

# ALPINA

Model	Bore mm (in.)	Stroke mm (in.)	Displacement cc (cu. in.)	Drive Type
070, 070S, A70, Pro 70, Super Pro 70S	51 (2.0)	34.5 (1.36)	70 (4.3)	Direct
P90, Pro 90, Super Pro 90	54 (2.13)	39.1 (1.54)	90 (5.5)	Direct
P120, Pro 120, Super Pro 120	58 (2.28)	45.5 (1.79)	120 (7.3)	Direct

## MAINTENANCE

**SPARK PLUG.** Recommended spark plug for all models is Champion CJ7Y. Electrode gap should be 0.5 mm (0.020 in.).

**CARBURETOR.** All models are equipped with a Tillotson HS diaphragm carburetor. Refer to Tillotson section of CARBURETOR SERVICE section for service and exploded views.

Initial adjustment of low speed mixture screw is 1 $\frac{7}{8}$  turns open on Super Pro 120, 2 turns open on Super Pro 90 and 1 $\frac{3}{4}$  turns open on all other models. Initial adjustment of high speed mixture screw is  $\frac{7}{8}$  turn open on Super Pro 120 and  $\frac{3}{4}$  turn open on all other models. Final adjustment should be made with engine running at operating temperature. Adjust idle speed to just below clutch engagement speed. Adjust low speed mixture screw so engine will accelerate cleanly without hesitation. Adjust high speed mixture screw to obtain maximum speed of 10,300 rpm on Super Pro 120, 9,700 rpm on Super Pro 90 and 10,500 rpm on all other models.

**IGNITION.** Models 070 and 070S manufactured prior to 1984 are

equipped with a breaker-point ignition system. All other models, including Models 070 and 070S manufactured after 1983, are equipped with a breaker-less electronic ignition system.

**Breaker-Point Ignition.** Breaker-point gap should be 0.45-0.50 mm (0.018-0.020 in.). Air gap between ignition coil lamination and flywheel magnets should be 0.45 mm (0.018 in.). Use a suitable thread locking solution on coil attaching screws. Ignition timing is not adjustable, however, breaker-point gap will affect timing. Be sure breaker-point gap is adjusted correctly.

**Electronic Ignition.** Refer to Fig. AP51 for exploded view of electronic ignition system used on Models A70, Super Pro 70 and so equipped Models 070 and 070S. Note that coil (8) is located outside of flywheel (1) while ignition module (13) is located behind flywheel (1). Super Pro 90 and Super Pro 120 models are equipped with electronic ignition system shown in Fig. AP52. Ignition coil and all electronic circuitry are contained in one-piece ignition module (13).

Except for faulty wiring or wiring connections, repair of ignition system

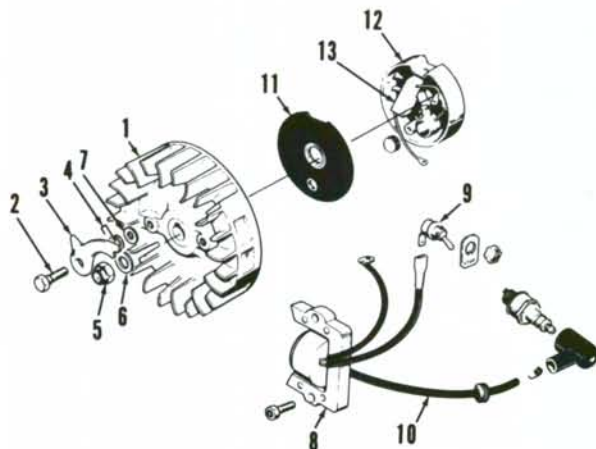
malfunctions is accomplished by component renewal.

On Super Pro 90 and Super Pro 120 models, air gap between ignition module and flywheel magnets should be 0.65 mm (0.026 in.). Air gap between ignition coil and flywheel magnets on all other models should be 0.40 mm (0.016 in.). Use a suitable thread locking solution on module (or coil) attaching screws. Ignition timing is not adjustable on all models.

