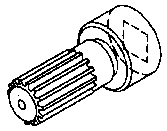
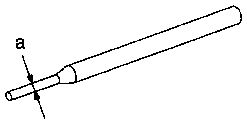
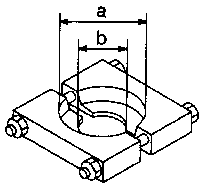
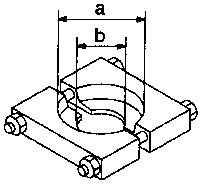
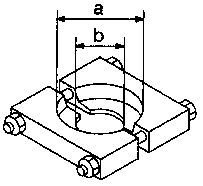
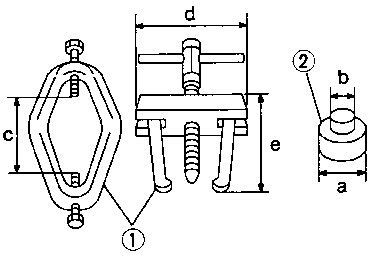
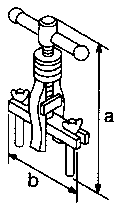
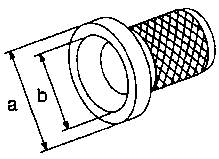
SECTION MT

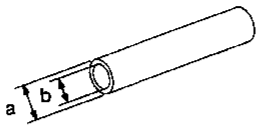
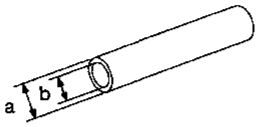
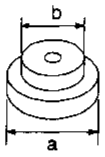
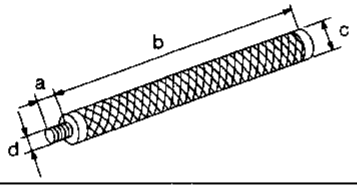
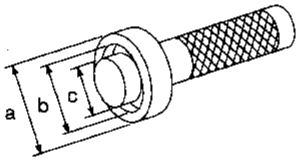
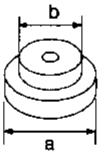
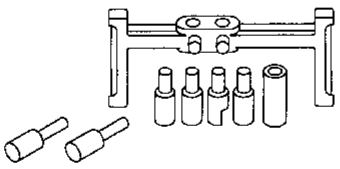
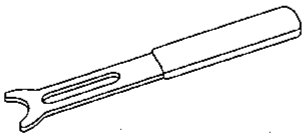
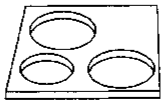
CONTENTS

Special Service Tools

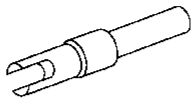
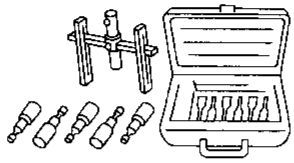
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description	
KV38105210 (—) Preload adapter	 NT075	Measuring turning torque of final drive assembly Measuring total turning torque
KV32101000 (J25689-A) Pin punch	 NT410	Removing and installing retaining pin **a: 4 mm (0.16 in) dia.**
ST22730000 (J25681) Puller	 NT411	Removing mainshaft front and rear bearing inner race **a: 82 mm (3.23 in) dia.** **b: 30 mm (1.18 in) dia.**
ST30031000 (J22912-01) Puller	 NT411	Removing input shaft front and rear bearing Removing 4th & 5th main gear **a: 90 mm (3.54 in) dia.** **b: 50 mm (1.97 in) dia.**
ST30021000 (J22912-01) Puller	 NT411	Removing 5th synchronizer Removing 3rd & 4th synchronizer Removing 2nd & 3rd main gear **a: 110 mm (4.33 in) dia.** **b: 68 mm (2.68 in) dia.**
ST3306S001 (J22888-D) Differential side bearing puller set ① ST33051001 (J22888-D) Puller ② ST33061000 (J8107-2) Adapter	 NT413	Removing differential side bearing inner race **a: 38 mm (1.50 in) dia.** **b: 28.5 mm (1.122 in) dia.** **c: 130 mm (5.12 in)** **d: 135 mm (5.31 in)** **e: 100 mm (3.94 in)**
ST33290001 (J34286) Puller	 NT414	Removing differential oil seal Removing mainshaft rear bearing outer race Removing differential side bearing outer race **a: 250 mm (9.84 in)** **b: 160 mm (6.30 in)**
ST33400001 (J26082) Drift	 NT086	Installing differential oil seal (50A and 50V right side) **a: 60 mm (2.36 in) dia.** **b: 47 mm (1.85 in) dia.**

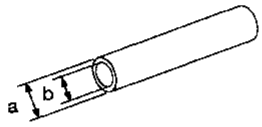
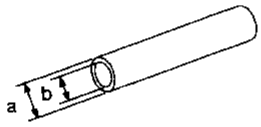
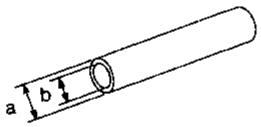
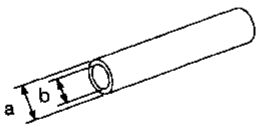
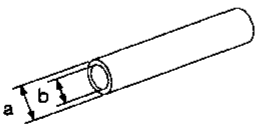
Special Service Tools (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	
ST30600000 (J25863-01) Drift	 NT065	Installing input shaft front bearing **a: 36 mm (1.42 in) dia.** **b: 31 mm (1.22 in) dia.**
ST22452000 (J34335) Drift	 NT065	Installing 3rd, 4th and 5th main gear **a: 45 mm (1.77 in) dia.** **b: 36 mm (1.42 in) dia.**
ST30621000 (J25742-5) Drift	 NT073	Installing mainshaft rear bearing outer race (Use with ST30611000.) **a: 79 mm (3.11 in) dia.** **b: 59 mm (2.32 in) dia.**
ST30611000 (J25742-1)	 NT419	(Use with ST30621000.) **a: 15 mm (0.59 in)** **b: 335 mm (13.19 In)** **c: 25 mm (0.98 in) dia.** **d: M12 x 1.5P**
KV38100300 (—) Drift	 NT085	Installing differential side bearing **a: 54 mm (2.13 in) dia.** **b: 46 mm (1.81 in) dia.** **c: 32 mm (1.26 in) dia.**
ST30613000 (—) Drift	 NT073	Installing differential side bearing **a: 72 mm (2.83 in) dia.** **b: 48 mm (1.89 in) dia.**
(J34290) Shim selecting tool set	 NT080	Selecting differential side bearing adjusting shim
(J34305) Snap ring remover and installer	 NT081	Removing and installing stopper ring of shift fork
(J25407-2)	 NT082	Measuring reverse baulk ring wear

Special Service Tools (Cont'd)

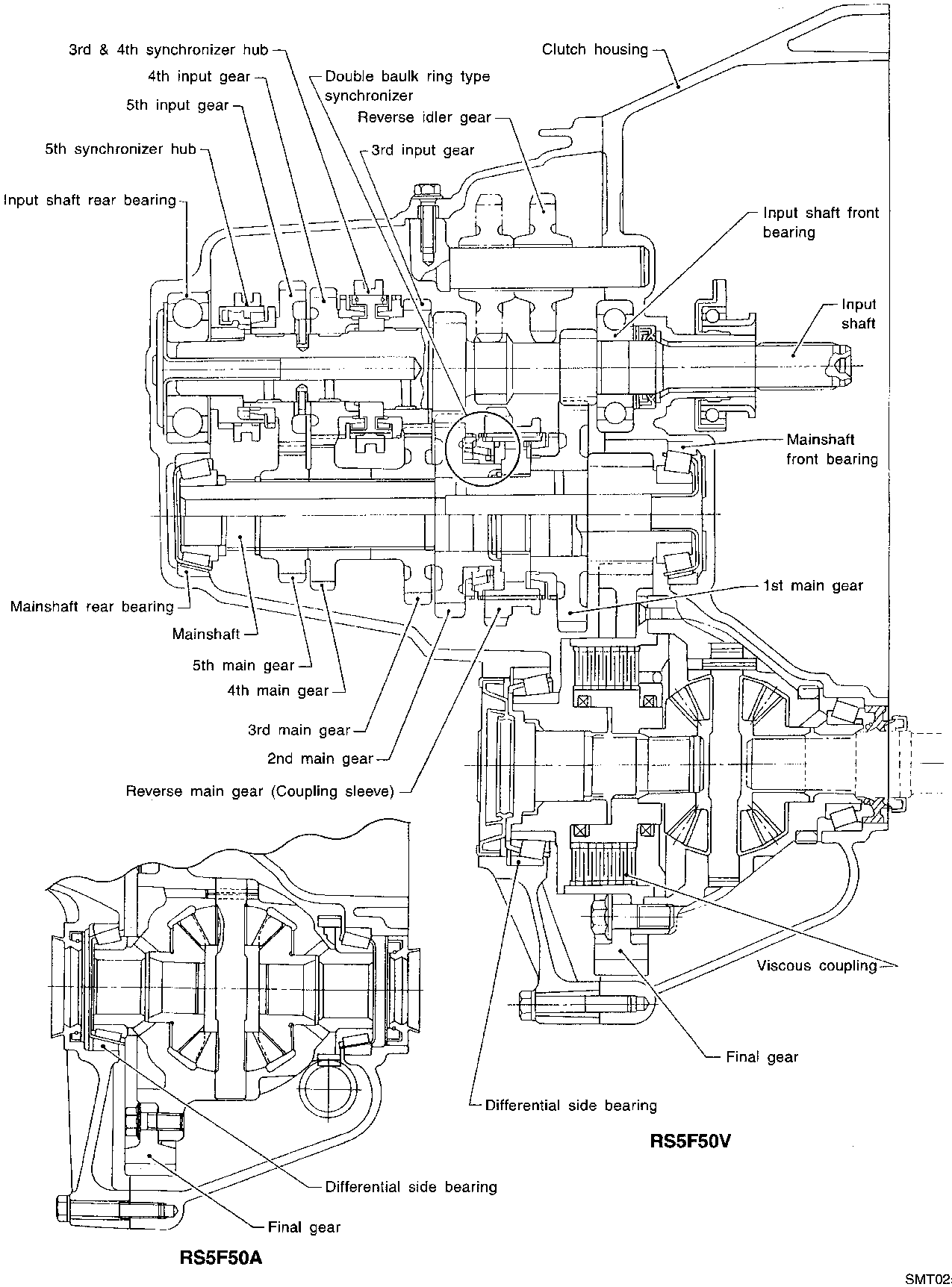
Tool number (Kent-Moore No.) Tool name	Description	
KV38106500 (J34284) Preload adapter	 NT087	Measuring turning torque of final drive assembly
(J34291) Shim setting gauge set	 NT101	Selecting side gear thrust washer

Commercial Service Tools

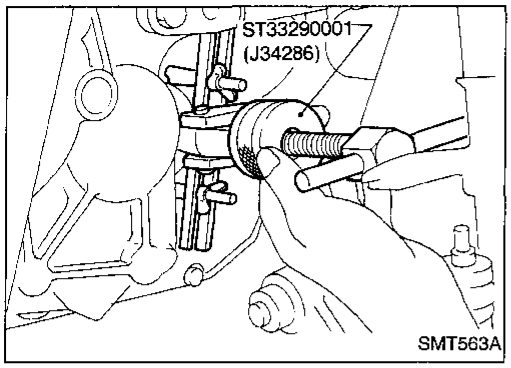
Tool name	Description	
Drift	 NT065	Installing differential side bearing inner race **a: 45 mm (1.77 in) dia.** **b: 41 mm (1.61 in) dia.**
Drift	 NT065	Installing differential side bearing outer race **a: 69 mm (2.72 in) dia.** **b: 64 mm (2.52 in) dia.**
Drift	 NT065	Installing striking rod oil seal **a: 38 mm (1.50 in) dia.** **b: 20 mm (0.79 in) dia.**
Drift	 NT065	Installing differential oil seal (50V left side) **a: 92 mm (3.62 in) dia.** **b: 72 mm (2.83 in) dia.**
Drift	 NT065	Installing differential side bearing outer race (50V) **a: 99 mm (3.90 in) dia.** **b: 94 mm (3.70 in) dia.**

Cross-sectional View

RS5F50A AND 50V



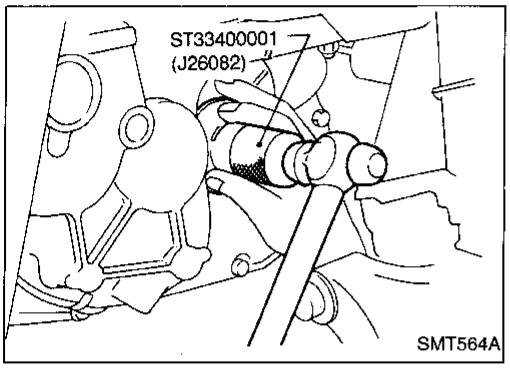
SMT025D



Replacing Oil Seal

DIFFERENTIAL OIL SEAL

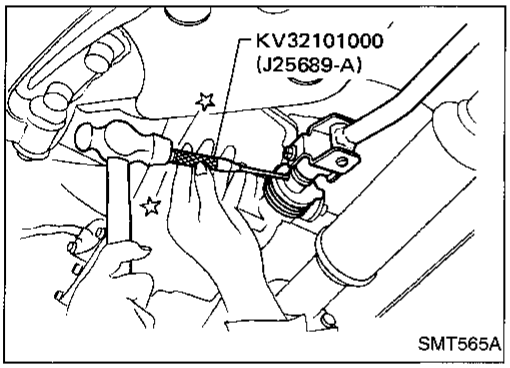
1. Drain gear oil from transaxle.
2. Remove drive shafts. Refer to FA section ("Removal", "FRONT AXLE — Drive Shaft").
3. Remove differential oil seal.



4. Install differential oil seal.

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

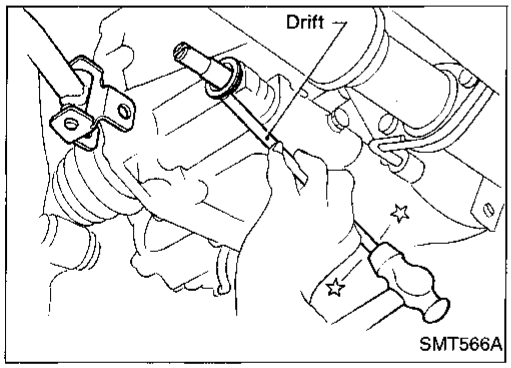
5. Install drive shafts. Refer to FA section ("Installation", "FRONT AXLE — Drive Shaft").



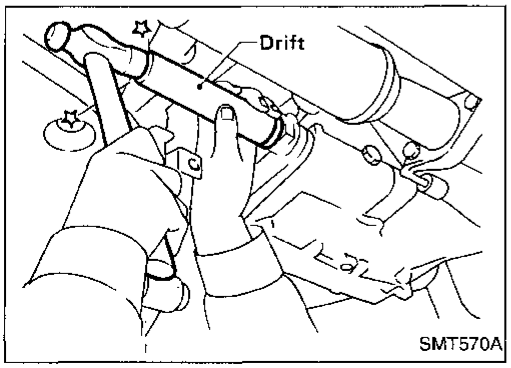
STRIKING ROD OIL SEAL

1. Remove transaxle control rod from yoke.
2. Remove retaining pin.

- **Be careful not to damage boot.**

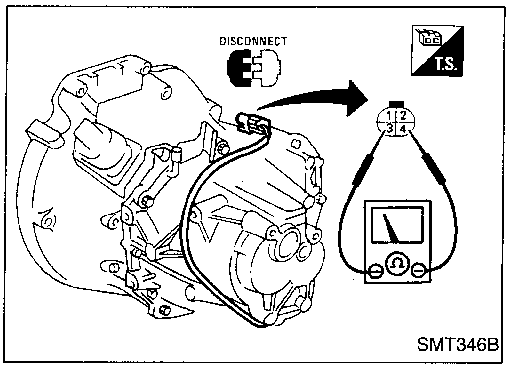


3. Remove striking rod oil seal.



4. Install striking rod oil seal.

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

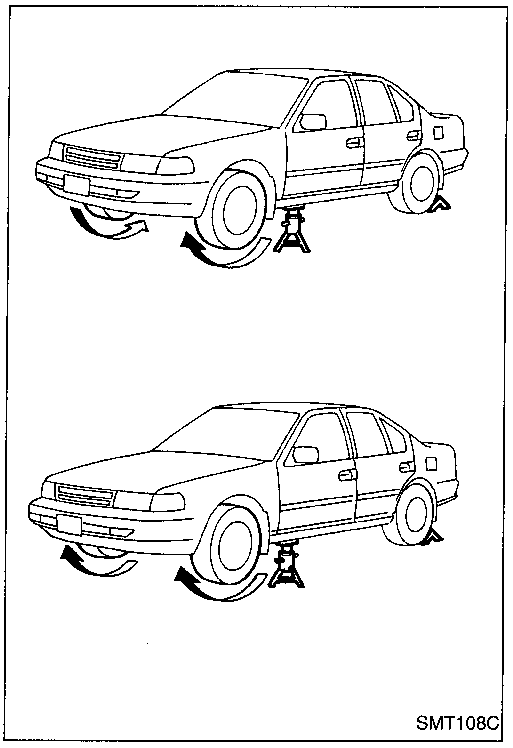


Position Switch Check

BACK-UP LAMP SWITCH AND NEUTRAL POSITION SWITCH

- Check continuity.

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



Viscous Coupling Check

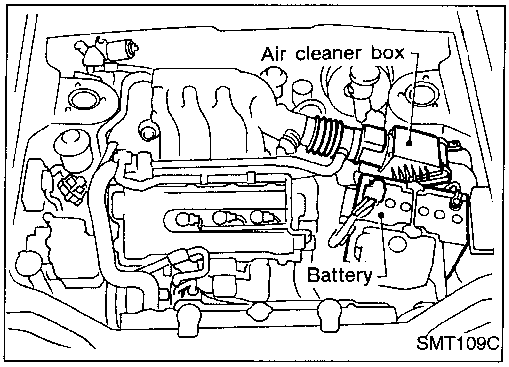
1. Apply parking brake firmly and place shift lever in the neutral position.
2. Jack up front wheels.
3. Rotate one front wheel and check turning direction of the other front wheel.

Turning direction of the two wheels is opposite:

The viscous coupling is not functioning normally.

Turning direction of the two wheels is the same:

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



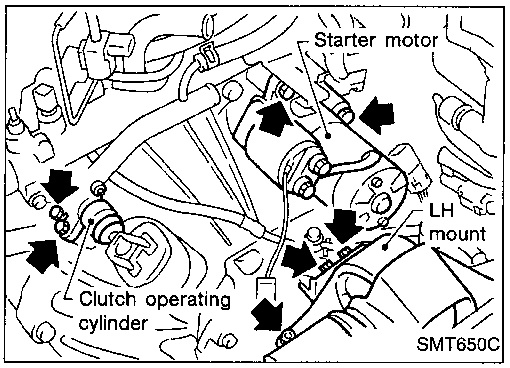
Removal

CAUTION:

Remove the crankshaft position sensor (POS) from transaxle assembly before separating transaxle from engine.

