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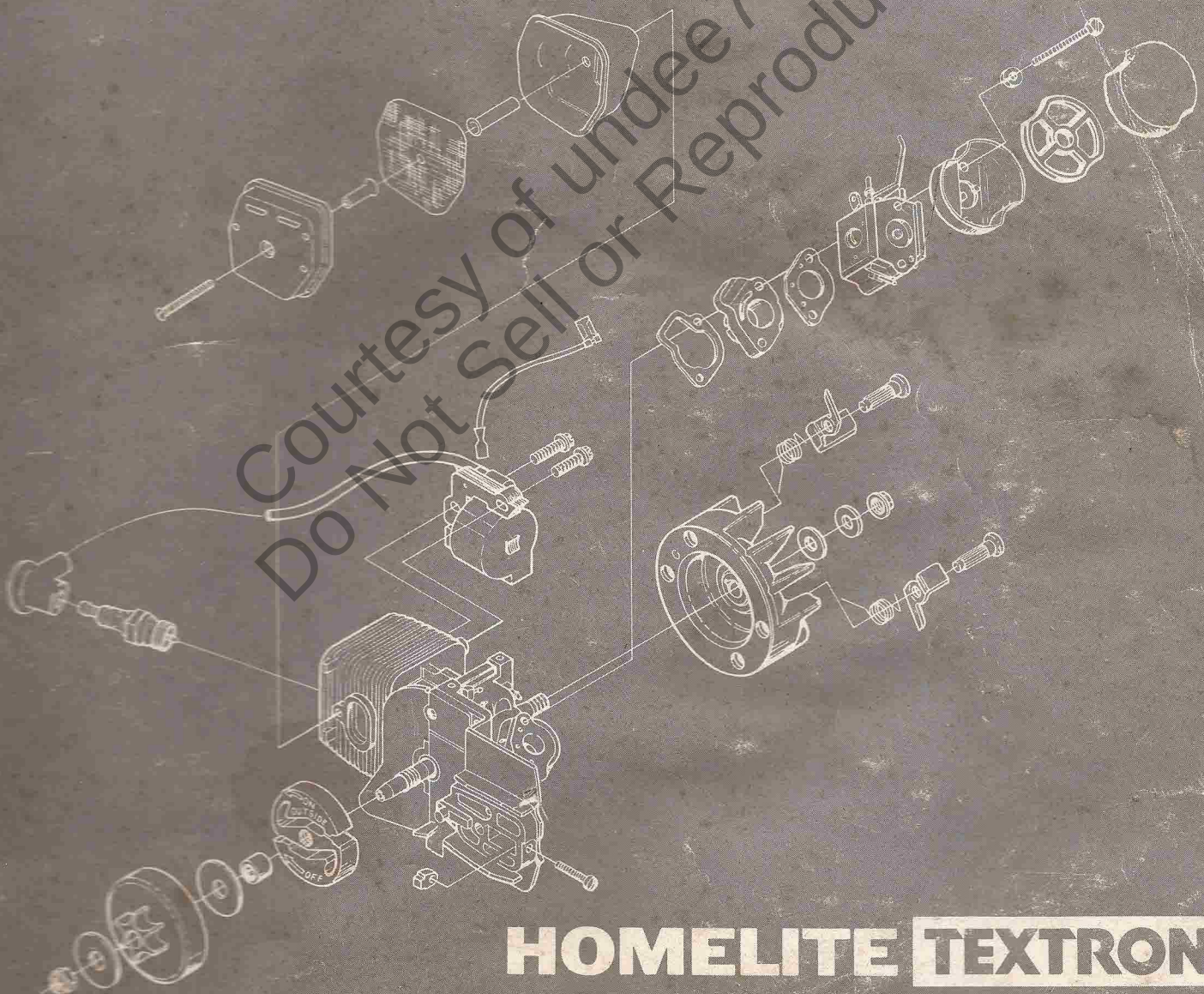
SERVICE GUIDE

XL®, XL-2 and Super 2 Chain Saws



HOMELITE TEXTRON

Homelite Division of Textron Inc.

PREFACE

This manual contains detailed instructions for the disassembly and reassembly of the XL®, XL-2 and Super-2 chain saws. Read this manual thoroughly before beginning any repairs to the saw. The troubleshooting chart is provided as an aid in the diagnosing of troubles before actual disassembly and repair of the saw is begun. Note all safety precautions to be taken during repairs.

Homelite also offers a SHOP SERVICE MANUAL #23855-5 that explains in depth such areas as carburetion, ignition, two-cycle engine theory, and bar and chain maintenance. The SHOP SERVICE MANUAL is available through your Homelite dealer or by sending a check for $7.50 to:

Homelite Division of Textron Inc.
14401 Carowinds Boulevard
P.O. Box 7047
Charlotte, North Carolina 28217
Attn: Service Department

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DISASSEMBLY SECTION

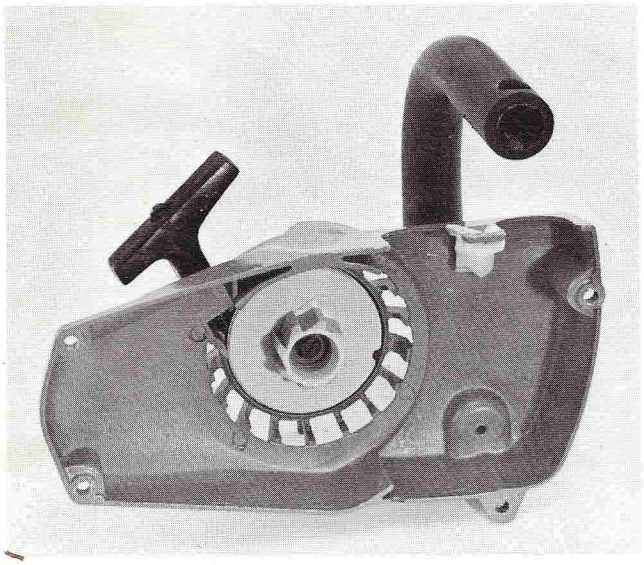

FIGURE 1

Remove the screw at the top of the handlebar and the four screws securing the starter housing to the engine housing. Lift the starter housing and the handlebar off the engine.

