SUPER PRO 80 GENERAL SERVICE INFORMATION

The information contained in this publication is intended as a supplement to the Mac 10 Series Shop Manual, P/N 63084, in the servicing and repair of the Super Pro 80 Chain Saw.

As the majority of servicing procedures for the Super Pro 80 Chain Saw are similar to the CP 70 left hand start model engine, this General Service Information bulletin and the Mac 10 Series Shop Manual are all that are required to service and maintain the Super Pro 80 Chain Saw.

Specifications, tool requirements, and torque values are included along with additional and new servicing procedures for this model.

Because of the increased performance of the Super Pro 80 Chain Saw special care must be given to the new servicing procedures and screw torque figures as described in this General Service Information bulletin.

SUPER PRO 80 DESIGN FEATURES

The Super Pro 80 design improvements are listed below:

1. Increased displacement, 5 cubic inches (80 c.c.), Total power increase of 16% over 4.3 cubic inch 10 Series type units.
2. New, heavy duty, full contact three shoe clutch.
3. New, low maintenance cushioned power system with low stress shock mounts. New design lower shock mount.
4. New, taper faced cast iron piston rings for faster break in.
5. Two needles (total of 22) added to crank pin bearings for increased bearing surface.
6. New connecting rod which is slotted for better lubrication.
7. Larger, super finished crank pin journal to accommodate increased power and for long service life.
8. New, poppet-type, compression release valve which is part of the SP-80, "Safe-T-Start" system with adjustable throttle latch.
9. Smooth, flat bottomed, anti-snag skid.

10. Side slotted air filter cover extends filter life.

11. New muffler secured with 4 mounting screws.

12. "Sound Silencer" (reed) muffler and fine mesh screen spark arrester Available as accessories, which meet all known regulations and standards.

13. Pre-heater kit available as an accessory for cold weather operation.

14. Left-hand starter cast in bronze bushing for maximum reliability and less maintenance.

GENERAL SERVICE INFORMATION

SPECIFICATIONS

Weight	15 lbs. 2 oz. (Dry and less cutting attachment)
Displacement	5.0l Cu. In. (80 C.C.)
Bore and Stroke	2.063 x 1.500
Compression Ratio	7:1
Bearings	Main: Ball bearing - flywheel end Needle roller - clutch end Connecting Rod: Needle roller (22) crankshaft end
Piston Rings	Top: 1 cast iron, tapered face Bottom: 1 cast iron, square face (Initial production run only. Both rings will be tapered on future production engines)
Carburetor SDC38	Diaphragm type with external adjustments, Initial carburetor adjustments low and high speed fuel needles, one turn open.
Fuel Type	Leaded regular grade
Fuel oil Mixture	40:1 with McCulloch Oil
Fuel Tank Capacity	730 cc/ .76 Qt. (Approx. 24 oz.)
Chain Oiler Capacity	281 cc/ .29 Qt. (Approx. 9 oz.)

Cylinder	3rd Port, piston timed, chrome bore
Clutch	Automatic centrifugal, 3 shoe
Clutch Engaging Speed	2600/3000 RPM
Ignition	Waterproof magneto
Lamination Air Cap	.010 to .015
Timing	26° B.T.D.C.
Breaker Point Gap	.018"
Coil Location	Outside flywheel, fan cooled
Spark Plug	AC CS 45T, P/N 63097 AC CS 42T, P/N 63432, standard AC CS 41T, P/N 65778 (.025 gap)

TOOLS FOR SERVICING THE SP 80

1. End Wrenches
   - A. 1/4"
   - B. 11/32"
   - C, 7/16"
   - D. 1/2"
   - E. 5/8"
2. Socket Wrenches
   - A. 1/4"
   - B. 5/16"
   - C. 7/16"
   - D. 9/16"
   - E. 5/8"

SPECIAL TOOLS

1. Merc-O-Tronic Tester
2. 10 Series timing tool, P/N 65712
3. Piston tools, P/N 84223 (same as 10 Series Piston tool)
4. Pressure test tool, P/N 62849 (same as 10 Series)
   - a. Adaptor, P/N 69191 (same as 10 Series)
   - b. Connector, P/N 62863 (same as 10 Series)
   - c. Exhaust Adaptor, P/N to be (announced (Different)
5. 7/16" x 2 1/2" deep broached socket for removal of poppet valve.

NOTE: Sears Craftsman is a source that carries this 3/8" drive, 12 point 7/16" x 2 1/2" deep broached socket.

TOOLS FOR SERVICING THE SP 80

3. Allen Wrenches
   A. 9/64"
   B. 5/32"
4. Screwdrivers
   A. Medium diameter
   B. Small diameter
5. Drift Punches
   A. .085"
   B. .180"
6. .012 Shim Stock

TORQUE SPECIFICATIONS

DESCRIPTION	SCREW SIZE	TORQUE LBS. IN.
Conn Rod (Oiled threads, SAE 20-30	8-36	65-70
Crankcase to Cylinder	12-24	55-60
Crankcase to Cylinder	8-32	35-40
Breaker Box to Cylinder	8-32	30-35
Breaker Spring Contact	6-32	10
Condenser	8-32	25-30
Clutch Nut	3/8-24 Nut	400-420
Flywheel	3/8-24 Nut	265-325
Coil & Lamination Mounting	10-24	55-60
Shroud Upper to Cylinder	10-24	55-60
Shroud Lower	10-24	55-60
Front Shock Mount to Fuel Tank	1/4-20	110-120
Rear Shock Mount to Fuel Tank	10-24	55-60
Front Bumper to Oil Tank	1/4 Nut	90-100

