TRANSMISSION
MANUAL AND AUTOMATIC

CONTENTS

GENERAL SPECIFICATIONS

Manual Transmission			
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			23/8
Automatic Transmission			
Automatic transmission model			JM600
Stall torque ratio			1.84 : 1
Transmission gear ratio	1st		2.458
	2nd		1.458
	3rd		1.000
	4th (O.D.)		0.686
	Reverse		2.182
Automatic transmission assembly			
Model code number			MR600
Torque converter assembly			
Stamped mark on the T/C			GKA
High-reverse clutch (Front)			
Number of drive plates			3
Number of driven plates			5
Clearance mm (in.)			1.6 – 2.0 (.063 – .079)
Thickness of retaining plate	mm (in.)	MD610366	5.0 (.197)
		MD610367	5.2 (.205)
		MD610368	5.4 (.213)
		MD610369	5.6 (.220)
		MD610370	5.8 (.228)
		MD610371	6.0 (.236)
		MD610372	6.2 (.244)
Direct clutch			
Number of drive plates			2
Number of driven plates			2
Clearance mm (in.)			1.6 – 1.8 (.063 – .071)
Thickness of retaining plate	mm (in.)	MD610252	5.6 (.220)
		MD610253	5.8 (.228)
		MD610254	6.0 (.236)
		MD610255	6.2 (.244)
		MD610256	6.4 (.252)
		MD610257	6.6 (.260)
		MD610258	6.8 (.268)
		MD610259	7.0 (.276)

Forward clutch (Rear)			
Number of drive plates			6
Number of driven plates			6
Clearance mm (in.)			0.8 – 1.6 (.031 – .063)
Thickness of retaining plate	mm (in.)		4.80 (.1890)
Low & reverse brake			
Number of drive plates			6
Number of driven plates			6
Clearance mm (in.)			0.80 – 1.25 (.0315 – .0492)
Thickness of retaining plate	mm (in.)	MD610103	11.8 (.465)
		MD610104	12.0 (.472)
		MD610105	12.2 (.480)
		MD610106	12.4 (.488)
		MD610107	12.6 (.496)
		MD610108	12.8 (.504)
2nd brake band			
Piston size mm (in.)			
Big dia.			72 (2.835)
Small dia.			50 (1.969)
O.D. brake band			
Piston size mm (in.)			
Big dia.			60 (2.36)
Small dia.			36 (1.42)
Return spring			Equipped
Control valve assembly			
Stamped mark on strainer			GBDM
Governor assembly			
Stamped mark on governor body			M33
Stall engine speed			2,350 – 2,650 rpm

SERVICE SPECIFICATIONS

mm (in.)

Standard value	
Retainer to bearing clearance	0—0.1 (0—.004)
Counter gear end play	0—0.05 (0—.0020)
Reverse idler gear end play	0.12—0.28 (.005—.011)
Overdrive gear end play	0.04—0.20 (.002—.008)
Resistance spring free length	28 (1.10)
Plunger springs free length	42 (1.65)
Main drive gear end play	0—0.06 (0—.002)
3rd-4th synchronizer hub end play	0—0.08 (0—.003)
Automatic transmission	
Distance of adjusting cam to selector lever end	15—15.7 (.59—.62)

Adjustment Spacer and Snap Ring

Snap ring for main drive gear	
Thickness mm (in.) — Ident. color — Parts No.	
	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
Spacer for main drive gear bearing	
Thickness mm (in.) — Ident. color — Parts No.	
	0.84 (.033) — Black — MD701845
	0.93 (.037) — None — MD701839
	1.02 (.040) — Red — MD701840
	1.11 (.044) — White — MD701841
	1.20 (.047) — Yellow — MD701842
	1.29 (.051) — Blue — MD701843
	1.38 (.054) — Green — MD701844
Snap ring for mainshaft front end	
Thickness mm (in.) — Ident. color — Parts No.	
	2.15 (.085) — Blue — MD701761
	2.22 (.087) — None — MD701762
	2.29 (.090) — Brown — MD701763
	2.36 (0.93) — White — MD701764
Spacer for countershaft taper bearing	
Thickness mm (in.) — Ident. mark — Parts No.	
	1.84 (.0724) — 84 — MD706580
	1.87 (.0736) — 87 — MD706581
	1.90 (.0748) — 90 — MD706582
	1.93 (.0760) — 93 — MD706583
	1.96 (.0772) — 96 — MD706584
	1.99 (.0783) — 99 — MD706585
	2.02 (.0795) — 02 — MD706586
	2.05 (.0807) — 05 — MD706587
	2.08 (.0819) — 08 — MD706588

Thickness	mm (in.) – Ident. mark – Parts No.	2.11 (.0831) – 11 – MD706589
		2.14 (.0843) – 14 – MD706590
		2.17 (.0854) – 17 – MD706591
		2.20 (.0866) – 20 – MD706592
		2.23 (.0878) – 23 – MD706593
		2.26 (.0890) – 26 – MD706594
		2.29 (.0902) – 29 – MD706595
		2.32 (.0913) – 32 – MD706596
		2.35 (.0925) – 35 – MD706597
		2.38 (.0937) – 38 – MD706598
		2.41 (.0949) – 41 – MD706599
		2.44 (.0961) – 44 – MD706600
		2.47 (.0972) – 47 – MD706601
		2.50 (.0984) – 50 – MD706602
		2.53 (.0996) – 53 – MD706603
		2.56 (.1008) – 56 – MD706604
		2.59 (.1020) – 59 – MD706605
		2.62 (.1031) – 62 – MD706606
		2.65 (.1043) – 65 – MD706607
		2.68 (.1055) – 68 – MD706608

TORQUE SPECIFICATIONS

Nm (ft.lbs.)

Manual Transmission		
Starting motor mounting bolt	22–32 (16–23)	
Engine to transmission	43–55 (31–40)	
Mainshaft locking nut	265–294 (196–216)	
Countershaft locking nut	157–186 (116–137)	
Idler shaft locking nut	20–58 (15–43)	
Drain plug	59 (44)	
Oil filler plug	30–34 (22–25)	
Back-up light switch	30 (22)	
Under cover	8–9 (6–7)	
Seal plug (Neutral return plunger plug)	30–41 (22–30)	
Speedometer sleeve clamp bolt	10–12 (7.5–9)	
Automatic Transmission		
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		
Transmission case to converter housing	44–54 (33–40)	
Transmission case to rear extension	20–25 (14–18)	
Oil pan transmission case	6–8 (4.4–5.7)	
2nd servo piston retainer to transmission case	7–9 (5.1–6.5)	
2nd piston stem (when adjusting band brake)	7–10 (5.1–7.2)	[Turn back two turns after tightening.]
2nd piston stem lock nut	15–39 (11–29)	
One-way clutch inner race to transmission case	13–18 (9–13)	
Control valve body to transmission case	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 (5.1–7.2)	
O.D. stem lock nut	15–39 (11–29)	
Governor tube	11–18 (11–13)	
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 to oil distributor	5–7 (3.6–5.1)	
Oil pump housing to oil pump cover	6–8 (4.3–5.8)	

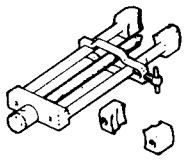
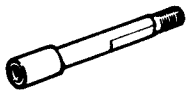
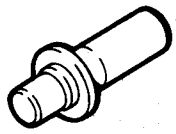
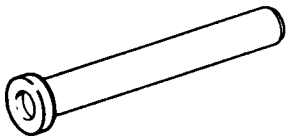
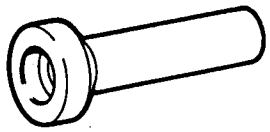
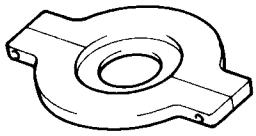
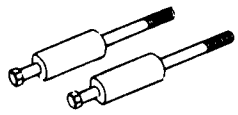
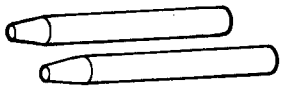
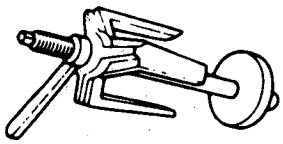
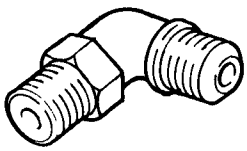
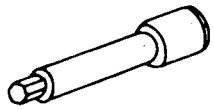
Inhibitor switch to transmission case	5 – 7 (3.6 – 5.1)
Manual shaft lock nut	29 – 39 (22 – 29)
Oil cooler pipe to transmission case	29 – 49 (22 – 36)
Test plug (oil pressure inspection hole)	5 – 10 (3.6 – 7.2)
Support actuator (parking rod inserting position) to rear extension	8 – 11 (5.8 – 8.0)
Drum 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)

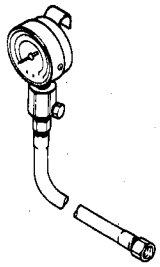
LUBRICANTS

	Specified lubricant	Quantity
Manual transmission oil	MOPAR Hypoid Gear Oil Part Number 3744994 or equivalent	2.3 lit. (2.4 U.S.qts., 2.0 Imp.qts.)
Automatic transmission fluid	DEXRON II type	7.0 lit. (7.4 U.S. qts., 6.2 Imp. qts.)
Sliding parts of selector lever	MOPAR Multi-Mileage Lubricant Part Number 2525035 or equivalent	Small amount

SEALANT

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

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 		MD998029 Main drive gear bearing installer 	
MD998359 Taper bearing puller 		MD998390 Sliding hammer 	Removal of oil pump
MD998393 Guides 	Assembly of oil pump and O.D. case	MD998391 Clutch spring compressor 	Assembly and disassembly of clutch
MD998394 Oil pressure gauge adaptor 	Use with oil pressure gauge	MD998392 Hex-head extension 	Loosening and tightening of one-way clutch inner race bolt

Tool (Number and name)	Use
C-3292 C-3293 Oil pressure gauge 	Measurement of oil pressure

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	.	.	.	.	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 slip.			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 wont 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 adn 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 accelerater pedal released in "D_4" range and engine vacuum pressure of about –60.0 kPa (–450 mmHg, –17.72 in.Hg).

Order	Test item	Procedure
	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.
	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.

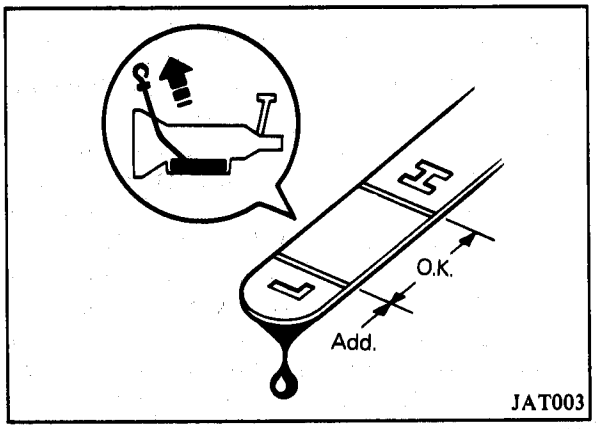
PRELIMINARY CHECKS (Prior to road testing)

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 U.S. pt., 3/4 Imp. 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.

Idling speed	850 ± 50 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 21-14. 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 Trouble-shooting Chart on page 21-10.

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.

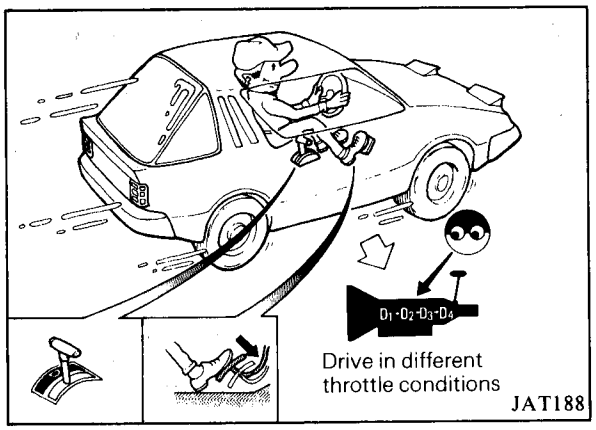
Neutral

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 21-21.



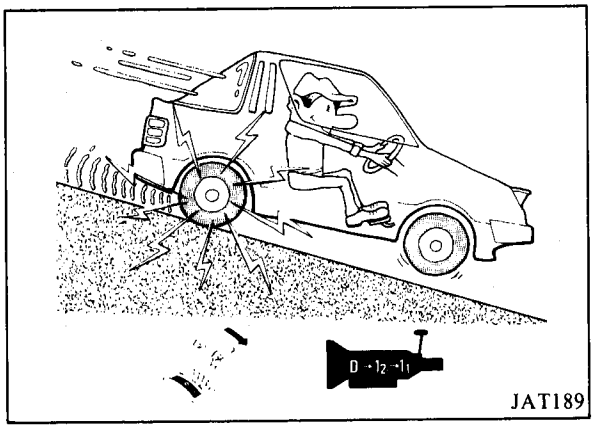
Range "2"

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).

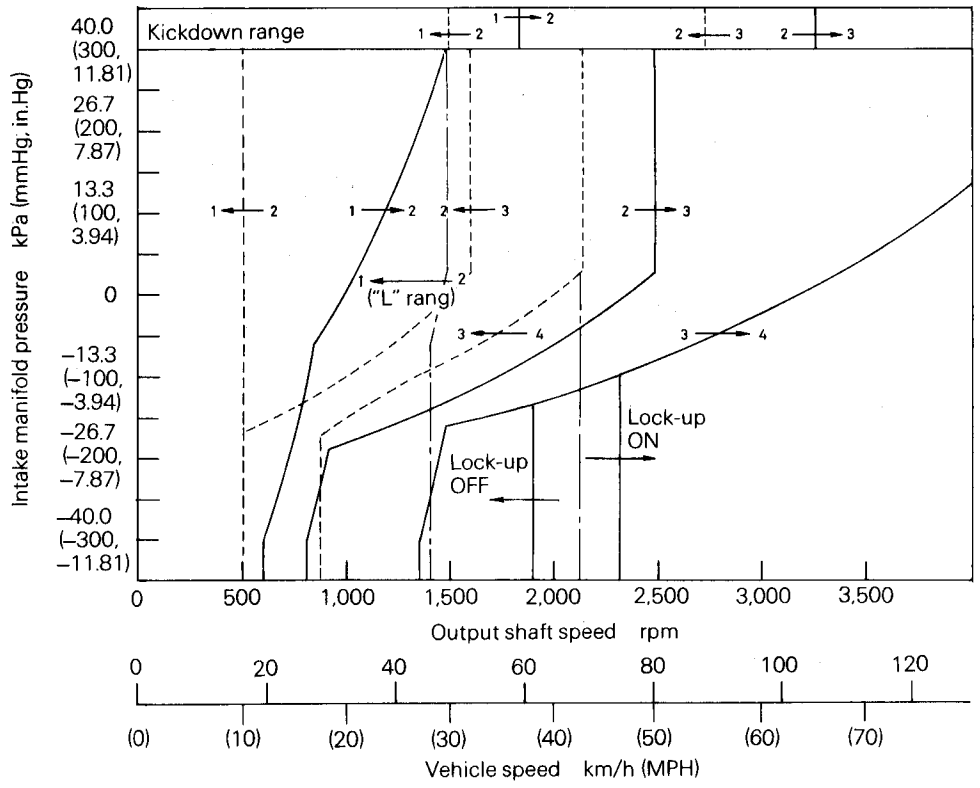
Record line pressure at each range and at each throttle vacuum in accordance with the pressure testing described below.



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

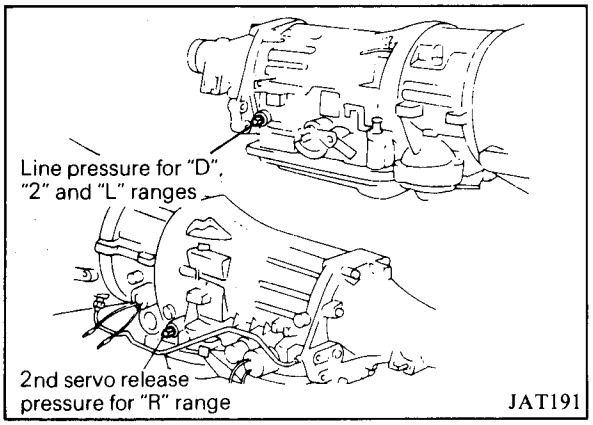
Shift Schedule



JAT190

PRESSURE TESTING

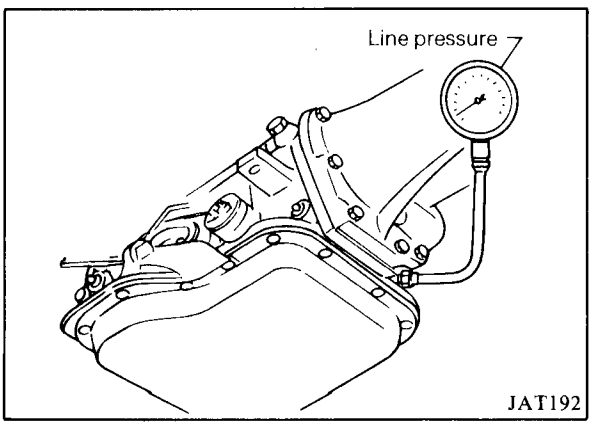
The transmission is provided with two pressure test ports.



JAT191

Line Pressure

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

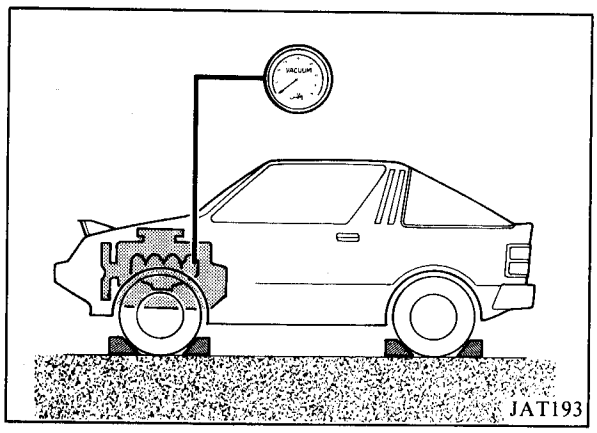


JAT192

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 operating temperatures.

Fluid temperature	50–80°C (122–176°F)

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

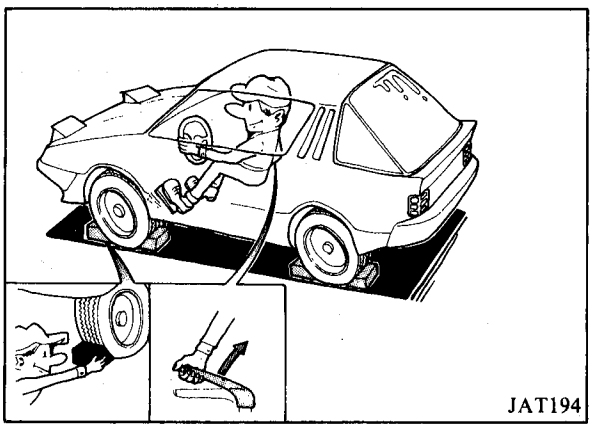
The stall test is an effective method of testing clutch and band holding ability, torque converter one-way clutch operation, and engine performance. A stall test should only be performed as a last resort because of the high fluid temperature it generates and the excessive load it places on the engine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

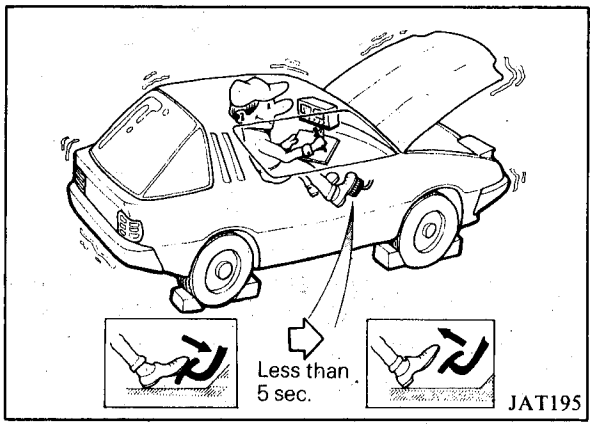
Stall Test Procedure

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.


JAT194

7. Quickly note the engine stall speed and immediately release throttle.

Stall engine speed	2,350—2,650 rpm

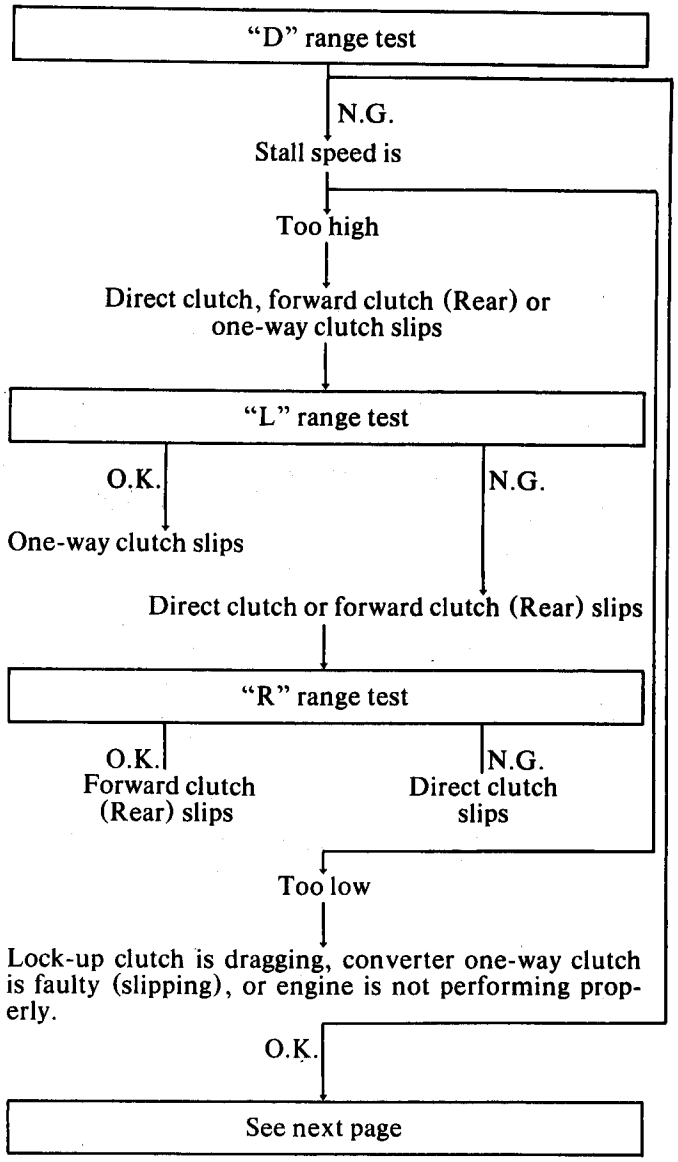


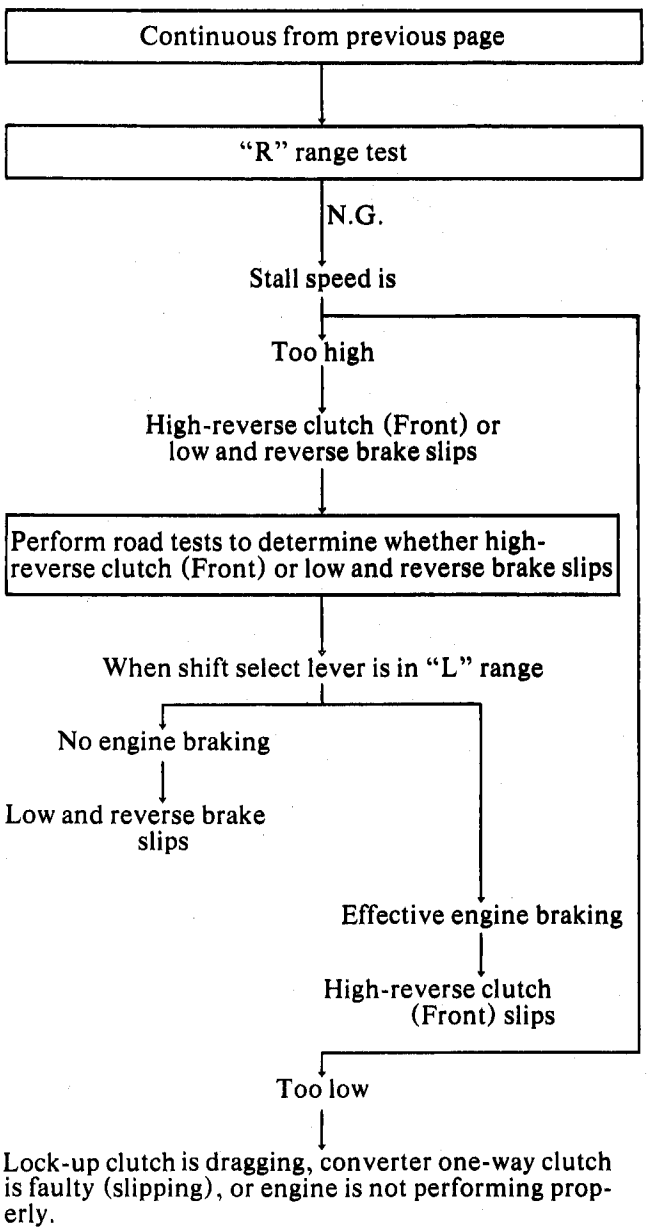
JAT195

8. Shift selector lever to "N".
9. Run eninge 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

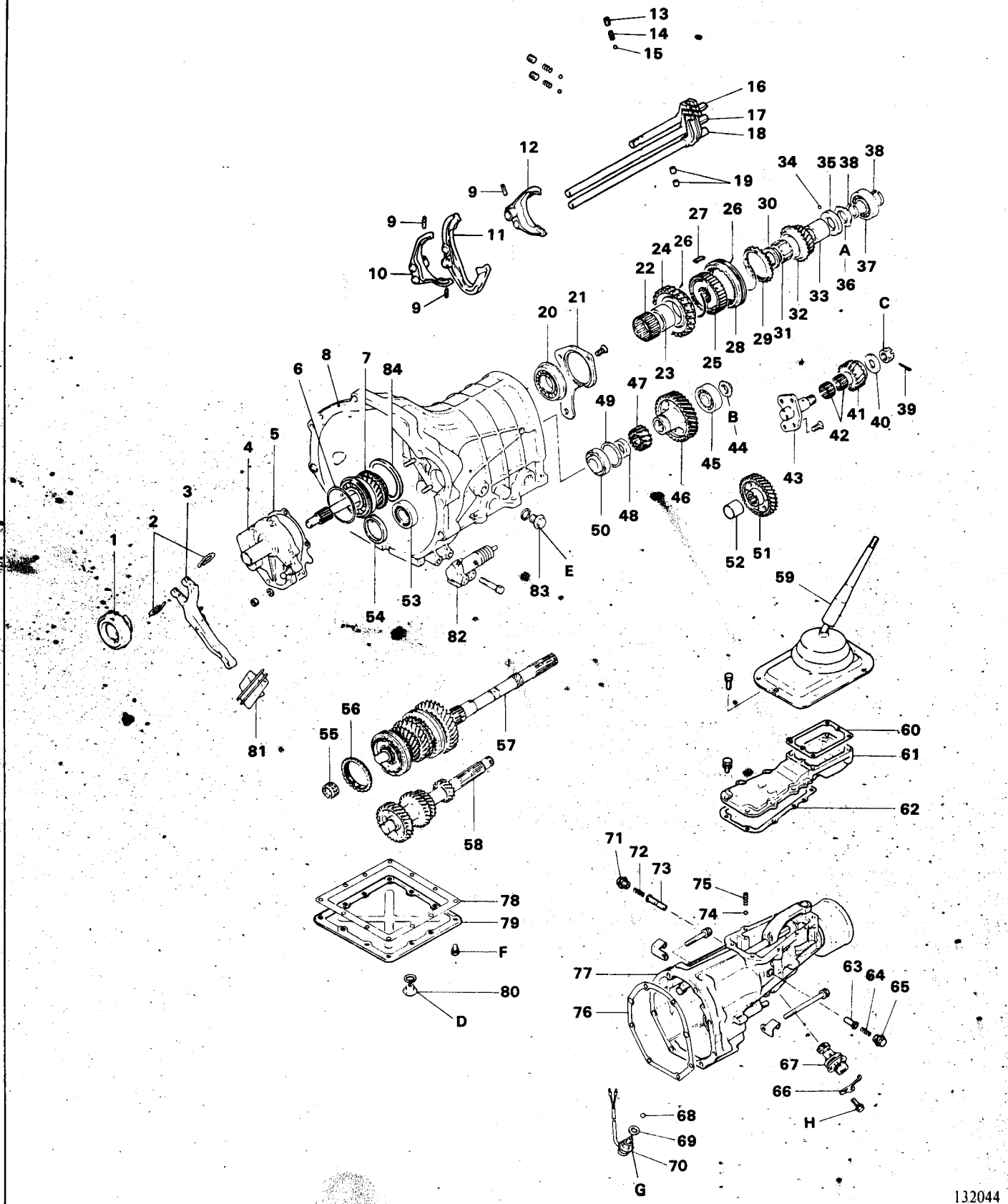
1. Satisfactory results in "D" range indicates forward clutch (Rear), direct clutch, high-reverse clutch (Front), one-way clutch of transmission, and one-way clutch of torque converter, are functioning properly.
   The analysis diagram is shown below.





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).

COMPONENTS



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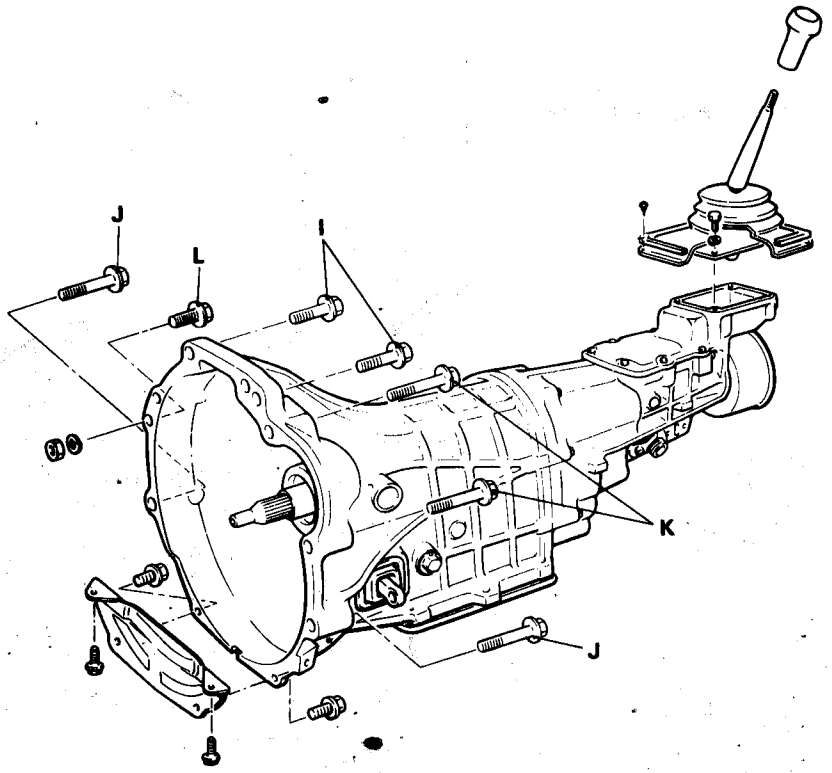
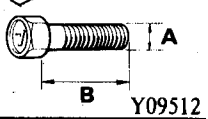


1. Clutch release bearing
2. Return clip (2)
3. Clutch release fork
4. Front bearing retainer
5. Front bearing retainer gasket
6. Snap ring
7. Main drive gear
8. Transmission case
9. Spring pin (2)
10. 3-4 speed shift fork
11. 1-2 speed shift fork
12. OD-R shift fork
13. Plug (3)
14. Poppet spring (3)
15. Poppet ball (3)
16. OD-R shift rail
17. 3-4 speed shift rail
18. 1-2 speed shift rail
19. Interlock plunger (2)
20. Mainshaft center bearing
21. Rear bearing retainer
22. Needle bearing
23. Bearing sleeve
24. Reverse gear
25. Synchronizer hub
26. Synchronizer spring (2)
27. Synchronizer key (3)
28. Synchronizer sleeve
29. Synchronizer ring
30. Bearing spacer
31. Needle bearing
32. Overdrive gear
33. Bearing sleeve
34. Steel ball
35. Spacer
36. Mainshaft lock nut
37. Mainshaft rear bearing
38. Snap ring (2)
39. Cotter pin
40. Thrust washer
41. Reverse idler gear
42. Needle bearing (2)
43. Reverse idler gear shaft
44. Countershaft lock nut
45. Counter rear bearing
46. Counter overdrive gear (KM132 – G only)
47. Counter reverse gear
48. Spacer
49. Spacer – select
50. Counter center bearing
51. Counter overdrive gear (KM132 – B only)
52. Spacer (KM132 – B only)
53. Counter front bearing
54. Spacer (KM132 – G only)
55. Needle bearing
56. Synchronizer ring
57. Mainshaft assembly
58. Counter gear
59. Control lever assembly
60. Control lever gasket
61. Extension housing cover
62. Gasket
63. Neutral return plunger "A"
64. Spring
65. Plug
66. Speedometer sleeve clamp
67. Speedometer gear assembly
68. Steel ball
69. Gasket
70. Back-up light switch
71. Plug
72. Spring
73. Neutral return plunger "B"
74. Steel ball
75. Resistance spring
76. Extension housing gasket
77. Extension housing
78. Under cover gasket
79. Under cover
80. Drain plug
81. Release fork boot
82. Clutch release cylinder
83. Oil filler plug
84. Spacer (KM132 – B only)

	Nm	ft.lbs.	O.D. x Length mm (in.)	Bolt identification
A	265 – 294	195 – 216	–	
B	157 – 186	116 – 137	–	
C	20 – 58	15 – 43	–	
D	58	43	–	
E	30 – 34	22 – 25	–	
F	8 – 9	6 – 7	–	
G	30	22	–	
H	10 – 12	7.5 – 9	–	
I	43 – 55	31 – 40	⑦ 10 × 40 (1.6)	⑦ A × B
J	43 – 55	31 – 40	⑦ 10 × 65 (2.6)	
K	22 – 32	16 – 23	⑦ 10 × 60 (2.4)	
L	20 – 27	14 – 20	⑦ 8 × 55 (2.2)	

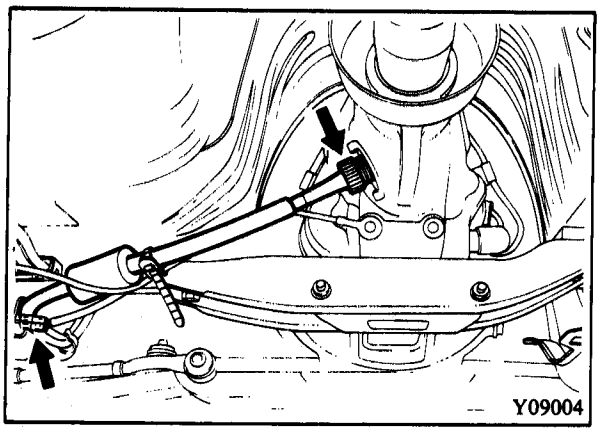


Y09512

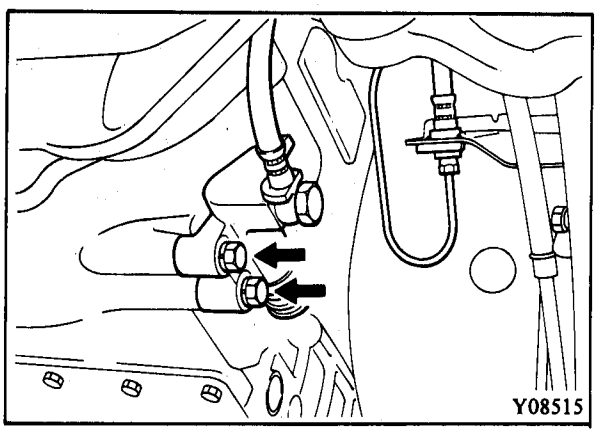
09Y548

REMOVAL

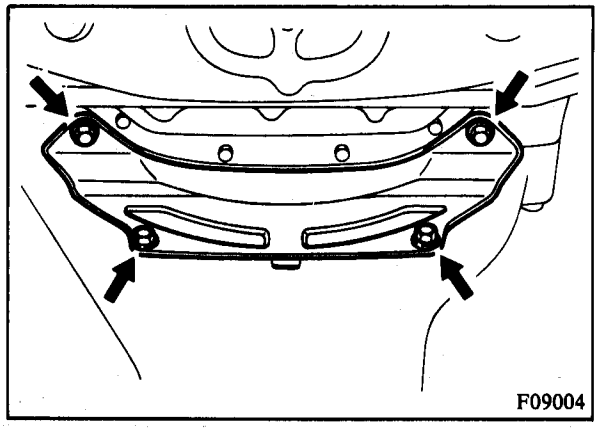
1. Drain the transmission oil.
2. Remove the propeller shaft.
3. Disconnect the speedometer cable and the back-up light switch harness. (Y09004)



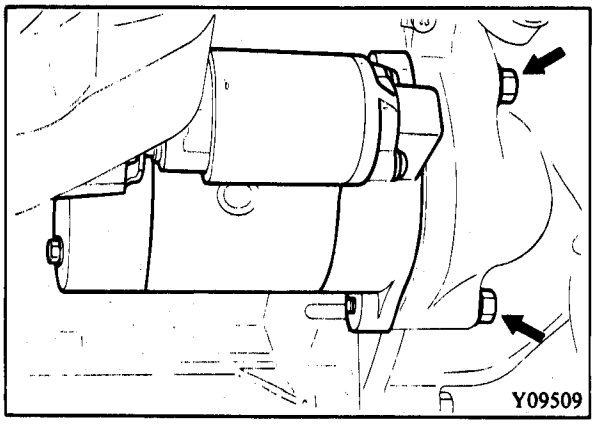
4. Remove the clutch release cylinder.



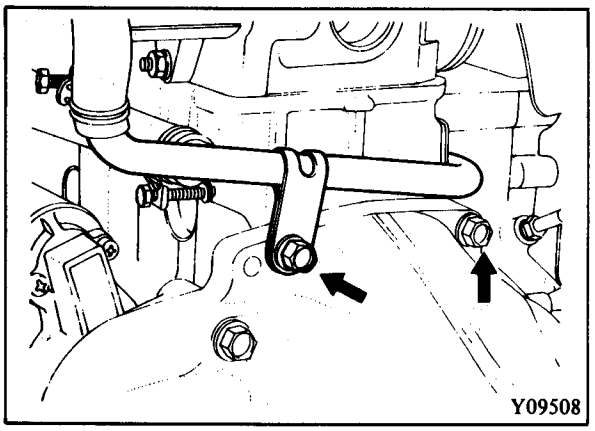
5. Remove the bell housing cover.



6. Remove the starting motor.

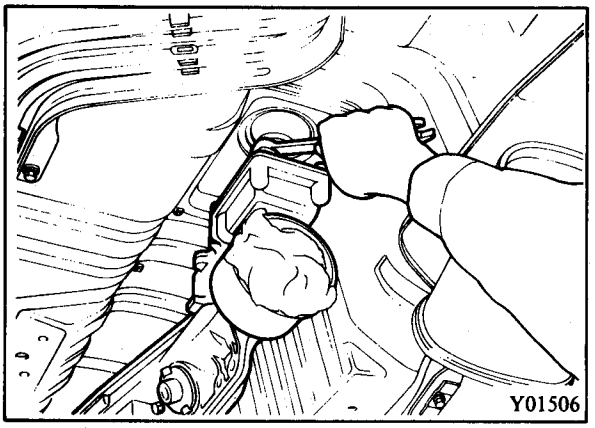


7. Remove the two upper transmission mounting bolts from the bell housing. (Y09508)
8. Remove the remaining transmission mounting bolts.
9. Support the transmission with a jack.
10. Remove the engine support bracket, insulator assembly and the ground cable.

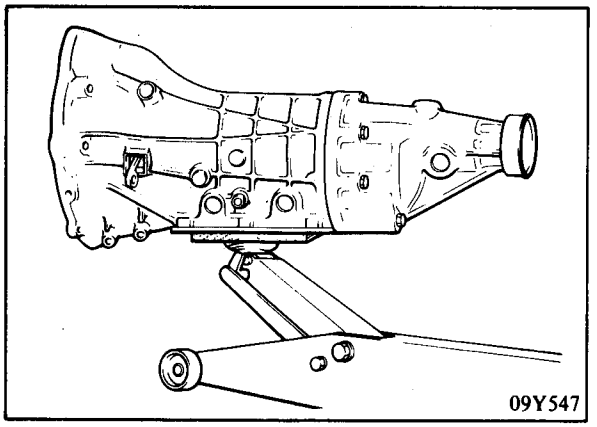

Y09508

11. Remove the gearshift lever assembly while the lever is in the neutral position as shown in the illustration.

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


Y01506

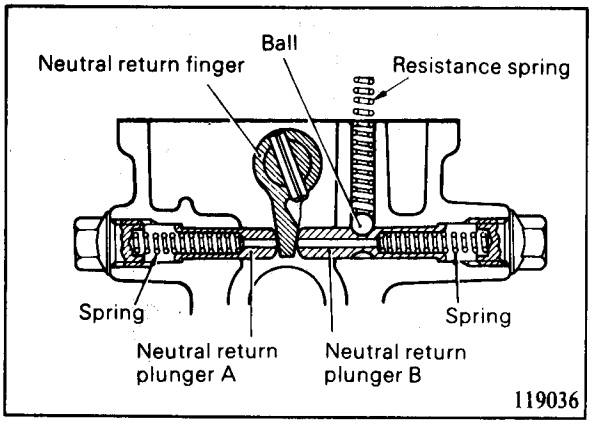
12. Remove the transmission.


09Y547

DISASSEMBLY

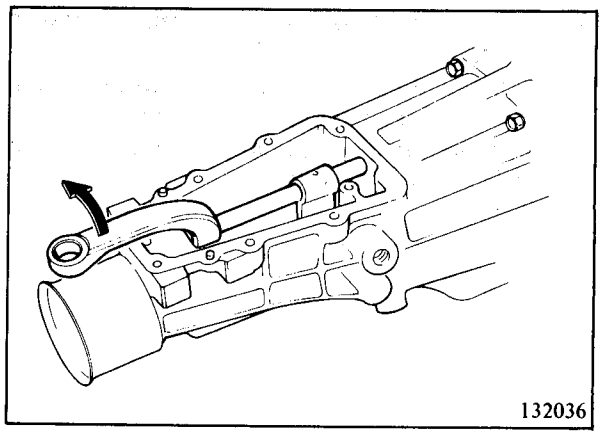
Extension Housing

1. Remove the control lever assembly.
2. Remove the extension housing cover and gasket.
3. Remove the resistance spring and steel ball from the extension housing. (119036)
4. Remove two plugs, and take out springs and neutral return plungers A and B. (119036)
5. Remove the back-up light switch and the steel ball.
6. Remove the speedometer sleeve clamp and pull out the speedometer sleeve assembly.
7. Remove the extension housing mounting bolts.

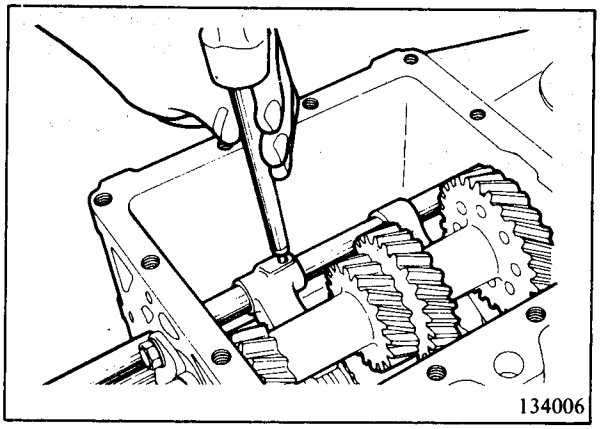


119036

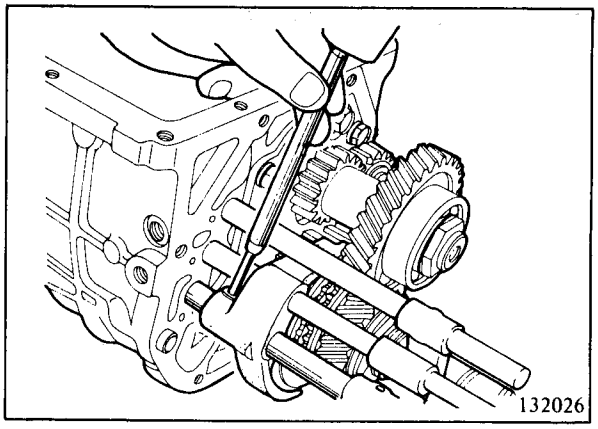
8. Push change shifter down to left side to move control finger from selector grooves. Then remove extension housing by pulling rearward. (132036)
9. Place transmission upside down on bench.
10. Remove the transmission under cover.


132036

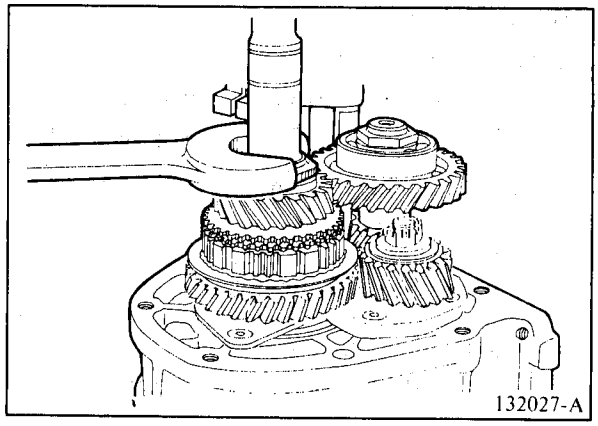
11. Using a pin punch, drive out 3-4 and 1-2 shift fork spring pins. (134006)


134006

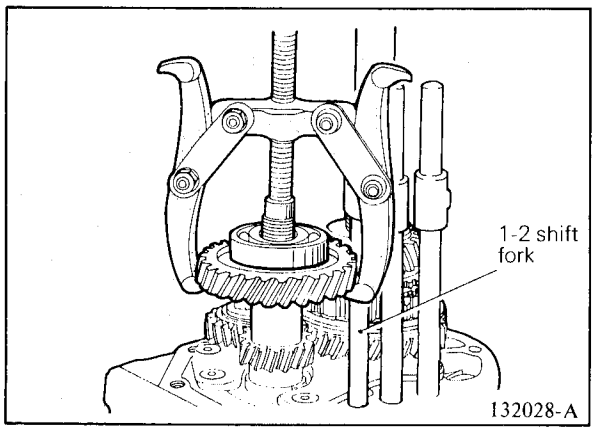
12. Drive out overdrive and reverse shift fork spring pin.

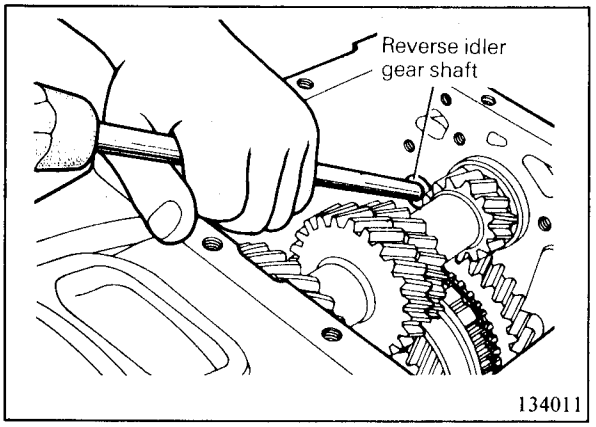

132026

13. Place transmission front side down.
14. Remove the mainshaft rear bearing and snap rings.
15. Bend back the locking nut lock and loosen two locking nuts (mainshaft and countershaft rear ends). Nuts can be loosened by double-engaging reverse and 2nd gears.
16. Remove the poppet plugs, and take out the poppet springs and steel balls.