STARTER REPAIR

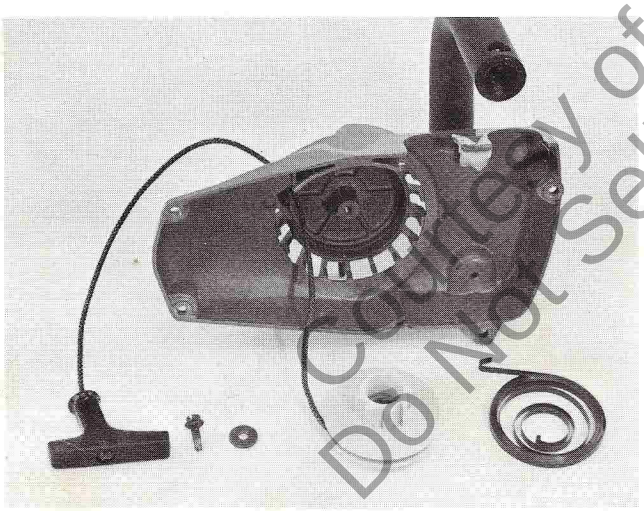

FIGURE 2

If the rope is to be replaced, cut the rope below the grip. This will immediately relieve the spring tension. Otherwise, the spring tension must be relieved by looping the rope as shown in Figure 3 and winding the pulley counterclockwise. Remove the screw which holds the pulley to the housing.

WARNING

Put on safety glasses and gloves before removing the pulley.

Grasp the toothed pulley hub and pull the pulley out about a half-inch or the width of your finger. Using a thin bladed screwdriver, insert it between the pulley and the housing to free the pulley from the spring. Push the spring coils into the housing.

CAUTION

If you lift the pulley too far out before detaching the spring, the coils may fly apart. They are difficult to rewind.

Replace the recoil spring if broken or bent. If the inner spring loop has been straightened so that it does not engage the pulley, bend the loop until it is curved enough to engage the pulley.

Replace necessary parts and lightly grease the pulley post before reassembly. Refer to Figure 3 to properly tension recoil spring.

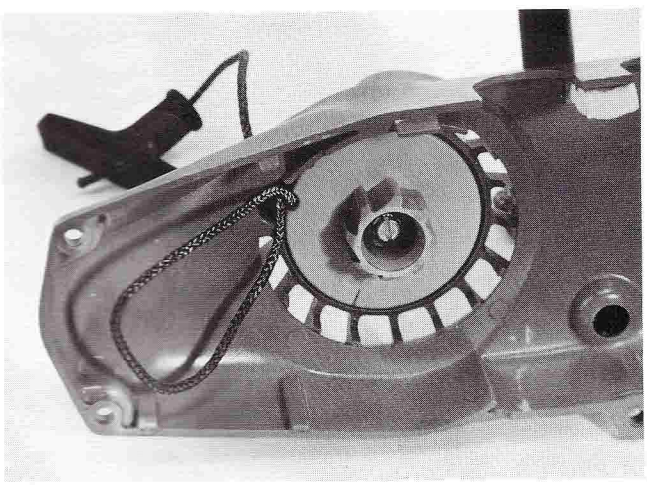

FIGURE 3

Note the rounded notch in the edge of the pulley. Pull out the grip about one foot and hold the pulley to keep it from rewinding. Turn the pulley to locate the notch at the rope

entry hole in the housing. Hook a loop of rope between the housing and the pulley. Grasp the loop and wind two turns in a clockwise direction. Place a thumb on the pulley to keep it from turning. Pull the rope through the hole.

NOTE

When reassembling starter to engine housing, place pulley against rotor while pulling the starter rope a short distance until the pulley engages the pawls. Replace fastening screws securely.

REMOVE ENGINE FROM HOUSING

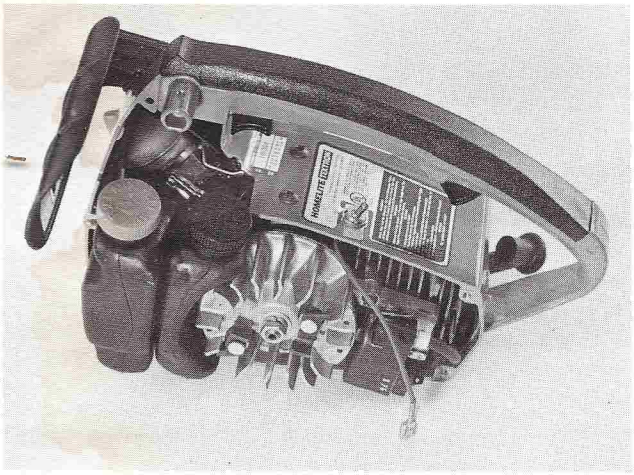

FIGURE 4

Remove plastic filter cover. Remove the switch wire from module. Remove the spark plug.

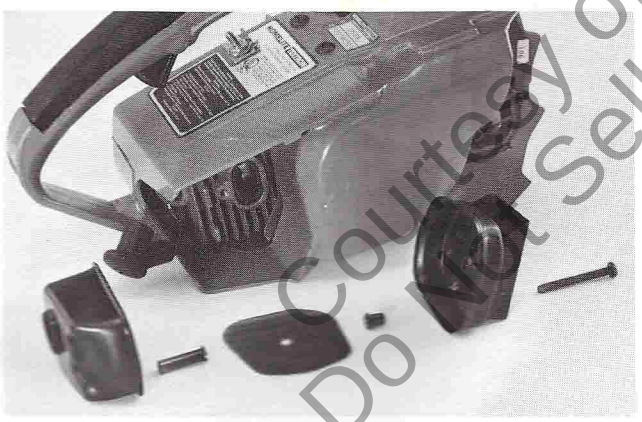

FIGURE 5

The muffler may be removed at this time. A single screw secures the muffler to the cylinder.

NOTE

Early models used a 10-24 x 1/2" hex cap screw not visible from the outside. A 9/64" Allen wrench must be inserted through the hole in the muffler cap to remove this screw.

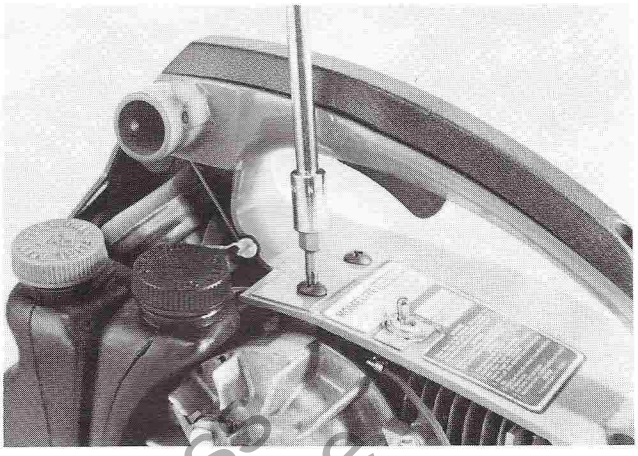

FIGURE 6

Remove the four screws (two on top and two on bottom) that fasten the engine housing to the crankcase. These screws may be Torx head screws with a screwdriver slot. A Torx bit (Homelite #24982-01 or Torx #TX25) may be necessary to remove these screws.