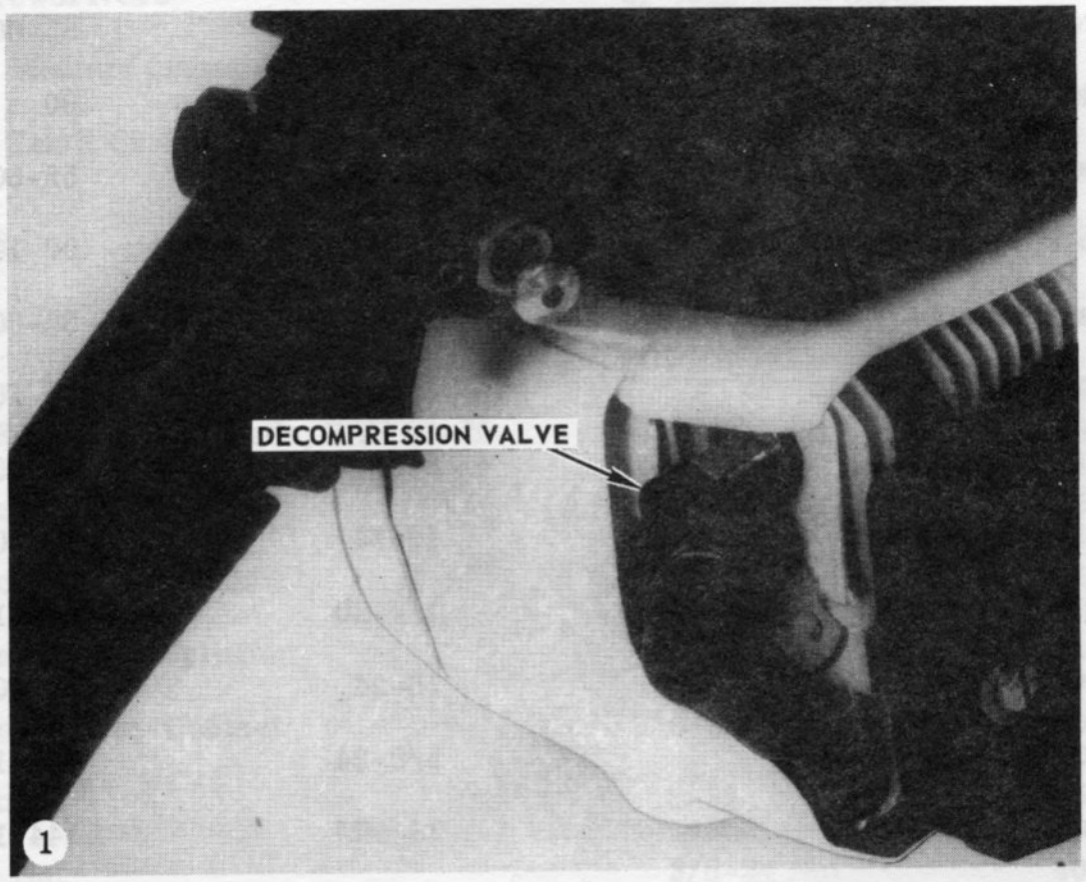
TORQUE SPECIFICATIONS

DESCRIPTION	SCREW SIZE	TORQUE LBS. IN.
Rear Mount to Upper Shroud	12-24	90-100
Carburetor to Fuel Tank	10-24	55-60
Muffler Mounting Screws	10-24	55-60
Pivot Screw Manual Oiler	10-24	55-60
Bottom Skid to Handle	1/4-20	90
Bottom Bumpers to Skid	10-24	55-60
Front Shock Mount Skid to Powerhead	1/4-20	90-100
Front Frame Clamp	10-24	55-60
Fan Housing to Powerhead	8-32	35-40
Starter Cover to Starter	8-32	40-45
Fan Housing to Coil Stud	10-24	55-60
Top Frame Mounting Screw	1/4-20	110-120
Cover to Oil Tank	10-24	35-40
Poppet Compression Release	3/8-24	120-130
Spark Plug	14 MM	144-180
Clutch Shoe Plate Screws	8-32	55-60

Starting Procedure

The SP 80 is equipped with a poppet type decompression valve.

See Figure 1.

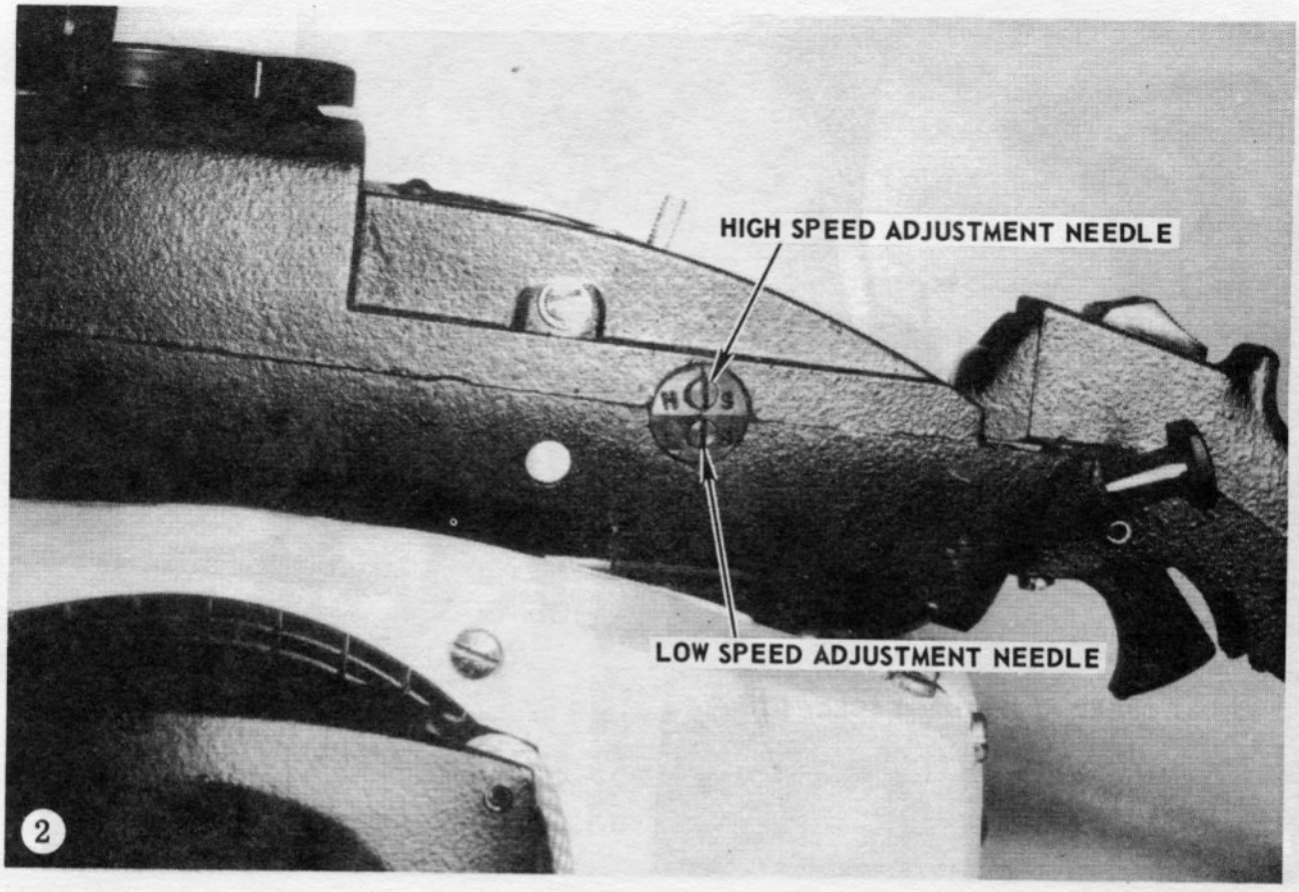


The starting procedure for the SP 80 is the same as previous 10 series models with DSP valves except for the poppet compression release valve. When starting, push the valve in to relieve compression. If the engine fires, but does not continue to run, the valve must be pushed in again before attempting another start. This procedure must be followed anytime the engine does not continue to run.

NOTE: See section (page 12) for decompression valve servicing.

Carburetor Adjustments and Service

Figure 2 shows the external carburetor adjustment screws.



