# CHAPTER 4

# TOOLS

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TSD 2042

## CHAPTER 4

# TOOLS

The following is a list of special tools for the servicing and overhauling of the Automatic Gearbox; these are recommended for use when carrying out repairs and adjustments.

General tools are not included as it is felt that these will be available locally.

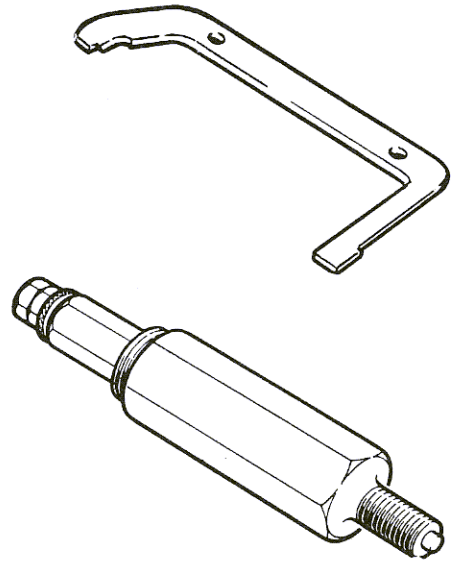
Orders should be addressed to

## ROLLS-ROYCE LIMITED

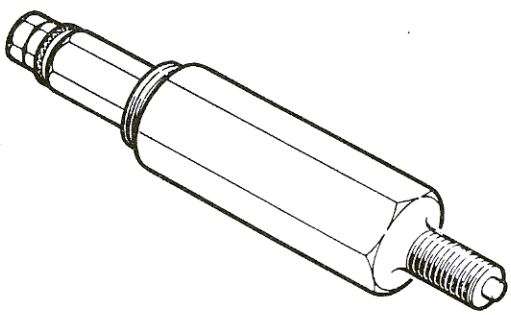
CREWE SERVICE DEPARTMENT
Pym's Lane, Crewe, Cheshire
*Telephone:* Crewe 55155
*Telegrams:* 'ROYCRU, CREWE'
*Telex:* 3621

LONDON SERVICE DEPARTMENT
Hythe Road, Willesden, London, N.W.10
*Telephone:* LADbroke 2444
*Telegrams:* 'SILVAGOST, WESPHONE, LONDON'
*Telex:* 25133

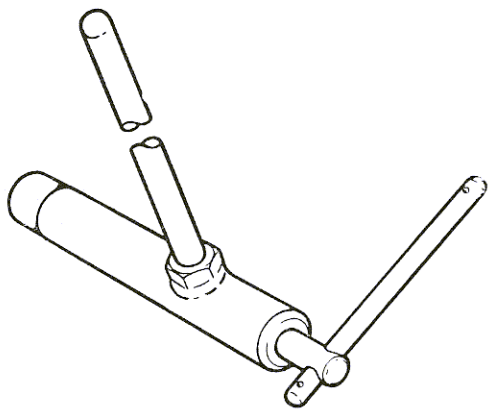
| Bands | Part number |
|---|---|
| Gauge — Rear band setting .. .. .. | .. 23789/G1002 |
| Tool — Front band setting — Early 'R' type | .. RH 671 |



