16.Main Shaft Assembly for Single-range

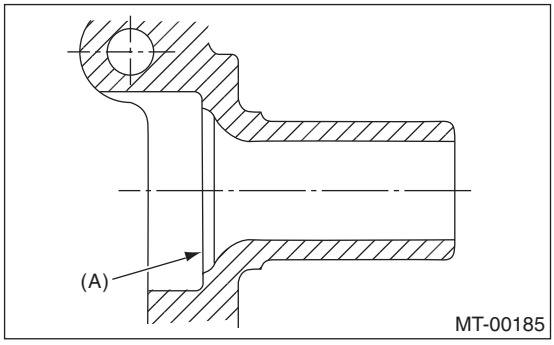
A: REMOVAL

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-37, REMOVAL, Transfer Case and Extension Case Assembly.>
3) Remove the transmission case. <Ref. to 5MT-37, REMOVAL, Transfer Case and Extension Case Assembly.>
4) Remove the drive pinion shaft assembly. <Ref. to 5MT-57, REMOVAL, Drive Pinion Shaft Assembly.>
5) Remove the main shaft assembly.

B: INSTALLATION

1) Wrap the clutch splined section with vinyl tape to prevent damage to the oil seal.
2) Apply UNILUBE #2 (or equivalent) to the sealing lip of the oil seal.
3) Install the needle bearing and new oil seal onto the front of the transmission main shaft assembly.
4) Attach the needle bearing outer race knock pin hole into the transmission case knock pin.

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

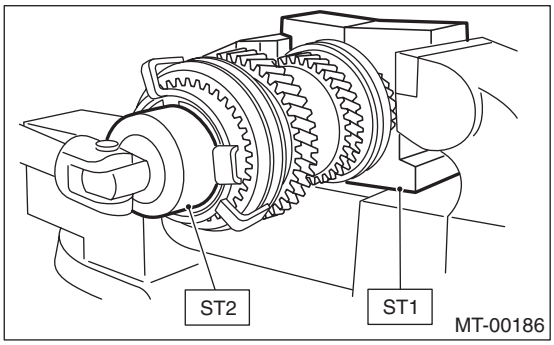


5) Install the drive pinion assembly. <Ref. to 5MT-57, INSTALLATION, Drive Pinion Shaft Assembly.>
6) Install the transmission case. <Ref. to 5MT-49, INSTALLATION, Transmission Case.>
7) Install the transfer case together with the extension case assembly. <Ref. to 5MT-37, INSTALLATION, Transfer Case and Extension Case Assembly.>
8) Install the manual transmission assembly to the vehicle. <Ref. to 5MT-26, INSTALLATION, Manual Transmission Assembly.>

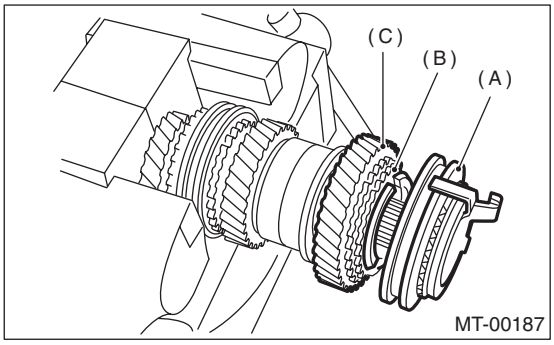
C: DISASSEMBLY

1) Put vinyl tape around main shaft splines 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.

NOTE:
Straighten the crimp before taking off lock nut.
ST1 498937000 TRANSMISSION HOLDER
ST2 499987003 SOCKET WRENCH (35)

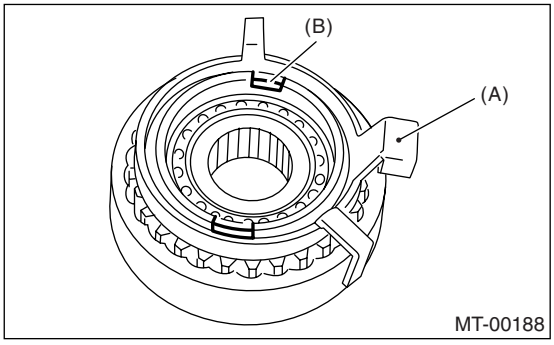


3) Remove the 5th-Rev sleeve & hub assembly, 5th baulk ring, 5th drive gear and needle bearing from the transmission main shaft assembly.



