

PIONEER

MODEL COVERAGE

Model	Bore In.	Stroke In.	Displ. Cu. In.	Drive
1110	1 1/8	1 1/8	3.3	Direct
1100, 1120, 1130, 1150, 1160	1 13/16	1 1/8	3.546	Direct
Holiday 1100 G, 1130 GT, 1160 GTA	1 13/16	1 1/8	3.546	Direct
1200	1 13/16	1 1/8	3.546	Direct
2200, 2270	1 13/16	1 1/8	3.546	Direct

MAINTENANCE

SPARK PLUG. Spark plug electrode gap should be 0.030 inch. The recommended spark plug is Champion CJ8. AC type CS45 spark plug may also be used. Spark plug should be tightened to 7-8 Ft.-Lbs. torque.

CARBURETOR. Tillotson HS carburetors are used on all models. Normal setting for mixture needles on 1200, 2200 and 2270 models is 1 turn open for high speed needle (8—Fig. PR4—1); 1 1/2 turns open for low speed mixture needle (7). Normal setting for mixture needles on other saw models is 1 1/8 turn open for high speed needle

(8); 1 1/2 turns open for low speed mixture needle (7). Clockwise rotation of the adjusting needles will lean the mixture. Idle speed is adjusted by turning throttle stop screw (6). Original carburetor application is as follows:

- 1100, 1100 G, 1200 HS-44A
- 1110 HS-12A
- 1120, 1130, 1150,
- 1160, 1160 GTA HS-16B
- 1130 GT, 2200, 2270 HS-66A

The carburetors used on some models are equipped with a choke valve as shown in Fig. PR4—1. A fuel primer pump (Fig. PR4—2) is used on models not equipped with a choke. Primer outlet check valve (12) can be

removed, disassembled and inspected without removing pump from engine.

A felt wick fuel pick-up (2—Fig. PR4—3) is used on early saws and a tube pick-up (15 & 16) is used on later models. A gasket is used between the tank halves on all models.

MAGNETO. A Wico magneto is used on all models. The breaker points and condenser are located under the flywheel. Flywheel retaining nut is left hand thread. Breaker point gap should be 0.015 inch. Ignition should occur (breaker points just open) at 30 degrees BTDC. Condenser capacity should be 0.16-0.20 Microfarads. Flywheel retaining nut should be tight-

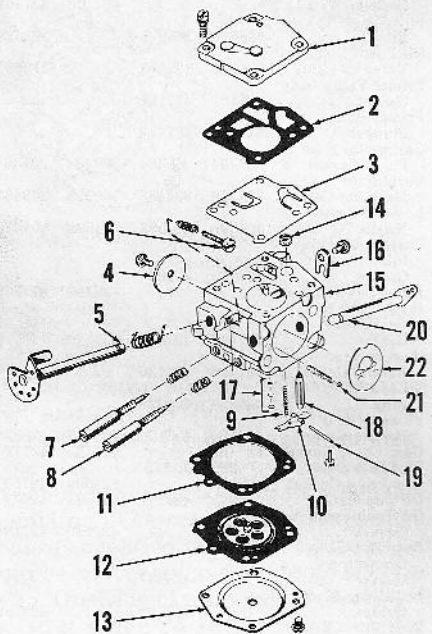


Fig. PR4-1—Exploded view of Tillotson HS carburetor. A check valve is installed at location (17) on models equipped with a fuel primer pump instead of the choke shown at (20, 21 & 22).

- 1. Fuel pump cover
- 2. Gasket
- 3. Fuel pump
- 4. Throttle disc
- 5. Throttle shaft
- 6. Idle speed stop screw
- 7. Idle mixture needle
- 8. High speed mixture needle
- 9. Spring
- 10. Inlet control lever
- 11. Gasket
- 12. Fuel control
- 13. diaphragm
- 14. Cover
- 15. Fuel inlet screen
- 16. Carburetor body
- 17. Throttle shaft retainer
- 18. Body channel screen, retainer ring & plug
- 19. Inlet needle
- 20. Pivot pin
- 21. Choke shaft
- 22. Choke detent
- 23. Choke plate

