Chapter 3

FLOW DISTRIBUTOR, TYPE FD 26 SERIES

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

General

1. Each flow distributor is identified by its type number, e.g. FD26/29P is made up of the basic number (26) the installation number (/29) and the calibration letter (P).

2. During reconditioning, the unit should be handled with care and not subjected to severe shock, otherwise the calibration may be affected or slight distortion may cause sticking of the metering piston. Precautions must be taken at every stage of assembling and testing to ensure that all details are thoroughly clean.

3. On time-expired units, the joint washers, sealing rings, tab-washers, split-pins and locking wire must be discarded.

4. When it is necessary to assemble a unit temporarily, it is advisable to use slave unions, nuts, washers, etc., but these items should be distinguishable to avoid their retention when the unit is being finally assembled.

5. The following special tools and test rigs are required :—

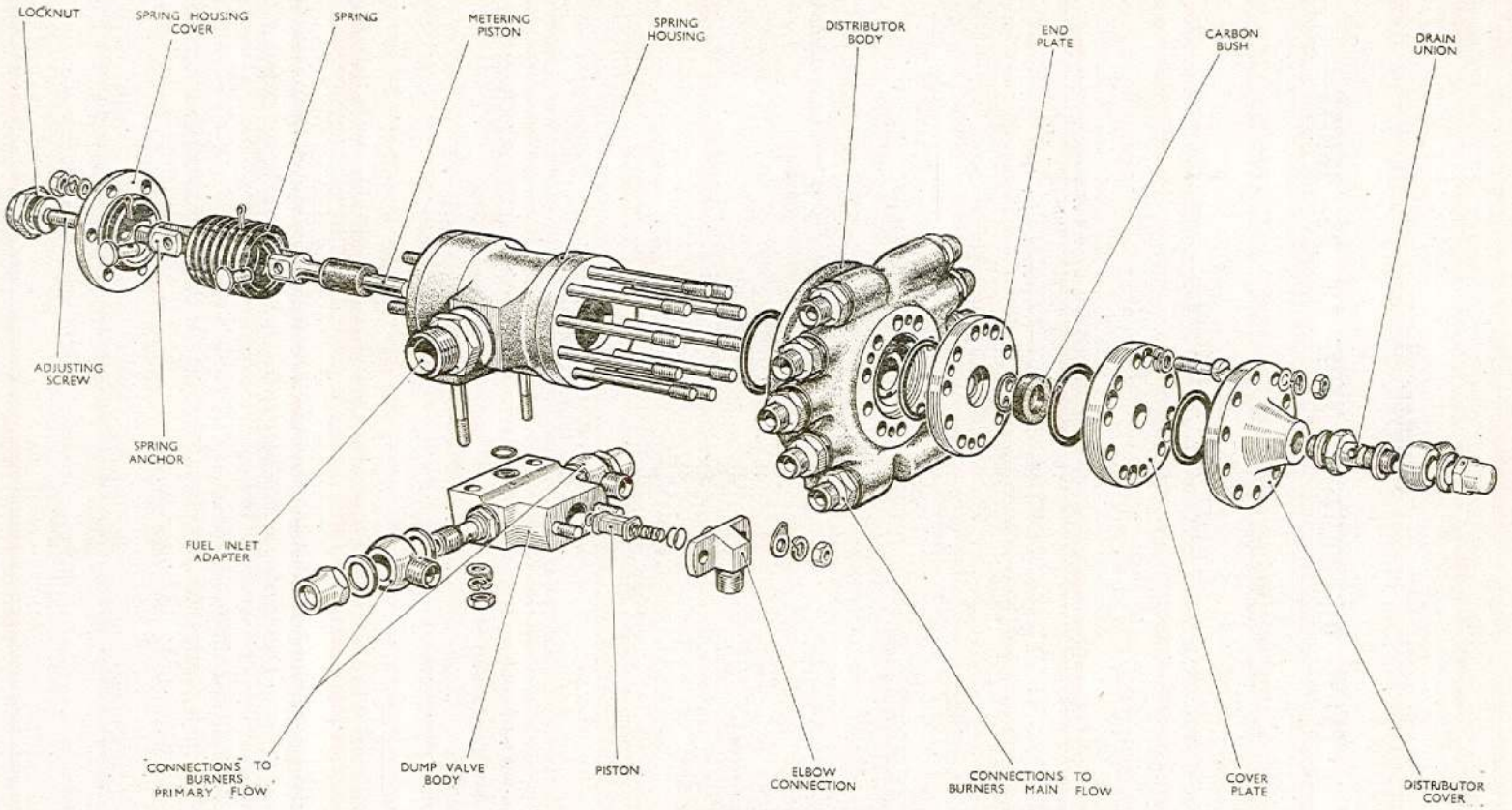

Fig. 1. Flow distributor (exploded view)

Part No.	*Description*	*Application*
T.160988	Key	Range adjusting screw
T.167552	Micrometer adapter	Port calibration
T.177125	Box spanner	Cover retaining nuts
T.233074	Loading adapter	Port calibration
T.234721	Lap	Metering piston
T.234722	Lap holder	Metering piston
T.235322	Assembling and extracting tool	Cover plate
T.251558	Assembling-tool guide	Spring anchor
R.30	Test rig	Dump valve flow
R.48	Test rig	Port calibration
R.115	Test rig	Performance calibration

6. Before dismantling, consider any complaints of defects reported with the unit, then examine the exterior for signs of damage. Ensure that the locking wire on the adjusting screw is unbroken and that all unions have been blanked off.

7. If the general condition of the distributor appears to be satisfactory, the unit should be mounted on the performance test rig and a calibration check made in accordance with the Appendix. If the distributor has been reported as leaking it should be leak-tested in order to find the source and nature for the defect.

8. Clean and dry metal boxes should be at hand to receive the components. It is recommended that only one dismantled unit is present on the bench at one time in order to avoid the accidental interchanging of parts.

