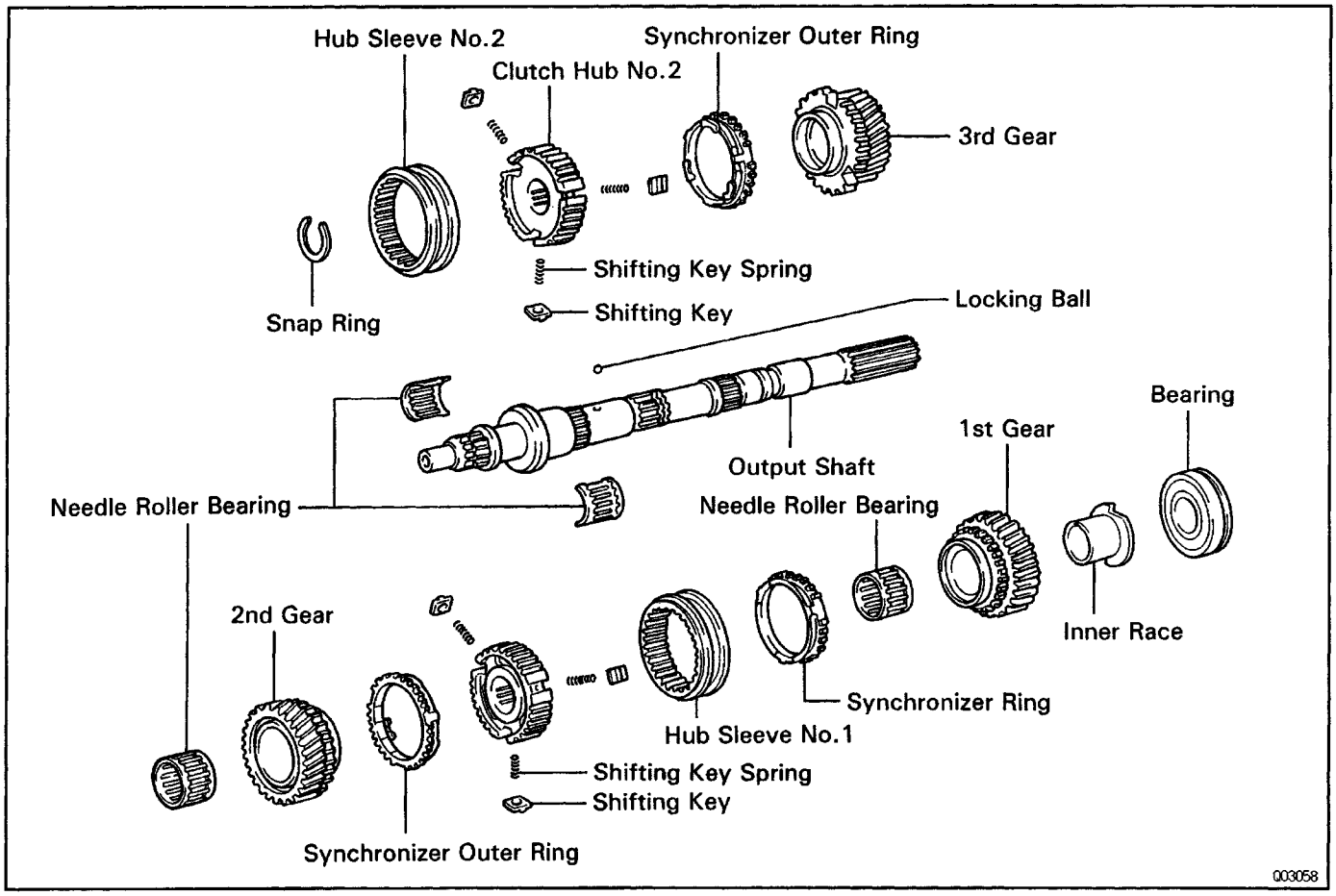
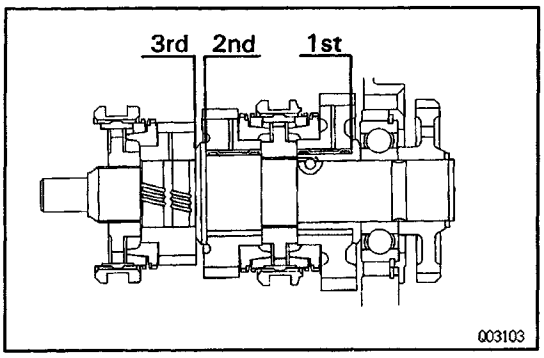
# OUTPUT SHAFT