- 1. Primer button
- 2. Spring
- 3. Cover
- 4. Cup
- 5. Diaphragm
- 6. Cup washer
- 7. Screw
- 8. Gasket
- 9. Body
- 10. Inlet check valve and fitting
- 11. Outlet check valve
- 12. Throttle trigger & link rod
- 13. Carburetor
- 14. Gaskets
- 15. Insulator
- 16. Air cleaner
- 17. Reed valve plate
- 18. Reed petal
- 19. Reed stiffener
- 20. Gasket
- 21. "O" ring
- 22. Chain oiler piston
- 23. Spring
- 24. Inlet check valve (chain oiler)
- 25. Outlet check valve (chain oiler)

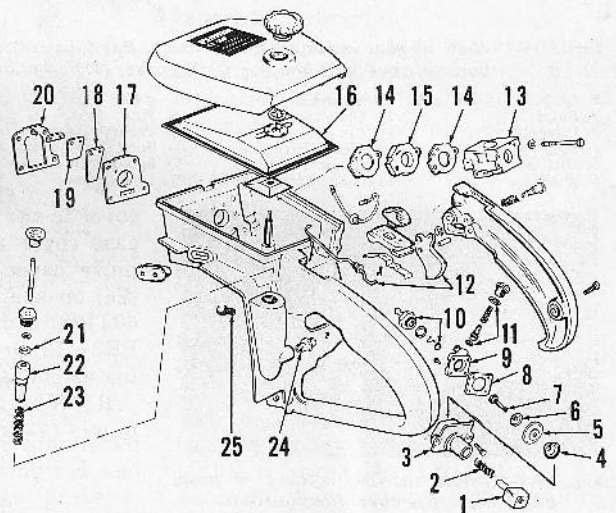
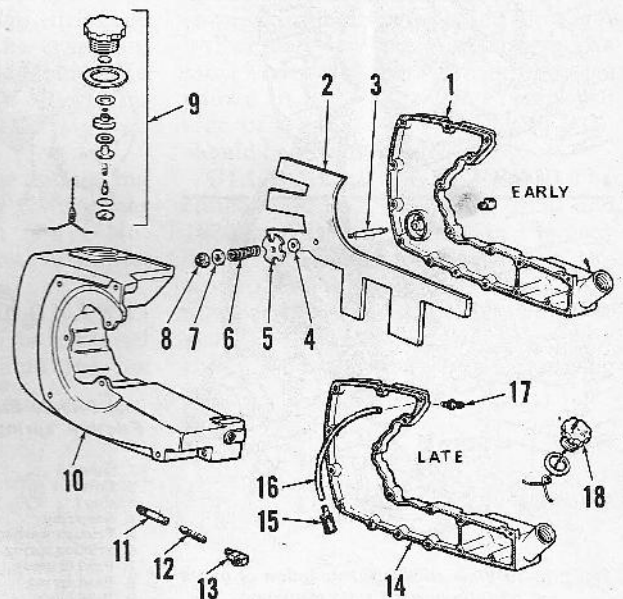


Fig. PR4-2—Exploded view of the rear handle and air box typical of all models. A choke is used on some models instead of fuel primer pump (1 thru 11).

Fig. PR4-3—Exploded view of the fuel and chain oiler tanks. Early models use a wick fuel pick-up (2); later models use tube (16) and pick-up (15). Method of attaching washer (5) and spring (6) may be different than shown.



- 1. Early cover
- 2. Wick felt
- 3. Stud
- 4. Gasket
- 5. Compression washer
- 6. Spring
- 7. Washer
- 8. Nut
- 9. Gas cap and vent valve
- 10. Fuel and chain oiler tank
- 11. Chain oiler pick-up
- 12. Hose
- 13. Fitting
- 14. Late type cover
- 15. Pick-up & filter
- 16. Hose
- 17. Fitting
- 18. Oil tank cap

