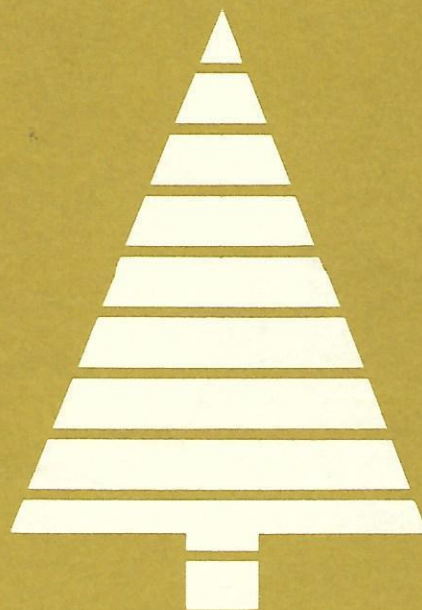


PIONEER CHAIN SAWS

Operators' Manual



model 850 CHAIN
SAW

850 SPECIFICATIONS

| | | | |
|-----------------|---|---------------------|---|
| Engine Type: | Single Cylinder - Two Cycle | Air Cleaner: | Nylon Flock Screen |
| Bore: | 2-5/16" Dia. | Intake: | Reed Valve |
| Stroke: | 1-9/16" | Reed Valve: | Pyramid Cone - 4 reeds of .006" steel |
| Displacement: | 6.56 Cubic Inches | Muffler: | Spark Arresting Design |
| Rotation: | Clockwise Facing P.T.O. End | Starter: | Pioneer Auto Rewind |
| Cylinder: | Diecast Alum. Block | Compression Ratio: | 8:1 |
| Cylinder Liner: | Cast Iron | Fuel Capacity: | 1-1/6 Imp. Quart |
| Crankcase: | Split Type-Diecast Magnesium | Chain Oil Pump: | Manual Type |
| Piston: | Aluminum Alloy | Chain Oil Capacity: | .4 Imperial Quart |
| Piston Rings: | Two - Compression | Type of Drive: | SPUR GEAR - Straight Cut - Hardened Steel |
| Ring Gap: | .008" - .014" | Gear Ratio: | 2:1 Standard. 3:1 Optional |
| Main Bearings: | Ball Type | Gears: | Pinion 17-tooth, Idler 32-tooth, Drive 47-tooth |
| Seals: | Closure Type | Gear Oil Capacity: | 3 Fl. Oz. Correct Level Indicated |
| Con. Rod: | Steel Forging | Clutch: | Cent. Action, Wet, Friction Lining |
| Con. Rod. Brgs: | Full Complement of Needle Rollers | Sprocket: | 1/2" Pitch, Self-Aligning, Side Strap Support |
| Top End: | Rollers | Guide Bar: | Pioneer Durarail, Stellite Tip, Induction Hardened Rails, Copper Brazed |
| Con. Rod Brgs: | 12 Caged Needle Rollers | Chain: | Pioneer Duracut |
| Btm. End: | Silver Plated Cage | Gear Oil: | O.M.C. Type "C" S.A.E. 20 |
| Crankshaft: | Forged Alloy Steel | | |
| Ignition: | Flywheel Magneto | | |
| Timing: | 30° Advance | | |
| Point Gap: | .020" | | |
| Spark Plug: | J4J 14 M.M. | | |
| Spark Plug Gap: | .025" | | |
| Lubrication: | Gas & Oil Mix 16:1 (30-40 S.A.E. Motor Oil) | | |
| Carburetor: | Pioneer - All Position Diaphragm Type | | |

WARRANTY

WE WARRANT EACH NEW PIONEER ENGINE TO BE FREE OF DEFECTS IN MATERIAL AND WORKMANSHIP UNDER NORMAL USE AND SERVICE. OUR OBLIGATION UNDER THIS WARRANTY BEING LIMITED TO MAKING GOOD ANY PART OR PARTS THEREOF WHICH SHALL, UPON EXAMINATION, DISCLOSE TO OUR SATISFACTION TO HAVE BEEN THUS DEFECTIVE.

THE BARS AND CHAIN ARE WARRANTED SEPARATELY FOR A PERIOD OF THIRTY DAYS AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP UNDER THE SAME CONDITIONS HERETOFORE MENTIONED.

THIS WARRANTY BEING EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES AND REPRESENTATIONS EXPRESSED OR IMPLIED AND OF ALL OTHER LIABILITIES IN CONNECTION WITH THE SALE OR USE OF ANY PIONEER SAWS.

TO MAKE A CLAIM UNDER THIS WARRANTY, CONTACT THE DEALER FROM WHOM THE SAW WAS PURCHASED, OR THE NEAREST AUTHORIZED PIONEER SAW DEALER. ALL CLAIMS MUST BE ACCOMPANIED WITH THE MODEL AND SERIAL NUMBER OF THE SAW.

THIS WARRANTY IS EXTENDED IN THE U.S.A. BY PIONEER SAWS, OUTBOARD MARINE CORPORATION, GALESBURG, ILLINOIS; IN CANADA BY PIONEER SAWS LTD., PETERBOROUGH, ONTARIO. MOTORS SOLD ELSEWHERE ARE WARRANTED BY OUTBOARD MARINE INTERNATIONAL, NASSAU, BAHAMAS; OUTBOARD MARINE BELGIUM S.A., BRUGES, BELGIUM, AND OUTBOARD MARINE AUSTRALIA PTY. LIMITED, BANKSTOWN, N.S.W., AUSTRALIA.

To assure you of your warranty, fill out the Warranty Cards and immediately forward them as directed.

When a service problem arises do not hesitate to consult your local Pioneer Chain Saw Dealer. Your dealer was appointed after careful consideration of his ability in providing prompt and effective service. Only he can offer the complete technical knowledge and skill to maintain your chain saw in tip-top condition.

Your dealer also stocks a complete line of genuine factory replacement parts. Therefore, when you require replacement parts, order them from your local dealer: **DO NOT RETURN MOTOR TO FACTORY.**

When ordering, specify:

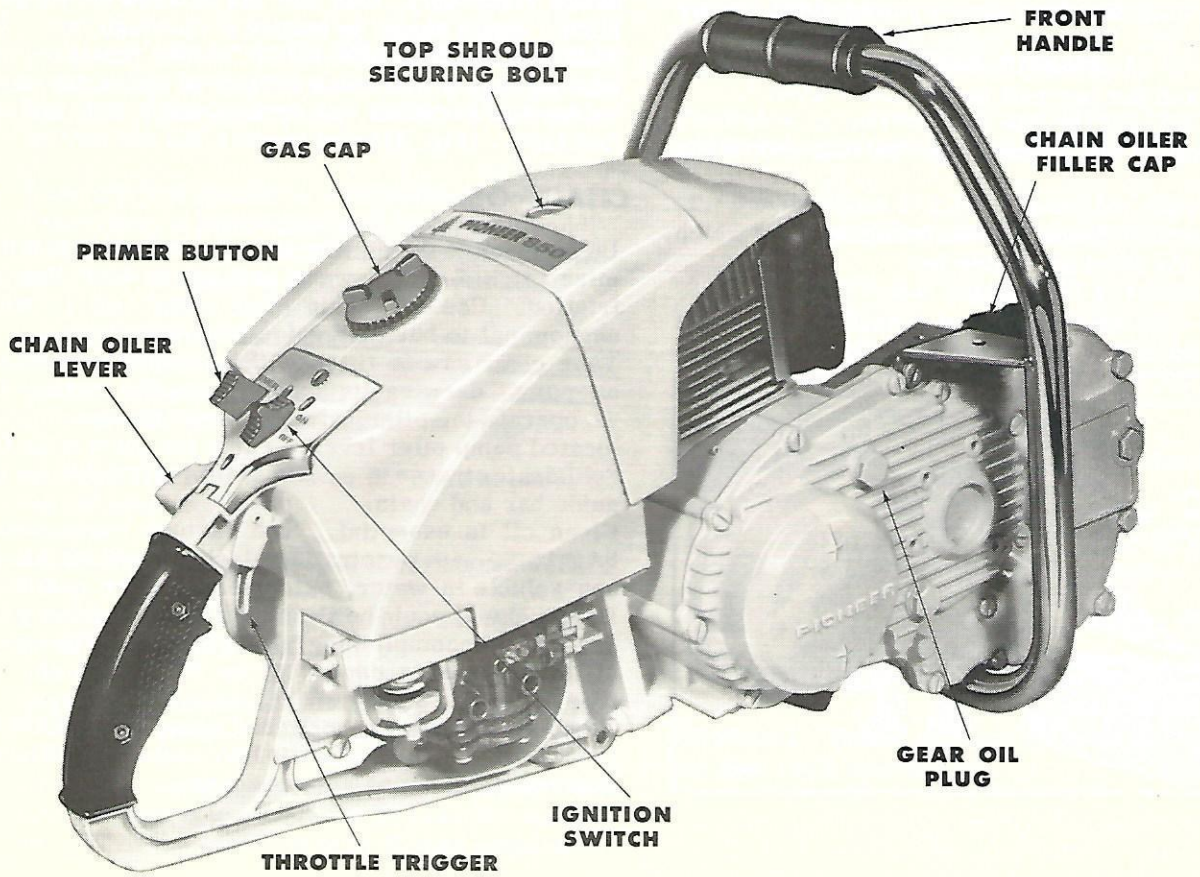
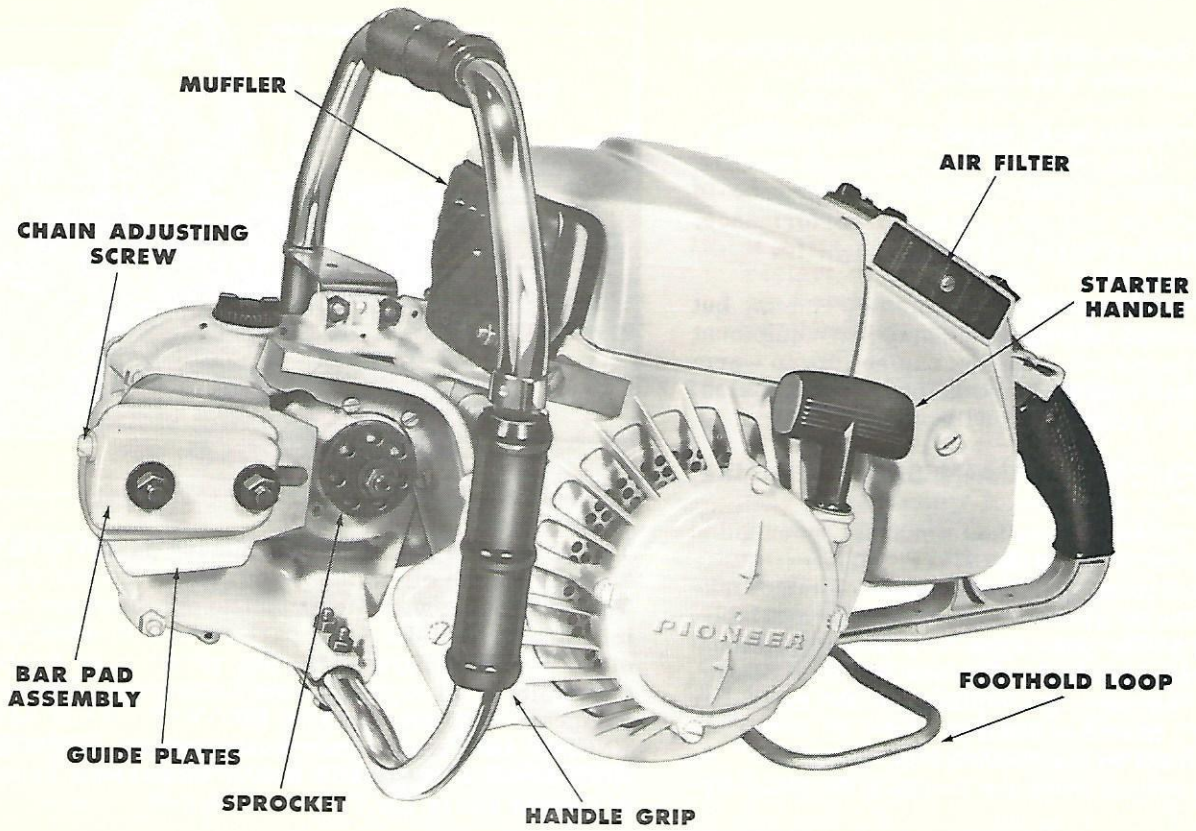
1. Model and Serial Number of your chain saw.
2. Quantity, part number and description of part in full.
3. Complete shipping instructions.

REGISTER YOUR MODEL AND SERIAL NUMBER IN THE SPACES PROVIDED BELOW.

Model Number

Serial Number

CHAIN - CAN. PAT. 1950 - 1955; U.S. PATENT 24, 129; 2, 508, 784; 2, 622, 636



GENERAL INFORMATION

If you are a new owner, some of the terms applied to power chain saws may need explanation.

Throughout the following pages of this Operator's Manual, you will find detailed instructions on the care and maintenance of your chain saw. Adherence to these instructions will give you better performance, lower maintenance costs and longer saw life.

Your power saw has received a factory run-in, but should be treated as you would any new equipment for a break-in period. Let the engine idle to warm up. Recheck all nuts and screws for correct tension. The operator's initial care will pay off.

