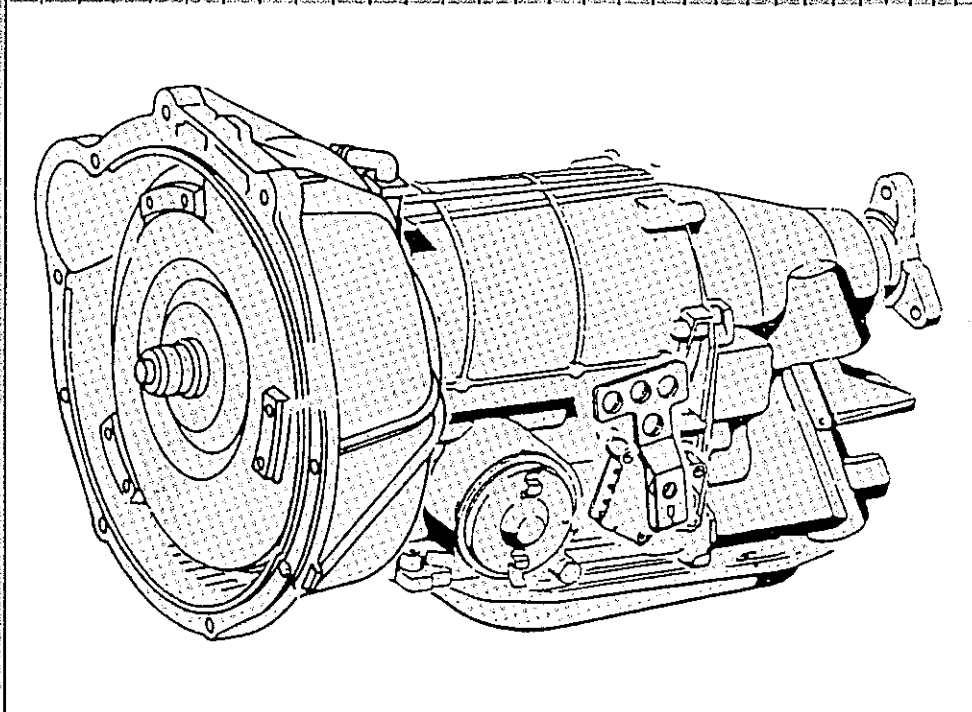




MERCEDES 722.1 722.2 TECHTRAN™ MANUAL

REVISED EDITION



AUTOMATIC TRANSMISSION SERVICE GROUP



INTRODUCTION

MERCEDES (722.1-722.2)

This manual covers the teardown and assembly of the early (1968-1981 four bolt pan) Mercedes Transmission. It will include the 025, 040, 050 model transmission.

We thank Mercedes Benz for the illustrations and information that have made this booklet possible.

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Technical Service Information

General Description

The MB automatic transmission consists of a fluid coupling in series with a four-speed planetary gearing. To engage/disengage the various gears, five hydraulically-actuated servo elements — two multiple-disk clutches and three band brakes — are actuated in the appropriate combination. A free wheel is fitted between inner and outer disk carriers of the clutch K 2.

The gear train design is one of the characteristic features of the automatic transmission. It includes drive, output, intermediate and hollow shafts, the three planetary gear sets arranged in series, and the disk-clutches and band brakes.

For a planetary gear train to be able to transmit torque, the hollow gear, the planet gear carrier or the sun gear must be held stationary (band brake), or the entire planetary gear train must be interlocked (clutch).

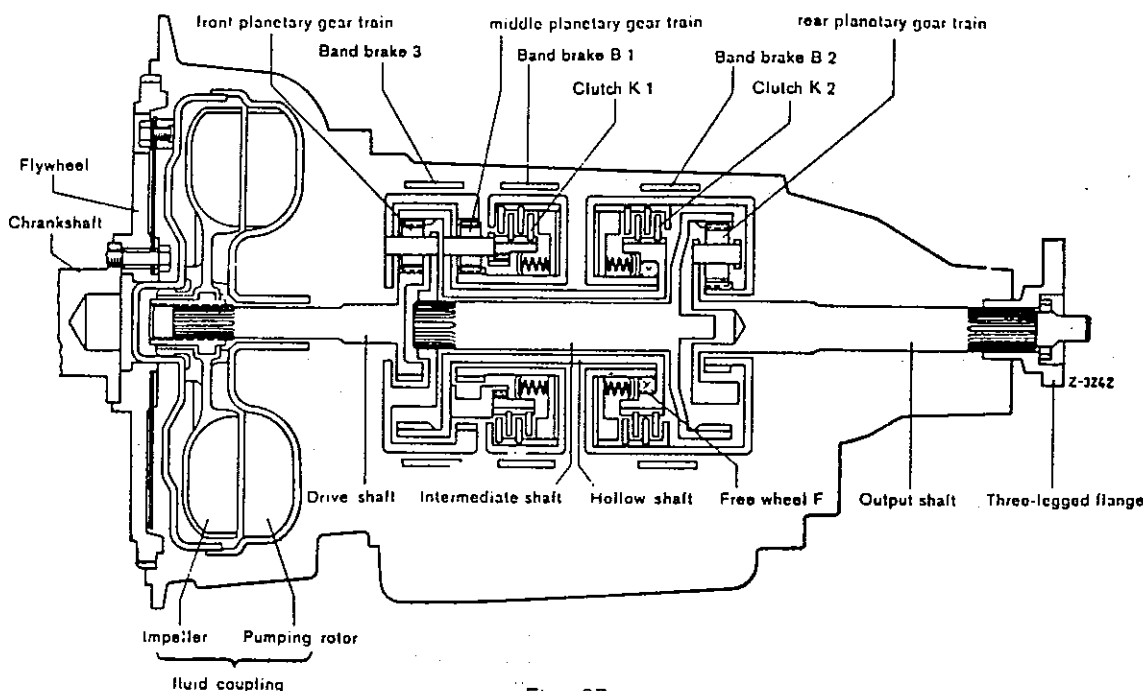


Fig. 27

In Fig. 27 all the servo elements are released; co-ordination of the various elements is explained as follows:

Rigidly connected with each other are:

Impeller of the fluid coupling, drive shaft and sun gear of the front planetary gear train.

Band brake drum B 3, outer gear of the middle planetary gear train, planet wheel carrier of front planetary gear train, intermediate shaft, outer gear of rear planetary gear train.

Outer gear of front planetary gear train, planet gear carrier of middle planetary gear train with inner disk carrier K 1, hollow shaft with inner disk carrier K 2.

Band brake drum B 1 with outer disk carrier K 1, sun gear of middle planetary gear train.

Band brake drum B 2 with outer disk carrier K 2, sun gear of rear planetary gear train.

Planet gear carrier of rear planetary gear train, output shaft, three-legged flange.

The free wheel "F" locks the inner disk carrier with the outer disk carrier of clutch K 2 in the backward sense of rotation.

Trouble-Shooting Hints

The Table below indicates which servo elements are engaged in the various gears:

Servo elements						
Gear	B 1	K 1	B 2	K 2	B 3	F
1			x			x
2	x		x			
3		x	x			
4		x		x		
R					x	x

Trouble	Cause
---------	-------

Faults during Operation and when Shifting Manually

Starter cannot be actuated	<ol style="list-style-type: none"> 1. Starter defective 2. Incorrect selector indicator reading 3. Starter lock-up switch does not make contact
Vehicle starts to move when starter is actuated	<ol style="list-style-type: none"> 1. Selector sleeve (28) detached 2. Short circuit in starter lock-up switch
Heavy jolt on starting	Engine idling speed too high
Engine stalls when a driving position is selected	Engine idling faulty
Vehicle creeps excessively	Engine idling speed too high
No power transmission with selector lever in position "R", all forward gears in order	<ol style="list-style-type: none"> 1. Band brake B 3 wrongly adjusted 2. Band brake B 3 and/or lining badly damaged mechanically 3. Free wheel defective 4. Working pressure too low or completely absent — lip sealing ring on band brake piston B 3 damaged
No power transmission in any position of selector lever — servo elements act only at high engine speeds (about 3000 rpm) in certain circumstances	<p>Working pressure too low or completely absent</p> <ol style="list-style-type: none"> 1. Primary pump failure 2. Main pressure control sleeve jams (pressure build-up with increasing engine speed)
No changedown on kickdown	<ol style="list-style-type: none"> 1. Kickdown solenoid valve does not go into kickdown position <ol style="list-style-type: none"> a) Kickdown switch badly adjusted or defective b) Cables or their connections damaged or loose c) Blown fuse d) Kickdown solenoid valve defective 2. Floor mat cut-out too small



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Faults during Operation and when Shifting Manually (continued)

Braking by changing down not possible	Diaphragm in vacuum box defective. Control pressure linkage wrongly adjusted.
Parking lock does not engage	1. Shift gate of shift linkage not correctly adjusted, is loose or bent 2. Shift linkage not correctly adjusted 3. Locking sleeve for parking lock is jammed
Hydraulic interlock for "R" and "P" not effective above 15 km/h	1. Locking sleeve for parking lock is jammed 2. No governor pressure
Engine will not start when vehicle is towed	1. Engine fault 2. Check valve jammed 3. Insufficient transmission fluid pressure 4. Secondary pump defective

Faults during Automatic Shifting

General shift faults, such as: 1. Engine races when drive range is selected 2. Irregular shifting 3. Very much delayed shifting downward, especially when cold	As a rule, contaminated transmission fluid is the cause (check by removing sump pan) Note: If there are a great many chips, shavings, turned abrasive dust and other foreign bodies present, the transmission must be completely disassembled, cleaned and, if necessary, repaired. If the sump pan is clean (a few scattered aluminum chips are of no consequence), renewal or repair of the sleeve shift box is usually sufficient to remedy the trouble.
Engine races in 3rd and 4th gears	Clutch K 1 has failed 1. Mechanical destruction 2. Too low a working pressure or complete absence of it
Engine races in 4th gear, engine has no braking effect in 1st gear	Clutch K 2 has failed 1. Mechanical destruction 2. Too low a working pressure or complete absence of it; round cord ring at pipe connection defective or damaged
Engine races in 2nd gear	Band brake B 1 has failed 1. Mechanical destruction of brake band or lining 2. Insufficient oil pressure acting on brake band; lip seal leaking heavily
Engine races in 1st, 2nd and 3rd gears	Band brake B 2 has failed 1. Mechanical destruction of brake band or lining 2. Brake band does not grip, since fluid pressure on lift side is not released a) Seating does not close b) Slot ring in sleeve shift box leaks c) Lifting sleeve is jammed
Engine races in 1st, 2nd and 3rd gears	Note: Re 2a and 2b Braking by changing down is possible and low torques are transmitted, but at larger throttle opening the engine races, since pressure is acting on the lift side of the brake band piston via the lifting sleeve 3. Shift side of brake band receives insufficient fluid pressure a) Quick-closing valve in band brake piston is open b) Piston ring leaking heavily

Trouble	Cause
---------	-------

Faults during Automatic Shifting (continued)

Engine races as throttle is increasingly opened (all selector lever positions)	Modulating pressure too low 1. Modulating pressure control sleeve is jammed 2. Diaphragm of vacuum box is jammed 3. Working pressure control sleeve is jammed 4. Diaphragm wrongly adjusted
Transmission does not change up beyond 2nd gear	1. Selector sleeve detached 2. Command valve jammed 3. Governor pressure too low
With the selector lever in position "4" the transmission does not shift into 4th gear	1. Governor pressure too low 2. Command valve jammed
Transmission always shifts up, irrespective of accelerator pedal position, at the partial throttle shift points; 1st gear not available	1. Control pressure linkage disturbed or detached 2. Control pressure control sleeve jammed

Noises

Chattering, rattling noise when engine is running while driving and stationary	1. Primary pump is drawing in air (transmission fluid level too low) 2. Fluid filter dirty
Whining noise rising i. intensity as engine speed increases	Primary pump loud
Grunting noises at idling speed	Sleeve vibrations (of no consequence, does not cause any trouble) Remedy: Renew lower section of shift sleeve housing
Transmission loud in 1st and 2nd gears	Loud front or middle planetary gear train
Transmission loud in 1st, 2nd and 3rd gears	Loud rear planetary gear train

Miscellaneous

When transmission fluid level is checked the fluid is discoloured black and smells burned	Shift members (mainly disk clutches) burned and damaged seriously. As a rule this is secondary damage; the primary cause is frequently excessively low modulating pressure, jammed sleeve shift and the like
---	--

Miscellaneous (continued)

Exhaust smokes heavily	Diaphragm in vacuum box leaks or is seriously damaged. transmission fluid reaches intake pipe Remedy: Close vacuum line at once!
Small but steady loss of transmission fluid	1. Diaphragm in the vacuum box leaks, transmission fluid reaches intake pipe 2. Other leaks



Service Information Mercedes 722.1-722.2

Transmission Ratios

Gear	Ratio	
First	in front and rear planetary gear set	3.98
Second	in front, center and rear planetary gear set	2.39
Third	in rear planetary gear set	1.46
Fourth	no ratio	1
Reverse gear	in front and rear planetary gear set	5.47

Number of Teeth

Planetary gear set	Front	Center	Rear
Ring gear	76	76	76
Planetary gear	17	17	20
Sun gear	44	44	35

Test Data (Hydraulic Pressures)

Type	200 D/8, 220 D/8	200/8, 220/8.	230/8, 250/8, 250 E/8, 250/8 Cp. (114.023)	280 S/8, 280 SE/8, 300 SEL/8
Modulating pressure, min. kp/cm ²	-	0.65	0.65	0.65
max.	2.8	3.8	3.8	3.8
Working pressure, First gear Basic pressure kp/cm ² Max. pressure	5.7 9.2	6.25 11.9	6.95 13.15	6.95 14.5
Second to fourth gear Basic pressure Max. pressure	2.9 4.5	3.1 5.8	3.1 6.4	3.4 7.1

Governor pressure

Speed, km/h	200 D/8, 220 D/8	200/8, 220/8, 230/8 ²⁾ 250/8 ²⁾ , 250 E/8 ²⁾ 250/8 Cp. (114.023), 280 S/8 ²⁾ 280 DE/8 ²⁾ , 300 SEL/8 ²⁾	230/8 ³⁾ , 250/8 ³⁾ 250 E/8 ³⁾ , 250/8 Cp. (114.023), 280 S/8 ³⁾ , 280 SE/8 ³⁾ , 300 SEL/8 ³⁾
		Governor pressure in kp/cm ²	
20	0.75 + 0.1	0.75 + 0.1	0.7 + 0.1
40	1.6 + 0.2	1.6 + 0.2	1.4 + 0.2
60	2.4 + 0.2	2.3 + 0.2	2.1 + 0.2
90	3.6 + 0.2	3.3 + 0.2 ¹⁾	3.0 + 0.2 ¹⁾
120	-	4.6 + 0.3 ¹⁾	4.2 + 0.3 ¹⁾

¹⁾ Can only be measured at full throttle.

²⁾ Up to November 1969 with rear axle ratio 3.92 : 1

³⁾ As of November 1969 with rear axle ratio 3.69 : 1

Pressure springs of Mechanical Part

Spring for	Unloaded length	Outer dia.	Wire dia.	Number of coils
Brake band piston B 1 (release spring)	55.5	38	3.6	3.5
Brake band piston B 3 (release spring)	77.5	42/64	3.2	3
Piston pump	46	37	2.5	5.5
Pressure valve, piston pump	20	6	0.5	17.5
Interlock piston (reverse gear parking interlock)	45.5	8.2	0.7	12.5
Pressure absorber, cut in (outside)	107.5	23.5	3	14
Pressure absorber, cut in (inside)	70.7	16.5	2.25	7.5
Disc clutch K 1 (piston return springs)	31	6.8	1	12.5
Disc clutch K 2 (piston return springs)	30	6.7	0.9	12.5

Annular Grooved Ball Bearing

	Dimensions	DIN Number
Front transmission housing cover	68 x 40 x 9	6008 DIN 625
Output shaft transmission housing	72 x 35 x 17	6206 DIN 625
Rear transmission housing cover	62 x 30 x 16	6207 DIN 625



Service Information Mercedes 722.1-722.2

Wear of Linings (Wear limit)

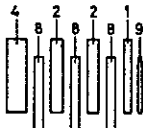

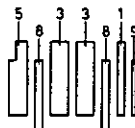
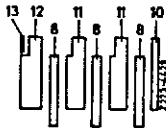
Brake bands	The lining must not show any scuffing, cracks, or chipping; the profile must still be visible.
Clutch discs	The lining must not show any scuffing, cracks, or chipping. Test: When scraping the lining with a fingernail, no carbon-like dust should appear.

Clutch Discs

	Thickness	Item No.	Part No.
+ Externally toothed discs (for clutches with internal springs)	2.0	1	112 272 12 26
	3.5	2	112 272 05 26
	5.0	3	115 272 01 26
	5.5	4	100 272 00 26
	5.5 1)	5	115 272 02 26
+ Externally toothed discs (for clutches with external springs)	2.0	10	115 272 03 26
	5.0	11	109 272 02 26
	5.5	12	109 272 05 26
Internally toothed discs		8	112 272 02 25
Shim (internal springs)	0.6	9	112 272 14 62
+ Shim (external springs)	0.6	13	109 272 00 62

1) Disc is recessed at the external toothing.

Clutch Disc Arrangement

Model	200/8, 200 D/8, 220/8, 220 D/8, 230/8, 250/8	250 E/8, 250/8 Cp. (114.023), 280 S/8, 280 SE/8, 300 SEL/8	Piston end
Clutch K 1			
Clutch K 2 (with internal springs)			
+ Clutch K 2 (with external springs)			

Pressure Pins for Modulating Pressure Transmitter

Identifying color	Length
bright metal (no color)	39.65
yellow	40.15
black	40.65

Piston Support Flange K 1 and K 2 (Diameter)

Types	200/8, 220/8, 200 D/8, 220 D/8, 230/8, 250/8, 250 E/8	250/8 Cp. (114.023), 280 S/8, 280 SE/8, 300 SEL/8
K 1	135	
K 2	115	113

Clutch Piston K 1 and K 2 (Diameter)

Types	200/8, 220/8, 200 D/8, 220 D/8, 230/8, 250/8, 250 E/8	250/8 Cp. (114.023), 280 S/8, 280 SE/8, 300 SEL/8
K 1	134.6	
K 2	114.6	112.6



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Adjustment Data

	Fig. No.	Adjustment Value
Axial play, front transmission cover	27-1/44, 45, 46	0.4 + 0.1
Free play of brake band pistons B 1 and B 2	27-1/53	3.0 - 4.0
Adjusting screw, brake band B 3	27-1/54	Tighten adjusting screw to 0.5 mkp, then back off 1 3/4 turns and tighten counternut.
Axial play of sun gear, center planetary gear set (in the case of free wheel without snap ring)	27-2/19, 20, 21	0.7 + 0.1
+ Axial play of sun gear, center planetary gear set (in the case of free wheel with snap ring)	27-2/19, 20, 21	0.2 + 0.1
Axial play of hollow shaft	27-2/18, 19	0.2 + 0.1
Axial play of sun gear, rear planetary gear set		0.25 + 0.1
Clearance "L" Clutch K 1	27-3/10, 11	0.7 - 1.2
Disc clutch Clutch K 2	27-3/31, 32, 33	0.7 - 1.2

Shims

Used for	Thickness
Grooved ball bearing, front transmission cover	0.1 0.2 0.5
Center gear set	0.1 0.2 0.5
Front gear set	0.1 0.2 0.5
Disc clutches K 1 and K 2	0.6

Pressure Pins of Brake Bands

Pressure pin for	Length	Remarks
B 1 and B 2	22 23 24 25 26	Depending on wear of brake band (see free play of brake band pistons in table "Adjustment Data").
B 3	45	

Checkup of torque converter stalling speed

Type	Stalling speed/min	Torque converter dia.
107.023 107.043 116.028 116.029	2150–2350	270
107.024 107.044 116.032 116.033	USA-version 1900–2100	
107.024 107.044 116.032 116.033	2050–2250	310
116.036	2050–2250	

Model	Stalling speed/min.	Torque converter dia.
123.126	1350–1550	
123.105 123.130 123.150	1600–1800	
123.120	1300–1500	
123.102 123.103 123.123	1500–1700	
123.020	1500–1700	
123.000 123.023 123.043	1700–1900	270
123.003 123.026	1850–2050	
116.020 123.030 123.050	1850–2050	
107.022 107.042 116.024 116.025 123.007 123.033 123.053	1900–2100	



Service Information Mercedes 722.1-722.2

Tightening Torques in mkg

Hex. hd. bolts for hydraulic coupling on driven plate	3.5
Hex. hd. bolts for primary pump	2.0
Hex. hd. bolts for front transmission case	1.3
Slotted bolts for starter lock and back-up light switch	0.5
Hex. hd. bolts for rear transmission case	1.3
Slotted nut on three-arm flange	12.0
Socked head screw for arrestor plate on selector lever shaft	1.0
Hex. hd. bolts for leaf spring of arrestor plate	1.0
Hex. hd. bolts for shaft valve housing centrifugal governor	0.8
Hex. hd. bolts for governor body on centrifugal governor	0.8
Hex. hd. bolt for modulating pressure valve body on transmission case	0.7
Hex. hd. bolt for secondary pump	0.8
Hex. hd. bolt for speedometer drive	0.8
Phillips screw for retaining plate of interlock piston, reverse gear	0.4
Hex. hd. bolts for valve body assembly on transmission case	1.3
Cyl. hd. bolt for oil filter on valve body assembly	0.4
Hex. hd. bolt for oil pan on transmission case	0.7
Adjustment screw B 3	0.5 ¹⁾
Countersunk bolts on support flange gear set	0.7
Hex. hd. bolts for valve upper and lower body	0.8
Cylindrical bolts for end plate of valve body	0.4
Clamp screw for range selector lever shaft	0.8
Adjustment screw for range selector lever	0.18
Kickdown solenoid valve	3.0

¹⁾ Refer to "Adjustment Data" Brake band free play.

A. Type 200/8 to 300 SEL/8

Shift Points

		Types	200/8, 220/8		200 D/8, 220 D/8		230/8, 250/8, 250 E/8, 250/8 Cp (114.023), L 280 S/8 280 SE/8, 300 SEL/8	
	Accelerator Position	Shifting	▲ km/h	▼ km/h	▲ km/h	▼ km/h	▲ km/h	▼ km/h
4	Idle	1-2-1	9.5	5	9.5	5	9.5	5
		2-3-2	27	20	30	21	27	20
		3-4-3	39	29	39	29.5	39	29
	Full Throttle	1-2-1	25	5	23	5	25	5
		2-3-2	53	20	47	21	53	20
		3-4-3	121	46.5	89	43	121	46.5 48 1)
	Kick-down	1-2-1	25	17.5	23	16.5	25	17.5
		2-3-2	53	43.5	47	41.5	53	43.5 45 1)
		3-4-3	121	109	89	82	121	109
3	Idle	1-2-1	9.5	5	9.5	5	9.5	5
		2-3-2	33	28	32	23.5	33	28
	Full Throttle	1-2-1	25	5	23	5	25	5
		2-3-2	72	33.5	53	25	73.5	34.5
	Kick-down	1-2-1	25	17.5	23	16.5	25	17.5
		2-3-2	72	61	53	44	73.5	63
2	Idle	1-2-1	37	5	32	5	37	5
	Full Throttle	1-2-1	37	17	32	15.7	37	17
	Kick-down	1-2-1	37	30	32	27	37	30

Note: All speeds are approximate and refer to rear axle ratio 3.92:1. At a rear axle reduction ratio of 3.69:1, the speeds are approximately 5% higher.

1) Only on types 280 S/8, 280 SE/8, 300 SEL/8.

▲ Shifting up ▼ Shifting down



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3 SPEED

Shift Points

All speed values are approximate.

Vehicle model	116.036	107.024	107.023	108.067/068
		107.044	107.043	109.057
Explanation of symbols:	▲ Shifting up	116.032	116.028	
	▼ Shifting down	116.033		

Position of gas pedal	Shift	▲ km/h	▼ km/h	▲ km/h	▼ km/h	▲ km/h	▼ km/h	▲ km/h	▼ km/h
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Selector Lever Position "D"

Idle throttle	1-2-1	30	13	30	19	27	17	29	19
	2-3-2	47	34	45	35	46	32	43	34
Full throttle	1-2-1	79	13	68	19	73	17	65	19
	2-3-2	144	76	138	60	139	67	131	58
Kickdown	1-2-1	79	73	68	51	73	60	65	49
	2-3-2	144	127	138	123	139	126	131	117

Selector Lever Position "S"

Idle throttle	1-2-1	36	23	34	23	31	20	31	22
Full throttle	1-2-1	86	33	77	27	82	24	73	25
Kickdown	1-2-1	86	78	77	62	82	68	73	59

Selector lever position "L"

Idle	1-2-1		40	7		41	8
Full throttle	1-2-1		40	20		41	22
Kickdown	1-2-1		40	34		41	35

4 SPEED

Model		115.110 115.115		115.114		115.117	
Transmission		722.107		722.109		722.108	
Gas pedal position	Shift	▲ km/h	▼ km/h	▲ km/h	▼ km/h	▲ km/h	▼ km/h
Selector lever "D"		Symbols: ▲ = shifting up ▼ = shifting down					
Idle	1-2-1	-	-	-	-	-	-
	2-3-2	26	19	28	20	32	19
	3-4-3	39	32	41	34	44	36
Full throttle	1-2-1	-	-	-	-	-	-
	2-3-2	50	31	53	33	50	19
	3-4-3	88	54	93	57	97	56
Kickdown	1-2-1	29	19	31	20	33	21
	2-3-2	50	44	53	46	50	45
	3-4-3	88	77	93	81	97	84
Selector lever "S"							
Idle	1-2-1	-	-	-	-	-	-
	2-3-2	26	19	28	20	34	22
Full throttle	1-2-1	-	-	-	-	-	-
	2-3-2	50	31	53	33	52	24
Kickdown	1-2-1	29	19	31	20	33	21
	2-3-2	50	44	53	46	52	48
Selector lever "L"							
Idle	1-2-1	31	7	33	8	35	9
Full throttle	1-2-1	31	17	33	18	35	20
Kickdown	1-2-1	31	28	33	30	35	31



Service Information Mercedes 722.1-722.2

Model	115.015	115.017 California emission control model year 1975	115.017 USA version federal emission control model year 1975 USA and Sweden version model year 1976
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Transmission		722.106		722.110		722.110	
Accelerator pedal position	Shift	▲ km/h	▼ km/h	▲ km/h	▼ km/h	▲ km/h	▼ km/h

Selector lever position "D"

Idle	1-2-1	—	—	—	—	—	—
	2-3-2	26	18	27	19	25	18
	3-4-3	42	32	45	35	42	32
Full throttle	1-2-1	—	—	—	—	—	—
	2-3-2	59	18	58	19	54	18
	3-4-3	113	49	122	53	113	49
Kickdown	1-2-1	32	17	34	22	32	20
	2-3-2	59	45	58	46	54	42
	3-4-3	113	98	122	107	113	98

Selector lever position "S"

Idle	1-2-1	—	—	—	—	—	—
	2-3-2	29	22	34	22	29	23
Full throttle	1-2-1	—	—	—	—	—	—
	2-3-2	67	25	52	24	86	28
Kickdown	1-2-1	32	17	33	21	32	20
	2-3-2	67	55	52	48	66	55

Selector lever position "L"

Idle	1-2-1	36	7	35	9	36	8
Full throttle	1-2-1	36	22	35	20	36	20
Kickdown	1-2-1	36	32	35	31	36	31

Model	114.062	107.022	107.042
	114.072	114	115.017
		116.020	116.024

Transmission	722.200	722.100-105
		722.110 *

Accelerator pedal position	Shift	▲ km/h	▼ km/h	▲ km/h	▼ km/h
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Selector lever position "D"

Idle	1-2-1	10	7	-	-
	2-3-2	30	22	28	20
	3-4-3	47	34	47	35
Full throttle	1-2-1	28	7	-	-
	2-3-2	60	22	63	20
	3-4-3	131	57	131	57
Kickdown	1-2-1	32	20	35	22
	2-3-2	60	48	63	47
	3-4-3	131	114	131	114

Selector lever position "S"

Idle	1-2-1	10	7	-	-
	2-3-2	37	32	33	26
Full throttle	1-2-1	28	7	-	-
	2-3-2	78	37	78	32
Kickdown	1-2-1	32	20	35	22
	2-3-2	78	68	78	65

Selector lever position "L"

Idle	1-2-1	40	7	41	8
Full throttle	1-2-1	40	20	41	22
Kickdown	1-2-1	40	34	41	35

Adjustment of Control Pressure Rod and Selector Rod

Caution! All the adjusting jobs described below should be made only with the vehicle standing on its wheels.

Adjustment of Control Pressure Rod

Remove air filter and disconnect control pressure linkage (13).

Throttle valve should rest against idling speed stop.

Push regulating lever (17) and angle lever (20) to idle throttle position.

Push control pressure rod (13) completely toward the rear against stop and check or adjust length free of stress in relation to ball head.

Note: When checking the control pressure linkage for length, hold ball socket to the left adjacent to ball head and not above, due to the circular movement of the linkage.

Adjustment of Selector Rod – Floor Shift all Models

Disconnect selector rod (5) on range selector lever (6). Set range selector lever (6) and selector lever (1) to „N“. making sure that approx. 1 mm play is available between the selector lever (1) and the „N“ stop on gate plate. Adjust length of selector rod (5) in such a manner that it can be attached free of stress; then tighten counternut (4) again. (Fig 2).

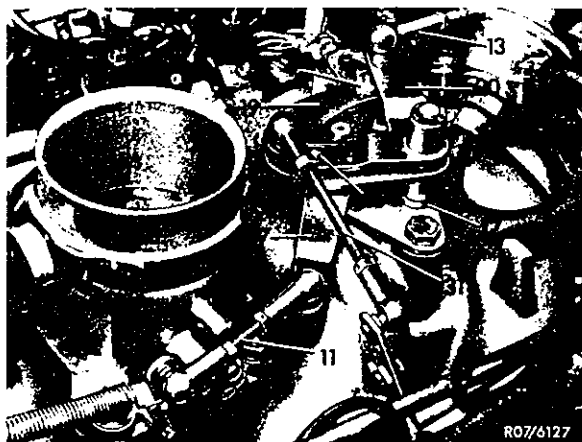


Fig. 1

- | | |
|-------------------------|-------------------|
| 7 Roller | 18 Stop pin |
| 11 Connecting rod | 19 Gate lever |
| 12 Bearing bracket | 20 Angle lever |
| 13 Control pressure rod | 31 Connecting rod |
| 17 Regulating lever | |

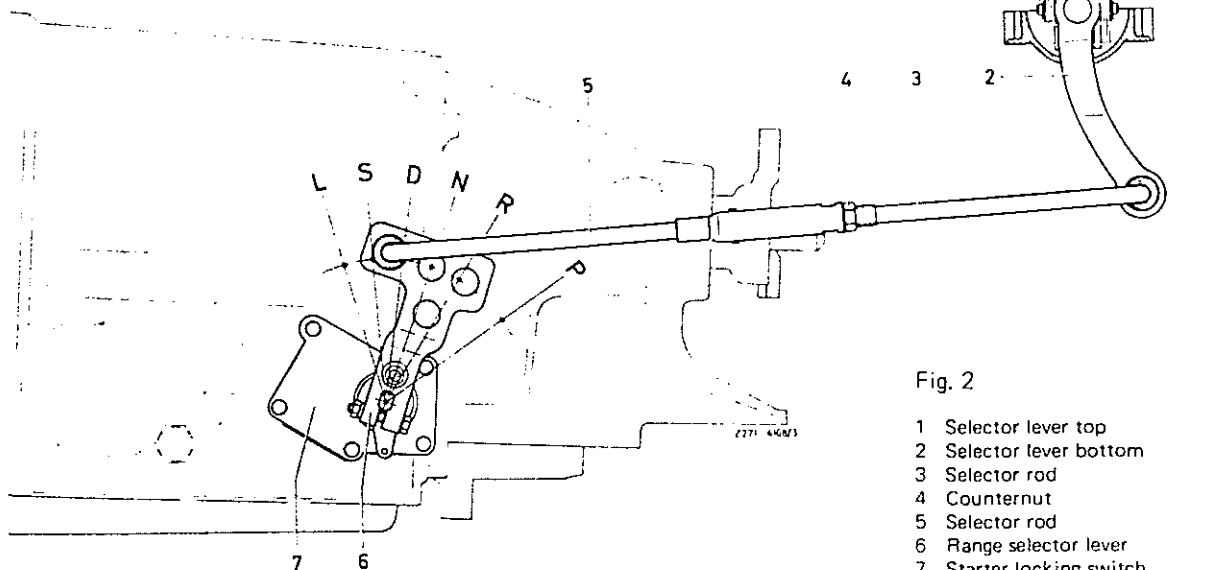


Fig. 2

- | |
|--------------------------|
| 1 Selector lever top |
| 2 Selector lever bottom |
| 3 Selector rod |
| 4 Counternut |
| 5 Selector rod |
| 6 Range selector lever |
| 7 Starter locking switch |

Switch and Kickdown Switch

Adjustment of Starter Locking and Backup Light Switch

Disconnect selector rod and move range selector lever (1) on transmission into position "N". Tighten clamping bolt (6) prior to making adjustments. (Fig. 1).

Loosen adjusting screw (3) and insert locating pin (5) through carrier into locating hole in gear shift housing.

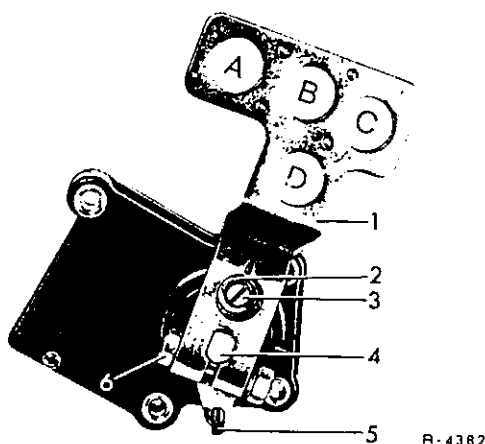


Fig. 1

- | | |
|------------------------|-----------------|
| 1 Range selector lever | 4 Shaft |
| 2 Washer | 5 Locating pin |
| 3 Adjusting screw | 6 Clamping bolt |

Tighten adjusting screw (3) and remove locating pin (5).

Place selector lever of steering column or floorshift in position "N" and attach selector rod free of tension. Then check whether the engine can be started in selector lever position "N" or "P".

Adjustment of Kickdown Switch

The kickdown position of the magnetic valve is controlled by the accelerator pedal via the kickdown switch. Depress accelerator pedal (9) from inside vehicle against kickdown end position. (Fig. 2).

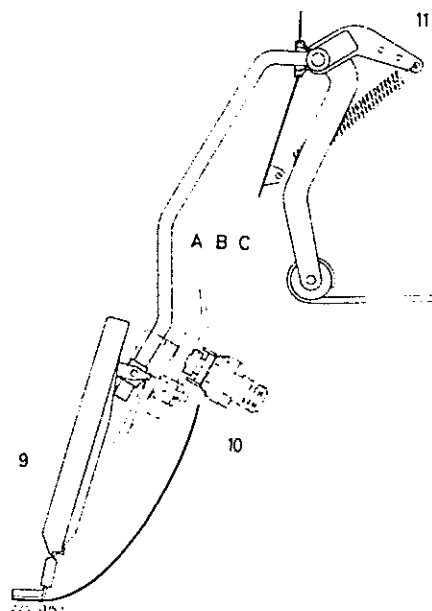


Fig. 2

- | | |
|---------------------|--------------------------|
| 9 Accelerator pedal | A Idle throttle position |
| 10 Kickdown switch | B Full throttle position |
| 11 Retracting lever | C Kickdown position |

In this position the throttle valve lever should rest against the full load stop of venturi control unit.

Adjustments are made by loosening the clamping bolt (refer to arrow) on the retracting lever of the accelerator pedal shaft and turning of accelerator pedal. Then tighten clamping bolt again. (Fig. 3).

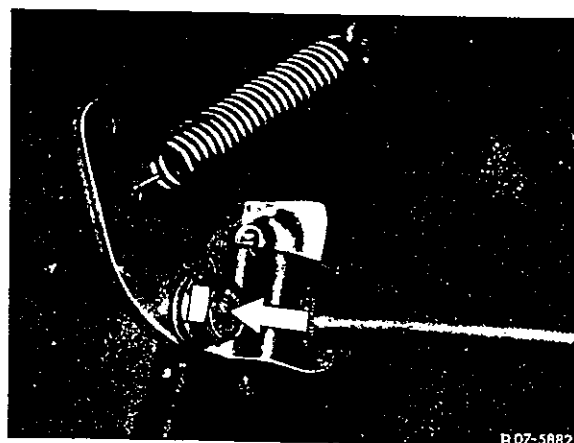


Fig. 3



Service Information Mercedes 722.1-722.2

1. Depress the accelerator pedal (9) (Figure 4) until it bears against the kickdown switch; on vehicles with gasoline engine there must then be 5 mm clearance between throttle valve lever and full-load stop on the carburetor. On vehicles with diesel engine the throttle valve lever must be in contact with the full-load stop.

If necessary, after releasing the lock nut adjust the kickdown switch by turning it in or out of the cover plate in the steering column jacket. If the range of adjustment of the kickdown switch is not sufficient, adjust the control shaft (6) after loosening the hexagon screw (7) (Figure 3).

2. Depress accelerator pedal to the kickdown position. On vehicles with gasoline engine there should then be 1 mm clearance between throttle valve lever and full-load stop on the carburetor. On vehicles with diesel engine the throttle valve lever must be in contact with the full-load stop.

4. Adjusting the Control Pressure Linkage (Gasoline Engines)

The control pressure linkage controls the shift points dependent upon the throttle linkage position, and works against governor pressure.

Control pressure linkage on all versions of the K4C-025 transmission must be properly adjusted to insure the proper shift points.

There is no pressure tap on the transmission to read TV pressure. Correct adjustment of the linkage insures correct TV pressure.

The control pressure linkage adjustment is described on the following pages.

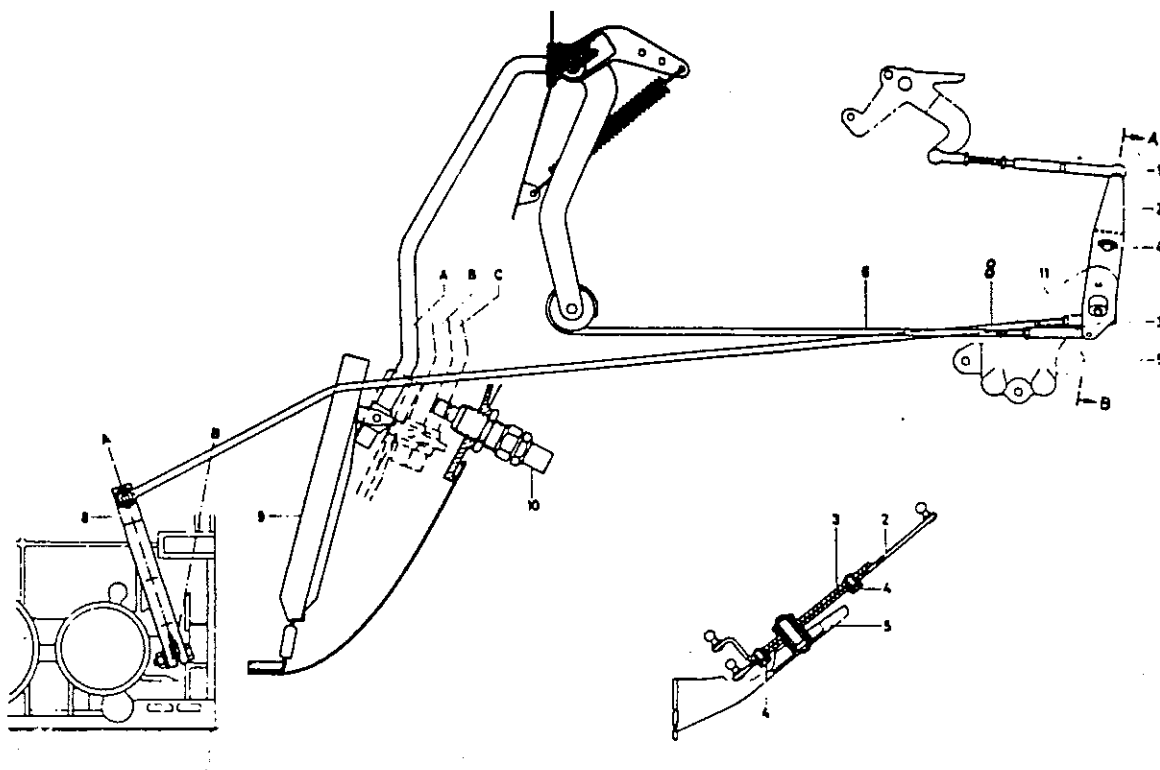


Figure 4

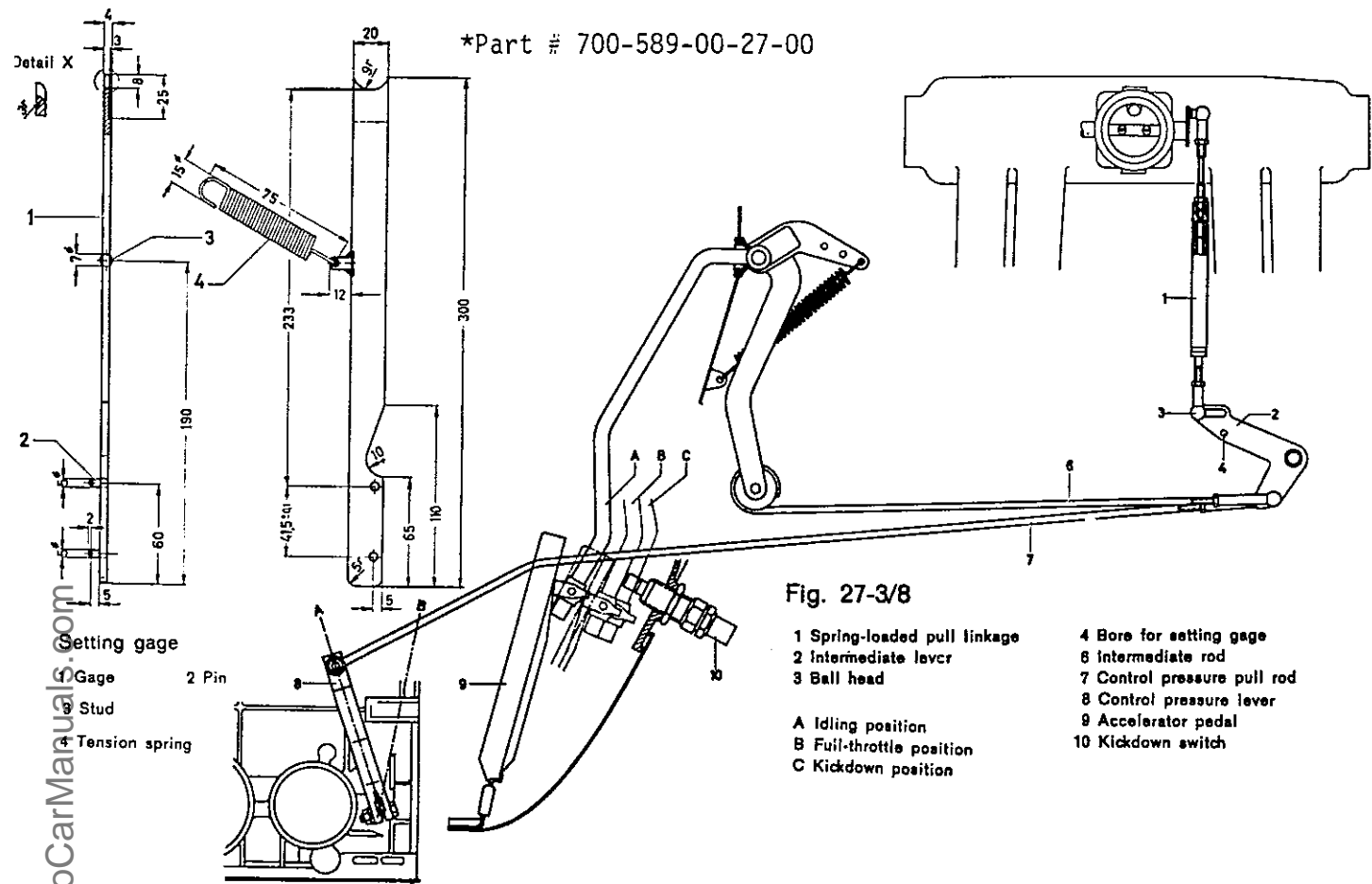
- | | | |
|-------------------------|---------------------------|--------------------------------|
| 1. Push rod | 8. Control pressure lever | A. Idle position |
| 2. Intermediate lever | 9. Accelerator pedal | B. Wide open throttle position |
| 3. Notched lever | 10. Kickdown switch | C. Kickdown position |
| 4. Control pressure rod | 11. Ball joint | |

CONTROL PRESSURE LINKAGE ADJUSTMENT MODELS 230/8, 250/8, 280S/8

To check:

1. Chokes must be open, off fast idle cams, and rod between carburetors disconnected.
2. Disconnect push rod #1 at front ball joint. Check that the free travel is not bound or sticking. The free travel is set and locked at the factory. Do not tamper with the jam nut.
3. Hold intermediate lever #2 forward to put control pressure lever #8 full back.
4. Extend push rod #1 to full length. If the control linkage is correct, the ball socket will fit on to the ball joint at this point.

