFFERENTIAL

4) Remove the snap ring and synchro cone stopper from the 5th-Rev sleeve & hub assembly.



- (A) Synchro cone stopper
- (B) Snap ring

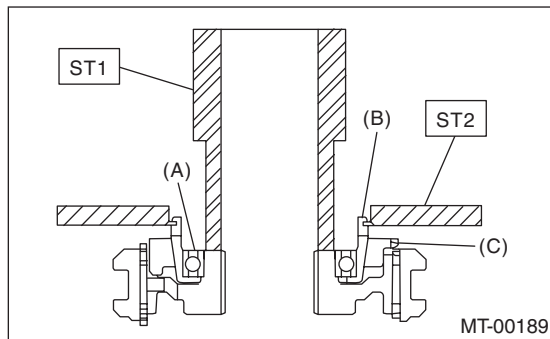
5) Using the ST1, ST2 and a press, remove the ball bearing, synchro cone and baulk ring (Rev).

NOTE:

- When replacing the sleeve & hub, replace them as a set.
- Do not disassemble the sleeve & hub; the aligning position is pre-matched.
- If it is necessary to disassemble, mark the engaging points on the splines beforehand.
- Do not reuse the ball bearing.

ST1 499757002 INSTALLER

ST2 498077400 SYNCHRO CONE REMOVER



- (A) Ball bearing
- (B) Synchro cone
- (C) Baulk ring

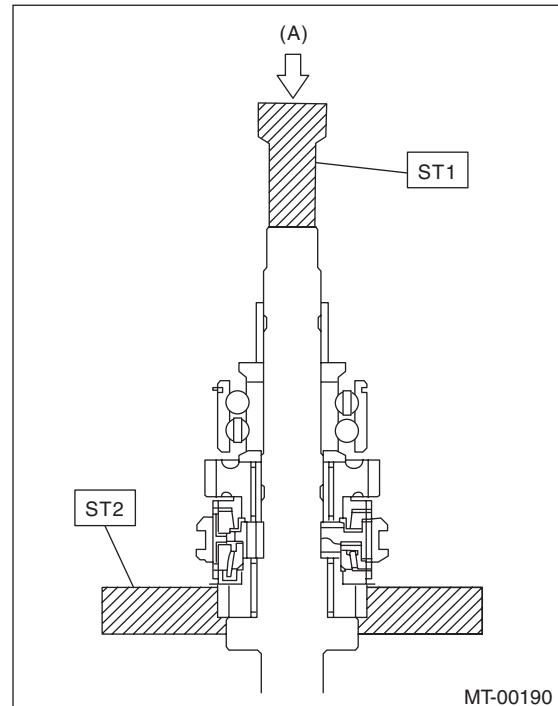
6) Using ST1 and ST2, remove the rest of the parts.

NOTE:

- When replacing the sleeve & hub, replace them as a set.
- Do not disassemble the sleeve & hub; the aligning position is pre-matched.
- If it is necessary to disassemble, mark the engaging points on the splines beforehand.

