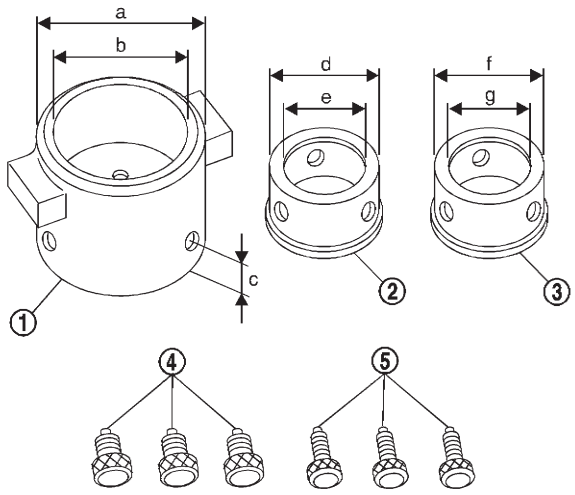
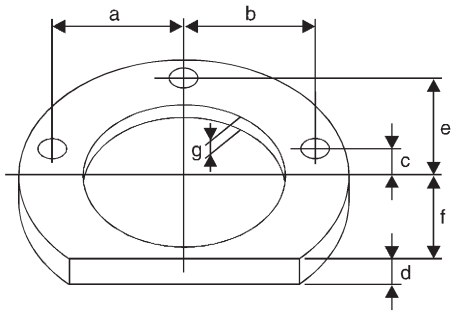
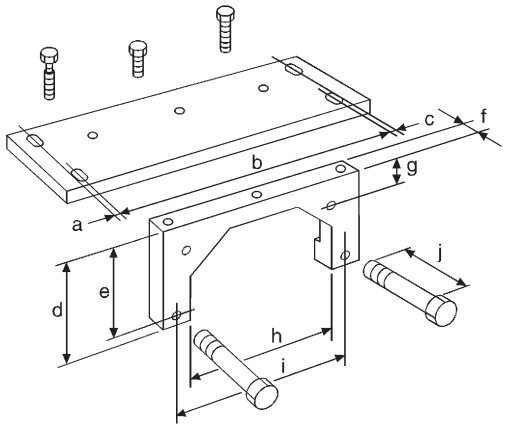
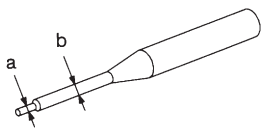
<SUPPLEMENT-I>

MANUAL TRANSAXLE

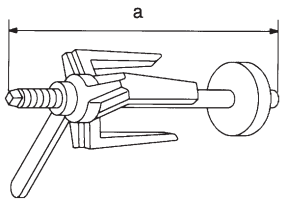
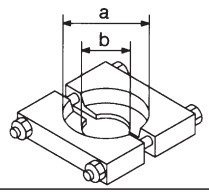
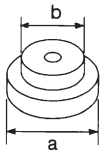
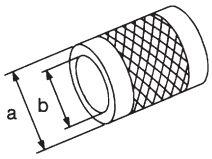
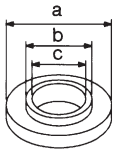
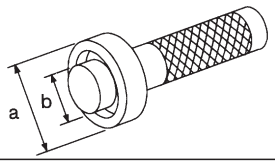
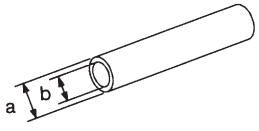
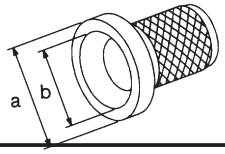
SECTION MT

CONTENTS

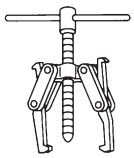
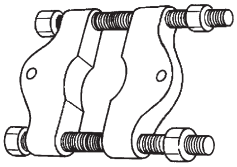
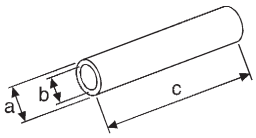
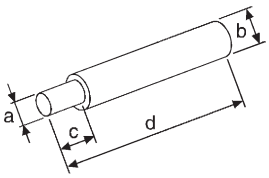
Special Service Tools

Tool number Tool name	Description	
KV321022S1 Bushing hook set ① KV32102211 Bushing hook ② KV32102221 Spacer ③ KV32102240 Spacer ④ KV32102231 Bolt (M12) ⑤ KV32102250 Bolt (M8)	 NT730	Removing OD gear bushing Removing 3rd gear bushing **a: 75 (2.95) dia.** **b: 59 (2.32) dia.** **c: 15 (0.59)** **d: 55 (2.17) dia.** **e: 42.2 (1.661) dia.** **f: 55 (2.17) dia.** **g: 40.2 (1.583) dia.** Unit: mm (in)
KV32102400 Counter gear stopper	 NT731	Installing OD gear bushing **a: 48 (1.89)** **b: 48 (1.89)** **c: 12 (0.47)** **d: 15 (0.59)** **e: 49 (1.93)** **f: 40 (1.57)** **g: 5 (0.20)** Unit: mm (in)
KV32102501 Mainshaft stopper	 NT732	Installing mainshaft bearing Installing OD main gear Installing mainshaft rear end bearing **a: 2 (0.08)** **b: 212 (8.35)** **c: 2 (0.08)** **d: 85 (3.35)** **e: 75 (2.95)** **f: 16 (0.63)** **g: 38 (1.50)** **h: 115 (4.53)** **i: 140 (5.51)** **j: 110 (4.33)** Unit: mm (in)
KV31100300 Pin punch	 NT442	Removing and installing retaining pin for reverse check assembly, reverse shift fork, reverse fork rod bracket, striking lever, and shift lever bracket **a: 4.5 (0.177) dia.** **b: 12 (0.47) dia.** Unit: mm (in)

Special Service Tools (Cont'd)

Tool number Tool name	Description	
ST25420001 Clutch spring compressor	 NT443	Installing sub-gear components **a: 157 mm (6.18 in)**
ST30031000 Puller	 NT411	Removing OD main gear Removing main drive gear bearing **a: 90 (3.54) dia.** **b: 50 (1.97) dia.** Unit: mm (in)
ST30613000 Drift	 NT073	Installing main drive gear bearing Installing OD synchronizer cone **a: 71.5 (2.815) dia.** **b: 47.5 (1.870) dia.** Unit: mm (in)
ST33200000 Drift	 NT091	Installing 3rd gear bushing Installing 3rd & 4th synchronizer assembly Installing counter gear front bearing Installing counter gear rear bearing (Use with KV40100630) **a: 60 (2.36) dia.** **b: 44.5 (1.752) dia.** Unit: mm (in)
KV40100630 Drift	 NT107	Installing counter gear rear bearing (Use with ST33200000) **a: 67.5 (2.657) dia.** **b: 44 (1.73) dia.** **c: 38.5 (1.516) dia.** Unit: mm (in)
KV38102100 Drift	 NT084	Installing front cover oil seal **a: 44 (1.73) dia.** **b: 24.5 (0.965) dia.** Unit: mm (in)
ST22452000 Drift	 NT065	Installing OD gear bushing Installing OD main gear Installing mainshaft rear end bearing **a: 45 (1.77) dia.** **b: 36 (1.42) dia.** Unit: mm (in)
ST30720000 Drift	 NT086	Installing rear oil seal **a: 77 (3.03) dia.** **b: 55.5 (2.185) dia.** Unit: mm (in)

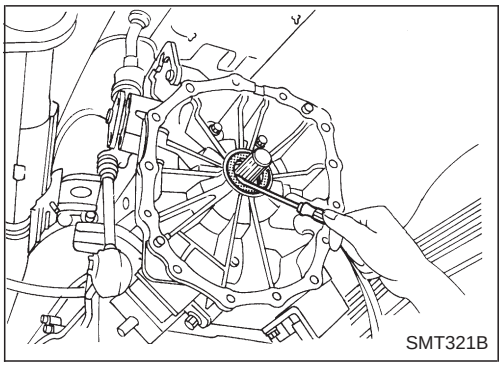
Commercial Service Tools

Tool name	Description	
Puller	 NT077	Removing companion flange Removing mainshaft rear end bearing Removing OD synchronizer assembly Removing OD gear bushing Removing OD main gear Removing mainshaft bearing Removing reverse synchronizer hub Removing 3rd & 4th synchronizer hub Removing 3rd gear bushing
Puller	 NT726	Removing mainshaft low gear bearing Removing counter low & high gear front bearing Removing counter gear front and rear bearing
Puller	 NT733	Installing reverse synchronizer hub Installing 1st & 2nd synchronizer hub Installing mainshaft bearing **a: 48.6 (1.913) dia.** **b: 41.6 (1.638) dia.** **c: 410 (16.14)** Unit: mm (in)
Drift	 NT734	Removing slide ball bearing Installing slide ball bearing **a: 16 (0.63) dia.** **b: 18 (0.71) dia.** **c: 30 (1.18)** **d: 300 (11.81)** Unit: mm (in)

NVH Troubleshooting Chart

Use the chart below to help you find the cause of the symptom. The numbers indicate the order of the inspection. If necessary, repair or replace these parts.

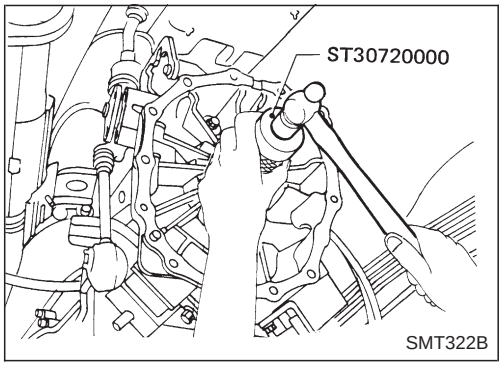
Reference page		FS5R50B	Refer to MA section (“Checking M/T Oil”, “CHASSIS AND BODY MAINTENANCE”).			MT-1011	MT-1011	MT-1014	MT-1014	MT-1012	MT-1012	MT-1012	MT-1012
SUSPECTED PARTS (Possible cause)		Transmission model	OIL (Level low)	OIL (Wrong)	OIL (Level too high)	LIQUID GASKET (Damaged)	OIL SEAL (Worn or damaged)	CHECK PLUG RETURN SPRING AND CHECK BALL (Worn or damaged)	SHIFT FORK (Worn)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING (Damaged)
Symptom	Noise		1	2						3	3		
	Oil leakage			3	1	2	2						
	Hard to shift or will not shift			1	1							2	2
	Jumps out of gear							1	2	2			


SMT321B

Replacing Rear Oil Seal

REMOVAL

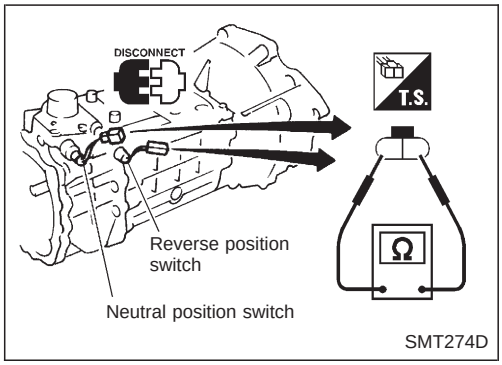
1. Remove transfer assembly. — Refer to TF section.
2. Pull out rear oil seal.



SMT322B

INSTALLATION

1. Install rear oil seal.
- **Before installing apply multi-purpose grease to seal lip.**
2. Install transfer assembly. — Refer to TF section.

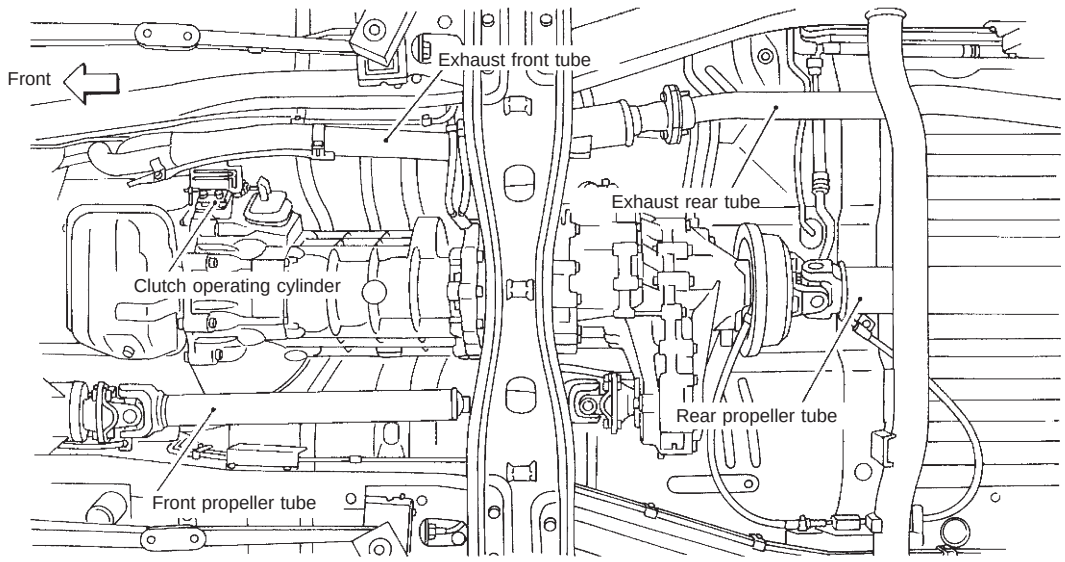


SMT274D

Position Switch Check

Switch	Gear position	Continuity
Reverse position switch	Reverse	Yes
	Except reverse	No
Neutral position switch	Neutral	Yes
	Except neutral	No

Removal



SMT321D

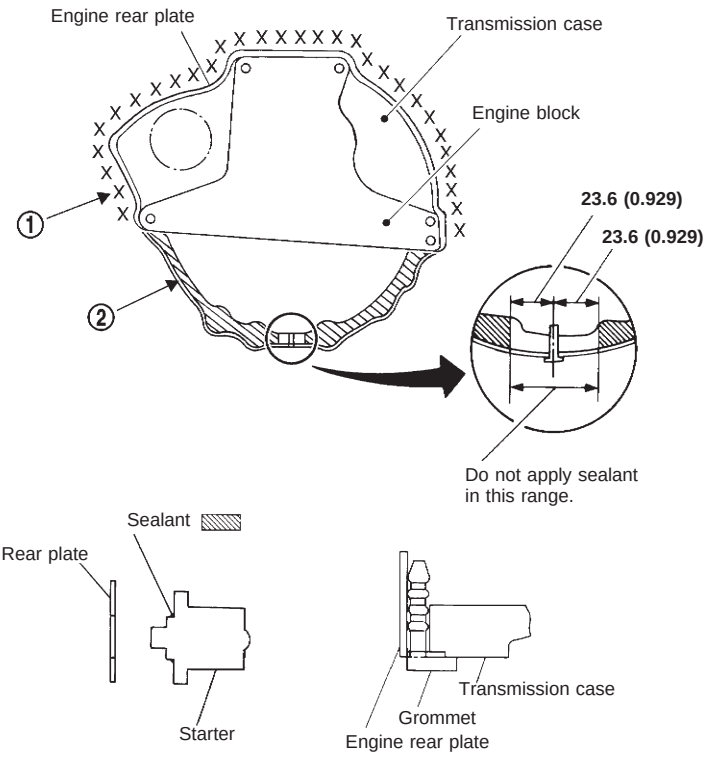
1. Remove front and rear propeller shafts. Refer to PD section (''Removal and Installation'', ''PROPELLER SHAFT'').
2. Remove clutch operating cylinder.
3. Remove exhaust front and rear tubes. Refer to FE section (''EXHAUST SYSTEM'').
4. Disconnect vehicle speed sensor, back-up lamp switch, 4WD switch and neutral position switch harness connector.
5. Remove center brake cable. Refer to BR section.
6. Remove shift lever of transmission. Refer to MT-1014 (FS5R50B).
7. Remove transfer control lever. Refer to TF section (''Removal'', ''REMOVAL AND INSTALLATION'').
8. Support engine by placing a jack under oil pan.
   - **Do not place jack under the oil pan drain plug.**
9. Remove transmission with transfer from engine.

