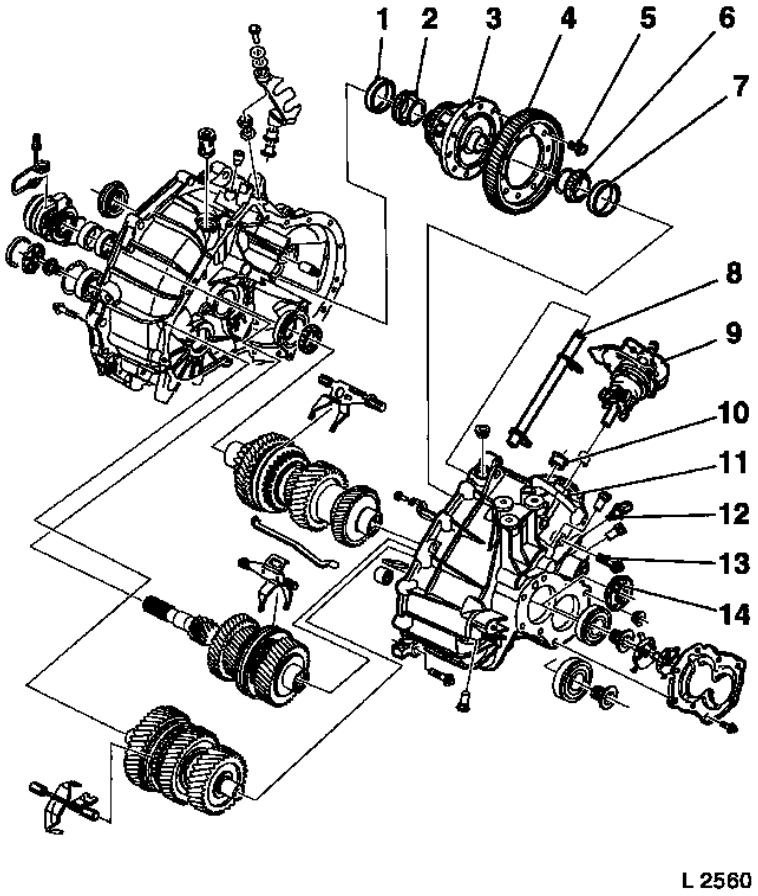
Transmission, Seal Completely

1. Illustration of transmission (part 1)

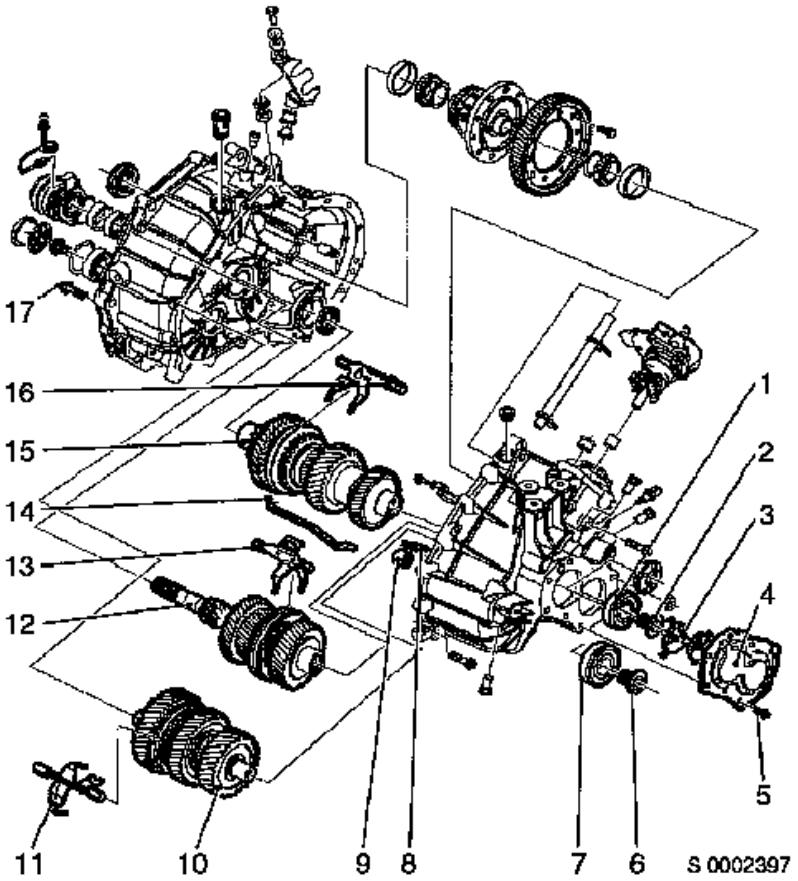


1. Outer race for tapered roller bearing of differential (clutch housing side)
2. Inner race for tapered roller bearing of differential (clutch housing side)
3. Differential
4. Ring gear
5. 10x Bolt
6. Inner race for tapered roller bearing of differential (transmission housing side)
7. Outer race for tapered roller bearing of differential (transmission housing side)
8. Gearshift lever shaft
9. Shift mechanism assembly
10. Guide sleeve for gearshift lever shaft
11. Transmission housing
12. Reversing lamp switch
13. 7x bolt
14. Axle shaft seal ring (transmission housing side)

2. Illustration of transmission (part 2)

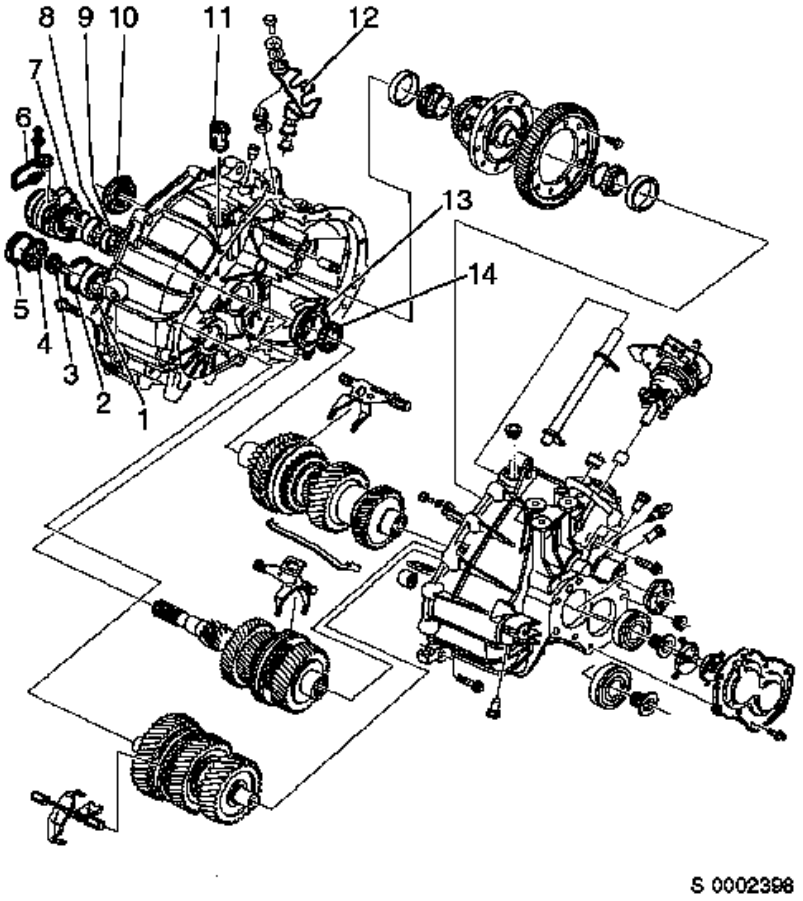
1. Main shaft bearing (transmission housing side)
2. Fastening bolt for main shaft
3. Fluid collector pipe
4. Transmission housing cover

5. 8x bolt for transmission housing cover
6. Bolt (drive shaft)
7. Drive shaft bearing (transmission housing side)
8. Magnet
9. Intermediate shaft bearing (transmission housing side)
10. Intermediate shaft
11. 1st/2nd gear shift fork
12. Drive shaft
13. 3rd/4th gear shift fork
14. Fluid guide pipe
15. Main shaft
16. Gear shift fork 5th /reverse gear
17. 12x bolt



3. Illustration of transmission (part 3)

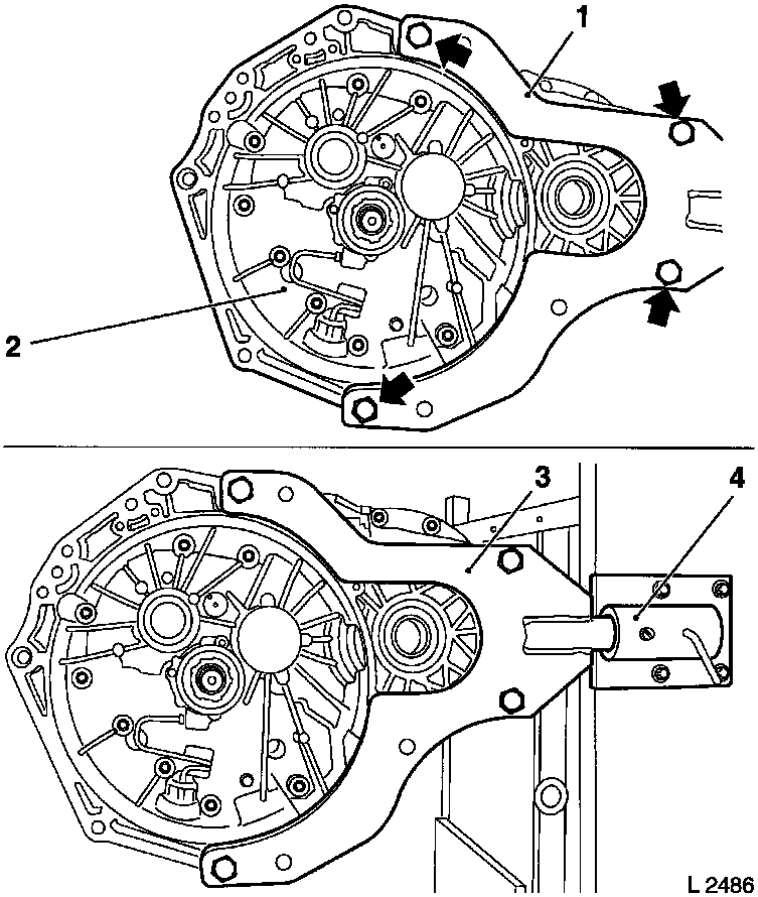
1. Intermediate shaft bearing (clutch housing side)
2. Retaining ring for intermediate shaft bearing (clutch housing side)
3. Fastening bolt for intermediate shaft
4. Fluid spout
5. Intermediate shaft cover
6. Pressure line
7. Central release
8. Spacer sleeve
9. Drive shaft bearing (clutch housing side)
10. Axle shaft seal ring (clutch housing side)
11. Pressure line fastening sleeve
12. Shift Bowden cable bracket