ST1 899864100 REMOVER

ST2 899714110 REMOVER



- (A) Press

Main Shaft Assembly for Single-range

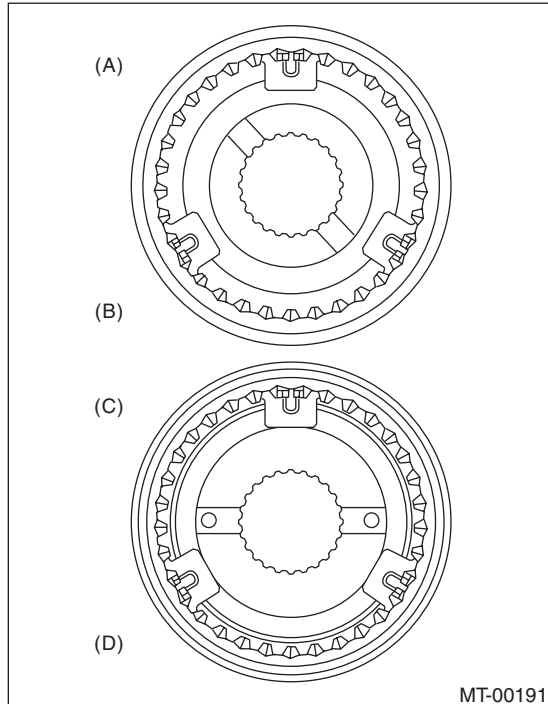
MANUAL TRANSMISSION AND DIFFERENTIAL

D: ASSEMBLY

1) When the sleeve & hub assemblies have been disassembled, reassemble by aligning the alignment marks.

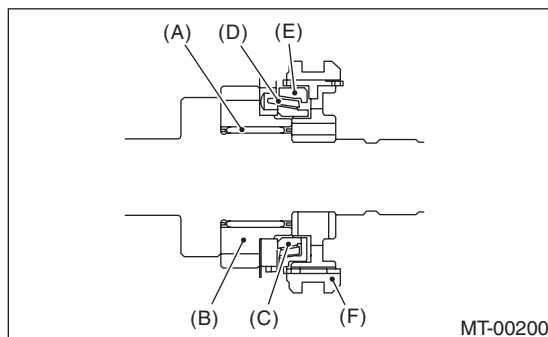
NOTE:

Position the open ends of the spring 120° apart.



- (A) 3rd-4th hub ASSY
- (B) 3rd gear side
- (C) 5th-Rev hub ASSY
- (D) 5th gear side

2) Install the 3rd drive gear, outer baulk ring, synchro cone, inner baulk ring, sleeve and hub assembly for the 3rd needle bearing, on the transmission main shaft.



- (A) 3rd needle bearing
- (B) 3rd drive gear
- (C) Inner baulk ring
- (D) Synchro cone
- (E) Outer baulk ring
- (F) Sleeve & hub ASSY

NOTE:

Align the groove in baulk ring with the shifting insert.

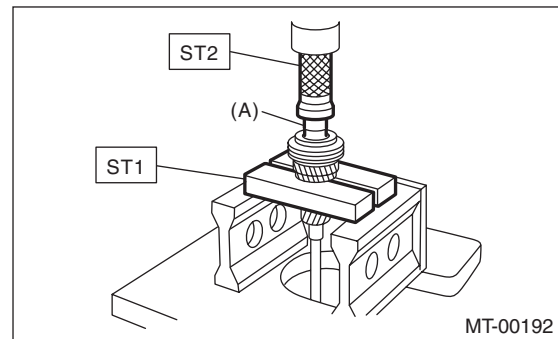
3) Install the 4th needle bearing race onto transmission main shaft using ST1, ST2 and press.

NOTE:

Do not apply pressure in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).

ST1 899714110 REMOVER

ST2 499877000 RACE 4-5 INSTALLER

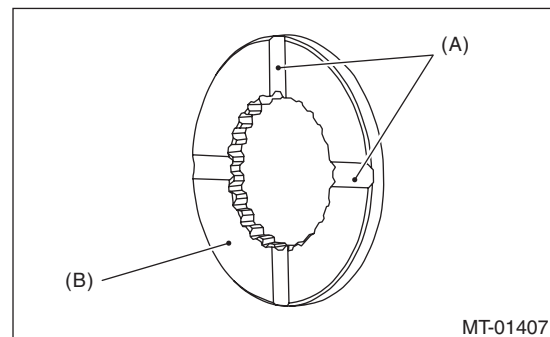


(A) 4th needle bearing race

4) Install the baulk ring, needle bearing, 4th drive gear and 4th gear thrust washer to the transmission main shaft.

NOTE:

Align the baulk ring and gear & hub assembly with the key groove.