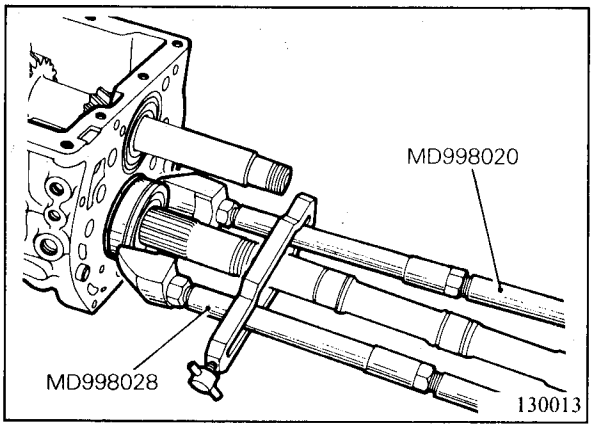

132027-A

17. Use a gear puller to remove the counter overdrive gear and the ball bearing. Remove these parts and the 1-2 shift rail at the same time. (132028)
18. Remove the spacers and counter reverse gear from countershaft gear.
19. Remove the 3-4 shift rail toward rear of case.
20. Remove the OD-R shift rail and shift fork.
21. Remove the interlock plungers from case.
22. Remove the spacer, steel ball, overdrive gear, needle bearing and bearing spacer from mainshaft.
23. Remove the bearing sleeve, overdrive synchronizer assembly, reverse gear, needle bearing, bearing sleeve and spacer from the main shaft.
24. Remove the locking nut from the reverse idler gear shaft.
25. Remove the thrust washer, reverse idler gear and needle bearing.
26. Remove reverse idler gear shaft retaining bolts.
27. Remove the reverse idler gear shaft by driving from the inside of the case with a punch.
28. Remove the rear bearing retainer from the rear end of case.
29. Remove the front bearing retainer from the case.

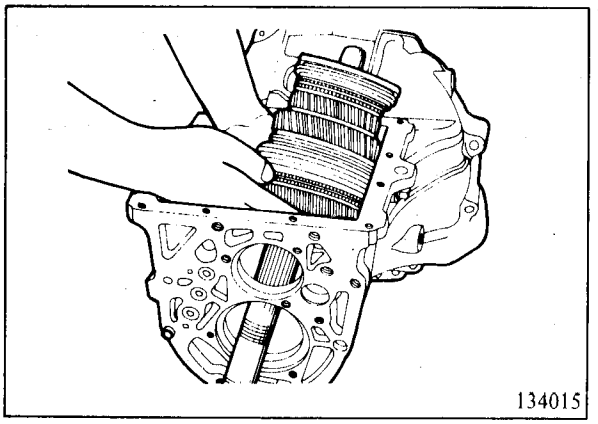




30. Remove mainshaft center bearing snap ring.
31. Remove mainshaft center bearing with bearing puller (MD998020) and adapter (MD998028). (130013)
32. Remove the outer races of counter gear front and rear bearings from the case.
33. Pull the counter gear up in the case and remove the main drive gear with bearing toward front of case.
34. Remove the counter gear from the transmission case.



35. Remove the shift forks from the mainshaft.
36. Remove mainshaft assembly from transmission case.

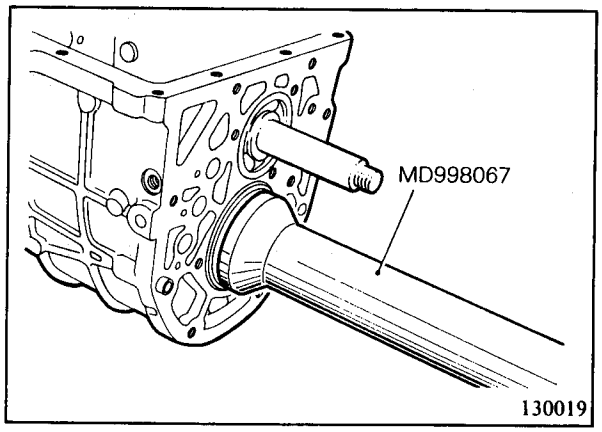


REASSEMBLY

1. Install the mainshaft assembly into case.
2. Install the 1-2 and 3-4 shift forks to the synchronizer sleeves of mainshaft assembly.
3. Install the counter gear into the case.
4. Install the needle bearing to the front end of mainshaft.
5. Install the synchronizer ring onto the 3rd speed gear.
6. Hold the counter gear upward in the case and install the main drive gear assembly.
7. Install the taper bearing outer races to the front and rear of counter gear.

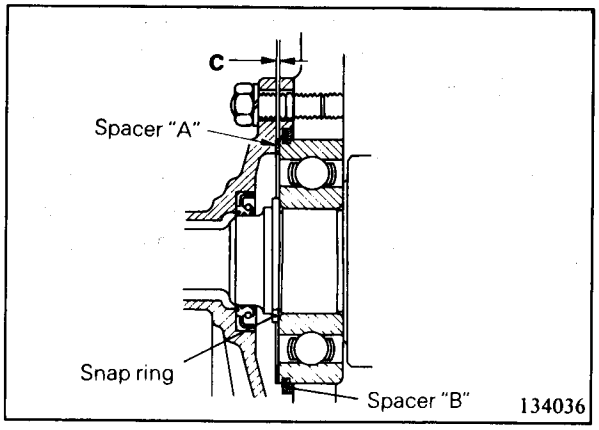
8. Install mainshaft center bearing with special tool (MD998067).

NOTE
When the center bearing is driven into place, force is applied to the 3-4 speed synchronizer. After installation of the center bearing, make sure that the synchronizer ring is not caught on the 4th speed gear.



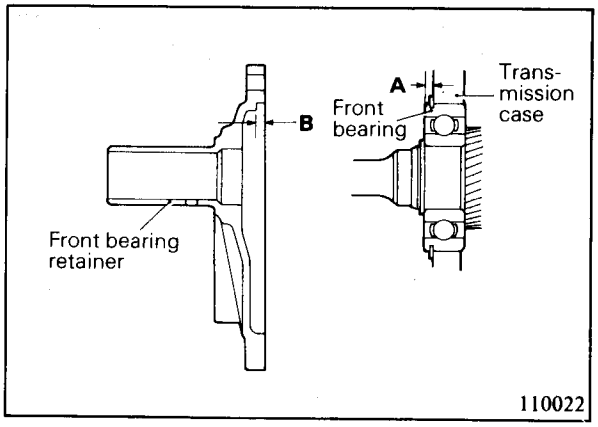
9. When installing retainer, select spacer "A" so that clearance "C" will be of standard value.

Retainer to bearing clearance C .....
0 — 0.1 mm (0 — .004 in.)



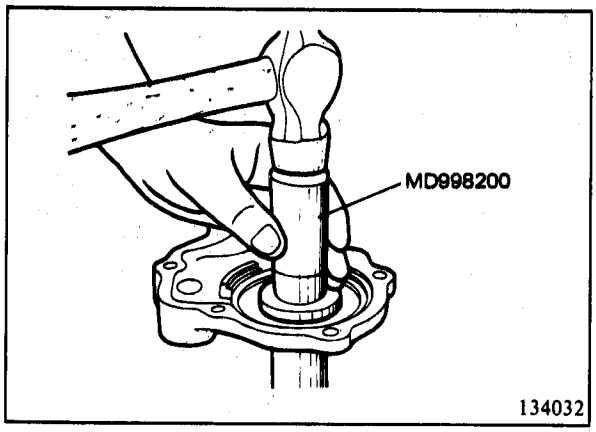
(1) Measure dimensions of A and B.
(2) Select proper spacer per following formula.
Thickness of spacer = [B + 0.3 mm (.012 in.) – A] – [0 to 0.1 mm (0 to .004 in.)]

Thickness of spacer mm (in.)	Identification color
0.84 (.033)	Black
0.93 (.037)	None
1.02 (.040)	Red
1.11 (.044)	White
1.2 (.047)	Yellow
1.29 (.051)	Blue
1.38 (.054)	Green

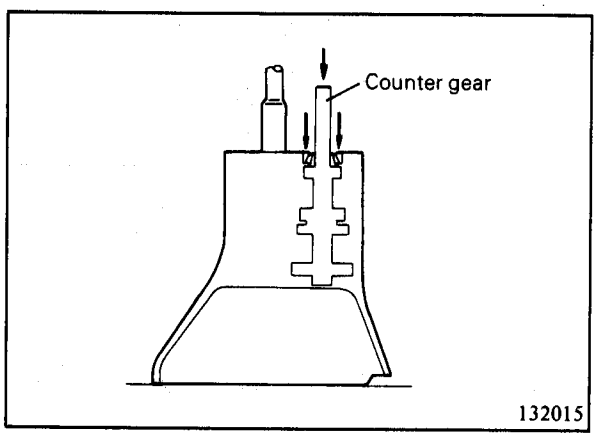


10. Install oil seal to front bearing retainer. When installing oil seal, apply grease to oil seal lip and drive in oil seal, using Special Tool, Oil Seal Installer (MD998200).
11. Apply sealant to both sides of new front bearing retainer gasket and install gasket to retainer.
12. Apply grease on spacer selected in paragraphs 1 and 2 above and position spacer on retainer and then install retainer onto case.
13. Install and torque retainer attaching nut as specified.

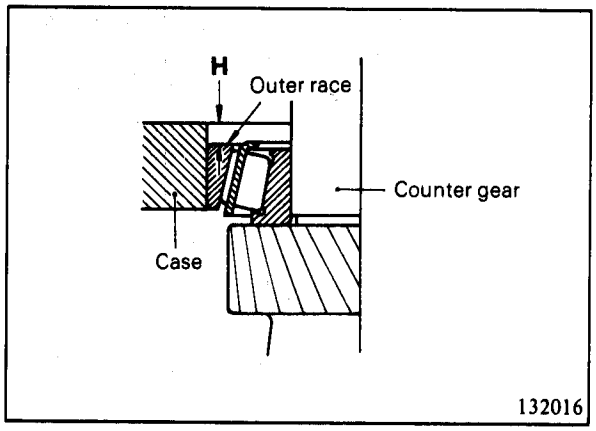
Front bearing retainer nuts ..... 10—12 Nm (7.5—9.0 ft.lbs.)



14. Counter gear end play should be adjusted with a spacer installed on the rear side of outer race of center taper roller bearing. This spacer is held down by rear bearing retainer and reverse idler gear shaft.
    Adjust counter gear end play as follows:
    (1) Without attaching rear bearing retainer and reverse idler gear shaft, place transmission on work bench as shown in illustration. (132015)
    (2) Hold down counter gear and bearing outer race (in the direction of arrow shown in illustration). (132015)

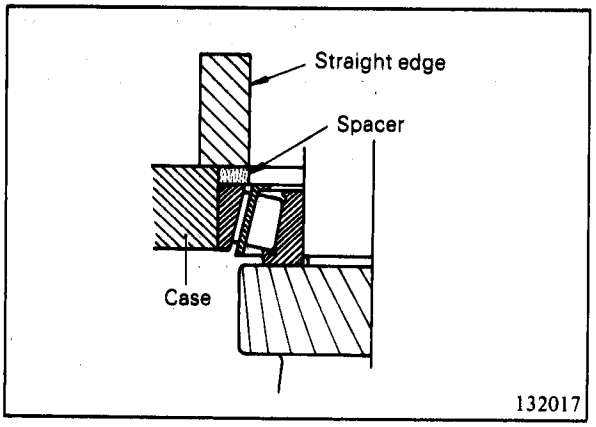


    (3) Put a spacer of proper thickness (slightly thinner than dimension "H" shown in illustration) on outer race. (132016)

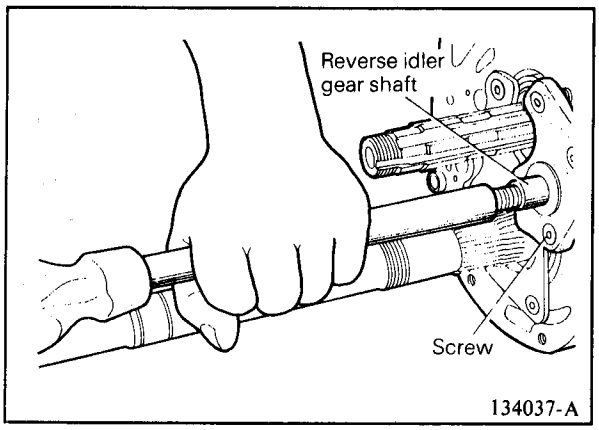


    (4) Put straight edge on spacer and try to turn spacer by index finger. If spacer turns lightly, replace it with spacer one rank [0.03 mm (.0012 in.)] thicker, and similarly turn this spacer. In this manner, choose and install a spacer which makes clearance between straight edge and spacer closest to 0. Make sure that the bearings are NOT preloaded.

Counter gear end play ..... 0—0.05 mm (0—.0020 in.)

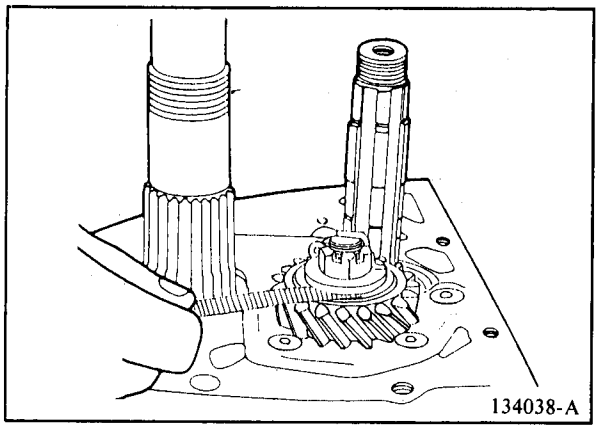


15. Install the rear bearing retainer.
16. Apply screw lock cement to the retainer screws and tighten the screws firmly.
17. Install reverse idler gear shaft. When installing shaft, install screws as guide. (134037-A)
18. Install needle bearing, reverse idler gear and thrust washer. Lock them with a nut. Then install cotter pin to lock nut in place.
    Install thrust washer with rounded edge toward the front of the case.

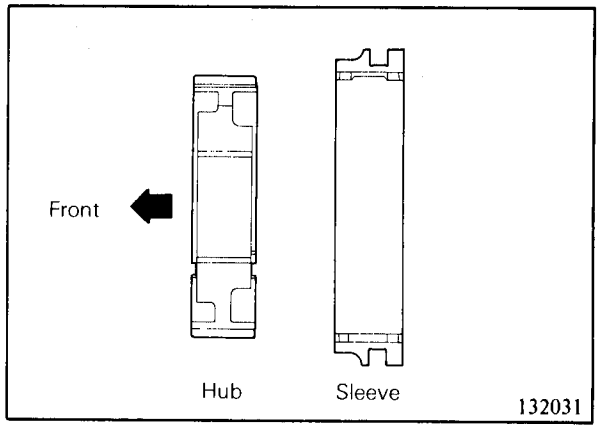


19. Check reverse idler gear end play.

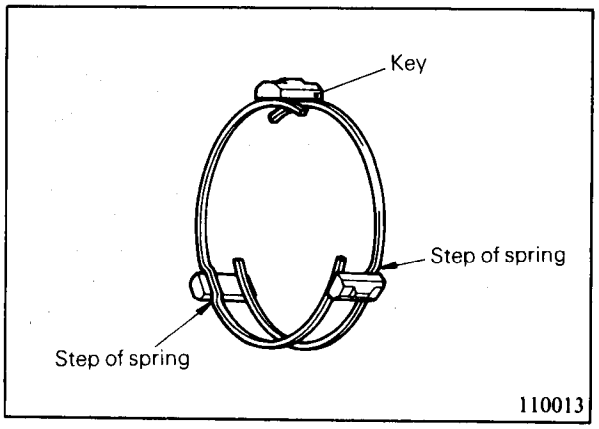
Reverse idler gear end play ..... 0.12—0.28 mm (.005—.011 in.)



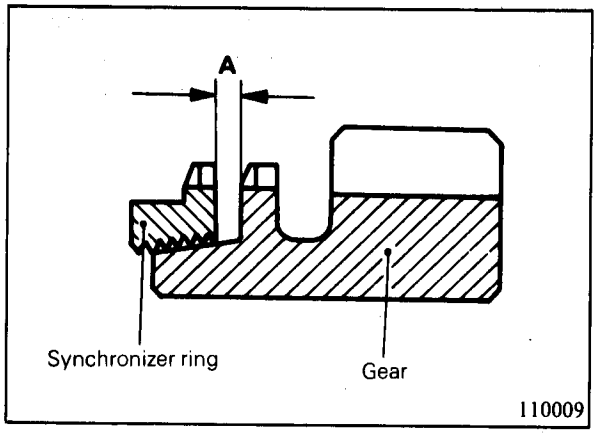
20. Assemble synchronizer hub and sleeve. Make sure that hub and sleeve slide smoothly.
21. Insert three keys into groove of hub. Assemble hub and keys as shown in illustration since they have a definite direction to be assembled. (132031)



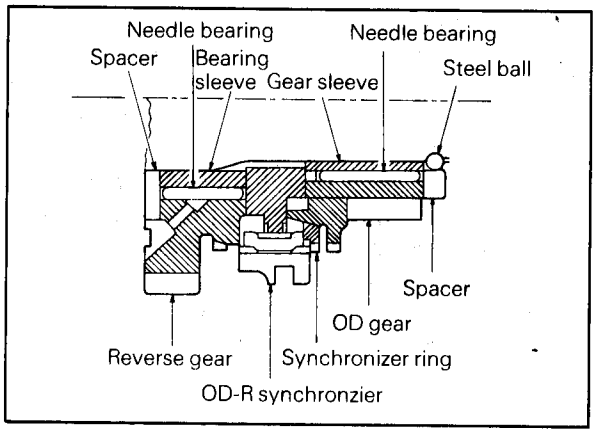
22. Install two synchronizer springs. When installing springs, make sure that steps of front and rear springs are positioned on synchronizer key, but not on the same key.

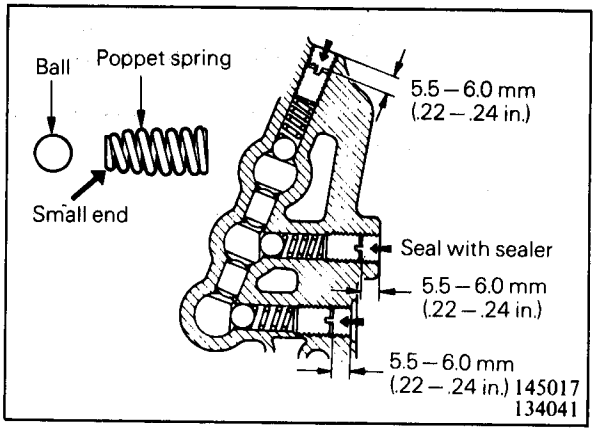


23. Engage synchronizer ring to OD gear as shown in illustration before installing OD gear and ensure that there is certain clearance "A". If dimension "A" is less than 0.5 mm (.020 in.), replace ring and/or gear. (110009)



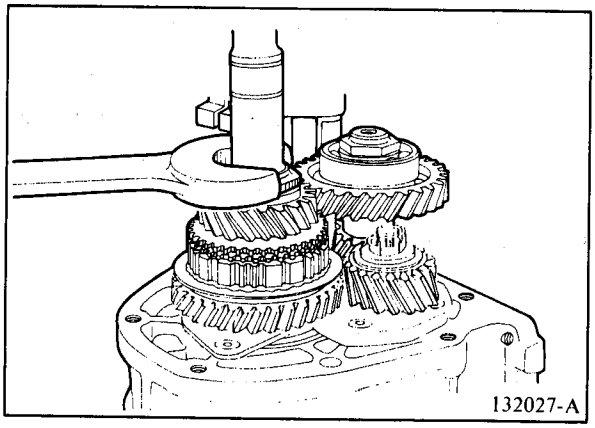
24. Install the spacer, reverse gear, needle bearing, bearing sleeve and OD-R synchronizer assembly.
25. Install the OD gear sleeve, bearing spacer and needle bearing.
26. Install the synchronizer ring and OD gear.
27. Insert the steel ball into the hole of mainshaft and install the spacer.
28. Insert the two interlock plungers into holes in transmission case.
29. Insert the OD-R shift rail through the OD-R shift fork and into the transmission case.
30. Insert the 3-4 shift rail through the OD-R shift fork and into the case. Then insert the shift rail into the 3-4 shift fork.
31. Install the spacers and counter reverse gear to the rear end of counter gear.
32. Insert the 1-2 shift rail to the case and install the counter overdrive gear to the counter gear shaft.
33. Insert ball and poppet spring into each shift rail. Tighten plug to specified position. Install poppet spring with small end on ball side. After installation, seal plug head with sealer. Insert poppet spring with small end on ball side.
34. Install the ball bearing onto the rear end of counter gear.



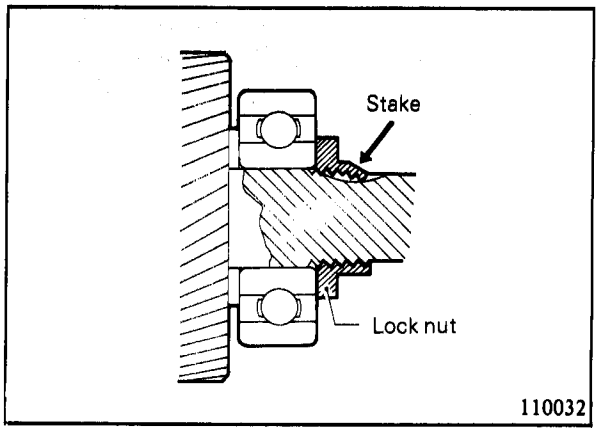


35. Tighten the mainshaft and counter gear locking nuts to the specified torque. Locking nuts can be tightened by double-engaging reverse and 2nd gears.

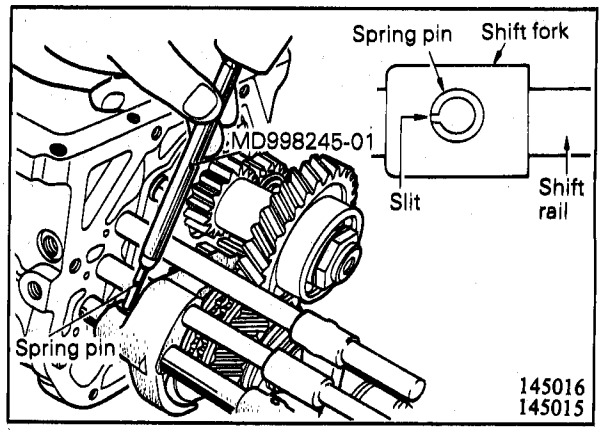
Mainshaft lock nut	99 – 127 Nm (73 – 94 ft.lbs.)
Counter gear lock nut	69 – 98 Nm (51 – 72 ft.lbs.)



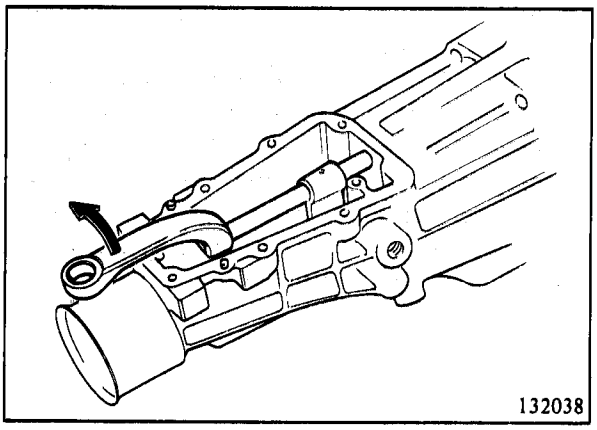
36. Carefully stake the shoulder of the locknut as shown in illustration to prevent it from loosening. (110032)
37. Ensure that OD gear rotates smoothly.



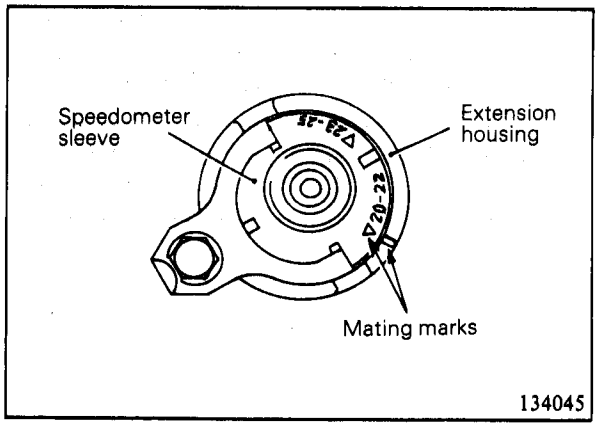
38. Using Special Tool, Lock Pin Installer (MD998245-01), drive in OD-R shift fork spring pin.
    Drive in spring pin so as to place slit in direction of center line of shift rail. Drive in spring pin for 3-4 and 1-2 shift forks in the same manner.
39. Install the snap ring (front) for mainshaft rear bearing. Then, drive the mainshaft rear bearing into place with special tool (MD998067). Lastly, install the snap ring (rear) for mainshaft rear bearing.
40. Apply sealant to both sides of new extension housing gasket and install gasket to the case.



41. When installing extension housing, tilt change shifter fully down to left, and fit control finger in groove provided in selector.
42. Apply sealant to threaded portions of extension housing mounting bolts, whose threaded holes penetrate into the case.
43. Install bolts and torque to 15 — 21 Nm (10 — 15 ft.lbs.).

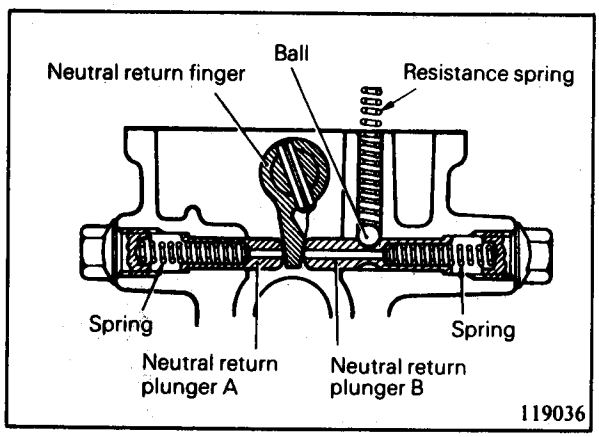


44. Install the speedometer sleeve assembly to the extension housing.
    Number embossed on flange surface of speedometer sleeve indicates the number of speedometer driven gear teeth.
    Align ▽ mark before embossed number of teeth with ∪ mark on extension housing properly.
45. Install the speedometer sleeve clamp and tighten the bolt.



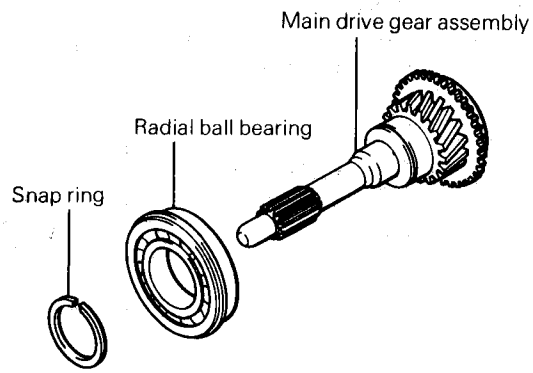
46. Insert the steel ball and install the back-up light switch.
47. Install neutral return plungers A and B and springs. Then install steel ball and resistance spring, and tighten the seal plugs.

Resistance spring free length	28 mm (1.10 in.)
Plunger spring free length	42 mm (1.65 in.)



48. Install the gasket and the extension housing cover to the extension housing.
49. Apply sealant to the both sides of control lever gasket and install the gasket to extension housing.
50. Install the control lever assembly.

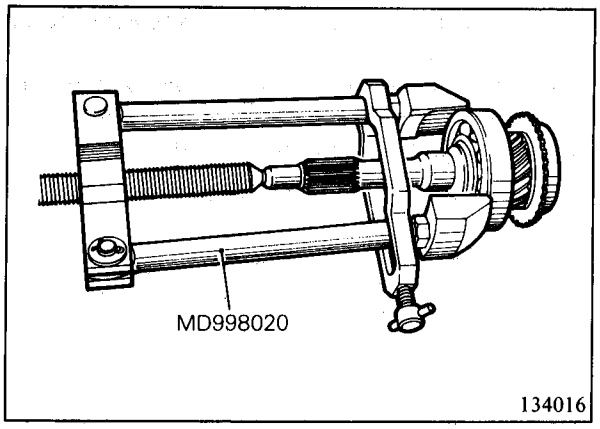
COMPONENTS



110038

DISASSEMBLY

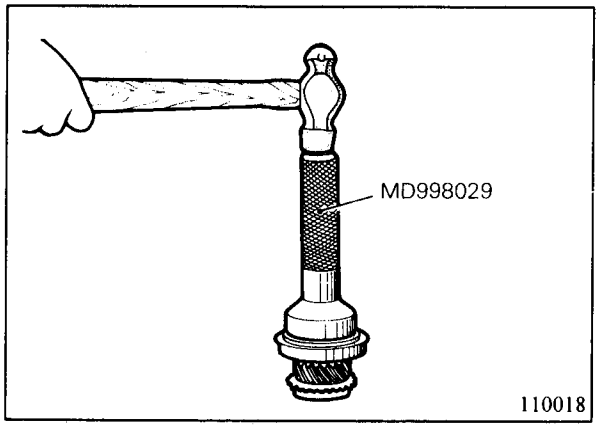
1. Remove main drive gear snap ring and bearing snap ring.
2. Using Special Tool, Bearing Puller (MD998020), pull ball bearing from main drive gear.



134016

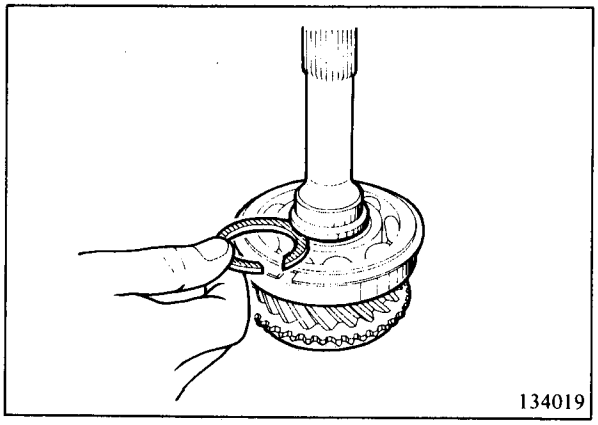
REASSEMBLY

1. With Special Tool, Bearing Installer (MD998029), applied to main drive gear, press bearing in by means of a hammer or a press.



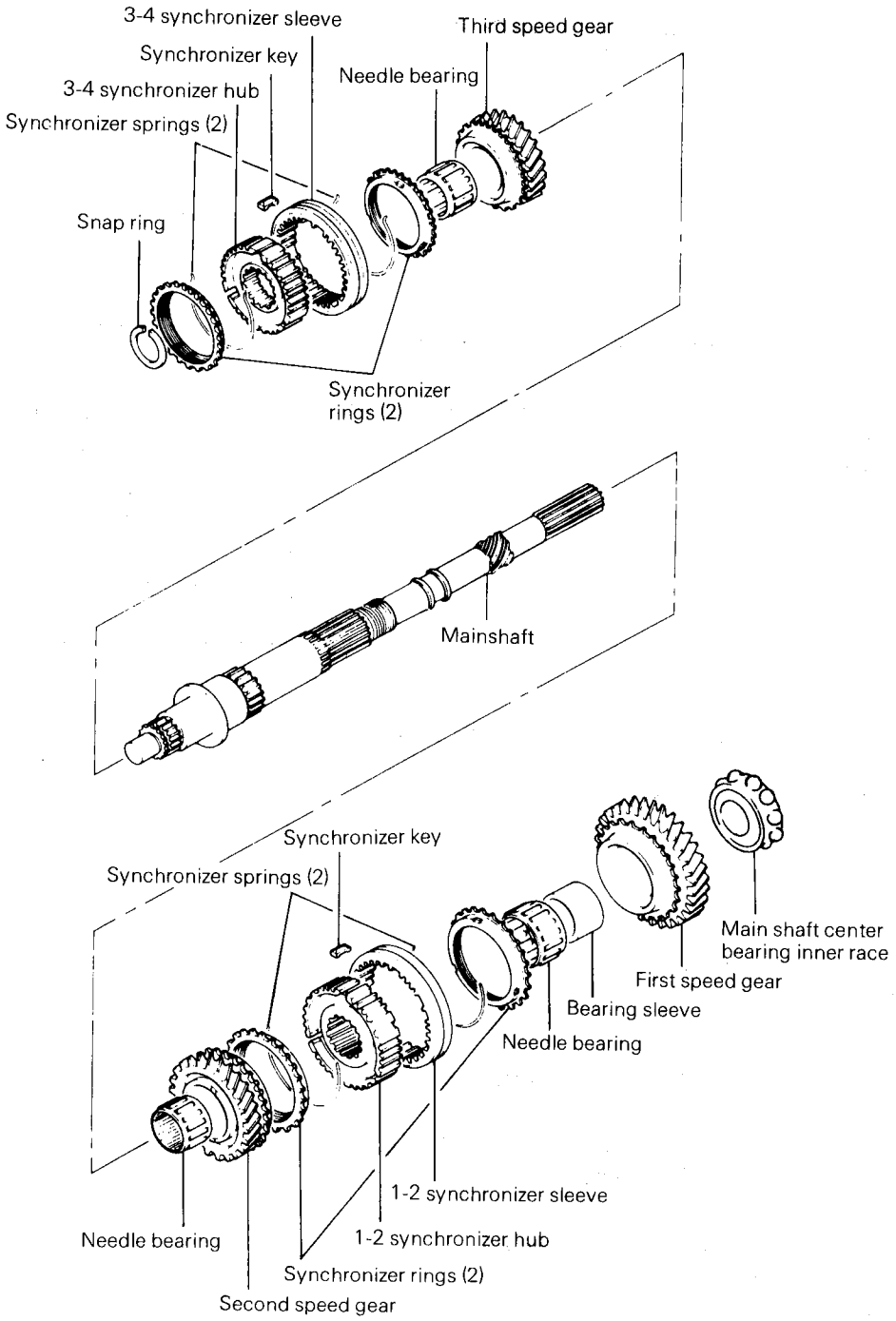
110018

2. Select and install main drive gear snap ring of such thickness that will minimize clearance between snap ring and bearing. In other words, install the thickest snap ring that can fit in snap ring groove.



134019

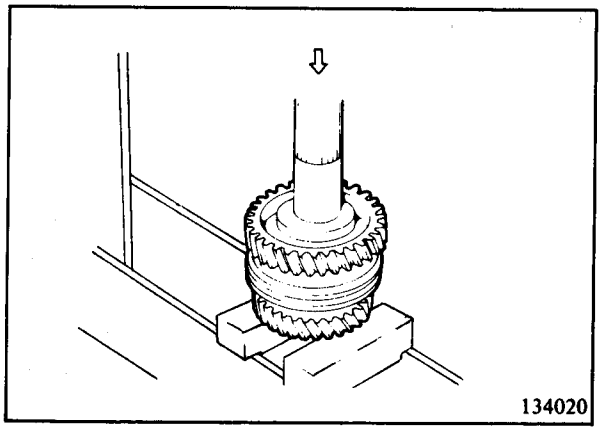
COMPONENTS



132039

DISASSEMBLY

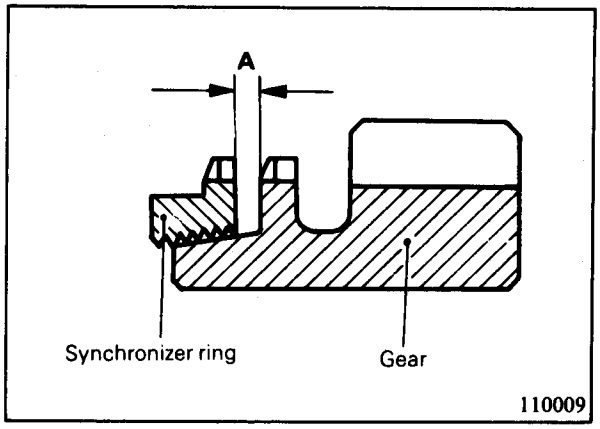
1. Support second speed gear on press base, and push rear end of mainshaft to remove bearing inner race, gear bearing sleeve, first speed gear, 1-2 synchronizer and second speed gear. (134020)
2. Remove the snap ring from the front end of mainshaft.
3. Remove the 3-4 synchronizer, third speed gear and needle bearing.



INSPECTION

Synchronizer Ring

1. Check synchronizer ring for worn and damaged internal threads.
2. With synchronizer assembled to cone of each gear, check dimension "A".
   If "A" is less than 0.5 mm (.020 in.), replace synchronizer ring and/or gear.



Synchronizer Assemblies

1. Inspect synchronizer assemblies for wear or breakage. Make sure that the sleeve moves freely on the hub.
2. Inspect the synchronizer springs for distorsion.
3. Inspect the synchronizer keys for damage.

Gears and Shafts

1. Check all gears for excessive wear, chips or cracks; replace as required.
2. Check shafts for bending, wear and worn splines; replace if necessary.

Bearings

1. Thoroughly clean bearings and dry with compressed air.

Caution
Do not allow bearings to spin as this will damage the races, balls or rollers. Turn them slowly by hand.

2. Exert lateral and radial pressure against the races and turn the bearings; check for rough or uneven feel.
3. Visually inspect all bearings for wear or damage.

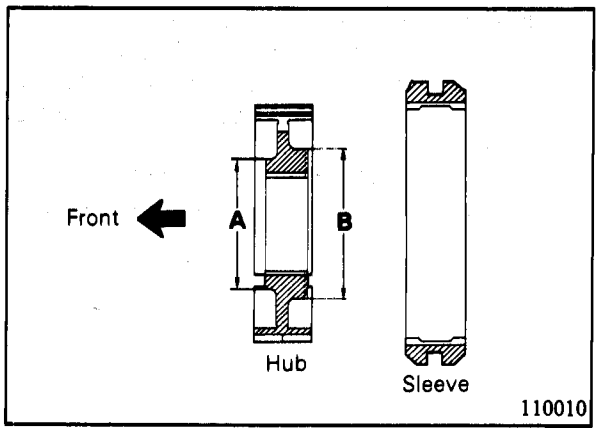
Case and Housings

1. Inspect the transmission case and the extension housing for cracks or damage.
2. Inspect the front bearing retainer for cracks, distorsion or damage.

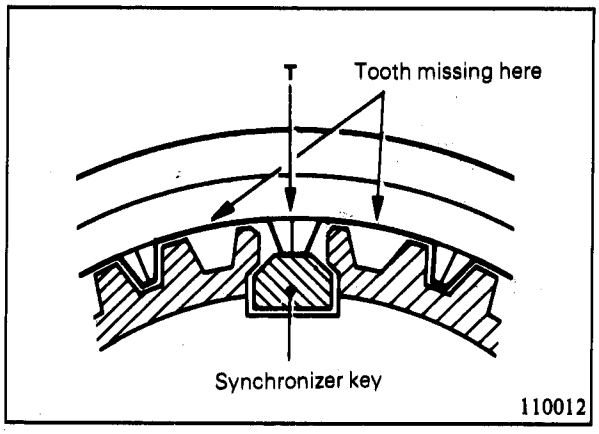
REASSEMBLY

Synchronizer

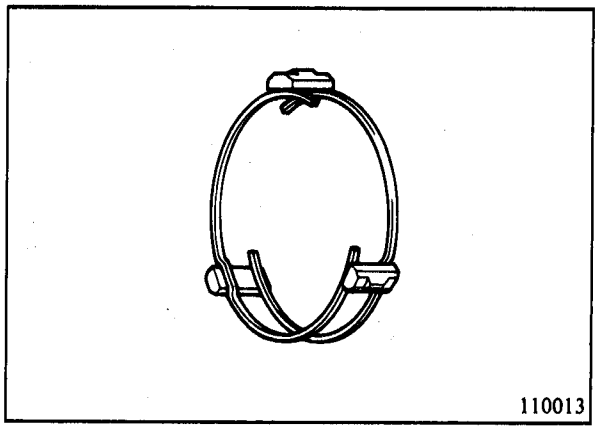
1. Install 3-4 synchronizer hub with smaller diameter side "A" of center boss directed toward front.
2. 3-4 synchronizer sleeve, 1-2 synchronizer hub and sleeve may be installed in either direction. However, be sure not to change their originally installed directions when they are reinstalled.



3. Synchronizer sleeve has tooth missing at three or six portions.
   Assemble hub to sleeve in such a way that center tooth "T" between two missing teeth will touch synchronizer key.

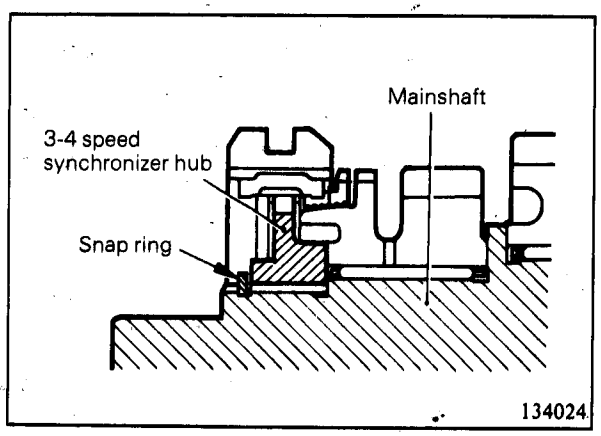


4. When synchronizer springs are installed, make sure that front and rear ones are not faced in same direction.

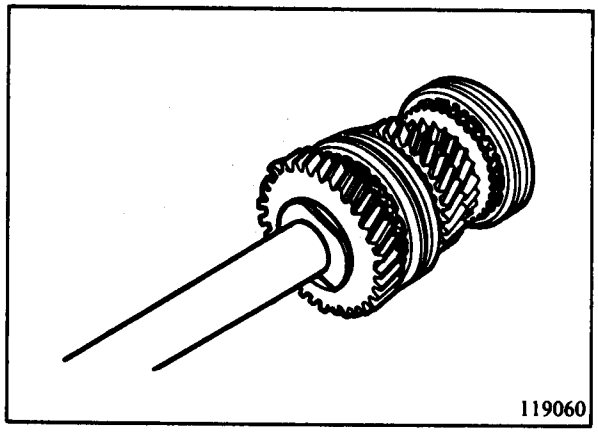


Mainshaft

1. Select and install the thickest mainshaft front end snap ring, that will fit into the snap ring groove.

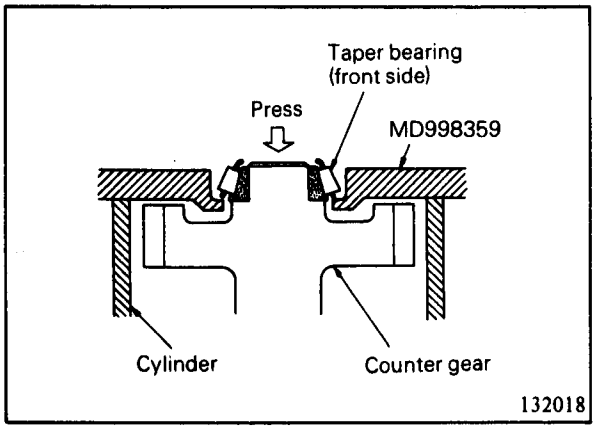


2. Make sure that 3rd speed gear turns smoothly.
3. After installation of 2nd speed gear, 1-2 synchronizer and 1st speed gear, push bearing spacer firmly by hand toward 1st speed gear and make sure that 1st and 2nd speed gears turn smoothly.
4. Check all parts for free movement.
5. Press in the center bearing inner race to the mainshaft.

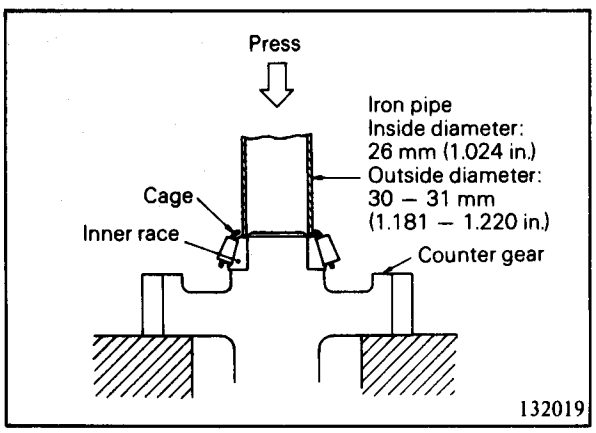

119060

TAPER BEARING REPLACEMENT PROCEDURE

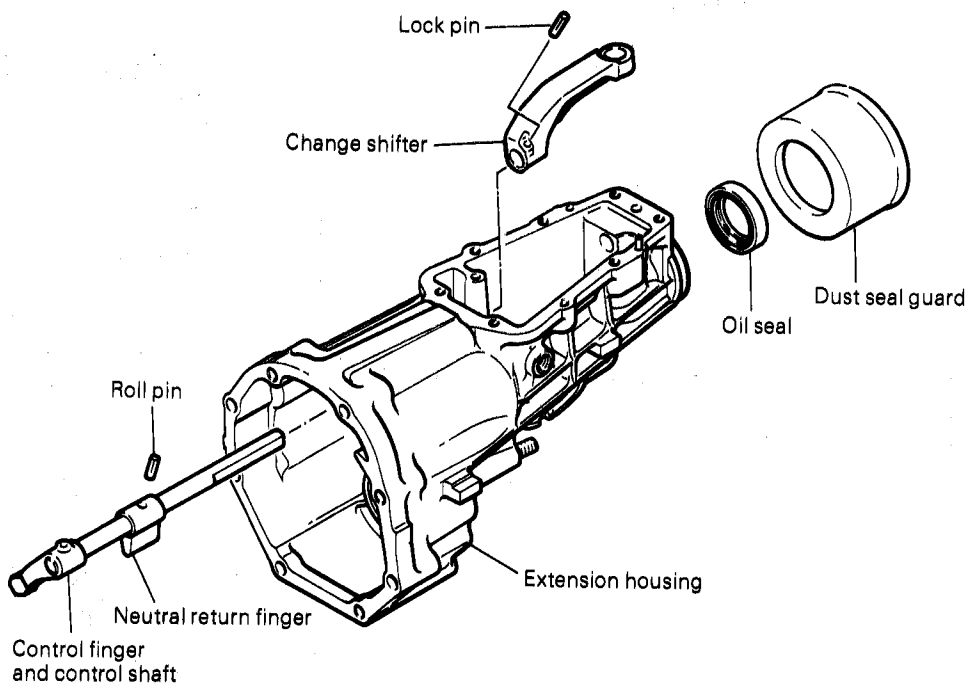
1. Use special tool (MD998359) to support the front and rear counter gear bearings while pressing them from the counter gear.