13. Outer race for main shaft bearing (clutch housing side)
14. Main shaft bearing (clutch housing side)

4. Remove transmission from vehicle — see operation “Transmission, Remove and Install”

Important: In this operation, transmission is disassembled, individual parts are checked for damage, then replaced if necessary. Individual transmission shafts cannot be disassembled, they can only be replaced as an assembly. Dismantling of fastening bolts of transmission shafts with impulse or impact screwdriver is not permitted

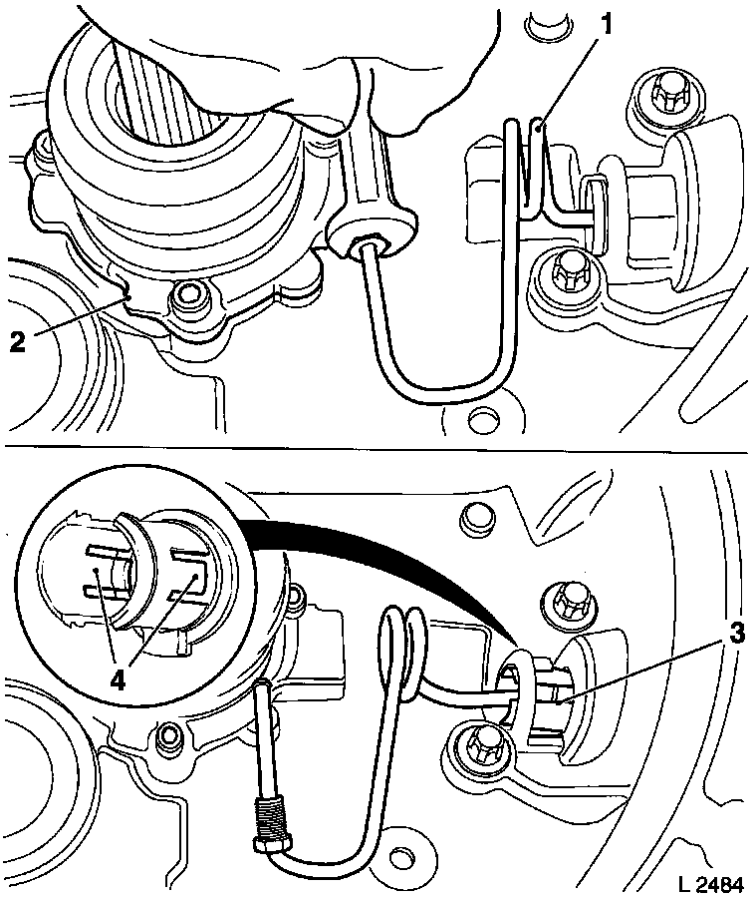


5. Install **KM-6115** (1) to transmission (2)
- Install 4x bolt (arrowed)

6. Attach transmission and **KM-6115** (3) to **KM-113-2** (4)

7. Remove pressure line (1) from central release (2)

8. Disassemble pressure line from fastening sleeve (3) and remove
Note: Carefully release 2x lug (4) with screwdriver by prising outwards



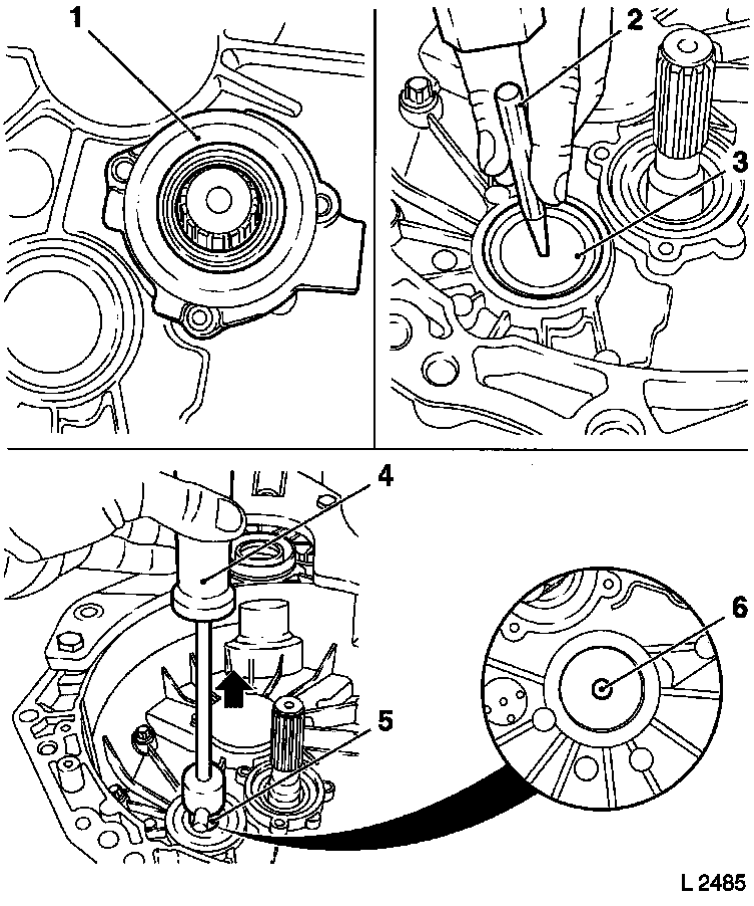
9. Remove fastening sleeve from transmission

10. Disassemble central release (1)
- Remove 3x bolt

11. In centre of intermediate shaft cover (3), drive a hole (6), using suitable drift (2), then screw in **KM-6101** (5) in conjunction with **KM-328-B** (4) with intermediate shaft cover

12. Remove intermediate shaft cover from transmission

13. Remove fluid spout from transmission



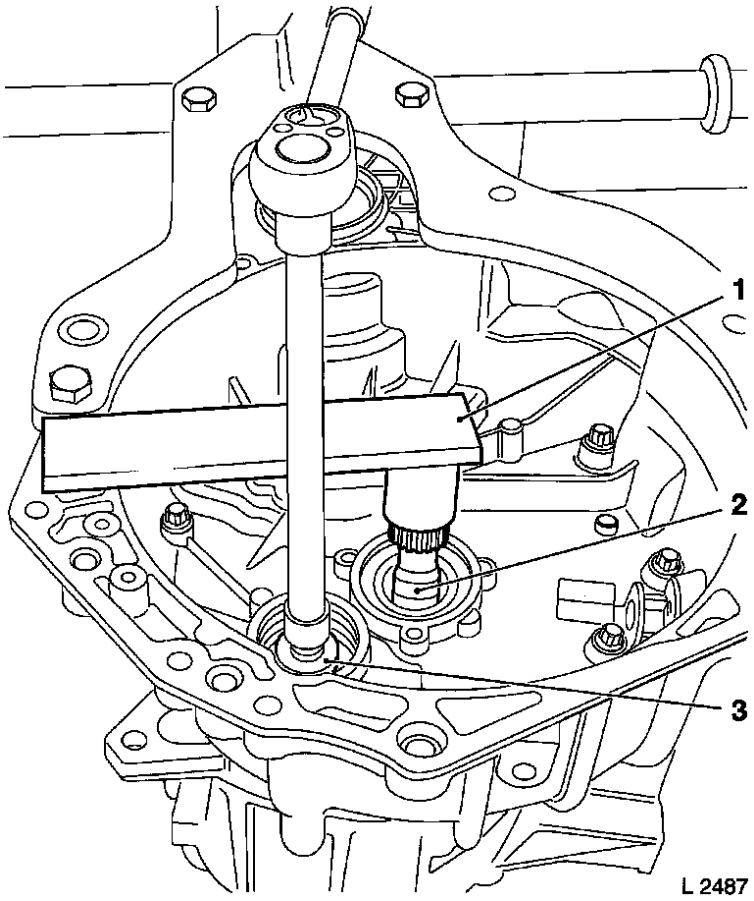
14. Engage gear at shift mechanism assembly

