

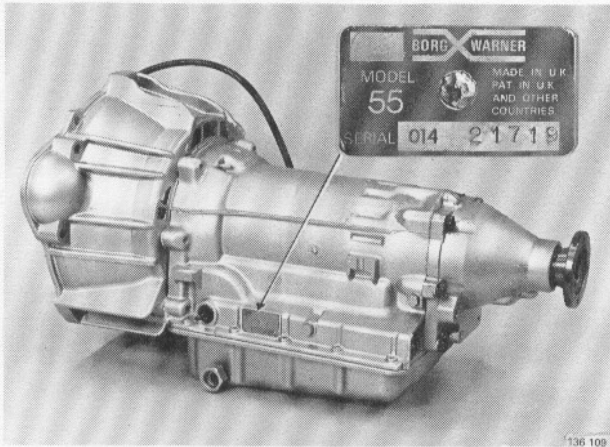
Service Manual

Repairs and maintenance

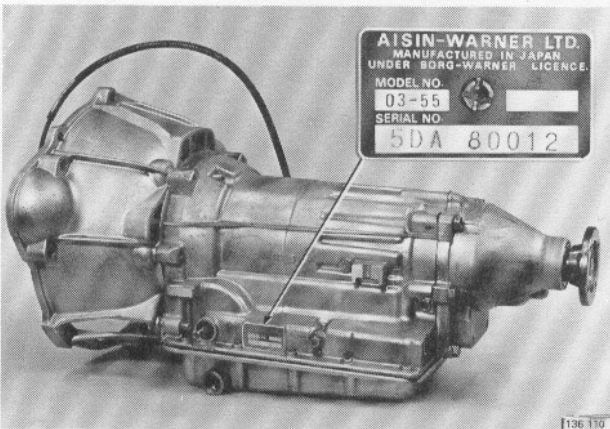
Section 4 (43)

BW55, AW55
AW70, AW71
Automatic
transmissions
240, 260
1975-

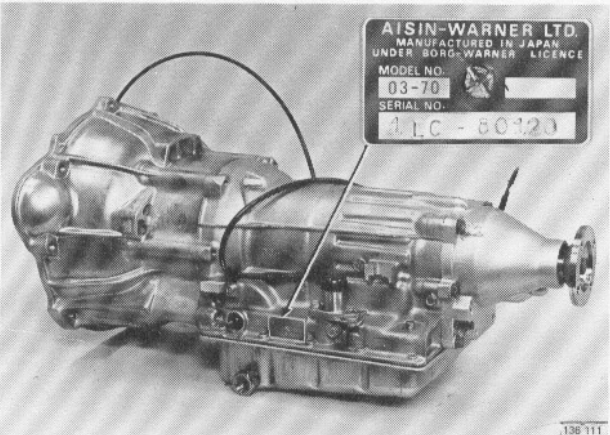
VOLVO



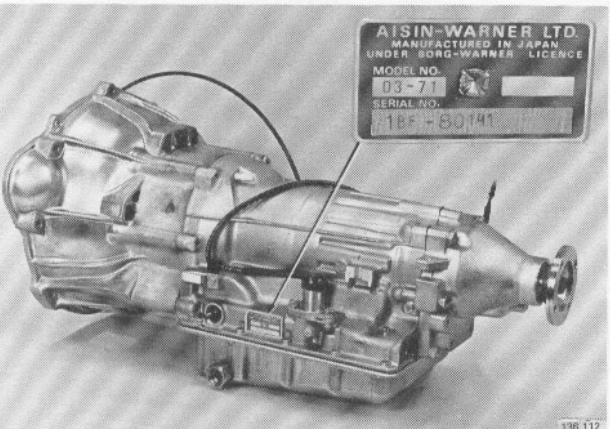
BW 55



AW 55



AW 70



AW 71

BW55, AW55, AW70, AW71

This manual deals with the repair and maintenance of Borg Warner (BW55) and Aisin Warner (AW55, 70 and 71) automatic transmissions.

AW55 and BW55 are three speed units whereas AW70 and AW71 are four speed transmissions where the fourth gear is effectively an overdrive.

The main difference between the AW55 and BW55 is that the front and rear clutches in the AW55 gear case have only one large return spring: the BW clutches have many small springs. Otherwise the two transmissions are the same.

Note that the capacity of the oil pan on a AW55/BW55 was increased in 1979. For distinguishing purposes, the later type has a plastic dipstick.

AW70 and 71 four speed transmissions are similar in many respects to the model 55 units. However the valve body assemblies on the transmissions are different and are adapted to the wide range of engine types found on Volvos. (See page 11 for details.)

An identification plate carrying the serial and model numbers as well as the Volvo part number is fixed to the side of the transmission gear case.



A 1983 plate is shown above.

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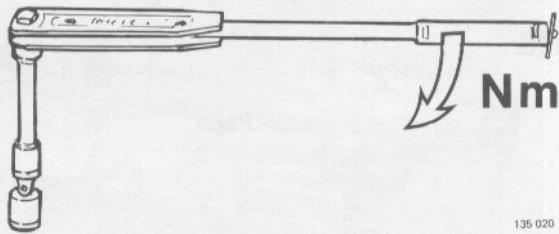
Volvo are sold in versions adapted for different markets. These adaptations depend on many factors including legal, taxation and market requirements.

This manual may therefore show illustrations and text which do not apply to cars in your country.

Order number: TP 30578/1
Supersedes service manual TP 10968
Fault tracing TP 11298
(TP 11403/3 N. AMERICA)

We reserve the right to make alterations without prior notification.

Important information



136 020

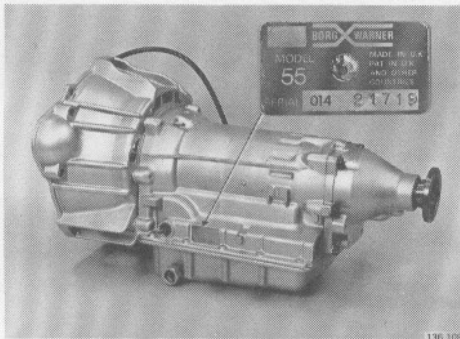
Tightening torques

Two kinds of tightening torques will be found in this manual

1. Tighten to **40 Nm** (30 ft lbs) indicates that a torque wrench must be used for tightening.
2. Tightening torque 40 Nm (30 ft lbs) indicates a guide valve. Tightening need not be done with a torque wrench.

Specifications

Group 40 General



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Model and serial numbers

Identification plate attached to side of gear case. Used in service publications and parts catalogue. Should be quoted in all correspondence (e.g. technical reports) with Volvo.

BW 55

Also stamped on identification plate is a code which gives details of serial number as follows:

Eg 014-21719

014 = Volvo part number 1208165 (015 = 1208166 etc.)

21719 = transmission serial number (1001 = production start).

AW55, 70, 71

Serial number and model number are stamped on a plate. Eg 03-55 000100

03 = Aisin Warner's code

55 = type 55 (70 = type 70 etc.)

100 (in 00100) = code equivalent to Volvo P/N 1208165 (250 = P/N 1208195 etc.)

Eg serial number 5 DA 80012

5 = year of manufacture (1975)

D = month (A = Jan., B = Feb etc.) (NOTE! "I" is not used.)

A = type 55 (C = type 70, F = type 71)

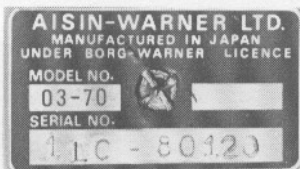
8 = Volvo installed unit

0012 = manufacturing number, start = 0001 each month.

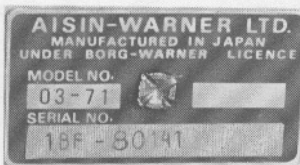
With effect from 1983 models, only Volvo part number is stamped on transmission.



136 110



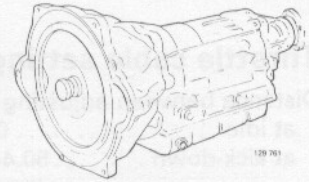
136 111



136 112

Group 43 Automatic transmission

BW55, AW55 AUTOMATIC TRANSMISSIONS



Manufacturer and type.....	Borg Warner type 55, Aisin Warner type 55	
Reduction ratios, 1st speed.....	2.45:1	
2nd speed.....	1.45:1	} x torque converter ratio
3rd speed.....	1:1	
Reverse.....	2.21:1	
Torque converter, ratio.....	1-2:1	
size.....	9.5 in	
Lubricant.....	ATF type G (or F) ¹ DEXTRON 11 D AW 70, AW 71 1984 —	
Capacity, early types.....	6.5 liters (6.9 US qts) incl. approx. 2.5 litres (2.6 US qts) in torque converter	
late types (with deep oil pan, 1979-)... ..	6.9 liters (7.3 US qts) incl. approx. 2.5 liters (2.6 US qts) in torque converter	

¹ ATF = automatic transmission fluid (specification must comply with Ford M2 C33-F or G)

BW55

Engine type	Normal stall speed* r/s (r/min)	Type designation	Plate colour
B 17 A	38.3 (2300)	0455 . . . 022	Dark-blue
	38.3 (2300)	0455 . . . 9PP22	—
B 19 A	35.0 (2100)	0455 . . . 003	Light-yellow
	35.0 (2100)	0455 . . . 014	Brown-yellow
B 19 E	41.7 (2500)	0455 . . . 008	Green
	41.7 (2500)	0455 . . . 015	Deep-red
B 21 A	36.7 (2200)	0455 . . . 003	Light-yellow
	36.7 (2200)	0455 . . . 014	Brown-yellow
B 21 A Taxi	36.7 (2200)	0455 . . . 009	Yellow
	36.7 (2200)	0455 . . . 016	Light-green
	40.0 (2400)	0455 . . . 031	Light-green
B 21 E	42.5 (2550)	0455 . . . 008	Green
	42.5 (2550)	0455 . . . 015	Deep-red
B 21 E Police	42.5 (2550)	0455 . . . 010	Light-brown
	42.5 (2550)	0455 . . . 017	Grey
B 21 F	41.7 (2500)	0455 . . . 005	Green
	41.7 (2500)	0455 . . . 006	Grey
	41.7 (2500)	0455 . . . 012	Grey
	41.7 (2500)	0455 . . . 019	Yellow-brown
	35.0 (2100)	0455 . . . 027	Green
B 23 A	40.0 (2400)	0455 . . . 031	Light-green
B 23 E	40.0 (2400)	0455 . . . 030	Smoke-grey

AW 55

Engine type	Normal stall speed* r/s (r/inm)	Type designation	Plate colour
B 21 F	41.7 (2500)	0355 . . . 100	Black
	41.7 (2500)	0355 . . . 250	Black
	41.7 (2500)	0355 . . . 320	Black
	35.0 (2100)	0355 . . . 376	Black (Red 1982-)

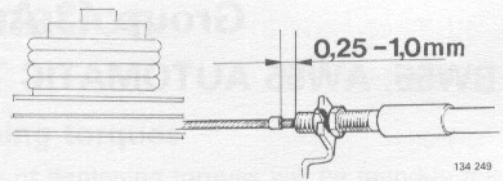
* Stall speed drops by 2 r/s (120 r/min) for each 1000 meter above sea level.

Engine type	Normal stall speed* r/s (r/min)	Type designation	Plate colour
D 20 D 20 Taxi	32.5 (1950)	0455 . . . 020	Smoke-grey
	32.5 (1950)	0455 . . . 026	Light-blue
B 27 A	36.7 (2200)	0455 . . . 001	Light-green
	36.7 (2200)	0455 . . . 013	Yellow-white
	36.7 (2200)	0455 . . . 025	Green
B 27 E	36.7 (2200)	0455 . . . 002	Dark-blue
	36.7 (2300)	0455 . . . 011	Light-orange
	36.7 (2200)	0455 . . . 018	Pink
	36.7 (2300)	0455 . . . 021	Brown
	36.7 (2200)	0455 . . . 023	Light-yellow
B 27 F	38.3 (2300)	0455 . . . 007	Light-blue
	36.7 (2300)	0455 . . . 011	Light-orange
	36.7 (2200)	0455 . . . 018	Pink
	36.7 (2300)	0455 . . . 021	Brown
B28 A	36.7 (2200)	0455 . . . 025	Green
B 28 E	40.0 (2400)	0455 . . . 023	Light-yellow
B 28 F	40.0 (2400)	0455 . . . 023	Light-yellow

Specifications AW55, BW55

Throttle cable setting

Distance between adjusting sleeve and cable stop
 at idle 0.25–1.0 mm (0.01–0.04 in)
 at kick-down 50.4–52.6 mm (1.986–2.072 in)



Stall speed pressures

BW55

Position D 1.12–1.37 MPa (159–195 psi)
 Position R 1.54–1.96 MPa (219–279 psi)

AW55

Position D 0.95–1.20 MPa (135–171 psi)
 Position R 1.40–1.70 MPa (199–242 psi)

Line pressures

BW55

Idle, position D 0.53–0.63 MPa (75–90 psi)
 position R 0.74–0.91 MPa (105–129 psi)

AW55

Idle, position D 0.40–0.45 MPa (57–64 psi)
 position R 0.58–0.68 MPa (82–97 psi)

Governor pressures

Final drive ratio	Governor pressure											
	MPa	psi	km/h	mph	MPa	psi	km/h	mph	MPa	psi	km/h	mph
BW55 3.31:1 Diesel	0.11–0.14	16–20	34	21	0.18–0.22	26–31	62	39	0.38–0.43	54–61	121	76
3.54:1	0.10–0.13	14–18	32	20	0.15–0.19	21–27	57	36	0.36–0.46	51–65	110	69
3.54:1 Diesel	0.12–0.14	17–20	32	20	0.19–0.23	27–33	57	34	0.43–0.48	61–68	110	69
3.73:1	0.10–0.13	14–18	20	19	0.16–0.20	23–28	55	34	0.37–0.44	53–63	108	67
3.73:1 Diesel	0.13–0.15	18–21	30	19	0.20–0.23	28–33	55	34	0.47–0.52	67–74	108	67
3.91:1	0.10–0.13	14–18	29	18	0.16–0.20	23–28	53	33	0.37–0.44	53–63	103	64
4.10:1	0.10–0.13	14–18	28	17	0.16–0.20	23–28	51	32	0.37–0.44	53–63	98	61
AW55 3.73:1	0.10–0.15	14–21	30	19	0.16–0.22	23–32	55	34	0.42–0.52	60–74	108	67
3.91:1	0.10–0.15	14–21	29	18	0.16–0.22	23–32	53	33	0.42–0.52	60–74	103	64
4.10:1	0.10–0.15	14–21	28	17	0.16–0.22	23–32	51	32	0.42–0.52	60–74	98	61

Shift speeds km/h (mph)

Limits for shift points

BW55

Engine type	B 17 A	B 19 A	B 19 E	B 21 A	B 21 A	B 21 E	B 21 E	B 21 F	B 21 F
final drive ratio	3.91:1	3.91:1	3.91:1	3.54:1	3.73:1	3.72:1	3.91:1	3.73:1	3.91:1
1-2.....	61 (38)	61 (38)	64 (40)	67 (42)	64 (40)	66 (41)	64 (40)	63 (39)	63 (39)
2-3.....	107 (67)	107 (67)	114 (71)	118 (74)	112 (70)	117 (73)	114 (71)	111 (69)	109 (68)
3-2.....	99 (62)	99 (62)	106 (66)	109 (68)	104 (65)	109 (68)	106 (66)	102 (64)	99 (62)
3-1 ca.....	50 (31)	50 (31)	50 (31)	50 (31)	50 (31)	50 (31)	50 (31)	50 (31)	50 (31)

Final drive ratio	B 23 A	B 23 E	B 27 A	B 27 E	B 27 F	B 28 A	B 28 E	B 28 F	D 20	D 24	D 24
3.54:1	3.54:1	3.54:1	3.54:1	3.54:1	3.54:1	3.54:1	3.54:1	3.54:1	3.72:1	3.31:1	3.54:1
1-2.....	67 (42)	69 (43)	67 (42)	70 (44)	70 (44)	67 (42)	70 (44)	70 (44)	53 (33)	58 (36)	55 (34)
2-3.....	117 (73)	123 (77)	120 (75)	125 (78)	125 (78)	120 (75)	125 (78)	125 (78)	95 (59)	106 (55)	100 (63)
3-2.....	109 (68)	114 (71)	110 (69)	115 (72)	115 (72)	110 (69)	115 (72)	115 (72)	88 (55)	98 (61)	92 (58)
3-1 ca.....	50 (31)	50 (31)	50 (31)	50 (31)	50 (31)	50 (31)	50 (31)	50 (31)	50 (31)	50 (31)	50 (31)

AW55

Final drive ratio	B 21 F	B 21 F	B 21 F
3.73	3.91	4.10	
1-2.....	63 (39)	63 (39)	60 (39)
2-3.....	111 (69)	109 (68)	104 (65)
3-2.....	101 (63)	99 (62)	94 (59)
3-1 ca.....	50 (31)	50 (31)	50 (31)

Clearances

	BW55	AW55
Oil pump: pump body – outer gear wheel.....	0.07–0.30 mm (0.0027–0.0118 in)	0.07–0.15 mm (0.0027–0.0059 in)
arc segment – large gear wheel.....	0.11–0.50 mm (0.0043–0.0197 in)	0.11–0.14 mm (0.0043–0.0055 in)
axial clearance.....	0.02–0.10 mm (0.0008–0.0040 in)	0.02–0.05 mm (0.0008–0.0020 in)
C2 clutch, B1 and B2 brakes: clearance between clutch assembly pressure plate and lock ring.....	0.3–1.2 mm (0.0118–0.0472 in)	0.3–1.2 mm (0.0118–0.0472 in)
Input shaft, C1 clutch, axial clearance.....	0.20–0.55 mm (0.0078–0.0216 in)	0.20–0.55 mm (0.0078–0.0216 in)
Output shaft, axial clearance.....	0.20–0.55 mm (0.0078–0.0216 in)	0.20–0.55 mm (0.0078–0.0216 in)

Brake and clutch discs

Minimum permissible thickness.....	2.1 mm (0.083 in)
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BW55 spring identification chart

Spring	Free length mm (in)	Active coils	Wire dia mm (in)	Spring OD mm (in)	Remarks
Accumulator B2:					
B17A, B19A, B21A, B23A, B21A Taxi, B23A Taxi	52.9 (2.083)	12	2.24 (0.088)	16.2 (0.638)	
B21E Police, B27, B28	67.0 (2.637)	12.5	2.3 (0.091)	17.8 (0.701)	
B19E, B21E, B21F, D20, D24	58.6 (2.307)	12.6	2.337 (0.092)	17.8 (0.701)	
B23 ¹	66.5 (2.618)	12.5	2.7 (0.106)	17.9 (0.705)	
Accumulator C2, late type	54.0 (2.136)	12.0	2.24 (0.088)	15.0 (0.591)	
early type	52.25 (2.057)	12.5	2.0 (0.079)	15.31 (0.603)	
Accumulator C1, late type	68.5 (2.697)	10.5	2.65 (0.104)	19.65 (0.774)	
early type	67.0 (2.638)	12.5	2.3 (0.091)	17.80 (0.701)	
Governor B17-B23, B27, B28	20.63 (0.812)	7.5	0.9 (0.035)	9.05 (0.356)	
D20/D24	19.52 (0.768)	7.5	0.9 (0.035)	9.05 (0.356)	
Throttle valve, secondary, type 2	20.0 (0.787)	7.0	0.81 (0.032)	8.68 (0.342)	
type 1	19.34 (0.761)	7.3	0.81 (0.032)	8.68 (0.342)	P/N 1239287
Throttle valve, primary	43.03 (1.694)	14.0	1.37 (0.054)	10.95 (0.431)	
Detent regulator valve	36-32 (1.430)	12.0	0.76 (0.030)	9.14 (0.360)	
Intermediate coast modulator valve, type 2	35.92 (1.414)	13.5	0.94 (0.037)	8.94 (0.352)	
type 1	35.92 (1.414)	13.5	0.94 (0.037)	9.88 (0.389)	
Reverse clutch sequence valve	37.21 (1.465)	15.5	1.4 (0.055)	9.0 (0.354)	
Governor modulator valve*	36.07 (1.420)	12.0	0.71 (0.028)	9.09 (0.358)	
*Line pressure relief valve, type 1	32.14 (1.265)	9.0	2.03 (0.080)	13.14 (0.517)	
type 2	36.8 (1.449)	9.0	1.9 (0.075)	13.4 (0.528)	260
Cut-back valve*	18.0 (0.709)	19.0	0.36 (0.014)	3.92 (0.154)	
Low coast modulator valve type 1	33.22 (1.308)	13.5	0.94 (0.037)	9.88 (0.389)	
type 2 = transmission code: 003, 005, 006, 008, 009, PP22, 010, 012, 020, 026	35.92 (1.414)	13.5	0.94 (0.037)	8.94 (0.352)	Black
type 3 = transmission code: 001, 002, 007, 011, 013, 014, 015, 016, 017, 018, 019, 021, 022, 023, 025, 027, 030, 031	33.22 (1.308)	13.5	0.94 (0.037)	8.94 (0.352)	Red
Shift valve 3-2, type 2	32.07 (1.308)	11.0	0.94 (0.037)	10.21 (0.402)	
type 1	36.17 (1.424)	11.0	0.94 (0.037)	10.20 (0.402)	
Secondary regulator valve, type 3	55.45 (2.183)	13.5	2.3 (0.091)	16.95 (0.667)	
type 2	69.11 (2.721)	13.5	1.75 (0.069)	16.99 (0.669)	
type 1 very early models	59.45 (1.947)	11.0	2.10 (0.083)	16.45 (0.648)	
Primary regulator valve	69.11 (2.271)	13.5	1.75 (0.069)	16.99 (0.669)	
By-pass valve, type 3	25.0 (0.984)	7.0	1.75 (0.069)	11.6 (0.457)	
type 2	28.89 (1.137)	7.9	1.42 (0.056)	11.4 (0.449)	
type 1 very early models	29.70 (1.169)	7.0	1.52 (0.060)	13.80 (0.543)	
Low coast shift valve, late type	30.33 (1.194)	12.6	0.65 (0.026)	7.2 (0.284)	
early type	29.61 (1.166)	13.0	0.64 (0.025)	5.40 (0.213)	

* Discontinued on later models. Only fitted on transmissions 002, 005, 006 and 007.