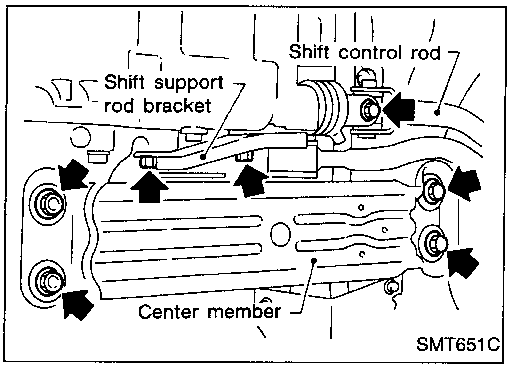
Be careful not to damage sensor edge.

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



3. Remove clutch operating cylinder from transaxle. Tighten clutch operating cylinder to the specified torque. Refer to CL section ("CLUTCH SYSTEM — Hydraulic Type").
4. Remove clutch hose clamp.
5. Disconnect speedometer pinion, position switch and ground harness connectors.
6. Remove starter motor from transaxle.
7. Remove crankshaft position sensor (POS) from transaxle front side.

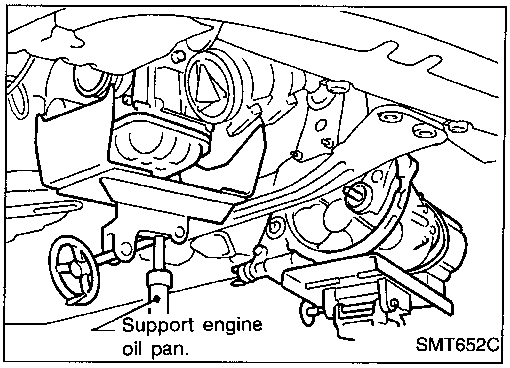
Removal (Cont'd)



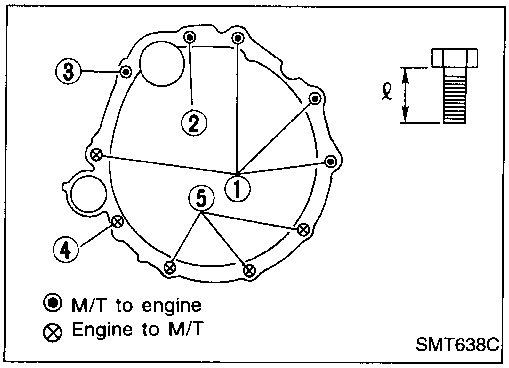
8. Remove shift control rod and support rod bracket from transaxle.
9. Drain gear oil from transaxle.
10. Draw out drive shafts from transaxle. Refer to FA section ("Removal", "FRONT AXLE — Drive Shaft").
11. Support engine of transaxle by placing a jack under oil pan.

CAUTION:
Do not place jack under oil pan drain plug.

12. Remove bolts securing center member. Tighten center member to the specified torque. Refer to EM section ("ENGINE REMOVAL").



13. Remove LH mounts. Tighten center member to the specified torque. Refer to EM section ("ENGINE REMOVAL").
14. Remove bolts securing transaxle.
15. Lower transaxle while supporting it with a jack.



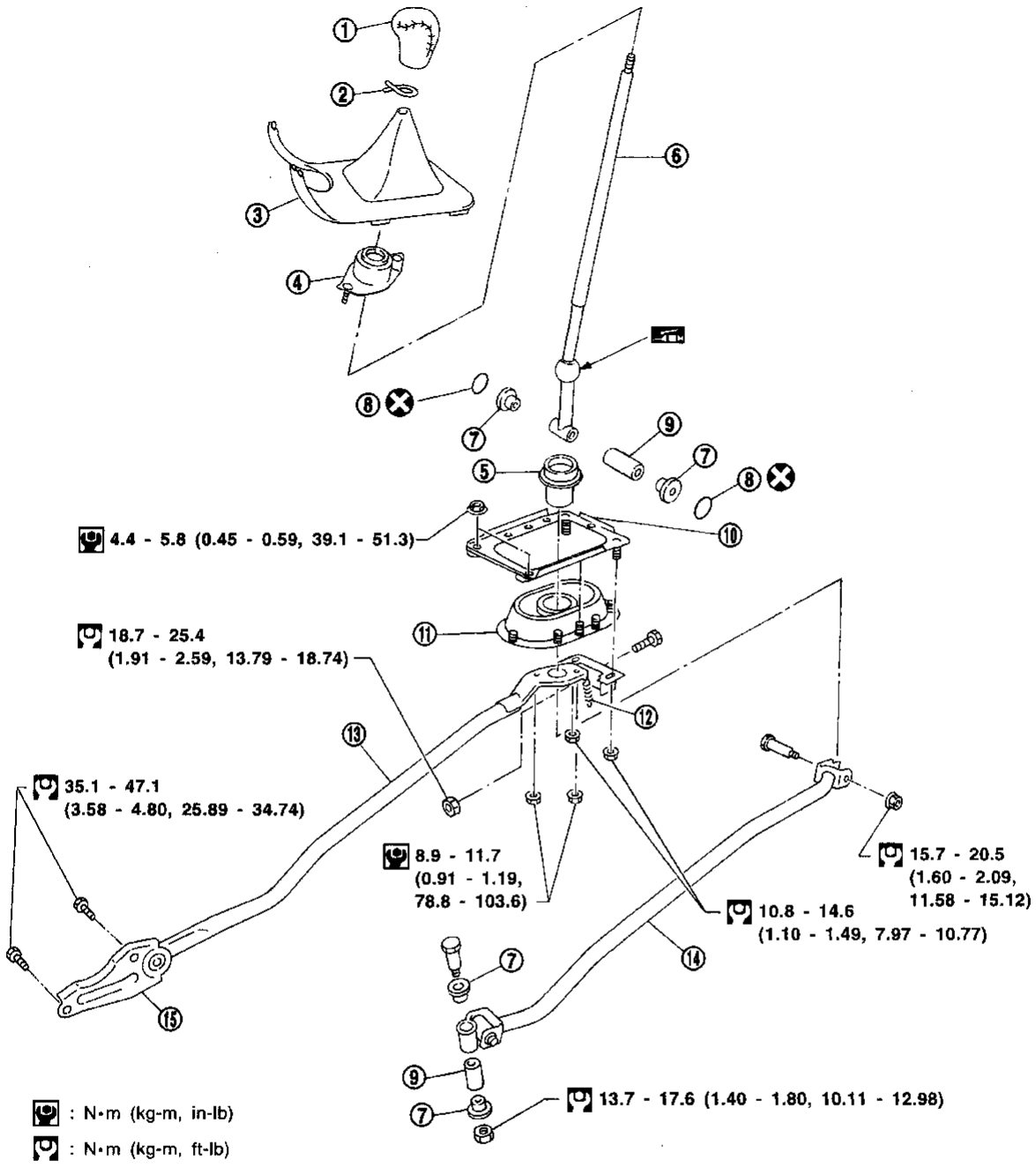
Installation

- Tighten all transaxle bolts.

Bolt No.	Tightening torque N·m (kg-m, ft-lb)	"ℓ" mm (in)
①	70 - 79 (7.1 - 8.1, 51 - 59)	52 (2.05)
②	70 - 79 (7.1 - 8.1, 51 - 59)	65 (2.56)
③	70 - 79 (7.1 - 8.1, 51 - 59)	124 (4.88)
④	35.1 - 47.1 (3.58 - 4.80, 25.89 - 34.74)	40 (1.57)
⑤	35.1 - 47.1 (3.58 - 4.80, 25.89 - 34.74)	40 (1.57)

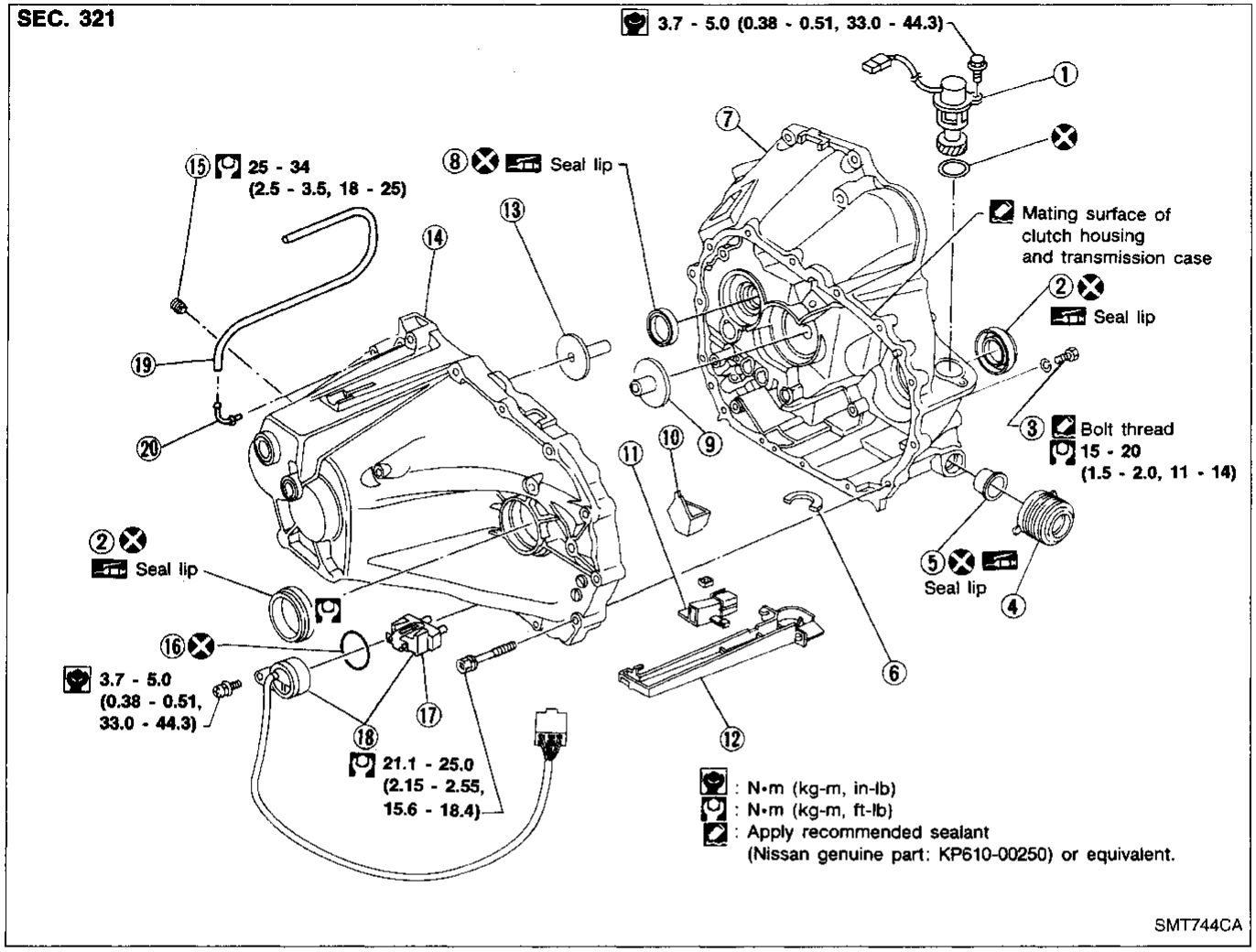
③ with starter
④ with support rod bracket

SEC. 341



① Control lever knob
② Boot retainer
③ Boot
④ Control lever socket
⑤ Seat-bearing set
⑥ Control lever
⑦ Bushing
⑧ O-ring
⑨ Collar
⑩ Plate bolt
⑪ Transaxle hole cover
⑫ Return spring
⑬ Support rod
⑭ Shift control rod
⑮ Shift support rod bracket

Case Components



① Speedometer pinion
② Differential oil seal
③ Drain plug
④ Boot
⑤ Striking rod oil seal
⑥ Magnet
⑦ Clutch housing
⑧ Input shaft oil seal
⑨ Oil channel (Mainshaft)
⑩ Oil pocket
⑪ Box breather
⑫ Oil gutter
⑬ Oil channel (Input shaft)
⑭ Transmission case
⑮ Filler plug
⑯ O-ring
⑰ Movable plate assembly
⑱ Position switch
⑲ Breather hose
⑳ Breather pipe

Gear Components

SEC. 322

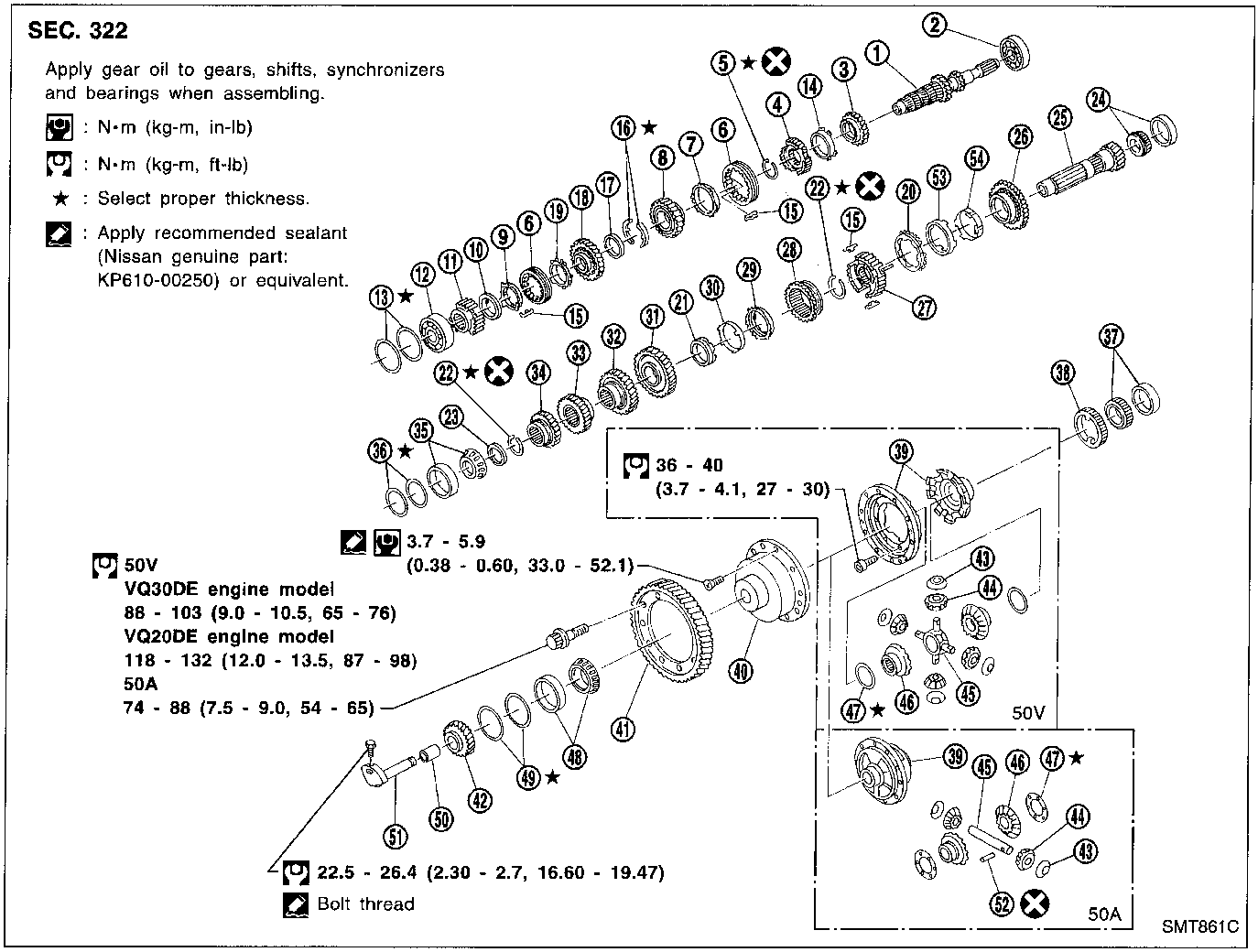
Apply gear oil to gears, shifts, synchronizers and bearings when assembling.

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

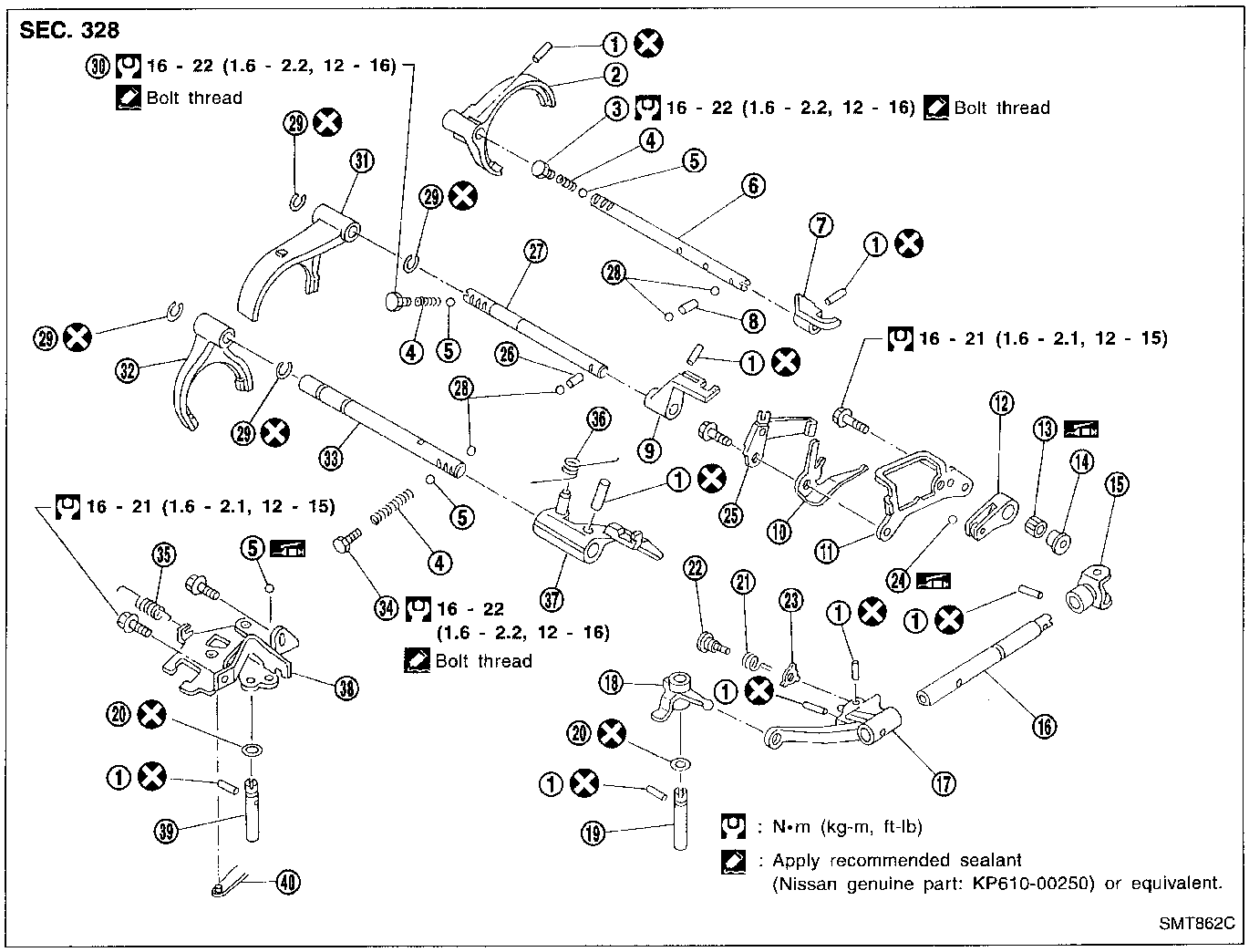
★ : Select proper thickness.