MT00J–02

## COMPONENTS




MT00K–02

## OUTPUT SHAFT DISASSEMBLY

### 1. INSPECT EACH GEAR THRUST CLEARANCE

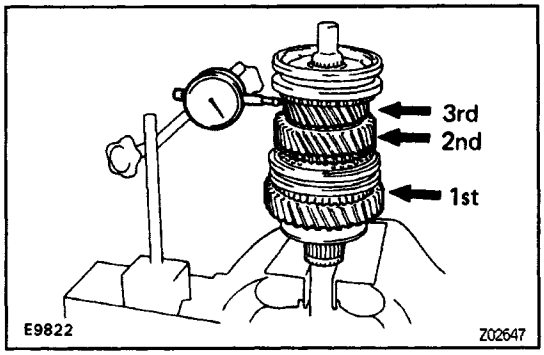
Using a feeler gauge, measure the thrust clearance of each gear.

**Standard clearance:**

**0.10–0.25 mm (0.0039–0.0098 in.)**

**Maximum clearance:**

**0.30 mm (0.0118 in.)**




**2. INSPECT EACH GEAR OIL CLEARANCE**

Using a dial indicator, measure the oil clearance of each gear.

**Standard clearance:**

**1 st and 2nd gear**

**0.009–0.060 m m (0.0004–0.0024 in.)**

**3rd gear**

**0.015–0.066 mm (0.0006–0.0026 in.)**

**Maximum clearance:**

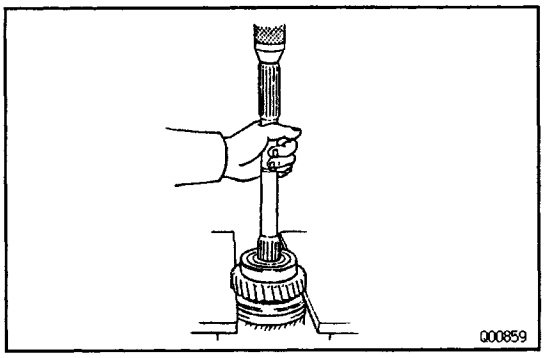
**1st and 2nd gear**

**0.15 mm (0.0059 in.)**

**3rd gear**

**0.20 mm (0.0079 in.**)

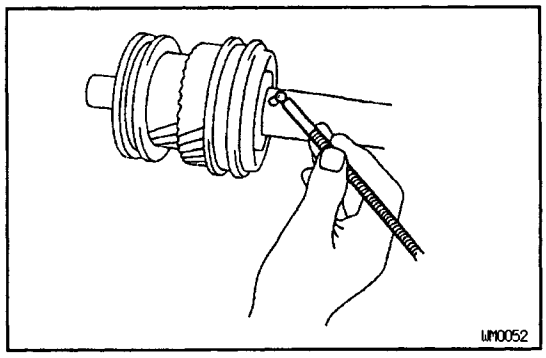
If the clearance exceeds the maximum, replace the gear, shaft or needle roller bearing.




**3. REMOVE OUTPUT SHAFT CENTER BEARING AND FIRST GEAR ASSEMBLY**

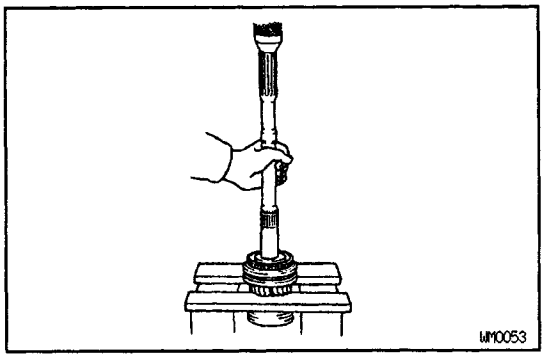
(a) Shift the No. 1 hub sleeve onto the 2nd gear.

(b) Using a press, remove the center bearing, 1st gear, needle roller bearing, inner race and synchronizer ring.