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

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

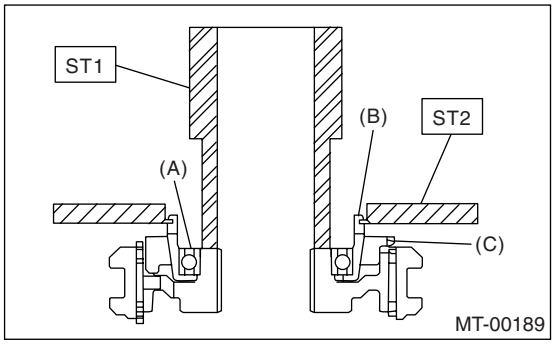


(A) Synchro cone stopper
(B) Snap ring

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

NOTE:
If necessary, use the new sleeve gear & hub assembly, when replacing the sleeve or hub assembly. Do not attempt to disassemble because they must engage at a specified point. If they have to be disassembled, mark the engaging point beforehand.

ST1 499757002 INSTALLER
ST2 498077400 SYNCHRO CONE REMOVER

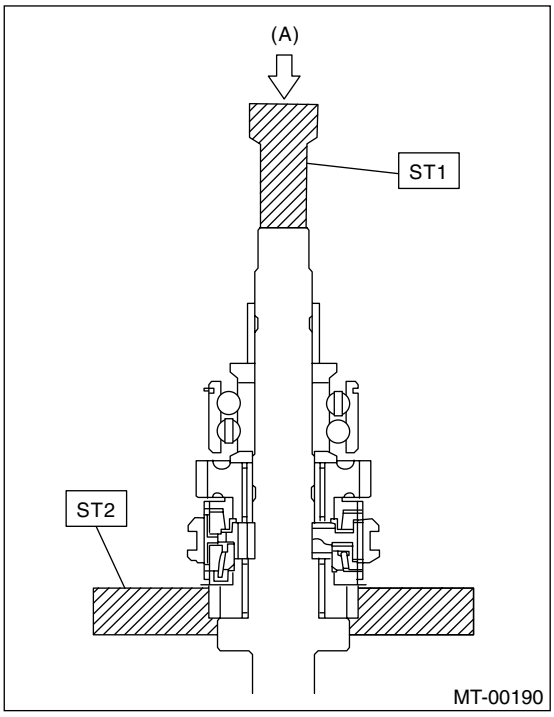


(A) Ball bearing
(B) Reverse synchro cone
(C) Reverse baulk ring

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

NOTE:
If necessary, use the new sleeve gear & hub assembly, when replacing the sleeve or hub assembly. Do not attempt to disassemble because they must engage at a specified point. If they have to be disassembled, mark the engaging point beforehand.

ST1 899864100 REMOVER
ST2 899714110 REMOVER

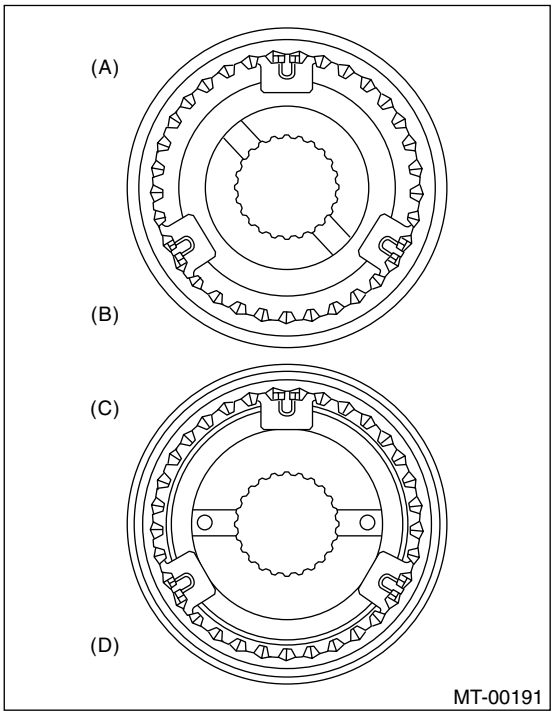


(A) Press

D: ASSEMBLY

1) Assemble individual sleeve & hub assemblies.