WARNING:
Support Manual Transmission with transfer, while removing it.

Installation

- Apply sealant as below:

FS5R50B



1) Place

① : Sticked out portion for engine rear plate from transmission case.

② : Mating surface of transmission case and rear plate.

2) Sealant

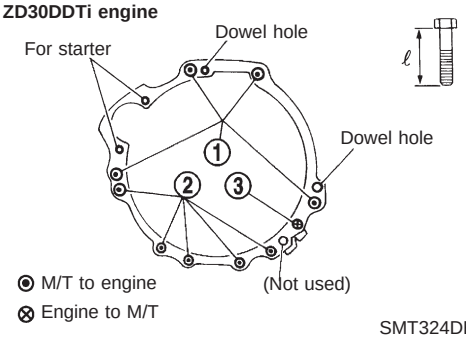
XXXX : Apply genuine anaerobic liquid gasket, Three Bond TB1207B or TB1207D.

: Apply genuine anaerobic liquid gasket, Three Bond TB1215 or TB1207D.

Unit: mm (in)

SMT280D

ZD30DDTi engine

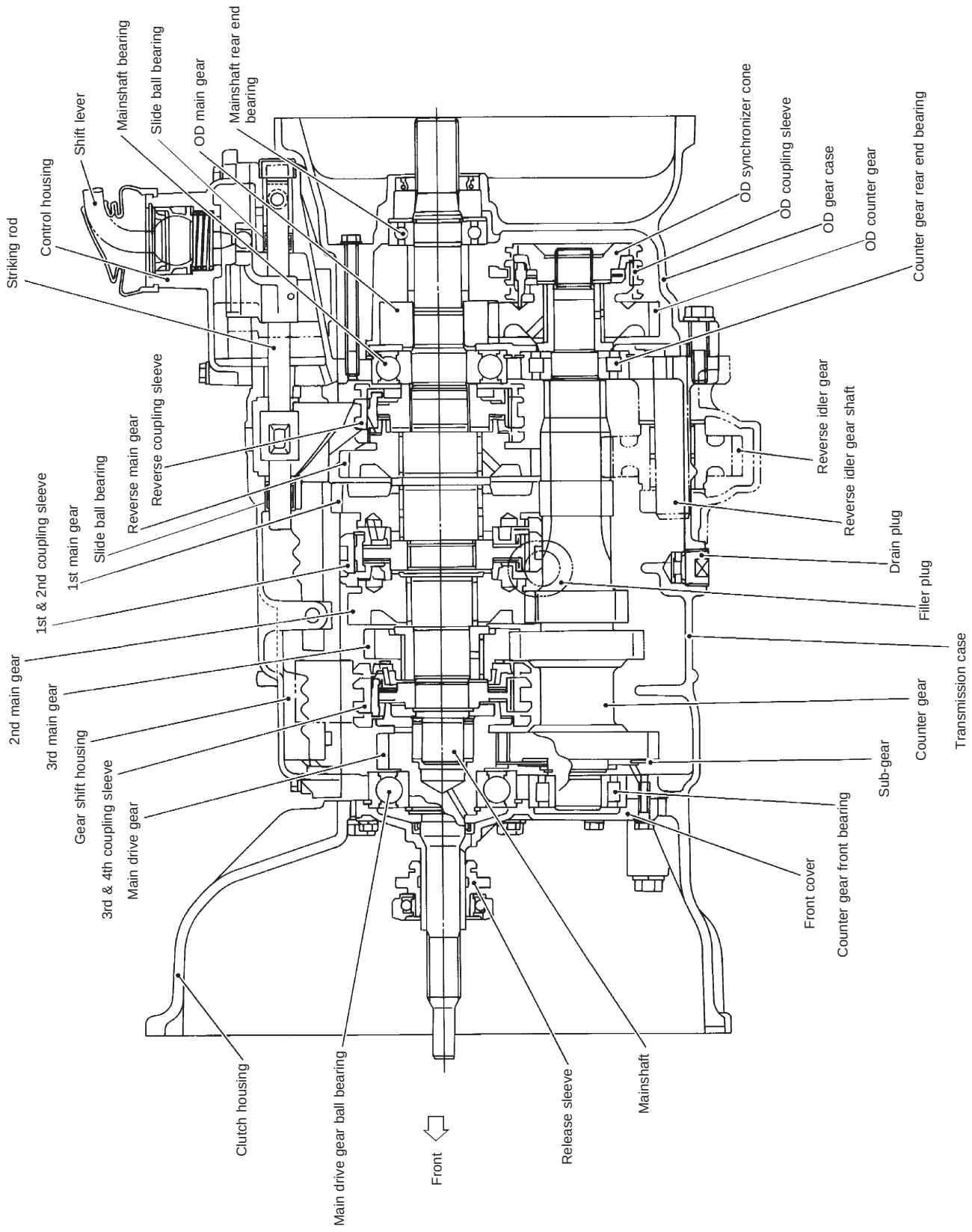


SMT324DB

- Tighten bolts securing transmission.

Engine	Bolts		Tightening torque N·m (kg-m, ft-lb)	ℓ mm (in)
ZD30DDTi	①	M/T to engine block	83 - 113 (8.5 - 11.5, 61 - 83)	100 (3.94)
	②	M/T to engine oil pan	29 - 39 (3.0 - 4.0, 22 - 29)	100 (3.94)
	③	Engine oil pan to M/T	29 - 39 (3.0 - 4.0, 22 - 29)	70 (2.76)

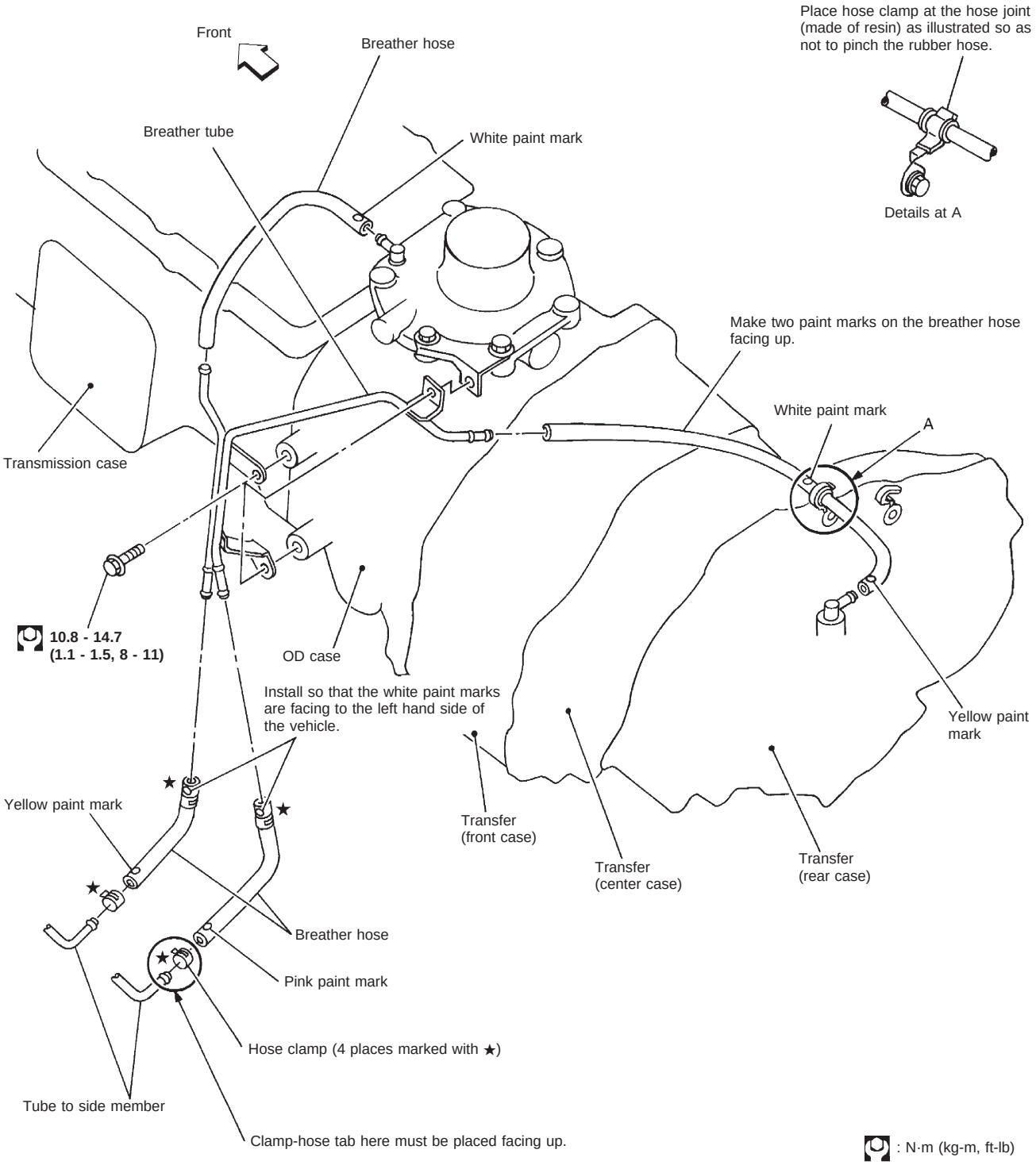
Cross-sectional View



SMT269D

Air Breather Piping

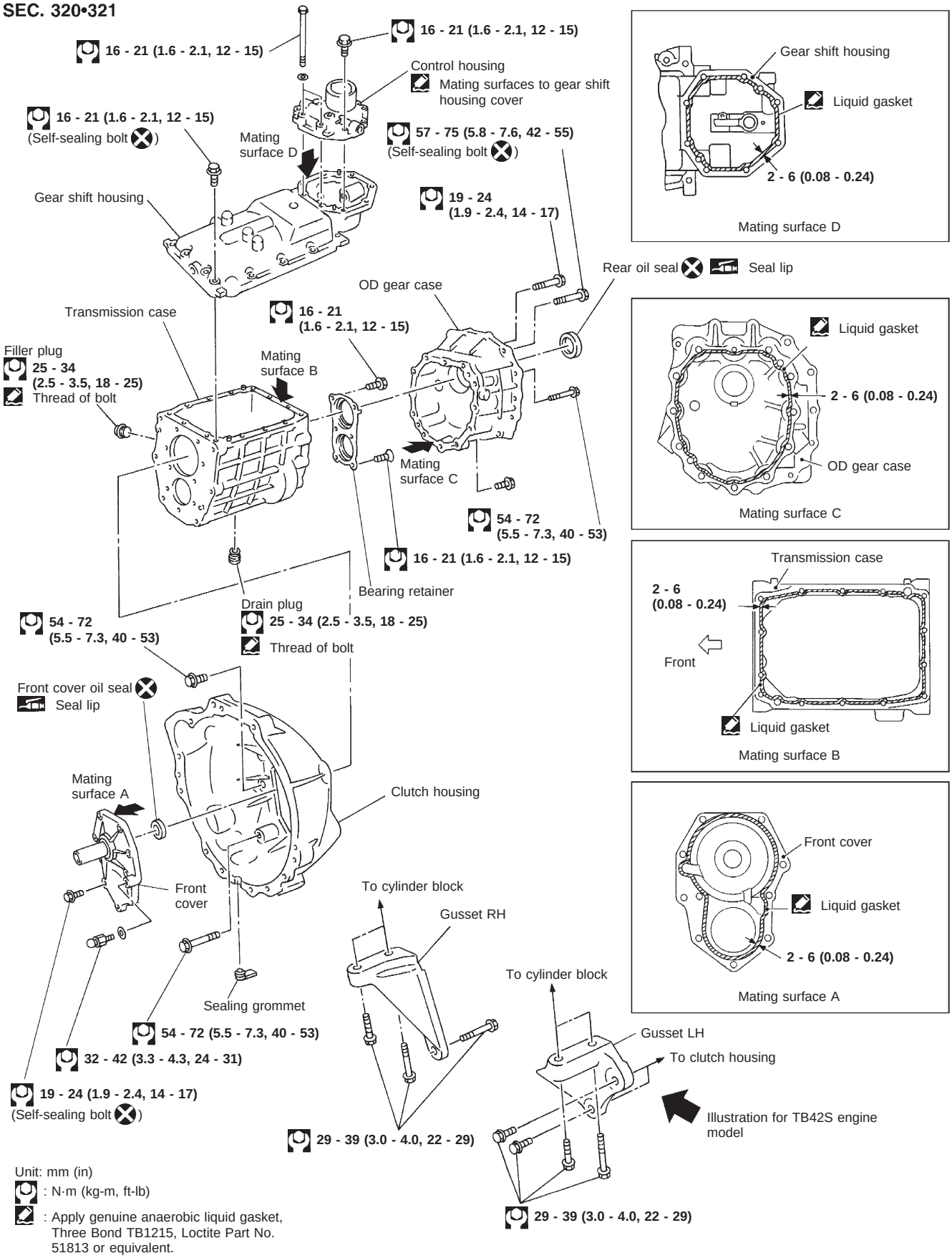
Remarks:
1. Route rubber hoses so that they are not bent pinched.
2. Hose insertion
   - Insert the tube bulge spool into the spool.
   - Insert the tube bulge into the right-angle bend section of the tube.
   - Insert unit bulge until the hose connot go in any further.