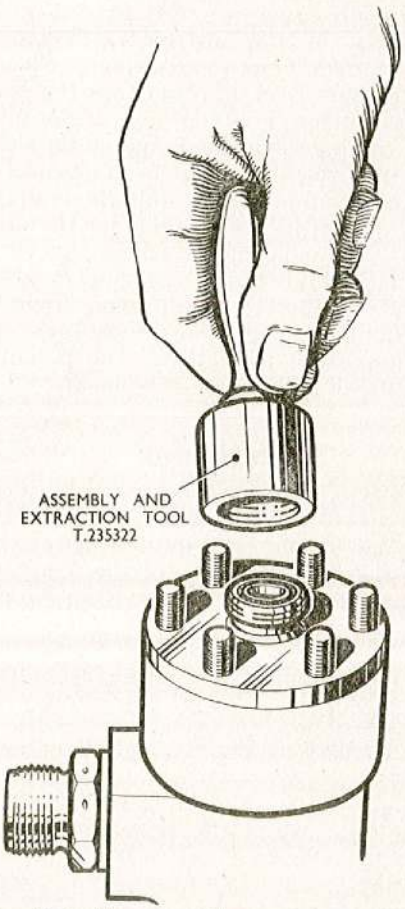

Fig. 2. Using the assembling and extraction tool

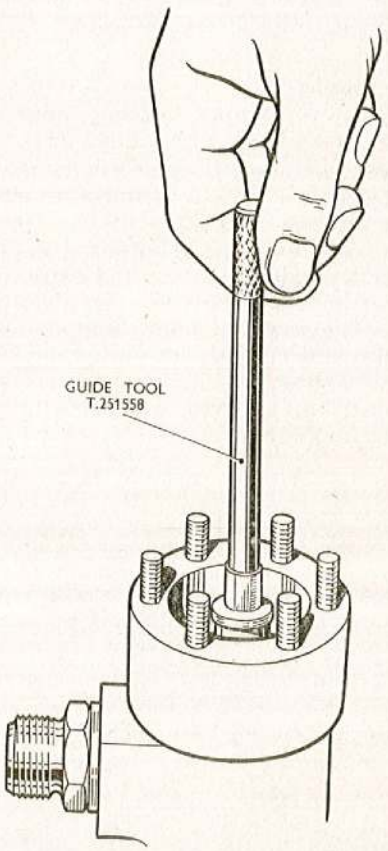

Fig. 3. Using the guide tool

DISMANTLING

9. Remove the installation connections and the bonded seals which are fitted to the inlet and the outlet ports, the dump valve drain and the return to pump inlet.

Dump valve

10. Unlock and remove the two nuts, grover washers and tabwashers and withdraw the dump valve from the studs. Remove the seal from the annular slot in the mating face.

11. Break the locking wire, remove the two nuts, grover washers and tabwashers and detach the elbow connections from the valve body. Remove the outer sealing ring.

12. Remove the insert sealing ring from the main joint face but do not attempt to remove the insert as this is pressed into position.

13. Withdraw the spring and piston from the bore of the dump valve, and detach the sealing ring from the piston head.

Spring housing

14. With the spring housing uppermost, unlock and remove the adjusting screw locknut. Remove the adjusting screw from the spring housing cover and screw in the extraction tool T.235322 (*fig.* 2). Unscrew the six retaining nuts, remove the grover washers and shim washers and, with a firm straight pull, withdraw the cover plate and seals. Unscrew the ten retaining nuts at the opposite end of the unit, remove the grover washers and shim washers, slide off the distributor cover and withdraw the sealing ring.

15. Screw in the guide tool T.251558 (*fig.* 3), and ease the spring housing from the distributor body, holding the guide tool down so that the metering piston assembly will not be withdrawn from the distributor body. When the spring housing is free, unscrew the guide tool, taking care to avoid lifting it until is it clear of the spring anchor threads, then remove the tool and lift off the spring housing, leaving the spring and piston assembly in the distributor body.

16. Withdraw the spring and piston assembly from the body and ensure that no damage occurs to the carbon sleeve on the piston.

17. Remove the two split pins and extract the clevis pins from the spring anchor and the piston.

18. Remove the sealing ring from the large end of the spring housing cover and also the one from the annular groove in the threaded end.

Distributor body

19. Unscrew the four setscrews from the face of the cover plate, the end cover having been removed during removal of the spring housing, and withdraw the grover washers and steel washers. Lift off the cover plate with its sealing ring, and ease out the sealing ring.

20. Take off the end plate with the carbon bush and inner sealing ring, invert the plate and carefully shake out the carbon bush into the hand and remove the sealing ring.

21. Remove the two sealing rings in the end faces of the distributor body and inspect them before discarding. The extremely close clearances between the piston and the metering sleeve bore are obtained by machining the piston to match the sleeve-bore after the sleeve has been shrunk into the distributor body, and therefore, no attempt must be made to remove the sleeve. As this matching of the piston, sleeve and body is essential to the correct performance of the distributor, should more than one unit be undergoing repair at the same time, it is important that there is no possibility of the interchanging of components.

CLEANING

22. If any defect in the unit is suspected to be due to the presence of foreign matter, the parts should be inspected before cleaning, otherwise the cause of the defect may be washed away.

23. The components must be cleaned individually in kerosine immediately prior to inspection. It is recommended that the parts should be pressure-washed using an appropriate bath and jet-nozzle supplied by a pump having adequate filtering facilities. Cloth, hard brushes and abrasives must not be used. Components should be dried thoroughly with compressed air which must be free from water, and then placed in clean, dry containers.

INSPECTION

General

24. Visual inspection of the components is described in this section. Where dimensional checks are necessary, the appropriate details are given in the Schedule of Fits, Clearances and Repair Tolerances (Vol. 2, Part 2).

25. Every component should be inspected closely for signs of damage or wear, and if necessary the parts should be discarded and a replacement fitted.

26. It is advisable that the surface of the bench be covered with zinc sheeting, bakelized fabric or linoleum. Following inspection, the components should be placed in clean receptacles containing a quantity of light mineral oil.

27. If distortion is suspected, a joint face may be checked by means of a surface plate and marking blue. The alignment of bores relative to each other or to joint face squareness should be checked in accordance with general inspection practice.

