

# MANUAL TRANSAXLE

## SECTION

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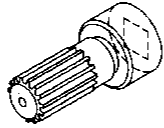
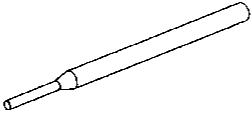
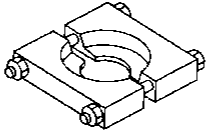
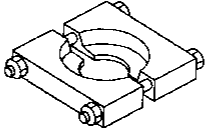
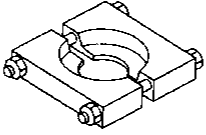
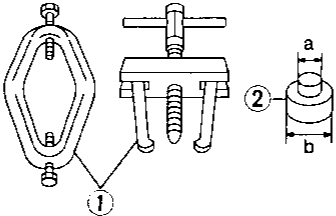
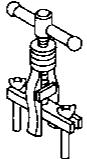
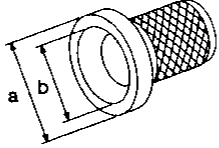
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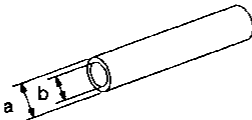
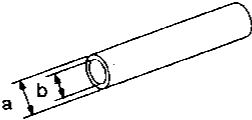
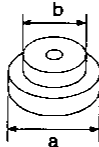
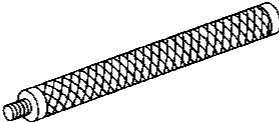
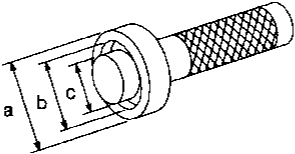
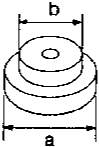
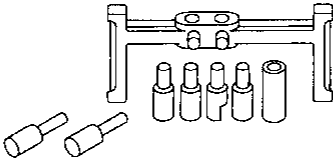
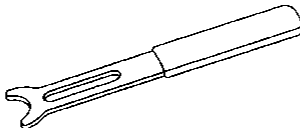
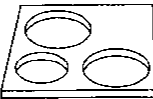
# PREPARATION

## Special Service Tools

Tool number (Kent-Moore No.) Tool name	Description
KV38105210 ( — ) Preload adapter	 <p style="text-align: right;">Measuring turning torque of final drive assembly Measuring total turning torque</p> <p>NT075</p>
KV32101000 (J25689-A) Pin punch	 <p style="text-align: right;">Removing and installing retaining pin</p> <p>NT070</p>
ST22730000 (J25681) Puller	 <p style="text-align: right;">Removing mainshaft front and rear bearing inner race</p> <p>NT071</p>
ST30031000 (J22912-01) Puller	 <p style="text-align: right;">Removing input shaft front and rear bearing Removing 4th &amp; 5th main gear</p> <p>NT071</p>
ST30021000 (J22912-01) Puller	 <p style="text-align: right;">Removing 5th synchronizer Removing 3rd &amp; 4th synchronizer Removing 2nd &amp; 3rd main gear</p> <p>NT071</p>
ST3306S001 ( — ) Differential side bearing puller set ① ST33051001 ( — ) Puller ② ST33061000 (J8107-2) Adapter	 <p style="text-align: right;">Removing differential side bearing inner race</p> <p style="text-align: right;">a: 28.5 mm (1.122 in) dia. b: 38 mm (1.50 in) dia.</p> <p>NT072</p>
ST33290001 (J34286) Puller	 <p style="text-align: right;">Removing differential oil seal Removing mainshaft rear bearing outer race Removing differential side bearing outer race</p> <p>NT076</p>
ST33400001 (J26082) Drift	 <p style="text-align: right;">Installing differential oil seal</p> <p style="text-align: right;">a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.</p> <p>NT086</p>

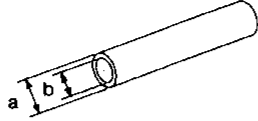
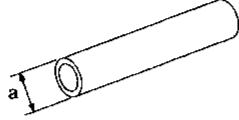
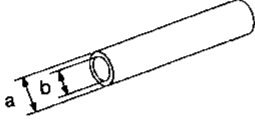
## PREPARATION

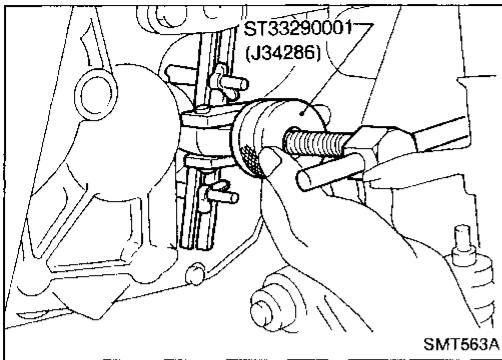
### Special Service Tools (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	GI
ST30600000 (J25863-01) Drift	 <p style="text-align: center;">NT065</p> <p style="text-align: right;">Installing input shaft front bearing</p> <p style="text-align: right;"><b>a: 36 mm (1.42 in) dia.</b> <b>b: 31 mm (1.22 in) dia.</b></p>	MA
ST22452000 ( — ) Drift	 <p style="text-align: center;">NT065</p> <p style="text-align: right;">Installing 3rd, 4th and 5th main gear</p> <p style="text-align: right;"><b>a: 45 mm (1.77 in) dia.</b> <b>b: 36 mm (1.42 in) dia.</b></p>	EM
ST30621000 (J25742-5) Drift	 <p style="text-align: center;">NT073</p> <p style="text-align: right;">Installing mainshaft rear bearing outer race (Use with ST30611000.)</p> <p style="text-align: right;"><b>a: 79 mm (3.11 in) dia.</b> <b>b: 59 mm (2.32 in) dia.</b></p>	EF & EC
ST30611000 (J25742-1)	 <p style="text-align: center;">NT090</p> <p style="text-align: right;">(Use with ST30621000.)</p>	CL
KV38100300 Drift	 <p style="text-align: center;">NT085</p> <p style="text-align: right;">Installing differential side bearing</p> <p style="text-align: right;"><b>a: 54 mm (2.13 in) dia.</b> <b>b: 46 mm (1.18 in) dia.</b> <b>c: 32 mm (1.26 in) dia.</b></p>	AT
ST30613000 Drift	 <p style="text-align: center;">NT073</p> <p style="text-align: right;">Installing differential side bearing</p> <p style="text-align: right;"><b>a: 72 mm (2.13 in) dia.</b> <b>b: 48 mm (2.89 in) dia.</b></p>	RA
(J34290) Shim selecting tool set	 <p style="text-align: center;">NT080</p> <p style="text-align: right;">Selecting differential side bearing adjusting shim</p>	ST
(J34305) Snap ring remover and installer	 <p style="text-align: center;">NT081</p> <p style="text-align: right;">Removing and installing stopper ring of shift fork</p>	HA
(J25407-2)	 <p style="text-align: center;">NT082</p> <p style="text-align: right;">Measuring reverse baulk ring wear</p>	IDX

# PREPARATION

## Commercial Service Tools

Tool name	Description
Drift	 <p data-bbox="407 394 461 422">NT065</p> <p data-bbox="976 243 1403 300">Installing differential side bearing inner race</p> <p data-bbox="976 384 1214 411"><b>a: 45 mm (1.77 in) dia.</b></p> <p data-bbox="976 415 1214 443"><b>b: 41 mm (1.61 in) dia.</b></p>
Drift	 <p data-bbox="407 611 461 638">NT065</p> <p data-bbox="976 457 1403 514">Installing differential side bearing outer race</p> <p data-bbox="976 611 1214 638"><b>a: 69 mm (2.72 in) dia.</b></p>
Drift	 <p data-bbox="407 804 461 831">NT065</p> <p data-bbox="976 653 1289 680">Installing striking rod oil seal</p> <p data-bbox="976 772 1214 800"><b>a: 38 mm (1.50 in) dia.</b></p> <p data-bbox="976 804 1214 831"><b>b: 20 mm (0.79 in) dia.</b></p>



## Replacing Oil Seal

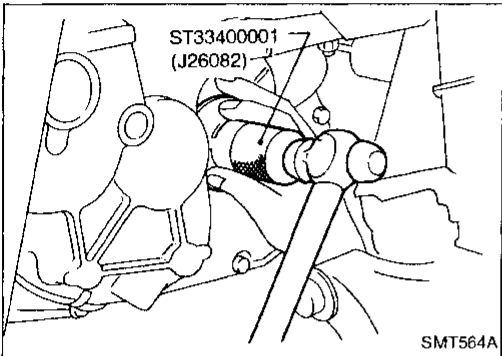
### DIFFERENTIAL OIL SEAL

1. Drain gear oil from transaxle.
2. Remove drive shafts — Refer to section FA.
3. Remove differential oil seal.

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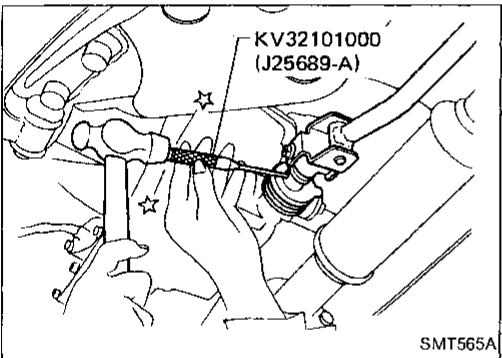
4. Install differential oil seal.
  - **Apply multi-purpose grease to seal lip of oil seal before installing.**
5. Install drive shafts — Refer to section FA.

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### STRIKING ROD OIL SEAL

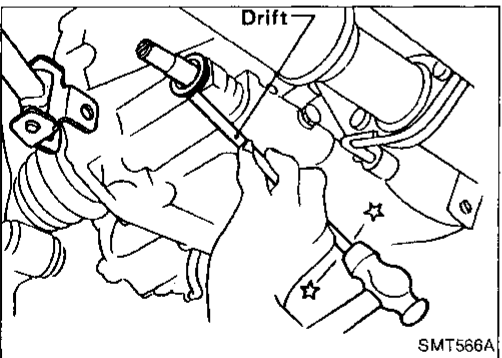
1. Remove transaxle control rod from yoke.
2. Remove retaining pin of yoke.
  - **Be careful not to damage boot.**

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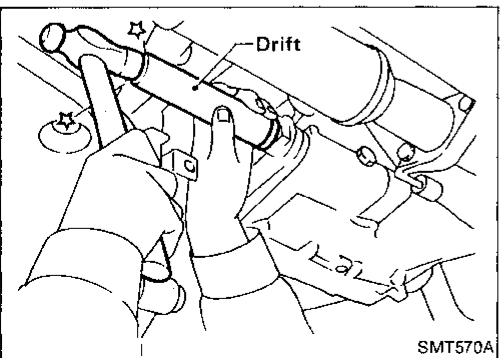
3. Remove striking rod oil seal.

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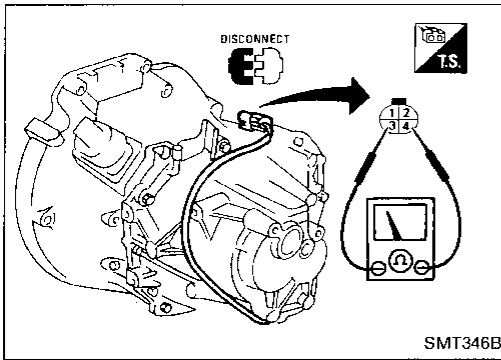
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4. Install striking rod oil seal.
  - **Apply multi-purpose grease to seal lip of oil seal before installing.**

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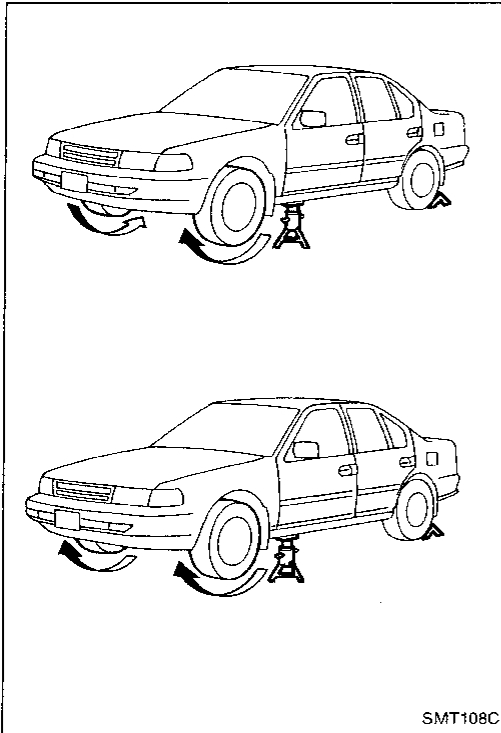


## Check of Position Switch

### BACK-UP LAMP SWITCH AND NEUTRAL POSITION SWITCH

- Check continuity.

Gear position	Continuity
Reverse	2 - 4
Neutral position	1 - 3
Except reverse and neutral position	No



## Viscous Coupling Check

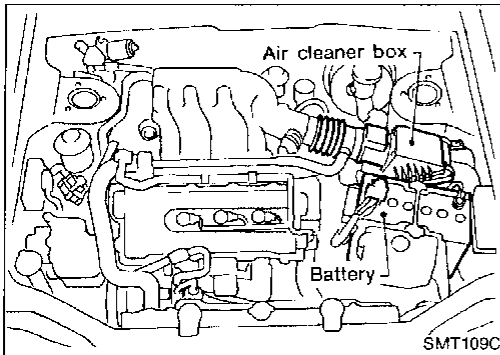
1. Apply parking brake firmly and place shift lever in the neutral position.
2. Jack up front wheels.
3. Rotate one front wheel and check turning direction of the other front wheel.

### Turning direction of the two wheels is opposite:

The viscous coupling is not functioning normally.

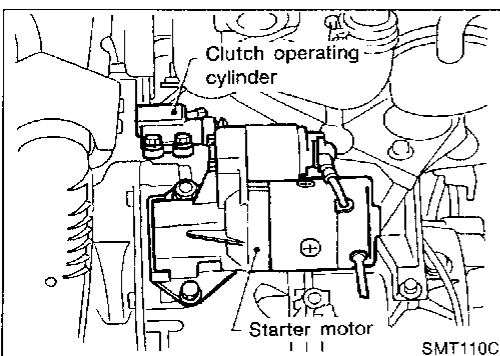
### Turning direction of the two wheels is the same:

If differential side gear and pinion mate gear thrust washers are OK, viscous coupling is functioning normally.



## Removal

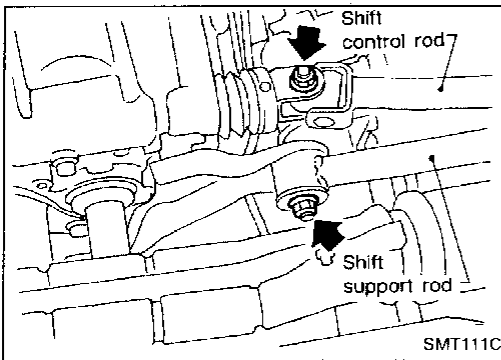
1. Remove battery and its bracket.
2. Remove air cleaner box with mass air flow sensor.



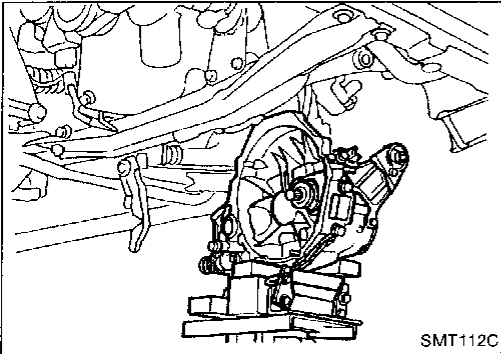
3. Remove clutch operating cylinder from transaxle.
4. Remove clutch hose clamp.
5. Disconnect speedometer pinion and position switch connectors.
6. Disconnect back-up lamp switch, neutral position switch and ground harness connectors.
7. Remove starter motor from transaxle.

# ON-VEHICLE SERVICE/REMOVAL AND INSTALLATION

## Removal (Cont'd)



8. Remove shift control rod and support rod from transaxle.
9. Drain gear oil from transaxle.
10. Draw out drive shafts from transaxle. — Refer to section FA.

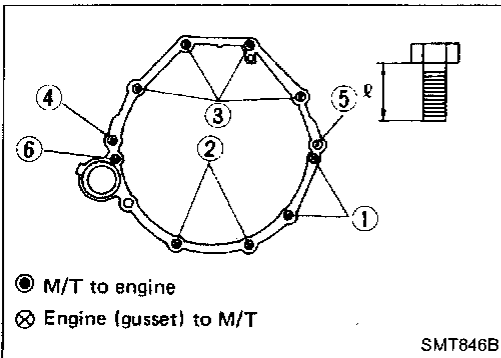


11. Support engine by placing a jack under oil pan.

### CAUTION:

**Do not place jack under oil pan drain plug.**

12. Remove rear and LH mounts.
13. Remove bolts securing transaxle.
14. Lower transaxle while supporting it with a jack.



## Installation

- Tighten all transaxle bolts.

