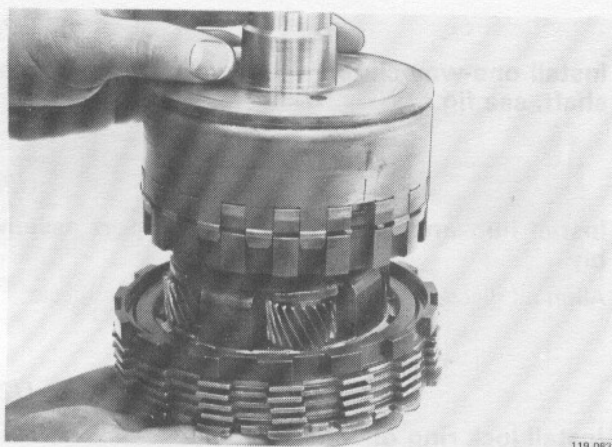
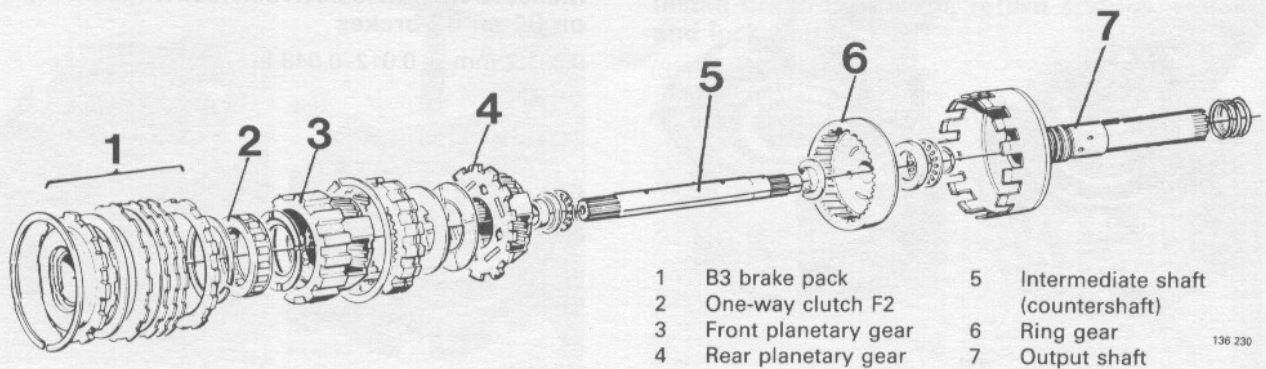


V. Planetary gear assembly

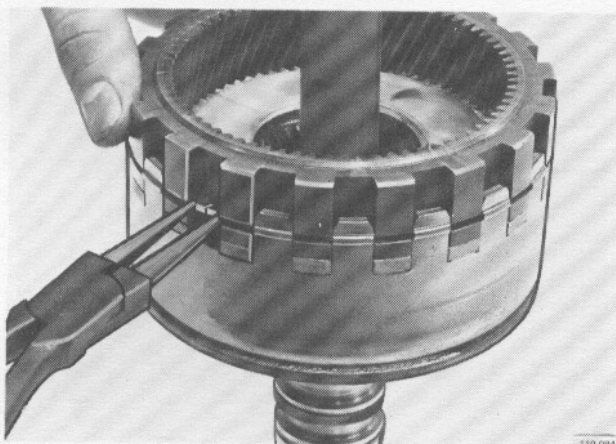


To disassemble

V1

Remove B3 brake discs, one-way clutch F2 and front planetary gear

Place complete planetary gear assembly on intermediate shaft as illustrated and ease off brake pack and front planetary gear assembly.



V2

Remove front ring gear

Place ring gear on output shaft.

Compress lock ring to release front ring gear.

Lift off front gear.

V3

Remove thrust washers from rear planetary gear

(Washer (1) may remain fixed to front planetary gear.)

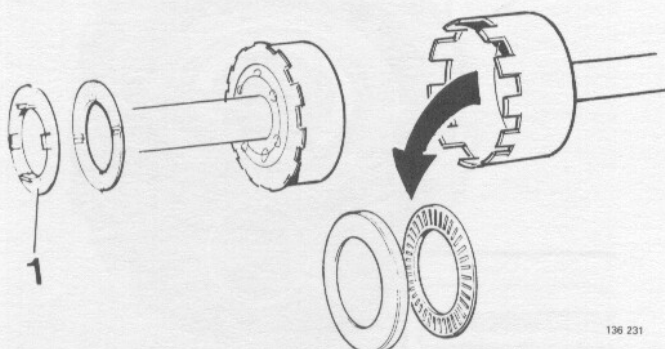
V4

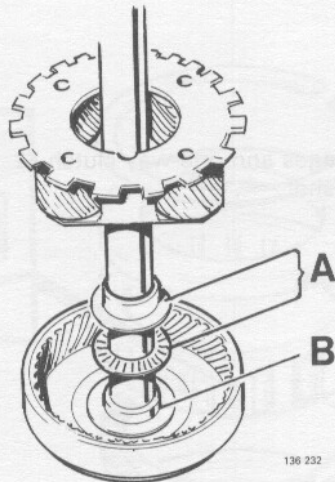
Separate input and output shafts

Place planetary gear to one side and pull intermediate shaft in direction shown.

V5

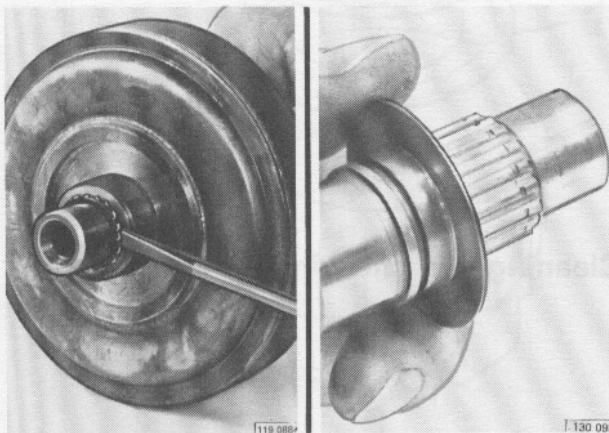
Remove bearing race and needle bearing from output shaft





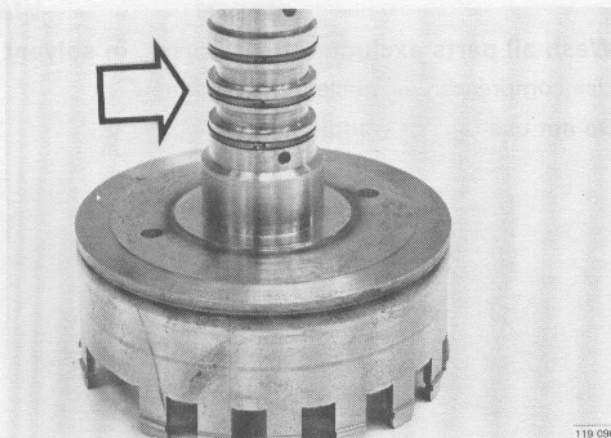
V6
Separate rear planetary gear assembly on rear ring gear

V7
(A) Remove bearing washer and needle bearing

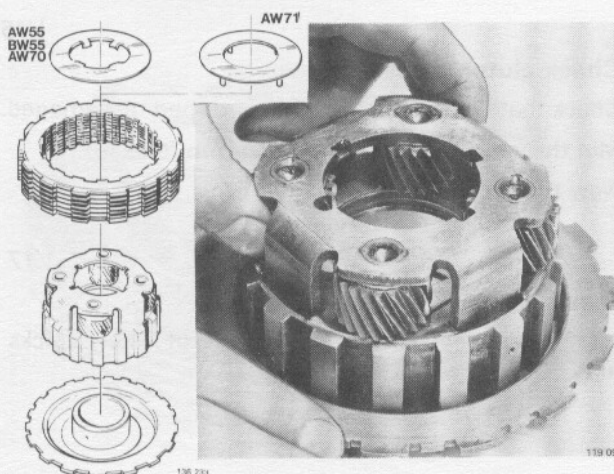


V8
Remove rear ring gear
Unclip lock ring with a screwdriver.

V9
Remove rear bearing race (B) from intermediate shaft



V10
Remove oil sealing rings (3x) from output shaft
Unclip rings and lift off hub.

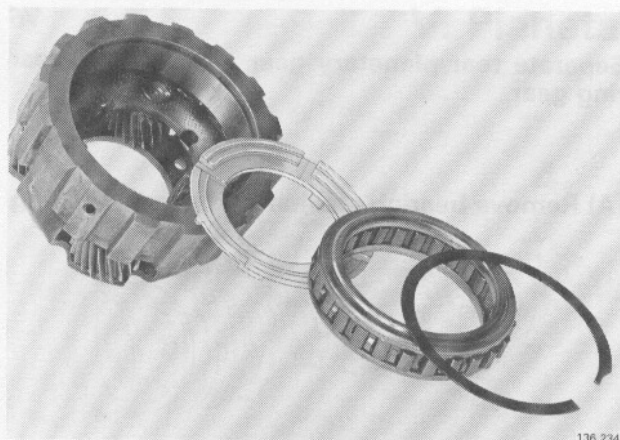


V11
Remove thrust washer from front planetary gear carrier
(See V3)

V12
Remove brake pack

V13
Detach front planetary gear carrier from brake pack thrust/reaction plate
Ease off planetary gear carrier from plate.

Planetary gear assembly

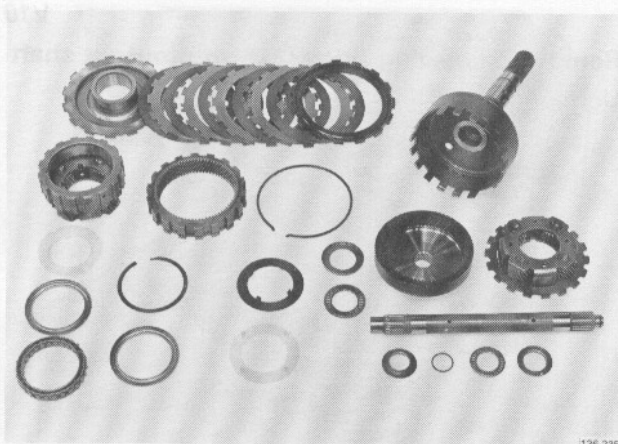


Remove:

- lock ring
- bearing cages and one-way clutch F2
- thrust washer.

V14

Cleaning and checking

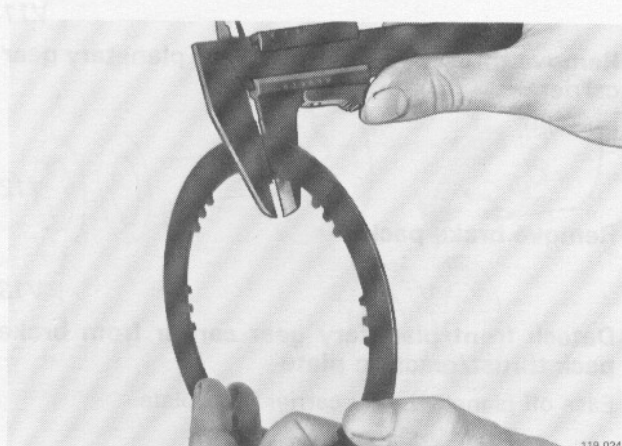


V15

Wash all parts excluding brake discs, in solvent

Use compressed air to clean/dry channels.

Do **not** use rags or wadding.



V16

Check clutch discs

Check that discs are flat and not warped or damaged.

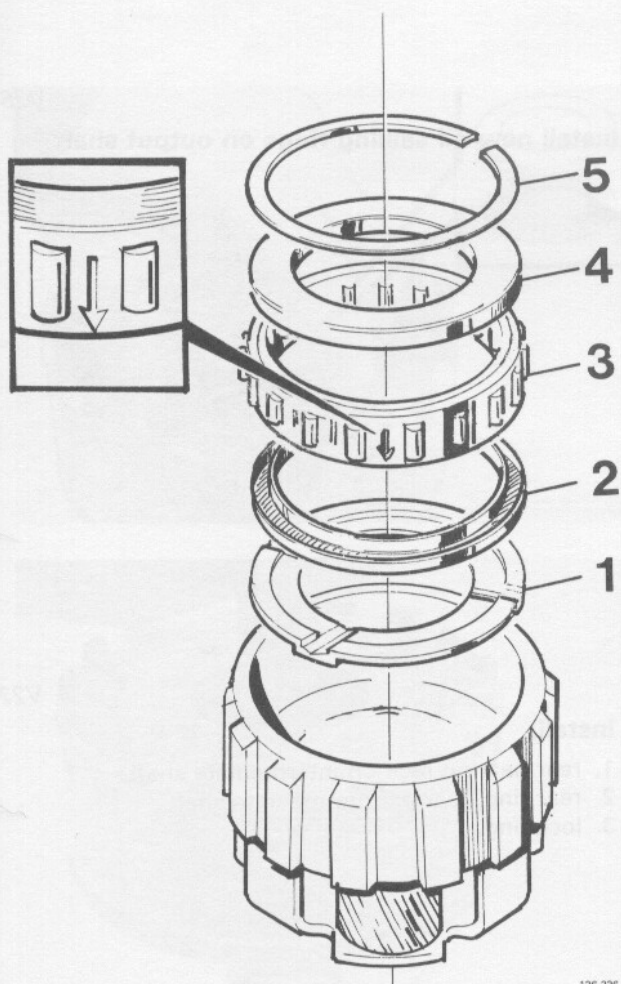
Min thickness, friction disc = 2.1 mm (0.83 in)

New thickness = 2.3 mm = (0.91 in)

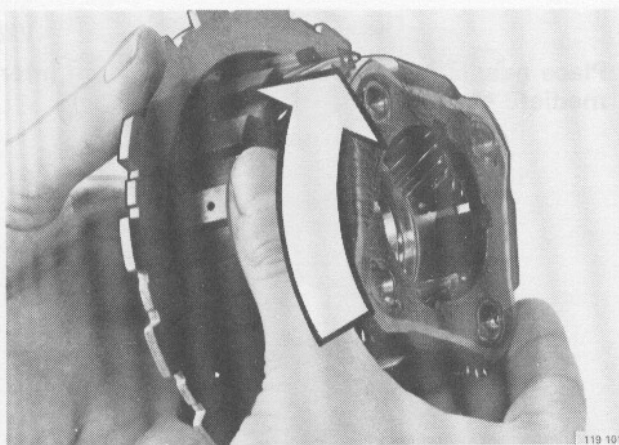
V17

Check parts

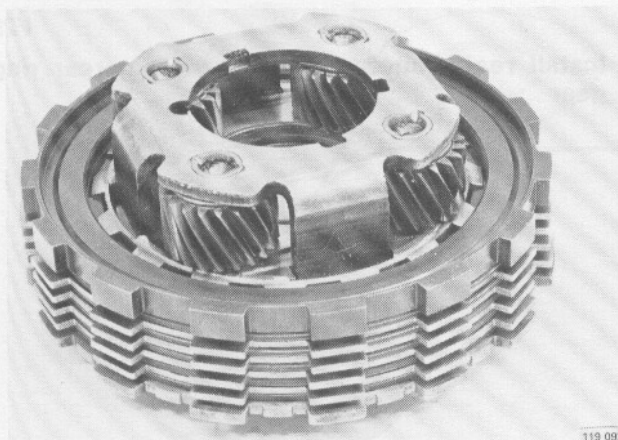
Carefully inspect all parts for signs of wear, cracks etc.



136 236



119 101



119 092

To assemble

V18

Smear all moving parts in ATF

New discs should be soaked in ATF prior to installing.

V19

Install thrust washer (1)

AW71: Nylon washer

Install with lugs facing down. Make sure that lugs fit correctly in planetary gear carrier (washer can only be fitted on one way).

V20

Install lower bearing cage (2)

V21

Install one-way clutch (3)

Press one-way clutch into position with hand. Arrow on outside of clutch must point down (i.e. flange side up).

V22

Install upper bearing cage (4) and lock ring (5)

Make sure that lock ring fits correctly in groove.

V23

Assemble brake pack reaction plate to front planetary gear carrier.

V24

Check one-way clutch

Hold clutch as illustrated. It should be possible to turn front planetary gear anti-(counter)clockwise but not clockwise (i.e. in direction of arrow).

One-way clutch must not bind or be loose.

V25

Place B3 brake pack on front planetary gear carrier

First place one lined disc on top of reaction plate. Then alternate with unlined and lined discs. Thrust disc should be outermost.

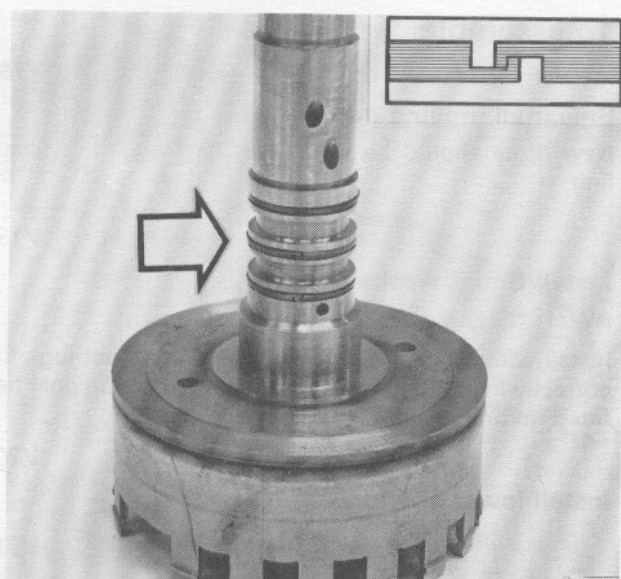
BW55

Improved friction material on B3 brake introduced with effect from:

Serial number	Transmission code	Serial number	Transmission code
1305-	013	7837-	018
6954-	014	2141-	019
3532-	016	1001-	020
1162-	016	1265-	022
1134-	017	1034-	023

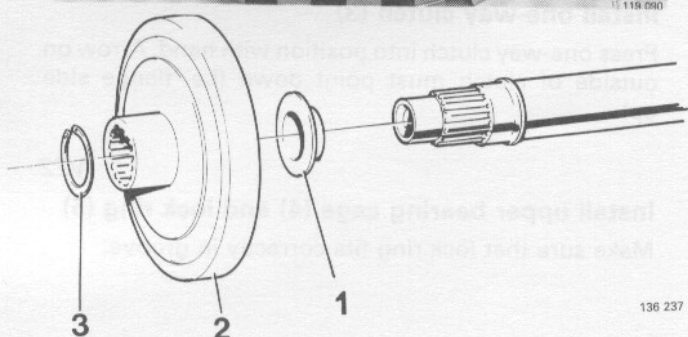
Note! Friction material is intended for brake discs and must not be used for clutches.

Planetary gear assembly



V26

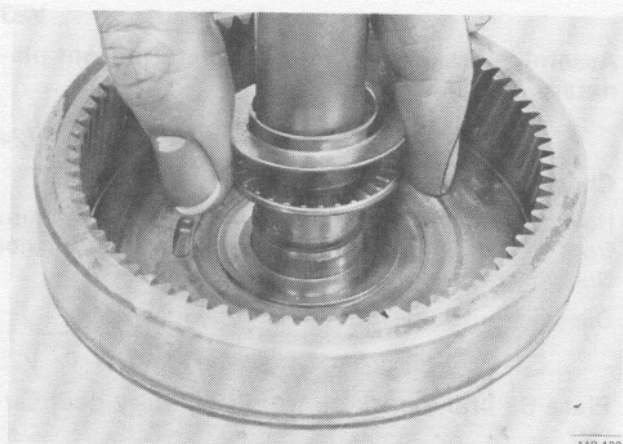
Install new oil sealing rings on output shaft



V27

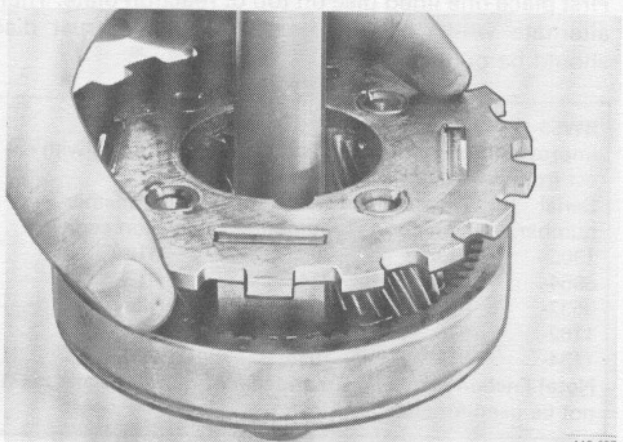
Install:

1. rear bearing race on intermediate shaft
2. rear ring gear on intermediate shaft
3. lock ring.



