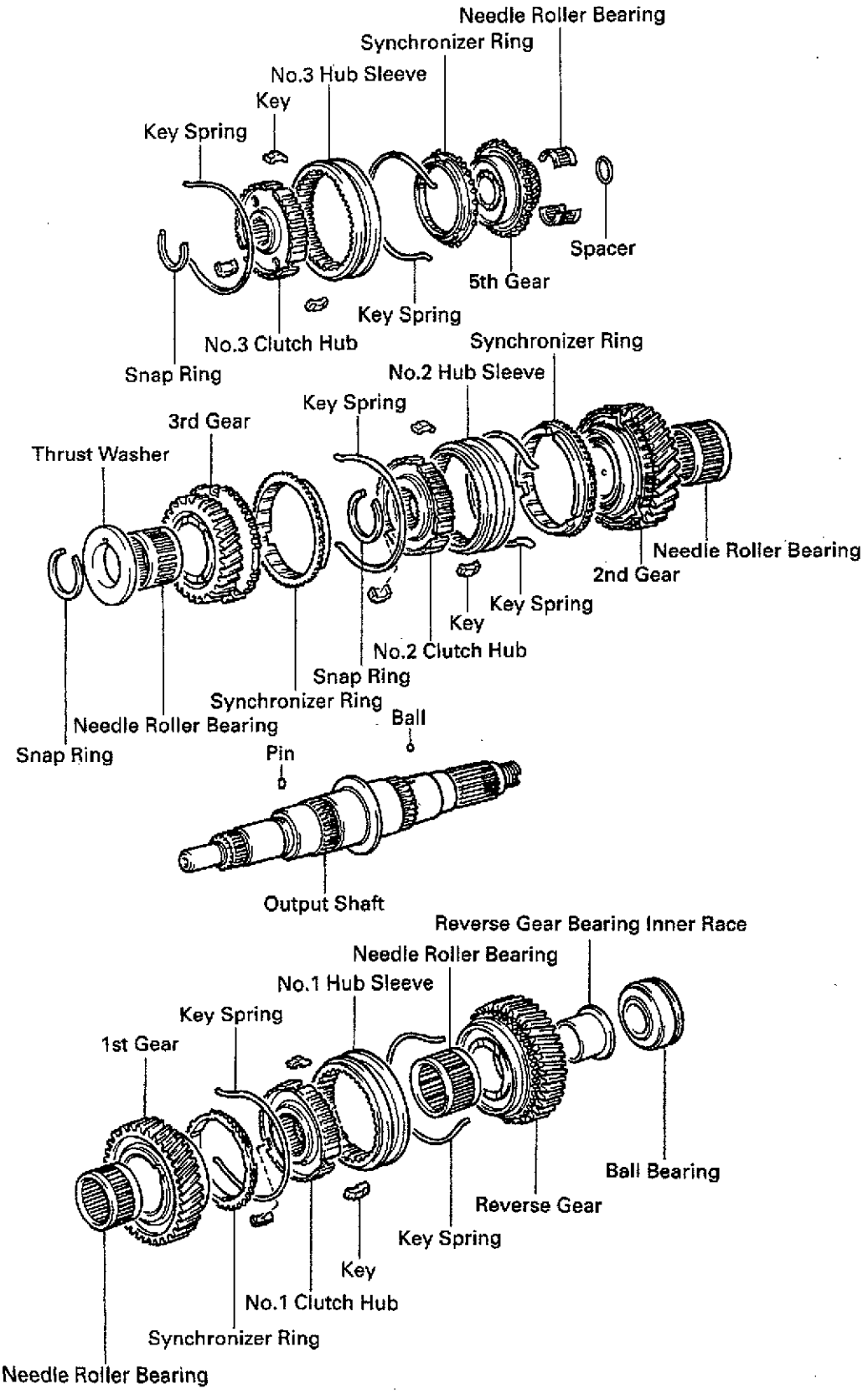
OUTPUT SHAFT

COMPONENTS

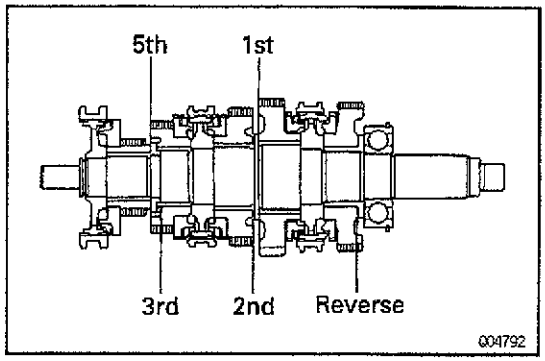
MT08J–02



Q04791

MT08M-01

OUTPUT SHAFT DISASSEMBLY



MT

1. MEASURE THRUST CLEARANCE

Measure the thrust clearance of each gear.

Standard clearance:

1st and 2nd gear
0.10–0.35 mm (0.0039–0.0138 in.)

3rd gear
0.10–0.60 mm (0.0039–0.0236 in.)

5th gear
0.10–0.50 mm (0.0039–0.0197 in.)

Reverse gear
0.15–0.40 mm (0.0059–0.0157 in.)

