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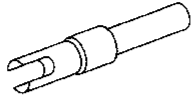
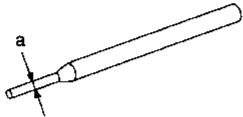
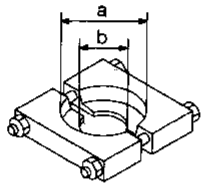
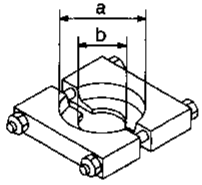
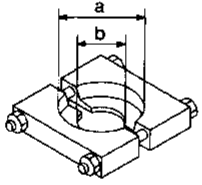
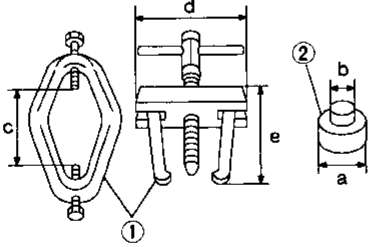
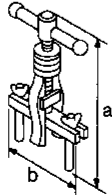
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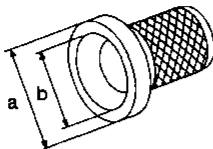
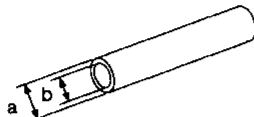
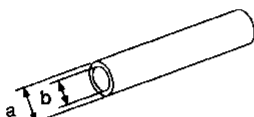
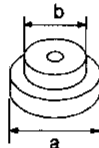
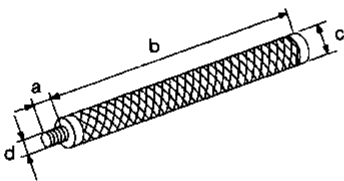

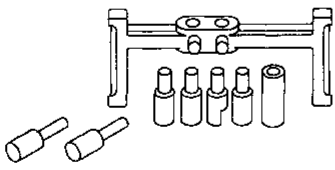
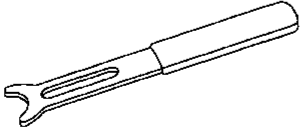
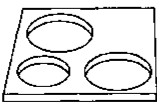
PREPARATION

Special Service Tools

Tool number (Kent-Moore No.) Tool name	Description
KV38106500 (J34284) Preload adapter	 <p>Measuring turning torque of final drive assembly Measuring total turning torque Measuring clearance between side gear and differential case with washer Selecting differential side bearing adjusting shim</p>
KV32101000 (J25689-A) Pin punch	 <p>Removing and installing retaining pin</p> <p>a: 4 mm (0.16 in) dia.</p>
ST22730000 (J25681) Puller	 <p>Removing mainshaft front and rear bearing inner race</p> <p>a: 82 mm (3.23 in) dia. b: 30 mm (1.18 in) dia.</p>
ST30031000 (J22912-01) Puller	 <p>Removing input shaft front and rear bearing Removing 4th & 5th main gear</p> <p>a: 90 mm (3.54 in) dia. b: 50 mm (1.97 in) dia.</p>
ST30021000 (J22912-01) Puller	 <p>Removing 5th synchronizer Removing 3rd & 4th synchronizer Removing 2nd & 3rd main gear</p> <p>a: 110 mm (4.33 in) dia. b: 68 mm (2.68 in) dia.</p>
ST3306S001 (J22888-D) Differential side bearing puller set ① ST33051001 (J22888-D) Puller ② ST33061000 (J8107-2) Adapter	 <p>Removing differential side bearing inner race</p> <p>a: 38 mm (1.50 in) dia. b: 28.5 mm (1.122 in) dia. c: 130 mm (5.12 in) d: 135 mm (5.31 in) e: 100 mm (3.94 in)</p>
ST33290001 (J34286) Puller	 <p>Removing differential oil seal Removing mainshaft rear bearing outer race Removing differential side bearing outer race</p> <p>a: 250 mm (9.84 in) b: 160 mm (6.30 in)</p>

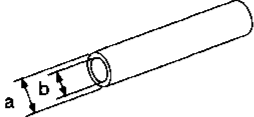
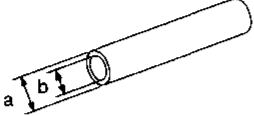
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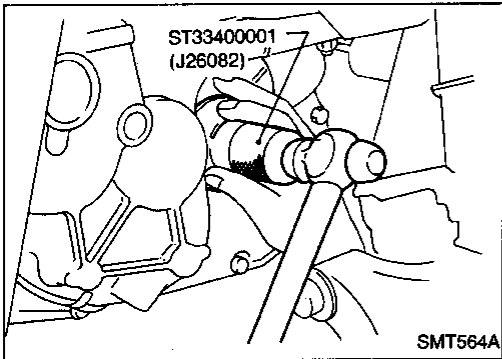
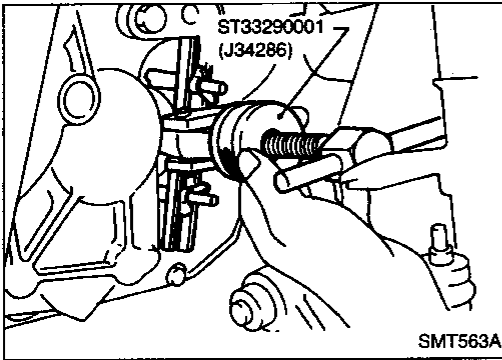
Special Service Tools (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description		
ST33400001 (J26082) Drift		Installing differential oil seal a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.	GI MA EM
ST30600000 (J25863-01) Drift		Installing input shaft front bearing a: 36 mm (1.42 in) dia. b: 31 mm (1.22 in) dia.	LC EC
ST22452000 (—) Drift		Installing 3rd, 4th and 5th main gear a: 45 mm (1.77 in) dia. b: 36 mm (1.42 in) dia.	FE CL
ST30621000 (J25742-5) Drift		Installing mainshaft rear bearing outer race (Use with ST30611000.) a: 79 mm (3.11 in) dia. b: 59 mm (2.32 in) dia.	MT AT
ST30611000 (J25742-1) Drift		Installing mainshaft rear bearing outer race (Use with ST30621000.) a: 15 mm (0.59 in) b: 335 mm (13.19 in) c: 25 mm (0.98 in) dia. d: M12 x 1.5P	FA RA
ST307200000 (—) Drift		Installing differential side bearing outer race a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	BR ST
(J34290) Shim selecting tool set		Selecting differential side bearing adjusting shim	RS BT
(J34305) Snap ring remover and installer		Removing and installing stopper ring of shift fork	HA EL
(J25407-2)		Measuring reverse baulk ring wear	IDX

PREPARATION

Commercial Service Tools

Tool name	Description
Drift	 <p data-bbox="834 254 1305 285">Installing differential side bearing inner race</p> <p data-bbox="834 359 1068 390">a: 45 mm (1.77 in) dia.</p> <p data-bbox="834 390 1068 422">b: 41 mm (1.61 in) dia.</p>
Drift	 <p data-bbox="834 432 1143 464">Installing striking rod oil seal</p> <p data-bbox="834 537 1068 569">a: 38 mm (1.50 in) dia.</p> <p data-bbox="834 569 1068 600">b: 20 mm (0.79 in) dia.</p>



Differential Side Oil Seal Replacement

1. Drain gear oil from transaxle.
2. Remove drive shafts. Refer to FA section ("Removal", "FRONT AXLE — Drive Shaft").
3. Remove differential oil seal.
4. Install differential oil seal.
 - **Apply multi-purpose grease to seal lip of oil seal before installing.**
5. Install drive shafts. Refer to FA section ("Installation", "FRONT AXLE — Drive Shaft").

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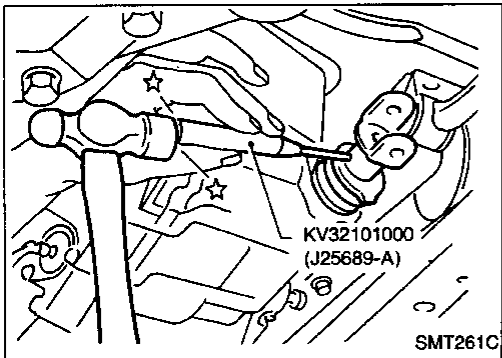
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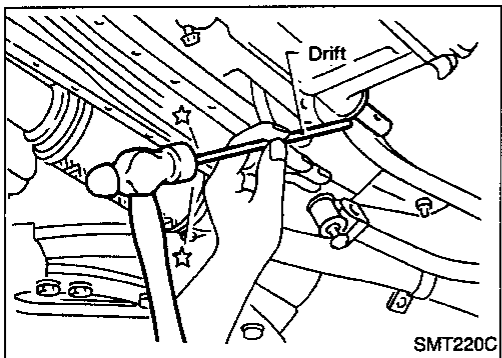
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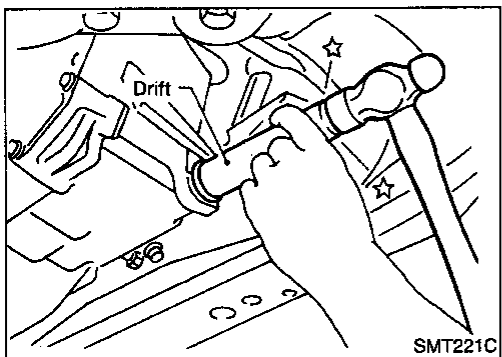


Striking Rod Oil Seal Replacement

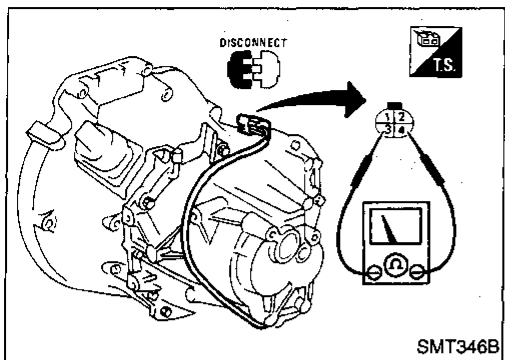
1. Remove transaxle control rod from yoke.
2. Remove yoke retaining pin.
 - **Be careful not to damage boot.**



3. Remove striking rod oil seal.



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

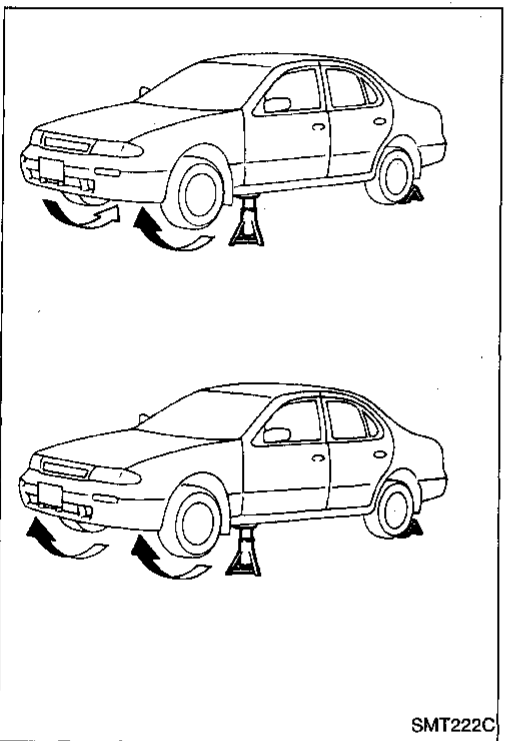


Position Switch Check

BACK-UP LAMP SWITCH AND NEUTRAL POSITION SWITCH

- Check continuity.

Gear position	Continuity
Reverse	② — ④
Neutral	① — ③
Except reverse and neutral	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.

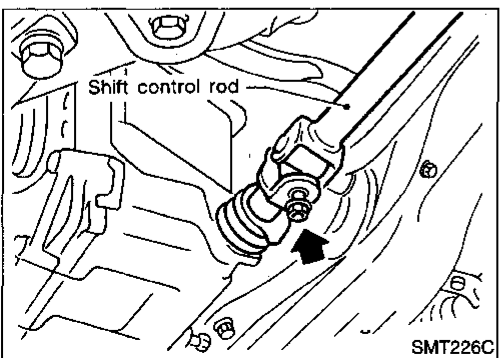
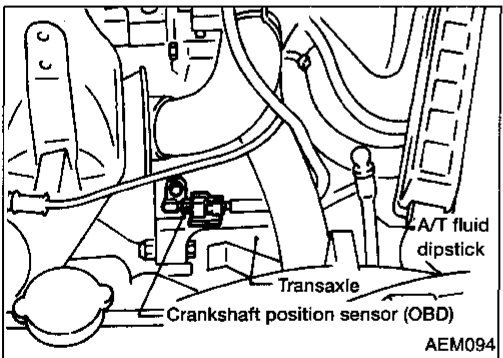
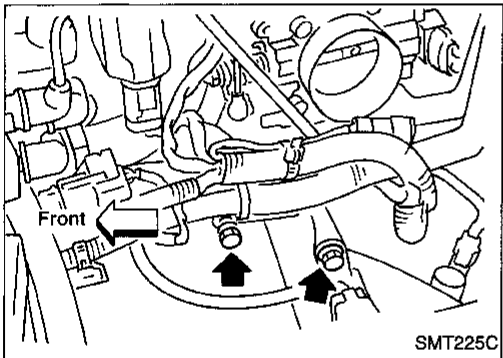
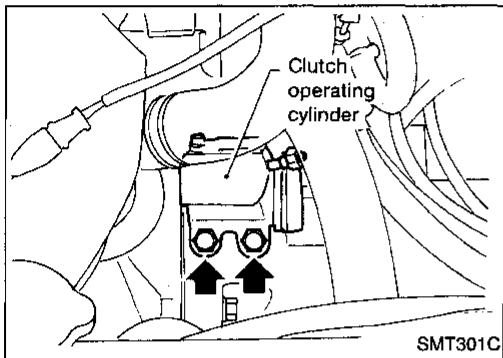
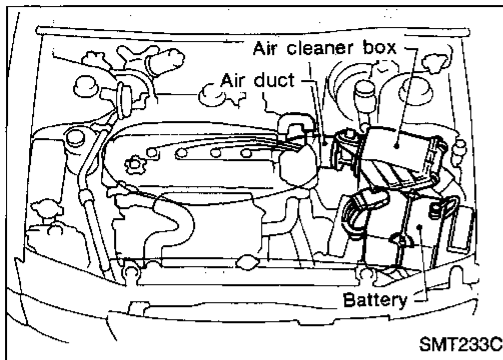
Turning direction of the two wheels is opposite:

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 AND INSTALLATION



Removal

CAUTION:

Before separating transaxle from engine, remove the crankshaft position sensor (OBD) from transaxle.

Be careful not to damage sensor.

1. Remove battery and its bracket.
2. Remove air cleaner box with mass air flow sensor.
3. Remove air duct.
4. Remove clutch operating cylinder from transaxle.
5. Disconnect back-up lamp switch harness connectors.

