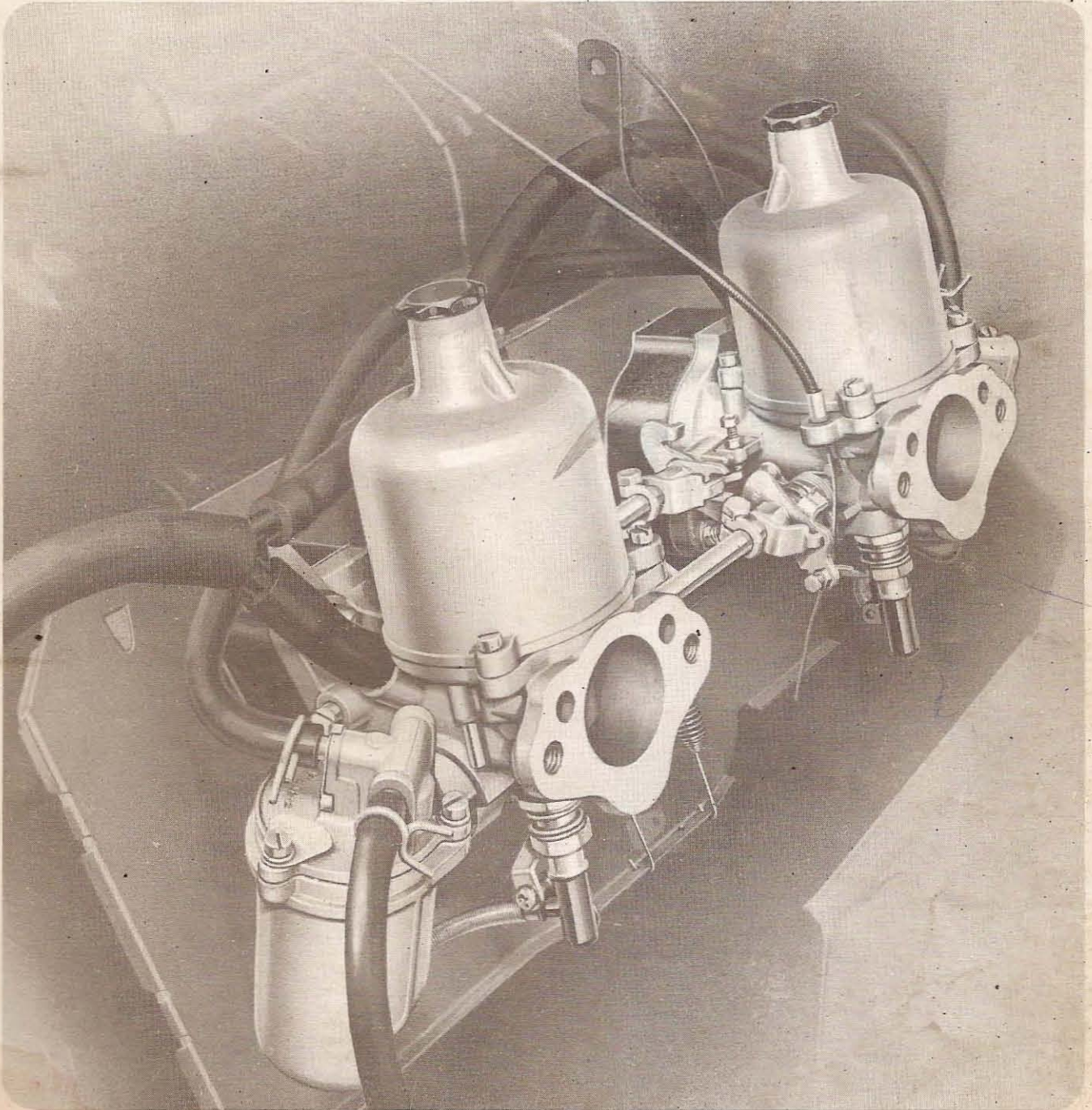




# Type HS Carburettors

## TUNING & SERVICING



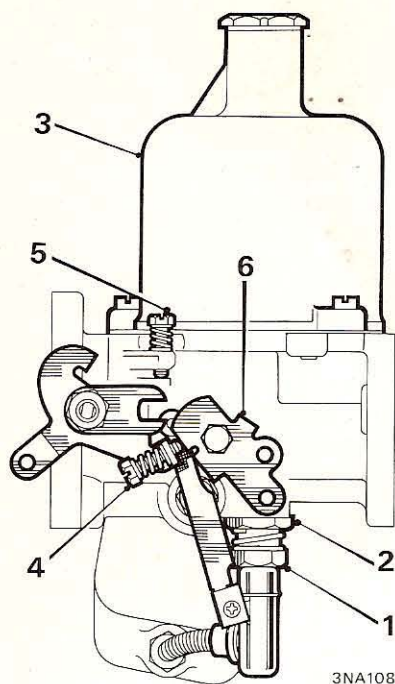
**SU Carburettors**

Wood Lane, Erdington, Birmingham B24 9QS

Telephone 021-373 7371 Telex: 338342 Telegrams: Carburflex Birmingham

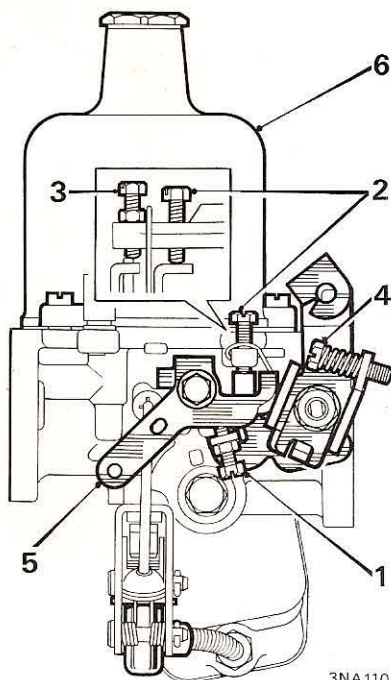
AUC 9942  
AKD 8670





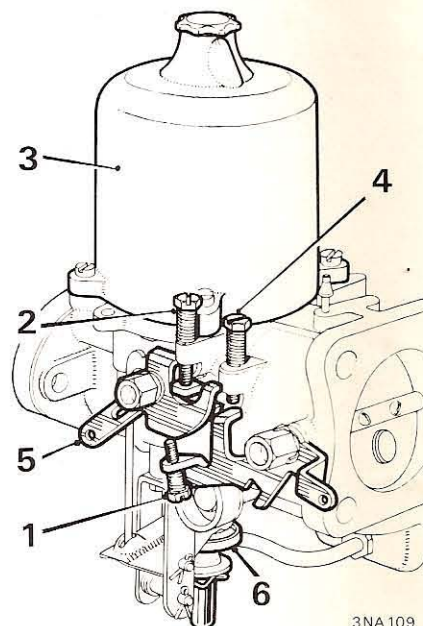
3NA108

HS2-HS4-HS6



3NA110

HS4C



3NA109

HS8

1. Jet adjusting nut
2. Jet locking nut
3. Suction chamber assembly
4. Fast-idle adjusting screw
5. Throttle adjusting screw
6. Cam lever

1. Fast-idle adjusting screw
2. Throttle adjusting screw
3. Jet adjusting screw
4. Lost motion adjusting screw
5. Cam lever
6. Suction chamber assembly

1. Fast-idle adjusting screw
2. Jet adjusting screw
3. Suction chamber assembly
4. Throttle adjusting screw
5. Cam lever
6. Temperature compensator

## TUNING—TYPE HS CARBURETTERS

### Foreword

These instructions are intended as a general guide for tuning and servicing the Type HS carburettors and variants in both single and multi-installations. It is essential, particularly where vehicles are equipped and tuned to comply with engine emission control regulations, that the carburettors are tuned in accordance with the vehicle manufacturer's tuning data.

