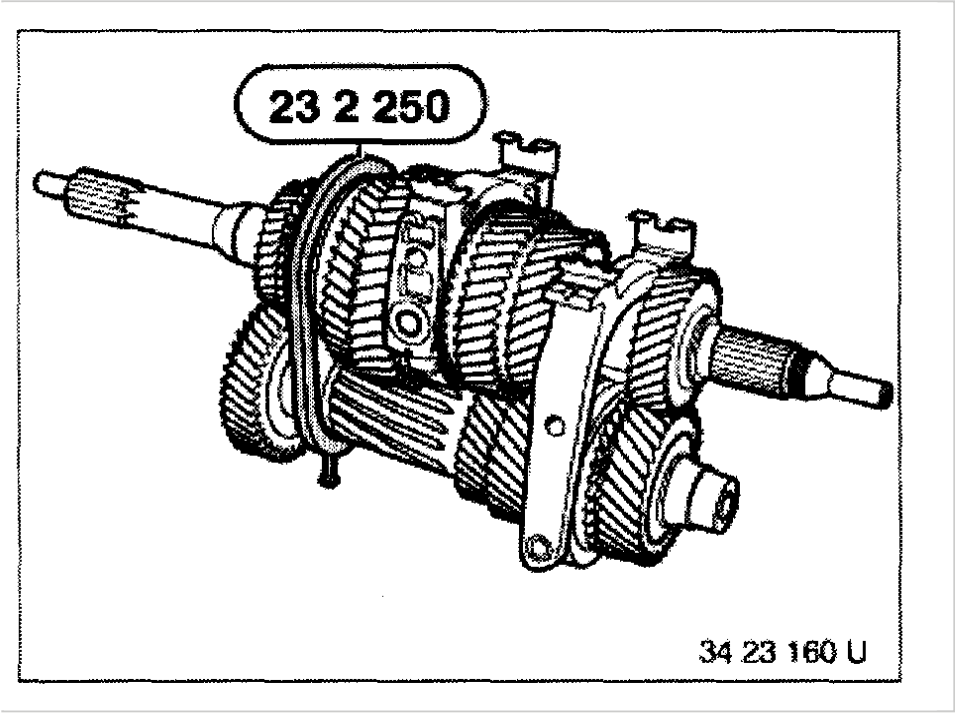
1997 BMW 328is (E36) L6-2793cc 2.8L DOHC (M52)

Vehicle > Transmission and Drivetrain > Manual Transmission/Transaxle > Service and Repair > Procedures

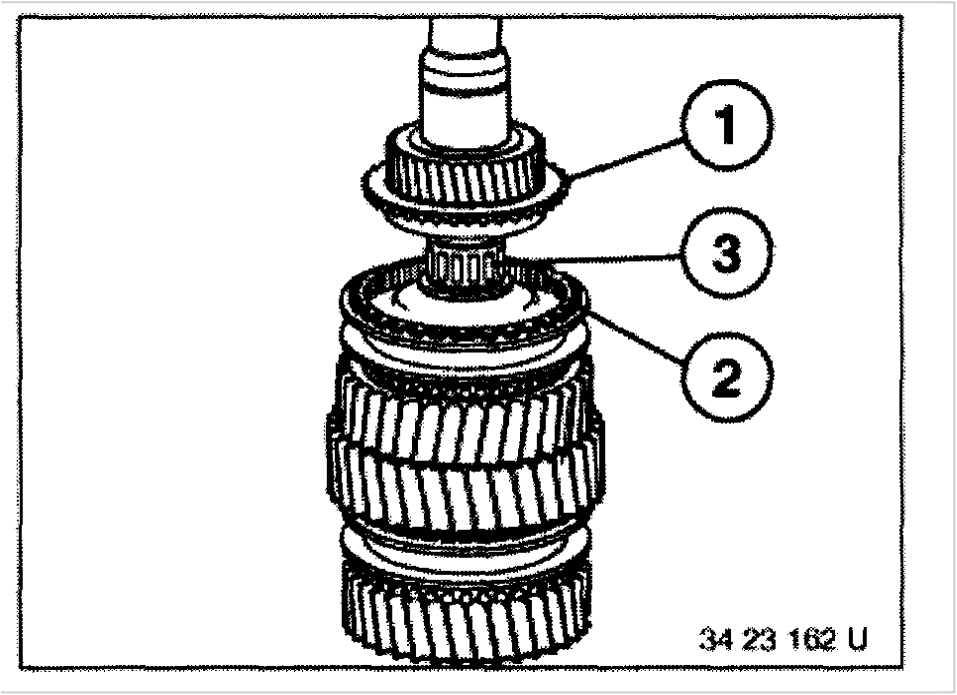
REPLACING SYNCHRONIZING DEVICE

Dismantle and re-assemble all the synchronizing devices (S5D 260Z/310Z/320Z)

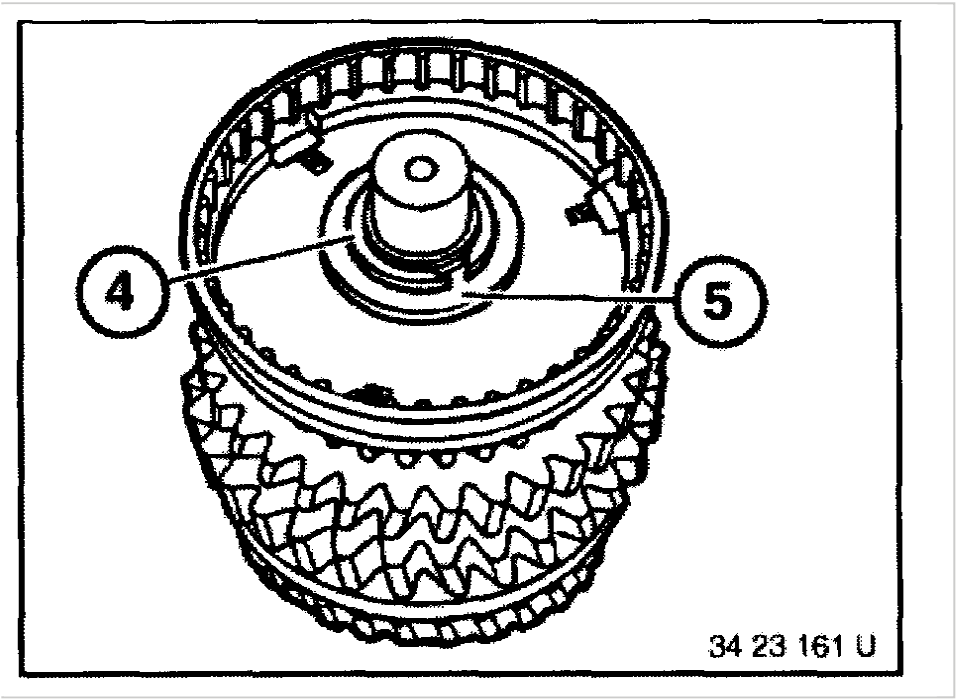
Remove the entire input and output shaft, refer to Disassembly and Assembly



Pull off the shift arms for 1st/2nd and 3rd/4th gear.
Remove Special Tool 23 2 250.



Pull off input shaft (1), synchromesh ring (2) and needle bearing (3).