6. Remove starter motor from transaxle.

7. Remove crankshaft position sensor (OBD) from transaxle.
Be careful not to damage sensor tip.

8. Remove shift control rod from transaxle.
9. Drain gear oil from transaxle.

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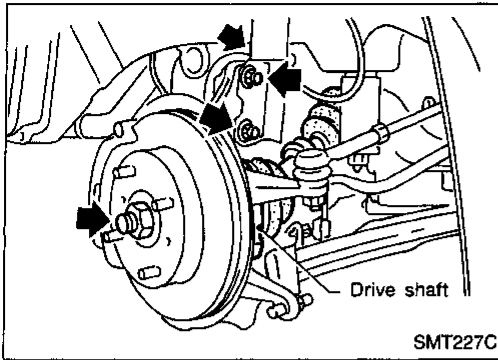
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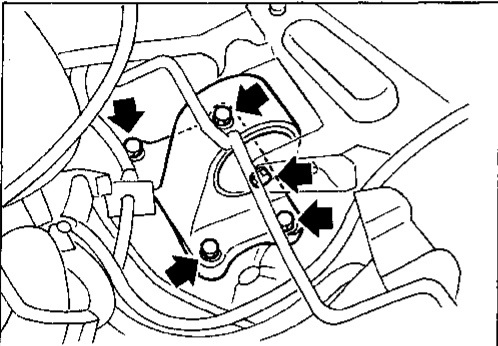
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REMOVAL AND INSTALLATION

Removal (Cont'd)



10. Draw out drive shafts from transaxle. Refer to FA section ("Removal", "FRONT AXLE — Drive Shaft").

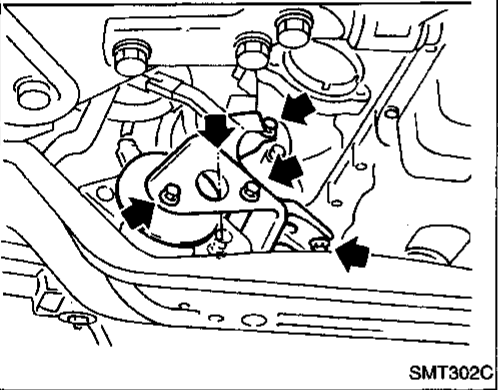


11. Support engine by placing a jack under oil pan.

CAUTION:

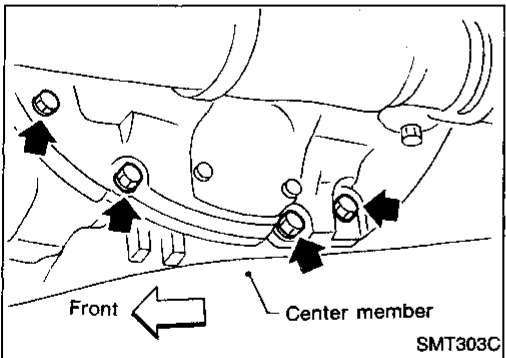
Do not place jack under oil pan drain plug.

12. Remove rear and LH mounts.

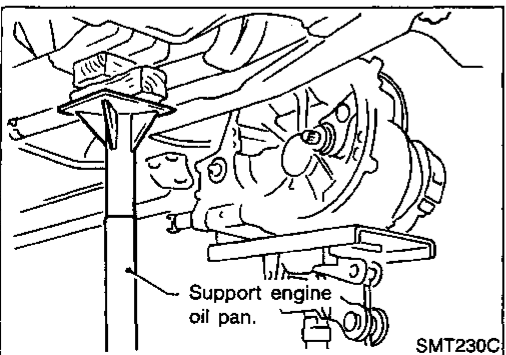


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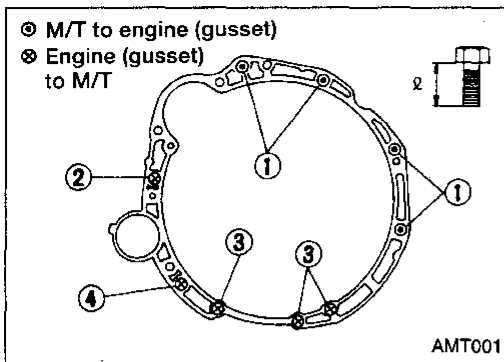
13. Raise jack for access to lower housing bolts. Remove bolts. Lower jack.



14. Remove bolts securing transaxle.
15. Lower transaxle while supporting it with a jack.



REMOVAL AND INSTALLATION



Installation

1. Tighten bolts securing transaxle.

Bolt No.	Tightening torque N·m (kg·m, ft·lb)	ℓ mm (in)
1	39 - 49 (4.0 - 5.0, 29 - 36)	45 (1.77)
2	39 - 49 (4.0 - 5.0, 29 - 36)	48 (1.89)
3	30 - 40 (3.1 - 4.1, 22 - 30)	30 (1.18)
4	30 - 40 (3.1 - 4.1, 22 - 30)	40 (1.57)

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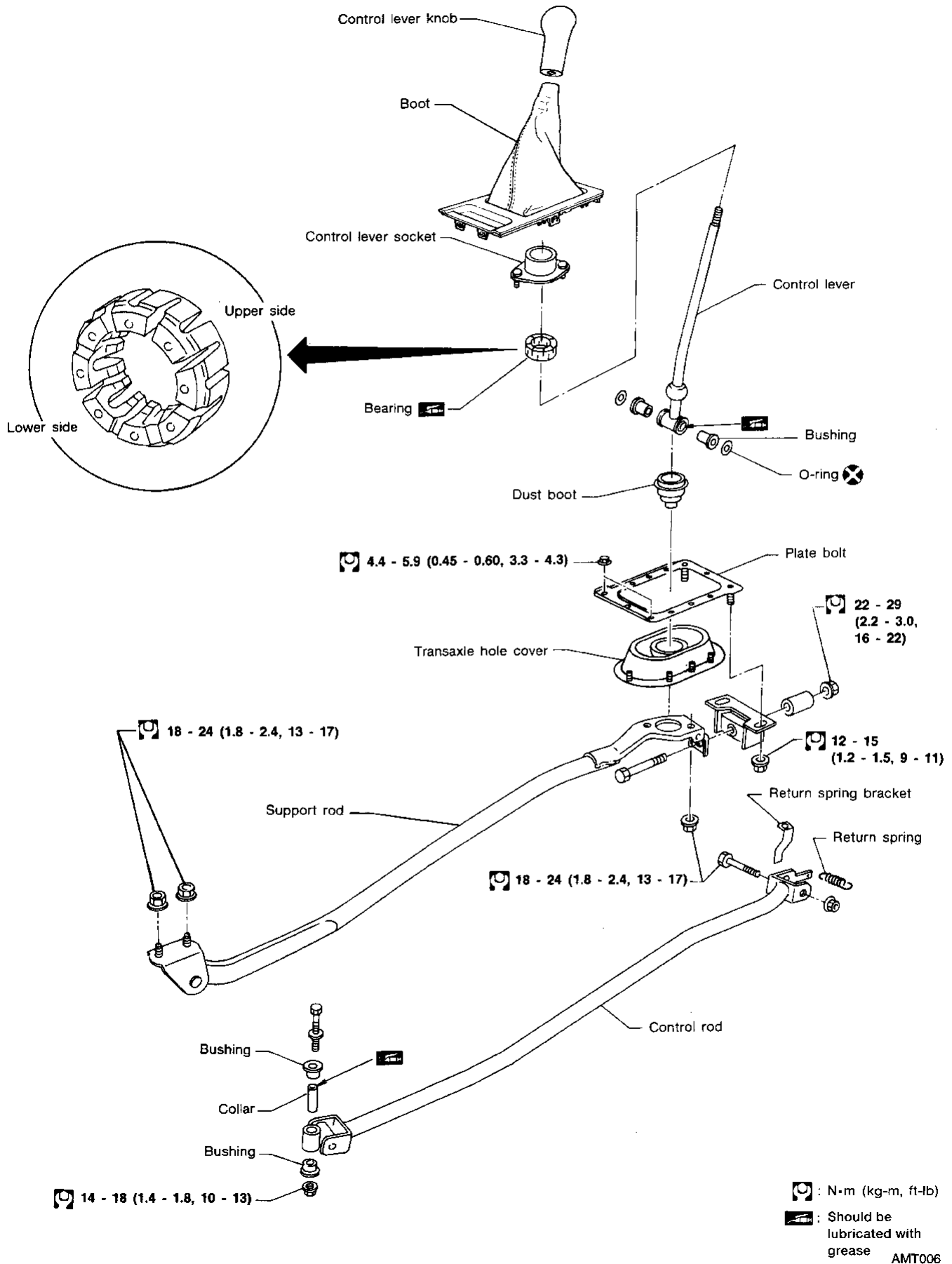
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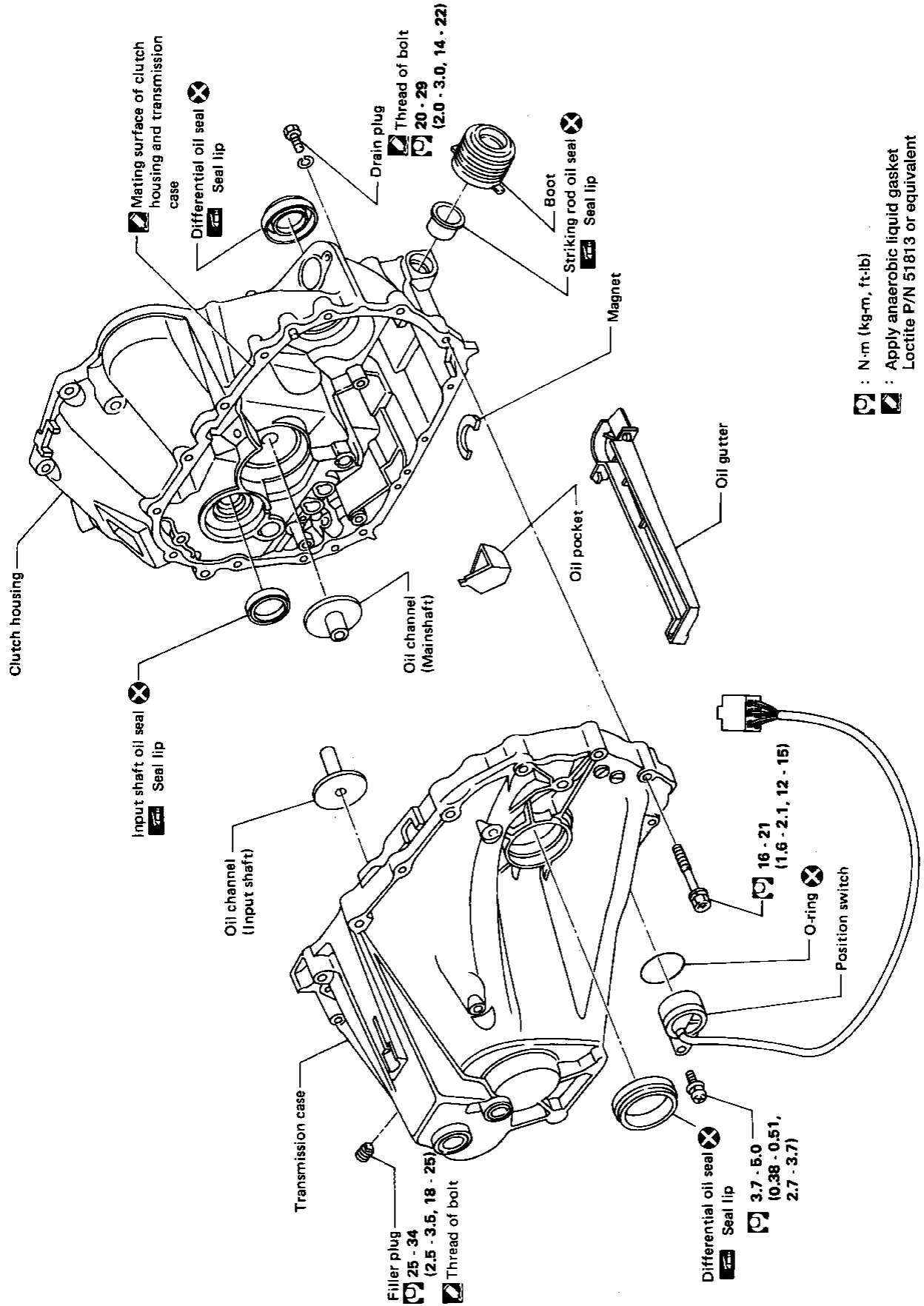
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TRANSAXLE GEAR CONTROL