- (A) Groove
- (B) 4th gear side

Main Shaft Assembly for Single-range

MANUAL TRANSMISSION AND DIFFERENTIAL

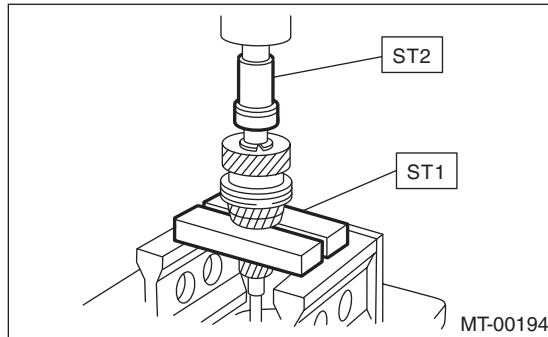
5) Press-fit the ball bearing into the rear section of transmission main shaft using ST1, ST2 and a press.

NOTE:

Do not apply pressure in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).

ST1 899714110 REMOVER

ST2 499877000 RACE 4-5 INSTALLER



6) Using the ST1 and ST2, install the 5th gear thrust washer and 5th needle bearing race onto the rear section of transmission main shaft.

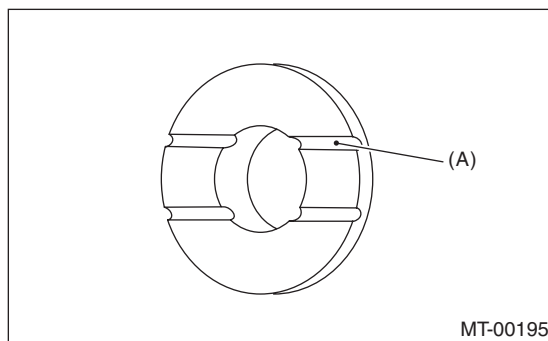
NOTE:

- Do not apply pressure in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).

- Face the thrust washer in the correct direction.

ST1 899714110 REMOVER

ST2 499877000 RACE 4-5 INSTALLER



(A) Face this surface to the 5th gear side.

7) Install the bearing onto the synchro cone.

8) Install the baulk ring and synchro cone onto the 5th-Rev sleeve & hub assembly using the ST and a press.

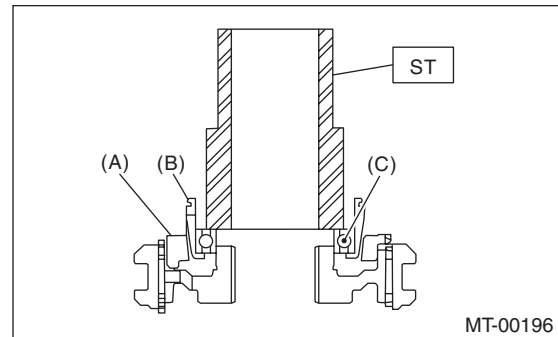
NOTE:

- Do not apply pressure in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).

- Use a new ball bearing.

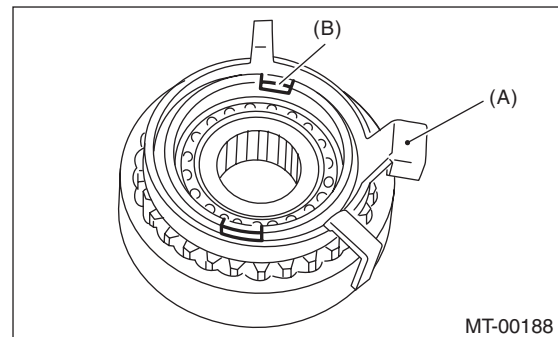
- After press-fitting, make sure the synchro cone rotates smoothly.

ST 499757002 INSTALLER



- (A) Baulk ring
- (B) Synchro cone
- (C) Ball bearing

9) Install the synchro cone stopper and snap ring to the 5th-Rev sleeve & hub assembly.