To achieve the best results when tuning, the use of a reliable tachometer, balancing meter and an exhaust gas analyser (CO meter of the infra-red non-dispersive type or equivalent are required). **These instruments are essential when tuning vehicles equipped to conform with exhaust emission regulations.**

Before servicing or tuning a carburettor in an endeavour to rectify poor engine performance, make sure that the maladjustment or fault is not from another source by checking the following:

- Valve clearance
- Spark plug condition
- Contact breaker (dwell angle)
- Ignition timing and advance
- Presence of air leaks into the induction system

**NOTE:** Each instruction in this leaflet has a sequence number, and to complete a tuning or servicing operation efficiently it is essential that the instructions are performed in numerical sequence. Where applicable, the sequence numbers identify the relevant components in the appropriate illustration.

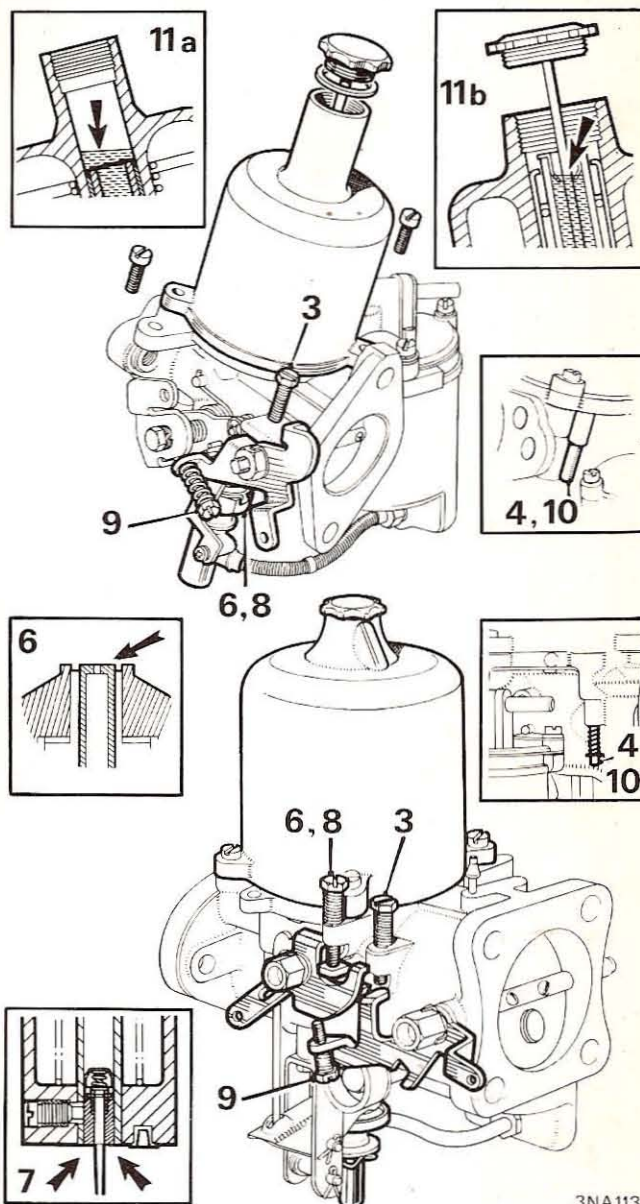


## Single and multi-carburettor installations

1. Remove the air cleaner(s).
2. Check the throttle for correct operation and signs of sticking.
3. Unscrew the throttle adjusting screw (each screw multi-carburetters) until it is just clear of the throttle lever with the throttle closed, then turn the screw clockwise  $1\frac{1}{2}$  full turns (single), one turn on each (multi-).
4. Raise the piston of each carburettor with the lifting pin and check that it falls freely onto the bridge when the pin is released. If the piston shows any tendency to stick, the carburettor must be serviced.
5. Lift and support the piston clear of the bridge so that the jet is visible; if this is not possible due to the installed position of the carburettor, remove the suction chamber assembly.
6. Turn the jet adjusting nut/screw up/anti-clockwise until the jet is flush with the bridge or as high as possible without exceeding the bridge height. Ensure that the jets on multi-carburetters are in the same relative position to the bridge of their respective carburetters.
7. Check that the needle shank is flush with the underside of the piston.
8. Turn the jet adjusting nut/screw two turns down/clockwise (each nut/screw multi-carburetters).
9. Turn the fast idle adjusting screw anti-clockwise (each screw multi-carburetters) until it is well clear of the cam.
10. Refit the suction chamber assembly if it has been removed and, using the lifting pin, check that the piston falls freely onto the bridge.

**NOTE:** If ball bearing suction chambers are fitted take care not to wind up piston spring when refitting the suction chamber—see item 38 d, page 9.

11. Check the piston damper oil level:
  - a. *Standard suction chambers.* Unscrew the cap and withdraw the damper. Top up with engine oil (preferably S.A.E. 20) until the level is  $\frac{1}{2}$  in (13 mm) above the top of the hollow piston rod, refit the damper and screw the cap firmly into the suction chamber.
  - b. *Ball bearing suction chambers.* Unscrew the cap and raise the piston and damper to the top of their travel. Fill the recess in the damper retainer with engine oil (preferably S.A.E. 20). lower the damper until the cap contacts the suction chamber, repeat this procedure until the oil level is just visible at the bottom of the retainer recess. Screw the cap firmly into the suction chamber.
12. *Vehicles with emission control.* Connect a reliable tachometer to the engine in accordance with the instrument manufacturer's instructions.



3NA113

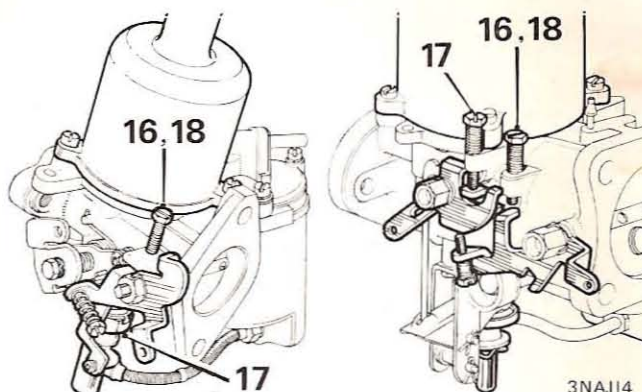
13. Start the engine and run it at a fast idle speed until it attains normal running temperature, then run it for a further five minutes.
14. Increase the engine speed to 2,500 rev/min for 30 seconds.
15. *Vehicles with emission control.* Connect an exhaust gas analyser to the engine in accordance with the instrument manufacturer's instructions.

Setting can now commence. If the correct setting cannot be obtained within three minutes, increase the engine speed to 2,500 rev/min for 30 seconds and then re-commence tuning. Repeat this clearing operation at three-minute intervals until tuning is completed.