¹ B23E may have same spring as B19E, B21E, B21F, D20 and D24.

NOTE! The above chart can be used to identify springs prior to installing. If the free length of a spring is not exactly according to specifications this does not necessarily mean that the spring is defective (special test equipment is necessary to ascertain this).

AW55 spring identification chart

Spring	Free Lngh mm (in)	Active coils	Wire dia mm (in)	Spring OD mm (in)	Remarks
Accumulaor B2.....	67.00 (2.638)	12.5	2.30 (0.091)	17.80 (0.701)	
Accumulator C2.....	38.42 (1.513)	10.0	2.03 (0.080)	14.03 (0.552)	
Accumulator C1.....	68.56 (2.699)	15.5	2.03 (0.080)	17.53 (0.691)	
Governor.....	20.63 (0.812)	7.5	0.90 (0.035)	9.05 (0.356)	
Throttle valve, secondary.....	21.44 (0.844)	8	0.71 (0.028)	8.58 (0.338)	
Throttle valve, primary.....	43.0 (1.693)	15.5	1.19 (0.047)	10.89 (0.429)	
Detent regulator valve, type 1.....	30.43 (1.198)	13	0.90 (0.035)	8.90 (0.351)	
type 2.....	31.39 (1.236)	13.5	0.90 (0.035)	8.85 (0.348)	
Intermediate coast modulator valve, type 1.....	35.43 (1.395)	14.4	0.90 (0.035)	8.80 (0.346)	
type 2.....	25.6 (1.008)	11.5	1.14 (0.045)	9.00 (0.354)	
Reverse clutch sequence valve, type 1.....	36.83 (1.450)	15	1.14 (0.045)	9.14 (0.360)	
type 2.....	37.55 (1.478)	14.5	1.17 (0.046)	9.17 (0.361)	
Governor modulator valve.....	36.07 (1.420)	12.0	0.71 (0.028)	9.09 (0.358)	
Low coast modulator valve.....	42.35 (1.667)	15.0	0.84 (0.033)	9.24 (0.364)	
Intermediate coast shift valve.....	35.10 (1.382)	12.5	0.76 (0.030)	8.96 (0.353)	White
Reverse clutch sequence valve.....	37.55 (1.478)	14.5	1.17 (0.046)	9.17 (0.361)	
Low coast shift valve.....	34.62 (1.363)	13.0	0.56 (0.022)	7.56 (0.298)	
Line pressure relief valve.....	32.14 (1.265)	9.0	2.03 (0.080)	13.14 (0.517)	
Pressure relief valve.....	30.65 (1.207)	7	1.32 (0.052)	13.82 (0.544)	
Primary regulator valve.....	73.3 (2.886)	15	1.588 (0.063)	16.118 (0.635)	Red
Secondary regulator valve.....	74.83 (2.946)	15	1.60 (0.063)	16.84 (0.663)	

NOTE! The above chart can be used to identify springs prior to installing. If the free length of a spring is not exactly according to specifications this does not necessarily mean that the spring is defective (special test equipment is necessary to ascertain this).

Tightening torques

BW55, AW55	Nm	ft-lbs
Converter housing to engine, M10	35-50	25-36
M12	55-90	40-65
Drive plate to torque converter, M10	41-50	30-36
M8 (diesel).....	17-27	12-20
Cover plate to converter housing, 3 x M6.....	6-9	4-6
2 x M8.....	18-25	13-18
Center support to gear case		
Tighten alternately in steps of 7 Nm (5 ft-lbs).....	24-28	17-20
Pump cover to pump.....	5-9	4-6
Pump assembly to gear case.....	22-28	16-20
Plate above parking pawl.....	6-9	4-6
Converter housing to gear case		
4 x M10.....	26-40	19-29
2 x M12.....	47-60	34-43
Rear extension housing to gear case.....	26-40	19-29
Valve body to gear case.....	8-12	6-9
Valve body, for cam, M6.....	6-9	4-6
other bolts, M5.....	5-6	3.5-4
Oil strainer to lower valve body.....	5-6	3.5-4
Oil pan to gear case (grey cork gasket) AW55.....	4-5	3-3.5
(yellow gasket).....	6-10	4-7
(blue gasket) ¹	8-12	6-9
Coupling flange to output shaft ²	40-50	30-36
Nut, oil cooler to gear case.....	20-30	14-22
Blind plug for pressure test.....	9-12	7-9
Cover plate to gear case (governor), M6.....	6-9	4-6
Speedometer drive.....	4-6	3-4
Nut, oil dipstick tube.....	80-100	58-72
Inhibitor switch to gear case (B27 early type).....	5-7	3.5-5
Drain plug to oil pan, AW55.....	18-23	13-17
BW55.....	12-17	9-12

¹ Grease lightly before installing² Apply locking fluid P/N 1161053-2 (1161054-0)**AW70, AW71 AUTOMATIC TRANSMISSIONS**

Manufacturer and type.....	Aisin Warner types 70 and 71
Reduction ratios, 1st speed.....	2.45:1
2nd speed.....	1.45:1
3rd speed.....	1:1
Overdrive.....	0.69:1
Reverse.....	2.21:1
Torque converter, ratio.....	1-approx. 2:1
size.....	248 mm
Lubricant.....	ATF type G (F) ¹
Capacity.....	DEXTRON 11 D AW 70, AW 71 1984 — 7.5 liters (9.8 US qts) incl. approx. 2.5 liters (2.6 US qts) in torque converter

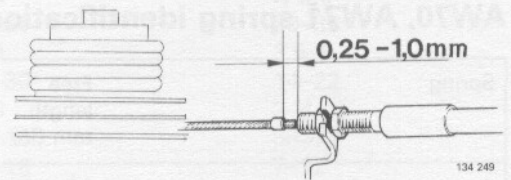
¹ ATF = automatic transmission fluid (specification must comply with Ford M2 C33-F or G)

Type	Normal stall speed*	Volvo P/N	Plate colour
AW70	r/s (r/min)		
B21F-MPG	30.8 (1800)	1208 220	Yellow
B21F-LH	33.0 (1980)	1208 284	Silver
B23F	37.0 (2220)	1208 320	Purple
AW71			
B21FT	34-41 (2050-2500)	1208 222	Pink
B21FT	34-41 (2050-2500)	1208 319	Dark brown

* Stall speed drops by 2 r/s (120 r/min) for each 1000 meters above sea level.

Throttle cable setting

Distance between adjusting sleeve and cable stop
 at idle 0.25–1.0 mm (0.01–0.040 in)
 at kick-down 50.4–52.6 mm (1.986–2.072 in)



Line pressure

	AW70	AW71
Position D	0.35–0.44 MPa (50–63 psi)	0.46–0.54 MPa (65–77 psi)
Position R	0.50–0.64 MPa (71–91 psi)	0.70–0.82 MPa (106–117 psi)

Stall speed pressure

	AW70	AW71
Position D	0.96–1.10 MPa (137–156 psi)	1.00–1.20 MPa (142–205 psi)
Position R	1.37–1.70 MPa (195–242 psi)	1.50–1.90 MPa (213–270 psi)

Governor pressures

Final drive ratio	Governor pressure											
	MPa	km/h	psi	mph	MPa	km/h	psi	mph	MPa	km/h	psi	mph
3.73:1	0.09–0.15	30	13–21	19	0.16–0.22	55	23–31	35	0.41–0.53	108	58–75	122
3.91:1	0.09–0.15	29	13–21	18	0.16–0.22	53	23–31	33	0.41–0.53	108	58–75	65

Shift speeds km/h (mph)

Limits for shift points	AW 70	AW 70	AW 71	AW 71	Throttle opening %
	3.73	3.91	3.73	3.91	
1–2	65 (41)	62 (39)	63 (40)	60 (38)	100* (63)
2–3	108 (68)	103 (65)	105 (66)	100 (63)	100* (63)
3–4	114 (72)	109 (69)	111 (70)	105 (66)	75 (47)
4–3	40 (25)	38 (24)	39 (25)	37 (23)	0 (0)
3–2	102 (64)	97 (61)	99 (62)	94 (59)	100* (63)
2–1	51 (32)	49 (31)	50 (32)	48 (30)	100* (63)

* Kick-down position

Clearances

Oil pump: pump body – outer gear wheel	2.1 (0.083 in)
arc segment – large gear wheel	0.11–0.14 mm (0.0043–0.0055 in)
axial clearance	0.02–0.05 mm (0.0008–0.0019 in)
Brake BO: clearance between clutch pressure plate and lock ring	0.35–1.60 mm (0.0138–0.063 in)
Clutch C2, brakes B1 and B2: clearance between clutch assembly pressure plate and lock ring	0.3–1.2 mm (0.0118–0.0472 in)
Input shaft, clutch CO, axial clearance	0.3–0.9 mm (0.0118–0.0472 in)
Output shaft, axial clearance	0.3–0.9 mm (0.0118–0.0472 in)

Brake and clutch rings

Minimum permissible thickness 2.1 mm (0.083 in)

Solenoid valve

Resistance 13 ohms

AW70, AW71 spring identification chart

Spring	Free length mm (in)	Active coils	Wire dia mm (in)	Spring OD mm (in)	Remarks
Accumulator B2	66.68 (2.625)	14.00	2.80 (0.110)	17.34 (0.682)	AW70: 020, 033
	68.35 (2.691)	13.00	2.60 (0.102)	17.91 (0.705)	AW70: 055
	66.68 (2.625)	12.00	3.20 (0.126)	20.4 (0.803)	AW71
Accumulator C2	61.21 (2.410)	11.5	2.50 (0.098)	16.54 (0.651)	AW70
	55.18 (2.172)	8.5	2.00 (0.079)	15.87 (0.625)	AW71
Accumulator C1	68.56 (2.700)	15.5	2.03 (0.080)	17.53 (0.690)	AW70, AW71
	64.80 (2.551)	13.0	2.00 (0.079)	17.20 (0.677)	AW70: 053
Governor	20.63 (0.812)	1.5	0.90 (0.035)	9.05 (0.356)	
Throttle valve, secondary	21.94 (0.864)	8	0.71 (0.028)	8.58 (0.338)	
Throttle valve, primary	43.0 (1.693)	15.5	1.19 (0.047)	10.89 (0.429)	
Detent regulator valve	31.39 (1.236)	13.5	0.90 (0.035)	8.85 (0.348)	
Intermediate coast modulator valve					
type 1	25.6 (1.008)	11.5	1.14 (0.045)	9.00 (0.354)	AW70
type 2	27.26 (1.073)	9.5	1.10 (0.043)	9.04 (0.356)	AW71
Reverse clutch sequence valve	37.55 (1.478)	14.5	1.17 (0.046)	9.17 (0.361)	
Governor modulator valve	36.07 (1.420)	12.0	0.71 (0.028)	9.09 (0.358)	Yellow
Intermediate coast modulator valve ..	42.35 (1.667)	15.0	0.84 (0.033)	9.24 (0.364)	
Intermediate coast shift valve	35.10 (1.382)	12.5	0.76 (0.030)	8.96 (0.353)	
Low coast shift valve	34.62 (1.363)	13.0	0.56 (0.022)	7.56 (0.298)	
Line pressure relief valve	32.14 (1.265)	9.0	2.03 (0.080)	13.14 (0.517)	
Pressure relief valve	33.32 (1.312)	7.0	1.32 (0.052)	13.82 (0.544)	
Shift valve 3-4, type 1	37.88 (1.491)	14.5	1.10 (0.043)	10.60 (0.417)	AW70
	type 2	33.65 (1.325)	14.5	1.10 (0.043)	10.60 (0.417)
Primary regulator valve, type 1	73.30 (2.886)	15	1.588 (0.063)	16.72 (0.658)	AW70
	type 2	61.20 (2.409)	13	1.80 (0.071)	17.2 (0.677)
Secondary regulator valve	71.27 (2.806)	15	1.93 (0.076)	17.43 (0.686)	

Note! The above chart can be used to identify springs prior to installing.

If the free length of a spring is not exactly according to specifications this does not necessarily mean that the spring is defective (special test equipment is necessary to ascertain this).

Tightening torques

	Nm	ft-lbs
Converter casing – engine, M10	35–50	25–36
M12	55–90	40–65
Drive plate to torque converter	41–50	30–36
Centre support to gear case		
tighten alternately in steps to		
7 Nm (5 ft lbs)	24–28	17–20
Pump cover to pump body	6–9	4–6
Pump assembly to gear case	18–25	13–18
Plate above parking pawl	6–9	4–6
Converter casing to gear case		
4 x M10	26–47	19–34
2 x M12	48–68	35–49
Rear extension housing to gear case	27–42	20–30
Valve bodies, for cam M6	6–9	4–6
other bolts, M5	5–6	3.5–4
Oil strainer to lower valve body	5–6	3.5–4
Cover plate to gear case, M6	6–9	4–6
Valve body to gear case	8–12	6–9
Oil pan to gear case	4–5	3–3.5

	Nm	ft-lbs
Coupling flange to output shaft*	40-50	30-36
Blind plug for pressure test	5-9	3.5-6
Nut, oil cooler to gear case	20-30	14-22
Speedometer drive	4-6	3-4
Nut, oil dipstick tube	80-100	58-72
Solenoid valve	10-16	7-12
Drain plug to oil pan	18-23	13-17

* Use locking fluid P/N 1161053-2 (1161054-0)

VALVE BODY ASSEMBLIES

A brief description of the many different types of valve body assemblies in use on Volvos is described in the following pages. Modifications have been made throughout the years, and can be identified by a code number or by the change in part and serial numbers as shown below

When replacing an old type valve body with a new one, it is very important that the governor is replaced as well even if it is in fully working order. This is because the valve body and governor are matched to ensure correct shift speeds.

The valve body assemblies for the different transmissions are very similar but parts must not be interchanged otherwise there is risk of too high or too low shift speeds or no shift at all.

Note that AW transmissions have only one governor.

Contents

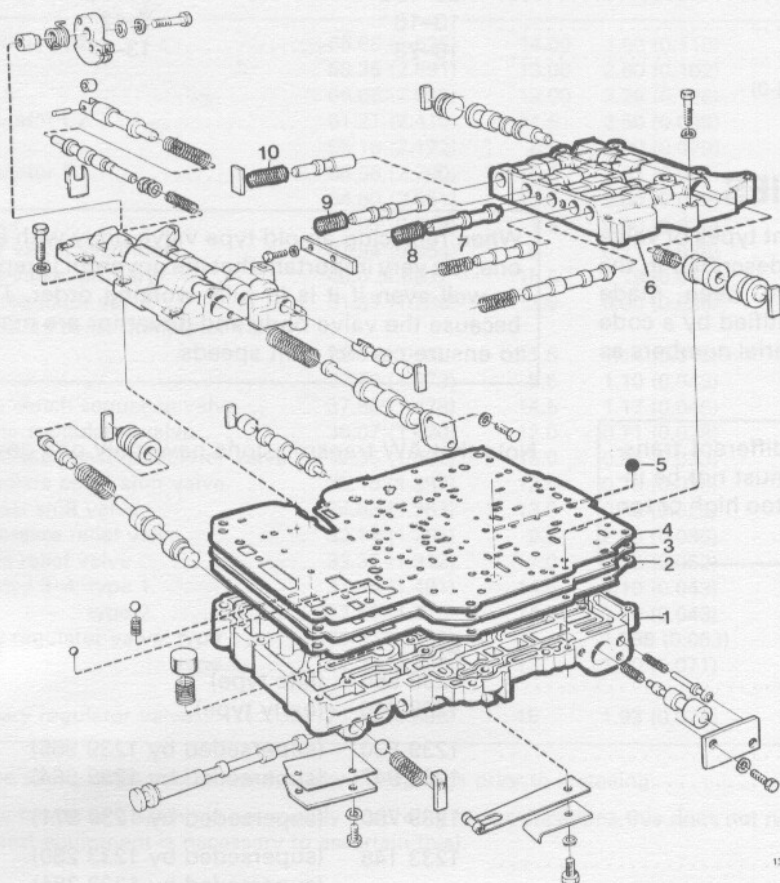
	P/N		Page
Valve body AW55	1239 556	(late type)	12
	1239 646	(early type)	12
AW70	1239 830	(superseded by 1239 965)	13
AW70 B23F	1239 947	(superseded by 1239 964)	13
AW71	1239 790	(superseded by 1239 971)	13
BW55	1233 148	(superseded by 1233 280)	14
		(superseded by 1233 281)	
		1233 289)	
	1233 280	(superseded by 1233 295)	15
	1233 281	(superseded by 1233 296)	15
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	1233 295	(superseded by 1233 371)	16
	1233 296	(superseded by 1233 371)	16
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	1233 349	(superseded by 1233 387)	17
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Governor transmission code

Governor P/N

001	1233 274	012	1233 274	023	1233 275
002	1233 244 to serial no 11336	013	1233 274	025	1233 274
002	1233 275 from serial no 11337	014	1233 274	026	1233 344
003	1233 274	015	1233 276	027	1233 274
005	1233 274	016	1233 274	030	1233 276
006	1233 274	017	1233 276	031	1233 274
007	1233 244 to serial no 2819	018	1233 275	AW55	1239 511 to 2BA 80000
007	1233 275 from serial no 2820	019	1233 274	AW55	1239 785 from 2BA 80001
008	1233 276	020	1233 344	AW70	1239 867 to 1LC 86636
009	1233 274	021	1233 275	AW70	1239 785 from 1LC 86637
010	1233 276	022	1233 274	AW71	1239 785
011	1233 275				

AW55 1976-



- 1 Lower valve body
- 2 Gasket
- 3 Separator plate
- 4 Gasket
- 5 Valve ball (upper rear valve body)
- 6 Upper rear valve body
- 7 Reverse clutch sequence valve
- 8 Spring (reverse clutch sequence valve)
- 9 Spring (intermediate coast modulator valve)
- 10 Spring (detent regulator valve)

136 310

Valve body

Early type (1976-1977)

Valve body P/N 1239 556 fitted only to transmissions 1208 063 (code 100) to serial no -80 492.

Late type (1978-)

Valve body P/N 1239 646. Difference between old and new types is shown above. The numbered components are only to be found on 1978- valve bodies. Note! Extra ball (5) P/N 1239 572.

Valve body system introduced from serial no 80 493 on:

P/N 1208 063 (1978)

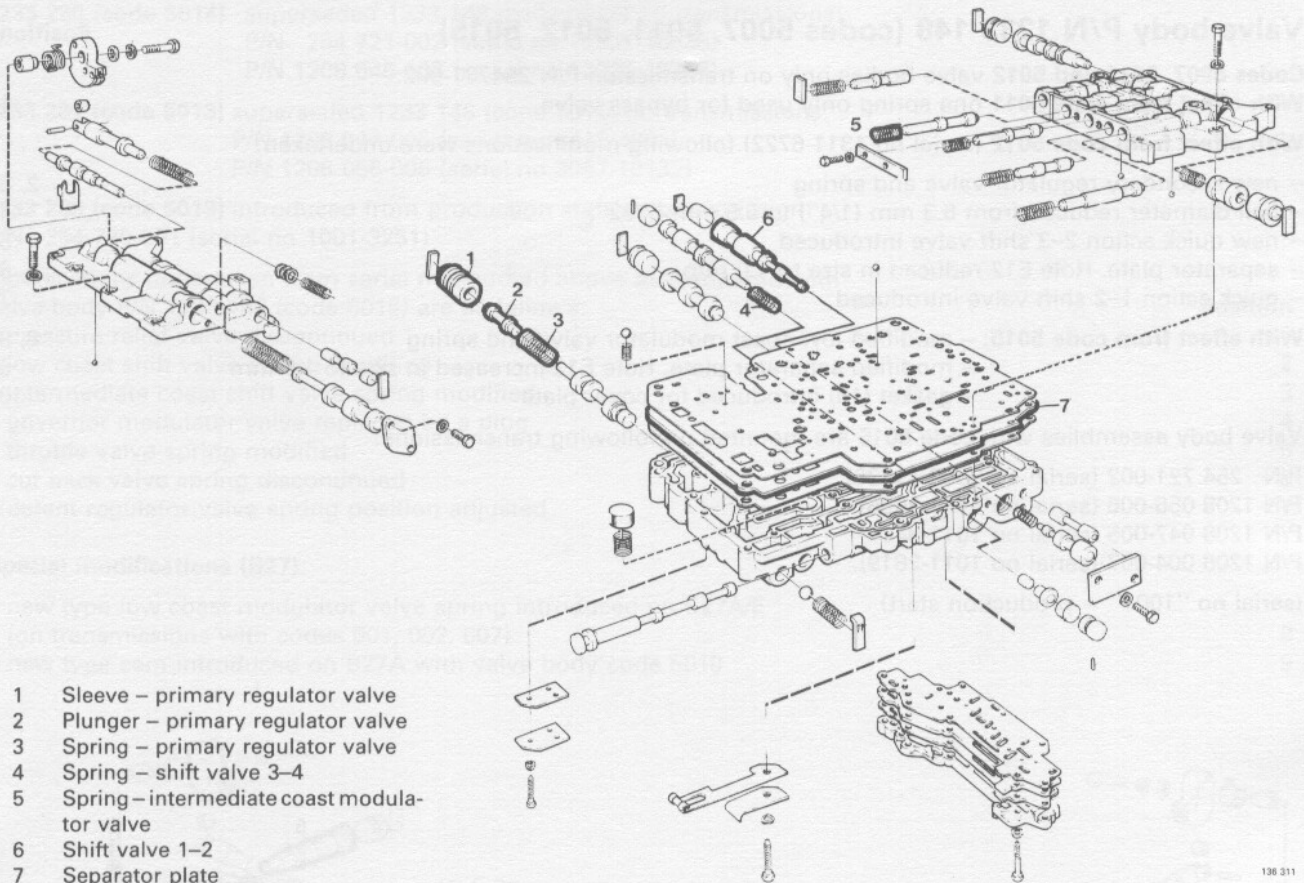
from production start on transmissions:

1208 163 (code 250) (1979-1980)

1208 193 (code 320) (1980)

1208 253 (code 376) (1981-).