Starter pawl assemblies (2, 3, 4 and 7—Fig. AP51) can be removed to accommodate a suitable bolt-type puller to remove flywheel on all models. Use a suitable thread locking solution on bolts (2) when reassembling pawls. Tighten flywheel nut to 39.2 N·m (29 ft.-lbs.) on Super Pro 90 and Super Pro 120 models and 28.4 N·m (21 ft.-lbs.) on all other models.

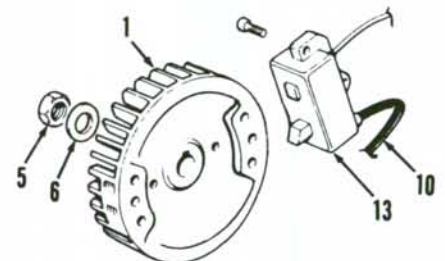
**LUBRICATION.** The engine is lubricated by mixing oil with the fuel. Use a good quality oil designed for use in air-cooled two-stroke engines. Fuel:oil mixture should be a 16:1 ratio. Use a separate container when mixing fuel and oil.

Models 070S and Super Pro 70 are equipped with a manual and automatic chain oil pump. All other models are only equipped with an automatic chain oil



**Fig. AP51—Exploded view of electronic ignition system used on Models A70, Super Pro 70, and Models 070 and 070S manufactured after 1983. Two pawl assemblies (2, 3, 4 and 7) are used.**

1. Flywheel
2. Bolt
3. Pawl
4. Spring
5. Nut
6. Washer
7. Washer
8. Ignition coil
9. Ignition switch
10. High tension lead
11. Cover
12. Module case
13. Module



**Fig. AP52—Exploded view of electronic ignition system used on Super Pro 90 and Super Pro 120 models. Refer to Fig. AP51 for component identification.**

pump. Automatic oil pump output is only adjustable on Super Pro 90 and Super Pro 120 models. Refer to OIL PUMP under REPAIRS for service and exploded views of manual and automatic oil pump assemblies. Use clean automotive oil for saw chain lubrication.

## REPAIRS

**CYLINDER, PISTON, PIN AND RINGS.** Cylinder bore is chrome plated and should be renewed if cracking, scoring or other damage is noted in cylinder bore. Note that cylinder used on Super Pro 90 and Super Pro 120 models is equipped with decompression valve (28—Fig. AP54) to ease starting.

Piston and cylinder are matched during production to get desired piston-to-cylinder clearance of 0.02 mm (0.0008 in.). Original equipment piston and cylinder are marked "A." Factory renewal piston and cylinder assemblies are marked "B." Piston or cylinder marked "C" is 0.127 mm (0.005 in.) oversize. Piston or cylinder marked "D" is 0.127 mm (0.005 in.) undersize. Piston and cylinder markings should match, however, a new piston marked "B" can be installed into a used cylinder marked "A."

**NOTE: Do not install a new piston marked "B" or "C" into a new cylinder marked "A."**

Piston is equipped with two piston rings. Piston should be inspected and renewed if cracking or scoring is noted. Maximum allowable piston ring end gap is 1.0 mm (0.039 in.). Locating pins are present in ring grooves to prevent ring rotation. Be certain ring end gaps are properly positioned around locating pins when installing cylinder. Tighten cylinder screws to 11.8 N·m (9 ft.-lbs.) on all models.

On Models 070, 070S, A70 and Super Pro 70, piston pin (8—Fig. AP53) is a press fit in connecting rod small end. Piston rides in needle bearings (7) installed in each side of piston. Piston pin is retained with two snap rings (9). Use Alpina tool 4180020 or a suitable equivalent press to remove and install piston pin. Be sure piston is properly supported to prevent damage to piston.

On all other models, piston pin (8—Fig. AP54) is a press fit in piston and rides in one needle bearing (7) installed in connecting rod small end. Piston pin is retained with two wire clips (9). Use Alpina tool 4180010 or a suitable equivalent to remove and install

piston pin. Piston may be heated to approximately 110°-120° C (230°-248° F) to ease installation of piston pin.