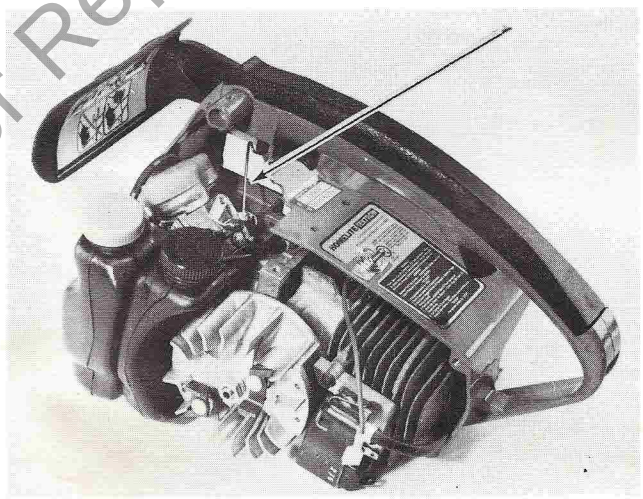

FIGURE 7

Remove the engine from the housing. The throttle rod connecting the carburetor to the throttle lever will separate from the lever when the engine seperates from the housing.

NOTE

It is not necessary to remove the throttle cover unless it is to be serviced.

DISASSEMBLING ENGINE

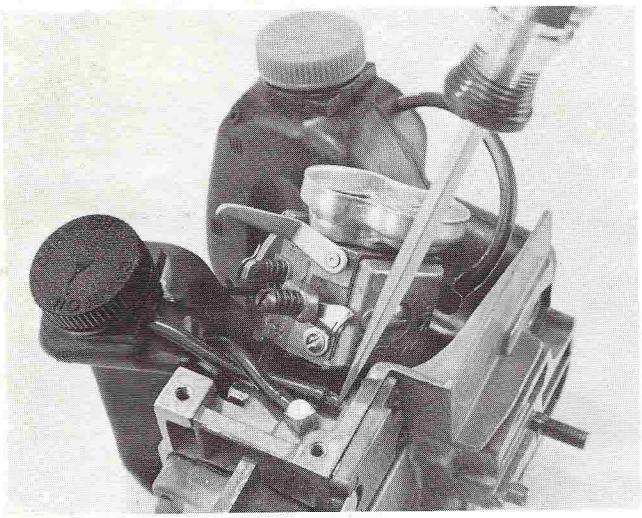

FIGURE 8

Before removing the fuel and oil tubes from their fittings, mark each tube for reassembly purposes. Use a screwdriver to push the tubes from their fittings.

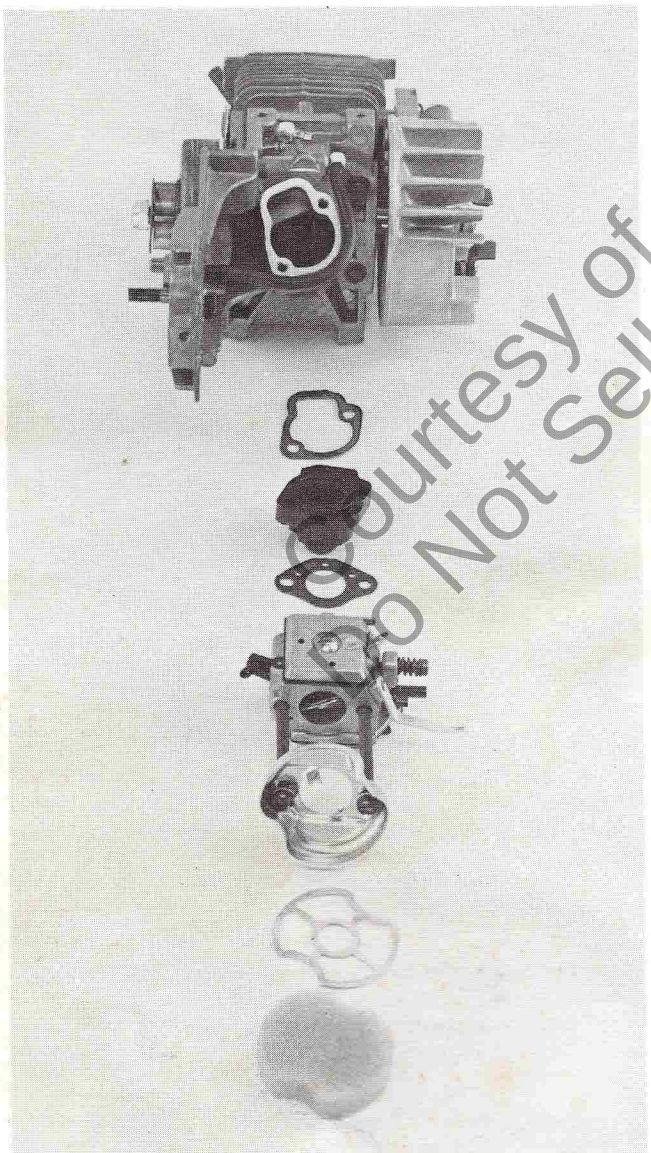

FIGURE 9

Remove the air filter and filter support. Use a 5/16" socket to remove the two screws that secure the carburetor to the crankcase. It may be necessary to gently tap the carburator to break it away from the manifold. Repeat this to free the manifold from the crankcase.