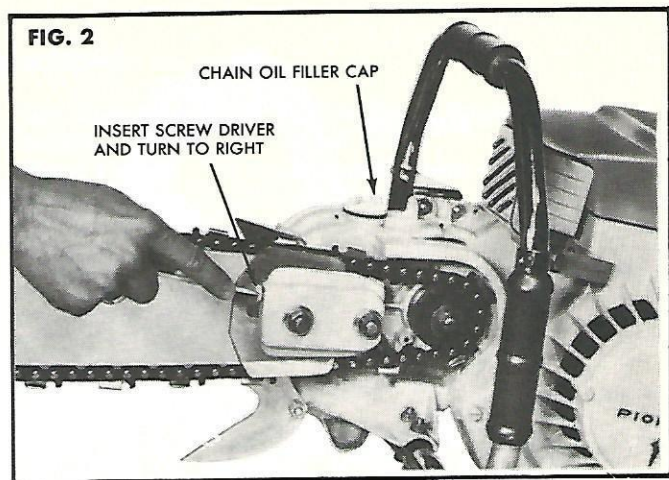
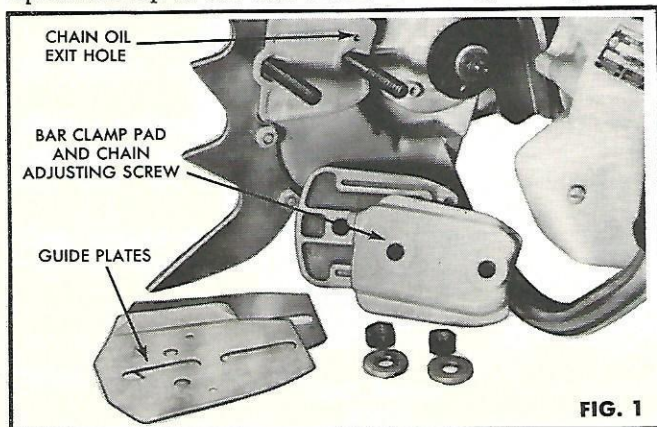
PREPARING YOUR CHAIN SAW FOR USE

1. Remove the strut, nuts and washers, inner guide plate and outer guide plate. (Fig. 1).
2. Secure the pivot grip on the front of the crankcase. There are two pivot grips available, customized for your type of timber. (Optional Equipment) See your Pioneer service dealer.
3. Replace the inner guide plate and the guide bar on the two mounting studs.
4. Fit the chain on the sprocket and guide bar. Be sure the cutting teeth are facing in the right direction.
5. Replace the outer guide plate and strut assembly. Be sure the chain adjusting pin is locating through the outer guide plate and the guide bar. Do not tighten the strut permanently.
6. Tighten chain, using adjusting screw as shown in Fig. 2, until the chain can be pulled out of the bar about 1/2". When released it should snap back about 1/8" clearance between the top of the side straps and the bar rail on the lower side.

Test tension and alignment by pulling chain along the bar.

7. Permanently tighten the two hexagonal nuts which secure the strut and guide bar.

CAUTION - To ensure correct chain/bar entry, lift up on the tip of the bar before final tightening.



FUEL AND LUBRICATION

The lubrication of all internal moving parts depends entirely on the oil which is mixed in the gasoline. Therefore, it is very important to prepare your fuel mix properly. Mix ONE part of SAE 30-40 motor oil to SIXTEEN parts of regular gasoline, or a ratio of one pint of oil to two gallons of gasoline. Pioneer engineers recommend using PIONEER CHAIN SAW ENGINE OIL to lubricate your engine. PIONEER CHAIN SAW ENGINE OIL is available at your dealer in Canada and in the U.S.A.

MIXING PROCEDURE

Pour one half the amount of the gasoline to be used in a clean container, then add all the oil required. Shake vigorously, then add the balance of the gasoline. Again shake to ensure a thorough mix. DO NOT MIX IN THE SAW FUEL TANK. Strain the fuel mix through a fine mesh screen to eliminate water or foreign particles, prior to pouring into the saw fuel tank. (Fig. 3).

CHAIN OIL

Lubrication of the cutting chain is essential to minimize pitch fouling, wear and power loss through friction. Use the chain oiler often - oil is more economical to buy than guide bars and chain.

Your chain saw is fitted with a manually operated oil pump, drawing its supply from the reservoir. To operate the oiler, simply pump the conveniently located pump oiler lever. Pump the oiler with full deliberate strokes to ensure sufficient oil flow to the guide bar and chain.

Clean oil is essential. The factory recommends SAE 10-20 with penetrating, tacky, rust inhibiting, non-soluble in water, extreme pressure qualities. Less tacky oil could be thrown off the end of the guide bar before accomplishing full lubrication. The weight of the oil used is dependent on the season and the type of timber being cut.

Pioneer engineers recommend using only PIONEER CHAIN OIL for proper chain lubrication and efficient maintenance of bars and sprockets.



STARTING INSTRUCTIONS

1. Fill the fuel tank with thoroughly mixed 16:1 fuel.
2. Fill the chain oil reservoir.
3. Place the saw in a convenient position where it will sit squarely and firmly while the starter rope is being pulled.
4. Open the fuel shut-off valve.
5. This chain saw is equipped with a PRIMER PUMP. The manual choke system has been eliminated.
6. On a saw with a completely dry fuel system, pump the primer button to fill the fuel pickup line, fuel filter system and the fuel lines to the carburetor and primer pump.
7. When the fuel system is completely primed and free of air, a resistance will be felt. An additional 2-3 pumps (after feeling resistance) will prime the crankcase ready for starting.
8. Use the primer as you would a manual choke; that is, if the engine starts, then falters, give an extra prime or two until the engine draws the correct mixture through the carburetor.
9. Slide the ignition switch on the control panel to the ON position.
10. Take a firm hold on the top of the front handlebar.
11. Grip the starter handle and place your foot firmly on the foothold loop.
12. Engage the starter pawls and give the starter firm sharp pulls.
13. When the engine starts, lightly squeeze the throttle trigger to maintain a fast idle for warm-up. When the engine is cold it may require an

extra prime or two before the carburetor is operational. During the warm-up on fast idle, the chain will revolve - pump the chain oiler often to ensure thorough lubrication.

14. A hot engine should restart without priming.
15. If a hot engine, which is not flooded, fails to restart, a single pump of the primer should ease starting. A few trial pulls will indicate whether the engine is flooded or not.
16. Do not over-prime. A flooded engine may take 5-6 pulls to clear and start.
17. After warm-up, to obtain peak performance, it may be necessary to vary the carburetor adjustment SLIGHTLY. Weather conditions, altitude, etc., all affect carburetion to some degree. Adjust the low speed setting to obtain a smooth, even idle. Adjust the speed of idle by adjusting the throttle stop idle screw. High speed adjustment must be done while the saw is under load at full throttle. Adjust for maximum power by sound and feel. Please refer to the 'Carburetor Adjustment' section for further information.
18. Again, we stress treating your new saw with care during break-in: -
 - (a) Warm up the engine before starting to cut.
 - (b) Use full throttle while cutting.
 - (c) Do NOT race the engine when cutting smaller timber or when starting and finishing a cut.

BREAKING IN YOUR CHAIN

The following instructions are IMPORTANT and will add to the efficient operational life of your chain.

1. Run the chain at a slow speed for approximately 5 minutes. Use plenty of oil during break-in.
2. Switch OFF the engine and readjust the chain tension.
3. Recheck the chain tension often during the break-in period.
4. Keep your chain well lubricated during cutting operations.
5. If possible, leave the chain in an oil bath overnight, to ensure internal lubrication.
6. Keep your chain SHARP. Frequent light touch-ups will prevent wear and damage to the cutters and side links by operating with a dull chain.

WARNING - Do not use reclaimed crankcase oil for bar and chain lubrication.

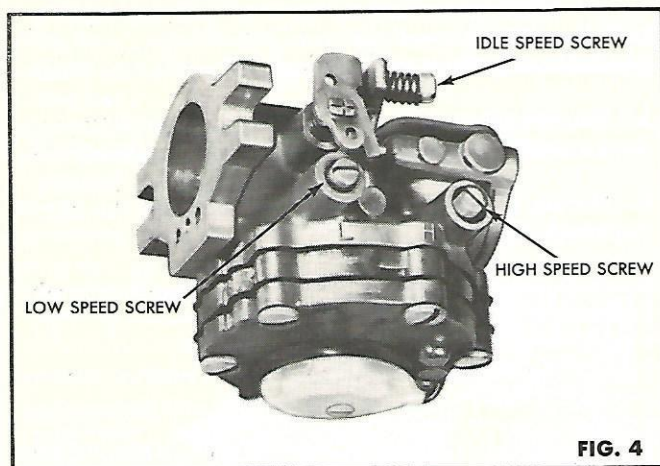
CARBURETOR ADJUSTMENTS

All carburetors on Pioneer chain saws are tested and adjusted at the factory. Very little readjustment, if any, is required. Before any adjustment is made, note the present position of the needle and move only slightly in the direction felt necessary. Excessive smoking, lack of power and an irritating rough exhaust noise indicate the fuel mixture adjustments are set too RICH. Sluggish acceleration, lack of power and stalling in the cut indicate the carburetor fuel mixture adjustments are too LEAN.

NOTE: - ONLY when the above conditions are noted should the carburetor adjustments be reset.

1. The idle speed adjusting screw (indicated) controls the engine idling speed and should be set so that the engine will idle without the chain revolving. Fig. 4.
2. The low speed adjustment (marked "L") controls the fuel mixture at idling speed. This should be set so the warm engine idles smoothly and evenly. Setting - approximately 3/4 turn open. Fig. 4.
3. The high speed adjustment (marked "H") controls the fuel mixture at full throttle. The high speed adjustment MUST be set with the unit at full throttle and under load. Setting - approximately 3/4 turn open. Fig. 4.

CAUTION - Do not close the adjustment needles too tightly and damage the needle seat in the casting.



OPERATING INSTRUCTIONS

This model has been designed to operate between 5000 and 7500 RPM for peak efficiency and safety. Excessively high RPM attained by lean carburetor setting can be detrimental to the life and efficiency of your chain saw. This is more critical in the case of small timber and pulp cutting. We recommend that your carburetor be adjusted to the settings referred to under 'Carburetor Adjustments'.

Using your chain saw as recommended will give you more production, low maintenance cost and guarantee safe operation which cannot be obtained with carburetor adjustment settings that will not give the maximum engine performance and allow excessively high, unsafe RPM engine speeds.

If you have never operated a chain saw, carefully prepare the unit as previously suggested, then cut a few lengths from a small log to get the feel of the saw in operation. When starting the cut, do not race the engine and ram the saw into the wood. Secure the tips of the pivot grip in the log and raise the rear handle as you slowly increase the throttle to engage the chain.

This unit will not require you to exert pressure to force the saw through the cut. You will realize, after a few cuts, that a firm, even pressure will cut more wood with less effort. Be prepared to release the throttle immediately the cut is finished. This will prevent the engine racing with no load.

Be generous with chain oil. Check the oil reservoir regularly. In pitchy wood or cold weather many operators have found thinning the chain oil with kerosene helps the oil to flow more freely and reduce fouling of the chain by wood resin.

PREVENTIVE MAINTENANCE

'Preventive Maintenance' is the elimination of potential causes of trouble before they occur. To realize the full value of your investment, prevent unnecessary repair bills and loss of use or "down" time, make preventive maintenance a MUST. Set up a regular schedule of inspections and tune-ups.

1. Air Cleaner

The air cleaner, located on the side of the rear handle assembly, filters the air entering the carburetor. The dust and grit should be cleaned regularly from the flock screen filter element daily under certain extreme conditions. The air cleaner is easily serviced. By removing one centrally located 1/4-20 screw, the filter element may be removed and washed in clean gasoline or solvent. This is preferable to washing in fuel mix. The mix leaves a sticky film of oil which necessitates more frequent cleaning. The filter element may be tapped lightly to dry it. It is recommended the area behind the filter element be wiped clean of accumulated dirt and sawdust.

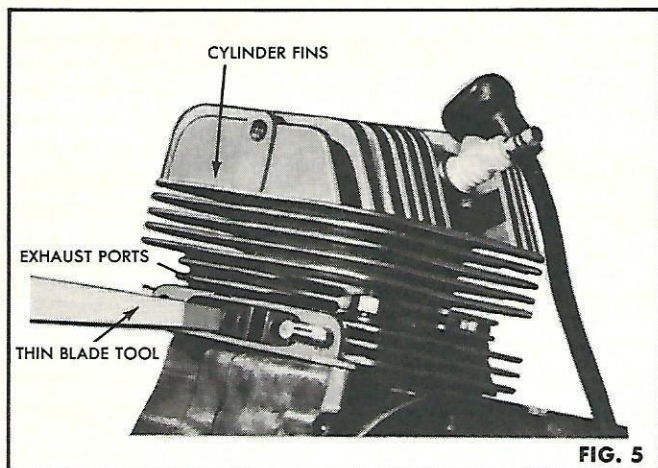
2. Cylinder Block and Head Fins

At least once a week, remove the outer shroud and inner shroud. This will expose the power head. With a thin blade type tool, clean any accumulated dust and chips from between the fins. Clogged fins impair the passage of cooling air from the flywheel and causes the engine to overheat.

PREVENTIVE MAINTENANCE CONT'D.

3. Exhaust Ports

Occasionally remove the exhaust muffler by removing the two 7/16" nuts. Rotate the crankshaft until the piston is clear of the exposed exhaust ports. With a blunt edged tool, carefully scrape away any carbon build-up present in both the exhaust port openings and the muffler flange opening. Replace the muffler gasket if necessary. (Fig. 5)



4. Ignition

Check the high tension and ignition switch wires for breaks or wear.

5. Spark Plug

Check for carbon, fouling and porcelain cracks. Keep the spark plug clean and maintain the proper electrode gap of .025".

6. Magneto

Do not inspect or adjust the magneto unless absolutely necessary. The appearance of the spark arcing from the spark plug electrode will indicate magneto condition. The breaker point gap should be .020" when the rocker arm is riding the highest point on the cam. If the magneto is serviced, the parts must be replaced in the same location with the correct settings. It is recommended that a local Pioneer dealer service the magneto when required.

