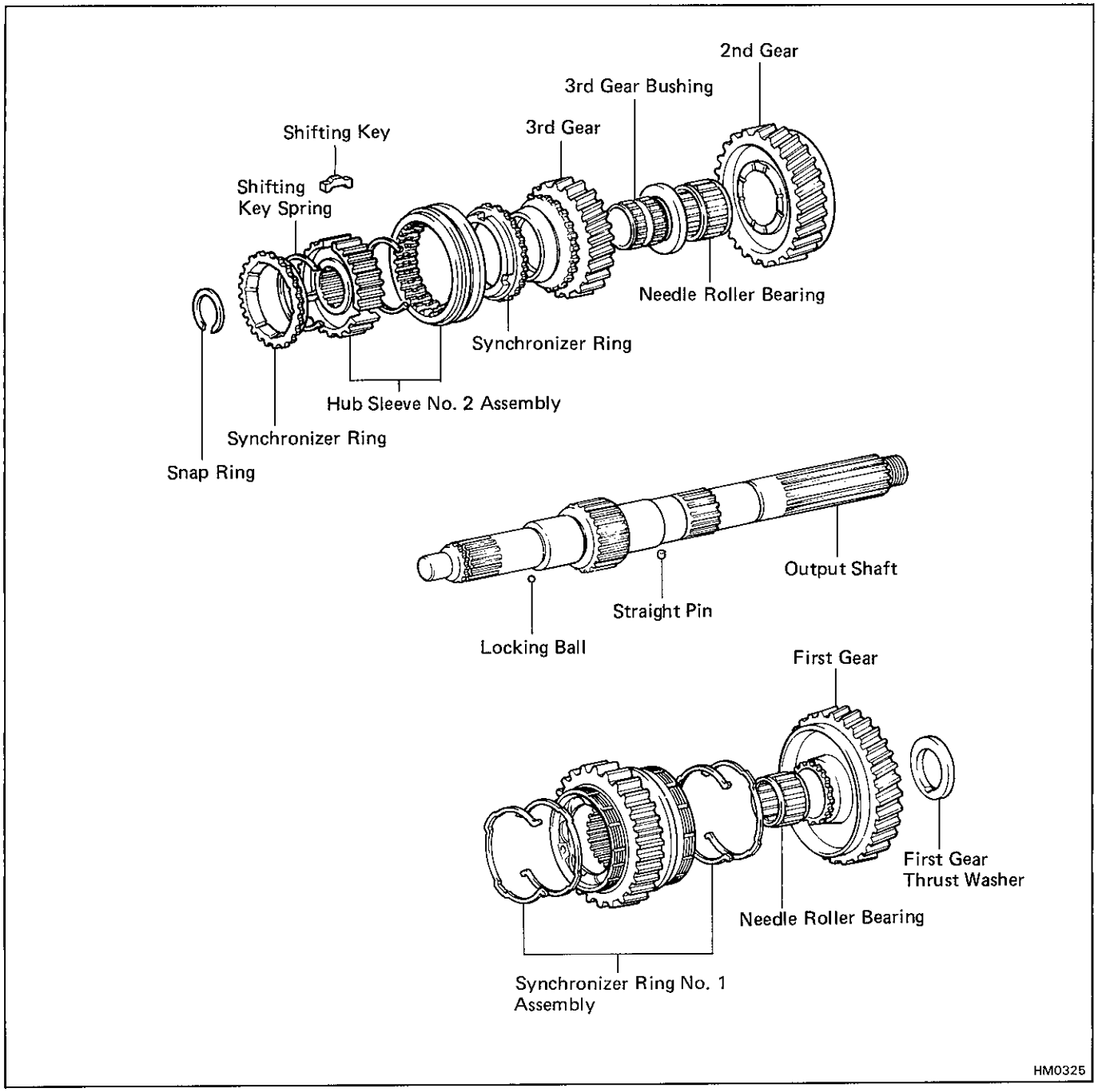
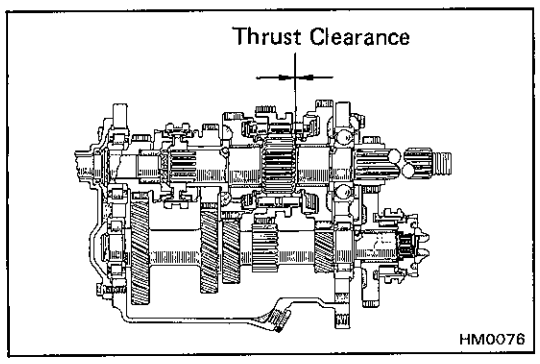
Output Shaft Assembly

