

Appendix C

Tools & Equipment

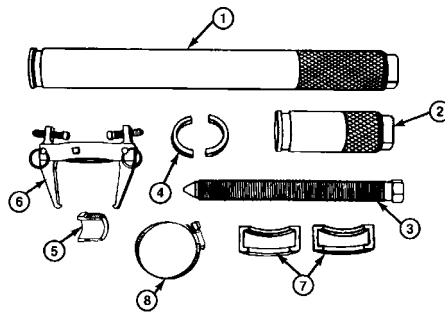
SST: Transmission Bearing Service Set

OTC A division of SPX Corporation
655 Eisenhower Drive
Owatonna, MN 55060-0995 USA
Phone: (507) 455-7000
Tech. Serv.: (800) 533-6127
Order Entry: (507) 455-1480
International Sales: (507) 455-7223

Form No. 104857

Parts List & Operating Instructions
for: 00002-00907-01

Toyota Transmission Bearing Service Set



Item No.	Part No.	No. Req'd	Description
1	00002-00907-7	1	Remover/Replacer (15-3/4")
2	00002-00907-12	1	Remover/Replacer (5-1/2")
3	00002-00907-8	1	Forcing Screw
4	00002-00907-10	1	Puller Ring Half
5	00002-00907-11	1	Replacer Shaft Collar
6	00002-00907-9	1	Bearing Puller
7	00002-00907-13	2	Collet Halves
8		1	Clamp
PARTS INCLUDED BUT NOT SHOWN			
206613		1	Storage Box

NOTE: The tool set listed above is used in conjunction with a previously released Output Shaft Rear Bearing/Fifth Gear Service Set No. 00002-00907. The parts list and illustration for the previously released service set is shown on sheet 2 of 2.

OPERATING INSTRUCTIONS

BEARING REMOVAL - FRONT/REAR COUNTER SHAFT AND OUTPUT SHAFT

1. Remove the hitch pins from the Bearing Puller (Item 6) and slide the puller head onto the proper length Remover/Replacer (Item 1 or 2).
2. Position the puller ring halves (Items 4) into the groove on the remover/replacer tool (see Figure 1). Slide the puller head over the puller ring halves (see Figure 2). Tighten the set screw onto the ring halves as shown.



FIGURE 1



FIGURE 2

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ISSUE DATE: 4-25-83

Fig. C-1
T302fC01

SST: Transmission Bearing Service Set

Parts List & Operating Instructions

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3. Position the puller jaws behind the snap ring as shown in Figure 3.

NOTE: To provide clearance for the puller jaws, pull the transmission shaft out from the case as far as possible.

4. Slide the remover/replacer, with the puller head assembled, over the shaft and replace the hitch pins as shown in Figure 4.
5. Adjust the preload screws, as shown in Figure 5, until the remover/replacer is visually centered. Wrench tighten evenly.
6. Thread the Forcing Screw (Item 3) into the remover/replacer and turn clockwise until the bearing is pulled from the case.



FIGURE 3



FIGURE 4



FIGURE 5

BEARING INSTALLATION - FRONT/REAR COUNTER SHAFT AND OUTPUT SHAFT

FRONT/REAR COUNTERSHAFT BEARINGS

1. Position the bearing components to be installed onto the shaft. Place a remover/installer tube on the bearing and install the bearing.

IMPORTANT: Use a "dead-blow" type hammer to prevent damage to the threaded end of the remover/installer tube.

OUTPUT SHAFT BEARINGS

NOTE: Output shaft bearing replacement requires the use of a previously released Output Shaft Rear Bearing/Fifth Gear Service Set No. 00002-00907 in conjunction with the Replacer Shaft Collar (Item 5).

1. Position the bearing onto the output shaft. Place the Washer (Item 6 of tool set no. 00002-00907) against the bearing.
2. Place the Replacer Shaft Collar (Item 5 from tool set no. 00002-00907-01) onto the output shaft. Thread the Replacer Shaft (Item 4 of tool set no. 00002-00907) onto the replacer shaft collar. See Figure 8.
3. Slide the remover/replacer tube over the replacer shaft and up to the washer. Thread the hex nut onto the threaded shaft and wrench tighten until the bearing is installed.