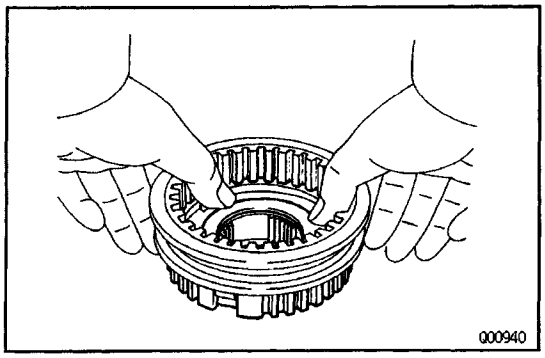

**4. REMOVE LOCKING BALL**

Using a magnetic finger, remove the locking ball.



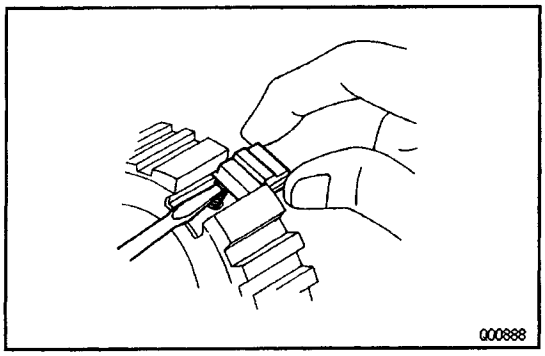

**5. REMOVE NO.1 HUB SLEEVE ASSEMBLY, SECOND GEAR AND NEEDLE ROLLER BEARING**

Using a press, remove the parts from the shaft as an assembly.

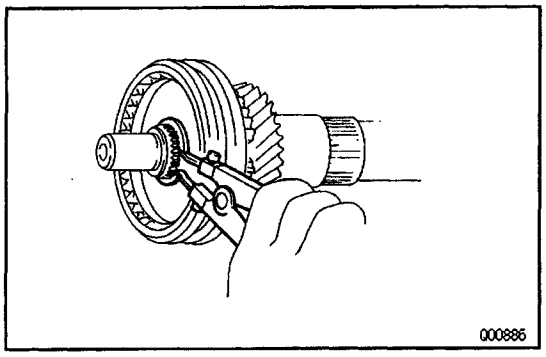



**6. REMOVE NO.1 HUB SLEEVE, SHIFTING KEYS AND SPRINGS FROM CLUTCH HUB NO.1**

(a) Remove the No. 1 clutch hub from the No. 1 hub sleeve.

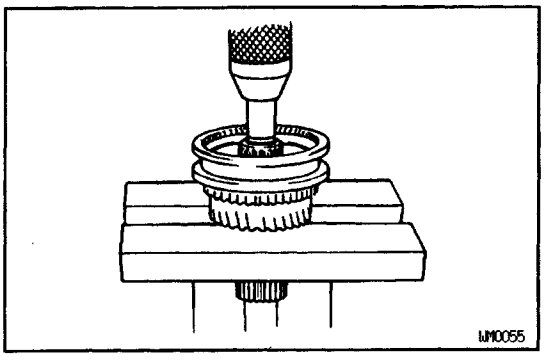



(b) Push the shifting key spring with screwdriver, remove the three shifting keys and key springs.

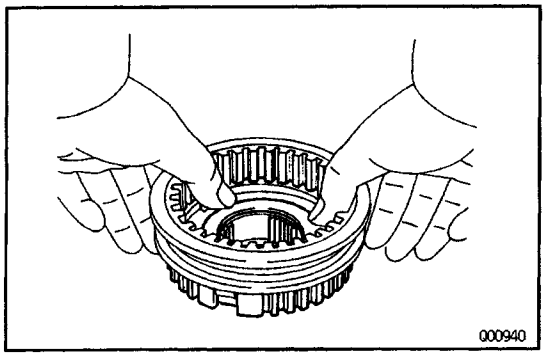



**7. REMOVE NO. 2 HUB SLEEVE ASSEMBLY AND THIRD GEAR**

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

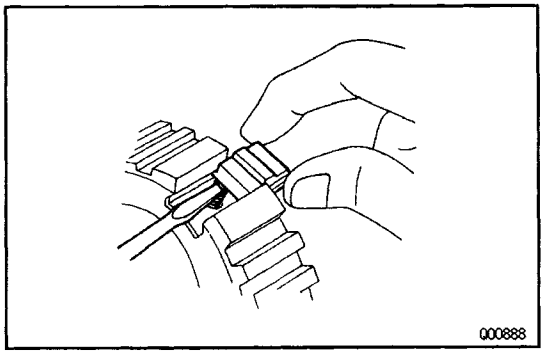



(b) Using a press, remove the No.2 hub sleeve, synchro–nizer ring and 3rd gear.