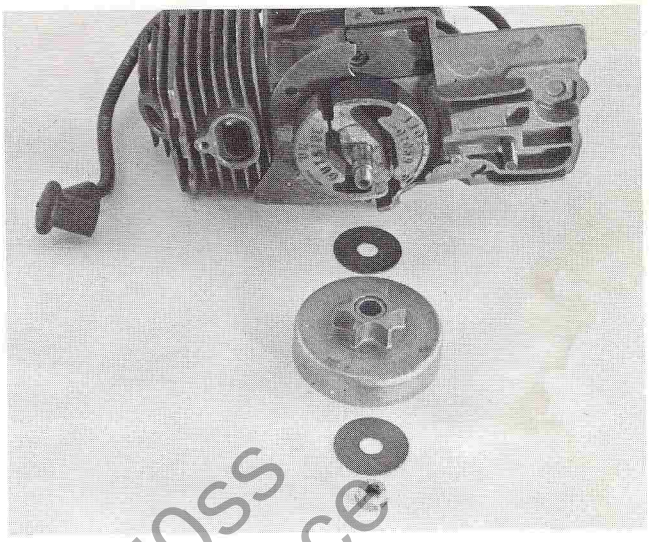

FIGURE 10

To remove the sprocket and drum, remove the crankshaft nut using a 1/2" socket. Early models used a tru-arc ring to secure the sprocket. This ring must be expanded and lifted out of the shaft groove. On early models, only one washer was used.

CAUTION

Wear eye protection when removing this retaining ring. The ring is under tension and may release prematurely.

NOTE

Do not reuse the retaining ring. Install a new ring with the curved edge toward the sprocket.

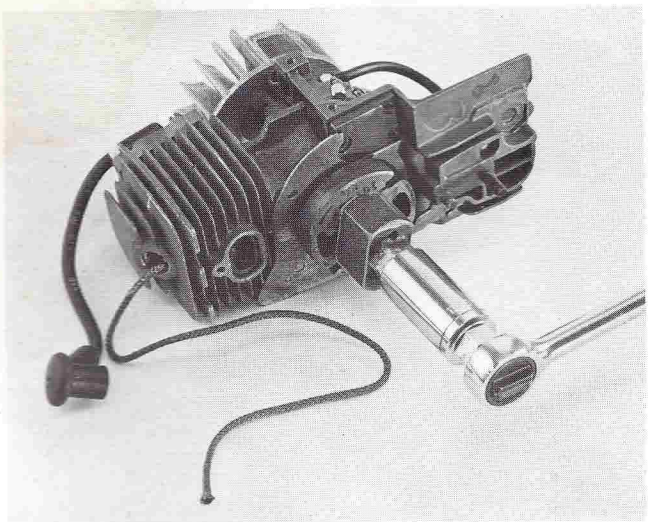

FIGURE 11

When removing the clutch it will be necessary to hold the crankshaft to keep it from turning. To do this rotate the shaft until the piston reaches its lowest point of travel. Insert 2"-3" of starter rope into the cylinder (as shown). Slowly turn the shaft until it locks. Using a spanner wrench (Homelite A-93791) and a 13/16" socket, turn the clutch in the direction noted on the clutch.

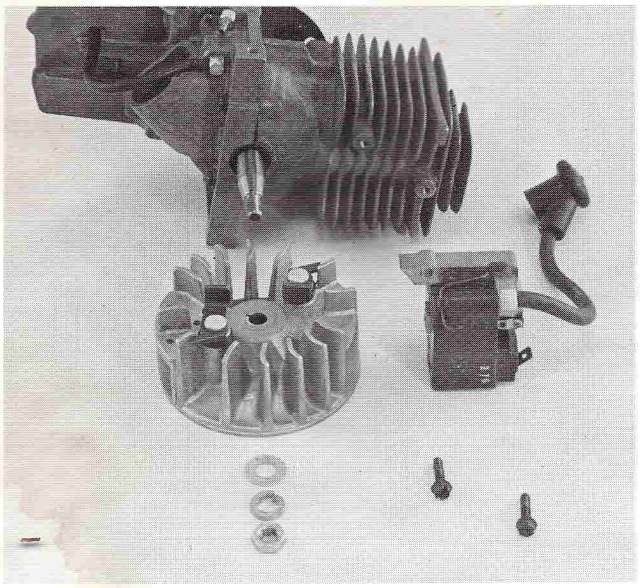

FIGURE 12

With the shaft locked, use a 1/2" socket to remove the rotor nut. Some models may require a 3/8" socket. The module may be removed at this time, if necessary. Use a 1/4" socket.

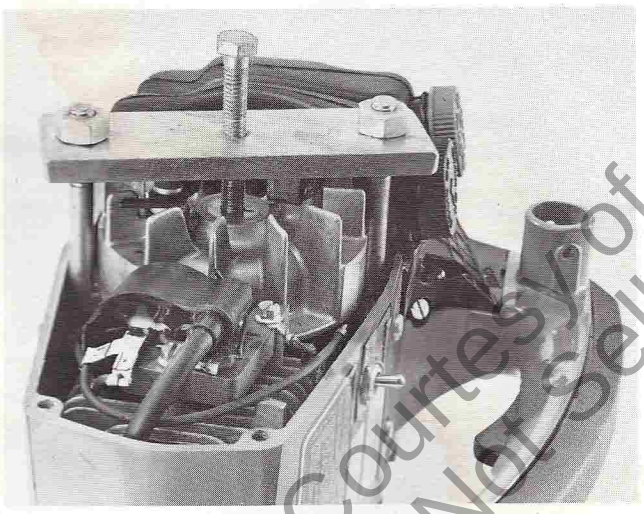

FIGURE 13

Install rotor tool (Homelite #A-24747-A) as shown. Tighten the center screw until the rotor loosens. Remove points and condenser if necessary.

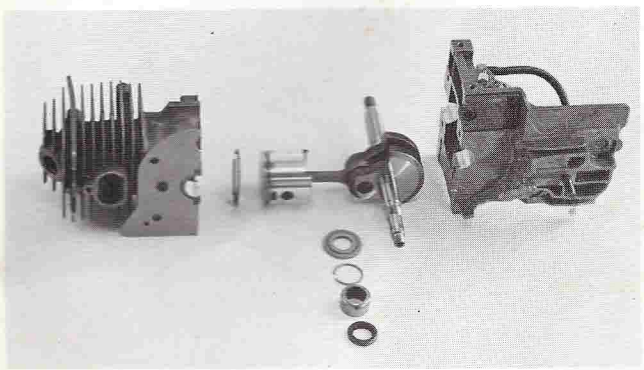

FIGURE 14

Remove the four screws which hold the crankcase to the cylinder. Tap the crankcase with a plastic hammer to break the Silastic seal between the mating surfaces. Once this is done, remove the crankshaft assembly.