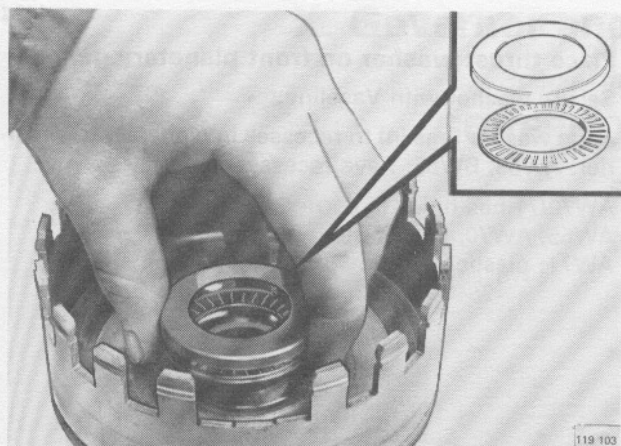
V28

Place needle bearing and bearing race on intermediate shaft



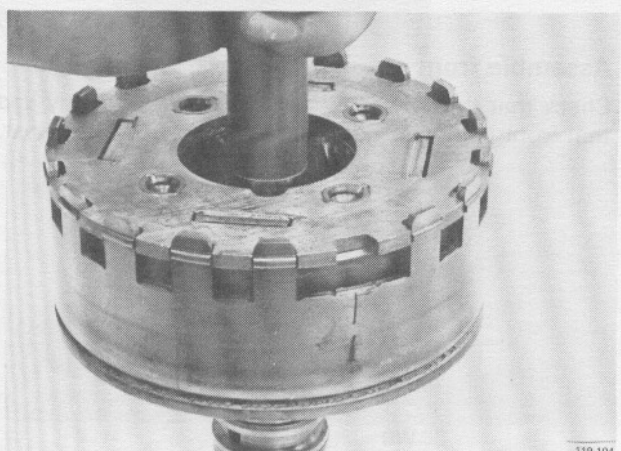
V29

Install rear planetary gear carrier in rear ring gear



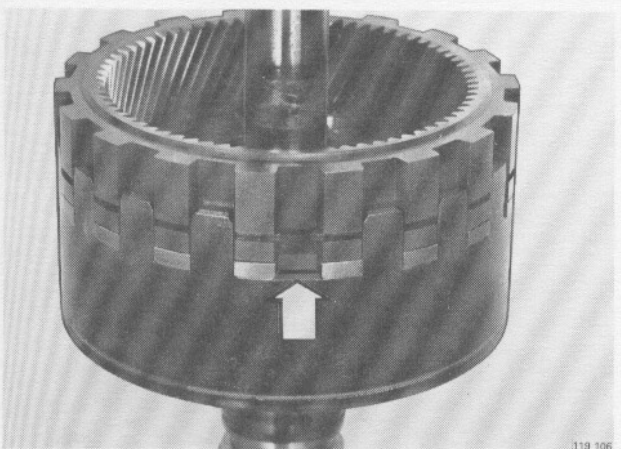
V30

Place needle bearing and bearing race on output shaft



V31

Assemble intermediate shaft to output shaft



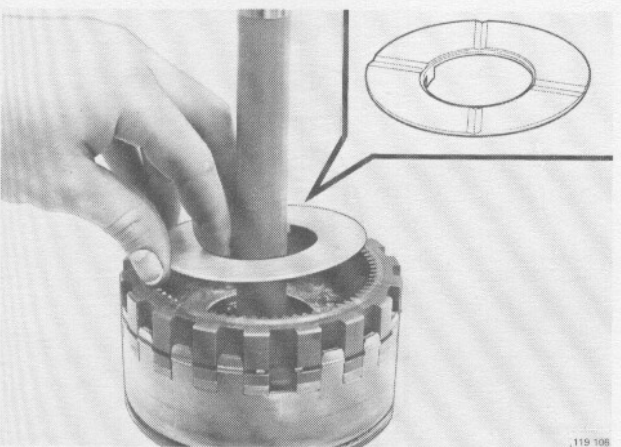
V32

Place front ring gear above rear ring gear

Position lock ring gap as illustrated (arrowed).

(i.e. where lug is missing). When lock ring is correctly

When lock ring is correctly installed, gap should be just as wide as cog recess on front ring gear.



V33

Install thrust washer on rear planetary gear

Align lugs on washer to rear planetary gear carrier.

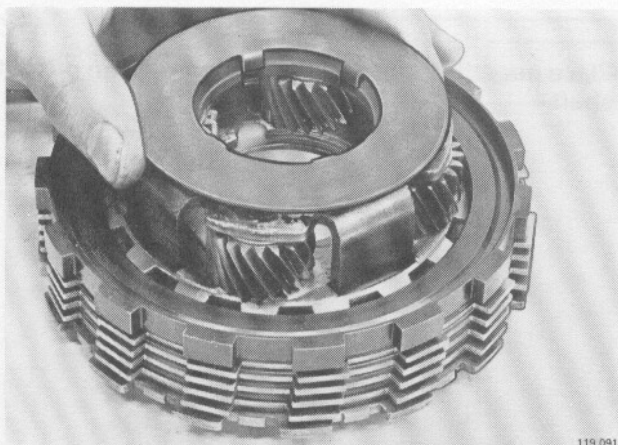
Note! type of washer varies with transmission:

AW55 and BW55 = two lugs

AW70 = 4 lugs

AW71 = 4 lugs

Planetary gear assembly



V34

Place thrust washer on front planetary gear

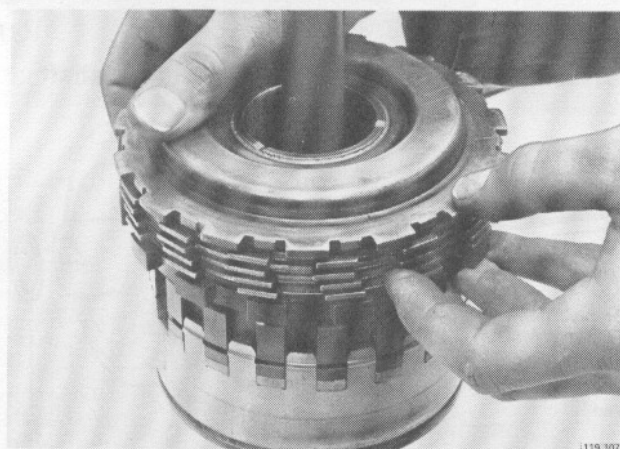
Secure washer with Vaseline.

Align washer lugs (4) to recesses in planetary gear carrier. AW55, BW55: have recesses in carrier

AW70/71 has holes in carrier.

AW55, AW70, BW55: steel washer

AW71: plastic washer.



V35

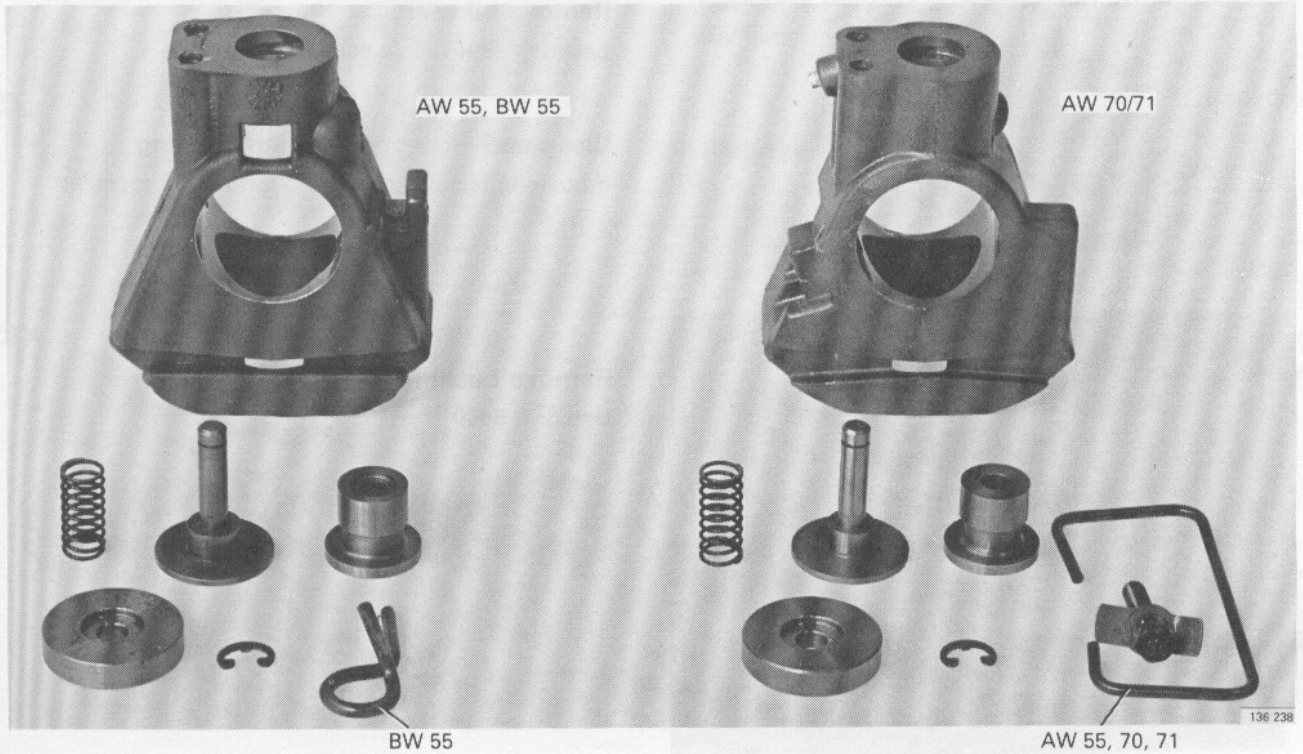
Assemble front and rear planetary gears

Check that thrust washers are installed correctly and that front planetary gear carrier fits in front ring gear.

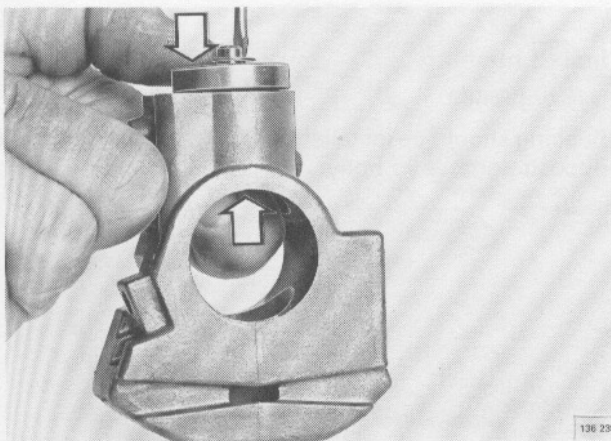
X. Governor and extension housing

Special tools: 5075, 5080

GOVERNOR – disassembly



X1



Remove:

- drive ring (clip)
- governor weight
- shaft
- governor
- spring

Cleaning and checking

X2

Clean all parts with unused solvent
Blow – clean/dry oil passages and parts.

X3

Carefully inspect all parts for scoring, cracks and signs of wear etc.

To assemble

X4

Smear all parts in ATF

X5

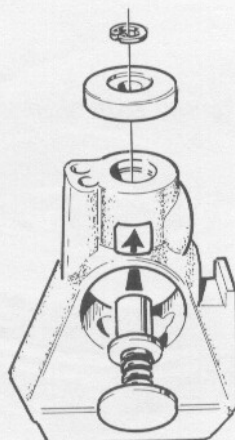
Install shaft, spring and governor in body

X6

Install weight and drive ring

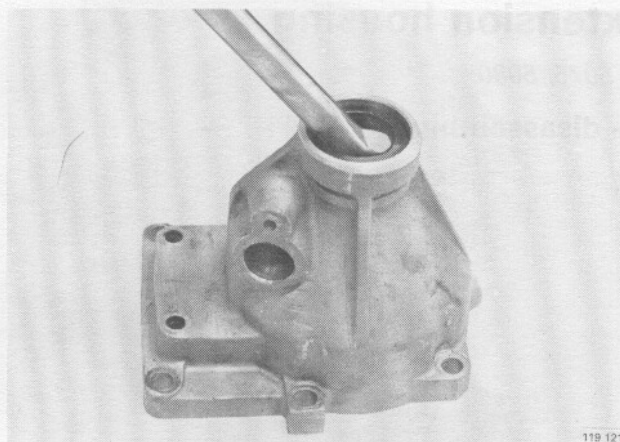
X7

Check that governor does not bind



134 197

Extension housing



EXTENSION HOUSING

Replacement of oil seal and bushing

X8

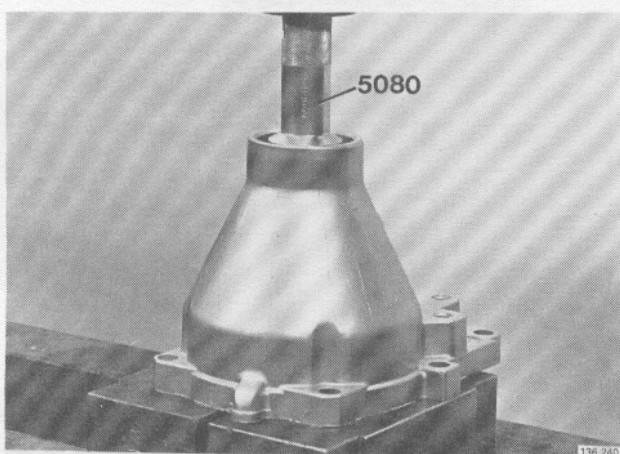
Remove oil seal

Ease out seal with a screwdriver.

X9

Clean and inspect extension housing

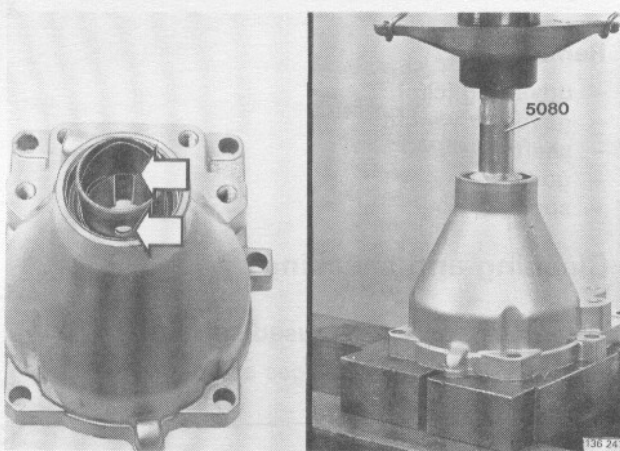
If bushing is worn or scored it must be replaced.



X10

Remove bushing

Use drift 5080.



X11

Install bushing

Use drift 5080.

Bushing should be installed as illustrated i.e. blind hole opposite groove in body.

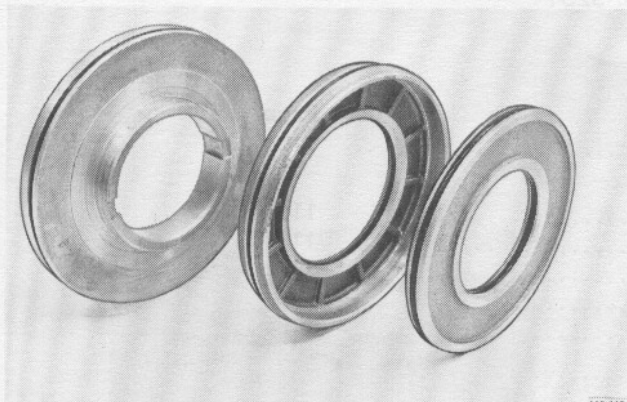


X12

Install oil seal

Attach new seal to drift 5075. Install seal in extension housing.

Y. B3 brake pistons



119 115

Y1

Separate pistons (3) from each other

(By hand)

Y2

Remove O-rings



119 116

Y3

Clean and check all parts

Wash parts in solvent.

Blow clean/dry with compressed air.

Do **not** use rags or wadding.

Check pistons and especially O-ring grooves for scoring, cracks, signs of wear etc.

Also check return springs and spring retainer for B3 brake piston.

Y4

Install new O-rings on pistons

Do **not** turn O-rings in grooves.

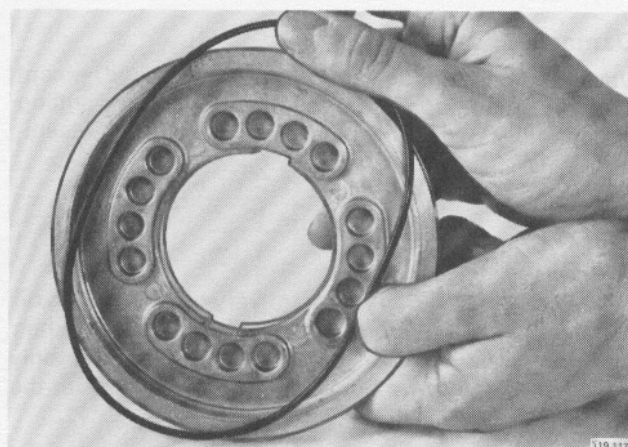
Y5

Smear all friction surfaces in ATF

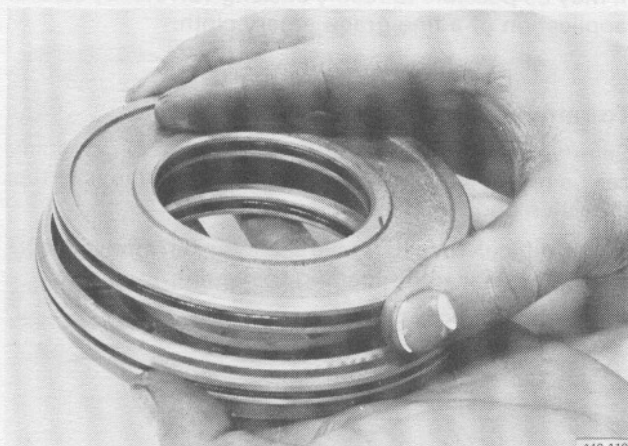
Y6

Assemble pistons

(By hand)



119 117



119 118

Z1-Z38 Valve bodies assembly

Special tool: 5231

	Page
General information.....	110
Disassembly:	
Valve body	110
Upper front valve body.....	113
Upper rear valve body	114
Lower valve body (AW55, BW55)	115
Lower valve body (AW70/71)	116
Cleaning and inspection.....	117
Assembly:	
General information.....	118
Upper front valve body.....	118
Upper rear valve body	120
Lower valve body (AW55, BW55)	122
Lower valve body (AW70/71)	124
Valve bodies, complete.....	126

General information

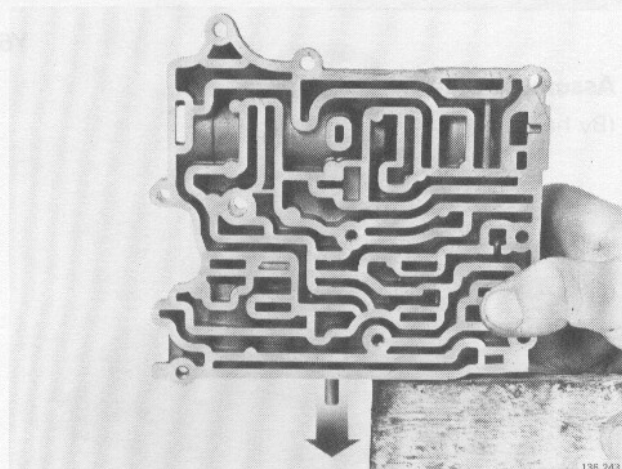
Z1

Working procedures

As far as possible the procedures given in this section apply to AW55, 70, 71 and BW55 transmissions. Consequently the illustrations in this section do not always conform exactly to each specific valve body assembly.

For production modifications to valve body assemblies see page 11.

Do **not** interchange parts between different valve bodies, as incorrect parts can cause false shift speeds or no shift at all.



Damage

Valve body assemblies are not often damaged, except during dismantling and reassembly. When dismantling inspect all parts and clean carefully before reassembly.

Sticking valves

Valve-valve body tolerances are very small and it is often very difficult to establish if a valve is sticking when the valve body is disassembled. The fault may only arise when the valve body is firmly screwed onto the gear case.

It may be possible to rectify sticking valve(s) by careful application of a fine grade emery cloth.

To remove sticking valves

Seized or sticking valves should under no circumstances be removed by levering. The best method is to tap the valve body against a piece of wood.

Small, difficult to reach valve seats can be removed with a magnet prior to off-loading the spring.

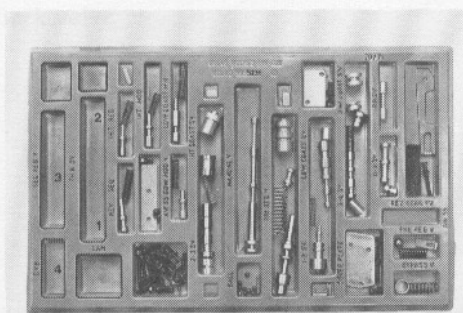
Inspection

When dismantling, carefully inspect the valve body and separator plate for damage which could cause leakage.

Check for foreign materials etc. Evidence of such could give advance warning of a transmission fault.

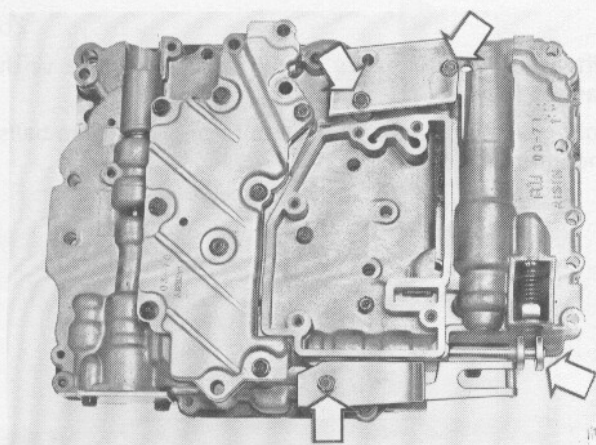
Special tools

Display tray 5231 is very useful to place parts in as they are removed from the transmission. In this way loss is prevented and the risk of parts being interchanged is lessened.



136 261

Display tray

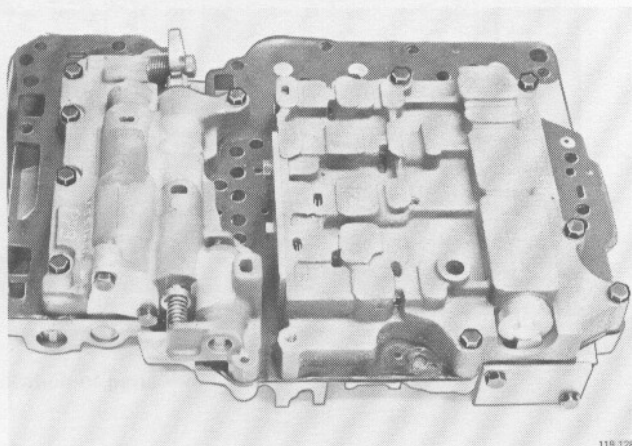
Valve body, disassembly

136 244

Remove:

- catch spring and bracket (not fitted to AW55)
- gear selector valve
- cover plate
- gasket (late type BW55 only).

Z2

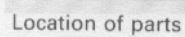
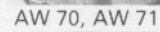
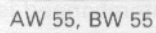


118 128

Remove screws retaining upper front and upper rear valve bodies

Ten screws.

Z3



Turn assembly over

Remove 5 screws securing upper valve bodies to lower

Lift away lower valve body and put aside with gasket facing up

Hold gasket and separator plate to prevent valve balls and springs from falling out.