AW70/71 1982-



- 1 Sleeve - primary regulator valve
- 2 Plunger - primary regulator valve
- 3 Spring - primary regulator valve
- 4 Spring - shift valve 3-4
- 5 Spring - intermediate coast modulator valve
- 6 Shift valve 1-2
- 7 Separator plate

A brief description of the differences between the valve body assemblies on the AW70 and AW71 transmissions is given below.

AW70, Valve body P/N 1239 380¹ (1982-)

Components:

- sleeve P/N 1239 600 (1)
- plunger P/N 1239 599 (2)
- spring P/N 1239 558 (3)
- spring - shift valve 3-4 P/N 1239 869
- spring - intermediate coast modulator valve P/N 1239 649 (two part shift valve 1-2 introduced from serial no KC 86 659-).

AW70, Valve body P/N 1239 947¹ B23F (1983-)

Components:

- sleeve (1) same as AW71
- plunger (2) same as AW71
- spring (3) same as AW71
- spring - shift valve 3-4, same as AW70
- spring - intermediate coast modulator valve, same as AW70
- two part shift valve, same as AW70

AW71, Valve body P/N 1239 790¹ (1982-)

Components:

- sleeve P/N 1239 794 (1)
- plunger P/N 1239 793 (2)
- spring P/N 1239 792 (3)
- spring - shift valve 3-4 P/N 1239 797
- spring - intermediate coast modulator valve P/N 1239 812 (two part shift valve 1-2 introduced from serial no KF 80 439-).

¹ Separator plate modified several times in 1983 to improve lubrication of overdrive.

Valve body 1239 830 replaced by 1239 965
1239 790 replaced by 1239 971
1239 947 replaced by 1239 964

Specifications

BW55 1975-

Valve body P/N 1233 148 (codes 5007, 5011, 5012, 5015)

Position

Codes 5007, 5011 and 5012 valve bodies only on transmission P/N 254721-002.

With effect from code 5011 one spring only used for bypass valve

With effect from code 5012 (serial no 1311-6722) following modifications were undertaken:

- new secondary regulator valve and spring
- ball diameter reduced from 6.3 mm (1/4") to 5.5 mm (7/32")
- new quick action 2-3 shift valve introduced
- separator plate. Hole E12 reduced in size to 1.0 mm
- quick action 1-2 shift valve introduced

- 2, 3
- 4
- 5
- 6
- 7

- With effect from code 5015:
- modified low coast modulator valve and spring
 - modified separator plate. Hole E12 increased in size to 1.5 mm
 - gasket (10) introduced for cover plate

- 8, 9
- 6
- 10

Valve body assemblies with code 5015 are mounted on following transmissions:

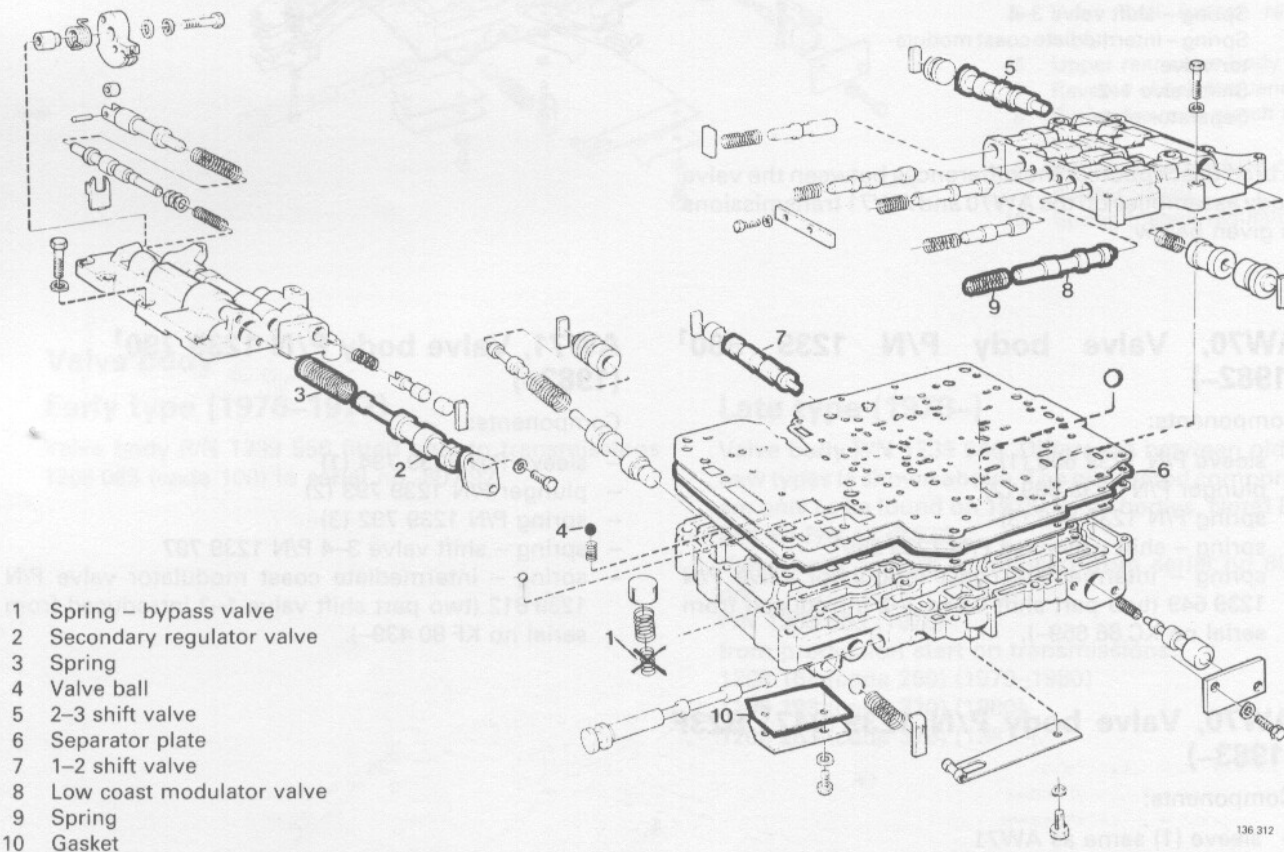
P/N 254 721-002 (serial no 9688-11336)

P/N 1208 056-006 (serial no 1011-3056)

P/N 1208 047-005 (serial no 1011-3414)

P/N 1208 004-007 (serial no 1011-2819).

(serial no "1001" = production start)



136 312

Valve body P/N 1233 280, 1233 281, 1233 289

1233 280 (code 5014) superseded 1233 148 (code 5015) on transmissions:
 P/N 254 721-002 (serial no 11337-18888)
 P/N 1208 046-007 (serial no 12820-19717)

1233 281 (code 5013) superseded 1233 148 (code 5015) on transmissions:
 P/N 1208 047-005 (serial no 3415-4893)
 P/N 1208 056-006 (serial no 3057-10132)

1233 289 (code 5019) introduced from production start on transmission:
 P/N 254 720-001 (serial no 1001-3251)

Modifications undertaken from serial nos quoted above as compared with valve body P/N 1233 148 (code 5015) are as follows:

- pressure relief valve discontinued
- low coast shift valve spring modified
- intermediate coast shift valve spring modified
- governor modulator valve replaced by a plug
- throttle valve spring modified
- cut back valve spring discontinued
- detent regulator valve spring position adjusted

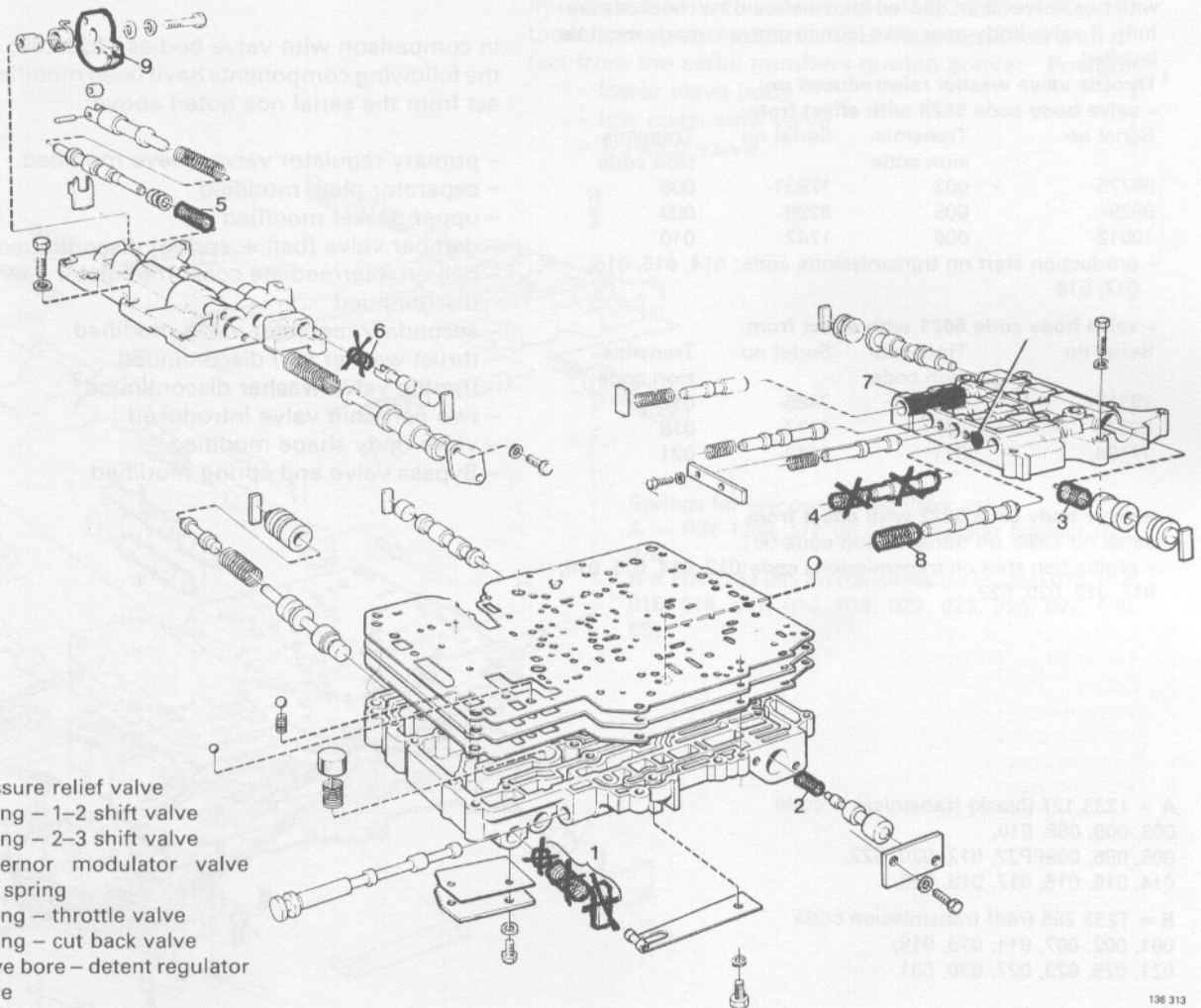
Position

- 1
- 2
- 3
- 4
- 5
- 6
- 7

Special modifications (B27):

- new type low coast modulator valve spring introduced on B27A/E (on transmissions with codes 001, 002, 007)
- new type cam introduced on B27A with valve body code 5019

- 8
- 9



- 1 Pressure relief valve
- 2 Spring - 1-2 shift valve
- 3 Spring - 2-3 shift valve
- 4 Governor modulator valve and spring
- 5 Spring - throttle valve
- 6 Spring - cut back valve
- 7 Valve bore - detent regulator valve
- 8 Spring - low coast modulator valve
- 9 Throttle cam

Specifications

Valve body P/N 1233 295, 1233 296, 1233 297

1233 295 (codes 5017, 5021)

superseded 1233 280 on transmissions:
 P/N 254 721-002 (serial no 18889-20452)
 P/N 1208 046-007 (serial no 19718-21946)

Introduced from production start
 on transmissions:

- P/N 1208 128-011 (1011-)
- P/N 1208 170-018 (1001-12401)
- P/N 1208 164-021 (1001-)
- P/N 1208 189-023 (1001-1038)

1233 296 (codes 5016, 5020)

superseded 1233 281 on transmission:
 P/N 1208 047-005 (serial no 4894-7415)
 P/N 1208 056-006 (serial no 10133-)¹

Introduced from production start on transmissions from serial no:

- P/N 254 718-003 (1024-12306)
- P/N 1208 066-008 (1001-4875)
- P/N 1208 111-009 (1001-1509)
- P/N 1208 112-010 (1001-1241)
- P/N 1208 162-012 (1001-)
- P/N 1208 165-014 (1001-10516)
- P/N 1208 166-015 (1001-4763)
- P/N 1208 171-016 (1001-1246)
- P/N 1208 172-017 (1001-1134)
- P/N 1208 167-019 (1011-2702)
- P/N 1208 197-022 (1001-1354)
- P/N 1208 198-PP22 (1001-)

1233 297 (codes 5018, 5022) superseded 1233 289 on transmissions:

P/N 254 720-001 (serial no 3252-5782)
 introduced from production start 1208 168-013 (serial no 1001-1537)

¹ Unchanged throughout production, discontinued 1977.
² Modified to prevent deposits on gear case. Transmissions with nos. lower than quoted above should be checked carefully. If valve body-gear case joint is uneven -parts must be levelled.

³ **Throttle valve washer reintroduced on:**
 - valve body code 5020 with effect from:

Serial no	Transmis- sion code	Serial no	Transmis- sion code
55775-	003	17901-	008
9929-	005	3299-	009
10012-	006	1742	010

- production start on transmissions code: 014, 015, 016, 017, 019

- valve body code 5021 with effect from:

Serial no	Transmis- sion code	Serial no	Transmis- sion code
29317-	002	2485-	012
22825-	007	3177-	018
17194-	011	2543-	021.

- valve body code 5022 with effect from

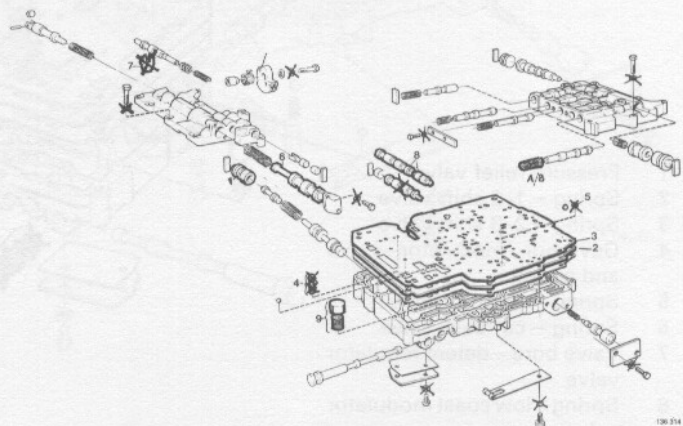
serial no 7590- on transmission code 001.
 - production start on transmissions code:013, 014, 015, 016, 017, 019, 020, 022

In comparison with valve bodies 1233-280; -281; -289 the following components have been modified with effect from the serial nos qoted above:

	Position
- primary regulator valve sleeve modified	1
- separator plate modified	2
- upper gasket modified	3
- damper valve (ball + spring) discontinued	4
- ball on intermediate coast modulator valve discontinued	5
- secondary regulator valve modified	6
- thrust washer (all) discontinued	-
- throttle valve washer discontinued ³	7
- two part shift valve introduced	8
- valve body shape modified ¹	-
- Bypass valve and spring modified	9

A = 1233 127 (black) transmission code
 003, 009, 008, 010,
 005, 006, 009PP22, 012, 020, 022,
 014, 015, 016, 017, 019, 026.

B = 1233 285 (red) transmission code
 001, 002, 007, 011, 013, 018,
 021, 025, 023, 027, 030, 031



Valve body P/N 1233 349, 1233 370, 1233 371

1233 370 (code 5023) superseded 1233 297 on transmission:
 P/N 1208 168-013 (serial no 1538-)
 introduced from production start on transmission:
 P/N 1208 218-025 (serial no 1001-2515)

1233 371 (code 5024) superseded 1233 296 on transmission:
 P/N 1208 165-014 (serial no. 10517-49595)
 P/N 1208 166-015 (serial no. 4764-14477)
 P/N 1208 171-016 (serial no. 1247-)
 P/N 1208 172-017 (serial no. 1135-1305)
 P/N 1208 167-019 (serial no. 2703-)
 P/N 1208 197-022 (serial no. 1355-1955)

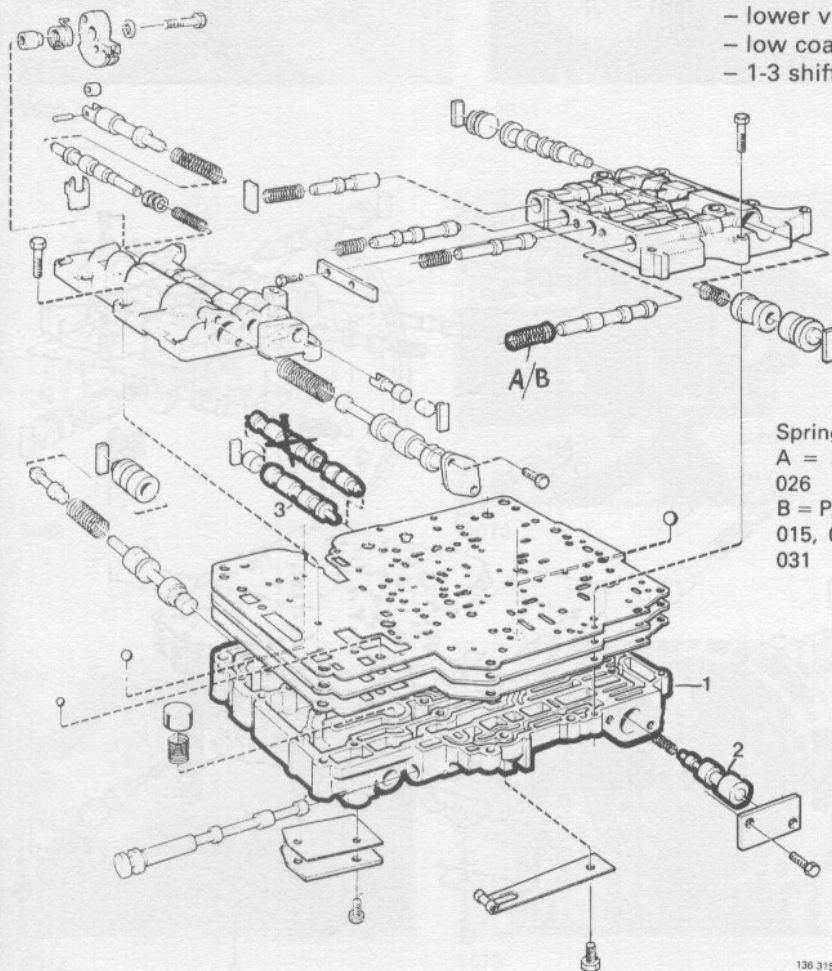
superseded 1233 295 on transmission:
 1208 170-018 (serial no 12402-)
 1208 189-023 (serial no 1039-28661)

introduced from production start on transmissions:
 P/N 1208 254-027 (serial no 1001-9071)
 P/N 1208 207-030 (serial no 1001-8601)
 P/N 1208 262-031 (serial no 1001-6405)

1233 349 (code 5027) introduced from production start on transmissions:
 P/N 1208 173-020 (serial no 1001-10810)
 P/N 1208 227-026 (serial no 1001-1668)

In comparison with valve bodies 1233 295; -296; -297 the following components have been modified with effect from the serial numbers quoted above: **Position**

- lower valve body	1
- low coast shift valve	2
- 1-3 shift valve	3



Springs for low coast modulator valve
 A = P/N 1233 172 on transmission (codes) 020, 026
 B = P/N 1233 285 on transmission (codes) 013, 014, 015, 016, 017, 018, 019, 022, 023, 025, 027, 030, 031

Specifications

Valve body P/N 1233 387, 1233 388, 1233 389

1233 387 (code 5029) superseded 1233 349 on transmission:

P/N 1208 173-020 (serial no 10811-)

P/N 1208 227-026 (serial no 1669-)

1233 388 (code 5030) superseded 1233 370 on transmission:

P/N 1208 218-025 (serial no 2516-)

1233 389 (code 5031) superseded 1233 371 on transmissions:

P/N 1208 165-014 (serial no 1956-)

P/N 1208 166-015 (serial no 14478-)

P/N 1208 172-017 (serial no 1306-)

P/N 1208 192-022 (serial no 1956-)

P/N 1208 189-023 (serial no 28662-)

P/N 1208 254-027 (serial no 9072-)

P/N 1208 207-030 (serial no 8602-)

P/N 1208 262-031 (serial no 6406-)