7. Carburetor

Remove the fuel pump valve housing. Clean the fuel pump valves of accumulated fine dust and foreign particles. A complete inspection and overhaul should be performed by your servicing dealer.

CAUTION - Do not screw in the carburetor adjustments too tightly; a damaged needle seat can be costly to repair.

WARNING - When reinstalling the fuel line to the carburetor, care must be taken to ensure that the fuel line is free of all dirt and foreign particles which, if present, will immediately cause malfunction of the fuel pump valves.

8. Fuel Filter

Periodically remove the fuel filter bowl and clean out accumulated sediment and trapped moisture. Remove and clean the filter outlet screen. Be sure the filter bowl gasket is correctly located before tightening the filter bowl clamp.

9. Guide Bar

Make sure the bar grooves are clean at all times. The lubricating oil enters the grooves through the side oil vent and is picked up by the moving chain. Check for guide bar rail wear at regular intervals. Make a practice of turning the bar over to ensure the rail wear is even on both sides. Should a sharp edge develop on the rail, it may be removed with a flat file.

10. Primer Pump

The primer pump requires very little servicing. However, if dirt enters the inlet valve, or exit valve, it must be removed and carefully cleaned. Dirt particles in the inlet valve will be indicated by a lack of resistance when pressing the primer button. Dirt present in the exit valve will be indicated by a noticeably rich idle and a smoking condition caused by fuel leaking past the exit valve and entering the crankcase. A preventive measure would be to ensure a thoroughly clean fuel mix and careful refueling procedure.

SPECIAL NOTE

Clutch:

The clutch is automatic-designed to engage at a specific engine speed. It has a "wet" type clutch lining and must be run in oil. Do not slip and wear the clutch by over-loading. Release the throttle immediately if the chain becomes pinched.

Gearing:

The straight cut spur gear design does not require servicing under normal circumstances. Keep the gear oil clean and free of foreign particles. Check the gear oil level and top up if necessary. Should the gearing require servicing, it is recommended that a Pioneer service dealer undertake the repair and replacement necessary.

SERVICE DIAGNOSIS

| Trouble | Probable Cause | Remedy |
|---|---|---|
| Motor fails to start. | <p>Fuel tank empty. Fuel shut-off valve closed. Motor not primed. Carburetor. Over-priming. Flooded Engine.</p> <p>Dirt in primer pump inlet or outlet valve. Spark Plug.</p> <p>Magneto.</p> <p>*Plugged or frost covered pickup in fuel tank.</p> <p>*Plugged impulse hole in carburetor, misaligned carburetor gasket or reed valve gasket.</p> <p>*Frozen gas line or ice in filter or carburetor.</p> | <p>Fill with correct fuel mixture. Open shut-off valve. Pump primer button 2-3 times after resistance is felt. See carburetor adjustment. Open throttle and pull starter until motor fires. If motor is continually flooding, check for plugged air filter and dirt in the carburetor inlet needle and seat.</p> <p>Remove and clean primer pump valves.</p> <p>Remove plug, clean and adjust. Re-attach wire and hold metal seat of plug against motor. Pull starter. A blue spark should jump gap between electrodes.</p> <p>Disconnect wire from spark plug. Hold so metal end is 1/4" from clean metal surface. (Away from gas tank). Pull starter. There should be a strong blue spark across the gap. If no spark, the trouble is breaker points, coil, condenser, shorted wire, or switch.</p> <p>Remove and clean. Check for ice, water and dirt in fuel filter screen.</p> <p>Remove and clean. Check for ice, water and dirt in fuel filter screen.</p> <p>Remove and clean. De-ice additive used in prescribed proportion will counteract this. (One teaspoonful to a full tank of fuel).</p> |
| Motor cuts out, leans out, or misfires. | <p>Short circuit in ignition system. Partial stoppage in fuel system. Fouled, wet or damaged spark plug. Magneto: Faulty breaker points, coil, condenser, ignition wire or connection. Inlet control lever sticking on the control lever hinge pin. Improper sequence of fuel pump diaphragm and gasket. Dirt in fuel lines or carburetor passages. Air leak in fuel lines. **Improper inlet lever setting.</p> | <p>Check all wires and connections. Clean out carefully and check carburetor. Clean and adjust, or replace.</p> <p>Check.</p> <p>Remove and clean inlet lever and hinge pin, or replace.</p> <p>Fuel pump gasket must be next to fuel pump valve housing. Check and clean.</p> <p>Replace. Adjust. Clean and gap, or replace. Drain tank, refill with correct mixture. Adjust carburetor. Clean. Clean. See your servicing dealer. Clean.</p> |
| Motor lacks power. | <p>Fouled spark plug. Incorrect Fuel Mixture. Carburetor out of adjustment. Exhaust ports or muffler clogged. Air intake filter clogged. Poor compression.</p> | <p>Clean. Clean. See your servicing dealer. Clean.</p> |
| Motor overheats | <p>Cylinder fins or air system clogged. Incorrect fuel mixture. Carburetor lean. Leaking cylinder or base baskets.</p> | <p>Drain tank, refill with correct mixture. Adjust. Check and replace if necessary.</p> |
| Chain Oiler stops pumping. | <p>Dirt in pump assembly or discharge vent.</p> | <p>Remove and clean pump and feed line. Fill with clean (S. A. E. 10 or 20) oil.</p> |

*Conditions which may be experienced during cold weather operation.

**Inlet Needle Lever Adjustment: The correct lever setting is level with the face of the diaphragm chamber. Adjust short part of the lever to obtain correct setting. Do not jamb the needle into the seat.

SERVICE DIAGNOSIS CONT'D.

NOTE: If motor idling is erratic or races away and then drops, it may indicate the possibility of excess air entering the crankcase. If this condition exists, the motor would continue to idle with the idle stop screw backed completely off.

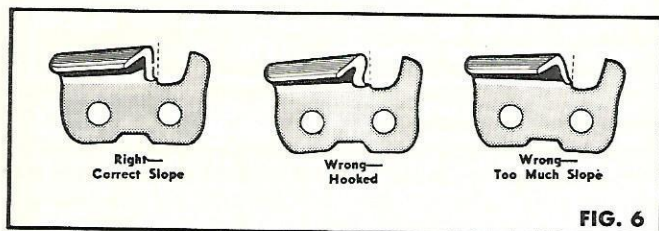
Check the following points:

- (1) Cocked throttle shutter.
- (2) Leaking carburetor or reed valve gaskets.
- (3) Loose carburetor nuts.
- (4) Leaking crankshaft seals.

CHAIN SHARPENING

Tighten the chain firmly on the guide bar to hold it securely. When sharpening, take a firm grip on the file and use a steady even stroke. Do not swing the file during the stroke. Keep a constant cutting angle on all teeth. Make sure the file is bearing against the under side of the top face. (Fig. 8)

Keeping one fifth of the diameter of the file above the top cutting edge of the tooth, as shown in Fig. 7, will ensure a hollow ground cutting edge. This edge will cut fast and hold sharp longer. Don't file back any more metal than necessary to give a sharp cutting edge. Be sure and use a sharp file. A dull file will work harden the already heat treated steel alloy and make it virtually impossible to sharpen the next time. Use only a sharp 1/4" full round file. Keep all the cutting teeth the same length. If the cutting teeth are an uneven length, the longer teeth will bite deeper and cause the saw to cut in an arc. When you have finished sharpening the chain, slack off to the recommended tension and run it with an excessive amount of oil to clear the filings from the guide bar groove.



NOTE:

Filing with the tooth, to maintain the approximate 30 degree angle from the vertical as illustrated in Fig. 8a, hold the file approximately 5 degrees from horizontal, with the handle low. Factory recommendation for general purpose cutting calls for the 5 degrees from the horizontal when filing. Various types of wood and cutting conditions may necessitate the operator lowering the file handle an additional 5 degrees. This should only be changed after testing or on recommendation from your Pioneer dealer.

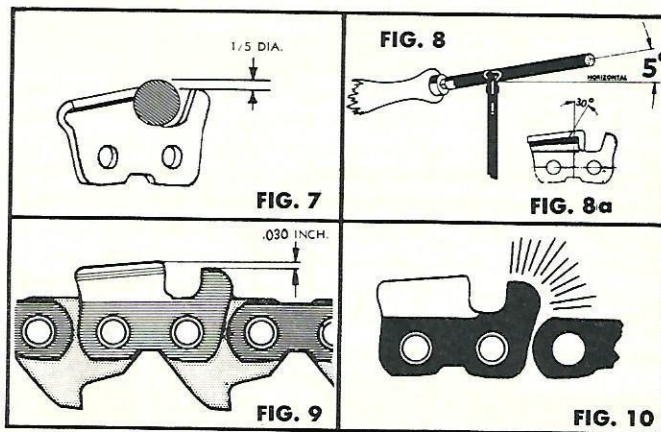
CHAIN TENSION

The importance of correct chain tension cannot be over-stressed. PARTICULAR CARE must be used during the chain break-in period.

Correct chain tension is especially important to pre-

vent the chain jumping off the bar and damaging the chain, guide bar and sprocket.

When the chain is correctly filed, jointed, tensioned and lubricated, it will cut smoothly and efficiently with the minimum of wear and effort.



CORRECT JOINTING AND CUTTING ACTION

The chain is precision ground at the factory and has a standard joint of .030". Fig. 8a. Tests have indicated the .030" joint clearance is the best for average conditions. To suit particular cutting conditions, however, the joint can be altered, provided the joint height is kept uniform for all jointers. If you change the joint, use Gauge No. 471135 (Available from your service dealer) to help you maintain uniform joint heights. A chain may be easily damaged or become severely worn by over filing. When filing the jointer runners, be sure and maintain the rounded corners. Not rounding the corners will cause rough cutting and a tendency to cut out of line. (Fig. 10).

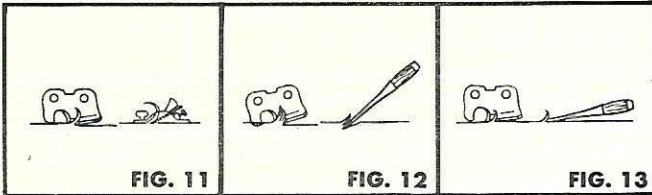
Make a practice of jointing your chain after every second filing. This will result in a fast cutting, smooth operating chain with less effort on your part. Visualize your cutters as a properly adjusted planer blade with all depth gauges jointed evenly. (Fig. 11).

EXCESSIVE JOINT

Lack of care in jointing may result in excessive or uneven joint. This will cause the cutters to bite in, chain will grab, resulting in overloading of attachments, poor performance and damage to both chain and bar. (Fig. 12).

INSUFFICIENT JOINT

FAILING TO CHECK OR JOINT REGULARLY. Cutters cannot bite into the wood, chain will not cut efficiently or to capacity. This will require extra pressure on your part, resulting in excessive wear to the bottom of the cutters and links, plus rapid wear to the guide bar rails. (Fig. 13).

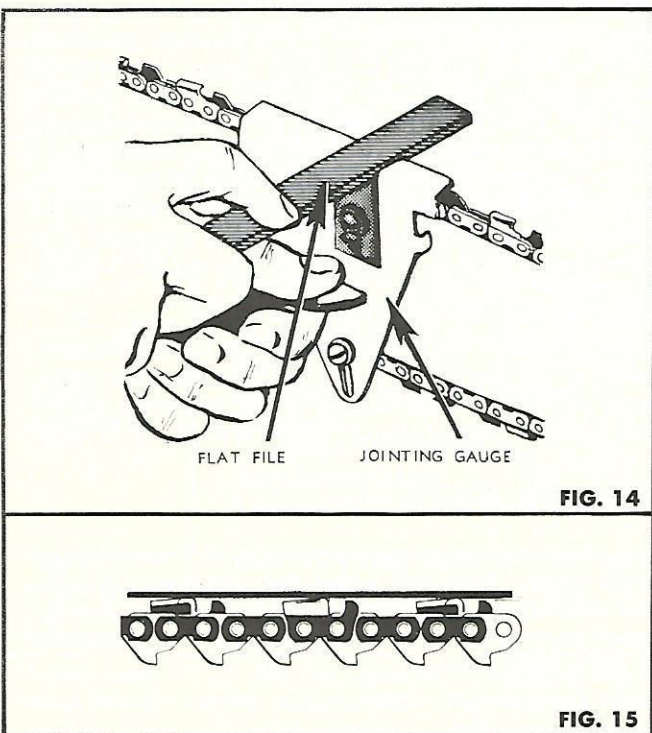


JOINTING GAUGE

1. Use the Pioneer Jointing Gauge No. 471135 for simple and accurate jointing. First preset the adjustable plate, using the feeler gauge supplied, to the recommended joint. Next, place jointing tool on top of the chain with the depth gauge protruding through the slot in the jointing plate and resting on the two cutters near the centre of the bar. Using a flat file, file the depth gauge to the level of the jointing tool plate. (Fig. 14).

WARNING

Always work near the centre of the bar and move the chain each time, NOT the tool. This is necessary due to the contour of all guide bars. To operate your jointing tool at various positions could give an uneven joint and a rough cutting chain.