Bolt No.	Tightening torque N-m (kg-m, ft-lb)	ℓ mm (in)
1	16 - 21 (1.6 - 2.1, 12 - 15)	25 (0.98)
2	30 - 40 (3.1 - 4.1, 22 - 30)	28 (1.10)
3	39 - 49 (4.0 - 5.0, 29 - 36)	57 (2.24)
4	39 - 49 (4.0 - 5.0, 29 - 36)	57 (2.24)
5	39 - 49 (4.0 - 5.0, 29 - 36)	64 (2.52)
6	21 - 27 (2.1 - 2.8, 15 - 20)	30 (1.18)
Front gusset to engine	30 - 40 (3.1 - 4.1, 22 - 30)	25 (0.98)
Rear gusset to engine	30 - 40 (3.1 - 4.1, 22 - 30)	25 (0.98)

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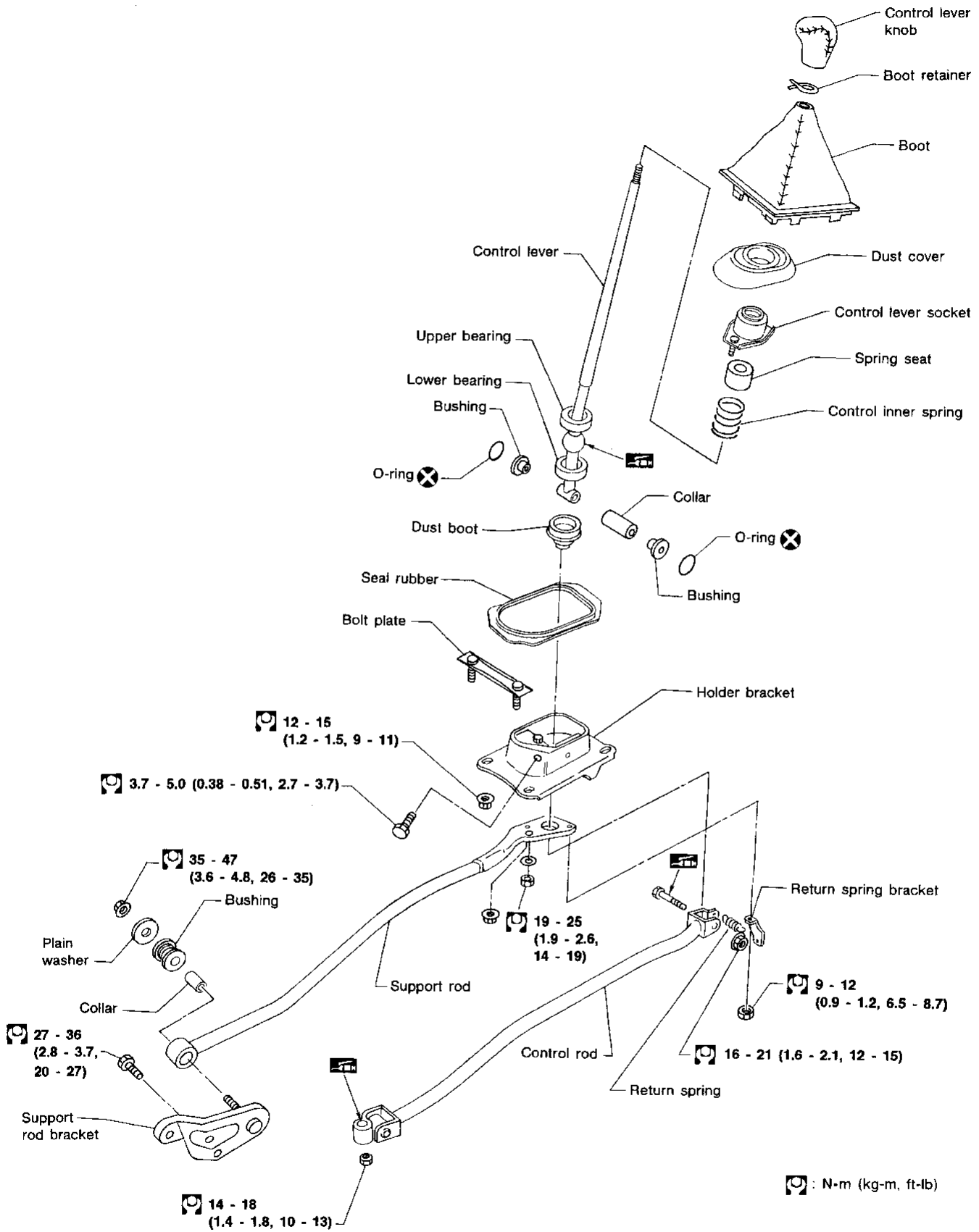
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# TRANSAXLE GEAR CONTROL

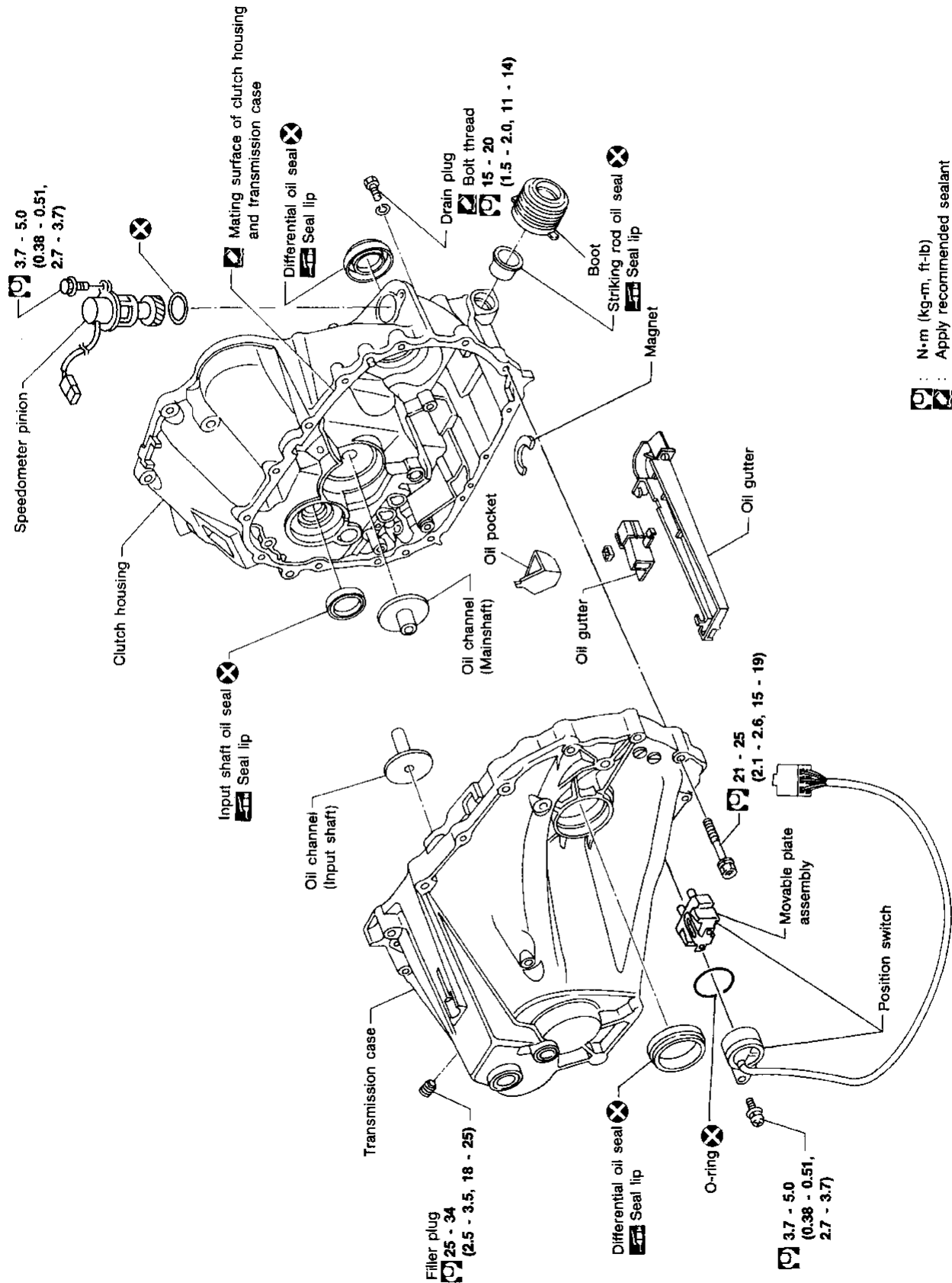


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# MAJOR OVERHAUL

## Case Components

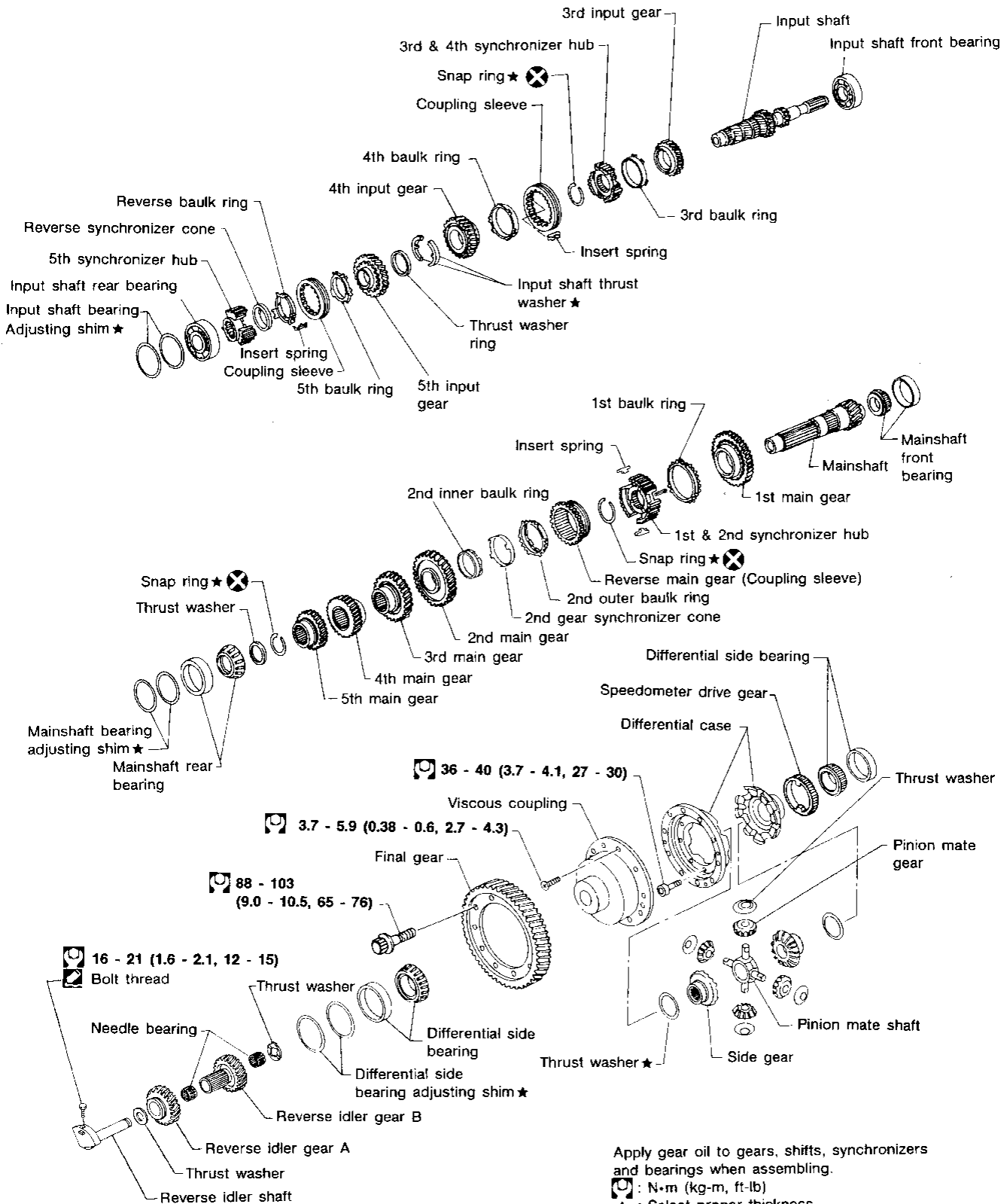


: N·m (kg·m, ft·lb)  
 : Apply recommended sealant  
 : (Nissan genuine part: KP610-00250) or equivalent.

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- EF & EC
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- CL
- MT**
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- EL
- IDX

# MAJOR OVERHAUL

## Gear Components



Apply gear oil to gears, shifts, synchronizers and bearings when assembling.

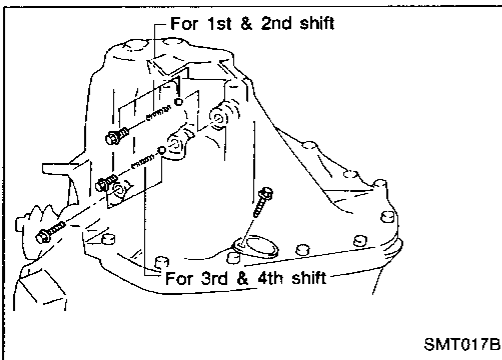
⊗: N·m (kg-m, ft-lb)

★: Select proper thickness.

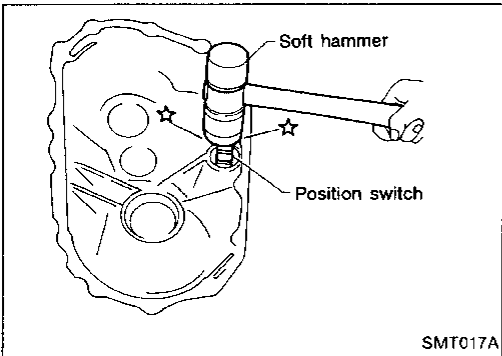
⊠: Apply recommended sealant (Nissan genuine part: KP610-00250) or equivalent.



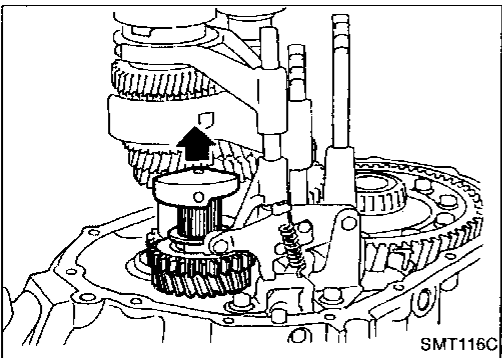
## DISASSEMBLY



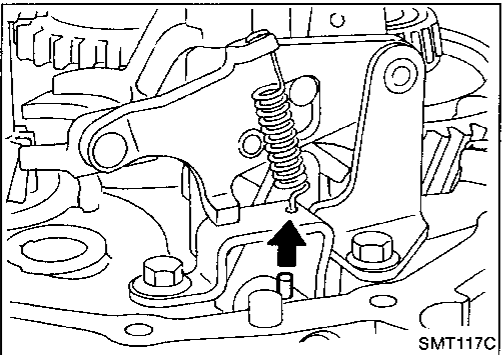
1. Before removing transmission case, remove bolts and plugs as shown left.
2. Remove transmission case.



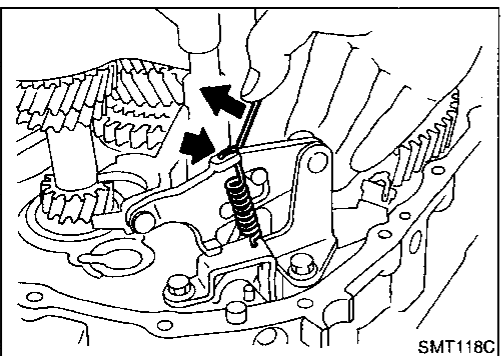
3. Remove position switch.