Case Components

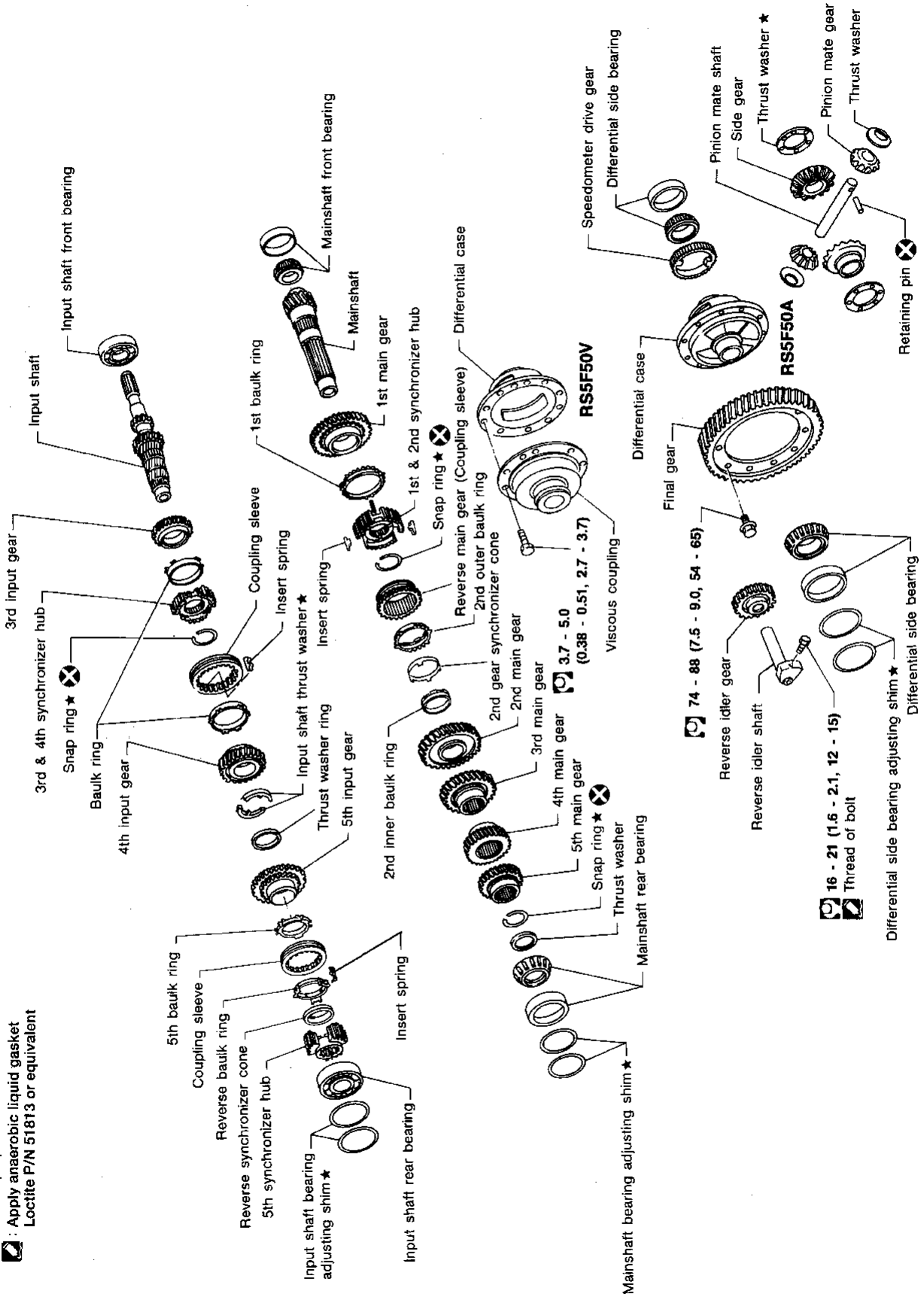


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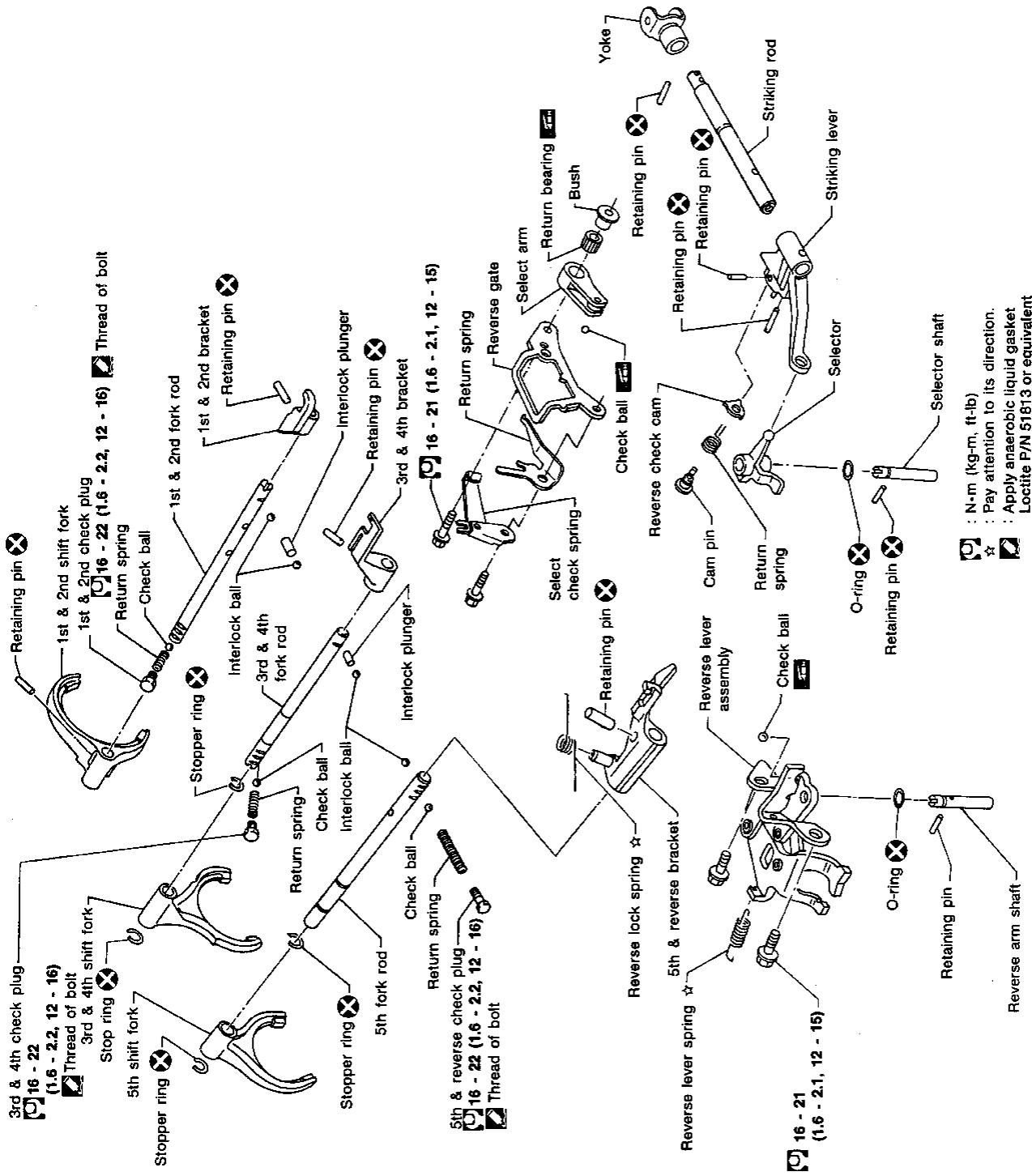
Gear Components

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

-  : N·m (kg-m, ft-lb)
-  : Select proper thickness.
-  : Apply anaerobic liquid gasket Loctite P/N 51813 or equivalent



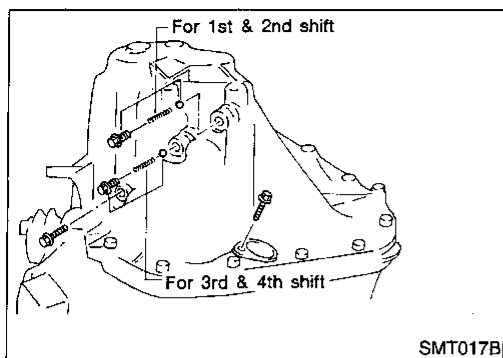
Shift Control Components



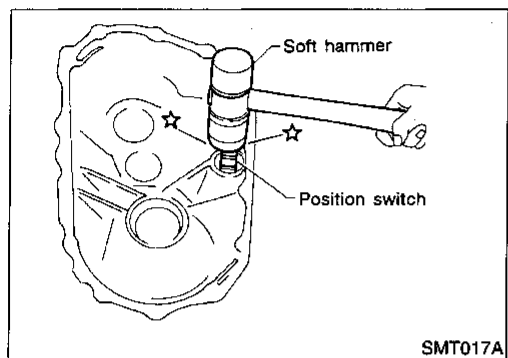
: N·m (kg·m, ft·lb)
 ☆ : Pay attention to its direction.
 : Apply anaerobic liquid gasket
 Loctite P/N 51813 or equivalent

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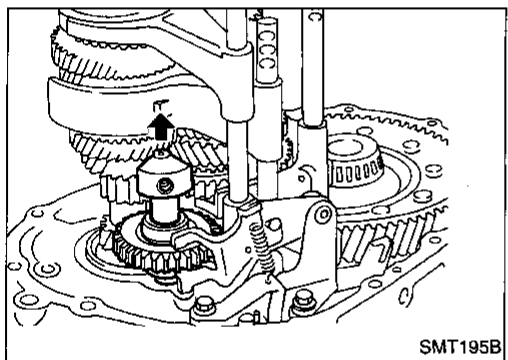
DISASSEMBLY



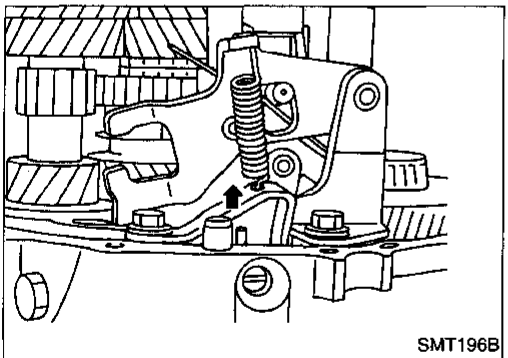
1. Before removing transmission case, remove bolts and plugs as shown left.
2. Remove transmission case.



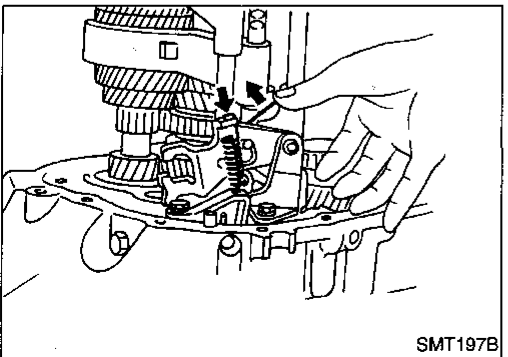
3. Remove position switch.



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

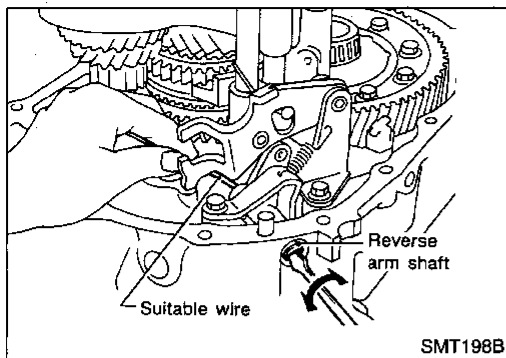


5. Pull out retaining pin from clutch housing.

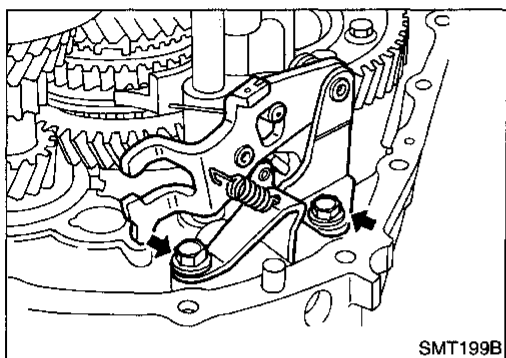


6. Remove reverse lever spring and reverse lock spring from reverse lever assembly.

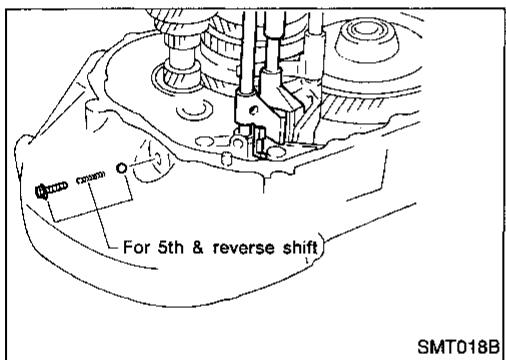
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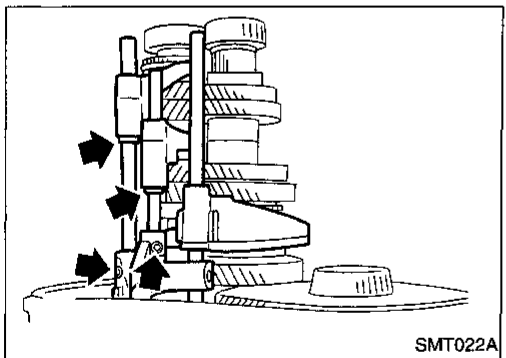
7. Remove reverse arm shaft while rotating it.



8. Remove reverse lever assembly.

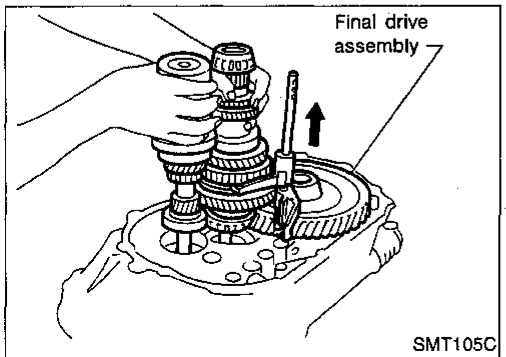


9. Remove 5th & reverse check plug, spring and ball.



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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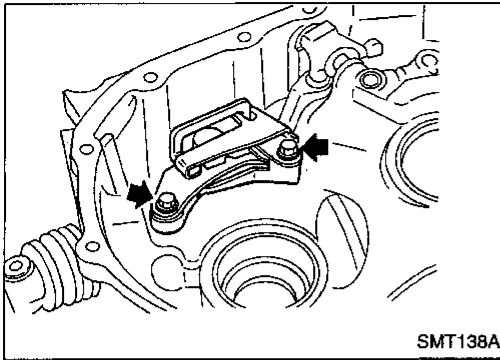
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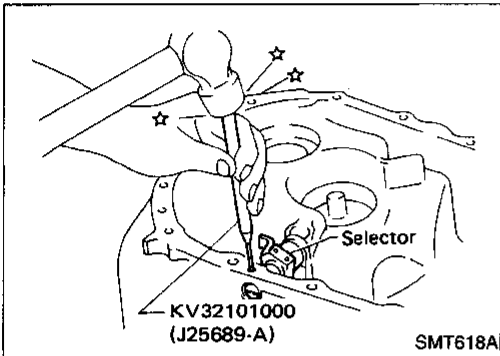
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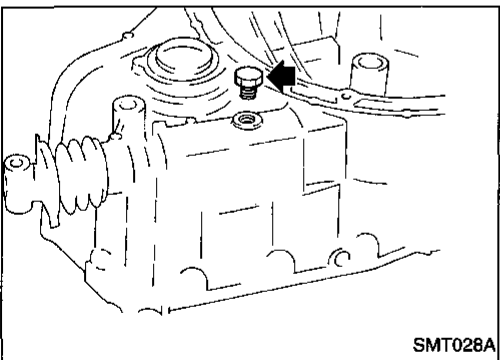
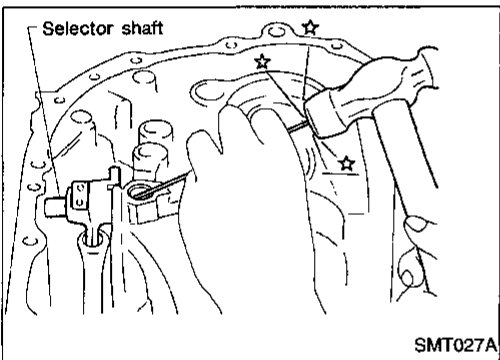
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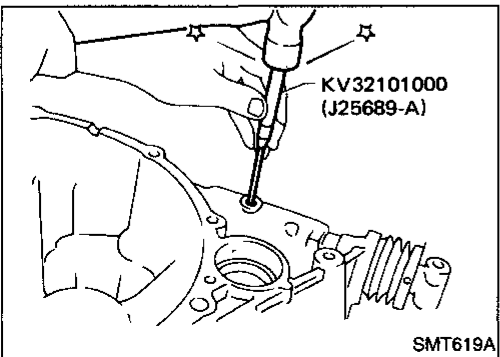
14. Remove reverse check assembly.



