DAIHATSU

ROCKY

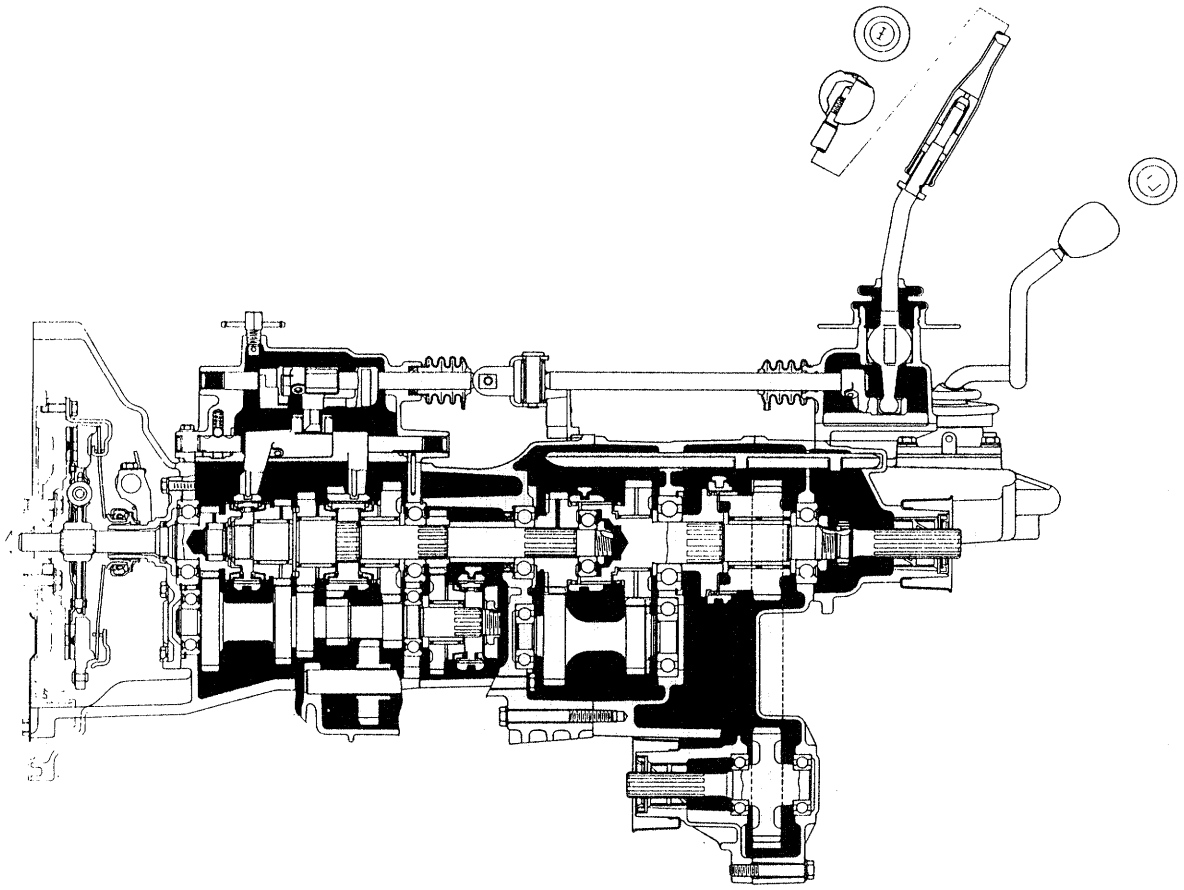
MANUAL TRANSMISSION

MT

WRU92-MT492

SECTIONAL VIEW

The manual transmission is connected directly to the engine and mounted longitudinally.
A five-speed transmission is available on all models. A center-through type transfer is employed, in which the power train components from the input shaft to the output shaft are arranged straight in one row.
The transmission controls employ a semi-direct method in which the transmission control section is connected with the shift lever section by means of a cross joint.



WRU90-MT002

Transmission and transfer gear ratio specifications

Transmission	Gear ratio	1st gear	3.752
		2nd gear	2.182
		3rd gear	1.428
		4th gear	1.000
		5th gear	0.865
		Reverse gear	3.942
	Oil used	Kind	API GL-3 or GL-4 SAE 75W-85 or 75W-90
		Capacity liter (USA gal, US qts)	1.7 (0.44, 1.79)
Transfer	Gear ratio	High gear	1.000
		Low gear	1.754
	Oil used	Kind	API GL-3 or GL-4 SAE 75W-85 or 75W-90
		Capacity liter (USA gal, US qts)	1.4 (0.36, 1.48)

WRU92-MT504

Transmission and transfer teeth number

Transmission	Input shaft gear		23
	Counter gear	Driven gear	34
		1st gear	13
		2nd gear	21
		3rd gear	30
		5th gear	41
		Reverse gear	12
	Output gear	1st gear	33
		2nd gear	31
		3rd gear	29
		5th gear	24
		Reverse gear	32
	Reverse idle gear		23
Transfer	Input shaft gear		33
	Counter gear	Driven gear	32
		Low gear	21
	Output shaft gear		38
	Sprocket	Driven gear	33
		Drive gear	33

WRU90-MT004

TRANSMISSION

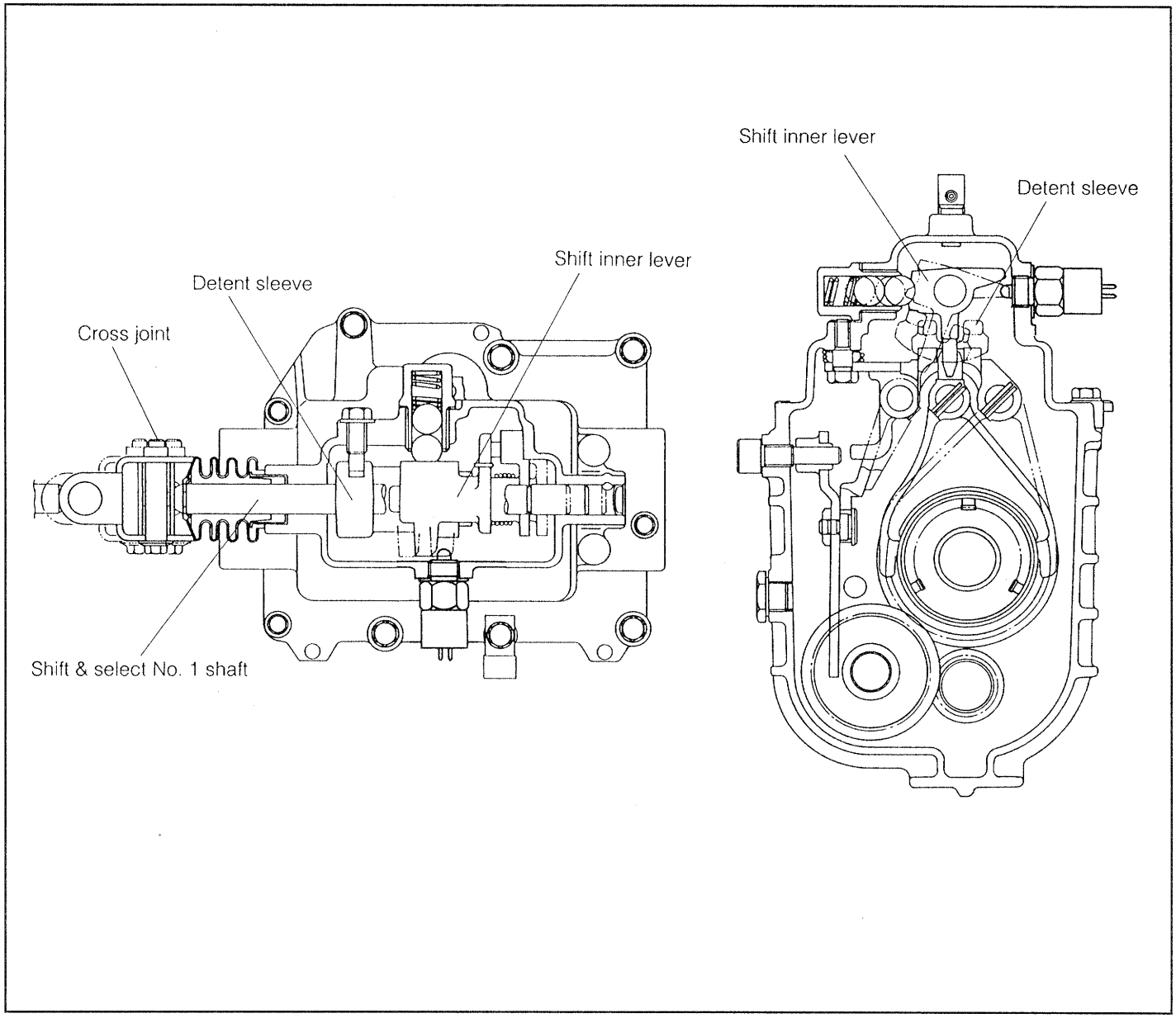
TRANSMISSION SHIFT & SELECT MECHANISM

The transmission controls employ a semi-direct method, where the control section at the transmission side is connected to the shift lever section by means of a cross joint.
The shift & select mechanism incorporates such safe mechanisms as mis-shift preventing mechanism, interlock mechanism and one-way mechanism.

WRU90-MT005

INTERLOCK MECHANISM

The transmission control shaft is connected to the shift & select No. 1 shaft by means of a cross joint. When the transmission control shaft is moved in the selecting direction, the shift inner lever attached to the shift & select No. 1 shaft swings in the selecting direction like a pendulum.
When the transmission control shaft is moved in the shifting direction, the shift inner lever moves the shift fork of each gear. This movement is restricted by a dent sleeve, thus preventing two gears from being engaged simultaneously.

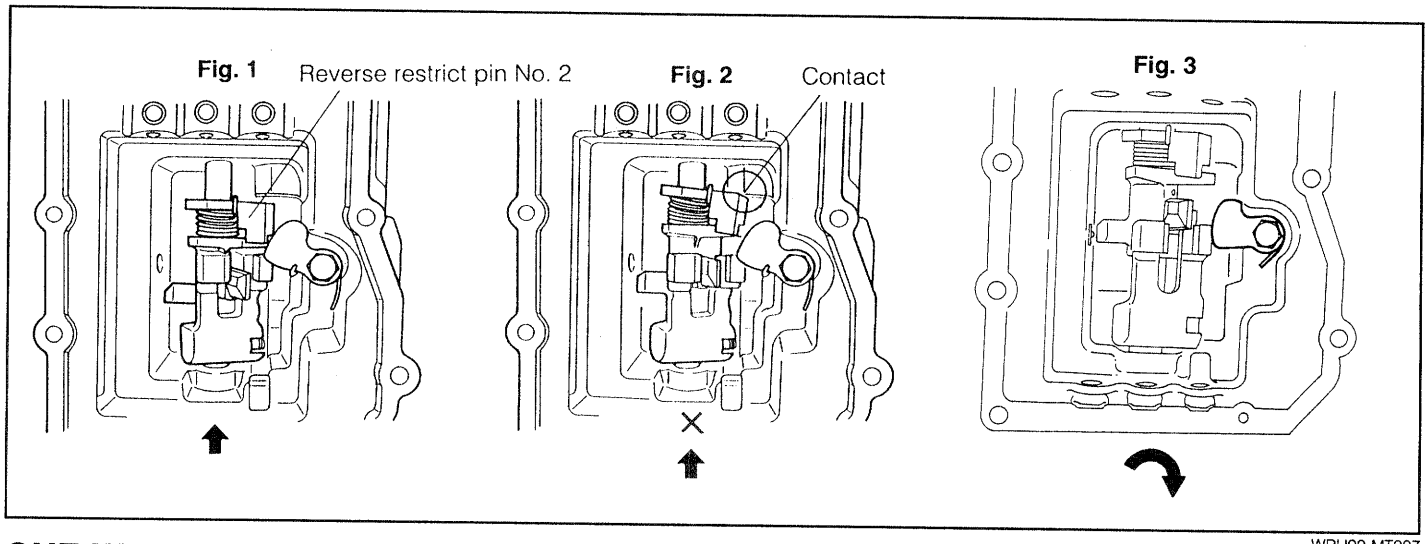


WRU90-MT006

MIS-SHIFT PREVENTING MECHANISM (5TH GEAR-TO-REVERSE GEAR SHIFT)

When the transmission control shaft is shifted into the 5th gear position, the shift inner lever attached to the transmission control shaft is shifted into the 5th gear position, as shown in Fig. 1. Simultaneously, the same movement of the reverse restrict pin No. 2 also takes place. However, if an effort is made under this condition to shift the transmission control shaft from the 5th gear position directly into the reverse gear position, the reverse restrict pin No. 2 is brought into contact with the stopper surface of the transmission case cover, thus preventing the shifting of the control shaft into the reverse gear, as shown in Fig. 2.

Once the transmission control shaft is returned to the neutral position, as shown in Fig. 3, the reverse restrict pin No. 2 returns to the original position, thus making it possible for the control shaft to be shifted into the reverse gear.

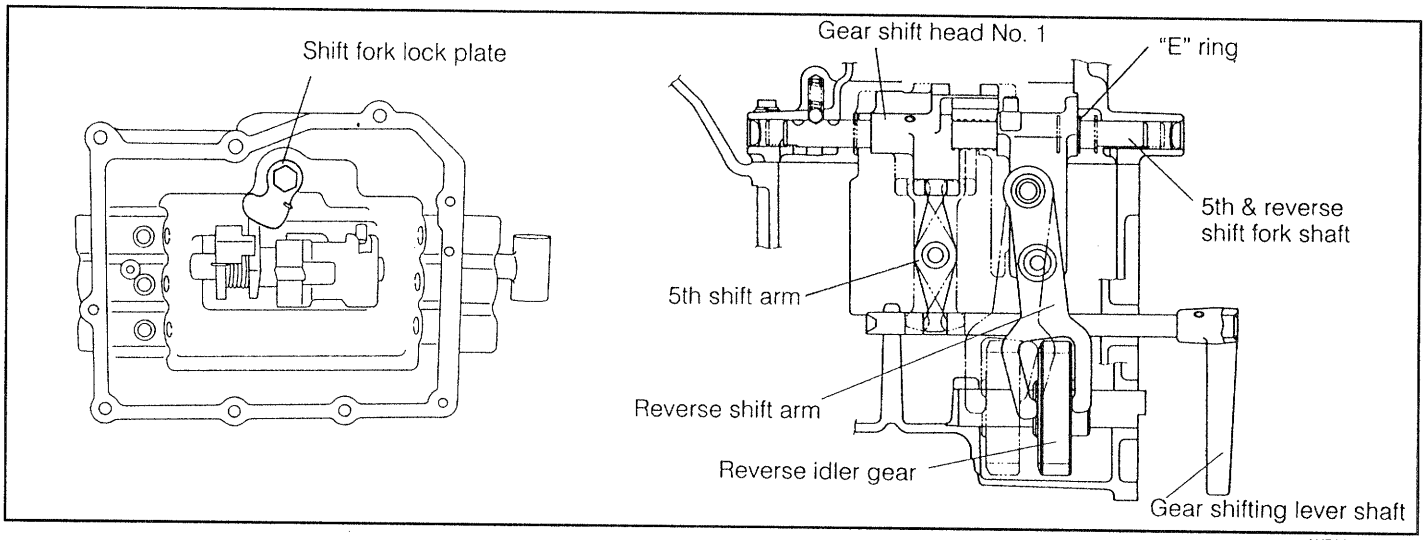


WRU90-MT007

ONE-WAY MECHANISM

When the transmission control shaft is shifted into the 5th gear position, the gear shift head No. 1 attached to the 5th & reverse shift fork shaft moves backward (to the transfer side). In this way, the shift is made into the 5th gear from the 5th shift arm through the gear shifting lever shaft.

On the other hand, when the transmission control shaft is shifted into the reverse gear position, the "E" ring of the 5th & reverse shift fork shaft pushes the reverse shift fork forward (to the clutch side). Then, the reverse idler gear is shifted into the reverse gear position through the reverse shift arm. Moreover, when the transmission control shaft is returned to the neutral position, the returning force of the return spring of the shift fork lock plate returns the reverse shift fork to the original position. Consequently, the reverse idler gear is returned to the neutral position.



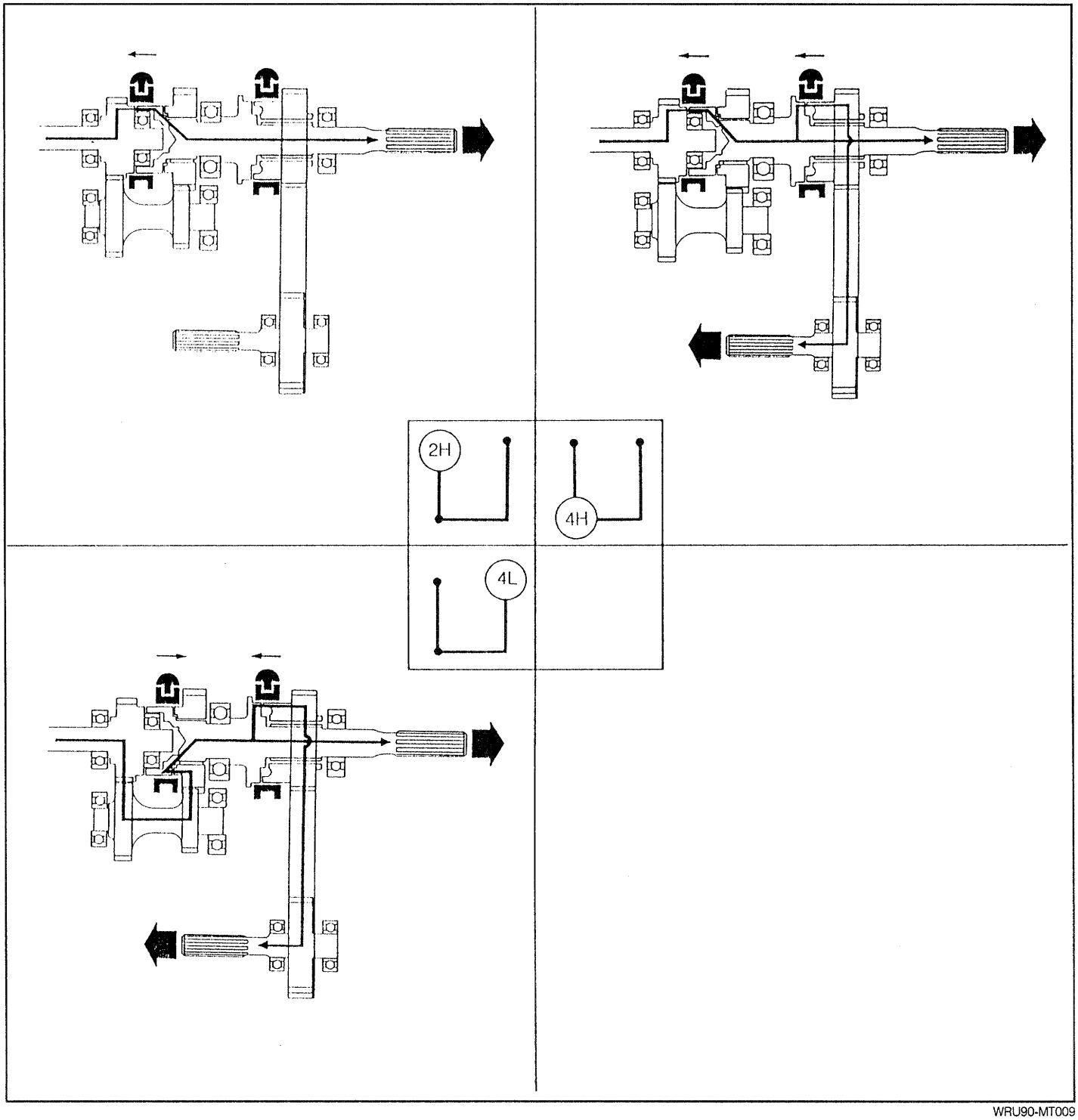
WRU90-MT008

TRANSFER

TRANSFER POWER TRANSMITTING MECHANISM

When the transfer shift lever is shifted into the 2H position, the power from the transmission output shaft is transmitted to the rear wheels through the transfer output rear shaft. Furthermore, when the transfer shift lever is shifted into the 4H position, the shift is made into the transfer front drive gear. Then, the power is transmitted to the transfer output front shaft through the transfer front drive chain, finally driving the front and rear wheels.

When the transfer shift lever is placed in the 4L position, the shift is made into the transfer low speed input gear. Then, the power is transmitted in the following sequence; the transfer countergear, transfer output rear shaft, transfer front drive chain and transfer output front shaft. Finally, the power drives the front and rear wheels.



WRU90-MT009

TRANSFER SHIFT & SELECT MECHANISM

4H→2H

1. The transfer high & low shift fork shaft is pressed by a ball indicated in Fig. 1. Since this ball engagement is so deep that the center of the ball nearly reaches the outer contour of the transfer high & low shift fork shaft as shown by Ⓐ in the figure below, the transfer high & low shift fork shaft is in a locked state.

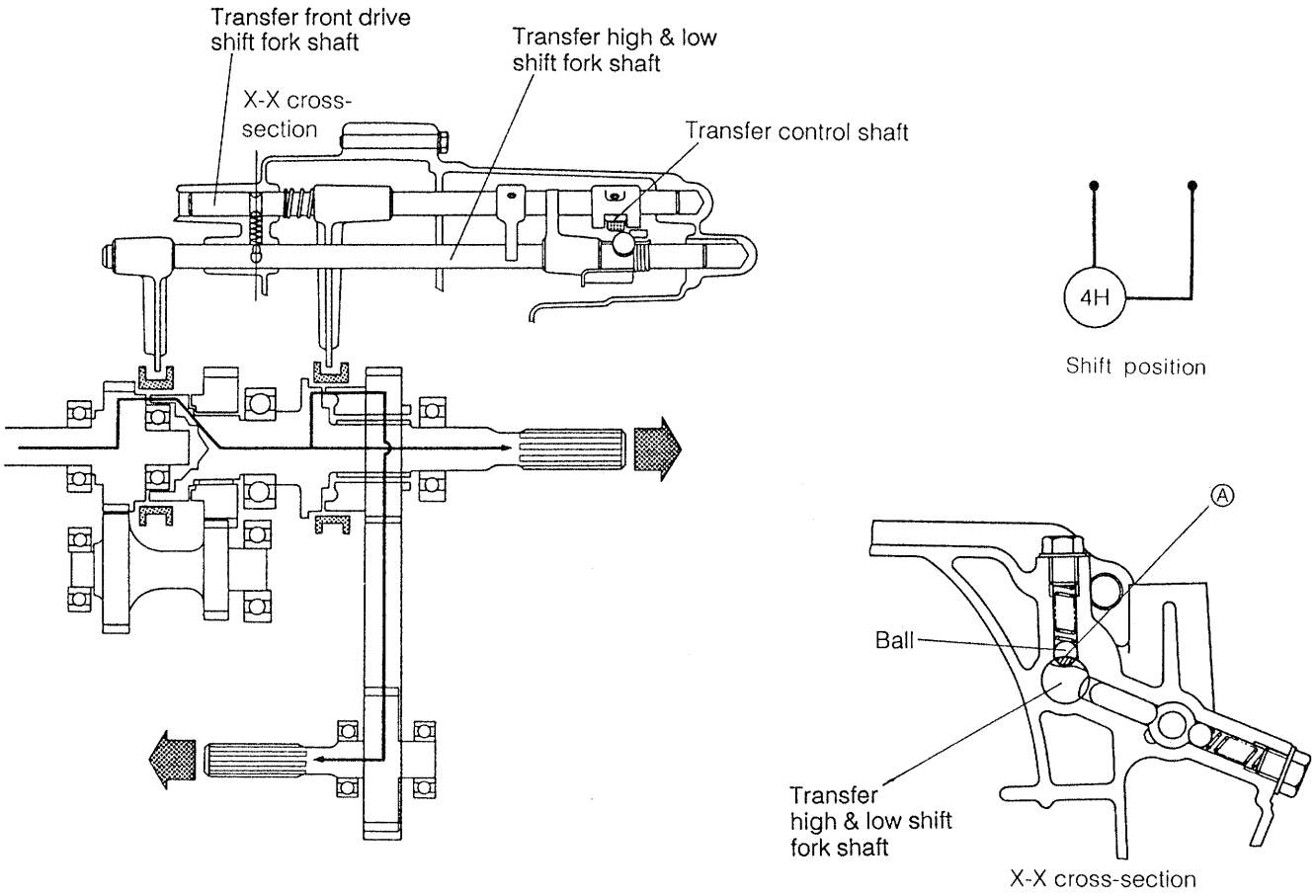
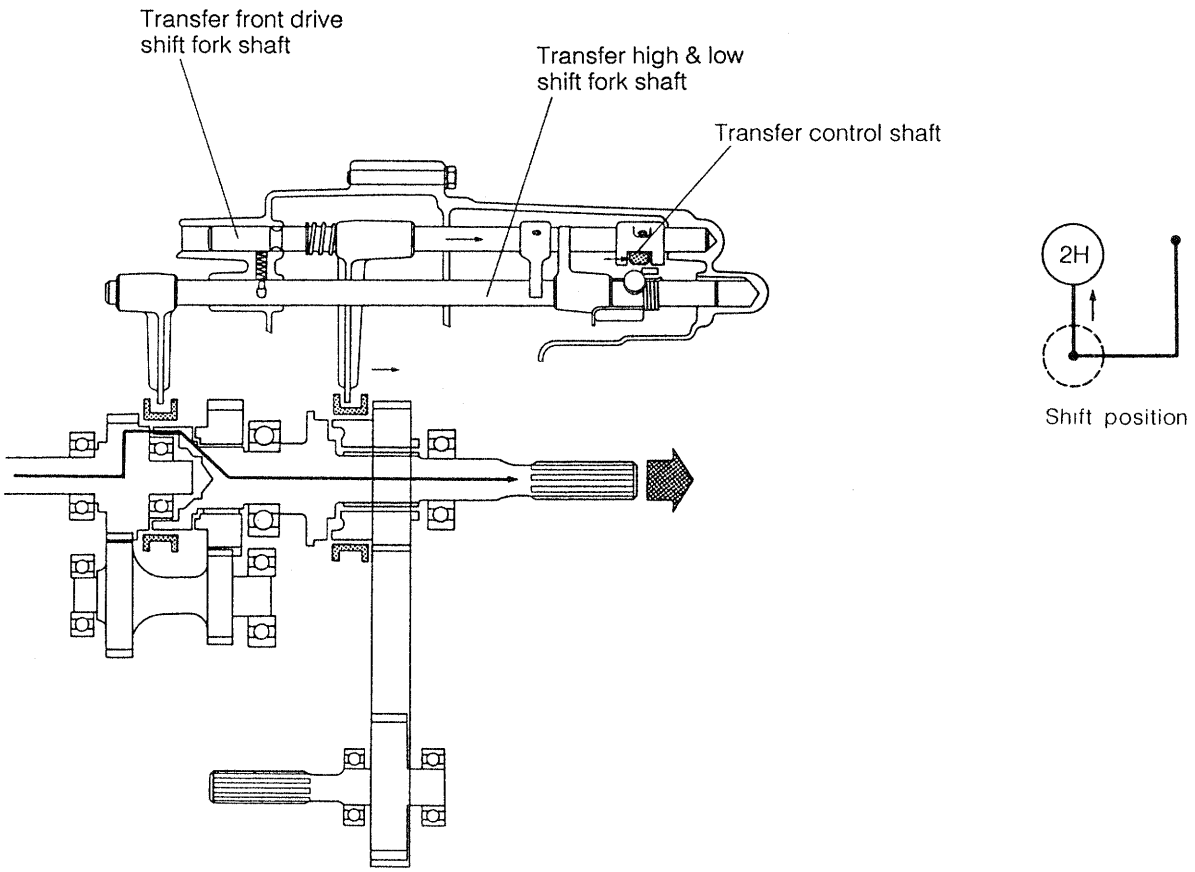


Fig. 1

4H condition

WRU90-MT010

2. When the transfer control shaft is shifted from the 4H position to the 2H position, the transfer front drive shift fork shaft alone moves to the right, for the transfer high & low shift fork shaft is locked by the ball. If there is any difference in rotating torque between the front wheel and the rear wheel at this time, a wait mechanism described later functions owing to the resistance by a twisting torque between the front drive clutch hub and the front drive gear. As a result, the front drive shift fork is kept in the 4H condition. When the difference in rotating torque diminishes, the front drive shift fork is returned to the right by a spring tension, thus switching to the 2H condition.

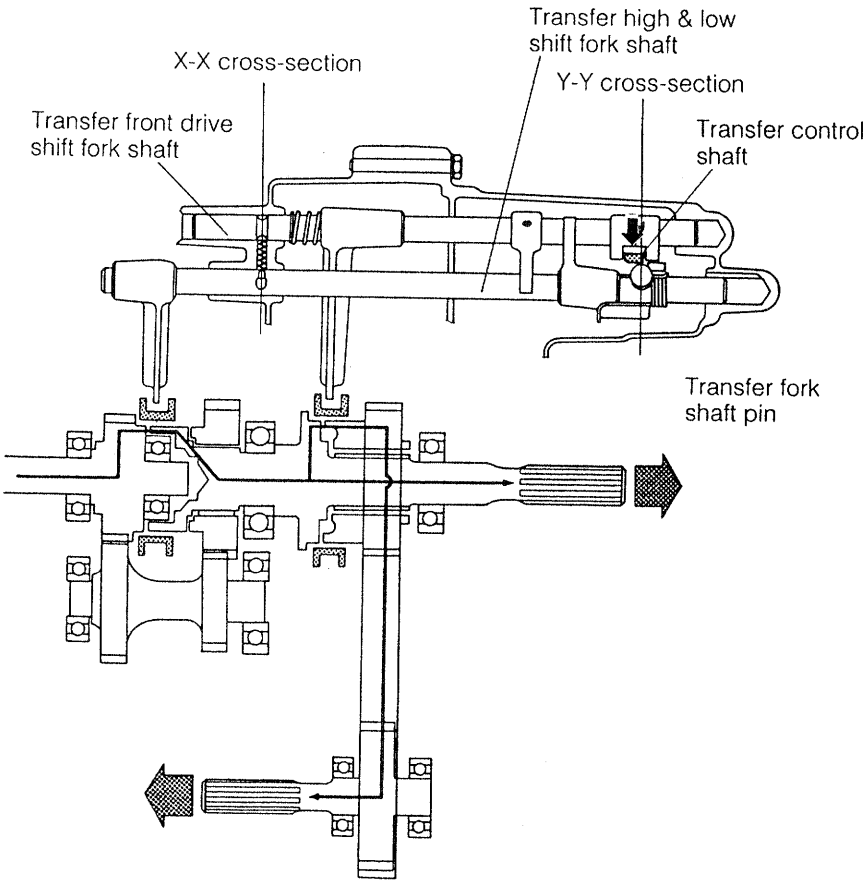


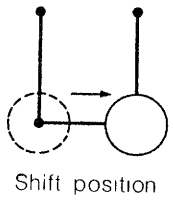
2H condition.

WRU90-MT011

4H→4L

1. When the transfer control shaft is switched from the 4H direction to the 4L direction, the transfer shift lever moves downward. Thus, the transfer fork shaft pin is erected almost vertically as shown in Fig. 2 below.Inasmuch as the transfer fork shaft pin is secured to the transfer high & low shift fork shaft, the transfer fork shaft pin is erected almost vertically. Consequently, the transfer high & low shift fork shaft turns to the left, as shown in Fig. 1 below. Simultaneously the roller moves and fits into the groove of the transfer front drive fork shaft. As a result, the transfer front drive shift fork shaft is brought into a locked state.





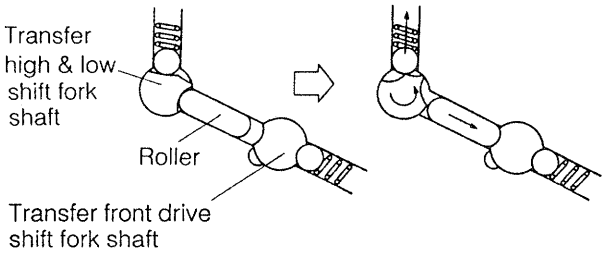


Fig. 1

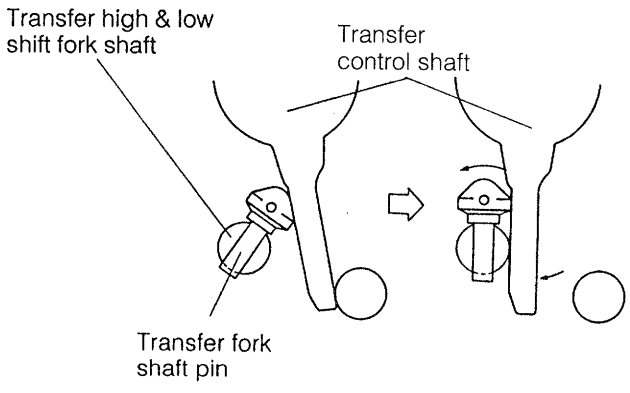
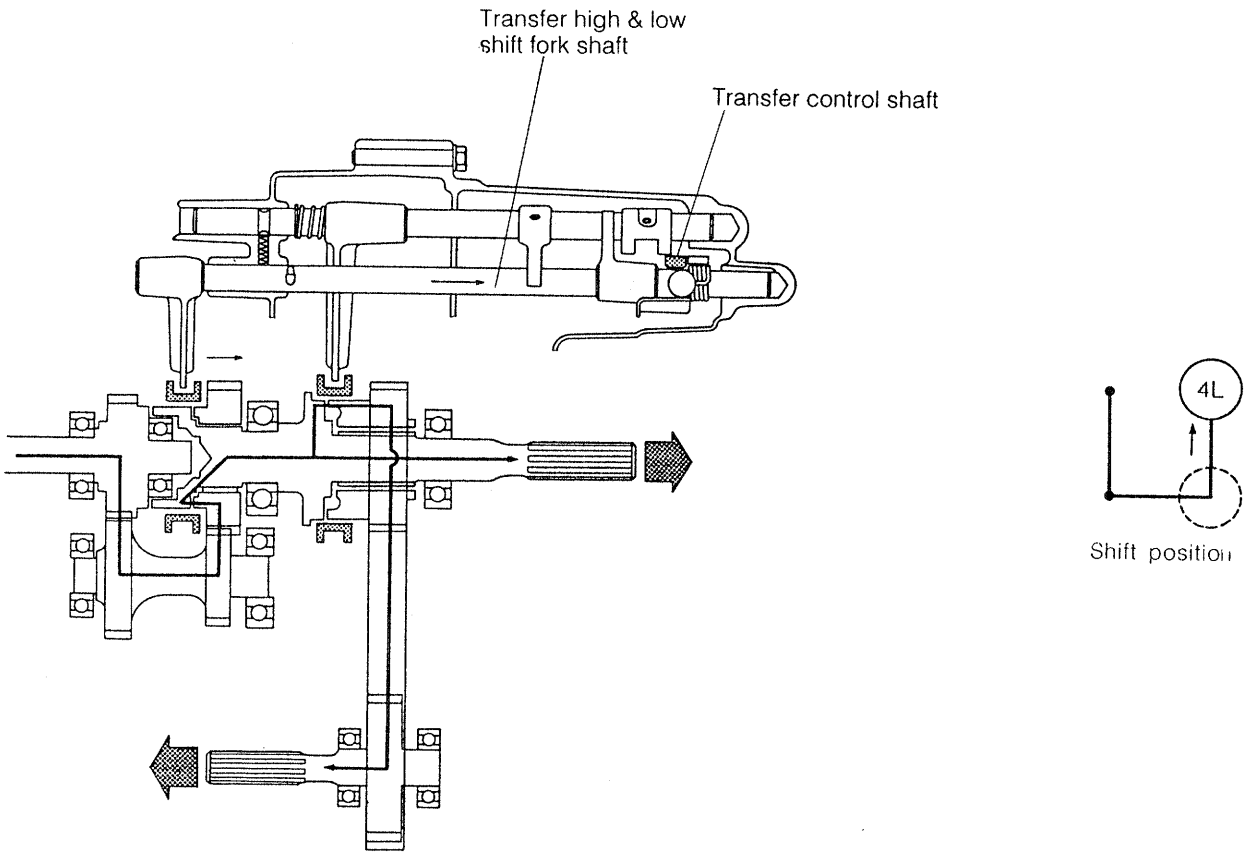


Fig. 2

4H condition

WRU90-MT012

2. When the transfer control shaft is shifted to the 4L direction, the transfer high & low shift fork shaft alone moves to the right, thereby attaining the 4L condition.



4L condition

WRU90-MT013

TROUBLE SHOOTING

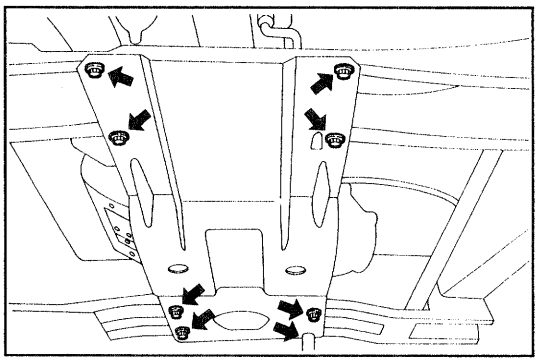
Symptom	Possible causes	Checking points
Noise emitted from gear Slipping out of gear	Malfunctioning control-related components	Check control-related components.
Abnormal noise from bearing	Bearing seizure, Abnormal wear	Check bearing and gear for seizure.
Hard shifting	Malfunctioning control-related components	Check control-related components.
	Improper contact of synchronizer rings	Check synchronizer rings.

WRU90-MT014

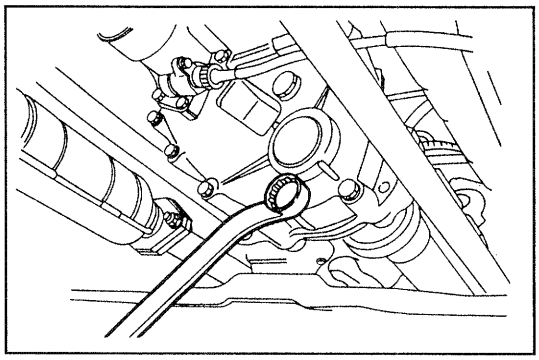
OIL SEAL REPLACEMENT (IN-VEHICLE SERVICE)

REMOVAL

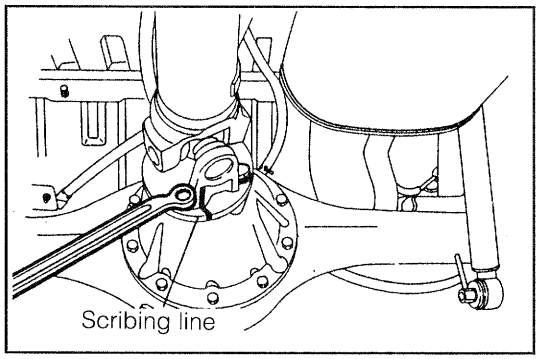
1. Remove the transmission undercover by removing the eight bolts.


WRU90-MT044

2. Drain the oil of the transfer.

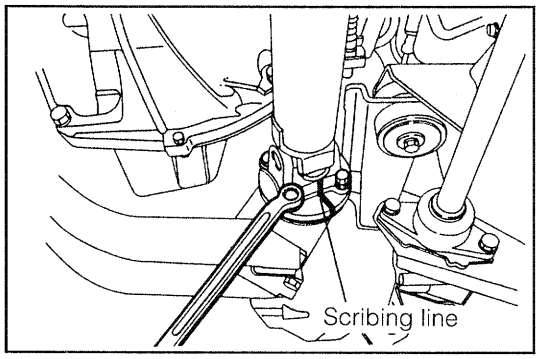

WRU90-MT045

3. Remove the rear propeller shaft.
   CAUTION:
   - Prior to the removal, be sure to put a scribing line. If this operation should fail to be performed, the propeller shaft may emit abnormal noise or vibration.



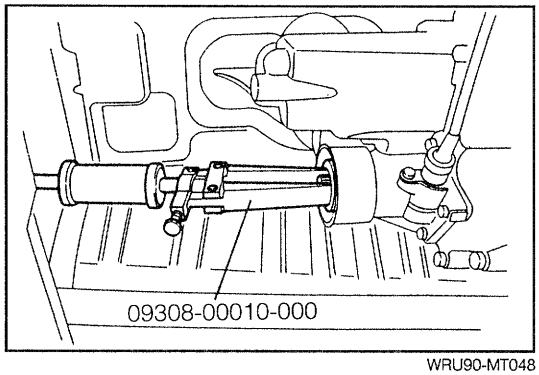
WRU90-MT046

4. Remove the front propeller shaft.
   CAUTION:
   - Prior to the removal, be sure to put a scribing line. If this operation should fail to be performed, the propeller shaft may emit abnormal noise or vibration.



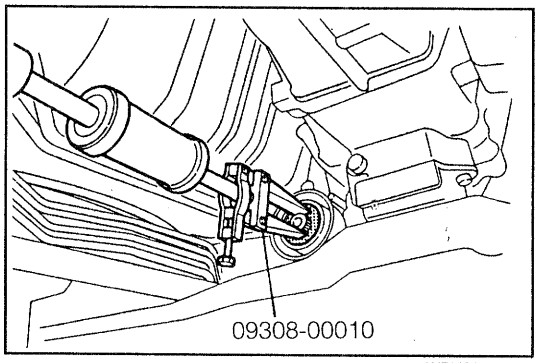
WRU90-MT047

5. Remove the rear oil seal, using the following SST.
   SST: 09308-00010-000



WRU90-MT048

6. Remove the front oil seal, using the following SST.
   SST: 09308-00010-000

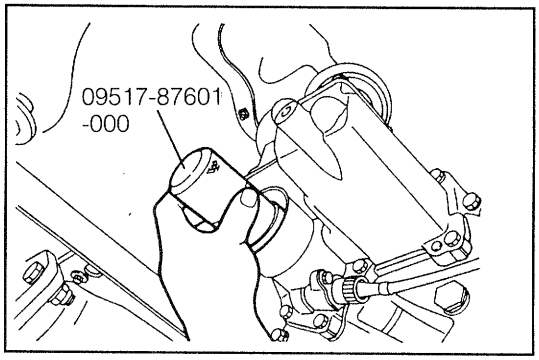


WRU90-MT049

INSTALLATION

1. Press the rear oil seal, using the following SST.
   SST: 09517-87601-000

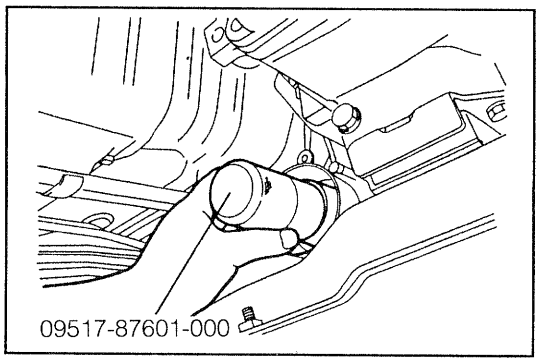
   NOTE:
   - Apply MP grease to the lip section of the oil seal.



WRU90-MT050

2. Press the front oil seal, using the following SST.
   SST: 09517-87601-000

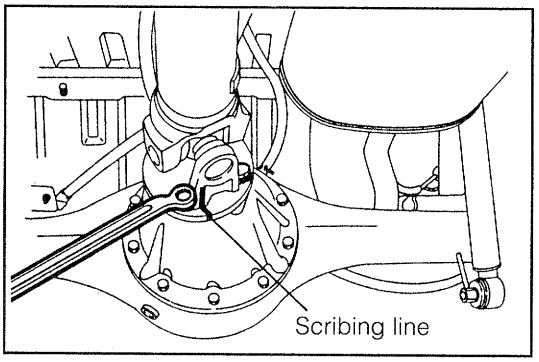
   NOTE:
   - Apply MP grease to the lip section of the oil seal.



WRU90-MT051

3. Install the rear propeller shaft.
   Tightening Torque:
   6.0 - 8.0 kg-m (43.4 - 57.9 ft-lb, 58.8 - 78.5 N·m)

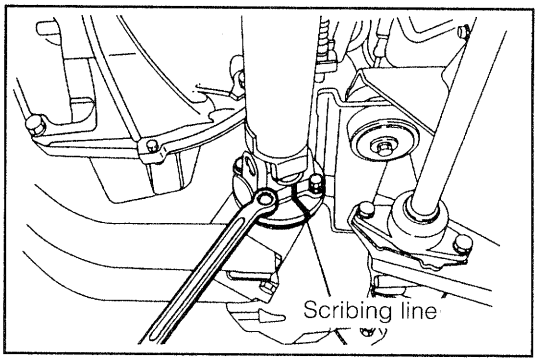
   CAUTION:
   - Install the propeller shaft, while aligning the scribing lines which were put during the removal.
     If this operation should fail to be performed, the propeller shaft may emit abnormal noise or vibration.



WRU90-MT052

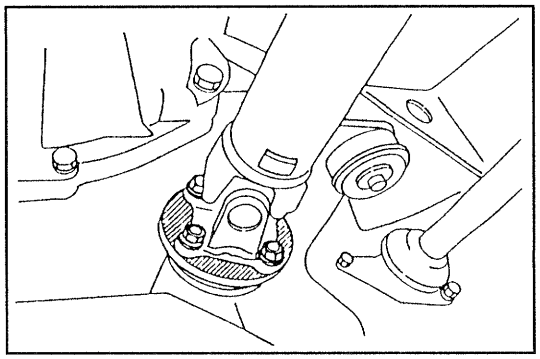
4. Install the front propeller shaft.
   Tightening Torque:
   6.0 - 8.0 kg-m (43.4 - 57.9 ft-lb, 58.8 - 78.5 N·m)

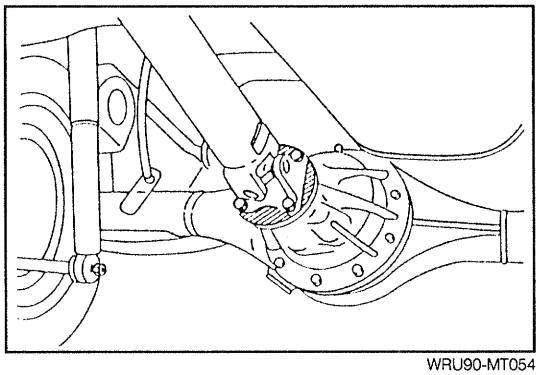
   CAUTION:
   - Install the propeller shaft, while aligning the scribing lines which were put during the removal.
     If this operation should fail to be performed, the propeller shaft may emit abnormal noise or vibration.



WRU90-MT053

5. After installing the propeller shaft, apply black paint to the exposed machined surface of the differential (slant line section in the right figure) as a rust preventive measure.



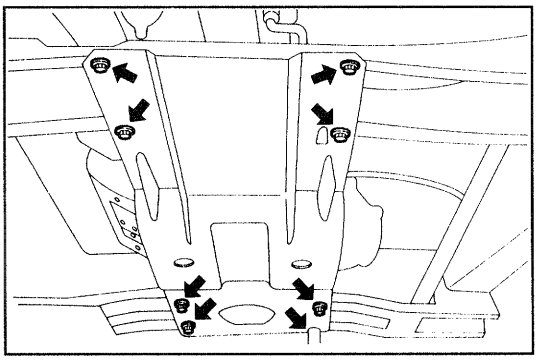


WRU90-MT054

6. Install the transmission undercover with the eight bolts.
7. Fill the transfer with oil.

   Transfer Oil Capacity: 1.4 liters
   (0.36 USA gal, 1.48 US qts)

   Transfer Oil: API GL-3 or GL-4
   SAE 75W-85 or 75W-90

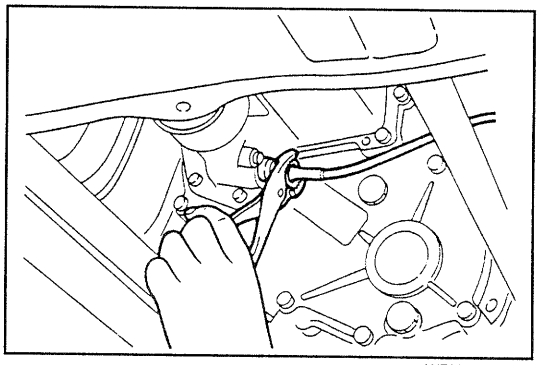


WRU90-MT055

SPEEDOMETER GEAR

REMOVAL

1. Disconnect the speedometer cable with oil seal from the transfer shift lever retainer, using the common tool of plier.

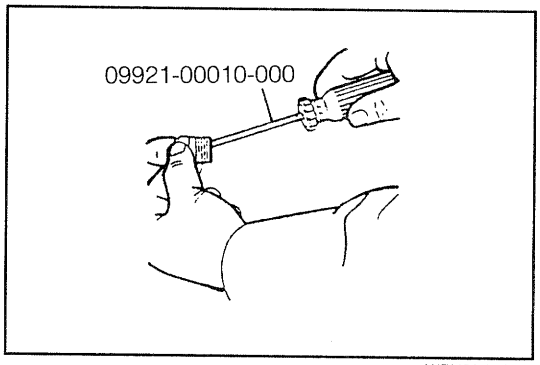


WRU90-MT058

DISASSEMBLY

Remove the oil seal, using the following SST.

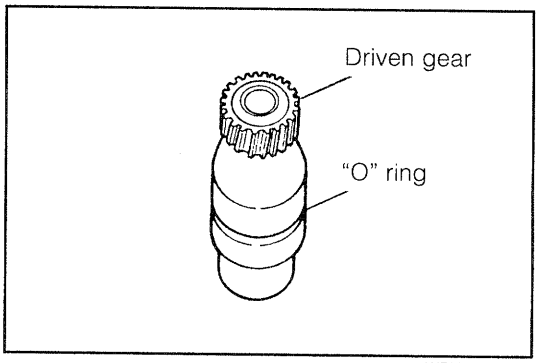
SST: 09921-00010-000



WRU90-MT059

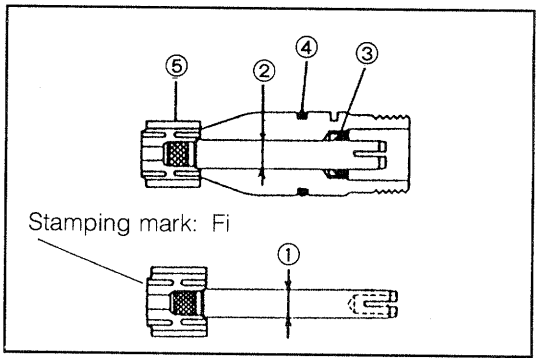
INSPECTION

1. Check the oil seal, "O" ring and driven gear of the speedometer shaft sleeve for wear or damage.



WRU90-MT060

Part		Specified value mm (inch)	Limit mm (inch)
Driven gear shaft diameter	①	$8\ ^{-0.013}_{-0.028}$ ($0.3150\ ^{-0.00051}_{-0.00110}$)	7.96 (0.313)
Shaft sleeve bore	②	$8\ ^{+0.065}_{+0.029}$ ($0.3150\ ^{+0.0026}_{+0.0011}$)	8.10 (0.319)
Oil seal lip section	③	Visually inspect the section for excessive wear or damage.	
"O" ring	④		
Driven gear tooth surface	⑤		



WRU90-MT061

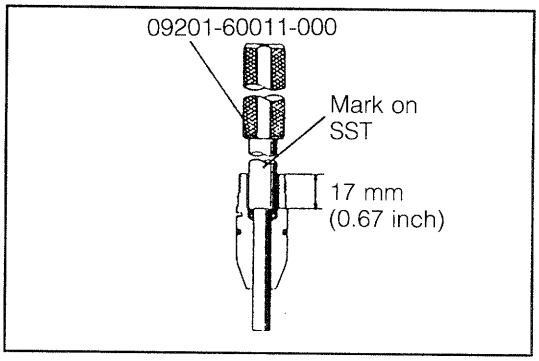
ASSEMBLY

Assembly the oil seal for speedometer shaft sleeve, using the following SST.

SST: 09201-60011-000

INSTALLATION

Install the speedometer shaft sleeve to the transfer rear output shaft bearing retainer.

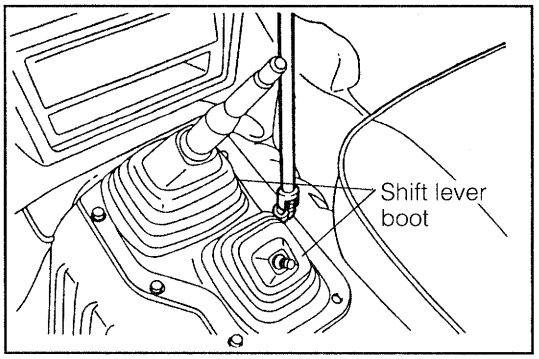


WRU90-MT062

MANUAL TRANSMISSION & TRANSFER REMOVAL

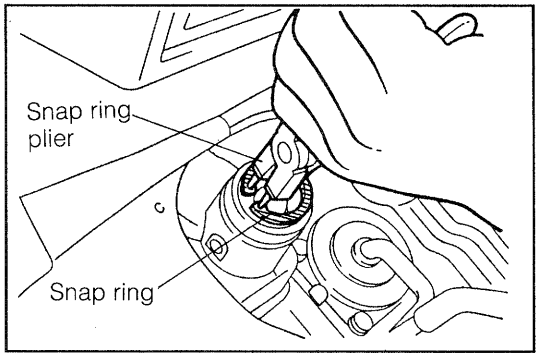
REMOVAL

1. Working from the vehicle interior
   (1) Remove the Transmission and Transfer shift lever knob by turning the counterclockwise directions.
   (2) Turn over the floor carpet.
   (3) Remove the shift lever boot by removing the six bolts and then, pull up toward you.