Tool — Front band setting — 'R' and 'S' type .. UR 3144

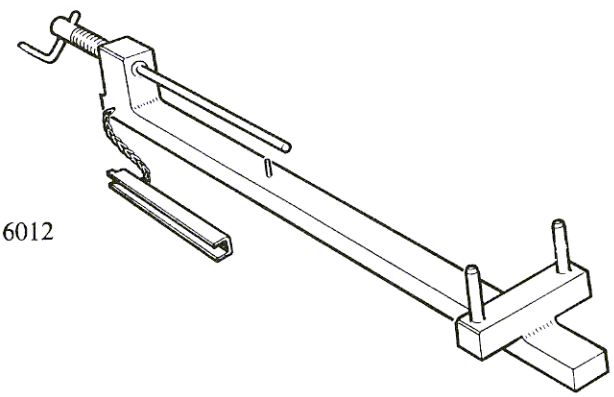


Tool — Band adjuster.. .. .. .. .. RH 131



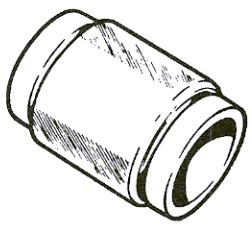
## Servos

Compressor — Rear servo spring .. .. STD 6012



## Governor

Alignment gauge — Governor sleeve .. .. RH 329



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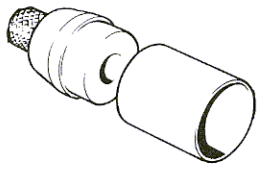
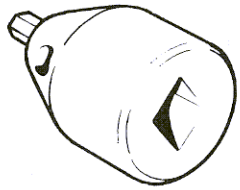
Assembly sleeve — Oil sealing ring .. .. 25937/T1002–5

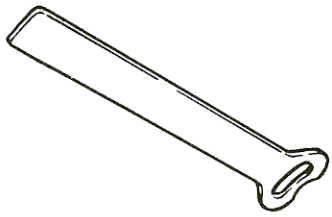


## Front pump

Adaptor — Torque spanner .. .. .. 26225/T1002

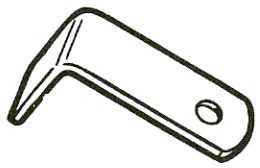


Holding tool — Front pump .. .. .. STD 6007



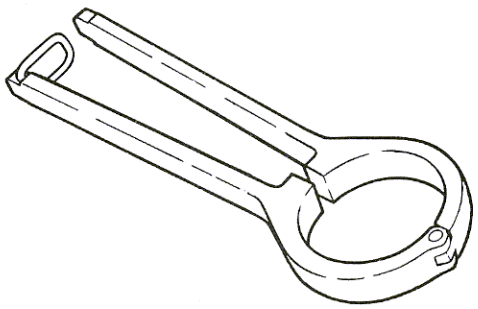
## Rear clutch

Hub retainer .. .. .. .. .. 23789/T1001



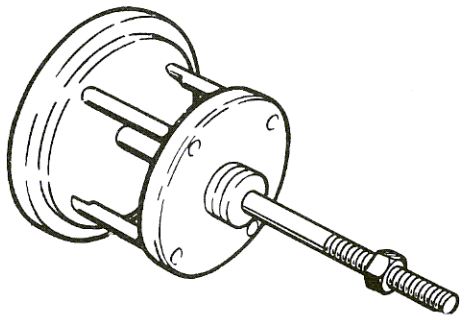
## Oil delivery sleeve

Compressing tool — Oil delivery sleeve ring .. RH 186

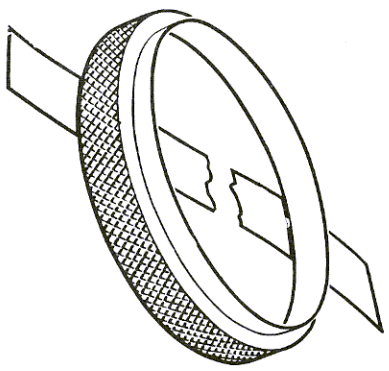


## Reverse clutch

Compressing tool — Reverse clutch spring .. 23789/F1002

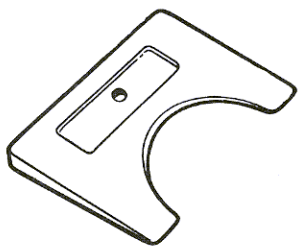


Installing tool — Piston to drum .. .. 23789/F1004



## Drums

Spacer — Front drum .. .. .. .. STD 6010



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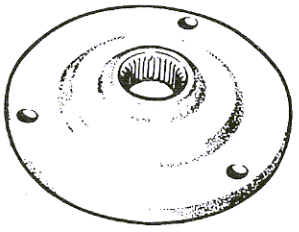
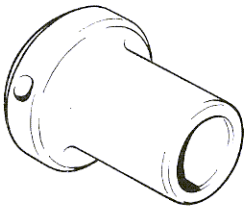
## Shafts