2. Using iron pipe specified in illustration, press fit inner race of taper bearing.
   Use care not to deform cage.



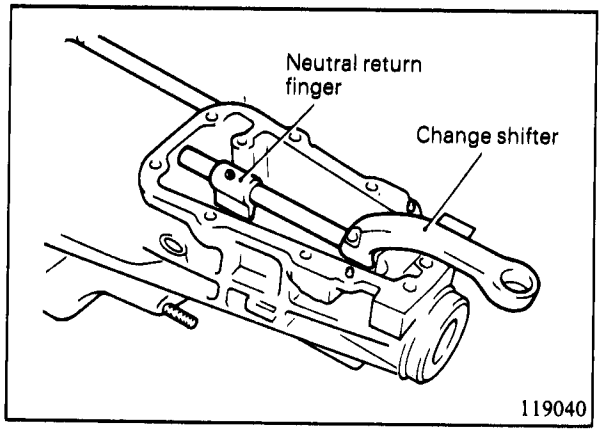
COMPONENTS



132040

DISASSEMBLY

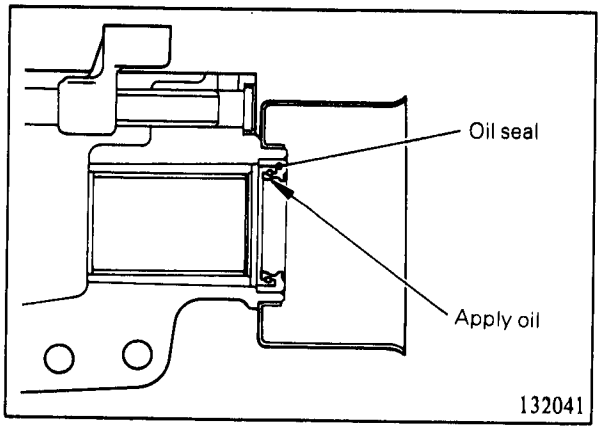
1. Remove roll pin from neutral return finger and remove lock pin from change shifter with Pin Punch. (119040)
2. Remove control shaft toward front of housing.
3. Remove oil seal.



119040

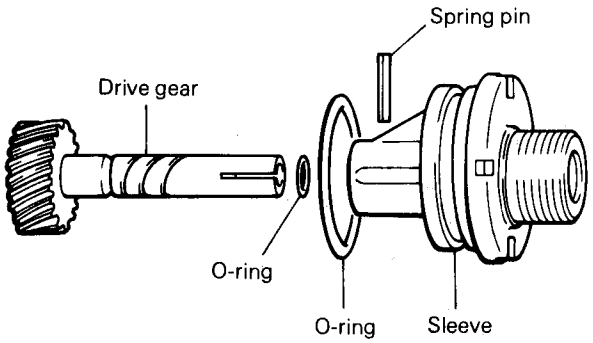
REASSEMBLY

1. Install the control shaft from the front of the housing, being sure to engage the neutral return finger and the change shifter.
2. Install the roll pin into the neutral return finger and the lock pin into the change shifter.
3. Make sure the control shaft operates smoothly.
4. Apply oil to lip of oil seal. (132041)
5. Install oil seal with lip toward front of housing.



132041

COMPONENTS



110008

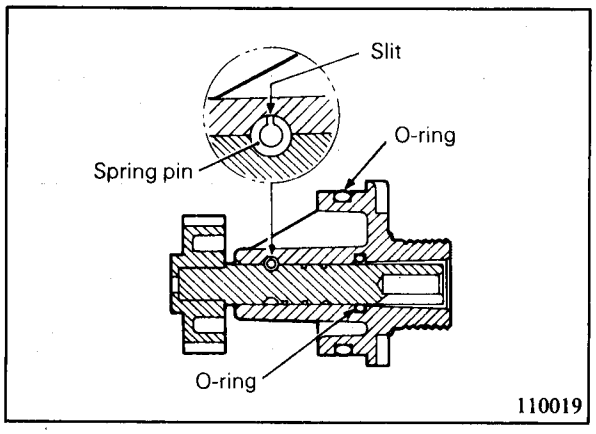
DISASSEMBLY

1. Drive out spring pin, and gear and sleeve can be disassembled.
2. Remove gear from sleeve.

Caution
Do not reuse O-ring and spring pin.

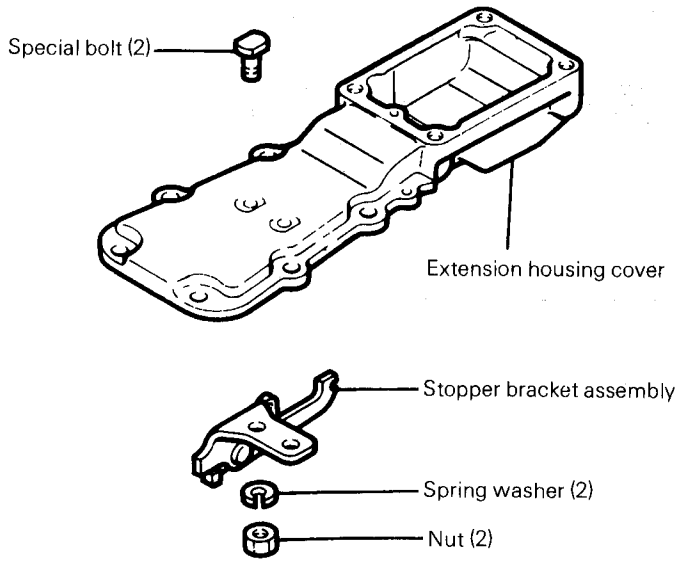
REASSEMBLY

1. Install new O-ring.
2. Install gear in sleeve and drive spring pin in, making sure that slit does not face gear shaft.



110019

COMPONENTS



132013

REASSEMBLY

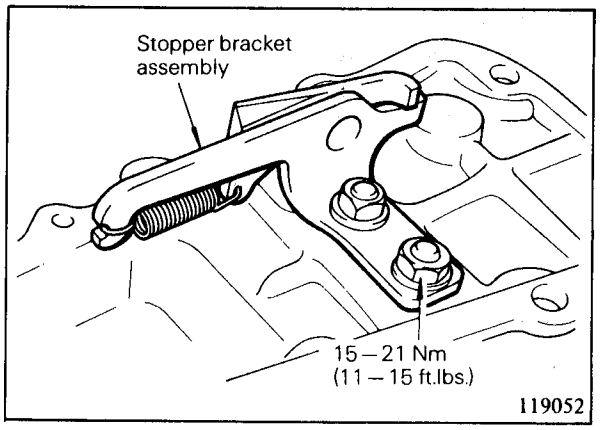
1. Apply recommended sealant to two special bolts (except threaded portions) and install them to cover. Do not wipe away excess sealant from cover.

Recommended sealant .....
3M Liquid Gasket 8959 or equivalent

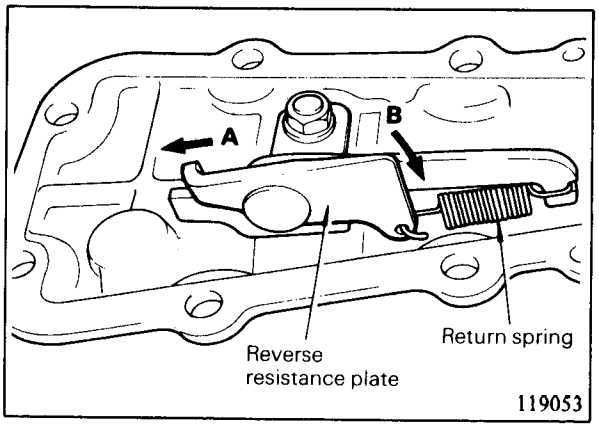
2. Mount stopper bracket assembly and apply recommended sealant to threaded portions of special bolts. (119052)

Recommended sealant .....
3M Liquid Gasket 8959 or equivalent

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

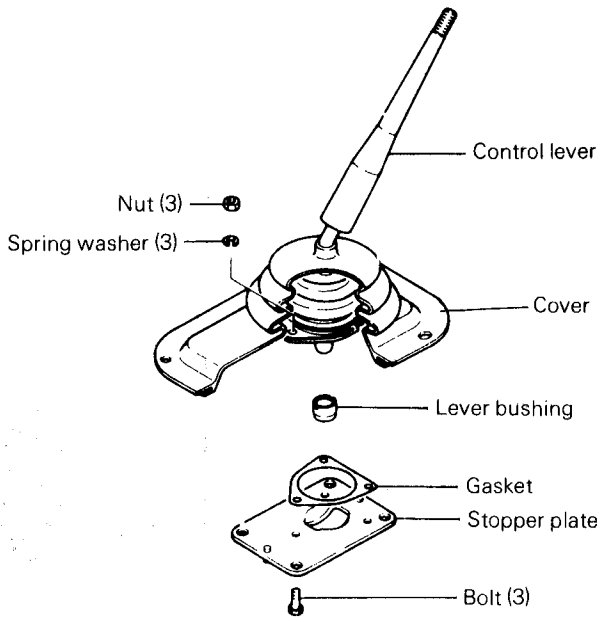


119052



119053

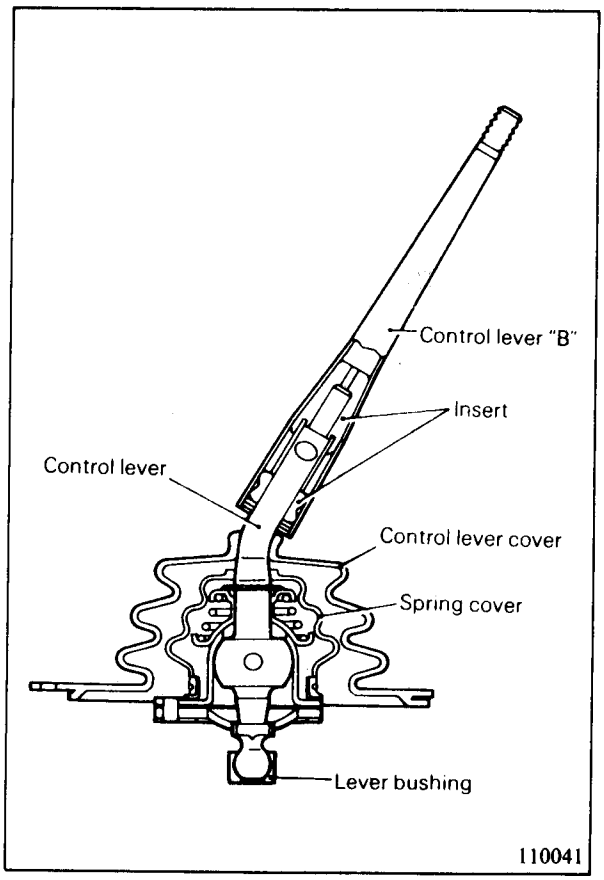
COMPONENTS



132014

INSPECTION

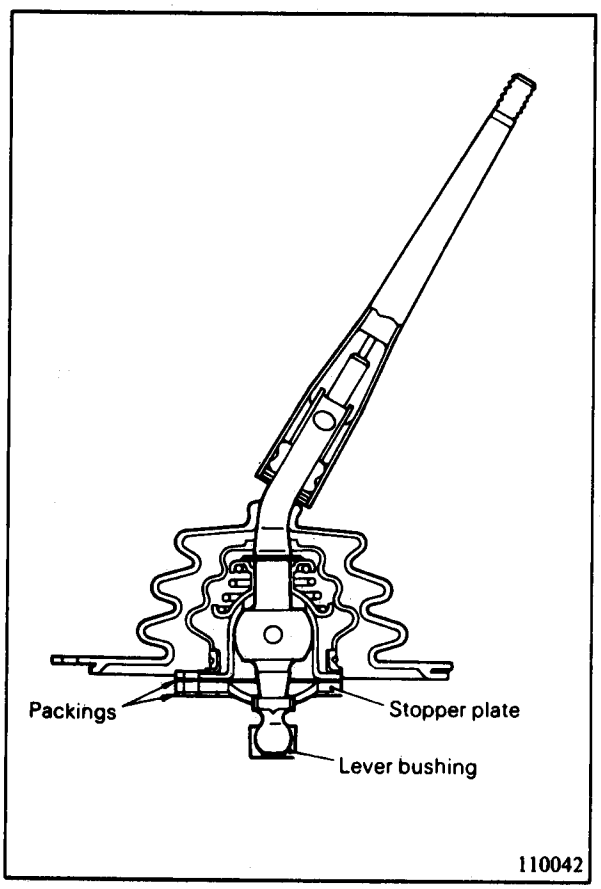
1. Check for play between control lever and control lever "B". If play is evident, replace lever assembly.
2. Push control lever in and check to ensure that it moves smoothly up and down.
3. Check cover for damage and replace if necessary. To remove cover, cut away with knife. To install new cover, first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



110041

REASSEMBLY

1. Apply sealant to both sides of two packings.
2. Apply grease generously to both inside and outside surfaces of lever bushing.



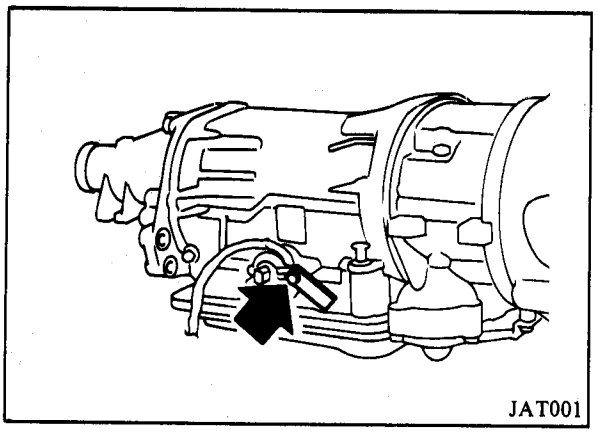
GENERAL INFORMATION

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.

IDENTIFICATION NUMBER

Stamped Position

The plate is attached to the right hand side of transmission case.


JAT001

Identification of Number Arrangements

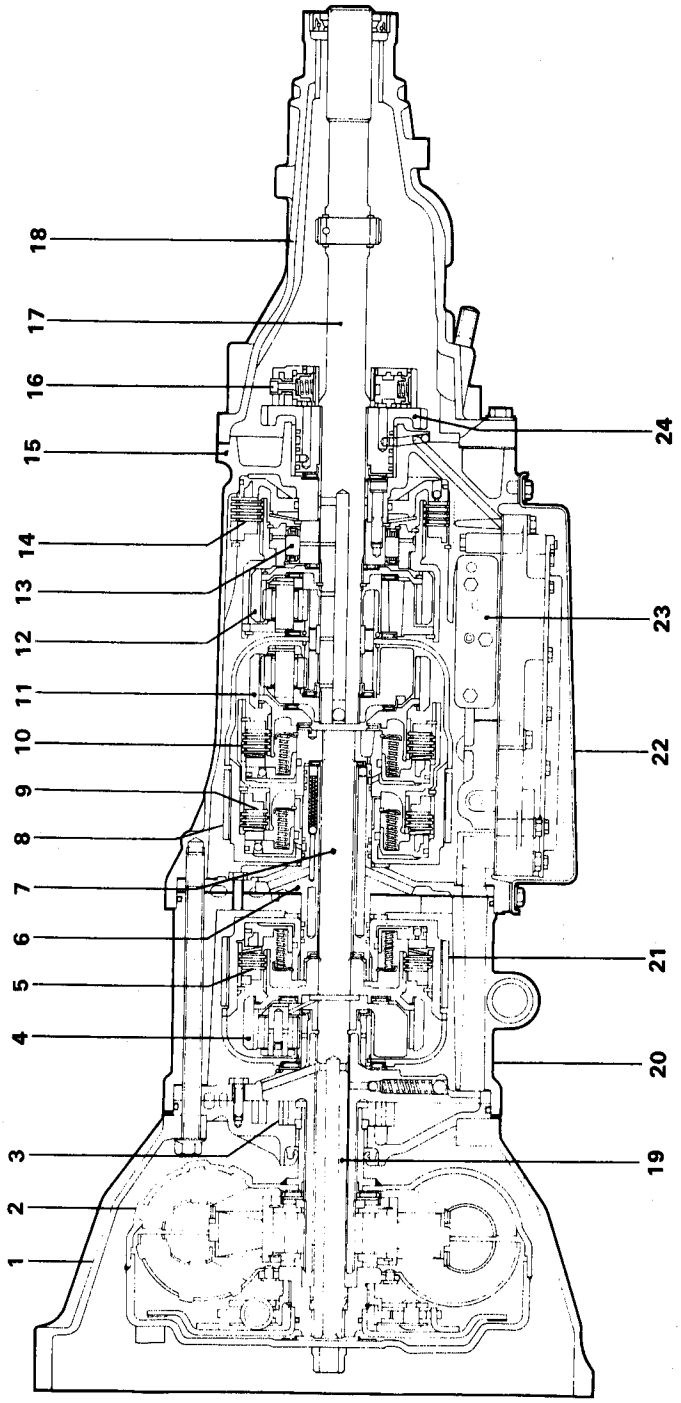
JAPAN AUTOMATIC TRANSMISSION CO., LTD
MODEL MR600
NO. 3601234

Number designation

3 6 0 1 2 3 4

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

JM600 AUTOMATIC TRANSMISSION SECTIONAL VIEW



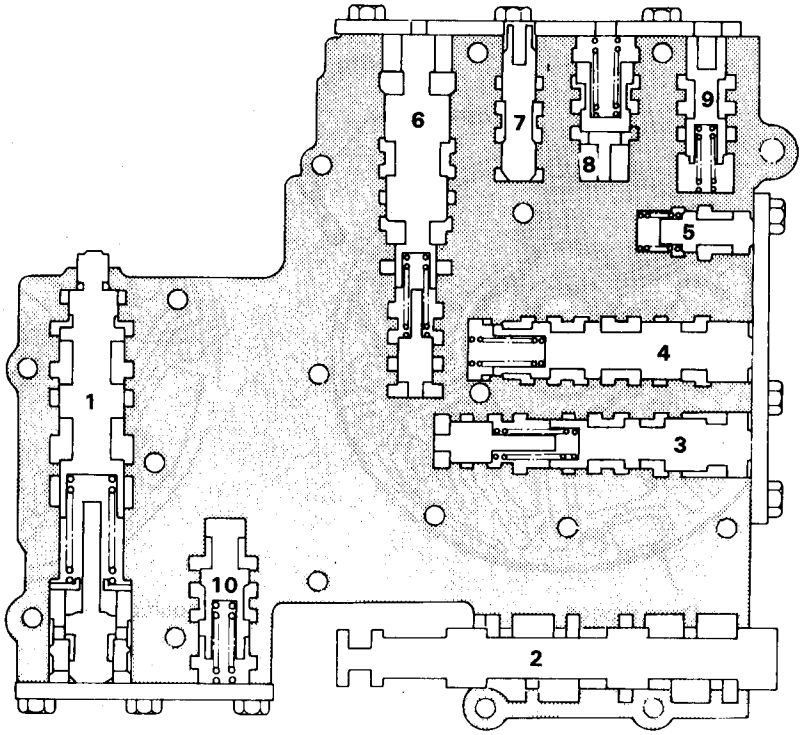
1. Converter housing
2. Torque converter
3. Oil pump
4. O.D. planetary gear
5. Direct clutch
6. Drum support
7. Intermediate shaft
8. Second band brake
9. High – reverse clutch (Front)
10. Forward clutch (Rear)
11. Front planetary gear
12. Rear planetary gear
13. One-way clutch
14. Low-reverse clutch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

JAT004

HYDRAULIC CONTROL UNIT AND VALVES

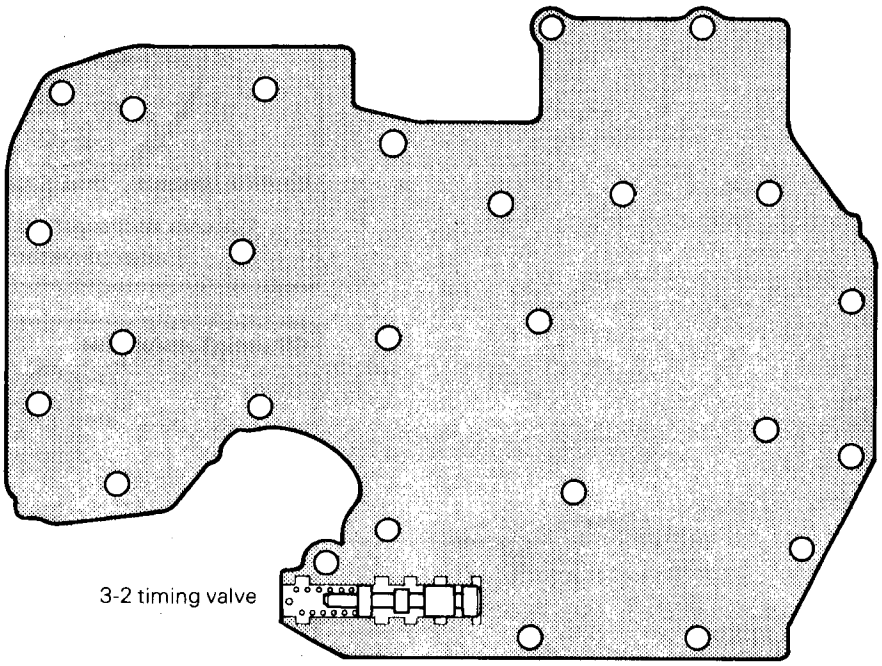
Control Valve

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



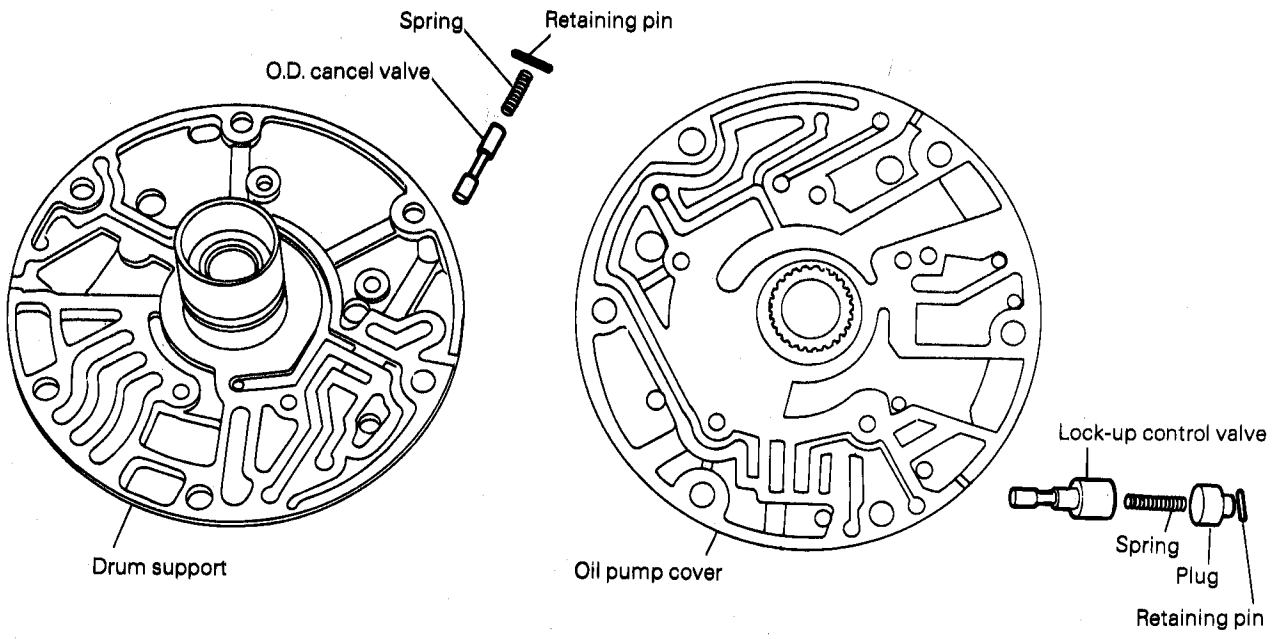
JAT005

Lower Valve Body



JAT197

Lock-up Control Valve and O.D. Cancel Valve

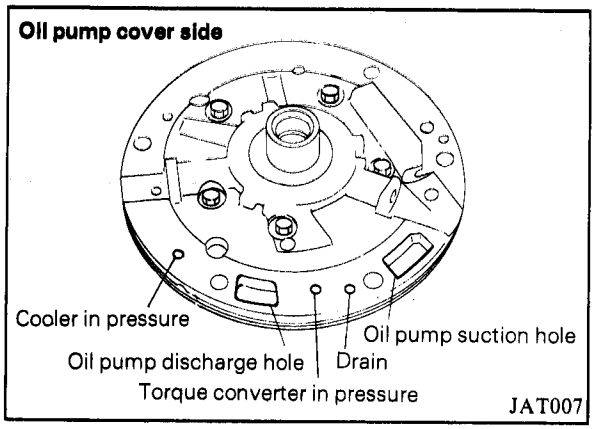


JAT006

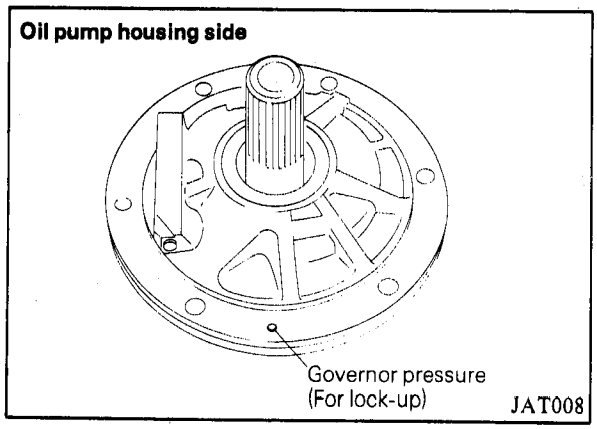
OIL CHANNEL

Oil channels which connect components are located in the areas shown illustrations.

Oil Channels in Oil Pump

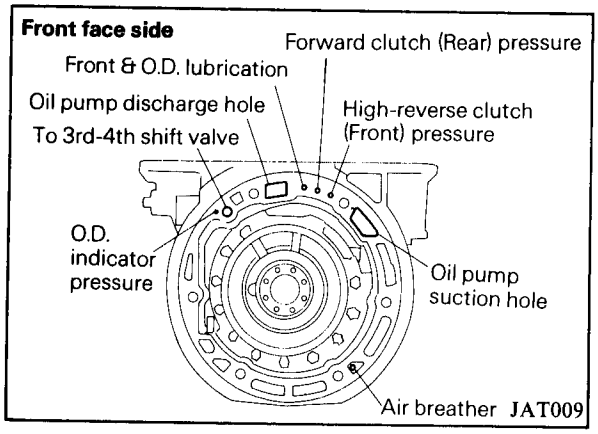


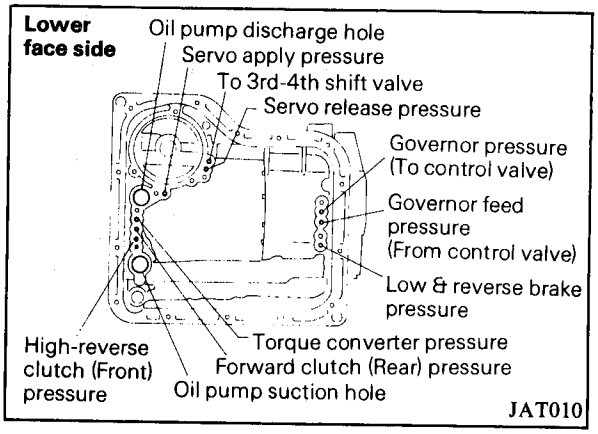
JAT007



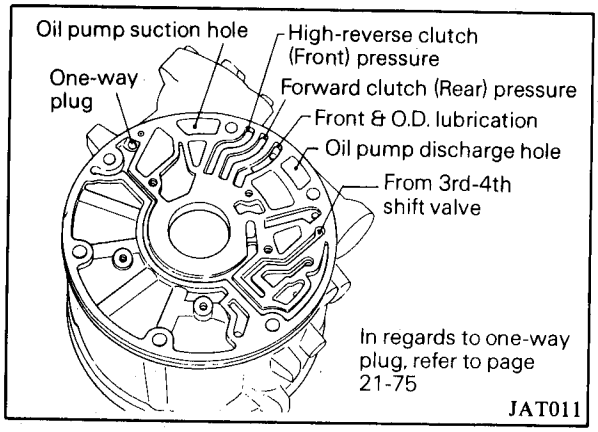
JAT008

Oil Channels in Transmission Case

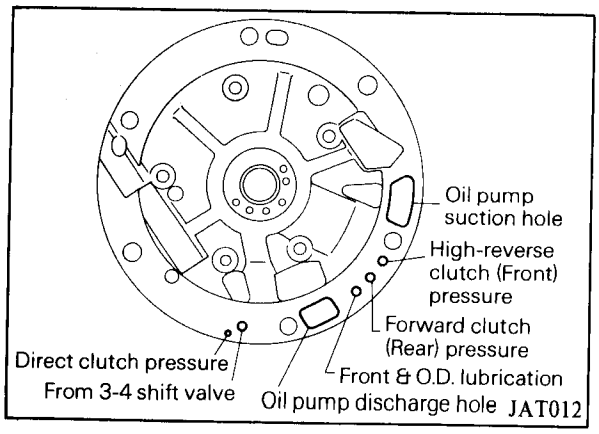




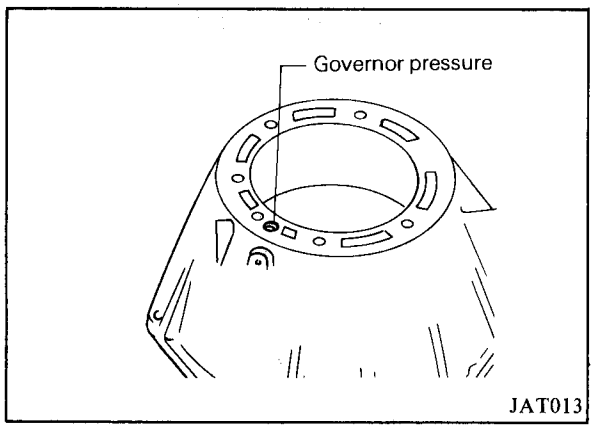
Oil Channels in O.D. Case



Oil Channels in Drum Support



Oil Channels in Converter Housing



MECHANICAL OPERATION

In the JM600 automatic transmission, each part operates as shown in the following table at each gear select position.

Range		Direct clutch	O.D. band servo		High-reverse clutch (Front)	Forward clutch (Rear)	Low & reverse brake	2nd band servo		One-way clutch	Parking Pawl
			Apply	Release				Apply	Release		
Park		ON	(ON)	ON			ON				ON
Reverse		ON	(ON)	ON	ON		ON		ON		
Neutral		ON	(ON)	ON							
D	D_1 (Low)	ON	(ON)	ON		ON				ON	
	D_2 (Second)	ON	(ON)	ON		ON		ON			
	D_3 (Top)	ON	(ON)	ON	ON	ON		(ON)	ON		
	D_4 (O.D.)		ON		ON	ON		(ON)	ON		
2	Second	ON	(ON)	ON		ON		ON			
1	1_2 (Second)	ON	(ON)	ON		ON		ON			
	1_1 (Low)	ON	(ON)	ON		ON	ON			ON	

The low & reverse brake is applied in "1_1" range to prevent free wheeling when coasting and allows engine braking.

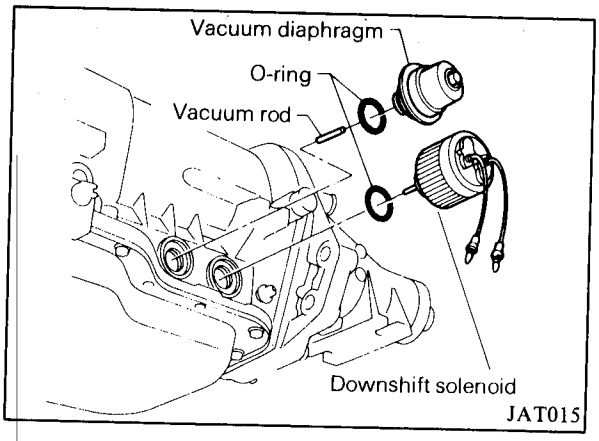
The following parts can be serviced with the transmission on the vehicle.

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

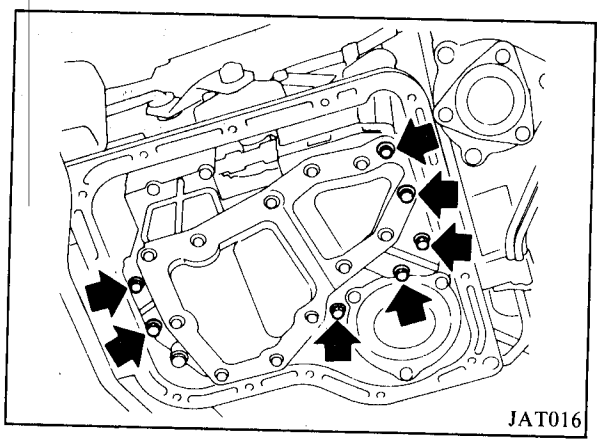
Check and/or replace faulty parts as follows:

CONTROL VALVE ASSEMBLY

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



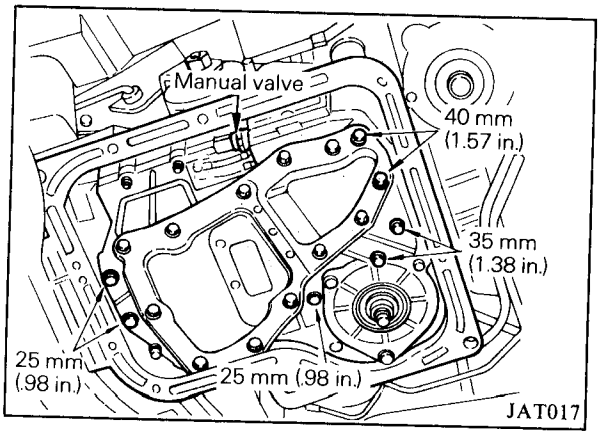
3. Remove seven bolts and remove control valve assembly.
4. Disassemble, inspect and reassemble control valve assembly. Refer to page 21-114 for Control Valve Body.



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

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

7. After installing control valve to transmission case, make sure that control lever can be moved to all position.



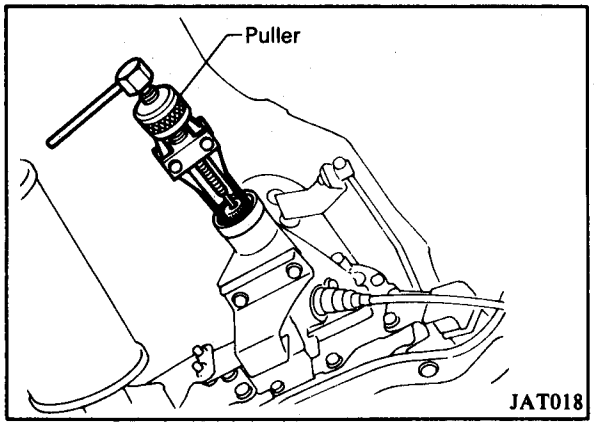
8. Install downshift solenoid and vacuum diaphragm and rod.
   Make sure that vacuum diaphragm rod does not interfere with side plate of control valve.
9. Install new gasket and oil pan.

Oil pan mounting bolts	6–8 Nm (4.4–5.7 ft.lbs.)

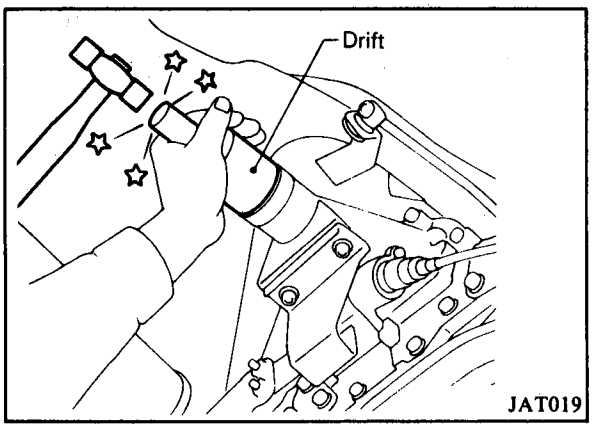
10. Secure clamps of governor tube and oil cooler tubes.
11. Refill with automatic transmission fluid.

REPLACEMENT OF EXTENSION OIL SEAL

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

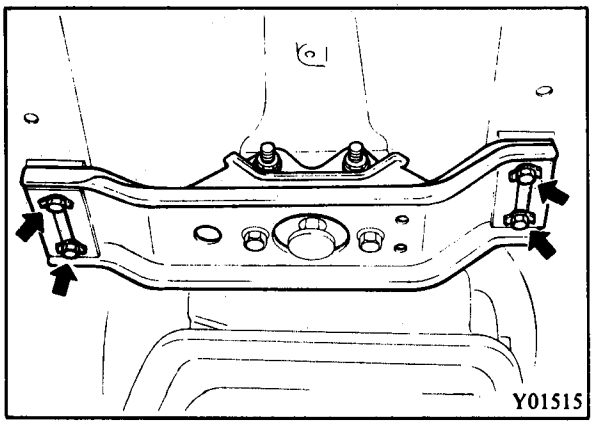


3. Apply coat of ATF to oil seal surface, then drive new seal into place.
4. Coat sealing lips with vaseline, then install propeller shaft. Refer to Propeller Shaft for installation.



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. (Y01515)
5. Remove rear extension bolts, then remove rear extension with rear mounting.
6. Remove control valve assembly. Refer to Control Valve Assembly.

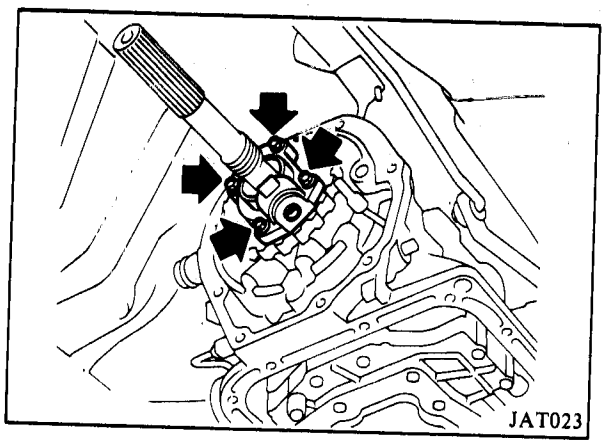


7. Inspect and repair parking components. Refer to Parking Mechanism for inspection.
8. Install control valve assembly. Refer to Control Valve Assembly for on-vehicle service.
9. Install rear extension, then install rear mounting parts.
10. Install speedometer sleeve assembly and cable.
11. Install propeller shaft. Refer to Propeller Shaft for installation.
12. Install oil pan with new gasket.

Oil pan to transmission case .....
6 – 8 Nm (4.4 – 5.7 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 body to oil distributor .....
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 to transmission case .....
6 – 8 Nm (4.4 – 5.7 ft.lbs.)

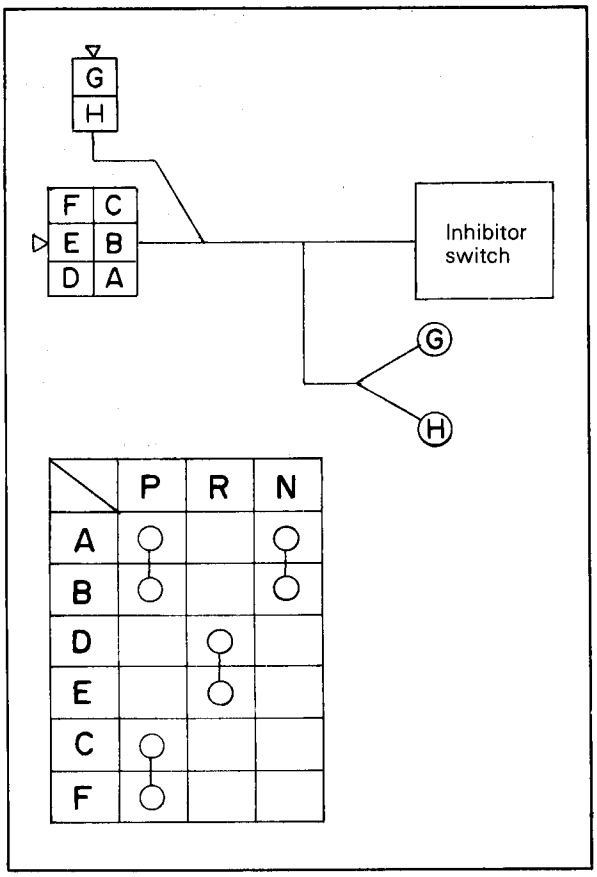
INHIBITOR SWITCH ADJUSTMENT

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

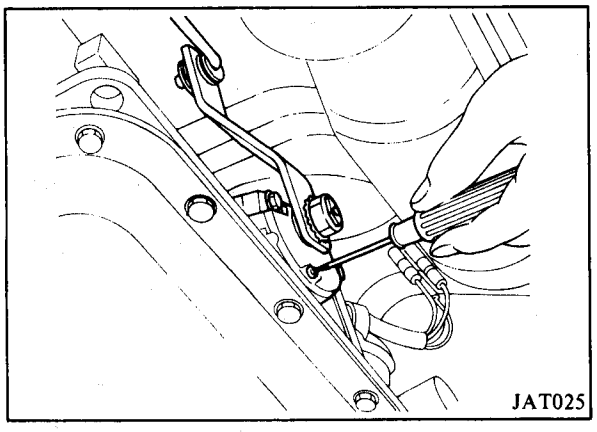
A continuity tester may be used to check the inhibitor switch for proper operation.

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

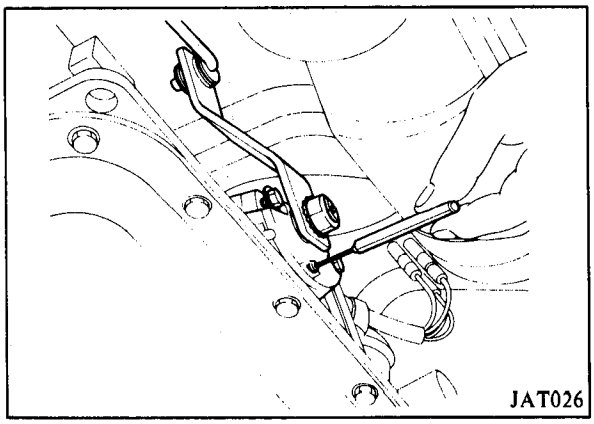
1. Place the manual valve in Neutral (vertical position).
2. Remove the screw as illustrated.
3. Loosen the attaching bolts.



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 to transmission case ..... 5 – 7 Nm (3.6 – 5.1 ft.lbs.)

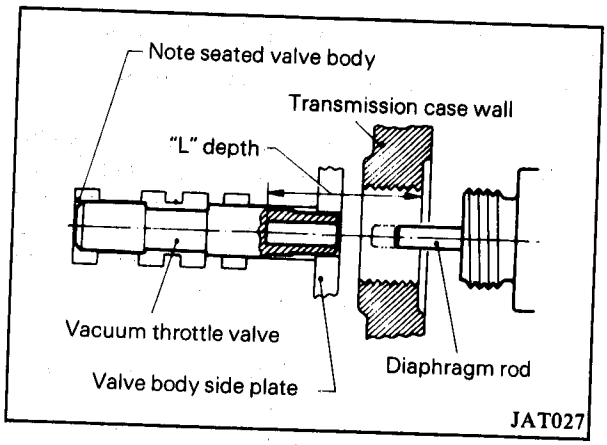
6. Recheck for continuity. If faulty, replace the switch.



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.



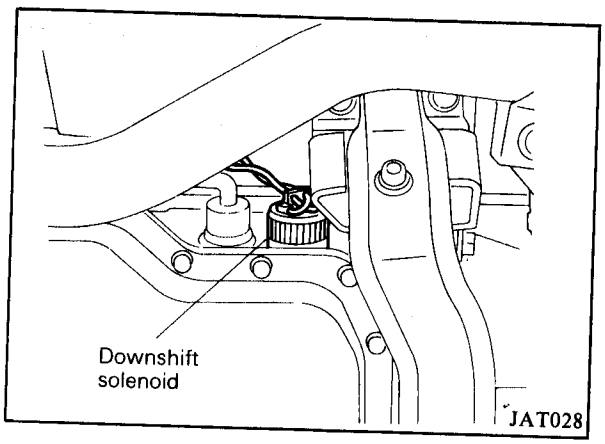
Vacuum Diaphragm Rod Selection

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

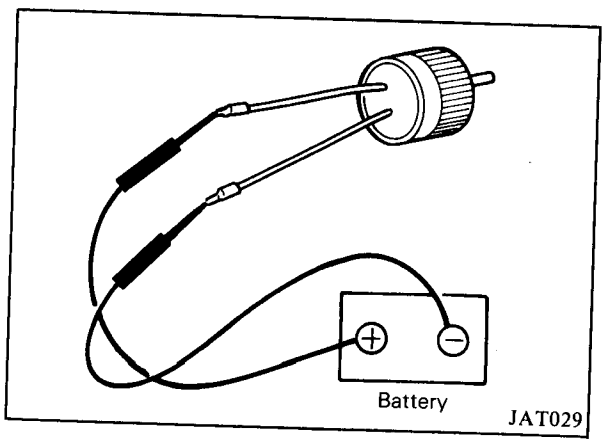
DOWNSHIFT SOLENOID

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.

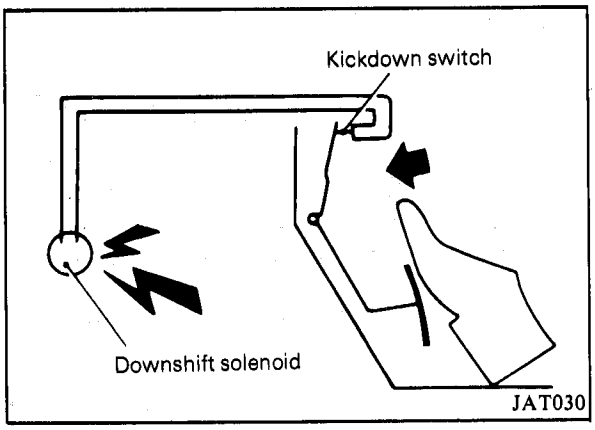


KICKDOWN SWITCH ADJUSTMENT

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).

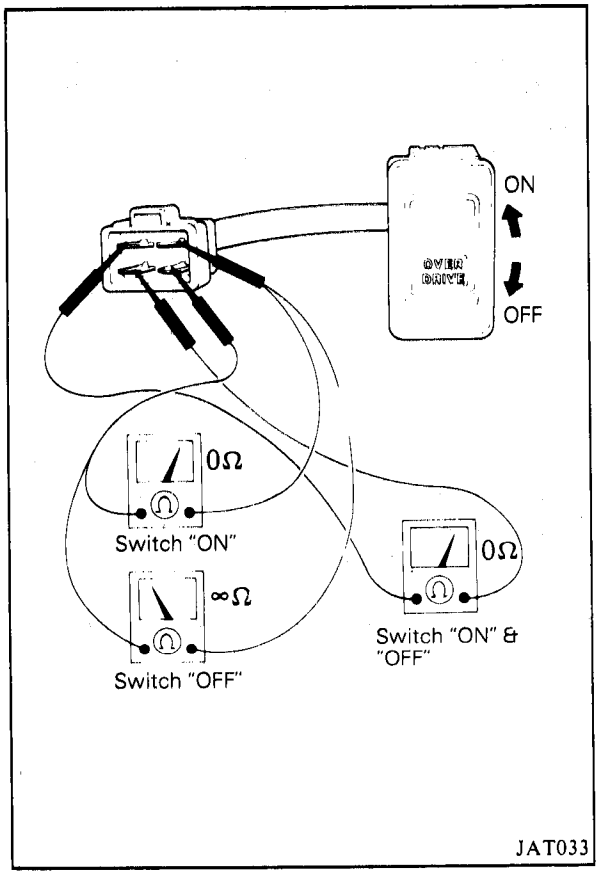


O.D. CANCEL SWITCH & O.D. INDICATOR LIGHT

Location

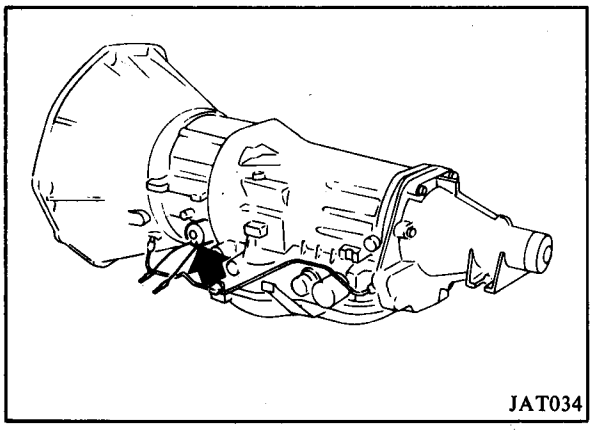
The O.D. cansel switch is located in center console box.