Upper front valve body, disassembly

Z7

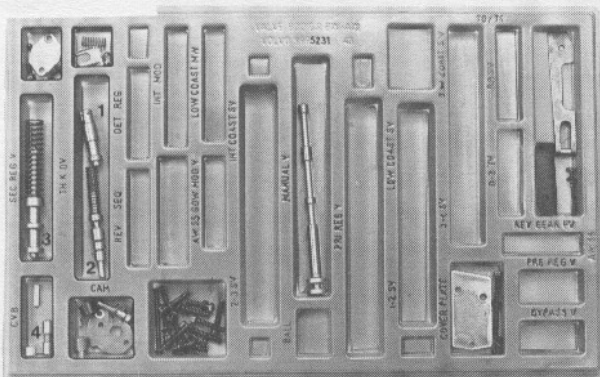
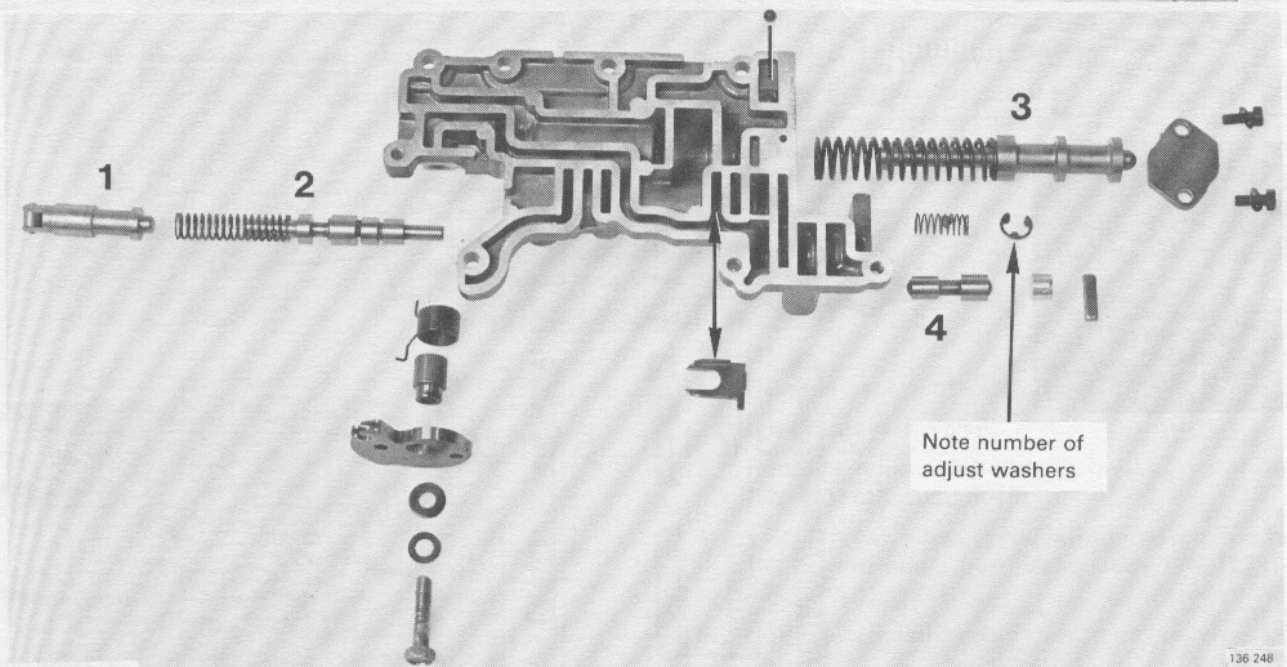
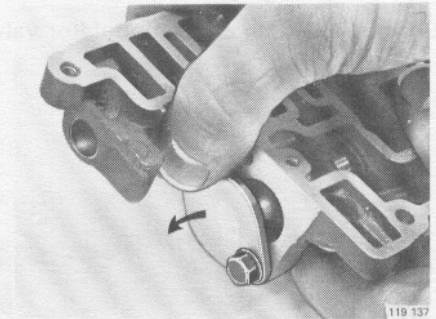
Valves

1. Kick-down valve + spring
2. Throttle valve (retainer not fitted to all types of BW55)
3. Secondary regulator valve
4. Cut-back valve

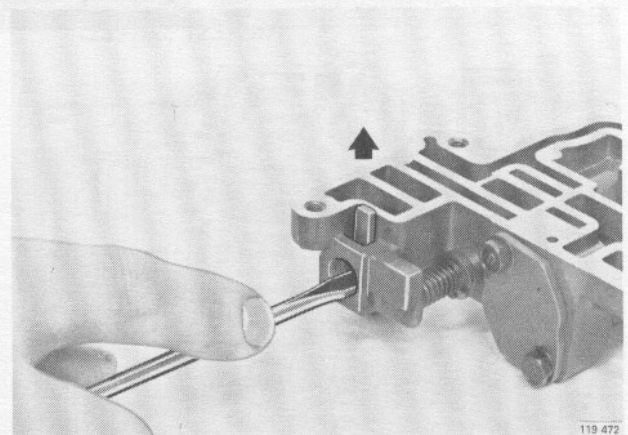
Remove secondary regulator valve

Remove one screw from cover plate and slide cover to one side to obtain access to valve.

Note! Strong spring force.



Location of parts



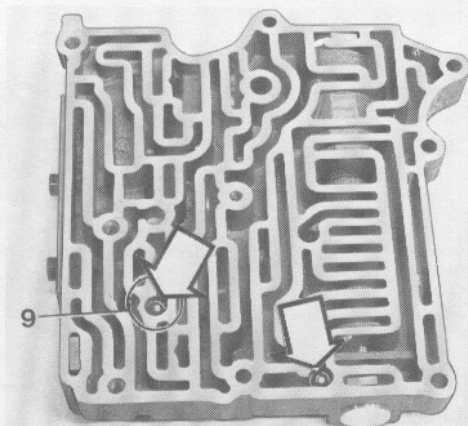
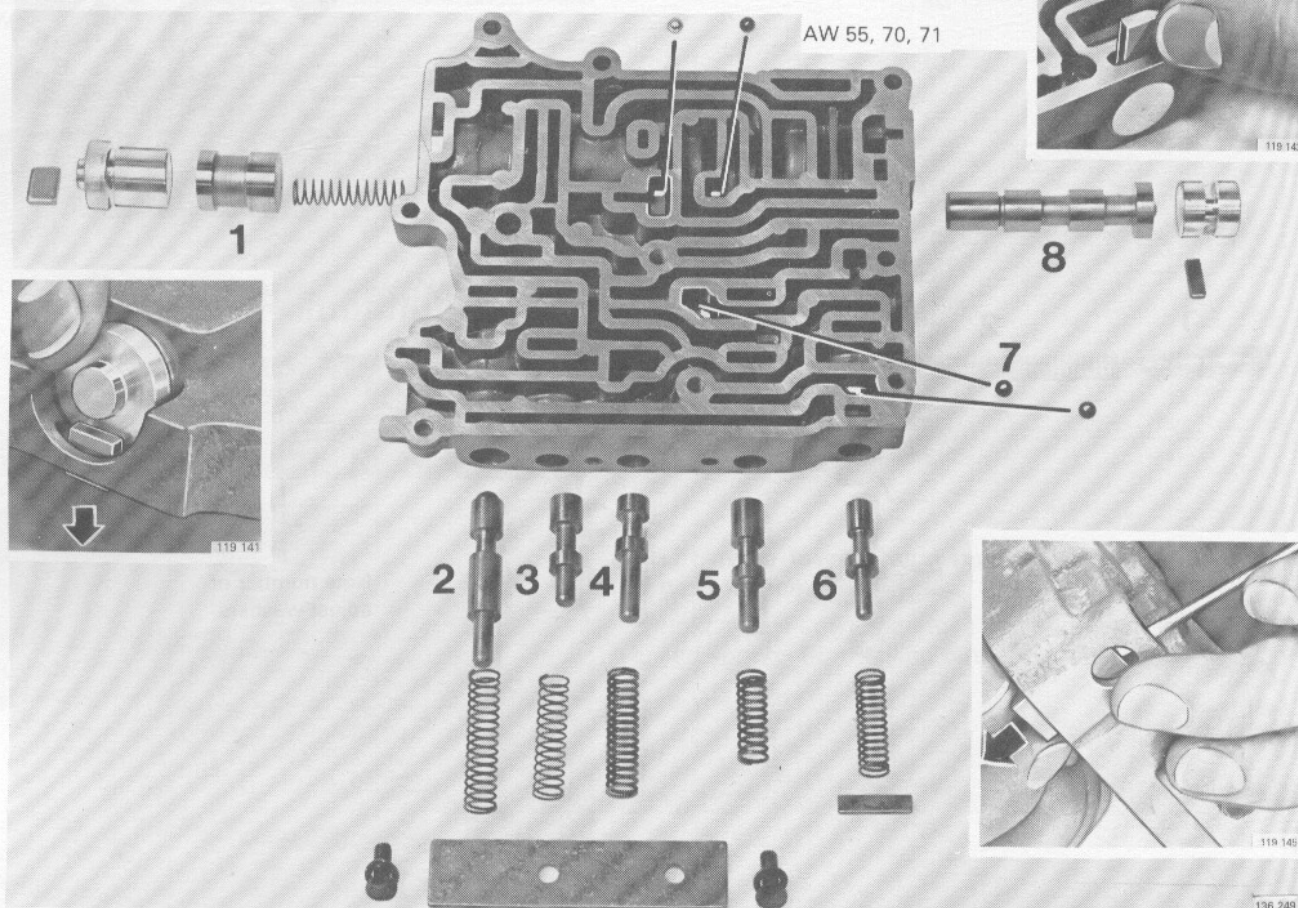
Removal of cut-back valve

Upper rear valve body, disassembly

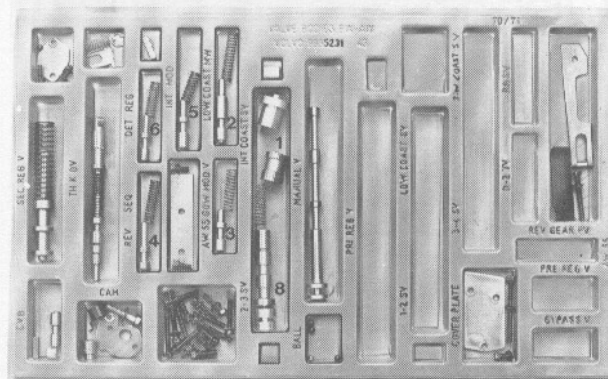
Z8

Valves

1. Intermediate coast shift valve
2. Low coast modulator valve
3. Governor modulator (valve spring + valve replaced by plug on BW55 with effect from P/N 1233280, 1233281, 1233289)
4. Reverse clutch sequence valve
5. Intermediate coast modulator valve
6. Detent regulator valve
7. Rubber valve ball (5.5 mm (not fitted on early type AW55 i.e. AW55 with valve body P/N 1233556)
8. 2-3 shift valve
9. Rubber ball diameter 5.5 mm (discontinued on BW55 with effect from valve body P/N 1233295, 1233296, 1233297)

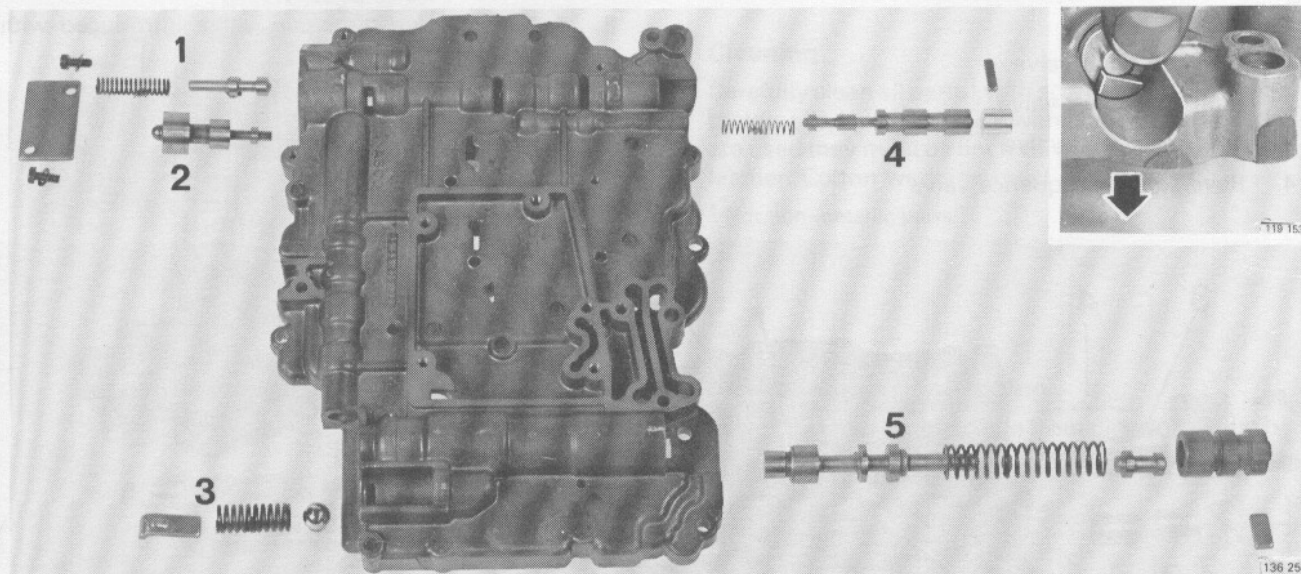


Location of valve balls on BW55



Location of parts

Lower valve body, disassembly (AW55, BW55)

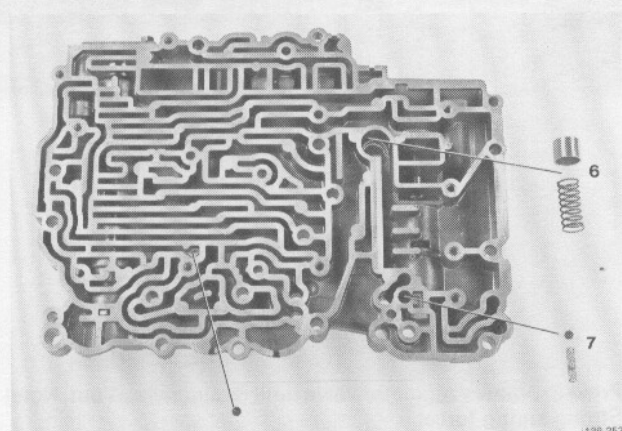
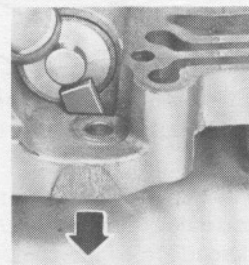


Remove retainer for pressure relief valve. Use flat nosed pliers.

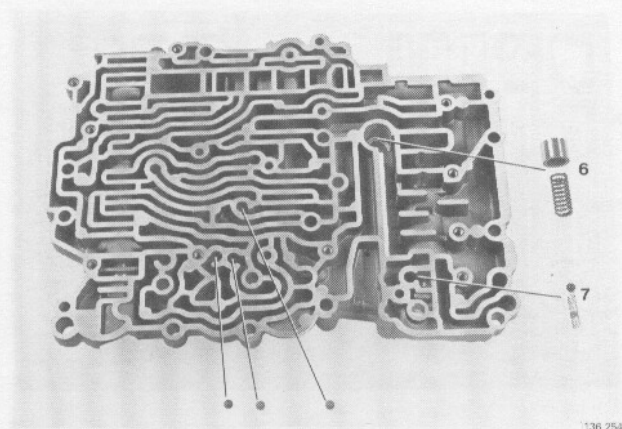
Note! Strong spring pressure, place hand over spring

Press in primary regulator valve until retainer drops out.

Note! Strong spring pressure



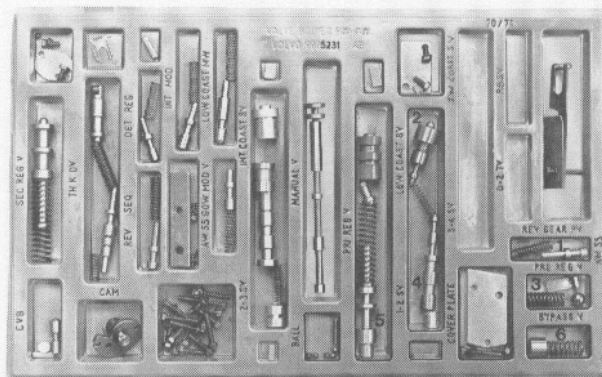
AW 55



BW 55

Valves

1. Reverse gear pilot valve (AW55 only)
2. Low coast shift valve
3. Pressure relief valve (BW55: only on valve body P/N 1233148, code 5015)
4. 1-2 shift valve (twin type introduced on late type BW55 with effect from valve body P/N 1233149, 1233370, 1233371)
5. Primary regulator valve
6. Cooler by-pass valve
7. Damping valve (ball + spring) (discontinued on BW55 with effect from valve body P/N 1233295, 1233296, 1233297).



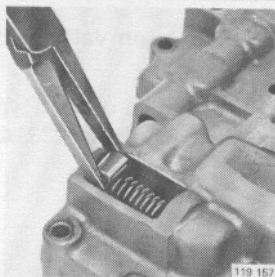
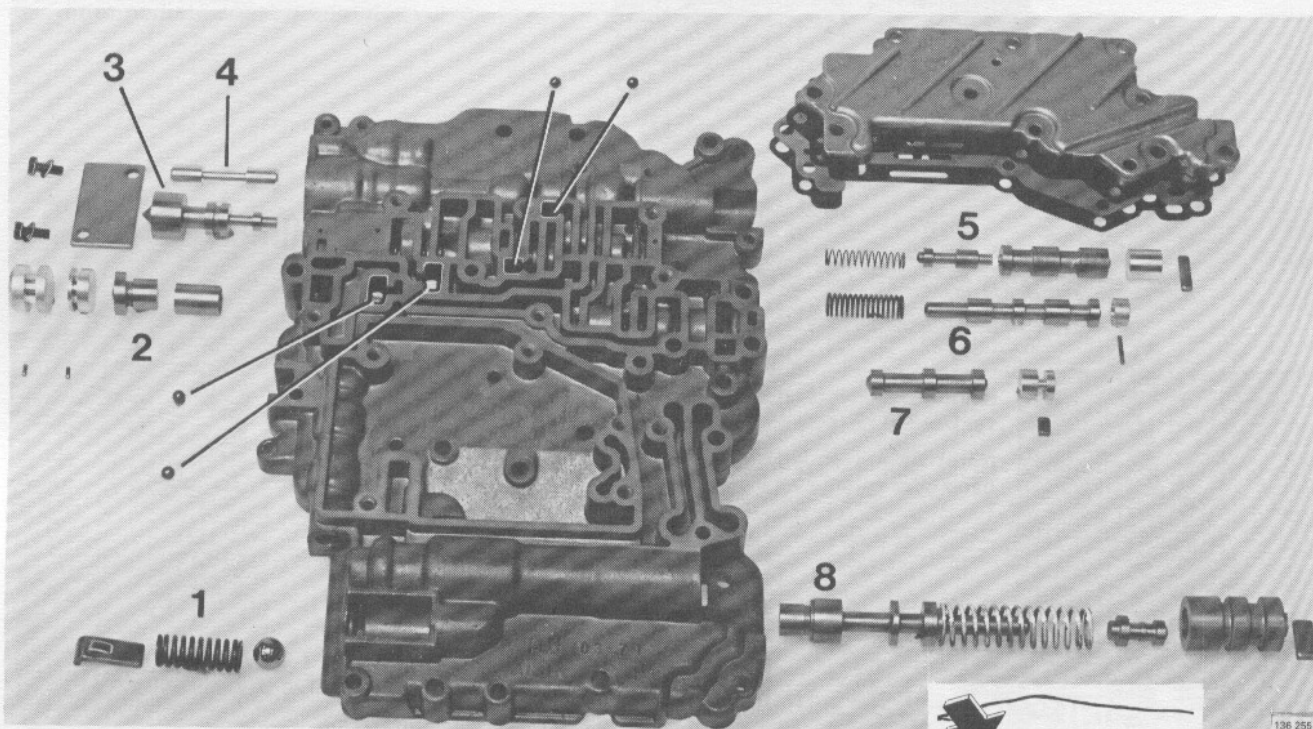
Location of parts

Lower valve body, disassembly (AW70, 71)

Z10

Valves

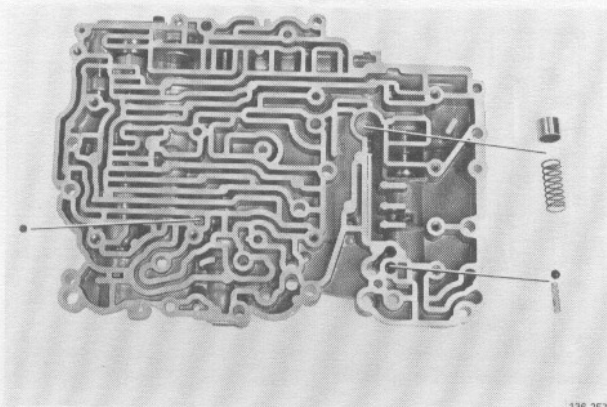
1. Pressure relief valve
2. High coast shift valve
3. Low coast shift valve
4. Reverse gear sequence valve
5. 1-2 shift valve (two part valve introduced with effect from AW70 1 KC 80659- AW71 KF 80439-
6. 3-4 shift valve
7. Detent regulator valve
8. Primary regulator valve



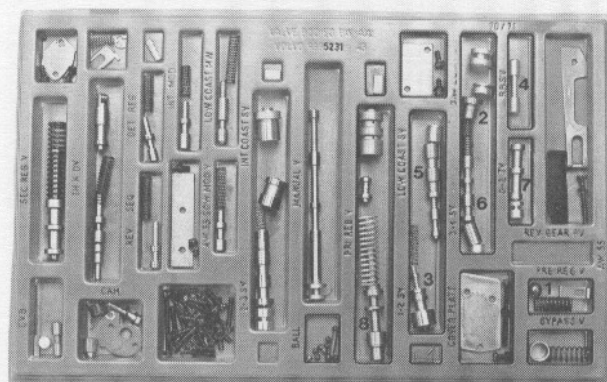
Remove retainer for pressure relief valve. Use flat nosed pliers.