15. Remove retaining pin and detach the selector.

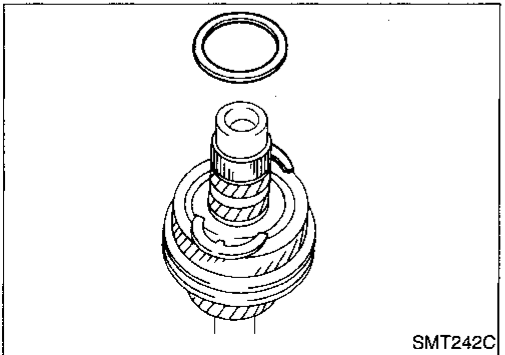
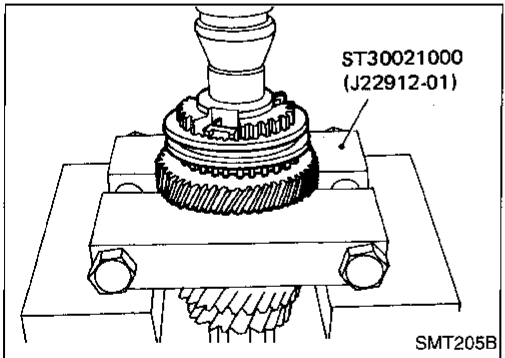
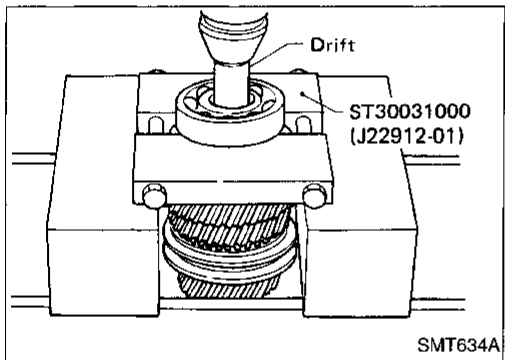
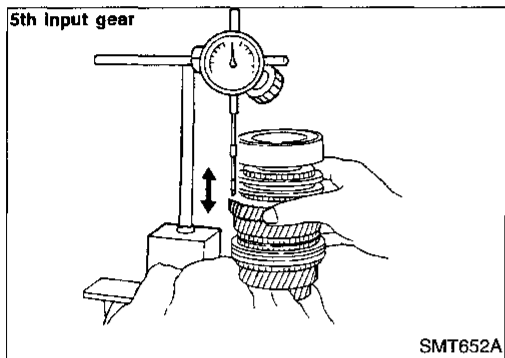
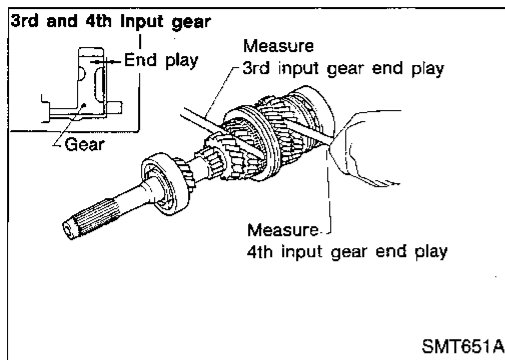


16. Remove drain plug for convenience in removing retaining pin which holds striking lever to striking rod.



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

REPAIR FOR COMPONENT PARTS



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-19.

2. Remove input shaft rear bearing.

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

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

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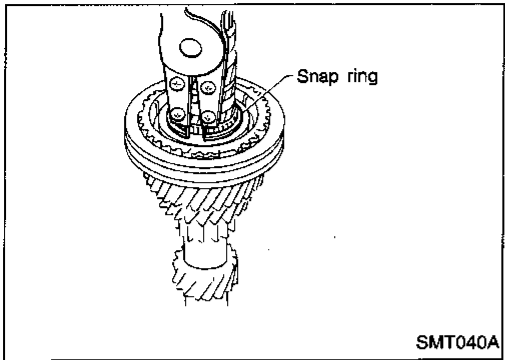
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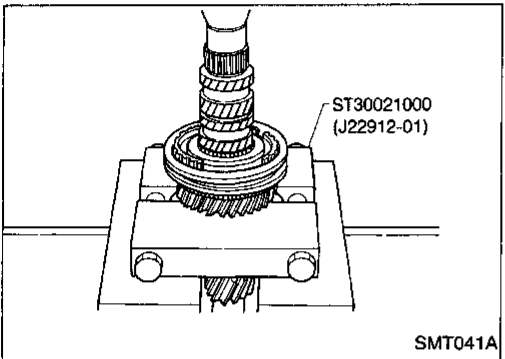
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REPAIR FOR COMPONENT PARTS

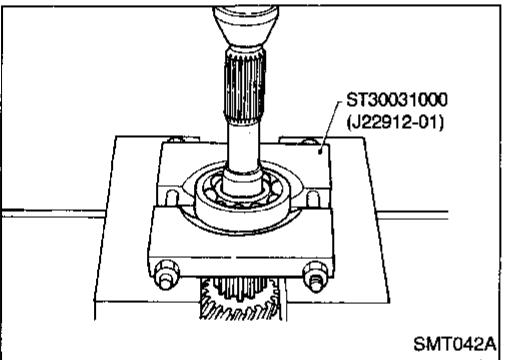
Input Shaft and Gears (Cont'd)



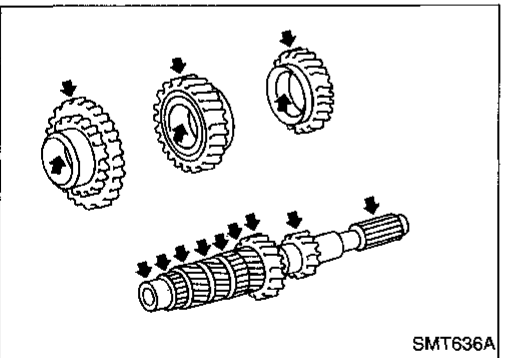
5. Remove snap ring.



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



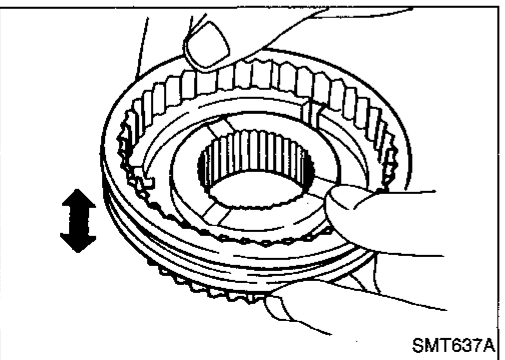
7. Remove input shaft front bearing.



INSPECTION

Gear and shaft

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

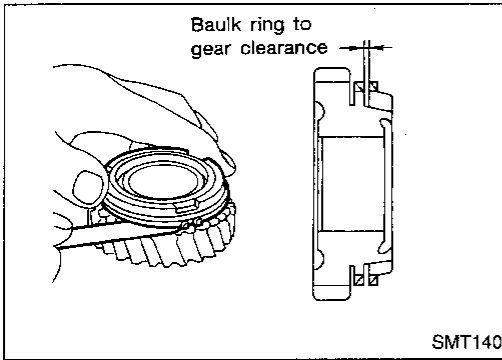


Synchronizer

- 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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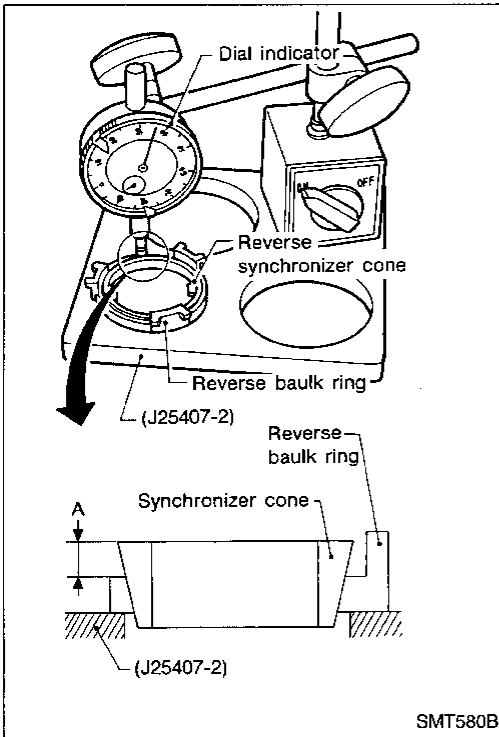
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- Measure wear of reverse baulk ring.

- 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.

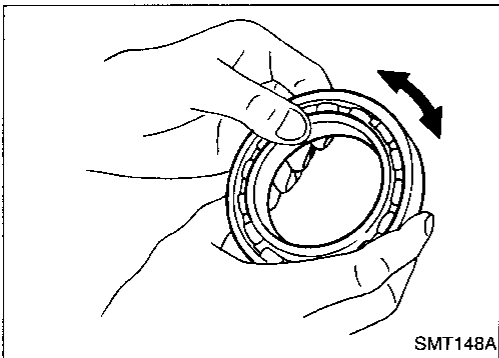
- While holding reverse synchronizer cone against reverse baulk ring as firmly as possible, measure dimension "A" with dial indicator.

Wear limit:

Dimension "A"

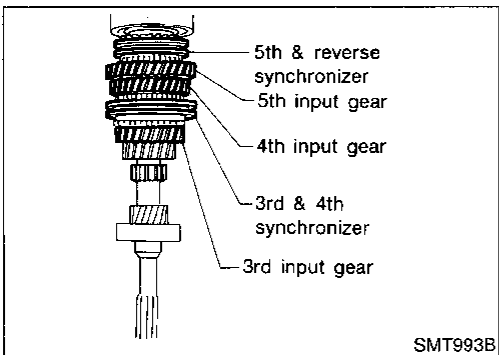
1.2 mm (0.047 in)

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



Bearing

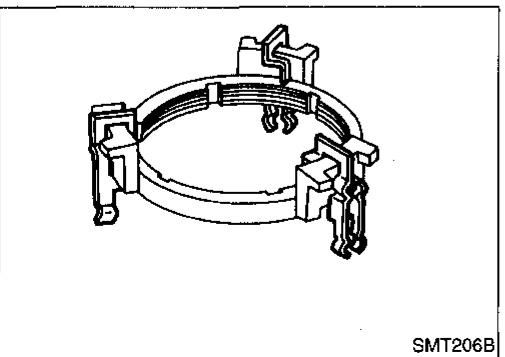
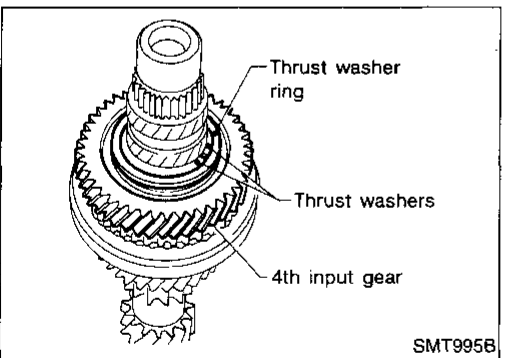
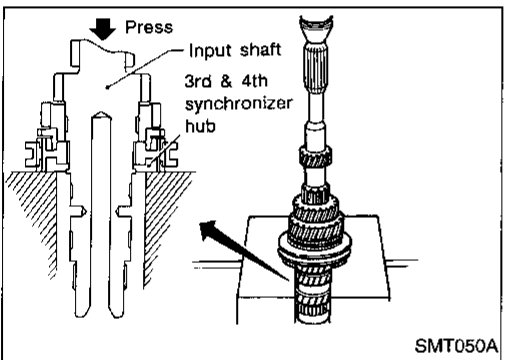
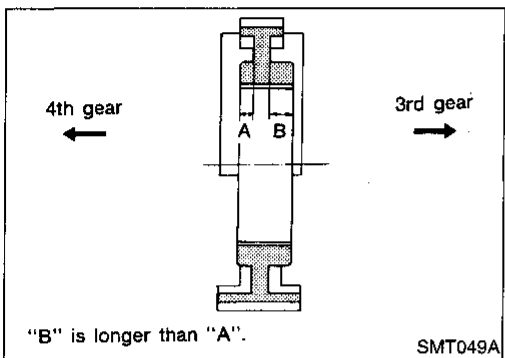
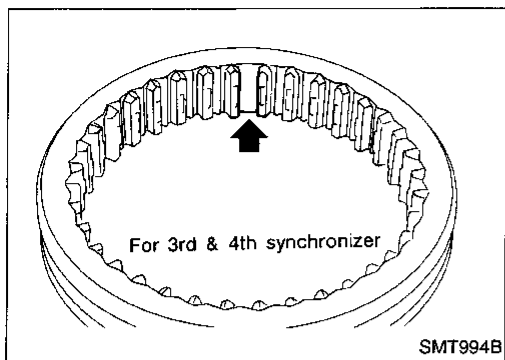
- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.



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 MT-42.

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:

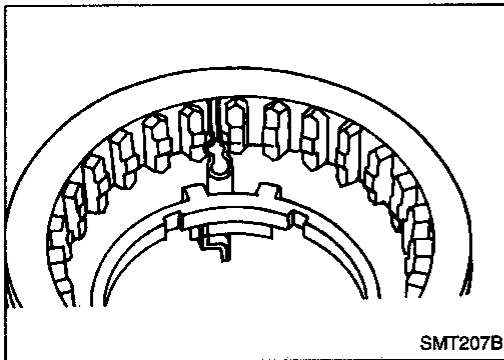
Refer to MT-43.

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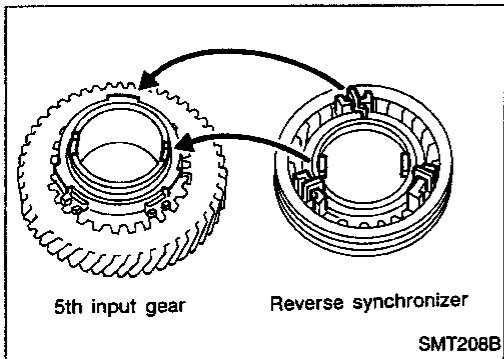
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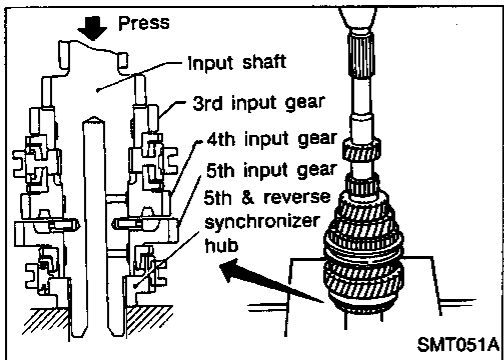
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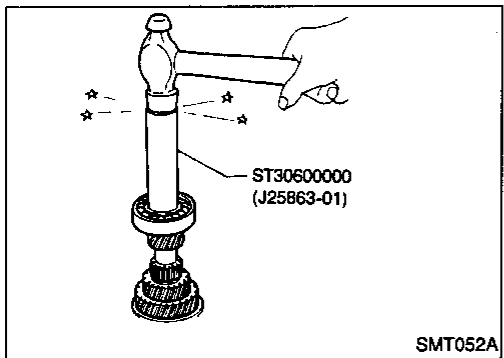
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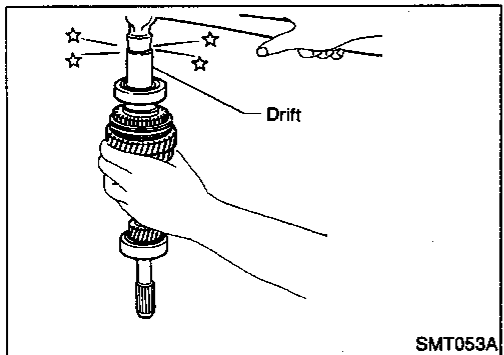
- e. Place reverse synchronizer assembly on 5th input gear.
- **Mesh recesses of 5th input gear with projections of reverse synchronizer cone.**
- **Put insert spring mounts on reverse baulk ring upon those on 5th baulk ring.**



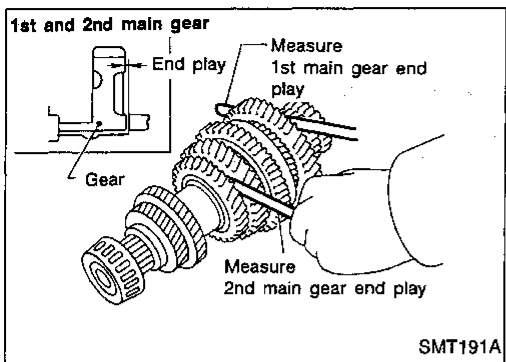
- f. Press on 5th & reverse synchronizer assembly with 5th input gear.