Inspection



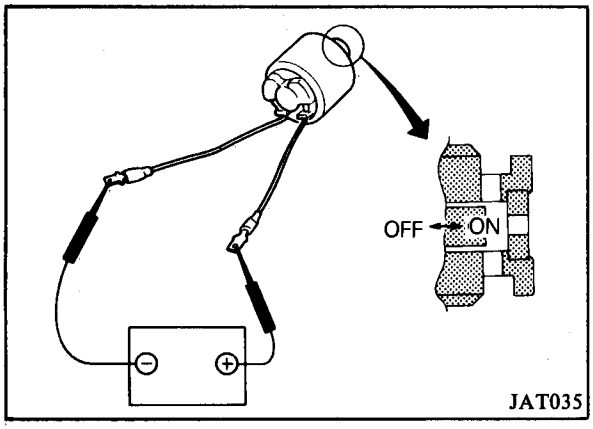
O.D. CANCEL SOLENOID

Location

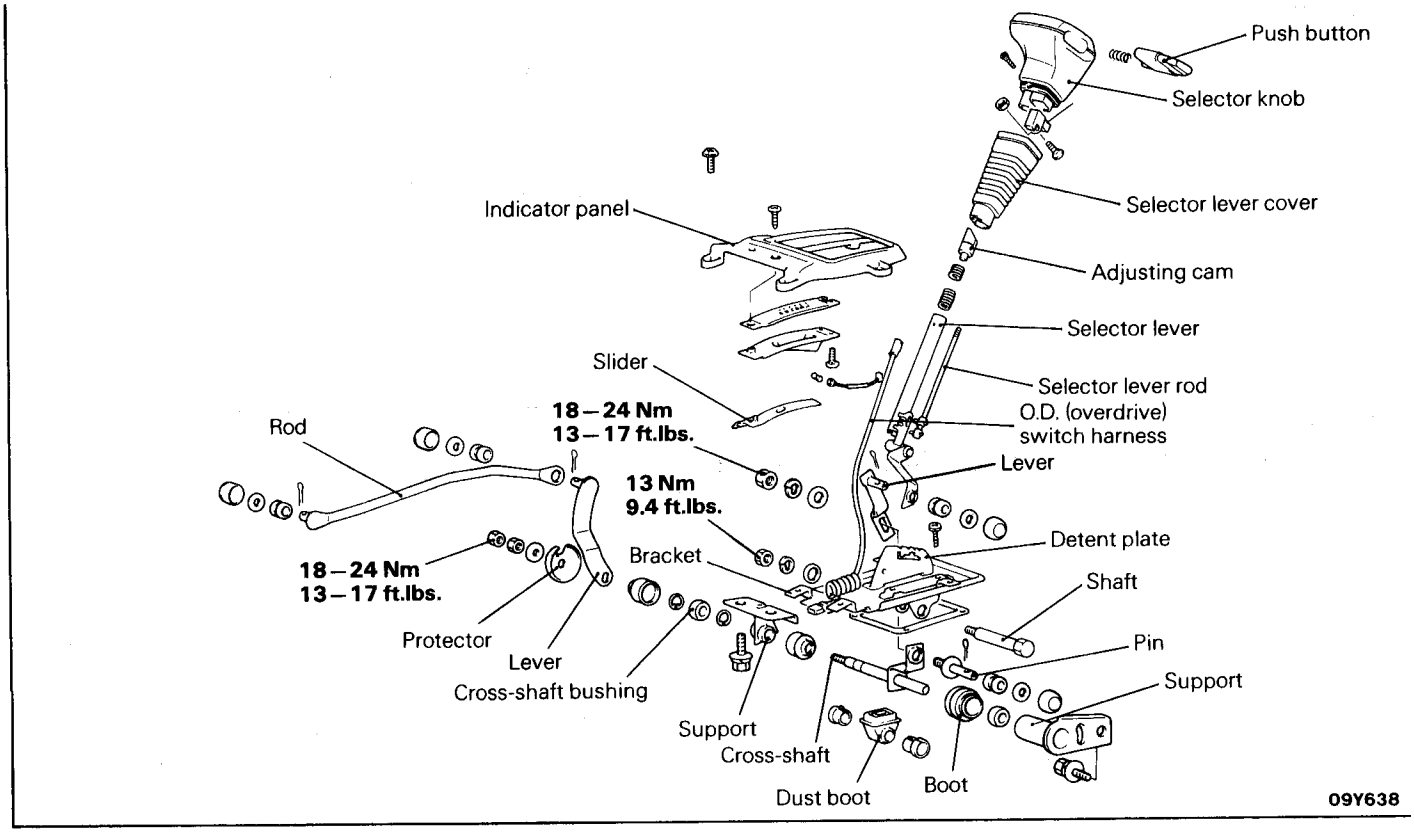


Inspection

Confirm that clicking sound is heard when power is applied.

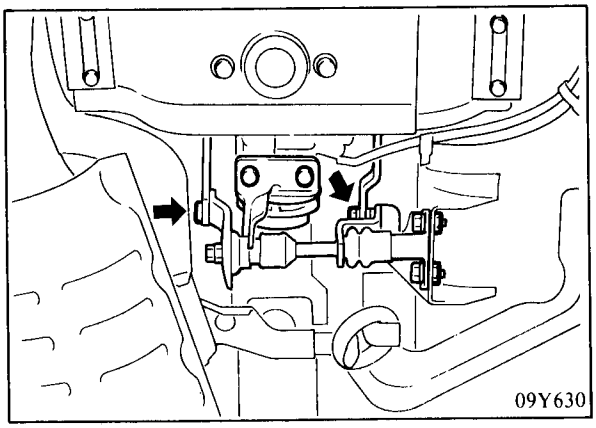


COMPONENTS

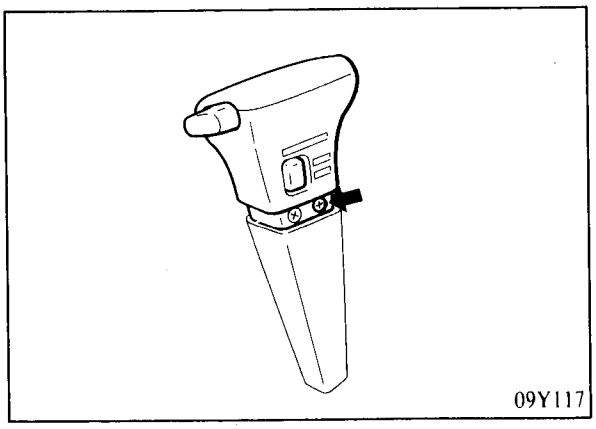


REMOVAL

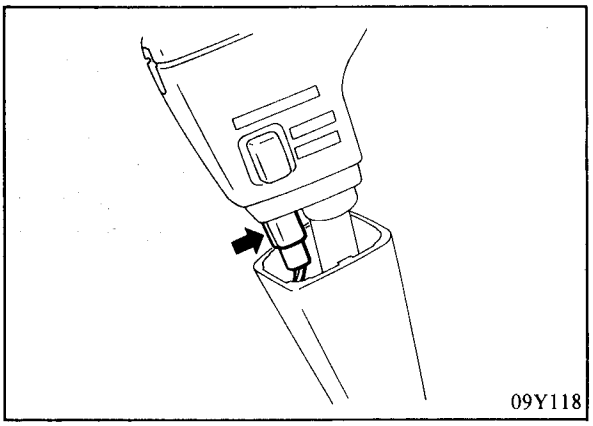
1. Set the selector lever to "N" position, and then disconnect the lever and rod from the cross-shaft.



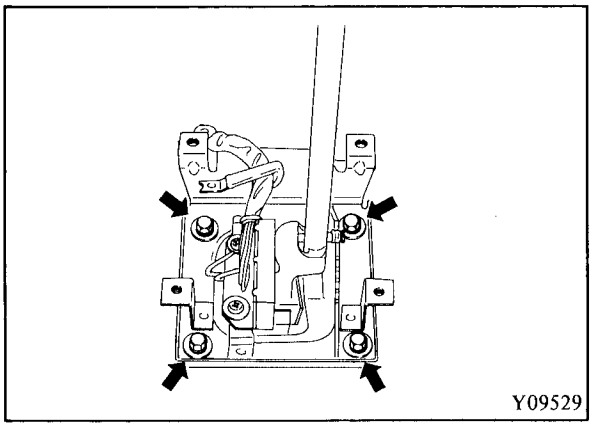
2. Remove the front console box.
3. Push down the selector lever cover.
4. Remove the selector knob from the selector lever.



5. Disconnect the O.D. switch connector.
6. Remove the selector lever cover.
7. Remove the indicator panel.
8. Disconnect the connector of indicator illumination light.

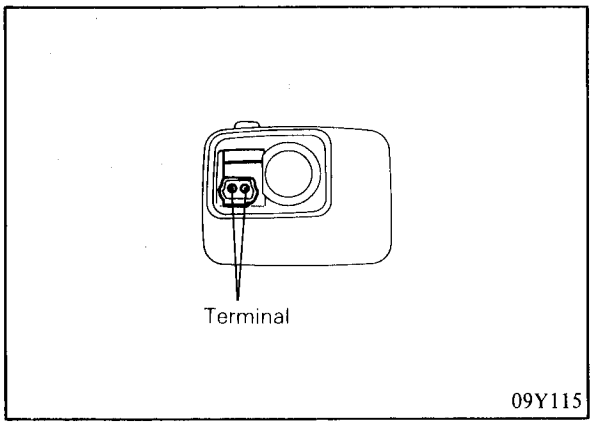


9. Remove the selector lever and bracket assembly. (Y09529)
10. Remove the split pins in order to disconnect the lever from bracket assembly.



INSPECTION

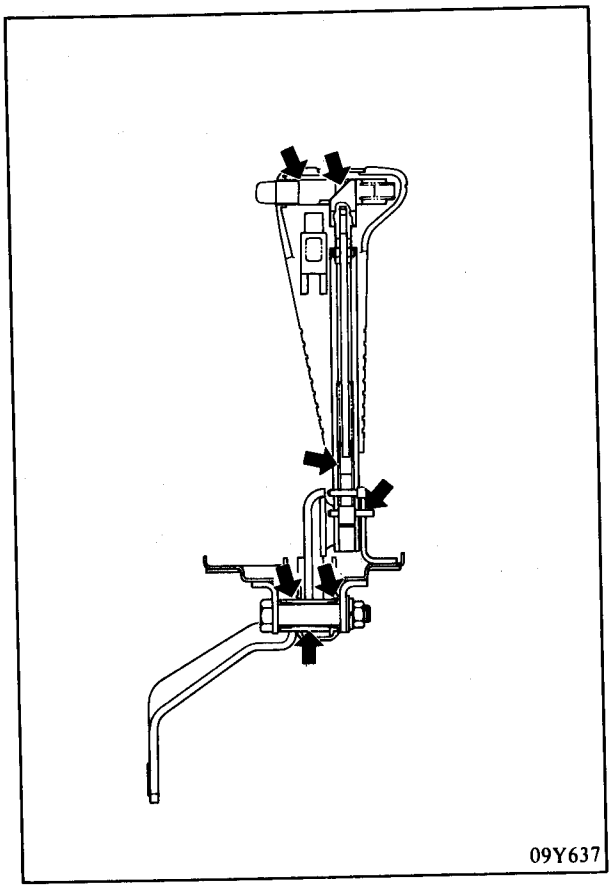
1. Check the detent plate for wear.
2. Check the pin at the end of selector lever for wear.
3. Check the contact surfaces of push button and adjusting cam for wear.
4. With the O.D. switch turned on, check for continuity across the terminals.
5. Check the O.D. switch harness for continuity.



INSTALLATION

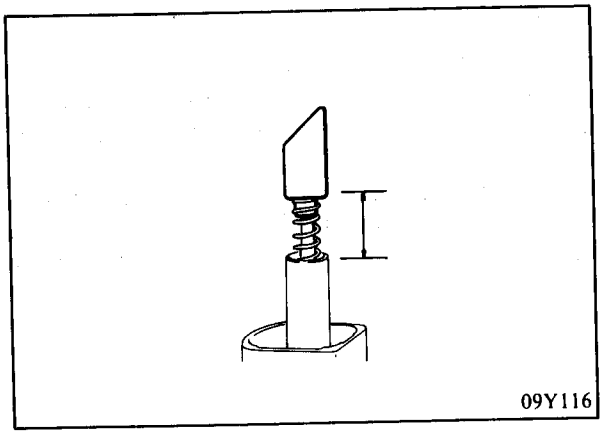
1. Apply a thin coat of specified multipurpose grease to the sliding parts.

Recommended multipurpose grease .....
MOPAR Multi-Mileage Lubricant
Part Number 2525035 or equivalent

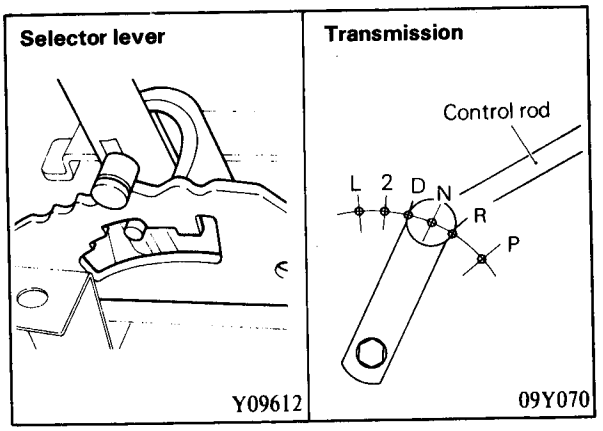

09Y637

2. Set the selector lever to "N" position, and adjust the adjusting cam until the dimension shown in the illustration reaches the standard value.

Distance of adjusting cam to selector lever end
[Standard value] .....
15—15.7 mm (.59—.62 in.)

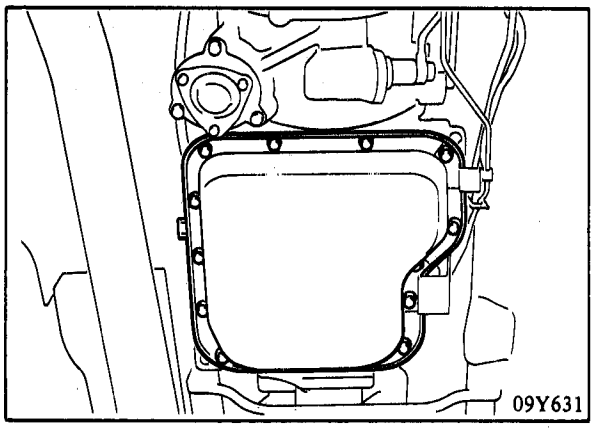

09Y116

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 assembly.

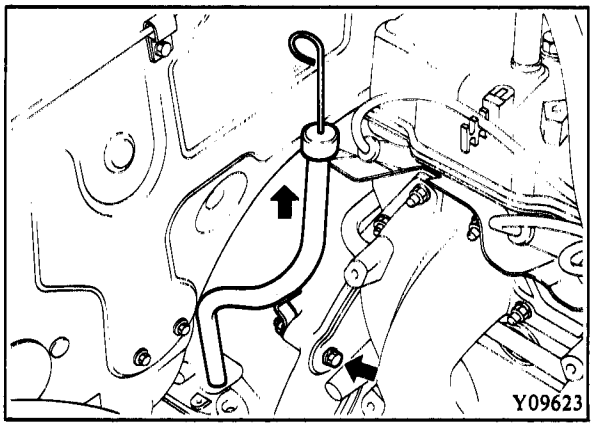


REMOVAL

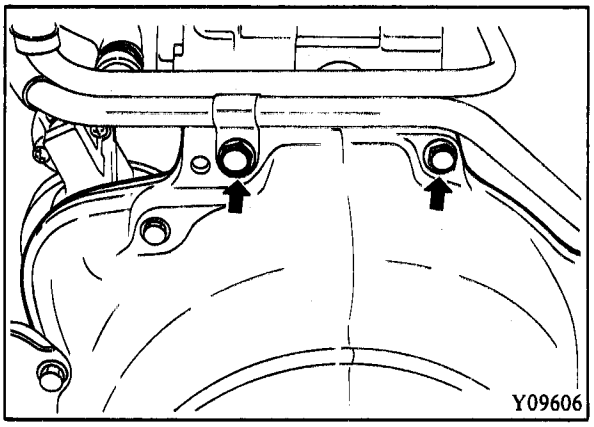
1. Before starting the removal work, drain the automatic transmission fluid as follows:
   (1) Loosen the oil pan screws and tap the oil pan at one corner to break it loose and allow automatic transmission fluid to drain. (09Y631)
   (2) Drain automatic transmission fluid remaining in bottom of oil pan after its removal.
   (3) Reinstall the oil pan.
2. Disconnect the battery negative cable.



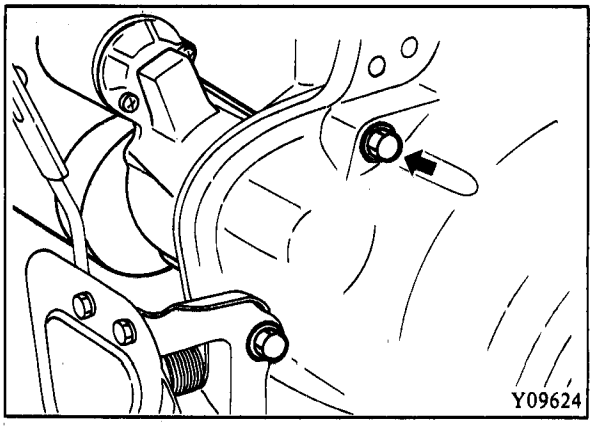
3. Remove oil pan oil filler tube attaching bolt and remove the tube from transmission case.



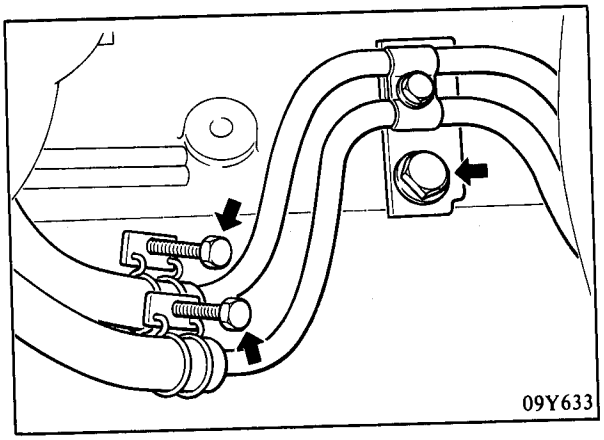
4. Jack up the vehicle and support it with safety stands.
5. Among the transmission mounting bolts, remove the two upper bolts by using T type wrench with long arm. (Y09606)



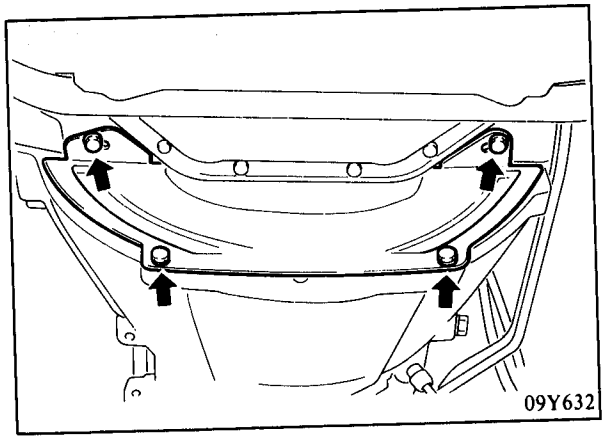
6. Remove starter by removing its retaining bolts and store it in a suitable place so that the connector and harness will not be damaged.



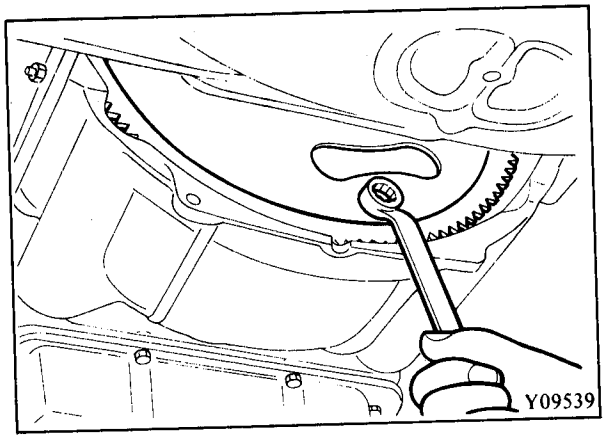
7. Remove the oil cooler return tube and oil cooler supply tube bracket from the cylinder block and then disconnect the oil cooler return tube and oil cooler supply tube from the oil cooler hoses.



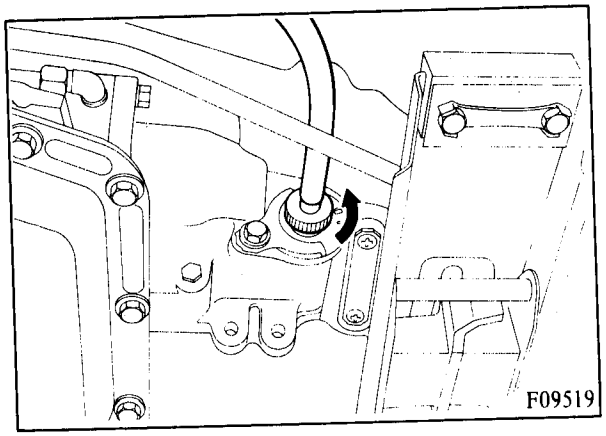
8. Remove the bell housing cover.



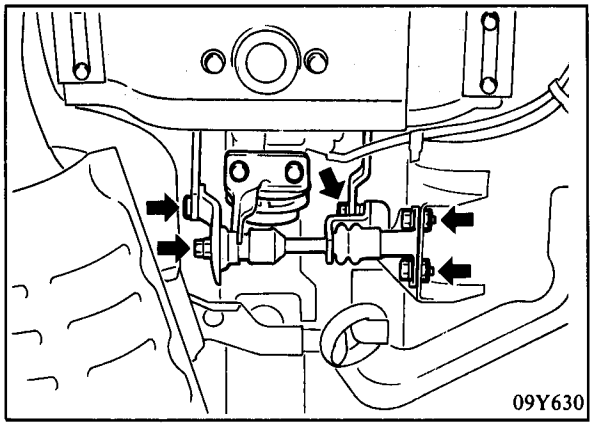
9. Turn the crankshaft clockwise using a wrench on crankshaft pully bolt to bring one of the torque converter to drive plate attaching flange bolts to its lowered position, and remove it.
Remove all remaining bolts in the same manner.



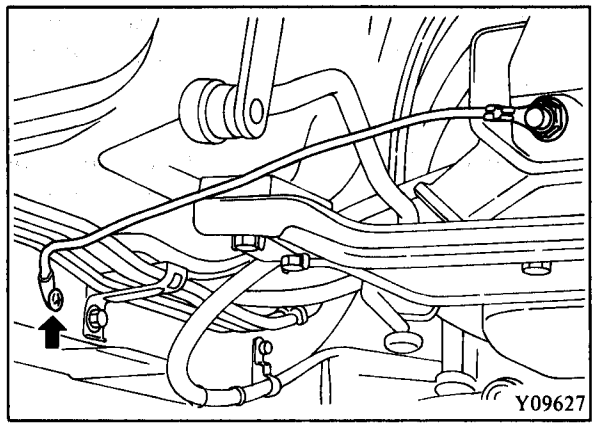
10. Disconnect the speedometer cable from the transmission.



11. Disconnect the transmission control rod from the cross-shaft assembly and the connection lever from the cross-shaft assembly. Remove the cross-shaft assembly.

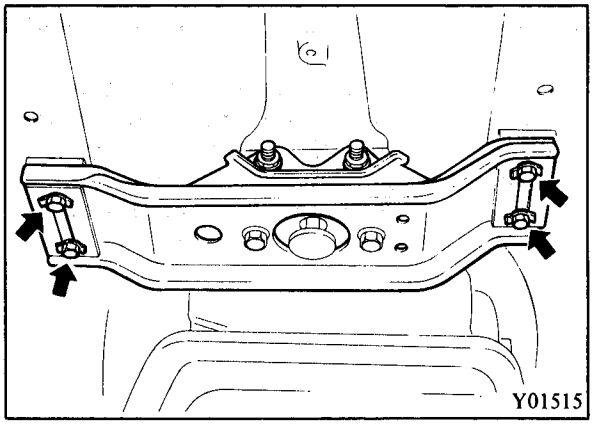


12. Disconnect the ground cable.

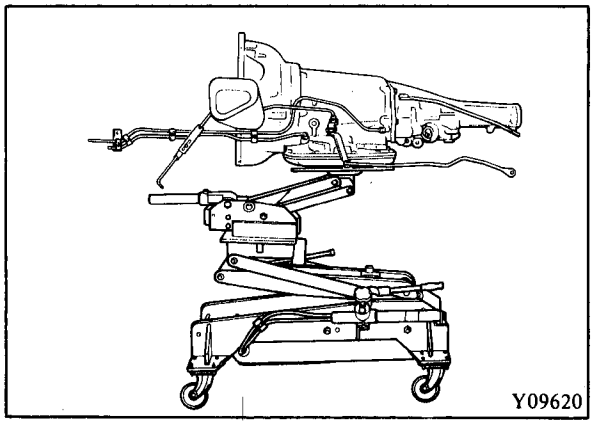


13. Remove the propeller shaft assembly. (Refer to GROUP 16.)
14. Support the rear of the engine with jack or similar device.
15. With the transmission assembly supported by using transmission jack, remove the engine support rear bracket (Y01515)

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



16. Remove remaining transmission mounting bolts.
17. Separate the transmission assembly from the engine.
18. Lower the transmission jack, and take the transmission assembly out from under the vehicle. (Y09620)

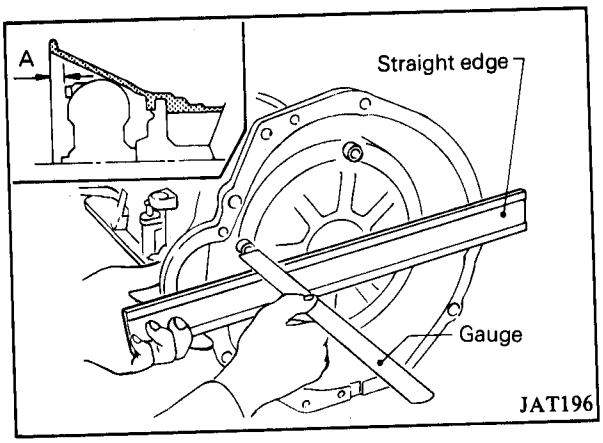


INSTALLATION

Install automatic transmission reversing the removal procedure and noting the following excepsion.

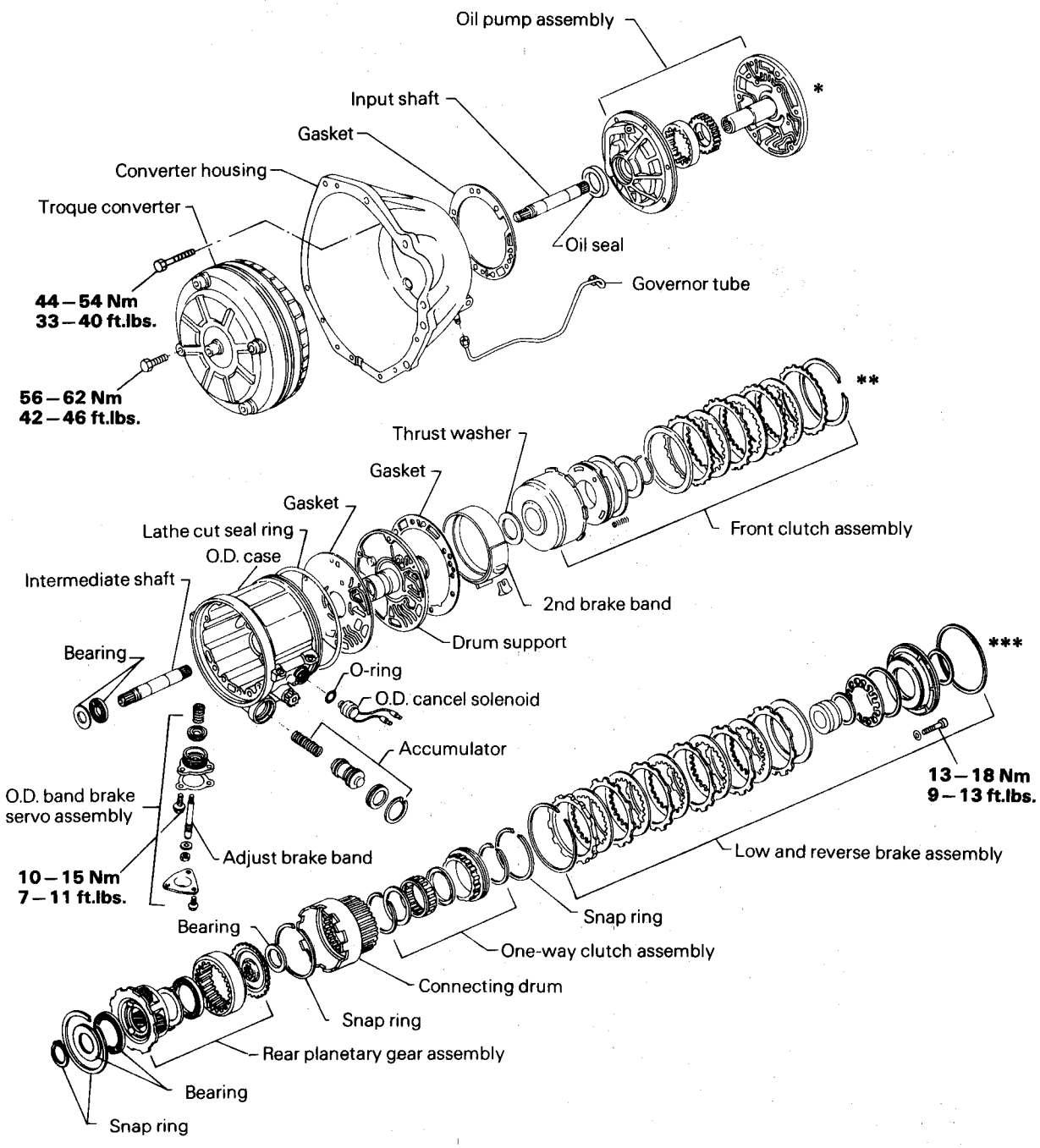
1. Before installing automatic transmission to vehicle, measure distance "A" to be certain that they are correctly assembled.

Distance "A"	More than 35 mm (1.38 in.)

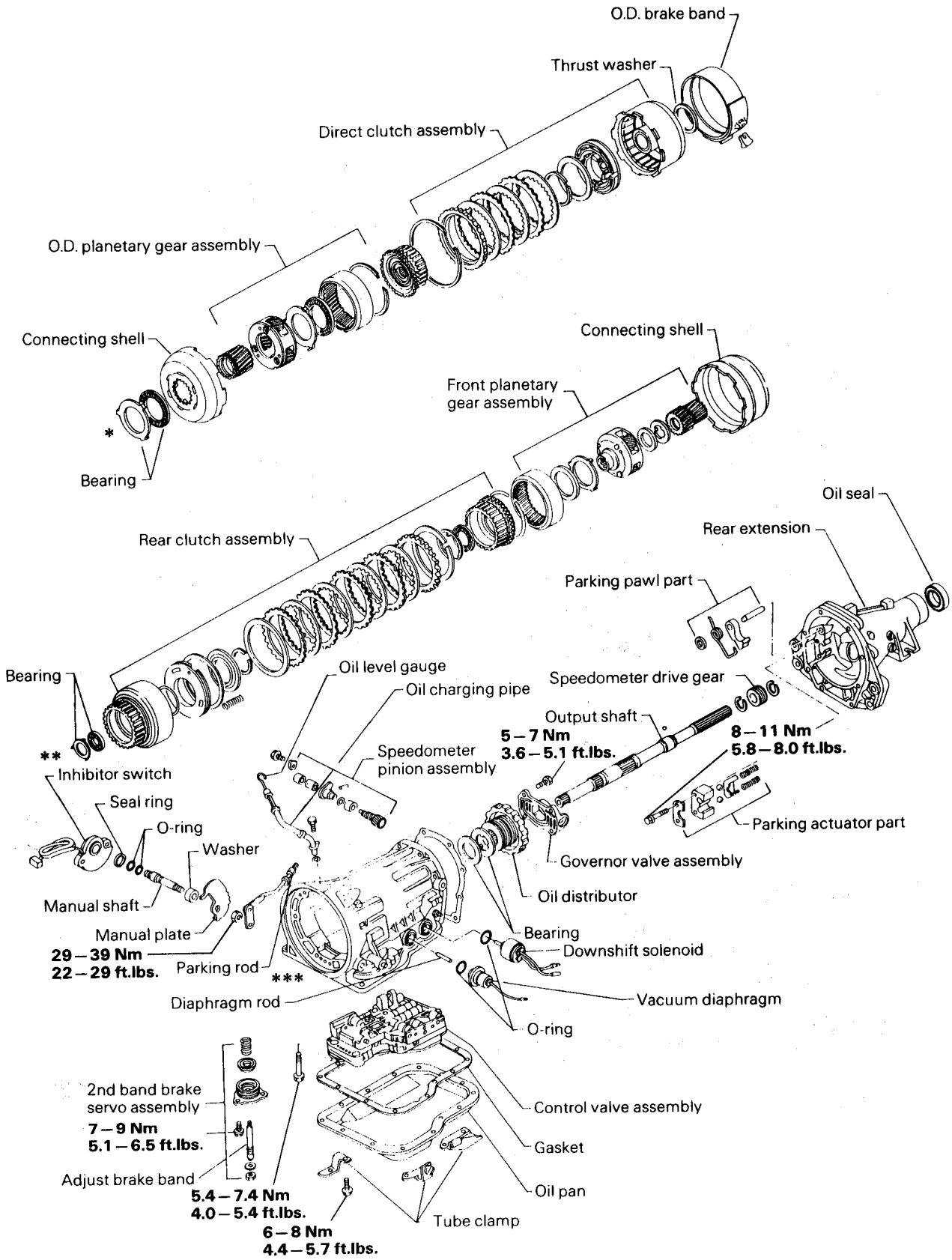


2. Refill automatic transmission with fluid and check fluid level.
3. Check inhibitor switch for operation. Starter motor should be brought into operation only when selector lever is in "P" and "N" positions (it should not be started when selector lever is in "D", "2", "L" and "R" positions). Back-up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

COMPONENTS



JAT036



JAT037

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.

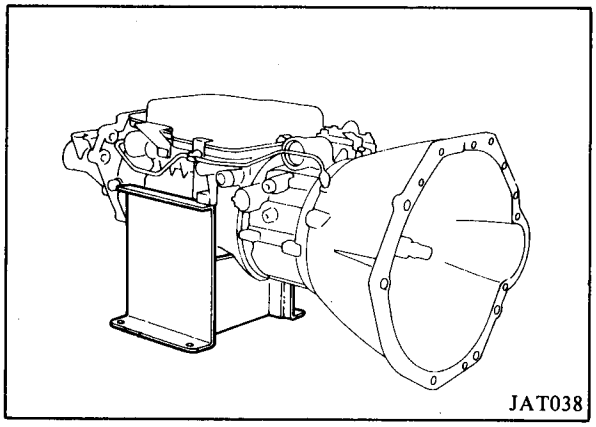
DISASSEMBLY

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

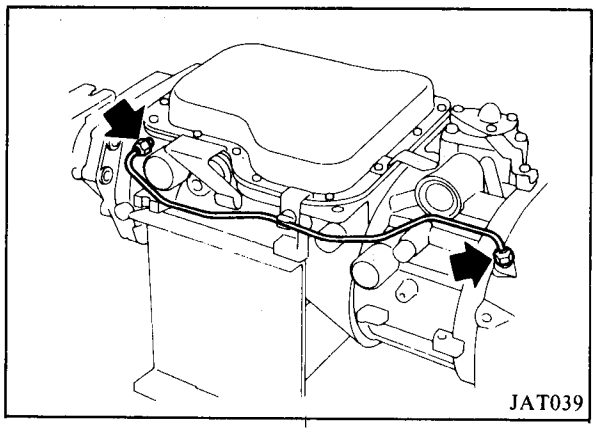
- Oil pump assembly
- Front clutch assembly
- Rear clutch assembly
- Direct clutch assembly
- Control valve assembly
- Governor valve assembly
- Planetary gear assembly

For repair procedures of each sub-assembly, refer to page 21-98 to 21-120.

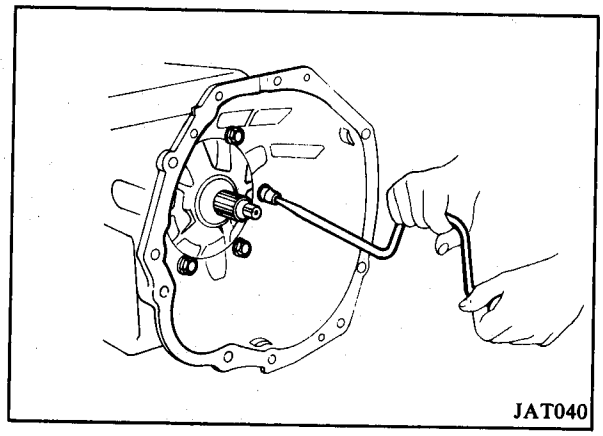
1. Remove torque converter and drain transmission fluid through end of rear extension.


JAT038

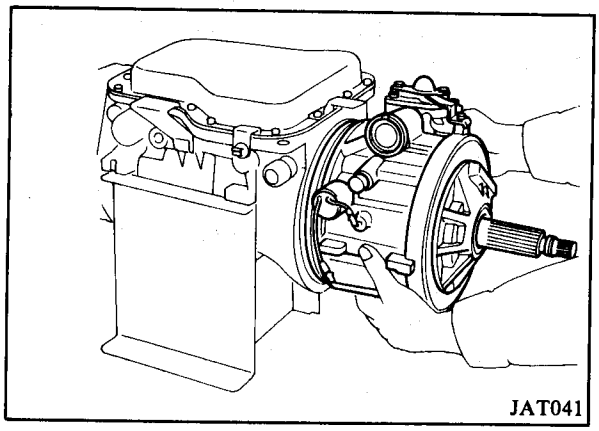
2. Remove governor tube.


JAT039

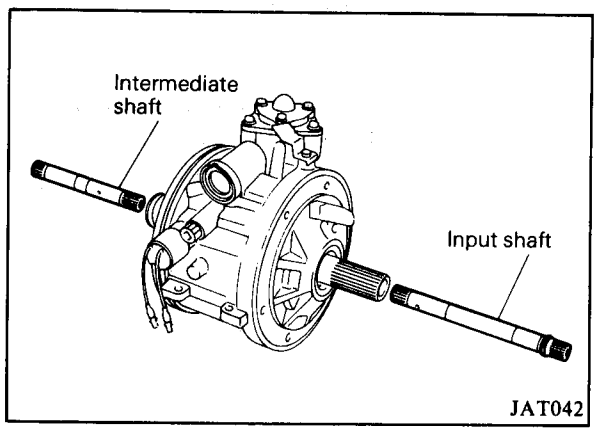
3. Remove converter housing.


JAT040

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

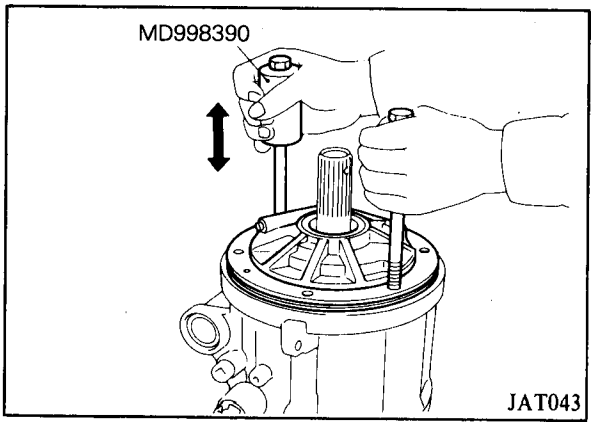

JAT041

5. Remove input shaft and intermediate shaft.



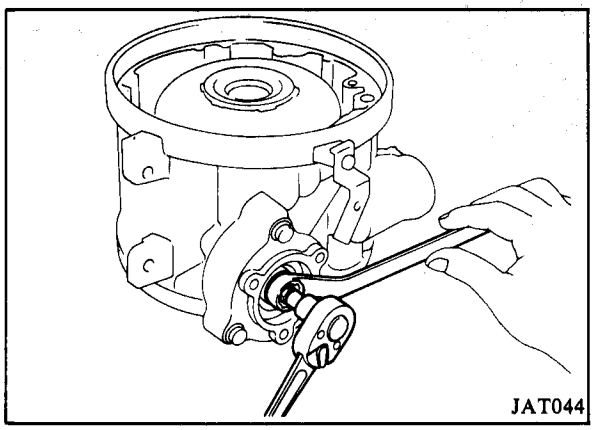
JAT042

6. Attach Special Tool MD998390 to oil pump and remove oil pump from O.D. case.

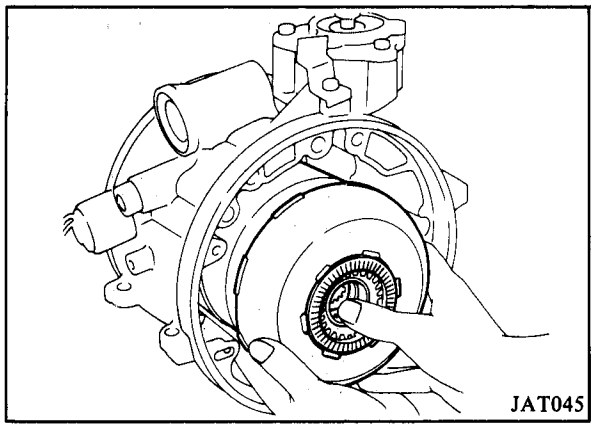


JAT043

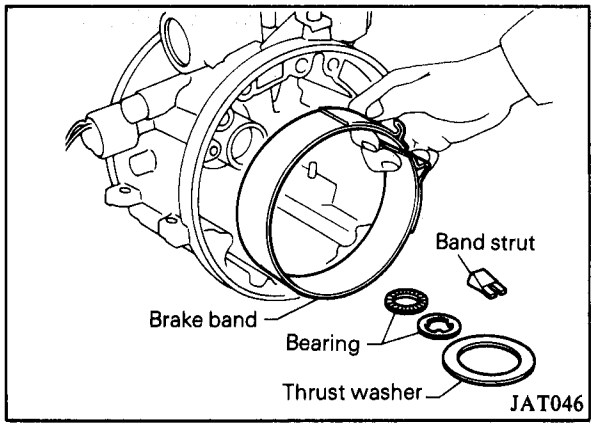
7. Remove O.D. servo cover, then loosen O.D. band servo piston stem.



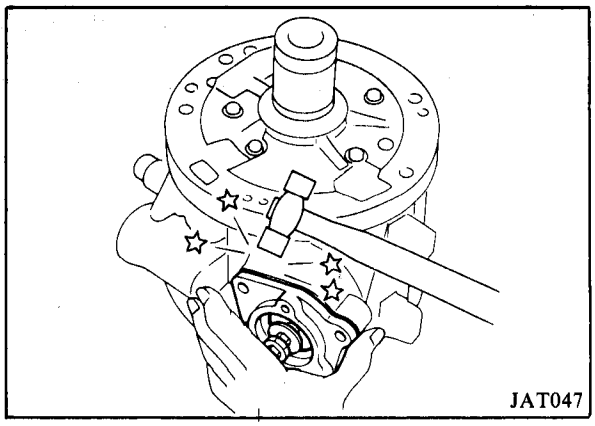
8. Remove O.D. pack (O.D. planetary gear and direct clutch assembly).



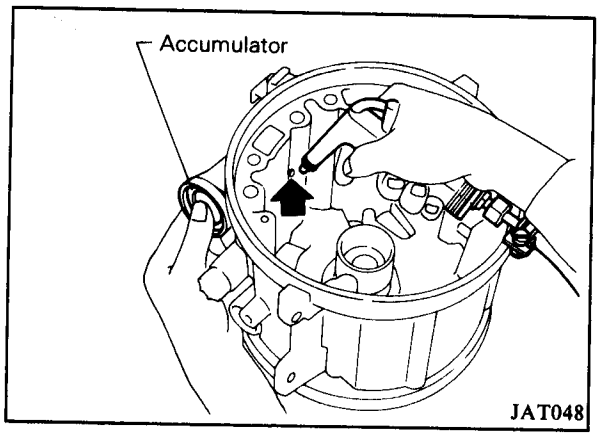
9. Remove needle bearing, race and direct clutch thrust washer, then remove O.D. brake band and strut.



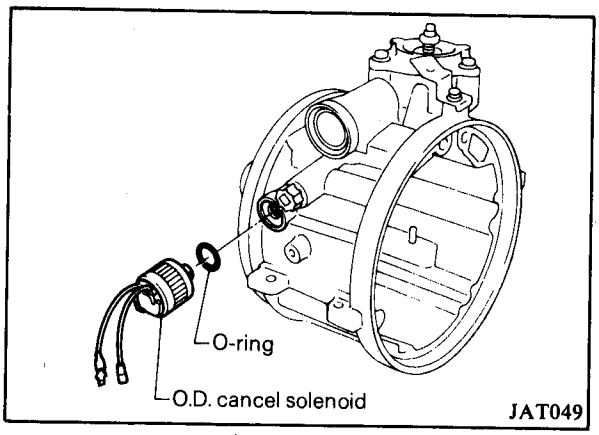
10. Remove O.D. servo assembly by lightly tapping retainer.



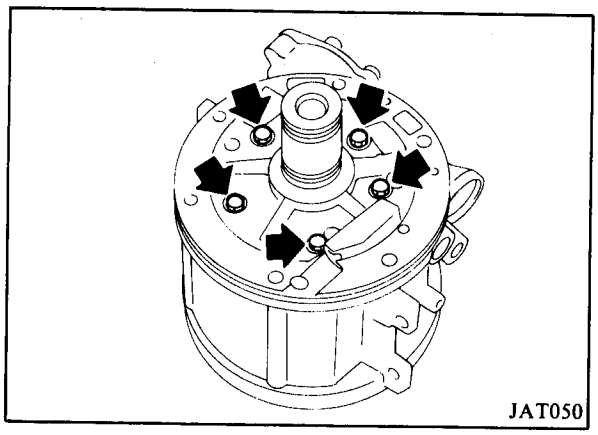
11. Remove accumulator snap ring, then apply pressure to remove accumulator plug, piston and spring.



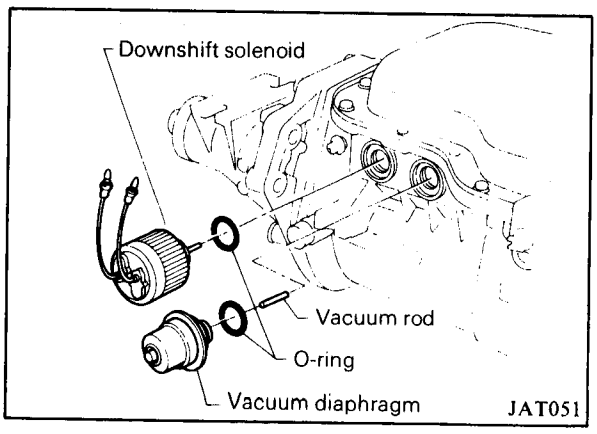
12. Remove O.D. cancel solenoid and O-ring.