**NOTE: Use electric oven or hot oil bath to heat piston. Do not use an open flame.**

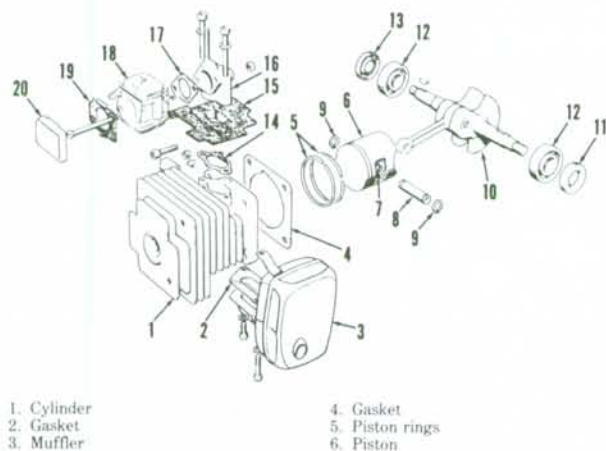
On all models, install piston into cylinder with arrow on piston crown facing toward exhaust port.

**CRANKSHAFT, CONNECTING ROD AND CRANKCASE.** Crankshaft and connecting rod are available as a unit assembly only. Check rotation of connecting rod around crankpin and renew crankshaft assembly if roughness, excessive play or other damage is noted. Check crankshaft runout by supporting crankshaft between two counter points such as a lathe. Make certain no damage is present in centering holes at each end of crankshaft. Renew crankshaft assembly if runout exceeds 0.08 mm (0.0031 in.).

**NOTE: Crankshaft runout can be checked while still assembled in crankcase. Remove clutch and flywheel and mount dial indicators on each side of crankshaft as close to main bearings as possible. Measure runout while rotating crankshaft. Renew crankshaft assembly if runout exceeds 0.07 mm (0.0027 in.) when measured in this manner.**

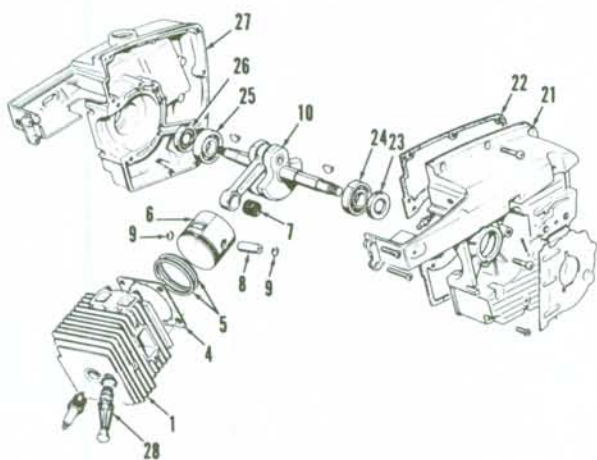
Crankshaft is supported with ball-type main bearings (12—Fig. AP53) or (24 and 25—Fig. AP54) at both ends. Main bearings are a press fit into crankcase halves. Use the proper size drivers to remove and install main bearings. Use Alpina tool 4180900 or a suitable equivalent to install crankshaft assembly into crankcase. Refer to Fig. AP57. Do not use gasket sealer on crankcase gasket. Tighten crankcase screws using a crisscross pattern to 7.8 N·m (69 in.-lbs.) on Super Pro 90 and Super Pro 120 models and 7.3 N·m (69 in.-lbs.) on Super Pro 90 and Super Pro 120 models and 7.3 N·m (65 in.-lbs.) on all other models.

**CLUTCH.** Late Models 070, 070S, A70 and Super Pro 70 are equipped with the clutch assembly shown in Fig. AP58. Late Models Super Pro 90 and Super Pro 120 are equipped with the clutch assembly shown in Fig. AP60. Refer to Fig. AP59 for view of shoes (4), hub (5) and spring (3) used on all early models. Note that hub (5—Figs. AP58, AP59 and AP60) is keyed to crankshaft on all models. Inspect shoes (4—Fig. AP58 or Fig. AP60), drum (7) and needle bearing (9) for excessive wear or damage due to overheating. Use Alpina tool 4180110 or a suitable bolt-type puller to remove



**Fig. AP53—Exploded view of engine assembly, carburetor and related components used on all models except Super Pro 90 and Super Pro 120. Two needle bearings (7) are used. Refer to text.**