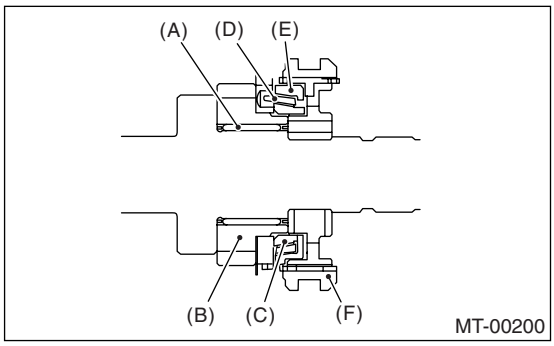
NOTE:
Position the open ends of the spring 120° apart.



(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.

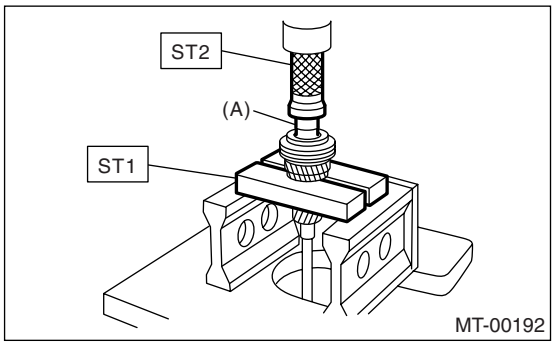
NOTE:
Align the convex portion of baulk ring with the shifting insert.



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

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

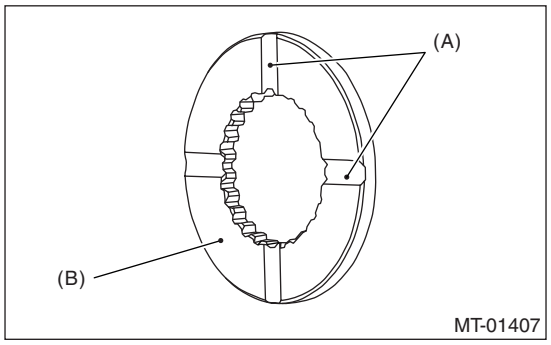
CAUTION:
Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).
ST1 899714110 REMOVER
ST2 499877000 RACE 4-5 INSTALLER



(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.

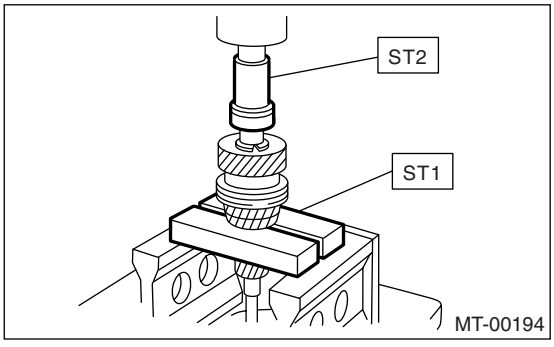
NOTE:
• Align the baulk ring and gear & hub assembly with key convex portion.
• Make sure the thrust washer is oriented in the correct direction.



(A) Groove
(B) Face this surface to 4th gear side.

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

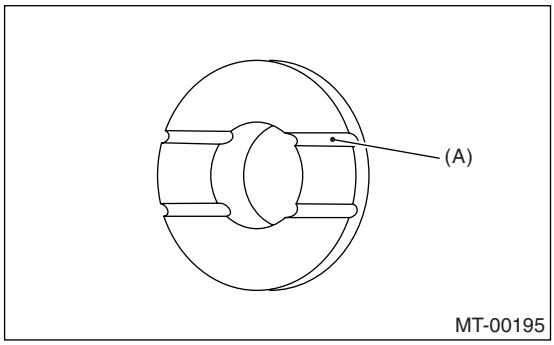
CAUTION:
Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).
ST1 899714110 REMOVER
ST2 499877000 RACE 4-5 INSTALLER



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.

CAUTION:
Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).