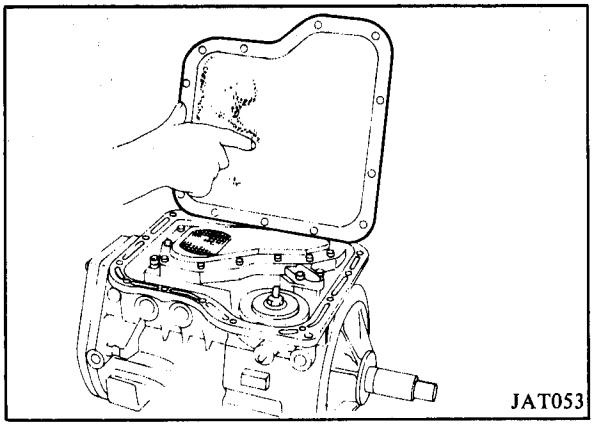
13. Remove drum support from O.D. case.



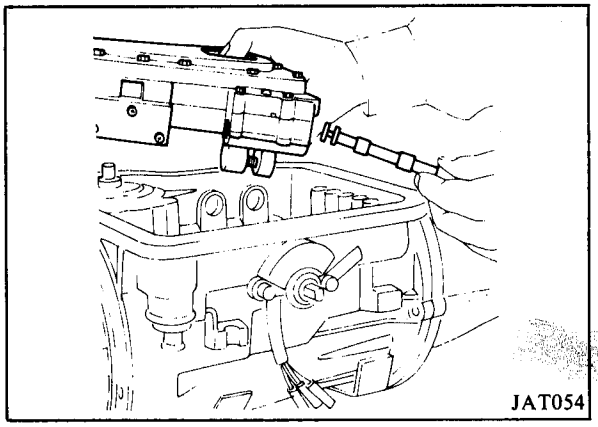
14. Remove downshift solenoid, vacuum diaphragm, rod and O-rings.
15. Remove speedometer pinion from rear extension.



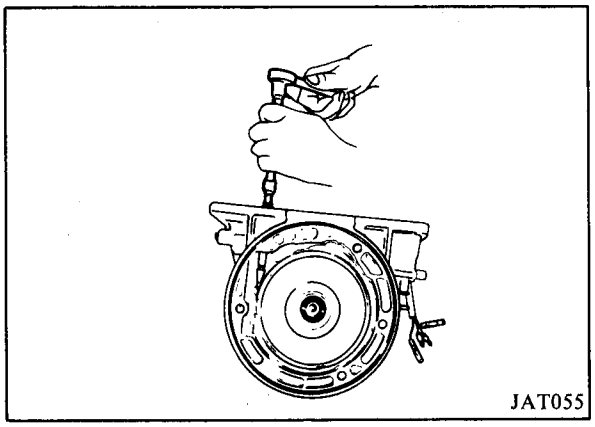
16. Remove oil pan and inspect its contents. An analysis of any foreign matter can indicate the types of problems to look for. If the fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean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


JAT053

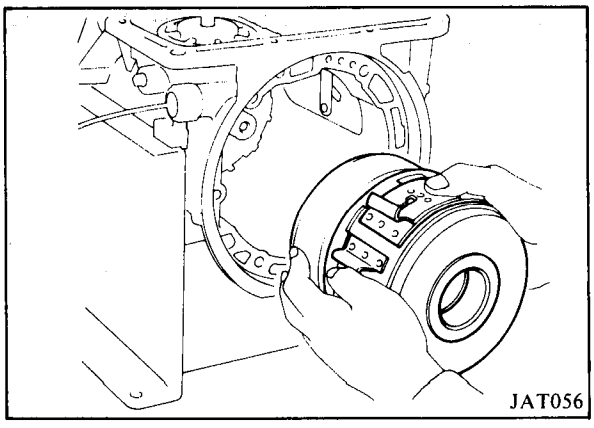
17. Remove control valve body.
    Remove manual valve from valve body as a precaution, to prevent valve from dropping out accidentally.


JAT054

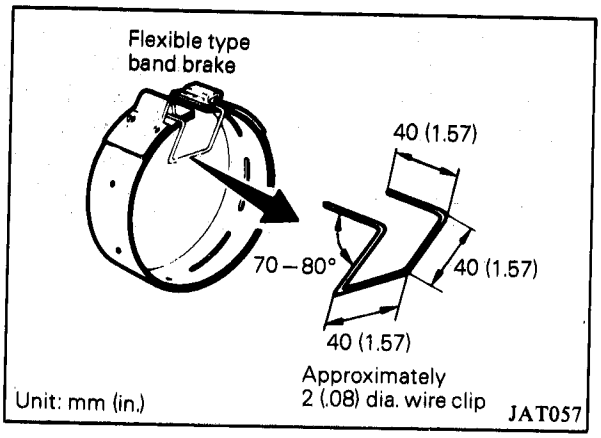
18. Loosen 2nd band servo piston stem lock nut and tighten piston stem. If it turns more than two turns, the band is worn out. Back off band servo piston stem to release band.


JAT055

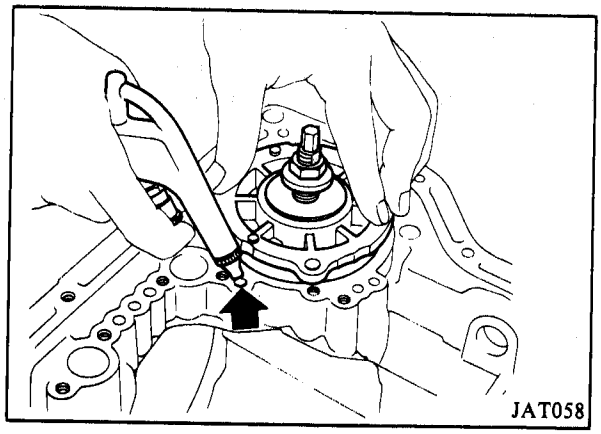
19. Remove brake band strut. Brake band and clutch and planetary gear pack [including high-reverse clutch (Front), forward clutch (Rear) and front planetary gear] may be removed together.


JAT056

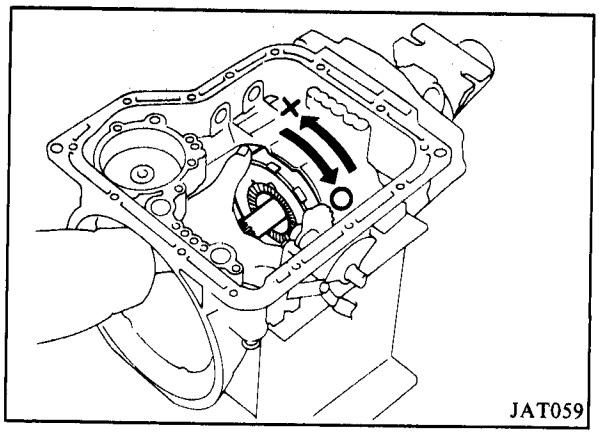
To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. Before removing the brake band, always secure it with a clip as shown in illustration.
Leave the clip in position after removing the brake band.



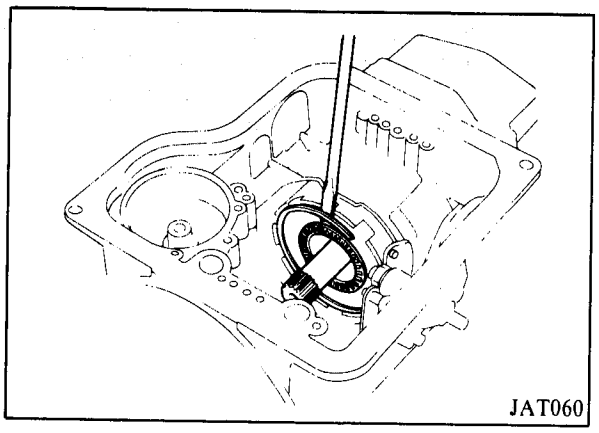
20. Remove 2nd band servo retaining bolts. Apply pressure to remove 2nd band servo.



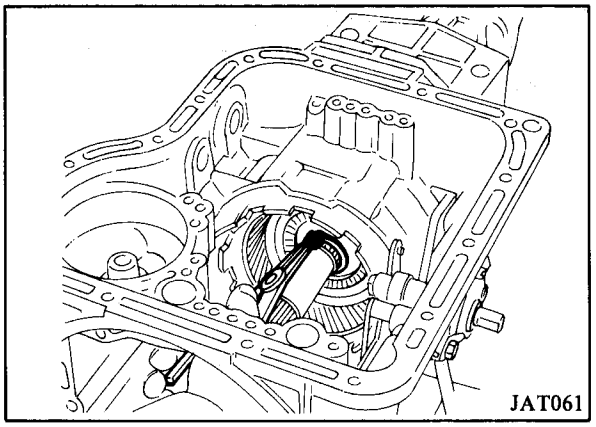
21. Check one-way clutch to see if it operates properly.



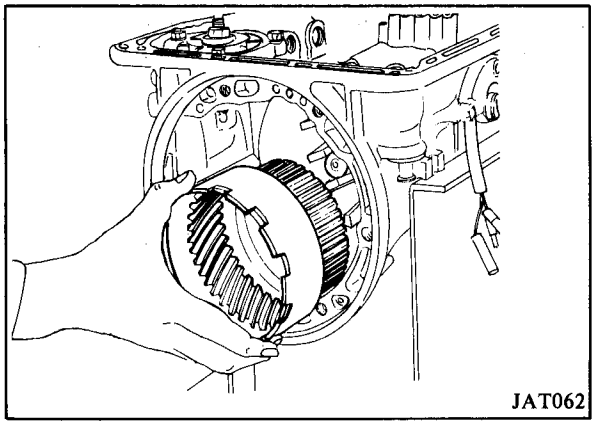
22. Remove rear planetary carrier snap ring and rear planetary carrier.



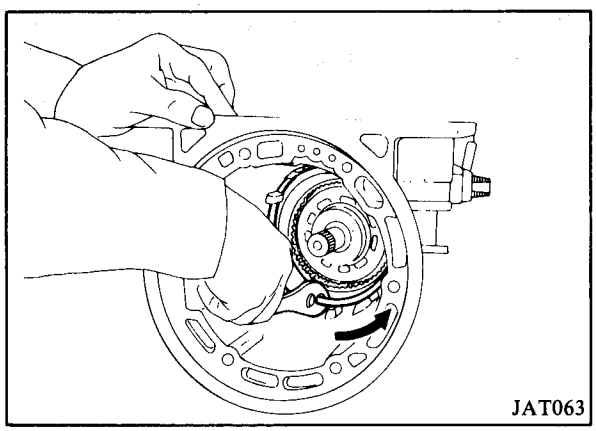
23. Remove output shaft snap ring.


JAT061

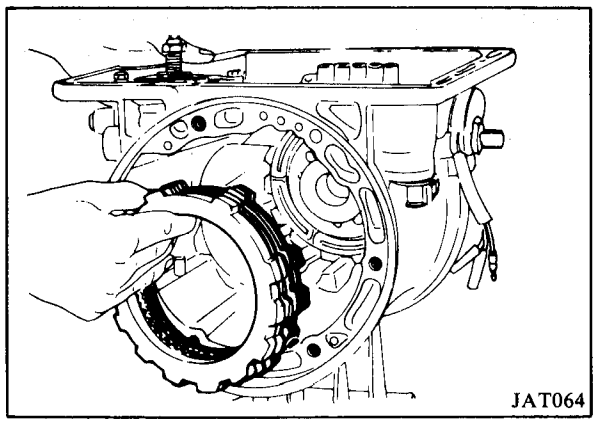
24. Remove connecting drum with internal gear.


JAT062

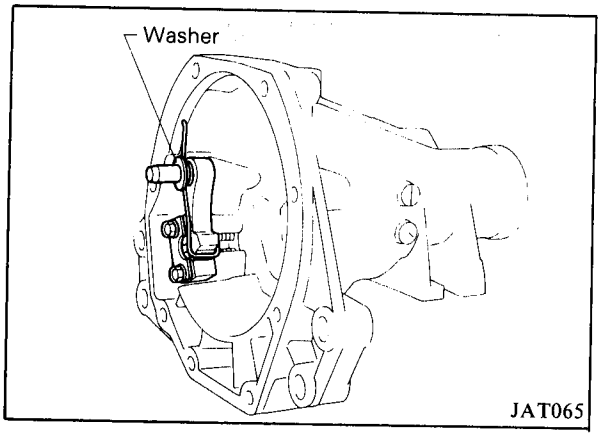
25. Pry off one end of snap ring with a screwdriver. Remove snap ring from low and reverse brake assembly while applying plier force in direction of arrow.


JAT063

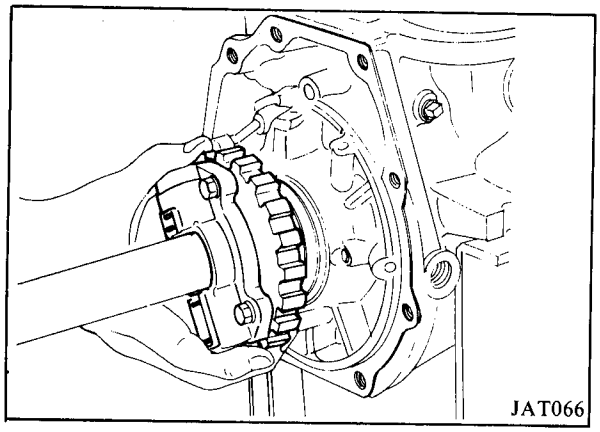
26. Remove low and reverse brake clutch assembly.


JAT064

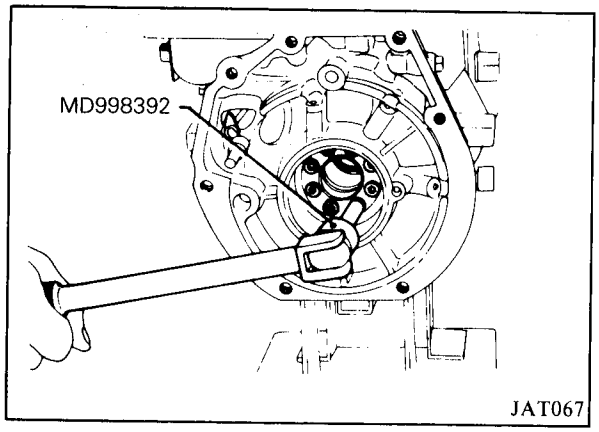
27. Remove rear extension.
Be careful not to lose parking pawl, spring and retainer washer.



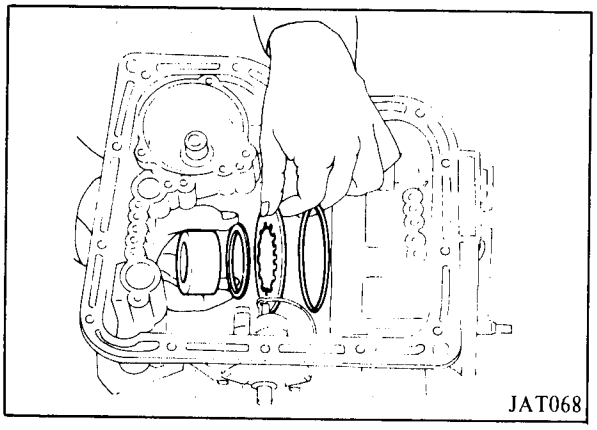
28. Remove output shaft with governor.
Remove governor thrust washer and needle bearing.



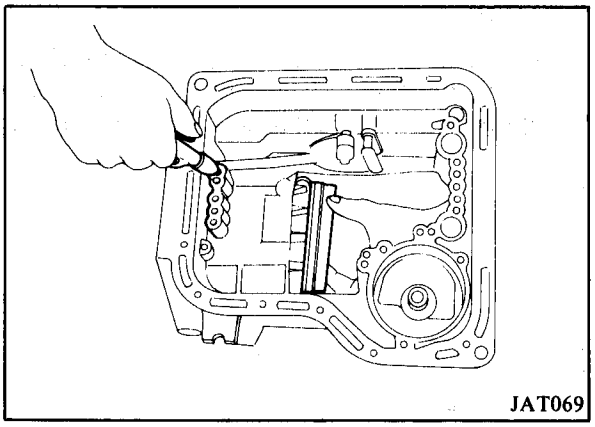
29. Remove one-way clutch inner race attaching hex-head slotted bolts using Special Tool MD998392.



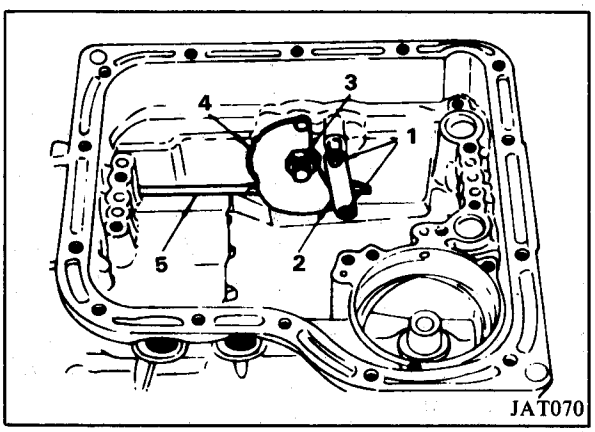
30. Remove one-way clutch inner race, return thrust washer, low and reverse return spring and spring thrust ring.



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


JAT069

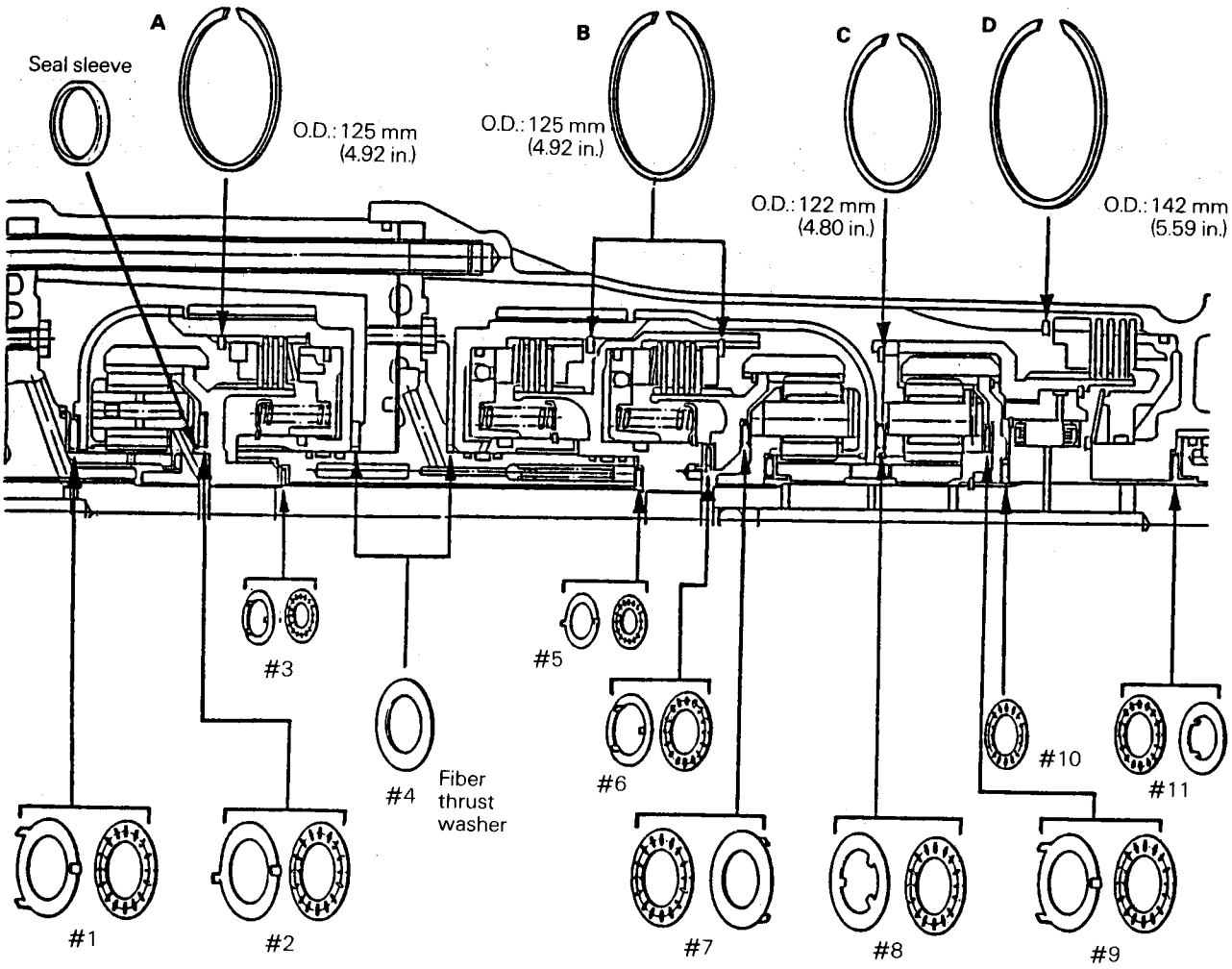
32. Pry off snap ring (1) from both ends of parking brake lever (2) and remove the lever. Back off manual shaft lock nut (3) and remove manual plate (4) and parking rod (5).
33. Remove inhibitor switch and manual shaft by loosening two retaining bolts.



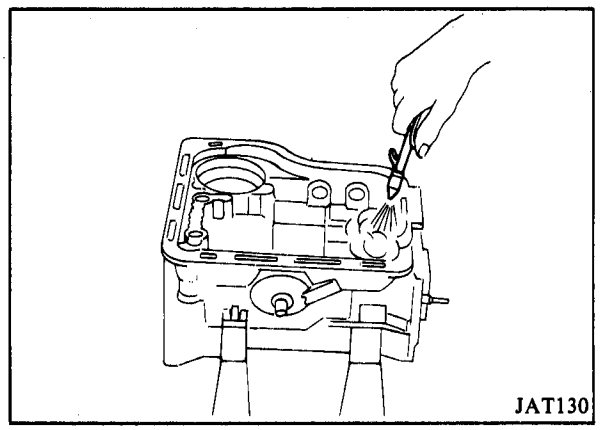
JAT070

REASSEMBLY

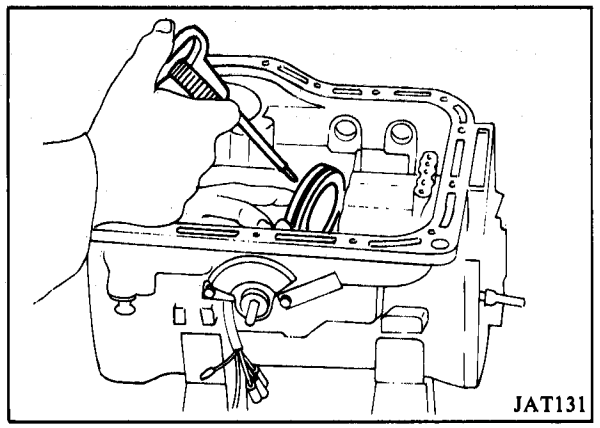
When installing/assembling needle bearing, bearing race, snap ring and O-ring (seal ring), use the following illustration as a guide to installation procedures and locations.



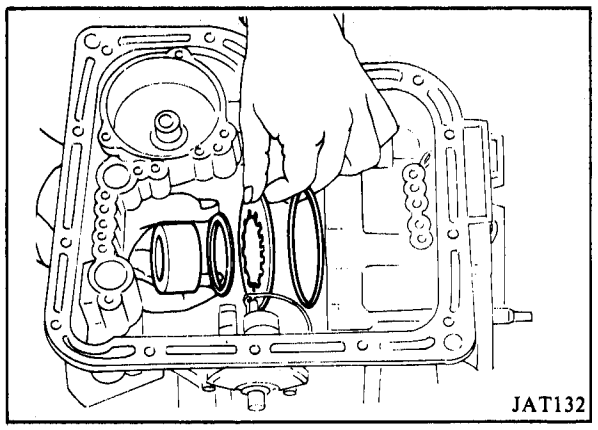
1. Before proceeding with the reassembly of all components, it is important to verify that the case, housing and parts are clean and free from dust, dirt and foreign matter (use air gun). Have a tray available with clean transmission fluid for lubricating parts.
   Petroleum jelly can be used to secure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


JAT130

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


JAT131

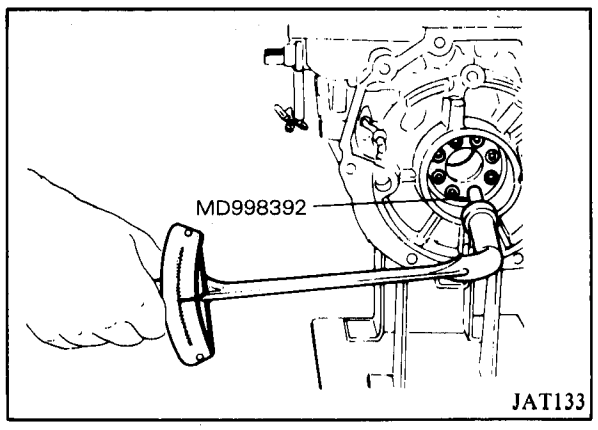
3. Install thrust ring, piston return spring, thrust washer and one-way clutch inner race.


JAT132

4. Tighten inner race attaching bolts to specified torque using Special Tool MD998392.

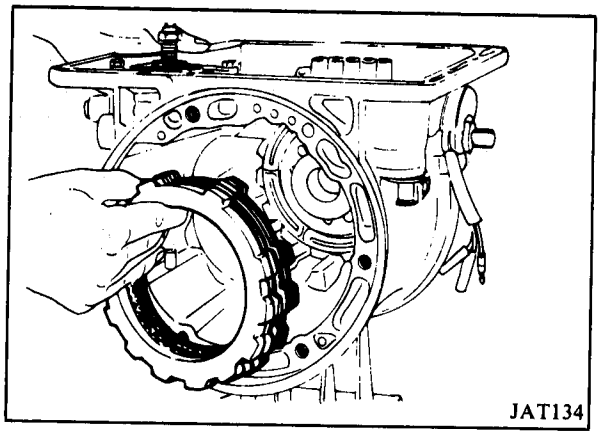
Caution
Check that return spring is centered on race before tightening.

One-way clutch inner race to transmission case	13 – 18 Nm (9 – 13 ft.lbs.)



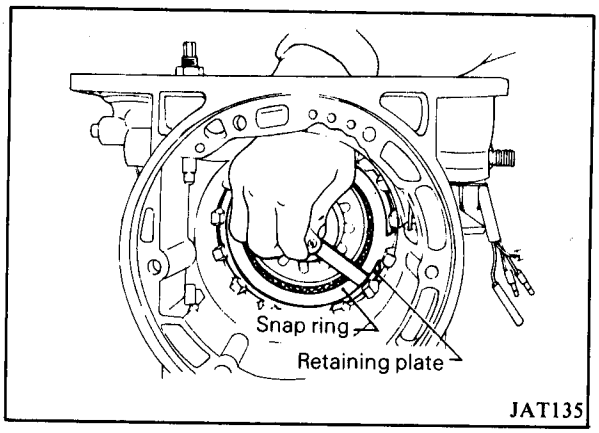
JAT133

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


JAT134

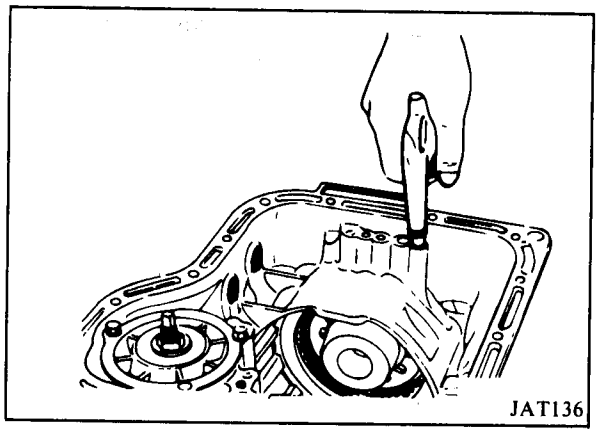
6. After low and reverse brake has been completely assembled, measure clearance between snap ring and retainer plate. If measurement exceeds specifications it can be adjusted by replacing retainer plate with one of a different thickness.

Low and reverse brake clearance	0.80—1.25 mm (.0315—.0492 in.)

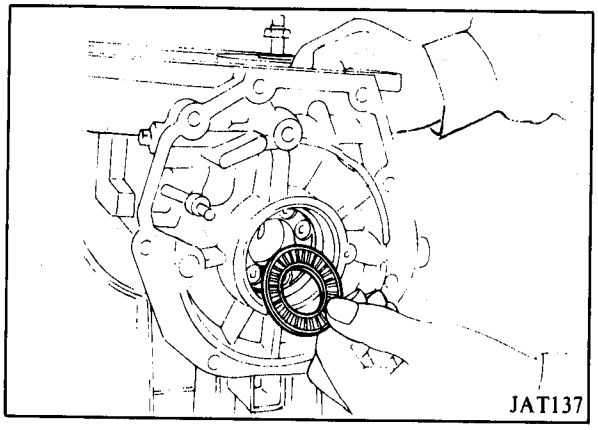


JAT135

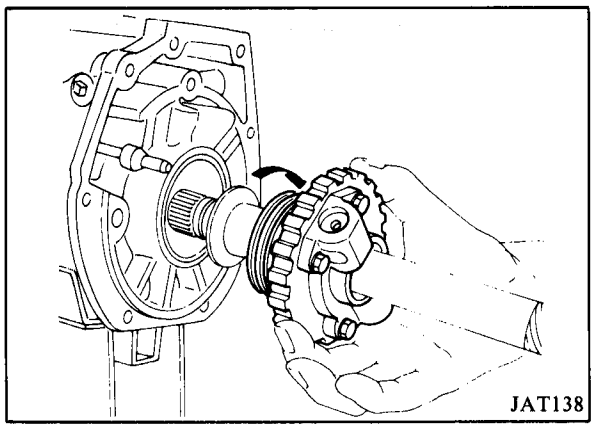
7. Using an air gun with a tapered rubber tip, check low and reverse brake operation.


JAT136

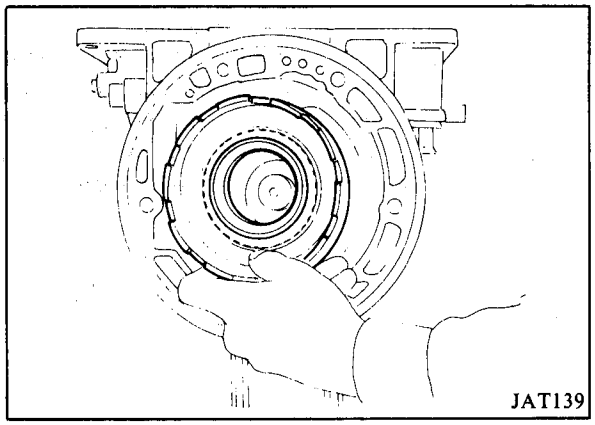
8. Install governor thrust washer and needle bearing.


JAT137

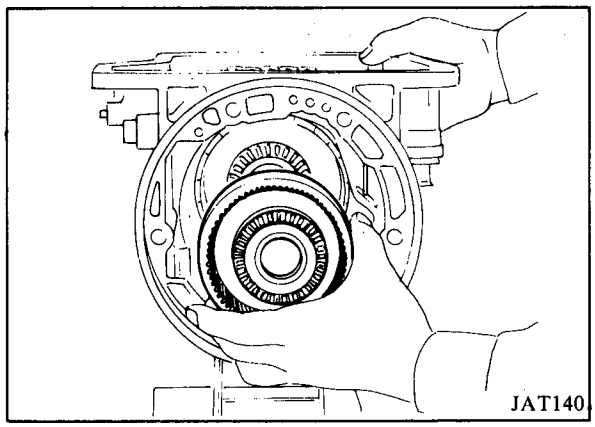
9. Slide governor distributor assembly on output shaft from front of shaft. Install shaft and governor distributor into case, using care not to damage distributor rings.


JAT138

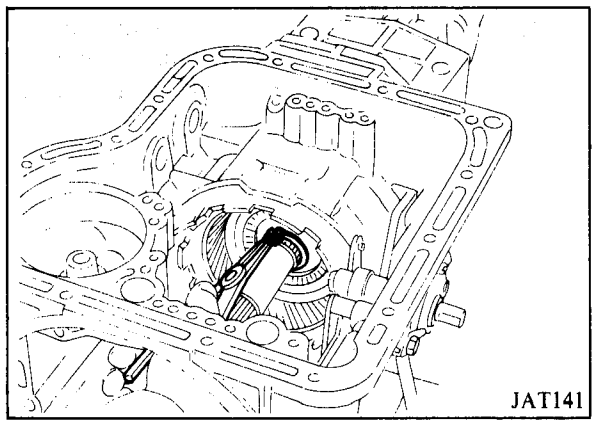
10. Install connecting drum with sprag by rotating drum clockwise using a slight pressure and wobbling to align plates with hub and sprag assembly. Connecting drum should now be free to rotate clockwise only. This check will verify that sprag is correctly installed and operative.


JAT139

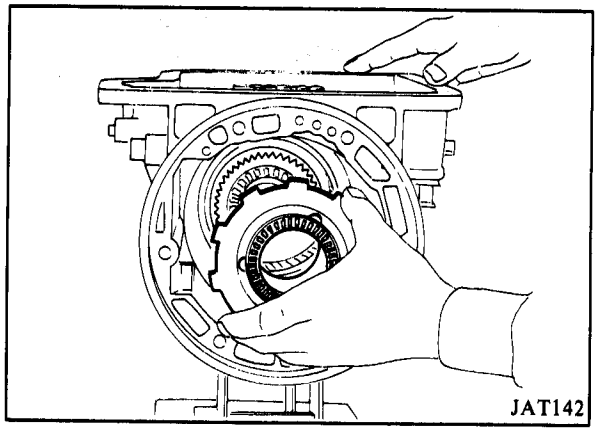
11. Install rear internal gear.


JAT140

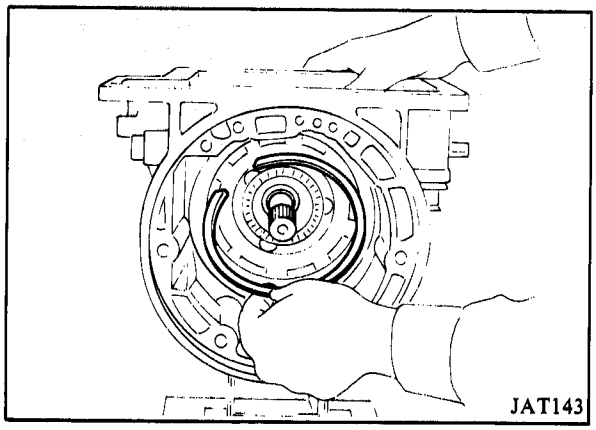
12. Install snap ring on shaft.


JAT141

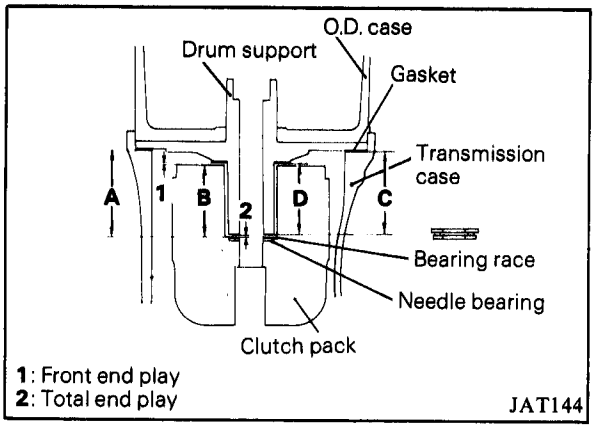
13. Secure thrust bearing and thrust washer with petroleum jelly and install rear planetary carrier.


JAT142

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.

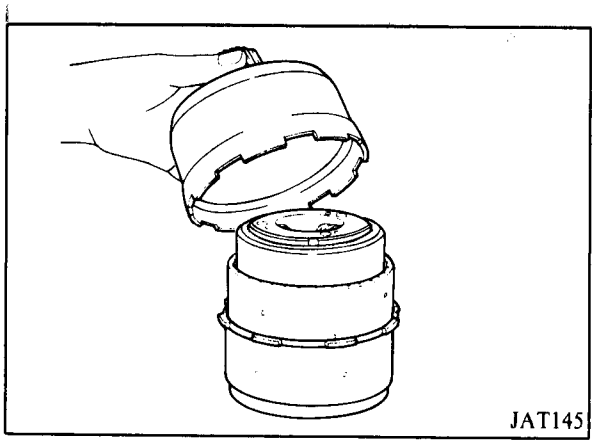

JAT143

15. Adjust front end play as follows:

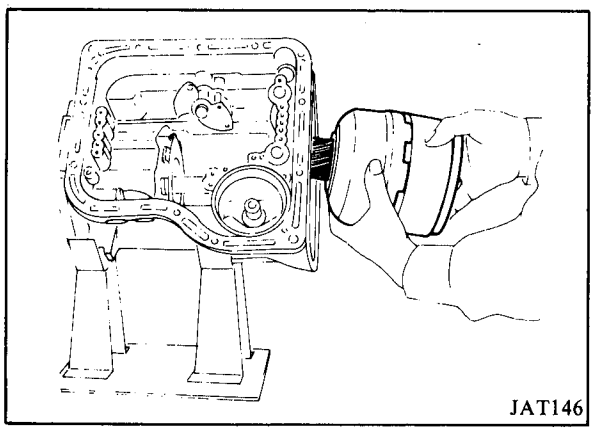


1: Front end play
2: Total end play
JAT144

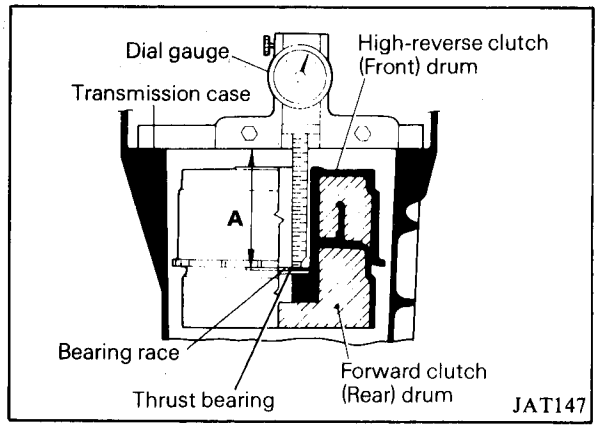
(1) Assemble high-reverse clutch (Front) and forward clutch (Rear), front internal gear, front planetary carrier and connecting shell. Secure thrust bearings with petroleum jelly.

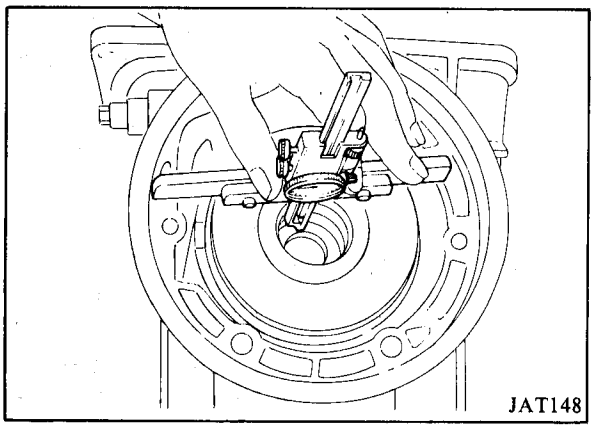

JAT145

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

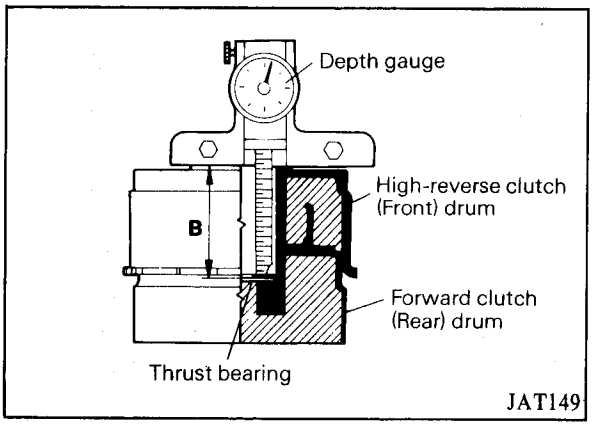


(3) Using a dial gauge or caliper with a seven inch base, measure from rear hub thrust bearing race to case (dimension A).

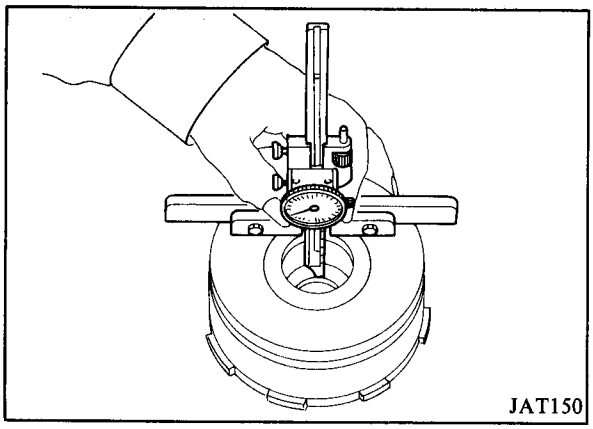




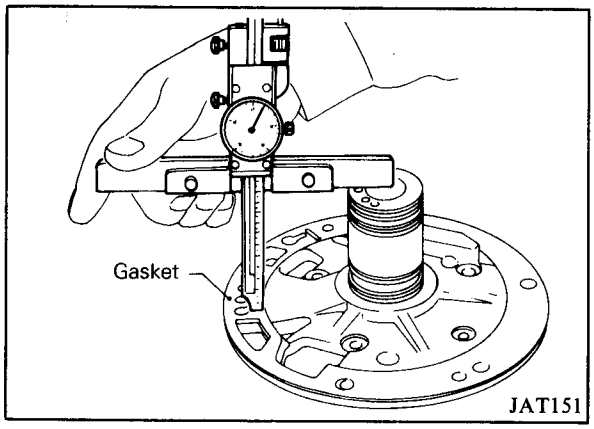
(4) Assemble high-reverse clutch (Front) and forward clutch (Rear) drum assemblies together and lay them flat on bench. Be sure rear hub thrust bearing is properly seated.



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

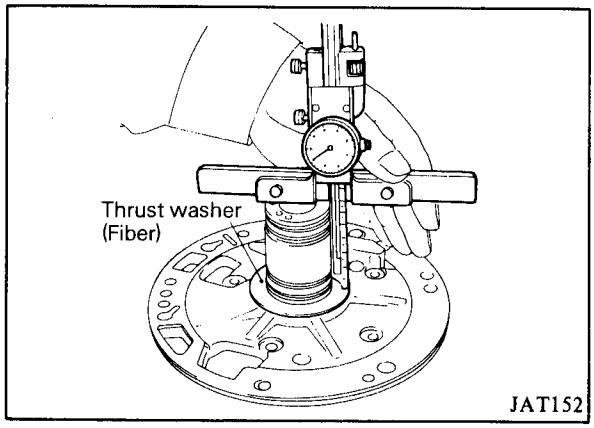


(5) Measure from top of drum support shaft (front clutch and rear clutch side) to installed gasket (dimension C).



(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 specified value.

Specified front end play .....
0.5–0.8 mm (.020–.031 in.)

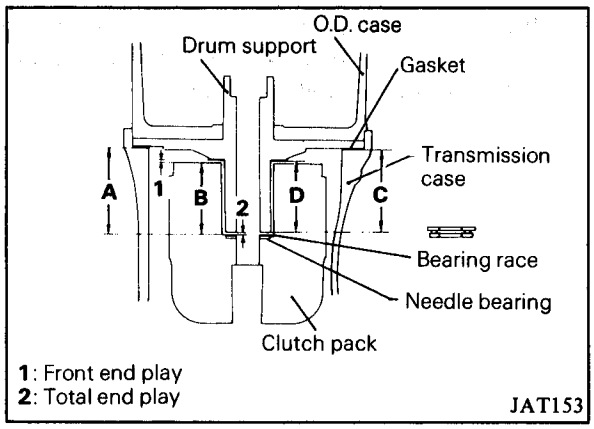


Front end play can be adjusted with high-reverse clutch (Front) thrust washers of different thickness.

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 specified value.



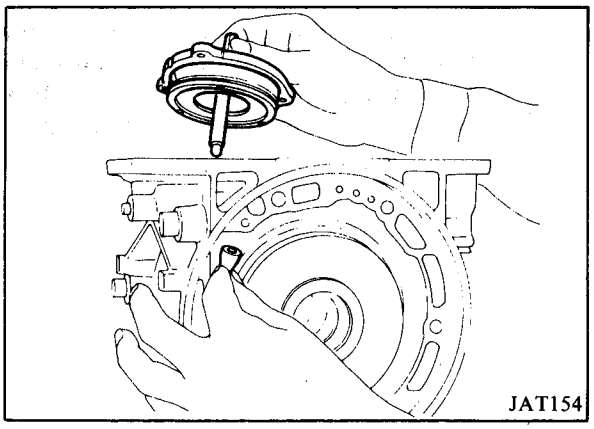
Specified total end play ..... 0.25–0.50 mm (.0098–.0197 in.)

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

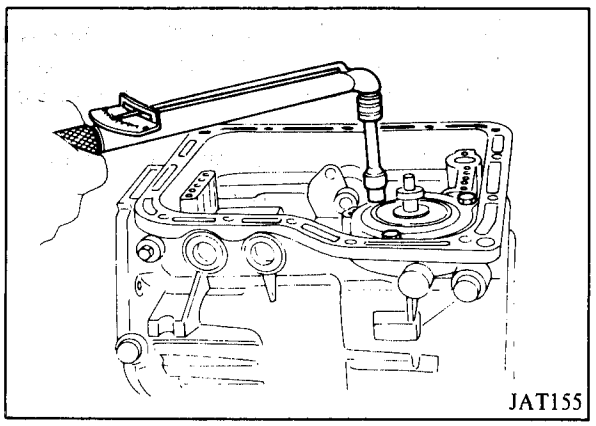
Thickness mm (in.)	Part number
1.2 (.047)	MD610221
1.4 (.055)	MD610222
1.6 (.063)	MD610223
1.8 (.071)	MD610224
2.0 (.079)	MD610225
2.2 (.087)	MD610226

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.

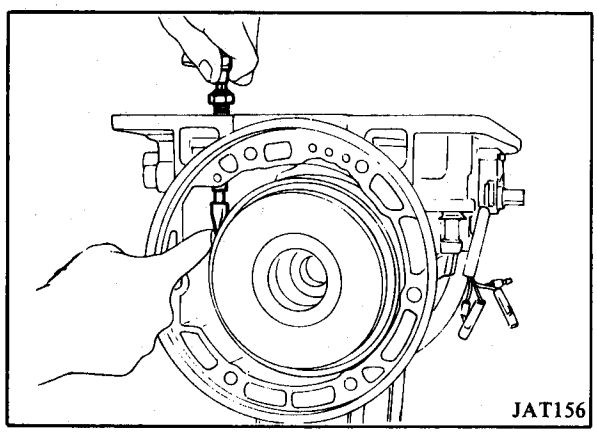


18. Install and torque the retainer bolts. Loosen piston stem.

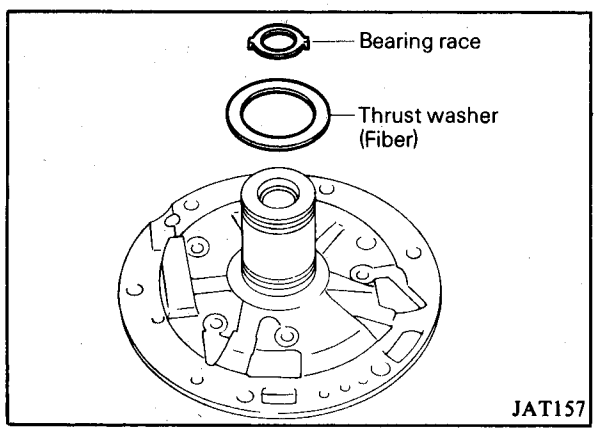
Servo piston retainer bolt ..... 7–9 Nm (5–6 ft.lbs.)