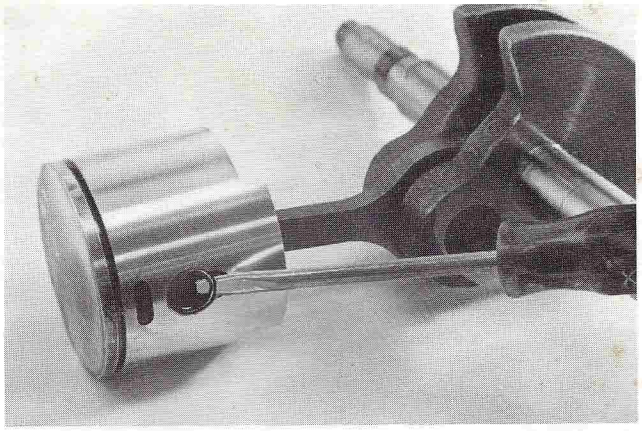

FIGURE 15

The piston may be removed from the connecting rod by placing a small screwdriver or awl in the notch located on the rotor side of the piston. Pry out the piston pin retaining ring and push out the piston pin.

FIGURE 16

The crankshaft needle bearings are retained in their cage by grease. When the bearings are removed they may fall out of the cage. In order to prevent this, wrap a small piece of paper around the shaft and slide the bearing over the paper. Remove the paper and bearing together. This will hold the needles in place. The crankshaft, connecting rod and connecting rod bearings must be replaced as a complete assembly.

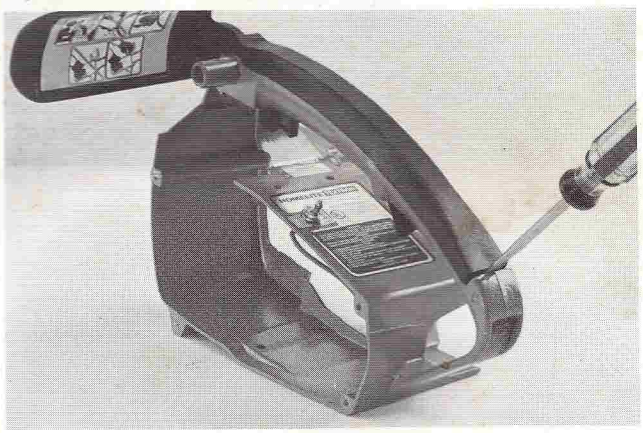

FIGURE 17

To remove the throttle assembly cover, insert a wide blade screwdriver between the rear of the cover and the engine housing. Grasp the rear trigger and twist the screwdriver handle while pushing it forward. Care should be taken not to break the cover tab. Holding the rear trigger will prevent the spring-loaded throttle rod from popping out. On saws having only a single trigger, remove the screw in the rear of the cover and lift the cover off.

FIGURE 18

This figure shows the throttle levers and linkage properly assembled.

REASSEMBLY SECTION

Reverse the above procedure to reassemble the saw. Follow the special instructions given below to correctly reassemble the saw.

CRANKCASE AND CYLINDER AREA

The piston must be assembled to the connecting rod so that the piston ring gap is opposite the exhaust port.

1. Install the thrust washer with the flanged (or raised) side of the washer facing outward.
2. Install the bearings with the lettered (or flat) side facing outward.
3. Lubricate shaft seals with oil before installing onto shaft. After assembling the powerhead, the outer seal surface must be flush with the cylinder and crankcase.
4. Clean the cylinder and crankcase mating surfaces thoroughly.
5. Apply a film of oil to the cylinder bore before inserting the piston.
6. Apply a very light coat of Silastic sealant (Homelite #24823) to the cylinder and crankcase mating surfaces, including the bearing bore.
7. Assemble the cylinder to the crankcase. Secure but *do not* tighten the 4 crankcase screws. Gently tap each end of the crankshaft with a plastic hammer. This will establish "end play" in the shaft. The saw will bind and will not run without end play. Tighten all 4 screws.
8. IMPORTANT: Refer to the "Torque Specification Section" before tightening each fastening part.

FIGURE 19

ENGINE HOUSING AREA

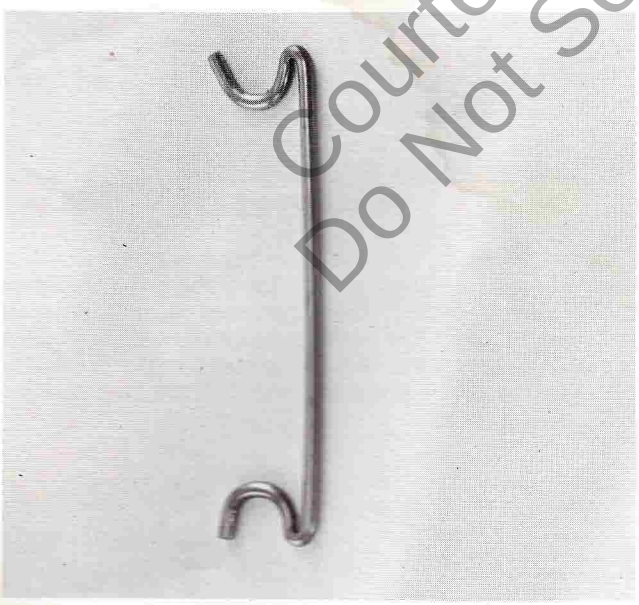

FIGURE 20

Note that the throttle rod has a bend in each end. One of the two bends is closed more than the other (as shown on the bottom portion of Figure 20). This end of the rod will be placed into the carburetor lever.

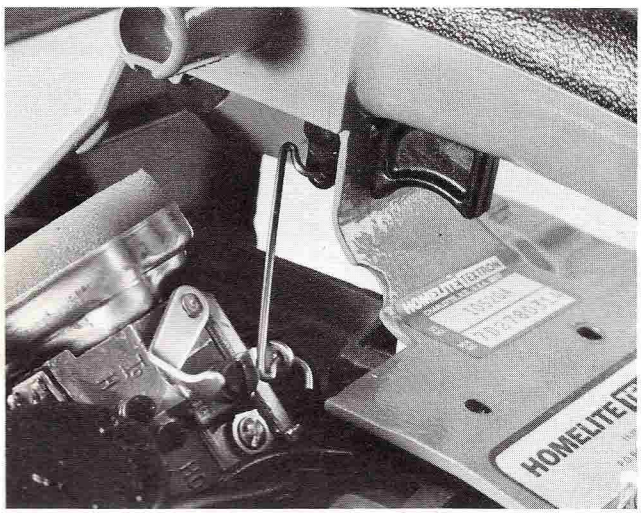

FIGURE 21

Slide the engine halfway into the housing. Align the throttle rod with the hole in the plastic throttle lever. Push the engine into the housing.

