TRANSMISSION

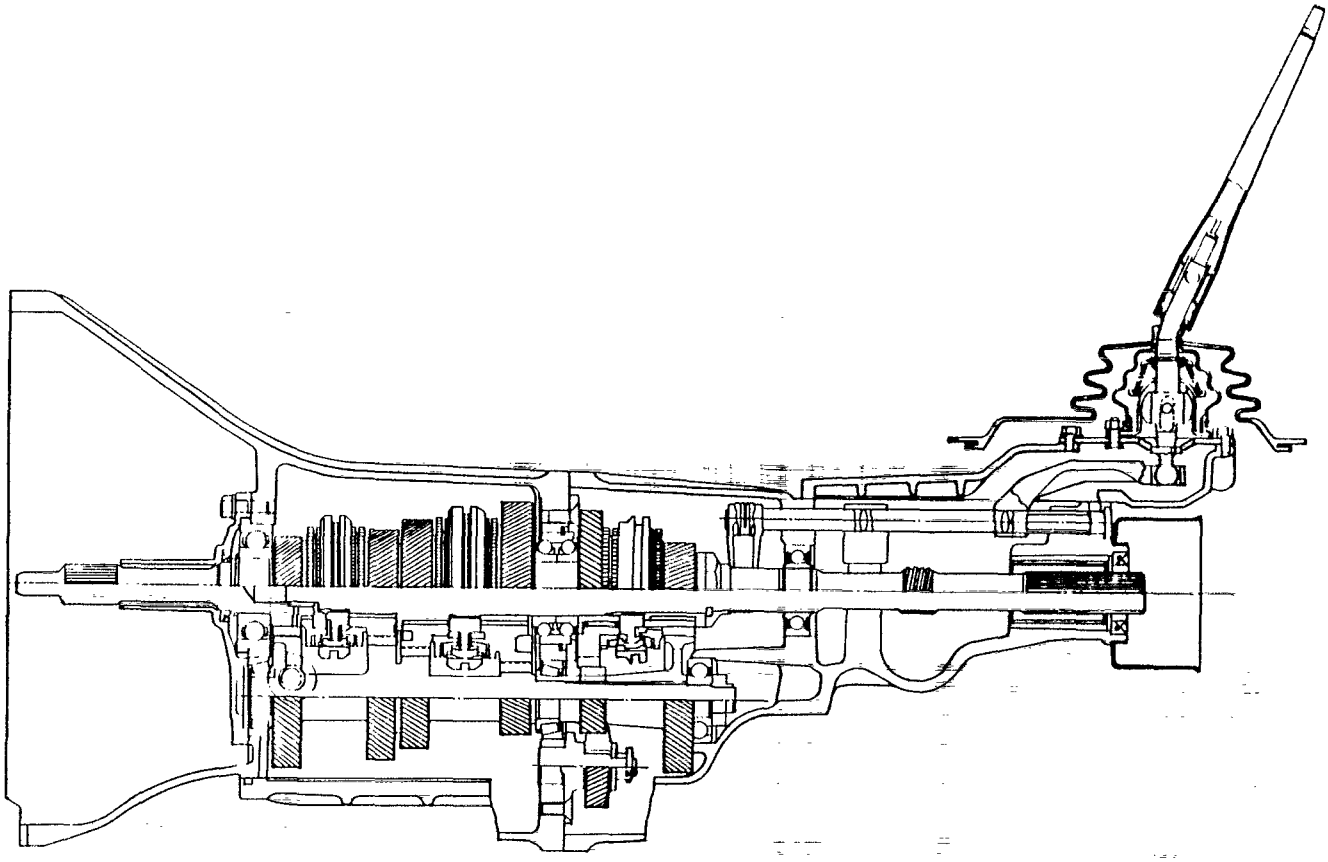
MANUAL AND AUTOMATIC

CONTENTS

GENERAL INFORMATION

N21BAAI

The KM132 5-speed manual transmission has the gear reduction and ratio selection functions combined into one unit and housed in the aluminum diecast housing and case.
The gear train is all constant mesh type both forward and reverse and in order to provide driving performance meeting the engine performance, the gear train has a close gear ratio in the case of engine with intercooler.



1320002

SPECIFICATIONS

N21CA--

GENERAL SPECIFICATIONS

Items		Specifications
Model		KM132-M-CNL
Type		5 speed, Floor-shift
Gear ratio	1st	3.369
	2nd	2.035
	3rd	1.360
	4th	1.000
	5th	0.856
	Reverse	3.578
Speedometer gear ratio (drive/driven)		8/23

SERVICE SPECIFICATIONS

mm (in.)

Items	Specifications
Standard value	
Main drive gear end play	0 – 0.06 (0 – .002)
Front bearing retainer end play	0 – 0.1 (0 – .0040)
3rd-4th synchronizer hub end play	0 – 0.08 (0 – .003)
Countershaft preload	0 – 0.05 (0 – .0020)
Overdrive gear sleeve end play	0 – 0.2 (0 – .0080)

ADJUSTMENT SPACER AND SNAP RINGS

mm (in.)

Part name	Thickness	Identification symbol	Part No.
Snap ring (for adjustment of main drive gear end play)	2.30 (.091)	White	MD701729
	2.35 (.093)	None	MD701730
	2.40 (.094)	Red	MD701731
	2.45 (.096)	Blue	MD701732
	2.50 (.098)	Yellow	MD701733
Snap ring (for adjustment of overdrive gear sleeve end play)	2.17 (.085)	White	MD729179
	2.36 (.093)	Blue	MD729180
	2.55 (.100)	Black	MD729181
	2.74 (.108)	None	MD729182
	2.93 (.115)	Brown	MD729183
	3.12 (.123)	Red	MD729184
	3.31 (.130)	Yellow	MD729185
	3.50 (.138)	White	MD729186
	3.69 (.145)	Blue	MD729187
Snap ring (for adjustment of 3rd-4th speed synchronizer hub end play)	2.15 (.085)	Blue	MD701761
	2.22 (.087)	None	MD701762
	2.29 (.090)	Brown	MD701763
	2.36 (.093)	White	MD701764

Part name	Thickness	Identification symbol	Part No.
Spacer (for adjustment of countershaft preload)	1.84 (.072)	84	MD706580
	1.87 (.074)	87	MD706581
	1.90 (.075)	90	MD706582
	1.93 (.076)	93	MD706583
	1.96 (.077)	96	MD706584
	1.99 (.078)	99	MD706585
	2.02 (.080)	02	MD706586
	2.05 (.081)	05	MD706587
	2.08 (.082)	08	MD706588
	2.11 (.083)	11	MD706589
	2.14 (.084)	14	MD706590
	2.17 (.085)	17	MD706591
	2.20 (.087)	20	MD706592
	2.23 (.088)	23	MD706593
	2.26 (.089)	26	MD706594
	2.29 (.090)	29	MD706595
	2.32 (.091)	32	MD706596
	2.35 (.093)	35	MD706597
	2.38 (.094)	38	MD706598
	2.41 (.095)	41	MD706599
	2.44 (.096)	44	MD706600
	2.47 (.097)	47	MD706601
	2.50 (.098)	50	MD706602
	2.53 (.100)	53	MD706603
	2.56 (.101)	56	MD706604
	2.59 (.102)	59	MD706605
	2.62 (.103)	62	MD706606
	2.65 (.104)	65	MD706607
	2.68 (.106)	68	MD706608
Spacer (for adjustment of front bearing retainer end play)	0.84 (.033)	Black	MD725212
	0.93 (.037)	None	MD725213
	1.02 (.040)	Red	MD725214
	1.11 (.044)	White	MD725215
	1.20 (.047)	Yellow	MD725216

TORQUE SPECIFICATIONS

N21CC--

Items	Nm	ft.lbs.
Propeller shaft flange yoke attaching bolt	50 – 60	36 – 43
Transmission mounting bolt	43 – 55	31 – 40
Starting motor mounting bolt	22 – 32	16 – 23
Engine to transmission	43 – 55	31 – 40
Mainshaft locking nut	250 – 270	181 – 195
Countershaft locking nut	160 – 190	116 – 137
Idler shaft locking nut	20 – 60	14 – 43
Idler shaft set bolt	15 – 22	11 – 15
Drain plug	35 – 45	26 – 32
Oil filler plug	30 – 35	22 – 25
Back-up light switch	30	22
Under cover	15 – 22	10 – 15
Seal plug (Neutral return plunger plug)	30 – 42	22 – 30
Speedometer sleeve clamp bolt	10 – 13	7 – 9
Control lever	15 – 22	11 – 15
Rear engine mounting to transmission bolt	20 – 24	14 – 17
Rear engine mounting to body bolt	10	7

LUBRICANTS

N21CD--

Items	Specified lubricant	Quantity
Manual transmission oil lit. (qts.)	MOPAR Hypoid Gear Oil Part No. 3744994 or equivalent	2.3 (2.4)

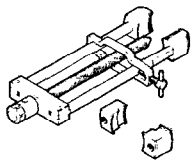
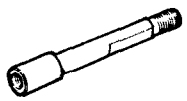
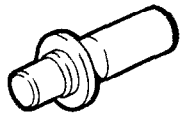
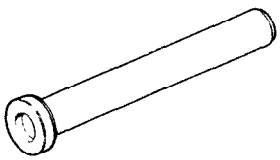
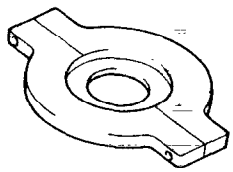
SEALANTS AND ADHESIVES

N21CE--

Items	Specified sealant	Quantity
Threaded portion of extension housing mounting bolt	3M Super Silicone 8662 or equivalent	As required
Extension housing mounting bolts (special bolt)	3M Liquid Gasket 8959 or equivalent	As required

SPECIAL TOOLS

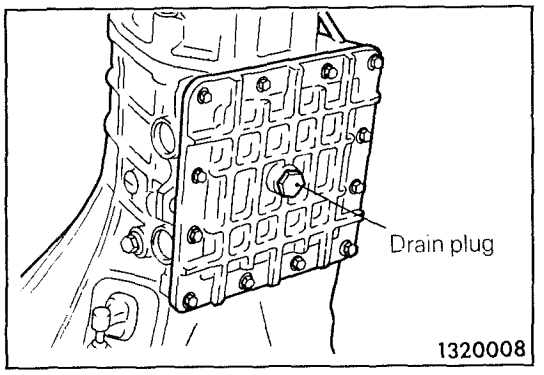
N21DA--

Tool (Number and name)	Use	Tool (Number and name)	Use
MD998245 Lock pin installer 		MD998020 Bearing puller 	
MD998028 Bearing puller adapter 	Use with MD998020	MD998200 Front bearing retainer oil seal installer 	
MD998067 Mainshaft bearing installer 		MD998359 Taper bearing puller 	

TROUBLESHOOTING

N21EAACa

Symptom	Probable cause	Remedy
Abnormal noise and vibration	a. Loose or broken transmission and engine mounts	a. Tighten or replace mounts
	b. Improper end play of counter gear	b. Correct
	c. Worn or damaged gear	c. Replace
	d. Improper grade of oil	d. Replace to the specified grade of oil
	e. Low oil level	e. Add oil
Oil leaks	a. Damaged oil seal or gasket	a. Replace
Shifting hard or difficult	a. Abnormal contact or worn synchronizer ring and gear corns	a. Replace
	b. Synchronizer spring weakened	b. Replace synchronizer ring
	c. Improper grade of oil	c. Replace to the specified grade of oil
Gear jump out	a. Worn gear shift fork or broken poppet spring	a. Replace
	b. Excessive synchronizer hub to sleeve spline play	b. Replace

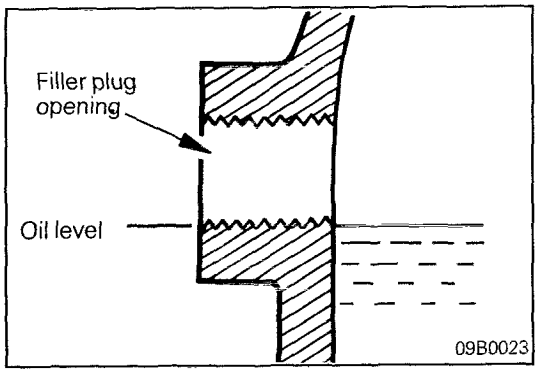


SERVICE ADJUSTMENT PROCEDURES

N21FCAAa

TRANSMISSION FLUID REPLACEMENT

(1) Position vehicle on a flat level and remove drain plug to drain transmission oil.
(2) Replace packing with a new one and tighten the drain plug.



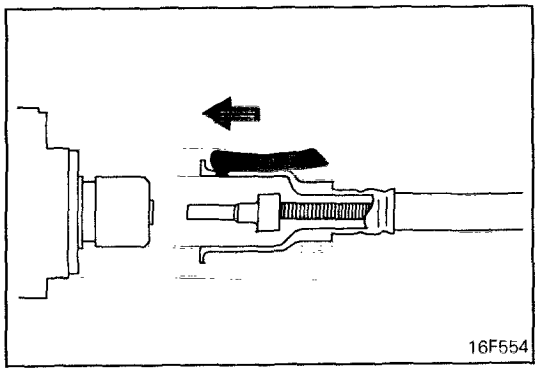
(3) Pour in fresh transmission oil through filler plug hole until it reaches the bottom of filler port.

Specified transmission oil:
MOPAR Hypoid Gear Oil Part No. 3744994 or equivalent
Quantity: 2.3 lit. (2.4 qts.)

TRANSMISSION FLUID INSPECTION

N21FBAAa

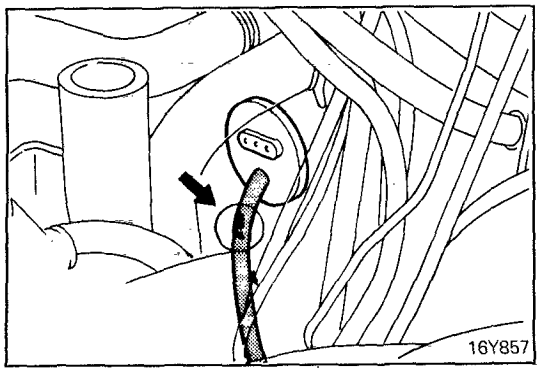
Refer to GROUP 0, LUBRICATION AND MAINTENANCE – Manual Transmission.



SPEEDOMETER CABLE REPLACEMENT

N21FEAAa

(1) Replace the cable assembly if there is a malfunction.
(2) When connecting the cable to the meter, insert the cable until its stopper properly fits to the meterside groove.



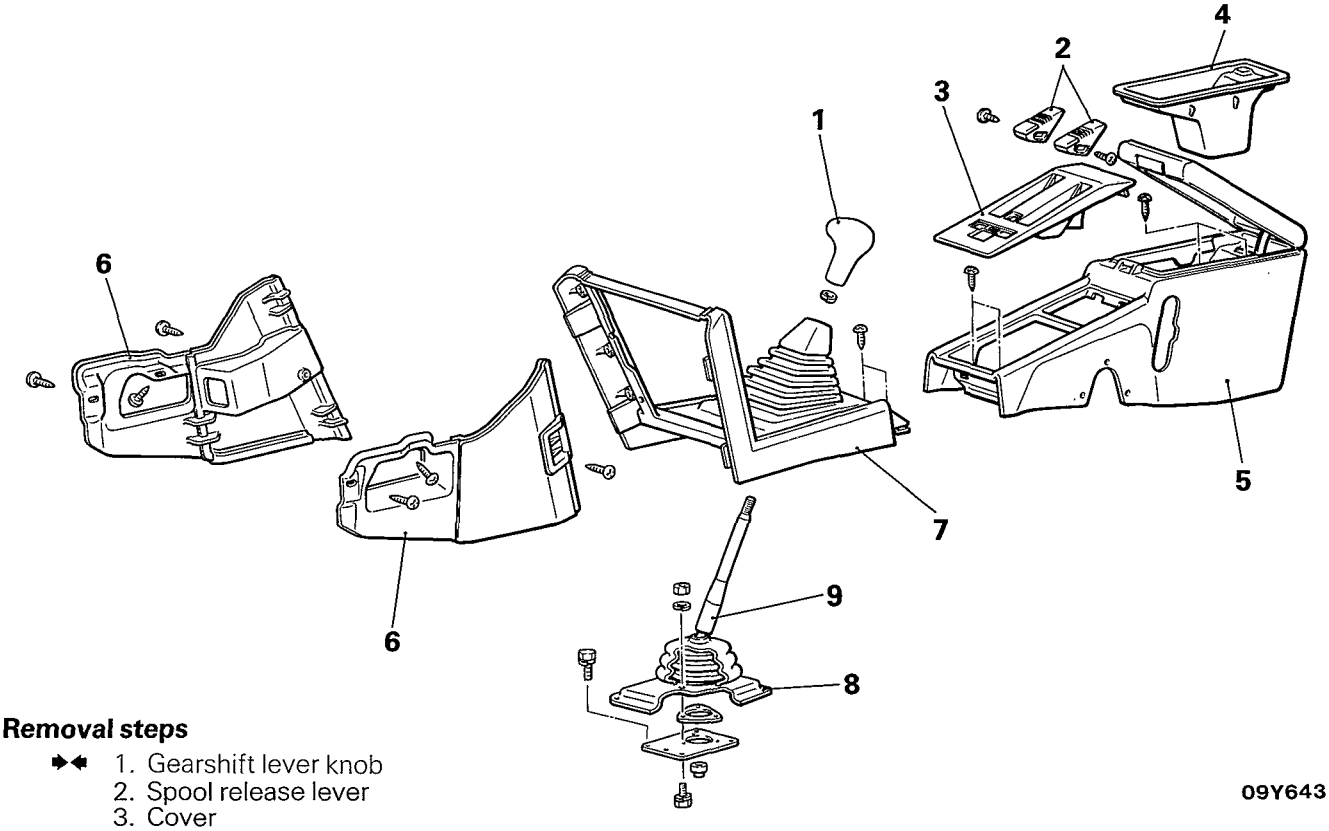
(3) After installing the speedometer, pull the speedometer cable through the grommet in the toeboard until the cable marking is visible from the engine compartment side.

Caution
Poor installation of the cable may cause a fluctuating meter pointer, or noise and a damaged harness inside the instrument panel.

GEARSHIFT LEVER ASSEMBLY

N21GA--

REMOVAL AND INSTALLATION

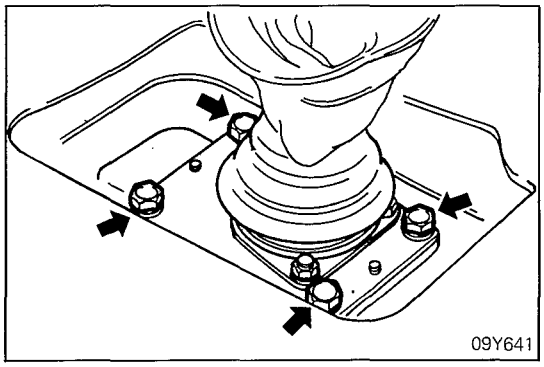


09Y643

Removal steps

- ◆◆ 1. Gearshift lever knob
- 2. Spool release lever
- 3. Cover
- 4. Inner box
- 5. Rear console box
- 6. Side console cover
- 7. Front console box
- 8. Dust cover retaining plate
- ◆◆ 9. Gearshift lever assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".



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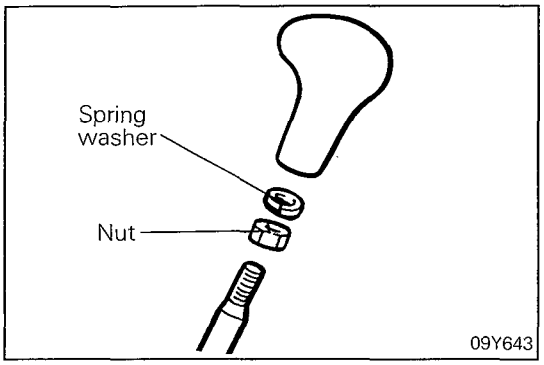

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SERVICE POINT OF REMOVAL

N21GBAA

9. REMOVAL OF GEARSHIFT LEVER ASSEMBLY

(1) Remove the bolts attaching the control lever cover.
(2) Uncouple stopper plate from extension cover.
(3) Remove the gearshift lever assembly by lifting it up.

NOTE
Keep the gearshift lever in the neutral position.

SERVICE POINT OF INSTALLATION

N21GDAG

1. INSTALLATION OF GEARSHIFT LEVER KNOB

(1) Loosely tighten the nut down to the end of threaded portion of the shift lever. Then back off the nut about a half turn and install the spring washer.
(2) Give one turn to the knob after the spring washer begins to bend. Tighten further the knob until the shift pattern faces toward the front of vehicle and adjust.

NOTE
If the knob has been fully tightened by the above procedure, back off it not more than one turn and make adjustment.

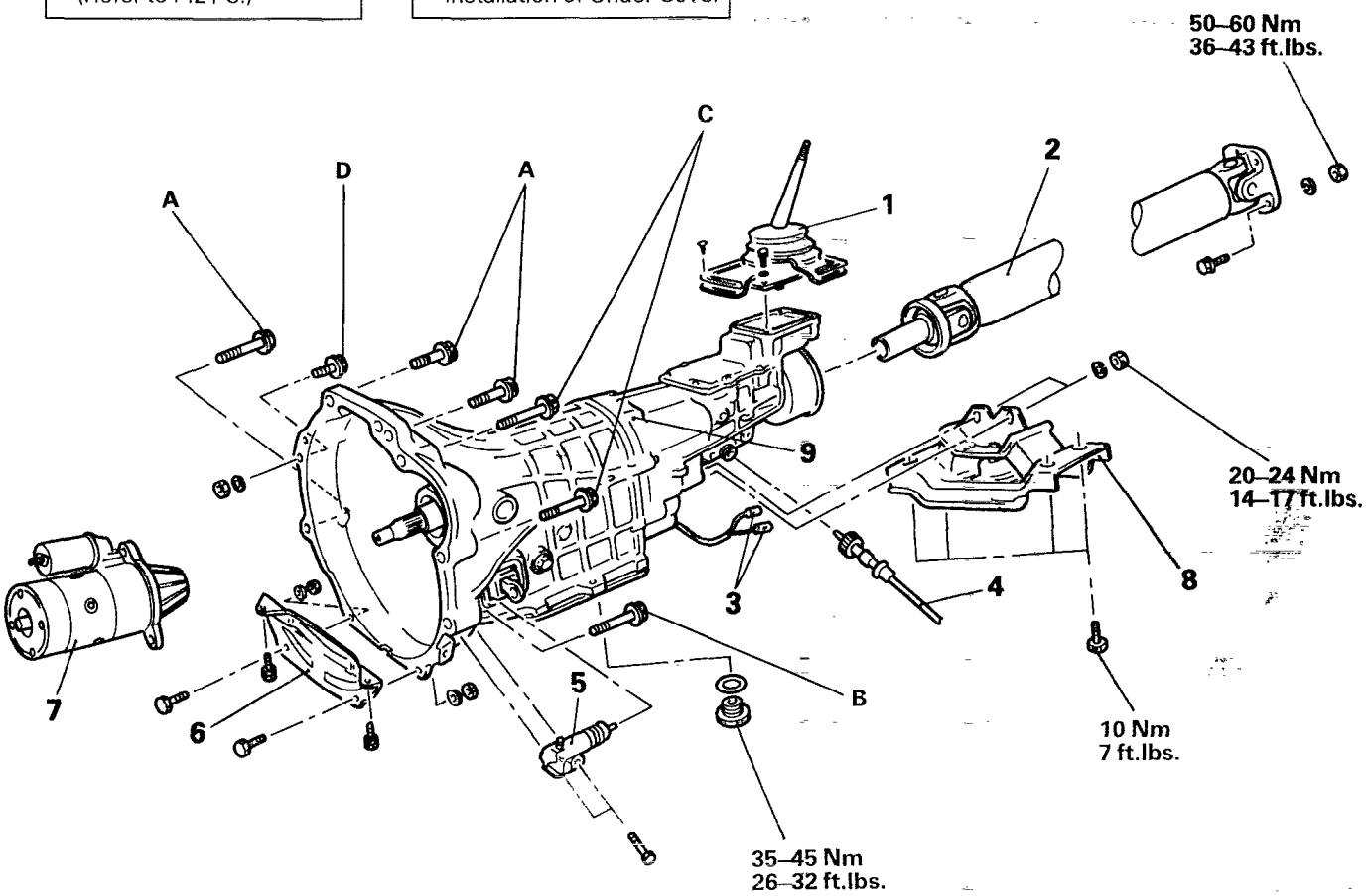
TRANSMISSION

N21MA--

REMOVAL AND INSTALLATION

Pre-removal Operation
- Removal of Under Cover
- Draining Transmission Oil (Refer to P.21-8.)

Post-installation Operation
- Refilling Transmission Oil (Refer to P.21-8.)
- Installation of Under Cover

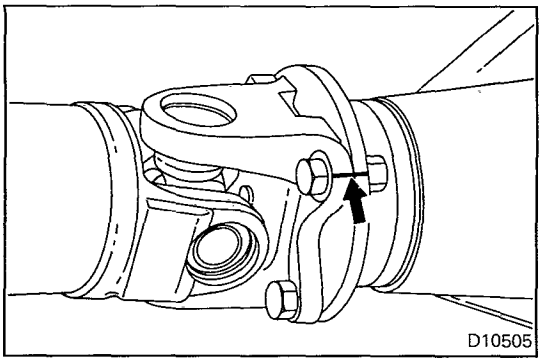


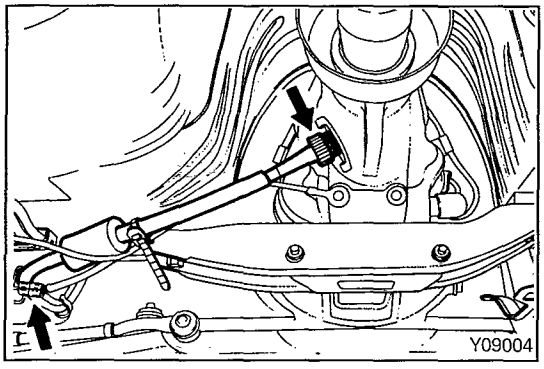
Removal steps

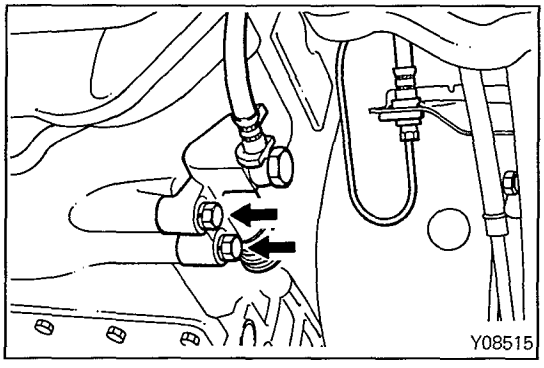
◀▶ 1. Gearshift lever assembly
◀▶ 2. Propeller shaft
◀▶ 3. Back-up lamp harness connector
◀▶ 4. Speedometer cable
◀▶ 5. Clutch release cylinder
◀▶ 6. Bell housing cover
◀▶ 7. Starting motor
8. Rear engine mounting
◀▶ ▶◀ 9. Transmission assembly

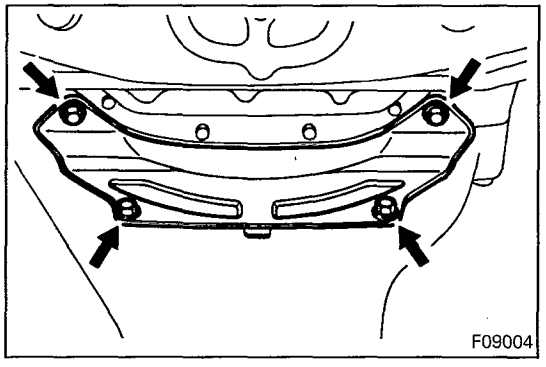
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◀▶: Refer to "Service Points of Removal".
(3) ▶◀: Refer to "Service Points of Installation".

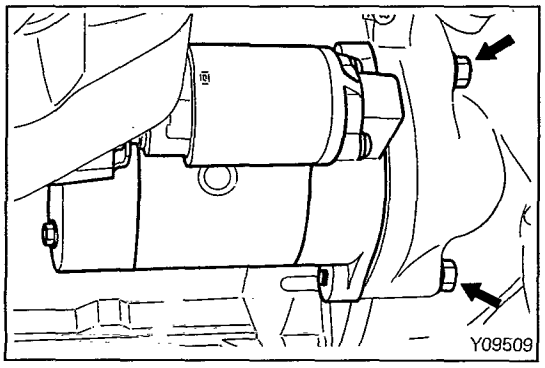
	Nm	ft.lbs.	O.D. x Length mm (in.)	Bolt identification
A	43 – 55	31 – 40	⑦ 10 x 40 (1.6)	⑦ A x B
B	43 – 55	31 – 40	⑦ 10 x 65 (2.6)	A, B, Y09512
C	22 – 32	16 – 23	⑦ 10 x 60 (2.4)	
D	20 – 27	14 – 20	⑦ 8 x 55 (2.2)	











SERVICE POINTS OF REMOVAL N21MBAD

1. REMOVAL OF GEARSHIFT LEVER ASSEMBLY

Refer to P.21-9.

2. REMOVAL OF PROPELLER SHAFT

(1) Make the mating marks on the flange yoke and the differential companion flange.
(2) Pull out the propeller shaft from the transmission.

Caution
Use care not to damage the lip of transmission oil seal.
Do not allow foreign matter to enter the transmission.

3. DISCONNECTION OF BACK-UP LAMP HARNESS CONNECTOR / 4. SPEEDOMETER CABLE

Disconnect the speedometer cable and the back-up lamp switch harness.

5. REMOVAL OF CLUTCH RELEASE CYLINDER

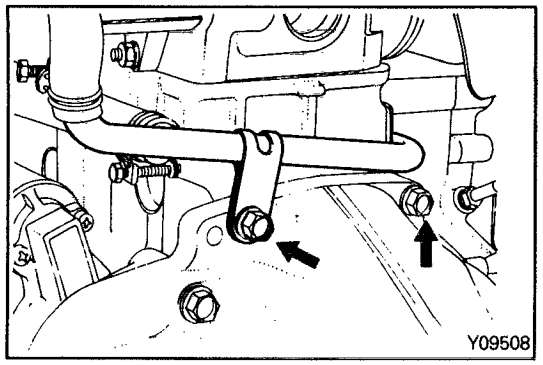
Remove the release cylinder attaching bolts and slide the release cylinder sideway.

6. REMOVAL OF BELL HOUSING COVER

Remove the bell housing cover.

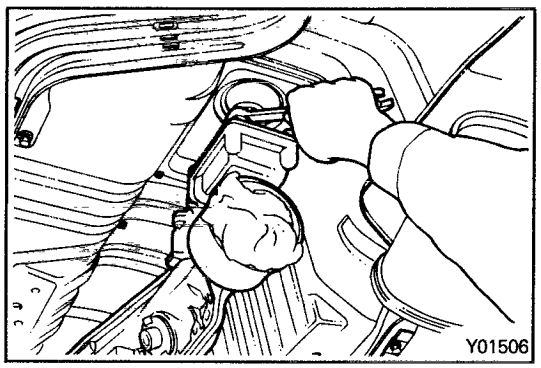
7. REMOVAL OF STARTING MOTOR

Remove the starting motor.



9. REMOVAL OF TRANSMISSION ASSEMBLY

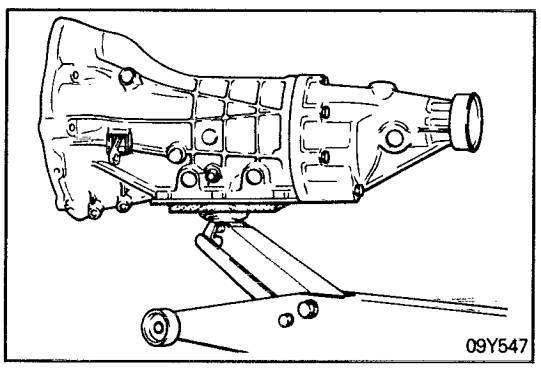
(1) Remove the transmission mounting bolts (two bolts on the upper side) from the bell housing.
(2) Remove the remaining transmission mounting bolts.
(3) Support the transmission with a jack.
(4) Remove the engine support bracket and insulator assembly with the ground cable which is tightened together with the insulator.



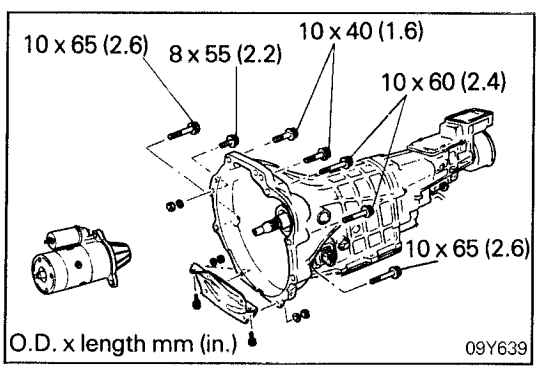
(5) Lower the transmission as shown in the illustration.

NOTE
Place a piece of cloth on the rear of the cylinder head to prevent damage to the toeboard.

Remove the gearshift lever assembly while the lever is in the neutral position.



(6) Remove the transmission by pulling it toward the rear of the vehicle.



SERVICE POINT OF INSTALLATION N21MDAE

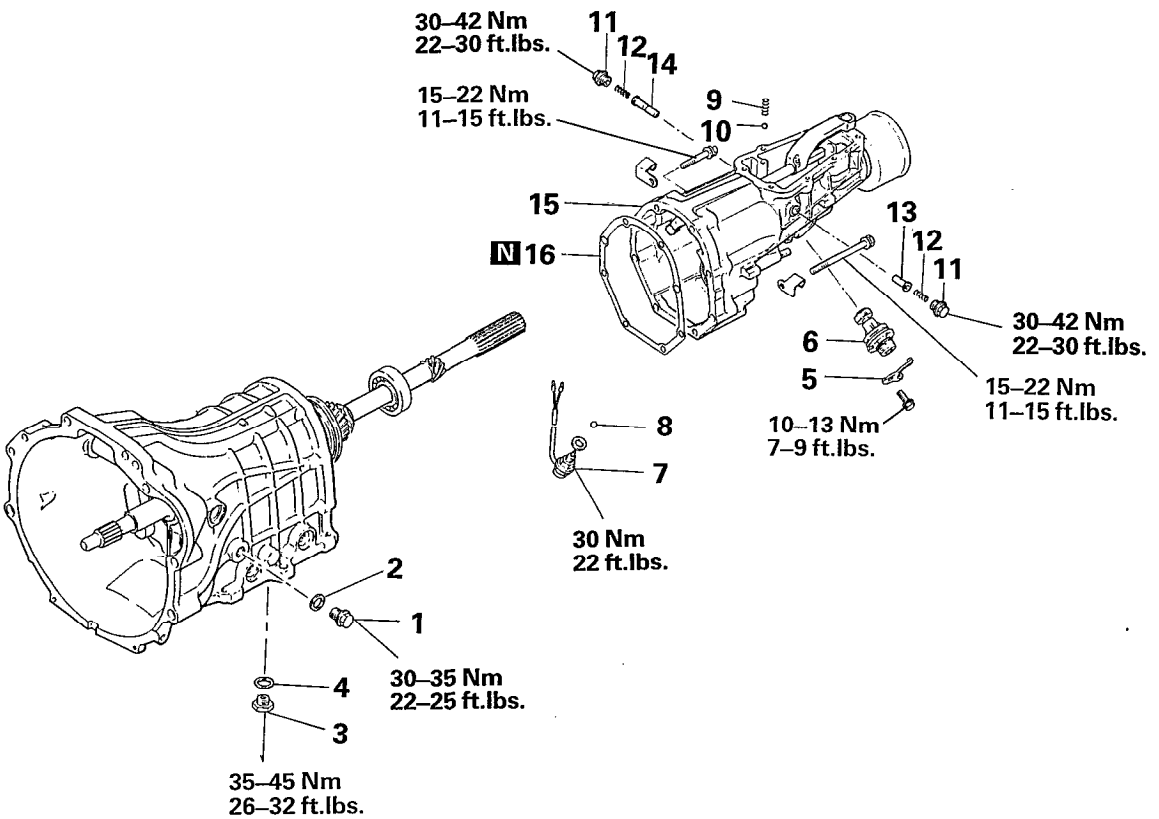
9. INSTALLATION OF TRANSMISSION ASSEMBLY

Note that transmission mounting bolts differ in size from one place to another.

TRANSMISSION

N21ME--

DISASSEMBLY AND REASSEMBLY



Disassembly steps

1. Oil filler plug
2. Gasket
3. Oil drain plug
4. Gasket
5. Sleeve clamp
6. ◆◆ Speedometer assembly
7. Back-up lamp switch
8. Steel ball
9. ◆◆ Spring
10. ◆◆ Ball
11. ◆◆ Plug
12. ◆◆ Spring
13. ◆◆ Neutral plunger A
14. ◆◆ Neutral plunger B
15. ◆◆ ◆◆ Extension housing
16. Extension housing gasket

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts

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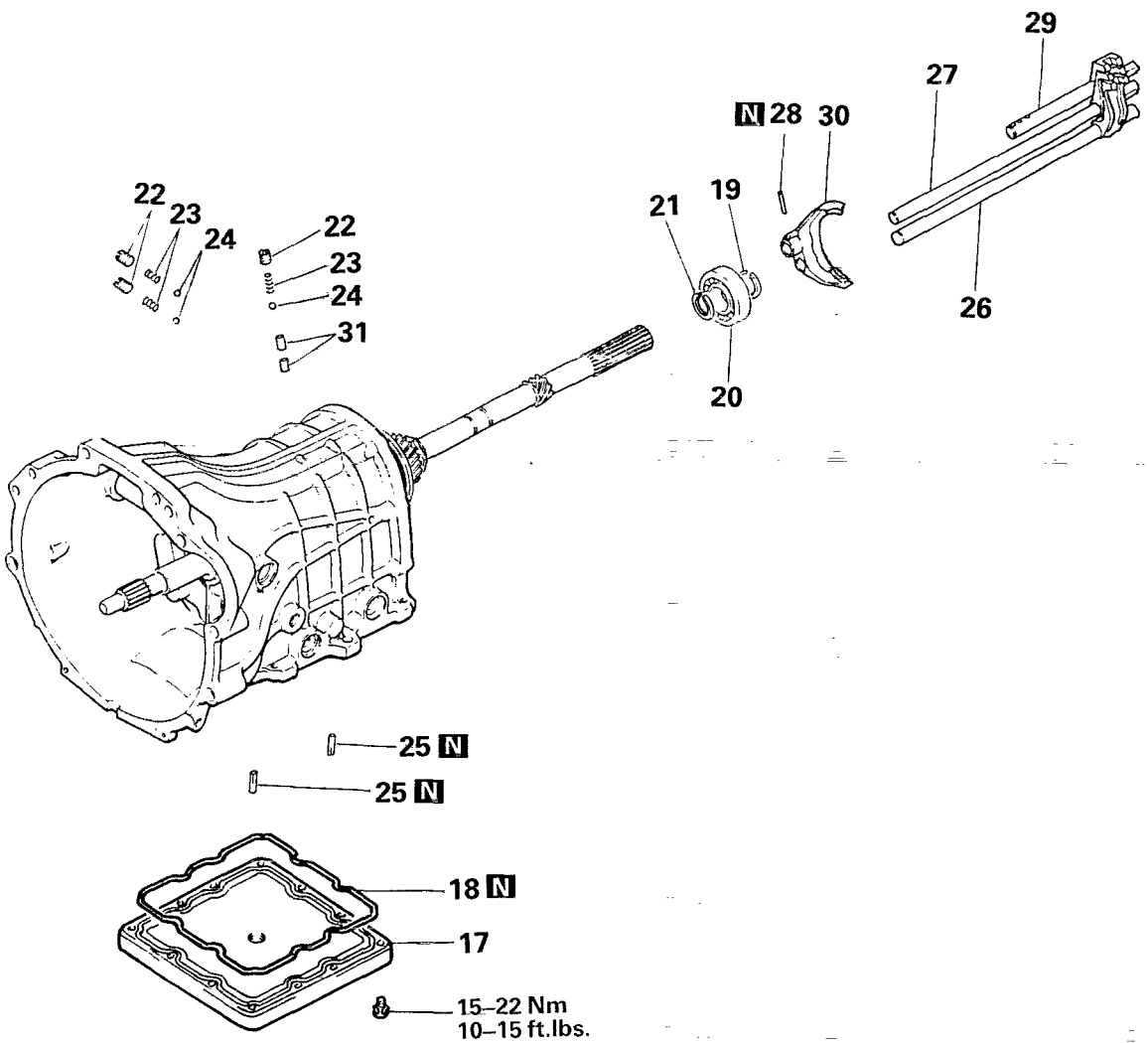
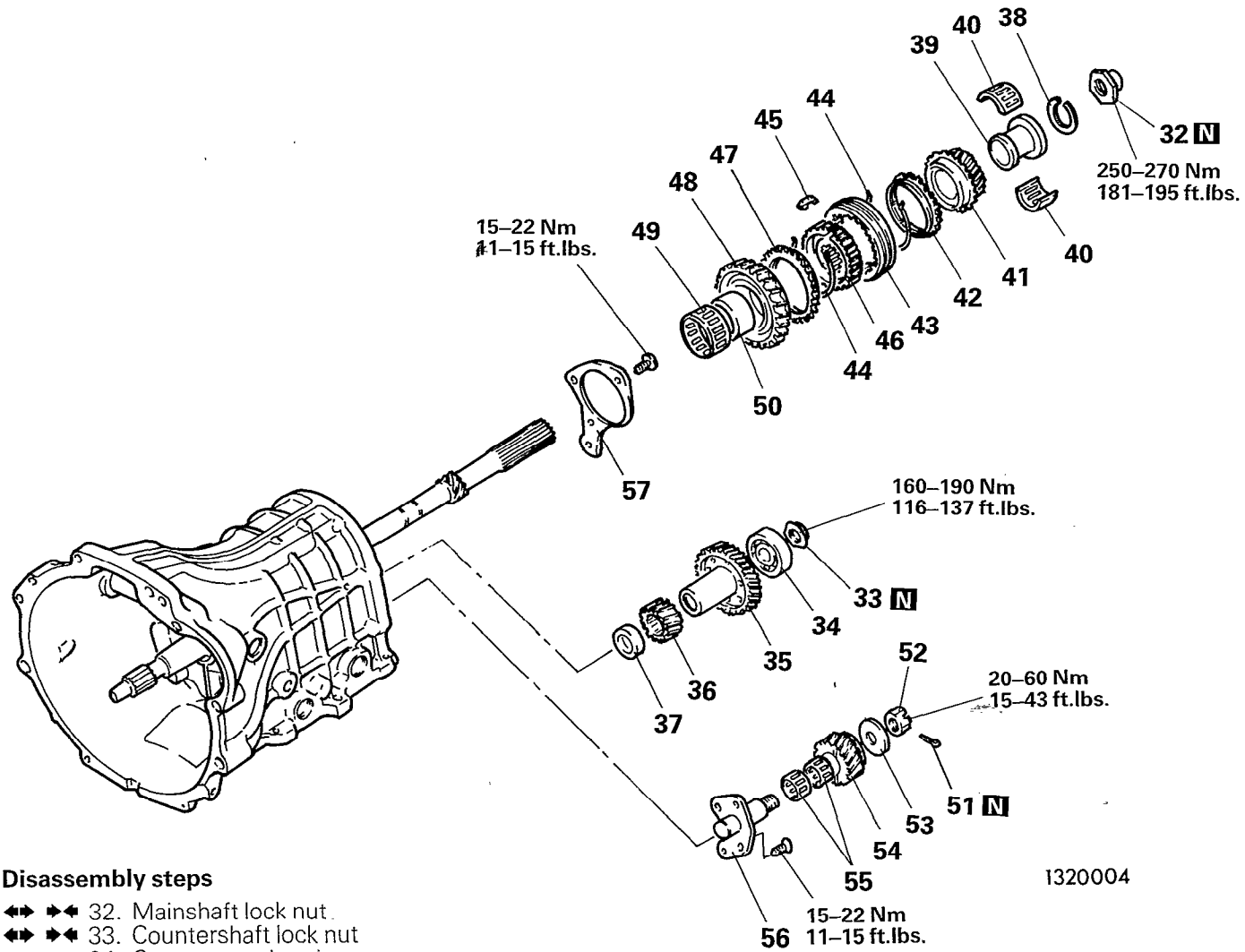


Disassembly steps

17. Under cover
18. O-ring
19. Snap ring
20. Mainshaft rear bearing
21. Snap ring
◆◆ 22. Plug
◆◆ 23. Poppet spring
◆◆ 24. Steel ball
◆◆ ◆◆ 25. Spring pin
26. 1-2 shift rail
27. 3-4 shift rail
◆◆ ◆◆ 28. Spring pin
29. OD-R shift rail
30. OD-R shift fork
31. Interlock plunger

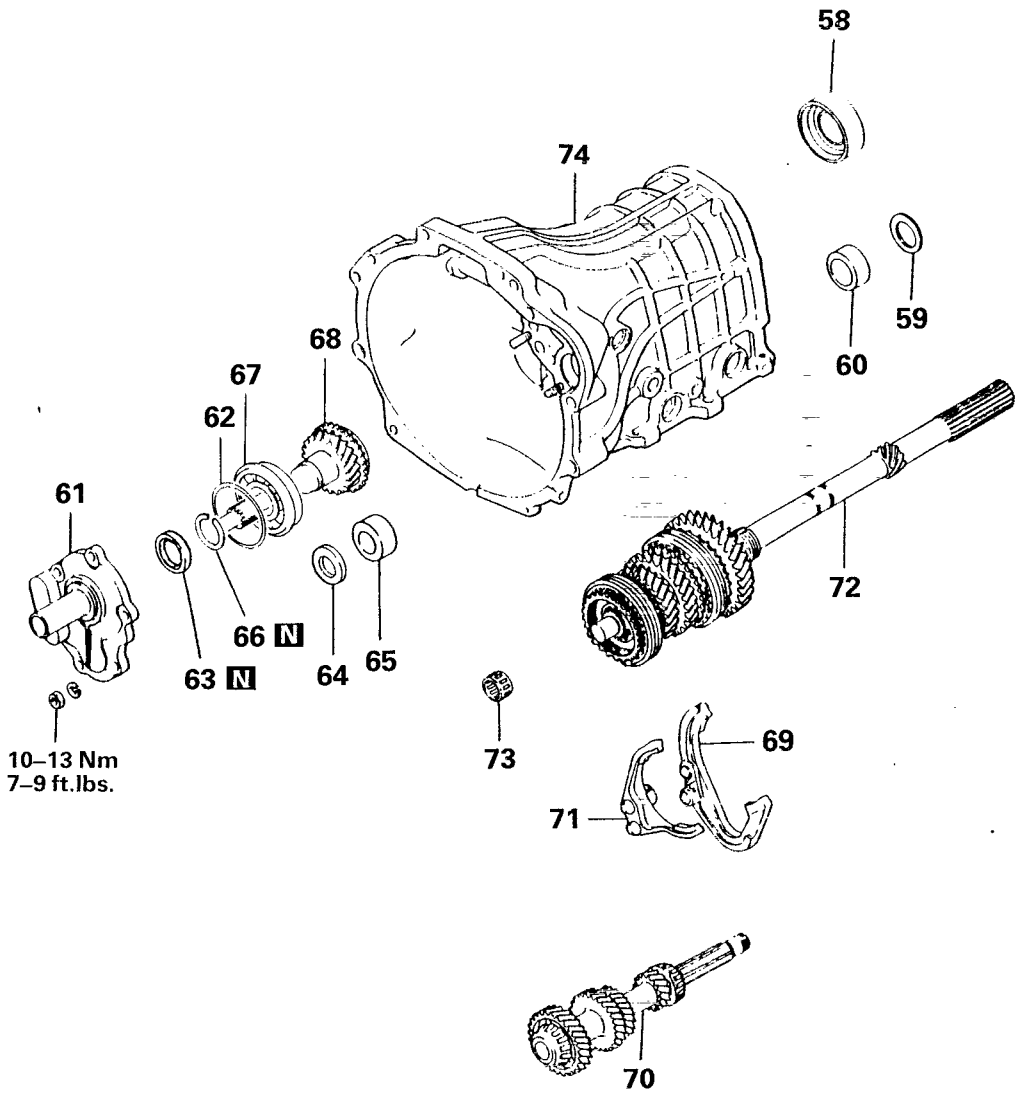
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts



Disassembly steps

- ◆◆ ▶◀ 32. Mainshaft lock nut
- ◆◆ ▶◀ 33. Countershaft lock nut
- ◆◆ 34. Counter rear bearing
- ◆◆ 35. Counter overdrive gear
- 36. Reverse idler gear
- 37. Spacer
- ▶◀ 38. Snap ring
- ◆◆ 39. Overdrive gear sleeve
- ◆◆ 40. Needle bearing
- ◆◆ 41. Overdrive gear
- ▶◀ 42. Synchronizer ring
- ▶◀ 43. OD-R synchronizer sleeve
- ▶◀ 44. Synchronizer spring
- ▶◀ 45. Synchronizer key
- ▶◀ 46. Synchronizer hub
- ▶◀ 47. Synchronizer ring
- 48. Reverse gear
- 49. Needle bearing
- 50. Bearing sleeve
- 51. Split pin
- 52. Slotted nut
- 53. Thrust washer
- 54. Reverse idler gear
- 55. Needle bearing
- ◆◆ ▶◀ 56. Reverse idler gear shaft
- 57. Rear bearing retainer

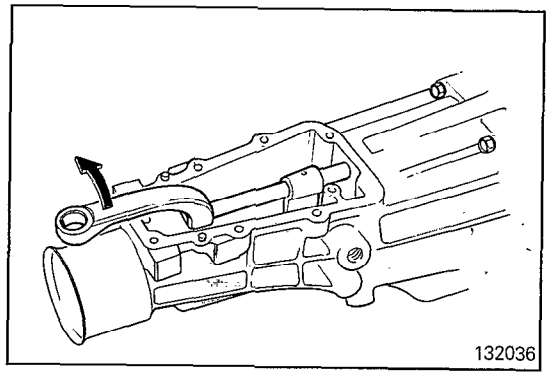
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ▶◀: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts



Disassembly steps

- ◆◆ ▶◀ 58. Mainshaft center bearing
- ▶◀ 59. Spacer
- 60. Counter center bearing outer race
- ▶◀ 61. Front bearing retainer
- ▶◀ 62. Spacer
- ▶◀ 63. Oil seal
- 64. Spacer
- 65. Counter front bearing outer race
- ◆◆ ▶◀ 66. Snap ring
- ◆◆ ▶◀ 67. Main drive gear bearing
- 68. Main drive gear
- 69. 1st-2nd shift fork
- 70. Countershaft assembly
- 71. 3rd-4th shift fork
- 72. Mainshaft assembly
- 73. Needle bearing
- 74. Transmission case

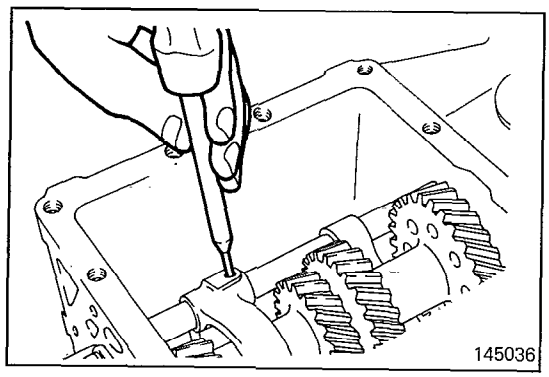
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ▶◀: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts



SERVICE POINTS OF DISASSEMBLY N21MFBH

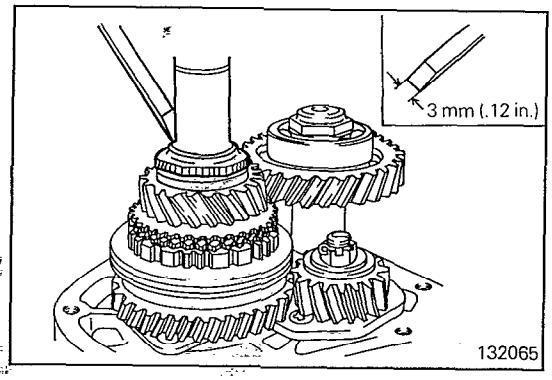
15. REMOVAL OF EXTENSION HOUSING

While pushing the change shifter down to left, remove extension housing by pulling rearward.



