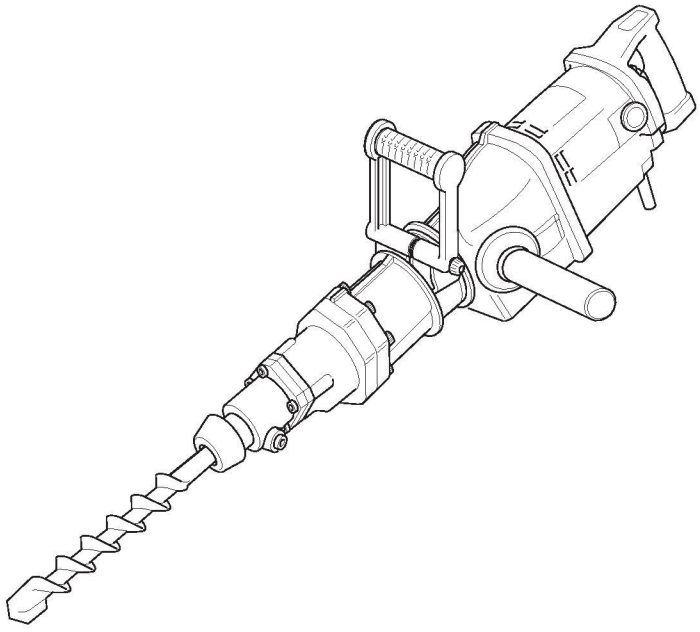
KANGO®

GB

Service and Repair Manual



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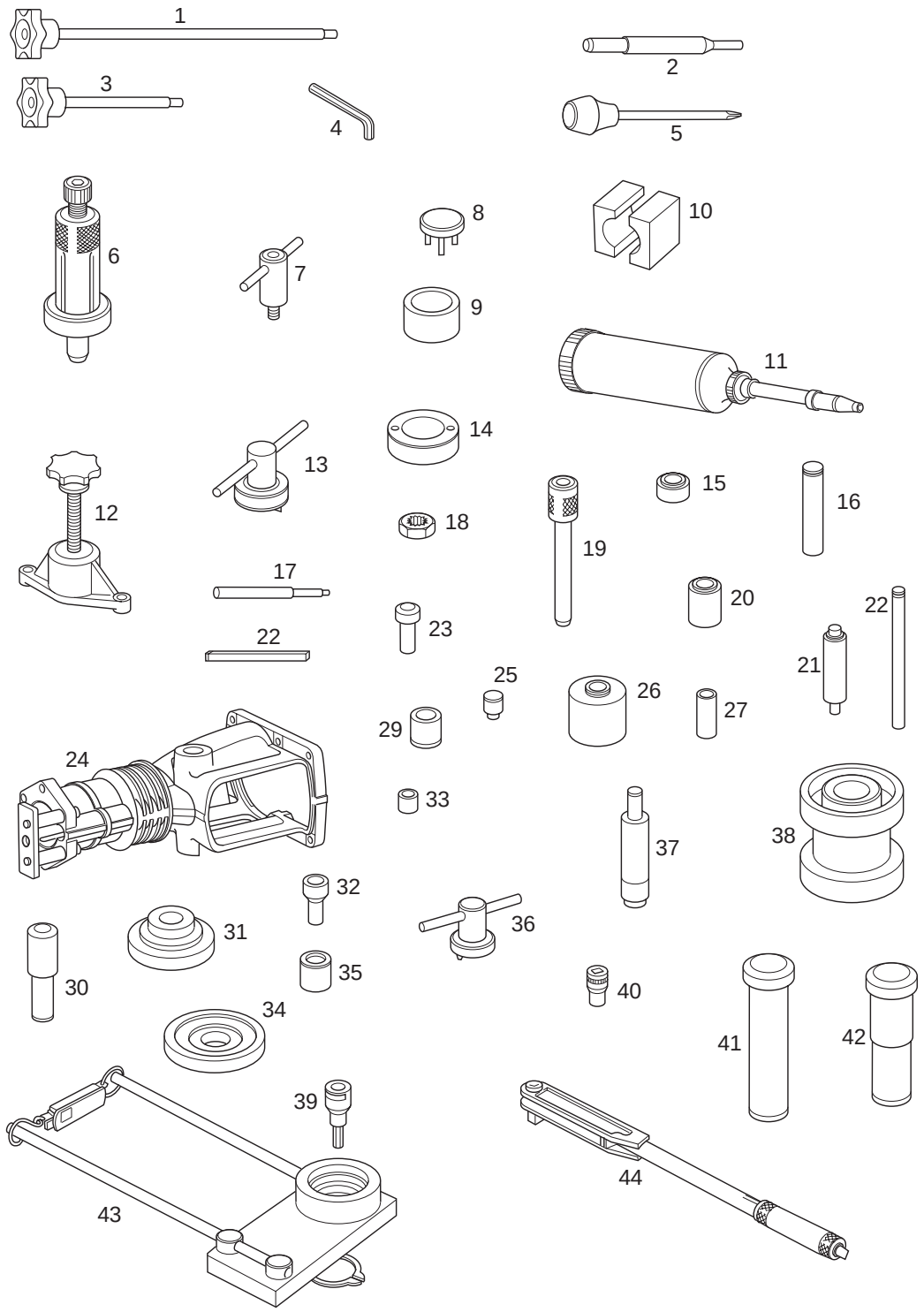


ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1	9170 0231 30	LONG ALLEN KEY	17	9170 0232 50	ROCKER PIVOT DRIFT	33	9170 0234 60	CLUTCH TAIL EJECT BUSH
2	9170 0737 20	3/32 PIN PUNCH	18	9170 0236 30	PINION NUT	34	9170 0234 00	CLUTCH SHFT BGR BOLS
3	9170 0231 40	SHORT ALLEN KEY	19	9170 0233 00	DISC BEARING MANDREL	35	9170 0234 60	SHAFT BRG MAND. BASE
4	9170 0230 70	ALLEN KEY SET	20	9170 0233 30	1 1/2" COLLAR	36	9170 0232 90	CLUTCH SPANNER
5	9170 0239 10	SCREWDRIVER	21	9170 0233 60	D/SHFT BRG MANDREL	37	9170 0734 80	BRG DISMANTLING TOOL
6	9170 0231 50	TOP BEARING PULLER	22	9170 0232 60	ALIGNMENT BAR	38	9170 7327 01	BRG SERVICE TOOL
7	9170 0232 40	BEARING ASSY TOOL	23	9170 0234 10	BIG END BGR MANDREL	39	9170 0737 60	ADAPTOR, ALLEN KEY
8	9170 0232 10	CARTRIDGE EJECTOR	24	9170 3199 50	DUMMY HAMMER CASE	40	9170 0236 70	SOCKETS - 3/8", 9/16"
9	9170 0232 20	EJECTOR BASE	25	9170 0234 30	BIG END BGR EJECTOR	41	9170 7327 02	BRG SERVICE TOOL
10	9170 0236 40	WOOD BLOCKS	26	9170 0233 10	DISC MANDREL BASE	42	9170 7327 03	BRG SERVICE TOOL
11	9170 0236 80	GREASE GUN	27	9170 0233 40	DISC BRG EJECT COLLAR	43	9170 0737 90	CLUTCH TORQUE SET RIG
12	9170 0231 70	MTR DISMANTLING TOOL	28	9170 0233 70	D/SHFT EJECTOR PUNCH	44	9170 0236 60	TORQUE WRENCH
13	9170 0232 00	FAN SPANNER	29	9170 0234 20	B/E BRG MANDREL BASE			
14	9170 0232 30	PINION MASK	30	9170 0233 80	CLUTCH BRG MANDREL			
15	9170 0233 20	5/8" COLLAR	31	9170 0233 90	CLUTCH BRG MAN. BASE			
16	9170 0233 50	BORE SUPPORT BAR	32	9170 0234 40	CLUTCH TAIL MANDREL			

Important! Before carrying out any repairs the hammer should be checked for electrical safety and for mechanical performance. For electrical safety the hammer should be placed on a non-conductive surface which is either of a wooden construction (with the mains supply disconnected) which contains no metal parts or a bench which is insulated by a rubber mat. The hammer should then be checked by high voltage flash testing. On completion of dismantling procedure all electrical components should then be checked for electrical safety. The hammer should **ONLY** be checked for hammer performance if the unit passes the electrical safety test.

DISMANTLING

Removing the forward handle (All models, 950 shown)

Note: In the disassembly instructions numbers starting 200 are Model 900, numbers starting with 300 are Model 950, numbers starting with 400 are Model 990, numbers starting with 500 are Model 900M in both text and illustrations.

1. Remove knob (460), washer (459) and bolt (457).
2. Remove handle (458) and strap casing (456).

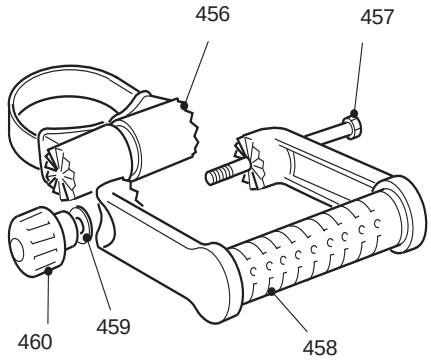


Fig. 1

Removing the latch bar mechanism. (All models - 950S shown except 900M)

1. Using a suitable drift on the latch bar remove the latch retainer (360, *245,*), latch spring (363, *252*), latch spring cover (362, *251*) and latch bar (359, *248*).

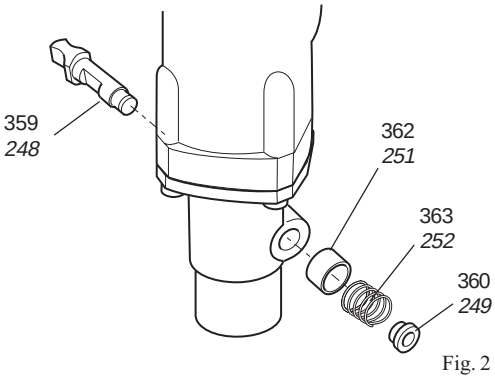


Fig. 2

Removing the nosepiece. (All models - 950S shown except 900M)

1. Remove the four screws (365, *246, 443*) and four spring washers (366, *245, 442*) from nosepiece (367, *247, 444*). Note that the screws are secured by Loctite.
2. Remove the nosepiece (367, *247, 444*) and driver sealing felt (368) or compression ring (*244, 441*) - (Model 900 & 990 only).