NOTE

The spark plug lead must be routed underneath the first two cylinder fins. Do not route it between the rear of the cylinder and engine housing.

IGNITION SECTION

TROUBLESHOOTING CHART FOR IGNITION SYSTEM

SYMPTOM: NO SPARK AT THE SPARK PLUG

Possible Cause	Remedy
Spark plug fouled	Clean and regap spark plug.
Electrode gap incorrect	Regap spark plug.
Spark plug wire damaged	Inspect and replace.
Faulty switch	Disconnect switch wire and test for spark.
Breaker point contacts burned	Inspect, clean and regap or replace.
Breaker point gap incorrect	Regap to .015".
Rotor air gap incorrect	Regap to .015".

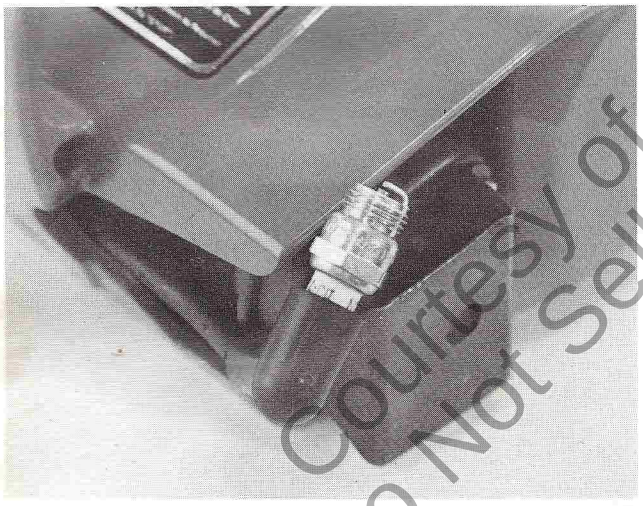

FIGURE 22

To check for ignition spark, first remove the spark plug from the cylinder. Check that the electrode gap is set to .025". Connect the boot assembly to the spark plug terminal. Then lay the spark plug in contact with the muffler as shown. With the ignition switch on, pull the starter rope briskly. A spark should be seen at the spark plug electrode. If not, install a test spark plug and repeat the procedure. A test spark plug can be made by breaking the side electrode off of a new DJ-7J spark plug. If the ignition system can fire a spark across the 1/8" gap, it should fire under compression. If no spark is evident, disconnect the switch lead and repeat test.

NOTE

A solid state module will not produce a spark unless the rotor is turned briskly by the starter assembly. Solid state modules produce an orange "pin-like" spark best seen in the dark. Breaker point ignition systems will produce a heavy blue spark when the rotor is turned by hand.

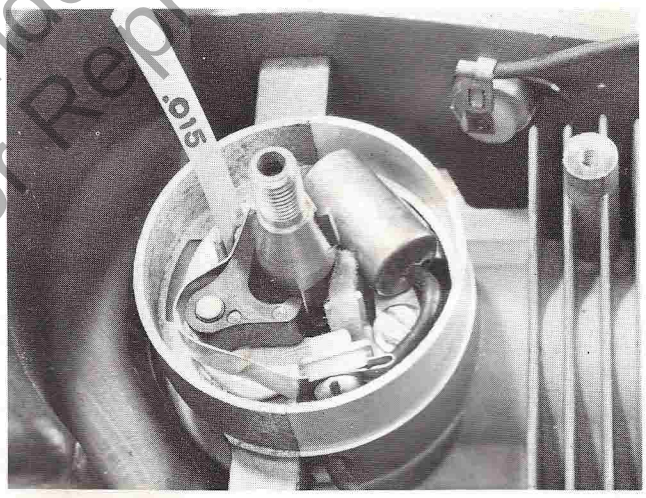

FIGURE 23

To set the points, turn the crankshaft until the breaker arm rests on the highest point of the crankshaft (known as the cam). Place a .015" shim (Homelite #22486) between the point contacts. The point contacts may be moved after loosening of the two screws that secure them to the engine. After setting the point gap, retighten the two screws. Recheck point gap.

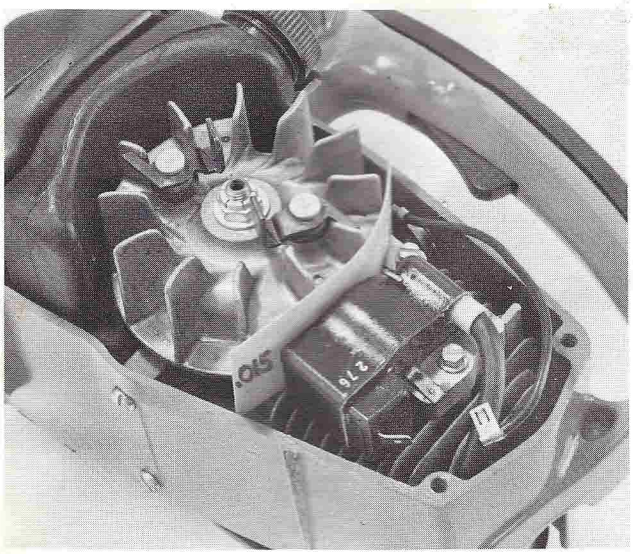

FIGURE 24

To set the air gap between the rotor and module (or coil), loosen the two screws that fasten the module to the cylinder. Rotate the rotor magnets away from the module. Place a .015" shim between the rotor and module core. Rotate the rotor so that the magnets are in line with the module core. Retighten the screws. Recheck gap.

EXHAUST SYSTEM SECTION

Cylinder fins and fan housing should be cleaned occasionally to prevent engine from running too hot.

The muffler should be kept clean and open, but the saw should never be run without the muffler. If local regulations require use of a spark arrestor screen, check condition periodically, and replace when clogged or deteriorated.

While the muffler is off, check the condition of the cylinder ports (and the piston and rings through the ports). If the ports are clogged, it will be necessary to first put the piston to top dead center, then remove carbon carefully with a wooden scraper. Do not scratch the piston or damage edges of the ports.