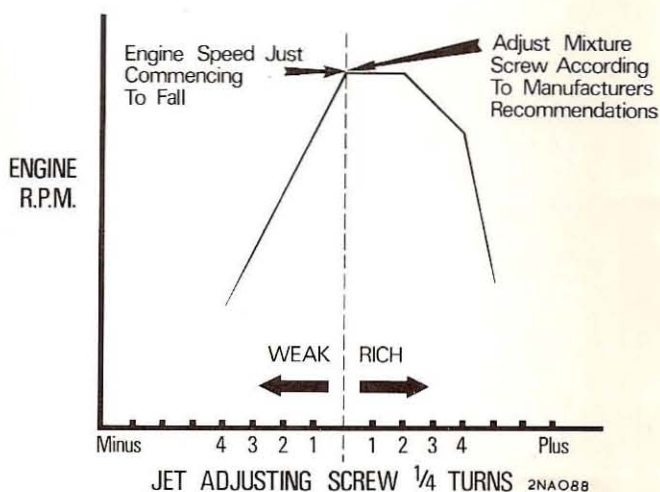


## Single carburetters

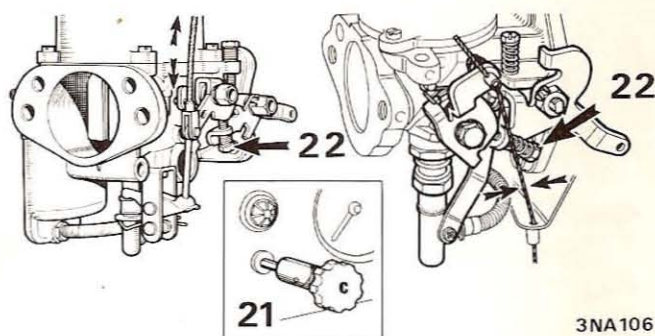
16. Adjust the throttle adjusting screw until the correct idle speed (see vehicle manufacturer's tuning data) is obtained.
17. Turn the jet adjusting nut/screw, down/clockwise to enrich or up/anti-clockwise to weaken, until the fastest speed is indicated; turn the nut/screw up/anti-clockwise until the engine speed just commences to fall. Turn the nut/screw down/clockwise very slowly the minimum amount until the maximum speed is regained. From this setting adjust the mixture screw according to the vehicle manufacturer's recommendations.
18. Check the idle speed, and re-adjust it as necessary with the throttle adjusting screw to obtain the correct setting.
19. *Vehicles with emission control.* Using the exhaust gas analyser, check that the percentage CO reading is within the limits given by the vehicle manufacturer. If the reading falls outside the limits given, reset the jet adjusting nut/screw by the minimum amount necessary to bring the reading just within the limits. If an adjustment exceeding three flats of the nut/half a turn of the adjusting screw is required to achieve this, the carburettor must be removed and serviced.



3NA114



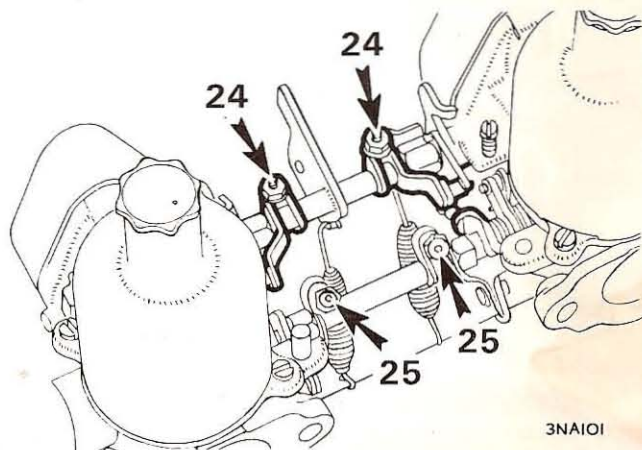
20. With the fast idle cam against its return stop, check that a  $\frac{1}{16}$  in (1.5 mm) free movement of the mixture control (choke) cable exists before the cable moves the cam.
21. Pull out the mixture control (choke) until the linkage is about to move the jet.
22. Turn the fast idle adjusting screw clockwise until the correct fast idle speed (see vehicle manufacturer's recommendations) is obtained.
23. Refit the air cleaner.



3NA106

## Multi-carburetters

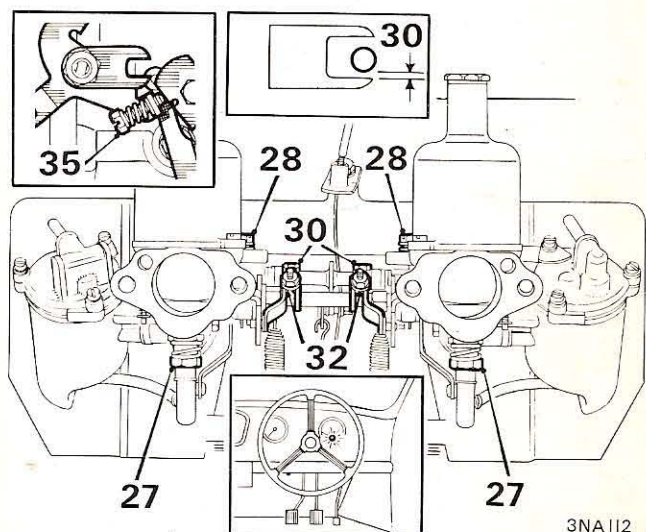
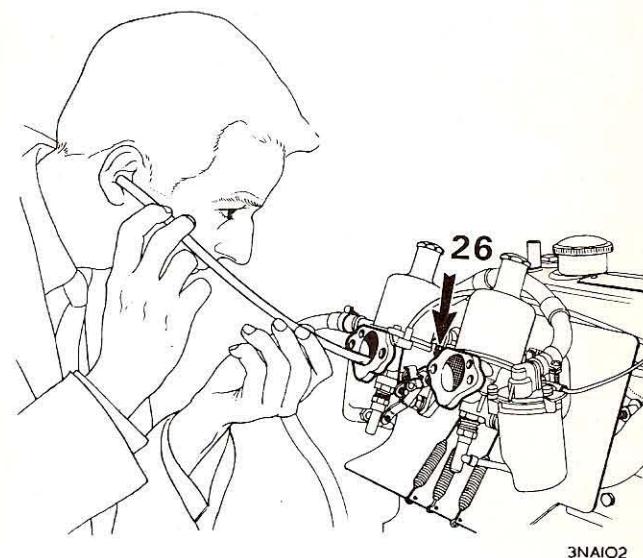
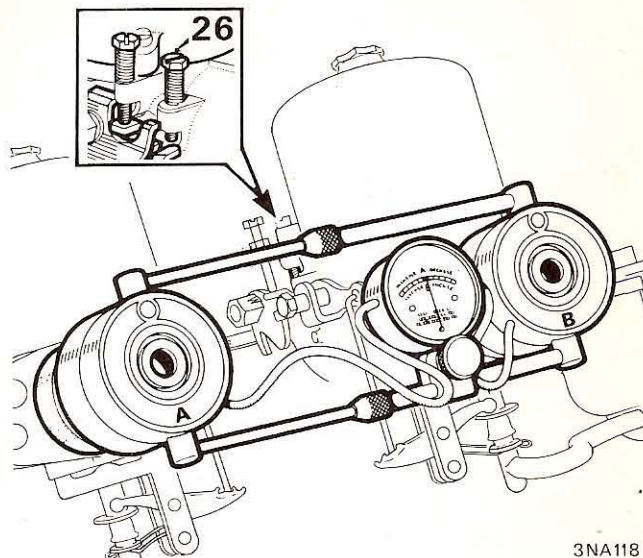
24. Slacken both clamping bolts on the throttle spindle interconnections.
25. Slacken both clamping bolts on the cold start interconnections.