4. Mesh 4th gear, and then remove reverse idler shaft and reverse idler gear.

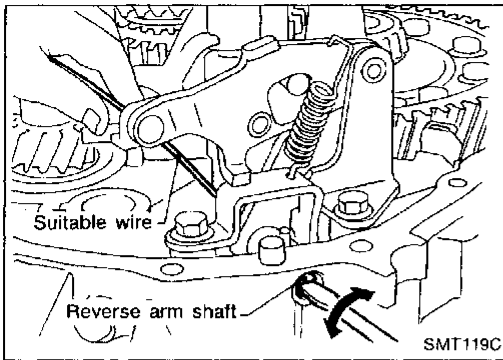


5. Pull out retaining pin from clutch housing.

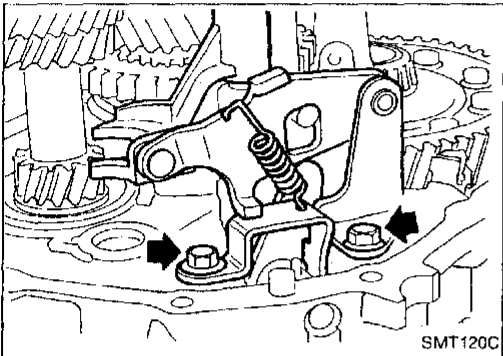


6. Remove reverse lever spring and reverse lock spring from reverse lever assembly.

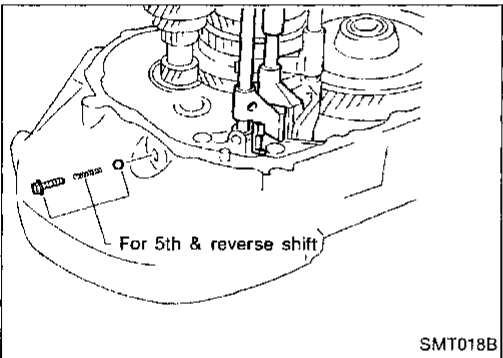
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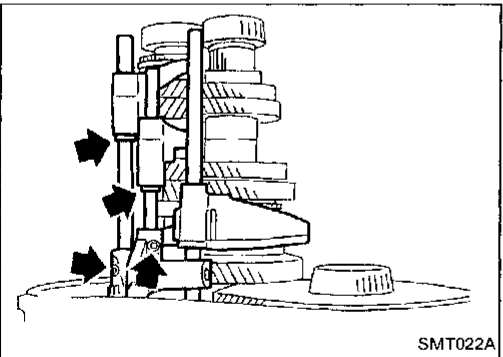
7. Remove reverse arm shaft while rotating it.



8. Remove reverse lever assembly.

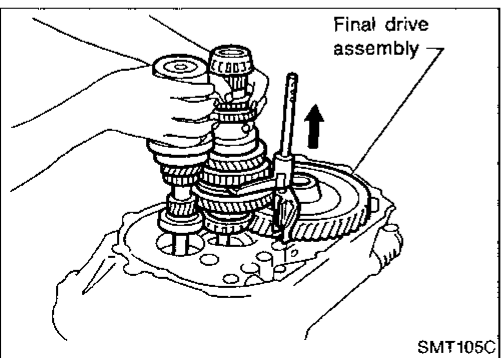


9. Remove 5th & reverse check plug, spring and ball.



10. Remove stopper rings and retaining pins from 5th & reverse and 3rd & 4th fork rods.

11. Remove 5th & reverse and 3rd & 4th fork rods. Then remove forks and brackets.



12. Remove both input and mainshafts with 1st & 2nd fork and fork rod as a set.

13. Remove final drive assembly.

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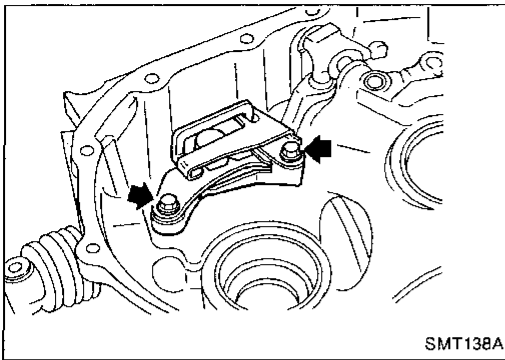
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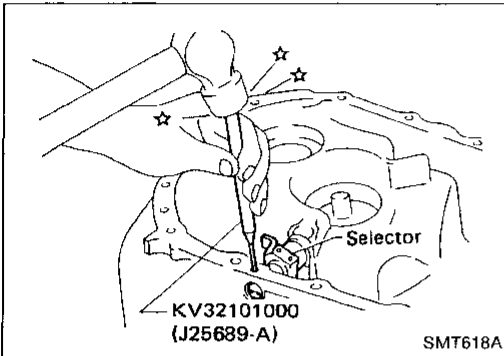
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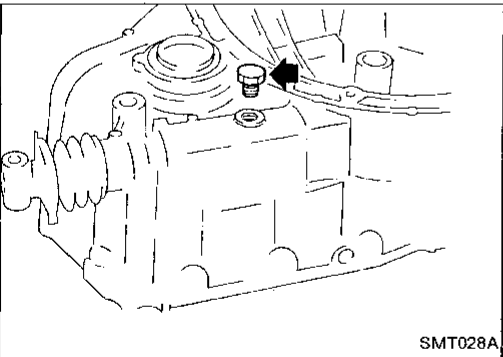
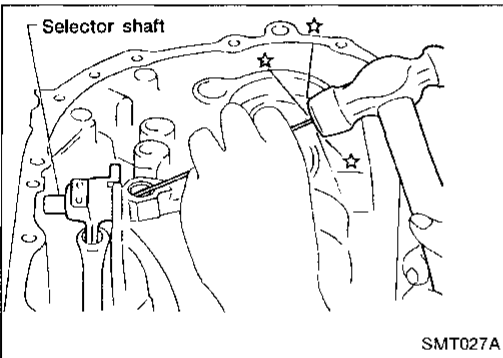
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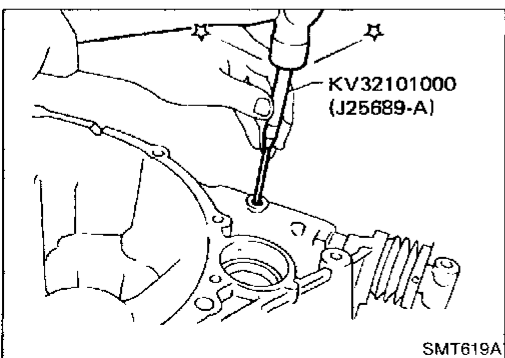
14. Remove reverse gate assembly.  
**Be careful not to lose check ball.**



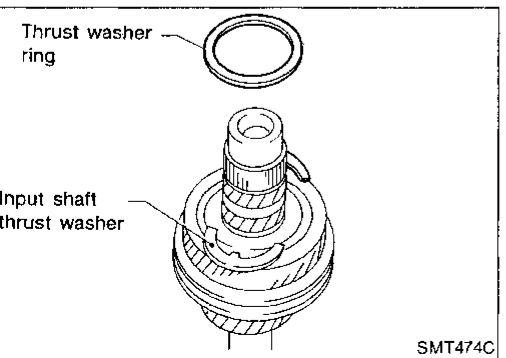
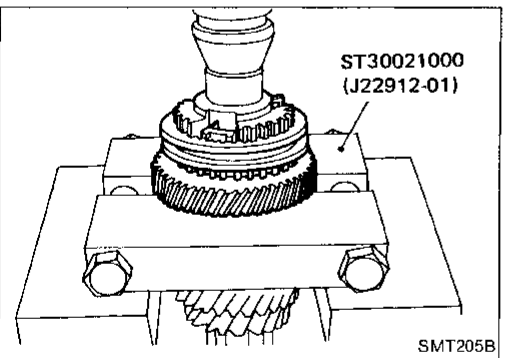
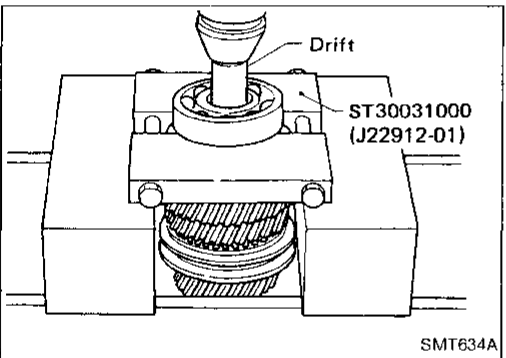
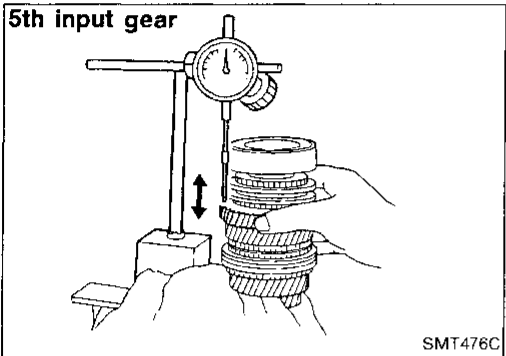
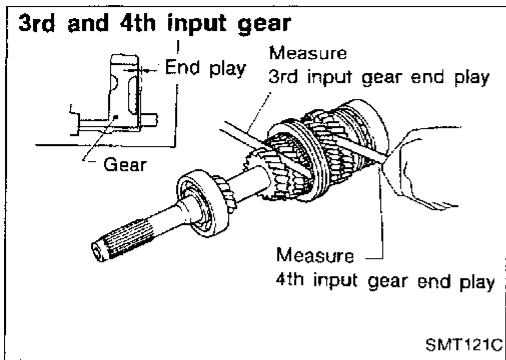
15. Remove retaining pin and detach the selector.



16. Remove drain plug for convenience in removing retaining pin which holds striking lever to striking rod.



17. Remove retaining pin and then withdraw striking lever and striking rod.



## Input Shaft and Gears

### DISASSEMBLY

1. Before disassembly, check 3rd, 4th and 5th input gear end plays.

#### Gear end play

Gears	End play mm (in)
3rd input gear	0.23 - 0.43 (0.0091 - 0.0169)
4th input gear	0.25 - 0.55 (0.0098 - 0.0217)
5th input gear	0.23 - 0.48 (0.0091 - 0.0189)

- If not within specification, disassemble and check contact surface of gear, shaft and hub. Then check clearance of snap ring and thrust washer — Refer to "Assembly", MT-17.

2. Remove input shaft rear bearing.

3. Remove 5th & reverse synchronizer and 5th input gear.

4. Remove thrust washer ring, input shaft thrust washers and 4th input gear.

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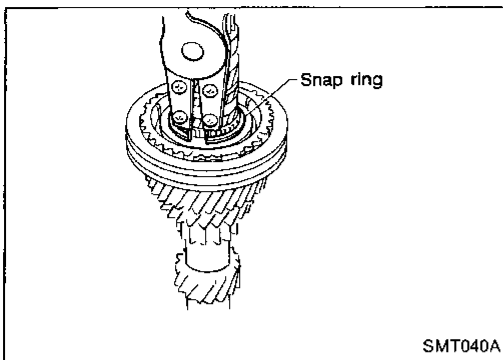
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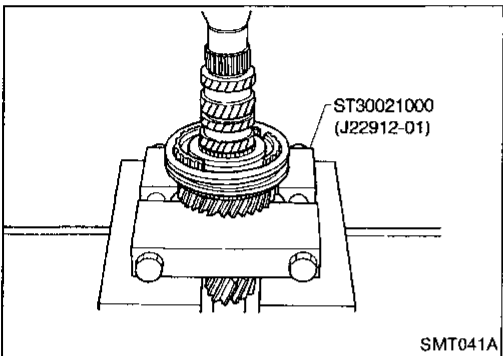
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## REPAIR FOR COMPONENT PARTS

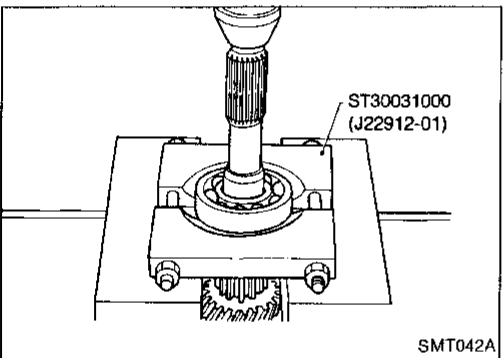
### Input Shaft and Gears (Cont'd)



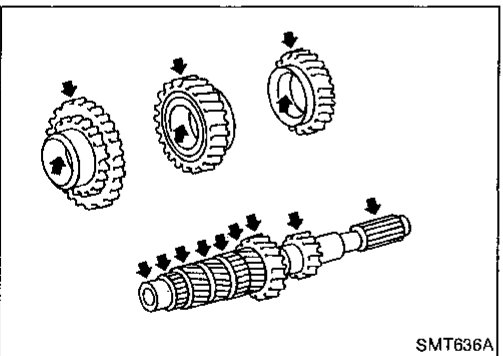
5. Remove snap ring.



6. Remove 3rd & 4th synchronizer and 3rd input gear.



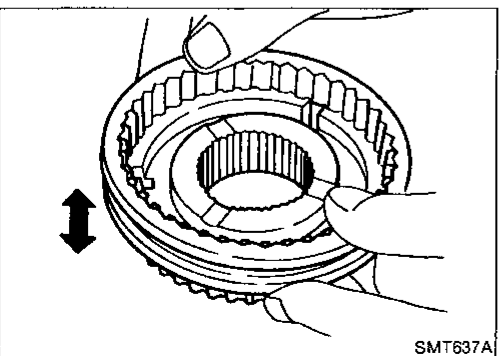
7. Remove input shaft front bearing.



### INSPECTION

#### Gear and shaft

- Check shaft for cracks, wear or bending.
- Check gears for excessive wear, chips or cracks.



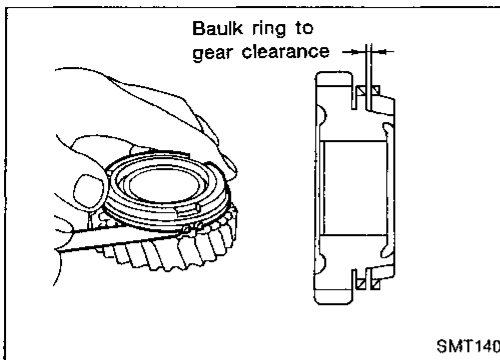
#### Synchronizer

- Check spline portion of coupling sleeves, hubs and gears for wear or cracks.
- Check baulk rings for cracks or deformation.
- Check insert springs for wear or deformation.



# REPAIR FOR COMPONENT PARTS

## Input Shaft and Gears (Cont'd)



- Measure clearance between baulk ring and gear (4th and 5th).

### Clearance between baulk ring and gear:

#### Standard

1.0 - 1.35 mm (0.0394 - 0.0531 in)

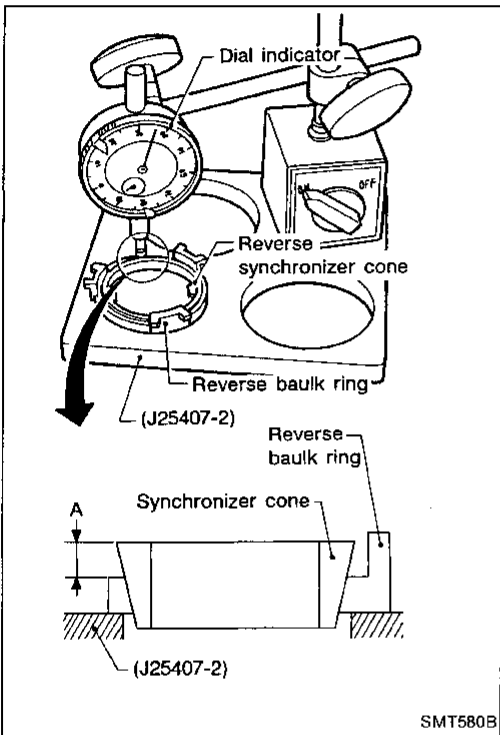
#### Wear limit

0.7 mm (0.028 in)

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- Measure wear of reverse baulk ring.

- Place reverse baulk ring on Tool and then place reverse synchronizer cone on reverse baulk ring.

- Make sure projection of synchronizer cone is positioned over the recess on Tool.

- While holding reverse synchronizer cone against reverse baulk ring as firmly as possible, measure dimension "A" with dial indicator.

#### Wear limit:

Dimension "A" 1.2 mm (0.047 in)

- If dimension "A" is smaller than the wear limit, replace baulk ring.

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## Bearing

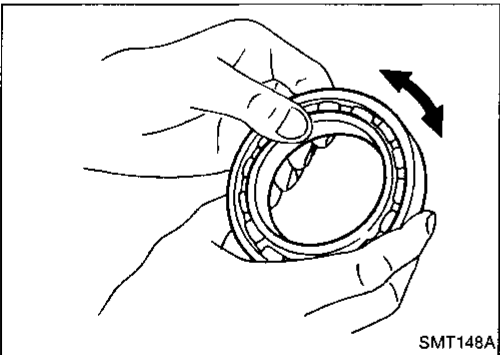
- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.