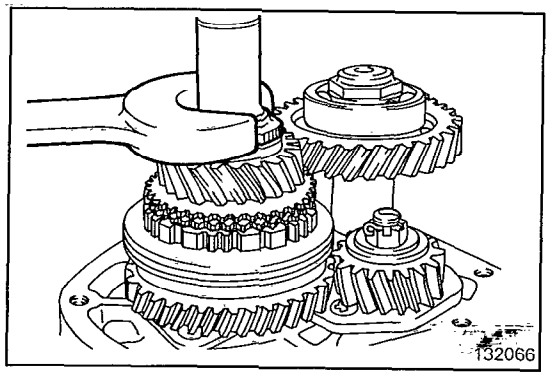
25. 28. REMOVAL OF SPRING PINS

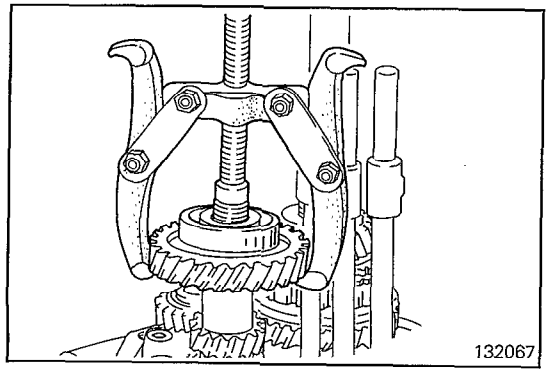
Using a pin punch, drive out the spring pins.



32. REMOVAL OF MAINSHAFT LOCK NUT / 33. COUNTERSHAFT LOCK NUT

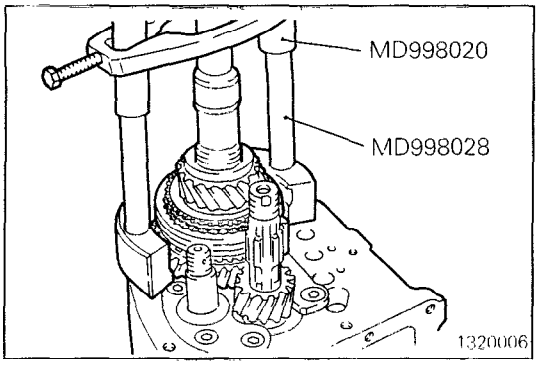
(1) Using blunt punch or chisel that has a blade as shown in the illustration, bend back lock tabs of the mainshaft and countershaft lock nuts.
(2) Shift the OD-R synchronizer sleeve in reverse, and then 1st-2nd synchronizer sleeve in 2nd.
(3) Remove the mainshaft lock nut and countershaft lock nut.





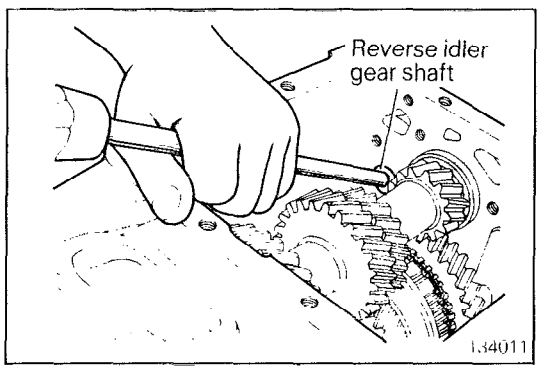
34. REMOVAL OF COUNTER REAR BEARING / 35. COUNTER OVERDRIVE GEAR

Pull off counter overdrive gear and ball bearing by using a suitable puller.



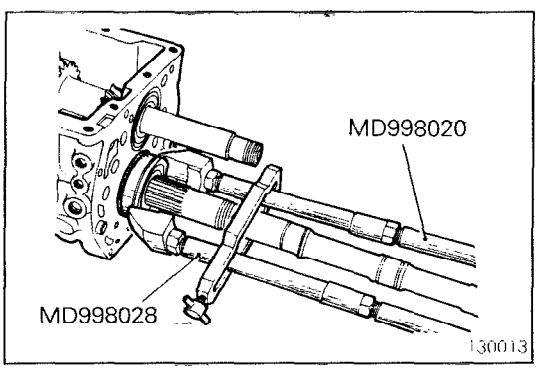
39. REMOVAL OF OVER DRIVE GEAR SLEEVE / 40. NEEDLE BEARING / 41. OVER DRIVE GEAR

Using the special tools, remove over drive gear sleeve.



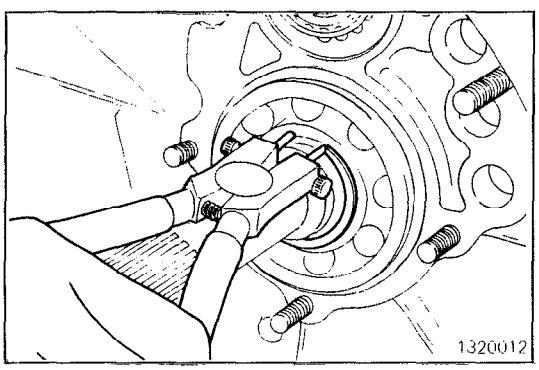
56. REMOVAL OF REVERSE IDLER GEAR SHAFT

(1) Remove four reverse idler gear shaft mounting bolts.
(2) Drive reverse idler gear shaft from inside of case.



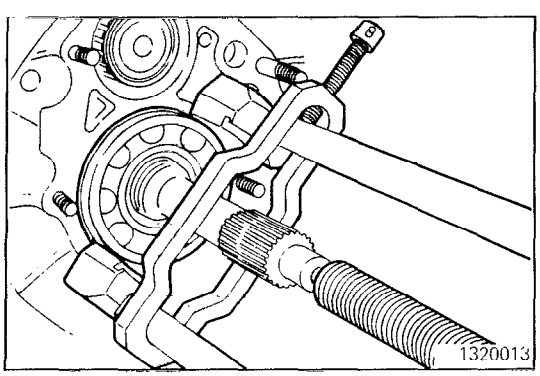
58. REMOVAL OF MAINSHAFT CENTER BEARING

Using the special tools, remove mainshaft rear bearing.



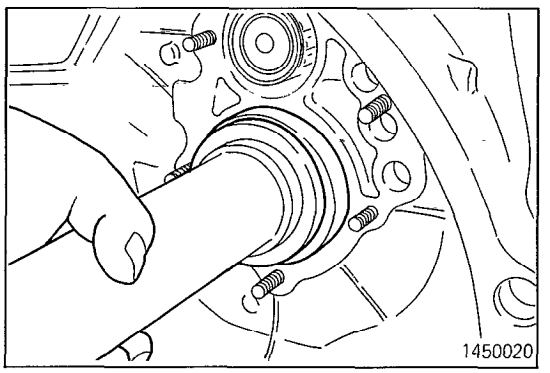
66. REMOVAL OF SNAP RING

Remove the snap ring with snap ring pliers.



67. REMOVAL OF MAIN DRIVE GEAR BEARING

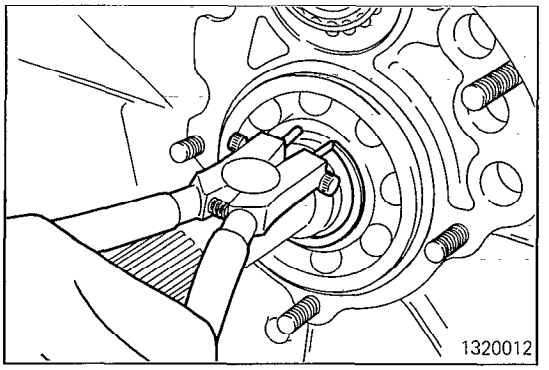
Use the special tool to remove the main drive gear bearing.



SERVICE POINTS OF REASSEMBLY

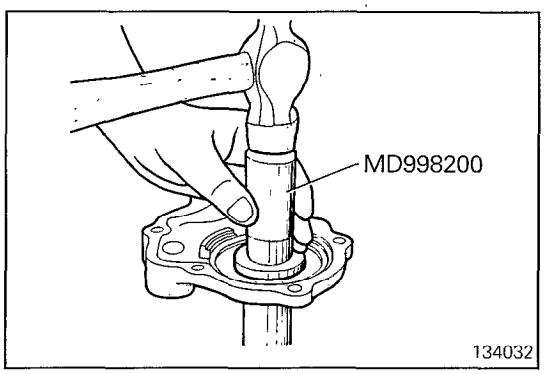
67. INSTALLATION OF MAIN DRIVE GEAR BEARING

Use the special tool to install the main drive gear bearing.



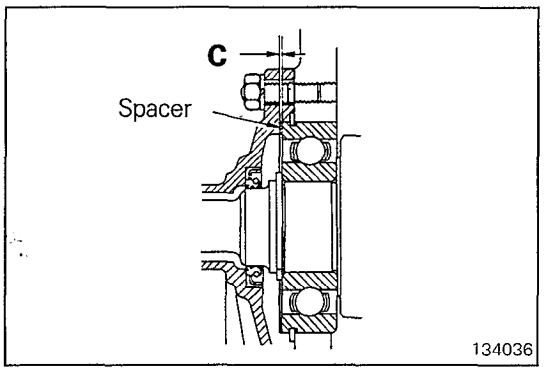
66. INSTALLATION OF SNAP RING

Install the snap ring with snap ring pliers.



63. INSTALLATION OF OIL SEAL

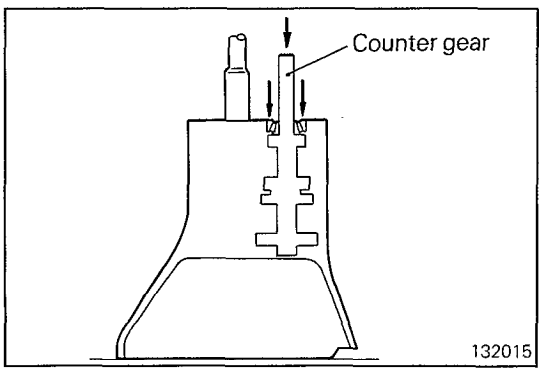
Apply transmission oil to oil seal lip, and install the oil seal to the front bearing retainer using the special tool.



62. INSTALLATION OF SPACER / 61. FRONT BEARING RETAINER

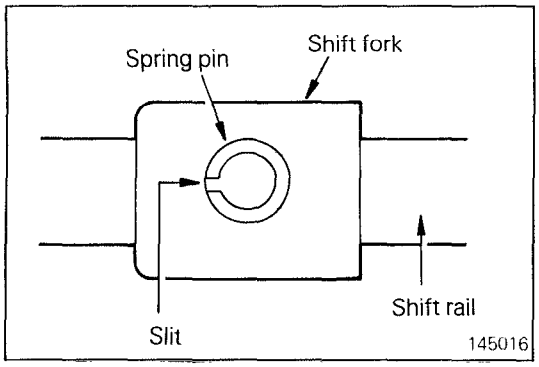
Select spacer to adjust clearance (C) to the standard value before installing the front bearing retainer.

Standard value: 0 – 0.1 mm (0 – .004 in.)



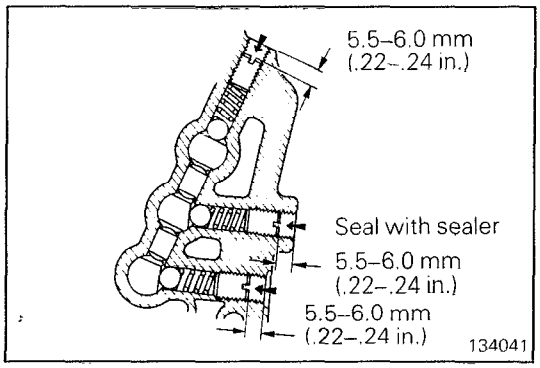
59. INSTALLATION OF SPACER

(1) Hold down counter gear and bearing outer race (in the direction of arrow shown in the illustration).



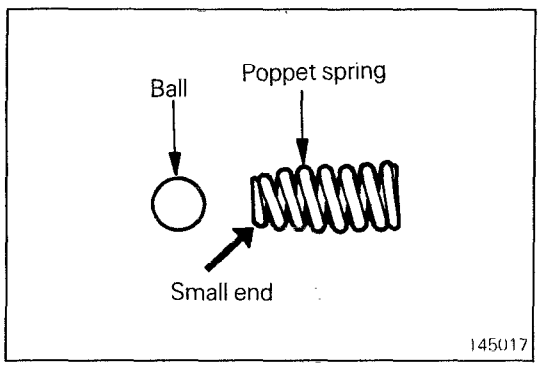
(2) Drive in spring pin so as to place slit in direction of center line of shift rail. Drive in spring pin for 3rd-4th and 1st-2nd shift forks in the same manner.

NOTE
Do not reuse spring pin.



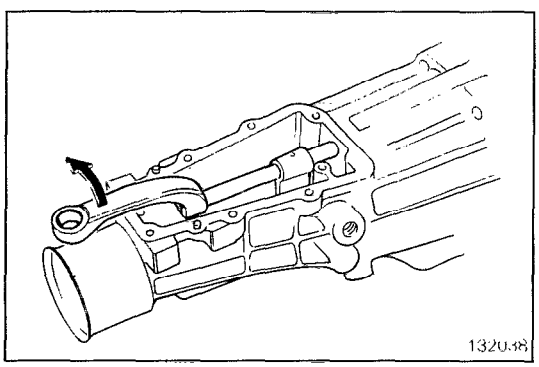
24. INSTALLATION OF STEEL BALL / 23. POPPET SPRING / 22. PLUG

(1) Insert steel ball and poppet spring into each shift rail. Tighten plug to specified position.



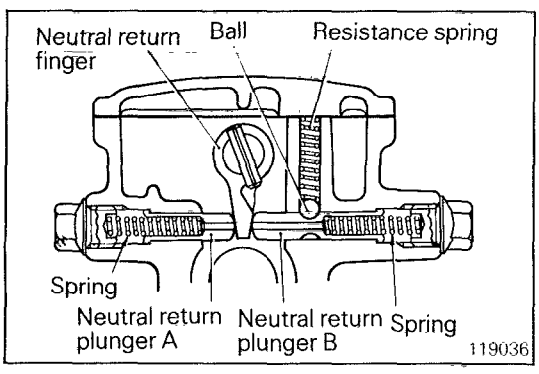
(2) Insert poppet spring with small end on ball side. Three springs are identical to one another.
(3) After installation, seal plug head with sealer.

Specified sealant: 3M Super Silicone 8662 or equivalent



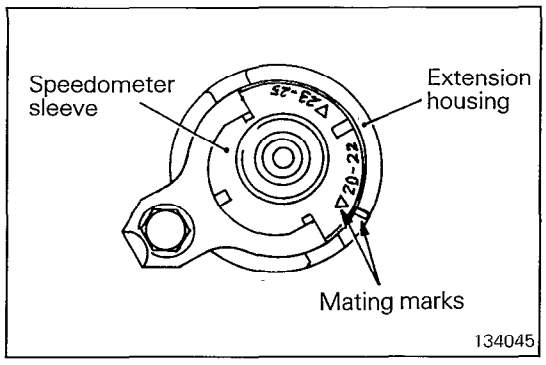
15. INSTALLATION OF EXTENSION HOUSING

When installing the extension housing, put the change shifter down in the arrow direction, and fit control finger in groove provided in selector.



14. INSTALLATION OF NEUTRAL PLUNGER B / 13. NEUTRAL PLUNGER A / 12. SPRING / 11. PLUG / 10. BALL / 9. SPRING

Install neutral return plungers A and B and springs. Then install steel ball and resistance spring, and tighten the seal plugs.



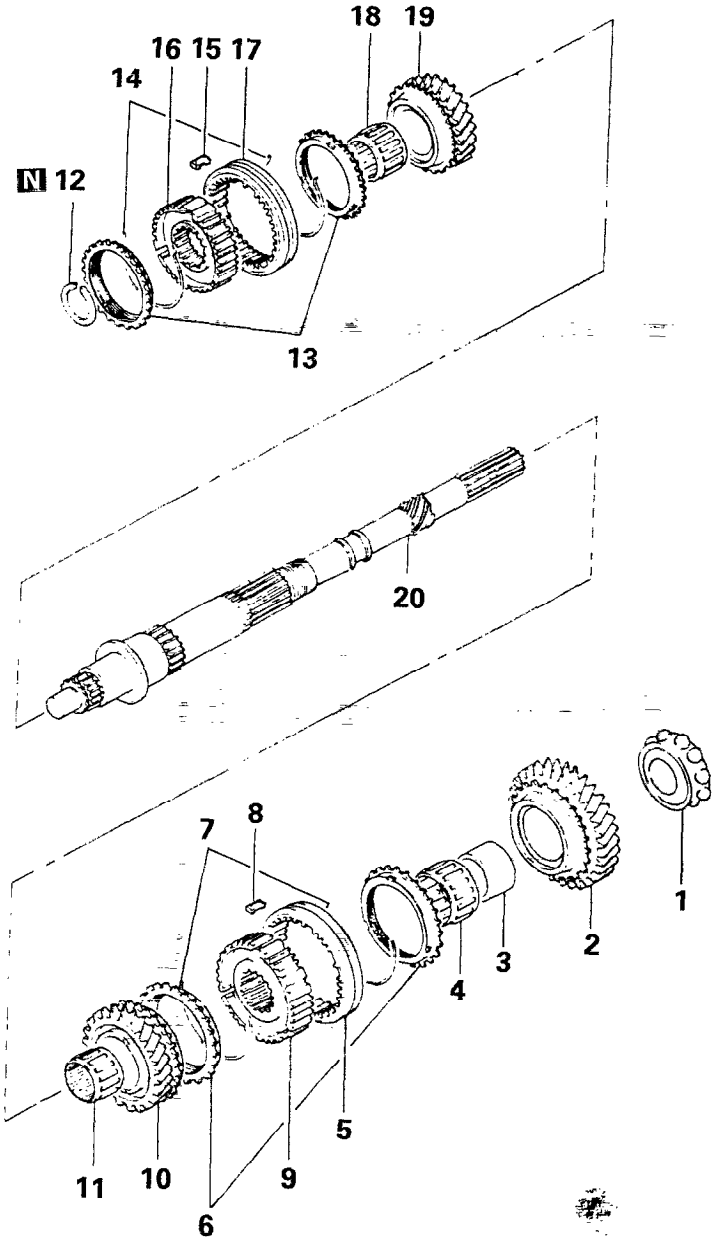
6. INSTALLATION OF SPEEDOMETER ASSEMBLY

Align mating marks according to the number of teeth of speedometer driven gear and install assembly.

MAINSHAFT ASSEMBLY

N21PE--

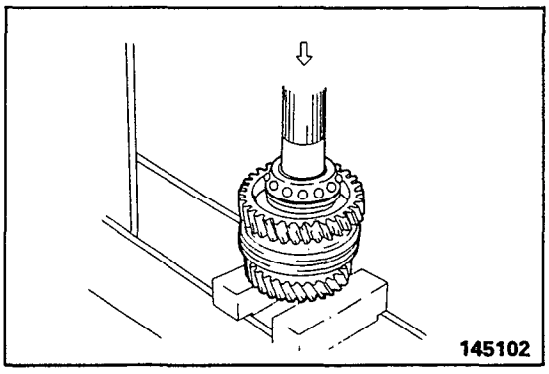
DISASSEMBLY AND REASSEMBLY



Disassembly steps

- ◆◆ 1. Ball bearing inner race
- 2. 1st speed gear
- 3. Bearing sleeve
- 4. Needle bearing
- ◆◆ 5. 1st-2nd synchronizer sleeve
- 6. Synchronizer ring
- ◆◆ 7. Synchronizer spring
- ◆◆ 8. Synchronizer key
- ◆◆ 9. 1st-2nd synchronizer hub
- ◆◆ 10. 2nd speed gear
- 11. Needle bearing
- 12. Snap ring
- 13. Synchronizer ring
- ◆◆ 14. Synchronizer spring
- ◆◆ 15. Synchronizer key
- ◆◆ 16. 3rd-4th synchronizer hub
- ◆◆ 17. 3rd-4th synchronizer sleeve
- 18. Needle bearing
- 19. 3rd speed gear
- 20. Mainshaft

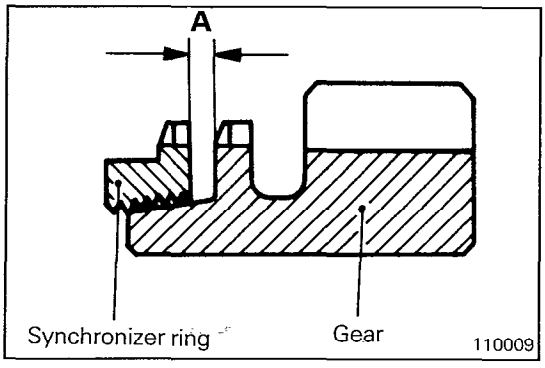
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts



SERVICE POINTS OF DISASSEMBLY N21PFAA

1. REMOVAL OF BALL BEARING INNER RACE / 10. SECOND SPEED GEAR

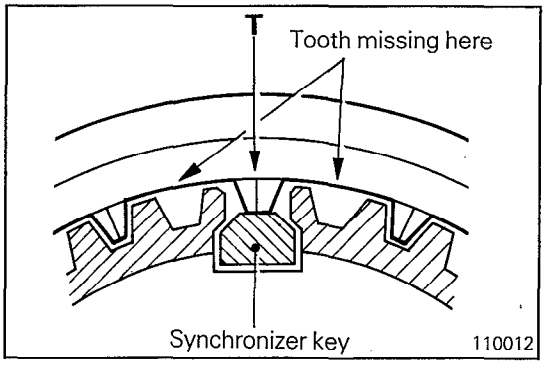
Holding second speed gear on press base, push rear end of mainshaft to remove bearing inner race (double bearing only), gear bearing sleeve, first speed gear, 1st-2nd speed synchronizer and second speed gear.



INSPECTION N21PGAA

- Check synchronizer ring for worn and damaged internal threads.
- With synchronizer assembled to cone of each gear, check dimension "A".
  If "A" exceeds the limit, replace synchronizer ring and/or gear.

  Limit: 0.5 mm (.020 in.)

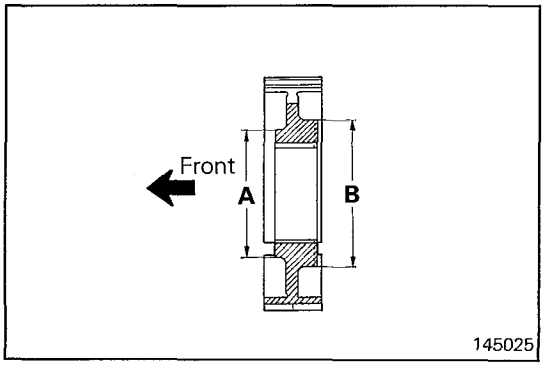


SERVICE POINTS OF REASSEMBLY N21PHAA

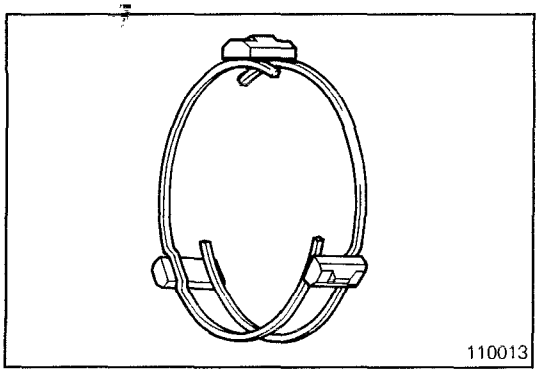
17. INSTALLATION OF 3RD-4TH SYNCHRONIZER SLEEVE / 16. 3RD-4TH SYNCHRONIZER HUB / 15. SYNCHRONIZER KEY / 14. SYNCHRONIZER SPRING

(1) Mate synchronizer hub with sleeve using mark made at disassembly. Make sure that hub and sleeve slide smoothly. If they slide unsmoothly, replace hub and sleeve assembly.

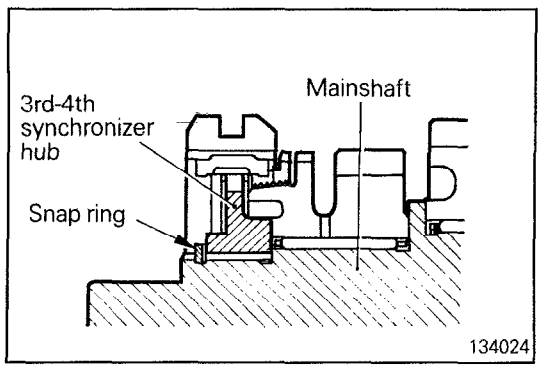
(2) 3rd-4th synchronizer sleeve has teeth missing at six portions. Assemble hub to sleeve in such a way that center tooth "T" between two missing teeth will touch synchronizer key.



(3) Use care when installing 3rd-4th synchronizer hub since only 3rd-4th synchronizer is directional. Smaller diameter side "A" of center boss is front of 3rd-4th synchronizer hub.


110013

(4) Insert three keys into groove of synchronizer hub.
(5) Install two synchronizer springs to synchronizer. When synchronizer springs are installed, make sure that front and rear ones are not faced in same direction.



134024

16. INSTALLATION OF 3RD-4TH SYNCHRONIZER HUB / 12. SNAP RING

(1) Assemble 3rd-4th synchronizer positioning hub toward correct direction.
(2) As for mainshaft front end snap ring, select and install one of such thickness that will minimize clearance between snap ring and hub. In other words, install the thickest snap ring that fits in snap ring groove.
(3) Make sure that 3rd speed gear turns smoothly.

9. INSTALLATION OF 1ST-2ND SYNCHRONIZER HUB / 8. SYNCHRONIZER KEY / 7. SYNCHRONIZER SPRING / 5. 1ST-2ND SYNCHRONIZER SLEEVE

Assemble 1st-2nd synchronizer in the same manner as for the 3rd-4th synchronizer described in the preceding step.

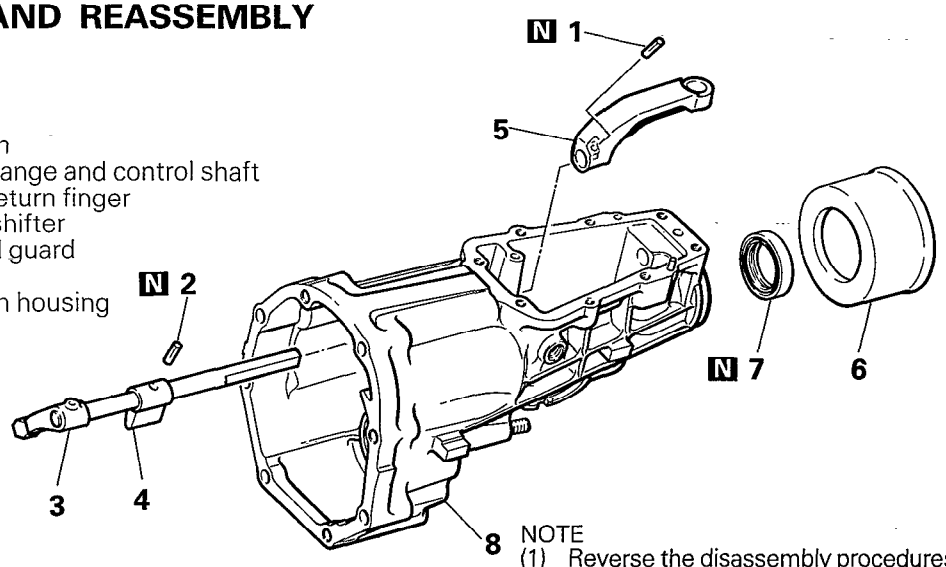
EXTENSION HOUSING

N21QE--

DISASSEMBLY AND REASSEMBLY

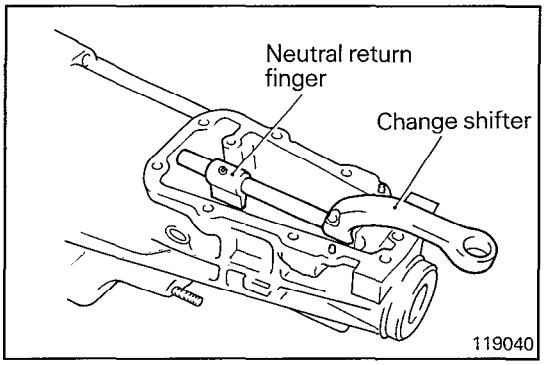
Disassembly steps

◆◆ ◆◆ 1. Lock pin
◆◆ ◆◆ 2. Spring pin
3. Control flange and control shaft
4. Neutral return finger
5. Change shifter
6. Dust seal guard
◆◆ 7. Oil seal
8. Extension housing



NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts

132040

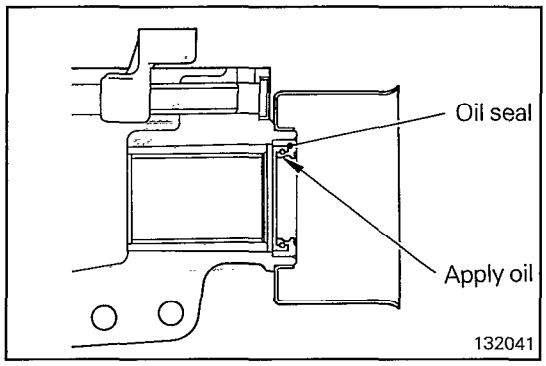


SERVICE POINTS OF DISASSEMBLY

N21QFA--

1. REMOVAL OF LOCK PIN / 2. SPRING PIN

To remove control shaft from extension housing, remove lock pin from neutral return finger and remove spring pin from change shifter with the special tool, Lock Pin Extractor. Then remove control shaft toward front of housing.

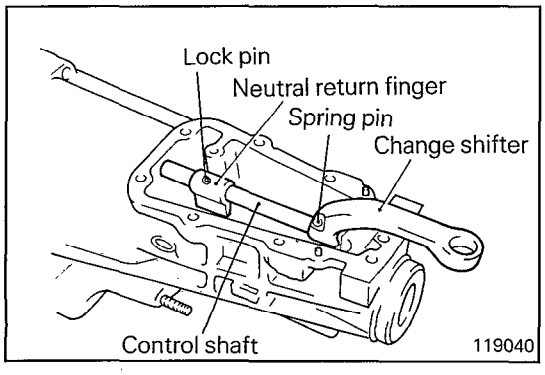


SERVICE POINTS OF REASSEMBLY

N21QHAA

7. INSTALLATION OF OIL SEAL

(1) Apply oil to lip of oil seal.
(2) Install oil seal with lip toward front of housing.



2. INSTALLATION OF SPRING PIN / 1. LOCK PIN

Align pin holes of control shaft, neutral return finger and change shifter and using the special tool, Lock Pin Installer, install lock pin and spring pin.

NOTE
Do not reuse spring pin.

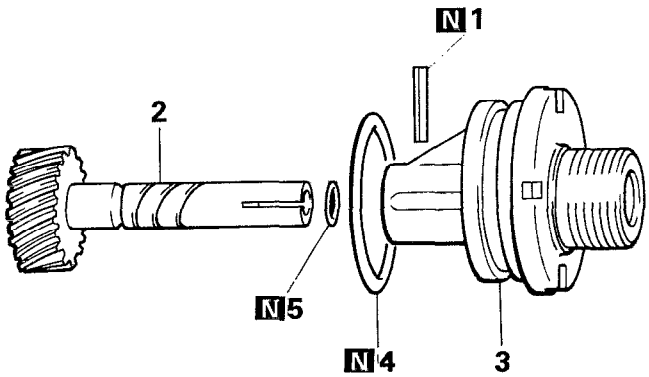
SPEEDOMETER SLEEVE ASSEMBLY

N21RE--

DISASSEMBLY AND REASSEMBLY

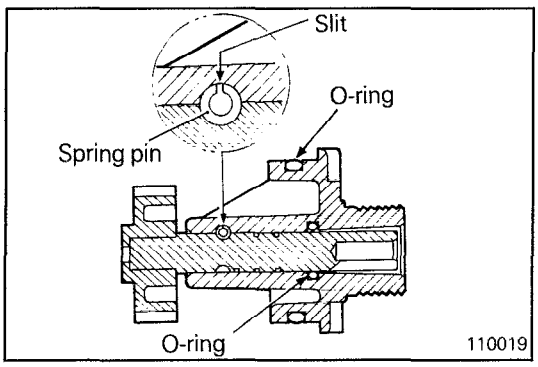
Disassembly steps

- ◆◆ 1. Spring pin
- 2. Driven gear
- 3. Sleeve
- 4. O-ring
- 5. O-ring



NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Reassembly".
(3) N: Non-reusable parts

110008



SERVICE POINT OF REASSEMBLY

1. REMOVAL OF SPRING PIN

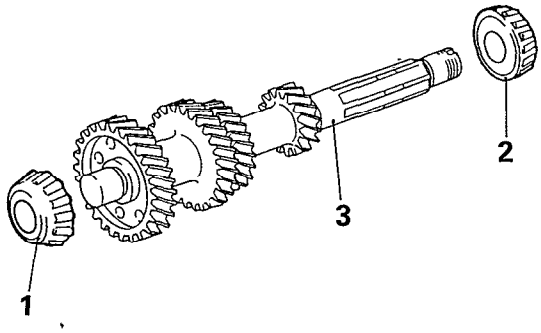
Drive spring pin in, while making sure that slit does not face gear shaft.

NOTE
Do not reuse spring pin.

COUNTERSHAFT

N21XE--

DISASSEMBLY AND REASSEMBLY

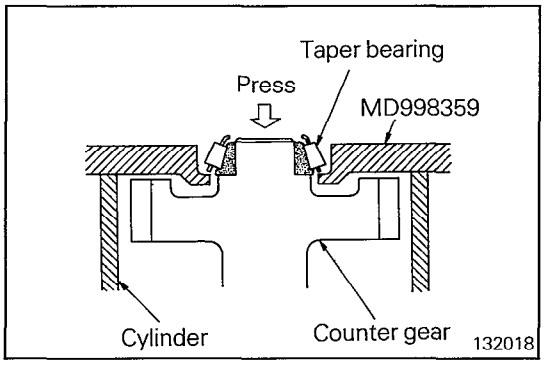


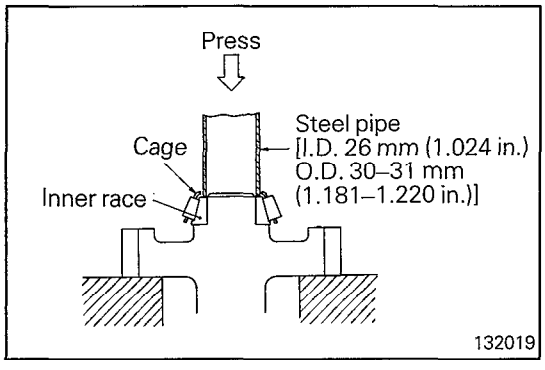
Disassembly steps

◆◆ ▶◀ 1. Counter front bearing
◆◆ ▶◀ 2. Counter center bearing
3. Countershaft gear

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ▶◀: Refer to "Service Points of Reassembly".

132069





SERVICE POINTS OF DISASSEMBLY

N21XFAA

1. REMOVAL OF COUNTER FRONT BEARING / 2. COUNTER CENTER BEARING

Remove taper roller bearings installed on both ends of countershaft gear using the special tool.

SERVICE POINTS OF REASSEMBLY

N21XHAA

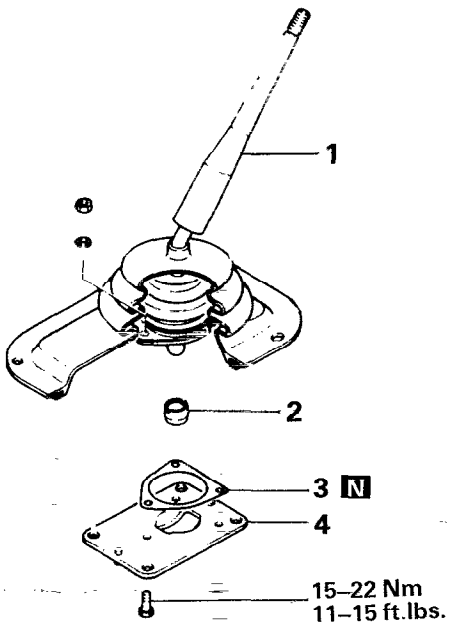
1. INSTALLATION OF COUNTER FRONT BEARING / 2. COUNTER CENTER BEARING

Using a steel pipe with dimensions shown in the illustration, press fit the taper roller bearings.
Be sure to set the pipe in such manner that it will press only the bearing inner race, and not the cage.

GEARSHIFT LEVER ASSEMBLY

N21YE--

DISASSEMBLY AND REASSEMBLY

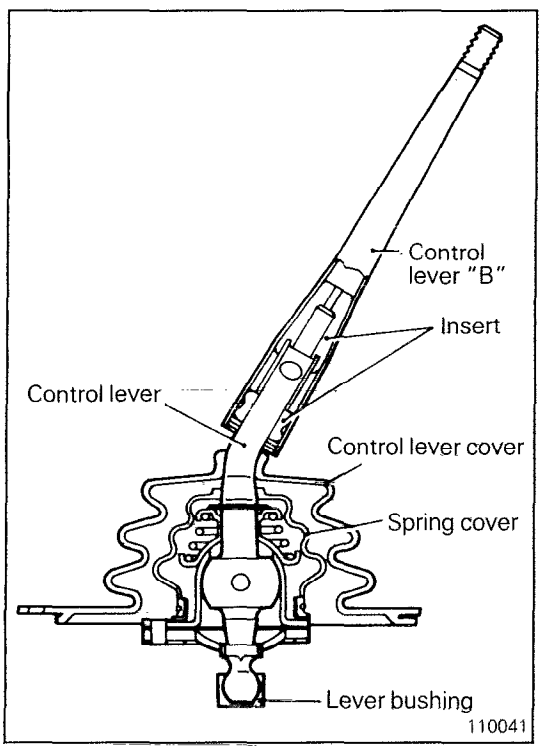


132014

Disassembly steps

1. Gearshift lever
2. Lever bushing
3. Gasket
4. Stopper plate

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) N: Non-reusable parts



INSPECTION

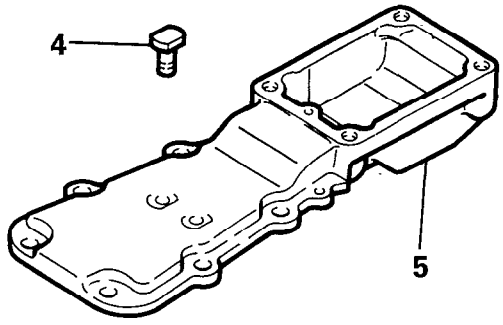
N21YGAA

- Check for play between control lever and control lever "B". If play is evident, replace lever assembly.
- Push control lever in and check to ensure that it moves smoothly up and down.
- Check cover for damage and replace if necessary. To remove cover, cut away with knife. To install new cover, first apply thin coat of oil to periphery of control lever "B". Then install by sliding it down from top of lever "B".
- Check lever bushing for wear and replace if necessary.

EXTENSION HOUSING COVER

N21ZE--

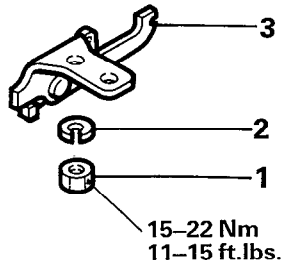
DISASSEMBLY AND REASSEMBLY



Disassembly steps

1. Nut (2)
2. Spring washer (2)
3. ◆◆ Stopper bracket
4. ◆◆ Special bolt (2)
5. Extension housing cover

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Reassembly".



132013

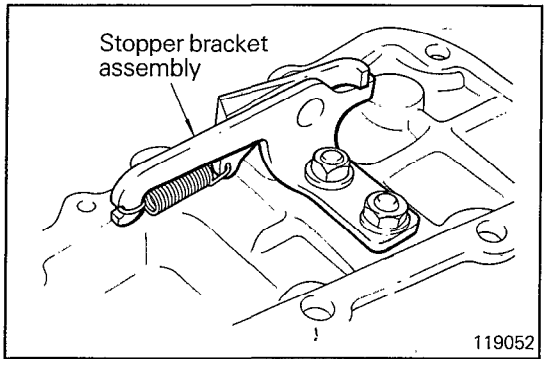
SERVICE POINTS OF REASSEMBLY

N21ZHAA

4. INSTALLATION OF SPECIAL BOLT

Apply recommended sealant to two special bolts (except threaded portions) and install them to cover. Do not wipe away excess sealant from cover.

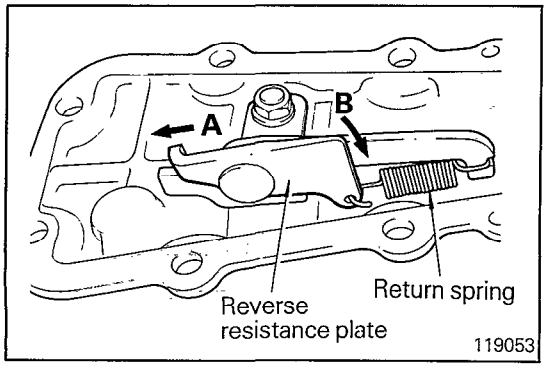
Recommended sealant: 3M Liquid Gasket 8959 or equivalent



3. INSTALLATION OF STOPPER BRACKET

(1) When installing the stopper bracket, apply recommended sealant to threads of special bolts and torque nuts.

Recommended sealant: 3M Liquid Gasket 8959 or equivalent

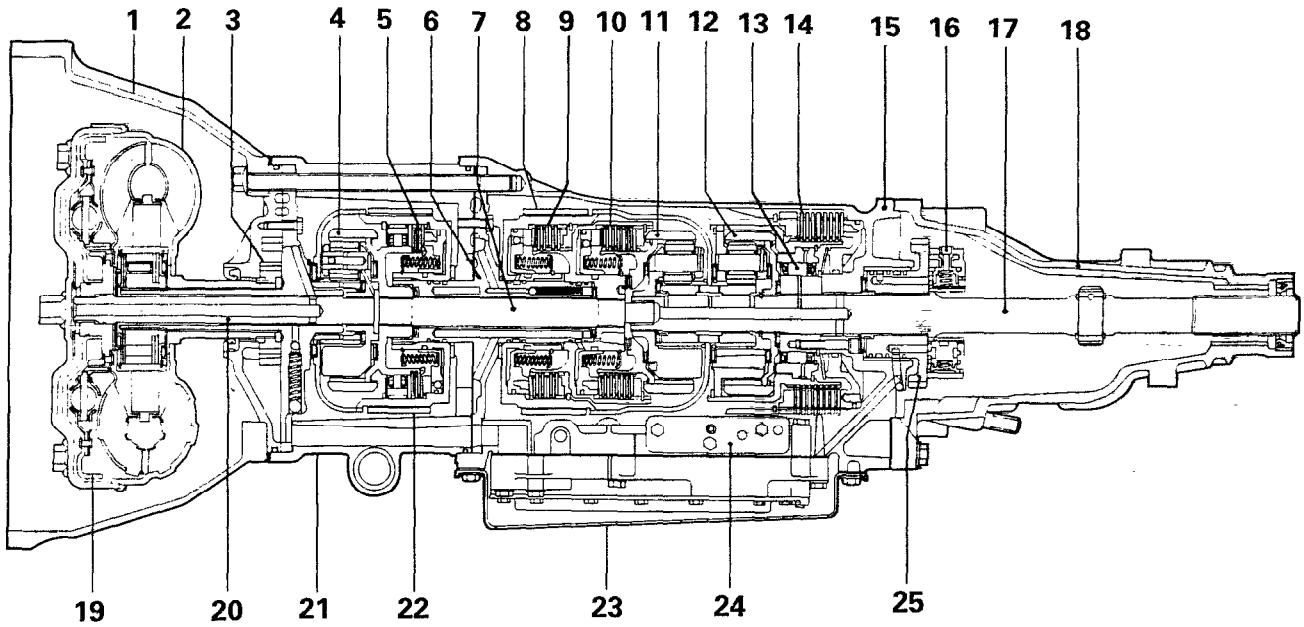


(2) Check to ensure that reverse resistance plate moves smoothly in directions A and B shown in the illustration and is brought back by return spring.

GENERAL INFORMATION

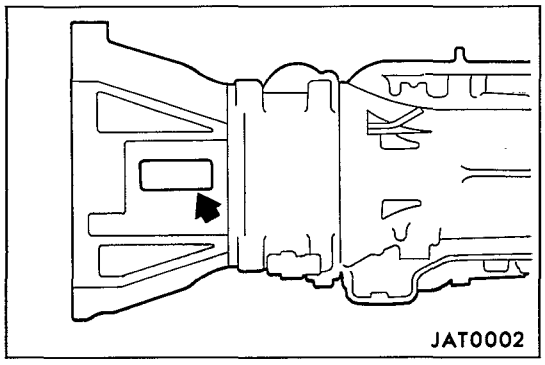
N21BABJ

The JM600 transmission is a fully automatic unit consisting primarily of a 3 element hydraulic lock-up torque converter and three planetary gear sets. Three multiple-disc clutches, a multiple-disc brake, two brake bands, and a one-way clutch provide the friction elements necessary to obtain the desired function of the three planetary gear-sets.
A hydraulic control system is used to operate the friction elements and automatic shift controls.
The lock-up torque converter is attached to the crankshaft through a flexible drive plate and serves to directly couple the turbine and pump impeller through the lock-up piston which is controlled by the lock-up control valve. Heat generated in the torque converter is dissipated by circulating the transmission fluid through an oil-to-air type cooler.
The welded construction of the torque converter prohibits disassembly or service unless highly specialized equipment is available.



1. Converter housing
2. Torque converter
3. Oil pump
4. O.D. planetary gear
5. Direct clutch
6. Drum support
7. Intermediate shaft
8. Second band brake
9. High-reverse clutch (Front)
10. Forward clutch (Rear)
11. Front planetary gear
12. Rear planetary gear
13. One-way clutch
14. Low-reverse clutch
15. Transmission case
16. Governor valve
17. Output shaft
18. Rear extension
19. Lock-up clutch
20. Input shaft
21. O.D. case
22. O.D. brake band
23. Oil pan
24. Control valve assembly
25. Oil distributor

IA10001


JAT0002

IDENTIFICATION NUMBER

STAMPED POSITION

The plate is located on the top of the transmission.

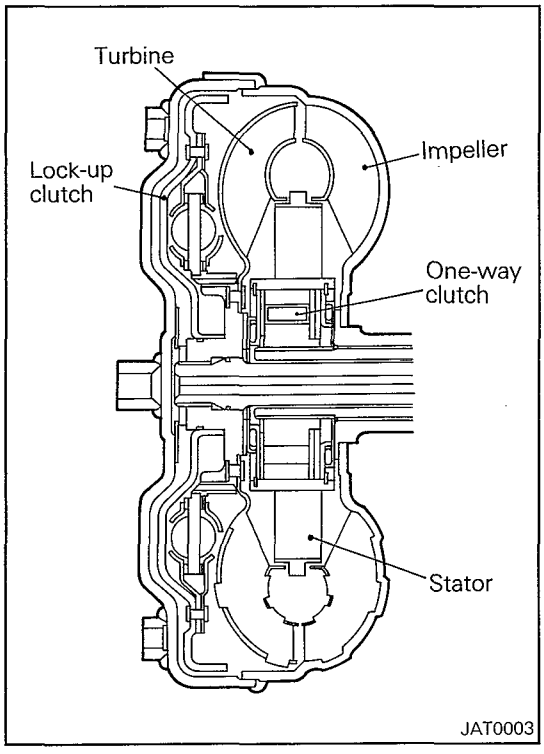
IDENTIFICATION OF NUMBER ARRANGEMENTS

MD 726188
31020 MR604 JATCO

NUMBER DESIGNATION

3 1 0 2 0

- 3: Last figure denoting the year (A.D.)
- 1: Month of production
  1: Jan., 2: Feb., ...
  X: Oct., Y: Nov., Z: Dec.
- 02: Serial production number for the month
- 0



JAT0003

TORQUE CONVERTER

The torque converter is with a lock-up clutch, which is designed to operate when specified vehicle speed is exceeded in the "D" range, 4th speed.

AUTOMATIC TRANSMISSION MECHANISM

The transmission mechanism consists of three sets of multiple disc clutches, two sets of band type brakes, one set of one-way clutch and single row type planetary gear and double row type (called Simpson type) planetary gear.

The three sets of clutches are the element to control input to the planetary gears and the three sets of brakes and one-way clutch are the element to fix or prevent rotation of the planetary gears. By these elements, the point at which the input is made and the gears which are to be fixed are controlled, thus giving the gear change ratio meeting the driving conditions.