28. It is usual during overhaul to discard parts rendered redundant by modifications; sufficient details of such modifications must be available, therefore, to enable redundant parts to be discarded and new ones embodied on assembling.

29. Adapters and unions must be inspected for cleanliness and for general condition of the hexagons, threads and sealing faces.

Metering piston

30. Examine the piston for pitting, scoring and cracking or the inclusion of foreign matter in the carbon surface. Should any such defects appear, the piston, distributor body and shrunk-fit sleeve assembly must be rejected.

31. The condition of the metering edge at the clevis-pin end of the piston is important to the efficient functioning of the distributor. Inspection should be carried out with the aid of a magnifying glass to ensure that the edge is clean and free from burrs and other damage.

32. Inspect the piston assembly for any other visible defect and subject the components to a magnetic crack-detection test, particular attention being paid to signs of radial cracking around the clevis pin holes in the fork. Ensure that the piston, particularly the carbon surface, is afterwards washed thoroughly in a kerosine spray to remove all traces of the crack-detecting ink.

Distributor body and metering sleeve

33. Using a magnifying mirror, examine the metering sleeve bore for scoring and other damage. Minute longitudinal cracks are permissible provided that they do not run into the edges of the metering slots. No scoring whatever is permitted between the run-out of the metering slots and the edge of the bore and circumferentially between any portion of two adjacent ports. Ensure that the metering edge of the bore is free from damage, burrs and scores. Any razor sharpness should be polished out with fine emery paper, taking care to avoid producing a chamfer or radius. Scrapers and other such tools must not be used.

34. Examine the cast surfaces of the body for damage, cracks and corrosion, particularly for radial cracks around the inlet and outlet ports and around the retaining bolt holes in the mounting flange. See that the sealing ring grooves are clean and that the sealing surface surrounding each port is free from damage. Check that the radial drillings are clean and free from obstruction and that all threads are serviceable.

End plate and cover plate

35. Examine the plates generally for cleanliness and see that there are no scores on the faces. Examine the sealing ring grooves and ensure that the face surrounding the hole on the carbon sealing bush side is undamaged; this face retains the carbon bush in position and any deviation from flatness will cause out-of-squareness of the bush when the distributor is assembled.

Carbon bush

36. Inspect the sealing bush for signs of cracking on the faces and chipping on the edges, particularly on the edge of the bore. See that there are no severe radial scores on the sealing face. The small sealing lip at one end of the bore must be free from chipping, scratching or scoring.

Distributor cover

37. Examine the threads and face of the

tapped boss for cleanliness and check that the sealing ring face is flat and free from damage. See that the sealing ring groove is clean and undamaged.

Spring housing

38. Inspect the spring housing generally for damage and cracks or corrosion. Ensure that the end faces, the fuel inlet boss face and the dump valve attachment facing are in good condition. Scores or damage marks are not permissible owing to the risk of leakage. See that all the studs are tight, that they are correctly aligned and that the threads are in good condition.

Control spring

39. Examine the spring visually for distortion, surface defects and for cracks, particularly adjacent to the attachment loops.

40. Inspect the spring anchor for damage and for signs of radial cracks around the clevis-pin holes in the fork. Examine the holes for wear and see that the threads in the item are clean and free from damage.

Spring adjusting screw

41. Examine the adjusting screw for damage to the threads, flange, spannering square and screwdriver slot. Roughness and severe scoring is not acceptable on the underside of the flange ; a damaged surface here may allow fuel to leak across the sealing ring in the end face of the housing cover. It is not advisible to attempt to polish score marks from the flange face as out-of-squareness with the thread may result and create a further source of leakage.

42. See that the locknut hexagon is not damaged and that the threads are serviceable.

Clevis pins

43. Examine the clevis pins for excessive wear and cracks and see that the split pin holes are clear.

Spring housing cover

44. Inspect the plate for general condition. Check that the threads are undamaged, that the sealing ring grooves are clean and that the square guide hole through the centre is free from obstruction.

Dump valve

45. Examine the valve body for signs of scores in the piston bore and ensure that the end faces are square. See that the sealing ring groove and attachment bolt holes are clean and that the elbow connection studs are in good condition. Check the union connection threads and bores for damage.

46. Inspect the piston for signs of scoring and ensure that the sealing ring groove is clean.

47. Examine the spring visually for distortion, surface defects and for cracks.

48. See that the elbow connection bore and its pressed-in insert are clean and that the sealing ring grooves are in good condition. Ensure that the mating face is square and free from scores. Examine the stud holes for cleanliness and check the union threads for serviceability.

REBUILDING

General

49. It is essential that all details, the assembly bench and tools are clean before commencing to rebuild the unit.

50. Initially the distributor is to be assembled with certain slave components to facilitate an intermediate rig-test for calibration of the metering ports, after which the complete unit is to be rebuilt and subjected to a final calibration and performance test.

Assembling the distributor

51. (1) Fit the unions complete with seals to the distributor body outlet ports.

(2) Insert the sealing rings in the front and rear face grooves.

(3) Assemble the metering piston to the distributor body with the plain end of the piston protruding through the body counterbore.

(4) Fit the sealing ring to the counterbore in the end plate and, with the counterbore outermost, place the plate over the piston end against the distributor body.

(5) Slide the carbon bush over the piston end and ease it into the end plate counterbore. The bush has a small lip inside one end of the bore which must be fitted towards the distributor body. Should a new metering piston and distributor body be required, it will be necessary to lap the piston tail to suit the carbon bush (*para.* 77).

(6) Insert a sealing ring in the cover plate groove, align the four small attachment holes with those in the end plate and

distributor body and fit the four retaining setscrews, together with plain washers and grover washers. Run the set screws down until the plates are nipped, then tighten the screws evenly a little at a time until secure.

(7) Whilst tightening the setscrews, move the metering piston in and out gently, but avoid withdrawing it sufficiently to disengage the piston from the carbon bush. The constant moving of the piston will provide a check on the correct alignment of the seal, sudden tightness indicating that the bush is being tightened unevenly. In this event, slacken the screw that was being turned immediately prior to the stiffness occurring to the piston and tighten the opposite screw, adjusting the setscrew similarly until they are secured and the piston free from interference.