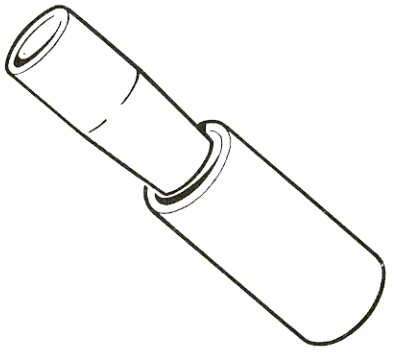
Holding fixture — Intermediate shaft .. .. RH 584



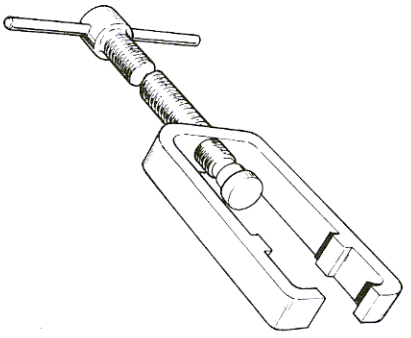
Checking sleeve — Mainshaft end float .. 23789/T1005



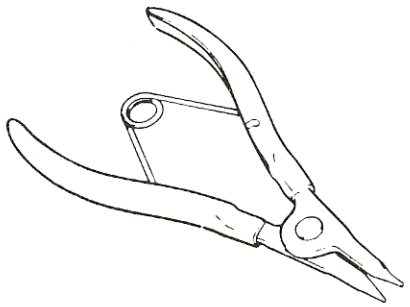
Assembly tool — Mainshaft snap ring .. RH 551



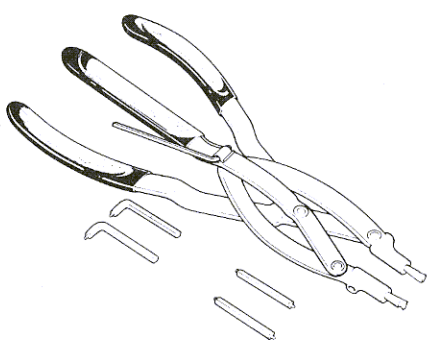
Extractor — Output shaft bearing .. .. 32794/T1001



Pliers — Circlip .. .. .. .. RH 166

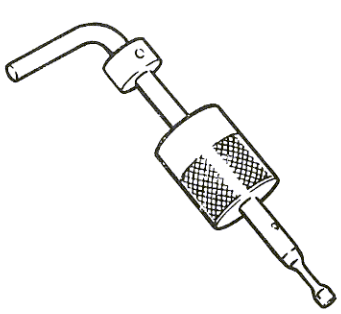


Pliers — 2-way — Snap ring .. .. RH 7674
(May be used for further applications using the various nose pieces)



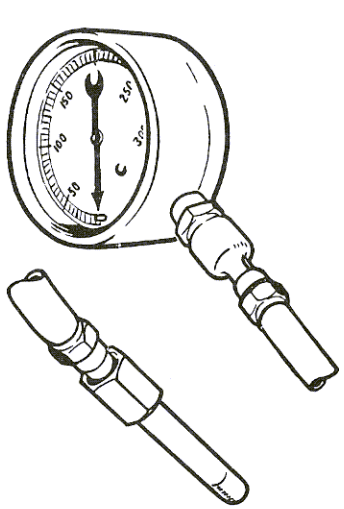
## Casing

Extractor — Exhaust valve — Early 'R' type .. STD 6003



## Pressure checks

Pressure gauge .. .. .. .. .. R 5244



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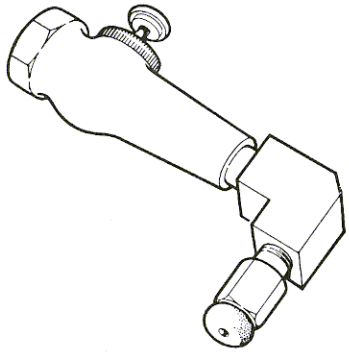
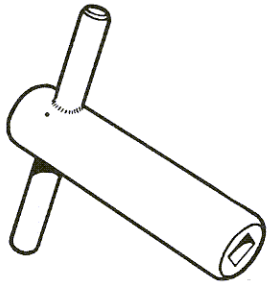
Adaptor — Air checking .. .. .. .. R 5280