When and which element operates is shown in the Element in Use at Each Position of Selector Lever.

Element in Use at Each Position of Selector Lever

Selector lever position	Gear	Direct clutch	O.D. band brake	High-reverse clutch	Forward clutch	Low & reverse brake	2nd band brake (Apply)	One-way clutch	Parking pawl
Park	Neutral	ON				ON			ON
Reverse	Reverse	ON		ON		ON			
Neutral	Neutral	ON							
D	First	ON			ON			ON	
	Second	ON			ON		ON		
	Third	ON		ON	ON				
	Fourth (O.D.)		ON	ON	ON				
2	Second	ON			ON		ON		
L	First	ON			ON	ON		ON	

HYDRAULIC CONTROL SYSTEM

The hydraulic control system consists of an oil pump that generates hydraulic pressure, the valve body assembly incorporating a hydraulic pressure control valve, oil passage change-over valve, etc., hydraulic piston to operate the clutches and brakes, etc. These elements are operated either manually or hydraulically to control the planetary gears.

OIL PUMP

The oil pump generates hydraulic pressure to supply oil to the torque converter or control the hydraulic control system and to lubricate the planetary gear sets, overrunning clutch and other parts requiring lubrication. The oil pump is an internal/external gear pump of which drive gear is driven by the pump drive hub welded at the center of the torque converter shell, constantly developing hydraulic pressure while the engine is running.

PRESSURE REGULATOR VALVE

The pressure regulator valve automatically regulates the hydraulic pressure supplied to each element to a pressure (line pressure) according to current vehicle speed and engine output (throttle valve opening).

MANUAL VALVE

This valve provides switching of oil ways that is linked to the selector lever. The valve causes either P, R, N, D, 2 or L range to be selected according to the lever operation.

1ST-2ND SHIFT VALVE

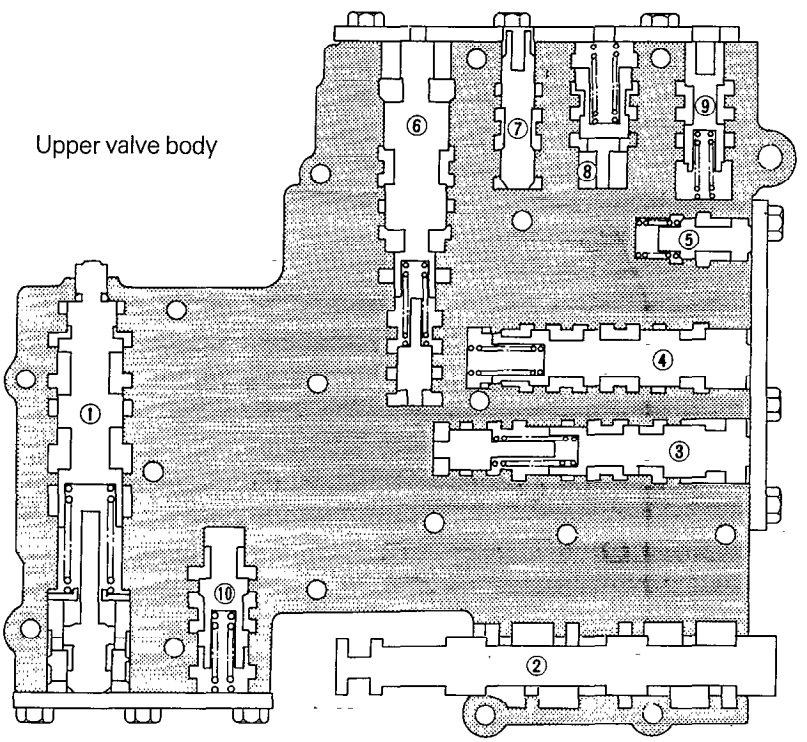
This valve automatically switches oil ways between the 1st and 2nd speeds according to the governor pressure and throttle pressure.

2ND-3RD SHIFT VALVE

This valve automatically switches oil ways between the 2nd and 3rd speeds according to the governor pressure and throttle pressure.

PRESSURE MODIFIER VALVE

This valve controls the throttle pressure acting on the pressure regulator valve to reduce line pressure when the vehicle is running at high speed.

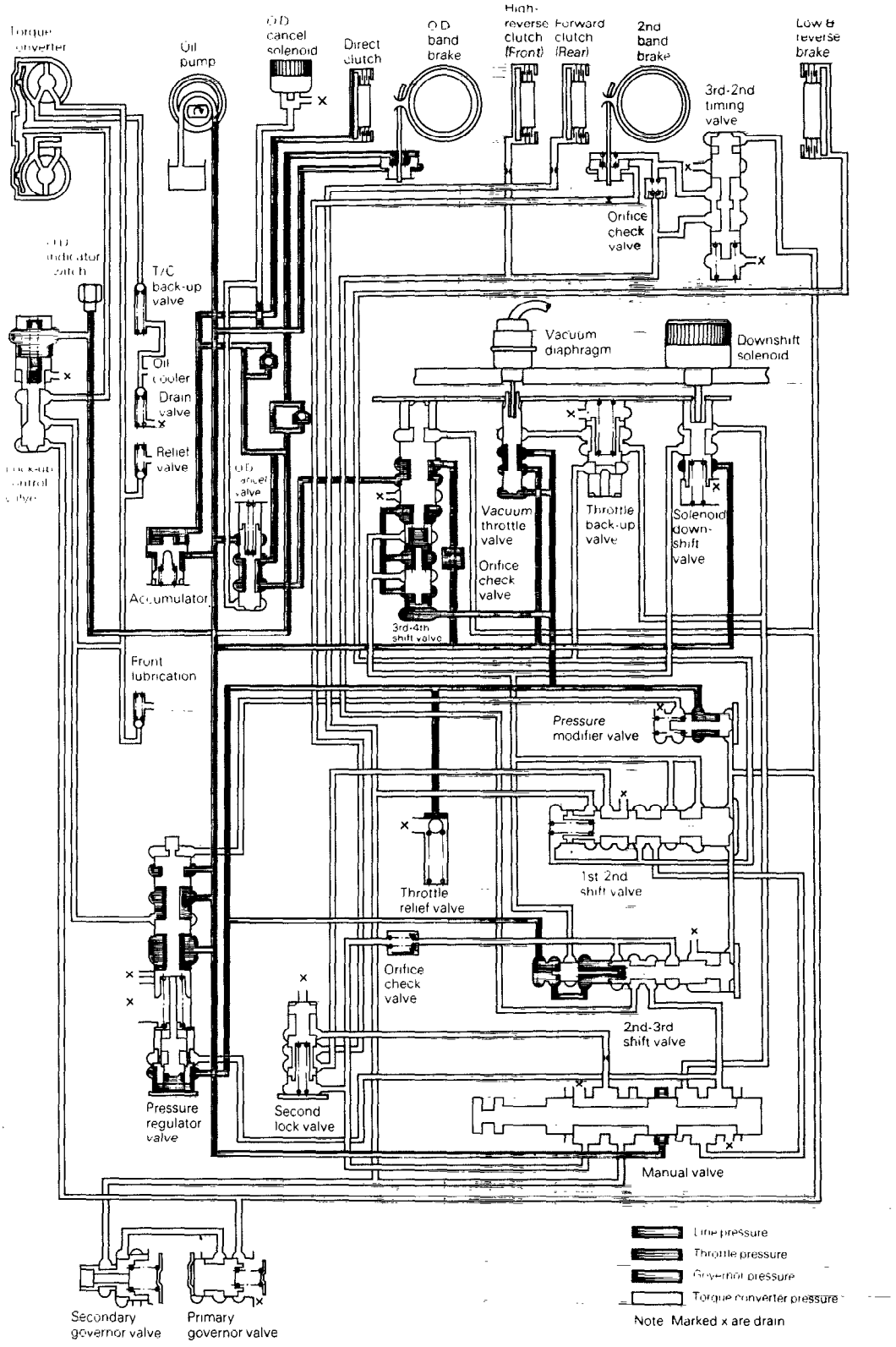


1. Pressure regulating valve
2. Manual valve
3. 2nd-3rd shift valve
4. 1st-2nd shift valve
5. Pressure modifier valve
6. 3rd-4th shift valve
7. Vacuum throttle valve
8. Throttle back-up valve
9. Solenoid downshift valve
10. Second lock valve

JAT005

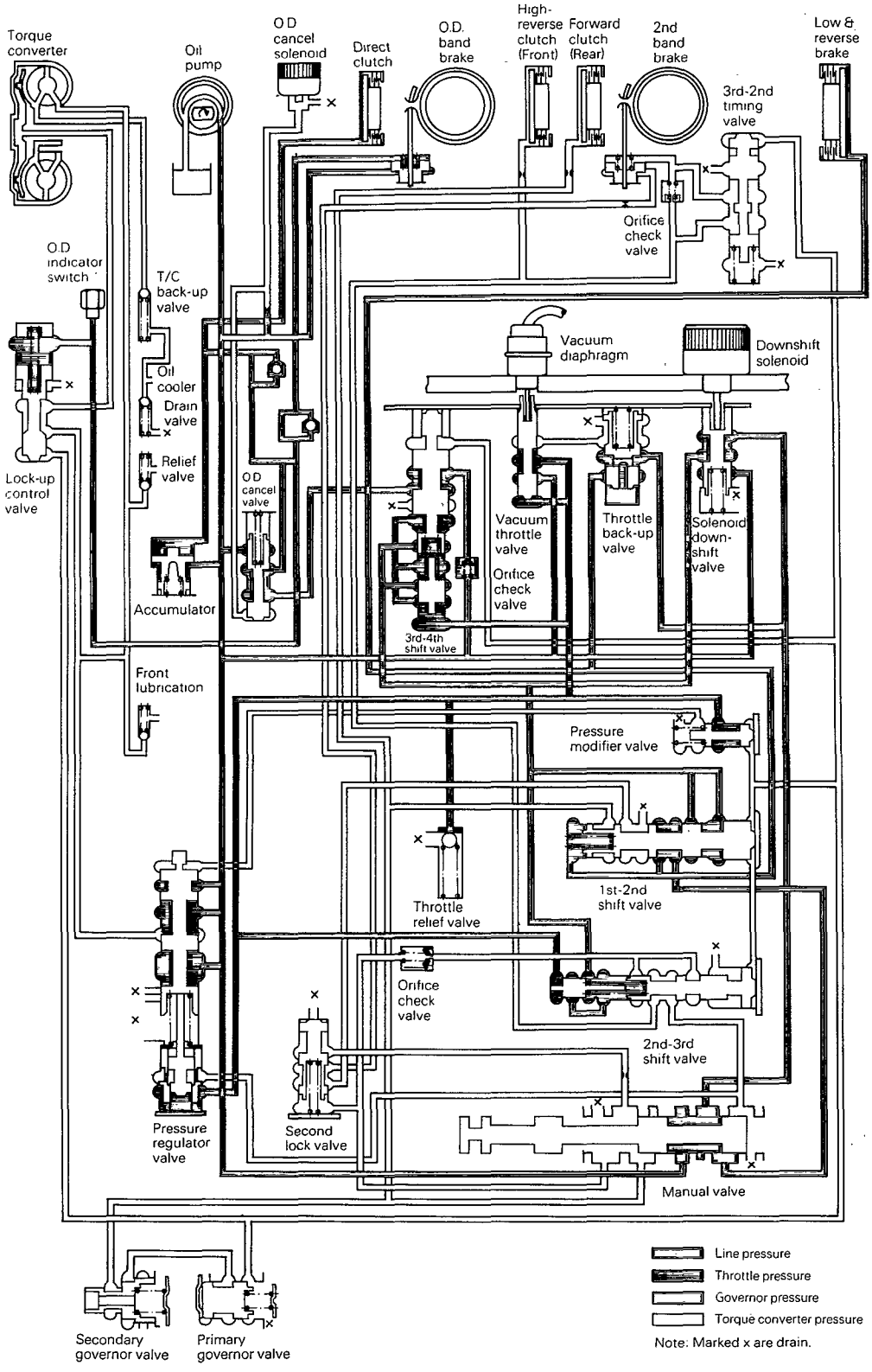
HYDRAULIC CONTROL CIRCUIT

"N" (NEUTRAL)

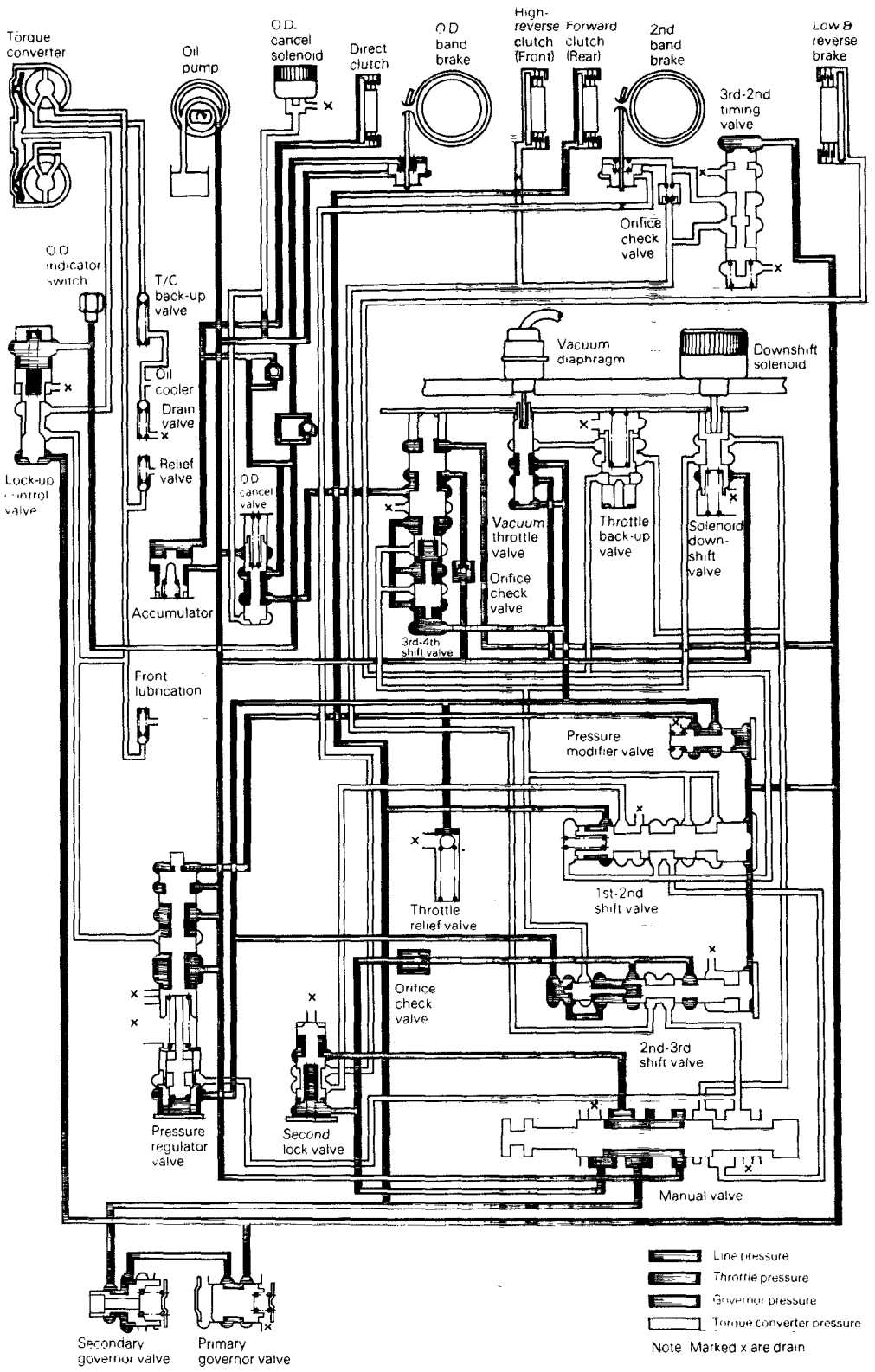


JAT198

"P" (PARKING)

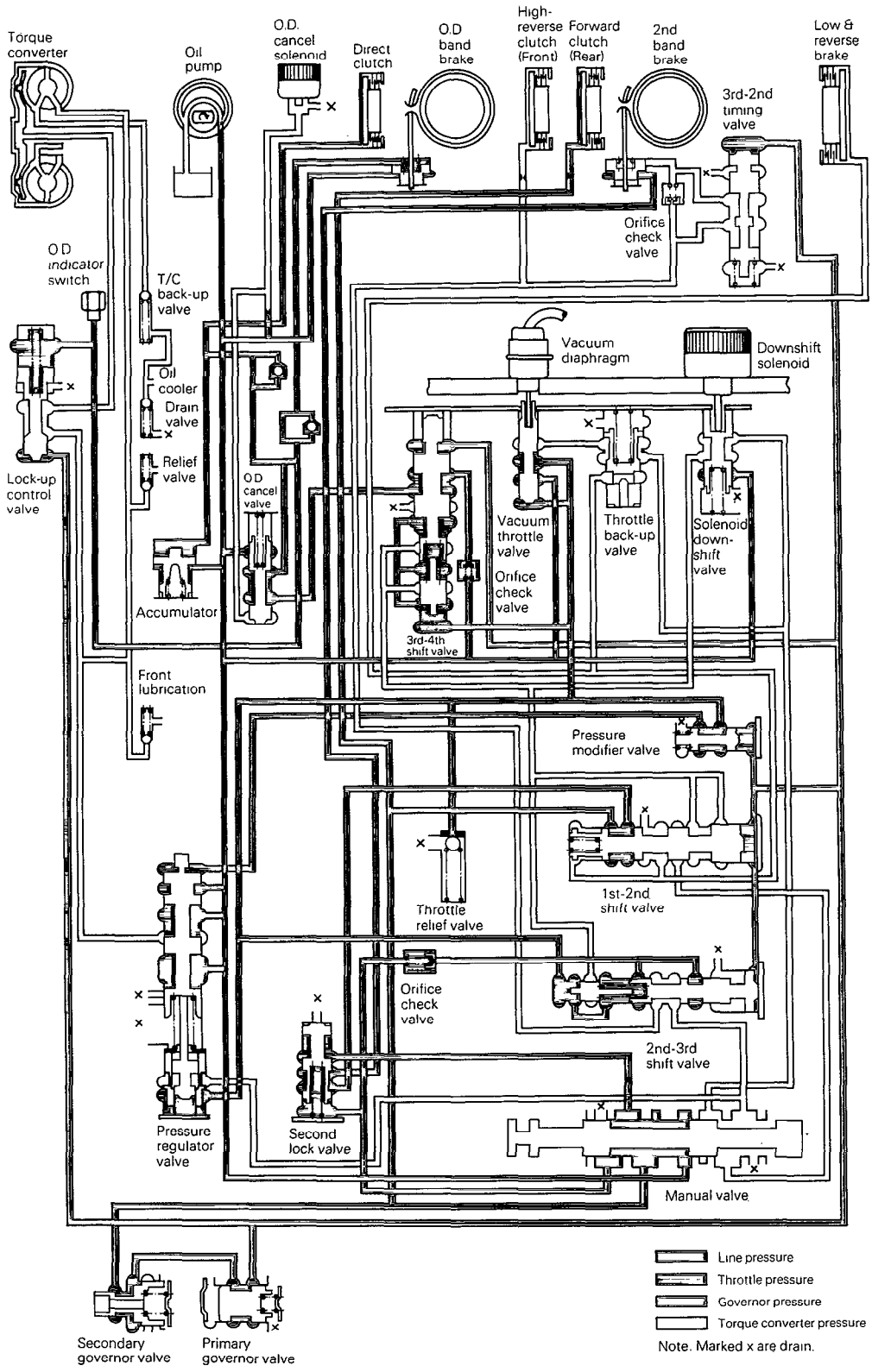

Torque converter
Oil pump
O D cancel solenoid
Direct clutch
O.D. band brake
High-reverse clutch (Front)
Forward clutch (Rear)
2nd band brake
Low & reverse brake
3rd-2nd timing valve
Orifice check valve
O.D indicator switch
T/C back-up valve
Oil cooler
Drain valve
Relief valve
Lock-up control valve
O D cancel valve
Accumulator
Vacuum diaphragm
Downshift solenoid
Vacuum throttle valve
Orifice check valve
Throttle back-up valve
Solenoid down-shift valve
3rd-4th shift valve
Front lubrication
Pressure modifier valve
Throttle relief valve
1st-2nd shift valve
Orifice check valve
2nd-3rd shift valve
Pressure regulator valve
Second lock valve
Manual valve
Secondary governor valve
Primary governor valve
Line pressure
Throttle pressure
Governor pressure
Torque converter pressure
Note: Marked x are drain.

"D" (DRIVE) – FIRST

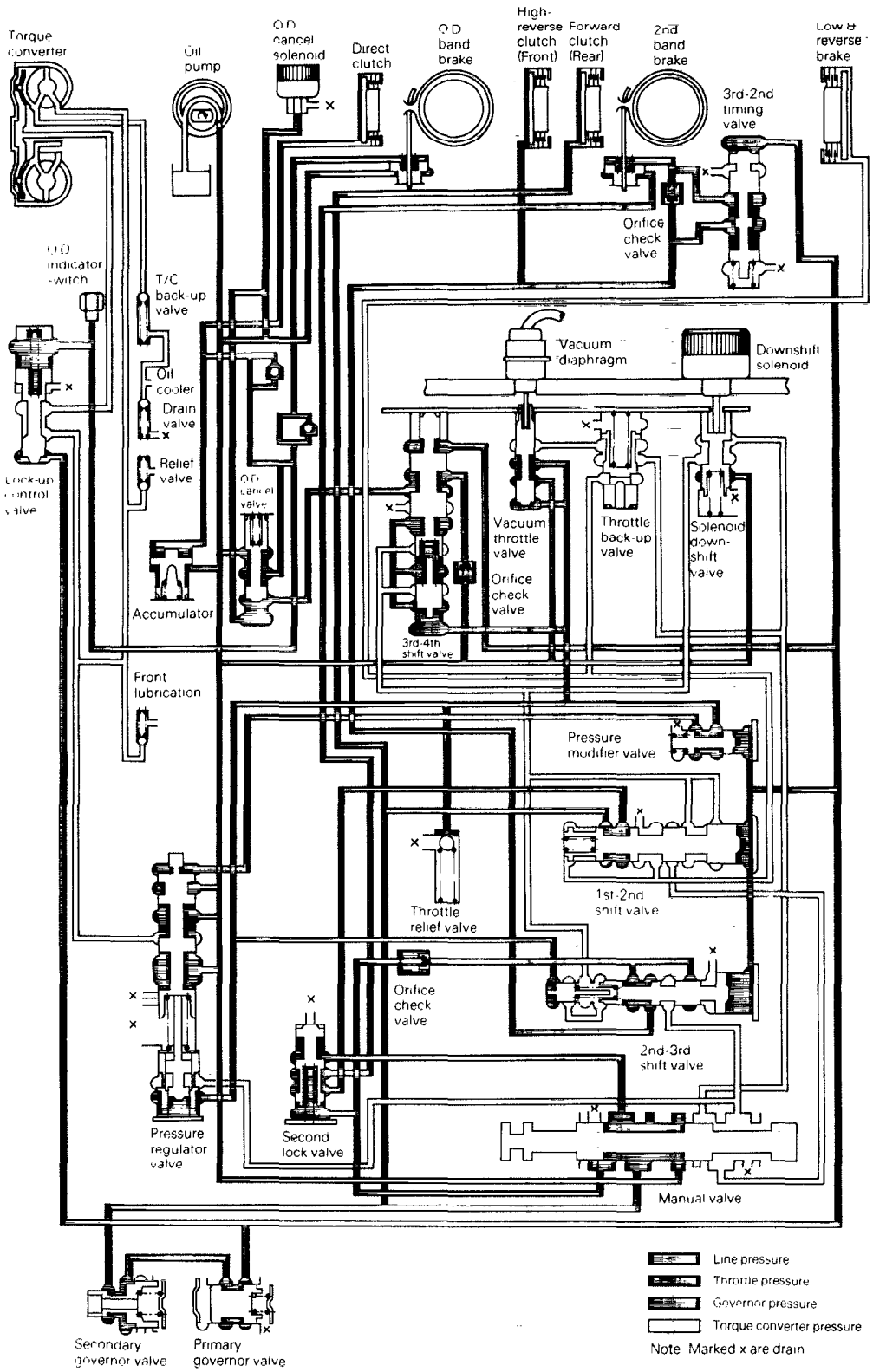


JAT201

"D" (DRIVE) – SECOND

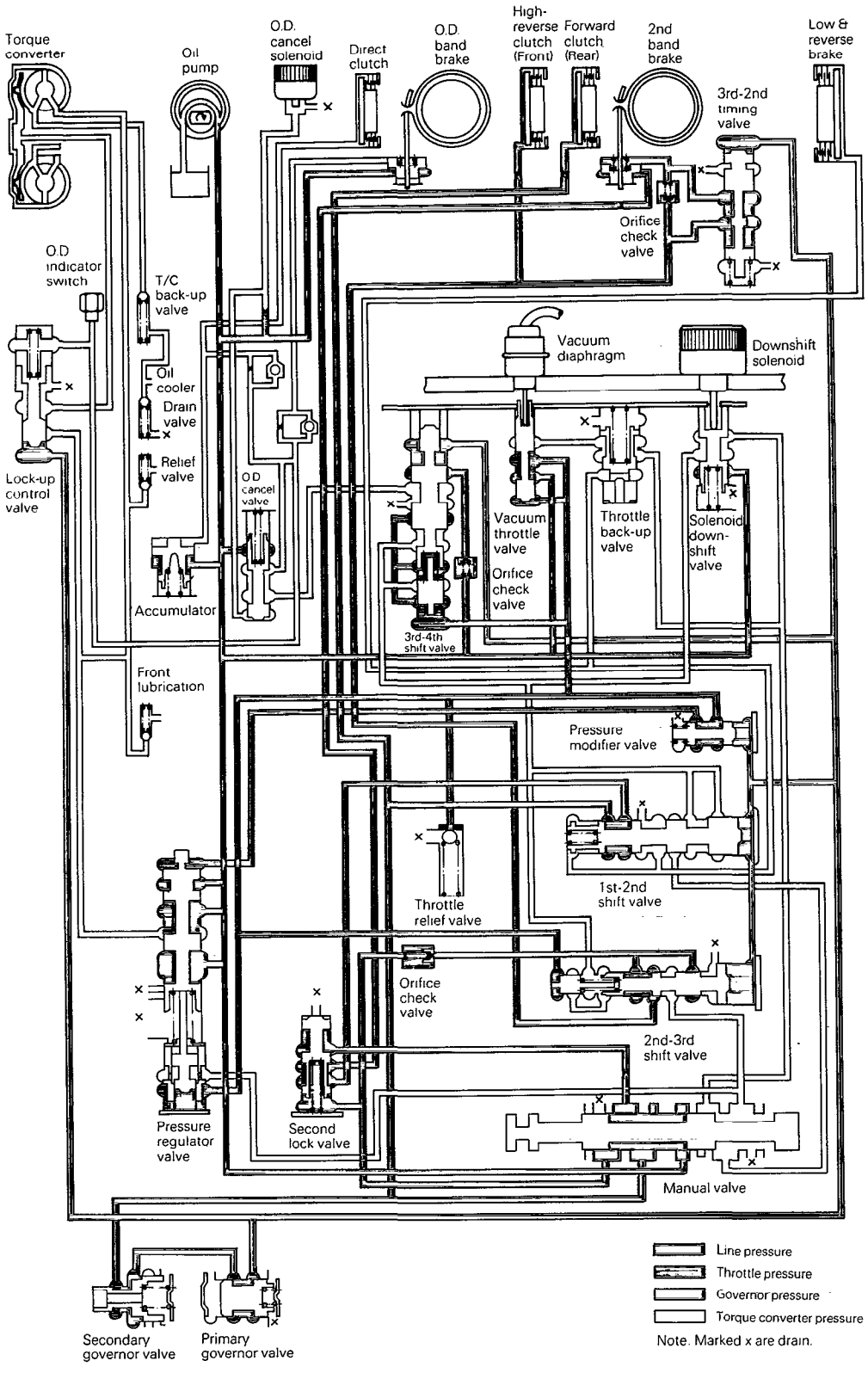


"D" (DRIVE) – THIRD, O.D. SOLENOID IN OPERATION

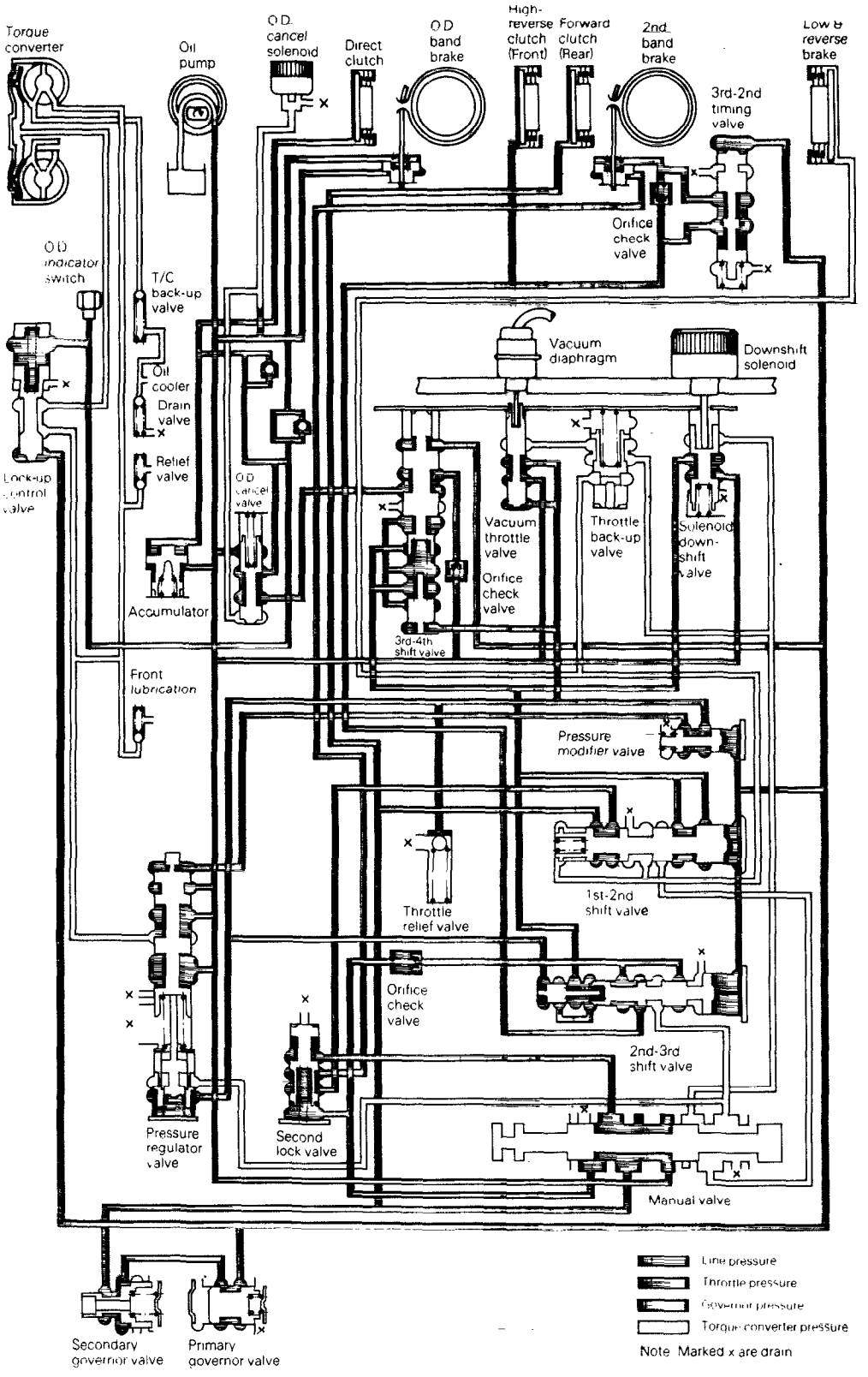


1A1203

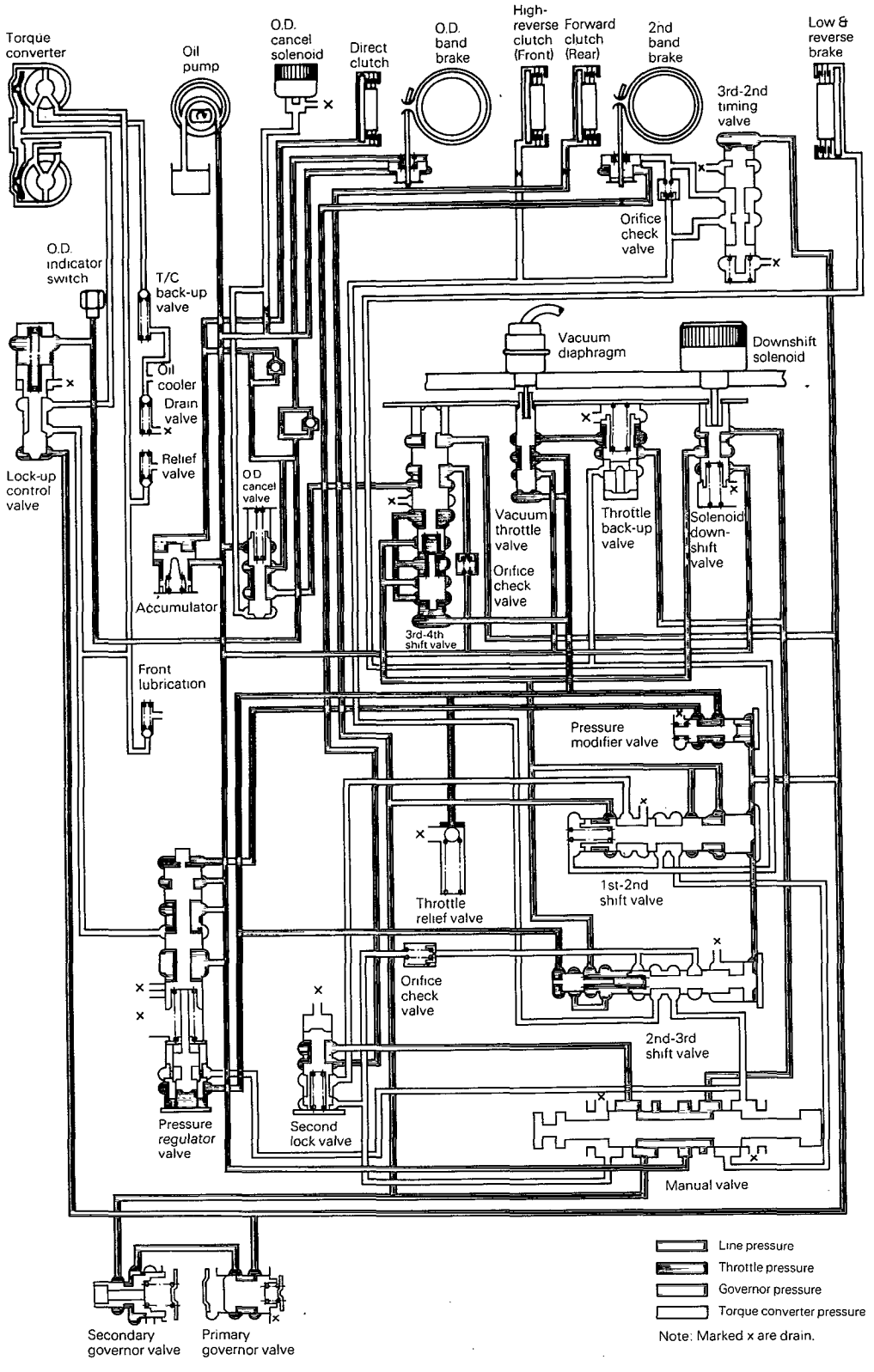
"D" (DRIVE) – FOURTH, TORQUE CONVERTER LOCKED UP



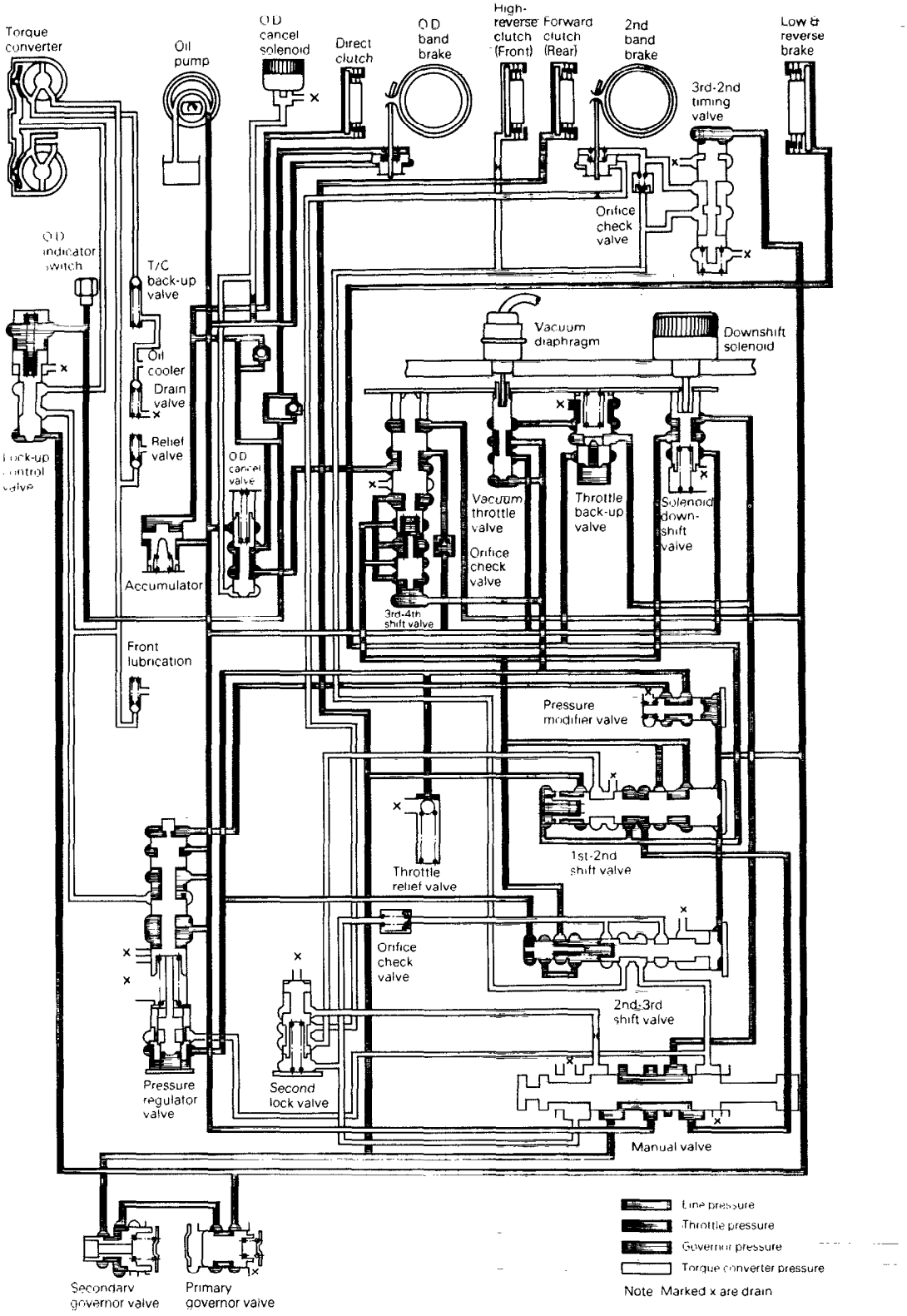
"D" (DRIVE) – KICKDOWN



"2" (SECOND) – SECOND

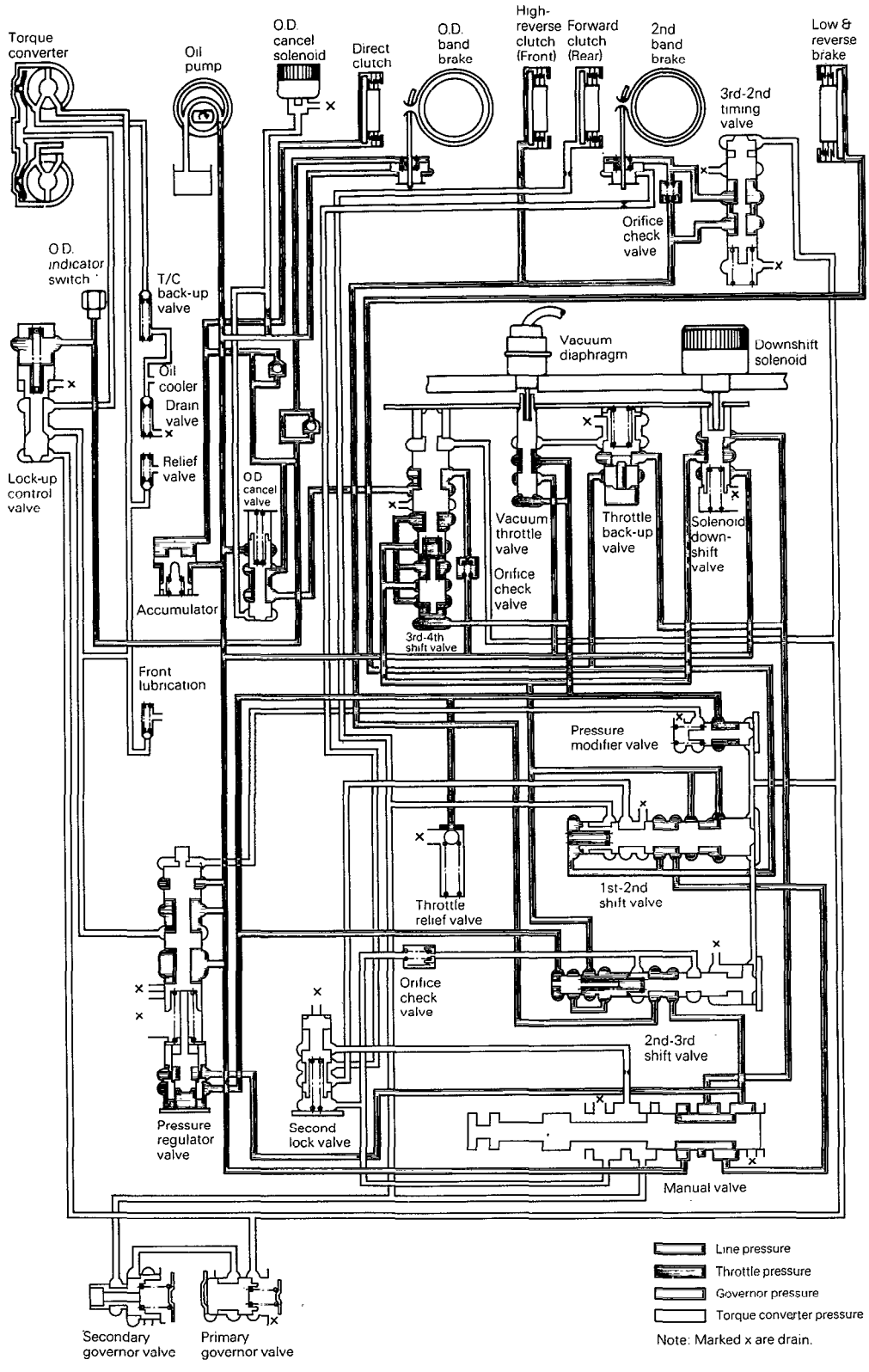


"L" (LOCK-UP)



JA1208

"R" (REVERSE)


Torque converter
Oil pump
O.D. cancel solenoid
Direct clutch
O.D. band brake
High-reverse clutch (Front)
Forward clutch (Rear)
2nd band brake
Low & reverse brake
3rd-2nd timing valve
Orifice check valve
O.D. indicator switch
T/C back-up valve
Oil cooler
Drain valve
Relief valve
Lock-up control valve
O.D. cancel valve
Accumulator
Vacuum diaphragm
Downshift solenoid
Vacuum throttle valve
Orifice check valve
Throttle back-up valve
Solenoid down-shift valve
3rd-4th shift valve
Front lubrication
Pressure modifier valve
Throttle relief valve
1st-2nd shift valve
Orifice check valve
2nd-3rd shift valve
Pressure regulator valve
Second lock valve
Manual valve
Secondary governor valve
Primary governor valve
Line pressure
Throttle pressure
Governor pressure
Torque converter pressure
Note: Marked x are drain.

SPECIFICATIONS

N21CA--

GENERAL SPECIFICATIONS

Items		Specifications
Torque converter		
Type		With lock-up clutch
Stall torque ratio		2.0 : 1
Stall speed rpm		2,750 – 3,050
Transmission		
Type		4-speed, Full-automatic
Gear ratio	1st	2.458
	2nd	1.458
	3rd	1.000
	4th	0.686
	Reverse	2.182
Direct clutch		
Type		Multiple-disc
No. of drive plates		2
No. of driven plates		2
High-reverse clutch		
Type		Multiple-disc
No. of drive plates		4
No. of driven plates		5
Forward clutch		
Type		Multiple-disc
No. of drive plates		6
No. of driven plates		6
Overdrive brake		
Type		Band
Second brake		
Type		Band
Low/reverse brake		
Type		Multiple-disc
No. of drive plates		8
No. of driven plates		8
Oil pump		
Type		Internal-external gear type
Driven by		Engine
Oil cooler		Oil-to-water type

SERVICE SPECIFICATIONS

N21CB--

Items	Standard	Limit
Engine idle speed rpm	850 ± 100	–
Stall speed rpm	2,750 – 3,050	–
Direct clutch side plate clearance mm (in.)	0 – 0.2 (0 – .008)	–
High-reverse clutch clearance mm (in.)	1.6 – 2.0 (.063 – .079)	–
Forward clutch clearance mm (in.)	0.8 – 1.6 (.031 – .063)	–
Low-reverse brake clearance mm (in.)	0.80 – 1.25 (.031 – .049)	–
Front end play mm (in.)	0.5 – 0.8 (.020 – .031)	–
Front total end play mm (in.)	0.25 – 0.50 (.010 – .020)	–
O.D. pack end play mm (in.)	0.5 – 0.8 (.020 – .031)	–
O.D. total end play mm (in.)	0.25 – 0.50 (.010 – .020)	–
Clearance between oil pump outer gear and crescent mm (in.)	0.14 – 0.21 (.0055 – .0083)	0.25 (.0098)
Clearance between oil pump outer gear and housing mm (in.)	0.05 – 0.20 (.0020 – .0079)	0.25 (.0098)
Oil pump gear end play mm (in.)	0.02 – 0.04 (.0008 – .0016)	0.08 (.0031)

TORQUE SPECIFICATIONS

N21CC--

Items	Nm	ft.lbs.
Transmission installation		
Drive plate to crankshaft	128 – 138	94 – 100
Drive plate to torque converter	56 – 62	42 – 46
Converter housing to engine	43 – 54	31 – 39
Component part		
Converter housing mounting bolt	44 – 54	33 – 40
Rear extension mounting	20 – 25	14 – 18
Oil pan bolt	5 – 7	3.6 – 5.1
2nd servo piston retainer to transmission case	7 – 9	5 – 6
2nd piston stem (when adjusting band brake)	12 – 15 [Turn back three turns after tightening]	9 – 11 [Turn back three turns after tightening]
2nd piston stem lock nut	15 – 39	11 – 29
One-way clutch inner race tightening bolt	13 – 18	9 – 13
Control valve body mounting bolt	5.4 – 7.4	4.0 – 5.4
Lower valve body to upper valve body	2.5 – 3.4	1.8 – 2.5
O.D. servo cover to retainer	5 – 7	3.6 – 5.1
O.D. servo piston retainer to O.D. case	10 – 15	7 – 11
O.D. stem (when adjusting band brake)	7 – 10	5 – 7
O.D. stem lock nut	15 – 39	11 – 29
Governor tube	15 – 18	11 – 13

Items	Nm	ft.lbs.
Side plate to control valve body	2.5 – 3.4	1.8 – 2.5
Nut for control valve reamer bolt	5 – 7	3.6 – 5.1
Oil strainer to lower valve body	3 – 4	2.2 – 2.9
Governor valve body mounting bolt	5 – 7	3.6 – 5.1
Oil pump housing to oil pump cover	6 – 8	4.3 – 5.8
Cross-shaft to cross-shaft lever	18 – 24	13 – 17
Shaft to detent plate	13	9.4
Inhibitor switch mounting bolt	5 – 7	3.6 – 5.1
Manual shaft lock nut	29 – 39	22 – 29
Oil cooler pipe to transmission case	30 – 50	22 – 36
Test plug (oil pressure inspection hole)	5 – 10	3.6 – 7.2
Support actuator (parking rod inserting position) to rear extension	8 – 11	5.8 – 8.0
Drum support to O.D. case	7 – 9	5.1 – 6.5
Downshift solenoid	5	3.6
Vacuum diaphragm	1.4 – 3.5	1.1 – 2.5
O.D. solenoid	4	2.9
Flange yoke attaching bolt	50 – 60	36 – 43

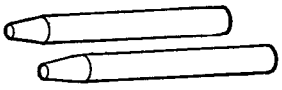
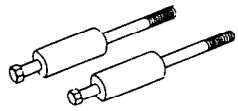
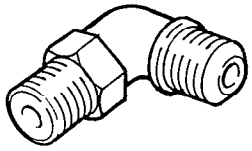
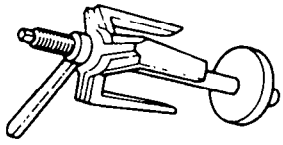
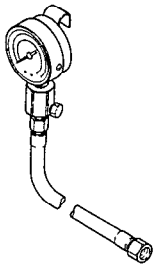
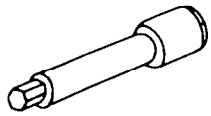
LUBRICANTS

N21CD

Items	Specified lubricant	Quantity
Automatic transmission fluid lit. (qts.)	DEXRON II type	7.2 (7.4)
Sliding parts of selector lever	MOPAR Hypoid gear oil Part No. 3744994 or equivalent	Small amount

SPECIAL TOOLS

N21DA--

Tool (Number and name)	Use	Tool (Number and name)	Use
MD998393 Guides 	Assembly of oil pump and O.D. case	MD998390 Sliding hammer 	Removal of oil pump
MD998394 Oil pressure gauge adaptor 	Use with oil pressure gauge	MD998391 Clutch spring compressor 	Assembly and disassembly of clutch
C-3292 C-3293 Oil pressure gauge 	Measurement of oil pressure	MD998392 Hex-head extension 	Loosening and tightening of one-way clutch inner race bolt

TROUBLESHOOTING

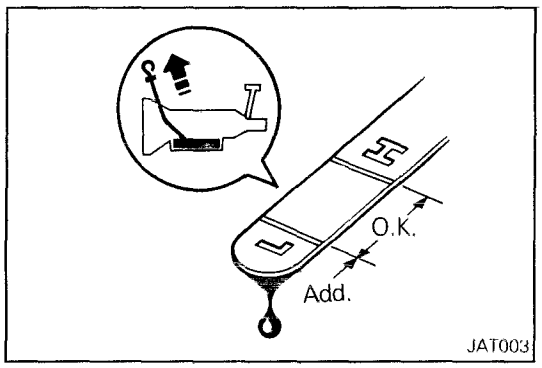
N21EBADa

PRELIMINARY CHECKS (Prior to road testing)

VERIFY CUSTOMER COMPLAINT

The customer should supply as much information as possible, including any unusual characteristics that accompany the complaint.