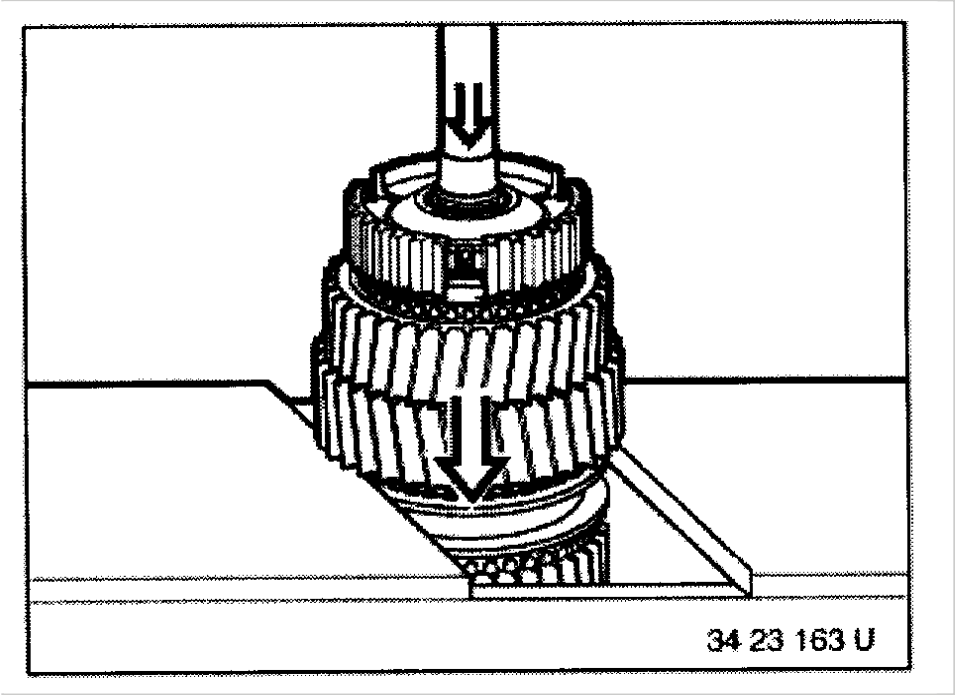


Clamp gear set in a vise fitted with soft jaws on the output shaft.
Pull off 5th/reverse gear operating sleeve.

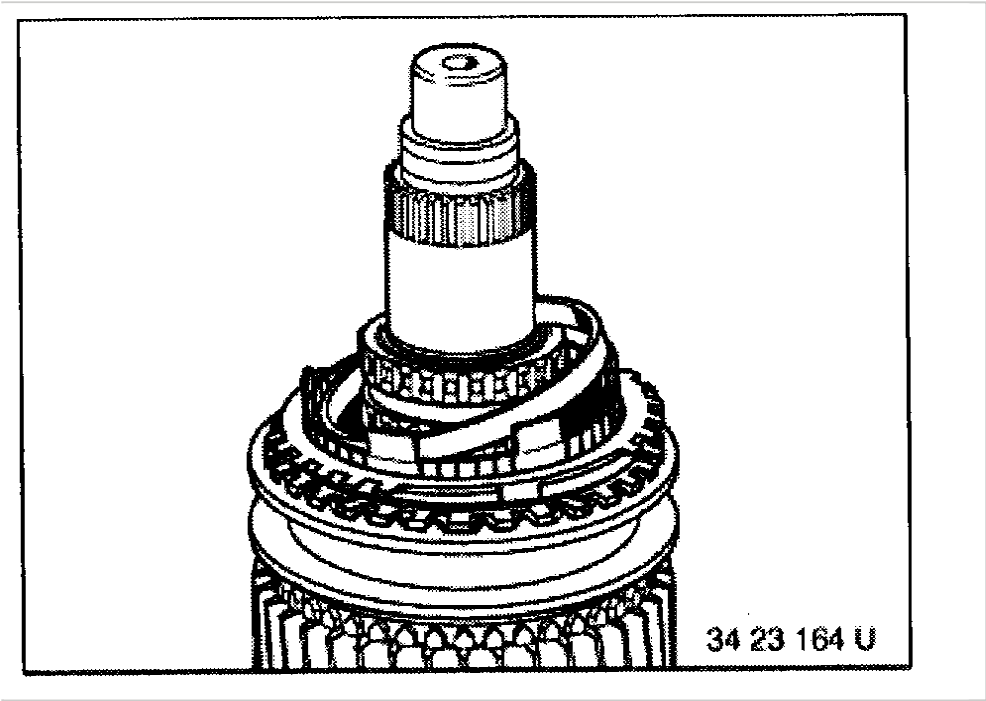
Caution: Loose thrust pieces, balls and springs. Remove circlip (4) and spacer (5).

Installation:

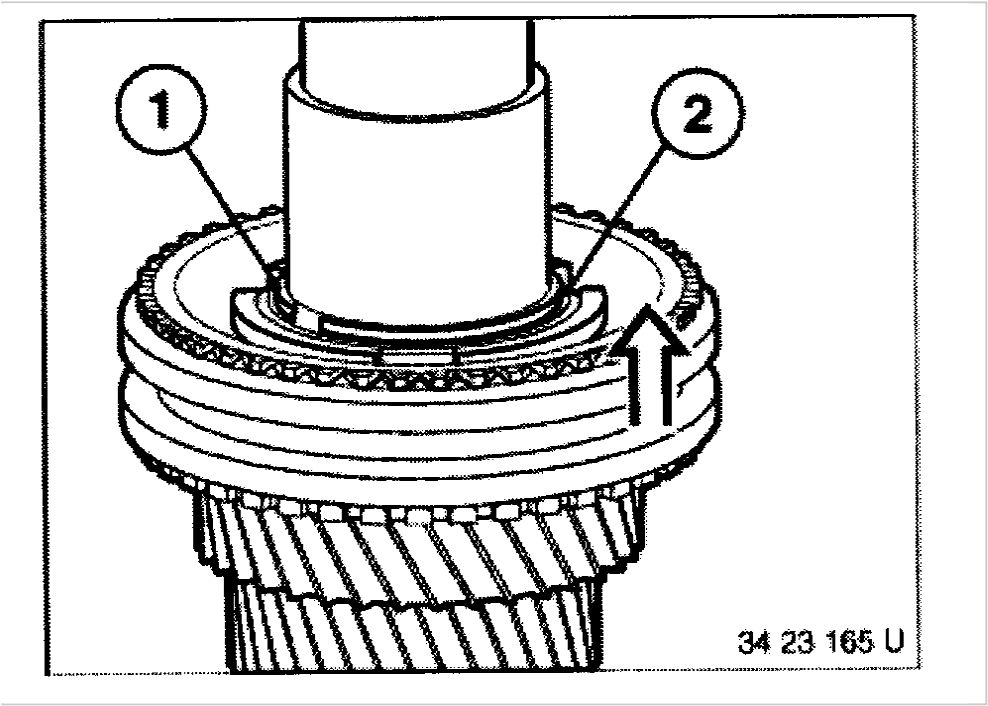
Replace circlip (4).



Shift the operating sleeve for 1st/2nd gear towards 2nd gear.
Place contact surfaces of open tool on the 1st gear wheel.
Pull off the guide sleeve, reverse gear wheel with synchromesh ring, pin bearing and bearing bush, 1st gear wheel and thrust washer from the output shaft.



Pull off the needle bearing, synchromesh ring, intermediate ring and outer race.