Fig. C-2
T302fC02

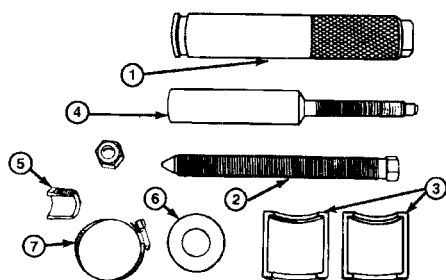
SST: 5th Gear Service Set

A division of SPX Corporation
655 Eisenhower Drive
Owatonna, MN 55060-0995 USA
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Form No. 104857

Parts List & Operating Instructionsfor: **00002-00907-01****5TH GEAR SERVICE SET**

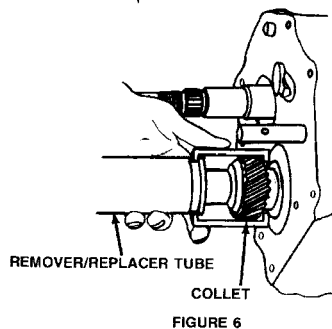
NOTE: 5th gear removal and installation requires use of a previously released Output Shaft Rear Bearing/Fifth Gear Service Set No. 00002-00907 in conjunction with the Replacer Shaft Collar (Item 5).

**OUTPUT SHAFT REAR BEARING/
5TH GEAR SERVICE SET**

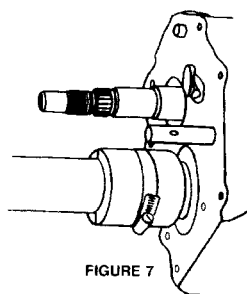
Item No.	Part No.	No. Req'd	Description
1	00002-00907-1	1	Remover/Replacer Tube (10-3/4")
2	00002-00907-2	1	Forcing Screw
3	00002-00907-3	1	Collet—Pair
4	00002-00907-4	1	Replacer Shaft
5	00002-00907-5	1	Replacer Shaft Collar
6	00002-00907-6	1	Washer
7		1	Clamp

5TH GEAR REMOVAL

- Slide the proper length Remover/Replacer Tube over the transmission output shaft. Position the two halves of the Collet (Item 3) over the fifth gear and into the groove of the remover/replacer tube as shown in Figure 6.
- Slide the clamp over the collets and tighten it securely. See Figure 7.
- Thread the Forcing Screw (Item 2) into the remover/replacement tube. Hold the tube securely and wrench turn the forcing screw until the gear is removed.

**5TH GEAR INSTALLATION**

- Position 5th gear onto the output shaft. Place the Washer (Item 6) against the 5th gear.
- Place the Replacer Shaft Collar (Item 5 from tool set 00002-00907-01 [Part No. 00002-00907-11]) onto the output shaft. Thread the Replacer Shaft (Item 4) onto the replacer shaft collar. See Figure 8.
- Slide the remover/replacer tube over the replacer shaft and up to the washer. Thread the hex nut onto the threaded shaft and wrench tighten until the gear is installed.



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Fig. C-3
T302IC03

SST: 5th Gear Service Set

Parts List & Operating Instructions

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AUTOMATIC TRANSMISSION FRONT PUMP PULLER

1. Thread the Forcing Screw (Item 3) into the Remover/Replacer Tube (Item 2).
2. Position the pulling flange of the Collet Halves (Item 7) over the pump shaft splined area and the remover/replacer tube. Slide the clamp over the collet halves and tighten securely. See Figure 9.
3. Wrench turn the forcing screw to pull the pump from the transmission housing.