FLUID LEVEL



1. Drive the car several miles (kilometers) to bring the transmission up to normal operating temperature [50 to 80°C (122 to 176°F)].
2. Park the car on a level surface.
3. Put wheel chocks in place, apply parking brake securely and leave the engine running.
4. Slowly move the selector lever through the entire shift pattern, and return it to "N" neutral.
5. Remove the dipstick, clean it, and replace it fully in the filler tube.
6. Quickly remove it again and read the level.
   Keep the fluid at the proper level. Overfilling may blow off the fluid during high-speed driving. Underfilling may cause the clutches to slip, and burn.
   The "L" mark on the dipstick indicates the transmission is approximately 0.4 liter (7/8 pt.) low.
   Add only clean DEXRON II type transmission fluid.

FLUID LEAKAGE

To detect a fluid leak:
1. Raise car.
2. Clean area suspected of leaking.
3. Start engine, apply foot brake, place gear selector in drive, and wait a few minutes.
4. Stop engine.
5. Check for fresh leakage.

If the transmission breather is suspected:
1. Raise car.
2. Clean the area around the breather.
3. Run the car at highway speeds.
4. Check the breather for fresh leakage.

FLUID CONDITION

Transmission fluid color and texture can aid greatly in transmission troubleshooting. When checking fluid level, examine the transmission fluid and note its color, texture, and odor.
Some common forms of contamination are listed below:

Dark or Black Fluid:
With a burned odor – Worn friction material.

Milky Pink Fluid: Water contamination
– Road water entering through filler tube or breather.

Varnished Fluid, Light to Dark Brown and Tacky: Oxidation
– Over or underfilling.
– Overheating.

ENGINE IDLE SPEED

Check and adjust idle speed to specifications.

Standard value: 850 ± 100 rpm

ENGINE OIL AND COOLANT LEVELS

Prior to road testing, check engine oil and coolant levels, and fill as necessary.

SHIFT LINKAGE

Start in Park position, depress detent button and slowly move the gear selector through all ranges. The detent "clicks" should correspond with the range indicator.

DIAGNOSTIC ROAD TEST

Prior to road testing, perform the preliminary inspections outlined earlier. If the car is not equipped with a tachometer, install a portable tachometer in the car. And also install a suitable vacuum gauge and pressure gauge. If the customer has a specific complaint, select road conditions similar to those described. (e.g. steep hills, freeways, etc.)
Follow the test sequence as outlined in this section and mark the results on the Symptom Chart on page 21-64. It may be necessary to repeat sections of the test under different throttle conditions (e.g. light, medium or full throttle). After completing the road test, compare the test results to the Troubleshooting Chart on page 21-60.

ROAD TESTING

PARK RANGE

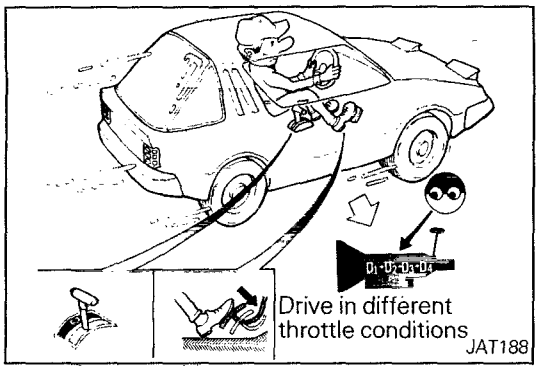
Place the selector lever in "P" range and start the engine. Stop the engine and repeat the procedure in all other ranges and neutral. In park, the car should be locked in position, unable to roll or move. Mark all results on the Symptom Chart.

REVERSE

Manually shift the selector lever from "P" to "R", and note shift quality. Drive the car in reverse long enough to detect slippage or other abnormalities. Note results.

NEUTRAL

Manually shift the selector lever from "P" to "N" and note quality. In neutral, there should be no movement. Note results.



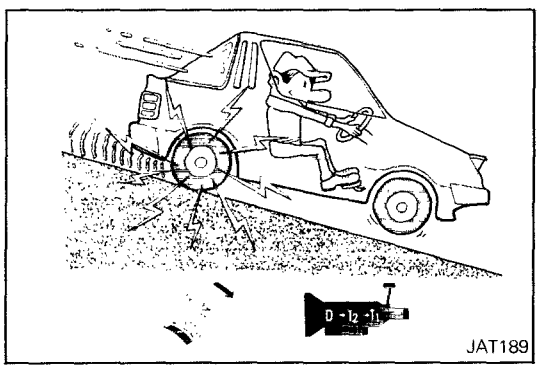
DRIVE RANGE

Manually shift the selector lever to range "D", and note shift quality. Drive the car through all automatic shifts and in all gear ranges. Note shift quality and timing [km/h (MPH)], and check whether torque converter is locked up or not at specified speed. Check for slippage, noise, or other abnormal conditions. If necessary, drive the test sequence under different throttle opening (e.g. light, medium or full throttle).

Check overdrive range for slippage, noise, or other abnormal conditions. Maintain a constant speed of 56 to 64 km/h (35 to 40 MPH) on a level surface and turn the O.D. switch on the console "ON" and "OFF". The transmission should upshift immediately when the switch is turned "ON", and downshift immediately when the switch is turned "OFF".

Because the shock is very low and is not noticeable when the torque converter is locked up, it is difficult to confirm whether the torque converter is locked up or not. So please check the engine rpm with tachometer while the car is driving to confirm it. If the torque converter is locked up the engine rpm is decreased 200 to 400 rpm at the same time.

Lock-up zone: Refer to Shift Schedule on page 21-56.



RANGE "2"

Manually shift the selector lever to range "2". Check for slippage, hesitation or abnormal condition. The transmission should remain in 2nd gear regardless of car speed or engine revolutions. Note results.

RANGE "L"

Manually shift the selector lever to range "L". Note shift quality. It should, however, downshift immediately to 2nd gear and downshift again to 1st gear as road speed decreases. Accelerate and decelerate in 1st gear to determine engine revolutions. Note results.

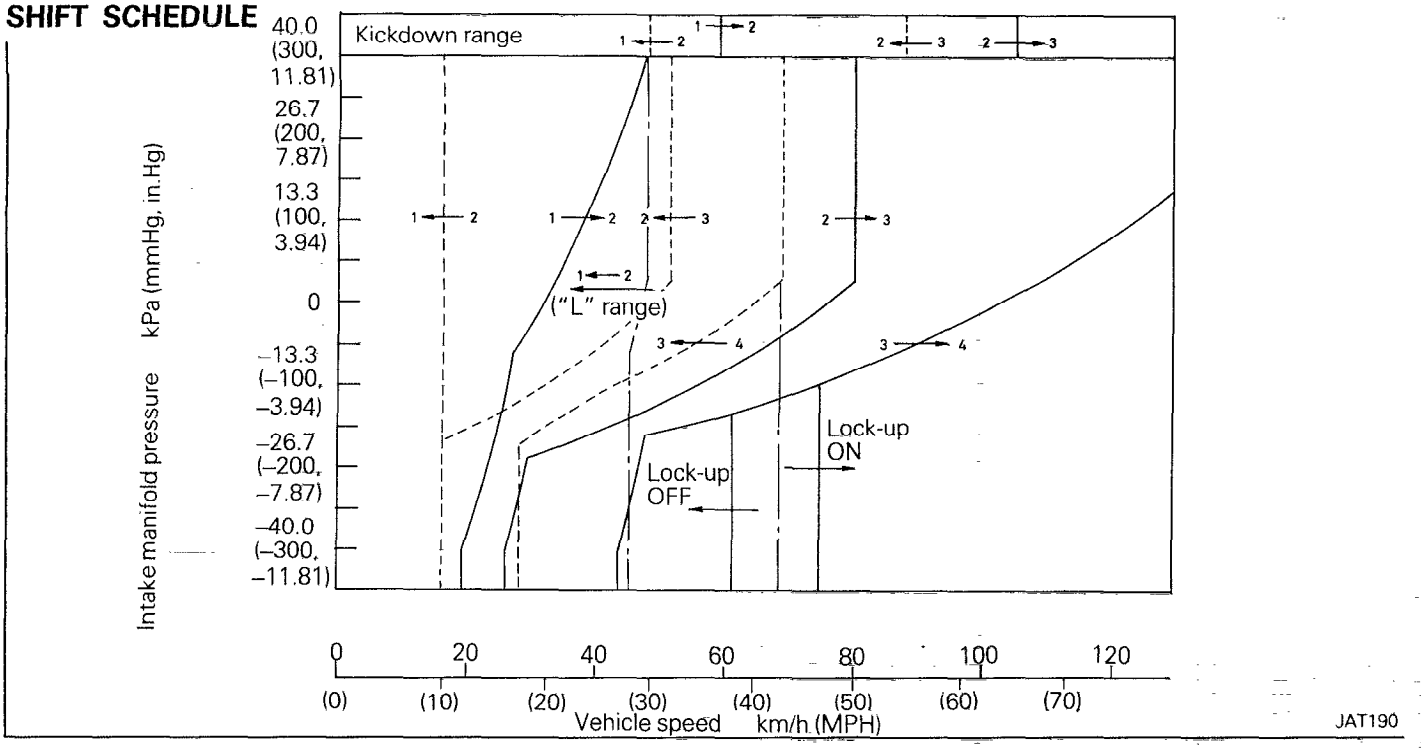
The transmission should not shift into 1st gear from "D" range if the car road speed is above approximately 50 km/h (30 MPH).

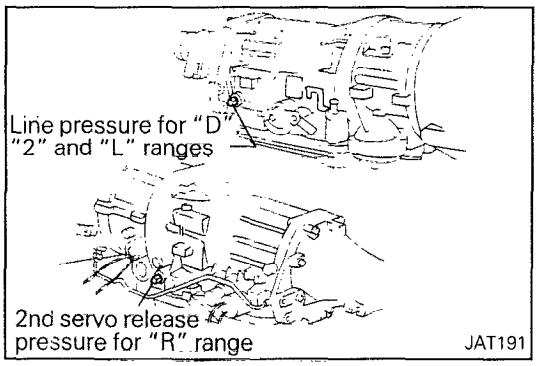
Record line pressure at each range and at each throttle vacuum in accordance with the pressure testing described below.

CAR SPEED AND LINE PRESSURE WHEN SHIFTING GEARS

VAC kPa (mmHg, in.Hg)	Gearshift	Car speed km/h (MPH)	Output shaft speed rpm
+46.7 (+350, +13.8)	$D_1 \rightarrow D_2$	59 – 68 (37 – 42)	1,800 – 2,100
	$D_2 \rightarrow D_3$	101 – 111 (63 – 69)	3,100 – 3,400
	$D_3 \rightarrow D_4$	–	–
	$D_4 \rightarrow D_3$	–	–
	$D_3 \rightarrow D_2$	83 – 93 (52 – 58)	2,550 – 2,850
	$D_2 \rightarrow D_1$	44 – 54 (27 – 34)	1,350 – 1,650
0 (0, 0)	$D_1 \rightarrow D_2$	23 – 33 (14 – 21)	700 – 1,000
	$D_2 \rightarrow D_3$	67 – 80 (42 – 50)	2,050 – 2,450
	$D_3 \rightarrow D_4$	98 – 114 (61 – 71)	3,020 – 3,520
	$D_4 \rightarrow D_3$	54 – 71 (34 – 44)	1,670 – 2,170
	$D_3 \rightarrow D_2$	34 – 50 (21 – 31)	1,050 – 1,550
	$D_2 \rightarrow D_1$	11 – 20 (7 – 12)	350 – 600
–26.7 (–200, –7.9)	$D_1 \rightarrow D_2$	16 – 26 (10 – 16)	500 – 800
	$D_2 \rightarrow D_3$	20 – 33 (12 – 21)	600 – 1,000
	$D_3 \rightarrow D_4$	41 – 57 (25 – 35)	1,260 – 1,760
	$D_4 \rightarrow D_3$	18 – 34 (11 – 21)	560 – 1,060
	$D_3 \rightarrow D_2$ or $D_3 \rightarrow D_1$	11 – 28 (7 – 17)	350 – 850
	$D_2 \rightarrow D_1$	11 – 20 (7 – 12)	350 – 600
+46.7 (+350, +13.8)	$1_2 \rightarrow 1_1$	44 – 54 (27 – 34)	1,350 – 1,650
–60 (–450, –17.8)	$1_2 \rightarrow 1_1$	42 – 52 (26 – 32)	1,300 – 1,600

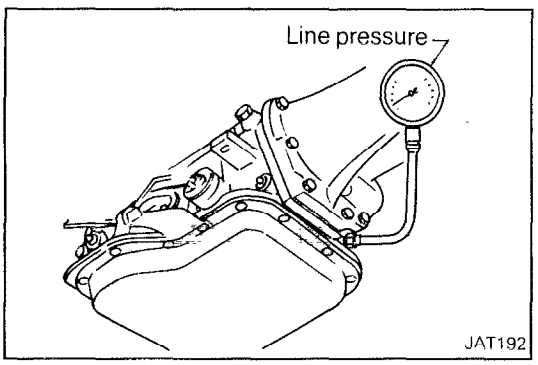
SHIFT SCHEDULE





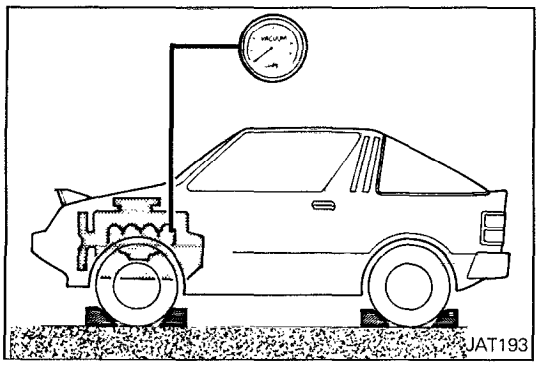
PRESSURE TESTING

The transmission is provided with two pressure test ports.



LINE PRESSURE

1. Disconnect both line pressure and servo release pressure plugs and, in their places, attach pressure gauges.



2. Install vacuum gauge.
3. Check levels of engine cooling water, engine oil and automatic transmission fluid. Add as necessary, to reach the specified level.
4. Warm up engine until engine oil and automatic transmission fluid reach normal operating temperatures.
5. Place wheel chocks at all wheels, and firmly engage parking brake.
6. Measure line pressure at idle and at stall point while depressing brake pedal fully.

Line Pressure at Idle

Range	Line pressure kPa (psi)
R	304 – 441 (44 – 64)
D	275 – 373 (40 – 54)
2	785 – 1,128 (114 – 164)
1	275 – 373 (40 – 54)

Line Pressure at Stall Point

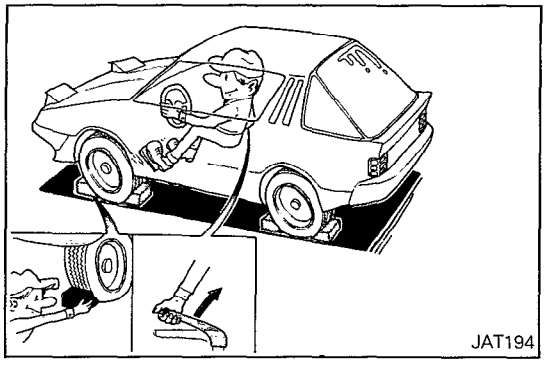
Range	Line pressure kPa (psi)
R	1,961 – 2,354 (284 – 341)
D	1,667 – 1,883 (242 – 273)
2	1,667 – 1,785 (242 – 259)
1	1,667 – 1,883 (249 – 273)

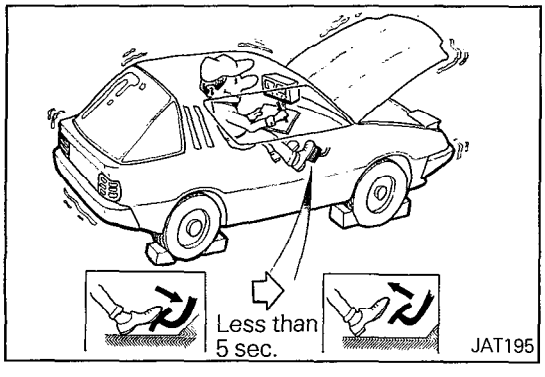
Key points of pressure testing are:
1. Pressure at idle: Lock for a steady rise in pressure as car speed increases under light load.
2. Pressure drop between shift points should not exceed 98 kPa (14 psi). Excessive pressure drop may indicate an internal leak at servo or clutch seal.

STALL TEST

The stall test is an effective method of testing clutch and band holding ability, torque converter one-way clutch operation, and engine performance. A stall test should only be performed as a last resort because of the high fluid temperature it generates and the excessive load it places on the engine and transmission.

Caution
1. **During test, never hold throttle wide-open for more than 5 seconds.**
2. **Do not test more than two gear ranges without driving car to cool off engine and transmission.**


JAT194



JAT195

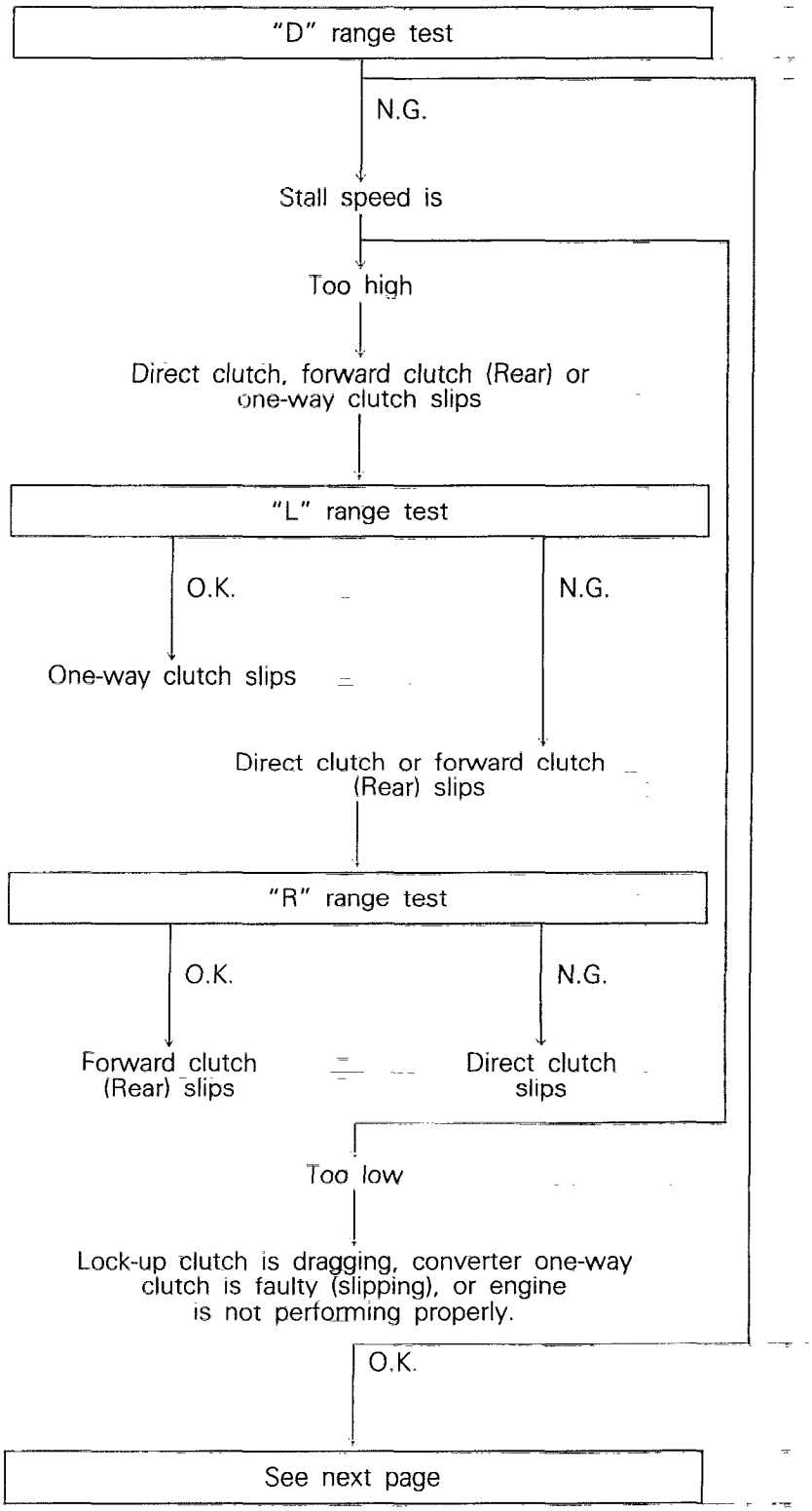
STALL TEST PROCEDURE

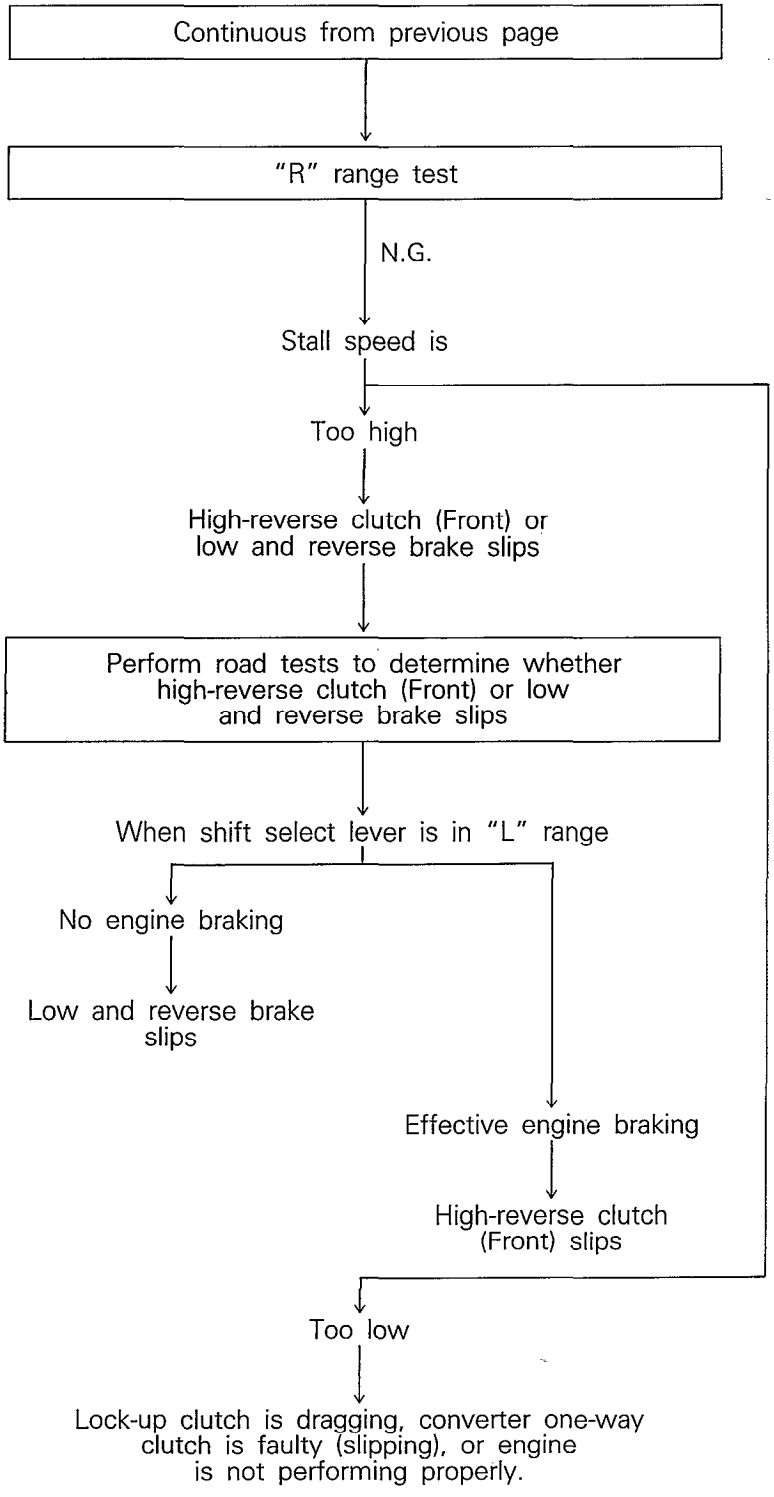
1. Transmission and engine fluid levels should always be checked and fluid added as needed.
2. Run engine at 1,200 rpm to attain proper warm-up.
3. Set parking brake and block wheels.
4. Install a tachometer where it can be seen by driver during test.
5. Start engine and place selector lever in "D" range.
6. Apply foot brake and accelerate to wide-open throttle. Do not hold throttle open longer than five seconds.
7. Quickly note the engine stall speed and immediately release throttle.

   Standard value: 2,750 – 3,050 rpm
8. Shift selector lever to "N".
9. Run engine at 1,200 rpm for at least one minute, allowing it to cool off.
10. Perform stall tests in the same manner as in steps 5 through 9 with select lever in "2", "L" and "R", respectively.

STALL TEST ANALYSIS

1. Satisfactory results in "D" range indicates forward clutch (Rear), direct clutch, high-reverse clutch (Front), one-way clutch of transmission, and one-way clutch of torque converter, are functioning properly.
   The analysis diagram is shown below.





If converter one-way clutch is frozen, car will have poor high speed performance. If converter one-way clutch is slipping, car will be sluggish up to 50 or 60 km/h (30 or 40 MPH).

TROUBLESHOOTING CHART

Numbers are arranged in order of probability. Perform inspections starting with number one and working up. Circled numbers indicate that the transmission must be removed from the car	ON CAR												OFF CAR													
	Oil level	Range select linkage	Inhibitor switch and wiring	Vacuum diaphragm and piping	Kickdown solenoid, switch and wiring	Engine idling rpm	*Line pressure*	Control valve	Governor	Band servo	Transmission air check	Oil quality	Ignition switch and starter motor	Engine adjustment, brake inspection	*Forward clutch (Rear)*	High-reverse clutch (Front)	O.D. band brake	2nd band brake	Low and reverse brake	Oil pump	Oil passage leak	Transmission one-way clutch	High-reverse clutch (Front) check ball	Park linkage
Engine does not start in "N", "P" ranges	.	2	3	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
Engine starts in range other than "N" and "P"	.	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Transmission noise in "P" and "N" ranges	1	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	③	.	.	.	.	.
Car moves when changing into "P" range or parking gear does not disengage when shifted out of "P" range	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	②
Car runs in "N" range	.	1	.	.	.	.	.	3	.	.	.	2	.	.	④	.	.	.	.	.	.	.	.	.	.
Car will not run in "R" range (but runs in "D", "2" and "L" ranges). Clutch slips Very poor acceleration	1	2	.	.	.	.	3	5	.	.	6	4	.	.	⑨	⑧	.	.	⑦	.	⑩	.	⑪	.
Car braked when shifting into "R" range	.	.	.	.	.	.	.	.	.	3	2	1	.	.	④	.	.	⑤	.	.	.	.	.	⑥	.
Sharp shock in shifting from "N" to "D" range	.	.	.	2	.	1	3	4	.	.	.	.	.	.	⑤	.	.	.	.	.	.	.	.	.	.
Car will not run in "D" range (but runs in "2", "L" and "R" ranges)	.	1	.	.	.	.	2	3	.	.	.	.	.	.	.	.	.	.	.	.	.	④	.	.	.
Car will not run in "D", "L", "2" ranges (but runs in "R" range) Clutch slips Very poor acceleration	1	2	.	.	.	.	4	5	.	.	6	3	.	7	⑧	⑩	.	.	.	.	⑨	.	.	.	.
Clutches or brakes slip somewhat in starting	1	2	.	6	.	.	3	5	.	.	7	4	.	.	.	.	.	.	.	⑧	⑨	.	.	.	.
Excessive creep	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
No creep at all	1	2	.	.	.	3	.	5	.	.	.	4	.	.	⑧	⑨	.	.	.	⑥	⑦	.	.	.	.
Failure to change gear from "1st" to "2nd"	.	1	.	2	3	.	.	5	6	8	7	4	.	.	.	.	.	⑨	.	.	⑩	.	.	.	.
Failure to change gear from "2nd" to "3rd"	.	1	.	2	3	.	.	5	6	8	7	4	.	.	.	⑨	.	.	.	.	⑩	.	⑪	.	.
Failure to change gear from "3rd" to "4th"	.	1	.	2	3	.	.	5	6	8	7	4	.	.	.	.	⑨	.	.	.	⑩	.	.	.	.
Too high a gear change point from "1st" to "2nd", from "2nd" to "3rd", from "3rd" to "4th"	.	.	.	1	2	.	3	5	6	.	.	4	.	.	.	.	.	.	.	.	⑦	.	.	.	.
Gear change directly from "1st" to "3rd" occurs	.	.	.	.	.	.	.	2	4	.	3	1	.	.	.	.	.	⑤	.	.	⑥	.	.	.	.
Gear change directly from "2nd" to "4th" occurs	.	.	.	.	.	.	.	2	4	.	3	1	.	.	⑤	.	.	.	.	.	⑥	.	.	.	.

Numbers are arranged in order of probability. Perform inspections starting with number one and working up. Circled numbers indicate that the transmission must be removed from the car	ON CAR												OFF CAR								
	Oil level	Range select linkage	Vacuum diaphragm and piping	Kickdown solenoid, switch and wiring	Line pressure	Engine stall rpm	Control valve	Governor	Band servo	Transmission air check	Oil quality	Engine adjustment, brake inspection	Direct clutch	Forward clutch (Rear)	High-reverse clutch (Front)	O.D. band brake	2nd band brake	Low and reverse brake	Oil pump	Oil passage leak	Transmission one-way clutch	High-reverse clutch (Front) check ball
Too sharp a shock in change from "1st" to "2nd"	.	.	1	.	.	2	4	.	5	.	3	.	.	.	.	.	⑥	.	.	.	.	.
Too sharp a shock in change from "2nd" to "3rd"	.	.	1	.	2	.	3	.	5	4	.	.	.	.	⑥	.	.	.	.	.	.	.
Too sharp a shock in change from "3rd" to "4th"	.	.	1	.	2	.	3	.	5	4	.	.	.	.	.	⑥	.	.	.	.	.	.
Almost no shock or clutches slipping in change from "1st" to "2nd"	1	2	3	.	4	.	6	.	8	7	5	.	.	.	.	.	⑨	.	.	⑩	.	.
Almost no shock or slipping in change from "2nd" to "3rd" Engine races extremely fast	1	2	3	.	4	.	6	.	8	7	5	.	.	.	⑨	.	.	.	.	⑩	.	⑪
Almost no shock or slipping in change from "3rd" to "4th"	1	2	3	.	4	.	6	.	8	7	5	.	.	.	.	⑨	.	.	.	⑩	.	.
Car braked by gear change from "1st" to "2nd"	.	.	.	.	.	.	2	.	.	.	1	.	.	.	④	.	.	③	.	.	⑤	.
Car braked by gear change from "2nd" to "3rd"	.	.	.	.	.	.	3	.	2	.	1	.	.	.	.	.	④	.	.	.	.	.
Car braked by gear change from "3rd" to "4th"	.	.	.	.	.	.	2	.	.	.	1	.	③	.	④	.	.	.	.	.	.	.
Maximum speed not attained. Acceleration poor	1	2	.	.	4	5	7	.	6	.	3	8	.	⑪	⑫	.	⑨	⑩	⑬	.	.	.
Failure to change gear from "4th" to "3rd"	.	.	1	.	.	.	3	4	.	5	2	.	⑥	.	⑦	⑧	.	.	.	⑨	.	.
Failure to change gear from "3rd" to "2nd" and from "4th" to "2nd"	.	.	1	.	.	.	3	4	6	5	2	.	.	.	⑦	⑩	⑧	.	.	⑨	.	.
Failure to change gear from "2nd" to "1st" or from "3rd" to "1st"	.	.	1	.	.	.	3	4	6	5	2	.	.	.	.	.	⑦	.	.	.	⑧	.
Gear change shock felt during deceleration by releasing accelerator pedal	.	1	2	3	4	.	5	6	.	.	.	.	.	.	.	.	.	.	.	⑦	.	.
Too high a change point from "4th" to "3rd", from "3rd" to "2nd", from "2nd" to "1st"	.	1	2	3	4	.	5	6	.	.	.	.	.	.	.	.	.	.	.	⑦	.	.
Kickdown does not operate when depressing pedal in "3rd" within kickdown car speed	.	.	2	1	.	.	4	5	.	.	3	.	.	.	.	.	⑥	.	.	⑦	.	.
Kickdown operates or engine overruns when depressing pedal in "3rd" beyond kickdown car speed limit	.	1	2	.	3	.	5	6	.	7	4	.	.	.	⑧	.	.	.	.	⑨	.	.
Races extremely fast or slips in changing from "4th" to "3rd" when depressing pedal	.	.	1	.	2	.	4	.	6	5	3	.	⑦	.	⑧	⑨	.	.	.	⑩	.	⑪
Races extremely fast or slips in changing from "3rd" to "2nd" when depressing pedal	.	.	1	.	2	.	4	.	6	5	3	.	.	.	⑦	.	⑧	.	.	⑨	.	⑩

Numbers are arranged in order of probability. Perform inspections starting with number one and working up. Circled numbers indicate that the transmission must be removed from the car	ON CAR												OFF CAR											
	Oil level	Range select linkage	Vacuum diaphragm and piping	Engine idling rpm	Line pressure	Engine stall rpm	Rear lubrication	Control valve	Governor	Band servo	Transmission air check	Oil quality	O.D. cancel switch and wiring	O.D. cancel solenoid	Direct clutch	Forward clutch (Rear)	High-reverse clutch (Front)	O.D. band brake	2nd band brake	Low and reverse brake	Oil pump	Oil passage leak	Torque converter, one-way clutch	Transmission one-way clutch	Park linkage	Planetary gear	O.D. cancel valve
Car will not run in any range	1	2			3			5			6	4									⑦	⑧			⑨		
Transmission noise in "D", "2", "L" and "R" ranges	1				2											③					④			(5)		⑥	
Failure to change from "3rd" to "2nd" when changing lever into "2" range		1			2			4		5		3							⑥			⑦					
Gear change from "2" to "1st" or from "2nd" to "3rd" in "2" range		1			2			3																			
No shock at change from "L" to "2" range or engine races extremely	1	2	3	4		5		7			8	6							⑨		⑩						
Failure to change from "3rd" to "2nd" when shifting lever into "L" range		1			2			4	5	7	6	3					⑧		⑨			⑩					
Engine brake does not operate in "L" range		1			2			4			5	3								⑥		⑦					
Gear change from "1st" to "2nd" or from "2nd" to "3rd" in "L" range		1						2														③					
Does not change from "2nd" to "1st" in "L" range	1	2						4	5	6	7	3								⑧		⑨					
Large shock changing from "2nd" to "1st" in "L" range			1			2		4				3								⑤							
Transmission overheats *	1				3	4	2	6		8	7	5					⑨		⑩	⑪	⑫	⑬	⑭			⑮	
Oil shoots out during operation White smoke emitted from exhaust pipe during operation	1		3		5	6	2	7			8	4					⑨		⑩	⑪	⑫	⑬	⑭			⑮	
Offensive smell at oil charging pipe	1											2			③	④	⑤	⑥	⑦	⑥	⑦	⑧	⑨			⑩	
Transmission shifts to overdrive even if O.D. cancel switch is turned to "ON"													1	2													(3)
Light inside O.D. cancel switch does not glow even if ignition switch is turned to "ON" (engine not started)													1														
Light inside O.D. cancel switch does not glow even if transmission is shifted to O.D.													1														

*: Refer to the next page.

Numbers are arranged in order of probability. Perform inspections starting with number one and working up. Circled numbers indicate that the transmission must be removed from the car.	ON CAR			OFF CAR				
	Governor tube	Governor	Line pressure	O-ring in input shaft	Torque converter	Lock-up control valve	Lock-up orifice in oil pump cover	Oil pump
Torque converter is not locked up	1	2	3	④	⑨	⑥	⑦	⑤
Lock-up piston slips			1	②	⑤		③	④
Lock-up point is extremely high or low	1	2				③		
Engine is stopped at "R", "D", "2" and "L" ranges					②	①		
Transmission overheats			1	②	⑤		③	④

ROAD TEST SYMPTOM CHART

			Shift quality									
			Rough	Shift timing [Mark km/h (MPH)]	No shift	Shift slippage	Car won't move	Cruise slippage	Poor power acceleration	Noisy	OK	Comments
PARK RANGE	ENG. START											
	HOLDING											
"R" RANGE	Man. shift	P-R										
	REVERSE											
"N" RANGE	Man. shift	R-N										
	ENG. START											
	N											
"D" RANGE	Man. shift	N-D										
	1st											
	Auto shift	1-2										
	2nd											
	Auto shift	2-3										
	3rd											
	Auto shift	3-4										
	4th in Lock-up "OFF"											
	Auto shift Lock-up "OFF" (4) → Lock-up "ON" (4)											
	4th in Lock-up "ON"											
	Auto shift Lock-up "ON" (4) → Lock-up "OFF" (4)											
	Decel.	4-3										
	Kickdown	4-3										
	Decel.	3-2										
	Kickdown	3-2										
	Decel.	2-1										
	Kickdown	2-1										
"2" RANGE	Man. shift	D-2										
	2nd											
"L" RANGE	Man. shift	2-L										
	Man. shift	D-L										
	Acceleration											
	"L"	Engine Braking										

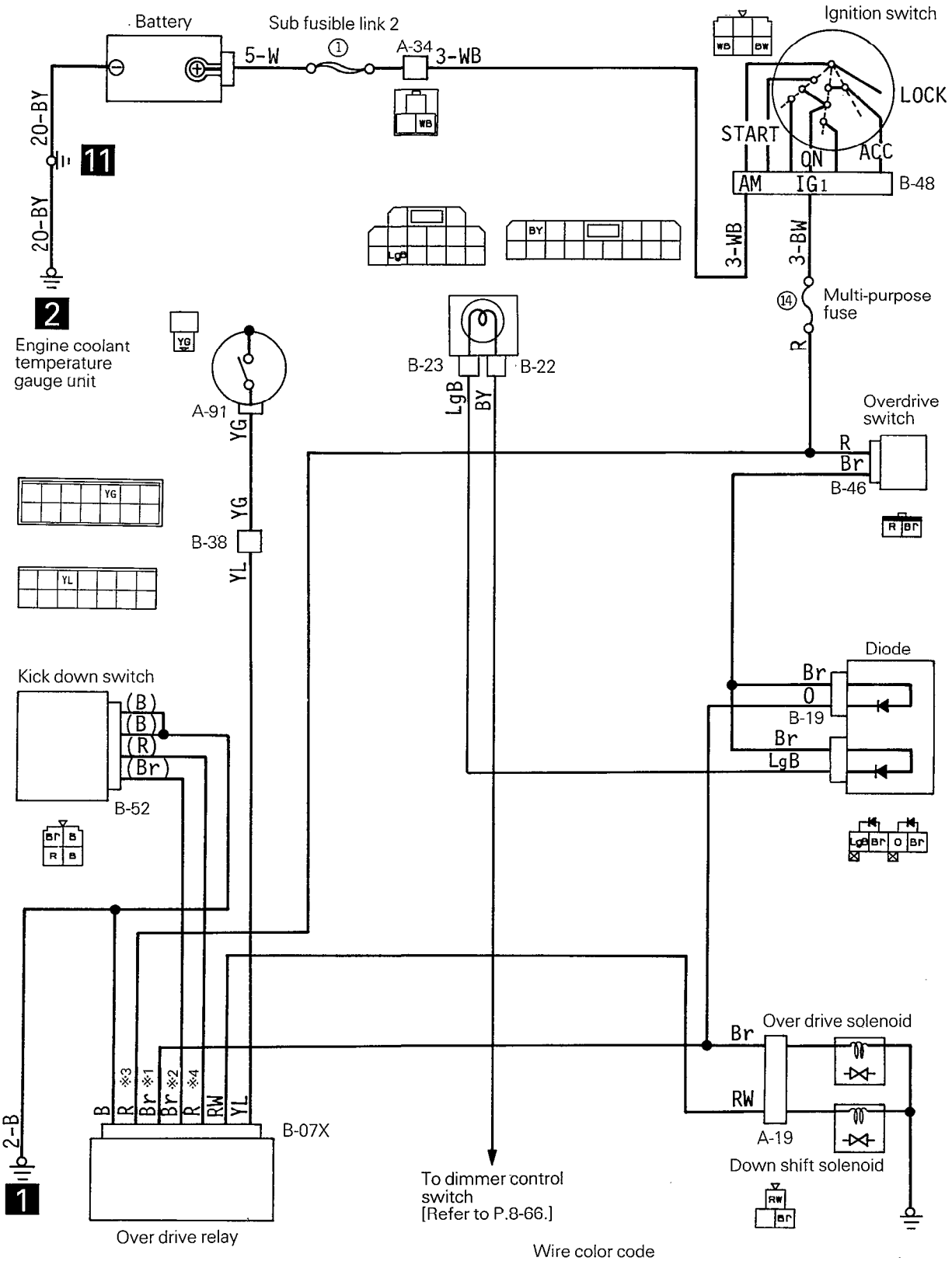
TROUBLESHOOTING GUIDE

Order	Test item	Procedure
Checking	1. Oil level gauge	Check gauge for oil level and leakage before and after each test.
	2. Downshift solenoid	Check for sound of operating solenoid when depressing accelerator pedal fully with ignition key "ON".
	3. Manual linkage	Check by shifting into "P", "R", "N", "D", "2" and "L" ranges with selector lever.
	4. Inhibitor switch	Check whether starter operates in "N" and "P" ranges only and whether reverse light operates in "R" range only.
	5. Engine idling rpm	Check whether idle speed meets specifications.
	6. Vacuum pressure of vacuum pipe	Check whether vacuum pressure is more than 60.0 kPa (450 mmHg, 177.72 in.Hg) at idle and whether it decreases with increasing rpm.
	7. Operation in each range	Check whether transmission engages positively by shifting "N" → "D", "N" → "2", "N" → "L" and "N" → "R" range while idling with brake applied.
	8. Creep of car	Check whether there is any creep in "D", "2", "L" and "R" ranges.
Stall test	1. Oil pressure before testing	Measure line pressures in "D", "2", "L" and "R" range while idling.
	2. Stall test	Measure engine speed and line pressure in "D", "2", "L" and "R" ranges during full throttle operation. Temperature of torque converter oil used in test should be from 60 to 100°C (140 to 212°F) i.e., sufficiently warmed up but not overheated. **Caution To cool oil between each stall test for "D", "2", "L" and "R" ranges, idle engine, i.e., rpm at about 1,200 rpm for more than 1 minute in "P" range. Measurement time must not be more than 5 seconds.**
	3. Oil pressure after testing	Same as item 1.
Road test	1. Slow acceleration, 1st → 2nd, 2nd → 3rd, 3rd → 4th	Check car speeds and engine rpm in shifting up 1st → 2nd, 2nd → 3rd range and 3rd → 4th range and when torque converter is locked up while running with lever in "D" range and engine vacuum pressure of about 0 kPa (0 mmHg, 0 in.Hg).
	2. Quick acceleration, 1st → 2nd, 2nd → 3rd	Same as item 1 above except with engine vacuum pressure of +46.66 kPa (+350 mmHg, +13.78 in.Hg) (i.e., in position just kickdown).
	3. Kickdown operation, 4th → 3rd, 3rd → 2nd or 2nd → 1st	Check whether the kickdown operates and measure the time delays while running at 30, 40, 50, 60, 70, 100 km/h (19, 25, 31, 37, 43, 62 MPH) in "D_3" or "D_4" range.
	4. Shift down, $D_4 \rightarrow D_3 \rightarrow D_2 \rightarrow D_1$	Check car speeds and engine rpm in shifting down from 4th → 3rd → 2nd → 1st (sequentially) while coasting with accelerator pedal released in "D_4" range and engine vacuum pressure of about –60.0 kPa (–450 mmHg, –17.72 in.Hg).
	5. Shift down, $D_3 \rightarrow 1_2 \rightarrow 1_1$	Check for shifting down $D_3 \rightarrow 1_2$ and engine braking, and further for shifting down $1_2 \rightarrow 1_1$ and engine braking after shifting the lever into "L" range with the accelerator pedal released and the engine vacuum pressure of about 60 kPa (450 mmHg, 17.72 in.Hg) while driving at about 50 km/h (30 MPH) in "D_3" range.
	6. Shift down, $D_3 \rightarrow 2$	Check for quick shifting down $D_3 \rightarrow 2$ and engine braking, after shifting the lever into "2" range while driving at about 50 km/h (30 MPH) in "D_3" range. Also, check for locking of the transmission in 2nd gear ratio regardless of car speed.

Order	Test item	Procedure
Road test	7. Shift up, $1_1 \rightarrow 1_2$	Check for failure of the transmission to shift up during acceleration, when starting in "L" range.
	8. Shift up or down when starting in "2" range	Check the transmission for not shifting up or down during acceleration or deceleration, when starting in "2" range.
	9. Parking	Confirm that car will not move on grade when shifting to "P" range.
	10. O.D. cancel switch operation	Confirm that transmission will not shift to overdrive while running with O.D. cancel switch ON.
	11. O.D. indicator light	Confirm that O.D. indicator light glows when ignition switch is ON (engine not started), and that it goes off as soon as engine is started. Confirm that light glows when transmission is shifted to O.D. and driven in "D" range with O.D. cancel switch OFF.
Others	Abnormal shock, oil leakage	Enter into record conditions observed during these tests such as gear noise, abnormal clutch noise and acceleration performance.

4-SPEED AUTOMATIC TRANSMISSION

CIRCUIT DIAGRAM



Wire color code

B: Black	Br: Brown	G: Green
Gr: Gray	L: Blue	Lg: Light green
LI: Light blue	O: Orange	P: Pink
R: Red	W: White	Y: Yellow

Remark
For details of grounding points (ex.: 2), refer to page 8-10.

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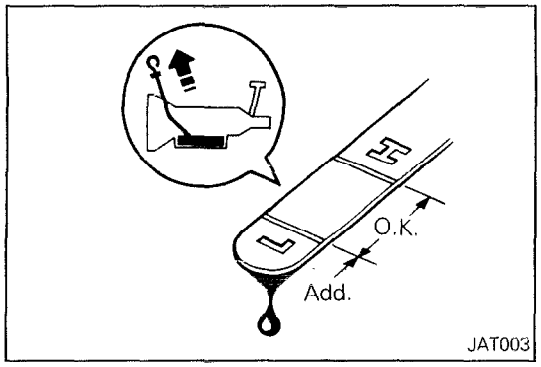


SERVICE ADJUSTMENT PROCEDURES

N21FBBBa

TRANSMISSION FLUID INSPECTION

(1) Place vehicle on level floor.
(2) Before removing dipstick, wipe all dirt from area around dipstick.
(3) With selector lever in "P" (Park) and parking brake applied, start engine.
(4) Engine should be running at idle speed. Transmission should be warmed-up sufficiently [fluid temperature 50 to 80°C (120 to 180°F)].
(5) Move selector lever sequentially to every position to fill torque converter and hydraulic circuit with fluid, then place lever in "N" (Neutral) position.
(6) Check to see if fluid level is in the range indicated on dipstick.
If it is low, add ATF until level reaches that range.

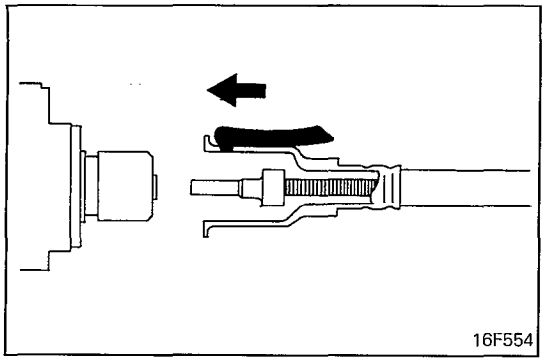
Transmission fluid: DEXRON II type

Low fluid level can cause a variety of troubles because it allows pump to take in air along with fluid. Air trapped in hydraulic circuit forms bubbles which make fluid spongy. Therefore, pressures will be erratic, and causes delay of shifting, and slippage of clutch and brake.
Improper filling can raise fluid level too high. When transmission has too much fluid, gears churn up foam and cause same conditions which occur with low fluid level, resulting in accelerated deterioration of ATF.
In either case, air bubbles can cause overheating, fluid oxidation, and varnishing, which can interfere with normal valve, clutch, and servo operation.
Foaming can also result in fluid escaping from transmission vent where it may be mistaken for a leak. Along with fluid level, it is important to check the condition of the fluid. When fluid smells burned, it is contaminated with metal bushing or friction material particles, and a complete transmission overhaul is needed. Be sure to examine fluid on dipstick closely. If there is any doubt about its condition, drain out sample for double check. After fluid has been checked, seat dipstick fully to seal out water and dirt.

TRANSMISSION FLUID REPLACEMENT

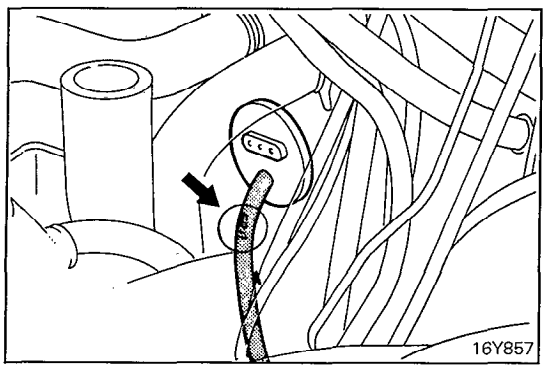
N21FCBAa

Refer to GROUP 0 LUBRICATION AND MAINTENANCE – Automatic Transmission.