COMPONENTS





DISASSEMBLY OF OUTPUT SHAFT ASSEMBLY

1. MEASURE EACH GEAR THRUST CLEARANCE

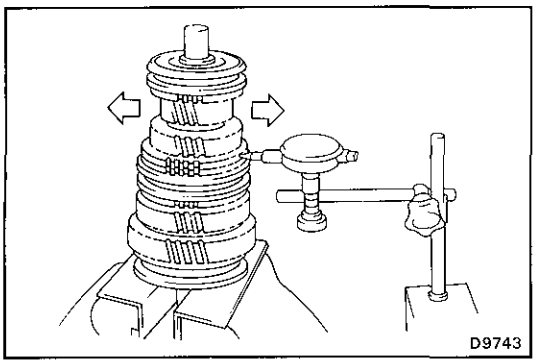
Standard clearance:

1st and 2nd gears	**0.175 — 0.320 mm (0.0069 — 0.0126 in.)**
3rd gear	**0.125 — 0.270 mm (0.0049 — 0.0106 in.)**

Maximum clearance:

1st and 2nd gears	**0.35 mm (0.0138 in.)**
3rd gear	**0.30 mm (0.0118 in.)**

If clearance is more than the limit, replace the gear, needle roller bearing or shaft.


D9743

2. **MEASURE EACH GEAR OIL CLEARANCE**

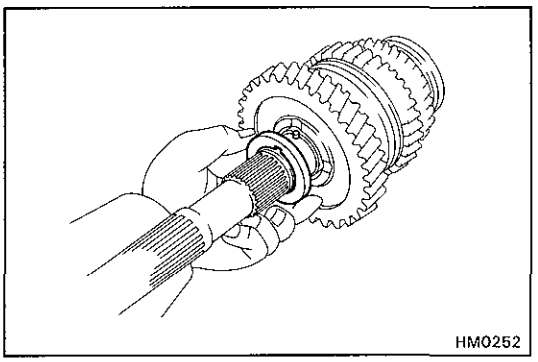
Standard clearance:

1st and 2nd gears	**0.020 — 0.073 mm (0.0008 — 0.0029 in.)**
3rd gear	**0.065 — 0.115 mm (0.0020 — 0.0045 in.)**

Maximum clearance:

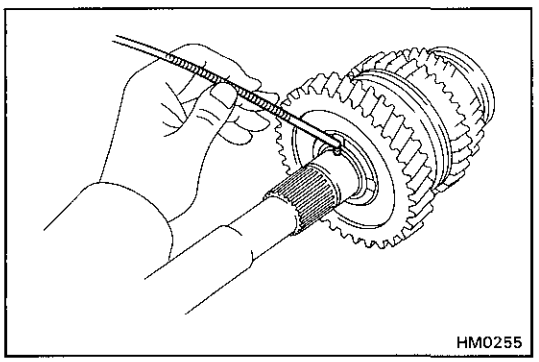
1st and 2nd gears	**0.08 mm (0.0031 in.)**
3rd gear	**0.12 mm (0.0047 in.)**

If clearance is more than the limit, replace the gear, needle roller bearing or shaft.

