MANUAL GEARBOX

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Description and Operation

Adjustments

Repairs

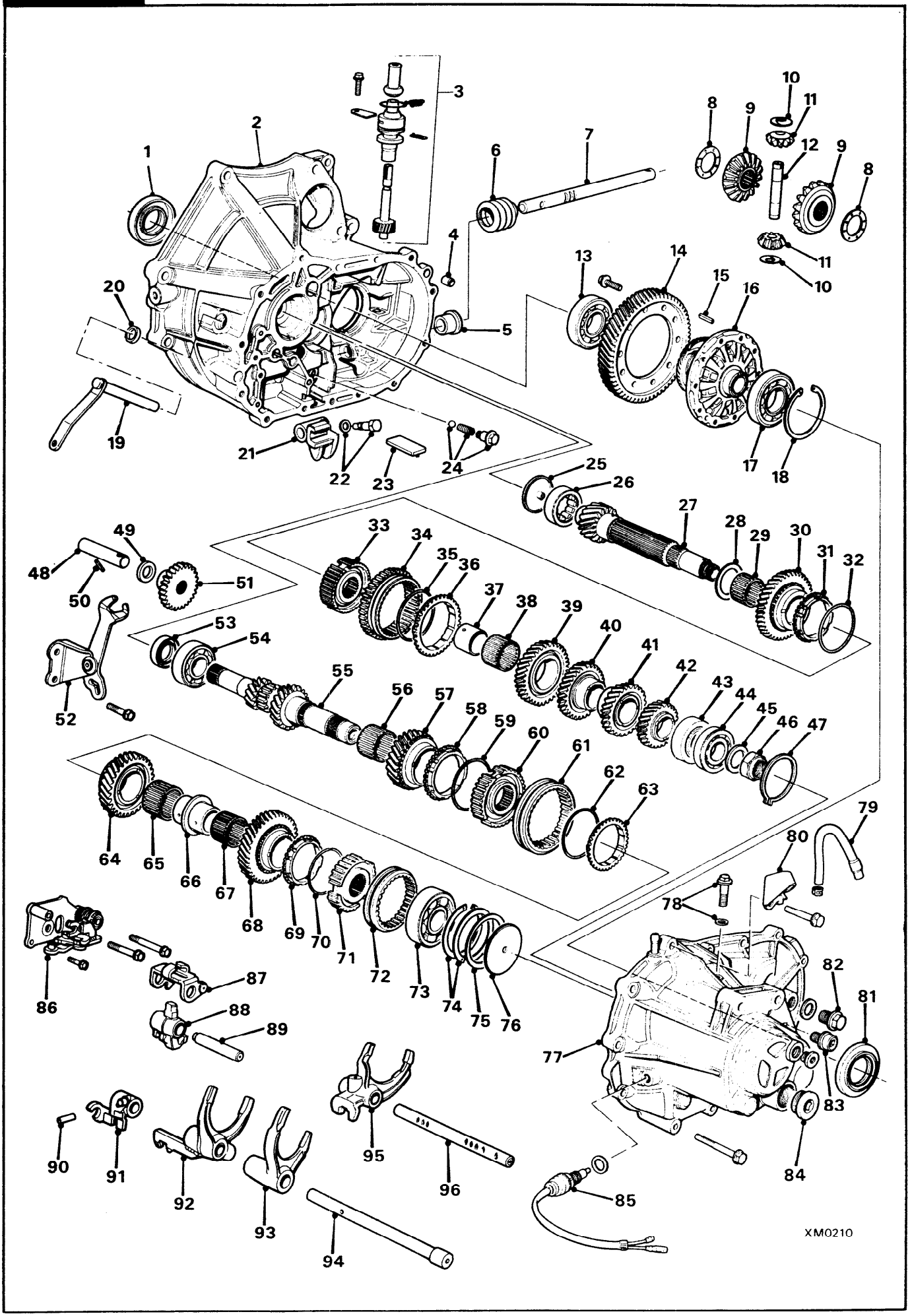
⚠ ***CAUTION:*** *Care must be taken when overhauling PG1 gearboxes. Two suppliers are used and many components are not interchangeable. Repair procedures that differ are identified as follows:*
PG1¹ - gearboxes up to No. 1999999
PG1² - gearboxes from 2000001

NOTES

Symbols have the following meanings:

→ = TO
← = FROM

⚠ = *WARNING*
⚠ = *CAUTION*
ⓘ = *NOTE*
TQ = TORQUE WRENCH FIGURE
ST = SERVICE TOOL
FC = *FASTCHECK TOOL*
NR = NON REUSABLE ITEM
i = INFORMATION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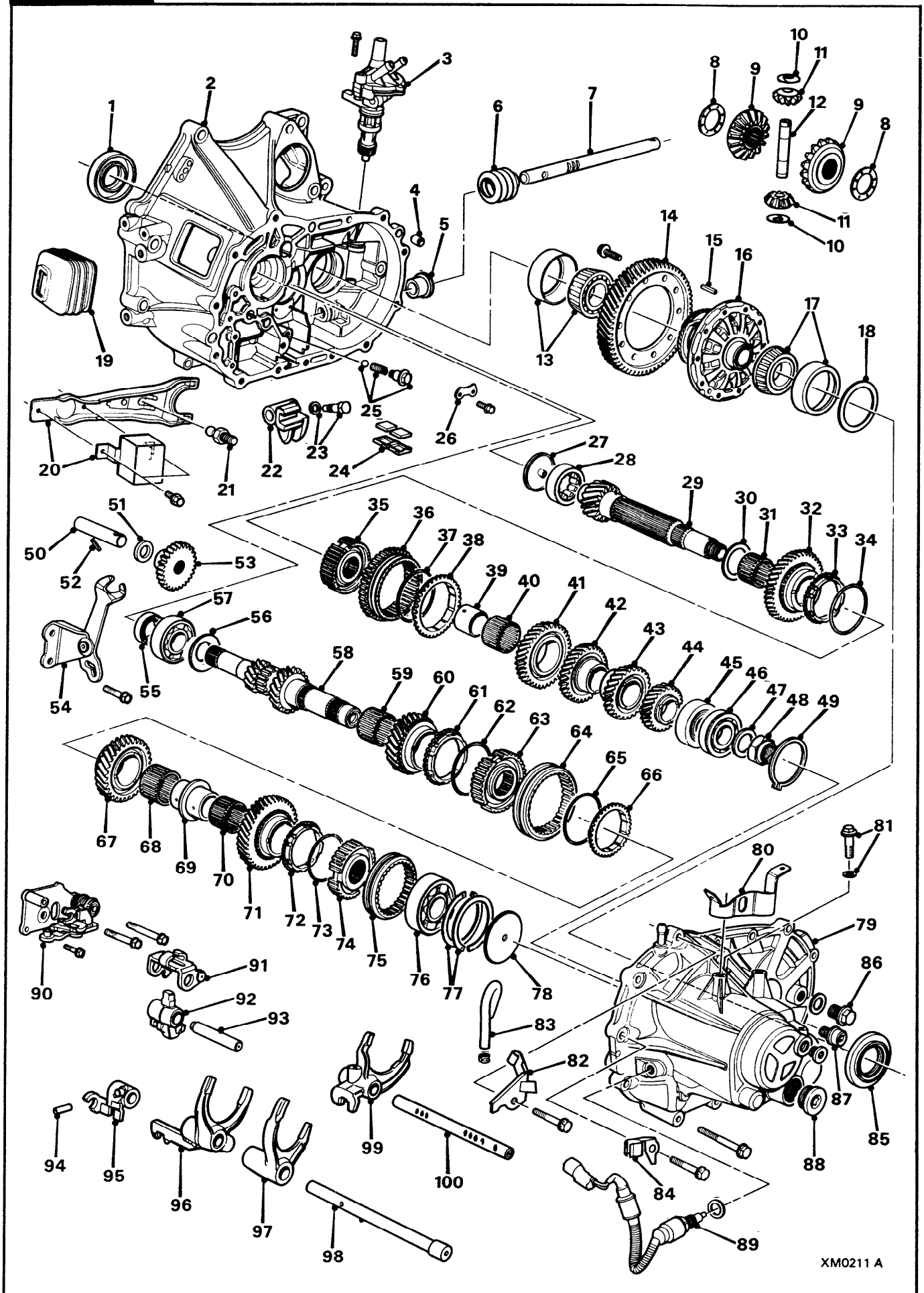
GEARBOX COMPONENTS - PG1 GEARBOX

1. Oil seal - differential
2. Differential housing
3. Speed sensor - instruments
4. Dowel
5. Oil seal - selector rod
6. Boot
7. Selector rod
8. Thrust washer - sun gear
9. Sun gear
10. Thrust washer - planet pinion
11. Planet pinion
12. Pinion shaft
13. Ball bearing - differential
14. Final drive gear
15. Roll pin - differential pinion shaft
16. Differential casing
17. Ball bearing - differential
18. Selective shim
19. Clutch release arm
20. Oil seal - clutch release arm
21. Selector rod guide
22. Dowel bolt and washer
23. Magnet
24. Detent cap bolt, ball and spring - selector rod
25. Oil guide plate
26. Parallel roller bearing - countershaft
27. Countershaft
28. Selective thrust washer - 1st gear end float
29. Needle roller bearing - 1st gear
30. 1st gear
31. Synchro ring - 1st gear
32. Synchro spring
33. Synchro hub - 1st/2nd gear
34. Synchro sleeve - 1st/2nd gear
35. Synchro spring
36. Synchro ring - 2nd gear
37. Selective collar - 2nd gear end float
38. Needle roller bearing - 2nd gear
39. 2nd gear
40. 3rd gear
41. 4th gear
42. 5th gear
43. Roller bearing - countershaft
44. Ball bearing - countershaft
45. Washer
46. Countershaft nut - L.H. thread
47. Circlip
48. Reverse idler shaft
49. Thrust washer - reverse idler gear
50. Roll pin - reverse idler shaft
51. Reverse idler gear
52. Reverse fork
53. Oil seal - mainshaft
54. Ball bearing - mainshaft
55. Mainshaft
56. Needle roller bearing - 3rd gear
57. 3rd gear
58. Synchro ring - 3rd gear
59. Synchro spring
60. Synchro hub - 3rd/4th gears
61. Synchro sleeve - 3rd/4th gears
62. Synchro spring
63. Synchro ring - 4th gear
64. 4th gear
65. Needle roller bearing - 4th gear
66. Distance collar - 4th/5th gears
67. Needle bearing - 5th gear
68. 5th gear
69. Synchro ring
70. Synchro spring
71. Synchro hub - 5th gear
72. Synchro sleeve - 5th gear
73. Ball bearing - mainshaft
74. Selective snap rings - mainshaft end thrust
75. Belville washer - mainshaft end thrust
76. Oil guide plate
77. Gearbox casing
78. Reverse idler shaft bolt and washer
79. Breather pipe
80. Breather pipe bracket
81. Oil seal - differential
82. Filler/level plug
83. Drain plug
84. Access plug - countershaft bearing circlip
85. Reverse light switch
86. Shift arm assembly
87. Interlock
88. Shift arm guide
89. Shift shaft
90. Roll pin - 5th/reverse gear selector
91. Gear selector - 5th/reverse gears
92. Selector fork - 3rd/4th gears
93. Selector fork - 5th gear
94. Selector shaft - 5th/reverse gears
95. Selector fork - 1st/2nd gears
96. Selector shaft - 1st/2nd gears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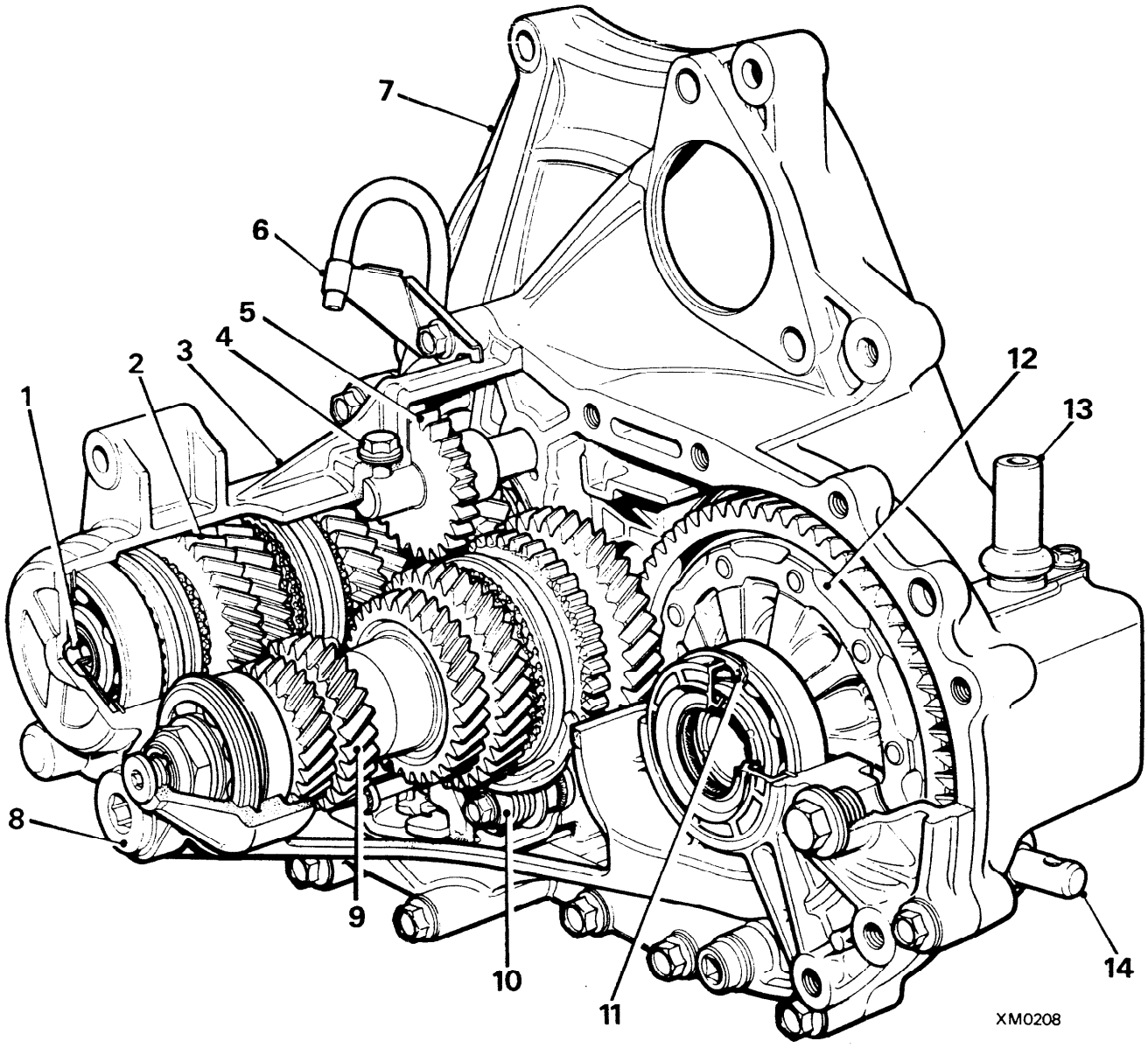
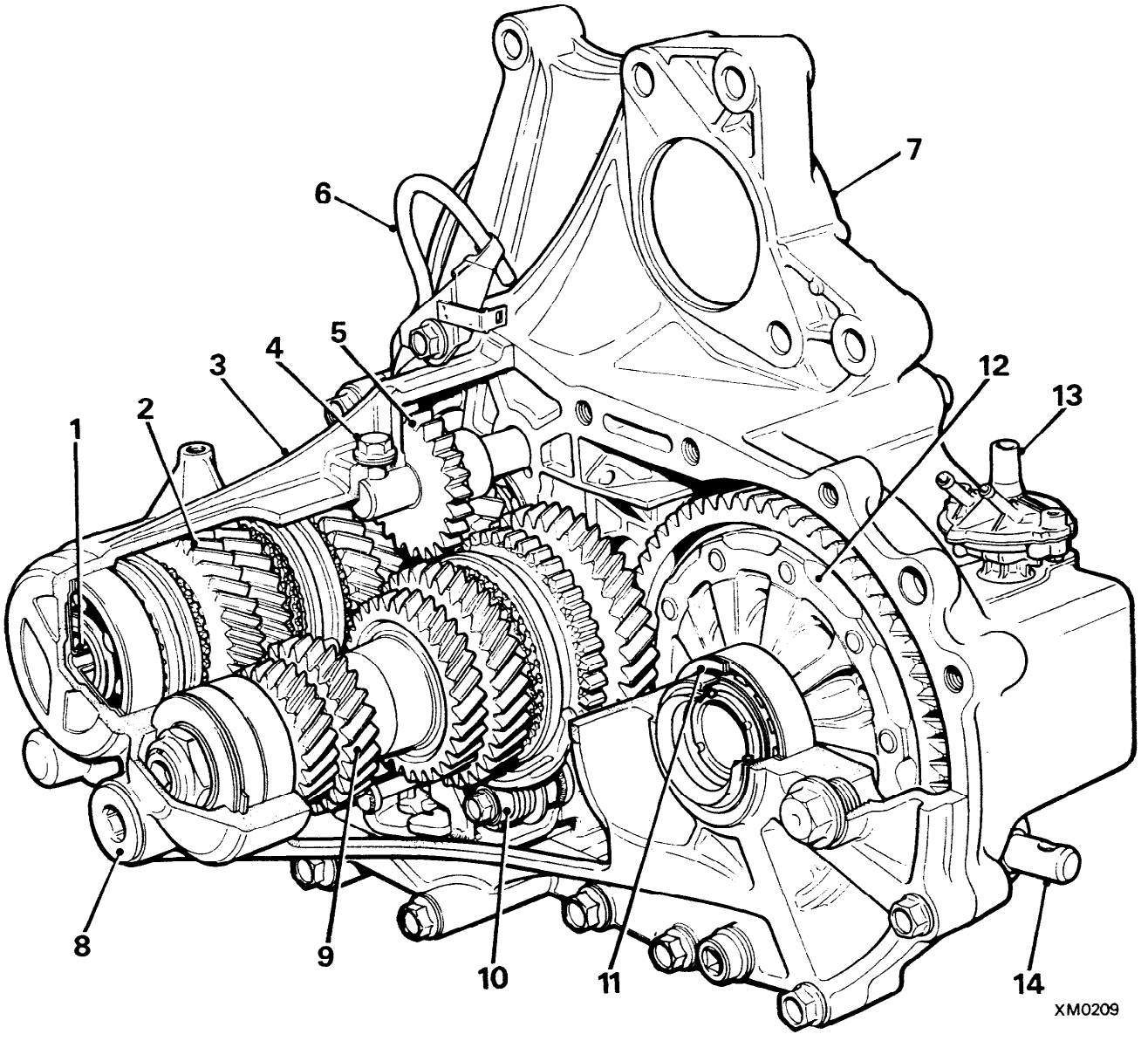
GEARBOX COMPONENTS - PG2 GEARBOX