*Part #: 700-589-00-27-00



CONTROL PRESSURE LINKAGE ADJUSTMENT, MODEL 220D/8

A special tool is required for this adjustment.

1. Adjust idle speed to smooth idle with warm engine. Set fast idle knob to full right position.
2. Disconnect all rods at intermediate lever (2).
3. Place special tool at hollow screw (vacuum connection on manifold and upper pin of tool into locating hole (4).
4. Adjust spring-loaded rod so that it fits tension-free (rod compressed). Make sure throttle is against idle stop.
5. Adjust control pressure rod (7) to that it is tension-free while held to rear stop.
6. Place lower pin of special tool into locating hole (4), and, if throttle valve is not in wide open position, adjust ball head (3) at elongated slot.
7. Remove special tool.
8. Place accelerator pedal in full load position and check to see if throttle valve is in wide open position. If it isn't, adjust at linkage on firewall.

To adjust:

1. The intermediate lever #2 and notched lever #3 are held in relation to each other with two 10 mm hex head bolts, #4 and #4. (Figure 4)
2. Loosen these two bolts and adjust levers, as necessary, to arrive at the condition described in Step 4.

CONTROL PRESSURE LINKAGE ADJUSTMENT MODEL 280SE/8, 300SEL/8 - 2.8

To check:

1. The vertical push rod from the bell crank on the engine block to the injection linkage cross shaft should have free travel.
2. With the injection linkage in the idle position and the transmission control pressure rod fully back, the vertical rod should fit free when the free play is fully extended.

To adjust:

1. Adjust length of vertical push rod at ball joint ends.

CONTROL PRESSURE LINKAGE ADJUSTMENT, MODEL 220/8 - SOLEX CARBURETOR

1. Disconnect rod between carburetors and remove dashpot. Carburetors must be in idle position.
2. Intermediate rod to rear carburetor must have free travel.
3. Disconnect intermediate rod to rear carburetor at intermediate lever. When fully extended, rod must fit tension-free.
4. Adjust intermediate rod ball ends accordingly.
5. Replace dashpot and reconnect carburetor connecting rod.

MODEL 220/8 - STROMBERG CARBURETOR (Figure 5)

1. Disconnect pull rod (7) and push back to stop on transmission. Adjust pull rod at ball joint (8) to fit free of tension.
2. With the carburetor in the hot idle position, (off choke, vacuum throttle control clear) adjust control rod (12) with ball joint (11) to fit free when fully extended.

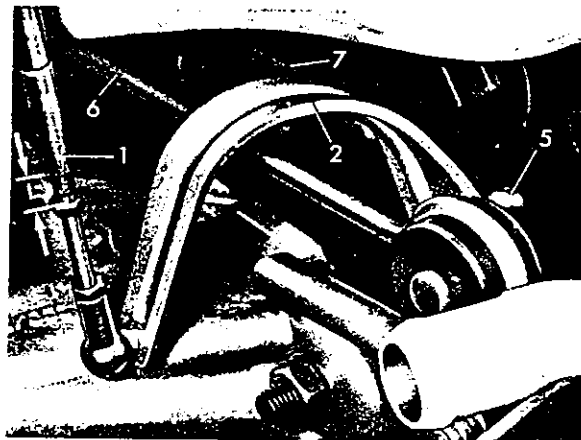


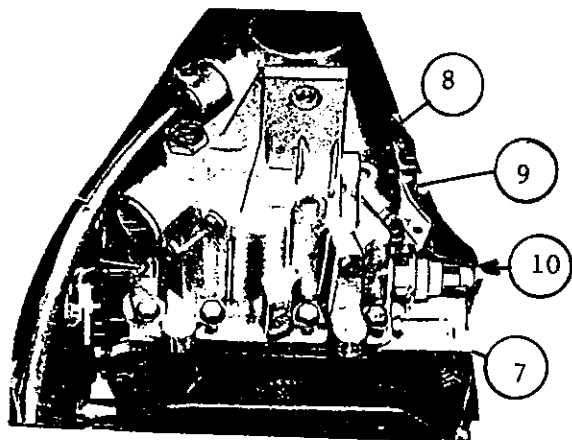
FIGURE 5

PRESSURE TESTING AND ADJUSTMENTS

There are three pressure check points at the rear of the K4C-025 automatic transmission.

They are:

1. Working pressure (primary pump).
2. Modulator pressure.
3. Governor pressure.



PRESSURE POINTS

- 7 - Modulator pressure connection.
- 8 - Working pressure connection.
- 9 - Governor pressure connection.
- 10 - Vacuum cell (modulator)

PRELIMINARY CHECKS PRIOR TO PRESSURE TESTING AND ADJUSTING

1. Check fluid level.
2. Check for burnt smell in fluid.
3. Check vacuum line fittings for tightness.
4. Prior to pressure testing, check, and if necessary adjust the control pressure linkage.

WORKING PRESSURE

Working pressure is built up by the primary pump and is the base for all pressures in the transmission.

To check:

1. Base pressure should be available at light throttle cruise in the specified gear.
2. Maximum pressure should be available at full load in the specified gear.

NOTE: Working pressure is not adjustable.

WORKING PRESSURE VALVES (± 5 PSI)

		2.3 & 2.5 ltr. 6-Cylinder Models	2.8 ltr. w/K4C-025	220/8	220D/8
1st and "R" Gears	Base PSI	90	100	90	80
	Max. PSI	190	205	170	130
2nd, 3rd and 4th Gears	Base PSI	45	50	45	40
	Max. PSI	90	100	80	65

MODULATOR PRESSURE

Modulator pressure is controlled by engine vacuum and regulates the strength of the shift (the "apply" pressure to the bands and clutches).

In-Shop Checks:

1. Apply a counter-hold on the 14 mm hex of the vacuum cell and disconnect and plug vacuum line.
2. Attach a 100 p.s.i. range pressure gauge to the modulator pressure check point.
3. Run engine at 3000 rpm and hold gauge at windshield level.
4. Maximum modulator pressure should be indicated.



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MODULATOR PRESSURE

	Gasoline Models	220D/8
Minimum psi	9± 1.5	--
Maximum psi	54	40

Should a complaint regarding harsh shifting occur and the above check indicates 54 psi modulator pressure:

With the vacuum line connected, apply full throttle in 4th gear at approximately 30 mph. Hold this speed with brake pedal (loading engine).

The following values are absolute minimum:

Carburetor Engines.....52 psi
Injection Engines.....53 psi

To adjust:

The adjusting screw used in the modulator is accessible by removing the hollow bolt for the vacuum line connection.

It is a common screw on the early modulator and a 4 mm Allen set screw on the later modulator.

The Diesel has a large set screw in place of a vacuum modulator. Adjust to the correct maximum modulator pressure. Tolerance is allowed at the minimum pressure. One turn in will increase the pressure approximately 3 PSI.

NOTE: Installation of a new modulator vacuum cell.

If the correct pressure range (maximum to minimum pressure) cannot be obtained with the modulator set screw, modulator pins are available in three sizes to correct for this.

The pin sizes are:

39.65 mm Part Number 115-277-29-75 (silver)
40.15 mm Part Number 115-277-30-75 (brown)
40.65 mm Part Number 115-277-31-75 (black)

Modulator-Working Pressure

The gauge pressures are shown in bar and correspond to the former pressure data given in kg/cm^2 (atü).

Due to the considerable heat developed in torque converter, the stalling speed may be held max. 5 seconds, while braking vehicle well with service brake and parking brake.

Test data modulating pressure and working pressure

Transmission	Modulating pressure		Working pressure		
	Position "D" 65 km/h	Stationary	Position "D" 65 km/h	Stationary	Position "R" stationary
722.111	3.8	6.3	6.3 ± 0.2	10.6 ± 0.4	18 and above
722.112			6.4 ± 0.2	10.7 ± 0.4	
722.113 722.115			5.6 ± 0.2	9.4 ± 0.4	
722.116	2.8	4.8	4.7 ± 0.2	8.2 ± 0.4	16 and above
722.117		4.8 $6.8^{1)}$	5.2 ± 0.2 $4.9 \pm 0.2^{1)}$	8.7 ± 0.4 $7.2 \pm 0.4^{1)}$	
722.118		6.8	5.6 ± 0.2	8.9 ± 0.4	
722.119	3.8	6.3	6.3 ± 0.2	10.3 ± 0.4	18 and above

1) Pressure data for vehicles with key starting

(AUS) (S) starting 1977

722.112	3.8	6.3	6.0 ± 0.2	10.3 ± 0.4	18 and above
722.113		6.5	5.4 ± 0.2	9.6 ± 0.4	
722.119		6.3	6.2 ± 0.2	10.0 ± 0.4	

(J) (USA) starting 1977

722.112	3.8	6.8	6.2 ± 0.2	10.6 ± 0.4	18 and above
722.117	2.8	6.8	4.9 ± 0.2	7.2 ± 0.4	16 and above
722.119	3.8	6.3	6.2 ± 0.2	10.0 ± 0.4	18 and above

Test data regulating pressure

Model	20 km/h	40 km/h	60 km/h	90 km/h	120 km/h
107.002 107.042 116.020 116.024 116.025 123.000 123.023 123.026 123.03 123.043 123.05	0.6 ± 0.1	1.5 ± 0.1	2.3 ± 0.1	$3.2 \pm 0.2^{1)}$	$4.5 \pm 0.2^{1)}$
123.020 123.120 123.126	0.6 ± 0.1	1.7 ± 0.1	2.5 ± 0.1	$3.7 \pm 0.2^{1)}$	$5.4 \pm 0.2^{1)}$
123.102 123.103 123.123	0.6 ± 0.1	1.6 ± 0.1	2.4 ± 0.1	$3.5 \pm 0.2^{1)}$	$5.0 \pm 0.2^{1)}$
123.105 123.130 123.150	0.5 ± 0.1	1.3 ± 0.1	2.3 ± 0.1	$3.7 \pm 0.2^{1)}$	$4.6 \pm 0.2^{1)}$
123.023 (AUS) (J) (S) (USA)	0.6 ± 0.1	1.7 ± 0.1	2.5 ± 0.2	$3.7 \pm 0.2^{1)}$	$5.4 \pm 0.2^{1)}$

Test values modulating pressure and working pressure

Transmission		722.100 722.102	722.101 722.103	722.104
Modulating pressure	in position "D"		3.8 ¹⁾ 6.3 ²⁾	
	in position "S"	6.3 ± 0.4 ¹⁾	6.4 ± 0.4 ¹⁾	5.8 ± 0.2 ¹⁾
Working pressure	in position "D"	10.6 ± 0.4 ²⁾	10.7 ± 0.4 ²⁾	9.7 ± 0.3 ²⁾
	reverse		18 and above ²⁾	
Transmission		722.105	722.106	722.110
Modulating pressure	in position "D"		3.8 ¹⁾ 6.3 ²⁾	
	in position "S"	6.4 ± 0.2 ¹⁾	5.6 ± 0.2 ¹⁾	6.3 ± 0.2 ¹⁾
Working pressure	in position "D"	10.7 ± 0.4 ²⁾	9.4 ± 0.3 ²⁾	10.2 ± 0.3 ²⁾
	reverse		18 and above ²⁾	
Transmission		722.107	722.108	722.109
Modulating pressure	in position "D"		2.8 ³⁾ 4.8 ⁴⁾	2.8 ³⁾ 6.8 ⁴⁾
	in position "L"	12.8 ± 0.2 ⁴⁾	13.6 ± 0.6 ⁴⁾	—
Working pressure	in position "S"	4.7 ± 0.2 ¹⁾	5.2 ± 0.2 ²⁾	5.6 ± 0.2 ³⁾
	in position "D"	8.2 ± 0.4 ¹⁾	8.7 ± 0.4 ¹⁾	8.9 ± 0.4 ¹⁾
	reverse		18 and above ⁴⁾	
USA version				
		722.102 California emission control model year 1975	722.102 Federal emission control model year 1974 and model year 1975	722.102 model year 1975 2nd version and model year 1976
Modulating pressure	in position "D"		3.8 ¹⁾ 6.3 ²⁾	
	in position "S"	6.0 ± 0.2 ¹⁾	5.8 ± 0.2 ¹⁾	5.4 ± 0.2 ¹⁾
Working pressure	in position "D"	10.3 ± 0.4 ²⁾	10.1 ± 0.4 ²⁾	9.6 ± 0.4 ²⁾
	reverse		18 and above ²⁾	
			722.110 model year 1974 and federal emission control model year 1975/76	722.110 California emission control model year 1975/76
Modulating pressure	in position "D"			3.8 ¹⁾ 6.3 ²⁾
	in position "S"		6.0 ± 0.2 ¹⁾	5.8 ± 0.2 ¹⁾
	in position "D"		10.3 ± 0.4 ²⁾	10.1 ± 0.4 ²⁾
	reverse			18 and above ²⁾

¹⁾ Measured at 65 km/h with vacuum line connected at full throttle.

²⁾ Measured with vehicle stopped, vacuum line disconnected and full throttle (stalling speed).

GOVERNOR PRESSURE

The governor is a centrifugal control turned by the output shaft in the transmission.

The governor pressure builds up on a "curve", gradually, contrary to the "stepped" pressure governor of the previous K4A-020 transmission.

This pressure works directly against control pressure, to regulate the shift depending on vehicle speed.

To check:

1. Drive car at specified MPH.
2. The pressure should be within the tolerance specified.

NOTE: Governor pressure is not adjustable.

GOVERNOR PRESSURE VALUES

MPH	Gasoline Models	220D/8
12	10 - 11.5 PSI	10 - 11.5
25	23 - 26	23 - 26
37	33 - 36	34 - 37
56	47 - 50*	51 - 54*
75	66 - 70*	

* These values obtained under full load only.



Service Information Mercedes 722.1-722.2

Governor Pressure

Test values governor pressure

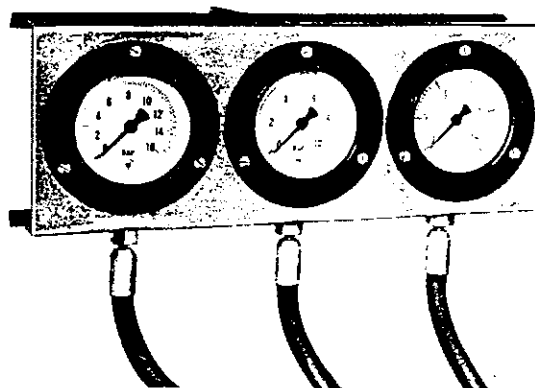
		722.100-105 722.110	722.106-107 722.110 USA- and Sweden version model year 1976	
Transmission				
Governor pressure	20 km/h	0.6 ± 0.1	0.6 ± 0.1	
	40 km/h	1.5 ± 0.1	1.7 ± 0.1	
	60 km/h	2.3 ± 0.1	$5.4 \pm 0.2^{1)}$	
	90 km/h	$3.2 \pm 0.2^{1)}$	$3.7 \pm 0.2^{1)}$	
	120 km/h	$4.5 \pm 0.2^{1)}$	$5.4 \pm 0.2^{1)}$	
Transmission		722.108	722.109	722.200
Governor pressure	20 km/h	0.6 ± 0.1	0.5 ± 0.1	0.75 ± 0.1
	40 km/h	1.6 ± 0.1	1.3 ± 0.1	1.3 ± 0.1
	60 km/h	2.4 ± 0.1	2.3 ± 0.1	2.1 ± 0.2
	90 km/h	$3.5 \pm 0.2^{1)}$	3.7 ± 0.2	$3.0 \pm 0.2^{1)}$
	120 km/h	$5.0 \pm 0.2^{1)}$	$4.6 \pm 0.2^{1)}$	$4.4 \pm 0.3^{1)}$

¹⁾ Can be measured under full throttle only.

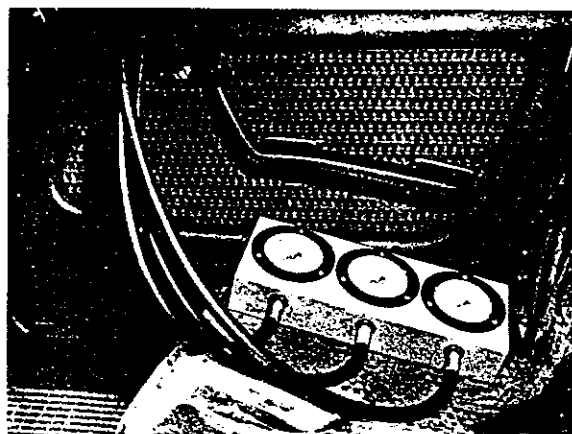
Connecting the tester

The tester is provided with three pressure gauges for the various pressure tests. The gauges permit measuring the three most important oil pressures (modulating pressure, regulating pressure and working pressure).

The working pressure test requires using the pressure gauge with scale value up to 25 bar.



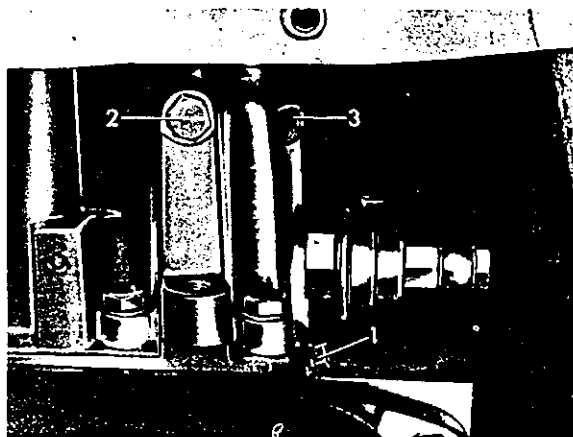
During a test run on the drum type dynamometer the tester is placed on the covered front passenger seat, to permit reading by driver. During test runs on the road, the tester is held by the front passenger and read. The pressure hoses are inserted through window frame. Make sure that the hoses do not sag too much or rest against exhaust pipe.



Test connections

The test connections serve for the following pressure tests: Modulating pressure, working pressure and regulating pressure.

- 1 Modulating pressure
- 2 Working pressure
- 3 Regulating pressure





Service Information Mercedes 722.1-722.2

Modulating pressure

Prior to testing all the pressures, measure the modulating pressure and adjust, if required. This requires an accurately measuring oil pressure gauge (scale value up to 10 bar and 0.1 bar precision) or the tester with three pressure gauges.

Measuring

Transmission 722.100–110 (W 4 B 025)

Connect tester. Accelerate vehicle on drum dynamometer or on the road (with vacuum line connected) in selector lever position "D" to 65 km/h. Accelerate to full throttle, maintain speed on drum dynamometer – or with service brake on road – and read modulating pressure.

The modulation pressure of transmissions with a torque converter must be tested at 65 km/h, since the pressure can be accurately measured only at this speed.

The specified pressure for stopped vehicle serves only as a reference value when adjusting modulating pressure.

Transmission 722.200 (K 4 C 025)

Connect tester. Disconnect vacuum line, while counter-holding at hexagon (SW 14) on vacuum box. Run engine, increase engine speed by means of accelerator pedal to approx. 1500–2000 min. while reading modulating pressure (max. pressure).

The specified basic pressure is attained only while driving vacuum line connected during deceleration.

Measuring

Connect tester. Ride vehicle on drum dynamometer or on the road while comparing the governor pressure with the values in table at the specified speeds.

If no governor pressure is measured or if the values are different, disassemble centrifugal governor and make operable.

Control pressure

The control pressure is a partial pressure of the modulating pressure. It is mechanically controlled in dependence of the precision of the accelerator pedal. If the modulating pressure and the control pressure linkage are correctly adjusted, the control pressure will be arrived automatically.

Note

Due to the considerable heat developed in torque converter or in hydraulic clutch, the stalling speed may be maintained **max. 5 seconds only**, while braking the vehicle well with service brake and parking brake.

The gauge pressure values shown are named in bars and correspond to the present pressure data in kp/cm^2 (atü).

Test values modulating pressure and working pressure

Transmission		722.100 722.102	722.101 722.103	722.104
Modulating pressure	in position "D"		3.8 ¹⁾ 6.3 ²⁾	
	in position "S"	6.3 ± 0.4 ¹⁾	6.4 ± 0.4 ¹⁾	5.8 ± 0.2 ¹⁾
Working pressure	in position "D"	10.6 ± 0.4 ²⁾	10.7 ± 0.4 ²⁾	9.7 ± 0.3 ²⁾
	reverse		18 and above ²⁾	

¹⁾ Measured at 65 km/h with vacuum line connected under full throttle.

²⁾ Measured with vehicle stopped, vacuum line disconnected and at full throttle, **not kickdown** (stalling speed).

Transmission		722.105	722.106	722.110
Modulating pressure	in position "D"		3.8 ¹⁾ 6.3 ²⁾	
	in position "S"	6.4 ± 0.2 ¹⁾	5.6 ± 0.2 ¹⁾	6.3 ± 0.2 ¹⁾
Working pressure	in position "D"	10.7 ± 0.4 ²⁾	9.4 ± 0.3 ²⁾	10.2 ± 0.3 ²⁾
	reverse		18 and above ²⁾	

¹⁾ Measured at 65 km/h with vacuum line connected under full throttle.

²⁾ Measured with vehicle stopped, vacuum line disconnected and at full throttle, **not kickdown** (stalling speed).



Service Information Mercedes 722.1-722.2

Transmission		722.107	722.108	722.109
Modulating pressure	in position "D"		2.8 ³⁾ 4.8 ⁴⁾	2.8 ³⁾ 6.8 ⁴⁾
	in position "L"	12.8 ± 0.2 ⁴⁾	13.6 ± 0.6 ⁴⁾	—
	in position "S"	4.7 ± 0.2 ³⁾	5.2 ± 0.2 ³⁾	5.6 ± 0.2 ³⁾
	in position "D"	8.2 ± 0.4 ⁴⁾	8.7 ± 0.4 ⁴⁾	8.9 ± 0.4 ⁴⁾
Working pressure				
	reverse		18 and above ⁴⁾	

¹⁾ Measured at 65 km/h under full throttle.

²⁾ Measured with vehicle stopped and at full throttle, not kickdown (stalling speed).

USA version

		722.102 California emission control model year 1975	722.102 Federal emission control model year 1974 and model year 1975	722.102 model year 1975 2nd version and model year 1976
Modulating pressure	in position "D"		3.8 ¹⁾ 6.3 ²⁾	
	in position "S"	6.0 ± 0.2 ¹⁾	5.8 ± 0.2 ¹⁾	5.4 ± 0.2 ¹⁾
Working pressure	in position "D"	10.3 ± 0.4 ²⁾	10.1 ± 0.4 ²⁾	9.6 ± 0.4 ²⁾
	reverse		18 and above ²⁾	

¹⁾ Measured at 65 km/h with vacuum line connected at full throttle.

²⁾ Measured with vehicle stopped, vacuum line disconnected and full throttle, not kickdown (stalling speed).

		722.110 model year 1974 and federal emission control model year 1975/76	722.110 California emission control model year 1975/76
Modulating pressure	in position "D"		3.8 ¹⁾ 6.3 ²⁾
	in position "S"	6.0 ± 0.2 ¹⁾	5.8 ± 0.2 ¹⁾
	in position "D"	10.3 ± 0.4 ²⁾	10.1 ± 0.4 ²⁾
	reverse		18 and above ²⁾

¹⁾ Measured at 65 km/h with vacuum line connected at full throttle.

²⁾ Measured with vehicle stopped, vacuum line disconnected and full throttle (stalling speed).

Sweden version

Transmission		722.102 model year 1976	722.110 model year 1976
Modulating pressure	in position "D"	3.8 ¹⁾ 6.5 ²⁾	3.8 ¹⁾ 6.3 ²⁾
	in position "S"	5.9 ± 0.2 ¹⁾	6.0 ± 0.2 ¹⁾
	in position "D"	10.7 ± 0.4 ²⁾	10.3 ± 0.4 ²⁾
	reverse	18 and above ²⁾	

¹⁾ Measured at 65 km/h with vacuum line connected at full throttle.

²⁾ Measured with vehicle stopped, vacuum line disconnected and full throttle (stalling speed).

Japan version

Transmission		722.102 model year 1976
Modulating pressure	in position "D"	3.8 ¹⁾ 6.5 ²⁾
	in position "S"	5.4 ± 0.2 ¹⁾
	in position "D"	9.6 ± 0.4 ²⁾
Working pressure	reverse	18 and above ²⁾

¹⁾ Measured at 65 km/h with vacuum line connected at full throttle.

²⁾ Measured with vehicle stopped, vacuum line disconnected and full throttle, **not kickdown** (stalling speed).

Transmission		722.200
Modulating pressure	Basic pressure	0.65 ± 0.1 ¹⁾
	Max. pressure	3.8
Working pressure	1st and 2nd reverse speed	Basic pressure Max. pressure 7.0 ± 0.4 14.1 ± 0.4
	2nd speed pos. "2"	Basic pressure 7.0 ± 0.4
	2nd-4th speed	Basic pressure Max. pressure 3.0 ± 0.2 6.1 ± 0.2

¹⁾ This value is attained only when closing throttle during deceleration.



Service Information Mercedes 722.1-722.2

Test values governor pressure

		722.100-105 722.110	722.106-107 722.110 USA- and Sweden version model year 1976	
Transmission				
Governor pressure	20 km/h	0.6 ± 0.1		0.6 ± 0.1
	40 km/h	1.5 ± 0.1		1.7 ± 0.1
	60 km/h	2.3 ± 0.1		$5.4 \pm 0.2^{1)}$
	90 km/h	$3.2 \pm 0.2^{1)}$		$3.7 \pm 0.2^{1)}$
	120 km/h	$4.5 \pm 0.2^{1)}$		$5.4 \pm 0.2^{1)}$
Transmission		722.108	722.109	722.200
Governor pressure	20 km/h	0.6 ± 0.1	0.5 ± 0.1	0.75 ± 0.1
	40 km/h	1.6 ± 0.1	1.3 ± 0.1	1.3 ± 0.1
	60 km/h	2.4 ± 0.1	2.3 ± 0.1	2.1 ± 0.2
	90 km/h	$3.5 \pm 0.2^{1)}$	3.7 ± 0.2	$3.0 \pm 0.2^{1)}$
	120 km/h	$5.0 \pm 0.2^{1)}$	$4.6 \pm 0.2^{1)}$	$4.4 \pm 0.3^{1)}$

¹⁾ Can be measured under full throttle only.

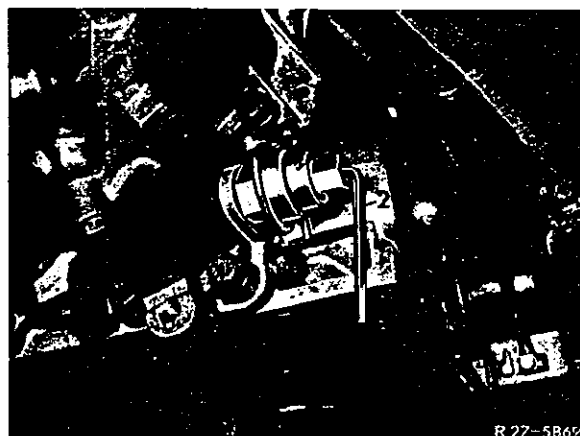
Adjustment

1 The modulating pressure can be adjusted by means of a 4 mm hexagon socket wrench (3) applied to adjusting screw in vacuum box (1).

Reference value:

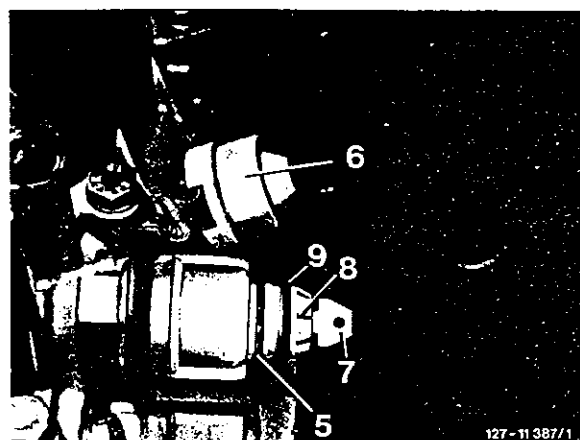
One revolution of adjusting screw provides a pressure change of approx. 0.2 bar (kp/cm²).

Vacuum box 1st version



2 Compress circlip (5) and remove closing cap (6). Pull locking plate (7) out of locking slots (8). The modulating pressure is adjusted in vacuum box with locking plate resting against adjusting screw. Following adjustment, push locking plate back into the nearest locking slots.

Vacuum box 2nd version

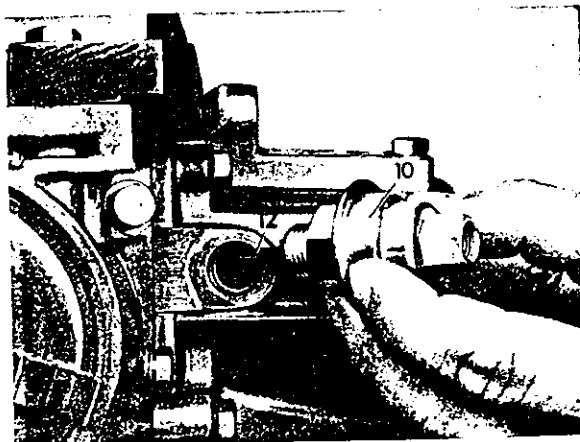


Glue thrust pin (12) as measured into vacuum box (10) with Omnifit-Rapid led-M.

Provide vacuum box on threads with sealing compound and screw in, making sure that the thrust pin (12) enters bore of control valve.

Attention!

Tighten vacuum box at hex head SW 22 with an open end wrench only.

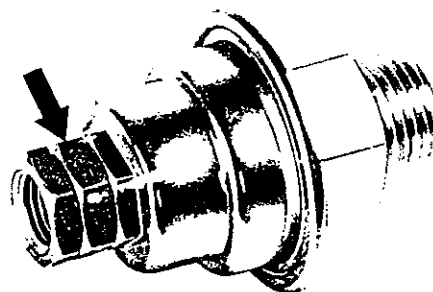


Working pressure

The working pressure is not adjustable and is automatically established with correctly adjusted modulating pressure. For checking, use pressure gauge with a scale value up to at least 25 bar (kp/cm²).

Measuring

Connect tester. The working pressure test is completed similar to the modulating pressure test. If in spite of a correctly adjusted modulating pressure the specified values are not attained, the shifting valve housing must be either cleaned and checked or exchanged.



Regulating pressure

The regulating pressure is a partial pressure of the working pressure and is set to the required value by the centrifugal governor. The regulating pressure can never exceed the working pressure and for this reason the upper pressure values can be measured only while driving at full throttle. Measuring requires an oil pressure gauge with a scale value of up to 10 bar (kp/cm²).

The number of transmission versions of models 114, 115 are provided with vacuum boxes having a modified full-load spring. The vacuum boxes are each identified at the hex head SW 14.

Below is a list of the different (modified) vacuum boxes together with the models in which they are installed.

Vacuum box with 2 identification grooves (arrow).

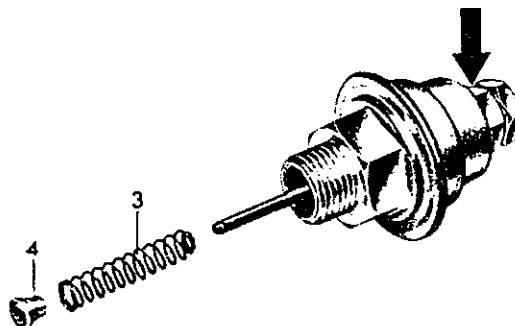
Installed in transmission 722.106.



Service Information Mercedes 722.1-722.2

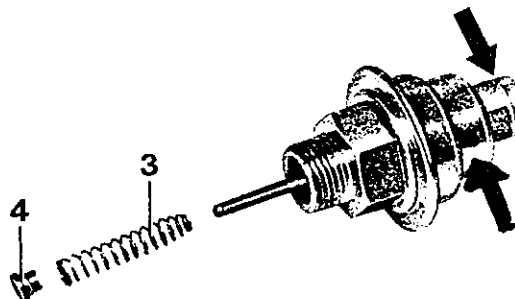
Vacuum box with 1 identification groove (arrow), as well as compression spring (3) and spring guide (4).

Installed in transmission 722.110 California version model year 1975/76.



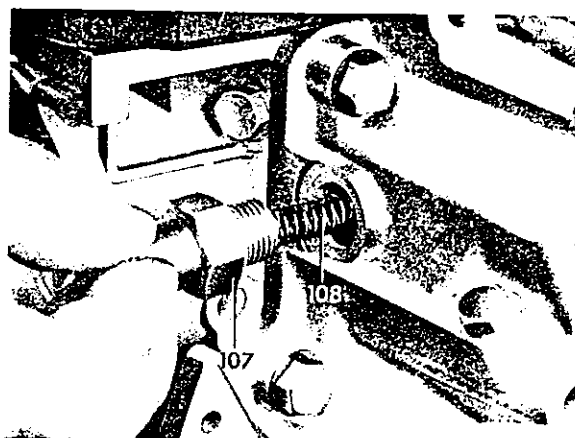
Vacuum box with partially machined hex head SW 14 (arrow), as well as compression spring (3) and spring guide (4).

Installed in transmission 722.102 Federal and California version model year 1975 76 and Sweden version model year 1976.



NOTE:
Current Late modulators
have a green Dot ID mark

On transmission for Diesel engines, screw-in adjusting screw (107) with aluminum sealing ring and compression spring (108) and tighten.



TEARDOWN and ASSEMBLY

Types 200/8 to 300 SEL/8

During all assembly operations, painstaking cleanliness has to be observed. The satisfactory functioning of the transmission depends upon the absence of dirt on the transmission parts, on the control valves and in the oil circuits. Therefore, after disassembly all parts must be carefully cleaned and the oil passages flushed and dried. When washing, make sure that no rubber parts are washed in gasoline as they will disintegrate. Use alcohol as a cleaning agent for rubber parts. Furthermore, care has to be taken

that the parts do not come into contact with woolen rags at any time, since the slightest particles (for instance, fluff) could cause malfunctions.

When assembling the transmission parts, the bearings and the moving parts are to be lubricated with the specified automatic transmission fluid.

A. Disassembly of Transmission

The work comprises the following items:

- a) Valve body
- b) Rear transmission case, centrifugal governor and parking interlock.
- c) Front transmission case
- d) Brake band piston B 1 and B 2
- e) Brake bands and gear set
- f) Modulating pressure housing, parking interlock mechanism, range selector lever and starter lock-out switch.
- g) Brake band piston B 3, brake band piston lever B 3 and brake band abutment

a) Valve Body

- 1 Set up transmission with oil pan on top.

Loosen the four attachment bolts (2) and remove oil pan, seal and shim (3) **Fig. 1**

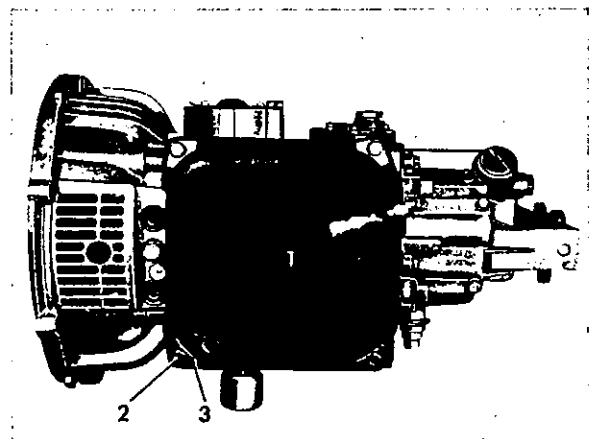


Fig. 1

- 1 Oil pan
- 2 Attachment bolt
- 3 Shim

- 2 Mount transmission on assembly fixture
115 589 05 59 00 **Fig. 2**

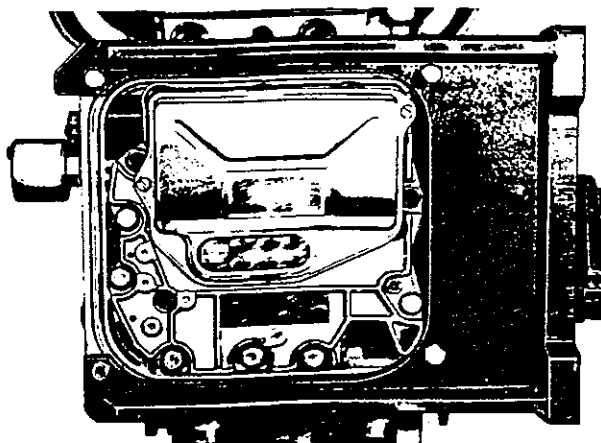


Fig. 2

3 Remove oil filter (4) **Fig. 3**
Remove bolts (6) of valve body (7). Place range selector lever between positions "P" and "R" and remove valve body **Fig. 4**

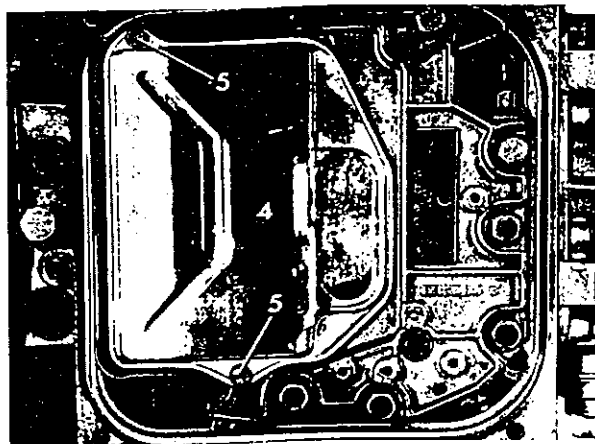


Fig. 3

4 Oil filter

5 Attachment bolts

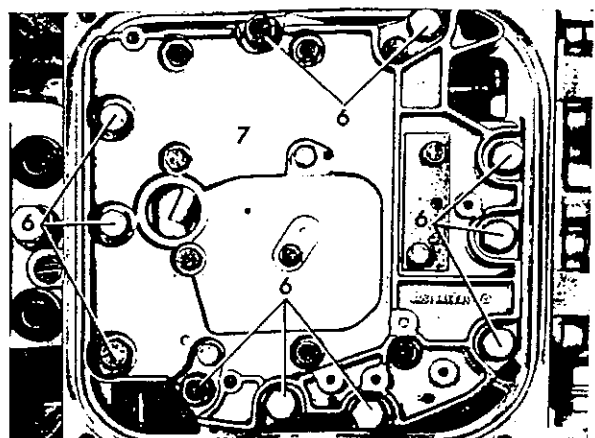


Fig. 4

6 Attachment bolts

7 Valve body

4 Remove tubes (8), then remove the seals (9) from the tubes (Fig. 27-1/5).

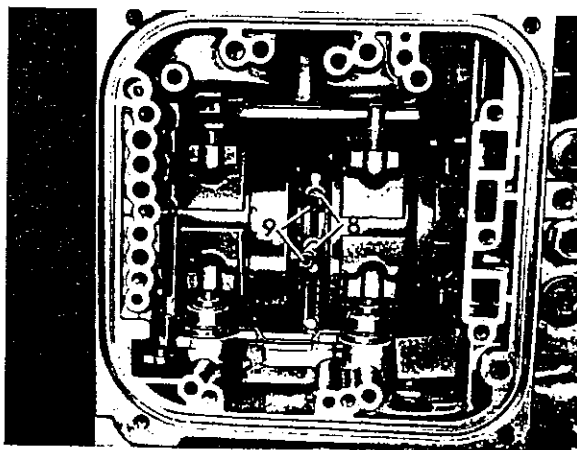


Fig. 5

8 Tubes

9 Seals

b) Rear Transmission Case
Centrifugal Governor and Parking Interlock

5 Swivel transmission on the assembly stand so that the rear transmission case points upwards. Remove vacuum cell (10) pressure spring (11) and pressure pin (12) **Fig. 6**

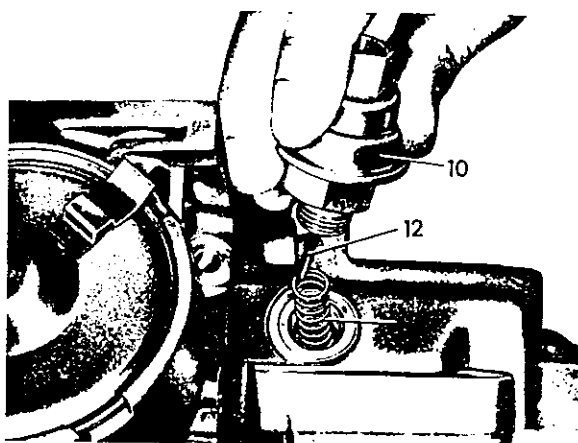


Fig. 6

10 Vacuum cell
11 Pressure spring

12 Pressure pin

Note: Diesel transmissions have, instead of a vacuum cell, a plug with compression spring.