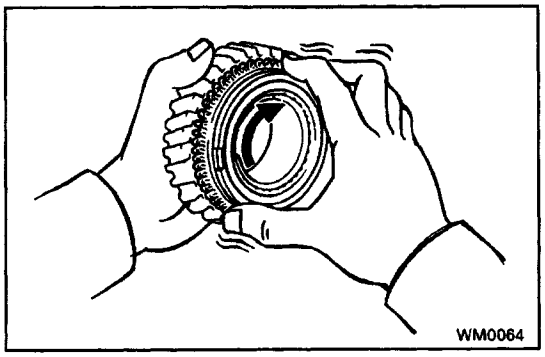


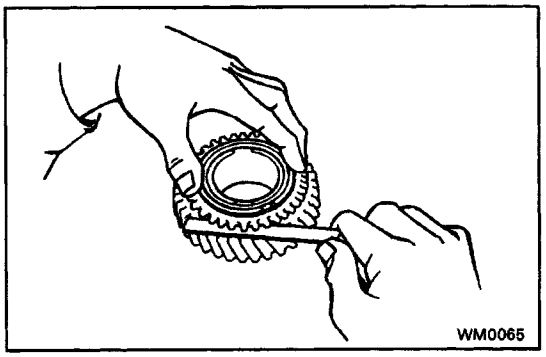

**8. REMOVE NO.2 HUB SLEEVE, SHIFTING KEYS AND SPRINGS FROM NO.2 CLUTCH HUB**

(a) Remove the No. 2 hub sleeve from the No. 2 hub sleeve.




(b) Push the shifting key spring with screwdriver, remove the three shifting keys and key springs.




## OUTPUT SHAFT COMPONENT PARTS INSPECTION

MT032–01

**1. INSPECT SYNCHRONIZER RINGS**

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone and check that the ring is locked. If the braking effect is insufficient, lightly rub the synchronizer ring and gear cone by applying a small amount of fine lapping compound.

**NOTICE:**

- Wash off completely the fine lapping compound after rubbing.
- Check again the braking effect of the synchronizer ring.

(c) Using a feeler gauge, measure the clearance between the synchronizer ring back and the gear spline end.

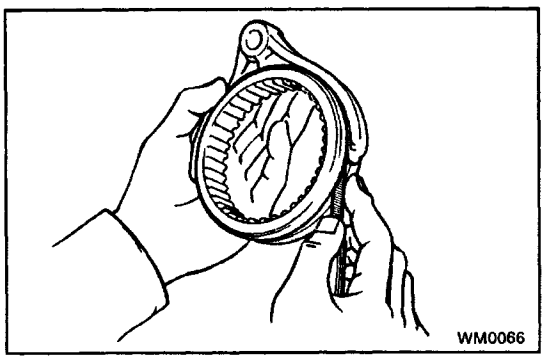
**Minimum clearance:**

**0.5 mm (0.020 in.)**

HINT:

- **When replacing either a synchronizer ring or apply a small amount of fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear together.**
- **When replacing both the synchronizer ring and gear, there is no need to apply any compound or to rub them together.**

**NOTICE: Wash off completely the fine lapping compound after rubbing.**



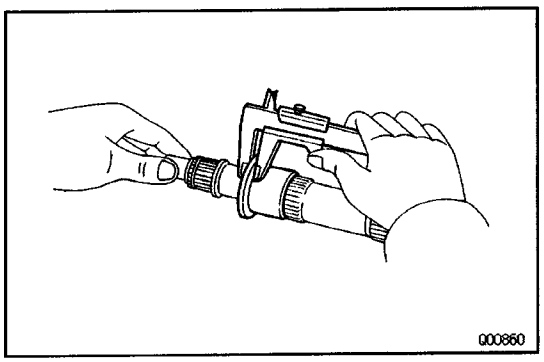

**2. INSPECT CLEARANCE OF SHIFT FORKS AND HUB SLEEVES**

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

**Minimum clearance:**

**1.0 mm (0.039 in.)**

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.