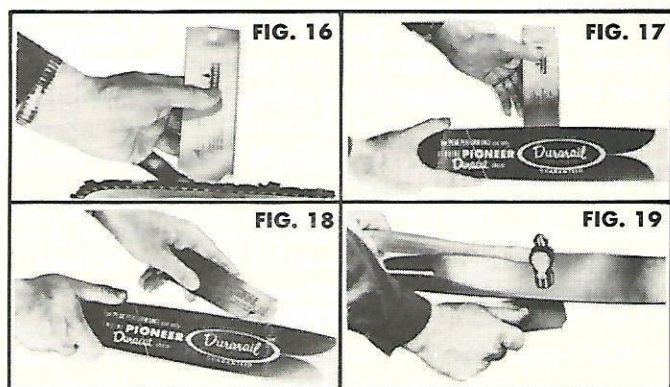


2. If the above mentioned jointing tool is not available, place a straight edge, long enough to cover at least six cutters, on top of the chain. (Fig. 15). Next, check the existing joint with a standard .030" feeler gauge. If you cannot insert the feeler, give one stroke of a flat file and recheck. When correctly jointed, you should just feel the drag between the straight edge and the top of the depth gauge. Repeat this step for each depth gauge throughout the entire chain. This method of jointing chains is much slower and less accurate than with a proper jointing tool.

BAR AND CHAIN SERVICING

Pioneer Guide Bar Tool - Part Number 426235

1. We recommend the use of the die cut corner, sheared at 35° , for the maintaining of correct top angle on all cutters. This important feature on chain filing is outlined in all chain instructions pieces and the Operator's Manual. (Fig. 16).
2. Front end of the guide bar tool is marked to indicate the minimum safety depth of the bar groove to avoid the chain drive lugs riding on the bottom of the groove causing extensive chain and bar damage. (Fig. 17).
3. By using either of the sharp corners of this tool, the bar groove can be cleaned regularly. The removal of the accumulated sawdust, old oil and chain filings will overcome the common fault of a chain riding up in the groove resulting in both chain weave and breakage. (Fig. 18).
4. To carry out minor repairs such as a pinched bar, enter one corner of the tool in the groove near the pinched section, then tap the tool with a light hammer until the entire length of the gauge enters into the groove. While in this position, lightly tap along the bar rail which will straighten out pinch and give chain clearance. (Fig. 19).
5. A further use for the side of this tool is to close up the rails to correct groove width for proper chain performance. This overcomes chain weave and rapid deterioration of both the bar and chain. (Fig. 19).



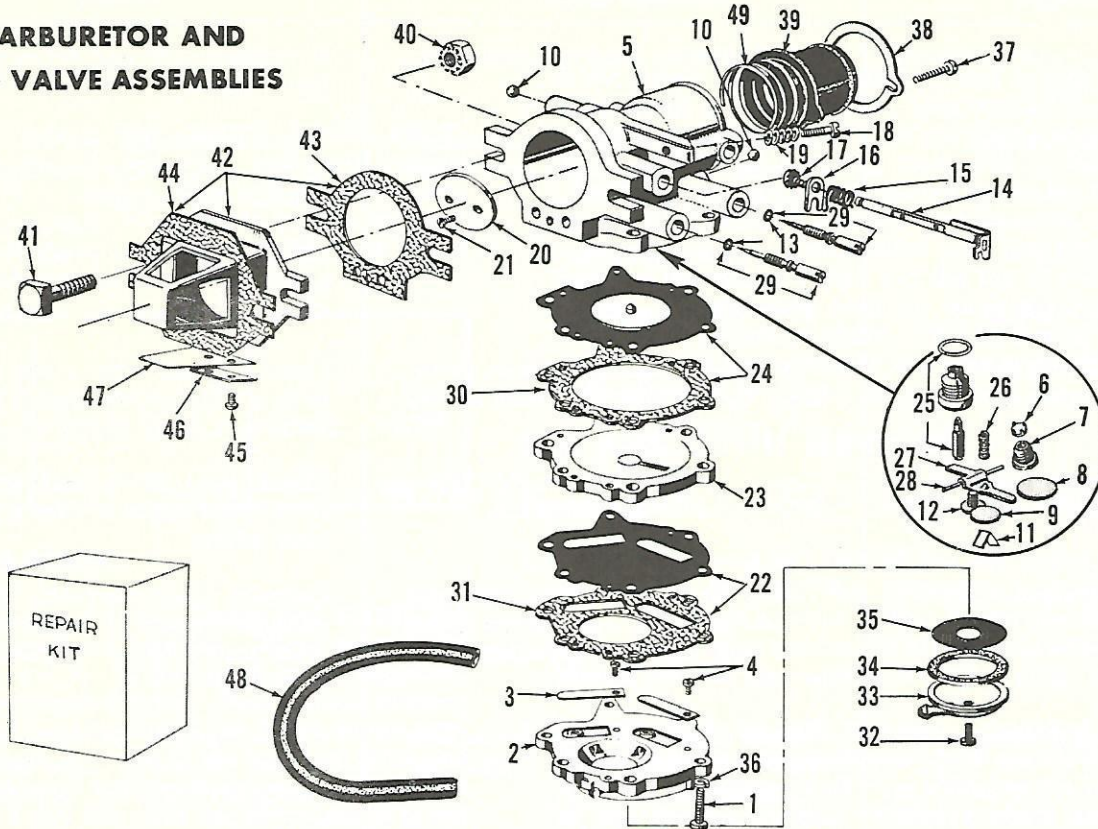
CHAIN DIAGNOSIS

| Trouble | Probable Cause | Remedy |
|--|---|---|
| Chain stretched beyond adjustment. | Dull cutters. Lack of lubrication. | Remove a side and drive link. Increase lubrication. |
| Chain breakage. | Excessive pressure by Operator. Excessive joint. Lack of lubrication. Dull cutters. | Replace damaged parts. Check balance of oil. Increase lubrication. Rejoint chain. File chain. |
| Chain stiff. | Lack of lubrication. | Clean chain in solvent. Oil bath over night. |
| Hard to tension. | Poor maintenance. | Check oil pump and vent holes. |
| Chain stalls in cut and/or scored drum. | Clutch slipping. Excessive pressure by operator. Clutch spring not releasing. | Check clutch shoes for wear. Check spring for tension. Apply less pressure; correctly filed chain will self-feed. |
| Chain cuts rough or digs in. | Cutter angles incorrectly filed. Too much or uneven joint. | Check your filing instructions. Refile to correct angles. Check joint. Rejoint your chain. |
| Chain jumps bar. | Incorrect chain tension. Damaged cutter bar. Damaged drive links. Worn or damaged sprocket. | Correct chain tension. Check bar for damage, repair or replace. Check drive links for damage. Replace links or entire chain. |
| Chain cuts on an angle. | Cutter angles not the same on both sides. Uneven joint. Cutter bar rails uneven. | Refile cutters to same angle. Check rails. If worn, have bar serviced or replaced. Rejoint. Increase lubrication. |
| Worn drive sprockets. | Incorrect chain tension. Lack of lubrication. Dull cutters. | Replace sprocket. Correct chain tension. Increase lubrication. File cutters and joint chain. |
| Excessive wear drive links and/or side straps. | Lack of lubrication. Excessive tension. Dull chain. Worn sprocket. | Increase lubrication. Check oil pump. Extensive damage can be occasioned in a few hours. Check tension. File chain. Check sprocket. |

SAFETY PRECAUTIONS

- Refuel your saw with the use of funnel on an area that has been cleared down to bare ground.
- If gas is spilled on the saw, wipe it off or let it evaporate before starting the motor.
- Move the saw 10 feet at least from the fueling spot before starting the motor.
- Never ask anyone to hold the saw while starting the motor.
- During operation, keep inquisitive bystanders clear at all times.
- Clear inflammable material away before cutting.
- Let a hot saw cool before refueling.
- Never start cutting until you have a clear place to work, a secure place to stand, a safe exit path from a falling tree.
- Before starting motor, examine carefully the lean of the tree, look up for loose limbs or bark and inter-twined branches.
- Wherever possible, place the pivot grip against the tree or log before starting the cut.
- When undercutting, wherever possible have chain in an inverted position.
- Never operate a chain saw in a closed room as the exhaust fumes can be deadly.
- Never touch or try to stop a moving chain.
- Before you start the motor, make sure the saw is not touching anything.
- When removing saw from cut, shut the motor off before the chain leaves the tree.
- When operating the chain saw, be relaxed but in full control of the saw at all times.
- Never carry your saw with the motor running when walking through a bushy area. A branch or twig may open the throttle and make the chain revolve.
- Never operate the saw if the chain is dull or if repairs are needed.
- Never attempt to sharpen or remove the chain while the motor is running.
- Keep the muffler on the saw.
- Keep the saw free of sawdust.
- Keep the spark plug and wire connections tight.
- Keep a filled fire extinguisher and shovel handy.

CARBURETOR AND REED VALVE ASSEMBLIES



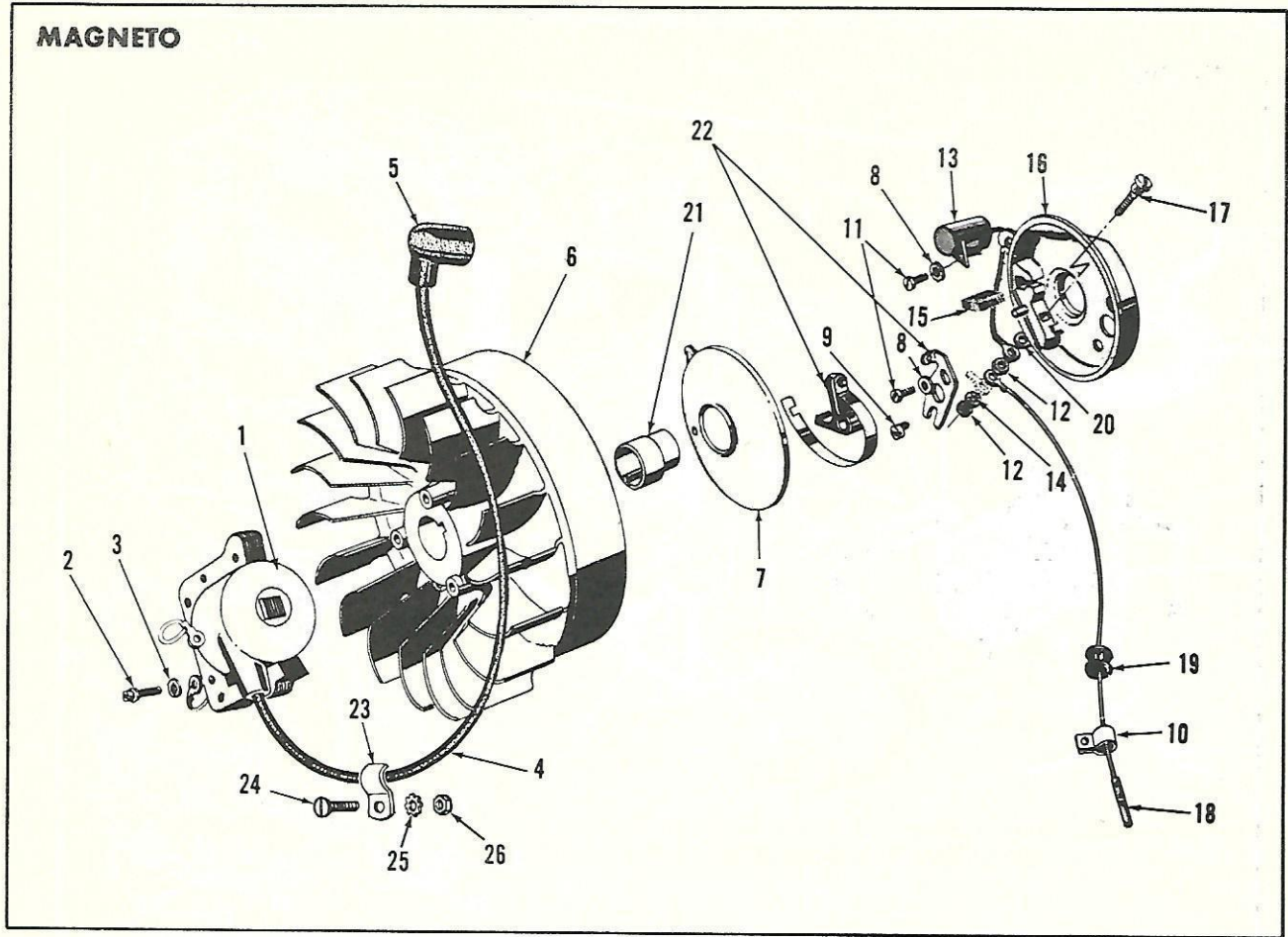
CARBURETOR AND REED VALVE ASSEMBLIES PARTS LIST

| Ref. No. | Part No. | Description | Qty. Req'd | Ref. No. | Part No. | Description | Qty. Req'd |
|----------|----------|------------------------------------|------------|----------|----------|---------------------------------------|------------|
| + | 380611 | Carburetor Assembly Complete | 1 | 25 | 379159 | . Inlet Needle, Valve & Seat Assembly | 1 |
| 1 | 427248 | . Screw (Hsg. to Body) | 6 | | 379237 | . Inlet Control Kit | 1 |
| 2 | 309320 | . Housing & Nipple Assembly | 1 | *26 | 309455 | . . Spring (Lever) | 1 |
| 3 | 309466 | . Valve (Fuel Pump) | 2 | *27 | 309420 | . . Lever (Inlet Control) | 1 |
| 4 | 310822 | . Screw (Valve to Hsg.) | 2 | *28 | 309456 | . . Hinge Pin | 1 |
| 5 | 380614 | . Carburetor Body | 1 | *29 | 379232 | . Low & High Speed "Adj. Needle | 1 |
| 6 | 309422 | . . Check Valve | 1 | 30 | 309463 | . Metering Gasket | 1 |
| 7 | 309421 | . . Valve Seat | 1 | 31 | 309464 | . Pump Gasket | 1 |
| 8 | 202310 | . . Core Plug | 1 | 32 | 306915 | . Screw (Cover) | 1 |
| 9 | 303405 | . . Core Plug | 1 | 33 | 310407 | . Cover | 1 |
| 10 | 304201 | . . Lead Shot | 2 | 34 | 427369 | . Gasket (Screen) | 1 |
| 11 | 427647 | Screen - Idle Well | 1 | 35 | 427123 | . Screen | 1 |
| 12 | 309457 | . Screw (Hinge Pin) | 1 | 36 | 306310 | . Washer | 6 |
| 13 | 304598 | . "O" Ring (Slow & High Speed) | 2 | 37 | 309798 | Screw (Grommet to Carb.) | 2 |
| 14 | 471308 | . Throttle Shaft Assy. | 1 | 38 | 427139 | Retainer | 1 |
| 15 | 427572 | . Spring Throttle Shaft | 1 | 39 | 427138 | Intake Grommet | 1 |
| 16 | 310942 | . Retainer | 1 | 40 | 304609 | Keys Nut | 2 |
| 17 | 307191 | . Screw | 1 | 41 | 427203 | Bolt (Carburetor) | 2 |
| 18 | 309462 | . Screw (Idle Adj.) | 1 | 42 | 471116 | Reed Valve Assembly | 1 |
| 19 | 309473 | . Spring (Idle Adj.) | 1 | 43 | 427137 | . Gasket (Reed Valve to Carb.) | 1 |
| 20 | 311767 | . Throttle Valve | 1 | 44 | 427136 | . Gasket (Rear Handle) | 1 |
| 21 | 303760 | . Screw (Throttle Valve) | 2 | 45 | 303764 | . Screw (Plate) | 8 |
| *22 | 379234 | . Fuel Pump Diaphragm & Gasket Set | 1 | 46 | 427135 | . Retainer Plate | 4 |
| 23 | 309323 | . Plate (Diaphragm Carb.) | 1 | 47 | 427134 | . Reed | 4 |
| 24 | 379233 | . Metering Diaphragm & Gasket Set | 1 | 48 | 427126 | Pickup Line | 1 |
| | | | | 49 | 427579 | Spring (Grommet) | 1 |