(8) If it is not possible to secure the screws without causing the bush to interfere with the piston free movement, remove the screws and rotate the carbon bush through 90 to 180 deg., re-assemble and tighten under similar conditions. Should interference still be apparent it will be necessary to remove the screws again and rotate either or both plates until the required piston freedom is obtained.

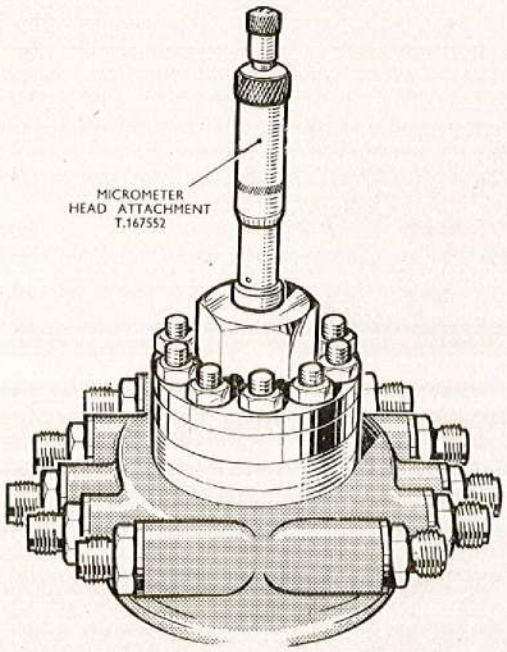

Fig. 4. Port calibration micrometer adapter

Fitting the port calibration adapters

52. In order to measure the flow through the metering ports it is necessary to fit a micrometer adapter to the distributor to measure the amount of plunger travel, and a piston loading adapter to maintain the piston in contact with the end of the micrometer at low fuel inlet pressures. For this reason the spring, spring anchor and end covers are omitted from the initial assembly.

53. Screw in the fuel inlet adapter complete with seal to the spring housing inlet port. A slave spring housing may be used if available, when the housing and adapter may be kept assembled permanently. Assemble the housing to the distributor body, fit the micrometer setting tool T.167552 to the distributor body cover plate (*fig.* 4) and secure with slave nuts and washers, using the box spanner T.177125. Adjust the micrometer to its extended position.

54. Fit the piston loading adapter T.233074 to the end face of the spring housing (*fig.* 5) and secure it with slave nuts and washers, using the box spanner T.177125.

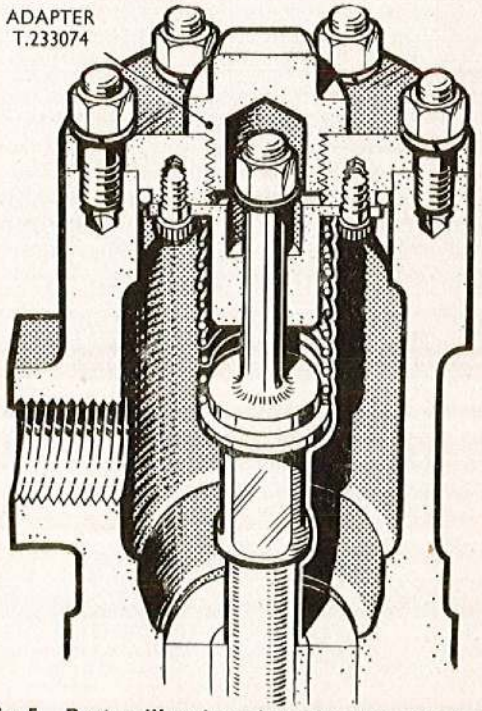

Fig. 5. Port calibration piston-loading adapter

Assembling the dump valve

55. Place the seal on the piston head, ease the piston head into the valve body bore and insert the spring in the piston bore. Fit the seals in the elbow connection grooves and assemble the connection to the dump valve body. Fit a tabwasher, grover washer and nut on each of the studs and tighten them with a standard spanner. Assemble the banjo unions complete with sealing washers to the valve body and tighten them. Insert the sealing ring in the joint face groove.

TESTING

Dump valve tests

56. The purpose of the preliminary test is to check separately the functioning of the dump valve and the individual and collective calibration of the flow distributor metering ports, the specific values being given in the Appendix.

57. Throughout the tests, the fuel used is to be AVTUR. The fuel temperature must be maintained at 20 to 26 deg. C. and the pressure at 10 to 15 lb. per sq. in.

Functional test

58. Connect the valve to the rig as shown in fig. 6.

59. Check that the rig pump delivery control is set to minimum flow and that the delivery pressure cock is set to minimum restriction. Switch on the rig pump motor and allow the rig to run for a few minutes to stabilise and attain its working temperature.

60. Set the restriction downstream of the dump valve to the flow specified and record the pressure drop registered on the rig gauge.

61. Increase the fuel supply pressure until the dump valve opens and record the pressure indicated.

62. Reduce the fuel supply pressure until the dump valve closes and record the pressure indicated.

Leakage test

63. Apply the inlet pressures stated in the Appendix and check the leakage with the aid of a graduated container and stop watch.

64. Should any of the readings be beyond the limits stated, return the unit to the bench, dismantle the assembly and examine the piston, piston sealing ring and spring for serviceability. Flush the delivery drilling and bores thoroughly. Re-build the valve, assemble it to the test rig and repeat the test procedure.

65. When the results are satisfactory, record the figures on the test certificate. Return the valve to the bench to await assembly to the distributor.

Calibrating the ports

66. With a slave adapter fitted to the flow distributor in place of the dump valve, connect the unit to the metering port calibration rig as shown in fig. 7.

67. Check that the rig pump delivery control is set to minimum flow, that the delivery pressure cock is set to minimum restriction, that the low-range flowmeter cock is closed and that the high-range flowmeter cock is open. Switch on the rig pump motor and allow the rig to run for a few minutes to stabilise and attain its working temperature.