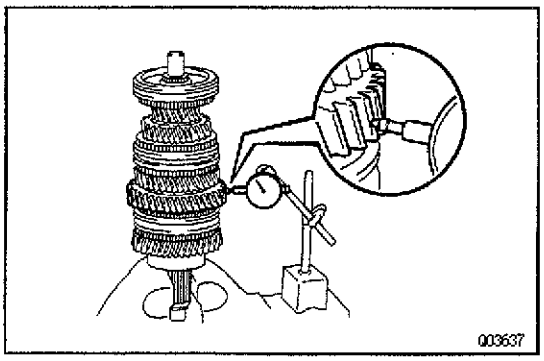
Maximum clearance:

1st and 2nd gear
0.35 mm (0.0138 in.)

3rd gear
0.60 mm (0.0236 in.)

5th gear
0.50 mm (0.0197 in.)

Reverse gear
0.40 mm (0.0157 in.)



2. MEASURE RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance for the following gears.

Standard clearance:

1st gear
0.030–0.075 mm (0.0012–0.0030 in.)

2nd and Reverse gear
0.030–0.081 mm (0.0012–0.0032 in.)

3rd and 5th gear
0.015–0.066 mm (0.0006–0.0026 in.)

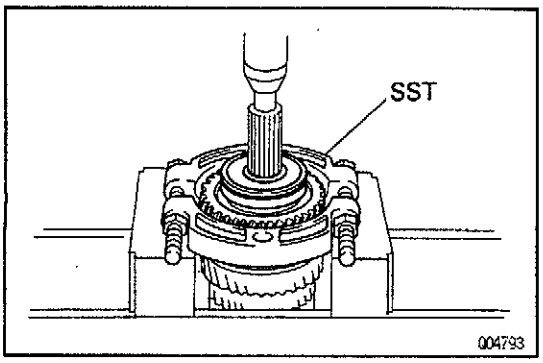
Maximum clearance:

1st gear
0.075 mm (0.0030 in.)

2nd and Reverse gear
0.081 mm (0.0032 in.)

3rd and 5th gear
0.066 mm (0.0026 in.)

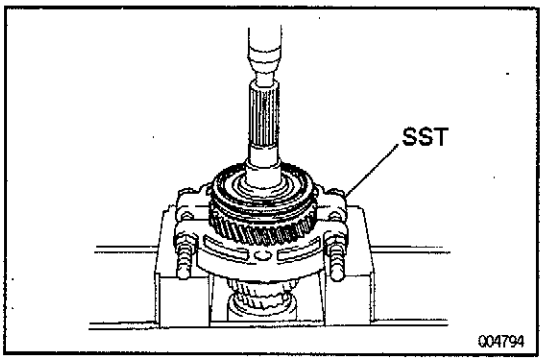
If the clearance is more than the limit, replace the gear, needle roller bearing and shaft.



3. REMOVE REVERSE GEAR, REAR BEARING AND INNER RACE

(a) Using SST and a press, remove the reverse gear, rear bearing and inner race.
SST 09555–55010

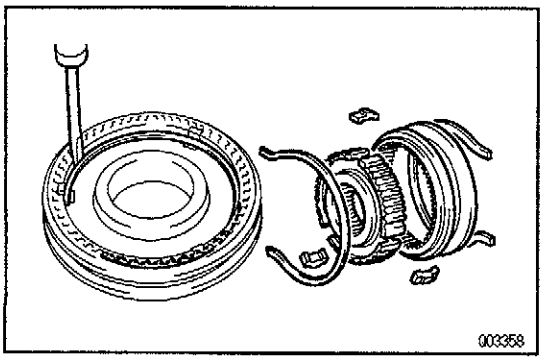
(b) Remove the ball and needle roller bearing.



4. REMOVE 1ST GEAR AND NO.1 HUB SLEEVE ASSEMBLY

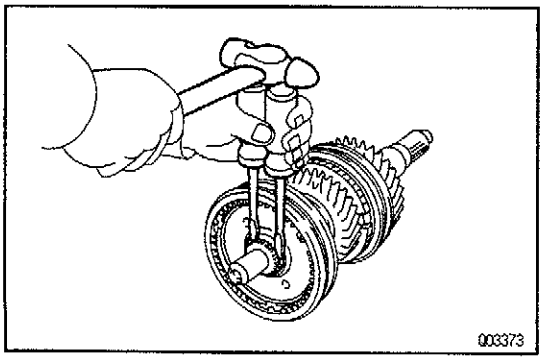
(a) Using SST and a press, remove the 1st gear, synchronizer ring and No.1 hub sleeve assembly.
SST 09555–55010

(b) Remove the needle roller bearing.



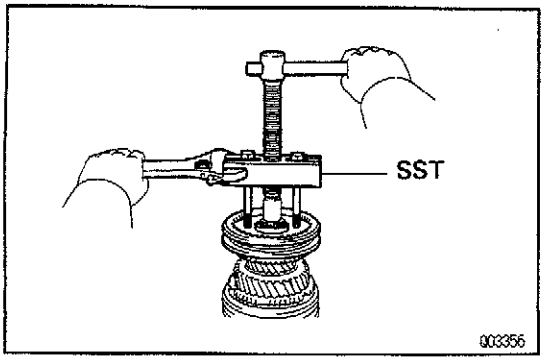
5. REMOVE NO.1 HUB SLEEVE, SHIFTING KEYS AND SPRINGS FROM NO.1 CLUTCH HUB

Using a screwdriver, remove the 3 shifting keys and 2 springs from the No.1 clutch hub.