6 Remove plug for the secondary pump (13) with special tool 115 589 00 11 00. Remove compression spring (14). **Fig. 7**

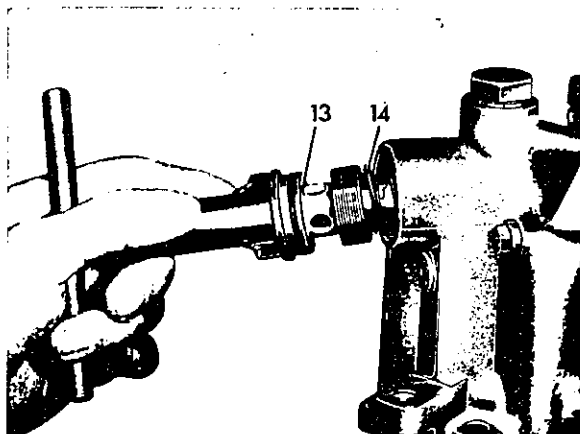


Fig. 7

13 Plug secondary pump 14 Compression spring

7 Remove lock from grooved nut on three-arm flange and unscrew nut. Pull off three-arm flange from output shaft.

8 Loosen rear transmission case bolts. Pull off rear transmission case using puller 115 589 03 33 00

Fig. 8

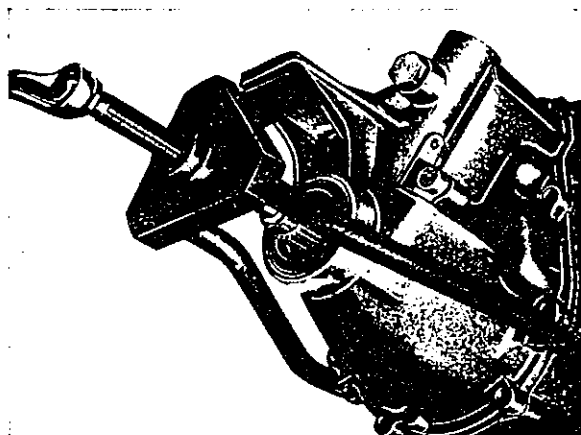


Fig. 8

9 Remove worm gear of speedometer drive (15), eccentric ring for secondary pump (16) and centrifugal governor (17) from output shaft **Fig. 9**

10 Remove parking lock pawl (19) and spring. Pull off parking lock gear (18) from output shaft **Fig. 9**

c) Front Transmission Case

11 Swivel transmission on the assembly fixture

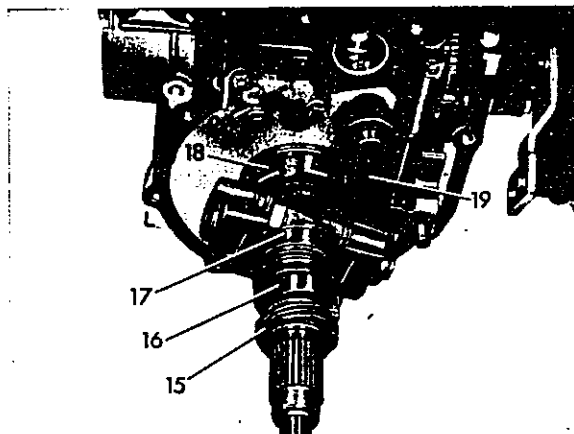


Fig. 9

15 Worm gear speedometer drive 18 Parking lock gear
16 Eccentric ring secondary pump 19 Parking lock pawl
17 Centrifugal governor 20 Modulating pressure housing

so that the front transmission case is on top. Remove attachment bolts (21) for the front transmission case (22) **Fig. 10**

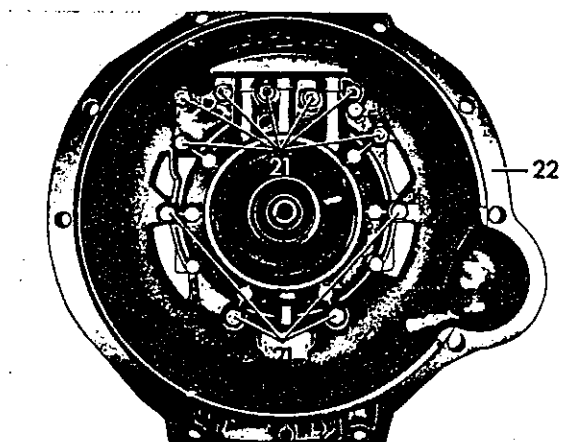


Fig. 10

21 Attachment bolts
22 Front transmission case

12 Loosen front transmission case by tapping it lightly with a plastic hammer and remove.

d) Brake Band Pistons B 1 and B 2

13 Place transmission on the assembly stand in a horizontal position. Bend up securing lugs (68) for the brake band piston covers B 1 and B 2

Fig. 11

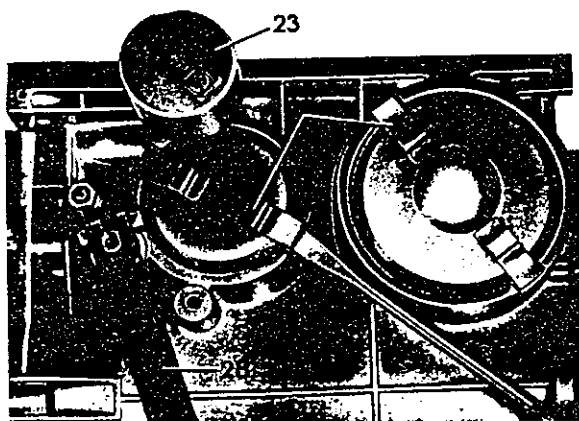


Fig. 11

23 Solenoid valve
28 Control pressure lever
68 Securing lugs

14 Remove solenoid valve (23) and control pressure lever (28).

15 Remove snap ring (24) from brake band piston cover B 2 (25) and pull off brake band piston cover (25) with remover handle 115 589 05 33 00 **Fig. 12**

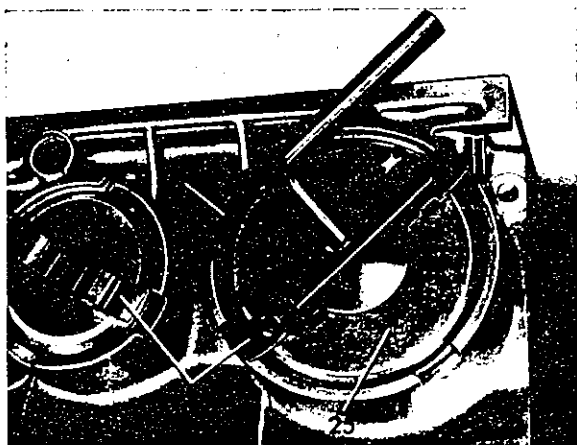


Fig. 12

24 Snap ring
25 Brake band piston cover B 2
68 Securing lugs

16 Remove guide ring with brake band piston B 2.

17 Mount assembly fixture (26) for brake band piston cover B 1, tighten and remove snap ring (27) **Fig. 13**

18 Release assembly fixture and remove brake band piston cover (29) with brake band piston B 1 (30) and pressure spring (31) **Fig. 14**

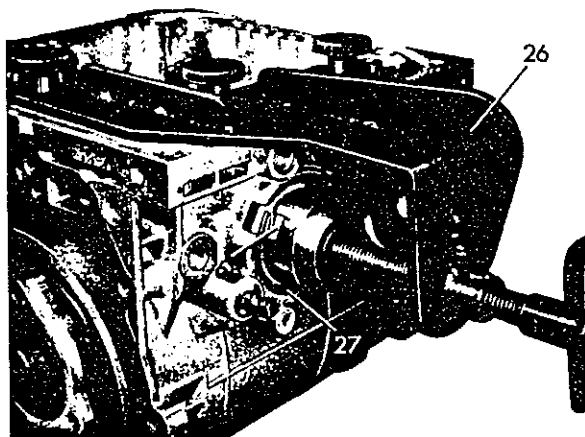


Fig. 13

26 Assembly fixture
115 589 04 59 00
27 Snap ring
68 Securing lugs

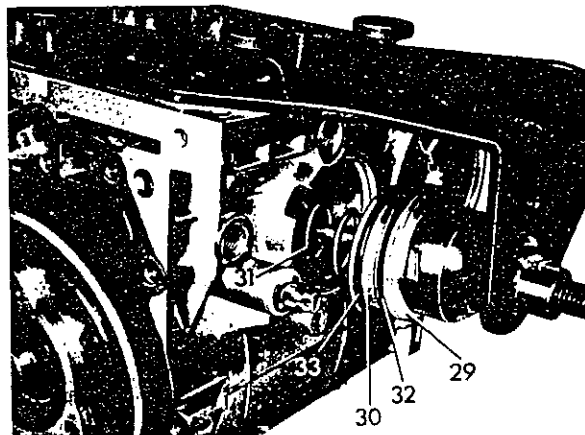


Fig. 14

29 Brake band piston cover B 1
30 Brake band piston B 1
31 Pressure spring
32 O-ring
33 Lip seal ring

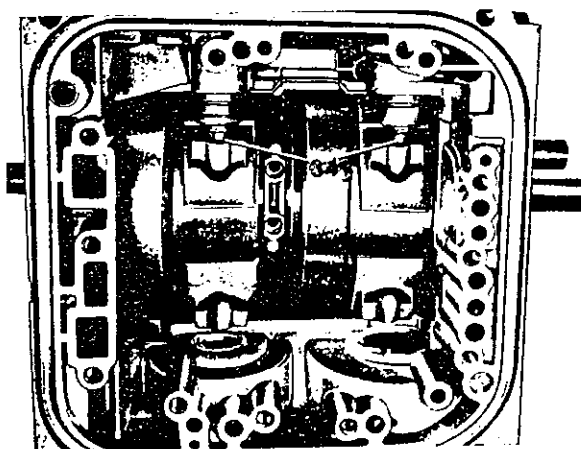


Fig. 15

34 Pressure pin

19 Remove assembly fixture.

20 Remove pressure pins (34) for B 1 and B 2 (Fig. Fig. 15

e) Brake Bands and Gear Set

21 Loosen counternut (36) and remove adjustment screw for brake band B 3 (35). Remove both pressure pins (37) Fig. 16

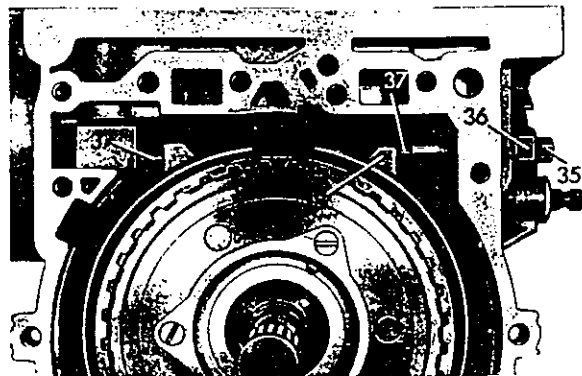


Fig. 16

35 Adjustment screw B 3 37 Pressure pin
36 Counternut 38 Brake band B 3

22 Pull out brake band B 3 (38) toward the front Fig. 17

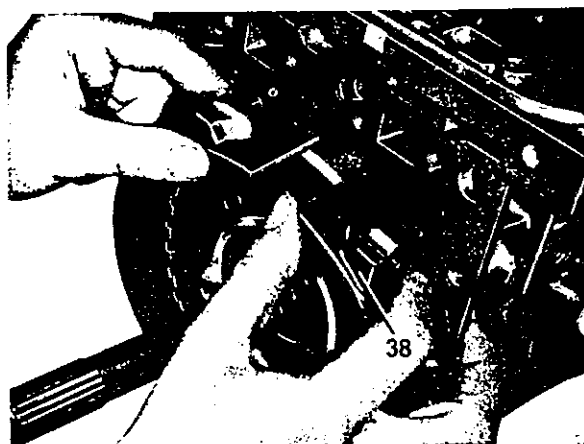


Fig. 17

38 Brake band B 3

23 Secure brake band B 1 (39) on the drum with a snap ring for brake band piston cover B 2 and remove gear set (40) from transmission case. Brake band B 2 remains in the transmission case Fig. 18

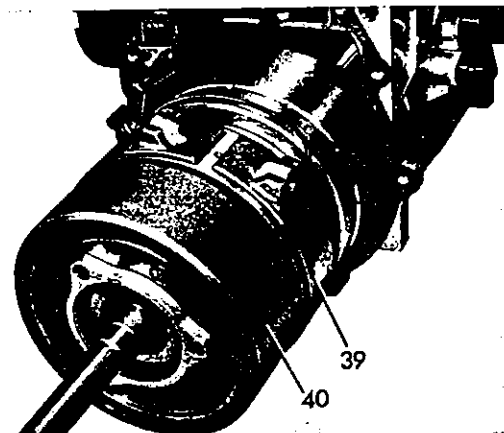


Fig. 18

39 Brake band B 1 40 Gear set

24 Remove brake band B 2 from transmission case.

f) Modulating Pressure Housing, Parking Lock Mechanism, Range Selector Lever and Starter Lock-out Switch

25 Loosen the three bolts. Then remove modulating pressure valve housing (41) and gasket of rear transmission case (42) Fig. 19

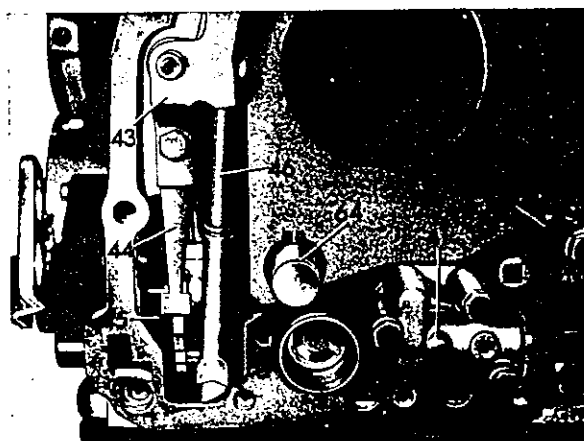


Fig. 19

41 Modulating pressure housing 45 Clamp screw
42 Gasket 46 Spring-loaded rod
43 Bracket, parking lock 64 Bearing pin, parking lock pawl
44 Leaf spring

26 Remove bracket (43) and leaf spring (44).

27 Unscrew clamp screw (45) on arrestor wheel.

28 Remove range selector lever (48) and take out arrestor wheel (49) with spring-loaded rod (46) from transmission case. Take off needle bearing (47)

Fig. 20

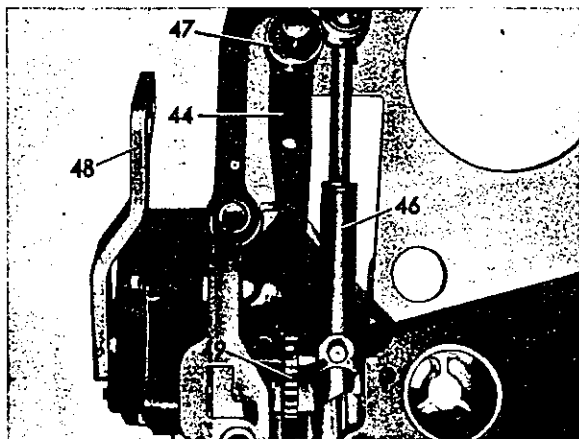


Fig. 20

44 Leaf spring
46 Spring-loaded rod
47 Needle bearing
48 Range selector lever
49 Notched arrestor wheel

29 Loosen attachment bolts and remove starter lock-out and back-up light switch (50) Fig. 21

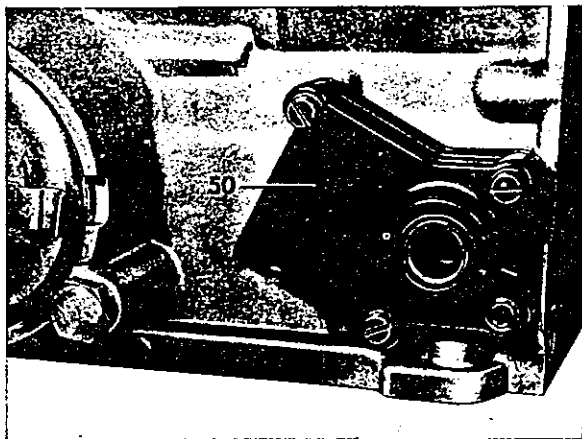


Fig. 21

50 Starter lock-out switch

g) Brake Band Piston B 3, Brake Band Piston Lever B 3 and Brake Band Abutment

30 Remove transmission case from assembly fixture.

31 Release brake band piston cover B 3, remove lock ring (51) and remove cover (52) using fixture 115 589 05 33 00 Fig. 22

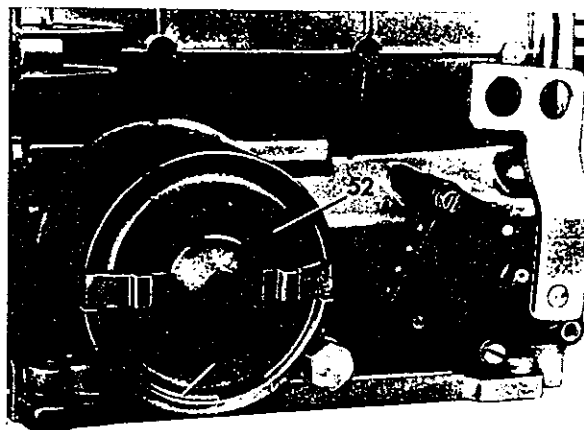


Fig. 22

51 Lock ring 52 Cover, brake band piston B 3

32 Remove brake band piston B 3 (53) and conical spring (54) Fig. 23

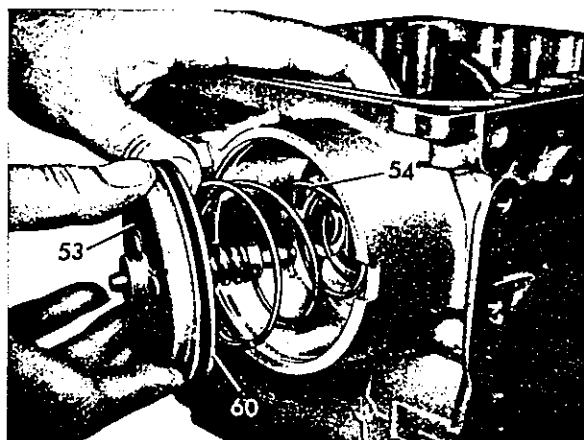


Fig. 23

53 Brake band Piston B 3 60 Lip seal ring
54 Conical spring

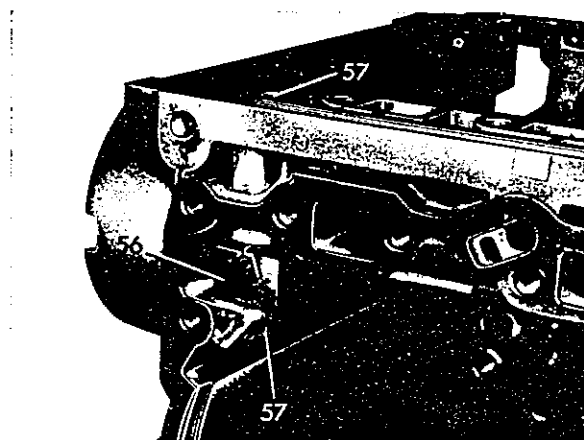


Fig. 24

55 Snap ring 57 Bearing pin
56 Brake band lever B 2

33 Remove snap ring (55) of the bearing pin of brake band lever B 3 and knock out bearing pin (57) downwards **Fig. 24**

34 Remove brake band lever B 3 (56) from transmission case.

35 Remove securing yoke (58) for pressure pin B 1 and B 2 and take out both pressure pins (59) (Fig. Fig. 26

B. Assembly of Transmission

The work comprises the following items:

- a) Brake band piston B 3, brake band lever B 3 and pressure pin
- b) Parking lock mechanism, range selector lever, starter lock-out switch, modulating pressure housing
- c) Gear set, brake bands
- d) Rear transmission case, governor and parking lock
- e) Rear transmission case, preassembly
- f) Measuring pressure pin for regulating valve of modulating pressure
- g) Front transmission case
- h) Brake band pistons B 1 and B 2
- i) Measuring clearance of brake bands
- j) Valve body assembly
- k) Starter lock-out and back-up light switch (adjustment)

a) Brake Band Piston B 3, Brake Band Lever B 3, Installation of Pressure Pin

1 Install pressure pins B 1 and B 2 (59) with new O-rings into transmission case and lock with securing yoke (58) **Fig. 27**

Caution: Pressure pin B 1 should not be confused with pressure pin B 2. B 1 is provided with a groove in the valve cap. Prior to installing the pressure pin (abutment), deburr cross hole if necessary.

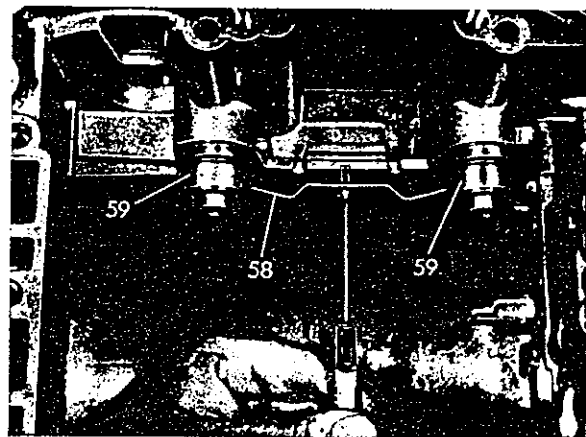


Fig. 26

58 Securing yoke

59 Pressure pin

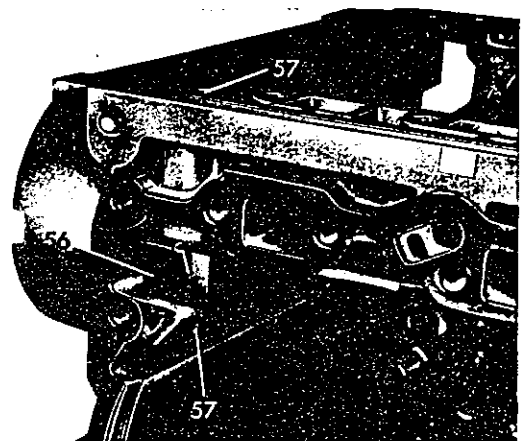


Fig. 27

55 Securing yoke

56 Brake band lever B 3

57 Bearing pin

2 Insert brake band lever B 3 (57) into transmission case, install bearing pin (56) from above and secure with yoke (55) Fig. 27

3 Install brake band piston B 3 (53) into transmission case, using a new lip seal ring (60) and compression spring (54) Fig. 28

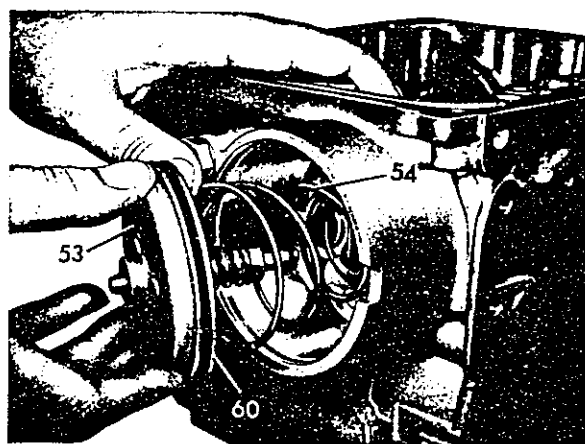


Fig. 28

53 Brake band piston B 3 60 Lip seal ring
54 Conical spring

4 Mount brake band piston cover B 3 using a new O-ring and install lock ring (51) Fig. 29

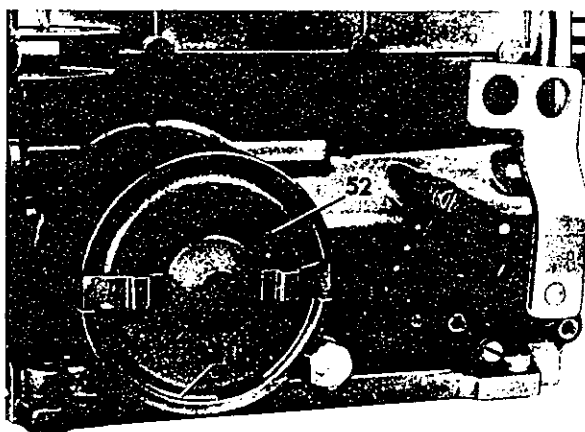


Fig. 29

51 Lock ring 52 Cover, brake band piston B 3

b) Parking Lock Mechanism, Range Selector Lever, Starter Lock-out Switch, Modulating Pressure Housing

5 Mount starter lock-out and back-up light switch (50) and tighten bolts to specified torque Fig. 30

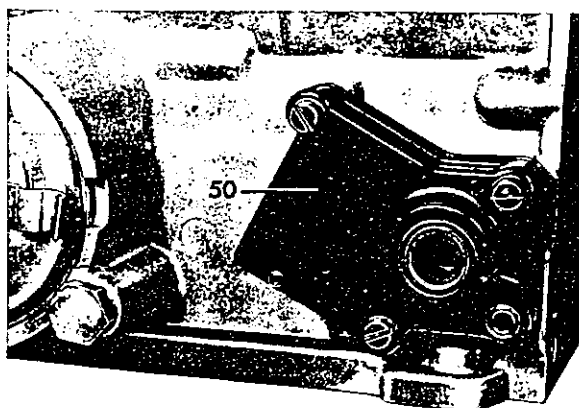


Fig. 30

50 Starter lock-out switch

6 Install arrestor wheel (49) into transmission case. Engage range selector lever (48) into the toothing of the arrestor wheel (49) and secure with clamp screw (45) Fig. 31 & 32

7 Clamp transmission case on assembly fixture.

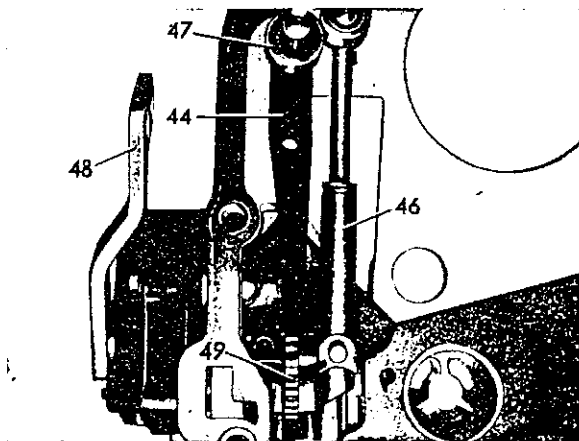


Fig. 31

44 Leaf spring 48 Gear selector lever
46 Spring-loaded rod 49 Arrestor wheel
47 Needle bearing

8 Mount needle bearing roller (47), spring-loaded rod (46) with washer and roller. Mount leaf spring (44) and bracket (43) Fig. 31 & 32 Install bearing pin for the parking lock pawl (64).

9 Mount modulating pressure valve housing (41) with new gasket to the rear transmission case (42). Tighten attachment bolts to the specified torque

Fig. 32

Note: Prior to tightening the modulating pressure valve housing, center the seals in the bores for the fitted pins.

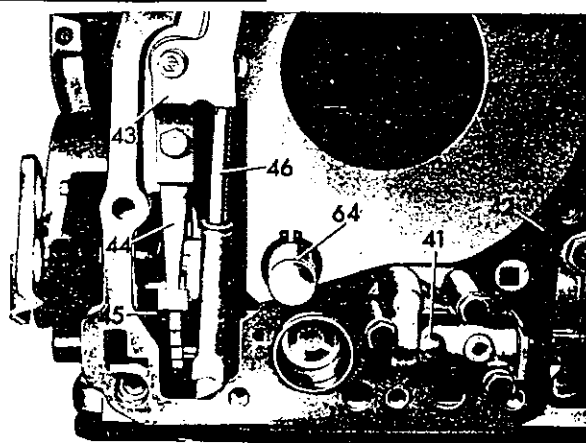


Fig. 32

- | | |
|--------------------------------|-----------------------------------|
| 41 Modulating pressure housing | 45 Clamp screw |
| 42 Gasket | 46 Spring-loaded rod |
| 43 Bracket, parking lock | 64 Bearing pin, parking lock pawl |
| 44 Leaf spring | |

After tightening, check valve for easy operation.

c) Gear Set, Brake Bands

10 Install output shaft (76) with radial-ball bearing and parking lock gear into transmission case and seat with a plastic hammer **Fig. 33**

11 Insert brake band B 2 (77) with radially grooved lining into transmission case (weak steel band).

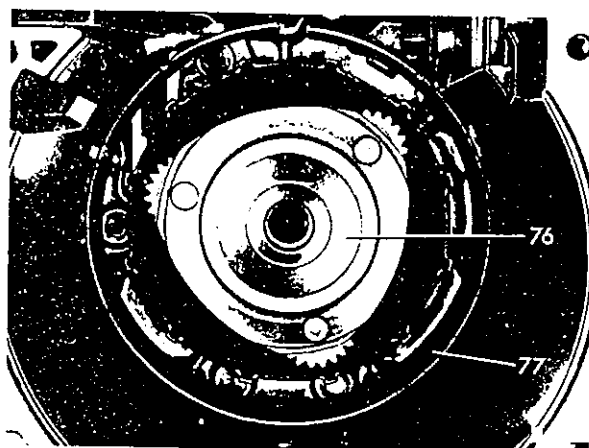


Fig. 33

- | | |
|-----------------|-------------------|
| 76 Output shaft | 77 Brake band B 2 |
|-----------------|-------------------|

12 Install axial bearing (78) and radial bearing (79) into gear set, using some grease **Fig. 34**

13 Install gear set with brake band B 1 (smooth lining), in doing so, insert support lever for the

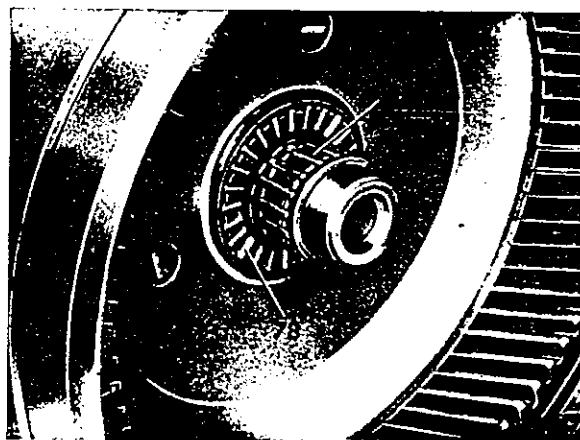


Fig. 34

- | | |
|------------------|-------------------|
| 78 Axial bearing | 79 Radial bearing |
|------------------|-------------------|
- oil supply sleeve into groove in transmission case

Fig. 35

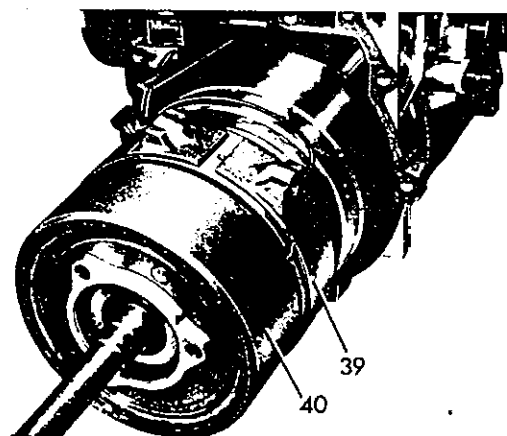


Fig. 35

- | | |
|-------------------|-------------|
| 39 Brake band B 1 | 40 Gear set |
|-------------------|-------------|

Note: When installing the gear set, make sure that the carrier plate of the sun gear engages properly with the brake drum B 2.

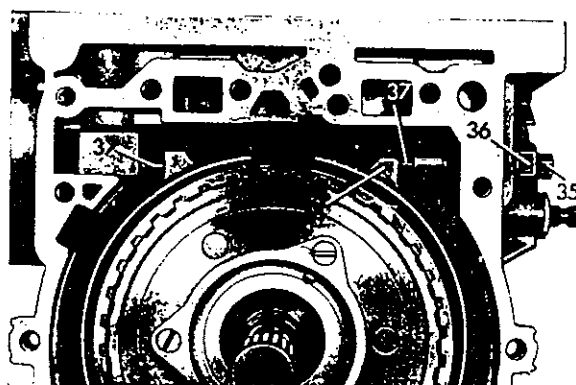


Fig. 36

- | | |
|-------------------------|-------------------|
| 35 Adjustment screw B 3 | 37 Pressure pin |
| 36 Counternut | 38 Brake band B 3 |

14 Install brake band B 3 with radial grooved lining (strong steel band) (38) into transmission case from the front, insert both pressure pins (37) into brake band B 3 (38) and turn down adjustment screw (35) coated with sealing compound into transmission case until the brake band is held **Fig. 36**

15 Support gear set, front, with the assembly flange (61) of the assembly fixture **Fig. 37**

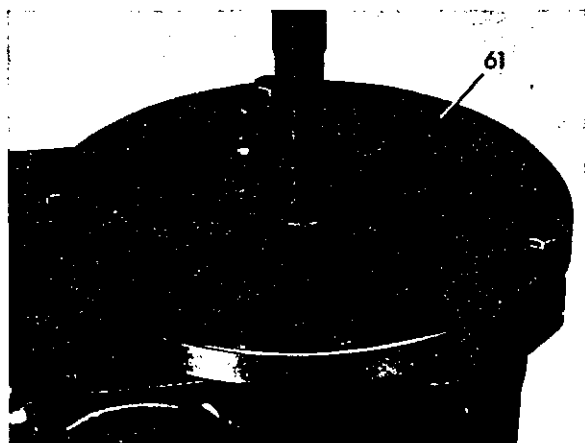


Fig. 37

61 Assembly flange

16 Turn transmission on the assembly fixture until the output shaft points upwards.

d) Rear Transmission Case, Governor and Parking Lock

17 Install parking lock gear (18) on output shaft. Insert parking pawl (19) with retracting spring **Fig. 38**

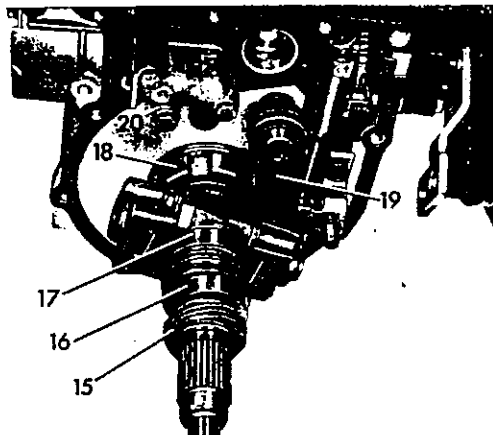


Fig. 38

- | | |
|-----------------------------------|--------------------------------|
| 15 Worm gear, speedometer drive | 18 Parking gear |
| 16 Eccentric ring, secondary pump | 19 Parking pawl |
| 17 Centrifugal governor | 20 Modulating pressure housing |

18 Check function of parking lock mechanism. Mount centrifugal governor (17), eccentric ring for secondary pump (16) and worm gear for speedometer drive (15) on output shaft (Fig. 27-1/38).

e) Preassembly of Rear Transmission Case

19 Press in ball bearing (80) and insert lock ring. Press in seal ring, install secondary pump and speedometer drive with attachment bolts (25 and 26) **Fig. 39**

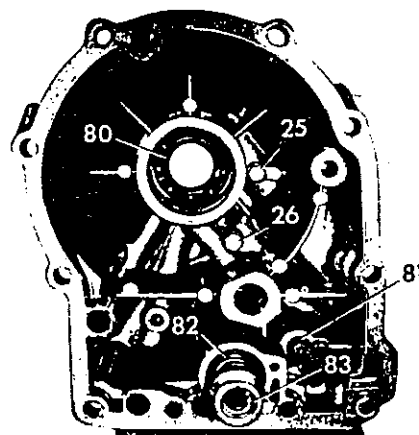


Fig. 39

- | | |
|---------------------------------------|------------------------------|
| 25 Attachment bolt, speedometer drive | 80 Ball bearing |
| 26 Attachment bolt, secondary pump | 81 Locking piston |
| | 82 Pressure absorber springs |
| | 83 Spring retainer |

20 Install locking piston (81) with spring and screw down cover plate. Push feed piston for the secondary pump outwards, install pressure absorbing piston with 2 springs (82) and spring retainer (83) and attach rear cover to transmission.

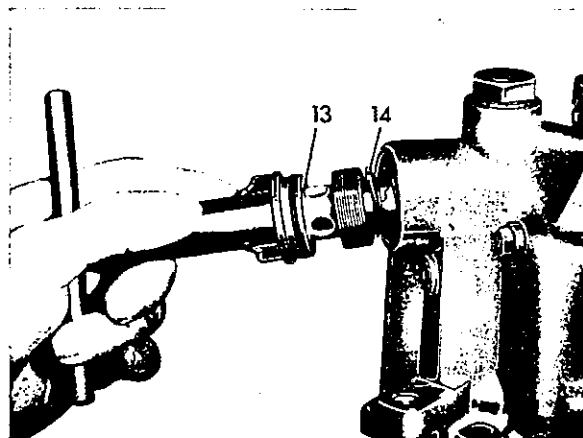


Fig. 40

- | | |
|-------------------------|--------------------|
| 13 Plug, secondary pump | 14 Pressure spring |
|-------------------------|--------------------|

21 Screw down attachment screws of rear transmission case and tighten to specified torque. Screw in plug for secondary pump (13) and pressure spring (14) **Fig. 40**

f) Measuring Pressure Pin for Regulating Valve of Modulating Pressure

22 Screw gauge (62) down into housing and tighten lightly. Insert pressure pin (12) and press it in as far as it will go **Fig 41** The pressure pin must be flush with the face of the gauge. For this reason the pressure pins are available in three different lengths.

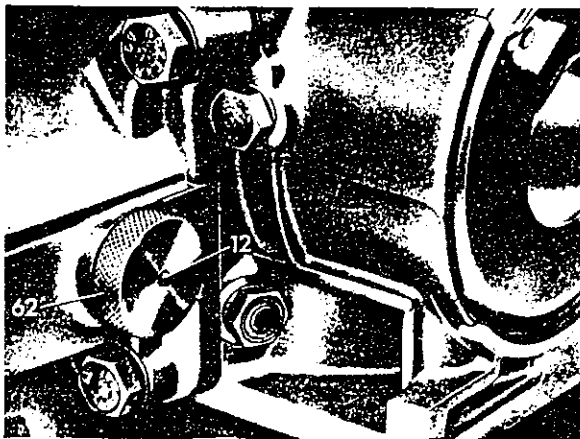


Fig. 41

12 Pressure pin 62 Gauge 115 589 11 21 00

23 Coat threads of vacuum cell (10) with sealing compound and screw vacuum cell down into rear transmission case, together with pressure pin (12) and spring (11) **Fig. 42**

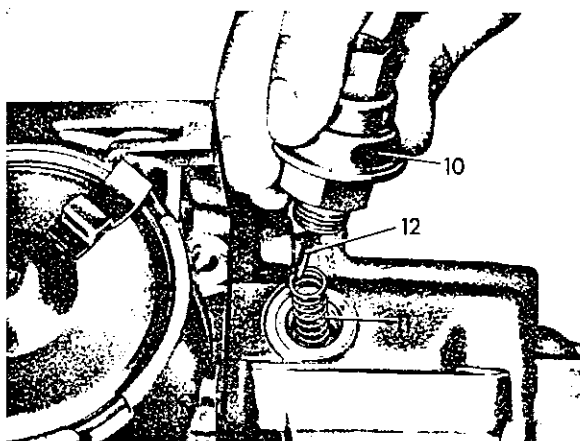


Fig. 42

10 Vacuum cell
11 Pressure spring

12 Pressure pin

Caution: Install pressure pins without grooves only (the new version is identified by a color dot).