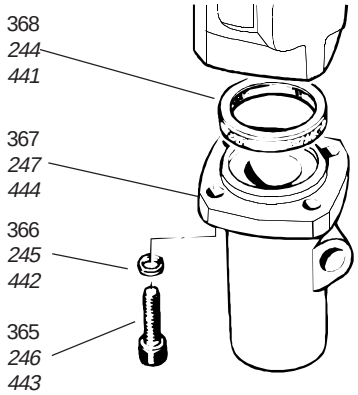


Fig. 3

Dismantling the SDS assembly (900MV)

1. Remove end cap (563) and chuck cover (562).
2. Remove the following items:
   - wire clip (561)
   - buffer stop (560)
   - buffer (559)
   - SDS chuck (558)
3. Remove two latches (557) and remove the following items:
   - latch plate (556)
   - spring (555)
   - lock plate (554)
   - lock chuck (553)

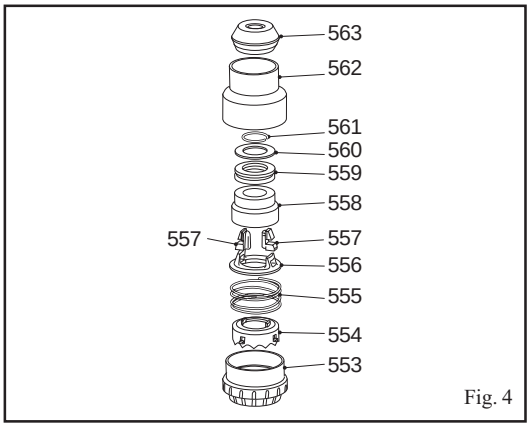


Fig. 4

Removing the driver (900MV)

1. Remove the six screws (551), nose piece (550), four balls (552) and trans housing (541).
2. Remove the following items:
   - 'O' ring (542)
   - 'O' ring (535)
   - seal (543)
   - junk ring (544)
   - seal (545)
   - anvil (546)
   - junk ring (547)
   - 'O' ring (548)
   - driver (549)

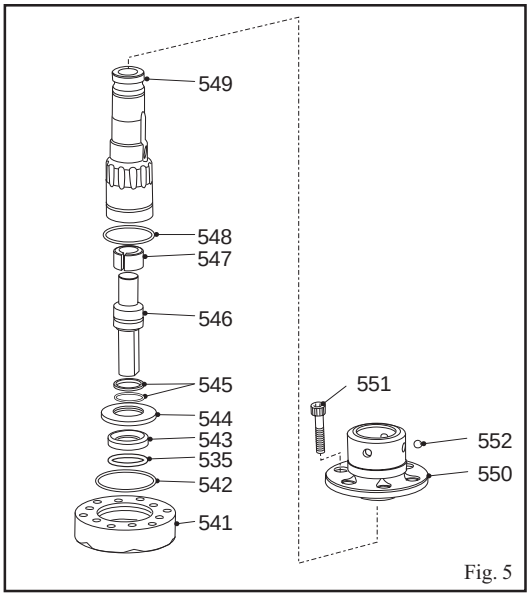


Fig. 5

Dismantling the transmitter housing (All models, 950 shown)

1. Remove the six screws (349, *229*), six spring washers (350, *230*) securing the transmitter housing (369, *242*) to the hammer casing (346, *228*).
2. Using a soft faced hammer, loosen and remove the transmitter assembly. The transmitter assembly contains the anvil assembly and associated components. Remove the anvil assembly from the transmitter assembly and (Model 900 only) the stepped ring (*235*).
3. Remove the rubber ring (355, *236*). Pull the anvil (357, *238*), recoil transfer ring (356, *237*) and the two anvil rings (358,*239*) from the driver housing (372). Remove the anvil rings and recoil transfer ring from the anvil.
4. Remove junk ring (373, *240*) from driver (372) (Model 950) or anvil sleeve (Model 900) and press out the driver bearing (371) from the transmitter housing.
5. Model 950 only. Using service tool, part no. 9710732701, press the drive shaft bearing (374) from the transmitter housing (using thick grease or similar product).

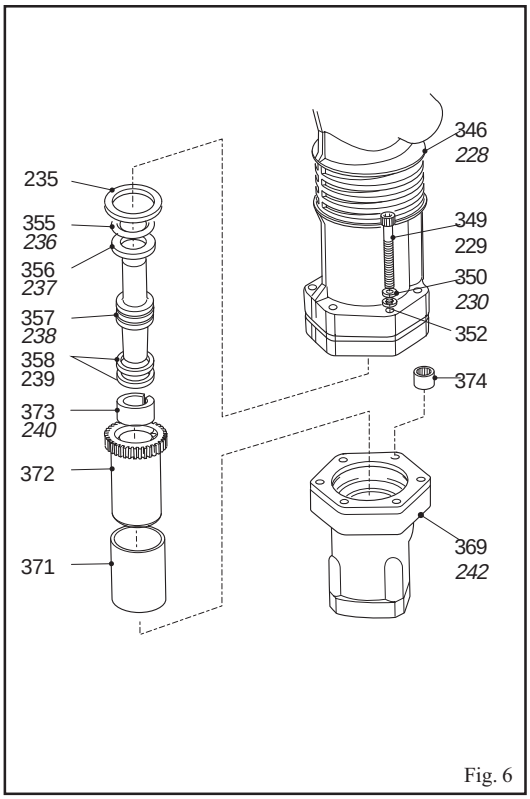


Fig. 6

Dismantling the buffer housing (All models, Model 950 shown)

1. Remove the buffer housing (354, *233*) from the hammer casing (346, *228*).
2. Remove the gaskets (352, *231)*, (375, *234*) and buffer housing ring (353, *232*) from the buffer housing.

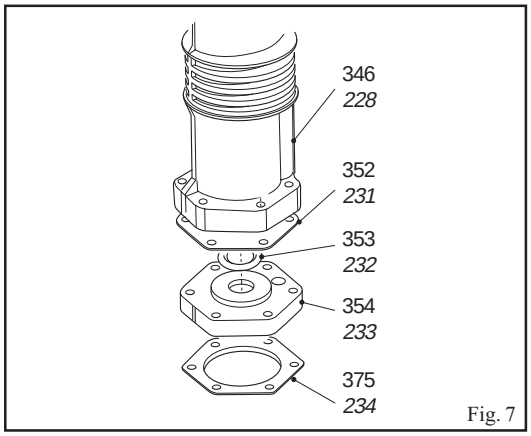


Fig. 7

Dismantling the hammer casing.

1. Position the tool vertically in the vice, using soft metal jaw plates, with the hammer case uppermost.
2. Remove the six screws (348, *227, 427, 527*) and washers (347, *226, 426, 526*) securing the hammer casing (346, *228, 428, 528*) to the motor casing (149). Using a soft-faced hammer, loosen the hammer casing.
3. Holding the connecting rod (305, *205, 405,505*) carefully remove the hammer casing. Remove the gasket (150).

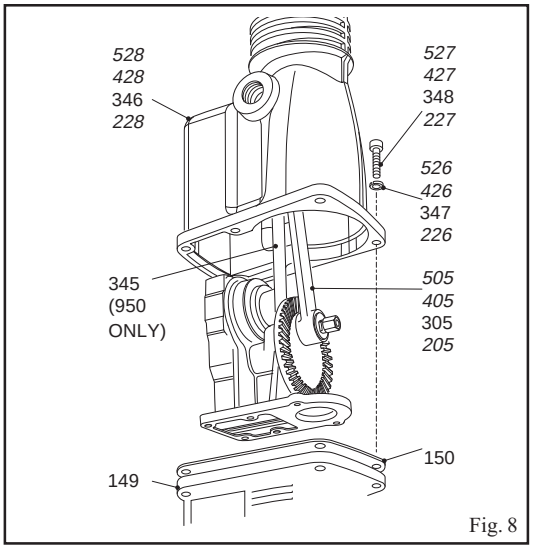


Fig. 8

Dismantling the piston (All models, 950 shown)

1. Remove the striker (301, *201, 401, 501*) from the piston (303, *203, 403, 503*).
2. Push the gudgeon pin (304, *204, 404, 504*) from the piston and remove the piston from the connecting rod (305, *205, 405, 505*).
3. Remove the two piston seals (302, *202, 402, 502*) from the piston.

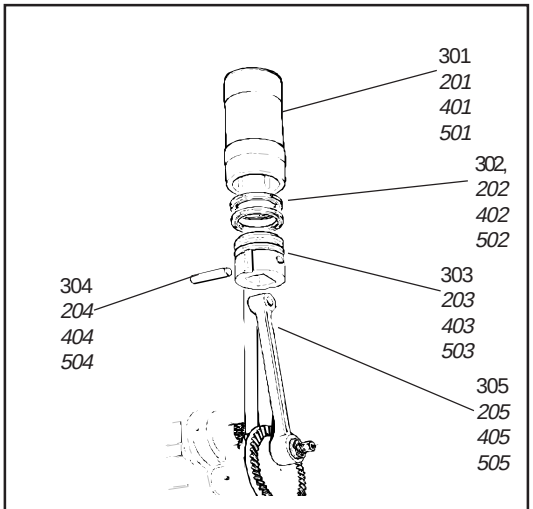


Fig. 9

Removing the connecting rod (All models, 950 shown)

1. Remove the retainer circlip (307, *207, 407, 507*) and crank pin washer (308, *208, 408, 508*). Remove the connecting rod (305, *205, 405, 505*).
2. Press the big end bearing (309, *209, 409, 509*) from the connecting rod.

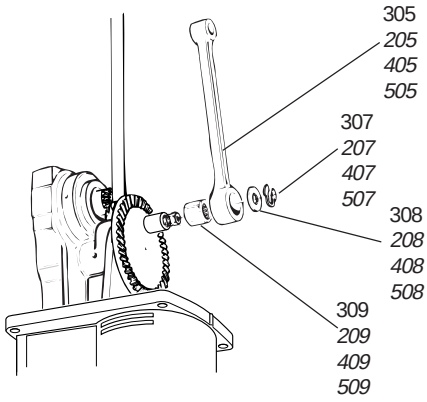


Fig. 10

Removing the gear carrier assembly. (All models, Model 950 shown)

1. Remove six screws (320, *220, 420, 520*) and six spring washers (319, *219, 419, 519*) securing the gear carrier assembly to the motor casing.
2. Remove the gear carrier assembly (318, *218, 418, 518*).