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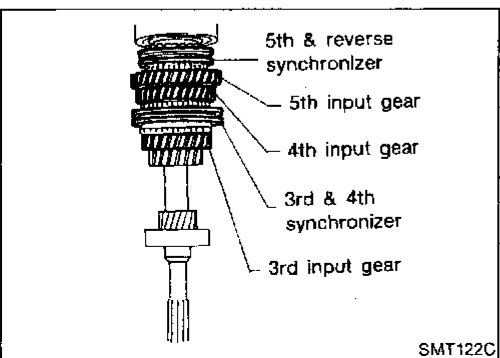
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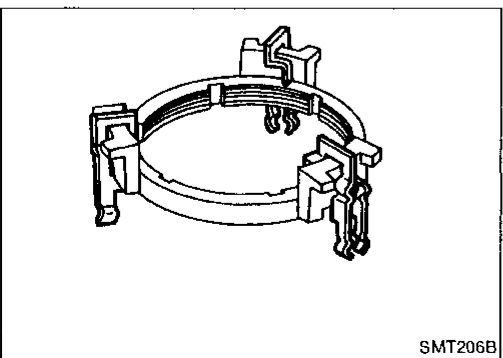
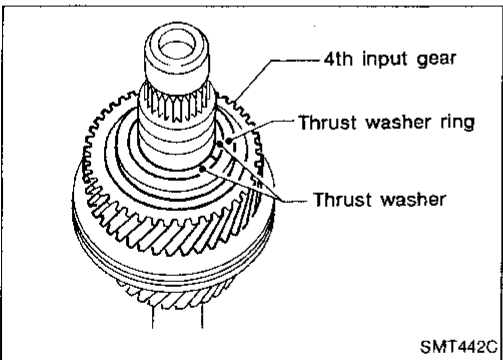
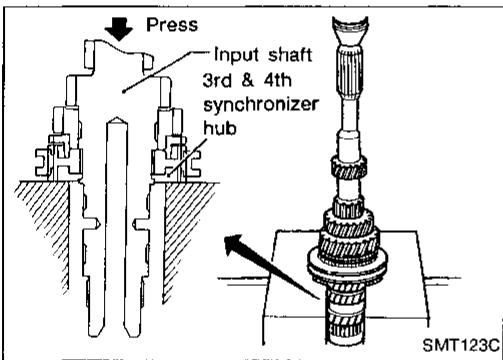
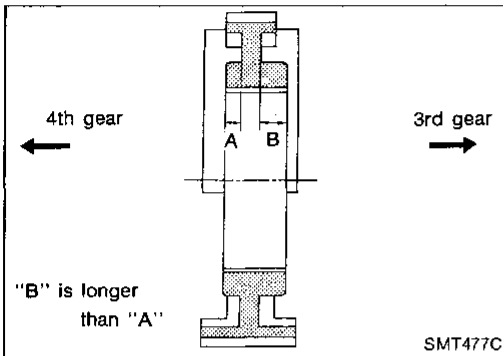
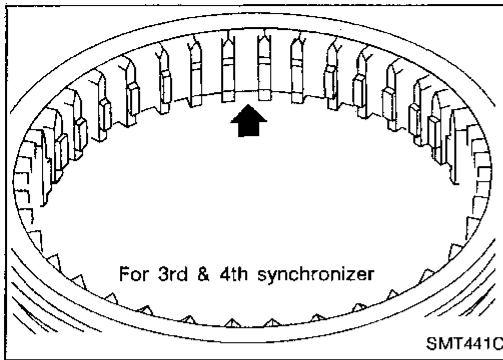
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## ASSEMBLY



## REPAIR FOR COMPONENT PARTS

### Input Shaft and Gears (Cont'd)



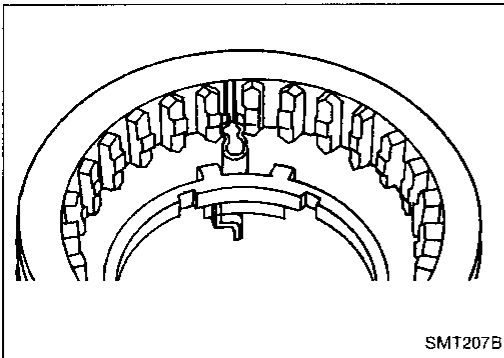
1. Place inserts in three grooves on coupling sleeve (3rd & 4th synchronizer).
2. Install 3rd input gear and 3rd baulk ring.
3. Press on 3rd & 4th synchronizer hub.
  - **Pay attention to its direction.**
4. Select proper snap ring of 3rd & 4th synchronizer hub to minimize clearance of groove, and then install it.
  - Allowable clearance of groove:**  
0 - 0.1 mm (0 - 0.004 in)
  - Snap ring of 3rd & 4th synchronizer hub:**  
Refer to SDS, MT-38.

5. Install 4th input gear.
6. Select proper thrust washers to minimize clearance of groove. Then install them and thrust washer ring.
  - Allowable clearance of groove:**  
0 - 0.06 mm (0 - 0.0024 in)
  - Input shaft thrust washer:**  
Refer to SDS, MT-38.

7. Install 5th & reverse synchronizer assembly.
  - a. Hook insert springs on reverse baulk ring.

# REPAIR FOR COMPONENT PARTS

## Input Shaft and Gears (Cont'd)

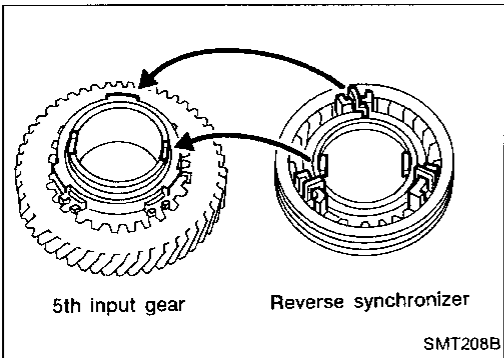


- b. Install insert springs with reverse baulk ring onto coupling sleeve.
- **Pay attention to position of insert springs.**
- c. Place 5th baulk ring on 5th input gear.
- d. Install reverse synchronizer cone on reverse baulk ring.

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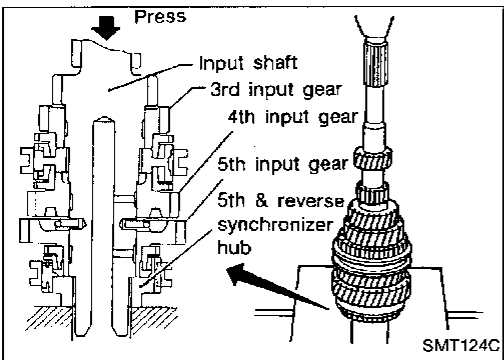
- e. Place reverse synchronizer assembly on 5th input gear.
- **Mesh recesses of 5th input gear with projections of reverse synchronizer cone.**
- **Put insert spring mounts on reverse baulk ring upon those on 5th baulk ring.**

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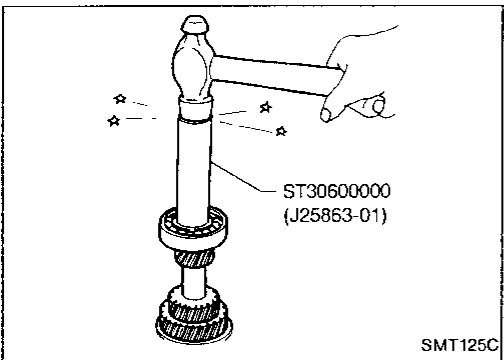
- f. Press on 5th & reverse synchronizer assembly with 5th input gear.

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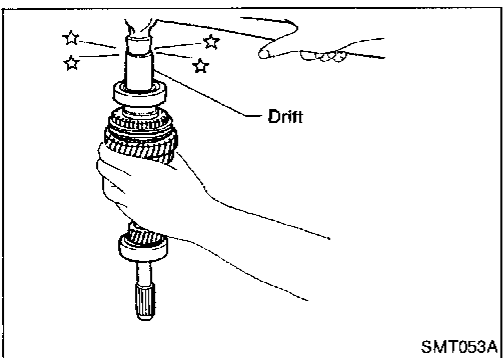
- 8. Install input shaft front and rear bearings.
- 9. Measure gear end play as the final check — Refer to "Disassembly", MT-15.

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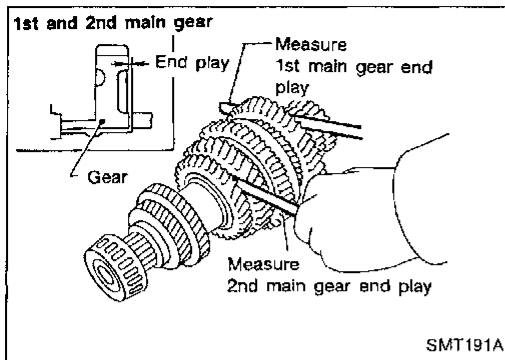
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# REPAIR FOR COMPONENT PARTS



## Mainshaft and Gears

### DISASSEMBLY

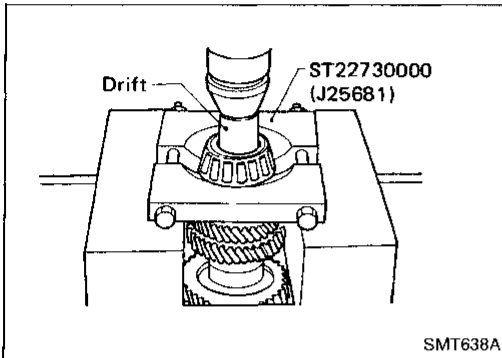
1. Before disassembly, check 1st and 2nd main gear end plays.

#### Gear end play

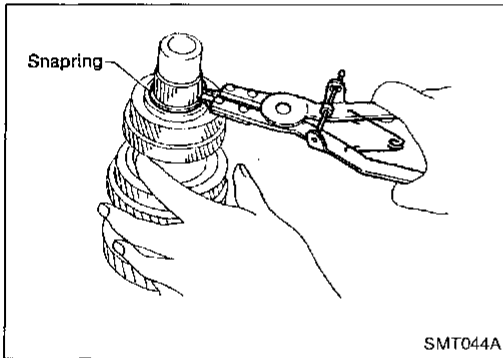
Gears	End play mm (in)
1st main gear	0.23 - 0.43 (0.0091 - 0.0169)
2nd main gear	0.23 - 0.58 (0.0091 - 0.0228)

If not within specification, disassemble and check contact surface of gear, shaft and hub. Then check clearance of snap ring — Refer to "Assembly", MT-22.

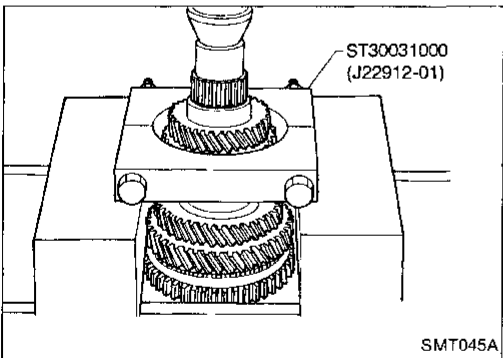
2. Press out mainshaft rear bearing.



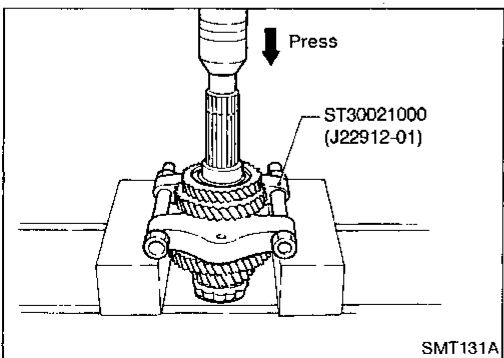
3. Remove thrust washer and snap ring.



4. Press out 5th main gear and 4th main gear.

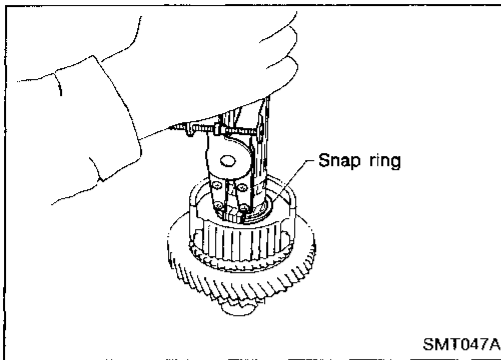


5. Press out 3rd main gear and 2nd main gear.

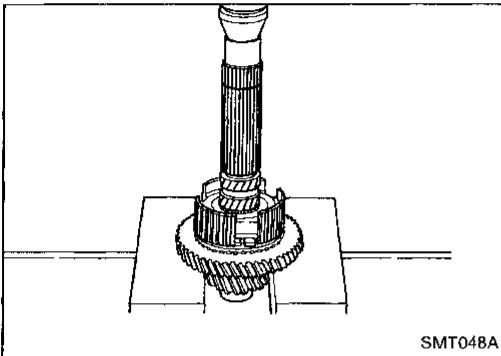


# REPAIR FOR COMPONENT PARTS

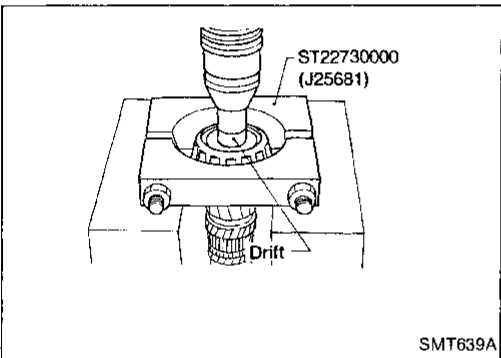
## Mainshaft and Gears (Cont'd)



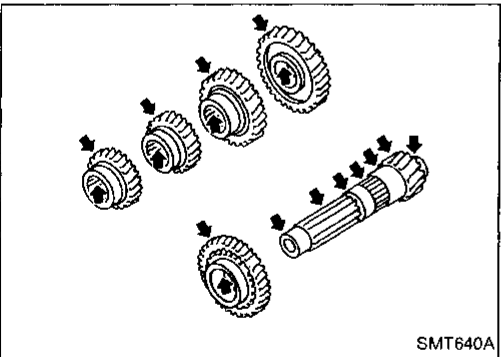
6. Remove snap ring.



7. Remove 1st & 2nd synchronizer hub and 1st main gear.



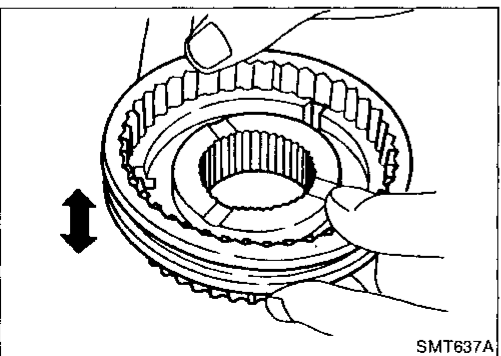
8. Remove mainshaft front bearing.



### INSPECTION

#### Gear and shaft

- Check shaft for cracks, wear or bending.
- Check gears for excessive wear, chips or cracks.



#### Synchronizer

- Check spline portion of coupling sleeves, hubs and gears for wear or cracks.
- Check baulk rings for cracks or deformation.
- Check insert springs for deformation.

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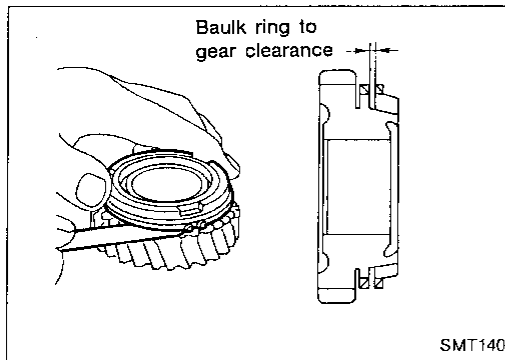
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## REPAIR FOR COMPONENT PARTS

### Mainshaft and Gears (Cont'd)



- Measure clearance between baulk ring and gear (1st).

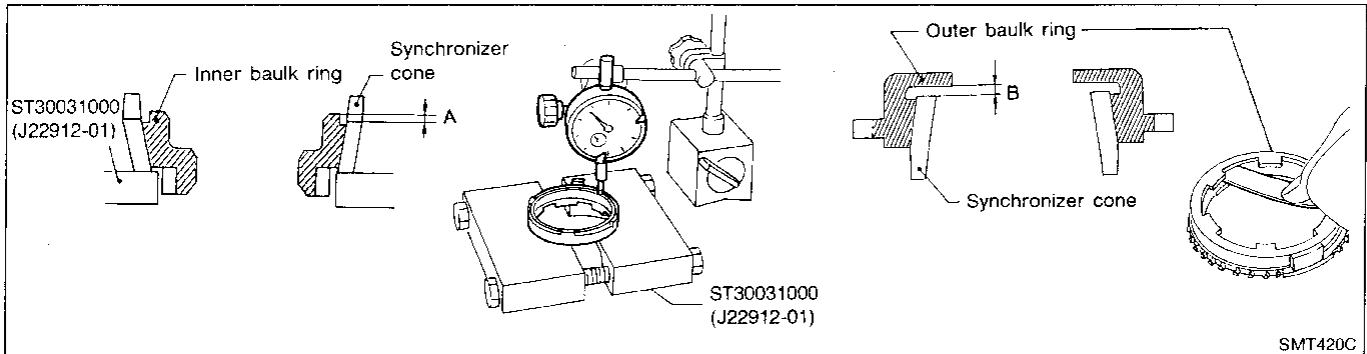
#### Clearance between baulk ring and gear:

##### Standard

1.0 - 1.35 mm (0.0394 - 0.0531 in)

##### Wear limit

0.7 mm (0.028 in)



- Measure wear of 2nd baulk rings.
  - a. Place baulk rings in position on synchronizer cone.
  - b. While holding baulk ring against synchronizer cone as far as it will go, measure dimensions "A" and "B".