7. Needle bearing
8. Piston pin
9. Snap ring
10. Crankshaft & connecting rod assy.
11. Seal
12. Main bearing
13. Seal
14. Gasket
15. Gasket
16. Intake manifold
17. Gasket
18. Carburetor
19. Plate
20. Screen



**Fig. AP54—Exploded view of engine assembly used on Super Pro 90 and Super Pro 120 models.**

1. Cylinder
4. Gasket
5. Piston rings
6. Piston
7. Needle bearing
8. Piston pin
9. Wire clip
10. Crankshaft & connecting rod assy.
21. Right crankcase half
22. Gasket
23. Seal
24. Main bearing
25. Main bearing
26. Seal
27. Left crankcase half
28. Decompression valve

clutch. Nut (12) has right-hand threads. Clutch shoes (4) are available only as a complete set. Tighten nut (12) to 45.1 N·m (33 ft.-lbs.) on Super Pro 90 and Super Pro 120 models and 35.3 N·m (26 ft.-lbs.) on all other models.

**OIL PUMP.** Refer to Fig. AP61 for exploded view of manual chain oil pump used on Models 070S and Super Pro 70.

Disassembly for repair or component renewal is evident after inspection of unit and referral to Fig. AP61. Hoses (4) must be renewed if pump is disassembled. Be sure clamps (3) are tight and properly installed to prevent leakage.

Refer to Fig. AP62 for exploded view of automatic oil pump used on Models 070, 070S, A70 and Super Pro 70. Oil is pumped by piston (5) which is rotated by

drive plate (10). Drive plate is cycled up and down by plunger (15) which rides on cam of engine crankshaft. Piston (5) rotates one notch with each down stroke of drive plate (10). Spring (12) forces piston brake (13) against piston (5), preventing piston (5) from backing up during drive plate (10) return stroke.

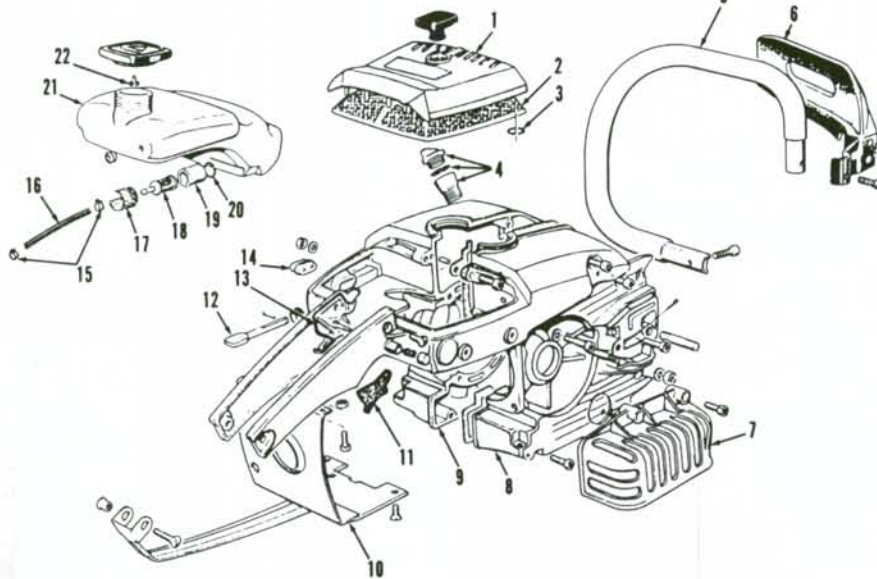


Fig. AP55—Exploded view of crankcase, front handle assembly, fuel tank and related components used on Models 070, 070S and A70.

- |                       |                         |                  |                 |
|-----------------------|-------------------------|------------------|-----------------|
| 1. Cover              | 7. Muffler cover        | 12. Choke lever  | 17. Screen      |
| 2. Air filter         | 8. Right crankcase half | 13. Throttle rod | 18. Fuel pickup |
| 3. Snap ring          | 9. Left crankcase half  | 14. Grommet      | 19. Filter      |
| 4. Oil tank cap assy. | 10. Cylinder cover      | 15. Clamp        | 20. "O" ring    |
| 5. Front handle       | 11. Trigger             | 16. Fuel hose    | 21. Fuel tank   |
| 6. Hand guard         |                         |                  | 22. Vent valve  |