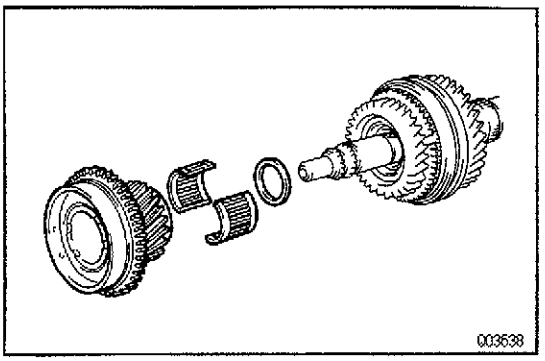
6. REMOVE 5TH GEAR AND NO.3 HUB SLEEVE ASSEMBLY

(a) Using 2 screwdrivers and a hammer, tap out the snap ring.



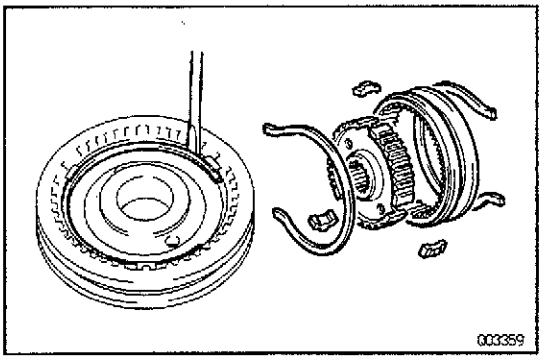
(b) Using SST, remove the No.3 hub sleeve assembly.
SST 09213–60017 (09213–00020, 09213–00030, 09213–00130)

(c) Remove the synchronizer ring.



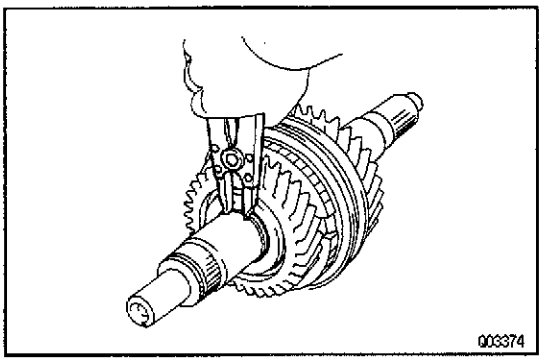
(d) Remove the 5th gear, needle roller bearing and spacer.

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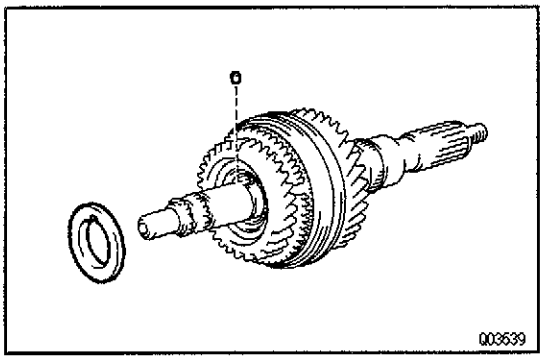
7. REMOVE NO.3 HUB SLEEVE, SHIFTING KEYS AND SPRINGS FROM NO.3 CLUTCH HUB

Using a screwdriver, remove the 3 shifting keys and 2 springs from the No.3 clutch hub.



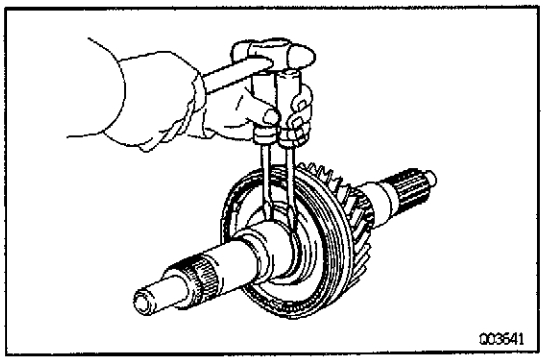
8. REMOVE THRUST WASHER AND 3RD GEAR

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



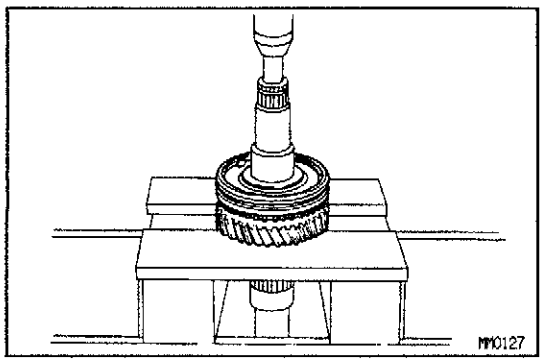
(b) Remove the thrust washer and straight pin.

(c) Remove the 3rd gear, needle roller bearing and synchronizer ring.

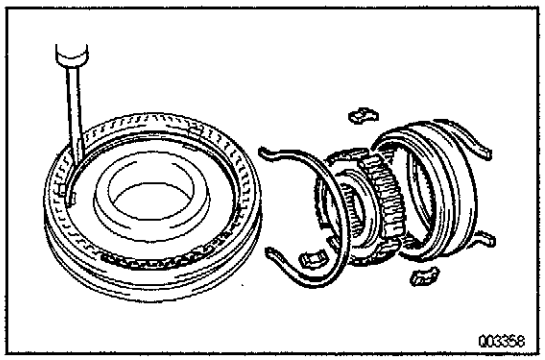


9. REMOVE 2ND GEAR AND NO.2 HUB SLEEVE ASSEMBLY

(a) Using 2 screwdrivers and a hammer, tap out the snap ring.