15. Lock drive shaft (2) with **KM-6117** (1)

16. Release intermediate shaft union (3)

17. Remove **KM-6117**

18. Turn transmission in**KM-113-2** by 90° anti-clockwise

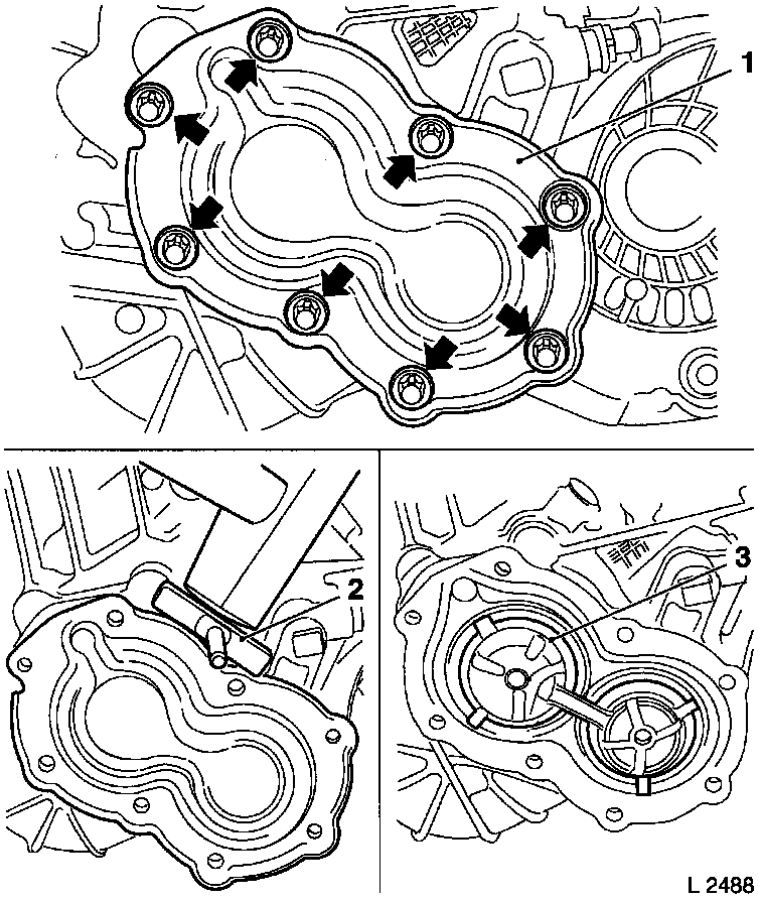


19. Remove 8x bolt (arrowed) from transmission housing cover (1)

Important: Do not damage sealing surfaces

20. Remove transmission housing cover using **KM-J-37228** (2)

21. Remove fluid collector pipe (3)



22. Lock drive shaft with

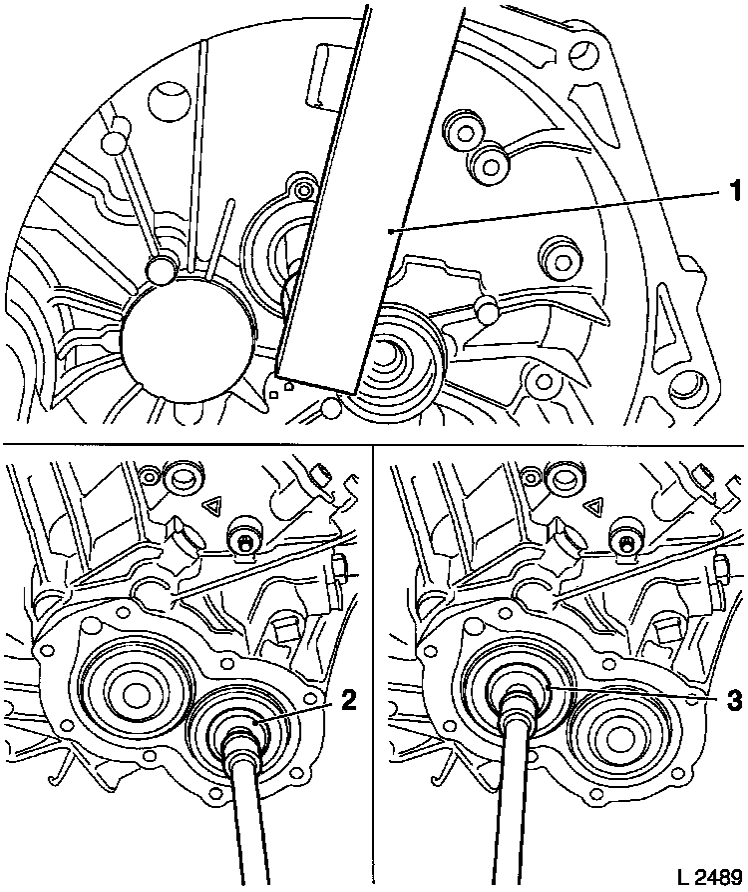
KM-6117 (1)

23. Engage transmission in gear

24. Release union for main shaft (2) and drive shaft (3), then remove from transmission

25. Remove **KM-6117** from drive shaft

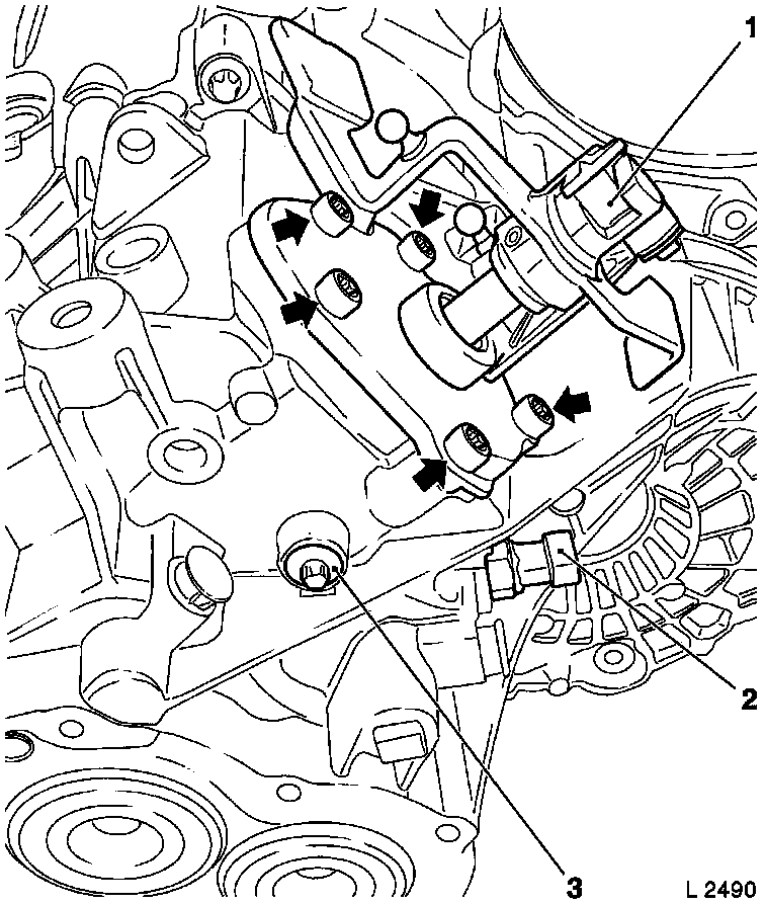
26. Engage transmission into neutral



27. Remove bolt (3) from shift mechanism assembly

28. Remove 5x bolt (arrowed), then remove shift mechanism assembly (1) from transmission

29. Remove reverse lamp switch (2) from transmission

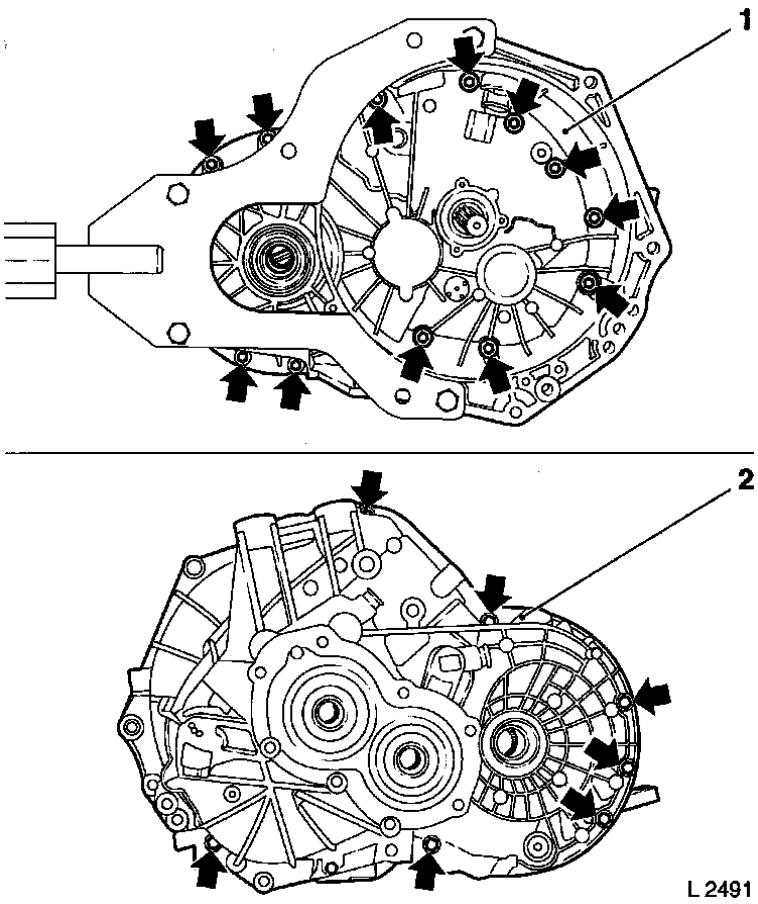


30. Remove 12x bolt

(arrowed) from clutch housing (1)

31. Turn transmission in **KM-113-2** by 90° anti-clockwise

32. Remove 7x bolt (arrowed) from transmission housing (2)



33. Attach **KM-6116** (2) using 4x bolt (3) to transmission housing

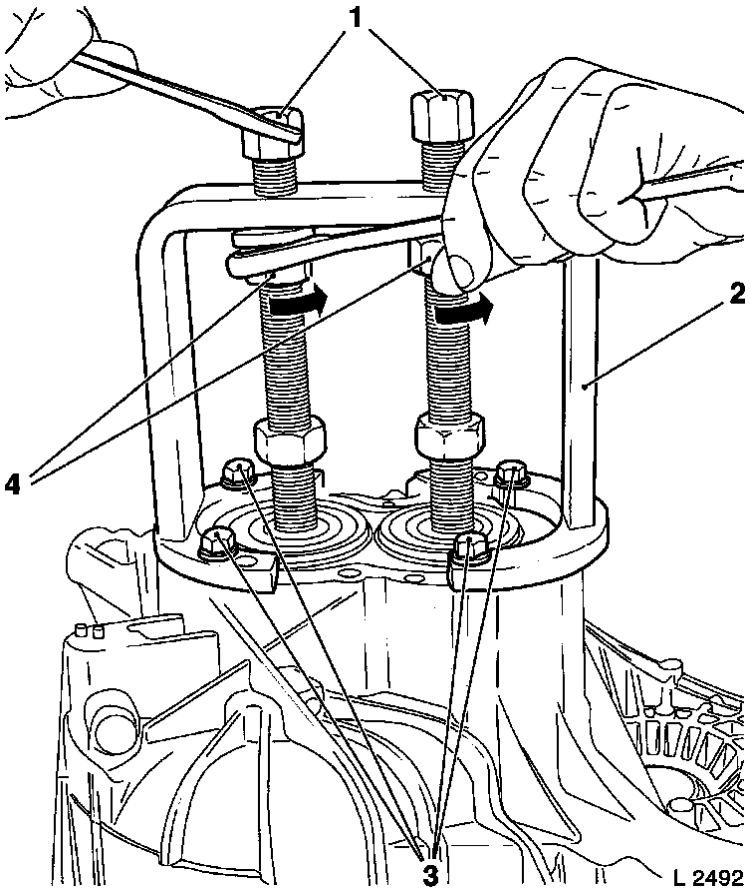
34. Screw in spindle in main and drive shaft