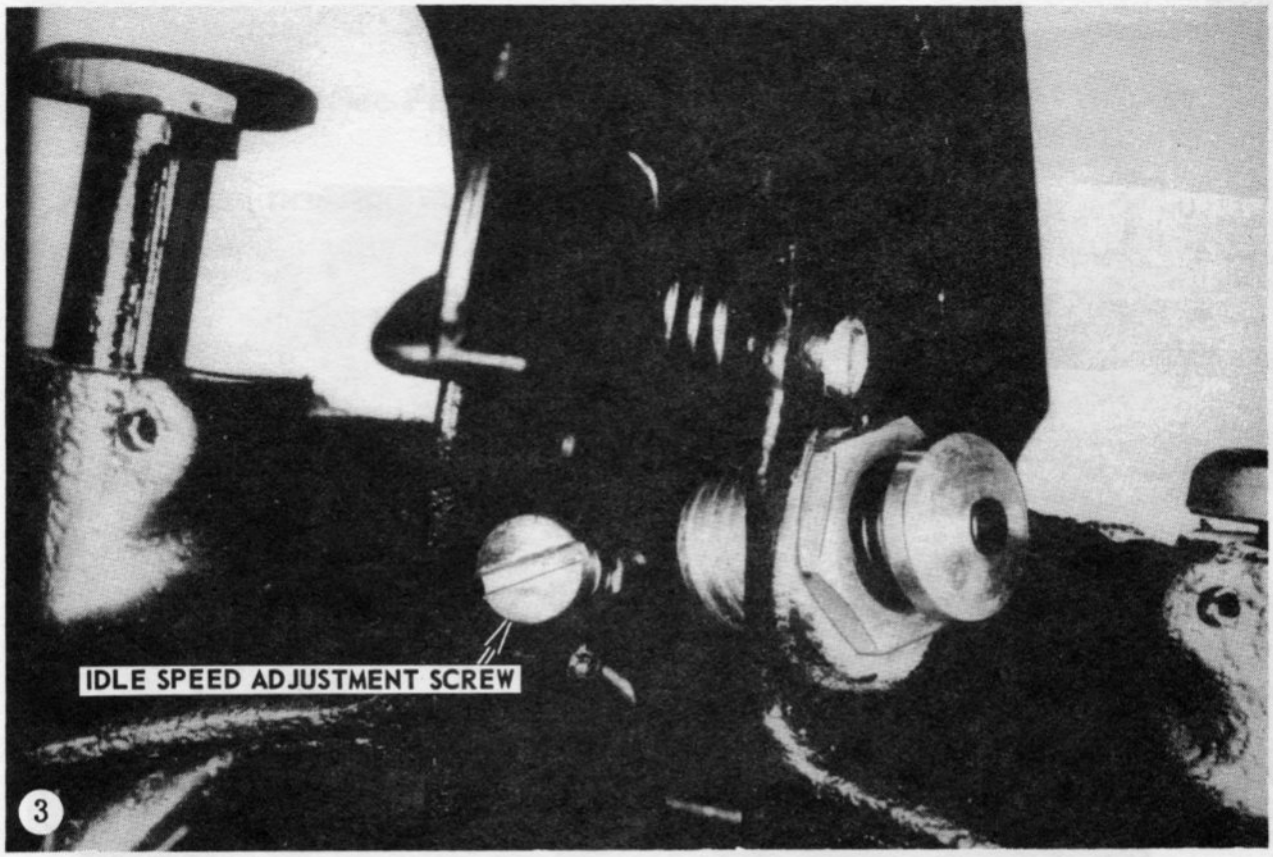
Adjustments

The basic settings for both the low and high speed fuel needles are 1 turn open from the gently closed position. The idle speed screw should be adjusted so the inside tapered end contacts the throttle lever and then turn in slightly to just crack the throttle open.

The final carburetor adjustment procedure is the same as for the basic 10 series units with SDC carburetors. (Refer to Mac 10 Shop Manual or SP 80 Owner's Manual).

The throttle latch (See Figure 3) provides a means of advancing the throttle, while starting, without manually holding the throttle open. The latch mechanism releases automatically when the throttle is opened by squeezing the trigger. The amount of throttle advance is adjusted by turning the adjustment screw in to increase starting speed and out to decrease starting speed. Always make this adjustment after the regular idle and high speed adjustments have been made.

Always adjust fast idle to a speed below clutch engagement so that chain does not move. At normal idling speeds the throttle latch adjustment screw must not be touching the throttle latch.



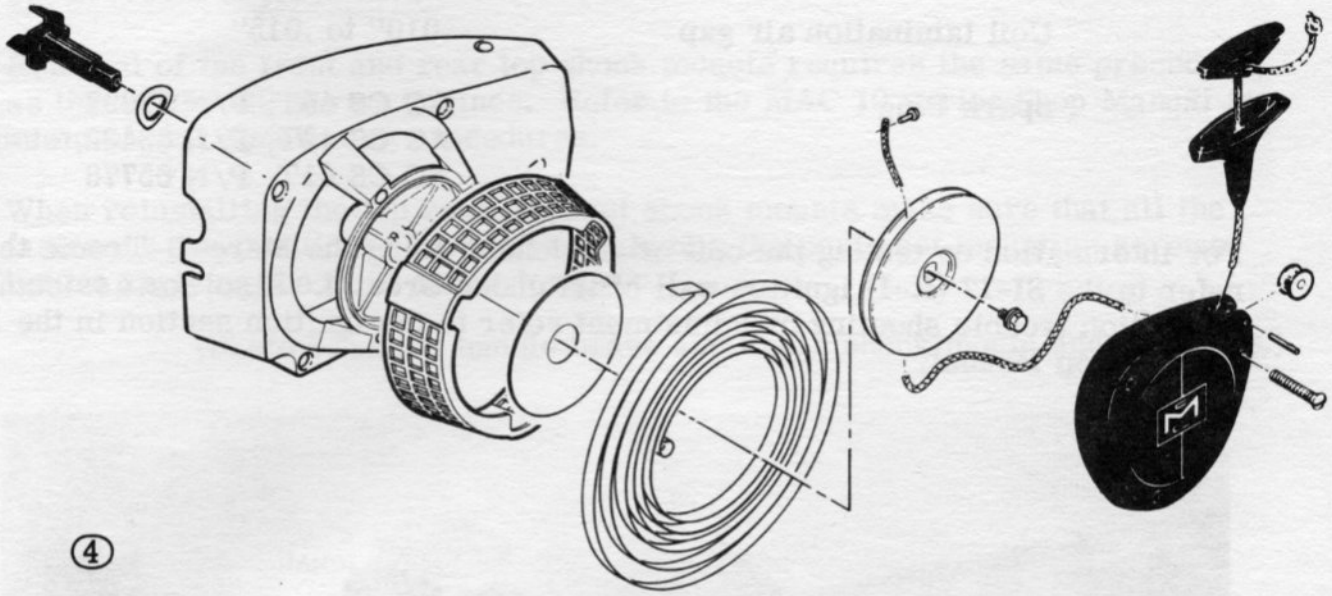
Service

The basic service procedure for the SP 80 carburetor is the same as for other 10 series SDC carburetors.