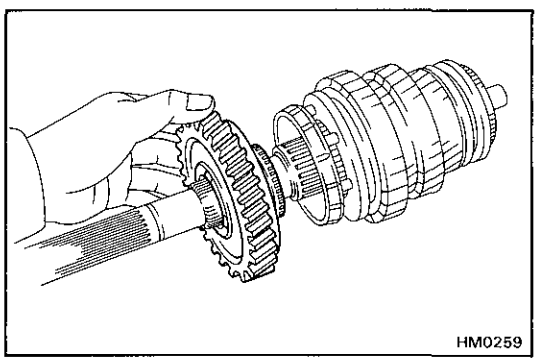

HM0252

3. **REMOVE FIRST GEAR**

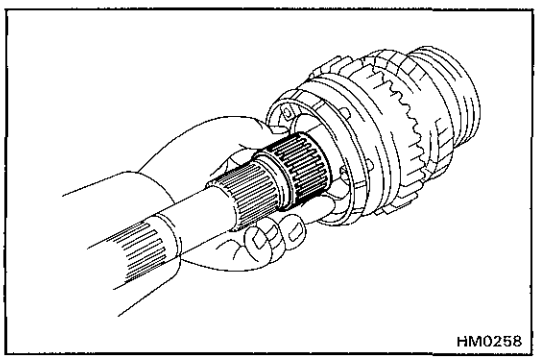
(a) Remove the first gear thrust washer.


HM0255

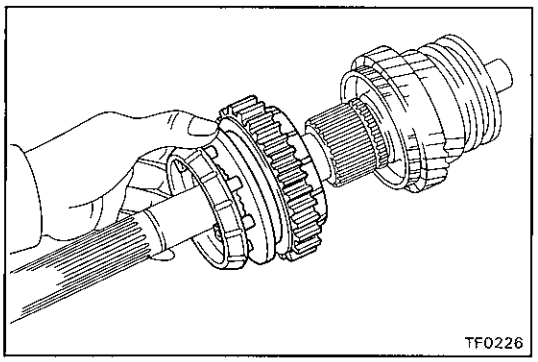
(b) Using a magnetic finger, remove the straight pin.


HM0259

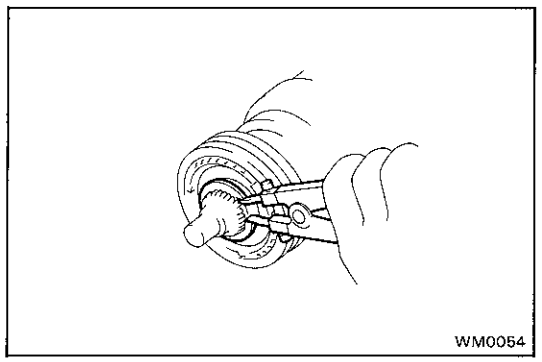
(c) Remove the first gear.


HM0258

(d) Remove the needle roller bearing.

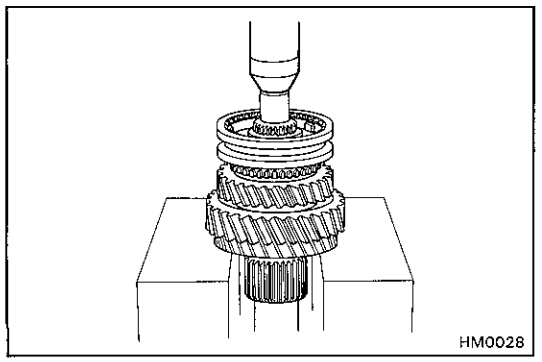


4. **REMOVE SYNCHRONIZER RING NO.1 ASSEMBLY**

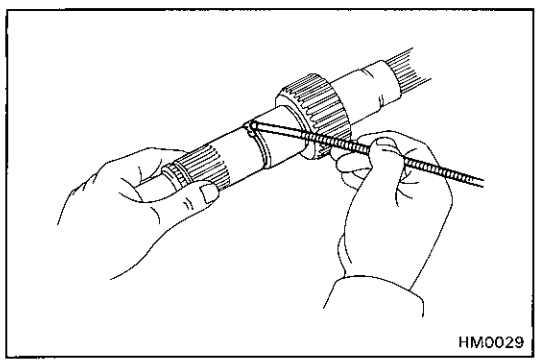


5. **REMOVE HUB SLEEVE NO.2 ASSEMBLY, SYNCHRONIZER RING, THIRD GEAR, THIRD GEAR BUSHING, NEEDLE ROLLER BEARING AND SECOND GEAR FROM OUTPUT SHAFT**

(a) Using snap ring pliers, remove the snap ring.