68. Move the piston to close the ports by screwing in the micrometer thimble until the fuel delivery is reduced to droplets and adjust the rig pump delivery control until the inlet pressure is as stated in the Appendix. Screw the micrometer in gently, 0·001 in. at a time, until the flow ceases completely, indicating that the metering edge of the piston has sealed off the ports. Record the exact micrometer setting; this is the datum from which the calibration is obtained and must be found accurately since any error will affect the calibration throughout the range.

69. Screw the micrometer head in a further 0·025 in. from the datum point and readjust the rig pump to produce the inlet pressure specified in the Appendix. Maintain this condition for the period stated.

70. After the specified period place the empty measuring cylinders in position beneath the outlet nozzles and move the sliding cut-off plate lever to allow any fuel issuing from the nozzle to fall into the cylinders, checking the time with a stop watch as the slide uncovers the nozzles. After one minute move the slide to the cut-off position; any fuel collected in the cylinders must not exceed the quantity stated in the Appendix.

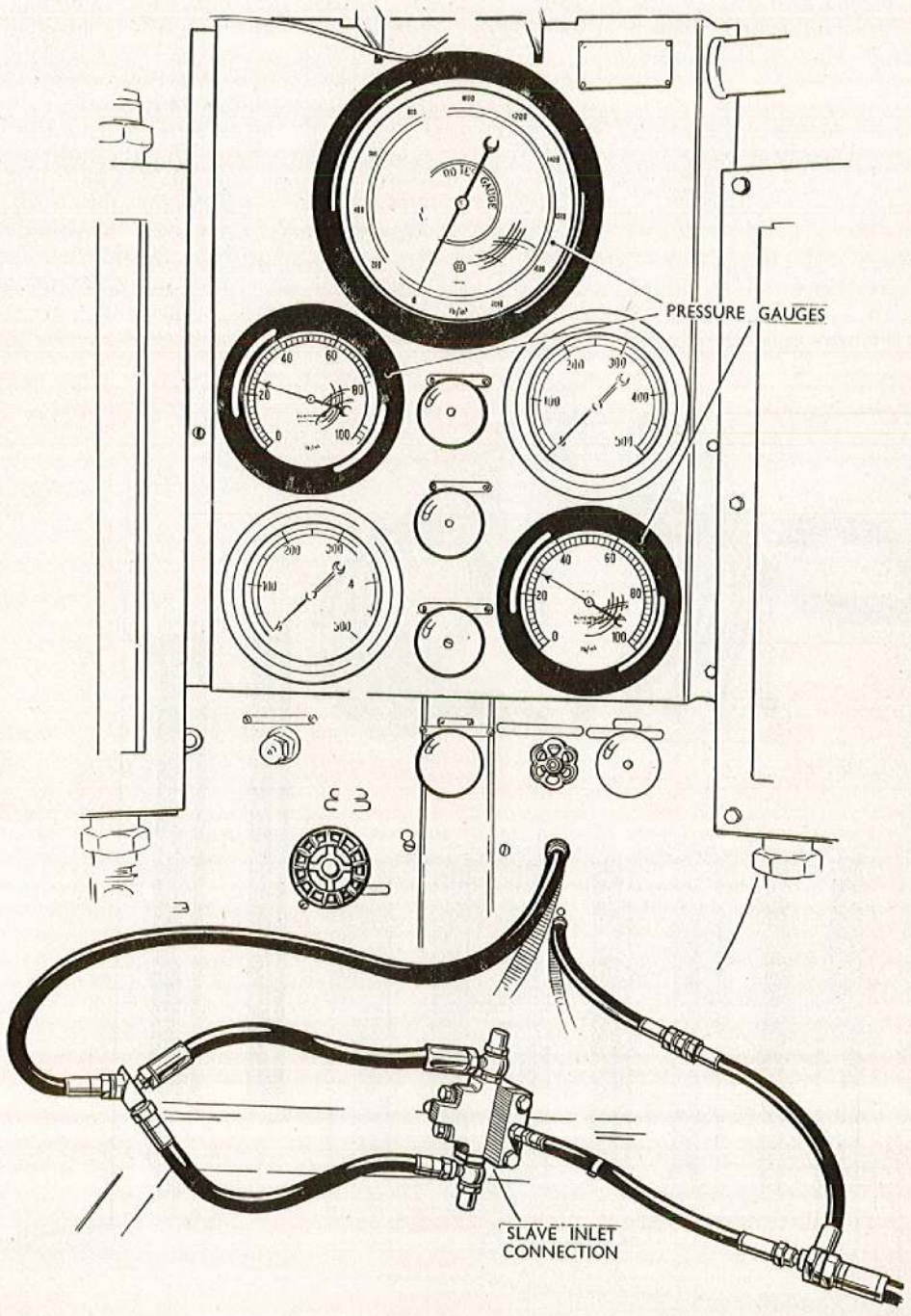

Fig. 6. Testing the dump valve

71. Screw the micrometer head out to the datum point again, adjust the rig pump control to provide the inlet pressure stated in the Appendix, change over to the low-range flowmeter and screw the micrometer head out again gently until the specified flow is indicated on the flowmeter.

Note . . .

The value specified in the Appendix table is the flow per port and must be multiplied by the number of ports in the unit to obtain the total quantity to be indicated on the flowmeter.

72. When the test rig indications are steady at the specified values, record the micrometer reading then move the cut-off slide to permit the fuel delivery from the ports to enter the previously emptied measuring cylinders.

73. Watch the measuring cylinders constantly and immediately the level in any one cylinder reaches the larger of the values in the ' maximum variation ' column move the slide to cut off the flow to the cylinders. The level of the fuel in each of the other cylinders must be within the limits stated, whilst the micrometer reading must be within the minimum and maximum measurements from the datum point. Record the quantity of fuel in each cylinder against the inlet pressure, flow and micrometer readings. Empty the measuring cylinders.