The inlet lever setting is measured from the two small bosses on the floor of the fuel chamber. The lever should be from .010" below to .015" above the bosses.

Starter Assembly

Servicing of the starter assembly can be accomplished by following the procedures as described in the MAC 10 Series Shop Manual.



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See Figure 4. (SP 80 starter assy) Note that the SP 80 does not have the two nylon bushings in the starter base. In place of these the starter base has a cast in bronze bushing. A new "wavey" washer is installed at the bottom of the starter ratchet.

Starter assemblies which have the three piece sawdust guard cannot accept the one-piece sawdust guard as a replacement. Conversely, starter assemblies with the one-piece sawdust guard cannot have the three piece guard assembly installed.

On the first production SP 80 engines the three piece sawdust guard assembly was installed. On future production engines the one-piece sawdust guard will be used.

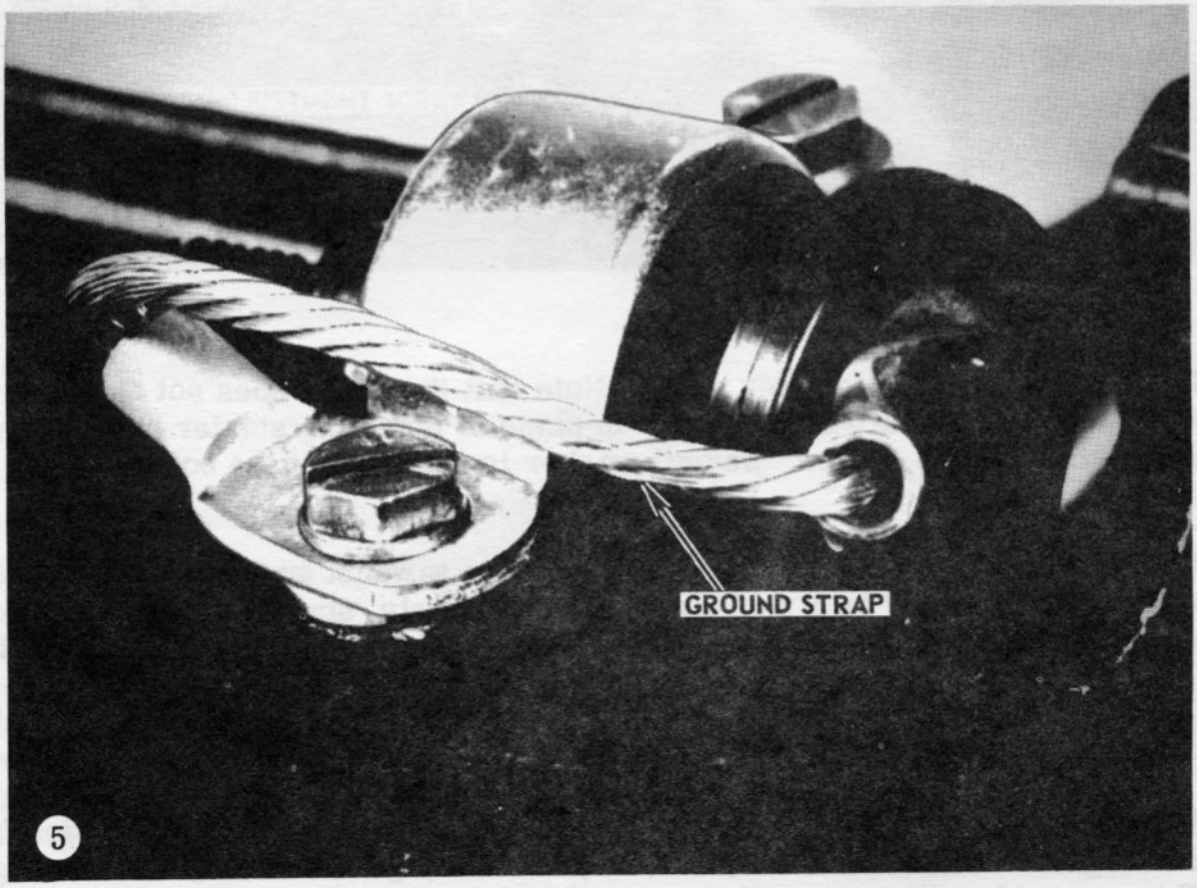
When ordering a starter assembly which has the three-piece guard order fan Housing P/N 85334. Order P/N 86051, fan housing for the single sawdust guard. This assembly will come with the single sawdust guard included.

Ignition System

The ignition specifications for the SP 80 are the same as those for previous 10 Series units.

Timing	26^{O} B.T.D.C.
Breaker point gap	.018"
Coil lamination air gap	.010" to .015"
Spark Plug	AC CS 45T, P/N 63097 AC CS 42T, P/N 63432, standard AC CS 41T, P/N 65778

For information on testing the coil or condenser using the Merc-O-Tronic tester, refer to the SI-17 (R-1) ignition wall chart under Group I. Also, for assistance in ignition trouble shooting or adjustment refer to the Ignition section in the 10 Series Shop Manual.



