

MANUAL TRANSMISSION

SECTION **MT**

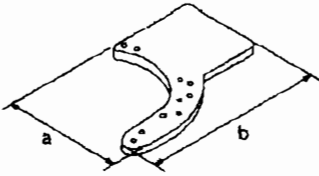
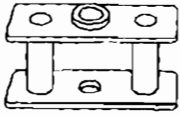
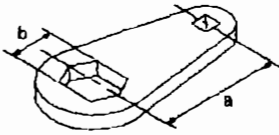

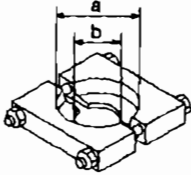
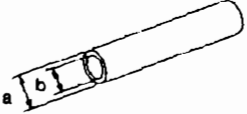
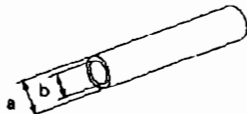
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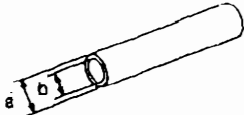
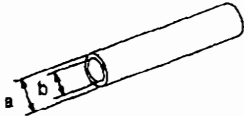
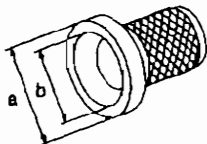
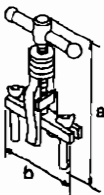

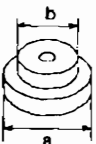
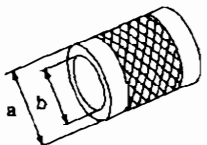
PREPARATION

Special Service Tools

Tool number Tool name	Description
ST23810001 Adapter setting plate	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p>NT407</p> </div> <div style="text-align: right;"> <p>Fixing adapter plate with gear assembly</p> <p>a: 166 mm (6.54 in) b: 270 mm (10.63 in)</p> </div> </div>
KV31100401 Transmission press stand	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p>NT068</p> </div> <div style="text-align: right;"> <p>Pressing counter gear and mainshaft</p> </div> </div>
ST22520000 Wrench	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p>NT409</p> </div> <div style="text-align: right;"> <p>Tightening mainshaft lock nut</p> <p>a: 100 mm (3.94 in) b: 41 mm (1.61 in)</p> </div> </div>
ST23540000 Pin punch	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p>NT442</p> </div> <div style="text-align: right;"> <p>Removing and installing fork rod retaining pin</p> <p>a: 2.3 mm (0.091 in) dia. b: 4 mm (0.16 in) dia.</p> </div> </div>
ST30031000 Puller	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p>NT411</p> </div> <div style="text-align: right;"> <p>Removing and installing 1st gear bushing Removing main drive gear bearing Measuring wear of baulk rings</p> <p>a: 90 mm (3.54 in) dia. b: 50 mm (1.97 in) dia.</p> </div> </div>
ST23860000 Drift	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p>NT065</p> </div> <div style="text-align: right;"> <p>Installing counter drive gear</p> <p>a: 38 mm (1.50 in) dia. b: 33 mm (1.30 in) dia.</p> </div> </div>
ST22360002 Drift	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p>NT065</p> </div> <div style="text-align: right;"> <p>Installing counter gear front and rear end bearings</p> <p>a: 29 mm (1.14 in) dia. b: 23 mm (0.91 in) dia.</p> </div> </div>

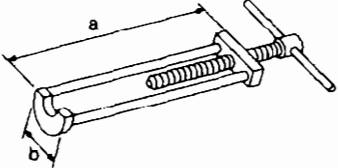
PREPARATION

Special Service Tools (Cont'd)

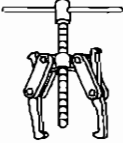
Tool number Tool name	Description	
ST22350000 Drift	 <p style="text-align: center;">NT065</p> <p style="text-align: right;">Installing OD gear bushing</p> <p style="text-align: right;">a: 34 mm (1.34 in) dia. b: 28 mm (1.10 in) dia.</p>	GI VA EM
ST23800000 Drift	 <p style="text-align: center;">NT065</p> <p style="text-align: right;">Installing front cover oil seal</p> <p style="text-align: right;">a: 44 mm (1.73 in) dia. b: 31 mm (1.22 in) dia.</p>	LC EC
ST33400001 Drift	 <p style="text-align: center;">NT086</p> <p style="text-align: right;">Installing rear oil seal</p> <p style="text-align: right;">a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.</p>	FE CL MT
ST33290001 Puller	 <p style="text-align: center;">NT414</p> <p style="text-align: right;">Removing rear oil seal</p> <p style="text-align: right;">a: 250 mm (9.84 in) b: 160 mm (6.30 in)</p>	AT PD
ST30720000 Drift	 <p style="text-align: center;">NT115</p> <p style="text-align: right;">Installing mainshaft ball bearing</p> <p style="text-align: right;">a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.</p>	FA RA BR
ST30613000 Drift	 <p style="text-align: center;">NT073</p> <p style="text-align: right;">Installing main drive gear bearing</p> <p style="text-align: right;">a: 71.5 mm (2.815 in) dia. b: 47.5 mm (1.870 in) dia.</p>	ST RS BT
ST33200000 Drift	 <p style="text-align: center;">NT091</p> <p style="text-align: right;">Installing counter rear bearing Installing 3rd & 4th synchronizer assembly</p> <p style="text-align: right;">a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.</p>	HA EL DX

PREPARATION

Special Service Tools (Cont'd)

Tool number Tool name	Description
KV32101330 Puller	 <p data-bbox="1012 384 1204 441">a: 447 mm (17.60 in) b: 100 mm (3.94 in)</p>

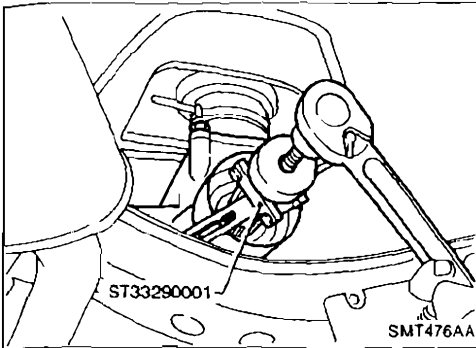
Commercial Service Tool

Tool name	Description
Puller	 <p data-bbox="1012 649 1392 707">Removing counter bearings, counter drive and OD gears</p>

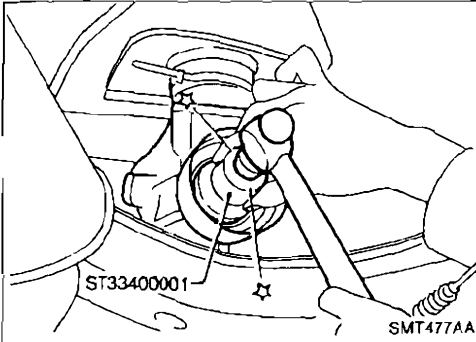
ON-VEHICLE SERVICE

Replacing Rear Oil Seal

REMOVAL

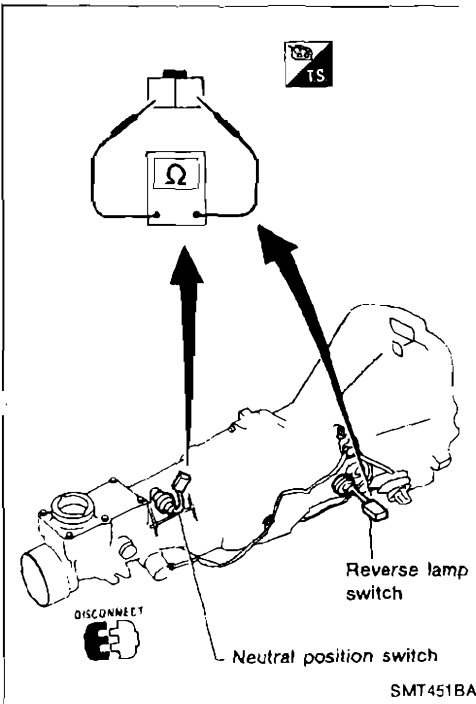


INSTALLATION



Check of Position Switches

Switch	Gear position	Continuity
Reverse lamp switch	Reverse	Yes
	Other than reverse	No
Neutral position switch	Neutral	Yes
	Other than neutral	No



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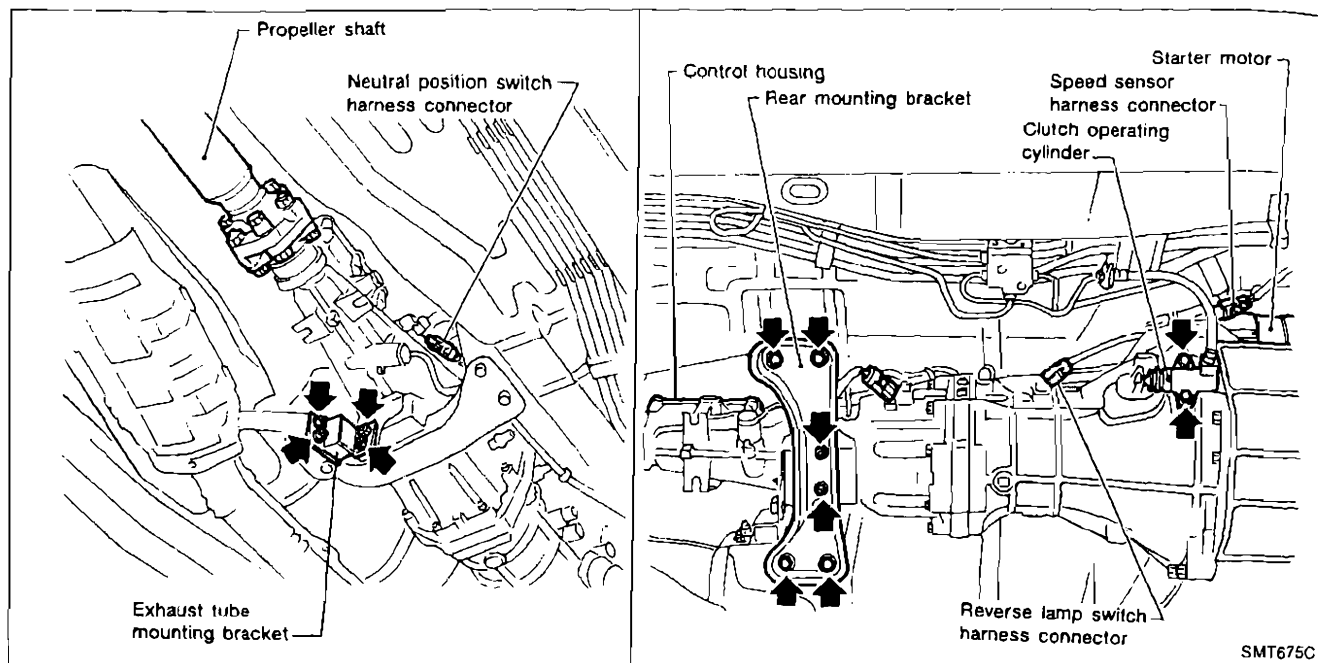
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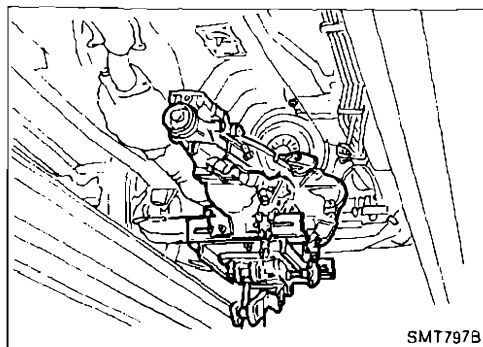
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REMOVAL AND INSTALLATION