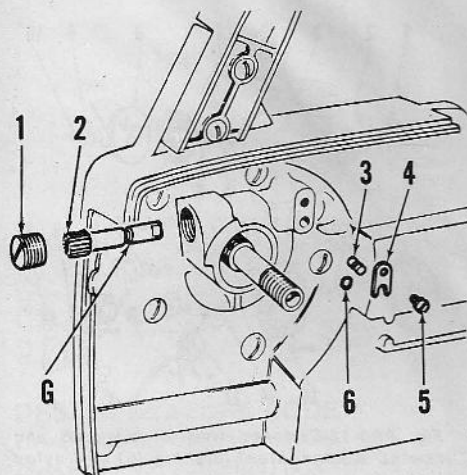


Fig. PR4-4—The oiler pump (2) is rotated by a worm gear on crankshaft.

- | | |
|---------------|---------------|
| 1. Plug | 4. Lock plate |
| 2. Pump shaft | 5. Screw |
| 3. Guide pin | 6. "O" ring |

ened to 18-22 Ft.-Lbs. torque. Refer to Fig. PR4-13 for installation of starter pawls and springs.

LUBRICATION. The engine is lubricated by mixing oil with the fuel at a ratio of 16:1 (½ pint of oil with each gallon of gasoline). Regular or premium grade gasolines are recommended. DO NOT use low lead gasolines. In some gasolines the amount of lead has been reduced and has been replaced with phosphorus. The use of these gasolines is not recommended.

OMC (Johnson or Evinrude) 2 CYCLE ENGINE OIL is recommended and ½ pint of oil should be mixed with each gallon of gasoline. A good quality SAE 30 or SAE 40 oil with an API classification MS, SB or SD may be used if the preferred oil is not available.

Proper and complete mixing of oil and gasoline is important. Pour about half of the amount of gasoline to be mixed into a clean metal container, add all of the oil required; then, stir or shake until thoroughly mixed. Add the balance of the gasoline to make the correctly proportioned mixture; then, stir or shake until it is properly and permanently blended. DO NOT MIX DIRECTLY IN THE FUEL TANK.

The oiler reservoir should be filled with Pioneer Chain Oil winter or summer grade, or, if not available, use a good grade SAE 10 to SAE 40 motor oil depending upon prevailing temperature. The manual chain oiler pump is shown at (21 thru 25—Fig. PR4-2). The inlet check valve to pump (24) and the outlet check valve (25) are also special fittings. Do not substitute standard fittings for the special ones containing chain oiler check valves. An automatic chain oiler is used on some models. Pump shaft (2—Fig. PR4-4) is rotated by a worm gear on the

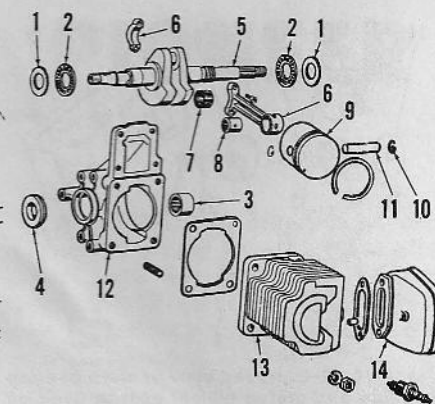


Fig. PR4-5—Exploded view of the crankshaft, crankcase and cylinder typical of all models.

- | | |
|---------------------------|------------------------|
| 1. Washers | 8. Piston pin bearing |
| 2. Thrust bearings | 9. Piston |
| 3. Main bearing | 10. Pin retaining clip |
| 4. Crankshaft seal | 11. Piston pin |
| 5. Crankshaft | 12. Crankcase |
| 6. Connecting rod and cap | 13. Cylinder |
| 7. Crankpin bearing | 14. Muffler |

crankshaft. Guide pin (3) is positioned in groove (G), is held by plate (4) and sealed by "O" ring (6).

CARBON. Exhaust ports and muffler should be cleaned approximately every two weeks of use or if a loss of power is noticed. Excessive carbon build up may indicate an excessive amount of oil, an improper type of oil mixed with the fuel or a rich fuel-air mixture. Cylinder cooling fins should be cleaned at the same time carbon is cleaned from exhaust.