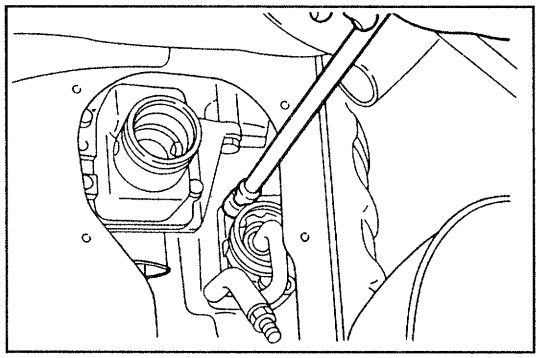
WRU90-MT063

   (4) Remove the transmission control lever by detaching the snap ring, using the common tool of snap ring plier.

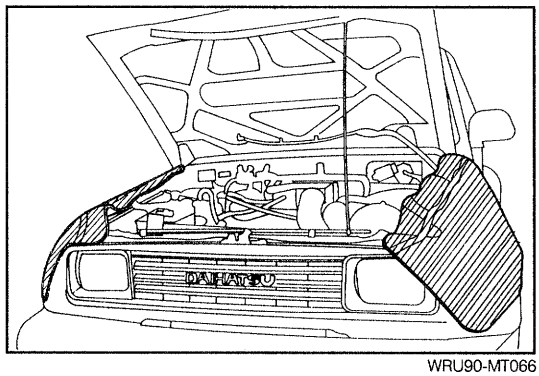


WRU90-MT064

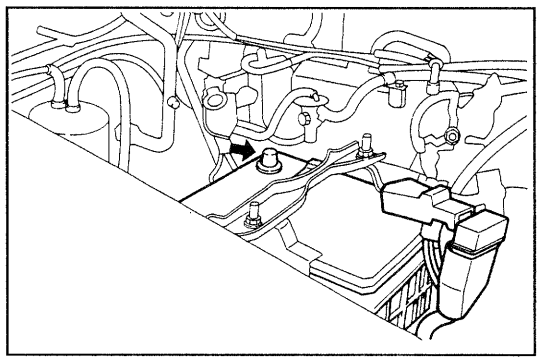
   (5) Remove the transfer control lever by removing the four bolts attaching to the transfer rear case.


WRU90-MT065

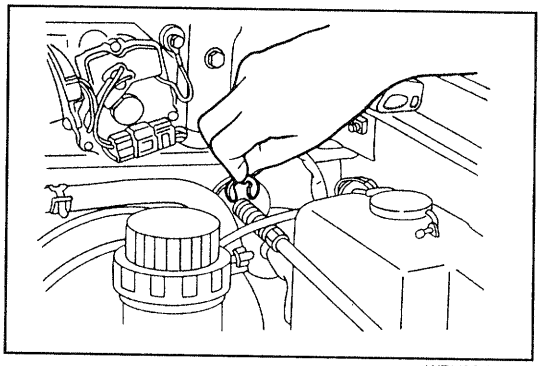
2. Working from the engine compartment room
   (1) Install the fender cover to the fenders so that no scratch may be made to the fenders.


WRU90-MT066

   (2) Disconnect the battery ground cable from the negative (–) terminal of the battery.

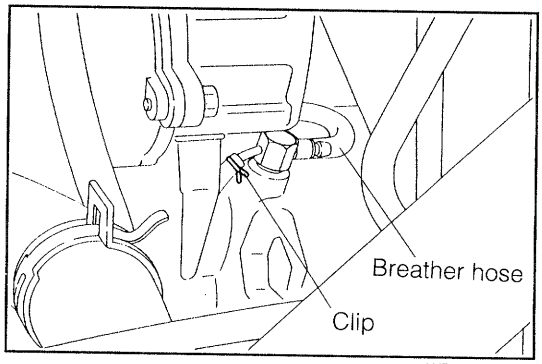

WRU90-MT067

(3) Remove the E-ring for the adjusting play.



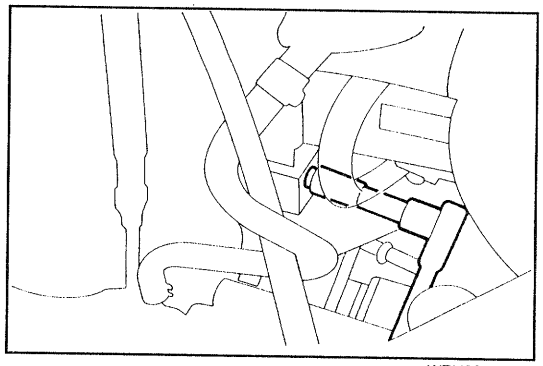
WRU90-MT068

(4) Detach a clip on the transmission breather hose from the union.



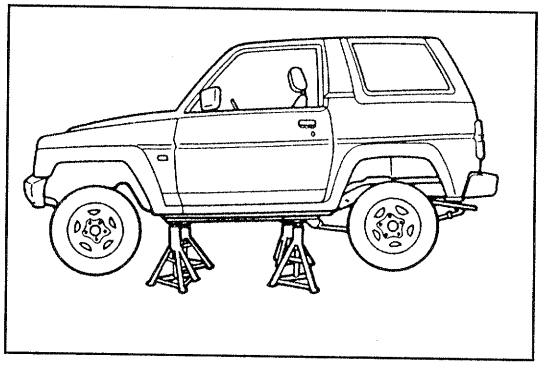
WRU90-MT069

(5) Remove the direct connecting one-bolt under the starter motor.



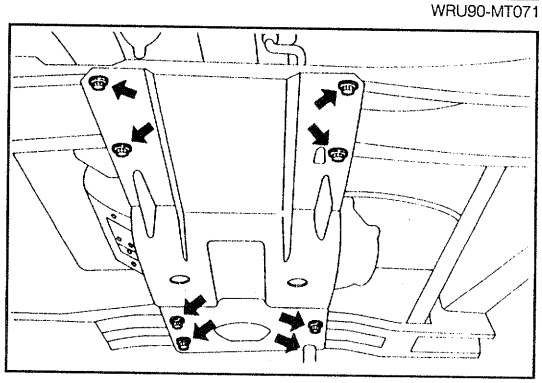
WRU90-MT070

3. Working from the vehicle outside
   (1) Jack or lift up the vehicle and support the vehicle body with safety stands securely. (As for the jack or lift up points, refer with the GI-section.)



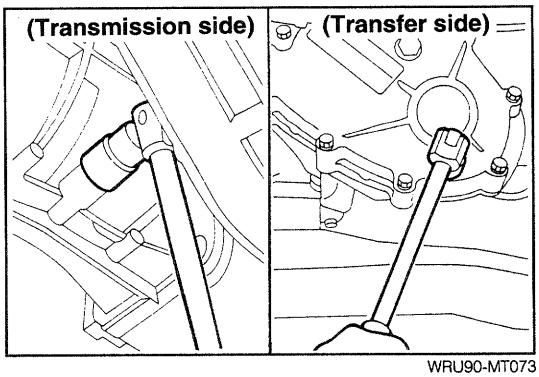
WRU90-MT071

4. Working from the under vehicle
   (1) Remove the transmission under cover by removing the eight bolts.



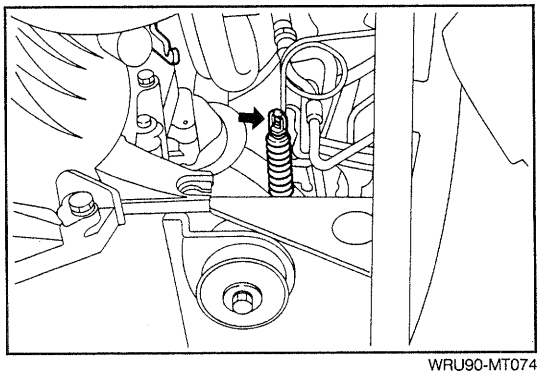
WRU90-MT072

(2) Drain the oil from the transmission and transfer by removing the drain plugs.

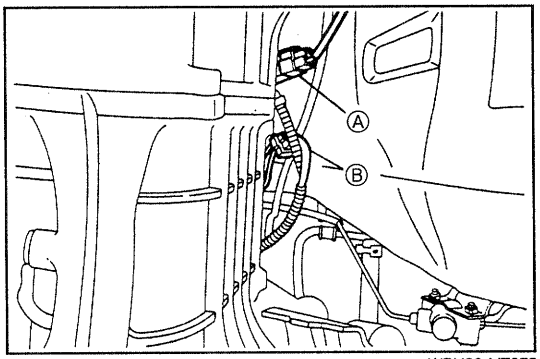


WRU90-MT073

(3) Disconnect the clutch release cable subassembly at the clutch housing side.

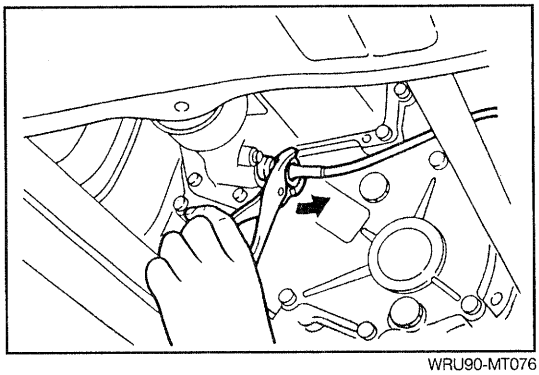

WRU90-MT074

(4) Disconnect the coupler of back up lamp Ⓐ and transmission position detect switch Ⓑ.



WRU90-MT075

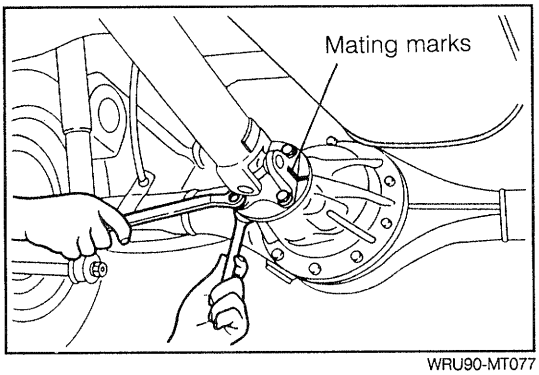
(5) Disconnect the speedometer cable with oil seal from the transmission case, using the common tool of plier.


WRU90-MT076

(6) Remove the front propeller shaft and rear propeller shaft by removing the four bolts and four nuts.

CAUTION:

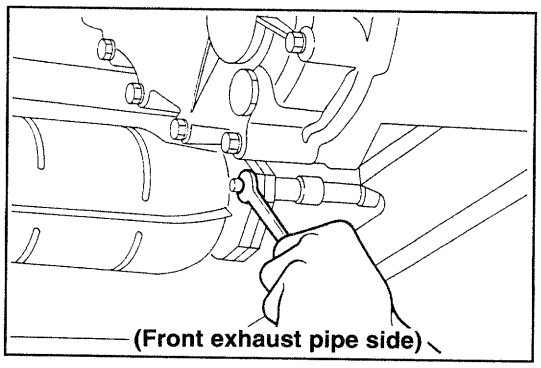
- When installing these parts, align the mating marks with each other which were put on the connecting section during the removal as guide during the installation. If this operation should fail to be performed, the propeller shaft may emit abnormal noise or vibration.

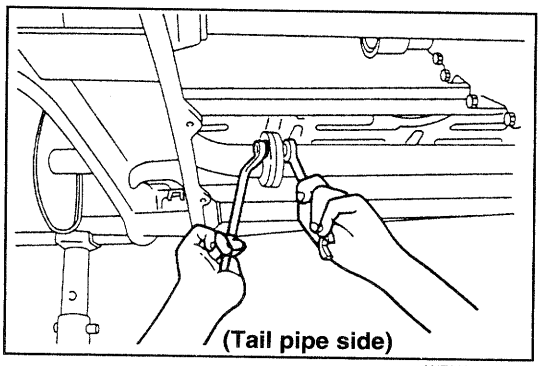


WRU90-MT077

(7) Separate by catalyst converter assembly by removing the two nuts.

WARNING:
Be sure to put on a pair of gloves because the exhaust pipe may be still hot for a little while after the engine has stopped.

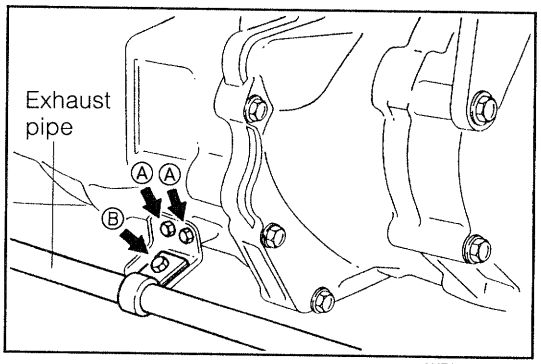




WRU90-MT078

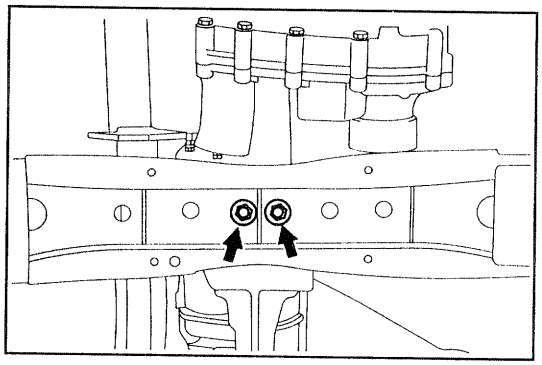
(8) Remove the exhaust pipe support bracket by removing the three bolts.

WARNING:
Be very careful not to touch the exhaust pipe because the exhaust pipe may be still hot for a little while after the engine has stopped.



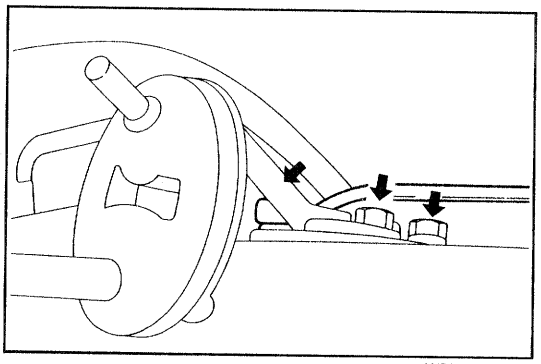
WRU90-MT079

(9) Remove the two attaching nuts at the crossmember No. 2.



WRU90-MT080

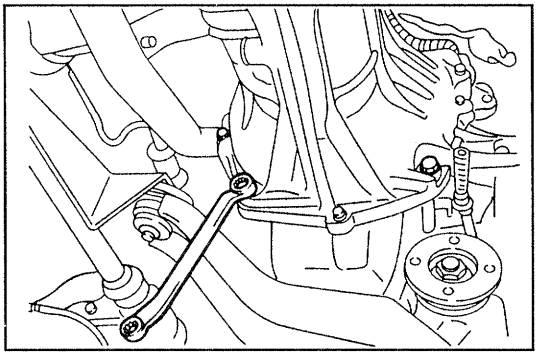
(10) Remove the exhaust pipe bracket attaching to the crossmember No. 3 by removing the three bolts.



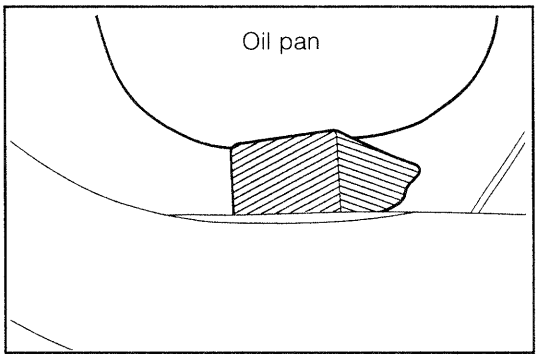
WRU90-MT081

(11) Remove the starter motor by removing the two bolts.
(12) Remove the transmission direct-connecting six bolts and leave them in inserted condition.

WARNING:
Be very careful not to touch the exhaust pipe, engine and transmission because the its may be still hot for a little while after engine has stopped.

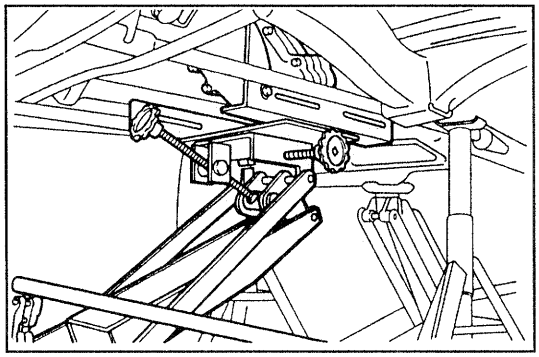

WRU90-MT082

NOTE:
- As directed in the relevant section on remounting, insert a wooden piece(s) between the oil pan and the differential carrier support front bracket to prevent downward movement of the engine assembly to the transmission side (and to prevent contact between the fan and the fan shroud).



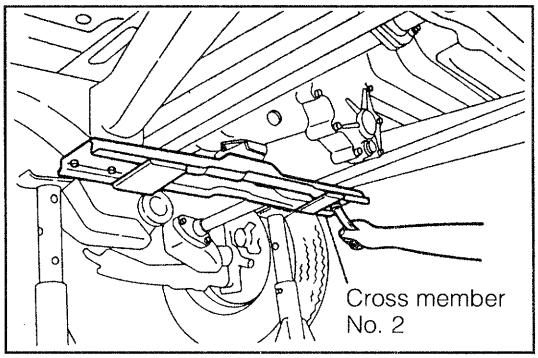
WRU90-MT083

(13) Support the transmission with a transmission jack.


WRU90-MT084

(14) Remove the crossmember No. 2 by removing the four bolts on both left and right sides.
(15) While supporting the transmission with a transmission jack, remove the transmission direct-connecting bolts. Then, take out the transmission from the engine with installed the crossmember No. 2.

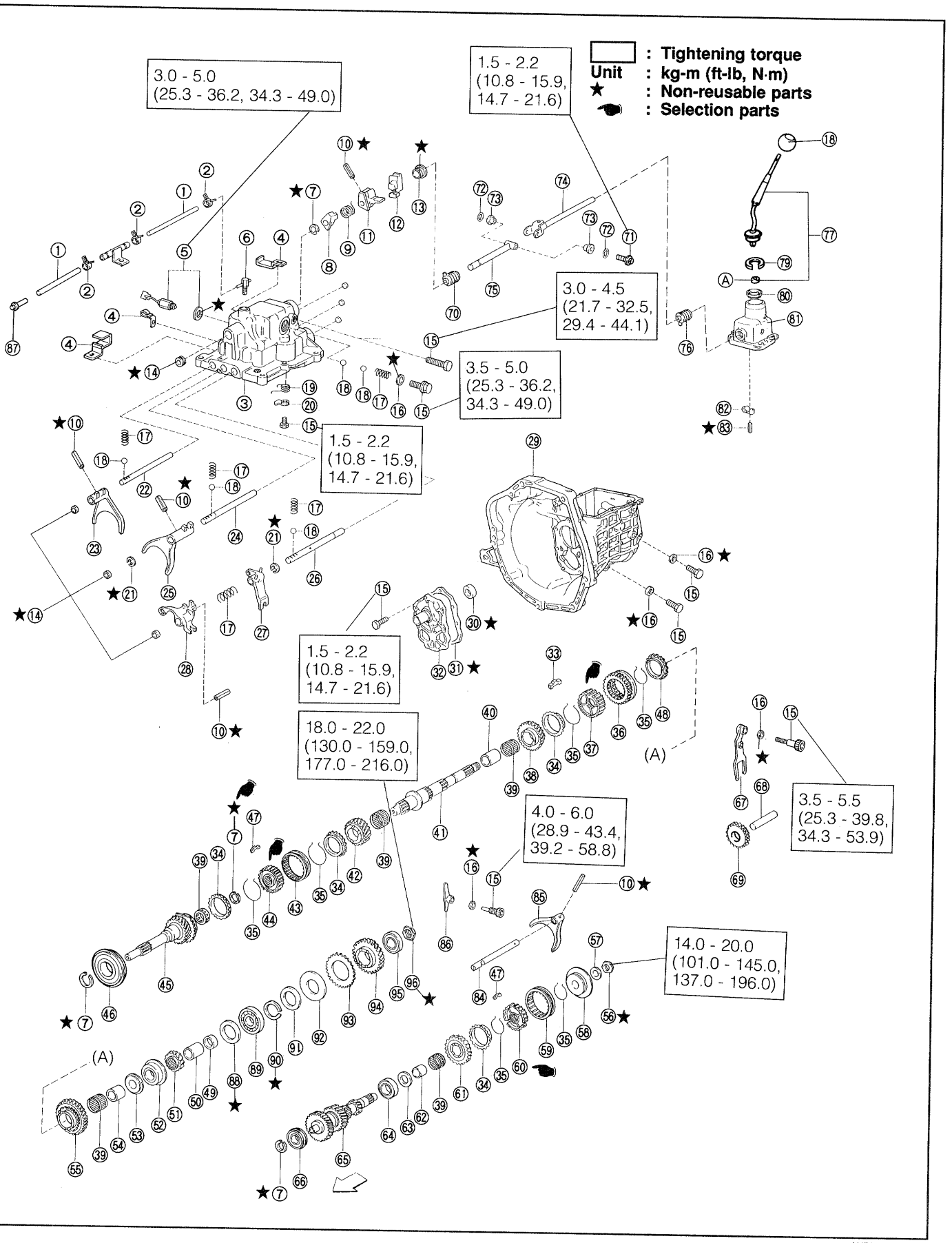
NOTE:
- The transmission direct-connecting bolts should be removed, while raising the rear section of the transfer with a transmission jack. Then, pull out the transmission input shaft from the clutch. Thus, remove the transmission and transfer by sliding them toward the rear.



WRU90-MT085

TRANSMISSION

COMPONENTS

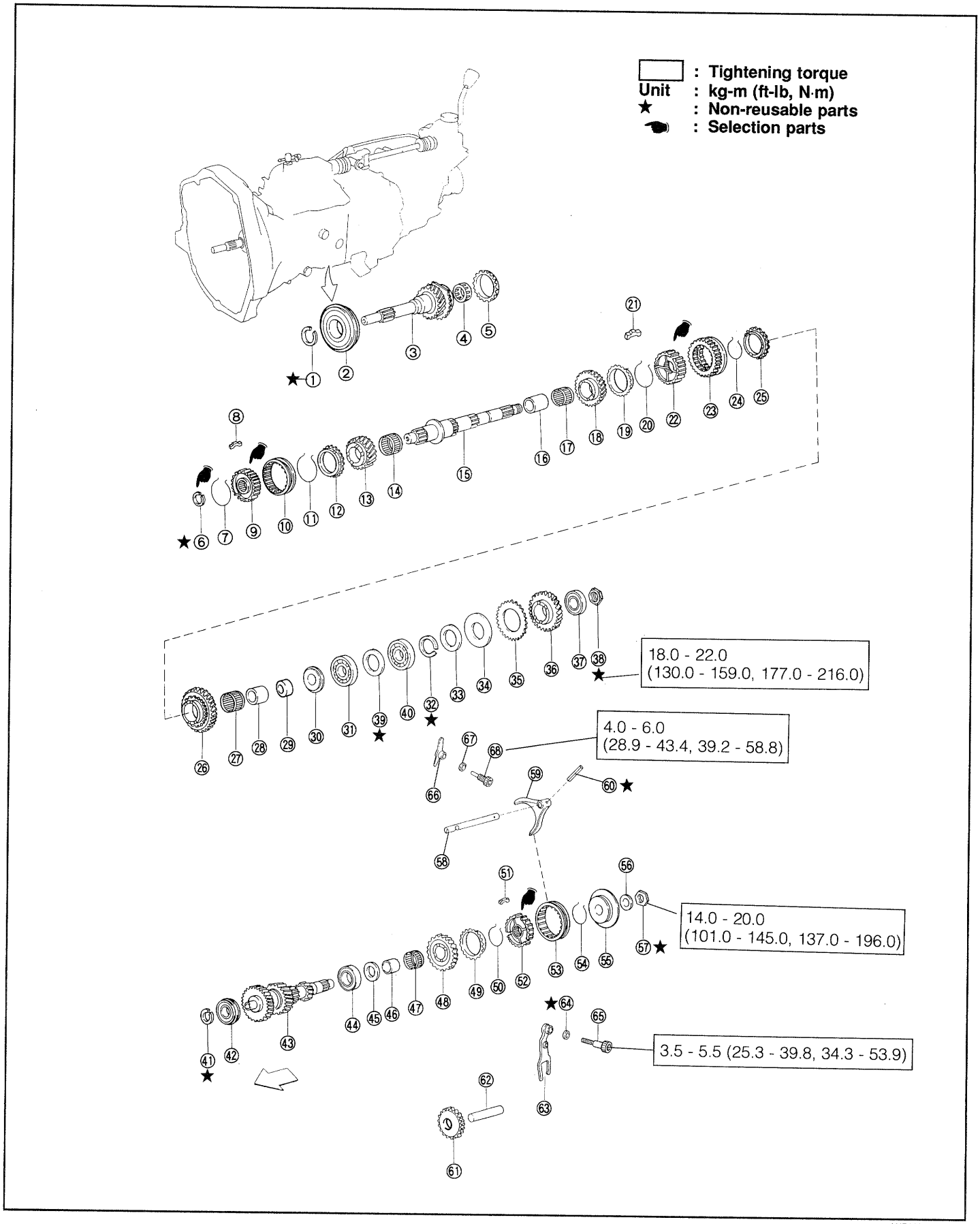


WRU92-MT488

① Breather hose
② Clip
③ T/M case cover
④ Clamp
⑤ Backup lamp switch
⑥ Union
⑦ Snap ring
⑧ Reverse restrict pin No. 2
⑨ Torsion spring
⑩ Slotted pin
⑪ Shift inner lever
⑫ Detent sleeve
⑬ Oil seal
⑭ Tight plug
⑮ Bolt
⑯ Gasket
⑰ Spring
⑱ Ball
⑲ Torsion spring
⑳ Shift fork lock plate
㉑ "E" ring
㉒ 1st & 2nd shift fork shaft
㉓ 1st & 2nd shift fork
㉔ 3rd & 4th shift fork shaft
㉕ 3rd & 4th shift fork
㉖ 5th & reverse shift fork shaft
㉗ Reverse shift fork
㉘ Gear shift head No. 1
㉙ T/M case assy
㉚ Oil seal
㉛ Gasket
㉜ Bearing front retainer
㉝ Synchromesh shifting key (3 piecies)
㉞ Synchronizer ring No. 3
㉟ Synchromesh shifting key spring
㊱ Reverse gear
㊲ T/M clutch hub No. 1
㊳ 2nd gear
㊴ Needle roller bearing
㊵ 1st gear bearing inner race
㊶ Output shaft
㊷ 3rd gear
㊸ Hub sleeve No. 1
㊹ T/M clutch hub No. 2
㊺ Input shaft
㊻ Radial ball bearing
㊼ Synchromesh shifting key No. 2
㊽ Synchronizer ring No. 2
㊾ Output shaft gear spacer No. 2
㊿ Output shaft gear spacer No. 1
(51) 5th gear
(52) Radial ball bearing
(53) 1st gear thrust washer
(54) 1st gear bearing inner race
(55) 1st gear
(56) Lock nut
(57) Conical washer spring
(58) Shifting key retainer
(59) T/M hub sleeve
(60) Synchronizer hub No. 1
(61) Counter shaft 5th gear
(62) 5th gear bearing inner race
(63) 5th gear thrust washer
(64) Radial ball bearing
(65) Counter gear
(66) Radial ball bearing
(67) Reverse shift arm
(68) Reverse idle gear shaft
(69) Reverse idle gear S/A
(70) Shift & select shaft No. 1 boot
(71) Bolt
(72) "O" ring
(73) Bush
(74) Control shaft
(75) Shift & select shaft No. 1
(76) Control shaft boot
(77) T/M shift lever assy (Ⓐ: Bush)
(78) T/M control shift knob
(79) Snap ring
(80) T/M shift lever ball seat
(81) Shift lever retainer S/A
(82) Shift lever outer
(83) Slotted spring pin
(84) Gear shifting lever shaft
(85) 5th shift fork
(86) 5th shift arm
(87) 2way
(88) Oil seal
(89) Radial ball bearing
(90) Snap ring
(91) Conical spring washer
(92) Washer plate
(93) Sub gear No. 1
(94) Transfer low speed input gear
(95) Bearing
(96) Lock nut

WRU90-MT110

INPUT SHAFT-, OUTPUT SHAFT- & COUNTERSHAFT-RELATED COMPONENTS



WRU92-MT485

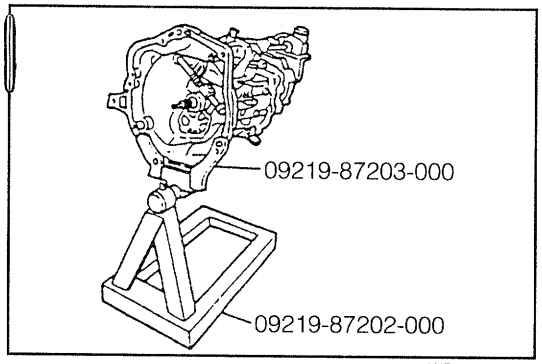
① Snap ring
② Radial ball bearing
③ Input shaft
④ Needle roller bearing
⑤ Synchronizer ring No. 3
⑥ Snap ring
⑦ Synchromesh shifting key spring
⑧ Synchromesh shifting key No. 2 (3 pieces)
⑨ Transmission clutch hub No. 2
⑩ Transmission hub sleeve No. 1
⑪ Synchromesh shifting key spring
⑫ Synchronizer ring No. 3
⑬ 3rd gear
⑭ Needle roller bearing
⑮ Output shaft
⑯ 1st gear bearing inner race
⑰ Needle roller bearing
⑱ 2nd gear
⑲ Synchronizer ring No. 3
⑳ Synchromesh shifting key spring
㉑ Synchromesh shifting key No. 1 (3 pieces)
㉒ Transmission clutch hub No. 1
㉓ Reverse gear
㉔ Synchromesh shifting key spring
㉕ Synchronizer ring No. 2
㉖ 1st gear
㉗ Needle roller bearing
㉘ 1st gear bearing inner race
㉙ 1st gear bearing inner race No. 2
㉚ 1st gear thrust washer
㉛ Radial ball bearing
㉜ Snap ring
㉝ Conical spring washer
㉞ Washer plate
㉟ Sub gear No. 1
㊱ Transfer low speed input gear
㊲ Bearing
㊳ Lock nut
㊴ Oil seal
㊵ Bearing
㊶ Snap ring
㊷ Radial ball bearing
㊸ Counter gear
㊹ Radial ball bearing
㊺ 5th gear thrust washer
㊻ 5th gear bearing inner race
㊼ Needle roller bearing
㊽ Counter shaft 5th gear
㊾ Synchronizer ring No. 3
㊿ Synchromesh shifting key spring
(51) Synchromesh shifting key No. 2 (3 piecies)
(52) Synchronizer No. 1 hub
(53) Transmission hub sleeve No. 2
(54) Synchromesh shifting key spring
(55) 5th Shifting key retainer
(56) Conical spring washer
(57) Lock nut
(58) Gear shifting lever shaft
(59) 5th shift fork
(60) Slotted pin
(61) Reverse idle gear S/A
(62) Reverse idle gear shaft
(63) Reverse shift arm
(64) Gasket
(65) Bolt
(66) 5th shift arm
(67) Gasket
(68) Bolt

WRU90-MT112

TRANSMISSION DISASSEMBLY

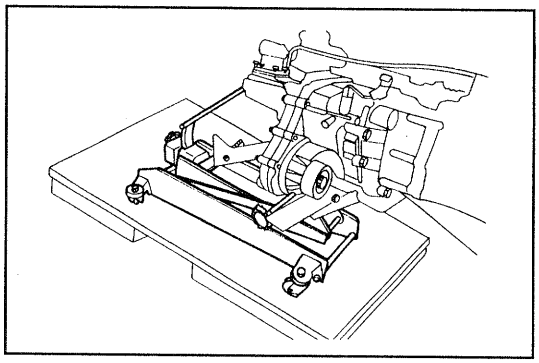
1. Install the transmission assembly with transfer on the overhaul stand using the following SSTs.
   SST: 09219-87202-000
   09219-87203-000

   As for the removal of transmission assembly with transfer, see page MT–16 to MT–20.

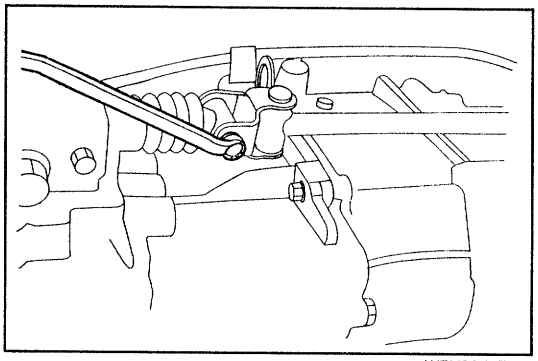


WRU92-MT493

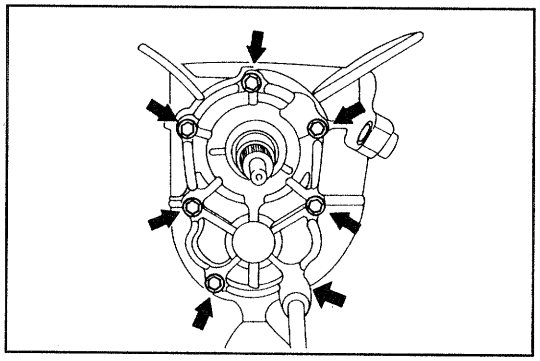
2. Place wooden plates or any other suitable materials on the overhauling stand, as shown in the diagram at right.
3. Support the transfer front and transfer rear case with a transmission jack.


WRU90-MT114

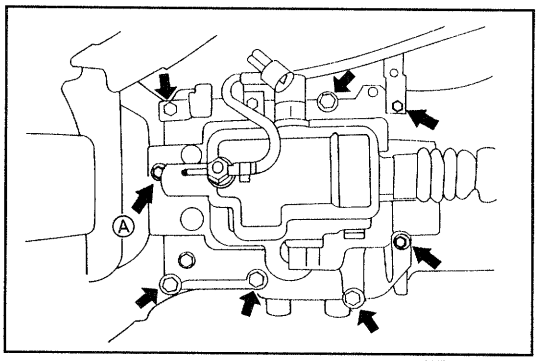
4. Remove the control shaft with installed the shift lever retainer subassembly by removing the hexagon bolt.


WRU90-MT115

5. Remove the clutch release bearing and related parts. (Refer CL–section.)
6. Remove the front bearing retainer by removing the seven bolts.

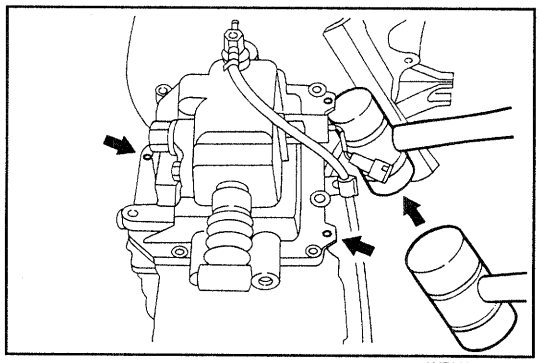

WRU90-MT116

7. Remove the transmission case cover subassembly by removing the seven bolts and a reamer bolt Ⓐ.

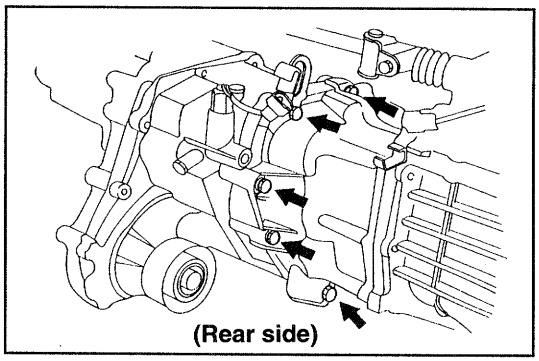


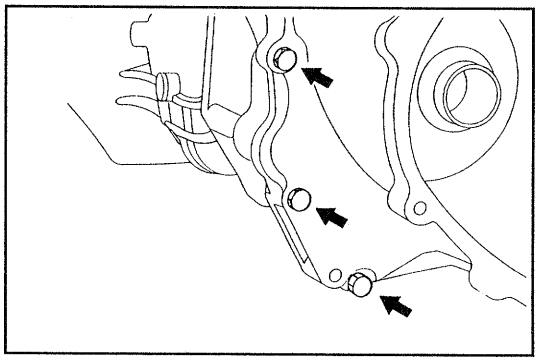
WRU90-MT117

8. Disconnect the breather hose by detaching a clip.
9. Remove the transmission case cover subassembly by lightly tapping each of the ribs evenly toward the upper side of the transmission case.

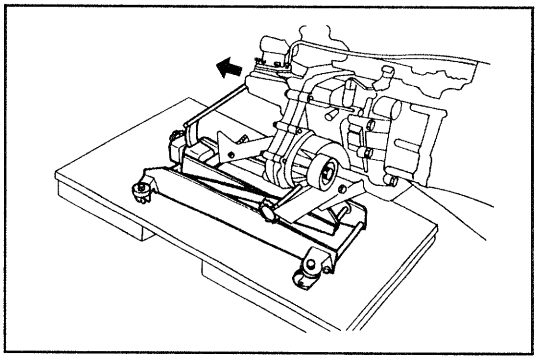

WRU90-MT118

10. Remove the eight bolts that hold the transfer front case and the transfer adapter together.




WRU90-MT119

11. Pull out the transfer front case subassembly toward you.

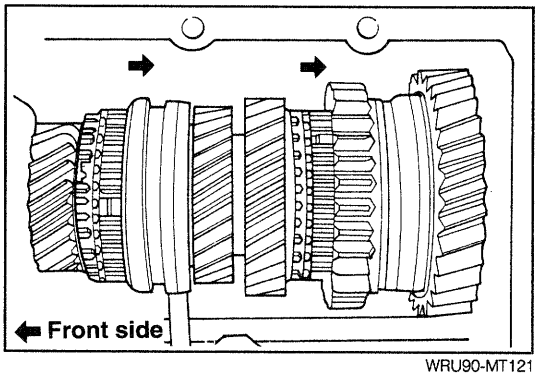

WRU90-MT120

12. Interlock the first and third gears.
NOTE:
- **Measure the following section, prior to an interlock.**

Specified Value:

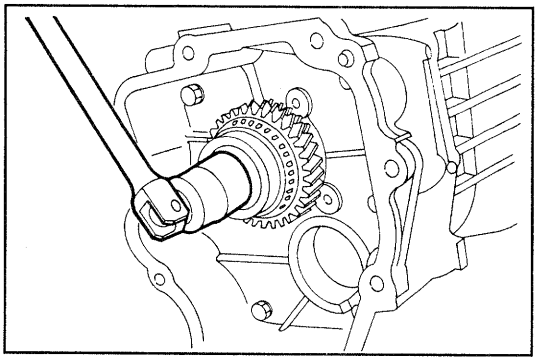
Unit: mm (inch)

	1st	2nd	3rd	4th
Gear backlash	0.05 - 0.18 (0.0019 - 0.0070)	0.05 - 0.16 (0.0019 - 0.0062)	0.05 - 0.14 (0.0019 - 0.0055)	0.05 - 0.13 (0.0019 - 0.0051)
Thrust clearance	0.17 - 0.30 (0.0067 - 0.011)	0.10 - 0.37 (0.0039 - 0.014)	0.10 - 0.33 (0.0039 - 0.013)	

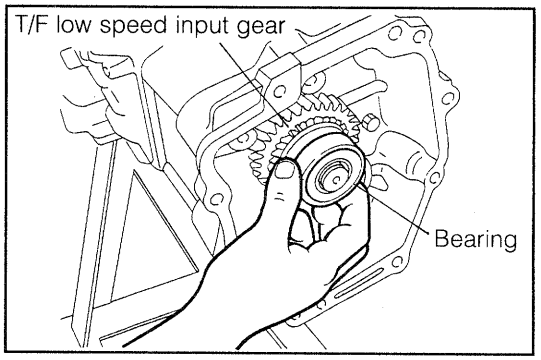


WRU90-MT121

13. Raise the lock section of the lock nut of the transfer lower speed input gear. Remove the lock nut.
NOTE:
- Never use the impact wrench.
- The radial ball bearing seal face may be avoided from the damage.
- Never reuse the removed lock nut.

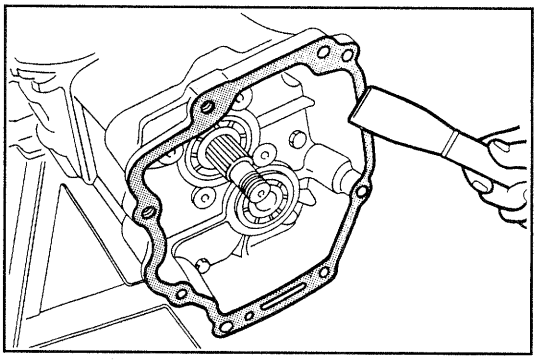

WRU90-MT122

14. Remove the bearing and transfer lower speed input gear. (As for the inspection for the removed parts. See page MT–35.)

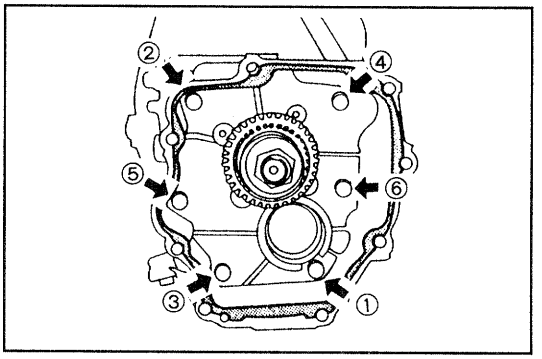


WRU92-MT494

15. Remove the gasket on the transfer adapter with a gasket scraper.
NOTE:
- Remove the gasket on the transmission case attaching surface of the transfer adapter, using a gasket scraper. Be very careful not to scratch the attaching surface.


WRU90-MT124

16. Remove the transfer adapter by removing the six bolts with installed the radial ball bearing and oil seal.

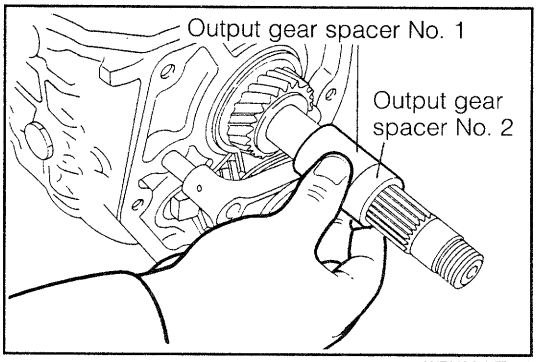


WRU90-MT125

17. Remove the output gear spacer No. 1 and output gear spacer No. 2.
NOTE:
- Measure the backlash and thrust clearance of the 5th gear.

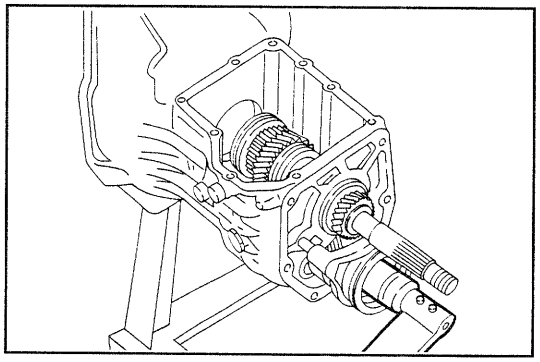
Unit: mm (inch)

Backlash	0.05 - 0.13 (0.0019 - 0.0051)
Thrust clearance	0.11 - 0.30 (0.0039 - 0.011)

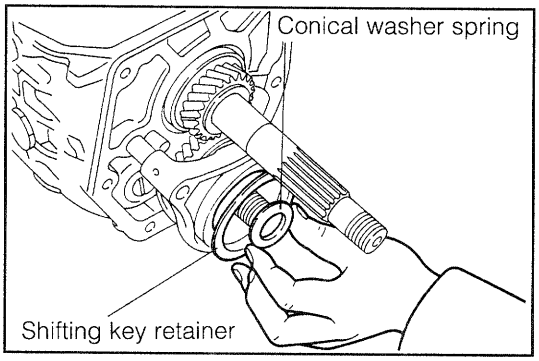


WRU90-MT126

18. Raise the lock section of the lock nut of the countershaft 5th gear.
19. Remove the lock nut of the countershaft 5th gear.
    NOTE:
    - Never reuse the removed lock nut.

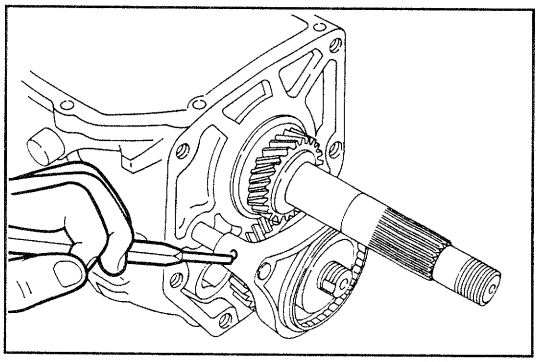

WRU90-MT127

20. Remove the conical washer spring and shifting key retainer.

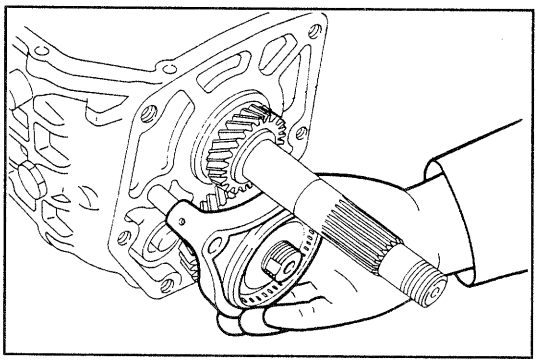


WRU90-MT128

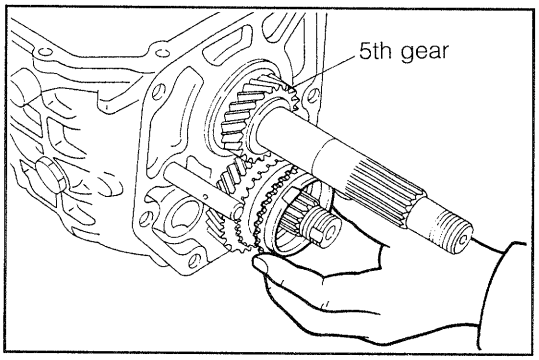
21. Drive off the slotted pin of the 5th shift fork.
    NOTE:
    - Never reuse the removed slotted pin.


WRU90-MT129

22. Remove the 5th shift fork together with synchronizer hub sleeve in a set.

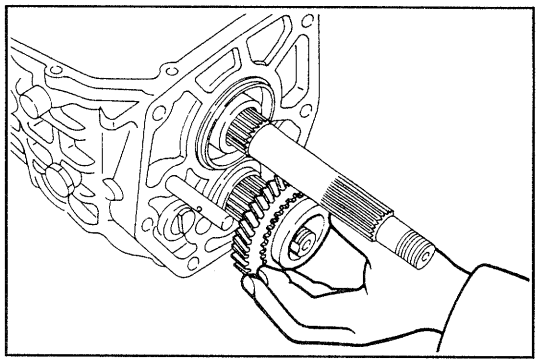

WRU90-MT130

23. Remove the synchronizer ring and 5th gear.



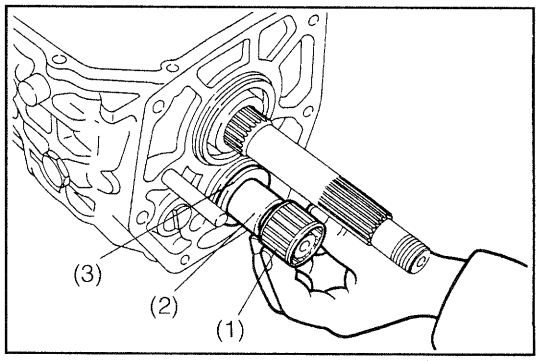
WRU90-MT131

24. Remove the countershaft 5th gear.



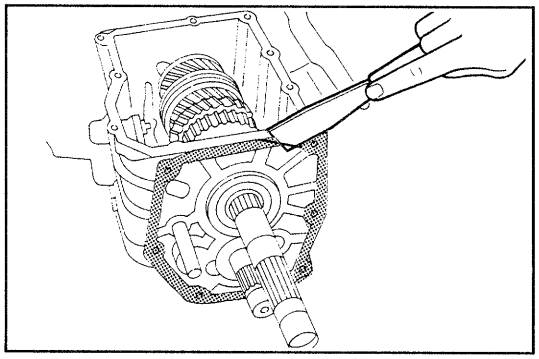
WRU90-MT132

25. Remove the following parts from the countershaft.
    (1) Needle roller bearing
    (2) 5th gear bearing inner race
    (3) 5th gear thrust washer



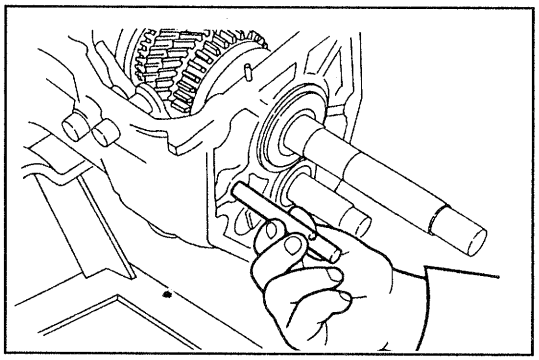
WRU90-MT133

26. Remove the liquid gasket from the transmission case, using a gasket scraper.
    NOTE:
    - **Be very careful not to scratch the transmission case during the removal.**



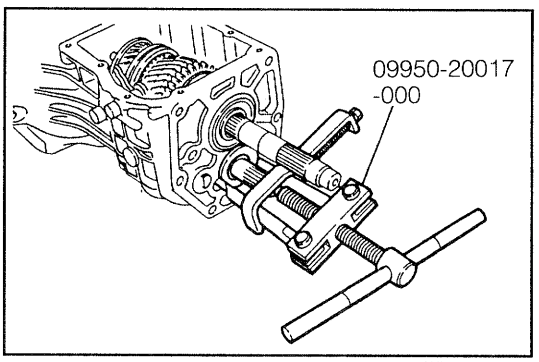
WRU90-MT134

27. Remove the gear shifting lever shaft.



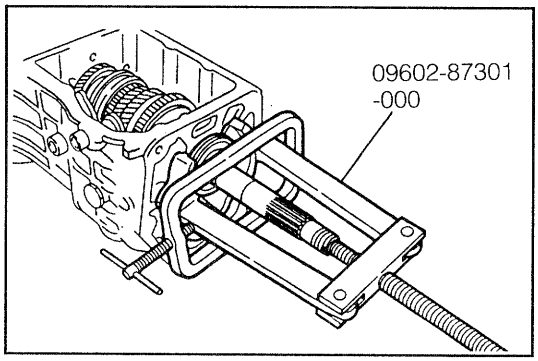
WRU90-MT135

28. Remove the countershaft rear bearing, using the following SST.
    SST: 09950-20017-000



WRU90-MT136

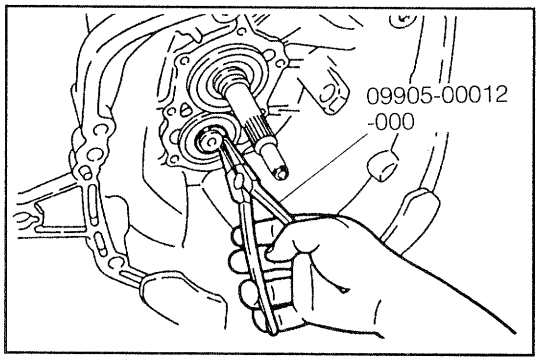
29. Detach the stop ring of the output shaft bearing. Remove the output shaft bearing, using the following SST.
    SST: 09602-87301-000



WRU90-MT137

30. Detach the snap ring of the countershaft, using the following SST.
    SST: 09905-00012-000

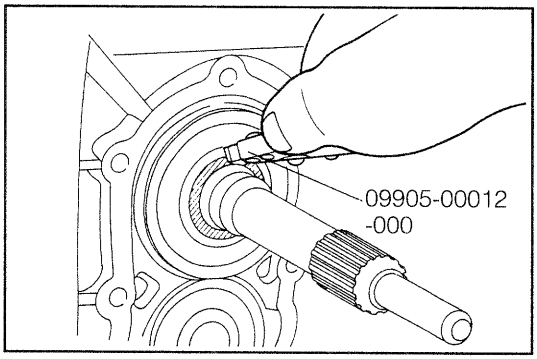
    NOTE:
    - Never reuse the removed snap ring.