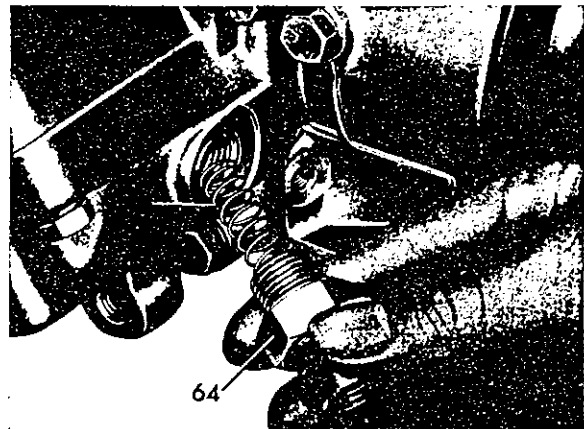


Fig. 43

64 Plug 65 Pressure spring

In diesel engine transmissions, a plug (64) with pressure spring (65), without pressure pin, is provided in place of the vacuum cell **Fig. 43**

24 Mount three-arm flange on output shaft and tighten slotted nut to specified torque, secure slotted nut.

g) Front Transmission Case

25 Rotate transmission on the assembly fixture so that the drive shaft points up, remove assembly flange.

26 Measure axial clearance of gear set, for this purpose, place measuring gauge on transmission case and determine dimension "A" with depth gauge **Fig. 44**



Fig. 44

63 Measuring bar

27 Place new gasket on front transmission case and find dimension "B" **Fig.45**

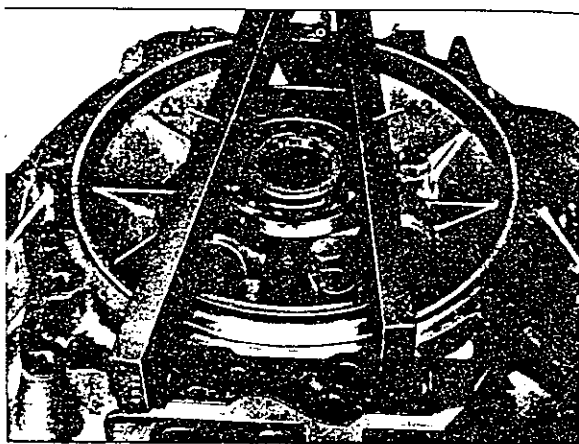


Fig.45

63 Measuring bars

The difference between dimensions A and B gives the gear set clearance "C" **Fig. 46**

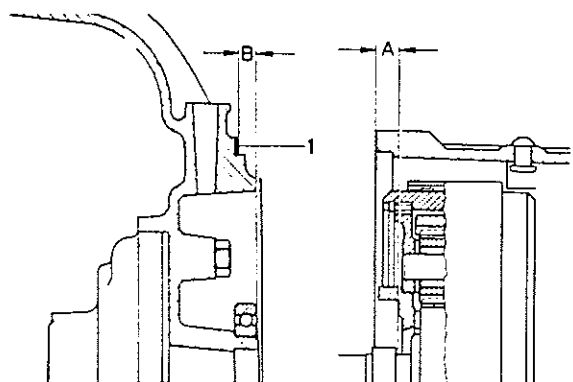


Fig. 46

28 Dimension "C" is compensated for by adding selective washers to the support flange (refer to Job No. 27-0).

29 Mount front transmission case (22) with new gasket. Screw down attaching screws and tighten to specified torque **Fig. 47**

Note: When mounting the front transmission case, center the gasket. Position piston ring on drive shaft so that the gap is in alignment with the groove.

h) Brake Band Pistons B 1 and B 2

30 Check oil seal ring and bypass valve for brake band piston B 2 for wear.

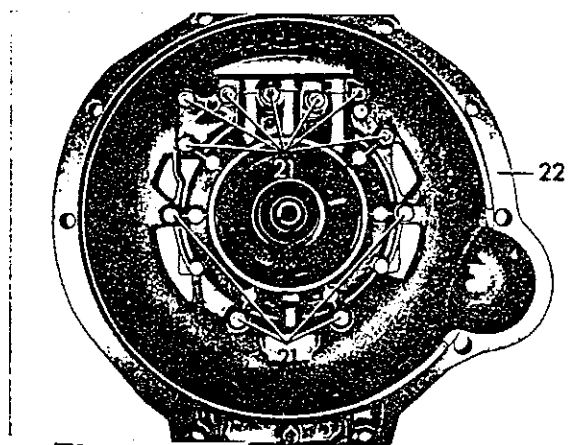


Fig. 47

22 Front transmission case 21 Attaching screws

31 Insert the two pressure pins (34) on the reverse end of the brake band pistons **Fig. 48**

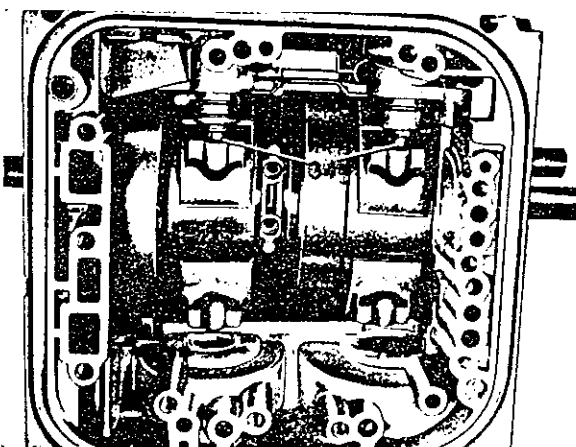


Fig. 48

34 Pressure pins

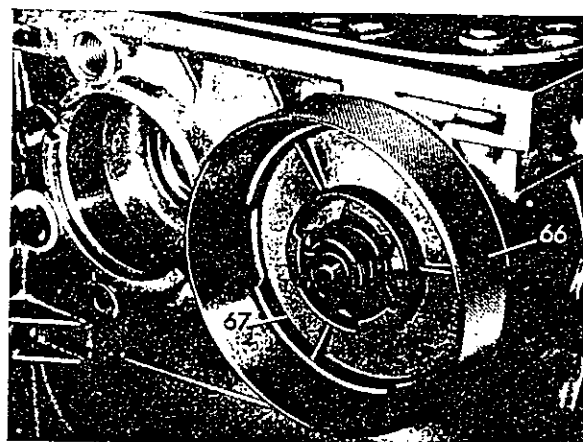


Fig. 49

66 Installing ring 115 589 18 61 00 67 Brake band piston B 2

32 Insert brake band piston B 2 (67) into transmission case by using installing ring (66) **Fig. 49**

33 Mount brake band piston cover B 2 (25) with a new O-ring and lock with snap ring (24) **Fig. 50**

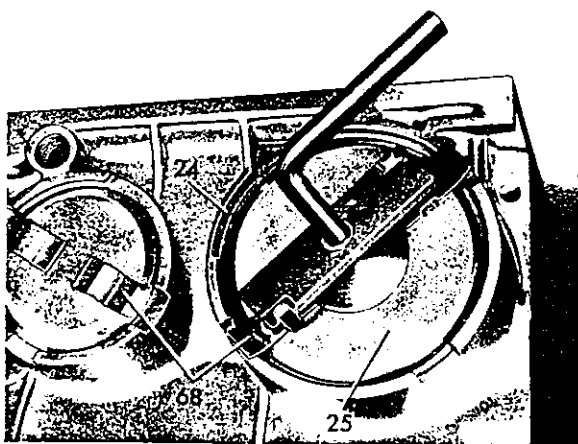


Fig. 50

24 Snap ring 68 Securing lugs
25 Brake band piston cover B 2

34 Mount assembly fixture for the brake band piston B 1. Mount brake band piston B 1 (30) with a new lip seal ring (33) and compression spring (31). Mount brake band piston cover B 1 (29) with a new O-ring (32) and install by using assembly fixture **Fig. 51**

35 Lock brake band piston cover B 1 by using snap ring (27) **Fig. 52**

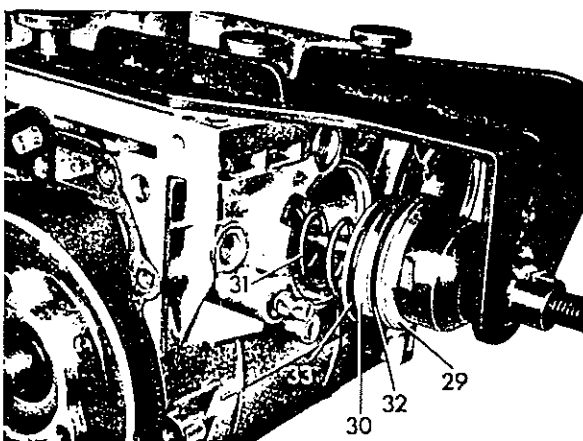


Fig. 51

29 Brake band piston cover B 1 32 O-ring
30 Brake band piston B 1 33 Lip seal ring
31 Compression spring

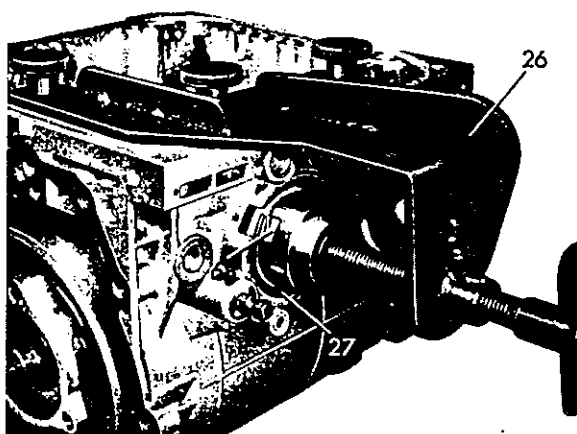


Fig. 52

26 Assembly fixture 115 589 04 59 00 27 Snap ring
68 Securing lugs

36 Remove assembly fixture for brake band piston B 1.

i) Measuring Clearance of Brake Bands

37 Measure free play of brake band pistons B 1 and B 2. For the purpose, set brake band piston B 2 to the released position by means of compressed air via the release pressure bore (69) and scribe the end of brake band 2 on the brake band drum. Then set the brake band piston to the applied position by means of compressed air via the apply pressure bore B 2 (70) and again mark the end of the brake band on the brake band drum **Fig. 52**

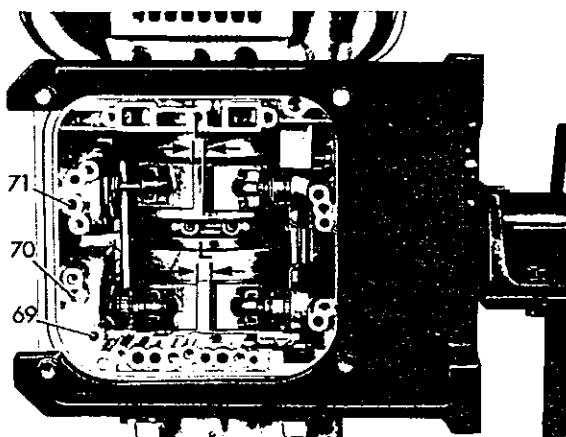


Fig. 53

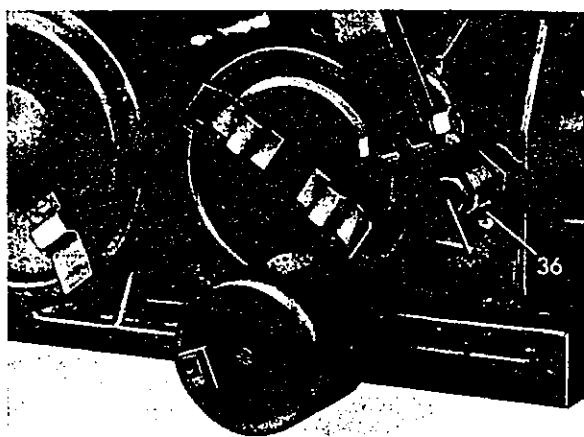
60 Release pressure B 2 71 Apply pressure B 1
70 Apply pressure B 2

Brake band piston B 1 is held in the released position by the compression spring so that the end of brake band 1 can be directly marked on the brake band drum. Then move brake band piston B 1 to the applied position by compressed air via the apply pressure bore B 1 (71) and also mark the end of brake band 1 on the brake band drum **Fig. 53**

The distance between the two marks on the brake band drum corresponds to the free play "L" of the brake band pistons.

With excessive free play, install a longer pressure pin (34); with too little free play, install a shorter pressure pin (34). For free plays and pressure pins

38 Coat threads of adjustment screw for brake band B 3 (35) with sealing compound and screw down. Tighten adjustment screw to 0.5 mkp and then back off by 1 3/4 turns. Lock adjustment screw by means of counternut (36) **Fig. 54**


Fig. 54

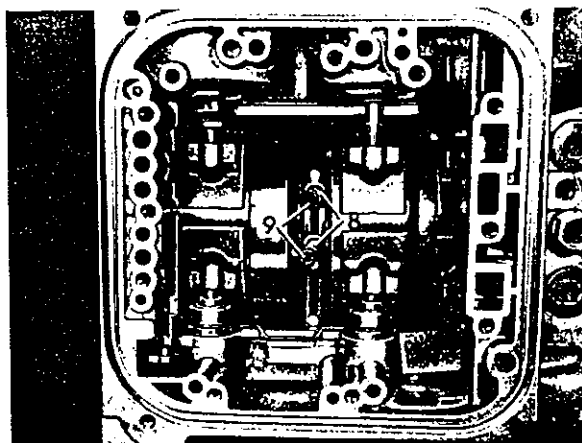
35 Adjustment screw 36 Counternut

j) Valve Body Assembly

39 Install both tubes (8) with new seals (9) **Fig. 55**

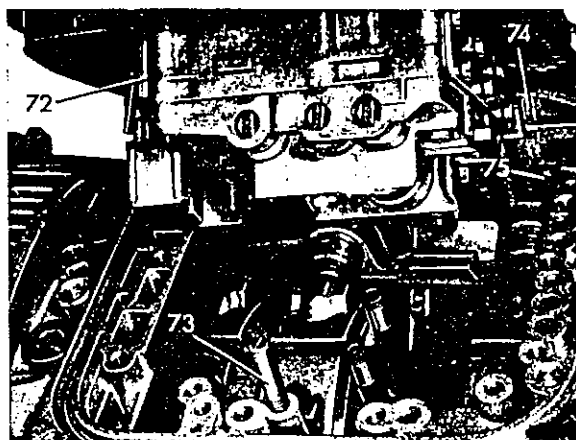
40 Move range selector lever between position "P" and "R". Insert assembly arbor for control pressure valve (72) into valve body and screw pilot pin (73) down into transmission case **Fig. 56**

41 Install valve body carefully into transmission case. When doing so, make sure that the range selector valve (74) engages the range selector lever (75).


Fig. 55

8 Tubes

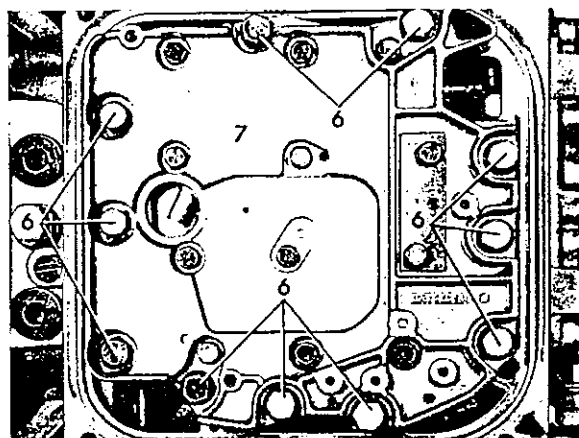
9 Seals


Fig. 56

7 Valve body
72 Assembly arbor,
control pressure
73 Pilot pin

74 Range selector valve
75 Range selector lever

42 Screw out pilot pin (73). Screw down attaching bolts (6) with spring washers and tighten to speci-


Fig. 57

6 Attaching bolts

7 Valve body

Change: Section C added on page 27-1/16

cation **Fig. 57**

Caution: Watch out for the different lengths of the attaching bolts.

43 Remove assembly arbor (72) for control pressure valve.

44 Install oil filter (4), screw down attaching bolts (5) and tighten to specification **Fig. 58**

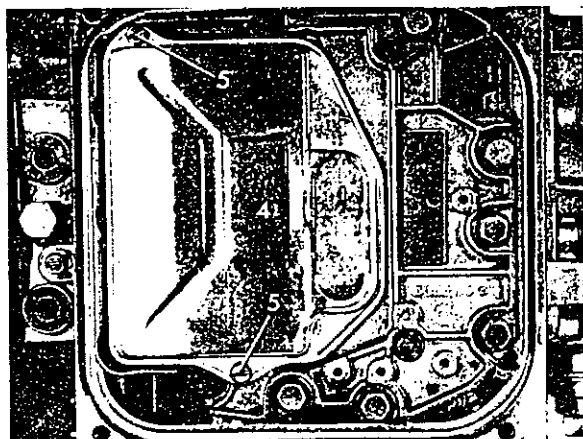


Fig. 58

4 Oil filter

5 Attaching bolts

45 Remove transmission from assembly stand.

46 Install oil pan (1) with new gasket, screw down oil pan bolts (2) with corrugated washers and shims (3) and tighten to specified torque **Fig. 59**

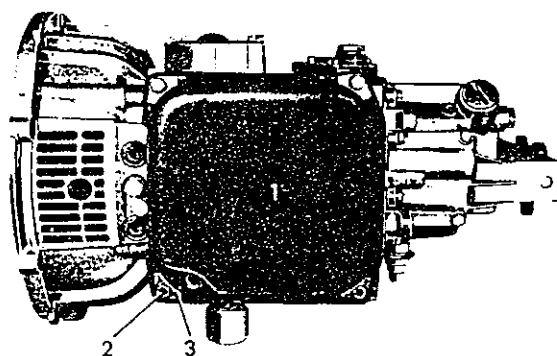


Fig. 59

1 Oil pan
2 Attaching bolts

3 Shims

47 Screw down control pressure lever and solenoid valve with new O-ring and seal ring.

k) Starter Lock-Out and Back-Up Light Switch (Adjustment)

When the new K4C 025 transmission with 3 planetary gear sets was introduced for models 280 S/8 to 300 SEL/8, the starter lock-out and back-up light switch was altered. Lever (1) can be removed from the shaft (4), so that in this version the starter lock-out switch can be removed without removing the rear transmission cover **Fig. 60**

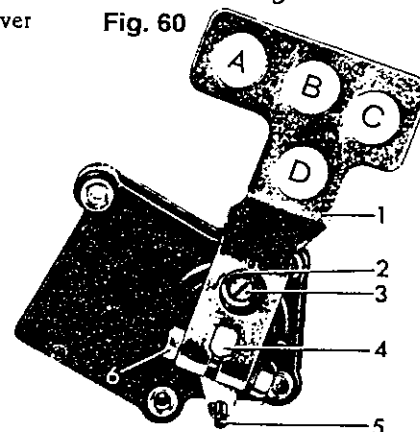
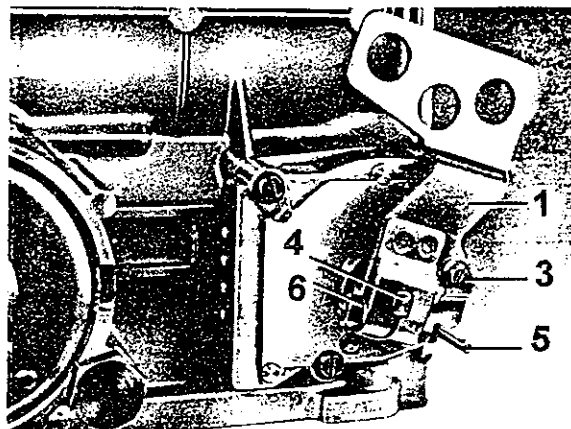


Fig. 60

1 Range selector lever
2 Washer
3 Adjusting screw
4 Shaft
5 Locating pin
115 589 18 63 00
6 Clamp screw

The following adjustments must be made on the modified version:

Tighten clamp screw (6) and move range selector lever into position "N". Loosen adjusting screw (3) and insert locating pin (5) through the link into the locating bore on the switch housing, then tighten adjusting screw (3) to specified torque and remove locating pin.



Starter lock and backup light switch 2nd version

C. Modifications

a) Vacuum Unit

As of June 18, 1970, a vacuum unit with bonded pressure pin is being installed. With this modification, the basic pressure spring between vacuum unit and modulating pressure control valve is no longer required.

Prior to installing the new vacuum unit proceed as follows:

Determine length of pressure pin with gauge 115 589 11 21 00. To do this, turn gauge in as far as it will go and use pressure pin to push back control valve. The pressure pin must be flush with the gauge face. Fit the pressure pin determined by the measurement into vacuum unit.

The outer appearance of the new vacuum unit is the same as that of the old one; the only difference is the bore for the pressure pin.

If a new version vacuum unit is installed when repairs are made, the basic pressure spring must not be reinstalled as it may cause functional trouble

Fig. 61

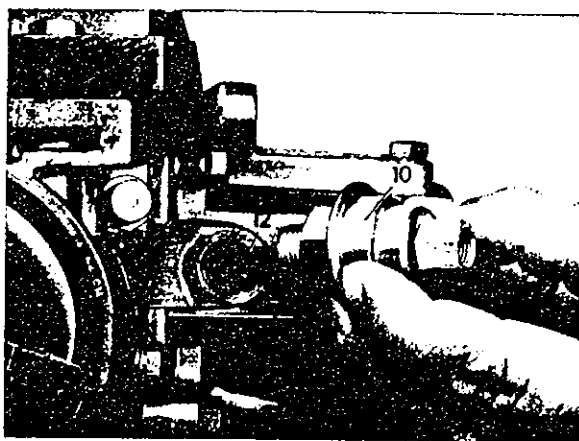


Fig. 61

10 Vacuum unit 12 Pressure pin

b) Cup Spring on Speedometer Drive

As of April 13, 1970, a cup spring (85) has been installed between the helical gear speedometer drive (15) and the ball bearing (80). The cup spring

may only be installed in conjunction with the modified helical gear speedometer drive which has only one collar. Make sure to install the cup spring with the curvature facing the ball bearing **Fig. 62**

Fig.63

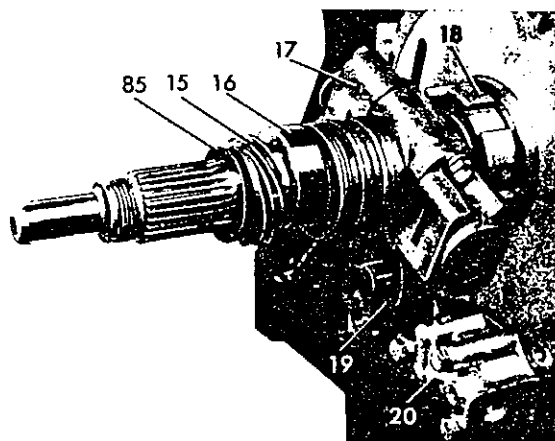


Fig. 62

15 Helical gear speedometer drive
16 Eccentric ring, secondary pump
17 Centrifugal governor

18 Parking gear
19 Parking pawl
20 Modulating pressure housing
85 Cup spring

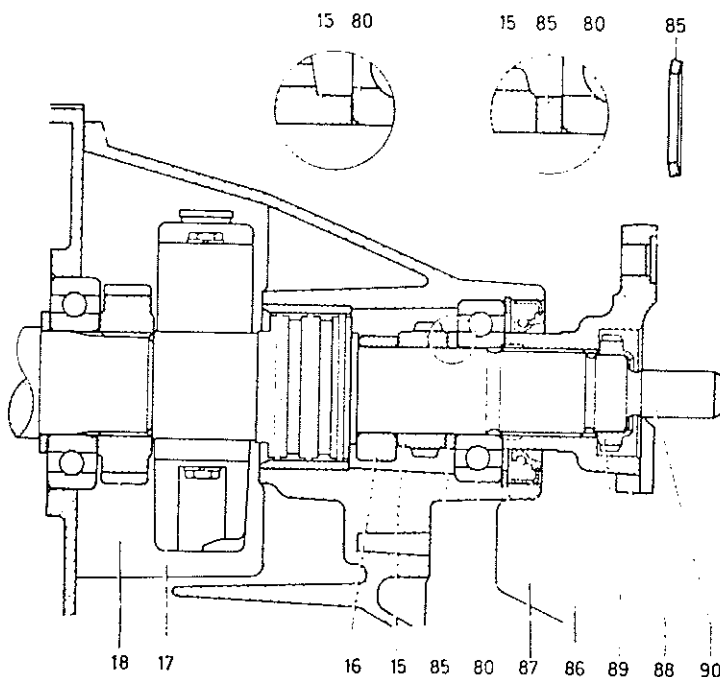


Fig. 63

15 Helical gear, speedometer drive
80 Ball bearing

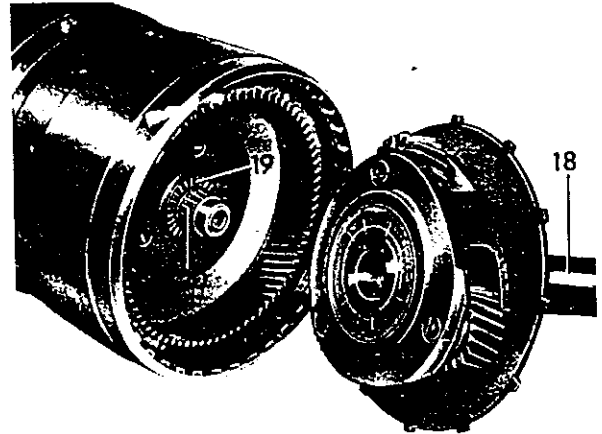
85 Cup spring
89 Grooved nut

DISASSEMBLY / ASSEMBLY OF GEAR ASSEMBLY

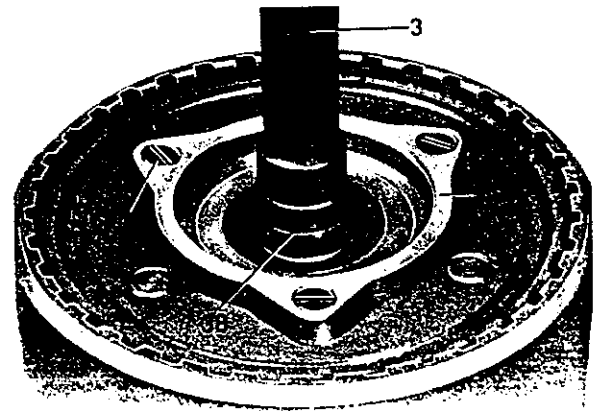
4 Speed

Disassembly

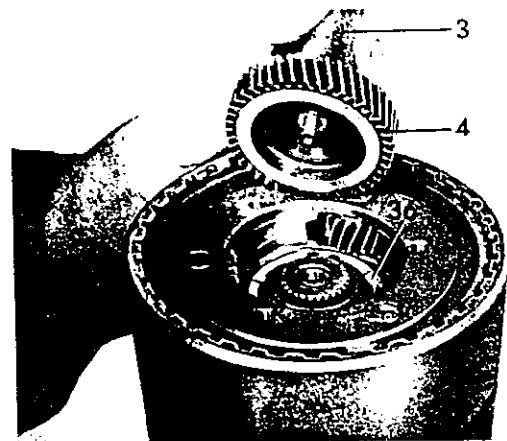
- 1 Remove output shaft (18).
- 2 Remove radial bearing (20) and axial bearing (19).



- 3 Place gear assembly with input shaft (3) in upward direction on assembly fixture.
- 4 Remove supporting flange (1) after loosening the three countersunk screws (2).

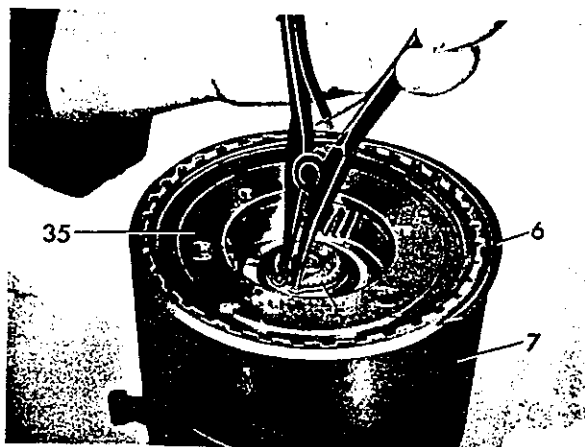


- 5 Remove input shaft (3) and thrust washer (36).

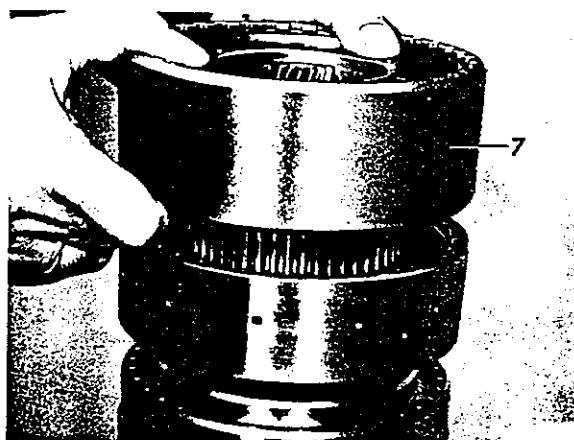


4 Speed

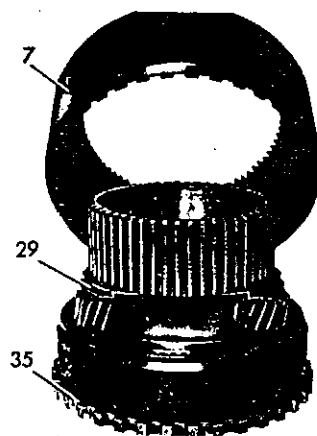
- 6 Remove locking ring intermediate shaft (5) and circlip gear assembly (6).



- 7 Remove brake band drum B 3 (7) including front and center planetary gear set.



- 8 Remove brake band drum B 3 from gear assembly.



3 Speed

Adjusting Data

End play of hollow shaft	0.3–0.4
End play of sun gear 1st gear assembly	0.2–0.3

Special Tools

Assembly fixture	112 589 07 59 00
Pulling fixture	000 589 98 33 00
Assembly mandrel	198 589 03 39 00

Disassembly

- 1 Remove output shaft (18) together with rear planetary gear carrier.
- 2 Remove radial bearing (20) and axial bearing (19) (Fig. 1).

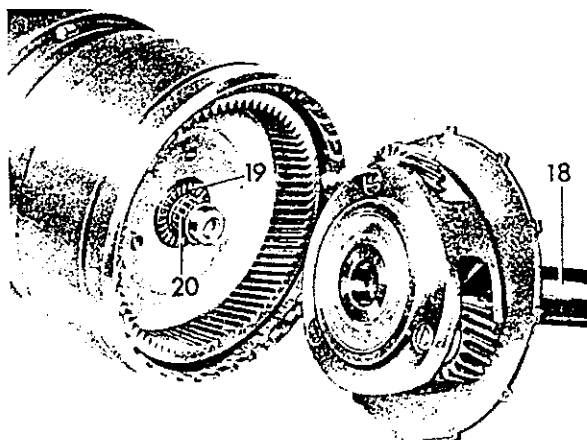


Fig. 1
18 Output shaft
19 Axial bearing
20 Radial bearing

- 3 Place gear assembly with input shaft in upward direction on assembly fixture 112 589 07 59 00 (Fig. 2).

- 4 Remove input shaft (1) with ring gear, as well as radial bearing (24) (Fig. 2 and 3).

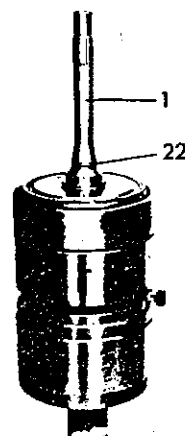


Fig. 2
1 Input shaft
22 Lube pressure ring

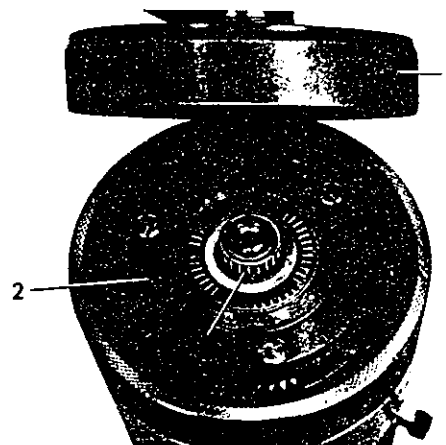


Fig. 3
1 Input shaft
2 Planetary carrier
24 Radial bearing

3 Speed

5 Remove planetary carrier first gear assembly (2) (Fig. 3).

6 Remove sun gear (3) and needle bearing (28) (Fig. 4).

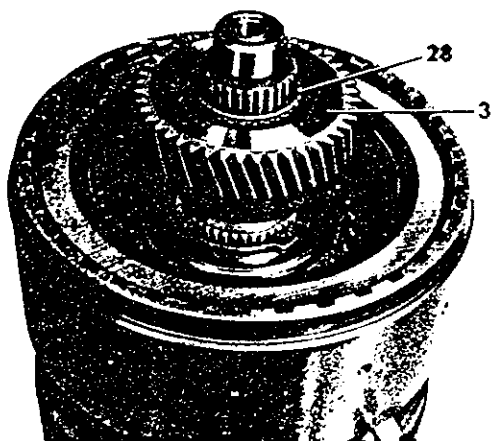


Fig. 4

3 Sun gear
28 Needle bearing

7 Remove circlip (31) and compensating washers (32) and pull off clutch K 1 (6) (Fig. 5).

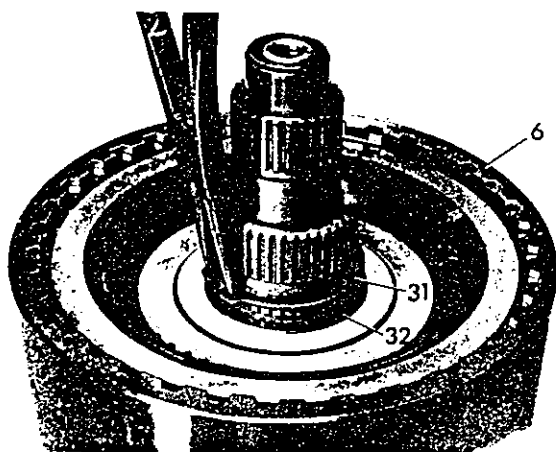


Fig. 5

6 Clutch K 1
31 Circlip
32 Compensating washers

8 Pull oil feeding sleeve (7) from supporting flange of K 2 (8) and remove (Fig. 6).

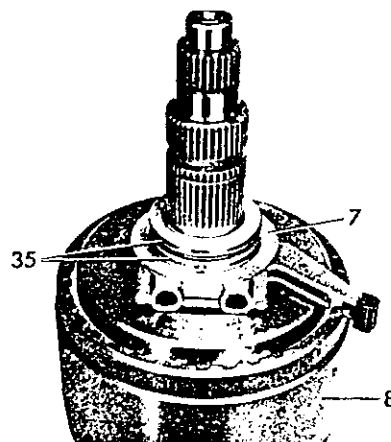


Fig. 6

6 Oil feeding sleeve
8 Supporting flange K 2
35 Oil sealing rings

9 Remove hollow shaft (11) with clutch K 2 (8) from intermediate shaft (12) (Fig. 7).

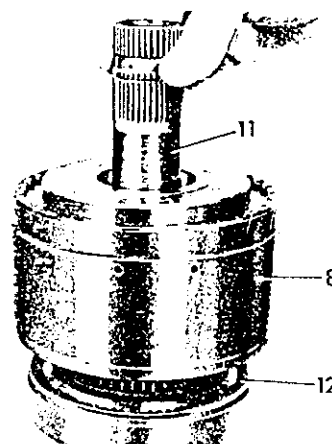


Fig. 7

8 Clutch K 2
11 Hollow shaft
12 Intermediate shaft

10 Remove needle bearing (44) and thrust washer (45) from intermediate shaft (12) (Fig. 8).

3 Speed

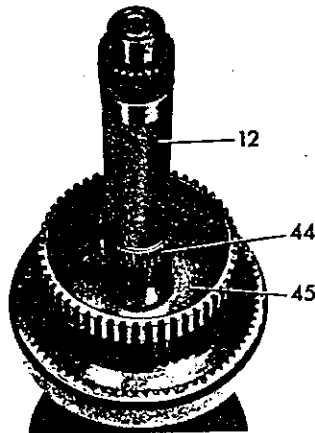


Fig. 8

12 Intermediate shaft
44 Needle bearing
45 Thrust washer

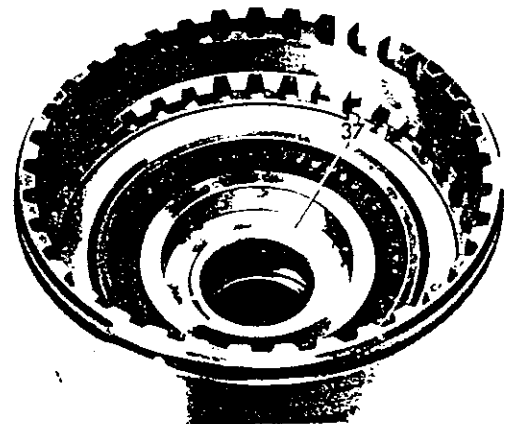


Fig. 10

37 Thrust washer

11 Remove hollow shaft (11) and roller clutch (43) from clutch K 2 (8) (Fig. 9).

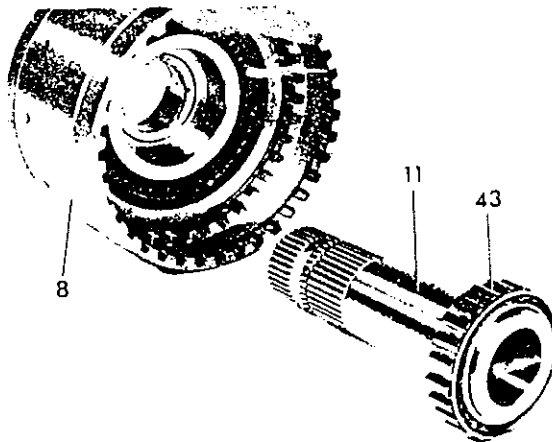


Fig. 9

8 Clutch K 2
11 Hollow shaft
43 Roller clutch

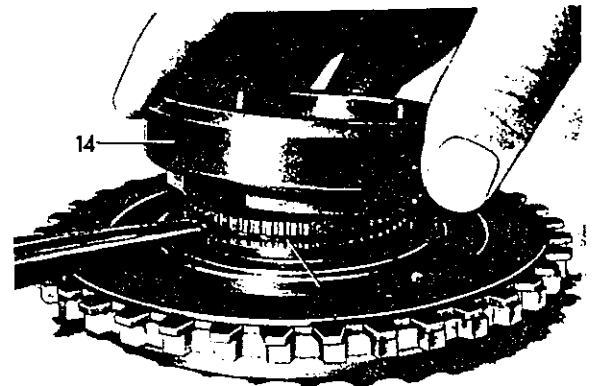


Fig. 11

14 Roller clutch outer race
15 Circlip

12 Pull out thrust washer (37) (Fig. 10).

13 Disassemble clutch K 2 (8) (Job No. 27.2-690).

14 Compress circlip (15) with pointed pliers and lift roller clutch outer race (14) from supporting flange K 2 (Fig. 11).

15 Pull ball bearing (16) from output shaft (18) by means of puller (17) (Fig. 12).

16 Remove thrust washer (41) with sun gear (40), as well as needle bearings (39) and (46) (Fig. 13 and 14).

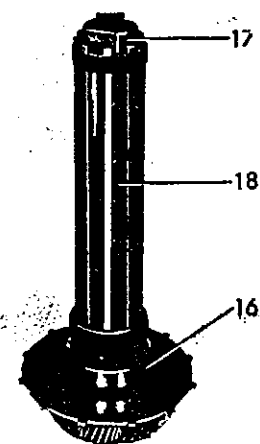


Fig. 12

16 Ball bearing
17 Puller
18 Output shaft

3 Speed

Assembly

- 17** Insert axial bearing (46) and split needle bearing (39) coated with grease (Fig. 13).

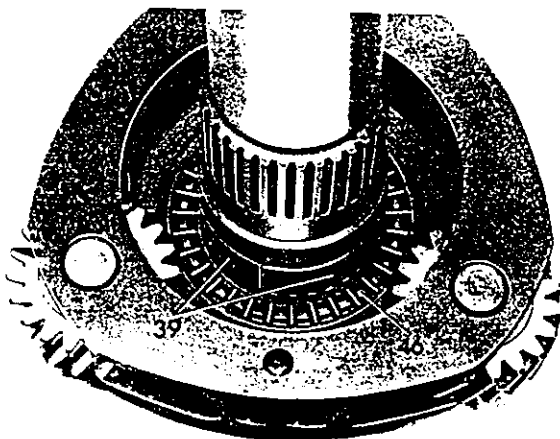


Fig. 13

- 39 Needle bearing
46 Axial bearing

- 18** Mount sun gear (40) and thrust washer (41), with offset end of thrust washer facing sun gear (Fig. 14).

- 19** Press-on ball bearing (16) and parking lock gear (42) with assembly mandrel (Fig. 14).