#### Standard:

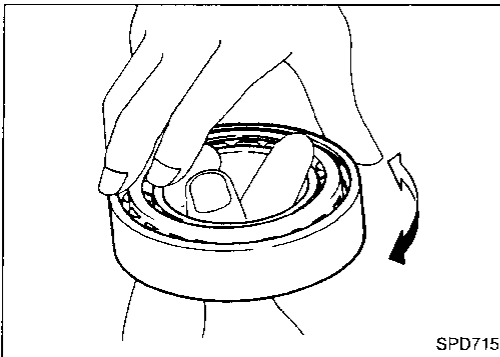
A 0.6 - 0.8 mm (0.024 - 0.031 in)

B 0.6 - 1.1 mm (0.024 - 0.043 in)

#### Wear limit:

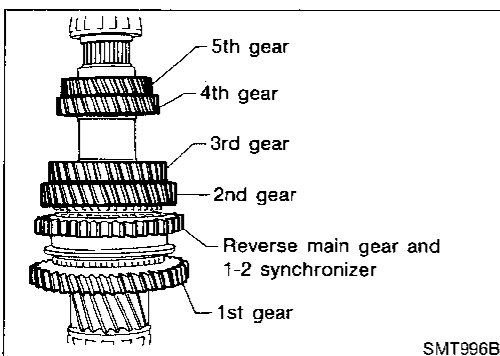
0.2 mm (0.008 in)

- c. If dimension "A" or "B" is smaller than the wear limit, replace baulk ring.



### Bearing

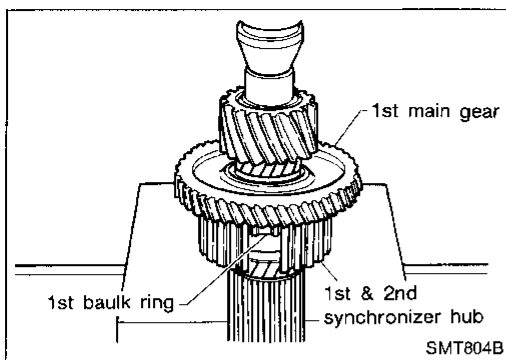
- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- **When replacing tapered roller bearing, replace outer and inner race as a set.**



### ASSEMBLY

# REPAIR FOR COMPONENT PARTS

## Mainshaft and Gears (Cont'd)



1. Press on 1st main gear, 1st baulk ring and 1st & 2nd synchronizer hub.
2. Select proper snap ring of 1st & 2nd synchronizer hub to minimize clearance of groove and then install it.

**Allowable clearance of groove:**

0 - 0.1 mm (0 - 0.004 in)

**Snap ring of 1st & 2nd synchronizer hub:**

Refer to SDS, MT-38.

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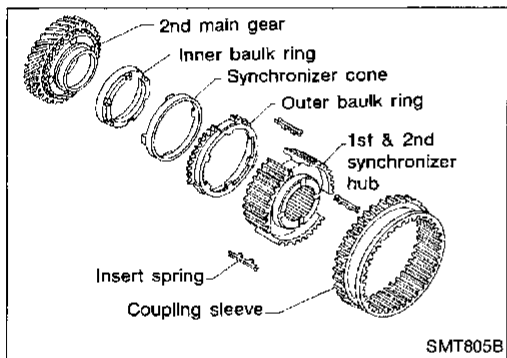
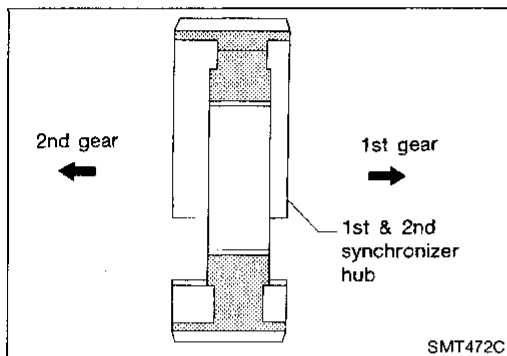
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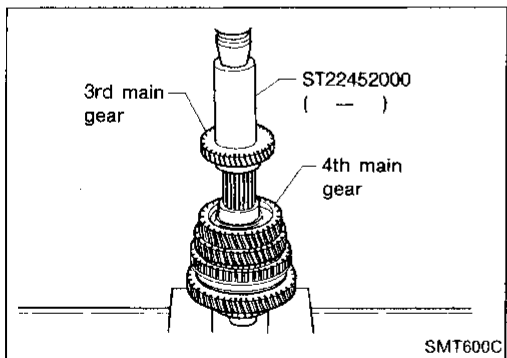
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3. Install 2nd synchronizer cone, inner & outer baulk rings. Insert springs and 1st & 2nd coupling sleeve.

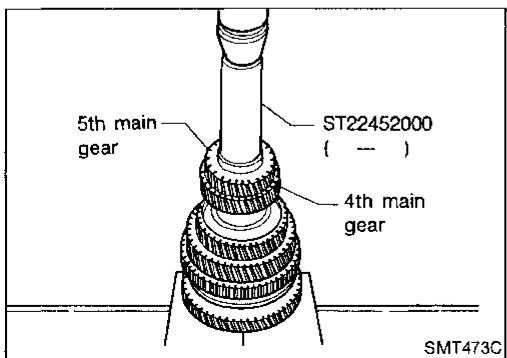
4. Install 2nd main gear.

- Ensure four protrusions of 2nd synchronizer cone are set in holes of 2nd main gear.



5. Press on 3rd main gear.

6. Press on 4th main gear.



7. Press on 5th main gear.

8. Select proper snap ring of 5th main gear to minimize clearance of groove and then install it.

**Allowable clearance of groove:**

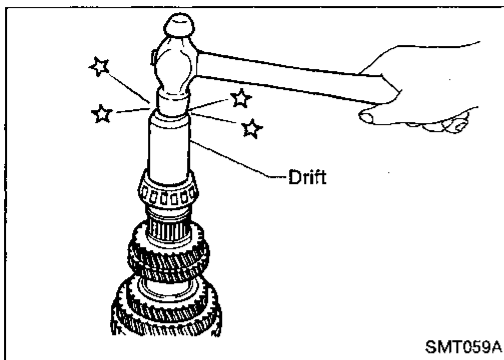
0 - 0.15 mm (0 - 0.0059 in)

**Snap ring of 5th main gear:**

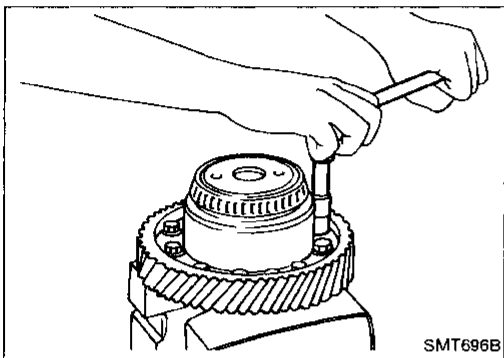
Refer to SDS, MT-38.

## REPAIR FOR COMPONENT PARTS

### Mainshaft and Gears (Cont'd)



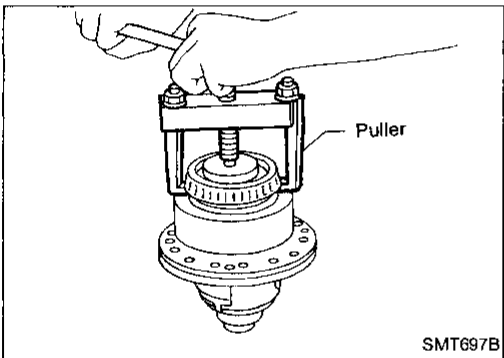
9. Press on thrust washer and press on mainshaft rear bearing.
10. Press on mainshaft front bearing.
11. Measure gear end play as the final check — Refer to "Disassembly", MT-20.



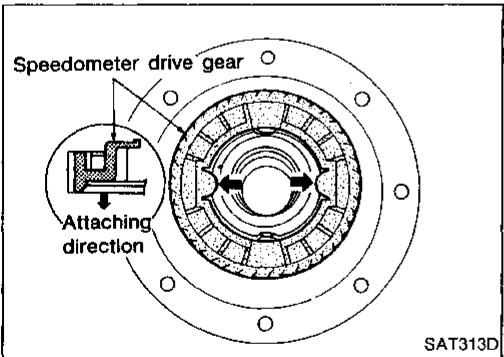
### Final Drive

#### DISASSEMBLY

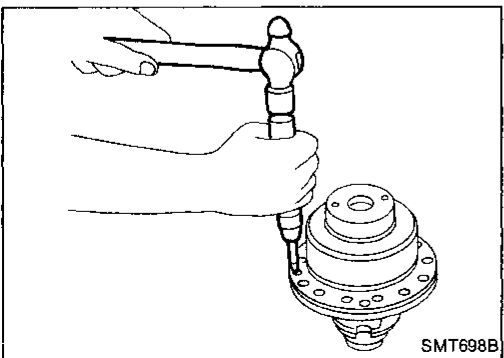
1. Remove final gear.



2. Press out differential side bearings.



3. Remove speedometer drive gear.



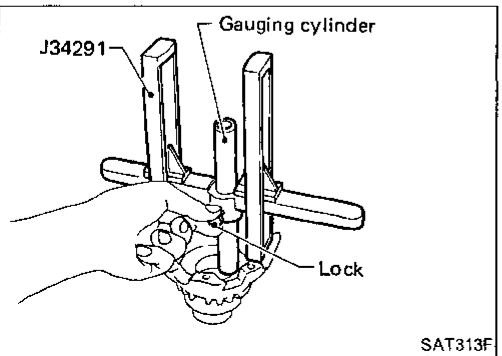
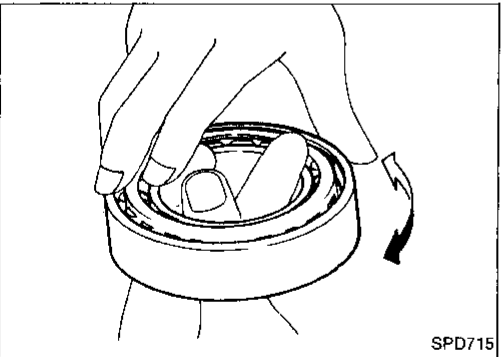
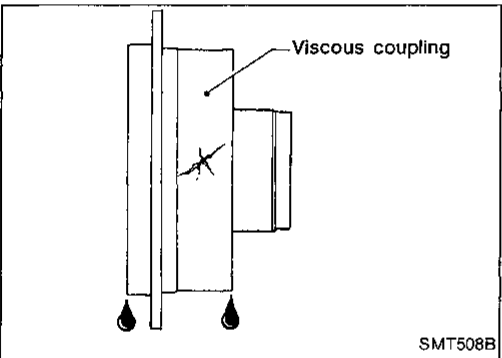
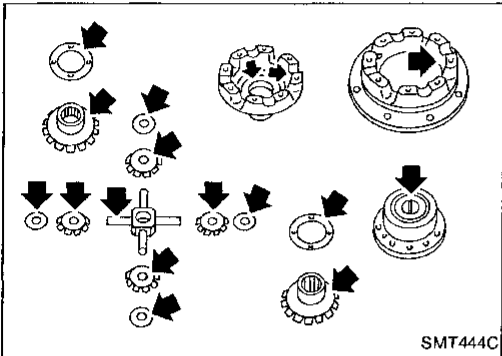
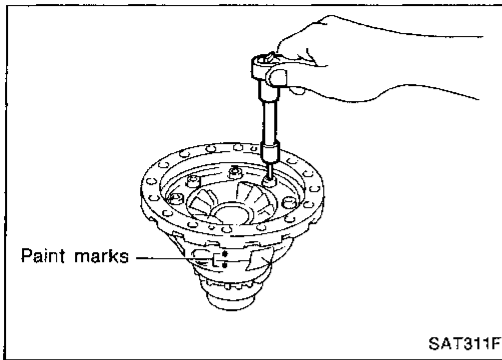
4. Remove viscous coupling.



# REPAIR FOR COMPONENT PARTS

## Final Drive (Cont'd)

5. Separate differential cases. Make paint marks to identify their original positions.
6. Remove pinion mate shaft with gears.



## INSPECTION

### Gear, washer, shaft and case

- Check mating surfaces of differential case, viscous coupling, side gears and pinion mate gears.
- Check washers for wear.

### Viscous coupling

- Check case for cracks.
- Check silicone oil for leakage

### Bearings

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- **When replacing taper roller bearing, replace outer and inner race as a set.**

## ASSEMBLY

1. Measure clearance between side gear and differential case & viscous coupling with washers using the following procedure:

### Differential case side

- a. Set tool on the differential case and lock gauging cylinder in place with set screw.

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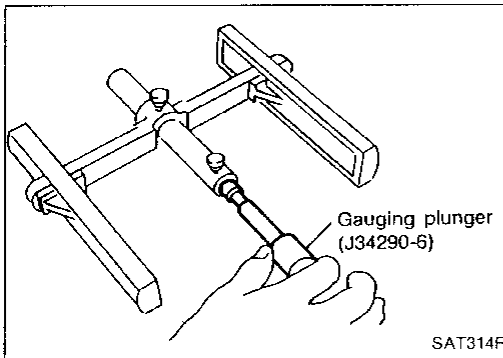
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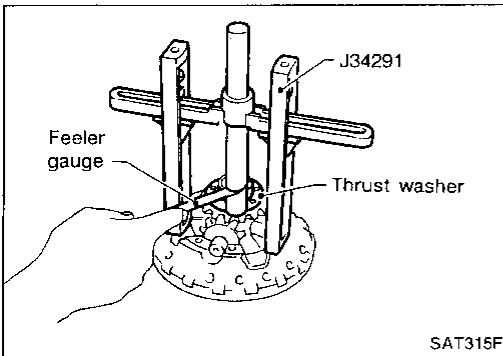
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## REPAIR FOR COMPONENT PARTS

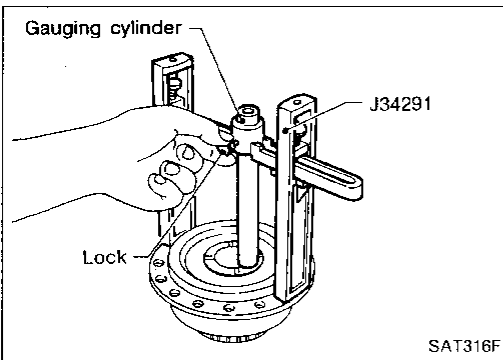
### Final Drive (Cont'd)



- b. Install gauging plunger into cylinder.

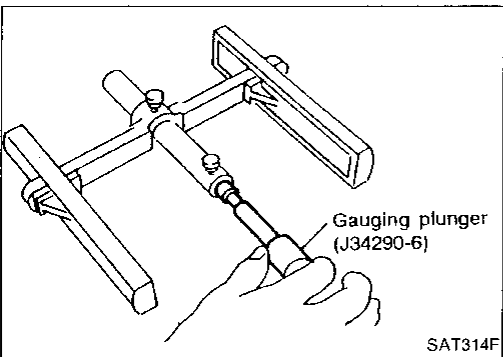


- c. Install pinion mate gears and side gear with thrust washer on differential case.
- d. Set tool and allow gauging plunger to rest on side gear thrust washer.
- e. Measure gap between plunger and cylinder. This measurement should give exact clearance between side gear and differential case with washers.
- Standard clearance: 0.1 - 0.2 mm (0.004 - 0.008 in)**
- f. If not within specification adjust clearance by changing thickness of side gear thrust washer. **Side gear thrust washers for differential case side: Refer to SDS, MT-40.**

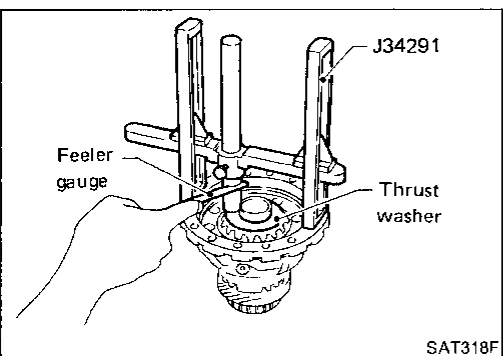


#### Viscous coupling side

- a. Place side gear and thrust washer on pinion mate gears installed on differential case.
- b. Measure dimension X.
- **Measure dimension X in at least four places.**
- a. Set tool on viscous coupling and lock gauging cylinder in place with set screw.



- b. Install gauging plunger into cylinder.



- c. Install pinion mate gears and side gears with original washers on differential cases.
- Align paint marks.**
- d. Tighten differential case bolts.
- e. Set tool and allow plunger to rest on side gear thrust washer.
- f. Measure gap between plunger and cylinder. This measurement should give exact clearance between side gear and differential case with washers.
- Standard clearance: 0.1 - 0.2 mm (0.004 - 0.008 in)**

## REPAIR FOR COMPONENT PARTS

### Final Drive (Cont'd)

- g. If not within specification, adjust clearance by changing thickness of side gear thrust washer.