FIGURE 9

Fig. C-4
T302fC04

SST: Output Shaft Rear Bearing/5th Gear Service Set



OWATONNA TOOL COMPANY
OWATONNA, MINNESOTA 55060, U.S.A. — TELEX: 29-0777

OPERATING INSTRUCTIONS FOR

Form No. 104638

MAJOR MOTORS 00002-00907

OUTPUT SHAFT REAR BEARING/ FIFTH GEAR SERVICE SET

OUTPUT SHAFT REAR BEARING AND FIFTH GEAR REMOVAL:

1. Position the forcing screw (00002-00907-2) into the end of the remover/replacer tube (00002-00907-1).
2. Slide the clamp over the remover/replacer tube. Do not tighten at this time.
3. Slide the remover/replacer tube over the transmission output shaft.
4. Position the two halves of the collet (00002-00907-3) into the tube groove and over the rear bearing and fifth gear. (Fig. A)
5. Slide the clamp over the collet to hold the collet in place and tighten it with a screw driver. (See Fig. B)
6. Turn the forcing screw in to remove the bearing and gear. (Fig. C)



FIGURE A

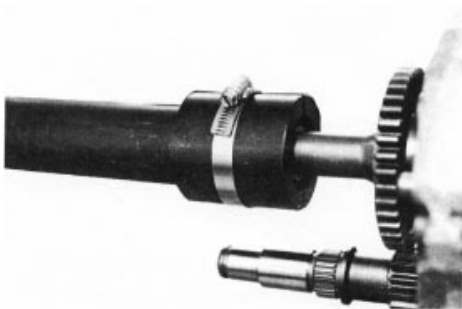


FIGURE B



FIGURE C

SST: Output Shaft Rear Bearing/5th Gear Service Set

OPERATING INSTRUCTIONS (CONT'D)

OUTPUT SHAFT REAR BEARING AND FIFTH GEAR INSTALLATION:

1. Position the fifth gear and output shaft rear bearing onto the shaft.
2. Install the washer (00002-00907-6) over the shaft and slide the washer up to the bearing. (Fig. D)
3. Position the replacer shaft collar (00002-00907-5) on the output shaft. Slide the shaft sleeve replacer (00002-00907-4) over the shaft and thread it onto the collar (00002-00907-5). (Fig. D)
4. Slide the remover/replacer tube (00002-00907-1) over the assembly. Install the washer and forcing nut.
5. Tighten the forcing nut until the bearing is properly seated. (Fig. E)

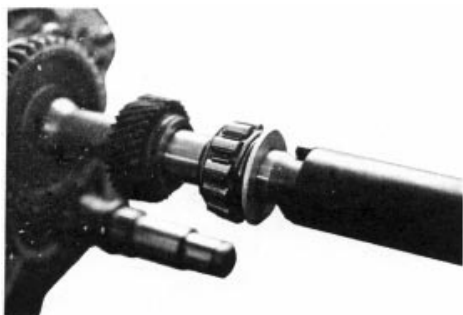


FIGURE D



FIGURE E

SST: 5th Gear/Hub Puller Installation Instructions



OWATONNA TOOL COMPANY

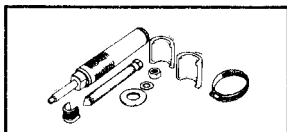
OWATONNA, MINNESOTA 55060, U.S.A. — TELEX RCA 201674

**OPERATING
INSTRUCTIONS
FOR**

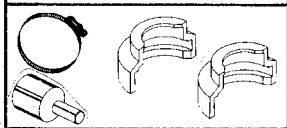
Form No. 10501

O.E.M. 0002-00907-1

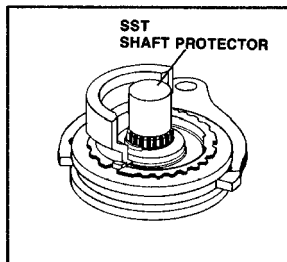
TOYOTA FIFTH GEAR/HUB PULLER INSTALLATION INSTRUCTIONS



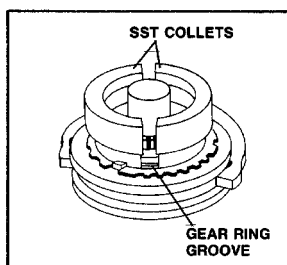
Previously released Essential Tool 00002-00907



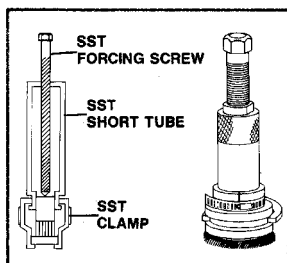
Additional Essential Tool 00002-00907-14