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

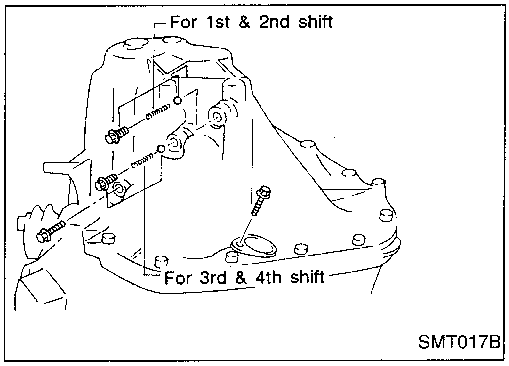


① Input shaft
② Input shaft front bearing
③ 3rd input gear
④ 3rd & 4th synchronizer hub
⑤ Snap ring
⑥ Coupling sleeve
⑦ 4th baulk ring
⑧ 4th input gear
⑨ Reverse baulk ring
⑩ Reverse synchronizer cone
⑪ 5th synchronizer hub
⑫ Input shaft rear bearing
⑬ Input shaft bearing adjusting shim
⑭ 3rd baulk ring
⑮ Insert spring
⑯ 4th input gear thrust washer
⑰ Thrust washer ring
⑱ 5th input gear
⑲ 5th baulk ring
⑳ 1st outer baulk ring
㉑ 2nd inner baulk ring
㉒ Snap ring
㉓ Mainshaft bearing spacer
㉔ Mainshaft front bearing
㉕ Mainshaft
㉖ 1st main gear
㉗ 1st & 2nd synchronizer hub
㉘ Reverse main gear (Coupling sleeve)
㉙ 2nd outer baulk ring
㉚ 2nd gear synchronizer cone
㉛ 2nd main gear
㉜ 3rd main gear
㉝ 4th main gear
㉞ 5th main gear
㉟ Mainshaft rear bearing
㊱ Mainshaft bearing adjusting shim
㊲ Differential side bearing
㊳ Speedometer drive gear
㊴ Differential case
㊵ Viscous coupling
㊶ Final gear
㊷ Reverse idler gear
㊸ Pinion mate gear thrust washer
㊹ Pinion mate gear
㊺ Pinion mate shaft
㊻ Side gear
㊼ Side gear thrust washer
㊽ Differential side bearing
㊾ Differential side bearing adjusting shim
㊿ Bushing
(51) Reverse idler shaft
(52) Retaining pin
(53) 1st gear synchronizer cone
(54) 1st inner baulk ring

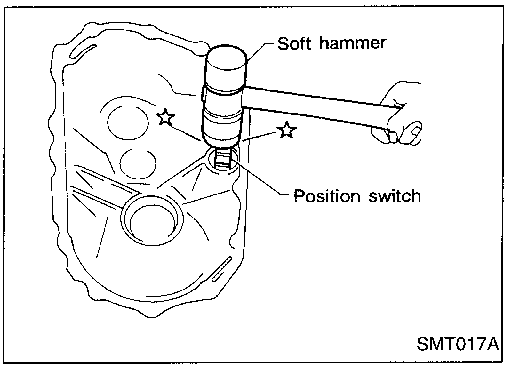
Shift Control Components



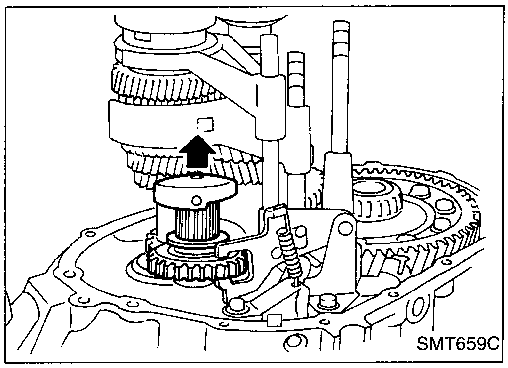
① Retaining pin
② 1st & 2nd shift fork
③ 1st & 2nd check plug
④ Return spring
⑤ Check ball
⑥ 1st & 2nd fork rod
⑦ 1st & 2nd bracket
⑧ Interlock plunger
⑨ 3rd & 4th bracket
⑩ Return spring
⑪ Reverse gate
⑫ Select arm
⑬ Return bearing
⑭ Bush
⑮ Yoke
⑯ Striking rod
⑰ Striking lever
⑱ Selector
⑲ Selector shaft
⑳ O-ring
㉑ Return spring
㉒ Cam pin
㉓ Reverse check cam
㉔ Check ball
㉕ Select check spring
㉖ Interlock plunger
㉗ 3rd & 4th fork rod
㉘ Interlock ball
㉙ Stopper ring
㉚ 3rd & 4th check plug
㉛ 3rd & 4th shift fork
㉜ 5th shift fork
㉝ 5th fork rod
㉞ 5th & reverse check plug
㉟ Reverse lever spring
㊱ Reverse lock spring
㊲ 5th & reverse bracket
㊳ Reverse lever assembly
㊴ Reverse arm shaft
㊵ Control lever spring



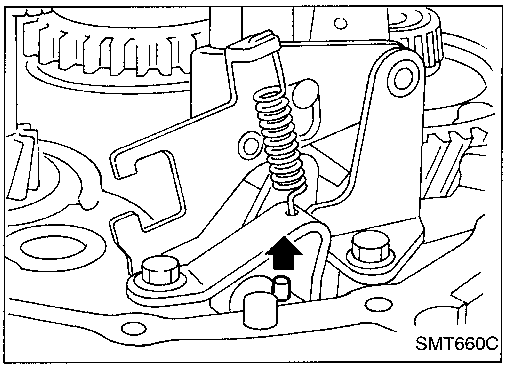
1. Before removing transmission case, remove bolts and plugs as shown left.
2. Remove transmission case.



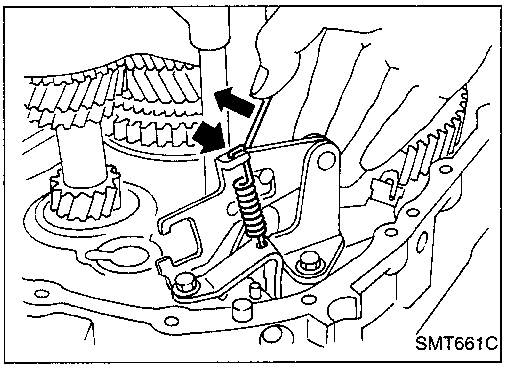
3. Remove position switch.



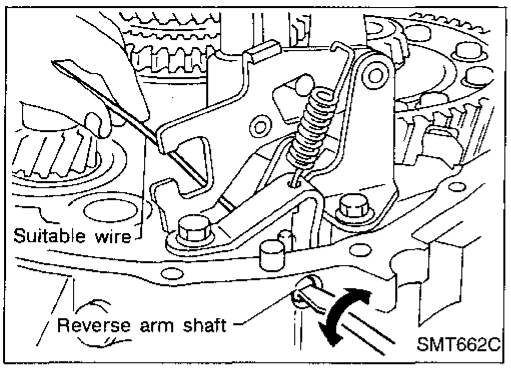
4. Mesh 4th gear, and then remove reverse idler shaft and reverse idler gear.



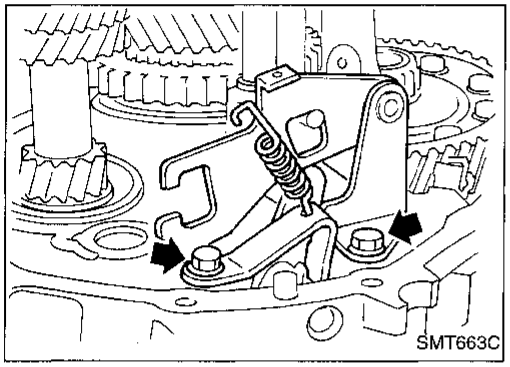
5. Pull out retaining pin.



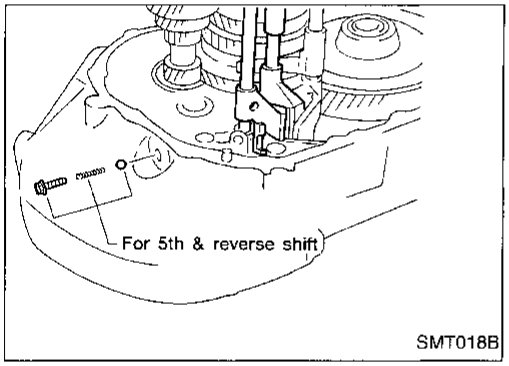
6. Remove reverse lever spring and reverse lock spring from reverse lever assembly.



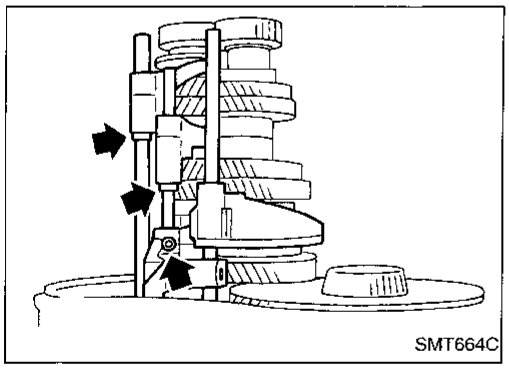
7. Remove reverse arm shaft while rotating it.



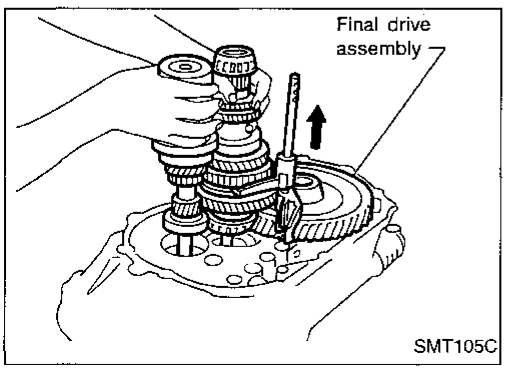
8. Remove reverse lever assembly.



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

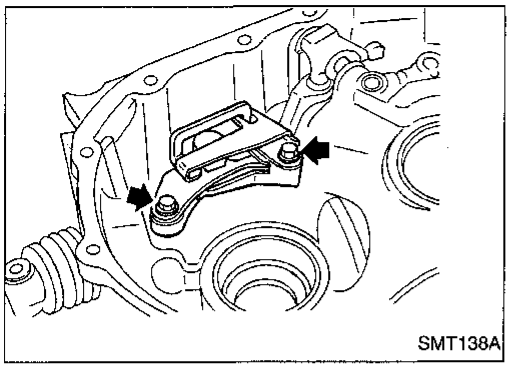


10. Remove stopper rings and retaining pins from 5th and 3rd & 4th fork rods.
11. Remove 5th and 3rd & 4th fork rods. Then remove forks and brackets.

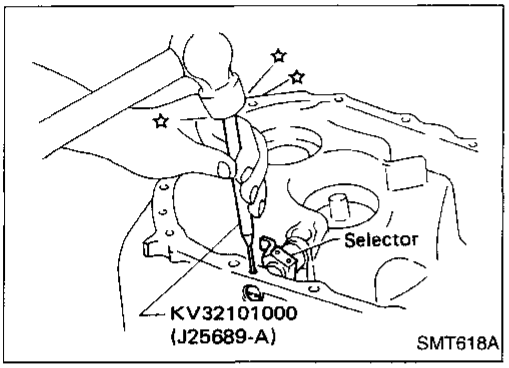


12. Remove both input and mainshafts with 1st & 2nd fork and fork rod as a set.
13. Remove final drive assembly.

- **Always withdraw mainshaft straight out. Failure to do so can damage resin oil channel on clutch housing side.**

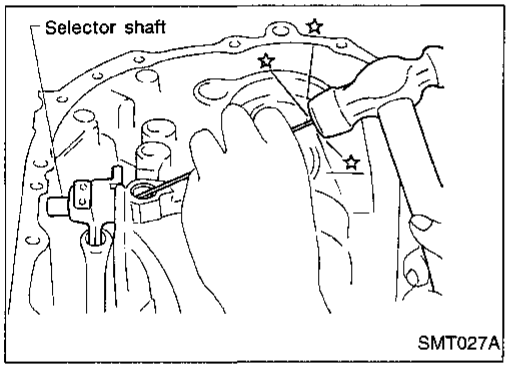

SMT138A

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

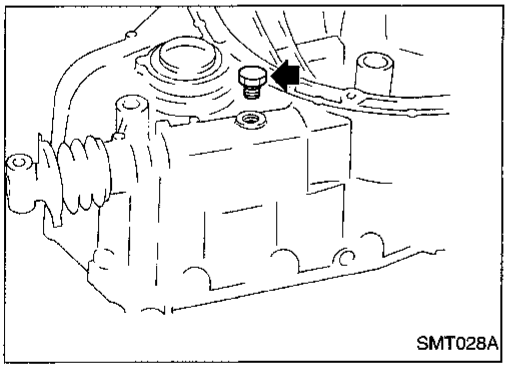


SMT618A

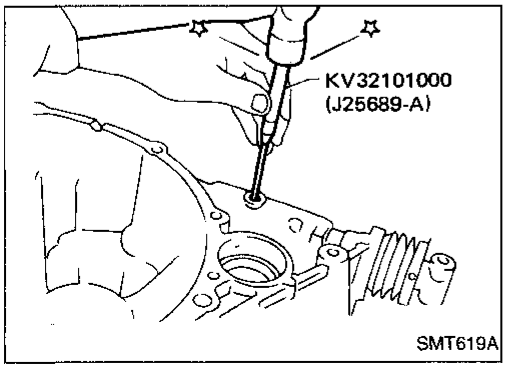
15. Remove retaining pin and detach the selector.



SMT027A

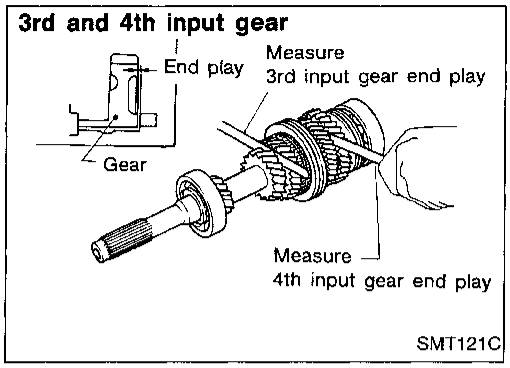

SMT028A

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



SMT619A

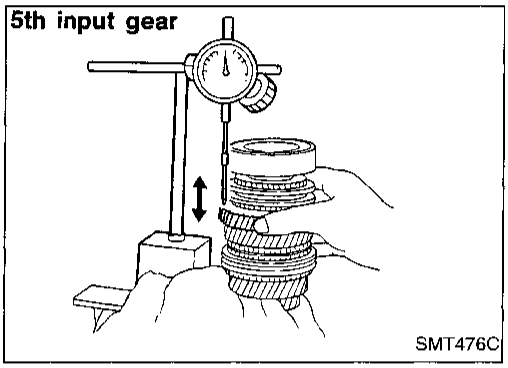
17. Remove retaining pin and then withdraw striking lever and striking rod.



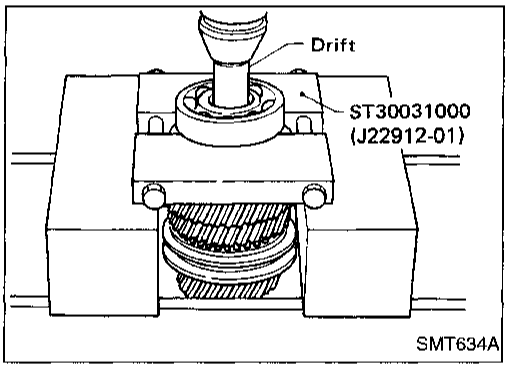
Input Shaft and Gears

DISASSEMBLY

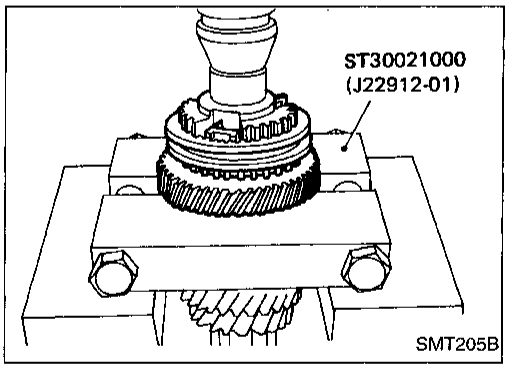
1. Before disassembly, check 3rd, 4th and 5th input gear end plays.
   Gear end play:
   Refer to SDS, AT-40.



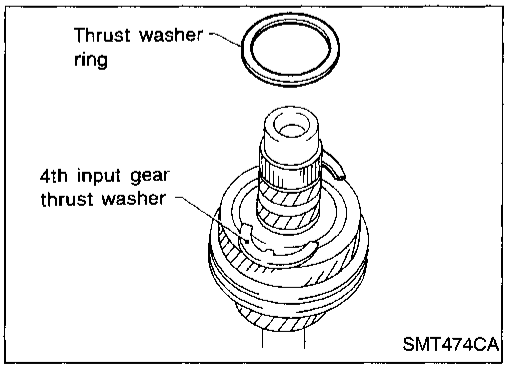
- If not within specification, disassemble and check contact surface of gear, shaft and hub. Check clearance of snap ring groove. Refer to "ASSEMBLY", MT-18.