Note! Strong spring pressure, cover spring with hand.

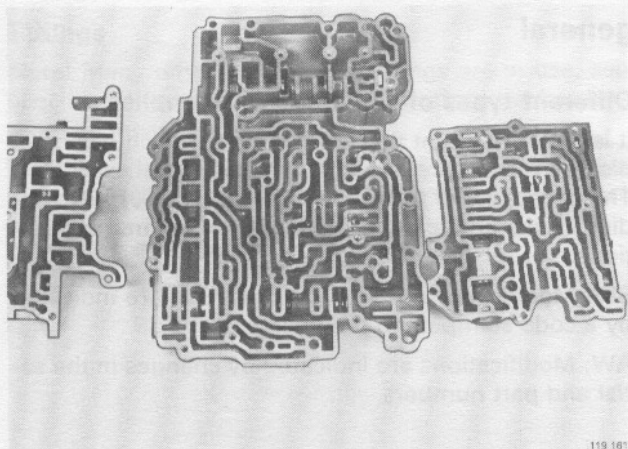
Press in primary regulator valve until retainer drops out. Note! Strong spring force.



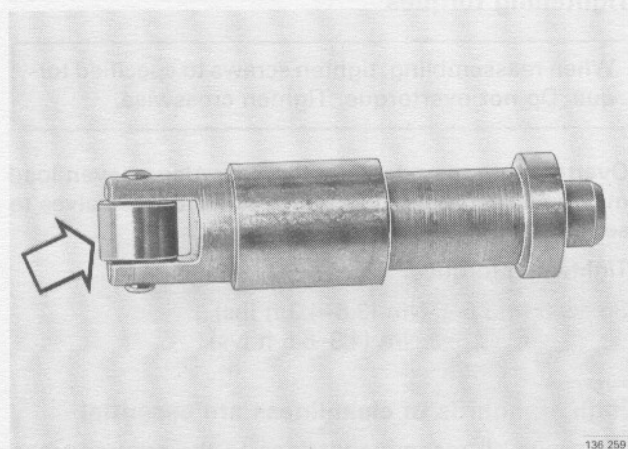
Removal of cooler by-pass valve and valve balls



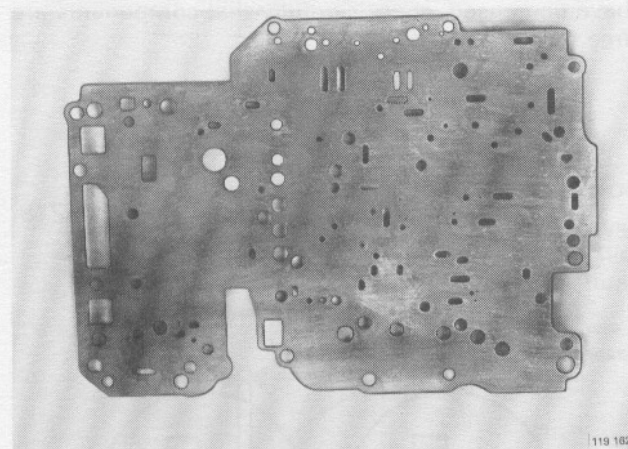
Location of parts



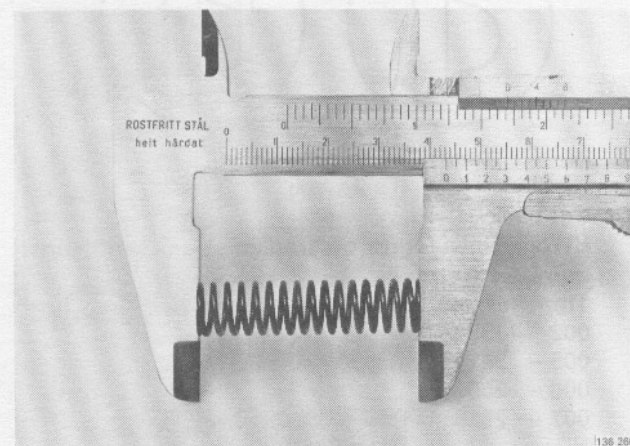
119 101



136 259



119 102



136 260

Cleaning and inspection

Z11

Cleaning

Carefully clean all parts¹ with solvent, petrol, paraffin or trichloroethylene. Dry parts with compressed air. If rags are used they must be lint free, best material is chamois leather. Cotton wadding must not be used.

¹ Not non-metallic parts.

Z12

Check valve body housing

Ensure oil passages are free from dirt. Check that bores are not scored or worn.

Z13

Check valves

Check valves for scoring and signs of wear etc. Make sure that valves move smoothly in bores. If necessary valves can be carefully cleaned with a fine grade emery cloth.

Note! That valves may appear to be perfect when valve body assembly is dismantled but seize when valve body is screwed onto transmission gear case. This is because of very small tolerances between valve and valve body. It may help to rub valve down with very fine grade emery cloth. **Carefully.**

Z14

Check kick-down valve roller

Check that roller is not worn or seized.

Z15

Check separator plate

Check that all holes are free from dirt.

Z16

Check valve spring height

See specifications on pages 6, 7 and 10.

Note! Type of spring varies with valve body type, see page 11.

Assembly, general

Z17

Vaseline

Petroleum jelly such as Vaseline must not be used to retain valve balls and springs in position, as balls may stick.

Do not force valves into bores

If valves cannot be installed with light force then check for dirt or burrs. If necessary carefully rub down valve with a very fine grade emery cloth.

Always use new gaskets

Always install new gaskets on valve body assembly, to lessen chance of leakage.

Do not interchange parts between different valve bodies

Interchanging springs/valves can cause incorrect shift speeds or not shift at all.

If it is necessary to change an entire valve body assembly it is of utmost importance that the governor is changed as well, even if it is in perfect working order. Valve body assembly and governor are very carefully matched to ensure correct shift speeds. See page 11 for modifications, differences, code numbers, part numbers and serial numbers of the different types.

Different types of valve body assemblies

It is very important that a valve body which has been disassembled, is reassembled in its original execution. This is because of the many different types of valve bodies in use and also because of production modifications.

BW: Modifications to BW transmissions are indicated by a code stamped on the gearcase.

AW: Modifications are indicated by changes in the serial and part numbers.

Tightening torques

When reassembling, tighten screws to specified torque. Do **not** overtorque. Tighten crosswise.

Overtorquing may damage threads. Also uneven load may be placed on valves which could cause valves to seize.

Tightening torques:

Screws: M5: 5–6 Nm (3.6–4.3 ft lbs)
M+: 6–9 Nm (4.3–6.5 ft lbs)

High standards of cleanliness are essential

If, despite all recommendations to the contrary, rags have been used, check carefully that components are free from lint.

Valves

1. Kick-down valve
2. Throttle valve
3. Secondary regulator valve (two types in use on BW55).

Type 1 up to valve body P/N 1233349, 1233370, 1233371

Type 2 with effect from valve body P/N 1233387, 1233388 and 1233389. (Introduced to counteract cold start problems. Serial numbers quoted on page 18.)

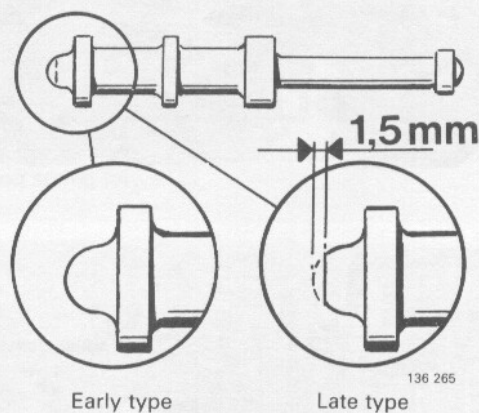
If cold start problems are encountered and pressure test 1 indicates that secondary regulator valve functions fully then change to **type 2** valve.

If late type secondary regulator valve is defective, early type can (if no new valve is available) be modified by carefully grinding off 1.5 mm (0.06 in) from rounded end of valve. Use a very fine grade emery cloth.

¹ Pressure test carried out before transmission is dismantled, see page 26.

Upper front valve body, assembly

Z18

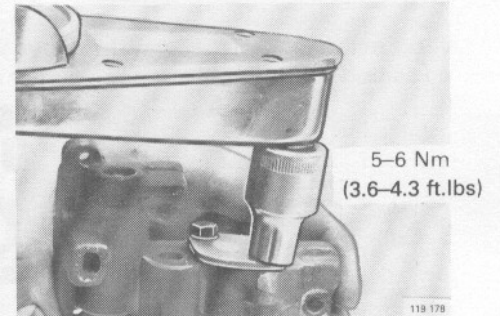
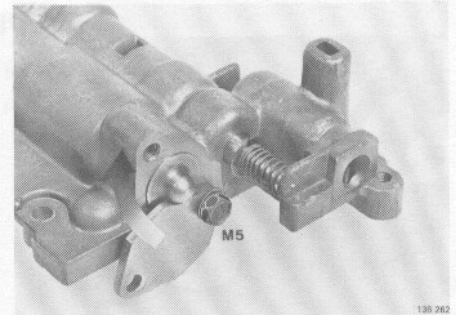


4. Cut-back valve
BW55: Only found on transmissions with serial numbers from:
Transmission code
002 – 11336
005 – 3414
006 – 3056
007 – 2818

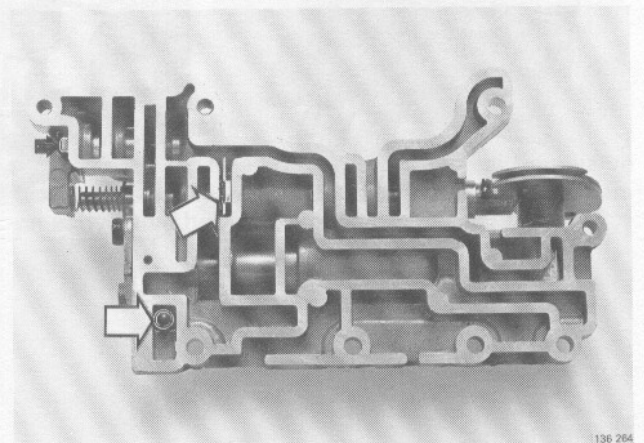
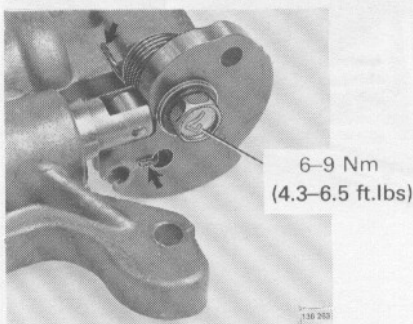
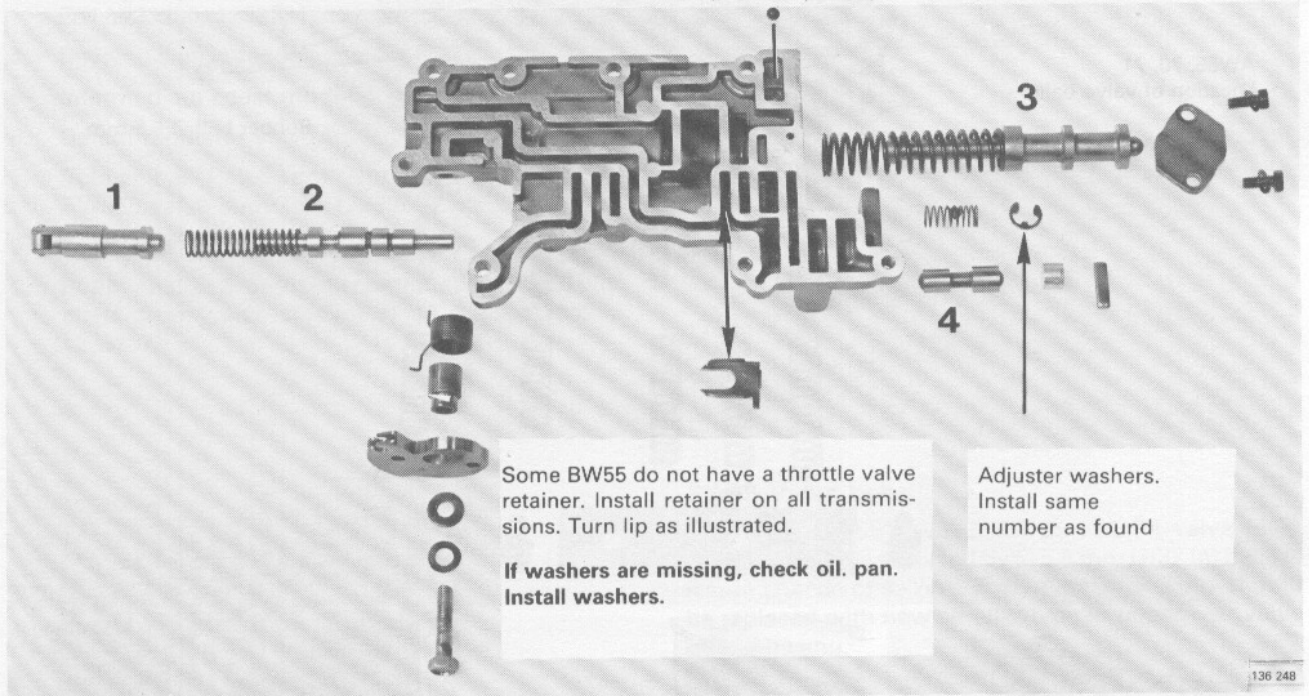
Springs

Note! Many different types of springs are in use, see specifications on pages 6, 7 and 10. Springs can be identified by measuring length.

Note! No lock washers on BW55 with effect from valve body P/N 1233295, 1233296, 1233297. Remove washers even on earlier valve body assemblies.

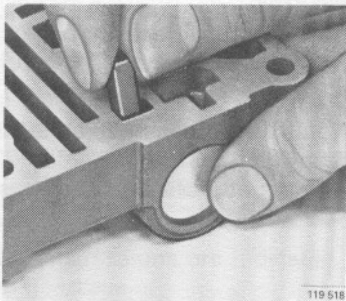
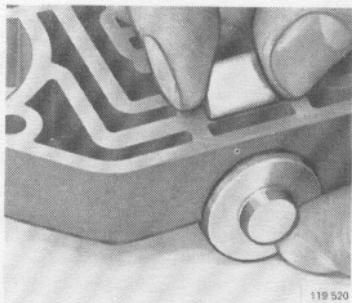


Valve ball \varnothing 5.5 mm (AW55, 70, 71)
 \varnothing 8 mm (BW55)

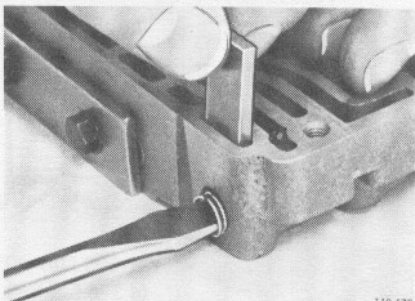
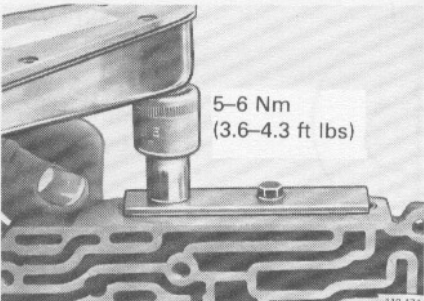
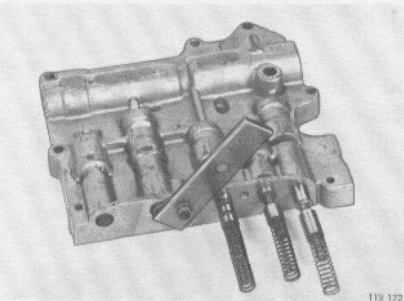
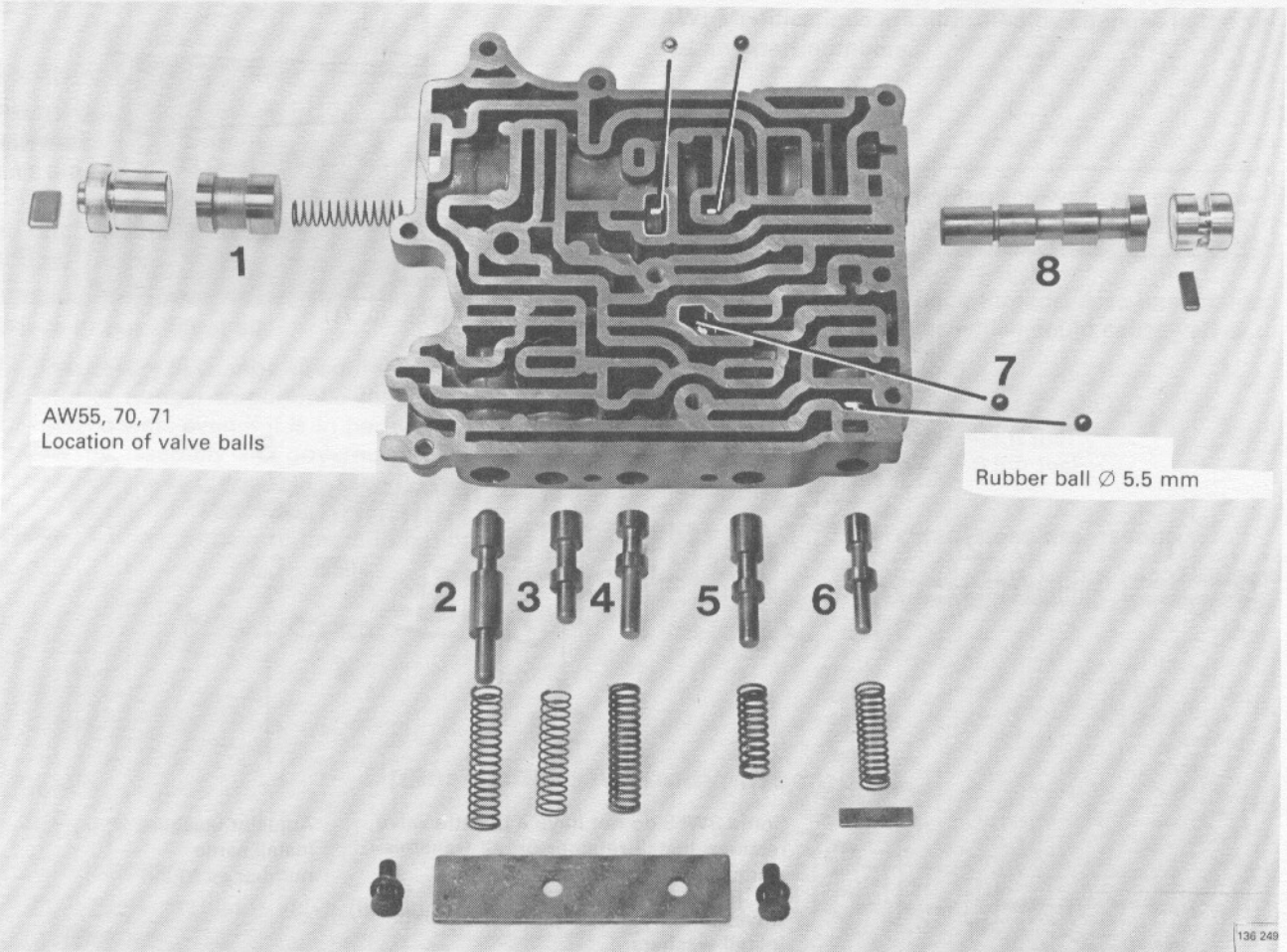


Valve bodies assembly

Upper rear valve body, assembly

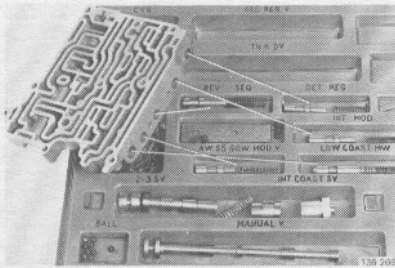


Steel ball \varnothing 5.5 mm Rubber ball \varnothing 5.5 mm



Springs

Springs can be identified by measuring length. For specifications see pages 6, 7 and 10.

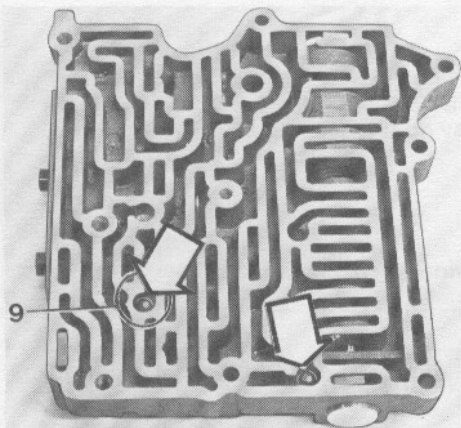


Location of parts

Note! Different types of valves, springs, valve body housings etc are in use, see section on valve bodies on page 11.

Valves

1. Intermediate coast shift valve
2. Low coast modulator valve
3. Governor modulator valve (spring and valve replaced by plug on BW55 with effect from valve body P/N 1233280, 1233281, 1233289)
4. Reverse clutch sequence valve
5. Intermediate coast modulator valve
6. Detent regulator valve
7. Rubber ball \varnothing 5.5 mm (Not fitted on early type AW55 valve body P/N 1233356)
8. 2-3 shift valve
9. Rubber ball \varnothing 5.5mm (discontinued on BW55 with effect from valve body P/N 1233295, 1233296, 1233297).