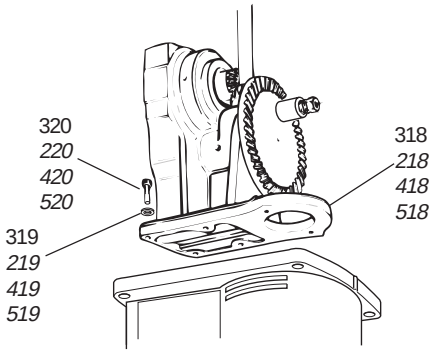


Fig. 11

Dismantling the gear carrier assembly (Model 950 only)

1. Hold gear carrier in vice by base. Remove the four screws (339), and remove the clutch shaft bearing cap (338).
2. Using a suitable mandril, press out the clutch shaft tail bearing (337) from the bearing cap.
3. Remove the two thrust washers (335) and the thrust bearing (336) and shim (334) from the clutch shaft. Pull the clutch assembly from the gear carrier.
4. Remove the drive shaft (345) from the gear carrier. Remove the drive shaft thrust race (343) and drive shaft thrust bearing (344) from the drive shaft.

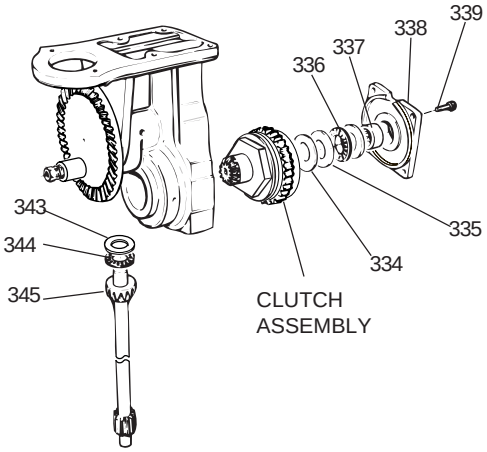


Fig. 12

Dismantling the crank disc. (Model 950 shown)

1. Remove the screw (321, *221, 421, 521*), spring washer (322, *222, 422, 522*) and gear clamp plate (323, *223, 423, 523*).
2. Pull the gear (324) or bearing keeper (*224, 424, 524*) from the crank disc shaft. (**Model 950 only**) Using pliers remove the gear key (326) from the gear.
3. Remove the crank disc (311, *211, 411, 511*), the two thrust races (313, *213, 413, 513*), thrust bearing (314, *214, 414, 514*) and shim (s) (315, *215, 415, 515*) from the gear carrier. Remove the thrust races, bearing and shims from the crank disc shaft.
4. Remove the crank pin nut (312, *212, 412, 512*), screw (306, *206, 406, 506*) and crank pin bush (310, *210, 410, 510*)

   Note: The crank pin screw and nut have left-hand threads.

(Model 900 & 990 shown)

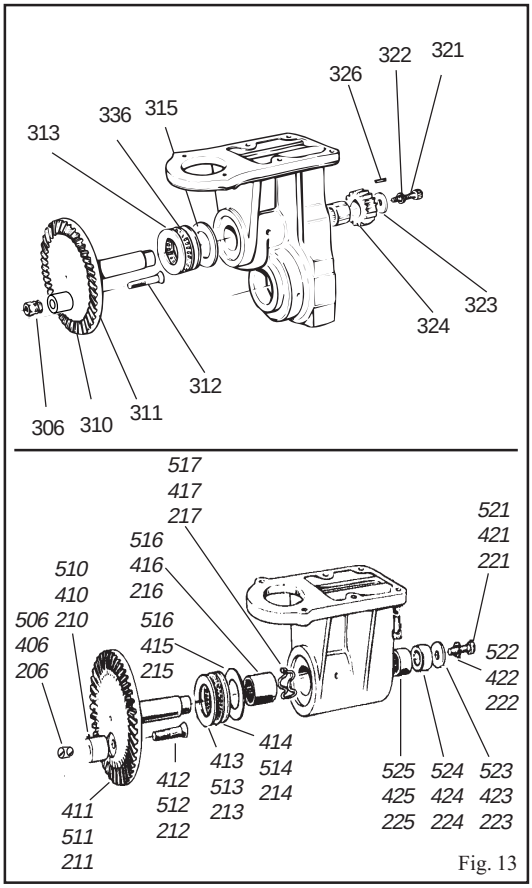


Fig. 13

Dismantling the gear carrier. (All models, Model 950 shown)

1. Fill the drive shaft bearing (342) with thick grease or similar material and using a suitable mandril press out the bearing. (Model 950 only)
2. Press out the crank disc front bearing (316), bearing spacer (317) and crank disc rear bearing (325) and (Model 950 only) the clutch head bearing (342).

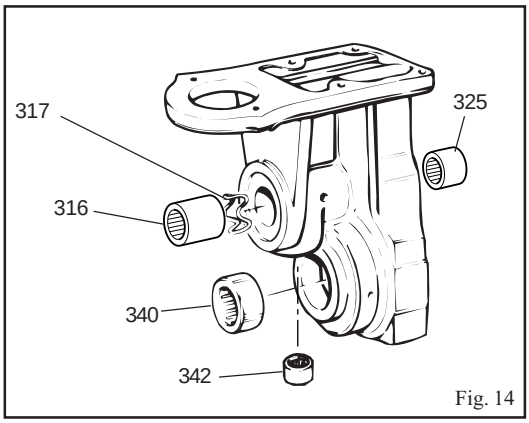


Fig. 14

Dismantling the clutch (Model 950 only)

1. Position the clutch assembly horizontally in a vice. Straighten the clutch lock washer (328) using soft metal jaw plates.
2. Using a spanner unscrew the clutch nut (327)
3. Remove the clutch lock washer (328), the clutch spring (329), the two clutch plates (330) and the gear (331). Press out the bearing (332) from the gear (331)
4. Insert a 3/16 in. Allen key into the clutch pinion shaft (341) and remove from the clutch hub (333).

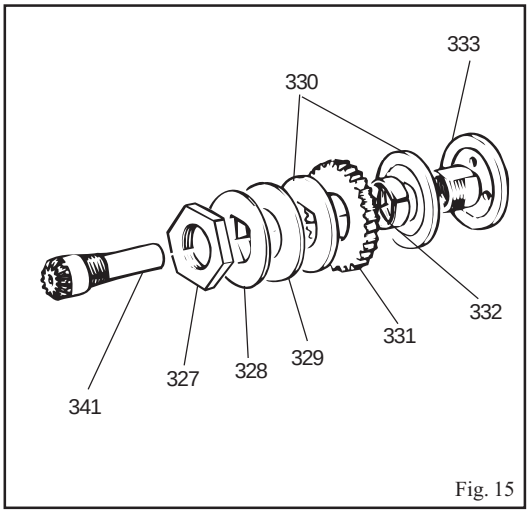


Fig. 15

Dismantling the brushes. (All models)

1. Remove the two end cap springs (174) and two outer brush caps (173).
2. Unscrew the two inner brush end caps (127) and remove the two carbon brushes (128).

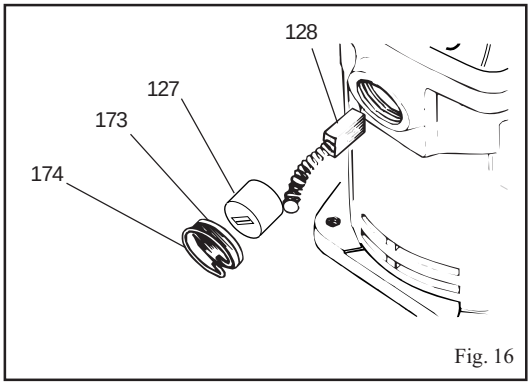


Fig. 16

Removing the rear handle and motor end plate (All models)

1. Remove the four screws (104) securing the handle (118) to the motor case (149) and remove the handle.
2. Depress the rocker assembly (101) and remove the plunger (121).
3. Using a screwdriver lever out the large and small handle plugs (102 and 119).
4. Press out the rocker pivot pin (120) and remove the rocker assembly (101).
5. Unscrew and remove the lock button assembly (103).
6. Remove the motor end plate assembly (105). Remove, from the end plate assembly, the two terminal pads (107).
7. Remove the following items:
   - spring ring (111)
   - thrust washer (110)
   - spring washer (108)
   - bearing (126)
   - bearing insulator (112)

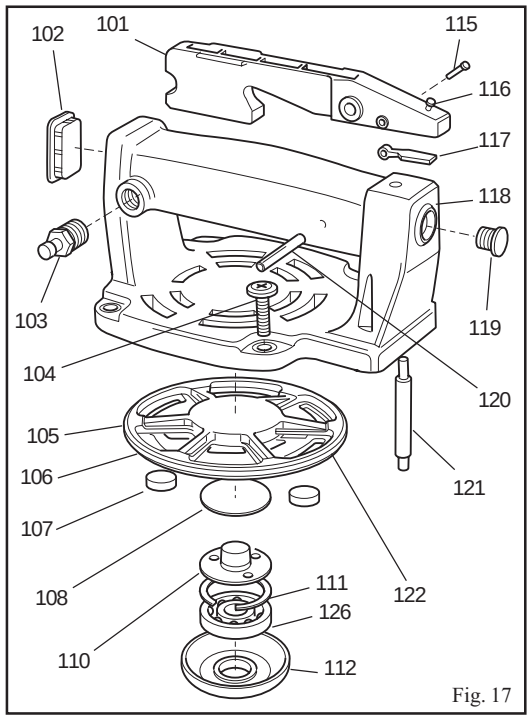


Fig. 17

Dismantling the switch (All models)

1. Slacken the four captive screws (162) securing the switch cover (163) and remove the cover and the switch box seal (160).
2. Lift the switch (159), remove the cover and disconnect the four electrical connections. Remove the condenser (158).
3. Remove two screws (168) securing the cord guard housing (167) and remove the housing and cord. Remove the two screws (152) securing the cord grip (153) and remove the grip. Pull the power cord free.
4. Lever off the plunger abutment plate (124) and remove the two springs (177), two push rods (123) and the switch plate (125). Remove the switching pad (165), switch (159), the four terminal pads (164) and the switch cup (155).
5. Remove elbow connector (174) from motor housing. Remove grommet (166). Remove liner (154) from motor housing. Remove grommet (172).

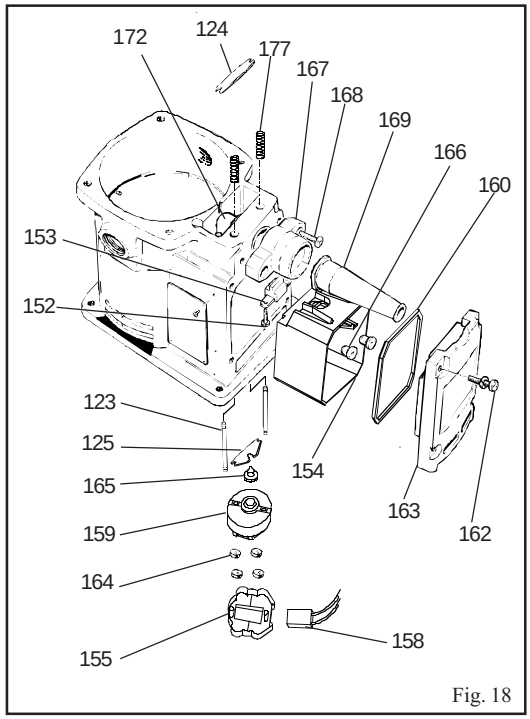


Fig. 18

Dismantling the rear armature bearing and brush ring (All models)

1. Remove the terminal screws (130) and remove the field connections.
2. Remove the the top bearing inner race (126) using service tool No. 9170 0231 50 and lever off the top bearing shroud (112).
3. Remove the brush housing, the two waved washers (133) and the pressure ring (134).