REPAIRS

TIGHTENING TORQUES. Recommended tightening torques are listed in the following table. All values are listed in inch-pounds unless otherwise noted.

Fan Housing Screws	45-50
Main Bearing Housing	45-50
Flywheel Nut	18-22 Ft.-Lbs.
Connecting Rod Screws	55
Cylinder Base Nuts	70-80
Muffler to Cylinder	50-60
Clutch Nut	18-22 Ft.-Lbs.
Rear Handle to Crankcase	35-40

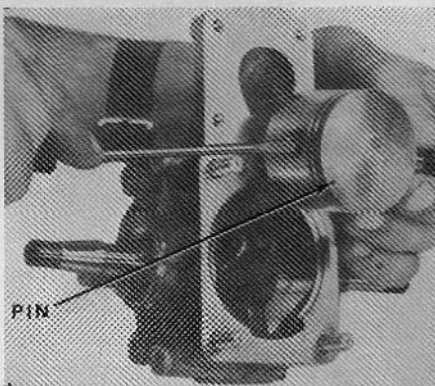


Fig. PR4-6—Ring locating pin must be away from exhaust port side of cylinder as shown, when installing the piston to the connecting rod.

Handle Bar to Crankcase	45-50
Coil to Bearing Housing	25-35
Bar to Crankcase	80-110
Pivot Grip to Crankcase	60-80

CYLINDER, PISTON, RINGS AND PIN.

Compression pressure at cranking speed should be approximately 130-140 PSI with engine cold. Cylinder and cylinder head is one piece and is attached to the crankcase with four stud nuts. Piston pin can be withdrawn after removing retaining clips (10—Fig. PR4-5). Cylinder bore diameter is smaller for 1110 model than others. The cylinder bore of most models is chrome plated and cylinder should be renewed if plating is worn away exposing the soft base metal. The following repair specifications are in inches.

Cylinder Bore, Nominal Diameter—

1110 Model	1.750
Other Models	1.8125

Piston Skirt Clearance—

1110 Model	0.007
Ring End Gap—	

1110 Model	0.070-0.076
Other Models	0.088-0.098

Piston rings on most models are pinned to prevent rotation in the grooves. Make sure that ring locating pin (Fig. PR4-6) is located on the magneto side. The opening in the piston pin retaining clips (10—Fig. PR4-5) should be toward the closed end of piston.

CONNECTING ROD. Connecting rod can be separated and removed after removing the cylinder and piston. Make certain that all of the 28 loose rollers at crankpin end are removed. New crankpin bearing rollers should be used each time connecting rod is removed. Remove the backing strip from the rollers, then carefully wrap the needles around the crankpin journal. The Pioneer special tool (No. 427899) can be used to hold the rod cap in place while installing the cap retaining screws (Fig. PR4-7).

CRANKCASE AND CRANK-SHAFT.

Crankshaft can be removed after removing the starter, magneto, chain, bar, clutch, muffler, carburetor,

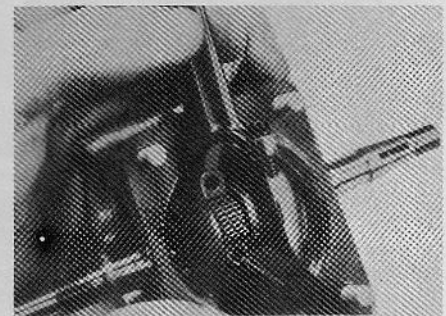


Fig. PR4-7—View showing correct method of installing connecting rod using the Pioneer special holding tool.

rear handle, cylinder, piston and connecting rod. Remove screws attaching main bearing housing to crankcase, then disconnect chain oiler line (Fig. PR4-8). On models with automatic chain oiler, remove pin (3—Fig. PR4-4), plug (1) and pump shaft (2) before removing main bearing housing.

The crankcase (12—Fig. PR4-5) should be heated before installing new main bearing (3). Main bearing housing (1—Fig. PR4-10 or Fig. PR4-11) should be heated before installing main bearing (3). Lip of seals (4) should be toward the bearings (3). Lip of magneto seal (4—Fig. PR4-5) should be toward inside. Crankshaft needle thrust bearings (2) and washers (1) should limit crankshaft end play.