Removal

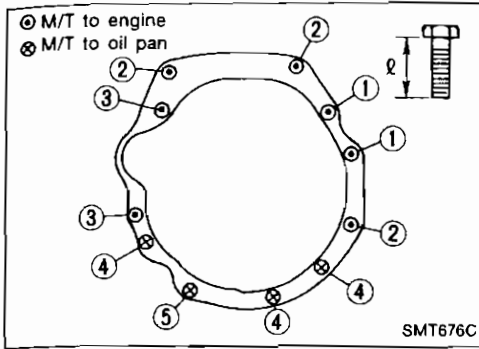


1. Remove battery negative terminal.
2. Remove shift lever with control housing from transmission.
3. Remove clutch operating cylinder from transmission.
4. Disconnect speed sensor, reverse lamp switch and neutral position switch harness connectors.
5. Remove starter motor from transmission.
6. Remove propeller shaft. — Refer to section PD.
- Insert plug into rear oil seal after removing propeller shaft.
- Be careful not to damage spline, sleeve yoke and rear oil seal when removing propeller shaft.
7. Remove exhaust tube mounting bracket from transmission.
8. Support manual transmission with a jack.
9. Remove rear mounting bracket.
10. Lower manual transmission as much as possible.



11. Remove transmission fixing bolts.
12. Remove transmission from engine.
- Support manual transmission while removing it.

REMOVAL AND INSTALLATION



Installation

- Tighten transmission fixing bolts.

Bolt No.	Tightening torque N·m (kg-m, ft-lb)	"L" mm (in)
①	70 - 79 (7.1 - 8.1, 51 - 59)	68 (2.68)
②	70 - 79 (7.1 - 8.1, 51 - 59)	63 (2.48)
③	70 - 79 (7.1 - 8.1, 51 - 59)	78 (3.07)
④	29 - 39 (3.0 - 4.0, 22 - 29)	60 (2.36)
⑤	29 - 39 (3.0 - 4.0, 22 - 29)	30 (1.18)

- Install any part removed.

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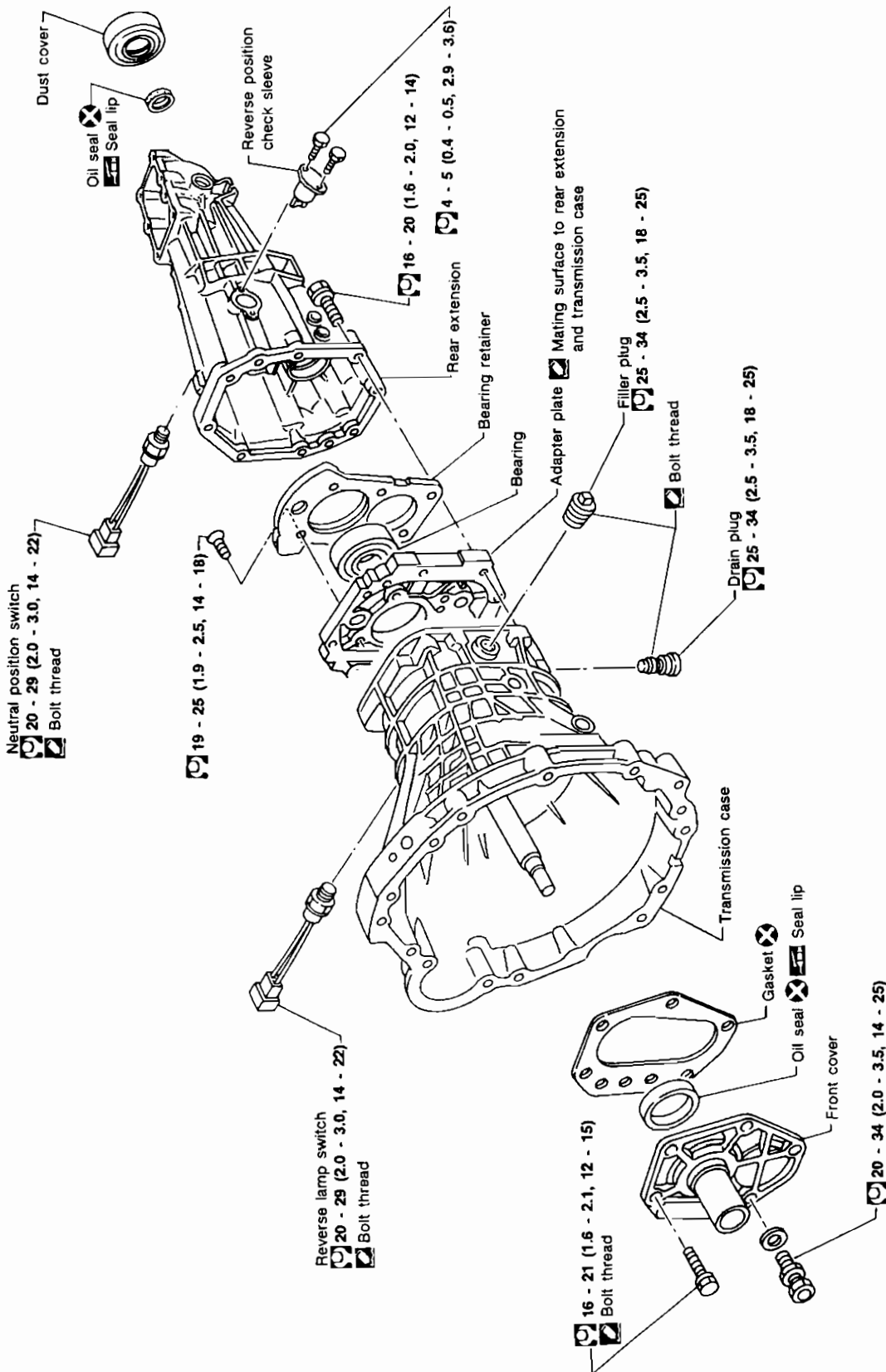
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MAJOR OVERHAUL

Case Components



⊗: N·m (kg-m, ft-lb)

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

SEC. 320-321

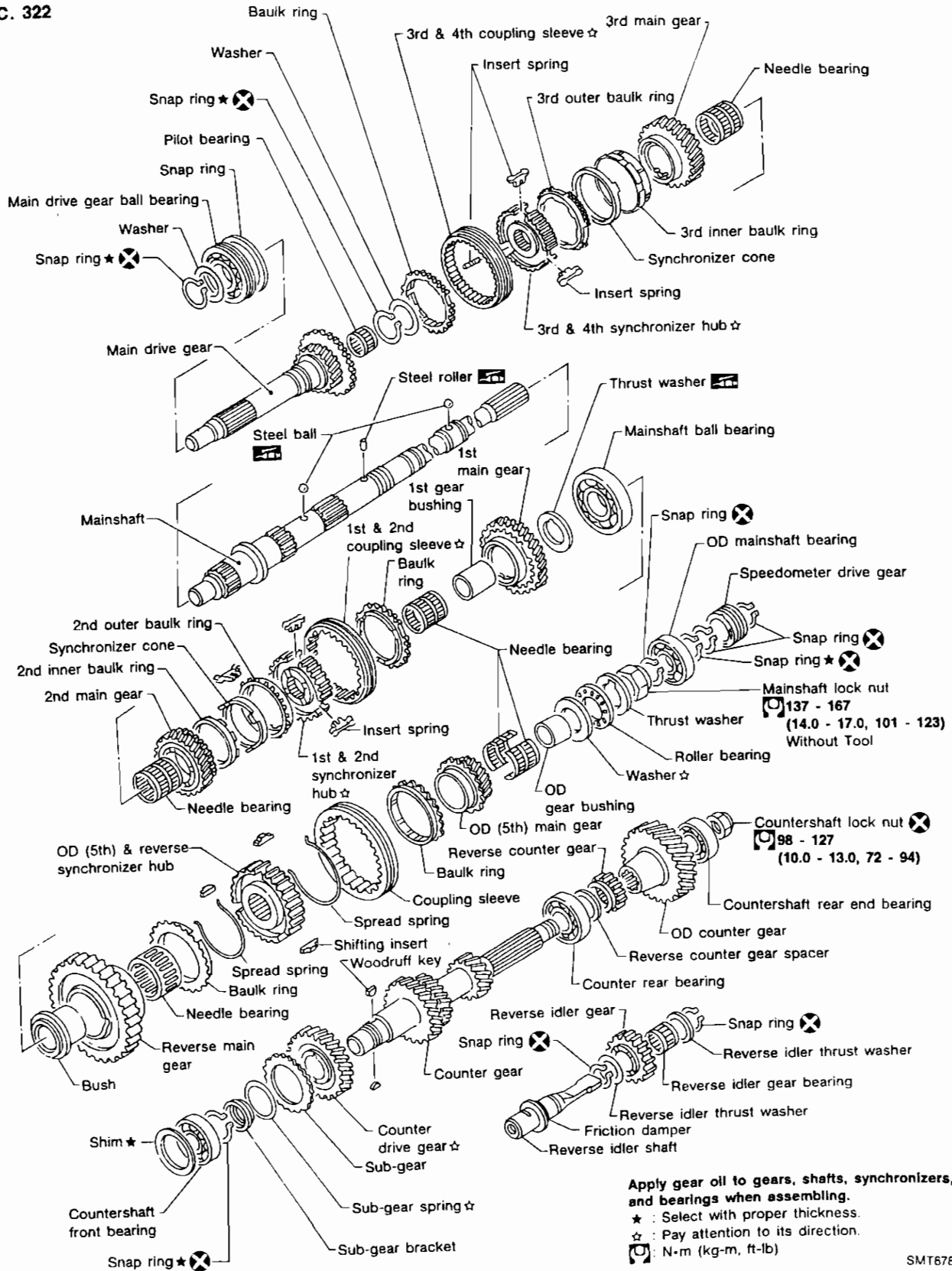
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MAJOR OVERHAUL