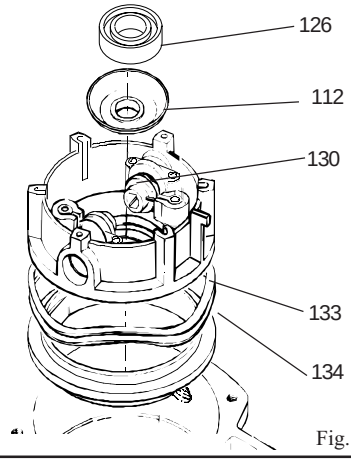


Fig. 19

Dismantling the brush holder housing (All models)

1. Remove the four retaining screws (113) and two brush holder retaining straps (114).
2. Remove the brush holders (130).
3. Remove the two terminal housings (131).

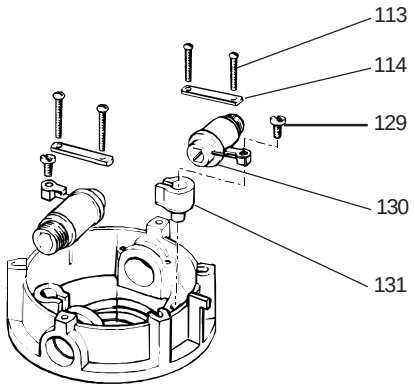


Fig. 20

Dismantling the motor (All models)

1. Remove the two cartridge locating screws (151).
2. Using two main assembly screws (348) fit the motor dismantling tool to the motor case. Ensure the two field coil switch leads are pulled back into the motor case
3. Screw in knob of the motor dismantling tool and push the motor assembly from the motor housing.

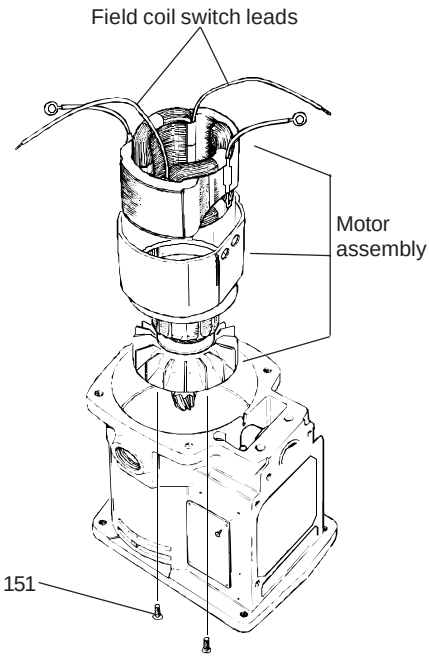


Fig. 21

Dismantling the armature assembly (All models)

1. Fit the pinion nut service tool to the pinion (145).

CAUTION: During the following operation take care to ensure the fan (138) is not damaged by the vice jaws.

2. Mount the armature assembly and pinion in a vice, between two pieces of wood, with the pinion nut uppermost. Using a suitable open-ended spanner on the pinion nut unscrew the pinion (145).

3. Pull the pinion bearing cartridge (175) from the motor shaft. Remove the clip (179) and bearing (141).

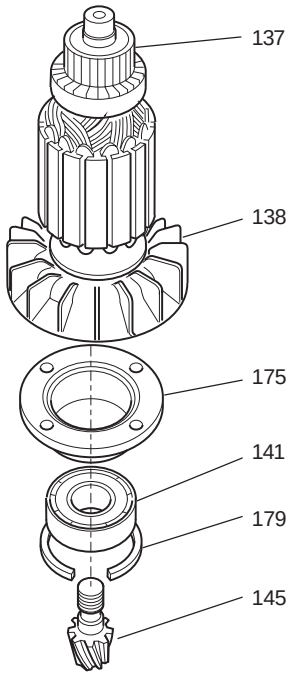


Fig. 22

General For best performance hammers should be serviced at regular intervals, any indication that the hammer is not performing as specified should be investigated to prevent any adverse damage occurring.

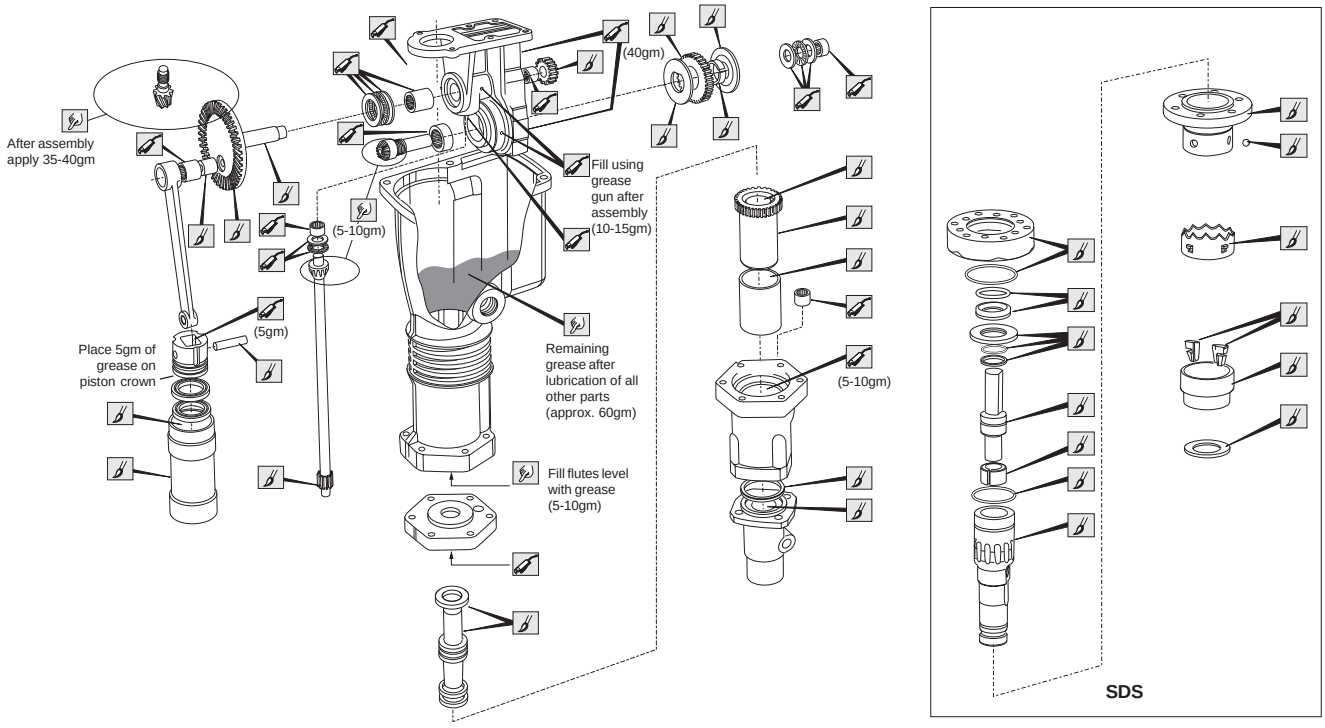
ALL SEALS, GASKETS, GREASE OR OTHER PARTS DEEMED NECESSARY FOR SERVICING ARE IN THE SERVICE KIT.

ALL NEEDLE ROLLER BEARINGS SHOULD BE PRESSED WITH THE ROUNDED EDGE ENTERING THE BORE FIRST, AND THE INSERTION TOOL PRESSING AGAINST THE FLAT SURFACE OF THE BEARING.

Cleaning All mechanical parts with the exception of any sealed bearings should be cleaned in a suitable cleaning fluid. Electrical parts should be cleaned by the use of compressed air.
PRECAUTIONS MUST BE TAKEN FOR PERSONAL SAFETY THE USE OF EYE PROTECTION AND GLOVES IS RECOMMENDED.

Inspection All mechanical and electrical parts should be inspected for wear and replaced as required.

Lubrication At service and repair intervals the lubrication should be carried out as shown in the diagram below. **(950 model)** All parts in the service kit should be fitted. The total amount of grease for the 900 is 170gm., for the 950 model 225gm. Lubrication of the hammer is as shown on the grease charts.