35. Turn nut (4) and counterhold spindle at head (1)

36. Detach transmission housing from clutch housing

37. Remove **KM-6116** from main shaft, drive shaft and transmission housing

38. Remove transmission housing from clutch housing

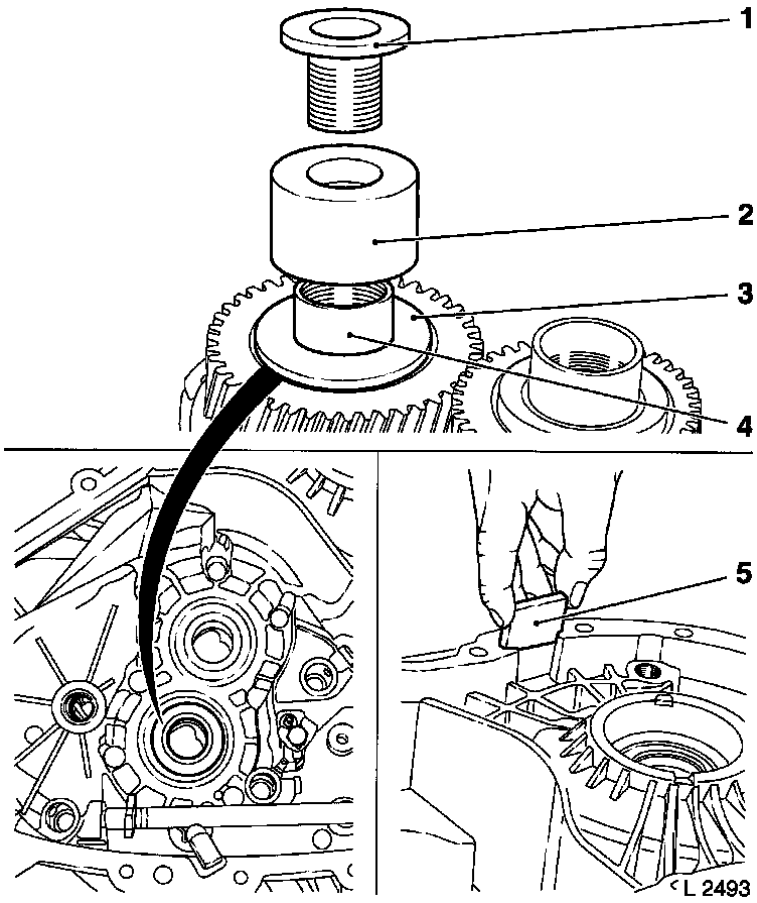


Important: Ensure drive

shaft friction washer (3) does not remain in transmission housing. Springs, balls and slide blocks of synchronisation cannot be supplied individually. If lost, replace drive shaft

39. Attach **KM-6121** (2) to drive shaft (4) using bolt (1)
Note: This prevents synchromesh body assembly 4th / 5th gear from falling apart

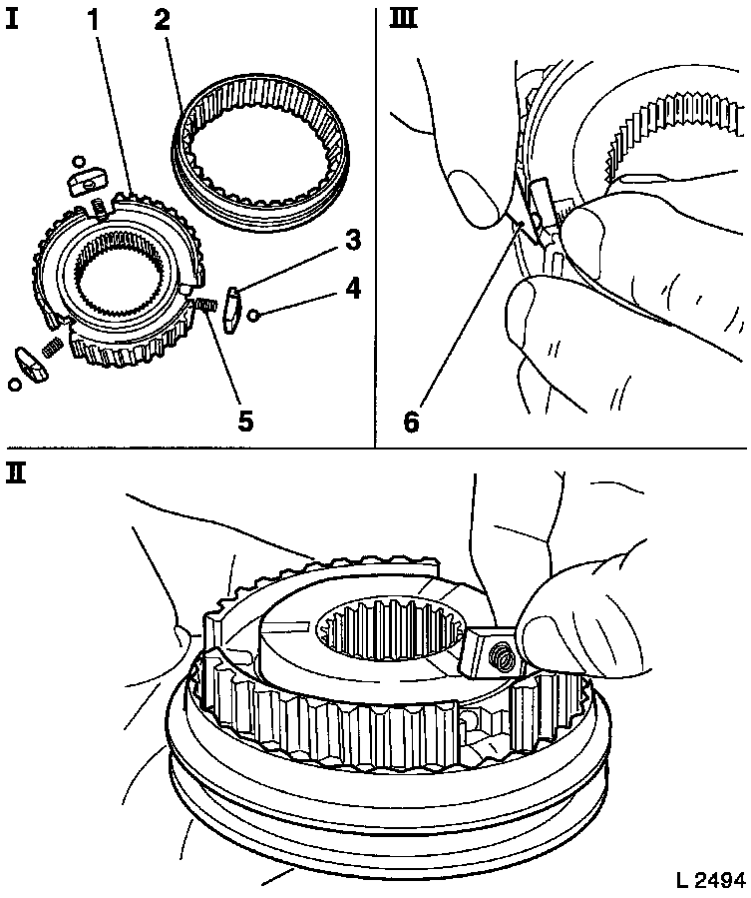
40. Remove magnets (5), then clean



41. If synchromesh body assembly 3rd / 4th gear fall apart, assemble as follows:

- (I) Identify parts
  1. Synchromesh body
  2. Shift sleeve
  3. Sliding block
  4. Ball
  5. Spring

- (II) Clamp drive shaft in vice with light alloy protective jaws. Push shifter collar on synchromesh body back completely. Insert slide block with spring into synchromesh body
- (III) Press ball into slide block with screwdriver (6), pull shifter collar upwards. With remaining slide blocks, proceed in

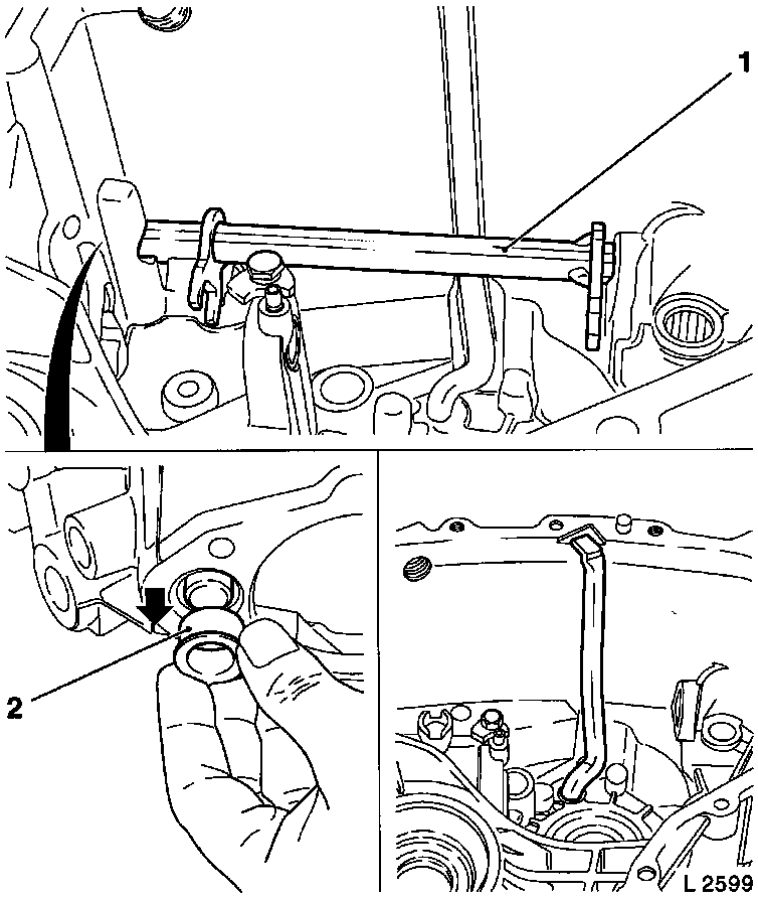


same way, but do not push shifter collar back completely, otherwise slide blocks that are already installed will jump out again. Secure synchromesh body assembly with **KM-6121** and check whether shifter collar has engaged in two shift positions (3rd / 4th gear)