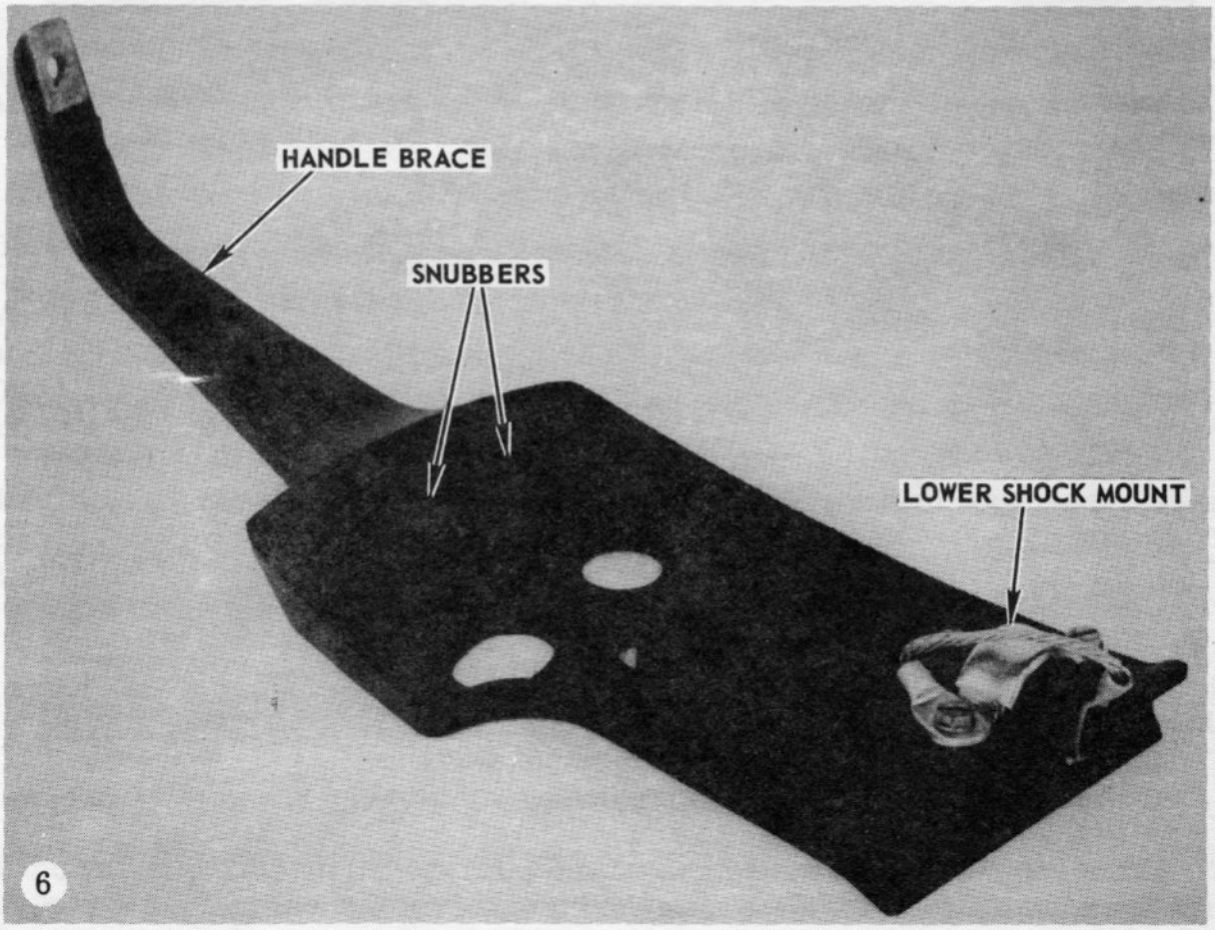
The ground strap wire Figure 5 is located on the retaining stud of the bottom shock mount assembly. If this ground wire breaks, the stop switch will not ground out the primary circuit and stop the motor. Since the ignition system is isolated from the switch by the rubber shock mounts, the ground wire is essential for proper switch performance.

Shock Mount Replacement

Removal of the front and rear top shock mounts requires the same procedure as that of the CP series engines. Refer to the MAC 10 series Shop Manual for removal and installation procedures.

When reinstalling the top rear or front shock mounts make sure that all the fasteners are positioned correctly, including the port boot mounting screws before applying the final screw torque.

(Photo 6, shows handle brace and lower shock mount and snubbers.)



In order to remove the lower mount , first remove the bolt which runs through the mount and attaches to the boss on the lower portion of the crankcase. When tightening the screw be careful not to twist the rubber shock mount; Otherwise early mount failure may occur.

The frame grip and skid plate assembly may then be taken off by removing the screw at the back of the trigger handle and the bolt which holds the frame handle grip to the side of the fuel tank.

Once this frame grip and skid plate are removed there is easy access to the two screws which hold the shock mount in place. By removing these two screws the old shock mount may be removed and a replacement installed.

At this time the two snubbers at the rear of the skid plate may be inspected for wear or damage.

Port Boot Removal (Photo 7, shows sequence of assy for Port Boot and Shroud)

To gain access to the port boot and upper cylinder shroud the fan housing, lower handle brace and frame assembly must be removed. Remove the fuel tank assembly by removing the port boot to fuel tank screw, both front and rear shock mount to fuel tank screws, stop switch wire, and carburetor fuel pump pulse tube.

Since the port boot is subject to damage, such as puncturing, care should be taken not to damage it during removal and installation.

After the fuel tank assembly has been removed, the mounting screws that hold the top cylinder shroud to the cylinder, and the manual oiler housing can be removed in order to remove the shroud and port boot.

When installing the SP 80 port boot insulator block (black in color) into the port boot, a light coat of 30 weight oil should be applied to aid in the installation. Install the insulator block into the port boot after the port boot has been installed into the shroud and before the boot and insulator are assembled into their final position in the shroud. (See Figure 7 for proper installation sequence)

When installing the cylinder shroud, with the port boot, insulator block and gasket assembled onto the cylinder, make sure that all the port boot assembly components are in position and that the port boot is not folded under.

Decompression Valve Servicing

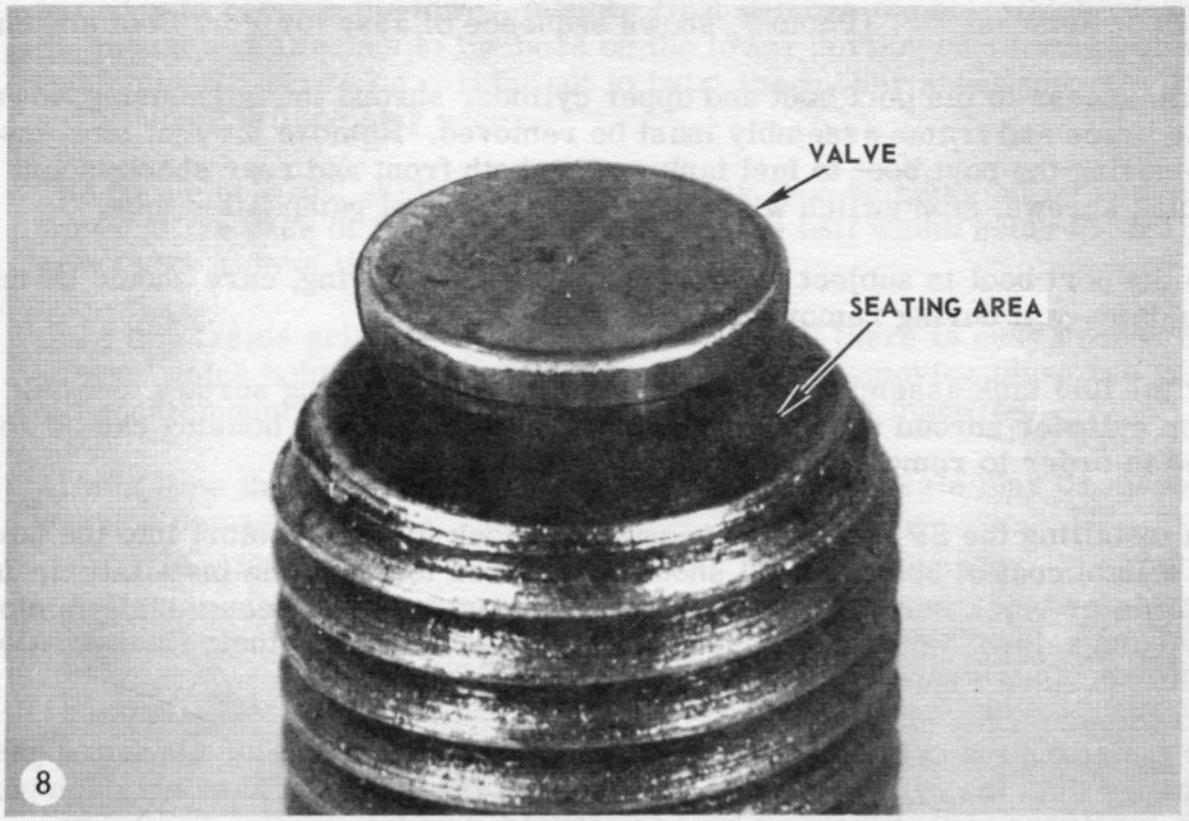
For removal of the decompression valve, use a 7/16" x 2 1/2" deep socket. This socket is available through Sears Roebuck & Co., under catalog number 9A 43311. Once removed, the valve assembly can be washed in a cleaning solvent to remove carbon accumulation at the valve seating area (Figure 8).