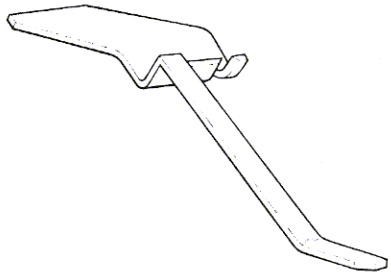


Spanner — Square holed — Blanking plug .. RH 412

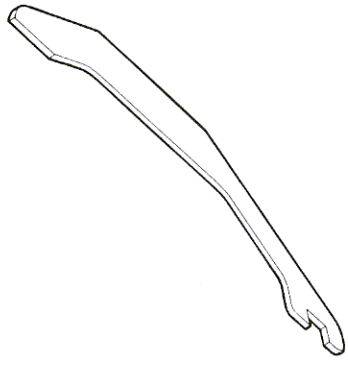


## Controls

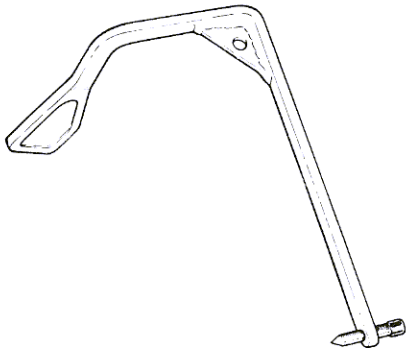
Gauge — Throttle linkage — 'R' type .. .. RH 581



Gauge — Throttle setting — 'R' type .. 24918/G1002



Gauge — Throttle linkage — S1 cars .. .. RH 407



Circulation - All Distributors and Retailers other than North America.

CATEGORY B

# PHANTOM VI GEARBOX OIL COOLERS

## APPLICABLE TO:

All Rolls-Royce Phantom VI motor cars.

## DESCRIPTION

A number of recent complaints of slipping gearchanges in cars used frequently in city conditions have been attributed to overheated gearbox oil. The overheated oil causes slip between the clutch plates on drive take-up resulting in harsh and jerky gear changes.

To overcome this problem, a gearbox oil cooler has been developed and is now available in kit form.

The oil cooler is fitted in the left-hand front wing behind the small grille known as the "snow pack". Using a restrictor, a percentage of oil is taken from the gearbox front pump pressure take-off point and is passed through the oil cooler before being returned to the gearbox sump.

It is important that all Phantom VI motor cars are fitted with these oil coolers at the earliest opportunity, e.g. at the next scheduled service, or in the case of complaint.

Note It should first be ascertained that the gearbox is functioning normally.

## PROCEDURE

1. Firmly apply the handbrake, chock the rear wheels and disconnect the battery. Jack up the front of the car and remove the left-hand front wheel.

2. Remove the setscrew from the radiator bracket under the left-hand front wing (see Fig. 1).

Continued...

3. Use the setscrew previously removed, locate the mounting plate RH.8360 (Figure 1 (1)) against the valance, and using this as a template, drill a hole 0.281 in. (7,1 mm.) dia. to the rear of the setscrew.

4. Fit the upper cover assembly (Figure 2 (2)) RH.8354, to the oil cooler (Figure 2 (5)) using four 0.250 in. (6,35 mm.) dia. nuts, bolts and washers as shown in Figure 2.

5. Attach the plate RH.8360 (Figure 1 (3)) to the left-hand side of the upper cover (Figure 2 (2)) using two 2B.A. setscrews and washers such that it protrudes horizontally from the rear of the assembly.

   Note An exploded view of the oil cooler assembly is shown in Figure 2.

6. Fit the lower cover (Figure 2 (4)) RH.8357 and the right-hand support bracket (Figure 2 (3)) RH.8359 to the assembly with the ears of the lower cover inside the side pieces of the upper cover and the flange on the support bracket towards the front of the assembly. Secure with four 2B.A. setscrews and washers to the weld nuts in the lower cover.