Position

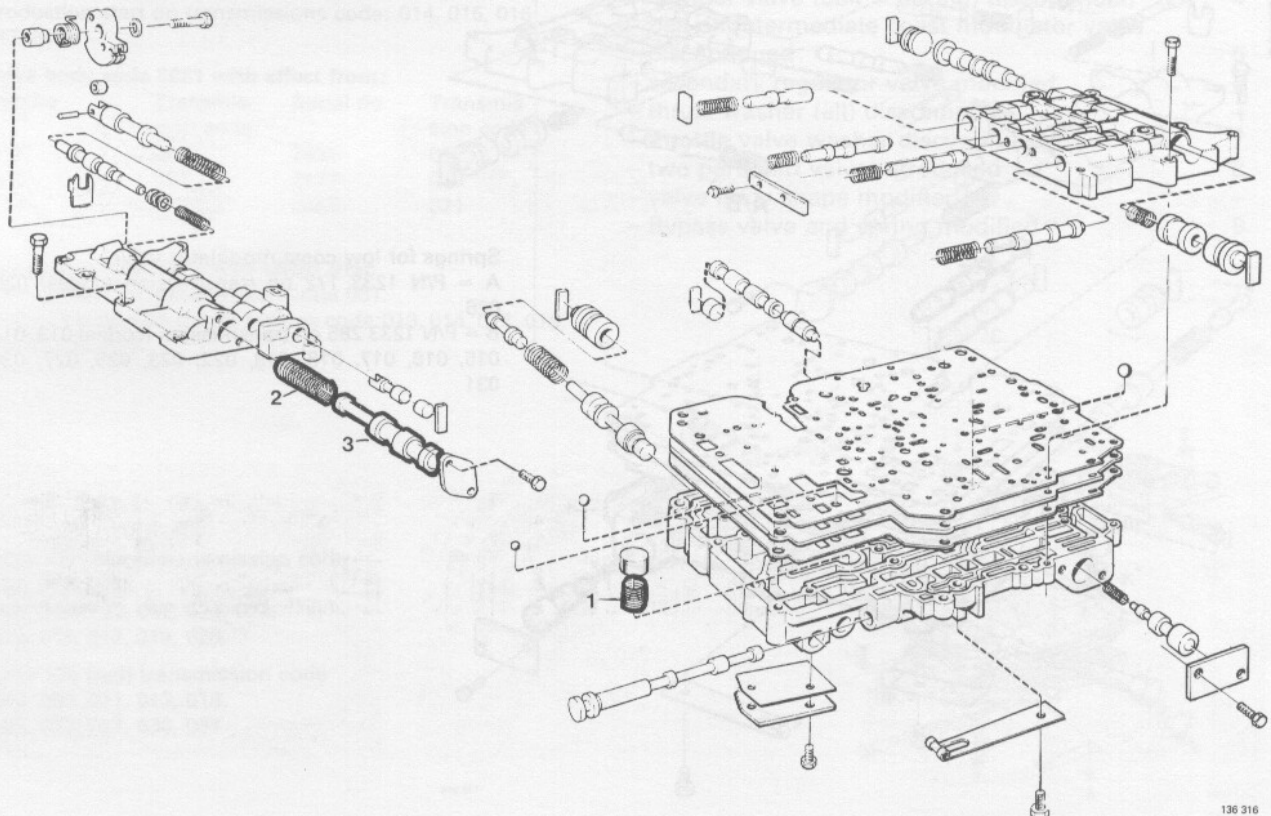
With effect from serial numbers quoted above the following modifications have been undertaken:

- Bypass valve spring modified 1

- secondary regulator valve spring modified 2

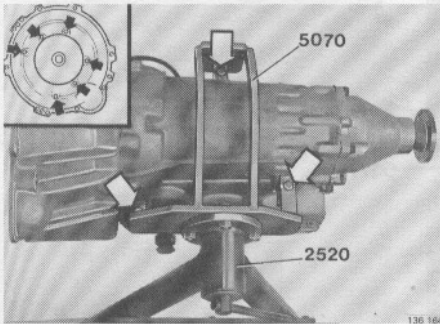
New secondary regulator valve (P/N 1233 396) introduced with effect from: 3

Transmis- sion code	Serial number	Transmis- sion code	Serial number
013	1750-	022	1872-
014	29606-	023	22336-
015	1925-	025	2043-
016	1925-	026	1592-
017	1300-	027	4146-
019	7579-	030	3881-
020	9252-	031	3000-

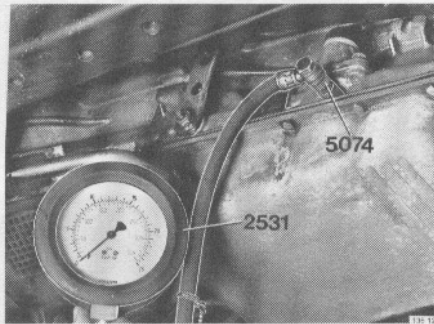


Special tools

999	Description – use
2520-8	Stand
2531-5	Pressure gauge (0–25 kp/cm ²): checking line pressure
2779-0	Socket (11 mm): removing propeller shaft flange bolts
2846-7	Spanner (9/16 in): removing propeller shaft flange bolts
5069-3	Puller : removing oil pump seal
5070-1	Fixture : transmission overhaul
5071-9	Puller : oil pump
5072-7	Spring compressor : removing/installing return springs in clutches
5073-5	Spring compressor : removing return springs from B3 brake
5074-3	Nipple : connecting oil pressure test equipment, used with 2531 and 5114



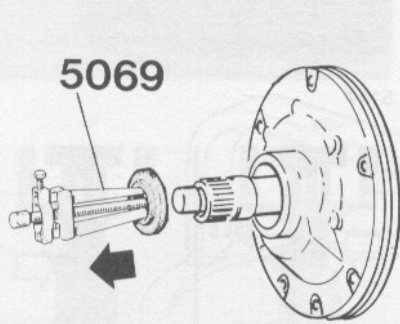
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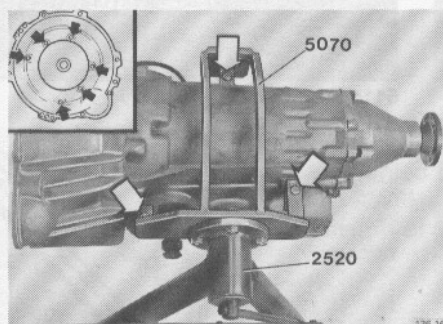
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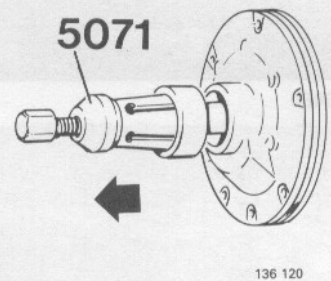
2779, 2846



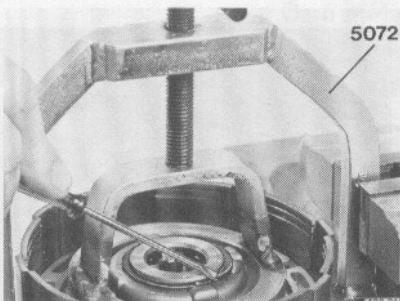
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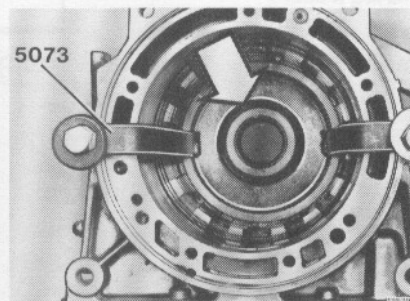
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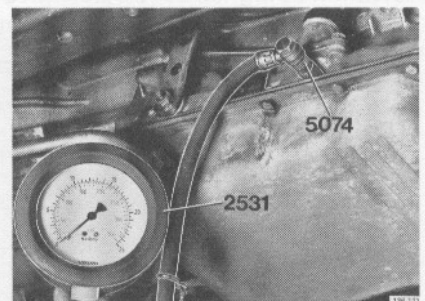
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5072



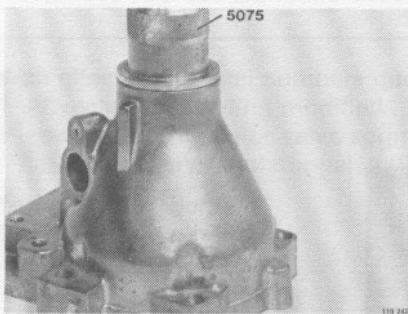
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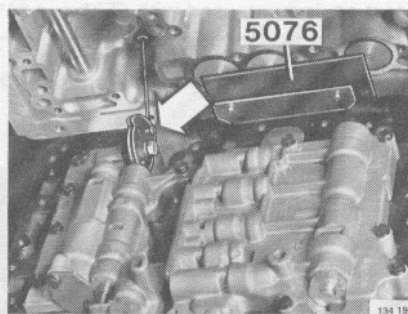
5074

Special tools

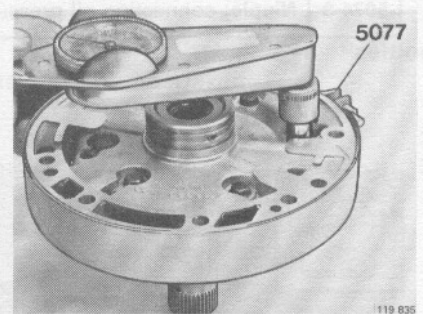
999	Description – use
5075-0	Drift: installing oil seal in coupling flange at rear
5076-8	Retainer: accumulator pistons
5077-6	Centering band: assembling oil pump
5080-0	Drift: removing/installing bushing in extension housing
5114-7	Pressure gauge (0–10 kp/cm ²): checking governor pressure
5117-0	Drift: installing oil pump seal
5118-8	Drift: installing selector shaft seal
5149-3	Spanner: flange nut
5225-1	Drift: removing/installing rubber bushing in transmission mount
5231-9	Display tray: for valves and springs
5241-8	Guide pins: installing overdrive section
5972-8	Fixture: removing/installing transmission



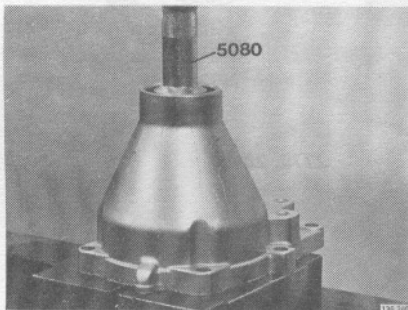
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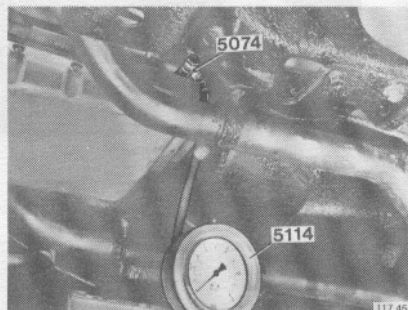
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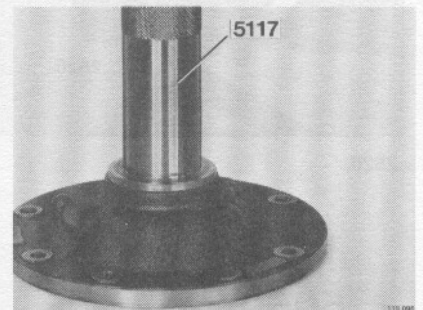
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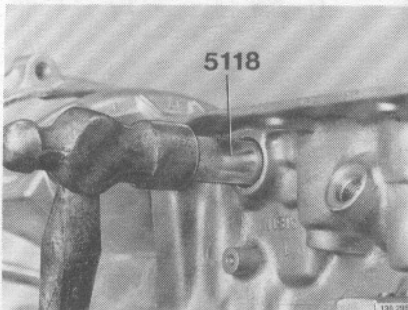
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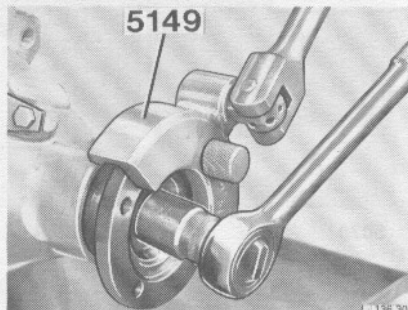
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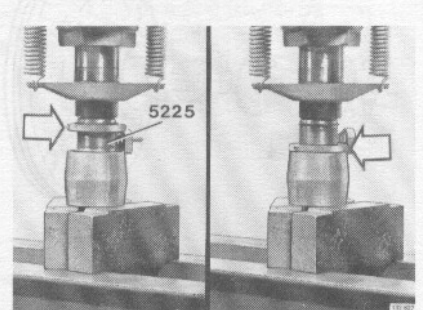
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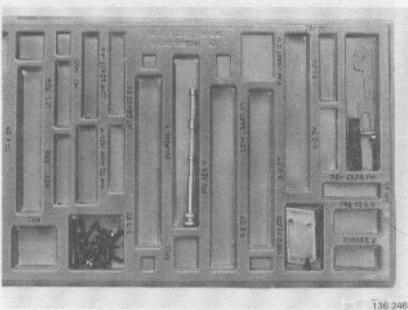
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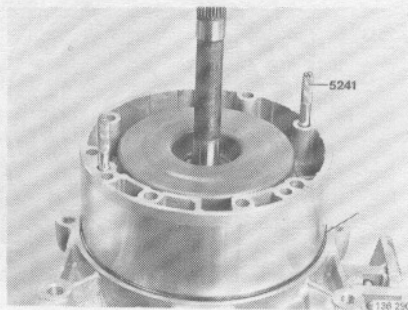
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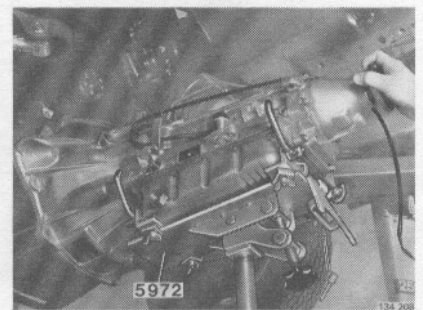
5225



5231



5241

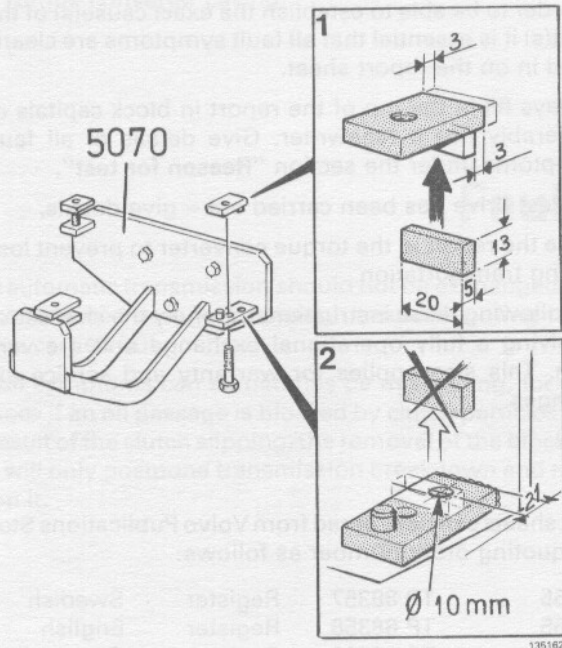


5972

Modification of tools

Fixture 999 5070-1

Fixture 5070 for supporting AW55 and BW55 transmissions has been modified to fit new type BW55 units as well as AW70 and 71.



To modify old type fixtures

Detach support plate from back plate.

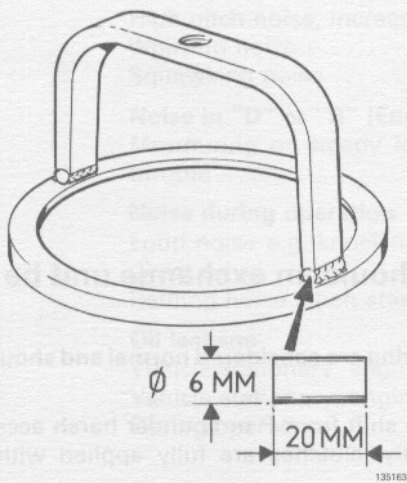
Cut off 3 mm (0.12 in) of support plate.

Weld on a new plate as illustrated.

Dimensions = 20 x 13 x 5 mm (0.79 x 0.51 x 0.1 in).

Grind off stud on support plate.

Drill a 10 mm (0.39 in) hole, 21 mm (0.83 in) from back plate, see fig.



Spring compressor 999 5072-7

Now modified to fit AW70 and AW71 transmissions as well as AW55 and BW55. Modification involves increasing height of arm by 5 mm.

To modify

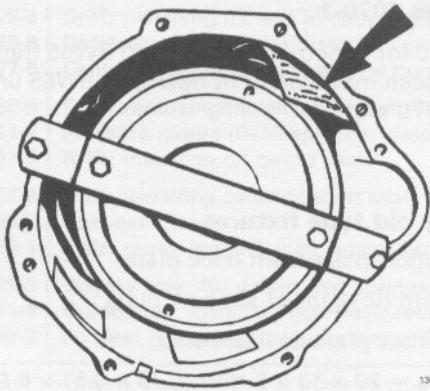
Remove weld from one side of arm and bend arm up free from ring.

Place a piece of 6 mm (0.2 in) rod (length 20 mm: 0.79 in) on ring, see arrow.

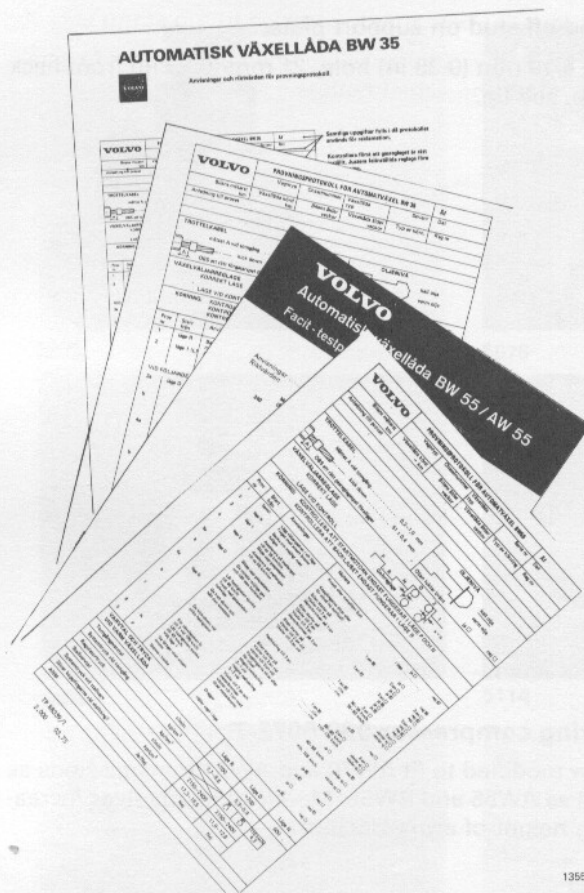
Weld on arm again.

Repeat procedure on opposite side of ring.

Exchange units, automatic transmissions



135533



135534

It is not necessary to remove the automatic transmission from the vehicle to rectify faults associated with the following items. (Also unacceptable as reason for installing exchange unit.)

- Oil level
- Oil leakage, excluding leakage from torque converter and oil pump
- Kickdown cable
- Selector linkage
- Parking pawl
- Valve body assembly
- Governor
- Extension housing, coupling flange, speedometer drive and oil seal
- Hydraulics
- Accumulator pistons
- Solenoid valve (AW70/71)

All transmissions are overhauled at a central workshop.

In order to be able to establish the exact cause(s) of the fault(s) it is essential that **all** fault symptoms are clearly filled in on the report sheet.

Always fill in the top of the report in block capitals or preferably use a typewriter. Give details of all fault symptoms under the section "**Reason for test**".

If a test drive has been carried out – give details.

Place the report in the torque converter to prevent loss during transportation.

By following these instructions carefully the chances of receiving a fully operational exchange unit are very high. This also applies for warranty and service exchanges.

Test sheets can be ordered from Volvo Publications Stores quoting order number as follows:

BW55	TP 88357	Register	Swedish
BW55	TP 88358	Register	English
BW55	TP 88422	Register	German
BW55/AW55	TP 88359/3	Test sheet	Swedish
BW55/AW55	TP 88360/3	Test sheet	English
BW55/AW55	TP 88423/3	Test sheet	German
BW55/AW55	TP 88543/3	Test sheet	French
BW55/AW55	TP 88545/3	Test sheet	Dutch

When should an exchange unit be installed?

The following are considered normal and should not be rectified:

- Slip on shift from P or N under harsh acceleration. Normally, clutches are fully applied within 2 seconds.
- 3–2 downchange under part load and low speed (25–40 km/h = 15–25 mph) occasionally accompanied by light jerk and clicking noise.
- If accelerator is released quickly during a stall test in position D a screeching noise can sometimes result (AW55 only).
- 1–2 upshift harsher with gear selector in 2 than D. (AW55 only.)

Following faults can be repaired with transmission mounted on fixture 5972

- Oil leakage from torque converter or oil pump
- Torque converter
- Torque converter casing.

Installing exchange unit (see O9-20, page 66)

It is extremely important that the instructions on page 66 are followed carefully and carried out before testing the vehicle, otherwise damage may occur which may invalidate the warranty.

Fault tracing

An automatic transmission should not be exchanged or reconditioned before a thorough troubleshooting has been carried out.

Fault symptoms can sometimes be misleading, for instance if an oil passage is blocked by clutch particles as a result of the clutch slipping, the removal of the blockage will only postpone transmission breakdown and not stop it.

It is therefore important to check the condition of the oil; if the strainer is blocked, particles in the sump etc.

In this way it will be possible at an early stage to establish where the actual fault is.