Valve ball location BW55

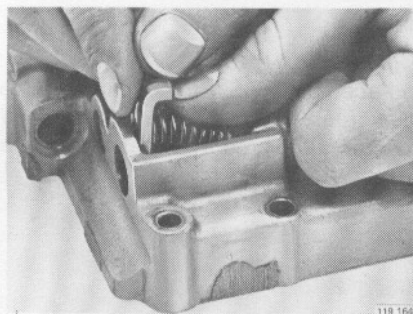
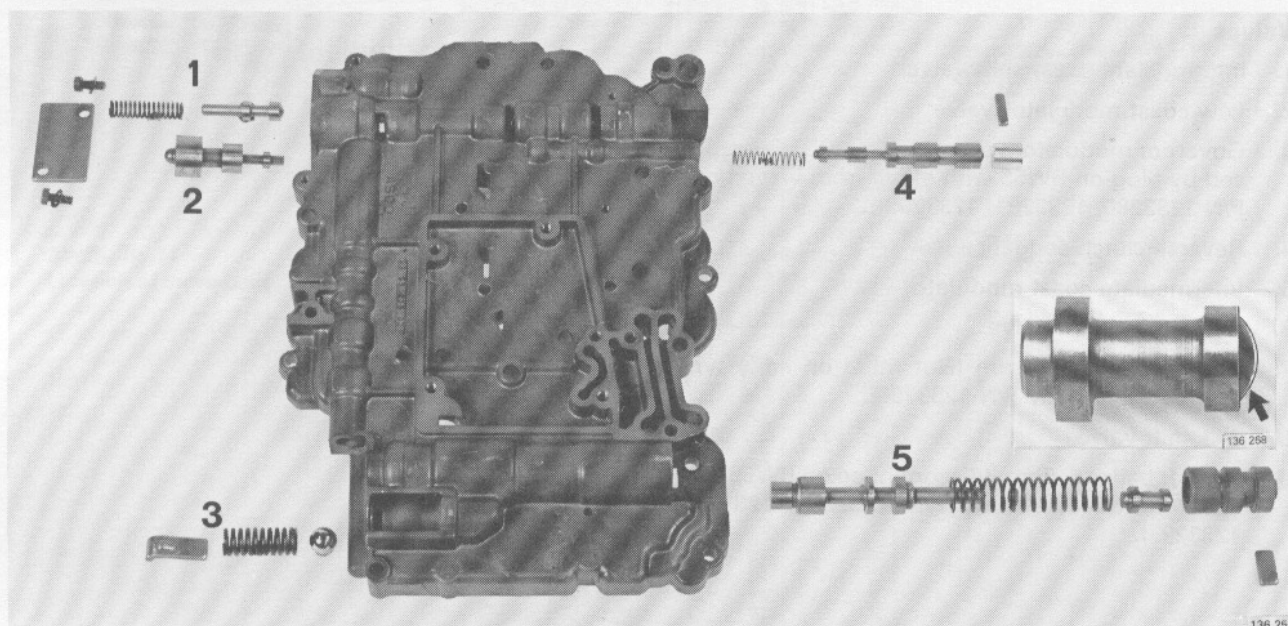
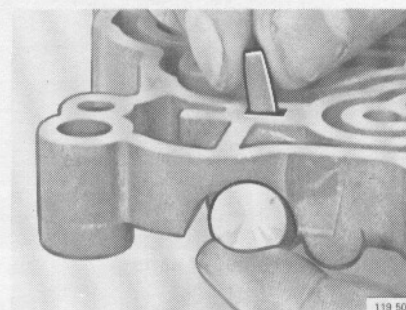
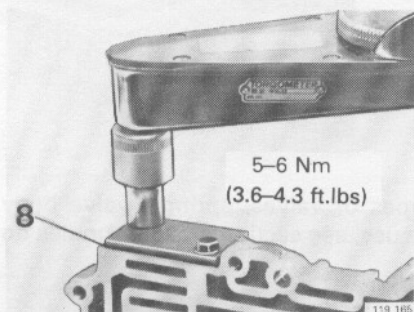
BW55 Valve balls

Early type BW55 have \varnothing 6.3 mm (1/4") valve balls. These balls were replaced by \varnothing 5.5 mm (7/32 in) balls to lessen chance of seizing. Early type valve balls should be replaced with new smaller type in upper rear valve body housing.

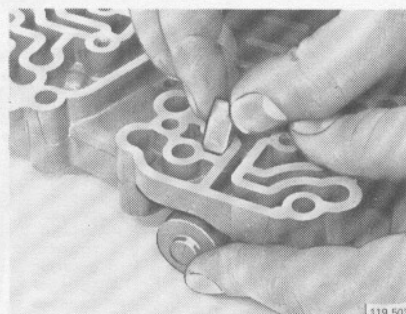
BW55 lock washers

No lock washers fitted on BW55 with effect from valve body P/N 1233295, 1233296, 1233297. Remove washers on early valve body assemblies.

Lower valve body, assembly (AW 55, BW 55)



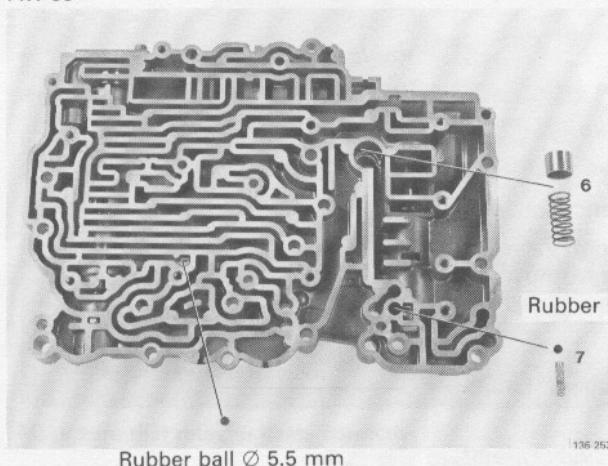
Place valve ball in position.
Compress spring and retainer together



Springs

Springs can be identified by measuring length. For specifications see pages 6, 7 and 10.

AW 55

Rubber ball \varnothing 5.5 mmRubber ball \varnothing 5.5 mm

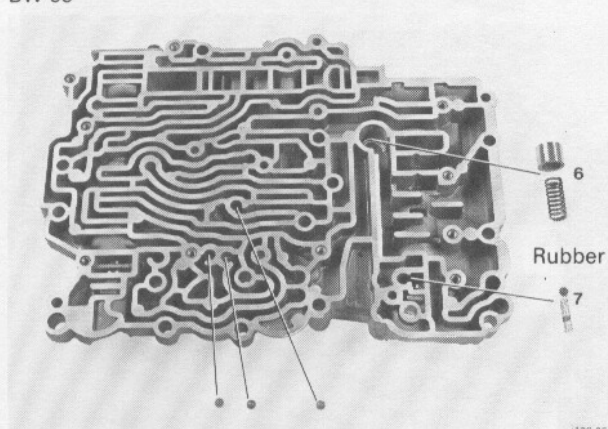
6. Cooler by-pass valve (type varies). (Two springs are used on very early types of BW55 with valve body P/N 1233148).

Note! Cooler by-pass valve spring and primary regulator valve spring are matched and must be replaced at same time.

7. Damping valve (ball + spring) (discontinued on BW55 with effect from valve body P/N 1233295, 1233296, 1233297).
8. Some early type BW55 do not have a cover plate gasket. Install gasket on all transmissions.

Valve balls to BW55. Early type \varnothing 6.3 mm (1/4 in) replace by \varnothing 5.5 mm (7/32 in) to lessen chances of seizing. Replace early type with new smaller balls in lower valve body housing.

BW 55

Rubber ball \varnothing 5.5 mmRubber ball \varnothing 5.5 mm

Note! Different types of valves, springs, valve body housings etc are in use, see section on valve bodies on page 11.

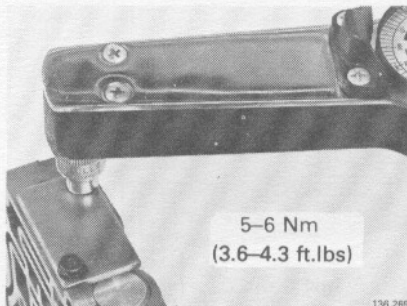
Valves

1. Reverse gear pilot valve (AW55 only)
2. Low coast shift valve
3. Pressure relief valve (only fitted on early type BW55 with effect from valve body P/N 1233148 (code number 5015).
4. 1-2 shift valve (Two part valve introduced on later types of BW55 with effect from valve body P/N 1233295, 1233296, 1233297).
5. Primary regulator valve (sleeve modified on BW55 with effect from valve body P/N 1233295, 1233296, 1233297).

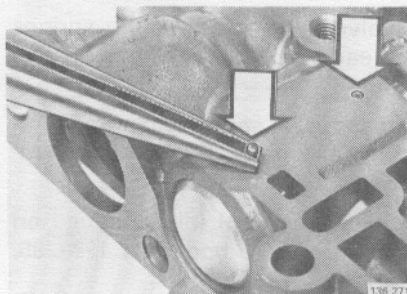
Valve body

Lower valve housing, assembly (AW70/71)

Z21



Cover plate - low coast shift valve



Retainer - high coast shift valve

Valves

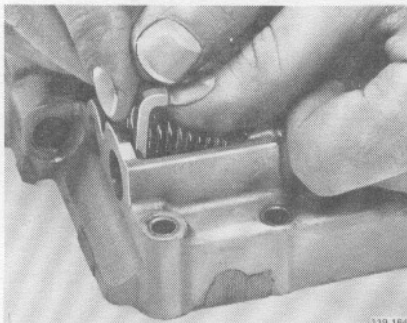
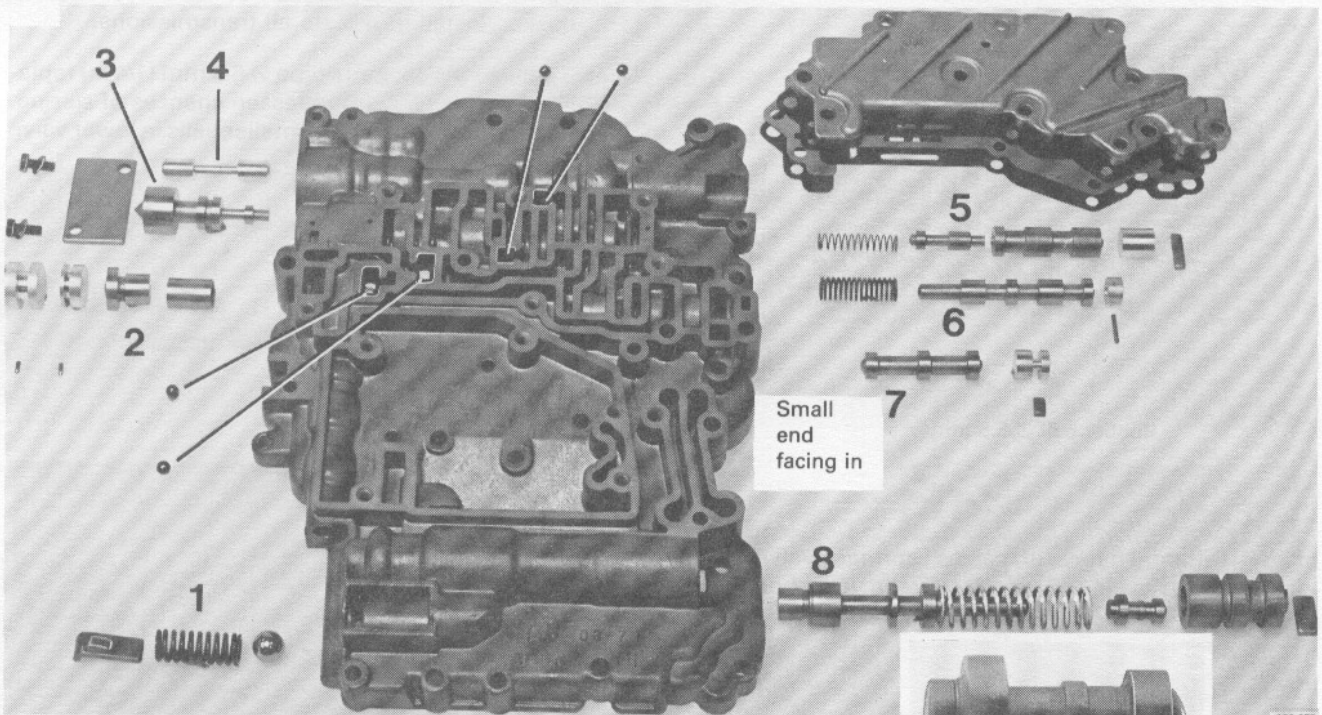
1. Pressure relief valve
2. High coast shift valve
3. Low coast shift valve
4. Reverse gear sequence valve
5. 1-2 shift valve (two part valve introduced with effect from AW70 80659- AW71 80439-
6. 3-4 shift valve
7. Detent regulator valve (small end facing in)
8. Primary regulator valve (end should be flush with body)

Springs

Spring type can be identified by measuring length, see specifications on page 10.

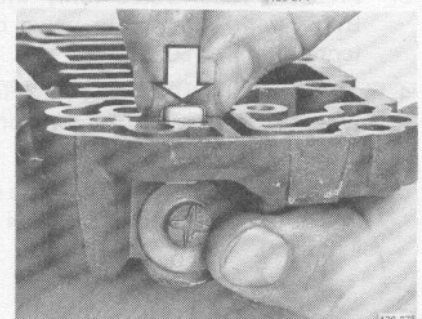
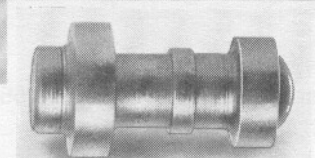
Valve body types

Refer to page 11 for specifications.



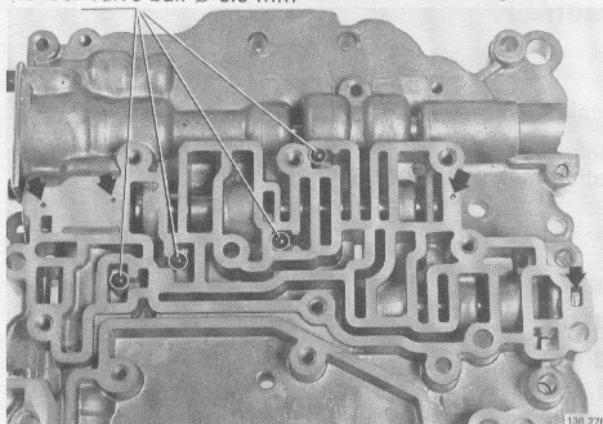
Place valve ball in position. Compress spring and retainer together

Assemble primary regulator valve piston and sleeve
Insert dome end of piston first.



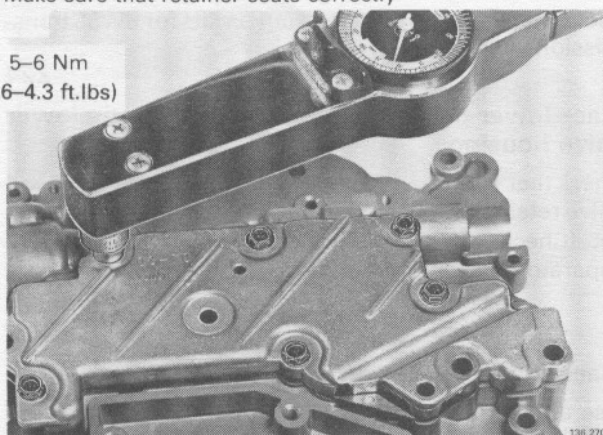
Rubber valve ball \varnothing 5.5 mm

Installing retainer and ball



Make sure that retainer seats correctly

5-6 Nm
(3.6-4.3 ft.lbs)

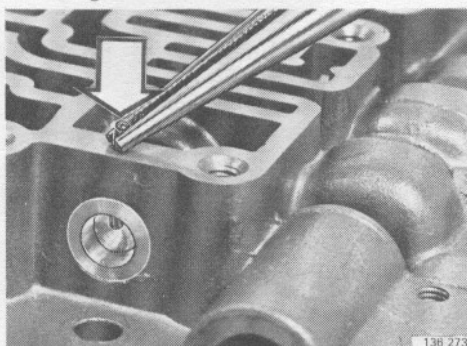


Installation of cover

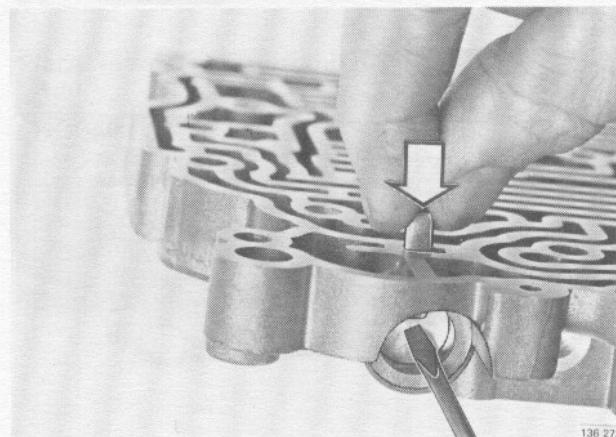
Install gasket, separator plate, gasket and cover.

Note! The gaskets are different.

Installing 3-4 shift valve

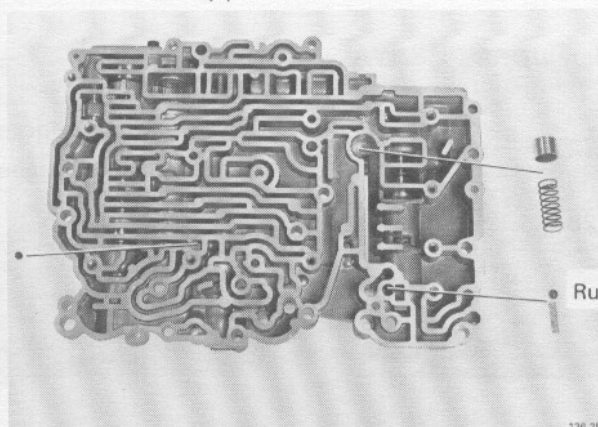


Installing 1-2 shift valve



Location of cooler by-pass valve

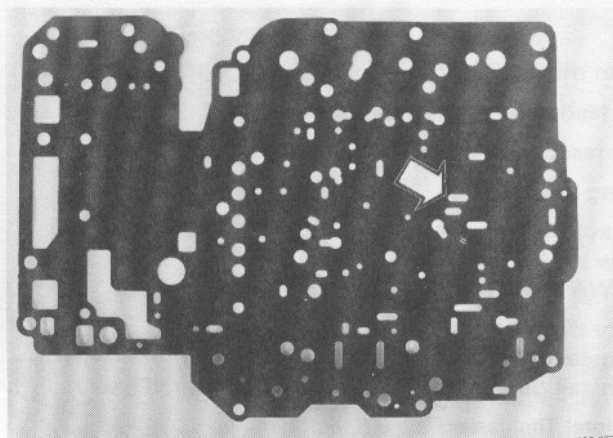
Rubber valve ball \varnothing 5.5 mm



Rubber valve ball \varnothing 6.3 mm

Valve body

Valve body assembly



136 277

Z22

Gasket – important

Upper and lower gaskets are different and must be installed in correct position.

Z23

Gasket kit – BW55

CAUTION!

A hole may be missing in some BW55 gasket kits (P/N 2373685), see fig. If the gasket is installed, B1 brake will burn up during driving in position 2, which would result in a lack of engine braking. It is therefore essential to check that the hole is not missing on kits for BW55 transmission.

Z24

Place lower gasket and separator plate on lower valve housing

Check that valve balls, cooler by-pass valve, spring and valve retainer (AW70/71) are in place. Install a new gasket. (Check that it is of same type as original). Secure separator plate loosely with a screw.

Z25

Place upper gasket on separator plate

Use a new gasket. Make sure that it is same as original.

Z26

Check that all valve balls and retainers are in position in upper rear valve body

Z27

Place lower valve body on rear valve body

Ensure gasket and holes coincide.

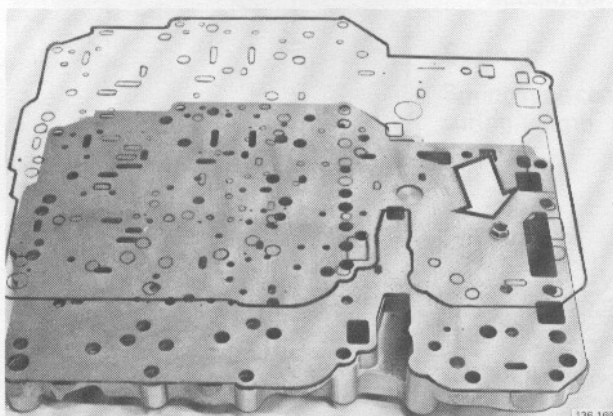
Z28

AW55, BW55:

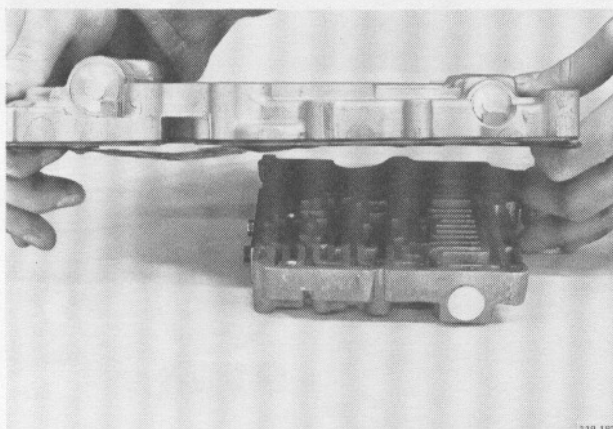
Install screws for upper rear valve body, hand tight.

Also install cover panel (do not forget gasket on BW55).

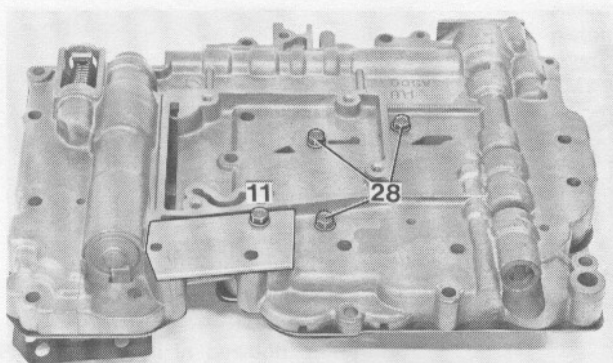
Four screws.