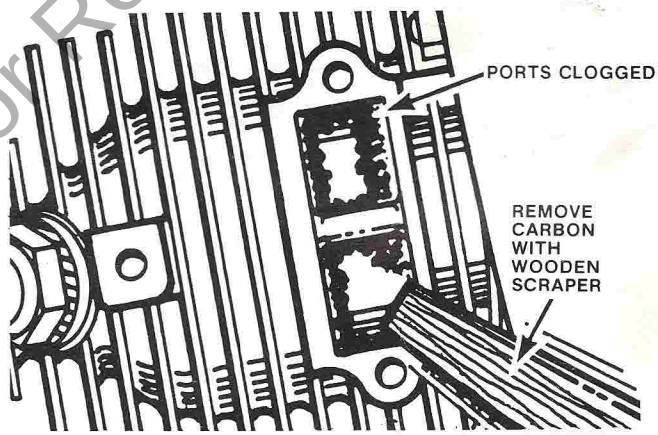

FIGURE 25

AUTOMATIC OILER SECTION

Two types of automatic oilers have been used in the XL family. One type is the pulse actuated diaphragm pump. The other is a pressure feed system. Below is information useful in troubleshooting both types of systems.

DIAPHRAGM PUMP TYPE OIL SYSTEM

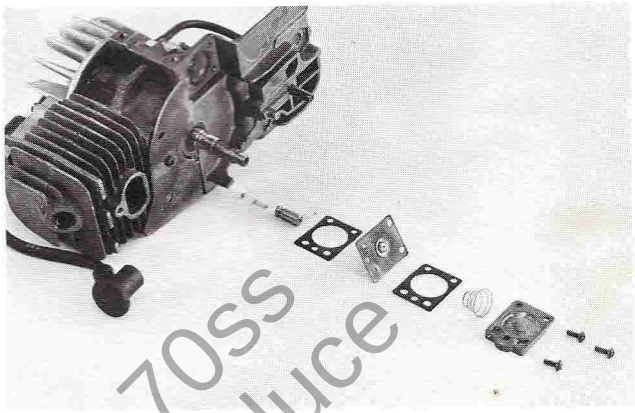

FIGURE 26

Figure 26 is an exploded view of the diaphragm type pump. These parts are not used with the pressure feed system. All XL-2 and Super 2 chain saws use the diaphragm pump. Only the XL chain saws have used either a diaphragm or a pressure feed system.

DIAPHRAGM PUMP TROUBLESHOOTING CHART

NO OIL OUTPUT

Possible Cause	Remedy
Oil weight too heavy	Replace with Homelite® Bar and Chain Oil.
Oil filter plugged	Remove and clean.
Atmospheric vent in oil pump cover plugged	Remove and clean.
Diaphragm torn or deteriorated	Inspect and replace.
Diaphragm loose on plunger	Replace diaphragm.
Leak between oil pump cylinder and crankcase	Replace pump cylinder (see Homelite manual #23855-5).
Exit hole at guide bar pad plugged	Remove bar and clean exit hole.
Oil hole in guide bar plugged	Remove bar, clean groove and oil hole.
Diaphragm plunger too short	Correct measurement is .620-.630 (.625 = 5/8″).
No spring action in check valve (diaphragm does not spring back when depressed and released).	Replace check valve (see Homelite manual #23855-5).
Dirt in oil system	Flush with solvent.
Oil line has fallen off tube fitting in crankcase	Reconnect

LOW OIL OUTPUT

Possible Cause	Remedy
Oil weight too heavy	Replace with Homelite® Bar and Chain Oil.

Diaphragm Pump Troubleshooting continued on next page.

Diaphragm Pump Troubleshooting continued.

Oil filter restricted	Remove, clean and reinstall.
Hole in oil inlet line	Replace line.
Oil cap cracked, loose or leaks (tank won't hold pressure)	Replace cap.
Tank pressure line blocked or restricted	Clean or replace.
Duck bill check valve plugged	Clean or replace.
Connector in pressure line too porous	Replace connector.
Diaphragm plunger too long (over .630")	Replace or shorten.

HIGH OIL OUTPUT

Possible Cause	Remedy
Oil weight too light	Replace with Homelite®Bar and Chain Oil.

PRESSURE FEED OILING SYSTEM (XL ONLY)

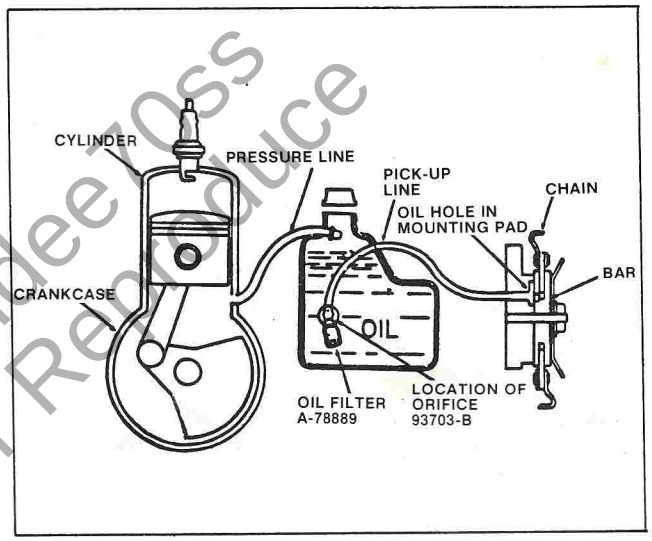

FIGURE 27

Figure 27 is a diagram of the pressure feed oiling system. The tank is pressurized by air from the crankcase. This pressure forces oil to the guide bar pad.

PRESSURE FEED OILING SYSTEM TROUBLESHOOTING CHART

NO OIL OUTPUT

Possible Cause	Remedy
No pressure coming through pressure line	Clean line and/or replace duck bill valve.
Duck bill valve not on pressure line	Install new valve.
Tank will not hold pressure; hole in tank; oil cap cracked, loose or not sealing	Replace necessary parts.
Oil pickup line restricted	Clean line.
Will not oil at idle	Normal.
Oil filter plugged*	Clean filter.
Oil filter check valve not working	Replace.
Oil line has fallen off crankcase fitting	Re-connect
Guide bar oil hole plugged	Clean
Exit hole at guide bar pad plugged	Clean

LOW OIL OUTPUT

Possible Cause	Remedy
Hole in orifice too small	Correct size 3/64" (.046).
Restricted oil pickup line	Clean.
Restricted oil filter	Clean.
Connector in duck bill valve too porous	Replace with connector 69659-B.
Too much connector exposed	Jam duck bill valve against pressure line.
Oil weight too heavy in cold weather	Dilute with kerosene (see owners manual).