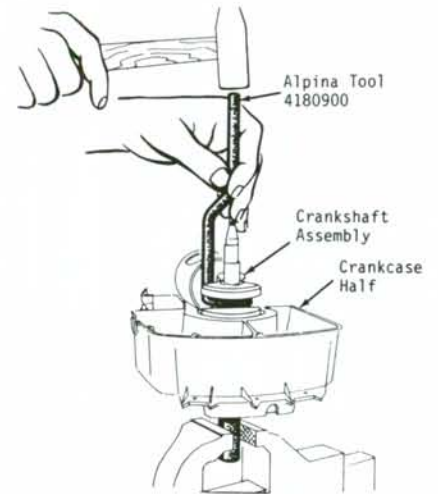


Fig. AP57—View showing installation procedure of crankshaft and connecting rod assembly into crankcase half using Alpina tool 4180900. Main bearing is pressed into crankcase half prior to installation of crankshaft assembly.

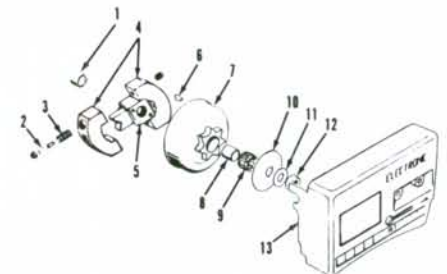


Fig. AP58—Exploded view of new design clutch used on late 070, 070S, A70 and Super Pro 70 models.

- |                 |                   |
|-----------------|-------------------|
| 1. Bushing      | 8. Bushing        |
| 2. Screw        | 9. Needle bearing |
| 3. Spring       | 10. Washer        |
| 4. Shoes        | 11. Washer        |
| 5. Hub          | 12. Nut           |
| 6. Woodruff key | 13. Cover         |
| 7. Drum         |                   |

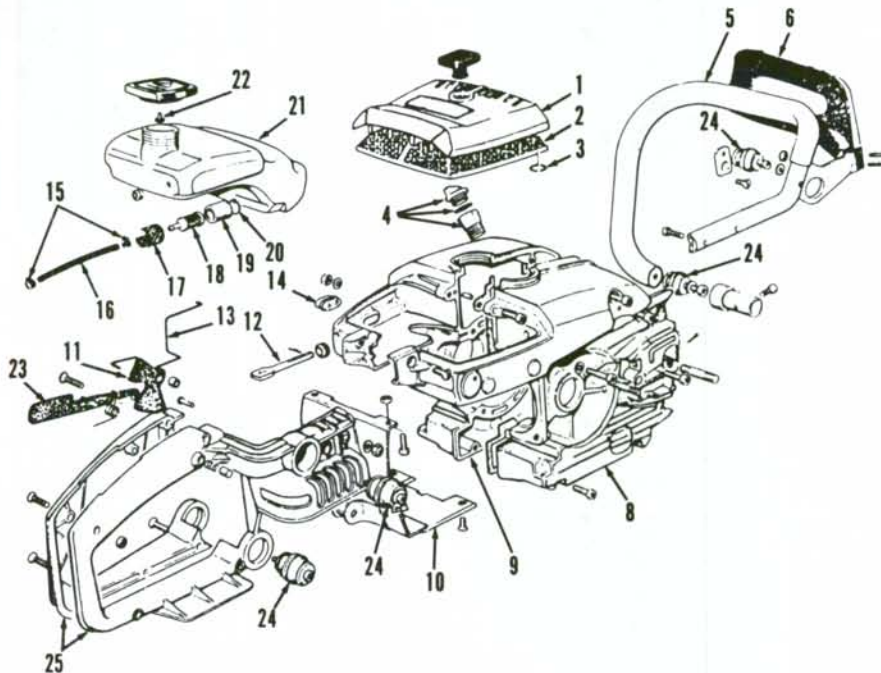


Fig. AP56—Exploded view of crankcase, front handle assembly, rear grip assembly, fuel tank and related components used on Model Super Pro 70. Refer to legend in Fig. AP55 for component identification except, safety lever (23), vibration isolator (24) and rear grip assembly (25). Super Pro 90 and Super Pro 120 models are similar.