SPEEDOMETER CABLE REPLACEMENT N21FEAAa

(1) Replace the cable assembly if there is a malfunction.
(2) When connecting the cable to the meter, insert the cable until its stopper properly fits to the meterside groove.



(3) After installing the speedometer, pull the speedometer cable through the grommet in the toeboard until the cable marking is visible from the engine compartment side.

Caution
Poor installation of the cable may cause a fluctuating meter pointer, or noise and a damaged harness inside the instrument panel.

ON-VEHICLE SERVICE

N21FA--

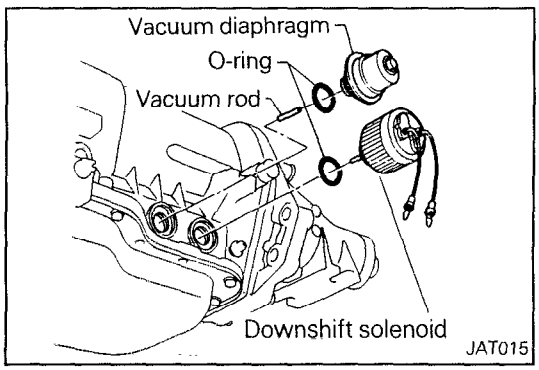
The following parts can be serviced with the transmission on the vehicle.

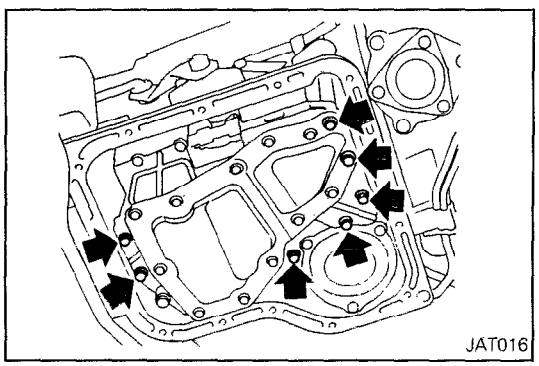
1. Control valve body assembly
2. Extension oil seal
3. Parking components
4. Governor valve assembly
5. Inhibitor switch
6. Vacuum diaphragm and downshift solenoid

Check and/or replace faulty parts as follows:

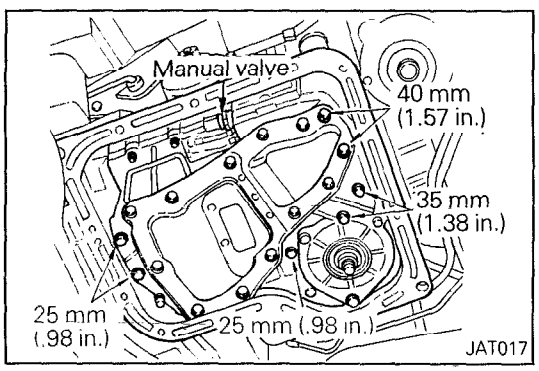
CONTROL VALVE BODY ASSEMBLY

1. Drain fluid by removing oil pan.
2. Remove downshift solenoid and vacuum diaphragm and rod. Be careful not to lose vacuum rod.





3. Remove seven bolts and remove control valve body assembly.
4. Disassemble, inspect and reassemble control valve body assembly. Refer to page 21-120 for Control Valve Body.



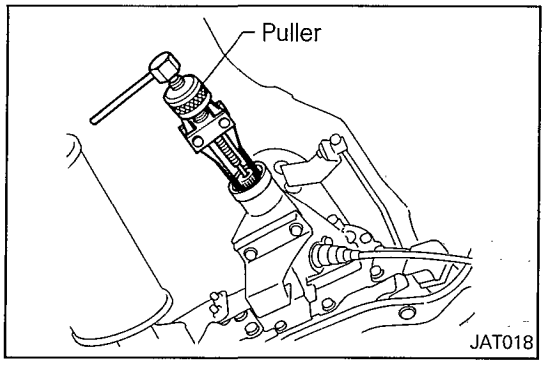
5. Set manual shaft in Neutral, then align manual plate with groove in manual valve.
6. Install control valve body assembly and tighten seven bolts to the specified torque.

   Control valve body mounting bolts:
   5.4 – 7.4 Nm (4.0 – 5.4 ft.lbs.)

7. After installing control valve body to transmission case, make sure that control lever can be moved to all position.
8. Install downshift solenoid and vacuum diaphragm and rod. Make sure that vacuum diaphragm rod does not interfere with side plate of control valve.
9. Install new gasket and oil pan.

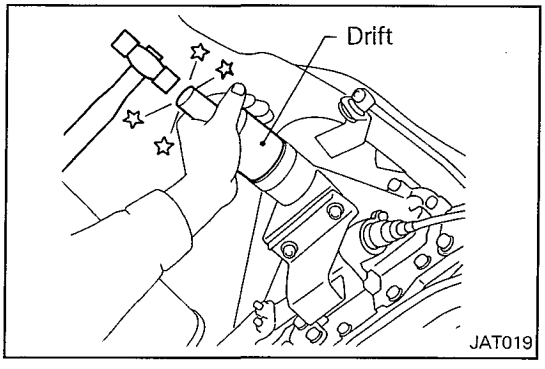
   Oil pan bolts: 5 – 7 Nm (3.6 – 5.1 ft.lbs.)

10. Secure clamps of governor tube and oil cooler tubes.
11. Refill with automatic transmission fluid.

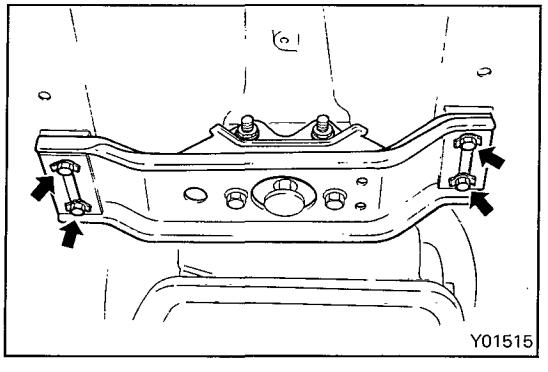


EXTENSION OIL SEAL REPLACEMENT

1. Remove propeller shaft.
2. Remove extension oil seal use with suitable puller.



3. Apply coat of ATF to oil seal surface, then drive new seal into place.
4. Coat sealing lips with vaseline, then install propeller shaft. Refer to Propeller Shaft for installation.

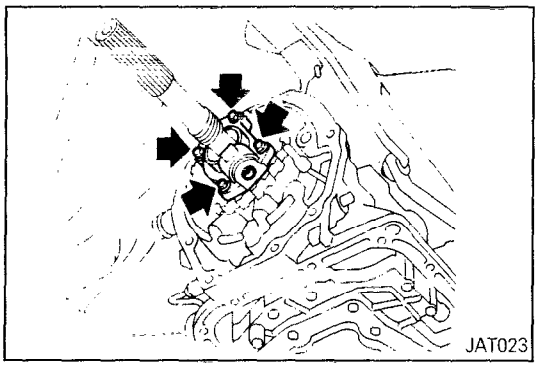


PARKING COMPONENTS

1. Drain oil by removing oil pan.
2. Remove propeller shaft.
3. Remove speedometer cable from transmission, then remove speedometer sleeve assembly.
4. Support transmission with a jack and wooden block, then remove rear mounting bolts.
5. Remove rear extension bolts, then remove rear extension with rear mounting.
6. Remove control valve assembly. Refer to Control Valve Assembly.
7. Inspect and repair parking components. Refer to Parking Mechanism for inspection.
8. Install control valve assembly. Refer to Control Valve Assembly for on-vehicle service.
9. Install rear extension, then install rear mounting parts.
10. Install speedometer sleeve assembly and cable.
11. Install propeller shaft. Refer to Propeller Shaft for installation.
12. Install oil pan with new gasket.

    Oil pan bolts: 5 – 7 Nm (3.6 – 5.1 ft.lbs.)

13. Refill with automatic transmission fluid.

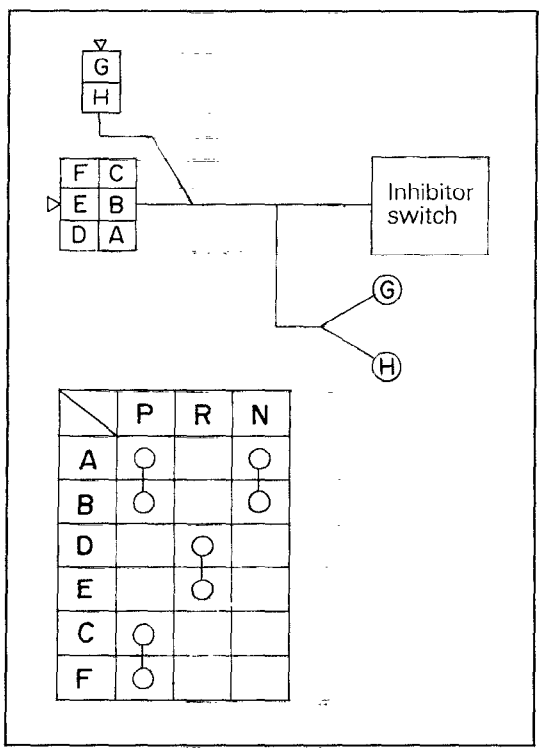


GOVERNOR VALVE ASSEMBLY

1. Drain oil by removing oil pan.
2. Remove rear mounting parts, then remove rear extension. Refer to Parking Components.
3. Remove governor valve assembly.
4. Inspect and repair governor valve assembly. Refer to Governor for inspection.
5. Install governor valve assembly.

   Governor valve mounting bolts: 5 – 7 Nm (3.6 – 5.1 ft.lbs.)
6. Install extension, then install rear mounting parts. Refer to Parking Components.
7. Install oil pan with new gasket.

   Oil pan bolts: 5 – 7 Nm (3.6 – 5.1 ft.lbs.)



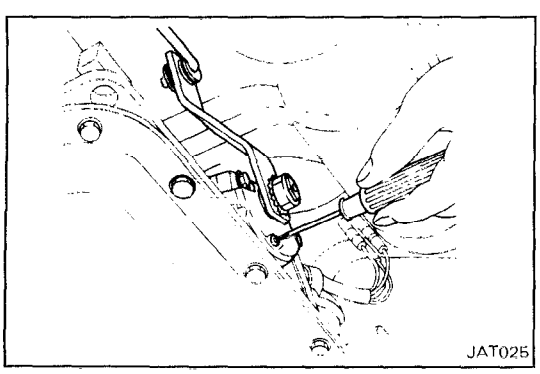
INHIBITOR SWITCH ADJUSTMENT

The inhibitor switch has two major functions. It causes the back-up lights to illuminate when the shift lever is placed in the reverse range. It also acts as a neutral safety switch allowing current to pass from the starter only when the lever is placed in the "P" or "N" range.

INSPECTION

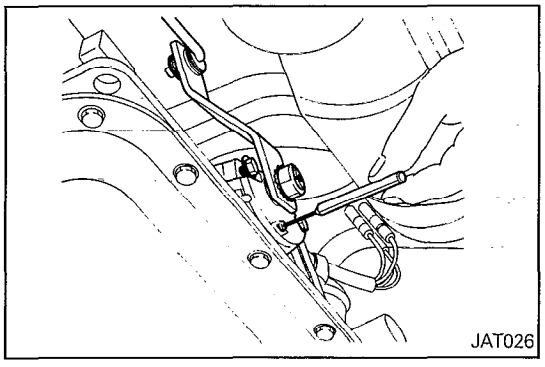
A continuity tester may be used to check the inhibitor switch for proper operation.

1. Check continuity at "N", "P" and "R" ranges.
2. With control lever held in Neutral, turn manual lever an equal amount in both directions to see if current flow ranges are nearly the same. (Current normally begins to flow before manual lever reaches an angle of 1.5° in either direction.)
   If current flows outside normal range, or if normal flow range is out of specifications, properly adjust inhibitor switch.



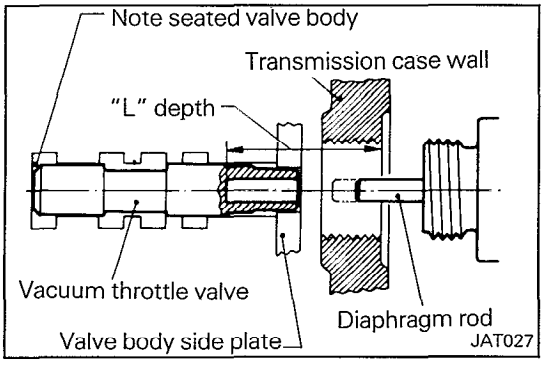
ADJUSTMENT

1. Place the manual valve in Neutral (vertical position).
2. Remove the screw as illustrated.
3. Loosen the attaching bolts.



4. Using an aligning pin, [2.0 mm (.079 in.) dia.] move the switch until the pin falls into the hole in the rotor.
5. Tighten the attaching bolts equally.

   Inhibitor switch mounting bolts:
   5 – 7 Nm (3.6 – 5.1 ft.lbs.)
6. Recheck for continuity. If faulty, replace the switch.



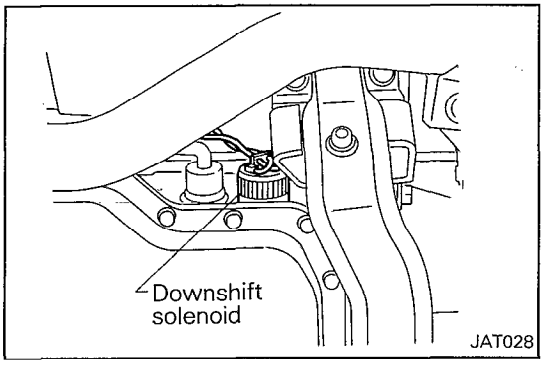
VACUUM DIAPHRAGM ROD ADJUSTMENT

The vacuum diaphragm and the length of its diaphragm rod help determine the shift patterns of the transmission. It is essential that the correct length rod be installed.

1. Disconnect vacuum hose at vacuum diaphragm and remove diaphragm from transmission case.
2. Using a depth gauge, measure depth "L". Be sure vacuum throttle valve is pushed into valve body as far as possible.
3. Check "L" depth with chart below and select proper length rod.

Vacuum Diaphragm Rod Selection

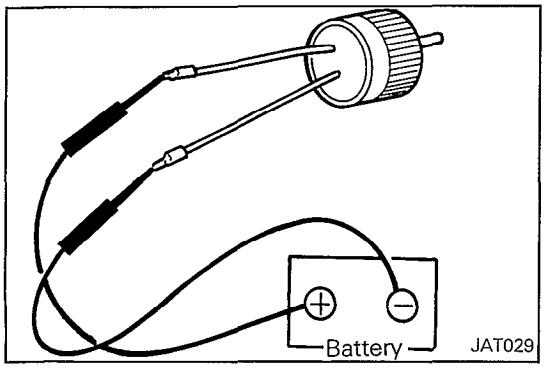
Measured depth "L" mm (in.)	Rod length mm (in.)	Part number
Under 25.55 (1.0059)	29.0 (1.142)	MD610614
25.65 – 26.05 (1.0098 – 1.0256)	29.5 (1.161)	MD610615
26.15 – 26.55 (1.0295 – 1.0453)	30.0 (1.181)	MD610616
26.65 – 27.05 (1.0492 – 1.0650)	30.5 (1.201)	MD610617
Over 27.15 (1.0689)	31.0 (1.220)	MD610618



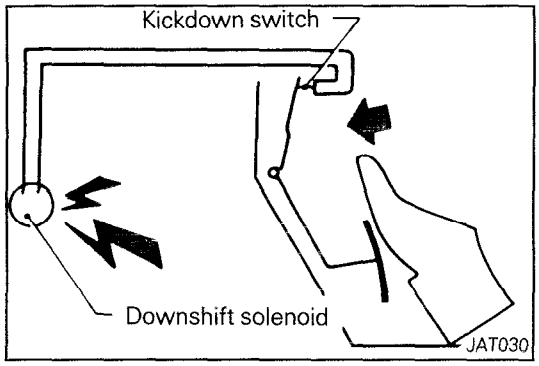
DOWNSHIFT SOLENOID

1. Disconnect downshift solenoid harness.
2. Remove downshift solenoid and O-ring.

   NOTE
   Catch oil draining from the hole.



3. Check to verify that downshift solenoid is operating properly. If faulty, replace it with a new one.
4. Apply coat of ATF to O-ring, and install O-ring and downshift solenoid.
5. Connect downshift solenoid harness.
6. Refill with automatic transmission fluid.



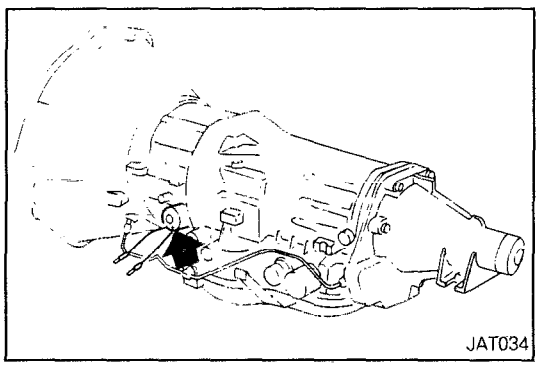
KICKDOWN SWITCH ADJUSTMENT

The kickdown switch is located at the upper post of the accelerator pedal, inside the car.
When the pedal is fully depressed, a click can be heard just before the pedal bottoms out. If the click is not heard, loosen the lock nut and extend the switch until the pedal lever makes contact with the switch and the switch clicks.
Do not allow the switch to make contact too soon. This would cause the transmission to downshift on part throttle.

DIAGNOSIS

Switch can be heard clicking, and the transmission still does not kickdown:
Check the continuity of the switch using a continuity tester. Also check for available current.

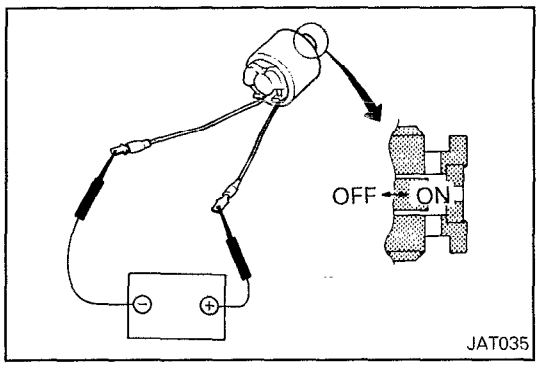
The car upshifts at approximately 60 and 100 km/h (36 and 60 MPH) only:
The kickdown switch may be internally shorted. (When the switch is shorted, there is continuity through the switch in any position).



O.D. CANCEL SOLENOID

LOCATION

The O.D. cancel solenoid is located on left side of transmission.



INSPECTION

Confirm that clicking sound is heard when power is applied.

TRANSMISSION OIL COOLER

N21SA--

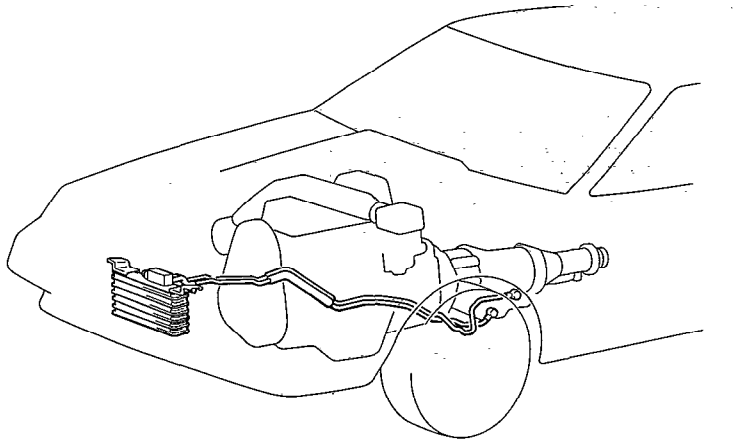
REMOVAL AND INSTALLATION

Pre-removal Operation
- Removal of Air Guide Panel
- Draining Automatic Transmission Fluid
  (Refer to GROUP 0 LUBRICATION AND MAINTENANCE – Maintenance Service.)

Post-installation Operation
- Installation of Air Guide Panel
- Refilling with Automatic Transmission Fluid
  (Refer to GROUP 0 LUBRICATION AND MAINTENANCE – Maintenance Service.)

1. Eye bolts
2. Gasket
3. Oil return tube
4. Oil feed tube
5. Oil return hose
6. Oil feed hose
7. Oil return tube
8. Oil feed tube
9. Oil return hose
10. Oil feed hose
11. Oil cooler assembly

NOTE
◆◆: Refer to "Service Points of Removal"



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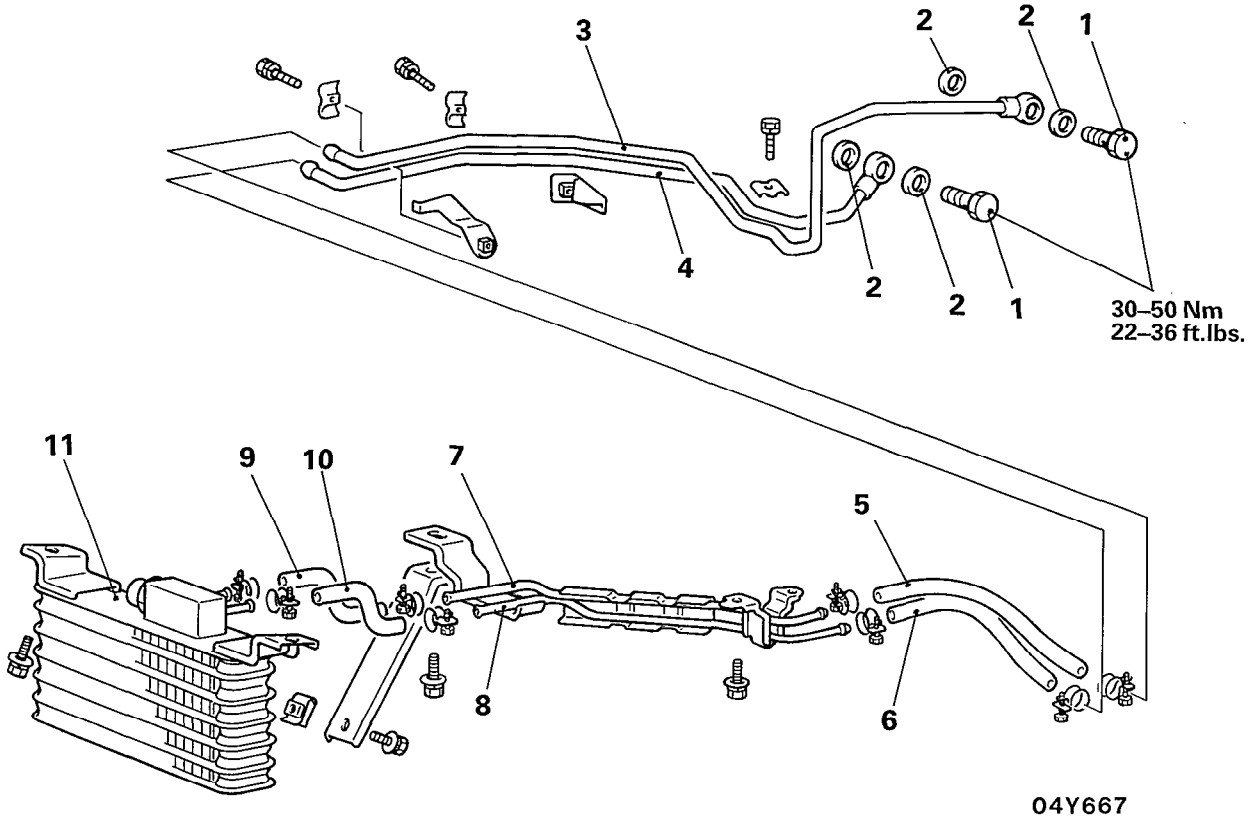

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SERVICE POINT OF REMOVAL N21SBAA

11. REMOVAL OF OIL COOLER ASSEMBLY

Caution
Plug the ends of the oil cooler hoses and the oil cooler and transmission ports to prevent the transmission fluid from spilling out and foreign material from getting in.

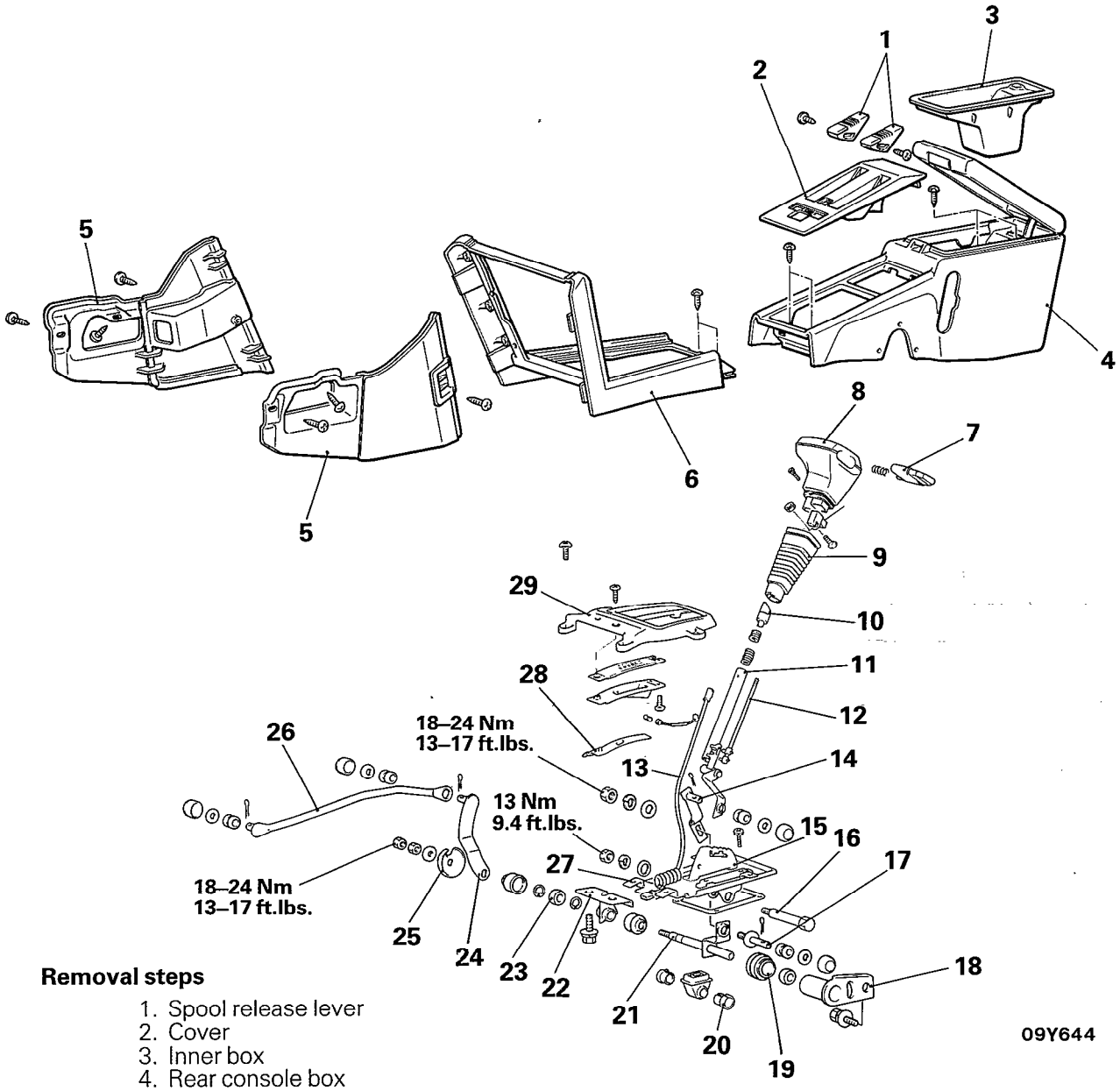
INSPECTION N21SCAC

- Check the oil cooler hoses for cracks, damage and deterioration.
- Check the pad for damage and deterioration.
- Check the oil cooler for foreign material.

TRANSMISSION CONTROL

N21IA--

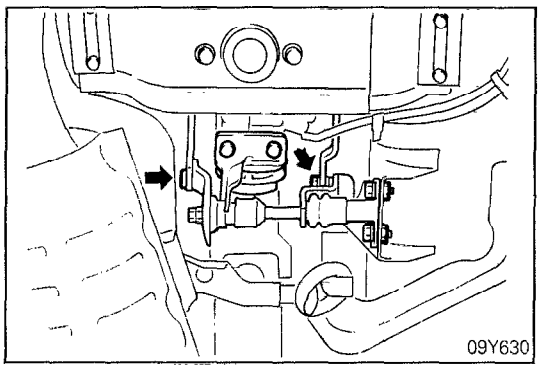
REMOVAL AND INSTALLATION



Removal steps

1. Spool release lever
2. Cover
3. Inner box
4. Rear console box
5. Side console cover
6. Front console box
7. Push button
◆◆ 8. Selector knob
◆◆ 9. Selector lever cover
10. Adjusting cam
◆◆ ◆◆ 11. Selector lever
12. Selector lever rod
13. O.D. (overdrive) switch harness
14. Lever
15. Detent plate
16. Shaft
17. Pin
18. Support
19. Boot
20. Dust boot
21. Cross-shaft
22. Support
23. Cross-shaft bushing
24. Lever
25. Protector
26. Rod
◆◆ 27. Bracket
28. Slider
29. Indicator panel

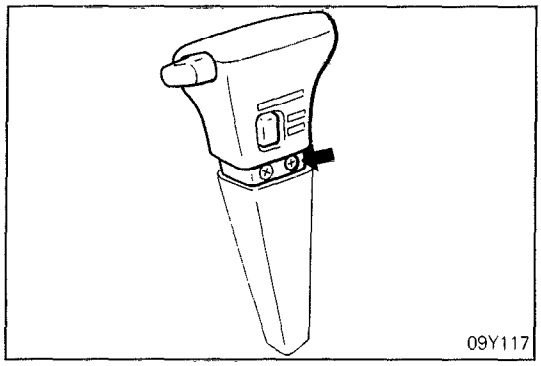
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".



SERVICE POINTS OF REMOVAL

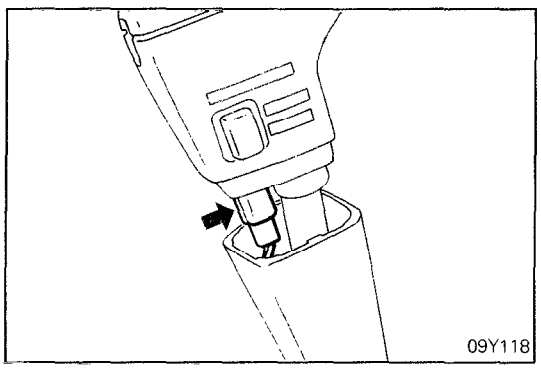
N21IBAD

NOTE
Before servicing be sure to set the selector lever to "N" position, and then disconnect the lever and rod from the cross-shaft.



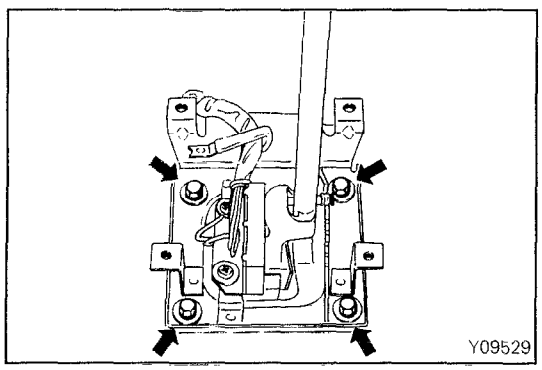
8. REMOVAL OF SELECTOR KNOB / 9. SELECTOR LEVER COVER

(1) Remove the front console box.
(2) Push down the selector lever cover.
(3) Remove the selector knob from the selector lever.

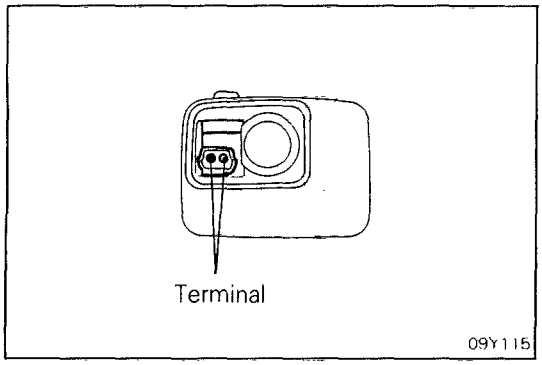


11. REMOVAL OF SELECTOR LEVER / 27. BRACKET

(1) Disconnect the connector of indicator illumination light.



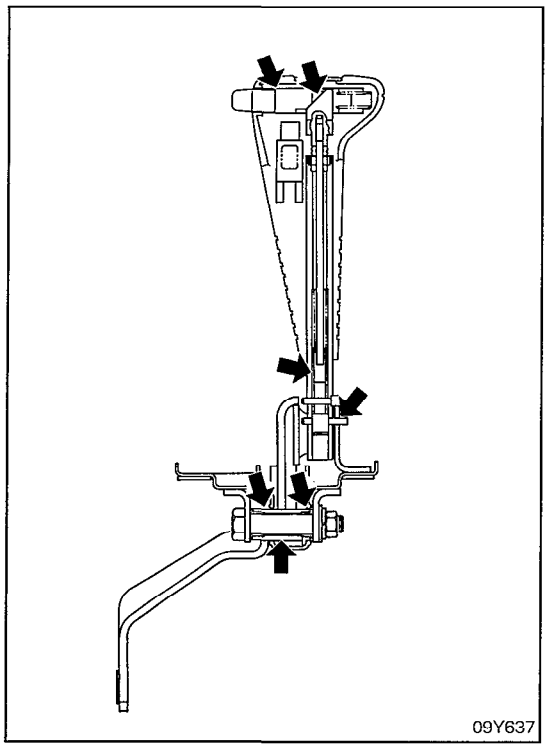
(2) Remove the selector lever and bracket.
(3) Remove the split pins in order to disconnect the lever from bracket.



INSPECTION

N21ICAD

- Check the detent plate for wear.
- Check the pin at the end of selector lever for wear.
- Check the contact surfaces of push button and adjusting cam for wear.
- With the O.D. switch turned on, check for continuity across the terminals.
- Check the O.D. switch harness for continuity.

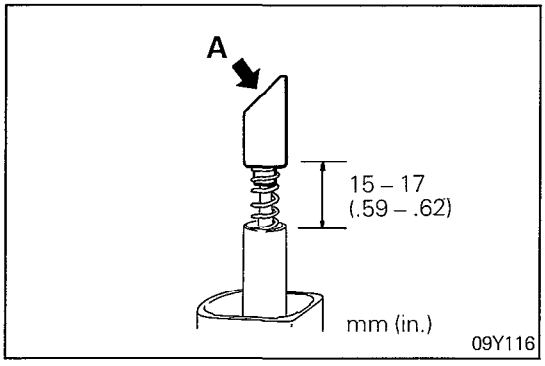


SERVICE POINT OF INSTALLATION N21IDAK

11. INSTALLATION OF SELECTOR LEVER

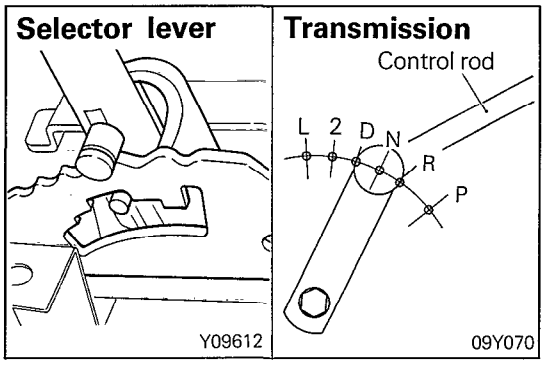
(1) Apply a thin coat of specified multipurpose grease to the sliding parts.

Specified grease: MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent



(2) Place the shift lever in the "N" position, and then turn the sleeve so that the clearance between the sleeve and the lever assembly end is within the specified range.

NOTE
Be sure to face A of the adjusting cam to the pushbutton (driver's side).



(3) Connect the control rod to the transmission side lever and the cross-shaft assembly lever. With the selector lever set to "N" position and the transmission side lever to its neutral position, connect and lock the lever to cross-shaft.

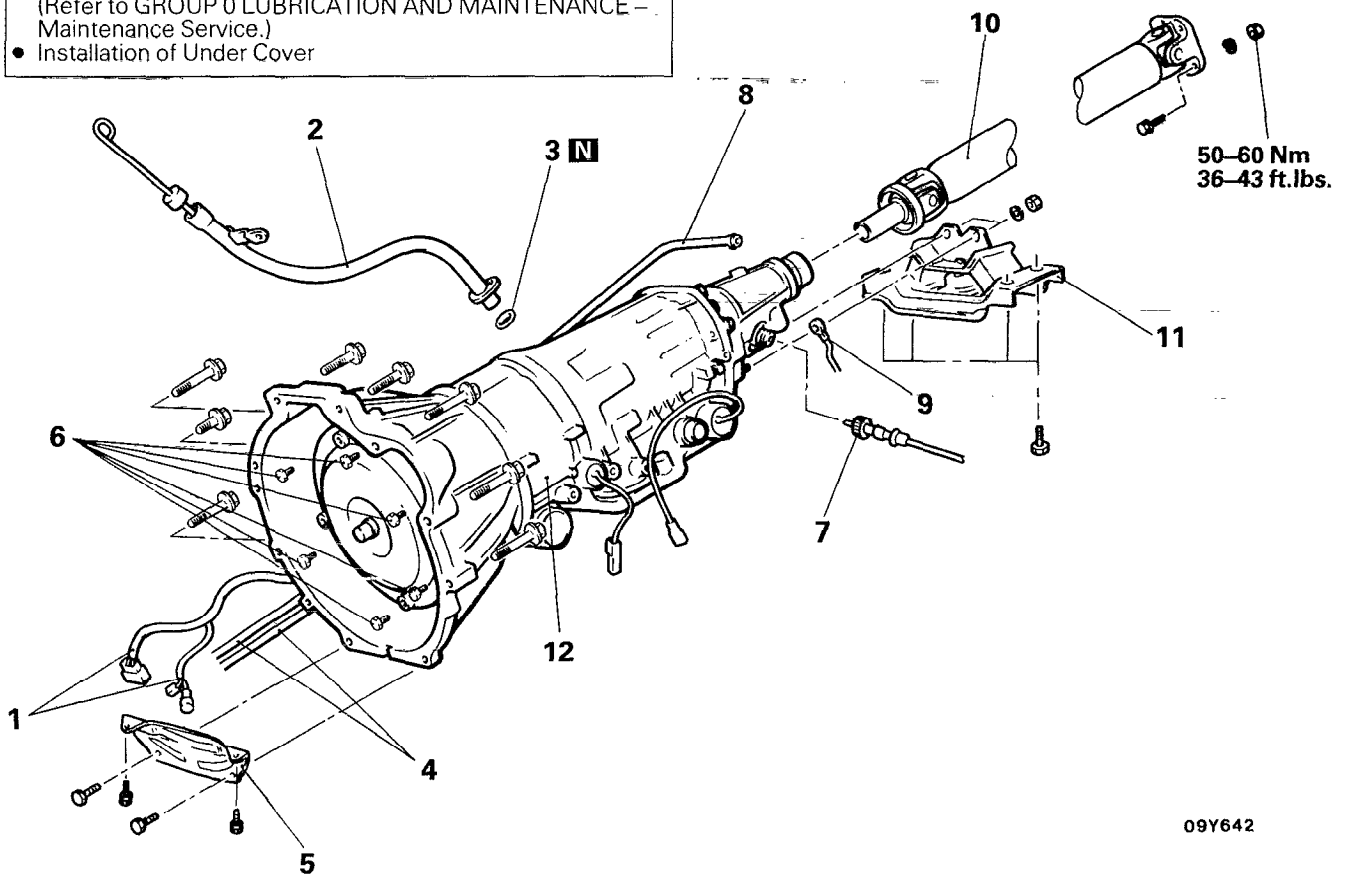
TRANSMISSION

N21LA··

REMOVAL AND INSTALLATION

Pre-removal Operation
- Removal of Under Cover
- Draining Transmission Fluid
  (Refer to GROUP 0 LUBRICATION AND MAINTENANCE – Maintenance Service.)

Post-installation Operation
- Refilling with Transmission Fluid
  (Refer to GROUP 0 LUBRICATION AND MAINTENANCE – Maintenance Service.)
- Installation of Under Cover

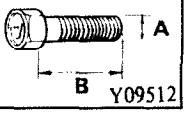


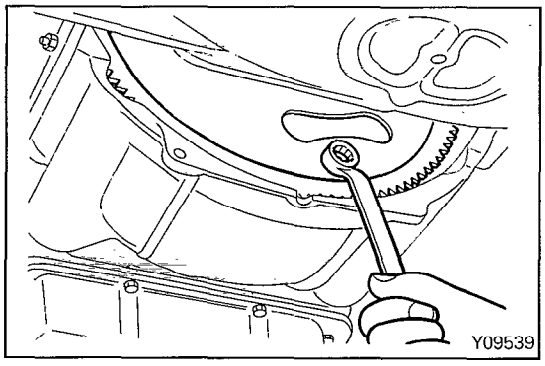
Removal steps

1. Transmission control harness
2. Filler tube
3. O-ring
4. Oil feed tube and oil return tube connection
5. Bell housing cover
◆◆ 6. Special bolts
7. Speedometer cable
8. Transmission control rod
9. Ground cable
◆◆ 10. Propeller shaft
◆◆ 11. Engine support rear bracket
◆◆ ◆◆ 12. Transmission assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts

	Nm	ft.lbs.	O.D. x Length mm (in.)	Bolt identification
A	43 – 55	31 – 40	⑦ 10 x 40 (1.6)	⑦ A x B
B	43 – 55	31 – 40	⑦ 10 x 65 (2.6)	
C	22 – 32	16 – 23	⑦ 10 x 60 (2.4)	
D	20 – 27	14 – 20	⑦ 8 x 55 (2.2)	





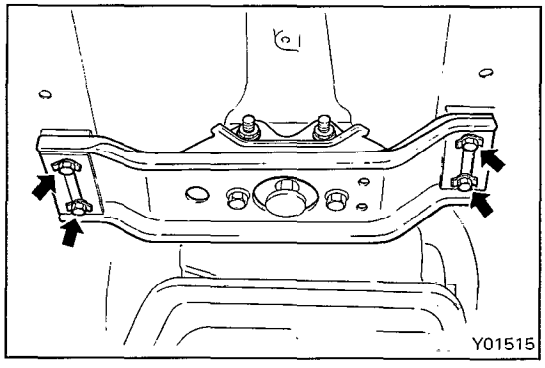
SERVICE POINTS OF REMOVAL N21LBAD

6. REMOVAL OF SPECIAL BOLTS

Remove six special bolts connecting the torque converter and drive plate.

10. REMOVAL OF PROPELLER SHAFT

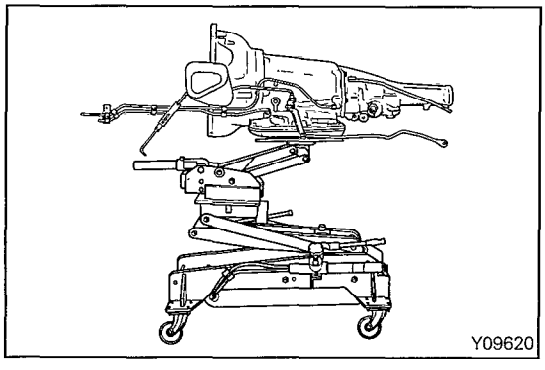
Refer to GROUP 16 PROPELLER SHAFT AND UNIVERSAL JOINT – Propeller Shaft.



11. REMOVAL OF ENGINE SUPPORT REAR BRACKET

Support the rear of the engine with jack or similar device. With the transmission assembly supported by using transmission jack, remove the engine support rear bracket.

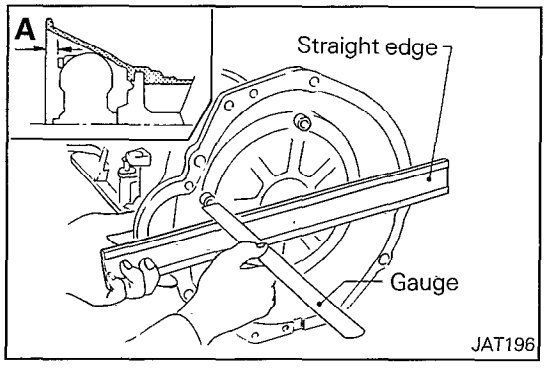
Caution
When the transmission assembly is supported on a service jack, the supporting area should be as wide as possible.



12. REMOVAL OF TRANSMISSION ASSEMBLY

Move the transmission rearward to separate it from engine.

Caution
The torque converter should not remain on engine when separated.



SERVICE POINT OF INSTALLATION N21LDAD

12. INSTALLATION OF TRANSMISSION ASSEMBLY

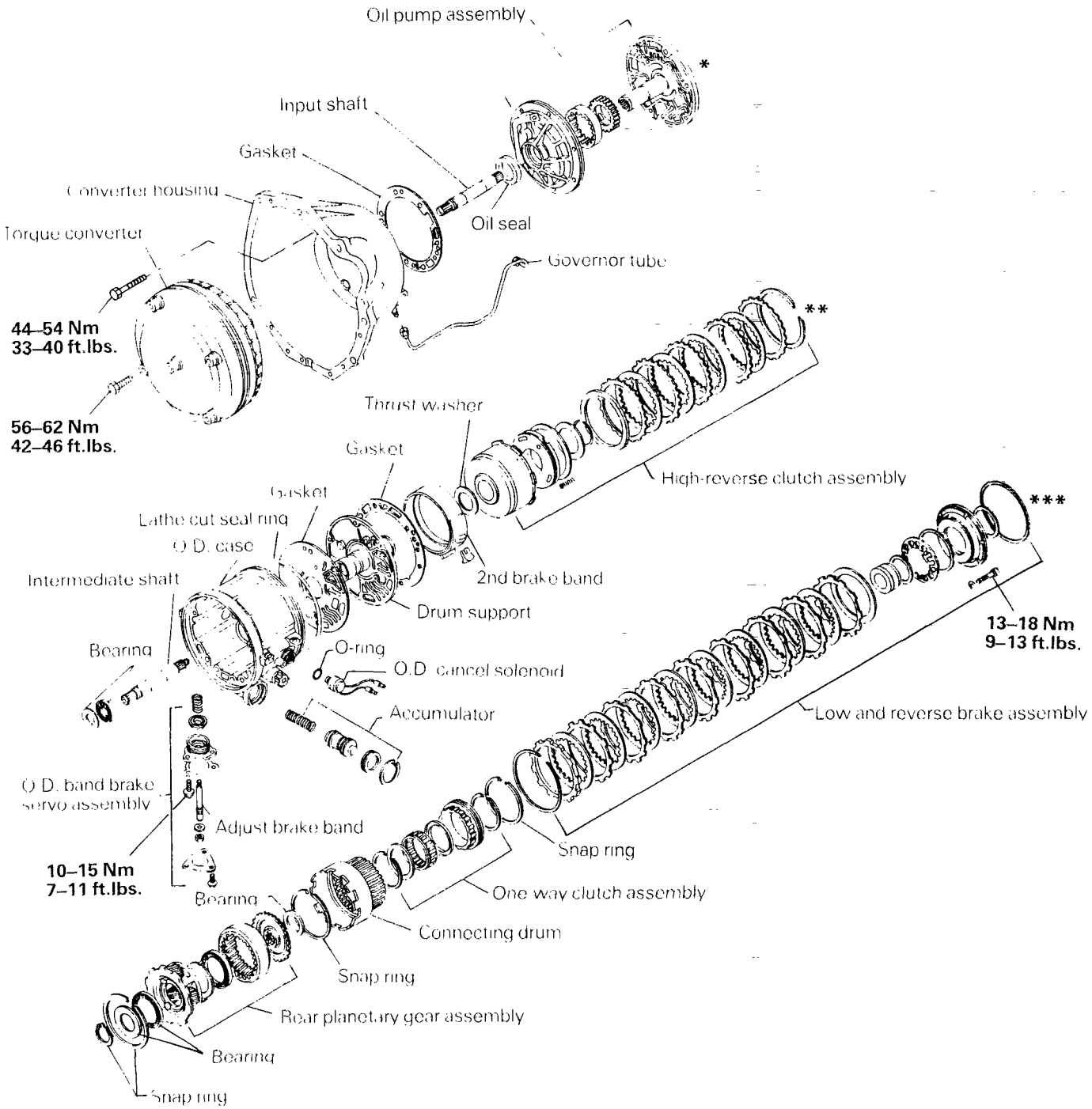
Install automatic transmission reversing the removal procedure and noting the following exception.
Before installing automatic transmission to vehicle, measure distance "A" to be certain that they are correctly assembled.