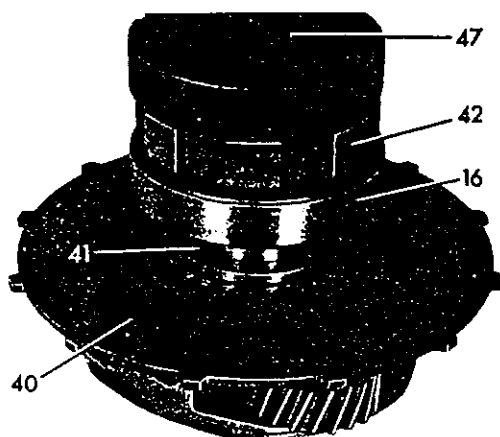


Fig. 14

- 16 Ball bearing
40 Sun gear
41 Thrust washer
42 Parking lock gear
47 Assembly mandrel

- 20** Place intermediate shaft (12) on assembly fixture, then insert thrust washer (45) and needle bearing (44) with some grease (Fig. 8).

- 21** Insert piston into supporting flange (8) (Job No. 27.2-690, Fig. 7).

- 22** Insert roller clutch outer race (14) into supporting flange and lock with circlip (15) watching out for correct seat of circlip (Fig. 11).

Caution! As from April 1972, transmission W 3 A 040 ist provided with a roller clutch outer race and holding plate.

The holding plate (50) encloses the roller clutch outer race (14) with roller clutch (43) and thrust washer (37) (Fig. 14a). The roller clutch with holding plate is a replacement for the version used up to then.

The installation width for the W 3 A 040 roller clutch is approx. 13 mm, for the W 3 B 050 roller clutch approx. 19 mm.

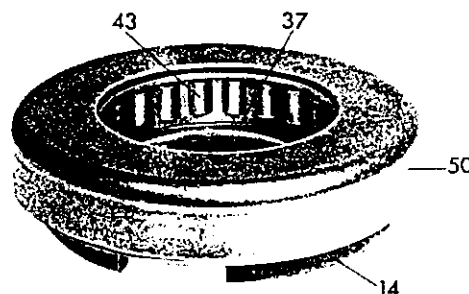


Fig. 14a

- 14 Roller clutch outer race
37 Thrust washer
43 Roller clutch
50 Holding plate

- 23** Assemble clutch K 2 and measure (Job No. 27.2-690).

- 24** Insert thrust washer (37) coated with grease (Fig. 10).

- 25** Insert roller clutch (43) into outer race (14). The edge with outward bead (refer to arrow) should face upwards (Fig. 15).

3 Speed

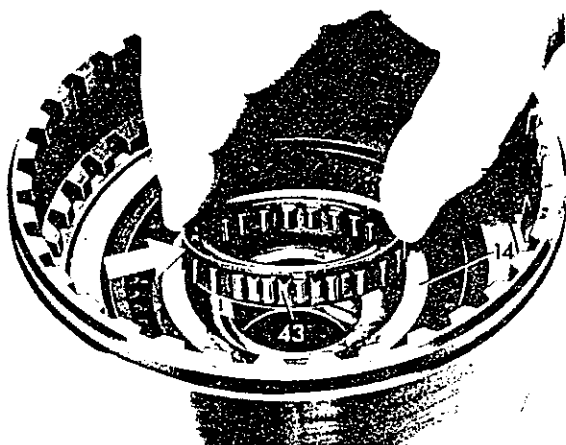


Fig. 15

14 Free-running assembly outer race
43 Free-running assembly

26 Insert hollow shaft (11) into free-running assembly (43) while rotating hollow shaft in direction of arrow (Fig. 16).

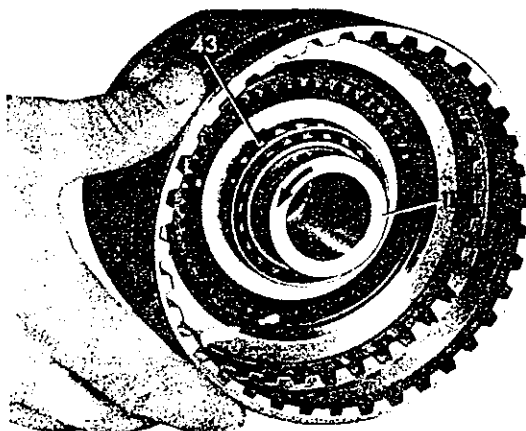


Fig. 16

11 Hollow shaft
43 Free-running assembly

Caution: Upon insertion of hollow shaft, the shaft should lock opposite to the direction of the arrow shown in Fig. 16.

27 Insert intermediate shaft (12) into clutch K 2 while rotating slightly, so that the teeth of the inner disc carrier enter the inner discs (Fig. 17).

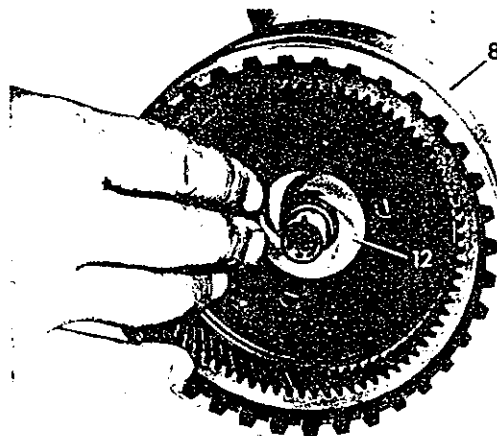


Fig. 17

8 Clutch K 2
12 Intermediate shaft

28 Place gear assembly again on assembly fixture.

29 Insert radial bearing (36) in between hollow shaft (11) and supporting flange K 2 (8) (Fig. 18).

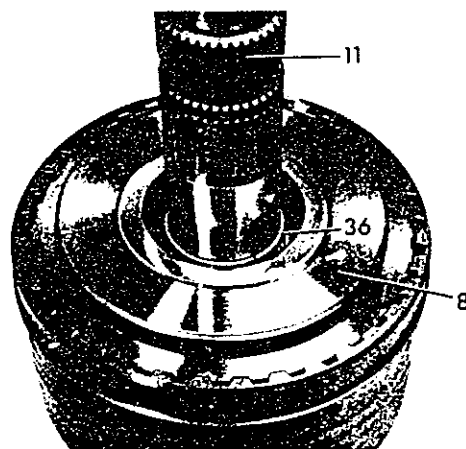


Fig. 18

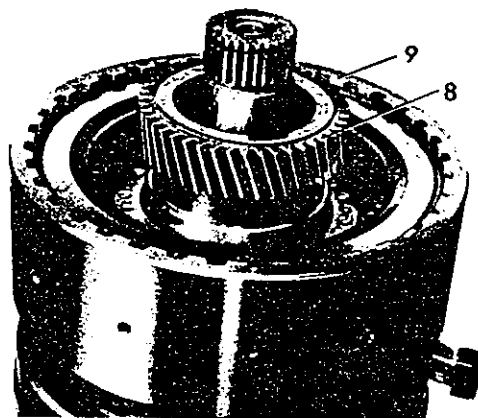
8 Supporting flange K 2
36 Radial bearing
11 Hollow shaft

30 Check oil sealing rings (35) on oil feeding sleeve and replace, if required.

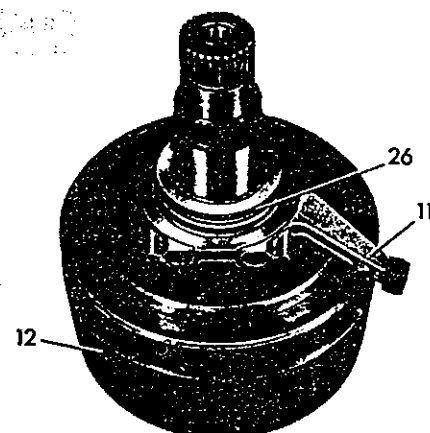
31 Insert oil feeding sleeve (7) into supporting flange K 2 (8), while completely pushing down so that both oil sealing rings will enter the supporting flange K 2 (Fig. 19).

4 Speed

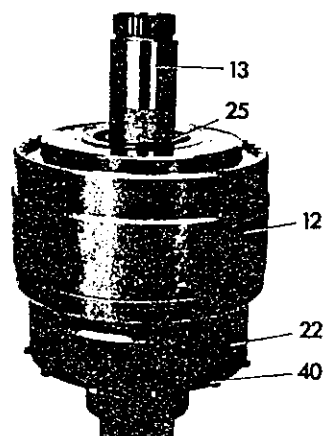
- 9 Lift off sun gear for center planetary gear assembly (8) and clutch K 1 (9).



- 10 Pull off oil feed sleeve (11).



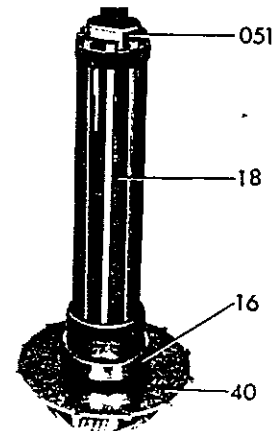
- 11 Lift off hollow shaft (13) with clutch K 2 (12).



4 Speed

12 Pull radial ball bearing (16) from output shaft (18) by means of puller (051).

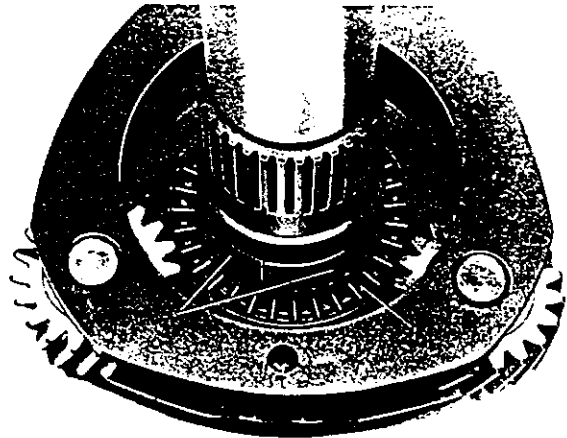
13 Remove sun gear (40) with thrust washer.



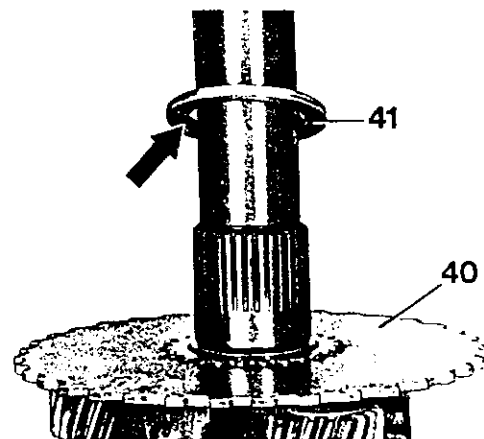
14 Remove axial bearing (46) and split needle bearing (39).

Assembly

15 Insert axial bearing (46) and split needle bearing (39) with grease.

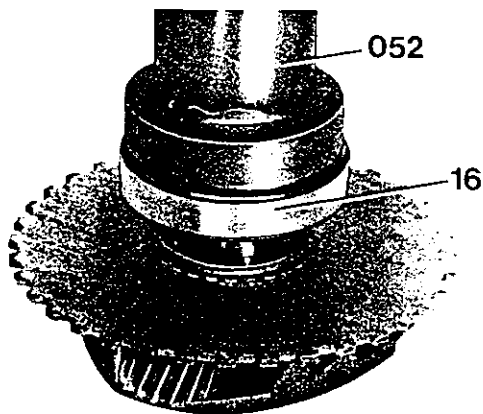


16 Insert sun gear (40), mount thrust washer (41) with offset end (arrow) in downward direction.

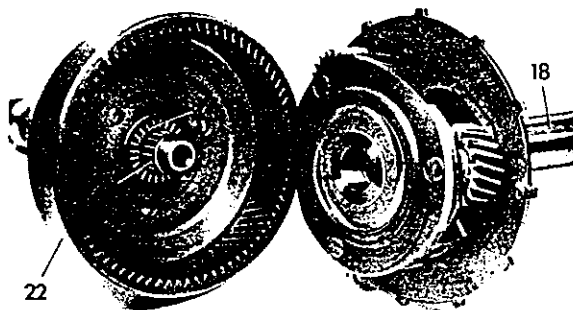


4 Speed

17 Mount radial ball bearing (16) with assembly fixture (052).

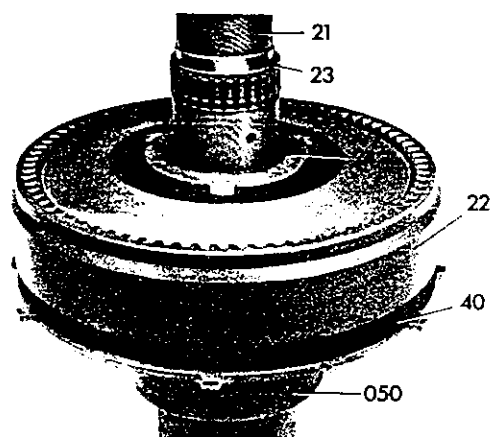


18 Insert axial bearing (19) and radial bearing (20) with some grease into intermediate shaft, then assemble output shaft (18) and intermediate shaft.



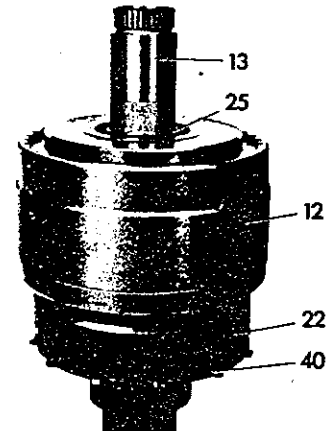
19 Insert output shaft together with intermediate shaft (21) into assembly fixture (050).

20 Mount thrust washer (24) and needle bearing (23).



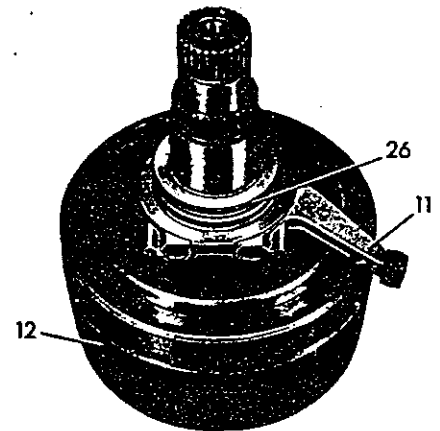
4 Speed

- 21 Insert hollow shaft (13) into clutch K 2 (12).
- 22 Place hollow shaft together with clutch K 2 on intermediate shaft while rotating shaft slightly so that the teeth of the sun gear (40) and the clutch K 2 will engage.
- 23 Insert needle bearing (25) into one-way roller clutch.



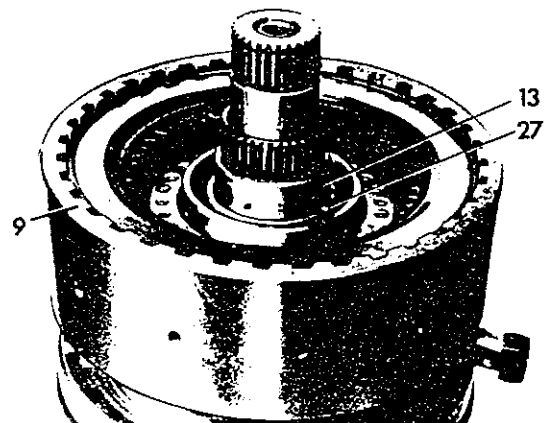
- 24 Check the four oil sealing rings (26) visually and replace, if required.

- 25 Insert oil feed sleeve (11) into clutch K 2. Push oil feed sleeve completely down, so that both oil sealing rings enter supporting flange of K 2.



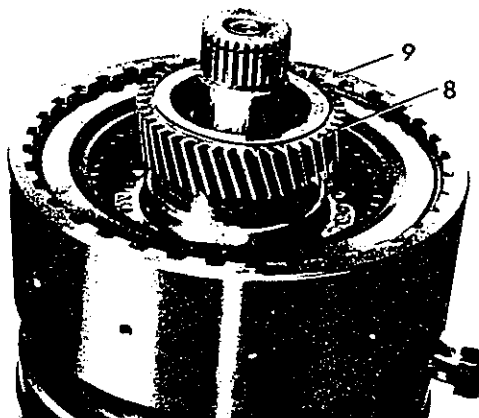
- 26 Mount clutch K 1 (9), making sure that the oil sealing rings of the oil distribution sleeve are correctly engaging.

- 27 Place needle bearing (27) on hollow shaft (13).



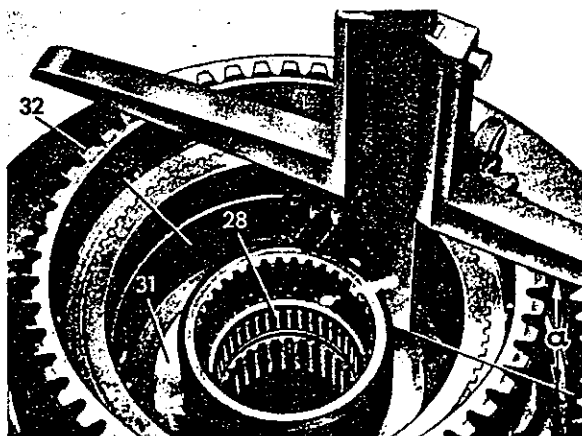
4 Speed

28 Place sun gear (8) into supporting gear of K 1.

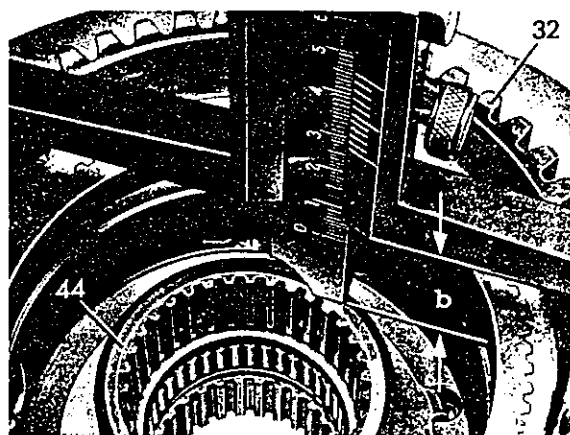


29 Measure end play "S" of sun gear, center planetary gear assembly.

Determine dimension "a" from internal plate carrier K 1 (32) to thrust washer (31) by means of depth gauge.

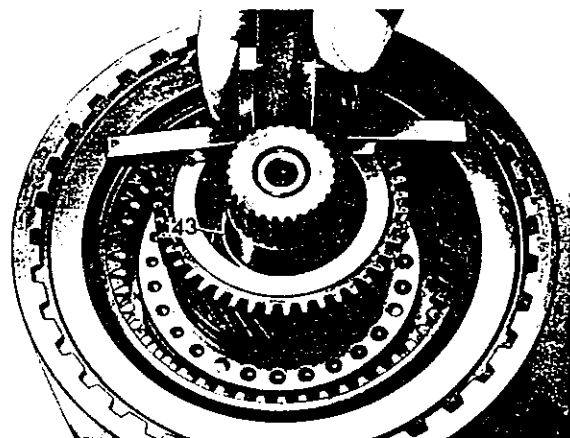
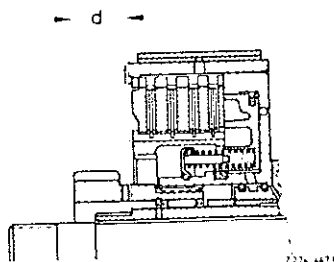


Determine dimension "b" from internal plate carrier K 1 (32) up to shoulder (44) by means of depth gauge.



4 Speed

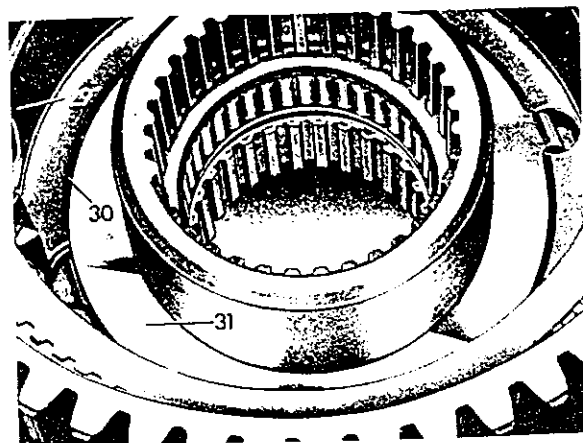
Determine dimension "d" from thrust surface sun gear to shoulder of hollow shaft (43) by means of depth gauge.



The play results from dimensions $a - b = "c"$ and $c - d = "S"$.

30 Adjust end play "S" to its value of 0.2 to 0.3 mm by adding compensating washers.

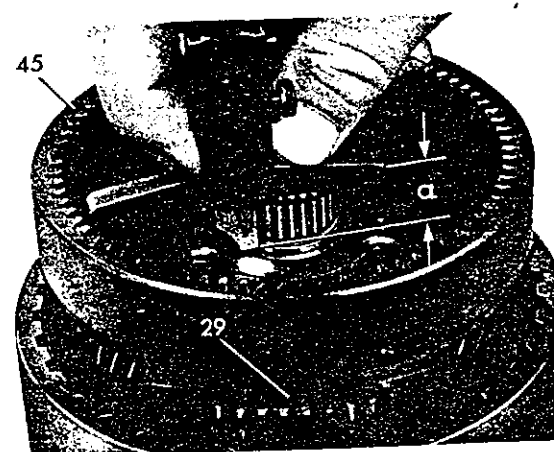
31 Glue measured compensating washers (30) and thrust washer (31) with grease into planetary gear carrier (29).



32 Mount planetary gear carrier of center planetary gear assembly (29).

33 Measure end play "S" of hollow shaft.

Determine dimension "a" with depth gauge (from upper edge of intermediate shaft to shoulder of intermediate shaft).





ATSG

Service Information Mercedes 722.1-722.2

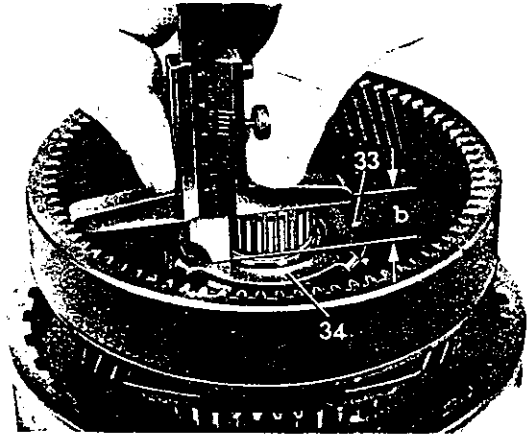
4 Speed

34 Determine dimension "b" with depth gauge (from upper edge of intermediate shaft to thrust washer (34)).

35 Play "S" results from dimension "b" - "a" = "S".

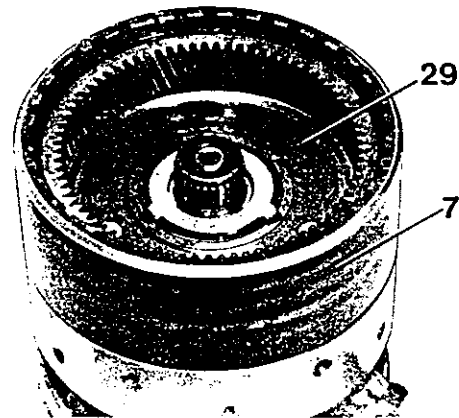
36 Adjust play to its value of 0.2 to 0.3 mm by adding compensating washers (33).

37 Insert measured compensating washers (33) and thrust washer (34) with grease.



38 Remove planetary gear assembly (29).

39 Mount hollow gear (7), reinstall planetary gear assembly (29).



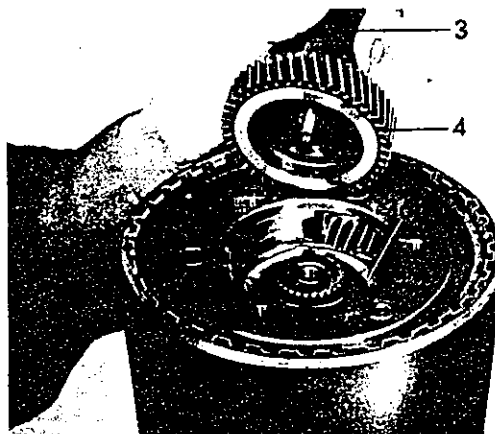
40 Insert planetary wheel carrier (35) of front planetary gear assembly and secure intermediate shaft with locking ring (5).

41 Push ring gear (7) upwards and insert circlip (6).

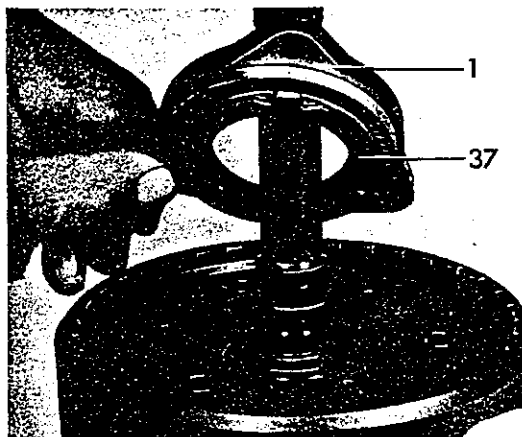


4 Speed

- 42 Insert thrust washer (36) and input shaft (3).



- 43 Mount supporting flange (1) with thrust washer (37).

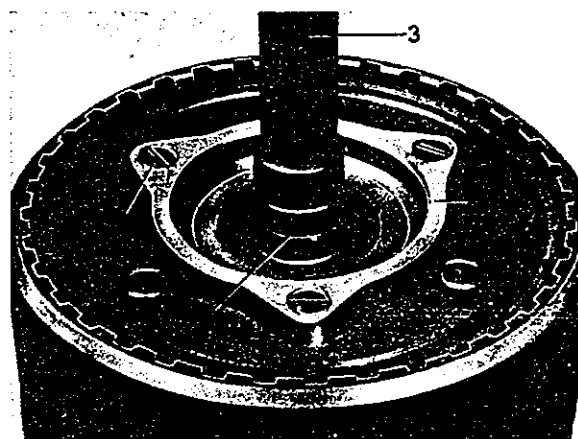


- 44 Make threaded bores in planetary gear carrier and threads of countersunk screws (2) free of grease by means of activator. Provide the front three to four threads of the screws with Loctite hydraulic sealer.

- 45 Screw-in countersunk screws and tighten to 7 Nm (0.7 kpm).

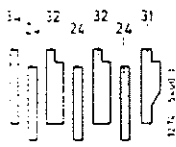
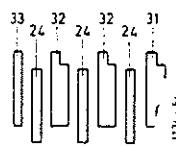
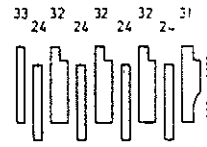
- 46 Insert lube pressure ring (38) into groove and attach at joint.

- 47 Lift gear assembly from assembly fixture.



DISASSEMBLY / ASSEMBLY OF K 2 CLUTCH

Clutch plate diagram

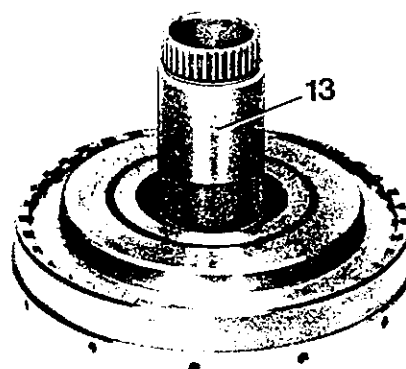
Transmission	722.116- 118	722.115 and 119	722.111--113
Clutch K 2			

Piston end

Note

Starting February 1976 a cover plate with oil retaining ring is installed into clutch K 2 of all 4- and 5-cylinder vehicles. This means that during assembly of the K 2 the hollow shaft (13) with one-way roller clutch is simultaneously also installed. In this connection, the following parts were modified: Outside and inside plate carrier, restoring springs, spring guide ring, clutch piston and inside plates.

The number of compression springs for clutch piston differs. If new compression springs are required, the same number must be installed.



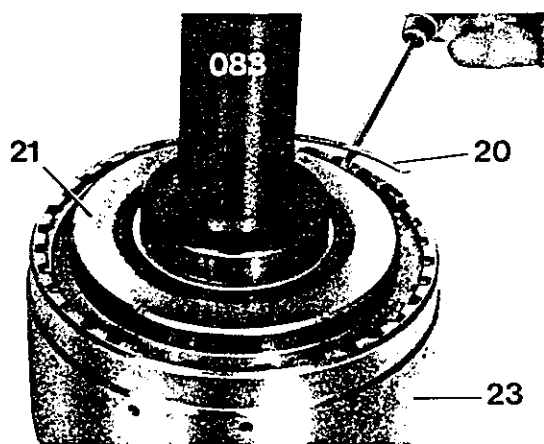
Disassembly

1 Push supporting flange (21) down under a press with assembly mandrel (083) until circlip (20) is released and can be removed.

2 Remove supporting flange (21) with piston.

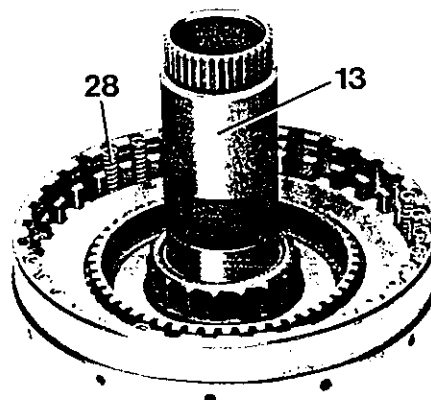
Attention!

Keep supporting flange and piston together, so that the piston cannot fall out.



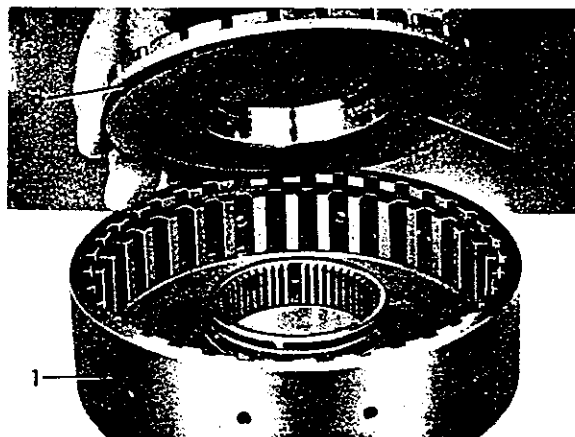
3 Remove compression springs (28).

4 Remove plate assembly. On clutch K 2 with oil retaining ring, remove hollow shaft (13) together with plate assembly.



5 Hold piston (8) with two pointed pliers and pull out of supporting flange (1) until it can be held manually.

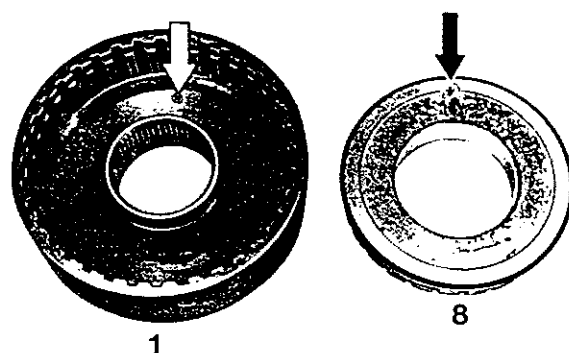
6 Lift piston with lip sealing ring (9) out of supporting flange (1) and check lip sealing ring by sight.



Assembly

Attention!

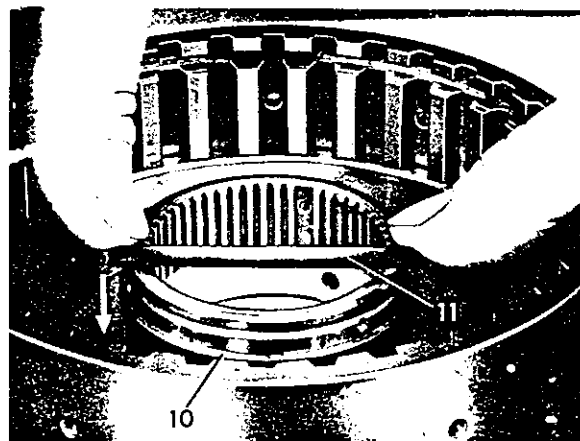
Since March 1977, the bleed valve for K 1 (arrow) is no longer installed in supporting flange (1), but in clutch piston (8). When renewing components, make sure that only one bleed valve is located in K 1. Never pair both components with or both components without venting valves.



7 Install new lip sealing ring (11). The lip sealing ring should rest correctly in groove (10), the lip should face downwards in direction of arrow.

Attention!

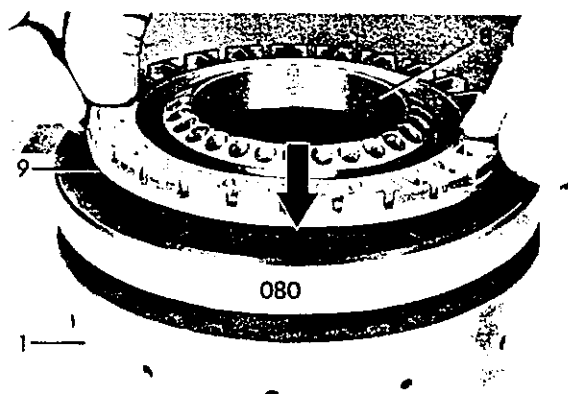
Do not use sharp-edged tools.



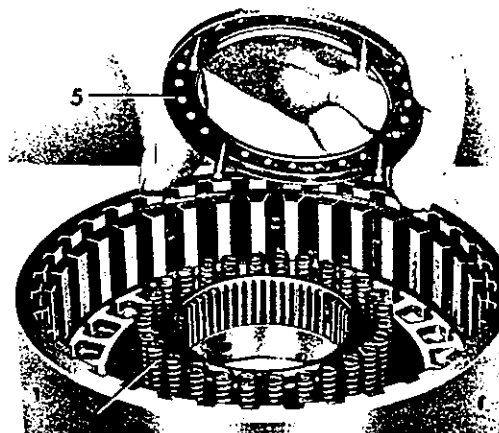
8 Insert introducing ring (080) into supporting flange (1).

9 Install new lip sealing ring: Sealing lip should point downwards in direction of arrow.

10 Lubricate piston (8) and lip sealing ring, insert and press-on housing bottom without canting. Do not use force, since this may damage sealing ring.



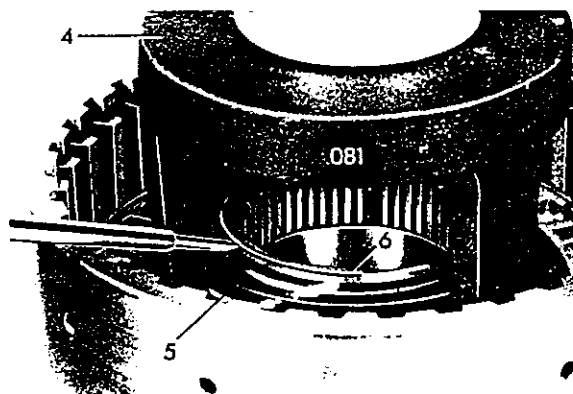
11 Insert piston restoring springs (7) into piston. Position spring retainer (5) in such a manner that each spring is centered in one prominence of the spring retainer. Do not confuse springs with those of clutch K 2.



12 Mount assembly fixture (081) and push spring retainer carefully and without canting down under press until circlip (6) can be inserted.

13 Carefully release press and watch out for correct seat of circlip (6).

14 Assemble plate assembly for clutch K 1 according to diagram. Immerse new lining plates first for a short moment in an ATF-oil bath.



Attention!

Replace outer plates showing badly burnt spots and bends.

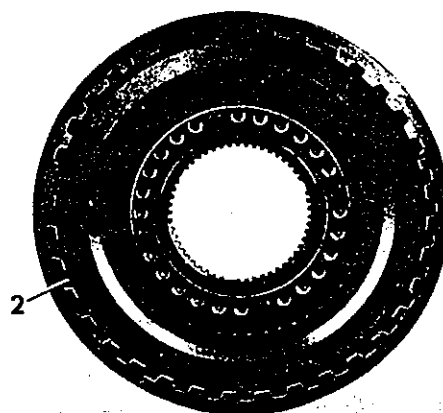
Also inside plates showing burnt spots and wear. Inside plates are worn when their thickness is less than 2 mm.

15 Insert plate assembly into supporting flange.

16 Insert circlip (2) into groove and push down with a screwdriver.

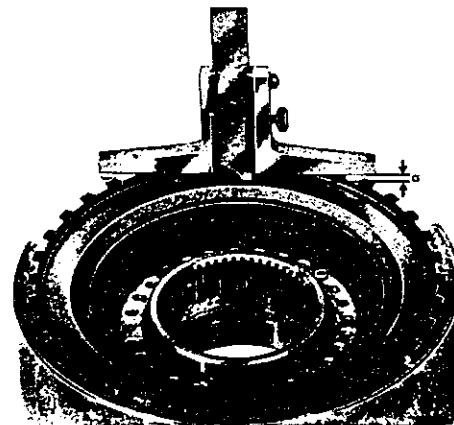
Attention!

The resilient circlips of clutches K 1 and K 2 are different in spring force and should therefore not be confused. The circlip of clutch K 1 has 6 undulations. The circlip (2) on transmission for Diesel engines is not undulated, but rigid.



17 Determine play "L".

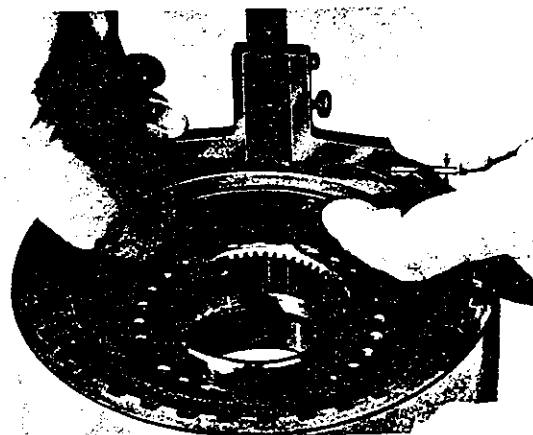
Measure distance "a" with a depth gauge, while positioning measuring tip of depth gauge only lightly, so that the plate package is not compressed.



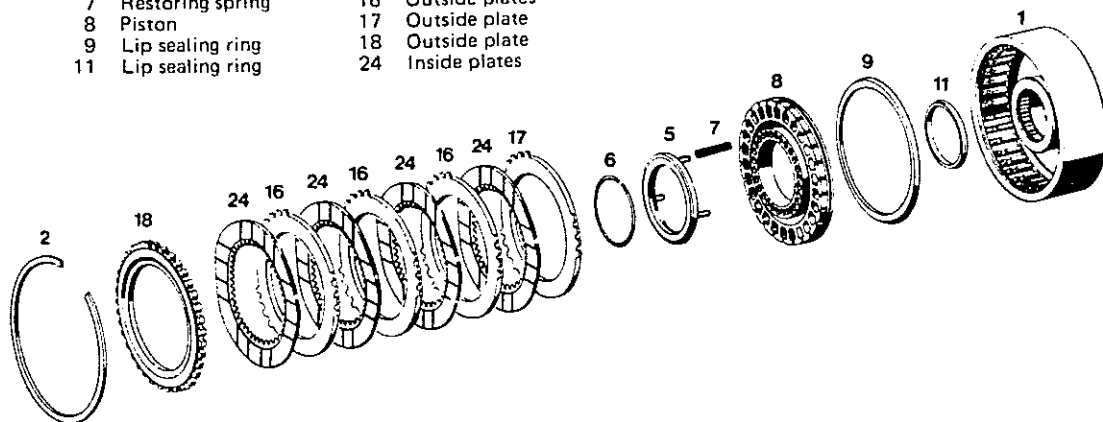
Push outside plate completely up and measure distance "b". The difference of the two measurements is play "L".

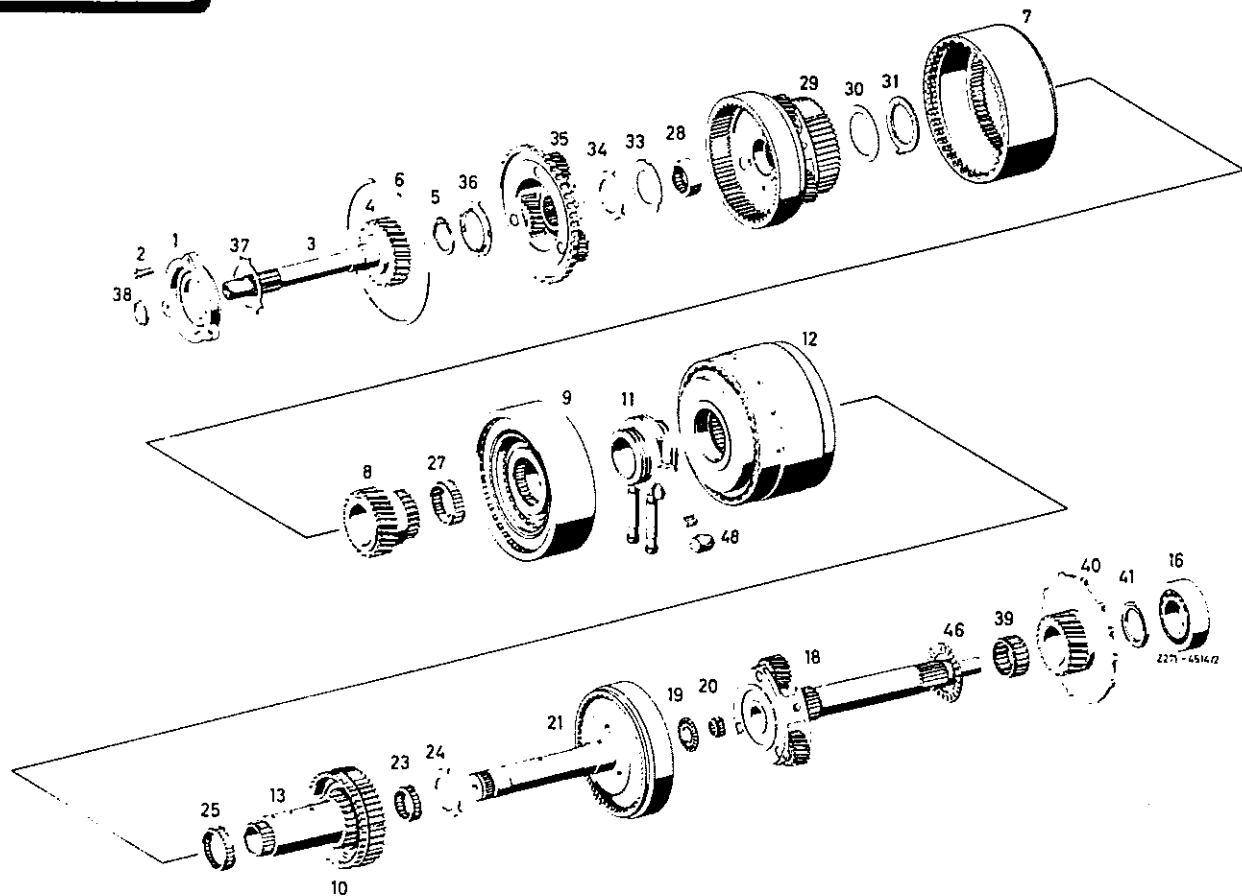
Play "L" should amount to 1.0 ± 0.2 mm.