- 8. Install input shaft front and rear bearings.
- 9. Measure gear end play as the final check. Refer to MT-17.



REPAIR FOR COMPONENT PARTS



Mainshaft and Gears

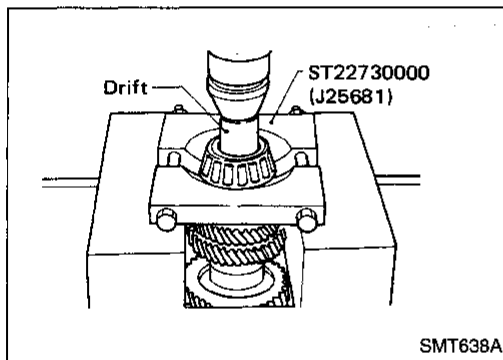
DISASSEMBLY

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

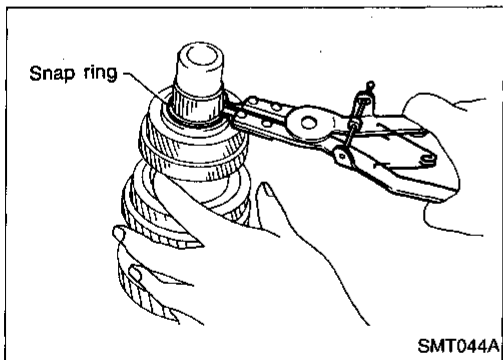
Gear end play

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)

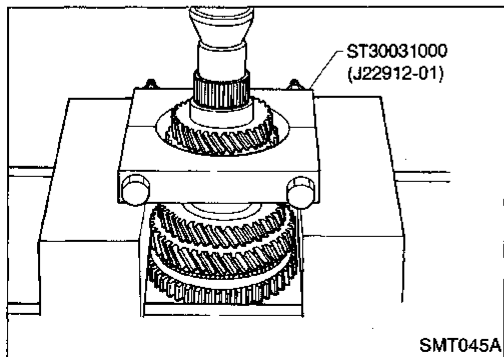
If not within specification, disassemble and check contact surface of gear, shaft and hub. Then check clearance of snap ring. Refer to "ASSEMBLY", MT-25.



2. Press out mainshaft rear bearing.



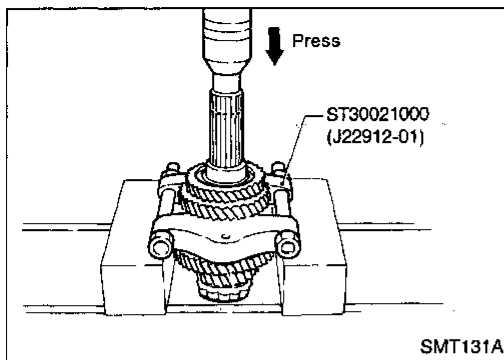
3. Remove thrust washer and snap ring.



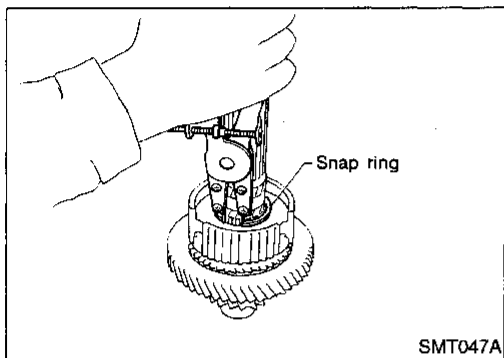
4. Press out 5th main gear and 4th main gear.

REPAIR FOR COMPONENT PARTS

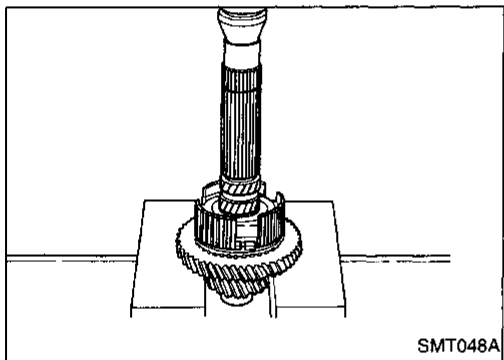
Mainshaft and Gears (Cont'd)



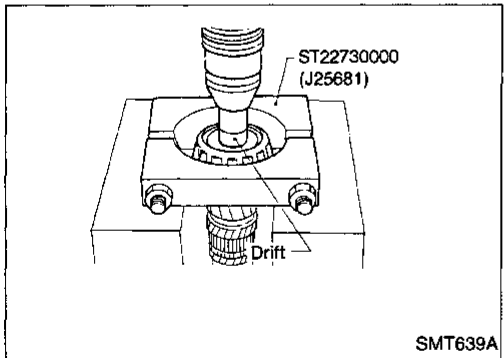
5. Press out 3rd main gear and 2nd main gear.



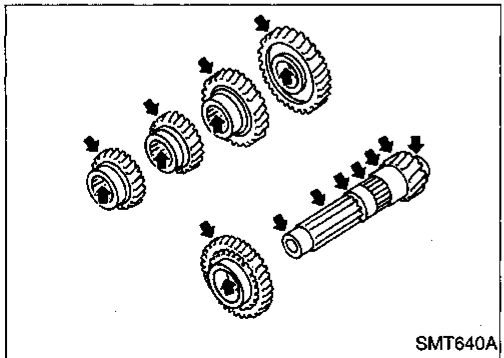
6. Remove snap ring.



7. Remove 1st & 2nd synchronizer 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.

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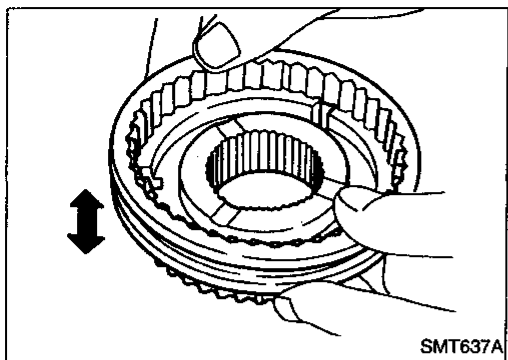
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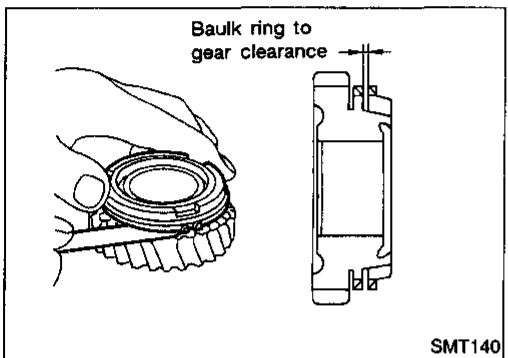
REPAIR FOR COMPONENT PARTS

Mainshaft and Gears (Cont'd)

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.



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

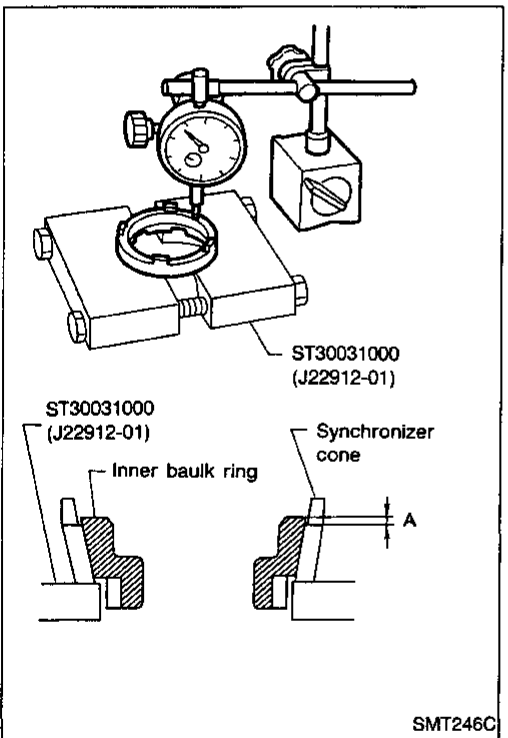
Clearance between baulk ring and gear:

Standard

1.0 - 1.35 mm (0.0394 - 0.0531 in)

Wear limit

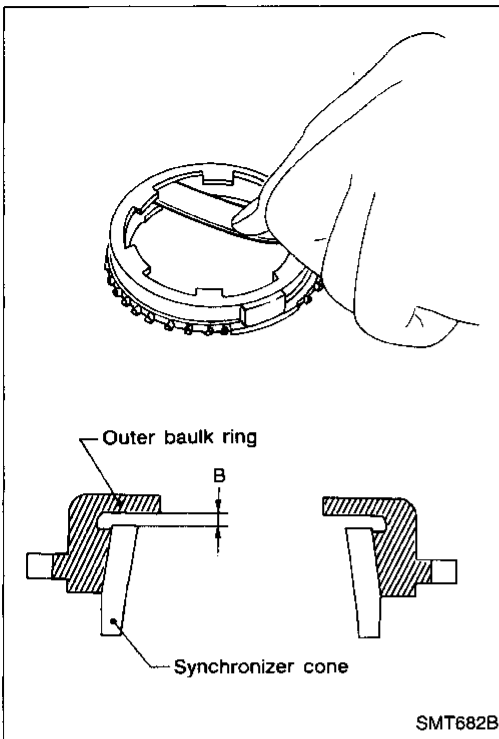
0.7 mm (0.028 in)



- Measure wear of 2nd baulk rings.
 - a. Place inner baulk ring in position on synchronizer cone.
 - b. Hold baulk ring evenly against synchronizer cone and measure distance "A".

REPAIR FOR COMPONENT PARTS

Mainshaft and Gears (Cont'd)



- c. Place outer baulk ring in position on synchronizer cone.
- d. Hold baulk ring evenly against synchronizer cone and measure distance "B".

Standard:

Inner "A" 0.6 - 0.8 mm (0.024 - 0.031 in)

Outer "B" 0.6 - 1.1 mm (0.024 - 0.043 in)

Wear limit:

0.2 mm (0.008 in)

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

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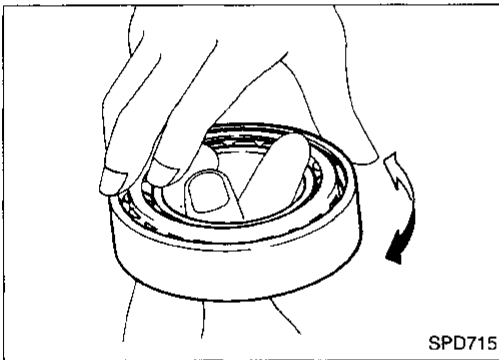
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Bearing

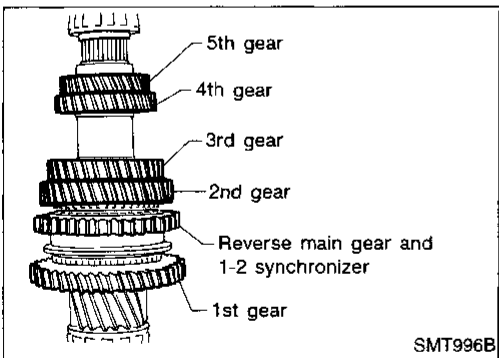
- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- **When replacing tapered roller bearing, replace outer and inner race as a set.**

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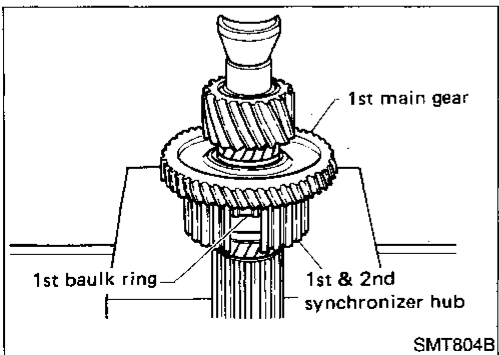
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ASSEMBLY



1. Press on 1st main gear, 1st baulk ring and 1st & 2nd synchronizer hub.
- **Pay attention to direction of 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 MT-42.

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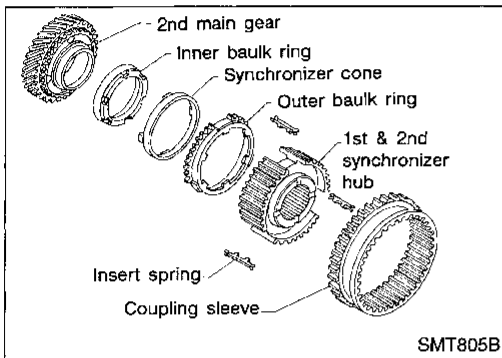
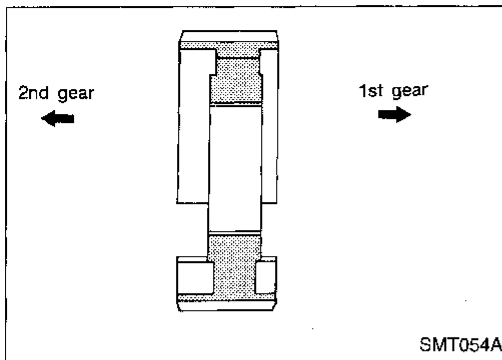
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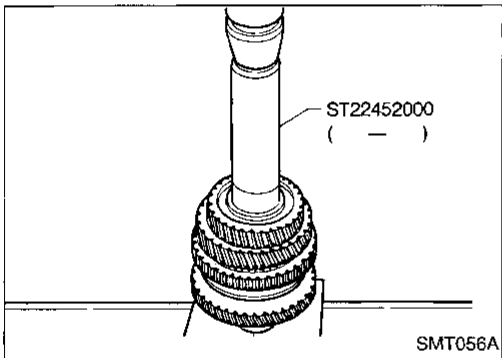
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REPAIR FOR COMPONENT PARTS

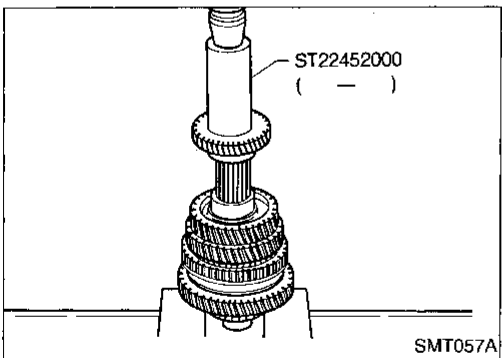
Mainshaft and Gears (Cont'd)



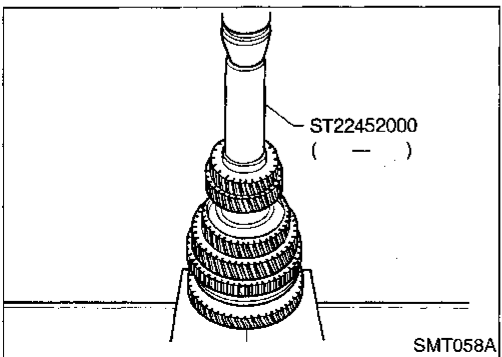
3. Install 2nd synchronizer cone, inner & outer baulk rings. Insert springs and 1st & 2nd coupling sleeve.
4. Install 2nd main gear.
- Ensure four protrusions of 2nd synchronizer cone are set in 2nd main gear holes.