7. Clean the area under the left-hand front wing behind the "snowpack" so that the oil cooler will be tightened and sealed against a clean flat surface.

8. Locate the assembly under the wing using the radiator bracket securing setscrew; check the position of the hole in the body flange below the oil cooler to ensure alignment with the hole in the support bracket (Figure 2 (3)). If alignment is not possible, drill a new hole 0.281 in. (7,10 mm.) dia.

Continued...

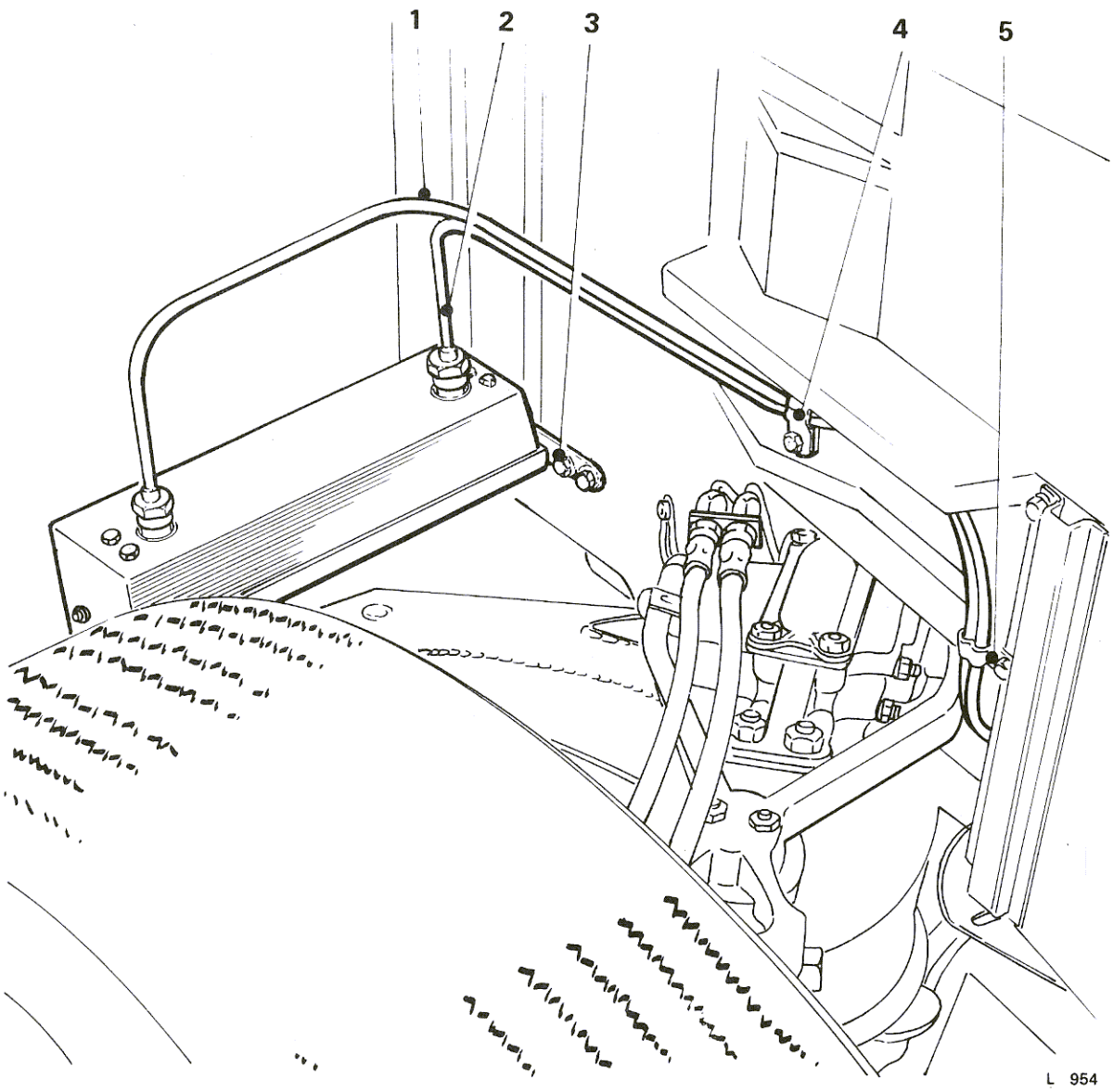



Figure 1 Oil cooler in position behind left-hand "snowpack"

1. Pipe (RH.8367).
2. Pipe (RH.8365).
3. Mounting plate (RH.8360).
4. Clip (UR.14505).
5. Clip (UR.14505).

Continued...