42. Press sleeve (2) of gearshift lever shaft from transmission housing from inside

43. Remove gearshift lever shaft (1) from transmission housing

44. Remove fluid guide pipe from transmission housing

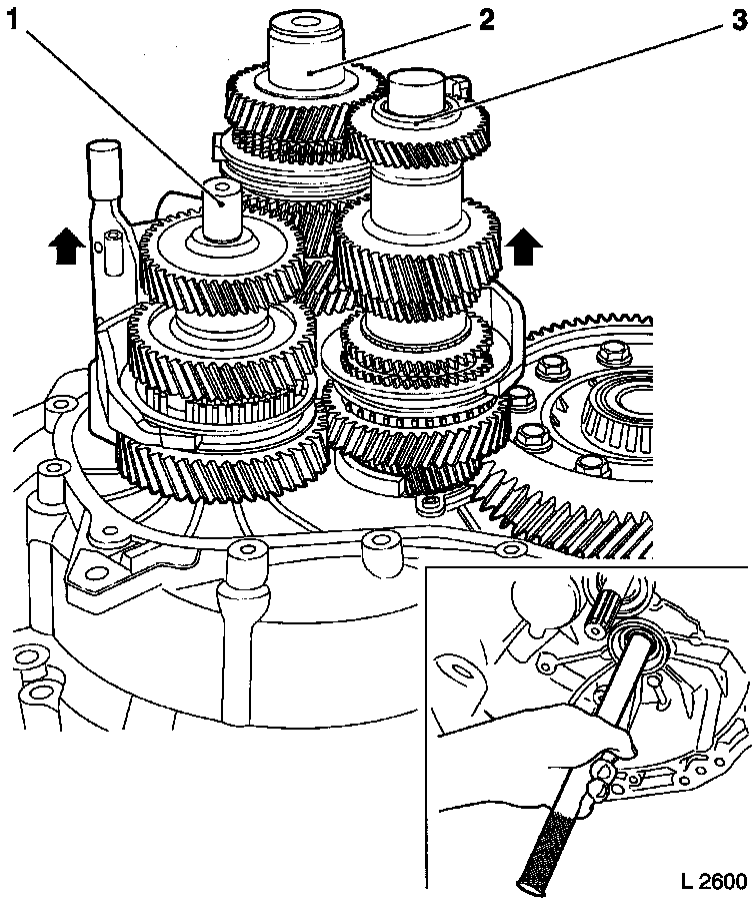


45. Remove assembly of main shaft (3), intermediate shaft (1) and drive shaft (2) with the respective gear shift forks out of clutch housing

- Drive intermediate shaft with **KM-6126** in conjunction with **KM-523-1** (4) out of intermediate shaft bearing in

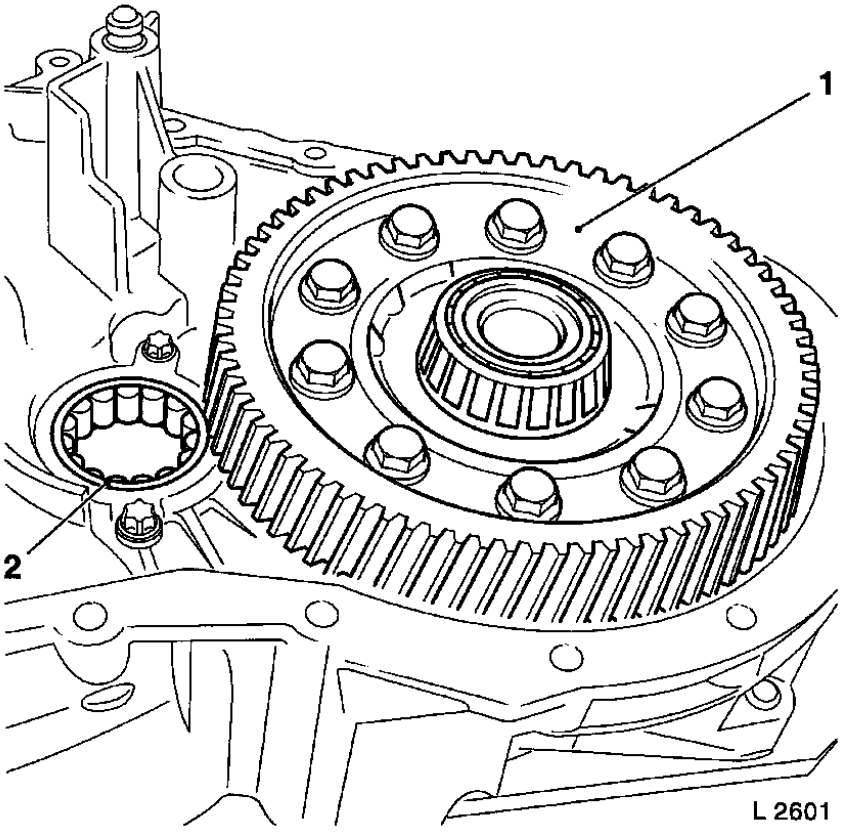
clutch housing

- Second technician secures assembly of main shaft, intermediate shaft and drive shaft with respective gear shift forks



46. Remove differential (1) from clutch housing

47. Remove main shaft roller bearing (2)



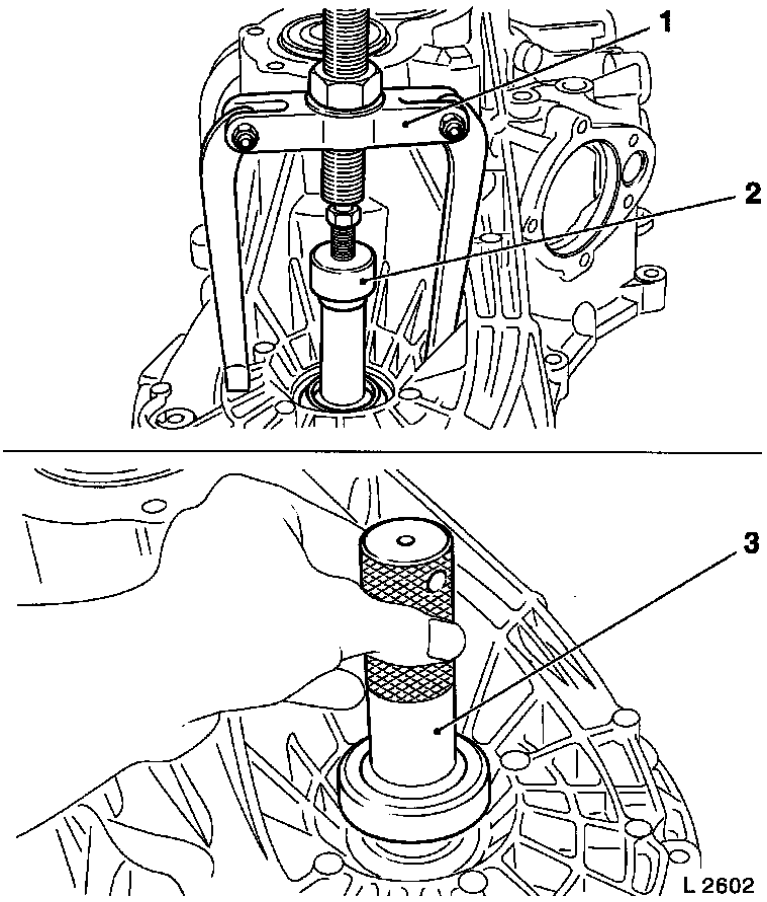
48. Remove bearing for main shaft and drive shaft out of transmission housing - see operation "Bearings, Main Shaft and / or Drive Shaft in Transmission Housing, Remove and Install"

49. Remove both axle shaft seal rings out of clutch and transmission housing using **MKM-557-1** (1) and **MKM-557-2**(2)

50. Clean all sealing faces and transmission parts

51. Check all sealing faces and transmission parts for damage and replace if necessary

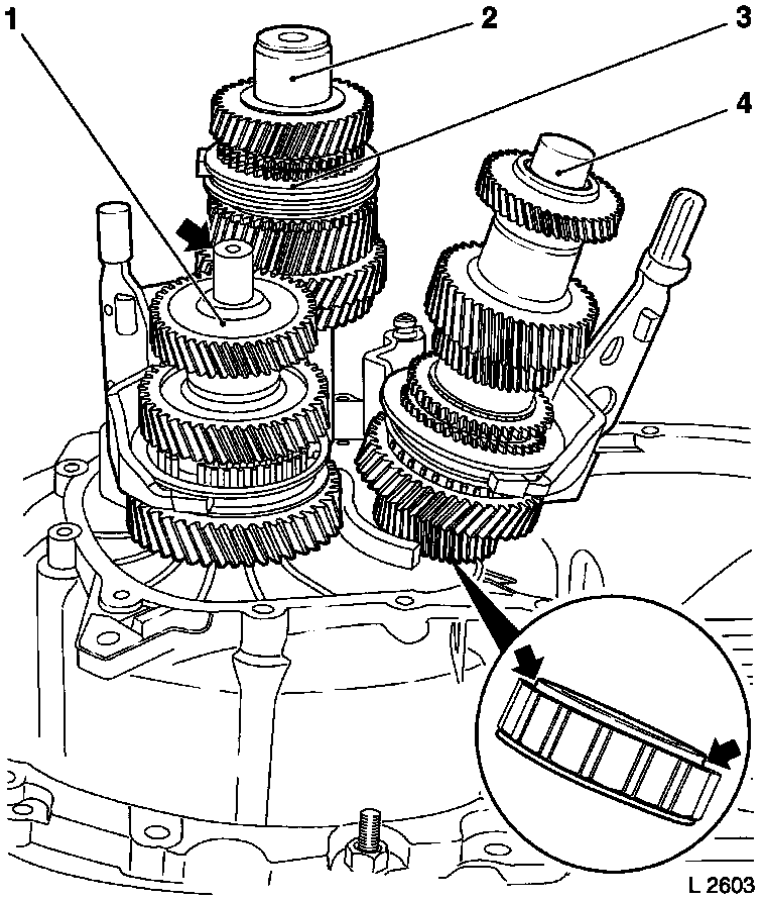
52. Drive both axle shaft seal rings into clutch housing and transmission housing using **KM-519** (3)



53. Insert main shaft roller bearing
Note: Collar (arrowed) points towards clutch housing

54. Insert main shaft (4), intermediate shaft (1) and drive shaft (3) assemblies into clutch housing with relevant shift forks

- Drive intermediate shaft (arrowed) into intermediate shaft bearing in clutch housing using plastic hammer
- Second technician required
Note: Seating of shaft and shift forks in clutch housing and against one another must be continually checked in order to prevent damage to components