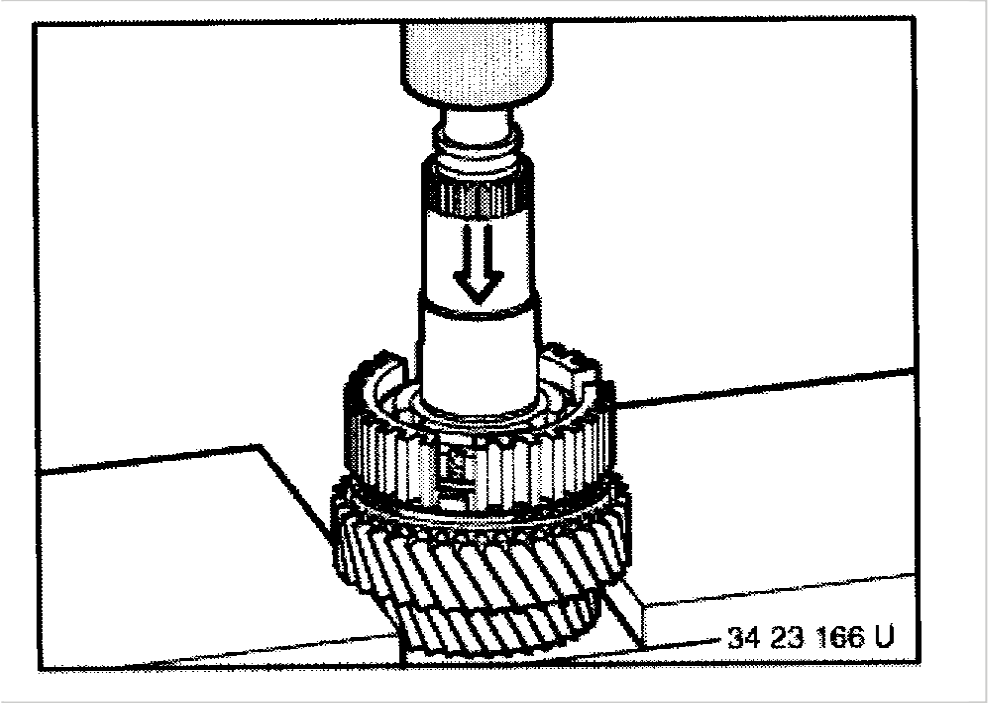


Pull off the operating sleeve for the 1st/2nd gear.

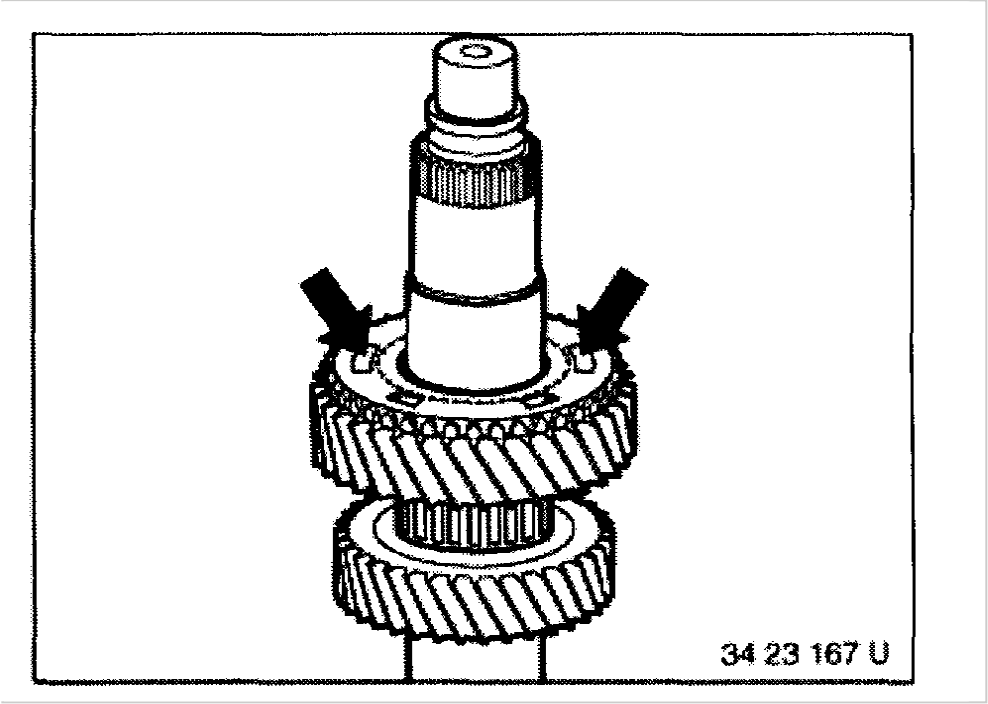
Caution: Loose thrust pieces, balls and springs.

Lift out circlip (1).
Take off spacer (2).

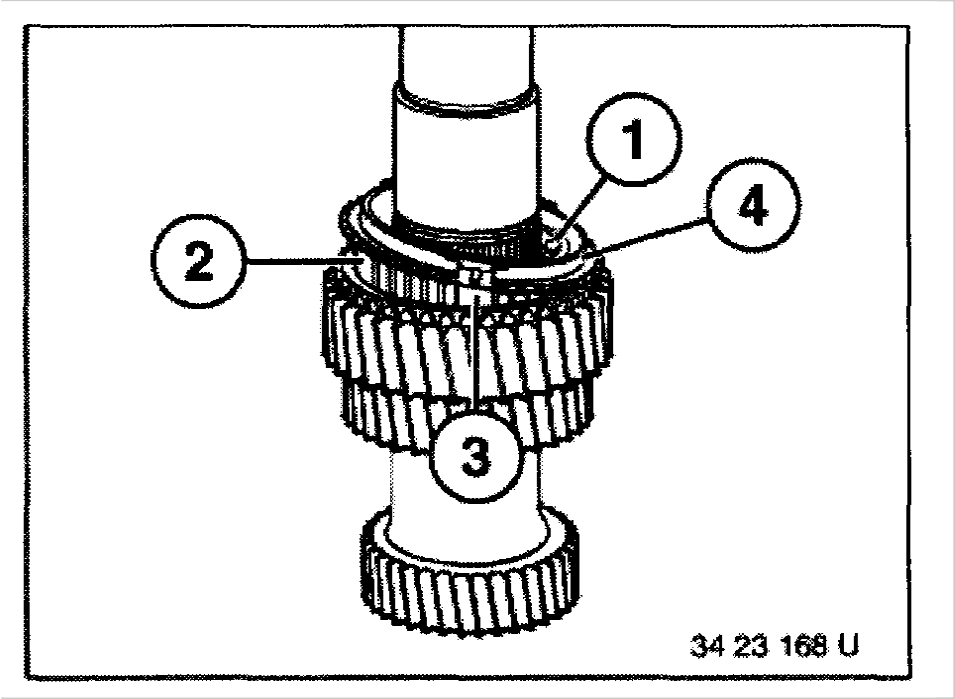
Installation:
Replace circlip (1).