**Side gear thrust washers for viscous coupling side: Refer to SDS, MT-40.**

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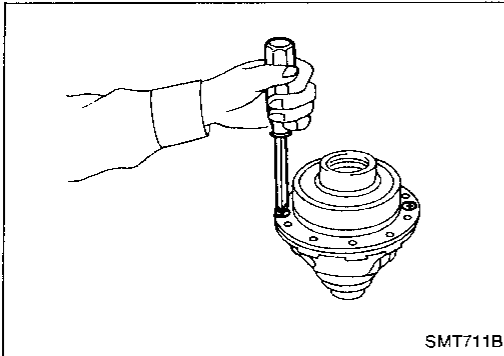
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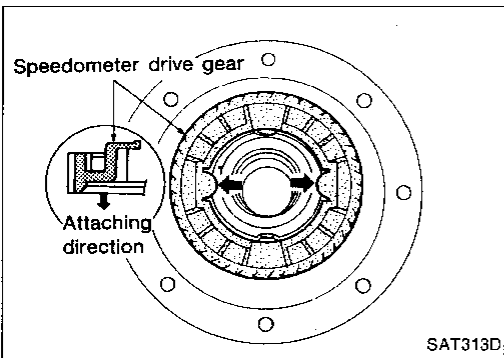
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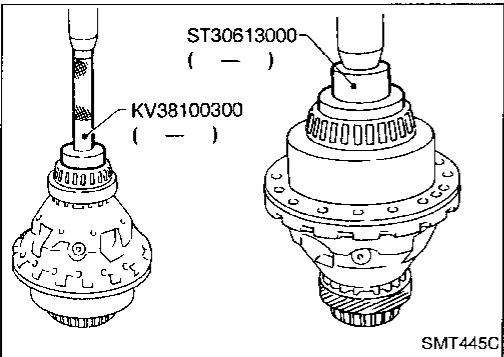


2. Install viscous coupling

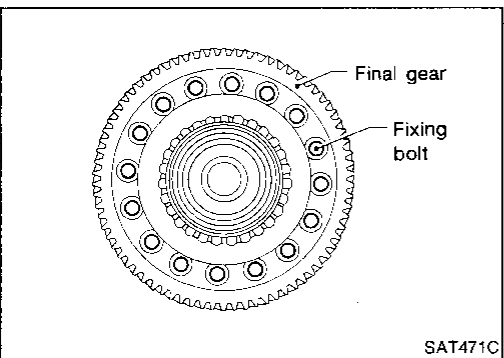


3. Install speedometer drive gear on differential case.

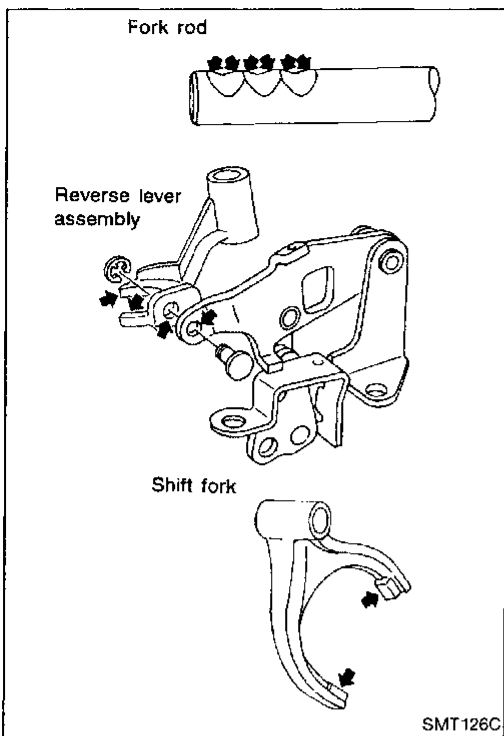
- **Align the projection of speedometer drive gear with the groove of differential case.**



4. Press differential side bearings on differential case.



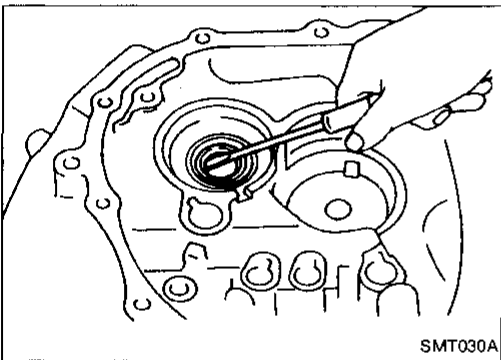
5. Install final gear and tighten fixing bolts in a crisscross pattern.



## Shift Control Components

### INSPECTION

- Check contact surface and sliding surface for wear, scratches, projections or other damage.

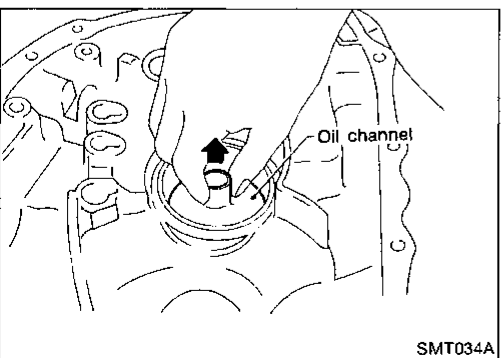
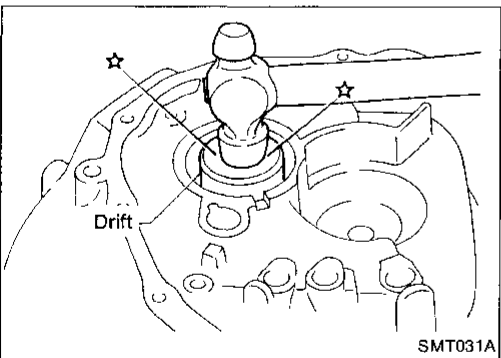


## Case Components

### REMOVAL AND INSTALLATION

#### Input shaft oil seal

- Apply multi-purpose grease to seal lip of oil seal before installing.



#### Mainshaft front bearing outer race

Mainshaft rear bearing outer race — Refer to “ADJUSTMENT”, MT-30.

Differential side bearing outer race — Refer to “ADJUSTMENT”, MT-29.

## ADJUSTMENT

### Input Shaft End Play and Differential Side Bearing Preload

If any of the following parts are replaced, adjust input shaft end play.

- Input shaft
- Input shaft bearing
- Clutch housing
- Transmission case

If any of the following parts are replaced, adjust differential side bearing preload.

- Differential case
- Differential side bearing
- Clutch housing
- Transmission case

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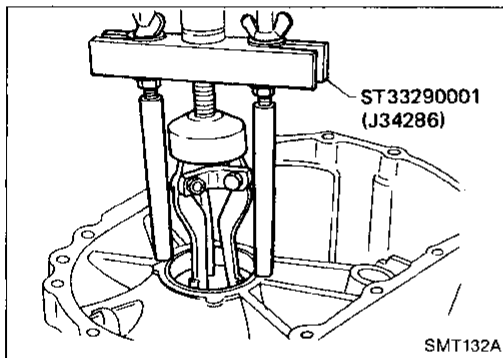
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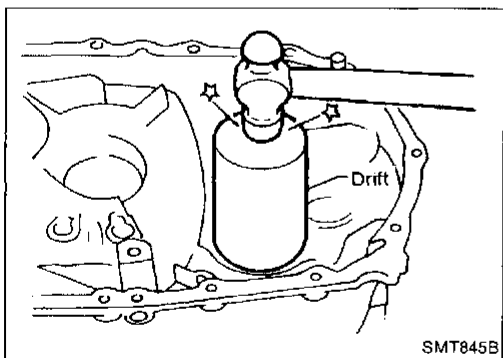
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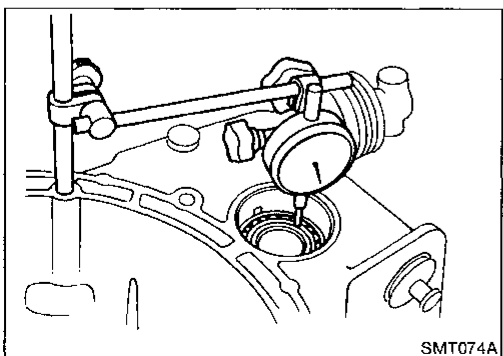
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1. Remove differential side bearing outer race (transmission case side) and shim(s).



2. Reinstall differential side bearing outer race without shim(s).
3. Install input shaft and final drive assembly on clutch housing.
4. Install transmission case without input shaft bearing shim(s). Then tighten it to the specified torque. Refer to MT-9.

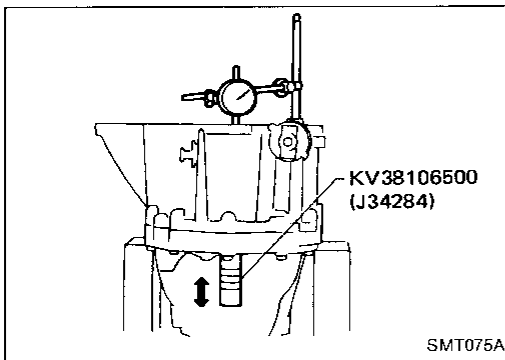


5. Using the following procedures, measure clearance between bearings and transmission case.

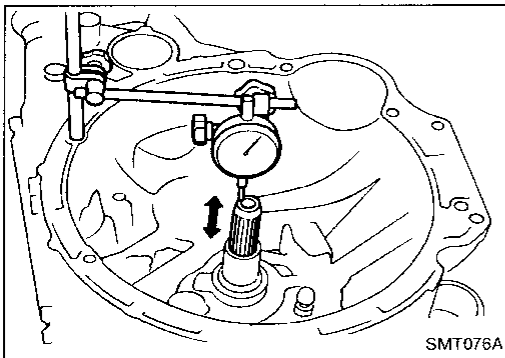
- **Differential side**
  - a. Attach dial indicator. If clamp diameter of dial indicator is too small or too large, attach dial indicator using a magnetic stand.

## ADJUSTMENT

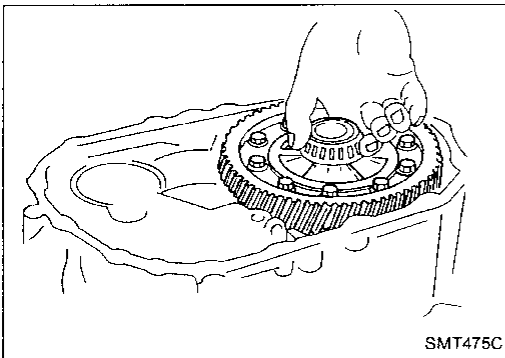
### Input Shaft End Play and Differential Side Bearing Preload (Cont'd)



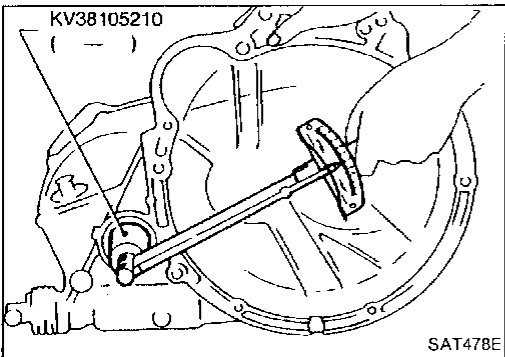
- b. Insert Tool all the way into differential side gear. Move Tool up and down and measure dial indicator deflection.



- **Input shaft side**
  - a. Set dial indicator on end of input shaft.
  - b. Move input shaft up and down and measure dial indicator deflection.
- 6. Select shims with proper thickness with SDS table as a guide. Refer to MT-40.
- 7. Install selected differential side bearing adjusting shim and differential side bearing outer race.



8. Check differential side bearing turning torque.
  - a. Install final drive assembly on clutch housing.
  - b. Install transmission case on clutch housing.
- **Tighten transmission case fixing bolts to the specified torque.**



- c. Measure turning torque of final drive assembly.
  - Turning torque of final drive assembly (New bearing):**  
4.9 - 7.8 N·m (50 - 80 kg-cm, 43 - 69 in-lb)
  - **When old bearing is used again, turning torque will be slightly less than the above.**
  - **Make sure torque is close to the specified range.**

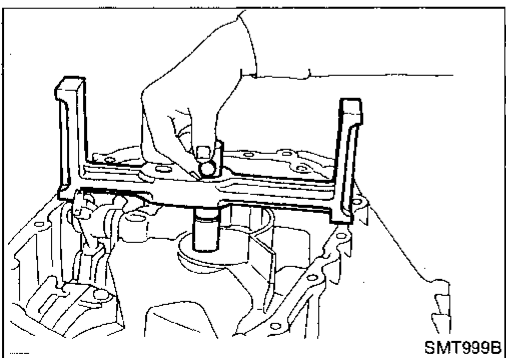
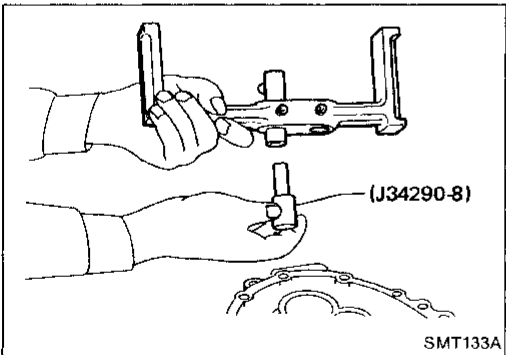
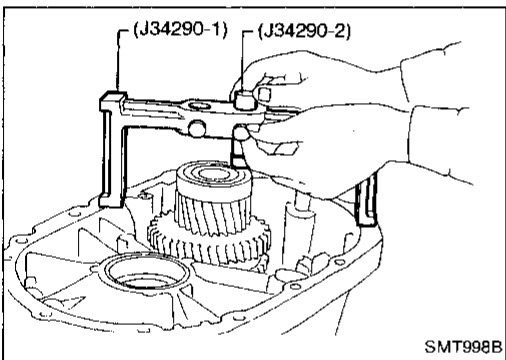
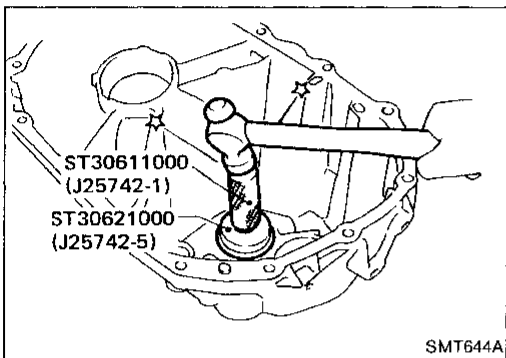
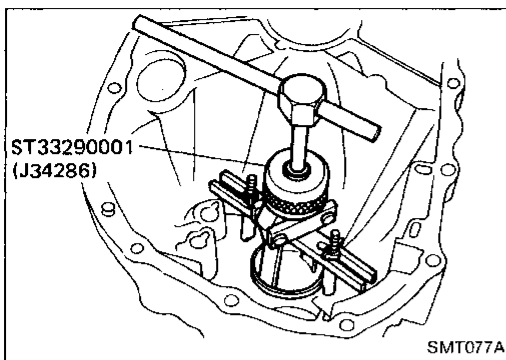
### Mainshaft Bearing Preload

If any of the following parts are replaced, adjust mainshaft bearing preload.

- **Mainshaft**
- **Mainshaft bearings**
- **Clutch housing**
- **Transmission case**

## ADJUSTMENT

### Mainshaft Bearing Preload (Cont'd)



1. Remove mainshaft rear bearing outer race and shim(s).
2. Reinstall mainshaft rear bearing outer race without shims.
3. Clean mating surfaces of clutch housing and transmission case with solvent.
4. Install mainshaft and mainshaft front bearing outer race into transmission case. Turn mainshaft while holding bearing outer race so that bearings are properly seated.
5. Place Tools (bridge and gauging cylinder) onto machined surface of transmission case, allowing gauging cylinder to rest on surface of mainshaft front bearing outer race. Use proper screw in bridge to lock gauging cylinder in place.
6. Turn bridge over and place Tool (gauging plunger) into gauging cylinder.
7. Place bridge, legs up, onto machined surface of clutch housing and allow gauging plunger to rest upon mating surface where mainshaft front bearing outer race fits.

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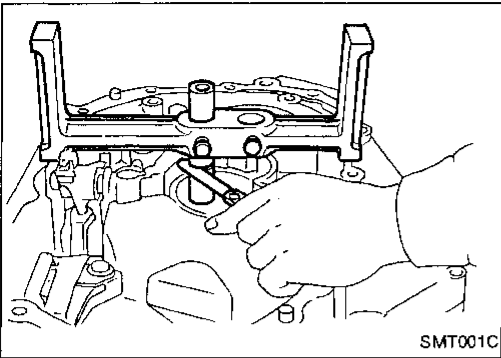
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## ADJUSTMENT

### Mainshaft Bearing Preload (Cont'd)

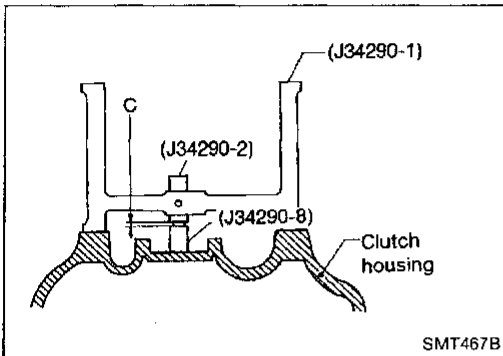


8. Measure with feeler gauge distance between gauging cylinder and shoulder of gauging plunger.
9. Use feeler gauge reading to select correct mainshaft preload shim(s).