GREASE APPLICATION CODE

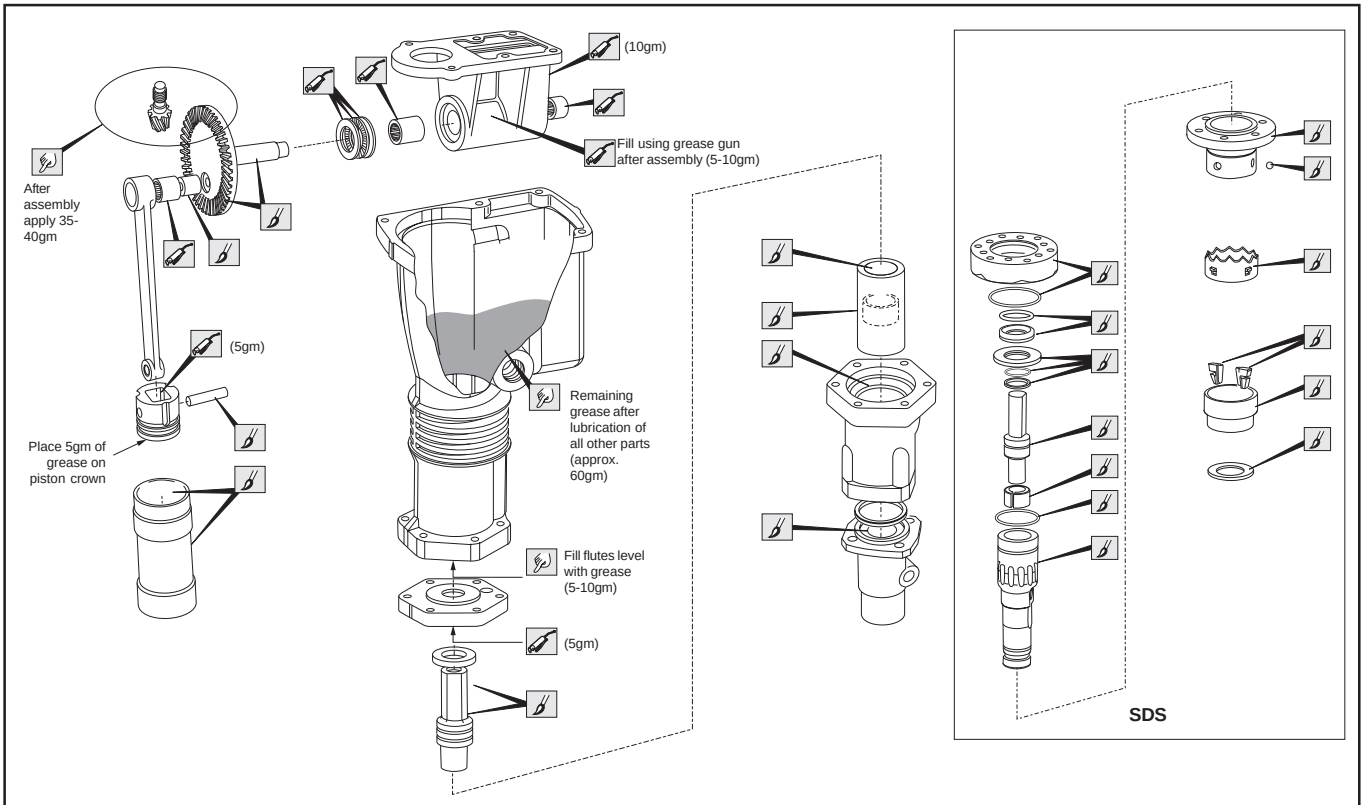
Liberally coat

Pack

Generously apply

Use grease Part No. 9170 3108 00 (85gm sachet)
Total quantity 225gm (3 sachets)

SCREWS ARE TO BE REFITTED USING LOCTITE® 271 OR SIMILAR



GREASE APPLICATION CODE

Liberally coat

Pack

Generously apply

Use grease Part No. 9170 3108 00 (85gm sachet)
Total quantity 170gm (2 sachets)

TORQUE SETTINGS

MODELS 900KV/900SV/900MV/950K/950B/990KV

ITEM NO.	PART NO.	Nm	lb.ft	ITEM NO.	PART NO.	Nm	lb.ft
103	9170 0020 70	2	1.75	254/382	9170 0199 70	30	21
104	9170 0193 90	3.5	2.5	320	9170 0190 60	7	4
113	9170 0191 70	0.75	0.5	321	9170 0190 60	7	4
129	9170 0191 90	2	1.75	338	9170 0190 70	4.5	3.5
145	9170 0070 50	22	16	341	9170 0130 10	27	20
151	9170 0191 10	3.5	2.5	366	9170 0198 30	18	13
152	9170 0197 60	1	0.75				
159	9170 2874 30	2.9	2.25				
162	9170 6909 00	2	1.75				
168	9170 0190 80	2	1.75				
227/348	9170 0190 10	16	11				
229	9170 0194 20	20	15				
246/365	9170 0193 20	35	25				

ELECTRICAL TESTING

Before assembly all electrical parts **MUST** be checked for safety, and that they conform to specification. The recommended test voltage should be applied as follows:

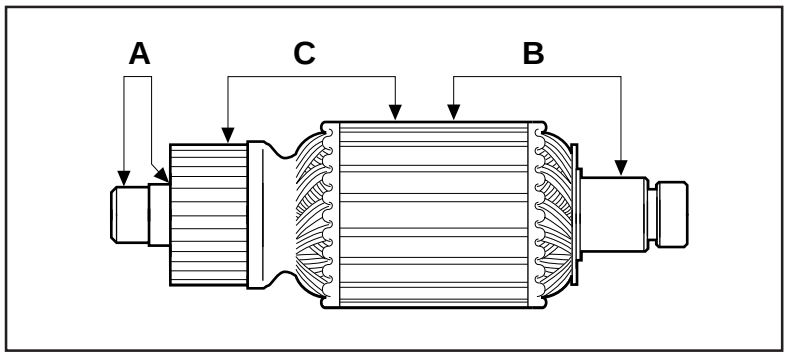
1. Apply half the recommended test voltage and increase to the full recommended test voltage as rapidly as possible.
2. The full recommended test voltage should be maintained for two to three seconds without the insulation failing.

Testing the armature (Flash Testing)

A	Armature shaft to commutator bush	1250 volts increasing to 2500 volts
B	Lamination pack to armature shaft	1250 volts increasing to 2500 volts
C	Commutator segments to commutator bush	750 volts increasing to 2500 volts

Field coil testing Connect all the field coil leads together and apply one test probe to the leads and one to the laminations. Set the test voltage to 750 volts increasing to 1500 volts.

WARNING: IF EITHER THE ARMATURE OR FIELD COIL FAILS THE PREVIOUS TESTS THE COMPONENT MUST BE CHANGED.



ELECTRICAL PERFORMANCE TEST READINGS

ARMATURES					
MODEL	**100V**	**110V**	**120V**	**220V**	**240V**
900 K/B/V	Ω 0.514	Ω 0.66	Ω 0.66	Ω 2.84	Ω 3.04
950 K/S	Ω 0.514	Ω 0.66	Ω 0.66	Ω 2.84	Ω 3.04
FIELD COILS					
	100V	**110V**	**120V**	**220V**	**240V**
900 K/B/V	Ω 0.36	0.45	Ω 0.56	Ω 1.88	Ω 2.57
950	Ω 0.36	0.45	Ω 0.56	Ω 1.88	Ω 2.57
PERFORMANCE					
Full Load Hammer Test					
	100V	**110V**	**120V**	**220V**	**240V**
900K/B/V	850 - 900 W				
950K/S	850 - 900 W				
Clutch Slip Test					
	100V	**110V**	**120V**	**220V**	**240V**
950K/S	1300 - 1400 W				

Note:- On all test readings + or - 5% of figures shown is acceptable.

ASSEMBLY - 900/950

Assembling the armature (All models)

Note: In the assembly instructions numbers starting 200 are Model 900, numbers starting with 300 are Model 950, numbers starting with 400 are Model 990, numbers starting with 500 are Model 900M in both text and illustrations.

1. Insert, into the pinion bearing cartridge (175), bearing (141) and secure with clip (179).
2. Fit the pinion bearing cartridge assembly to the armature shaft with the assembly against the shoulder of the shaft.
3. Screw the pinion (145) onto the armature shaft. Fit the pinion service tool to the pinion.

CAUTIONS:

a. During the following operation take care to ensure the fan (138) is not damaged by the vice jaws.

b. Failure to tighten the pinion to the correct torque could result in damage to the hammer gear mechanism.

4. Mount the armature assembly and pinion in a vice, between two pieces of wood, with the pinion nut sitting on the bottom of the vice slide. Tighten the pinion nut (145) to 20 Nm.

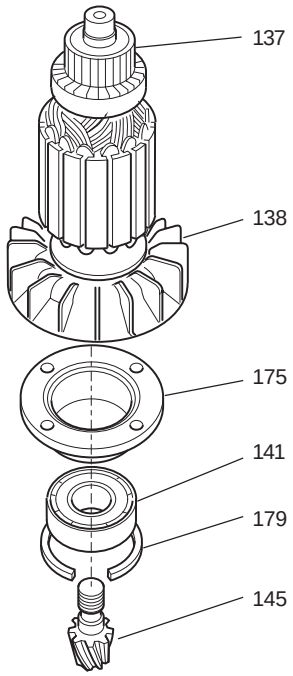


Fig. 23

Assembling the motor (All models)

1. Mount the motor case (149) in a vice, using soft metal jaws, and insert the assembled armature into the motor case.
2. Align the holes in the pinion bearing cartridge and secure with the two screws (151).
3. Insert the field coil (135) into the insulating liner (136).

Note: If the field coil is fitted with inductors these should be placed in the flat section between the coil and the liner.

4. Insert the assembled field coil into the motor case (149) until the top of the liner is level with the step in the motor case.
5. Feed the two switch leads through the holes in the liner into the switch box housing.

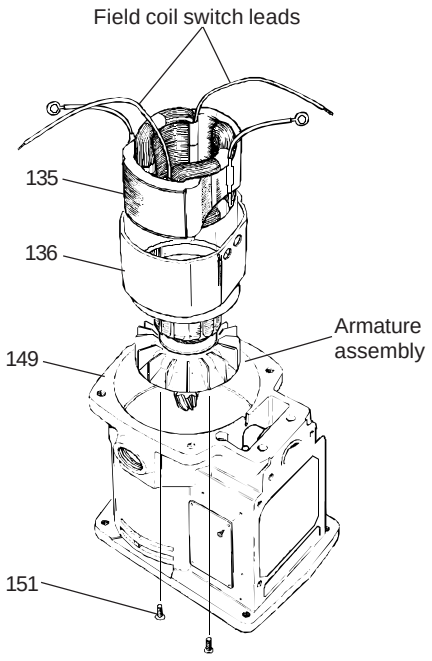


Fig. 24

Assembling the brush holder (All models)

1. Fit the two terminal housings (131).
2. Fit the two brush holders (130) into the brush holder housing (132). Fit the brush holder alignment service tool through the brush holders.
3. Fit the two brush holder retaining straps (114) and four retaining screws (113).

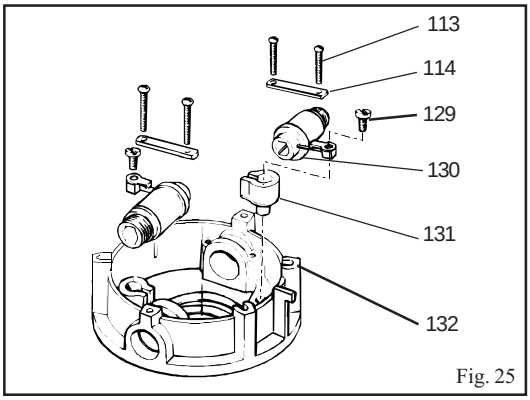


Fig. 25

Assembling the brush housing assembly and rear armature bearing (All models)

1. Fit the pressure ring (134), the two waved washers (133) and the assembled brush housing. Feed field leads through holes in brush holder housing.

Note: The brush housing is correctly located when the housing is flush with the top of the motor case, when light pressure is applied.

2. Connect the two field connections to the brush terminals (130) and tighten the two terminal screws (129).
3. Fix on the top bearing shroud (112). Lubricate and the fit the top bearing inner ring only (126), using service tool No. 9170 0232 40.