2. Remove input shaft rear bearing.

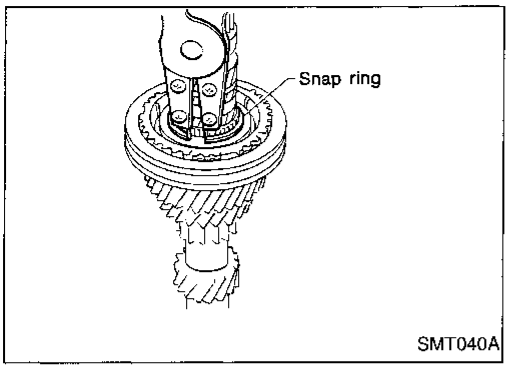


3. Remove 5th & reverse synchronizer and 5th input gear.

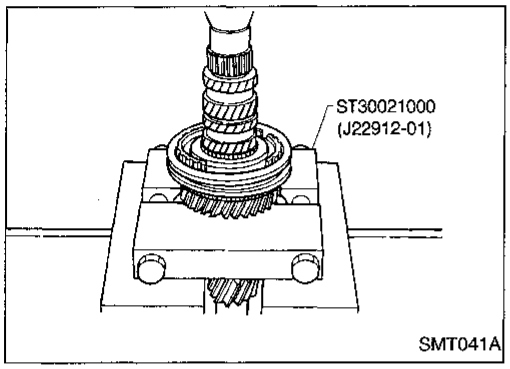


4. Remove thrust washer ring, 4th input gear thrust washers and 4th input gear.

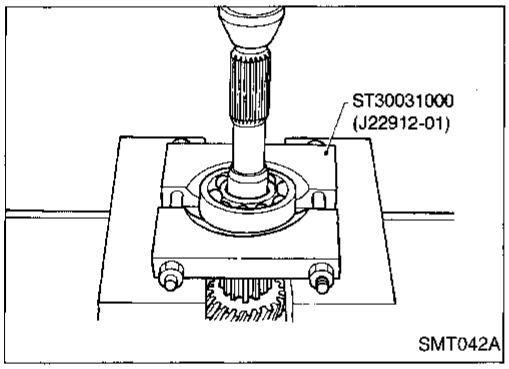
Input Shaft and Gears (Cont'd)



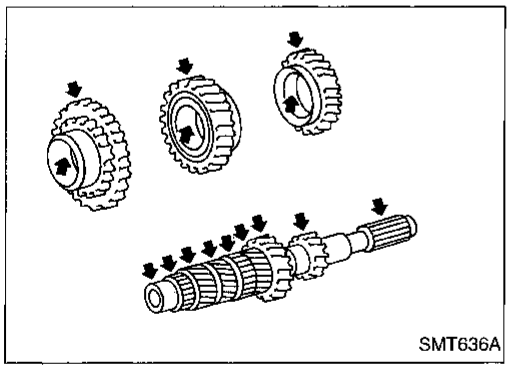
5. Remove snap ring.



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



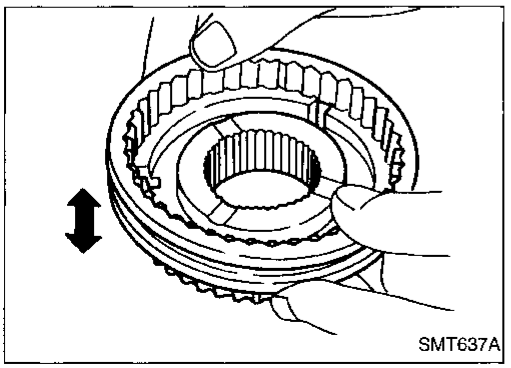
7. Remove input shaft front bearing.



INSPECTION

Gear and shaft

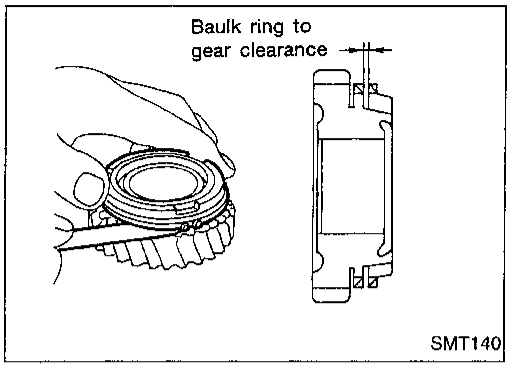
- Check shaft for cracks, wear or bending.
- Check gears for excessive wear, chips or cracks.



Synchronizer

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

Input Shaft and Gears (Cont'd)



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

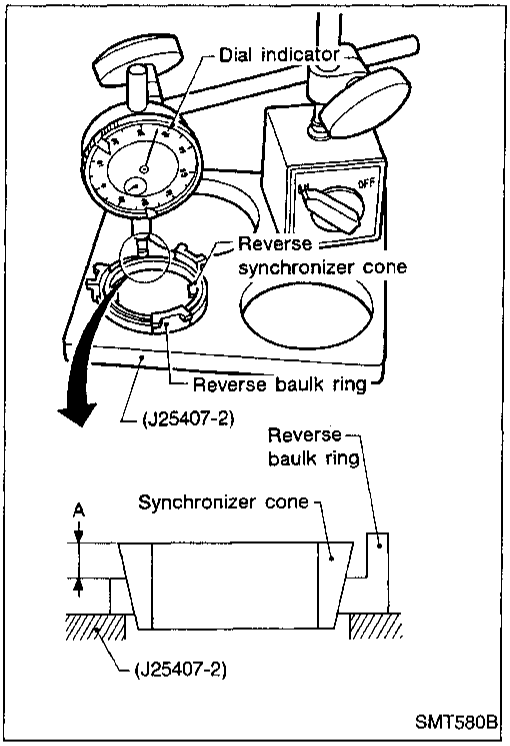
Clearance between baulk ring and gear:

Standard

1.0 - 1.35 mm (0.0394 - 0.0531 in)

Wear limit

0.7 mm (0.028 in)



- **Measure wear of reverse baulk ring.**

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

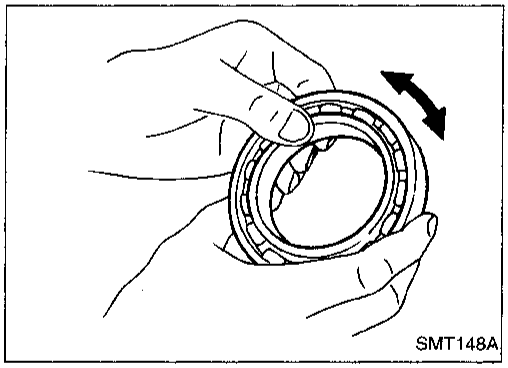
- **Make sure projection of synchronizer cone is positioned over the recess on Tool.**

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

Wear limit:

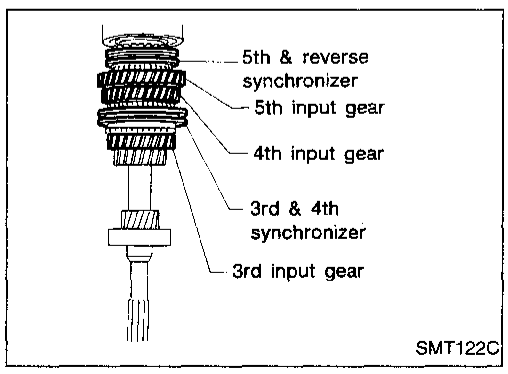
Dimension "A" 1.2 mm (0.047 in)

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



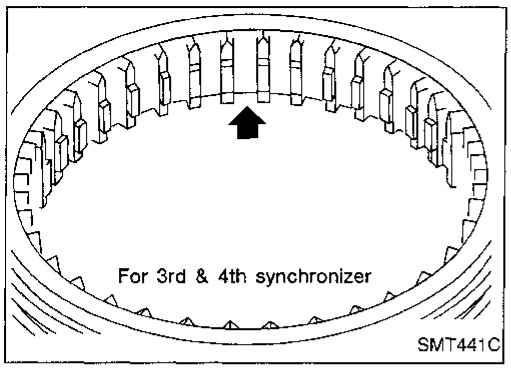
Bearing

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

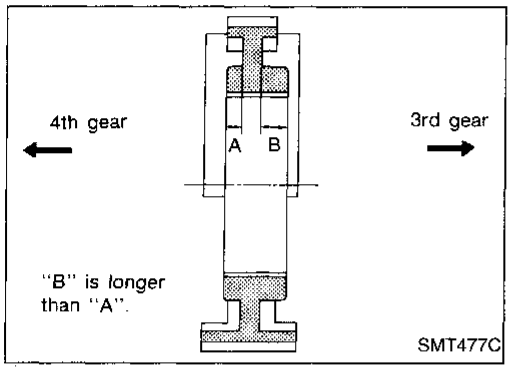


ASSEMBLY

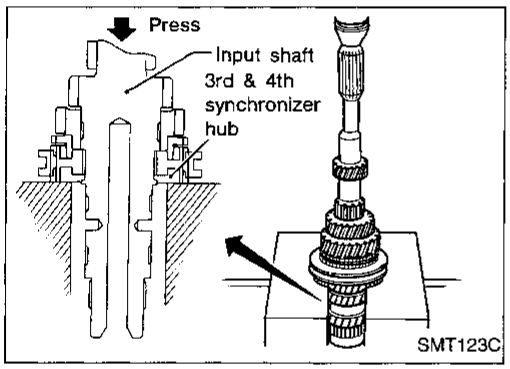
Input Shaft and Gears (Cont'd)

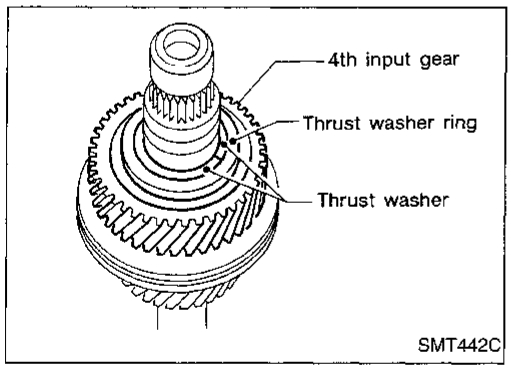


1. Place inserts in three grooves on coupling sleeve (3rd & 4th synchronizer).

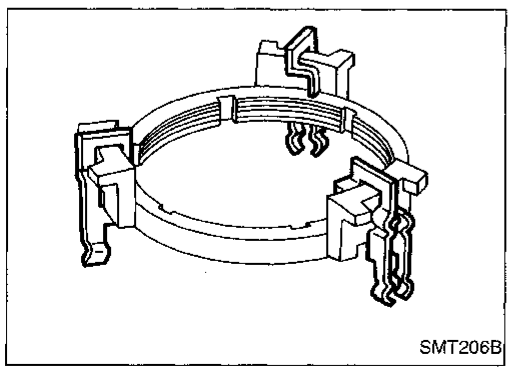


2. Install 3rd input gear and 3rd baulk ring.
3. Press on 3rd & 4th synchronizer hub.
   - **Pay attention to its direction.**
4. Select proper snap ring of 3rd & 4th synchronizer hub to minimize clearance of groove, and then install it.
   Allowable clearance of groove:
   0 - 0.1 mm (0 - 0.004 in)
   Snap ring of 3rd & 4th synchronizer hub:
   Refer to SDS, MT-41.





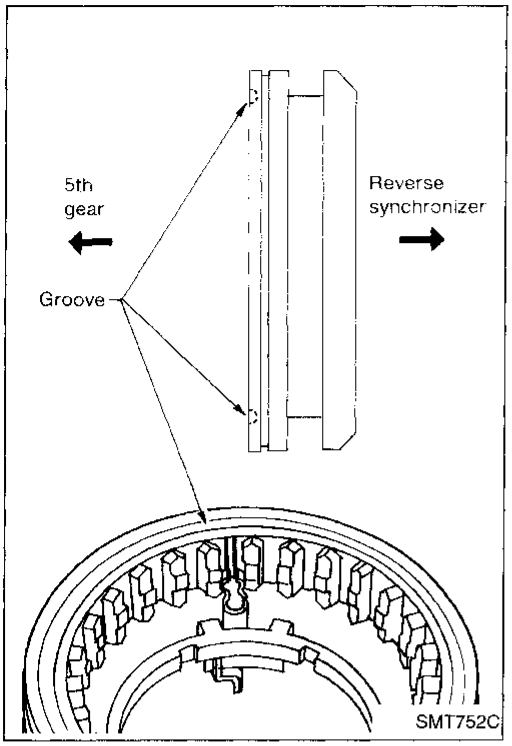
5. Install 4th input gear.
6. Select proper thrust washers to minimize clearance of groove. Then install them and thrust washer ring.
   Allowable clearance of groove:
   0 - 0.06 mm (0 - 0.0024 in)
   4th input gear thrust washer:
   Refer to SDS, MT-41.



7. Install 5th & reverse synchronizer assembly.

a. Hook insert springs on reverse baulk ring.

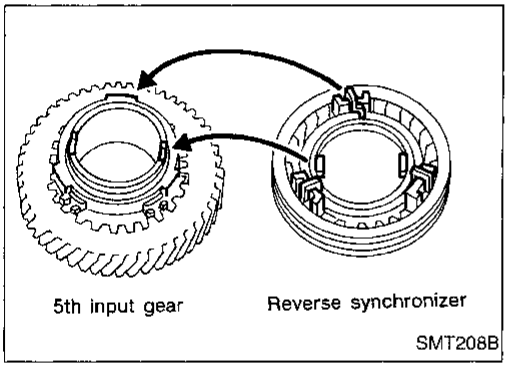
Input Shaft and Gears (Cont'd)



b. Install insert springs with reverse baulk ring onto coupling sleeve.

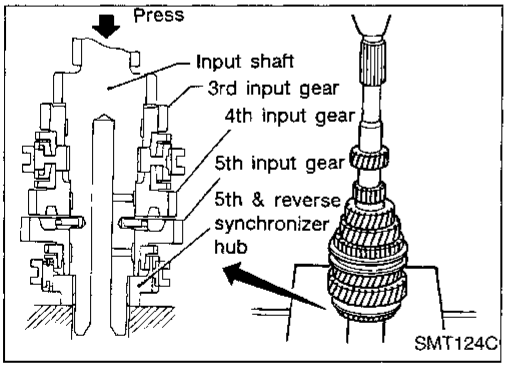
- **Pay attention to position of insert springs.**

c. Place 5th baulk ring on 5th input gear.
d. Install reverse synchronizer cone on reverse baulk ring.

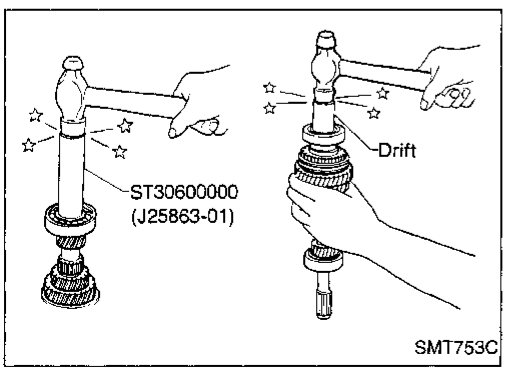


e. Place reverse synchronizer assembly on 5th input gear.

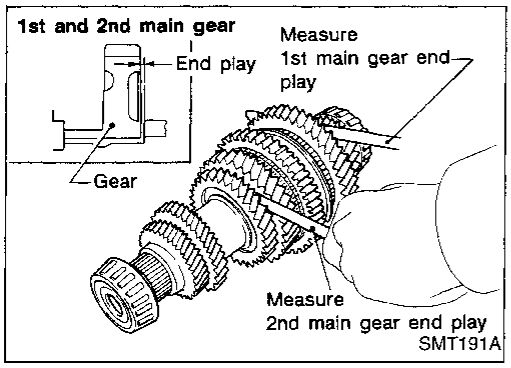
- **Mesh recesses of 5th input gear with projections of reverse synchronizer cone.**
- **Put insert spring mounts on reverse baulk ring upon those on 5th baulk ring.**



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



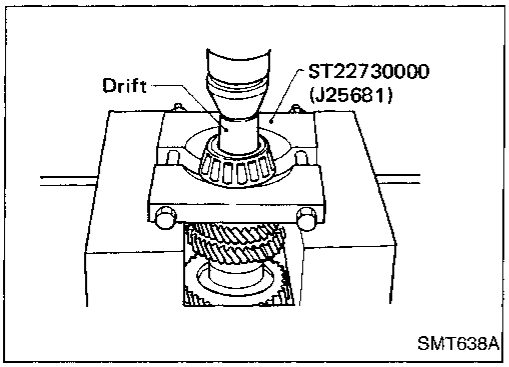
8. Install input shaft front and rear bearings.
9. Measure gear end play as a final check. Refer to "DISASSEMBLY", MT-16.



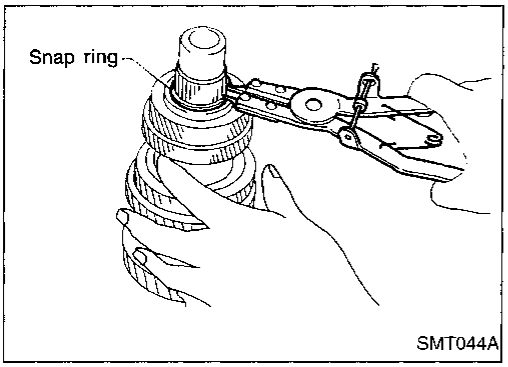
Mainshaft and Gears

DISASSEMBLY

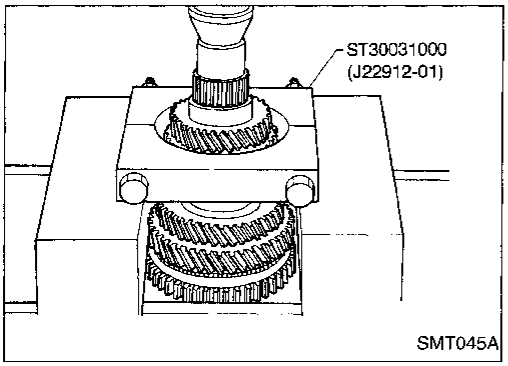
1. Before disassembly, check 1st and 2nd main gear end plays.
   Gear end play:
   Refer to SDS, AT-40.
   If not within specification, disassemble and check contact surface of gear, shaft and hub. Check clearance of snap ring groove. Refer to "ASSEMBLY", MT-23.



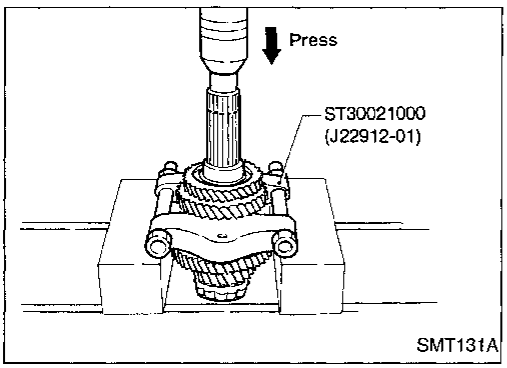
2. Press out mainshaft rear bearing.