9. Fit the assembly beneath the wing.

10. Fit the pipe RH.8365 (Figure 1 (2)) to the inboard outlet on the cooler and the pipe RH.8367 (Figure 1 (1)) to the outboard outlet. Do not tighten the unions at this stage (see Figure 1).

11. Fit a clip (Figure 1 (4)) UR.14505 to the pipes on the vertical section of their run behind the damper and secure with the lower existing bolt supporting the forward edge of the engine access plate.

12. Fit the second clip (Figure 1 (5)) UR.14505 to the pipes at a point coincident with the alternator clearance indentatation in the valance.

13. Using the clip as a template and supporting the pipes horizontally, carefully drill a hole 0.281 in. (7,1 mm.) dia. and secure the clip with a 0.250 in. (6,35 mm.) dia. bolt, nut and washer.

14. Tighten the unions on the oil cooler.

15. Drain the oil from the gearbox.

16. Remove the left-hand side undertray and the gearbox band adjusting screws access plug.

17. Fit the plate (Figure 3 (7)) RH.8376 to the gearbox bell housing using a 0.50 in. (12,7 mm.) dia. setscrew in the position shown in Figure 3.

18. Remove the square headed plug located between the two gearbox band adjusting screws.

19. Fit the pipe (Figure 3 (8)) RH.8371 to the tapping point using the banjo bolt restrictor (Figure 3 - Inset A (1)) RH.8375 and sealing washers as supplied.

20. Fit the adaptor (Figure 3 (4)) RH.8378 in place of the gearbox sump drain plug using sealing washers.

21. Fit the pipe (Figure 3 (3)) RH.8369 to the adaptor RH.8378 using the banjo bolt (Figure 3 (5)) RE.14445 and sealing washers.

Continued...