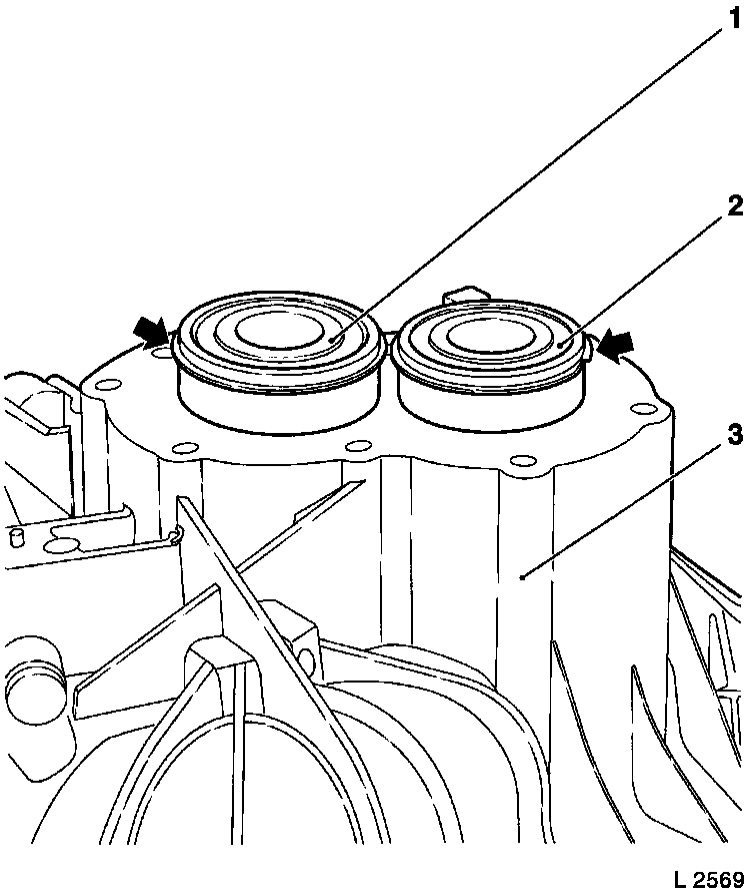


55. Detach **KM-6121** (2) when all shafts are seated in clutch housing, do not displace shift sleeve

Important: For following operation, differential, fluid pipe, magnet and shift lever shaft are not installed and surface sealant is not applied

56. Position transmission housing on clutch housing
Note: Main shaft and drive shaft must engage in their bearings in transmission housing. Intermediate shaft and gear shift forks must be seated in their thrust bearings in transmission housing

57. Position drive shaft bearing (1) and main shaft bearing (2) on transmission housing (3)
Note: Bearing retaining rings (arrowed) must not be detached from bearings. Retaining rings cannot be mounted with bearings installed. When replacing main shaft bearing, operation "Bearing, Main Shaft and/or Drive Shaft in Transmission Housing, Remove and Install" is observed



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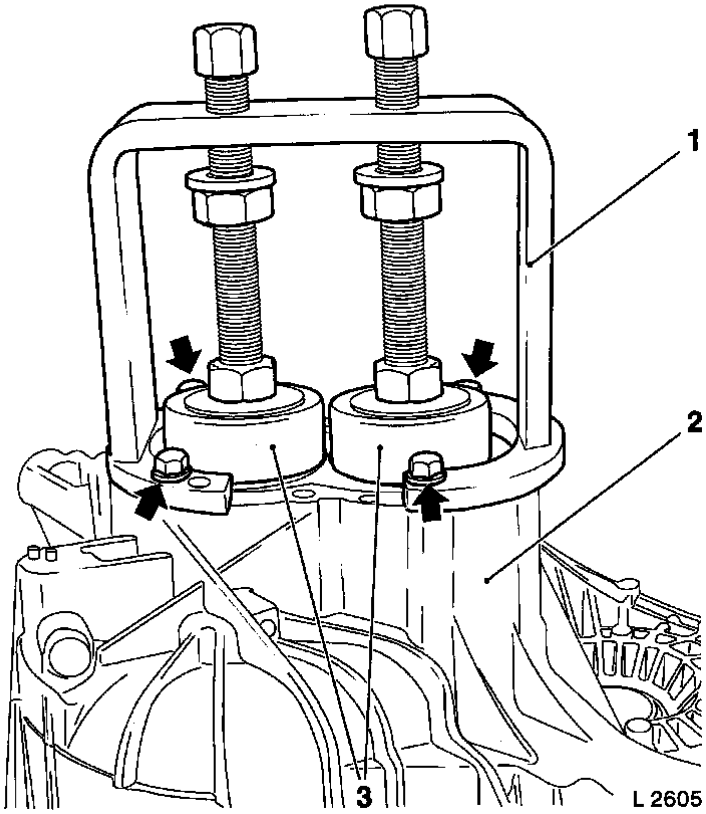
58. Install **KM-6116** (1) with thrust pieces (3) using 4x bolt (arrowed) to transmission housing (2)



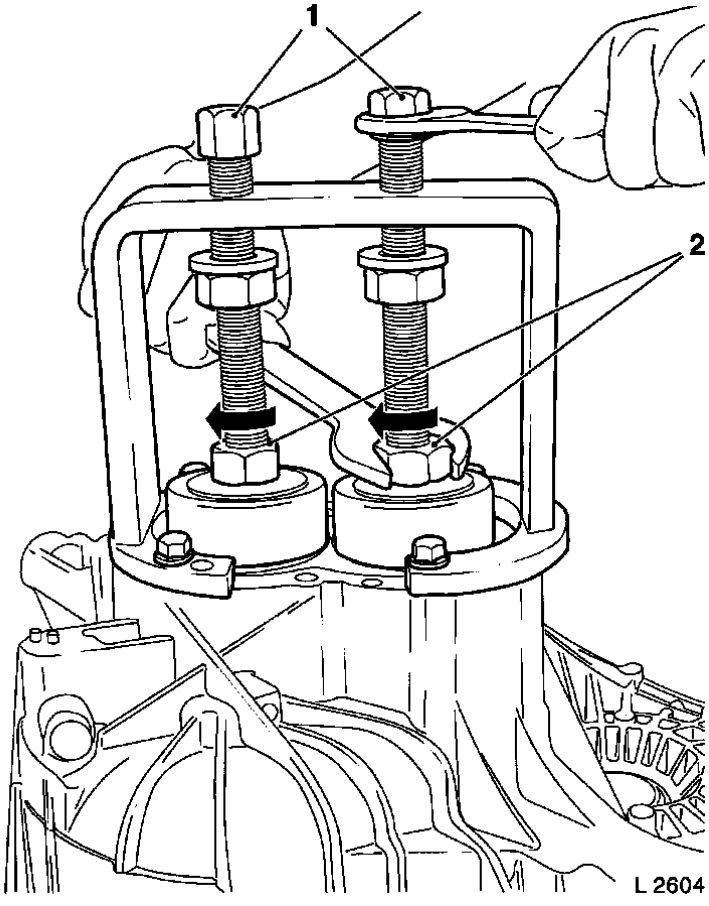
Important: In following section of operation, main shaft and drive shaft are pulled into their bearings in transmission housing and thus transmission housing is combined with clutch housing. Do no use any force. If large forces are necessary when actuating **KM-6116**, separate transmission housing and clutch housing again, check positioning of shaft and gear shift forks, then repeat operation

59. Screw in spindles in main shaft and drive shaft

60. Turn nut (2) in direction of arrow and counterhold spindle at head (1)

61. Pull main shaft and drive shaft uniformly into their bearings in transmission housing and thus press transmission housing onto clutch housing

62. Remove **KM-6116** from transmission



Note: If retaining rings of two shaft bearings do not bear against transmission housing, drive in both bearings with light taps in conjunction with **KM-6116-3** and plastic hammer until they bear against the retaining rings on transmission housing. Install 2x old bolt as an installation aid

63. Secure clutch housing and transmission housing assembly
- Install 4x bolt

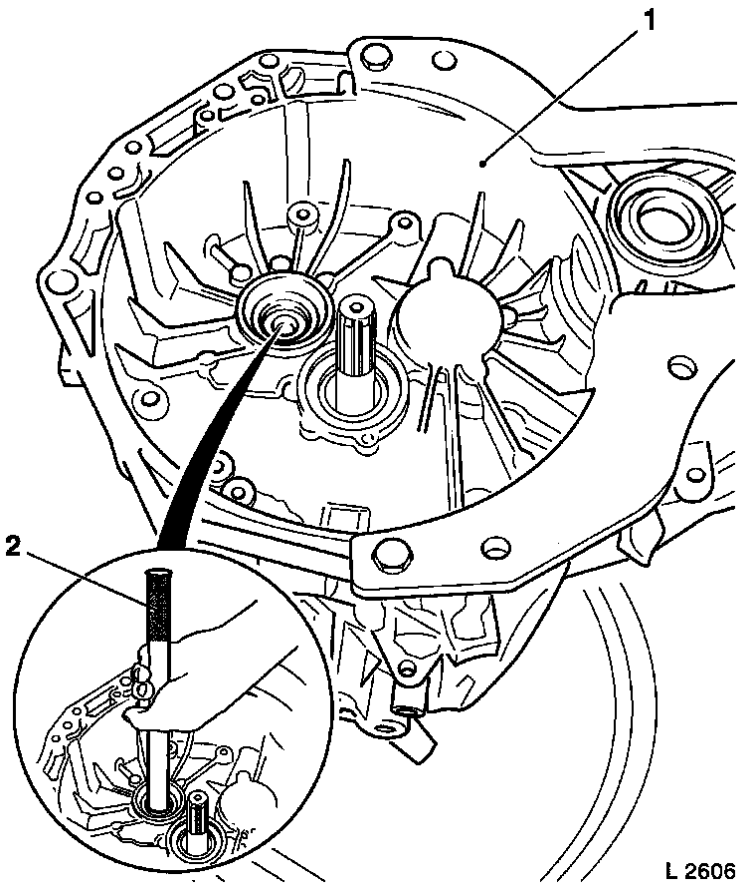
64. Turn transmission by 180° using **KM-6115** in**KM-113-2**

65. Remove 4x bolt

66. Hold transmission housing in position
- Second technician required

67. Drive intermediate shaft from clutch housing (1) using **KM-6126** in conjunction with **KM-523-1** (2)
Note: In this way, clutch housing and transmission housing are separated from one another