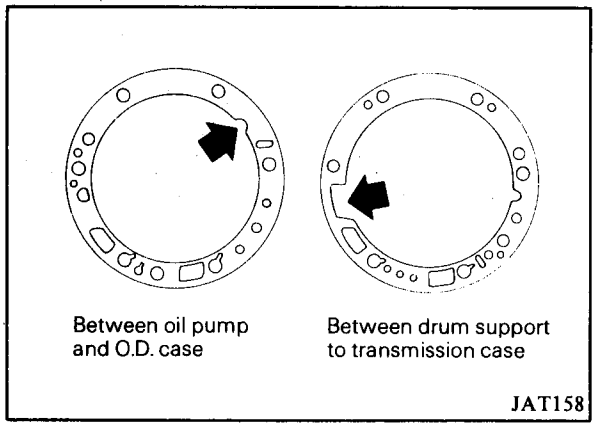
19. Finger tighten brake band servo piston stem enough to prevent brake band and strut from falling out. Do not adjust brake band at this time.



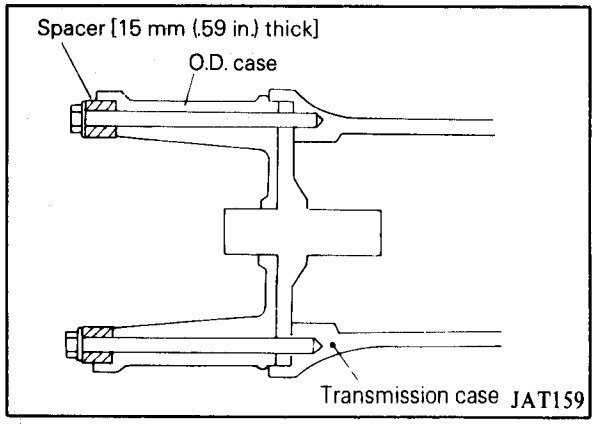
20. Apply petroleum jelly to bearing race and thrust washer, then mount them on drum support.



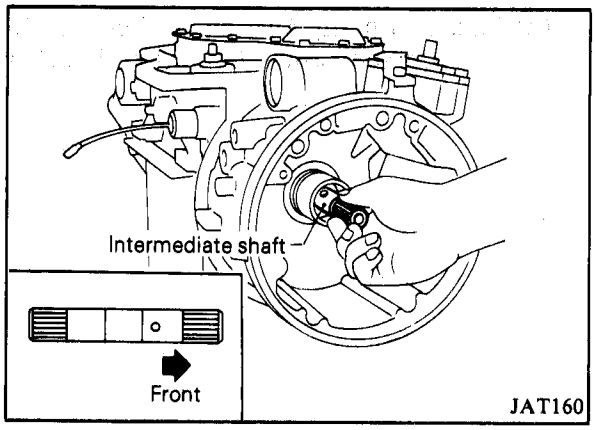
21. Mount drum support gasket on drum support after coating with petroleum jelly. Apply automatic transmission fluid to O-ring of drum support. Align drum support with O.D. case to transmission case and install.



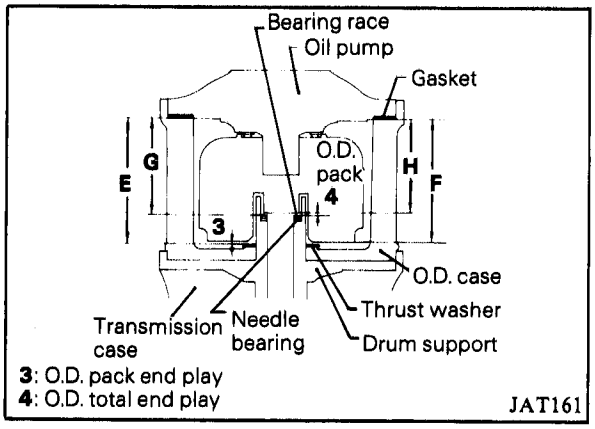
Before installing drum support and O.D. case on transmission case, ensure that they have been centered properly. Refer to Component Service Drum Support on page 21-73.
Install O.D. case and temporarily tighten it using two converter housing securing bolts.



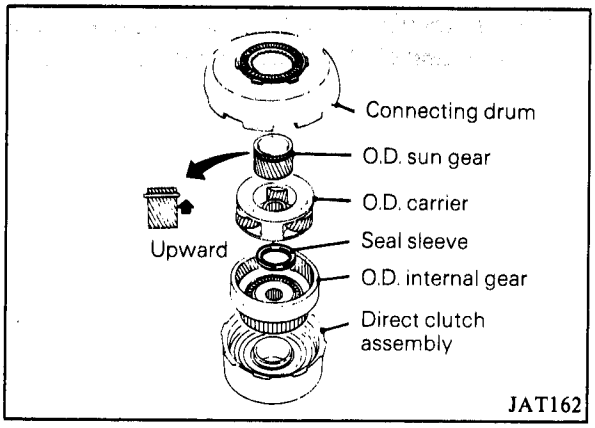
22. Insert intermediate shaft being especially careful of its direction.



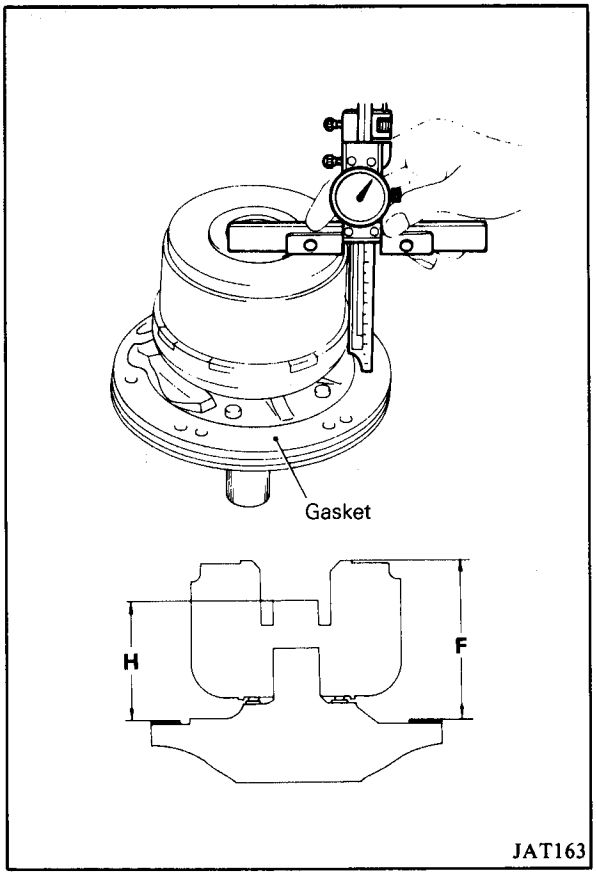
23. Adjust O.D. pack end play and O.D. total end play as follows:



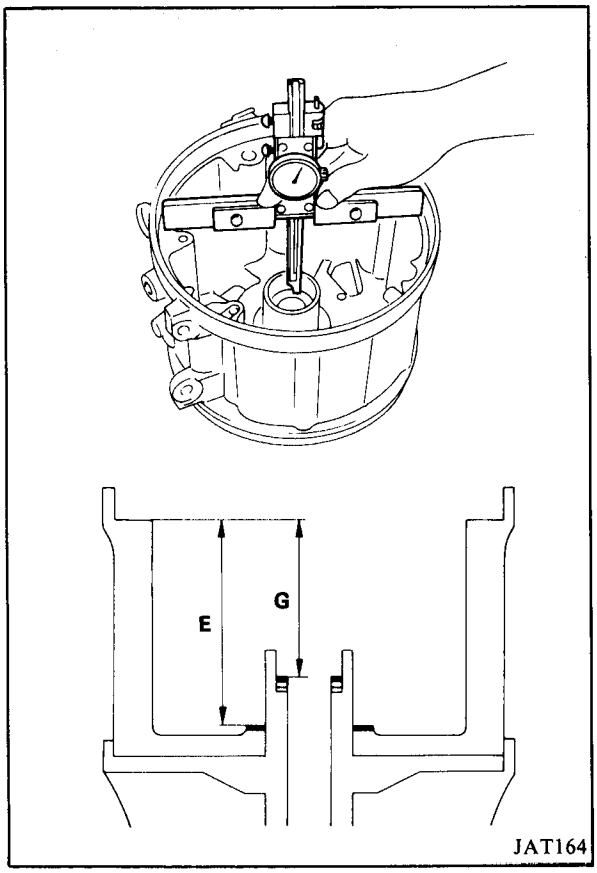
(1) Assemble direct clutch assembly, O.D. planetary gear set and connecting drum, and install them on O.D. pack.



(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 specified value.

Specified O.D. pack end play .....
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. Thrust Washer

Thiskness 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

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

Specified O.D. total end play .....
0.25–0.50 mm (.0098–.0197 in.)

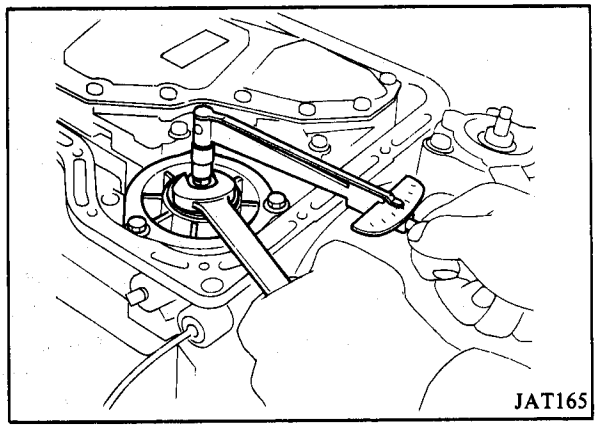
If difference between [G – 0.1 mm (.004 in.)] and H is not within the tolerance, select proper size O.D. bearing race.

Available O.D. Bearing Races

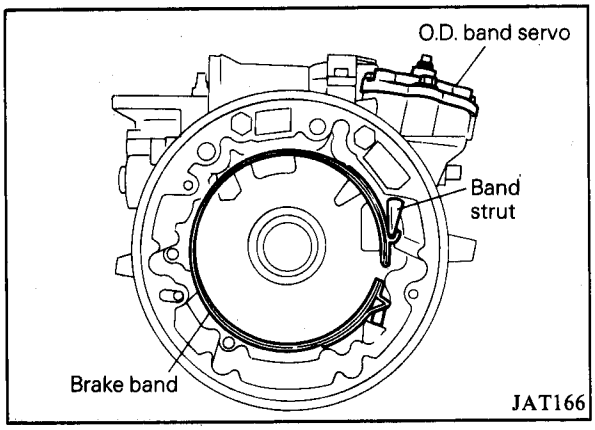
Thickness mm (in.)	Part number
1.2 (.047)	MD610415
1.4 (.055)	MD610416
1.6 (.063)	MD610417
1.8 (.071)	MD610418
2.0 (.079)	MD610419
2.2 (.087)	MD610420

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	7—10 Nm (5—7 ft.lbs.)
Piston stem lock nut	15—39 Nm (11—29 ft.lbs.)

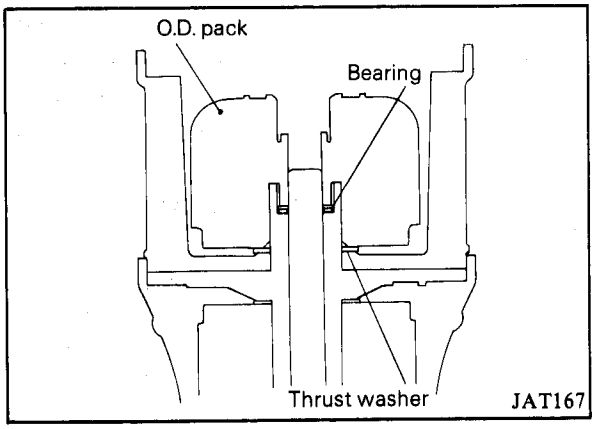

JAT165

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



JAT166

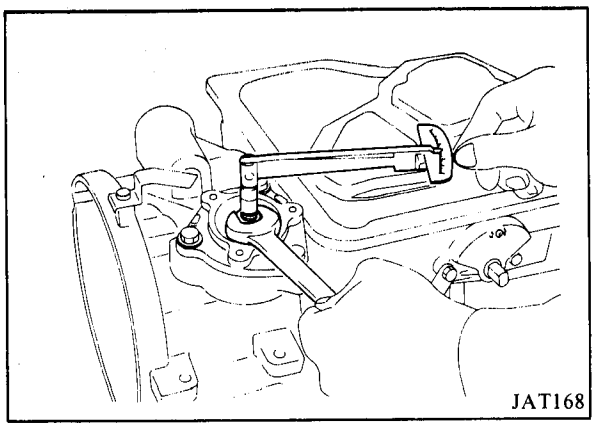
26. Apply automatic transmission fluid to seal ring of direct clutch, then install O.D. bearing and race, O.D. thrust washer and O.D. pack on drum support. Make sure that brake band strut is correctly installed.
27. Apply automatic transmission fluid to O-ring of oil pump, then install needle bearing, 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.



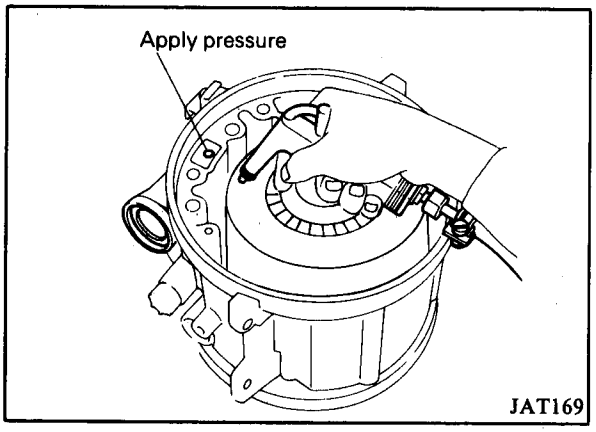
JAT167

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

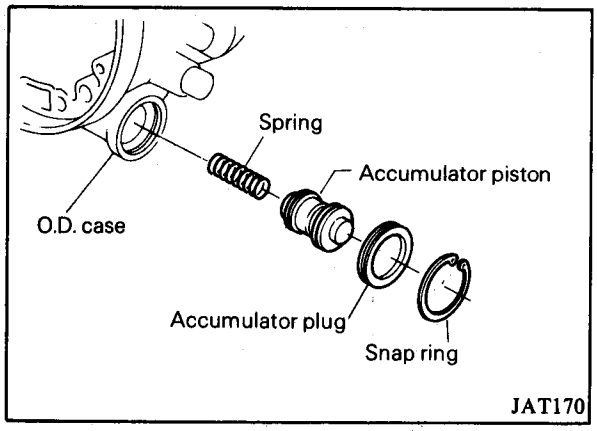
Piston stem	7—10 Nm (5.1—7.2 ft.lbs.)
Piston stem lock nut	15—39 Nm (11—29 ft.lbs.)


JAT168

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

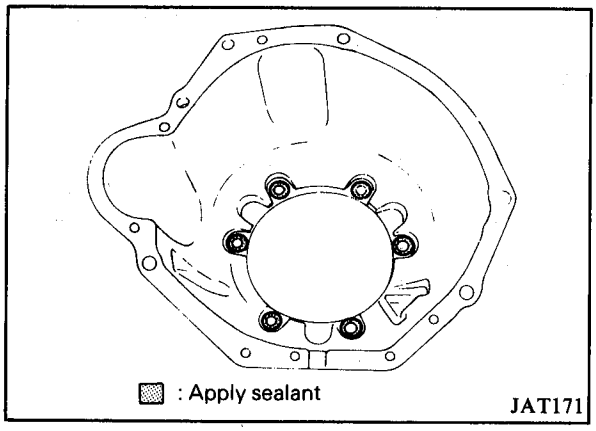


30. Install accumulator parts, then secure with snap ring.

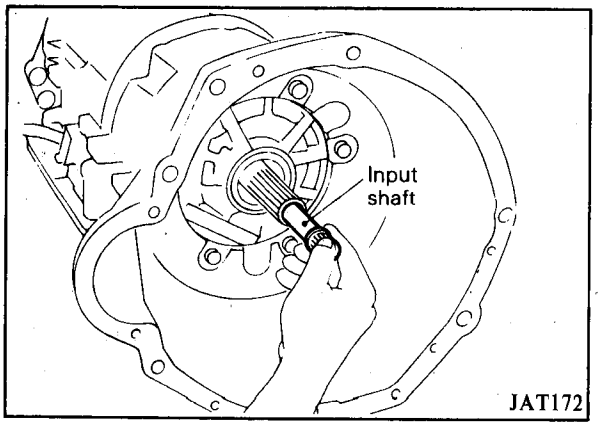


31. Remove the two bolts used to temporarily tighten O.D. case. Apply sealant to seating surfaces of converter housing at bolt locations. Install converter housing on O.D. case and tighten converter housing securing bolts.

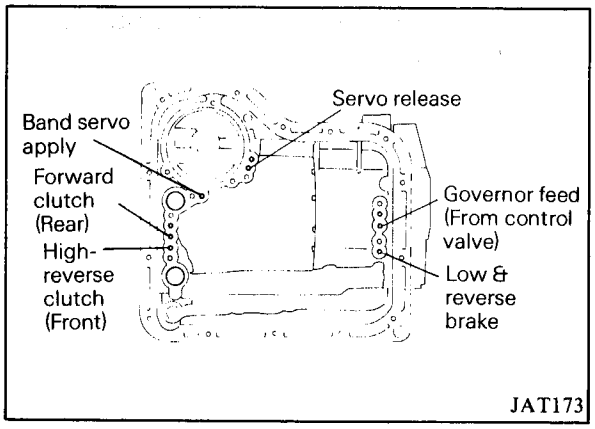
Converter housing securing bolt ..... 44 – 54 Nm (33 – 40 ft.lbs.)



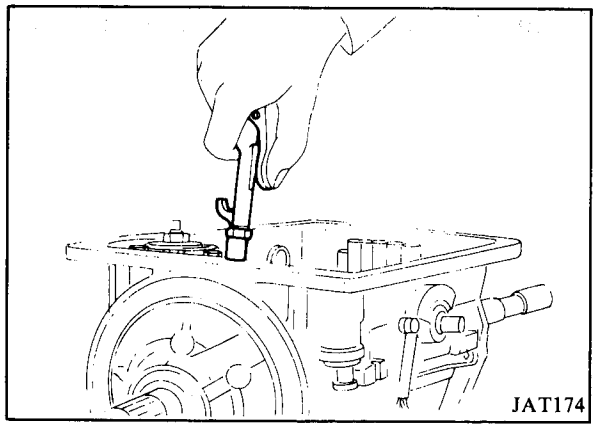
32. Install input shaft.
33. Before proceeding with installation of valve body assembly, perform a final air check of all assembled components. This will ensure that you have not overlocked tightening of any bolts or damaged any seals during assembly.



Air check point

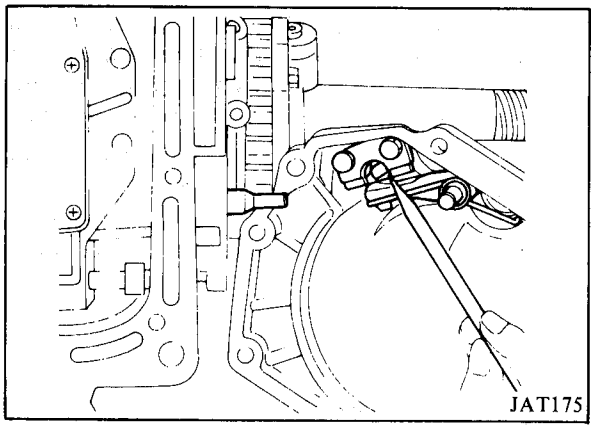


34. Using an air gun with a tapered rubber tip, perform air checks.



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

Rear extension to transmission case ..... 20–25 Nm (14–18 ft.lbs.)

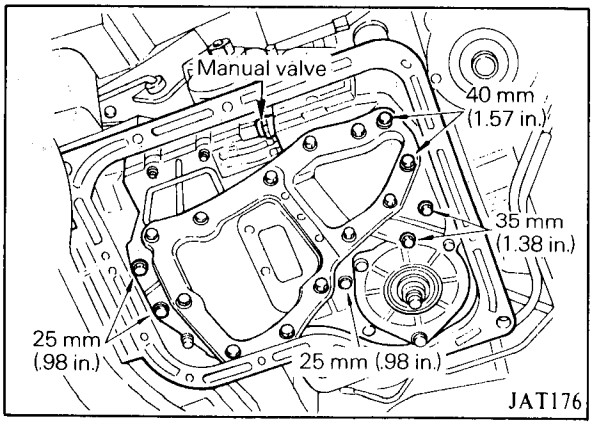


37. Install control valve body. Be sure manual valve is in alignment with selector pin. Tighten control valve body attaching bolts.

NOTE
Attaching bolt come in three different lengths.

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

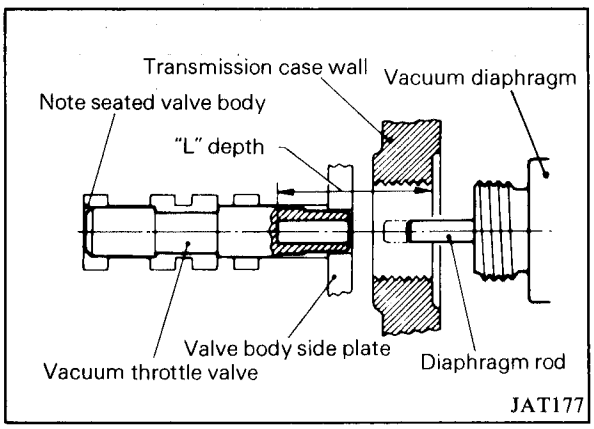
After installing control valve body to transmission case, make sure that manual lever can be moved to all positions.



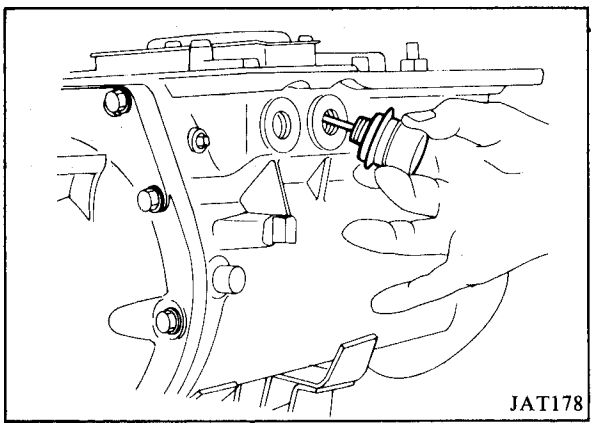
38. Before installing vacuum diaphragm valve, measure depth of hole in which it is inserted. This measurement determines correct rod length to ensure proper performance.

Vacuum Diaphragm Rod Selection

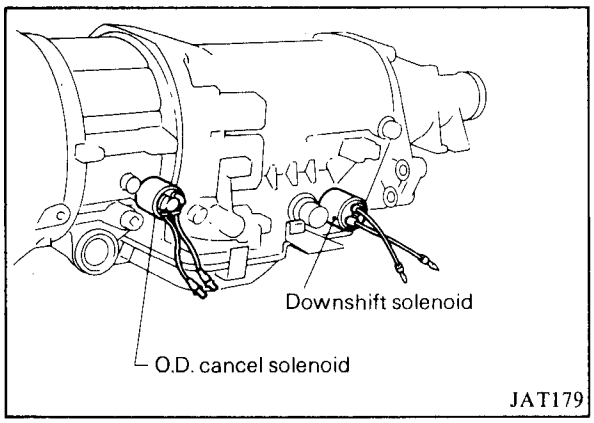
Measured depth "L" mm (in.)	Rod length mm (in.)	Part number
Under 25.55 (1.0059)	29.0 (1.142)	MD610614
25.65 – 25.05 (1.0098 – 1.0256)	29.5 (1.161)	MD610615
26.15 – 26.55 (1.0295 – 1.0453)	30.0 (1.181)	MD610616
26.65 – 27.05 (1.0492 – 1.0650)	30.5 (1.201)	MD610617
Over 27.15 (1.0689)	31.0 (1.220)	MD610618



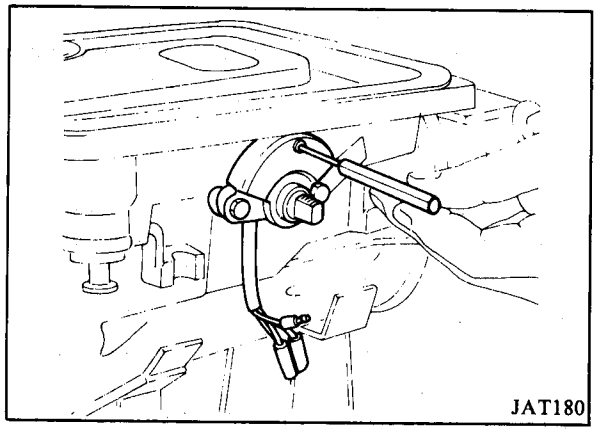
39. Install vacuum diaphragm.
Make sure that vacuum diaphragm rod does not interfere with side plate of control valve.



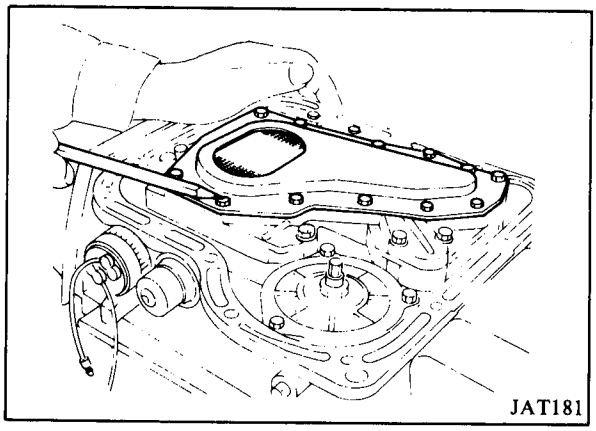
40. Install downshift solenoid, O.D. cancel solenoid.



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

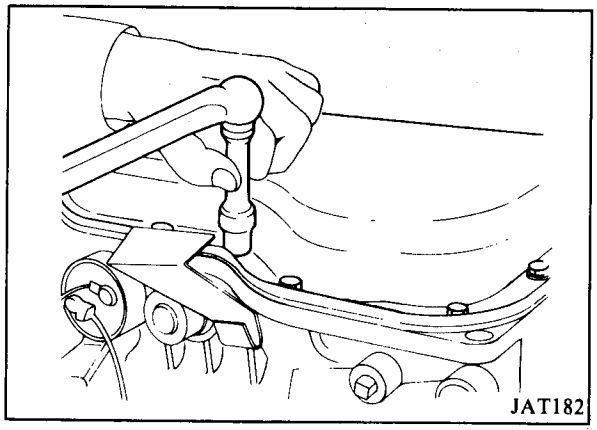

JAT180

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.

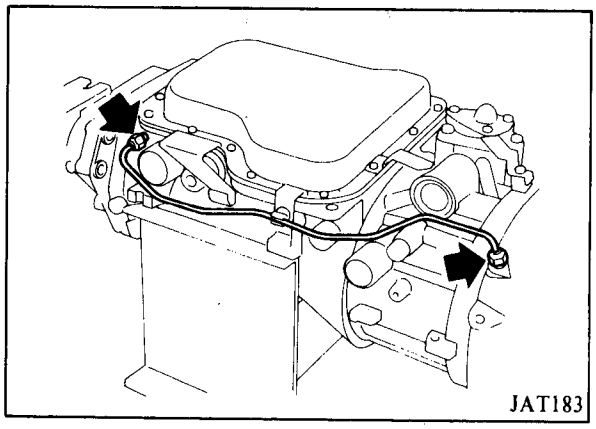

JAT181

43. Install oil pan with new gasket.

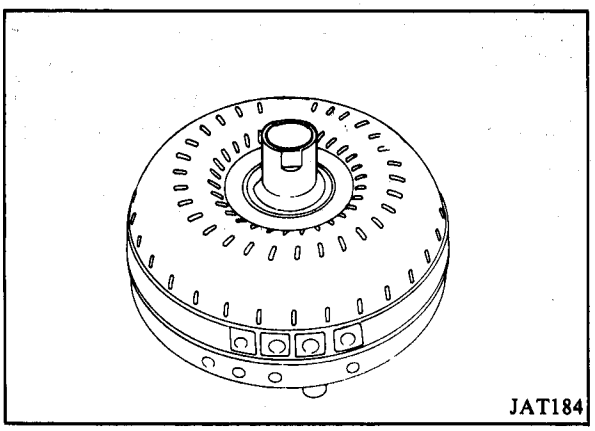
Oil pan to transmission case ..... 6–8 Nm (4.4–5.7 ft.lbs.)


JAT182

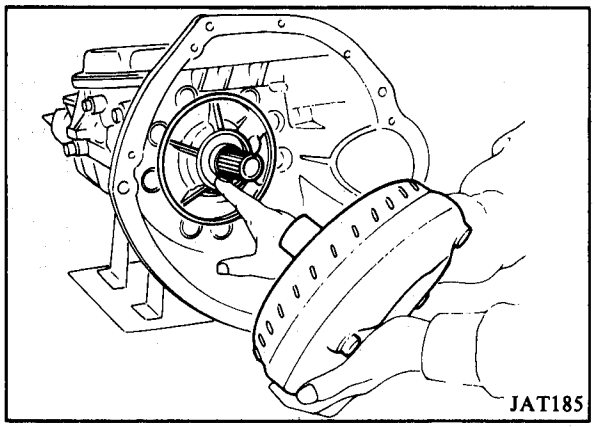
44. Install governor tube.


JAT183

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

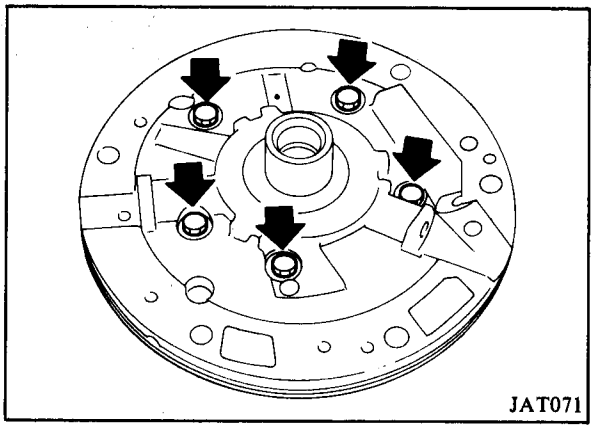

JAT184

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.


JAT185

DISASSEMBLY

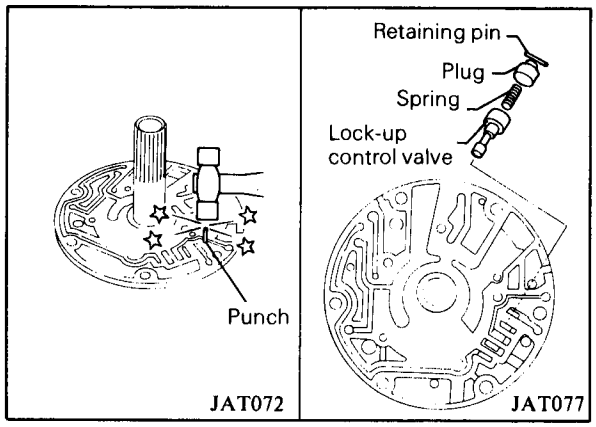
1. Remove front pump gasket and O-ring. Inspect pump body, bushing and pump shaft for wear.
2. Remove pump cover from pump housing.


JAT071

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)

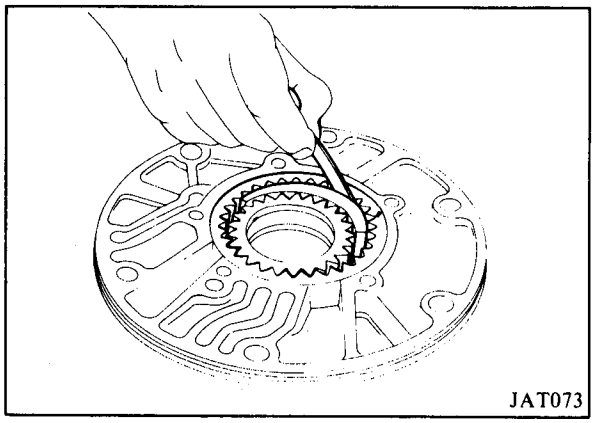
3. Remove retaining pin using a punch [outer dia. 1.5 to 1.8 mm (.059 to .071 in.)], then remove lock-up control valve and spring.
4. Inspect gears, lock-up control valve, spring and all internal surfaces for faults and visible wear.



5. Measure clearance between outer gear and crescent.

Standard clearance .....
0.14–0.21 mm (.0055–.0083 in.)

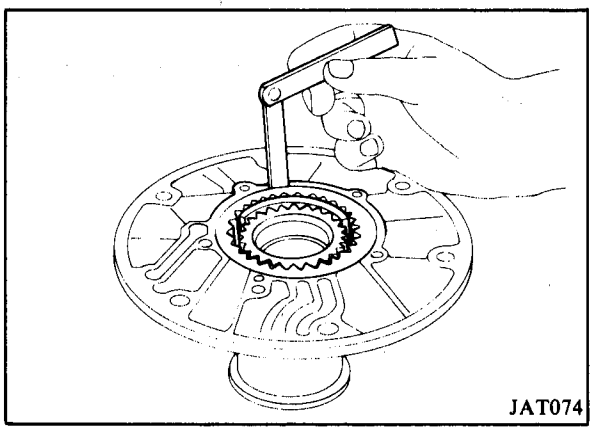
Replace if the clearance exceeds 0.25 mm (.0098 in.).


JAT073

6. Measure clearance between outer gear and pump housing.

Standard clearance .....
0.05 – 0.20 mm (.0020 – .0079 in.)

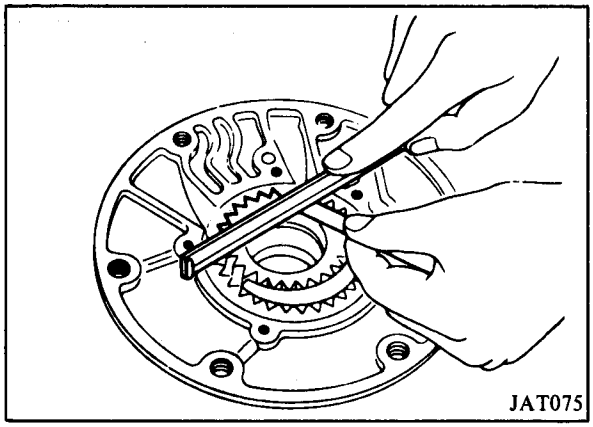
Replace if the clearance exceeds 0.25 mm (.0098 in.).


JAT074

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

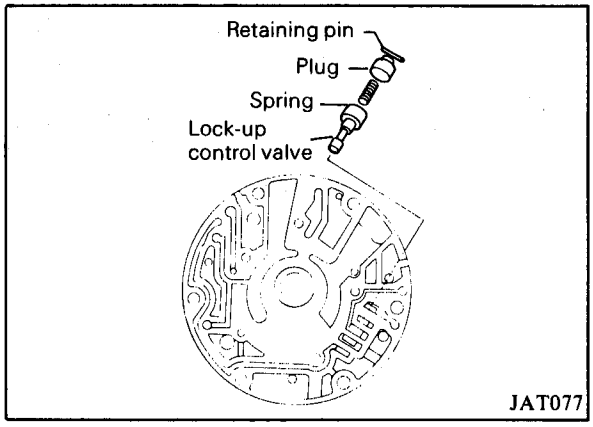
Standard clearance .....
0.02 – 0.04 mm (.0008 – .0016 in.)

Replace if the clearance exceeds 0.08 mm (.0031 in.).


JAT075

REASSEMBLY

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

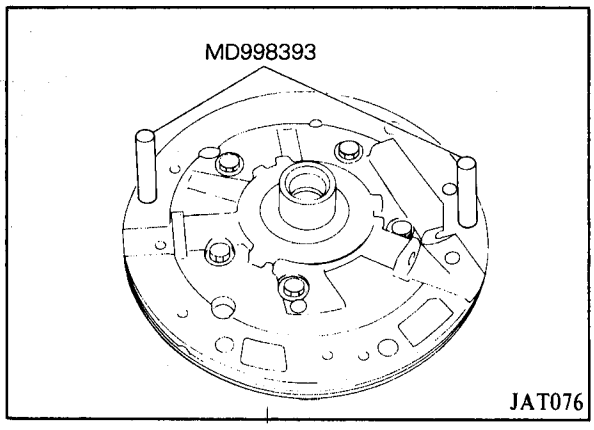


JAT077

2. Install inner and outer pump gears to pump housing.
3. Insert guides (MD998393) 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.)

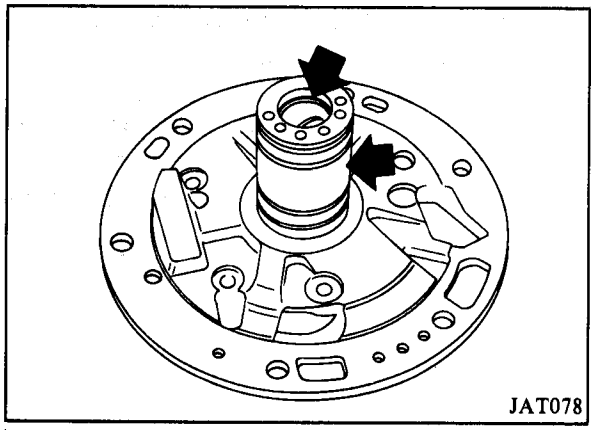
5. Install new O-ring.



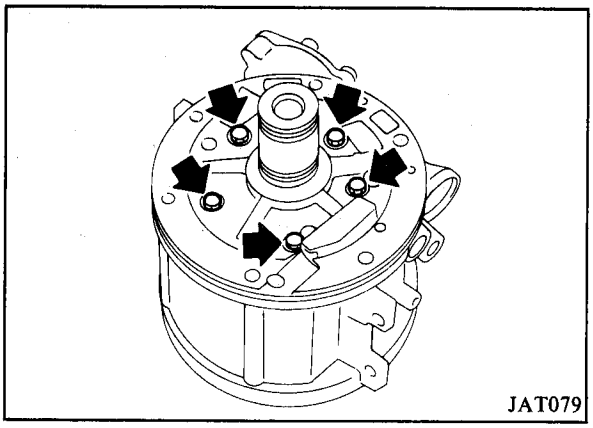
JAT076

DISASSEMBLY

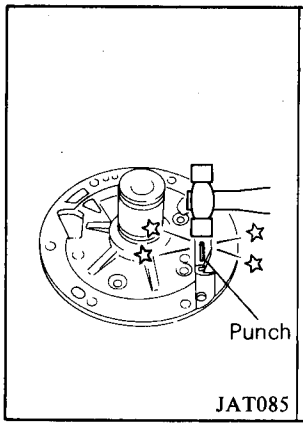
1. Inspect drum support bushing and ring groove areas for wear.


JAT078

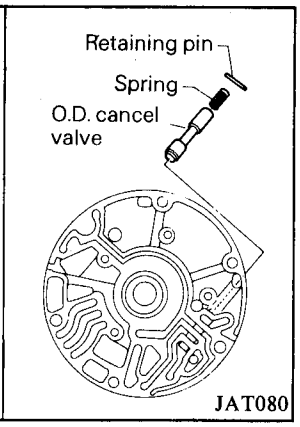
2. Remove drum support and gasket from O.D. case.


JAT079

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.
   Don't remove it from contacting face side.
4. Inspect O.D. cancel valve, spring and all internal surfaces for faults and visible wear.



JAT085



JAT080

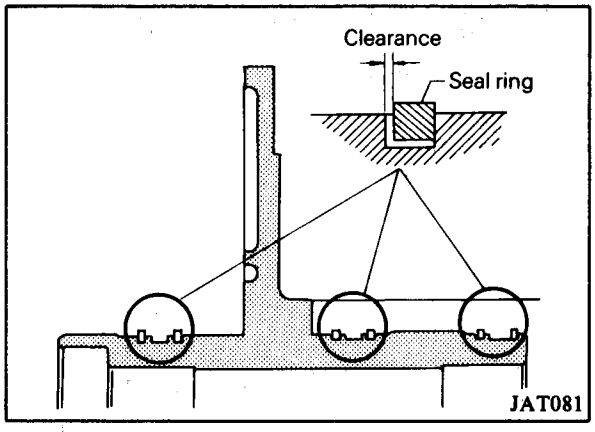
Valve Spring Chart

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)

5. Measure clearance between seal ring and ring groove.

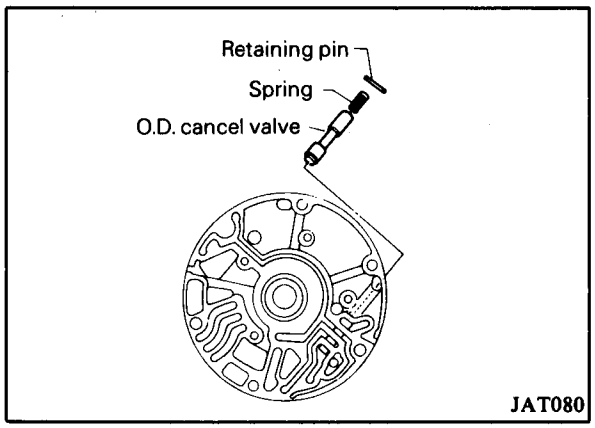
Standard clearance .....
0.05 – 0.20 mm (.0020 – .0079 in.)

Replace if the clearance exceeds 0.20 mm (.0079 in.).
Of course, it is good practice to replace all seal rings during an overhaul.

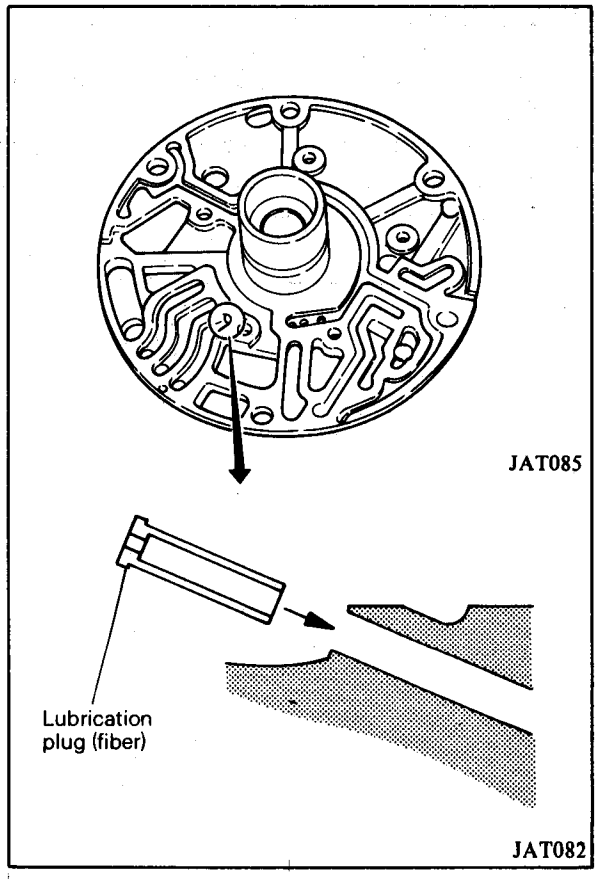


REASSEMBLY

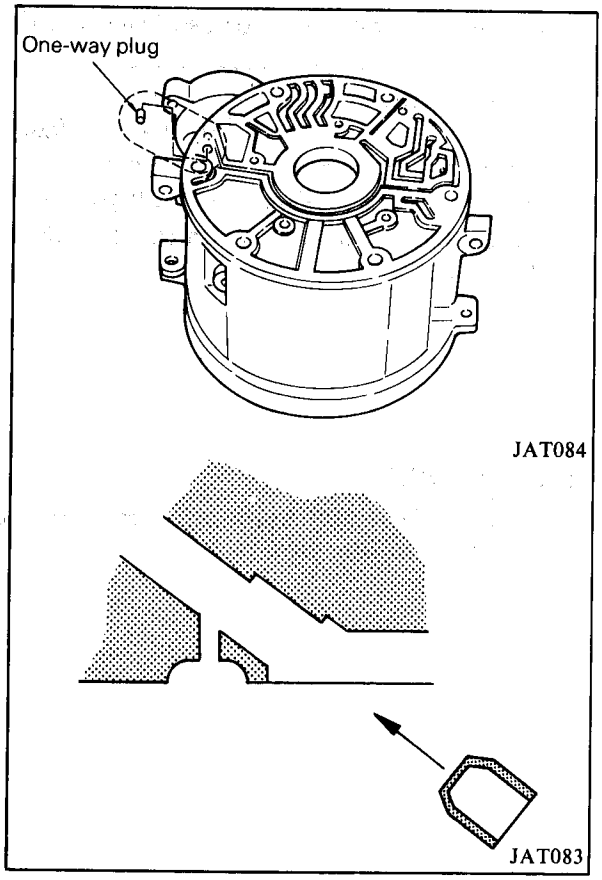
1. Install O.D. cancel valve and spring into drum support, then tap retaining pins.



2. Install lubrication plug in drum support.

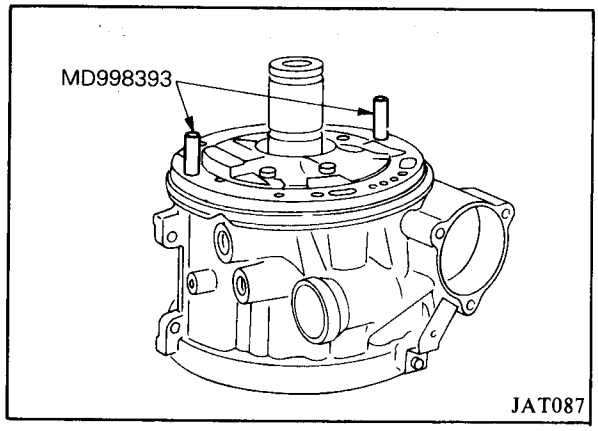


3. Install one-way plug in O.D. case.



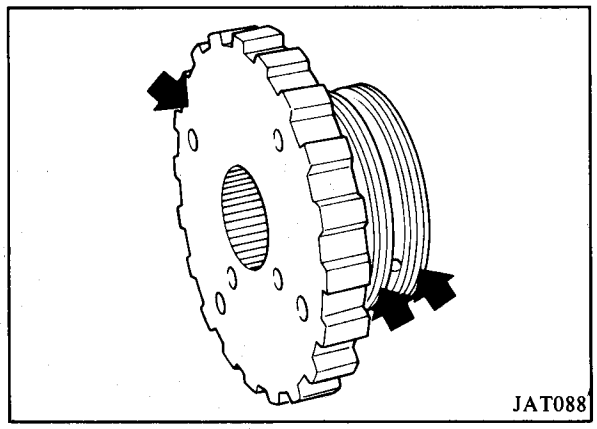
4. Install new O-ring and gasket on O.D. case.
5. Install drum support on O.D. case.
6. Insert Special Tool MD998393 into the bolt holes and perform the centering.
7. Tighten drum support securing bolts to specified torque.

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



INSPECTION

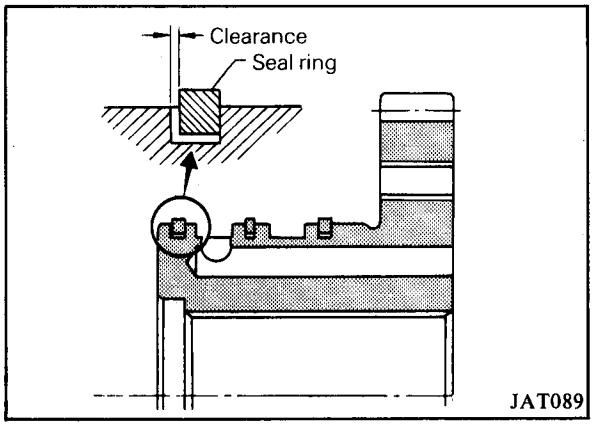
1. Inspect contacting surface of oil distributor and ring groove areas for wear.