WRU90-MT138

31. Detach the snap ring of the input shaft, using the following SST.
    SST: 09905-00012-000

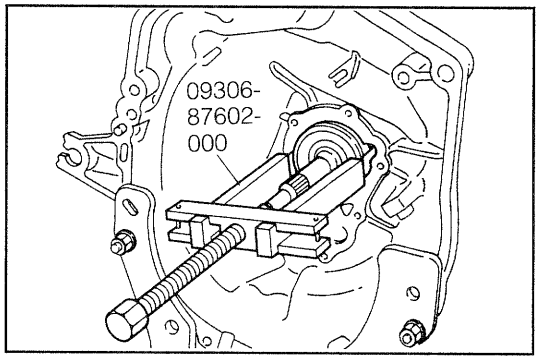
    NOTE:
    - Never reuse the removed snap ring.



WRU90-MT139

32. Remove the input shaft bearing, using the following SST.
    SST: 09306-87602-000

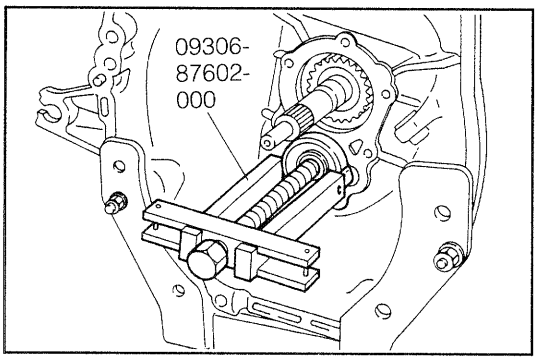
    NOTE:
    - Detach the stop ring, prior to remove the bearing.



WRU90-MT140

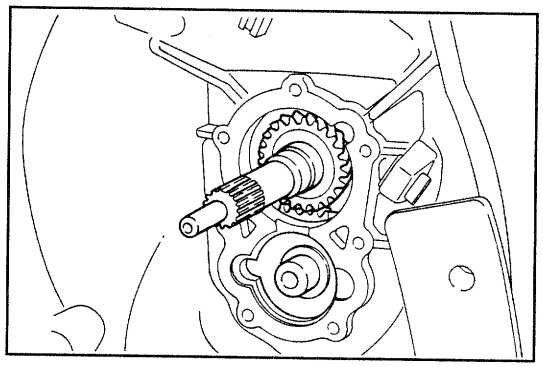
33. Remove the bearing of the countershaft at the clutch side, using the following SST.
    SST: 09306-87602-000

    NOTE:
    - Push out the bearing by tapping the countershaft at the output shaft side, using a plastic hammer.
    - Detach the stop ring, prior to remove the bearing.



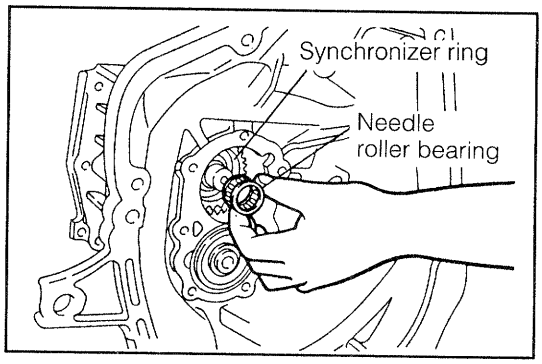
WRU90-MT141

34. Remove the input shaft.
(As for the inspection procedures for each section, see page MT–37.)



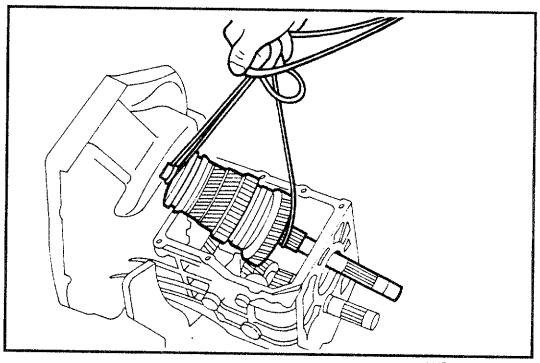
WRU92-MT495

35. Remove the needle roller bearing and synchronizer ring.
(As for the inspection on the removed parts, see page MT–37.)



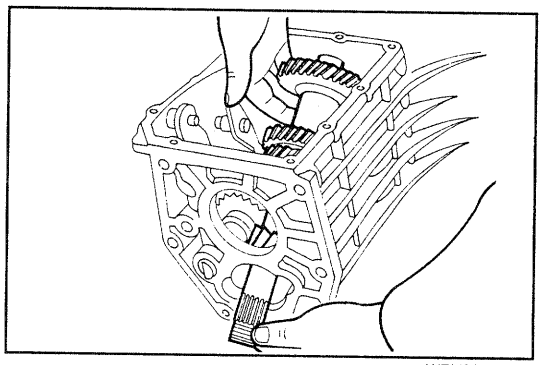
WRU92-MT496

36. Remove the output shaft assembly.
(As for the disassembly, inspection and assembly for the removed parts, see page MT–32.)
NOTE:
- It is recommended that as shown in the diagram at right, an operation rope (about 3 mm in outside diameter) be used to remove the output shaft assembly from the transmission case assembly.



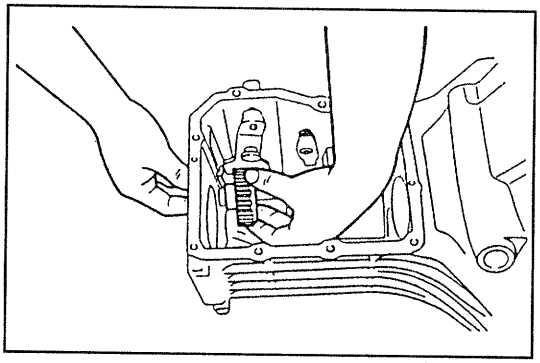
WRU92-MT497

37. Remove the countershaft from the transmission case.



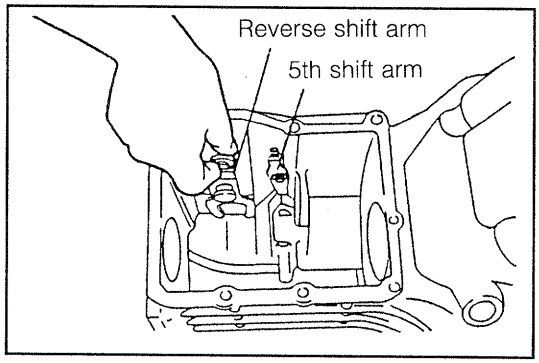
WRU90-MT145

38. Remove the reverse idler gear and reverse idler gear shaft.



WRU90-MT146

39. Remove the reverse shift arm and 5th shift arm.

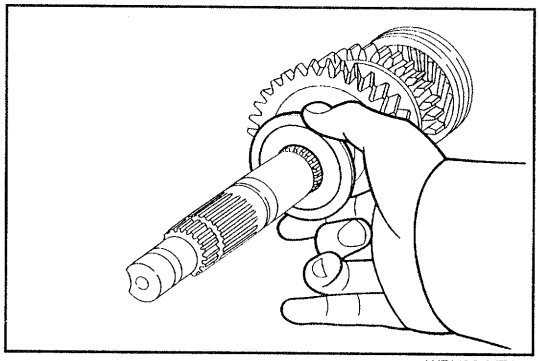


WRU90-MT147

TRANSMISSION OUTPUT SHAFT

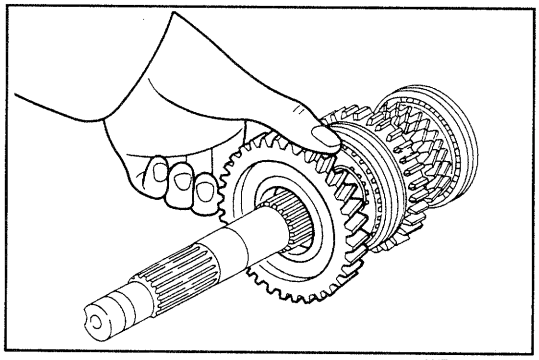
DISASSEMBLY

1. Remove the 1st gear thrust washer.



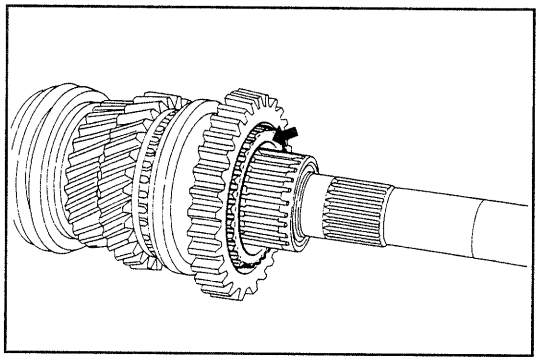
WRU90-MT148

2. Remove the 1st gear.



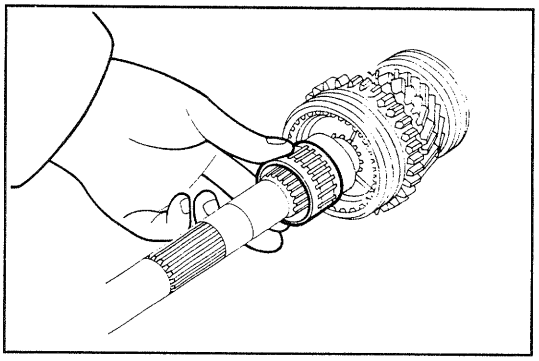
WRU90-MT149

3. Remove the synchronizer ring No. 2.



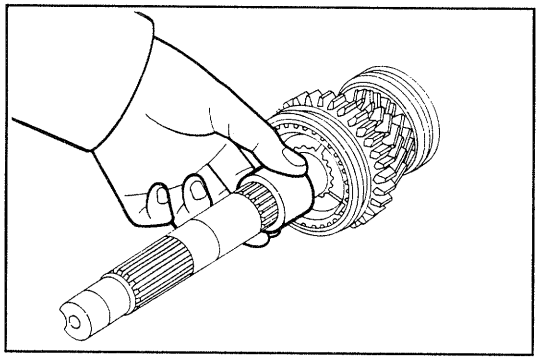
WRU90-MT150

4. Remove the needle roller bearing.



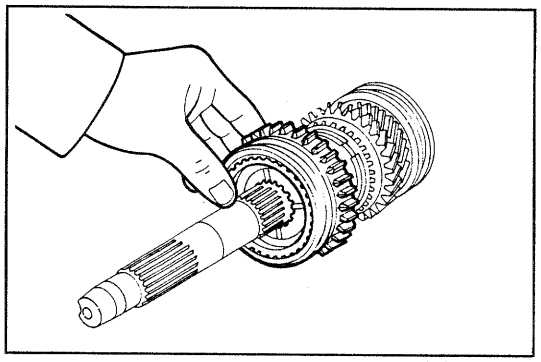
WRU90-MT151

5. Remove the 1st gear bearing inner race.



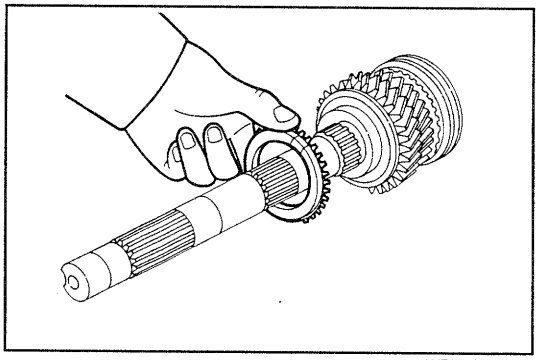
WRU90-MT152

6. Remove the reverse gear with installed the following parts in a set.
   (1) Transmission clutch hub No. 1
   (2) Synchromesh shifting key spring
   (3) Synchromesh shifting key



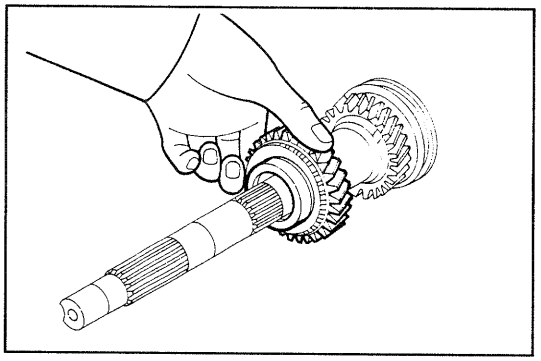
WRU90-MT153

7. Remove the synchronizer ring.



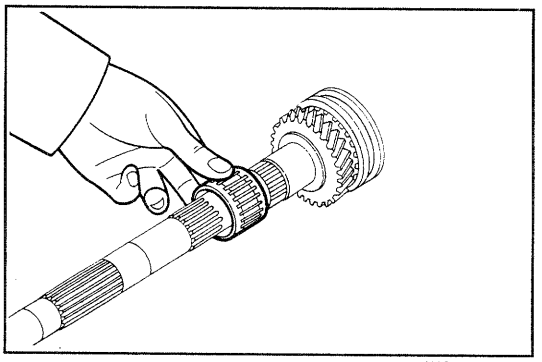
WRU90-MT154

8. Remove the 2nd gear.



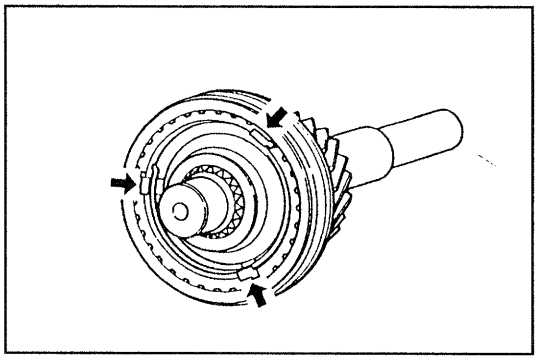
WRU90-MT155

9. Remove the needle roller bearing.

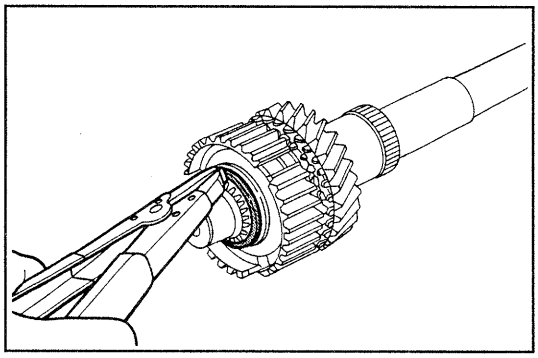


WRU90-MT156

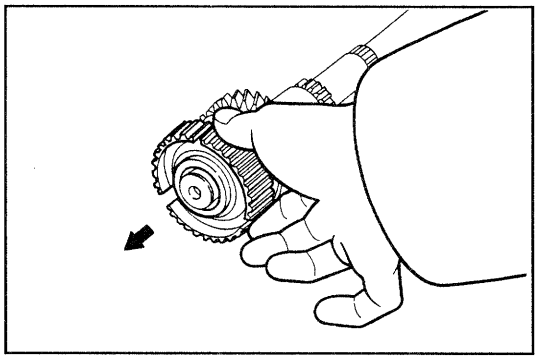
10. Remove the following parts.
    (1) Transmission hub sleeve No. 1
    (2) Synchromesh shifting key spring (1 piece)
    (3) Synchromesh shifting key (3 pieces)
    NOTE:
    - Make sure that an axial clearance of transmission clutch hub No. 2 should be measured, prior to assembly the above parts (See page MT–43).


WRU92-MT498

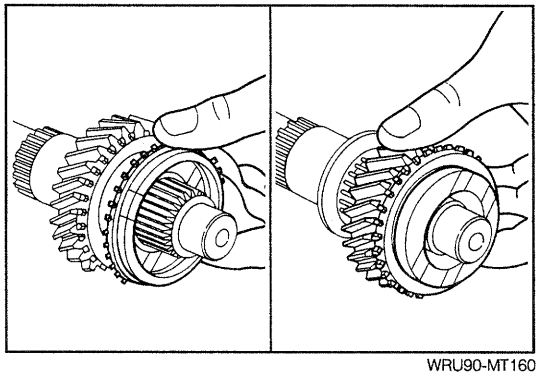
11. Detach the snap ring.
    NOTE:
    - Never reuse the removed snap ring.


WRU90-MT158

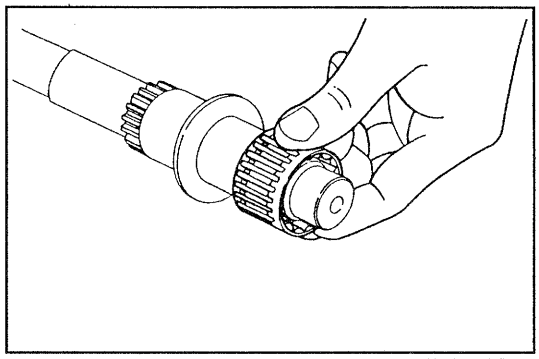
12. Remove the following parts in a set
    (1) Transmission clutch hub No. 2.
    (2) Synchromesh shifting key spring (1 piece)


WRU90-MT159

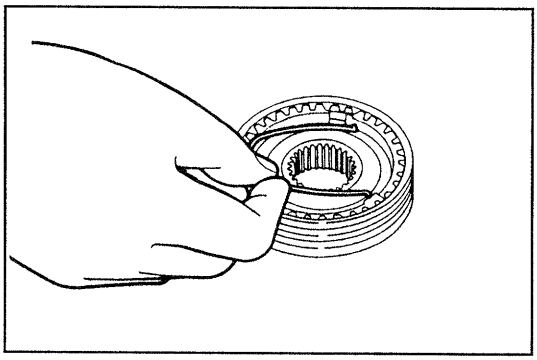
13. Remove the synchronizer ring No. 3 and 3rd gear.


WRU90-MT160

14. Remove the needle roller bearing.


WRU90-MT161

15. Remove the synchromesh shifting key spring and synchromesh shifting key from the fallowing transmission clutch hub sleeve No. 1, No. 2 and hub sleeve.

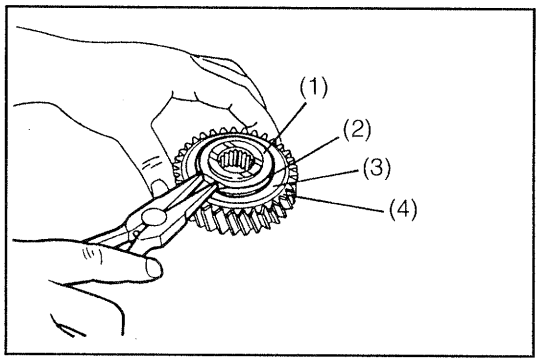


WRU90-MT162

TRANSFER ADAPTER

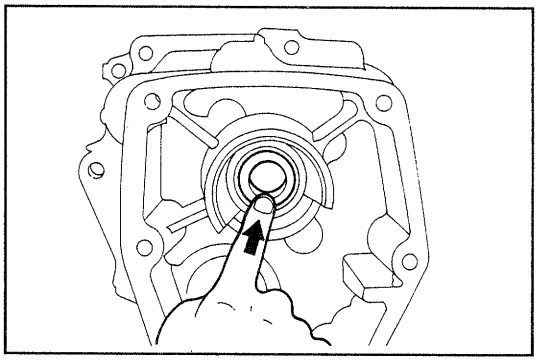
DISASSEMBLY

1. Remove the following parts of the transfer low speed input gear in this sequence.
   (1) Snap ring
   (2) Conical spring
   (3) Washer plate
   (4) Sub gear No. 1



WRU90-MT163

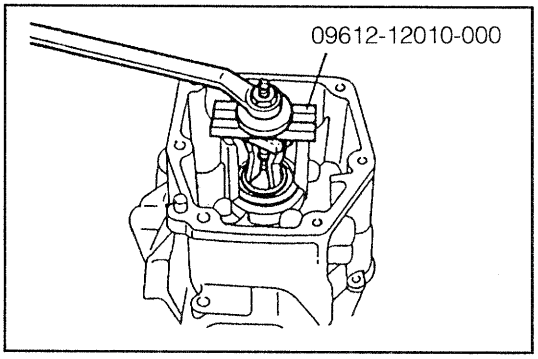
2. Remove the bearing of the transmission output shaft of the transfer adapter by pushing the output gear spacer No. 2 to the transfer front case side.



WRU90-MT164

3. Remove the oil seal of the transmission output shaft, using the following SSTs.
   SST: 09612-12010-000

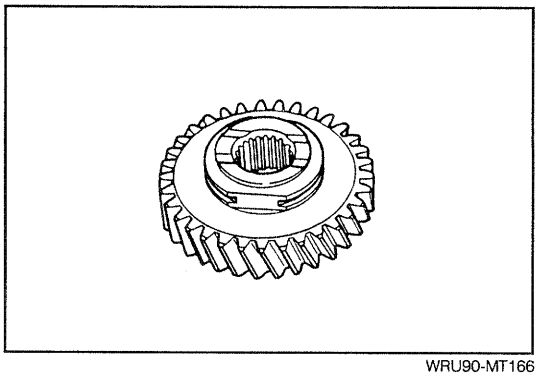
   NOTE:
   - Never reuse the removed oil seal.



WRU90-MT165

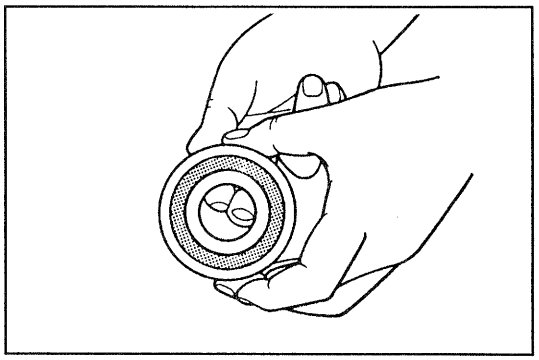
INSPECTION

1. Check the transfer low speed input gear for wear or damage.



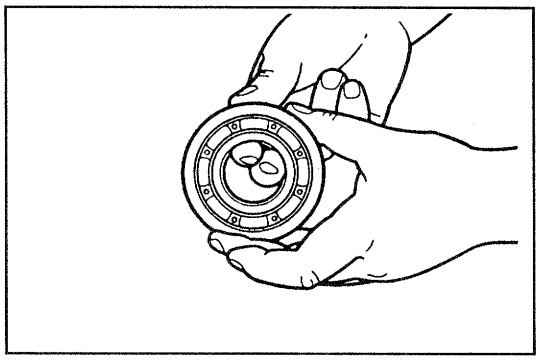
WRU90-MT166

2. Rotate the bearing inner race of the following parts by applying a force with your finger. Check to see if the bearing inner race rotates smoothly without any binding.
   (1) Transmission input shaft and out put shaft rear
   (2) Transmission counter front



WRU90-MT167

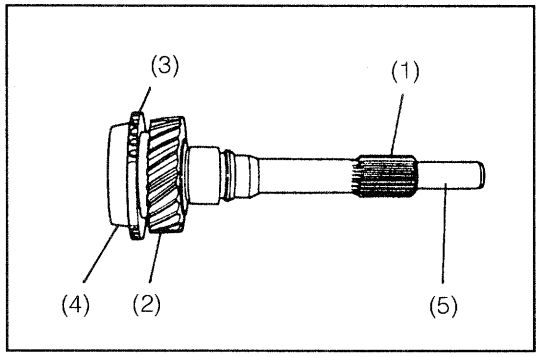
3. Rotate the bearing inner race of the following parts by applying a force with your finger. Check to see if the bearing inner race rotates smoothly without any binding.
   (1) Transfer counter gear of the transfer adapter.
   (2) Transmission output shaft of the transfer adapter.



WRU90-MT168

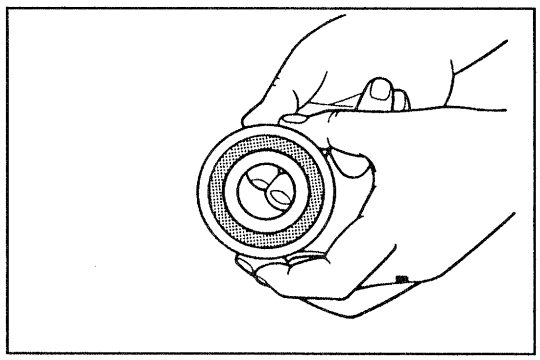
INPUT SHAFT

1. Check the input shaft for the following items.
   (1) Spline section for damage
   (2) Gear for damage and wear
   (3) Engaging section of hub sleeve for damage
   (4) Tapered section for wear or damage
   (5) Race section of roller bearing for wear or damage



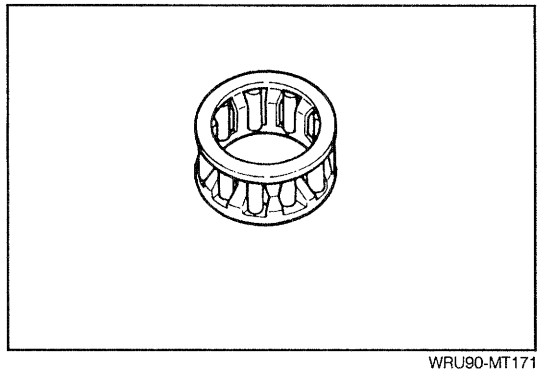
WRU90-MT169

2. Rotate the bearing inner race by applying a force with your finger. Check to see if the bearing inner race rotates smoothly without any sticking.



WRU90-MT170

3. Check the needle roller bearing for wear or damage.



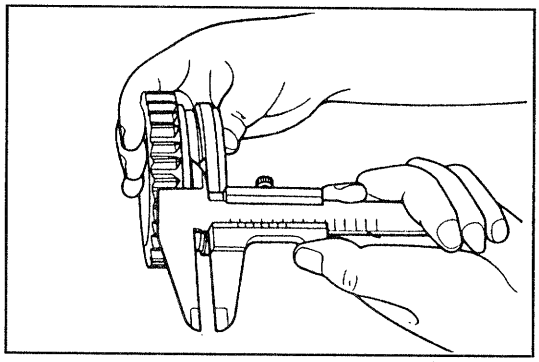
WRU90-MT171

HUB SLEEVE, SYNCHRONIZER RING & GEARS

1. Measure the contact width of the reverse gear with the shift fork, using vernier calipers.

mm (inch)

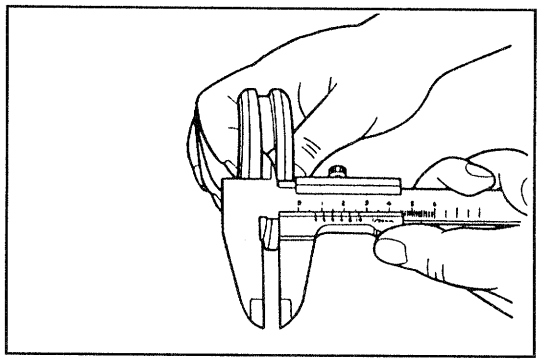
Item / Part name	Specified value	Allowable limit
Reverse gear	7.05 - 7.12 (0.278 - 0.280)	7.3 (0.287)


WRU90-MT172

2. Measure the contact width of the transmission hub sleeve with the shift fork, using vernier calipers.

mm (inch)

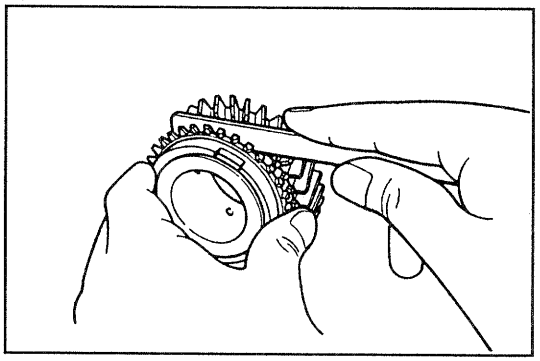
Item / Part name	Specified value	Allowable limit
Transmission hub sleeve	7.05 - 7.12 (0.278 - 0.280)	7.3 (0.287)


WRU90-MT173

3. Measure the clearance between each gear and the synchronizer ring, using a thickness gauge.

mm (inch)

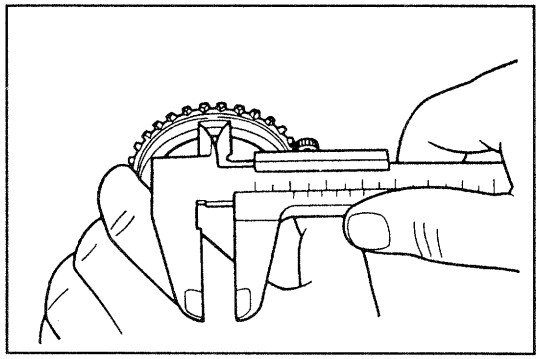
Item / Measuring point	Specified value	Allowable limit
1st gear 2nd gear 3rd gear 4th gear 5th gear	0.85 - 1.45 (0.0335 - 0.0571)	0.5 (0.0197)


WRU90-MT174

NOTE:

- The measurement should be performed at several points for each gear. The minimum value is regarded as the clearance for the said gear.

4. Measure the contact width of each synchronizer ring with the synchromesh shifting key, using vernier calipers. Replace the synchronizer ring which does not conform to the specifications with a new one.

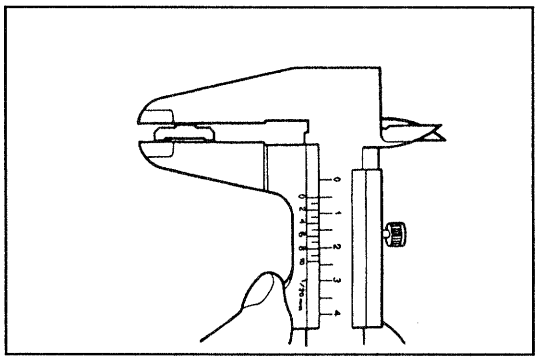

WRU90-MT175

mm (inch)

Item / Measuring point	Specified value
1st gear	9.9 - 10.1 (0.3898 - 0.3976)
2nd gear 3rd gear 4th gear 5th gear	11.3 - 11.5 (0.4449 - 0.4528)

NOTE:
- **The measurement should be performed at three points for each synchronizer ring. The maximum value is regarded as the contact width for the said ring.**

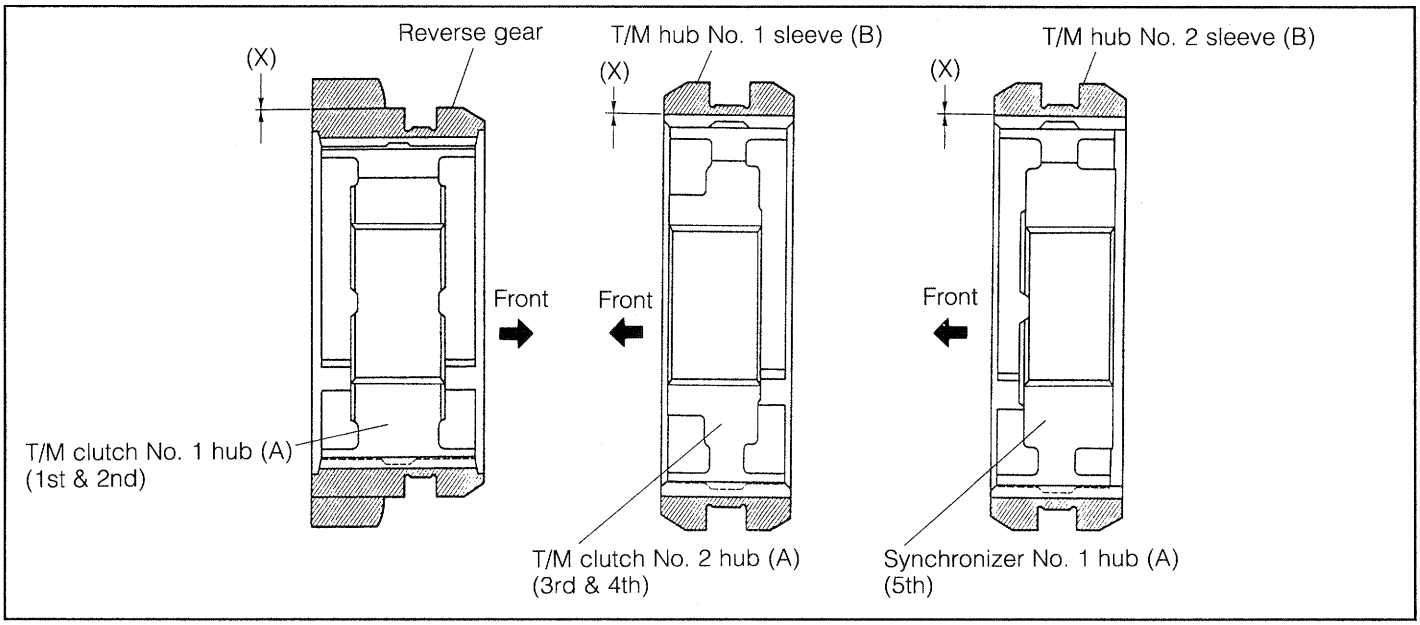
5. Measure the height of each synchromesh shifting key, using vernier calipers.


WRU90-MT176

mm (inch)

Item / Measuring point	Specified value	Allowable limit
1st & 2nd gears 3rd & 4th gears 5th gear	5.0 - 5.2 (0.1969 - 0.2047)	4.7 (0.1850)

6. Measure the dimension (A) and (B) of the followings parts. Make sure that the clearance (X) between this hubs and sleeves may confirm to the specification.
   Specified Valve: 0.03 - 0.19 mm (0.0012 - 0.0075 inch)



WRU90-MT177

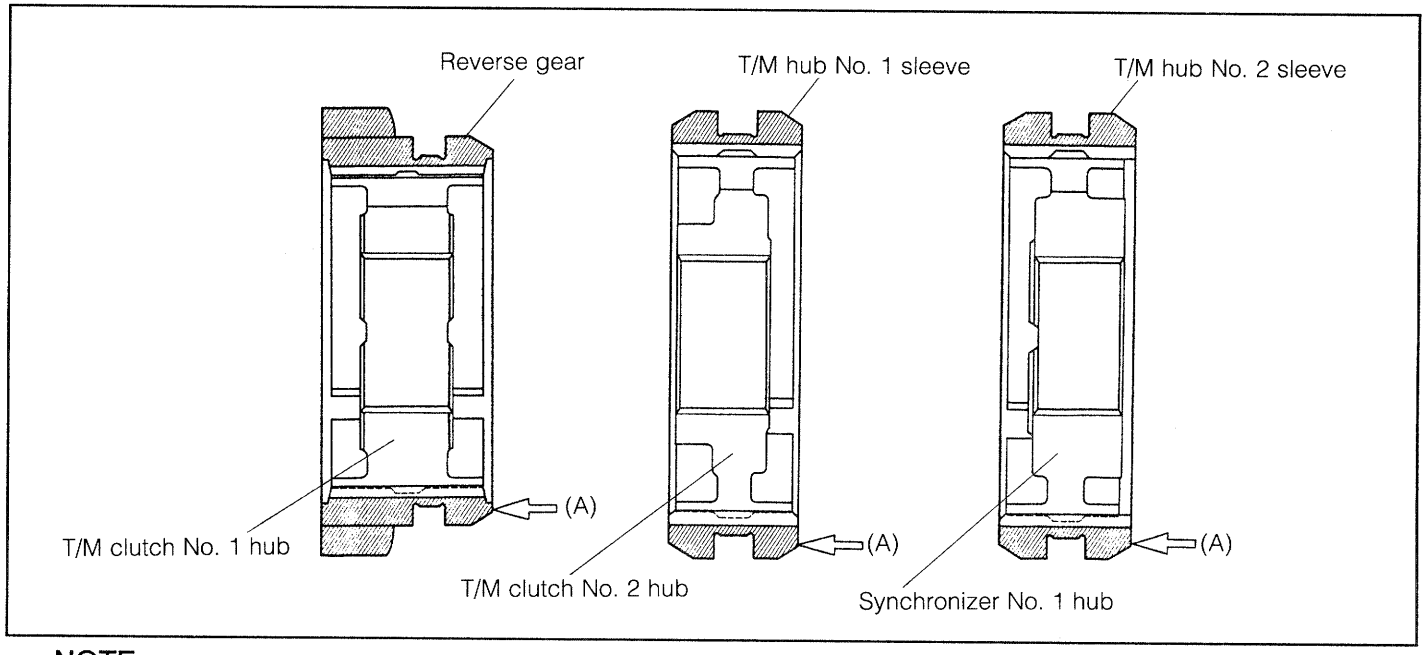
7. The outer diameter dimension of the (A) above parts has been machined in accordance with the bore dimension of the (B) parts. If either part exceeds the specified value above, be certain to replace them as a set.
   CAUTION:
   - **If either part which has been exceed the the specified value should be used against this caution, it would cause sllipping-out of gear and or emanation of abnormal noise.**

Units: mm (inch)

	Outer dimension	Classification No.		Bore dimension
T/M clutch No. 1 hub T/M clutch No. 2 hub Synchronizer No. 1 hub	69.78 - 69.84 (2.747 - 2.749)	2	Reverse gear T/M hub No. 1 sleeve T/M hub No. 2 sleeve	69.871 - 69.97 (2.750 - 2.754)
	69.68 - 69.74 (2.743 - 2.745)	1		69.971 - 69.87 (2.754 - 2.750)
	69.58 - 69.64 (2.739 - 2.741)	3		69.67 - 69.77 (2.742 - 2.746)

WRU90-MT178

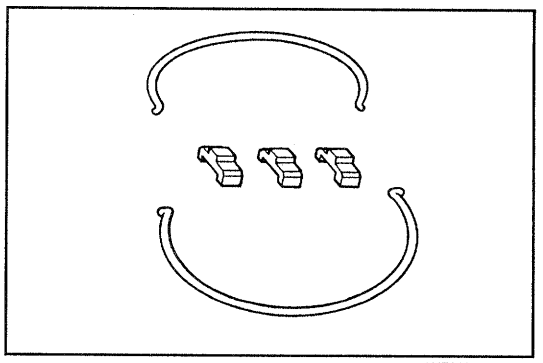
8. With the sleevs assembled to the hubs, measure the tilt width at the section (A) of the sleeves.
   Specified Value: Not to exceed 0.5 mm (0.0197 inch)



NOTE:
- **If the tilt width of the sleeves exceeds the above specified value, be certain to replace those parts as a set.**

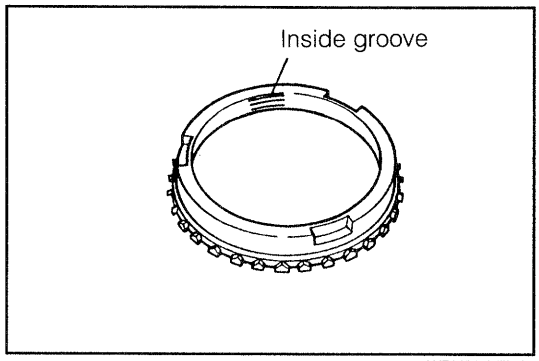
9. Check the synchromesh shifting key and synchromesh shifting key spring for evidence of wear or damage.

WRU90-MT179



WRU90-MT180

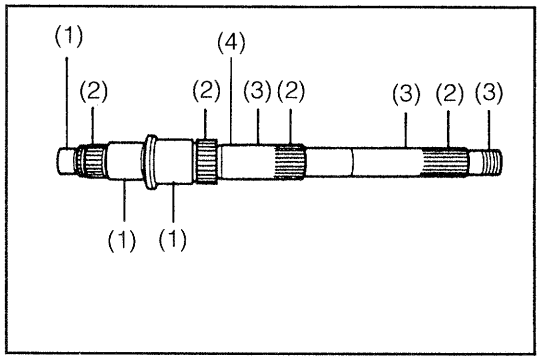
10. Check the inside groove of the synchronizer ring for wear or damage.



WRU90-MT181

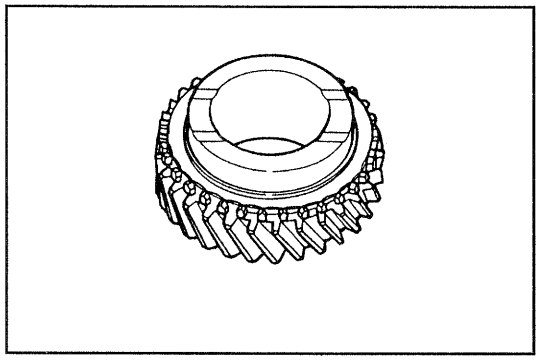
OUTPUT SHAFT

1. Check the output shaft for the following items.
   (1) Needle roller bearing race section for wear or damage
   (2) Spline section for damage
   (3) Fitting section of bearing inner race for wear
   (4) Measure the runout of the output shaft, using a dial gauge and V-block.
   Allowable Runout Limit: 0.05 mm (0.0020 inch)

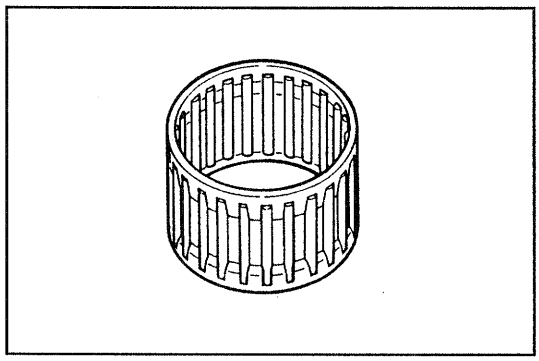


WRU90-MT182

2. Check the gear section of each gear for damage or abnormal wear.

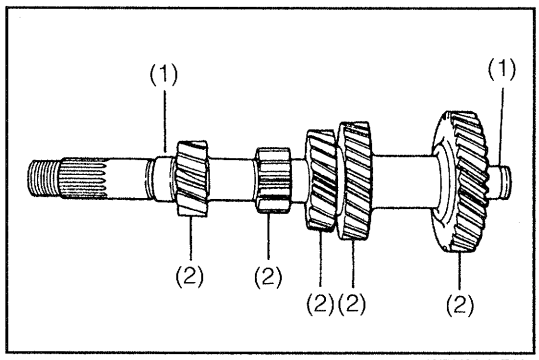

WRU90-MT183

3. Check each needle roller bearing for damage.


WRU90-MT184

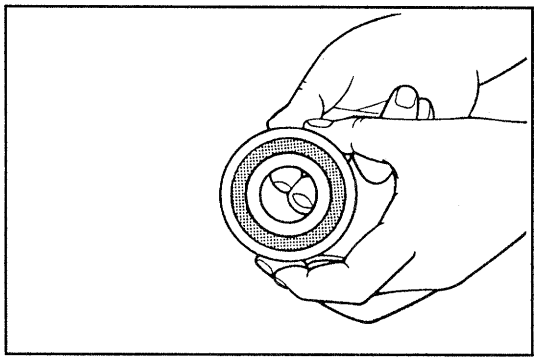
COUNTER GEAR- & REVERSE IDLER GEAR-RELATED PARTS

1. Check the transmission countershaft for the following items.
   (1) Bearing fitting section for wear or damage
   (2) Gear engaging section for damage or abnormal wear



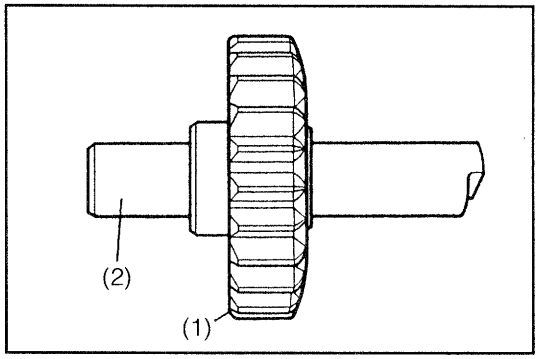
WRU90-MT185

2. Rotate the bearing inner race by applying a force with your finger. Check to see if the bearing inner race rotates smoothly without any sticking.



WRU90-MT186

3. Check the reverse idler gear and reverse idler gear shaft for the following items.
   (1) Reverse gear engaging section for damage or abnormal wear
   (2) Reverse gear sliding section for damage or wear

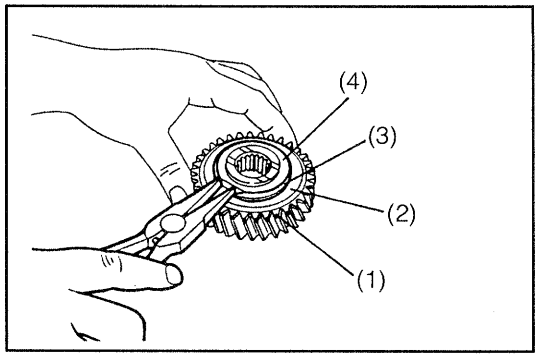


WRU90-MT187

ASSEMBLY (TRANSFER ADAPTER)

1. Install the following parts to the transfer low speed input gear in this sequence.
   (1) Sub gear No. 1
   (2) Plate washer
   (3) Conical spring washer
   (4) Snap ring

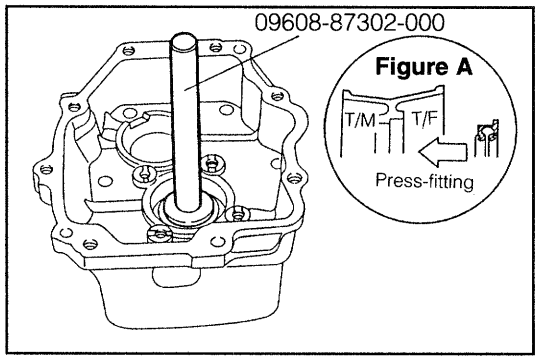
   NOTE:
   - Never reuse the removed snap ring.
   - Install the conical spring washer with its expanded side facing toward the sub gear No. 1.



WRU90-MT188

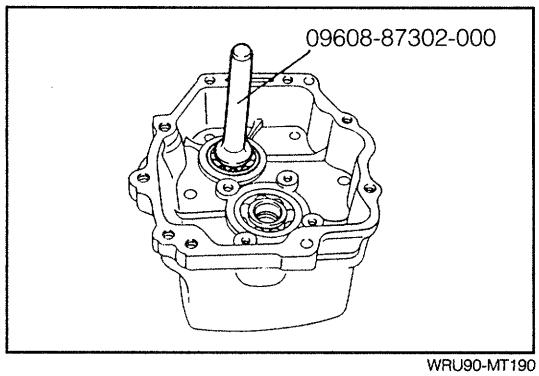
2. Press a new oil seal from the bearing side of the transmission output shaft, using the following SST.
   SST: 09608-87302-000

   NOTE:
   - Be sure to install the oil seal in the correct direction, as indicated in the right figure A.
   - Make sure that the oil seal exhibits no tilt and the garter spring of the oil seal is not disengaged.
   - Apply gear oil to the oil seal lip section, prior to press.



WRU90-MT189

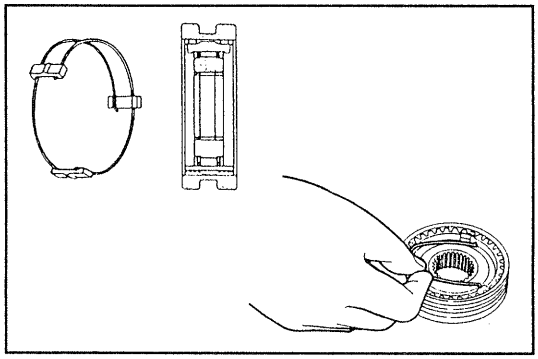
3. Press the bearing of the transfer counter gear of the transfer adapter, using the following SST.
   SST: 09608-87302-000



WRU90-MT190

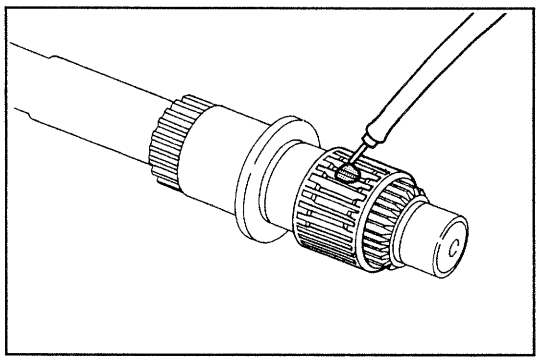
ASSEMBLY OF CLUTCH HUB

1. Assemble the selected transmission clutch hub to the following parts, using the synchromesh shifting key and synchromesh shifting key spring.
   (1) Reverse gear
   (2) Transmission hub sleeve (3rd ↔ 4th)
   (3) Transmission hub sleeve (5th)
   NOTE:
   - As for the synchromesh shifting key spring, the bent sections at the front and rear should not come at the same direction, as shown in the right figure.

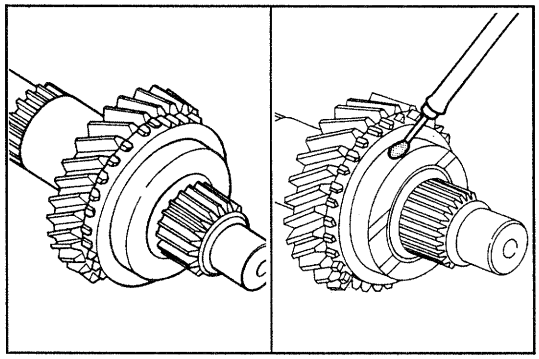

WRU90-MT191

TRANSMISSION OUTPUT SHAFT ASSEMBLY

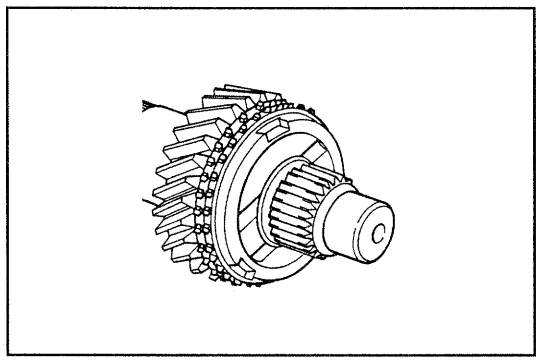
1. Apply the gear oil to the needle roller bearing and then, install to the output shaft.


WRU90-MT192

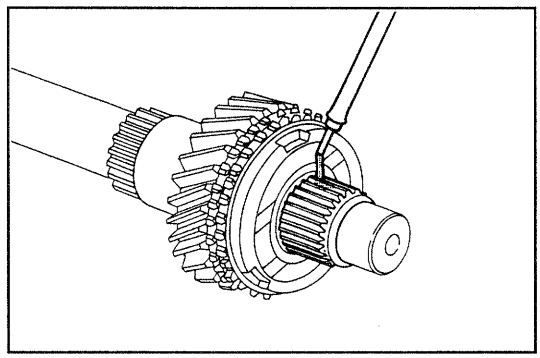
2. Install the 3rd gear to the output shaft.
3. Apply the gear oil to the tappered section of the 3rd gear.


WRU90-MT193

4. Install the synchronizer ring No. 3.


WRU90-MT195

5. Apply the gear oil to the sprine section of the output shaft.

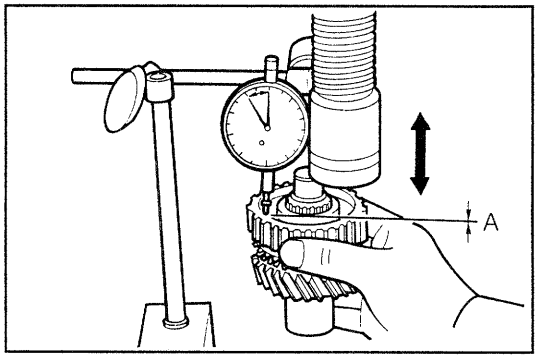

WRU90-MT196

6. Attach the new snap ring. Ensure that the clearance (A) in the right figure conforms to the specification. If it does not conform to the specification, select a suitable snap ring.
   NOTE:
   - Never reuse the removed snap ring.

   Specification:
   Not to exceed 0.1 mm (Not to exceed 0.0039 inch)

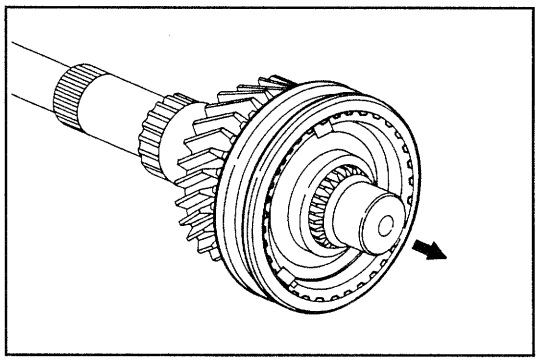
   Snap Ring Availability — mm (inch)

Snap ring thickness:	2.0 (0.0787) 2.1 (0.0827) 2.2 (0.0666)

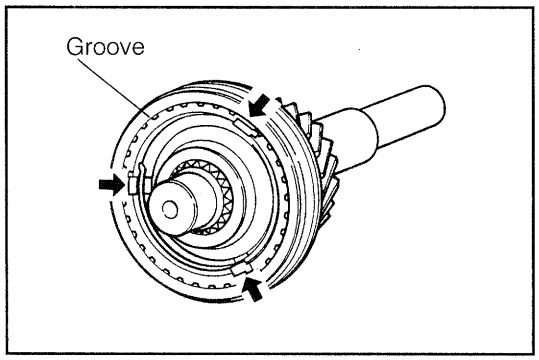


WRU90-MT194

7. Install the transmission clutch hub No. 2 with installed the two pieces of the synchromesh shifting key spring to the output shaft.