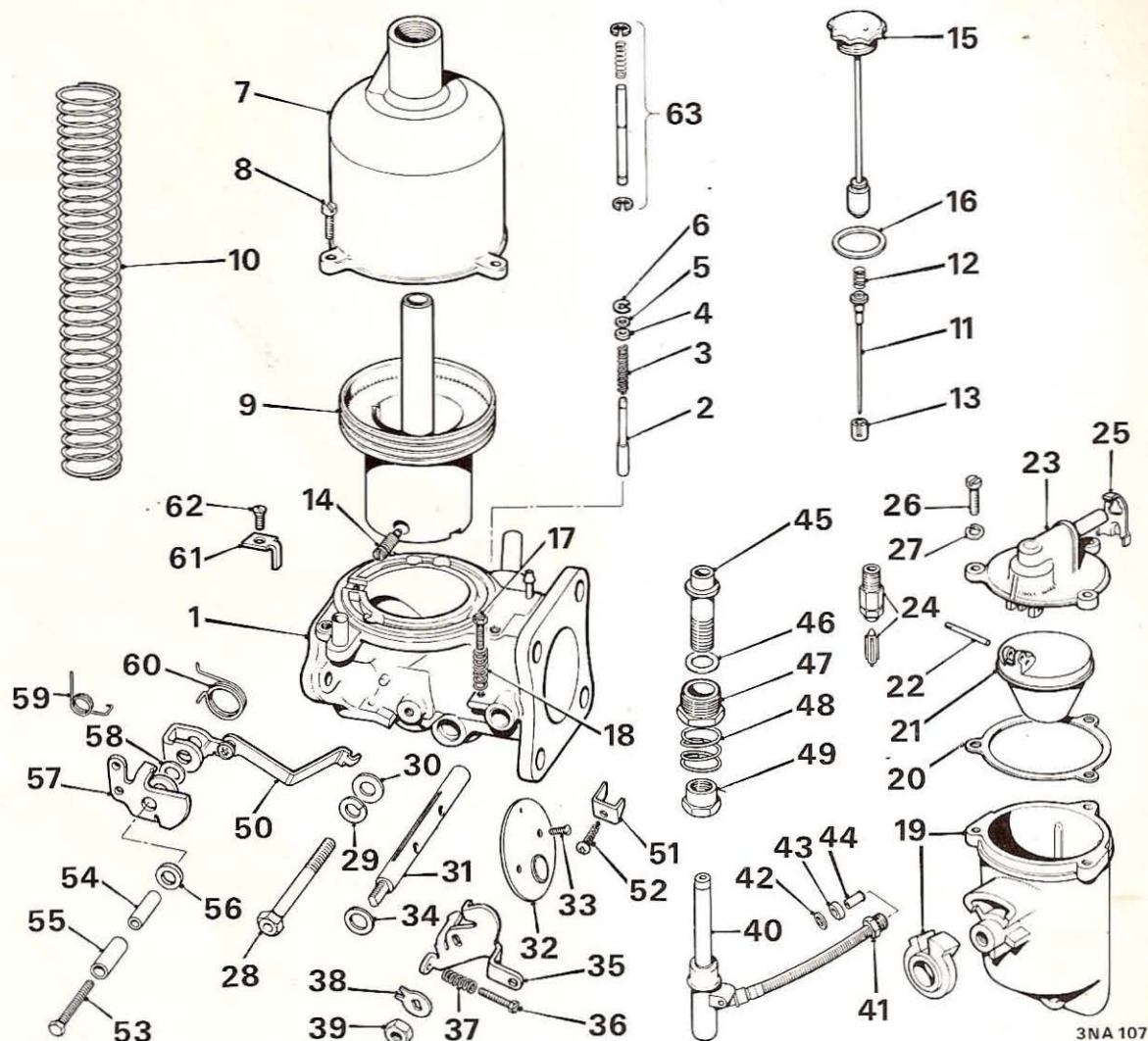
3NA101



26. Using a balancing meter in accordance with the maker's instructions, balance the carburetters by altering the throttle adjusting screws until the correct idle speed and balance is achieved. Alternatively, use a 'listening tube' to compare the intensity of the intake hiss on all carburetters and turn the throttle adjusting screws until the hiss is the same.
27. Turn the jet adjusting nut/screw on each carburetter down/clockwise to enrich or up/anti-clockwise to weaken, by the same amount until the fastest speed is indicated; turn each nut/screw up/anti-clockwise until the engine speed just commences to fall. Turn each screw very slowly down/clockwise by the minimum amount until the maximum speed is regained. From this setting adjust the mixture screws according to the vehicle manufacturer's recommendations. (See graph—Single Carburetters).
28. Check the idle speed and re-adjust it as necessary with the throttle adjusting screws, turning each by the same amount.
29. *Vehicles with emission control.* Using the exhaust gas analyser, check that the reading is within the limits given in the vehicle manufacturer's tuning data. If the reading falls outside the limits given, reset both jet adjusting nuts/screws by the minimum amount necessary to bring the readings just within the limits. If an adjustment exceeding three flats/half a turn is required to achieve this, the carburetters must be removed and serviced.
30. Set the throttle interconnection clamping levers, in accordance with the vehicle manufacturer's instructions, so that a clearance exists between the link pin and the lower edge of the fork. Tighten the clamp bolts, ensuring that there is approximately  $\frac{1}{32}$  in end-float on the interconnection rod.
31. Run the engine at 1,500 rev/min and check the throttle linkage for correct connection by re-checking the carburetter balance.
32. With the fast idle cams of each carburetter against their respective stops, set the cold start interconnections so that all cams begin to move simultaneously.
33. With the fast idle cams against their stops check that a  $\frac{1}{16}$  in (1.5 mm) free movement of the mixture control (choke) cable exists before the cable moves the cams.
34. Pull out the mixture control (choke) until the linkage is about to move the jet.
35. Using the balancing meter or listening tube to ensure equal adjustment, turn the fast idle adjusting screws to give the correct fast idle speed.
36. Refit the air cleaners.







3NA 107

### THE TYPE HS CARBURETTER COMPONENTS

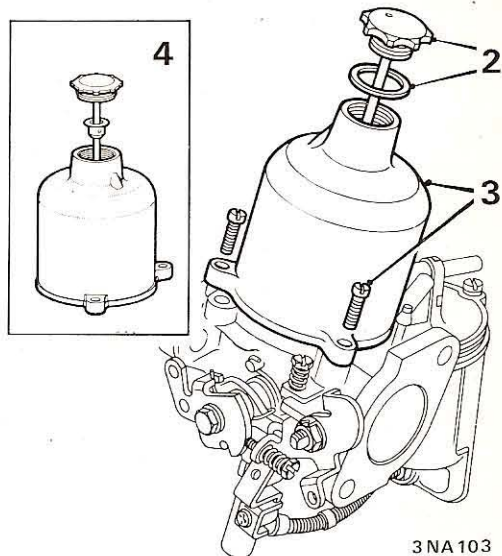
- |                                |                                      |                                    |
|--------------------------------|--------------------------------------|------------------------------------|
| 1. Body                        | 22. Float hinge pin                  | 43. Gland                          |
| 2. Piston lifting pin          | 23. Float-chamber lid                | 44. Ferrule                        |
| 3. Spring for pin              | 24. Float needle and seat            | 45. Jet bearing                    |
| 4. Sealing washer              | 25. Baffle plate                     | 46. Skid washer                    |
| 5. Plain washer                | 26. Float-chamber lid screw          | 47. Jet locking nut                |
| 6. Circlip                     | 27. Spring washer                    | 48. Spring                         |
| 7. Suction chamber             | 28. Float-chamber securing bolt      | 49. Jet adjusting nut              |
| 8. Suction chamber screw       | 29. Spring washer                    | 50. Pick-up lever assembly         |
| 9. Piston                      | 30. Plain washer                     | 51. Pick-up lever link             |
| 10. Spring                     | 31. Throttle spindle                 | 52. Lever to jet securing screw    |
| 11. Jet needle with collar     | 32. Throttle disc assembly           | 53. Pivot bolt                     |
| 12. Needle spring              | 33. Throttle disc securing screw     | 54. Pivot bolt tube—inner          |
| 13. Needle guide               | 34. Throttle spindle washer          | 55. Pivot bolt tube—outer          |
| 14. Needle guide—locking screw | 35. Throttle return lever            | 56. Distance washer                |
| 15. Piston damper              | 36. Fast-idle screw                  | 57. Cam lever                      |
| 16. Damper sealing washer      | 37. Spring                           | 58. Washer                         |
| 17. Throttle adjusting screw   | 38. Throttle spindle nut lock washer | 59. Cam lever spring               |
| 18. Spring for screw           | 39. Throttle spindle nut             | 60. Pick-up lever spring           |
| 19. Float-chamber and spacer   | 40. Jet assembly                     | 61. Piston guide key               |
| 20. Chamber joint washer       | 41. Jet assembly sleeve nut          | 62. Key securing screw             |
| 21. Float                      | 42. Washer                           | 63. Piston lifting pin—alternative |