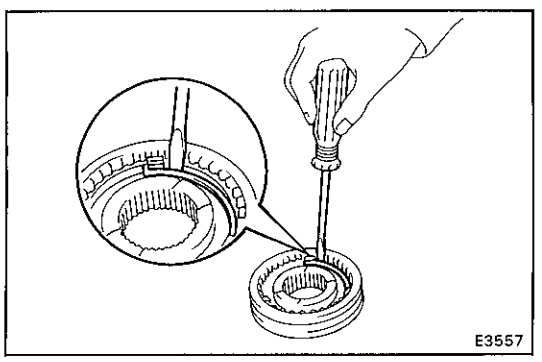


(b) Using a press, remove the hub sleeve No.2 assembly, synchronizer ring, third gear, third gear bushing, needle roller bearing and second gear.



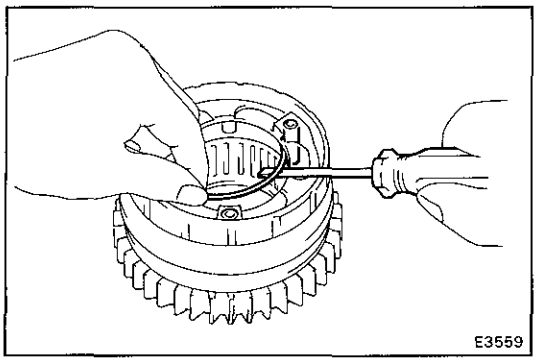
6. **REMOVE LOCKING BALL**

Using a magnetic finger, remove the locking ball.



7. **REMOVE HUB SLEEVE NO.2, SHIFTING KEYS AND SPRINGS FROM CLUTCH HUB NO.2**

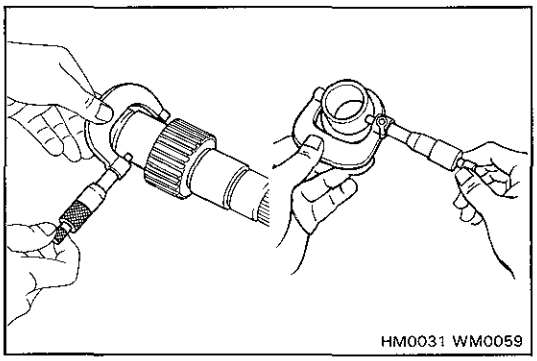
Using a screwdriver, remove the two shifting key springs, three shifting keys and hub sleeve No.2 from clutch hub No.2.



8. REMOVE SYNCHRONIZER RINGS OF FIRST AND SECOND GEARS

Remove the four synchronizer ring holders from synchronizer ring No.1.

INSPECTION OF OUTPUT SHAFT ASSEMBLY



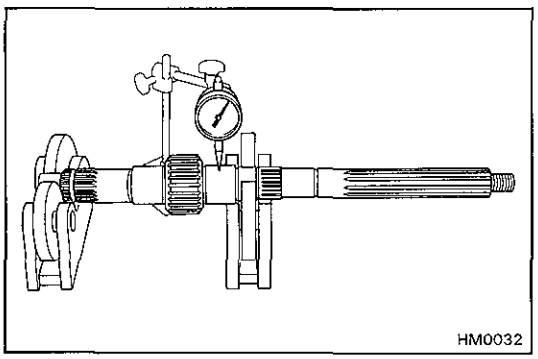
1. INSPECT OUTPUT SHAFT AND BUSHING

(a) Check the output shaft and bushing for wear or damage.

(b) Using a micrometer, measure the outer diameter of the output shaft journal and bushing.