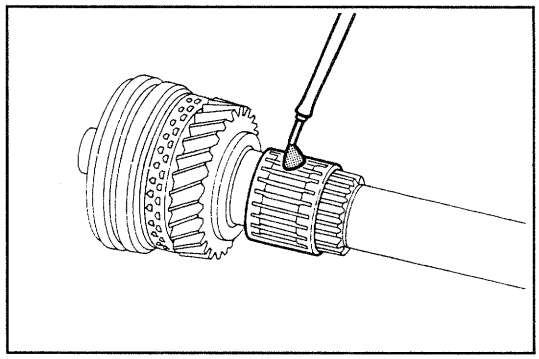

WRU90-MT197

8. Install the synchromesh shifting key (three pieces) to the transmission clutch hub No. 2 and then, install the transmission clutch hub No. 2 and then, install the transmission hub sleeve No. 1.
   NOTE:
   - Ensure that the sroove section of the transmission hub seeve No. 1 faces toward the input shaft.

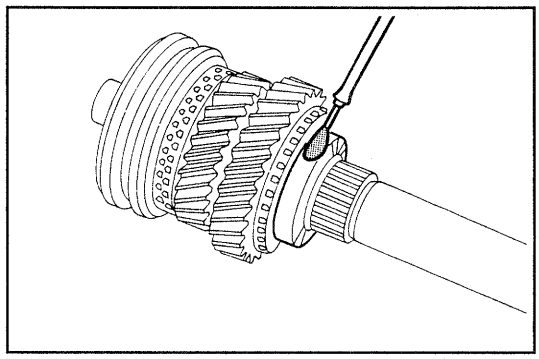


WRU90-MT198

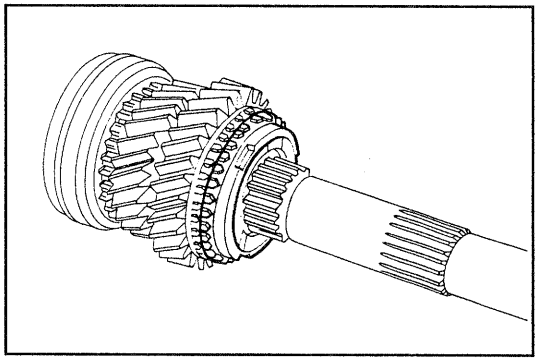
9. Apply the gear oil to the needle roller bearing and then, install to the output shaft.


WRU90-MT199

10 Apply the gear oil to the tappered section of the 2nd gear and then, install to the output shaft.

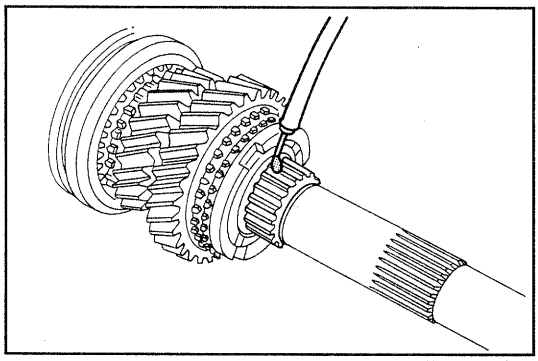

WRU90-MT200

11. Install the synchronizer ring No. 3.



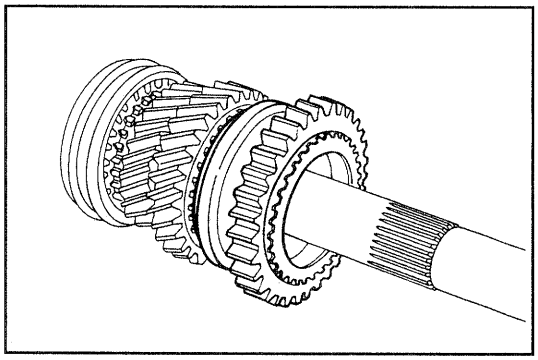
WRU90-MT201

12. Apply the gear oil to the spline section of the output shaft.



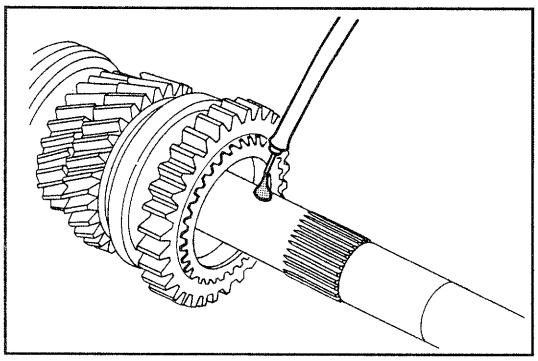
WRU90-MT202

13. Install the reverse gear to the output shaft in a set.
    (1) Synchromesh shifting key (Three pieces)
    (2) Synchromesh shifting key spring (Two pieces)
    (3) Transmission clutch hub sleeve No. 1
    NOTE:
    - **Make sure that the sleeve section of the reverse gear faces toward the input shaft.**



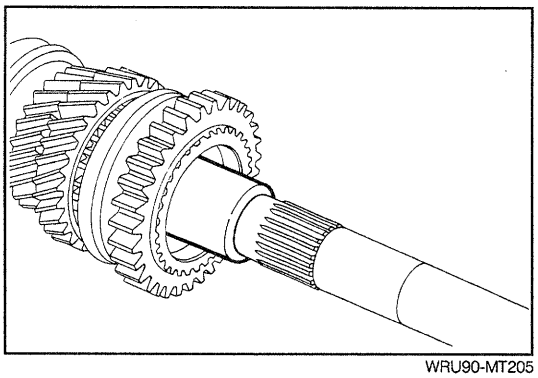
WRU90-MT203

14. Apply the gear oil to the outer periphery of the output shaft.



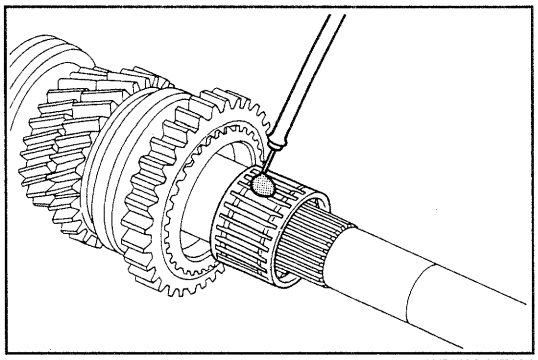
WRU90-MT204

15. Install the 1st gear inner race to the output shaft.



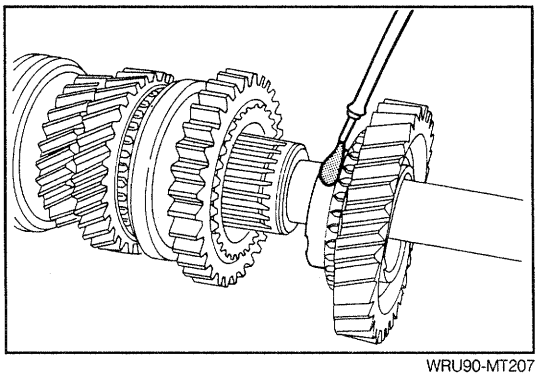
WRU90-MT205

16. Apply the gear oil to the needle roller bearing and then, install to the outer periphery of the 1st gear inner race.



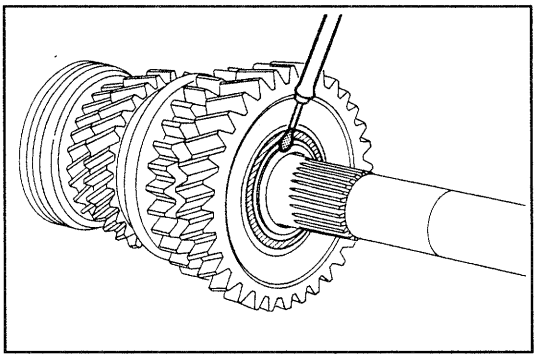
WRU90-MT206

17. Apply the gear oil to the tappered section of the 1st gear and then, install to the output shaft.



WRU90-MT207

18. Apply the gear oil to the end section of the 1st gear as shown in the right figure illustration and then, install the 1st gear thrust washer.

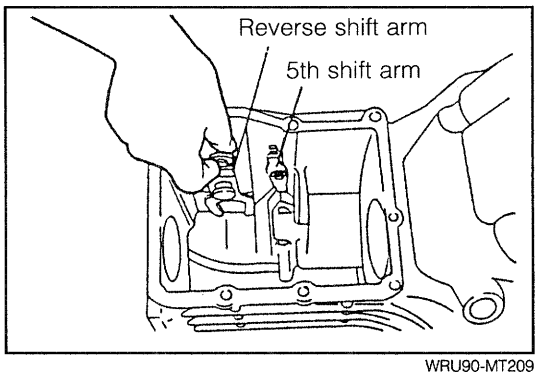


WRU90-MT208

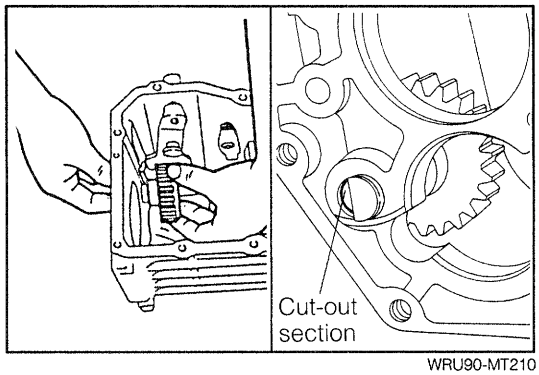
TRANSMISSION ASSEMBLY

NOTE:
Prior to assembling the transmission case, clean the transmission case by removing any dirt, gasket materials or the like.

1. Install the reverse shift arm and 5th shift arm.
2. Install the reverse idler gear shaft and reverse idler gear.
   NOTE:
   - **Be sure to install the reverse idler gear shaft in such a way that the cut-out section of the shaft faces toward the opposite side of the countershaft.**
   - **If this operation should fail to be observed correctly, there may be a case where the transfer adaptor can not be installed.**
   - **Before remounting the reverse idler gear, make sure that the gear chambering section faces toward the front side. If the reverse idler gear is remounted with the gear chambering section facing toward the rear, it may become difficult to put the gear in reverse or noise may result during shifting to reverse.**

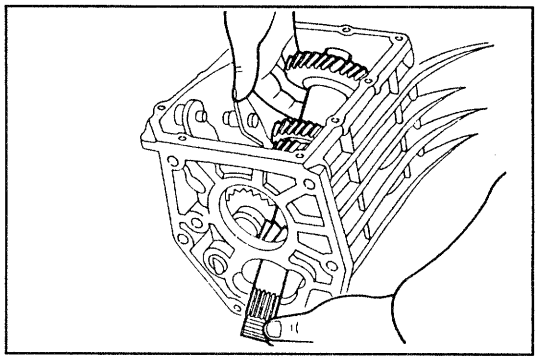


WRU90-MT209

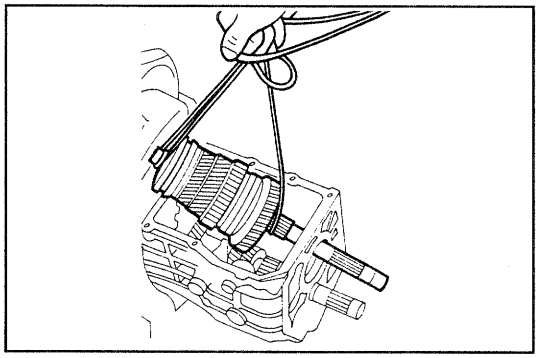


WRU90-MT210

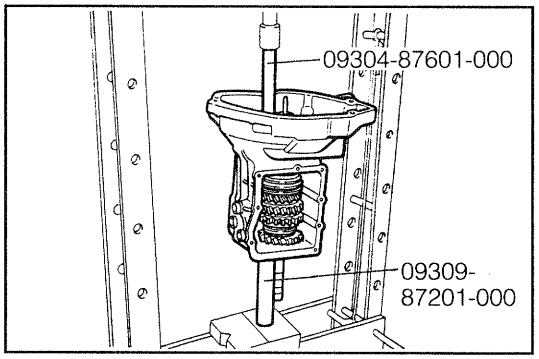
3. Insert the transmission countershaft into the transmission case.


WRU90-MT211

4. Place the output shaft in the transmission case.

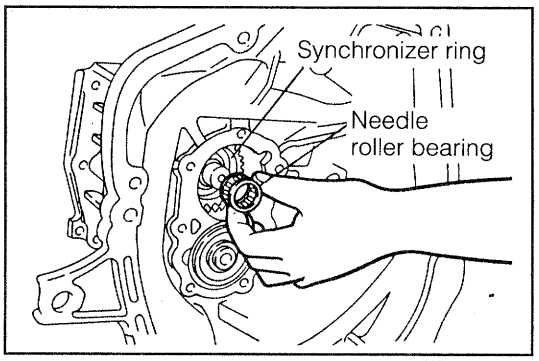

WRU90-MT212

5. Press the bearings provided at the front and rear of the transmission countershaft, using the following SSTs at the same time.
   SSTs: 09304-87601-000
   09309-87201-000



WRU90-MT213

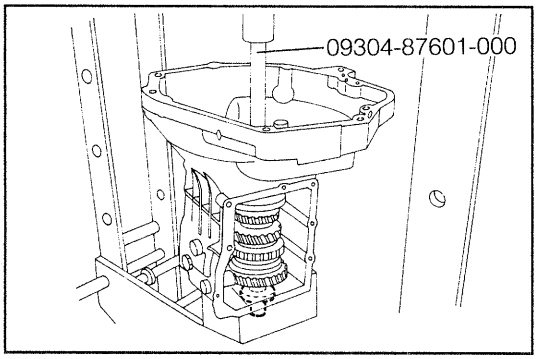
6. Apply the gear oil to the needle roller bearing and then, install to the output shaft.
7. Install the synchronizer ring No. 3.



WRU90-MT214

8. Press the input shaft bearing into position, using the following SST at the same time.
   SST: 09304-87601-000

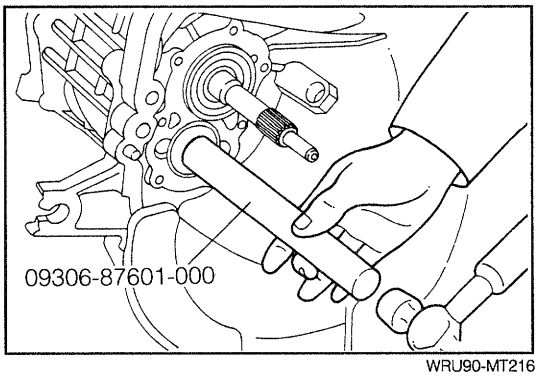
   NOTE:
   - Prior to install the above bearing, remove the stop ring.



WRU90-MT215

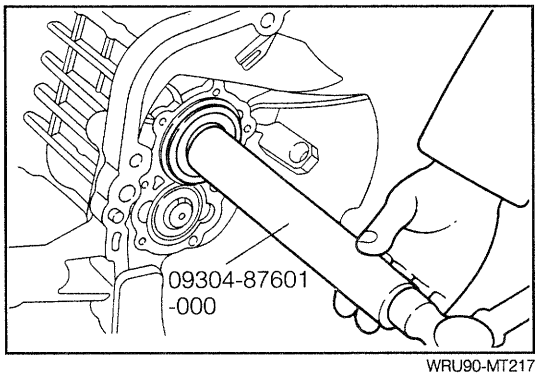
9. Install new snap ring to the countershaft, using the following SST:
   SST: 09306-87601-000

   NOTE:
   - Make sure that the snap ring should be installed to the groove section of the countershaft securely.



WRU90-MT216

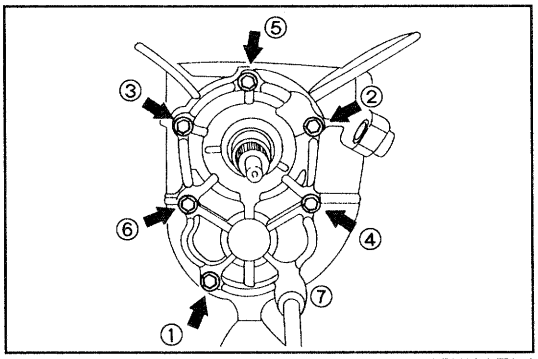
10. Install the stop ring to the countershaft front bearing.
    NOTE:
    - Push out the bearing by tapping the countershaft at the output shaft side, using a plastic hammer.
11. Install the new snap ring to the input shaft, using the following SST:
    SST: 09304-87601-000
12. Install the stop ring to the input shaft bearing.



WRU90-MT217

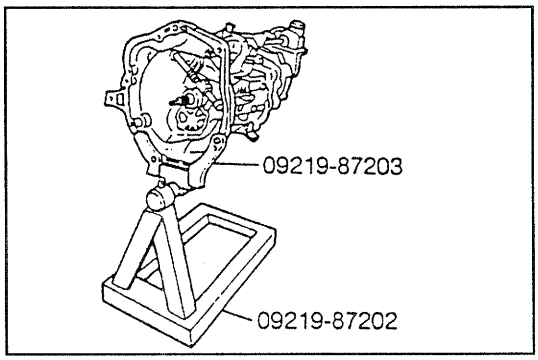
13. With a new gasket used, install the front bearing retainer.
    NOTE:
    (1) Apply gear oil to the oil seal lip section.
    (2) Apply molybdenum disulphide lithium base grease to the clutch hub sliding section of the front bearing retainer.
    Tightening Torque:
    1.5 - 2.2 kg-m (10.8 - 15.9 ft-lb, 14.7 - 21.6 N·m)

    (3) Be sure to tighten the bolts alternatelly and diagonally. (Right figure illustration indicates a typical example of the tighteing sequence.)



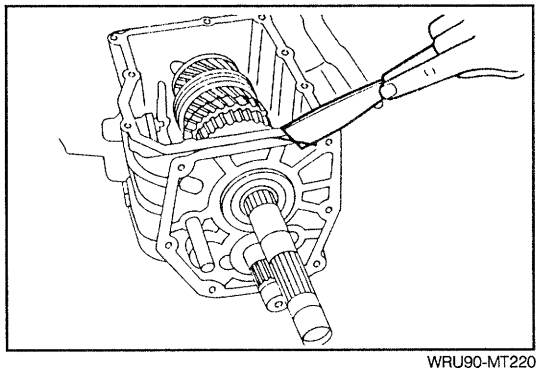
WRU90-MT218

14. Install the clutch related parts (Refer CL-section).
15. Install the transmission case on the overhaul stand.
    NOTE:
    - After the transmission case has been remounted on the overhauling stand, cover the transmission case temporarily with a cloth or any other suitable materials to prevent foreign matter, dust, etc. from entering the transmission case.

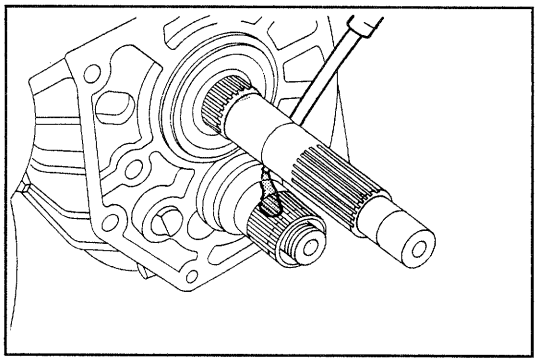


WRU90-MT219

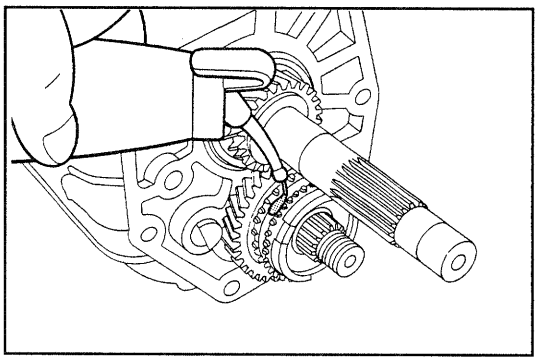
16. Remove any remaining gasket material from the transmission, using a gasket scraper.
    NOTE:
    - Be very careful not to scratch the attaching surface.


WRU90-MT220

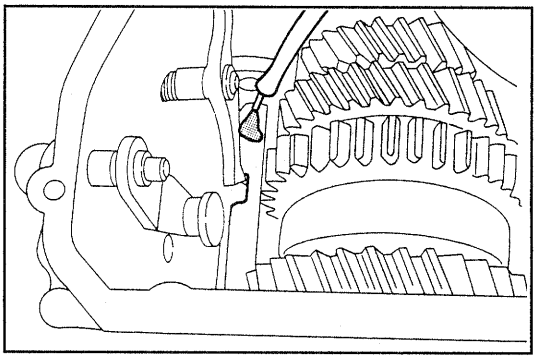
17. Apply the gear oil to the following parts and then, install then in this sequence to the countershaft.
    (1) 5th gear thrust washer
    (2) 5th gear bearing inner race
    (3) Needle roller bearing


WRU90-MT221

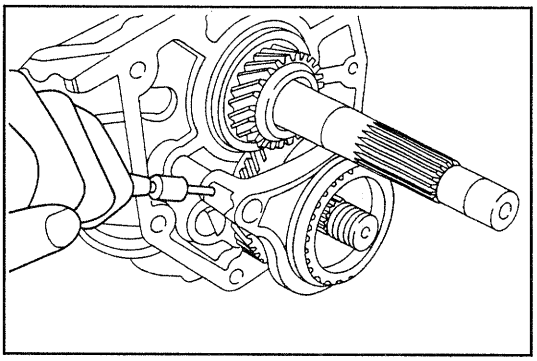
18. Apply the gear oil to the following parts in this sequence.
    (1) 5th gear
    (2) Countershaft 5th gear (Tappered section)
    (3) Synchronizer ring.


WRU90-MT222

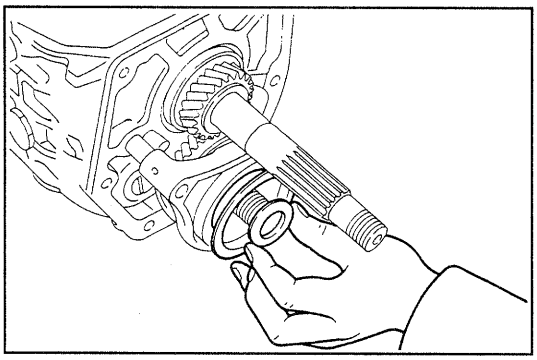
19. Apply the gear oil to the gear shifting lever shaft and then, insert to the transmission case.
    NOTE:
    - **Make sure that cut out section of the gear shifting lever faces toward the outside of transmission case.**

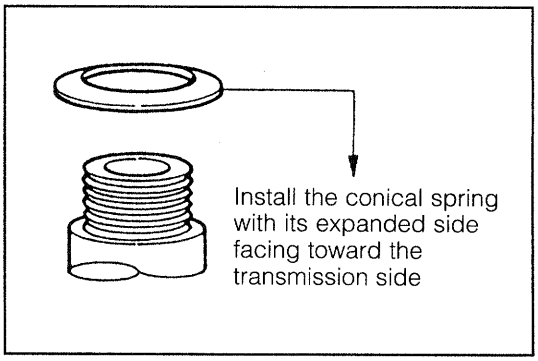

WRU90-MT223

20. Install the following parts to the counter shaft in a set (use new slotted pin securely).
    (1) Transmission hub sleeve No. 2
    (2) Synchronizer hub assy No. 1
    (3) Synchromesh shifting key spring (Three pieces)
    (4) Synchromesh shifting key (Two pieces)
    (5) Synchronizer ring


WRU90-MT224

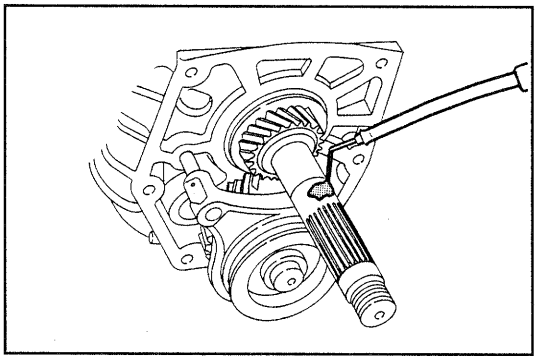
21. Install the following parts in this sequence.
    (1) Shifting key retainer
    (2) Conical washer spring





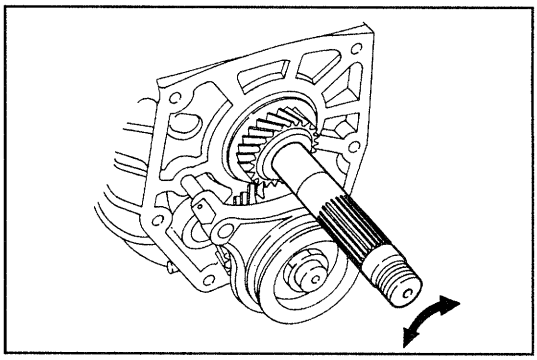
WRU90-MT225

22. Apply the gear oil onto the outer periphery of the output shaft.



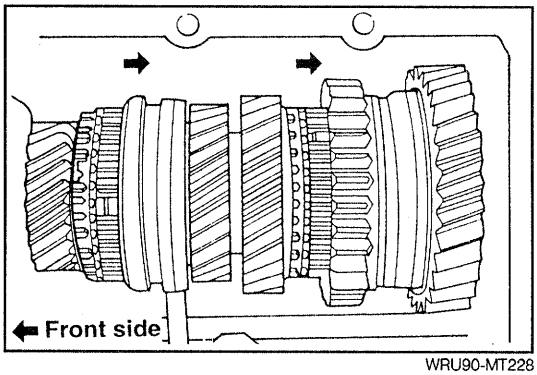
WRU90-MT226

23. Perform checks for smooth gear shifting by manual operation of the transmission, using the following procedure:
    (1) Fully hand-tighten the lock nut on the fifth gear of the countershaft.
    (2) Engage each gear in order of the manual transmission shift position.
    (3) Visually check that both the input shaft and the output shaft rotate clockwise during engagement of each gear (for the reverse gear, however, the output shaft rotates counterclockwise).



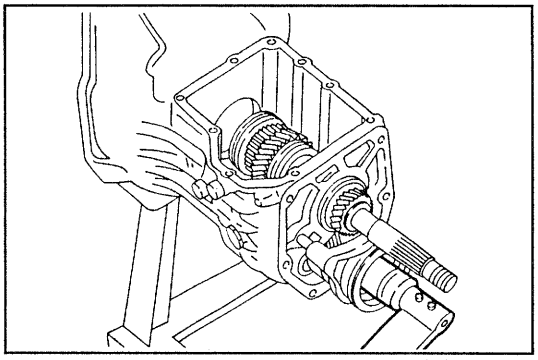
WRU90-MT227

24. Interlock the first and third gears.



WRU90-MT228

25. Tighten the countershaft 5th gear with the lock nut. Stake the lock nut with a chisel or the like.
    Tightening Torque:
    14.0 - 20.0 kg-m
    (101.0 - 145.0 ft-lb, 137.0 - 196.0 N·m)

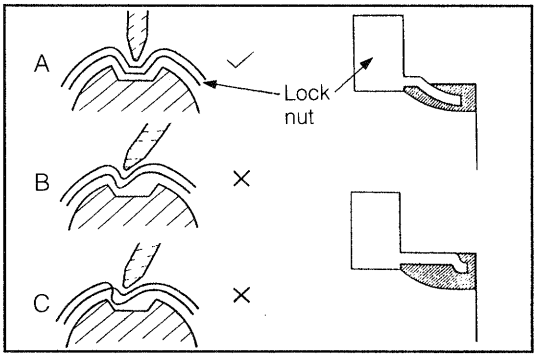

WRU90-MT229

NOTE:
- Measure the following sections, prior to stake the lock nut.

Specified Valve: Unit: mm (inch)

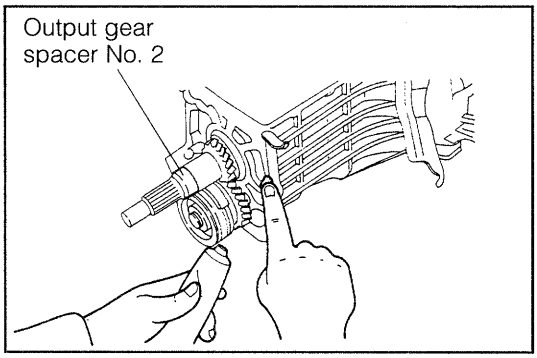
	1st	2nd	3rd	4th	5th
Backlash	0.05 - 0.18 (0.0019 - 0.0070)	0.05 - 0.16 (0.0019 - 0.0062)	0.05 - 0.14 (0.0019 - 0.0055)	0.05 - 0.13 (0.0019 - 0.0051)	0.05 - 0.13 (0.0019 - 0.0051)
Thrust clearance	0.17 - 0.30 (0.0067 - 0.011)	0.10 - 0.37 (0.0039 - 0.014)	0.10 - 0.33 (0.0039 - 0.013)		0.11 - 0.30 (0.0039 - 0.011)

NOTE:
- When staking the lock nut, point a suitable staking tool toward the transmission counter shaft axis center and stake to lock nut securely as shown in the right figure A.
- Poor staking may cause abnormal noise as shown in the right figure illustration B and C.



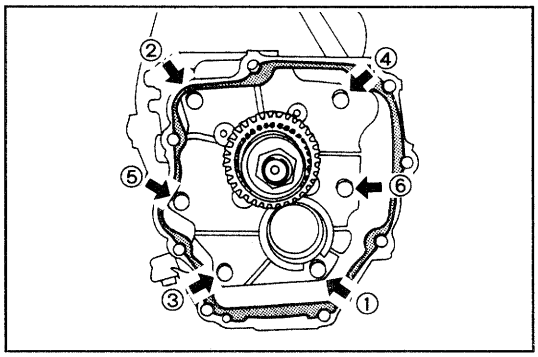
WRU90-MT230

26. Install the output gear spacer No. 1 and No. 2 to the output shaft.
27. Apply gear oil to the outer periphery of the output gear spacer No. 2.
28. Apply the following bond to the transfer adapter attaching surface of the transmission case.
    Bond: Three bond 1216 (Three bond made)



WRU90-MT231

29. Apply the following bond to the threaded section of the bolts. Install the transfer adaptor and bearing.
    Tightening Torque:
    3.0 - 4.5 kg-m (21.7 - 32.5 ft-lb, 29.4 - 44.1 N·m)
    Bond: Three bond 1324 (Three bond made)



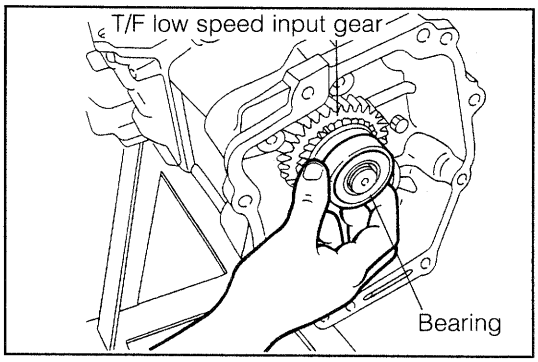
WRU92-MT499

NOTE:
- If the transmission adaptor can not be installed properly (i.e. a gap occurs between the transmission case and the transmission adaptor), probably it is caused by the reverse idle gear shaft that has not been installed correctly.
  (As for the installing procedure of the reverse idle gear shaft, see page MT–45.)

NOTE:
- Be sure to tighten the bolts alternatelly and diagonally (The right figure illustrallation indicates a the typical example of the tightening sequence).
- Apply the gear oil to the lip section of the oil seal so that the lip may be avoided from the turned over.

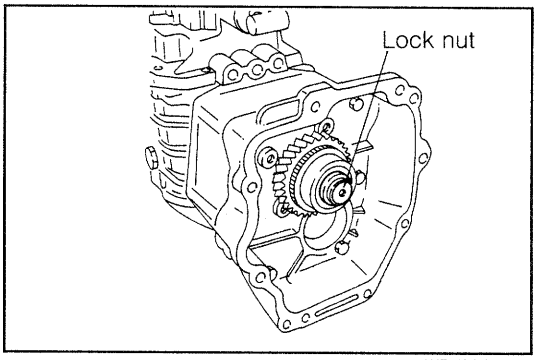
WRU90-MT234

30. Install the following parts in this sequence.
    (1) Transfer low speed input gear
    (2) Bearing



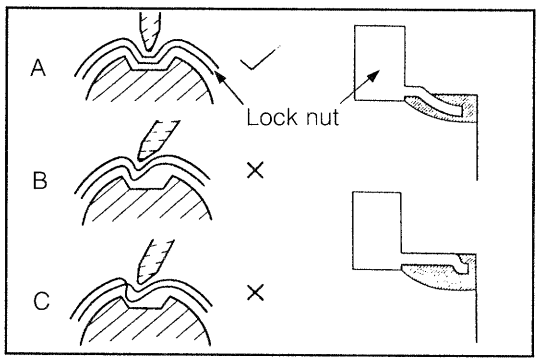
WRU90-MT235

31. Tighten the transfer low speed input gear by means of the lock nut. Stake the lock nut, using a chisel as below illustration securely.
    Tightening Torque:
    18.0 - 22.0 kg-m
    (130.0 - 159.0 ft-lb, 177.0 - 216.0 N·m)



WRU90-MT236

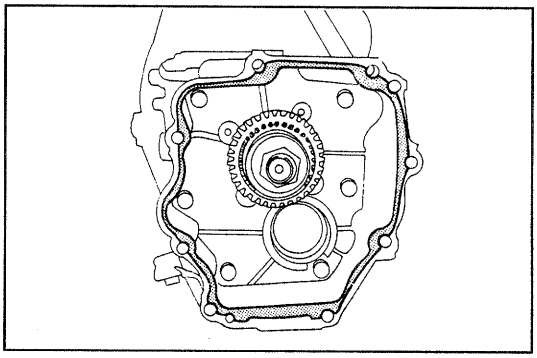
NOTE:
- When staking the lock nut, point a suitable staking tool toward the transmission output rear shaft axis center and stake to lock nut securely as shown in the right figure A.
- Poor staking may cause abnormal noise as shown in the right figure illustration B and C.



WRU90-MT237

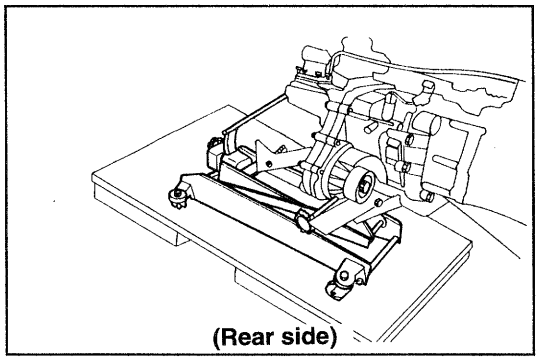
32. Apply the following bond to the mating surface between the transfer adapter and the transfer front case subassembly:
    Bond: THREE BOND 1216 (made by THREE BOND)

NOTE:
- Apply the bond to the inside of the bolt hole.
- Overlap the bond joints.



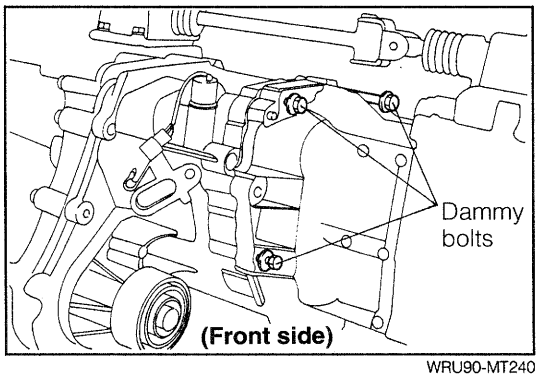
WRU90-MT238

33. Support the transfer front case subassembly and transfer rear case subassembly with a transmission jack.



WRU90-MT239

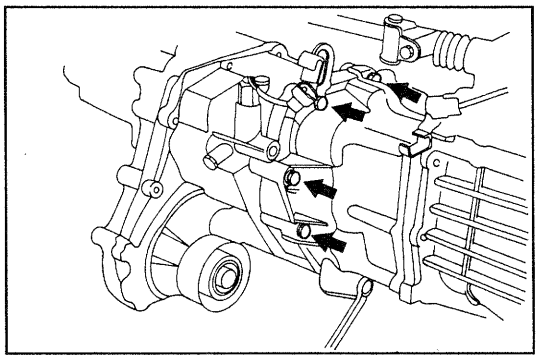
34. Press and hold down the transfer front case subassembly against the transfer adapter, and temporarily connect them using three to four dummy bolts.
CAUTION:
- The case of the transfer front case subassembly and that of the transfer adapter must be matched by slowly rotating the rear output shaft by hand until both sides have come into firm contact. Failure to observe the caution may bend the subgears, thus causing gear noise from the transmission.

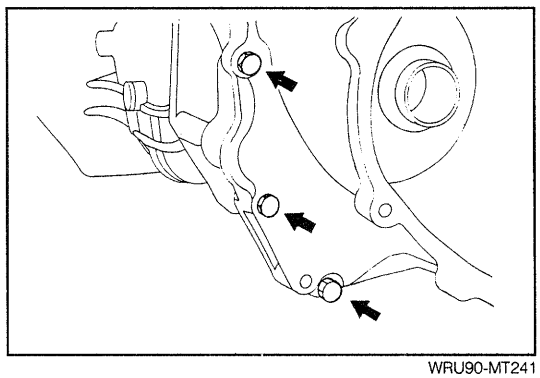


WRU90-MT240

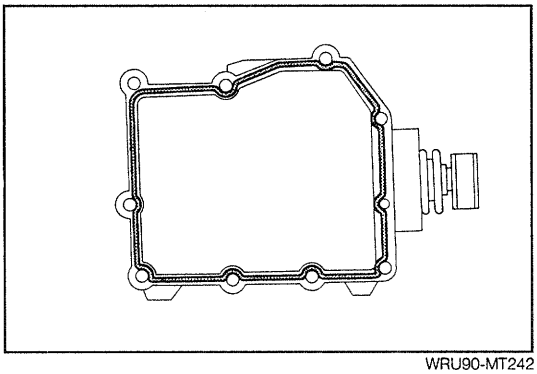
35. Tighten the transfer front case subassembly with the eight bolts.
Tightening Torque: 3.0 - 4.5 kg-m (21.7 - 32.5 ft-lb, 29.4 - 44.1 N·m)

NOTE:
- Apply the THREE BOND 1324 (made by THREE BOND) to the threaded sections of the bolts before tightening the transfer front case subassembly.

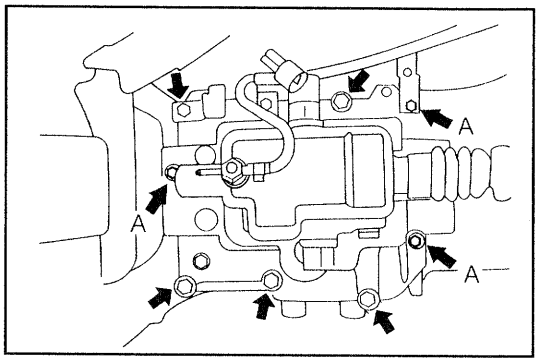



WRU90-MT241

36. Apply Three bond 1104 (Three bond made) to the transmission case cover attaching surface of the transmission case. Proceed to install the transmission case cover subassembly.
NOTE:
- Apply the bond to the inside of each bolt as shown in the diagram at right.


WRU90-MT242

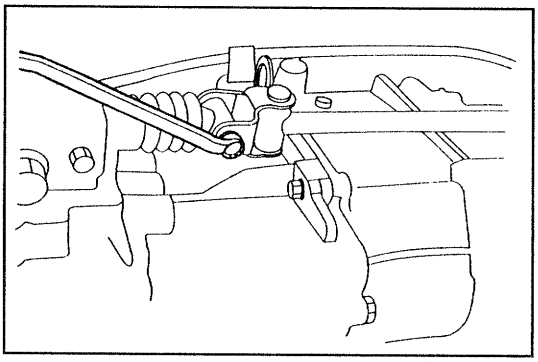
37. Install the transmission case cover subassembly, and tighten the bolts.
    NOTE:
    - Apply the THREE BOND 1324 (made by THREE BOND) to the threaded section of each bolt.
      Tightening Torque: 1.5 - 2.2 kg-m
      (10.8 - 15.9 ft-lb, 14.7 - 21.6 N·m)
      A-section
      0.7 - 1.0 kg-m (5.7 - 7.2 ft-lb, 6.9 - 9.8 N·m)



WRU90-MT243

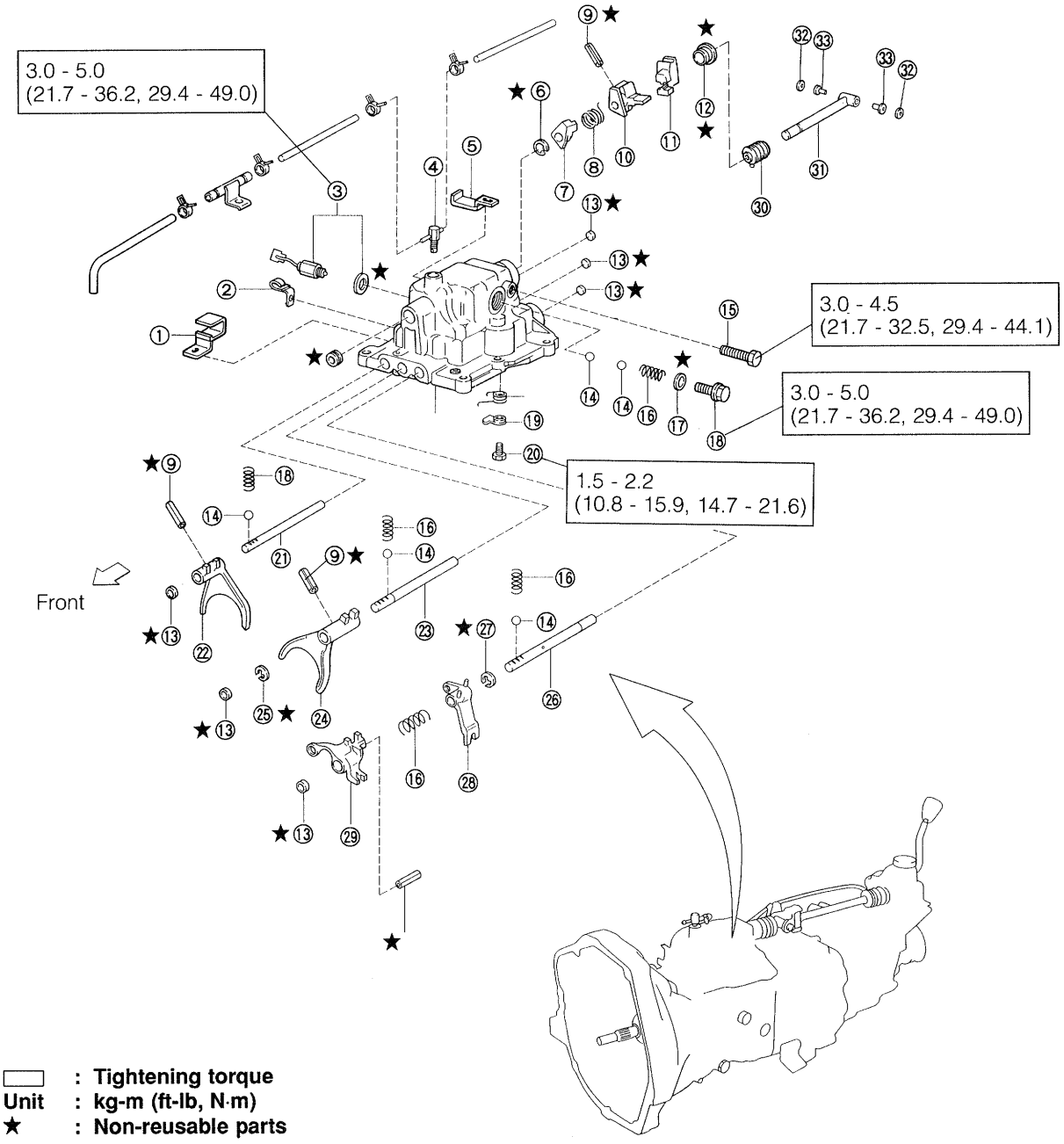
38. Install the shift lever retainer subassembly and the control shaft with a hexagon bolt (Use new hexagon bolt).
    Tightening Torque: 1.5 - 2.2 kg-m
    (10.8 - 15.9 ft-lb, 14.7 - 21.6 N·m)

39. Install the transmission assy with transfer to the vehicle (As for the installation procedures, see page MT–121 to MT–125).


WRU90-MT244

TRANSMISSION CASE COVER

COMPONENTS



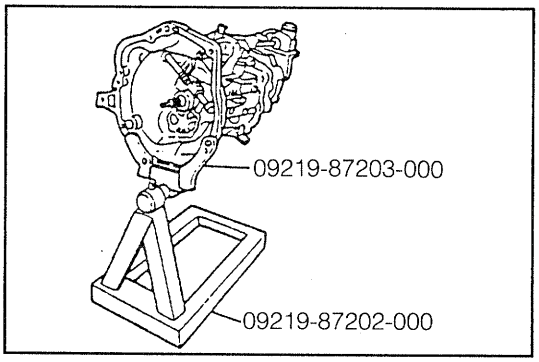
□ : **Tightening torque**
Unit : kg-m (ft-lb, N·m)
★ : **Non-reusable parts**

① Harness clamp
② Clamp
③ Backup lamp switch
④ Union
⑤ Harness clamp
⑥ Snap ring
⑦ Reverse restrict pin No. 2
⑧ Torsion spring
⑨ Slotted pin
⑩ Shift inner lever
⑪ Detent sleeve
⑫ Oil seal
⑬ Tight plug
⑭ Ball
⑮ Set bolt
⑯ Spring
⑰ Gasket
⑱ Reverse restrict pin holder
⑲ Shift fork lock plate
⑳ Bolt
㉑ 1st & 2nd shift fork shaft
㉒ 1st & 2nd shift fork
㉓ 3rd & 4th shift fork shaft
㉔ 3rd & 4th shift fork
㉕ "E" ring
㉖ 5th & reverse shift fork shaft
㉗ "E" ring
㉘ Reverse shift fork
㉙ Gear shift head No. 1
㉚ Control shaft boot
㉛ Shift & select shaft S/A
㉜ "O" ring
㉝ Bush
㉞ T/M case cover

WRU92-MT489

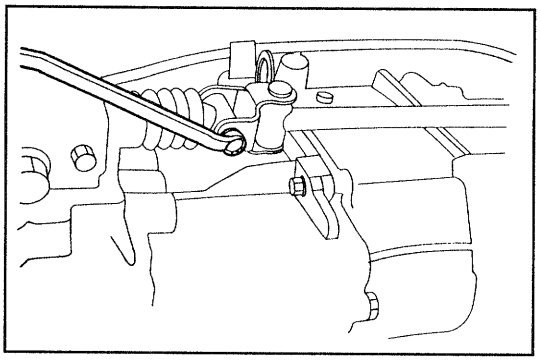
REMOVAL

1. Remove the transmission assembly with transfer from the vehicle.
2. Install the transmission assembly with transfer on the overhaul stand, using the following SSTs.
   SST: 09219-87202-000
   SST: 09219-87203-000

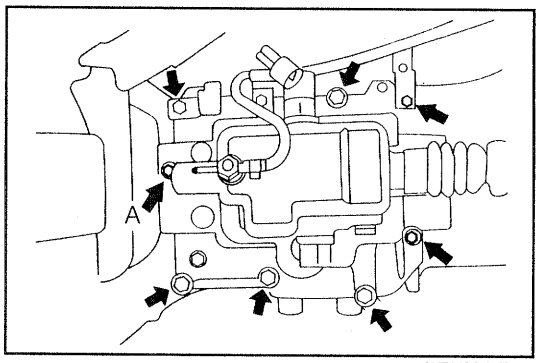


WRU92-MT490

3. Remove the shift lever retainer subassembly and the control shaft by removing the hexagon bolt.

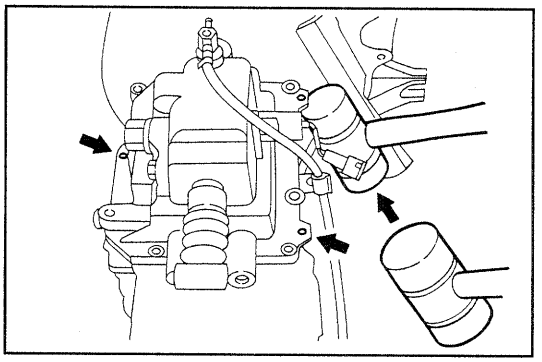

WRU90-MT247

4. Remove the transmission case cover subassembly by removing the seven bolts and a reamer bolt.



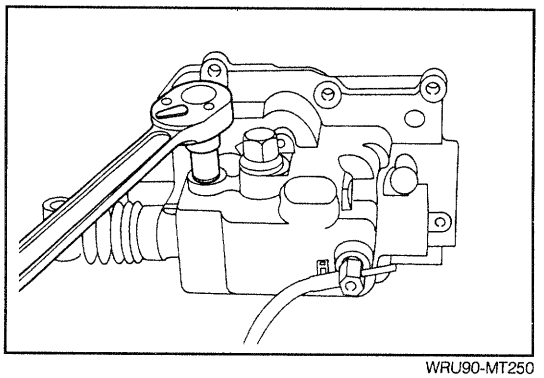
WRU90-MT248

5. Remove the transmission case cover subassembly by lightly tapping each of the ribs evenly toward the upper side of the transmission case.

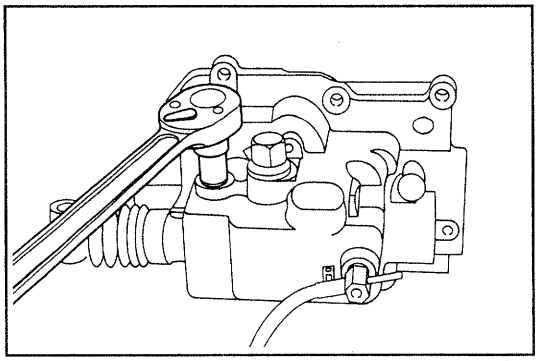

WRU90-MT249

DISASSEMBLY

1. Set the transmission case cover subassembly in a vice.

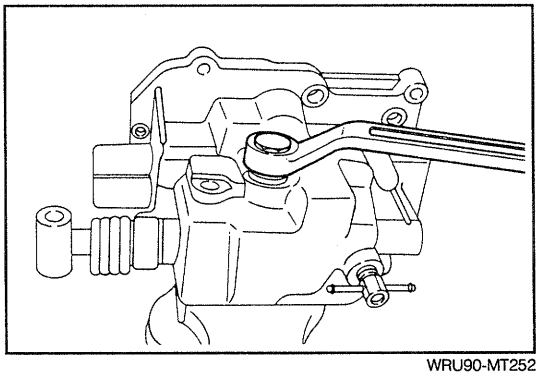

WRU90-MT250

2. Remove the set bolt and the spring lock washer.



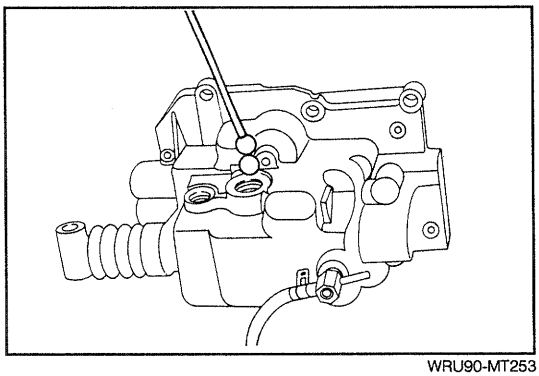
WRU90-MT251

3. Remove the reverse restrict pin holder, gasket and compression spring.



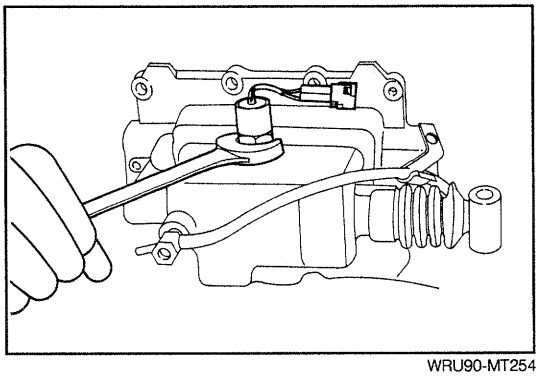
WRU90-MT252

4. Remove the two balls from the transmission case subassembly using a standard tool of magnet hand.



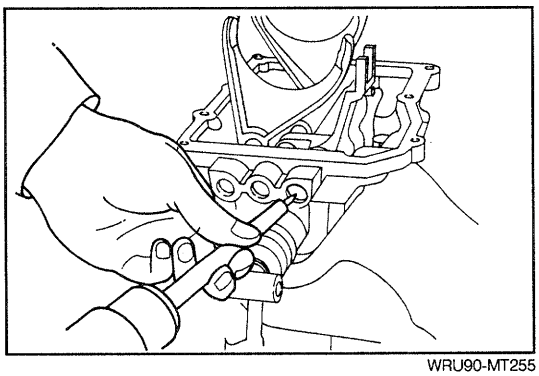
WRU90-MT253

5. Turn the transmission case cover subassembly through 180 degrees.
6. Remove the backup lamp switch assembly and the gasket.
   NOTE:
   - Never reuse the removed gasket.