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:

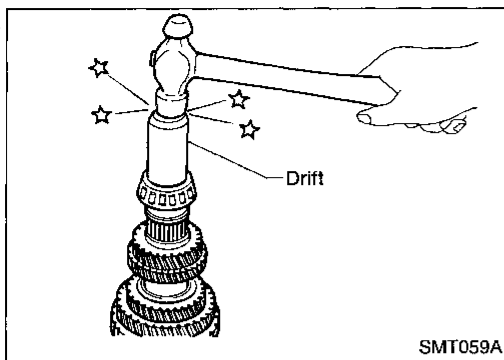
0 - 0.15 mm (0 - 0.0059 in)

Snap ring of 5th main gear:

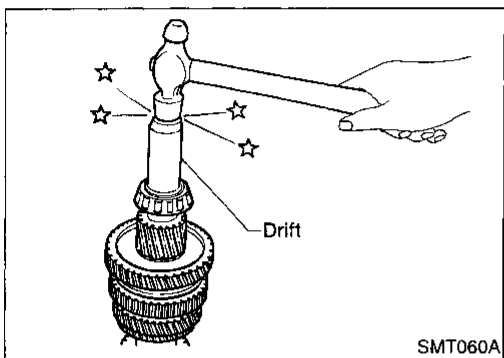
Refer to MT-42.

REPAIR FOR COMPONENT PARTS

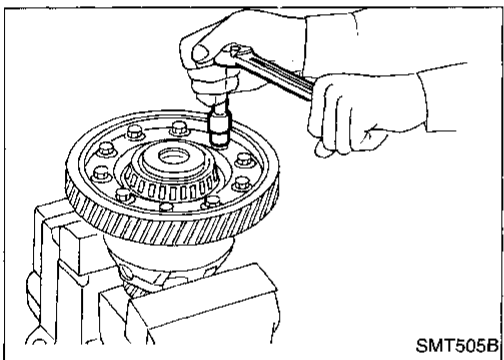
Mainshaft and Gears (Cont'd)



9. Press on thrust washer and press on mainshaft rear bearing.



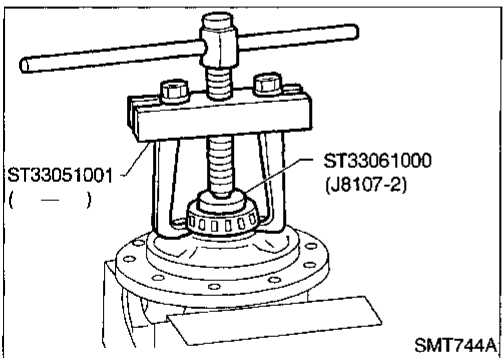
10. Press on mainshaft front bearing.
11. Measure gear end play as the final check. Refer to MT-22.



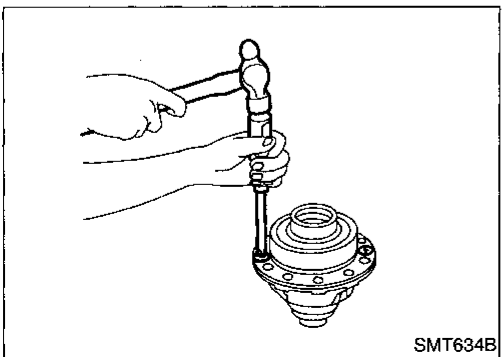
Final Drive

DISASSEMBLY

1. Remove final gear.
2. Remove speedometer drive gear by cutting it.



3. Press out differential side bearings.
 - Be careful not to mix up the right and left bearings.



4. Remove viscous coupling. (Models with viscous coupling).

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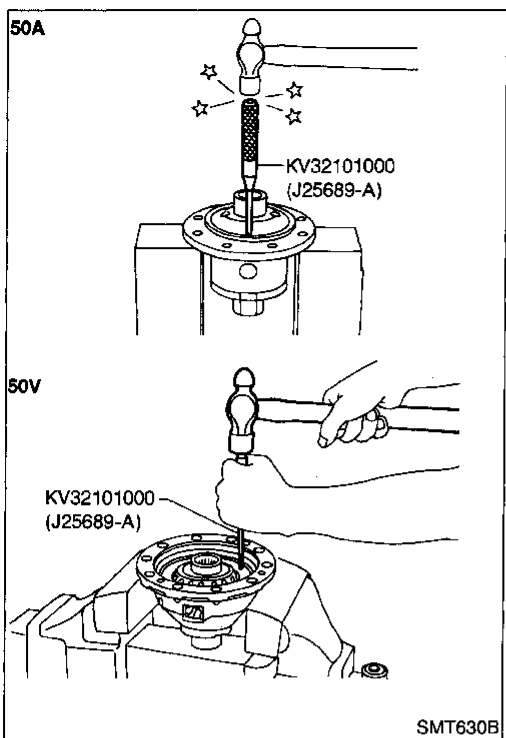
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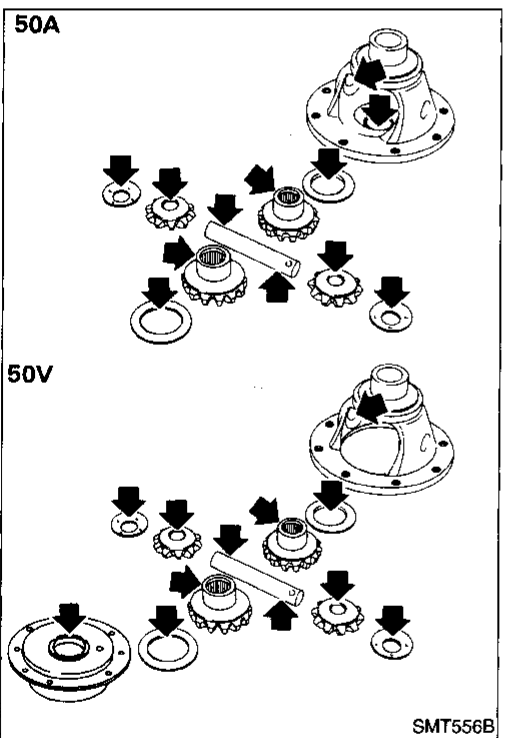
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REPAIR FOR COMPONENT PARTS

Final Drive (Cont'd)



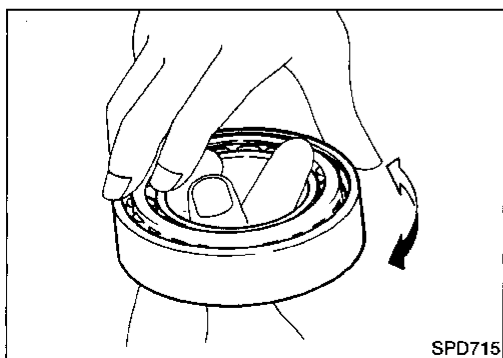
5. Drive out retaining pin and draw out pinion mate shaft.
6. Remove pinion mate gears and side gears.



INSPECTION

Gear, washer, shaft and case

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

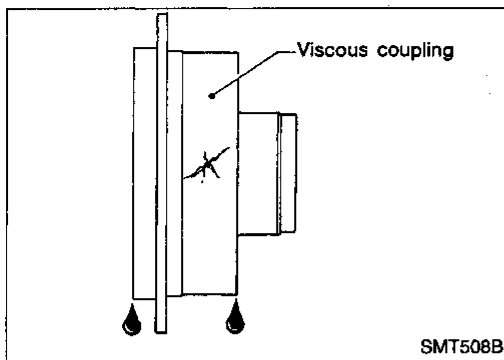


Bearing

- 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.**

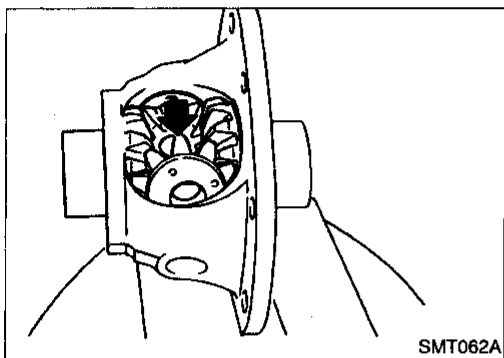
REPAIR FOR COMPONENT PARTS

Final Drive (Cont'd)



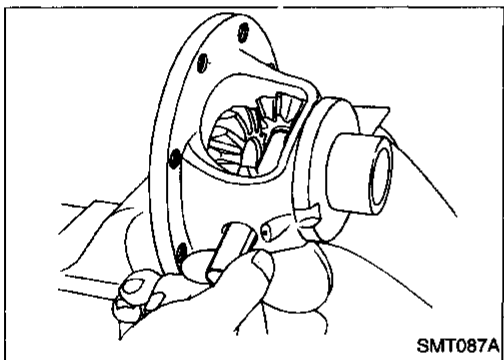
Viscous coupling

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

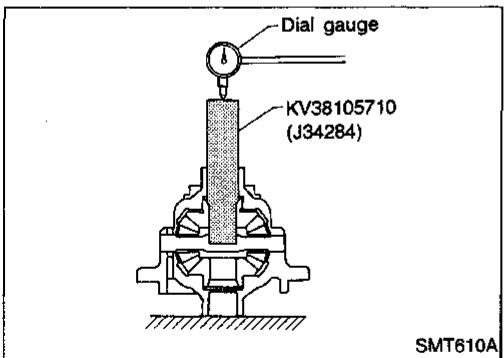


ASSEMBLY

1. Attach side gear thrust washers to side gears, then install pinion mate washers and pinion mate gears in place.



2. Insert pinion mate shaft.
 - When inserting, be careful not to damage pinion mate thrust washers.



3. Measure clearance between side gear and differential case with washers following the procedure below:
 - a. Set Tool and dial indicator on side gear.
 - b. Move side gear up and down to measure dial indicator deflection. Always measure indicator deflection on both side gears.

Clearance between side gear and differential case with washers:

0.1 - 0.2 mm (0.004 - 0.008 in)

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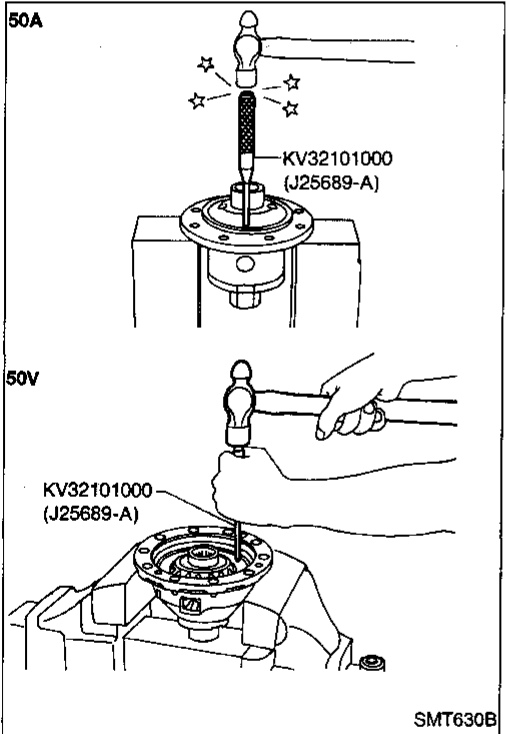
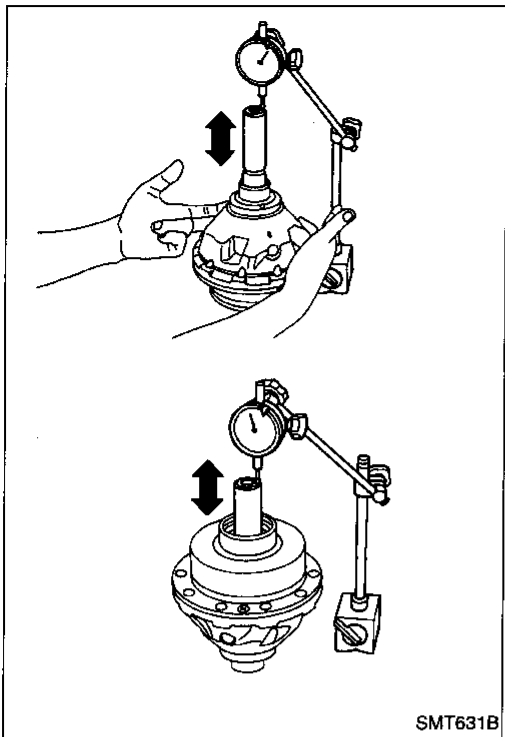
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REPAIR FOR COMPONENT PARTS

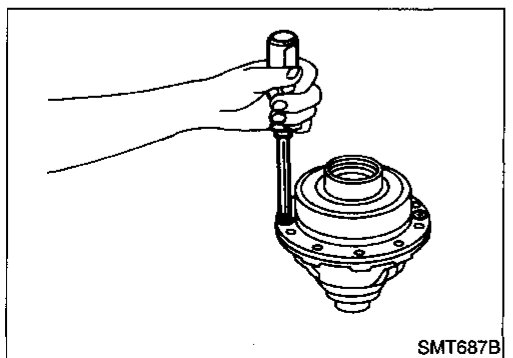
Final Drive (Cont'd)

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

**Side gear thrust washer:
Refer to SDS, MT-43.**



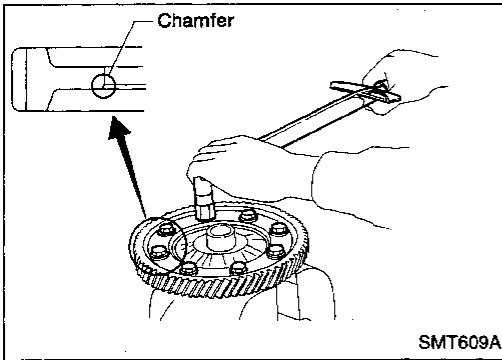
4. Install retaining pin.
- **Make sure that retaining pin is flush with case.**



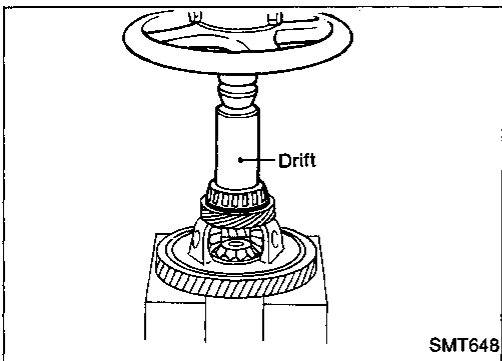
5. Install viscous coupling. (Models with viscous coupling).