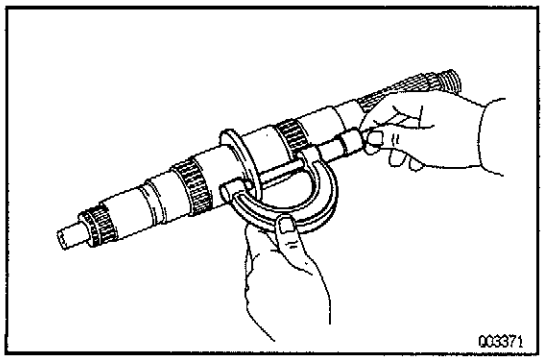


(b) Using a press, remove the 2nd gear, synchronizer ring and No.2 hub sleeve assembly.
(c) Remove the 2nd gear needle roller bearing.



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

Using a screwdriver, remove the 3 shifting keys and 2 springs from the No.2 clutch hub.



OUTPUT SHAFT COMPONENT PARTS INSPECTION

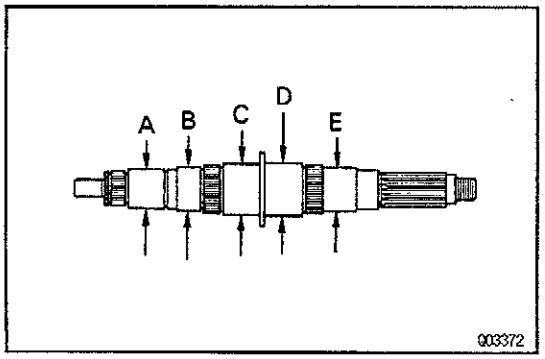
1. INSPECT OUTPUT SHAFT

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

Minimum thickness:

4.825 mm (0.1900 in.)

If the thickness is less than the minimum, replace the output shaft.

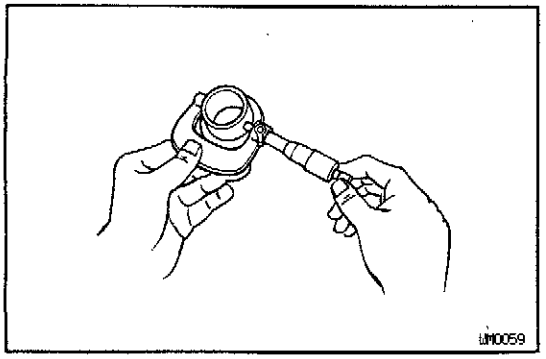


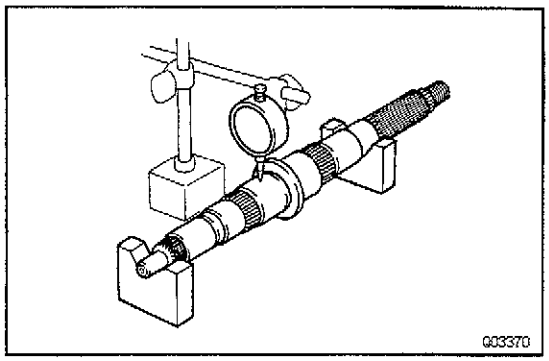
(b) Using a micrometer, measure the outer diameter of the output shaft journal.

Minimum diameter:

A 5th gear
36.975 mm (1.4557 in.)
B 3rd gear
46.975 mm (1.8494 in.)
C 2nd gear
53.975 mm (2.1250 in.)
D 1st gear
57.975 mm (2.2825 in.)
E Reverse gear inner race
53.975 mm (2.1250 in.)

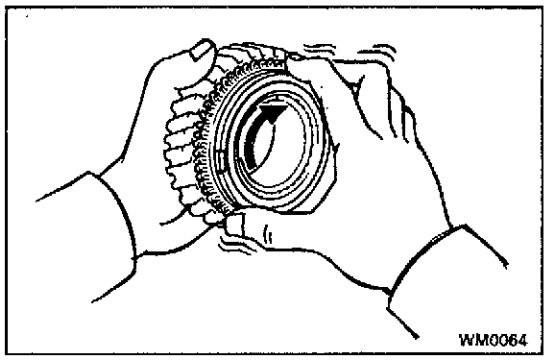
If the outer diameter is less than the minimum, replace the output shaft.



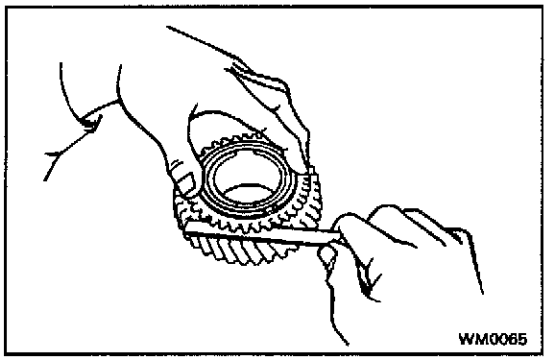


(c) Using a dial indicator, check the shaft runout.
Maximum runout:
0.05 mm (0.0020 in.)
If the runout exceeds the maximum, replace the output shaft.