## SERVICING

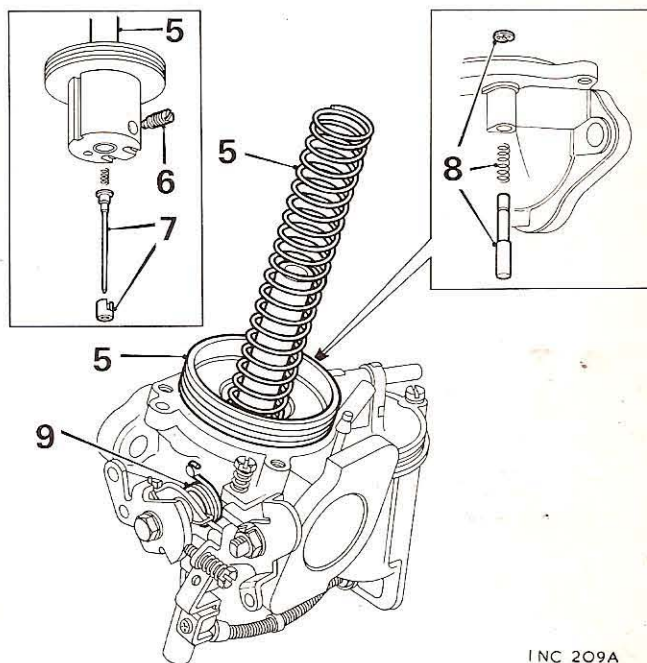
### —TYPE HS2, HS4 & HS6 CARBURETTORS

#### Dismantling

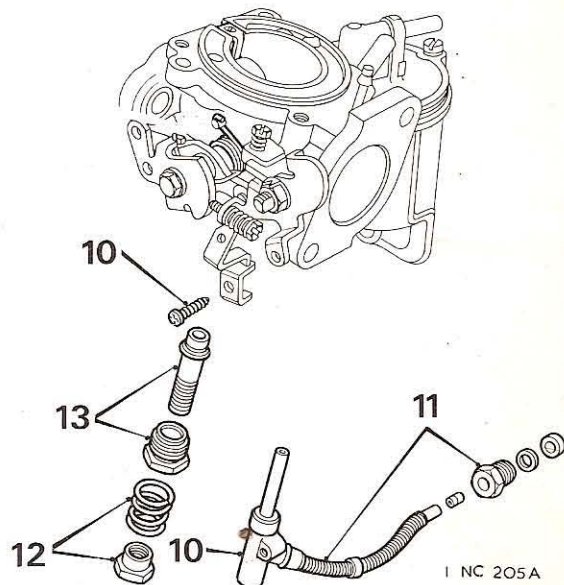
1. Thoroughly clean the outside of the carburettor.
2. *Standard suction chambers.* Remove the piston damper and its washer if fitted.
3. Unscrew the suction chamber retaining screws and lift the chamber assembly vertically from the body without tilting it.
4. *Ball bearing suction chambers.* Hold the piston firmly and pull the suction chamber, taking care not to bend the damper rod, until the damper retainer is freed from the piston rod. Remove the damper.



5. Remove the piston spring, lift out the piston assembly and empty the oil from the piston rod.
6. Note the position of the needle guide etch mark in relation to the piston transfer holes for correct reassembly and unscrew the needle guide locking screw.
7. Withdraw the needle, guide and spring.
8. Remove the piston pin lifting pin circlip and spring, withdraw the pin from the body.
9. Release the pick-up lever return spring from its retaining lug.

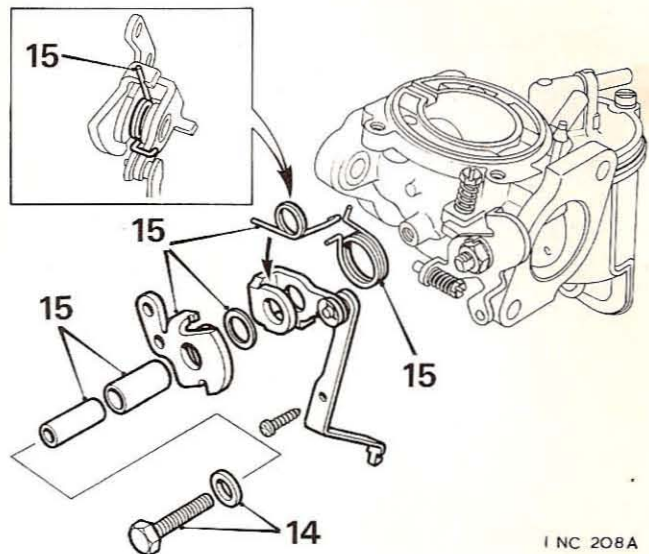


10. Support the plastic moulded base of the jet and remove the screw retaining the jet pick-up lever and link bracket (when fitted).
11. Unscrew the jet tube sleeve nut from the float-chamber and withdraw the jet assembly. Note the gland, washer and ferrule at the end of the jet tube.
12. Remove the jet adjusting nut and spring.
13. Unscrew the jet locking nut and detach the nut and jet bearing; withdraw the bearing from the nut.



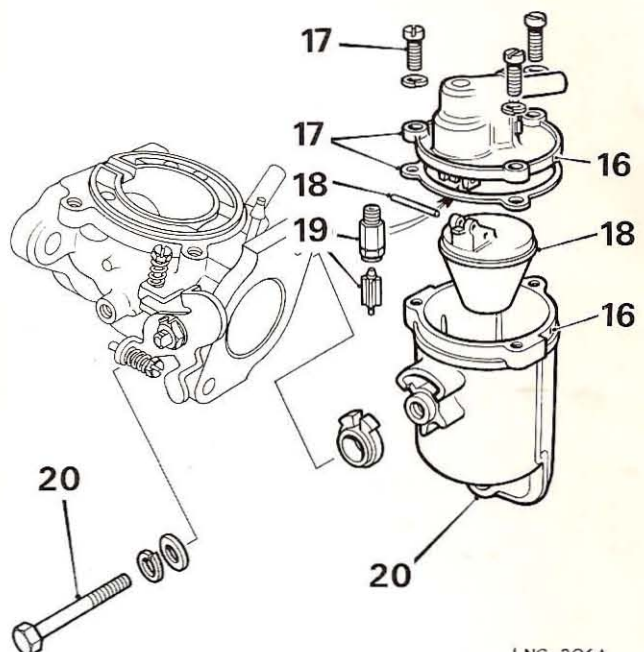


14. Unscrew and remove the lever pivot bolt and distance washer.
15. Detach the cam lever assembly and return springs, noting the pivot bolt tubes, skid washer and the locations of the cam and pick-up lever springs.