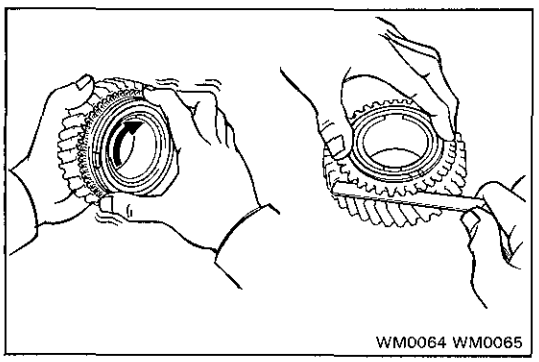
Minimum diameter

1st and 2nd gear journal	**43.984 mm (1.7317 in.)**
Bushing	**47.910 mm (1.8862 in.)**



(c) Using a dial indicator, measure the shaft runout.

Maximum runout: 0.03 mm (0.0012 in.)



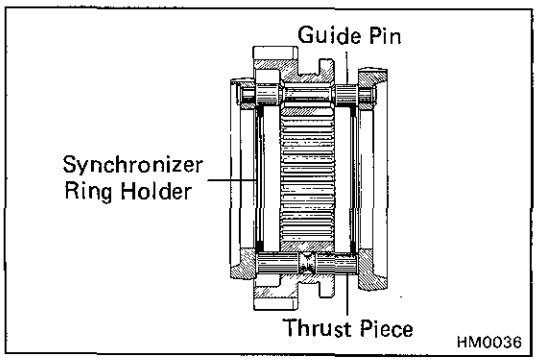
2. INSPECT SYNCHRONIZER RINGS OF THIRD GEAR, AND GEAR SPLINE PIECE NO.5

(a) Check the synchronizer rings for wear or damage.

(b) Turn the ring and push it into check the braking action.

(c) Measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.8 mm (0.031 in.)



3. INSPECT SYNCHRONIZER RINGS OF FIRST AND SECOND GEARS

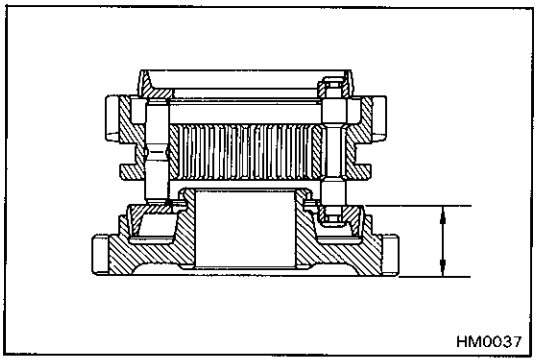
(a) Check the inner spline for wear or damage.

(b) Check the raised position of the guide pins for wear or damage.

(c) Check the thrust pieces and gear moving parts for wear or damage.

(d) Check the guide pin rivet staked parts for play or damage.

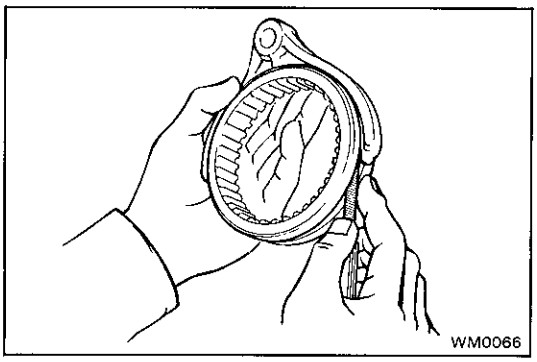
(e) Check the synchronizer ring holders for deterioration or wear.



(f) With the synchronizer ring pressed into the gear, measure the distance as shown.

Minimum distance:

1st gear 32.5 mm (1.280 in.)
2nd gear 38.0 mm (1.496 in.)

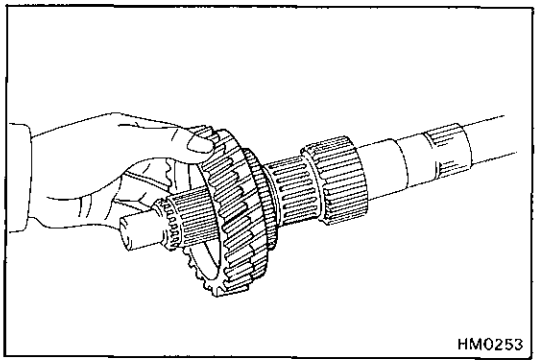


4. INSPECT SHIFT FORKS AND HUB SLEEVES

(a) Check the contact surfaces for wear or damage.