Gear Components

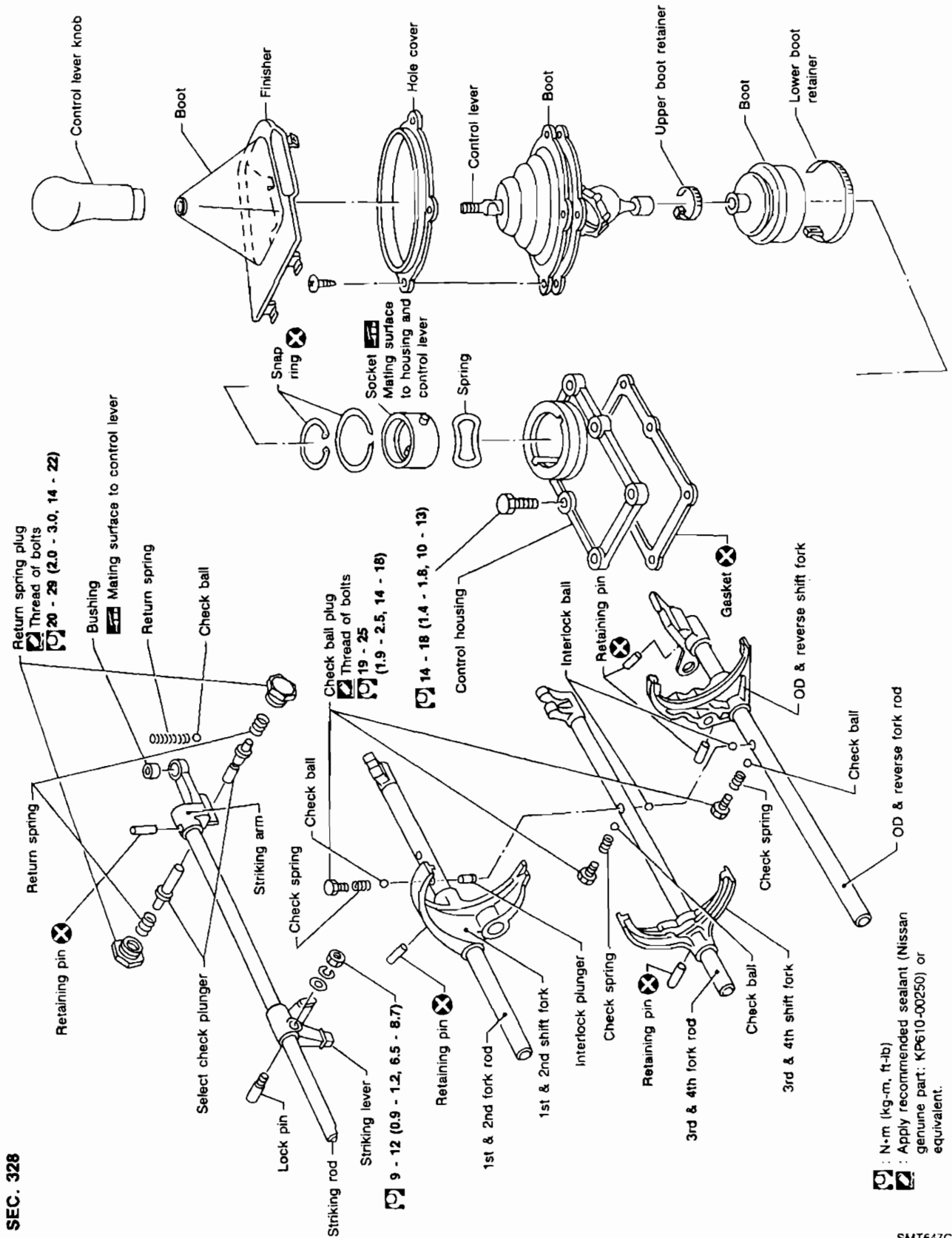
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MAJOR OVERHAUL

Shift Control Components



SEC. 328

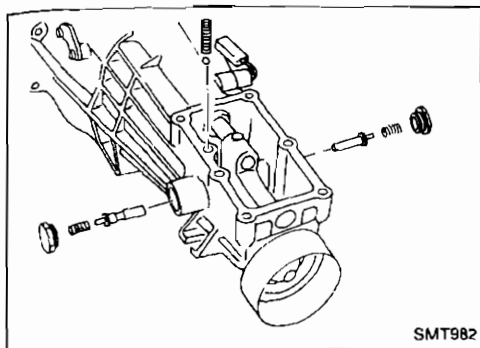
N·m (kg·m, ft·lb)
 : Apply recommended sealant (Nissan
 genuine part: KP610-00250) or
 equivalent.

SMT647C

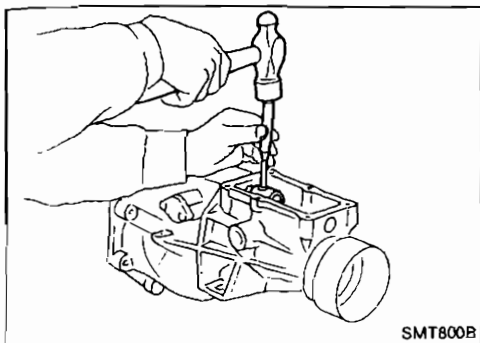
DISASSEMBLY

Case Components

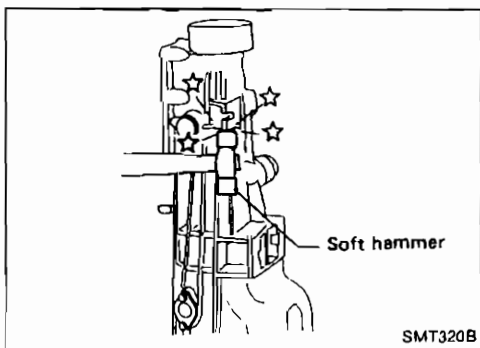
1. Remove rear extension.
 - a. Remove control housing, check ball, return spring plug, select check plunger and return springs.



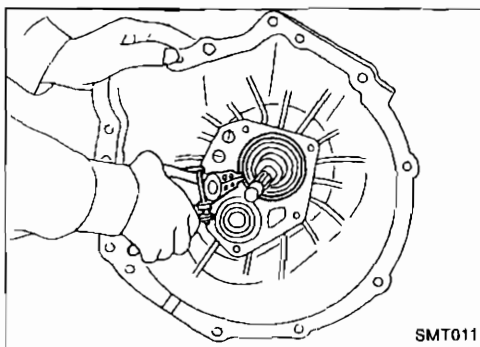
- b. Drive out striking arm retaining pin.
 - c. Remove striking arm from striking rod.



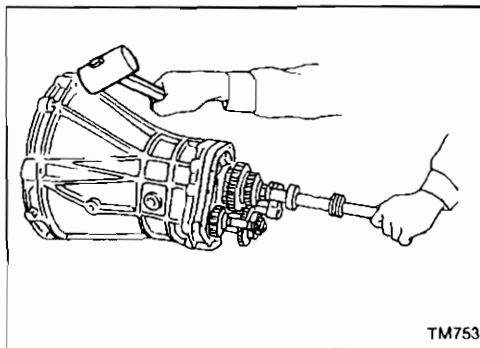
- d. Remove rear extension by lightly tapping it.



2. Remove front cover, gasket, shim of countershaft front bearing, and snap ring of main drive gear ball bearing.



3. Remove transmission case by tapping lightly.



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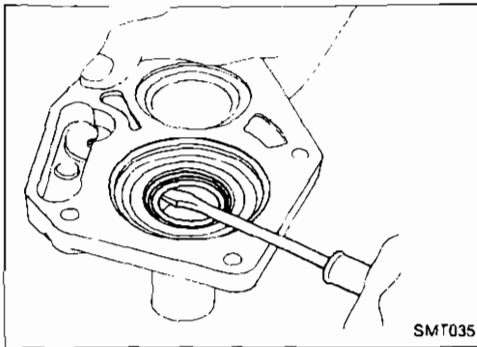
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DISASSEMBLY

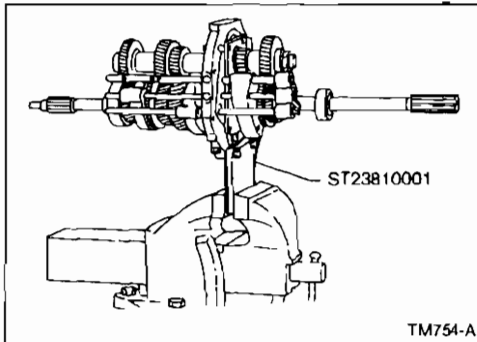
Case Components (Cont'd)

4. Remove front cover oil seal.

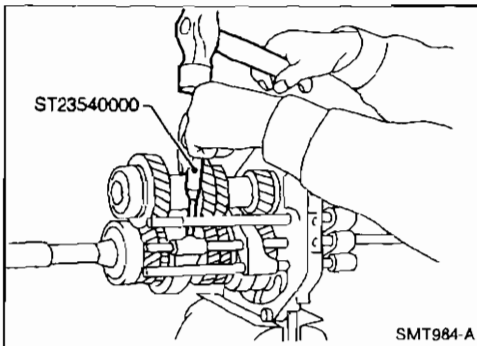


Shift Control Components

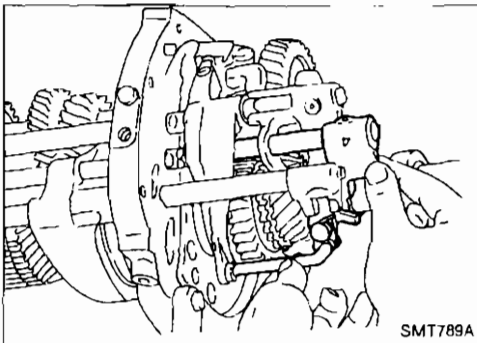
1. Set up Tool on adapter plate.
2. Remove striking rod from adapter plate.
3. Remove check ball plugs, check springs, and check balls.