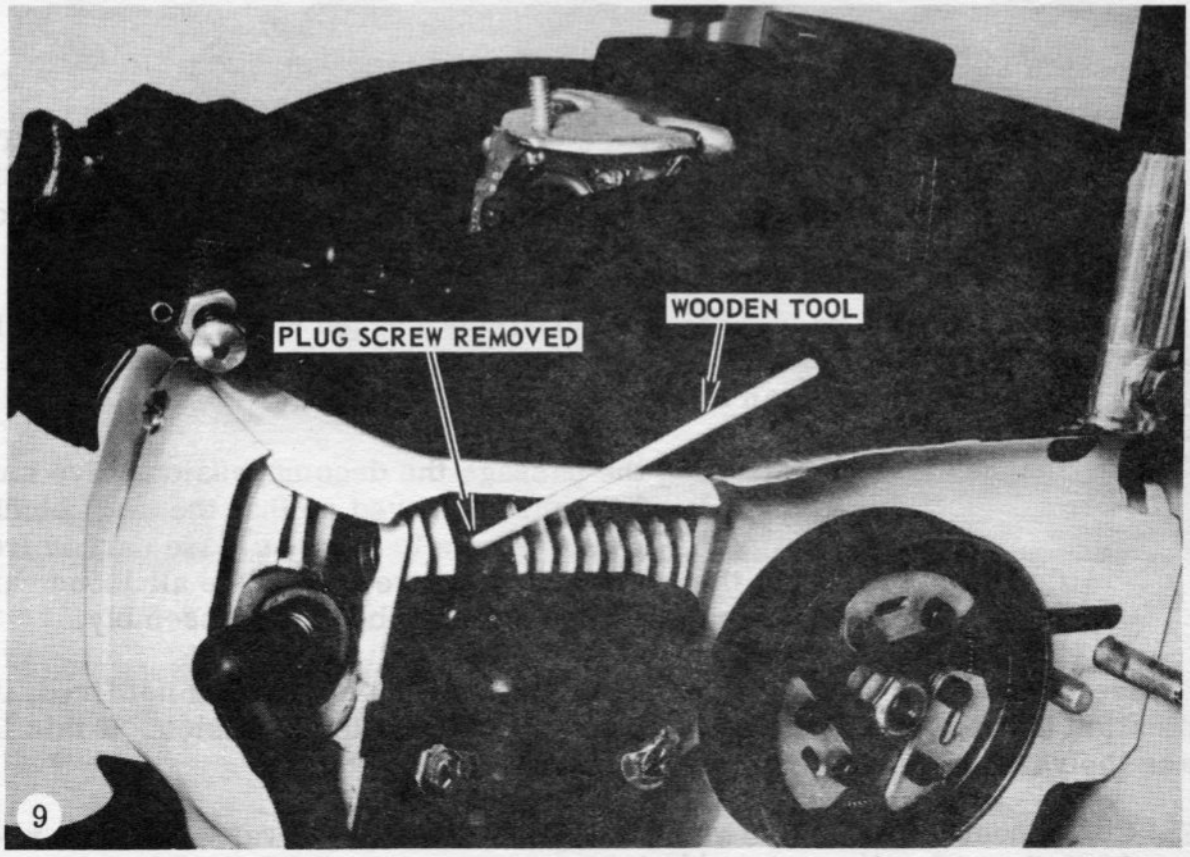
Should the decompression passage become partially plugged with carbon it can be cleaned by removing the passage plug Screw, P/N 110681 (Figure 9).
A suitable small wooden tool can be used to clean the passage.

CAUTION: When cleaning the passage the decompression valve must be removed and the piston moved so that the skirt blocks the inner end of the passage to prevent loose carbon from entering the cylinder. Be sure to remove all loose carbon from the passage and cylinder before reassembly.

If the valve closes during cranking of the engine and the engine has not fired, it is an indication that the two springs on the valve have lost their tension. If this is the case the valve assembly must be replaced.

NOTE: Components of the valve are not replaceable and the valve must be replaced as an entire assembly.