1. Oil seal - differential
2. Differential housing
3. Speed sensor - instruments and power steering
4. Dowel
5. Oil seal - selector rod
6. Boot
7. Selector rod
8. Thrust washer - sun gear
9. Sun gear
10. Thrust washer - planet pinion
11. Planet pinion
12. Pinion shaft
13. Taper roller bearing - differential
14. Final drive gear
15. Roll pin - differential pinion shaft
16. Differential casing
17. Taper roller bearing - differential
18. Selective shim - differential pre-load
19. Boot
20. Clutch release arm and damper
21. Pivot - clutch release arm
22. Selector rod guide
23. Dowel bolt and washer
24. Magnet
25. Detent cap bolt, ball and spring - selector rod
26. Retainer plate - countershaft bearing
27. Oil guide plate
28. Parallel roller bearing - countershaft
29. Countershaft
30. Selective thrust washer - 1st gear end float
31. Needle roller bearing - 1st gear
32. 1st gear
33. Synchro ring - 1st gear
34. Synchro spring
35. Synchro hub - 1st/2nd gear
36. Synchro sleeve - 1st/2nd gear
37. Synchro spring
38. Synchro ring - 2nd gear
39. Selective collar - 2nd gear end float
40. Needle roller bearing - 2nd gear
41. 2nd gear
42. 3rd gear
43. 4th gear
44. 5th gear
45. Roller bearing - countershaft
46. Ball bearing - countershaft
47. Washer
48. Countershaft nut - L.H. thread
49. Circlip
50. Reverse idler shaft
51. Thrust washer - reverse idler gear
52. Roll pin - reverse idler shaft
53. Reverse idler gear
54. Reverse fork
55. Oil seal - mainshaft
56. Belville washer - mainshaft end thrust
57. Ball bearing - mainshaft
58. Mainshaft
59. Needle roller bearing - 3rd gear
60. 3rd gear
61. Synchro ring - 3rd gear
62. Synchro spring
63. Synchro hub - 3rd/4th gears
64. Synchro sleeve - 3rd/4th gears
65. Synchro spring
66. Synchro ring - 4th gear
67. 4th gear
68. Needle bearing - 4th gear
69. Distance collar - 4th/5th gears
70. Needle bearing - 5th gear
71. 5th gear
72. Synchro ring
73. Synchro spring
74. Synchro hub - 5th gear
75. Synchro sleeve - 5th gear
76. Ball bearing - mainshaft
77. Selective snap rings - mainshaft end thrust
78. Oil guide plate
79. Gearbox casing
80. Lifting eye
81. Reverse idler shaft bolt and washer
82. Breather pipe
83. Breather pipe bracket
84. Reverse light switch harness bracket
85. Oil seal - differential
86. Filler/level plug
87. Drain plug
88. Access plug - countershaft bearing circlip
89. Reverse light switch
90. Shift arm assembly
91. Interlock
92. Shift arm guide
93. Shift shaft
94. Roll pin - 5th/reverse gear selector
95. Gear selector - 5th/reverse gears
96. Selector fork - 3rd/4th gears
97. Selector fork - 5th gear
98. Selector shaft - 5th/reverse gears
99. Selector fork - 1st/2nd gears
100. Selector shaft - 1st/2nd gears



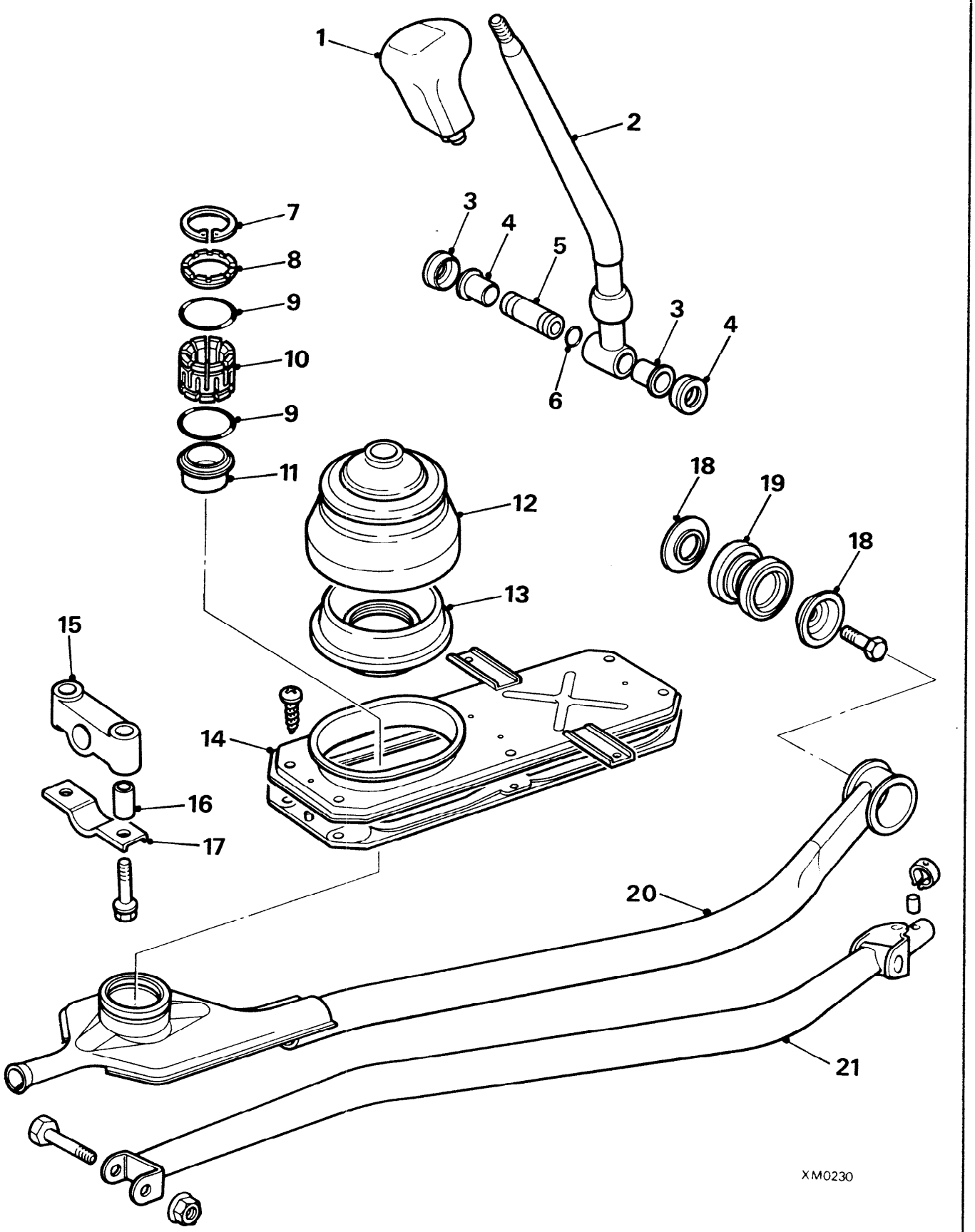
CUTAWAY VIEW OF GEARBOX - PG1 GEARBOX

1. Oil guide plate
2. Mainshaft assembly
3. Gearbox case
4. Reverse idler shaft bolt
5. Reverse idler gear
6. Breather pipe and bracket
7. Differential housing
8. Access plug - countershaft bearing circlip
9. Countershaft assembly
10. Shift arm assembly and interlock
11. Selective shims
12. Differential assembly
13. Speed sensor - instruments
14. Selector rod



CUTAWAY VIEW OF GEARBOX - PG2 GEARBOX

1. Oil guide plate
2. Mainshaft assembly
3. Gearbox case
4. Reverse idler shaft bolt
5. Reverse idler gear
6. Breather pipe and bracket
7. Differential housing
8. Access plug - countershaft bearing circlip
9. Countershaft assembly
10. Shift arm assembly and interlock
11. Selective shims - differential pre-load
12. Differential assembly
13. Speed sensor - instruments and power steering
14. Selector rod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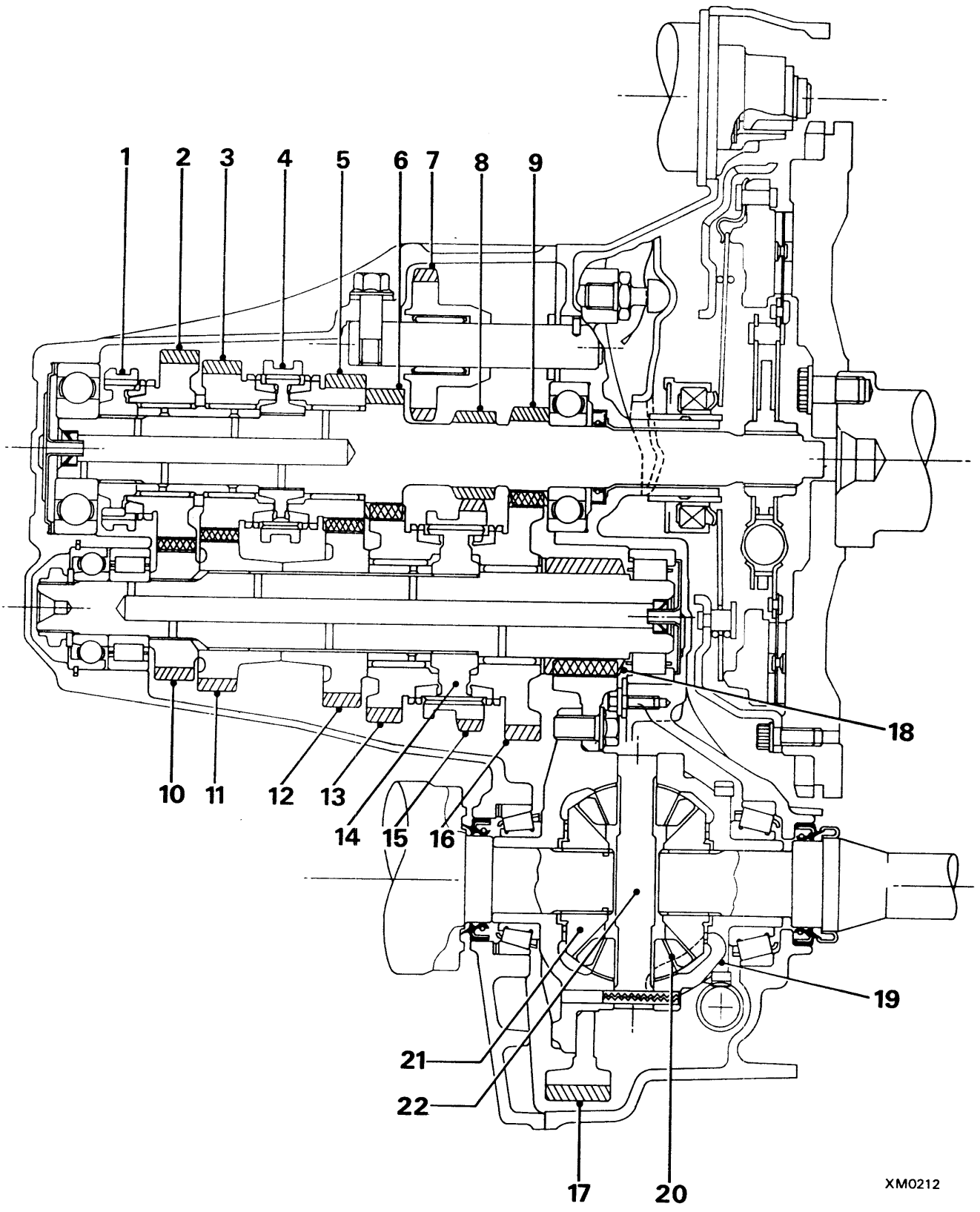
GEAR LINKAGE COMPONENTS - PG2 UNIT ILLUSTRATED

1. Gear lever knob
2. Gear lever
3. Sealing washer
4. Bush
5. Spacer
6. O ring
7. Circlip
8. Retaining ring
9. O ring
10. Gear lever seat
11. Dust cover
12. Gear lever boot
13. Dust cover
14. Retainer plate
15. Mounting rubber
16. Collar
17. Bracket
18. Washer
19. Bush
20. Steady rod
21. Selector rod



CROSS SECTION OF GEARBOX - PG2 ILLUSTRATED

OPERATION

Two types of manual gearbox are fitted to the Rover 800 range, type PG1 which is fitted to 2.0 engine models and type PG2 which is fitted to V6 engine models. Both types are 5 speed constant mesh gearboxes employing helical tooth gears and are fitted transversely in the vehicle.

The gearbox comprises two housings, the differential housing and the gearbox casing. The gearbox casing houses the mainshaft and countershaft.

1st, 2nd and reverse gears are integral with the mainshaft which also carries 3rd, 4th and 5th gears running on caged needle roller bearings. Mainshaft end thrust is adjusted by selective shims and a Belville washer located behind the bearing in the gearbox casing on the PG1 type gearbox. On the PG2 type gearbox, the selective shims are still located behind the bearing in the gearbox casing but the Belville washer is located at the opposite end of the mainshaft between the bearing and the 1st gear.

The countershaft carries 1st and 2nd gears on caged needle roller bearings with 3rd, 4th and 5th gears on splines. Reverse gear is integral with the synchromesh sleeve for 1st and 2nd gear. The reverse idler runs on a caged needle roller bearing on the idler shaft with a thrust washer fitted below it.

When the driver selects a gear, movement of the gear lever is transmitted to the selector rod located transversely in the differential housing and connected to a guide. This guide engages with the shift arm and interlock assembly which imparts movement to the required selector fork. The interlock mechanism prevents direct engagement of reverse gear from the 5th speed position.

Drive train

Mainshaft 1st gear (9) is integral with the shaft, the 1st/2nd selector fork pushes the 1st/2nd synchro sleeve (14) along its splines towards the countershaft 1st gear (16), the synchro ring synchronises the speed of the countershaft and the gear and the sleeve engages the splines on 1st gear locking the gear to the countershaft. This provides the drive train from mainshaft to countershaft. The final drive pinion (18) is integral with the countershaft and transmits torque to the final drive gear (17).

The remaining forward gears are engaged in a similar manner to 1st. In 2nd gear, mainshaft 2nd gear (6) is integral with the shaft and synchro sleeve (14) locks 2nd gear (13) to the countershaft.

In 3rd gear, 3rd/4th synchro sleeve (4) locks the 3rd gear (5) to the mainshaft. Countershaft 3rd gear (12) is splined to the shaft.

In 4th gear, 3rd/4th synchro sleeve (4) locks the 4th gear (3) to the mainshaft. Countershaft 4th gear (11) is splined to the shaft.

In 5th gear, 5th synchro(1) locks 5th gear (2) to the mainshaft. Countershaft 5th gear (10) is splined to the shaft.

In reverse gear, mainshaft reverse gear (8) is integral with the shaft, countershaft reverse gear (15) is integral with 1st/2nd synchro sleeve (14) and so is splined to the countershaft. The reverse fork pushes the reverse idler into engagement with the gears on the mainshaft and countershaft.

Differential

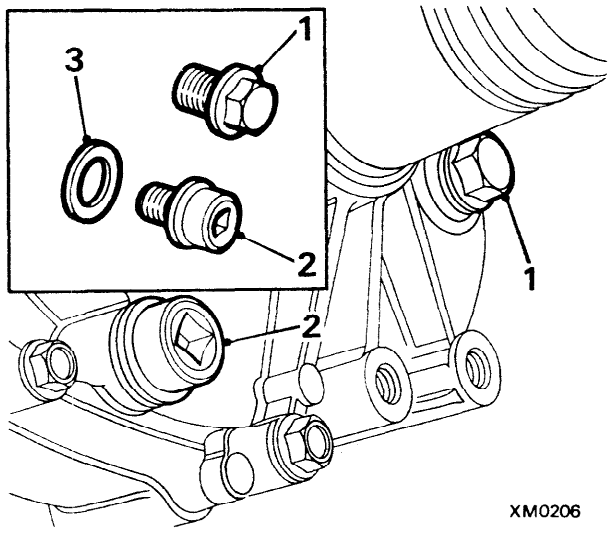
Power from the gearbox is transmitted to the final drive gear (17) which is bolted to the differential casing (19). Incorporated in this casing are the planet pinions (20) and sun gears (21) which are in constant mesh and comprise the differential assembly.

The sun gears are splined to the drive shafts and, when the vehicle is moving in a straight line the resistance to movement of both sun gears is equal. The differential transmits the drive through the pinion pin (22), forcing the differential casing to rotate as an assembly leaving the planet pinions and sun gears stationary.

When the vehicle is cornering, the inner road wheel will slow down, increasing the resistance to movement of the inner sun gear this causes the planet pinions to rotate on their own axis which in turn increases the speed of the outer sun gear thus increasing the speed of the outer road wheel.

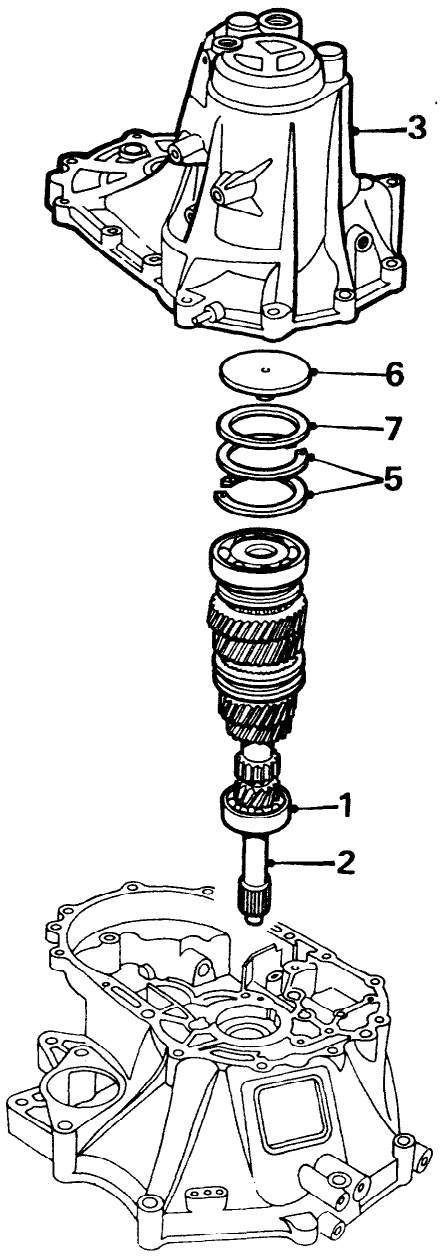
Lubrication

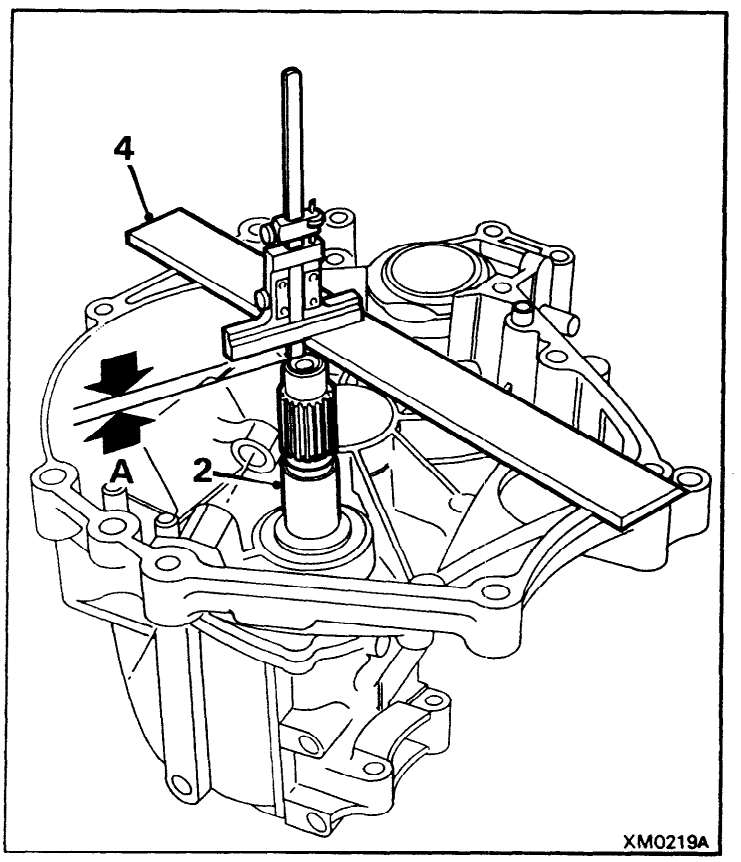
Lubrication is by splash. A trough located above the gear trains collects splashed oil which spills to the countershaft differential housing bearing and to the mainshaft gearbox casing bearing where, by means of oil guide plates, it is directed into drillings in the respective shafts to lubricate the needle bearings in the gears.