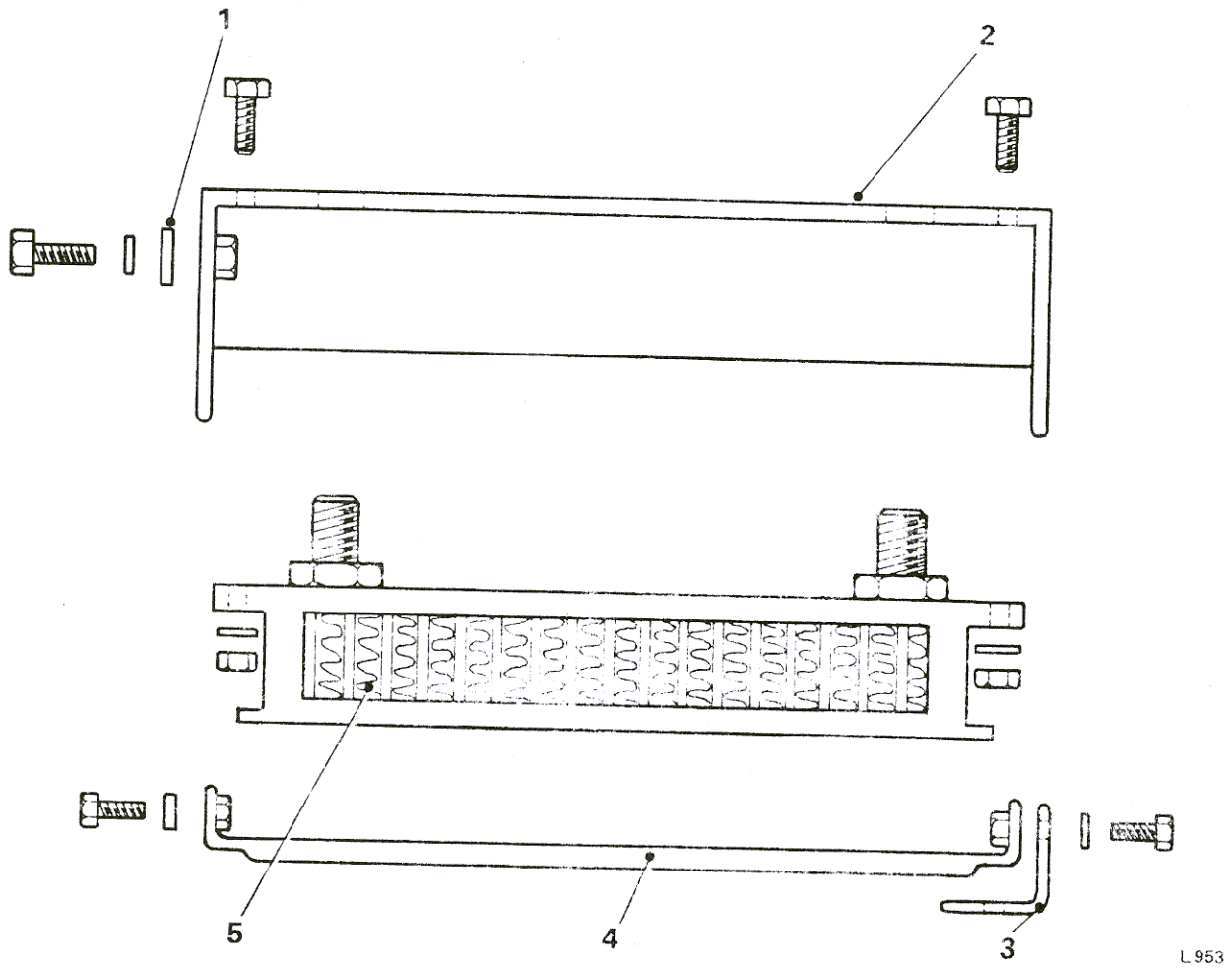



Figure 2 Exploded view of oil cooler assembly

1. Plate (RH.8360).
2. Top cover (RH.8354).
3. Support bracket (RH.8359).
4. Lower cover (RH.8357).
5. Oil cooler.

Continued....