JAT088

2. Measure clearance between seal ring and ring groove.

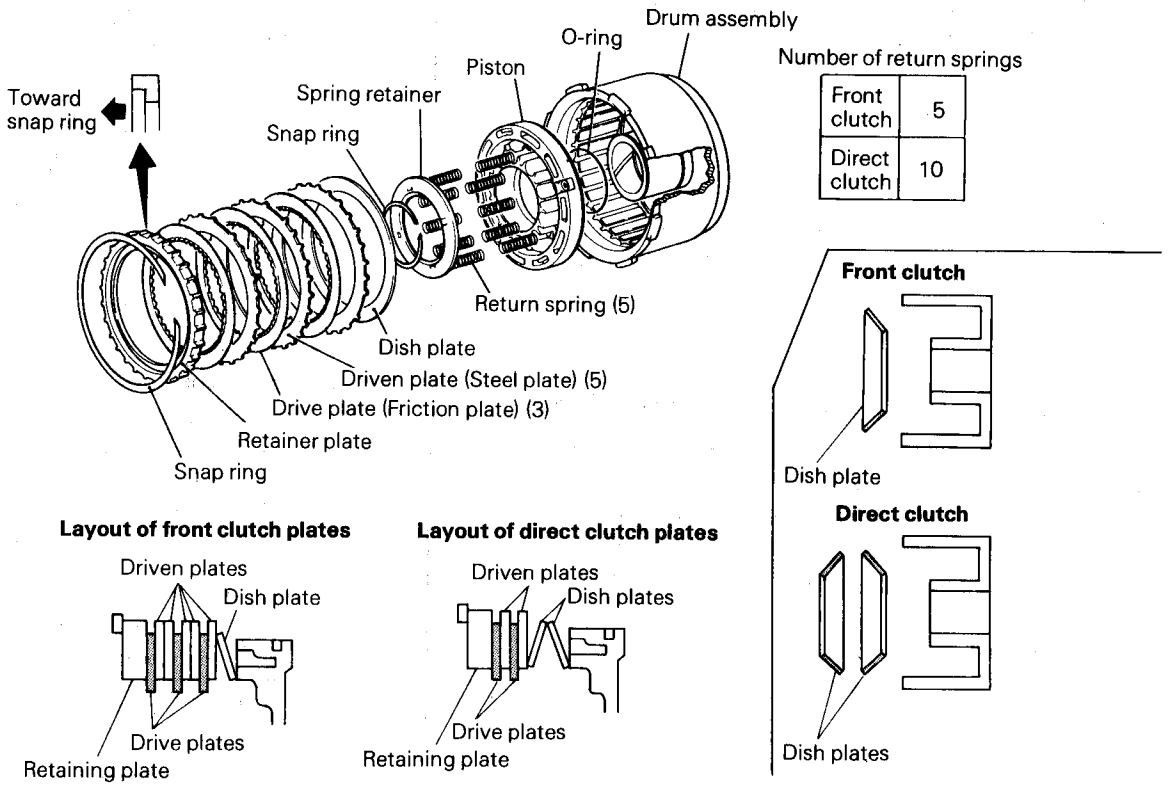
Standard clearance ..... 0.04—0.16 mm (.0016—.0063 in.)

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



JAT089

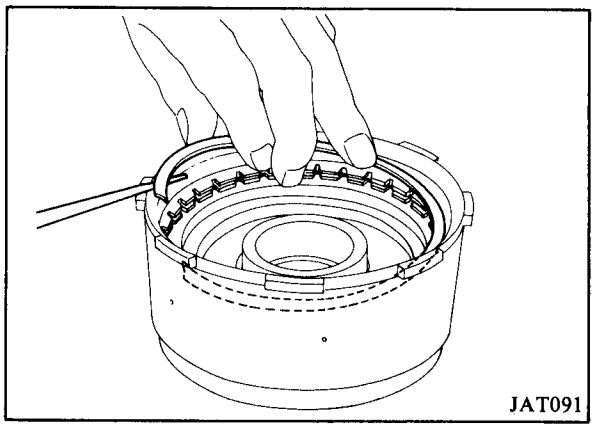
COMPONENTS



JAT090

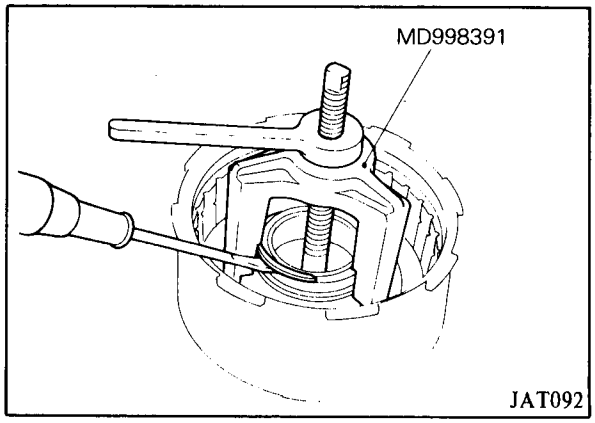
DISASSEMBLY

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



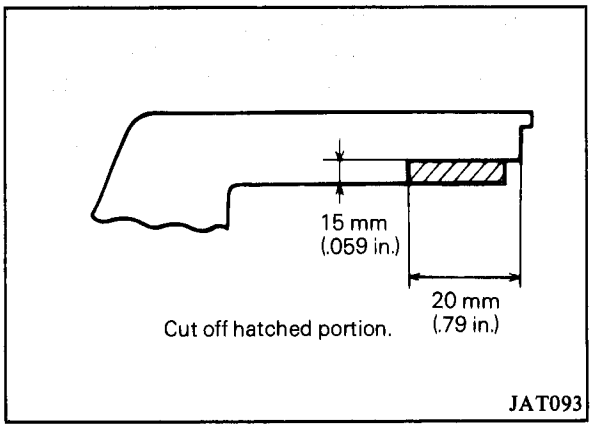
JAT091

3. Compress clutch springs using Special Tool MD998391 and remove snap ring from spring retiner.



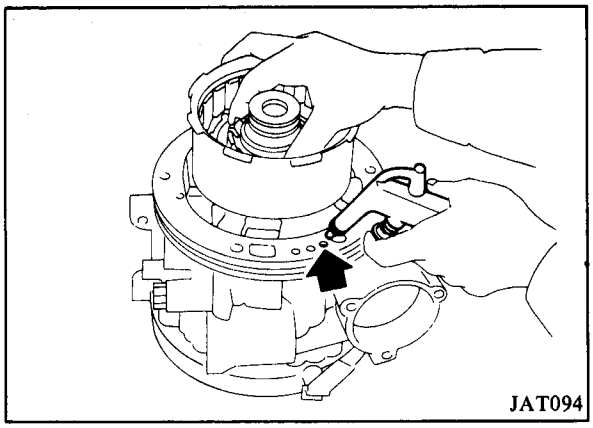
JAT092

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



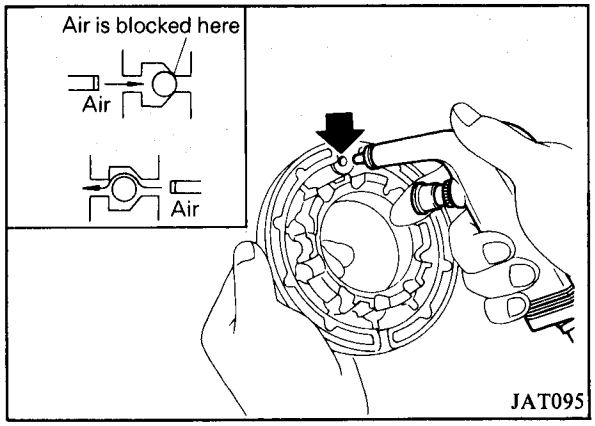
4. Remove spring retainer and springs.
5. For easy removal of piston from drum, mount clutch on drum support. Use an air gun with a tapered rubber tip to carefully apply air pressure to loosen piston from drum.
6. Check clutch drive plate facing for wear or damage. Drive plate thickness must not be less than 1.4 mm (.055 in.).

Standard drive plate thickness .....
1.50—1.65 mm (.0591—.0650 in.)



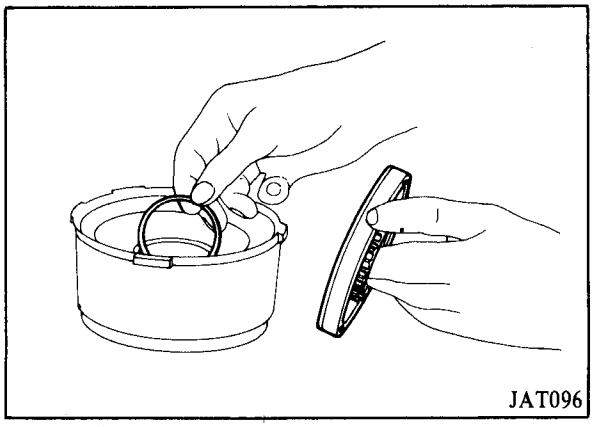
7. Check for wear on snap ring, weak or broken coil springs, and warped spring retainer.

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

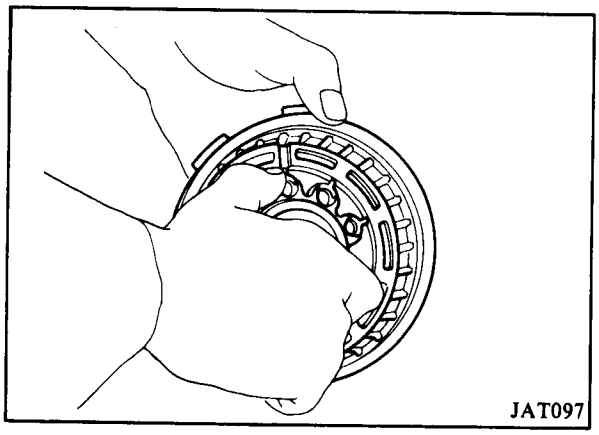


REASSEMBLY

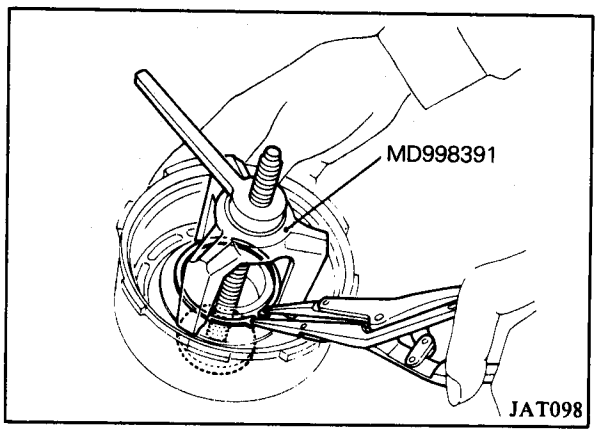
1. Lubricate clutch drum hub and seals, and install inner seal and piston seal as illustrated. Be careful not to stretch seals during installation.
   Never assemble clutch dry; always lubricate its components thoroughly.



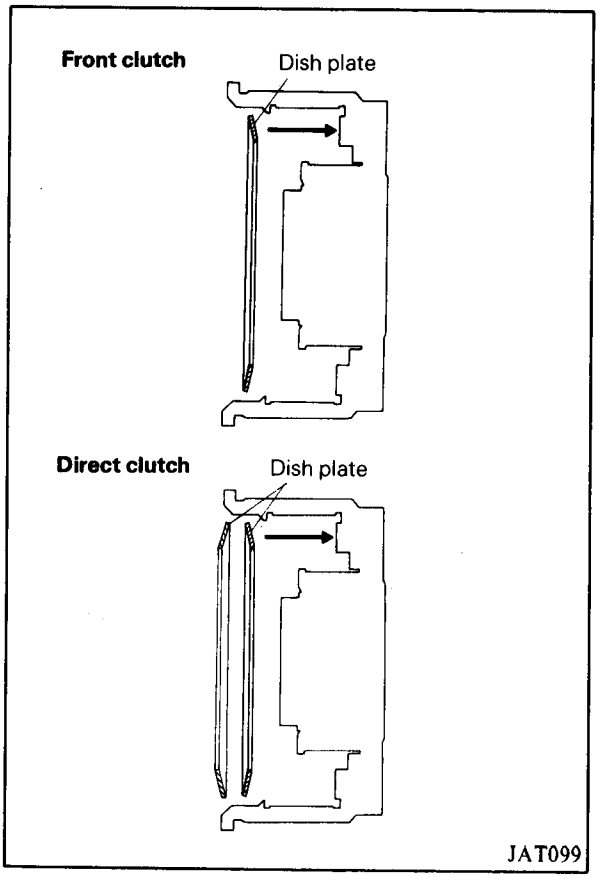
2. Assemble piston, being careful not to allow seal to kink or become damaged during installation. After installing, turn piston by hand to ensure that there is no binding.



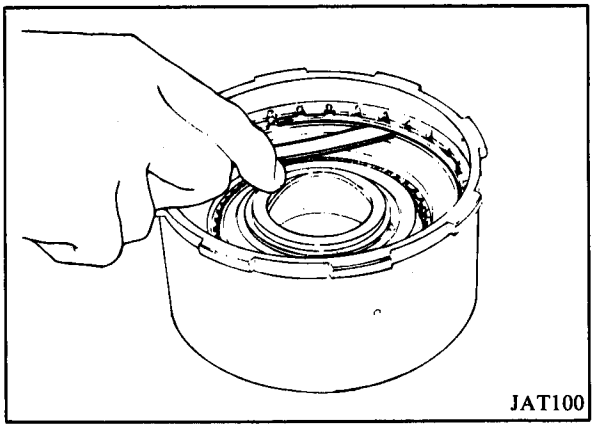
3. Reassemble spring and retainer. Reinstall snap ring. Be sure snap ring is properly seated.



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.


JAT100

Specified clearance
Direct ..... 1.6–1.8 mm (.063–.071 in.)
Front ..... 1.6–2.0 mm (.063–.079 in.)

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

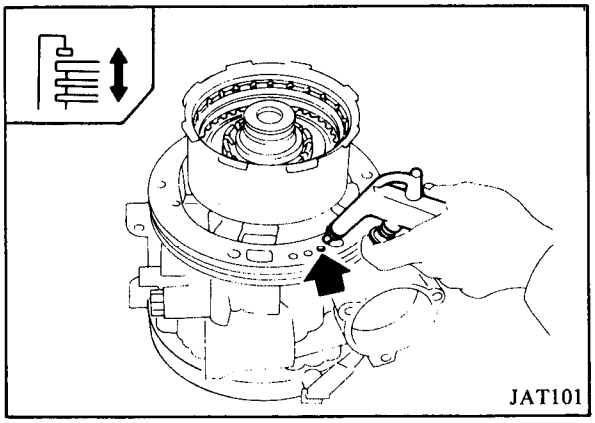
Available Retaining Plate for Front Clutch

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

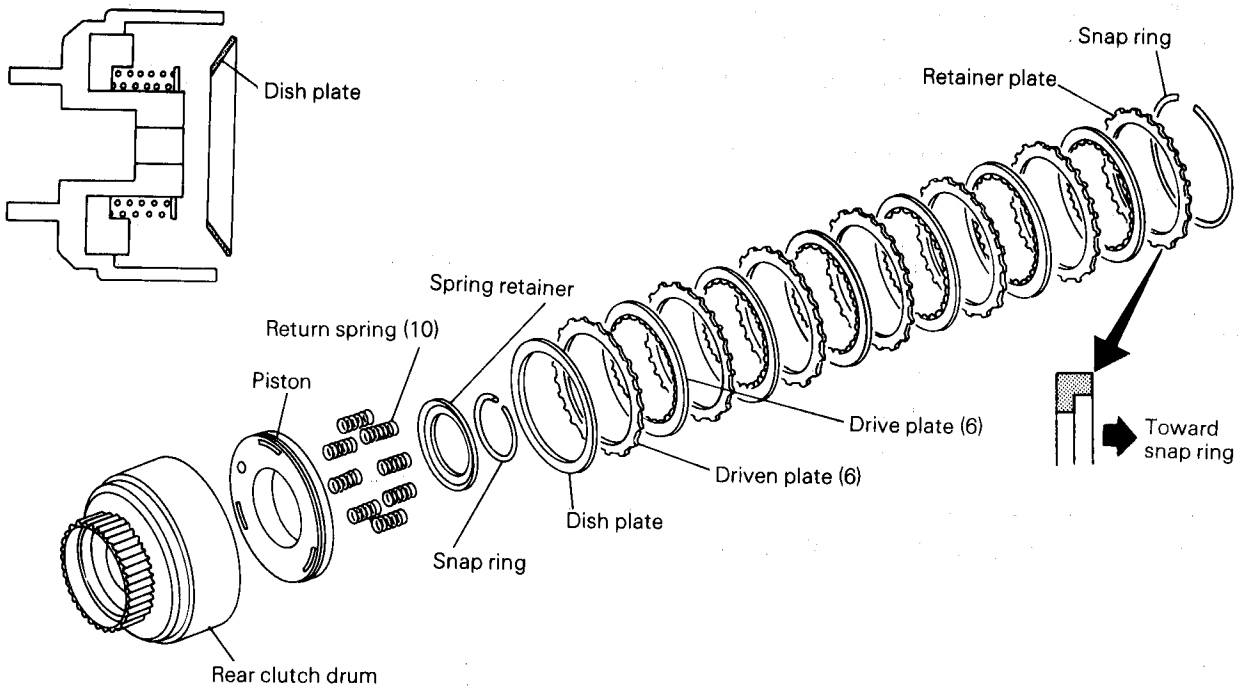
Thickness mm (in.)	Part number
5.6 (.220)	MD610252
5.8 (.228)	MD610253
6.0 (.236)	MD610254
6.2 (.244)	MD610255
6.4 (.252)	MD610256
6.6 (.260)	MD610257
6.8 (.268)	MD610258
7.0 (.276)	MD610259

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.


JAT101

COMPONENTS

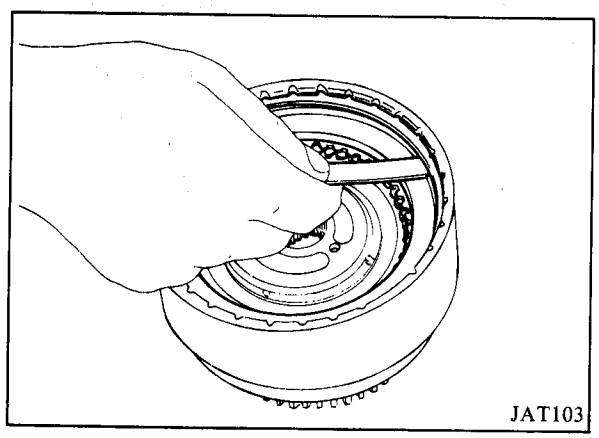
In regard to the number of clutch plates (drive plate and driven plate), refer to specifications.



JAT102

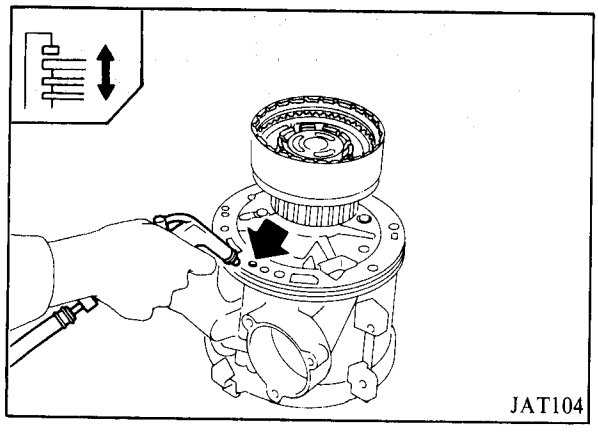
1. Service procedures for forward clutch (Rear) are essentially the same as those for high-reverse clutch (Front), with the following exception:

Specified clearance between retainer plate and snap ring	0.8—1.5 mm (.031—.059 in.)



JAT103

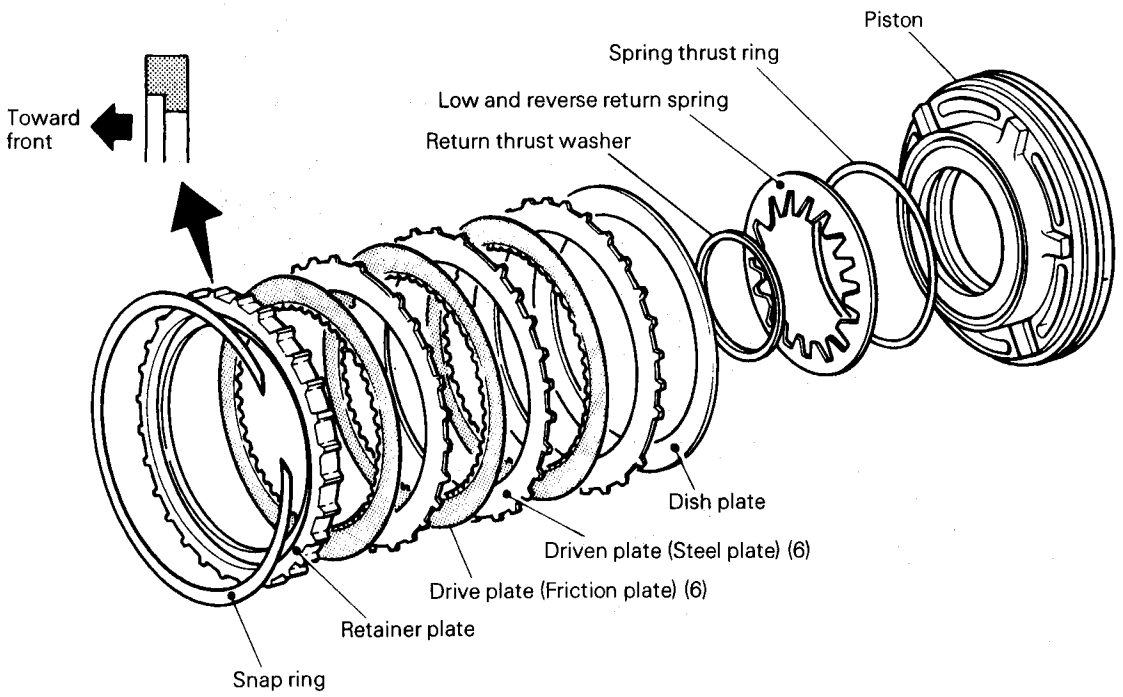
2. Test rear clutch operation.



JAT104

COMPONENTS

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

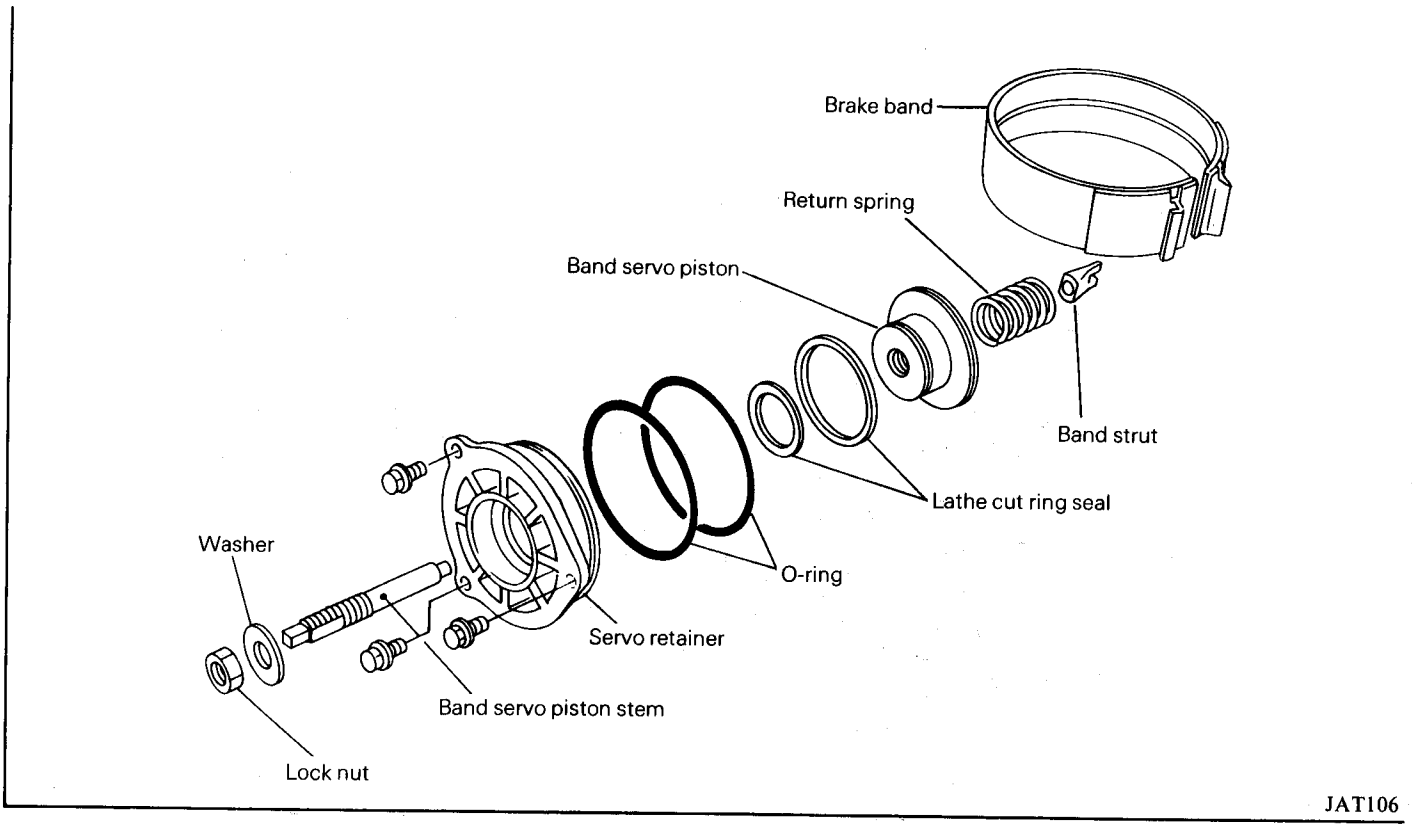


JAT105

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.

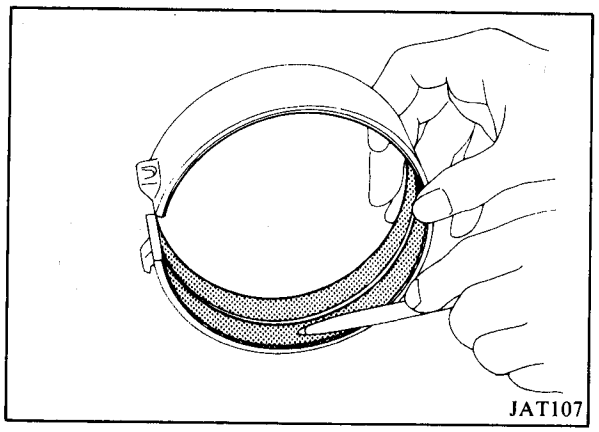
Drive plate thickness
Standard ..... 1.90—2.05 mm (.0748—.0807 in.)
Allowable limit ..... 1.8 mm (.071 in.)

COMPONENTS



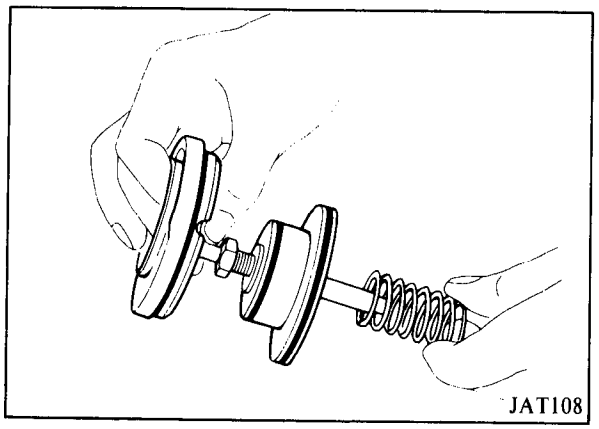
JAT106

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



JAT107

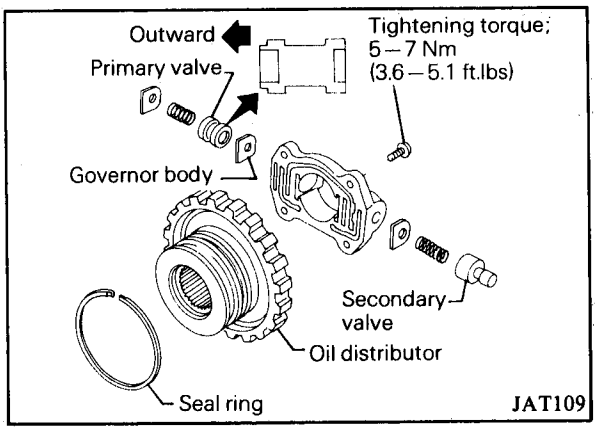
2. Check band servo components for wear and scoring. Replace piston O-rings and all other components as necessary.



JAT108

DISASSEMBLY

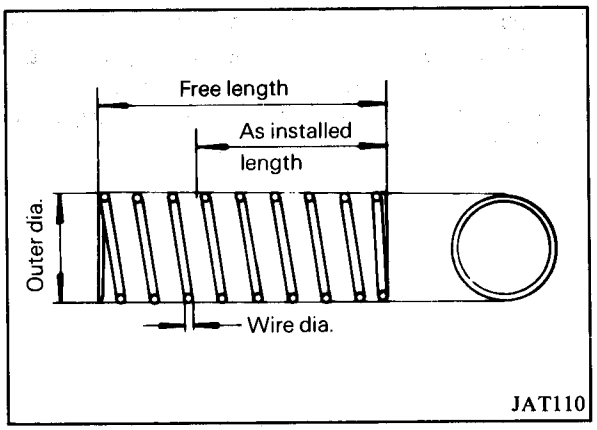
1. Remove governor body from oil distributor.
2. Disassemble governor and check valves for indication of burns or scratches. Inspect springs for weakness or distorsion. Replace parts as necessary and reassemble.
   Do not interchange components of primary and secondary governor valves.



REASSEMBLY

Reassemble governor, noting the following.

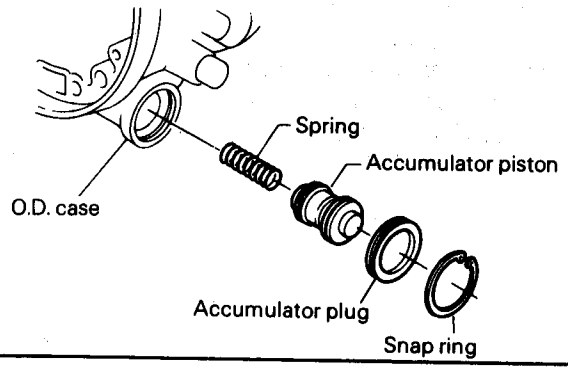
1. For identification of primary and secondary governor valve springs, refer to the following chart.



Governor Spring Chart

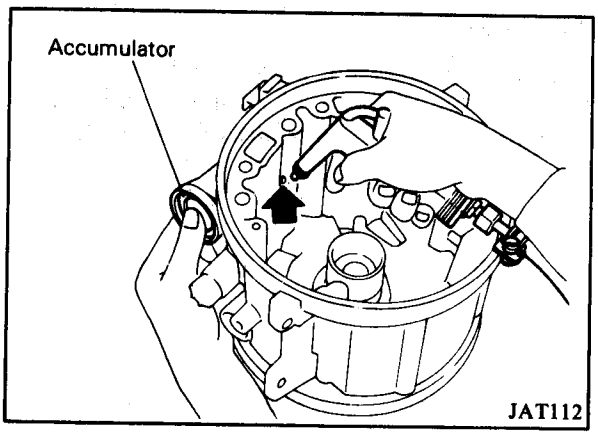
	Wire dia. mm (in.)	Outer coil dia. mm (in.)	No. of active coil	Free length mm (in.)	Installed	
					Length mm (in.)	Load N (lbs.)
Primary governor	0.45 (.0177)	8.75 (.3445)	5.0	21.8 (.858)	7.5 (.295)	2.109 (0.474)
Secondary governor	0.70 (.0276)	9.20 (.3622)	5.5	19.9 (.783)	10.5 (.413)	6.86 (1.54)

COMPONENTS



JAT111

1. Remove accumulator snap ring, then apply pressure to remove accumulator plug, piston, spring and spacer.
2. Check accumulator components for wear and scoring. Replace O-ring, seal rings and all other components as necessary.



JAT112

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.)
Accumulator spring	1.8 (.071)	14.85 (.5846)	7.3	39.7 (1.563)	30.5 (1.201)	58.8 (13.2)

PLANETARY CARRIER

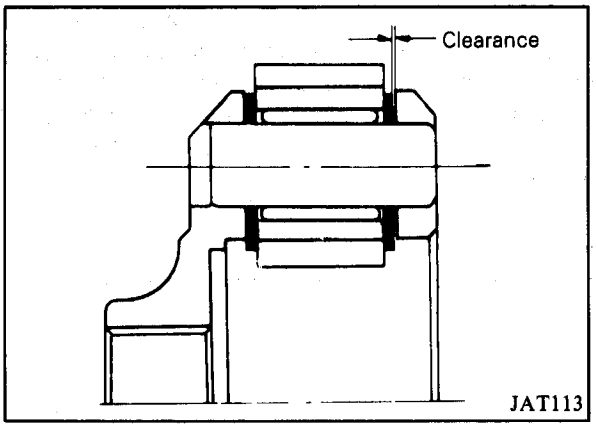
The planetary carrier cannot be divided into its individual components.
If any part of the component is faulty, replace the carrier as a unit.

1. Check clearance between pinion washer and planetary carrier with a feeler.

Standard clearance	0.20 – 0.70 mm (.0079 – .0276 in.)

Replace if the clearance exceeds 0.80 mm (.0315 in.).

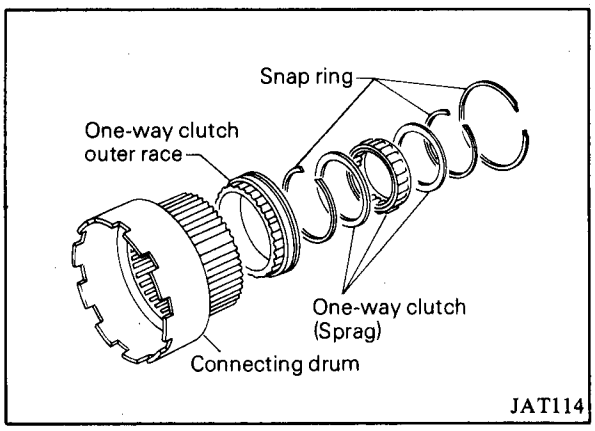
2. Check planetary gear sets for damaged or worn gears. Gear sets that have been damaged by overheating will have a blue discoloration.



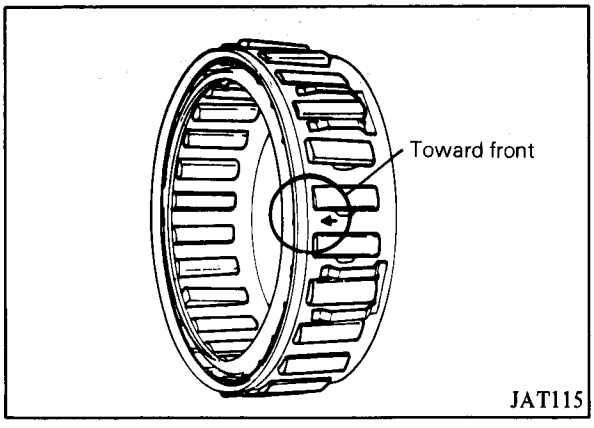
CONNECTING DRUM ASSEMBLY

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

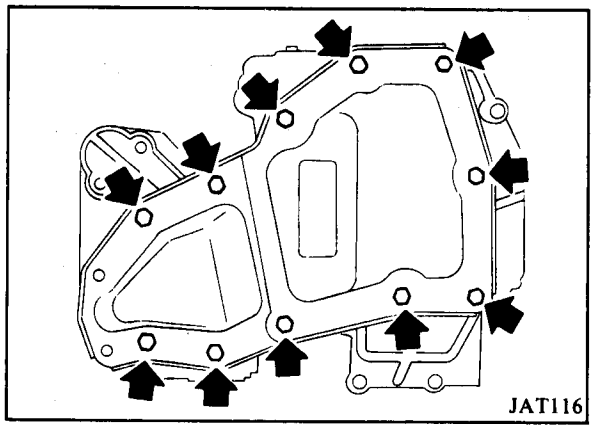
1. Remove the snap rings inner and outer races.



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.



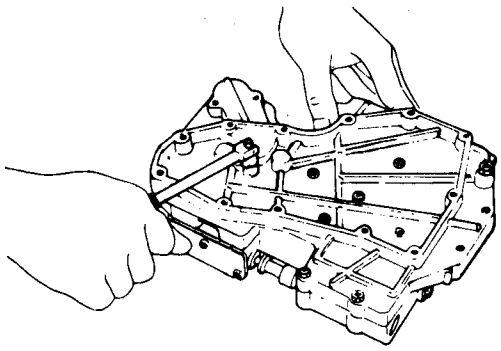
The valve body contains many precision parts and requires extreme care when parts are removed and serviced. Place removed parts on a parts rack so they can be put back in the valve body in the same positions and sequences. Care will also prevent springs and small parts from becoming scattered or lost.

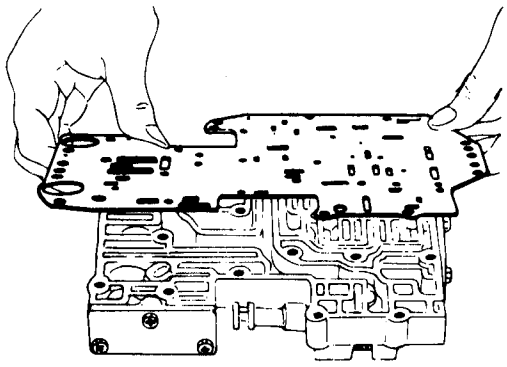

JAT116

DISASSEMBLY

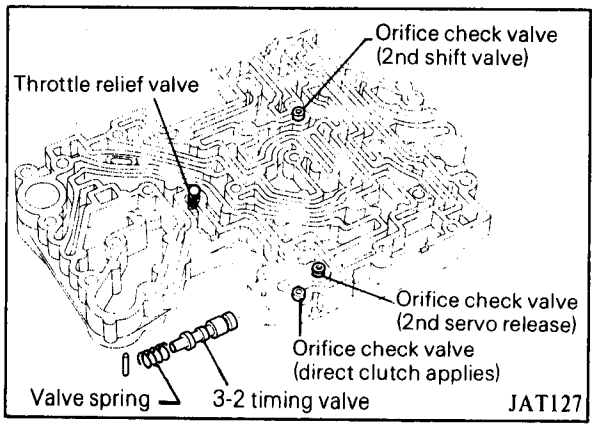
1. Remove oil strainer and its attaching screws, nuts and bolts.

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


JAT117

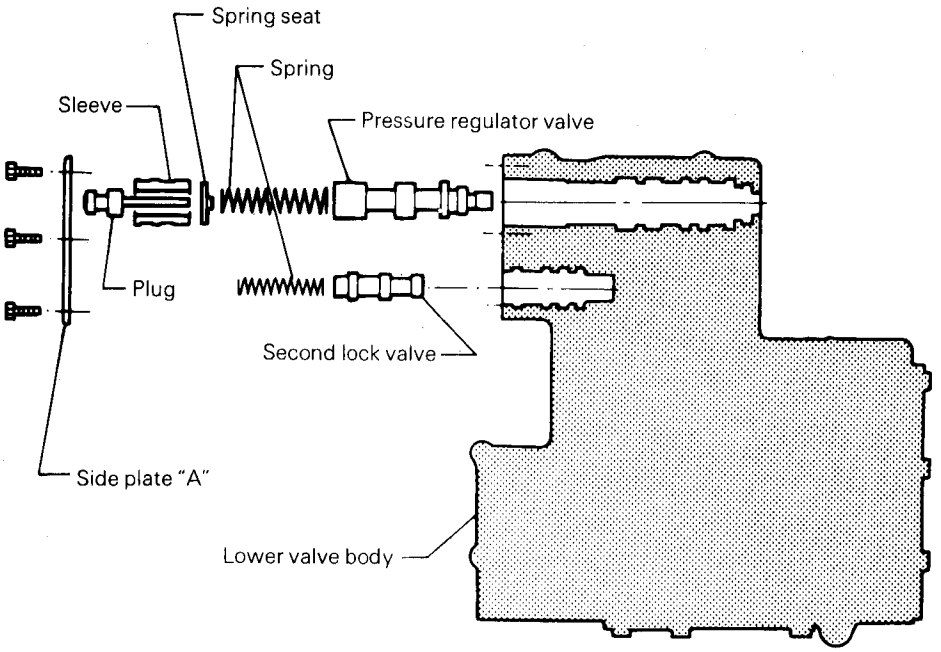

JAT118

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.



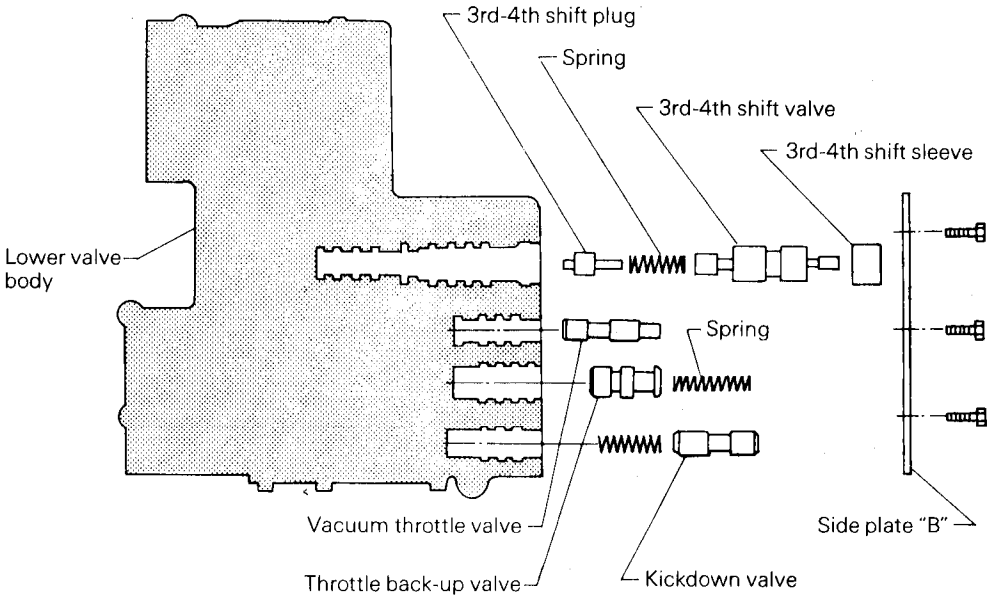
JAT127

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.



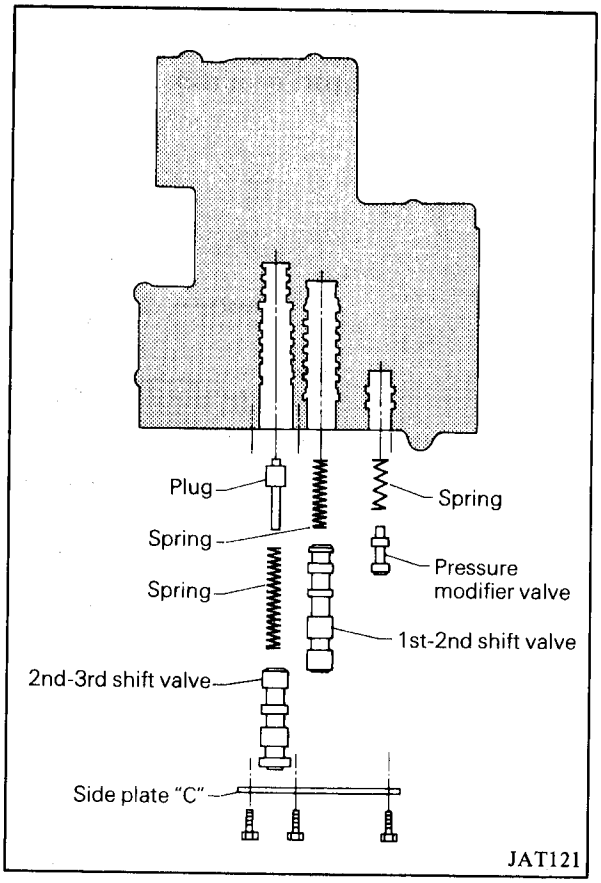
JAT119

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



JAT120

6. Remove side plate C, pressure modifier valve and spring, 2nd-3rd shift valve, spring and plug, and 1st-2nd shift valve and spring.
7. Remove 3-2 timing valve and spring from lower valve body.
   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.

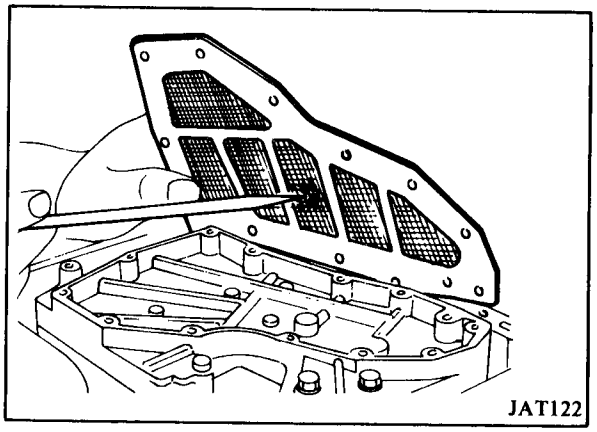
If one or more valves are sticking from varnish deposits or burns resulting from deteriorated oil or overheating, you may be able to clean the valves and valve bodies. Always use crocus cloth, which is a very fine type of cutting material. Never use emery cloth, as it is too coarse and can scratch the 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.

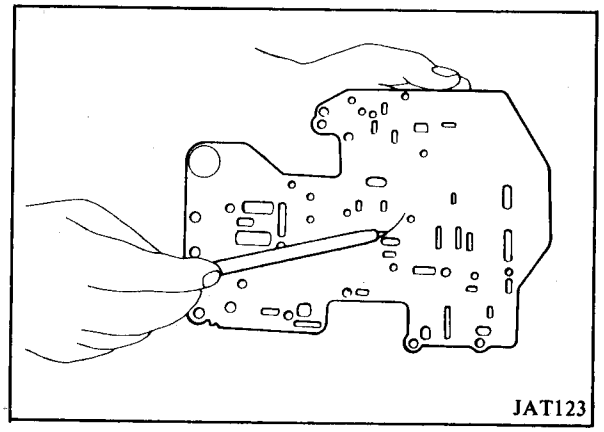
The valves may be cleaned using alcohol or lacquer thinner. The valve bodies can be dip cleaned with a good carburetor cleaner or lacquer thinner. Do not leave valve bodies submerged in carburetor cleaner longer than five minutes. Rinse parts thoroughly and dry.

Lubricate all parts in clean automatic transmission fluid before reassembly.

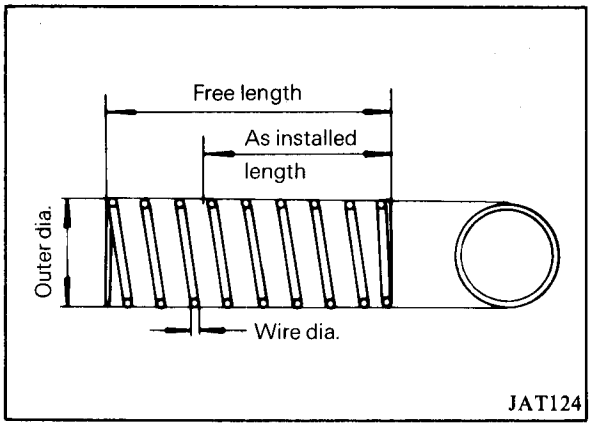
1. Check valves for signs of burning. Replace if beyond clean-up.
2. Check oil strainer for general condition. Replace if necessary.