WRU90-MT254

7. Remove the tight plugs in this sequence.
   (1) Set a sharp-edged rod to the end of each tight plug, and lightly tap the rod with a hammer.

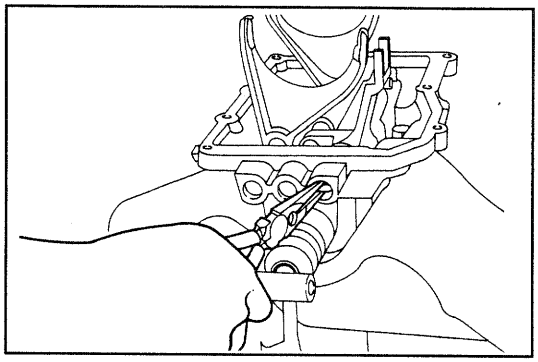


WRU90-MT255

(2) Rotate each tight plug through about 90 degrees, and pull them toward you with nose pliers or any other suitable tools.

NOTE:

- Never reuse the removed tight plugs.

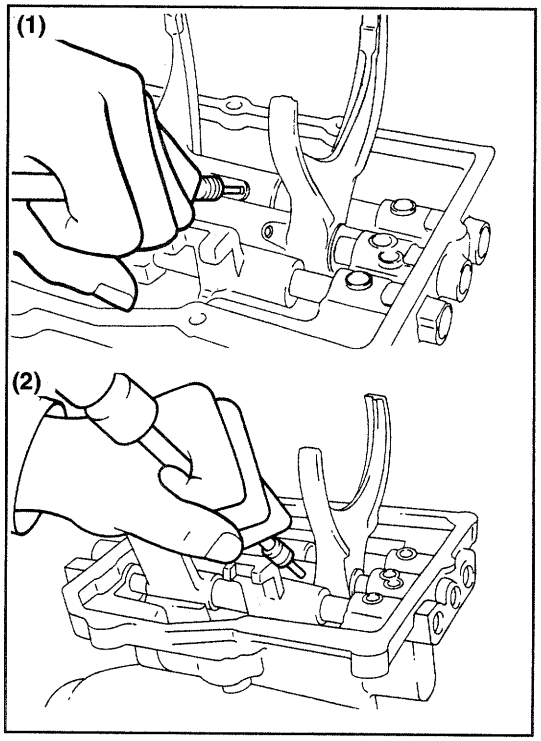


WRU90-MT256

8. Drive off the slotted pin of the following parts, using the pin ponch.
   (1) 1st & 2nd shift fork
   (2) 3nd & 4th shift fork

   NOTE:

   - Never reuse the removed slotted pin.

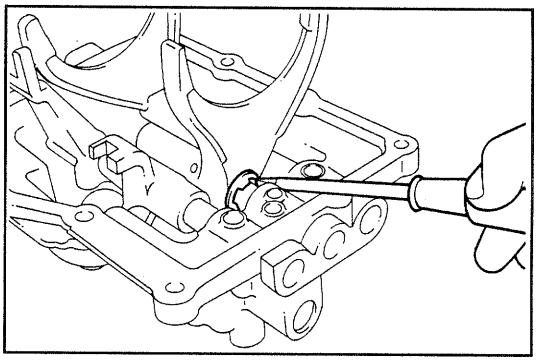


WRU90-MT257

9. Remove the E-ring of the 3rd & 4th shift fork shaft, using the standard tool of minus driver.

   NOTE:

   - Never reuse the removed E-ring.



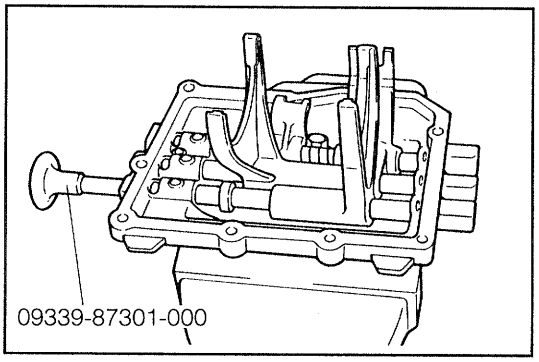
WRU90-MT258

10. Remove the 1st & 2nd shift fork shaft by inserting the following SST into the 1st & 2nd shift fork shaft hole of the transmission case cover subassembly and pushing those SST to the rear side.

    SST: 09339-87301-000

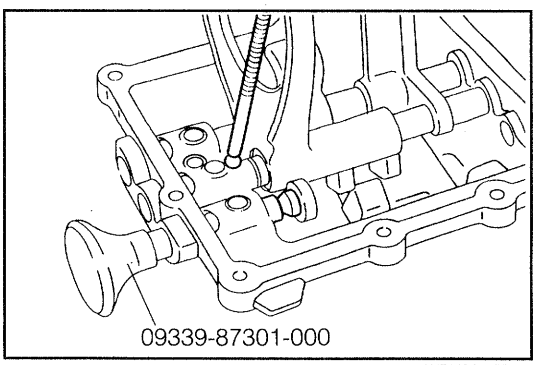
    NOTE:

    (1) Remove the shaft on both 3rd & 4th shift fork shaft and the 5th & reverse shift fork shaft in the same manner.

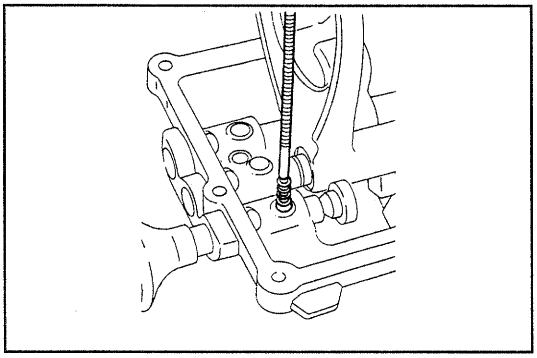


WRU90-MT259

(2) Remove the 1st & 2nd shift fork.
(3) Compress the ball and compression spring by inserting a small size SST to the shift fork shaft hole in the transmission case cover subassembly.
(4) Remove the shift fork shaft.
(5) Depress the small SST by inserting the large SST. remove the ball and compression spring, using the standard tool of magnet hand by rotating the SST either clockwise or couterclockwise.

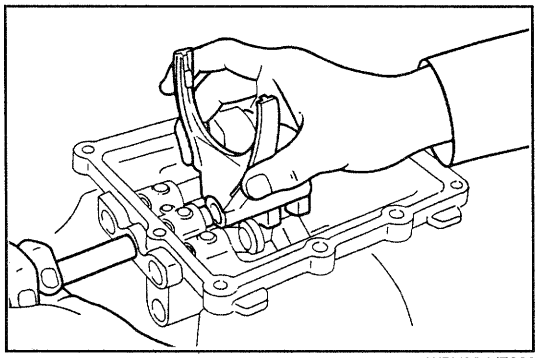


WRU90-MT260

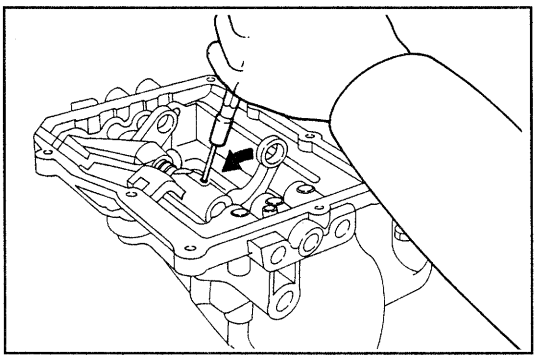

WRU90-MT261

11. Remove the 3rd & 4th shift fork shaft, using the following SST:
SST: 09339-87301-000

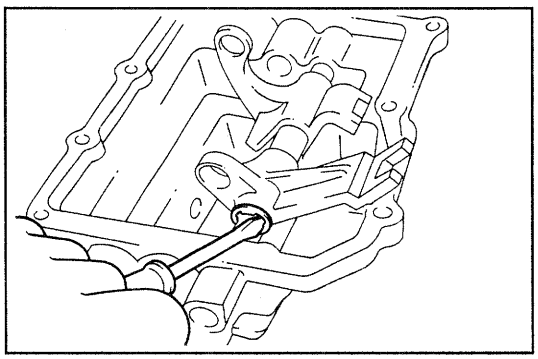
NOTE:
- Removal of shift fork shaft is same manner with the 1st & 2nd shift fork shaft.


WRU90-MT262

12. Drive off the slotled pin using the pin panch, while the gear shift No. 1 head is being tiltted.
13. Remove the gear shift No. 1 head with the slotted pin intalled from the 5th & reverse shift fork shaft.
NOTE:
- Never reuse the removed slotted pin.

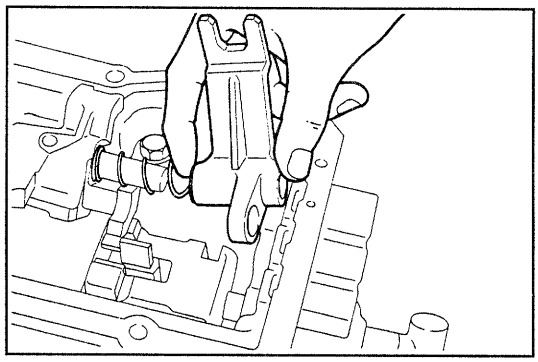

WRU90-MT263

14. Remove the E-ring of the 5th & reverse shift fork shaft, using the standard tool of minus driver.
NOTE:
- Never reuse the removed E-ring.


WRU90-MT264

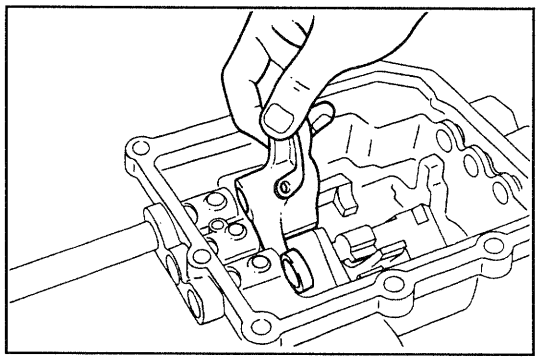
15. Remove the 5th & reverse shift fork shaft, using the following SST.
    SST: 09339-87301-000

    NOTE:
    - **Removal of shift fork shaft is same manner with the 1st & 2nd shift fork shaft.**



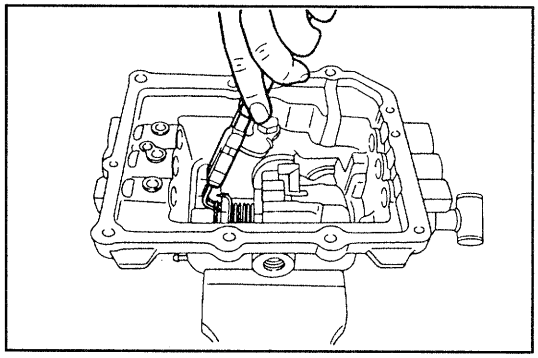
WRU90-MT265

16. Remove the gear shift No. 1 head and the compression spring, while pulling out the 5th & reverse shift fork shaft to ward you.
17. With the same manner to that of the above operation, remove the reverse shift fork.



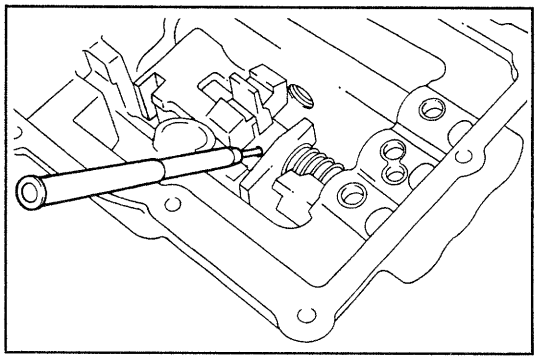
WRU90-MT266

18. Detach the snap ring of the shift & select shaft No. 1 and slightly move to toward the and of transmission case cover subassembly.



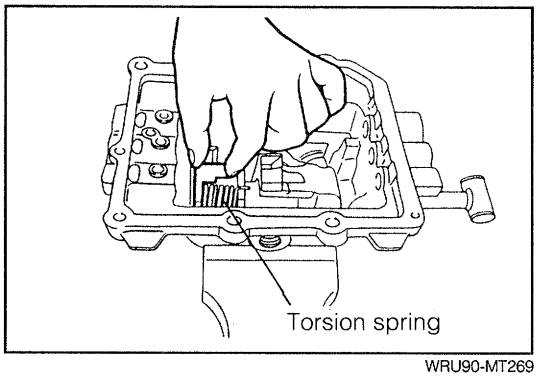
WRU90-MT267

19. Drive off the slotted pin of the shift inner lever.
    When driving off the slotted pin, tilt the shift inner lever as large angle as possible, while enabling the knock pin to be used.
    If the slotted pin is driven off vertically, the movement of the gear shift head NO.1 may be prevented due to contact of the slotted pin with the transmission case cover.



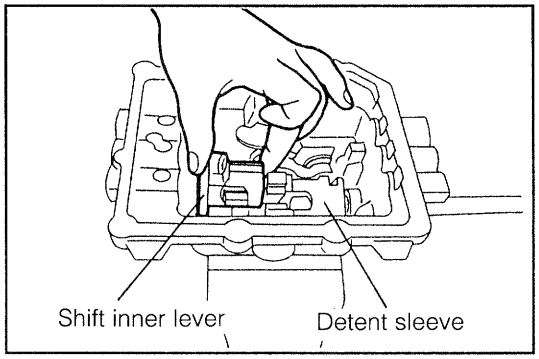
WRU90-MT268

20. Remove the reverse restrict pin and torsion spring.



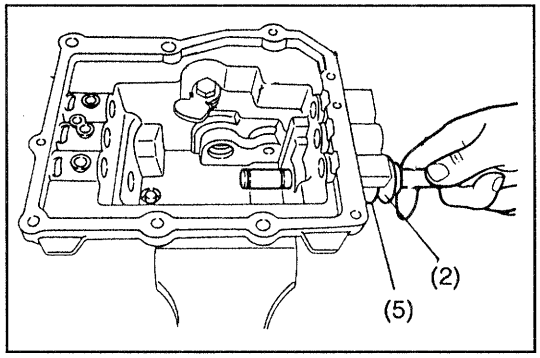
WRU90-MT269

21. Remove the shift inner lever and detent sleeve.



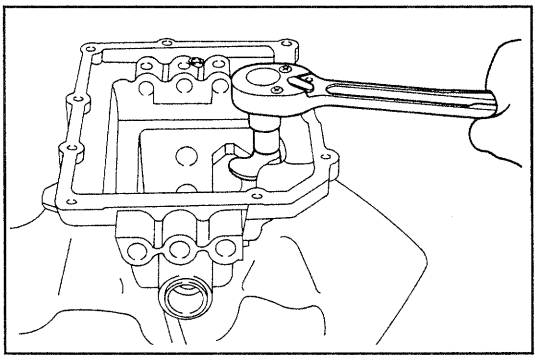
WRU90-MT270

22. Remove the shift & select shaft No. 1 with control shaft boot installed.

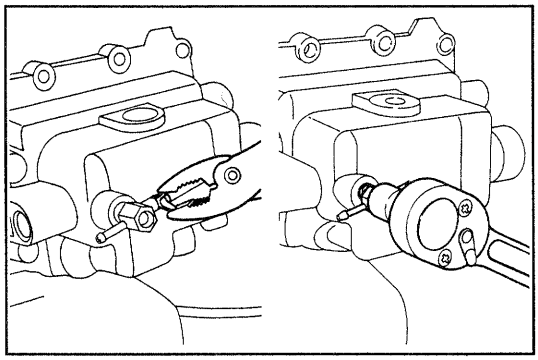


WRU90-MT271

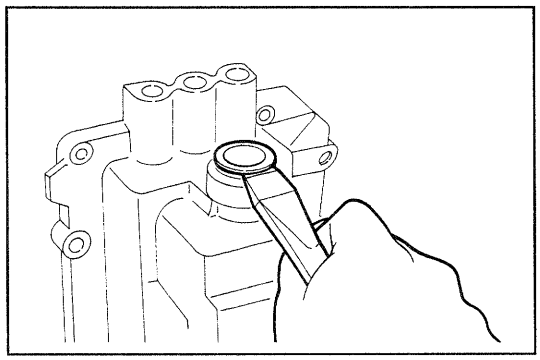
23. Remove the shift fork lock plate and torsion spring by removing the hexagon bolt.


WRU90-MT272

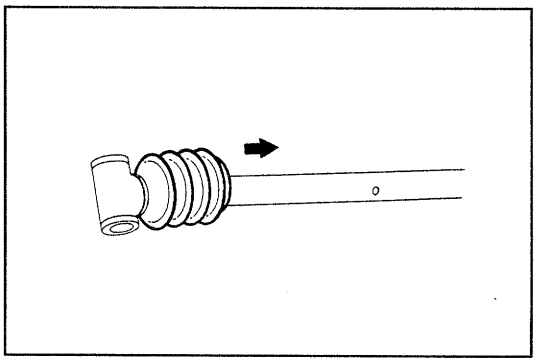
24. Disconnect clamp of the breather hose.
25. Remove the union.


WRU90-MT273

26. Remove the oil seal, using the chisel or the like.
NOTE:
- **Never reuse the removed oil seal.**


WRU90-MT274

27. Remove the control shaft No. 2 boots from the shift & select shaft subassembly.



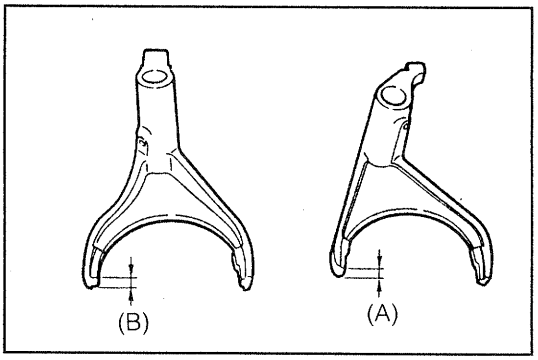
WRU90-MT275

INSPECTION

1. Measure the contact width of each shift fork with the hub sleeve, using vernier calipers.

mm (inch)

Item / Part name	Specified value	Allowable limit
1st & 2nd shift fork Dimension (A) in right figure	6.80 - 7.00 (0.2677 - 0.2756)	6.3 (0.2480)
3rd & 4th shift fork dimension (B) in right figure	6.80 - 7.00 (0.2677 - 0.2756)	

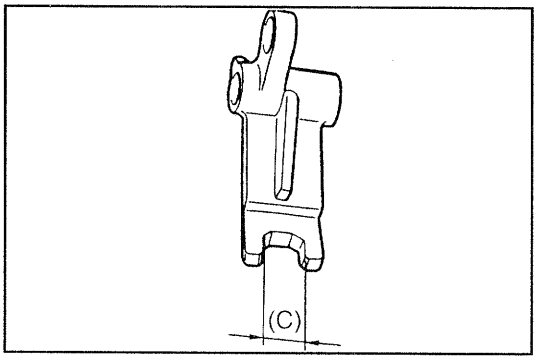


WRU90-MT276

2. Measure the contact width of the reverse shift fork with the reverse shift arm, using vernier calipers.

mm (inch)

Item / Part name	Specified value	Allowable limit
Reverse shift fork Dimension (C) in right figure	15.000 - 15.043 (0.5906 - 0.5922)	15.1 (0.5945)

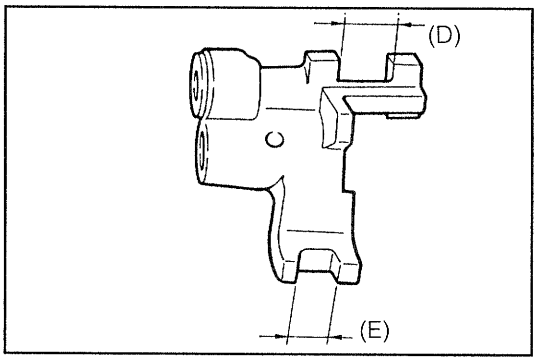


WRU90-MT277

3. Measure the contact width of the gear shift head No. 1 with 5th shift arm, using vernier calipers.

mm (inch)

Item / Part name	Specified value	Allowable limit
Gear shift head No. 1 Dimension (D) in right figure	16.1 - 16.2 (0.6339 - 0.6378)	16.7 (0.6575)
Gear shift head No. 1 Dimension (E) in right figure	12.1 - 12.2 (0.4764 - 0.4803)	12.7 (0.5000)

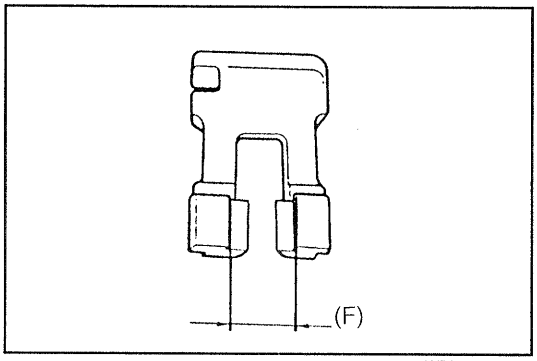


WRU90-MT278

4. Measure the dimension (F) of the detent sleeve shown in the right figure, using vernier calipers.

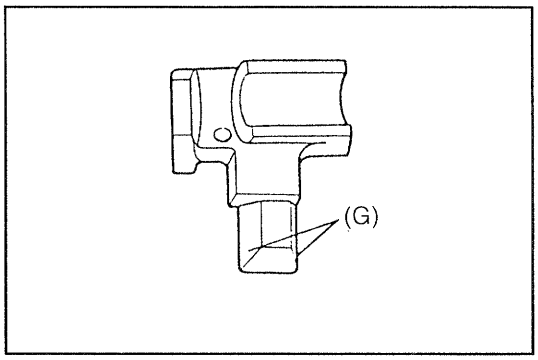
mm (inch)

Item / Part name	Specified value	Allowable limit
Detent sleeve Dimension (F) in right figure	18.8 - 19.2 (0.7402 - 0.7559)	19.5 (0.7677)



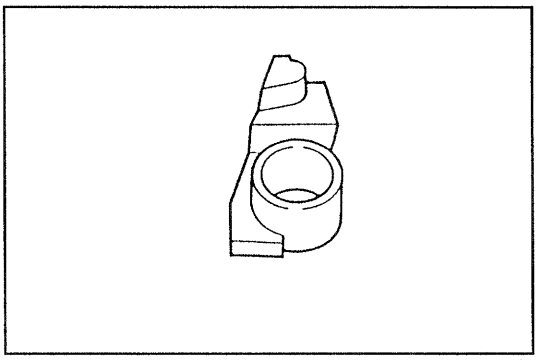
WRU90-MT279

5. Visually inspect the shift inner lever (G) for wear or damage.



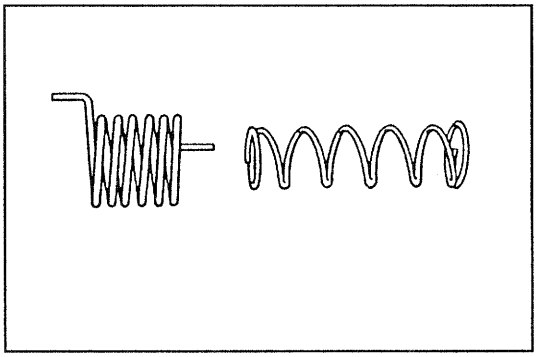
WRU90-MT280

6. Visually inspect the reverse restrict pin No. 2 for wear or damage.



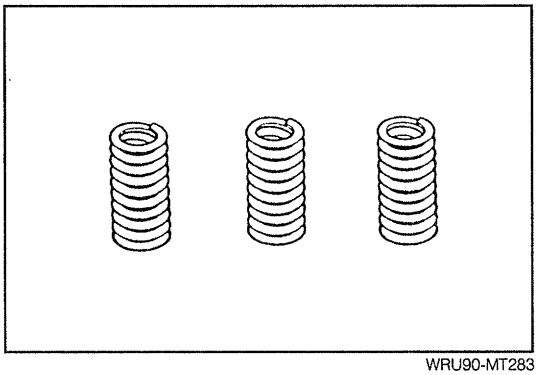
WRU90-MT281

7. Check the spring for damage.



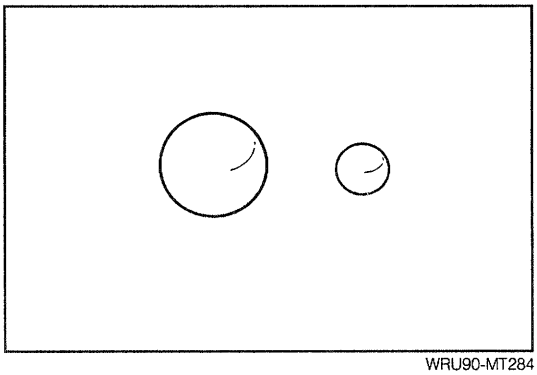
WRU90-MT282

8. Check the spring of the shift fork shaft for damage.



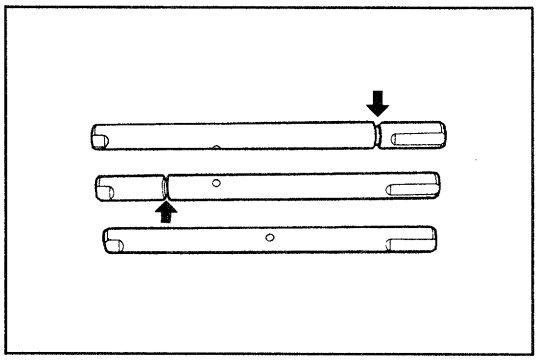
WRU90-MT283

9. Check the balls of the reverse restrict pin holder and shift fork shaft for wear of damage.



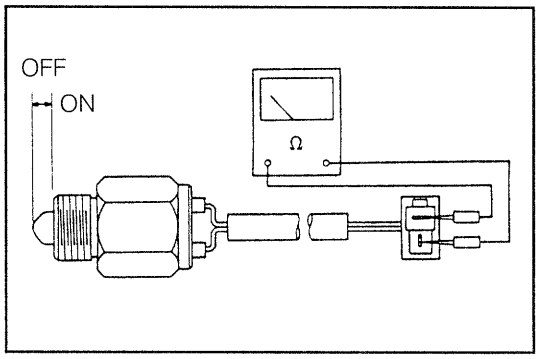
WRU90-MT284

10. Visually inspect the outer periphery of the shift fork shaft for wear, or damage.



WRU90-MT285

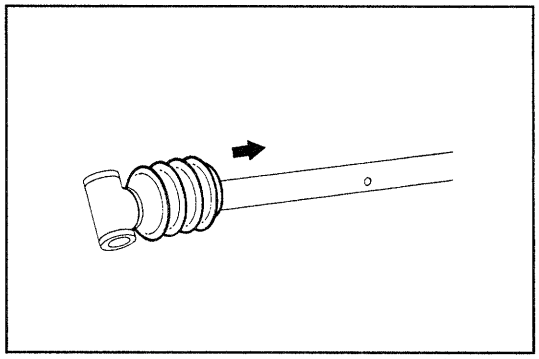
11. Turn ON and OFF the switch section of the backup lamp switch assembly. Ensure that continuity exists when the switch is turned ON. Also, ensure that no continuity exists when the switch is turned OFF.



WRU90-MT400

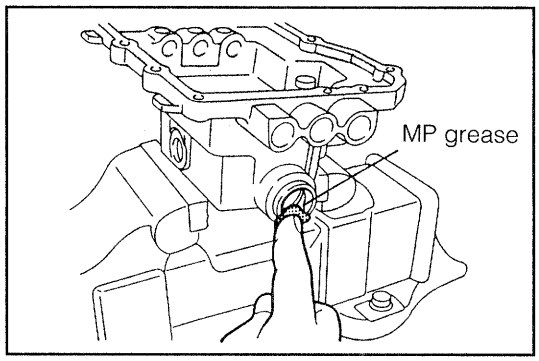
ASSEMBLY

1. Insert the control shaft No. 2 boots to the shift & select shaft subassembly.



WRU90-MT286

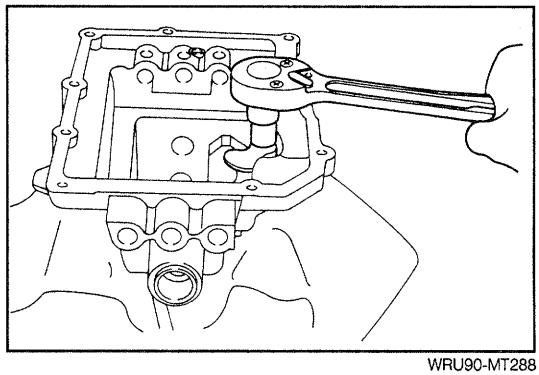
2. Apply Lithium base multi purpose grease to the lip section of the oil seal and then, drive the oil seal into the transmission case cover, using a hammer in combination with a wooden block interposed.



WRU90-MT287

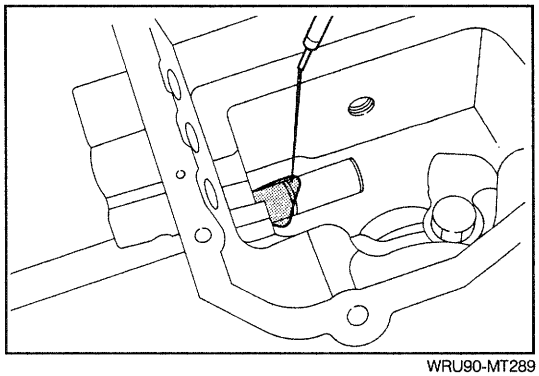
3. Apply the Three bond 1324 to the threaded section of the hexagon bolt.
4. Install the torsion spring and shift fork lock plate and then, tighten the hexagon bolt.

Tightening Torque:
1.5 - 2.2 kg-m (10.8 - 15.9 ft-lb, 14.7 - 21.6 N·m)



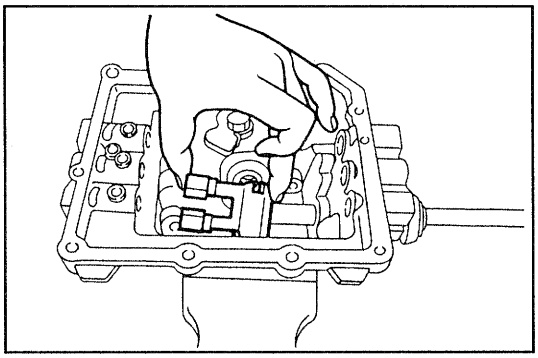
WRU90-MT288

5. Apply the gear oil to the outer periphery of the shift & select shaft No. 1.



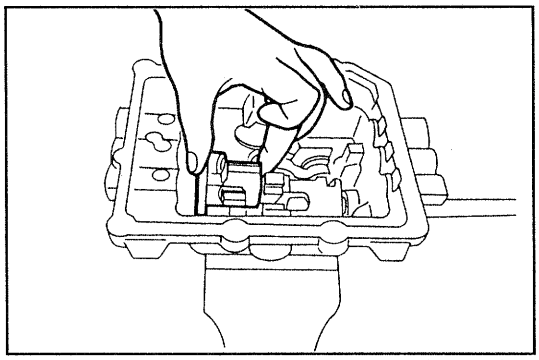
WRU90-MT289

6. Install the detent sleeve to the shift & select shaft No. 1.



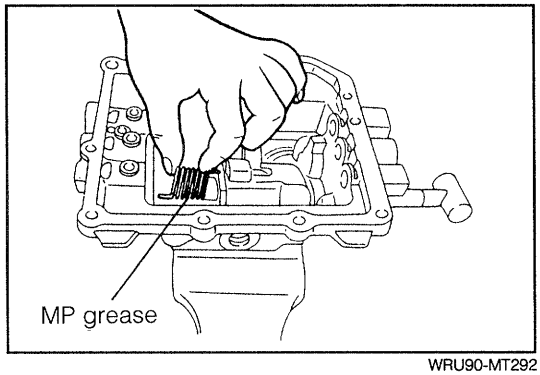
WRU90-MT290

7. Install the shift inner lever to the shift & select shaft No. 1.



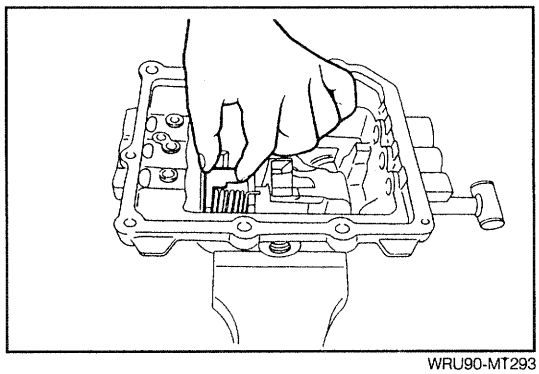
WRU90-MT291

8. Install the torsion spring to the shift & select shaft No. 1.
   NOTE:
   - Apply Lithium base multi purpose grease to the torsion spring installation section of the shift & select shaft No. 1.



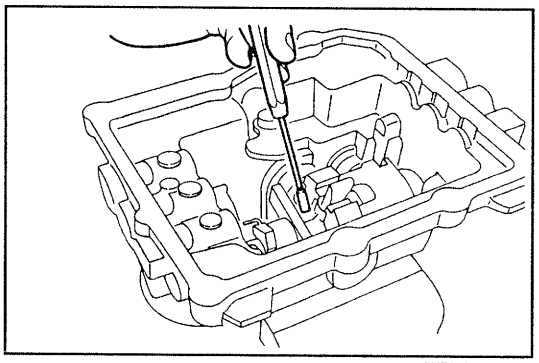
WRU90-MT292

9. Install the reverse restrict pin to the shift & select shaft No. 1. Temporarily attach the new snap ring.
   NOTE:
   - Never reuse the removed snap ring.

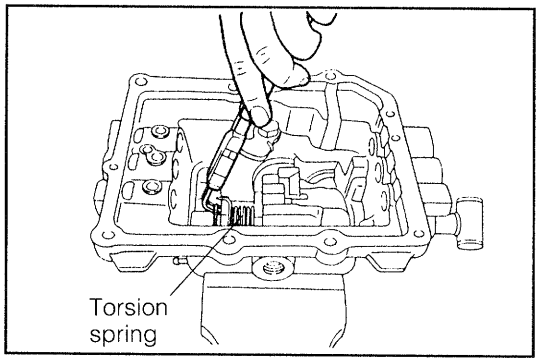


WRU90-MT293

10. Secure the shift inner lever by driving the new slotted pin into position.
NOTE:
- Never reuse the removed slotted pin.

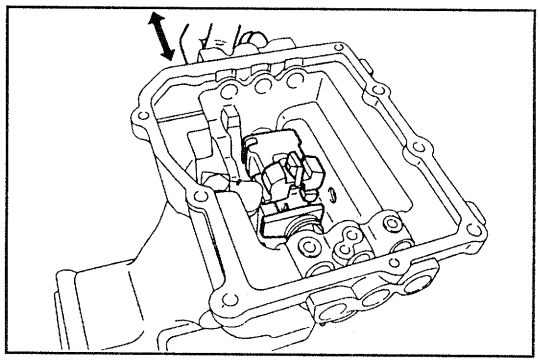

WRU90-MT294

11. Attach the snap ring into the groove section of the shift & select shaft No. 1 securely, while the torsion spring is being compressed with your fingers.

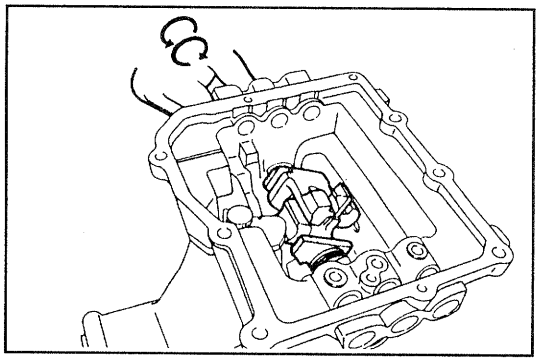


WRU90-MT295

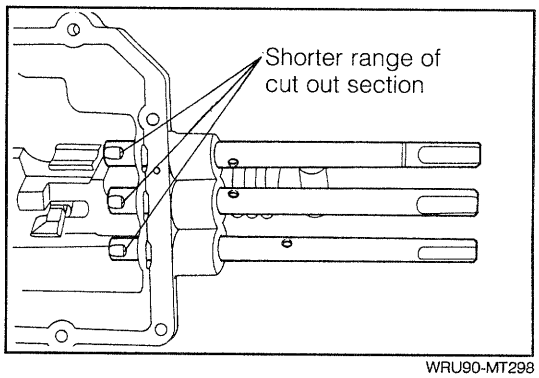
12. Inspection of operation
(1) Move the shift & select shaft No. 1 in the shifting direction. Ensure that it operates smoothly.


WRU90-MT296

(2) Move the shift & select shaft No. 1 in the selecting direction. Ensure that it operates smoothly.

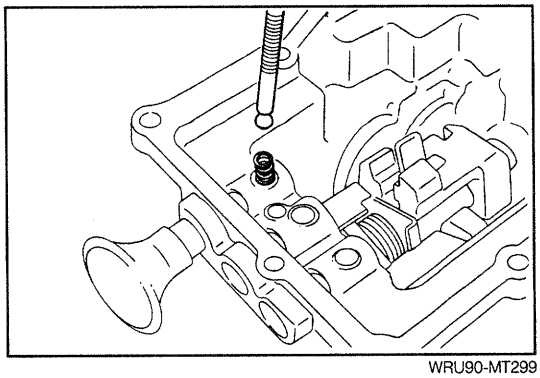

WRU90-MT297

13. Install the following shift fork shaft.
(1) 1st & 2nd shift fork shaft
(2) 3rd & 4th shift fork shaft
(3) 5th & reverse shift fork shaft
NOTE:
- Make sure that the shorter range of cut out section faces toward the front side as shown in the right figure illustration.

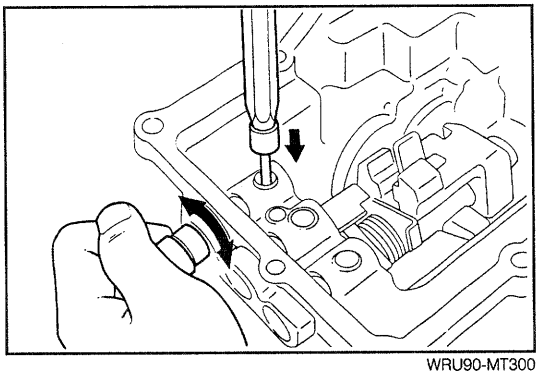


WRU90-MT298

14.
(1) Insert the large-sized SST into the shift fork shaft of the transmission case cover.
(2) Install the compression spring and ball in this sequence.

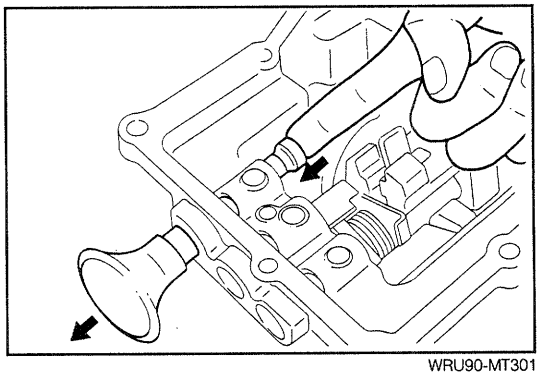

WRU90-MT299

(3) Turn the SST 90 degrees while pushing down the ball by means of a pin punch or the like.

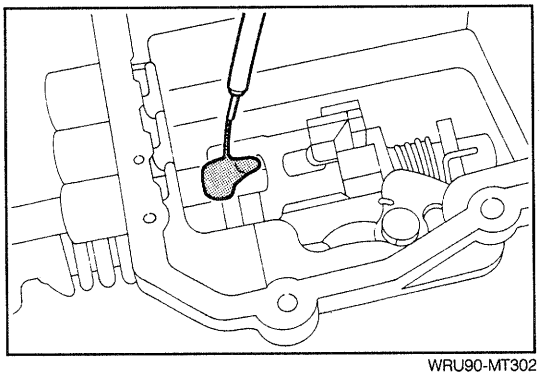

WRU90-MT300

(4) Insert the small-sized SST into position from the transmission case cover.
(5) Remove the large-sized SST by pushing the small-sized SST with your fingers.
(6) Install the 5th & reverse shift fork shaft by pushing the small-sized SST.

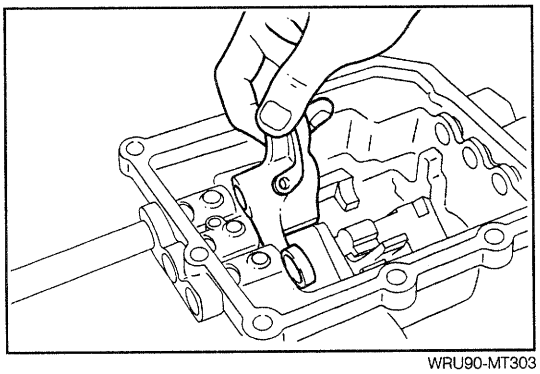
NOTE:
- **At this stage, install the compression springs and balls for the 1st & 2nd and 3rd & 4th shift fork shafts in the transmission case cover subassembly, following the aforesaid procedure.**


WRU90-MT301

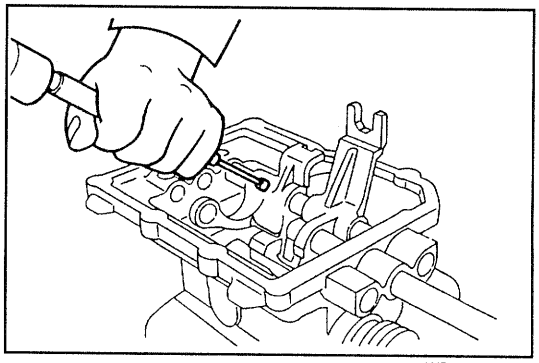
15. Apply the gear oil to the 5th & reverse shift fork shaft and then, insert them into the position.


WRU90-MT302

16. Install the reverse shift fork to the 5th & reverse shift fork shaft.
17. Install the gear shift No. 1 head in the 5th & reverse shift fork shaft.

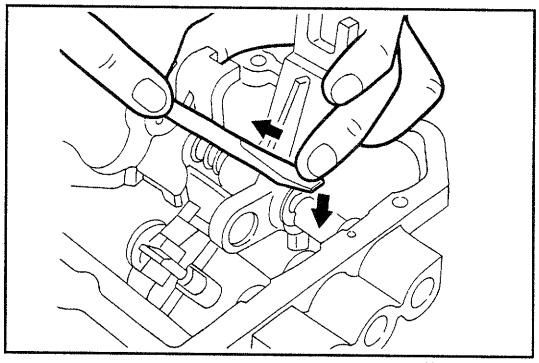

WRU90-MT303

18. Drive the new slotted pin into the gear shift No. 1 head securely.



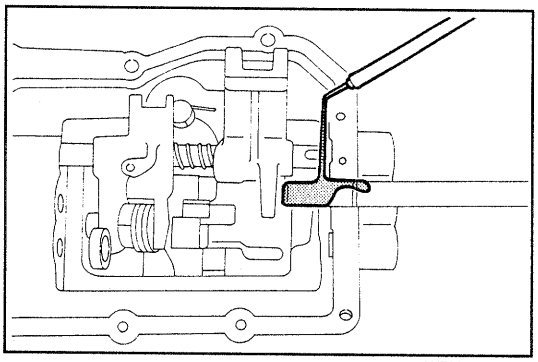
WRU90-MT304

19. Attach the new "E" ring, while the reverse shift fork is being compressed with your fingers.



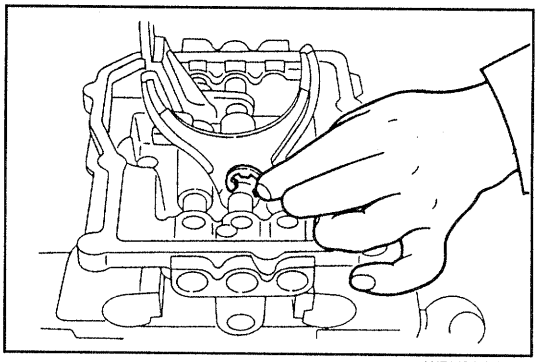
WRU90-MT305

20. Install the 3rd & 4th shift fork shaft to the transmission case cover subassembly.
NOTE:
- Apply the gear oil to the outer periphery of the 3rd & 4th shift fork shaft, prior to install.



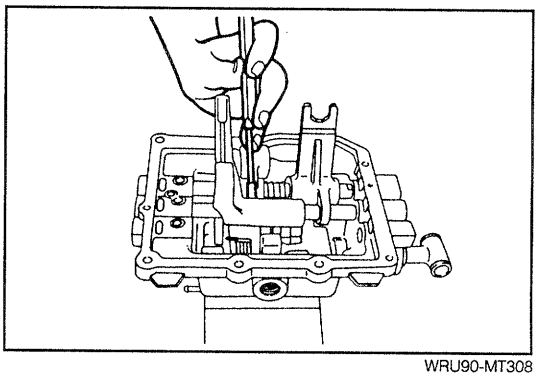
WRU90-MT306

21. Attach the new "E" ring to the 3rd & 4th shift fork.



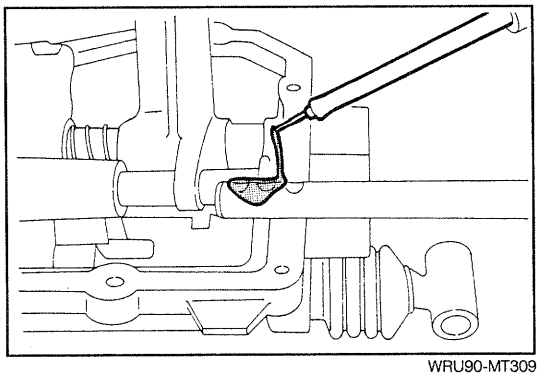
WRU90-MT307

22. Secure the 3rd & 4th shift fork shaft and 3rd & 4th shift fork by driving the new slotted pins.

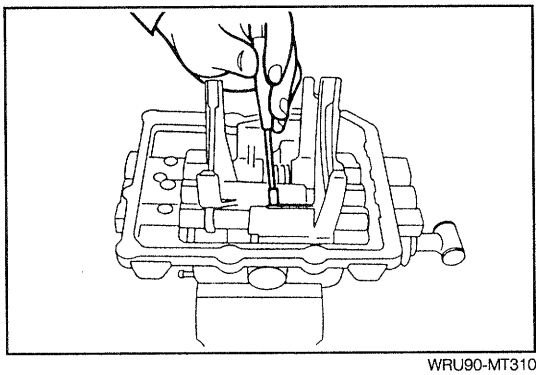


WRU90-MT308

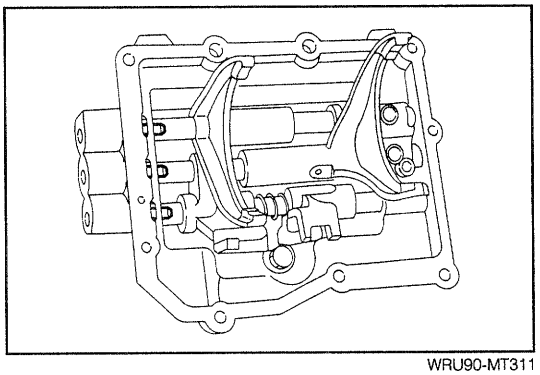
23. Install the 1st & 2nd shift fork shaft to the transmission case cover subassembly.
NOTE:
- Apply the gear oil to the outer periphery of the 1st & 2nd shift fork shaft prior to install.


WRU90-MT309

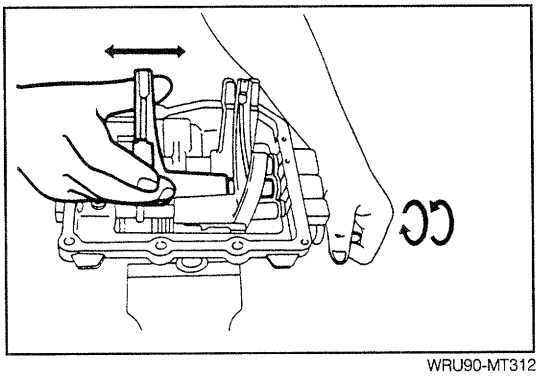
24. Secure the 1st & 2nd shift fork shaft and 1st & 2nd shift fork by driving the new slotted pins.
NOTE:
- Never reuse the removed slotted pin.


WRU90-MT310

25. Move the shift fork shafts to put the gear into the neutral position.
NOTE:
- Make sure that the long notch sections of the shift fork shafts are arranged uniformly.

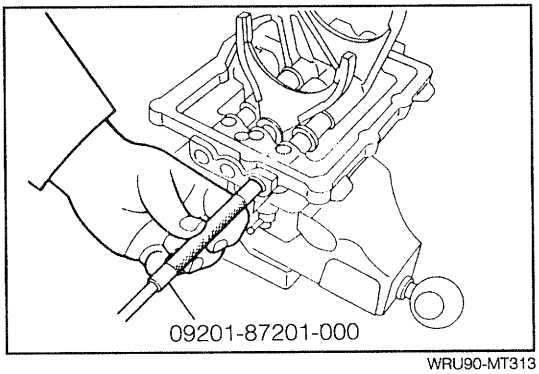

WRU90-MT311

26. Inspection of operation
Select the shift & select shaft No. 1 to each control shaft. Move the shift & select shaft No. 1 in the shifting direction. Ensure that the shift & select shaft No. 1 operates smoothly without any binding.


WRU90-MT312

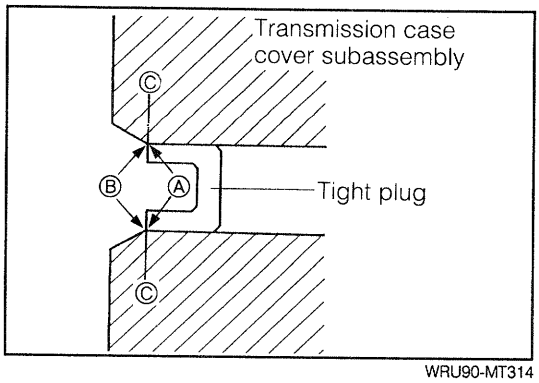
27. Apply the Three bond 1104 (Three bond made) to the new tight plug. Press all tight plugs into position, using the following SST.
SST: 09201-87201-000

NOTE:
- Never reuse the removed tight plug.



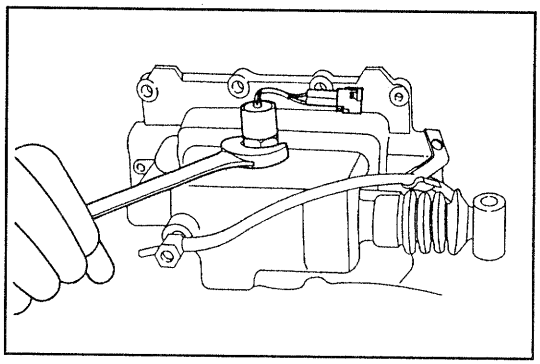
WRU90-MT313

- Visually inspect that the both edge in the tight plugs Ⓐ and chamber in the transmission case cover Ⓑ should the well matched with the vertical line Ⓒ as shown in the right figure illustration.