68. Lay transmission housing to one side on workbench



69. Support transmission housing with suitable piece of wood

70. Install differential (1) to transmission housing

71. Insert fluid guide pipe (5)

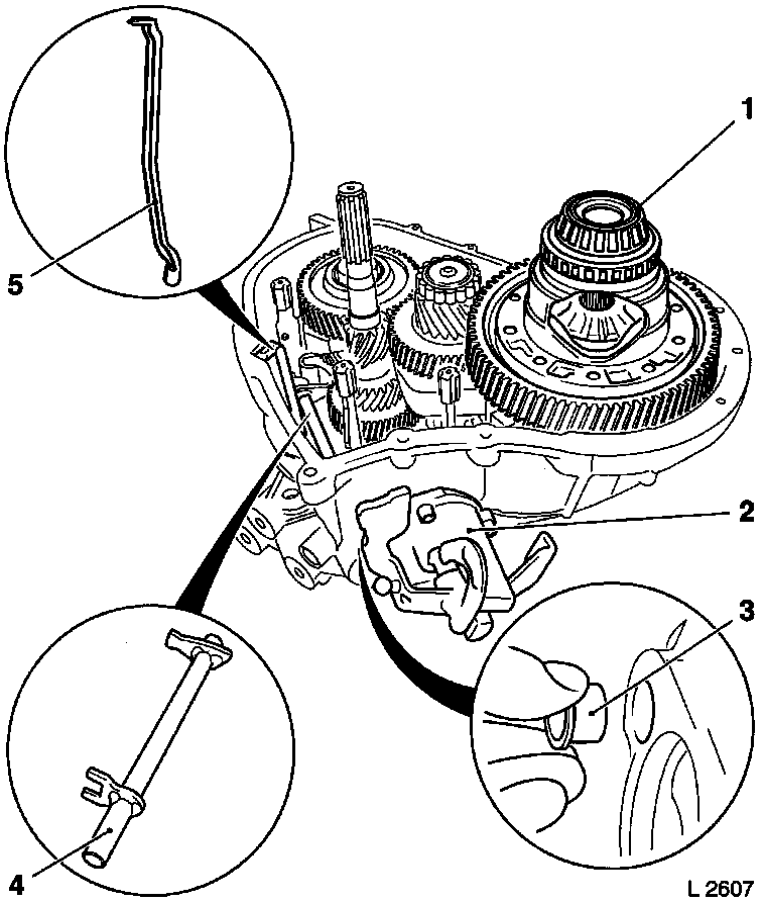
72. Install gearshift lever shaft (4) and guide sleeve (3)

73. Apply sealing compound to shift mechanism assembly

74. Insert shift

mechanism assembly (2) into transmission

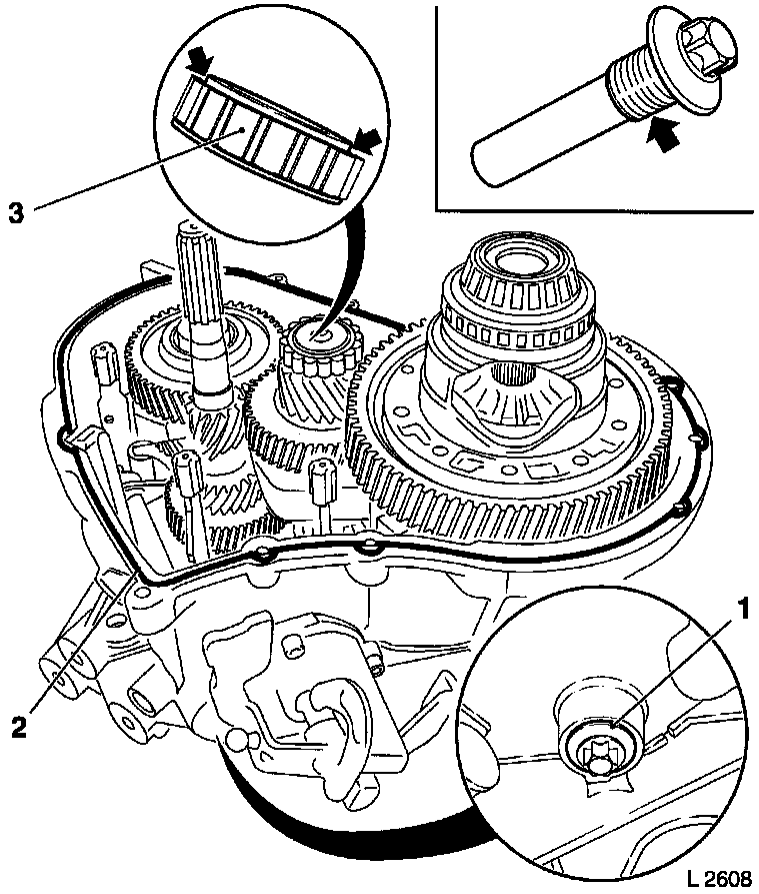
- Install 5x bolt **25 Nm**



75. Apply locking compound to thread of bolt (arrowed) of shift mechanism assembly

76. Install bolt for shift mechanism assembly (1) into transmission housing so that bolt engages in shift mechanism assembly

77. Apply sealing compound to sealing surfaces (2) of transmission housing (max. **2 mm** wide)
Note: Collar (arrowed) of main shaft roller bearing (3) points upwards



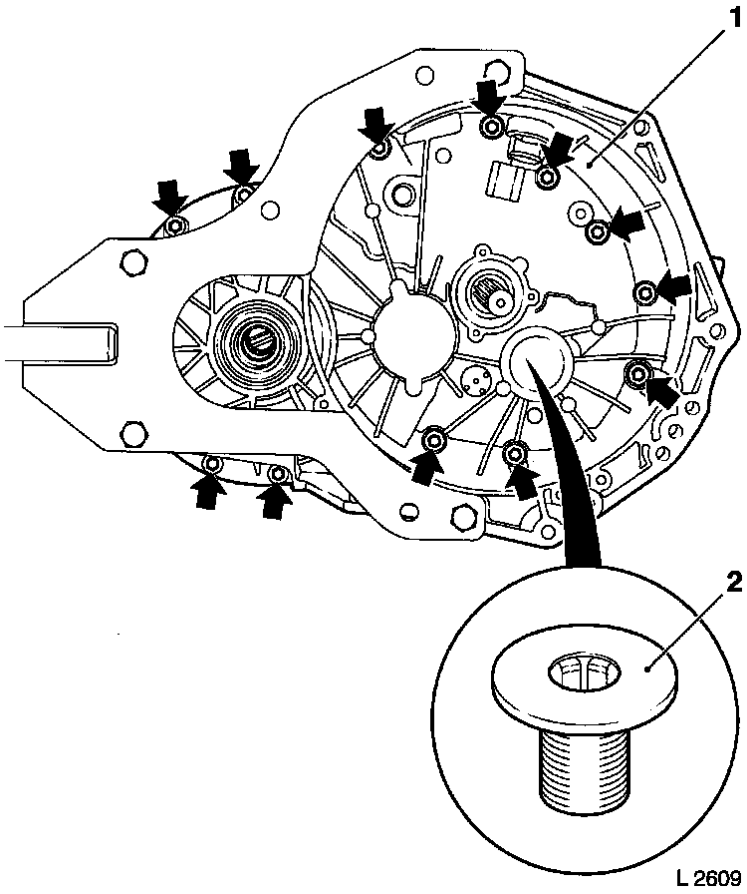
78. Remove clutch

housing from **KM-113-2** using **KM-6115**

79. Position clutch housing (1) on transmission housing with **KM-6115**
Note: Main shaft and drive shaft must engage in their bearings in clutch housing. Gear shift forks sit in their thrust bearings in clutch housing