3. Remove thrust washer and snap ring.

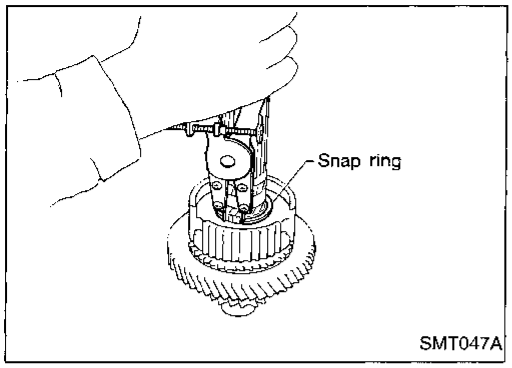


4. Press out 5th main gear and 4th main gear.

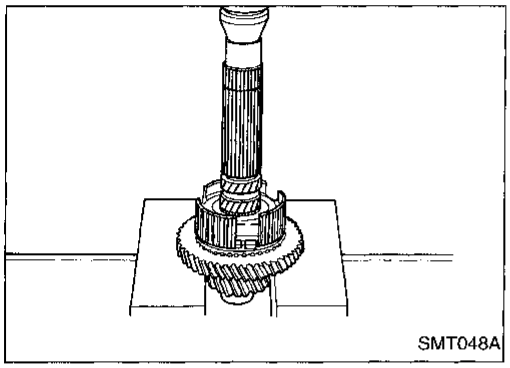


5. Press out 3rd main gear and 2nd main gear.

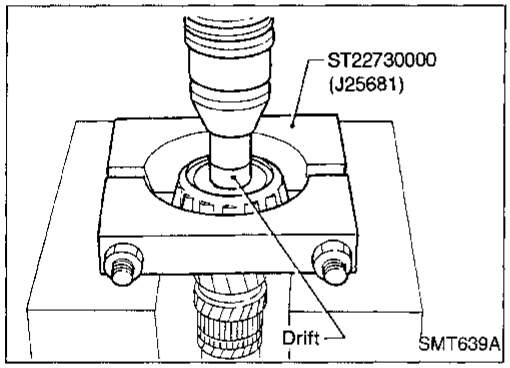
Mainshaft and Gears (Cont'd)



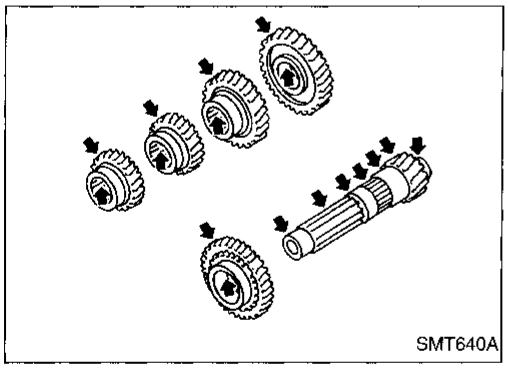
6. Remove snap ring.



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



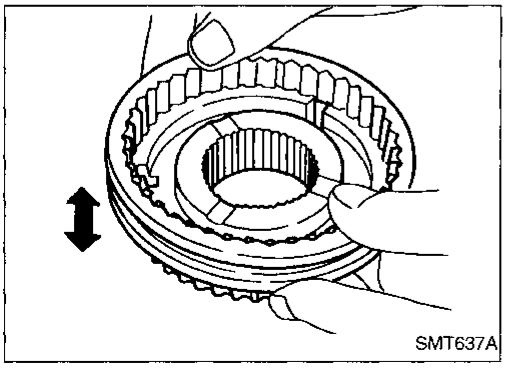
8. Remove mainshaft front bearing.



INSPECTION

Gear and shaft

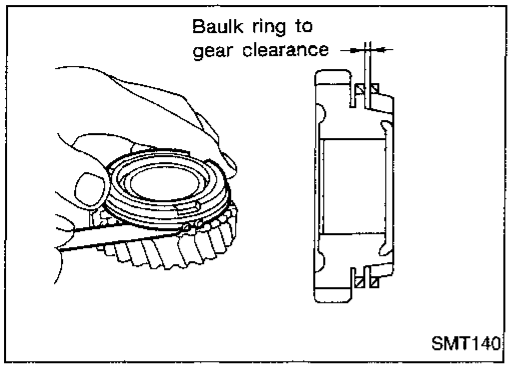
- Check shaft for cracks, wear or bending.
- Check gears for excessive wear, chips or cracks.



Synchronizer

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

Mainshaft and Gears (Cont'd)



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

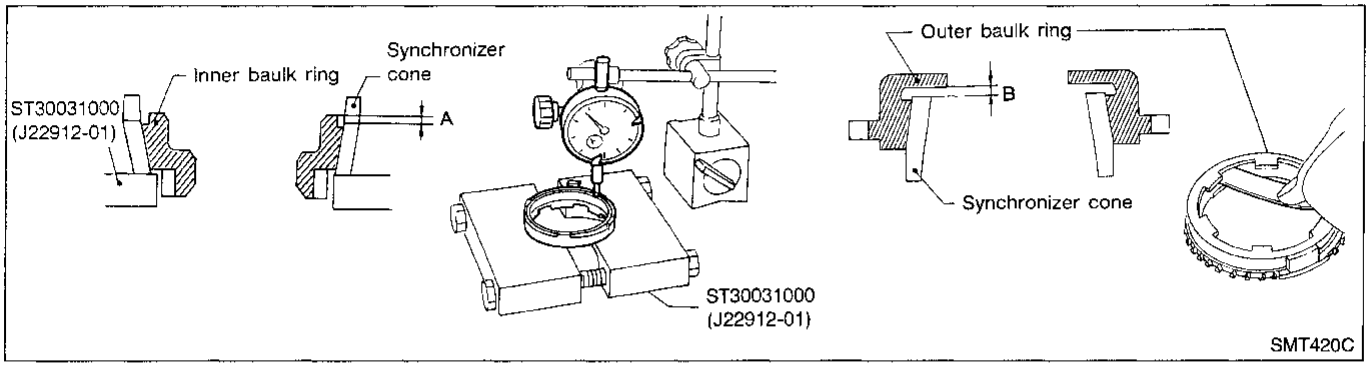
Clearance between baulk ring and gear:

Standard

1.0 - 1.35 mm (0.0394 - 0.0531 in)

Wear limit

0.7 mm (0.028 in)



- Measure wear of 2nd baulk rings.

a. Place baulk rings in position on synchronizer cone.

b. While holding baulk ring against synchronizer cone as far as it will go, measure dimensions "A" and "B".

Standard:

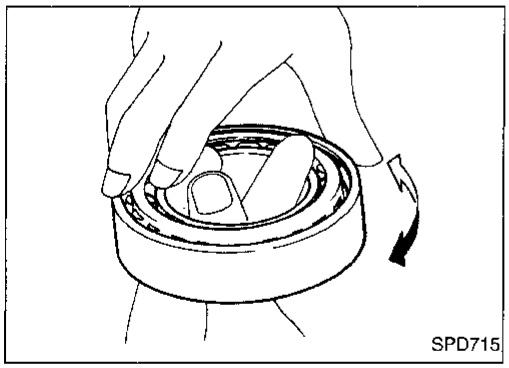
A 0.6 - 0.8 mm (0.024 - 0.031 in)

B 0.6 - 1.1 mm (0.024 - 0.043 in)

Wear limit:

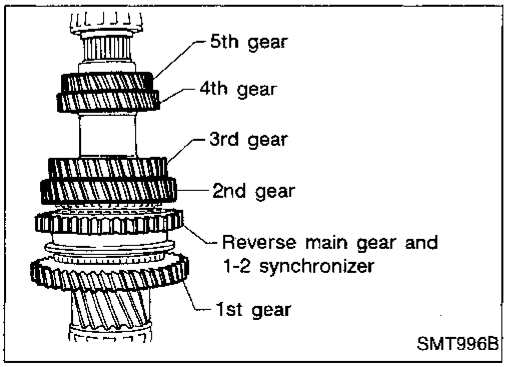
0.2 mm (0.008 in)

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



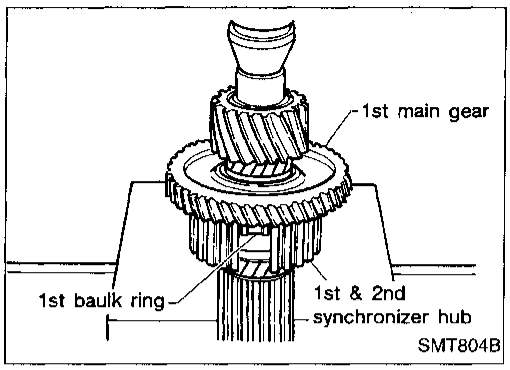
Bearing

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



ASSEMBLY

Mainshaft and Gears (Cont'd)

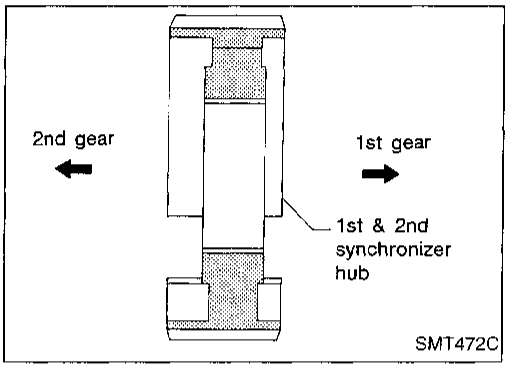


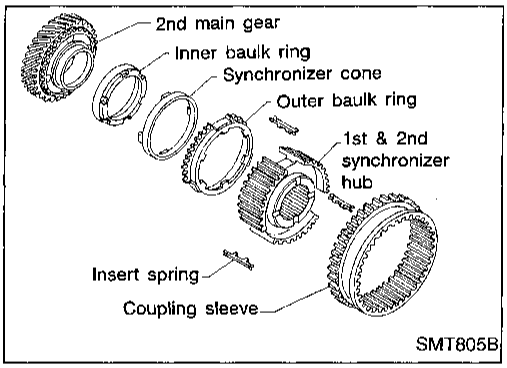
1. Press on 1st main gear, 1st baulk ring and 1st & 2nd synchronizer hub.

- **Pay attention to direction of 1st & 2nd synchronizer hub.**

2. Select proper snap ring of 1st & 2nd synchronizer hub to minimize clearance of groove and then install it.

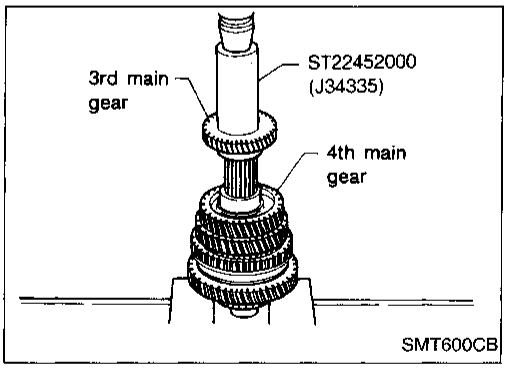
Allowable clearance of groove:
0 - 0.1 mm (0 - 0.004 in)
Snap ring of 1st & 2nd synchronizer hub:
Refer to SDS, MT-41.



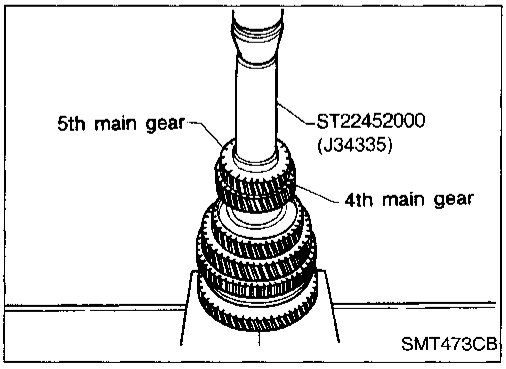


3. Install 2nd synchronizer cone, inner & outer baulk rings. Insert springs and 1st & 2nd coupling sleeve.
4. Install 2nd main gear.

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



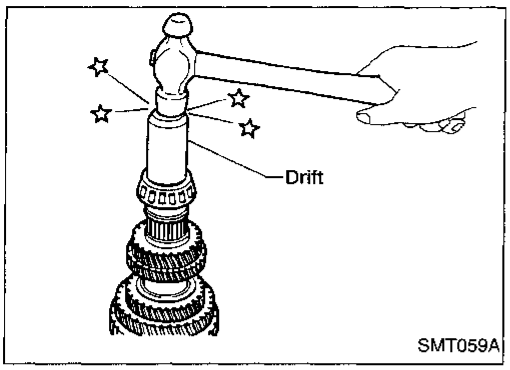
5. Press on 3rd main gear.
6. Press on 4th main gear.



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

Allowable clearance of groove:
0 - 0.15 mm (0 - 0.0059 in)
Snap ring of 5th main gear:
Refer to SDS, MT-41.

Mainshaft and Gears (Cont'd)

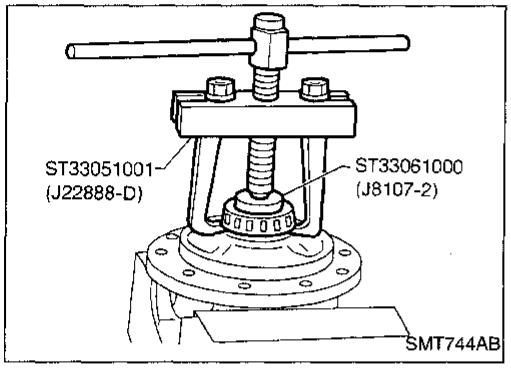


9. Press on thrust washer and press on mainshaft rear bearing.
10. Press on mainshaft front bearing.
11. Measure gear end play as a final check. Refer to "DISASSEMBLY", MT-21.

Final Drive

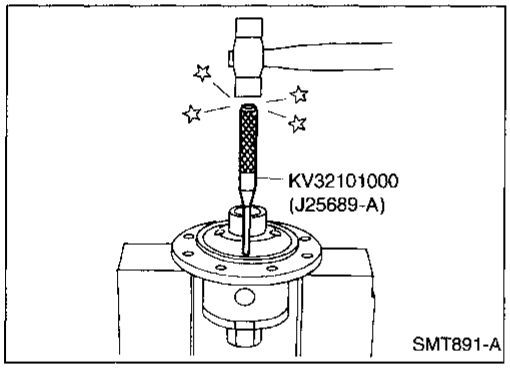
DISASSEMBLY

— RS5F50A —



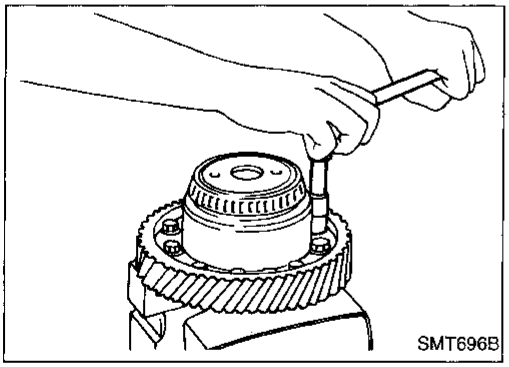
1. Remove final gear.
2. Remove speedometer drive gear by cutting it.
3. Press out differential side bearings.

- **Be careful not to mix up the right and left bearings.**

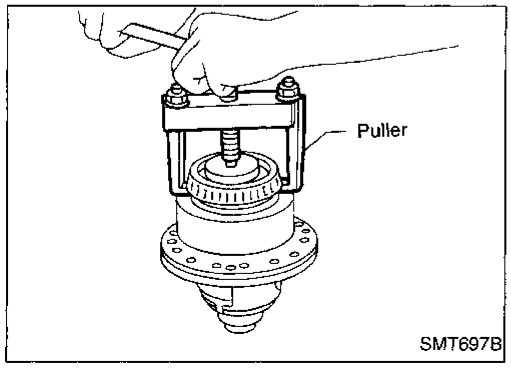


4. Drive out retaining pin and draw out pinion mate shaft.
5. Remove pinion mate gears and side gears.

— RS5F50V —

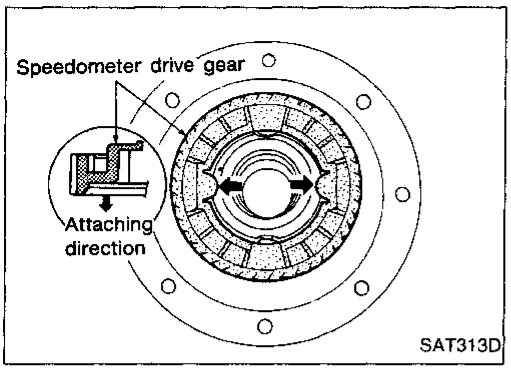


1. Remove final gear.

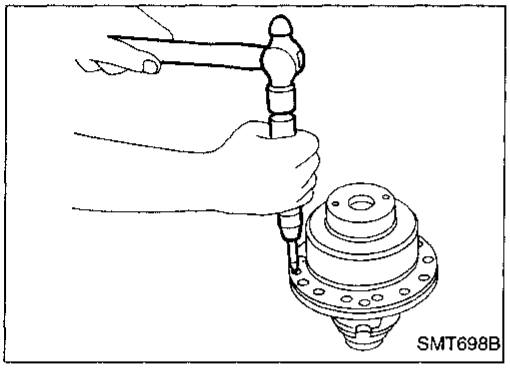


2. Press out differential side bearings.

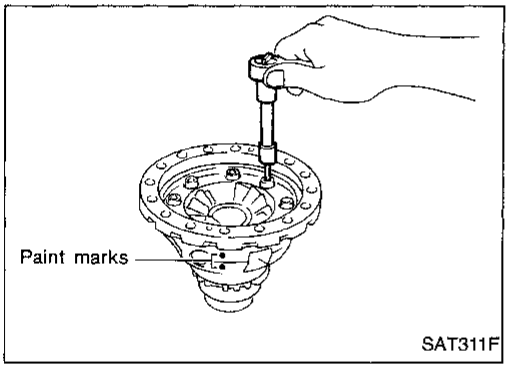
Final Drive (Cont'd)



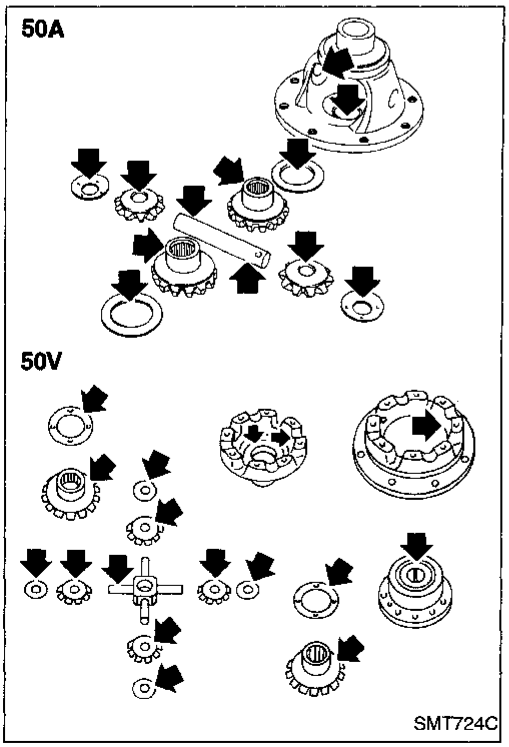
3. Remove speedometer drive gear.