INC 208A

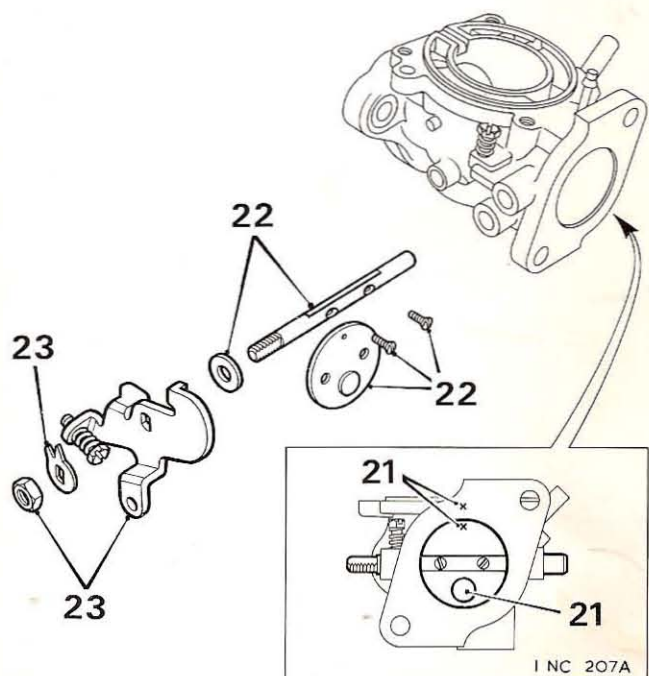
16. Mark the float-chamber lid location.
17. Remove the lid securing screws and detach the lid with its joint washer and float.
18. Hold the float hinge pin at its serrated end and withdraw the pin and float.
19. Extract the float needle from its seating and unscrew the seating from the lid.
20. Remove the float-chamber securing bolt and the chamber.
21. Close the throttle and mark the position of the throttle disc in relation to the carburetor flange. **Do not mark the disc in the vicinity of the over-run valve.**
22. Remove the throttle disc retaining screws, open the throttle and carefully withdraw the disc from the throttle spindle taking care not to damage the over-run valve.
23. Tap back the tabs of the lock washer securing the spindle nut; remove the nut and detach the throttle lever, washer and throttle spindle; note the location of the lever in relation to the spindle and carburetor body.



INC 206A

### Inspection

24. Examine the throttle spindle and its bearings in the carburetor body; check for excessive play, and renew parts as necessary.
25. Examine the float needle and seating for damage and excessive wear; renew if necessary.
26. Check condition of all gaskets; renew as necessary.
27. Examine the carburetor body for cracks and damage and for security of the brass connections and the piston key.
28. Clean the inside of the suction chamber and piston rod guide with fuel or methylated spirit (denatured alcohol) and wipe dry. **Abrasives must not be used.**
29. Examine the suction chamber and piston for damage and signs of scoring.
30. *Ball bearing suction chambers.* Check that all the balls are in the piston ball race (2 rows, 6 per row). Fit the piston into the suction chamber, without the damper and spring, hold the assembly in a horizontal position and spin the piston. The piston should spin freely in the suction chamber without any tendency to stick.

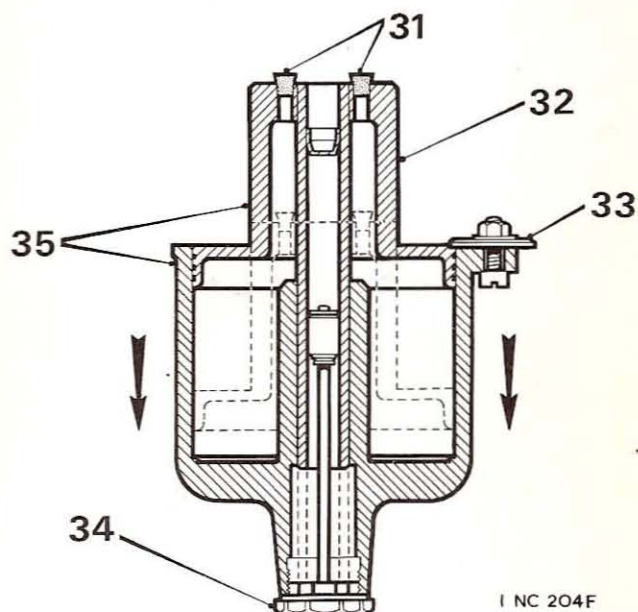


INC 207A



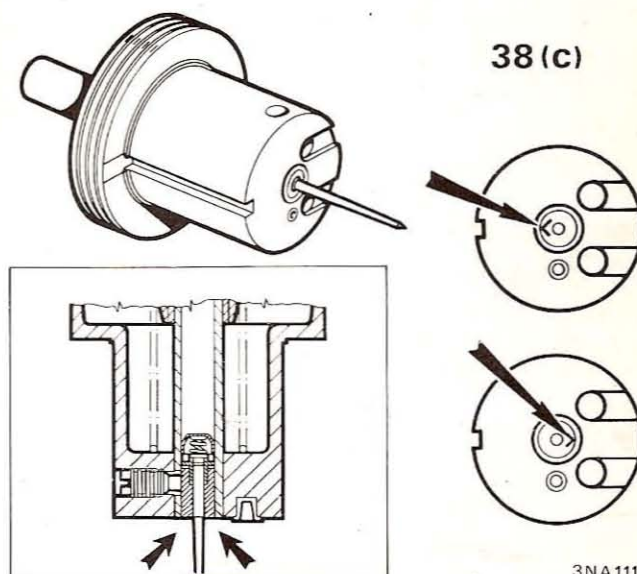
**NOTE:** the following timing check applies only to standard suction chambers and need only be carried out if the cause of the carburettor malfunction which necessitated the dismantling has not been located.

31. Temporarily plug the piston transfer holes.
32. Fit the piston into the chamber without its spring.
33. Fit a nut and screw, with a large flat washer under the nut, into one of the suction chamber fixing holes, positioning the washer so that it overlaps the chamber bore.
34. Fit the damper and washer, if fitted.
35. Check that the piston is fully home in the chamber, invert the assembly to allow the chamber to fall away until the piston contacts the washer.
36. Check the time taken for the chamber to fall the full extent of the piston travel. For carburettors of  $1\frac{1}{2}$  in (38 mm) to  $1\frac{7}{8}$  in (47.6 mm) bore the time taken should be 5 to 7 seconds.
37. If the times are exceeded check the piston and chamber for presence of oil, foreign matter and damage. If after re-checking the time is still not within these limits, renew the suction chamber assembly.