80. Pull intermediate shaft into intermediate shaft bearing with old bolt (2)

81. Assemble clutch housing and transmission housing assembly
- Install 12x bolt (arrowed) **28 Nm**



82. Insert transmission into **KM-113-2** with **KM-6115**

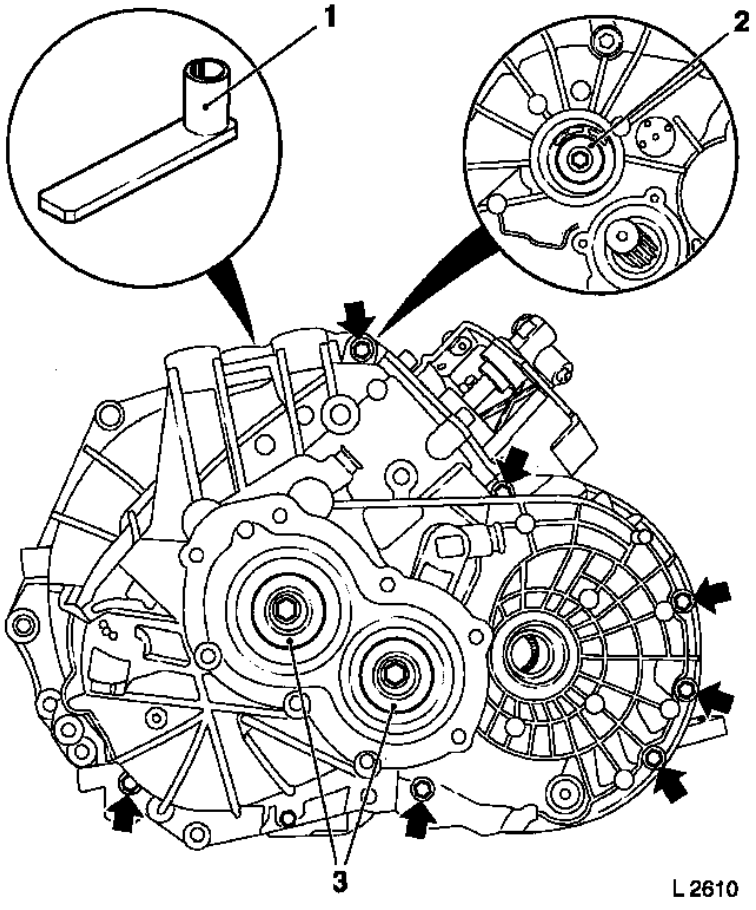
83. Attach 7x bolt (arrowed) **28 Nm**

84. Engage transmission in gear

85. Lock drive shaft using **KM-6117** (1)

86. Remove 2x old bolt (2, 3) from main shaft, intermediate shaft and drive shaft

87. Apply locking compound to 2x new bolt, then install in main shaft, intermediate shaft and drive shaft **100 Nm**

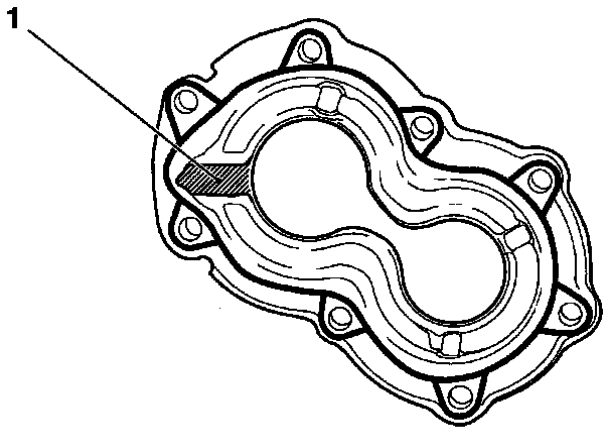


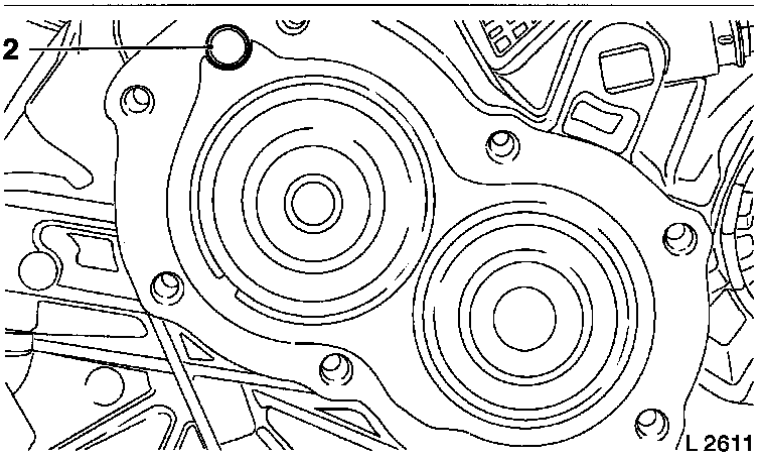
88. Insert fluid catcher

pipe

89. Coat transmission housing cover with sealing compound, leaving area (1) free to prevent blocking of fluid pipe (2)

90. Attach transmission housing cover to transmission housing
- Install 8x bolt **25 Nm**





91. Insert fluid spout (5) into intermediate shaft

92. Drive intermediate shaft cover (4) flush into clutch housing using **KM-6102**in conjunction with **KM-523-1** (3)

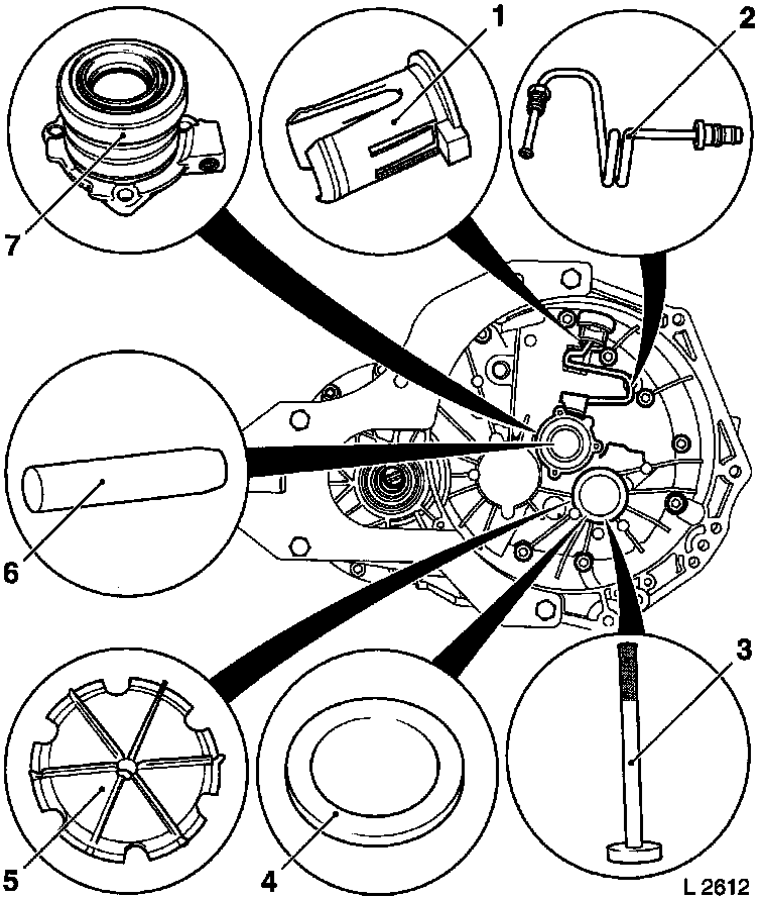
93. Install new central release (7) to drive shaft with **KM-6059** (6) and attach to transmission
- Install 3x bolt **10 Nm**

94. Remove **KM-6059**

95. Insert fastening sleeve (1) to clutch housing

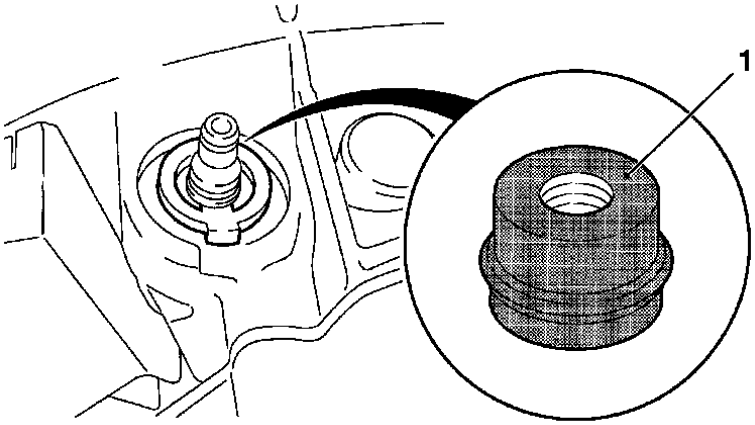
96. Insert pressure line (2) to fastening sleeve (1)
Note: Ensure Pressure line is engaged correctly

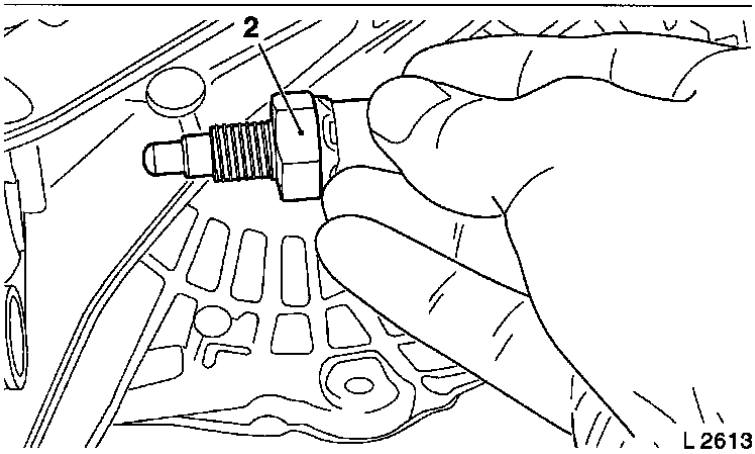
97. Install pressure line (2) to central release (7) **14 Nm**



98. Apply sealing

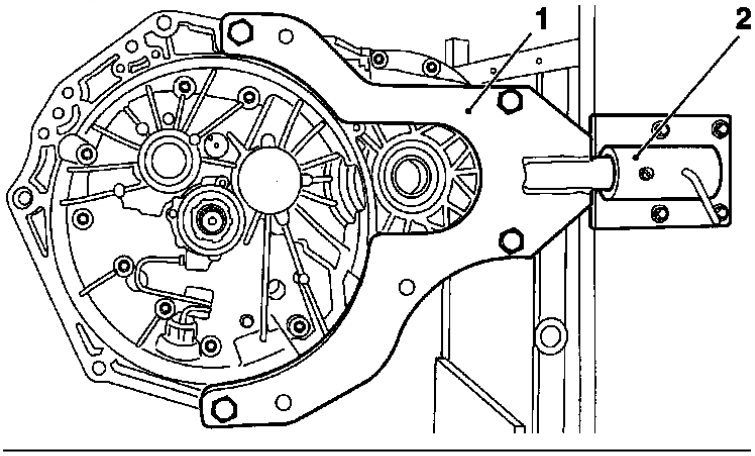
compound (green) to reverse lamp switch (2), then install to transmission **15 Nm**
Note: Pay attention to seating and state of seal ring (1)

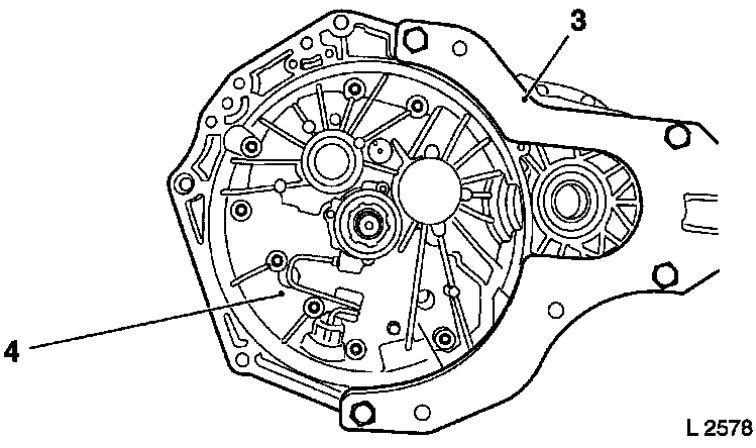




99. Remove transmission and **KM-6115**(1) from **KM-113-2** (2)

100. Remove **KM-6115** (3) from transmission (4)





101. Install transmission to vehicle - see operation "Transmission, Remove and Install"