- (A) Synchro cone stopper
- (B) Snap ring

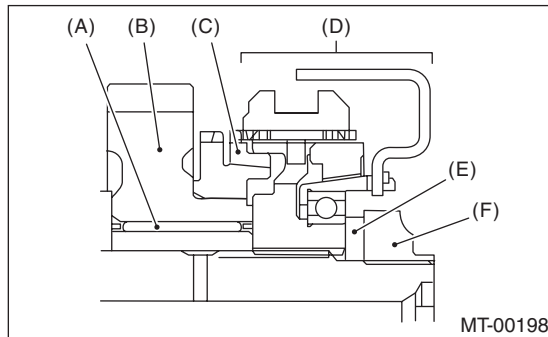
Main Shaft Assembly for Single-range

MANUAL TRANSMISSION AND DIFFERENTIAL

10) Install rest of the parts to the rear section of the transmission main shaft.

NOTE:

Align the groove in baulk ring with the shifting insert.



- (A) Needle bearing
- (B) 5th drive gear
- (C) Baulk ring
- (D) 5th-Rev sleeve & hub ASSY
- (E) Lock washer
- (F) Lock nut

11) Tighten the lock nuts to the specified torque using ST1 and ST2.

NOTE:

Crimp lock nuts in two locations after tightening.

ST1 499987003 SOCKET WRENCH

ST2 498937000 TRANSMISSION HOLDER

Tightening torque:

120 N·m (12.2 kgf·m, 88.5 ft·lb)

E: INSPECTION

Disassembled parts should be washed with unleaded gasoline first, then inspected carefully.

1) Bearing

Replace the bearings in the following cases.

- When the bearing balls, outer races and inner races are broken or rusty.
- When the bearing is worn.
- When the bearings fail to turn smoothly or emit noise in rotation after gear oil lubrication.
- When bearing has other defects.

2) Bushing (each gear)

Replace the bushing in following cases.

- When the sliding surface is damaged or abnormally worn.
- When the inner wall is abnormally worn.

3) Gear

- Replace gear with new part if its tooth surfaces are broken, damaged or excessively worn.
- Correct or replace if the cone that contacts the baulk ring is rough or damaged.
- Correct or replace if the inner surface or end face is damaged.

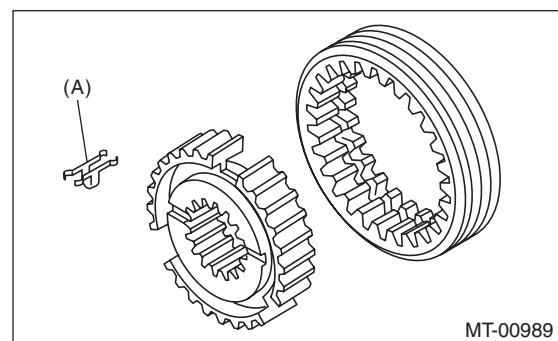
4) Baulk ring

Replace the ring in following cases:

- When the inner surface and end face are damaged.
- When the ring inner surface is abnormally or partially worn down.
- When the contact surface of the synchronizer ring insert is scored or abnormally worn down.

5) Shifting insert key

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



(A) Insert key

6) Oil seal

Replace the oil seal if the lip is deformed, hardened, worn or defective in any way.

7) O-ring

Replace the O-ring if the sealing face is deformed, hardened, damaged, worn or defective in any way.

8) Gearshift mechanism

Repair or replace the gearshift mechanism if excessively worn, bent or defective in any way.

Main Shaft Assembly for Single-range

MANUAL TRANSMISSION AND DIFFERENTIAL

F: ADJUSTMENT

Selection of main shaft rear plate:

Using the ST, measure the protrusion amount (A) of ball bearing from transmission main case surface, and select a suitable plate in the following table.

NOTE:

Before measuring, tap the end of main shaft with a plastic hammer lightly in order to make the clearance zero between the main case surface and moving flange of bearing.

ST 498147001 DEPTH GAUGE

Dimension (A) mm (in)	Part number	Mark
4.00 — 4.13 (0.1575 — 0.1626)	32294AA041	1
3.87 — 3.99 (0.1524 — 0.1571)	32294AA051	2