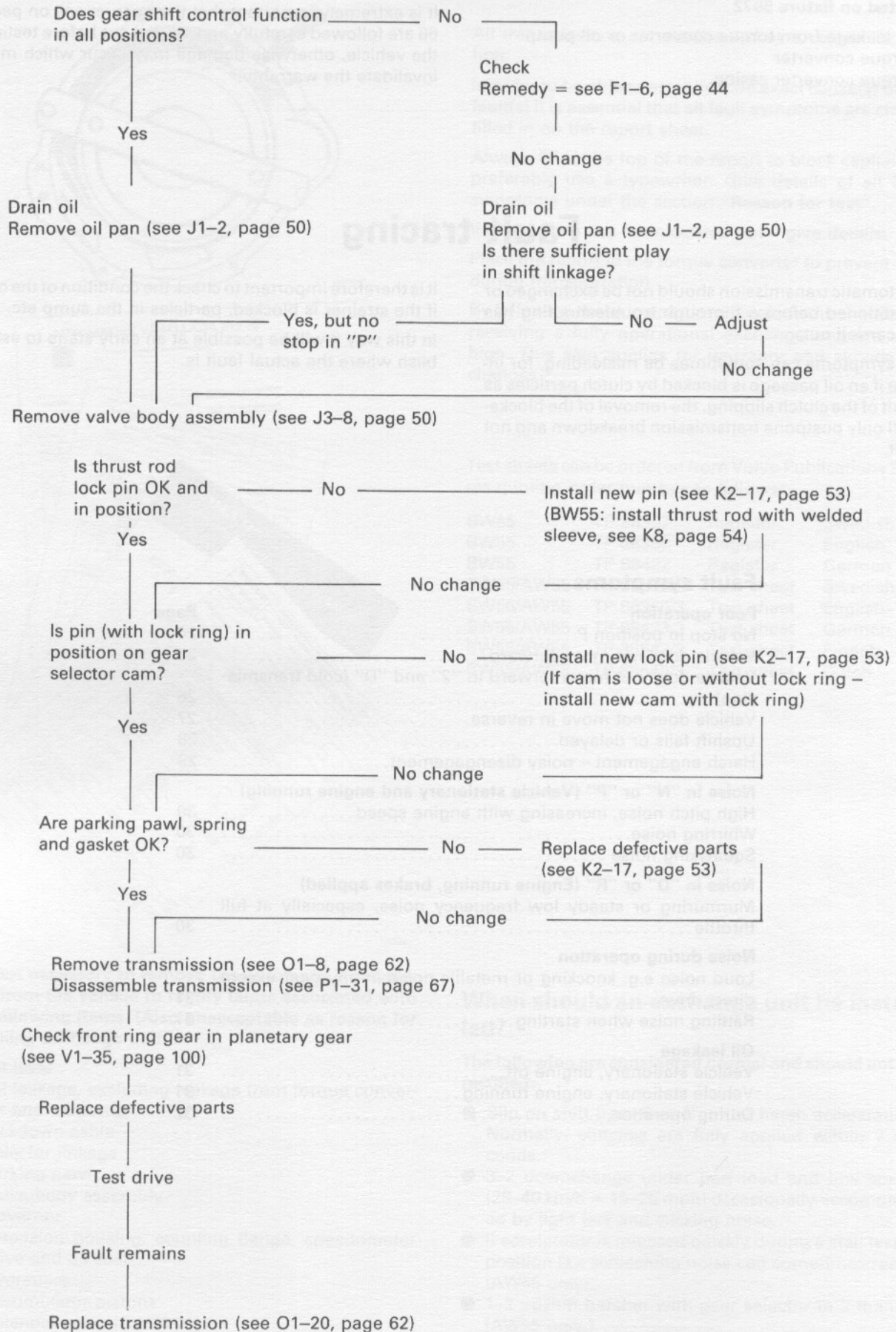
Fault symptoms

Poor operation	Page
No stop in position P.....	24
Vehicle does not move forward.....	25
Vehicle does not move forward in "2" and "D" (cold transmission).....	26
Vehicle does not move in reverse.....	27
Upshift fails or delayed.....	28
Harsh engagement – noisy disengagement.....	29
Noise in "N" or "P" (Vehicle stationary and engine running)	
High pitch noise, increasing with engine speed.....	30
Whirring noise.....	30
Squawking noise.....	30
Noise in "D" or "R" (Engine running, brakes applied)	
Murmuring or steady low frequency noise, especially at full throttle.....	30
Noise during operation	
Loud noise e.g. knocking or metallic noise in any gear except direct drive.....	31
Rattling noise when starting.....	31
Oil leakage	
Vehicle stationary, engine off.....	31
Vehicle stationary, engine running.....	31
During operation.....	32

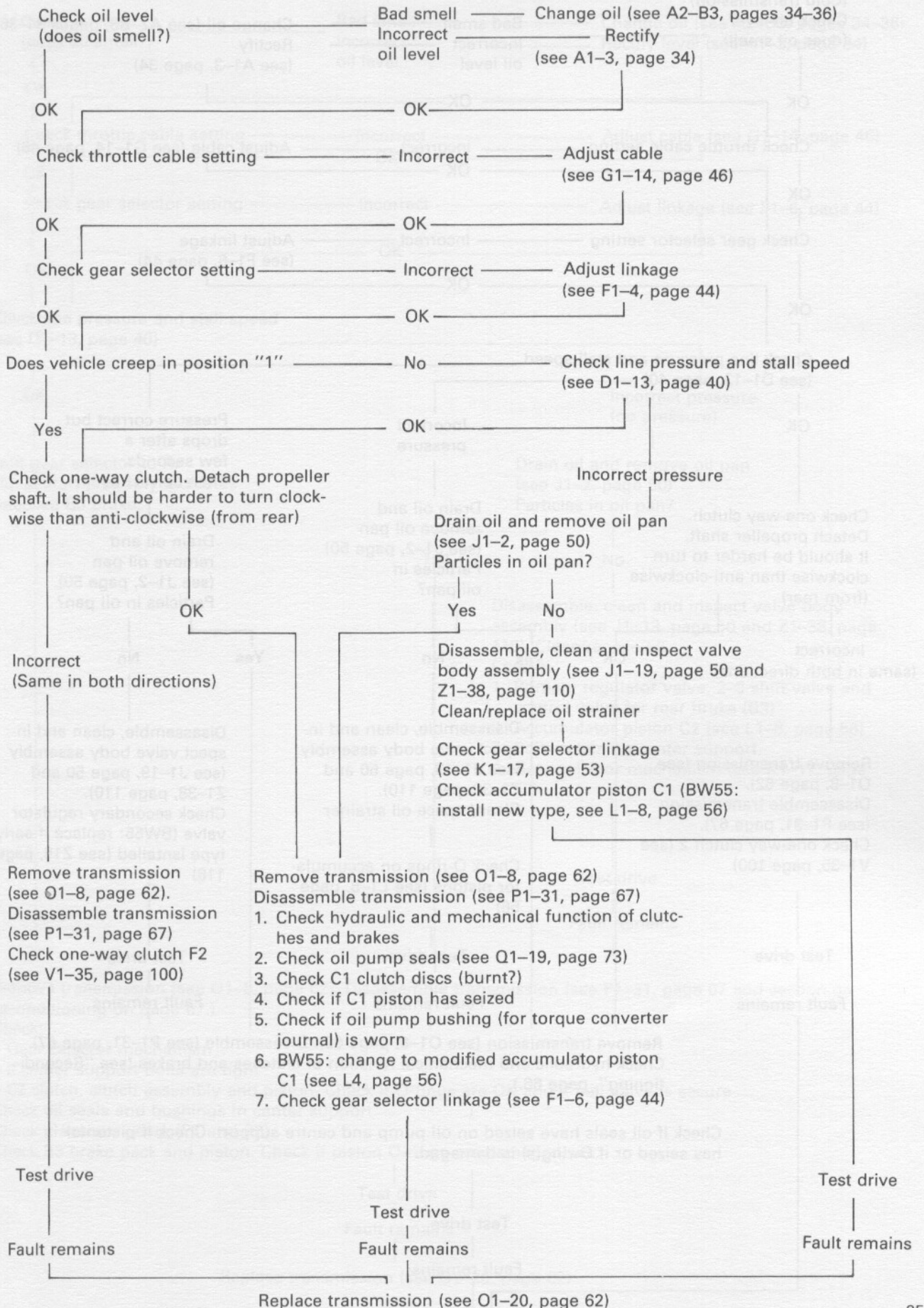
Fault tracing

Poor operation

No stop in position P

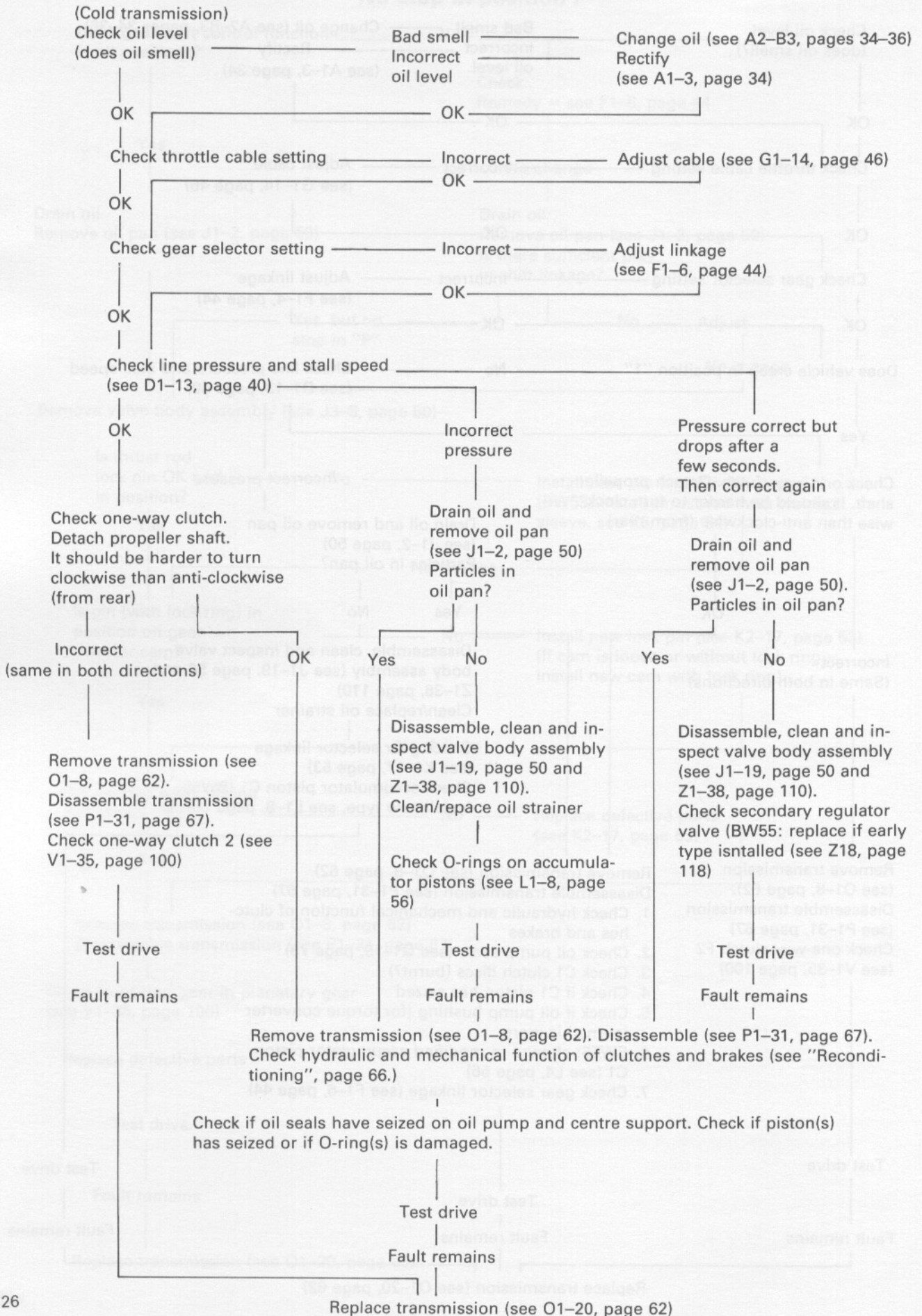


Vehicle does not move forward

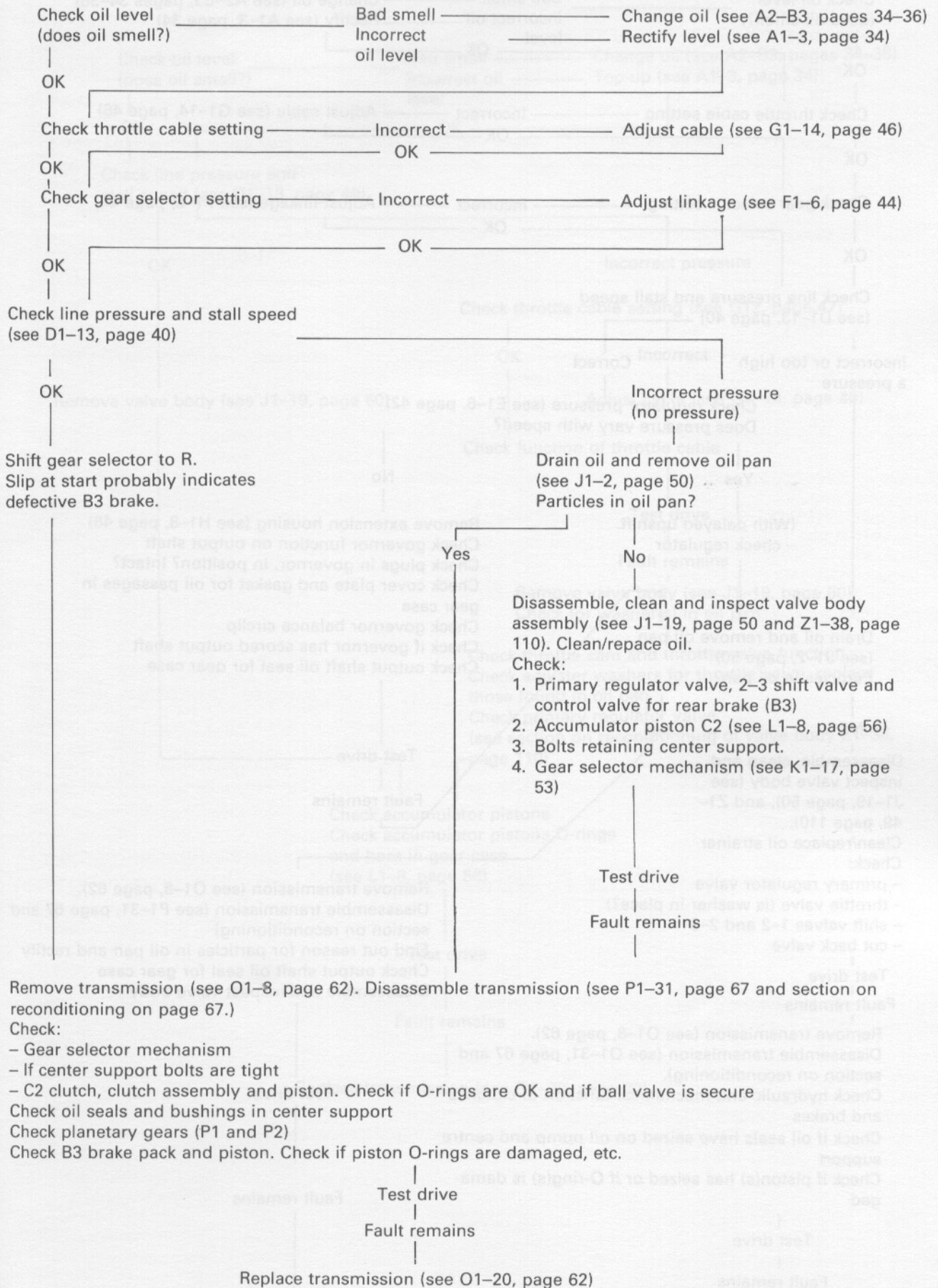


Fault tracing

Vehicle does not move forward in "2" or "D"

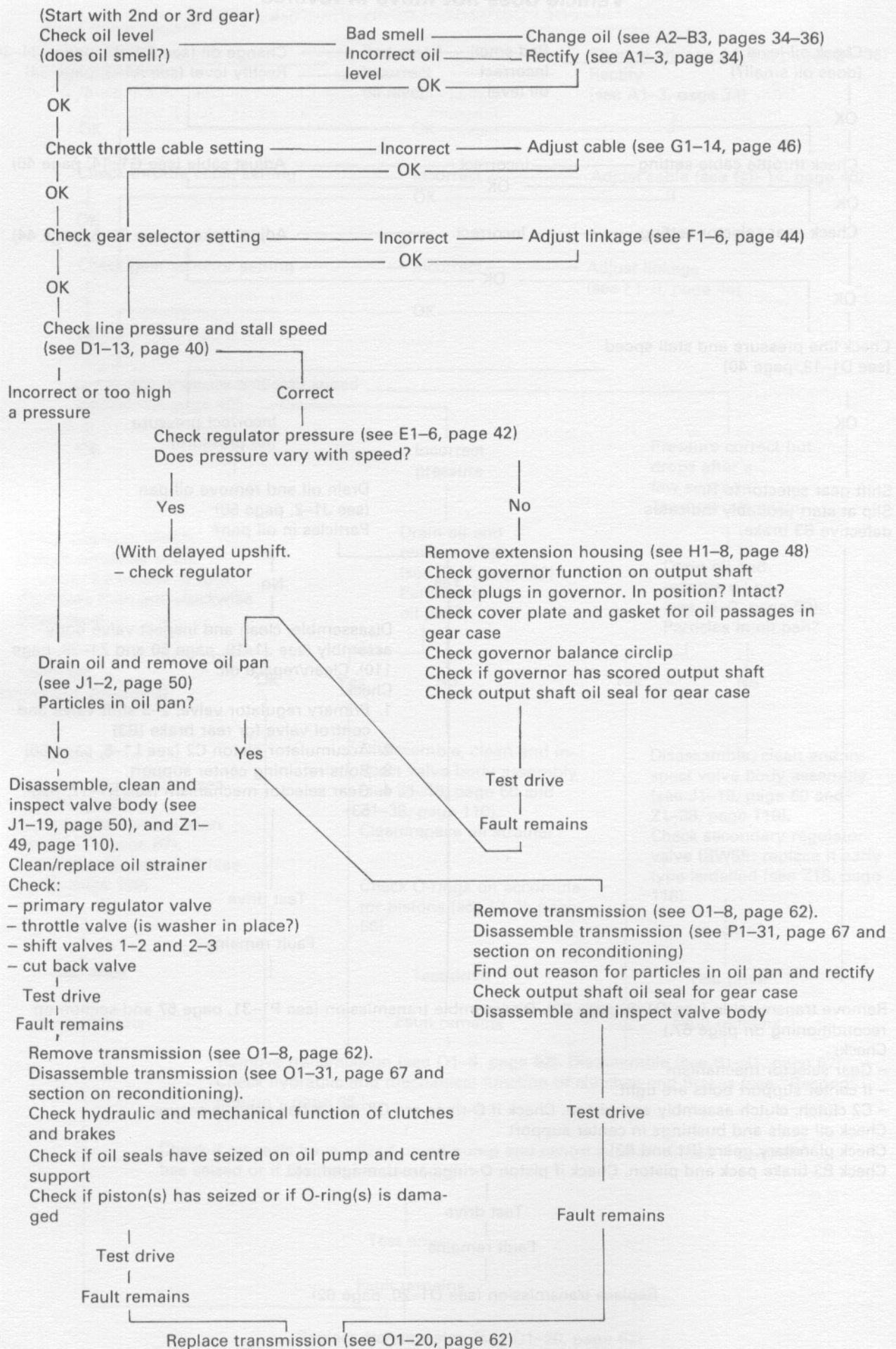


Vehicle does not move in reverse

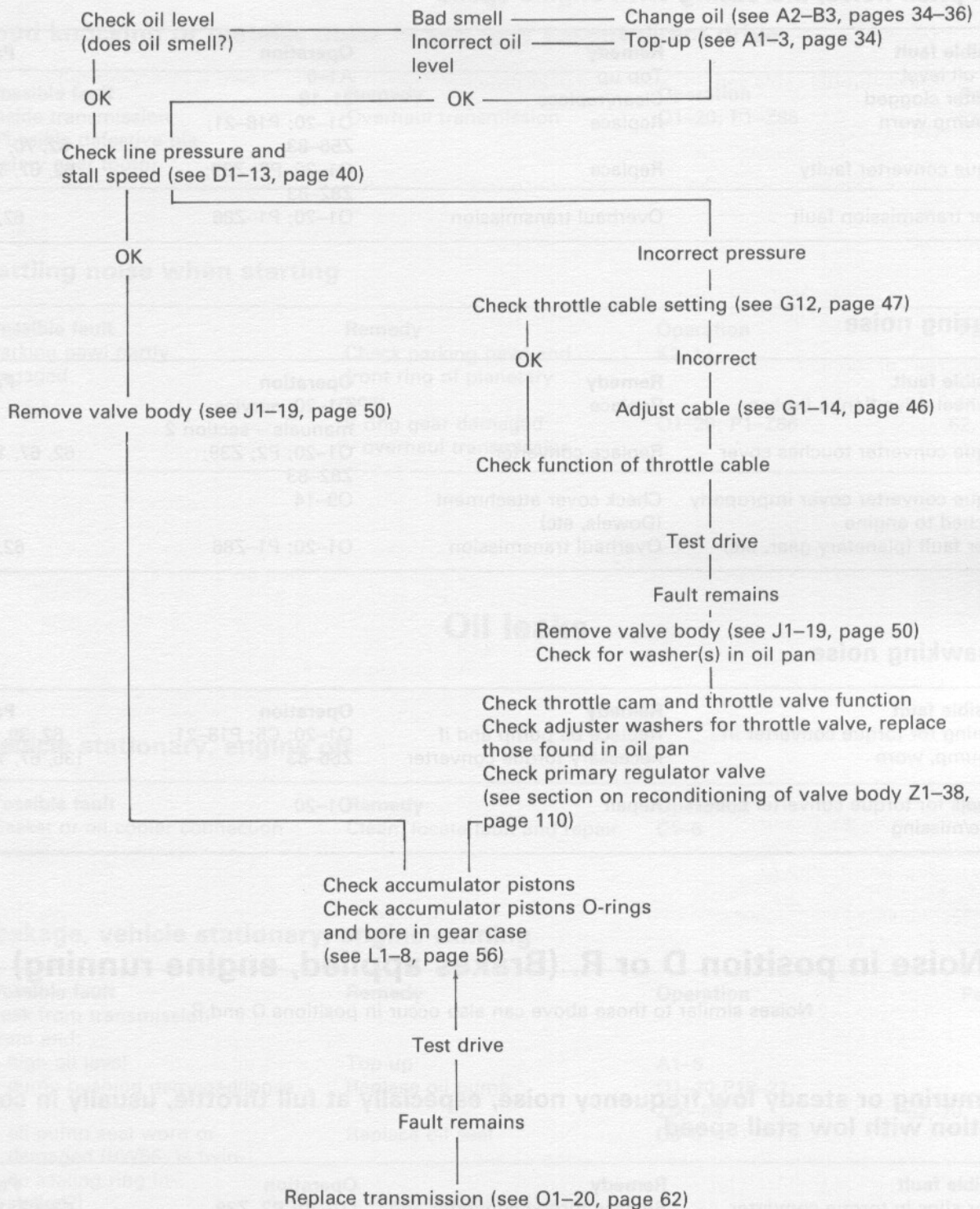


Fault tracing

No shift or delayed shift



Harsh engagement – noisy disengagement



Fault tracing

Noise in position N or P. (Vehicle stationary, engine running)