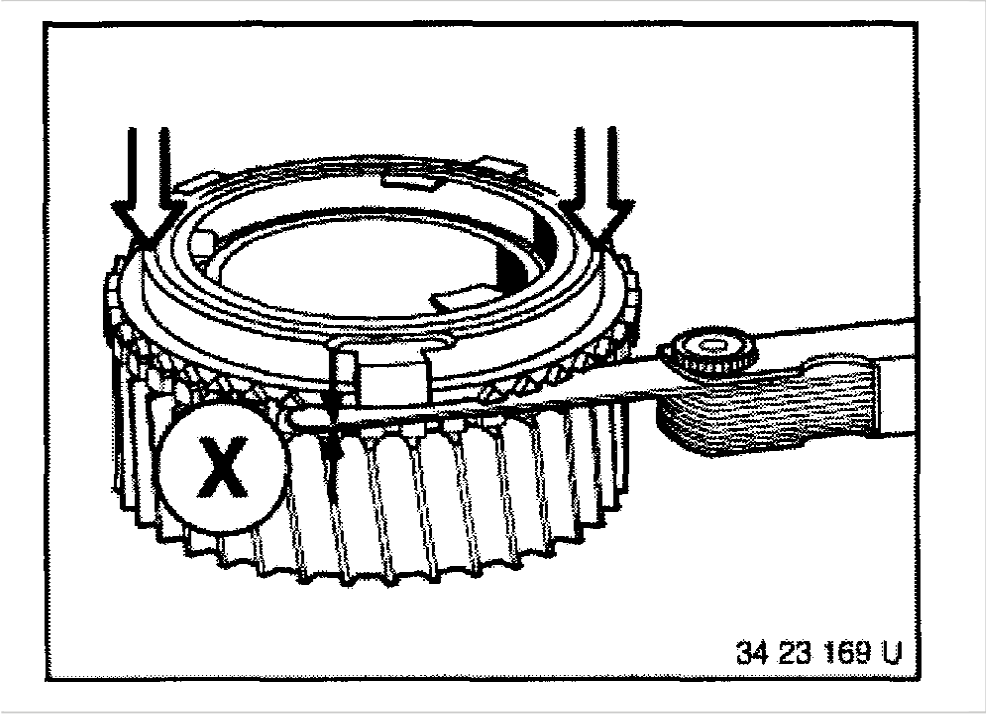
Place contact surfaces of open tool on the 2nd gear wheel.
Pull off the guide sleeve, 2nd gear wheel with synchronizing device and pin bearing from the output shaft.



Assembling Gear Set: Place on the pin bearing and 2nd gear wheel with the recesses facing upwards.

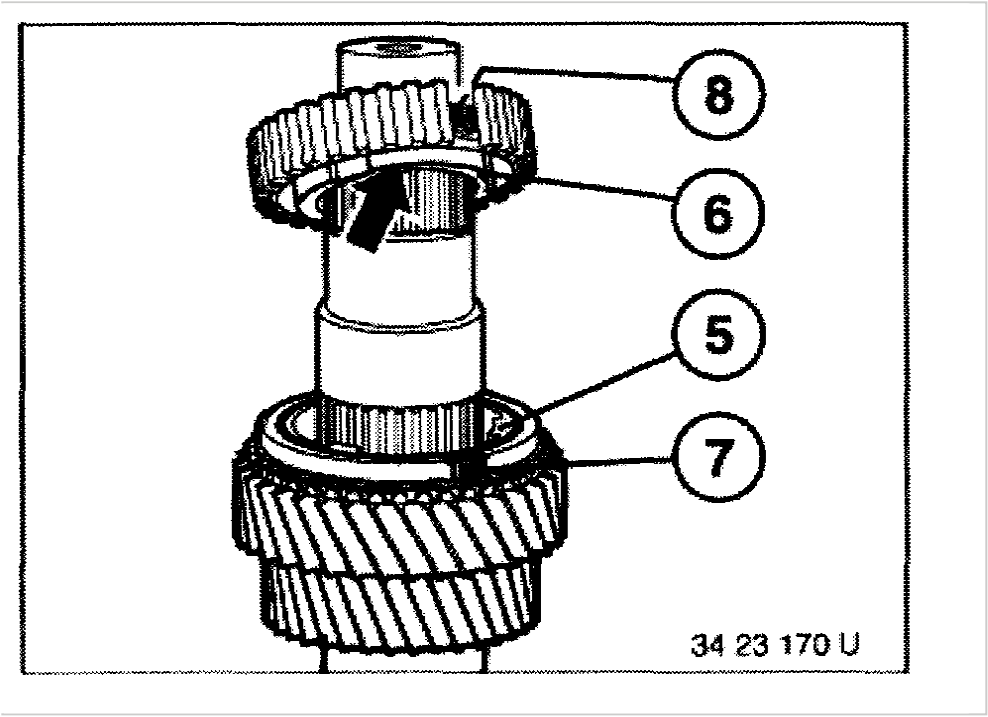


Install synchronizing device.
Consisting of: Place the inner race (1), intermediate ring (2) with drives (3) in the recesses of the 1st gearwheel and synchromesh ring (4).

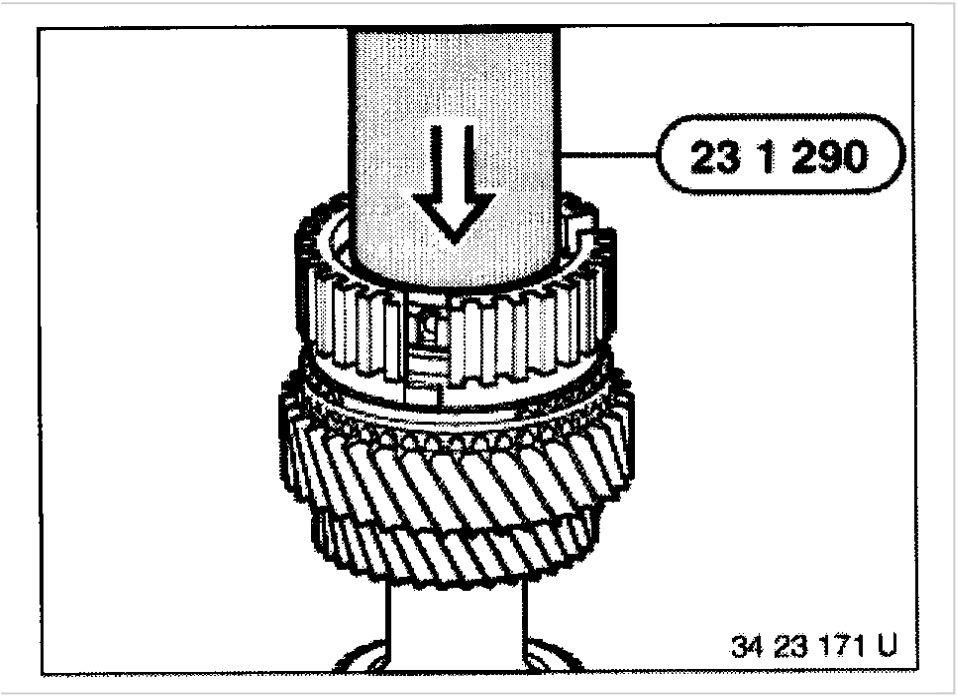


Check the synchronizing device for the 2nd gear for wear.
Measure distance X between the gear wheel and synchromesh ring. In so doing press down uniformly on the synchromesh ring by hand.
Specification: **at least 0.9 mm.**

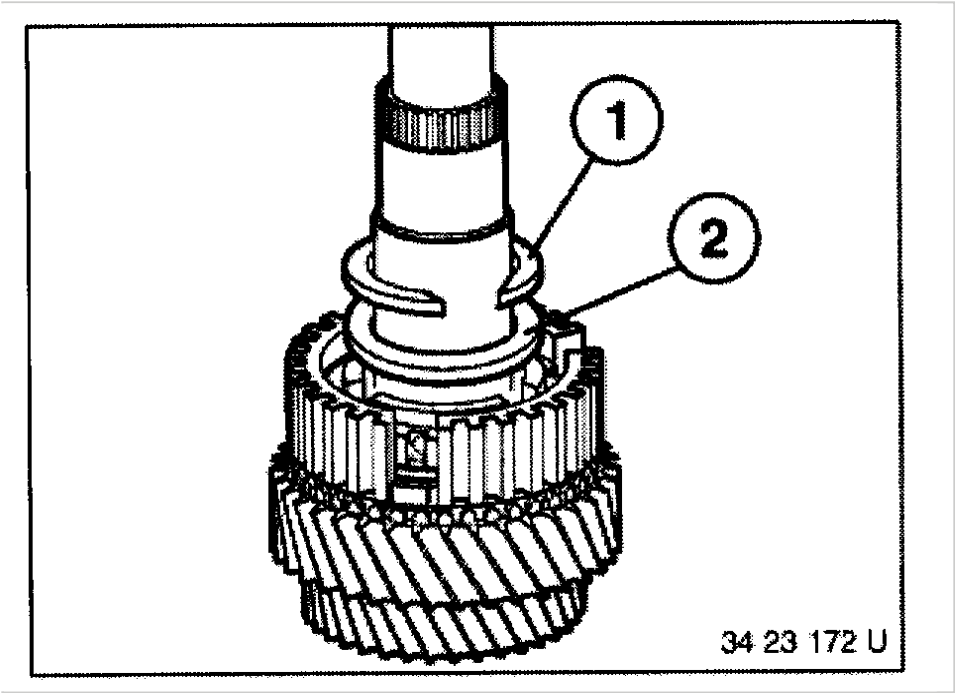
Actual new part distance: **1.1 - 1.6 mm.**
When replacing, all three parts must be replaced at one time