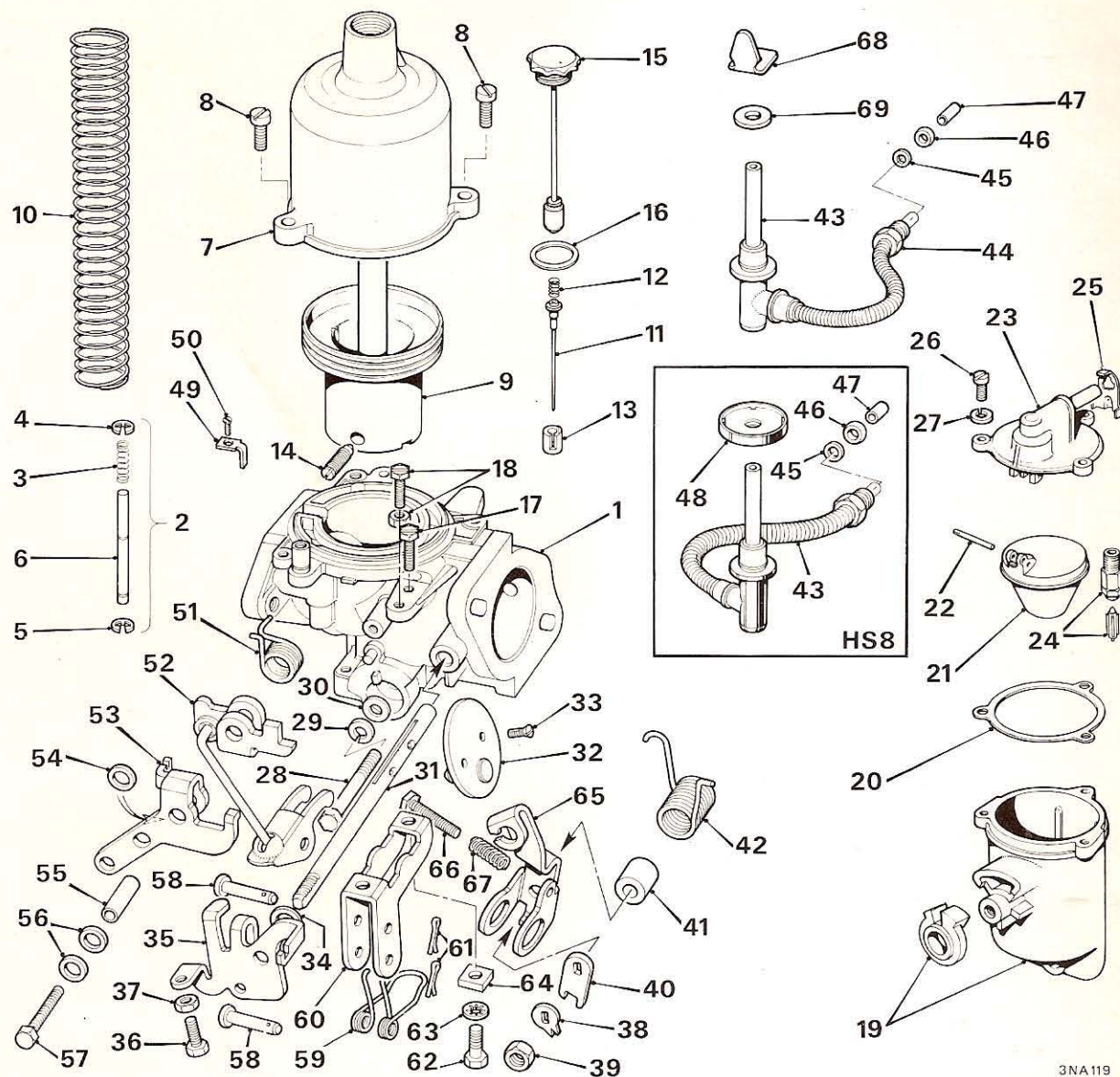


### Reassembling

38. Reverse the procedure in 1 to 23 noting the following:
  - a. Ensure that the throttle disc is fitted in its original position.
  - b. New throttle disc retaining screws must be used when refitting the disc. Ensure that the throttle disc is correctly positioned and closes correctly before tightening the retaining screws. Spread the split ends of the screws sufficiently to prevent turning.
  - c. Use a **new** retaining screw when refitting the needle and ensure that the needle guide etch mark aligns correctly with the piston transfer holes (alternative specifications illustrated). After fitting the needle assembly, check that the shoulder of the needle aligns the full face of the piston.
  - d. *Ball bearing suction chambers.* To prevent the piston spring from being 'wound up' during reassembly, temporarily fit the piston and suction chamber, less the piston spring, to the body and pencil mark their relative positions to each other. Fit the spring to the piston, hold the suction chamber above the piston, align the pencil marks and lower the chamber over the spring and piston.







3NA119

### THE TYPE HS4C & HS8 CARBURETTER COMPONENTS

- |                                     |                                      |                                     |
|-------------------------------------|--------------------------------------|-------------------------------------|
| 1. Body                             | 24. Float needle and seat            | 47. Ferrule                         |
| 2. Piston lifting pin assembly      | 25. Baffle plate                     | 48. Temperature compensator         |
| 3. Lifting pin spring               | 26. Float-chamber lid screw          | 49. Piston guide key                |
| 4. Circlip                          | 27. Spring washer                    | 50. Key securing screw              |
| 5. Circlip                          | 28. Float-chamber securing bolt      | 51. Pick-up lever spring            |
| 6. Lifting pin                      | 29. Spring washer                    | 52. Jet fork assembly pick-up lever |
| 7. Suction chamber                  | 30. Plain washer                     | 53. Cam lever                       |
| 8. Suction chamber screw            | 31. Throttle spindle                 | 54. Skid washer                     |
| 9. Piston                           | 32. Throttle disc assembly           | 55. Pivot bolt tube                 |
| 10. Spring                          | 33. Throttle disc securing screw     | 56. Washers                         |
| 11. Jet needle with collar          | 34. Throttle spindle washer          | 57. Pivot bolt                      |
| 12. Needle spring                   | 35. Throttle return lever            | 58. Clevis pin                      |
| 13. Needle guide                    | 36. Fast-idle screw                  | 59. Jet return spring               |
| 14. Needle guide locking screw      | 37. Fast-idle screw locknut          | 60. Jet assembly securing bracket   |
| 15. Piston damper                   | 38. Throttle spindle nut lock washer | 61. Split pins                      |
| 16. Damper sealing washer           | 39. Throttle spindle nut             | 62. Securing bracket bolt           |
| 17. Throttle adjusting screw        | 40. Lost motion lever                | 63. Starlock washer                 |
| 18. Jet adjusting screw and locknut | 41. Spacer                           | 64. Spacer                          |
| 19. Float-chamber and spacer        | 42. Throttle return spring           | 65. Throttle actuating lever        |
| 20. Chamber joint washer            | 43. Jet assembly                     | 66. Lost motion adjusting screw     |
| 21. Float                           | 44. Jet assembly sleeve nut          | 67. Spring                          |
| 22. Float hinge pin                 | 45. Washer                           | 68. Jet fork centering washer       |
| 23. Float-chamber lid               | 46. Gland                            | 69. Washer                          |