High pitch noise, increasing with engine speed

Possible fault	Remedy	Operation	Page
Low oil level	Top up	A1-6	34
Oil filter clogged	Clean/replace	J1-18	50
Oil pump worn	Replace	O1-20; P18-21; Z56-83	62, 70, 135
Torque converter faulty	Replace	O1-20, P2; Z39; Z82-83	62, 67, 129, 142
Other transmission fault	Overhaul transmission	O1-20; P1-Z86	62, 67

Whirring noise

Possible fault	Remedy	Operation	Page
Flywheel drive flange broken	Replace	O1-20; service manuals – section 2	62
Torque converter touches cover	Replace converter	O1-20; P2; Z39; Z82-83	62, 67, 129, 142
Torque converter cover improperly attached to engine	Check cover attachment (Dowels, etc)	O9-14	64
Other fault (planetary gear, etc)	Overhaul transmission	O1-20; P1-Z86	62, 67

Squawking noise

Possible fault	Remedy	Operation	Page
Bushing for torque converter in oil pump, worn	Replace oil pump and if necessary torque converter	O1-20; C5; P18-21; Z56-83	62, 39, 70, 135, 67, 129, 142
Dowels for torque converter cover loose/missing	Repair	O1-20	62

Noise in position D or R. (Brakes applied, engine running)

Noises similar to those above can also occur in positions D and R.

Murmuring or steady low frequency noise, especially at full throttle, usually in combination with low stall speed

Possible fault	Remedy	Operation	Page
Stator slips in torque converter	Replace torque converter and change oil	O1-20; P2, Z39; Z82-83	62, 67, 129 143
	Clean oil cooling system	A1-6; B1-3	34, 36

Noisy operation

Noises similar to those on the previous page can also occur when transmission is operating.

Loud knocking or metallic noise in any gear except direct drive

Possible fault	Remedy	Operation	Page
Inside transmission (Possible defective planetary gear tooth)	Overhaul transmission	O1-20; P1-Z86	62, 67

Rattling noise when starting

Possible fault	Remedy	Operation	Page
Parking pawl partly engaged	Check parking pawl and front ring of planetary gear	K1-17	53
	If ring gear damaged: - overhaul transmission	O1-20; P1-Z86	62, 67

Oil leaks

Vehicle stationary, engine off

Possible fault	Remedy	Operation	Page
Gasket or oil cooler connection	Clean, locate fault and repair	C1-6	37

Leakage, vehicle stationary, engine running

Possible fault	Remedy	Operation	Page
Leak from transmission front end:			
- high oil level	Top up	A1-6	34
- pump bushing damaged/loose	Replace oil pump	O1-20; P18-21; Z56-83	62, 70, 135
- oil pump seal worn or damaged (BW55: is twin-lip sealing ring installed?)	Replace oil seal	C5-6	39
- torque converter neck damaged	Replace torque converter	O1-20; P2; Z82-83	62, 67, 129, 142
- torque converter cover loosely attached to engine	Tighten, adjust	O1-20	62
Leak from oil filler tube (after driving)	Wipe clean. Check	C4	38

Fault tracing

Oil leaks during driving

Possible fault	Remedy	Operation	Page
Leak from rear extension housing gasket or oil seal	Replace gasket and oil seal	C2; H1-8; X8-12 C1-6	37, 48, 108, 37
Leak from oil seals	Check/replace oil seals	C1-6	37
Leak from transmission front end	See bottom of page 31		
Leak from oil pump oil seal during fast motor-way driving or towing	Check oil pump seal (BW55: is twin-lip seal installed?)	C5-6	39
Worn torque converter neck	Check	Z39	
Overheated oil	Install auxiliary oil cooler	Accessory	129

Power flow charts

BW55 AW55

Gear selector position	Gear	Clutch applied	Planetary gear used P1 or P2	Brake applied	One-way clutch applied	Engine braking
P	-	-	-	rear B3 ¹	-	-
R	reverse	rear C2	front	rear B3	-	yes
N	-	-	-	-	-	no
D	first	front C1	both	-	F2	no
	second	front C1	rear	B1, B2	F1	yes
	third	C1+C2	"direct"	B2 ²	-	yes
2	first	front C1	both	-	F2	no
	second	front C1	rear	B1, B2	F1	yes
1	first	front C1	both	B3	F2	yes

AW70, AW71

P	-	C0 ¹	-	B3 ¹	-	-
R	reverse	C0, C2	front	B3	F0	yes
N	-	C0	-	-	-	no
D	first	C0, C1	both	-	F0, F2	no
	second	C0, C1	rear	B2	F0, F1	no ²
	third	C0, C1, C2	"direct"	B3 ³	F0	yes
	fourth	C1, C2	overdrive + "direct"	B0, B2 ³	-	yes
2	first	C0, C1	both	-	F0, F2	no
	second	C0, C1	rear	B1, B2	F0, F1	yes
1	first	C0, C1	both	B3	F0, F2	yes

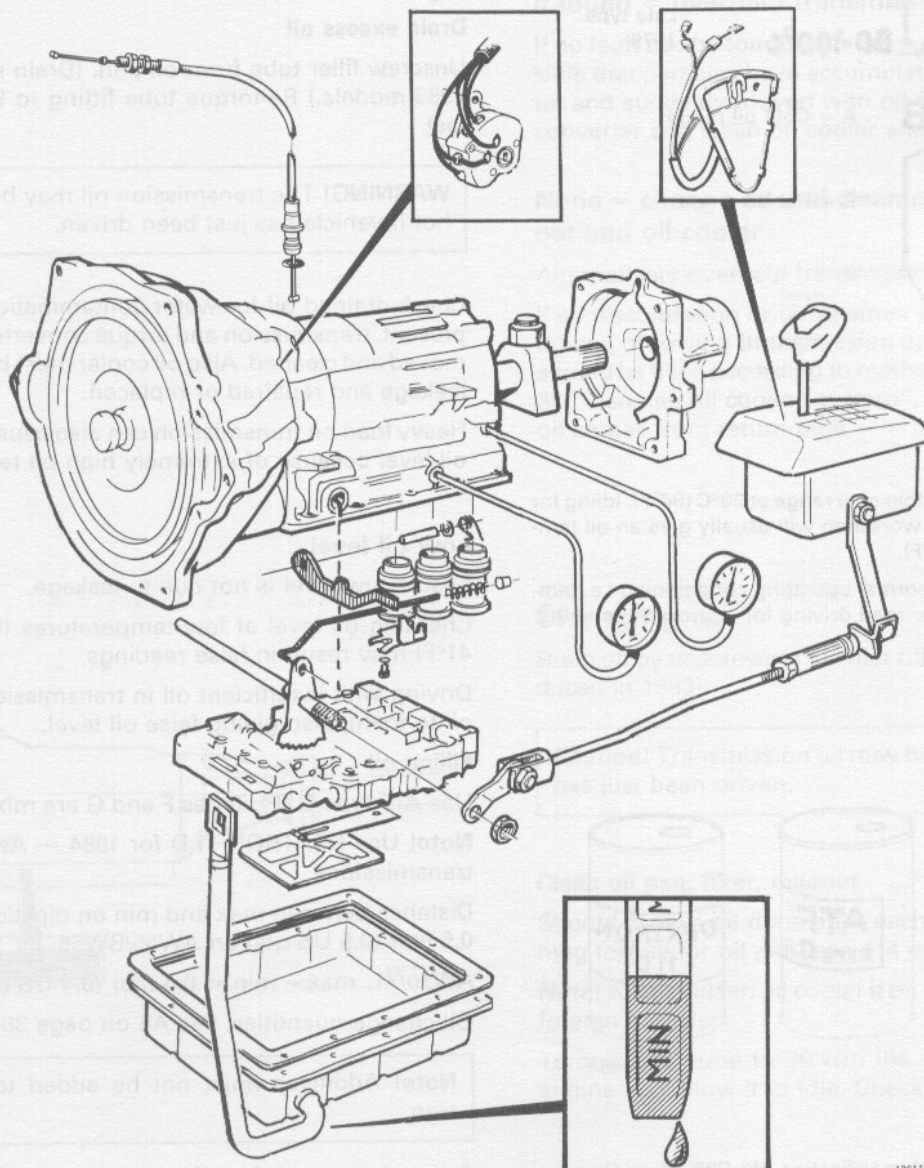
¹ With engine running.

² At speeds above 16 mph (25 km/h) third gear is engaged when throttle pedal is released.

³ Applied to facilitate gear changing.

In-car repairs

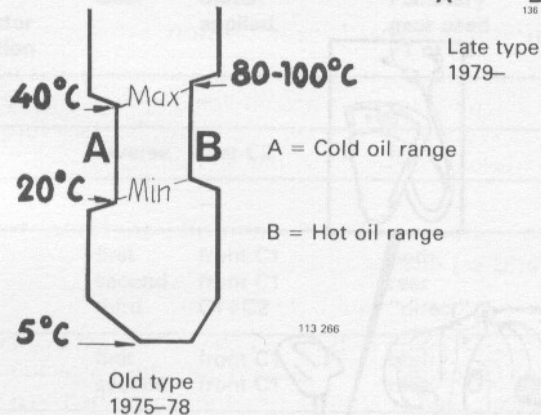
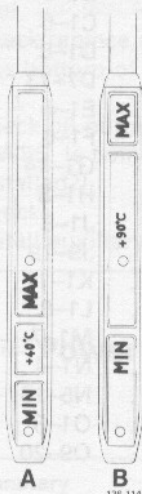
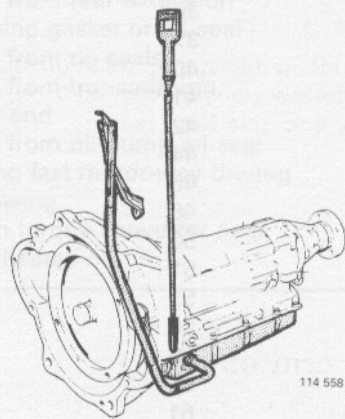
	Operation	Page
Oil, check-change	A1-6	34
Oil cooling system, cleaning	B1-3	36
Oil seals, replacement	C1-6	37
Line pressure, check	D1-6	40
Stall test	D7-13	41
Governor pressure, check	E1-6	42
Gear selector, adjustment	F1-6	44
Kick-down cable, replacement - adjustment	G1-14	46
Governor, removing, installing	H1-8	48
Valve body, removing	J1-8	50
installing	J9-19	51
Selector linkage, replacement	K1-17	53
Accumulator pistons, replacement	L1-8	56
Solenoid valve (AW70/71), replacement	M1-7	58
Transmission mounts:	N1-4	60
replacement	N5-10	61
Transmission, removing	O1-8	62
installing	O9-20	64



136113

A. Oil, checking – changing

Never start engine without oil in transmission!



A1

Checking oil level: Check oil when warm (cold part of dipstick is only for reference)

Conditions: vehicle on level surface, engine idling and selector lever in position "P".

Move selector level through all gear positions, stopping in each position for 4–5 seconds. Return lever to position P and wait 2 minutes before checking oil level.

Wipe dipstick with a nylon rag or chamois i.e. fluff-free materials.

Note! Two types of dipsticks are in use:

- 1975–1978 = steel ended
- 1979– = plastic ended.

A2

High oil level

Drain excess oil

Unscrew filler tube from oil pan. (Drain plug fitted on 1983-models.) Re-torque tube fitting to 90 Nm (66 ft-lbs).

WARNING! The transmission oil may be extremely hot if vehicle has just been driven.

Check drained oil for water contamination. If water is present, transmission and torque converter must be removed and cleaned. Also oil cooler must be checked for leakage and repaired or replaced.

Heavy load on transmission can also cause too high an oil level because of extremely high oil temperature.

A3

Low oil level

Ensure low level is not due to leakage.

Checking oil level at low temperatures (below 5°C = 41°F) may result in false readings.

Driving with insufficient oil in transmission will cause oil to foam, also giving false oil level.

Filling oil

Use ATF type G (F). Types F and G are mixable.

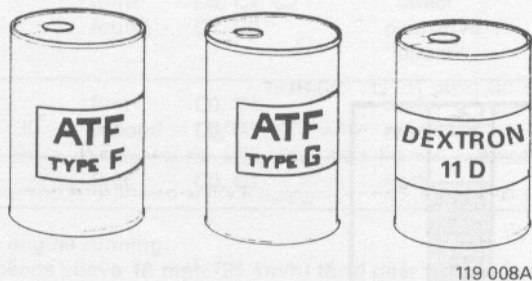
Note! Use DEXTRON 11 D for 1984 — AW 70, AW 71 transmissions.

Distance between max and min on dipstick represents 0.5 liter (0.5 US qts) on AW55/BW55.

AW70/71: max – min = 0.4 liter (0.4 US qts).

Oil change quantities, see A6 on page 36.

Note! Additives must not be added to transmission.



Oil should be to Ford specification M2 C33 – F or G.

Tightening torque for oil pan, see J14 on page 52.



Be careful when adding oil

Overfilling can cause frothing and leakage.

Do not check level immediately after adding oil, as oil adhering to filler tube may wipe off on dipstick and give false reading.

Note! Engine must be idling throughout addition of oil. If engine is revved with low transmission oil level, oil will froth considerably and give false reading.

A4

Discoloured or burnt oil

Remove oil pan and check for abnormal quantities of solid particles of steel, aluminium or clutch facing materials.

If found = overhaul transmission

If no fault can be found with the transmission, it is possible that particles have accumulated in torque converter and suddenly moved with oil flow. Replace torque converter and clean oil cooler and pipes.

None = change oil and clean oil pan, filter, magnet and oil cooler

Alternatively overhaul transmission.

If oil discoloration or burnt smell was caused by harsh driving or towing (transmission operates correctly), oil should be filled according to method described on page 36 "Cleaning oil cooling system", i.e. fill oil until clean oil comes from return pipe.

A5

Changing oil

Drain oil by unscrewing oil filler tube. (Drain plug introduced in 1983).

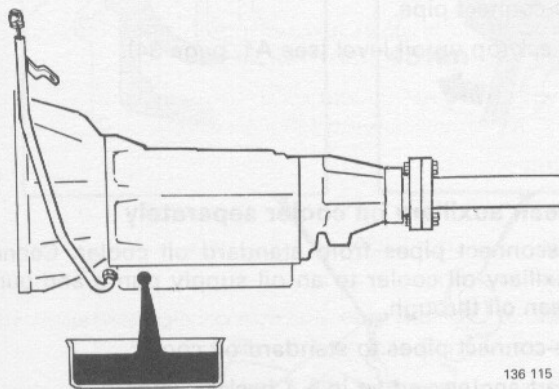
Caution! Transmission oil may be very hot if vehicle has just been driven.

Clean oil pan, filter, magnet

Should always be done after each oil change. (Tightening torque for oil pan, see J14 on page 52).

Note! Always clean oil cooler if oil is burnt and contains foreign particles.

Torque filler tube to 90 Nm (66 ft. lbs). Fill oil. Start engine and allow it to idle. Check oil level.



136 115

Oil fill quantities: Litres (US qts)

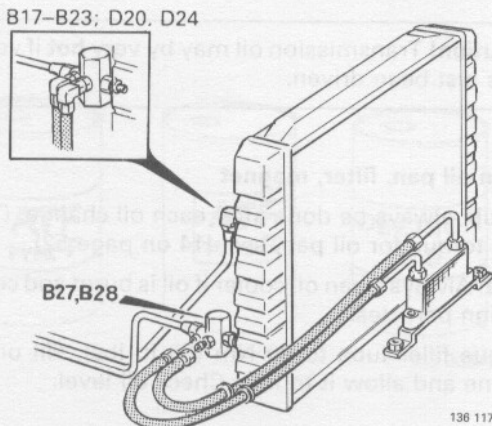
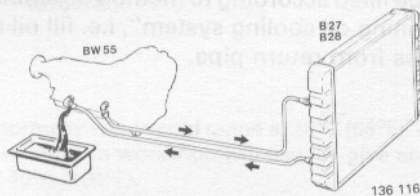
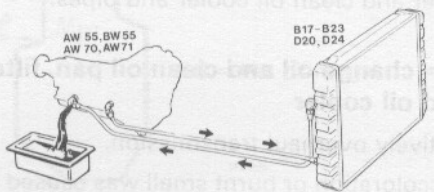
A6

	AW/BW55 1975–78	1979	AW70/71
Removing oil pan	3.0 (3.15)	3.4 (3.57)	3.3 (3.47)
Add before starting engine	2.5 (2.63)	2.9 (3.05)	2.7 (2.84)
Reconditioning valve body assembly in-car	4.5 (4.73)	4.9 (5.15)	5.5 (5.78)
Add before starting engine	4.0 (4.20)	4.4 (4.62)	5.0 (5.25)
Reconditioning transmission incl. installing new torque converter	6.5 (6.83)	6.9 (7.25)	7.4–7.5 (7.77–7.88)
Add before starting engine	6.0 (6.30)	6.4 (6.72)	7.0 (7.35)
Reconditioning transmission incl installing old torque converter	5.5 (5.78)	5.9 (6.20)	6.5 (6.83)
Add before starting engine (not possible to drain converter fully).....	5.1 (5.36)	5.5 (5.78)	6.1 (6.41)

Note! Add extra 3 dl (0.3 US qts) on vehicles with auxiliary oil cooler.

¹ Deeper sump introduced in 1979

B. Cleaning oil cooling system



B1

Always clean oil cooler when reconditioning/replacing transmission

B2

To clean

- Disconnect oil return pipe at rear of transmission.
- Overfill transmission by approx. 0.3 liter (0.3 US qt.).
- Start engine and allow to idle. Collect contaminated oil and switch off engine when clean oil comes out of pipe.
- Re-connect pipe.
- Check/top up oil level (see A1, page 34).

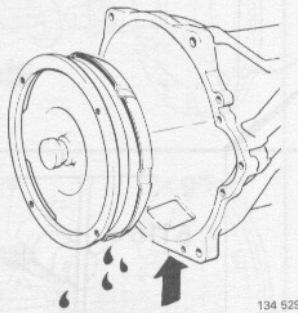
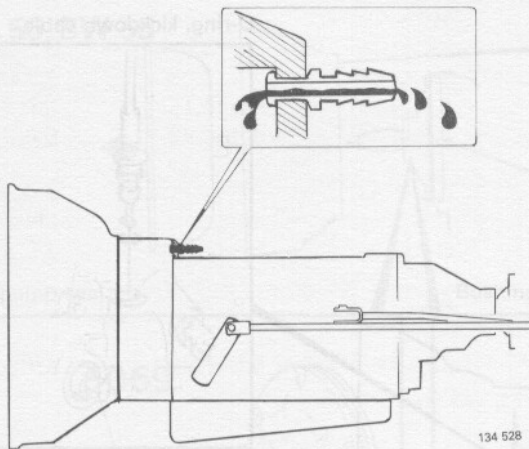
B3

Clean auxiliary oil cooler separately

- Disconnect pipes from standard oil cooler. Connect auxiliary oil cooler to an oil supply pump and pump clean oil through.
- Re-connect pipes to standard oil cooler.
- Start engine and let idle. Check oil level.
- (Illustration shows location of hoses and thermostat valve for different engine types.)

C. Oil seals, replacement

C1



Oil leakage

High level

First check that leakage is not due to high oil level; oil may be thrown out through vent located on top side of torque converter. Also check for leaks at oil cooler pipes and the test outlet plugs.

With other leakages, clean the transmission and determine if leak can be remedied or if transmission must be removed.

Leaks from torque converter welds

Insert a piece of paper through opening in bottom of torque converter housing. Run engine at idle for a few minutes.