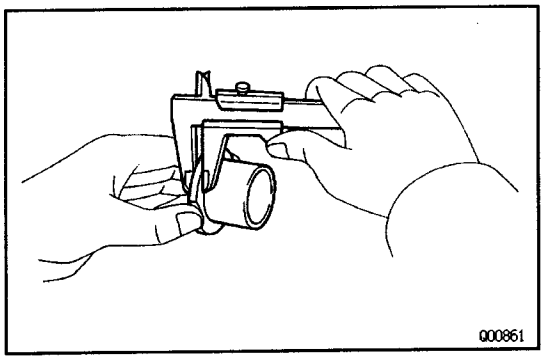

**3. INSPECT OUTPUT SHAFT AND INNER RACE**

(a) Using vernier calipers, measure the output shaft flange thickness.

**Minimum thickness:**

**5.60 mm (0.2204 in.)**

If the thickness exceeds the minimum, replace the output shaft.

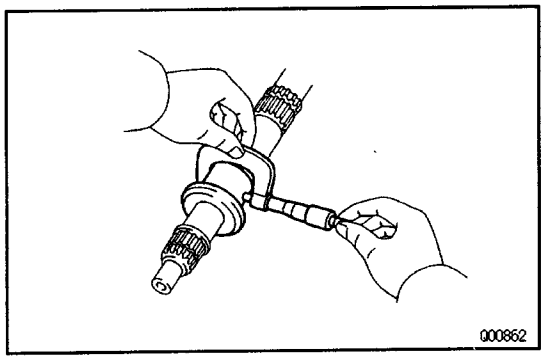



(b) Using vernier calipers, measure the inner race flange thickness.

**Minimum thickness:**

**4.78 mm (0.1882 in.)**

If the thickness exceeds the minimum, replace the inner race.




(c) Using a micrometer, measure the outer diameter of the output shaft journal.

Minimum diameter:

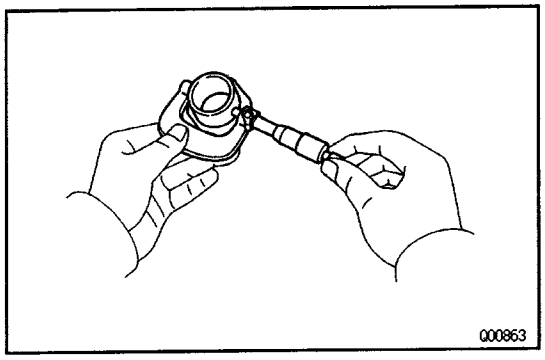
**2nd gear**

**42.975 mm (1.6919 in.)**

**3rd gear**

**31.969 mm (1.2586 in.)**

If the outer diameter exceeds the minimum, replace the output shaft.

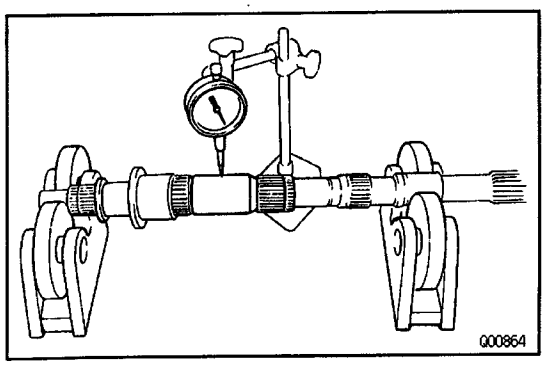



(d) Using a micrometer, measure the outer diameter of the inner race.

**Minimum diameter:**

**42.975 mm (1.6919 in.)**

If the outer diameter exceeds the minimum, replace the inner race.




(e) Using a dial indicator, check the shaft runout.

**Maximum runout:**

**0.06 mm (0.0024 in.)**

If the runout exceeds the maximum, replace the output shaft.