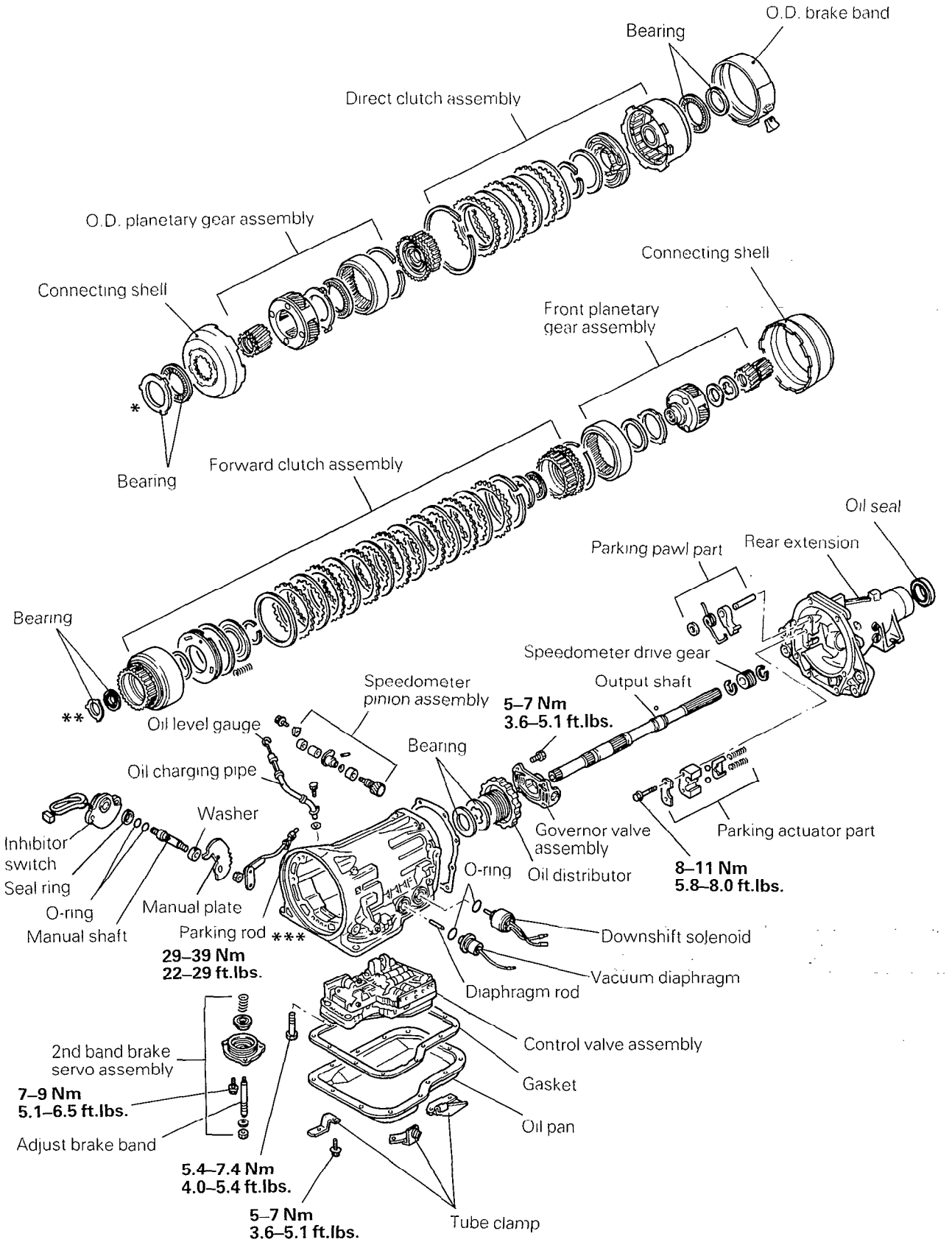
Distance "A": More than 26 mm (1.03 in.)

Refill automatic transmission with fluid and check fluid level.
Check inhibitor switch for operation. Starter motor should be brought into operation only when selector lever is in "P" and "N" positions (it should not be started when selector lever is in "D", "2", "L" and "R" positions). Back-up light should also light when selector lever is placed in "R" position.

AUTOMATIC TRANSMISSION ASSEMBLY

N21LE-




O.D. brake band
Bearing
Direct clutch assembly
O.D. planetary gear assembly
Connecting shell
Connecting shell
Front planetary gear assembly
*
Bearing
Forward clutch assembly
Oil seal
Parking pawl part
Rear extension
Bearing
Speedometer drive gear
Speedometer pinion assembly
5–7 Nm
3.6–5.1 ft.lbs.
Output shaft
**
Oil level gauge
Bearing
Oil charging pipe
Washer
Governor valve assembly
Parking actuator part
Inhibitor switch
Seal ring
O-ring
Manual shaft
Manual plate
Parking rod ***
29–39 Nm
22–29 ft.lbs.
O-ring
Oil distributor
8–11 Nm
5.8–8.0 ft.lbs.
Downshift solenoid
Vacuum diaphragm
Diaphragm rod
Control valve assembly
2nd band brake servo assembly
7–9 Nm
5.1–6.5 ft.lbs.
Adjust brake band
Gasket
Oil pan
5.4–7.4 Nm
4.0–5.4 ft.lbs.
5–7 Nm
3.6–5.1 ft.lbs.
Tube clamp

JAT0006

SERVICE NOTES

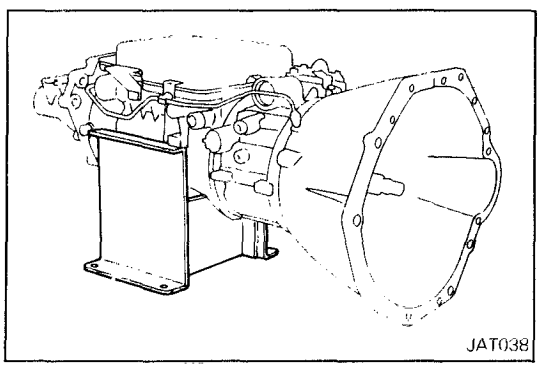
Before proceeding with disassembly, thoroughly clean the outside of the transmission. It is important to prevent contamination by dirt or other foreign matter.
Disassembly should be done in a clean work area.
Use a nylon cloth or paper towel for wiping parts clean. Common shop rags can leave lint that might interfere with the transmission's operation.
The transmission consists of many small parts that are quite alike in construction yet machined to very close tolerances. When disassembling parts, be sure to place them in order in part rack so they can be put back in the unit in their proper positions. All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly. Gaskets, seals, and similar parts should be replaced. It is also very important to perform functional tests whenever designated.

DISASSEMBLY

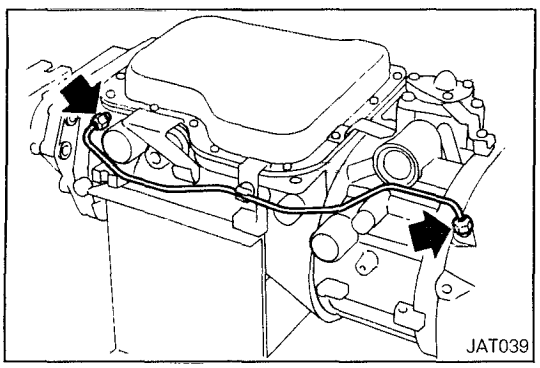
The steps below show disassembly of the following component parts down to sub-assembly configurations.

- Oil pump assembly
- Front clutch assembly
- Rear clutch assembly
- Direct clutch assembly
- Control valve assembly
- Governor valve assembly
- Planetary gear assembly

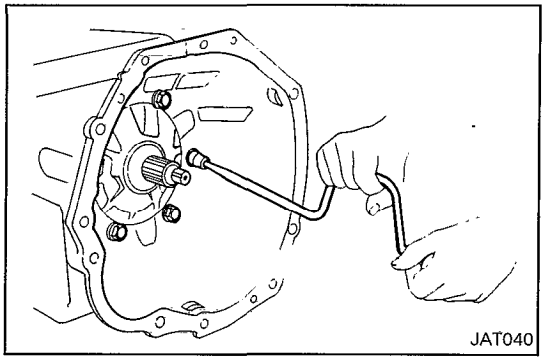
For repair procedures of each sub-assembly, refer to page 21-105 to 21-126.


JAT038

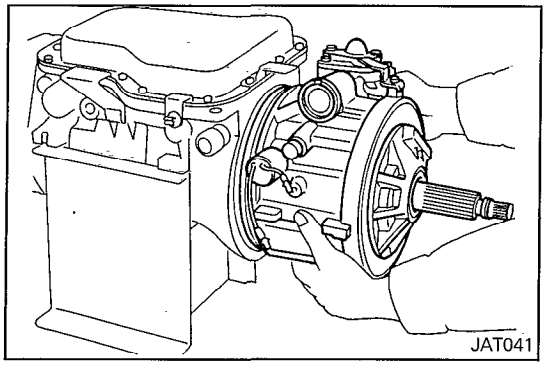
1. Remove torque converter and drain transmission fluid through end of rear extension.


JAT039

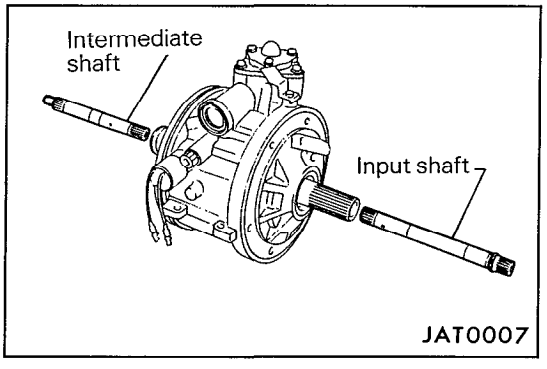
2. Remove governor tube.



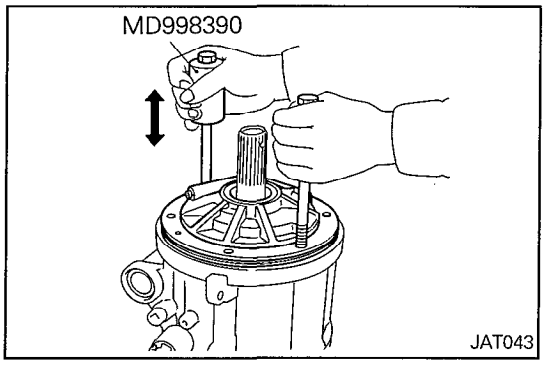
3. Remove converter housing.



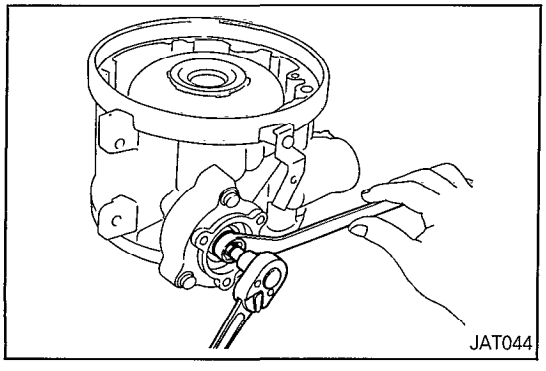
4. Remove O.D. component assembly, then remove high-reverse clutch (Front) thrust washer and needle bearing and race.



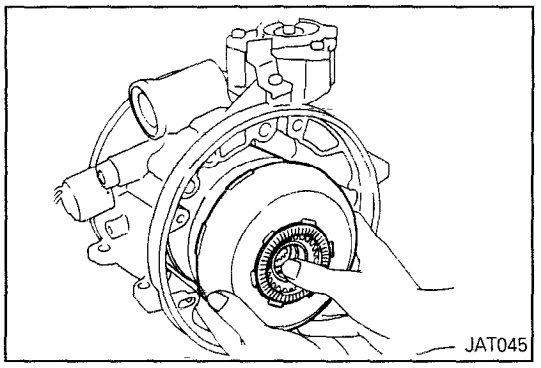
5. Remove input shaft and intermediate shaft.



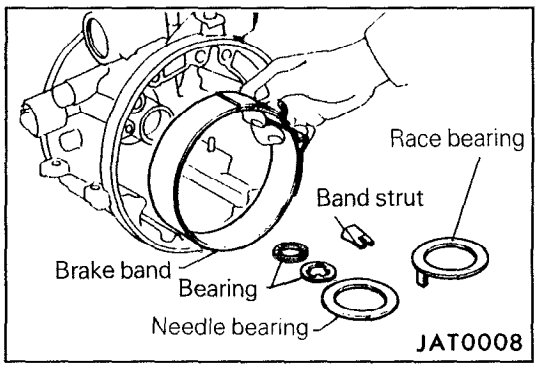
6. Attach the special tool to oil pump and remove oil pump from O.D. case.



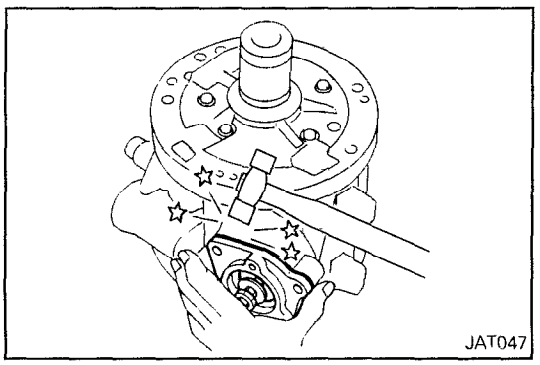
7. Remove O.D. servo cover, then loosen O.D. band servo piston stem.



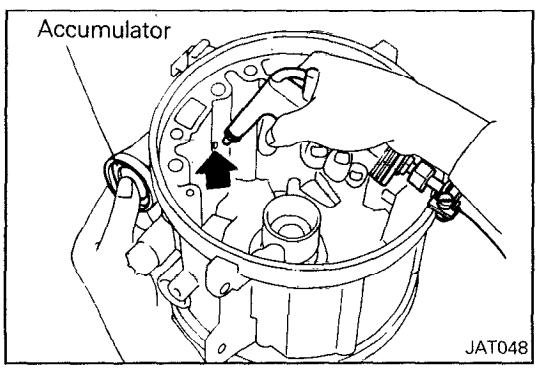
8. Remove O.D. pack (O.D. planetary gear and direct clutch assembly).



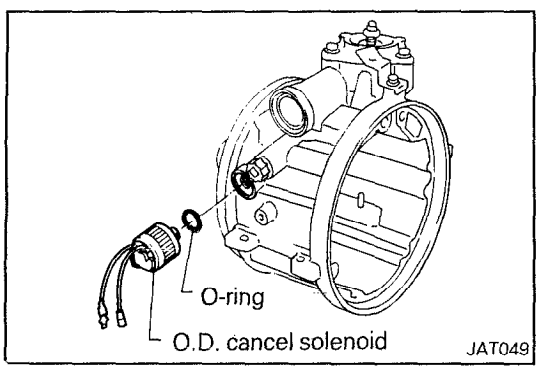
9. Remove needle bearing, race and direct clutch thrust washer, then remove O.D. brake band and strut.



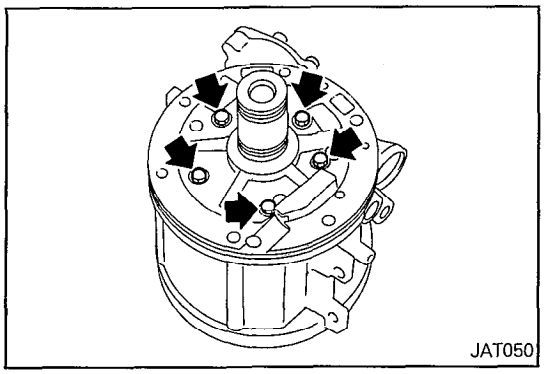
10. Remove O.D. servo assembly by lightly tapping retainer.



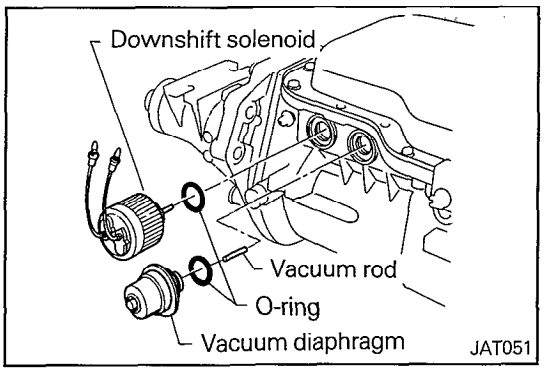
11. Remove accumulator snap ring, then apply pressure to remove accumulator plug, piston and spring.



12. Remove O.D. cancel solenoid and O-ring.

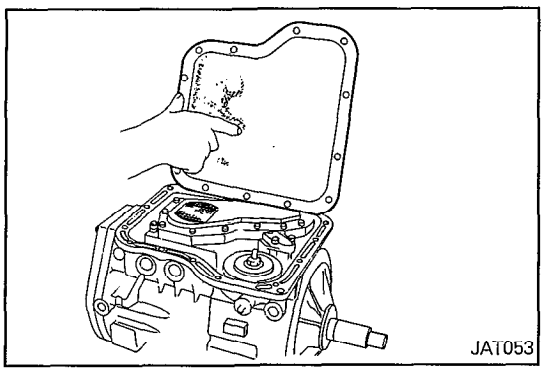

JAT050

13. Remove drum support from O.D. case.

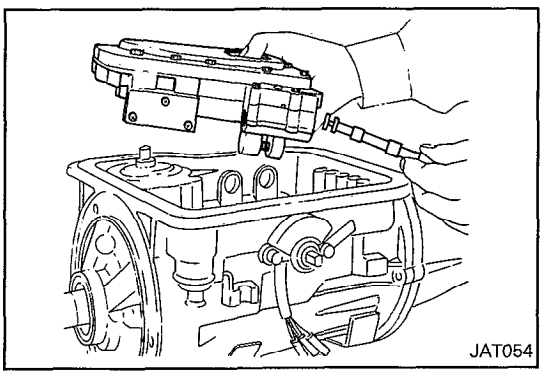


JAT051

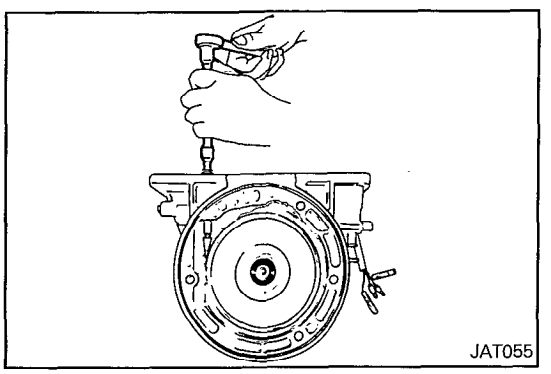
14. Remove downshift solenoid, vacuum diaphragm, rod and O-rings.
15. Remove speedometer pinion from rear extension.


JAT053

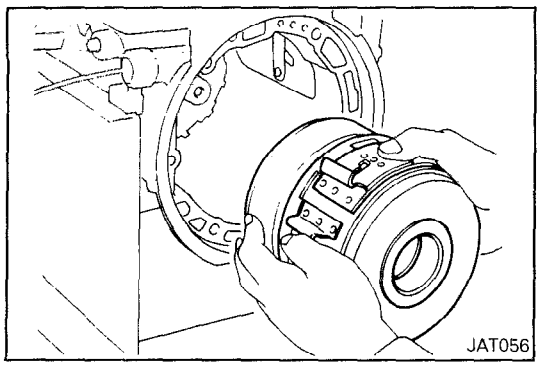
16. Remove oil pan and inspect its contents. An analysis of any foreign matter can indicate the types of problems to look for. If the fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up which can cause valves, servo and clutches to stick and may inhibit pump pressure.


JAT054

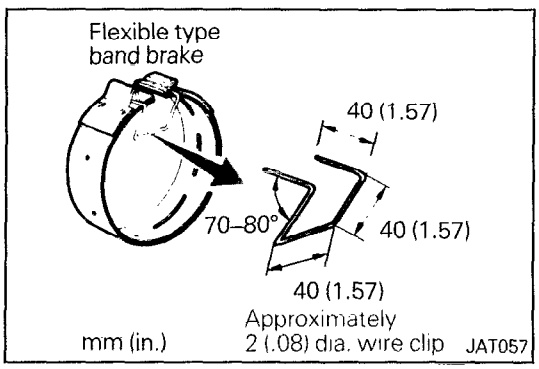
17. Remove control valve body.
Remove manual valve from valve body as a precaution, to prevent valve from dropping out accidentally.


JAT055

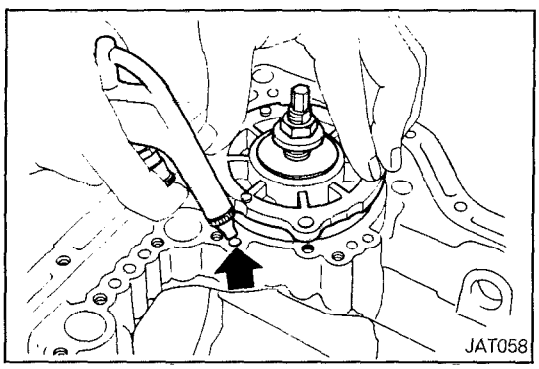
18. Loosen 2nd band servo piston stem lock nut and tighten piston stem. If it turns more than two turns, the band is worn out. Back off band servo piston stem to release band.


JAT056

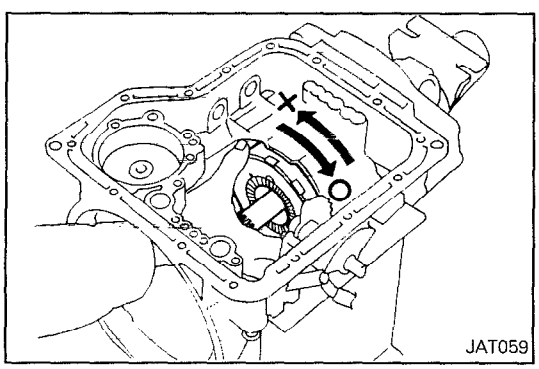
19. Remove brake band strut. Brake band and clutch and planetary gear pack [including high-reverse clutch (Front), forward clutch (Rear) and front planetary gear] may be removed together.



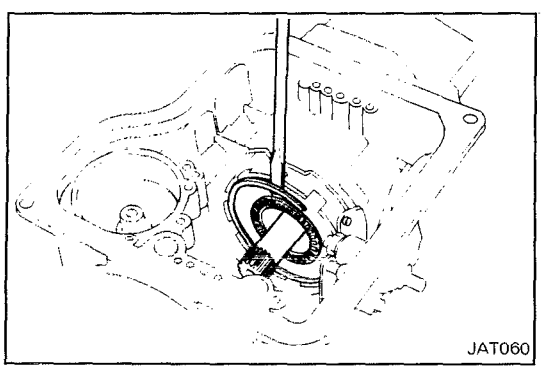
20. To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. Before removing the brake band, always secure it with a clip as shown in the illustration.
Leave the clip in position after removing the brake band.


JAT058

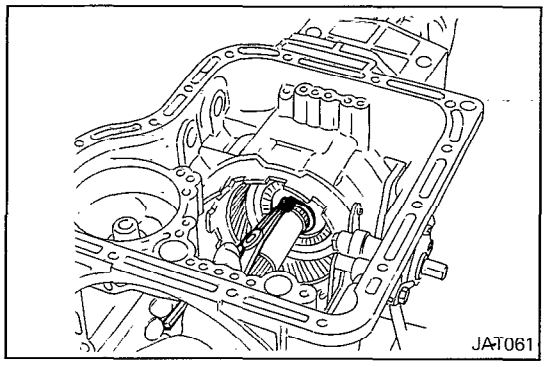
21. Remove 2nd band servo retaining bolts. Apply pressure to remove 2nd band servo.


JAT059

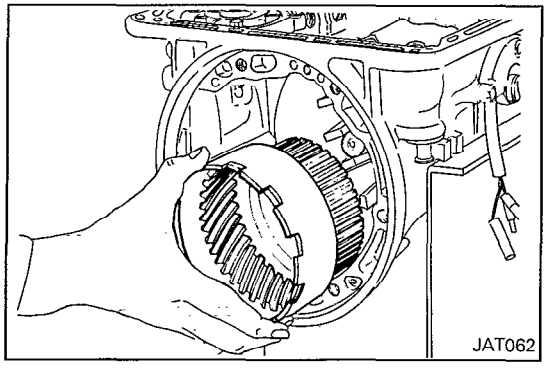
22. Check one-way clutch to see if it operates properly.


JAT060

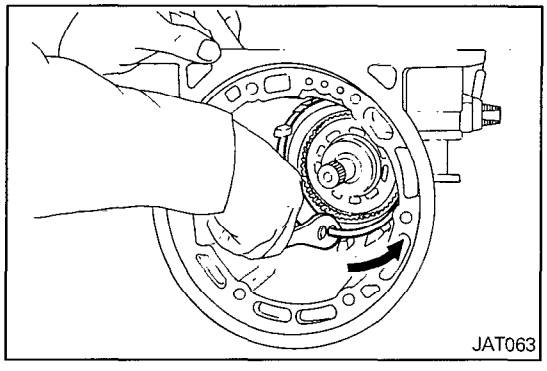
23. Remove rear planetary carrier snap ring and rear planetary carrier.



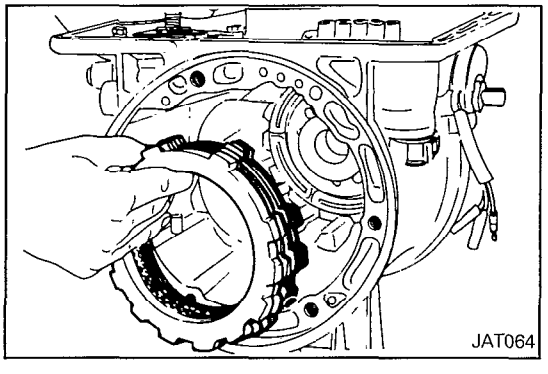
24. Remove output shaft snap ring.



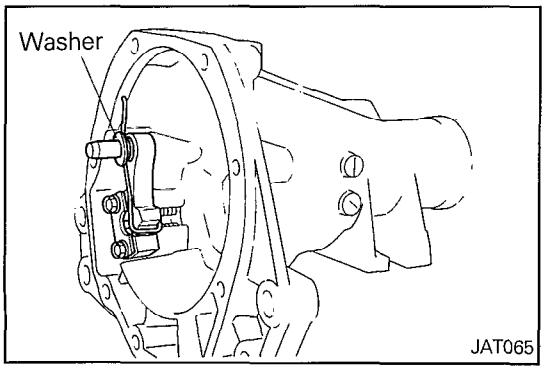
25. Remove connecting drum with internal gear.



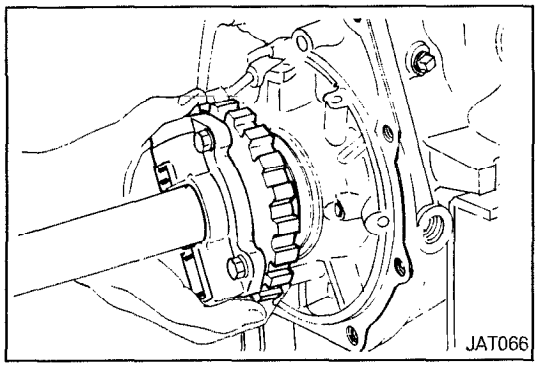
26. Pry off one end of snap ring with a screwdriver. Remove snap ring from low and reverse brake assembly while applying plier force in direction of arrow.



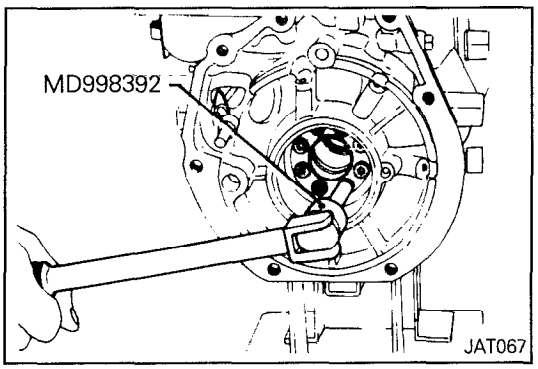
27. Remove low and reverse brake clutch assembly.



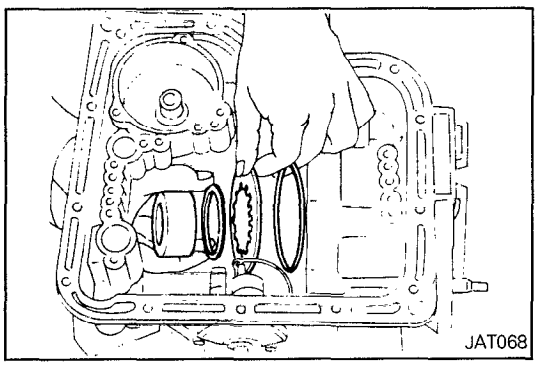
28. Remove rear extension.
    Be careful not to lose parking pawl, spring and retainer washer.



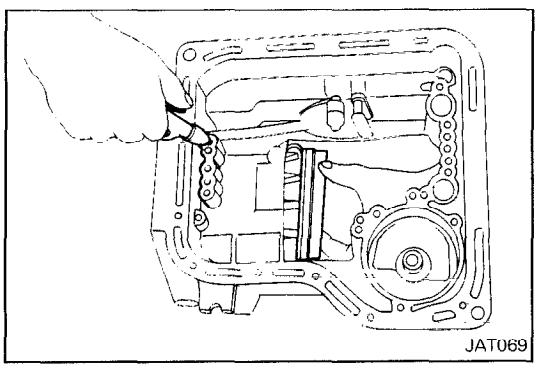
29. Remove output shaft with governor.
30. Remove governor thrust washer and needle bearing.



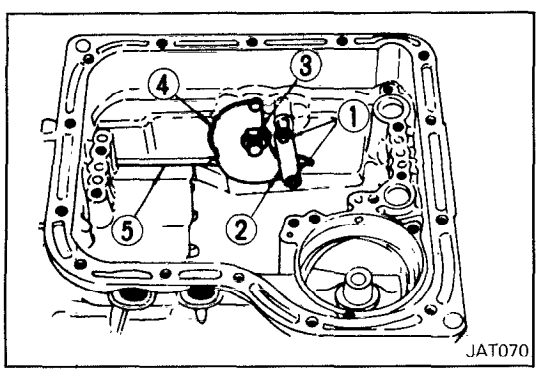
31. Remove one-way clutch inner race attaching hex-head slotted bolts using the special tool.



32. Remove one-way clutch inner race, return thrust washer, low and reverse return spring and spring thrust ring.



33. Using an air gun with a tapered rubber tip, carefully apply air pressure to remove low and reverse brake piston.

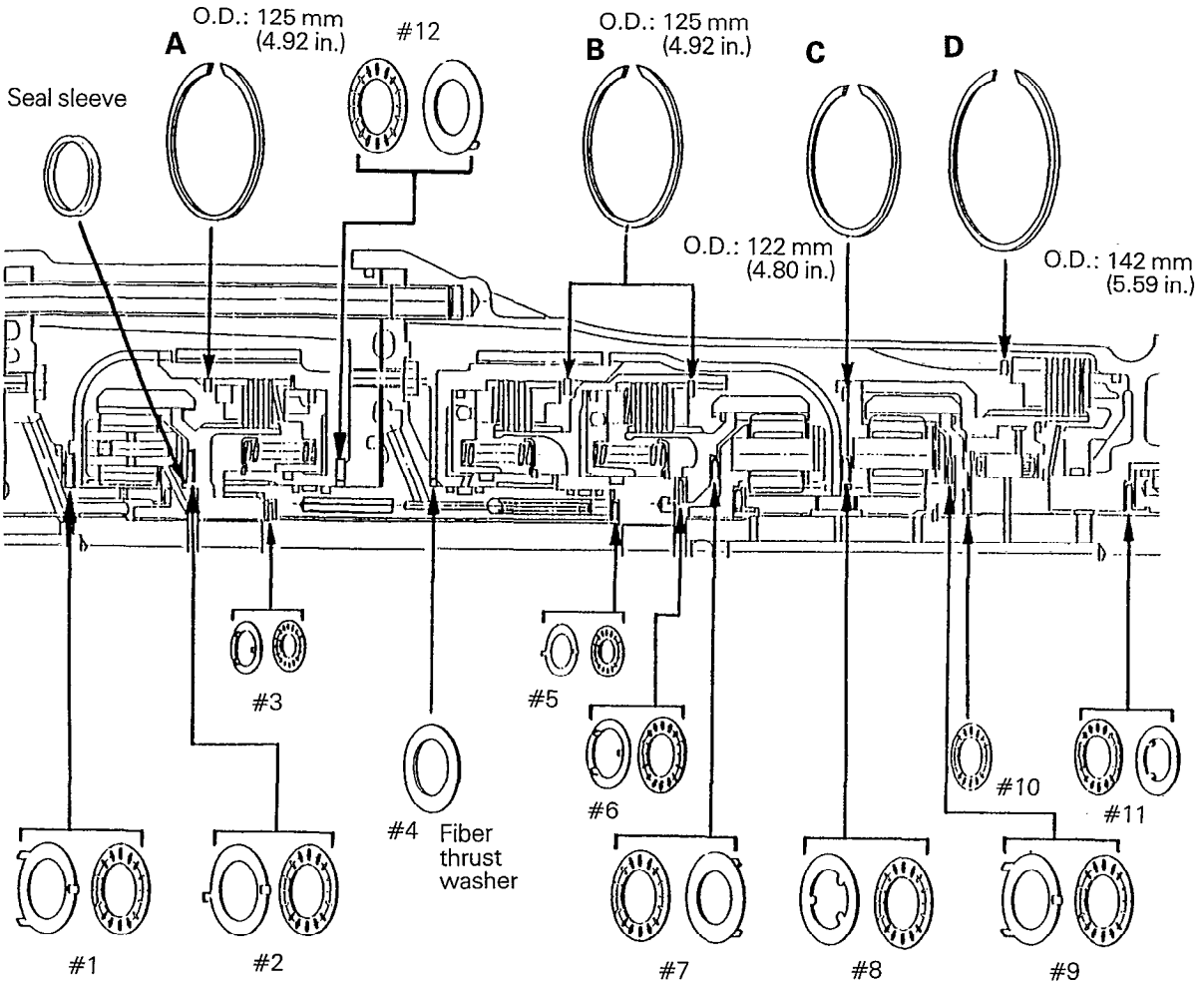


34. Pry off snap ring (1) from both ends of parking brake lever (2) and remove the lever. Back off manual shaft lock nut (3) and remove manual plate (4) and parking rod (5).
35. Remove inhibitor switch and manual shaft by loosening two retaining bolts.

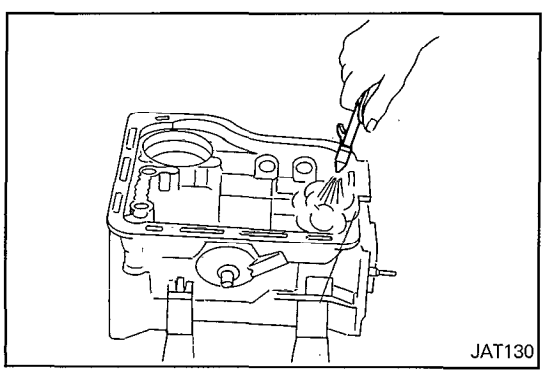
REASSEMBLY

N21LF--

When installing/assembling needle bearing, bearing race, snap ring and O-ring (seal ring), use the following illustration as a guide to installation procedures and locations.

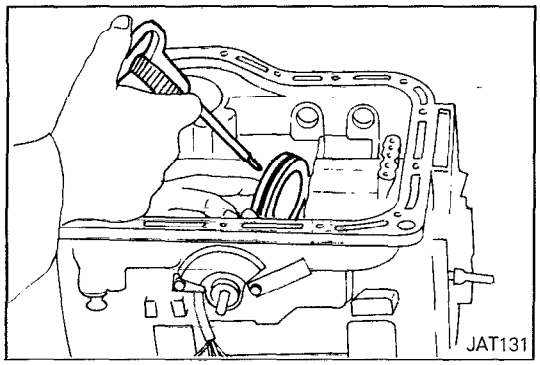


JAT0016

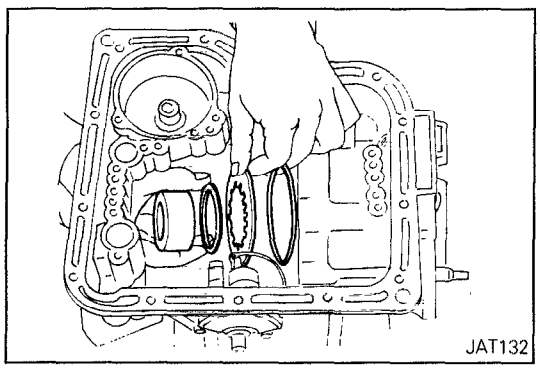


JAT130

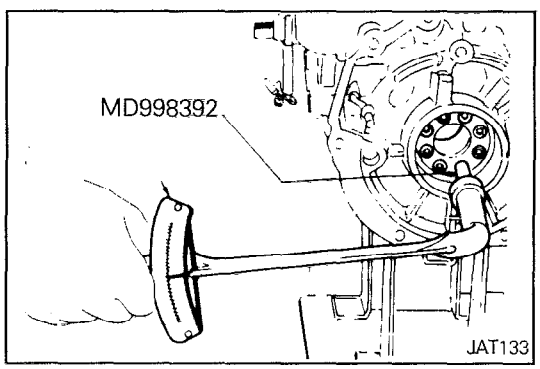
1. Before proceeding with the reassembly of all components, it is important to verify that the case, housing and parts are clean and free from dust, dirt and foreign matter (use air gun). Have a tray available with clean transmission fluid for lubricating parts.
   Petroleum jelly can be used to secure washers during installation. All new seals and rings should have been installed before beginning final assembly.



2. Lubricate and install low and reverse piston into the case.



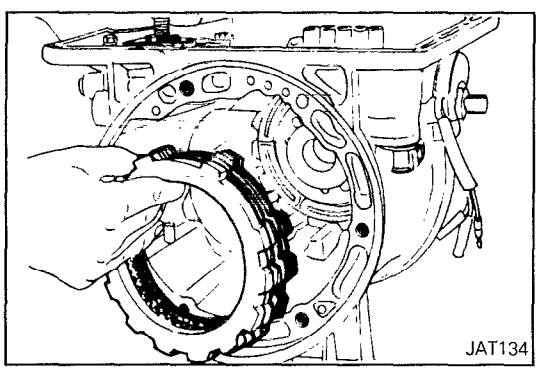
3. Install thrust ring, piston return spring, thrust washer and one-way clutch inner race.



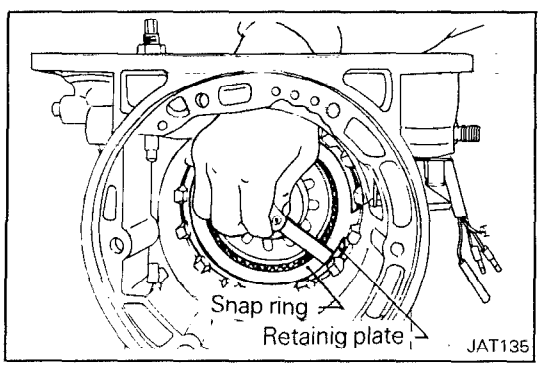
4. Tighten inner race attaching bolts to specified torque using the special tool.

Caution
Check that return spring is centered on race before tightening.

One-way clutch inner race tightening bolt:
13 – 18 Nm (9 – 13 ft.lbs.)

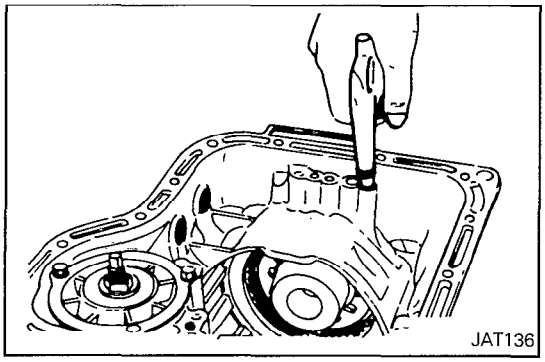


5. Install steel dished plate first, then steel and friction plates, and, finally, retaining plate and snap ring.

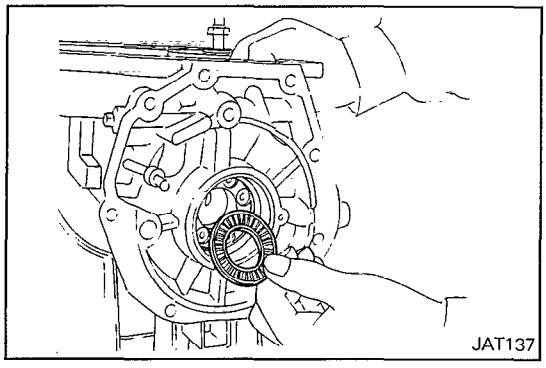


6. After low and reverse brake has been completely assembled, measure clearance between snap ring and retainer plate. If measurement exceeds specifications it can be adjusted by replacing retainer plate with one of a different thickness.

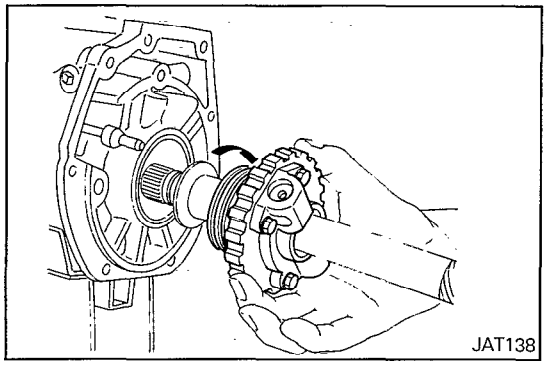
Standard value: 0.80 – 1.25 mm (.031 – .049 in.)


JAT136

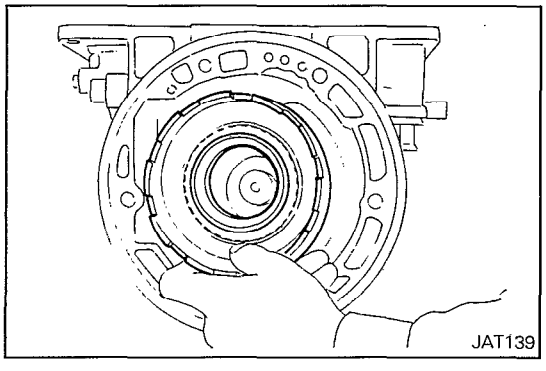
7. Using an air gun with a tapered rubber tip, check low and reverse brake operation.


JAT137

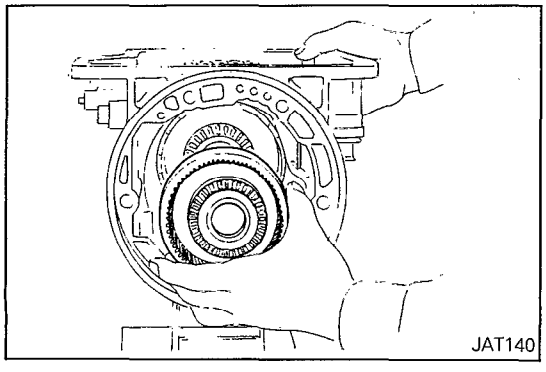
8. Install governor thrust washer and needle bearing.


JAT138

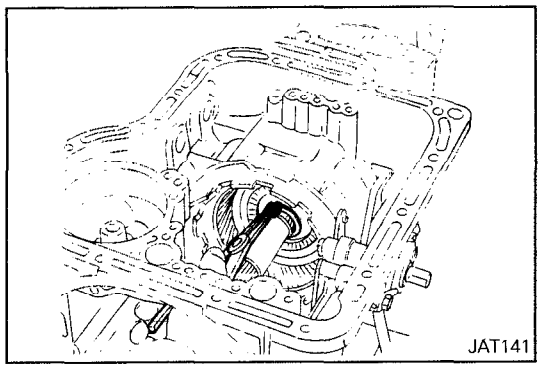
9. Slide governor distributor assembly on output shaft from front of shaft. Install shaft and governor distributor into case, using care not to damage distributor rings.


JAT139

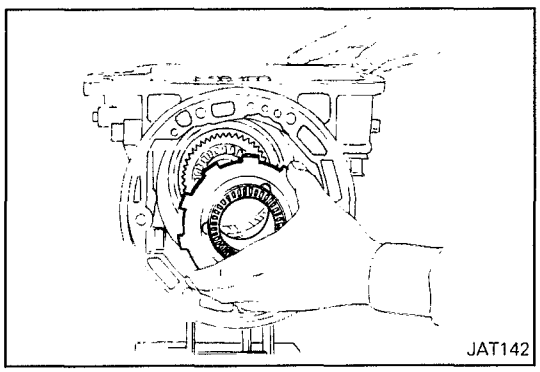
10. Install connecting drum with sprag by rotating drum clockwise using a slight pressure and wobbling to align plates with hub and sprag assembly. Connecting drum should now be free to rotate clockwise only. This check will verify that sprag is correctly installed and operative.


JAT140

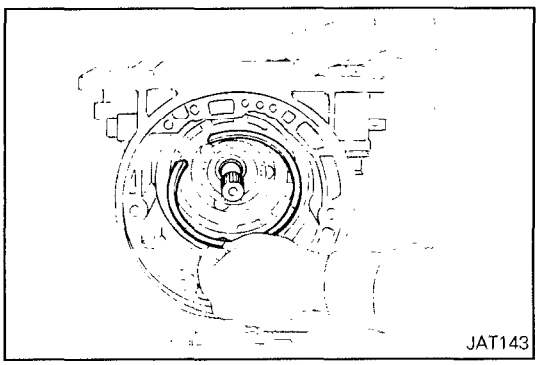
11. Install rear internal gear.


JAT141

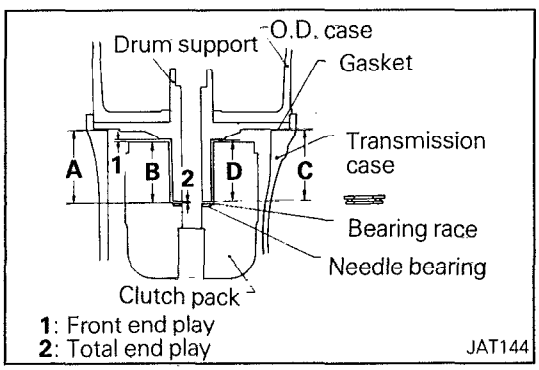
12. Install snap ring on shaft.


JAT142

13. Secure thrust bearing and thrust washer with petroleum jelly and install rear planetary carrier.

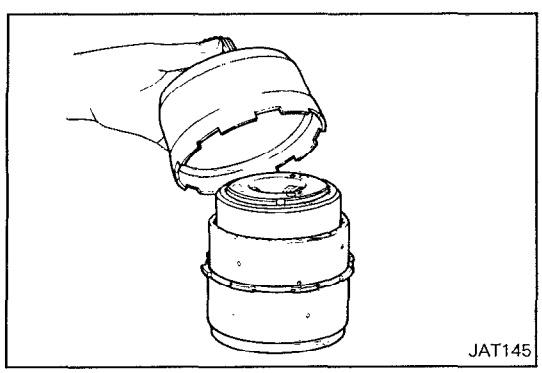

JAT143

14. Install rear planetary carrier snap ring.
This snap ring is thinner than a clutch drum snap ring so be sure you are using correct size. If you have insufficient space to install snap ring into drum groove, pull connecting drum forward as far as possible. This will give you sufficient groove clearance to install drum snap ring.

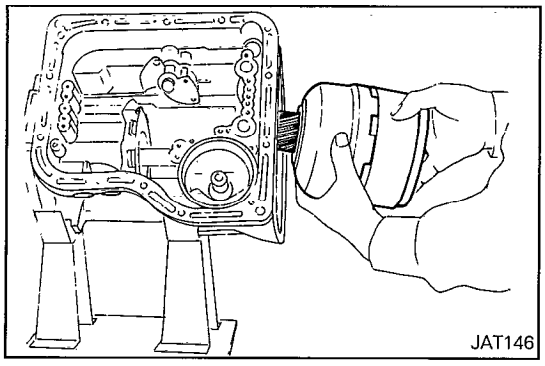


JAT144

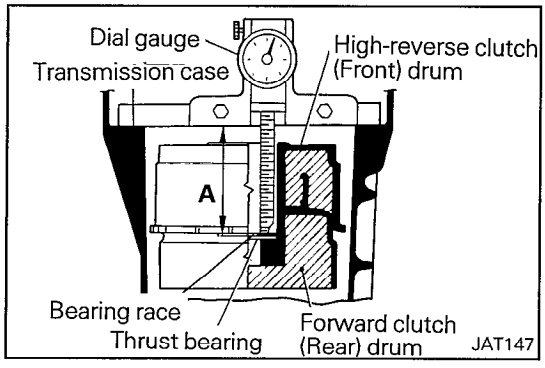
15. Adjust front end play as follows:


JAT145

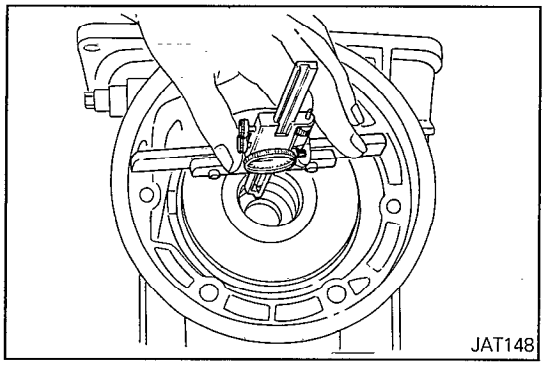
(1) Assemble high-reverse clutch (Front) and forward clutch (Rear), front internal gear, front planetary carrier and connecting shell. Secure thrust bearings with petroleum jelly.

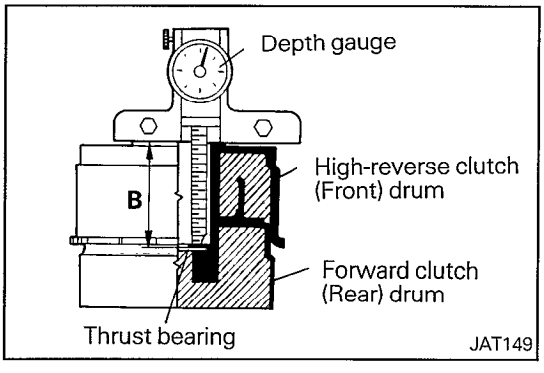


(2) Install assembly into transmission case. Check that parts are properly seated before proceeding with measurements.

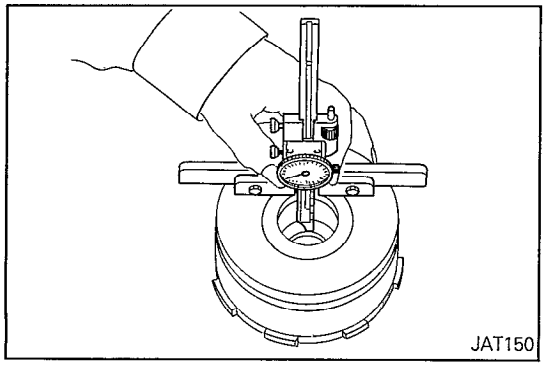


(3) Using a dial gauge or caliper with a seven inch base, measure from rear hub thrust bearing race to case (dimension A).

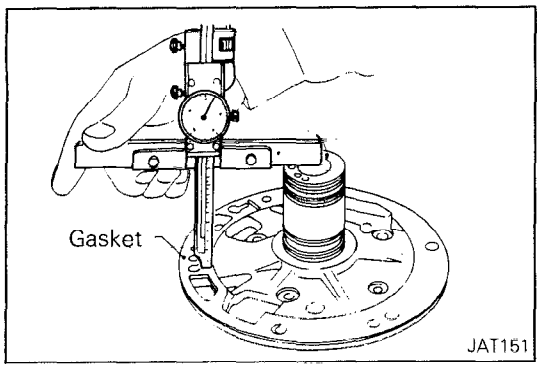




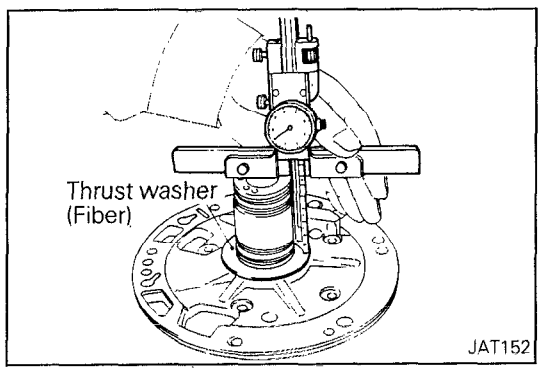
(4) Assemble high-reverse clutch (Front) and forward clutch (Rear) drum assemblies together and lay them flat on bench. Be sure rear hub thrust bearing is properly seated.