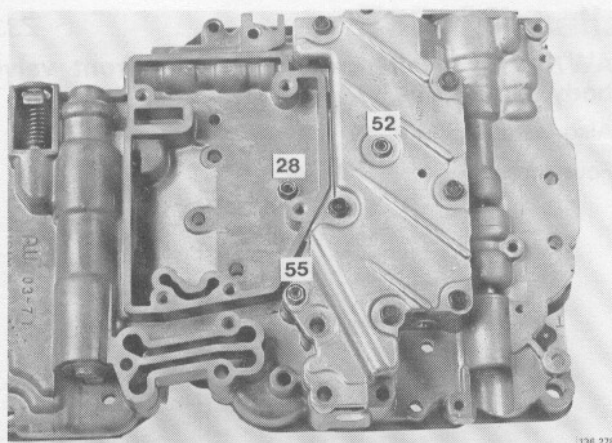
136 109



119 183

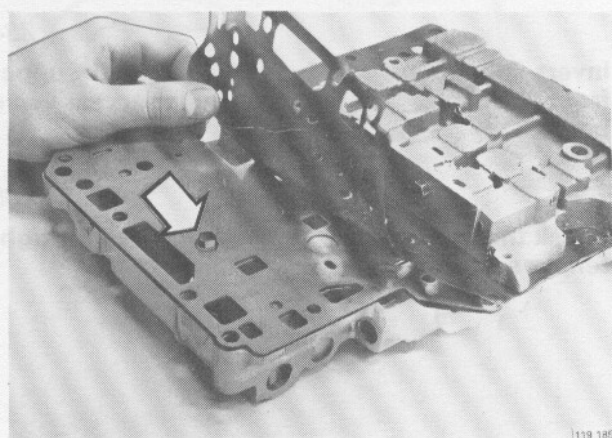


119 528

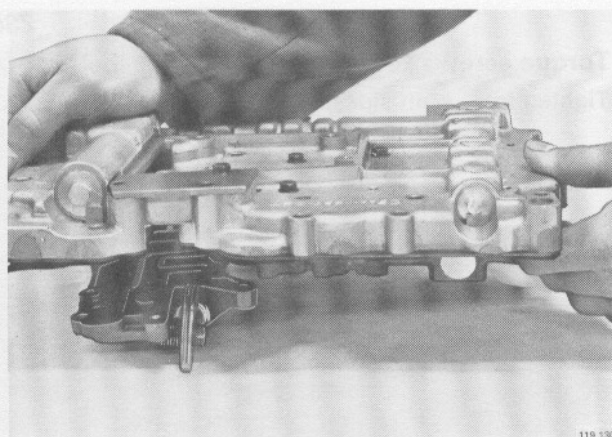


Z29
AW70/71: Install screws for rear upper valve body, hand tight

Three screws



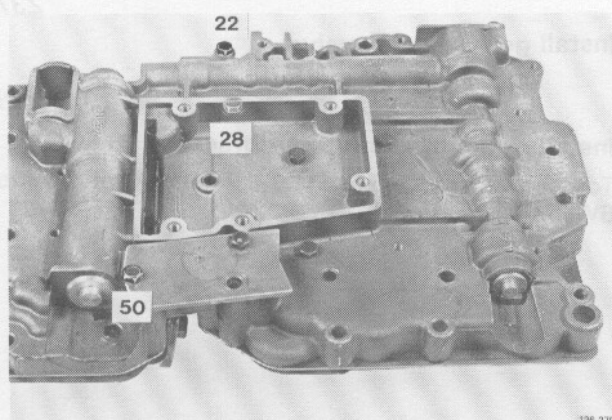
Z30
Invert valve body and remove screw retaining separator plate



Z31
Place lower valve body on upper front valve body

Check that valve ball and throttle valve stop washer are in position in upper front valve body.

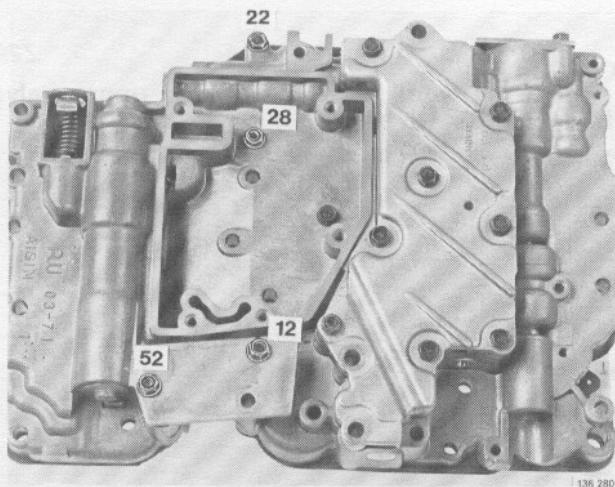
Ensure gasket and holes coincide.



Z32
AW55, BW55: Install screws for upper front valve body, hand tight

Three screws.

Valve body

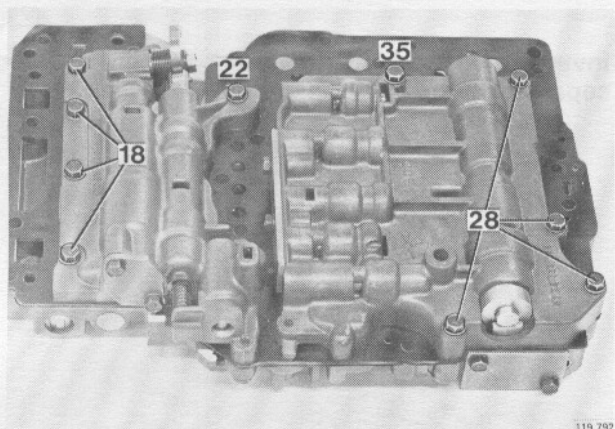


Z33

AW70/71: Install screw for upper front valve body, hand tight

Also install cover plate

Four screws.

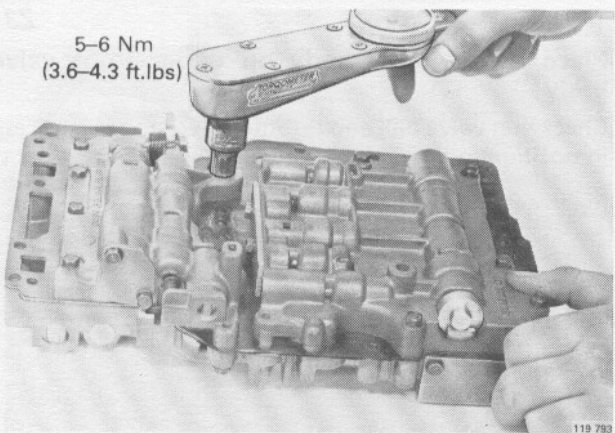


Z34

Invert valve body and install 5 screws in upper front valve body and 5 screws in upper rear valve body

Z35

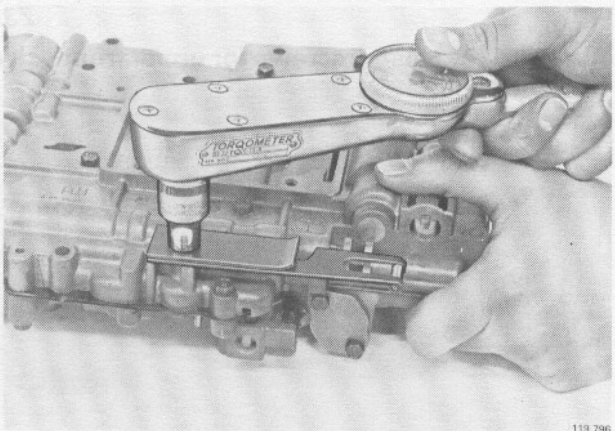
Check that gaskets are correctly located for tightening screws



Z36

Torque screws to 5-6 mm (3.6-4.3 ft lbs)

Tighten from both sides.



Z37

Install gear selector valve

Z38

Install retaining spring and bracket

Torque screws to 5-6 Nm (3.6-4.3 ft. lbs) (Not fitted to BW55 transmissions).

Z39. Miscellaneous parts

Z39



136 281

Clean and check all parts

It is important that:

- oil pan
- oil filter
- oil tube (AW70/71)
- magnet are all thoroughly cleaned prior to installing.

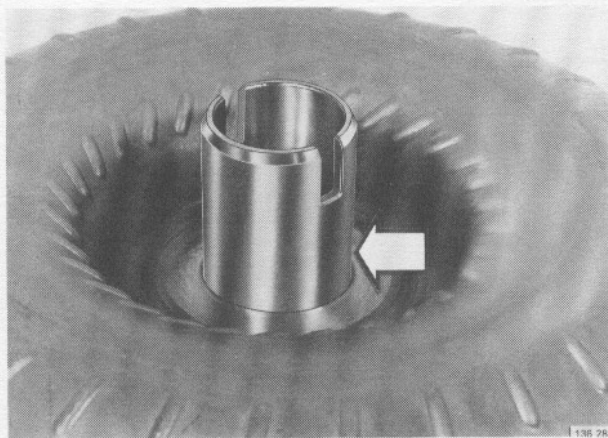
Dry parts with compressed air.

Do **not** use rags or wadding.

Inspect all parts for cracks, signs of wear etc.

Note! Refer to section on in-car repairwork for:

	Operation	Page
Accumulator piston	L1–8	56
Gear selector mechanism	K1–18	53
Solenoid valve	M1–7	58



136 282

Torque converter

Check converter neck for signs of damage, wear etc.

If scored excessively, fluid may leak from oil pump oil ring.

Assembly

Z40-86. Assembling transmission

Special tools: 2520, 5070, 5073, 5075, 5118, 5149, 5241

Check all parts carefully prior to installing. Ensure that thrust washers and needle bearing are correctly located.

Remember to soak new discs in ATF prior to installing.

Vaseline may only be used to keep thrust washers, needle bearings and races in position during assembly, and must not be used on other parts.

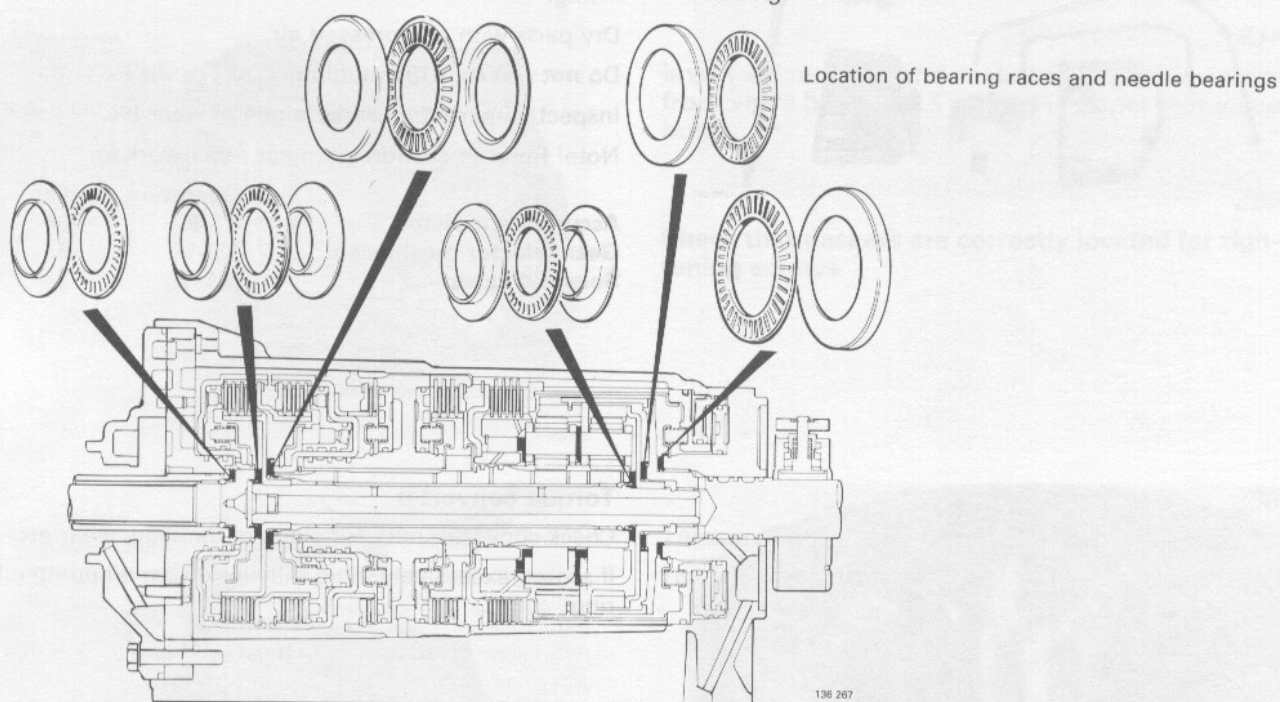
Smear transmission parts (not mentioned above) in ATF type G (F).

Always install new O-rings, sealing rings and gaskets.

Do not use gasket sealer etc.

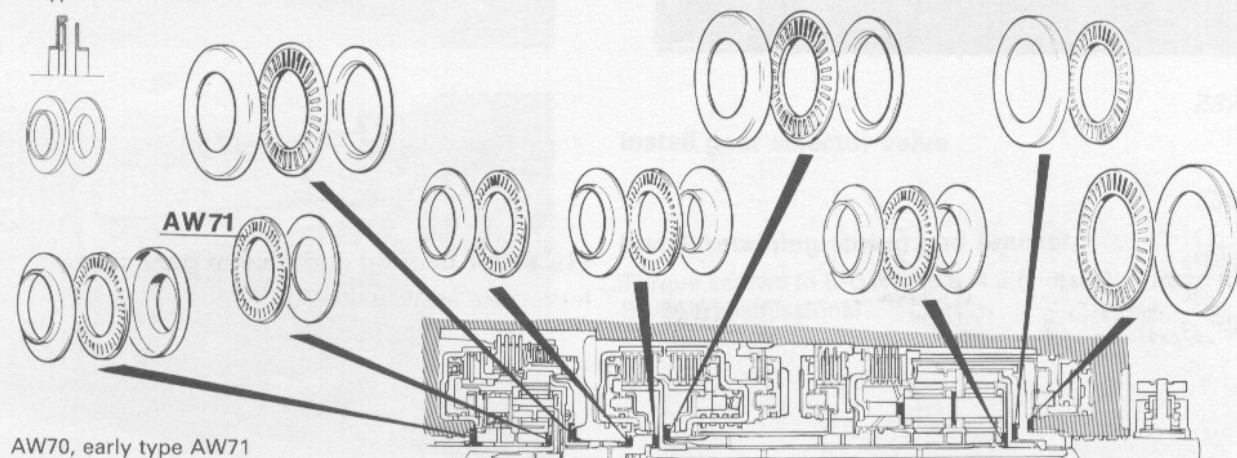
Dry parts only with compressed air. Do **not** use rags or wadding.

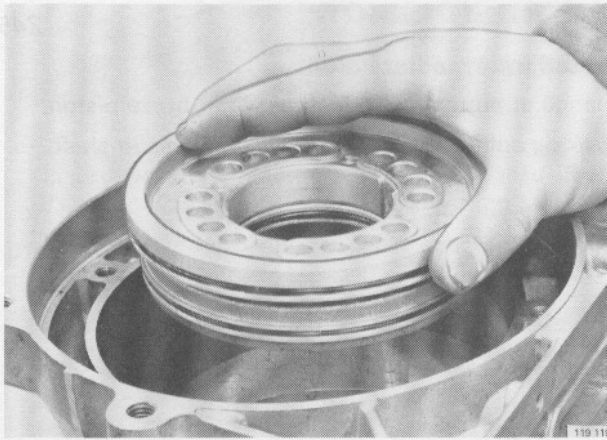
BW 55 AW 55



AW 70 AW 71

Late type AW71



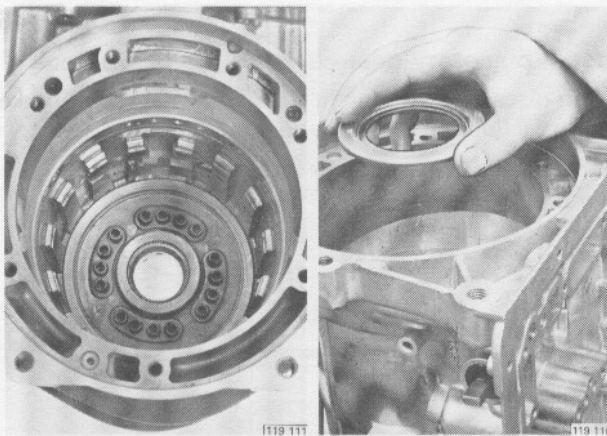


Z40

Install B3 brake piston in transmission gear case

Carefully press in piston, taking care not to damage O-rings.

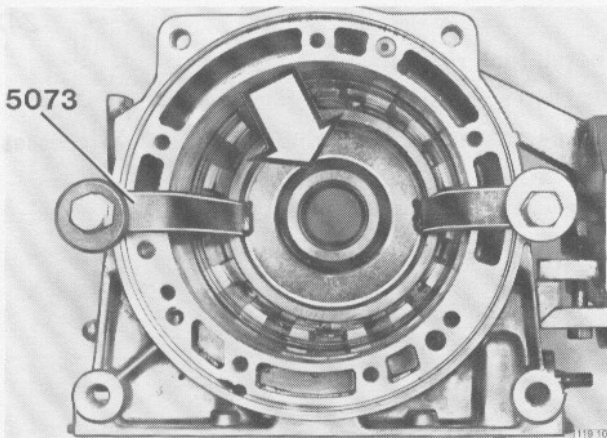
Special tool **5073** can be used if necessary.



Z41

Install return springs (16x) and spring retainer

Note! It is very important that the springs are installed vertically.



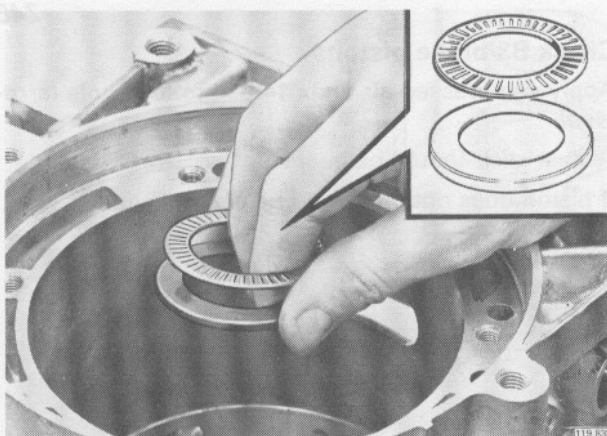
Z42

Install retaining ring

Off-load springs with tool **5073** before installing ring.
(Take care when using tool)

Tighten screws crosswise, first by hand and then with a spanner wrench.

Make sure that retaining plate is installed "square". Install retaining ring. Remove tool **5073**.



Z43

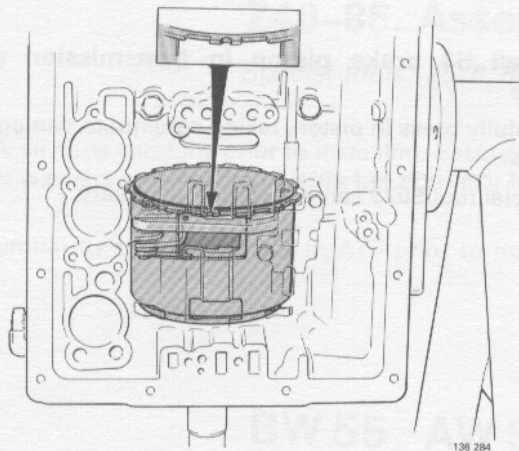
Turn gear case to vertical position

Z44

Place rear bearing and race in gear case

Install race as illustrated.

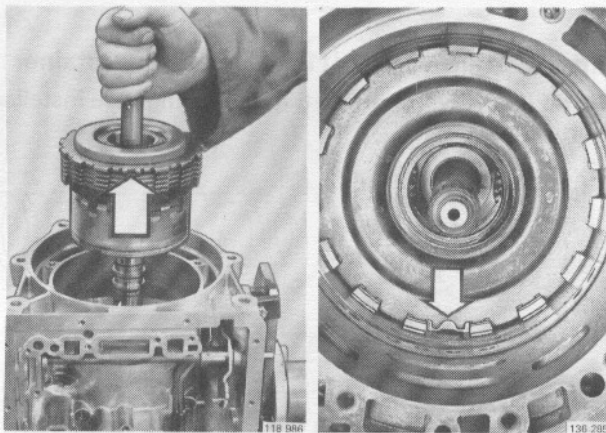
Assembly



Z45

Install intermediate shaft

Flange at bottom of shaft must fit in brake piston.
Parking ball lug must be opposite recess in shaft.

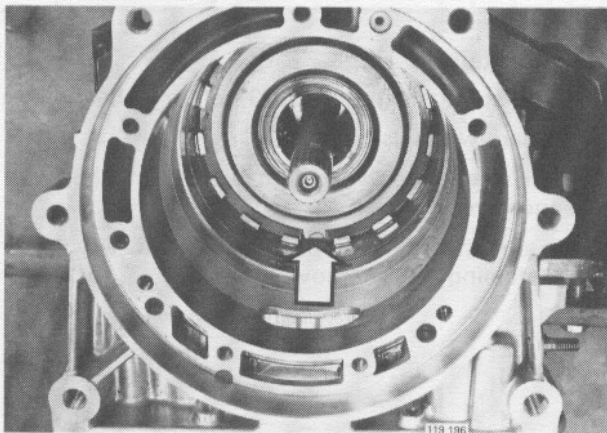


Z46

Install planetary gear carrier + B3 brake pack

Align discs with groove in gear case. Recess in brake pack reaction plate must face oil pan.

Lower brake pack carefully into gear case.

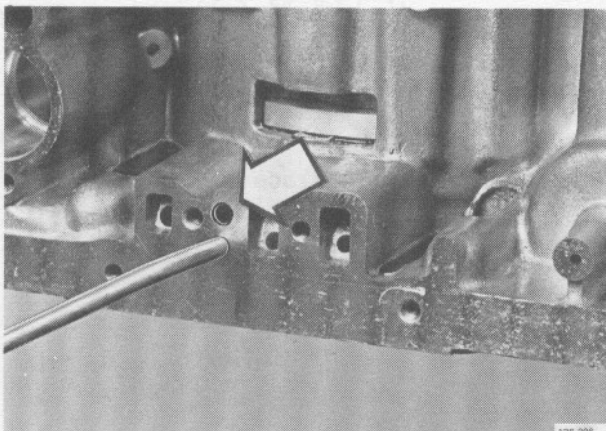


Z47

Install lock ring

Use two screwdrivers.