SMT547D

Case Components

SEC. 320•321



Unit: mm (in)

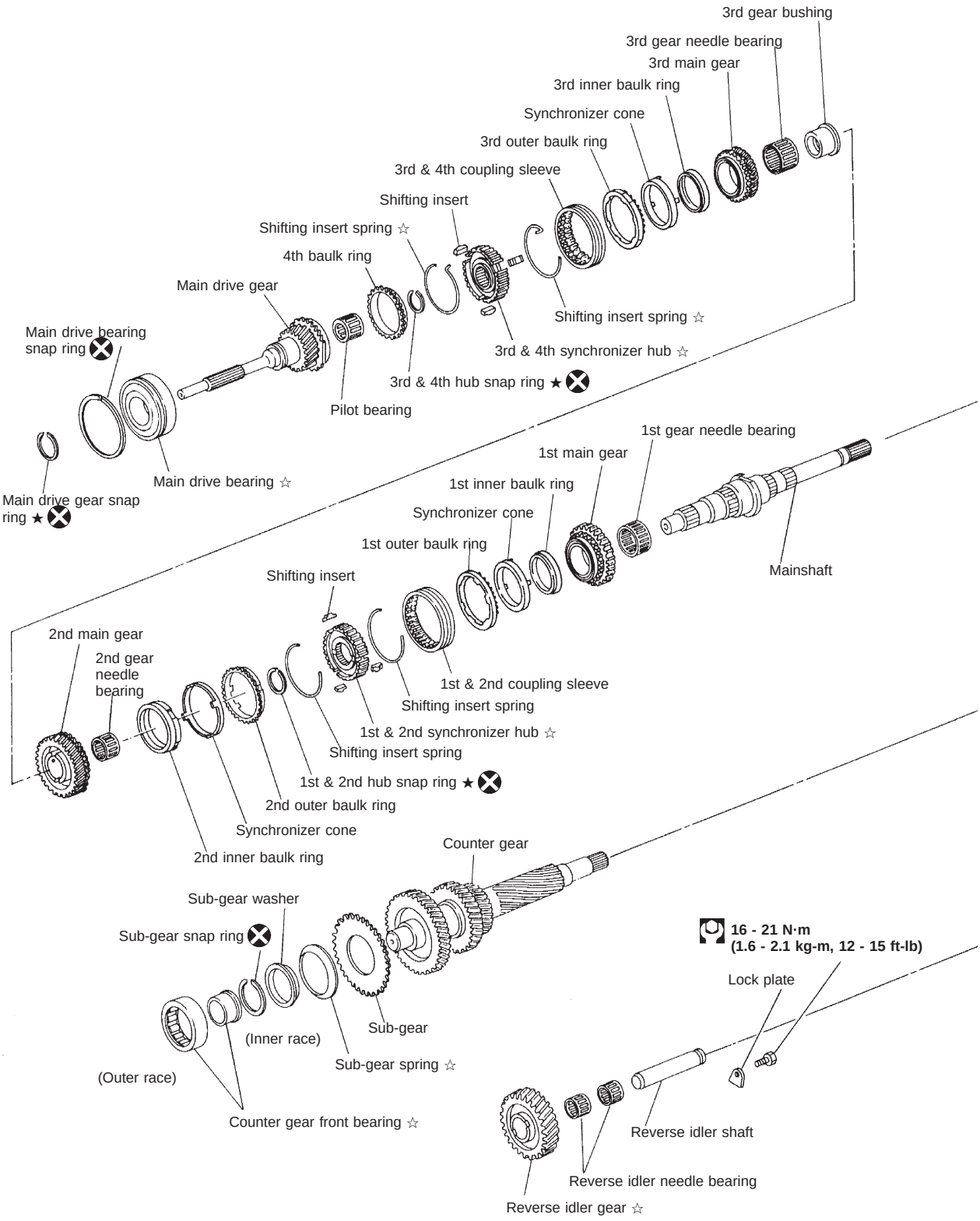
: N·m (kg-m, ft-lb)

: Apply genuine anaerobic liquid gasket, Three Bond TB1215, Loctite Part No. 51813 or equivalent.

SMT270D

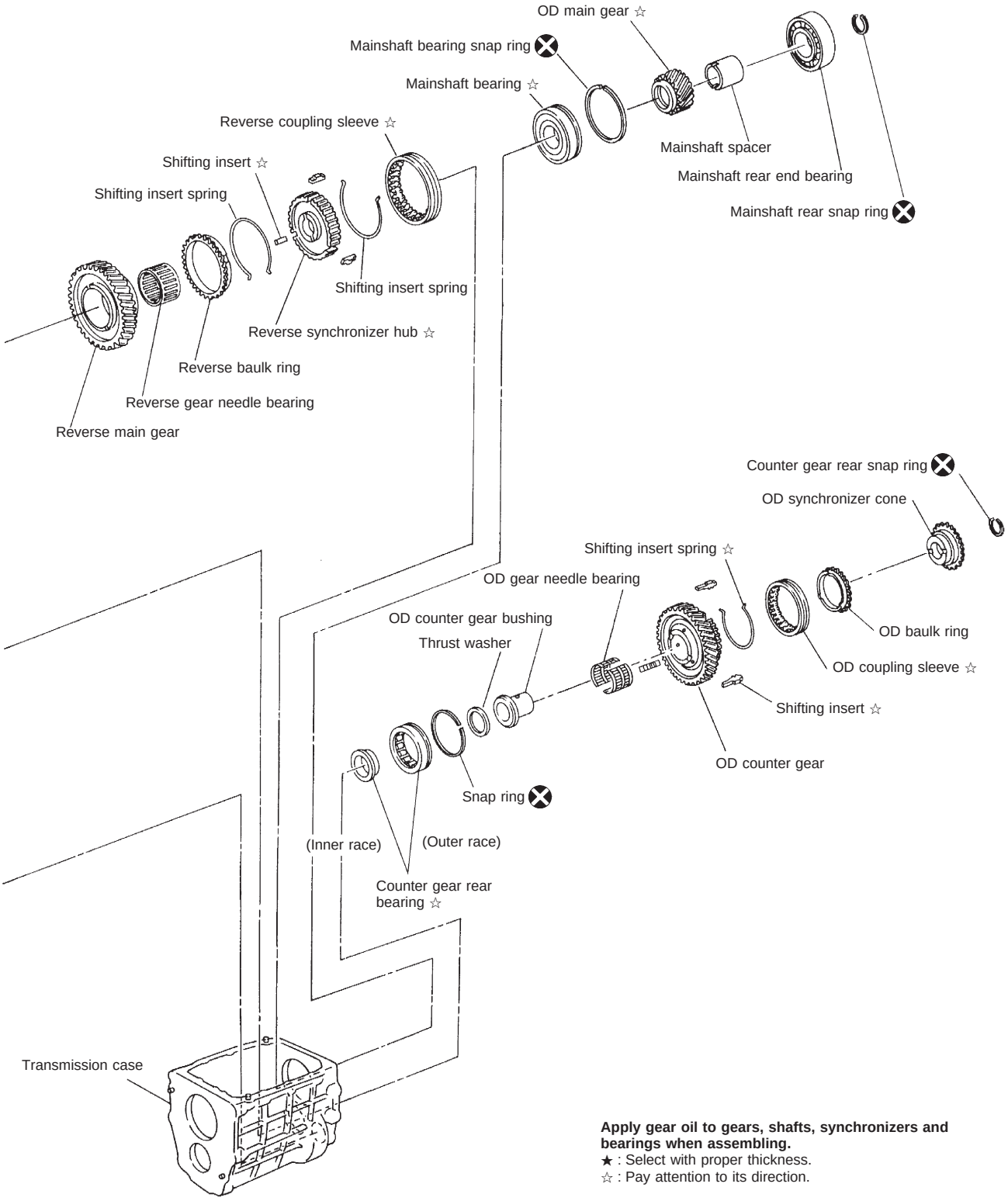
Gear Components

SEC. 322



SMT271D

Gear Components (Cont'd)

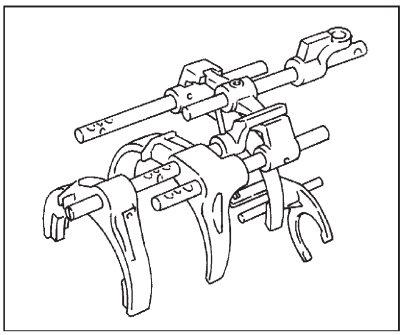


Apply gear oil to gears, shafts, synchronizers and bearings when assembling.
★ : Select with proper thickness.
☆ : Pay attention to its direction.

SMT272D

Shift Control Components

SEC. 328

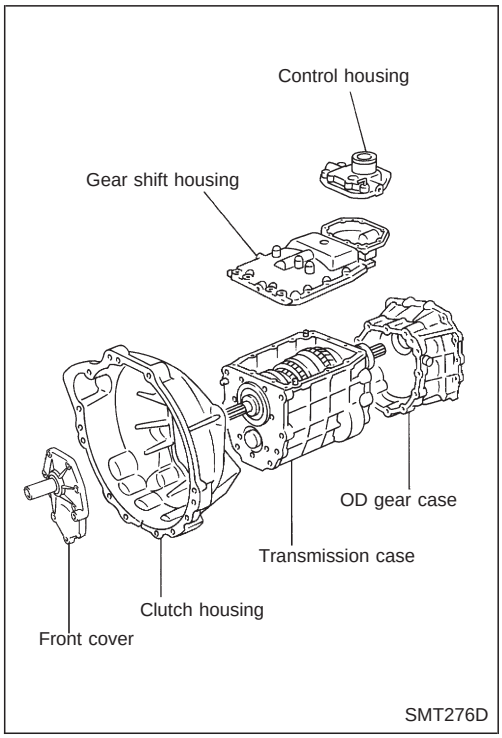


Bushing
Boot band
Boot
Boot band
Resin seat
Snap ring
Snap ring
Socket
Spring
Plug
Cam pin
Bracket
Control housing
Air breather
Check plunger
Spacer
Reverse check spring
Thrust washer
E-ring
Slide ball bearing
Striking rod cap
Plunger
Check ball
Interlock plunger
Interlock pin
Check ball
Gear shift housing
Fork rod cap
Shift knob
Shift lever
Select check plunger
Contact surface to shift lever bracket
Select check spring (Color: white)
Select check plug
20 - 29 (2.0 - 3.0, 14 - 22)
16 - 21 (1.6 - 2.1, 12 - 15)
16 - 21 (1.6 - 2.1, 12 - 15)
16 - 21 (1.6 - 2.1, 12 - 15)
Select check plunger
Contact surface to shift lever bracket
Select check spring (Color: black)
Select check plug
20 - 29 (2.0 - 3.0, 14 - 22)
Neutral position switch
20 - 29 (2.0 - 3.0, 14 - 22)
Reverse position switch
20 - 29 (2.0 - 3.0, 14 - 22)
Plug
20 - 29 (2.0 - 3.0, 14 - 22)
16 - 21 (1.6 - 2.1, 12 - 15)
16 - 21 (1.6 - 2.1, 12 - 15)
16 - 21 (1.6 - 2.1, 12 - 15)
Fork rod cap
Striking rod cap
Fork rod cap
Reverse fork rod
Retaining pin
Reverse shift fork
Retaining pin
Shift lever bracket
Striking rod
Check ball spring
Check ball
Clip
Retaining pin
Striking lever
Interlock pin
3rd & 4th fork rod
Retaining pin
3rd & 4th rod bracket
1st & 2nd rod bracket
Retaining pin
1st & 2nd fork rod
Retaining pin
OD fork rod
OD shift fork
3rd & 4th shift fork
1st & 2nd shift fork
Retaining pin

: N·m (kg-m, ft-lb)

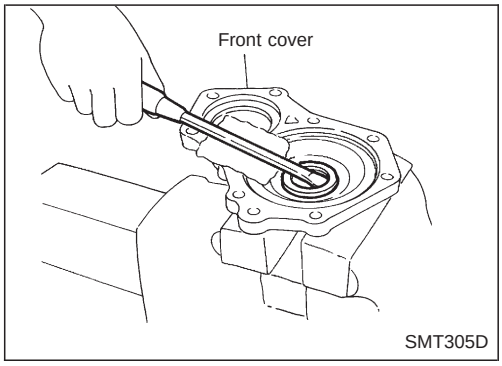
: Apply genuine anaerobic liquid gasket, Three Bond TB1215, Loctite Part No. 51813 or equivalent.

SMT273D

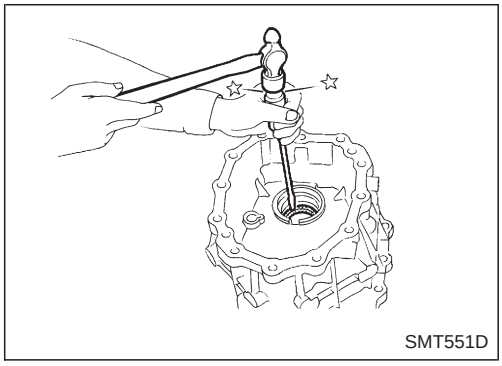


Case Components

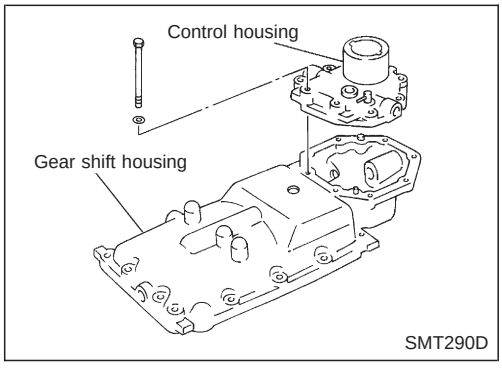
1. Remove transmission case outer parts.
- Control housing
- Gear shift housing
- Clutch housing
- OD gear case
- Front cover



2. Remove front cover oil seal.



3. Remove rear oil seal.

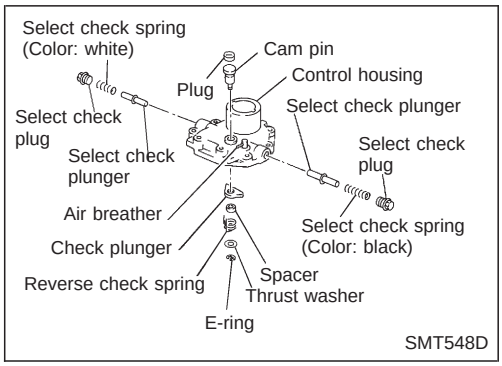


Shift Control Components

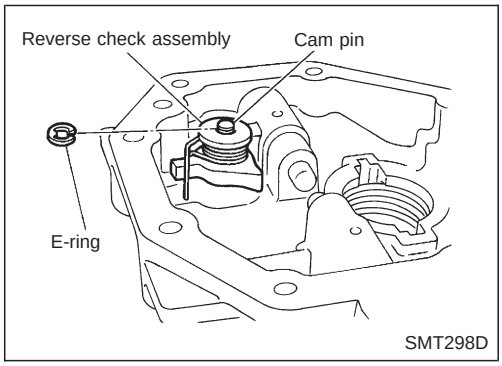
- Remove and disassemble gear shift housing and control housing parts.

Shift Control Components (Cont'd)

CONTROL HOUSING

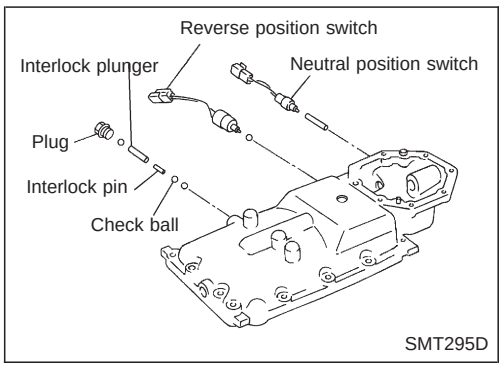


1. Remove select check plugs, springs and select check plungers.



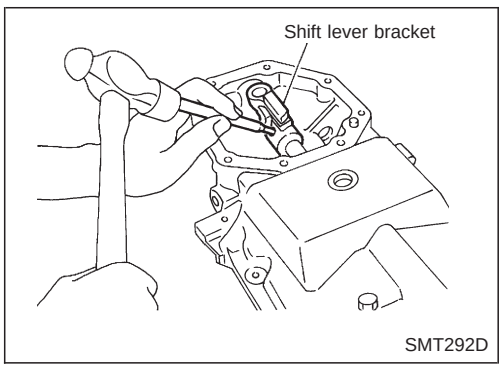
2. Remove E-ring, thrust washer, reverse check spring, spacer, check plunger and cam pin.
3. Remove plug.