#### Mainshaft bearing adjusting shim:

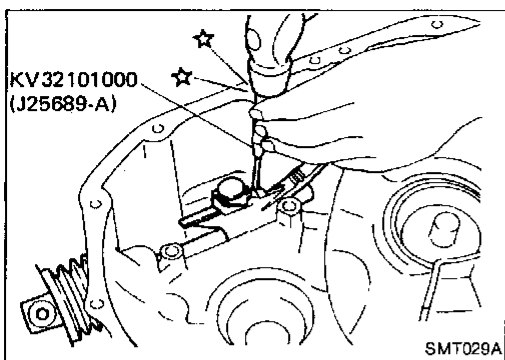
Refer to SDS, MT-39.

10. Install selected mainshaft bearing adjusting shim and mainshaft bearing outer race.
11. Check total turning torque after assembly — Refer to "ASSEMBLY", MT-36.

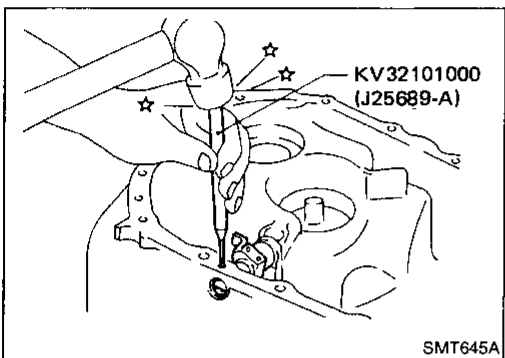




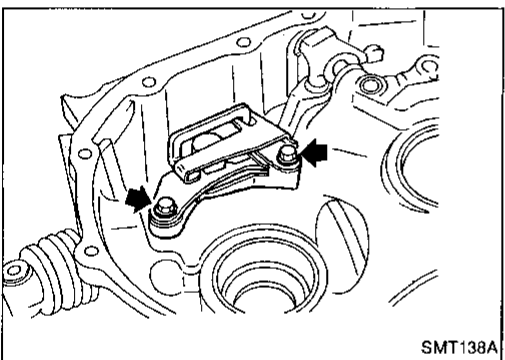
# ASSEMBLY



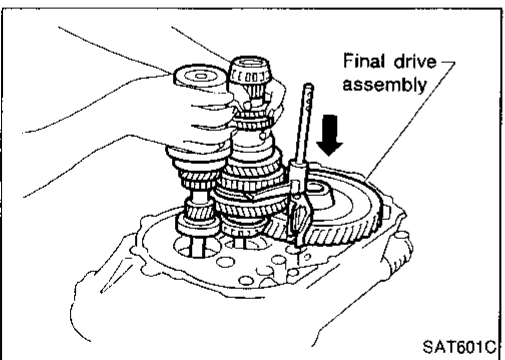
1. Install striking lever and striking rod.



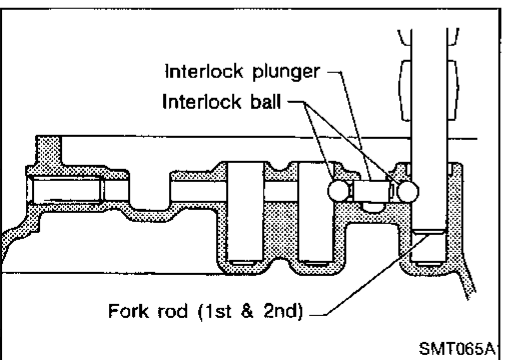
2. Install selector and retaining pin.



3. Install reverse gate assembly.  
**Be careful not to lose check ball.**



4. Install final drive assembly.  
5. Install input shaft and mainshaft with 1st & 2nd shift fork assembly.  
● **Be careful not to damage input shaft oil seal.**



6. Install interlock balls and plunger.

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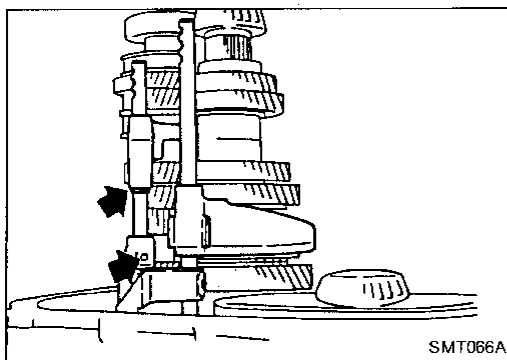
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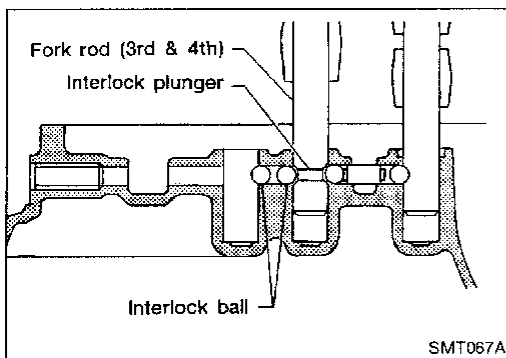
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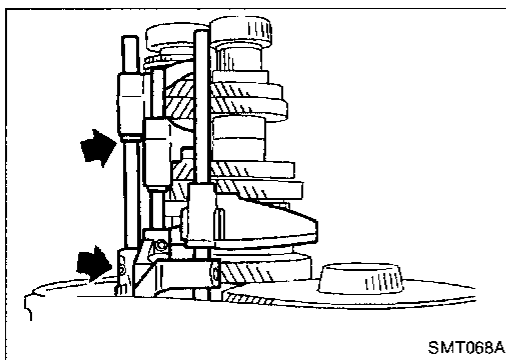
## ASSEMBLY



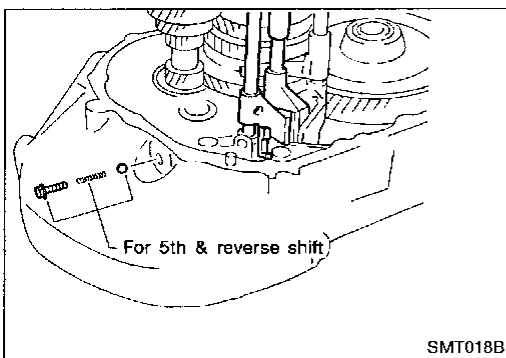
7. Install 3rd & 4th shift fork and bracket, then install 3rd & 4th fork rod, stopper ring and retaining pin.



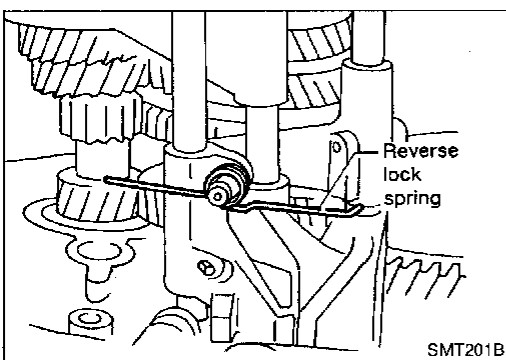
8. Install interlock balls.



9. Install 5th shift fork and reverse lever, then install fork rod, stopper ring and retaining pin.

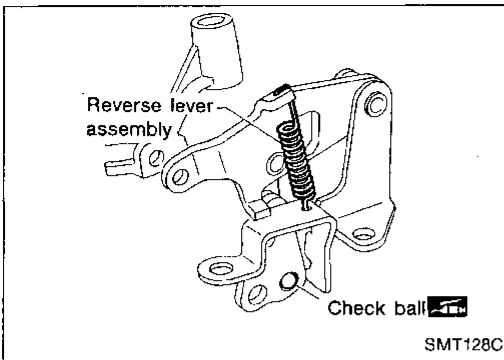


10. Install 5th & reverse check plug, spring and ball.

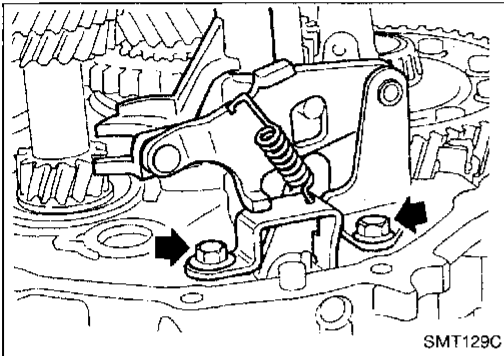


11. Install reverse lock spring on 5th & reverse bracket.
  - Pay attention to its direction.

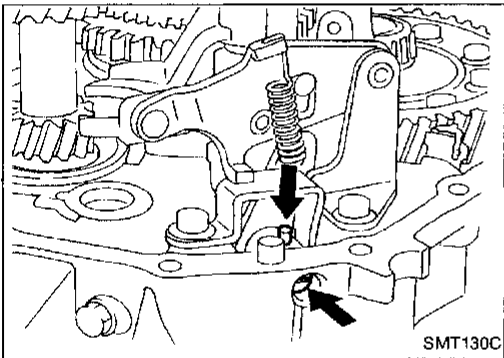
# ASSEMBLY



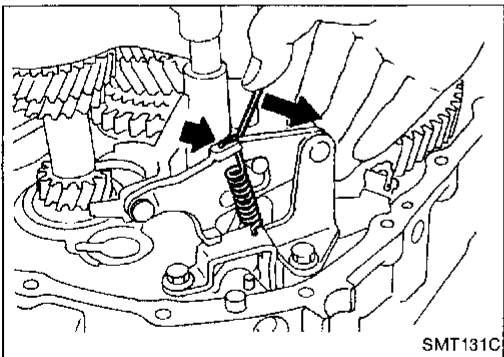
12. Install check ball and reverse lever spring on reverse lever assembly.
  - Apply multi-purpose grease to check ball.
  - Pay attention to direction of reverse lever spring.



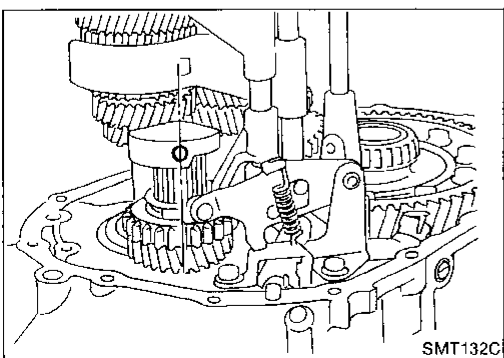
13. Install reverse lever assembly on clutch housing.



14. Install reverse arm shaft and retaining pin.



15. Hook reverse lock spring and reverse lever spring on reverse lever assembly.



16. Mesh 4th gear, then install reverse idler gear and shaft.
  - Pay attention to direction of tapped hole.

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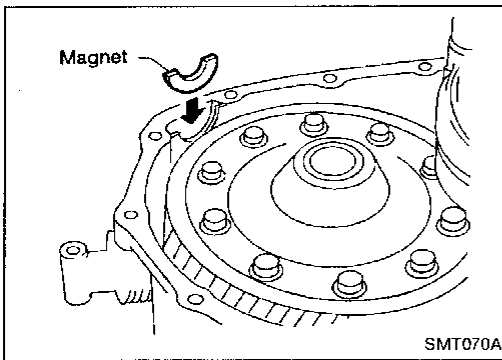
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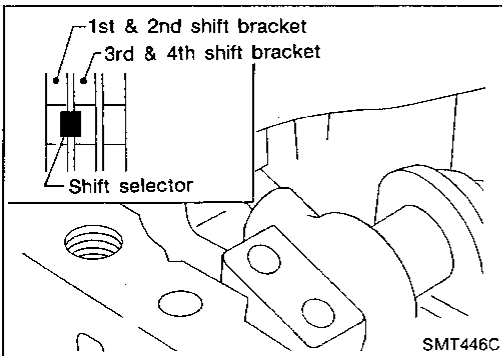
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## ASSEMBLY



17. Place magnet on clutch housing.

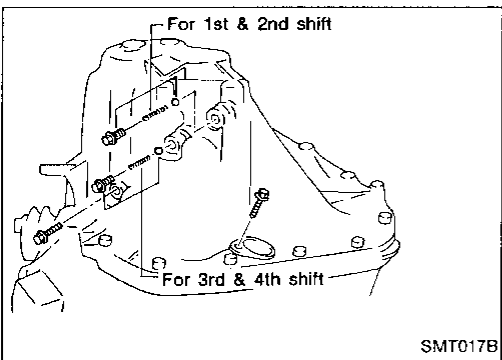


18. If bearing preload of mainshaft was adjusted, install selected shim(s) into transmission case.

- To aid in installation of transmission case, place shift selector in the 1st and 2nd shift bracket or between 1st and 2nd bracket and 3rd and 4th bracket.

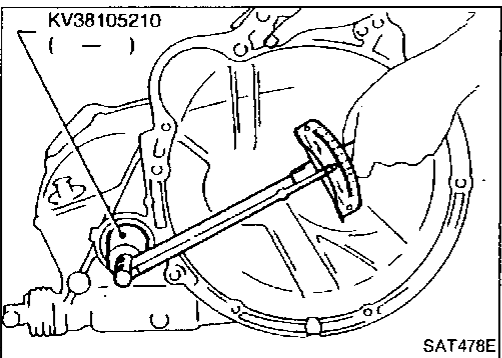
19. Apply sealant to mating surface of transmission case and install it.

20. Install position switch.



21. Apply sealant to threads of check plugs. Install balls, springs and plugs.

22. After assembly, check that you can shift into each gear smoothly.



23. Measure total turning torque.

**Total turning torque (New bearing):**

**8.8 - 21.6 N·m (90 - 220 kg-cm, 78 - 191 in-lb)**

- When old bearing is used again, preload will be slightly less than the above. Make sure torque is close to the specified range.

# SERVICE DATA AND SPECIFICATIONS (SDS)

## General Specifications

### TRANSAXLE

Engine	VE30DE		
Transaxle model	RS5F50V	RS5F50A	
Number of speeds	5		
Synchromesh type	Warner		
Shift pattern			
	Gear ratio	Number of teeth	
		Input gear	Main gear
1st	3.285	14	46
2nd	1.850	20	37
3rd	1.272	33	42
4th	0.954	44	42
5th	0.795	49	39
Rev.	3.266	14	41
Reverse idler gear A/B	29/26		
Oil capacity liter (US pt, Imp pt)	4.2 - 4.5 (4-1/2 - 4-3/4, 3-3/4 - 4)	4.4 - 4.7 (4-5/8 - 5, 3-7/8 - 4-1/8)	

### FINAL GEAR

Engine	VE30DE	
Final gear ratio	3.823	
Number of teeth	65/17	
Final gear/Pinion	65/17	
Side gear/Pinion	16/10	14/10

## Inspection and Adjustment

### GEAR END PLAY

Gear	End play mm (in)
1st main gear	0.23 - 0.43 (0.0091 - 0.0169)
2nd main gear	0.23 - 0.58 (0.0091 - 0.0228)
3rd input gear	0.23 - 0.43 (0.0091 - 0.0169)
4th input gear	0.25 - 0.55 (0.0098 - 0.0217)
5th input gear	0.23 - 0.48 (0.0091 - 0.0189)

### CLEARANCE BETWEEN BAULK RING AND GEAR

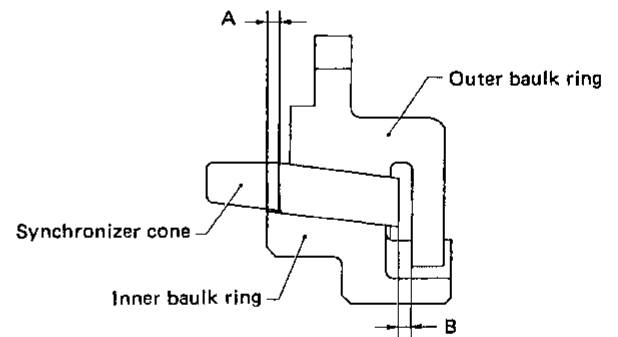
#### 1st, 3rd, 4th & 5th

Unit: mm (in)

	Standard	Wear limit
1st	1.0 - 1.35 (0.0394 - 0.0531)	0.7 (0.028)
3rd & 4th	1.0 - 1.35 (0.0394 - 0.0531)	0.7 (0.028)
5th	1.0 - 1.35 (0.0394 - 0.0531)	0.7 (0.028)

### 2nd baulk ring

Unit: mm (in)