Make sure that gap in lock ring is between two recesses, see fig.



Z48

Check B3 brake pistons

Apply compressed air (max 14 psi) to feed hole (arrowed).

A clear click should be heard.

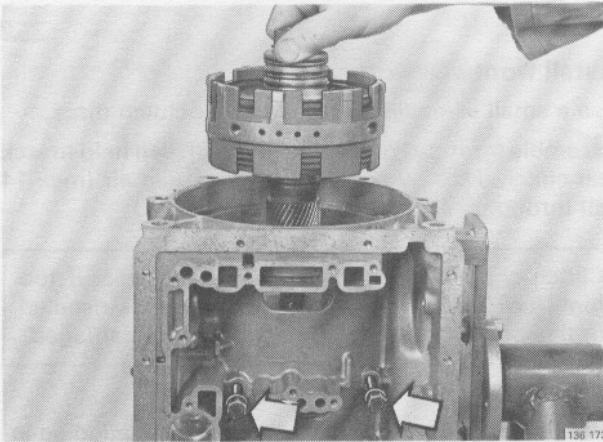
If piston does not move, dismantle and check.

Z49

Install centre support assembly

Install screws hand tight to avoid uneven load.

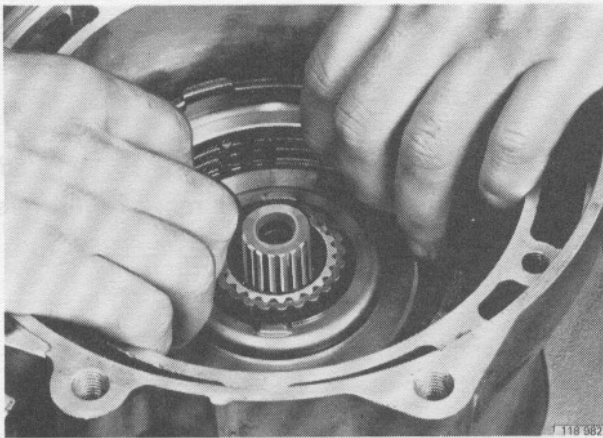
Do not torque screws.



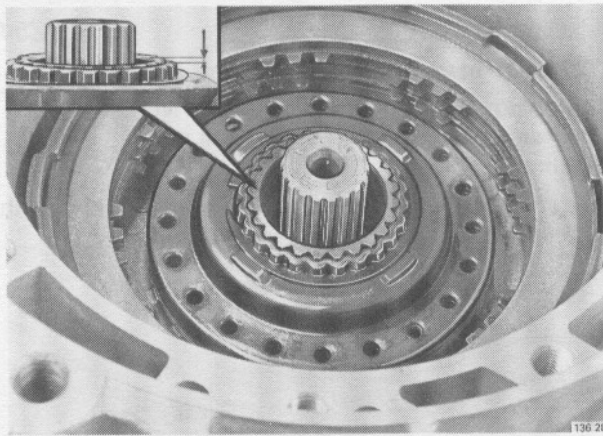
Z50

Install rear clutch

Align discs in centre support assembly.



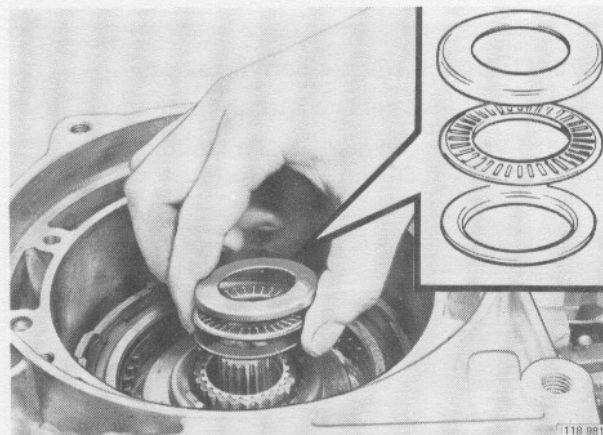
When correctly installed, clutch should lie flush or slightly lower than sun gear shaft.



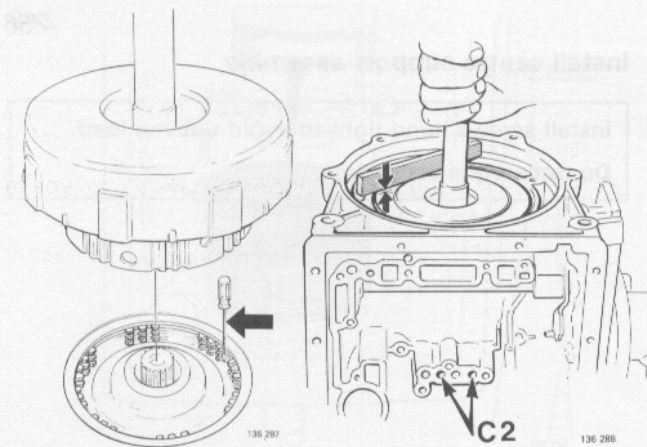
Z51

Install bearing races and needle bearing

Install races as illustrated. Apply Vaseline to races to keep them in position.



Assembly



Z52

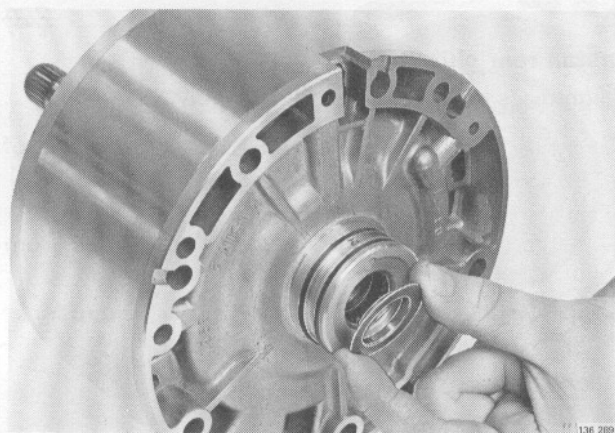
Install front clutch

Use a small screwdriver to align rear clutch discs.

Assemble front and rear clutch discs. (It can help to lock rear clutch discs by applying compressed air (max 14 psi) through feed hole as illustrated.)

Clutch should be slightly below gear case. If too high, it will not fit correctly and if oil pump is installed in this position, rear clutch discs will be damaged.

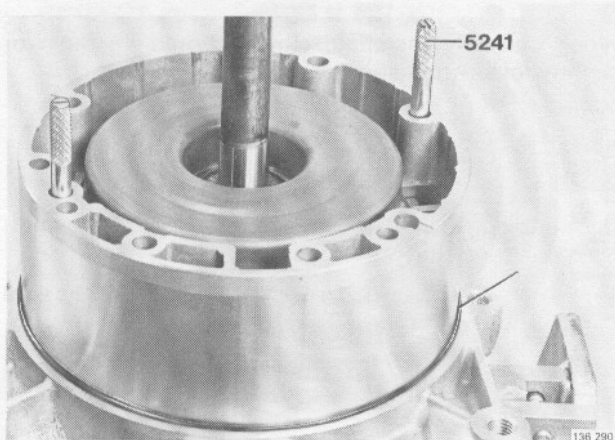
Check that needle bearing and race are installed on input shaft.



Z53

AW70/71: install bearing race in rear of overdrive housing

Apply a small amount of Vaseline.

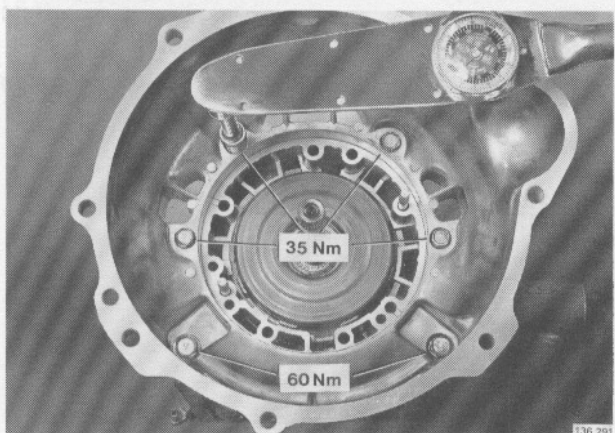


Z54

AW70/71: install:

- **guide pins 5241** to centralize overdrive
- **overdrive.** Turn recess towards oil pan
- **O-ring**

Check that CO clutch is approx. 3.5 mm (0.14 in) beneath edge of overdrive housing (see R51, page 85).



Z55

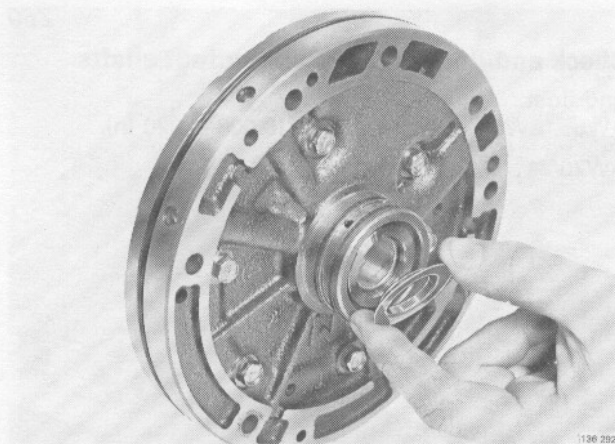
AW70/71: install torque converter casing

Lubricate overdrive contact surfaces with Vaseline

Torque: 4 upper screws to **35 Nm** (25 ft. lbs)

2 lower screws to **60 Nm** (43 ft. lbs).

Z56



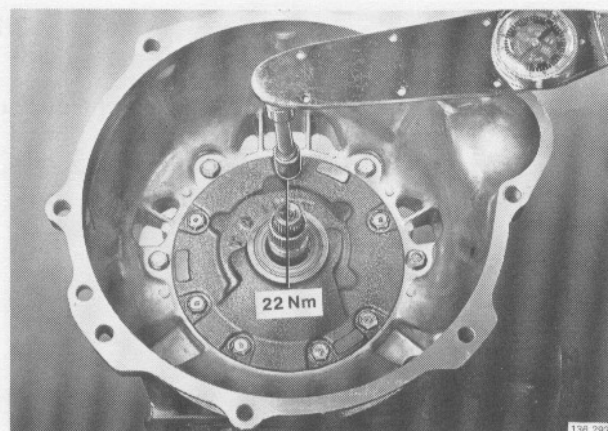
Install race in rear of oil pump

Use a small amount of Vaseline.

Install O-ring

AW55, 70, 61 (early types), BW55: all have same type of bearing and race.

Late type AW71: needle bearing and front thrust washer form one unit.



Z57

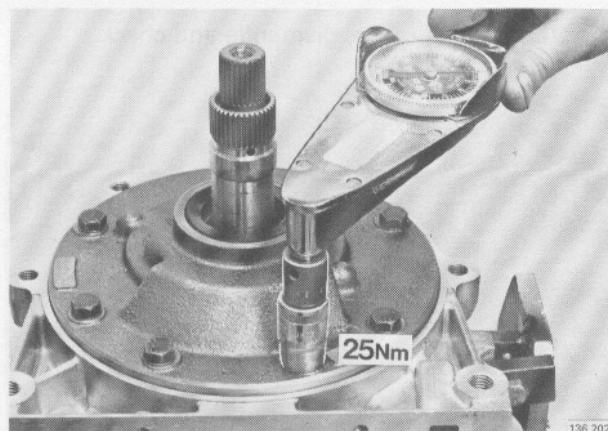
AW70/71: install oil pump

Lubricate oil pump O-ring with ATF

Remove guide pins 5241. Apply Silicon to heads of screws.

Install oil pump screws with new washers (P/N 1233270-6). Ensure oil pump seat for washer is free from paint.

Torque screws crosswise to **22 Nm** (16 ft. lbs). Make sure that O-ring is not twisted out of position.



Z58

AW55, BW55: install oil pump

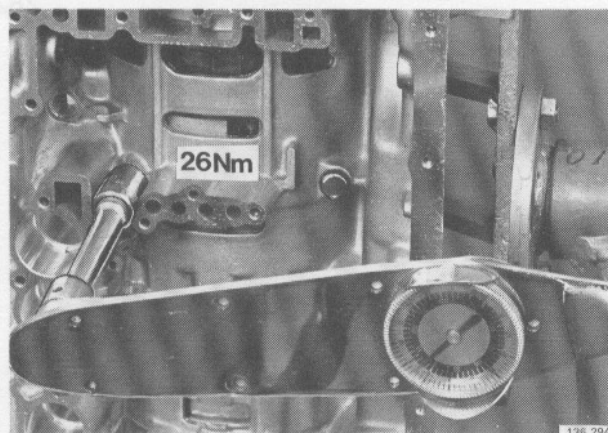
Lubricate oil pump O-ring with ATF

Smear screw heads with silicon.

Install screws with new washers.

Oil pump surface must be clean and free from paint if washers are to have max effect.

Torque screws crosswise to **25 Nm** (18 ft lbs). Make sure that O-ring is not twisted out of position.



Z59

Torque centre support assembly

Torque bolt nearest to accumulator pistons to **7 Nm** (5 ft lbs).

Then torque next bolt to **7 Nm** (5 ft lbs).

Continue torquing bolts crosswise to **14 Nm** (10 ft. lbs), **21 Nm** (15 ft. lbs) and finally **25 Nm** (19 ft. lbs).

Assembly

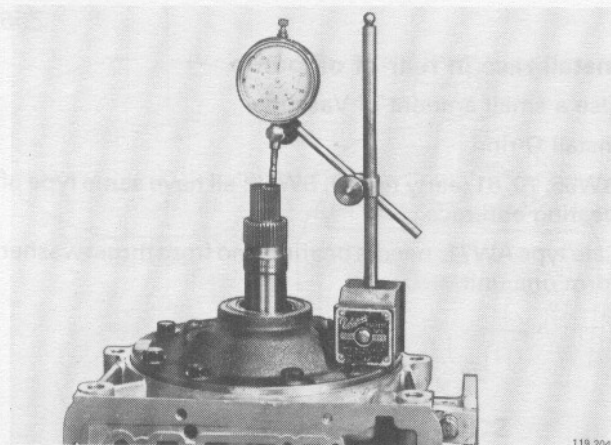
Z60

Check end float of input and output shafts

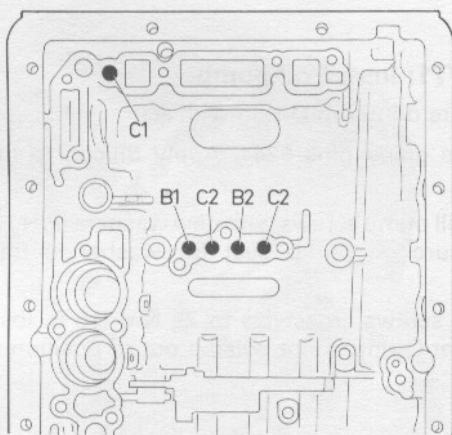
End float

AW55, BW55 = 0.20–0.5 mm (0.008–0.020 in).

AW70/71 = 0.3–0.9 mm (0.012–0.035 in).



119 204



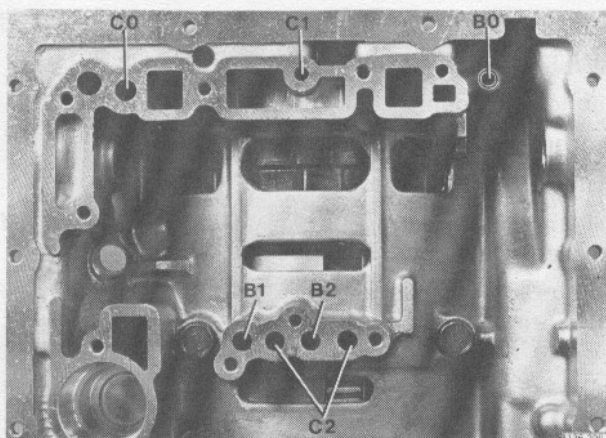
AW 55, BW 55

119 203

Z61

Check pistons

Apply compressed air (max 14 psi) to feed holes illustrated. A clear click should be heard.



AW 70, AW 71

119 201

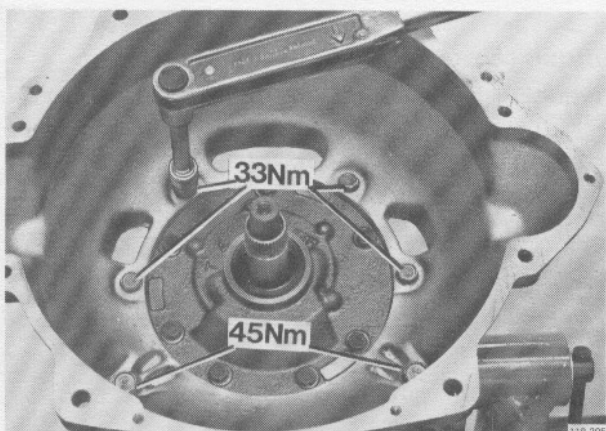
If pistons do not move, dismantle and check.

Z62

AW55, BW55: install torque converter casing

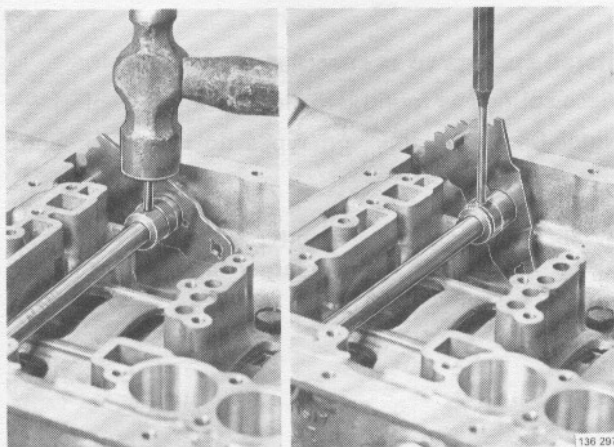
Torque: M10 (4x) to 33 Nm (24 ft. lbs)

M12 (2x) to 45 Nm (33 ft. lbs).



119 205

Z63



Install gear selector shaft and cam

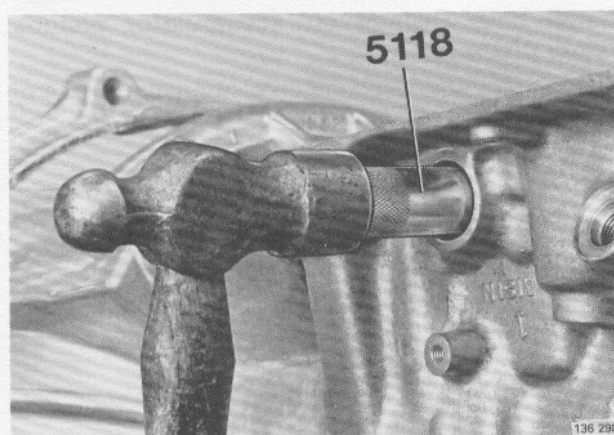
Tap in a new pivot pin.

Install lock ring. (Applies to late type transmissions).

Note! Type of shaft and pin varies with transmission, see section on replacement, K5, page 54.

Late type shafts should be installed.

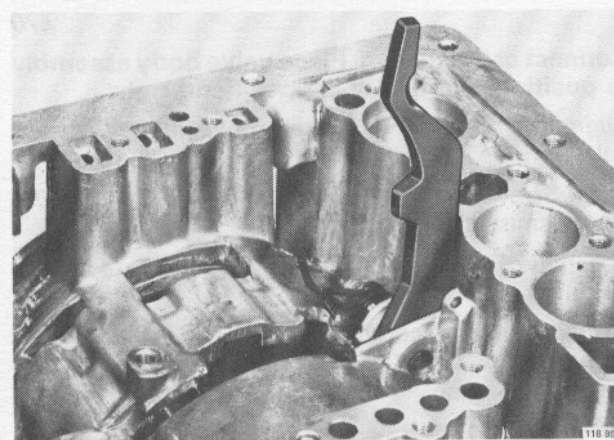
Z64



Install oil seals for gear selector shaft

Use drift 5118.

Z65

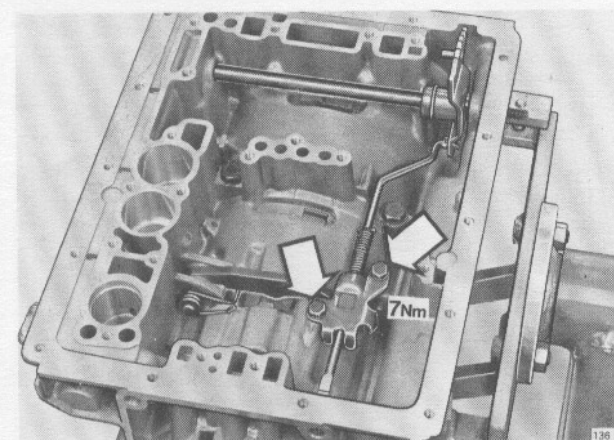


Install parking pawl, spring and pin

Spring should be installed as illustrated.

Note! See K8 page 54 for details of different types of parking pawls in use. Late type parking pawl should be installed.

Z66



Install thrust rod

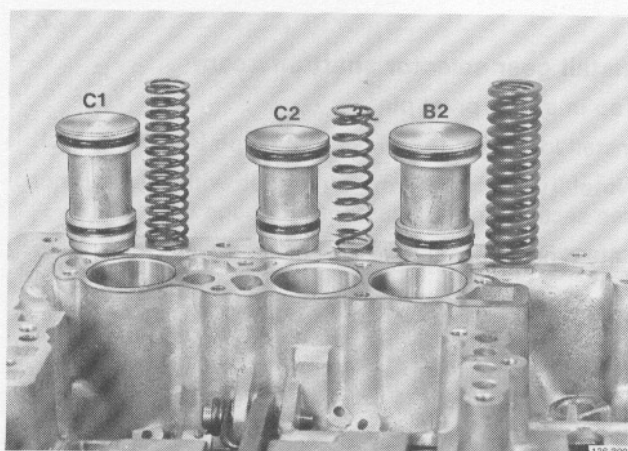
Connect rod to gear selector cam and install lock plate.