MT00M–02

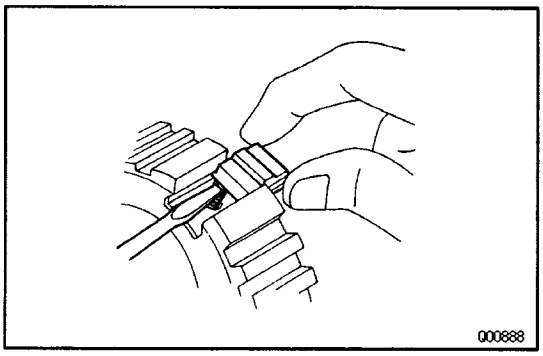
# OUTPUT SHAFT ASSEMBLY

HINT: Coat all of the sliding and rotating surface with gear oil before assembly.

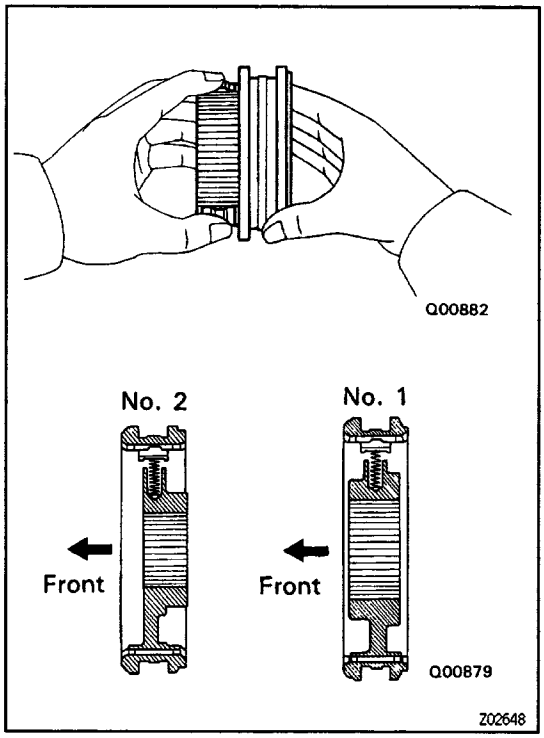
**1. INSTALL NO.1 AND NO.2 CLUTCH HUB INTO HUB SLEEVE**

(a) Install the three shifting key springs to the clutch hub.

(b) While pushing the shifting key spring with screw–driver, install the three shifting keys.



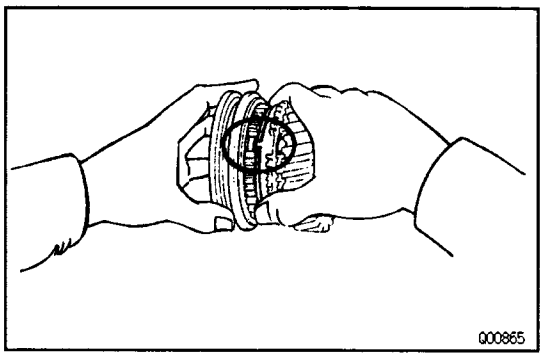

(c) While pushing the three shifting keys, install the clutch hub to the hub sleeve.



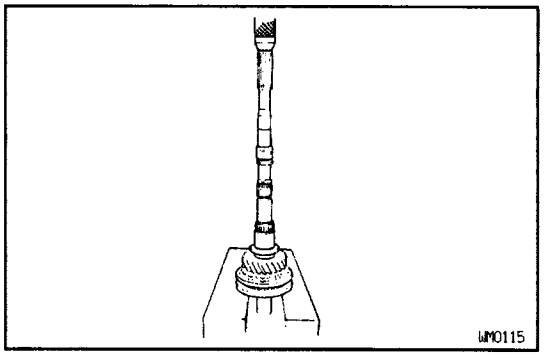

**2. INSTALL THIRD GEAR AND NO.2 CLUTCH HUB ON OUTPUT SHAFT**

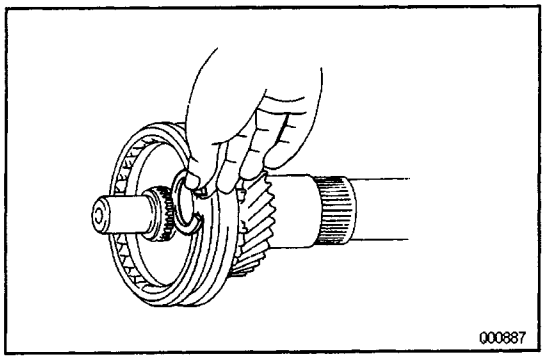
(a) Apply gear oil to the shaft.