4. Drive out retaining pins. Then drive out fork rods and remove interlock balls.



5. Draw out 3rd-4th and OD-reverse fork rods.

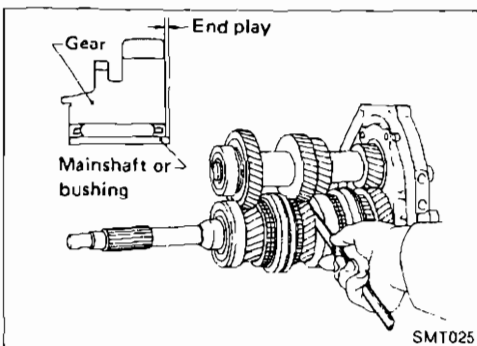


Gear Components

1. Before removing gears and shafts, measure each gear end play.

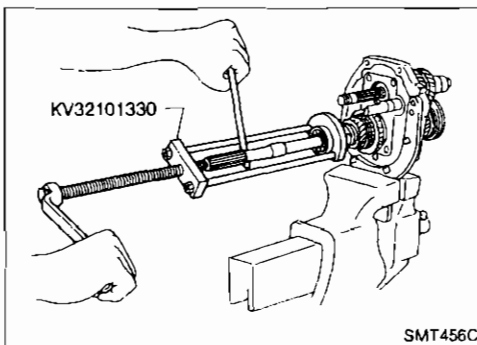
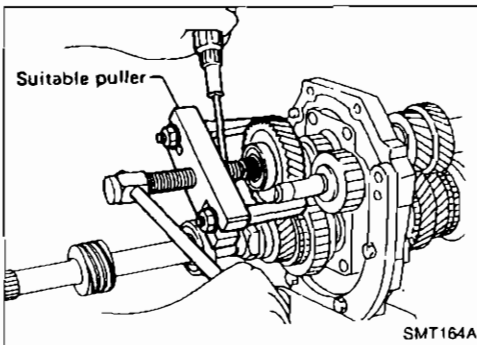
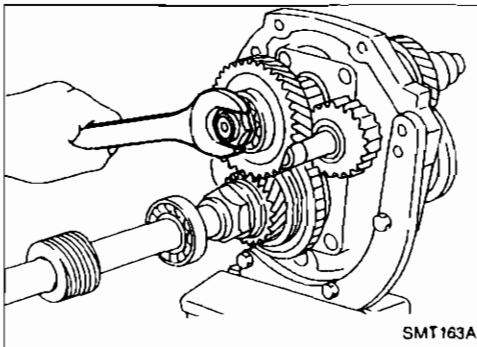
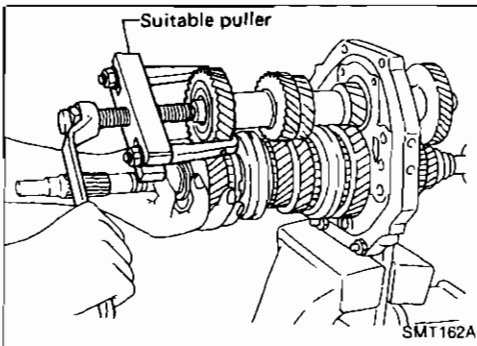
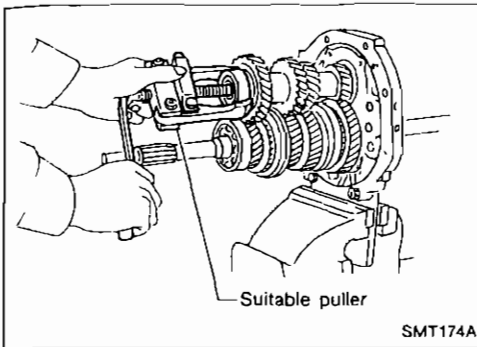
Gear end play: Refer to SDS, MT-28.

If not within specification, disassemble and check contact surface of gear to hub, washer, bushing, needle bearing and shaft.



DISASSEMBLY

Gear Components (Cont'd)



2. Mesh 2nd and reverse gear, then draw out counter front bearing with suitable puller.
3. Remove snap ring and then remove sub-gear bracket, sub-gear spring and sub-gear.

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4. Draw out counter drive gear with main drive gear assembly with suitable puller.

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- When drawing out main drive gear assembly, be careful not to drop pilot bearing and baulk ring.

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5. Remove rear side components on mainshaft and counter gear.

MT

- a. Release staking on countershaft nut and mainshaft nut and loosen these nuts.

AT

Mainshaft nut: Left-hand thread

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- b. Pull out OD counter gear with bearing with suitable puller.

- c. Draw out reverse counter gear and spacer.

- d. Remove snap rings from reverse idler shaft and draw out reverse idler gear, thrust washers and reverse idler gear bearing.

BR

- e. Remove speedometer drive gear and steel ball.

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- f. Remove snap ring and pull out OD mainshaft bearing, then remove snap ring.

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- g. Remove mainshaft nut.

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- h. Remove steel roller and washer.

- i. Remove roller bearing and washer.

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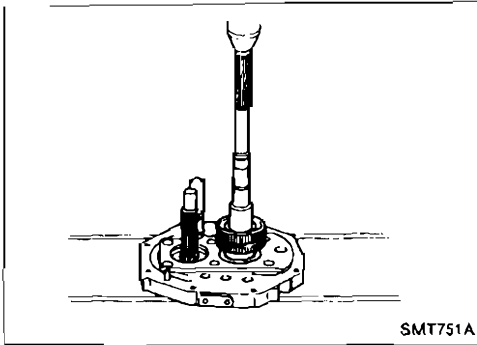
- j. Remove OD main gear, needle bearing and baulk ring (OD).

- k. Remove OD coupling sleeve and shifting inserts.

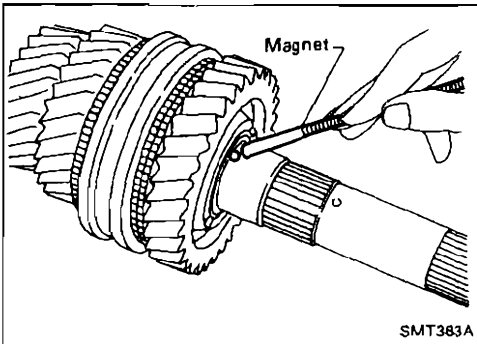
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DISASSEMBLY

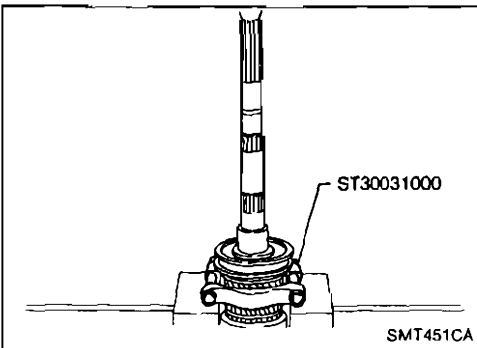
Gear Components (Cont'd)



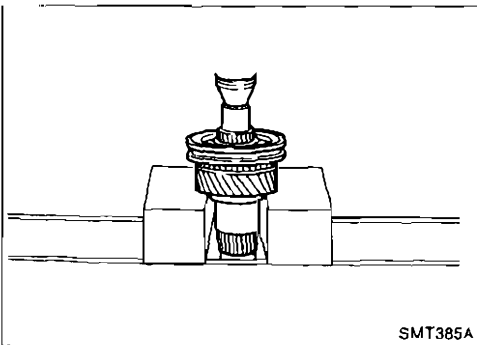
1. Press out mainshaft and counter gear alternately.
 - Press down mainshaft and counter gear alternately and carefully. Do not allow gears attached to mainshaft and counter gear underneath adapter plate to hit each other.



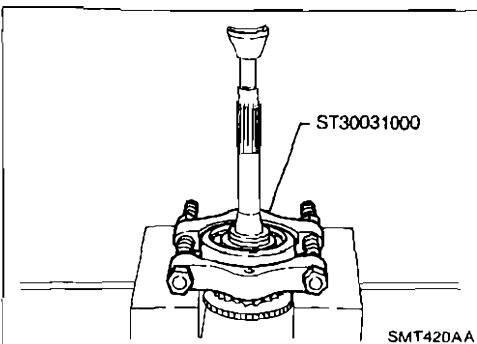
6. Remove front side components on mainshaft.
 - a. Remove 1st gear washer and steel ball.
 - b. Remove 1st main gear and 1st gear needle bearing.



- c. Press out 2nd main gear together with 1st gear bushing and 1st & 2nd synchronizer assembly.
 - d. Remove mainshaft front snap ring.



- e. Press out 3rd main gear together with 3rd & 4th synchronizer assembly and 3rd gear needle bearing.

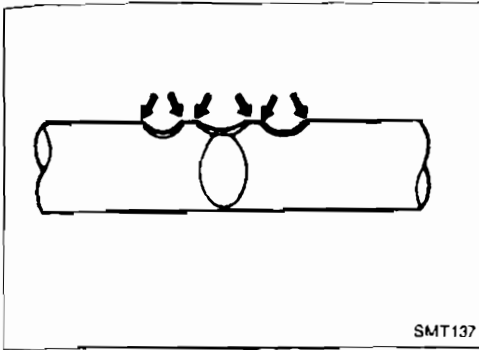


7. Remove main drive gear bearing.
 - a. Remove main drive gear snap ring and spacer.
 - b. Press out main drive gear bearing.