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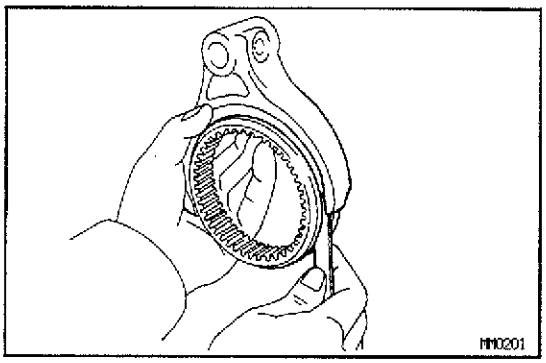


2. INSPECT SYNCHRONIZER RINGS
(a) Check for wear or damage.
(b) Check the braking effect of the synchronizer ring.
Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.
If the braking effect is insufficient, apply a small amount of fine lapping compound between the synchronizer ring and gear cone.
Lightly rub the synchronizer ring and gear cone together.
NOTICE: Ensure the fine lapping compound is completely washed off after rubbing.
(c) Check again the braking effect of the synchronizer ring. If it does not lock, replace the synchronizer ring.



(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.
Minimum clearance:
1st, 2nd and 3rd gear
1.1 mm (0.043 in.)
5th gear
0.8 mm (0.031 in.)
HINT:
- When replacing either a synchronizer ring or gear, apply a small amount of fine lapping compound between the synchronizer ring and gear cone.
  Lightly rub the synchronizer ring and gear cone together.
- When replacing both the synchronizer ring and gear, there is no need to apply any compound or to rub them together.

NOTICE: Ensure the fine lapping compound is completely washed off after rubbing.



3. INSPECT CLEARANCE OF SHIFT FORKS AND HUB SLEEVES

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

Maximum clearance:

0.35 mm (0.014 in.)

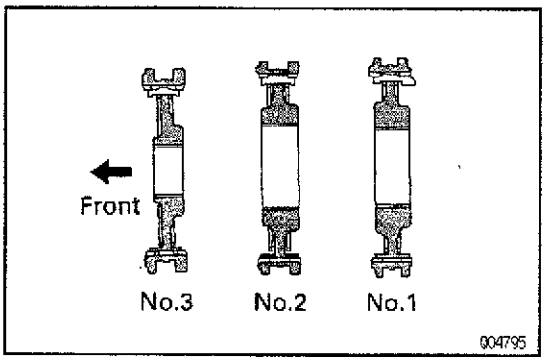
If the clearance exceeds the limit, replace the shift fork and hub sleeve.

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MT08P–01

OUTPUT SHAFT ASSEMBLY

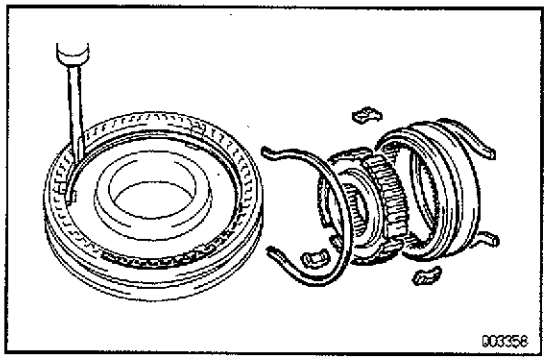
(See page MT–19)



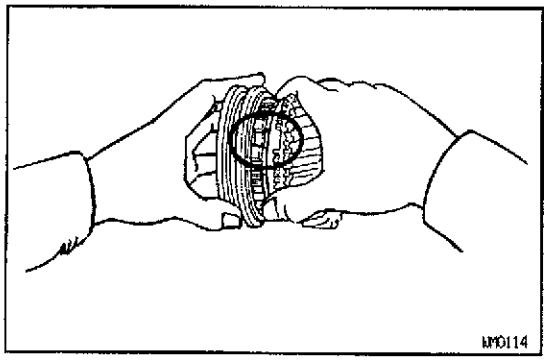
HINT: Coat all of the sliding and rotating surfaces with gear oil before assembly.

1. INSTALL NO.1, NO.2 AND NO.3 CLUTCH HUBS INTO HUB SLEEVES

(a) Install the clutch hub and shifting keys to the hub sleeve.



(b) Install the shifting key springs under the shifting keys.
NOTICE: Install the key springs positioned so that their end gaps are not in line.

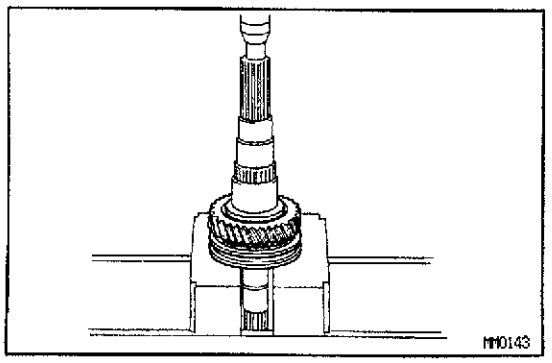


2. INSTALL 2ND GEAR AND NO.2 HUB SLEEVE

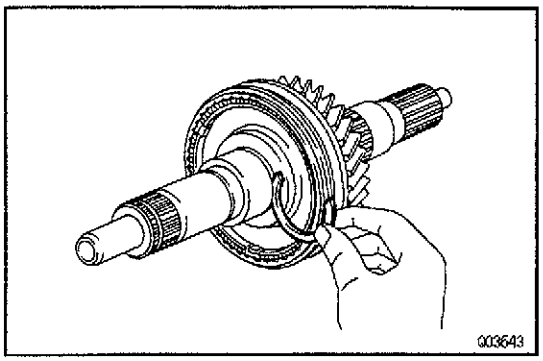
(a) Apply gear oil to the shaft and needle roller bearing.