*Included in Repair Kit 379235

+Not shown

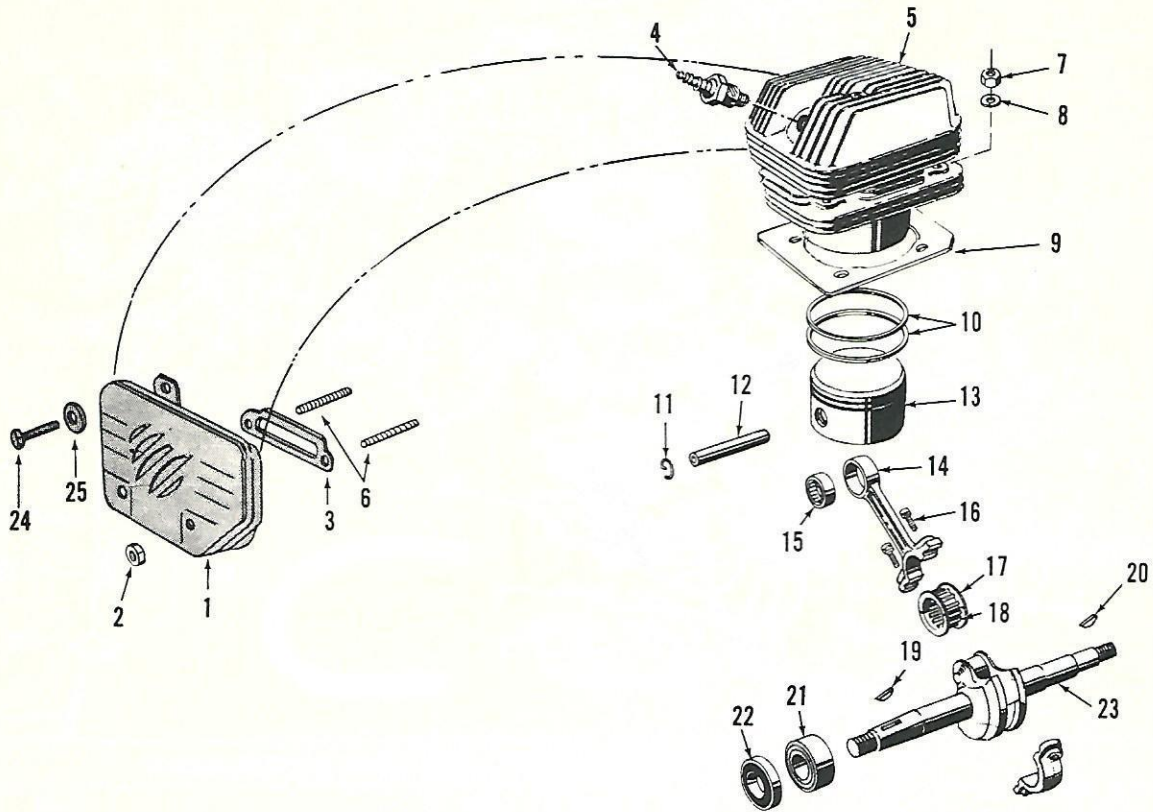
MAGNETO



MAGNETO PARTS LIST

| Ref. No. | Part No. | Description | Qty. Req'd. | Ref. No. | Part No. | Description | Qty. Req'd. |
|----------|----------|--------------------------------|-------------|----------|----------|---------------------------|-------------|
| 1 | 580454 | Coil & Lamination Assembly | 1 | 13 | 426528 | Condenser | 1 |
| 2 | 510397 | Screw | 3 | 14 | 307247 | Washer | 1 |
| 3 | 300154 | Washer | 1 | 15 | 510189 | Oiler Wick | 1 |
| 4 | 426232 | High Tension Wire | 1 | 16 | 510579 | Housing (Contact Breaker) | 1 |
| 5 | 580339 | Sparky Assembly | 1 | 17 | 426522 | Terminal Screw | 1 |
| 6 | 580486 | Flywheel Assembly | 1 | 18 | 470942 | Switch Wire Assembly | 1 |
| 7 | 510577 | Cover (Breaker Housing) | 1 | 19 | 425338 | Switch Wire Grommet | 1 |
| 8 | 303497 | Washer | 2 | 20 | 307189 | Washer | 1 |
| 9 | 510185 | Eccentric Screw | 1 | 21 | 510603 | Cam | 1 |
| 10 | 309040 | Clamp (Ign. Wire) | 1 | 22 | 580560 | Breaker Point Set | 1 |
| 11 | 307193 | Screw (Condenser to Crankcase) | 2 | 23 | 120001 | Clamp | 1 |
| 12 | 302437 | Nut | 2 | 24 | 306460 | Screw | 1 |
| | | | | 25 | 303916 | Washer | 1 |
| | | | | 26 | 130450 | Nut | 1 |

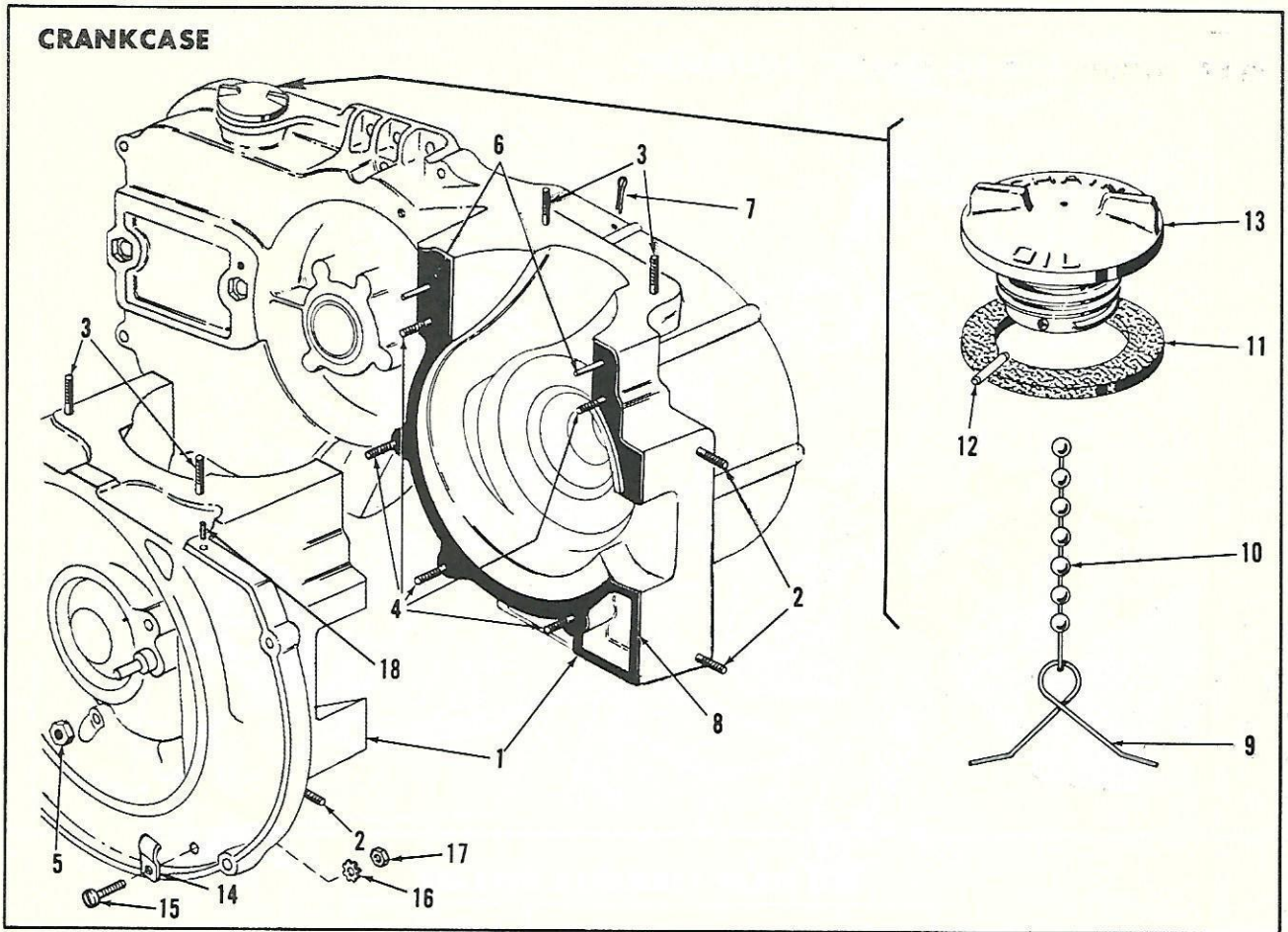
ENGINE



ENGINE PARTS LIST

| Ref. No. | Part No. | Description | Qty. Req'd. | Ref. No. | Part No. | Description | Qty. Req'd. |
|----------|----------|--------------------------|-------------|----------|----------|--------------------------|-------------|
| 1 | 471298 | Muffler Assembly | 1 | 15 | 425060 | . Needle Bearing | 1 |
| 2 | 304609 | Nut (Muffler) | 2 | 16 | 304610 | . Screw - Socket Head | 2 |
| 3 | 427600 | Gasket (Muffler) | 1 | 17 | 470927 | Bearing Cage Assembly | 1 |
| 4 | 378101 | J-4-J Spark Plug (850) | 1 | 18 | 470926 | Needles (Pkg. of 12) | 1 |
| 5 | 471292 | Cylinder Block | 1 | 19 | 425061 | Key - Flywheel | 1 |
| 6 | 427601 | . Stud (Muffler) | 2 | 20 | 425061 | Key - Clutch (Model 850) | 1 |
| 7 | 306397 | Nut (Cyl. to C'case.) | 4 | | | | |
| 8 | 306396 | Washer (Cyl. to C'case.) | 4 | 21 | 425066 | Bearing | 2 |
| 9 | 427523 | Gasket (Cylinder Base) | 1 | 22 | 425076 | Seal | 2 |
| 10 | 471002 | Ring Set | 1 | 23 | 427365 | Crankshaft (Model 850) | 1 |
| 11 | 425062 | Retaining Ring | 2 | | | | |
| 12 | 427480 | Wrist Pin | 1 | 24 | 302468 | Screw - (Muffler) | 1 |
| 13 | 428175 | Piston | 1 | 25 | 308134 | Washer (Muffler) | 1 |
| 14 | 470168 | Connecting Rod | 1 | | | | |