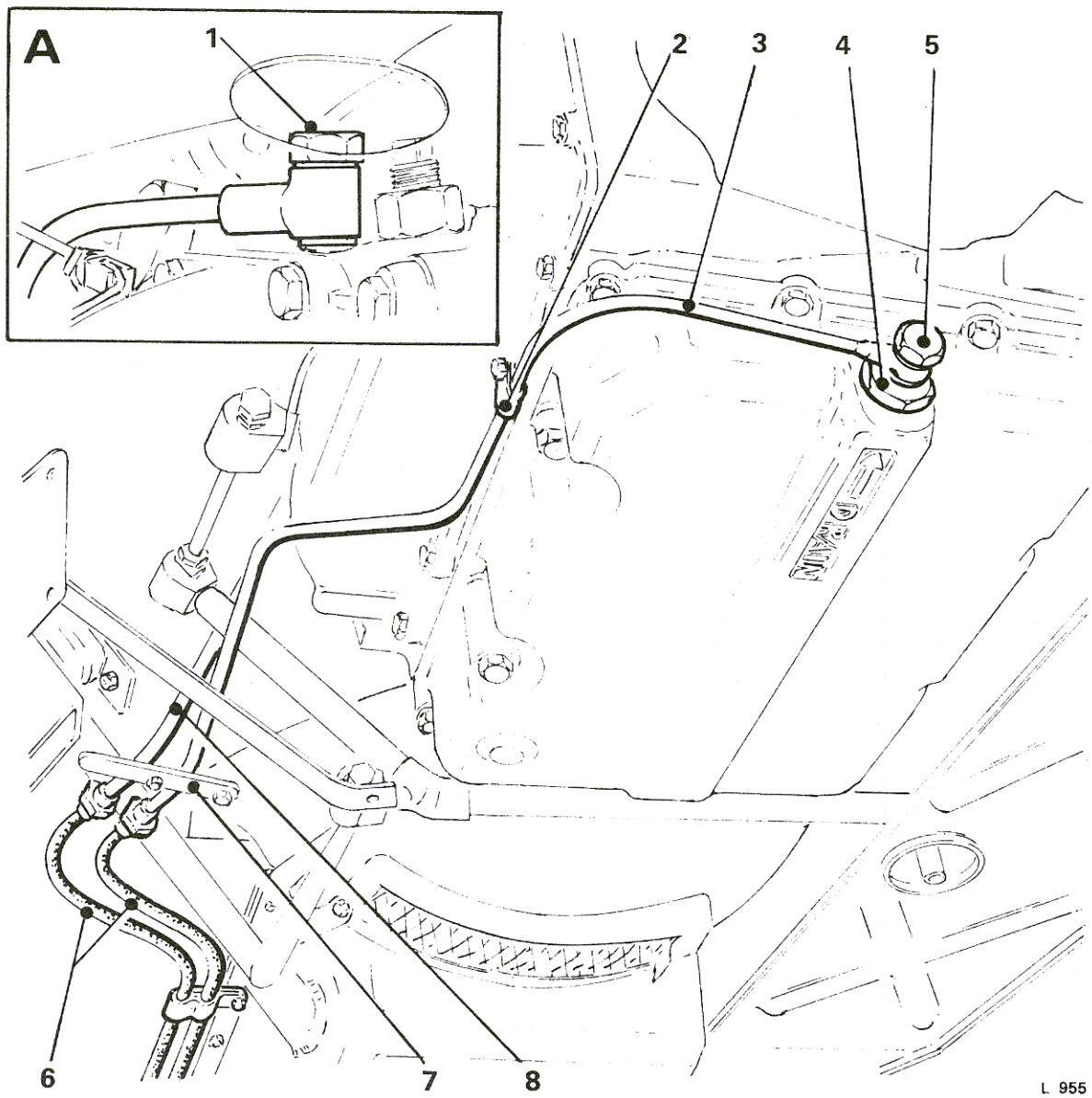



Figure 3 Pipes fitted to gearbox

Inset A. Banjo bolt restrictor fitted at the point between the two band adjusting screws.

1. Banjo bolt restrictor (RH.8375).
2. Clip.
3. Pipe (RH.8369).
4. Adaptor (RH.8378).
5. Banjo bolt (RE.14445).
6. Flexible pipes (RH.8379).
7. Plate (RH.8376).
8. Pipe (RH.8371).

Continued...

22. Ensure that the forward ends of both pipes lie on top of the bell housing plate (Figure 3 (7)) and pass either side of the gearbox actuation linkage, the pipe (Figure 3 (3)) from the gearbox sump lying inboard of pipe '8' shown in Figure 3.

Clip the pipe (Figure 3 (3)) to the gearbox control box as shown in Figure 3 (2)).

23. Clip the two pipes to the bell housing plate.

24. Ensure that the gearbox actuation linkage does not foul the pipes.

The run of the pipes may be modified to give adequate clearance.

The gearbox linkage fitted to left-hand drive cars uses a steady bracket in the vicinity of the forward ends of these pipes. Attention must be paid to the run of the pipes at this point to ensure that adequate clearance exists around the bracket and the gearbox linkage in all positions of the gear selector lever. The run of the pipes should be carefully adjusted should this be necessary.

25. Use the two flexible pipes (Figure 3 (6)) RH.8379 to connect the two pairs of copper pipes.

Note The direction of oil flow through the oil cooler is unimportant.

26. Clip the flexible pipes to the sump using a convenient sump setscrew.

27. Ensure that all the unions are correctly tightened.

28. Fill the gearbox with oil, noting that the oil cooler will only require one additional pint (0,5 litre) of oil.

29. Fit the access plug, the undertray and the wheel.

30. A brief test should be carried out to ensure the system is free of leaks.

MATERIAL REQUIRED:
Kit number 15

TIME ALLOWED - 6 hours