18 The play is adjusted by installing pertinent outside plates (refer to clutch plate diagram item 16 and 32), which are available in varying degrees of thickness.



- | | | |
|---------------------|---------------------|-------------------|
| 1 Supporting flange | 7 Restoring spring | 16 Outside plates |
| 2 Circlip | 8 Piston | 17 Outside plate |
| 5 Spring retainer | 9 Lip sealing ring | 18 Outside plate |
| 6 Circlip | 11 Lip sealing ring | 24 Inside plates |


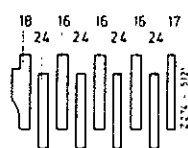




- | | | |
|----------------------------------|--|--|
| 1 Supporting flange | 18 Output shaft | 34 Thrust washer |
| 2 Countersunk screws | 19 Axial bearing | 35 Planetary gear carrier of front gear assembly |
| 3 Input shaft | 20 Radial bearing | 36 Thrust washer |
| 4 Sun gear | 21 Intermediate shaft | 37 Thrust washer |
| 5 Circlip intermediate shaft | 23 Needle bearing intermediate shaft | 38 Lube pressure ring |
| 6 Circlip gear assembly | 24 Thrust washer | 39 Split needle bearing |
| 7 Brake band drum B 3 | 25 Needle bearing hollow shaft | 40 Sun gear rear gear assembly |
| 8 Sun gear center gear assembly | 26 Needle bearing sun gear | 41 Thrust washer |
| 9 Brake band drum B 1 with K 1 | 28 Needle bearing planetary gear carrier | 46 Axial bearing |
| 10 Circlip one-way roller clutch | 29 Planetary gear carrier center gear assembly | 48 Rubber cap |
| 11 Oil feed sleeve | 30 Compensating washer | 51 Axial bearing |
| 12 Brake band drum B 2 with K 2 | 31 Thrust washer | |
| 13 Hollow shaft | 33 Compensating washer | |
| 16 Radial ball bearing | | |

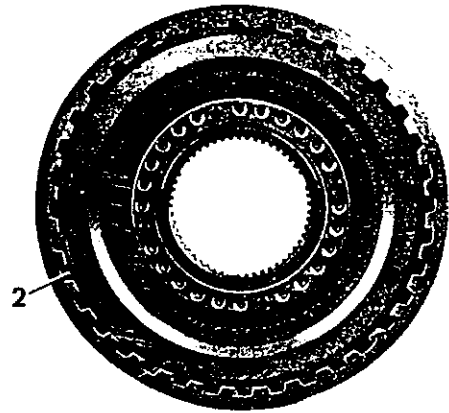
DISASSEMBLY / ASSEMBLY OF K 1 CLUTCH

Clutch plate diagram

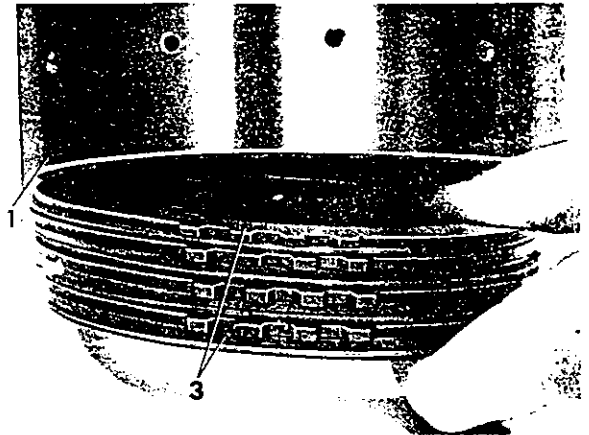
Transmission	722.115-119	722.111-113	
Clutch K 1			Piston end

Disassembly

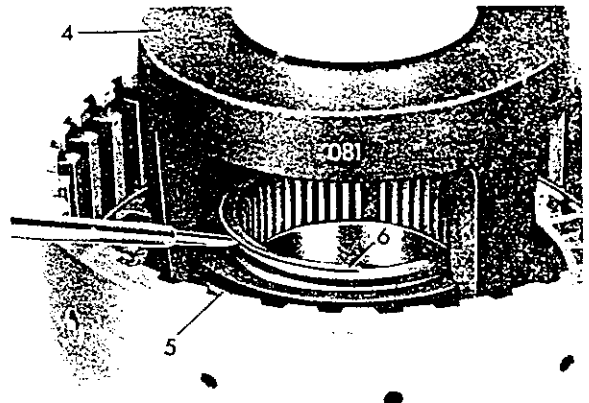
1 Push circlip (2) out of groove by means of a screwdriver and remove.



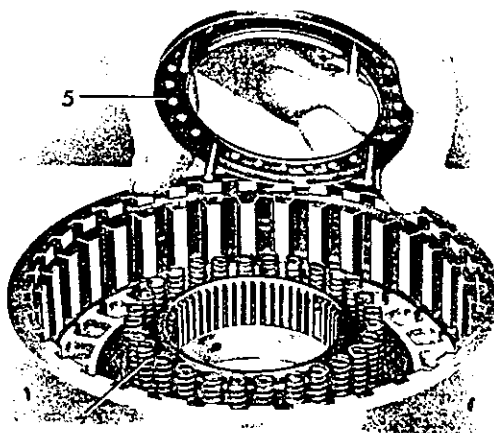
2 Remove plate assembly (3) by tilting supporting flange (1).



3 Place assembly fixture (081) on spring retainer (5) in such a manner, that the pressure ring is uniformly seated. Push spring retainer down with a press until circlip (6) is exposed and can be removed.

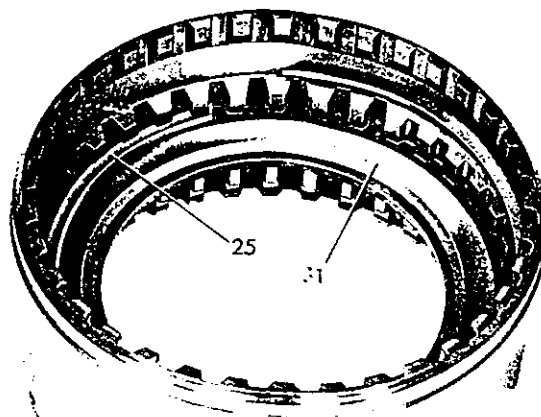


- 4 Carefully release press, remove spring retainer (5) and springs (7).

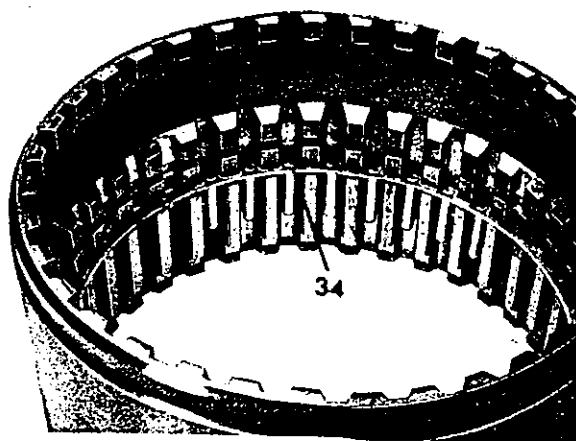


- 5 Push circlip (25) out of groove by means of screwdriver and remove.

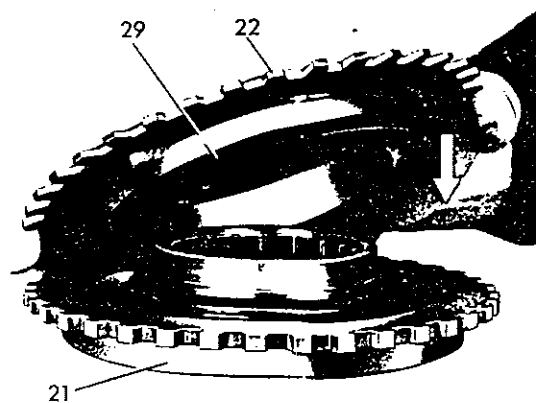
- 6 Remove cover plate (31).



- 7 Remove guide ring (34) for compression springs.

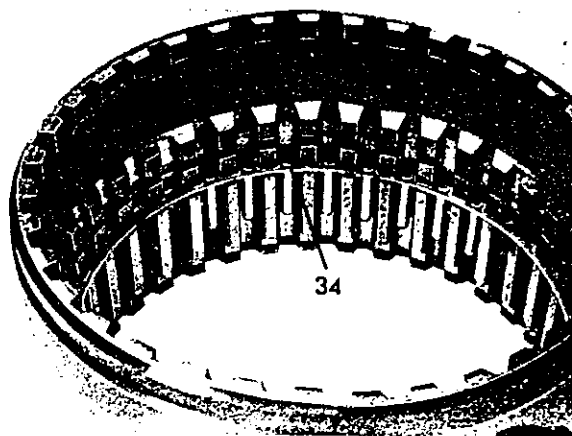


- 8 Remove piston (22) from supporting flange (21).



Assembly

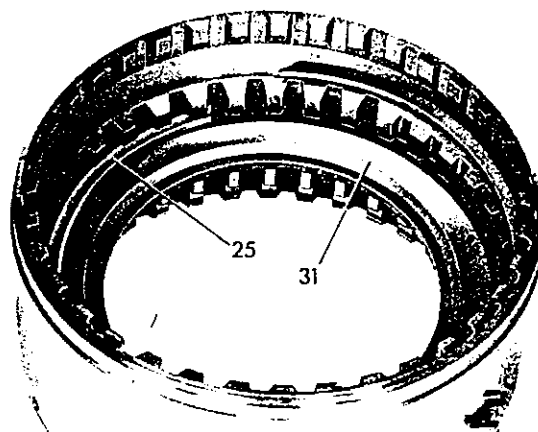
- 9 Insert guide ring (34) for compression springs.



10 Insert cover plate (31) and circlip (25).

Attention!

The resilient circlips of clutches K 1 and K 2 differ in spring force and should therefore not be confused. The circlip (25) on transmissions for Diesel engines is not undulated but rigid.

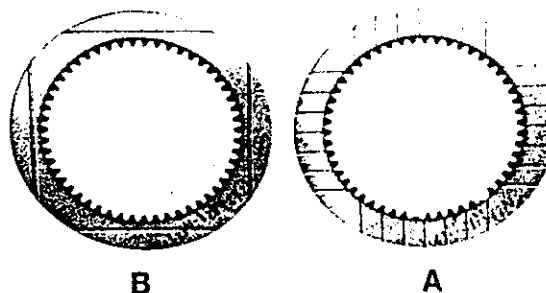


11 Assemble plate assembly for clutch K 2 according to clutch plate diagram. Immerse new, lining plates for a short moment in an ATF oil bath.

Attention!

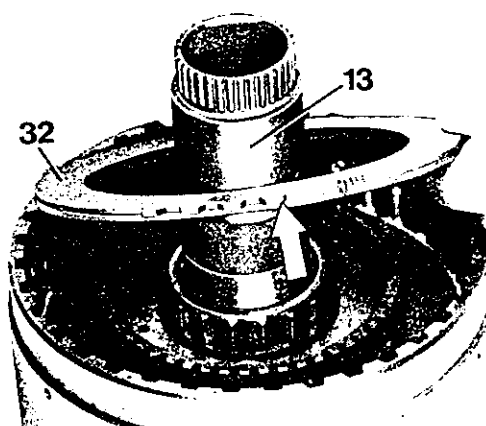
Outside plates with badly burnt spots or bends must be replaced. Also inside plates showing burnt spots and wear. Inside plates are worn out when they are less than 2 mm thick.

Clutches with oil retaining ring in cover plate may be provided only with inside plates (B) with modified grooves. Inside plates with the old type of grooves (A) may be inserted only in clutches without oil retaining ring.



12 On clutches with oil retaining ring in cover plate, insert hollow shaft (13).

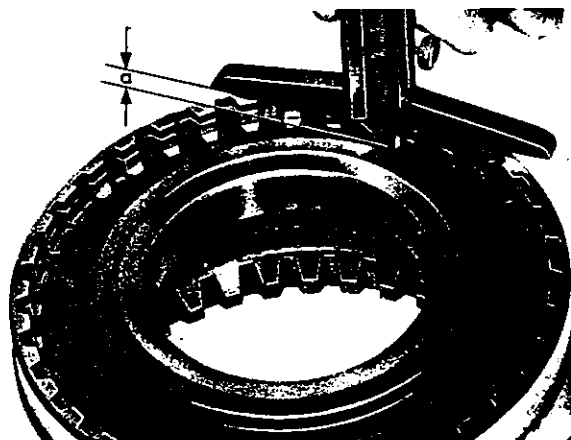
13 Insert plate assembly, the offset end of outside plates (32) should face downwards (arrow).



14 Determine play "L".

Place clutch piston on plate assembly and determine dimension "a" from upper edge of outside plate carrier to clutch piston by means of depth gauge.

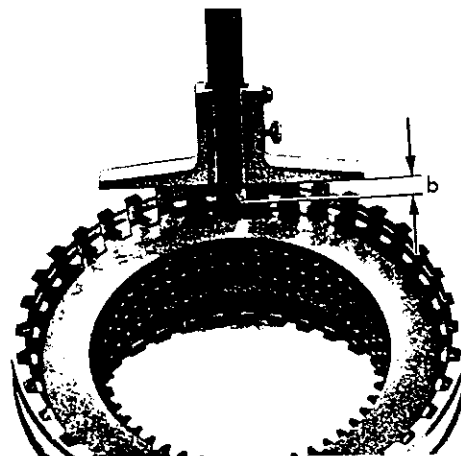
Remove clutch piston.



Determine dimension "b" from upper edge of outside plate carrier to seat of supporting flange by means of a depth gauge. The difference of the two measurements provides play "L".

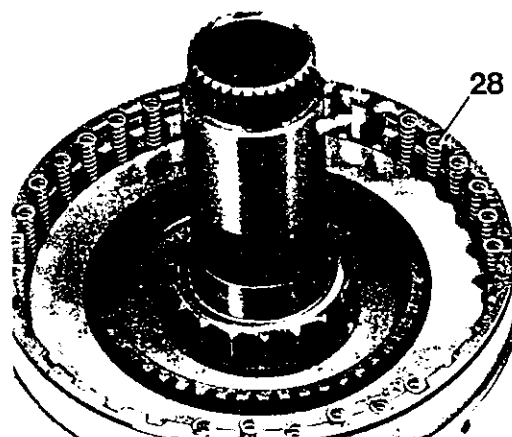
Play "L" should be 1.0 ± 0.2 mm.

The play is adjusted by installing pertinent outside plates (refer to clutch plate diagram) which are available in various degrees of thickness.

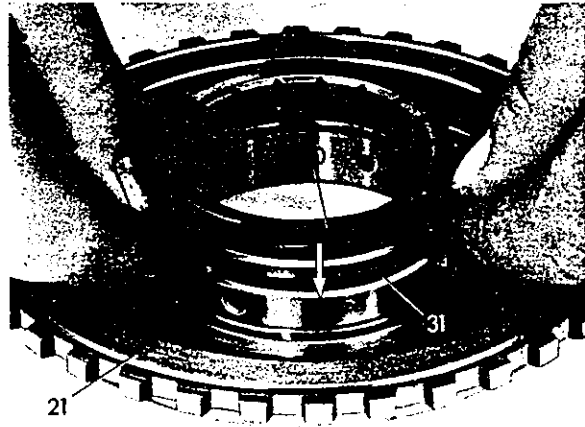


15 Place compression springs (28) on pins of spring guide ring. Distribute number of compression springs as uniformly as possible along entire circumference.

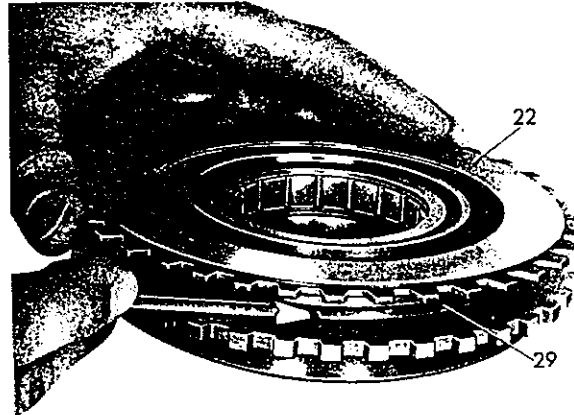
Note: The number of compression springs for clutch piston differs. If new compression springs are required, install the same number.



16 Install new lip sealing ring (30) into supporting flange (21). The lip sealing ring should be correctly located in groove (31), the lip should point downwards (in direction of arrow).



17 Insert lip sealing ring (29) into groove of clutch piston (22). Sealing lip should point downwards (in direction of arrow).

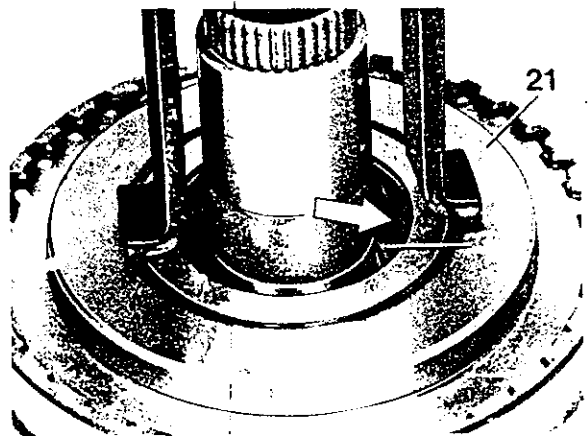


18 Lubricate lip sealing rings. Insert piston (22) into supporting flange. Push sealing lip into supporting flange with a pencil or a ball pen, then push-in piston without canting.

Attention!

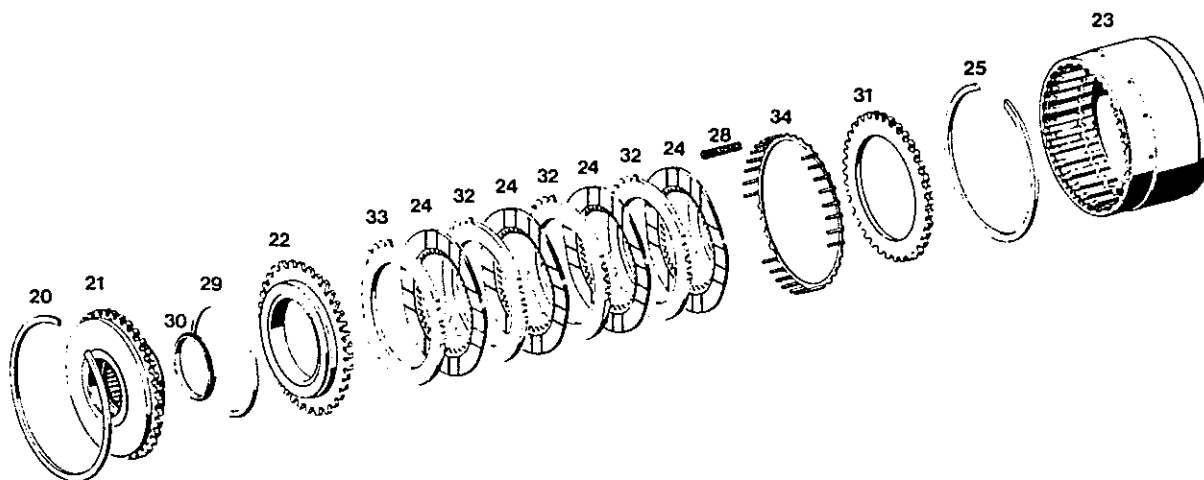
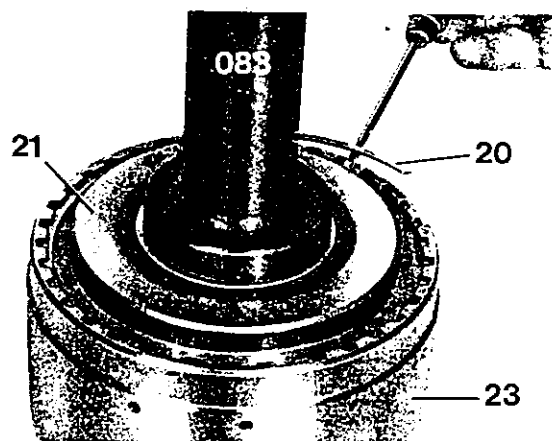
When inserting lip sealing rings into groove and when pushing into supporting flange, do not use pointed or sharp-edged tools.

19 Insert supporting flange (21). On clutches with oil retaining ring, make sure that the teeth of the one-way inside ring (37) and the supporting flange (21) are in mesh (arrow).



20 Mount assembly mandrel (083) and press down supporting flange (21) under a press.

21 Insert circlip (20).



- | | | | | | |
|----|-------------------|----|-------------------|----|----------------|
| 20 | Circlip | 25 | Undulated circlip | 32 | Outside plates |
| 21 | Supporting flange | 28 | Restoring springs | 33 | Outside plate |
| 22 | Piston | 29 | Lip sealing ring | 34 | Guide ring |
| 23 | Brake band drum | 30 | Lip sealing ring | | |
| 24 | Inside plates | 31 | Outside plate | | |

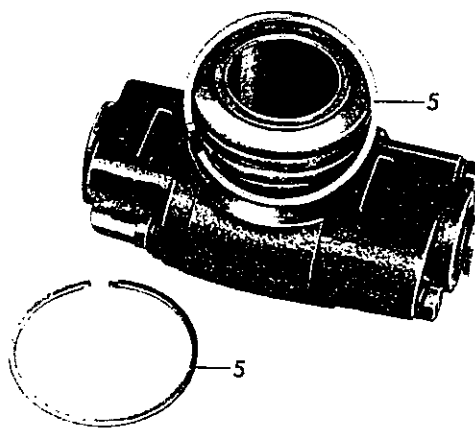
Governor Disassembly / Assembly

Tightening torque

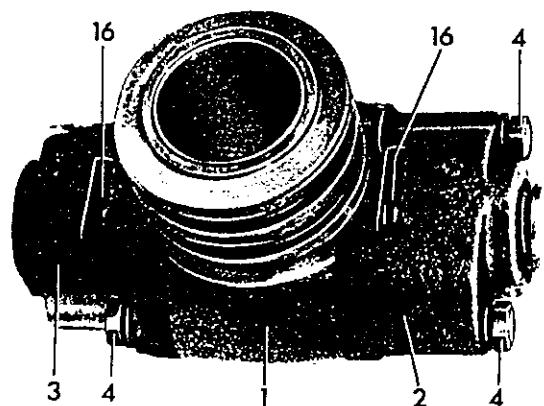
	Nm	(kpm)
Hex screw for shift housing and governor housing on centrifugal governor	8	(0.8)

Disassembly

- 1 Replace oil sealing rings (5) as required by disconnecting and removing oil sealing rings at joint.



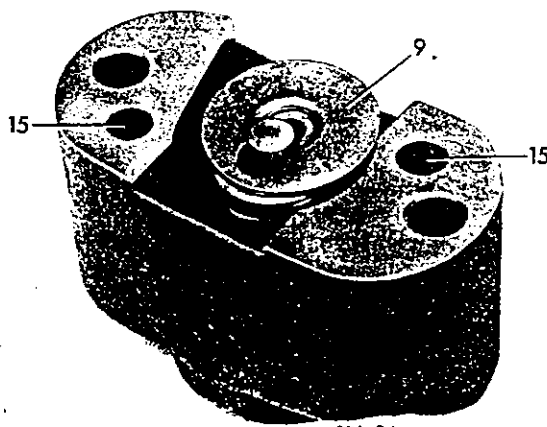
- 2 Unscrew fastening screws (4).
- 3 Remove shift housing (3) and governor housing (2) from flange (1).



- 4 Remove lock washer (6), take off compression spring (7) and shift valve (8).

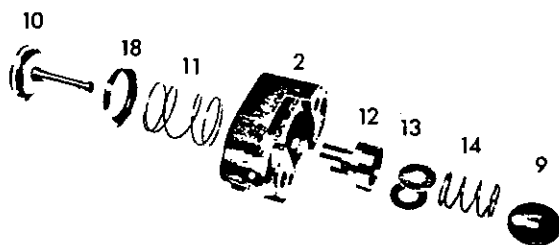


5 Remove spring plate (9).



6 Remove centrifugal weight (10) with spring guide (18) and weak compression spring (11) in upward direction.

7 Remove compression spring (14) with compensating washers (13) and control valve (12) in downward direction.



Assembly

Attention!

Clean all parts well in benzine. Check shift valve (8) and control valve (12) for damage and easy sliding in their bores.

8 Insert control valve (8) with compression spring (7) and push-on lock washer (6).

Note: When pushing-on lock washer, make sure that the spring end in groove of lock washer is not distorted.

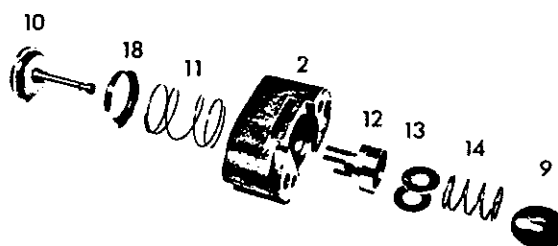


9 Insert control valve (12) into control housing (2).

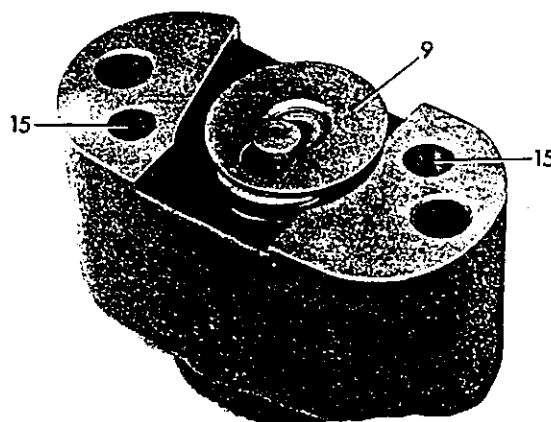
10 Insert centrifugal weight (10) with spring guide (18) and weak compression spring (11) into control valve (12).

11 Push control valve inward, insert compensating washers (13) together with compression spring (14) into control valve.

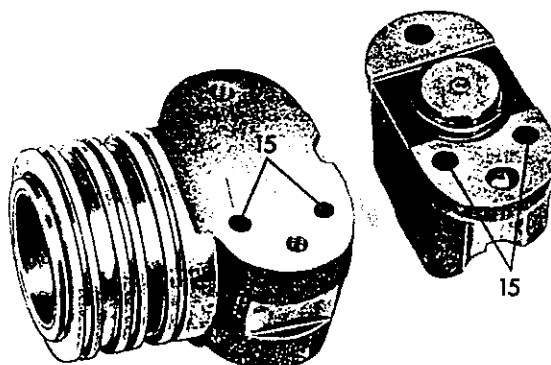
Note: Do not change number of compensating washers.



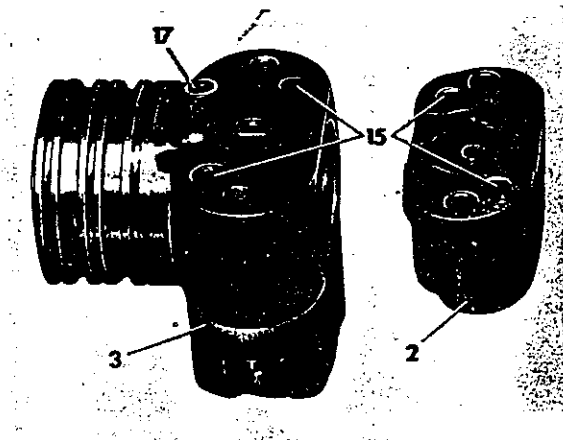
12 Push-on spring plate (9), making sure of correct seat.



13 Position shift housing on flange in such a manner that the oil outlet slots (16) (illustration item 15) are facing the oil sealing rings and that the oil ducts (15) are in alignment. Screw-in fastening screws.



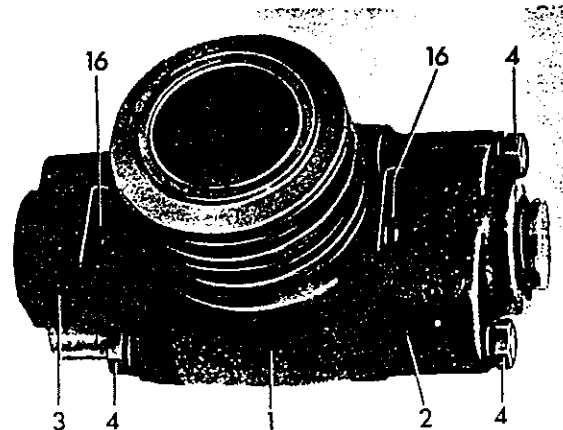
14 Insert strainer (17) into the seat provided in oil duct and mount control housing (2) in such a manner that the oil outlet slots (16) are facing the oil sealing rings (illustration item 15) and that the oil ducts (15) are in alignment. Screw-in fastening screws.



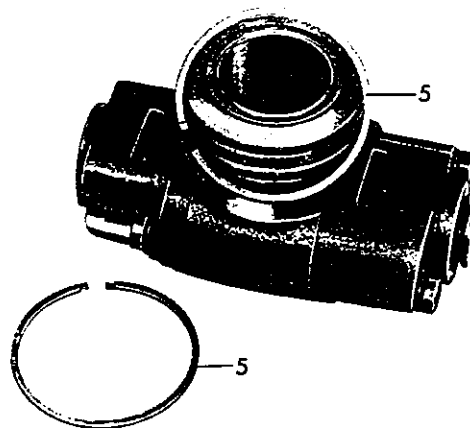
15 Tighten fastening screws (4) to 8 Nm (0.8 kpm).

IMPORTANT NOTE:

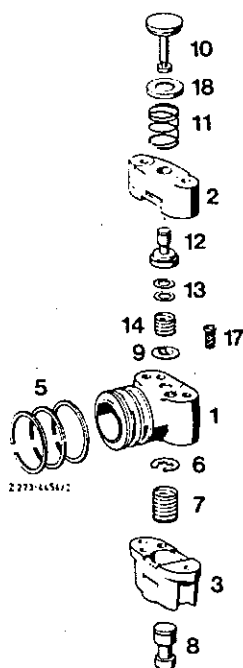
On assembly of governor two parallel slots on each side of the hub **MUST** face rearward. In the photo the hub with the rings block the two slots that are closest on each side of the hub. Items marked 16



16 Install oil sealing rings (5), if previously removed; for this purpose, insert oil sealing rings into grooves and attach at joint.



- 1 Flange
- 2 Governor housing
- 3 Shift housing
- 5 Oil sealing rings
- 6 Lock washer
- 7 Compression spring
- 8 Shift valve
- 9 Spring plate
- 10 Centrifugal weight
- 11 Compression spring
- 12 Control valve
- 13 Compensating washers
- 14 Compression spring
- 17 Strainer
- 18 Spring guide



3 Speed Bell Housing

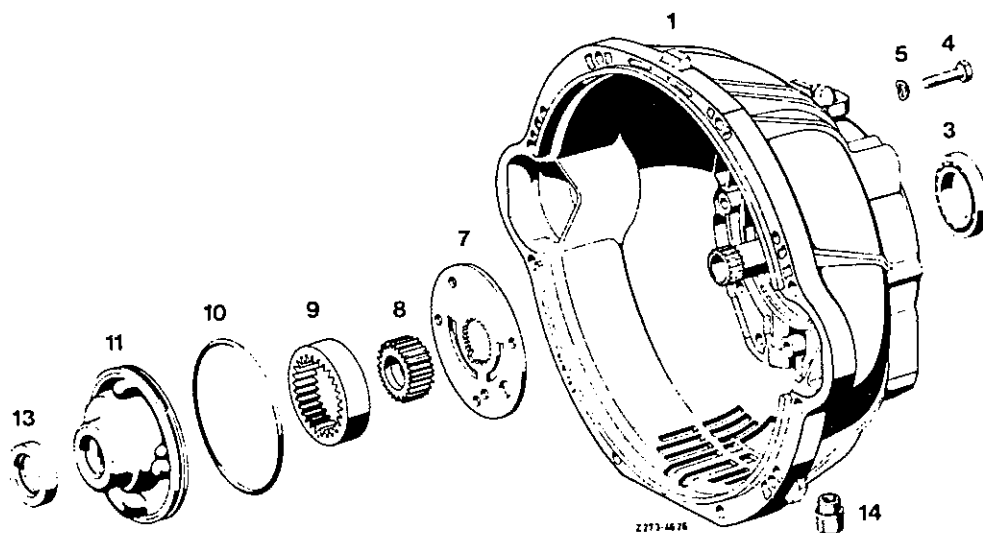


Fig. 11

- 1 Transmission cover
- 3 Ball bearing

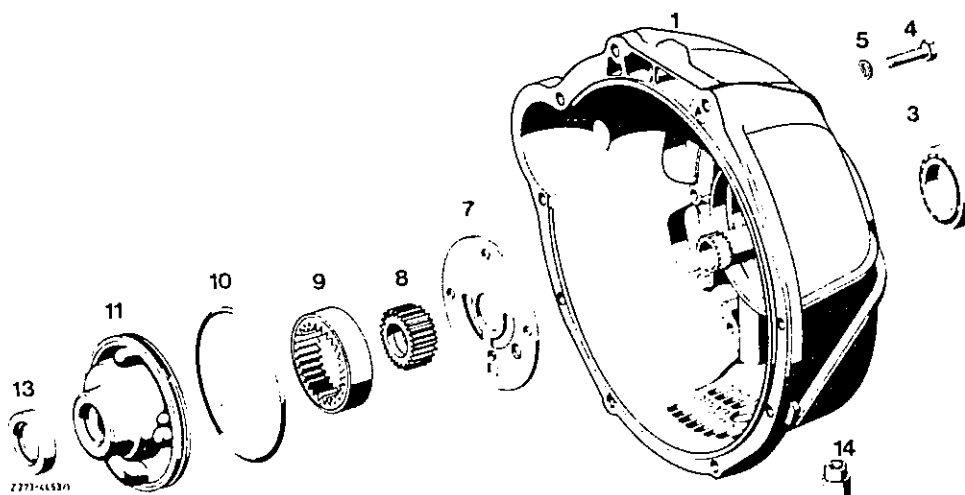
- 4 Fastening screw
- 5 Spring washer
- 7 Intermediate plate

- 8 Drive gear
- 9 Ring gear
- 10 O-ring

- 11 Primary pump housing
- 13 Radial sealing ring
- 14 Threaded plug

NOTE: the 3 speed bell housing has two starter ear boss.

4 Speed Bell Housing



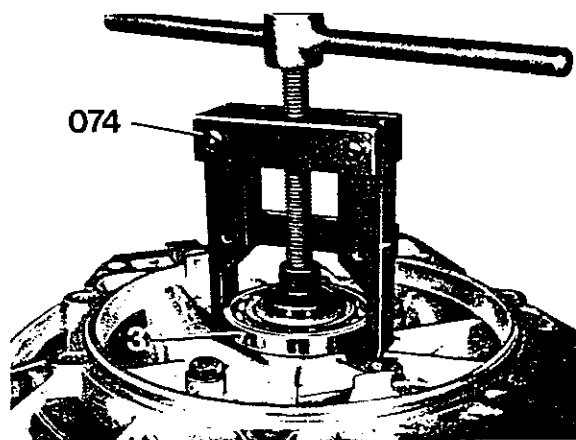
- 1 Converter housing
- 3 Ball bearing
- 4 Fastening screw
- 5 Spring plate
- 7 Intermediate plate
- 8 Drive gear
- 9 Ring gear
- 10 O-ring
- 11 Primary pump housing
- 12 Radial sealing ring
- 14 Threaded plug

NOTE: the 4 speed bell housing has one starter ear boss.

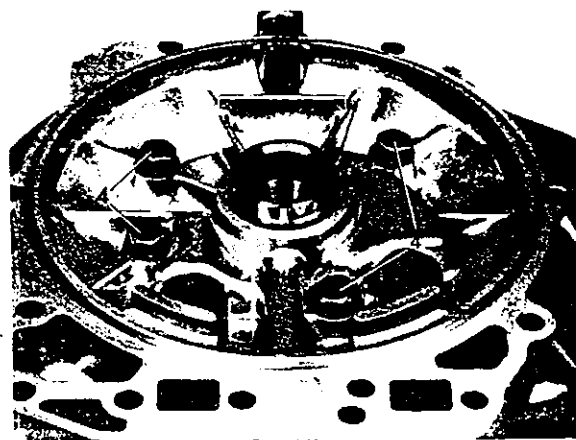
Front Pump Bell Housing Disassembly / Assembly

Disassembly

- 1 Pull off radial ball bearing (3) by means of puller (074).

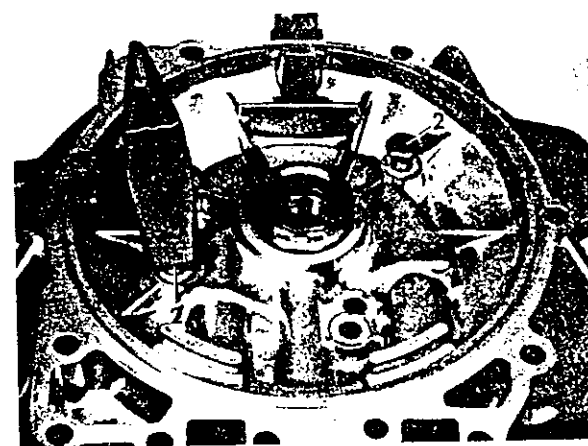


- 2 Unscrew fastening screws (4).

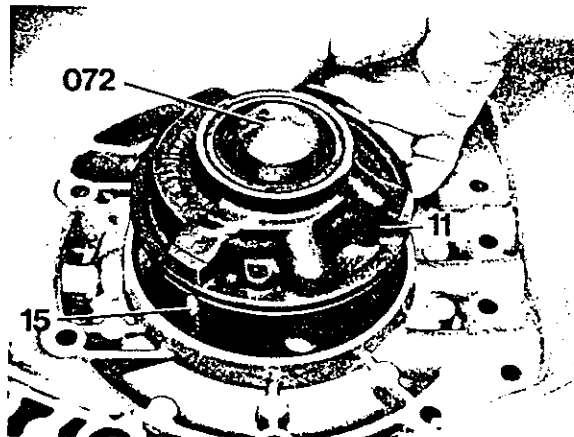


- 3 Screw-in two hex bolts (2) approx. 50 mm long from opposite directions.

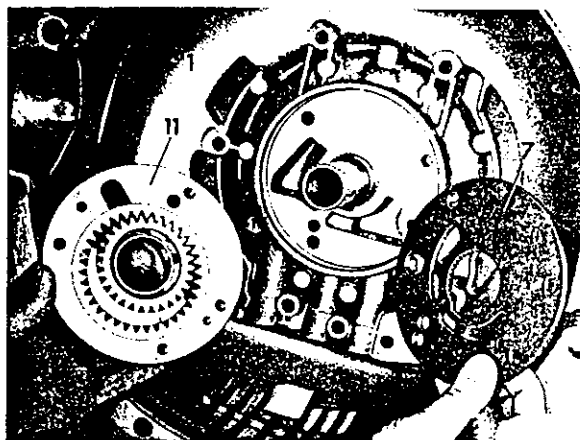
- 4 Loosen primary pump from transmission housing by means of light blows against the two hex bolts (2).



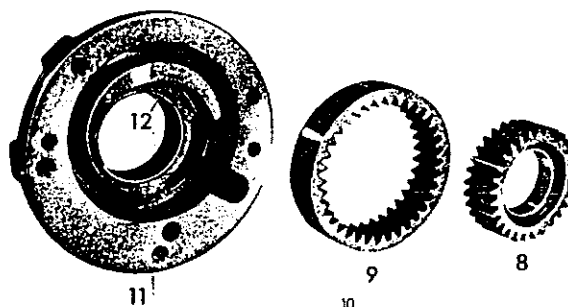
5 Place insertion sleeve (072) on stator shaft prior to removing primary pump.



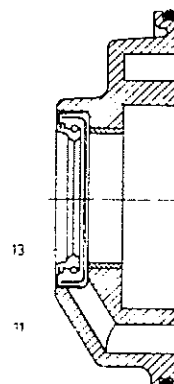
6 Remove primary pump (11) and intermediate plate (7).



7 Remove primary pump gears (8 and 9) from pump housing.



8 Remove O-ring (10) and radial sealing ring (13).



Assembly

Attention!