CRANKCASE

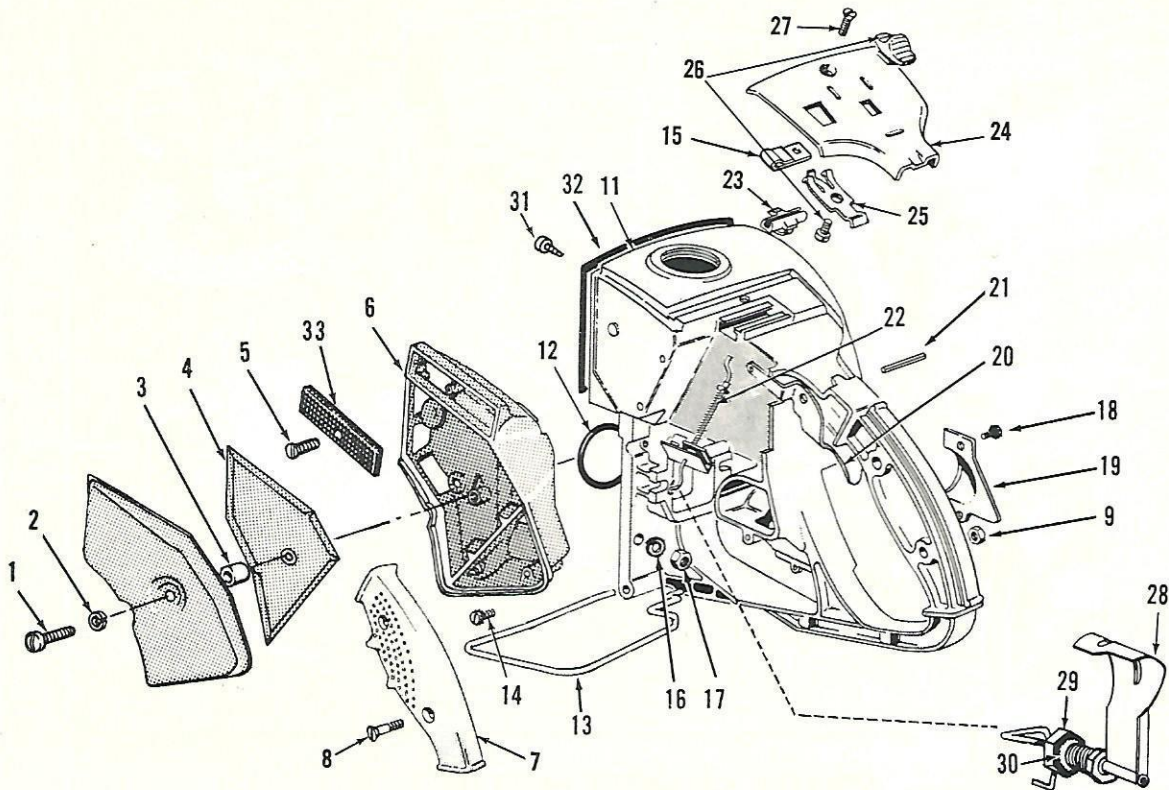


CRANKCASE PARTS LIST

| Ref. No. | Part No. | Description | Qty. Req'd. |
|----------|----------|--------------------------------|-------------|
| 1 | 470932 | Crankcase Assembly | 1 |
| 2 | 426642 | . Stud (Crankcase Rear Handle) | 3 |
| 3 | 426702 | . Stud (Cylinder) | 4 |
| 4 | 425578 | . Stud (Blower Half) | 5 |
| 5 | 304609 | . Keps Nut | 5 |
| 6 | 427073 | . Taper Pin | 2 |
| 7 | 306370 | . Cotter Pin | 1 |
| 8 | 427509 | . Gasket | 1 |
| * | 470976 | Oil Filler Cap Assembly | 1 |
| 9 | 427288 | . Lock Spring | 1 |
| 10 | 427277 | . Bead Chain | 1 |
| 11 | 425074 | . Gasket | 1 |
| 12 | 427289 | . Pin | 1 |
| 13 | 427286 | . Body | 1 |
| 14 | 120001 | Clamp | 1 |
| 15 | 306460 | Screw | 1 |
| 16 | 303916 | Washer | 1 |
| 17 | 130450 | Nut | 1 |
| 18 | 311534 | Roll Pin | 1 |

*Not shown

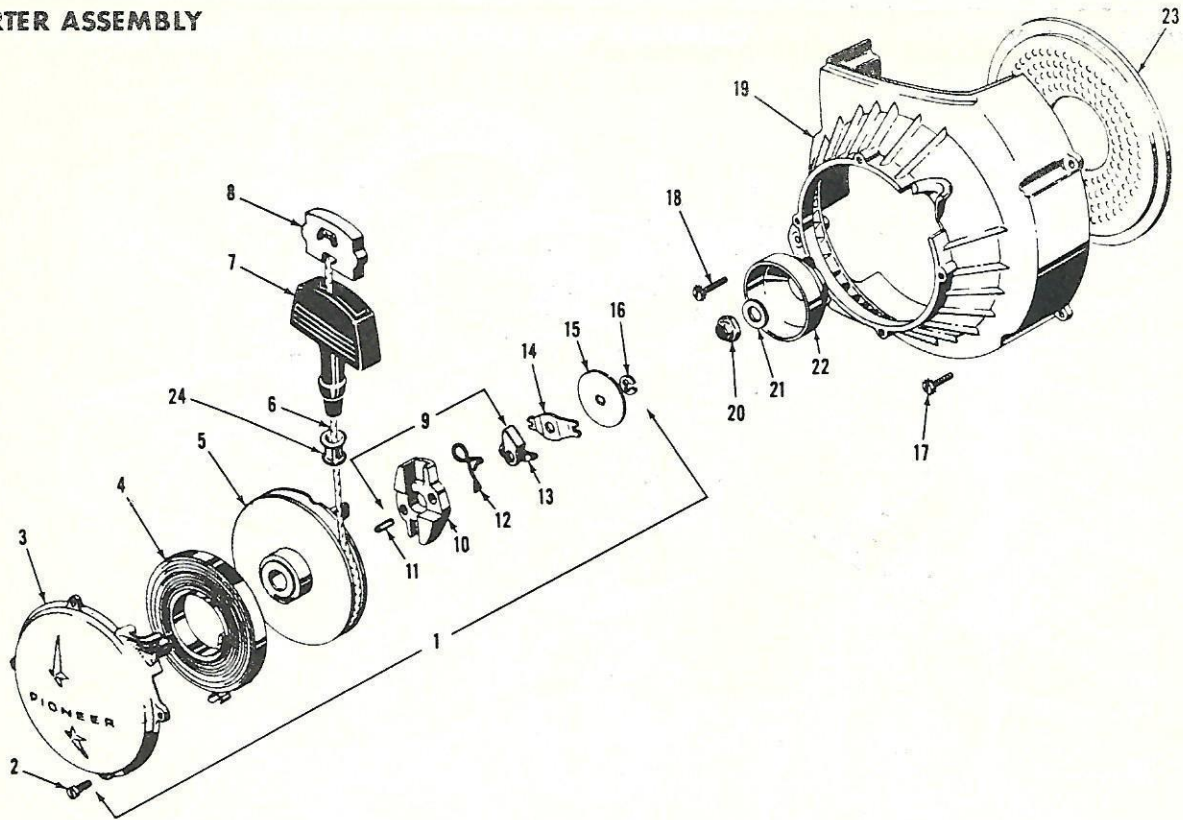
REAR HANDLE AND AIR CLEANER ASSEMBLIES



REAR HANDLE AND AIR CLEANER ASSEMBLIES PARTS LIST

| Ref. No. | Part No. | Description | Qty. Req'd | Ref. No. | Part No. | Description | Qty. Req'd |
|----------|----------|---------------------------------------|------------|----------|----------|--------------------------------|------------|
| * | 471521 | Filter Cover Assembly | 1 | 17 | 306397 | Nut (Rear Handle to Crankcase) | 3 |
| 1 | 427257 | . Screw | 1 | 18 | 307019 | Screw (Cover) | 2 |
| 2 | 306396 | . Lockwasher | 1 | 19 | 427118 | Air Passage Cover | 1 |
| 3 | 427258 | . Spacer | 1 | 20 | 427131 | Throttle Trigger | 1 |
| 4 | 427985 | Filter Element Assembly | 1 | 21 | 426636 | Roll Pin | 1 |
| 5 | 307193 | Screw | 1 | 22 | 471307 | Throttle Link Ass'y | 1 |
| 6 | 471617 | Air Filter Body | 1 | 23 | 426490 | Terminal Block | 1 |
| 7 | 471003 | Grip (Two Halves) | 1 | 24 | 470957 | Control Panel Assembly | 1 |
| 8 | 427248 | . Screw (Grip) | 2 | 25 | 426489 | . Switch Spring | 1 |
| 9 | 133079 | . Nut (Grip) | 2 | 26 | 471115 | . Switch Button & Screw | 1 |
| 11 | 470951 | Rear Handle and Tank Assembly | 1 | 27 | 427160 | Screw (Control Panel) | 1 |
| 12 | 425030 | "O" Ring (Rear Handle to Crankcase) | 1 | 28 | 471305 | Vane Ass'y. | 1 |
| 13 | 427155 | Foothold Loop | 1 | 29 | 427615 | . Nut (Vane) | 1 |
| 14 | 302948 | Screw (Body) | 1 | 30 | 309819 | . Lockwasher | 1 |
| 15 | 309040 | Clamp | 1 | 31 | 427534 | Screw | 16 |
| 16 | 306396 | Lockwasher (Rear Handle to Crankcase) | 3 | 32 | 428247 | Gasket | 1 |
| | | | | 33 | 428178 | Screen | 1 |

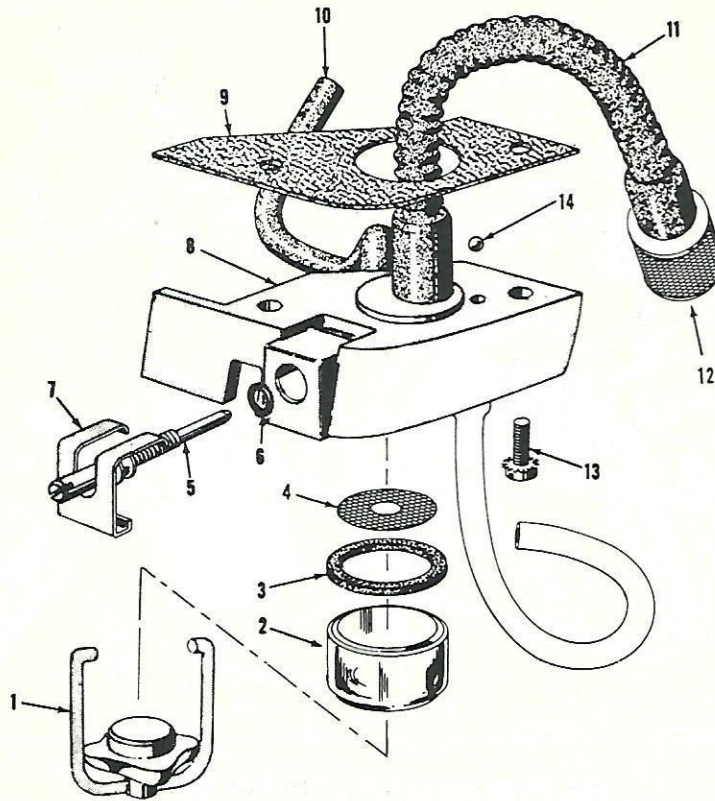
STARTER ASSEMBLY



STARTER ASSEMBLY PARTS LIST

| Ref. No. | Part No. | Description | Qty. Req'd. |
|----------|----------|--------------------------------------|-------------|
| 1 | 470968 | Starter Assembly | 1 |
| 2 | 302948 | . Screw (Cover to Housing) | 4 |
| 3 | 470969 | . Starter Cover Assembly | 1 |
| 4 | 427158 | . Starter Rewind Spring | 1 |
| 5 | 427159 | . Starter Pulley | 1 |
| 6 | 425846 | . Starter Cord | 1 |
| 7 | 427370 | . Starter Handle | 1 |
| 8 | 427492 | . Anchor | 1 |
| 9 | 470970 | . Starter Pawl Assembly | 1 |
| 10 | 427161 | . . Pawl Block | 1 |
| 11 | 427145 | . . Roll Pin | 2 |
| 12 | 427163 | . . Pawl Spring | 1 |
| 13 | 427162 | . . Pawl | 1 |
| 14 | 427164 | . Friction Spring | 1 |
| 15 | 427165 | . Friction Plate | 1 |
| 16 | 202139 | . "E" Ring | 1 |
| 17 | 302948 | Screw (Blower to Crankcase) | 3 |
| 18 | 305725 | Screw (Blower, Lamination Crankcase) | 1 |
| 19 | 427156 | Blower Cover | 1 |
| 20 | 425916 | Flywheel Nut | 1 |
| 21 | 304671 | Washer | 1 |
| 22 | 427167 | Starter Cup | 1 |
| 23 | 427168 | Rotating Screen | 1 |
| 24 | 303560 | Eyelet | 1 |