INSPECTION

Shift Control Components

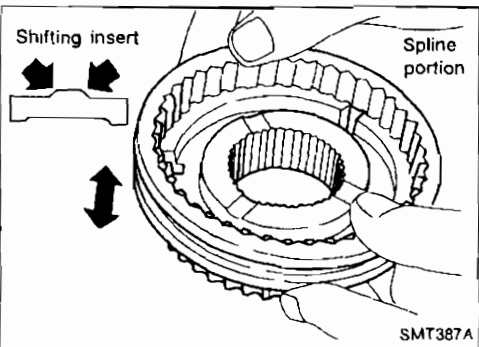
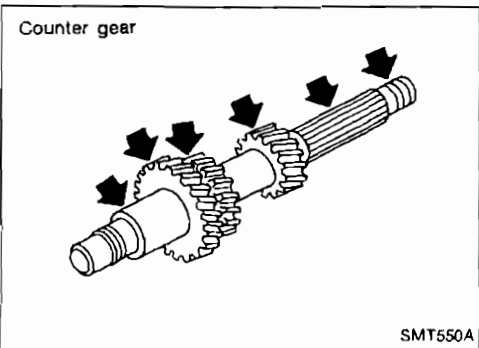
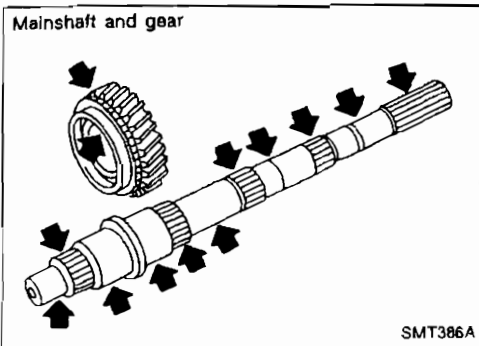
- Check contact surface and sliding surface for wear, scratches, projections or other damage.



Gear Components

GEAR AND SHAFT

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



SYNCHRONIZERS

- Check spline portion of coupling sleeves, hubs and gears for wear or cracks.
- Check baulk rings for cracks or deformation.
- Check shifting inserts for wear or deformation.
- Check spread spring for deformation.

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INSPECTION

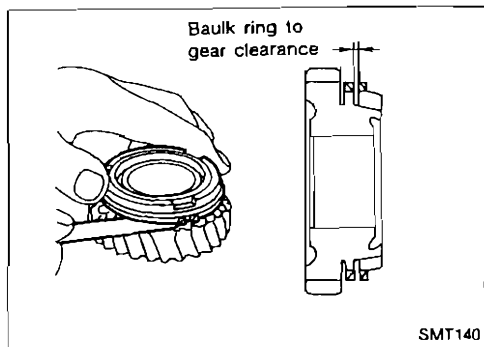
Gear Components (Cont'd)

- Measure clearance between baulk ring and gear.

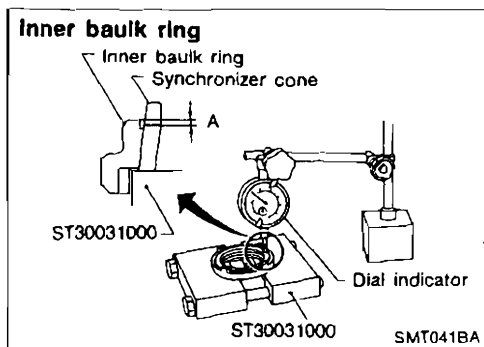
**Clearance between baulk ring and gear
(1st, main drive, OD and reverse baulk ring):**

Unit: mm (in)

Dimension	Standard	Wear limit
1st	1.2 - 1.6 (0.047 - 0.063)	0.8 (0.031)
Main drive	1.2 - 1.6 (0.047 - 0.063)	
OD	1.2 - 1.6 (0.047 - 0.063)	
Reverse	1.10 - 1.55 (0.0433 - 0.0610)	0.7 (0.028)



If the clearance is smaller than the wear limit, replace baulk ring.



- Measure wear of 2nd and 3rd baulk rings.
 - Place inner baulk ring in position on synchronizer cone.
 - Hold baulk ring evenly against synchronizer cone and measure distance "A".
 - Place outer baulk ring in position on synchronizer cone.
 - Hold baulk ring evenly against synchronizer cone and measure distance "B".

Standard:

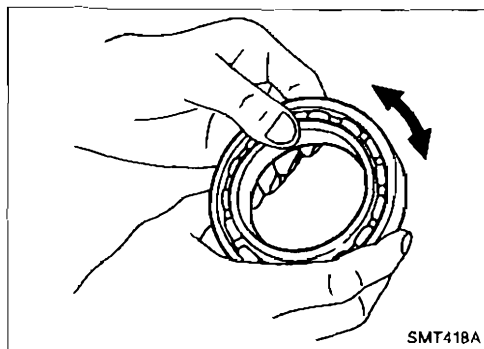
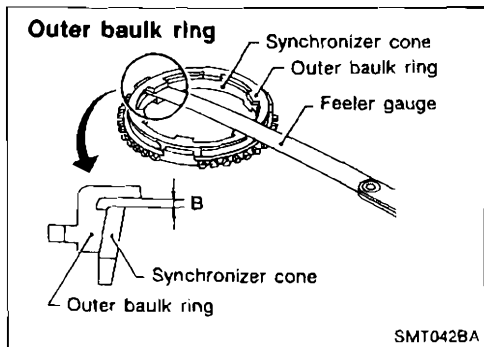
Inner-A 0.6 - 1.1 mm (0.024 - 0.043 in)

Outer-B 0.7 - 0.9 mm (0.028 - 0.035 in)

Wear Limit:

0.2 mm (0.008 in)

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



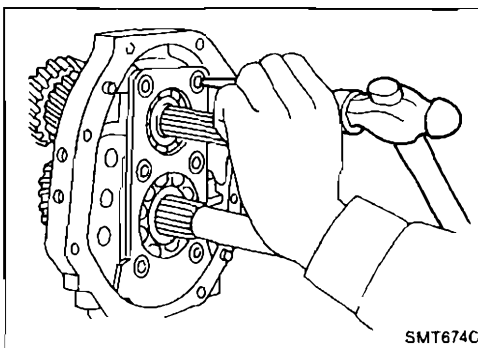
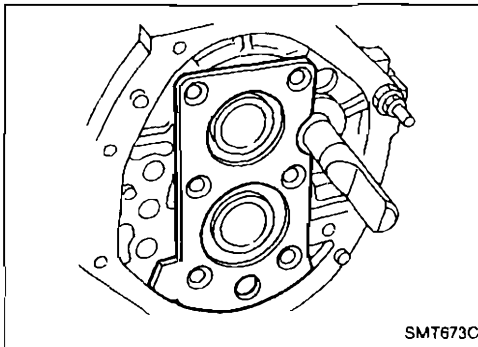
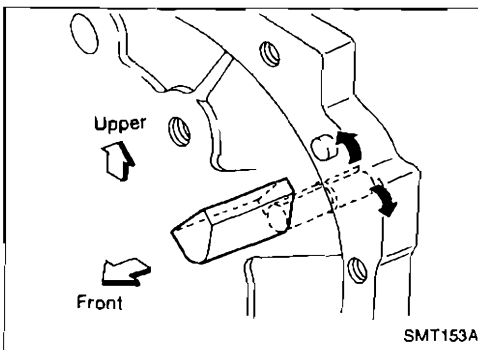
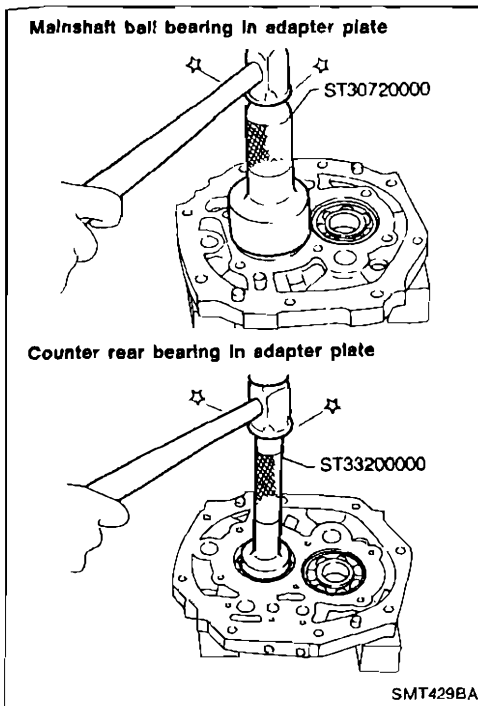
BEARINGS

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

ASSEMBLY

Gear Components

1. Install bearings into case components.



2. Assemble adapter plate parts.

- Install oil gutter on adapter plate and expand on rear side.

- Install bearing retainer.

- a. Insert reverse shaft, then install bearing retainer.

- b. Tighten each screw, then stake each at two points.

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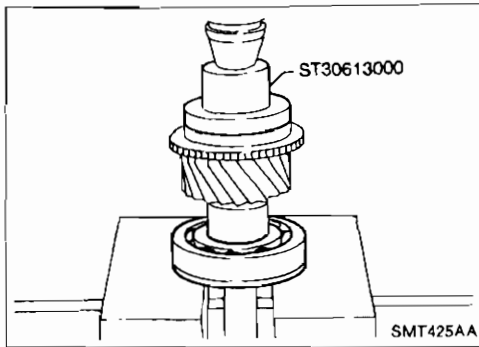
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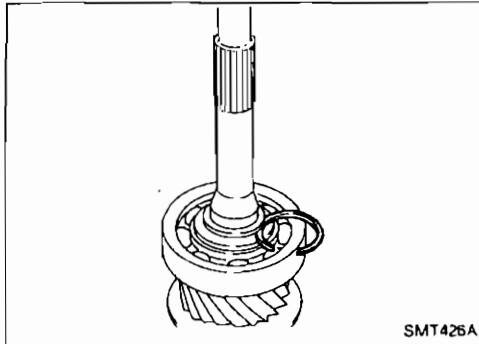
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ASSEMBLY

Gear Components (Cont'd)



3. Install main drive gear bearing.
 - a. Press main drive gear bearing.
 - b. Install main drive gear spacer.



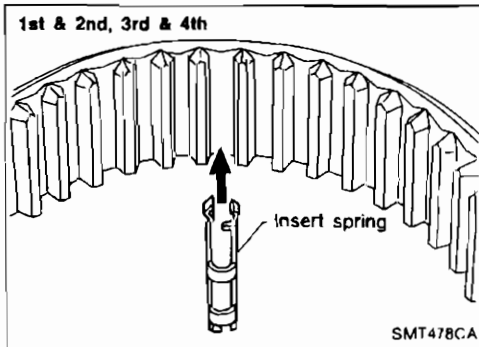
- c. Select proper main drive gear snap ring to minimize clearance of groove and install it.