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

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



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

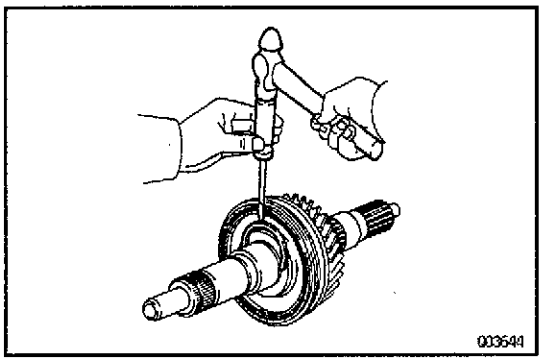


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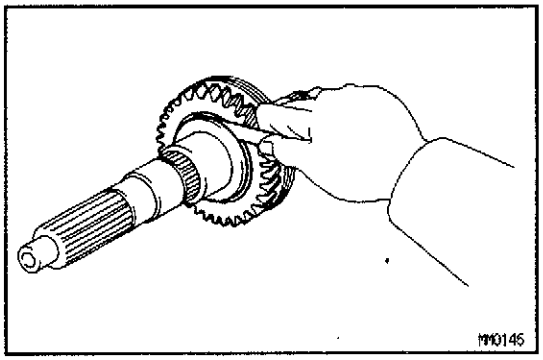
3. INSTALL SNAP RING

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

Mark	Thickness mm (in.)
2	1.90–1.95 (0.0748–0.0768)
3	1.95–2.00 (0.0768–0.0787)
4	2.00–2.05 (0.0787–0.0807)
5	2.05–2.10 (0.0807–0.0827)
6	2.10–2.15 (0.0827–0.0846)
7	2.15–2.20 (0.0846–0.0866)



(b) Using a screwdriver and hammer, install the snap ring.

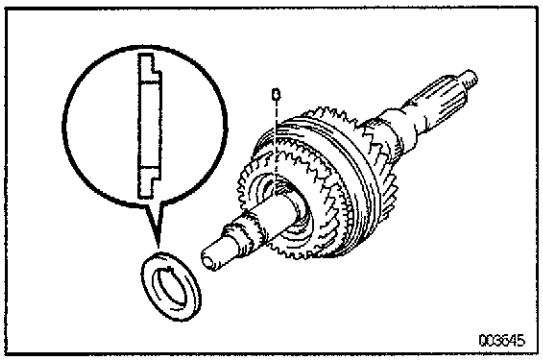


4. INSPECT 2ND GEAR THRUST CLEARANCE

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

Standard clearance:

0.10–0.35 mm (0.0039–0.0138 in.)



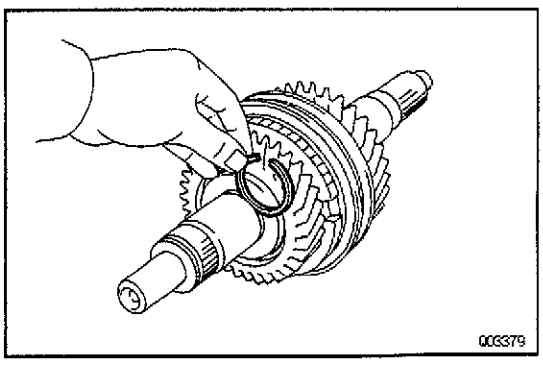
5. INSTALL 3RD GEAR AND THRUST WASHER

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

(b) Assemble the 3rd gear, synchronizer ring and needle roller bearing.

(c) Install the assembly on the shaft with the synchronizer ring slots aligned with the shifting keys.

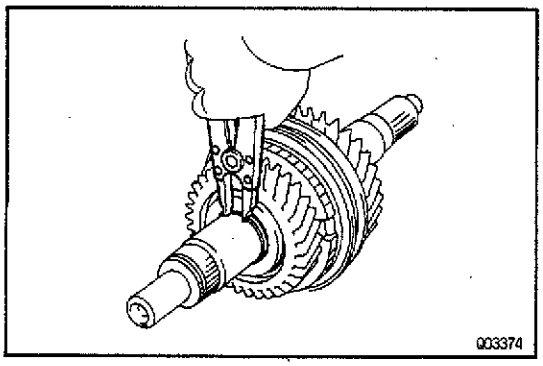
(d) Install the thrust washer onto the output shaft with the straight pin aligned with the thrust washer.