REPAIR FOR COMPONENT PARTS

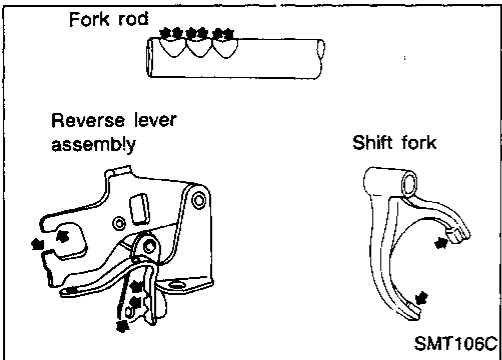
Final Drive (Cont'd)



6. Install final gear.
7. Install speedometer drive gear.



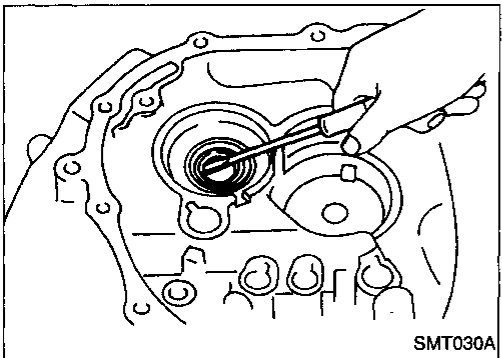
8. Press on differential side bearings.



Shift Control Components

INSPECTION

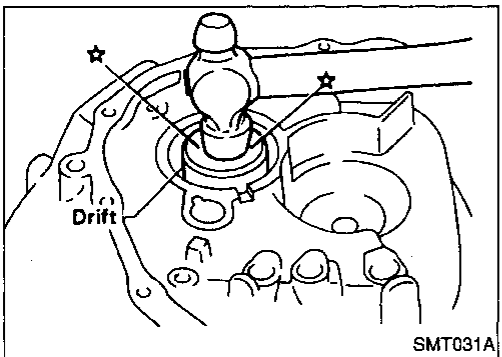
- Check contact surface and sliding surface for wear, scratches, projections or other damage.



Case Components

REMOVAL AND INSTALLATION

Input shaft oil seal



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

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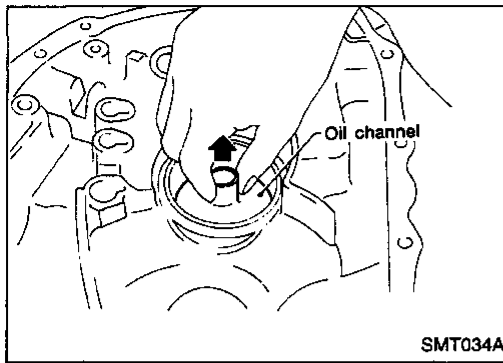
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REPAIR FOR COMPONENT PARTS

Case Components (Cont'd)

Mainshaft front bearing outer race



Mainshaft rear bearing outer race

Refer to MT-34.

Differential side bearing outer race

Refer to MT-33.

ADJUSTMENT

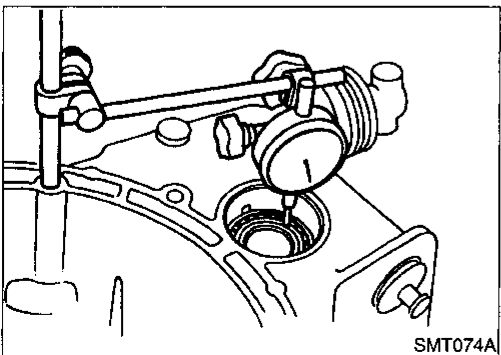
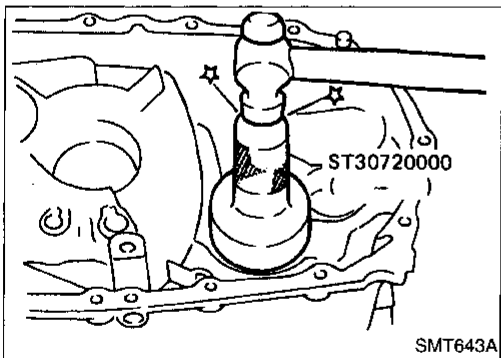
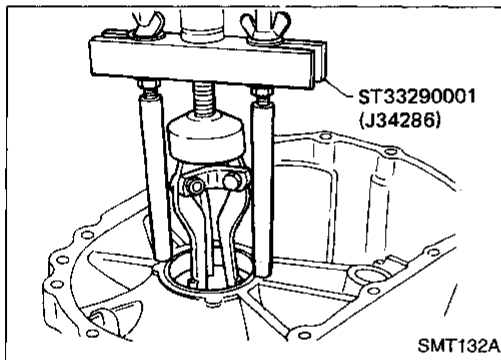
Input Shaft End Play and Differential Side Bearing Preload

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



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). Tighten it to the specified torque. Refer to MT-11.

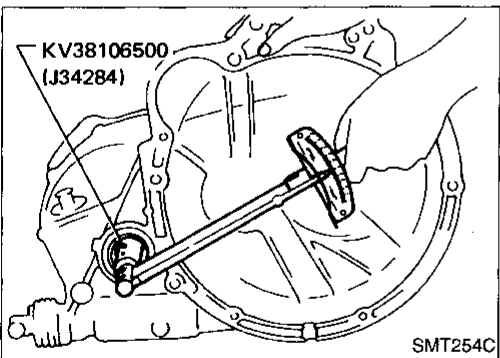
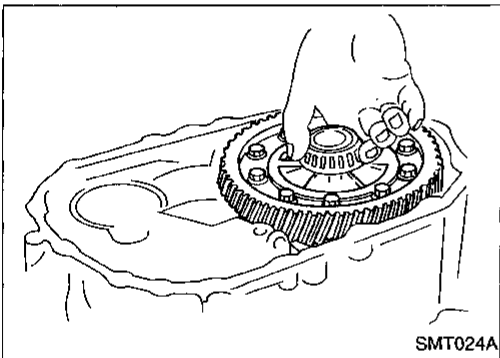
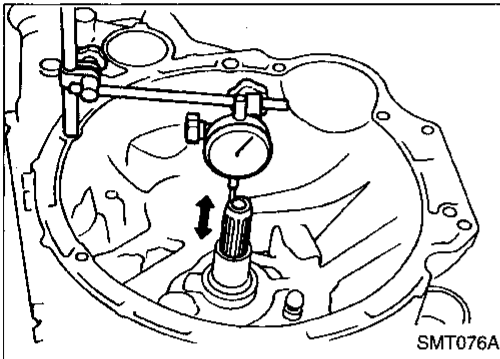
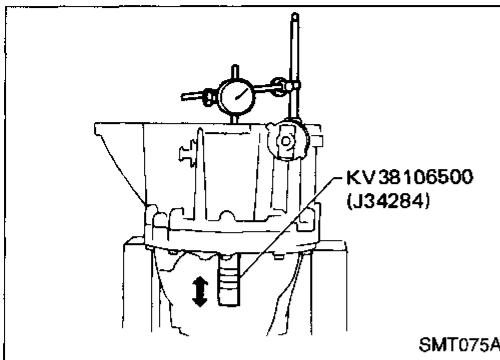
5. Using the following procedures, measure clearance between bearings and transmission case.

- **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.

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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 rear 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-44.
 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.**

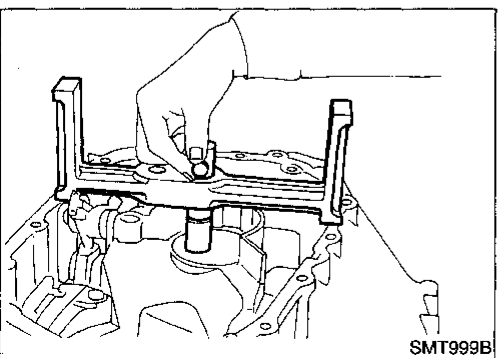
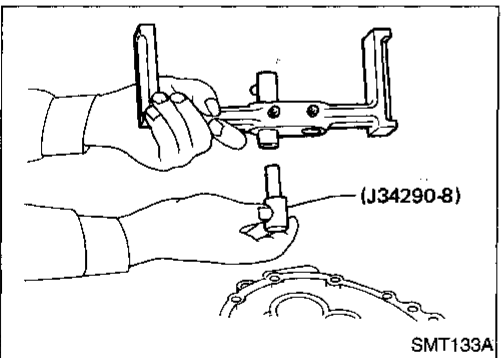
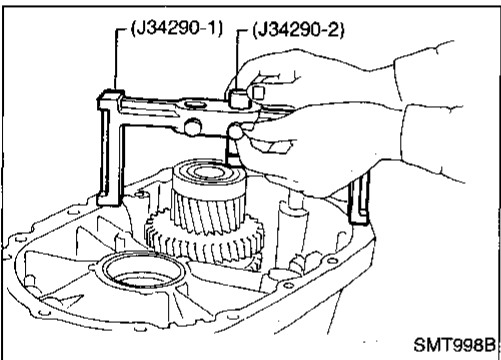
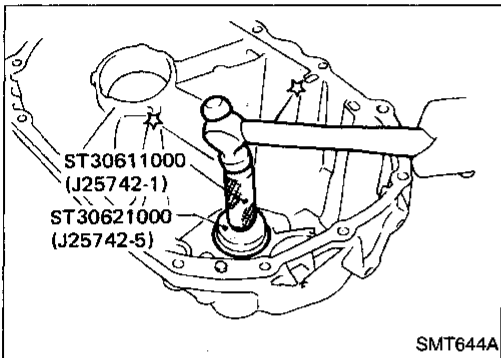
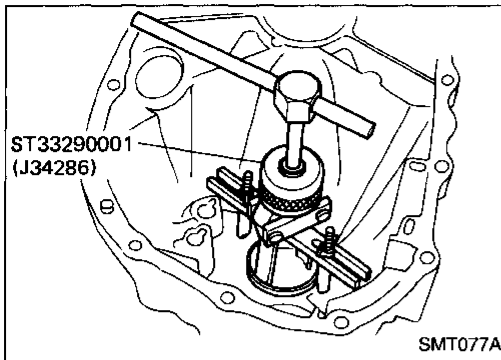
Mainshaft Bearing Preload

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. Allow 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. Allow gauging plunger to rest upon mating surface where mainshaft front bearing outer race fits.

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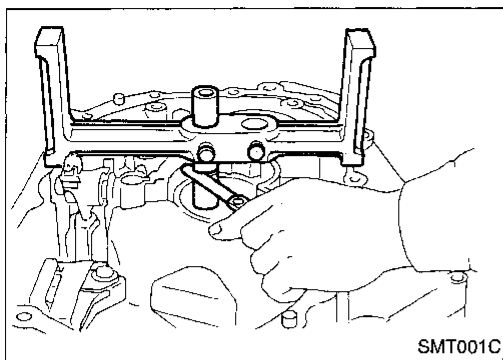
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ADJUSTMENT

Mainshaft Bearing Preload (Cont'd)

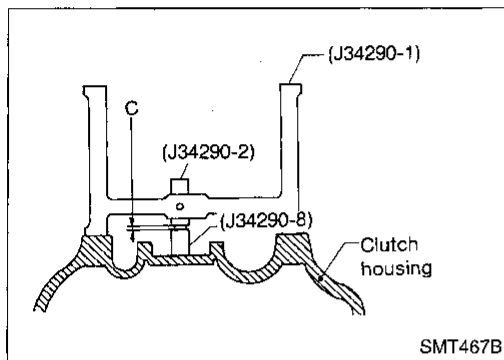


8. Measure with feeler gauge distance between gauging cylinder and shoulder of gauging plunger.
9. Use feeler gauge reading to select correct mainshaft preload shim(s).

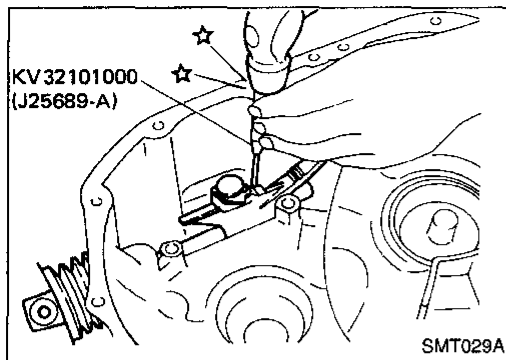
Mainshaft bearing adjusting shim:

Refer to MT-43.

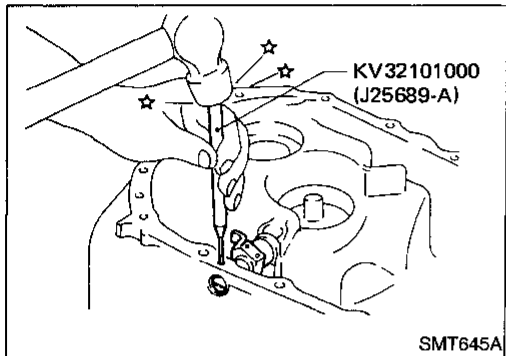
10. Install selected mainshaft bearing adjusting shim and mainshaft bearing outer race.
11. Check total turning torque after assembly. Refer to MT-37.



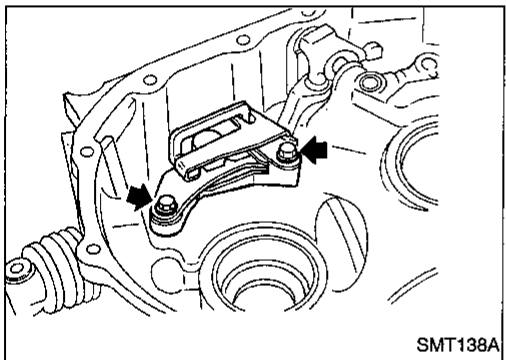
ASSEMBLY



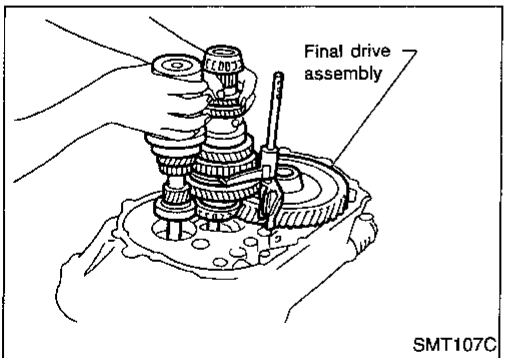
1. Install striking lever and striking rod.



2. Install selector and retaining pin.



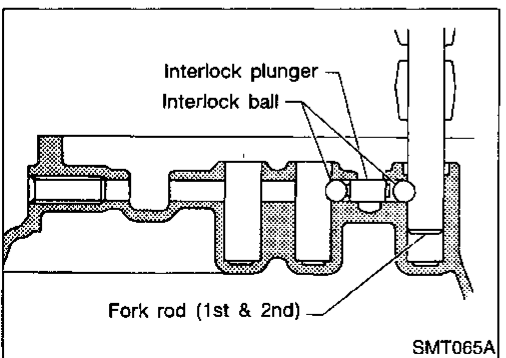
3. Install reverse gate assembly.