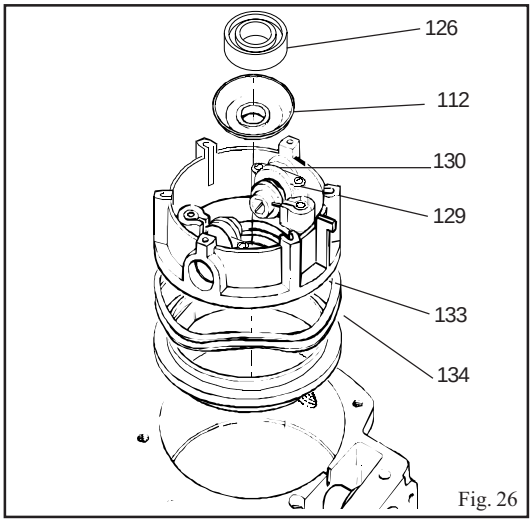


Fig. 26

Assembling the switch (All models)

1. Fit the switch box liner (154) and pass the two field coil switch leads through into the liner. Fit a grommet (166) over each lead and press the grommets into the liner apertures.
2. Fit switching pad (165), switch actuator plate (125) to the two push rods (123) and pass the push rods through the motor housing into the switch box opening. Fit the springs (177) over the push rods and fit the plunger abutment plate (124).
3. Fit the cord guard (169) in the cord guard housing (167) and pass the power lead through the cord guard ensuring there is sufficient lead available to connect to the switch.Fit the switch cup (155), the four terminal pads (164), the switch (159) and the switching pad (165).
4. Fit the switch cup (155), the four terminal pads (164), and condenser (158).Connect the switch leads, power leads and condensor connections. Fit the switch (159) and four terminal pads (164) into the switch cup (164). Fit the assembled switch into the switch box liner (154). Fit the switch box seal (160) and switch box cover (163 and secure with the four screws (162).

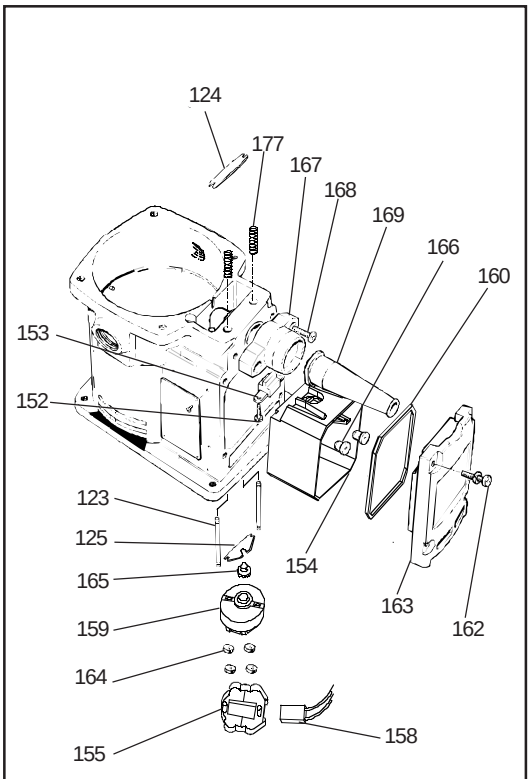


Fig. 27

Assembling the motor end plate and rear handle (All models)

1. Fit the two terminal pads (107) to the end plate (105).
2. Fit the washer (108) to the end plate. Apply 5gm of grease.
3. Fit the bearing thrust washer (110) and secure with spring ring (111). Fit the motor end plate into the motor case (149) and locate pin in brush holder assembly.
4. Fit the rocker assembly (101) into the handle (118) and insert the rocker pivot pin (120). Fit the lock button (103) and the large and small handle plugs (102, 115).
5. Fit the plunger (121) into the handle. Fit the handle assembly to the motor case and secure with the four screws (104), tighten the screws in a diagonal sequence to avoid distorting the handle assembly.

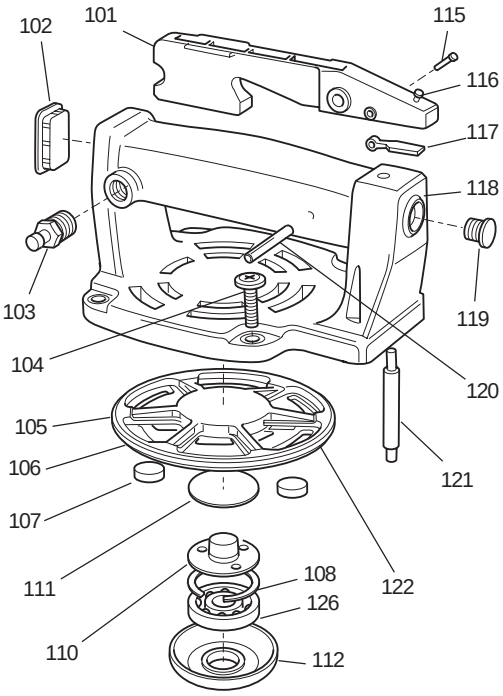


Fig. 28

Assembling the brushes (All models)

1. Fit the two brushes (128) and the two inner brush caps (127) (fully tighten).
2. Fit the two outer brush caps (173) and secure with the two end cap springs (174).

Note: Run and test motor.

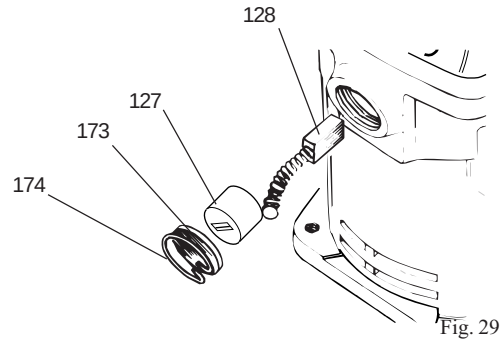


Fig. 29

Assembling the gear carrier. (Model 950 shown)

1. Refit the clutch head bearing (340) and the drive shaft bearing (342).

   Refer to greasing instructions.
2. Refit the crank disc rear bearing (325) and insert the bearing spacer (317). Refit the crank disc front bearing (316).

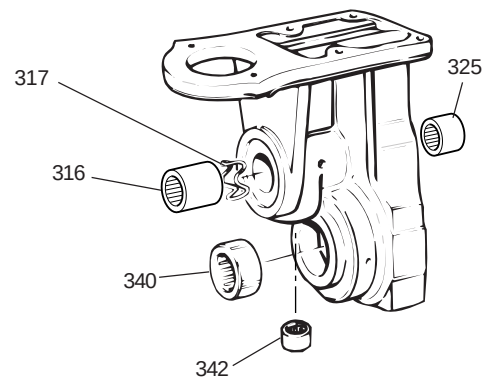


Fig. 30

Assembling the crank disc (All models, Model 950 shown)

Note:- Before assembly, follow greasing instructions.

1. Position the motor case (149) in a vice, using soft metal jaw plates.
2. Fit the crank pin screw (312, *212, 412, 512*), crank pin bush (311, *211, 411, 511) and* crank pin nut (306, *206, 406, 506*). Fit the thrust bearing (314, *214*, *414, 514*) and the two thrust washers (313, *213, 413, 513*) onto the crank disc (311, *211, 411, 511*). **Do not** fit shims at this stage.

Note: The crank pin screw and nut have left-hand threads.

3. Fit the crank disc into the gear carrier (310, *210, 410*) and carrier to motor case. Secure with a screw (320, *220, 420, 520*) and spring washer (319, *219, 419, 519*).

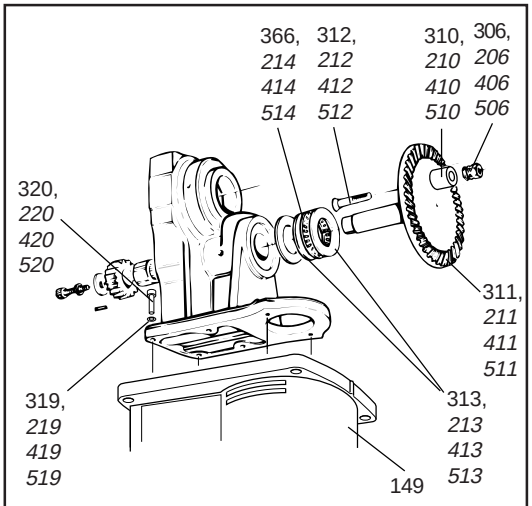


Fig. 31

Adjusting the gear backlash (All models, Model 950 shown)

1. The backlash between the crank disc assembly and the motor drive is set to the limits, 0.05mm (0.002in) and 0.08mm (0.003in). The backlash is adjusted by adding shims to the crank disc drive line behind the thrust race.
2. Using a feeler gauge, rotate the crank disc and measure the gap between the back of the crank disc and the thrust race. This should be done at the point closest to the mesh of the crank gear and the motor pinion.
3. Rotate crank slowly with feeler gauges in position until it is possible to lightly nip the feelers when the gear is rotated.Check measurement and subtract 0.05mm (0.002in) 0.08mm(0.003in)and add shim to set backlash the running clearance.
4. Fit the three remaining gear carrier securing screws (320, *220, 440, 520*) and spring washers (319, *219, 419, 519*).

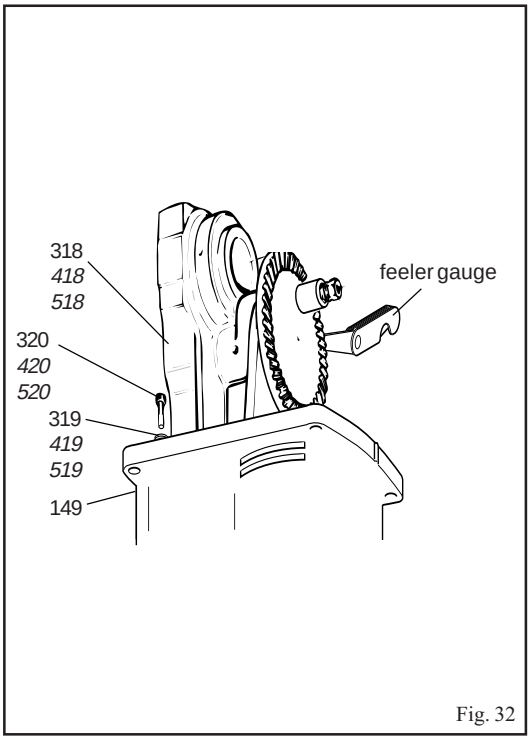


Fig. 32

Assembling the clutch (Model 950 only)

1. Press the bearing (332) into the gear (331)
2. Put clutch peg spanner in vice and place clutch hub (333) onto pegs.
3. Fit and tighten the pinion (341) and the following items in sequence:
   a) clutch plate (330) with coating up,
   b) gear (331),
   c) clutch plate (330) with coating facing the gear,
   d) clutch spring (329) with concave face to the clutch plate,
   e) clutch lock washer (328)
   f) clutch lock nut (327)

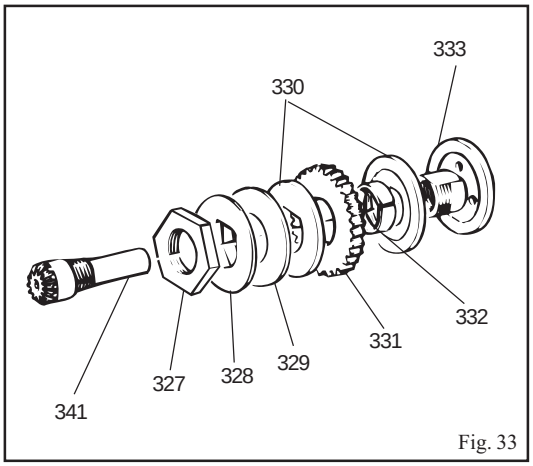


Fig. 33

Adjusting the clutch (Model 950 only)

1. Mount the clutch torque setting rig (Pt No. 9170 0236 50) in a vice and fit the clutch assembly into the rig body with the pinion uppermost.
2. Insert a 3/16in Allen key into the pinion and rotate counterclockwise and note the spring balance reading when the clutch starts to slip. The reading should be between 7-8lb (approximately 6 Nm), if the clutch slips below this figure tighten the clutch nut and repeat the test.
3. If during the test the clutch fails to slip remove the clutch assembly from the rig, replace the clutch spring (item 329) and repeat the test.
4. When the torque setting is completed secure the clutch nut by bending up the clutch lock washer (item 328).