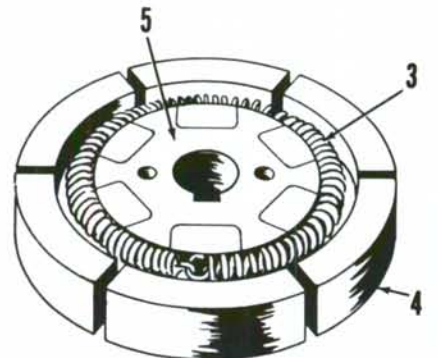


Fig. AP59—View showing clutch shoes (4), hub (5) and spring (3) used on all early models.

Plunger (15) is 31 mm (1.22 in.) long when new. Renew plunger if worn shorter than 30.3 mm (1.193 in.). Renew drive plate (10) if wear at piston contact area exceeds 1.5 mm (0.059 in.) when compared with a new drive plate. Reservoir (R) should be filled with high temperature lithium base grease and capped with felt plug (20). Pump output is not adjustable.

Refer to Fig. AP63 for exploded view of adjustable automatic oil pump used on Super Pro 90 and Super Pro 120 models. Oil is pumped by piston (5) which is rotated by worm gear (23) mounted on engine crankshaft. Pump output is regulated by turning adjusting lever (28). Renew piston and worm gear if excessive wear or damage is noted. Closely in-

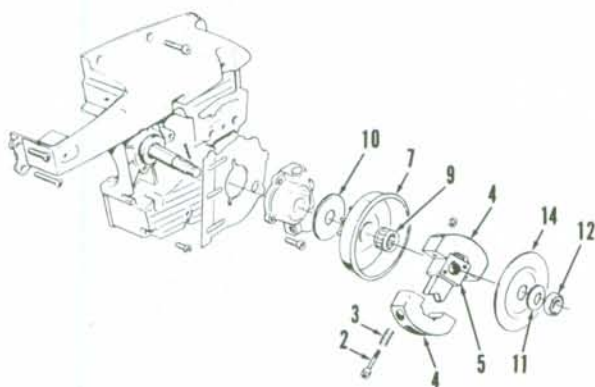
spect seal (30) and seal surface on worm gear (23). Note that slight wear on seal or worm gear may allow pump to draw air causing pump malfunction. It is recommended to renew seal (30) any time pump is disassembled.

**REWIND STARTER.** To disassemble starter, remove rope handle (10—Fig. AP64) and carefully allow rope to wind into housing, relieving tension on rewind spring (5). Remove screw (9) and rope pulley (6) using caution not to dislodge rewind spring (5). If rewind spring (5) must be removed, use caution not to allow spring to uncoil uncontrolled.

Install rewind spring (5) into housing (2) in a clockwise direction starting with

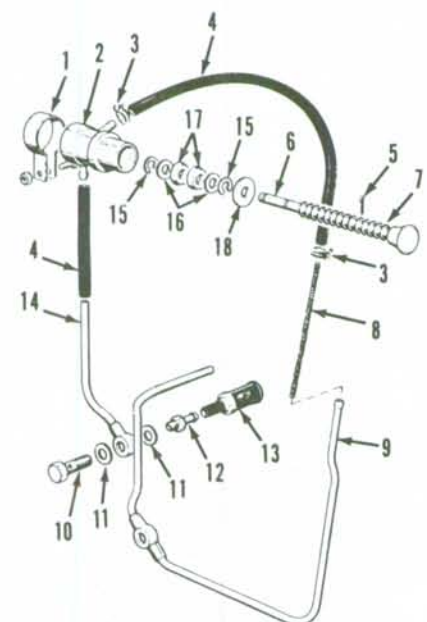
outer coil. Install rope onto rope pulley (6) in a clockwise direction as viewed from flywheel side of pulley. Rotate pulley (6) clockwise to apply tension on rewind spring. Apply only enough tension on rewind spring (5) to pull rope handle snug against housing. Rope pulley should be able to rotate an additional 1/2 turn with rope completely extended.

Refer to Fig. AP51 for exploded view of starter pawl assemblies. Use a suitable thread locking solution on pawl bolts (2).