Allowable clearance of groove:

0 - 0.13 mm (0 - 0.0051 in)

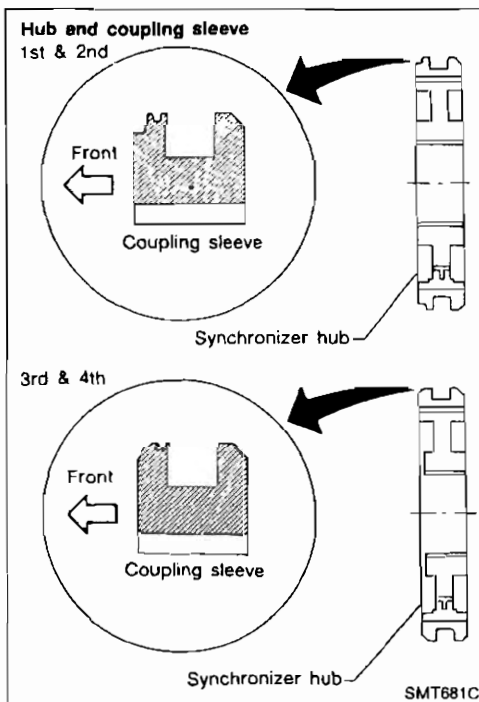
Main drive gear snap ring:

Refer to SDS, MT-28.



4. Assemble synchronizers.

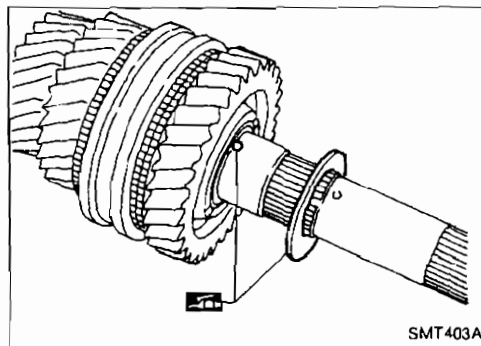
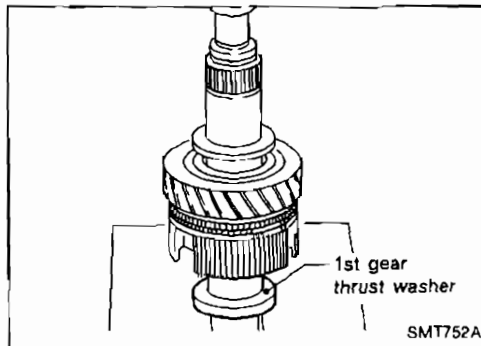
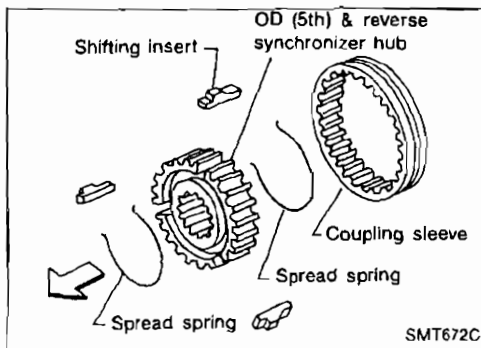
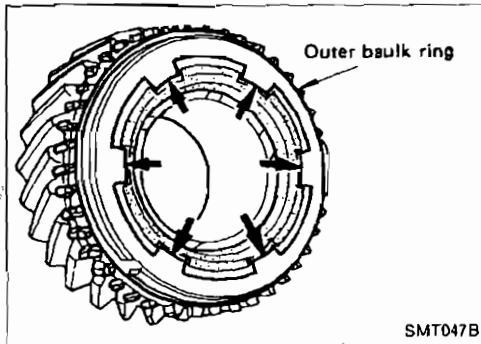
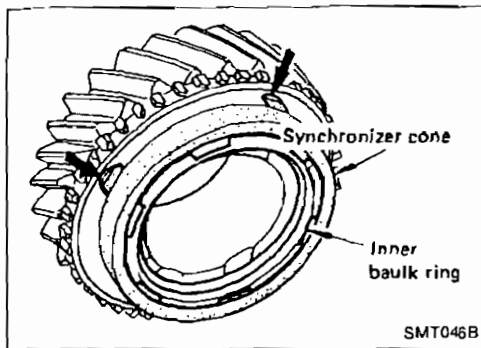
- 1st & 2nd, 3rd & 4th synchronizers



- Check coupling sleeve and synchronizer hub orientation.

ASSEMBLY

Gear Components (Cont'd)



● OD & reverse synchronizer

5. Install front side components on main shaft.
 - a. Assemble 2nd main gear, needle bearing and 1st & 2nd synchronizer assembly. Then press 1st gear bushing on mainshaft.
 - b. Install 1st main gear.

- c. Install steel ball and 1st gear washer.
 - Apply multi-purpose grease to steel ball and 1st gear washer before installing.

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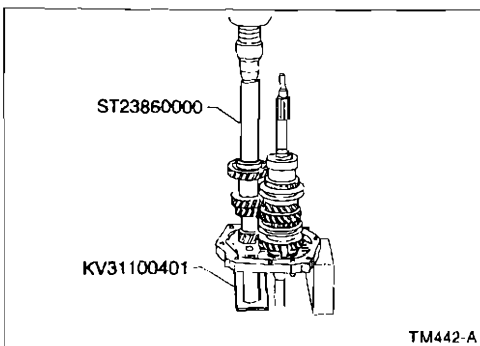
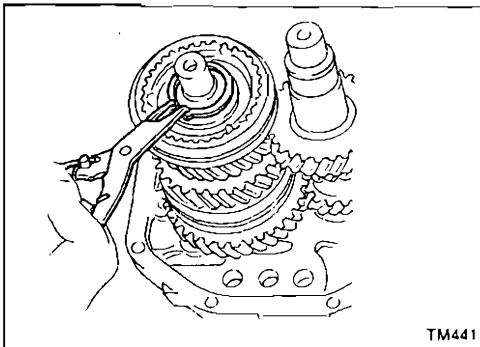
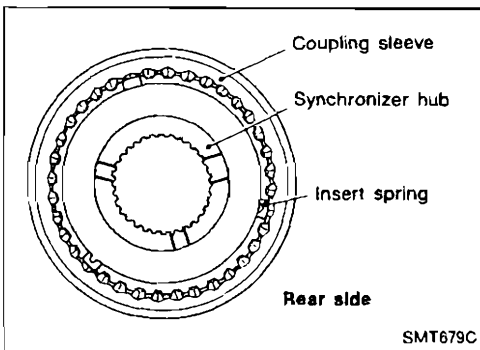
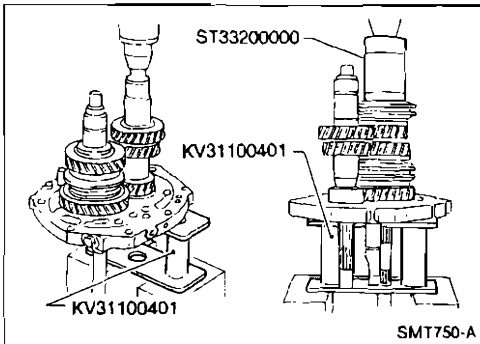
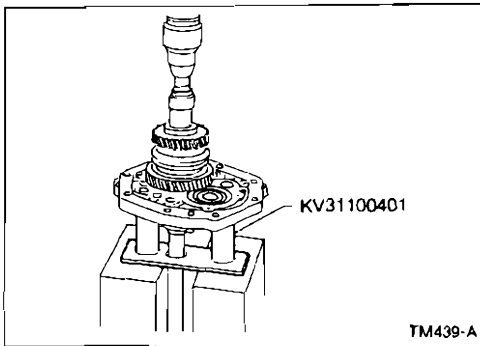
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ASSEMBLY

Gear Components (Cont'd)



6. Install mainshaft and counter gear on adapter plate and main drive gear on mainshaft.
- a. Press mainshaft assembly to adapter plate with Tool.

- b. Press counter gear into adapter plate with Tool.
- c. Install 3rd main gear and then press 3rd & 4th synchronizer assembly.

- Pay attention to direction of 3rd & 4th synchronizer.

- d. Install thrust washer on mainshaft and secure it with mainshaft front snap ring. Select proper snap ring to minimize clearance of groove in mainshaft.

Allowable clearance of groove:

0 - 0.18 mm (0 - 0.0071 in)

Mainshaft front snap ring:

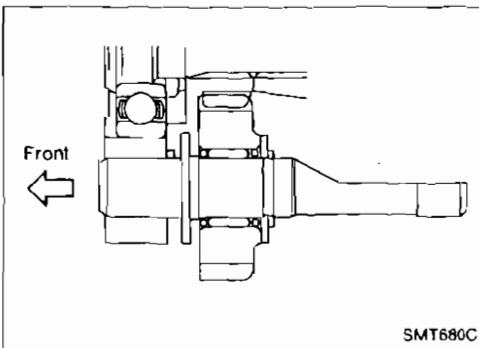
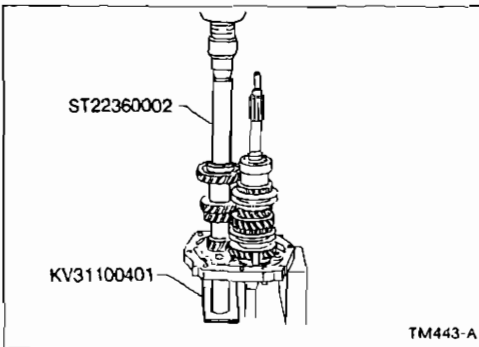
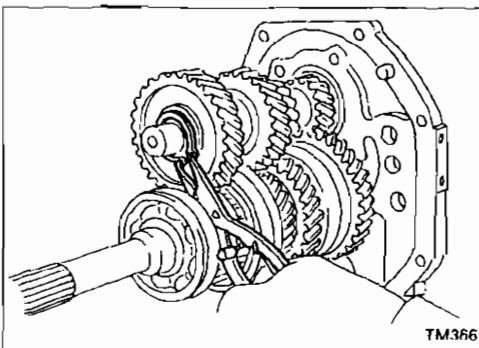
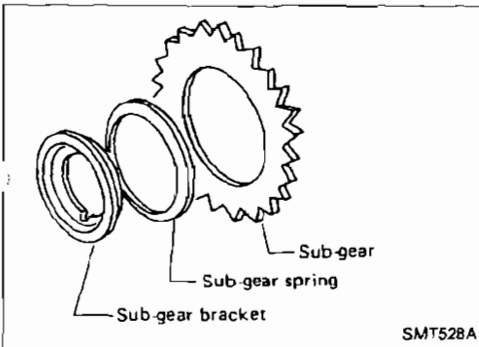
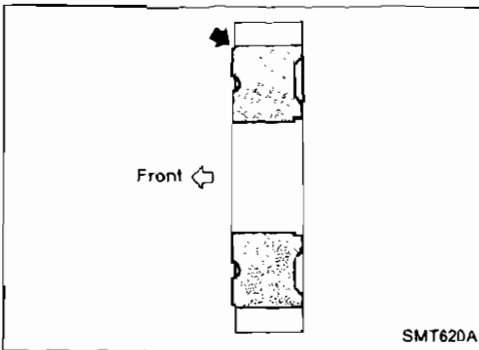
Refer to SDS, MT-28.