GEARBOX - DRAIN AND REFILL

Action	Ref.	Detail	Special Instructions
Drive		vehicle	Until gearbox is warm
Position		drain tray	
Remove	1.	filler/level plug ← gearbox	
"	2.	drain plug ← gearbox	⚠ ***CAUTION:*** *Gearbox oil can be very hot*
Drain		oil ← gearbox	
Remove	3.	washer ← drain plug	
Clean		drain plug	
Fit		new washer → drain plug	
"		drain plug → gearbox	40 Nm
Inject		oil → filler/level hole	See **Information, lubricants**
			Until oil runs from hole
Fit		filler/level plug → gearbox	45 Nm





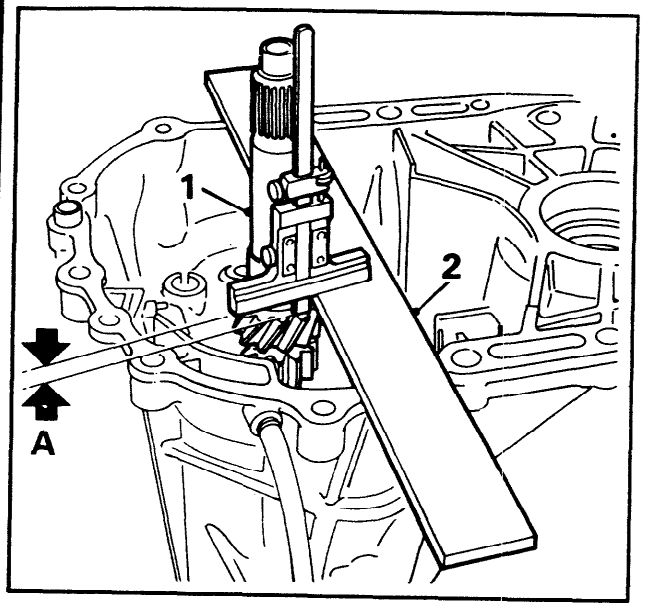
MAINSHAFT END THRUST - PG1 GEARBOX

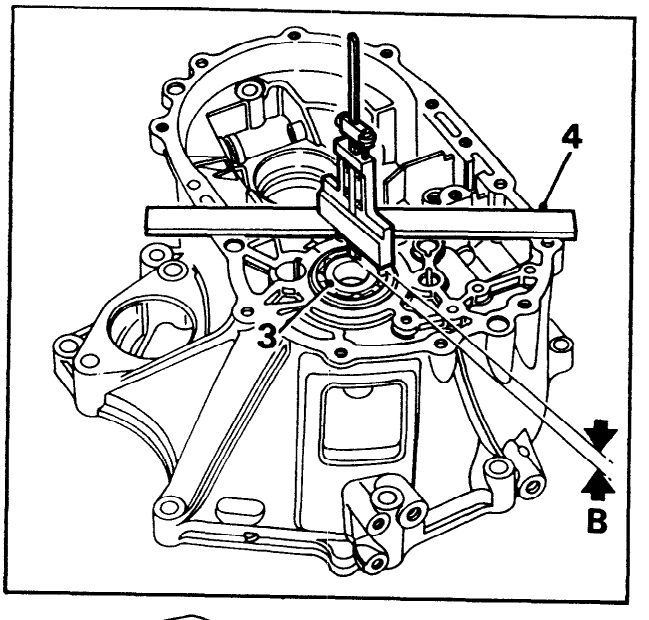
Action	Ref.	Detail	Special Instructions
Fit	1.	bearing → differential housing	Leave out oil seal
"	2.	mainshaft → differential housing	
Secure	3.	gearbox case → differential housing	Use several evenly spaced bolts
Position		assembly	Differential housing uppermost
"	4.	straight edge → differential housing	
Measure		clearance	Between straight edge and centre of mainshaft **A**
Tap		mainshaft	Gently downwards fully into gearbox case
Measure		clearance	Between straight edge and centre of mainshaft again

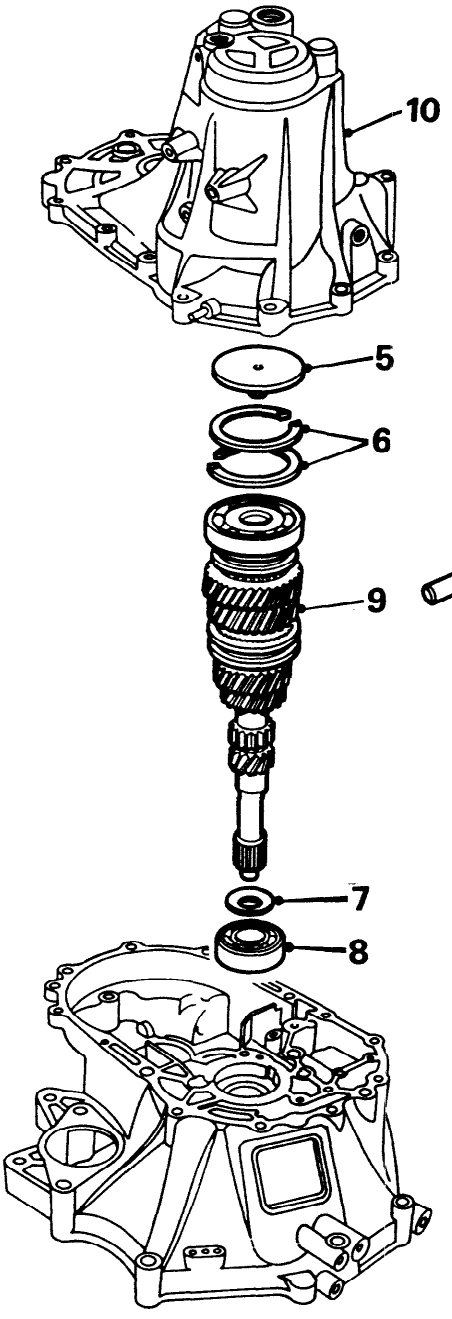
Subtract	first reading ← second reading	Call dimension **X**
Measure	belville washer thickness	Add 0.17 mm, 0.693 in for end thrust. Call dimension **Y**
Subtract	dimension **Y** ← dimension **X**	Value obtained = snap ring thickness required Example: **X** = 2.5 mm **Y** = 0.97 mm – – – – 1.53 mm Snap ring thickness required = 1.53 mm
Select	**5.** snap rings	One or at most two to achieve thickness in calculation or as close as possible End thrust must be 0.14 – 0.21 mm, 0.005 – 0.008 in Snap rings available: From 0.50 mm to 1.15 mm, 0.020 in to 0.045 in in steps of 0.05 mm, 0.002 in
Fit	**6.** oil guide plate → gearbox case	
"	**7.** belville washer → gearbox case	Dished face downwards
"	selected snap rings → gearbox case	
Reassemble	components	
Fit	selector forks and interlock assembly	
"	gearbox case	
"	gearbox → vehicle	

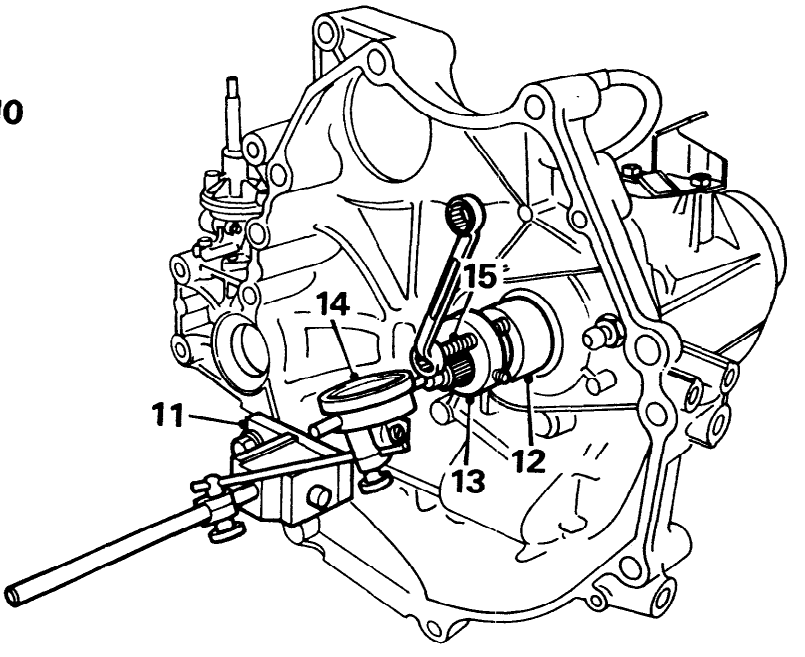
MANUAL GEARBOX

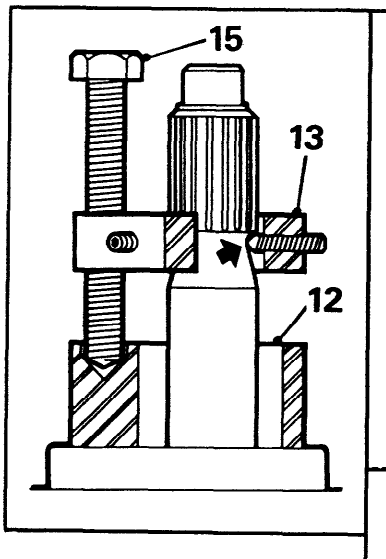
ADJUSTMENTS

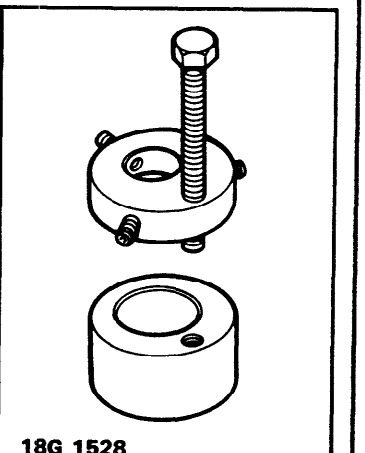


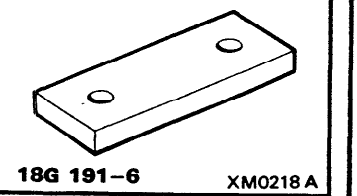










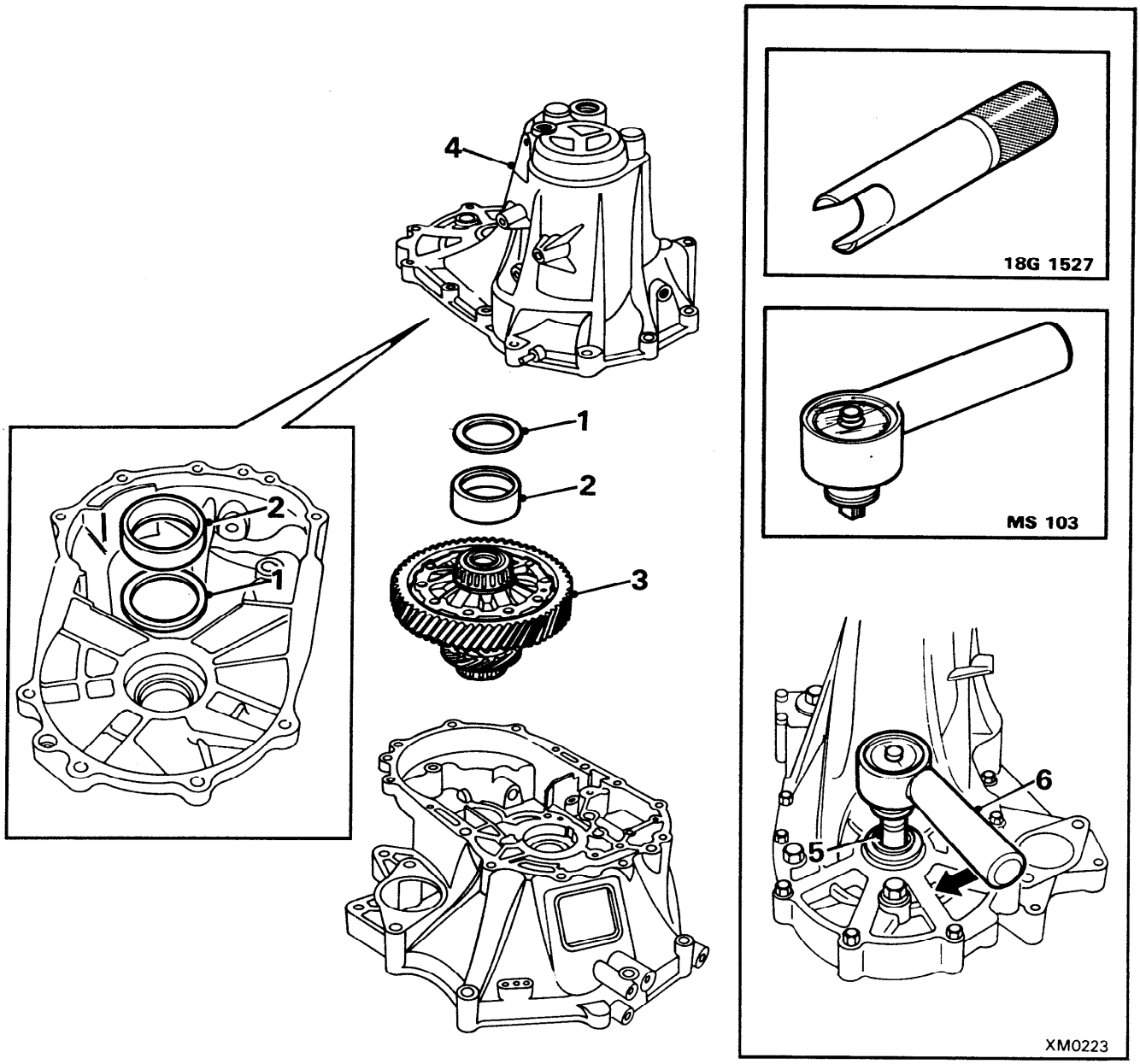


MAINSHAFT END THRUST - PG2 GEARBOX

Action	Ref.	Detail	Special Instructions
Fit	1.	mainshaft → gearbox case	
Position	2.	straight edge → gearbox case	
Measure		clearance	**A** mainshaft to straight edge using depth gauge. Take measurement with straight edge in two other positions. ⚠ ***Note:*** *Subtract thickness of straight edge from readings*
Calculate		average of three readings	
Remove		differential ← differential housing	
Fit	3.	bearing → differential housing	
Position	4.	straight edge → differential housing	
Measure		clearance	**B** inner race to straight edge using depth gauge. Take measurement with straight edge in two other positions. ⚠ ***Note:*** *Subtract thickness of straight edge from readings*
Calculate		average of three readings	
Select		snap rings	Calculation **A** - **B** - 0.98 mm = snap ring thickness required 0.98 mm = mid point of flex on belville washer Example: **A** = 5.01 2.79 **B** = 2.22 0.98 2.79 1.81 Snap ring thickness required = 1.81 mm Select one or at most two snap rings to achieve thickness in calculation or as close as possible ℹ Snap rings available: From 0.50 mm to 1.15 mm, 0.020 to 0.045 in in steps of 0.05 mm, 0.002 in e.g. 0.85 + 0.95 mm = 1.80 mm
Fit	5.	oil guide plate → gearbox case	
"	6.	snap rings → gearbox case	
"	7.	belville washer → mainshaft	Dished face away from 1st gear
"	8.	bearing → mainshaft	
	9.	mainshaft → differential housing	
"	10.	gearbox casing → differential housing	
"		bolts → differential housing	6 45 Nm
Tap		end of mainshaft	Gently using a soft hammer
Fit	11.	adaptor plate → differential housing	18G 191 - 6
Slide	12.	collar → mainshaft	Part of 18G 1528
Fit	13.	shaft holder → mainshaft	Part of 18G 1528 Align three Allen screws with groove behind splines and tighten evenly ⚠ ***CAUTION:*** *Do not tighten Allen screws against splines*
Position	14.	dial gauge → adaptor plate	
"		plunger → end of mainshaft	With slight pre - load
Secure		dial gauge	
Zero		dial gauge	

Continued....