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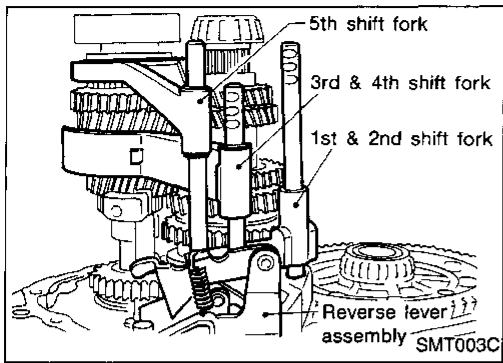
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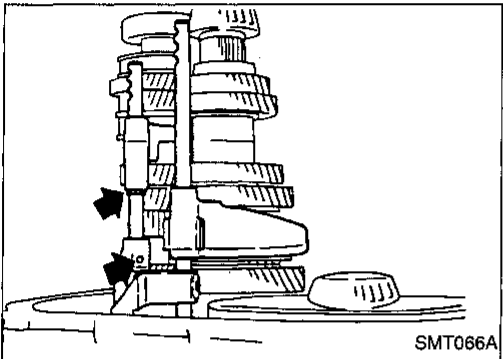
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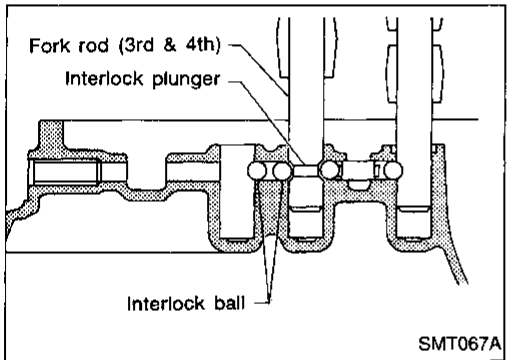
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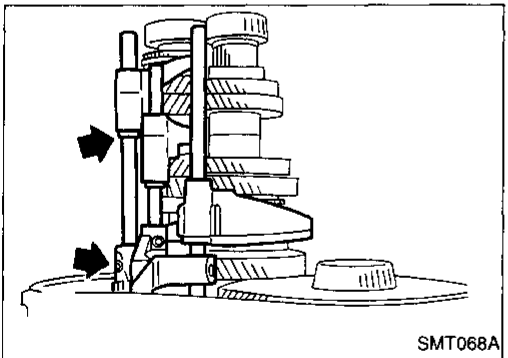
7. Install 3rd & 4th shift fork and bracket, then install 3rd & 4th shift rod, stopper ring and retaining pin.



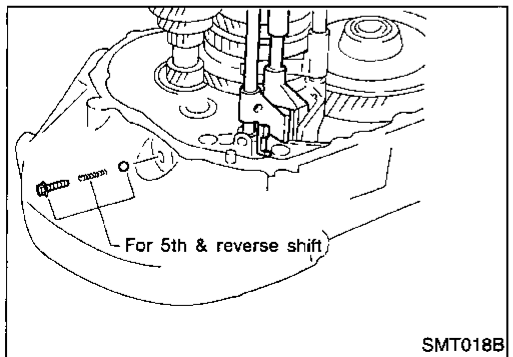
8. Install interlock balls.



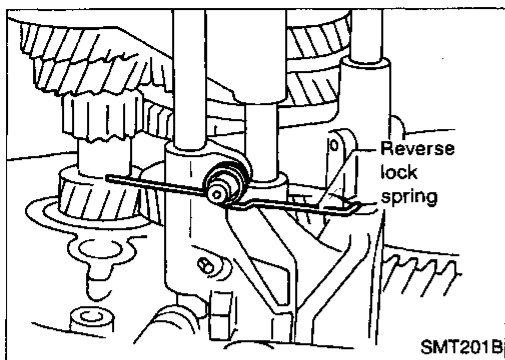
9. Install 5th shift fork and bracket, then install shift rod, stopper ring and retaining pin.



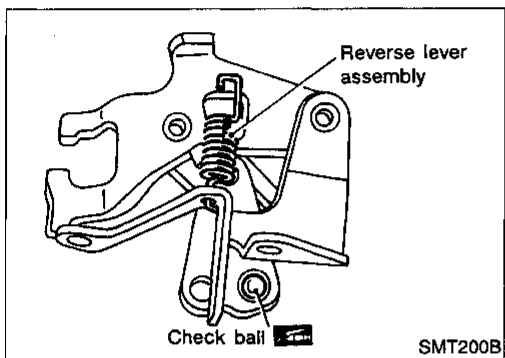
10. Install 5th & reverse check plug, spring and ball.



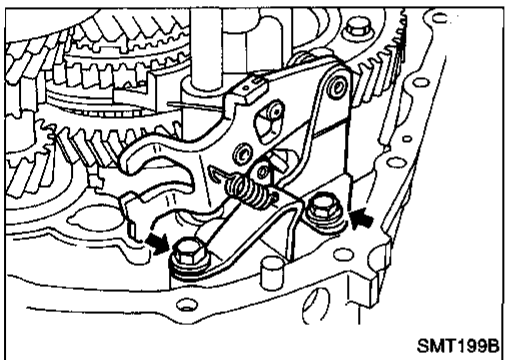
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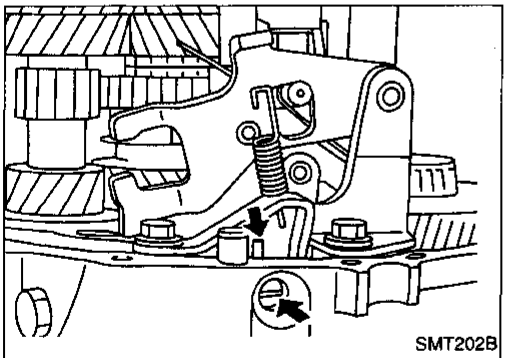
11. Install reverse lock spring on 5th & reverse bracket.
 - Pay attention to its direction.



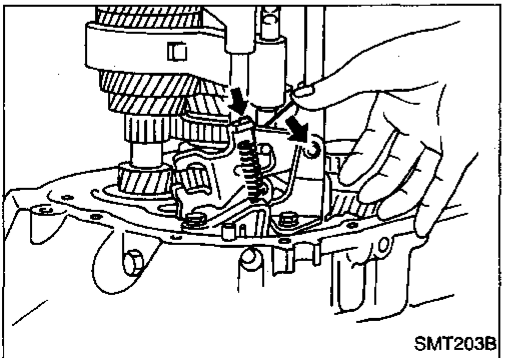
12. Install check ball and reverse lever spring on reverse lever assembly.
 - Apply multi-purpose grease to check ball.
 - Pay attention to direction of reverse lever spring.



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.

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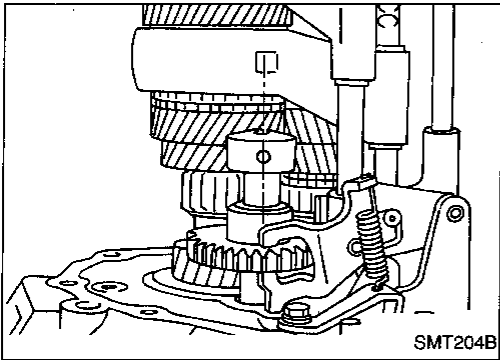
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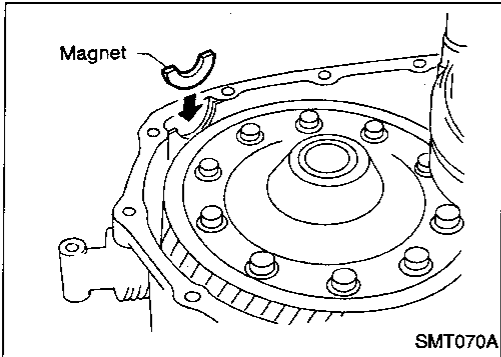
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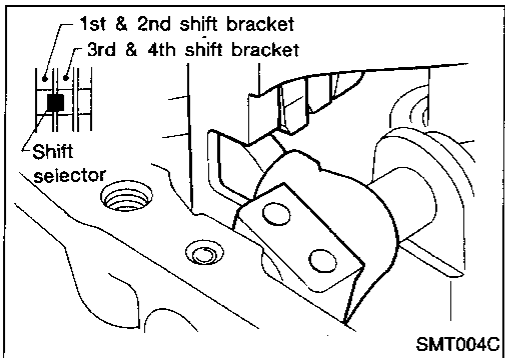
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16. Mesh 4th gear, then install reverse idler gear and shaft.
 - Pay attention to direction of tapped hole.



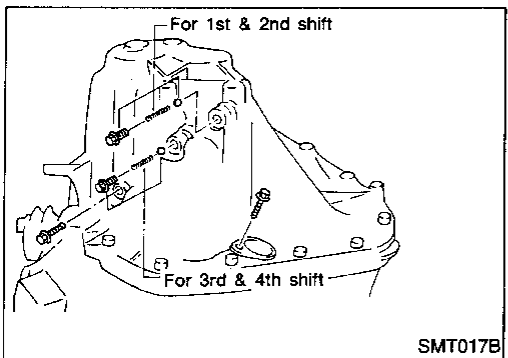
17. Place magnet on clutch housing.



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

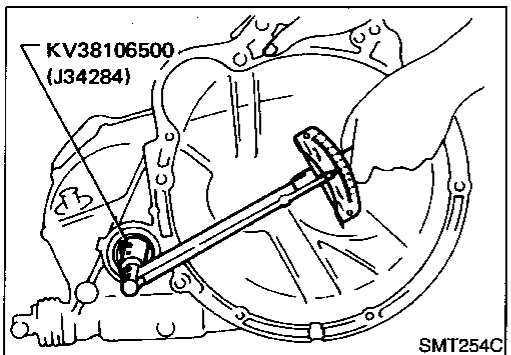
- To aid in installation of transmission case, place shift selector in the 1st & 2nd shift bracket or between 1st & 2nd bracket and 3rd & 4th bracket.

19. Apply an anaerobic liquid gasket Loctite P/N 51813 or equivalent to mating surface of transmission case and install it.
20. Install position switch.



21. Apply an anaerobic liquid gasket Loctite P/N 51813 or equivalent 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):

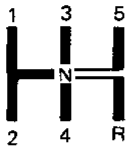
8.8 - 21.6 N·m (90 - 220 kg·cm, 78 - 191 in·lb)

- 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		KA24DE	
Transaxle model		RS5F50A	RS5F50V
Number of speeds		5	
Synchromesh type		Warner	
Shift pattern			
Gear ratio	1st	3.285	
	2nd	1.850	
	3rd	1.206	
	4th	0.954	
	5th	0.740	
	Rev.	3.428	
Number of teeth	Input gear	1st	14
		2nd	20
		3rd	29
		4th	44
		5th	50
		Rev.	14
	Main gear	1st	46
		2nd	37
		3rd	35
		4th	42
		5th	37
		Rev.	48
Reverse idler gear		29	
Oil capacity ℓ (US pt, Imp pt)		4.7 (10, 8-1/4)	

FINAL GEAR

Transaxle model	RS5F50A	RS5F50V, RS5F50A
Final gear ratio	3.650	3.895
Number of teeth		
Final gear/Pinion	73/20	74/19
Side gear/Pinion	16/10	16/10

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SERVICE DATA AND SPECIFICATIONS (SDS)

Inspection and Adjustment

GEAR END PLAY

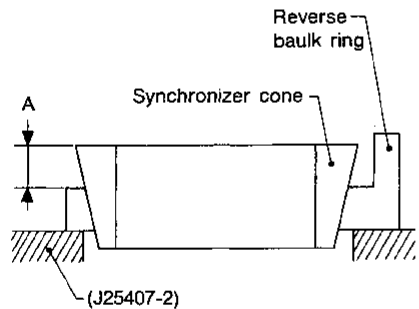
Gear	End play mm (in)
1st main gear	0.23 - 0.43 (0.0091 - 0.0169)
2nd main gear	0.23 - 0.58 (0.0091 - 0.0228)
3rd input gear	0.23 - 0.43 (0.0091 - 0.0169)
4th input gear	0.25 - 0.55 (0.0098 - 0.0217)
5th input gear	0.23 - 0.48 (0.0091 - 0.0189)

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)

REVERSE BAULK RING

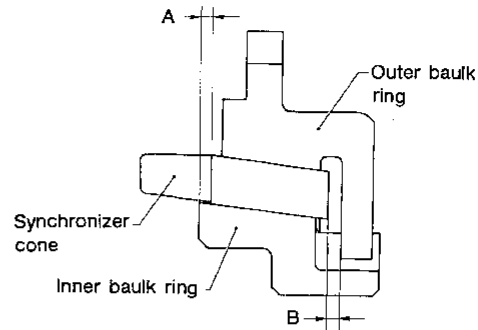


SMT581B

Dimension	Wear limit
A	1.2 mm (0.047 in)

2nd baulk ring

Unit: mm (in)



SMT806B

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)	

AVAILABLE SNAP RING

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

1st & 2nd synchronizer hub

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

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
2.55 (0.1004)	32348-05E03

SERVICE DATA AND SPECIFICATIONS (SDS)

Inspection and Adjustment (Cont'd)

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 (0.0295)	38424-E3020	
0.80 (0.0315)	38424-E3021	
0.85 (0.0335)	38424-E3022	
0.90 (0.0354)	38424-E3023	

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 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)

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

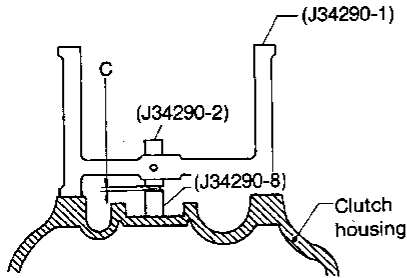
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SERVICE DATA AND SPECIFICATIONS (SDS)

Inspection and Adjustment (Cont'd)

Table for selecting mainshaft 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)
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)

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

Table for selecting input shaft bearing adjusting shim

Unit: mm (in)

Dial indicator deflection	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)
1.21 - 1.25 (0.0476 - 0.0492)	0.60 + 0.60 (0.0236 + 0.0236)
1.25 - 1.29 (0.0492 - 0.0508)	0.60 + 0.64 (0.0236 + 0.0252)
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 + 0.0315)
1.61 - 1.65 (0.0634 - 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)

SERVICE DATA AND SPECIFICATIONS (SDS)

Inspection and Adjustment (Cont'd)

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

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

Table for selecting differential side bearing adjusting shim(s) — RS5F50A

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)	0.44 + 1.20 (0.0173 + 0.0472)
1.23 - 1.27 (0.0484 - 0.0500)	0.48 + 1.20 (0.0189 + 0.0472)
1.27 - 1.31 (0.0500 - 0.0516)	0.52 + 1.20 (0.0205 + 0.0472)

Table for selecting differential side bearing adjusting shim(s) — RS5F50V

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)

GI
MA
EM
LC
EC
FE
CL
MT

AT
FA
RA
BR
ST
RS
BT
HA
EL
IDX