GEAR SHIFT HOUSING

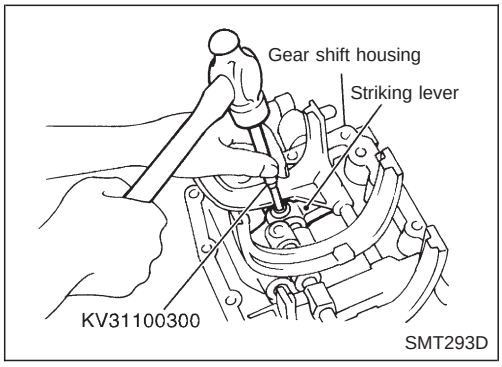


1. Remove reverse and neutral position switch.
- **Do not lose check balls and plungers.**

2. Remove plug, check balls, interlock pin and interlock plunger.
- **Do not lose check balls.**



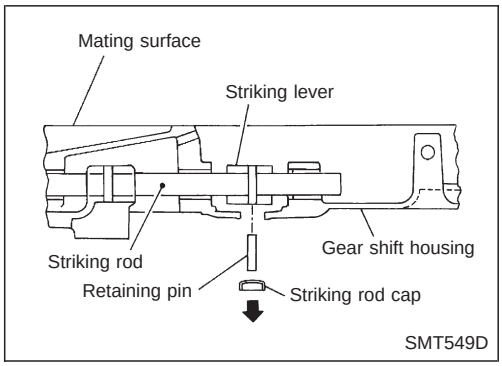
3. Drive out retaining pin from shift lever bracket.

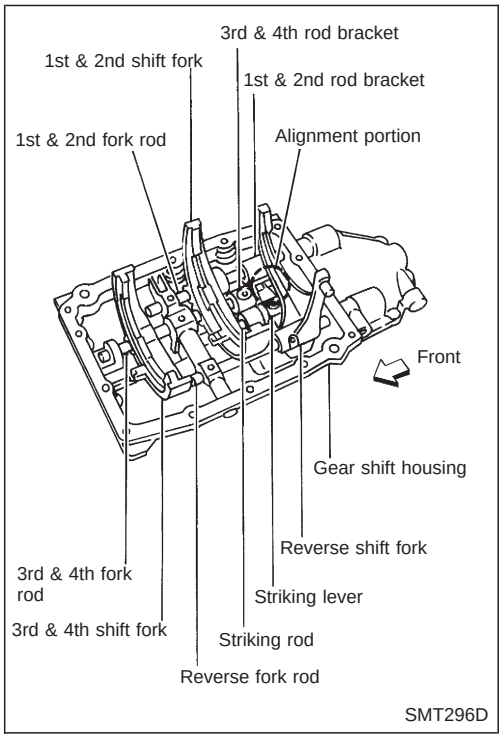


4. Remove retaining pin and plug.

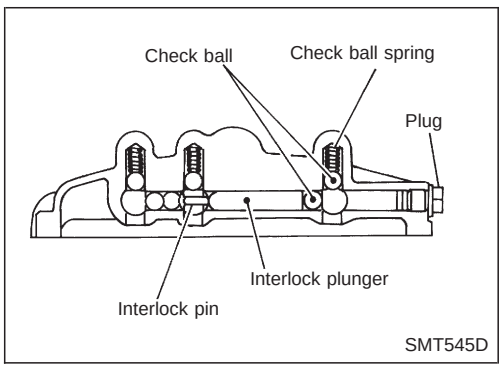
a. Drive out retaining pin from striking lever through plug on gear shift housing.

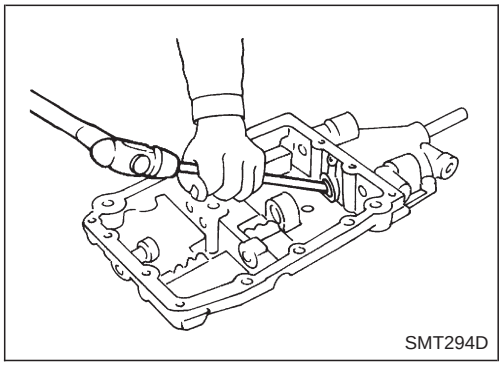
Shift Control Components (Cont'd)





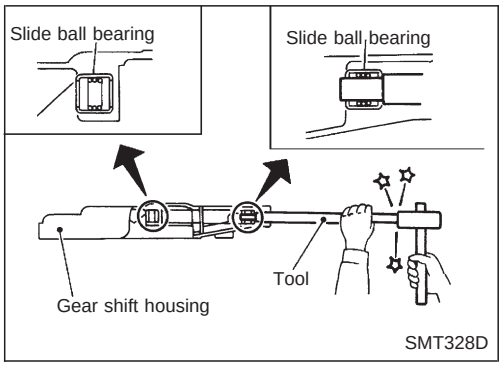
b. Drive out retaining pin from reverse shift fork, then drive out reverse fork rod and fork rod cap with brass bar.
c. Remove interlocking parts.
d. Drive out retaining pins from 3rd & 4th shift fork and 3rd & 4th rod bracket, then drive out 3rd & 4th fork rod and fork rod cap with brass bar.
e. Drive out retaining pins from 1st & 2nd shift fork and 1st & 2nd rod bracket, then drive out 1st & 2nd fork rod and fork rod cap with brass bar.



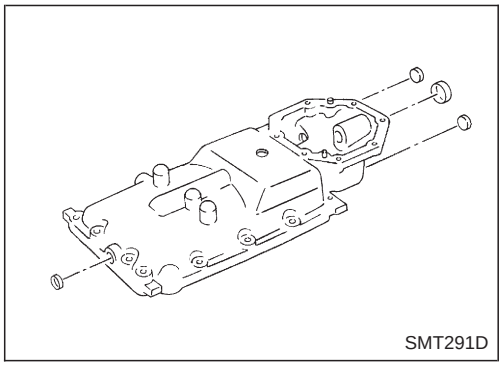


5. Drive out striking rod with brass bar through control rod plug on gear shift housing.

Shift Control Components (Cont'd)



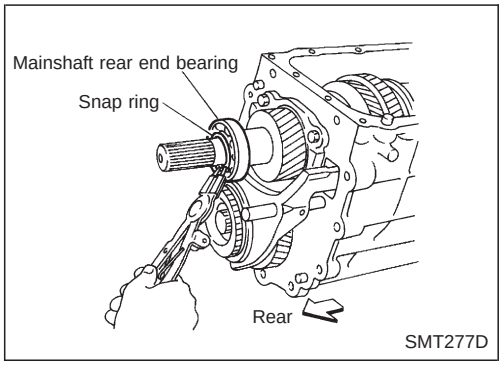
6. Drive out slide ball bearing using SST.



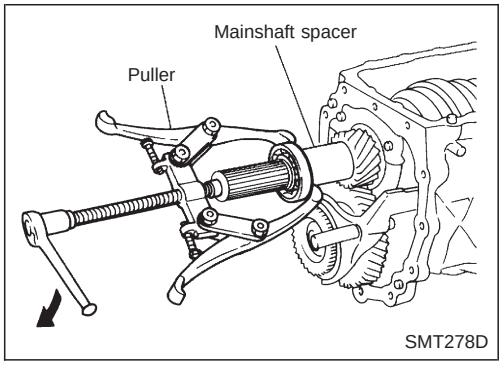
7. Remove caps.

Gear Components

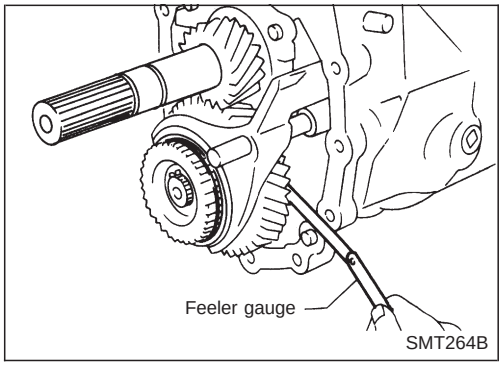
TRANSMISSION CASE



1. Remove snap ring for mainshaft rear end bearing.



2. Pull out mainshaft rear end bearing, then remove mainshaft spacer.



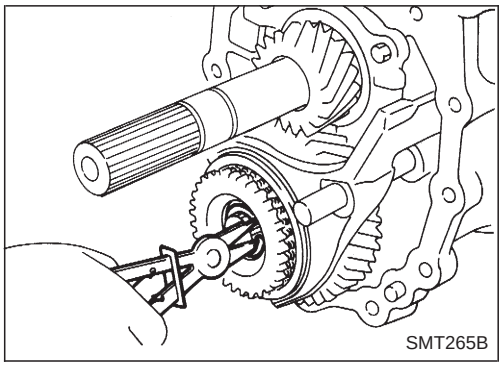
3. Check OD counter gear end play.

Gear end play

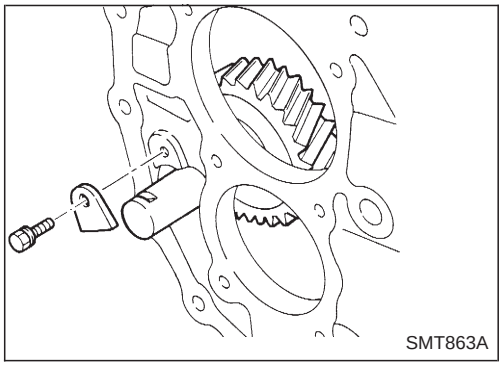
Gear	End play mm (in)
OD counter gear	0.20 - 0.47 (0.0079 - 0.0185)

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

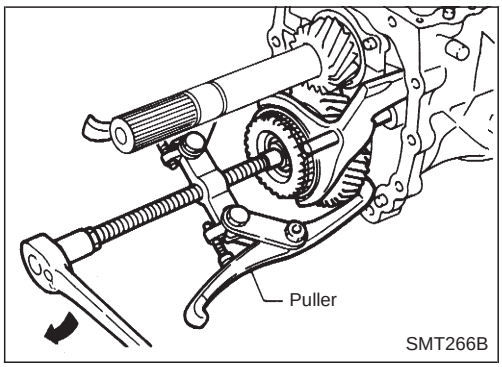
Gear Components (Cont'd)


SMT265B

4. Remove counter gear rear snap ring.

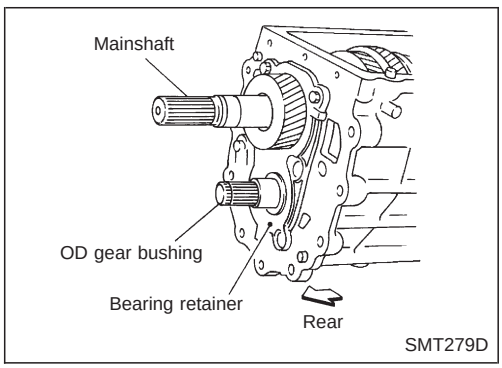

SMT863A

5. Remove lock plate of reverse idler shaft and then remove reverse idler gear, washers, reverse idler needle bearings and reverse idler shaft.



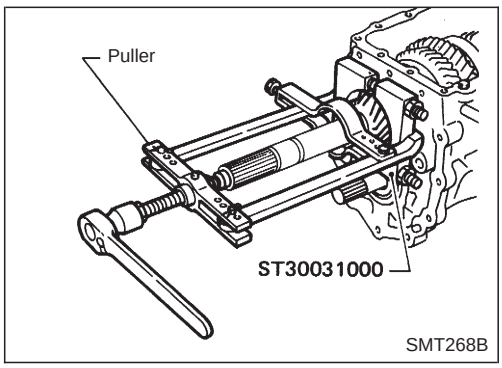
SMT266B

6. Pull out the following parts.
- OD counter gear
- OD synchronizer assembly with OD shift fork and OD fork rod



SMT279D

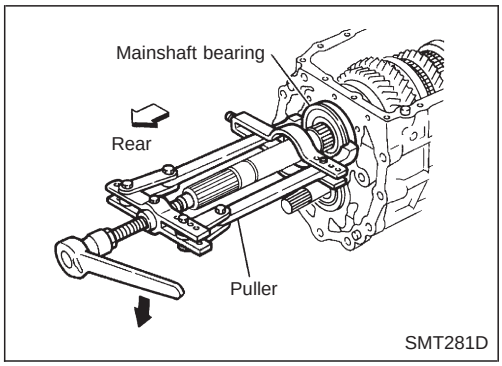
7. Pull out OD gear bushing and thrust washer.
8. Remove bolts securing bearing retainer and then remove bearing retainer.



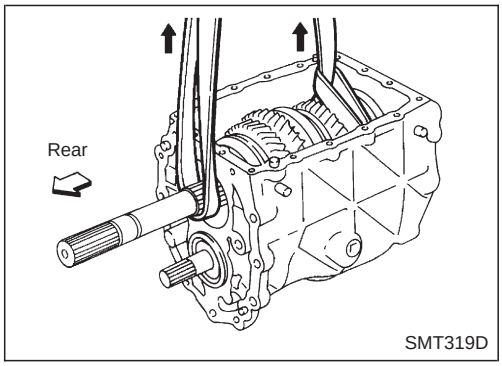
SMT268B

9. Pull out OD main gear.

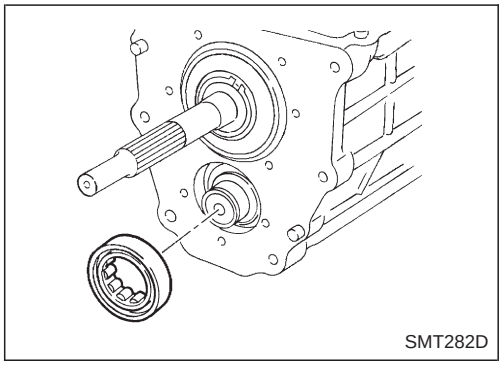
Gear Components (Cont'd)



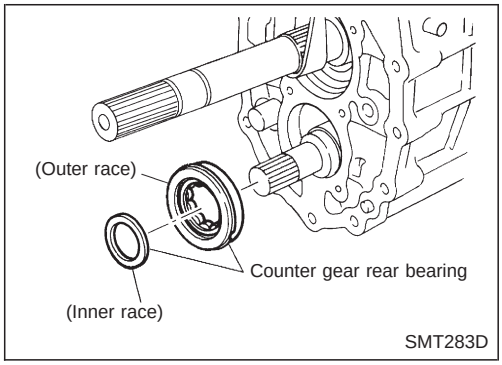
10. Remove mainshaft bearing snap ring.
11. Pull out mainshaft bearing.