4. Remove viscous coupling.



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



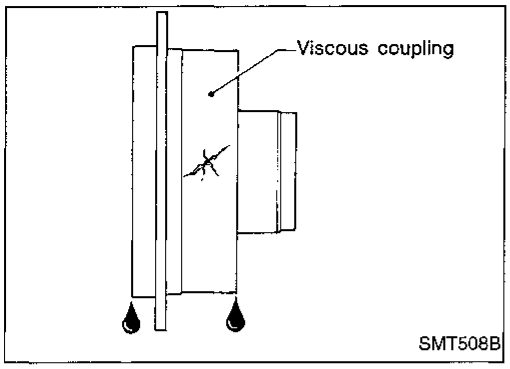
INSPECTION

Gear, washer, shaft and case

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

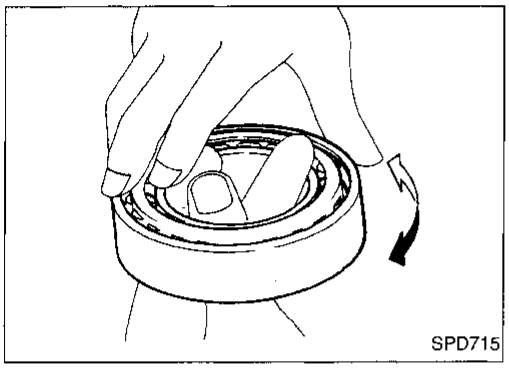
Final Drive (Cont'd)

Viscous coupling



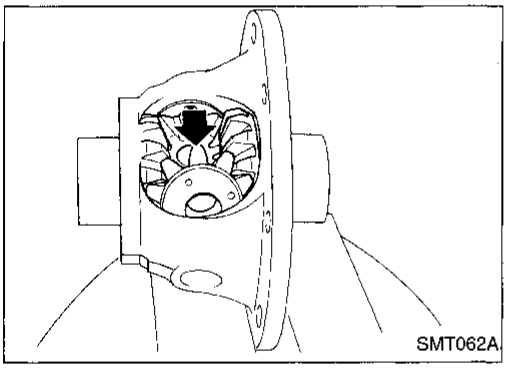
- Check case for cracks.
- Check silicone oil for leakage.

Bearings

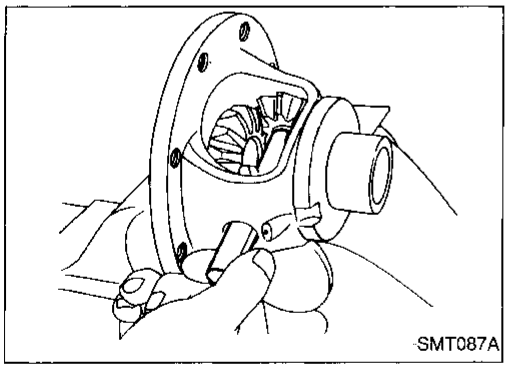


- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- **When replacing taper roller bearing, replace outer and inner race as a set.**

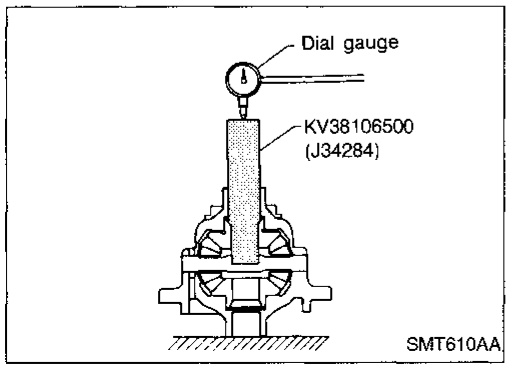
ASSEMBLY



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



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



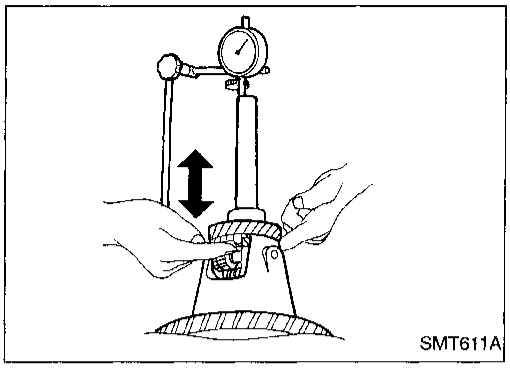
— RS5F50A —

3. Measure clearance between side gear and differential case with washers following the procedure below:

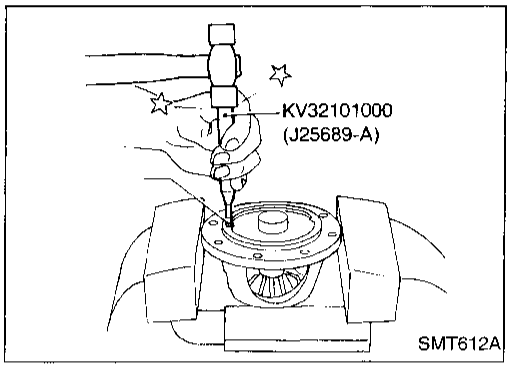
a. Set Tool and dial indicator on side gear.
b. Move side gear up and down to measure dial indicator deflection. Always measure indicator deflection on both side gears.

Clearance between side gear and differential case with washers:
0.1 - 0.2 mm (0.004 - 0.008 in)

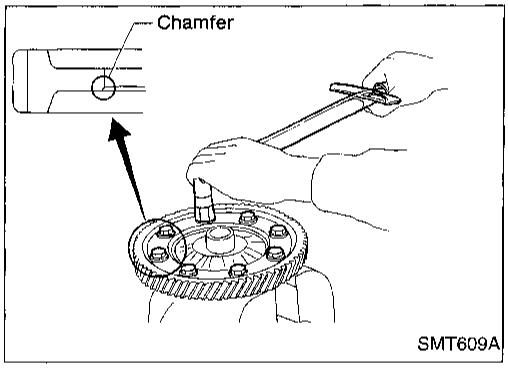
Final Drive (Cont'd)



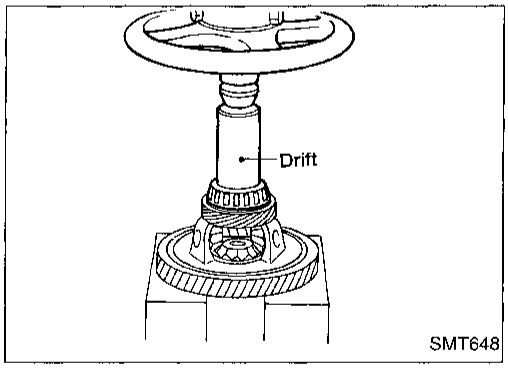
c. If not within specification, adjust clearance by changing thickness of side gear thrust washers.
Side gear thrust washer:
Refer to SDS, AT-41.



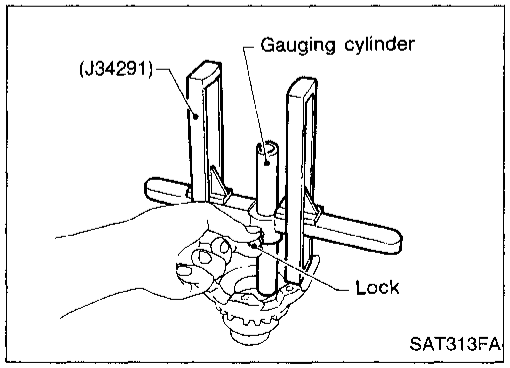
4. Install retaining pin.
- **Make sure that retaining pin is flush with case.**



5. Install final gear.
6. Install speedometer drive gear.



7. Press on differential side bearings.



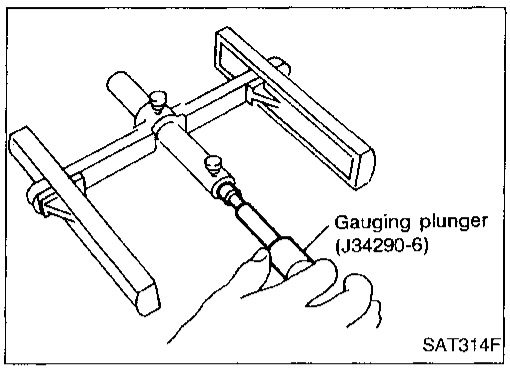
— RS5F50V —

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

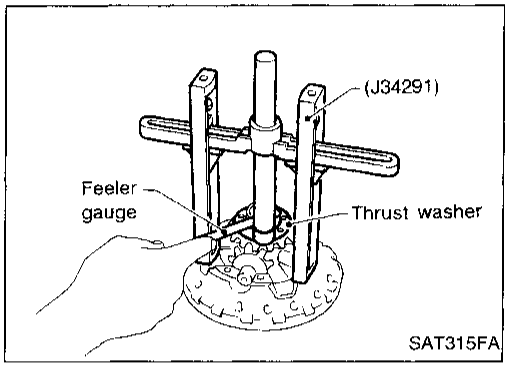
Differential case side

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

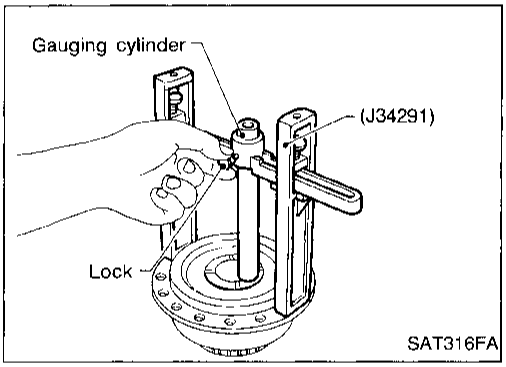
Final Drive (Cont'd)



b. Install gauging plunger into cylinder.



c. Install pinion mate gears and side gear with thrust washer on differential case.
d. Set tool and allow gauging plunger to rest on side gear thrust washer.
e. Measure gap between plunger and cylinder.
This measurement should give exact clearance between side gear and differential case with washers.
Standard clearance: 0.1 - 0.2 mm (0.004 - 0.008 in)
f. If not within specification adjust clearance by changing thickness of side gear thrust washer. **Side gear thrust washers for differential case side: Refer to SDS, MT-42.**

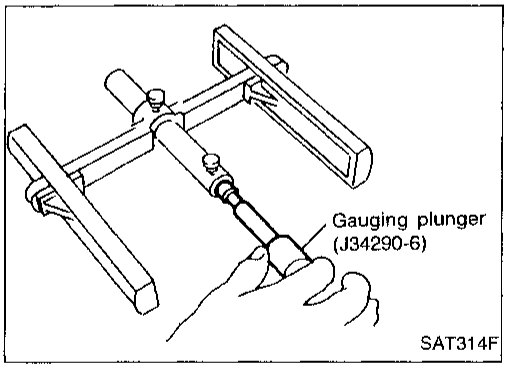


Viscous coupling side

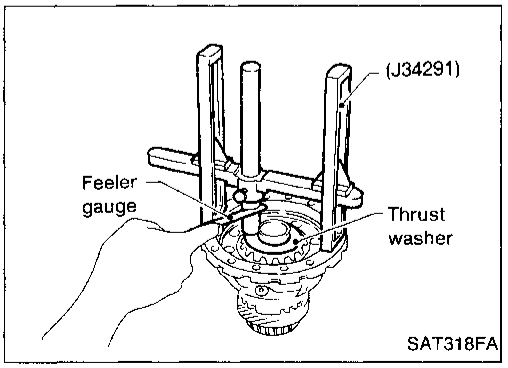
a. Place side gear and thrust washer on pinion mate gears installed on differential case.
b. Measure dimension X.

- **Measure dimension X in at least four places.**

a. Set tool on viscous coupling and lock gauging cylinder in place with set screw.



b. Install gauging plunger into cylinder.



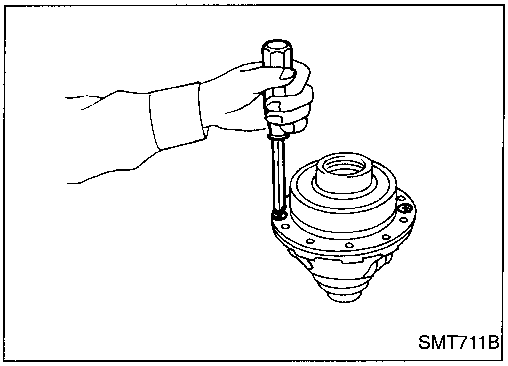
c. Install pinion mate gears and side gears with original washers on differential cases.

Align paint marks.

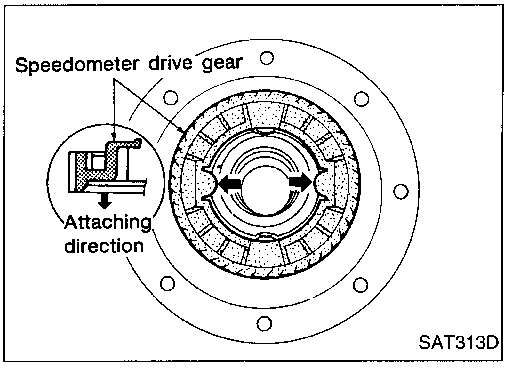
d. Tighten differential case bolts.
e. Set tool and allow plunger to rest on side gear thrust washer.
f. Measure gap between plunger and cylinder.
This measurement should give exact clearance between side gear and differential case with washers.
Standard clearance:
0.1 - 0.2 mm (0.004 - 0.008 in)

Final Drive (Cont'd)

g. If not within specification, adjust clearance by changing thickness of side gear thrust washer.
Side gear thrust washers for viscous coupling side:
Refer to SDS, MT-42.

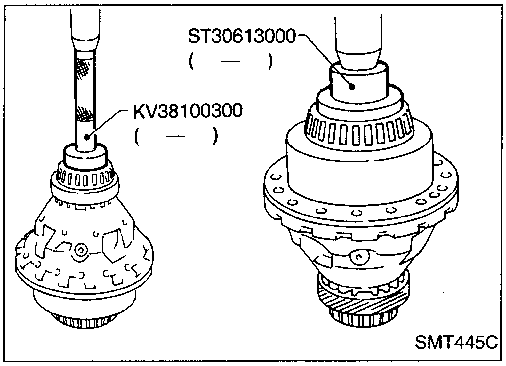

SMT711B

4. Install viscous coupling.



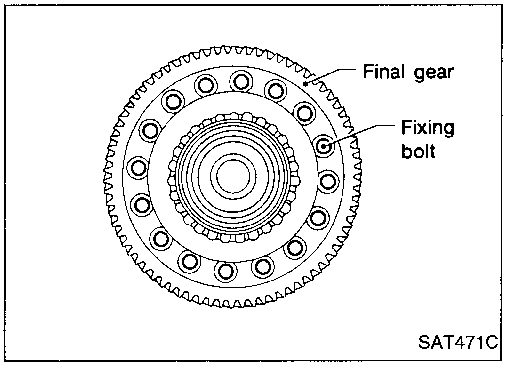
SAT313D

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



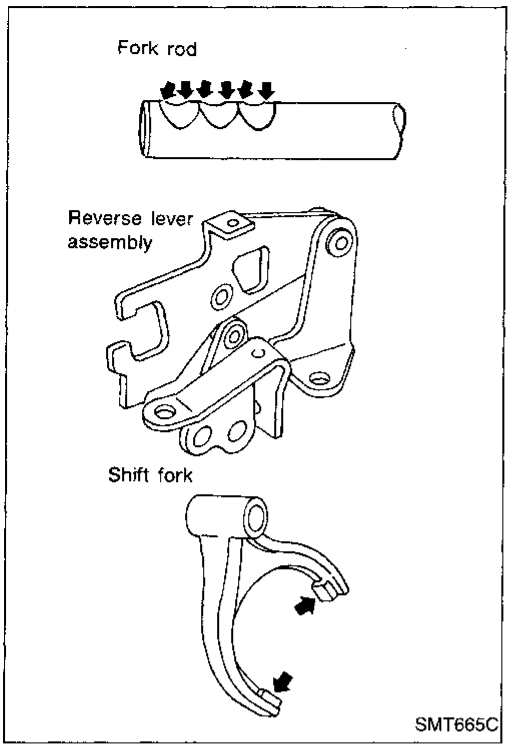
SMT445C

6. Press differential side bearings on differential case.



SAT471C

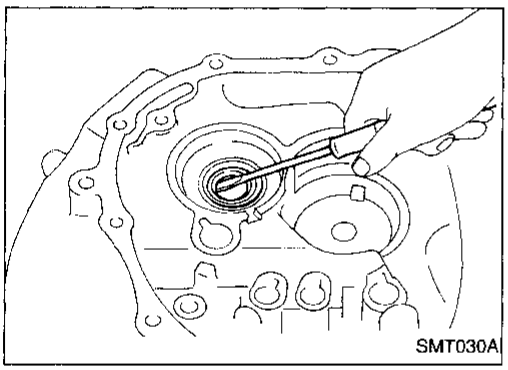
7. Install final gear and tighten fixing bolts in a crisscross pattern.



Shift Control Components

INSPECTION

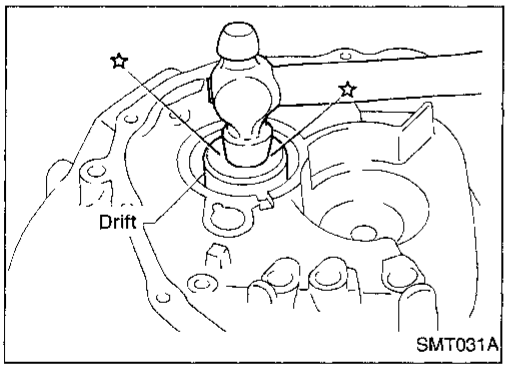
- Check contact surface and sliding surface for wear, scratches, projections or other damage.



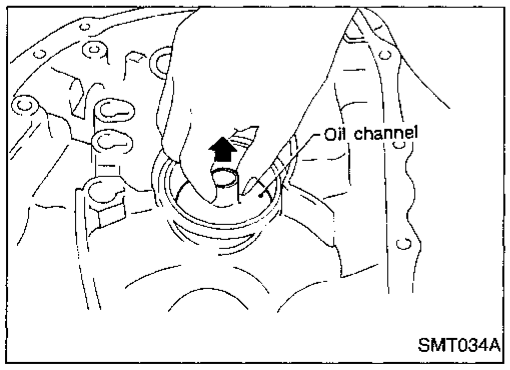
Case Components

REMOVAL AND INSTALLATION

Input shaft oil seal



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



Mainshaft front bearing outer race

Mainshaft rear bearing outer race
Refer to "ADJUSTMENT", MT-33.

Differential side bearing outer race
Refer to "ADJUSTMENT", MT-32.

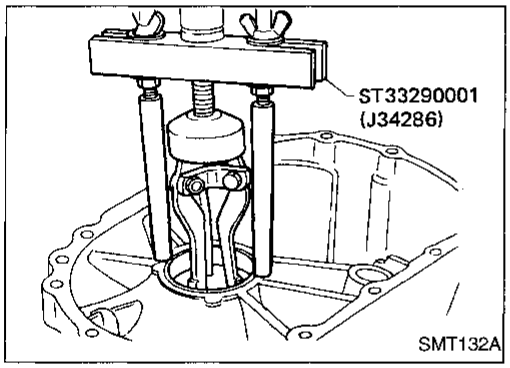
Input Shaft End Play and Differential Side Bearing Preload

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

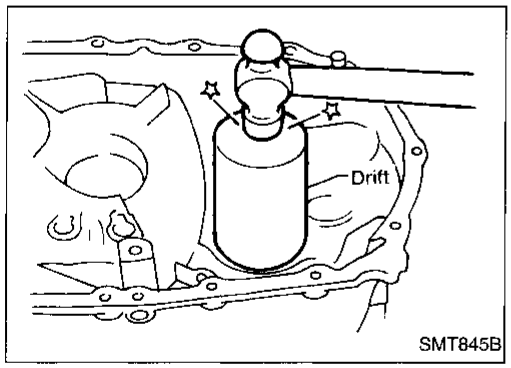
- **Input shaft**
- **Input shaft bearing**
- **Clutch housing**
- **Transmission case**

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

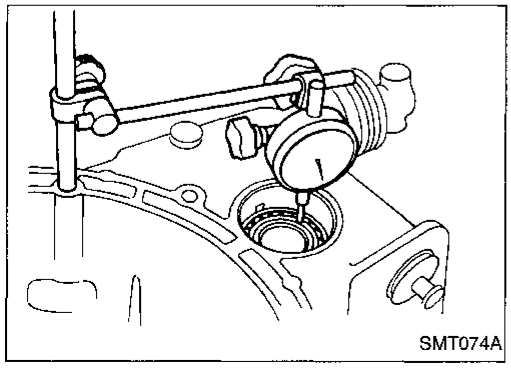
- **Differential case**
- **Differential side bearing**
- **Clutch housing**
- **Transmission case**



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



2. Reinstall differential side bearing outer race without shim(s).
3. Install input shaft and final drive assembly on clutch housing.
4. Install transmission case without input shaft bearing shim(s). Then tighten it to the specified torque.
   Refer to MT-10.