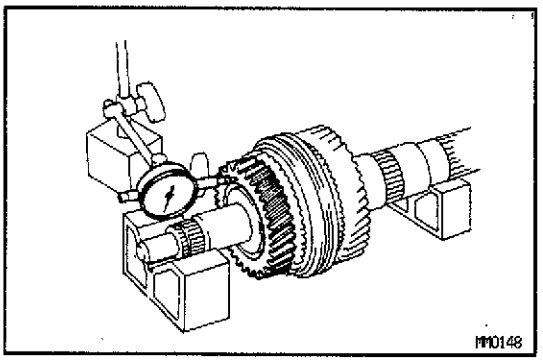
6. INSTALL SNAP RING

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

Mark	Thickness mm (in.)
A	2.90–2.95 (0.1142–0.1161)
B	2.95–3.00 (0.1161–0.1181)
C	3.00–3.05 (0.1181–0.1201)
D	3.05–3.10 (0.1201–0.1220)
F	3.10–3.15 (0.1220–0.1240)



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

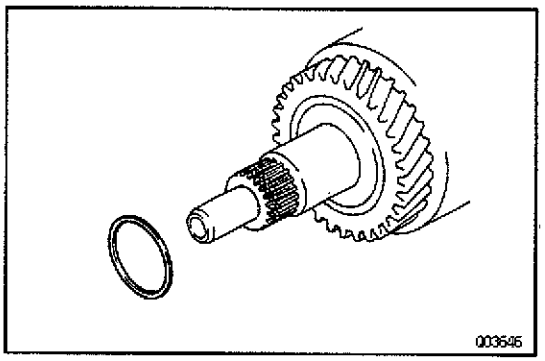


7. INSPECT 3RD GEAR THRUST CLEARANCE

Using a dial indicator, measure the 3rd gear thrust clearance.

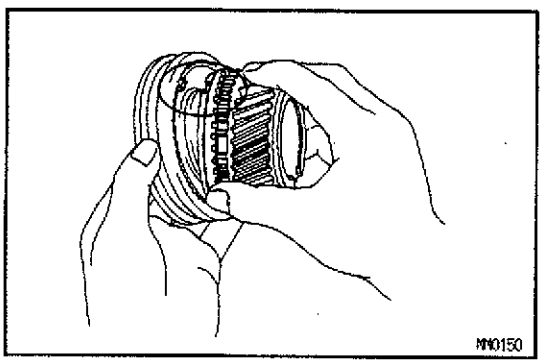
Standard clearance:

0.10–0.60 mm (0.0039–0.0236 in.)



8. INSTALL 5TH GEAR AND NO.3 HUB SLEEVE

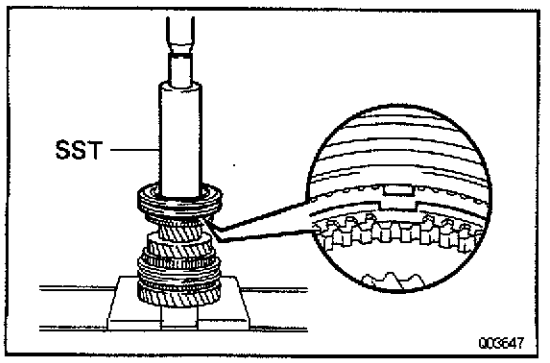
(a) Install the spacer on the output shaft.



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

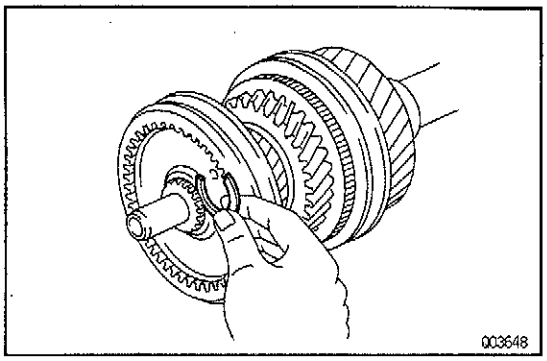
(c) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.

(d) Install the needle roller bearing in the 5th gear.



(e) Using SST and a press, install the 5th gear and No.3 hub sleeve.

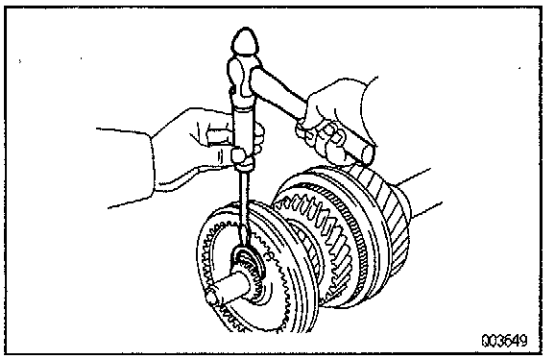
SST 09316–60010 (09316–00010)



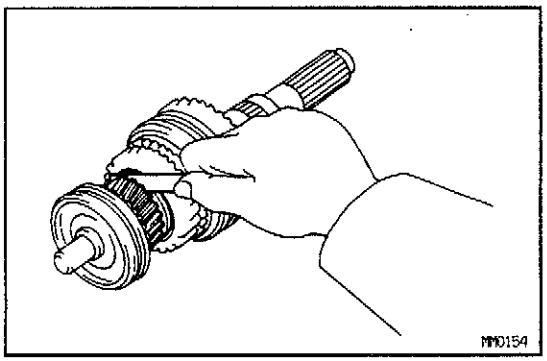
9. INSTALL SNAP RING

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

Mark	Thickness mm (in.)
4	1.90–1.95 (0.0748–0.0768)
5	1.95–2.00 (0.0768–0.0787)
6	2.00–2.05 (0.0787–0.0807)
7	2.05–2.10 (0.0807–0.0827)
8	2.10–2.15 (0.0827–0.0846)
9	2.15–2.20 (0.0846–0.0866)



(b) Using a screwdriver and hammer, install the snap ring.