- e. Apply gear oil to mainshaft pilot bearing and install it on mainshaft.
- f. Press counter drive gear with main drive gear with Tool.

ASSEMBLY

Gear Components (Cont'd)

- Pay attention to direction of counter drive gear.



g. Install sub-gear components.

- (1) Install sub-gear and sub-gear bracket on counter drive gear. Then select proper snap ring to minimize clearance of groove in counter gear.

Allowable clearance of groove:

0 - 0.13 mm (0 - 0.0051 in)

Counter drive gear snap ring: Refer to SDS, MT-28.

- (2) Remove snap ring, sub-gear bracket and sub-gear from counter gear.
- (3) Reinstall sub-gear, sub-gear spring and sub-gear bracket.

h. Install selected counter drive gear snap ring.

i. Press counter gear front bearing onto counter gear.

7. Install rear side components on mainshaft and counter gear.

- a. Install reverse idler gear to reverse idler shaft with spacers, snap rings and needle bearing.

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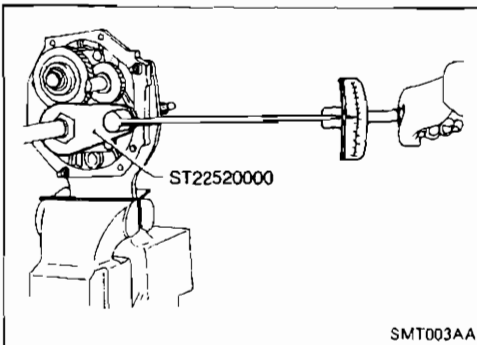
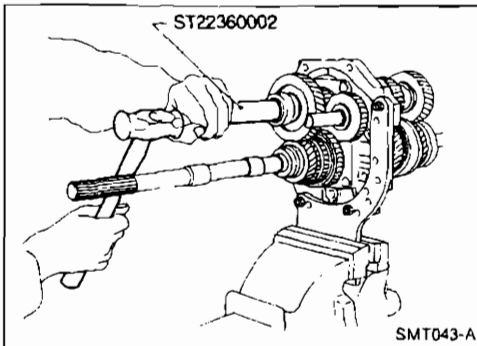
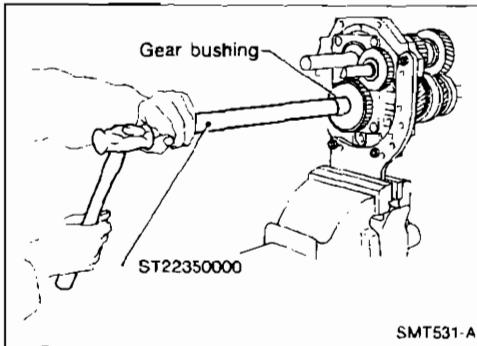
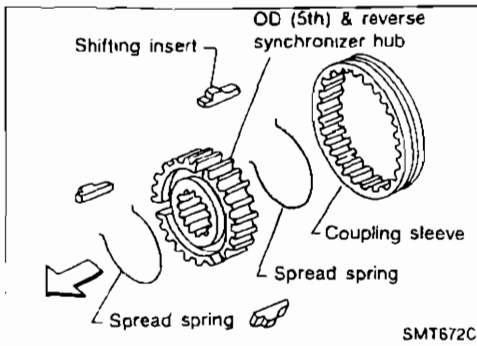
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ASSEMBLY

Gear Components (Cont'd)



b. Install insert retainer and OD & reverse synchronizer to mainshaft.

- Pay attention to direction of hub.

c. Install OD gear bushing with Tool.

d. Install OD main gear and needle bearing.

e. Install spacer, reverse counter gear and OD counter gear.

- OD main gear and OD counter gear should be handled as a matched set.

f. Install washer, roller bearing, steel roller and thrust washer.

g. Tighten mainshaft lock nut temporarily.

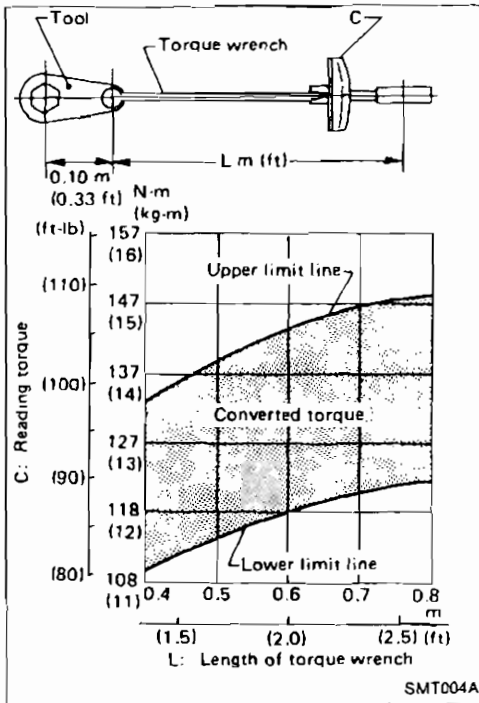
- Always use new lock nut.

h. Install countershaft rear end bearing with Tool.

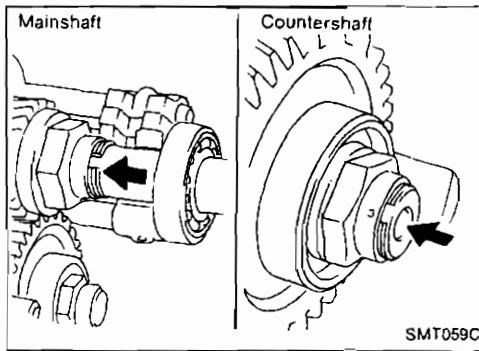
8. Mesh 2nd and reverse gears, then tighten mainshaft lock nut with Tool.

ASSEMBLY

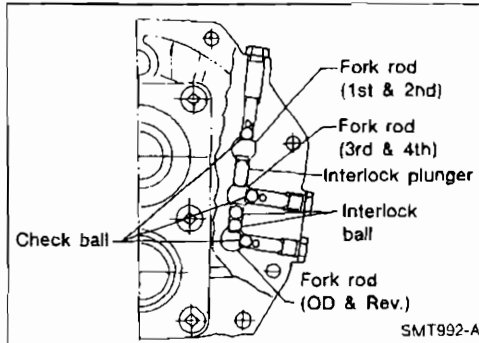
Gear Components (Cont'd)



- Use the left chart when deciding the reading torque. (Length of torque wrench vs. setting or reading torque)
9. Tighten countershaft lock nut.
- Always use new lock nut.

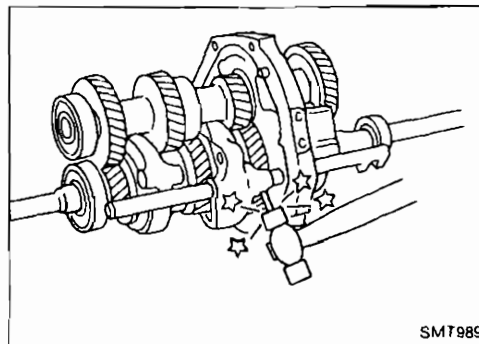


10. Stake mainshaft lock nut and countershaft lock nut with a punch.
11. Measure gear end play. For the description, refer to DIS-ASSEMBLY for Gear Components, MT-12.



Shift Control Components

1. Install shift rods, interlock plunger, interlock balls and check balls.



- a. 1st-2nd shift fork

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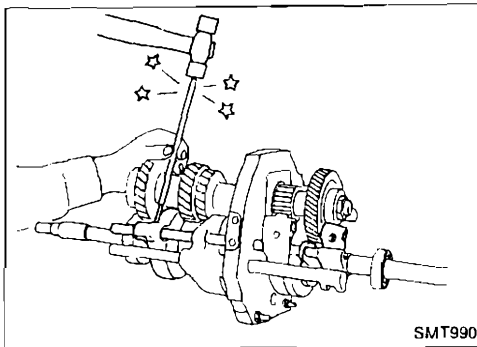
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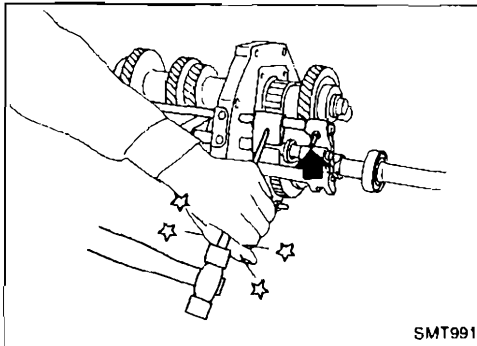
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ASSEMBLY

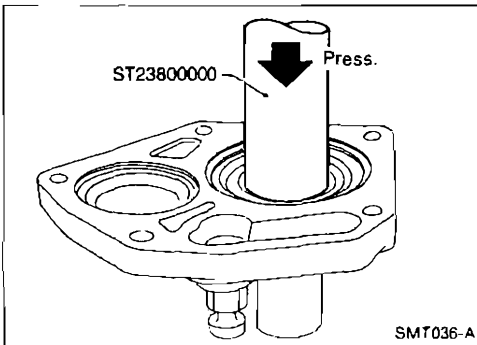
Shift Control Components (Cont'd)



b. 3rd-4th shift fork

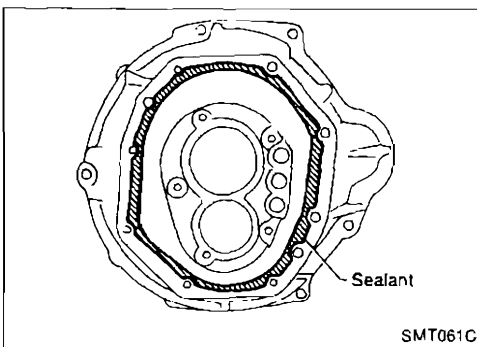


c. OD-reverse shift fork or reverse shift fork

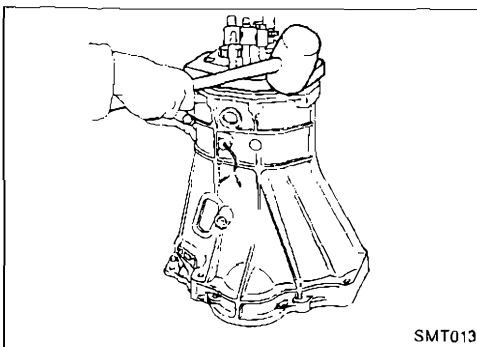


Case Components

1. Install front cover oil seal.
- **Apply multi-purpose grease to seal lip of oil seal before installing.**



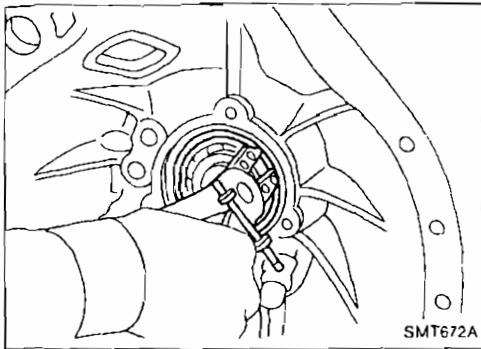
2. Apply sealant to mating surface of transmission case.