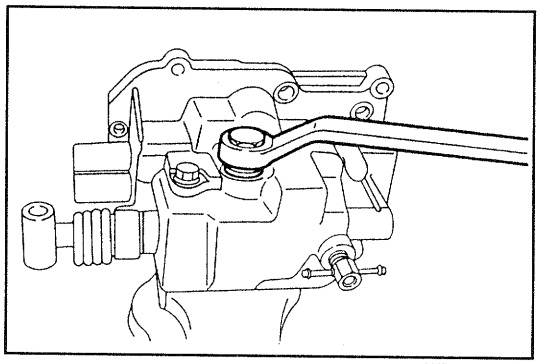


WRU90-MT314

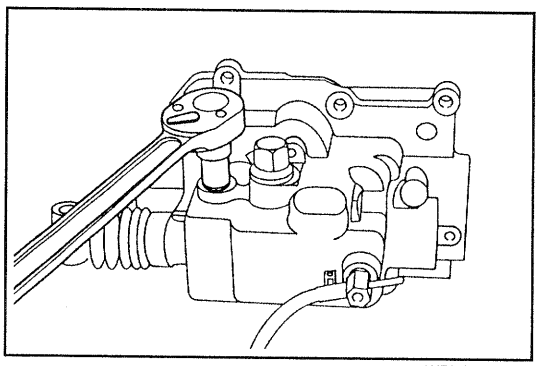
28. Turn the transmission case cover subassembly upside down, and then tighten the backup lamp switch assembly (use a new gasket).
    Tightening Torque:
    3.0 - 5.0 kg-m (21.7 - 36.0 ft-lb, 29.4 - 49.0 N·m)


WRU90-MT315

29. Tighten the reverse restrict pin with the two balls and compression spring (use new gasket).
    Tightening Torque:
    3.0 - 5.0 kg-m (21.7 - 36.0 ft-lb, 29.4 - 49.0 N·m)

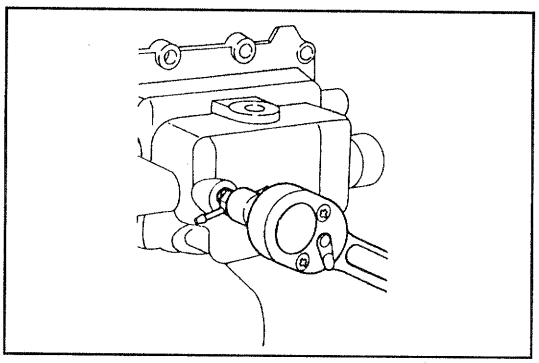

WRU90-MT316

30. Tighten the set bolt with a spring washer.
    Tightening Torque:
    3.0 - 4.5 kg-m (21.7 - 32.5 ft-lb, 29.4 - 44.1 N·m)

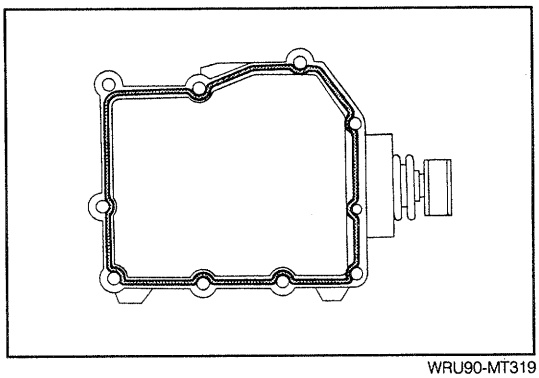

WRU90-MT317

31. Apply the THREE BOND 1214 (made by THREE BOND) to the threaded sections of the union, and tighten the union.
    Tightening Torque:
    1.3 - 1.6 kg-m (9.4 - 11.6 ft-lb, 12.7 - 15.7 N·m)

    NOTE:
    - The unions must be parallel in their longitudinal directions.

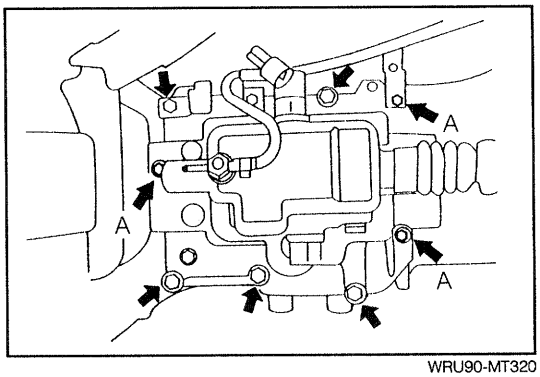

WRU90-MT318

32. Connect the breather hose to the union with a clamp.
33. Apply the Three bond 1216 (Three bond made) to the transmission case cover attaching surface of the transmission case.
    NOTE:
    - Apply the bond to the inside of the bolt hole, as shown in the right figure illustration.



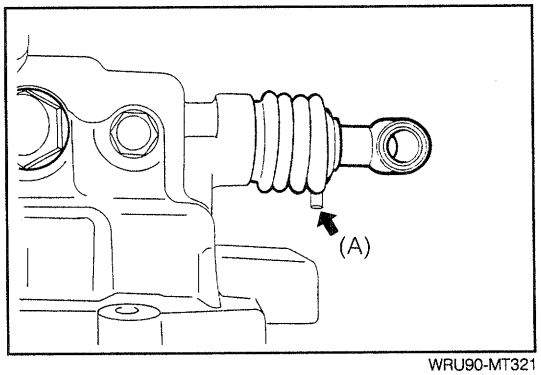
WRU90-MT319

34. Install the transmission case cover subassembly, and tighten the mounting bolts.
    Tightening Torque:
    1.5 - 2.2 kg-m (10.8 - 15.9 ft-lb, 14.7 - 21.6 N·m)
    A-section
    0.7 - 1.0 kg-m (5.7 - 7.2 ft-lb, 6.9 - 9.8 N·m)



WRU90-MT320

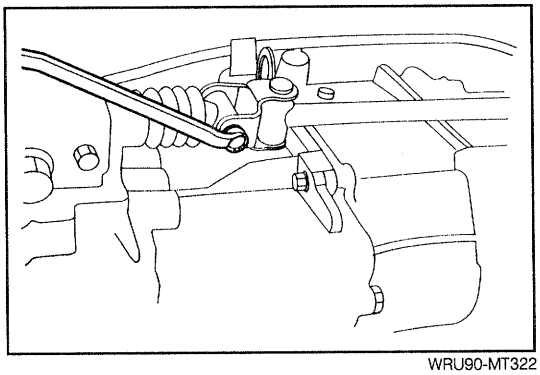
35. Install fit the control shaft No. 2 boot to the oil seal groove section securely.
    NOTE:
    - Air breeding holl (A) in the control shaft No. 2 faces toward with the transmission A/y.



WRU90-MT321

36. Bolt down and tighten the shift lever retainer assembly and the control shaft.
    Tightening Torque:
    1.5 - 2.2 kg-m (10.8 - 15.9 ft-lb, 14.7 - 21.6 N·m)

    NOTE:
    - Apply the THREE BOND 1324 (made by THREE BOND) to the threaded sections of the bolts.



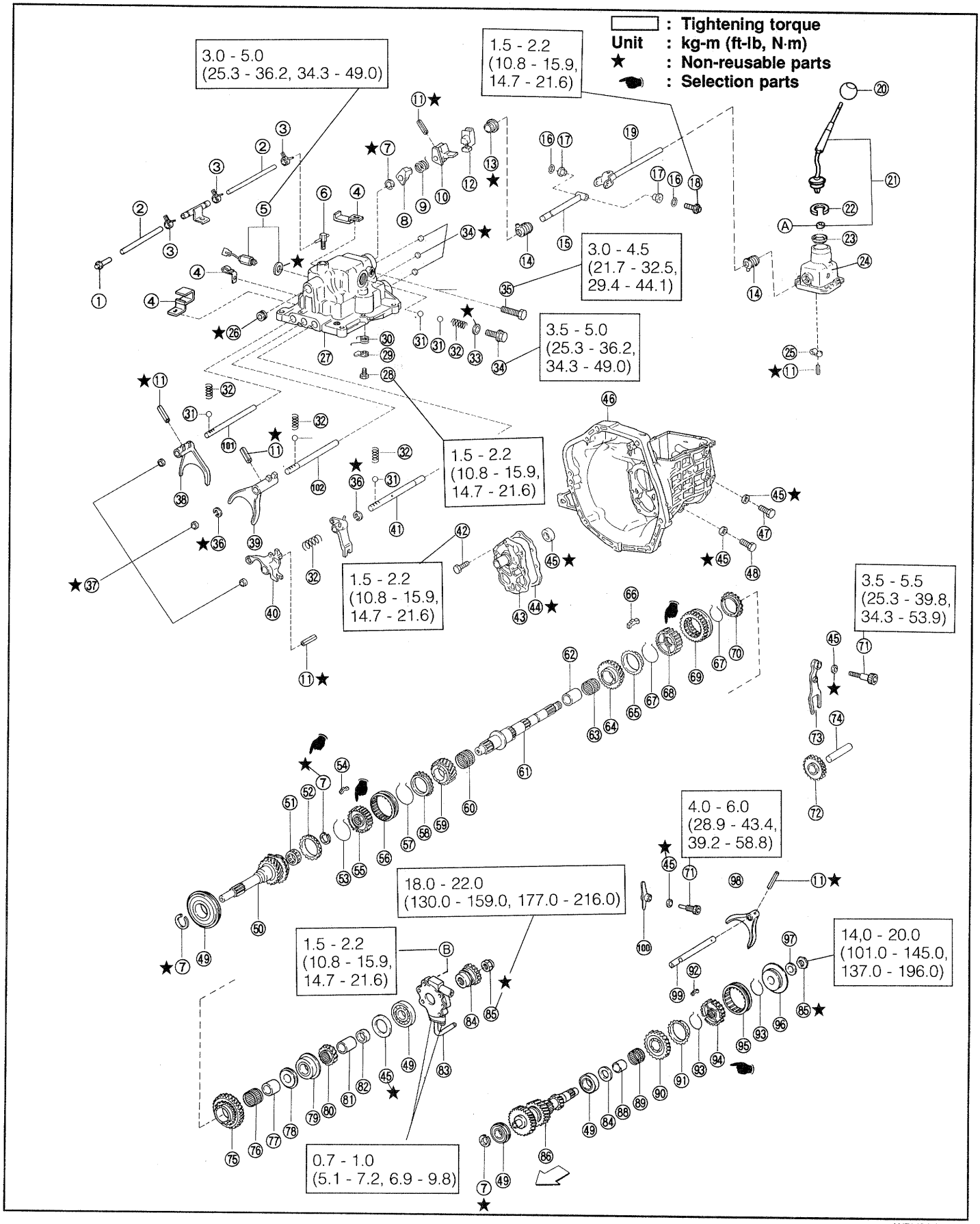
WRU90-MT322

37. Install the transmission assembly with transfer to the vehicle (As for the installation procedure, see page MT–105 to MT–109).

WRU92-MT500

TRANSMISSION

COMPONENTS



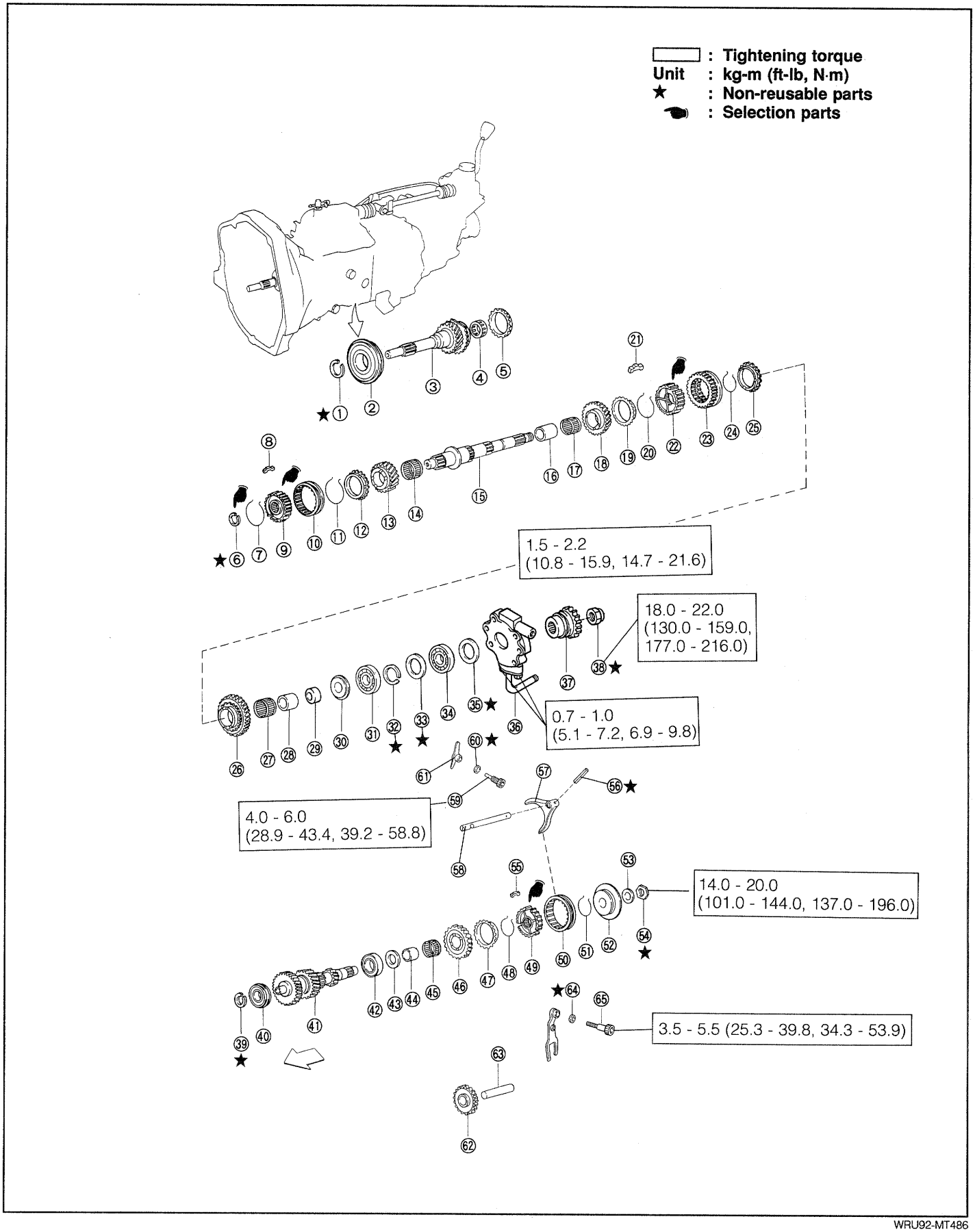
WRU92-MT491

① 2 way
② Breather hose
③ Clip
④ Clamp
⑤ Back up lamp switch
⑥ Union
⑦ Snap ring
⑧ Reverse restrict pin No. 2
⑨ Torsion spring
⑩ Shift inner lever
⑪ Slotted pin
⑫ Detent sleeve
⑬ Oil seal
⑭ Shift & select shaft No. 1 boot
⑮ Shift & select shaft
⑯ "O" ring
⑰ Bush
⑱ Bolt
⑲ Control shaft
⑳ T/M control shift knob
㉑ T/M shift lever assy (A: Bush)
㉒ Snap ring
㉓ T/M shift lever ball seat
㉔ Shift lever retainer S/A
㉕ Shift lever outer
㉖ Tight plug
㉗ T/M case cover
㉘ Bolt
㉙ Shift lock plate
㉚ Torsion spring
㉛ Ball
㉜ Spring
㉝ Gasket
㉞ Bolt
㉟ Bolt
㊱ "E" ring
㊲ Tight plug
㊳ 1st & 2nd shift fork
㊴ 3rd & 4th shift fork
㊵ Gear shift head No. 1
㊶ 5th & reverse shift fork shaft
㊷ Bolt
㊸ Bearing front retainer
㊹ Gasket
㊺ Oil seal
㊻ T/M case assy
㊼ Bolt
㊽ Bolt
㊾ Radial ball bearing
㊿ Input shaft
(51) Needle roller bearing
(52) Synchronizer ring No. 3
(53) Synchromesh shifting key spring
(54) Synchromesh shifting key No. 2
(55) T/M clutch hub No. 2
(56) Hub sleeve No. 1
(57) Synchromesh shifting key spring
(58) Synchronizer ring No. 3
(59) 3rd gear
(60) Needle roller bearing
(61) Output shaft
(62) 1st gear bearing inner race
(63) Needle roller bearing
(64) 2nd gear
(65) Synchronizer ring No. 3
(66) Synchromesh shifting key
(67) Synchromesh shifting key spring
(68) T/M clutch hub No. 1
(69) Reverse gear
(70) Synchronizer ring No. 2
(71) Bolt
(72) Reverse idle gear S/A
(73) Reverse shift arm
(74) Reverse idle gear shaft
(75) 1st gear
(76) Needle roller bearing
(77) 1st gear bearing inner race
(78) 1st gear thrust washer
(79) Radial ball bearing
(80) 5th gear
(81) Output shaft gear spacer No. 1
(82) Output shaft gear spacer No. 2
(83) Transfer oil pump body S/A
(84) Transfer input hub
(85) Lock nut
(86) Counter gear
(87) 5th gear thrust washer
(88) 5th gear bearing inner race
(89) Needle roller bearing
(90) Counter shaft 5th gear
(91) Synchronizer ring No. 3
(92) Synchromesh shifting key No. 2
(93) Synchromesh shifting key spring
(94) Synchronizer hub No. 1
(95) T/M hub sleeve
(96) Shifting key retainer
(97) Conical washer spring
(98) 5th shift fork
(99) Gear shifting lever shaft
(100) 5th shift arm
(101) 1st & 2nd shift fork shaft
(102) 3rd & 4th shift fork shaft

WRU90-MT401

INPUT SHAFT-, OUTPUT SHAFT- & TRANSFER INPUT HUB

COMPONENTS



WRU92-MT486

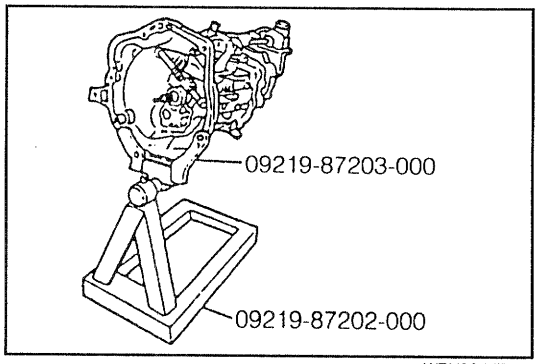
① Snap ring
② Radial ball bearing
③ Input shaft
④ Needle roller bearing
⑤ Synchronizer ring No. 3
⑥ Snap ring
⑦ Synchromesh shifting key spring
⑧ Synchromesh shifting key No. 2 (3 pieces)
⑨ Transmission clutch hub No. 2
⑩ Transmission hub sleeve No. 1
⑪ Synchromesh shifting key spring
⑫ Synchronizer ring No. 3
⑬ 3rd gear
⑭ Needle roller bearing
⑮ Output shaft
⑯ 1st gear bearing inner race
⑰ Needle roller bearing
⑱ 2nd gear
⑲ Synchronizer ring No. 3
⑳ Synchromesh shifting key spring
㉑ Synchromesh shifting key No. 1 (3 pieces)
㉒ Transmission clutch hub No. 1
㉓ Reverse gear
㉔ Synchromesh shifting key spring
㉕ Synchronizer ring No. 2
㉖ 1st gear
㉗ Needle roller bearing
㉘ 1st gear bearing inner race
㉙ 1st gear bearing inner race No. 2
㉚ 1st gear thrust washer
㉛ Radial ball bearing
㉜ O ring
㉝ Oil seal
㉞ Bearing
㉟ O ring
㊱ Transfer oil pump body S/A
㊲ Transfer input hub
㊳ Lock nut
㊴ Snap ring
㊵ Radial ball bearing
㊶ Counter gear
㊷ Radial ball bearing
㊸ 5th gear thrust washer
㊹ 5th gear bearing inner race
㊺ Needle roller bearing
㊻ Counter shaft 5th gear
㊼ Synchronizer ring No. 3
㊽ Synchromesh shifting key spring
㊾ Synchronizer No. 1 hub
㊿ Transmission hub sleeve No. 2
(51) Synchromesh shifting key spring
(52) 5th shifting key retainer
(53) Conical spring washer
(54) Lock nut
(55) Synchromesh shifting key No. 2
(56) Slotted pin
(57) 5th shift fork
(58) Gear shifting lever shaft
(59) Bolt
(60) Gasket
(61) 5th shift arm
(62) Reverse idle gear S/A
(63) Reverse idle gear shaft

WRU90-MT403

DISASSEMBLY

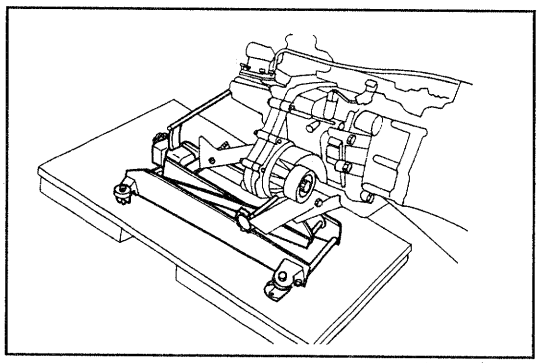
1. Install the transmission assembly with transfer on the overhaul stand, using the following SST.
   SST: 09219-87202-000
   09219-87203-000

   (As for the removal of transmission assembly with transfer, see page MT–16 to MT–20.)

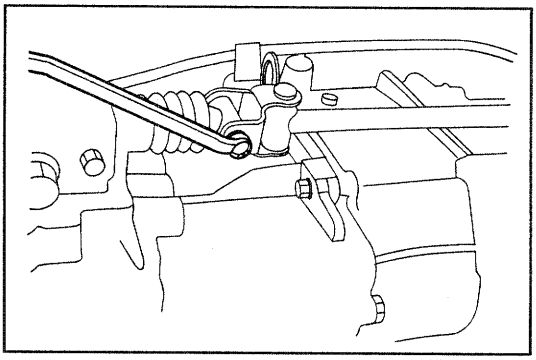


WRU92-MT501

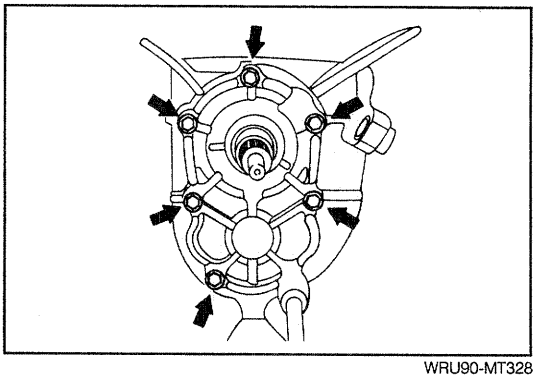
2. Place a wooden plate(s) or any other suitable materials on the overhauling stand, as shown in the diagram at right.
3. Support the transfer front and transfer rear case with a transmission jack.


WRU90-MT326

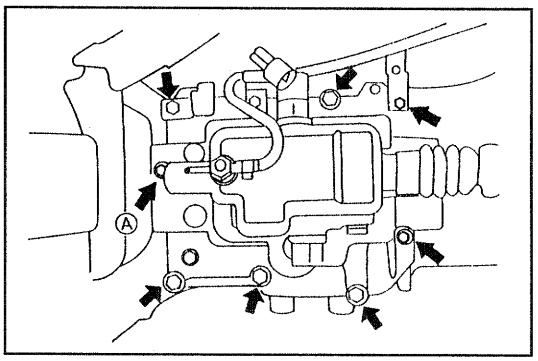
4. Remove the control shaft with installed the shift lever retainer subassembly by removing the hexagon bolt.


WRU90-MT327

5. Remove the clutch release bearing and related parts (see page CL-sections).
6. Remove the front bearing retainer by removing the seven bolts.

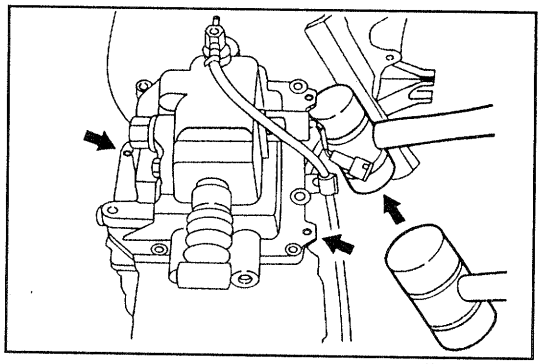

WRU90-MT328

7. Remove the transmission case cover subassembly by removing the seven bolts and a reamer bolt Ⓐ.

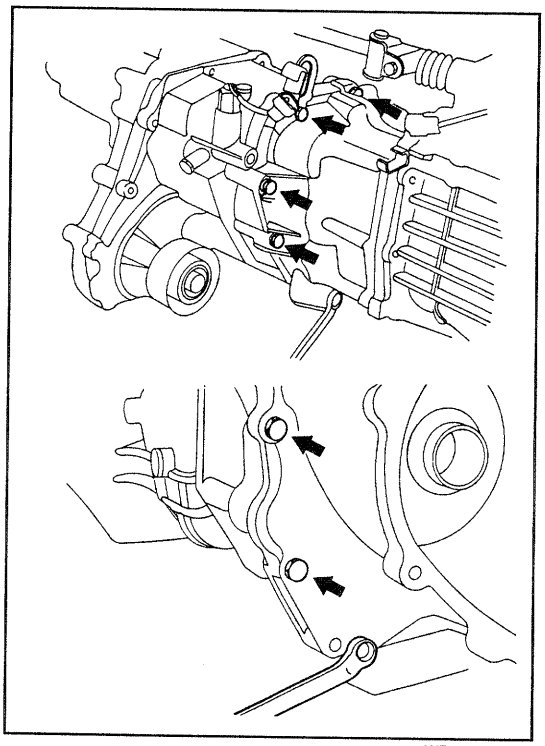


WRU90-MT329

8. Disconnect the breather hose by detaching a clip.
9. Remove the transmission case cover subassembly by lightly tapping each of the ribs evenly toward the upper side of the transmission case.


WRU90-MT330

10. Remove the transfer front case by removing the eight bolts from the transfer adapter and pull them toward you carefully.

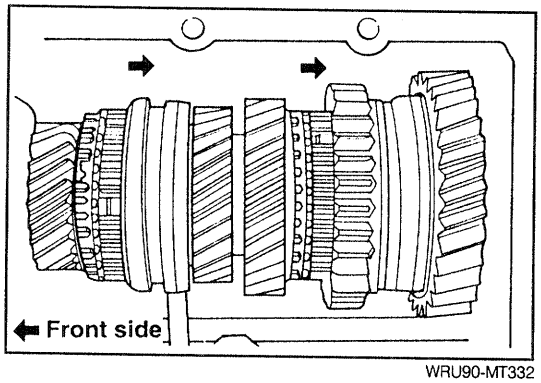

WRU90-MT331

11. Interlock the 1st gear and the 3rd gear.
NOTE:
- Measure the following sections, prior to an interlock.

Specified Value:

Unit: mm (inch)

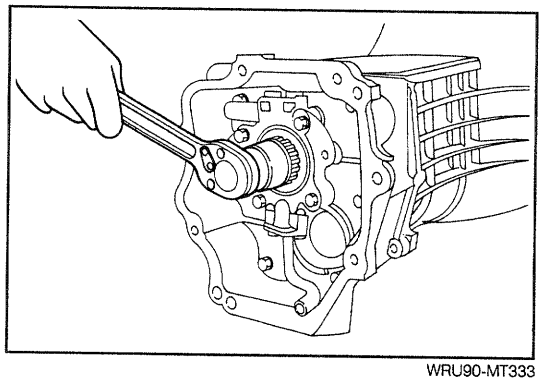
	1st	2nd	3rd	4th
Gear backlash	0.05 - 0.18 (0.0019 - 0.0070)	0.05 - 0.16 (0.0019 - 0.0062)	0.05 - 0.14 (0.0019 - 0.0055)	0.05 - 0.13 (0.0019 - 0.0051)
Thrust clearance	0.17 - 0.30 (0.0067 - 0.011)	0.10 - 0.37 (0.0039 - 0.014)	0.10 - 0.33 (0.0039 - 0.013)	



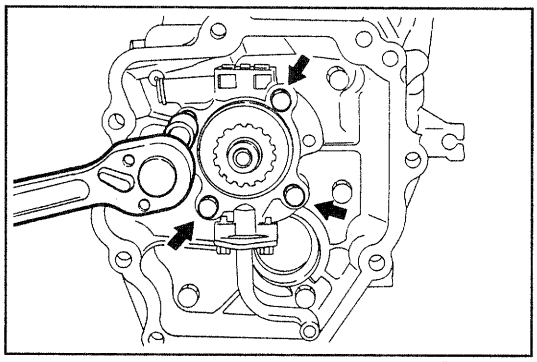
WRU90-MT332

12. Raise the lock section of the lock nut, using the chisel or the like.
CAUTION:
- Never reuse the removed lock nut.

13. Remove the lock nut, using the 32 mm socket wrench box.

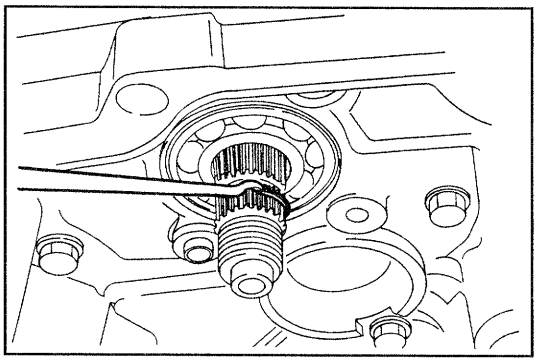

WRU90-MT333

14. Remove the transfer oil pump body subassembly with the transfer oil strainer tube and transfer input hub installed by removing the four bolts.



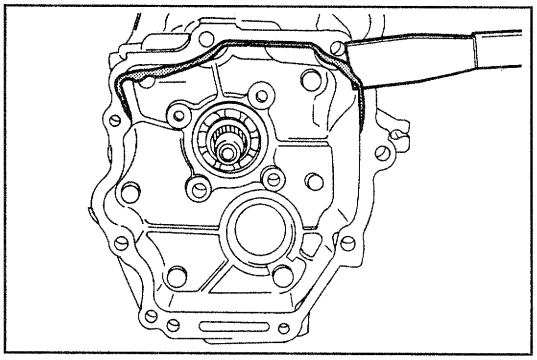
WRU90-MT334

15. Remove the "O" ring from the transmission output shaft.
CAUTION:
    - Never reuse the removed "O" ring.



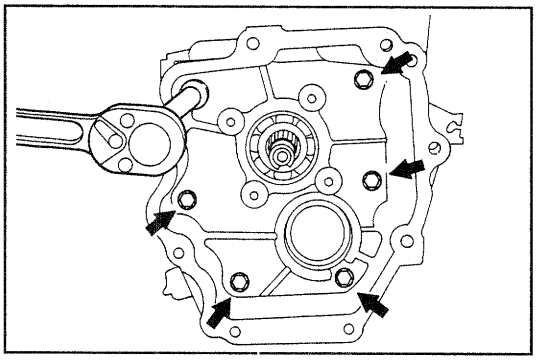
WRU90-MT335

16. Remove the liquid gasket in the attaching surface of the transfer adapter, using the standard tool of gasket scraper.
NOTE:
    - Be careful not to damage the mating surface.



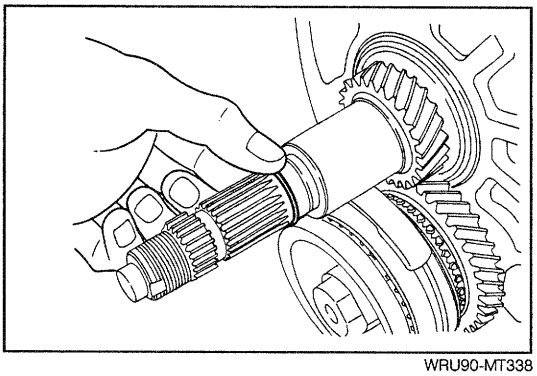
WRU90-MT336

17. Remove the transfer adapter with installed the bearing and output gear spacer No. 2 by removing the six bolts.



WRU90-MT337

18. Remove the "O" ring from the transmission output shaft.
CAUTION:
    - Never reuse the removed "O" ring.



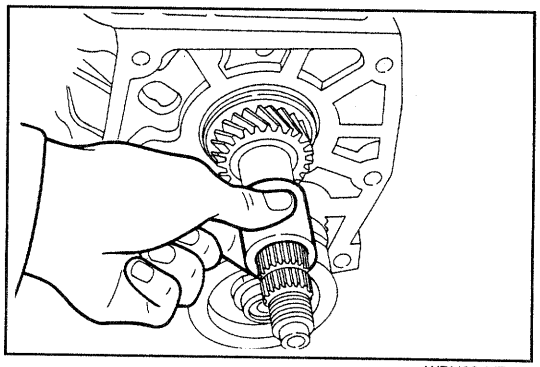
WRU90-MT338

19. Remove the output gear spacer No. 1 from the transmission output shaft.
NOTE:
- Measure the backlash and the thrust clearance of the 5th gear.

Specified Value:

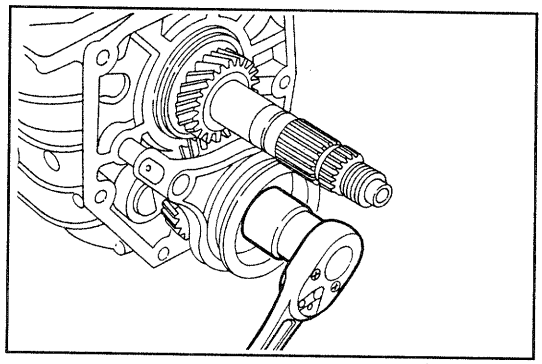
Unit: mm (inch)

Backlash	0.05 - 0.13 (0.0019 - 0.0051)
Thrust clearance	0.11 - 0.30 (0.0039 - 0.011)

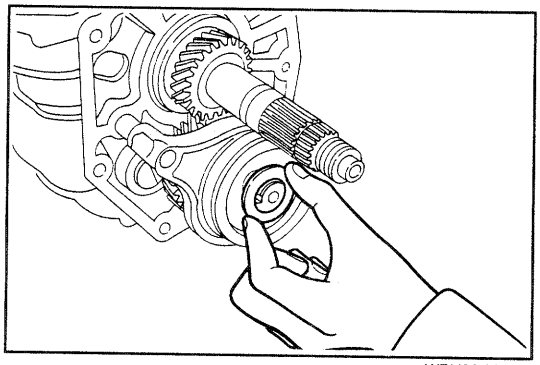

WRU90-MT339

20. Raise the lock section of the lock nut, using the chisel or the like.
CAUTION:
- Never reuse the removed lock nut.

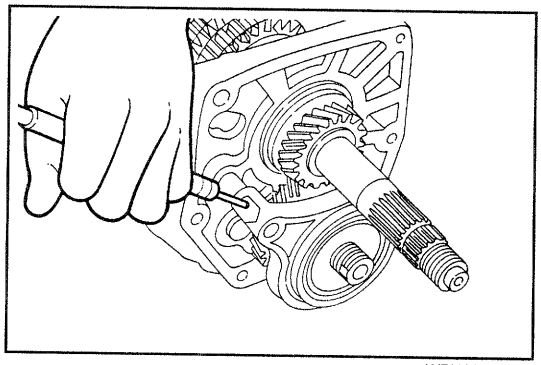
21. Remove the lock nut of the counter shaft 5th gear.


WRU90-MT340

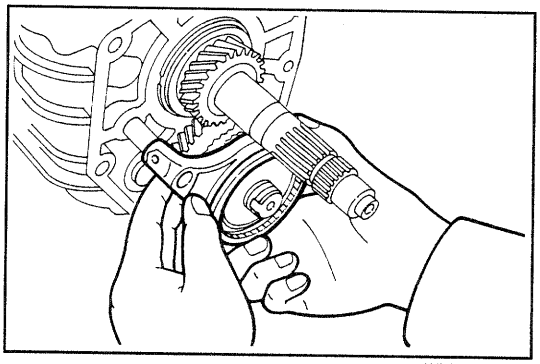
22. Remove the conical spring washer and shifting key retainer.


WRU90-MT341

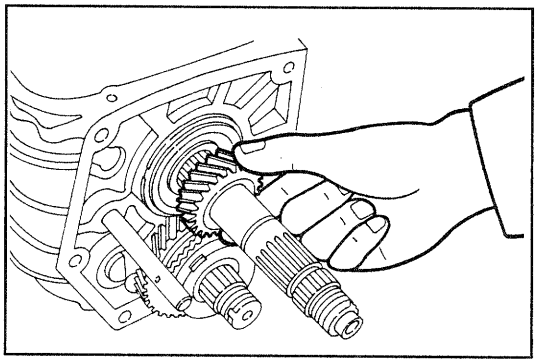
23. Drive off the slotted pin of the 5th shift fork.
CAUTION:
- Never reuse the removed slotted pin.


WRU90-MT342

24. Remove the 5th shift fork together with synchronizer hub sleeve in a set.

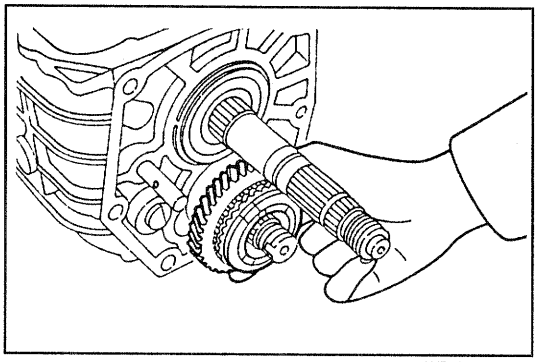

WRU90-MT343

25. Remove the 5th gear of the transmission output shaft.



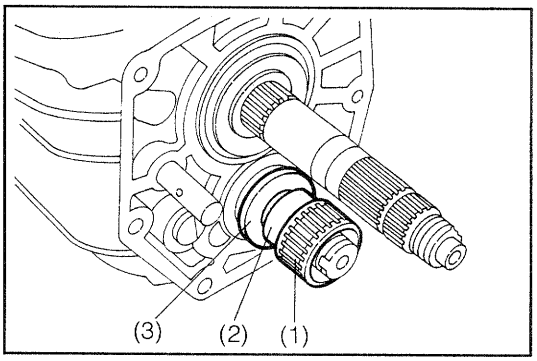
WRU90-MT344

26. Remove the synchronizer ring No. 3 and 5th gear of the countershaft.



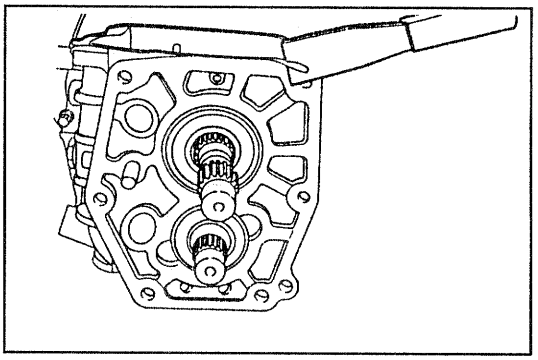
WRU90-MT345

27. Remove the following parts from the countershaft.
    (1) Needle roller bearing
    (2) 5th gear bearing inner race
    (3) 5th gear thrust washer



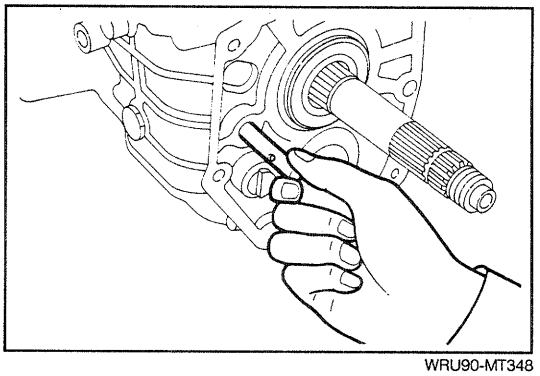
WRU90-MT346

28. Remove the liquid gasket from the transmission case, using the standard tool of gasket scraper.
    CAUTION:
    - Be very careful nut to scratch the transmission case.



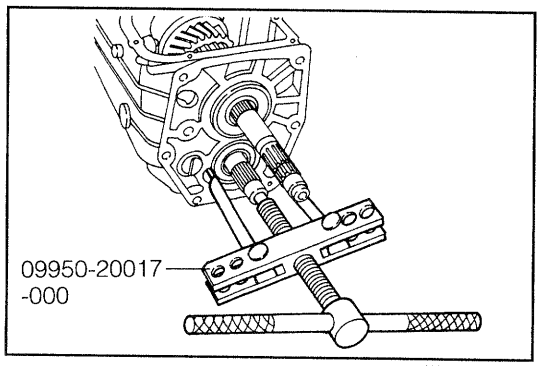
WRU90-MT347

29. Remove the gear shifting lever shaft.



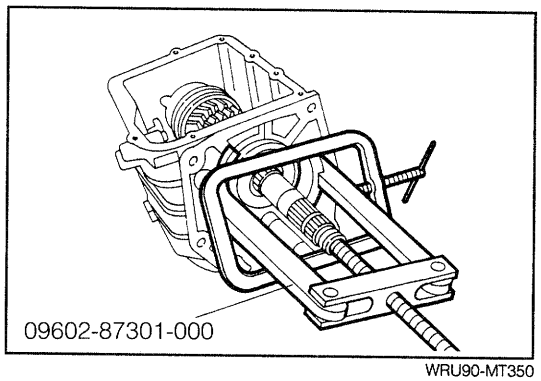
WRU90-MT348

30. Remove the countershaft rear bearing, using the following SST.
    SST: 09950-20017-000



WRU90-MT349

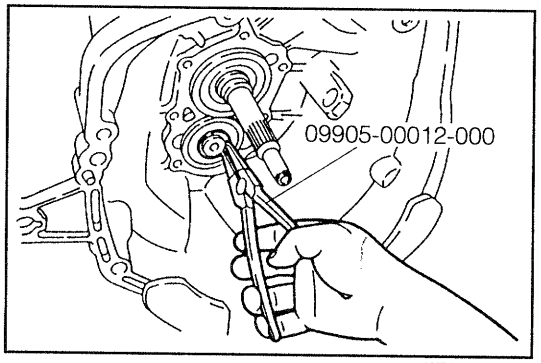
31. Detach the snap ring of the output shaft bearing. Remove the output shaft bearing, using the following SST.
    SST: 09602-87301-000



WRU90-MT350

32. Detach the snap ring of the countershaft, using the following SST.
    SST: 09905-00012-000

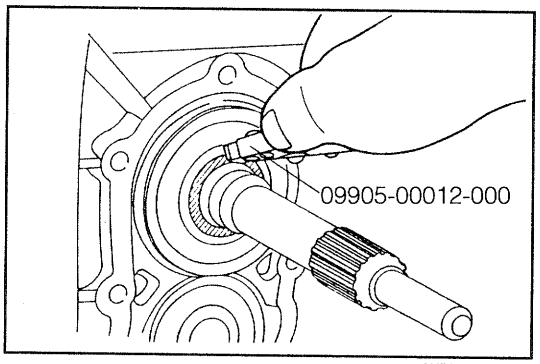
    NOTE:
    - Never reuse the snap ring.



WRU90-MT351

33. Detach the snap ring of the input shaft, using the following SST.
    SST: 09905-00012-000

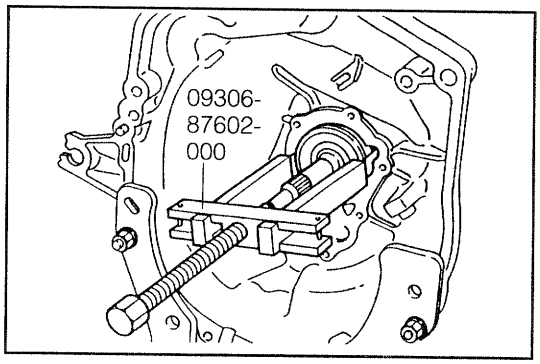
    NOTE:
    - Never reuse the removed snap ring.



WRU90-MT352

34. Remove the input shaft bearing, using the following SST.
    SST: 09306-87602-000

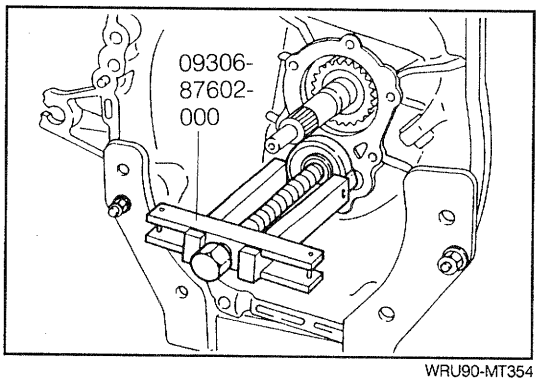
    NOTE:
    - Detach the stop ring, prior to remove the bearing.



WRU90-MT353

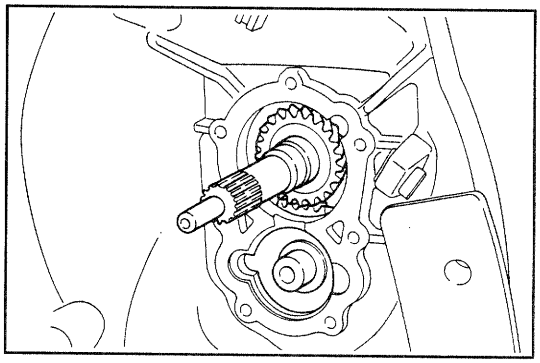
35. Remove the bearing of the countershaft at the clutch side, using the following SST.
    SST: 09306-87602-000

    NOTE:
    - Push out the bearing by tapping the countershaft at the output shaft side, using a plastic hammer.
    - Detach the stop ring, prior to remove the bearing.

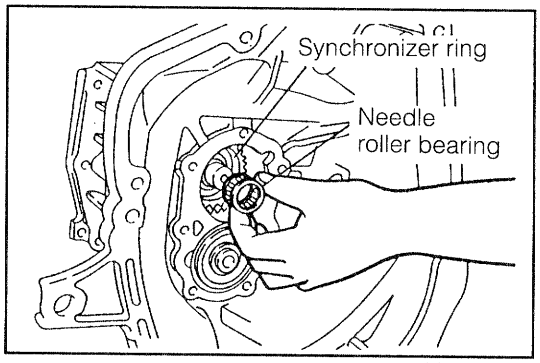


WRU90-MT354

36. Remove the input shaft.

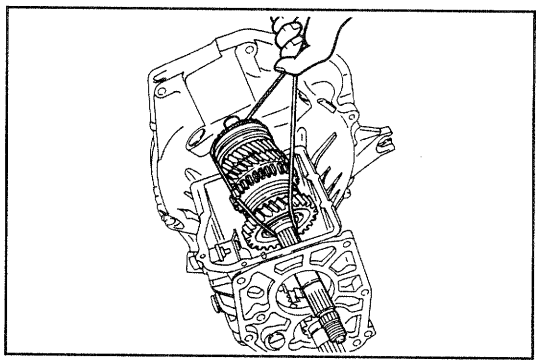

WRU90-MT355

37. Remove the needle roller bearing and synchronizer ring No. 3.

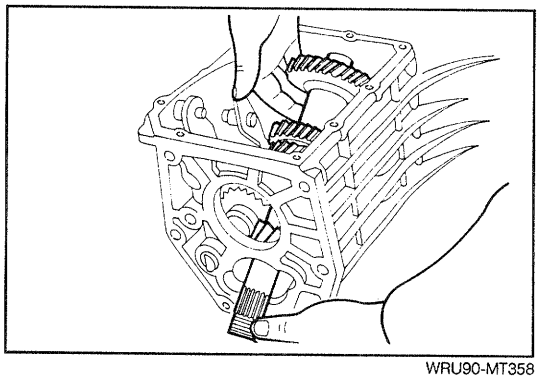


WRU90-MT356

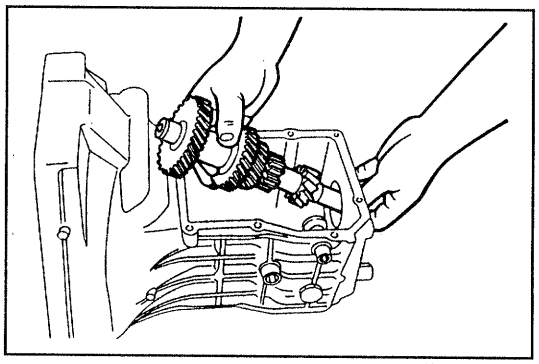
38. Remove the output shaft assembly.
    (As for the disassembly, inspection and assembly for the removed parts, see page MT-83.)
    NOTE:
    - It is recommended that as shown in the diagram at right, an operation rope (about 3 mm in outside diameter) be used to remove the output shaft assembly from the transmission case.


WRU92-MT502

39. Remove the countershaft from the transmission case.

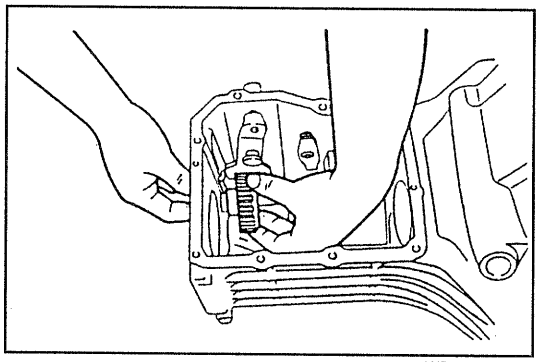

WRU90-MT358

40. Remove the countershaft from the transmission case.



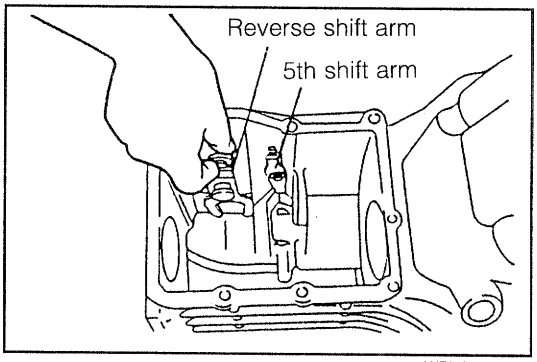
WRU90-MT359

41. Remove the reverse idler gear and reverse idler gear shaft.



WRU90-MT360

42. Remove the reverse shift arm and 5th shift arm.

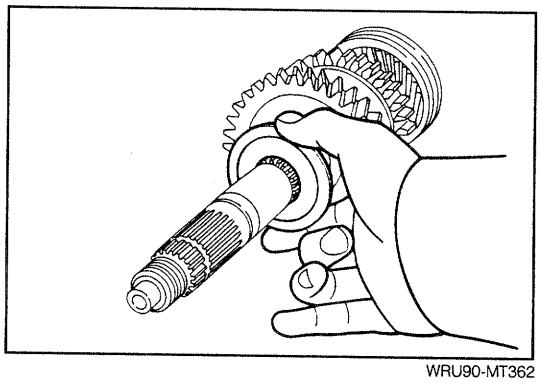


WRU90-MT361

TRANSMISSION OUTPUT SHAFT

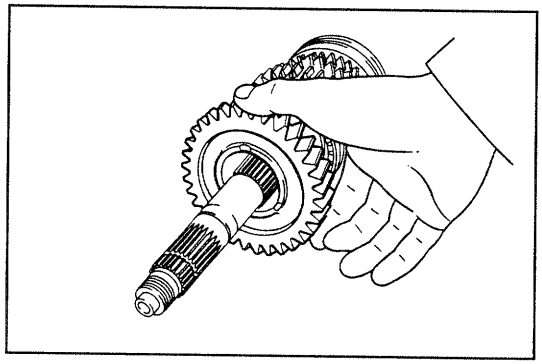
DISASSEMBLY

1. Remove the 1st gear thrust washer.



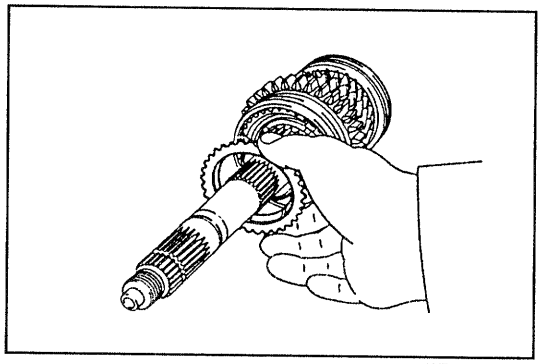
WRU90-MT362

2. Remove the 1st gear.



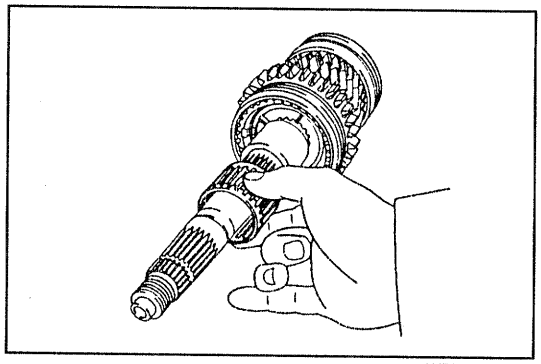
WRU90-MT363

3. Remove the synchronizer ring No. 2



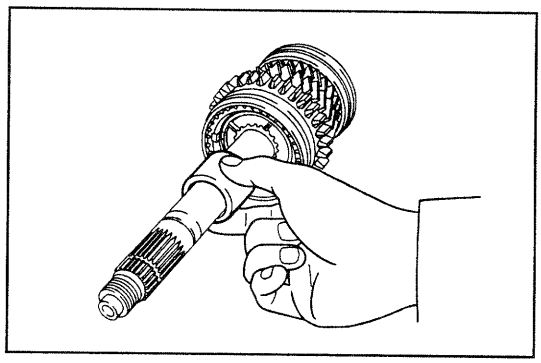
WRU90-MT364

4. Remove the needle roller bearing



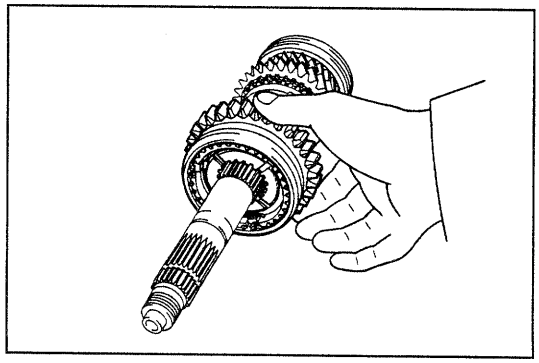
WRU90-MT365

5. Remove the 1st gear bearing inner race.

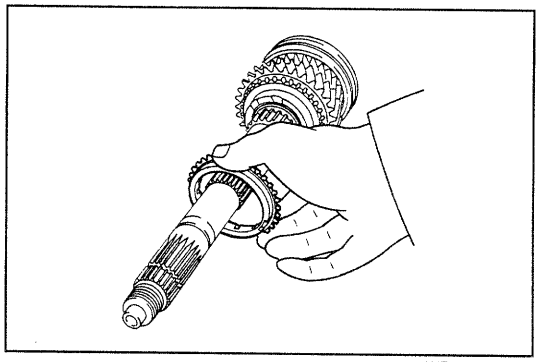


WRU90-MT366

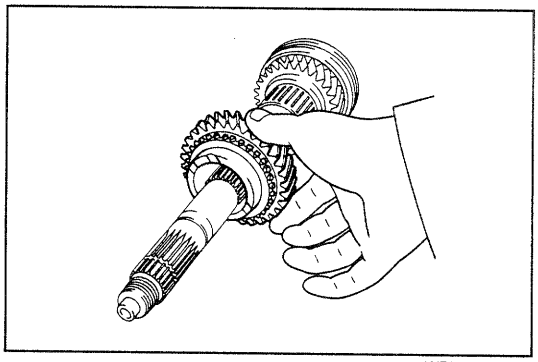
6. Remove the reverse gear with installed the following parts in a set.
   (1) Transmission clutch hub No. 1
   (2) Synchromesh shifting key spring (1 piece)
   (3) Synchromesh shifting key (3 piecies)


WRU90-MT367

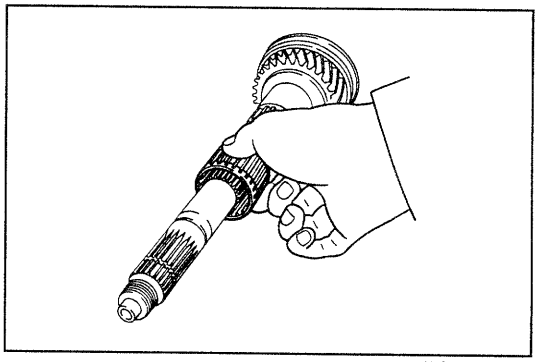
7. Remove the synchronizer ring No. 2.