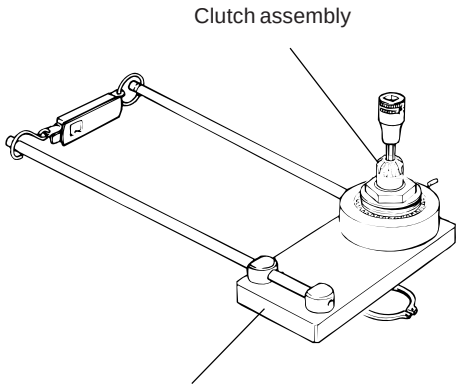


Fig. 34

Mounting the drive shaft (Model 950 only)

1. Mount the motor case in a vice, between soft metal jaw plates, with the gear carrier uppermost.
2. Fit the drive shaft thrust washer (343) and thrust race (344) to the drive shaft (345). Insert the drive shaft into the drive shaft bearing in the gear carrier.
3. Insert the clutch assembly into the gear carrier ensuring that the clutch and drive shaft pinions are correctly engaged.

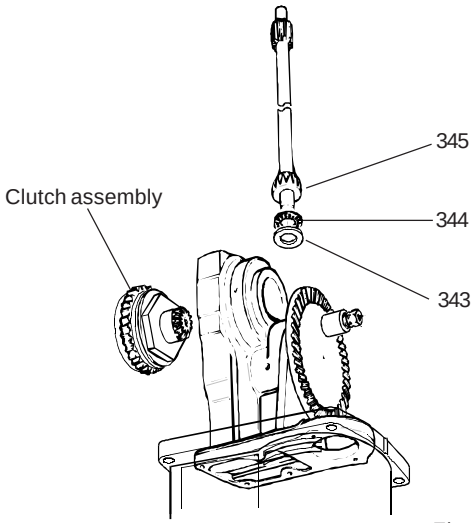


Fig. 35

Adjusting the drive shaft backlash (Model 950 only)

1. Fit the following items to the clutch shaft in sequence:
   a) clutch shim (334),
   b) clutch thrust race (335),
   c) clutch bearing (336),
   d) clutch thrust race (335),
   e) clutch shaft tail bearing (337) and
   f) clutch shaft bearing cap (338).

   Secure the bearing cap with 2 screws (339).
2. Turn the drive shaft (345) by hand. The drive shaft should be free to turn with a minimum of backlash between the clutch pinion and the drive shaft. If the backlash is excessive remove the clutch shaft bearing cap (338) and add a shim (334). Refit the bearing cap and four screws (339).

Note: With service tool fitted this is checked by rotating the clutch assembly by hand.

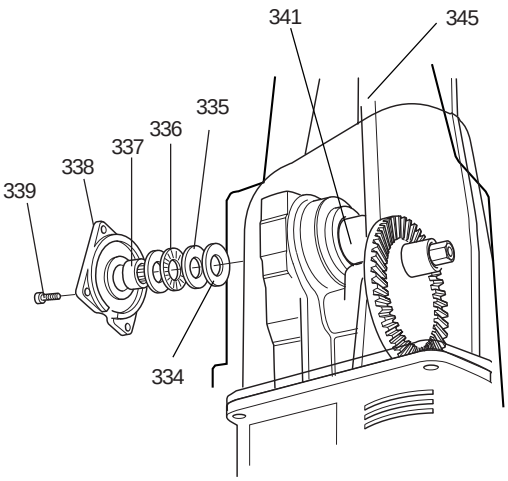


Fig. 36

Securing the crank disc (All models, 950 shown)

1. Fit the 19-tooth gear (324) or bearing keeper (*224, 424, 524*) to the crank disc shaft. For the 950 models insert the gear key (326).
2. Fit the clamp plate (323, *223, 423, 523*) and secure the gear or bearing keeper using the screw (321, *221, 421, 521*) and spring washer (322, *222, 422, 522*).

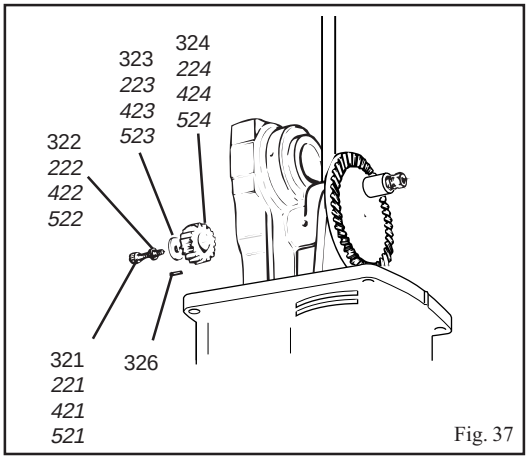


Fig. 37

Fitting the connecting rod (All models, 950 shown)

1. Fit the big end bearing (309, *209, 409, 509*) into the connecting rod (305, *205, 405, 505*). Fit the connecting rod over the crank pin bush (310, *210, 410, 510*). Rotate the crank wheel through one complete revolution and check that the connecting rod does not touch the teeth of the crank disc.

Note: Connecting rod is offset

2. Fit the crank pin washer (308, *208, 408, 508) and* secure with the retainer circlip (307, *207, 407, 507*).

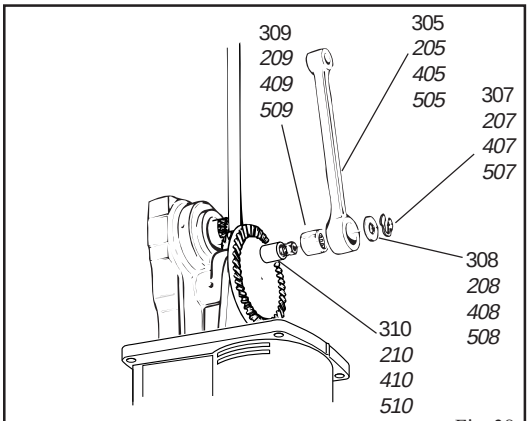


Fig. 38

Fitting the piston (All models, 950 shown)

1. Fit the two piston seals (302, *202, 402, 502*) to the piston (303, *203, 403, 503*), ensuring they are correctly seated.
2. Insert the connecting rod (305, *205, 405, 505) into* the piston and push in the gudgeon pin (304, *204, 404, 504*).
3. Lightly grease the bore of the striker (301, *201, 401, 501*) and push over the piston.

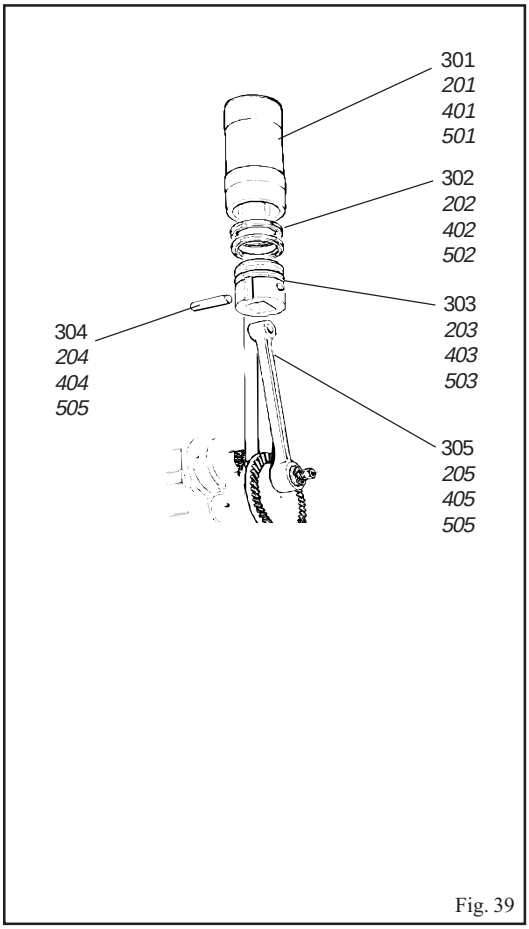


Fig. 39

Fitting the hammer case (All models, 950 shown)

1. Fit the hammer case (346, *228, 428, 528*) vertically in a vice between soft metal jaws.
2. Lightly grease the hammer case gasket (150) and locate on the hammer case.
3. Fit the assembled motor and gear carrier into the hammer case. **For 950 models** ensure the drive shaft (345) is correctly located.
4. Secure the hammer case using the six screws (348, *227, 427, 527*) and washers (347, *226, 426, 526*).

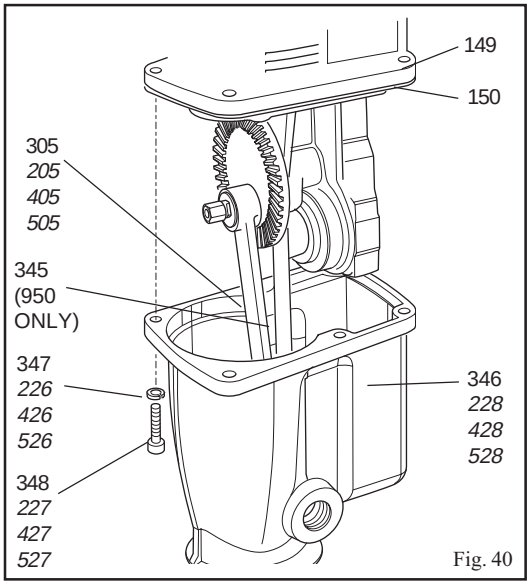


Fig. 40

Fitting the buffer housing (All models, model 950 shown)

1. Press the buffer housing ring (353, *232*) into the groove in the buffer housing (354, *233*).
2. Fit the buffer housing gasket (352, *231*) to the hammer casing (346, *228*).
3. Fit the buffer housing (354, *208*) and buffer housing gasket (375, *234*) to the hammer casing.
4. **For 990 only** fit spacer (432) and extra gasket (231, 352, 433) between gasket and buffer housing.