12. Support mainshaft with hoist.
13. Remove bolts securing front cover and then remove front cover.

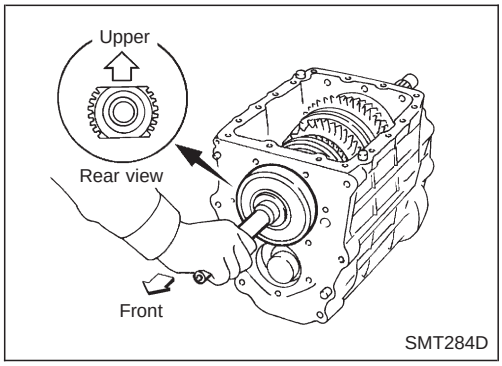


14. Remove counter gear front bearing outer race.
- **Tap rear end of counter gear lightly before removing bearing.**



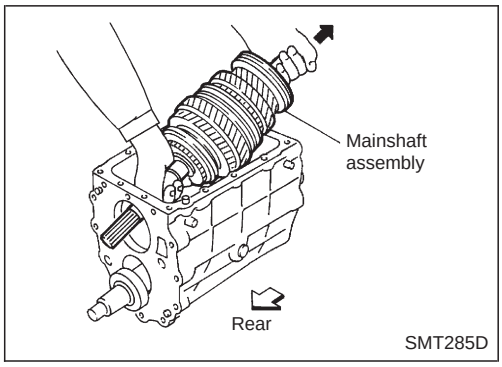
15. Remove counter gear rear bearing outer race.
- **Tap front end of counter gear lightly before removing bearing.**

16. Settle counter gear assembly down on bottom of transmission case.

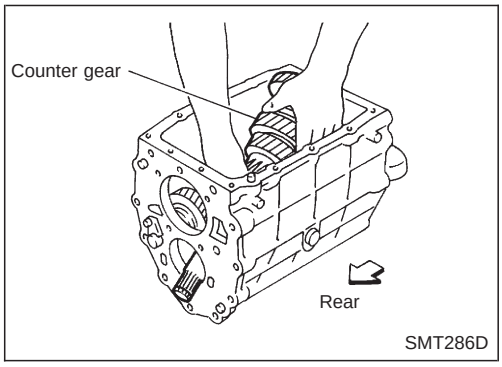


17. Remove main drive gear assembly.
- **Set cutting portion of clutch gear on main drive gear to upper side.**

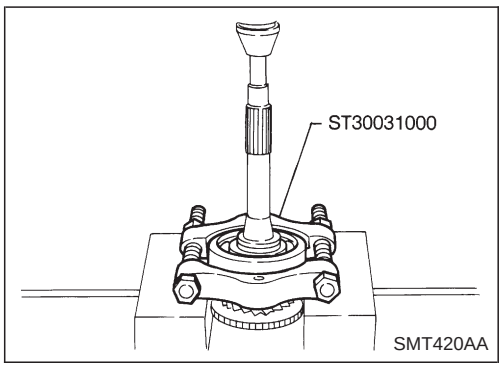
Gear Components (Cont'd)



18. Remove mainshaft assembly.

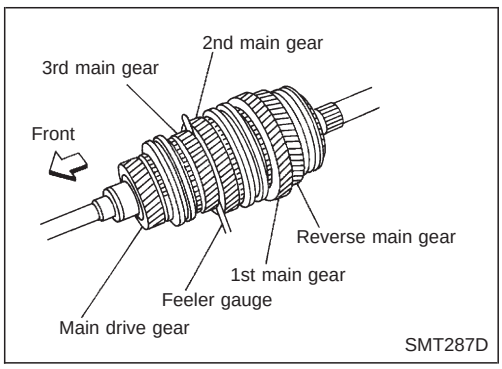


19. Remove counter gear assembly.



MAIN DRIVE GEAR

1. Remove main drive gear snap ring and main drive bearing snap ring.
2. Press out main drive gear bearing.

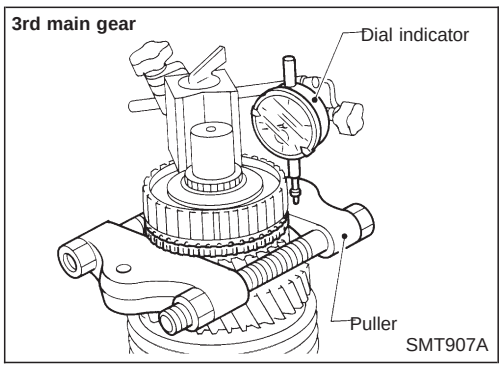


MAINSHAFT AND GEARS

1. Before disassembly, check 1st, 2nd, 3rd and reverse main gear end play.
   Gear end play:

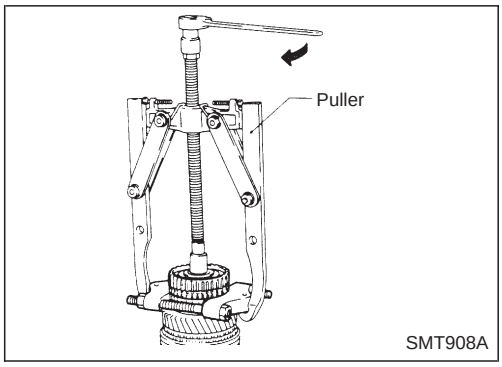
Unit: mm (in)

Gears	End play
1st main gear	0.20 - 0.48 (0.0079 - 0.0189)
2nd main gear	0.20 - 0.60 (0.0079 - 0.0236)
3rd main gear	0.20 - 0.45 (0.0079 - 0.0177)
OD counter gear	0.20 - 0.47 (0.0079 - 0.0185)
Reverse main gear	0.20 - 0.44 (0.0079 - 0.0173)

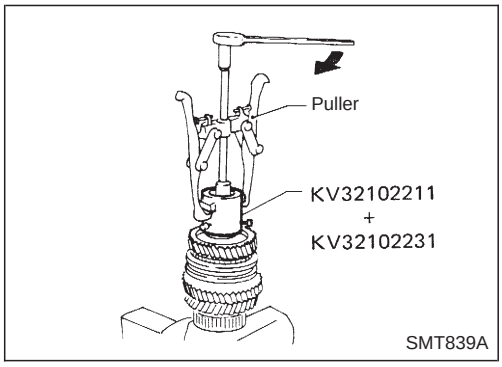


- If not within specification, disassemble and check contact surface of gears to hub, washer, bushing, needle bearing and shaft.

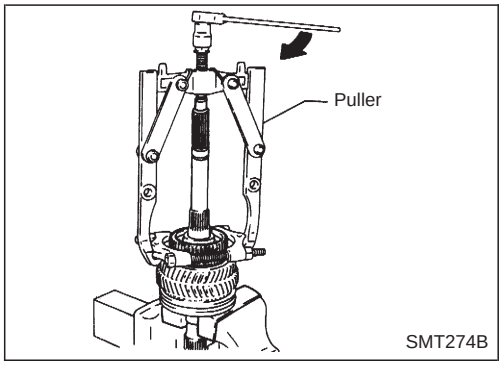
Gear Components (Cont'd)



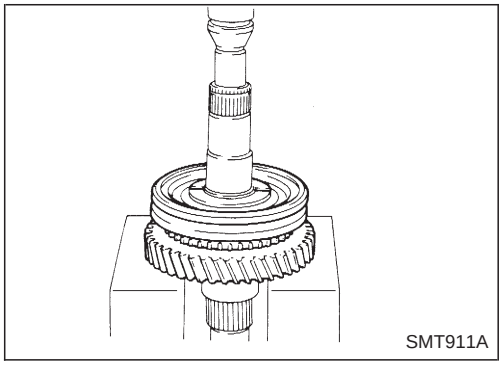
2. Remove 3rd & 4th hub snap ring.
3. Pull out 3rd main gear together with 3rd & 4th synchronizer assembly and 3rd gear needle bearing.



4. Pull out 3rd gear bushing.
5. Remove 2nd main gear and 2nd gear needle bearing.

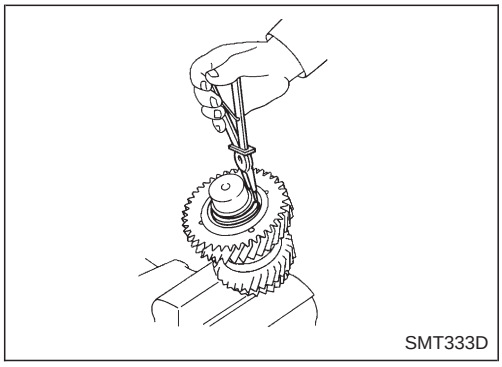


6. Pull out reverse synchronizer assembly.
7. Remove reverse main gear and reverse gear needle bearing.
8. Remove 1st & 2nd hub snap ring.



9. Press out 1st main gear together with 1st & 2nd synchronizer assembly.

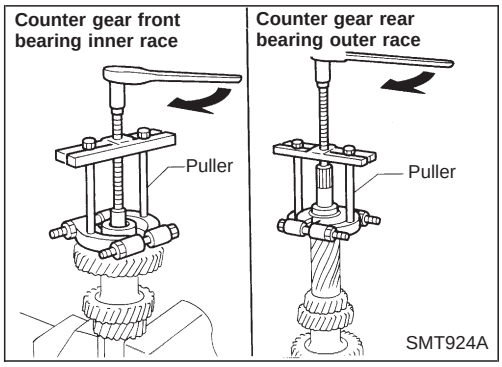
COUNTER GEAR



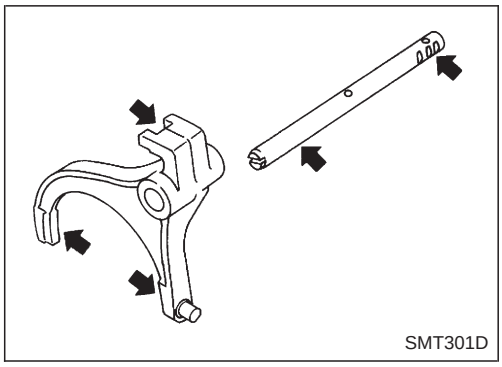
1. Remove sub-gear components.

a. Remove sub-gear snap ring.
b. Remove sub-gear, sub-gear washer and sub-gear spring.

Gear Components (Cont'd)

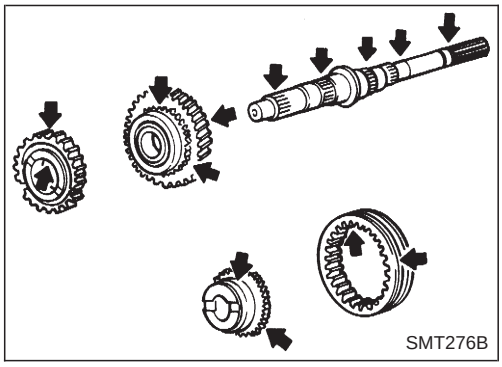


2. Pull out counter gear front and rear bearing inner race.


SMT301D

Shift Control Components

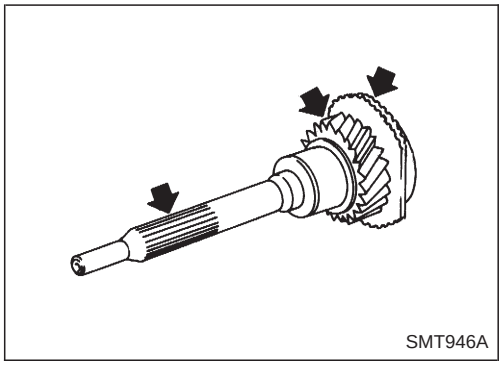
- Check contact surface and sliding surface for wear, scratches, projections or other damage.

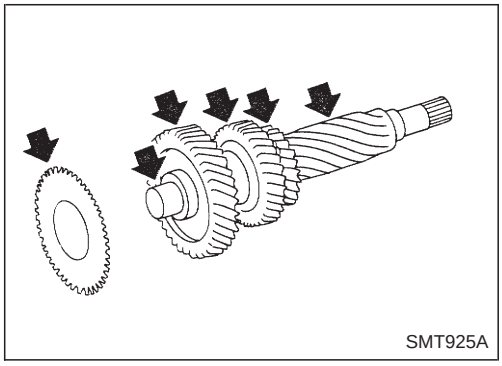

SMT276B

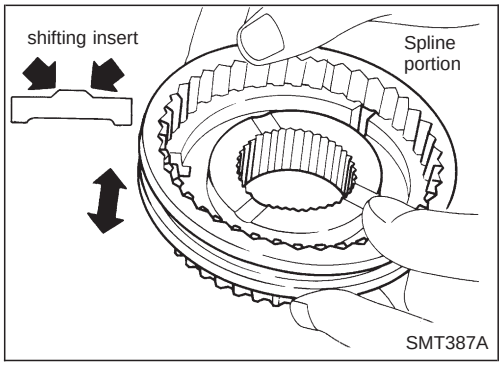
Gear Components

GEAR AND SHAFT

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


SMT946A


SMT925A

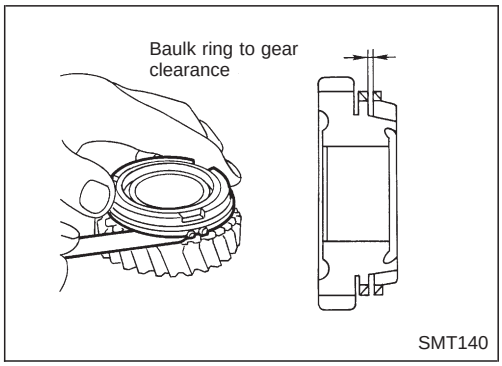


SMT387A

SYNCHRONIZER

- 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.

Gear Components (Cont'd)

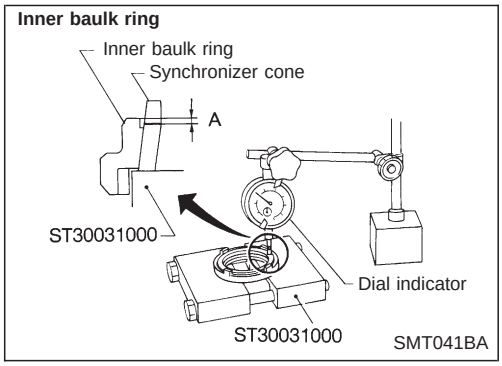


- Measure clearance between baulk ring and gear.

Clearance between baulk rings and main gears:

Unit: mm (in)

Gears	Standard	Wear limit
Main drive gear	1.00 - 1.45 (0.0394 - 0.0571)	0.7 (0.028)
OD counter gear	1.00 - 1.45 (0.0394 - 0.0571)	
Reverse main gear	1.00 - 1.45 (0.0394 - 0.0571)	



- Measure wear of 1st, 2nd and 3rd baulk rings.

a. Place inner baulk ring in position on synchronizer cone.
b. Hold baulk ring evenly against synchronizer cone and measure distance ''A''.
c. Place outer baulk ring in position on synchronizer cone.
d. Hold baulk ring evenly against synchronizer cone and measure distance ''B''.