1. Position SST shaft protector on output shaft as shown.
SST 00002-00907-14



2. Assemble SST collets into groove in gear ring.
SST 00002-00907-14



3. Assemble short tube and forcing screw from previous SST set into the collets.
SST 00002-00907
Clamp as shown.

4. Turn forcing screw to remove gear.

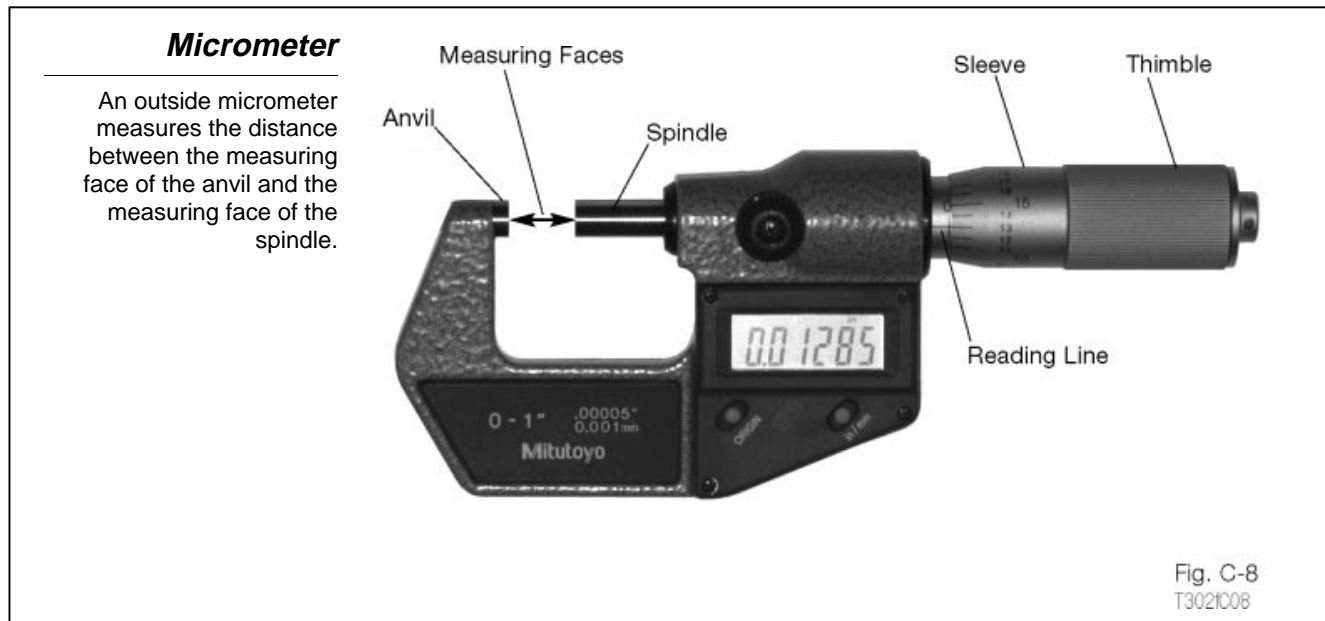
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Fig. C-7
T3021C07

Micrometers Two different types of micrometers are used in the automotive trade: the inside micrometer and the outside micrometer. The measurements that the technician will be performing on the manual transmission and transaxle components will only be of the thickness and diameter of a part. For this reason, only outside micrometers (both English and Metric) will be covered.

An outside micrometer measures the distance between the measuring face of the anvil and the measuring face of the spindle. By turning the thimble, the spindle is moved along the axis of measurement creating a smaller or larger gap between the measuring faces. On the thimble and sleeve are reading lines for determining the distance between the measuring faces. Digital micrometers feature a digital readout mounted in the frame of the micrometer; this feature allows for faster, more accurate readings to be taken.



English Micrometers Each division on the reading line of the sleeve equals 0.025 in. or 25/1000 in. Each number division on the reading line equals 0.1 in. or 100/1000 in. (4 X 0.025 in.). The thimble has 25 divisions each one equaling 0.001 in. One full rotation of the thimble will equal one division (0.025 in.) on the reading line of the sleeve.

English Micrometer

Each division on the reading line of the sleeve equals 0.025 in. or $\frac{25}{1000}$ in.