WRU90-MT368

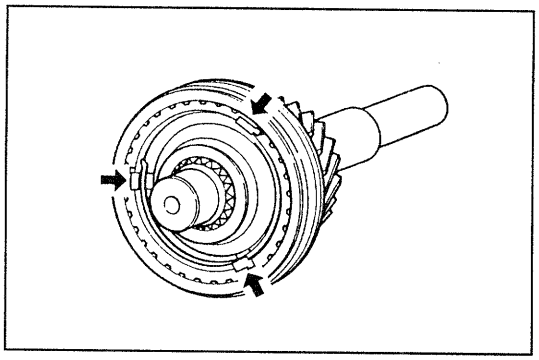
8. Remove the 2nd gear.


WRU90-MT369

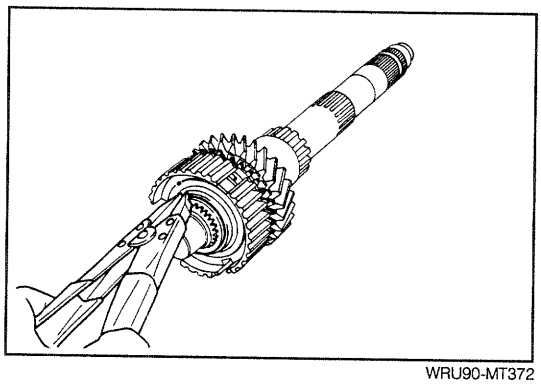
9. Remove the needle roller bearing.


WRU90-MT370

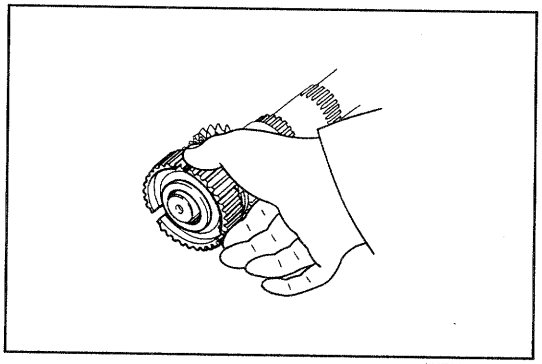
10. Remove the following parts.
    (1) Transmission hub sleeve No. 1
    (2) Synchromesh shifting key spring (1 piece)
    (3) Synchromesh shifting key (3 pieces)
    NOTE:
    - Measurement of the clearance (in the direction of the output shaft) of transmission clutch hub No. 2 must be performed with the above-listed parts removed. See page MT–89 for the measurement procedure.


WRU92-MT505

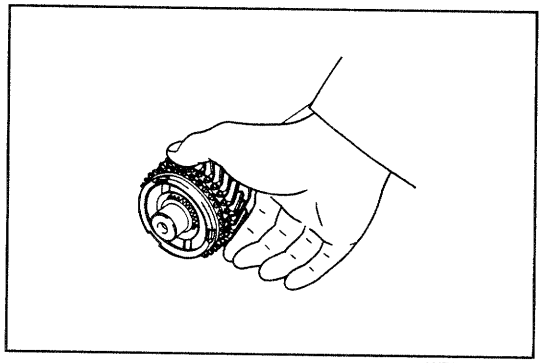
11. Detach the snap ring.
    NOTE:
    - Never reuse the removed snap ring.


WRU90-MT372

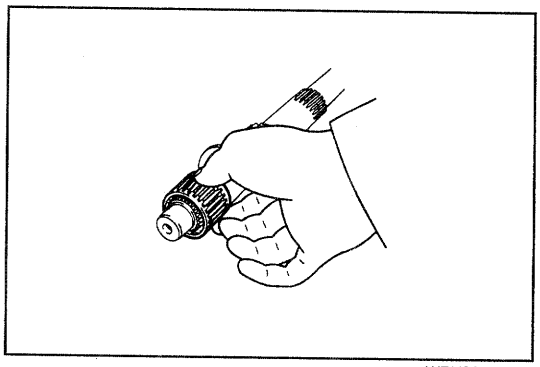
12. Remove the following parts in a set.
    (1) Transmission clutch hub No. 2
    (2) Synchromesh shifting key spring (1 piece)


WRU90-MT373

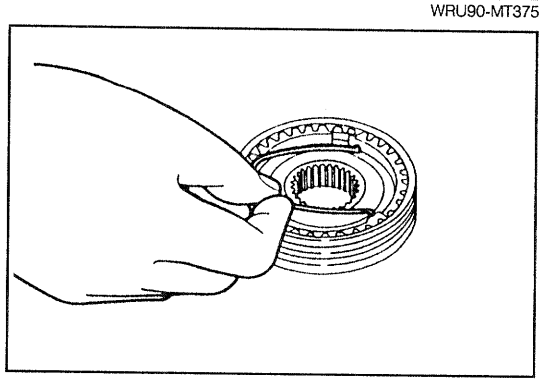
13. Remove the 3rd gear together with synchronizer ring No. 3.


WRU90-MT374

14. Remove the needle roller bearing.

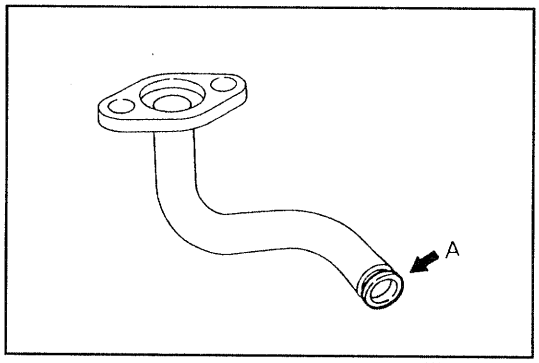

WRU90-MT375

15. Remove the synchromesh shifting key spring. Remove the transmission hub sleeve and synchromesh shifting key of the reverse gear and transmission hub sleeve No. 2.


WRU90-MT376

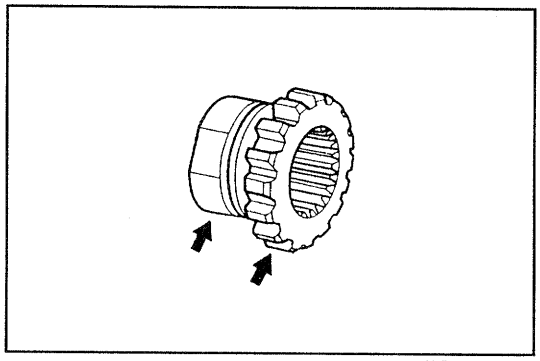
INSPECTION

1. Touch the end (section A) of the transfer oil strainer suction tube to check for burrs or other defects.

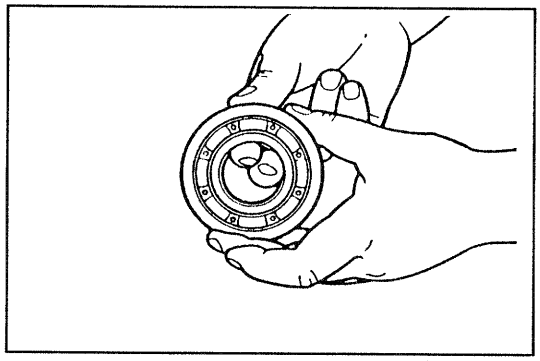


WRU90-MT404

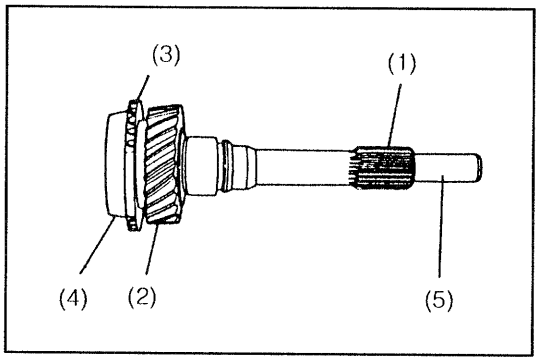
2. Visually check the gear and spline sections of the transfer input hub for damage, or wear.


WRU90-MT405

3. Rotate the bearing inner race by applying a force with your finger. Check to see if the bearing inner race rotates smoothly without any binding and sticking.

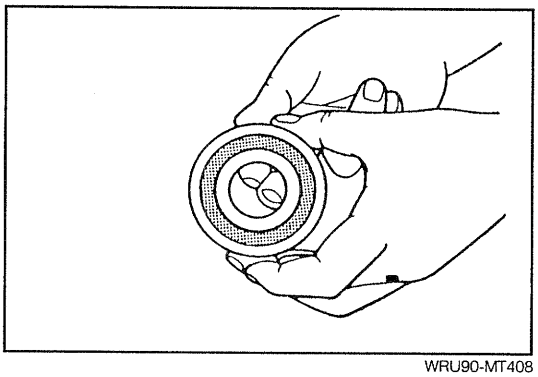

WRU90-MT406

4. Input shaft
   Check the input shaft for the following items.
   (1) Spline section for damage
   (2) Gear for damage and wear
   (3) Engaging section of hub sleeve for damage
   (4) Tapered section for wear or damage
   (5) Race section of roller bearing for wear or damage

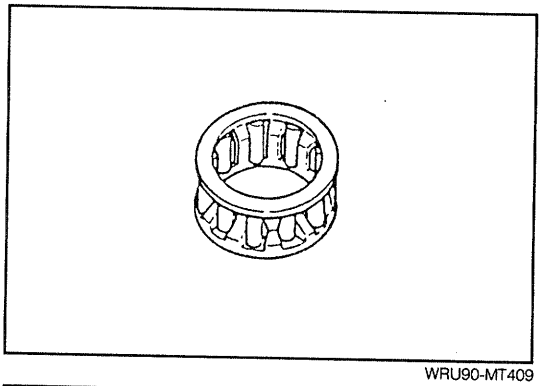


WRU90-MT407

5. Rotate the bearing inner race by applying a force with your finger. Check to see if the bearing inner race rotates smoothly without any sticking.

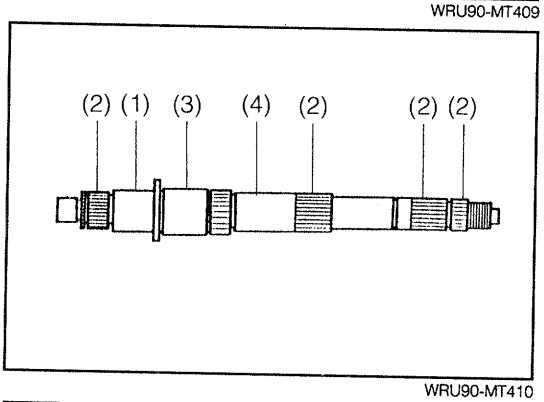

WRU90-MT408

6. Check the needle roller bearing for wear or damage.



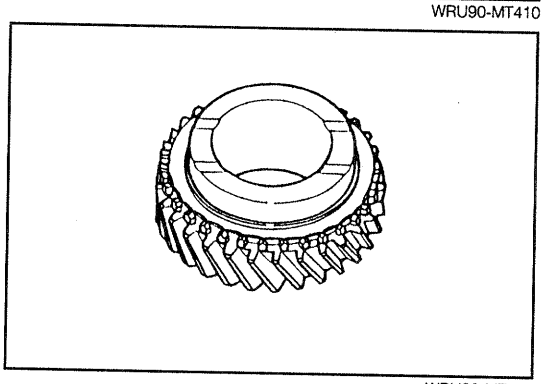
WRU90-MT409

7. Output shaft
   Check the output shaft for the following items.
   (1) Needle roller bearing race section for wear or damage
   (2) Spline section for damage
   (3) Fitting section of bearing inner race for wear
   (4) Measure the runout of the output shaft, using a dial gauge and V-block.
   Allowable Runout Limit: 0.05 mm (0.0020 inch)



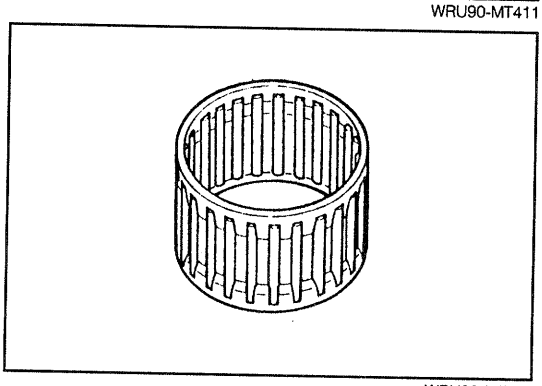
WRU90-MT410

8. Check the gear section of each gear for damage or abnormal wear.



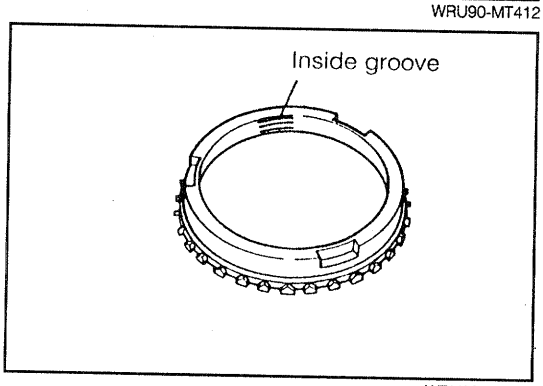
WRU90-MT411

9. Check each needle roller bearing for damage.



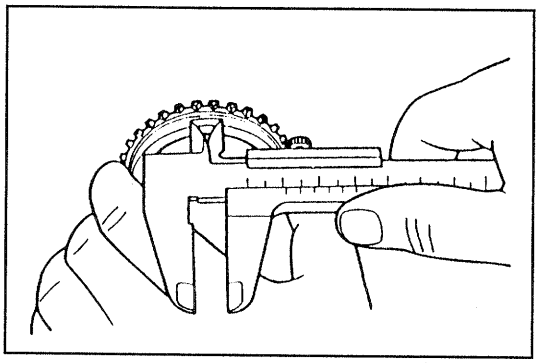
WRU90-MT412

10. Check the inside groove of the synchronizer ring for wear or damage.



WRU90-MT413

11. Measure the contact width of each synchronizer ring with the synchromesh shifting key, using vernier calipers. Replace the synchronizer ring which does not conform to the specifications with a new one.

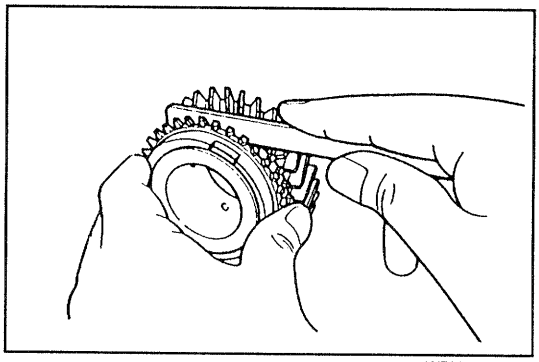

WRU90-MT414

mm (inch)

Item / Measuring point	Specified value
1st gear	9.9 - 10.1 (0.3898 - 0.3976)
2nd gear 3rd gear 4th gear 5th gear	11.3 - 11.5 (0.4449 - 0.4528)

NOTE:
- The measurement should be performed at three points for each synchronizer ring. The maximum value is regarded as the contact width for the said ring.

12. Measure the clearance between each gear and the synchronizer ring, using a thickness gauge.

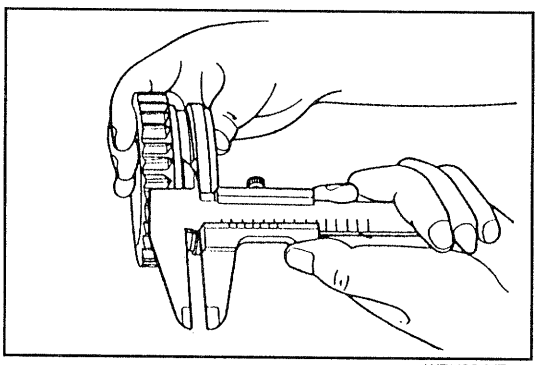

WRU90-MT415

mm (inch)

Item / Measuring point	Specified value	Allowable limit
1st gear 2nd gear 3rd gear 4th gear 5th gear	0.85 - 1.45 (0.0335 - 0.571)	0.5 (0.0197)

NOTE:
- The measurement should be performed at several points for each gear. The minimum value is regarded as the clearance for the said gear.

13. Measure the contact width of the reverse gear with the shift fork.


WRU90-MT416

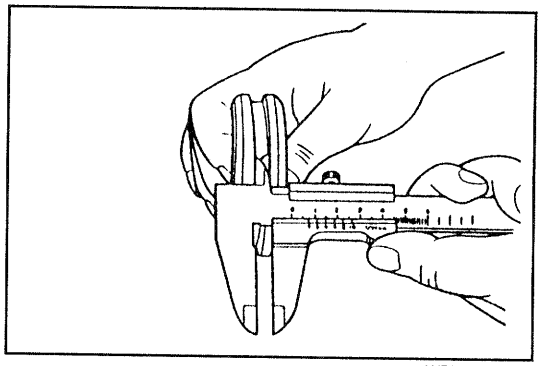
mm (inch)

Item / Part name	Specified value	Allowable limit
Reverse gear	7.05 - 7.12 (0.278 - 0.280)	7.3 (0.287)

14. Measure the contact width of the transmission hub sleeve with the shift fork.

mm (inch)

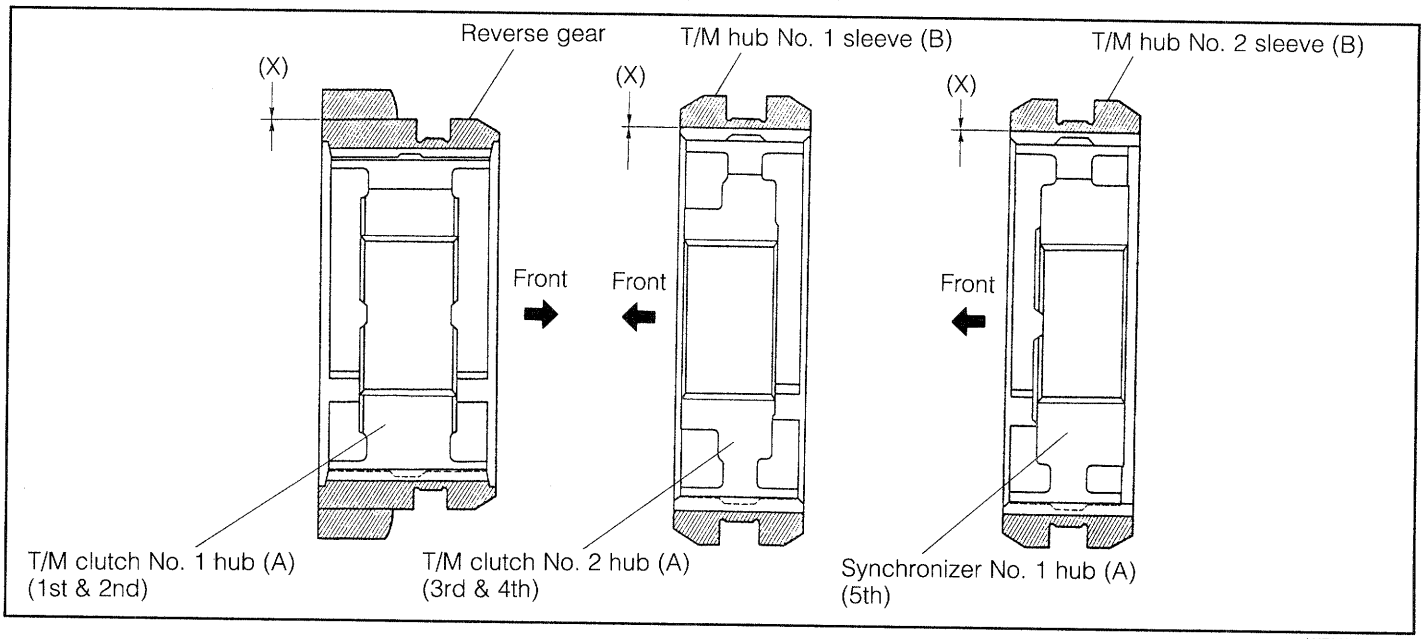
Item / Part name	Specified value	Allowable limit
Transmission hub sleeve	7.05 - 7.12 (0.278 - 0.280)	7.3 (0.287)



WRU90-MT417

15. Measure the dimension (A) and (B) of the followings parts. Make sure that the clearance (X) between this hubs and sleeves may confirm to the specification.

Specified Valve: 0.03 - 0.19 mm (0.0012 - 0.0075 inch)



WRU90-MT418

16. The outer diameter dimension of the (A) above parts has been machined in accordance with the bore dimension of the (B) parts. If either part exceeds the specified value above, be certain to replace them as a set.

CAUTION:

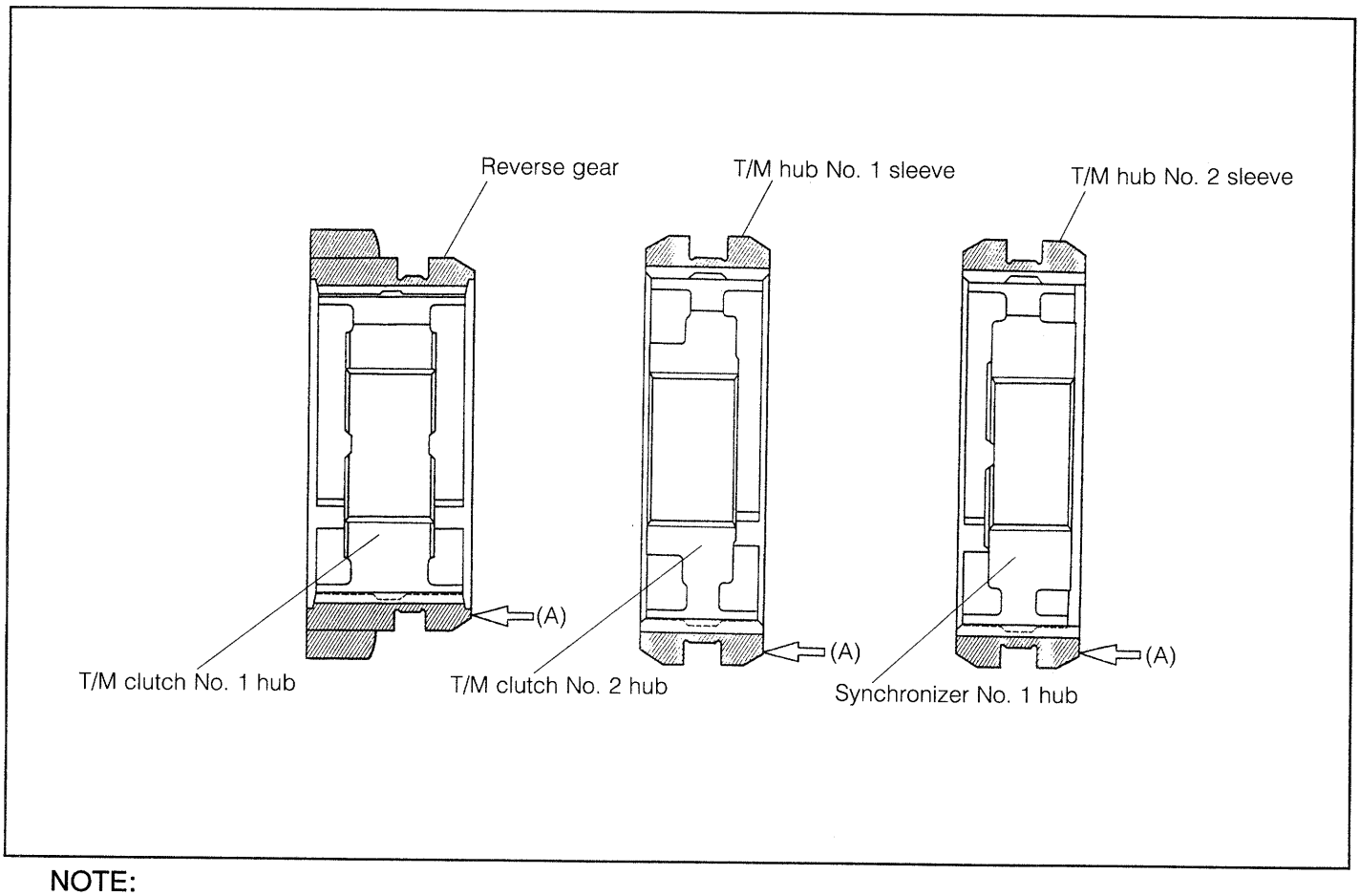
- **If either part which has been exceed the the specified value should be used against this caution, it would cause sllipping-out of gear and or emanation of abnormal noise.**

Units: mm (inch)

	Outer dimension	Classification No.		Bore dimension
T/M clutch No. 1 hub T/M clutch No. 2 hub Synchronizer No. 1 hub	69.78 - 69.84 (2.747 - 2.749)	2	Reverse gear T/M hub No. 1 sleeve T/M hub No. 2 sleeve	69.871 - 69.97 (2.750 - 2.754)
	69.68 - 69.74 (2.743 - 2.745)	1		69.971 - 69.87 (2.754 - 2.750)
	69.58 - 69.64 (2.739 - 2.741)	3		69.67 - 69.77 (2.742 - 2.746)

WRU90-MT419

17. With the sleevs assembled to the hubs, measure the tilt width at the section (A) of the sleeves.
    Specified Value: Not to exceed 0.5 mm (0.0197 inch)



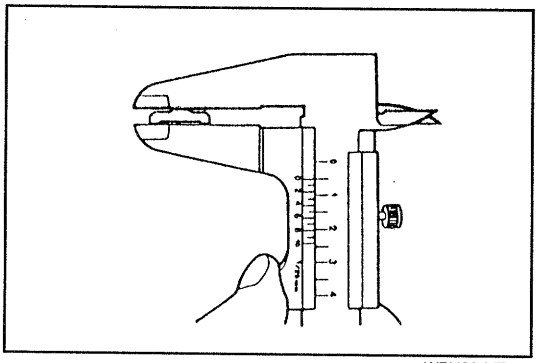
NOTE:
- If the tilt width of the sleeves exceeds the above specified value, be certain to replace those parts as a set.

18. Measure the height of each synchromesh shifting key, using vernier calipers.

mm (inch)

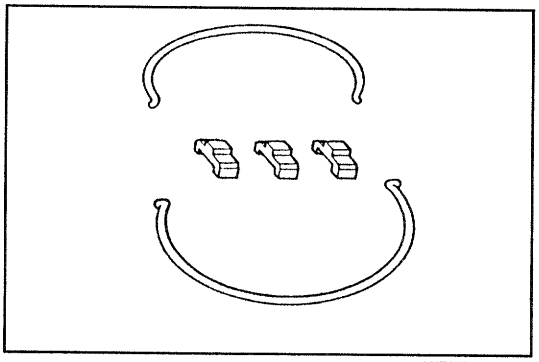
Item / Measuring point	Specified value	Allowable limit
1st & 2nd gears 3rd & 4th gears 5th gear	5.0 - 5.2 (0.1969 - 0.2047)	4.7 (0.1850)

WRU90-MT420



WRU90-MT421

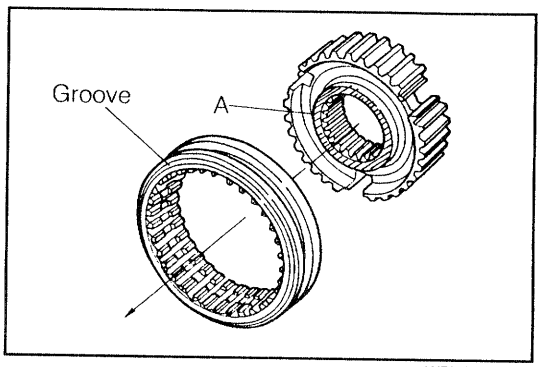
19. Check the synchromesh shifting key and synchromesh shifting key spring for evidence of wear or damage.



WRU90-MT422

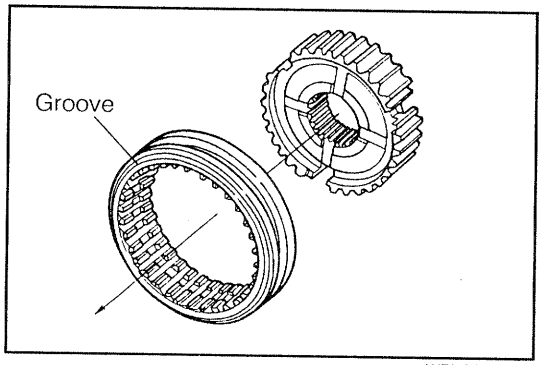
ASSEMBLY

1. The front ends of transmission clutch hub No. 2 and transmission hub sleeve No. 1, which is the sleeve for 3rd-4th speed selection, are as shown in the diagram at right.
   NOTES:
   (1) The outer groove in hub sleeve No. 1 is present at the front end.
   (2) Clutch hub sleeve No. 2 (section A) is present at the front end.



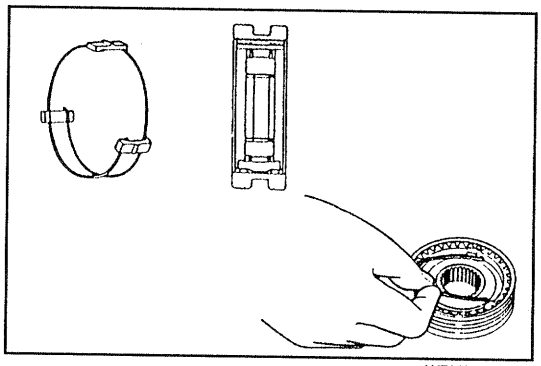
WRU90-MT423

2. The front ends of transmission synchronizer hub assembly No. 1 and transmission hub sleeve No. 2 (5th speed selection) are as shown in the diagram at right.
   NOTES:
   (1) The outer groove in hub sleeve No. 2 is present at the front end.
   (2) The notch in the crisscross direction of synchronizer hub assembly No. 1 is present at the front end.



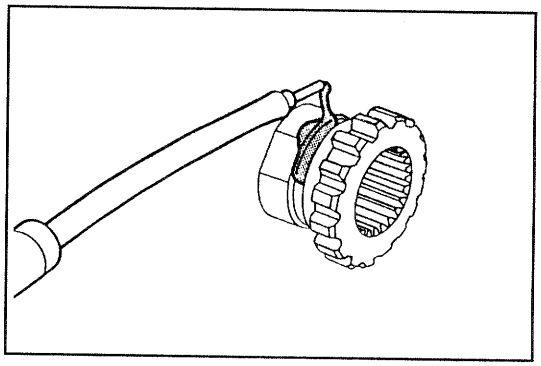
WRU90-MT424

3. Assemble the selected transmission clutch hub to the following parts, using the synchromesh shifting key and synchromesh shifting key spring.
   (1) Reverse gear
   (2) Transmission hub sleeve (5th)
   NOTE:
   - As for the synchromesh shifting key spring, the bent sections at the front and rear should not come at the same direction, as shown in the right figure.

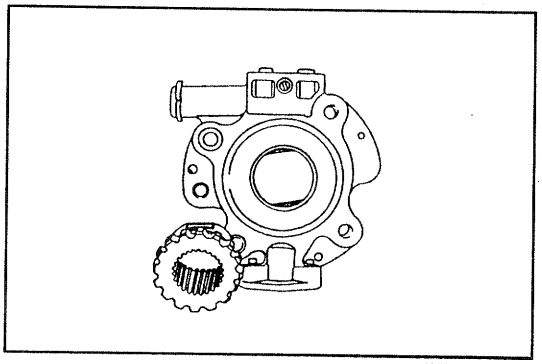

WRU90-MT425

ASSEMBLY OF TRANSFER OIL PUMP BODY SUBASSEMBLY

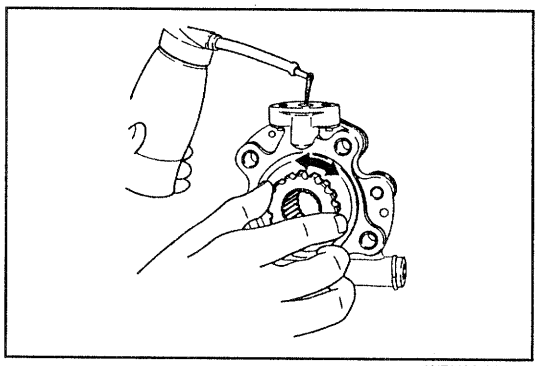
1. Apply gear oil to the outer periphery of the transfer input hub.


WRU90-MT426

2. Insert the transfer input hub into the transfer oil pump body subassembly lightly pushing with your finger.
   NOTE:
   - Apply the gear oil to the outer periphery of the transfer input hub, prior to install.

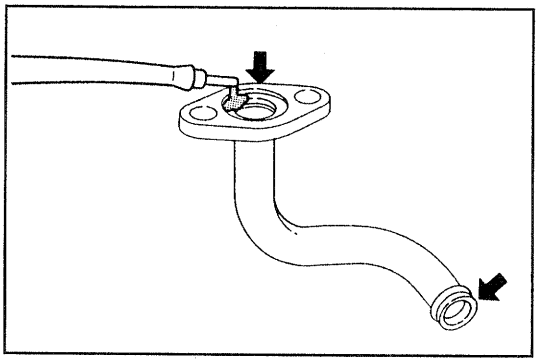

WRU90-MT427

3. Turn the transfer oil pump body subassembly upside down, and then rotating the transfer input hub by hand, apply gear oil into the transfer oil pump body subassembly.



WRU90-MT428

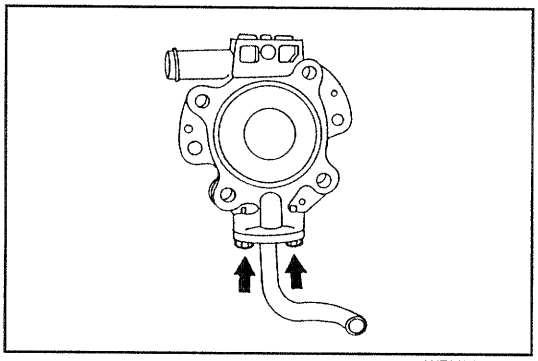
4. Install the two new O-rings to the transfer oil strainer suction tube and apply the gear oil to the O-rings.
   NOTE:
   - Be careful not to damage the O-rings while installing on the transfer oil strainer suction tube.



WRU90-MT429

5. Connect the transfer oil strainer suction tube to the transfer oil pump body subassembly using two bolts, and tighten the bolts.
   Tightening Torque: 0.7 - 1.0 kg-m
   (5.1 - 7.2 ft-lb, 6.9 - 9.8 N·m)

   CAUTION:
   - The bend section in the transfer oil strainer tube faces toward right side.



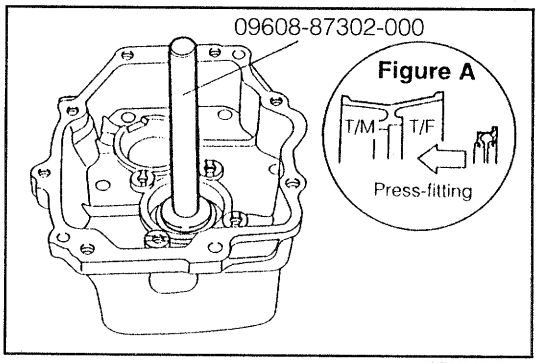
WRU90-MT430

ASSEMBLY OF TRANSFER ADAPTER

1. Press a new oil seal from the bearing side of the transmission output shaft, using the following SST.
   SST: 09608-87302-000

   CAUTION:
   - Be sure to install the oil seal in the correct direction, as indicated in the right figure A.

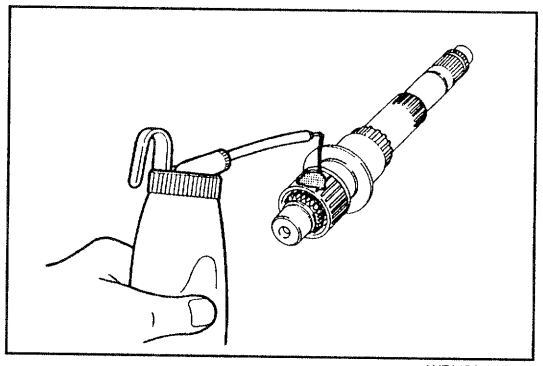
   NOTE:
   - Make sure that the oil seal exhibits no tilt and the garter spring of the oil seal is not disengaged.



WRU90-MT431

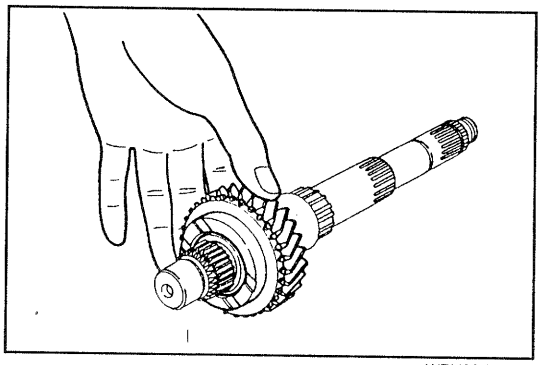
ASSEMBLY OF OUTPUT SHAFT

1. Apply gear oil to the needle roller bearing.



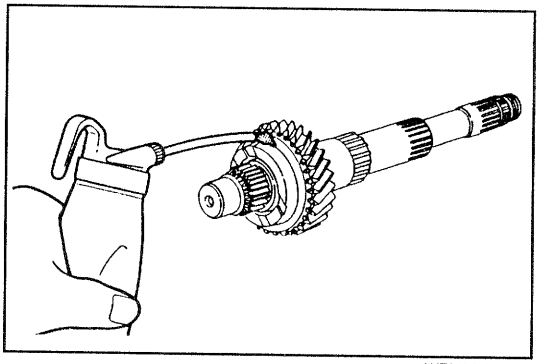
WRU90-MT432

2. Install the 3rd gear to the output shaft.



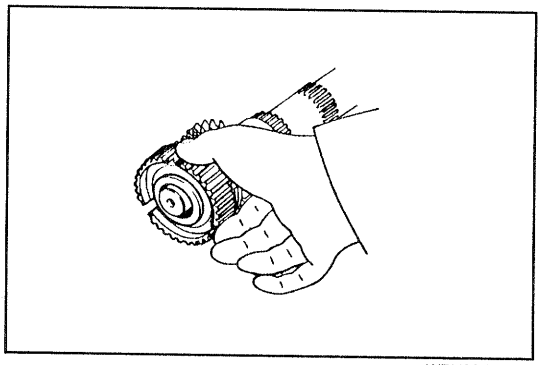
WRU90-MT433

3. Apply gear oil to the tapered section of the 3rd gear.



WRU90-MT434

4. Install the transmission clutch hub No. 2 to the output shaft with the synchromesh shifting key (1 piece) and synchronizer ring No. 3 installed.
   NOTE:
   - For easier installation of the synchromesh shifting key spring, put mark in the surface of clutch hub No. 2 so that the bent sections at the front and rear should not come at the same direction.



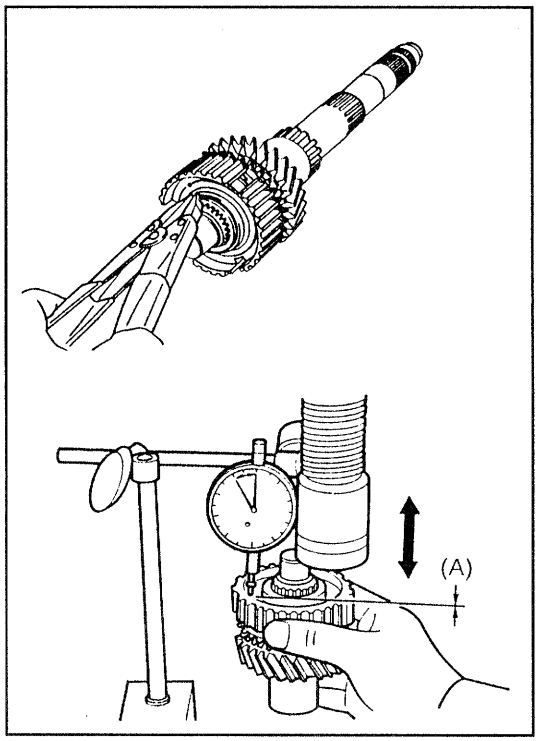
WRU90-MT435

5. Attach the new snap ring. Ensure that the clearance (A) in the right figure conforms to the specification. If it does not conform to the specification, select a suitable snap ring.
   NOTE:
   - Never reuse the snap ring.

   Specification:
   Not to exceed 0.1 mm (Not to exceed 0.0039 inch)

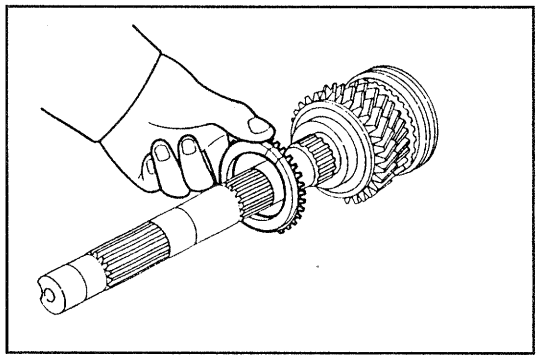
   Snap Ring Availability mm (inch)

Snap ring thickness:	2.0 (0.0787) 2.1 (0.0827) 2.2 (0.0866)

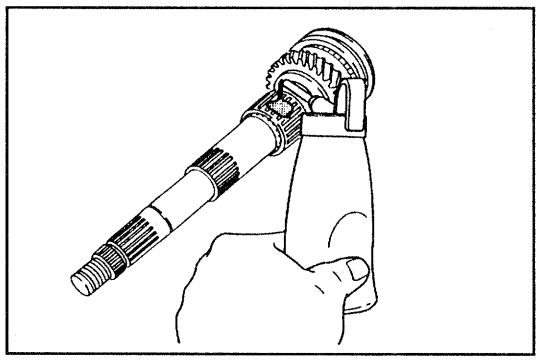


WRU90-MT436

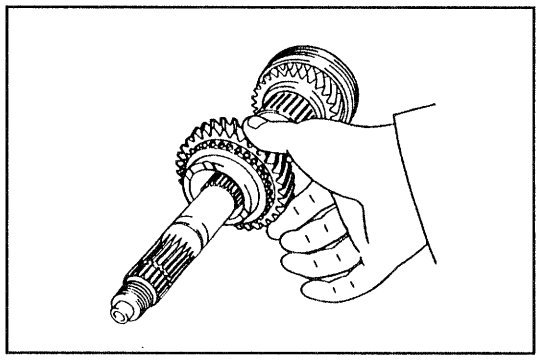
6. Install the following parts to the clutch hub No. 2, and then, install them to the output shaft.
   (1) Synchromesh shifting key (3 pieces)
   (2) Transmission hub sleeve No. 1
   (3) Synchromesh shifting key spring (1 piece)
   NOTE:
   - Ensure that the bent sections at the front and rear of the synchromesh shifting key spring, should not come at the same direction.


WRU90-MT437

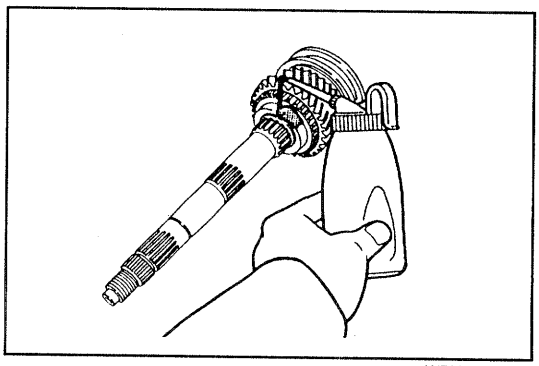
7. Apply gear oil to the needle roller bearing and install to the output shaft.


WRU90-MT438

8. Install the 2nd gear.

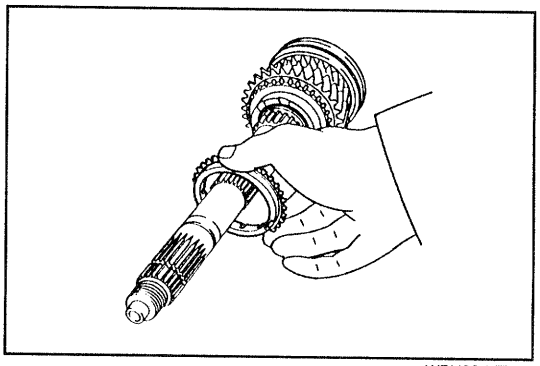

WRU90-MT439

9. Apply gear oil to the tapered section of the 2nd gear.



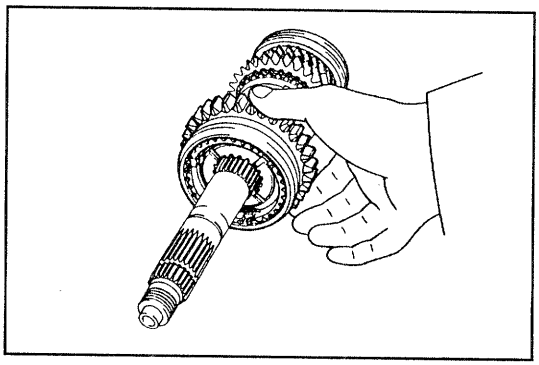
WRU90-MT440

10. Install the synchronizer ring No. 2.



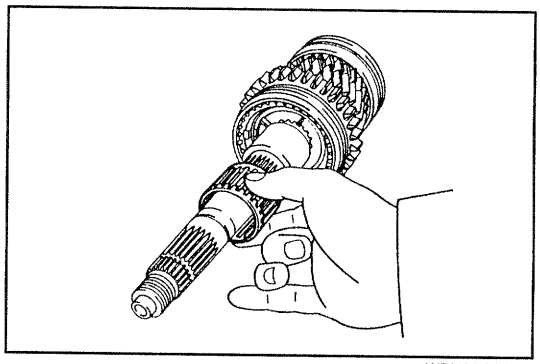
WRU90-MT441

11. Install the reverse gear with the following parts installed.
    (1) Synchromesh shifting key spring (2 pieces)
    (2) Synchromesh shifting key (3 pieces)
    (3) Transmission clutch hub No. 1
    NOTE:
    - Ensure that the bent sections at the front and rear of the synchromesh shifting key spring should not come at the same direction.



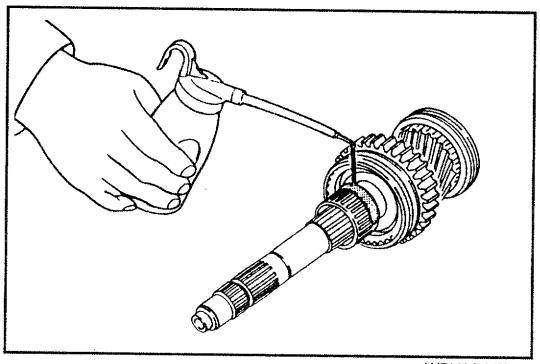
WRU90-MT442

12. Install the 1st gear inner race.



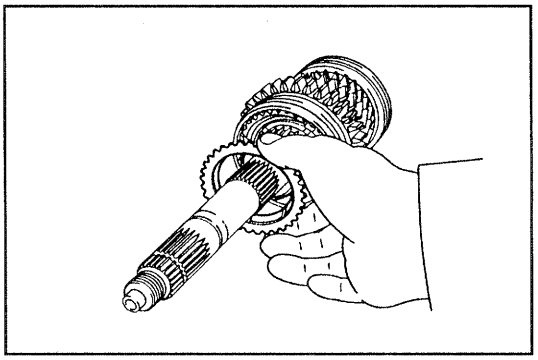
WRU90-MT443

13. Apply gear oil to the outer periphery of the 1st gear inner race and the needle roller bearing.

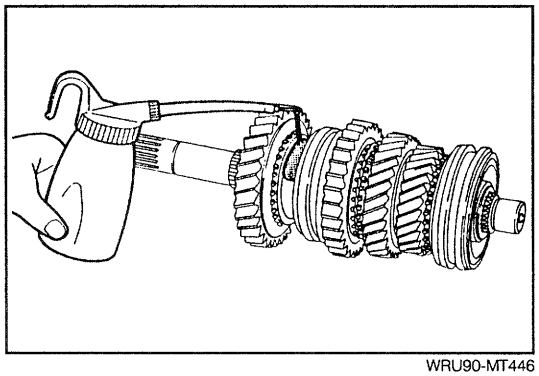


WRU90-MT444

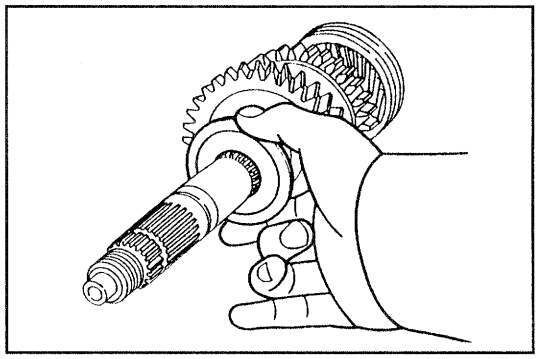
14. Install the synchronizer ring No. 2.


WRU90-MT445

15. Apply gear oil to the tapered section of the 1st gear, and install it.


WRU90-MT446

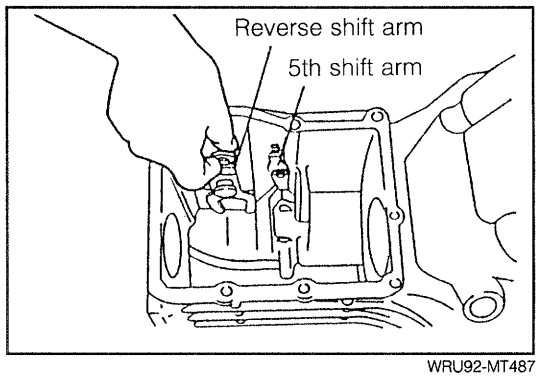
16. Install the 1st gear thrust washer.


WRU90-MT447

TRANSMISSION ASSEMBLY

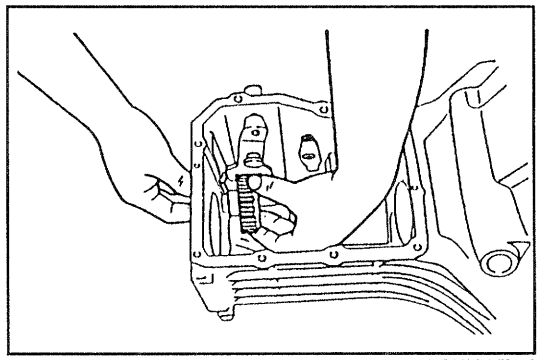
Prior to assembling the transmission case, clean the transmission case by removing any dirt, gasket materials or the like.