Turn	**15.** bolt	Clockwise and note the reading on the dial gauge ⚠ ***CAUTION:*** *Do not turn the bolt more than 60 ° once gauge pointer stops moving. DO NOT overtighten bolt* ℹ Reading must be 0.14 – 0.21 mm, 0.0055 – 0.0088 in OK, reassemble components Outside limits, re-calculate snap ring thickness
Reassemble	components	
Fit	selector forks and interlock assembly	
"	gearbox case	
"	gearbox → vehicle	

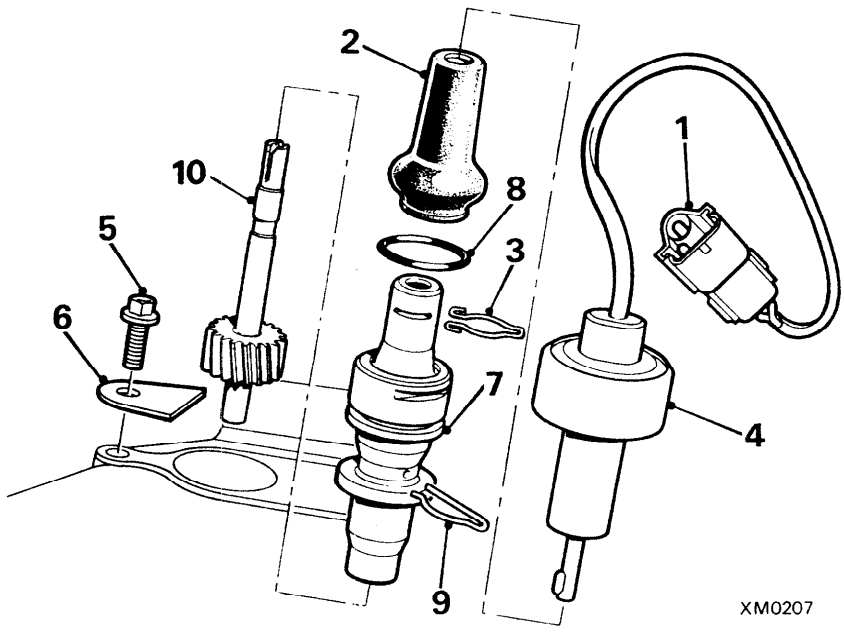


DIFFERENTIAL BEARING PRE-LOAD - PG2 GEARBOX

Action	Ref.	Detail	Special Instructions
Fit	1.	shim → gearbox case	Use standard size 2.15 mm, 0.085 in as starting point for adjustment ⚠ ***CAUTION:*** *Do not use more than one shim*
"	2.	bearing outer track → case	Ensure track is square and there is no clearance between track, shim and case
"		bearing outer track → housing	
Position	3.	differential → differential housing	
Fit	4.	gearbox case → differential housing	Do not fit mainshaft and countershaft
Tighten		bolts → differential housing	10 off, 🅓 45 Nm
Rotate		differential	Several times to seat bearings
Position	5.	adaptor → pinion pin	🅔 18G 1527, slot in adaptor fits over pinion pin

Continued . . .

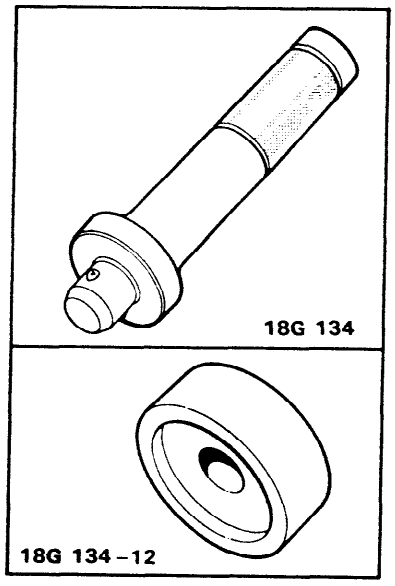
Fit	6. torque gauge → adaptor	MS 103
Turn	differential	Using MS 103, note torque required to turn differential on its bearings Pre-load = 1.4 - 2.0 Nm Reading OK reassemble gearbox Reading below limit, select thicker shim Each increase in shim size will increase pre-load by 0.4 Nm e.g. If reading obtained was 0.8 Nm below maximum pre-load, fit shim two sizes above 2.15 mm e.g. 2.25 mm, 0.088 in Reading above limit, select thinner shim Each decrease in shim size will decrease pre-load by 0.4 Nm e.g. If reading obtained was 0.4 Nm above maximum pre-load, fit shim one size below 2.15 mm e.g. 2.10 mm, 0.083 in shims available 1.90 mm (0.075 in) - 2.47 mm (0.097 in) In steps of 0.03 mm, 0.001 in
Fit	selected shim → gearbox case	
Reassemble	components	
Fit	mainshaft and countershaft	
"	selector forks and interlock assembly	
"	gearbox case	
"	gearbox → vehicle	

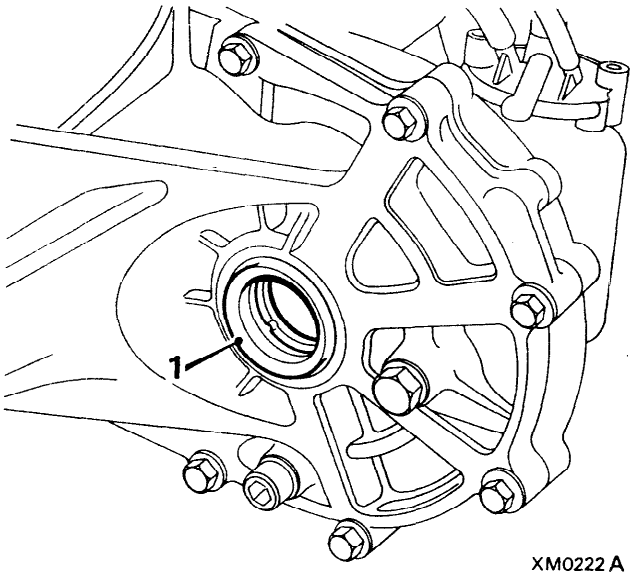


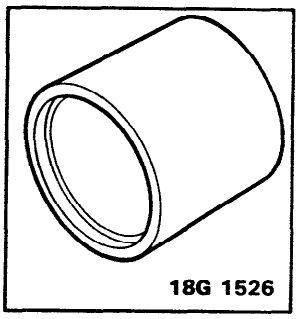
SPEEDOMETER PINION - PG1 GEARBOX - RENEW

For information on speedometer pinion fitted to PG2 gearbox, see **Steering**

Action	Ref.	Detail	Special Instructions
Disconnect	**1.**	multiplug ← harness	
Slide	**2.**	boot	Upwards to gain access to clip
Remove	**3.**	clip ← transducer	
"	**4.**	transducer ← drive housing	
"	**5.**	bolt ← retainer plate	11 Nm
Collect	**6.**	retainer plate ← drive housing	
Remove	**7.**	drive housing ← gearbox	
"	**8.**	O rings ← drive housing	
"	**9.**	clip ← drive housing	
Withdraw	**10.**	pinion ← drive housing	
Inspect		components	Renew if worn or damaged
Lubricate		components	Use gearbox oil
Reassemble		components	

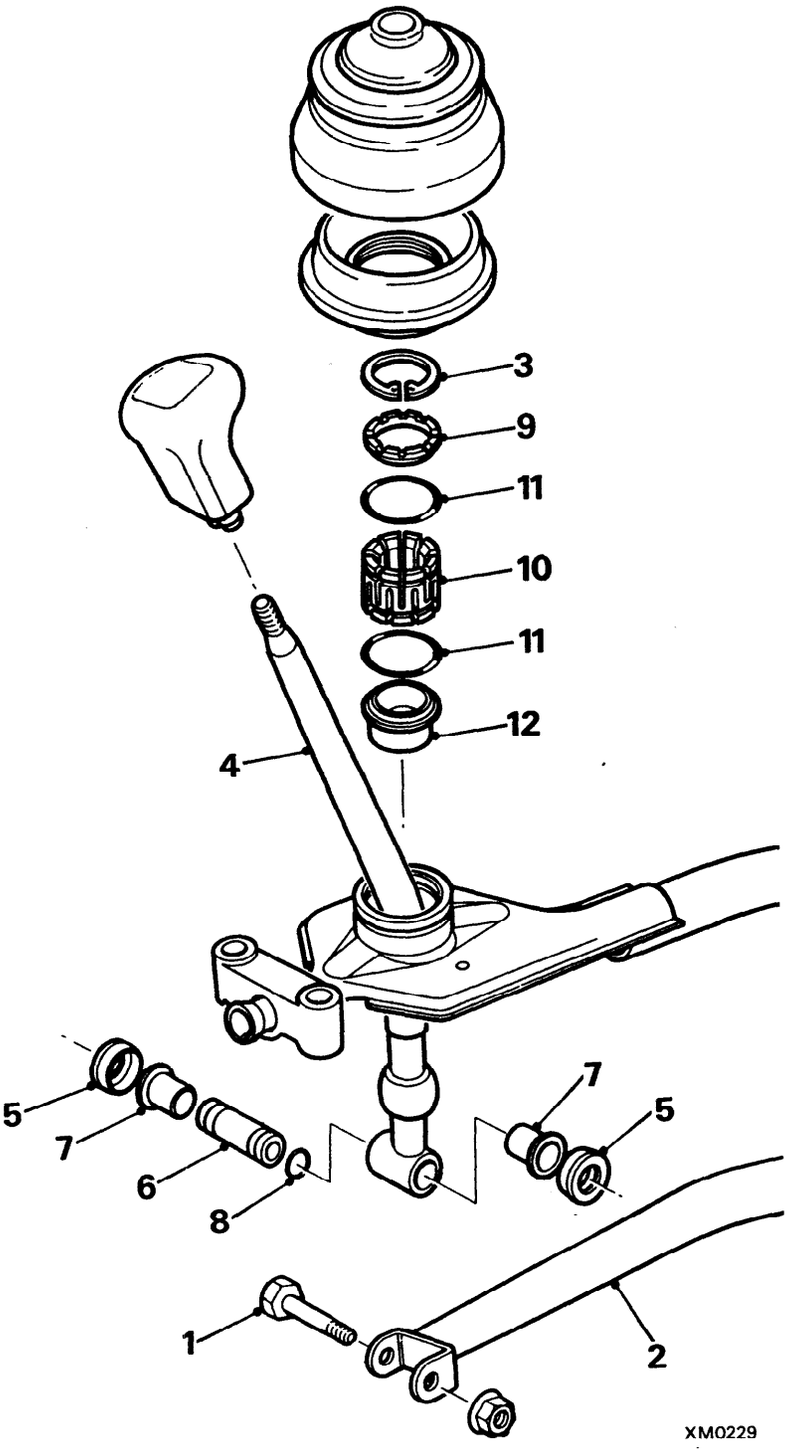






DIFFERENTIAL OIL SEAL - RENEW

Action	Ref.	Detail	Special Instructions
Drain		oil ← gearbox	See **Adjustments**
Release		driveshaft ← gearbox	Appropriate side. See **Drive shafts**
Lever		seal ← differential housing	
Clean		seal location	
Drift	1.	new seal → differential housing	Ensure sealing lip faces inwards Use 18G 134, 18G 134-12 on PG1 gearbox Use 18G 1526 on PG2 gearbox
Reassemble		components	
Fill		gearbox with oil	See **Adjustments**

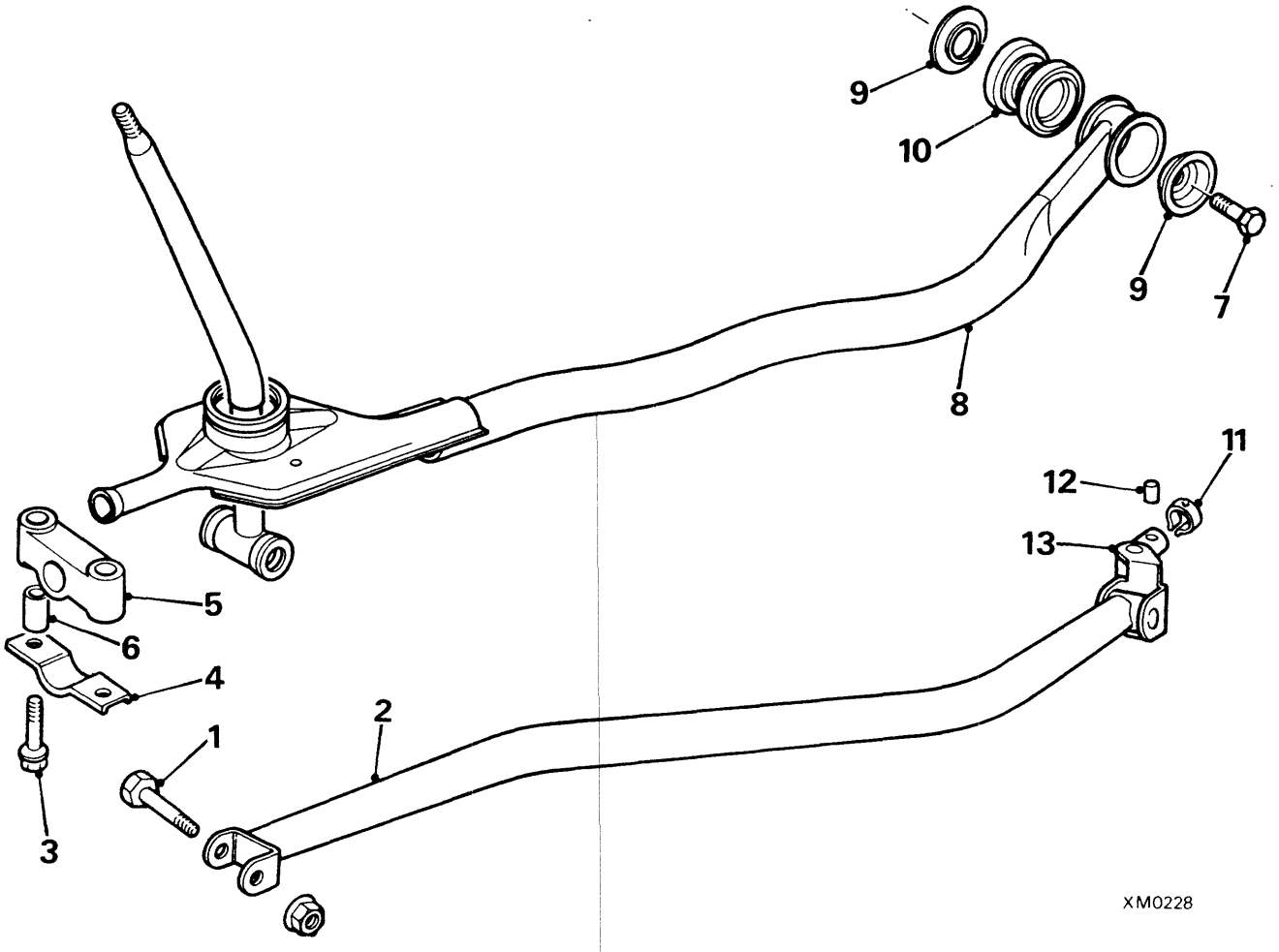


GEAR LEVER RENEW

Action	Ref.	Detail	Special Instructions
Remove		centre console ← vehicle	See **Body**
Raise		vehicle	Use 4 post lift
Remove		heat shield ← front pipe	See **Manifolds & Exhaust**
"	1.	bolt ← selector rod	Collect nut 6 22 Nm
Disconnect	2.	selector rod ← gear lever	
Remove	3.	circlip ← gear lever	
"	4.	gear lever	
"	5.	sealing washers ← gear lever	2 off 5
"	6.	spacer assembly ← gear lever	
"	7.	bushes ← gear lever	

Continued . . .

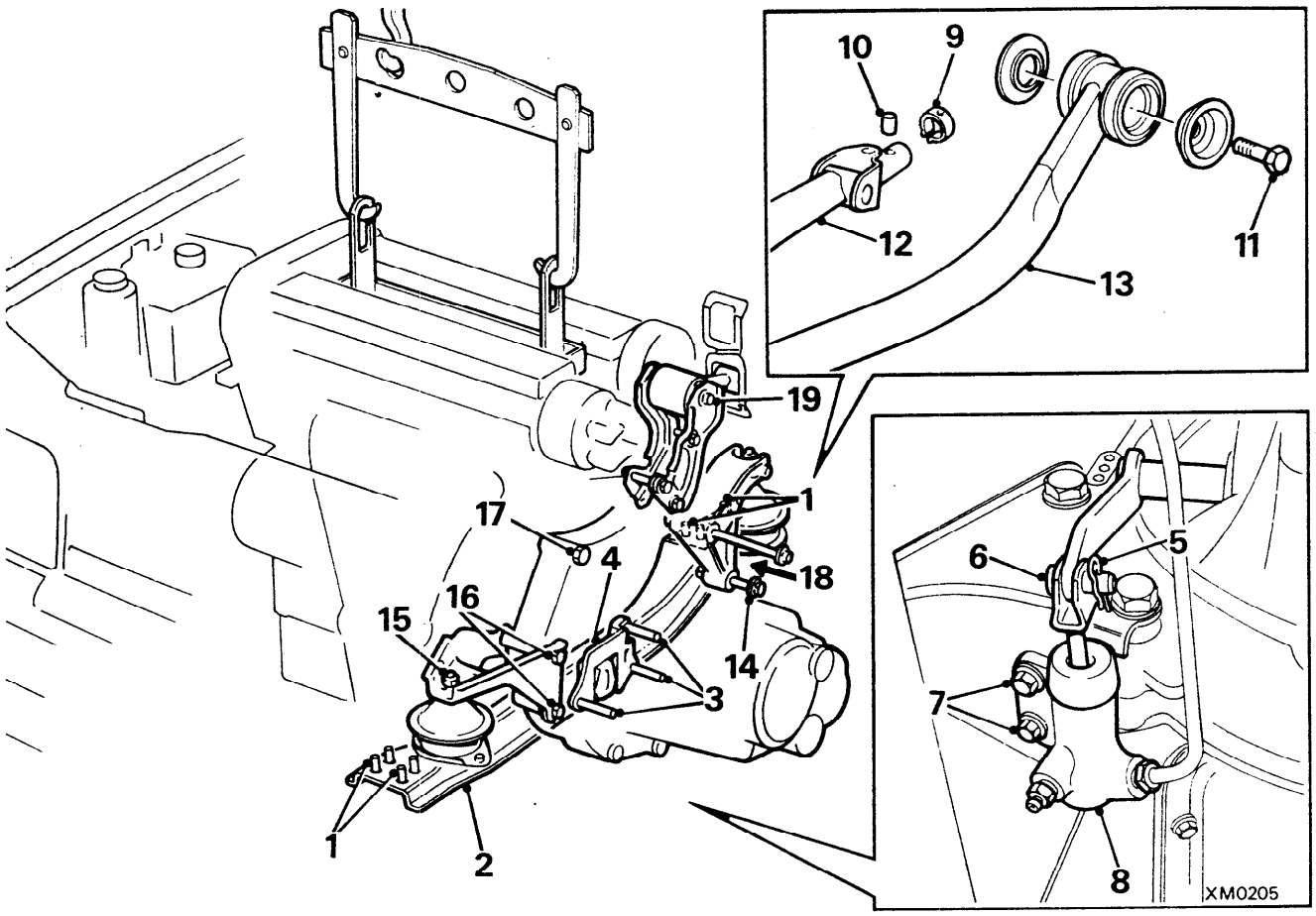
Remove	**8.** O rings ← spacer	4 off
"	**9.** retaining ring ← gear lever	
"	**10.** seat ← gear lever	
"	**11.** O rings ← seat	
"	**12.** dust cover ← gear lever	
Clean	components	
Inspect	components	Renew as necessary
Reassemble	components	