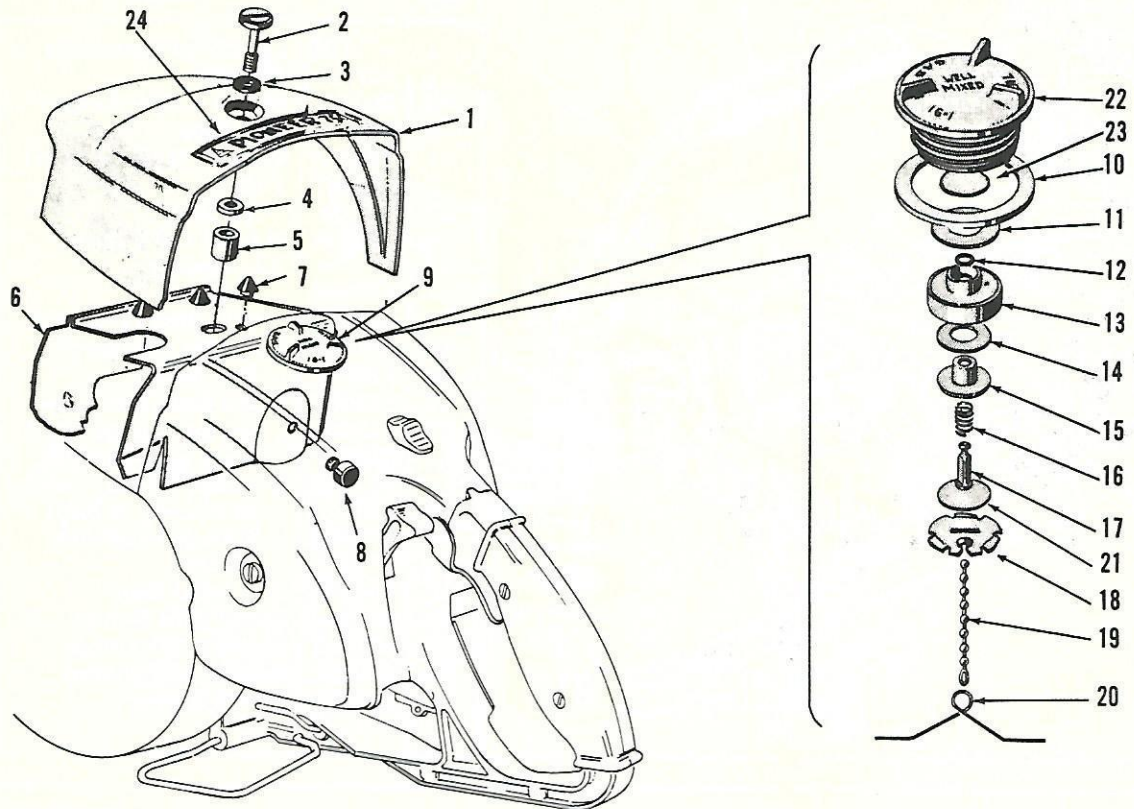
FUEL FILTER SYSTEM



FUEL FILTER SYSTEM PARTS LIST

| Ref. No. | Part No. | Description | Qty. Req'd. |
|----------|----------|---|-------------|
| | 470954 | Fuel Filter Body Assembly | 1 |
| 1 | 377607 | . Clamp Unit | 1 |
| 2 | 303121 | . Sediment Bowl | 1 |
| 3 | 427369 | . Gasket - Filter Bowl | 1 |
| 4 | 427123 | . Screen | 1 |
| 5 | 470956 | . Shut-off Valve Assembly | 1 |
| 6 | 425028 | . . "O" Ring | 1 |
| 7 | 427090 | . Fuel Filter Clip | 1 |
| 8 | 470997 | . Fuel Filter Body Assembly (Complete with Lead Shot) | 1 |
| 9 | 427124 | Gasket (Filter to Rear Handle) | 1 |
| 10 | 427125 | Hose (Filter to Primer) | 1 |
| 11 | 425343 | Flex Pickup Line | 1 |
| 12 | 471121 | Pickup Head Assembly | 1 |
| 13 | 302948 | Screw (Fuel Filter Body) | 2 |
| 14 | 304201 | Lead Shot | 1 |

OUTER AND INNER SHROUD AND GAS CAP ASSEMBLY

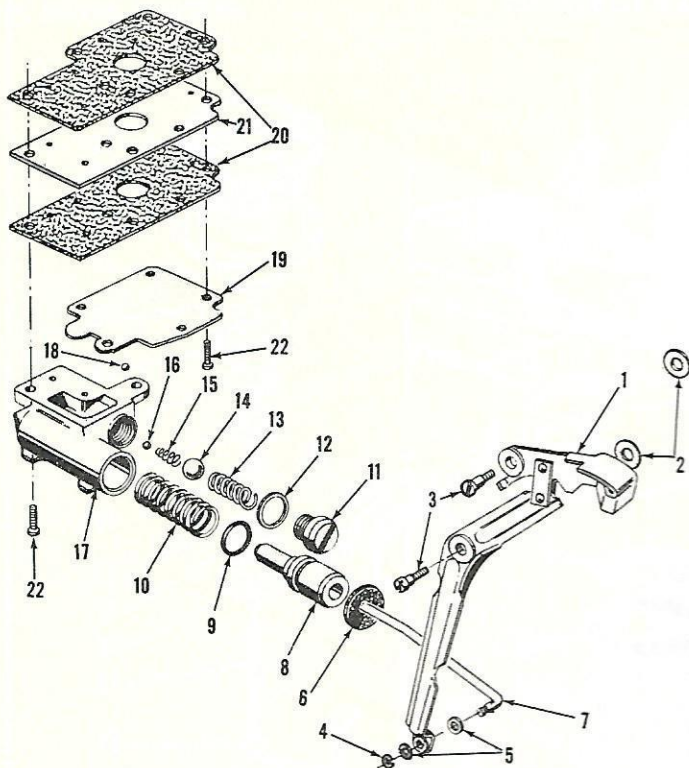


OUTER AND INNER SHROUD AND GAS CAP ASSEMBLY PARTS LIST

| Ref. No. | Part No. | Description | Qty. Req'd | Ref. No. | Part No. | Description | Qty. Req'd |
|----------|----------|------------------------|------------|----------|----------|-------------------------|------------|
| 1 | 471291 | Outer Shroud Assembly | 1 | 13 | 427276 | . Body (Valve) | 1 |
| 2 | 427094 | . Shroud Bolt | 1 | 14 | 427274 | . Valve (Vacuum) | 1 |
| 3 | 427521 | . Friction Washer | 1 | 15 | 427275 | . Backing Plate (Valve) | 1 |
| 4 | 427472 | . Washer - Shroud Bolt | 1 | 16 | 427280 | . Spring (Valve) | 1 |
| 5 | 427474 | . Spacer - Shroud Bolt | 1 | 17 | 427279 | . Stem (Valve) | 1 |
| 6 | 470943 | Inner Shroud Assembly | 1 | 18 | 427278 | . Cover | 1 |
| 7 | 426746 | . Bumper | 3 | 19 | 427277 | . Bead Chain | 1 |
| 8 | 602844 | . Rubber Cap | 1 | 20 | 427213 | . Lock Spring | 1 |
| 9 | 470964 | Gas Cap Assembly | 1 | 21 | 427993 | . Filter Disc | 1 |
| 10 | 425087 | . Gasket (Gas Cap) | 1 | 22 | 427271 | . Body | 1 |
| 11 | 427273 | . Gasket (Valve Body) | 1 | 23 | 427994 | . Filter Disc | 1 |
| 12 | 427281 | . "O" Ring (Valve) | 1 | 24 | 427624 | Decal - 850 | 1 |

OIL PUMP AND LEVER ASSEMBLIES

PARTS LIST

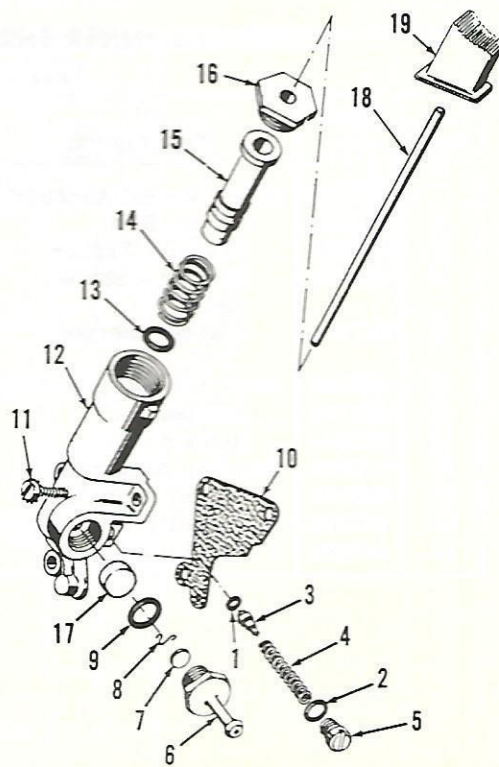


| Ref. No. | Part No. | Description | Qty. Req'd. |
|----------|----------|--------------------------|-------------|
| 1 | 471109 | Oil Lever Assembly | 1 |
| 2 | 427396 | Washer | 2 |
| 3 | 303247 | Screw (Oiler Lever) | 2 |
| 4 | 202755 | "E" Ring | 1 |
| 5 | 300154 | Washer (Oiler Lever) | 2 |
| 6 | 427367 | Felt | 1 |
| 7 | 427153 | Push Rod | 1 |
| * | 470946 | Manual Oil Pump Assembly | 1 |
| 8 | 427098 | . Plunger | 1 |
| 9 | 427360 | . "O" Ring (Plunger) | 1 |
| 10 | 427253 | . Spring (Plunger) | 1 |
| 11 | 427096 | . End Cap | 1 |
| 12 | 427097 | . Washer (End Cap) | 1 |
| 13 | 427254 | . Spring (Large Ball) | 1 |
| 14 | 426227 | . Steel Ball (Large) | 1 |
| 15 | 427251 | . Spring (Small Ball) | 1 |
| 16 | 427250 | . Steel Ball (Small) | 1 |
| 17 | 470971 | . Manual Oil Pump Body | 1 |
| 18 | 304201 | . . . Lead Shot | 1 |
| 19 | 427100 | Cover (Oil Pump) | 1 |
| 20 | 427102 | Gasket (Oil Pump) | 2 |
| 21 | 427259 | Spacer (Oil Pump) | 1 |
| 22 | 427099 | Screw (Cover) | 7 |

PARTS LIST

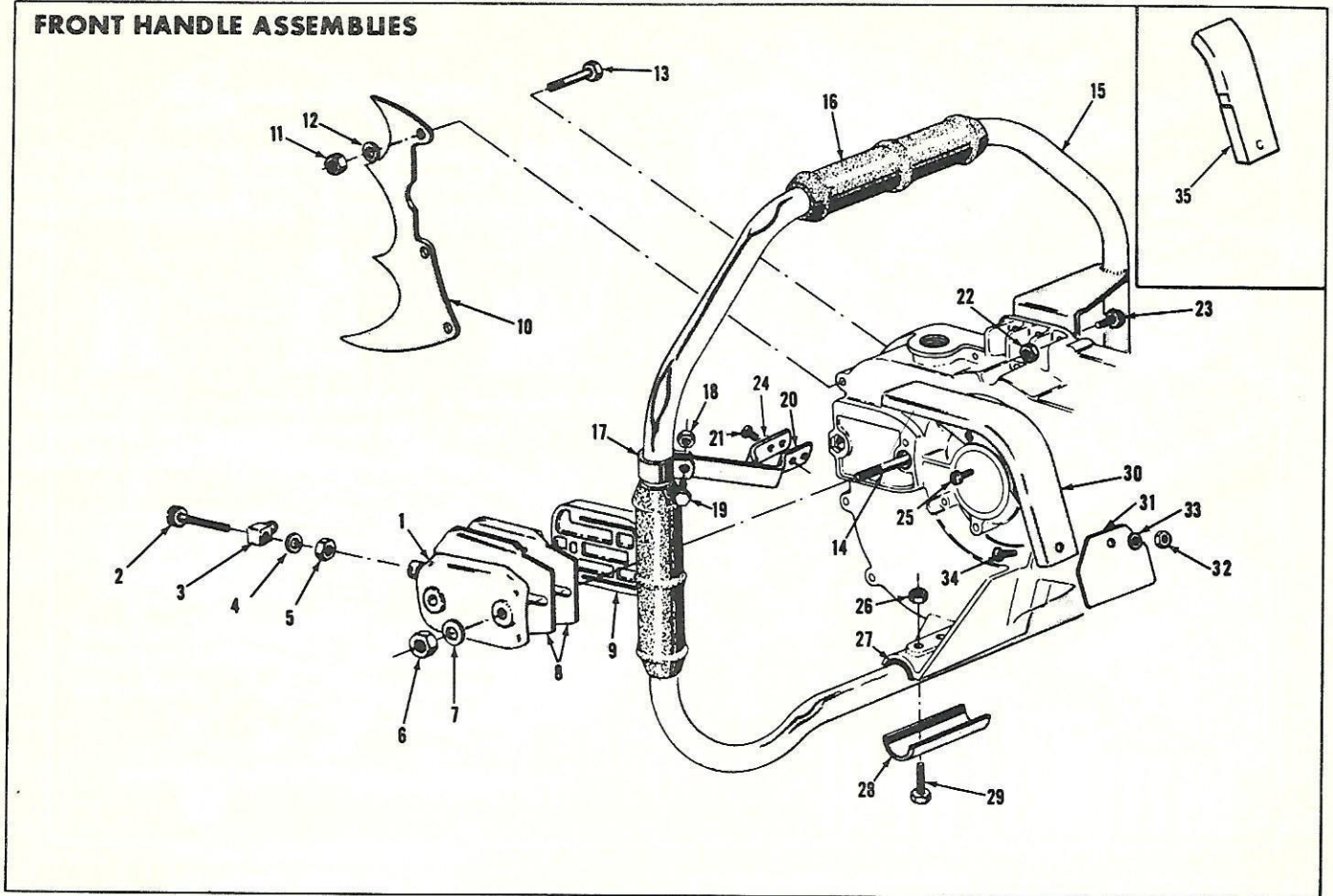
PRIMER PUMP

| Ref. No. | Part No. | Description | Qty. Req'd. |
|----------|----------|--------------------------------|-------------|
| * | 470960 | Primer Pump Assembly | 1 |
| * | 470729 | . Exit Valve Assembly | 1 |
| 1 | 308528 | . . "O" Ring | 1 |
| 2 | 426843 | . . End Cap Washer | 1 |
| 3 | † | . . Stem Exit Valve | 1 |
| 4 | † | . . Exit Valve Spring | 1 |
| 5 | † | . . End Cap - Exit Valve | 1 |
| * | 470728 | . Inlet Valve Housing Assembly | 1 |
| 6 | † | . . Inlet Valve Housing | 1 |
| 7 | 426825 | . . Disc Valve - Inlet | 1 |
| 8 | 426824 | . . Retaining Clip | 1 |
| 9 | 202893 | . . "O" Ring | 1 |
| 10 | 427151 | . Gasket (Primer Body) | 1 |
| 11 | 307613 | . Screw (Pump to Rear Handle) | 3 |
| 12 | 427140 | . Primer Pump Body | 1 |
| 13 | 427444 | . "O" Ring | 1 |
| 14 | 427142 | . Spring (Plunger) | 1 |
| 15 | 427141 | . Piston (Primer Pump) | 1 |
| 16 | 427143 | . Cap (Primer Pump) | 1 |
| 17 | 427520 | . Felt | 1 |
| 18 | 427149 | Primer Rod | 1 |
| 19 | 427150 | Primer Button | 1 |



*Not Shown
†Available in Assembly Only.