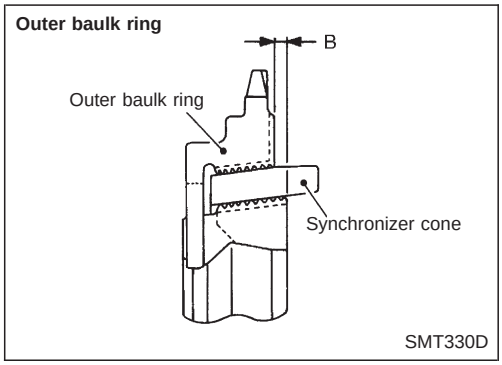
Standard:

Inner-A 0.7 - 0.9 mm (0.028 - 0.035 in)
Outer-B 1.4 - 1.6 mm (0.055 - 0.063 in)

Wear Limit:

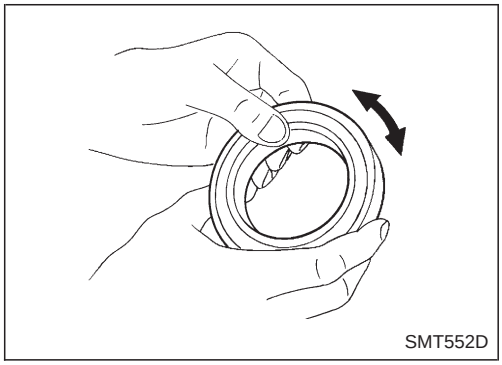
0.2 mm (0.008 in)

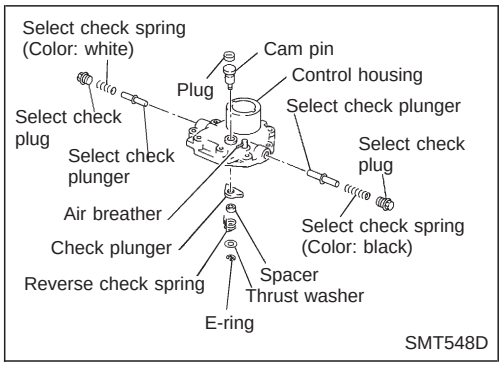
e. If distance ''A'' or ''B'' is smaller than the wear limit, replace outer baulk ring, inner baulk ring and synchronizer cone as a set.



BEARING

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



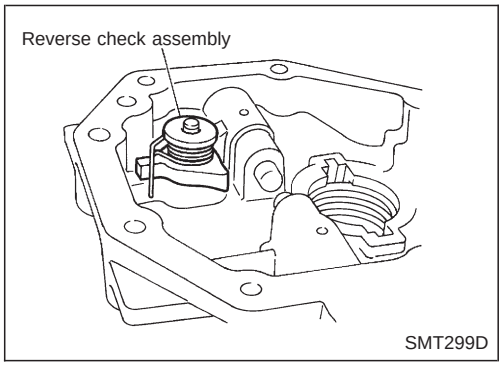


Shift Control Components

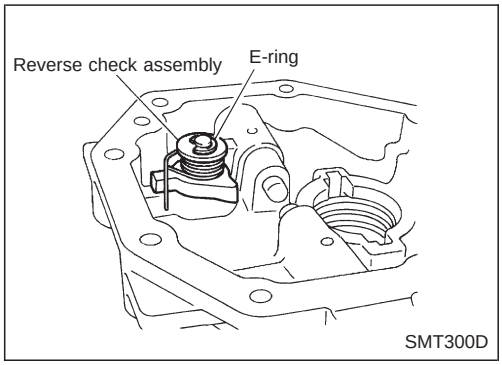
CONTROL HOUSING

1. Install select check plunger, select check spring and select check plug.
2. Install reverse check parts.

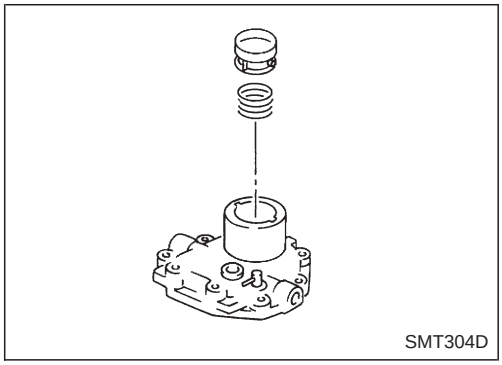
a. Install cam pin.



b. Install check plunger, spacer, reverse check spring and thrust washer.



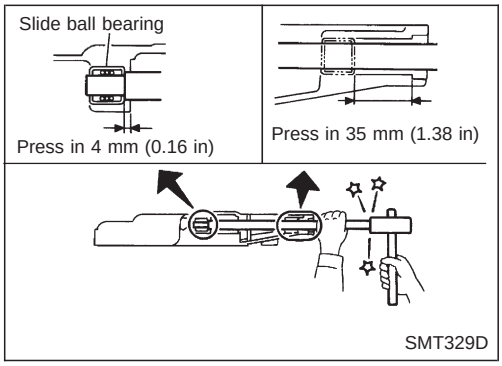
c. Install E-ring.



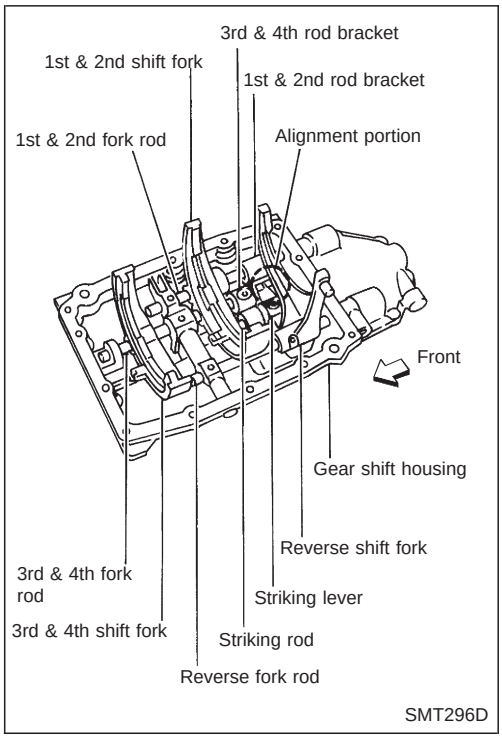
3. Assemble control housing parts as shown on left.

GEAR SHIFT HOUSING

1. Assemble gear shift housing.
2. Install slide ball bearing into gear shift housing using SST.

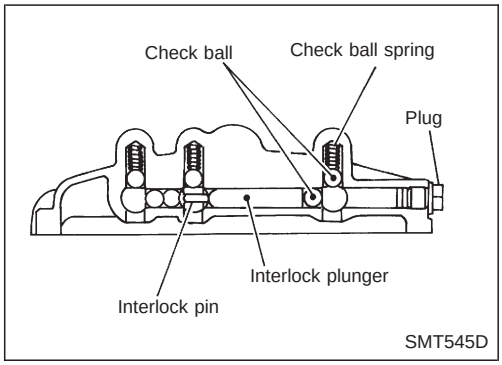


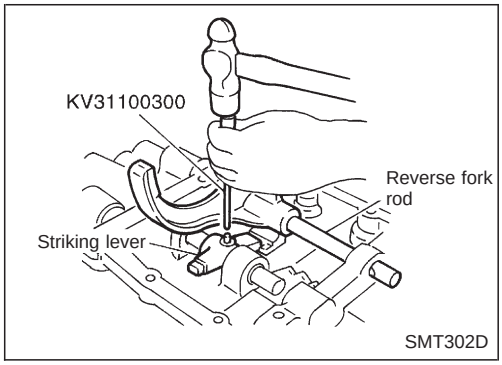
Shift Control Components (Cont'd)



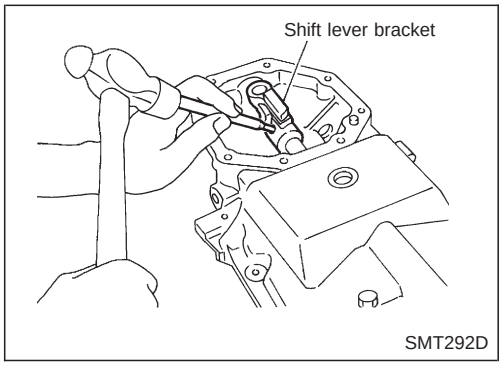
3. Install striking rod through striking lever and shift lever bracket.
- **Pay attention to direction of each part.**
- **Pay attention to direction of each part.**
- **Align cutout portion of striking lever, 1st & 2nd rod bracket, 3rd & 4th rod bracket and reverse shift fork.**

4. Install 1st & 2nd shift fork, 1st & 2nd rod bracket and 1st & 2nd fork rod.
5. Install 3rd & 4th rod bracket, 1st & 2nd and 3rd & 4th shift forks and 3rd & 4th fork rod.
6. Insert interlock plunger and check ball for interlock part, then install reverse shift fork and reverse fork rod.



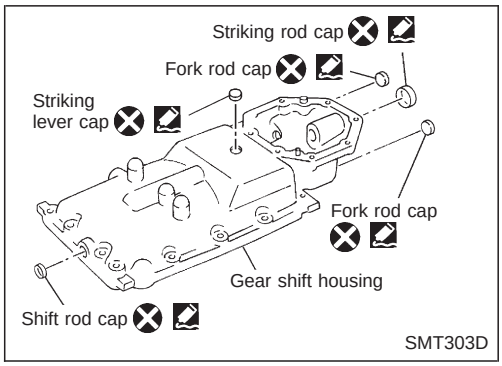


7. Drive in retaining pins into striking lever, each shift fork and bracket.

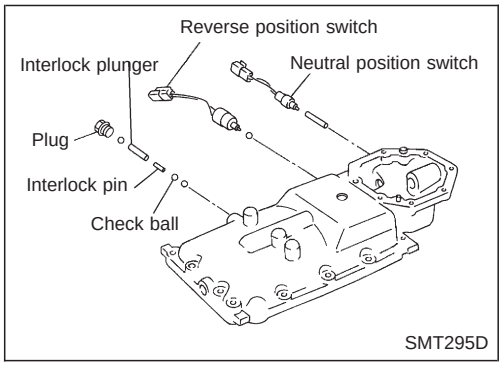


8. Install retaining pin into shift lever bracket.

Shift Control Components (Cont'd)



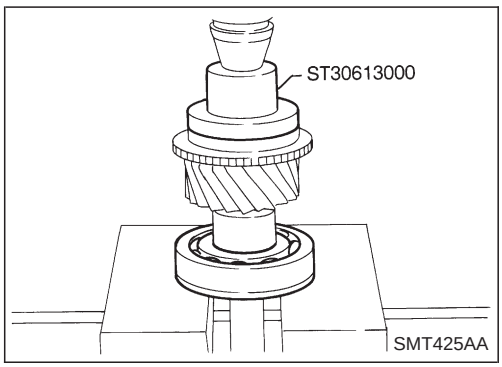
9. Install fork rod caps by tapping lightly.



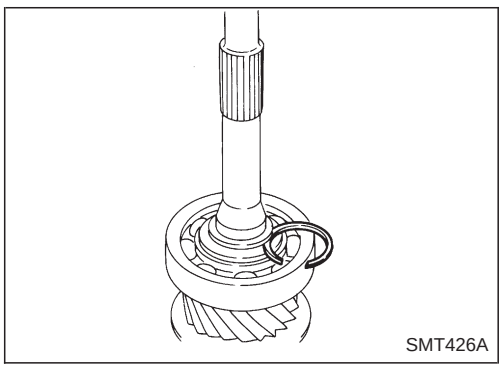
10. Install reverse and neutral position switches.

Gear Components

MAIN DRIVE GEAR

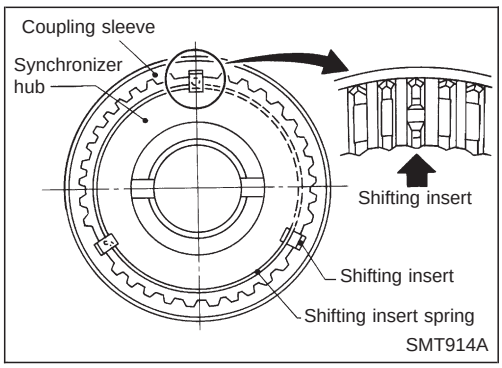


1. Press main drive gear bearing.



2. Select proper main drive gear snap ring to minimize clearance of groove, then install it.
   Allowable clearance of groove:
   0 - 0.15 mm (0 - 0.0059 in)
   Main drive gear snap ring:
   Refer to SDS, MT-1038.

MAIN SHAFT



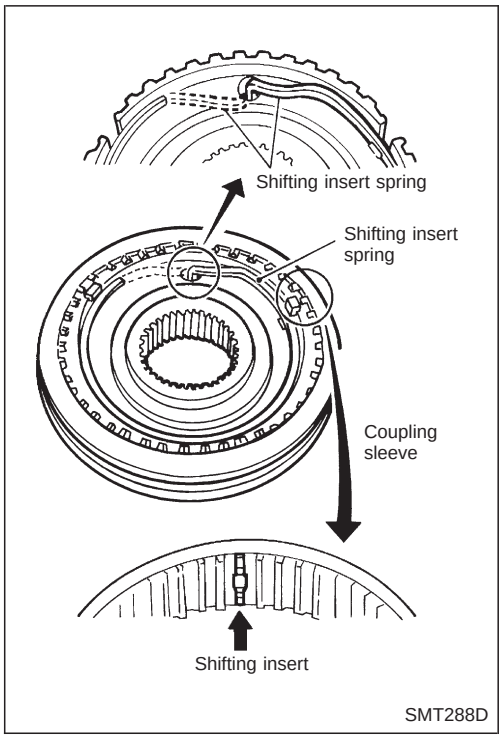
1. Assemble synchronizers.

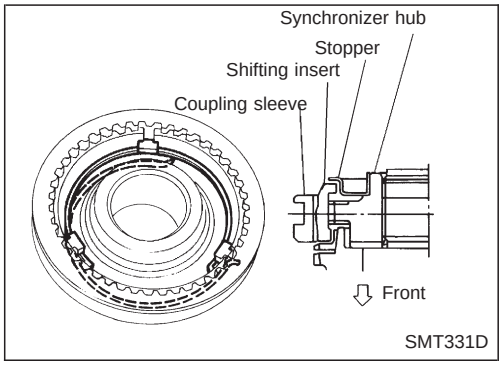
1st & 2nd synchronizer

- **Opening of shifting insert springs must not be aligned with each other.**

Gear Components (Cont'd)

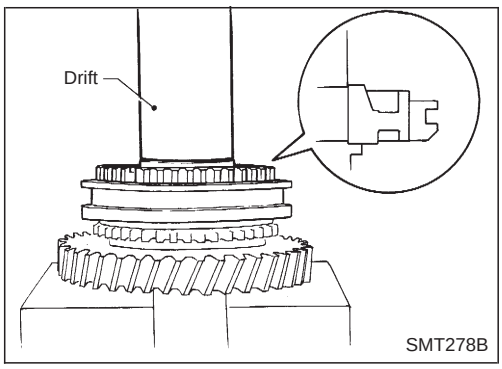
3rd & 4th synchronizer





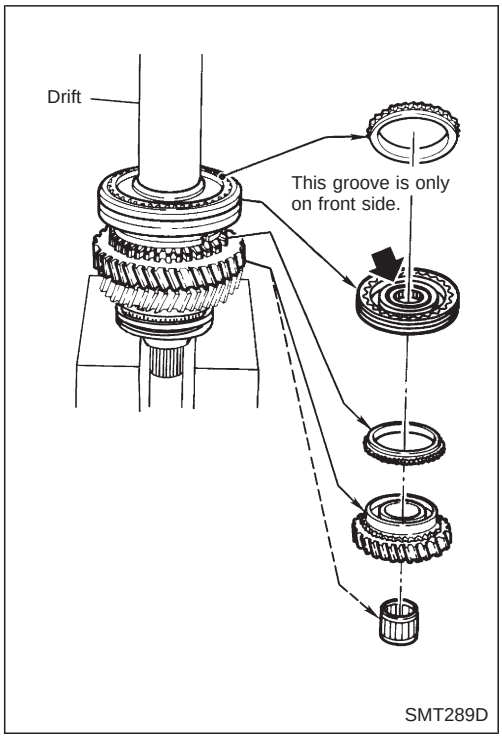
Reverse synchronizer

- **Pay attention to direction of synchronizer hub, shifting inserts and coupling sleeve.**
- **Openings of shift insert springs must not be aligned with each other.**

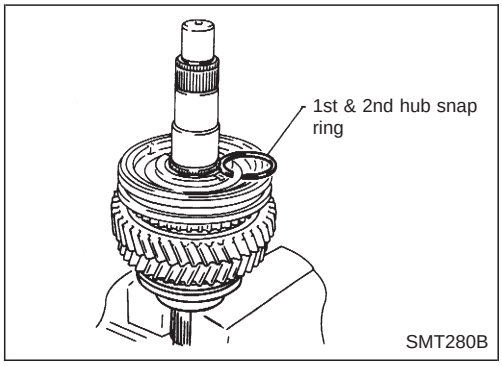


2. Press reverse synchronizer assembly together with reverse main gear and reverse gear needle bearing.
- **Pay attention to direction of reverse synchronizer hub assembly.**
3. Install 1st main gear and 1st gear needle bearing.