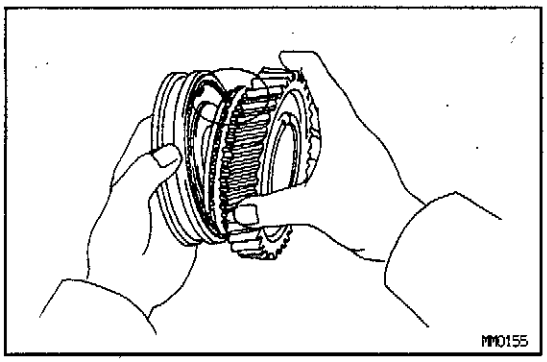


10. INSPECT 5TH GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 5th gear thrust clearance.

Standard clearance:

0.10–0.50 mm (0.0039–0.0197 in.)

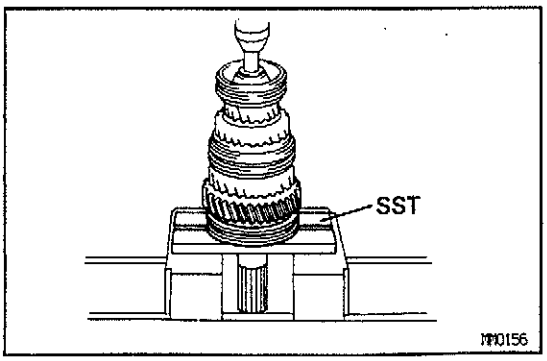


11. INSTALL 1ST GEAR AND NO.1 HUB SLEEVE

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

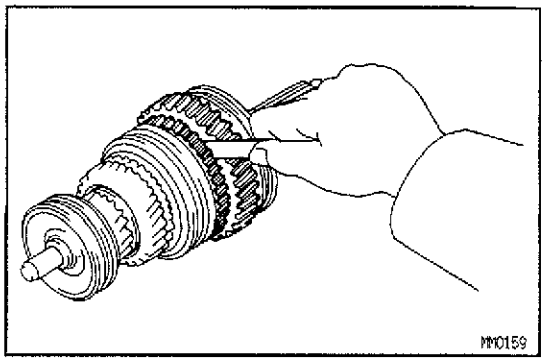
(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.

(c) Install the 1st gear needle roller bearing.



(d) Using SST and a press, install the 1st gear and No.1 hub sleeve.

SST 09527–30010



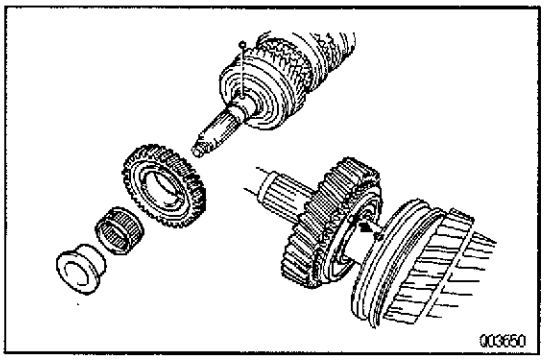
12. INSPECT 1ST GEAR THRUST CLEARANCE

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

Standard clearance:

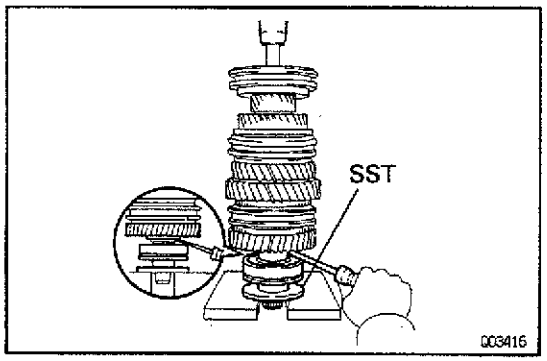
0.10–0.35 mm (0.0039–0.0138 in.)

MT



13. INSTALL REVERSE GEAR AND INNER RACE

(a) Apply gear oil to the needle roller bearing.
(b) Install the ball on the output shaft.
(c) Install the reverse gear's needle roller bearing and inner race.
(d) Install the reverse gear onto the output shaft with the ball aligned with the inner race.

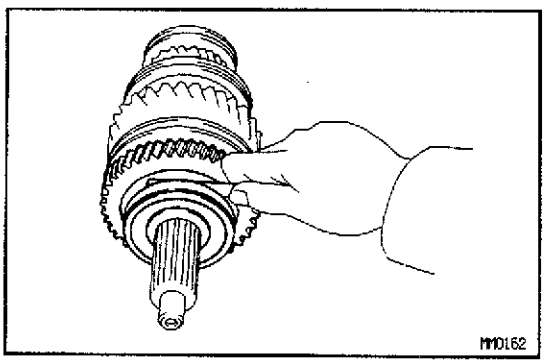


14. INSTALL OUTPUT SHAFT REAR BEARING

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

SST 09316–60010 (09316–00040)

HINT: Hold the reverse gear and thrust washer with a screwdriver to prevent it from falling.



15. INSPECT REVERSE GEAR THRUST CLEARANCE

Using a feeler gauge, measure the reverse gear thrust clearance.

Standard clearance:

0.15–0.40 mm (0.0059–0.0157 in.)