Measure from face of clutch drum to top of thrust bearing race (dimension B).



(5) Measure from top of drum support shaft (front clutch and rear clutch side) to installed gasket (dimension C).



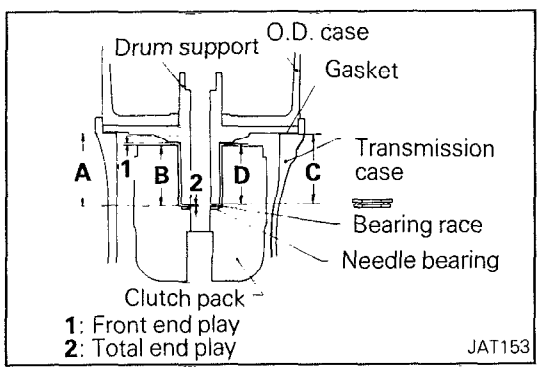
(6) Install thrust washer. Measure from top of drum support shaft (front clutch and rear clutch side) to thrust washer (dimension D).
(7) Difference between dimension [A – 0.1 mm (.004 in.) – B] and (C – D) is front end play and must be within standard value.

Standard value: 0.5 – 0.8 mm (.020 – .031 in.)

Front end play can be adjusted with high-reverse clutch (Front) thrust washers of different thickness.

Available High-Reverse Clutch (Front) Thrust Washer

Thickness mm (in.)	Part number
1.3 (.051)	MD610212
1.5 (.059)	MD610213
1.7 (.067)	MD610214
1.9 (.075)	MD610215
2.1 (.083)	MD610216
2.3 (.091)	MD610217
2.5 (.098)	MD610218
2.7 (.106)	MD610219



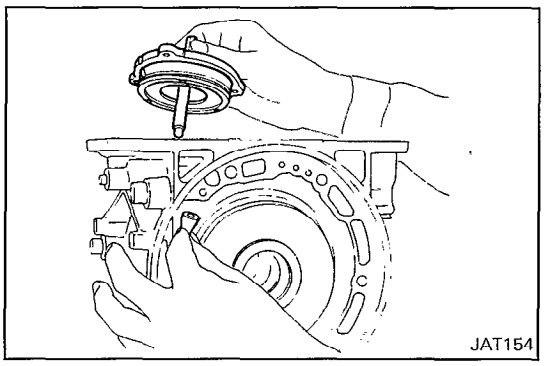
16. Adjust total end play as follows:
This adjustment is seldom required because this type of thrust bearing and race will normally show very little wear. We also have a standard tolerance of 0.25 to 0.50 mm (.0098 to .0197 in.). However, we are presenting correct checking procedure.
(1) Measure dimension A using instructions in steps (1), (2) and (3) under para. 15 above.
(2) Measure dimension C using instructions in step (5) under para. 15 above.
(3) Difference between dimension [A – 0.1 mm (.004 in.)] and C is total end play and it must be within standard value.

Standard value: 0.25 – 0.50 mm (.010 – .020 in.)

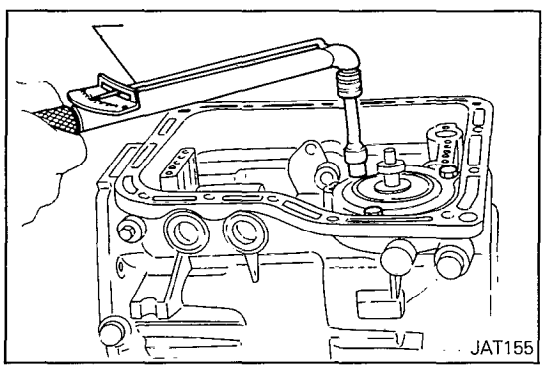
If difference between [A – 0.2 mm (.008 in.)] and C is not within tolerance, select proper size oil pump cover bearing race.

Available Oil Pump Cover Bearing Race

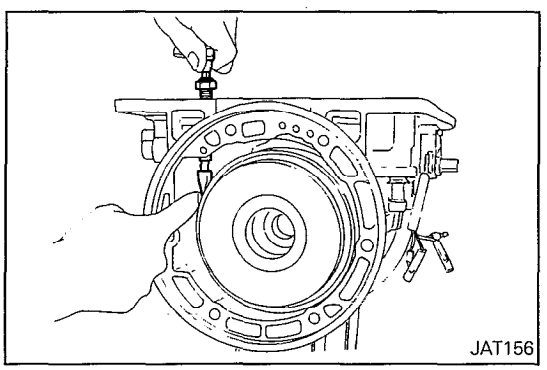
Thickness mm (in.)	Part number
1.2 (.047)	MD610221
1.4 (.055)	MD610222
1.6 (.063)	MD610223
1.8 (.071)	MD610224
2.0 (.079)	MD610225
2.2 (.087)	MD610226


JAT154

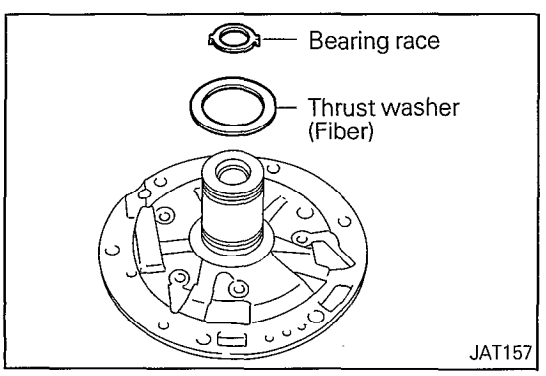
17. Install brake band, band strut and band servo. Lubricate servo O-rings before installing. Care should be taken to avoid damaging O-rings when reassembling.


JAT155

18. Install and torque the retainer bolts. Loosen piston stem.
Servo piston retainer bolt: 7 – 9 Nm (5 – 6 ft.lbs.)

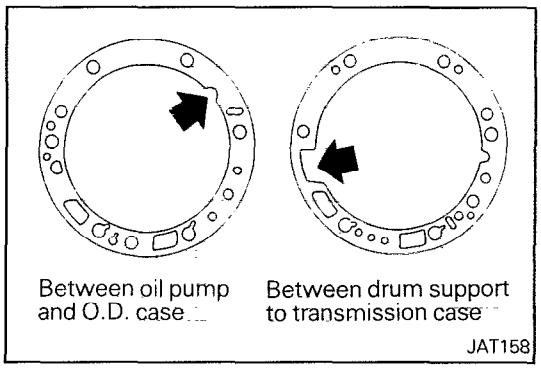

JAT156

19. Finger tighten brake band servo piston stem enough to prevent brake band and strut from falling out. Do not adjust brake band at this time.

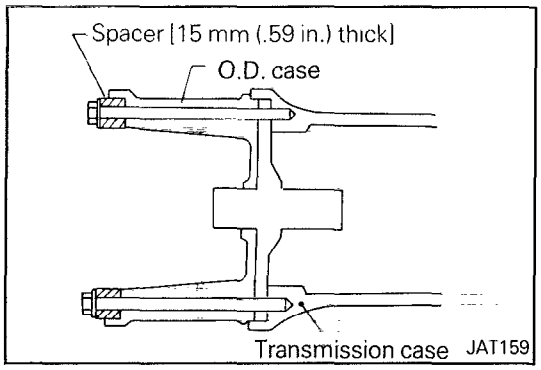


JAT157

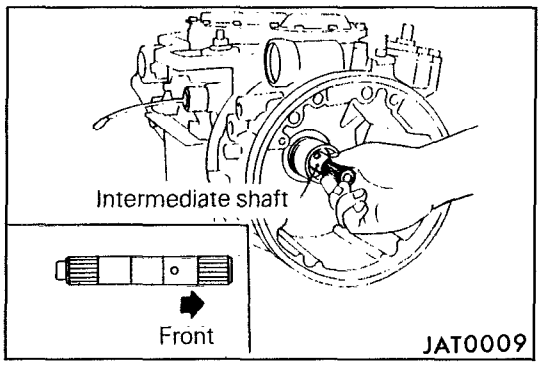
20. Apply petroleum jelly to bearing race and thrust washer, then mount them on drum support.



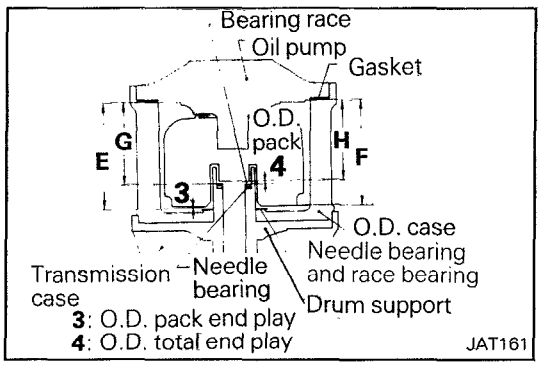
21. Mount drum support gasket on drum support after coating with petroleum jelly. Apply automatic transmission fluid to O-ring of drum support. Align drum support with O.D. case to transmission case and install.



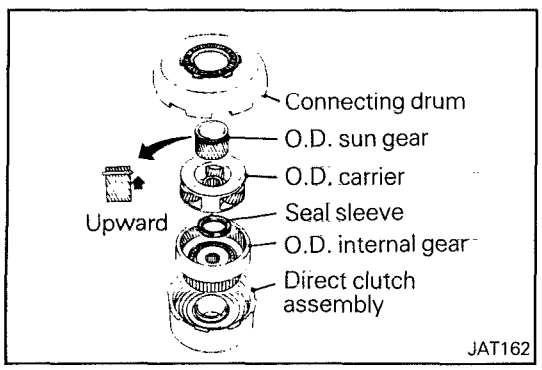
Before installing drum support and O.D. case on transmission case, ensure that they have been centered properly. Refer to Compornent Service Drum Support on page 21-107.
Install O.D. case and temporarily tighten it using two converter housing securing bolts.



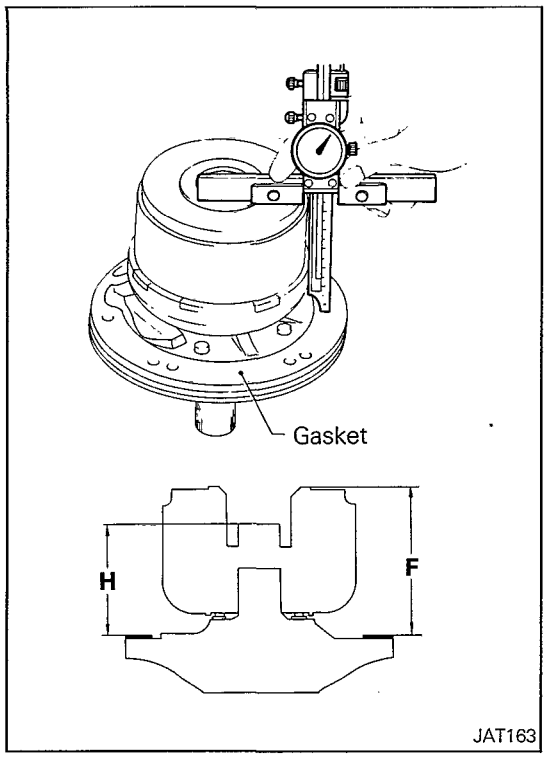
22. Insert intermediate shaft being especially careful of its direction.



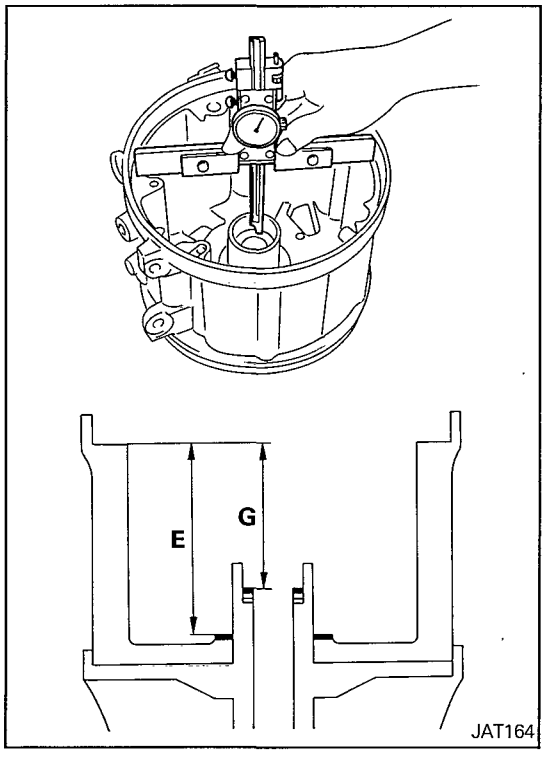
23. Adjust O.D. pack end play and O.D. total end play as follows:



(1) Assemble direct clutch assembly, O.D. planetary gear set and connecting drum, and install them on O.D. pack.



(2) Install oil pump bearing, gasket and O.D. pack on oil pump, and measure dimensions F and H.



(3) Attach thrust washer and needle bearing to drum support and O.D. case, and measure dimensions E and G.

(4) Difference between dimension [E – 0.1 mm (.004 in.)] and F is O.D. pack end play and must be within the standard value.

Standard value: 0.5 – 0.8 mm (.020 – .031 in.)

O.D. pack end play can be adjusted with O.D. thrust washers of different thicknesses (these parts are the same as the front clutch thrust washers).

Available O.D. Race Bearing

Thickness mm (in.)	Part number
0.8 (.031)	MD610284
1.0 (.039)	MD610285
1.2 (.047)	MD610286
1.4 (.055)	MD610287
1.6 (.063)	MD610288
1.8 (.071)	MD610289
2.0 (.079)	MD610290
2.2 (.087)	MD610291

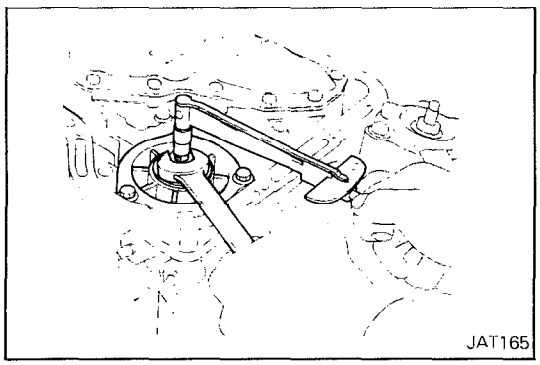
(5) Difference between dimension [G – 0.1 mm (.004 in.)] and H is O.D. total end play and it must be within the standard value.

Standard value: 0.25 – 0.50 mm (.010 – .020 in.)

If difference between [G – 0.1 mm (.004 in.)] and H is not within the tolerance, select proper size O.D. bearing race.

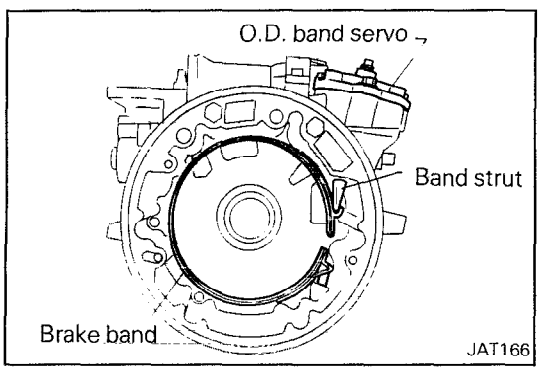
Available O.D. Bearing Races

Thickness mm (in.)	Part number
1.2 (.047)	MD610415
1.4 (.055)	MD610416
1.6 (.063)	MD610417
1.8 (.071)	MD610418
2.0 (.079)	MD610419
2.2 (.087)	MD610420

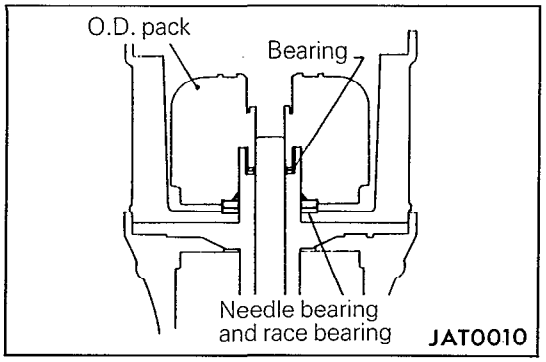

JAT165

24. Adjust band. Make sure that brake band strut is correctly installed. Torque piston stem to specified value. Back off two full turns and secure with lock nut.

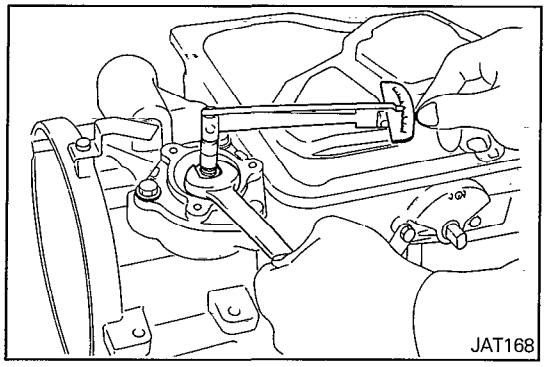
Piston stem: 12 – 15 Nm (9 – 11 ft.lbs.)
Piston stem lock nut: 15 – 39 Nm (11 – 29 ft.lbs.)



25. Lubricate O.D. servo O-rings with automatic transmission fluid, then install brake band, band strut and O.D. band servo.

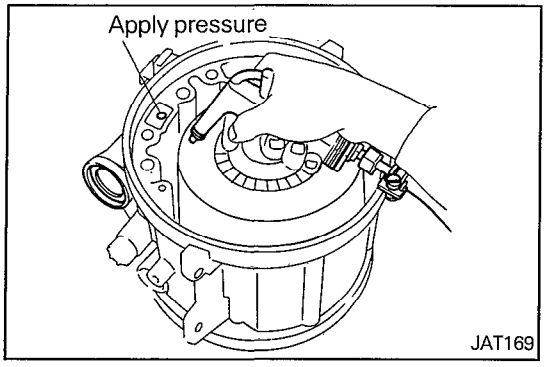


26. Apply automatic transmission fluid to seal ring of direct clutch, then install O.D. bearing and race, O.D. thrust washer and O.D. pack on drum support. Make sure that brake band strut is correctly installed.
27. Apply automatic transmission fluid to O-ring of oil pump, then install needle bearing, race and oil pump.
Before installing oil pump housing and oil pump on O.D. case, ensure that they have been centered properly. Refer to Oil Pump in Component parts.

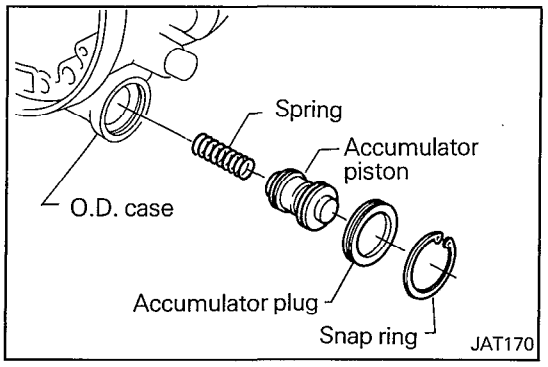


28. Adjust O.D. band. Adjust torque piston stem to the specified value. Back off two full turns and secure with lock nut.

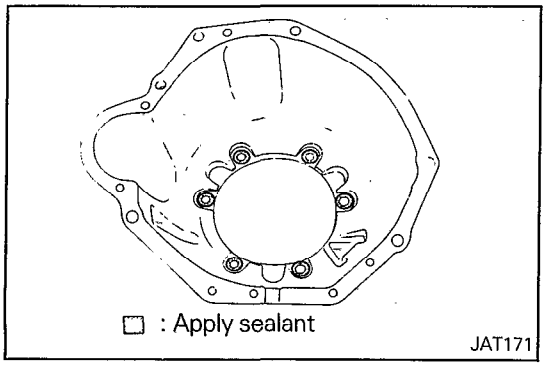
Piston stem: 12 – 15 Nm (9 – 11 ft.lbs.)
Piston stem lock nut: 15 – 39 Nm (11 – 29 ft.lbs.)



29. Using an air gun with a tapered rubber tip, test O.D. band servo operation.

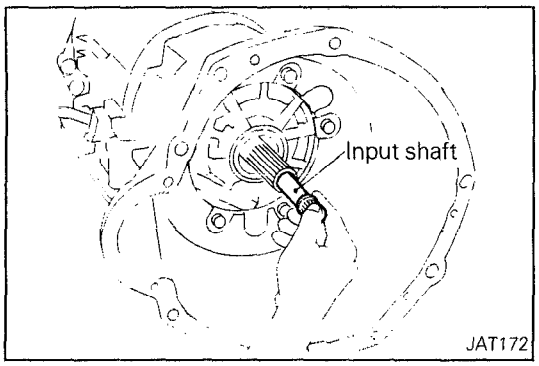


30. Install accumulator parts, then secure with snap ring.

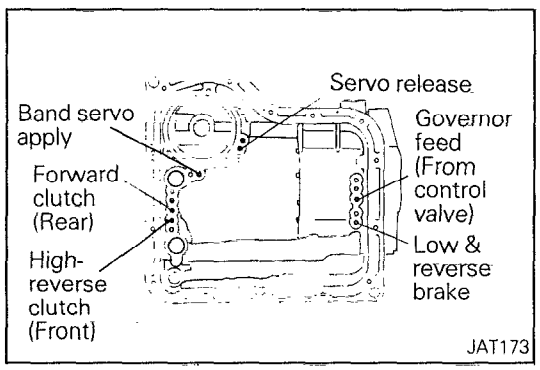


31. Remove the two bolts used to temporarily tighten O.D. case. Apply sealant to seating surfaces of converter housing at bolt locations. Install converter housing on O.D. case and tighten converter housing securing bolts.

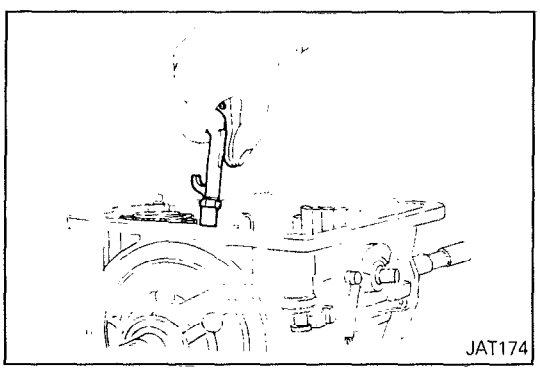
Converter housing bolt: 44 – 54 Nm (33 – 40 ft.lbs.)



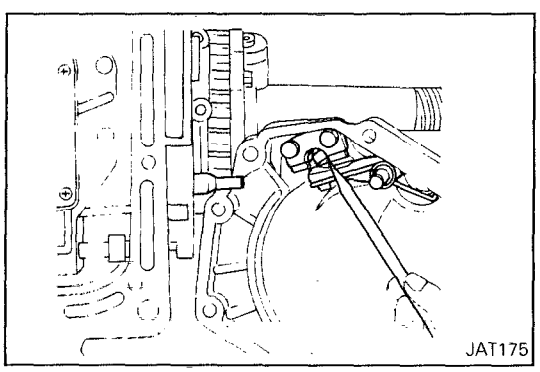
32. Install input shaft.
33. Before proceeding with installation of valve body assembly, perform a final air check of all assembled components. This will ensure that you have not overlocked tightening of any bolts or damaged any seals during assembly.



Air check point

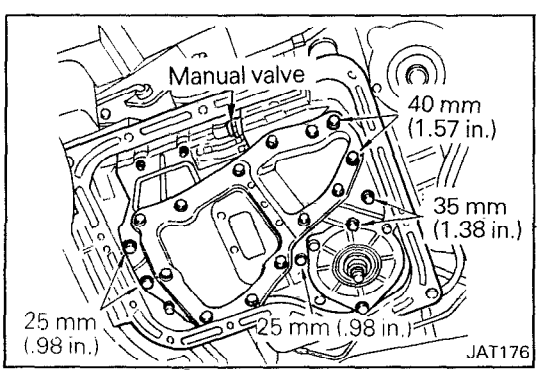


34. Using an air gun with a tapered rubber tip, perform air checks.



35. Check that parking pawl, pin, spring and washer are assembled correctly.
36. Install rear extension.

Rear extension bolt: 20 – 25 Nm (14 – 18 ft.lbs.)

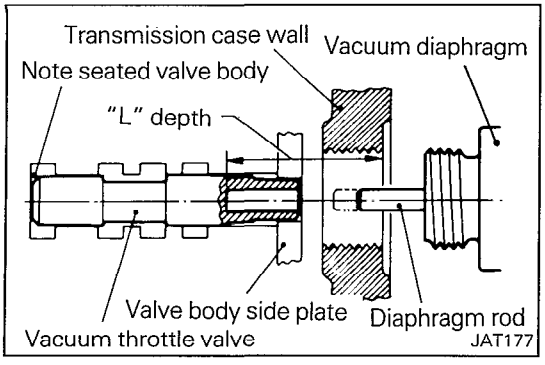


37. Install control valve body. Be sure manual valve is in alignment with selector pin. Tighten control valve body attaching bolts.

NOTE
Attaching bolts come in three different lengths.

Control valve body attaching bolt:
5.4 – 7.4 Nm (4.0 – 5.4 ft.lbs.)

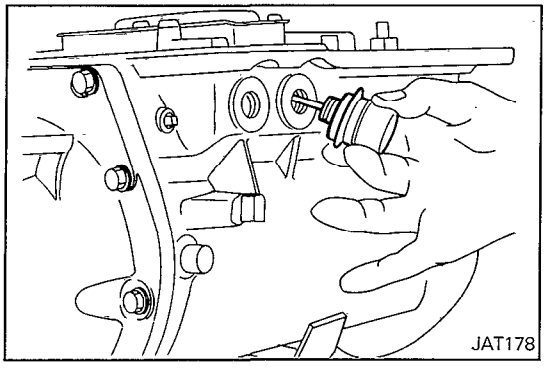
After installing control valve body to transmission case, make sure that manual lever can be moved to all positions.



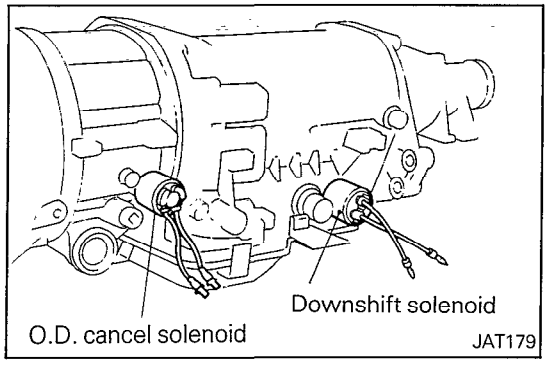
38. Before installing vacuum diaphragm valve, measure depth of hole in which it is inserted. This measurement determines correct rod length to ensure proper performance.

Vacuum Diaphragm Rod Selection

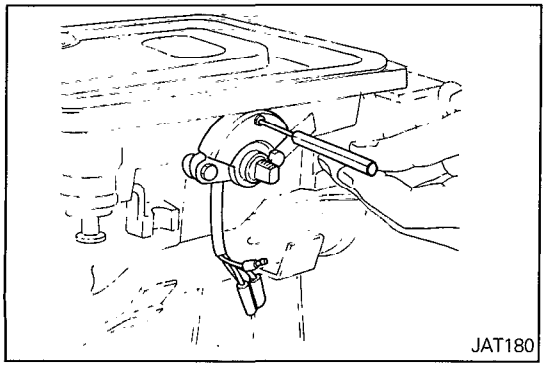
Measured depth "L" mm (in.)	Rod length mm (in.)	Part number
Under 25.55 (1.0059)	29.0 (1.142)	MD610614
25.65 – 26.05 (1.0098 – 1.0256)	29.5 (1.161)	MD610615
26.15 – 26.55 (1.0295 – 1.0453)	30.0 (1.181)	MD610616
26.65 – 27.05 (1.0492 – 1.0650)	30.5 (1.201)	MD610617
Over 27.15 (1.0689)	31.0 (1.220)	MD610618



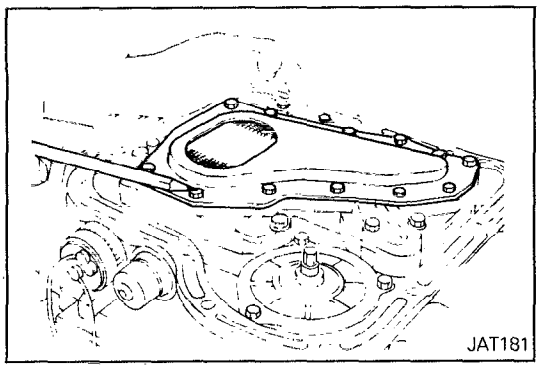
39. Install vacuum diaphragm.
Make sure that vacuum diaphragm rod does not interfere with side plate of control valve.



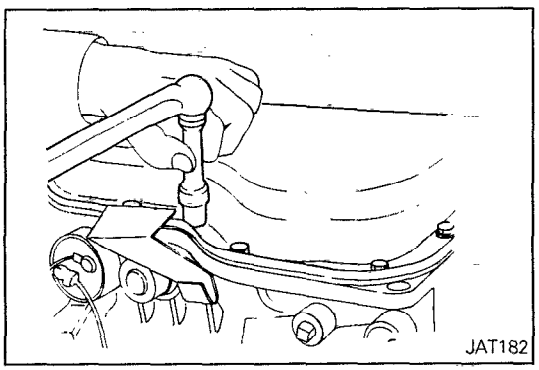
40. Install downshift solenoid, O.D. cancel solenoid.



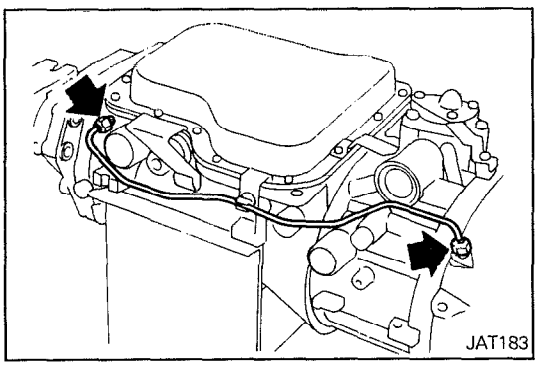
41. Install inhibitor switch. Check for proper operation in each range using a circuit tester. Refer to On-vehicle Service.


JAT181

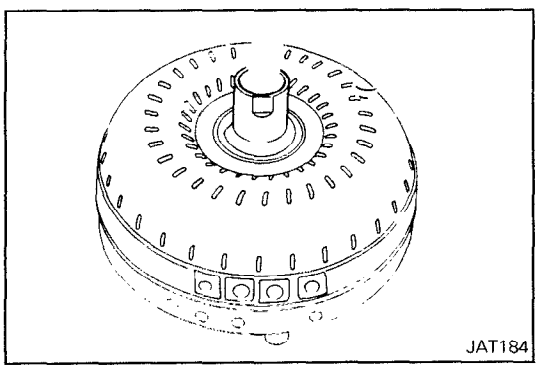
42. Before installing oil pan, check alignment and operation of control lever and parking pawl engagement. Blow mechanism with air to clean. Make final check to be sure all bolts are installed in valve body.


JAT182

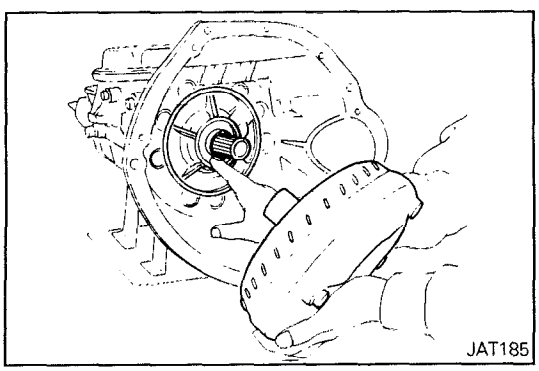
43. Install oil pan with new gasket.
Oil pan bolt: 5 – 7 Nm (3.6 – 5.1 ft.lbs.)


JAT183

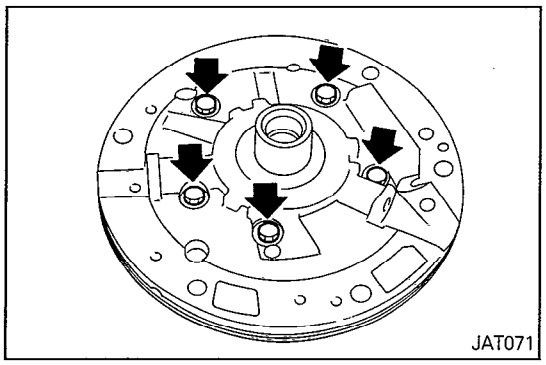
44. Install governor tube.


JAT184

45. Carefully inspect torque converter for damage. Check converter hub for grooves caused by hardened seals. Also check bushing contact area.


JAT185

46. Lubricate oil pump lip seal and converter neck before installing converter.
Install converter, being sure that converter is properly meshed with oil pump drive gear.


JAT071

OIL PUMP

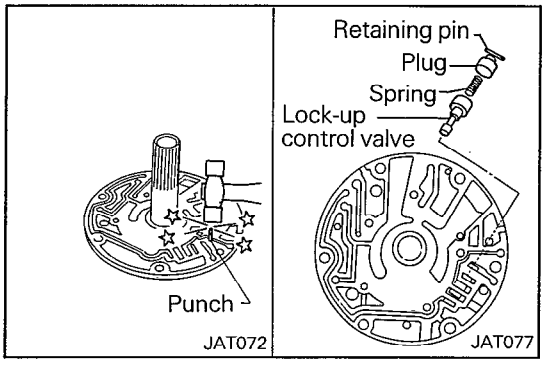
N21LG--

DISASSEMBLY

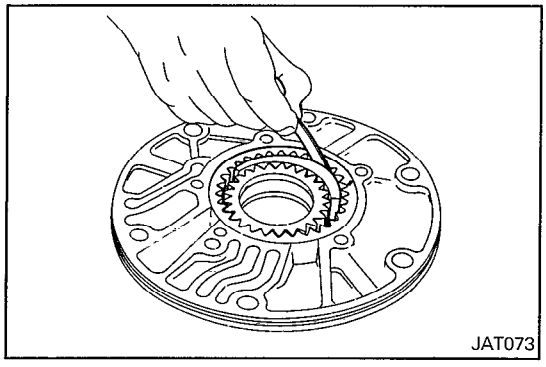
1. Remove front pump gasket and O-ring. Inspect pump body, bushing and pump shaft for wear.
2. Remove pump cover from pump housing.

Valve Spring Chart

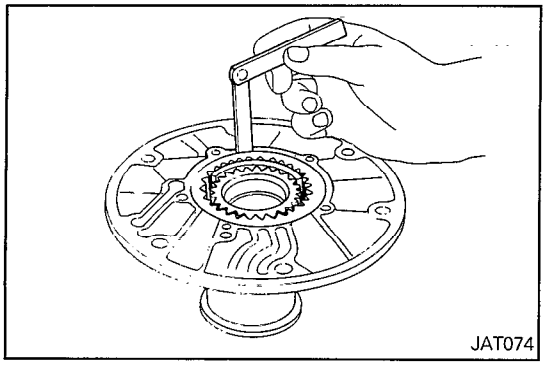
Valve spring	Wire dia. mm (in.)	Outer coil dia. mm (in.)	No. of active coil	Free length mm (in.)	Installed	
					Length mm (in.)	Load N (lbs.)
Lock-up control valve	0.70 (.0276)	5.50 (.2165)	13.5	26.3 (1.035)	16.0 (.630)	16.7 (3.74)



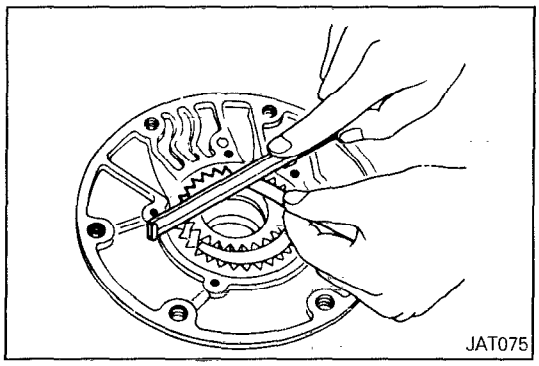
3. Remove retaining pin using a punch [outer dia. 1.5 to 1.8 mm (.059 to .071 in.)], then remove lock-up control valve and spring.
4. Inspect gears, lock-up control valve, spring and all internal surfaces for faults and visible wear.


JAT073

5. Measure clearance between outer gear and crescent.
   Standard value: 0.14 – 0.21 mm (.0055 – .0083 in.)
   Limit: 0.25 mm (.0098 in.)

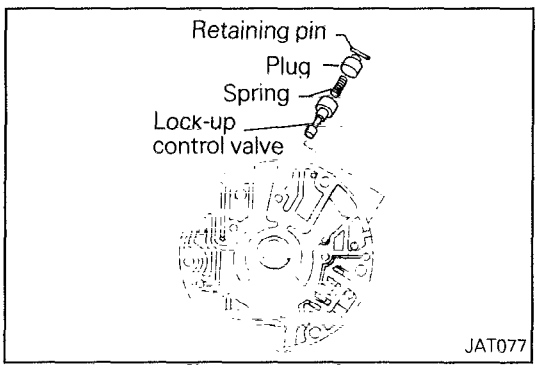

JAT074

6. Measure clearance between outer gear and pump housing.
   Standard value: 0.05 – 0.20 mm (.0020 – .0079 in.)
   Limit: 0.25 mm (.0098 in.)


JAT075

7. Using a feeler gauge and straight edge, measure clearance between gears and pump cover.

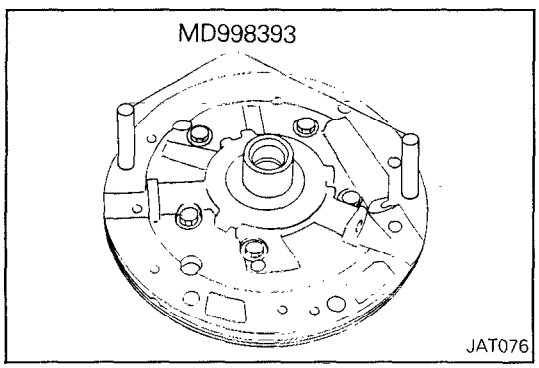
   Standard value: 0.02 – 0.04 mm (.0008 – .0016 in.)
   Limit: 0.08 mm (.0031 in.)



JAT077

REASSEMBLY

1. Install lock-up control valve and spring into oil pump cover, then install retaining pin.

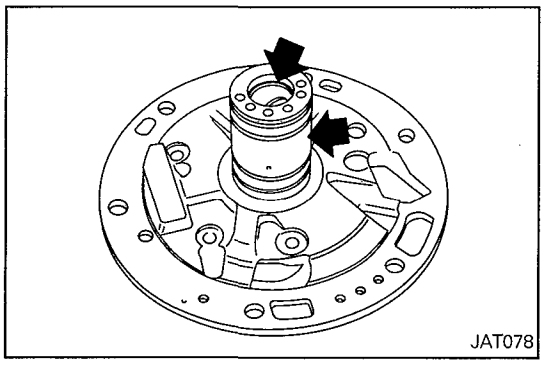


JAT076

2. Install inner and outer pump gears to pump housing.
3. Insert guides into bolt holes and install pump cover onto pump housing.
4. Tighten pump securing bolts to specified torque.

   Oil pump housing to oil pump cover:
   6 – 8 Nm (4.3 – 5.8 ft.lbs.)

5. Install new O-ring.

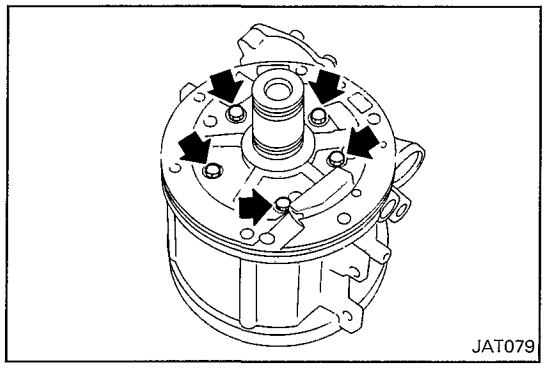

JAT078

DRUM SUPPORT

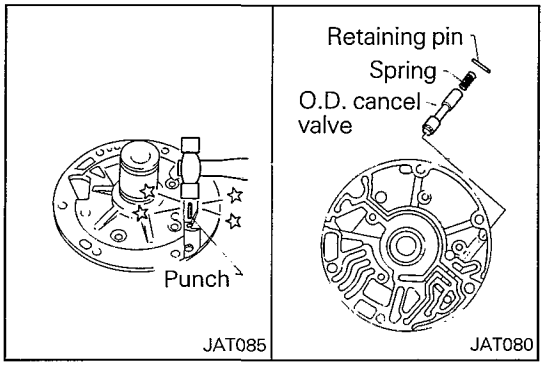
N21LT-

DISASSEMBLY

1. Inspect drum support bushing and ring groove areas for wear.


JAT079

2. Remove drum support and gasket from O.D. case.

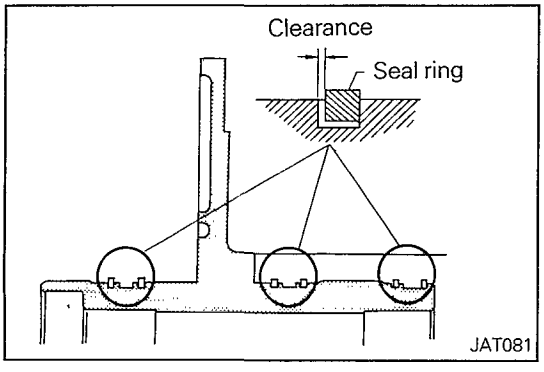


JAT085 JAT080

3. Remove retaining pin using a punch [outer dia. 1.5 to 1.8 mm (.059 to .071 in.)], then remove O.D. cancel valve and spring.
4. Don't remove it from contacting face side.
5. Inspect O.D. cancel valve, spring and all internal surfaces for faults and visible wear.

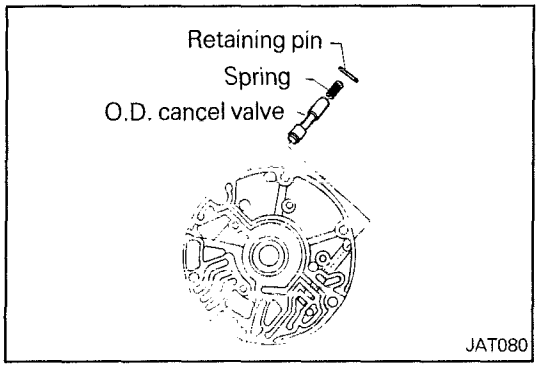
Valve Spring Chart

Valve spring	Wire dia. mm (in.)	Outer coil dia. mm (in.)	No. of active coil	Free length mm (in.)	Installed	
					Length mm (in.)	Load N (lbs.)
O.D. cancel valve	0.65 (.0256)	4.95 (.1949)	12.8	23.0 (.906)	16.0 (.630)	12.26 (2.76)



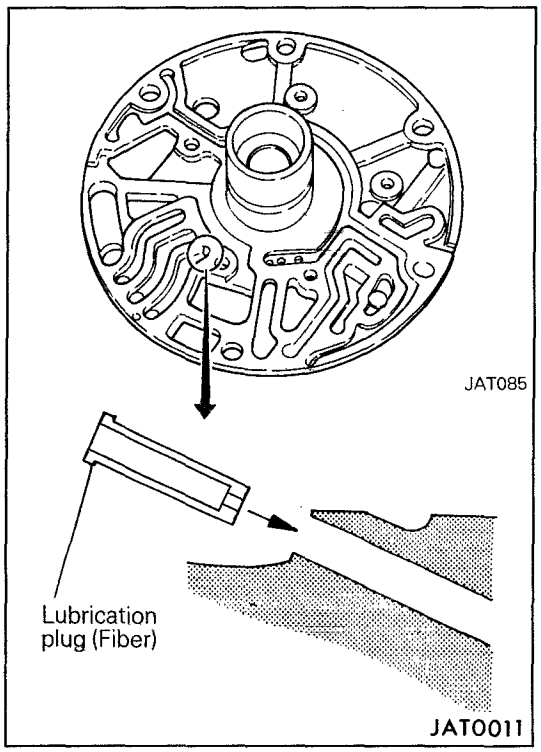
JAT081

6. Measure clearance between seal ring and ring groove.
   Standard value: 0.05 – 0.20 mm (.0020 – .0079 in.)
7. Replace if the clearance exceeds 0.20 mm (.0079 in.). Of course, it is good practice to replace all seal rings during an overhaul.

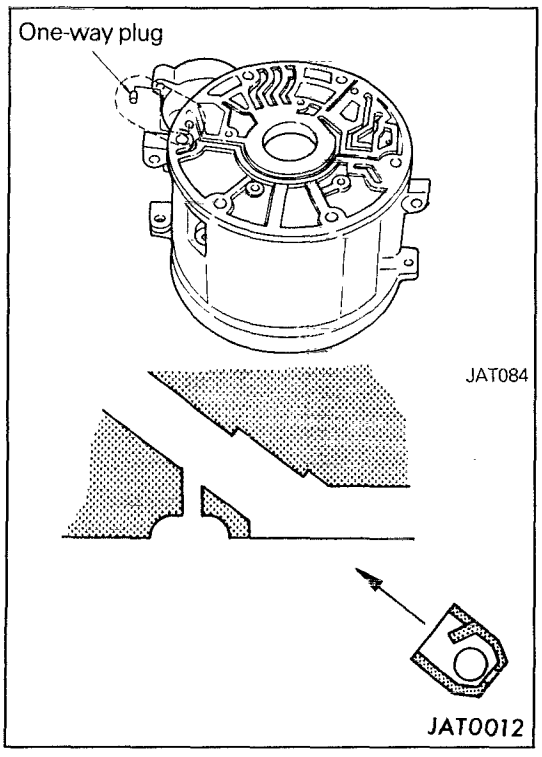


REASSEMBLY

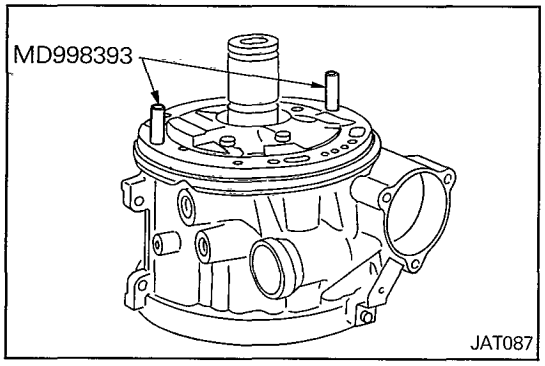
1. Install O.D. cancel valve and spring into drum support, then tap retaining pins.



2. Install lubrication plug in drum support.

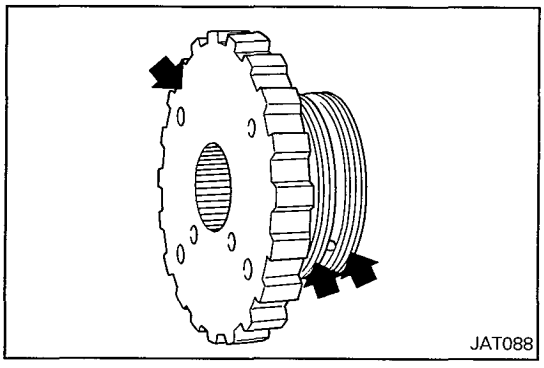


3. Install one-way plug in O.D. case.



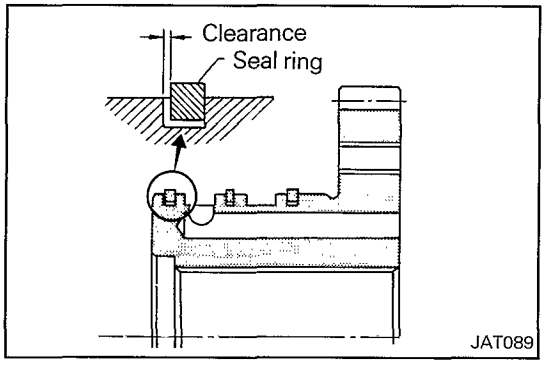
4. Install new O-ring and gasket on O.D. case.
5. Install drum support on O.D. case.
6. Insert the special tool into the bolt holes and perform the centering.
7. Tighten drum support securing bolts to specified torque.

Drum support to O.D. case: 7 – 9 Nm (5.1 – 6.5 ft.lbs.)



INSPECTION

1. Inspect contacting surface of oil distributor and ring groove areas for wear.



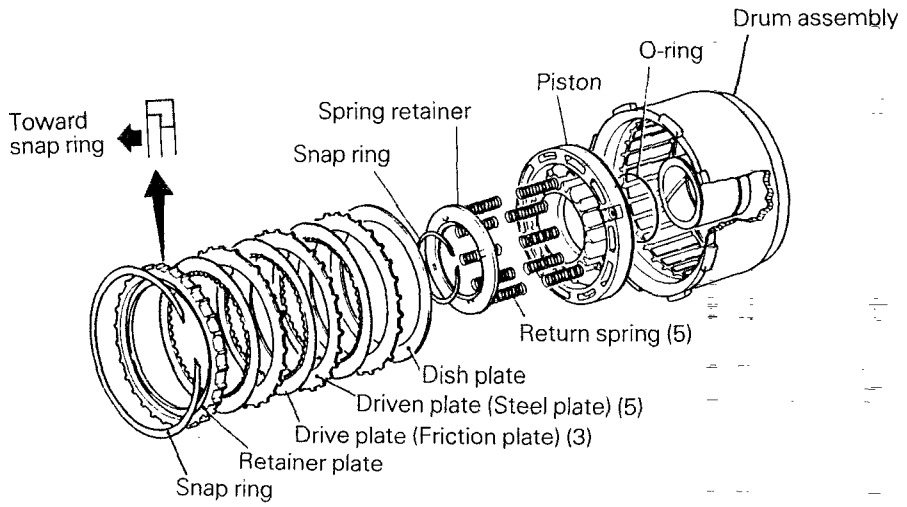
2. Measure clearance between seal ring and ring groove.