FRONT HANDLE ASSEMBLIES

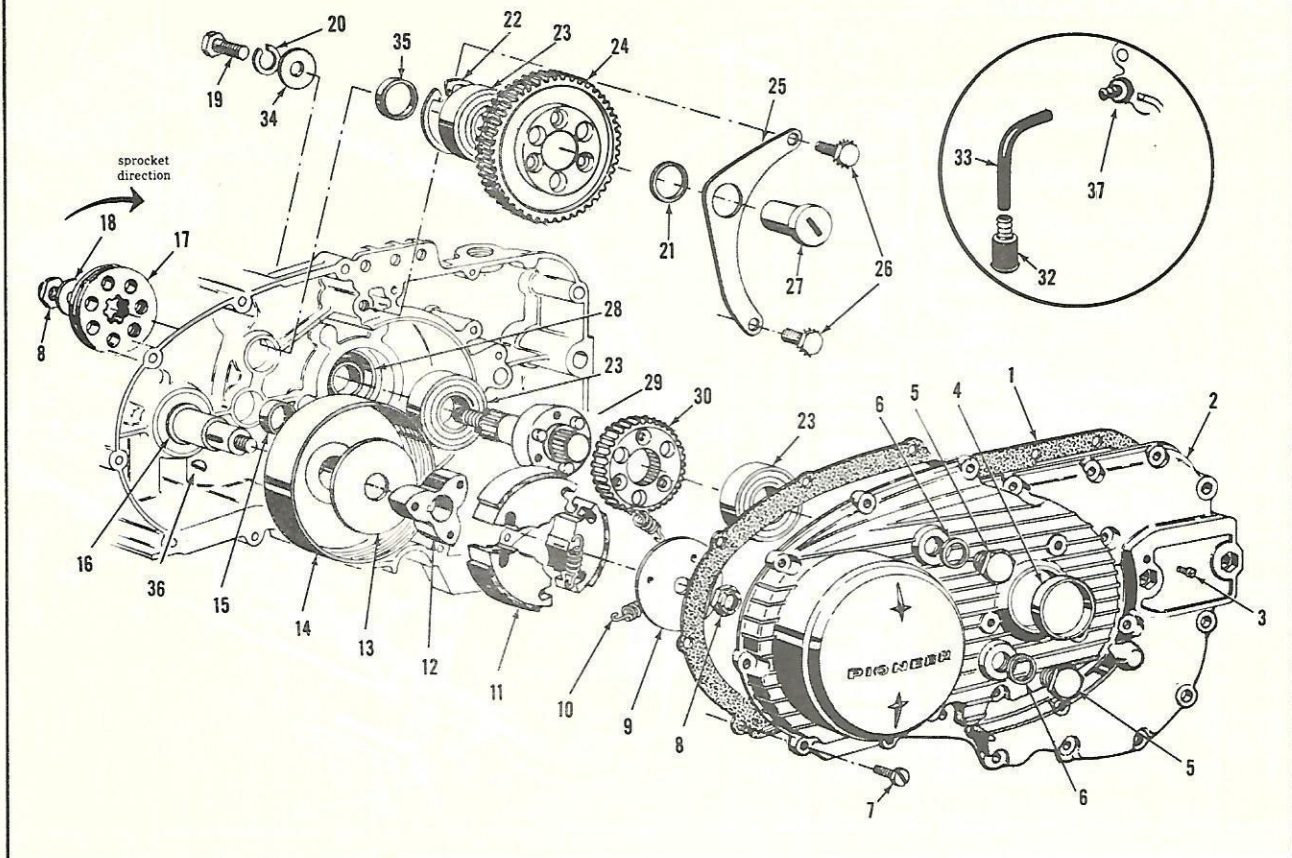


FRONT HANDLE ASSEMBLIES PARTS LIST MODEL 850 GEAR ONLY

| Ref. No. | Part No. | Description | Qty. Req'd. | Ref. No. | Part No. | Description | Qty. Req'd. |
|----------|----------|---|-------------|----------|----------|---|-------------|
| 1 | 470987 | Bar Clamp Pad Assembly | 1 | 20 | 427089 | Forward Brace | 1 |
| 2 | 427173 | . Tension Screw | 1 | 21 | 302948 | Screw (Brace to Cover) | 2 |
| 3 | 427238 | . Tension Pin | 1 | 22 | 426942 | Nut (Handle Bracket) | 2 |
| 4 | 306482 | . Washer | 1 | 23 | 603105 | Screw (Handle Bracket) | 2 |
| 5 | 427170 | . Nut | 1 | 24 | 427499 | Support (Forward Brace) | 1 |
| 6 | 427247 | Nut (Guide Bar Bolt) | 2 | 25 | 307019 | Screw (Deflector to Crankcase) | 3 |
| 7 | 427240 | Washer (Guide Bar Bolt) | 2 | 26 | 426942 | Nut (Handlebar to Crankcase) | 2 |
| 8 | 427218 | Inner and Outer Guide Plate | 2 | 27 | 427067 | Shock Absorber | 1 |
| 9 | 427217 | Bar Pad | 1 | 28 | 427223 | Clamp (Handlebar to Crankcase) | 1 |
| 10 | 427220 | Western Pivot Grip | 1 | 29 | 304627 | Screw (Handlebar to Crankcase) | 2 |
| * | 427224 | Eastern Pivot Grip | 1 | 30 | 471111 | Sawdust Deflector Assembly | 1 |
| 11 | 426942 | Nut | 3 | 31 | 427371 | . Extension Flap | 1 |
| 12 | 306358 | Washer | 3 | 32 | 427373 | . Locknut | 1 |
| 13 | 427077 | Bolt | 3 | 33 | 306413 | . Washer | 1 |
| 14 | 427080 | Guide Bar Bolt | 2 | 34 | 306286 | . Pan Head Screw | 1 |
| 15 | 470989 | Front Handle Assy. | 1 | 35 | 427443 | Sawdust Deflector (Modified for Bow Attachment) | 1 |
| 16 | 470795 | Handle Grip Assembly (Incl. 2-oz. Tube of Adhesive) | 1 | | | | |
| 17 | 427249 | Brace Clamp | 1 | | | | |
| 18 | 426942 | . Nut | 1 | | | | |
| 19 | 603105 | . Screw | 1 | | | | |

*Not Shown

GEAR SECTION



GEAR SECTION PARTS LIST

| Ref. No. | Part No. | Description | Qty. Req'd. | Ref. No. | Part No. | Description | Qty. Req'd. |
|----------|----------|-------------------------|-------------|----------|----------|------------------------------|-------------|
| 1 | 427183 | Gasket (Gear Cover) | 1 | 19 | 306861 | Bolt (Idler Spindle) | 1 |
| 2 | 471187 | Gear Case Cover | 1 | 20 | 306325 | Lockwasher | 1 |
| 3 | 306373 | Screw - Chain Oil | 1 | 21 | 427197 | Spacer (Idler Spindle) | 1 |
| 4 | 427199 | Cover (Output Shaft) | 1 | * | 470982 | Idler Gear Assembly | 1 |
| 5 | 427211 | Plug - Gear Oil | 2 | 22 | 425067 | . Retaining Ring | 1 |
| 6 | 170280 | Plug Screw Gasket | 2 | 23 | 425066 | . Bearing | 3 |
| 7 | 302948 | Screw (Gear Cover) | 17 | 24 | 427482 | . Gear (47-tooth) | 1 |
| 8 | 427181 | Nut (Clutch & Sprocket) | 2 | 25 | 427201 | Bracer Plate (Idler Spindle) | 1 |
| 9 | 427486 | Washer (Clutch) | 1 | 26 | 552421 | Bolt (Plate to Crank-case) | 2 |
| * | 470974 | Clutch Assembly | 1 | 27 | 427202 | Idler Gear Spindle | 1 |
| 10 | 427178 | . Clutch Spring | 3 | 28 | 425076 | Seal | 1 |
| 11 | 470975 | . Clutch Shoe | 3 | 29 | 471191 | Output Shaft | 1 |
| 12 | 427175 | . Clutch Driver | 1 | 30 | 427483 | Gear (32-tooth) | 1 |
| 13 | 427491 | Retainer Plate | 1 | 32 | 470193 | Oiler Pickup Assembly | 1 |
| 14 | 471680 | Clutch Drum Assembly | 1 | 33 | 427361 | Oiler Inlet Tube | 1 |
| 15 | 427182 | Plug (Idler Spindle) | 1 | 34 | 425116 | Plain Washer | 1 |
| 16 | 427180 | Thrust Washer | 1 | 35 | 427451 | Spacer | 1 |
| 17 | 427132 | Sprocket | 1 | 36 | 425061 | Key | 1 |
| 18 | 427240 | Washer Sprocket | 1 | 37 | 427212 | Oiler Connector | 1 |

*Not shown

FALLING AND BUCKING

Although there are many varied methods applied in the field, we will simply illustrate only a few of the more common methods of falling, bucking and limbing.



Easy to make - commonly made in small trees
Saves timber - leaves butt end square
Variation of type "A".



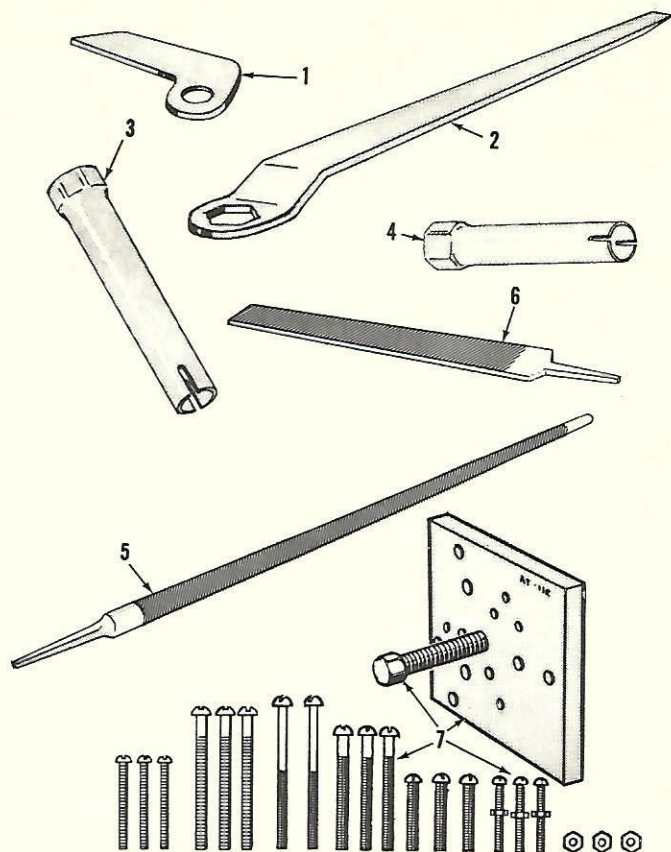
Step type undercut - this kind is used on large trees
Limbing heavy trees - undercut limb at "A" before making cut "B"



Wrong slope for bucking - will pinch chain and bar.



Right slope - log will fall free without bind



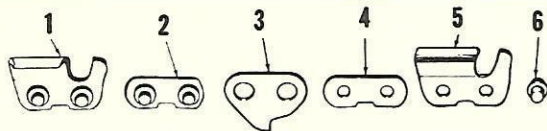
RECOMMENDED TOOLS FOR FIELD MAINTENANCE

| Item No. | Part No. | Description |
|----------|----------|--------------------------------|
| 1 | 427244 | Sprocket securing tool |
| 2 | 427245 | 9/16" wrench and Screw driver |
| 3 | 425733 | Spark Plug wrench |
| 4 | 426991 | 7/16" deep wrench |
| 5 | 425592 | 1/4" full round file |
| 6 | 426992 | Smooth edge flat jointing file |
| 7 | 471141 | Puller set |

SUGGESTED EXTRA TOOLS

7/16" open end wrench
wire feeler gauge .020"

CHAIN PARTS LIST ALWAYS USE GENUINE PIONEER BARS & CHAINS



| Ref. No. | Part No. F6EH | Part No. F6EJ | Description |
|----------|---------------|---------------|---------------------|
| 1 | 471040 | 471040 | Preset R. H. Cutter |
| 2 | 471041 | 471041 | Preset Side Link |
| 3 | 427308 | 427330 | *Center Link |
| 4 | 427309 | 427309 | Side Link |
| 5 | 427311 | 427311 | L. H. Cutter |
| 6 | 427312 | 427312 | Rivet |
| | 471039 | 471045 | Spares Kit |

* NOTE - Pioneer Duracut 1/2" pitch chain is available in two gauges: 1 F6EH, which is .058 gauge and has No. 427308 center links. 2 F6EJ, which is .063" gauge and has No. 427330 center links.

CAUTION - Be sure of your chain gauge when ordering replacement parts.

GUIDE BARS AND CHAIN LIST

| Cutter Bars Part No. | Chain F6EJ Part No. | Chain F6EH Part No. | Gear Drive Length |
|----------------------|---------------------|---------------------|-------------------|
| 471020 | 471046 | 471030 | 20" |
| 471021 | 471047 | 471031 | 24" |
| 471022 | 471048 | 471032 | 28" |
| 471023 | 471049 | 471033 | 32" |
| 471024 | 471050 | 471034 | 36" |
| 471025 | 471051 | 471035 | 42" |
| 471026 | 471052 | 471036 | 50" |

By the makers of
JOHNSON and EVINRUDE
outboards



PIONEER

CHAIN SAWS

PETERBOROUGH, ONTARIO, CANADA • GALESBURG, ILLINOIS, U.S.A.