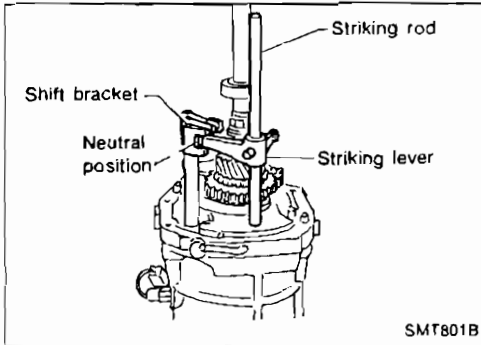
3. Install gear assembly onto transmission case.

ASSEMBLY

Case Components (Cont'd)

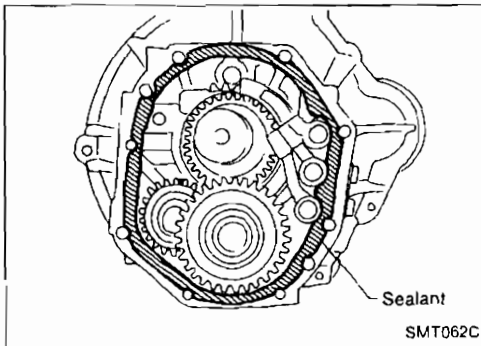


4. Install snap ring of main drive bearing.



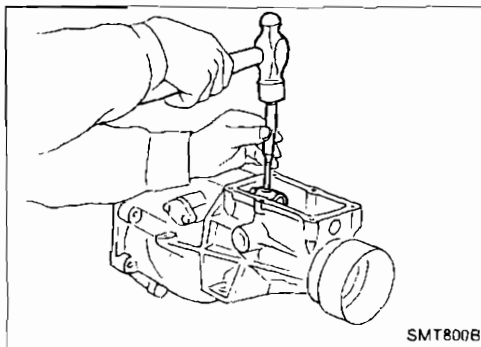
5. Set 1st & 2nd, 3rd & 4th and 5th & reverse shift forks in neutral position.

6. Install striking rod onto adapter plate while aligning striking lever with shift brackets.

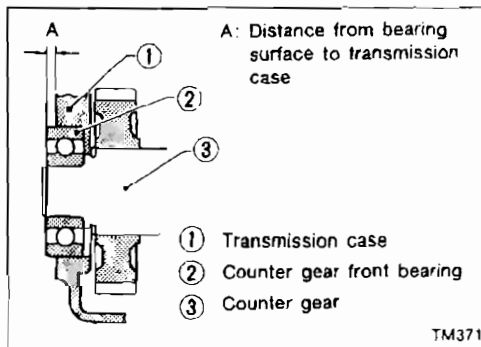


7. Apply sealant to mating surface of adapter plate.

8. Install rear extension while inserting striking arm into striking rod.



9. Install striking arm retaining pin.



10. Select counter front bearing shim.

Counter front bearing shim: Refer to SDS, MT-29.

11. Install gasket and front cover.

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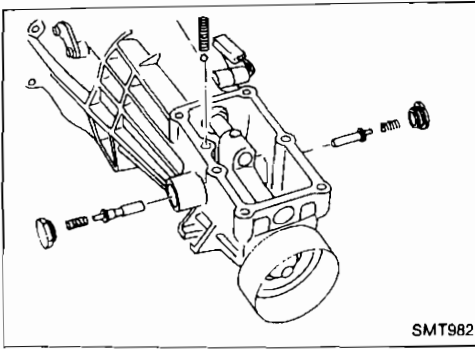
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ASSEMBLY

Case Components (Cont'd)

12. Install return spring plugs, check ball, return springs and select check plunger.
13. Install control housing and gasket.



SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

Transmission model		FS5W71C
Number of speeds		5
Shift pattern		
Synchronmesh type		Warner
Gear ratio	1st	3.321
	2nd	1.902
	3rd	1.308
	4th	1.000
	OD	0.838
	Reverse	3.382
Number of teeth		
Mainshaft	Drive	22
	1st	33
	2nd	27
	3rd	26
	OD	22
	Reverse	36
Countershaft	Drive	31
	1st	14
	2nd	20
	3rd	28
	OD	37
	Reverse	15
Reverse idler gear		21
Oil capacity	ℓ (Imp pt)	2.5 (4-3/8)
Remarks	Sub-gear	○
	Reverse synchronizer	○
	Double baulk ring type synchronizer	2nd and 3rd synchronizer

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SERVICE DATA AND SPECIFICATIONS (SDS)

Inspection and Adjustment

GEAR END PLAY

Gear	End play mm (in)
1st gear	0.31 - 0.41 (0.0122 - 0.0161)
2nd gear	0.11 - 0.21 (0.0043 - 0.0083)
3rd gear	0.11 - 0.21 (0.0043 - 0.0083)
OD gear	0.24 - 0.41 (0.0094 - 0.0161)

CLEARANCE BETWEEN BAULK RING AND GEAR

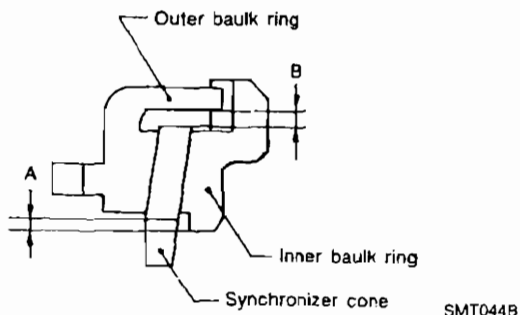
1st, main drive, OD and reverse baulk ring

Unit: mm (in)

	Standard	Wear limit
1st	1.2 - 1.6 (0.047 - 0.063)	0.8 (0.031)
Main drive	1.2 - 1.6 (0.047 - 0.063)	
OD	1.2 - 1.6 (0.047 - 0.063)	
Reverse	1.10 - 1.55 (0.0433 - 0.0610)	0.7 (0.028)

2nd and 3rd baulk ring

Unit: mm (in)



Dimension	Standard	Wear limit
A	0.6 - 1.1 (0.024 - 0.043)	0.2 (0.008)
B	0.7 - 0.9 (0.028 - 0.035)	

AVAILABLE SNAP RINGS

Main drive gear bearing

Allowable clearance		0 - 0.13 mm (0 - 0.0051 in)
Thickness mm (in)	Part number	
1.73 (0.0681)	32204-78005	
1.80 (0.0709)	32204-78000	
1.87 (0.0736)	32204-78001	
1.94 (0.0764)	32204-78002	
2.01 (0.0791)	32204-78003	
2.08 (0.0819)	32204-78004	

Mainshaft front

Allowable clearance		0 - 0.18 mm (0 - 0.0071 in)
Thickness mm (in)	Part number	
2.4 (0.094)	32263-V5200	
2.5 (0.098)	32263-V5201	
2.6 (0.102)	32263-V5202	

OD mainshaft bearing

Allowable clearance		0 - 0.14 mm (0 - 0.0055 in)
Thickness mm (in)	Part number	
1.1 (0.043)	32228-20100	
1.2 (0.047)	32228-20101	
1.3 (0.051)	32228-20102	
1.4 (0.055)	32228-20103	

Counter drive gear

Allowable clearance		0 - 0.13 mm (0 - 0.0051 in)
Thickness mm (in)	Part number	
1.4 (0.055)	32215-E9000	
1.5 (0.059)	32215-E9001	
1.6 (0.063)	32215-E9002	

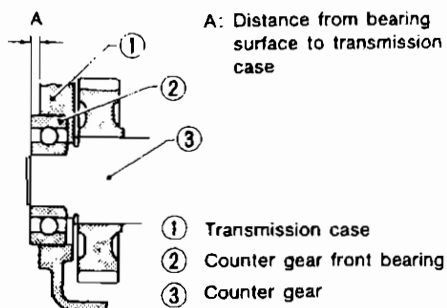
SERVICE DATA AND SPECIFICATIONS (SDS)

Inspection and Adjustment (Cont'd)

AVAILABLE SHIMS

Counter front bearing

Unit: mm (in)



TM371

Allowable clearance	0 - 0.16 (0 - 0.0063)	
"A"	Thickness of shim	Part number
4.52 - 4.71 (0.1780 - 0.1854)	Not necessary	
4.42 - 4.51 (0.1740 - 0.1776)	0.1 (0.004)	32218-V5000
4.32 - 4.41 (0.1701 - 0.1736)	0.2 (0.008)	32218-V5001
4.22 - 4.31 (0.1661 - 0.1697)	0.3 (0.012)	32218-V5002
4.12 - 4.21 (0.1622 - 0.1657)	0.4 (0.016)	32218-V5003
4.02 - 4.11 (0.1583 - 0.1618)	0.5 (0.020)	32218-V5004
3.92 - 4.01 (0.1543 - 0.1579)	0.6 (0.024)	32218-V5005

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PROPELLER SHAFT & DIFFERENTIAL CARRIER

SECTION PD

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PROPELLER SHAFT

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PD

When you read wiring diagrams:

- Read GI section, "HOW TO READ WIRING DIAGRAMS".
- See EL section, "POWER SUPPLY ROUTING" for power distribution circuit.

When you perform trouble diagnoses, read GI section, "HOW TO FOLLOW FLOW CHART IN TROUBLE DIAGNOSIS" and "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT".