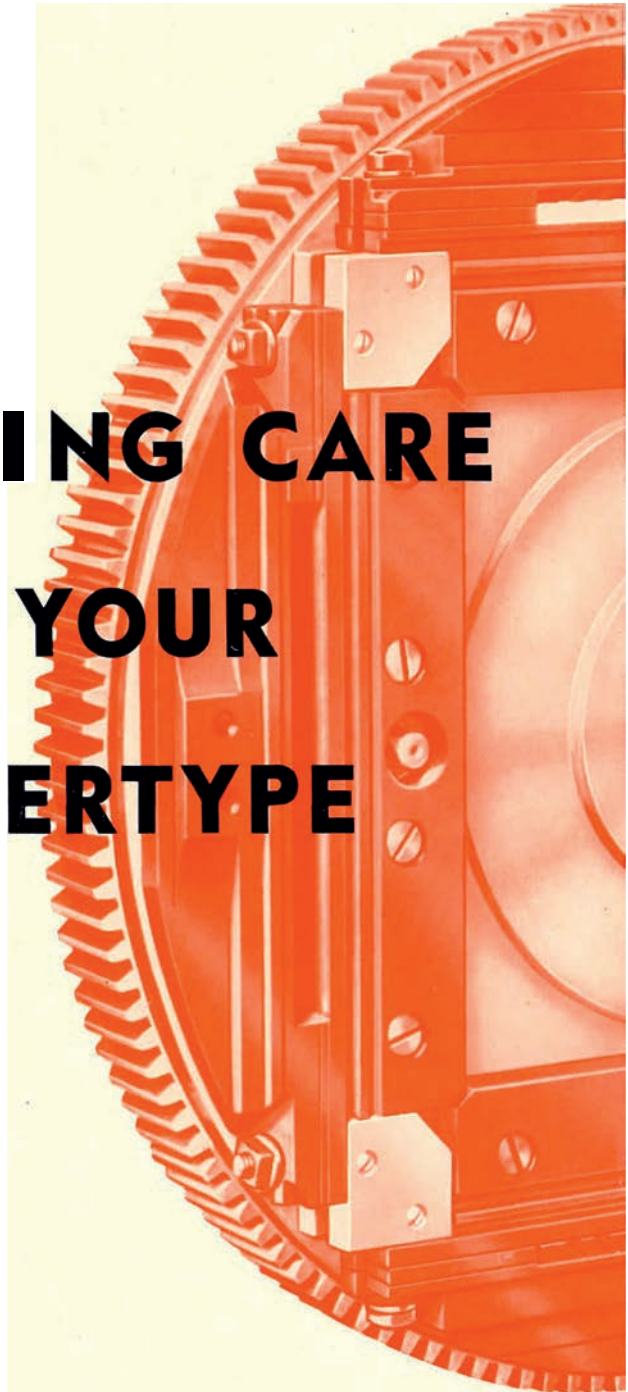


TAKING CARE OF YOUR INTERTYPE

GETTING the most out of existing equipment is the aim of every composing room. When you keep your Intertype clean and well lubricated—when you forestall damage by careful operation and maintenance—you are adding valuable years to the life of the machine. The benefits of a maintenance schedule are obvious.



LUBRICANTS AND THEIR USE

WHILE it is impossible to specify exactly how often each part of the machine should be oiled or how much lubricant should be used, it may be stated generally that all bearings and moving parts should be lubricated sufficiently, but not enough to cause a surplus of lubricant to flow out of the bearings. In this connection, it should be noted that the parts which operate intermittently, such as the cam shaft, do not require as much lubricant as those parts which turn continuously, such as the motor driving gear pulley. On the other hand, this does not mean that the pulley bearing should be flooded with lubricant and that the cam shaft should be left practically dry.

It should be borne in mind that an excess of lubricant can be detrimental in causing dirt and grit to accumulate on working surfaces and eventually to wear them down. A wiping cloth should be carried during the oiling routine and all excess lubricant should be removed as the work progresses. Cleanliness is especially important on all the parts which contact the matrices and spacebands. Oil and dirt on the machine will eventually be deposited in the magazine by the matrices and will clog the assembling units of the machine.

The lubricants listed below have been tested by Intertype and have proved satisfactory for use on the machine.

Intertype Lubricating Oil. Part No. W-4508 (one-pint can). This oil is used for most of the bearings and moving parts on the machine that require lubrication.

Light Oil. Part No. W-5788. This oil should be used for lubricating delicate parts on the machine as indicated in the oiling chart and should be applied sparingly.

Keyboard Cam Oil. Part No. W-1408. This is a high-grade clock oil which combines lightness, resistance to evaporation, and non-creep advantages.

Graphite Grease. Part No. W-5789. Used for certain sliding parts on the quadder mechanism.

Medium Grease. Part No. W-2876. A gun (W-2871) is supplied for pumping the grease into the bearings with grease nipples.

Dry Graphite. Part No. W-1369. For polishing spacebands and machine faces as shown on the oiling chart.

Vice Jaw Cushion Cylinder Hydraulic Oil. Part No. W-2875. For use in the quadding and centring device. This oil must be used only in the vice jaw cushion cylinder to transmit a smooth and shockless action as the vice jaws are closed and opened by the mechanism.

Delivery lever, elevator transfer lever and distributor shifter lever, cushion cylinder hydraulic oil. Part No. W-5239. The use of this oil must be confined to maintaining the oil level in these three cushion cylinders.

THE following maintenance routine provides a basic system applicable to the average conditions under which most line composing machines are used. Variable factors in these conditions, however, including climate and the relative cleanliness of the surroundings, will necessitate revisions in the general plan. A systematic inspection of the machine and its equipment will reveal conditions which require attention more frequently than those outlined below.

ONCE A DAY

Polish the spacebands on a flat pine board with dry graphite. The board must be kept clean and free from dust and grit.

Clean the plunger with a wire brush; scrape the pot crucible well and clean the intake holes in the well.

Polish the galley chute spring at the bottom of the right hand galley bracket with mould polish.

Apply a small quantity of dry graphite on a pad to the face of the moulds, vice jaws and first elevator jaws and gently polish. Remove all surplus graphite and wipe the top of the vice justification block to prevent graphite from depositing.

Brush all metal trimmings from the machine.

Collect all matrices that may have accumulated in the tray at the rear of the machine or on the keyboard and return them to proper magazines.

Dust the machine, especially those parts in immediate proximity to belts.

ONCE A WEEK

Oil the machine, as indicated in the lubrication charts. A complete list of lubricating points is presented immediately following this general maintenance outline. Clean the cams with white spirit or petrol and wipe them dry before resuming operation.

Clean the matrix delivery belt pulley and the supporting plate with a cloth dipped in petrol.

Wipe the pot crucible mouthpiece and scratch out all the vertical vents lightly to remove oxides. Clean the back of the mould disc and the moulds.

Roughen the back mould wiper with a stiff wire brush.

Clean the inside surfaces of the delivery slide fingers, the transfer slide finger and the face of the distributor shifter slide buffer with a cloth and petrol.

Wipe the top of the second elevator bar plate and the tops of the transfer channel plates where the elevator seats during transfer. In the case of double distributor machines, apply a minute quantity of oil to the top of second elevator bar plate after cleaning.

Inspect the cam rollers to see that they are turning freely.

Examine the distributor screws and wipe off any oil that may have worked out upon the threads. The oil, if permitted to remain on the threads, will foul the lugs of the matrices and may cause them to stick in the magazines.

EVERY TWO WEEKS

Oil the distributor bearings.

Oil the knife block sparingly.

Oil the assembling elevator gate spring roll and hinge rod sparingly, applying the oil with a wire or toothpick; grease the mould disc stud and oil the magazine frame chain sprockets, shutter cams, and magazine frame shaft rolls and counterbalance spring.

ONCE A MONTH

Oil the motor.

Grease all the bearings that are provided with grease nipples as indicated in the oiling chart. A grease gun (W-2871) is used for this work.

EVERY THREE MONTHS

In the case of a gas pot, remove the pot and the mouthpiece burners, clean them with a stiff wire brush and wipe out the burner orifices underneath pot.

Clean the front and back keyboard cams, rubber rolls and frames. *Lubricate the cam pivots with Keyboard Cam Oil only.*

Clean the magazines and matrices. These need not be attended to at one time but the cleaning process can be spread over a period of several weeks.

ONCE A YEAR

Remove the entire keyboard from the machine and clean it thoroughly, including the keyrods and frame. Once a year is usually frequent enough for this unit, but if the surroundings are unfavourable, this operation may be necessary every six months.

INTERTYPE MODELS "C" and "C"sm Single Distributor

DAILY

- 7 First elevator jaw line stop. *Clean, polish with dry graphite*

WEEKLY

- 5 Distributor clutch shaft (L.H. end). *Use light oil sparingly (oil hole)*
6 Distributor clutch shaft (R.H. end). *Use light oil sparingly (oil hole)*
8 First elevator jaw duplex rail and slides. *Spot of dry graphite*
9 First elevator jaw duplex rail operating lever. *Use light oil sparingly*
10 Elevator transfer slide. *Clean and use light oil sparingly*
11 Elevator transfer slide link. *Spot of light oil (both ends)*
12 Distributor shifter slide. *Clean and use light oil sparingly*
13 Distributor shifter lever link. *Spot of light oil (both ends)*
14 Second elevator guide lower. *Smear of light oil*
15 Spaceband lever pawl hinge pin. *Spot of light oil*
16 Magazine frame pinion link eccentric (L.H.). *(Oil hole)*
17 Fount distinguisher (automatic) operating lever shaft. *Use light oil (oil hole)*
19 Magazine shutter operating levers. *Spot of light oil*
20 Magazine frame pinion link eccentric (R.H.). *(Oil hole)*
21 First elevator slide hinged head (when fitted). *(2 oil holes)*
22 Assembling elevator gibs. *Clean and polish with dry graphite*
25 Delivery pawl fulcrum screw. *Spot of light oil*
26 Spaceband lever turnbuckle. *Spot of oil*
27 Delivery slide. *Clean and smear light oil in slide*
28 Assembler slide roll. *Small spot of light oil*
31 Assembler slide lever. *Use light oil (oil hole)*
32 Magazine frame operating handle detent. *Smear of oil on side*
33 Magazine frame operating chain clutch lever fulcrum screw (S.M.). *Spot of oil*
34 Magazine frame operating handle knob bushing. *One drop only (oil hole)*
35 Pi stacker idle pulley. *Use light oil (oil cup)*
36 Pi stacker star shaft (front). *Use light oil sparingly (oil hole)*
37 Pi stacker star shaft (back). *Use light oil sparingly (oil pipe)*
38 Vice automatic stop lever. *Smear of oil*
39 Starting and stopping lever hinge pin. *Spot of oil*

- 40 Assembling elevator lever link. *Spot of light oil*
42 Assembler slide brake operating lever stud. *Spot of light oil*
43 Assembler slide bearing roller. *Spot of light oil*
44 Assembler slide supporting roll. *Spot of light oil*
45 Assembler slide brake fulcrum screw. *Spot of light oil*
46 Assembling elevator lever shaft. *Use light oil (2 holes)*
48 Magazine frame operating handle detent collar. *Smear of oil*
49 Magazine frame operating handle stud. *Spot of light oil*
50 First elevator lever link hinge pins (upper and lower). *Spot of oil*
51 First elevator slide gibs. *Light film of oil on dovetail slides*
52 Slug lever operating cam support roll. *Spot of light oil*
53 Slug lever stud. *(Oil hole)*
54 Vice frame foot release. *Spot of oil*
55 Slug lever operating roll. *Use light oil (oil hole)*
56 Spaceband lever shaft. *(Oil hole in column)*
57 Elevator transfer lever shaft. *(Oil hole in column)*
58 Delivery lever shaft. *(Oil hole in column)*

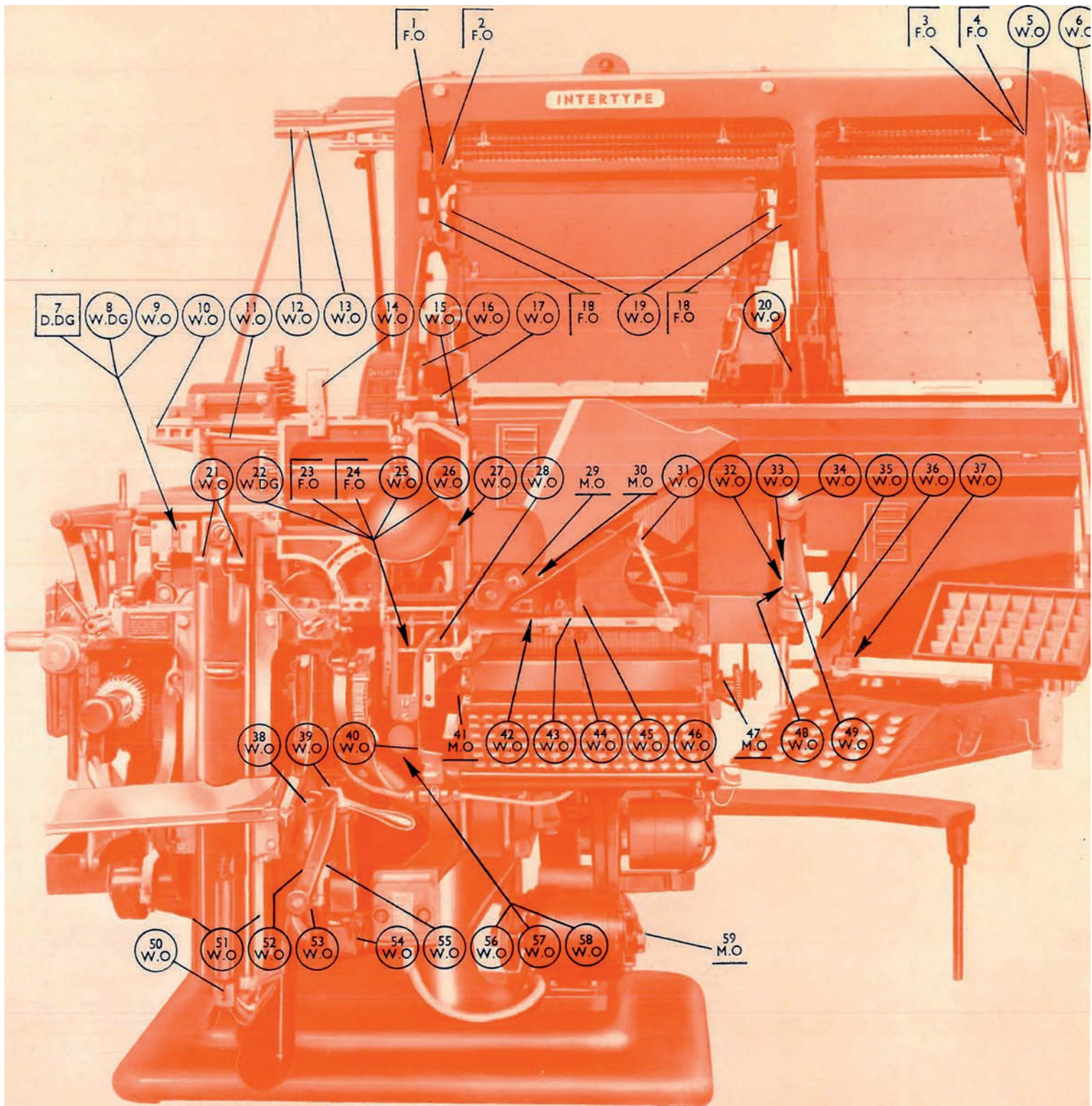
FORTNIGHTLY

- Distributor front screw upper (L.H. end). *Two drops light oil*
2 Distributor front screw lower (L.H. end). *Two drops light oil*
3 Distributor front screw upper (R.H. end). *Two drops light oil*
4 Distributor front screw lower (R.H. end). *Two drops light oil*
18 Magazine shutter cams. *Smear light oil on cam surface*
23 Assembling elevator gate spring roll. *Use light oil sparingly*
24 Assembling elevator gate hinge rod. *Use light oil sparingly*

MONTHLY

- 29 Assembler bearings. *Light oil (3 oil holes)*
30 Assembler pulley (loose) bearing. *Light oil (1 hole in pulley)*
41 Keyboard cam rubber roll shaft bearings (L.H.) (front and back). *Use light oil sparingly (2 oil cups)*
47 Keyboard cam rubber roll shaft bearings (R.H.) (front and back). *Use light oil sparingly (2 oil holes)*
59 Driving motor bearings. *(Oil hole)*

LUBRICATION POINTS Nos. 1-59



DAILY

61 Mould faces. *Polish with dry graphite*

WEEKLY

60 Mould disc locking stud. *Film of light oil on stud*

63 Knife wiper bar block. *Apply film of light oil on slide*

65 Vice automatic stop mould disc dog. *Apply film of oil on side*

66 Vice justification bar brace pin and cam (Quadding). *Graphite grease in cam track*

67 Mould wiper (front) screw. *Drop of light oil on hinge*

68 Vice jaw (R.H.) release lever pivot block (Quadding). *Polish with dry graphite*

69 Vice jaw rack pawl hinge pin (Quadding). *Two drops light oil*

71 Vice justification bar brace hinge pin. *One or two drops of oil*

72 Vice jaw rack pawl lever screw (Quadding). *One or two drops of light oil (oil hole)*

73 Vice justification bar brace actuating finger roll (Quadding). *Apply graphite grease*

74 Vice justification rods. *Film of oil on rods*

75 Mould disc locking stud block (floating). *One or two drops of light oil (oil hole)*

76 Vice justification bar roll (Quadding). *Two drops of oil on pin*

77 Vice jaw rack pawl lever latch wedge and block (Quadding). *Smear with graphite grease*

78 Vice jaw rack pawl lever latch fulcrum pin (Quadding). *One or two drops of light oil (oil hole)*

79 Vice closing connecting rod pin and roll (Quadding). *Drop only of oil on pin*

81 Vice locking screws and studs. *Use light oil on threads and faces*

82 Vice jaw rack gear shaft (Quadding). *Drop of light oil*

FORTNIGHTLY

62 Mould disc stud. *Do not over-grease (grease nipple)*

64 Knife block operating screw. *Drop of light oil on each thread*

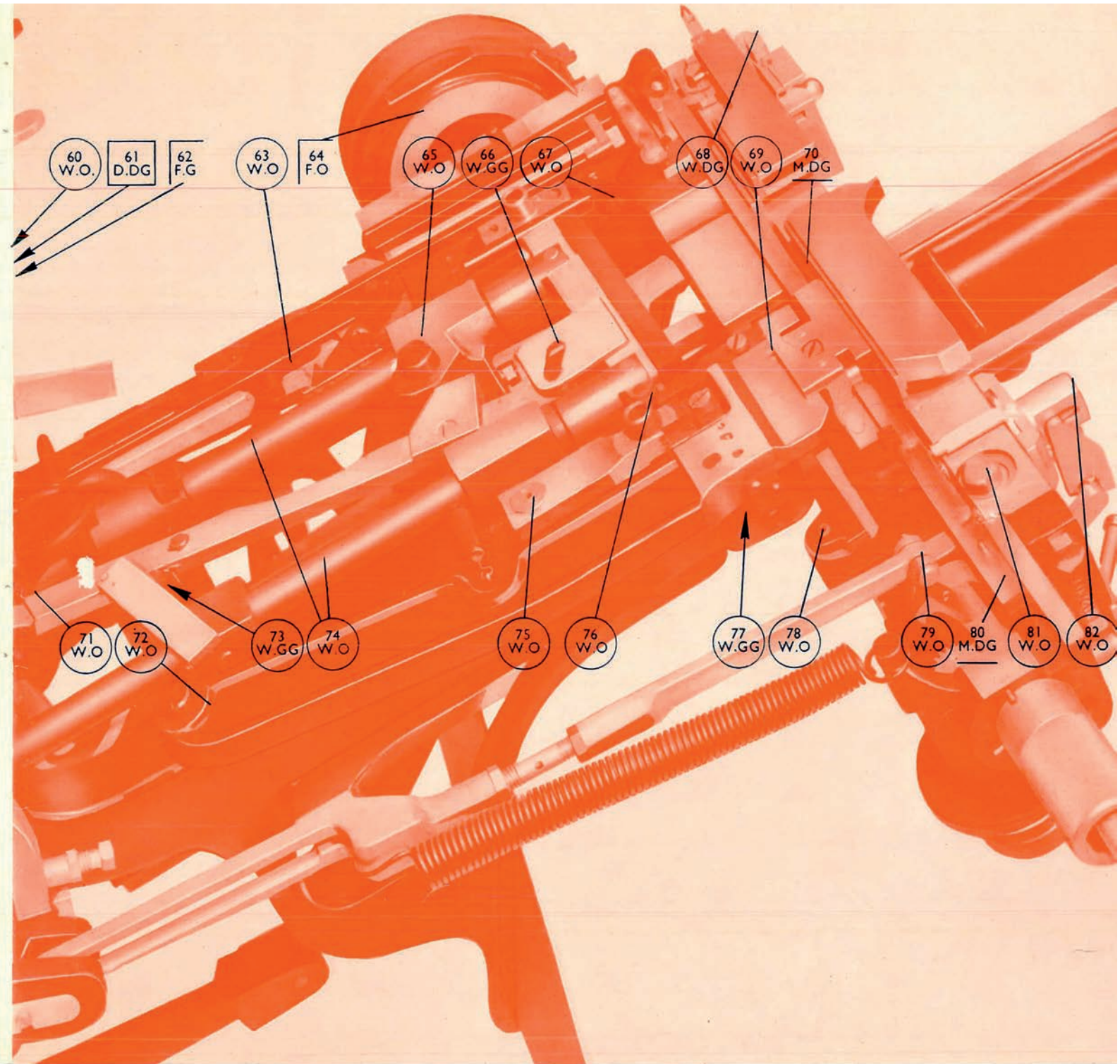
MONTHLY

70 Vice jaw blocks. *Polish with dry graphite*

80 Vice jaw (R.H.) rack (Quadding). *Polish sides with dry graphite*

INTERTYPE MODELS "C" and "C"sm Single Distributor *continued*

LUBRICATION POINTS Nos. 60-82



WEEKLY

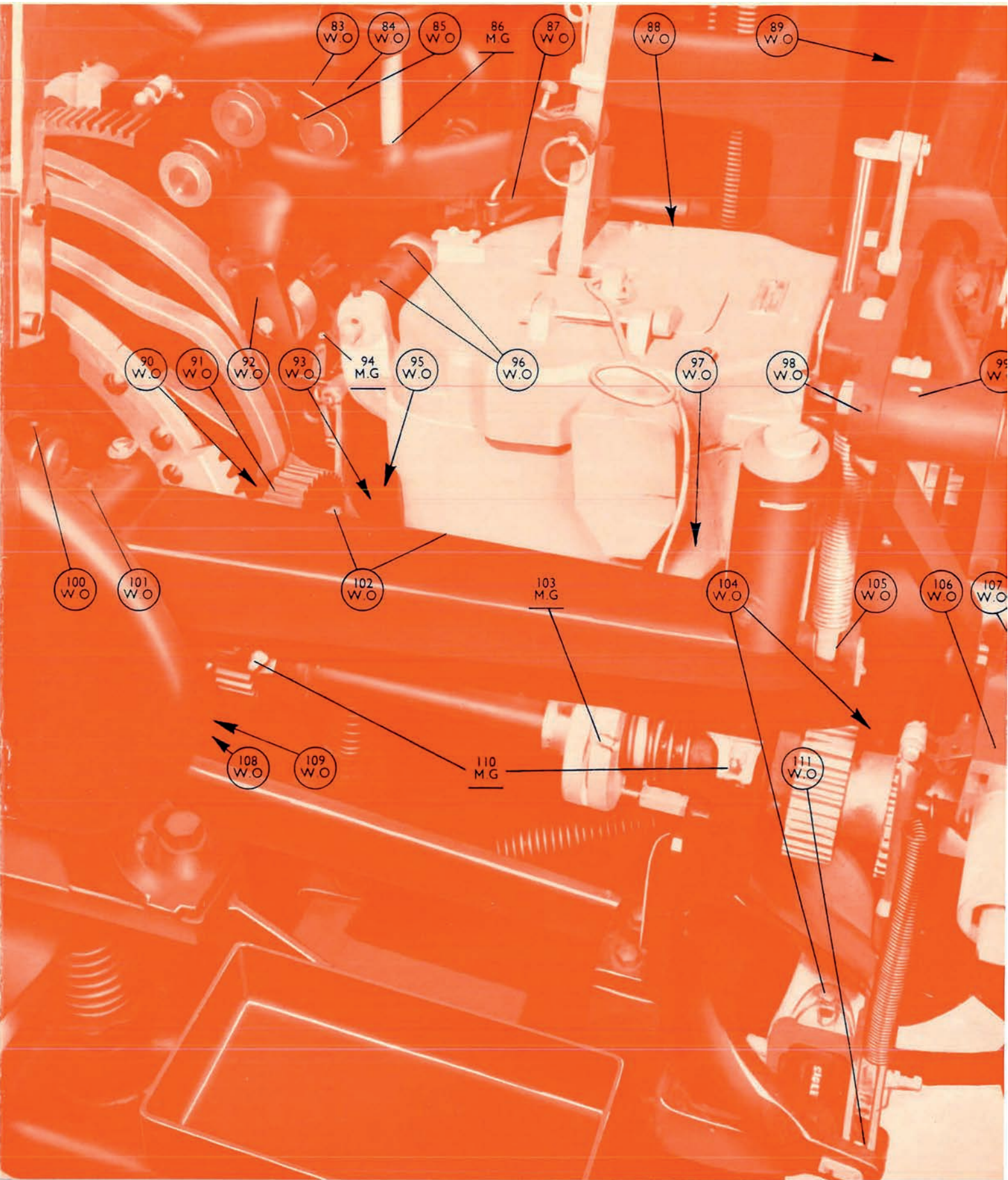
- 83 Mould cam lever handle shaft. (2 oil holes)
- 84 Mould cam lever hinge pin. (2 oil holes)
- 85 Pot pump lever shaft. (2 oil holes)
- 87 Pump stop lever. *Light film of oil on working faces*
- 88 Mould disc slide. *Light film of oil on dovetail*
- 89 Delivery lever link stud and link screws. *Spot of oil on each end*
- 90 Mould turning bevel pinion facings. *Light film of oil*
- 91 Mould turning bevel pinion and mould disc pinion and gears. *Spot of oil on teeth*
- 92 Pot pump cam roll. *One or two drops (oil hole)*
- 93 Mould disc slide safety lock pin. *Spot of oil on hinges*
- 95 Mould disc slide safety lock link. *Spot of oil on hinges*
- 96 Pot lever shaft. (2 oil holes)
- 97 Mould disc guide support screw. (Oil hole in guide)
- 98 Vice jaw operating safety lever (Quadding). *One or two drops (oil hole)*
- 99 Vice jaw lever (Quadding). *One or two drops (oil hole)*
- 100 Distributor shifter lever shaft. (2 oil holes)
- 101 Vice jaw operating lever shaft (Quadding). (Oil hole)
- 102 Mould turning bevel pinion shaft. (2 oil cups)
- 104 Pot leg bushings. (2 oil cups)
- 105 Vice jaw operating lever link hinge pin (Quadding). *Drop of oil on hinge pin*
- 106 Vice closing screw (adjustable attachment) (Quadding). *One or two drops of light oil (oil hole)*
- 107 Vice adjustable detent plate (Quadding). *Drop of light oil (oil hole)*
- 108 Justification cam roll. (2 oil holes)
- 109 Vice closing cam roll. (2 oil holes)
- 111 Vice closing connecting rod hinge pin. *Drop of oil on hinge*

MONTHLY

- 86 Pot pump lever well. *Smear of grease in well*
- 94 Pot cam roll. (Grease nipple)
- 103 Mould driving pinion shaft friction disc. (Grease nipple)
- 110 Mould driving pinion shaft. (2 grease nipples)

INTERTYPE MODELS "C" and "C"sm Single Distributor *continued*

LUBRICATION POINTS Nos. 83-111



WEEKLY

- 112 Distributor clutch flange spring. *Two drops of light oil (oil hole)*
- 113 Distributor clutch lever hinge pin. *Drop of light oil (2 oil holes)*
- 114 Distributor clutch flange collar. *Drop of light oil*
- 115 Distributor clutch pulley. *Two drops of light oil (oil hole)*
- 116 Distributor back screw (R.H. end). *One or two drops of light oil (oil hole)*
- 117 Distributor gear train. *Drop of light oil*
- 118 Channel entrance operating lever fulcrum stud. *Drop of light oil*
- 119 Channel entrance frame bracket fulcrum studs (3). *Drop of light oil*
- 120 Distributor back screw (L.H. end). *One or two drops of light oil (oil hole)*
- 121 Distributor box matrix lift cam. *Film of light oil on surface*
- 122 Distributor box matrix cam roll stud. *One drop of light oil*
- 123 Distributor box matrix cam lever hinge pin. *One or two drops of light oil (oil hole)*
- 124 Second elevator guide (upper). *Apply film of thin oil to sides*
- 125 Second elevator bar link hinge pin. *Spot of light oil*
- 126 Second elevator bar plate. *Apply film of thin oil to top*
- 129 Magazine frame pinion link (R.H.). *Two drops (oil hole)*
- 130 Magazine frame shaft (lower) eccentric (R.H.). *One or two drops (oil hole)*
- 133 Magazine frame shaft (lower) eccentric (L.H.). *One or two drops (oil hole)*
- 134 Magazine frame pinion link (L.H.). *Two drops (oil hole)*
- 137 Mould cam and mould cam lever rolls. *Spot of oil on roll spindles*
- 138 Mould cam safety lever hinge pin. *Spot of oil on pin*
- 139 Mould disc turning cam and pot and pump cam wipers. *Use oil to soften*
- 140 Vertical starting lever shaft. *One or two drops of oil*
- 141 Mould disc slide safety automatic stopping lever (upper). *Smear of oil on sides*
- 142 Mould disc slide safety stop. *Smear of oil on sides*
- 143 Automatic stopping lever (lower) fulcrum pin. *One or two drops of oil*
- 144 Magazine frame operating chain intermediate sprocket shaft (R.H.). *(Oil hole)*
- 145 Magazine frame operating universal joint (R.H.) (S.M.). *Spot or two of oil*
- 146 Magazine frame operating telescopic shaft (S.M.). *Smear of oil*
- 147 Magazine frame operating universal joint (L.H.) (S.M.). *Spot or two of oil*
- 148 Magazine frame telescopic shaft driver (S.M.). *(Oil hole)*
- 152 Assembler drive idle pulley stud (upper). *Light oil (oil cup)*
- 153 Delivery and transfer oil cushion cylinders hinge pins (4). *Oil hinge pins or links*
- 154 Automatic stop forked lever shaft. *Drop of oil on hinge*
- 155 Magazine frame counterbalance lever hinge pin. *Drop of oil*
- 156 Delivery lever cam roll. *Drop or two of oil on sides*
- 157 Elevator transfer lever shaft. *(Oil hole in column)*
- 158 Spaceband lever shaft. *(Oil hole in column)*
- 159 Delivery lever shaft. *(Oil hole in column)*
- 160 Ejector lever buffer rod. *One or two drops of oil on ends*
- 162 Second elevator cam roll. *(Oil holes)*
- 164 Vice jaw operating lever roll and shoe (Quadding). *One or two drops of oil on each side of roll*
- 167 Magazine frame operating chain intermediate sprocket. *(Oil hole)*
- 168 Intermediate shaft. *(Oil cup)*
- 169 Assembler drive idle pulley stud (lower). *Light oil (oil cup)*
- 170 Driving shaft friction link pins. *Light oil on hinges sparingly*
- 171 Elevator transfer cam roll. *(Oil hole)*
- 173 Second elevator lever shaft (R.H. end). *(Oil hole)*
- 174 Second elevator lever. *(2 oil holes)*
- 175 Automatic safety pawl buffer. *Smear of oil on sides*
- 176 Automatic safety pawl hinge pin. *Spot of oil on pin*
- 177 Automatic stopping pawl hinge pin. *Spot of oil on pin*
- 178 Ejector lever adjustable pawl. *(Oil hole)*
- 180 Second elevator lever shaft (L.H. end). *(Oil hole)*
- 181 First elevator cam roll. *(Oil hole)*
- 182 Driving shaft friction shoe and buffer rods. *Spot of light oil. (4 oil holes)*
- 183 Motor drive intermediate pulley bracket. *(2 oil cups)*
- 184 Magazine frame counterbalance lever shaft. *(Oil hole)*
- 185 Driving shaft clutch flange. *Smear of oil on both sides*
- 188 First elevator and ejector lever shaft (R.H. end). *(Oil hole)*
- 189 Justification and vice closing lever shaft (R.H. end). *(Oil hole)*
- 190 Second elevator lever safety pawl. *Apply smear of oil*
- 191 Ejector lever. *(Oil hole)*
- 192 Driving shaft. *Apply film of oil on surface*
- 194 Justification and vice closing lever. *(Oil hole)*
- 197 First elevator and ejector lever shaft (L.H. end). *(Oil hole)*
- 198 Justification and vice closing lever shaft (L.H. end). *(Oil hole)*

FORTNIGHTLY

- 128 Magazine frame operating chain sprocket (side and main). *One or two drops of oil*
- 131 Side magazine frame shaft rolls (2). *Oil sparingly*
- 132 Side magazine frame counterbalance spring. *One or two drops of oil between coils*
- 135 Magazine frame shaft rolls (2). *Oil sparingly*
- 136 Magazine frame counterbalance spring rolls. *One or two drops of oil between coils*

MONTHLY

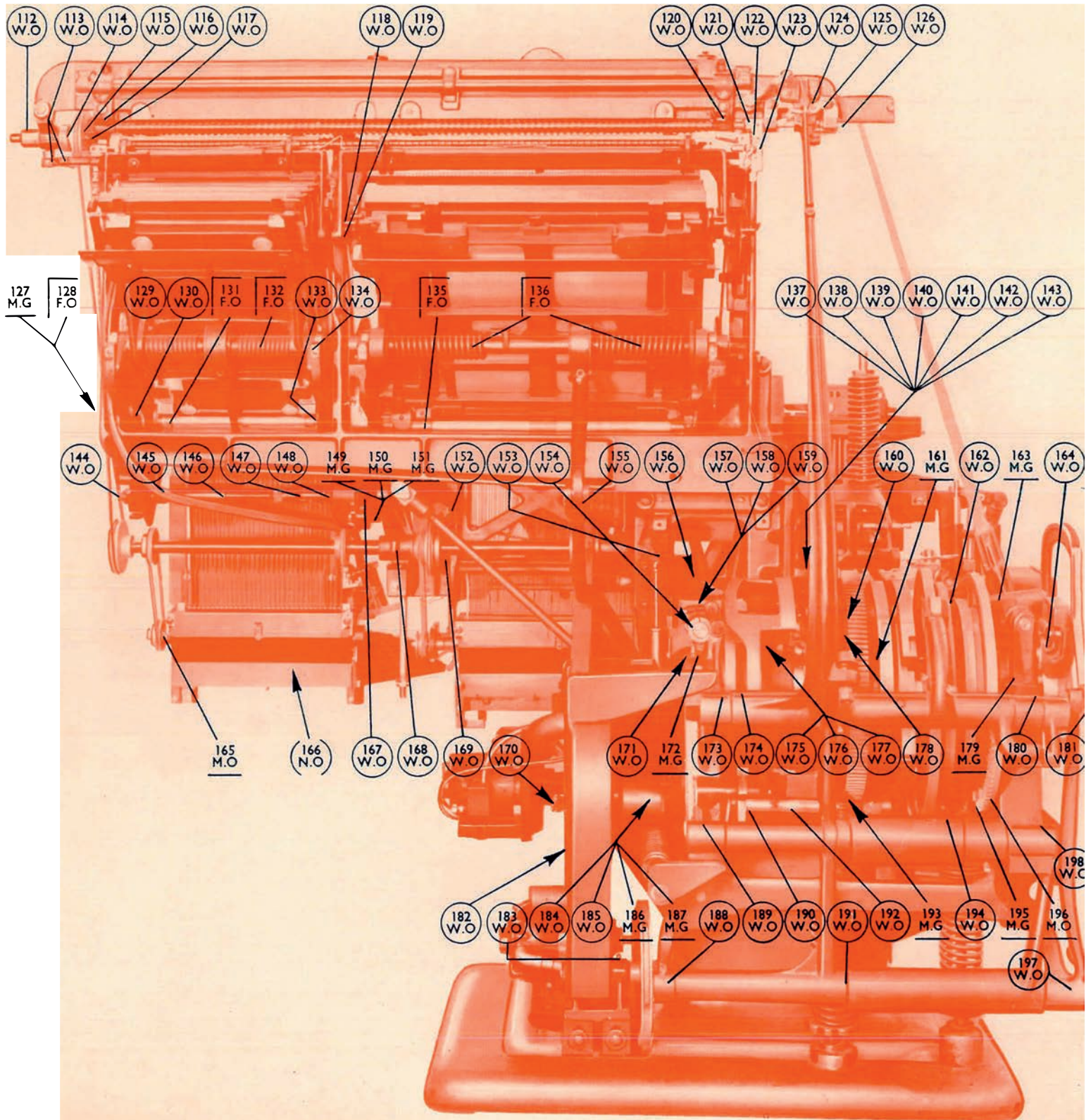
- 127 Magazine frame operating chain. *Grease lightly*
- 149 Magazine frame operating chain intermediate sprocket. *Grease lightly*
- 150 Magazine frame operating chain intermediate sprocket (loose). *Grease lightly*
- 151 Magazine frame operating chain intermediate sprocket (tight). *Grease lightly*
- 161 Pot return cam. *Smear of grease on surface*
- 163 Distributor shifter cam rider and cam. *Smear grease on cam*
- 165 Keyboard cam rubber roll shaft (S.M.). *Use light oil both ends (oil holes)*
- 172 Cam shaft (R.H. end). *(Grease nipple)*
- 179 Cam shaft (L.H. end). *(Grease nipple)*
- 186 Driving shaft (R.H. end) and (L.H. end). *(2 grease nipples)*
- 187 Motor driving pulley. *Do not over-grease, detrimental to clutch (grease nipple)*
- 193 Justification lever spring rod. *(Grease nipple)*
- 195 Vice closing lever spring rod. *(Grease nipple)*
- 196 Mould turning segments. *Spot of oil on teeth*

WHEN NECESSARY

- 166 Keyboard cams main and side. *Clean and apply spot of clock oil to each cam pivot*

INTERTYPE MODELS "C" and "C"sm Single Distributor *continued*

LUBRICATION POINTS Nos. 112-198



INTERTYPE MODELS "F" "F"sm and "G" "G"sm Double Distributor

DAILY

- 21 First elevator jaw line stop. *Clean, polish with dry graphite*

WEEKLY

- 1 Distributor shifter lever link. *Spot of light oil (both ends)*
2 Distributor shifter slide. *Clean and use light oil sparingly*
3 Distributor box clutch tripping lever shoe. *Light film of oil on working surface*
4 Fount selector operating lever bracket. *One drop only (2 oil holes)*
6 Distributor box clutch operating lever stud. *One drop of light oil*
7 Distributor box clutch cam roll. *One drop of light oil*
8 Distributor box shifter link. *One drop only (oil hole)*
9 Distributor box shifter link slide. *Smear of oil on sides*
10 Distributor box shifter gear stud. *One drop of light oil (oil hole in head)*
11 Distributor box clutch stop. *Smear of oil on top surface*
12 Distributor box clutch pawl fulcrum pin. *One drop of light oil*
13 Distributor box clutch pawl lever plate. *Light film of oil on operative surface*
14 Distributor box clutch pawl lever stud. *Drop of light oil (oil hole)*
15 Distributor box clutch pawl lever detainer. *Drop of light oil (oil hole)*
16 Channel entrance latch lever fulcrum and connecting screws (2). *Drop of light oil*
18 Distributor front screw bracket (R.H.) idle gear stud. *(2 oil tubes)*
19 Distributor clutch flange collar. *Smear of light oil*
20 Distributor clutch shaft. *Use light oil sparingly (oil hole)*
22 First elevator jaw duplex rail operating lever. *Spot of light oil*
23 First elevator jaw duplex rail and slides. *Spot of dry graphite*
24 Elevator transfer slide. *Clean and use light oil sparingly*
25 Elevator transfer slide link. *Spot of light oil (both ends)*
26 Second elevator guide lower. *Smear of light oil*
27 Magazine frame lifting cam roller (L.H.) (Main). *Oil track*
28 Spaceband lever pawl hinge pin. *Spot of light oil*
29 Magazine frame lifting cam roller (R.H.) (Main). *Oil track*
30 Magazine releasing bellcrank fulcrum screw. *Drop of light oil*
31 Magazine releasing rod. *Smear of oil on sides*
32 Channel entrance latch releasing cam hinge. *Spot of light oil*
33 Channel entrance releasing cam roll. *Spot of light oil*
34 Magazine frame lifting cam rollers (S.M.). *Smear oil on track*
35 Assembling elevator gibs. *Clean and polish with dry graphite*
36 Delivery pawl fulcrum screw. *Spot of light oil*
39 Spaceband lever turnbuckle. *Spot of oil*
40 Delivery slide. *Clean and smear light oil in slide*
43 Assembler slide lever. *Use light oil (oil hole)*
44 Assembler drive idle pulley stud (lower) (Main only). *Light oil (oil cup)*
45 Assembler drive idle pulley stud (upper) (Main only). *Light oil (oil cup)*
46 Magazine frame operating handle lock. *Oil sparingly*
47 Magazine frame operating handle detent collar. *Smear of oil*
48 Magazine frame operating handle detent. *Smear of oil on side*
49 Magazine frame operating handle knob bushing. *One drop only (oil hole)*
50 Magazine frame operating chain clutch lever detent and hinge (S.M.). *Oil sparingly*
51 Magazine frame operating handle stud. *Spot of light oil*
52 Vice automatic stop lever. *Smear of oil*
53 Starting and stopping lever hinge pin. *Spot of oil*
54 Assembler slide roll. *Small spot of light oil*
55 Keyrod frame shifting lever operating lever fulcrum. *Spot of light oil*
57 Assembler slide brake operating lever stud. *Spot of light oil*
58 Assembler slide supporting roll. *Spot of light oil*
59 Assembler slide bearing roller. *Spot of light oil*
60 Assembler slide brake fulcrum screw. *Spot of light oil*
62 Keyrod frame shifting lever operating lever fulcrum (S.M.). *Spot of light oil*
63 Pi stacker star shaft (lower). *Use light oil sparingly (oil tube)*
64 Pi stacker star shaft (upper). *Use light oil sparingly (2 oil tubes)*
65 Pi stacker idle pulleys. *Use light oil (2 oil cups)*
66 Matrix delivery belt driving pulley idle pulleys (S.M.). *(2 oil cups)*
67 First elevator lever link hinge pins (upper and lower). *Spot of oil*
68 First elevator slide gibs. *Light film of oil on dovetail slides*
69 Slug lever operating cam support roll. *Spot of light oil*
70 Slug lever operating roll. *Use light oil (oil hole)*
71 Slug lever stud. *(Oil hole)*
72 Vice frame foot release. *Spot of oil*
73 Elevator transfer lever shaft. *(Oil hole in column)*
74 Spaceband lever shaft. *(Oil hole in column)*
75 Delivery lever shaft. *(Oil hole in column)*
76 Assembling elevator lever link. *Spot of light oil (both ends)*
77 Assembling elevator lever shaft. *Use light oil (2 holes)*

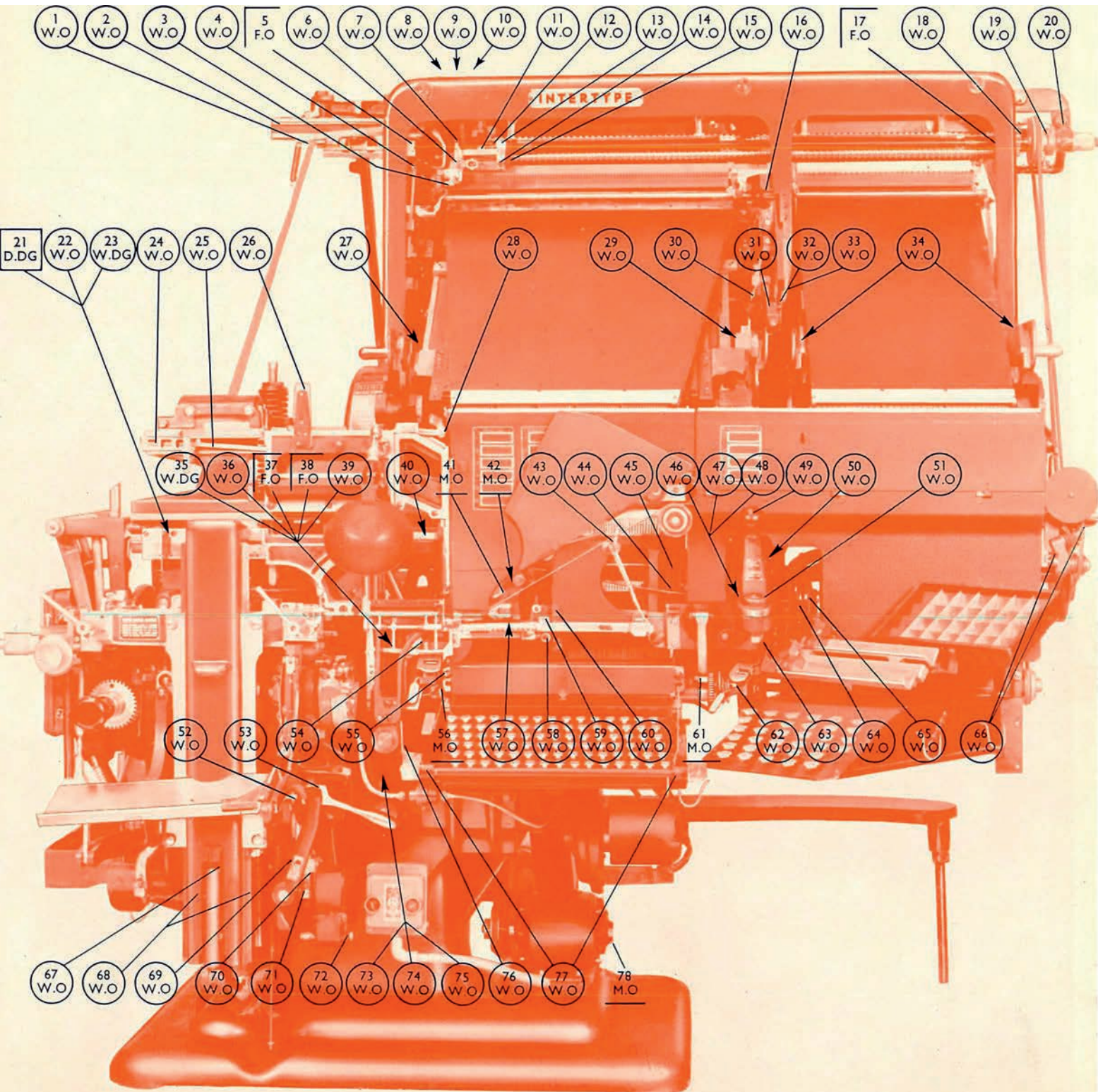
FORTNIGHTLY

- 5 Distributor front screw bracket (L.H. end). *Two drops of light oil (2 oil holes)*
17 Distributor front screw bracket (R.H. end). *Two drops of light oil (2 oil holes)*
37 Assembling elevator gate spring roll. *Use light oil sparingly*
38 Assembling elevator gate hinge rod. *Use light oil sparingly*

MONTHLY

- 41 Assembler bearings. *Light oil (3 oil holes)*
42 Assembler pulley (loose) bearing. *Light oil (1 hole in pulley)*
56 Keyboard cam rubber roll shaft bearings (L.H.) (front and back). *Use light oil sparingly (2 oil cups)*
61 Keyboard cam rubber roll shaft bearings (R.H.) (front and back). *Use light oil sparingly (2 oil cups)*
78 Driving motor bearings. *(Oil hole)*

LUBRICATION POINTS Nos. 1-78



DAILY

80 Mould faces. *Polish with dry graphite*

WEEKLY

79 Mould disc locking stud. *Film of light oil on stud*

82 Knife wiper bar block. *Apply film of light oil on slide*

84 Vice automatic stop mould disc dog. *Apply film of oil on side*

85 Vice justification bar brace pin and cams (back) and (front) (Quadding). *Graphite grease in cam track*

86 Mould wiper (front) screw. *Drop of light oil on hinge*

87 Vice jaw (R.H.) release lever pivot block (Quadding). *Polish with dry graphite*

88 Vice jaw rack pawl hinge pin (Quadding). *Two drops of light oil (oil hole)*

90 Vice justification bar brace hinge pin. *One or two drops of oil*

91 Vice jaw rack pawl lever screw (Quadding). *One or two drops of light oil (oil hole)*

92 Vice justification bar brace actuating finger roll (Quadding). *Apply graphite grease*

93 Vice justification rods. *Film of oil on rods*

94 Mould disc locking stud block (floating). *One or two drops of light oil (oil hole)*

95 Vice justification bar roll (Quadding). *Two drops of oil on pin*

96 Vice jaw rack pawl lever latch wedge and block (Quadding). *Smear with graphite grease*

97 Vice jaw rack pawl lever latch fulcrum pin (Quadding). *One or two drops of light oil (oil hole)*

98 Vice closing connecting rod pin and roll (Quadding). *Drop only of oil on pin*

100 Vice locking screws and studs. *Use light oil on threads and faces*

101 Vice jaw rack gear shaft (Quadding). *Drop of light oil*

FORTNIGHTLY

81 Mould disc stud. *Do not over-grease (grease nipple)*

83 Knife block operating screw. *Drop of light oil on each thread*

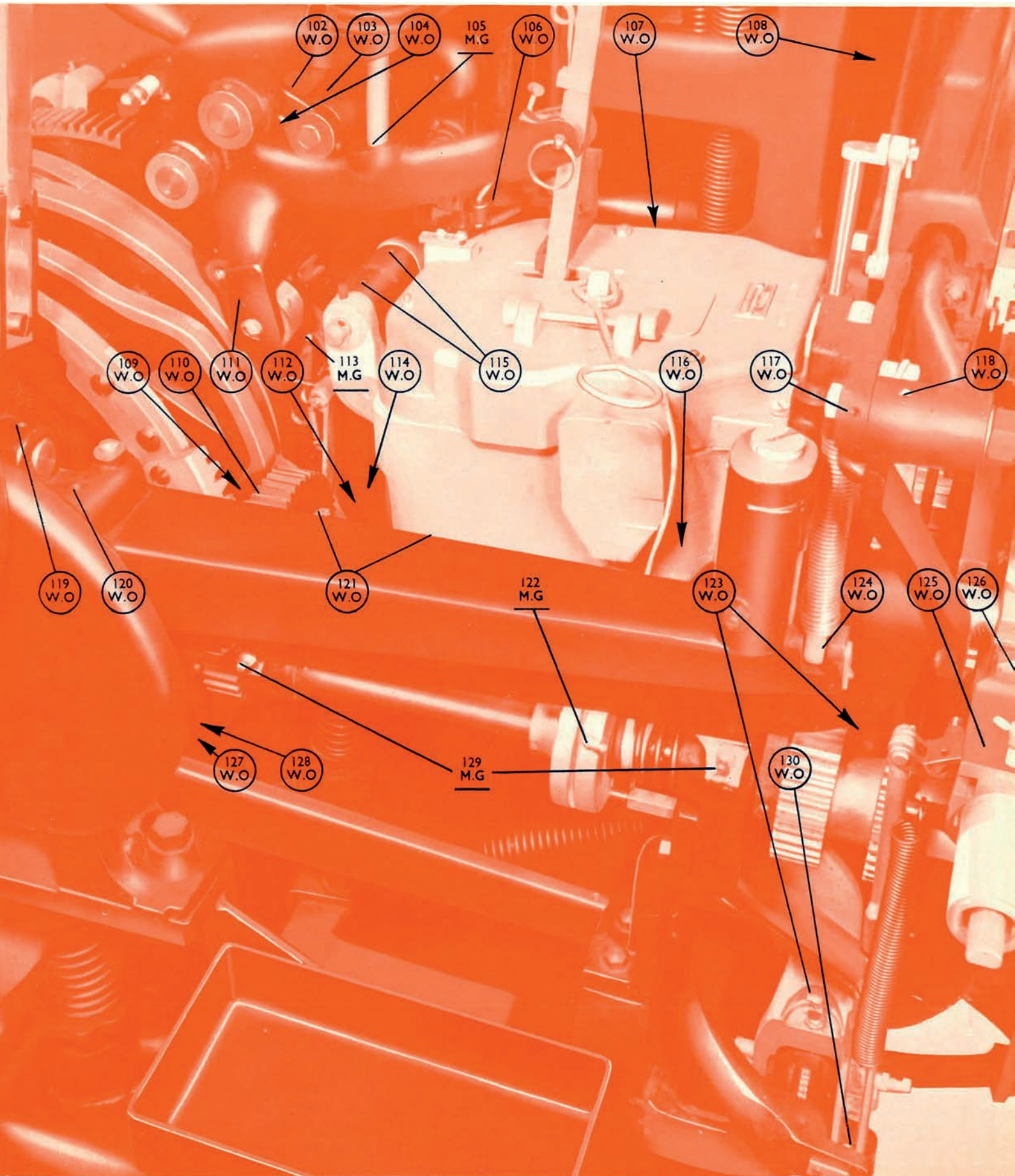
MONTHLY

89 Vice jaw blocks. *Polish with dry graphite*

99 Vice jaw (R.H.) rack (Quadding). *Polish sides with dry graphite*

INTERTYPE MODELS "F" "F"sm and "G" "G"sm Double Distributor continued

LUBRICATION POINTS Nos. 102-130



WEEKLY

- 102 Mould cam lever handle shaft. (2 oil holes)
- 103 Mould cam lever hinge pin. (2 oil holes)
- 104 Pot pump lever shaft. (2 oil holes)
- 106 Pump stop lever. *Light film of oil on working faces*
- 107 Mould disc slide. *Light film of oil on dovetail*
- 108 Delivery lever link stud and link screws. *Spot of oil each end*
- 109 Mould turning bevel pinion facings. *Light film of oil*
- 110 Mould turning bevel pinion and mould disc pinion and gears. *Spot of oil on teeth*
- 111 Pot pump cam roll. *One or two drops (oil hole)*
- 112 Mould disc slide safety lock pin. *Spot of oil on hinges*
- 114 Mould disc slide safety lock link. *Spot of oil on hinges*
- 115 Pot lever shaft. (2 oil holes)
- 116 Mould disc guide support screw. (Oil hole in guide)
- 117 Vice jaw operating safety lever (Quadding). *One or two drops (oil hole)*
- 118 Vice jaw lever (Quadding). *One or two drops (oil hole)*

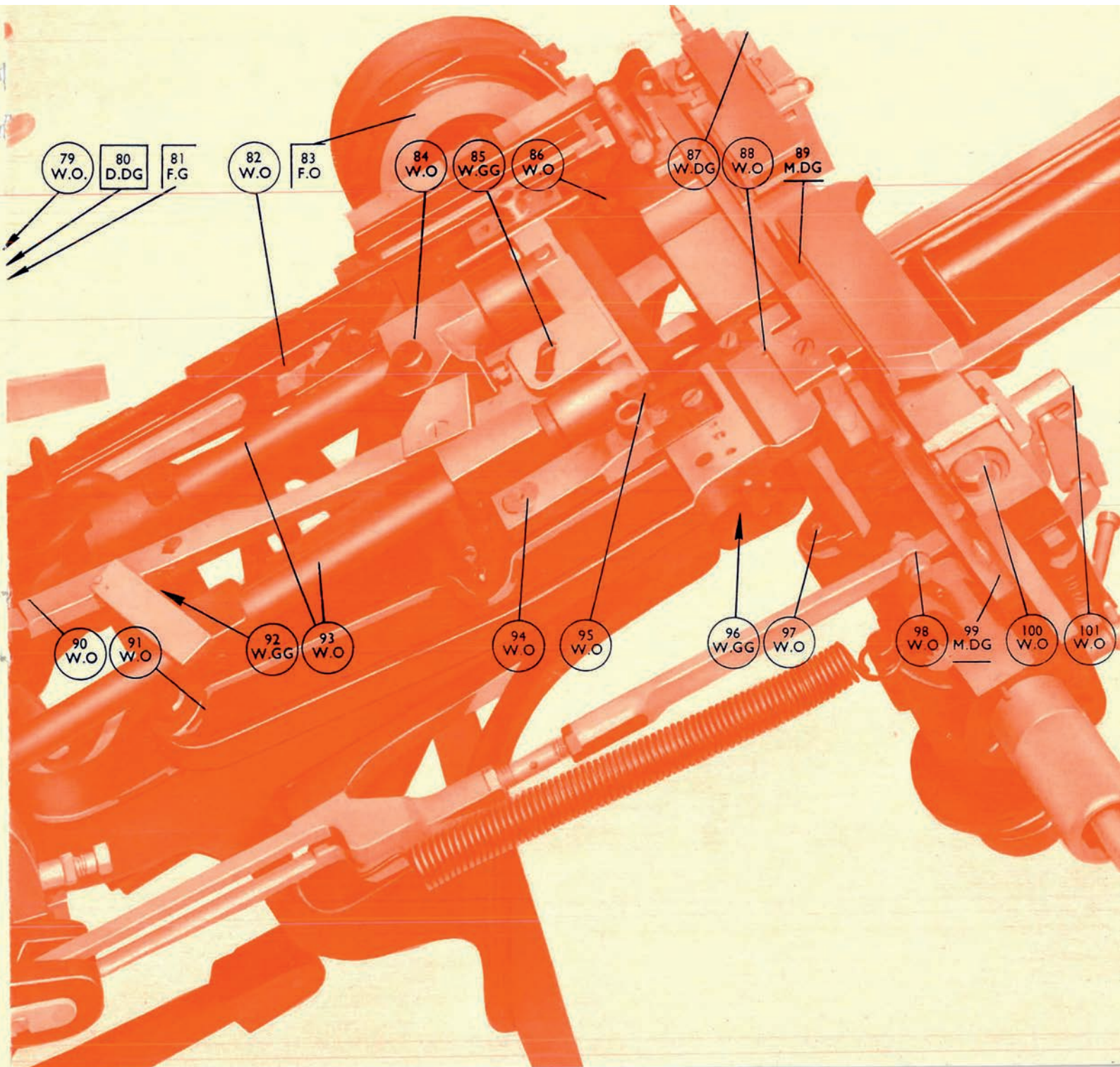
- 119 Distributor shifter lever shaft. (2 oil holes)
- 120 Vice jaw operating lever shaft (Quadding). (Oil hole)
- 121 Mould turning bevel pinion shaft. (2 oil cups)
- 123 Pot leg bushings. (2 oil cups)
- 124 Vice jaw operating lever link hinge pin (Quadding). *Drop of oil on hinge pin*
- 125 Vice closing screw (adjustable attachment) (Quadding). *One or two drops of light oil (oil hole)*
- 126 Vice adjustable detent plate (Quadding). *Drop of light oil (oil hole)*
- 127 Justification cam roll. (2 oil holes)
- 128 Vice closing cam roll. (2 oil holes)
- 130 Vice closing connecting rod hinge pin. *Drop of oil on hinge*

MONTHLY

- 105 Pot pump lever well. *Smear of grease in well*
- 113 Pot cam roll. (Grease nipple)
- 122 Mould driving pinion shaft friction disc. (Grease nipple)
- 129 Mould driving pinion shaft. (2 grease nipples)

INTERTYPE MODELS "F" "F"sm and "G" "G"sm Double Distributor continued

LUBRICATION POINTS Nos. 79-101



WEEKLY

- 131 Distributor clutch lever hinge pin. *Drop of light oil (2 holes)*
132 Distributor clutch pulley. *Two drops of light oil (oil hole)*
133 Distributor gear train. *Drop of light oil*
136 Fount selector (automatic) arm (back) shaft. *Drop of light oil.*
139 Distributor box matrix cam roll stud. *One drop of light oil*
140 Distributor box matrix lift cam. *Film of light oil on surface*
141 Matrix lift lever yoke bushing. *Spot of light oil*
142 Second elevator guide (upper). *Film of light oil to sides*
143 Second elevator bar link hinge pin. *Spot of light oil*
144 Distributor box arm stud. *(Oil hole)*
145 Second elevator bar plate. *Apply film of light oil to top*
146 Channel entrance yoke studs (3). *Spot of light oil*
147 Channel entrance frame bracket (R.H. and L.H.). *(4 oil holes)*
148 Channel entrance operating link screws (R.H.). *Spot of light oil*
149 Magazine shutter operating levers (2 per magazine). *Spot of light oil*
151 Channel entrance latch lever roll. *Spot of light oil*
152 Channel entrance latch stud. *Spot of light oil*
154 Channel entrance operating link screws (L.H.). *Spot of light oil*
155 Magazine frame safety latch stud (S.M.). *Spot of light oil*
156 Magazine frame pinion link (S.M.) (R.H.). *(2 oil holes)*
157 Magazine frame auxiliary counterbalance lever screw (S.M.). *Oil sparingly*
160 Magazine frame pinion link (S.M.) (L.H.). *(2 oil holes)*
163 Automatic stopping pawl hinge pin. *Spot of oil on pin*
164 Automatic safety pawl hinge pin. *Spot of oil on pin*
165 Automatic safety pawl buffer. *Smear of oil on sides*
166 Vertical starting lever shaft. *One or two drops of oil*
167 Mould disc slide safety automatic stopping lever (upper). *Smear of oil on sides*
168 Mould disc slide safety stop. *Smear of oil on sides*
169 Automatic stopping lever (lower) fulcrum pin. *One or two drops of oil*
170 Mould cam and mould cam lever rolls. *Spot of oil on roll spindles*
171 Mould disc turning cam and pot and pump cam wipers. *Use oil to soften*
172 Mould cam safety lever hinge pin. *Spot of oil on pin*
175 Magazine frame operating chain intermediate sprocket shaft (R.H.). *(Oil hole)*
176 Magazine frame operating universal joint (R.H.) (S.M.). *Spot or two of oil*
177 Magazine frame operating telescopic shaft (S.M.). *Smear oil on surface*
178 Magazine frame operating universal joint (L.H.) (S.M.). *Spot or two of oil*
179 Magazine frame telescopic shaft driver (S.M.). *(Oil hole)*
181 Magazine frame operating chain intermediate sprocket. *(Oil hole)*
182 Escapement rod depressing cam lever fulcrum stud. *(Oil hole)*
183 Magazine frame counterbalance lever hinge pin. *Drop of oil*
184 Elevator transfer lever shaft. *(Oil hole in column)*
185 Spaceband lever shaft. *(Oil hole in column)*
186 Delivery lever shaft. *(Oil hole in column)*
187 Delivery lever cam roll. *Drop or two of oil on sides*
188 Ejector lever adjustable pawl. *(Oil hole)*
189 Ejector lever buffer rod. *One or two drops of oil on ends*
190 Second elevator cam roll. *(2 oil holes)*
191 Second elevator cam lever link. *(Oil hole)*
192 Second elevator cam lever link sleeve. *(2 oil holes)*
194 Channel entrance operating cam lever shaft. *(2 oil holes)*
195 Channel entrance operating cam shaft. *(2 oil holes)*
196 Escapement rod depressing cam roll. *Oil spindle*
197 Channel entrance operating secondary shaft bearing housing (L.H.). *(2 oil holes)*
198 Intermediate shaft. *Two drops of oil (2 oil cups)*
199 Delivery and transfer oil cushion cylinders hinge pins (4). *Oil hinge pins*
202 Channel entrance operating cam roll. *(Oil tube)*
203 Channel entrance operating clutch fork. *Oil hinge and working faces*
204 Magazine releasing cable cam lever and shaft. *(Oil hole)*
205 Elevator transfer cam roll. *(Oil hole)*
206 Automatic stop forked lever shaft. *Drop of oil on hinge*
207 Driving shaft friction shoe and buffer rods. *Spot of light oil (4 oil holes)*
208 Driving shaft friction link pins. *Light oil on hinges sparingly*
210 Justification and vice closing lever shaft (R.H. end). *(Oil hole)*
211 Second elevator cam lever shaft (R.H. end). *(Oil hole)*
213 Pot pump cam quick-drop latch. *Oil hinge and working faces*
214 Second elevator lever frame. *Top front (2 oil holes)*
215 Second elevator lever frame. *Top rear (2 oil holes)*
217 Second elevator cam lever shaft (L.H. end). *(Oil hole)*
218 Vice jaw operating lever roll and shoe (Quadding). *One or two drops of oil on each side of roll*
219 First elevator cam roll. *(Oil hole)*
220 Magazine frame counterbalance lever shaft. *(Oil hole)*
221 Driving shaft clutch flange. *Smear of oil on both sides*
224 Motor drive intermediate pulley bracket. *(2 oil cups)*
225 First elevator and ejector lever shaft (R.H. end). *(Oil hole)*
226 Second elevator lever safety pawl. *Apply smear of oil*
227 Driving shaft. *Apply film of oil on surface*
228 Ejector lever. *(Oil hole)*
229 Second elevator lever frame. *(2 oil holes) (lower)*
231 Justification and vice closing lever. *(2 oil holes)*
234 Justification and vice closing lever shaft (L.H. end) *(Oil hole)*
235 First elevator and ejector lever shaft (L.H. end). *(Oil hole)*

FORTNIGHTLY

- 134 Distributor back screw bracket (R.H. end). *Two drops of light oil (2 oil holes)*
135 Distributor middle screw (R.H. end) (Raise back Distributor). *2 drops of light oil (oil hole)*
137 Distributor middle screw (L.H. end) (Raise back Distributor). *2 drops of light oil (oil hole)*
138 Distributor back screw bracket (L.H. end). *Two drops of light oil (2 oil holes)*
150 Magazine shutter cams (R.H.). *Smear light oil on cam surface*
153 Magazine shutter cams (L.H.). *Smear light oil on cam surface*
158 Side magazine frame shaft rolls (2). *Oil sparingly*
159 Side magazine frame counterbalance spring. *Oil between coils*
161 Magazine frame shaft rolls (2). *Oil sparingly*
162 Magazine frame counterbalance spring rolls. *Oil between coils*
174 Magazine frame operating chain sprocket (side and main). *One or two drops of oil*

MONTHLY

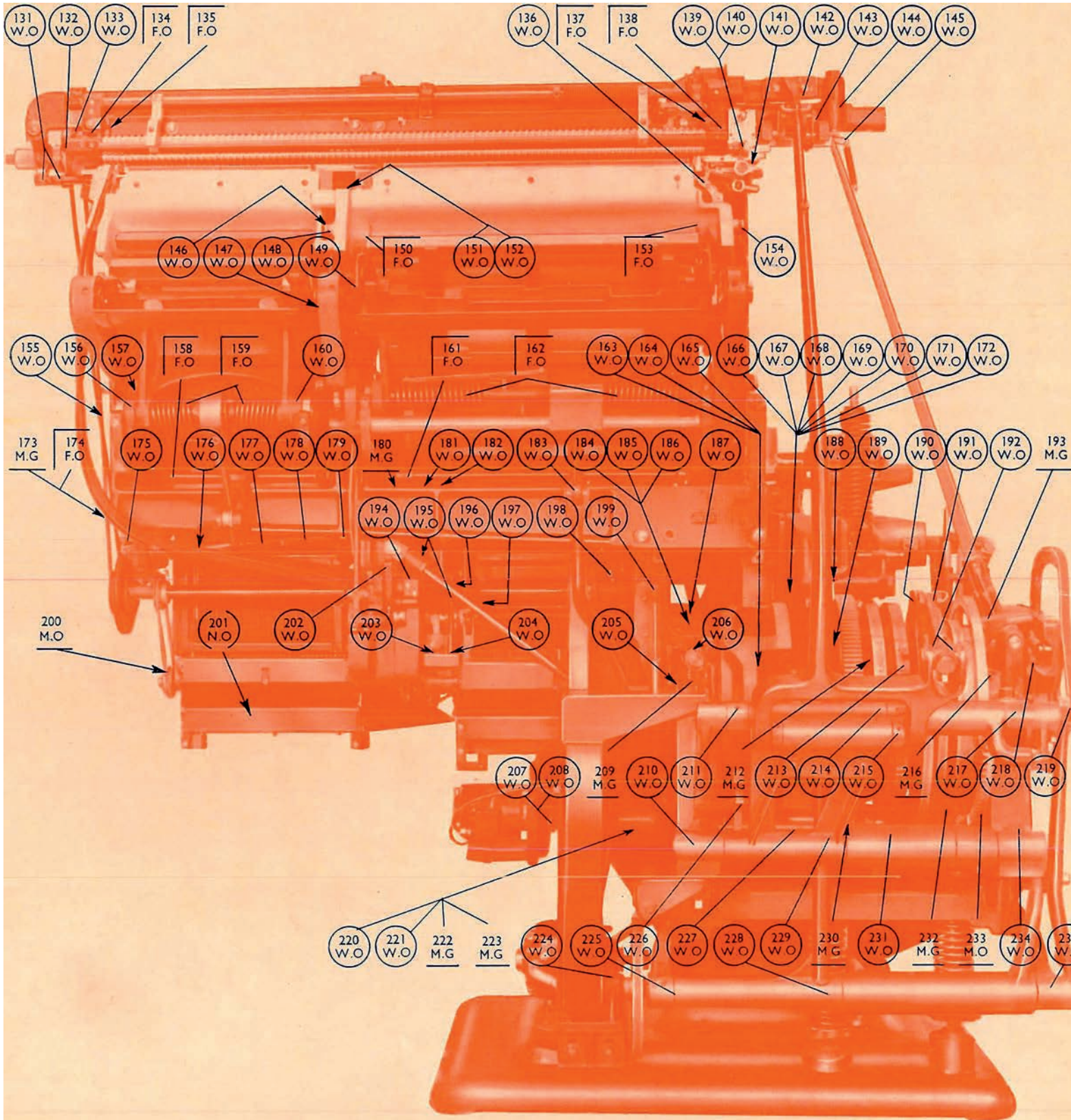
- 173 Magazine frame operating chain (S.M.). *Grease lightly*
180 Magazine frame operating chains (Main). *Grease lightly*
193 Distributor shifter cam rider and cam. *Smear grease on cam*
200 Keyboard cam rubber roll shaft (S.M.). *Use light oil both ends (oil holes)*
209 Cam shaft (R.H. end). *(Grease nipple)*
212 Pot return cam. *Smear of grease on surface*
216 Cam shaft (L.H. end). *(Grease nipple)*
222 Driving shaft (R.H. end and L.H. end). *(2 grease nipples)*
223 Motor driving pulley. *Do not over-grease, detrimental to clutch (grease nipple)*
230 Justification lever spring rod. *(Grease nipple)*
232 Vice closing lever spring rod. *(Grease nipple)*
233 Mould turning segments. *Spot of oil on teeth*

WHEN NECESSARY

- 201 Keyboard cams (Main and Side). *Clean and apply spot of clock oil to each cam pivot*

INTERTYPE MODELS "F" "F"sm and "G" "G"sm Double Distributor *continued*

LUBRICATION POINTS Nos. 131-235



THIS LIST of basic Intertype adjustments should be checked systematically in order to prevent wearing of critical parts and to ensure smooth, uninterrupted operation. Most of the settings listed can be checked rapidly once the basic relationships are understood. In the case of a person who is not fully conversant with the adjustments, it would probably be advisable to cover this inspection list partially each day until all the items have been checked.

BASIC MACHINE ADJUSTMENTS

1. Matrix Delivery Belt. The belt should be kept tight enough to run without whipping. Set the idle pulley back occasionally to obtain this condition. The idle pulley stud bearing fixing hole is elongated to permit this adjustment.

2. Assembler Star Pinion Friction Nut. This nut at the rear of the assembler star shaft should be set just tight enough to cause the star to convey em quads into the assembling elevator without hesitation. The friction spring should not be put under too much tension as otherwise its overmotion function during an overset line will be impaired.

3. Assembler Slide Brake Roll Stud Screw. Set the screw to release the brake slightly before the delivery slide is released. The assembler slide is then returned to its normal position by this setting.

4. Assembler Slide Finger. Set the finger so that the space between the finger and the star wheel will be about a thin space less than the measure indicated by the em scale. This will prevent overset lines as the star wheel wears. The finger is set by a screw at the left end of the slide.

5. Delivery Lever Cam Roll Arm. The arm is clamped on the delivery lever shaft at the rear of the machine column. The arm should be set to move the delivery slide short finger $\frac{1}{16}$ " past the right end of the delivery pawl at the end of the return stroke. The overmotion should not exceed this dimension because the finger may bear against and distort the spaceband chute.

6. Delivery Slide Stop Adjusting Screw. This screw at the left end of the face plate stops the delivery slide in relation to the first elevator jaw. See that the screw stops the slide when the right side of the short finger is $\frac{1}{32}$ " inside the first elevator jaw.

7. Automatic Stopping Pawl Plate. To be set so that the pawl will be moved $\frac{1}{64}$ " clear of the upper stopping lever when the delivery slide is all the way to the left. The automatic stopping pawl is pivoted in the delivery and elevator transfer cam.

8. Delivery Lever and Elevator Transfer Lever Cushion Cylinder. These are set to provide smooth delivery and transfer action. Efficient operation depends greatly on cleanliness and lubrication of associated mechanism.

9. First Elevator Slide Gibs. The right hand gib is dowelled to ensure the proper clearance between the first elevator jaw and the delivery and transfer channels. The left hand gib is adjustable and should be set for about .005" clearance with respect to slide.

10. Back Knife. Set the knife to bear lightly against the backs of the moulds. This knife trims the vent and jet sprues off the slug and is used to obtain type height.

11. Mould Turning Cam Shoes. Bushings under the shoes permit adjustment of the shoes in relation to the facings on the mould turning bevel pinion. Set the shoes for about .002" clearance with respect to the block facings. This adjustment stops the mould disc studs in position for easy entry into the locking stud block bushings on the vice frame.

12. Vice Jaws. Set each jaw so that the type will be flush at each end with the body of the slug. The right hand jaw is set by the screw in the first elevator back jaw support. The left hand jaw of non-quadding machines is set by a screw in the jaw block; those of regular quadding machines are set by the vice closing nut knob.

13. Justification Spring Collars. The collars on the justification and vice closing rod springs should be set to expand a long matrix line containing seven or eight spacebands fully between the vice jaws.

14. Pump Stop Rod Collar. Set the collar to move the pump stop lever fully under the pump stop block when the vice justification block is at its extreme upward stroke.

15. Pot Leg Adjusting Screw. Set the front and back screws so that the pot crucible mouthpiece will lock with perfect parallelism against the back of the mould. Adjust the vertical screws in each pot leg until the mouthpiece jets are slightly above the top face of the mould body.

16. Pot Lever Eyebolt. There should be $\frac{1}{64}$ " space between the rear nut and the lever when the pot is locked against the mould for the cast. On early machines, this setting is made by adjusting the front and back nuts on the eyebolt. On later machines, the relationship is obtained by inserting spacing washers in front of the spring.

17. Pot Gas Governor—Electric Pot Thermostat. Set the regulating screw for an approximate range of 525-550 degrees in the temperature of the type metal.

18. Pot Gas Mouth Burner Valve—Electric Pot Mouthpiece Control. Set the control for an approximate range of 460-480 degrees in the heat of the mouthpiece. An accurate contact pyrometer is necessary for this test.

19. Ejector Lever Stop Screw. This screw is at the lower part of the ejector lever and banks against a sleeve on the justification and vice closing lever shaft. The screw should be set so that the ejector locating plunger will enter the lock on the ejector blade holder smoothly when the ejector lever is in normal position.

20. Ejector Lever Pawl Adjusting Screw. Set this part to move the ejector blade $\frac{3}{32}$ " past the front edge of the knife block at the top of the slug chute.

21. Left and Right Hand Knives. Set the left hand knife to remove the shoulder of metal on the smooth side of the slug. Set the right hand knife to trim the ribbed side of the slug accurately to point size.

22. Slug Lever Operating Roll. This roll is mounted on a stud in an elongated slot in the slug lever. The roll should be set to move the slugs completely clear of the galley chute in order to permit smooth entry and stacking of ejected slugs.

23. Vice Jaw Rack Release Stop (Quadding). This stop at the right end of the vice jaw rack should be set for about .005" play with respect to the latch it engages.

24. Vice Jaw Cushion Cylinder Needle Valve (Quadding). This part should be adjusted to cushion the closing stroke of the vice jaws against the matrix line. The effect of this adjustment should be observed by permitting the jaws to close the full measure to the left, centre and right.

25. Vice Jaw Operating Lever Shoe (Quadding). Set the shoe so that it will disengage from its operating roll at the precise moment when the justification block touches the bottom of the first spaceband. If the shoe continues to operate during justification, the spacebands will be subjected to unnecessary strain.

26. Vice Closing Connecting Rod Adjusting Screw (Quadding). With the machine at transfer position, the screw in the vice closing connecting rod should be set to lower the vice jaw rack pawl so that it will slip under its rest block with about $\frac{1}{64}$ " clearance.

27. Vice Jaw Rack Pawl Lever Latch Wedge Block (Quadding). The edges of the block increase in steps of .005" from the pivot. The edge facing the wedge is the one that will ensure a positive wedging action, when the vice jaw rack pawl is engaged with the rack and various lengths of lines are held between the vice jaws.

28. Vice Jaw Rack Pawl Lever Latch Block (Quadding). On quadding machines developed prior to the wedge locking device, this block should be set to provide a minimum of $\frac{1}{16}$ " engagement for the rack pawl lever latch when the rack pawl lever is moved to the left.

29. Elevator Transfer Cam Roll Lever. The cam roll lever is clamped on the elevator transfer lever shaft at the rear of the machine column. The lever should be set to move the elevator transfer slide finger $5\frac{5}{8}$ " away from the duplex rail return plate at normal position in the case of the 30-em machine. The same relationship on the 42-em machine is $7\frac{5}{8}$ ".

30. Automatic Safety Pawl Buffer Adjusting Screw. When the transfer levers make their first stroke, the right side of the elevator transfer slide finger should be flush with left edge of the second elevator bar

plate. The safety pawl buffer adjusting screw limits the movement of the levers and is used to establish this relationship.

31. Elevator Transfer Slide Adjusting Screw. During the second stroke of the transfer levers, the transfer slide finger should approach to within $\frac{1}{8}$ " of the bottom of the slot in the spaceband lever pawl. This setting is made with the screw in the elevator transfer slide.

32. Spaceband Lever Turnbuckle. The hooked end of the spaceband lever pawl should be $\frac{1}{8}$ " to the right of the level surfaces of the spaceband box top rails when the machine is in normal position. This setting carries the spacebands sufficiently far to ensure their return to the spaceband box. The setting is made by turning the turnbuckle at the lower end of the elevator transfer lever.

33. Elevator Transfer Slide Releasing Lever. The screw in the second elevator lever depresses the releasing lever as the second elevator bar plate seats on the transfer channel. The adjusting screw should be set to raise the releasing lever $\frac{1}{32}$ " clear of the stop block on the elevator transfer slide.

34. Second Elevator Lever Adjusting Bolt. When the second elevator bar plate has just seated on the transfer channel, set the bolt to give .003" clearance between the cam roll and the second elevator cam. Adjust the bushing in the bolt lug in the second elevator lever to eliminate bounce, then take up the nuts on the bolt to maintain the clearance.

On earlier machines without the bushing adjust the bolt to give $\frac{1}{16}$ " clearance between cam and roll.

35. Distributor Box Block. This part should be set to permit the matrix lift to engage matrix by about .028".

36. Fount Distinguisher and Selector. The feelers should be set centrally with respect to the fount slot or the mixer notch of the matrices. The feeler elements are mounted on arms provided with adjusting screws for this purpose.

37. Fount Selector Arm Adjusting Screws. The normal location of the feelers with respect to the front edge of the matrices is determined by these screws. The screws should be set to permit the feelers to extend slightly less than .028" beyond the inside faces of the distributor box lower rails.

38. Distributor Box Clutch Cam Lever. The screws in the cam lever should be set to move operating lever $\frac{1}{32}$ " past the tripping lever shoe as the parts return to normal position.

39. Distributor Box Arm Stop Screws. The front and back stop screws should locate the distributor box precisely in a central location with respect to the front and back distributors. These stop screws govern the clearance between the matrix lugs and the distributor lift rails as the matrix is raised into the distributor screws.

40. Distributor Beam. See that the beam is set just high enough to obtain about $\frac{1}{16}$ " of clearance between the bottom of the matrices and the tops of the channel entrance partitions as the matrices are conveyed along the distributor bar.

Set the beam sidewise so that the matrices drop centrally between the channel entrance partitions when the distributor is running under power.

41. Channel Entrance. This unit should be set sidewise so that the lower ends of the partitions guide the matrices positively into the magazine channels. If the matrices hit the magazine plates, unnecessary wear will then be caused to the matrix lugs and the plates.

When the channel entrance is closed, it banks against the stop screws to prevent the partition plate from striking the magazine plates. The stop screws should be set to hold the partition plate approximately $\frac{1}{32}$ " away from the magazine plates.

Channel entrance partition plates of double distributor machines are adjustable for height with respect to the magazines. Plates should be set flush with the bottoms of the channels in the magazine lower plate.

42. Distributor Clutch Lever Plate. This part should have $\frac{1}{32}$ " engagement with the automatic stopping bar plate when the channel entrance is closed. The engagement should not exceed $\frac{1}{32}$ " as otherwise the partitions will have to move further to throw out the distributor clutch. This may cause the partitions to set permanently in incorrect positions.

43. Driving Shaft Friction Clutch Flange. There should be $\frac{15}{32}$ " space between the flange and the driving shaft bearing when the leather friction buffers are pressing against the driving gear pulley. This setting is obtained by adjusting the driving shaft clutch rod adjustable end, which can be rotated by removing the fulcrum screw and slackening the locknut.

44. Automatic Stopping Lever (Upper) Adjusting Screw. Set this part to provide $\frac{1}{32}$ " play between the forked lever and the lower stopping lever when the friction shoe buffers are engaged with the driving gear pulley. This clearance setting permits the clutch rod to function without interference from the forked lever.

45. Automatic Stopping Pawl and Safety Pawl. Viewed from the rear of the machine, the right sides of these pawls in the delivery and elevator transfer cam should be set $\frac{15}{16}$ " from the edge of the cam. The settings are made by means of screws in the pawls.

46. Vertical Starting Lever Stop Screw. This screw on the inside of the machine column should be set to provide $\frac{1}{64}$ " clearance between the lug on the vertical starting lever and the automatic stopping pawl.

47. Vertical Starting Lever Spring Adjusting Screw. Set this screw to move the automatic stopping pawl $\frac{1}{16}$ " clear of the upper stopping lever when the starting lever is pulled out.

48. Clutch Rod Spring Adjusting Bushing. Turn in the bushing to eliminate clutch slip during normal operation of the machine. The bushing should not be turned in too far, however, as an overset spring will defeat the ability of the clutch to slip when under abnormal stress.

49. Magazine Frame Operating Chain Adjusting Collars. All sprocket bearings of the chain shift type of magazine frame operating mechanism are adjustable in order to provide correct tension for the chains. Set the bearing collars to allow a slight amount of play between the chains and the sprockets so that the shifting of the magazine frames will be both effortless and positive.

50. Magazine Frame Operating Handle Lock. (Double Distributor Machines only.) The purpose of this lock is to prevent rotation of the magazine frame operating handle until the channel entrance is fully opened. Set the adjusting nuts on the cable so that the lock will just clear operating handle detent when the channel entrance is fully opened.

51. Magazine Frame Counterbalance Mechanism. Modern 2, 3 and 4 magazine machines are equipped with two spring systems for counterbalancing the main magazine frame. Two torsion springs under the frame counterbalance the front end of the unit and a tension spring at the lower end of the counterbalance lever assists in the forward movement of the frame. Set the two spring systems until the frame moves with maximum ease in both directions. In the case of earlier machines, the same result can be obtained by suitable adjustment of the counterbalance spring sleeve with respect to the yoke.

THE check-up outlined below covers the most essential mechanisms concerned in the preservation of matrices. The proper adjustment and maintenance of all these parts will do much to ensure the maximum amount of service from your matrices.

CHECK THESE PARTS

Assembler Entrance (Single Distributor). Assembler entrance should be adjusted so that the uppermost edge of the assembler entrance plate is set approximately $\frac{1}{32}$ " below the bevelled edge of the lower magazine plate. This setting is made by means of two adjusting screws in the front of assembler entrance plate after loosening the three securing screws. The assembler entrance guides should then be adjusted sidewise until they align properly with the magazine channels. These two settings ensure the necessary support and clearance for matrices as they are released from the magazine. Keep partitions clean.

Assembler Entrance Cover Cushion. This part is designed to provide a springy or yielding banking point for the matrices as they leave the magazine. When the cushion plate loses its resilience and shows sign of wear, it should be replaced with a new one.

Assembler Cover. The assembler cover should be flush with the assembler entrance cover. Owing to hard usage, the assembler cover may become distorted and its upper edge may extend further in than the lower edge of the large cover. As the matrices pass, they will be tripped by the obstruction and their lugs will be subject to undue wear. The assembler cover can be removed and straightened, but if it is badly bent, it should be replaced.

Assembler Chute Plate. The hardened steel plate attached to the assembler chute plate provides maximum protection for matrix side walls. The plate contacts the central or body portion of the matrix and is so designed that the side walls cannot contact the plate as it wears. The assembler chute plate should be set to permit smooth assembly of matrices and the plate points should align with the elevator pawls.

Assembling Elevator. The assembling elevator should be raised as gently as possible to the delivery slide. If the elevator is raised with too much force, matrices will be jarred out of alignment with the rails of the delivery channel. The lugs of these matrices will be burred as the line passes into the delivery channel. In many cases, uneven operation of the elevator can be overcome by adjusting assembling elevator counterbalance spring to suit the "feel" of the operator. The spring should be adjusted until it counterbalances most of the weight of the assembling elevator. The delivery pawl should release the delivery slide at the precise moment when the matrices are aligned with the rails in the delivery channel. The release of the delivery slide can be delayed or advanced by fitting the left end of the pawl slightly with respect to the assembling elevator.

First Elevator Jaw. Remember that the first elevator jaw should be positioned so that its rails are exactly aligned with or slightly lower than the corresponding rails in the delivery channel when the machine is in normal position. This adjustment is made by means of the adjusting screw in the first elevator auxiliary lever. Proper setting of this screw will minimise wear on matrix lugs.

First Elevator Lever Link. This part has recently been improved to provide approximately equal pressure on the matrices in all three alignment positions. A new spring of special material and design reduces wear on the matrix toes and facilitates sidewise spreading of the line during justification. The upper eyebolt is now pinned to the nut in its correct setting. The lower eyebolt can be set in fine increments. There should be $\frac{5}{8}$ " space between the upper edge of the hole in this eyebolt and the link casing.

First Elevator. The first elevator is provided with an adjustable screw which regulates the position of the first elevator when it is resting on the vice cap. This screw is threaded through the top of the first elevator slide and should be adjusted so that there is .010" clearance between the toes of the matrices and the alignment grooves in the mould body. *This setting is extremely important.* If it is not made properly, there will be undue wear on the lower front lugs of the matrices and alignment of the matrices with respect to the mould will be affected.

Vice Automatic Stop Screw. This screw should be adjusted so that the vice automatic stop mould disc dog just clears the vice automatic stop rod pawl when the first elevator is resting on the vice cap. The vice automatic is an extremely sensitive safety device. If it is properly adjusted it will prevent damage to the matrices whenever the downstroke of the first elevator is obstructed. Tight lines must be avoided. Whenever an overset line is sent in, there is a danger of distorting the side walls of the end matrices in the line.

Vice Jaws. These vital parts are subject to wear after a number of years of service. The inside surfaces of the jaws which contact the sides of the two end matrices may become rounded due to constant friction. It is most essential that these surfaces be perfectly square and if they show distortion, they should be reground to their original true relationship. Rounding of the vice jaws at this point is objectionable because it permits type metal to accumulate on the side walls of the matrices, causing hair lines between letters. The inside surface of Intertype vice jaws is relieved to offset rounding as long as possible.

Moulds. The moulds should be kept free from metal adhesions and other foreign substances. The face of the mould, especially the alignment grooves in the mould body, should be wiped with a clean cloth daily. Metal adhesions on the front of the mould disturb the lockup and interfere with alignment and justification.

Adhesions on the mould surfaces can be minimised by polishing with a mould lubricant.

Mould Cam Roll Eccentric Stud. This stud must be positive at all times. The stud on the mould cam lever determines the space between the mould and vice jaws when the mould disc slide moves forward for the first time. There should be .010" space between the mould and the jaws when the mould cam roll is on the high point of the first cam shoe. This setting can be obtained by turning the stud in its bearing. Proper justification and alignment depend to a great extent upon the condition of this important adjustment.

Mould Disc Slide Safety Device. Like the vice automatic stop this is an extremely sensitive safety device designed to prevent damage to the matrices. The device should be set so that with a $\frac{1}{16}$ " obstruction between the mould and the vice jaws, the clutch will throw out and stop the machine automatically.

The Vice Closing and Justification Mechanism. These parts should work freely at all times. The vice closing screw, the justification lever and the vice closing lever should be lubricated on the regular oiling day. The justification springs are provided with adjustable collars which regulate the tension of springs. These springs should have sufficient power to spread a long matrix line with seven or eight spacebands tightly between the vice jaws. After some time, the top of the justification block may show two highly polished lines where it contacts the spaceband wedges. If these polished surfaces cause spacebands to slip during justification, the block should be removed from the machine and lapped on an oil stone. The stone will produce a fine grained surface which will eliminate this condition.

Transfer Mechanism. Here is perhaps one of the most basic factors concerned in the preservation of matrices. If the transfer is not set properly, one of the most vital parts of the matrix—the combination teeth—will be subject to constant friction and wear. A properly adjusted transfer depends upon three basic mechanisms: (1) the transfer bar, (2) the first elevator, and (3) the second elevator. The lower edge of the transfer bar should be aligned vertically with the lower edge of the second elevator bar. There are two adjusting screws provided in the first elevator slide guide above the transfer bar for this setting.

On later machines the first elevator slide guide is provided with two lugs and adjusting screws to enable the guide to be adjusted to obtain a clearance of not more than .004" between the transfer bar and the front first elevator jaw. This adjustment should be checked

and corrected if necessary, before proceeding with adjustment of the transfer bar.

The first elevator should rise just high enough at the transfer position so that the matrix teeth are aligned vertically with the teeth of the second elevator bar. This setting is made with the adjusting screw in the first elevator slide stop, which is fastened at the bottom of the first elevator slide. The second elevator should come to position on the transfer channel so that the teeth of the second elevator bar are aligned sidewise with the teeth of the matrix. This setting is made with the two adjusting screws in the lower second elevator guide bracket. When making these adjustments, a new pi matrix should be used.

To observe the relationship between the teeth of the matrix and the second elevator bar, place a piece of white paper in the transfer channel and an extension light directly over the paper. The relationship can then be seen by looking through the left end of the first elevator jaw. After the transfer has been set, the fineness of the adjustment can be tested by moving a 30-em line of matrices and spacebands back and forth from the first elevator jaw to the second elevator bar by hand. Any excessive friction can be felt by this method and can be corrected before the machine is operated under power. Time spent on the adjustment of the transfer is time well spent. If a properly adjusted transfer is maintained consistently, the teeth of the matrices will last longer and distribution will be proportionately more efficient.

Second Elevator Bar. Keep second elevator bar free from burrs. Damaged teeth on the bar can be repaired with a small triangular file or a piece of emery cloth, but this will be unnecessary if the bar is handled properly.

Distributor Box Rails. Due to constant friction, these rails are subject to wear over a period of years. When the rails show signs of excessive wear, especially at the feeding end of the distributor box, they should be replaced with new ones.

Distributor Box Matrix Lift. This part controls the height to which matrices are lifted in relation to the distributor screws. When the matrix lift cam roll is on the high point of the matrix lift cam, the matrix should be lifted $\frac{1}{32}$ " above the upper distributor box rails. This adjustment is made with the adjusting screws in the distributor box matrix lift cam lever.

Cleanliness Is Most Essential. In addition to the mechanical factors outlined above, it should be borne in mind that clean and freely working parts aid immeasurably both in the operation of the machine and in the durability of matrices. Excess oil, dirt and gummy substances on the assembler bearings, assembling elevator, delivery slide, front and back mould wipers and the distributor mechanism should also be removed regularly.

MOST operators allow a fixed routine in making changes relative to composition. It is advisable to follow such a method because the more habitual the process becomes, the less danger there will be of overlooking a change and damaging a part of the machine. The sequence of steps involved in a complete change of face, body and measure is outlined below in a logical order, but any other sequence would be equally efficient as long as it is followed each time a change is made.

MACHINE CHANGES AND OPERATION

1. Mould
2. Ejector blade
3. Assembler slide
4. Delivery slide long finger
5. Knife block
6. Line stop
7. Left hand vice jaw
8. Fount distinguisher
9. Magazine

1. Mould. If a mould carrying liners for the body and length desired is already in the four-mould disc, it is necessary only to turn the mould into operating position. If it is necessary to change the liners, open the vice frame, turn the mould to casting position, loosen the two nuts on the mould cap swivel bolts, swing back the bolts, remove the mould cap and take out the liners; insert liners of the size required, replace the mould cap and turn the mould back to operating position. Tighten the swivel bolt nuts to a snug fit only. Make sure that the liners, mould cap and body are clean and free of metal chips.

2. Ejector Blade. To change the ejector blade of the four-mould disc, depress the locating lever, move the shifter lever until the desired length of blade is indicated on the em scale and release the locating lever. Move the shifter lever sidewise slightly after releasing the locating lever in order to make sure that the locating lever will lock in position.

3. Assembler Slide. To change the setting of the slide, depress the adjusting block detent and move the block until the indicator registers with the desired mark on

the scale. On machines equipped with either Single or Dual Duty Quadder, the Vice Jaw Setting Bracket sets both the Assembler Slide and Vice Jaws.

4. Delivery Slide Long Finger. Lift the detent on the delivery slide long finger block, move the finger until the right side of the finger is at the setting desired, then release the detent.

This change is completely eliminated on machines equipped with the regular quadding and centring device. The delivery slide long finger is constantly set at 30 ems. Delivery slide fingers close automatically against the matrices when the line is raised to the slide.

5. Knife Block. To set the knife block, lift the detent, turn the dial until the desired body size comes to position, then release the detent.

6. Line Stop. The first elevator jaw line stop should be pushed back to the right whenever the length of the line is changed to a shorter measure. Machines equipped with the automatic quadding and centring device have a line stop which is returned automatically to normal position by a returning pawl on the transfer slide.

7. Left Hand Vice Jaw. To set the vice jaw for the desired length of line, pull out the adjusting knob at the left of the vice cap and turn it until the desired measure is indicated by the indicator rod em scale. Releasing the knob will lock the setting for machines with either Single or Dual Duty Quadder; see note 3.

8. Fount Distinguisher. On machines equipped with the automatic fount distinguisher ensure that the magazines carry the correct shoes.

9. Magazines. All the essential facts relative to the front and rear removal of magazines are so well known that they need not be outlined here.

CARE OF MATRICES

IF matrices are fouled with dirt or gummy substances, wipe them with a soft, clean cloth. Place the matrices edgewise on a matrix tray or type galley and polish the lugs with a matrix eraser or an electrotyper's polishing square. Burrs on the lugs of matrices are removed with a fine file. A file with a safety edge should be used to avoid undercutting the body of the matrix. In filing the burr, remove only the main portion of the burr itself. If too much metal is removed from the matrix lugs, release of the matrix by the escapement may be faulty.

Matrices should never be cleaned in petrol. Solvents of this nature cause type metal and dirt to stick tenaciously to brass and may cause defects in the alignment, justification and casting of the matrices. Gummy substances on the sides of the matrices are most safely removed with a soft cloth. *Never use oil, graphite or any other lubricant on the matrices or magazines*—the best way to ensure smooth, uninterrupted assembling conditions is to keep the parts scrupulously clean at all times.

Avoid handling matrices and spacebands as much as possible. Some operator's hands perspire freely and cause the parts to accumulate dirt and gum much more rapidly than would ordinarily be the case. Foreign substances on the keyboard keybuttons can be removed easily by washing them with soap and water, using a soft brush. Solvents must not be used.

In addition to the above factors, there are several basic machine adjustments which have a very important relationship to the length of service secured from matrices.

Matrices, more than any other type of equipment, are extremely sensitive to the mechanical condition of the machine as a whole. In their travel through the machine, they come into contact with most of the major mechanisms. If a part is improperly adjusted or maintained, the condition will eventually show on some part of the matrices. For this reason, it is essential that several parts of the machine be inspected at regular intervals, particularly in the case of machines which have been in service for a number of years.

CARE OF MAGAZINES

TO clean a magazine, place the magazine on a table or bench with the shutter springs upward. Block the shutters up with a few slugs. Run a dry magazine brush through each section of the magazine a few times to remove the dirt and dust. Soak the brush in petrol and go over each section again. Be sure to remove the small spots of gum and dirt left in the channels by the lugs of the matrices.

After the main portion of the magazine has been cleaned in this manner, the escapements should be pressed two or three times with a piece of wood and this should release any loose bristles which may be lodged in the escapements. Never take a magazine apart—special equipment and knowledge are needed to re-assemble it properly.

To clean the escapements, soak a small stiff brush in petrol and clean the channels around the escapements. Work the escapements back and forth while using the brush. *Never put any lubricant on the escapements*—they will work most freely when they are perfectly clean. The same rule holds true for the magazines and the matrices.

Always handle magazines carefully when removing them from the frame or when inserting them in position. Unnecessary jarring may spring the plates and cause the matrices to hesitate when released. Magazines should always be stored vertically in a rack when they are not in use.

CARE OF SPACEBANDS

SPACEBANDS should be polished at least every eight-hour run, or even more frequently, to remove the oxide stain from the sleeves and to ensure smooth action of the sleeve on the wedge. The best method for polishing spacebands is to rub them on a smooth pine board sprinkled with graphite. Shake the excess graphite off the spacebands after polishing them. Dry graphite W-1369 is recommended.

Spacebands will hesitate in delivery if dirt or gum accumulate in the spaceband box. Gummy substances on the floor of the spaceband box will prevent spacebands from sliding forward easily. Wrap a cloth around the end of a stick, dip it in petrol or benzine and wipe the parts clean. After a long period of use, the top rails and the angular guide block at the upper part of the spaceband box may become notched. Remove such nicks with a stone.

An adjustable block is provided in the spaceband box to prevent double response of spacebands and consequent wedging of spacebands in the chute. The block should be set to cover one-half of the second spaceband after the first spaceband has moved forward against the banking pin. This will prevent the release

of the second spaceband through friction against the first spaceband.

After spacebands have been in use for some time, they should be measured at the front and back of the sleeve with a micrometer. The measurement of the sleeve and wedge on the casting edge of the spaceband should equal or exceed the measurement on the opposite side, but under no circumstances should it be less. Bent spacebands or the spacebands with rounded sleeve edges on the casting side should be replaced with new ones.

Six thicknesses of Intertype spacebands are made, with minimum and maximum measurements as follows:

	Min.	Max.	Points
T-668	·028 in.	·092 in.	2 to 6½
T-3711	·033 in.	·1185 in.	2¼ to 8½
T-2932	·037 in.	·1225 in.	2¾ to 8¾
T-656	·048 in.	·144 in.	3½ to 10¼

Special for use with Stick Attachment:

	Min.	Max.	Points
T-3967	·045 in.	·1077 in.	3¼ to 7¾
T-2990	·070 in.	·164 in.	5 to 11¾

T-3711 and T-2932 are specially recommended for use on Teletypesetter-equipped machines.

OPERATING HINTS

IT is not feasible to outline a system of machine operation in this book because the scope of the subject is as extensive as that of maintenance. A few basic suggestions are outlined below, however, to assist the operator in attaining maximum efficiency in his work.

The art in operating the Intertype keyboard with maximum speed and accuracy lies in touching the keybuttons evenly and smoothly so that the matrices will come to rest in the assembling elevator in their proper sequence. Consistent practice and faithful application of the principles of a touch system are fundamental requisites for the attainment of that skill.

It is not necessary to watch the keybuttons after having mastered a touch system of operating—the fingers will locate the keys automatically. The eyes will be free to watch the copy and the assembler. Nervous and physical energy will thus be devoted to the important factor of concentration on the copy being set. When a touch system has been mastered, the operator soon develops a sixth sense which enables him to detect the failure of a matrix to respond properly to the keyboard touch. The operating skill attained through a touch system helps the operator to set straight matter so rapidly that his alterations or thin spacing can be done without interrupting continuous operation.

Uniform Finger Movements. Control the movements of the fingers so that the intervals between the dropping of matrices will be evenly timed. If a matrix fails to respond, do not pound the keybutton. Locate the cause of non-response and correct it. Nothing is gained by losing one's temper and pounding the keybutton or magazine.

Spacing of Lines. An efficient operator always fills out the matrix line as nearly as possible to the measure being set without crowding more matrices into the assembling elevator than will enter freely. If necessary, insert thin spaces between words or letters to fill the line. It is just as easy to thin space lines correctly on an Intertype as it is when setting type by hand. Any spacing effect may be obtained by using suitable spacebands, which are made in various thicknesses for all classes of composition.

Neatness. Operators should acquire the habit of keeping the keyboard neat and orderly. Keep all the spacebands in the spaceband box. Deposit matrices from overset lines temporarily in the keyboard pi box. Before changing magazines, return the matrices to the magazine from which they were drawn. The annoyance and loss of time caused by wrong founts will thus be obviated.

Type Metal. It is important to keep the type metal consistently at the correct level in the crucible. The solidity of the slug body and the quality of the face are

largely dependent upon this factor. When the metal is permitted to run low, the plunger and the well are apt to become coated with dross and oxide. Porous slugs may result from this condition. The level of the metal should be maintained close to $1\frac{1}{4}$ " from the top of the electric pot crucible casting. It is also important, in cases where metal pots are fed by hand, that one pig at a time be put in the crucible at regular intervals. Replenishing the metal supply with a number of pigs simultaneously causes a sudden chilling of the type metal and may result in imperfect slugs.

It is preferable to use pigs of metal in the crucible rather than slugs. The old metal should be melted in a furnace holding as large quantities as possible, skimmed, toned and cast into pigs. Information regarding metal furnaces and their use will be sent by Intertype on request.

The type metal should be maintained at the correct temperature in the crucible. The ideal range is from 525 to 540 degrees. Overheating the metal causes rapid deterioration of its most valuable elements and decreases the quality of the slug.

Matrices and Spacebands should be handled as little as possible. Some operators' hands perspire freely and cause dirt and gum to accumulate on these parts as well as on the keybuttons. The keybuttons can be cleaned with ordinary soap and water. Matrices are easily cleaned with a piece of felt or a matrix eraser.

Opening Channel Entrance. If the distributor stops, open the channel entrance slowly until it is about $\frac{1}{2}$ " away from the magazine, then open the entrance quickly. This will prevent matrices from sliding flat-wise into the magazine. After the cause of the distributor stop has been corrected, close the entrance *gently*.

Miscellaneous Factors. Oil or graphite should never be used in the magazines or on the escapements. Keep all parts of the magazine absolutely clean.

If the machine is stopped by the vice automatic, mould slide safety or other part, push the starting and stopping lever in and remedy the obstructing condition.

The back distributor screws should not be raised while there are matrices on the distributor bar. The matrices should be run off before raising the screws because it is difficult to retime the screws and to engage their threads with the lugs of the matrices at the same time.

If an overset line is sent into the casting mechanism and it causes the first elevator slide to stall, lift the

elevator and remove enough matrices to permit the slide to seat. Forcing the line between the vice jaws damages the side walls of the matrices.

Whenever it is necessary to stop the machine in an intermediate position, *always make sure that the pot crucible mouthpiece is away from the mould*. The heat of the mouthpiece will warp the mould if the parts are left in contact for an extended period.

The spaceband lever pawl latch should be locked in front of the pawl before lowering the second elevator lever by hand after a distributor stop. If the transfer levers are not locked, they will spring together with an impact as soon as the elevator is lowered.

Never use the ejector lever to pound a slug out of the mould. The cams should be backed and the ejector pawl should be released to permit the machine to move to normal position without ejecting the slug. The slug can then be removed from the mould by lifting off the mould cap. The extra time spent in this operation will be repaid in preventing damage to expensive parts.

The foregoing check-up covers the most essential factors involved in the preservation of the machine and its equipment. While the list is admittedly lengthy, it will rarely be necessary to cover all of the parts mentioned.

A conscientious mechanic is invariably acquainted with the state of the machines under his supervision and it will be necessary for him to verify only those mechanisms which he has not recently had occasion to inspect. It has been deemed advisable, however, to introduce as many suggestions as possible in order to cover the widely varying conditions under which line composing equipment is used.

Intertype Limited desires that its customers secure the maximum amount of service from their machines and matrices and is constantly engaged in research towards the fulfilment of this end.

*The text of this book has been composed
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