CLUTCH. Different types of clutches have been used (Fig. PR4-10 and Fig. PR4-11). Bearing (7) should be lubricated with a small amount of Mobil Sovarex No. 1W or Shell Alvania No. 2 lubricant before installing clutch drum and bearing on crankshaft. Ends of garter spring (12) should be connected together and located at the middle of a clutch shoe. Do not have the spring connection between clutch shoes.

REWIND STARTER. Starter pawls (12—Fig. PR4-12) are located on the flywheel and engage a notch in pulley (8) for starting. Some (early) models are equipped with two sets of pawls (12), pivots (11) and springs (13). Later models use one pawl assembly and the weight of parts (11, 12 & 13) is counterbalanced by weight (14). Pawls and springs should be installed as shown in Fig. PR4-13. Starter must be disassembled to renew rope (3—Fig. PR4-12) or rewind spring (7). The 5/32-inch diameter nylon cord should be 45 inches long. The rewind spring should be preloaded 3 turns where assembling.

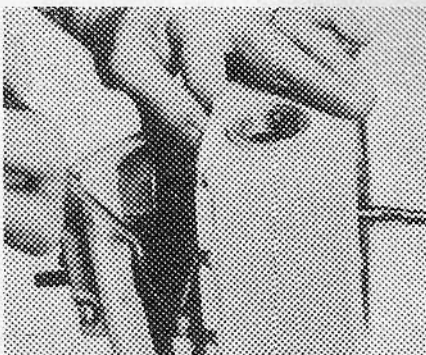


Fig. PR4-8—Chain lubricating oil line must be disconnected before removing the main bearing housing.

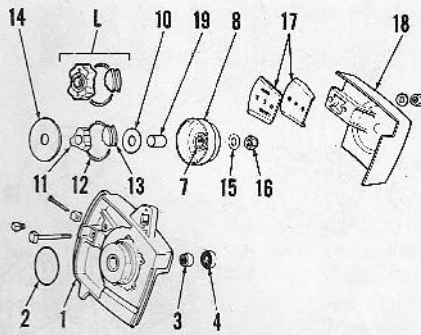


Fig. PR4-10—Exploded view of main bearing housing and clutch typical of type used on models with manual chain oiler. Metal side of seal (4) should be toward outside with lip in toward main bearing (3). Clutch shoes, driver and spring shown at (L) is used on 1200 models.

- 1. Main bearing housing
- 2. "O" ring
- 3. Main bearing
- 4. Crankshaft seal
- 7. Bearing
- 8. Clutch drum & sprocket
- 10. Small inner plate
- 11. Clutch driver housing
- 12. Clutch spring
- 13. Clutch shoes
- 14. Cover plate
- 15. Washer
- 16. Nut
- 17. Guide plates
- 18. Strut (cover)
- 19. Inner Race

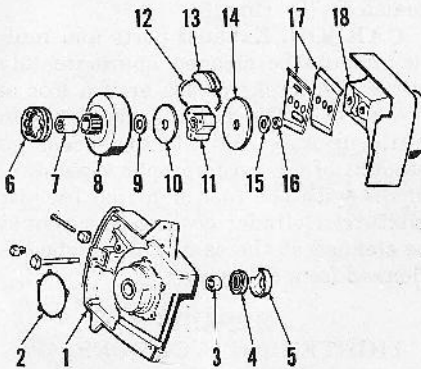


Fig. PR4-11—Exploded view of clutch used on models with automatic chain oiler. Parts shown in Fig. PR4-4 are located in main bearing housing (1) shown above.