(b) Measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 0.8 mm (0.031 in.)

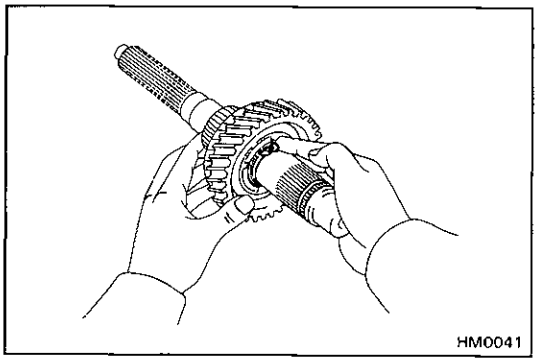


ASSEMBLY OF OUTPUT SHAFT ASSEMBLY

1. INSTALL SECOND GEAR AND NEEDLE ROLLER BEARING

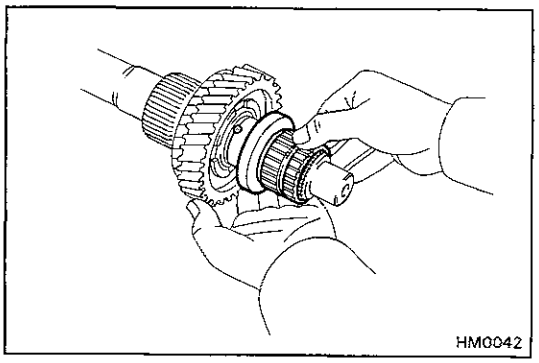
(a) Apply gear oil to the output shaft and needle roller bearing.

(b) Install the needle roller bearing and second gear.



2. INSTALL LOCKING BALL, BUSHING AND THIRD GEAR

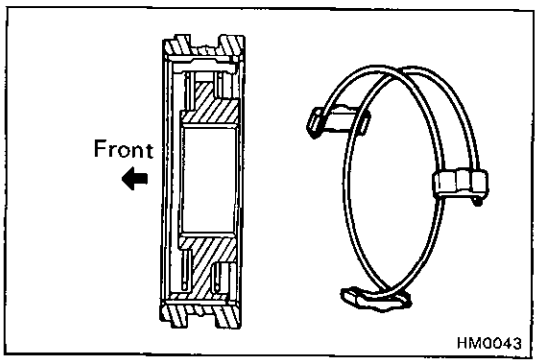
(a) Install the locking ball in the shaft.



(b) Install the bushing on the output shaft.

(c) Apply gear oil to the bushing.

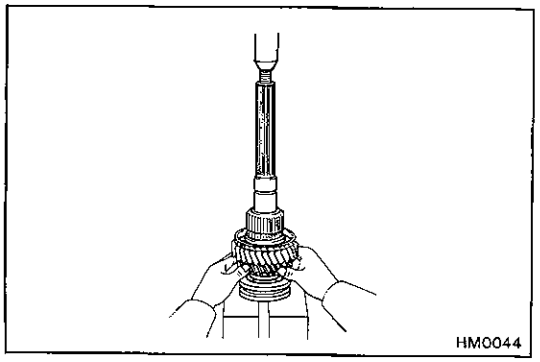
(d) Install the third gear on the bushing.



3. INSERT CLUTCH HUB NO.2 INTO HUB SLEEVE

Install the clutch hub and shifting keys to the hub sleeve.

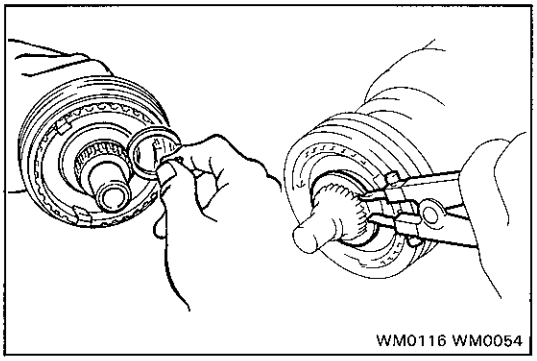
HINT: Install the shifting key springs positioned so that their ends are not in line.