GEAR LINKAGE AND BUSHES - RENEW

Action	Ref.	Detail	Special Instructions
Raise		vehicle	Use 4 post lift
Remove		heat shield ← vehicle	See **Manifolds & Exhaust**
"	**1.**	bolt ← selector rod	Collect nut 22 Nm
Disconnect	**2.**	selector rod ← gear lever	
Remove	**3.**	bolts ← floor	2 off 22 Nm
"	**4.**	bracket	
"	**5.**	mounting rubber ← steady rod	
"	**6.**	collars ← mounting rubber	2 off
"	**7.**	bolt ← steady rod	
Disconnect	**8.**	steady rod ← gearbox	
Remove	**9.**	washers ← steady rod	
"	**10.**	bush ← steady rod	
"	**11.**	clip ← selector rod	

Remove	**12.**	roll pin ← selector rod	
Disconnect	**13.**	selector rod ← gearbox	
Clean		components	
Inspect		components	Renew as necessary
Reassemble		components	



GEARBOX - PG1 - RENEW

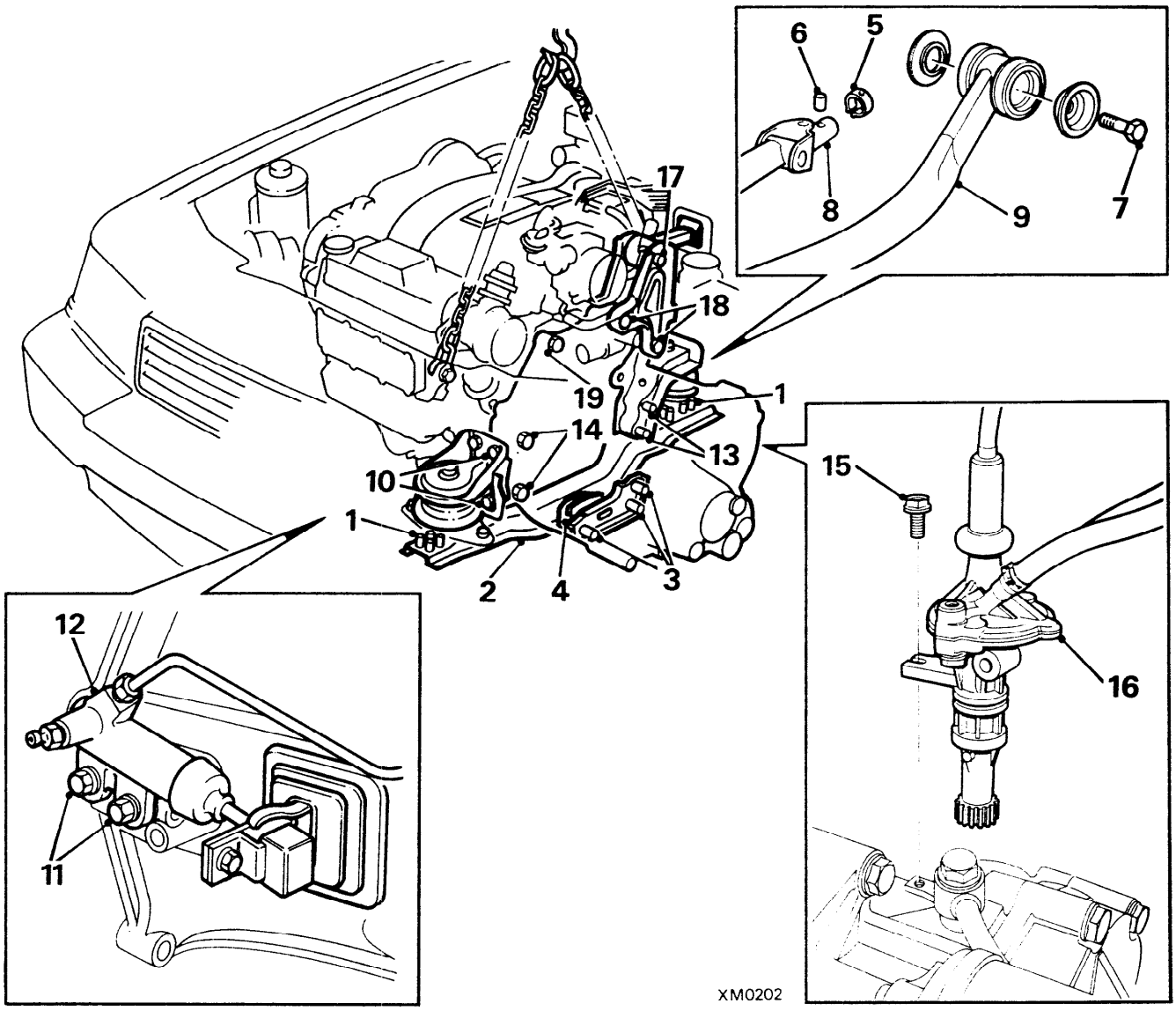
Action	Ref.	Detail	Special Instructions
Remove		air cleaner	See **Fuel 2.7**
Raise		front of vehicle	⚠ ***WARNING: Support on safety stands***
Remove		front wheels ← drive flanges	8 nuts 🔲 72 Nm
Drain		oil ← gearbox	Refit drain plug 🔲 40 Nm
Remove		clips ← bonnet struts	2 off
Release		bonnet ← struts	
Tie back		bonnet	
Remove		panel ← L.H. inner wing	2 self tapping screws
"		spark plug cover ← engine	2 bolts 🔲 6 Nm
Disconnect		leads ← spark plugs	4 off, move aside
Support		engine	Use 🔧 18G 1522, 600963 and lifting chains
Remove		starter motor	See **Electrical**
Move		crankshaft sensor bracket aside	
Disconnect		leads ← reverse light switch	
Disconnect		conector ← speed sensor	

Continued . . .

MANUAL GEARBOX

REPAIRS

Remove	1. bolts ← longitudinal beam	8 off 45 Nm
"	2. longitudinal beam	
"	3. bolts ← lower snubber bracket	3 off 45 Nm
"	4. lower snubber bracket ← gearbox	
"	5. R clip ← clevis pin	
"	6. clevis pin ← clutch release arm	
"	7. bolts ← clutch slave cylinder	2 off 22 Nm
Move	8. clutch slave cylinder	Aside
Remove	9. clip ← roll pin	
"	10. roll pin ← selector rod	
"	11. bolt ← steady rod	25 Nm, collect two washers
Disconnect	12. selector rod ← shaft	
"	13. steady rod ← gearbox	
Remove	14. bolt ← rear mounting	40 Nm
"	15. nut ← front mounting	
Raise	engine	To clear mounting bracket
Remove	16. bolts ← engine mounting bracket	2 off 40 Nm
Release	both driveshafts ← gearbox	See **Drive Shafts**
Remove	L.H. tie rod	See **Front Suspension**
Disconnect	earth lead ← gearbox	
Remove	17. bolt ← gearbox	75 Nm
"	18. bolt ← gearbox	45 Nm
"	19. bolt ← rear tie rod	75 Nm
Lower	engine	
Position	jack	To support gearbox
Release	gearbox ← dowels	
Lower	jack	
Manoeuvre	gearbox ← vehicle	From below
Clean	mating surfaces	Engine and gearbox
Reassemble	components	
Fill	gearbox with oil	See **Adjustments**
Road Test	vehicle	

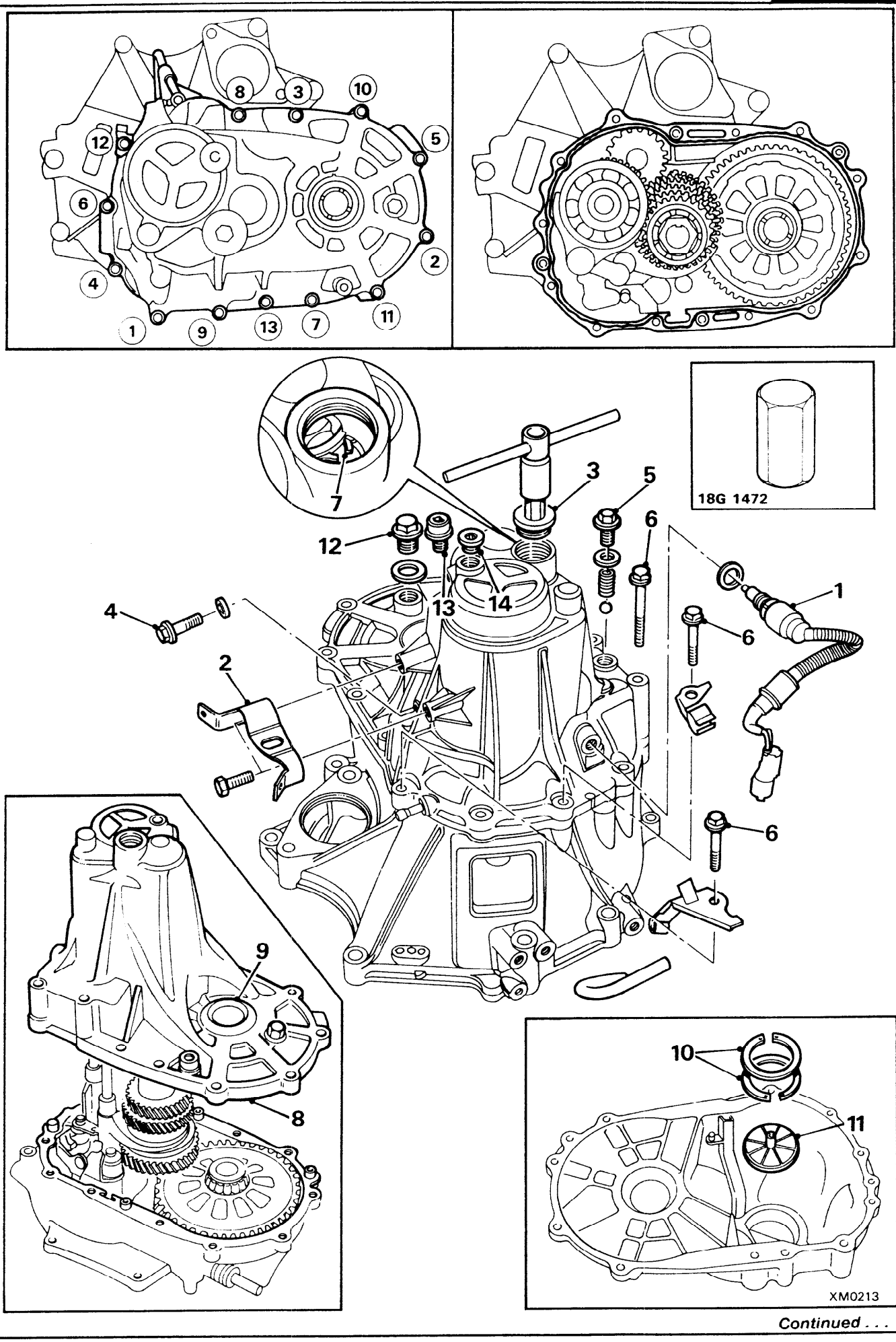


GEARBOX - PG2 - RENEW

Action	Ref.	Detail	Special Instructions
Remove		air cleaner	See **Fuel**
Raise		front of vehicle	⚠ ***WARNING: Support on safety stands***
Remove		L.H. front wheel ← drive flange	4 nuts 🔲 72 Nm
Drain		oil ← gearbox	
Remove		panel ← L.H. inner wing	2 self tapping screws
"		starter motor	See **Electrical**
"	1.	bolts ← longitudinal beam	8 off 🔲 45 Nm
"	2.	longitudinal beam	
"	3.	bolts ← lower snubber bracket	3 off 🔲 45 Nm
"	4.	lower snubber bracket ← gearbox	
"		cover ← engine	Flywheel access cover, located below engine
"	5.	clip ← roll pin	
"	6.	roll pin ← selector rod	
"	7.	bolt ← steady rod	🔲 25 Nm, collect two washers
Disconnect	8.	selector rod ← shaft	
"	9.	steady rod ← gearbox	
Position		jack below engine	

Continued . . .

Remove	**10.** bolts ← engine mounting bracket	2 off 🔧 40 Nm
"	**11.** bolts ← clutch slave cylinder	2 off 🔧 22 Nm
"	**12.** slave cylinder ← gearbox	
Move	slave cylinder	Aside
Remove	**13.** bolts ← rear mounting	2 off 🔧 40 Nm
"	bolt ← gearbox	🔧 45 Nm, located above R.H. drive shaft joint
Release	L.H. driveshaft ← gearbox	See **Drive Shafts**
"	reverse light multiplug ← bracket	
Disconnect	multiplug ← reverse light switch	
Remove	**14.** bolt ← gearbox	2 off 🔧 75 Nm
"	**15.** bolt ← speed sensor	🔧 10 Nm
Move	**16.** speed sensor	Aside
Plug	pinion orifice	To prevent dirt ingress
Remove	**17.** bolt ← tie rod	🔧 75 Nm, collect special nut
"	**18.** bolts ← tie rod brackets	2 off 🔧 40 Nm
"	tie rod brackets ← gearbox	2 off
Disconnect	earth lead ← gearbox	
Release	earth lead and harness	
Remove	**19.** bolt ← gearbox	🔧 75 Nm
Position	jack	To support gearbox
Release	gearbox ← dowels	
"	R.H. driveshaft ← gearbox	See **Drive Shafts**
Lower	jack	
Manoeuvre	gearbox ← vehicle	From below
Clean	mating surfaces	Engine and gearbox
Reassemble	components	
Fill	gearbox with oil	See **Adjustments**
Road Test	vehicle	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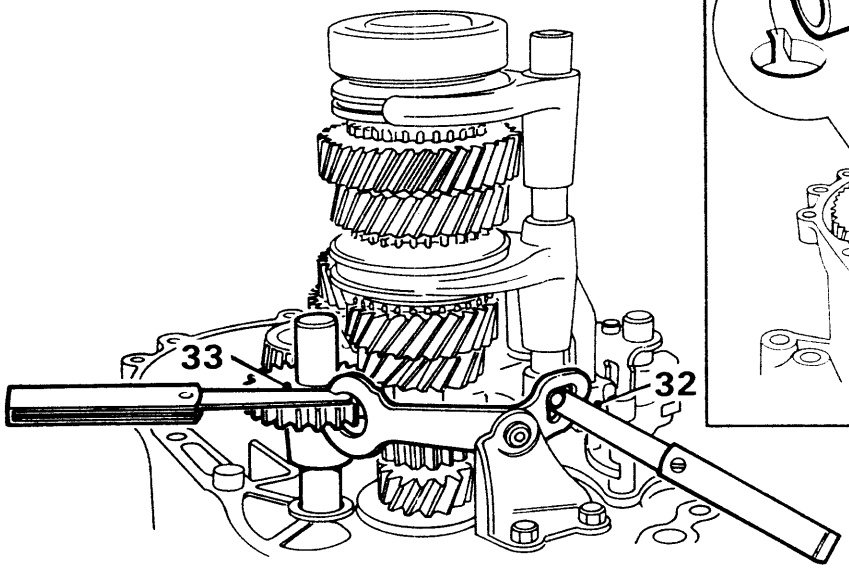
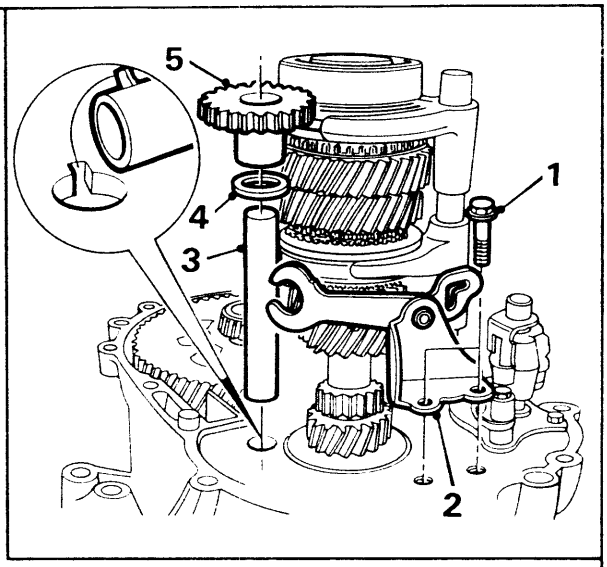
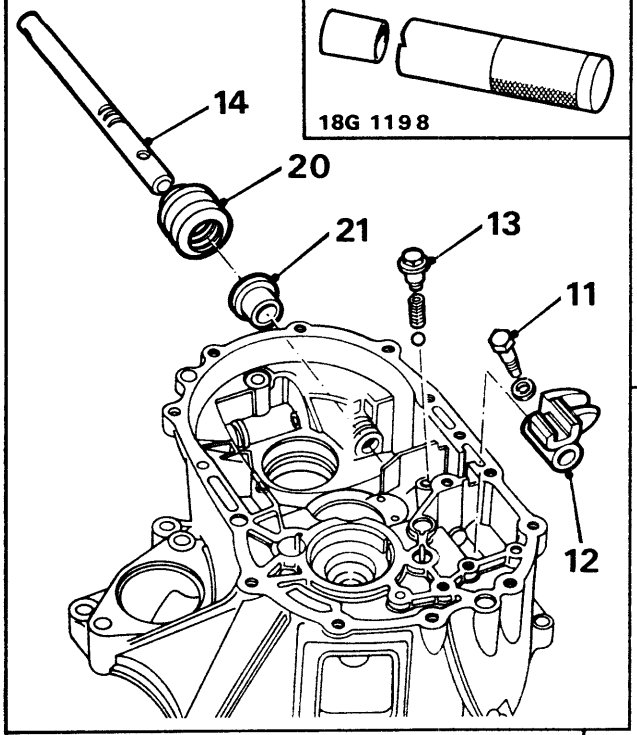
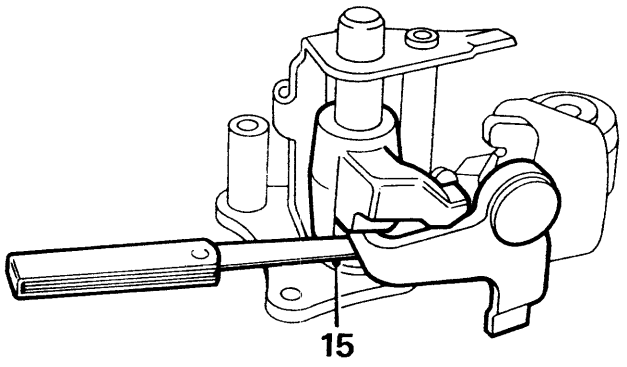
GEARBOX CASE - RENEW