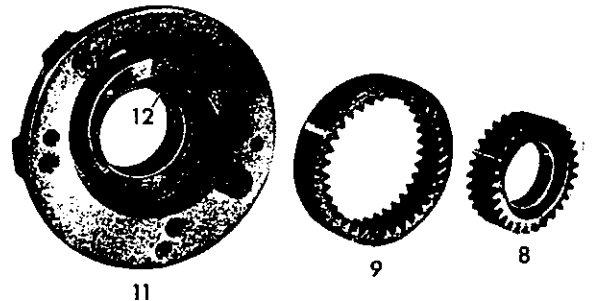
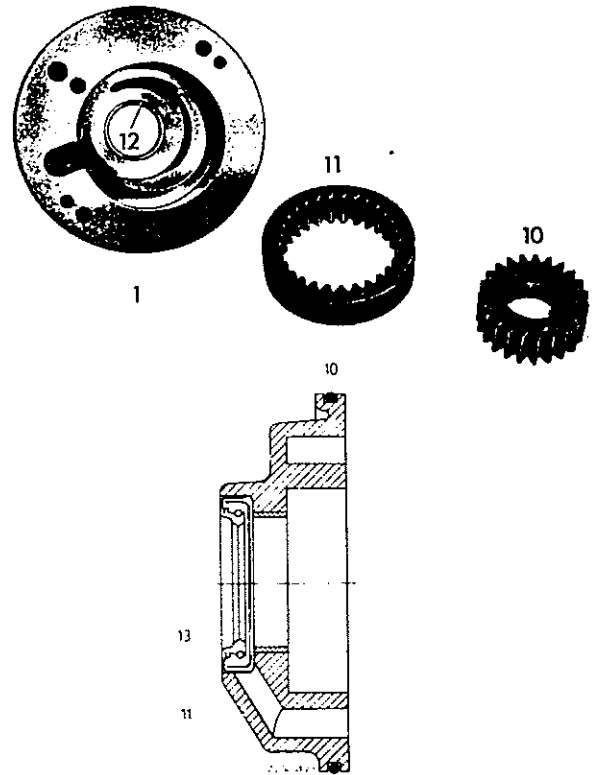
Check bronze bushing (12) for damage. If bronze bushing is badly worn or shows deep score marks, replace primary pump.

9 Mount new O-ring (10) and press new radial sealing ring (13) into pump housing. Then lubricate sealing lip on radial sealing ring and O-ring.

Attention!

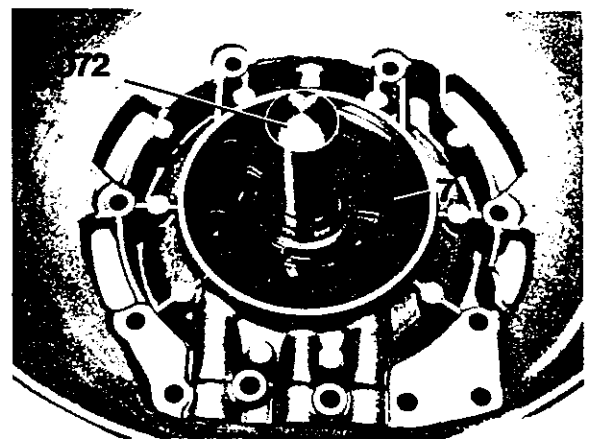
Be sure to press radial sealing ring (13) into pump housing until flush with outer edge of housing.

10 Lubricate pump gears (8 and 9) and insert into pump housing. The chamfered outer edge on large pump gear (9) should face bronze bushing (12).

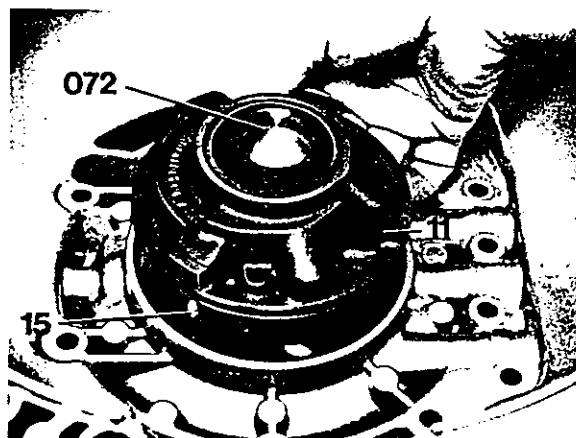


11 Insert intermediate plate (7) in such a manner that the fastening holes of intermediate plate and housing are in alignment.

12 Place insertion sleeve (072) on stator shaft.

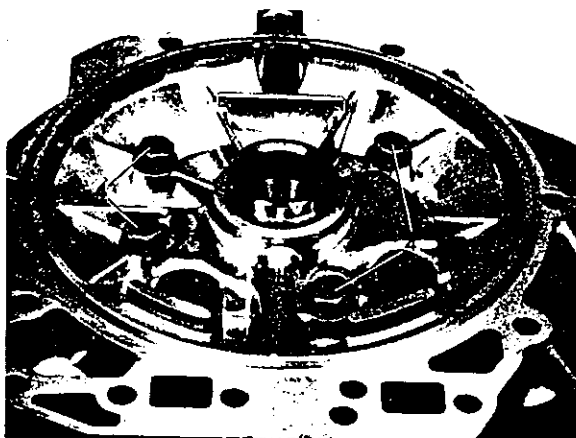


- 13 Screw two studs M 8 (15) opposite each other into pump housing and insert primary pump.

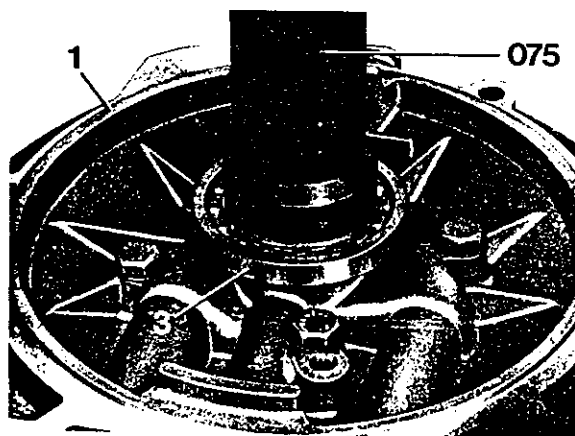


- 14 Insert fastening screws (4) and pull primary pump into housing by uniformly tightening the four fastening screws.

- 15 Tighten fastening screws to 20 Nm (2 kpm). The pump gears should then still turn easily.



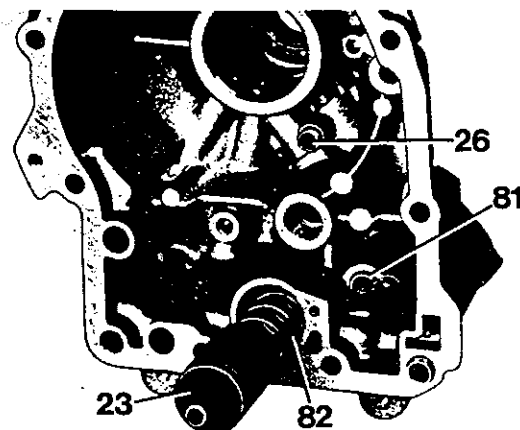
- 16 Press-on radial ball bearing (3) by means of assembly mandrel (075).



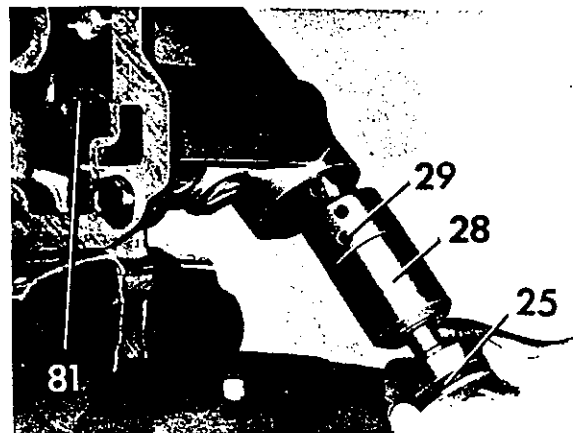
Extension Housing Rear Pump Disassembly / Assembly

Disassembly

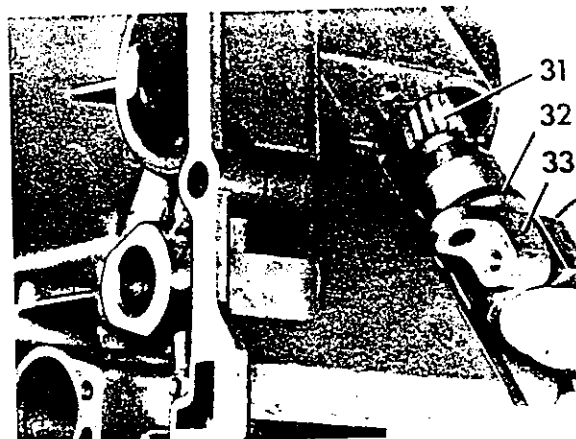
- 1 Unscrew fastening screw from cover plate of locking piston and remove locking piston (81) together with spring.
- 2 Unscrew fastening screw for secondary pump (26).



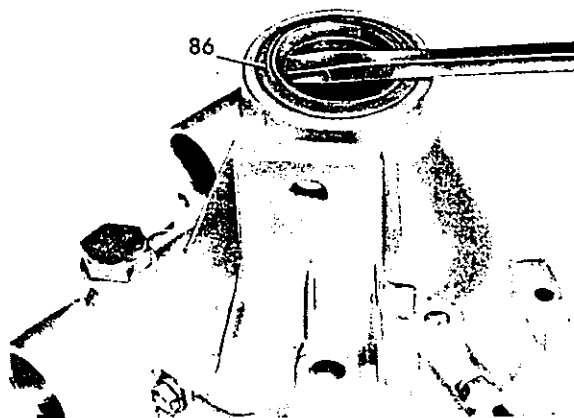
- 3 Take secondary pump (28) from housing.



- 4 Unscrew fastening screw for tachometer drive.
- 5 Pull tachometer drive (31 to 33) out of housing.
- 6 Remove tachometer pinion from bearing body (33).

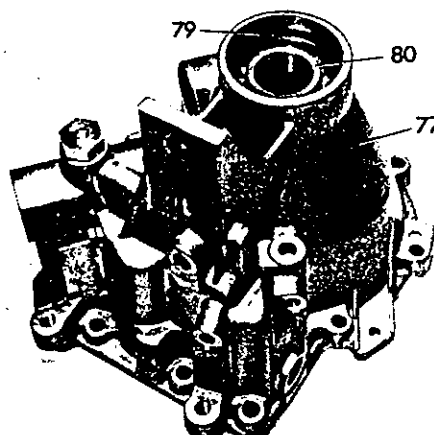


7 Push out radial sealing ring (86).

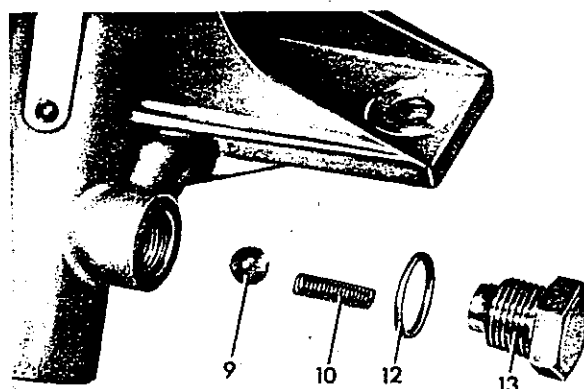


8 Remove locking ring (79) and press out ball bearing (80).

9 Unscrew the two measuring plug connections.



10 Remove closing plug (13) together with compression spring (10) and ball (9).

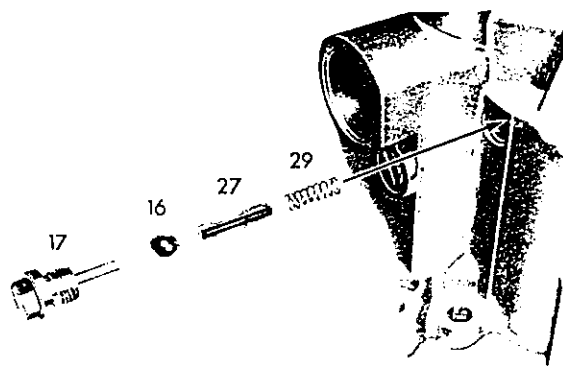


11 Unscrew closing plug (17) and remove steel ball (16).

12 Check thrust pin (27) for easy operation, reinstall steel ball (16) and closing plug (17).

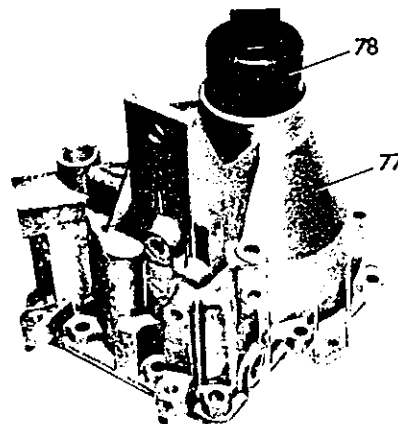
Attention!

If the plastic pin (27) binds or drops out, be sure to replace. New transmission covers are already provided with the plastic pin (27), compression spring (29), ball (16) and closing plug (17).

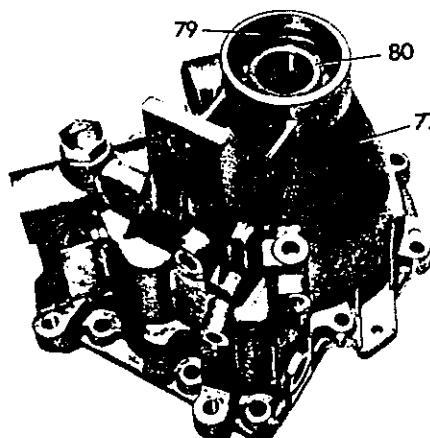


Assembly

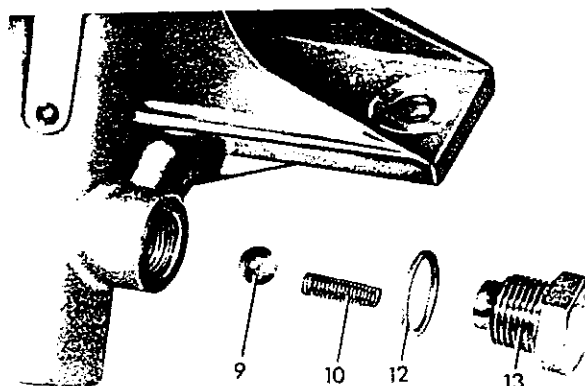
13 Press-in ball bearing (80) by means of assembly mandrel (78).



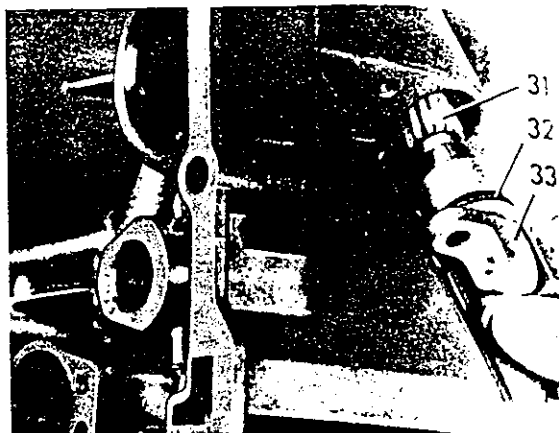
14 Insert locking ring (79) and press-in radial sealing ring.



15 Screw-in closing plug (13) together with compression spring (10) and ball (9).

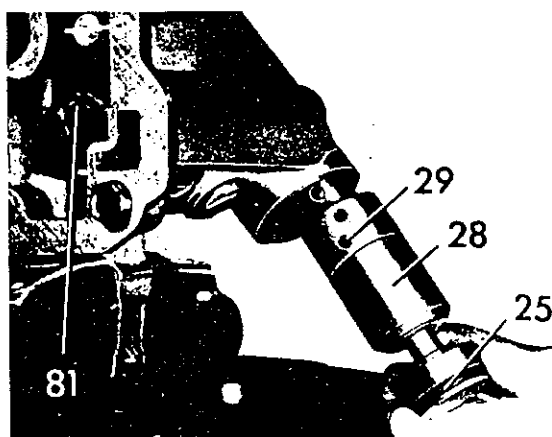


16 Insert tachometer pinion (31) into bearing body (33), introduce tachometer drive into rear transmission housing and tighten fastening screw to 8 Nm (0.8 kpm).



17 Insert locking piston (81) with spring and tighten screw for holding plate to 4 Nm (0.4 kpm).

18 Introduce secondary pump (28) into rear transmission case until the fastening bore (29) is in alignment with the bore in transmission housing.



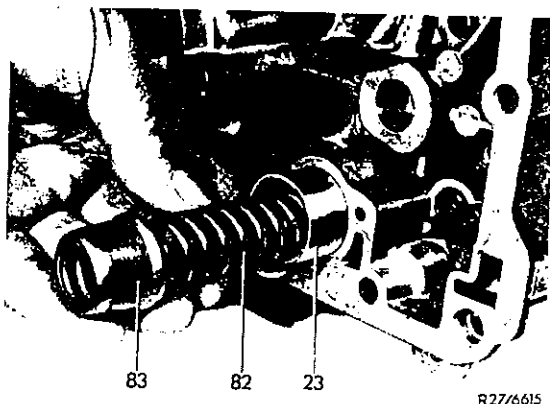
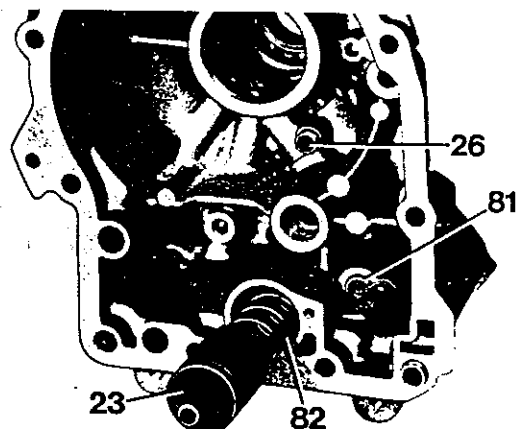


Fig. 6

- 23 Pressure receiving piston
82 Pressure receiving springs
83 Spring plate



19 Tighten fastening screws (26) of secondary pump to 8 Nm (0.8 kpm).

20 Screw-in the two measuring plug connections with new sealing rings.

NOTE:

The plunger in the extension housing from 1968-1974 is made of steel and is installed first then the spring and seat. No. 23

The plunger in the extension housing from 1975-1983 is made of aluminum and is installed after the spring. Item marked with the number 23.

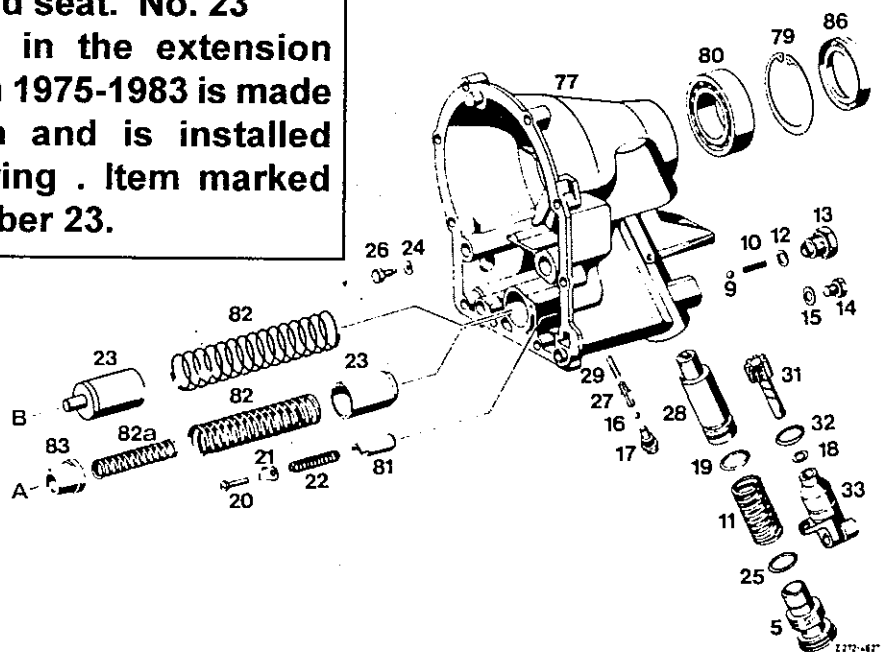


Fig. 8

- | | | | |
|--|------------------------------|---------------------------------------|-------------------------------|
| A 1. Version for K 4 C 025 | 15 Sealing ring | 25 O-ring | 79 Locking ring |
| B Version for W 4 B 025 and K 4 C 025 2. Version | 16 Ball | 26 Fastening screw for secondary pump | 80 Ball bearing |
| 5 Plug with inlet valve for secondary pump | 17 Closing plug | 27 Thrust pin | 81 Detent piston |
| 9 Ball | 18 Sealing ring | 28 Secondary pump | 82 Pressure receiving spring |
| 10 Compression spring | 19 O-ring | 29 Spring | 82a Pressure receiving spring |
| 11 Compression spring | 20 Oval head screw | 31 Tachometer pinion | 83 Spring retainer |
| 12 Sealing ring | 21 Holder | 32 O-ring | 86 Radial sealing ring |
| 13 Closing plug | 22 Compression spring | 33 Bearing body | 88 Three-arm flange |
| 14 Closing plug | 23 Pressure receiving piston | 77 Rear transmission housing | 89 Slot nut |
| | 24 Spring washer | | |

Valve Body Disassembly / Assembly

General notes

Observe particular cleanliness when working on shift valve housing. The work should be done as much as possible on a plastic surface. Do not use fuzzy cloth; leather would be best. Upon disassembly, wash all parts and blow out with compressed air.

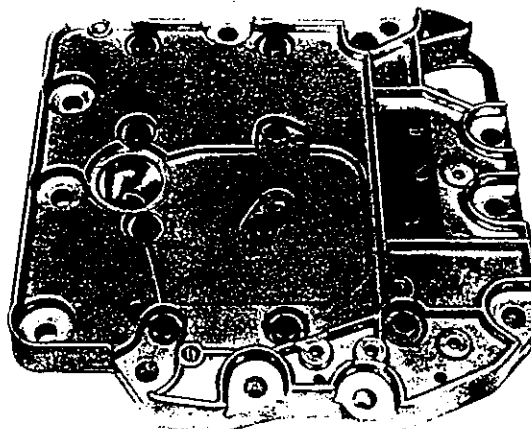
An additional detent valve is installed into shift valve housing for transmission 722.112 (J) (USA) 1977. The position of the detent valve (19) is shown on a separate illustration under assembly.

Disassembly

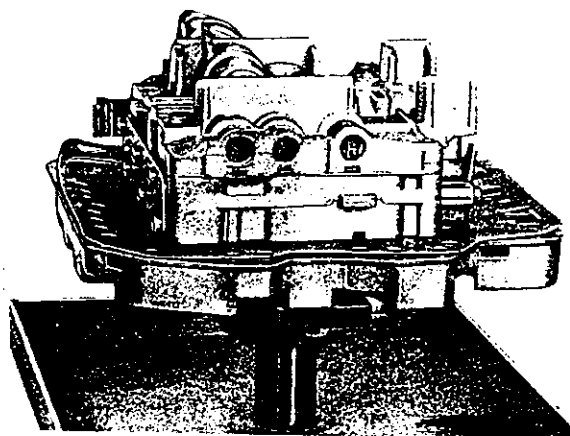
Attention!

The shift valve housing has 12 ball valves, 10 of 5.5 mm dia. and 2 of 7 mm dia. Be sure that the balls are not rolling off during disassembly.

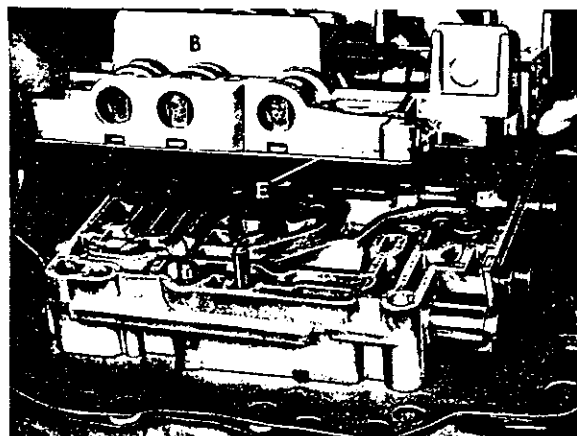
1 Loosen hex bolts from bottom and screw out except for two bolts located opposite of each other.



2 Place shift valve housing on assembly fixture.

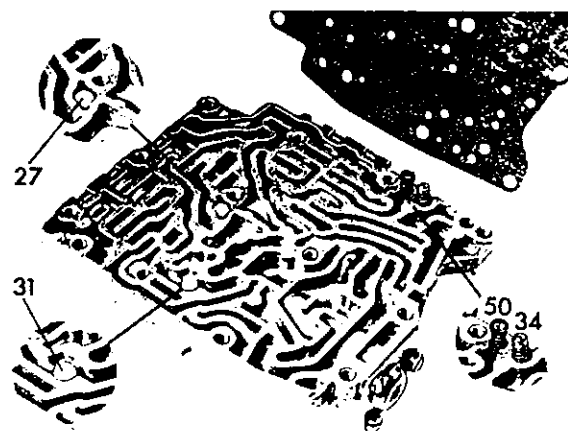


3 Unscrew the two remaining hex bolts from bottom and lift top (B) off with intermediate plate (E).

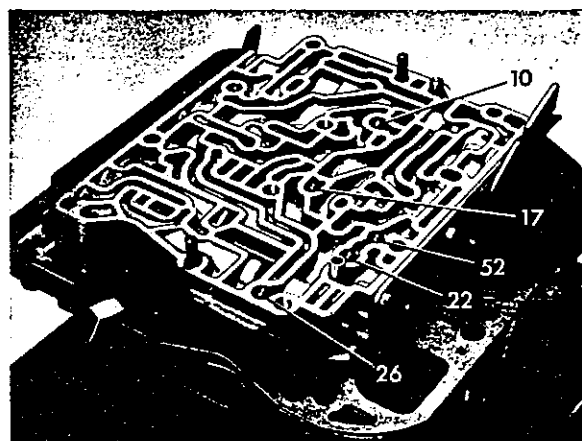


4 Take off intermediate plate (E) and remove filter (50) together with spring.

5 Remove two balls of 7 mm dia. (27 and 31) and one ball of 5.5 mm dia. (34) including spring from pressure relief valve modulating pressure out of top (B).



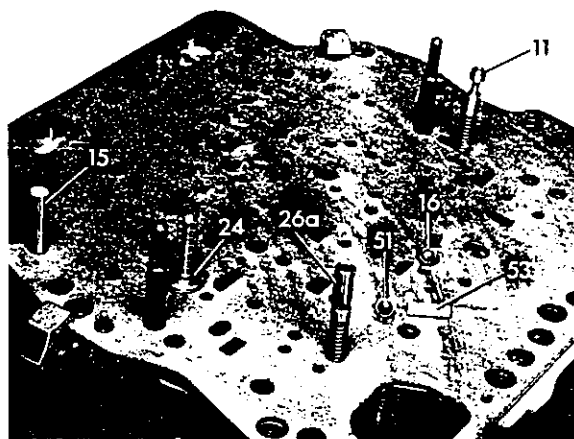
6 Lift bottom from assembly fixture and remove five balls of 5.5 mm dia. (10, 17, 22, 26 and 52) by tilting.



7 Remove piston brake shift (15) and check valve primary pump (24) including spring. Pull off detent valve (26a) and shift pin 3-4 (11) together with springs.

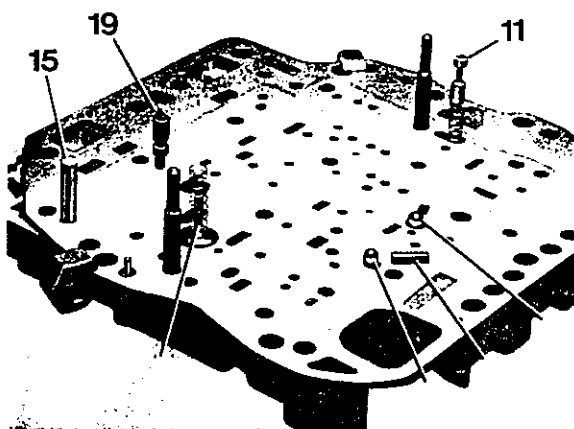
8 Remove the two balls of 5.5 mm dia. (16 and 51) and plastic pin (53).

9 Remove gasket and intermediate plate.



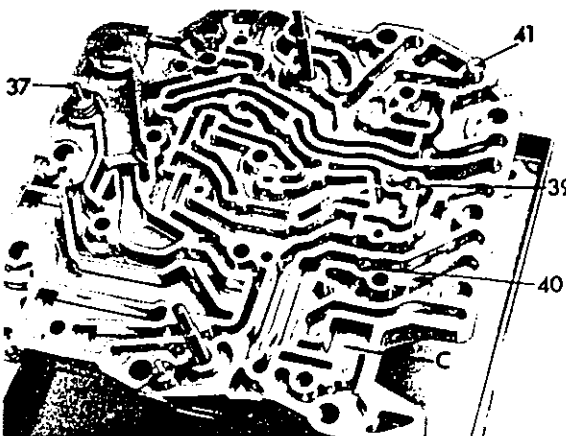
Transmission 722.112 (J) (USA) starting 1977

On this shift valve housing, remove additional detent valve (19).



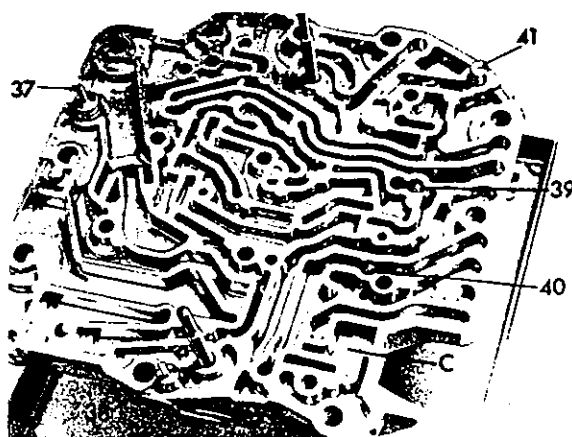
10 Remove lube pressure valve (37) one-way throttle valve B 3 (38) and one-way throttle valve releasing end B 2 (41) from oil distributing plate (C).

11 Take oil distributing plate from assembly fixture and remove the two balls of 5.5 mm dia. (39, 40) by tilting.



Assembly

- 12 Place oil distributing plate (C) on assembly fixture.
- 13 Insert lube pressure valve (37), one-way throttle valve B 3 (38) and one-way throttle valve releasing end B 2 (41) into their seat in oil distributing plate.
- 14 Place ball of 5.5 mm dia. (39) and ball of 5.5 mm dia. (40) into their countersunk seats.

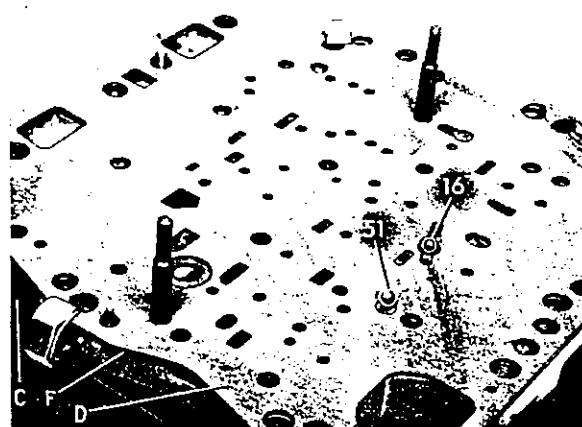


- 15 Place intermediate plate (F) with gasket (D) on oil distributing plate and clamp down with holding clip.

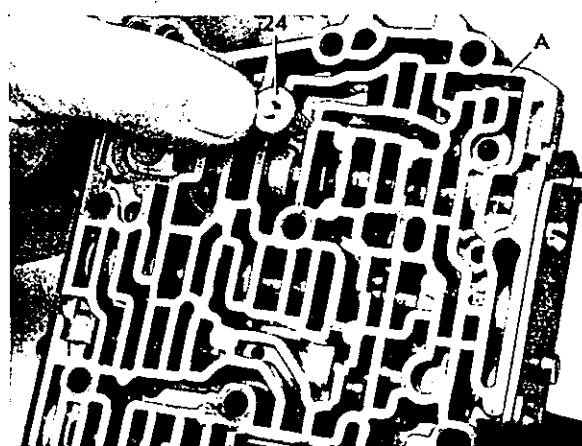
Attention!

Upon clamping of gasket and intermediate plate, check spring-loaded valve for easy operation by pushing down. Valve discs should not be clamped in between oil distributor plate and intermediate plate.

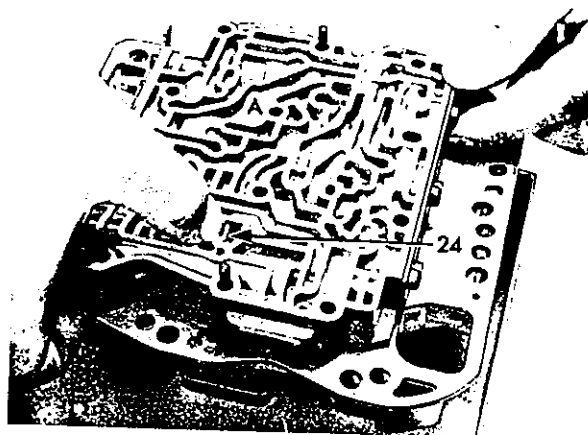
- 16 Place two balls of 5.5 mm dia. (16 and 51) on intermediate plate (F).



- 17 Insert check valve primary pump (24) with spring from below into shift valve housing bottom.



18 Cant valve stem projecting at top by applying lateral pressure. Place bottom (A) on oil distributor plate and release valve stem; valve should audibly knock against intermediate plate.



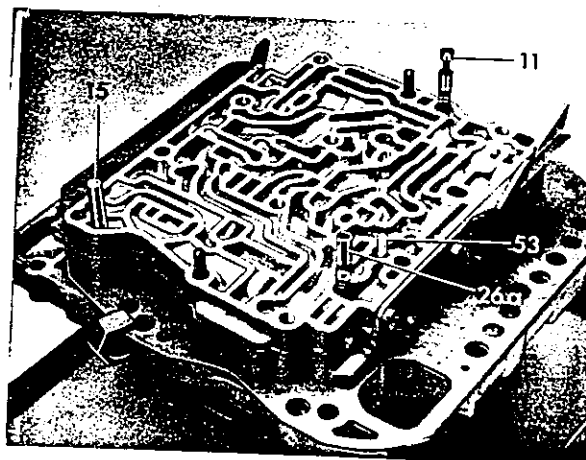
19 Insert piston brake shift 4-3 (15), as well as detent shift K 2 (26a) with spring, shift valve releasing end B 2 (11) with spring and plastic pin (53).

Attention!

The three compression springs of releasing valve B 2 (11), of detent valve K 2 (26a) and filter (50 in illustration item 22) are similar. The compression springs of modulating pressure valve (34 in illustration item 22) exert more pressure.

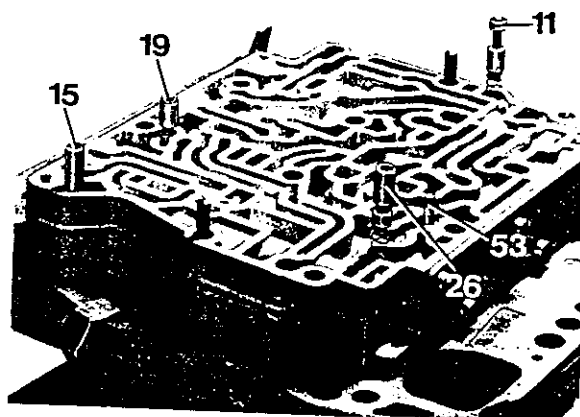
Spring of item 34 = 0.6 mm wire dia.

Spring of item 11, 26a and 50 = 0.45 mm wire dia.

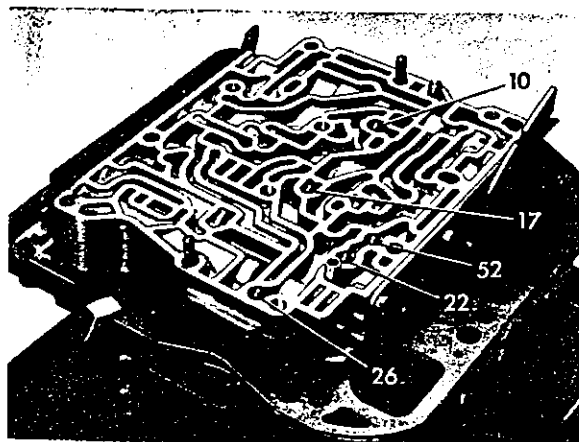


Transmission 722.112 (J) (USA) starting 1977

Insert detent valve (19).



20 Place five balls of 5.5 mm dia. (10, 17, 22, 26 and 51) into countersunk seats.

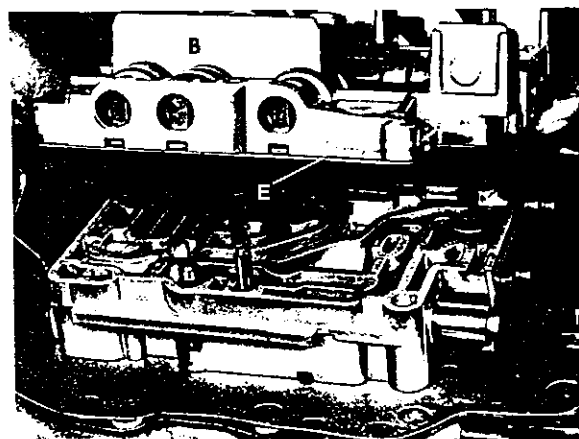


21 Insert ball of 7 mm dia. (27) of one-way throttle valve K 1, ball of 7 mm dia. (31) of one-way throttle valve K 2, ball of 5.5 mm dia. (34) with spring, as well as filter (50) with spring into top (B).



22 Place intermediate plate on top, making sure of correct seat of spring-loaded ball (34) and filter (50).

23 Hold intermediate plate (E) and top (B) tightly together, turn around and place on bottom.



24 Insert two opposite bolts and tighten slightly.

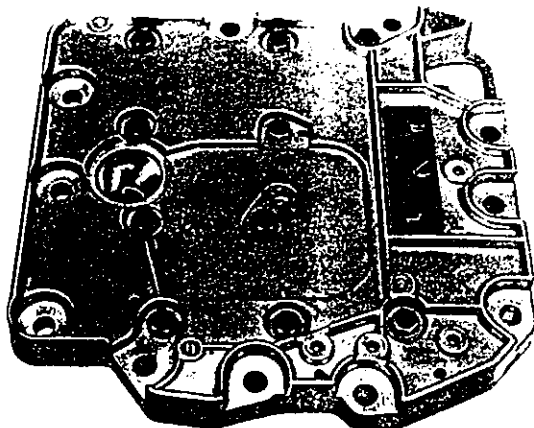
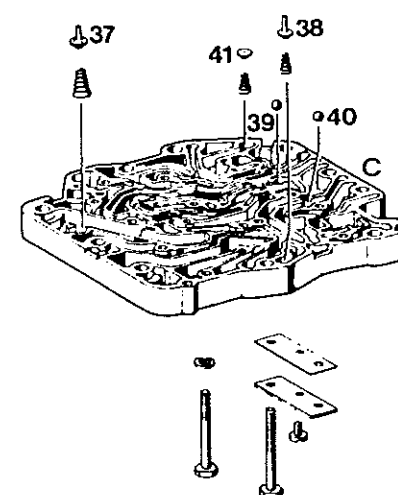
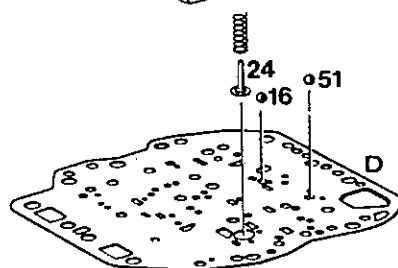
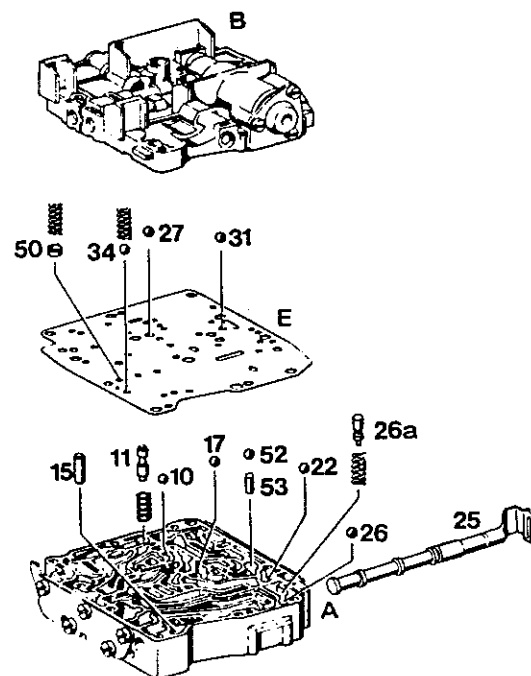
All shift valve housings, except those for transmission 722.112 (J) (USA) starting 1977.