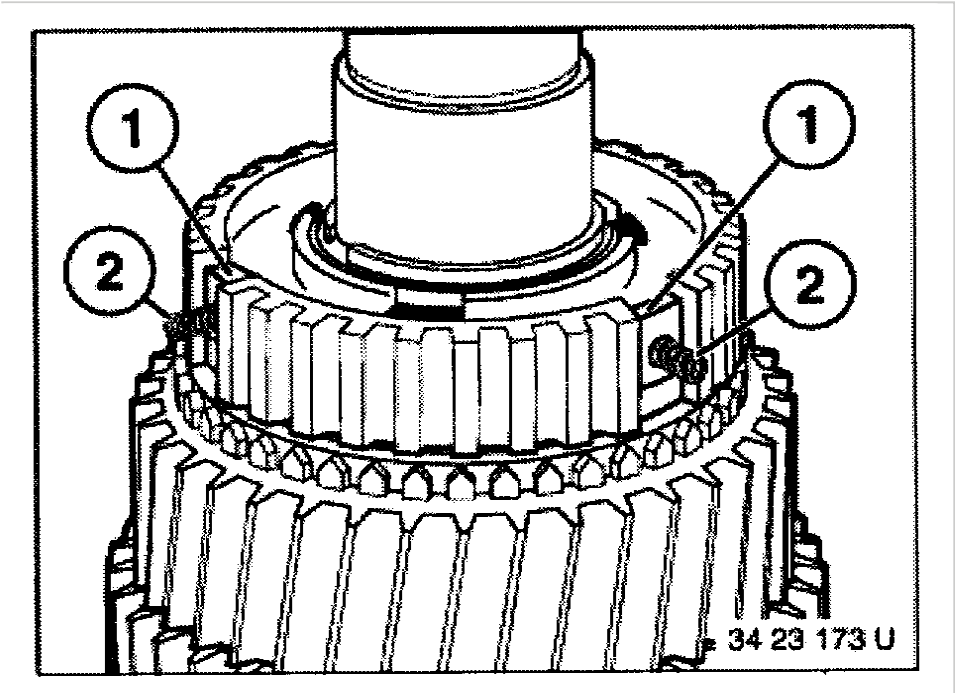
Heat guide sleeve to **about 80°C** with a hot air blower.
Mount the guide sleeve with the long shoulder facing the 2nd gear wheel.
When mounting make sure that lugs (5) of the inner race are aligned with recesses (6) in the gear wheel.
In addition lugs (7) on the synchromesh ring must engage in grooves (8) of the guide sleeve.



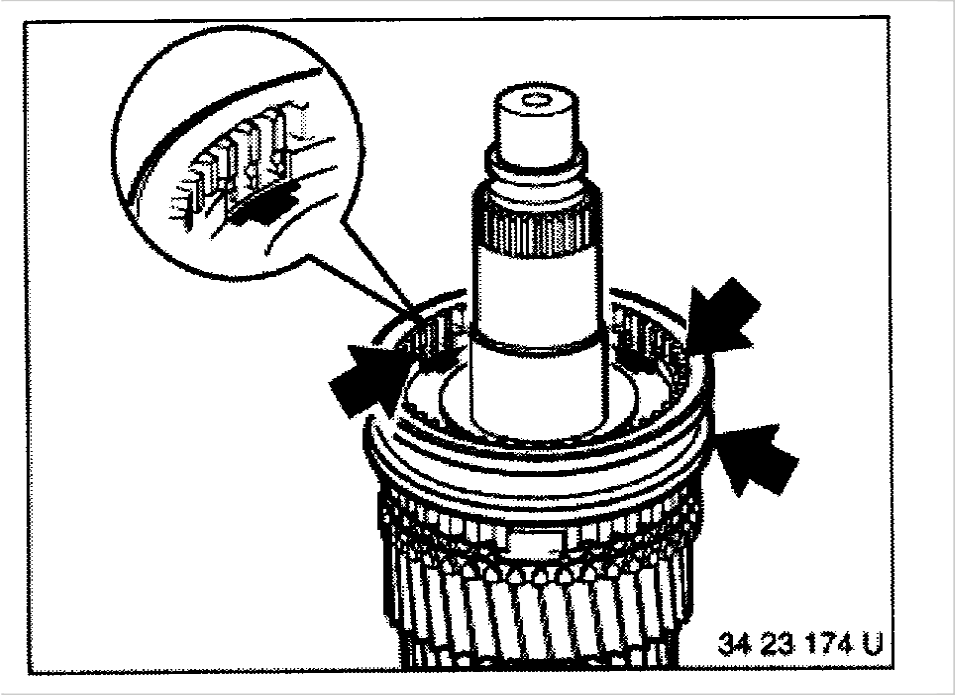
Press on guide sleeve to fit tight with Special Tool 231290.



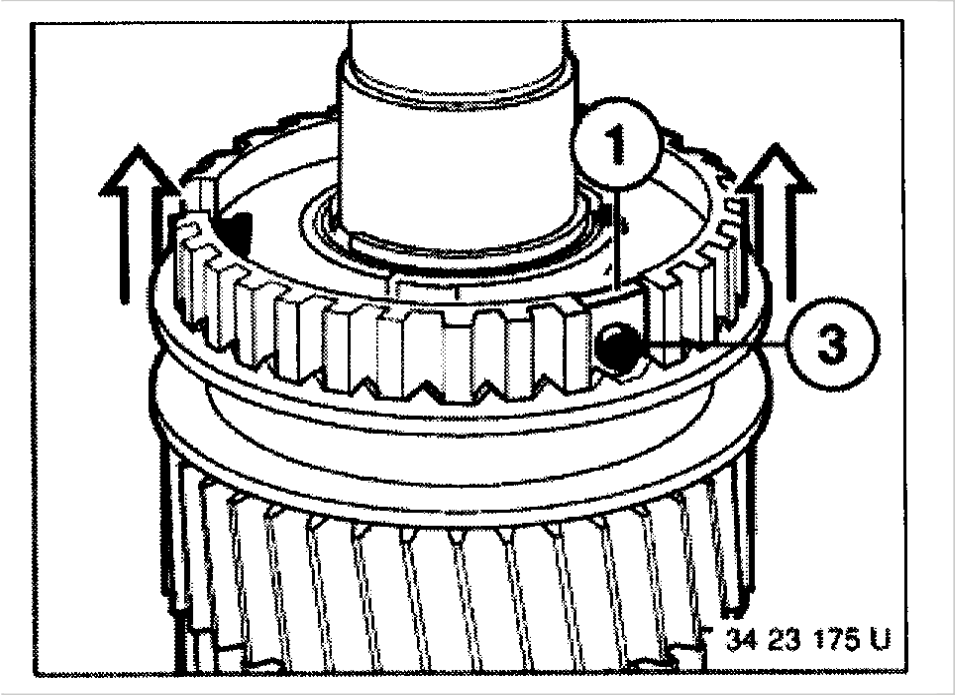
Install spacer (2).
Insert circlip (1).
The circlip must seat in the groove without play; if necessary replace spacer (1).
Spacers are available in different thicknesses in steps from 1.8 to 2.05 mm.