- 1. Main bearing housing
- 2. Gasket (Used on some models)
- 3. Main bearing
- 4. Crankshaft seal
- 5. Seal cover
- 6. Sprocket
- 7. Bearing
- 8. Clutch drum
- 9. Thrust washer
- 10. Inner cover
- 11. Clutch driver
- 12. Spring
- 13. Clutch shoes
- 14. Clutch cover plate
- 15. Washer
- 16. Nut
- 17. Guide plates
- 18. Strut (cover)

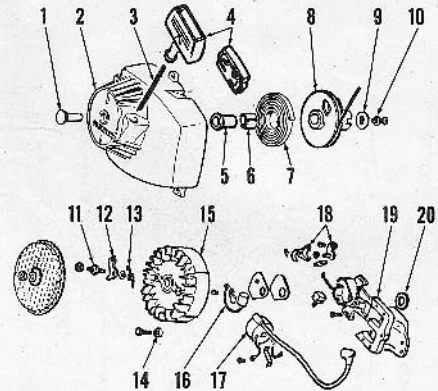


Fig. PR4-12—Exploded view of magneto and rewind starter. Steel bushing (5) and nylon liner (6) is used instead of bronze bushing used on early models. Some models use one pawl assembly (11, 12 & 13) and one balance weight (14); others are equipped with two starter pawl assemblies.

- 1. Center post
- 2. Housing
- 3. Rope
- 4. Handle & anchor
- 5. Bushing
- 6. Liner
- 7. Rewind spring
- 8. Pulley
- 9. Washer
- 10. Screw & lock washer
- 11. Post
- 12. Pawl
- 13. Spring
- 14. Balance weight
- 15. Flywheel
- 16. Condenser
- 17. Coil
- 18. Breaker points
- 19. Stator plate & coil core
- 20. Felt washer

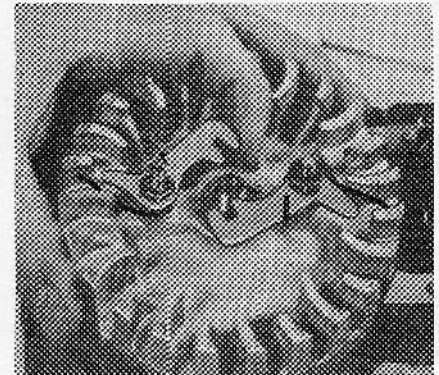


Fig. PR4-13—The starter pawls and springs should be installed as shown. A balance weight may be used with only one pawl assembly.

GASKET AND "O" RING PART NUMBERS

	1100, 1110	1160, 1120, 1150, 1130GT	Holiday 1100G, 1100W	2200, 2270	1200
Carburetor Diaphragm Gasket	427950	427950	427950	428906	428906
Carburetor Diaphragm Fuel Pump Gasket	427940	427940	427940	427722	427722
Fuel Tank Cover Gasket	428016	428146	428146	427715	427715
Oil Cap Gasket	427689	427689	427689	308528	308528
Crankcase & Cylinder Base Gasket	427672	428129	427672	428129	427950
Exhaust Gasket	427799	428189	428189	427940	427940
Gas Cap Gasket	425087	425087	425087	427757	427757
Gas Cap Valve Gasket	427273	427273	427273	428146	428146
Valve Body "O" Ring	427281	427281	427281	427689	427689
Breaker Box Gasket	427757	427757	427757	428131	428131
Oil Pump Plunger "O" Ring	427360	427360	427360	428189	428189
Insulating Block Gasket	427722	427722	427722	425087	425087
Primer Pump Body Gasket	427715	427715	427715	428150	428150
Exit Valve "O" Ring	308528	308528	308528	307554	307554
Bearing Carrier "O" Ring	427667	427667	427667	428462	428462
Bearing Carrier Gasket			428462		428462
Oil Pump Plunger "O" Ring				428462	428462
Carburetor Mounting Gasket					427672
Primer Pump Cover Gasket					
Check Valve "O" Ring					
Automatic Oil Pump "O" Ring					
Reed Body Gasket					
Metering Gasket—Carburetor					
Fuel Pump Gasket—Carburetor					
Breaker Box Gasket					
Tank Cover Gasket					
Oil Cap Gasket					
Cylinder Base Gasket					
Exhaust Gasket					
Gas Cap Gasket					
Reed Body Gasket					
Oil Pickup Head Gasket					
Crankcase Gasket					
Bearing Carrier Gasket					
Cylinder Base & Crankcase Gasket					