- A Shift valve housing bottom
- B Shift valve housing top
- C Oil distributing plate
- D Gasket
- E Small intermediate plate
- F Large intermediate plate
- 10 Two-way ball valve
- 11 Shift valve releasing end B 2
- 15 Piston brake shift 4-3
- 16 Check ball valve
- 17 Three-throttle ball valve
- 22 Two-way ball valve
- 24 Check valve primary pump
- 25 Range selector valve
- 26 Two-way ball valve
- 26a Detent valve K 2
- 27 One-way throttle valve K 1
- 31 One-way throttle valve K 2
- 34 Pressure relief valve modulating pressure
- 37 Lube pressure valve
- 38 One-way throttle valve B 3
- 39 Two-way ball valve
- 40 Two-way ball valve
- 41 One-way throttle valve B 2
- 50 Filter
- 51 Ball valve
- 52 Ball valve
- 53 Plastic pin

25 Remove shift valve housing from assembly fixture, insert remaining bolts and tighten to 8 Nm (0.8 kpm) from inside out.

Attention!

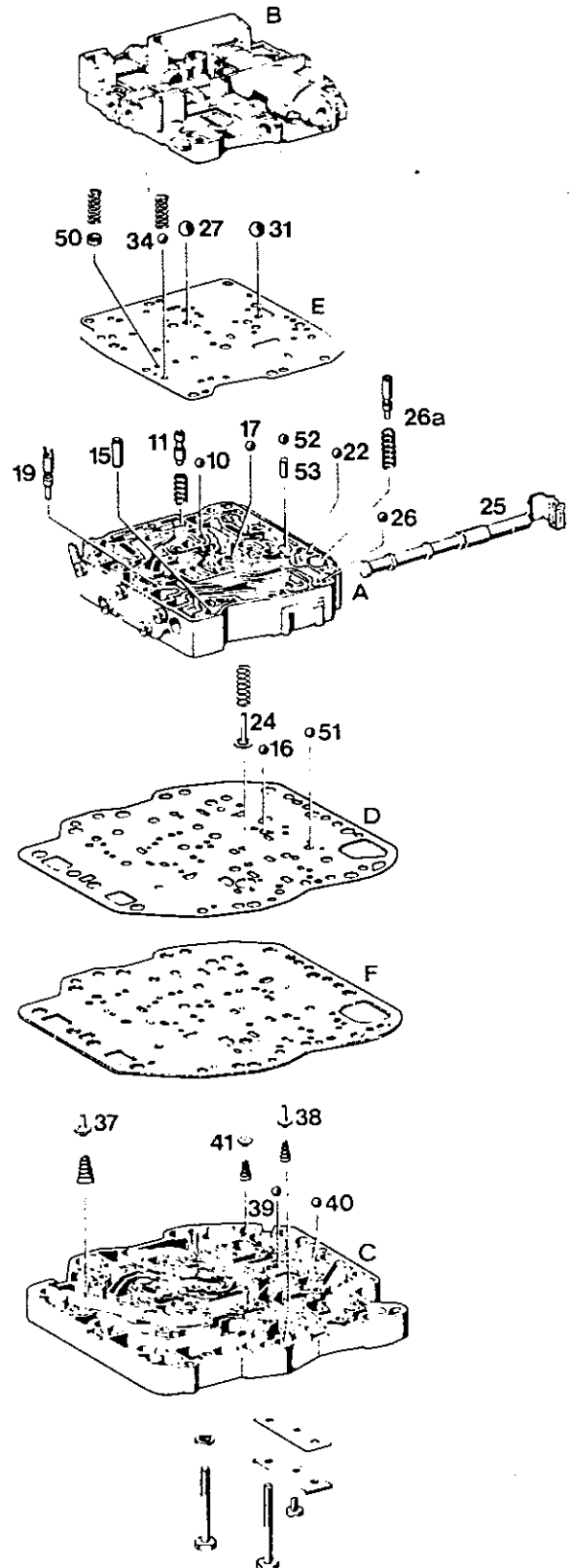
Two hex bolts are longer; they are used to screw cover plate down.

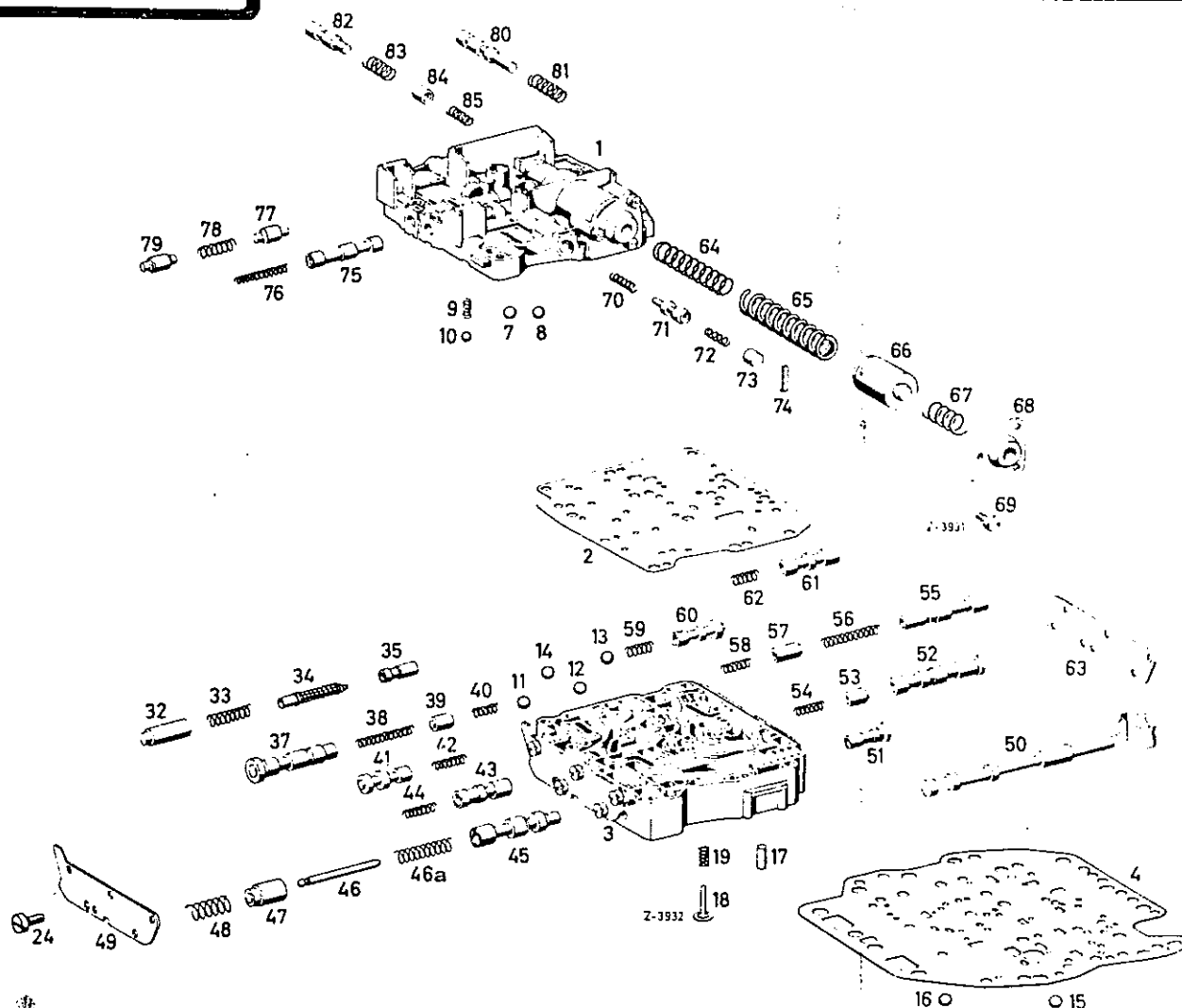


Shift valve housing for transmission 722.112

(J) (USA) starting 1977.

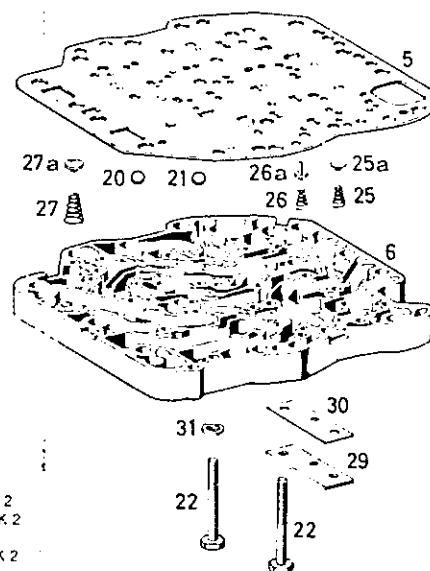
- A Shift valve housing bottom
- B Shift valve housing top
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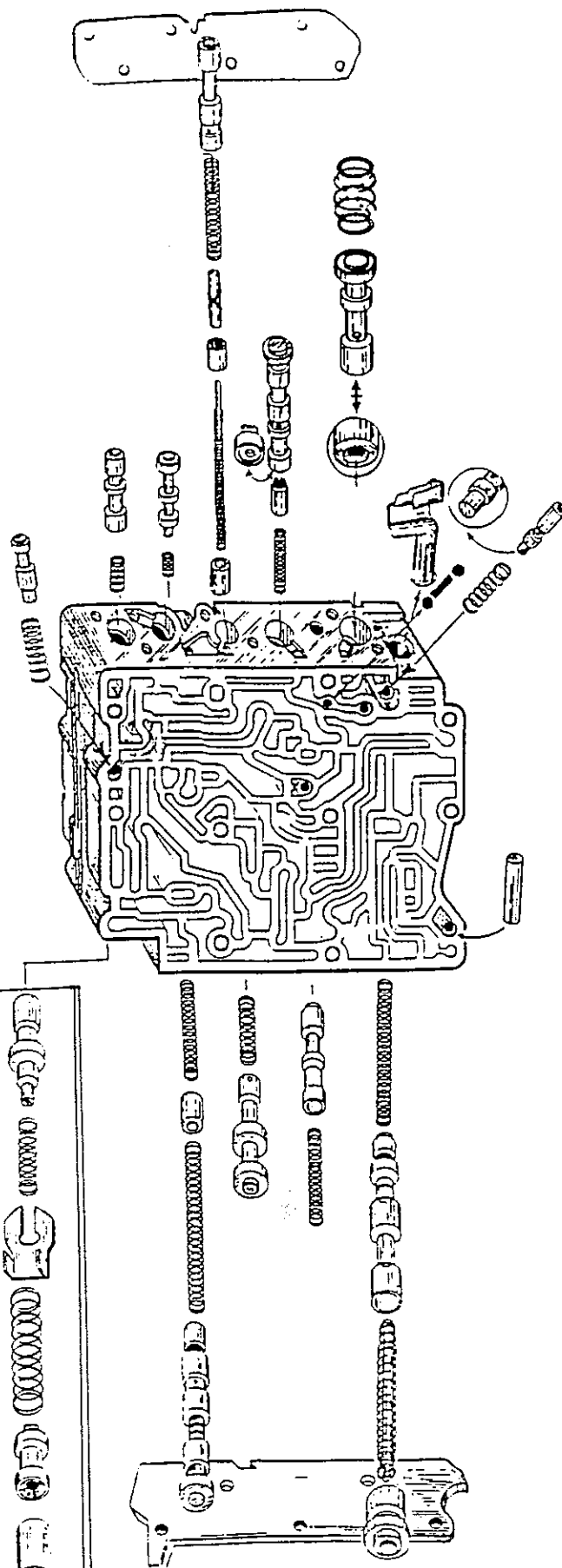
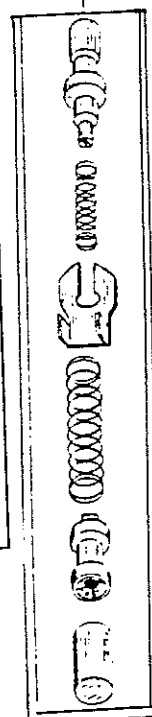


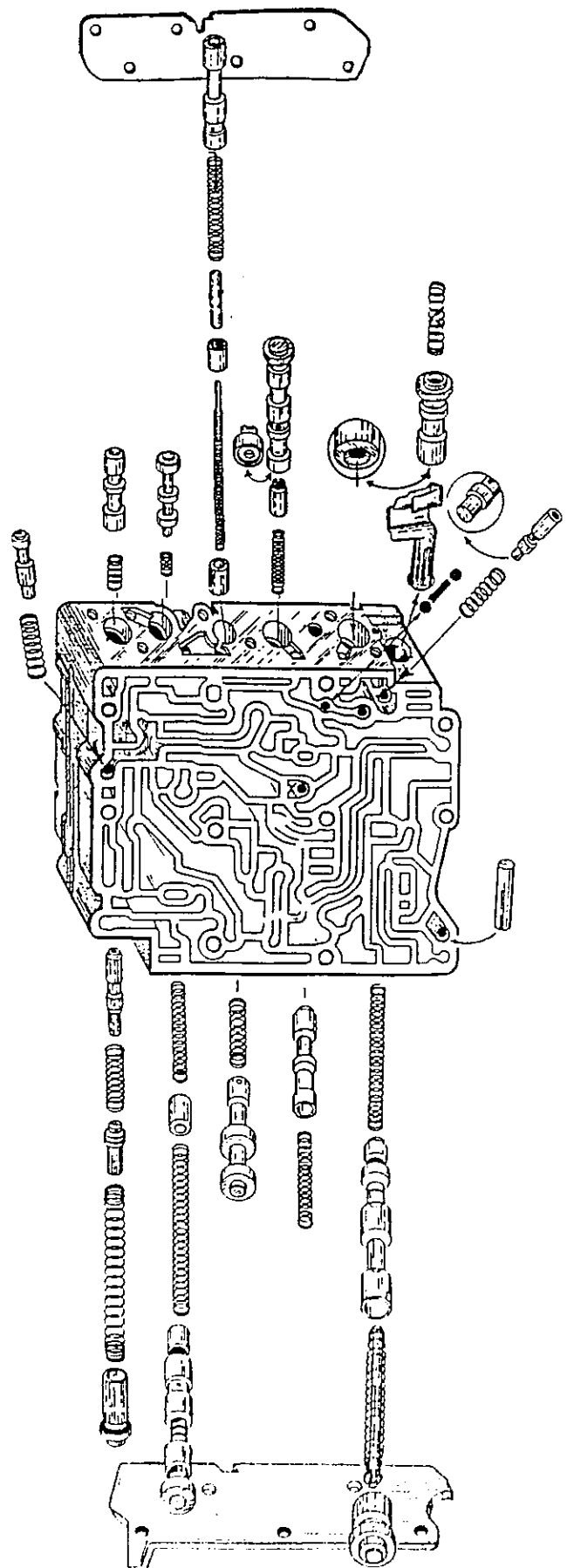
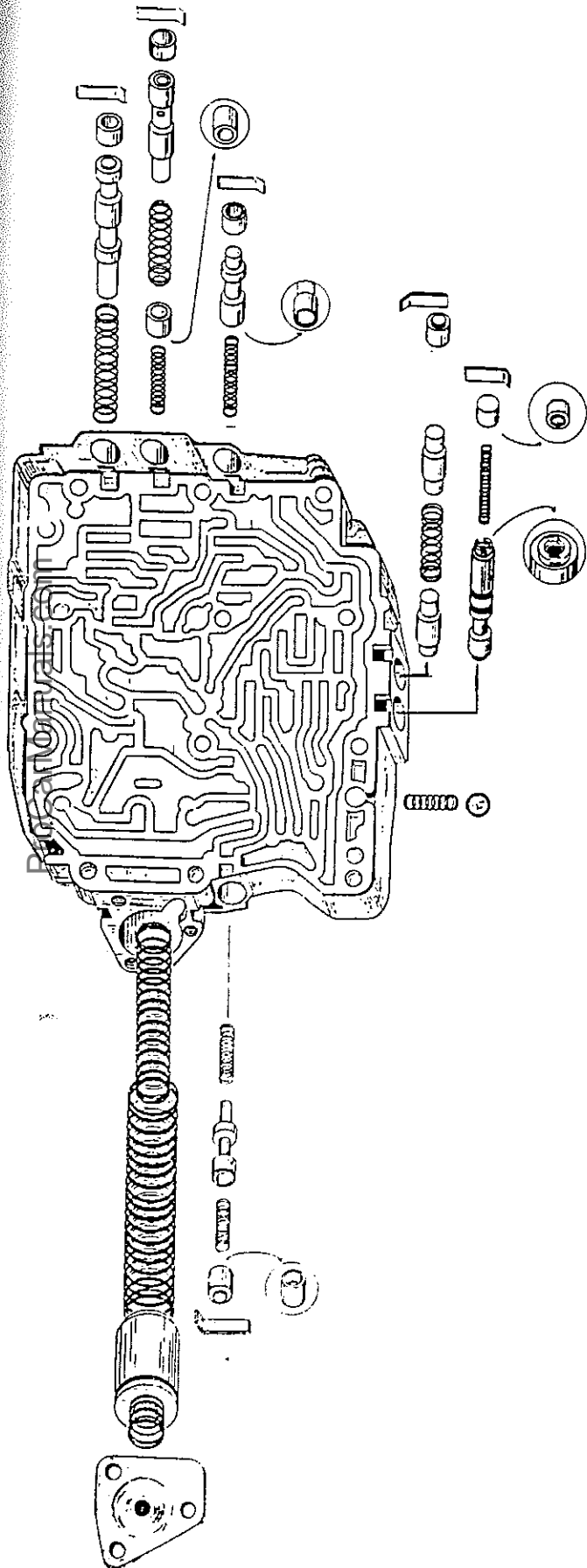
Valve Body

- | | |
|--|---|
| 1 Upper body | 40 Piston spring, return shift 3-2 |
| 2 Small intermediate plate | 41 Shift valve B 1 |
| 3 Lower body | 42 Spring, shift valve B 1 |
| 4 Gasket | 43 Shift valve, brake downshift 3-2 |
| 5 Large intermediate plate | 44 Shift valve spring, brake downshift 3-2 |
| 6 Oil distributor plate | 45 Working pressure regulating valve |
| 7 Ball, 7.0 mm dia., of one-way throttle valve K 1 | 46 Spring, working pressure regulating valve |
| 8 Ball, 7.0 mm dia., of one-way throttle valve K 2 | 47 Sleeve, working pressure regulating valve |
| 9 Ball, 5.5 mm dia., of modulating pressure relief valve | 48 Spring, working pressure regulating valve |
| 10 Spring | 49 End plate |
| 11 Ball, 5.5 mm dia., of two-way ball valve | 50 Range selector valve |
| 12 Ball, 5.5 mm dia., of two-way ball valve | 51 Booster valve, governor pressure |
| 13 Ball, 5.5 mm dia., of two-way ball valve | 52 Command valve 1-2 |
| 14 Ball, 5.5 mm dia., of two-way ball valve | 53 Piston, downshift 2-1 |
| 15 Ball, 5.5 mm dia. | 54 Piston spring, downshift 2-1 |
| 16 Ball, 5.5 mm dia. | 55 Command valve 3-4 |
| 17 Piston, brake downshift 4-3 | 56 Spring, command valve 3-4 |
| 18 Primary pump check valve | 57 Piston, downshift 4-3 |
| 19 Primary pump spring-loaded check valve | 58 Piston spring, downshift 4-3 |
| 20 Ball, 5.5 mm dia. | 59 Shift valve B 2 |
| 21 Ball, 5.5 mm dia. | 60 Spring, shift valve B 2 |
| 22 Hex. hd. bolts | 61 Release valve B 2 |
| 23 Cylindrical hd. bolts | 62 Spring, release valve B 2 |
| 24 Spring, one-way throttle valve B 2 | 63 End plate |
| 25a Lubricating pressure valve | 64 Weak spring, pressure absorber B 1, K 1, K 2 |
| 26 Spring, one-way throttle valve B 3 | 65 Strong spring, pressure absorber B 1, K 1, K 2 |
| 27 One-way throttle valve B 3 | 66 Piston, pressure absorber B 1, K 1, K 2 |
| 27a Spring, lubricating pressure valve | 67 Piston spring, pressure absorber B 1, K 1, K 2 |
| 27a One-way throttle valve B 2 | 68 End plate |
| 29 Cover plate | 69 Cylindrical hd. screw |
| 30 Gasket | 70 Pressure absorber spring regulating valve |
| 31 Spring washer | 71 Pressure absorber, regulating valve |
| 32 Control pressure sleeve | 72 Pressure absorber spring, regulating valve |
| 33 Weak spring, control pressure | 73 Spring guide |
| 34 Spring guide, control pressure | 74 End plate |
| 35 Control pressure regulating valve | 75 Idle shift valve |
| 37 Command valve 2-3 | 76 Spring, idle shift valve |
| 38 Spring, command valve 2-3 | 77 Kickdown regulating valve |
| 39 Piston downshift 3-2 | 78 Spring, kickdown regulating valve |



- | |
|---------------------------------|
| 79 Kickdown regulating valve |
| 80 Shift valve, upshift |
| 81 Shift valve spring, upshift |
| 82 Regulating valve B 1 |
| 83 Spring, regulating valve B 1 |
| 84 Piston, regulating valve B 1 |
| 85 Spring, regulating valve B 1 |





Mercedes 722.1-722.2

COMPLAINT: No Forward / slipping in Drive
Coast downshift clunk or bump.
Delayed engagement in Drive.

CAUSE: Broken plastic cap on servo piston.
Improper installation of spring seat.
Improper installation of servo piston spring.

CORRECTION: Be sure to have exhaust valve line-up as shown in Figure 1.
Be sure to install spring line-up as shown and spring seat installed as shown in Figure 1
Be sure that plastic cap is seated on servo piston as shown in Figure 1 and the spring line up on piston as shown in Figure 2
spring is seated on TOP of servo piston NOT on bottom.

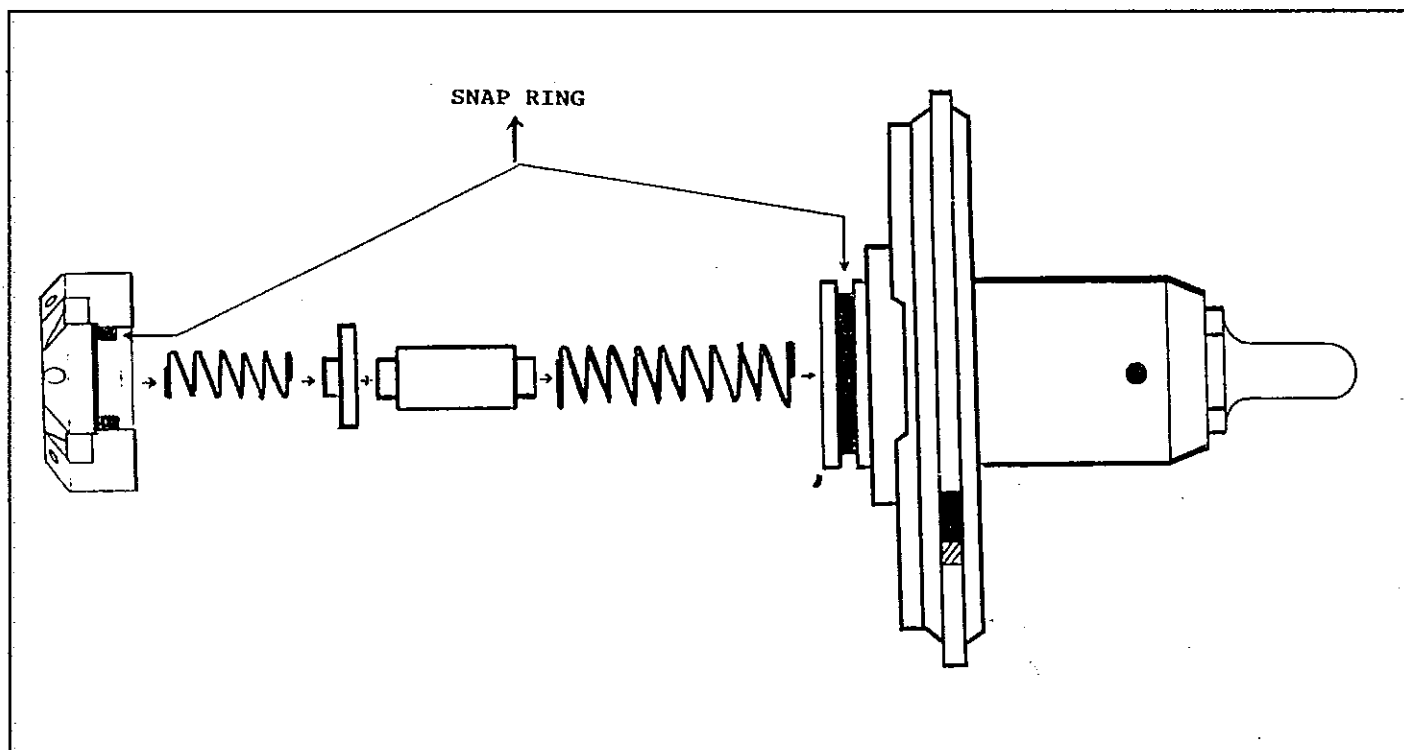
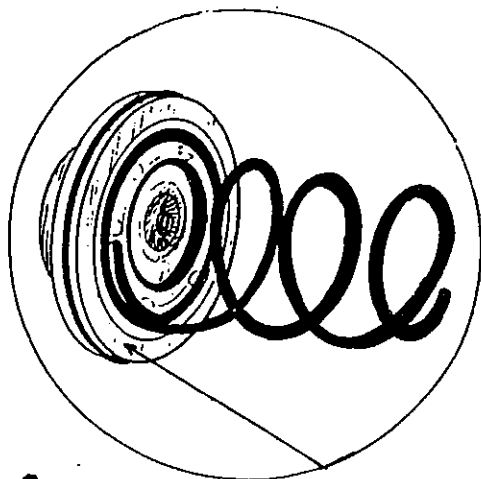


Figure 1



TECHNICAL SERVICE INFORMATION

Mercedes 722.1- 722.2



NOTE:

This illustration shows the correct installation of the servo spring. It must be placed on TOP of the servo piston and against the cover.

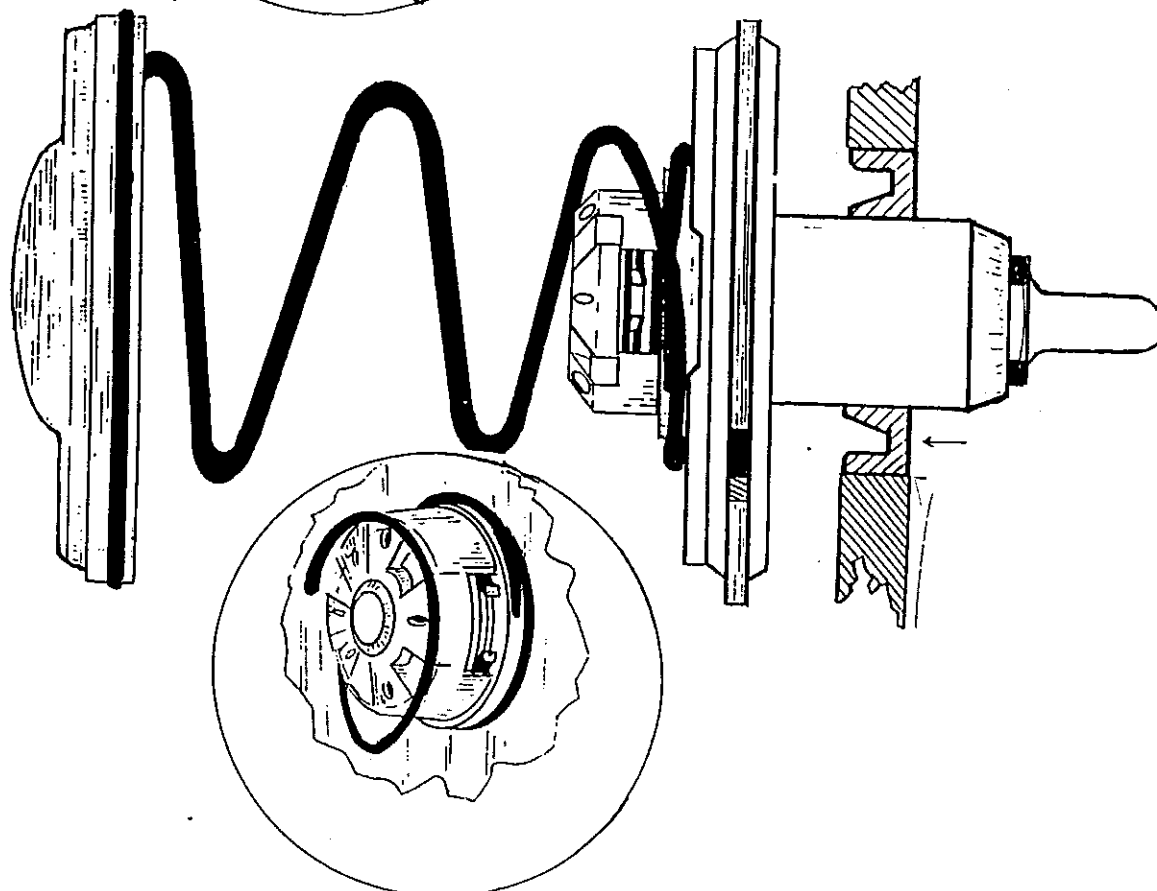


Figure 2



TECHNICAL SERVICE INFORMATION

Mercedes 722.1- 722.2

COMPLAINT: Slipping on 3-4 shift on 4 speed units or no 3-4 shift.

CAUSE: Orifice in servo bore falls out of case servo bore see Figure 3.

CORRECTION: Install a 1/16" cup plug and drill a .040 hole in cup plug.

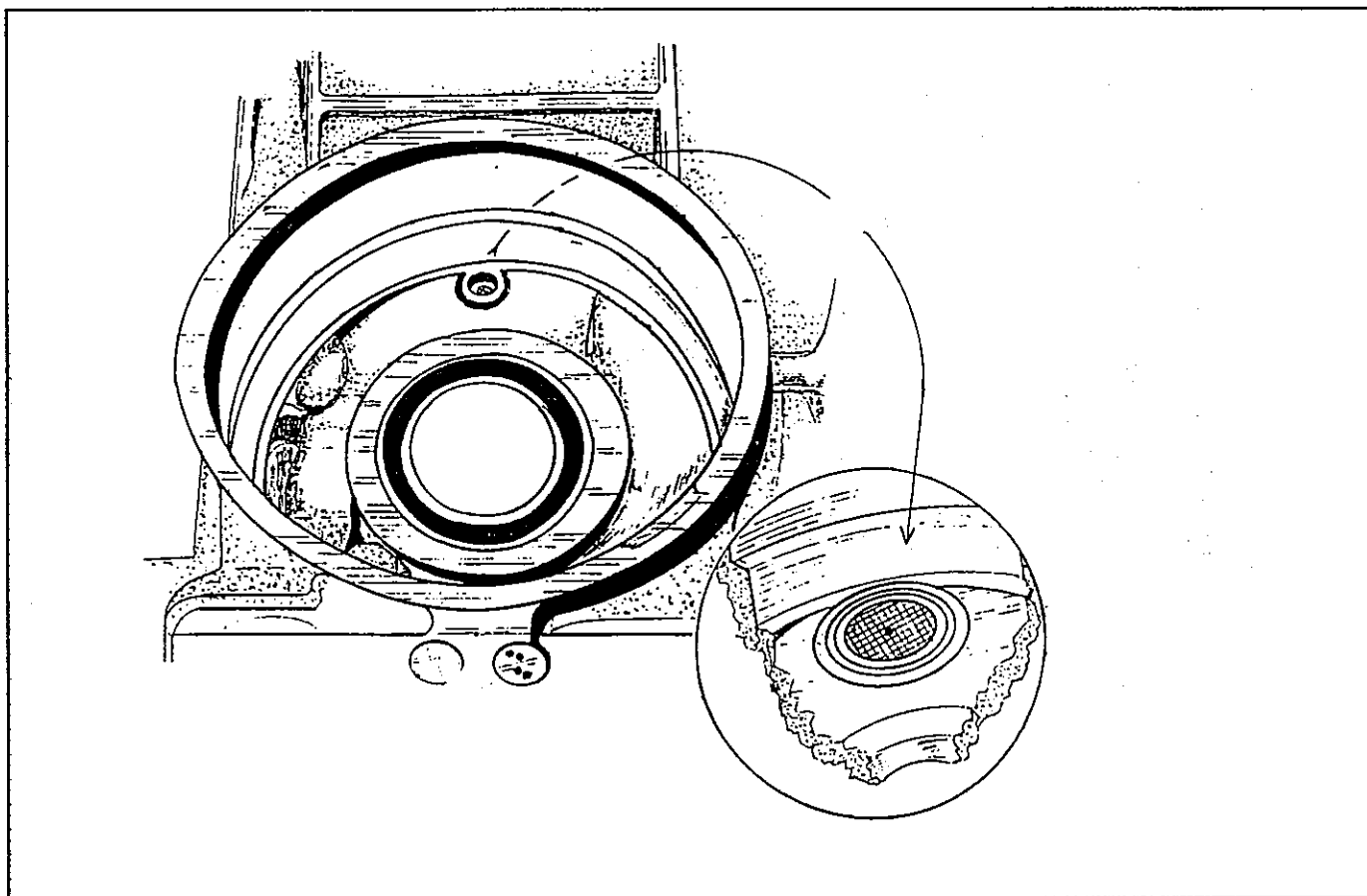


Figure 3



TECHNICAL SERVICE INFORMATION

Mercedes 722.1- 722.2

IMPROVE 1-2 UPSHIFT

Be sure to determine if the plate pertains to a vehicle with a 4 or 5 cylinder engine. Due to the difference in diameters and hole locations in plate. Enlarge hole shown by arrow in large separator plate to a diameter of 3mm or .120" or use a # 31 drill bit. Figure 4 illustrates both the 4 and 5 cylinder engines.

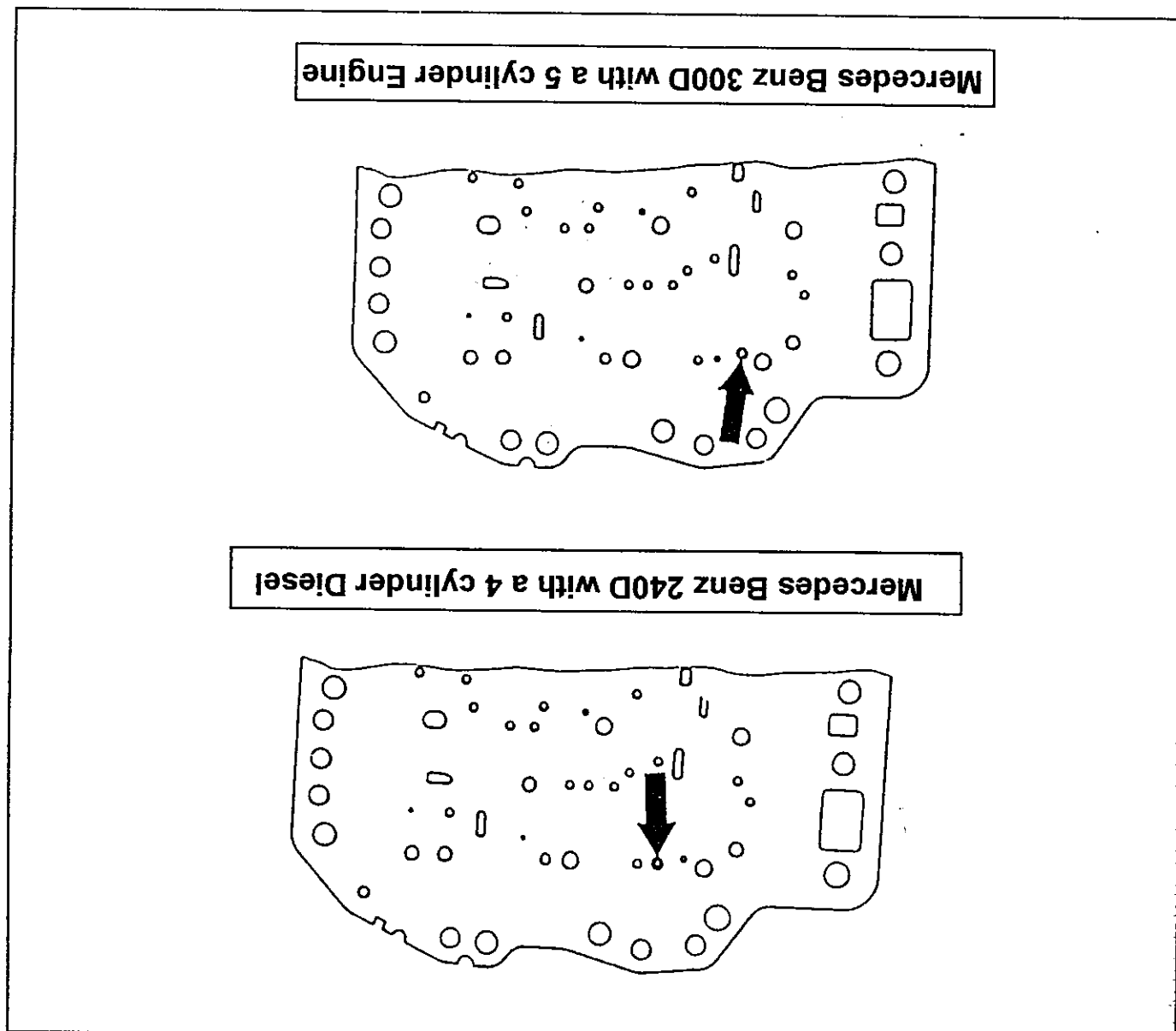


Figure 4

Mercedes 722.1- 722.2

Rear Seal Leak or Rear Seal Blows Out

- COMPLAINT:** After overhaul, the transmission may experience chronic rear seal leaks or rear seal blow outs.
- CAUSE:** Incorrect assembly of the rear (secondary) pump in the extension housing allowing exhaust pressure from the pump to pressurize the back side of the seal.
- CORRECTION:** Install the secondary rear pump with the slot facing towards the front of the transmission and not towards the back (See Figure 1). There is also another style pump where there are two holes on one side of the shaft with a slot on the opposite side. This style should have the slot towards the back with the two holes towards the front of the transmission (See Figure 1). Be sure to use the bottom hole for the anchor bolt. If the top hole is used, the roller on the pump will be destroyed. This style secondary rear pump with two holes will only fit in an extension housing with casting number 115 270 5811. The design with the slot and hole will NOT fit properly in this extension housing as the anchor bolt hole will not line up with the hole in the casting.

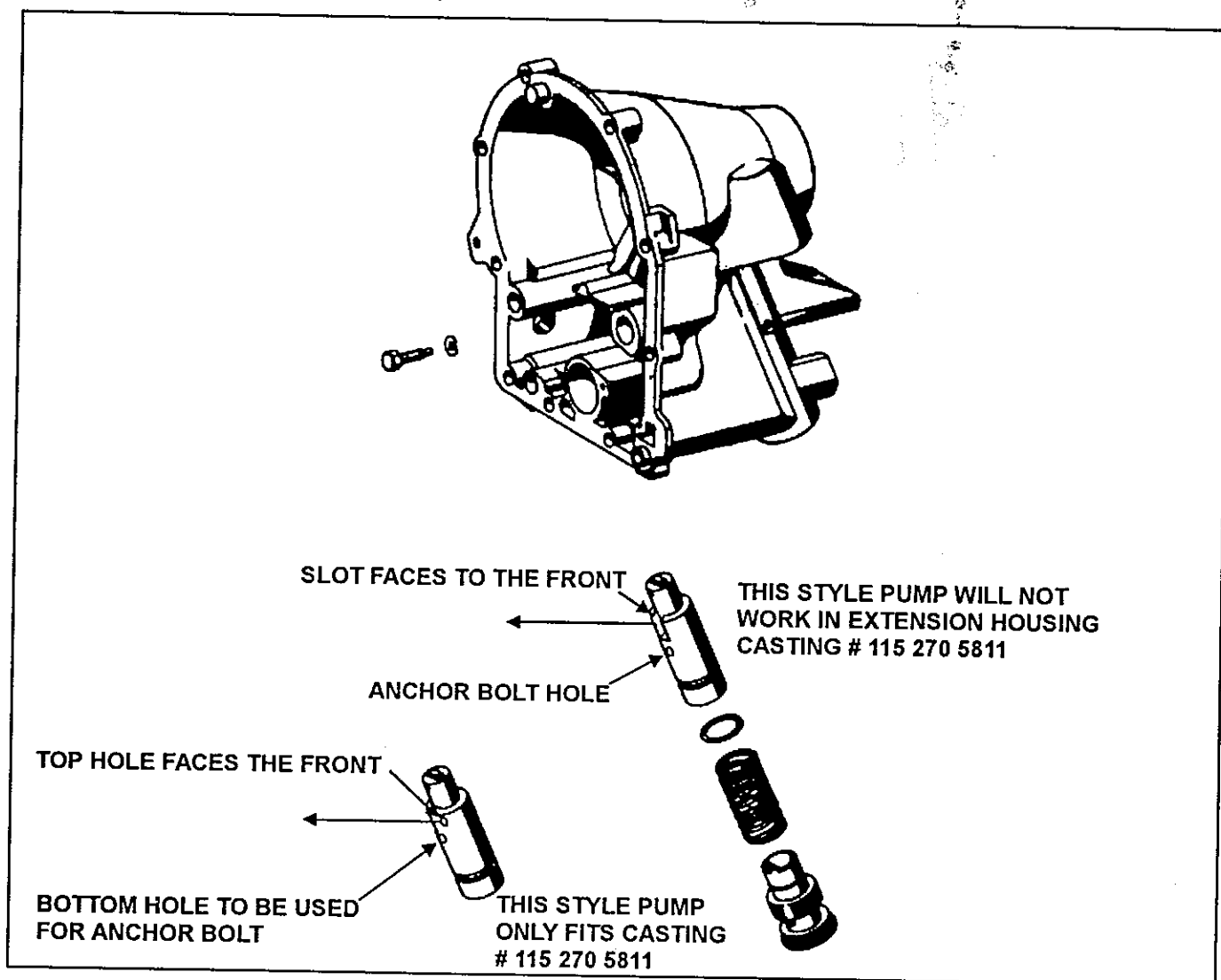


Figure 1