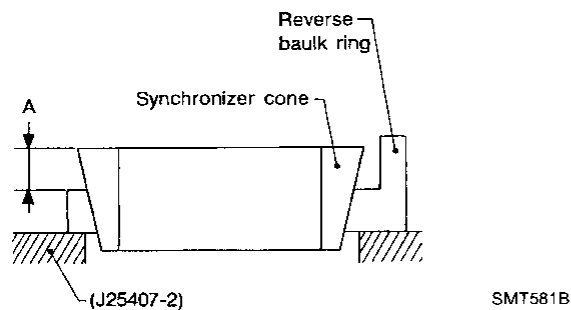
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Dimension	Standard	Wear limit
A	0.6 - 0.8 (0.024 - 0.031)	0.2 (0.008)
B	0.6 - 1.1 (0.024 - 0.043)	

# SERVICE DATA AND SPECIFICATIONS (SDS)

## Inspection and Adjustment (Cont'd)

### Reverse baulk ring



Dimension	Wear limit
A	1.2 mm (0.047 in)

### Differential side gear thrust washer — RS5F50V

Allowable clearance between side gear and (differential case or viscous coupling) with washer

0.1 - 0.2 mm  
(0.004 - 0.008 in)

	Thickness mm (in)	Part number
Differential case side	0.75 - 0.80 (0.0295 - 0.0315)	38424-E3000
	0.80 - 0.85 (0.0315 - 0.0335)	38424-E3001
	0.85 - 0.90 (0.0335 - 0.0354)	38424-E3002
	0.90 - 0.95 (0.0354 - 0.0374)	38424-E3003
Viscous coupling side	0.43 - 0.45 (0.0169 - 0.0177)	38424-51E10
	0.52 - 0.54 (0.0205 - 0.0213)	38424-51E11
	0.61 - 0.63 (0.0240 - 0.0248)	38424-51E12
	0.70 - 0.72 (0.0276 - 0.0283)	38424-51E13
	0.79 - 0.81 (0.0311 - 0.0319)	38424-51E14

### AVAILABLE SNAP RING

#### 1st & 2nd synchronizer hub (At mainshaft)

Allowable clearance	0 - 0.1 mm (0 - 0.004 in)
Thickness mm (in)	Part number
1.95 (0.0768)	32269-03E03
2.00 (0.0787)	32269-03E00
2.05 (0.0807)	32269-03E01
2.10 (0.0827)	32269-03E02

#### 3rd & 4th synchronizer hub (At input shaft)

Allowable clearance	0 - 0.1 mm (0 - 0.004 in)
Thickness mm (in)	Part number
1.95 (0.0768)	32269-03E03
2.00 (0.0787)	32269-03E00
2.05 (0.0807)	32269-03E01
2.10 (0.0827)	32269-03E02

#### 5th main gear (At mainshaft)

Allowable clearance	0 - 0.15 mm (0 - 0.0059 in)
Thickness mm (in)	Part number
1.95 (0.0768)	32348-05E00
2.05 (0.0807)	32348-05E01
2.15 (0.0846)	32348-05E02
2.25 (0.0886)	32348-05E03

### AVAILABLE WASHER

#### Input shaft thrust washer

Allowable clearance	0 - 0.06 mm (0 - 0.0024 in)
Thickness mm (in)	Part number
4.500 (0.1772)	32278-03E01
4.525 (0.1781)	32278-03E02
4.550 (0.1791)	32278-03E03
4.575 (0.1801)	32278-03E04

### Differential side gear thrust washer — RS5F50A

Allowable clearance between side gear and differential case with washer

0.1 - 0.2 mm (0.004 - 0.008 in)

Thickness mm (in)	Part number
0.75 - 0.80 (0.0295 - 0.0315)	38424-E3020
0.80 - 0.85 (0.0315 - 0.0335)	38424-E3021
0.85 - 0.90 (0.0335 - 0.0354)	38424-E3022
0.90 - 0.95 (0.0354 - 0.0374)	38424-E3023

### AVAILABLE SHIM

#### — INPUT SHAFT END PLAY AND MAINSHAFT AND DIFFERENTIAL SIDE BEARING PRELOAD AND ADJUSTING SHIM

#### Bearing preload and end play

	Unit: mm (in)
Mainshaft bearing preload	0.25 - 0.30 (0.0098 - 0.0118)
Input shaft end play	0 - 0.05 (0 - 0.0020)
Differential side bearing preload	0.40 - 0.45 (0.0157 - 0.0177)

#### Turning torque (New bearing)

	Unit: N·m (kg·cm, in·lb)
Final drive only	4.9 - 7.8 (50 - 80, 43 - 69)
Total	8.8 - 21.6 (90 - 220, 78 - 191)

# SERVICE DATA AND SPECIFICATIONS (SDS)

## Inspection and Adjustment (Cont'd)

### Mainshaft bearing adjusting shim

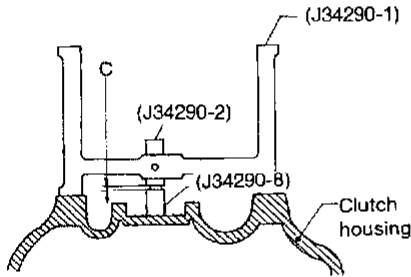
Thickness mm (in)	Part number
0.40 (0.0157)	32139-03E11
0.44 (0.0173)	32139-03E00
0.48 (0.0189)	32139-03E01
0.52 (0.0205)	32139-03E12
0.56 (0.0220)	32139-03E02
0.60 (0.0236)	32139-03E03
0.64 (0.0252)	32139-03E04
0.68 (0.0268)	32139-03E05
0.72 (0.0283)	32139-03E06
0.76 (0.0299)	32139-03E07
0.80 (0.0315)	32139-03E08
1.20 (0.0472)	32139-03E13

Dimension "C"	Suitable shim(s)
1.06 - 1.10 (0.0417 - 0.0433)	0.68 + 0.68 (0.0268 + 0.0268)
1.10 - 1.14 (0.0433 - 0.0449)	0.68 + 0.72 (0.0268 + 0.0283)
1.14 - 1.18 (0.0449 - 0.0465)	0.72 + 0.72 (0.0283 + 0.0283)
1.18 - 1.22 (0.0465 - 0.0480)	0.72 + 0.76 (0.0283 + 0.0299)
1.22 - 1.26 (0.0480 - 0.0496)	0.76 + 0.76 (0.0299 + 0.0299)
1.26 - 1.30 (0.0496 - 0.0512)	0.76 + 0.80 (0.0299 + 0.0315)
1.30 - 1.34 (0.0512 - 0.0528)	0.80 + 0.80 (0.0315 + 0.0315)
1.34 - 1.38 (0.0528 - 0.0543)	0.44 + 1.20 (0.0173 + 0.0472)
1.38 - 1.42 (0.0543 - 0.0559)	0.48 + 1.20 (0.0189 + 0.0472)
1.42 - 1.46 (0.0559 - 0.0575)	0.52 + 1.20 (0.0205 + 0.0472)
1.46 - 1.50 (0.0575 - 0.0591)	0.56 + 1.20 (0.0220 + 0.0472)

GI  
VA  
EM  
LC  
EF &  
EC

### Table for selecting mainshaft bearing adjusting shim

Unit: mm (in)



SMT467B

Dimension "C"	Suitable shim(s)
0.30 - 0.34 (0.0118 - 0.0134)	0.60 (0.0236)
0.34 - 0.38 (0.0134 - 0.0150)	0.64 (0.0252)
0.38 - 0.42 (0.0150 - 0.0165)	0.68 (0.0268)
0.42 - 0.46 (0.0165 - 0.0181)	0.72 (0.0283)
0.46 - 0.50 (0.0181 - 0.0197)	0.76 (0.0299)
0.50 - 0.54 (0.0197 - 0.0213)	0.80 (0.0315)
0.54 - 0.58 (0.0213 - 0.0228)	0.40 + 0.44 (0.0157 + 0.0173)
0.58 - 0.62 (0.0228 - 0.0244)	0.44 + 0.44 (0.0173 + 0.0173)
0.62 - 0.66 (0.0244 - 0.0260)	0.44 + 0.48 (0.0173 + 0.0189)
0.66 - 0.70 (0.0260 - 0.0276)	0.48 + 0.48 (0.0189 + 0.0189)
0.70 - 0.74 (0.0276 - 0.0291)	0.48 + 0.52 (0.0189 + 0.0205)
0.74 - 0.78 (0.0291 - 0.0307)	0.52 + 0.52 (0.0205 + 0.0205)
0.78 - 0.82 (0.0307 - 0.0323)	0.52 + 0.56 (0.0205 + 0.0220)
0.82 - 0.86 (0.0323 - 0.0339)	0.56 + 0.56 (0.0220 + 0.0220)
0.86 - 0.90 (0.0339 - 0.0354)	0.56 + 0.60 (0.0220 + 0.0236)
0.90 - 0.94 (0.0354 - 0.0370)	0.60 + 0.60 (0.0236 + 0.0236)
0.94 - 0.98 (0.0370 - 0.0386)	0.60 + 0.64 (0.0236 + 0.0252)
0.98 - 1.02 (0.0386 - 0.0402)	0.64 + 0.64 (0.0252 + 0.0252)
1.02 - 1.06 (0.0402 - 0.0417)	0.64 + 0.68 (0.0252 + 0.0268)

### Input shaft bearing adjusting shim

Thickness mm (in)	Part number
0.40 (0.0157)	32225-08E00
0.44 (0.0173)	32225-08E01
0.48 (0.0189)	32225-08E02
0.52 (0.0205)	32225-08E03
0.56 (0.0220)	32225-08E04
0.60 (0.0236)	32225-08E05
0.64 (0.0252)	32225-08E06
0.68 (0.0268)	32225-08E07
0.72 (0.0283)	32225-08E08
0.76 (0.0299)	32225-08E09
0.80 (0.0315)	32225-08E10
1.20 (0.0472)	32225-08E11

FE  
CL  
MT  
AT  
FA  
RA

### Table for selecting input shaft bearing adjusting shim

Unit: mm (in)

Dial indicator indication	Suitable shim(s)
0.65 - 0.69 (0.0256 - 0.0272)	0.64 (0.0252)
0.69 - 0.73 (0.0272 - 0.0287)	0.68 (0.0268)
0.73 - 0.77 (0.0287 - 0.0303)	0.72 (0.0283)
0.77 - 0.81 (0.0303 - 0.0319)	0.76 (0.0299)
0.81 - 0.85 (0.0319 - 0.0335)	0.80 (0.0315)
0.85 - 0.89 (0.0335 - 0.0350)	0.40 + 0.44 (0.0157 + 0.0173)
0.89 - 0.93 (0.0350 - 0.0366)	0.44 + 0.44 (0.0173 + 0.0173)
0.93 - 0.97 (0.0366 - 0.0382)	0.44 + 0.48 (0.0173 + 0.0189)
0.97 - 1.01 (0.0382 - 0.0398)	0.48 + 0.48 (0.0189 + 0.0189)
1.01 - 1.05 (0.0398 - 0.0413)	0.48 + 0.52 (0.0189 + 0.0205)
1.05 - 1.09 (0.0413 - 0.0429)	0.52 + 0.52 (0.0205 + 0.0205)
1.09 - 1.13 (0.0429 - 0.0445)	0.52 + 0.56 (0.0205 + 0.0220)
1.13 - 1.17 (0.0445 - 0.0461)	0.56 + 0.56 (0.0220 + 0.0220)
1.17 - 1.21 (0.0461 - 0.0476)	0.56 + 0.60 (0.0220 + 0.0236)

BR  
ST  
BF  
HA  
EL  
IDX

## SERVICE DATA AND SPECIFICATIONS (SDS)

### Inspection and Adjustment (Cont'd)

**Table for selecting input shaft bearing adjusting shim (Cont'd)**

Unit: mm (in)

Dial indicator indication	Suitable shim(s)
1.21 - 1.25 (0.0476 - 0.0492)	0.60 + 0.60 (0.0236 + 0.0236)
1.25 - 1.29 (0.0492 - 0.0508)	0.56 + 0.60 (0.0220 + 0.0236)
1.29 - 1.33 (0.0508 - 0.0524)	0.64 + 0.64 (0.0252 + 0.0252)
1.33 - 1.37 (0.0524 - 0.0539)	0.64 + 0.68 (0.0252 + 0.0268)
1.37 - 1.41 (0.0539 - 0.0555)	0.68 + 0.68 (0.0268 + 0.0268)
1.41 - 1.45 (0.0555 - 0.0571)	0.68 + 0.72 (0.0268 + 0.0283)
1.45 - 1.49 (0.0571 - 0.0587)	0.72 + 0.72 (0.0283 + 0.0283)
1.49 - 1.53 (0.0587 - 0.0602)	0.72 + 0.76 (0.0283 + 0.0299)
1.53 - 1.57 (0.0602 - 0.0618)	0.76 + 0.76 (0.0299 + 0.0299)
1.57 - 1.61 (0.0618 - 0.0634)	0.76 + 0.80 (0.0299 + 0.0615)
1.61 - 1.65 (0.0618 - 0.0650)	0.80 + 0.80 (0.0315 + 0.0315)
1.65 - 1.69 (0.0650 - 0.0665)	0.44 + 1.20 (0.0173 + 0.0472)

**Differential side bearing adjusting shim — RS5F50V**

Thickness mm (in)	Part number
0.36 (0.0142)	38753-56E00
0.40 (0.0157)	38753-56E01
0.44 (0.0173)	38753-56E02
0.48 (0.0189)	38753-56E03
0.52 (0.0205)	38753-56E04
0.56 (0.0220)	38753-56E05
0.60 (0.0236)	38753-56E06
0.64 (0.0252)	38753-56E07
0.68 (0.0268)	38753-56E08
0.72 (0.0283)	38753-56E09
0.76 (0.0299)	38753-56E10
0.80 (0.0315)	38753-56E11
0.84 (0.0331)	38753-56E12
0.88 (0.0346)	38753-56E13
0.92 (0.0362)	38753-56E14

**Differential side bearing adjusting shim — RS5F50A**

Thickness mm (in)	Part number
0.40 (0.0157)	38453-96E00
0.44 (0.0173)	38453-96E01
0.48 (0.0189)	38453-96E02
0.52 (0.0205)	38453-96E03
0.56 (0.0220)	38453-96E04
0.60 (0.0236)	38453-96E05
0.64 (0.0252)	38453-96E06
0.68 (0.0268)	38453-96E07
0.72 (0.0283)	38453-96E08
0.76 (0.0299)	38453-96E09
0.80 (0.0315)	38453-96E10
0.84 (0.0331)	38453-96E11
0.88 (0.0346)	38453-96E12
1.20 (0.0472)	38453-96E13

**Table for selecting differential side bearing adjusting shim(s)**

Unit: mm (in)

Dial indicator deflection	Suitable shim(s)
0.47 - 0.51 (0.0185 - 0.0201)	0.44 + 0.48 (0.0173 + 0.0189)
0.51 - 0.55 (0.0201 - 0.0217)	0.48 + 0.48 (0.0189 + 0.0189)
0.55 - 0.59 (0.0217 - 0.0232)	0.48 + 0.52 (0.0189 + 0.0205)
0.59 - 0.63 (0.0232 - 0.0248)	0.52 + 0.52 (0.0205 + 0.0205)
0.63 - 0.67 (0.0248 - 0.0264)	0.52 + 0.56 (0.0205 + 0.0220)
0.67 - 0.71 (0.0264 - 0.0280)	0.56 + 0.56 (0.0220 + 0.0220)
0.71 - 0.75 (0.0280 - 0.0295)	0.56 + 0.60 (0.0220 + 0.0236)
0.75 - 0.79 (0.0295 - 0.0311)	0.60 + 0.60 (0.0236 + 0.0236)
0.79 - 0.83 (0.0311 - 0.0327)	0.60 + 0.64 (0.0236 + 0.0252)
0.83 - 0.87 (0.0327 - 0.0343)	0.64 + 0.64 (0.0252 + 0.0252)
0.87 - 0.91 (0.0343 - 0.0358)	0.64 + 0.68 (0.0252 + 0.0268)
0.91 - 0.95 (0.0358 - 0.0374)	0.68 + 0.68 (0.0268 + 0.0268)
0.95 - 0.99 (0.0374 - 0.0390)	0.68 + 0.72 (0.0268 + 0.0283)
0.99 - 1.03 (0.0390 - 0.0406)	0.72 + 0.72 (0.0283 + 0.0283)
1.03 - 1.07 (0.0406 - 0.0421)	0.72 + 0.76 (0.0283 + 0.0299)
1.07 - 1.11 (0.0421 - 0.0437)	0.76 + 0.76 (0.0299 + 0.0299)
1.11 - 1.15 (0.0437 - 0.0453)	0.76 + 0.80 (0.0299 + 0.0315)
1.15 - 1.19 (0.0453 - 0.0469)	0.80 + 0.80 (0.0315 + 0.0315)
1.19 - 1.23 (0.0469 - 0.0484)	0.72 + 0.92 (0.0283 + 0.0362)
1.23 - 1.27 (0.0484 - 0.0500)	0.76 + 0.92 (0.0299 + 0.0362)
1.27 - 1.31 (0.0500 - 0.0516)	0.80 + 0.92 (0.0315 + 0.0362)