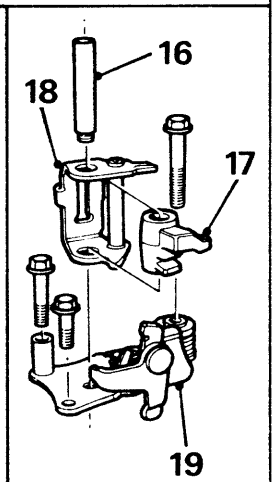
Action	Ref.	Detail	Special Instructions
Remove		gearbox ← vehicle	
"	**1.**	reverse light switch ← gearbox case	25 Nm
"	**2.**	lifting eye ← gearbox case	Two bolts 24 Nm PG2 gearbox only
"	**3.**	access plug ← gearbox case	Use 18G 1472 Apply thread sealer for reassembly, 70 Nm
"	**4.**	bolt ← gearbox case	Secures reverse idler shaft 70 Nm
"	**5.**	detent cap bolt ← gearbox case	33 Nm, extract spring and ball PG2 gearbox only
"	**6.**	bolts ← gearbox case	14 off 45 Nm Note position of breather and reverse light brackets and note bolt lengths
Release	**7.**	snap ring ← countershaft	Use circlip pliers
Tap	**8.**	gearbox case upwards	Use soft hammer
Remove		gearbox case ← differential housing	
Do not carry out further dismantling if component is removed for access only			
Drift	**9.**	seal ← gearbox case	
Transfer	**10.**	snap rings → new case	
"		belville washer → new case	PG1 gearbox only
"	**11.**	oil guide plate → new case	
"	**12.**	filler/level plug → new box case	45 Nm
"	**13.**	drain plug → new box case	40 Nm
"	**14.**	sealing plug → new case	30 Nm
"		bearing outer track → new case	
"		shim → gearbox case	PG2 gearbox only
"		circlip → gearbox case	PG1 gearbox only
Clean		all components	
Inspect		components	Renew as necessary
Adjust		mainshaft end thrust	See **Adjustments**
"		differential bearing pre - load	PG2 gearbox, see **Adjustments**
Check		differential bearing end - float	PG1 gearbox
Apply		RTV sealant → differential housing face	Thin continuous bead ⚠ ***CAUTION:*** *Allow 30 minutes for sealant to cure before filling with oil*
Lubricate		seals	With gearbox oil
Fit		differential seal	Use 18G 134, 18G 134 - 12 on PG1 gearbox Use 18G 1526 on PG2 gearbox
Reassemble		components	
Renew		sealing washers	
Tighten		bolts → gearbox case	Sequence illustrated
Check		mainshaft end thrust	PG2 gearbox only, see **Adjustments**
Fit		gearbox → vehicle	

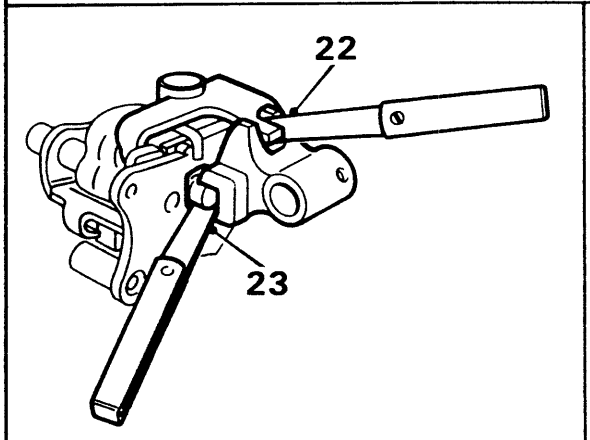


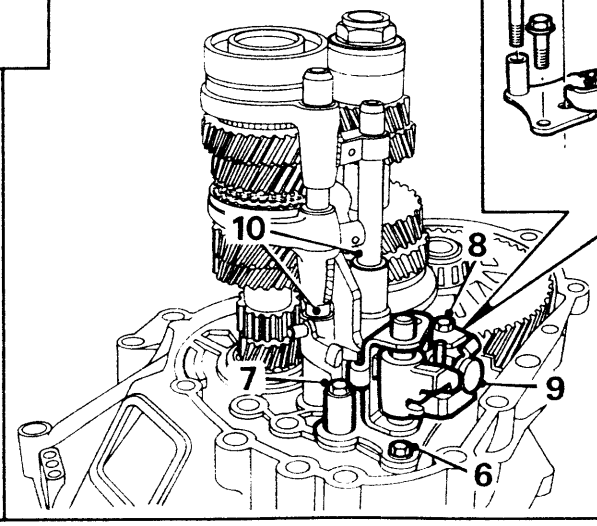












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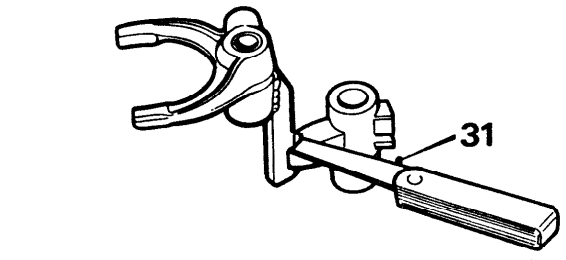
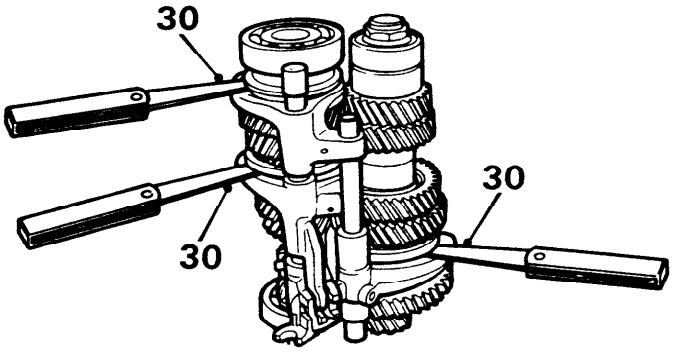
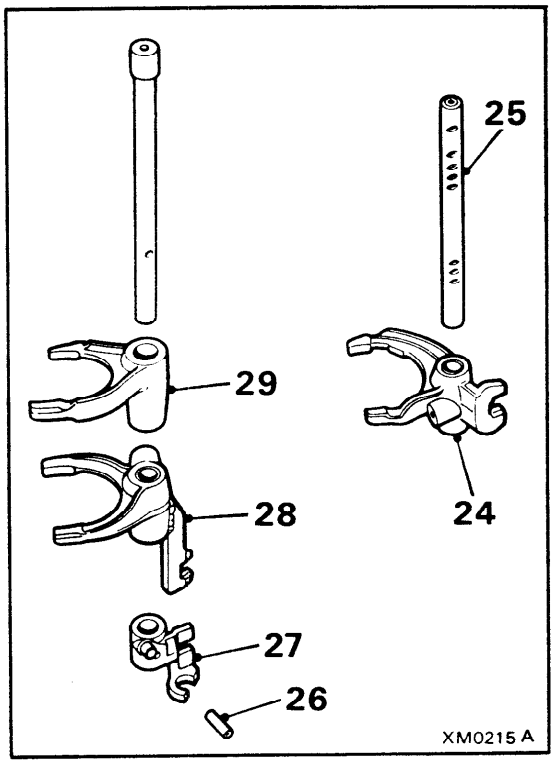
SELECTOR MECHANISM - RENEW

Action	Ref.	Detail	Special Instructions
Remove		gearbox ← vehicle	
"		gearbox case	
"	1.	bolts ← differential housing	2 off 6 15 Nm
"	2.	reverse fork	
"	3.	reverse idler shaft	Note roll pin which ensures shaft can only be fitted one way
"	4.	thrust washer ← shaft	
"	5.	gear ← shaft	
"	6.	dowel bolt ← differential housing	6 15 Nm
"	7.	dowel bolt ← differential housing	6 12 Nm
"	8.	bolt ← differential housing	6 28 Nm
"	9.	interlock assembly	Locates in machined groove at lower end of 1st/2nd selector shaft
"	10.	shaft and fork assembly	If mainshaft is tight, tap upwards gently with soft hammer from differential housing end
"	11.	bolt ← selector rod guide	6 30 Nm
"	12.	selector rod guide ← differential housing	
"	13.	detent cap bolt ← differential housing	6 22 Nm, collect ball and spring
"	14.	selector rod ← differential housing	
Do not carry out further dismantling if component is removed for access only			
Measure	15.	clearance	Shift arm to guide Standard 0.2 - 0.3 mm, 0.008 - 0.012 in Service limit 0.55 mm, 0.022 in Outside limit, measure width of groove in guide Standard 8.1 - 8.2 mm, 0.319 - 0.323 in Outside limit, renew guide
Remove	16.	shaft ← interlock	
"	17.	guide	
"	18.	interlock	
"	19.	shift arm assembly	
"	20.	gaiter ← rod	
"	21.	oil seal ← differential housing	Use 18G 1198 to fit new seal
Position		shift rod guide → interlock	
Measure	22.	clearance	Selector rod guide to shift arm Standard 0.05 - 0.35 mm, 0.002 - 0.014 in Service limit 0.60 mm, 0.024 in Outside limit, measure width of groove in guide Standard 13.05 - 13.25 mm, 0.514 - 0.522 in Outside limit, renew guide
"	23.	clearance	Selector rod guide to interlock Standard 0.05 - 0.25 mm, 0.002 - 0.010 in Service limit 0.50 mm, 0.020 in Outside limit, measure outside dia. of interlock Standard 12.05 - 12.15 mm, 0.474 - 0.478 in Below limits, renew interlock
Note		Assembled position	Selector fork assembly including detent balls and grooves. Balls and springs are retained by staking







Remove	**24.** 1st/2nd fork ← shaft	
Slide	**25.** shaft ← 5th fork	
Remove	**26.** roll pin ← shaft	Use 5 mm, 0.2 in pin punch,
"	**27.** reverse shift piece ← shaft	
"	**28.** 3rd/4th fork ← shaft	
"	**29.** 5th fork ← shaft	
Measure	**30.** clearance	Fork to synchro sleeve, carry out this check on each fork and its sleeve, Standard 0.45 - 0.65 mm, 0.018 - 0.026 in Service limit 1.00 mm, 0.039 in Outside limits, check fork thickness Standard: 1st/2nd 8.90 - 9.00 mm, 0.350 - 0.354 in 3rd/4th 8.40 - 8.50 mm, 0.331 - 0.335 in 5th 5.40 - 5.50 mm, 0.213 - 0.217 in Outside limits, renew fork Fork OK, renew synchro sleeve and hub Outside limits, renew fork
"	**31.** clearance	3rd/4th fork to shift arm guide Standard 0.2 - 0.5 mm, 0.008 - 0.020 in Service limit 0.8 mm, 0.032 in Outside limits, renew guides
Clean	components	
Inspect	components	
Renew	components	Any worn beyond limits

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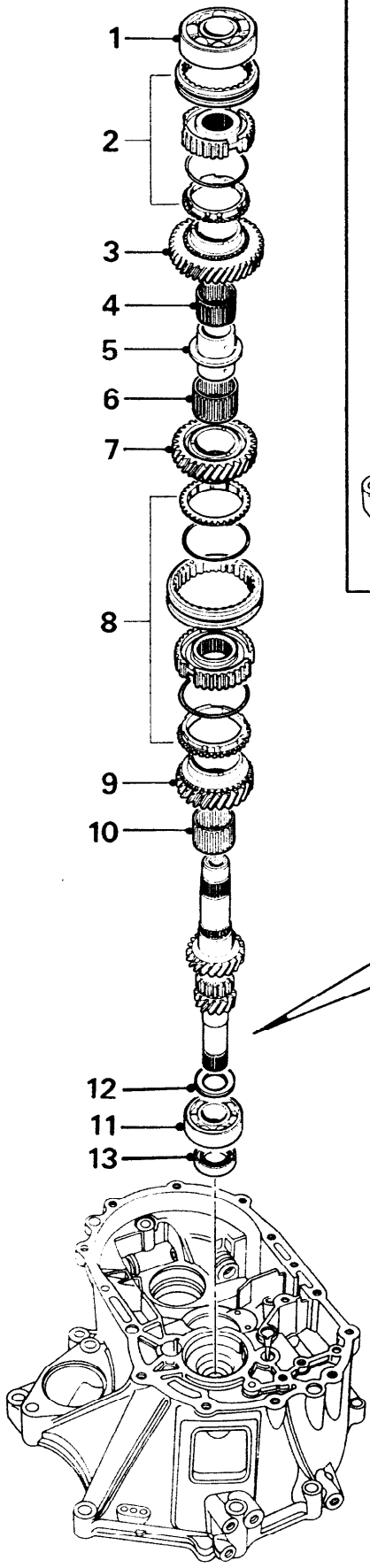
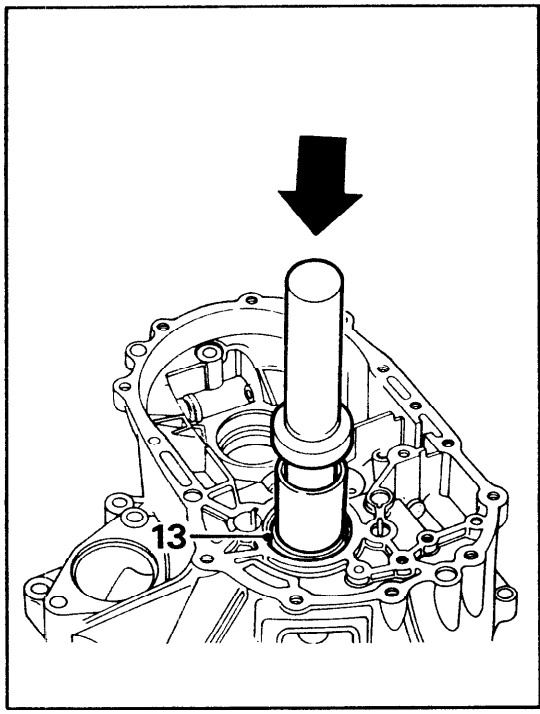
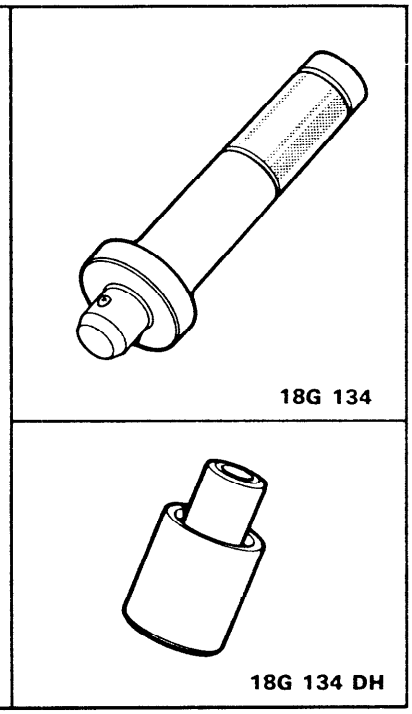
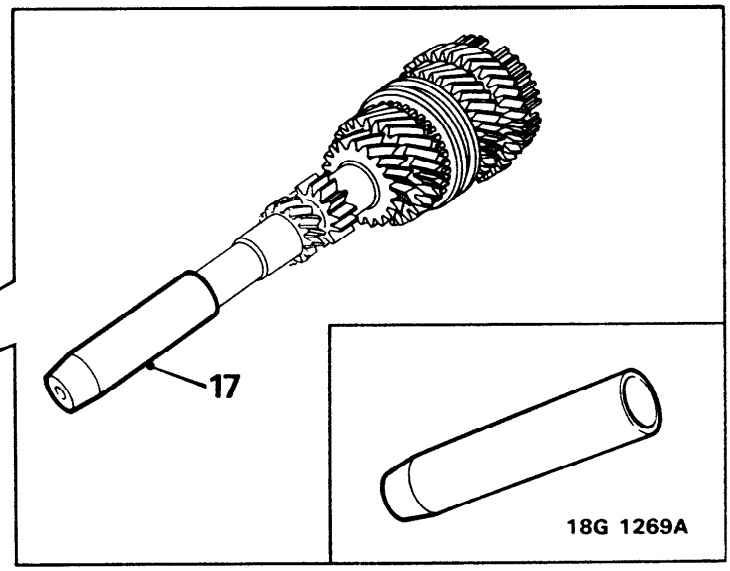
Measure	**32.** clearance	Pin to L shaped groove Standard 0.05 - 0.35 mm, 0.002 - 0.014 in Service limit 0.5 mm, 0.020 in Outside limit, measure width of L shaped groove, Standard 7.05 - 7.25 mm, 0.278 - 0.285 in
"	**33.** clearance	Reverse fork to gear Standard 0.5 - 1.1 mm, 0.020 - 0.043 in Service limit 1.8 mm, 0.071 in Outside limit, measure width across prongs of fork, Standard 13.0 - 13.3 mm, 0.512 - 0.524 in Outside limit, renew fork
Fit	gearbox case	
"	gearbox ← vehicle	









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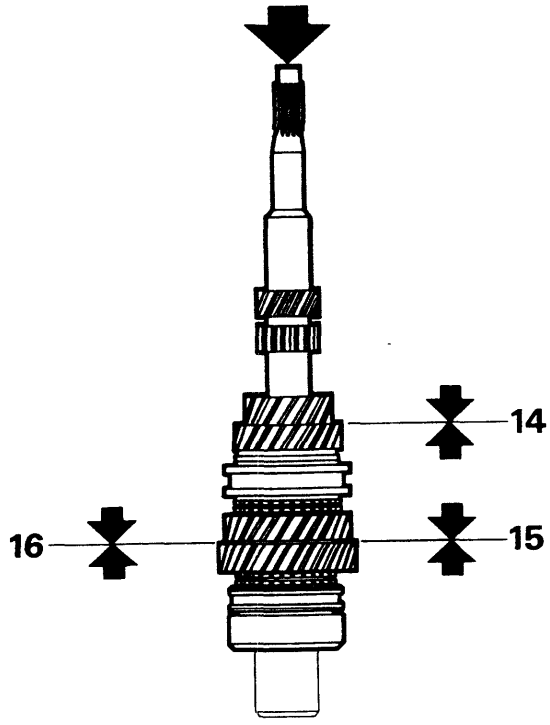
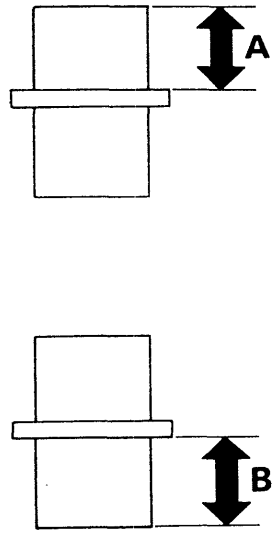
MAINSHAFT - RENEW