VALVE
SEATING AREA
8


PLUG SCREW REMOVED
WOODEN TOOL
9

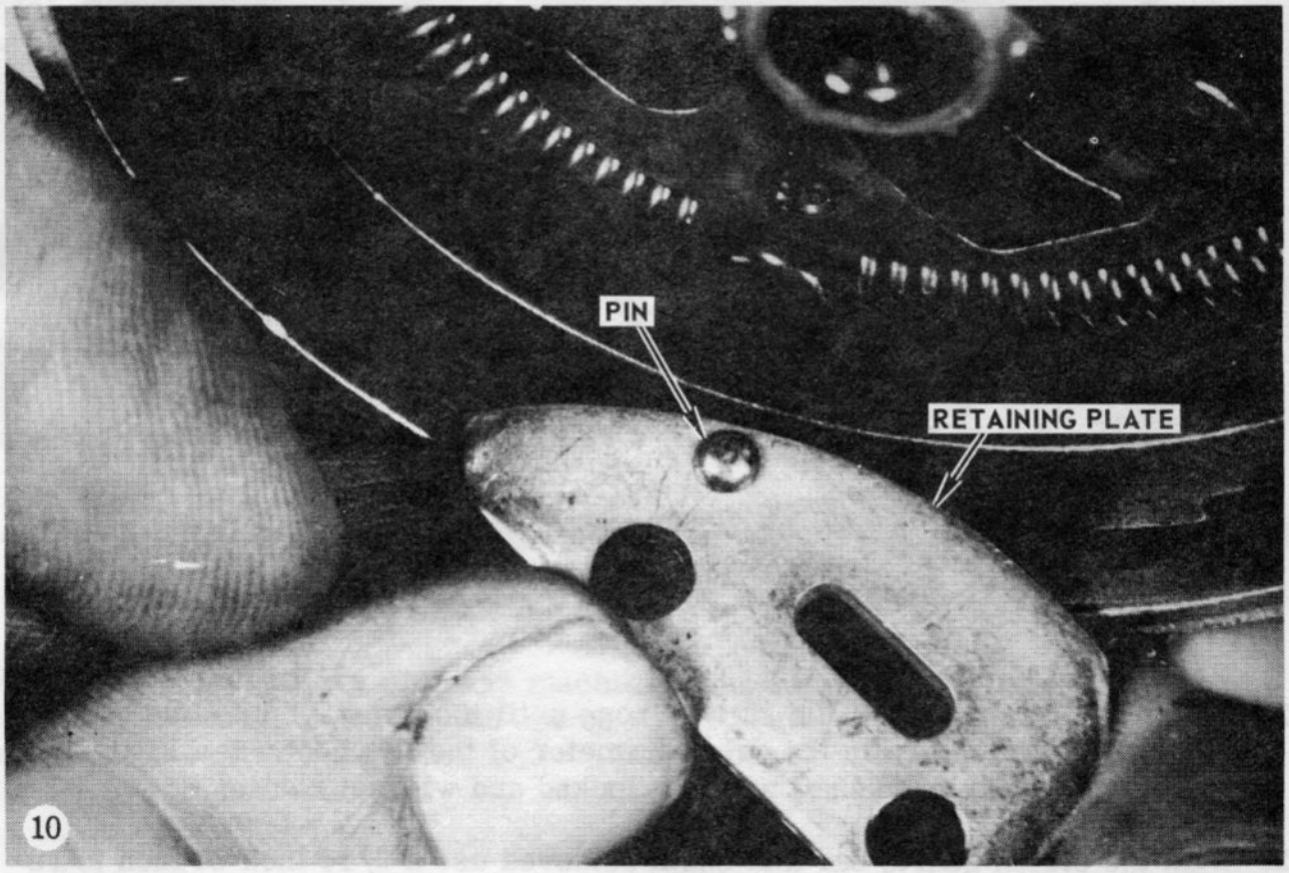
CLUTCH ASSEMBLY MAINTENANCE

Clutch Spring

The clutch spring can be replaced without removing the clutch assembly from the crankshaft.

Two of the three clutch spring retaining plates must be removed. One of the two plates removed must be the plate with the pin sticking out of it. (See Figure 10) The head of this pin fits between the connected spring ends and prevents the spring from rotating during engine operation.

When installing a new spring be sure that the connected spring ends rest directly beneath the pin head on the clutch retaining plate when the plate is installed.



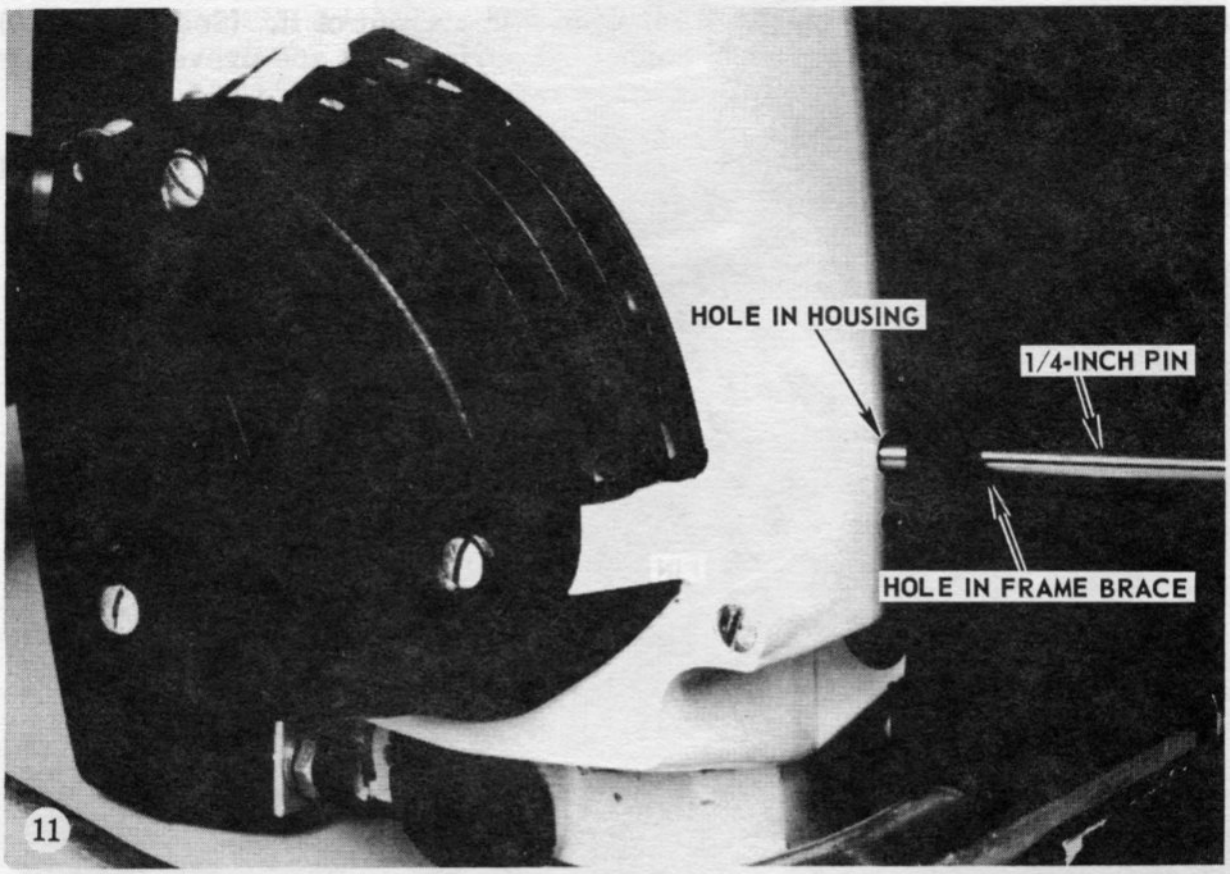
Clutch Assembly Installation and Removal

As a Woodruff key is not used between the clutch and crankshaft on the Super Pro 80 chain saw, proper installation of the clutch assembly P/N 85364 on to the crankshaft requires that the clutch retaining nut P/N 110594 be tightened to a torque value of 400 to 420 inch pounds or 35 foot pounds.

If the clutch retaining nut is not tightened to this torque value the clutch may rotate and cause possible damage to the crankshaft.

Procedure for removing and/ or installing the clutch assembly:

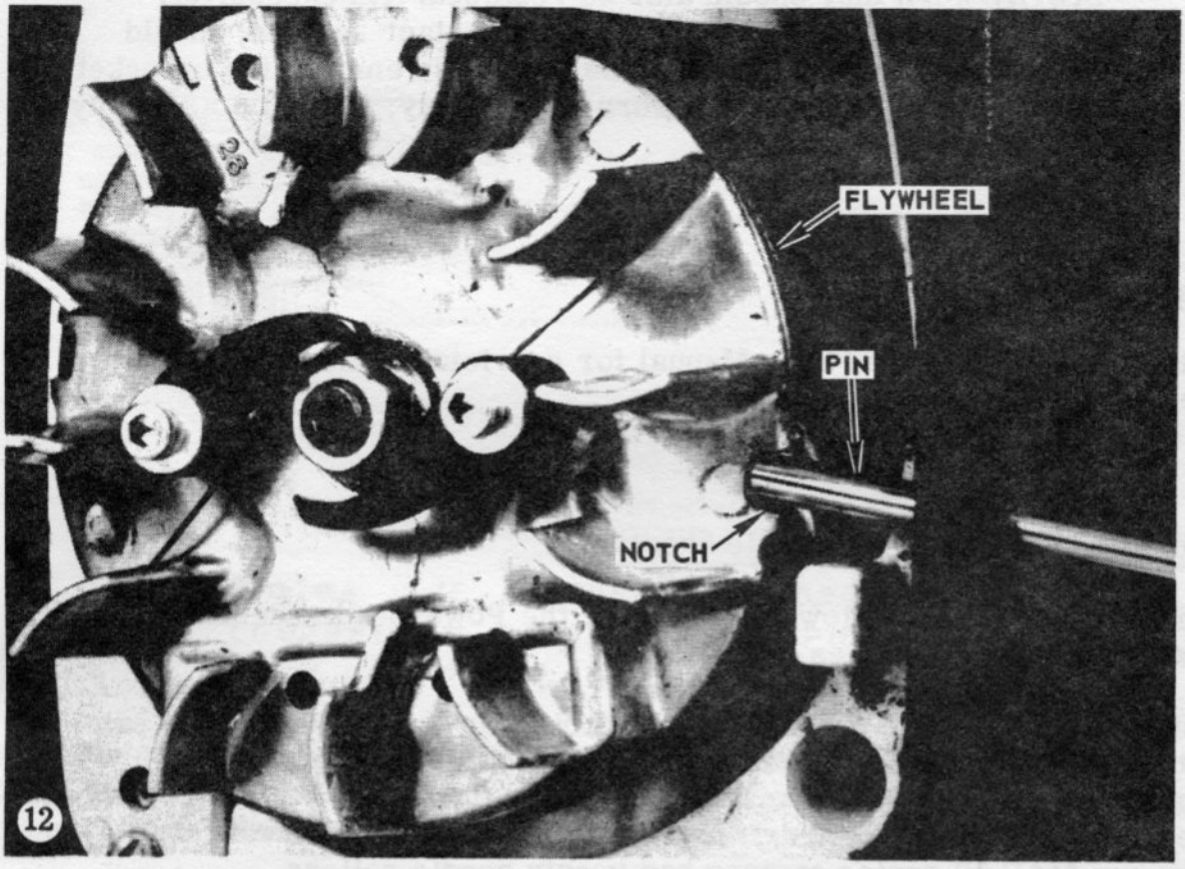
1. Install 1/4 inch diameter, 2 1/2 inch long pin, non threaded, into the hole in the bottom of the frame brace and fan housing. (Figure 11)



2. Rotate the flywheel with the starter rope until the pin slips into one of the two notches which are in the outer diameter of the flywheel. See Figure 12. The flywheel and crankshaft are now locked and will not rotate.

3. With the clutch guard, bar and chain removed use a 9/16 inch wrench to remove or tighten the clutch retaining nut.

4. Hold the locking pin in position while turning the clutch retaining nut. This will prevent the pin from disengaging from the flywheel notch.



CAUTION: Do not use an impact wrench to remove or install the clutch retaining nut as damage to the pin locking area of the frame, fan housing and flywheel can occur.

Although a Woodruff key slot was machined into the first production crankshafts, the clutch is not designed for the use of a key. Future crankshafts will not have this slot.

Clutch Shoes and Rotor

Clutch shoe replacement requires that the clutch assembly be removed from the engine.

1. Remove the clutch retaining plate which has the pin installed.

2. Disconnect the spring ends and feed the spring ends out from under the other two plates. All three plates may be removed if you wish.

3. Clutch shoe or rotor replacement is now possible.

CAUTION: If one clutch shoe breaks and the remaining two shoes are heavily worn they should also be replaced. An excessively worn clutch drum, at the clutch shoe contact surface, should also be replaced. Whenever the clutch is removed the sprocket should be inspected and if worn excessively, the drum assembly should be replaced.

Automatic & Manual Oiler

Refer to the MAC 10 Series Shop Manual for servicing of the entire oiler system on the SP 80.

Powerhead Disassembly & Trouble Shooting

With the exceptions that follow, servicing of the Powerhead assembly is fully covered in the MAC 10 Series Shop Manual.

1. Piston pin installation procedures and tools, for the SP 80, are the same as those used for the 4.3 cubic inch MAC 10 series engines.

2. The SP 80 has 22 needle bearings at the connecting rod to crankshaft area. Previous MAC 10 series engines had twenty needle rollers.

3. The top piston ring has a tapered outer surface. A locating dot on the outer diameter surface of the ring must always be toward the bottom of the piston when the ring is installed. (See Figure 13)
   In the future both rings will be tapered and must be installed in the same manner.

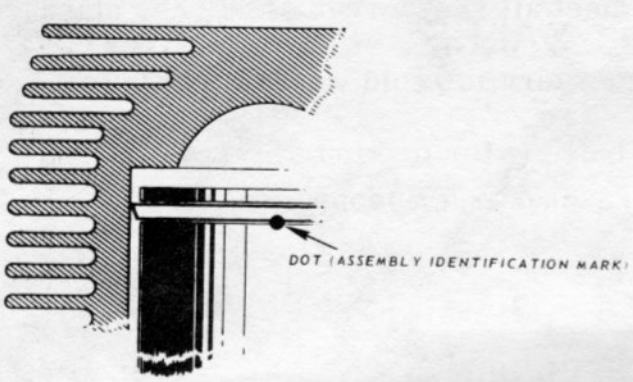
Pressure Testing the Cylinder

A new exhaust adaptor (because of relocated muffler retaining screw) and a 3/8 x 24 x 1/2" socket head screw for the decompression valve opening are required for proper pressure checking of the crankcase for air leaks.

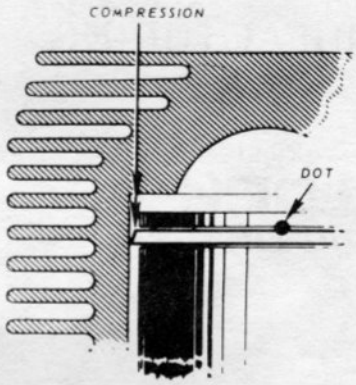
The decompression valve on the SP 80 will allow pressure loss when the crankcase is pressure tested. This pressure loss will not affect engine performance.

·INSTALLATION·

Tapered Piston Ring



CORRECT



INCORRECT

Note: *IF ASSEMBLED INCORRECTLY, COMPRESSION PRESSURE WILL PUSH RING BACK INTO RING GROOVE.*

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However, to properly test the crankcase for excessive leaks elsewhere a threaded plug should be made available to block off the valve opening after the valve has been removed prior to the pressure test.

Periodically remove and inspect the valve for excessive carbon buildup and seat wear at the sealing surfaces.

NOTE: By using McCulloch 40:1 two cycle oil at a 40:1 mix ratio, carbon buildup will be greatly reduced throughout the entire powerhead, including the decompression passages and valve. Engine life is also appreciably increased.

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