(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.




(c) Using a press, install the 3rd gear and No.2 clutch hub.

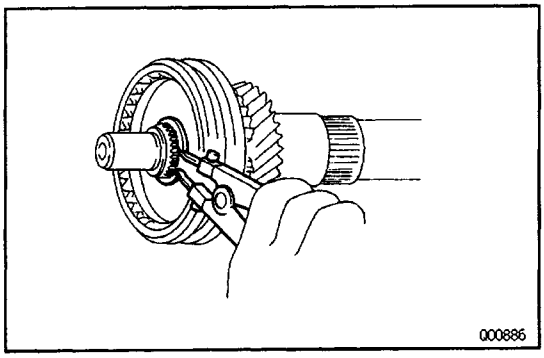




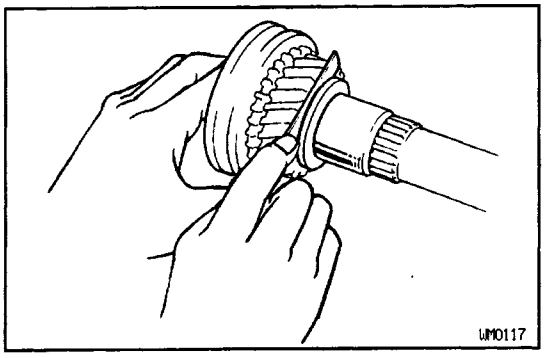

### 3. INSTALL SNAP RING

(a) Select a snap ring that will allow minimum axial play.

| Mark | Thickness mm (in.) |
|---|---|
| C–1 | 1.75–1.80 (0.0689–0.0709) |
| D | 1.80–1.85 (0.0709–0.0728) |
| 11 | 1.86–1.91 (0.0732–0.0752) |
| 12 | 1.92–1.97 (0.0756–0.0776) |
| 13 | 1.98–2.03 (0.0780–0.0799) |
| 14 | 2.04–2.09 (0.0803–0.0823) |
| 15 | 2.10–2.15 (0.0827–0.0846) |




(b) Using a snap ring expander, install the snap ring.

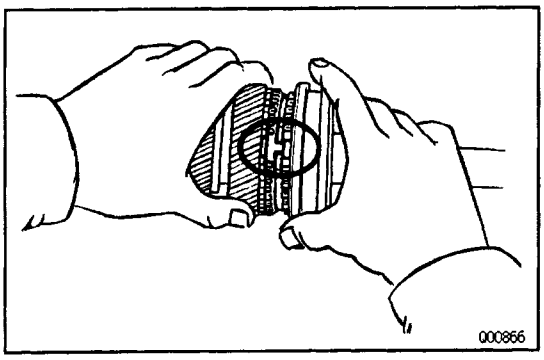



### 4. INSPECT THIRD GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 3rd gear thrust clearance.

**Standard clearance:**

**0.10–0.25 m m (0.0039–0.0098 in.)**

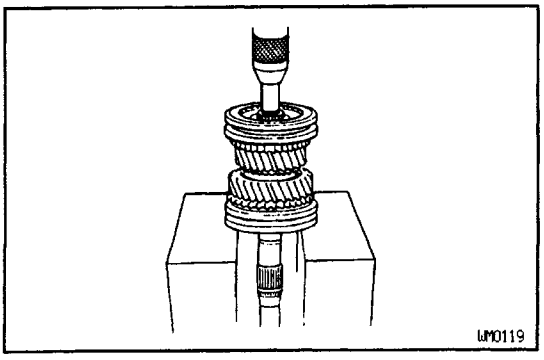



### 5. INSTALL SECOND GEAR AND NO.1 CLUTCH HUB

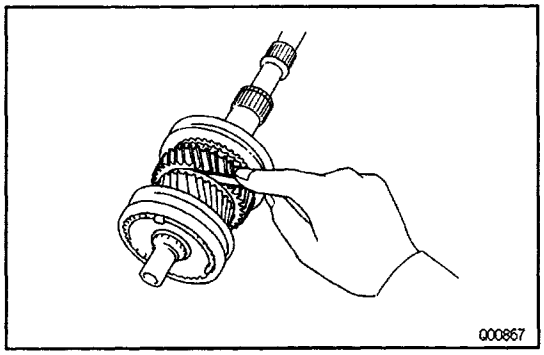
(a) Apply gear oil to the shaft and needle roller bearing.