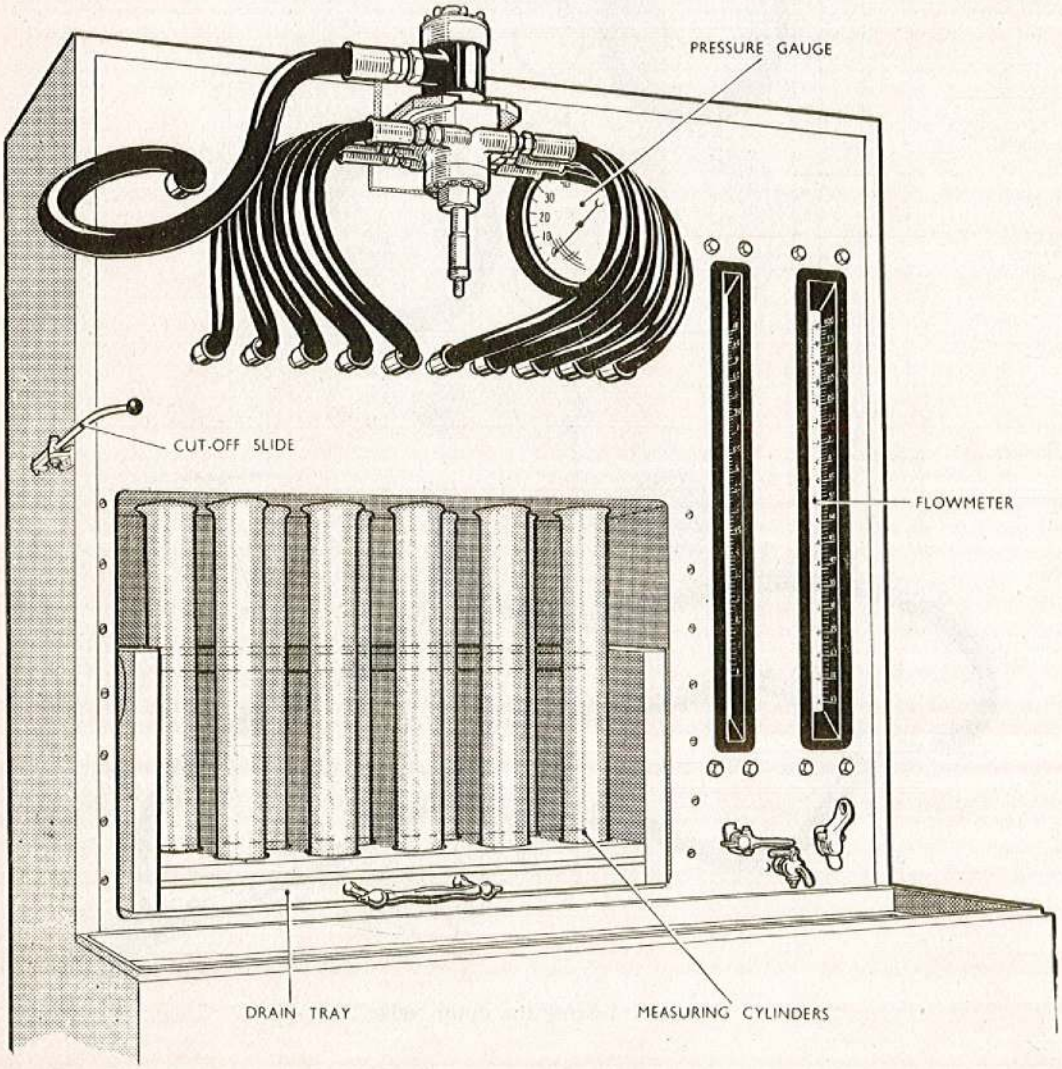

Fig. 7. Calibrating the ports

74. Repeat the procedure at each of the inlet pressure and flow values stated in the table, recording the micrometer reading and measuring cylinder quantities at each check.

75. Should any readings be outside the limits stated in the third and fourth columns of the table, return the unit to the assembly bench, dismantle the assembly and examine the metering slots in the sleeve bore for slight burrs, nicks in the edges and for any foreign matter. Flush the delivery drillings thoroughly and see that there is no damage in the delivery union bores. Check for obstruction in the bores of the flexible pipes connecting the distributor to the delivery nozzles on the test rig; renew these pipes if suspected of being defective.

76. Rebuild and re-test the distributor. Should there be no improvement, the body and sleeve assembly and the metering piston must be replaced by new components and the unit subjected to a complete re-test.

77. Should a new metering piston and distributor body be required, it will be necessary to lap the piston tail to suit the carbon bush. Using the lap T.234721 and the lap holder T.234722, place a small quantity of medium-fine lapping paste over the piston tail and rotate the tool along the