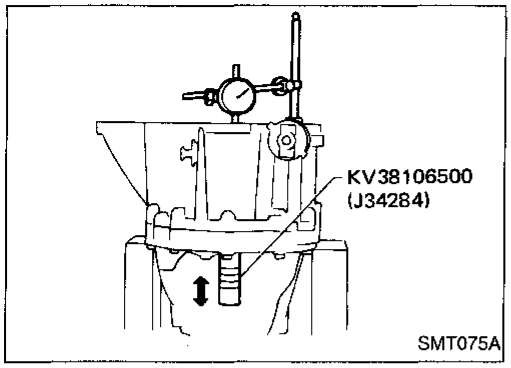


5. Using the following procedures, measure clearance between bearings and transmission case.

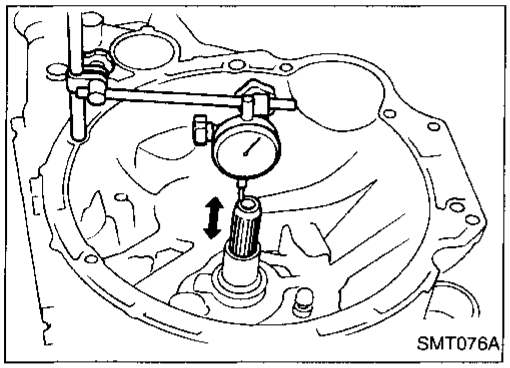
- **Differential side**

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

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

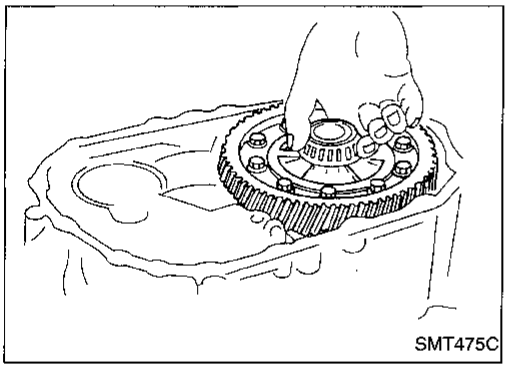


b. Insert Tool all the way into differential side gear. Move Tool up and down and measure dial indicator deflection.

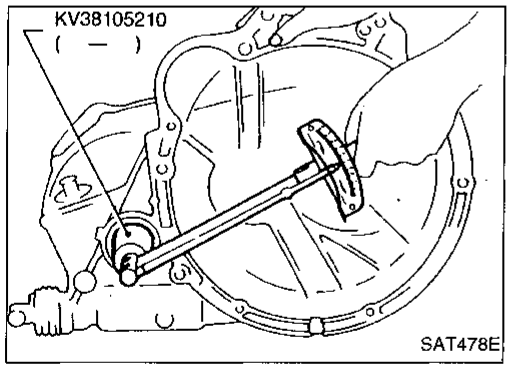


- **Input shaft side**

a. Set dial indicator on end of input shaft.
b. Move input shaft up and down and measure dial indicator deflection.
6. Select shims with proper thickness with SDS table as a guide. Refer to MT-44.
7. Install selected differential side bearing adjusting shim and differential side bearing outer race.



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



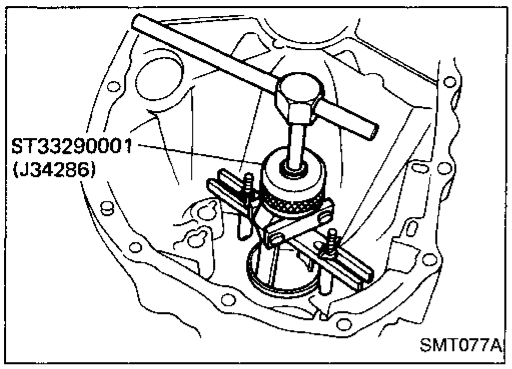
c. Measure turning torque of final drive assembly.
Turning torque of final drive assembly (New bearing):
4.9 - 7.8 N·m (50 - 80 kg-cm, 43 - 69 in-lb)
- **When old bearing is used again, turning torque will be slightly less than the above.**
- **Make sure torque is close to the specified range.**

Mainshaft Bearing Preload

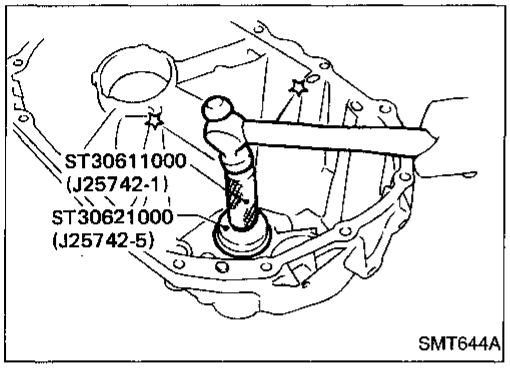
If any of the following parts are replaced, adjust mainshaft bearing preload.

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

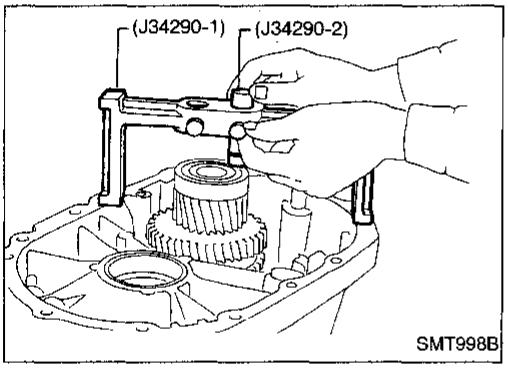
Mainshaft Bearing Preload (Cont'd)



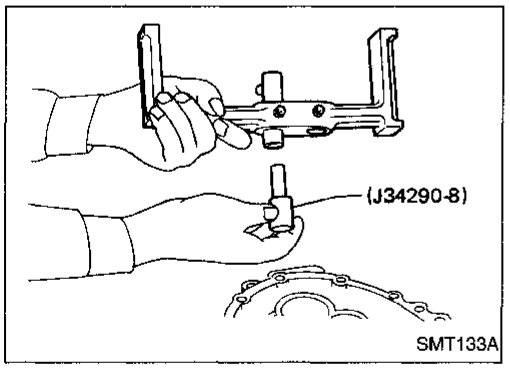
1. Remove mainshaft rear bearing outer race and shim(s).



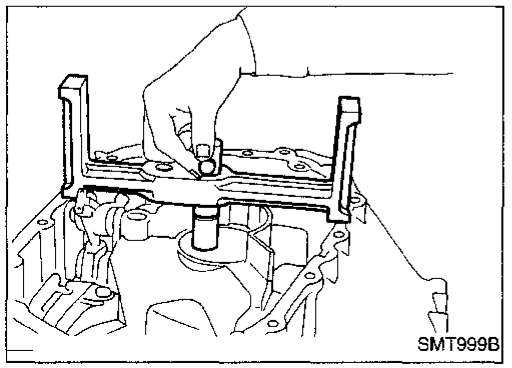
2. Reinstall mainshaft rear bearing outer race without shims.
3. Clean mating surfaces of clutch housing and transmission case with solvent.
4. Install mainshaft and mainshaft front bearing outer race into transmission case. Turn mainshaft while holding bearing outer race so that bearings are properly seated.



5. Place Tools (bridge and gauging cylinder) onto machined surface of transmission case. Allow gauging cylinder to rest on surface of mainshaft front bearing outer race. Use proper screw in bridge to lock gauging cylinder in place.

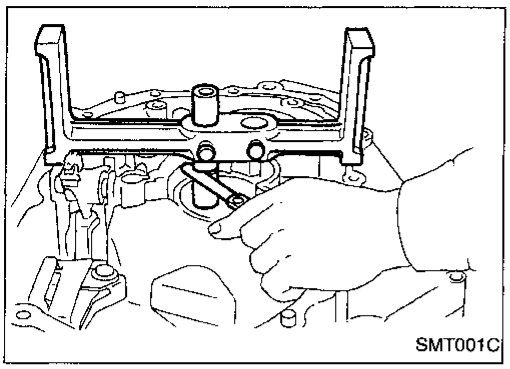


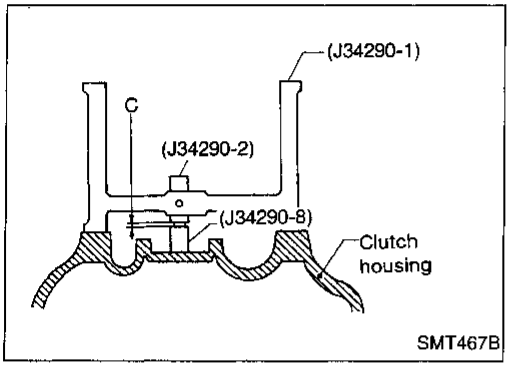
6. Turn bridge over and place Tool (gauging plunger) into gauging cylinder.



7. Place bridge, legs up, onto machined surface of clutch housing. Allow gauging plunger to rest upon mating surface where mainshaft front bearing outer race fits.

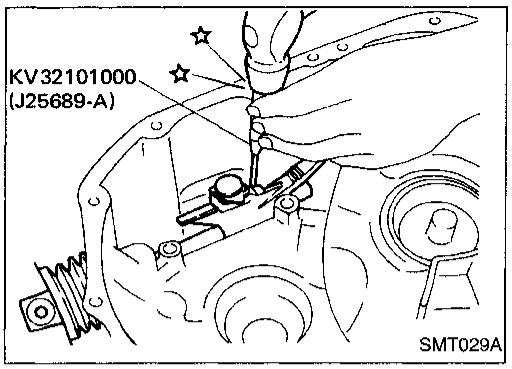
Mainshaft Bearing Preload (Cont'd)


SMT001C

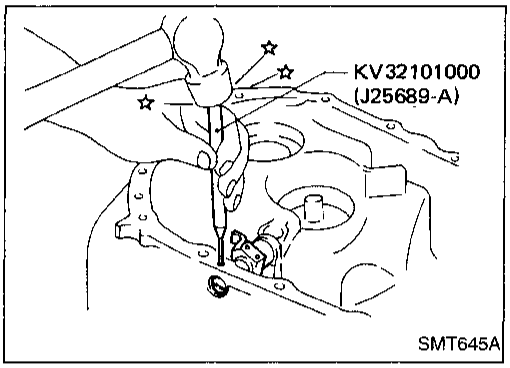


SMT467B

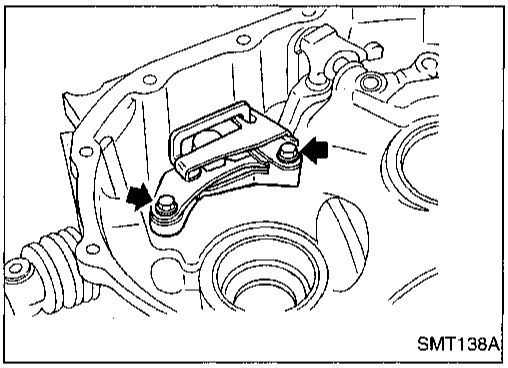
8. Measure with feeler gauge distance between gauging cylinder and shoulder of gauging plunger.
9. Use feeler gauge reading to select correct mainshaft preload shim(s).
   Mainshaft bearing adjusting shim:
   Refer to SDS, MT-42.
10. Install selected mainshaft bearing adjusting shim and mainshaft bearing outer race.
11. Check total turning torque after assembly. Refer to "ASSEMBLY", MT-39.



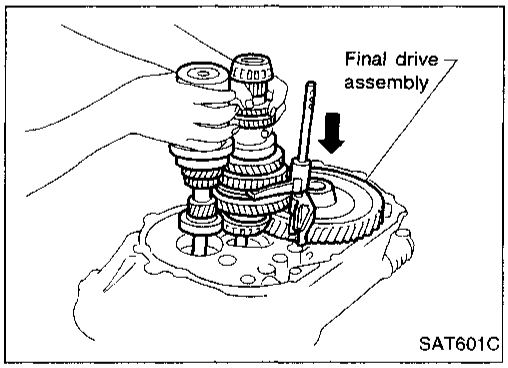
1. Install striking lever and striking rod.



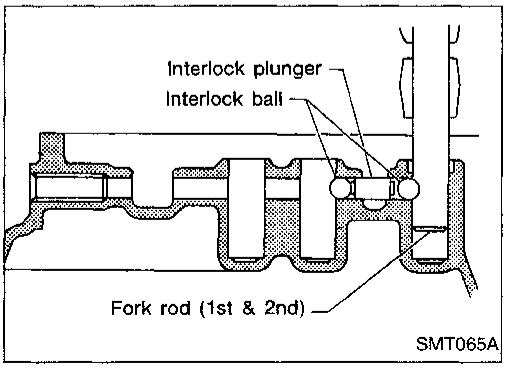
2. Install selector and retaining pin.



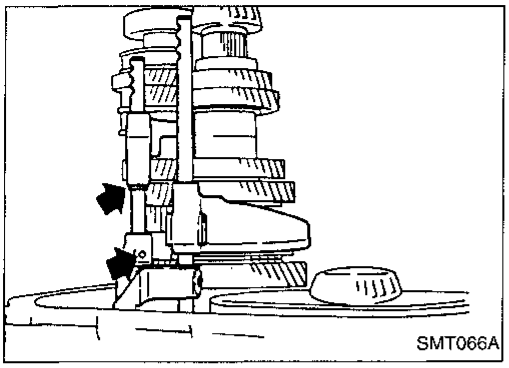
3. Install reverse gate assembly.
- **Be careful not to lose check ball.**



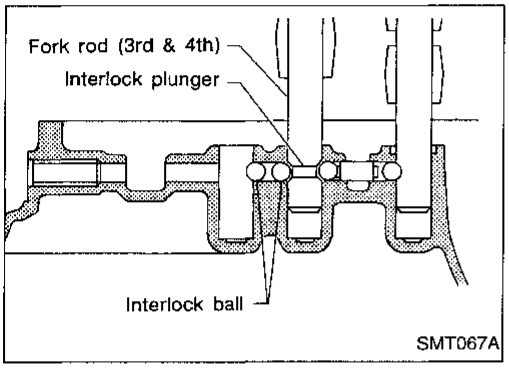
4. Install final drive assembly.
5. Install input shaft and mainshaft with 1st & 2nd shift fork assembly.
- **Be careful not to damage input shaft oil seal.**



6. Install interlock balls and plunger.

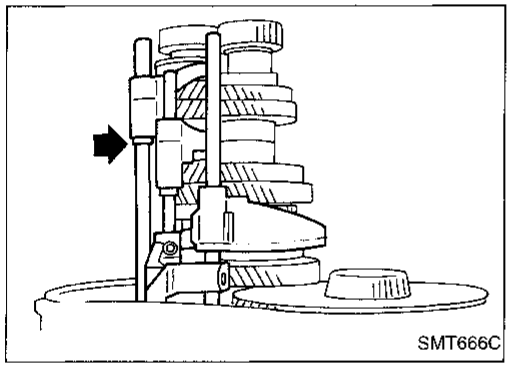

SMT066A

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

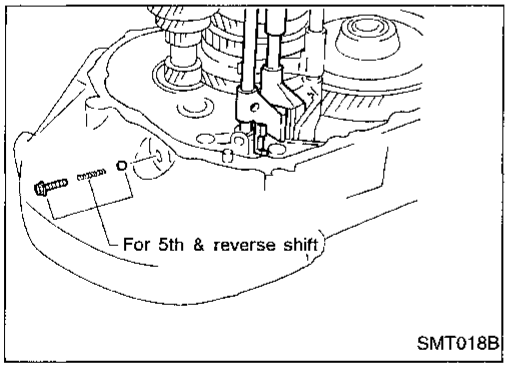


SMT067A

8. Install interlock balls.

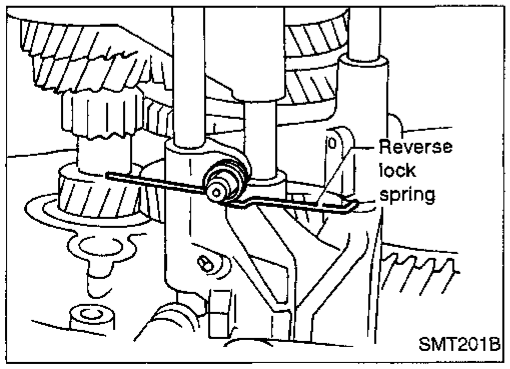

SMT666C

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



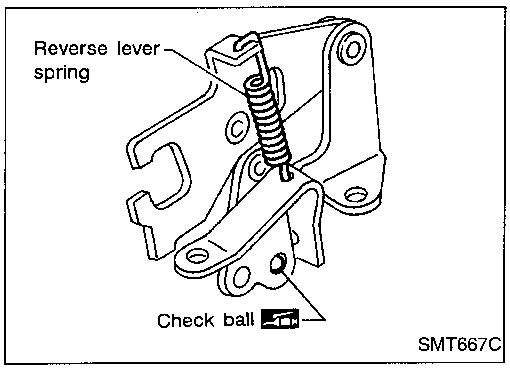
SMT018B

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

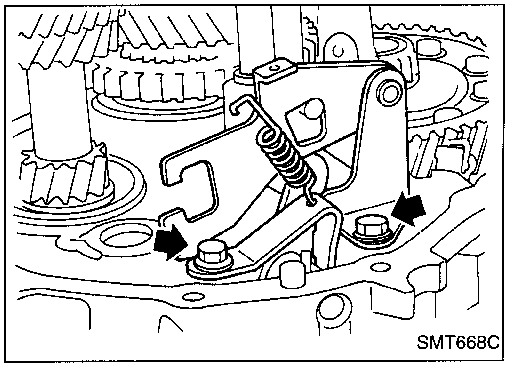


SMT201B

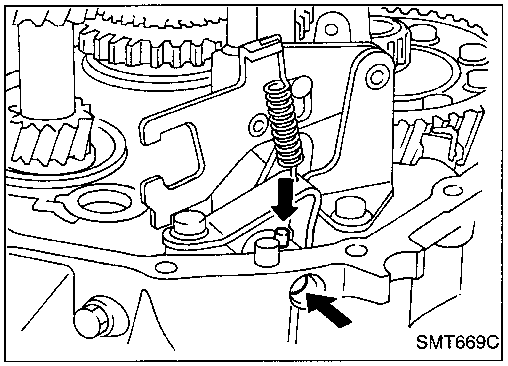
11. Install reverse lock spring on 5th & reverse bracket.
- **Pay attention to its direction.**



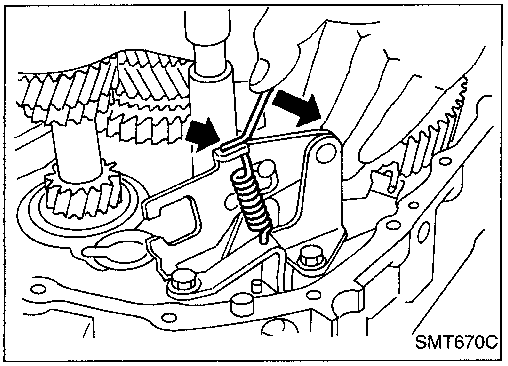
12. Install check ball and reverse lever spring on reverse lever assembly.
- **Apply multi-purpose grease to check ball.**
- **Pay attention to direction of reverse lever spring.**



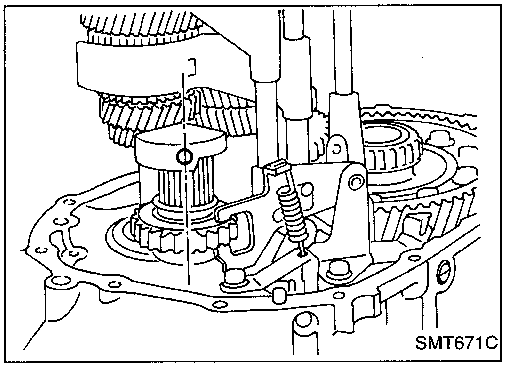
13. Install reverse lever assembly on clutch housing.