JAT122

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.


JAT123

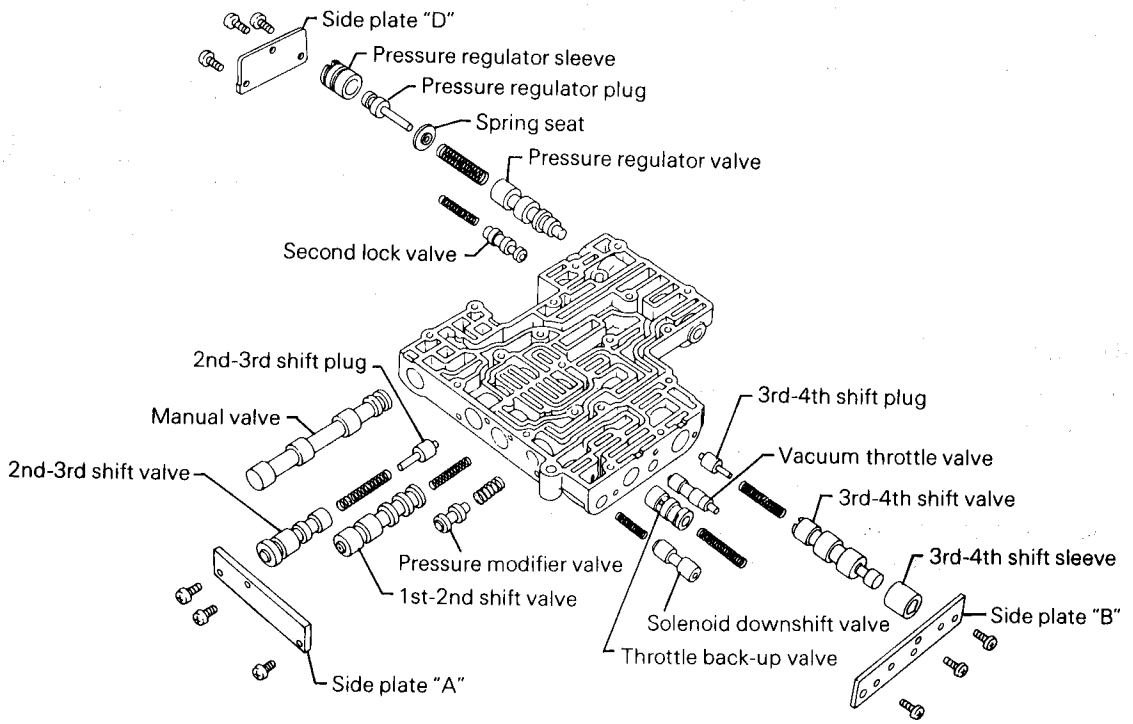
REASSEMBLY



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)

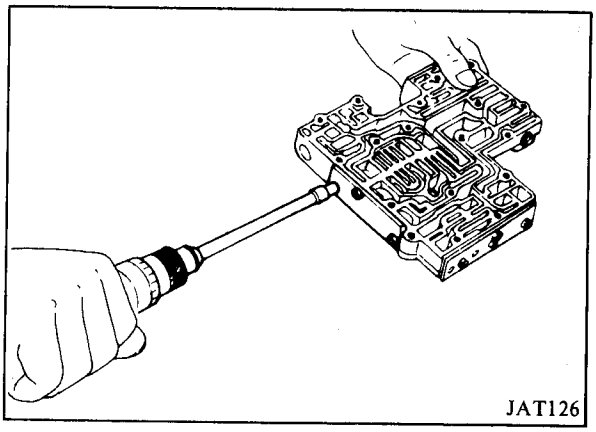
1. Assemble side plate A group of parts into lower valve body. Reinstall side plate and finger tighten screws.
Assemble side plate B group and side plate C group in same manner as A group.



JAT125

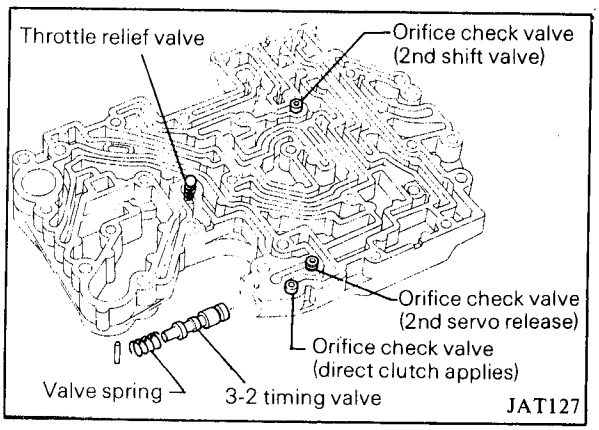
2. Tighten screws.

Side plate to valve body .....
2.5 – 3.4 Nm (1.8 – 2.5 ft.lbs.)



JAT126

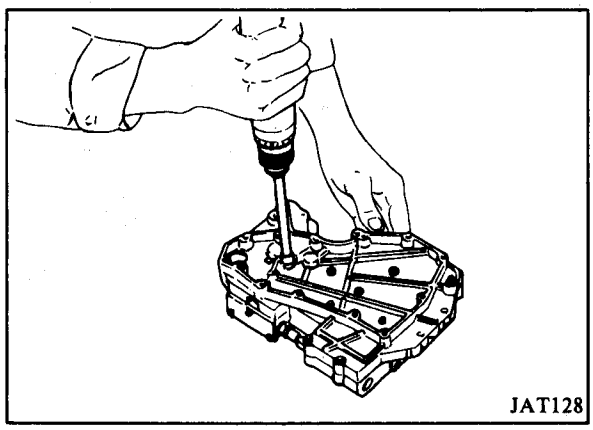
3. Install orifice check valves, valve springs, throttle relief valve spring and steel ball in valve body.
4. Install 3-2 timing valve and spring.



JAT127

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.)

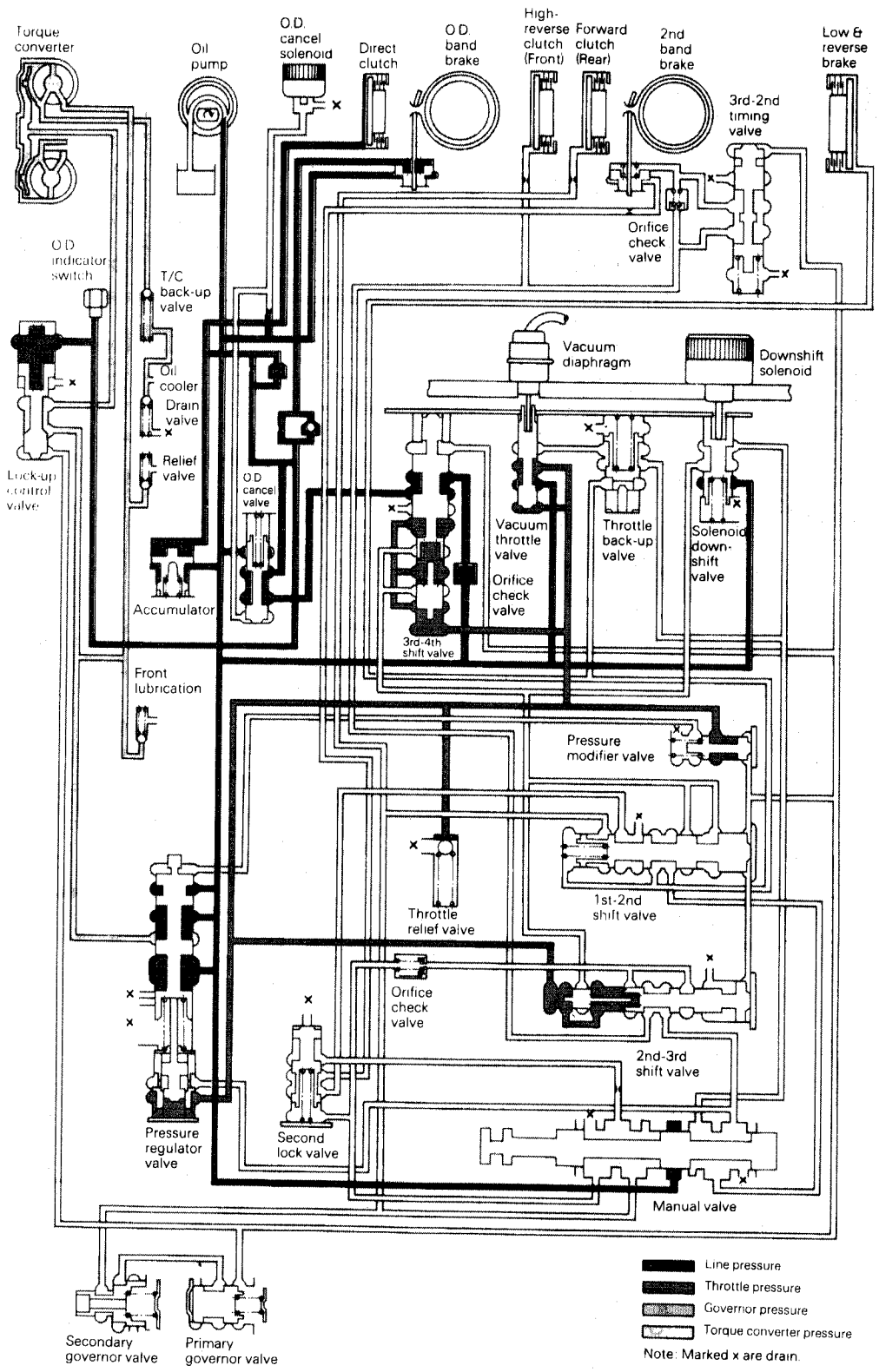

JAT128

6. Install oil strainer.

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

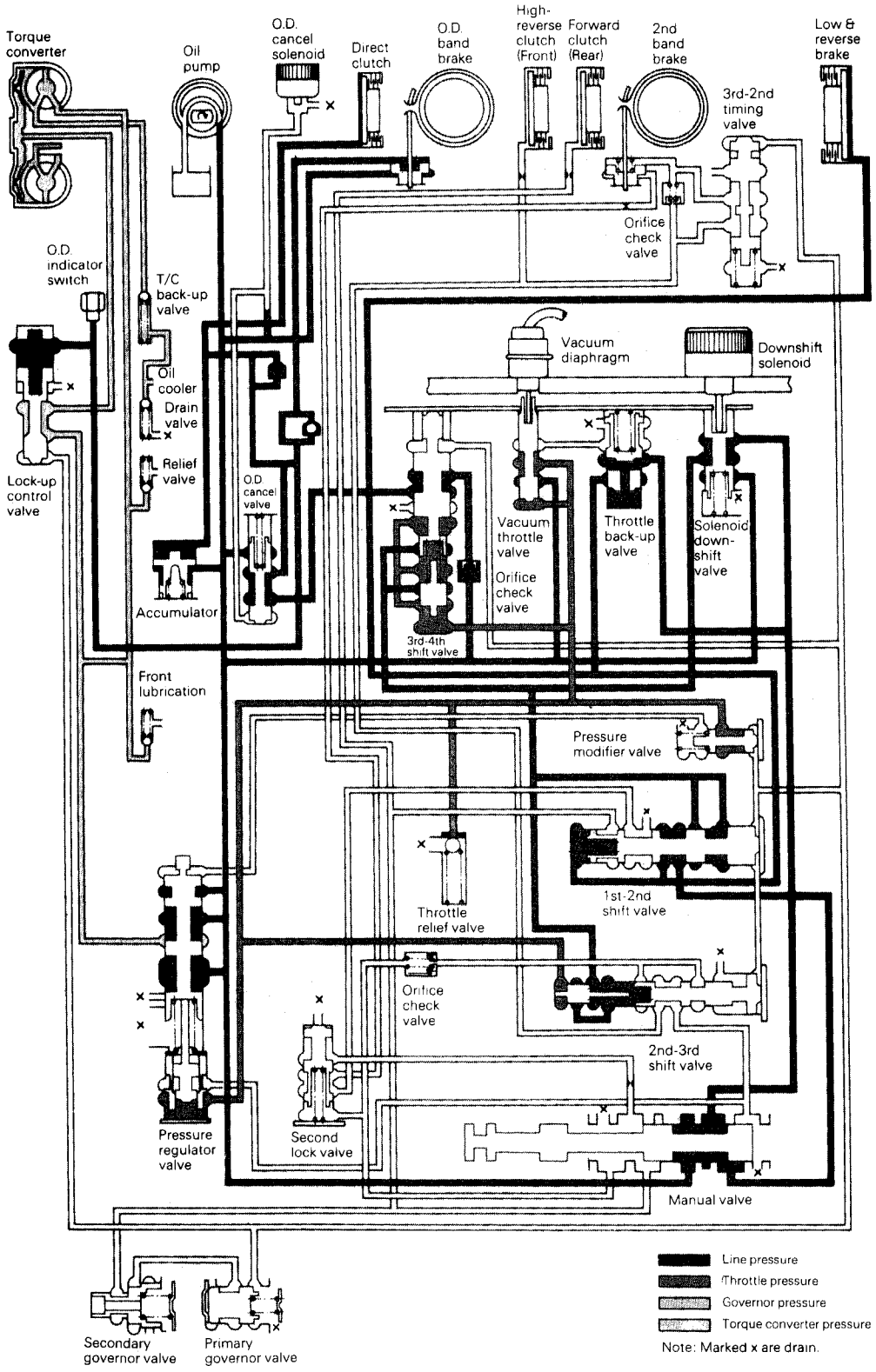
The manual valve is inserted into the valve body when the latter is installed in the transmission.

"N" (Neutral)



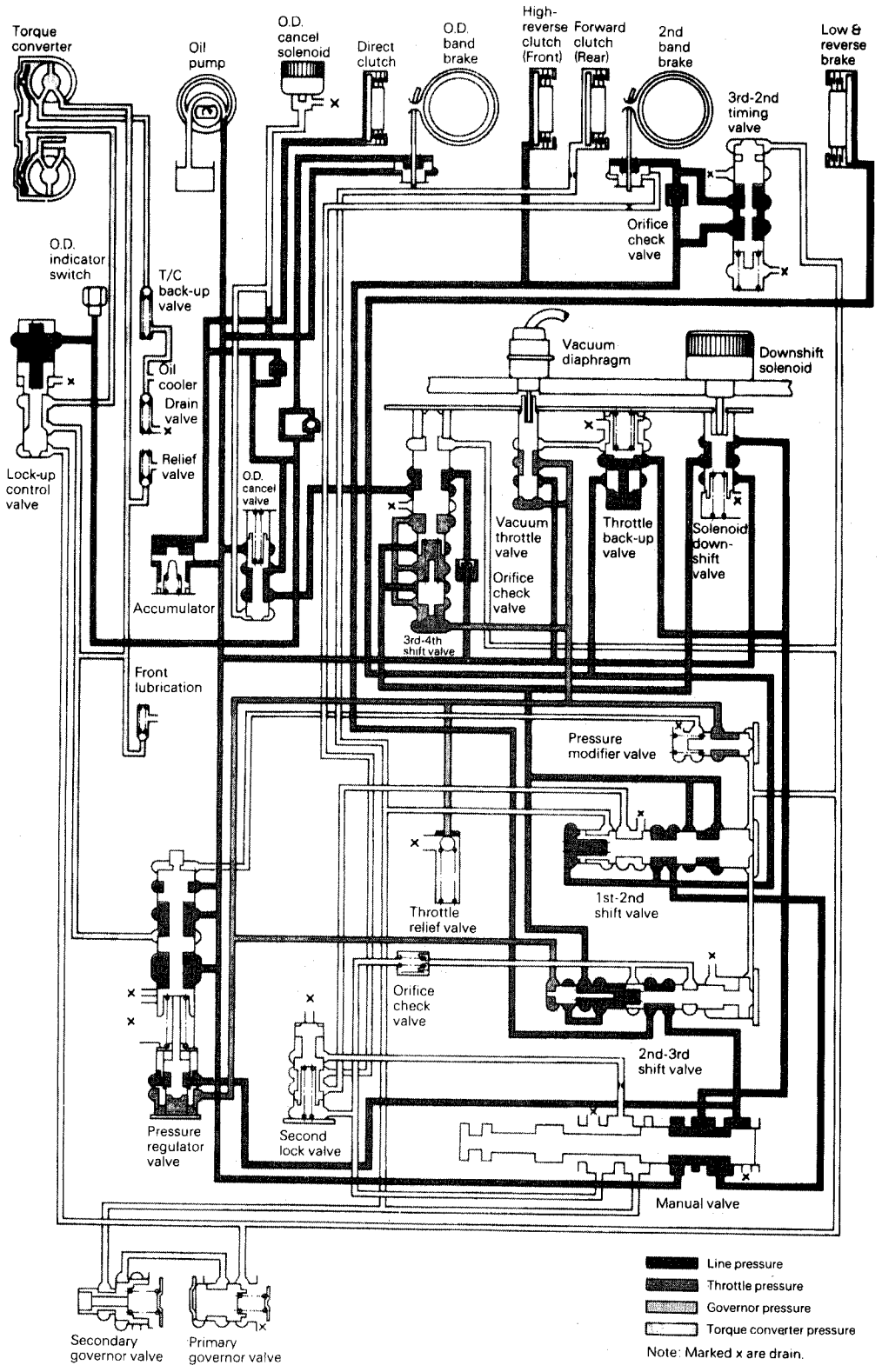
JAT198

"P" (Parking)



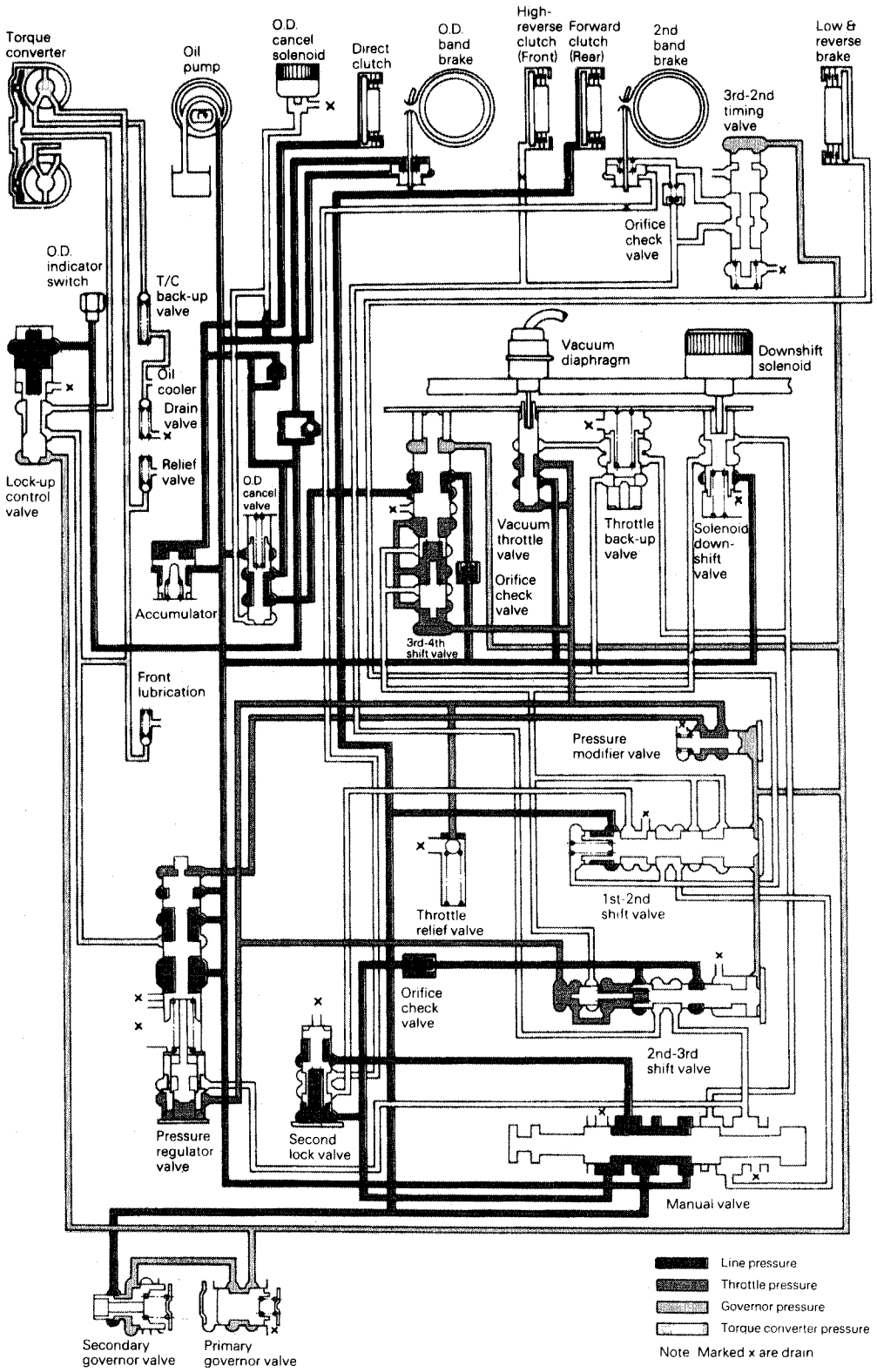
JAT199

"R" (Reverse)



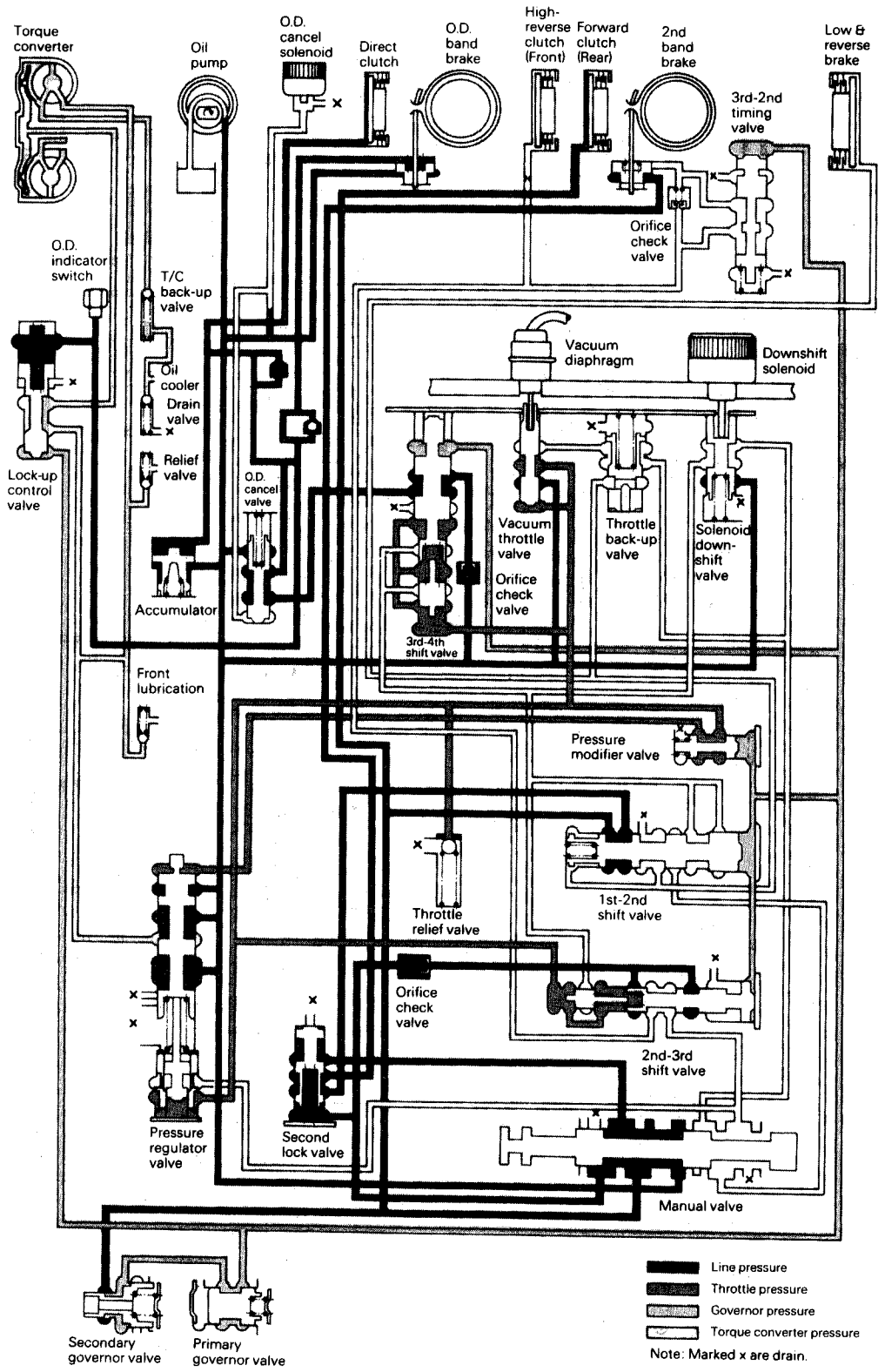
JAT200

"D" (Drive) — First



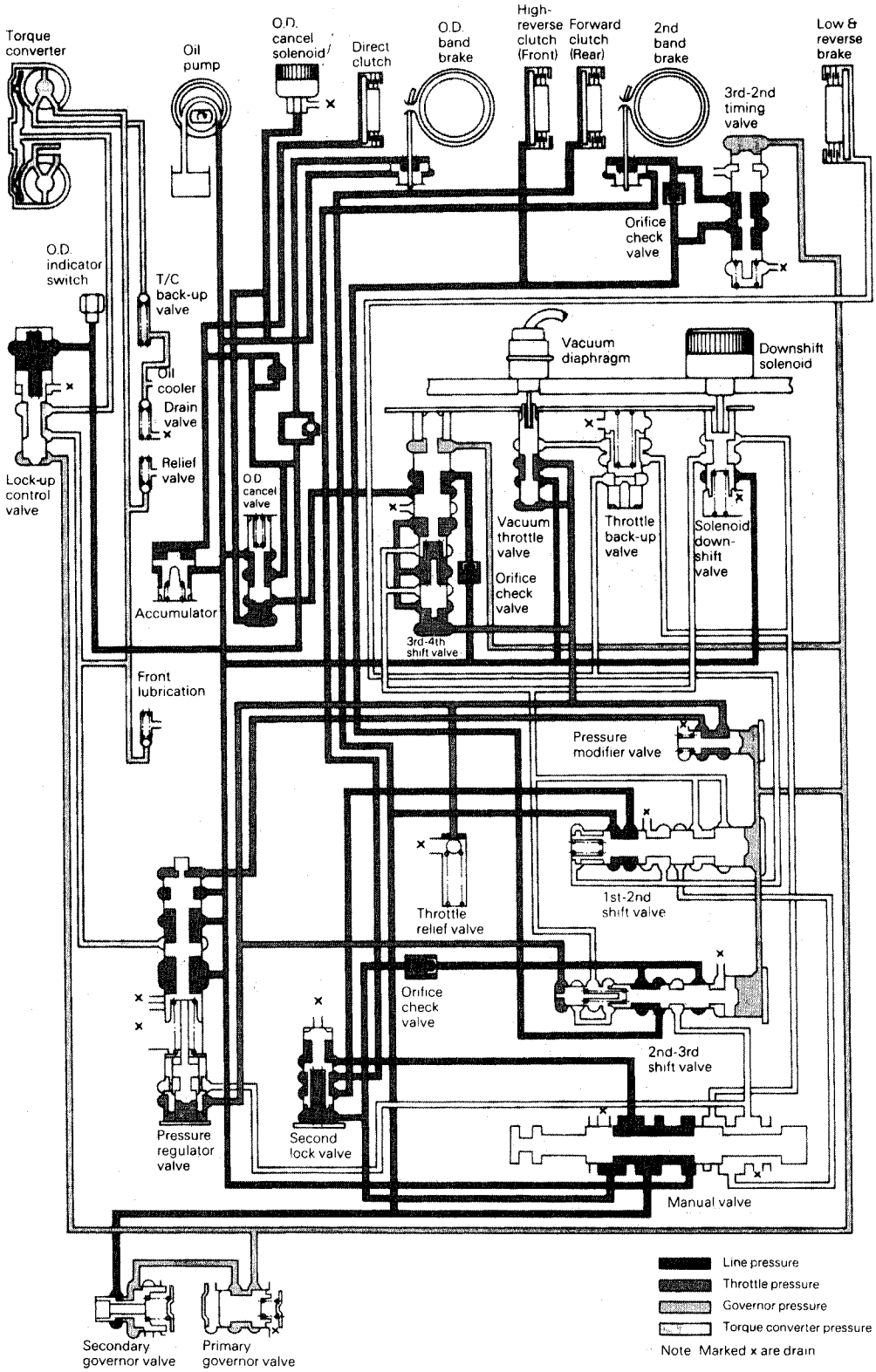
JAT201

"D" (Drive) – Second



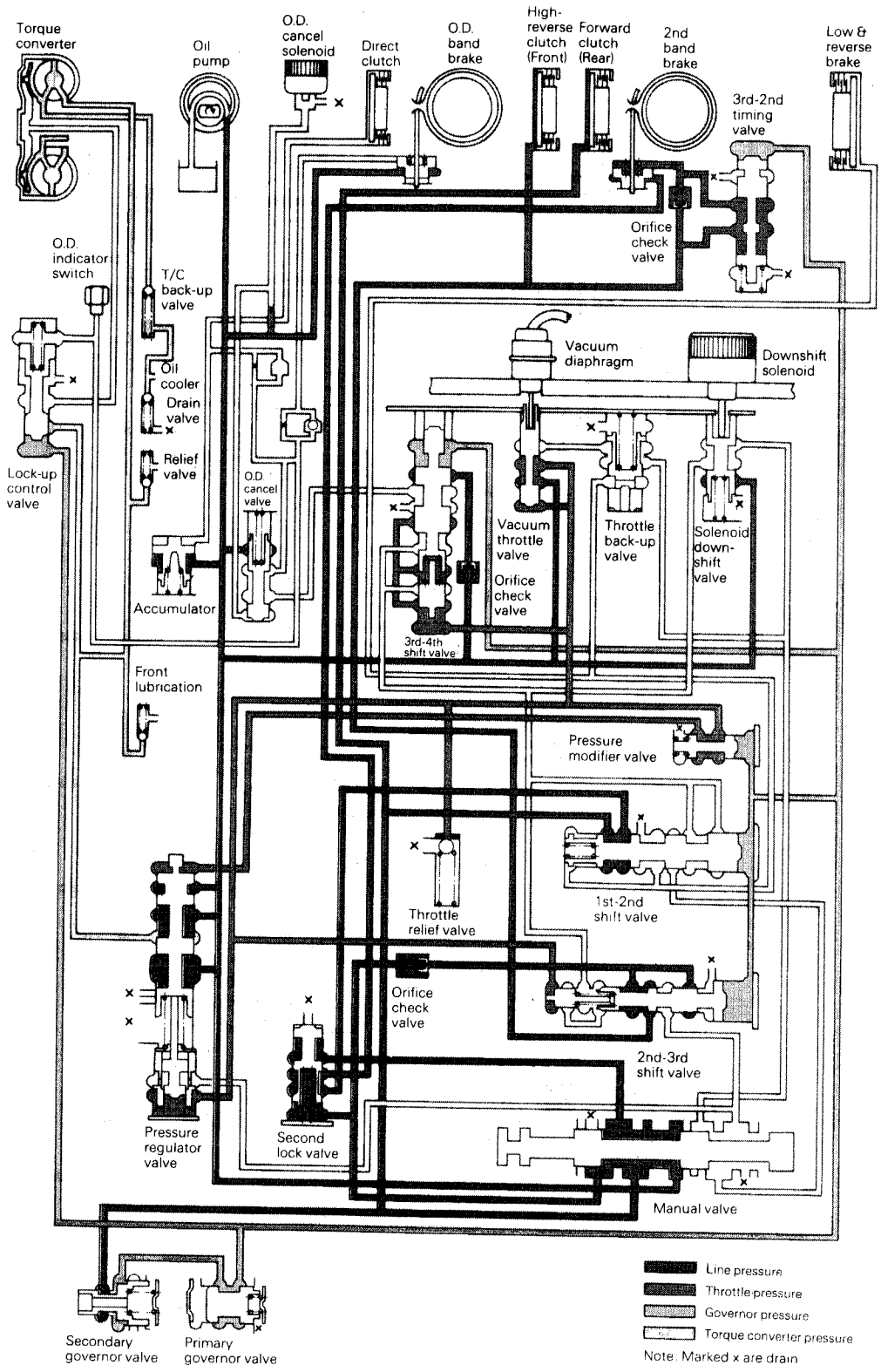
JAT202

"D" (Drive) – Third, O.D. solenoid in operation



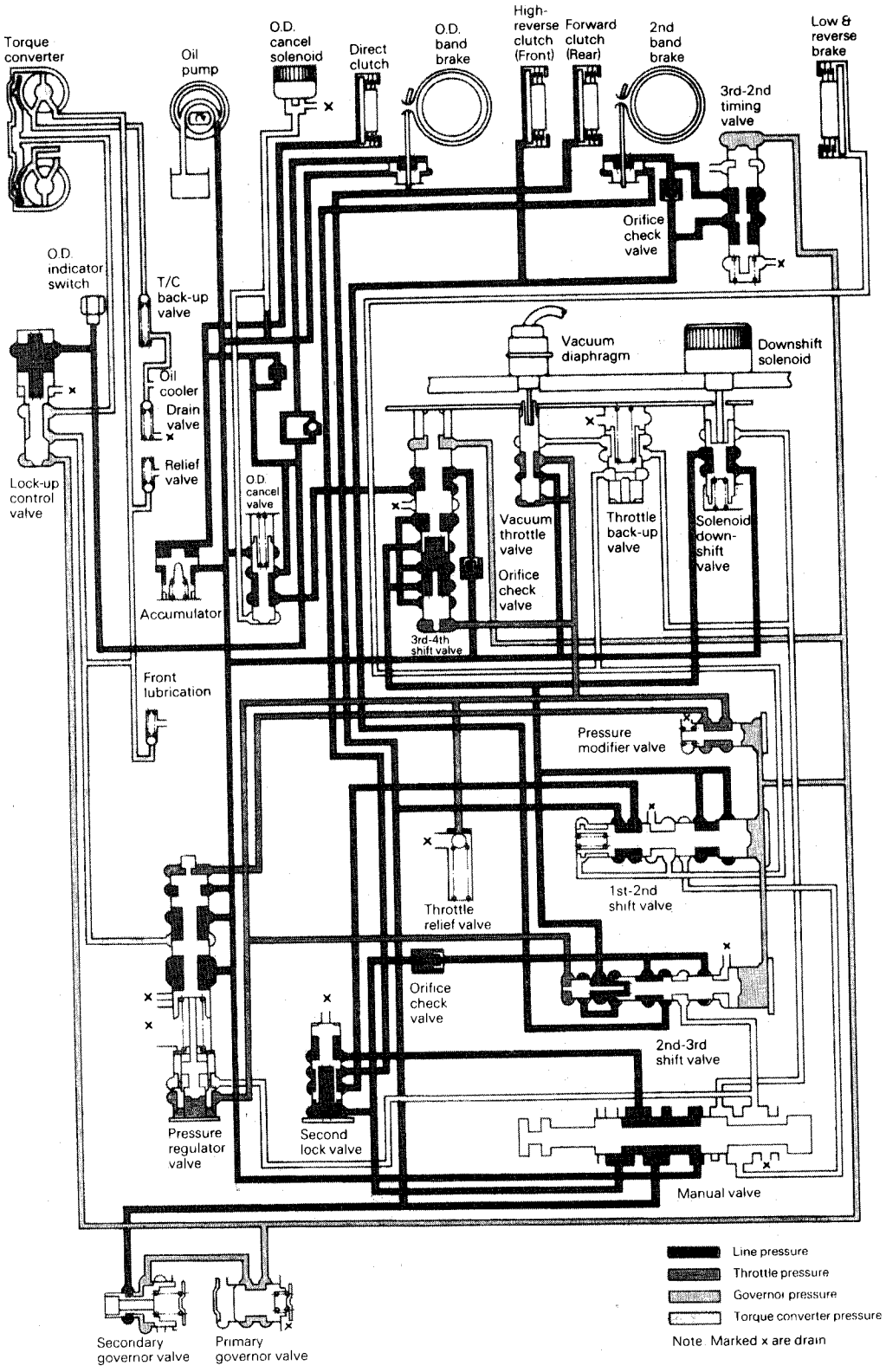
JAT203

"D" (Drive) — Fourth, torque converter locked up



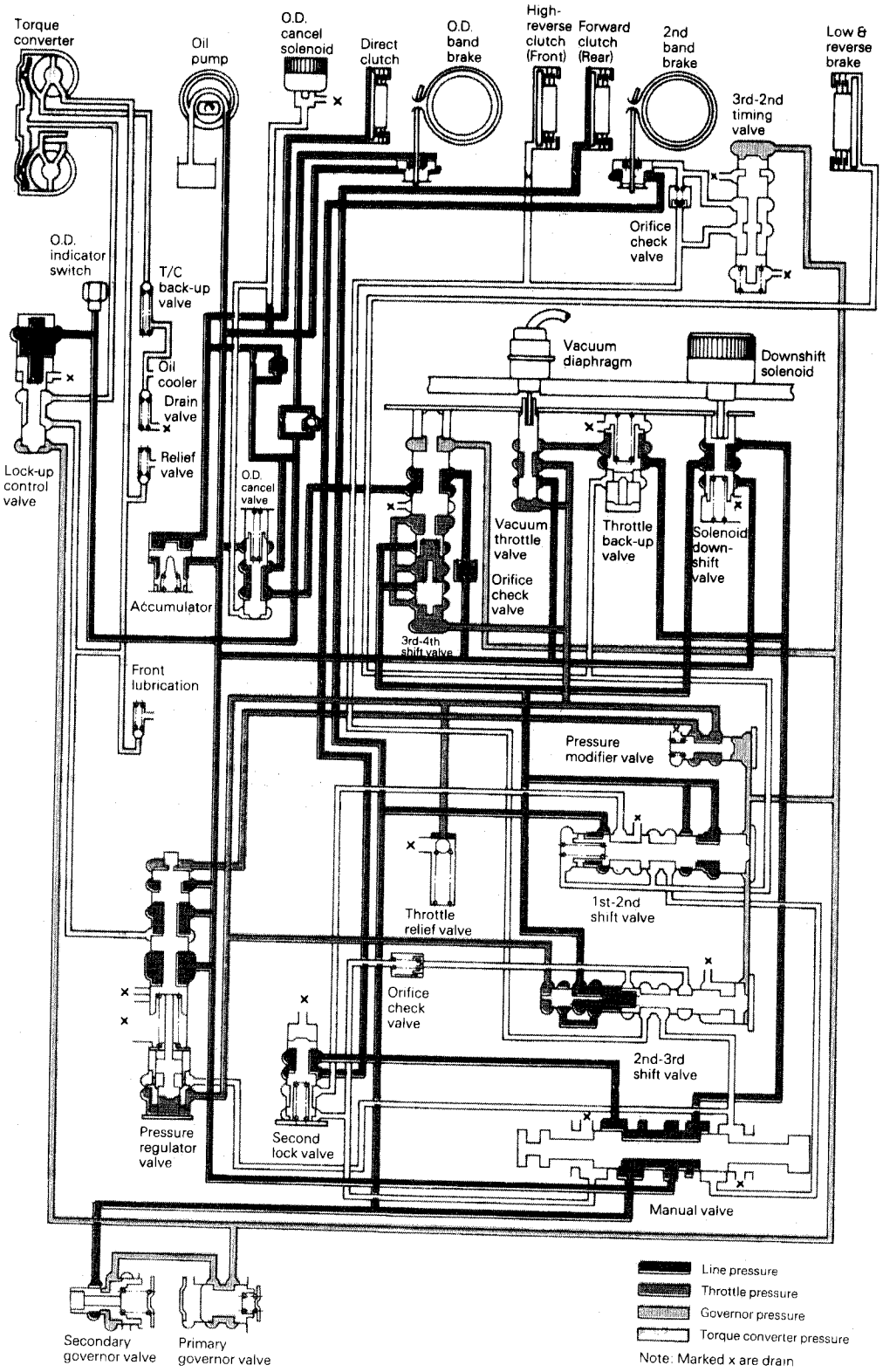
JAT204

"D" (Drive) — Kickdown



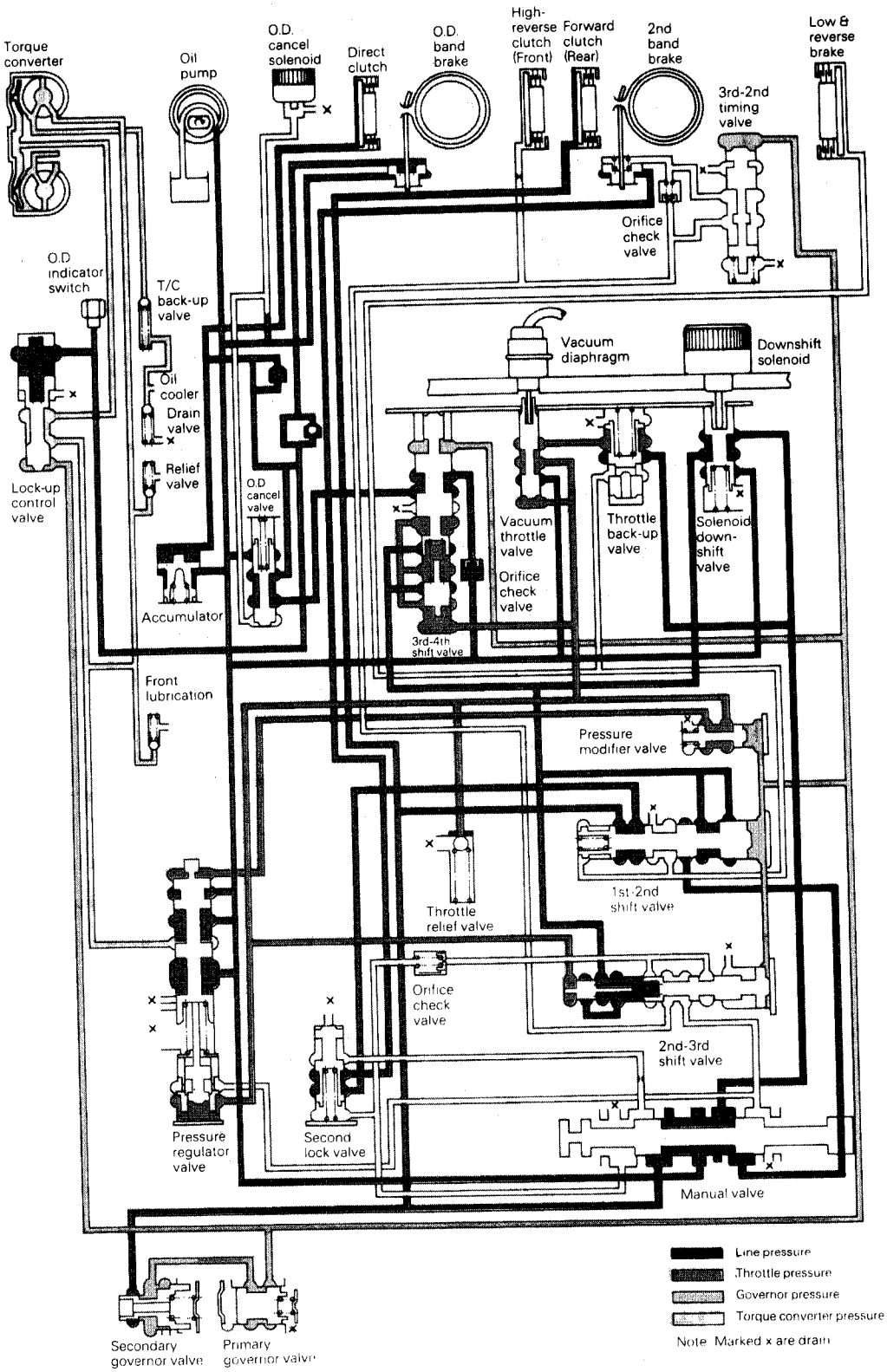
JAT205

"2" (Second) – First



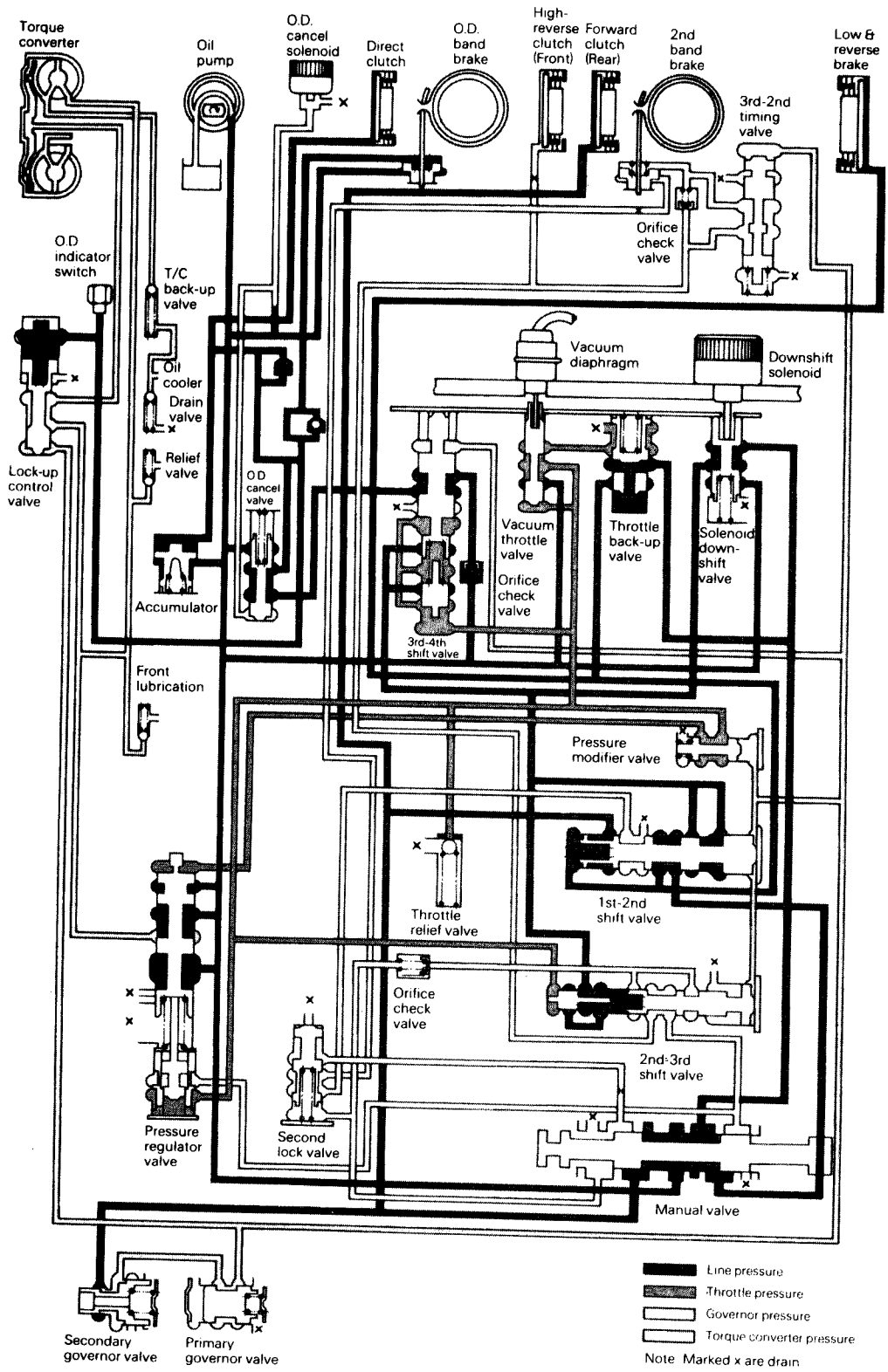
JAT206

"L" (Lock-up) — Second



JAT207

"L" (Lock-up) – First



JAT208