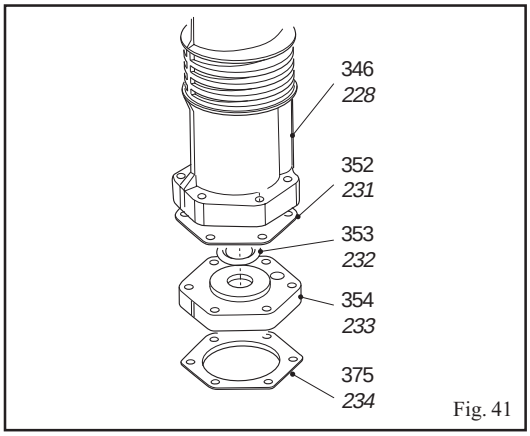


Fig. 41

Assembling the transmitter housing (All models, model 950 shown)

1. Place the transmitter housing (359) vertically in a vice between soft metal jaws. Using service tool, part no. 917003270, press the drive shaft bearing (374) into the transmitter housing . Press the driver bearing (371) into the transmitter housing (359). (Model 950 only).
2. Insert the junk ring (373, *240*), with the flat surface down, into the driver (372) or anvil sleeve.
3. Insert the recoil transfer ring (356, *237*), rubber ring (355, *236*) into the transmitter housing.
4. Fit the two anvil rings (358, *239*) on to the anvil (357, *238*) and insert the anvil into the driver (372) or anvil sleeve. Insert the anvil and driver assembly into the transmitter housing (369, *242*).
5. Fit the assembled transmitter housing to the hammer casing and secure with the six screws (349, *229*), spring washers (350, *230*).

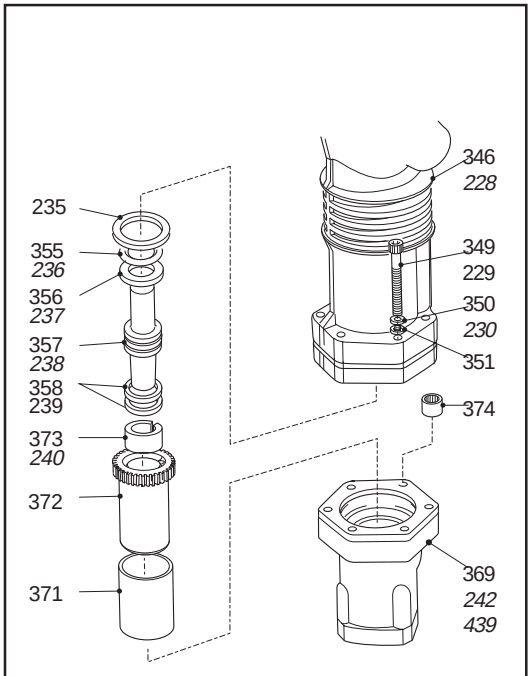


Fig. 42

Refitting the nosepiece (all models, Model 950SV shown)

1. Fit the sealing felt (368) (Model 950 only) to the nosepiece (367, *247*).

Note:- Rubber section to hammer case, felt to nosepeice sealing felt (368).

2. Fit the nosepiece to the transmitter housing (369, *242*). Apply Loctite to the four screws (365, *246*), fit the spring washers (366, *245*) and secure the nosepiece to the transmitter housing. Torque the screws to 20 Nm.

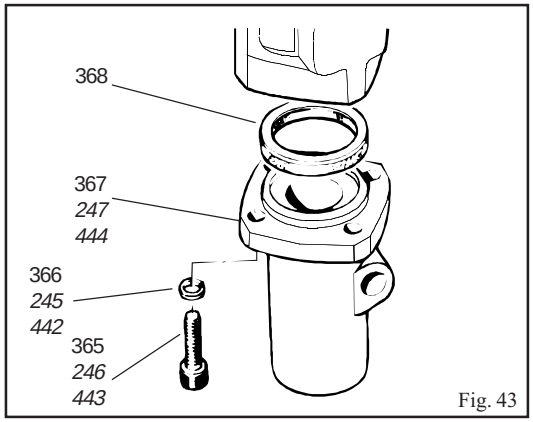


Fig. 43

Refitting the latch bar mechanism (All models - 950SV shown except 900MV)

1. Insert the latch bar (359, *248*) into the nosepiece.
2. Fit the latch spring cover (362, *251*) and latch spring (363, *252*) over the latch bar.
3. Fit the latch retainer (360, *249*) over the end of the latch bar and tap into place using a soft faced hammer.

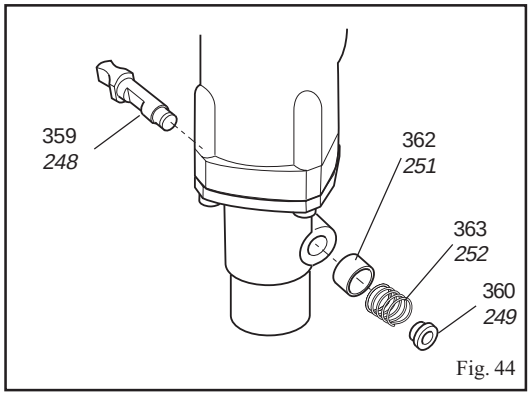


Fig. 44

Fitting the driver (900MV)

1. Fit driver (549), 'O' ring (548) and junk ring (547).
2. Fit seal (545) to anvil (546).
3. Fit the following items:
   - junk ring (544)
   - seal (543)
   - 'O' ring (535)
   - 'O' ring (542)
4. Fit the following items and secure using six screws (551):
   - trans housing (541)
   - nose piece (550)
   - four balls (552)

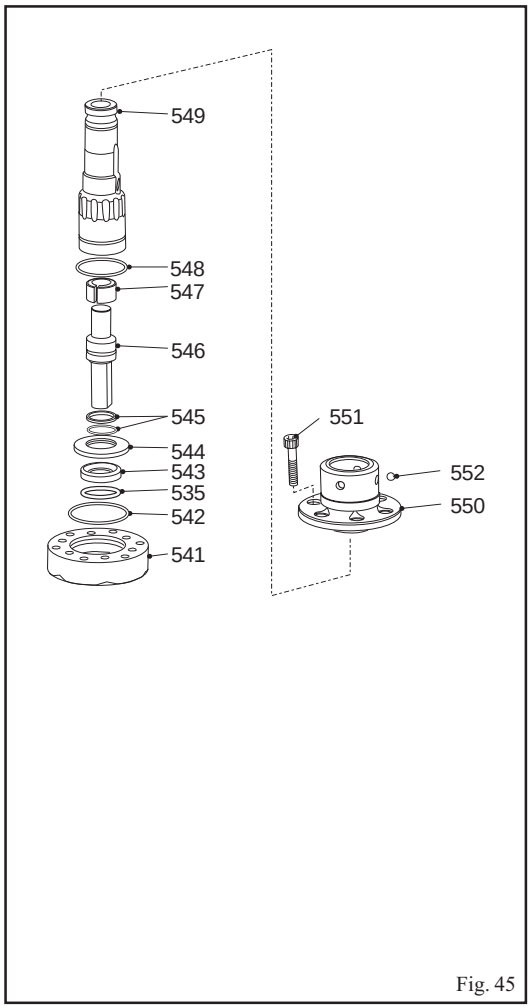


Fig. 45

Assembling the SDS assembly (900MV)

1. Fit the following items and secure using two latches (557):
   - lock chuck (558)
   - lock plate (554)
   - spring (555)
   - latch plate (556)

2. Fit the following items and secure using wire clip (561):
   - SDS chuck (558)
   - buffer (559)
   - buffer stop (560)

3. Fit chuck cover (562) and end cap (563)

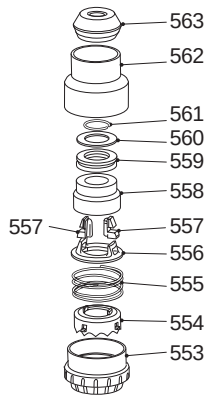


Fig. 46

Refitting the handle assembly (All models, 990 shown)

1. Fit casing strap (456) and handle (458). Secure using the following items:
   - bolt (457)
   - washer (459)
   - knob (460)

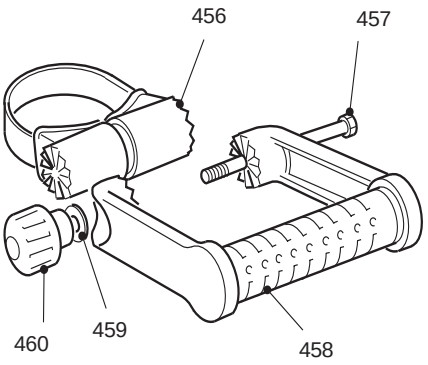


Fig. 47

WARNING **ON COMPLETION OF ASSEMBLY THE UNIT SHOULD BE FLASH TESTED AT 4000 VOLTS. THE UNIT SHOULD BE RUN PREFERABLY AT HALF STATED VOLTAGE FOR 10 MINUTES TO ENSURE CORRECT BEDDING OF BRUSHES. AFTER 10 MINUTES THE UNIT SHOULD BE RUN AT FULL STATED VOLTAGE. POWER READINGS SHOULD BE CHECKED AGAINST THE PERFORMANCE DATA.**

With the breaker completely assembled and with the switch "ON" apply not more than 2000 volts initially and then raise quickly to 4000 volts between the main casting and one of the pins of the plug on the power supply cord.

WARNING **LETHAL VOLTAGES PRESENT - DO NOT TOUCH PINS**

The full voltage of 4000 volts should be maintained without breakdown or flashover for a few seconds.

If, however, the armature has already been tested then it is better to remove the carbon brushes before carrying out the test. This avoids over-stressing the armature insulation system for a second time. In this case the test voltage must be applied between the main casting and each live pin of the plug in succession.

WARNING **FAILURE TO SWITCH THE MACHINE ON MAY CONCEAL A FAULT WHICH WILL RESULT IN AN ELECTRIC SHOCK TO THE USER. ENSURE THAT THE SWITCH IS *ON* BEFORE TESTING.**

FAULT FINDING

With the aid of the Fault Finding chart (below) the source of any malfunction may be quickly identified and repaired.