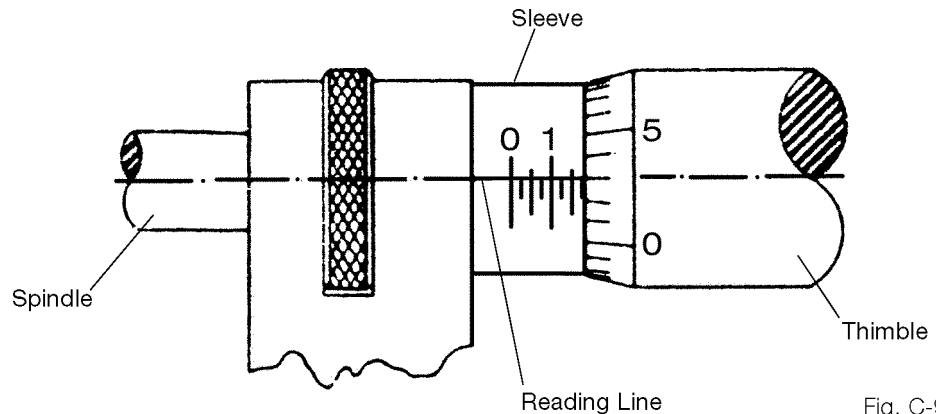


Fig. C-9
T302fC09

Metric Micrometer Each upper and lower division on the reading line of the sleeve equals 1.0mm. They are staggered on the reading line in 0.5mm increments. The thimble has 50 divisions each one equaling 0.01mm. One full rotation of the thimble will equal one division (0.5mm) on the lower portion of the reading line.

Metric

Each upper and lower division on the reading line of the sleeve equals 1.0mm.

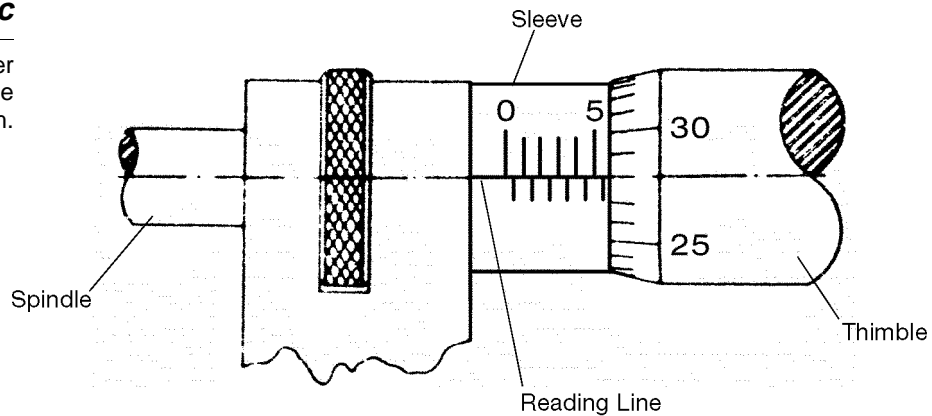


Fig. C-10
T302fC10

Operation Measurements are made between the measuring faces of the anvil and spindle. A measurement is taken in the following manner:

- Turn the thimble until both measuring faces contact the work.
- To achieve a consistent measurement, the ratchet stop is now turned clockwise to create a constant pressure on the faces.
- Remove the micrometer and set the locking mechanism to hold the spindle in place. The locking mechanism may either be a lock lever (as shown in the illustration) or a locknut mounted in the same location.

Reading a Micrometer There are three steps to reading a micrometer. Using figures C-11 and C-12, it will be easy to understand how the measurement is read.

English Readings

1. Count the number of 0.100 in. divisions that are visible on the reading line – 1 or 0.100 in.
2. Count the number of 0.025 in. divisions that are visible on the reading line – 3 or 0.075 in.
3. Count the number of 0.001 in. divisions on the thimble from 0 to the reading line of the sleeve – 3 or 0.003 in.

Adding the 3 values = 0.178 in.