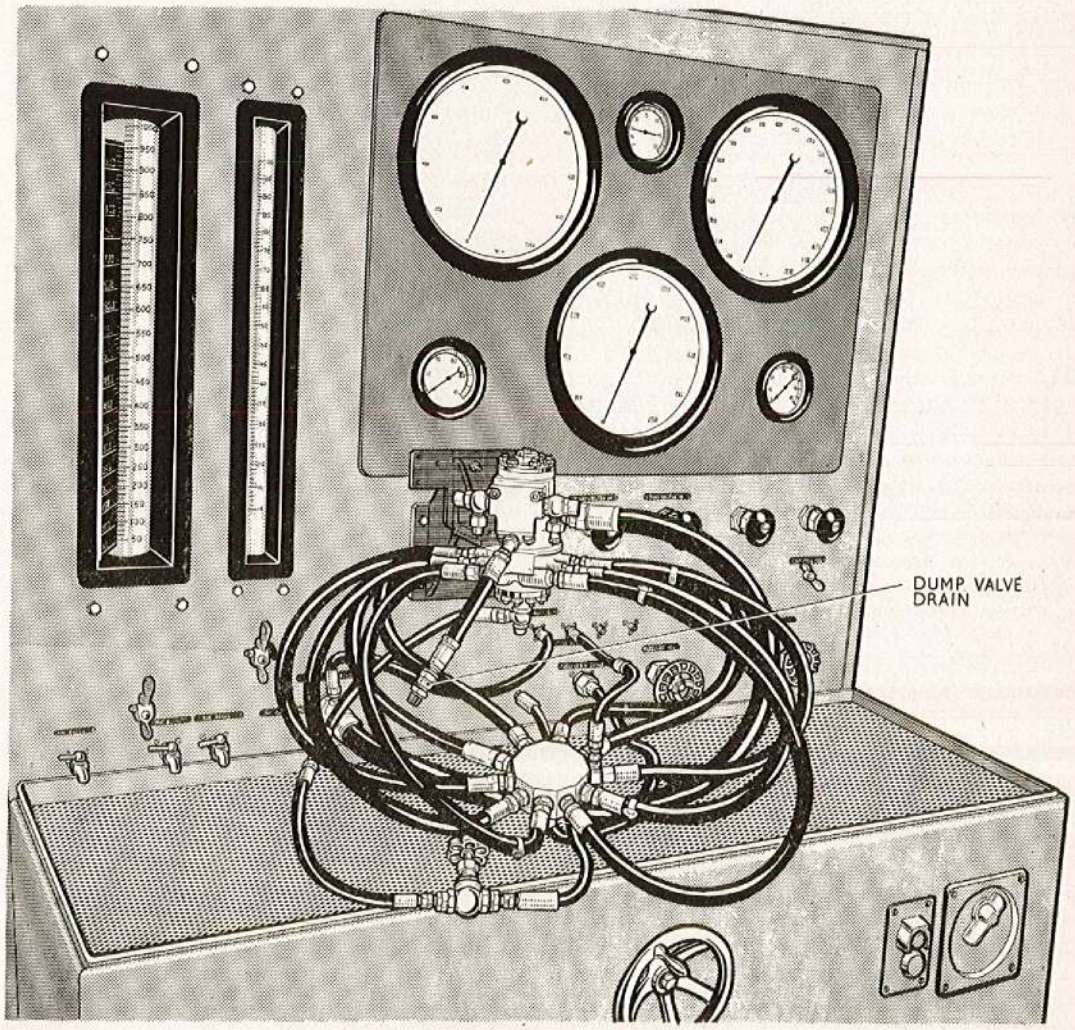

Fig. 8. Test rig

piston tail. At intervals, clean the piston with a kerosine spray, dry off with compressed air. With the carbon-bush lip towards the piston, ease the bush over the tail. Should it be a tight fit, repeat the lapping until satisfactory. It is emphasised that any attempt to force the bush over the piston will result in chipping of the carbon with consequent leakage. Finally, lightly polish the piston tail on a soft buffing wheel and then clean with a kerosine spray and dry off with compressed air.

78. When the test results are satisfactory, record the figures on the test certificate.

Final assembly

79. Remove the micrometer setting tool from the distributor body, the piston-loading adapter from the spring housing and the rig adapter-plate from the dump valve attachment face. Do not disturb the set-screws in the plates at the distributor body end, otherwise the alignment of the carbon bush will be affected. Carefully lift off the spring housing and withdraw the piston.

Assembling the spring and metering piston

80. Position the tension spring so that one end-loop is between the fork on the metering piston, insert a link pin and secure it with a new split pin. Fit the spring anchor likewise to the other end of the spring.

81. Invert the unit and assemble the spring housing to the distributor body. Fit the sealing ring in the distributor end cover, assemble the cover to the plates, secure with a grover washer and nut on each stud and tighten evenly.

82. Screw the guide tool T.251558 into the spring anchor and lower the assembly carefully into the spring housing, taking care to avoid damaging the carbon surface whilst pushing the piston fully into the metering sleeve.

83. Fit the large and small sealing rings in the ends of the spring housing cover and slide the cover over the guide tool to register with the housing studs and the square section of the spring anchor stem. Unscrew the guide tool and screw in the adjusting screw. To overcome the resistance of the large sealing ring, screw the assembly tool T.235322 (*fig.* 2) over the threaded end and press firmly until the cover contacts the end face of the spring housing. Remove the assembly tool and screw on the locknut finger-tight only, as the screw will require adjustment on the test rig. Fit a plain washer, grover washer and nut to each of the spring housing studs and tighten them evenly.

Assembling the dump valve to the distributor

84. Slide the previously assembled dump valve over the studs, fit a tabwasher, grover washer and nut to each of the studs and tighten them evenly.

85. Complete the assembly by fitting the banjo pillar, locking washers and blanking nut to the distributor end cover. Unless the unit is to be rig-tested immediately, seal all open connections with dust caps.

Calibrating the distributor

86. The purpose of the following test is to check the relationship of applied pressure to the collective flow from the distributor ports.

87. Throughout the test the fuel is to be AVTUR and its temperature is to be maintained at 20 to 26 deg. C.

88. In this rig-test (*fig.* 8) the distributor delivery unions are connected to a common collecting box having a single outlet pipe which returns the fuel through a pressure gauge tapping point and manually-variable restricting cock to the rig tank. The pressure gauge indicates the fuel delivery pressure whilst the cock enables a controllable pressure to be applied downstream of the flow distributor so as to simulate the combined restriction imposed by the burners in an actual engine installation.

89. Connect the unit to the test rig. See that the high-range flowmeter cock is open and the low-range flowmeter cock closed. Check that the flow control is set to low and that the delivery pressure cock is open. Start the rig pump and allow it to run for a few minutes to stabilise and attain its working temperature.

90. Open the low-range flowmeter cock, close the high range cock and adjust the flow to the first value stated in the appropriate table in the Appendix. Note that the value specified is for a single port and must be multiplied by the number of ports in the unit to obtain the value to be indicated by the flowmeter. Adjust the delivery restricting cock to raise the outlet pressure to the relevant value stated in the second column, re-adjust the flow if necessary as this may have fallen slightly, then record the indicated inlet pressure.

91. Should the inlet pressure be outside the limits stated in the third and fourth columns of the table, the spring adjusting screw must be altered. Slacken the locknut and, using the tool T.160988, rotate the adjusting screw clockwise to increase or anti-clockwise to decrease the inlet pressure, setting the adjustment so that the pressure is midway between the minimum and maximum values stated. Tighten the locknut and check the inlet pressure again as this may have altered slightly due to compression of the sealing ring under the adjusting screw when tightened by the locknut. For this reason each time an adjustment is made the locknut must be tightened before the inlet pressure is observed.