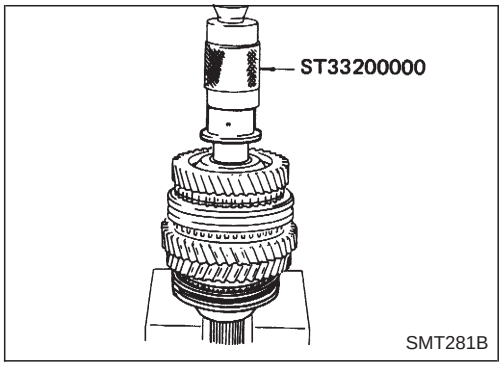
Gear Components (Cont'd)



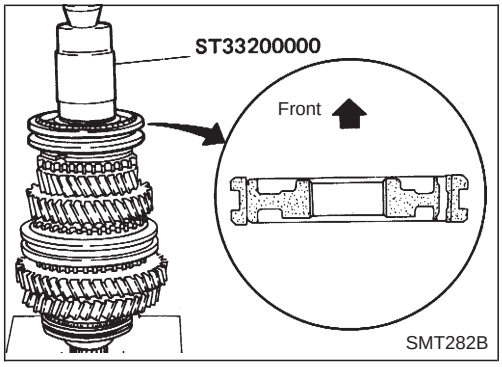
4. Press 1st & 2nd synchronizer assembly.
- **1st baulk ring and 2nd baulk ring are different.**



5. Select proper 1st & 2nd hub snap ring to minimize clearance of groove, then install it.
   Allowable clearance of groove:
   0 - 0.13 mm (0 - 0.0051 in)
   1st & 2nd hub snap ring:
   Refer to SDS, MT-1038.

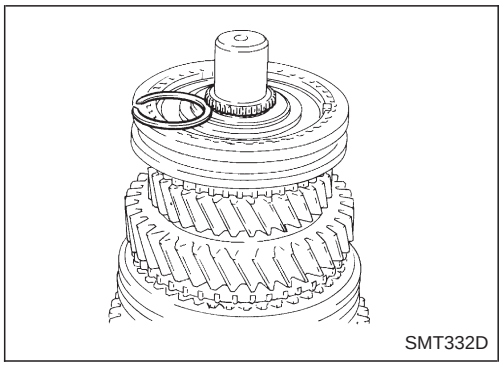


6. Install 2nd main gear and 2nd gear needle bearing.
7. Press 3rd gear bushing.
8. Install 3rd main gear and 3rd gear needle bearing.

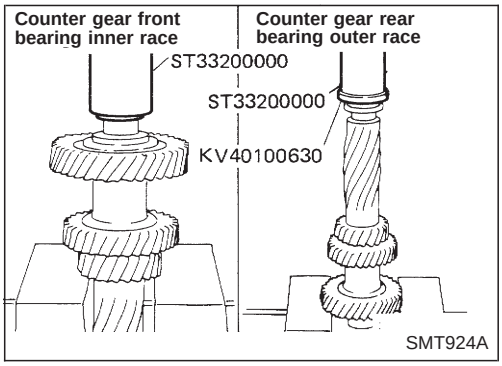


9. Press 3rd & 4th synchronizer assembly.
- **Pay attention to direction of synchronizer assembly.**

Gear Components (Cont'd)


SMT332D

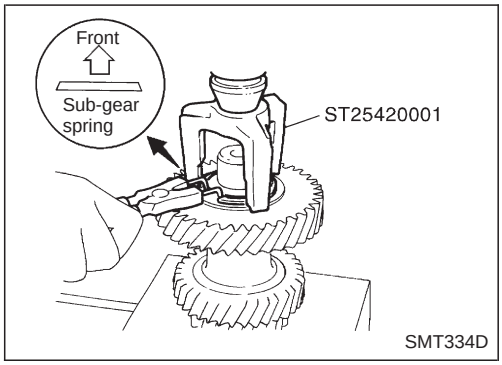
10. Select proper 3rd & 4th hub snap ring to minimize clearance of groove, then install it.
    Allowable clearance of groove:
    0 - 0.1 mm (0 - 0.004 in)
    3rd & 4th hub snap ring:
    Refer to SDS, MT-1038.
11. Measure 1st, 2nd, 3rd and reverse main gear end plays as the final check. — Refer to ''Disassembly''.



SMT924A

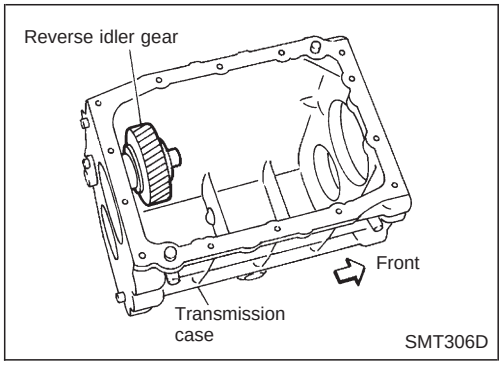
COUNTER GEAR

1. Press on counter gear front and rear bearing inner race.



SMT334D

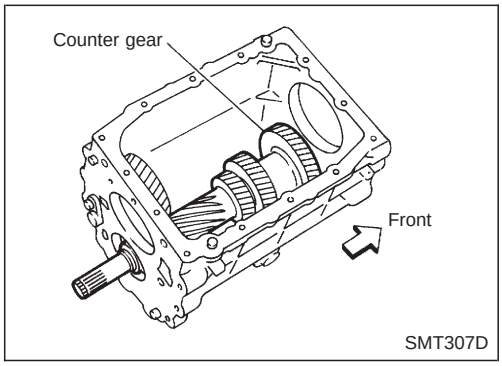
2. Install sub-gear, sub-gear spring, sub-gear washer, and snap ring, while compressing sub-gear spring.
- **Pay attention to direction of sub-gear spring.**



SMT306D

TRANSMISSION CASE

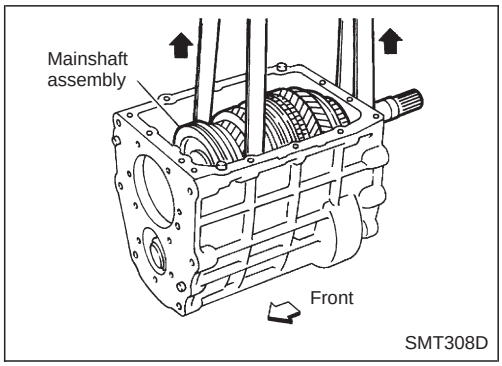
1. Install reverse idler shaft, thrust washers, needle bearings and gear.
- **Pay attention to direction of reverse idler gear and washers.**
2. Install lock plate of reverse idler shaft.



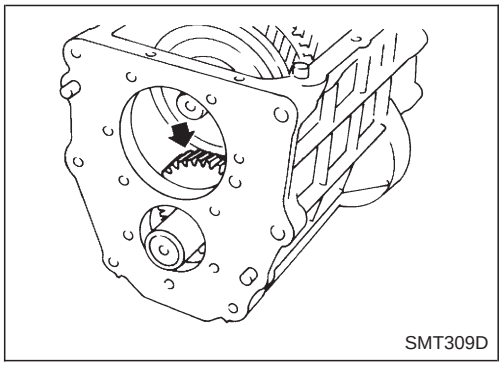
SMT307D

3. Settle counter gear assembly on bottom of transmission case.

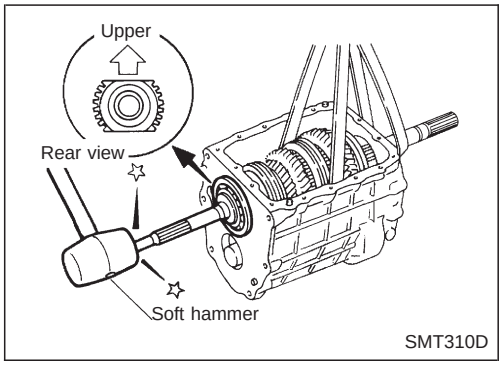
Gear Components (Cont'd)



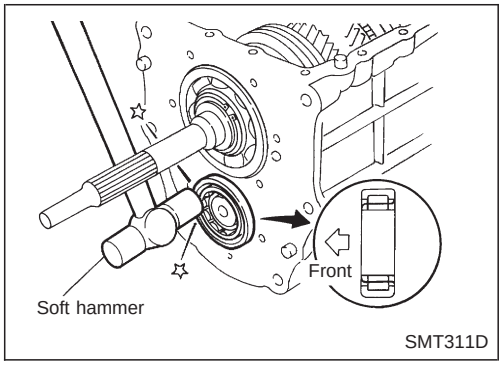
4. Place mainshaft assembly on top of counter gear assembly and then support it with hoist.



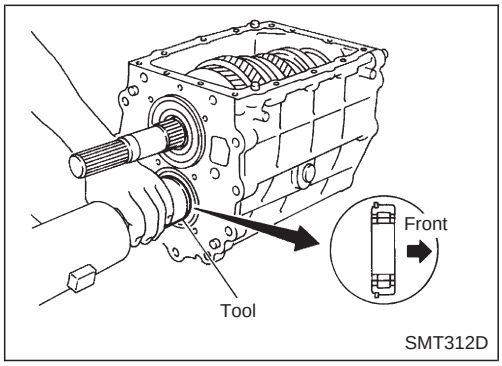
- **Align matching portion of counter gear and sub-gear tooth to upper side.**



5. Install main drive gear assembly by tapping front end of it lightly.
- **Set cutting portion of clutch gear on main drive gear to the upper side.**

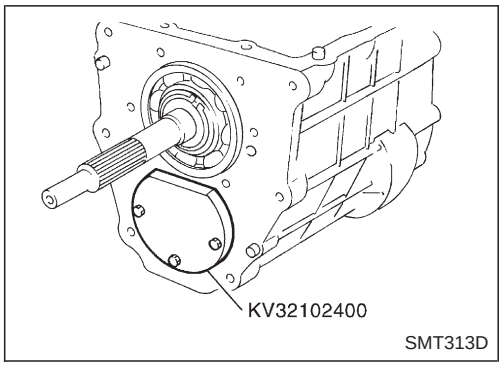


6. Install counter gear front bearing outer race by tapping it lightly while holding counter gear assembly.
- **Pay attention to direction.**

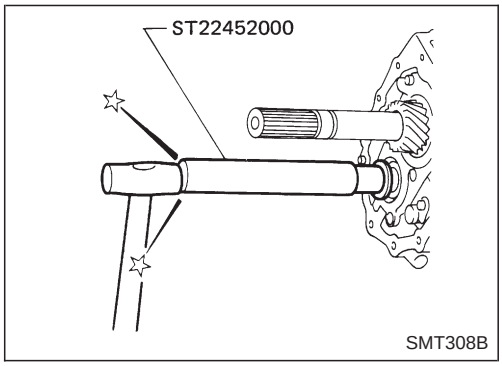


7. Install counter gear rear bearing outer race by tapping it lightly while holding counter gear assembly.
- **Pay attention to direction.**
8. Take off hoist from mainshaft.

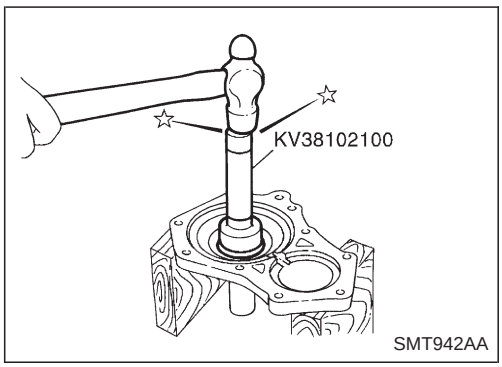
Gear Components (Cont'd)



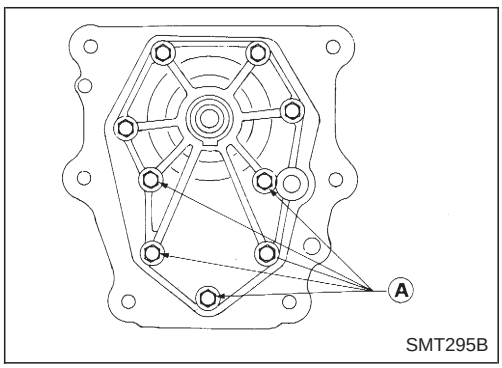
9. Install Tool onto transmission case.



10. Install OD gear bushing.
11. Remove KV32102400 (Counter gear stopper).



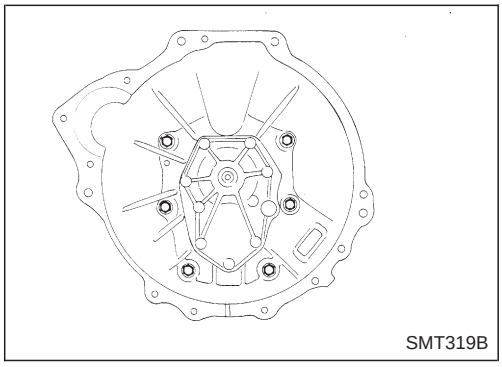
12. Install front cover oil seal.
- **Apply multi-purpose grease to lip of oil seal before installing.**



13. Install front cover.
- **Always use new bolts at portion Ⓐ as they are self-sealing bolts.**

  Tightening torque:

  Refer to Case Components, MT-1011.