Action	Ref.	Detail	Special Instructions
Remove		gearbox ← vehicle	
"		gearbox case	
"		selector forks and interlock assembly	
Lift		mainshaft and countershaft assembly ← differential housing	
Do not carry out further dismantling if component is removed for access only			
Lever	1.	bearing ← mainshaft	Use two screwdrivers one each side ⚠ ***CAUTION:*** *If bearings or synchro assemblies are a tight fit, use a suitable puller to remove them*
Note		assembled position	All gears and synchro assemblies
Remove	2.	5th synchro assembly ← mainshaft	Machined groove on hub faces 5th gear Large chamfer on sleeve faces away from 5th gear
"	3.	5th gear ← mainshaft	
"	4.	needle roller bearing ← mainshaft	
"	5.	spacer collar ← mainshaft	
"	6.	needle roller bearing	
"	7.	4th gear ← mainshaft	
"	8.	3rd/4th synchro assembly ← mainshaft	Synchro hub will fit either way round. Both rings have three pairs teeth missing 120° apart
"	9.	3rd gear ← mainshaft	
"	10.	needle roller bearing ← mainshaft	
"	11.	bearing ← mainshaft	
Collect	12.	belville washer ← mainshaft	PG2 gearbox only
Drift	13.	oil seal ← differential housing	Use 🧰 18G 134, 18G 134 DH to fit new seal
Clean		components	
Inspect		gears	For wear or damage
"		shaft splines	For wear and blocked oilways
"		synchro rings	For wear or damage
"		cone surface	For wear
Assemble		synchro hub ← sleeve	Check for ease of movement. Repeat for each matched pair
Fit		synchro ring ← gear	Rotate ring until it locks 10° to 20° approx
Measure		clearance	Ring to gear 📏 Standard 0.85 - 1.1 mm, 0.033 - 0.043 in Service limit 0.4 mm, 0.016 in Outside limit, renew ring Repeat for each ring and gear
Renew		components	As necessary
"		all synchro springs	
Lubricate		components	With gearbox oil
Reassemble		components	Each synchro sleeve has three groups of long teeth 120° apart that must align with deep grooves on hub ⚠ ***Note:*** *Do not fit the differential housing bearing at this stage.*
Position		assembled mainshaft → socket	Bearing inner race must contact rim of socket
Press		down on mainshaft assembly	



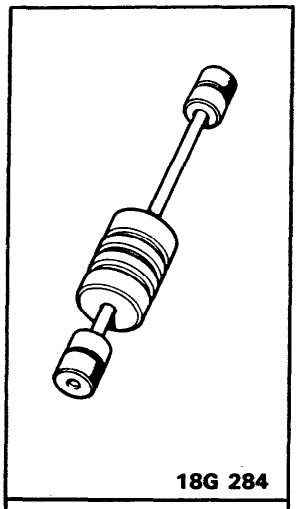


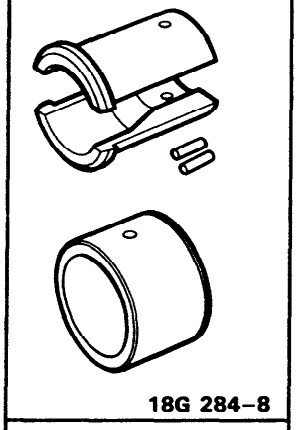
XM0216 A

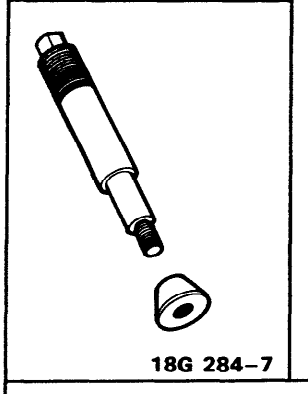
Measure	**14.** clearance	3rd gear to 2nd gear **d** Standard 0.06 - 0.21 mm, 0.002 - 0.008 in Service limit 0.3 mm, 0.012 in
CLEARANCE OUTSIDE LIMITS **Measure**	3rd gear thickness	**d PG1[1] and PG2** Standard 35.42 - 35.47 mm, 1.394 - 1.396 in Service limit 35.30 mm, 1.390 in **d PG1[2]** Standard 32.42 - 32.47 mm, 1.276 - 1.278 in Service limit 32.30 mm, 1.272 in Gear outside limits, renew Gear inside limits, renew 3rd gear synchro hub
"	**15.** clearance	4th gear to spacer collar **d** Standard 0.06 - 0.21 mm, 0.002 - 0.008 in Service limit 0.3 mm, 0.012 in
CLEARANCE OUTSIDE LIMITS **Measure**	spacer collar thickness **A**	**d** Standard 26.03 - 26.08 mm, 1.025 - 1.027 in Service limit 26.01 mm, 1.024 in Spacer outside limits, renew
SPACER INSIDE LIMITS **Measure**	4th gear thickness	**d PG1[1] and PG2** Standard 33.45 - 33.47 mm, 1.317 - 1.318 in Service limit 33.33 mm, 1.312 in **d PG1[2]** Standard 30.92 - 30.97 mm, 1.217 - 1.219 in Service limit 30.80 mm, 1.212 in

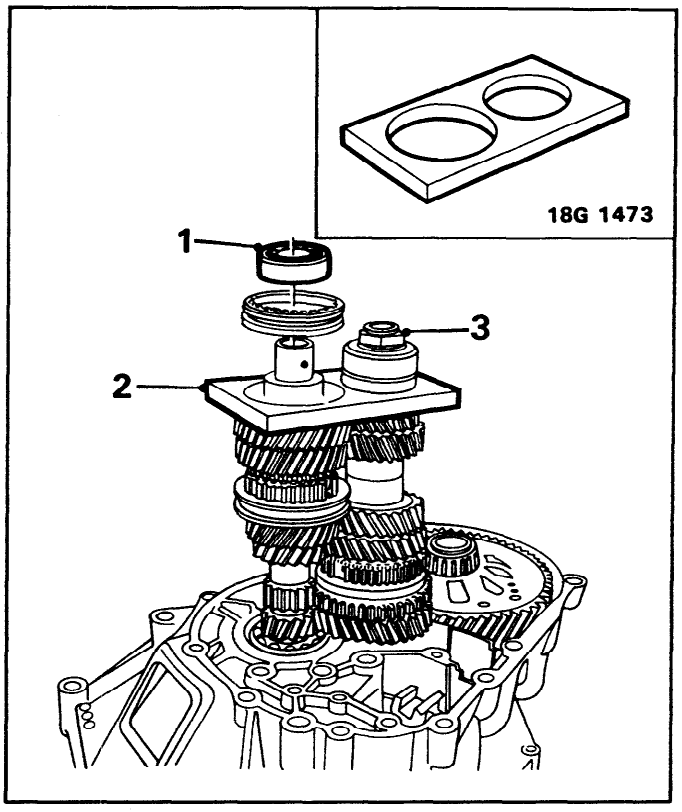
Continued....

Measure	**16.** clearance	5th gear to spacer collar Standard 0.06 - 0.21 mm, 0.002 - 0.008 in Service limit 0.3 mm, 0.012 in
CLEARANCE OUTSIDE LIMITS		
Measure	spacer collar thickness **B**	Standard 26.03 - 26.08 mm, 1.025 - 1.027 in Service limit 26.01 mm, 1.024 in Spacer outside limits, renew
SPACER INSIDE LIMITS		
Measure	5th gear thickness	**PG1[1] and PG2** Standard 31.92 - 31.97 mm, 1.257 - 1.259 in Service limit 31.80 mm, 1.252 in **PG1[2]** Standard 30.47 - 30.52 mm, 1.199 - 1.201 in Service limit 30.35 mm, 1.195 in Gear outside limits, renew Gear inside limits, renew 5th gear synchro hub
Remove	snap rings ← gearbox case	
"	belville washer ← gearbox case	PG1 gearbox only
"	oil guide plate ← gearbox case	
Select	snap rings	To give correct mainshaft end thrust See **Adjustments**
Fit	belleville washer → mainshaft	
"	bearing → mainshaft	
"	**17.** protector sleeve → mainshaft	18G 1269A
Reassemble	components	
Fit	selector forks and interlock assembly	
"	gearbox case	
"	gearbox → vehicle	

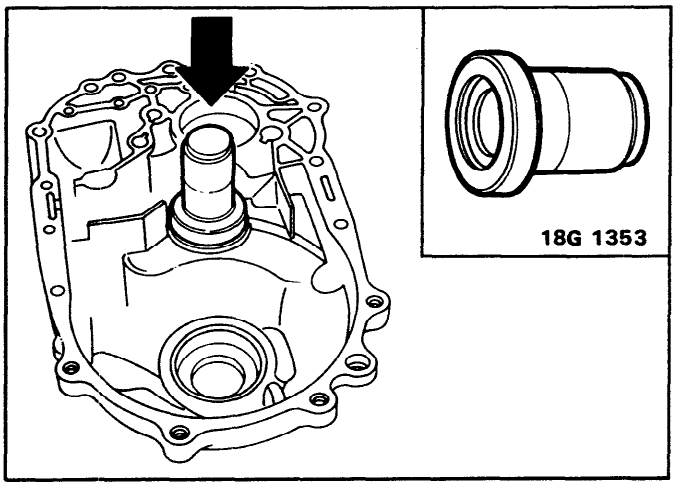

18G 284


18G 284-8

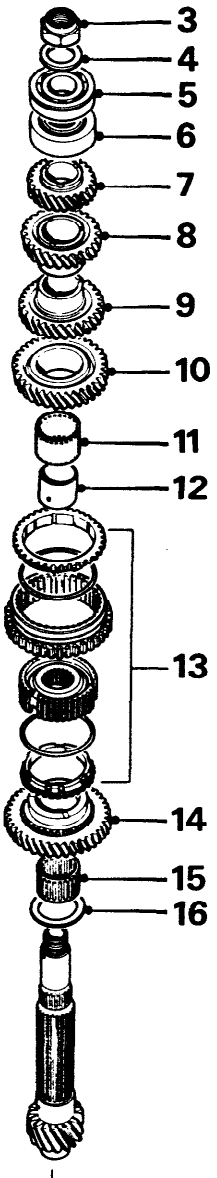

18G 284-7

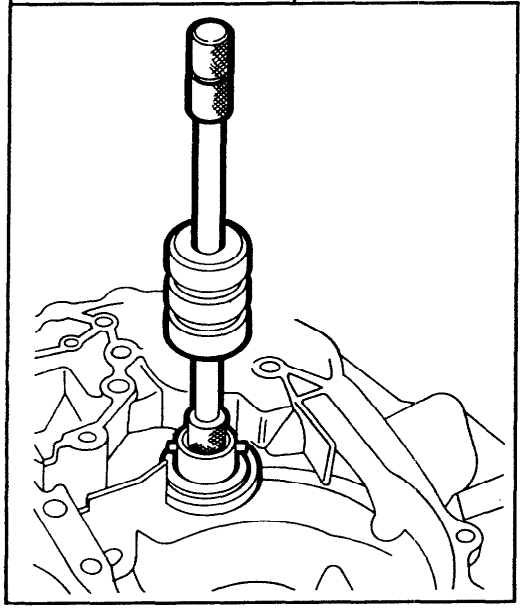


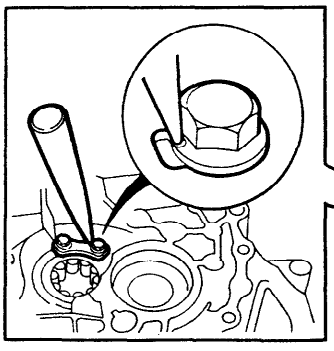
18G 1473

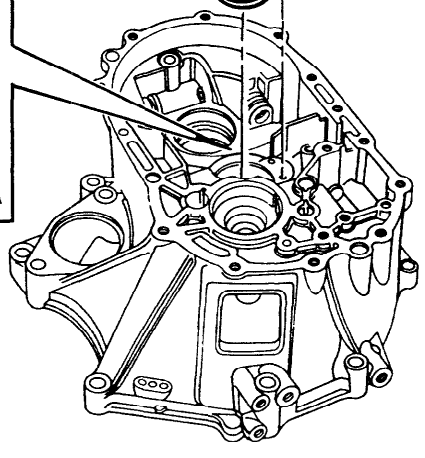


18G 1353









XM0221

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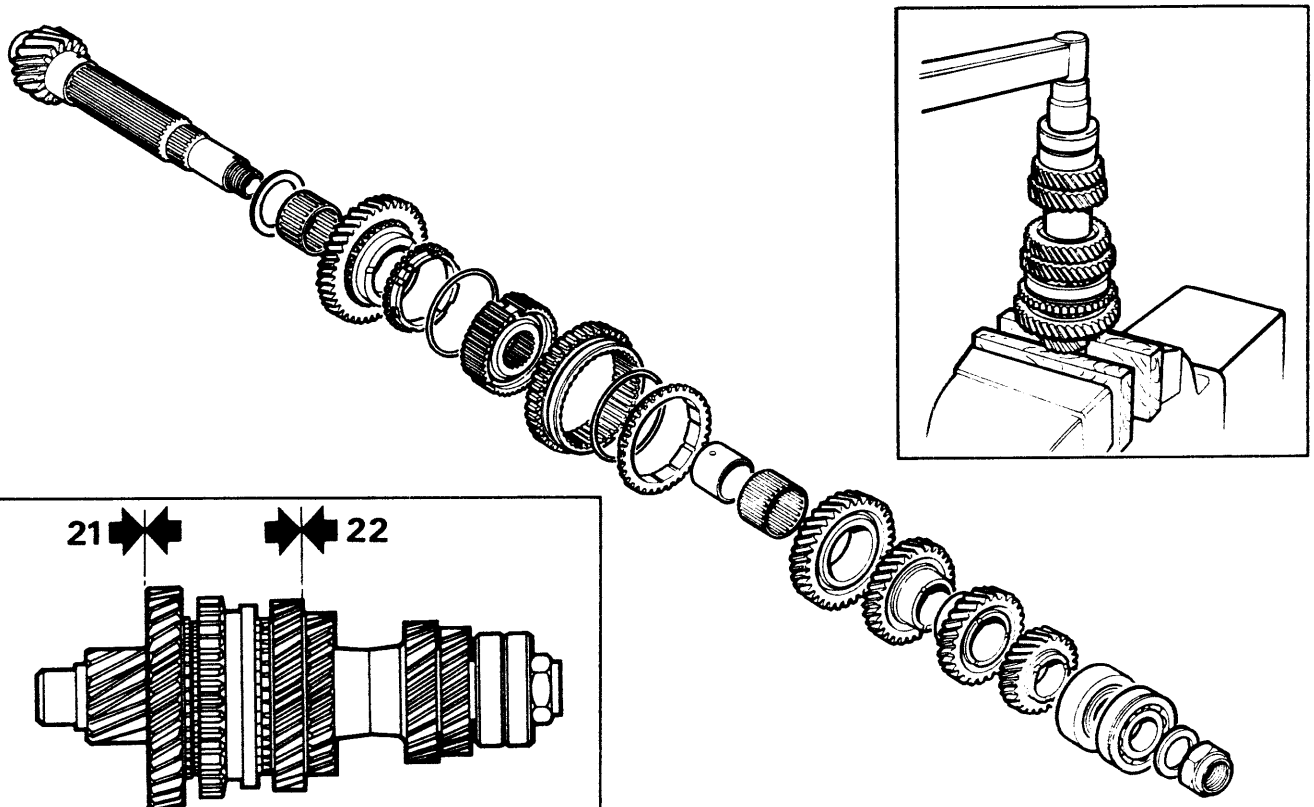
COUNTERSHAFT - RENEW

Action	Ref.	Detail	Special Instructions
Remove		gearbox ← vehicle	
"		gearbox case	
"		selector forks and interlock assembly	
Lift		mainshaft and countershaft assembly ← differential housing	
Do not carry out further dismantling if component is removed for access only			
Lever	1.	bearing ← mainshaft	Use two screwdrivers one each side ⚠ ***CAUTION:*** *If bearings or synchro assemblies are a tight fit, use a suitable puller to remove them*
Remove		5th synchro hub ← mainshshaft	PG2 gearbox only
Fit	2.	spreader plate → shafts	18G 1473
Engage		two gears	To lock shafts
Release		lock washer ← nut	
Slacken	3.	nut	L.H. thread 110 Nm
Engage		neutral	
Remove		spreader plate	18G 1473
Lift		mainshaft and countershaft assembly ← differential housing	
Note		assembled position	All gears and synchro assemblies
Remove		nut ← countershaft	L.H. thread
"	4.	washer ← countershaft	Dished side towards bearing
"	5.	bearing ← countershaft	Snap ring groove towards top
"	6.	bearing ← countershaft	Wide face of bearing track faces upwards ⚠ ***CAUTION:*** *If bearings or synchro assemblies are tight fit, use a suitable puller to remove them*
"	7.	5th gear ← countershaft	Large boss faces upwards
"	8.	4th gear ← countershaft	
"	9.	3rd gear ← countershaft	
"	10.	2nd gear ← countershaft	
"	11.	needle roller bearing ← countershaft	
"	12.	collar ← countershaft	⚠ ***Note:*** *Lubrication groove on inner radius must be fitted towards synchro hub*
"	13.	1st/2nd synchro assembly ← countershaft	⚠ ***Note:*** *Reverse gear teeth on sleeve must be fitted towards 1st gear, 2nd gear synchro ring has three pairs teeth missing 120° apart, locate in hub cut - aways*
"	14.	1st gear ← countershaft	
"	15.	needle roller bearing ← countershaft	
"	16.	thrust washer ← countershaft	Selective
"	17.	bolts ← differential housing	2 off 12 Nm PG2 gearbox only
"	18.	retainer plate ← differential housing	PG2 gearbox only
"	19.	bearing ← differential housing	Insert 18G 284 - 8 and 18G 284 - 7 into bearing. Fit 18G 284 slide hammer and remove bearing. ⚠ ***Note:*** *Two oil holes must face upwards*
"	20.	oil guide plate ← differential housing	
Check		lubrication drilling	Must be clear
Clean		components	
Inspect		gears	For wear or damage
"		shaft splines	For wear and blocked oilways
"		synchro rings	For wear or damage
"		cone surface	For wear
Assemble		synchro hub ← sleeve	Check for ease of movement
Fit		synchro ring → gear	Rotate ring until it locks 10° to 20° approx.