Performance test

92. When the above condition has been obtained satisfactorily the performance at the distributor is to be tested at each point in the table.

93. Record the inlet pressure obtained up to the highest flow value stated. Re-check at each point whilst reducing the flow to the starting point, recording the observed inlet pressure at each value against the pressure observed previously.

94. Compare the two sets of figures obtained. Should there be a discrepancy between any two adjacent values and the discrepancy is such that one value is outside the corresponding limit in the Appendix table, the distributor must be dismantled and the piston, metering sleeve bore and carbon bush examined closely for foreign matter or other defects which may affect the smooth and progressive working of the piston.

95. Before removing the carbon bush and plates, check that the piston is sliding quite freely over the length of its travel. If the piston is satisfactory in the free condition, examine the loops of the tension spring, particularly when a new spring has been fitted to the unit. It may be found that a loop is off-centre, causing a side load to be applied to the plunger under working conditions. This may occur also if the spring loop is not a free fit within the piston fork or if the link pin is too tight a fit within the spring loop. In either case a new spring must be fitted.

96. When the unit has been rebuilt it must be re-calibrated (*para.* 66 *to* 76) before commencing to repeat the final test (*para.* 89 *to* 93). Check the performance over the range stated in the table two or three times to ensure that the unit is quite satisfactory and record the observed results on the tests certificate.

Leakage tests

97. The unit must now be subjected to final leakage tests under the conditions specified in the relevant Appendix. It is important that the appropriate installation fittings are assembled to the distributor and, following a successful leakage check, these fittings should not be disturbed.

98. Apply the inlet pressure stated in the Appendix and check the leakage from the drain outlet port. Should this leakage exceed the stated amount, change the carbon bush as described in para. 51, in which event the unit must be re-calibrated completely.

99. Dry the exterior of the distributor thoroughly with compressed air, connect the drain union to the rig pump inlet, restrict the fuel delivery to provide the pressure stated in the Appendix and maintain the pressure for the period specified, during which there must be no leakage other than from the dump valve.

100. After removing the distributor from the test rig, drain all fuel from the unit, wire lock the adjusting screw lock nut and where required, the installation fittings, with 24 S.W.G. Specification DTD.189.

Inhibiting and final inspection

101. The unit is to be flushed and filled with oil OM–11 and have dust caps or plugs fitted to the distributor inlet, outlet and drain connections. Check that all other connections have been blanked off and ensure that the information on the name-plate corresponds with the details of the actual unit.

APPENDIX 1

CALIBRATION CODE P

Note . . .
The values quoted in this appendix must be rigidly adhered to and reference should be made to the particular paragraph in the main servicing instructions.

Dump valve tests (*para.* 58 *to* 65)

1. Set restriction downstream of the dump valve for 20 g.p.h. flow through the restriction for a pressure drop of 25 lb. per sq. in.

2. Increase the inlet pressure until the valve opens. The pressure at which this occurs must be 26 to 34 lb. per sq. in. above discharge pressure.

3. Reduce the inlet pressure until the valve closes. The pressure at which this occurs must be within 4 to 10 lb. per sq. in. above discharge pressure.

Dump valve leakage tests

4. With the valve closed, increase the inlet pressure to 22 lb. per sq. in. The leakage past the valve must not exceed 75 c.c. per minute.

5. With the valve open, reduce the line pressure until the downstream pressure is 15 lb. per sq. in. above discharge pressure. With the valve still open at this downstream pressure, the leakage to atmospheric drain must not exceed 50 c.c. per minute. At 1,500 lb. per sq. in. downstream pressure the leakage must not exceed 5 c.c. per minute.

Port calibration (*para.* 66 *to* 78)

6. Return the plunger to 0·025 in. from the datum recorded.

7. Increase the inlet pressure to 30 lb. per sq. in. and maintain for 15 minutes. After 15 minutes, leakage per port must not exceed 10 c.c. per minute.

8. Port calibration table (*para.* 71 *to* 78).

Inlet pressure (lb. per sq. in.)	Mean flow per port (g.p.h.)	Piston travel from opening point datum (in. micrometer reading)	Maximum variation between measuring cylinders (c.c. per min.)
100	0·5	Datum	100–75
50	1·0	0·010–0·020	100–75
20	1·12	0·022–0·032	100–85
10	1·58	0·040–0·060	100–91
5	2·23	0·075–0·095	100–94
5	4·47	0·126–0·146	200–190
5	6·70	0·164–0·184	200–190
5	8·90	0·191–0·221	300–285
5	13·4	0·247–0·277	500–475
5	17·9	0·304–0·334	700–665
5	22·3	0·355–0·395	800–760

9. With the combined flow distributor and dump valve connected to the rig, the following tests are to be carried out.

Calibrating the distributor (*para.* 86 *to* 96)

10.

Mean flow per port (g.p.h.)	Outlet pressure (lb. per sq. in.)	Inlet pressure (lb. per sq. in.)	
		Minimum	Maximum
5	6	365	385
10	25	425	445
20	100	510	540
30	225	585	615
40	400	675	705
50	625	790	820
55	758	875	905
60	900	975	1,005
65	1,058	1,105	1,140
70	1,225	1,250	1,295
75	1,405	—	1,450

LEAKAGE TEST (*refer to para.* 97 *to* 99)

11. At an inlet pressure of 1,000 lb. per sq. in. the leakage from the drain must not exceed 150 c.c. per minute.

12. Reduce the inlet pressure to 300 lb. per sq. in. and record the leakage to the burners.

13. Reduce the inlet pressure to 200 lb. per sq. in. when the leakage to the burners must not exceed 150 c.c. per minute.

14. With a pressure of 30 lb. per sq. in. applied to the suction connection, the leakage from the outlet connection (which should be pointing vertically downwards on the rig) must be recorded.

15. With an outlet pressure of 1,500 lb. per sq. in. and a boost pressure of 40 lb. per sq. in. there must be no external leakage other than from the dump valve. Duration of test, five minutes.

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