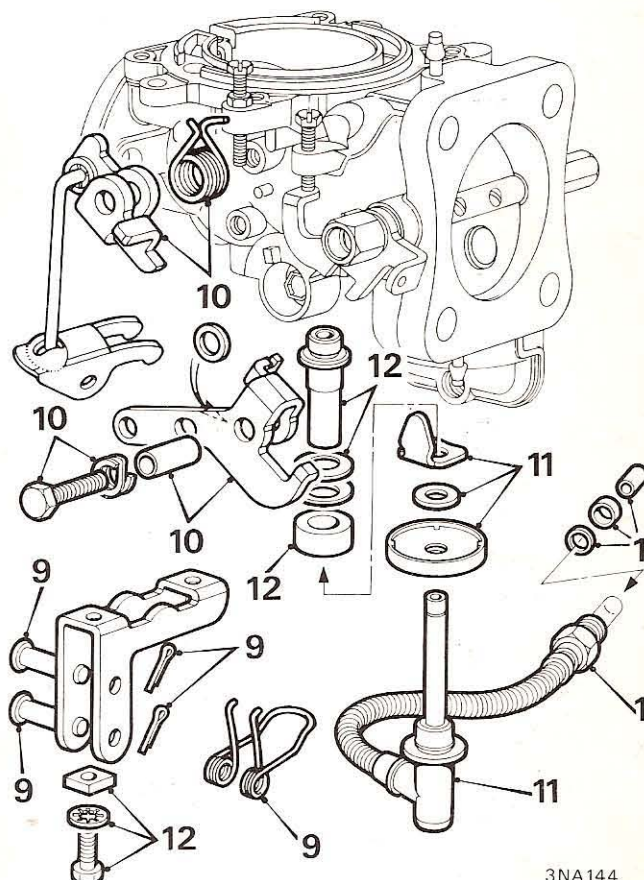
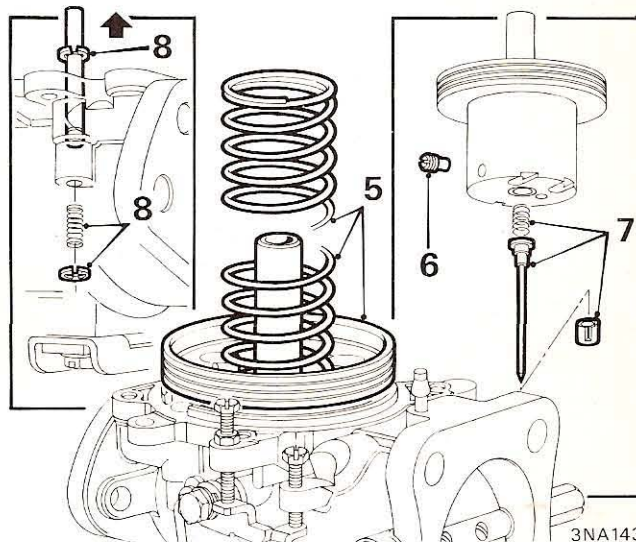
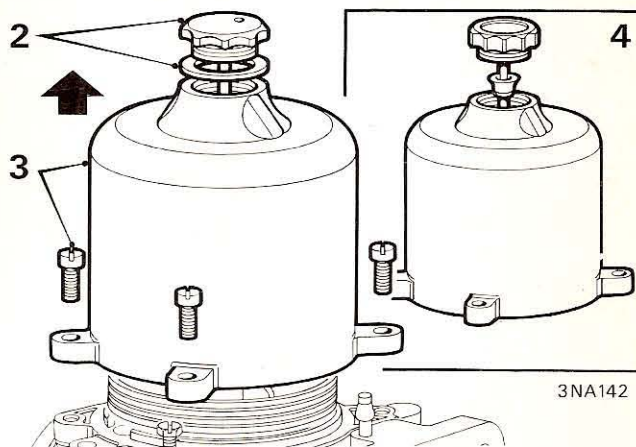


## SERVICING

### —TYPE HS4C AND HS8 CARBURETTERS

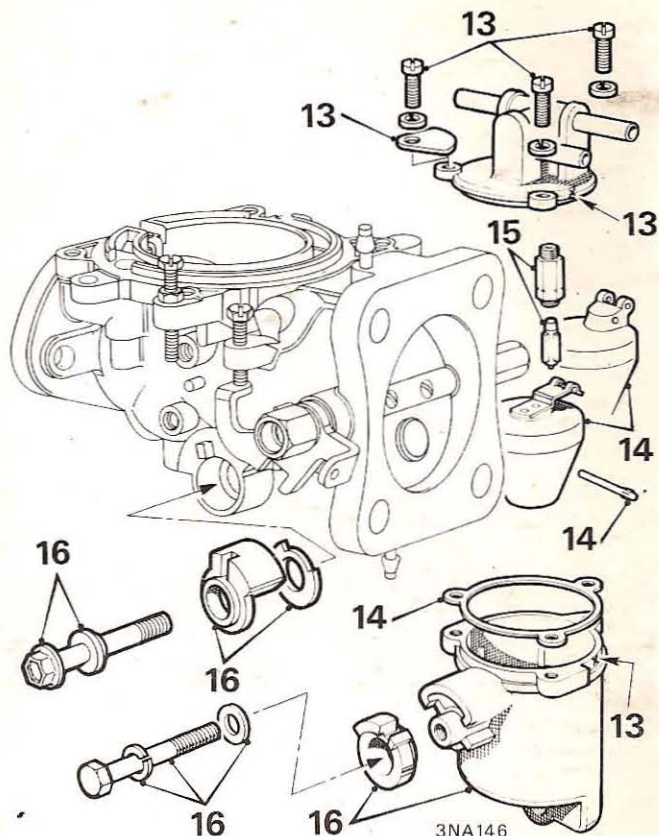
#### Dismantling

1. Thoroughly clean the outside of the carburetter.
2. *Standard Suction Chambers.* Remove the piston damper and its washer if fitted.
3. Unscrew the suction chamber retaining screws and lift the chamber vertically from the body without tilting it.
4. *Ball Bearing Suction Chambers.* Hold the piston firmly and pull the suction chamber, taking care not to bend the damper rod, until the damper retainer is freed from the piston rod. Remove the damper.
5. Remove the piston spring, lift out the piston assembly and empty the oil from the piston rod.
6. Note the position of the needle guide etch mark in relation to the piston transfer holes for correct re-assembly and unscrew the needle guide locking screw.
7. Withdraw the needle, guide and spring.
8. Remove piston lifting pin circlip and spring, withdraw the pin from the body.
9. Remove the split pins retaining the jet spring anchor pin and jet fork pivot pin. Remove the pins, spring and jet fork from the bracket.
10. Release the cam lever return spring from its lug, remove the bolt, washers, cam lever, bush and link arm assembly.
11. Unscrew the jet tube sleeve nut from the float chamber and withdraw the jet assembly complete with centering washer, copper washer and temperature compensator disc (when fitted). Note the gland, washer and ferrule at the end of the jet tube.
12. Remove the bolts, Starlock washers and spacers securing the fork bracket to the carburetter body and withdraw the jet bearing together with bush and Bellville washers.





13. Mark the relative position of the float lid and chamber, remove the float lid retaining screws, washers and identification tag.
14. Remove the float lid and gasket, withdraw the float hinge pin and remove the float.
15. Withdraw the float needle and unscrew the needle seat.
16. Remove the float chamber securing bolt, float chamber and metal spacer or rubber mountings and backing washer.



17. HS4C—release the return spring from the throttle lever.
18. Bend back the tabs and remove the throttle spindle nut(s) and tab washer(s).
19. HS4C—withdraw the lost motion lever, throttle actuating lever, return spring and spacer.
20. Close the throttle and mark the position of the throttle disc in relation to the carburettor flange. **Do not mark the dial in the vicinity of the over-run valve.**
21. Unscrew the disc retaining screws, open the throttle and ease the disc from its slot in the throttle spindle taking care not to damage the over-run valve.
22. Remove the throttle lever and washer and withdraw the spindle from the body.

#### Inspection

23. Examine the components as detailed for HS2, HS4 and HS6 on pages 8 and 9.

#### Reassembling

24. Reverse the procedure in 1 to 22 noting the points detailed for HS2, HS4 and HS6 on page 9.