Install 3 pressure pieces (1) and 3 pressure springs (2) in the recess of the guide sleeve.

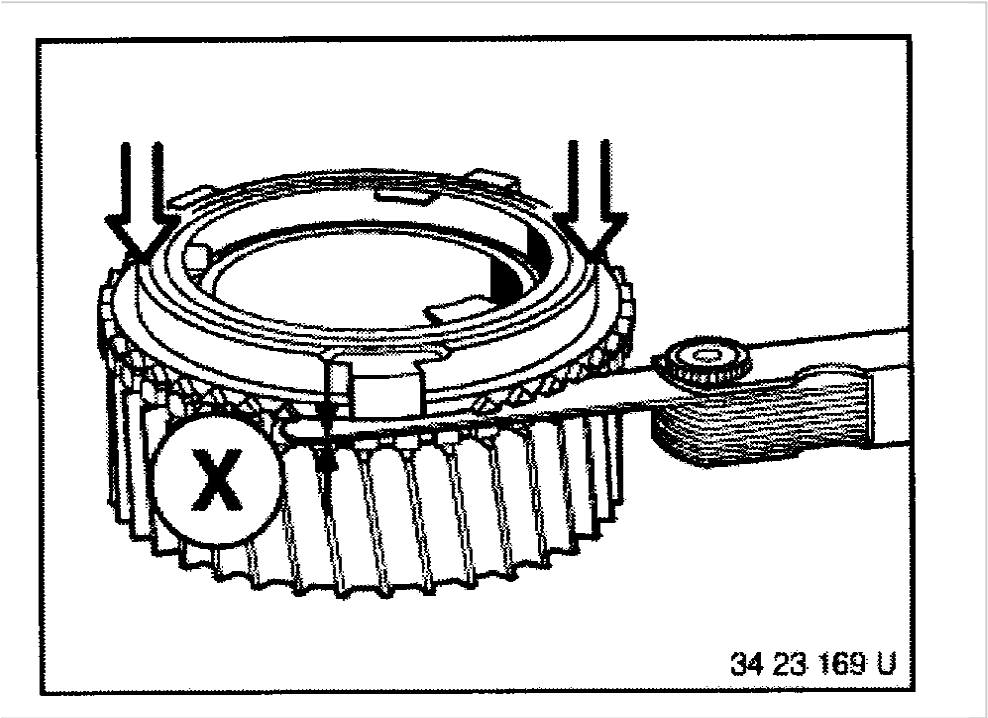


Place the operating sleeve for the 1st/2nd gear with the flat side facing upwards or the slanted side facing the 2nd gear wheel.
The three set-back or opened teeth must point to the springs



Tilt thrust pieces (1) out of the operating sleeve separately far enough that balls (3) can be placed on the springs.
Push in balls (3) and simultaneously press the thrust pieces into the operating sleeve.

Pull the operating sleeve upwards uniformly as far as the lock (neutral position).



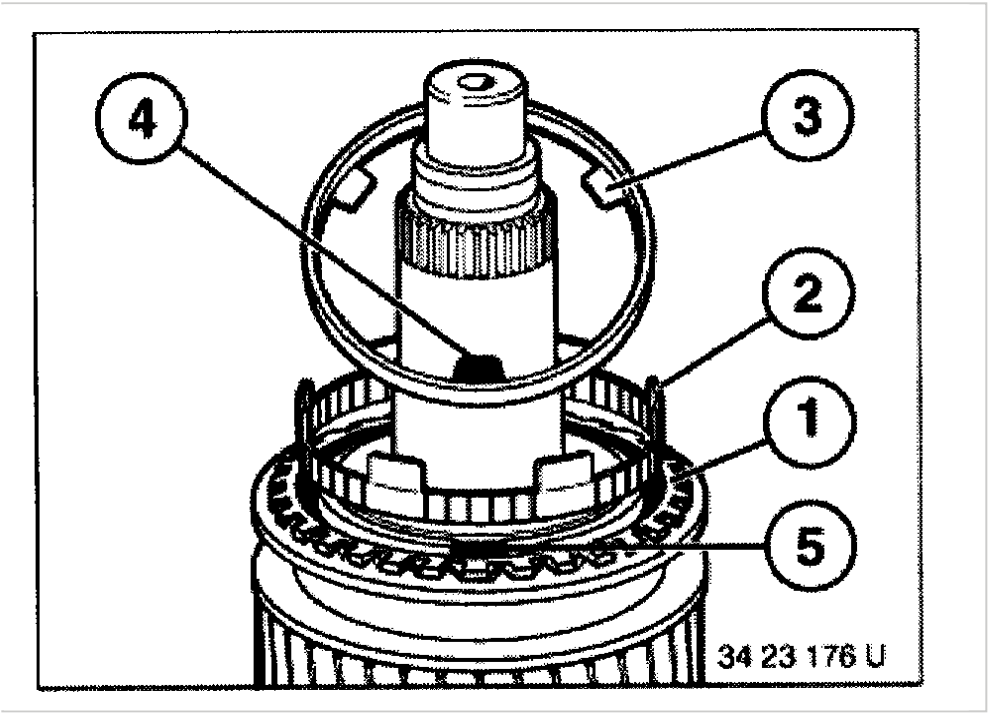
Check the synchronizing device for the 1st gear for wear.

Measure distance X between the gear wheel and synchromesh ring. In so doing, press down evenly on the synchromesh ring by hand.