(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.

(c) Install the needle roller bearing in the 2nd gear.




(d) Using a press, install the 2nd gear and No.1 clutch hub.

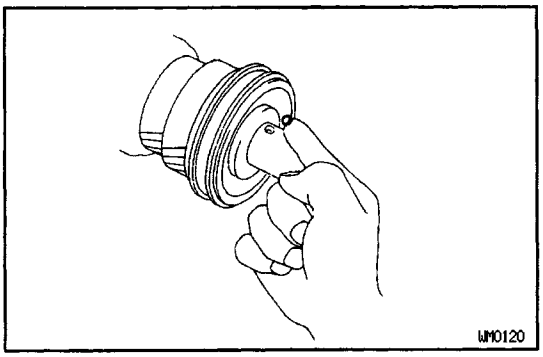



**6. INSPECT SECOND GEAR THRUST CLEARANCE**

Using a feeler gauge, measure the 2nd gear thrust clearance.

**Standard clearance:**

**0.10–0.25 mm (0.0039–0.0098 in.)**

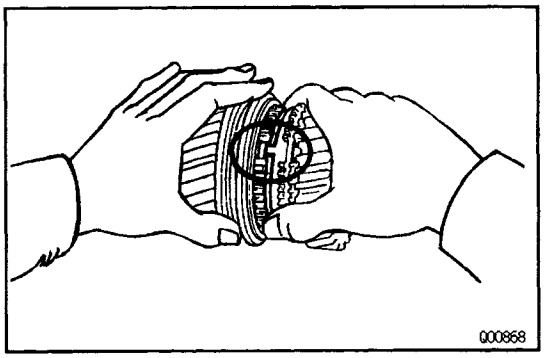



**7. INSTALL LOCKING BALL AND FIRST GEAR ASSEMBLY**

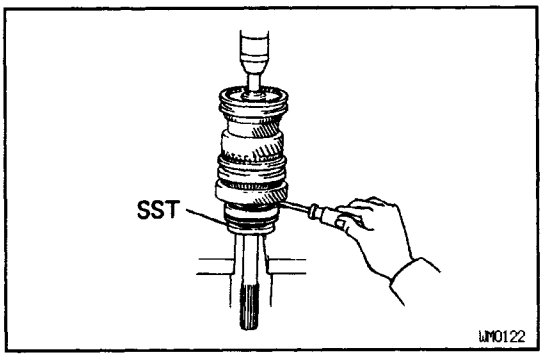
(a) Install the locking ball in the shaft.

(b) Apply gear oil to the bearing.

(c) Assembly the 1 st gear, synchronizer ring, needle roller bearing and bearing inner race.




(d) Install the assembly on the output shaft with the synchronizer ring slots aligned with the shifting keys and turn the inner race to align it with the locking ball.




**8. INSTALL OUTPUT SHAFT CENTER BEARING**

Using SST and a press, install the bearing on the output shaft with the outer race snap ring groove toward the rear.

HINT: Hold the 1 st gear inner race to prevent it frorn falling.

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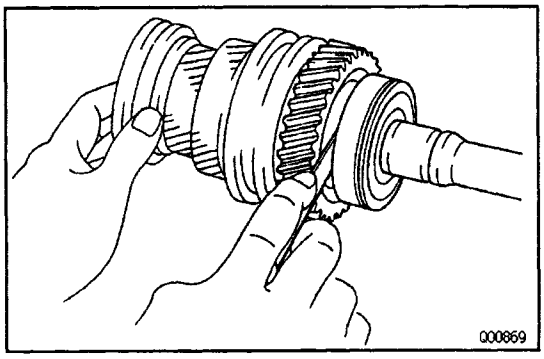


**9. INSPECT FIRST GEAR THRUST CLEARANCE**

Using a feeler gauge, measure the 1st gear thrust clearance.

**Standard clearance:**

**0.10–0.25 mm (0.0039–0.0098 in.)**