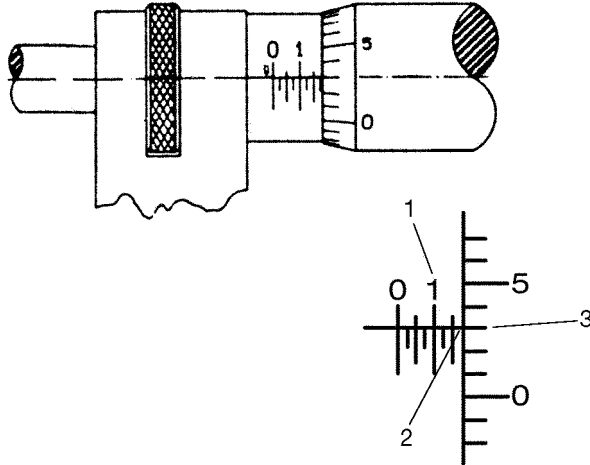


Fig. C-11
T302IC11

Metric Readings

1. Count the number of millimeter divisions that are visible on the reading line – 5 or 5.00mm.
2. Count the number of 0.50 millimeter divisions that are visible on the reading line – 1 or 0.50mm.
3. Count the number of 0.01 millimeter divisions on the thimble from 0 to the reading line of the sleeve – 28 or 0.28 mm.

Adding the 3 values = 5.78mm.

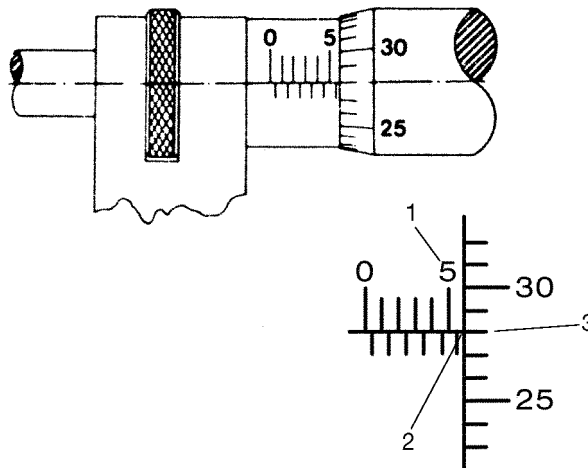


Fig. C-12
T302IC12

Vernier Scale Outside micrometers are available to measure to the 0.0001 in. This is helpful when the thimble reading is between the 0.001 in. divisions and an exact measurement is necessary. The vernier scale is on the sleeve of the micrometer and has 10 divisions equaling 0.0001 in. each.

The number of 0.0001 in. that the reading is between the thimble divisions is determined by a thimble division mark lining up with a vernier scale division mark. In the example, the 0.005 in. mark lines up with the 0.0006 in. mark. The 0.0006 in. is then added to the measurement.

Vernier Scale

The vernier scale is on the sleeve of the micrometer and has 10 divisions equaling 0.0001 in. each.

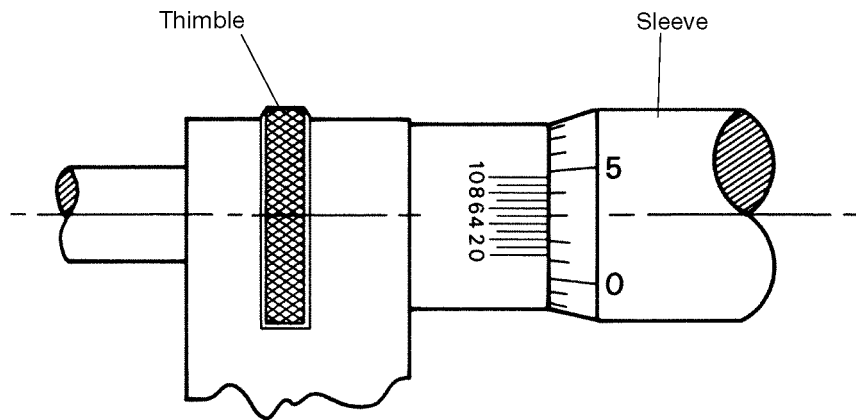


Fig. C-13
T302IC13

NOTE Before using a micrometer:

- Check the accuracy of the unit with a standard.
- Rotate the thimble for free movement.
- Make sure the spindle and frame are not bent.



Notes