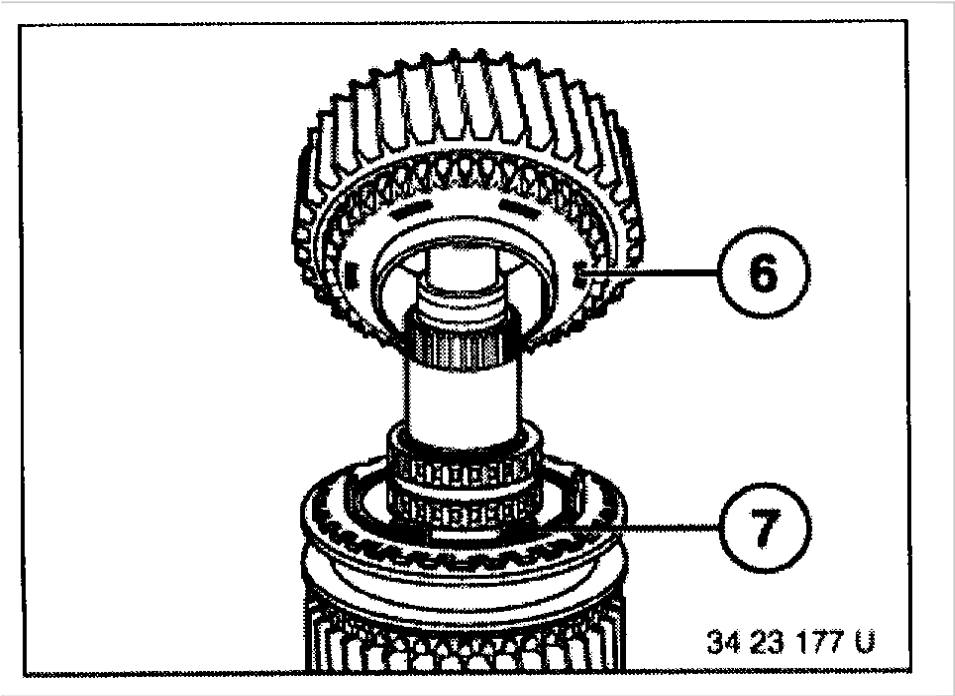
Specification: **at least 0.9 mm**

Actual new part distance: **1.1 - 1.6 mm.**

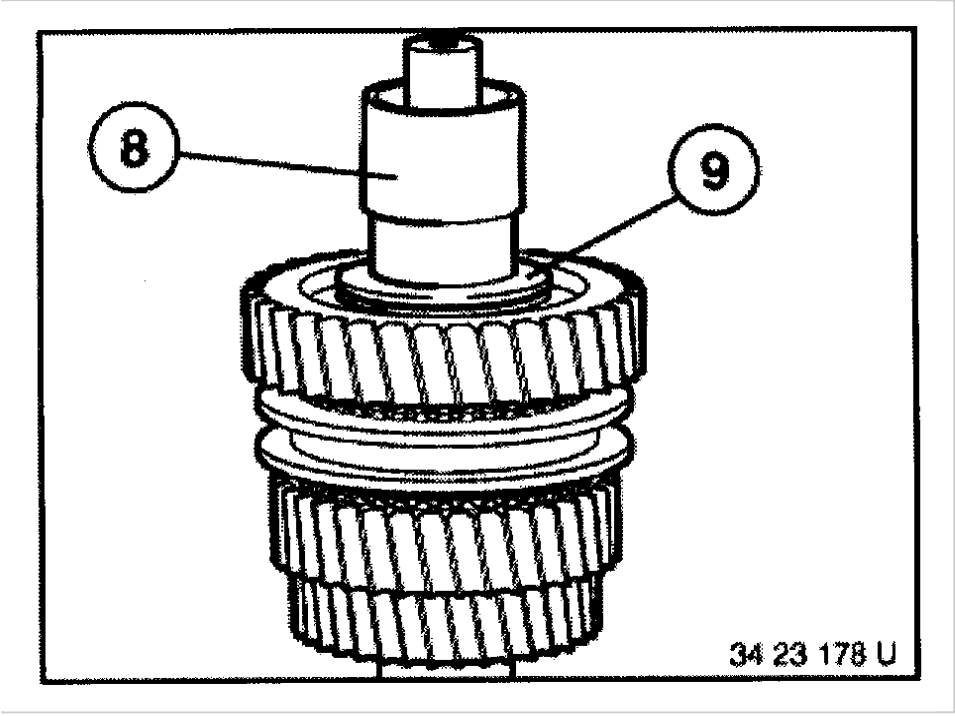
When replacing, all three parts must be replaced at one time



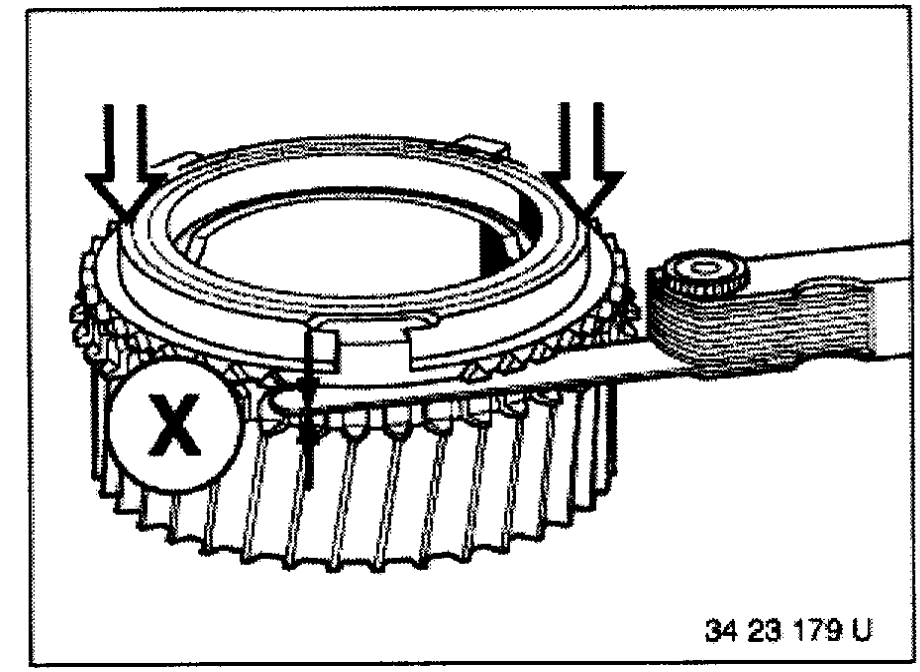
Install synchromesh ring (1), intermediate ring (2), and inner race (3) with lugs (4) in openings (5) of the guide sleeve.



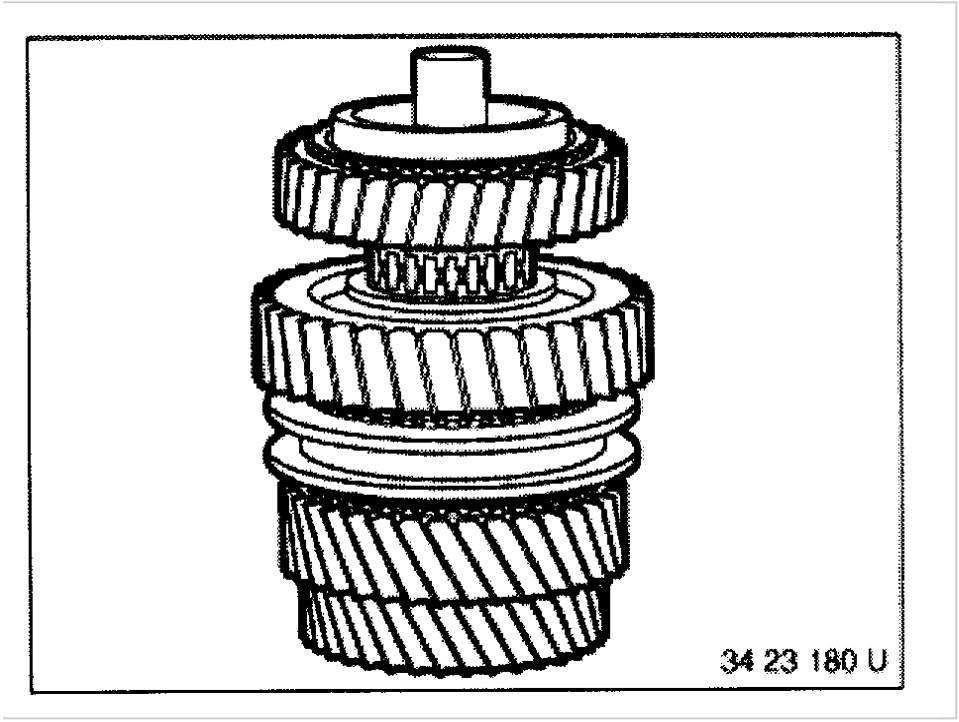
Mount needle bearing.
Place 1st gear wheel with grooves (6) facing the lugs (7).