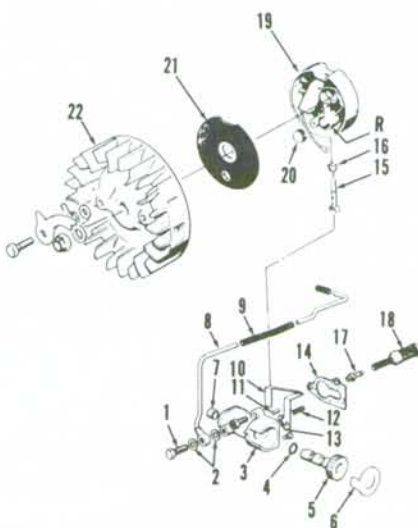
**Fig. AP60—Exploded view of clutch used on later Super Pro 90 and Super Pro 120 models.**

2. Screw
3. Spring
4. Shoes
5. Hub
7. Drum
9. Needle bearing
10. Washer
11. Washer
12. Nut
14. Washer



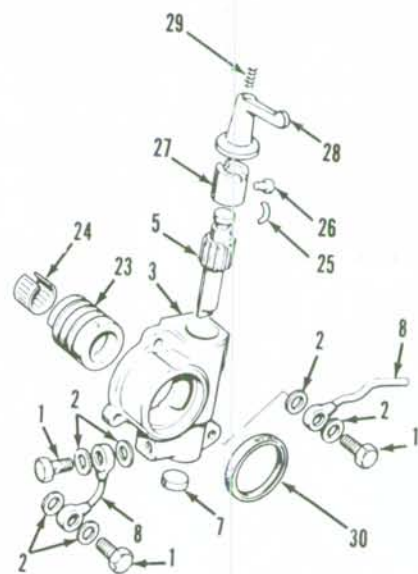
**Fig. AP61—Exploded view of the manual oil pump used on Models 070S and Super Pro 70.**

1. Clamp
2. Pump body
3. Clamp
4. Hose
5. Cotter pin
6. Piston
7. Spring
8. Spring
9. Tube
10. Bolt
11. Washer
12. Fitting
13. Oil pickup
14. Tube
15. "E" ring
16. Washers
17. Seals
18. Washer



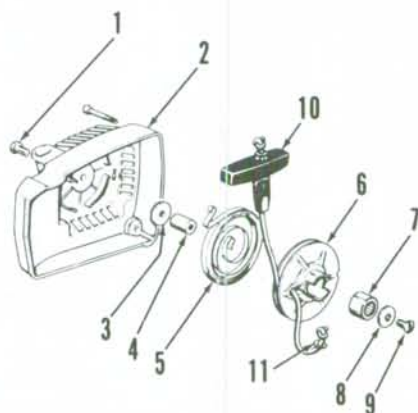
**Fig. AP62—Exploded view of automatic oil pump used on Models 070, 070S, A70 and Super Pro 70.**

1. Banjo bolt
2. Washers
3. Pump body
4. "O" ring
5. Piston
6. Cover
7. Plug
8. Hose
9. Hose
10. Drive plate
11. Pin
12. Spring
13. Piston brake
14. Gasket
15. Plunger
16. Seal
17. Fitting
18. Oil pickup
19. Module case
20. Felt plug
21. Cover
22. Flywheel
- R. Reservoir



**Fig. AP63—Exploded view of adjustable automatic oil pump used on Super Pro 90 and Super Pro 120 models.**

1. Banjo bolt
2. Washers
3. Pump body
5. Piston
7. Plug
8. Tube
23. Worm gear
24. Collar
25. Pin
26. Pin
27. Bushing
28. Adjusting lever
29. Spring
30. Seal



**Fig. AP64—Exploded view of rewind starter used on Models 070, 070S, A70 and Super Pro 70. Super Pro 90 and Super Pro 120 models are similar except, washer (11) is not used and shaft (4) is part of housing (2).**

1. Bolt
2. Housing
3. Washer
4. Shaft
5. Rewind spring
6. Rope pulley
7. Needle bearing
8. Washer
9. Screw
10. Rope handle
11. Washer

Copyright of *Chain Saw Service Manual (Covers models through 1998)* is the property of Penton Media, Inc. ("Clymer") and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.