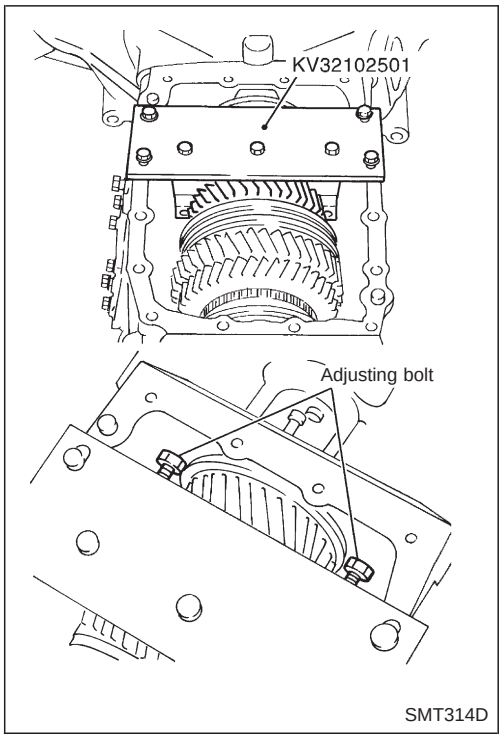


14. Install clutch housing.

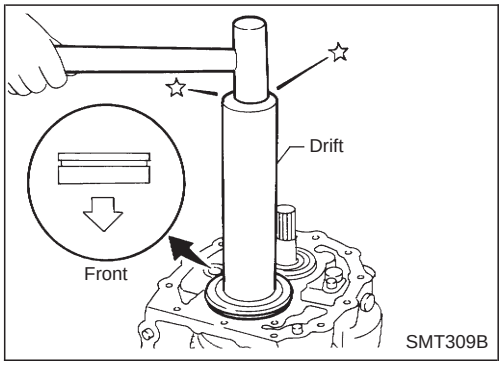
  Tightening torque:

  Refer to Case Components, MT-1011.

Gear Components (Cont'd)

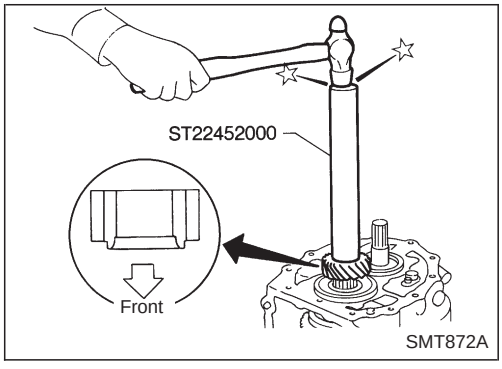


15. Install Tool onto transmission case.



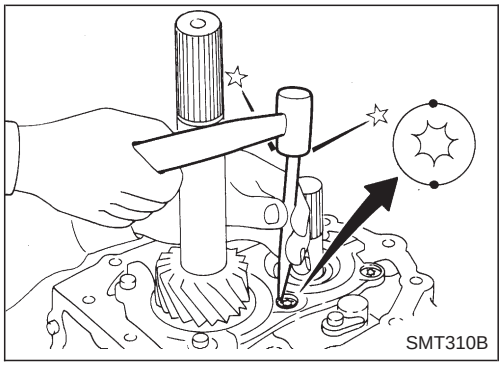
16. Stand transmission case assembly on two wooden blocks placed under clutch housing.
17. Install mainshaft bearing without snap ring to prevent it from damaging transmission case.
- **Pay attention to direction.**

18. Put snap ring back in place.



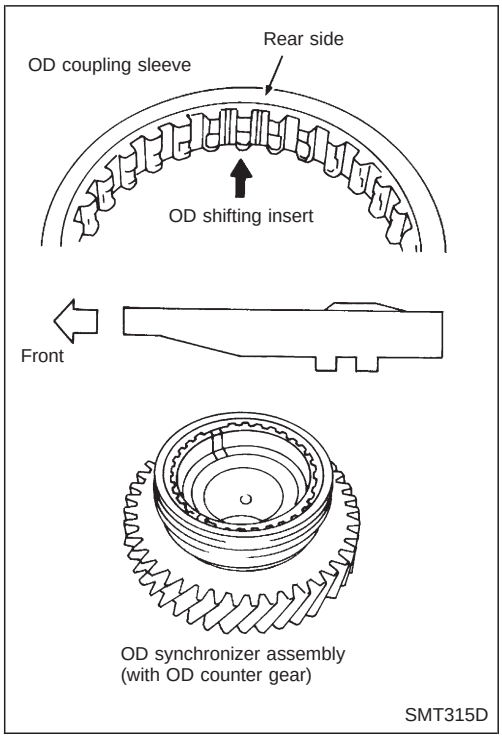
19. Install OD main gear.
- **Pay attention to direction.**

20. Remove KV32102500 (Mainshaft stopper).

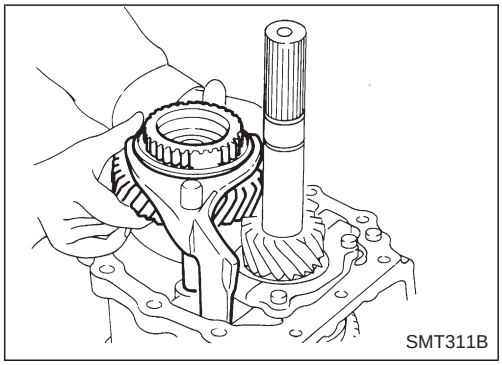


21. Install bearing retainer and then stake 4 torx bolts at two points.
- Install thrust washer and OD counter gear bushing.

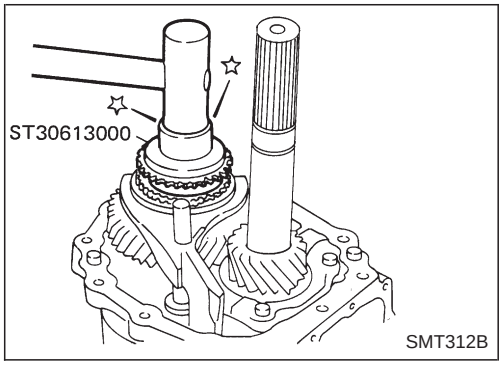
Gear Components (Cont'd)



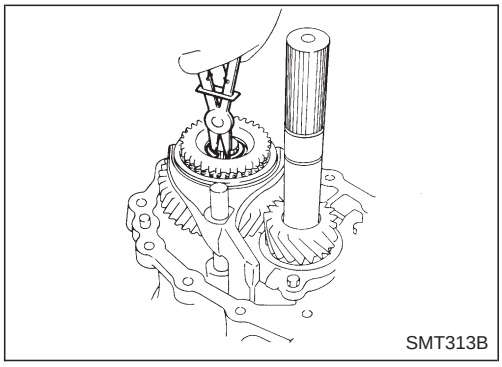
22. Install the following parts.
a. Assemble OD synchronizer onto OD counter gear.
- **Pay attention to direction of shifting inserts and OD coupling sleeve.**



b. Install OD counter gear with OD synchronizer assembly, OD shift fork and rod.

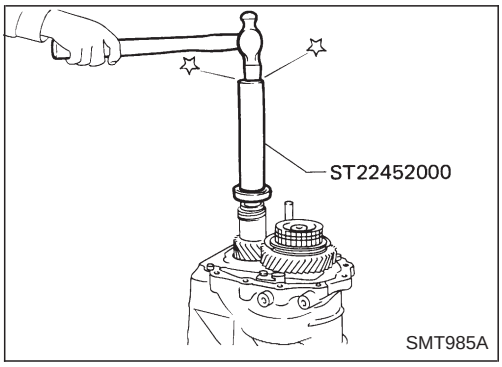


23. Install OD synchronizer cone.
24. Install OD synchronizer cone washer.

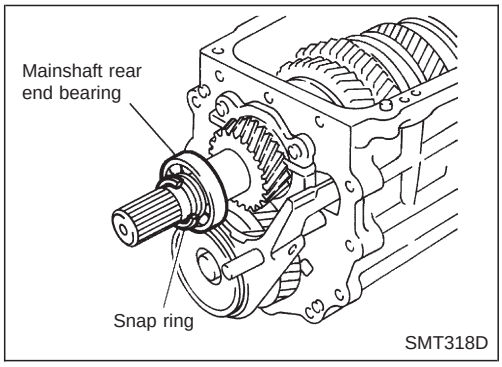


25. Select proper counter gear rear snap ring to minimize clearance of groove, then install it.
Allowable clearance of groove:
0 - 0.15 mm (0 - 0.0059 in)
Counter gear rear snap ring:
Refer to SDS, MT-1038.
- Measure OD counter gear end play as the final check — Refer to ''SDS'', MT-1038.

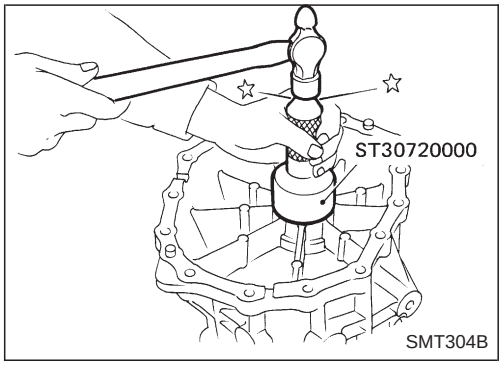
Gear Components (Cont'd)



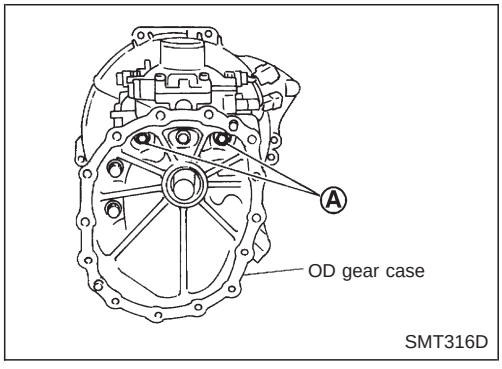
26. Install mainshaft spacer and mainshaft rear end bearing.



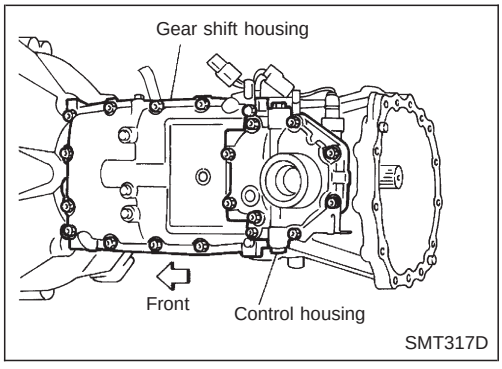
27. Select proper set of mainshaft rear end bearing snap ring to minimize clearance of groove, then install it.
Allowable clearance of groove:
0 - 0.15 mm (0 - 0.0059 in)
Mainshaft rear end bearing snap ring:
Refer to SDS, MT-1038.



28. Install rear oil seal.
- **Apply multi-purpose grease to lip of oil seal on OD gear case before installing.**



29. Install OD gear case and then tighten fixing bolts.
- **Always use new bolts at portion Ⓐ as they are self-sealing bolts.**
Tightening torque:
Refer to Case Components, MT-1011.



30. Install gear shift housing and control housing onto transmission case.
- **Always use new bolts at portion Ⓐ as they are self-sealing bolts.**

General Specifications

Applied model	ZD30DDTi
	Hardtop & Wagon
	4WD
Transmission	FS5R50B
Number of speed	5
Transmission control	Floor direct
Shift pattern	
Synchromesh type	Warner
Gear ratio	
1st	4.262
2nd	2.456
3rd	1.488
4th	1.000
OD	0.851
Reverse	3.972
Number of teeth	
Mainshaft	
Drive	27
1st	44
2nd	39
3rd	39
OD	25
Reverse	41
Countershaft	
Drive	34
1st	13
2nd	20
3rd	33
OD	37
Reverse	13
Reverse idler gear	27
Oil capacity ℓ (Imp pt)	3.8 (6-3/4)
Remarks	1st, 2nd and 3rd double baulk ring type synchronizer
	Reverse synchronizer type

Inspection and Adjustment

GEAR END PLAY

Unit: mm (in)

Gear	End play
1st main gear	0.20 - 0.48 (0.0079 - 0.0189)
2nd main gear	0.20 - 0.60 (0.0079 - 0.0236)
3rd main gear	0.20 - 0.45 (0.0079 - 0.0177)
OD counter gear	0.20 - 0.47 (0.0079 - 0.0185)
Reverse main gear	0.20 - 0.44 (0.0079 - 0.0173)

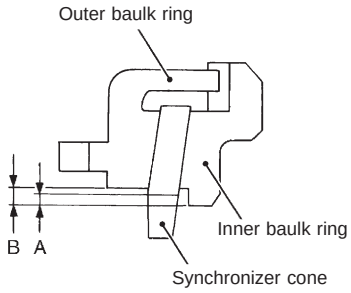
CLEARANCE BETWEEN BAULK RING AND GEAR

Main drive, OD and reverse baulk ring

Unit: mm (in)

Gear	Standard	Wear limit
Main drive gear	1.00 - 1.45 (0.0394 - 0.0571)	0.7 (0.028)
OD counter gear	1.00 - 1.45 (0.0394 - 0.0571)	
Reverse gear	1.00 - 1.45 (0.0394 - 0.0571)	

1st, 2nd and 3rd baulk ring (double baulk ring)



SMT327D

Unit: mm (in)

Dimension	Standard	Wear limit
A	0.7 - 0.9 (0.028 - 0.035)	0.2 (0.008)
B	1.4 - 1.6 (0.055 - 0.063)	0.2 (0.008)

AVAILABLE SNAP RING

Main drive gear snap ring

Unit: mm (in)

Allowable clearance	0 - 0.15 (0 - 0.0059)
Thickness	Part number
2.05 (0.0807)	32348-0T200
2.15 (0.0846)	32348-0T201
2.25 (0.0886)	32348-0T202

1st & 2nd hub snap ring

Unit: mm (in)

Allowable clearance	0 - 0.13 (0 - 0.0051)
Thickness	Part number
2.05 (0.0807)	32348-0T200
2.15 (0.0846)	32348-0T201

3rd & 4th hub snap ring

Unit: mm (in)

Allowable clearance	0 - 0.10 (0 - 0.0039)
Thickness	Part number
1.95 (0.0768)	32348-0T210
2.00 (0.0787)	32348-0T211
2.05 (0.0807)	32348-0T212
2.10 (0.0827)	32348-0T213
2.15 (0.0846)	32348-0T214
2.20 (0.0866)	32348-0T215

Counter gear rear snap ring

Unit: mm (in)

Allowable clearance	0 - 0.15 (0 - 0.0059)
Thickness	Part number
1.35 (0.0531)	32204-VB000
1.45 (0.0571)	32204-VB001
1.55 (0.0610)	32204-VB002
1.65 (0.0650)	32204-VB003
1.75 (0.0689)	32204-VB004
1.85 (0.0728)	32204-VB005

Mainshaft rear end bearing snap ring

Unit: mm (in)

Allowable clearance	0 - 0.15 (0 - 0.0059)
Thickness	Part number
1.8 (0.071)	32204-VB010
1.9 (0.075)	32204-VB011
2.0 (0.079)	32204-VB012
2.1 (0.083)	32204-VB013
2.2 (0.087)	32204-VB014
2.3 (0.091)	32204-VB015
2.4 (0.094)	32204-VB016