5. Disassembly

5.1 General Instructions

Remember a safe work place and a safe attitude is extremely important when working under a vehicle.

During any work on any automatic transmission cleanliness is paramount. Prior to commencing work make sure all surrounding surfaces are as clean as possible, so when the transmission is opened up, either whilst in the vehicle or removed, minimise the ingress of foreign matter especially around the valve body, the galleries and the other internals of the transmission.

In this instance the internal inspections and the subsequent repair was undertaken with the transmission remaining in situ. This was very good as most foreign matter fell away from the transmission, as the majority of the work is in the main body of the transmission and entry if from underneath via the oil pan area, however, when removing the B2 Piston it is located in a horizontal plan and debris can enter.

Care must also be exercised that items do not fall out of their location within the transmission.

Adequate lighting is required and in this case a 50 watt quarts halogen work lamp, a battery powered lantern and a torch were used.

Ensure that the work area is clean and that paper is available to spread out under the gear box during disassembly with a quantity of lint free rags.

5.2 Tools

The following assortment of tools were used during the work:

1. Various screwdrivers and Phillip-headed screwdrivers.
2. Circlip pliers.
3. Socket sets, ½", 3/8" and1/4" drives including a deep socket set.
4. Tension wrench. Two were used, one is a micrometer adjusted tension wrench and the other is an analogue pointer gauge wrench. Preference was for the micrometer type for ease of operation especially during incremental torquing up of bolts and nuts as required.
5. Various hammers especially a soft headed hammer.
6. Metric Allen Keys with a ball head for ease of removing Allen headed set screws.
7. Multy Grip pliers.
8. Vernier Caliper.
9. Air Compressor and blow gun.
10. A clean work bench (a portable bench was used which was install in front or at the back of the vehicle to hold all the tools required and provide a clean

disassembly area). Cleanliness was enhanced by the use of white 'butchers' paper on the working surface of the bench and the garage floor under the transmission.

In fact not many actual tools were required to complete the work.

5.3 B2 Piston Removal

1. Remove the RHS exhaust pipe section in way of the transmission to gain unimpeded access to AT.
2. Remove heat shield located above exhaust pipe. This shield is held in place by hexogen headed set screws.
3. Clean up vehicle's under body area in way of transmission as well as transmission in way of the B2 piston.

5.4 Removal B2 Cover Plate

B2 Piston Assembly Cover Plate

4. The cover plate is held in position by a circlip and is held against the circlip by the spring loaded B2 Piston.
5. Inwards axial pressure applied to cover plate and circlip removed by using a small screwdriver. To assist in its removal the circlip was moved

circumferentially round in its recess until an end was within the gap in the retaining flange. The tang of the screwdriver was placed under the end of the circlip and it was worked out of it retaining grove.

6. Cover plate removed by the use of two small screwdrivers to lever the cover plate out. During removal the plate canted and jammed several times, which required it to be relocated square within the housing. It was not a difficult operation.

During investigations, some owners reportedly had problems pushing the B2 Piston Assembly Cover against the spring load and they made a small apparatus using a longish bolt and nut, fitted a old shock absorber washer behind the nut and cut a length of copper tube to fit between the vehicle body and the shock absorber washer with the bolt head butting against the Cover Plate with the nut fully screwed up against the bolt inner side of its head. This apparatus could be used in either direction. By using two open ended spanner the nut can be turned anticlockwise, and this will push the cover against the spring tension as required to relieve the pressure on the circlip.

B2 Piston aperture showing black lip seal behind which is located the plastic guide bush. The location of the thrust pin into the brake band is also visible in the centre of the hole. Also visible is the cover O-ring seal (red)

Bush and lip seal for B2 Brake Band Piston are located at the end of the bore in the aperture into the transmission as shown in the preceding photograph.

5.5 Removal and disassembly of B2 Piston Assembly

7. With the cover plate removed, it exposes the cover plate O-ring seal and the B2 Brake Band Piston Assembly, both of which can be easily removed.
8. Once removed it should be examined for damage. Initially the piston assembly looked satisfactory until a thorough strip-down and evaluation was undertaken.
9. The strip down of the B2 Brake Band Assembly was undertaken on a clean work bench on white paper.
10. Removed the internal piston circlip and withdrew the thrust pin thimble piece, which came away in two pieces.
11. Removed the spring.
12. Viewed the internals and noted pieces of metal (4 quadrants of a circular piece of metal) laying on the inner face of the non-return valve.
13. Withdrew the piston, however, there was no piston crown and the piston jammed a little whilst being withdrawn.
14. Removed the 4 pieces of material from on top of the non-return valve.
15. Removed the large circlip at the other end of the B2 piston assembly.
16. Removed the large spring with its retaining ring.
17. Removed non-return valve conical spring and its associated cruciform locating washer.

5.6 Examination of B2 Piston Assembly

1990 Porsche 928 S4 Auto B2 Brake Band Piston Failure

B2 Brake Band Piston Assembly
With a view of thimble piece and retaining circlip

B2 Brake Band Piston Assembly
with a view of retaining washer, spring, "T" plastic seal ring and OD of piston cylinder where lip seal seals

B2 Brake Band Piston Assembly
with spring retaining ring, circlip and cruciform piece holding the conical spring and non-return valve that can be seen through centre hole

The B2 Piston Assembly disassembled

5.7 The B2 Piston Assembly consists of:

1. Cirlip,
2. Conical spring,
3. Non return valve disc,
4. Spring and Retaining Ring,
5. B2 Piston Outer Assembly (brake band piston),
6. B2 Piston (inner piston),

7. Piston spring,
8. Thrust pin thimble piece,
9. Thrust Pin, and
10. Circlip.

This unit can be purchased as a single unit (6) as displayed in PET5 illustration 307-45 part number 107 270 003 2 for 89 model 928 S4 and onwards.

Individual parts can also be purchased such as:

1. Item 4 part number 900 906 037 00 Circlip A 42.
2. Item 5 part number 126 277 245 5 sealing ring.
3. Item 6 part number 124 270 003 2 piston brake band (this is the major assembly item and appears not to include the B2 internal Piston, the internal spring or the thrust pin thimble piece.
4. Item 7 part number 126 277 095 5 sealing ring (for internal piston). **Note:** If a new ring is installed the ring must be installed in the correct manner with the angled edge of the ring facing inboard in the Brake Band Piston Assembly. (Refer to the WSM for clarification and confirmation).
5. Item 8 part number 900 042 005 01 lock ring (to retain internal piston, spring and thimble piece).

The thrust pin comes in four different lengths:

1. Item 9 part number 126 277 171 5 pin 47.2 mm long
2. Item (9) part number 126 277 271 5 pin 48.0 mm long
3. Item (9) part number 126 277 371 5 pin 48.8 mm long
4. Item (9) part number 126 277 471 5 pin 49.6 mm long

These various lengths allow for adjustment of the brake band clearance.