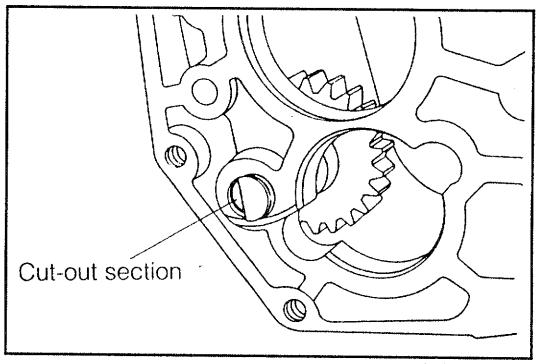
1. Install the reverse shift arm and 5th shift arm.



WRU92-MT487

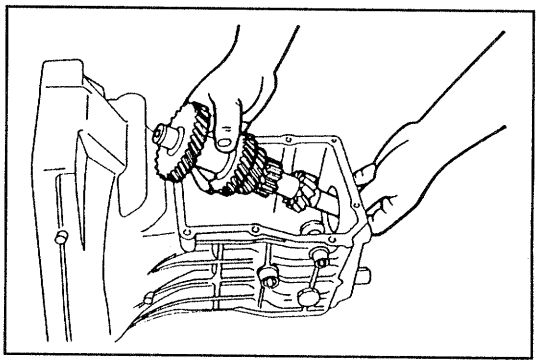
2. Install the reverse idler gear shaft and reverse idler gear.
   NOTE:
   - Be sure to install the reverse idler gear shaft in such a way that the cut-out section of the shaft faces toward the opposite side of the countershaft.
     If this operation should fail to be observed correctly, there may be a case where the transfer adaptor can not be installed.


WRU90-MT449

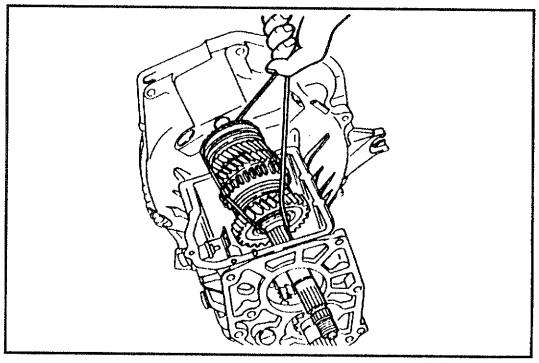


WRU90-MT450

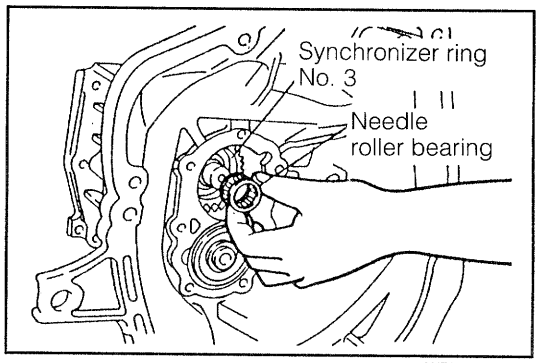
3. Insert the transmission countershaft into the transmission case.


WRU90-MT451

4. Place the output shaft in the transmission case.


WRU90-MT452

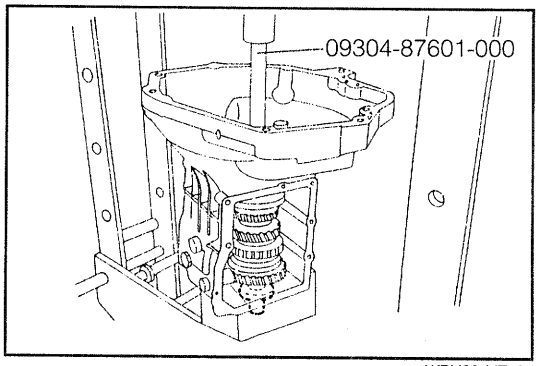
5. Apply the gear oil to the needle roller bearing and then, install to the output shaft.
6. Install the synchronizer ring No. 3.



WRU90-MT453

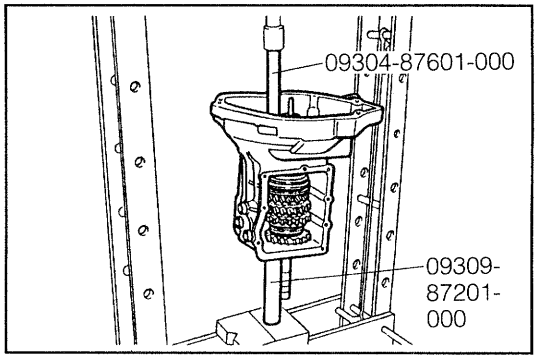
7. Press the input shaft bearing into position, using the following SSTs.
   SST: 09304-87601-000

   NOTE:
   - Prior to install the above bearing, remove the stop ring.



WRU90-MT454

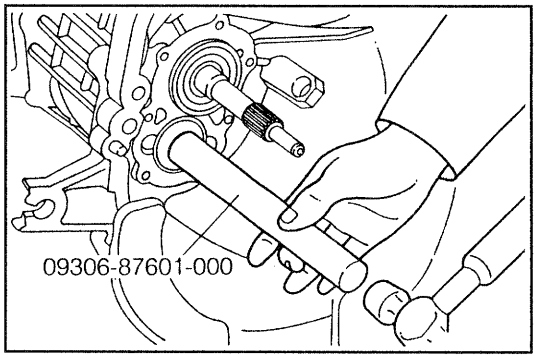
8. Press the bearings provided at the front and rear of the transmission countershaft, using the following SSTs at the same tim.
   SSTs: 09304-87601-000
   09309-87201-000



WRU90-MT455

9. Install a new snap ring to the countershaft, using the following SST:
   SST: 09306-87601-000

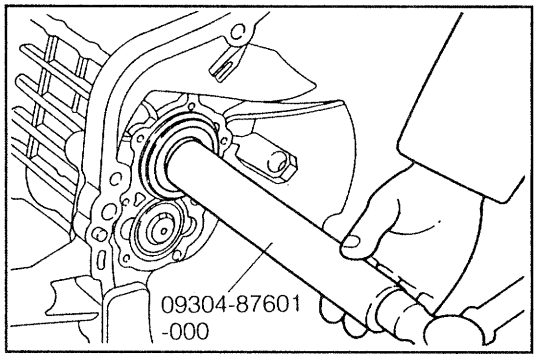
   NOTE:
   - Make sure that the snap ring securely installed into the groove section of the countershaft.



WRU90-MT456

10. Install the stop ring of the countershaft front bearing.
    NOTE:
    - Lightly tapping the countershaft from the rear side of transmission case with the plastic hammer or the like so that the bearing comes toward front side, prior to install the stop ring.

11. Install a new snap ring to the input shaft, using the following SST:
    SST: 09304-87601-000

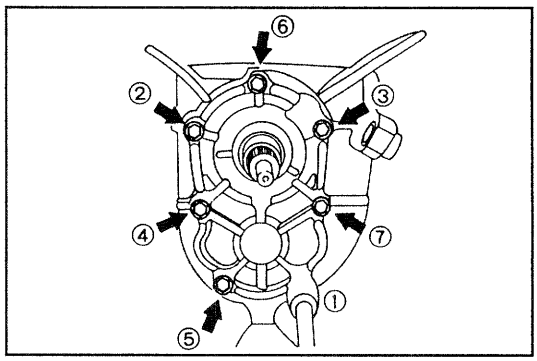


WRU90-MT457

12. Install the stop ring to the input shaft.

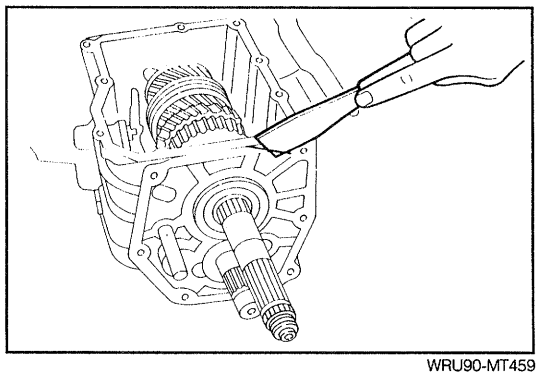
13. With a new gasket used, install the front bearing retainer.
    NOTE:
    (1) Apply gear oil to the oil seal lip section.
    (2) Molybdeum disulphide lithium base grease to the clutch hub sliding section of the front bearing retainer.
    Tightening Torque: 1.5 - 2.2 kg-m
    (10.8 - 15.9 ft-lb, 14.7 - 21.6 N·m)

    (3) Be sure to tighten the bolts alternately and diagonally (the right figure illustration indicates a typical example of the tightening sequence.)

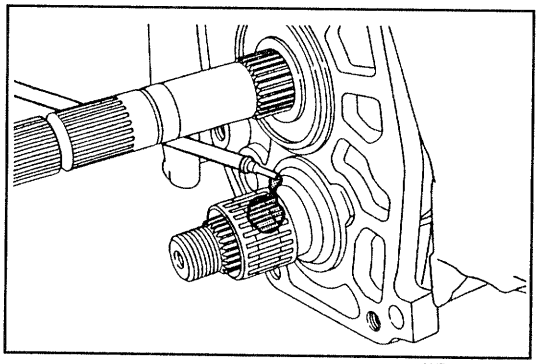


WRU90-MT458

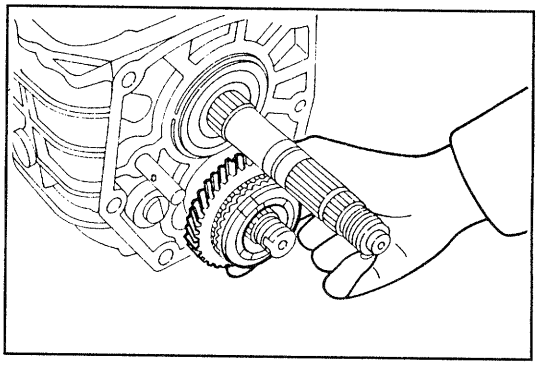
14. Install the clutch related parts (see page CL-sections).
15. Remove any remaining gasket material from the transmission, using a gasket scraper.
    NOTE:
    - Be very careful not to scratch the attaching surface.


WRU90-MT459

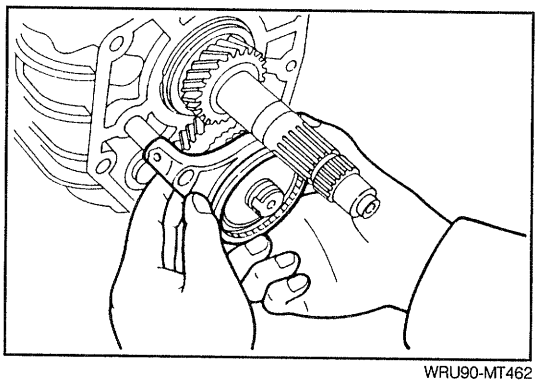
16. Install the 5th gear thrust washer.
17. Install the 5th gear inner race an needle roller bearing to the output shaft and then apply the gear oil to the outer periphery of the these parts.


WRU90-MT460

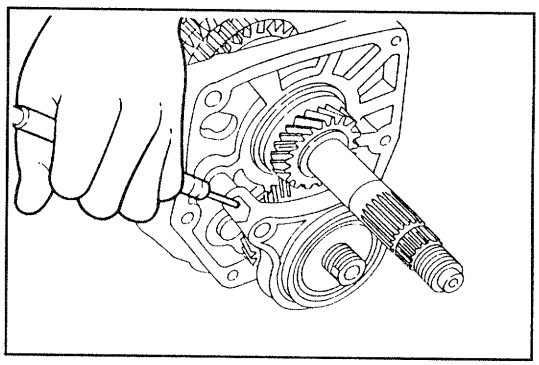
18. Apply gear oil to the tapered section of the 5th gear, and install the 5th gear and the synchronizer ring No. 3 to the counter shaft.


WRU90-MT461

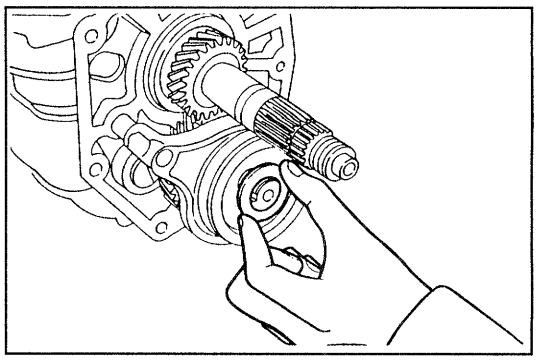
19. Install the 5th gear shift fork and the synchronizer hub sleeve together.

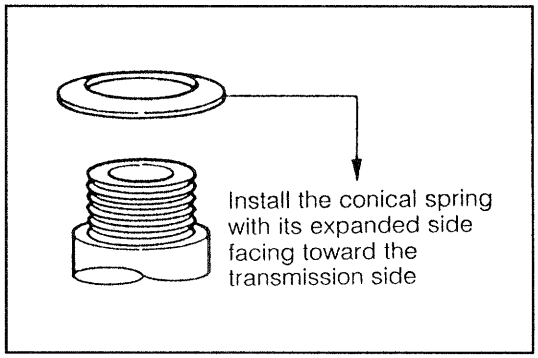

WRU90-MT462

20. Drive the new slotted pin of the 5th shift fork.
    NOTE:
    - Never reuse the removed slotted pin.


WRU90-MT463

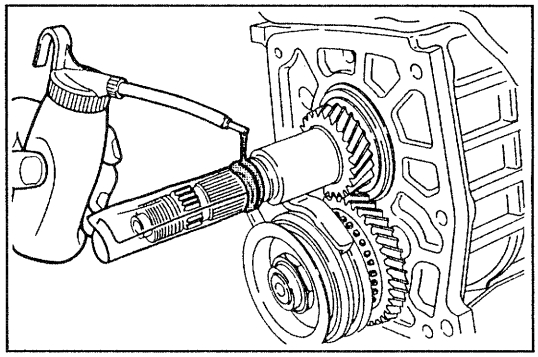
21. Install the shifting key retaine and conical spring washer in this sequence.





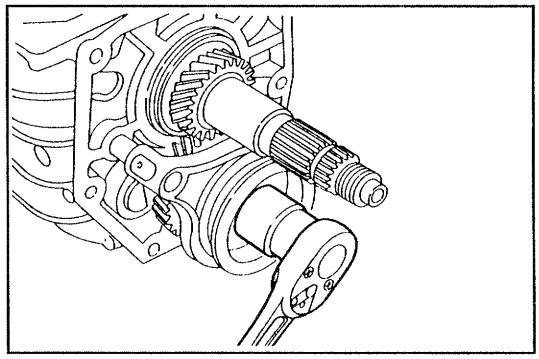
WRU90-MT464

22. Interlock the 1st gear and the 3rd gear.
23. Install the output gear spacer No. 1 to the output shaft.
24. Protect the spline section of the output shaft with the suitable vinyl sheets or the like.
25. Install the O-ring in a place and apply the gear oil to the O-ring.
    NOTE:
    - Be very careful not to damage the new O-ring during installation.



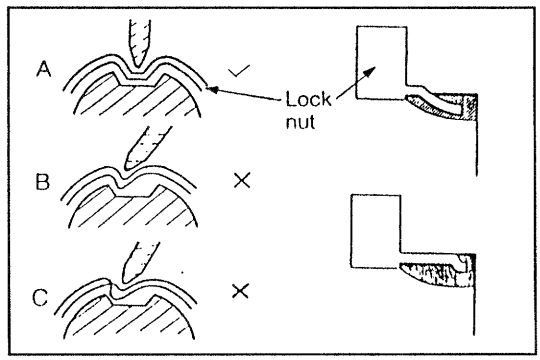
WRU90-MT465

26. Install the new lock nut of the 5th gear countershaft and then, tighten them.
    Tightening Torque:
    18.0 - 22.0 kg-m
    (130.0 - 159.0 ft-lb, 177.0 - 216.0 N·m)



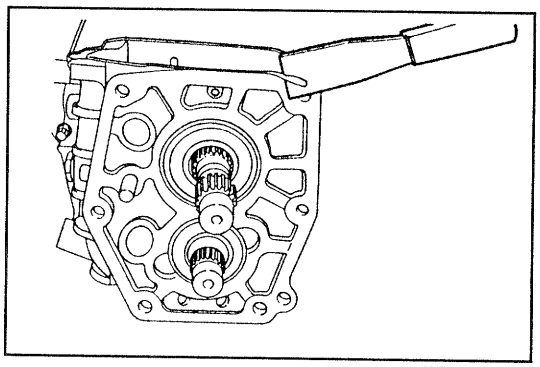
WRU90-MT466

NOTE:
- When staking the lock nut, point a suitable staking tool toward the counter shaft axis center and stake to lock nut securely as shown in the right figure A.
- Poor staking may cause abnormal noise as shown in the right figure B and C.

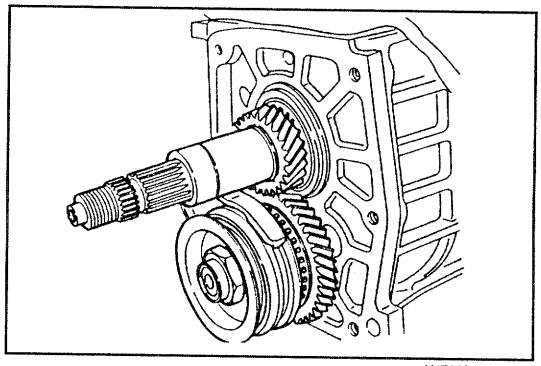


WRU90-MT467

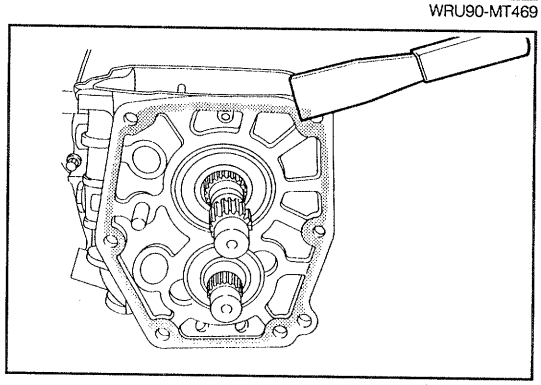
27. Remove any remaining gasket material from the transmission, using a gasket scraper.
CAUTION:
- Be very careful not to scratch the attaching surface.


WRU90-MT468

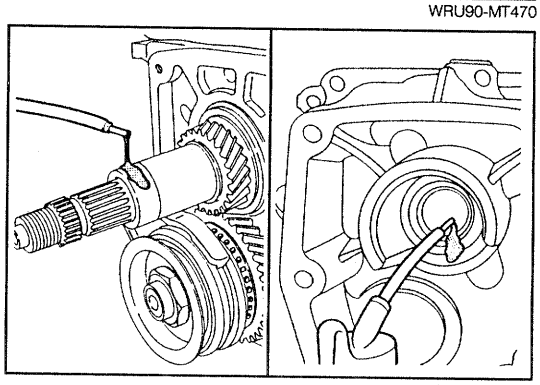
28. Place output gear spacer No. 2 on the transmission output shaft.


WRU90-MT469

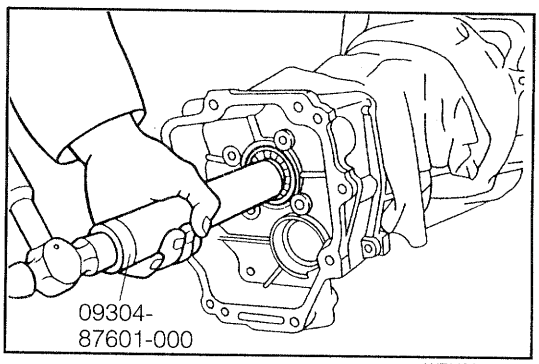
29. Apply the THREE BOND 1216 (made by THREE BOND) to the mating surface between the transfer case and the transmission case.
NOTE:
- Apply the bond to the inside of the bolt hole, as shown in the diagram at right.


WRU90-MT470

30. Apply gear oil to the outer periphery of the output gear spacer No. 2 and to the lip section of the oil seal, and push the transfer adapter until it has come into firm contact with the transmission case.
NOTE:
- Be very careful not to turned over the lip section of the oil seal during installation.


WRU90-MT471

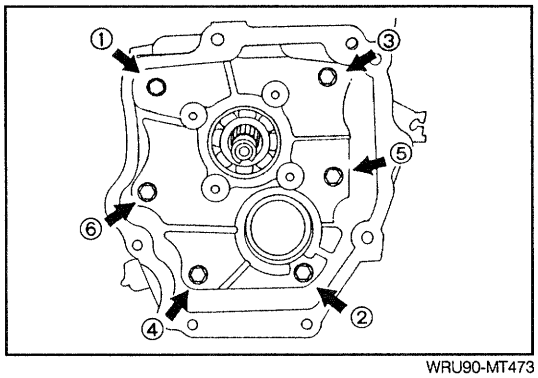
31. Install the bearing of the transmission output shaft using the following SST:
SST: 09304-87601-000



WRU90-MT472

32. Apply the THREE BOND 1216 (made by THREE BOND) to the thread sections of the bolts, and tighten those bolts.
    Tightening Torque: 3.0 - 4.5 kg-m
    (21.7 - 32.5 ft-lb, 29.4 - 44.1 N·m)

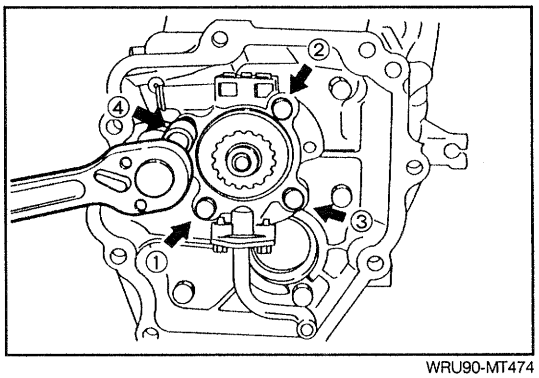
    NOTE:
    - Be sure to tighten the bolts alternately and diagonally (the right figure illustration indicates a typical example of tightening sequence)



WRU90-MT473

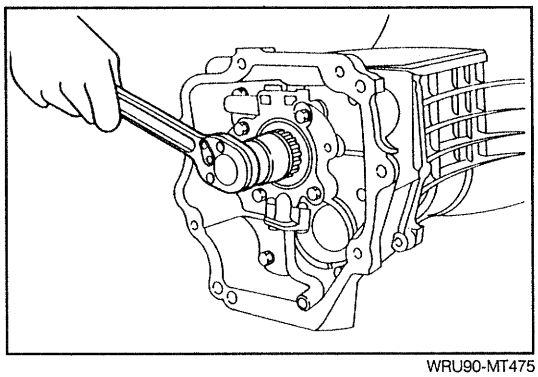
33. Install the transfer oil pump body subassembly to the transfer adapter and then tighten the adapter with four bolts.
    Tightening Torque: 1.5 - 2.2 kg-m
    (10.8 - 15.9 ft-lb, 14.7 - 21.6 N·m)

    NOTE:
    - Be sure to tighten the bolts alternately and diagonally (the right figure illustration is a typical example of tightening sequence)

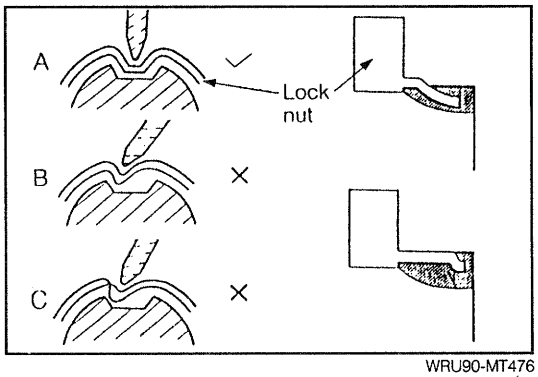


WRU90-MT474

34. Install the new lock nut of the transmission output shaft and then, tighten it.
    Tightening Torque:
    18.0 - 22.0 kg-m
    (130.0 - 159.0 ft-lb, 177.0 - 216.0 N·m)

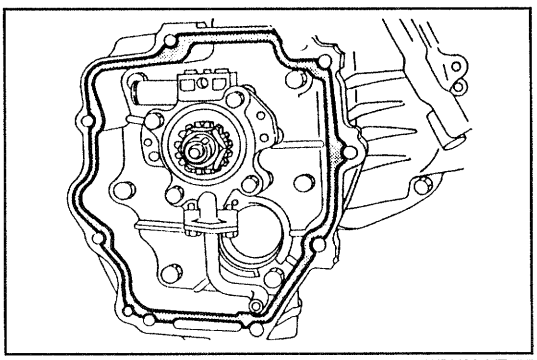

WRU90-MT475

    NOTE:
    - When staking the lock nut, point a suitable staking tool toward the transfer output rear shaft axis center and stake to lock nut securely, as shown in the right figure A.
    - Poor staking may cause abnormal noise as shown in the right figure B and C.

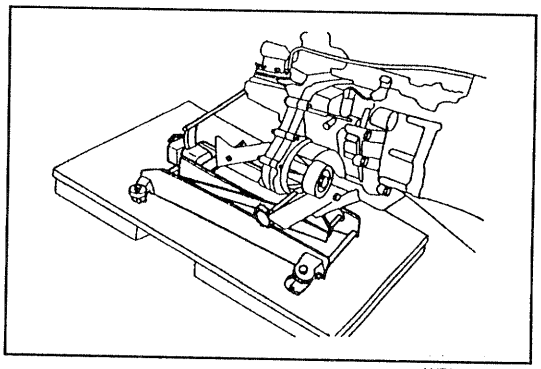


WRU90-MT476

35. Apply the liquid-gasket-use THREE BOND 1216 (made by THREE BOND) to the mating surface between the transfer adapter and the transfer front case.
    NOTE:
    - Apply the bond to the attaching surface of the inside bolt hole.

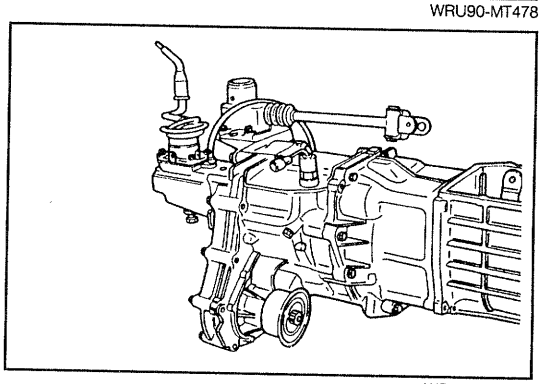

WRU90-MT477

36. Support the transfer front and rear cases with transmission jacks or the like.

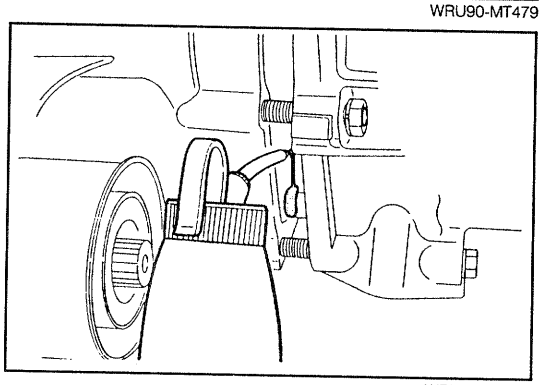


WRU90-MT478

37. Temporarily install the transfer front case to the transfer adapter, using the eight dummy bolts.
    NOTE:
    - Apply the gear oil to the O-ring section of the transfer oil strainer tube.

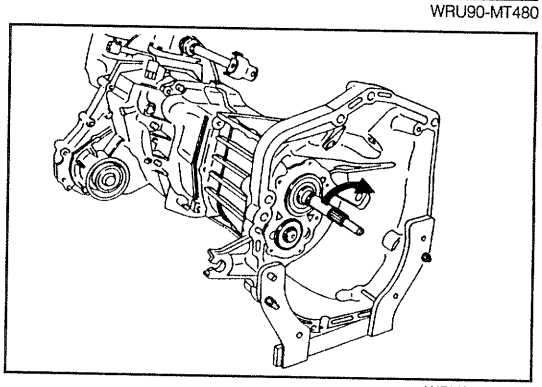


WRU90-MT479



WRU90-MT480

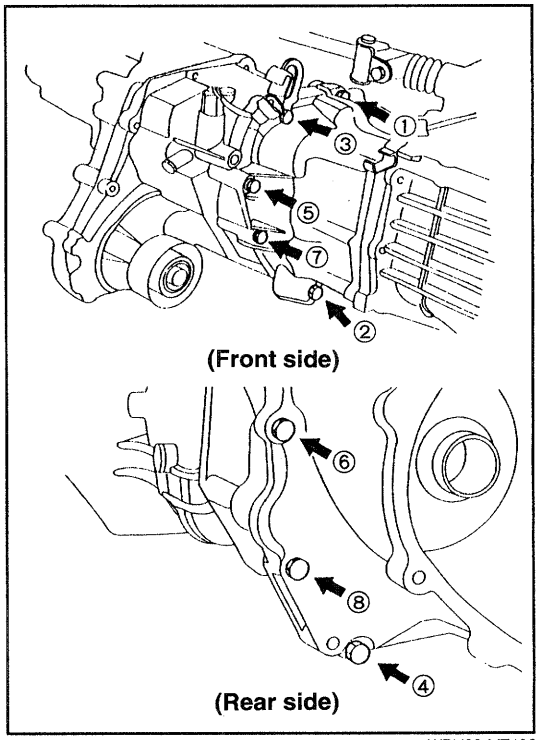
38. Shift the 1st gear into position.
39. Tighten the transfer front case with the eight dummy bolts with rotating the input shaft clockwise.
    CAUTION:
    - Be careful to tighten the dummy bolts alternately, evenly and diagonally.
    - If this operation should fail to be performed, failure to observe this caution may disengagement of gear.



WRU90-MT481

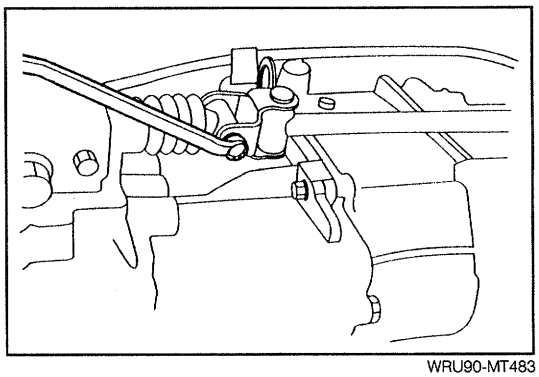
40. Remove the eight dummy bolts.
41. Apply the THREE BOND 1216 (made by THREE BOND) to the thread section of the bolts, and tighten them.
    Tightening Torque: 3.0 - 4.5 kg-m
    (21.7 - 32.5 ft-lb, 29.4 - 44.1 N·m)

    NOTE:
    - Be sure to tighten the bolts alternately and diagonally. (The illustration at the right figure indicates a typical example of tightening sequence.)



WRU90-MT482

42. Install the shift lever retainer subassembly and the control shaft with a hexagon bolt (Use new hexagon bolt).
    Tightening Torque: 1.5 - 2.2 kg-m
    (10.8 - 15.9 ft-lb, 14.7 - 21.6 N·m)

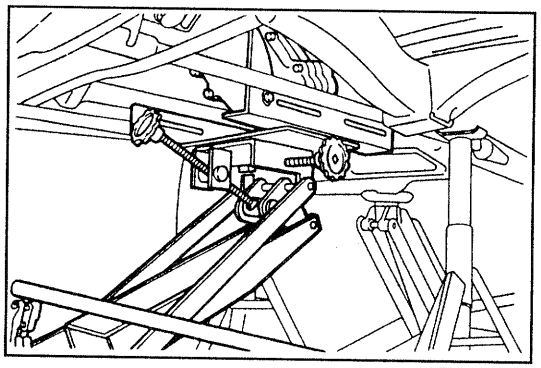

WRU90-MT483

43. Install the transmission case cover subassembly (see page MT–68).
44. Install the transmission and transfer assembly to the vehicle (see pages MT–105 to MT–109).

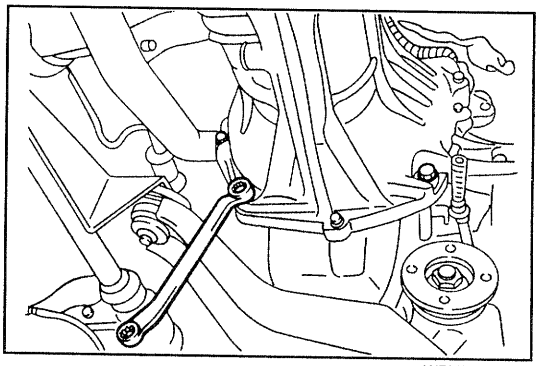
WRU92-MT503

INSTALLATION

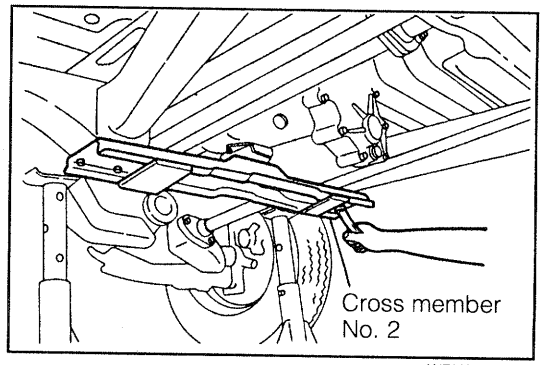
1. Working from the under vehicle
   (1) Support the transmission with a transmission jack.


WRU90-MT086

   (2) While supporting the transmission assembly with a transmission jack, push in the transmission assembly into the engine.
   Tightening Torque:
   5.0 - 7.0 kg-m (36.2 - 50.6 ft-lb, 49.0 - 68.6 N·m)

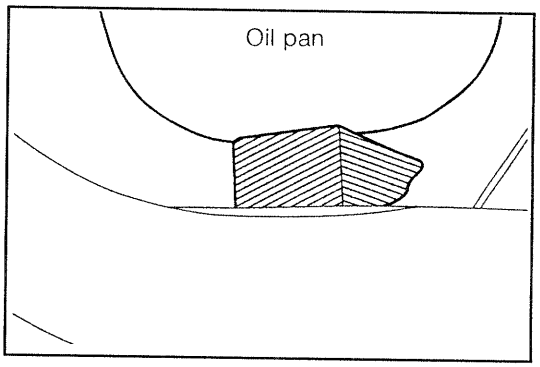

WRU90-MT087

   (3) Tighten the cross member No. 2 with the four bolts on both left and right sides bolts.
   Tightening Torque:
   4.0 - 5.5 kg-m (29.0 - 39.7 ft-lb, 39.2 - 53.9 N·m)



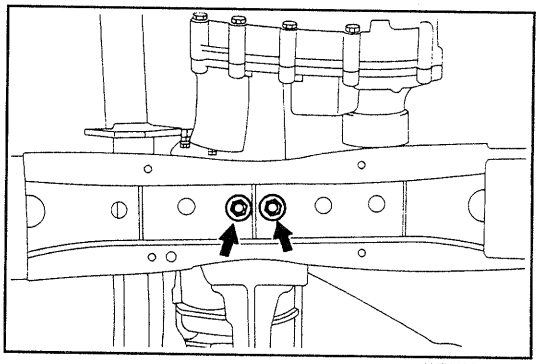
WRU90-MT088

   (4) Remove the wooden pieces between oil pan and differential carrier support front bracket.

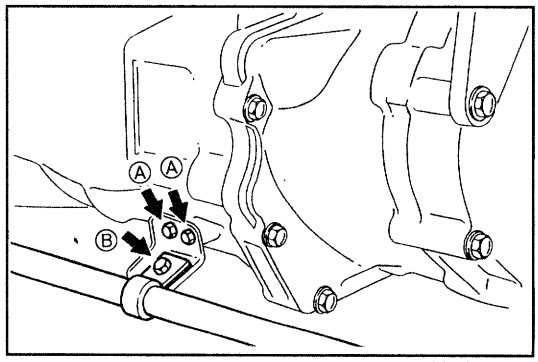


WRU90-MT089

   (5) Install the transmission mounting to the crossmember No. 2 with the two nuts and tighten them.
   Tightening Torque:
   6.0 - 8.0 kg-m (43.4 - 57.9 ft-lb, 58.8 - 78.5 N·m)


WRU90-MT090

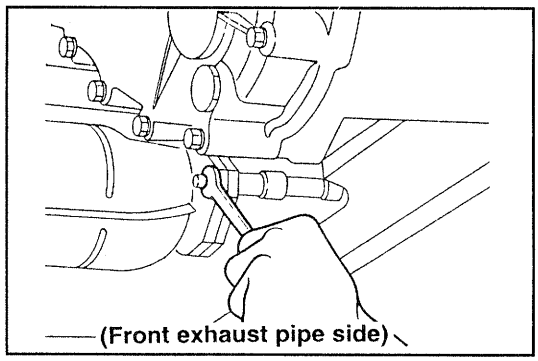
(6) Tighten the exhaust pipe support bracket with the three bolts.
Tightening Torque:
Ⓐ 1.5 - 2.2 kg-m (10.8 - 15.9 ft-lb, 14.7 - 21.6 N·m)
Bracket × Transmission
Ⓑ 3.0 - 4.5 kg-m (21.7 - 37.6 ft-lb, 29.4 - 44.1 N·m)
Bracket × Exhaust pipe

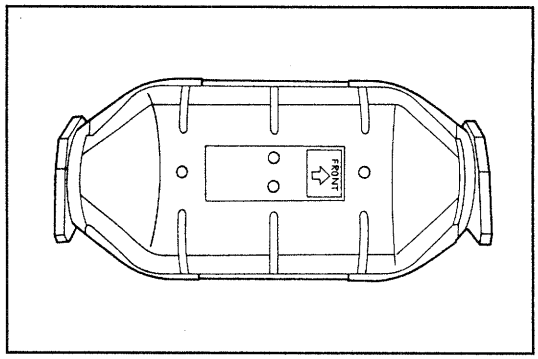


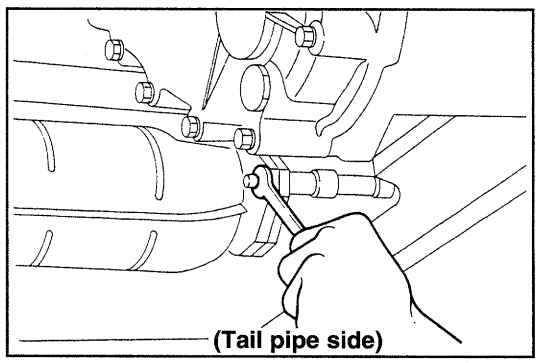
WRU90-MT091

(7) Tighten the catalyst converter assembly with the two nuts on both front and rear side, using the new gaskets.
Tightening Torque:
3.7 - 5.2 kg-m (26.8 - 37.6 ft-lb, 36.3 - 51.0 N·m)

NOTE:
- Install the converter in such a way that.
- Arrow marking facing with ground.
- Toward the front exhaust pipe.

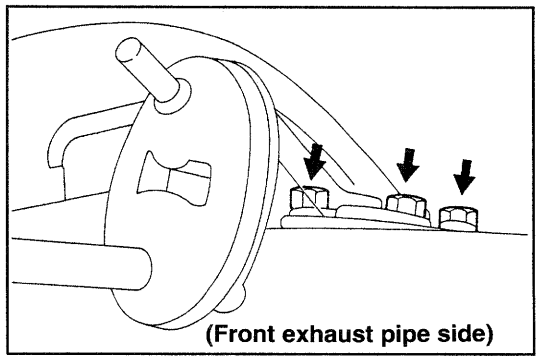






WRU90-MT092

(8) Tighten the bracket to the crossmember No. 3 with the three bolts.
Tightening Torque:
3.0 - 4.5 kg-m (21.7 - 37.6 ft-lb, 29.4 - 44.1 N·m)



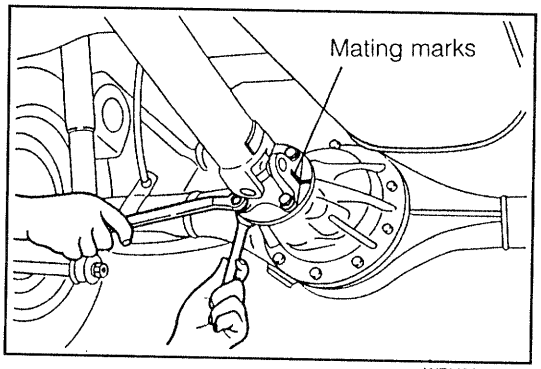
WRU90-MT093

(9) Install the front propeller shaft and rear propeller shaft and tighten with the bolts, spring washer and nuts.

CAUTION:

- Align the mating marks put during the removal with each others. If this operation should fail to be performed correctly, the propeller shaft may emit abnormal noise or vibration during the running.

Tightening Torque:
6.0 - 8.0 kg-m (43.4 - 57.8 ft-lb, 58.8 - 78.5 N·m)

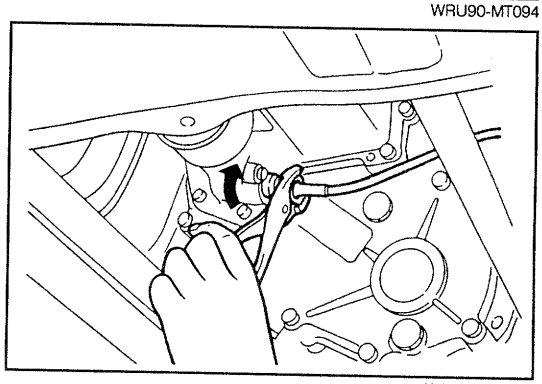


WRU90-MT094

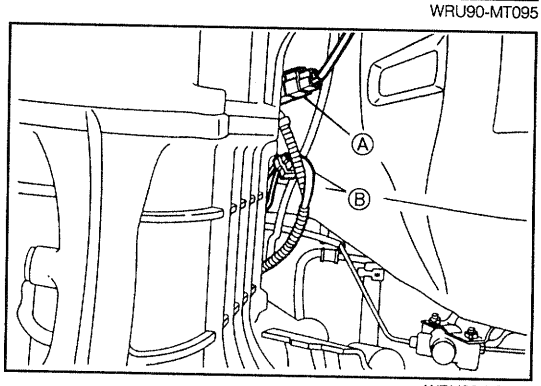
(10) Connect the speedometer cable with oil seal to the transmission case, using the common tool of plier.

NOTE:

- Make sure that the forward end of the speedometer cable has positively entered into the sleeve.


WRU90-MT095

(11) Connect the coupler of back up lamp and transmission position detect switch.

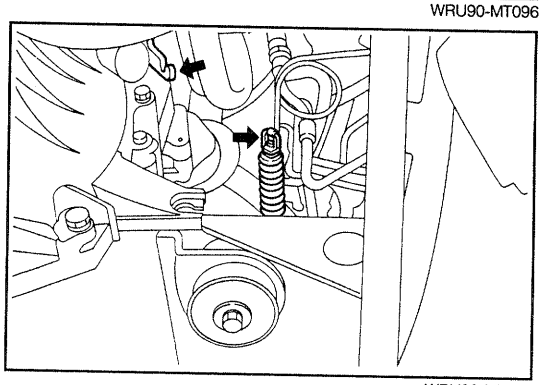


WRU90-MT096

(12) Connect the clutch release cable subassembly to the release fork.

NOTE:

- Apply the Lithium base multi purpose grease to the connecting sections.

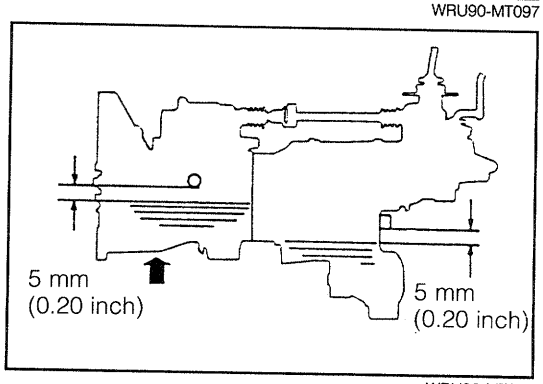

WRU90-MT097

(13) Fill in the transmission and transfer oil through the oil filler plug holes.

TRANSFER
Oil: API GL-3 or GL-4
SAE 75W-85 or 75W-90
Oil Capacity: 1.4 liters (0.36 US gal, 1.48 USA qts)

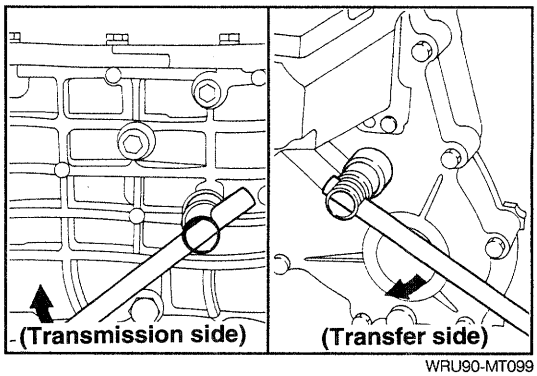
TRANSMISSION
Oil: API GL-3 or GL-4
SAE 75W-85 or 75W-90
Oil Capacity: 1.7 liters (0.44 US gal, 1.79 USA qts)

(14) Check of transmission and transfer checking of oil level and leakage oil should be up to the filler plug hole. Add oil if low and inspect for oil leakage.



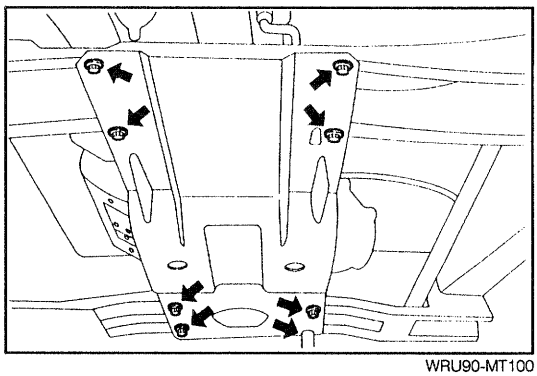
WRU90-MT098

(15) Tighten the filler plugs with new gasket.
Tightening Torque:
3.0 - 5.0 kg-m (21.7 - 36.2 ft-lb, 29.4 - 49.0 N·m)

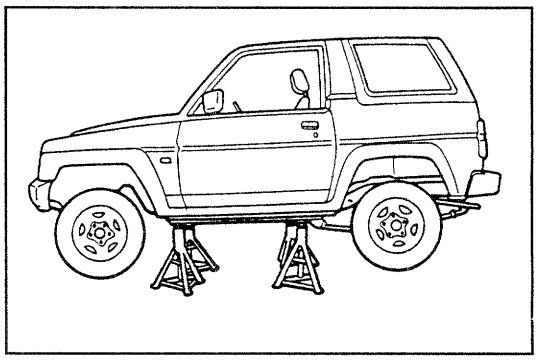


WRU90-MT099

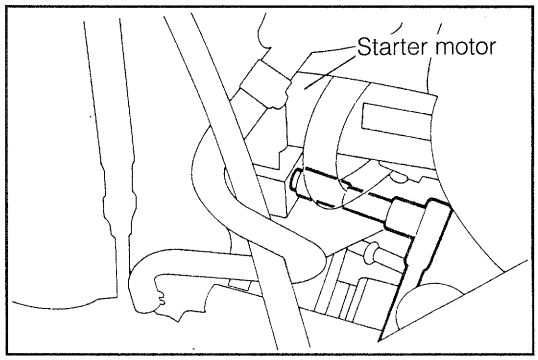
(16) Tighten the transmission under cover with the eight bolts.
Tightening Torque:
4.0 - 6.0 kg-m (28.9 - 43.4 ft-lb, 39.2 - 58.8 N·m)


WRU90-MT100

2. Working from the vehicle outside
(1) Jack down the vehicle.

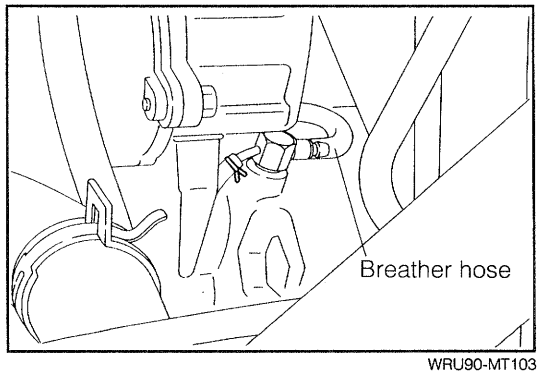

WRU90-MT101

3. Working from the engine compartment room
(1) Install the direct-connecting a bolt and tighten it.
Tightening Torque:
5.0 - 7.0 kg-m (36.2 - 50.6 ft-lb, 49.0 - 68.6 N·m)



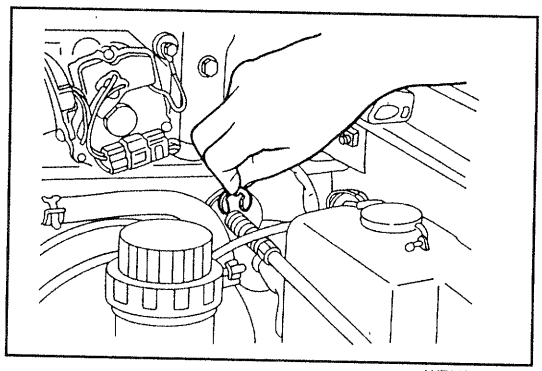
WRU90-MT102

(2) Install the transmission breather hose with a clip.

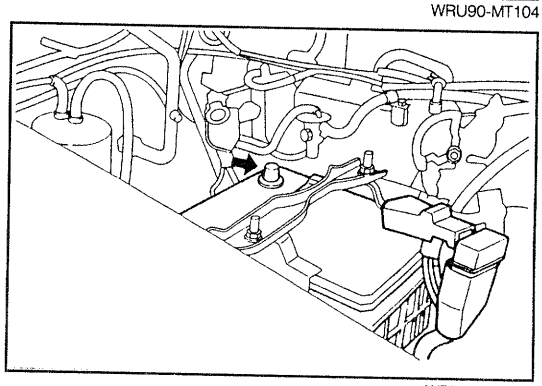


WRU90-MT103

(3) Install the clutch cable to the clutch release fork. Adjust the free travel by means of the E-ring.
Free Travel of Clutch Pedal:
18 - 27 mm (0.709 - 1.063 inches)

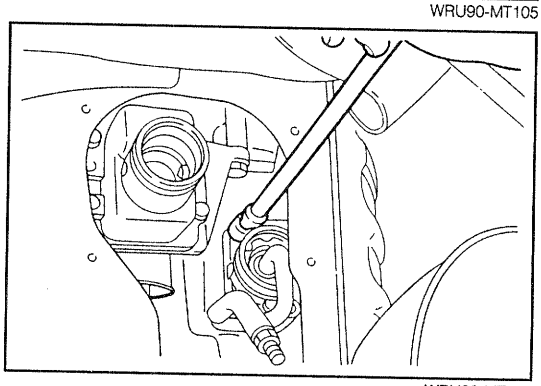

WRU90-MT104

(4) Connect the battery ground cable to the negative (–) terminal of the battery.


WRU90-MT105

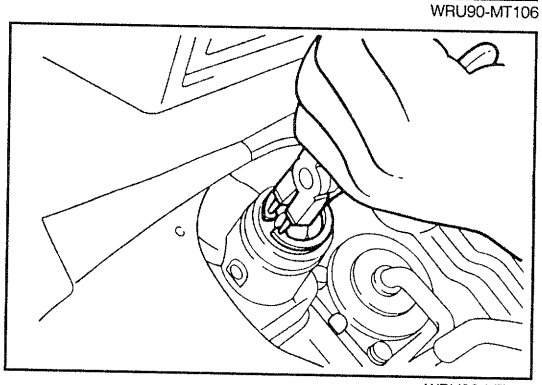
4. Working from the vehicle interior
(1) Install the transfer control lever with the four bolts, using the new gasket.
Tightening Torque:
1.5 - 2.2 kg-m (10.9 - 15.9 ft-lb, 14.7 - 21.6 N·m)

NOTE:
- **Apply the Lithium base multi purpose grease to the forward end of the transfer control lever.**

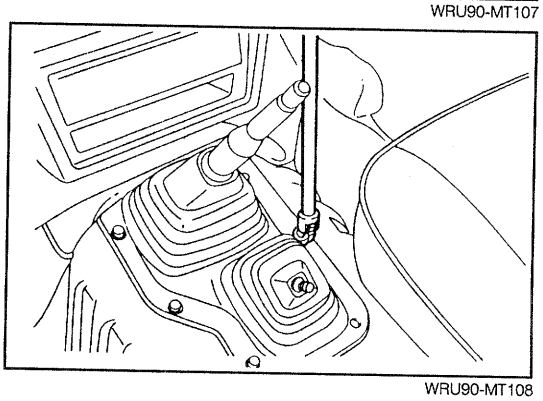

WRU90-MT106

(2) Install the transmission control lever with a snap ring, using the common tool of snap ring plier.
CAUTION:
- **Ensure that the snap ring must be inserted in the groove section of control shift lever retainer.**

NOTE:
- **Apply the Lithium base multi purpose grease to the forward end of the transfer control lever.**


WRU90-MT107

(3) Install the shift lever boot with the six bolts.
(4) Install the floor carpet in a place.
(5) Install the transmission and transfer shift lever knobs.


WRU90-MT108