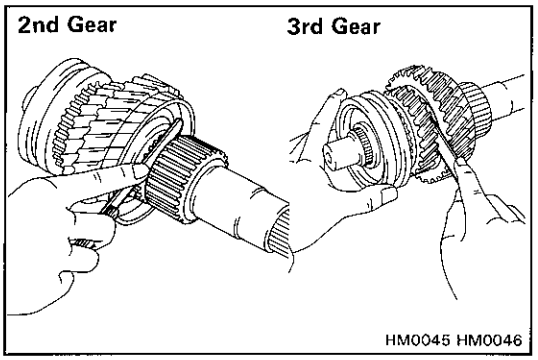


4. INSTALL HUB SLEEVE NO.2 ASSEMBLY

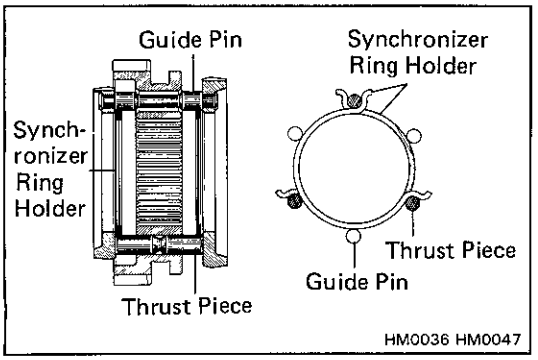
Using a press, install the hub sleeve No.2 assembly.

NOTICE: Hold the third gear to prevent the bushing from falling. Be sure that the shifting keys align with the synchronizer ring slots.

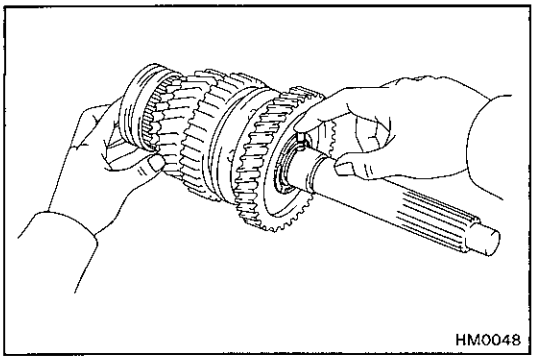

WM0116 WM0054



HM0045 HM0046



HM0036 HM0047


HM0048

5. INSTALL SNAP RING

Select a snap ring that will allow minimum axial play and install it on the shaft.

Snap ring thickness

Mark	Thickness mm (in.)
0	2.40 – 2.45 (0.0945 – 0.0965)
1	2.45 – 2.50 (0.0965 – 0.0984)
2	2.50 – 2.55 (0.0984 – 0.1004)
3	2.55 – 2.60 (0.1004 – 0.1024)
4	2.60 – 2.65 (0.1024 – 0.1043)
5	2.65 – 2.70 (0.1043 – 0.1063)

6. MEASURE THRUST CLEARANCE OF SECOND AND THIRD GEAR

Using a feeler gauge, measure the second and third gear thrust clearances.

Standard clearance:

2nd gear

0.175 – 0.320 mm (0.0069 – 0.0126 in.)

3rd gear

0.125 – 0.270 mm (0.0049 – 0.0106 in.)

Maximum clearance:

2nd gear 0.35 mm (0.0138 in.)

3rd gear 0.30 mm (0.0118 in.)

7. ASSEMBLE SYNCHRONIZER RING HOLDER

Hook the synchronizer ring holder ends to the thrust piece.

HINT:

- Align the synchronizer ring holder ends so they are not both facing in the same direction.
- Be sure the synchronizer ring holders are parallel and not intersecting.

8. INSTALL SYNCHRONIZER RING NO.1 AND FIRST GEAR

(a) Install synchronizer ring No.1.

(b) Apply gear oil to the needle roller bearing.

(c) Install the needle roller bearing and the first gear.

(d) Apply MP grease to the straight pin and first gear thrust washer.

(e) Install the first gear thrust washer onto the output shaft with the straight pin aligned with the first gear thrust washer.