Torque screws to **7 Nm** (5 ft. lbs).

Note! Type of thrust rod varies with transmission type. (See K8, page 54).

Late type rod should be installed.

Assembly



Z67

Install springs to accumulator pistons

Place springs as found (smallest spring in centre).

Note! Some transmission types do not have centre springs, see L6 on page 57.

Identification

BW55: C1 spring larger than B2 spring.

AW55, AW70/71: B2 spring larger than C1 spring.

Z68

Install new O-rings on accumulator pistons. Install pistons

Note! O-ring type depends on piston type, see L4 on page 56.

Place smallest piston in centre.

Z69

Connect kick-down cable to gear case

Note! Type of kick-down cable depends on engine type and transmission type.

Z70

Connect cable to cam. Place valve body assembly in position and install screws hand tight

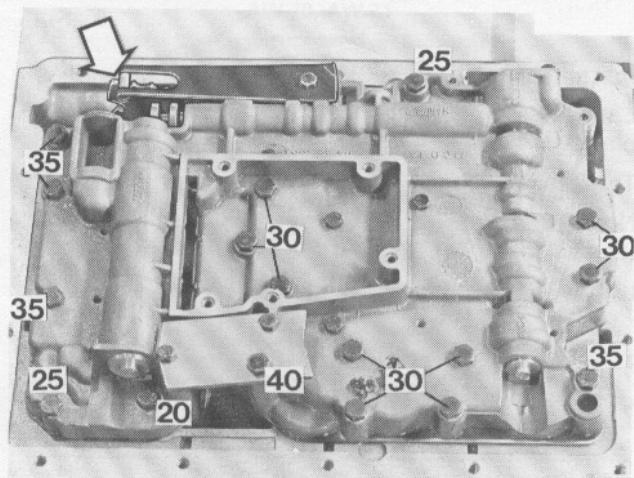
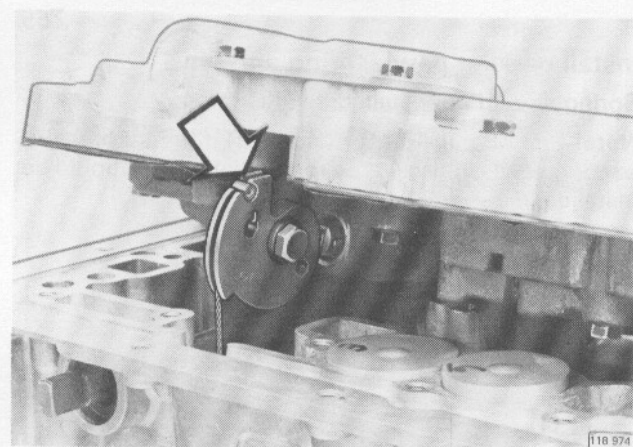
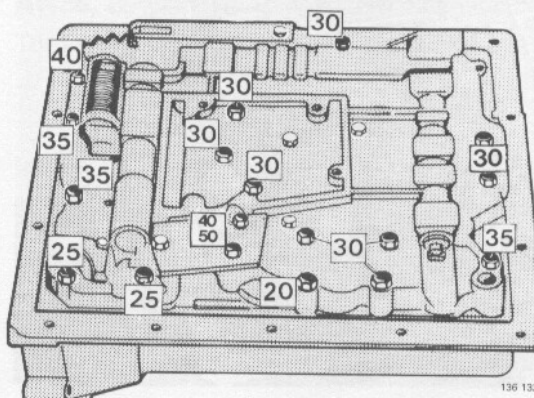
Align cam pin (arrowed) with groove in gear selector valve.

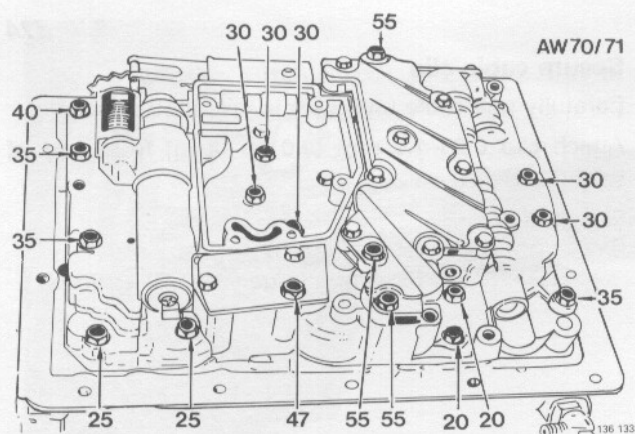
Note! Screw length varies on AW55, BW55 and AW70/71 transmission.

Location of screws is shown below (numbers refer to length in millimeters).

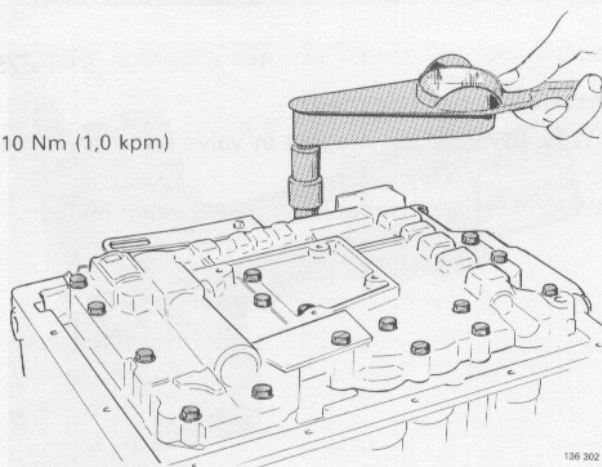
Arrange screws according to length and install shortest two screws first.

AW55



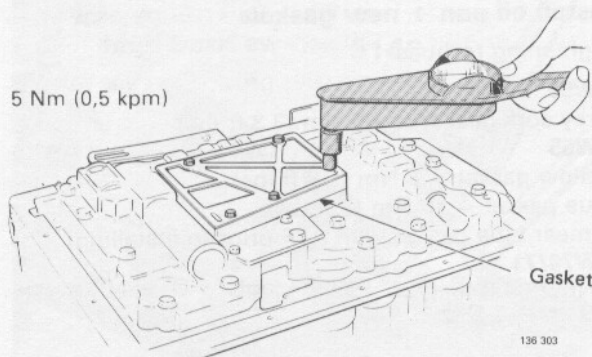


10 Nm (1,0 kpm)

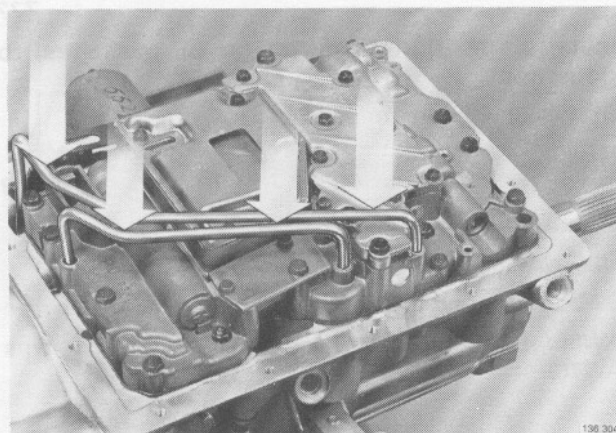


136 302

5 Nm (0,5 kpm)



136 303



136 304

Z71

Torque screws to 10 Nm (7 ft. lbs)

Z72

Install:

- gasket
- spacer (applies to AW70/71, AW55 and BW55 with deep oil pan)
- oil filter.

Torque screws to 5 Nm (3.6 ft. lbs)

BW55: two different types of oil filter are in use, either brass or steel.

Steel type is improvement on brass type. Spare stock brass filters may only be used on transmissions for B17, B19 and B21 engines.

Steel filters must be fitted to police and taxi vehicles.

Steel filters were introduced with effect from following serial numbers:

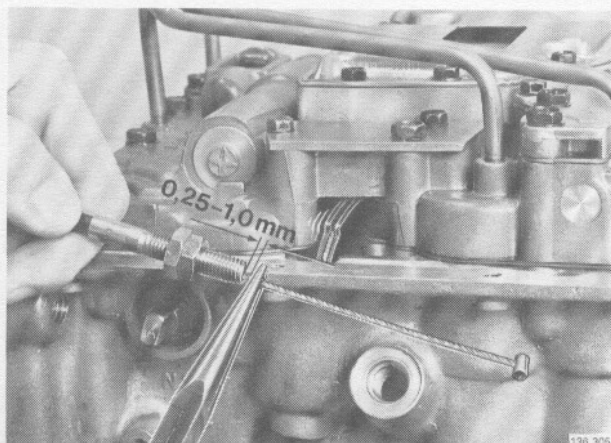
Code	Code	Code	Code
013 1750-	019 7579-	025 1911	031 2193-
015 12960-	020 8776-	026 1415-	
016 1925-	022 1839-	027 1430-	
017 1300-	023 21187-	030 1822-	

Brass filter installed on transmission 014 until stocks used up, thereafter steel filter.

AW70/71: Connect oil pipes

Carefully tap pipes into position with a plastic mallet.

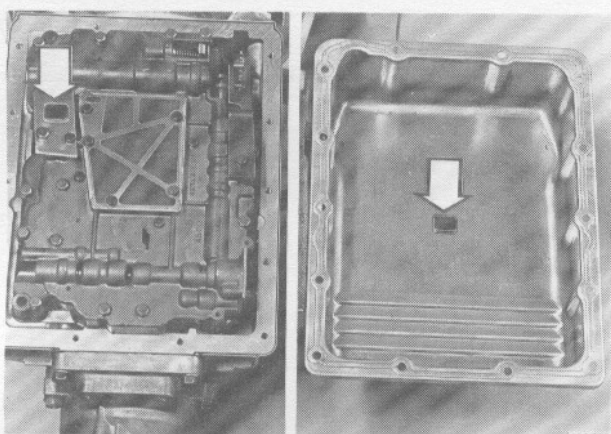
Assembly



Secure cable clip

Carefully pull cable until cam is just about to move.
Attach clip 0.25–1.0 mm (0.01–0.04 in) from end of thread, see fig.

Z74



AW 55, BW 55

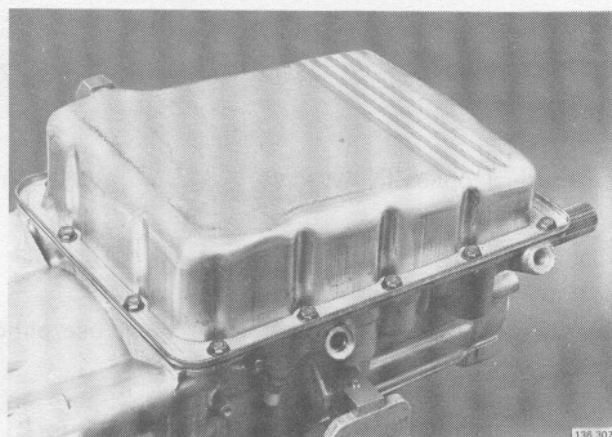
AW 70, AW 71

Install magnet (cleaned)

AW55, BW55: Place magnet in valve body cover plate.

AW70/71: Place magnet in oil pan beneath oil filter.

Z75



Install oil pan + new gasket

Tightening torques:

AW55

Grey cork gasket = 4.5 Nm (3.3 ft lbs)

BW55

Yellow gasket = 8 Nm (5.8 ft lbs)

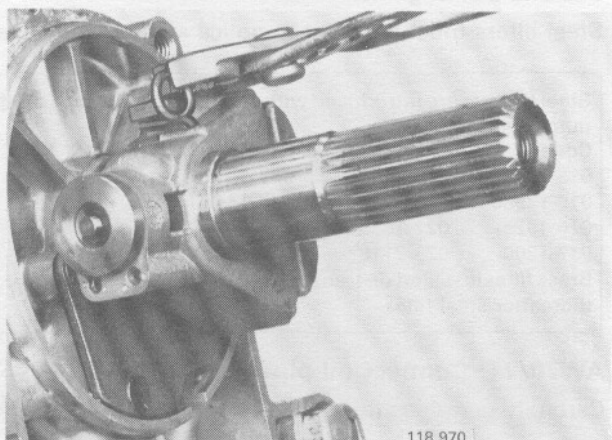
Blue gasket = 10 Nm (7 ft lbs)

(Smear blue gasket with ATF prior to installing).

AW70/71

5 Nm (3.6 ft lbs).

Z76



Install plate + new gasket for oil passages, to governor

AW: Install oil filter in passage.

Z77

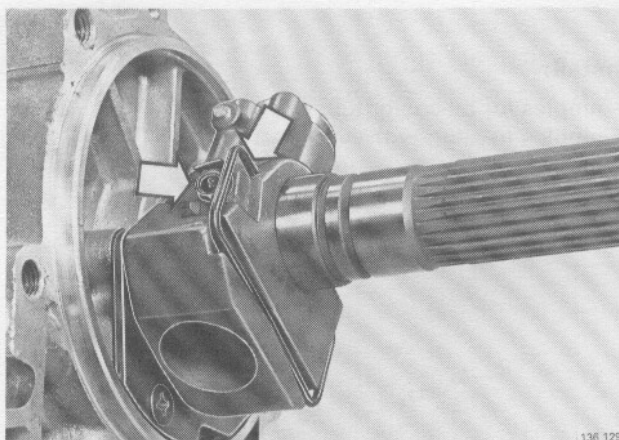
Install governor

Fit drive ring (clip) in hole in shaft.

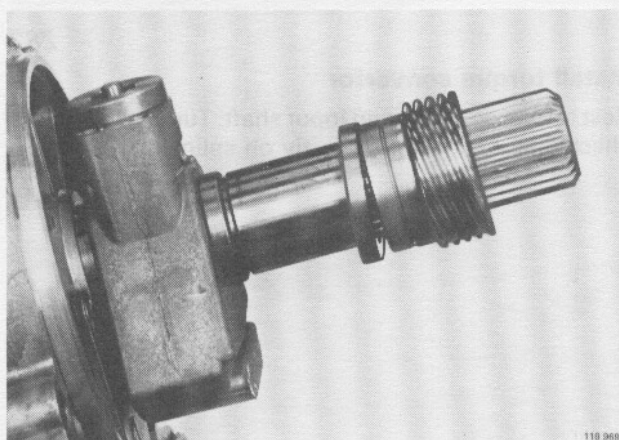
BW55: Turn ring until tight.

AW55: Hook on ring (also applies to early type AW70).

Z78



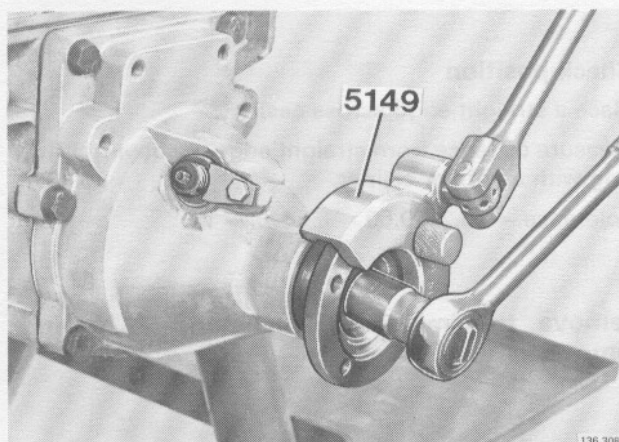
AW70/71: Install screw, bracket and drive ring. Tightening torque 4 Nm (2.9 ft lbs).



Install:

- spacer
- speedometer drive, see fig.

Z79

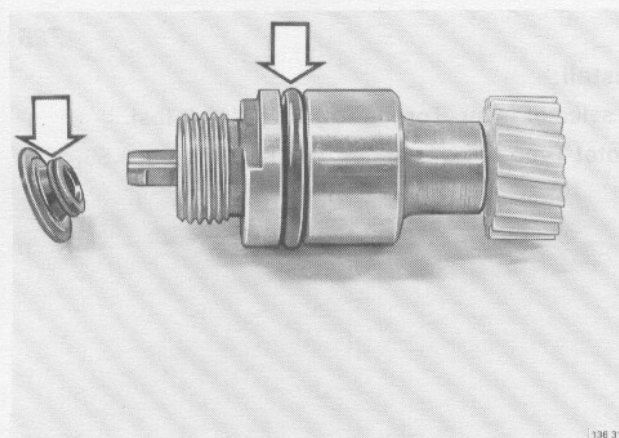


Install:

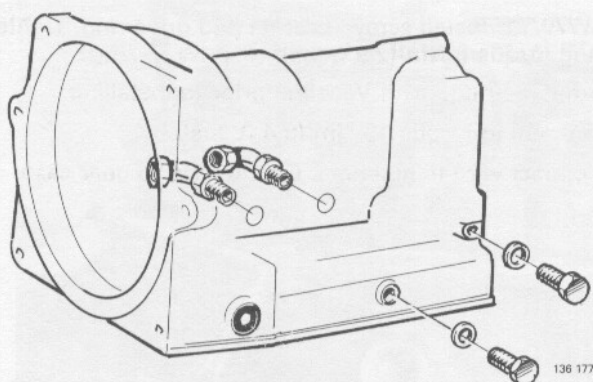
- extension housing + new gasket¹
Tightening torque **35 Nm** (25 ft lbs).
- speedometer driven gear + new O-rings. Turn recess in retainer towards hole in gear case.
Tightening torque **8 Nm** (5.8 ft lbs).
- coupling flange. Use wrench **5149**.
Tightening torque **45 Nm** (33 ft lbs).

Z80

¹ AW70/71: Do not forget to reconnect wire to solenoid valve, see Z86 on page 143.



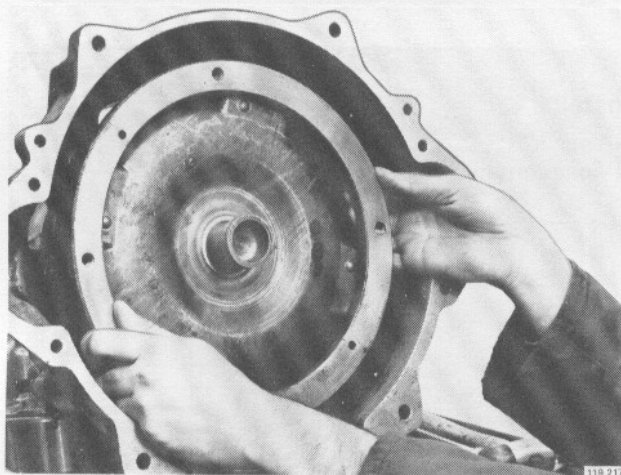
Assembly



Z81

Install:

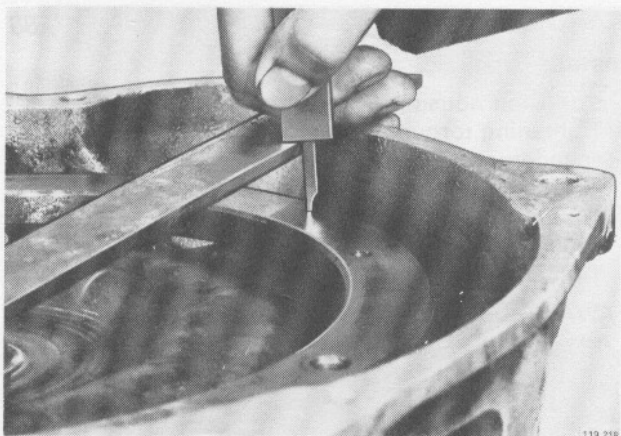
- nipples for oil cooler tubes. Use new O-rings. Adjust nipples to align with oil tubes.
- plugs for pressure gauge connections. Install new O-rings. Tightening torque **8 Nm** (5.8 ft lbs).



Z82

Install torque convertor

Rest torque convertor on input shaft. Turn it slowly and check that it slides in correctly on splines.



Z83

Check position

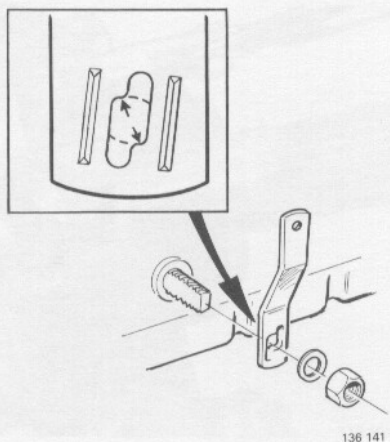
Place a straight edge across casing.

Measure distance from straight edge to convertor face ring with a vernier caliper.

Tolerance = 16.2–19.60 = 0.64–0.77 in.

Z84

Remove transmission from stand 2520 and remove fixture 5070



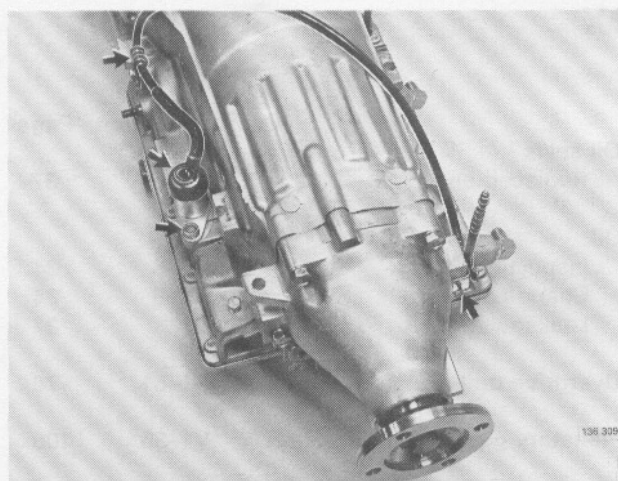
Z85

Install:

- selector lever. Torque to **14 Nm** (10 ft lbs).

Note! Type of lever varies, see K13 and page 55.

Z86

**AW70/71: Install solenoid + new O-rings**

Smear O-rings with Vaseline prior to installing.

Tightening torque **13 Nm** (9.4 ft. lbs).

Connect wire to solenoid. Clamp wire to gear case.

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