Measure	ring → gear clearance	Standard 0.85 - 1.1 mm, 0.033 - 0.043 in Repeat for remaining ring and gear Service limit 0.4 mm, 0.016 in Outside limit, renew ring
Renew	components	As necessary
"	all synchro springs	
Lubricate	components	With gearbox oil
Reassemble	components	Synchro sleeve has three groups of long teeth 120° apart that must align with deep grooves on hub
Secure	assembled countershaft	By spigot end in soft jawed vice
Tighten	new nut	L.H. thread 110 Nm. Slacken nut then tighten again to 110 Nm

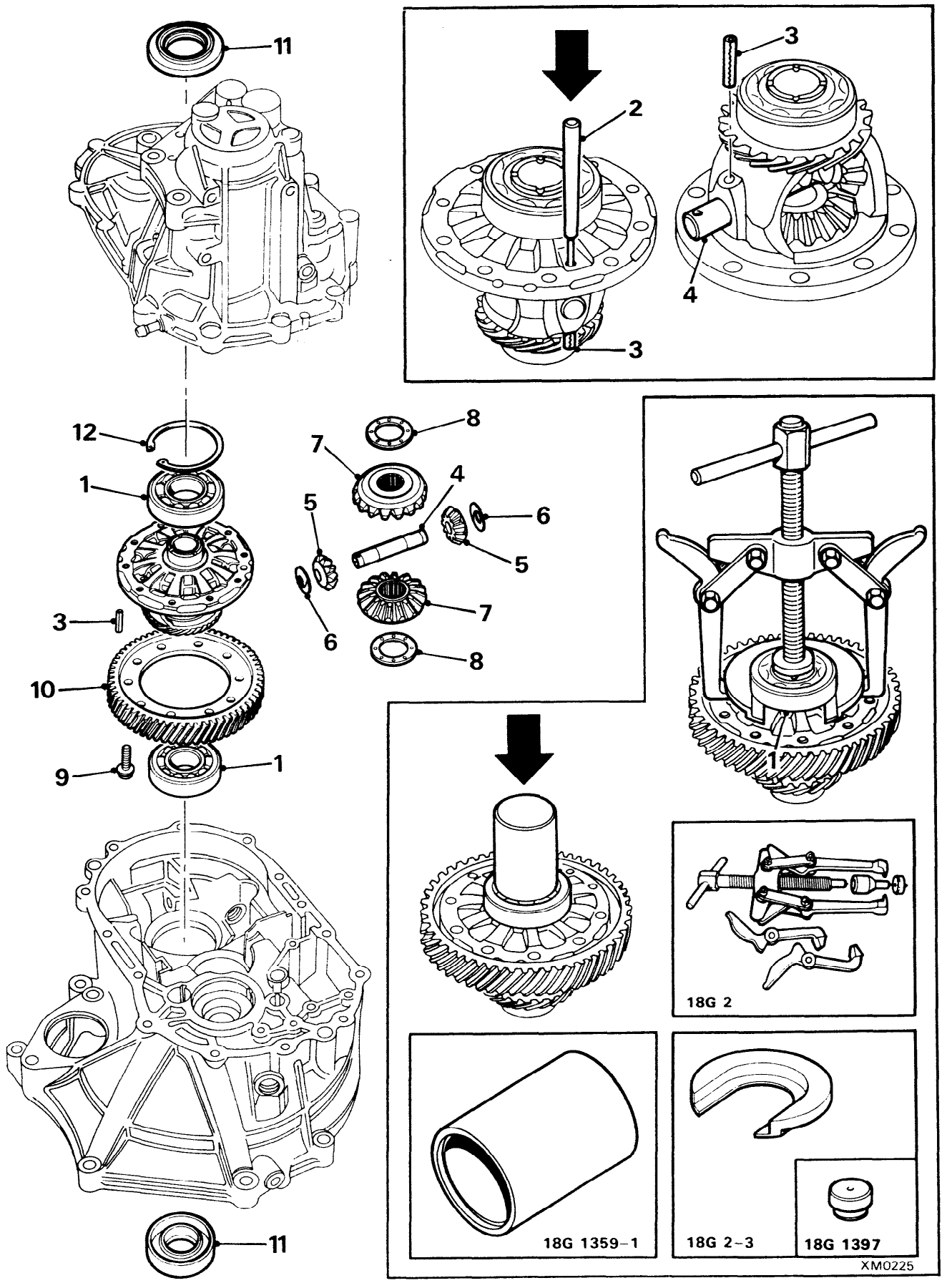


XM0220

Measure	**21.** clearance	Thrust washer to 1st gear Standard 0.03 - 0.08 mm, 0.001 - 0.003 in Service limit 0.18 mm, 0.007 in Select shims to bring end float within limits Shims available: A 1.96 mm, 0.077 in B 1.99 mm, 0.078 in C 2.02 mm, 0.080 in D 2.05 mm, 0.081 in E 2.08 mm, 0.082 in

Continued . . .

Measure	**22.** clearance	2nd gear to 3rd gear **PG1[1] and PG2** Standard 0.03 - 0.08 mm, 0.001 - 0.003 in **PG1[2]** Standard 0.03 - 0.10 mm, 0.001 - 0.004 in Select collar to bring end float within limits Collars available: A 29.03 - 29.05 mm, 1.143 - 1.144 in B 28.98 - 29.00 mm, 1.141 - 1.142 in
Fit	oil guide plate → differential housing	
"	bearing → differential housing	Fit bearing with oil holes upwards, use 18G 1353
"	retaining plate → differential housing	
"	bolts → differential housing	PG2 gearbox only: 12 Nm, use centre punch to stake bolt heads into groove in plate
Reassemble	components	
Fit	components	
"	selector forks and interlock assembly	
"	gearbox case	
"	gearbox → vehicle	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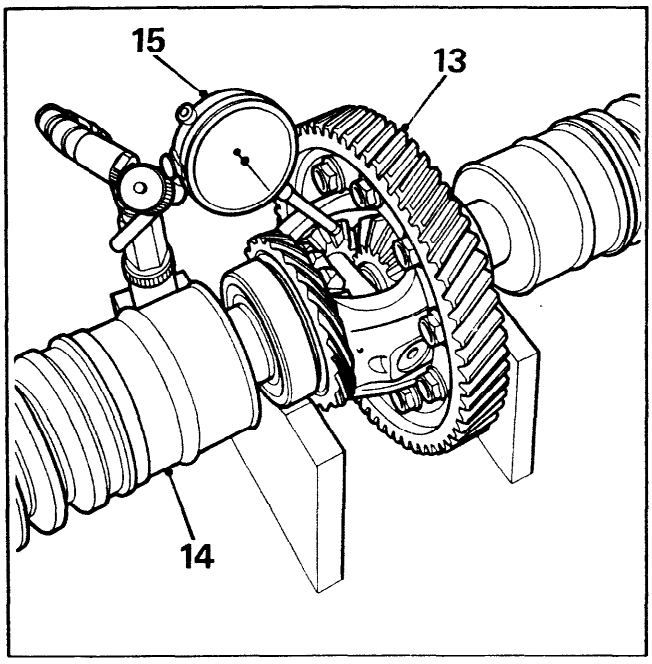
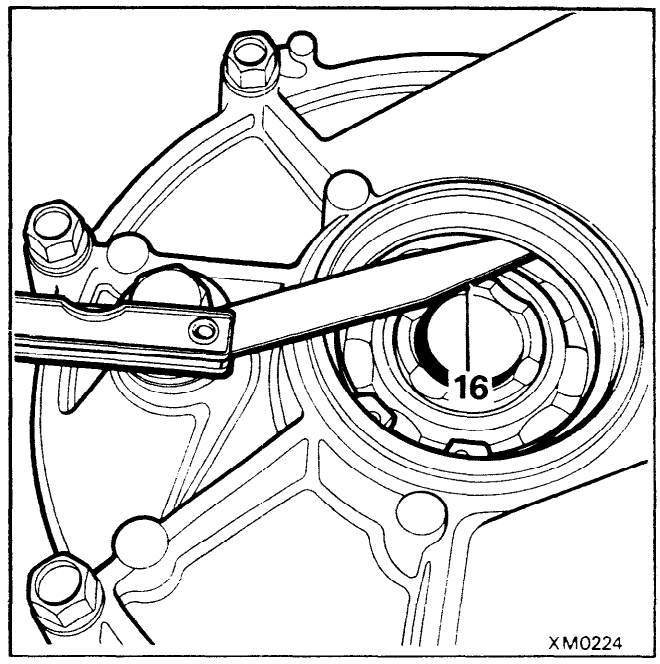
18G 2
18G 1359-1
18G 2-3
18G 1397
XM0225

Continued . . .

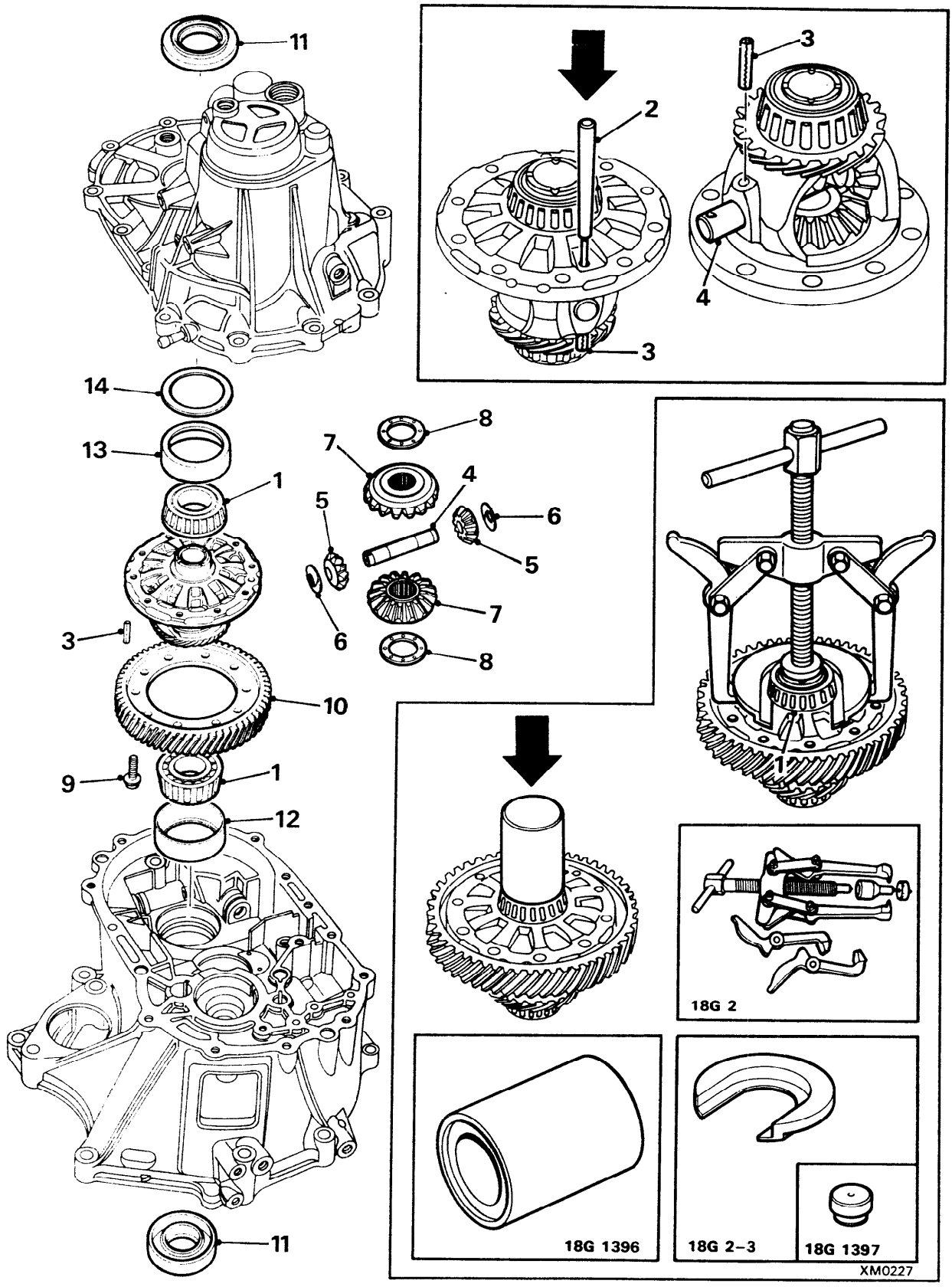
DIFFERENTIAL - PG1 GEARBOX - OVERHAUL

Action	Ref.	Detail	Special Instructions
Remove		gearbox ← vehicle	
"		gearbox case	
"		selector forks and interlock assembly	
Lift		mainshaft and countershaft assembly ← differential housing	
"		differential ← differential housing	
Remove	**1.**	bearings ← differential	Use 18G 2, 18G 2 - 3 and 18G 1397 ***Note:*** *Speedometer pinion not serviced separately*
Insert	**2.**	pin punch → differential	5.0 mm, 0.2 in dia. punch
Drift	**3.**	roll pin ← pinion pin	
Remove	**4.**	pinion pin ← differential	
"	**5.**	planet pinions ← differential	2 off
Collect	**6.**	thrust washers	2 off, selective
Remove	**7.**	sun gears ← differential	2 off
Collect	**8.**	thrust washers	2 off non selective
Mark		final drive gear → differential	For reassembly
Remove	**9.**	bolts ← differential	10 off
Separate	**10.**	final drive gear ← differential	
Remove	**11.**	differential oil seals	
Collect	**12.**	circlip ← gearbox case	
Clean		components	
Inspect		components	For wear or damage
Lubricate		components	Use molybdenum disulphide grease
Fit		final drive gear ← differential	Chamfer on inner radius towards differential
Tighten		bolts → differential	110 Nm
Reassemble		differential	Use 18G 1359/1 to press on bearings, do not fit roll pin





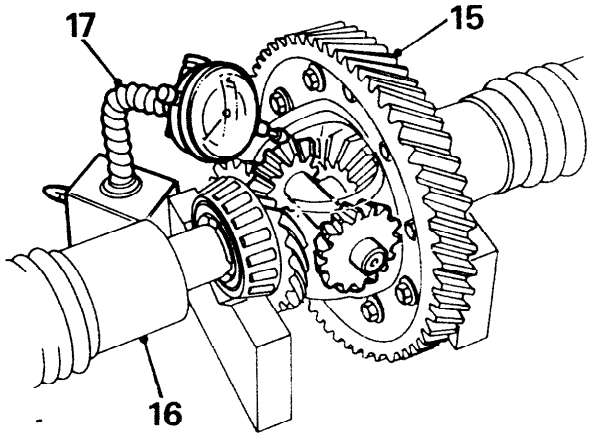
Position	**13.** differential → V blocks	To align sun gears
Fit	**14.** drive shafts ← differential	As illustrated
Position	**15.** dial gauge → differential	Backlash = 0.05 - 0.15 mm, 0.002 - 0.006 in
Measure	backlash	OK, secure pinion pin with new roll pin Not OK, dismantle differential, select pinion thrust washers to give correct backlash ⚠ ***CAUTION:*** *Washers must be equal thickness* Thrust washers available 0.70 - 0.05 mm, 0.028 - 0.041 in 0.70 mm (0.028 in) - 1.05 mm (0.041 in) in steps of 0.05 mm, 0.002 in If correct backlash cannot be obtained, renew components in following order rechecking backlash at each stage. Planet pinions, sun gears, differential housing
Reassemble	components	
Fit	mainshaft and countershaft	
"	selector forks and interlock assembly	
"	gearbox case	
Seat	differential	Lightly drive towards differential housing to seat circlip, then drive towards gearbox case until it is seated
Measure	**16.** clearance	Circlip to bearing outer face clearance = 0.15 mm, 0.006 in maximum Outside limits, select alternative circlip circlips available **PG1**[1] 2.45 - 2.95 mm, 0.096 - 0.116 in **PG1**[2] 2.50 - 3.0 mm, 0.098 - 0.118 in in steps of 0.10 mm, 0.004 in
Fit	circlip → gearbox case	Circlip can be removed and refitted through oil seal aperture
"	differential oil seal	Use 18G 134, 18G 134-12
"	gearbox → vehicle	



DIFFERENTIAL - PG2 GEARBOX - OVERHAUL

Action	Ref. Detail	Special Instructions
Remove	gearbox ← vehicle	
"	gearbox case	
"	selector forks and interlock assembly	

Lift	mainshaft and countershaft assembly ← differential housing	
"	differential ← differential housing	
Remove	**1.** bearings ← differential	Use 18G 2, 18G 2 - 3 and 18G 1397 ⚠ ***Note:*** *Speedometer pinion not serviced separately*
Insert	**2.** pin punch → differential	5.0 mm, 0.2 in dia. punch
Drift	**3.** roll pin ← pinion pin	
Remove	**4.** pinion pin ← differential	
"	**5.** planet pinions ← differential	2 off
Collect	**6.** thrust washers	2 off, selective
Remove	**7.** sun gears ← differential	2 off
Collect	**8.** thrust washers	2 off non selective
Mark	final drive gear → differential	For reassembly
Remove	**9.** bolts ← differential	10 off
Separate	**10.** final drive gear ← differential	
Remove	**11.** differential oil seals	18G 1526 to fit new seals
Drift	**12.** bearing outer track ← differential housing	Outer tracks can be removed by immersing housings in hot water
"	**13.** bearing outer track ← gearbox case	
Collect	**14.** shim ← gearbox case	
Clean	components	
Inspect	components	For wear or damage
Lubricate	components	Use molybdenum disulphide grease
Fit	final drive gear → differential	Chamfer on inner radius towards differential
Tighten	bolts → differential	123 Nm
Reassemble	differential	Use 18G 1396 to press on bearings, large bearing adjacent to speedometer gear. Do not fit roll pin
Position	**15.** differential → V blocks	To align sun gears
Fit	**16.** drive shafts → differential	As illustrated
Position	**17.** dial gauge → differential	Backlash = 0.05 - 0.15 mm, 0.002 - 0.006 in
Measure	backlash	OK, secure pinion pin with new roll pin Not OK, dismantle differential, select pinion thrust washers to give correct backlash ⚠ ***CAUTION:*** *Washers must be equal thickness* Thrust washers available 0.70 mm (0.028 in) - 1.05 mm (0.041 in) in steps of 0.05 mm, 0.002 in If correct backlash cannot be obtained, renew components in following order rechecking backlash at each stage. Planet pinions, sun gears, differential housing See **Adjustments**



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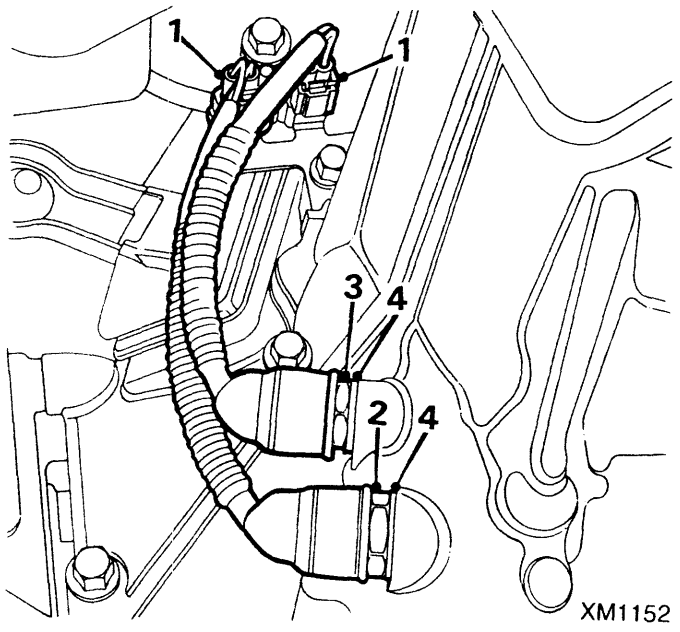
Check	differential bearing pre - load	
Reassemble	components	
Fit	mainshaft and countershaft	
"	selector forks and interlock assembly	
"	gearbox case	
"	gearbox → vehicle	



NEUTRAL AND REVERSE LIGHT SWITCHES - RENEW

Action	Ref.	Detail	Special Instructions
Raise		front of vehicle	⚠ ***WARNING: Support on safety stands***
Disconnect	1.	multiplug ← harness	2 off as required
Unscrew	2.	neutral switch ← gearbox	25 Nm
"	3.	reverse switch ← gearbox	25 Nm
Remove	4.	sealing washer ← switch	
Clean		sealing faces	
Reassemble		components	
Top - up		gearbox oil level	See **Adjustments**