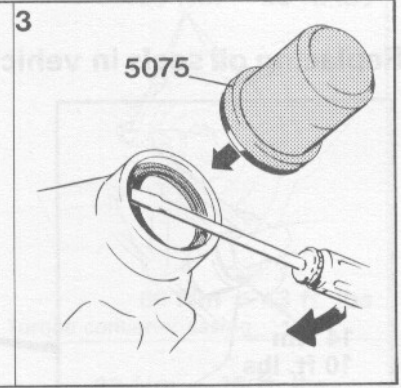
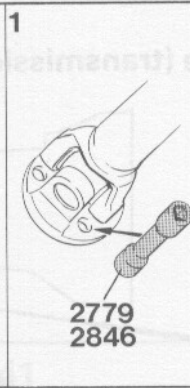
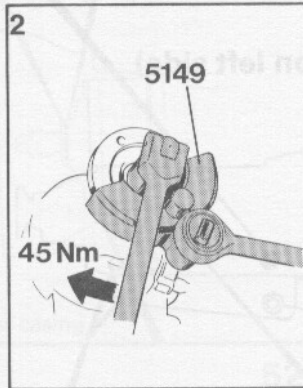
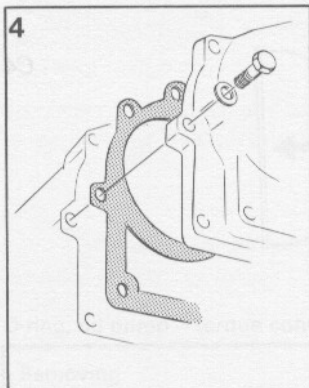
Oil spill on paper indicates an oil leak. Replace torque converter.

Replace seals in vehicle (transmission rear and underside)

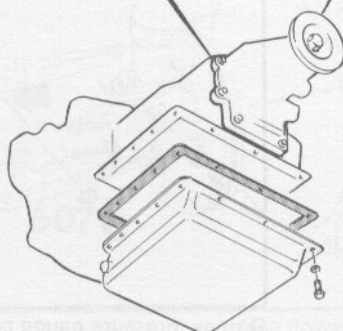
Special tools: 2779, 2846, 5075, 5149

Rear extension housing gasket

Oil seal at drive flange



Use 5075 to install oil seal. Ensure seal sits correctly



Oil pan gasket

Tightening torques:

- AW55: grey cork gasket 4.5 Nm (3.2 ft. lbs).
- BW55: Yellow natural cork gasket 8 Nm (5.8 ft. lbs).
- blue cellulose gasket 10 Nm (7.4 ft. lbs).
- (Smear blue gasket with oil before installing.)
- AW70/71: 5 Nm (3.6 ft. lbs).

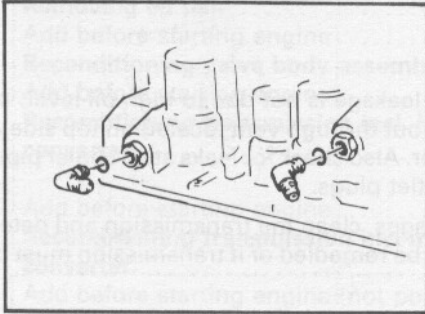
C2

Replacing oil seals in vehicle (transmission right side)

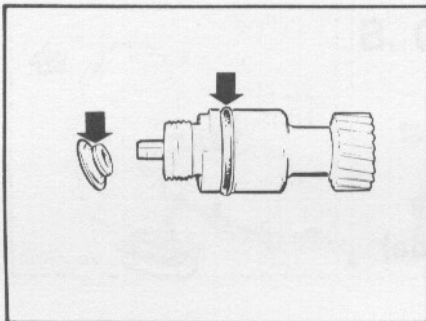
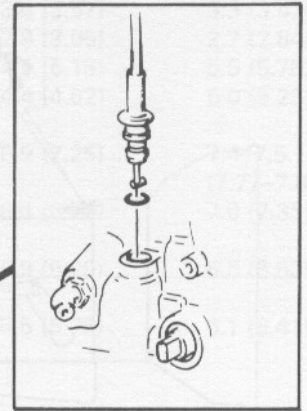
Special tool: 5118

C3

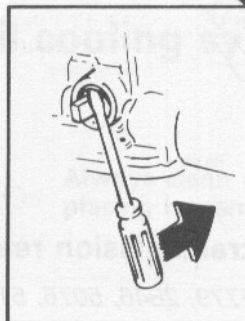
O-rings, oil cooler connections



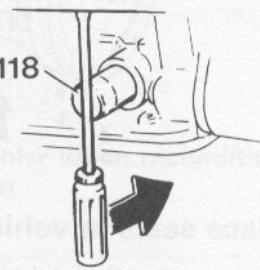
O-ring, kickdown cable



O-ring, speedometer drive



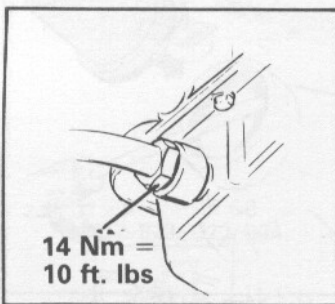
5118



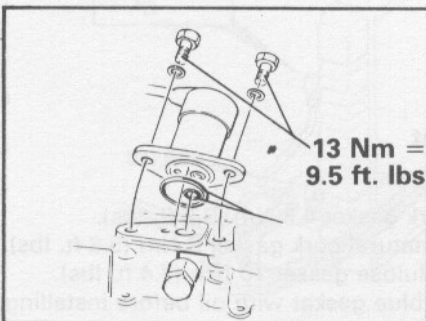
Oil seals, gear selector shaft

Replacing oil seals in vehicle (transmission left side)

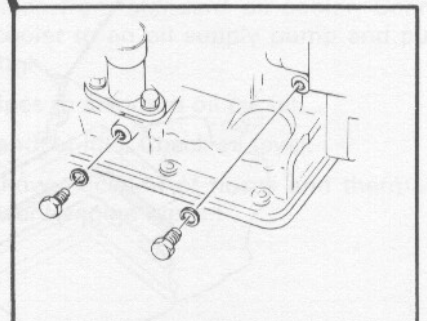
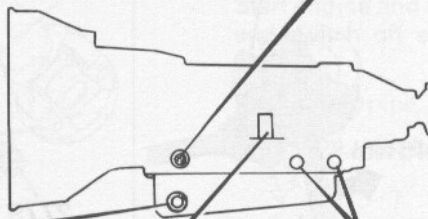
C4



Oil filler tube



O-rings, solenoid valve, AW70/71



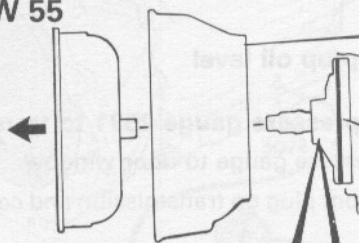
O-rings, pressure gauge connections

Replacing oil seals (transmission on fixture)

Special tools: 5069, 5071, 5117, 5241

C5

AW 55, BW 55

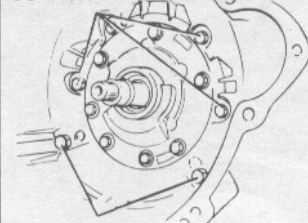


Oil pump seal

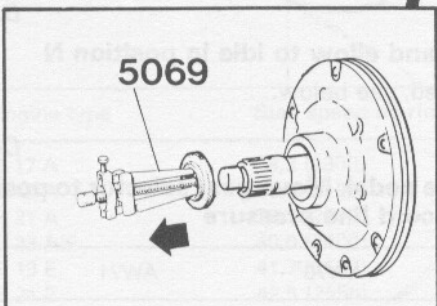
Bushing – oil pump

Installing

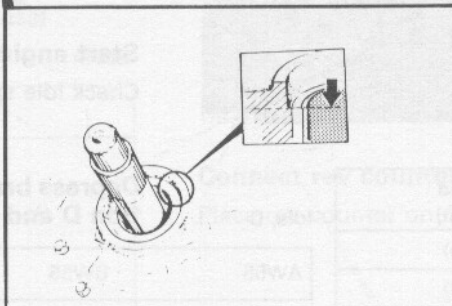
33 Nm = 24 ft. lbs



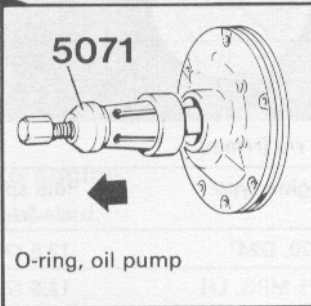
45 Nm = 32 ft. lbs



5069

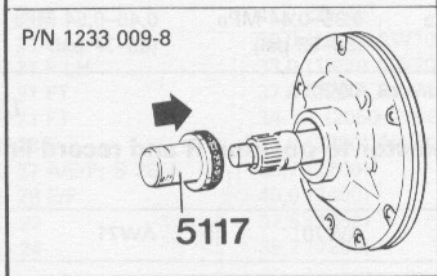


Replace oil pump if bushing is damaged or moved outward because it will block a drain channel and cause an oil leak.



5071

O-ring, oil pump



P/N 1233 009-8

5117

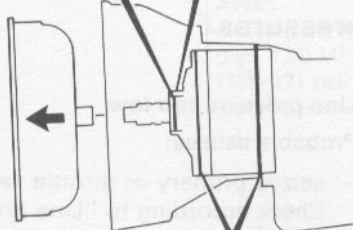


Installing

25 Nm = 18 ft. lbs

Bearing washer, rear
(see Z56, page 135)
Lightly smear with Vaseline

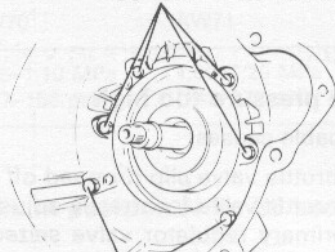
AW 70/71



O-ring, oil pump – torque converter casing

Installing

35 Nm = 25 ft. lbs

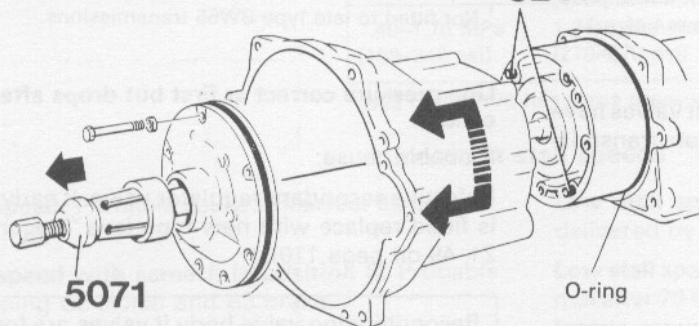


60 Nm = 43 ft. lbs

Torque converter casing

Removing

5241

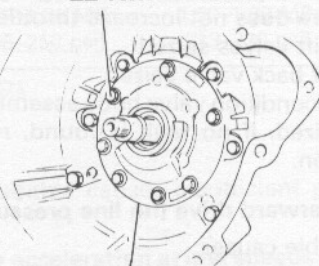


5071

O-ring

Installing

22 Nm = 16 ft. lbs



Vaseline

Oil pump

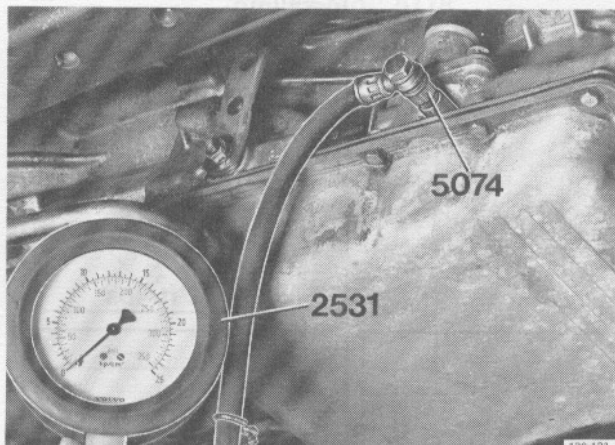
Use dowel pins 5241 to hold overdrive in place.

136 120

Checking line pressure

D. Checking line pressure

Special tools: 2531, 5074



Idle r/s (r/min)

Engine type	Idle speed r/s (r/min)
D 20, D24 ¹	12,5 (750)
B21 MPG, LH	12,5 (750)
B19/21A – 1977 B27A – 1976	14,2 (850)
Other markets	15,0 (900)
B23E – 1980 B27F – 1977 USA, CALIF, FEDERAL, CAN, JAPAN B28F 1980	15,8 (950)
B27E 1979–1980 B28E 1981 B28E 1982 Sweden, Aus	16,7 (1000)

¹ Low idle

Idle, D

AW55	BW55	AW70 ¹	AW71
0,40–0,45 MPa (57–64 psi)	0,53–0,63 MPa (75–90 psi)	0,35–0,44 MPa (50–63 psi)	0,46–0,54 MPa (65–77 psi)

¹ B23 FLH AW70 has same pressure as AW71.

Idle, R

AW55	BW55	AW70 ¹	AW71
0,58–0,68 MPa (83–97 psi)	0,74–0,91 MPa (105–129 psi)	0,50–0,64 MPa (71–91 psi)	0,7–0,82 MPa (100–117 psi)

¹ B23 FLH AW70 has same pressure as AW71.

Check/top-up oil level

D1

D2

Connect pressure gauge 2531 to transmission

Attach pressure gauge to door window.

Remove front plug on transmission and connect nipple 5074.

Connect pressure gauge hose to nipple.

D3

Start engine and allow to idle in position N

Check idle speed, see below.

D4

Depress brake pedal. Move gear selector to position D and record line pressure

D5

Move gear selector to position R and record line pressure

D6

Incorrect pressures

Line pressure too high

Probable causes:

- throttle valve clip dropped off
- throttle valve incorrectly adjusted
- primary regulator valve seized. Check as follows: Rev up engine. If pressure increases proportionally to engine speed, valve has seized.
- throttle valve seized. Check as follows: Allow engine to idle in position N. Pull out throttle valve by hand (without moving throttle). If line pressure does not increase throttle valve has seized.
- shift valves seized
- cut back valve seized
Recondition valve body assembly if shift valves have seized. If no fault is found, recondition transmission.

No rearward drive (no line pressure)

Probable causes:

- primary regulator valve defective
- 2–3 shift valve defective
- reverse gear sequence valve defective
- C2 accumulator piston defective
- center support bolts loose.

Line pressure too low

Probable causes:

- seized primary or throttle valve.
Check according to "Line pressure too high".

If test shows values are OK: low pressure may be caused by defective Bypass valve¹ or oil pump (noisy). Alternatively oil filter may be blocked or accumulator pistons may be defective.

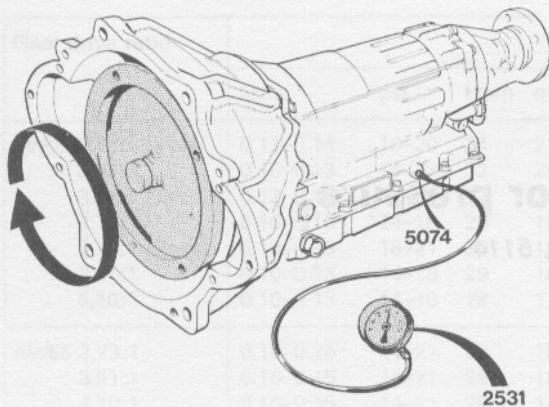
¹ Not fitted to late type BW55 transmissions.

Line pressure correct at first but drops after a few seconds

Probable cause:

Defective secondary regulator valve. If early type valve is fitted replace with new type (see "Reconditioning" Z1–49 on page 110).

Reconditioning valve body if valves are found to be defective.



118 928

Engine type	Stall speed r/s r(min)
B 17 A	38,3 (2300)
B 19 A	35,0 (2100)
B 21 A	36,7 (2200)
B 23 A/E	40,0 (2400)
B 19 E	41,7 (2500)
B 21 E	42,5 (2550)
B 21 F	41,7 (2500) ¹
B 21 F MPG	30,0 (1800) AW70
B 21 F LH	33,0 (1980) AW70
B 21 FT	37,0 (2220) AW71
B 21 FT	34-41 (2050-2500) AW71
B 23 F	37,0 (2200) AW70
B 27 A/E/F; B 28 A	36,7 (2200) ²
B 28 E/F	40,0 (2400)
D 20	32,5 (1950)
D 24	36,7 (2200)

¹ 35,0 (2100) for 1208 254-027 and 1208 253-376

² 38,3 (2300) for 1208 128-011 and 1208 164-021 for B27E and F and 1208 046-007 for B27F.

Position D

AW55	BW55	AW70 ¹	AW71
0,95-1,20 MPa (135-171 psi)	1,13-1,37 MPa (159-195 psi)	0,96-1,10 MPa (137-156 psi)	1,00-1,20 MPa (142-171 psi)

D11

Allow engine to idle in position N for 30 sec

D12

Position R

Engage reverse and repeat test

AW55	BW55	AW70 ¹	AW71
1,40-1,70 MPa (199-242 psi)	1,54-1,96 MPa (219-279 psi)	1,37-1,76 MPa (195-250 psi)	1,50-1,90 MPa (213-270 psi)

¹ B23 FLH AW70 has same pressure as AW71

Incorrect stall speeds

D13

High stall speed. Probable cause: incorrect oil level or blocked oil filter.

High stall speed with screech in position R. Probable cause: slipping C2 clutch and B3 brake.

High stall speed with screech in positions D1 and D2. Probable cause: Slipping C1 clutch.

Testing stall speed

To be carried out in conjunction with check of line pressure (D1-6).

Never test stall speed if line pressure is too low.

Stall speed test gives an indication of condition of torque converter and transmission clutches.

Test conditions:

- engine must be properly tuned
- correct line pressure
- correct oil level and transmission at normal operating temperature.

D8

Connect rev counter to engine

Place rev counter on dashboard.

D9

Start engine. Apply parking brake and brake heavily with left foot

D10

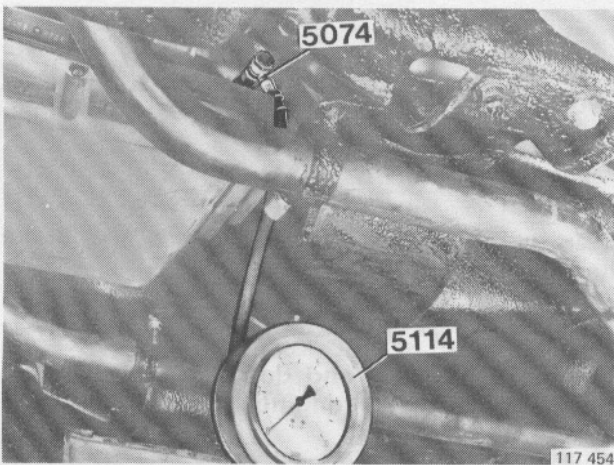
Engage position D and depress accelerator to floor. Record highest engine speed and line pressure

Do not depress accelerator for more than 5 seconds.

D. Checking line pressure

E. Checking governor pressure

Special tools: 5074, 5114



117 454

Check/top-up oil level

E1

Check line pressure

E2

Governor pressure is a transformed line pressure. Therefore if line pressure is incorrect so is governor pressure.

Connect pressure gauge 5114

E3

Attach pressure gauge to side window.

Remove plug from rear of transmission and attach nipple **5074**. Connect hose to nipple.

Check that governor pressure is zero when engine is idling in D and R, vehicle stationary

E4

Test drive vehicle in D and record governor pressure

E5

Final drive ratio	Governor pressure											
	MPa	psi	km/h	mph	MPa	psi	km/h	mph	MPa	psi	km/h	mph
BW55 3.31:1 Diesel	0.11–0.14	16–20	34	21	0.18–0.22	26–31	62	39	0.38–0.43	54–61	121	76
3.54:1	0.10–0.13	14–18	32	20	0.15–0.19	21–27	57	36	0.36–0.46	51–65	110	69
3.54:1 Diesel	0.12–0.14	17–20	32	20	0.19–0.23	27–33	57	34	0.43–0.48	61–68	110	69
3.73:1	0.10–0.13	14–18	20	19	0.16–0.20	23–28	55	34	0.37–0.44	53–63	108	67
3.73:1 Diesel	0.13–0.15	18–21	30	19	0.20–0.23	28–33	55	34	0.47–0.52	67–74	108	67
3.91:1	0.10–0.13	14–18	29	18	0.16–0.20	23–28	53	33	0.37–0.44	53–63	103	64
4.10:1	0.10–0.13	14–18	28	17	0.16–0.20	23–28	51	32	0.37–0.44	53–63	98	61
AW55 3.73:1	0.10–0.15	14–21	30	19	0.16–0.22	23–32	55	34	0.42–0.52	60–74	108	67
3.91:1	0.10–0.15	14–21	29	18	0.16–0.22	23–32	53	33	0.42–0.52	60–74	103	64
4.10:1	0.10–0.15	14–21	28	17	0.16–0.22	23–32	51	32	0.42–0.52	60–74	98	61
AW70/71 3.73:1	0.09–0.15	13–21	30	19	0.16–0.22	23–32	55	34	0.41–0.53	58–75	108	67
3.91:1	0.09–0.15	13–21	29	18	0.16–0.22	23–32	53	33	0.41–0.53	58–75	103	64

Incorrect governor pressure

E6

Too high

Probable cause:

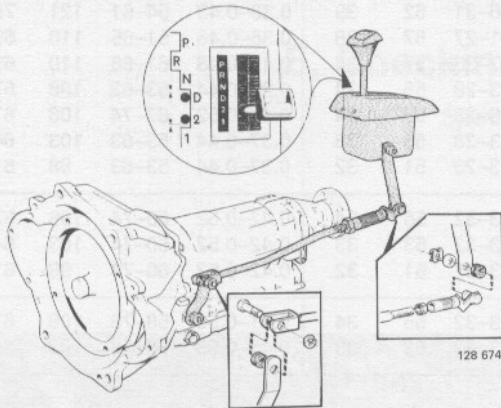
Governor seized. Remove, clean and check/replace governor.