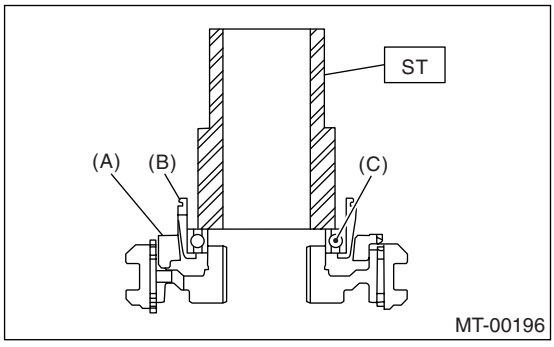
NOTE:
Make sure the thrust washer is oriented in the correct direction.
ST1 899714110 REMOVER
ST2 499877000 RACE 4-5 INSTALLER



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

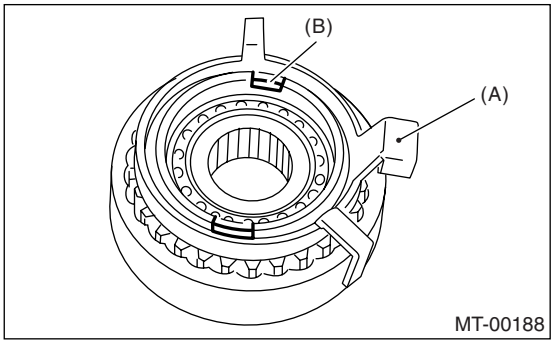
7) Install the bearing onto the synchro cone.
8) Install the baulk ring, synchro cone and new ball bearing onto the 5th-Rev sleeve & hub assembly using ST and a press.

CAUTION:
Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1 Imp ton).
9) After press-fitting, make sure the synchro cone rotates smoothly.
ST 499757002 INSTALLER



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

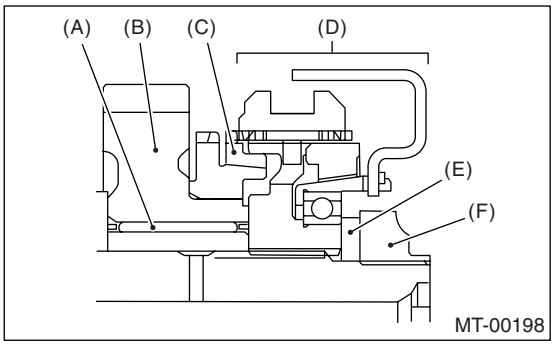
10) Install the synchro cone stopper and snap ring to the 5th-Rev sleeve & hub assembly.



(A) Synchro cone stopper
(B) Snap ring

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

NOTE:
Align the convex portion of 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

12) Tighten the lock nuts to the specified torque using ST1 and ST2.
13) 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 clean first and then inspected carefully.

1) Bearing

Replace the bearings in the following cases.

• If the ball bearing, outer race or inner race is damaged or rusted

• In case of worn or damaged bearings

• In the case that the bearing fails to turn smoothly or makes an abnormal noise when turned, even 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 excessively worn.

3) Gear

• Replace the gear with new one 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 baulk ring in following cases:

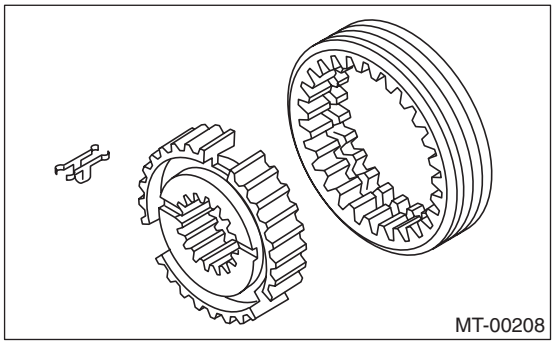
• When the inner surface and end face are damaged.

• When the baulk ring inner surface is excessively or partially worn down.

• When the contact surface of the synchronizer ring insert is scored or excessively worn down.

5) Shifting insert key

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



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.

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 498147000 DEPTH GAUGE

Dimension (A) mm (in)	Part No.	Mark
4.00 — 4.13 (0.1575 — 0.1626)	32294AA041	1
3.87 — 3.99 (0.1524 — 0.1571)	32294AA051	2