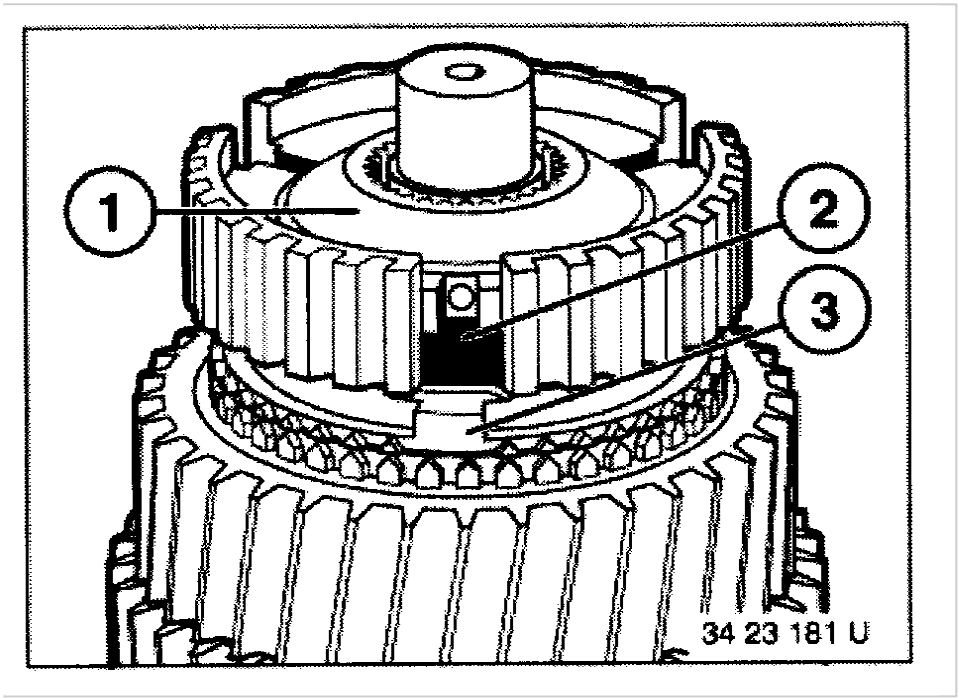
Heat thrust washer (9) and bearing sleeve (8) to **about 80°C** with a hot air blower and install then on the output shaft, pressing on if necessary.
Use Special Tool 23 1 290 for thrust washer.
Use Special Tool 33 1 342 for bearing sleeve.



Inspect reverse gear synchronization for wear.
Measure distance X between the gear wheel and synchromesh ring. In so doing, press down evenly on the synchromesh ring by hand.
Specification: **at least 0.5 mm.**
Actual new part distance: **0.7 - 1. 15 mm.**



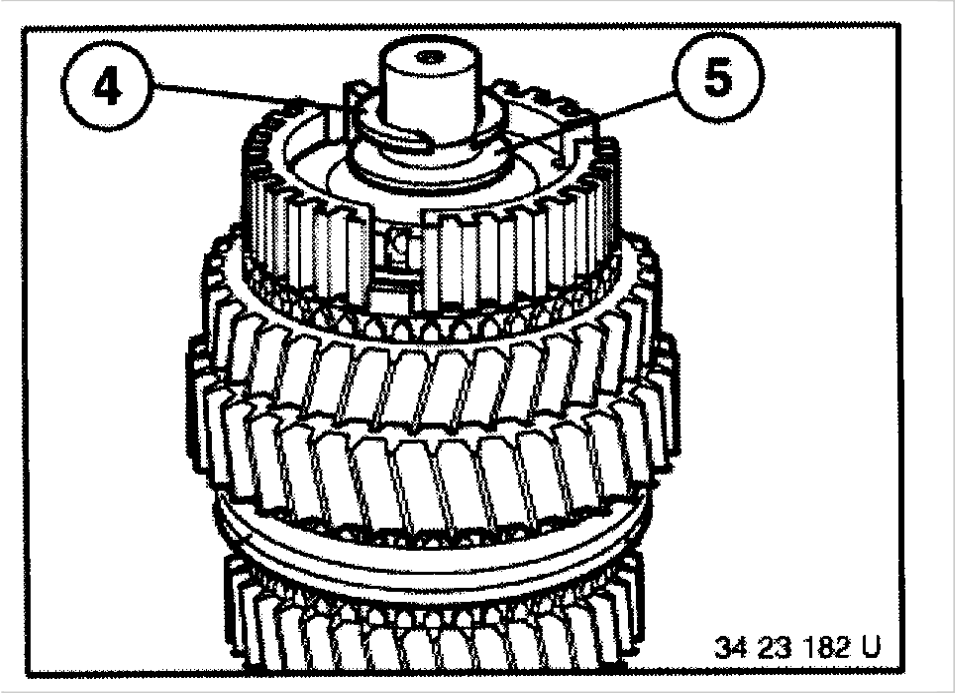
Mount the needle bearing and reverse gear wheel.



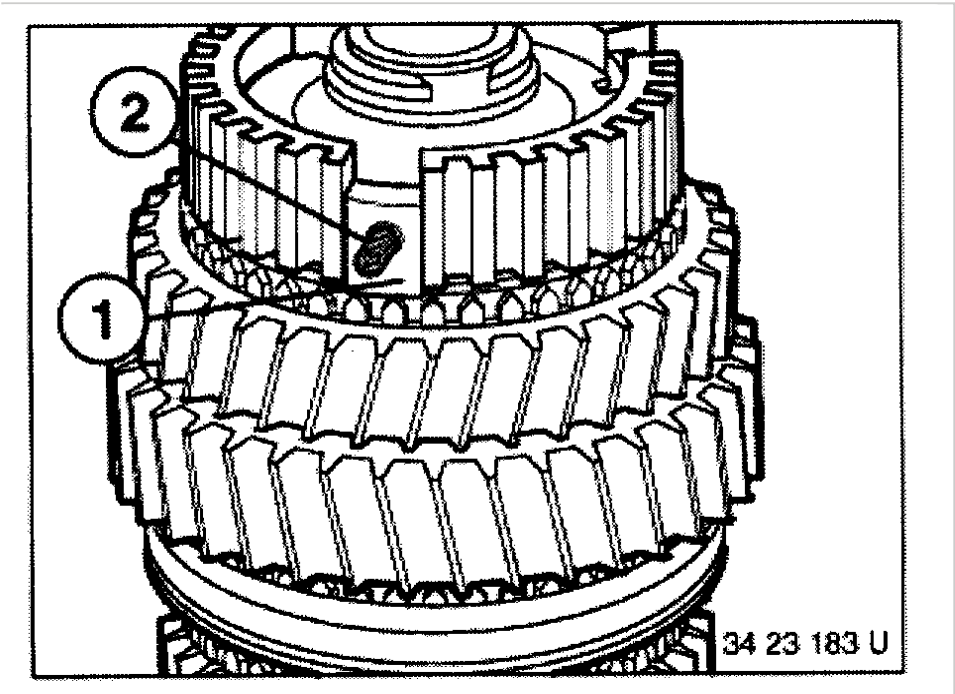
Place the reverse gear synchromesh ring on the reverse gear cone.

Heat the 5th/reverse gear guide sleeve to **about 80°C** with a hot air blower and install it on the output shaft with conical end (1) facing up; if necessary press on to fit tight with Special Tool 33 1 342.

Make sure that lugs (3) engage in opening (2).



Install spacer (5) and circlip (4).
Circlip (4) must seat in the groove without play; replace spacer if necessary.
Spacers are available in different thicknesses in steps from 3.6 to 4.0 mm.
Gently tap the circlip into place.



Fit 3 pressure pieces (1) and 3 compression springs (2) in the recess of the guide sleeve.