Too low:

Probable causes:

- Governor seized or leaking. Remove, clean and check/replace.
- Oil leak at cover plate for oil channels to governor. Replace gasket.
- Governor oil seals on output shaft worn or broken. Replace seals.

F. Adjusting shift linkage



F1 Check that play in linkage is not too large

If too large, replace bushings.

F1

F2 Check selector lever positions

Engage D and move lever against gate. Clearance should be same or greater than clearance in position 2 (see top left).

F2

F3 Adjust rod length if necessary

Rough adjustment: screw clevis in or out (clevis may be attached to front of rod on some models)

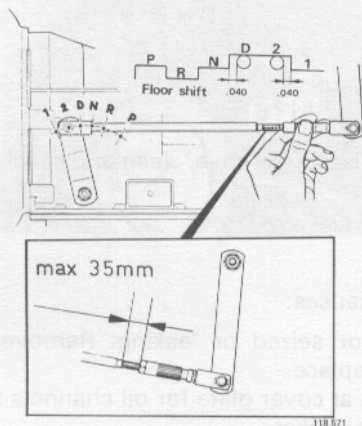
Fine adjustment: turn knurled sleeve as required.

Max. visible thread length = 35 mm (1.05 in).

Increasing rod length reduces clearance in position D and increases clearance in position 2.

After adjustment: engage position 1 and then P. Repeat test according to F2.

F3

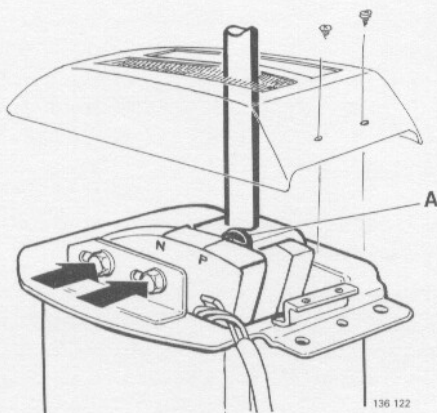


See K1-17 on page 53 if linkage mechanism inside transmission is defective.

F4 Checking start inhibitor switch

Remove gear selector cover. Check that N and P marks on inhibitor switch are opposite switch lever (A) in positions N and P respectively.

F4



F5 To adjust:

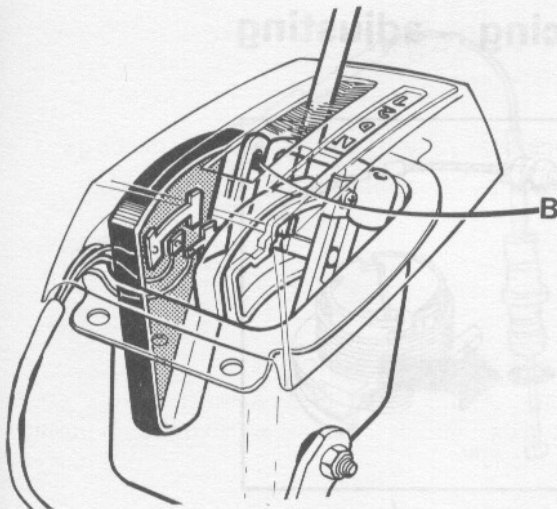
Engage position D.

Unscrew bolts (arrowed).

Adjust switch so that P is opposite lever (A).

Engage position N and check that N mark is opposite (A).

F5



Move selector lever forward and back, through gears (P to 1) and check that pin (B) does not slide out of lever (A).

Check that engine can only be started in positions P and N and that reversing (back-up) lights come on in position R.

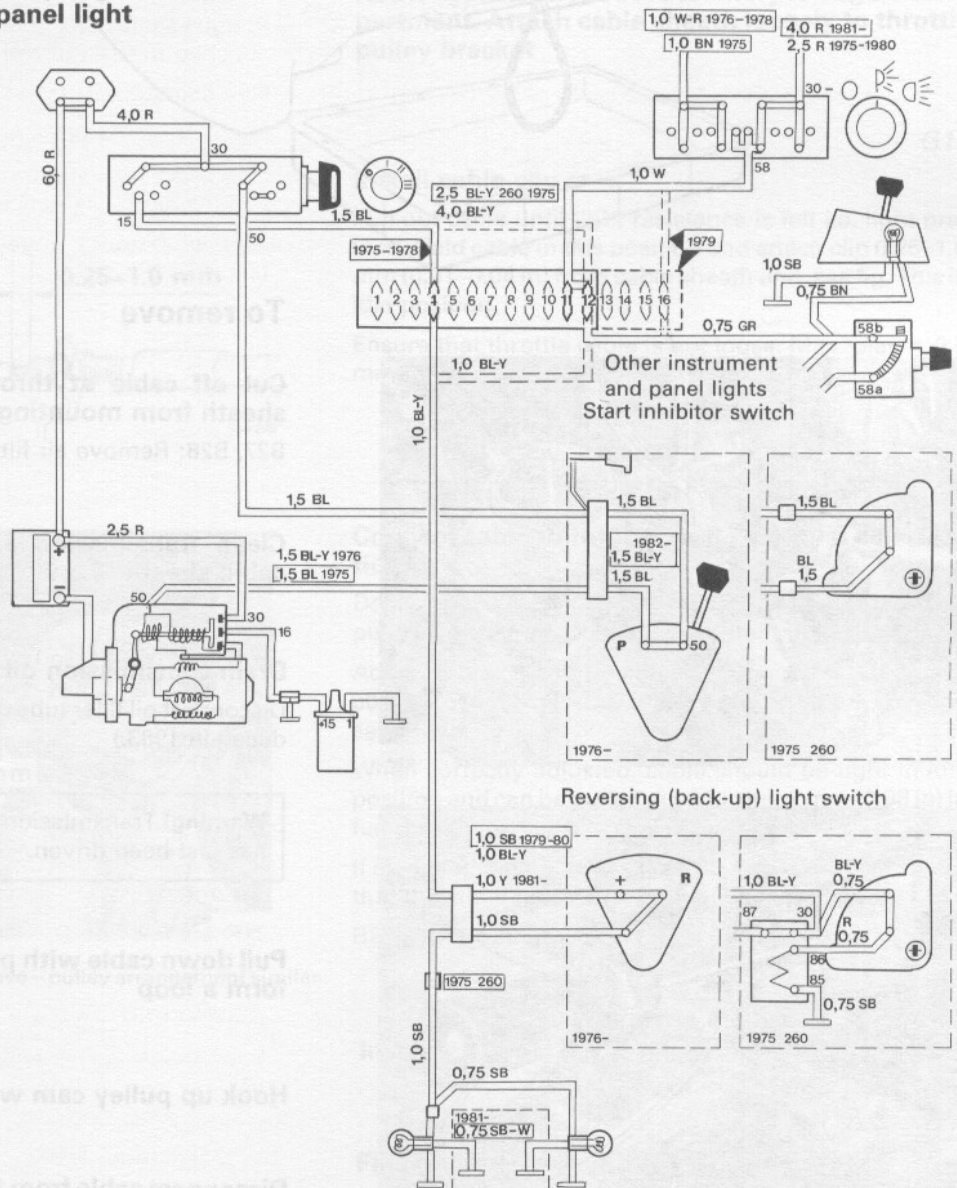
If reversing (back-up) light flashes when vehicle is reversed, move switch contact 1 mm (0.04 in) forward. After adjustment make sure that vehicle can only be started in "P" and "N".

Check that gear selector panel light works and is correctly installed. Install cover for selector linkage.

Wiring diagram 240, 260

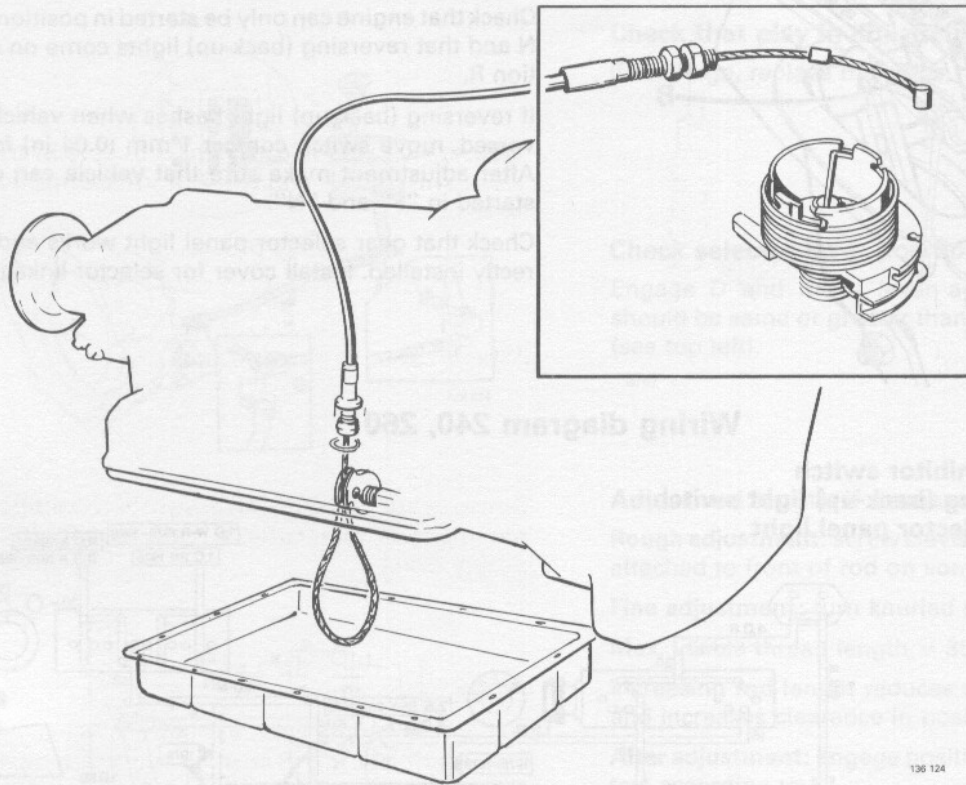
Start inhibitor switch
Reversing (back-up) light switch
Gear selector panel light

F6



- Colour code:
BL = Blue
BN = Brown
R = Red
SB = Black
W = White
Y = Yellow

G. Kick-down cable, replacing – adjusting



136 124

To remove

G1

Cut off cable at throttle pulley. Detach cable sheath from mounting bracket

B27, B28: Remove air filter first.

G2

Clean transmission around cable and remove cable sheath

G3

Drain transmission oil and remove oil pan

Disconnect oil filler tube from oil pan. (Drain plug introduced in 1983.)

G4

Pull down cable with pair of long-nosed pliers, to form a loop

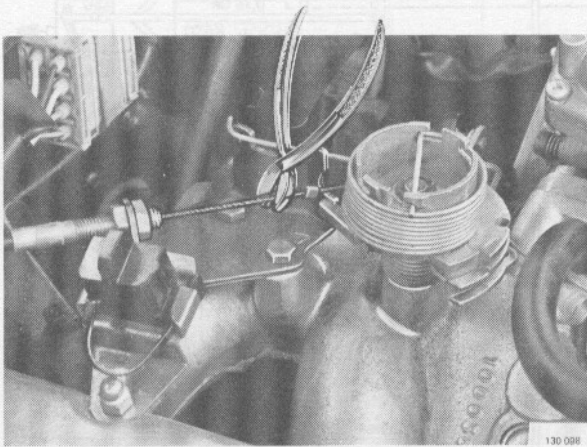
G5

Hook up pulley cam with a screwdriver

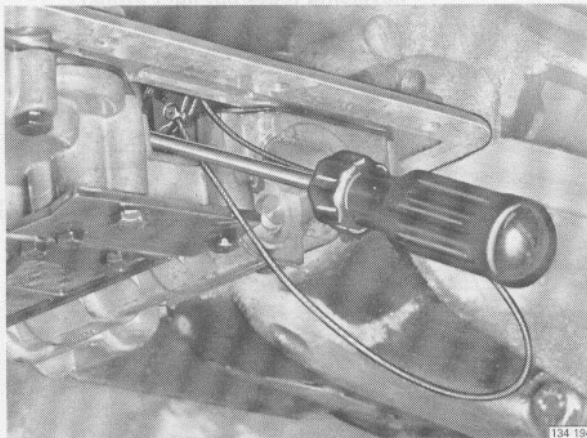
G6

Disconnect cable from throttle cam and withdraw from sheath

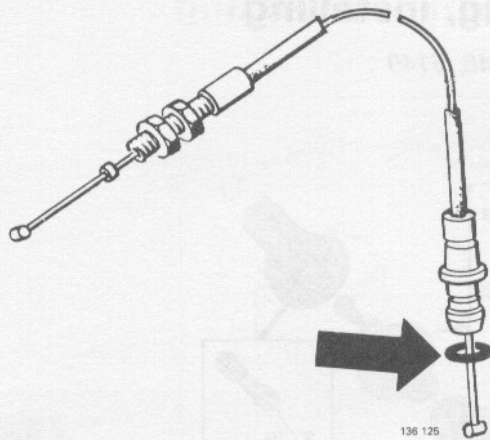
Lift up sheath with a screwdriver (see P15, page 69).



130 098



134 194



To install

G7

Install a new O-ring (arrowed)

G8

Withdraw cable slightly, insert cable in transmission and press sheath into transmission gear case

G9

Attach cable to throttle cam

G10

Route cable with sheath assembly to engine compartment. Attach cable sheath loosely to throttle pulley bracket

G11

Install cable clip

Pull out cable until light resistance is felt i.e. light pre-load. Hold cable in this position and attach clip 0.25–1.0 mm (0.01–0.04 in) from cable sheath end, see fig. This is idle position.

Ensure that throttle cable is not loose. Max. play = 0.5 mm (0.02 in).

G12

Connect cable to throttle pulley. Adjust clip position

Depress accelerator to floor. **Note!** Do not move throttle pulley by hand otherwise adjustment may be false.

Adjust cable sheath position so that clip is pulled out 50.4–52.6 mm (1.98–2.07 in) when accelerator is depressed fully.

When correctly adjusted, cable should be tight in idle position and can be pulled out a further 2 mm (0.08 in) in full throttle position.

If extended length is less than 50.4 mm (1.98 in), check that throttle pulley turns fully between stops.

B27/28: Install air filter.

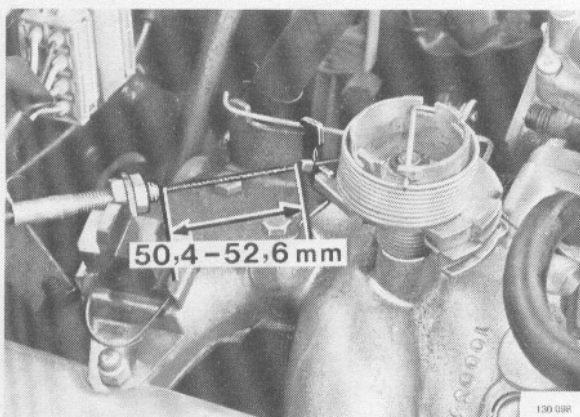
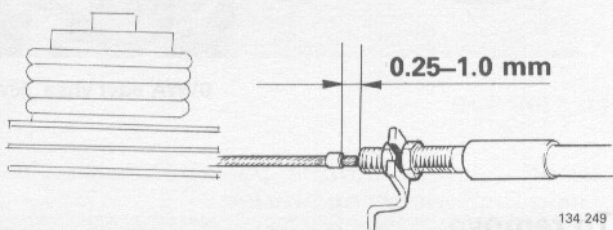
G13

Install oil pan and oil filler tube

G14

Fill transmission with ATF and topup

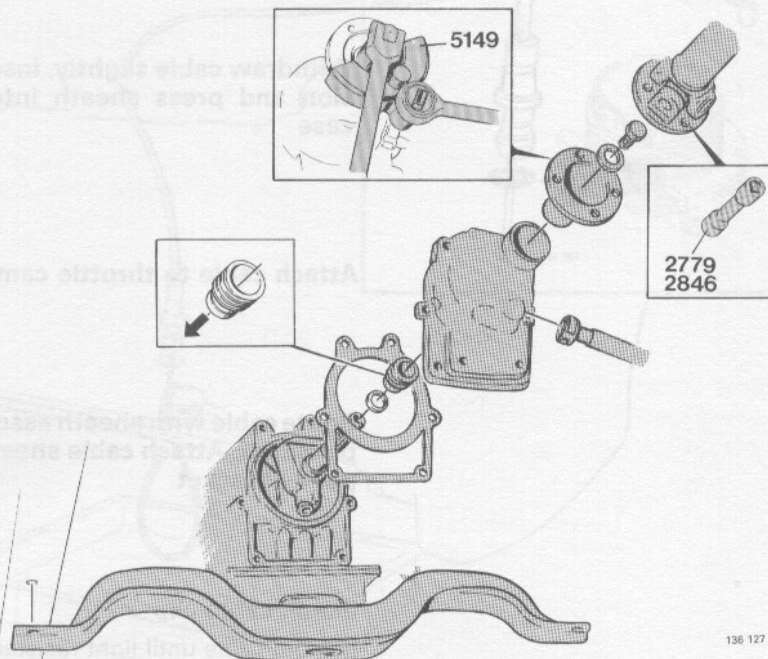
Level check: See A1–4, page 34.



4 cylinder A engine shown above – pulley arrangement similar on other engine types.

H. Governor, removing, installing

Special tools: 2779, 2846, 5149



To remove:

H1

Remove:

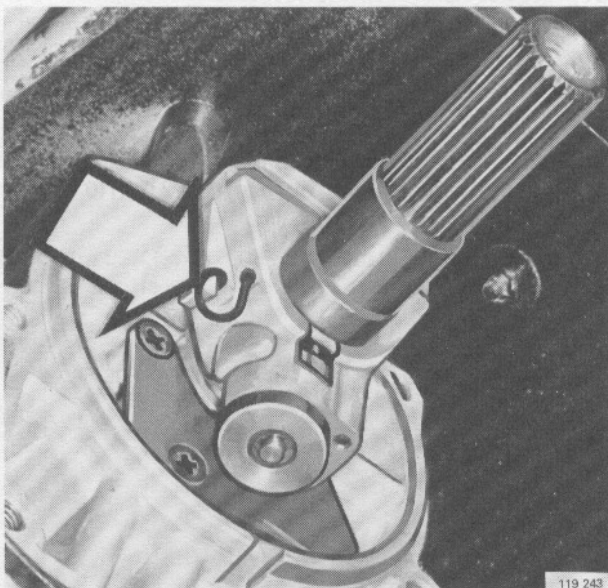
- transmission crossmember (for different types, see N1-4, page 60)
- propeller shaft. Wrench 2779 (2846)
- coupling flange
- speedometer cable
- rear extension housing and gasket
- large speedometer driven gear
- spacer.

H2

Remove governor

AW55, BW55, early type AW70: unsnap governor drive ring (clip) and withdraw governor. (AW55, BW55 have different drive rings.)

AW70 late type, AW71: unsnap drive ring and remove screw + lock plate. Then withdraw governor from shaft.



BW 55

H3

Reconditioning governor

See X1-7, page 107

Note! Type of governor depends on transmission type (see table on page 11).

To install

H4

H4

Replace gasket under channel plate

(AW: Clean oil filter, see P9, page 68.)

H5

Replace oil seal for flange and speedometer driven gear

Also check bushing in extension housing (see X1-12, page 107).

H6

Reverse procedure to install governor

Turn drive ring on BW55 to secure.

AW70 late type/AW71: install bolt, lock plate and drive ring.

Tightening torque 4 Nm (3 ft. lbs).

H7

Tightening torques (all transmissions)

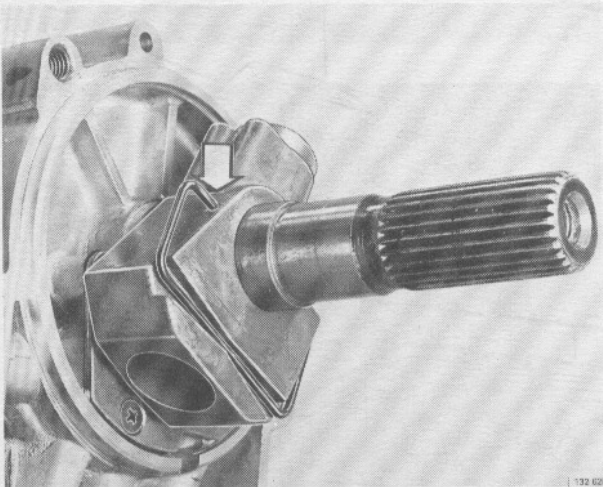
- rear extension housing = 35 Nm (26 ft. lbs)
- coupling flange = 45 Nm (33 ft. lbs)

H8

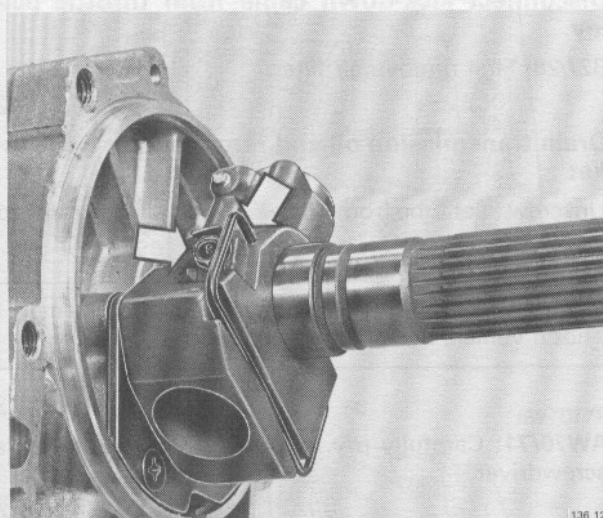
Fill oil and check level

ATF

Level check: See A1-4, page 34.



AW55, early type AW70



AW55, early type AW70