Standard clearance:
0.04 – 0.16 mm (.0016 – .0063 in.)

Replace if the clearance exceeds 0.16 mm (.0063 in.). Of course, it is good practice to replace all seal rings during an overhaul.

DIRECT CLUTCH AND HIGH-REVERSE CLUTCH

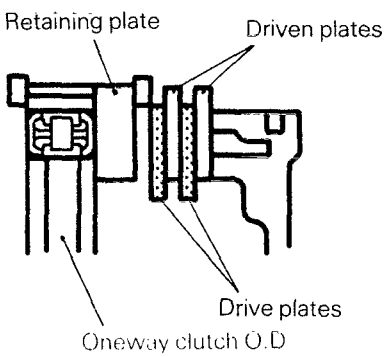
N21LHCAa



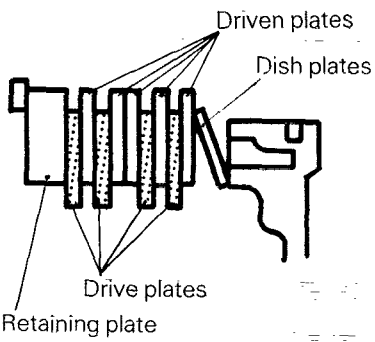
Number of return springs

High-reverse clutch	5
Direct clutch	10

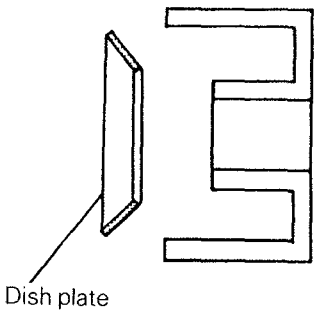
Layout of direct clutch plates



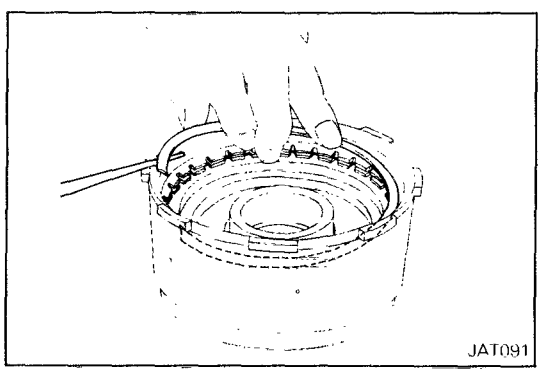
Layout of high-reverse clutch plates



High-reverse clutch

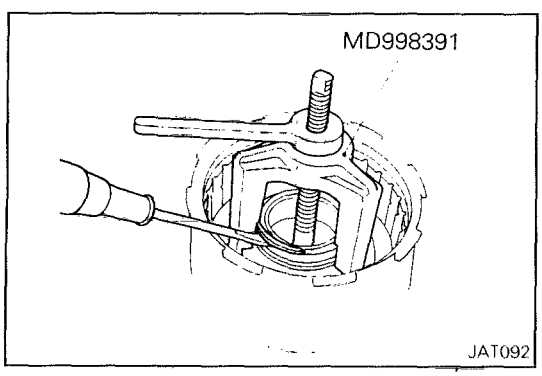


JAT0013

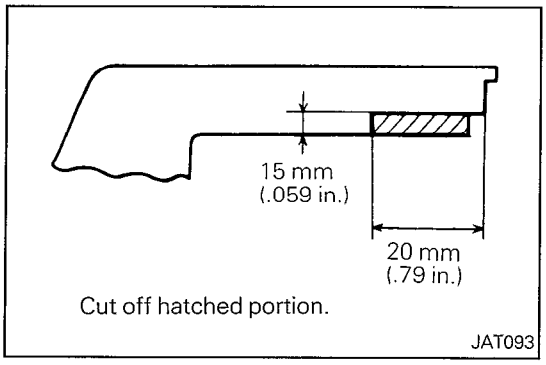


DISASSEMBLY

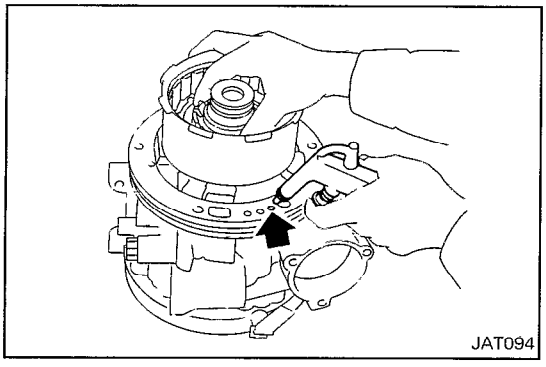
1. Using a screwdriver, remove large clutch retaining plate snap ring.
2. Remove clutch plate assembly.



3. Compress clutch springs using the special tool and remove snap ring from spring retainer.



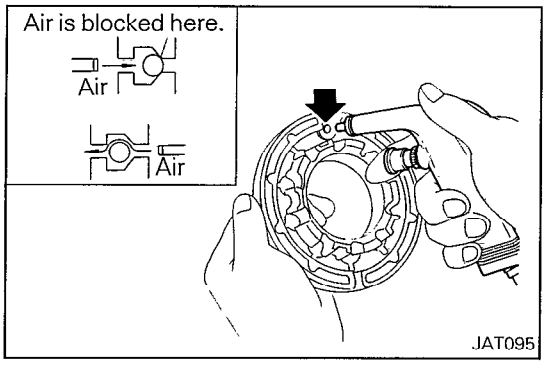
When tool is to be used, cut toe-tips of three legs with a grinding wheel.



4. Remove spring retainer and springs.
5. For easy removal of piston from drum, mount clutch on drum support. Use an air gun with a tapered rubber tip to carefully apply air pressure to loosen piston from drum.
6. Check clutch drive plate facing for wear or damage. Drive plate thickness must not be less than limit.

Drive plate thickness
Standard value: 1.50 – 1.65 mm (.0591 – .0650 in.)
Limit: 1.4 mm (.055 in.)

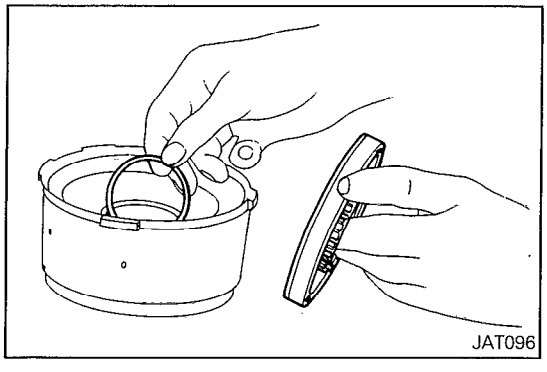
7. Check for wear on snap ring, weak or broken coil springs, and warped spring retainer.



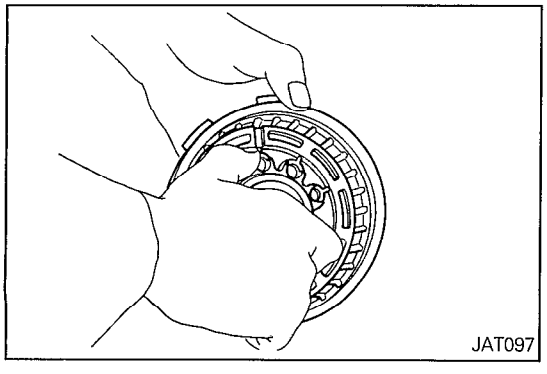
8. Check the operation of check ball in piston by applying air pressure.

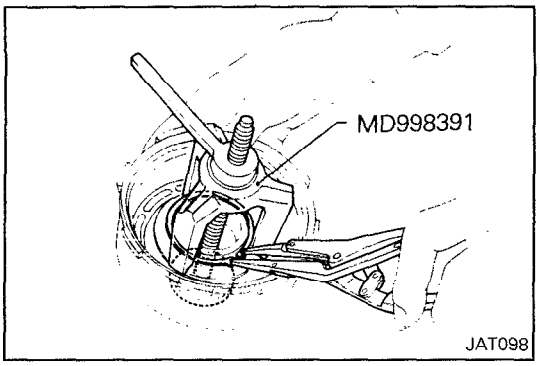
REASSEMBLY

1. Lubricate clutch drum hub and seals, and install inner seal and piston seal as illustrated. Be careful not to stretch seals during installation.
   Never assemble clutch dry; always lubricate its components thoroughly.

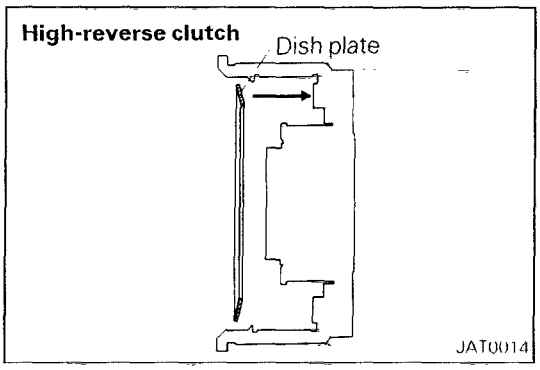


2. Assemble piston, being careful not to allow seal to kink or become damaged during installation. After installing, turn piston by hand to ensure that there is no binding.

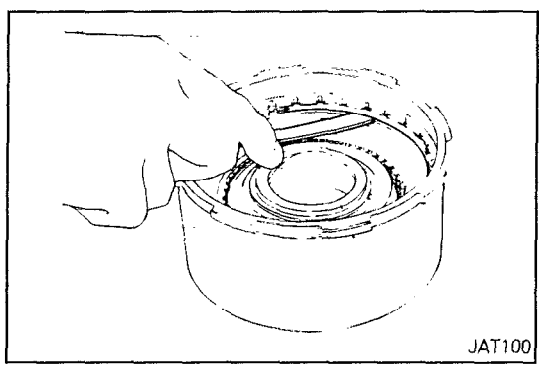




3. Reassemble spring and retainer. Reinstall snap ring. Be sure snap ring is properly seated.



4. Install dish plate with dish facing outward.
5. Now install driven plate (steel plate), then a drive plate (friction plate) and repeat in this order until correct number of plates has been installed (check Service Specifications for proper quantity of plates). Now install retainer plate and snap ring.



6. Measure clearance between retainer plate and snap ring.

Standard value:

Direct 1.6 – 1.8 mm (.063 – .071 in.)
High-reverse 1.6 – 2.0 mm (.063 – .079 in.)

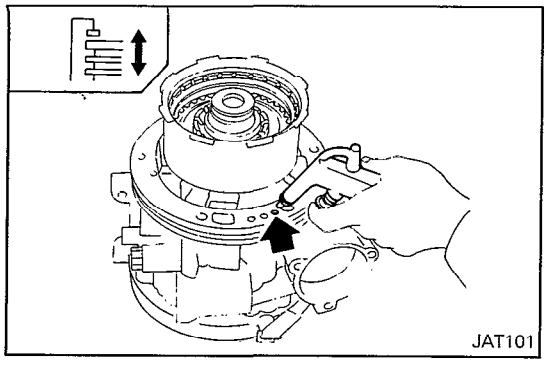
If necessary, try other retaining plates having different thicknesses until correct clearance is obtained.

Available Retaining Plate for High-Reverse Clutch

Thickness mm (in.)	Part number
5.0 (.197)	MD610366
5.2 (.205)	MD610367
5.4 (.213)	MD610368
5.6 (.220)	MD610369
5.8 (.228)	MD610370
6.0 (.236)	MD610371
6.2 (.244)	MD610372

Available Retaining Plate for Direct Clutch

Thickness mm (in.)	Part number
5.6 (.220)	MD610252
5.8 (.228)	MD610253
6.0 (.236)	MD610254
6.2 (.244)	MD610255
6.4 (.252)	MD610256
6.6 (.260)	MD610257
6.8 (.268)	MD610258
7.0 (.276)	MD610259

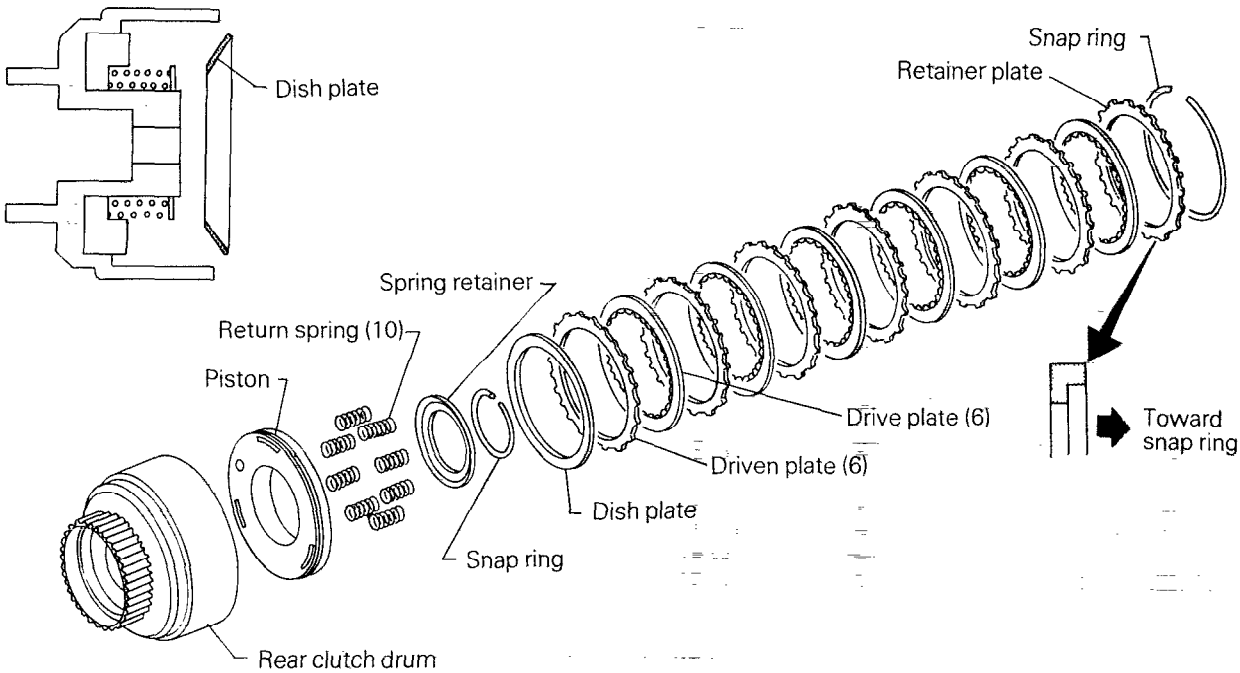


7. Testing high-reverse clutch (Front)
   With high-reverse clutch (Front) assembled on oil pump cover, direct a jet of air into hole in clutch drum for definite clutch operation.

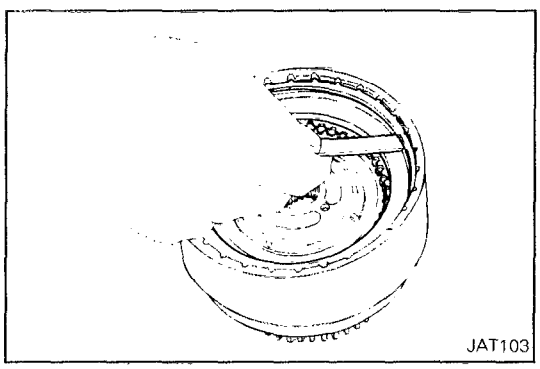
FORWARD CLUTCH

N21LHDA

In regard to the number of clutch plates (drive plate and driven plate), refer to specifications.



JAT102

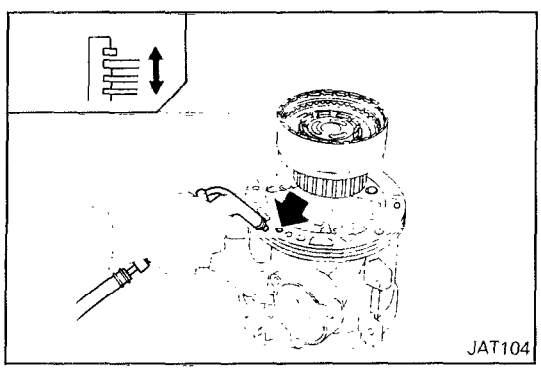


JAT103

REASSEMBLY

1. Service procedures for forward clutch (Rear) are essentially the same as those for high-reverse clutch (Front), with the following exception:

   Standard value: 0.8 – 1.5 mm (.031 – .059 in.)



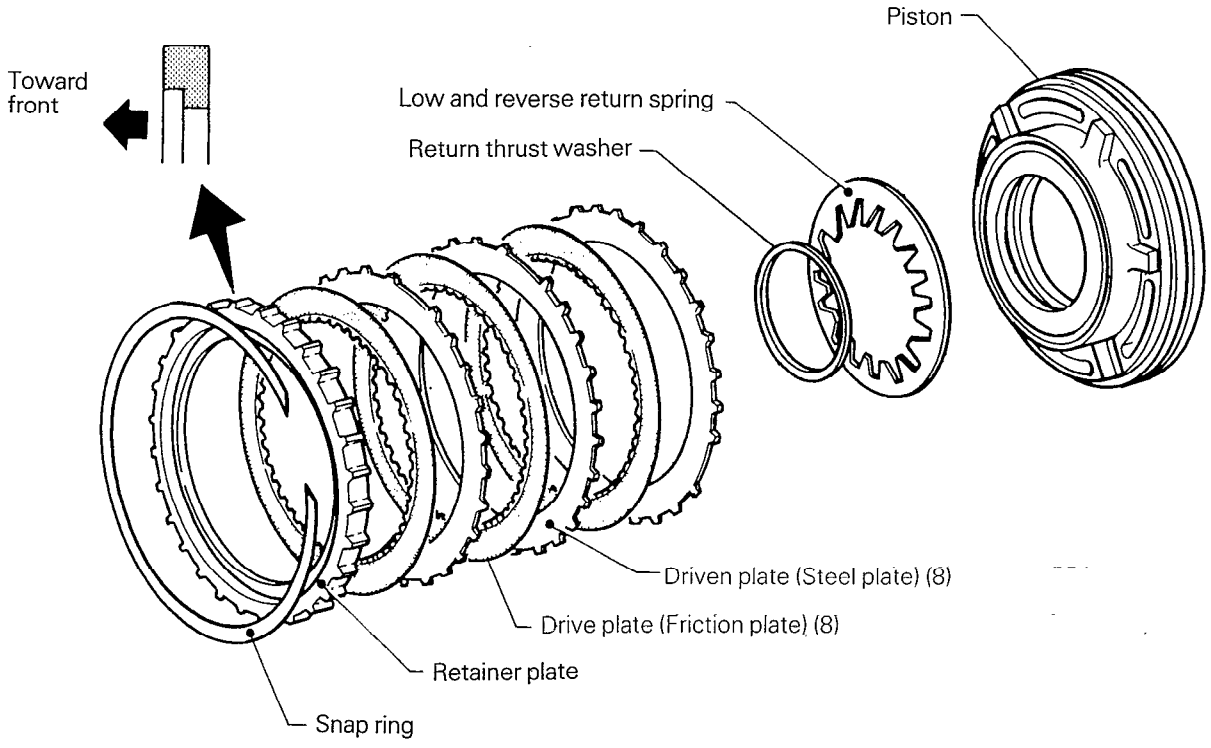
JAT104

2. Test rear clutch operation.

LOW-REVERSE BRAKE

N21LJ--

In regard to the number of clutch plates (drive plate and driven plate), refer to specifications.



JAT105

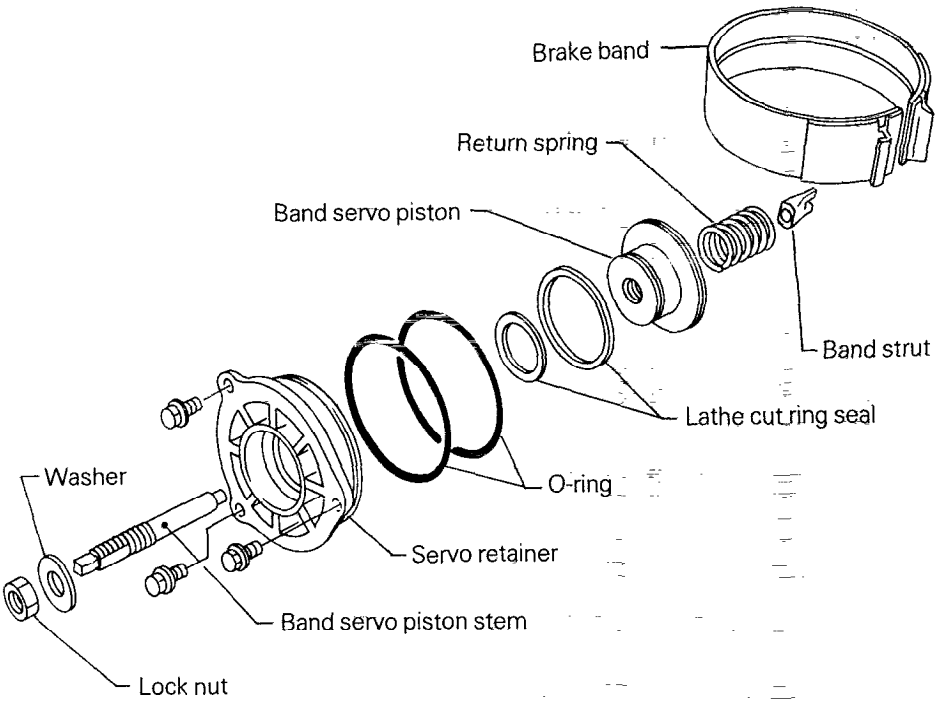
INSPECTION

1. Examine low and reverse brake for damaged clutch drive plate facing and worn snap ring.
2. Check drive plate facing for wear or damage; if necessary, replace.

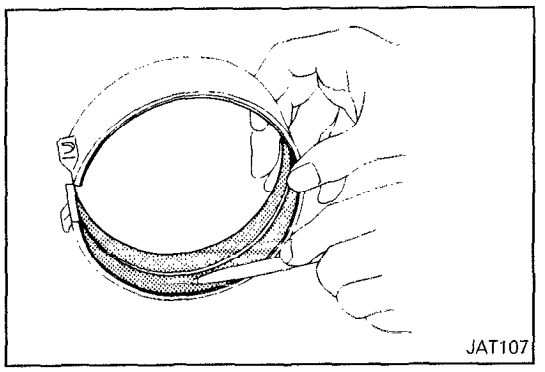
Drive plate thickness
Standard value: 1.90 – 2.05 mm (.0748 – .0807 in.)
Limit: 1.8 mm (.071 in.)

BRAKE BAND AND BAND SERVO

N21LV--



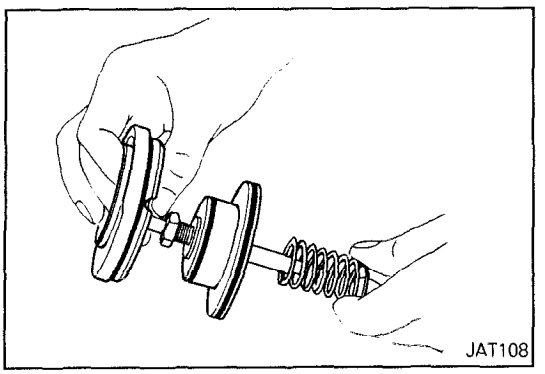
JAT106



JAT107

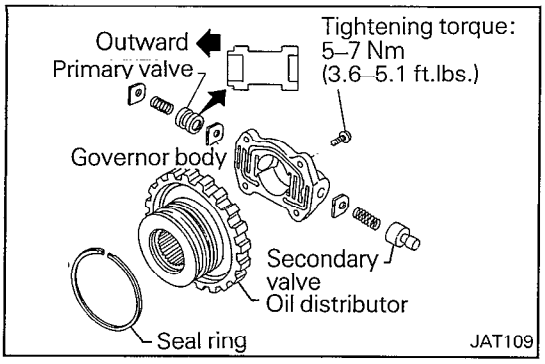
INSPECTION

1. Inspect band friction material for wear. If cracked, chipped or burnt spots are apparent, replace the band.



JAT108

2. Check band servo components for wear and scoring. Replace piston O-rings and all other components as necessary.

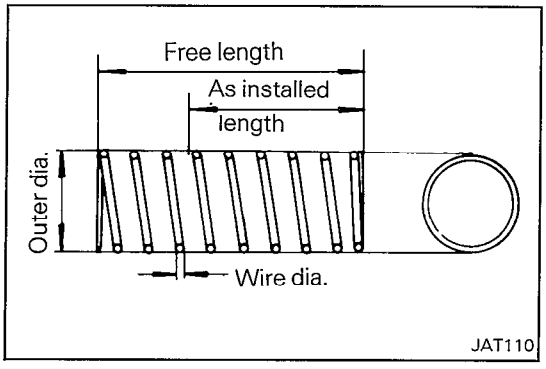


GOVERNOR

N21LM--

DISASSEMBLY

1. Remove governor body from oil distributor.
2. Disassemble governor and check valves for indication of burns or scratches. Inspect springs for weakness or distortion. Replace parts as necessary and reassemble. Do not interchange components of primary and secondary governor valves.



REASSEMBLY

Reassemble governor, noting the following.

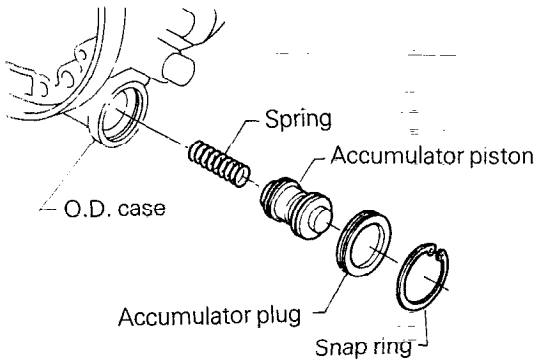
1. For identification of primary and secondary governor valve springs, refer to the following chart.

Governor Spring Chart

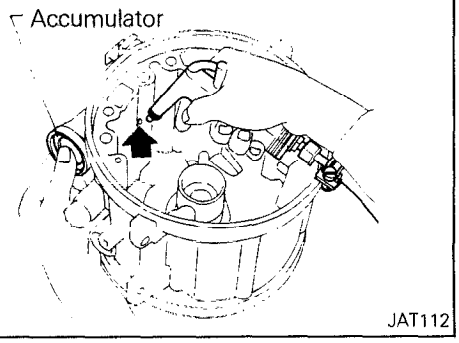
	Wire dia. mm (in.)	Outer coil dia. mm (in.)	No. of active coil	Free length mm (in.)	Installed	
					Length mm (in.)	Load N (lbs.)
Primary governor	0.45 (.0177)	8.75 (.3445)	5.0	21.8 (.858)	7.5 (.295)	2.109 (0.474)
Secondary governor	0.70 (.0276)	9.20 (.3622)	5.5	19.9 (.783)	10.5 (.413)	6.86 (1.54)

ACCUMULATOR

N21LW- -



JAT111



JAT112

DISASSEMBLY

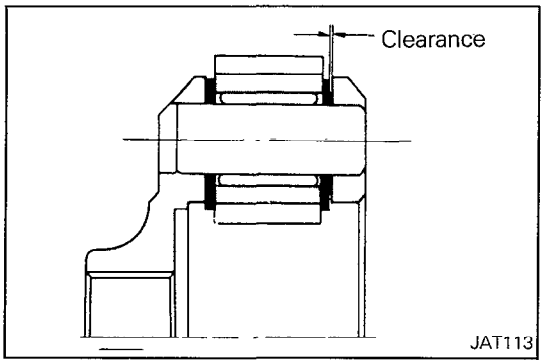
Remove accumulator snap ring, then apply pressure to remove accumulator plug, piston, spring and spacer.

INSPECTION

Check accumulator components for wear and scoring. Replace O-ring, seal rings and all other components as necessary.

Governor Spring Chart

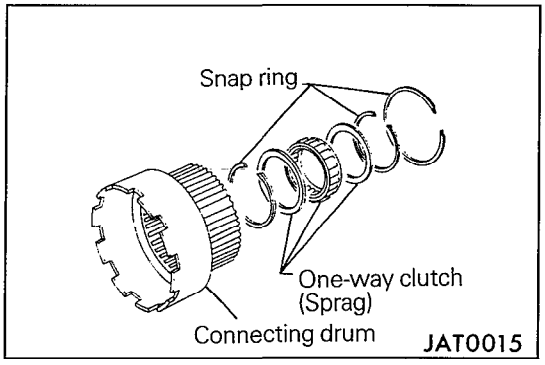
	Wire dia. mm (in.)	Outer coil dia. mm (in.)	No. of active coil	Free length mm (in.)	Installed	
					Length mm (in.)	Load N (lbs.)
Primary governor	0.45 (.0177)	8.75 (.3445)	5.0	21.8 (.858)	7.5 (.295)	2.109 (0.474)
Secondary governor	0.70 (.0276)	9.20 (.3622)	5.5	19.9 (.783)	10.5 (.413)	6.86 (1.54)



PLANETARY CARRIER N21LX--

The planetary carrier cannot be divided into its individual components.
If any part of the component is faulty, replace the carrier as an unit.

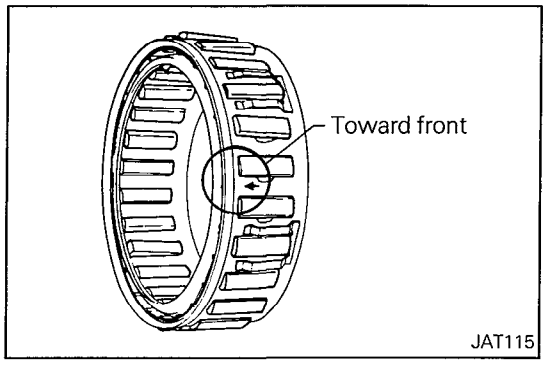
1. Check clearance between pinion washer and planetary carrier with a feeler.
   Standard value: 0.20 – 0.70 mm (.0079 – .0276 in.)
   Replace if the clearance exceeds 0.80 mm (.0315 in.).
2. Check planetary gear sets for damaged or worn gears. Gear sets that have been damaged by overheating will have a blue discoloration.



CONNECTING DRUM ASSEMBLY N21LY--

If one-way clutch is out of order as determined during disassembly, repair it as follows:

1. Remove the snap rings inner and outer races.

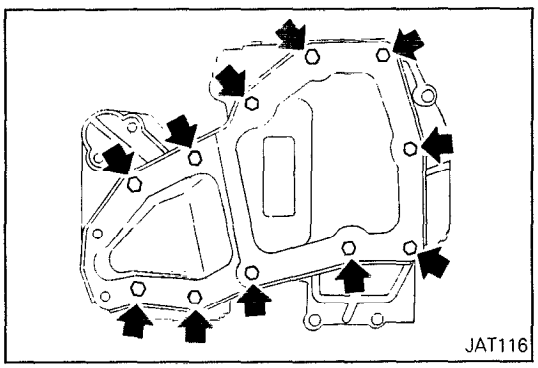


2. Inspect one-way sprag and contacting surface for wear or burns.
   Replace parts as necessary.
3. Assemble those parts.
   Install one-way clutch so that the arrow mark "→" is toward front of vehicle. It should be free to rotate only in clockwise direction.

CONTROL VALVE BODY

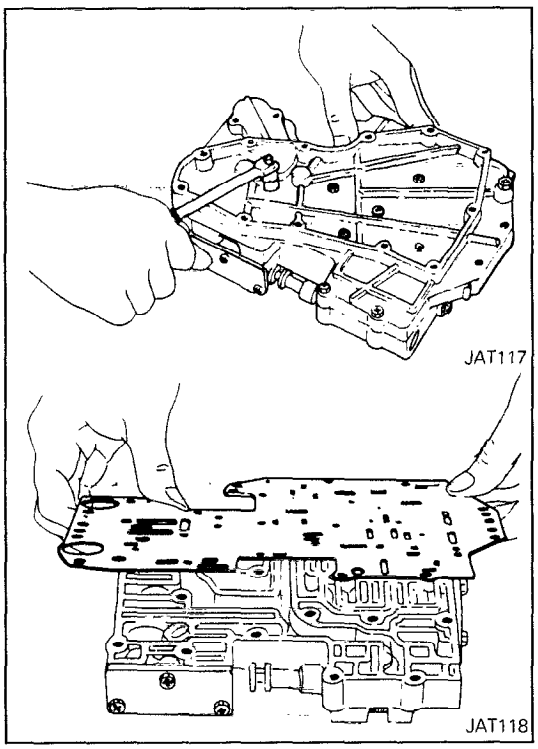
N21LO-

The valve body contains many precision parts and requires extreme care when parts are removed and serviced. Place removed parts on a parts rack so they can be put back in the valve body in the same positions and sequences. Care will also prevent springs and small parts from becoming scattered or lost.


JAT116

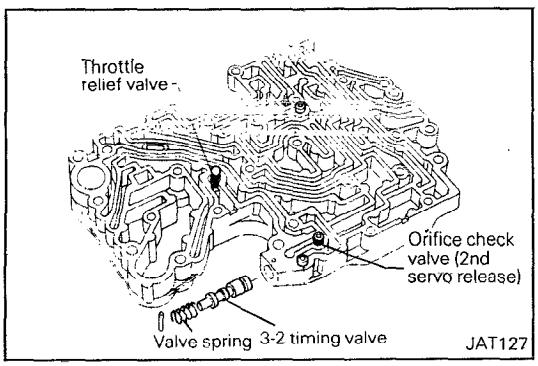
DISASSEMBLY

1. Remove oil strainer and its attaching screws, nuts and bolts.


JAT117

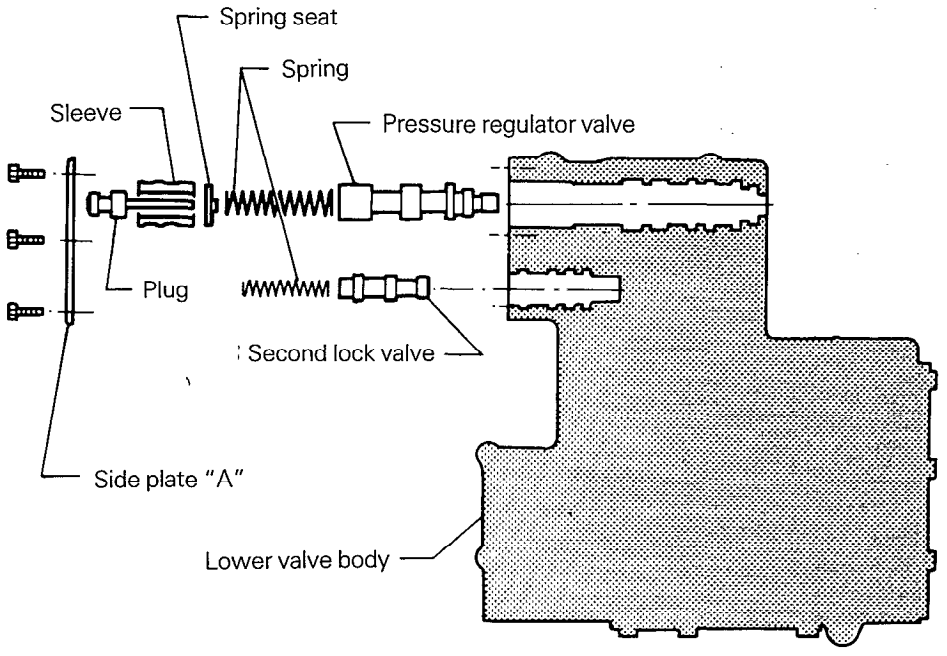
JAT118

2. Disassemble valve body and its remaining attaching bolts and nuts to carefully separate lower body, separator plate and upper body.



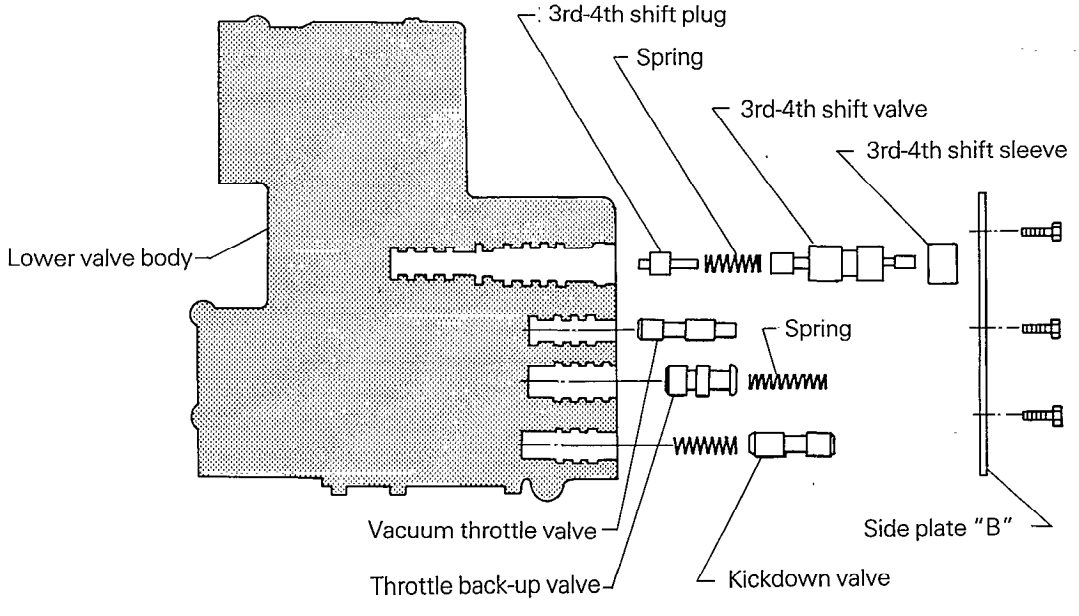
JAT127

3. During valve body separation, do not scatter or lose orifice check valve, servo orifice check valve, throttle relief check valve (ball) and related springs.



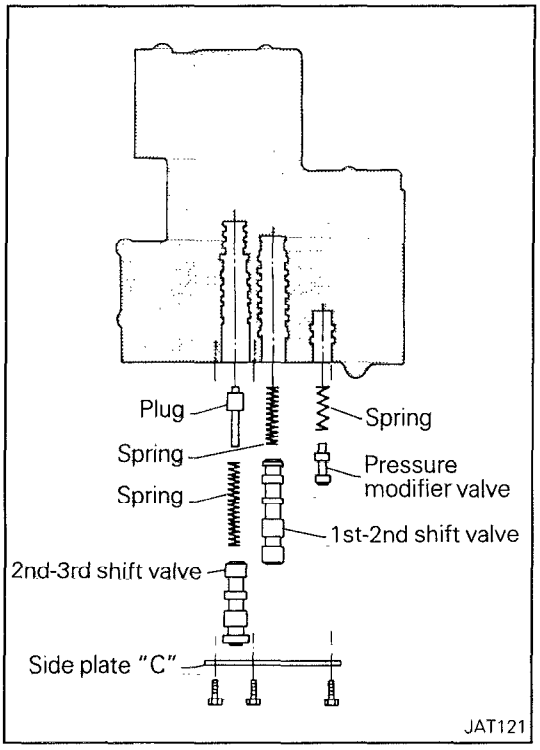
JAT119

4. Remove side plate A, pressure regulator valve, spring, spring seat, sleeve, plug, second lock valve and spring. Place each loose part on a rack to retain correct sequence of assembly.



JAT

5. Remove side plate B, 3rd-4th shift valve, vacuum throttle valve, throttle back-up valve and spring, and the kickdown valve and spring. Place each loosen part on a rack to retain sequence of assembly.



6. Remove side plate C, pressure modifier valve and spring 2nd-3rd shift valve, spring and plug, and 1st-2nd shift valve and spring.
   Remove 3-2 timing valve and spring from lower valve body.
7. Place each loose part on a rack to retain sequence of assembly.
   Manual valve was removed when valve body was removed from transmission. Include valve in subsequent inspection and service sequence.

INSPECTION

PRECAUTION FOR INSPECTION

A newly manufactured valve body represents precision manufactured valves assembled with close tolerances into precision bores of the valve body. If inspection reveals excessive clearances, 0.03 mm (.0012 in.) or more, between the valves and the valve body bores, replace the entire valve body rather than attempt rework.

If one or more valves are sticking from varnish deposits or burns resulting from deteriorated oil or overheating, you may be able to clean the valves and valve bodies. Always use crocus cloth, which is a very fine type of cutting material.

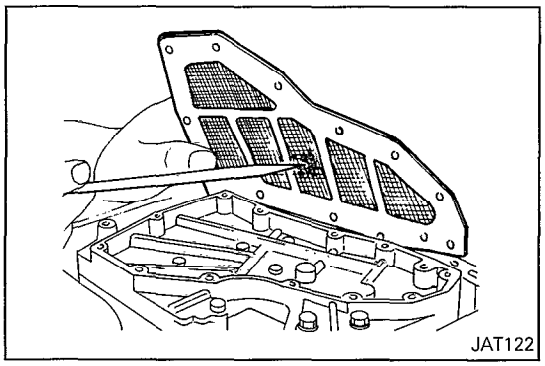
Never use emery cloth, as it is too coarse and can scratch the valves or valve bores. Scratches can lead to future deposits of varnish or foreign matter.

During cleaning, do not remove the sharp edges of the valve. When edges are rounded or scratched, entry is provided for dirt or foreign matter to work into the sides of the valves and hinder valve movement.

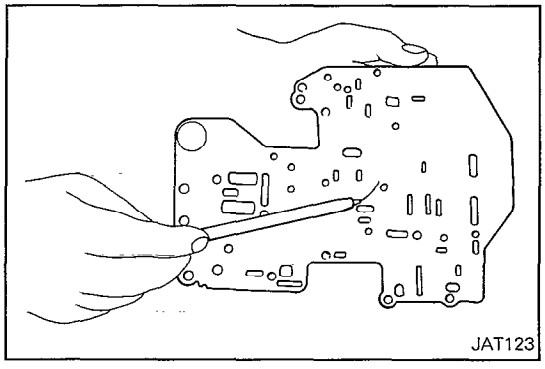
The valves may be cleaned using alcohol or lacquer thinner.

The valve bodies can be dip cleaned with a good carburetor cleaner or lacquer thinner. Do not leave valve bodies submerged in carburetor cleaner longer than five minutes. Rinse parts thoroughly and dry.

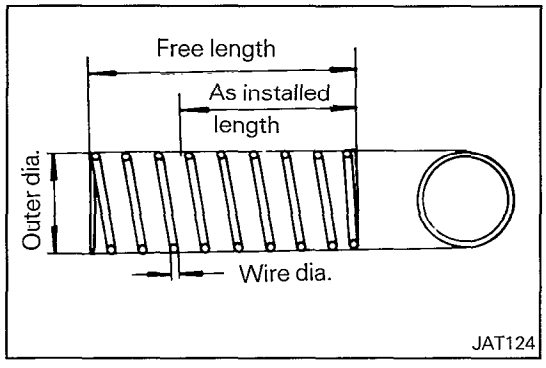
Lubricate all parts in clean automatic transmission fluid before reassembly.


JAT122

1. Check valves for signs of burning. Replace if beyond chean-up.
2. Check oil strainer for general condition. Replace if necessary.


JAT123

3. Check separator plate for scratches or damage. Replace if necessary. Scratches or score marks can cause oil to bypass correct oil passages and result in system malfunction.
4. Check oil passages in upper and lower valve bodies for varnish deposits, scratches or other damage that would impair valve movement. Check threaded holes and related bolts and screws for stripped threads; replace as needed.
5. Test valve springs for weakened load condition. Refer to Valve Body Spring Chart for spring specifications.

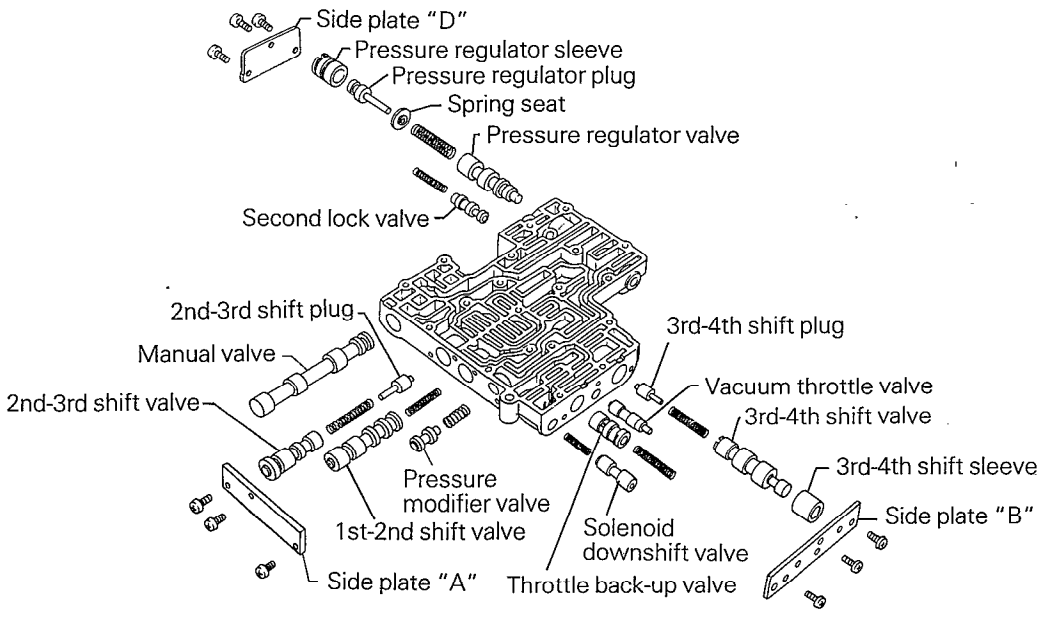


JAT124

REASSEMBLY

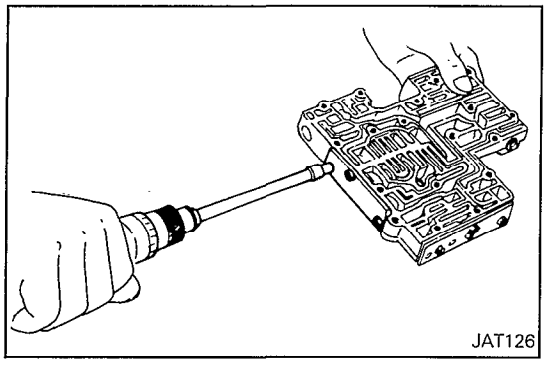
Valve Body Spring Chart

Valve spring	Wire dia. mm (in.)	Outer coil dia. mm (in.)	No. of active coil	Free length mm (in.)	Installed	
					Length mm (in.)	Load N (lbs.)
Manual detent	1.3 (.051)	7.3 (.287)	15	32.4 (1.276)	26.5 (1.043)	53.9 (12.1)
Pressure regulator valve	1.2 (.047)	11.7 (.461)	13	43.0 (1.693)	23.5 (.925)	27.5 (6.2)
Pressure modifier valve	0.6 (.024)	8.6 (.339)	5.5	19.6 (.772)	9.0 (.354)	10 (2.2)
1st-2nd shift valve	0.7 (.028)	7 (.276)	11.8	28.3 (1.114)	16.0 (.630)	6.129 (1.378)
2nd-3rd shift valve	0.7 (.028)	6.9 (.272)	18	41.0 (1.614)	17.0 (.669)	13.73 (3.09)
Throttle back-up valve	0.8 (.031)	7.3 (.287)	13.5	31.8 (1.252)	18.8 (.740)	14.31 (3.21)
Solenoid downshift valve	0.55 (.0217)	5.55 (.2185)	12	22.0 (.866)	12.5 (.492)	5.88 (1.32)
Second lock valve	0.55 (.0217)	5.55 (.2185)	16	33.5 (1.319)	21.0 (.827)	5.88 (1.32)
Throttle relief check valve	1.0 (.039)	6.5 (.256)	13	25 (.984)	19.0 (.748)	27.93 (6.27)
Orifice check valve	0.23 (.0091)	5.0 (.197)	12	15.5 (.610)	11.5 (.453)	0.10 (0.02)
Servo orifice check valve						
3rd-4th shift valve	0.8 (.0315)	6.6 (.260)	12.6	30.3 (1.193)	13.1 (.516)	24.57 (5.515)



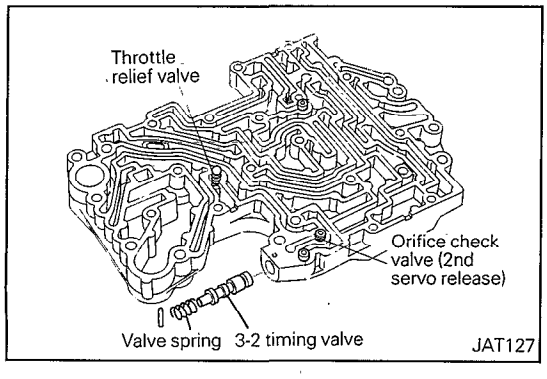
JAT125

1. Assemble side plate A group of parts into lower valve body. Reinstall side plate and finger tighten screws. Assemble side plate B group and side plate C group in same manner as A group.



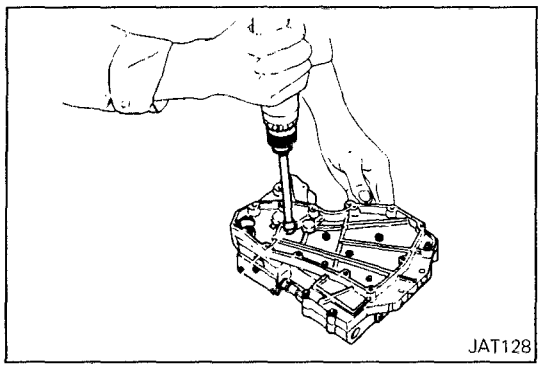
JAT126

2. Tighten screws.
   Side plate to valve body: 2.5 – 3.4 Nm (1.8 – 2.5 ft.lbs.)



JAT127

3. Install orifice check valves, valve springs, throttle relief valve spring and steel ball in valve body.
4. Install 3-2 timing valve and spring.


JAT128

5. Install upper and lower valves.

   Upper and lower valves: 2.5 – 3.4 Nm (1.8 – 2.5 ft.lbs.)
   Reamer bolt: 5 – 7 Nm (3.6 – 5.1 ft.lbs.)

6. Install oil strainer.

   Oil strainer to valve body: 3 – 4 Nm (2.1 – 2.8 ft.lbs.)

   The manual valve is inserted into the valve body when the latter is installed in the transmission.