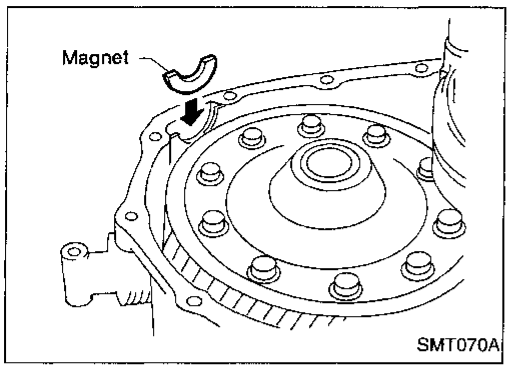
14. Install reverse arm shaft and retaining pin.



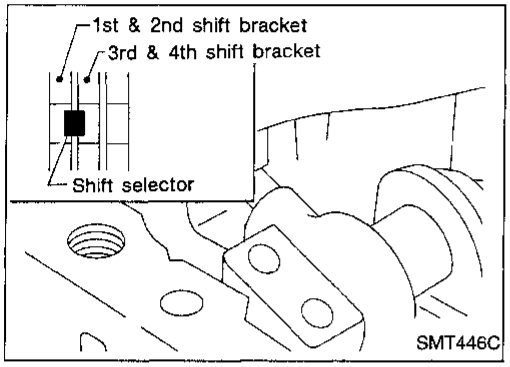
15. Hook reverse lock spring and reverse lever spring on reverse lever assembly.



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

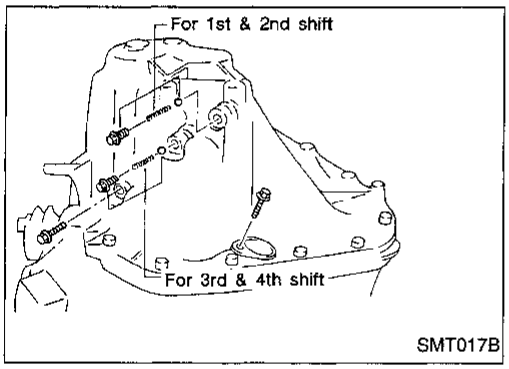


17. Place magnet on clutch housing.

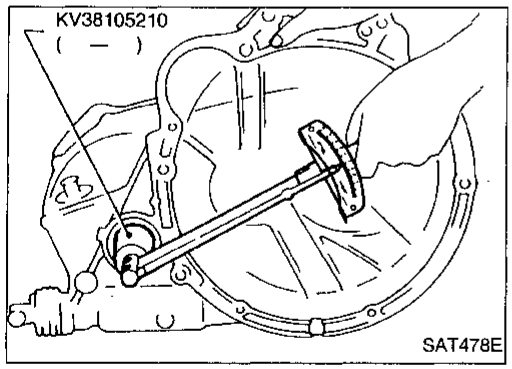


18. If bearing preload of mainshaft was adjusted, install selected shim(s) into transmission case.
- **To aid in installation of transmission case, place shift selector in the 1st and 2nd shift bracket or between 1st and 2nd bracket and 3rd and 4th bracket.**

19. Apply sealant to mating surface of transmission case and install it.
20. Install position switch.



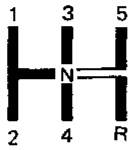
21. Apply sealant to threads of check plugs. Install balls, springs and plugs.
22. After assembly, check that you can shift into each gear smoothly.



23. Measure total turning torque.
Total turning torque (New bearing):
8.8 - 21.6 N·m (90 - 220 kg-cm, 78 - 191 in-lb)
- **When old bearing is used again, preload will be slightly less than the above. Make sure torque is close to the specified range.**

General Specifications

TRANSAXLE

Engine	VQ30DE	
Transaxle model	RS5F50A	RS5F50V
Number of speeds	5	
Synchromesh type	Warner	
Shift pattern		

	Gear ratio	Number of teeth	
		Input gear	Main gear
1st	3.285	14	46
2nd	1.850	20	37
3rd	1.272	33	42
4th	0.954	44	42
5th	0.795	49	39
Rev.	3.428	14	48

Reverse idler gear		29	
Oil capacity liter (US pt, Imp pt)		4.5 - 4.8 (9-1/2 - 10-1/8, 7-7/8 - 8-1/2)	4.3 - 4.5 (9-1/8 - 9-1/2, 7-5/8 - 7-7/8)
Remarks	Double baulk ring type synchronizer	1st & 2nd synchronizer	

FINAL GEAR

Engine	VQ30DE	
Transaxle model	RS5F50A	RS5F50V
Final gear ratio	3.823	
Number of teeth		
Final gear/Pinion	65/17	
Side gear/Pinion	14/10	16/10

Inspection and Adjustment

GEAR END PLAY

Unit: mm (in)

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

CLEARANCE BETWEEN BAULK RING AND GEAR

3rd, 4th & 5th

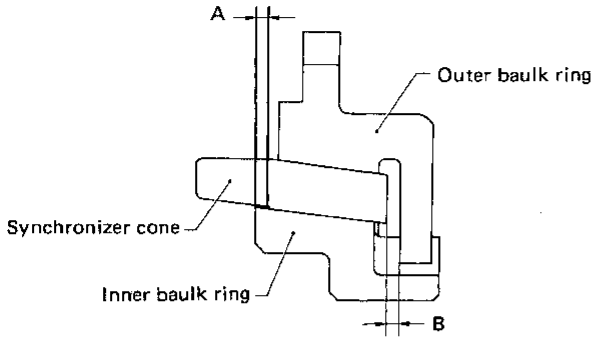
Unit: mm (in)

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

Inspection and Adjustment (Cont'd)

1st and 2nd double baulk ring

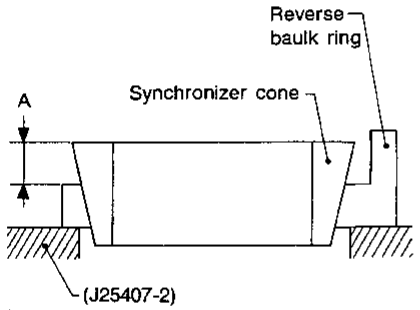
Unit: mm (in)



SMT806B

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

Reverse baulk ring



SMT581B

Dimension	Wear limit
A	1.2 mm (0.047 in)

AVAILABLE SNAP RING

1st & 2nd synchronizer hub (At mainshaft)

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

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

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

5th main gear (At mainshaft)

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

AVAILABLE THRUST WASHER

4th input gear (At input shaft)

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

Differential side gear thrust washer — RS5F50A

Allowable clearance between side gear and differential case with washer	0.1 - 0.2 mm (0.004 - 0.008 in)
Thickness mm (in)	Part number
0.75 - 0.80 (0.0295 - 0.0315)	38424-E3020
0.80 - 0.85 (0.0315 - 0.0335)	38424-E3021
0.85 - 0.90 (0.0335 - 0.0354)	38424-E3022
0.90 - 0.95 (0.0354 - 0.0374)	38424-E3023

Inspection and Adjustment (Cont'd)

Differential side gear thrust washer — RS5F50V

Allowable clearance between side gear and (differential case or viscous coupling) with washer	0.1 - 0.2 mm (0.004 - 0.008 in)

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

AVAILABLE SHIM

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

Bearing preload and end play

Unit: mm (in)

Mainshaft bearing preload	0.06 - 0.11 (0.0024 - 0.0043)
Input shaft end play	0 - 0.05 (0 - 0.0020)
Differential side bearing preload	0.40 - 0.45 (0.0157 - 0.0177)

Turning torque (New bearing)

Unit: N·m (kg-cm, in-lb)

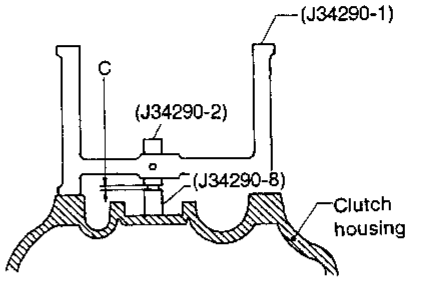
Final drive only	4.9 - 7.8 (50 - 80, 43 - 69)
Total	8.8 - 21.6 (90 - 220, 78 - 191)

Mainshaft bearing adjusting shim

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

Table for selecting mainshaft bearing adjusting shim

Unit: mm (in)



SMT467B

Dimension "C"	Suitable shim(s)
0.30 - 0.34 (0.0118 - 0.0134)	0.40 (0.0157)
0.34 - 0.38 (0.0134 - 0.0150)	0.44 (0.0173)
0.38 - 0.42 (0.0150 - 0.0165)	0.48 (0.0189)
0.42 - 0.46 (0.0165 - 0.0181)	0.52 (0.0205)
0.46 - 0.50 (0.0181 - 0.0197)	0.56 (0.0220)
0.50 - 0.54 (0.0197 - 0.0213)	0.60 (0.0236)
0.54 - 0.58 (0.0213 - 0.0228)	0.64 (0.0252)
0.58 - 0.62 (0.0228 - 0.0244)	0.68 (0.0268)
0.62 - 0.66 (0.0244 - 0.0260)	0.72 (0.0283)
0.66 - 0.70 (0.0260 - 0.0276)	0.76 (0.0299)
0.70 - 0.74 (0.0276 - 0.0291)	0.80 (0.0315)
0.74 - 0.78 (0.0291 - 0.0307)	0.40 + 0.44 (0.0157 + 0.0173)
0.78 - 0.82 (0.0307 - 0.0323)	0.44 + 0.44 (0.0173 + 0.0173)
0.82 - 0.86 (0.0323 - 0.0339)	0.44 + 0.48 (0.0173 + 0.0189)
0.86 - 0.90 (0.0339 - 0.0354)	0.48 + 0.48 (0.0189 + 0.0189)
0.90 - 0.94 (0.0354 - 0.0370)	0.48 + 0.52 (0.0189 + 0.0205)
0.94 - 0.98 (0.0370 - 0.0386)	0.52 + 0.52 (0.0205 + 0.0205)
0.98 - 1.02 (0.0386 - 0.0402)	0.52 + 0.56 (0.0205 + 0.0220)
1.02 - 1.06 (0.0402 - 0.0417)	0.56 + 0.56 (0.0220 + 0.0220)
1.06 - 1.10 (0.0417 - 0.0433)	0.56 + 0.60 (0.0220 + 0.0236)
1.10 - 1.14 (0.0433 - 0.0449)	0.60 + 0.60 (0.0236 + 0.0236)
1.14 - 1.18 (0.0449 - 0.0465)	0.60 + 0.64 (0.0236 + 0.0252)
1.18 - 1.22 (0.0465 - 0.0480)	0.64 + 0.64 (0.0252 + 0.0252)
1.22 - 1.26 (0.0480 - 0.0496)	0.64 + 0.68 (0.0252 + 0.0268)
1.26 - 1.30 (0.0496 - 0.0512)	0.68 + 0.68 (0.0268 + 0.0268)
1.30 - 1.34 (0.0512 - 0.0528)	0.68 + 0.72 (0.0268 + 0.0283)
1.34 - 1.38 (0.0528 - 0.0543)	0.72 + 0.72 (0.0283 + 0.0283)
1.38 - 1.42 (0.0543 - 0.0559)	0.72 + 0.76 (0.0283 + 0.0299)
1.42 - 1.46 (0.0559 - 0.0575)	0.76 + 0.76 (0.0299 + 0.0299)
1.46 - 1.50 (0.0575 - 0.0591)	0.76 + 0.80 (0.0299 + 0.0315)

Inspection and Adjustment (Cont'd)

Input shaft bearing adjusting shim

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

Table for selecting input shaft bearing adjusting shim

Unit: mm (in)

Dial indicator indication	Suitable shim(s)
0.65 - 0.69 (0.0256 - 0.0272)	0.64 (0.0252)
0.69 - 0.73 (0.0272 - 0.0287)	0.68 (0.0268)
0.73 - 0.77 (0.0287 - 0.0303)	0.72 (0.0283)
0.77 - 0.81 (0.0303 - 0.0319)	0.76 (0.0299)
0.81 - 0.85 (0.0319 - 0.0335)	0.80 (0.0315)
0.85 - 0.89 (0.0335 - 0.0350)	0.40 + 0.44 (0.0157 + 0.0173)
0.89 - 0.93 (0.0350 - 0.0366)	0.44 + 0.44 (0.0173 + 0.0173)
0.93 - 0.97 (0.0366 - 0.0382)	0.44 + 0.48 (0.0173 + 0.0189)
0.97 - 1.01 (0.0382 - 0.0398)	0.48 + 0.48 (0.0189 + 0.0189)
1.01 - 1.05 (0.0398 - 0.0413)	0.48 + 0.52 (0.0189 + 0.0205)
1.05 - 1.09 (0.0413 - 0.0429)	0.52 + 0.52 (0.0205 + 0.0205)
1.09 - 1.13 (0.0429 - 0.0445)	0.52 + 0.56 (0.0205 + 0.0220)
1.13 - 1.17 (0.0445 - 0.0461)	0.56 + 0.56 (0.0220 + 0.0220)
1.17 - 1.21 (0.0461 - 0.0476)	0.56 + 0.60 (0.0220 + 0.0236)
1.21 - 1.25 (0.0476 - 0.0492)	0.60 + 0.60 (0.0236 + 0.0236)
1.25 - 1.29 (0.0492 - 0.0508)	0.60 + 0.64 (0.0236 + 0.0252)
1.29 - 1.33 (0.0508 - 0.0524)	0.64 + 0.64 (0.0252 + 0.0252)
1.33 - 1.37 (0.0524 - 0.0539)	0.64 + 0.68 (0.0252 + 0.0268)
1.37 - 1.41 (0.0539 - 0.0555)	0.68 + 0.68 (0.0268 + 0.0268)
1.41 - 1.45 (0.0555 - 0.0571)	0.68 + 0.72 (0.0268 + 0.0283)
1.45 - 1.49 (0.0571 - 0.0587)	0.72 + 0.72 (0.0283 + 0.0283)
1.49 - 1.53 (0.0587 - 0.0602)	0.72 + 0.76 (0.0283 + 0.0299)
1.53 - 1.57 (0.0602 - 0.0618)	0.76 + 0.76 (0.0299 + 0.0299)
1.57 - 1.61 (0.0618 - 0.0634)	0.76 + 0.80 (0.0299 + 0.0315)
1.61 - 1.65 (0.0634 - 0.0650)	0.80 + 0.80 (0.0315 + 0.0315)
1.65 - 1.69 (0.0650 - 0.0665)	0.44 + 1.20 (0.0173 + 0.0472)

Differential side bearing adjusting shim — RS5F50A

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

Differential side bearing adjusting shim — RS5F50V

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

Inspection and Adjustment (Cont'd)

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

Unit: mm (in)

Dial indicator deflection	Suitable shim(s)
0.47 - 0.51 (0.0185 - 0.0201)	0.44 + 0.48 (0.0173 + 0.0189)
0.51 - 0.55 (0.0201 - 0.0217)	0.48 + 0.48 (0.0189 + 0.0189)
0.55 - 0.59 (0.0217 - 0.0232)	0.48 + 0.52 (0.0189 + 0.0205)
0.59 - 0.63 (0.0232 - 0.0248)	0.52 + 0.52 (0.0205 + 0.0205)
0.63 - 0.67 (0.0248 - 0.0264)	0.52 + 0.56 (0.0205 + 0.0220)
0.67 - 0.71 (0.0264 - 0.0280)	0.56 + 0.56 (0.0220 + 0.0220)
0.71 - 0.75 (0.0280 - 0.0295)	0.56 + 0.60 (0.0220 + 0.0236)
0.75 - 0.79 (0.0295 - 0.0311)	0.60 + 0.60 (0.0236 + 0.0236)
0.79 - 0.83 (0.0311 - 0.0327)	0.60 + 0.64 (0.0236 + 0.0252)
0.83 - 0.87 (0.0327 - 0.0343)	0.64 + 0.64 (0.0252 + 0.0252)
0.87 - 0.91 (0.0343 - 0.0358)	0.64 + 0.68 (0.0252 + 0.0268)
0.91 - 0.95 (0.0358 - 0.0374)	0.68 + 0.68 (0.0268 + 0.0268)
0.95 - 0.99 (0.0374 - 0.0390)	0.68 + 0.72 (0.0268 + 0.0283)
0.99 - 1.03 (0.0390 - 0.0406)	0.72 + 0.72 (0.0283 + 0.0283)
1.03 - 1.07 (0.0406 - 0.0421)	0.72 + 0.76 (0.0283 + 0.0299)
1.07 - 1.11 (0.0421 - 0.0437)	0.76 + 0.76 (0.0299 + 0.0299)
1.11 - 1.15 (0.0437 - 0.0453)	0.76 + 0.80 (0.0299 + 0.0315)
1.15 - 1.19 (0.0453 - 0.0469)	0.80 + 0.80 (0.0315 + 0.0315)
1.19 - 1.23 (0.0469 - 0.0484)	0.44 + 1.20 (0.0173 + 0.0472)
1.23 - 1.27 (0.0484 - 0.0500)	0.48 + 1.20 (0.0189 + 0.0472)
1.27 - 1.31 (0.0500 - 0.0516)	0.52 + 1.20 (0.0205 + 0.0472)

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

Unit: mm (in)

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