HIGH OIL OUTPUT

Possible Cause	Remedy
Connector in duck bill valve too dense	Replace with connector 69659-B.
Duck bill valve jammed tight against pressure line	Leave 1/16" gap between valve and pressure line.
Hole in orifice too large	Correct size is 3/64" (.046).
Orifice missing	Replace

*NOTE: Some saws have oil filters with check valves inside them. Others have screens with no valves.

ENGINE TROUBLESHOOTING

TROUBLESHOOTING CHART

ENGINE FAILS TO START OR STARTS WITH DIFFICULTY

Possible Cause	Remedy
1. No fuel in tank	Fill with clean, fresh fuel mix.
2. Switch not on	Push to "RUN" position.
3. Stale fuel	Fill with clean, fresh fuel mix.
4. Flooded engine	Remove and clean spark plug.
5. No spark	Refer to ignition section for spark check.
6. Spark plug fouled	Clean and regap spark plug.
7. Crankcase seals leaking	Replace seals.
8. Low compression	Overhaul engine.
9. Exhaust port plugged	Clean exhaust ports.
10. Improper carburetor adjustment	Adjust carburetor (refer to owners manual).
11. No fuel on spark plug	Fuel not flowing through carburetor.

FUEL NOT FLOWING THROUGH CARBURETOR

Possible Cause	Remedy
1. Inlet needle stuck	Disassemble and clean carburetor. Oil needle before reassembly.
2. Pulse passage blocked	Clean pulse passage through manifold and carburetor. Check orientation of carburetor and manifold gasket.
3. Dirt in carburetor	Disassemble and clean.
4. Fuel filter	Throughly clean or replace filter.
5. Fuel line kinked	Check routing of fuel line.
6. Torn fuel pump diaphragm	Replace diaphragm.
7. Leaking fuel fitting	Replace fitting.
8. Leaking fuel pump gasket	Replace gasket.
9. Atmospheric vent on fuel pump cover plugged	Clean cover.

Engine Troubleshooting continued on next page.

ENGINE STARTS AND RUNS BUT DIES OUT WHILE CUTTING

Possible Cause	Remedy
1. Vent valve in fuel tank restricted	Clean or replace.
2. Stale fuel causing vaporlock	Fill tank with clean, fresh fuel mix.
3. Air leak in engine	Check seals.
4. Fuel line too short	Fuel line must be routed properly. Proper length is 7 1/4".
5. Fuel filter hung up in tank	Filter must reach the tank bottom.
6. Carburetor needs adjusting	Adjust carburetor (refer to owners manual).
7. Ignition failure	Refer to ignition section for spark check.

ENGINE RUNS RICH OR FLOODS

Possible Cause	Remedy
1. Spark arrestor, muffler or exhaust port restricted	Clean throughly.
2. Restricted air filter	Clean or replace.
3. Oil soaked air filter	Clean or replace.
4. Carburetor inlet needle stuck open	Clean needle and seat.
5. Inlet needle lever too high	Reset according to repair manual (Homelite #23855-5).
6. Choke partially open	Check lever position.
7. Reed valve damaged or loose	Check manifold for loose reed rivets.

ENGINE RUNS TOO HOT

Possible Cause	Remedy
1. Starter housing air inlets restricted	Remove and clean housing throughly.
2. Cylinder fins plugged with dirt	Clean fins throughly.
3. Stale fuel causing vaporlock	Fill tank with clean, fresh fuel mix.
4. Carburetor needs adjusting	Adjust carburetor (refer to owners manual).
5. Spark plug heat range incorrect	Install proper spark plug.
6. Air leak in engine	Check seals.
7. Improper amount of oil in fuel mixture	Fill tank with clean, fresh fuel mix. Check owners manual for proper ratio.
8. Incorrect breaker point gap	Reset point gap.

ENGINE MISSES UNDER LOAD

Possible Cause	Remedy
1. Spark plug fouled	Clean and regap spark plug.
2. Improper spark plug gap	Regap spark plug.
3. Too much fuel at high speed	Adjust carburetor.
4. Ignition system shorted out	Refer to repair manual (Homelite #23855-5) for troubleshooting.
5. Spark plug wire broken	Replace.
6. Dirty or worn breaker points	Replace or clean and gap.
7. Incorrect rotor air gap	Adjust air gap.
8. Breaker point arm sluggish	Clean and lubricate breaker point arm.

ENGINE LACKS POWER

Possible Cause	Remedy
1. Restricted air filter	Clean air filter.
2. Air leak in engine	Check crankshaft seals.
3. Restricted muffler, exhaust port or spark arrestor screen	Clean throughly.
4. Low compression	Overhaul engine.
5. Choke partially closed	Check lever position.
6. Carburetor needs adjusting	Adjust carburetor (refer to owners manual).
7. Too much oil in fuel mixture	Fill with clean, fresh fuel mix. Refer to owners manual.

TORQUE SPECIFICATIONS

COMMON FASTENERS

SIZE & TYPE	LENGTH (mm)	QTY.	APPLICATION	TORQUE LIMITS in.-lbs.	Nm
10-24 X 1 3/4"	44	1	Muffler to cylinder	40-50	4,5 - 5,6
8 X 3/4"	19	2	Module to cylinder	30-40	3,4 - 4,5
10-32 X 2 1/4"	57	2	Carburetor to crankcase	30-40	
10-24 X 1 3/4"	44	1	Muffler to cylinder	40-50	4,5 - 5,6
8 X 3/4"	19	2	Module to cylinder	30-40	3,4 - 4,5
10-32 X 2 1/4"	57	2	Carburetor to crankcase	30-40	3,4 - 4,5
*10-24 X 1/2"	13	4	Engine housing to crankcase	40-50	4,5 - 5,6
8-32 X 1"	25	4	Crankcase to cylinder	40-50	4,5 - 5,6
5/16 - 24 Nut		1	Rotor to crankshaft	100-150	11,3 - 17,0
#6 X 5/16"		2	Shield to cylinder	18-24	2,0 - 2,7
1/4-28 nut		1	Guide bar to crankcase	150-200	17,0 - 22,6
Spark plug		1	To cylinder	120-180	13,6 - 20,3
Clutch		1	To crankshaft	100-150	11,3 - 17,0
5/16 - 24 nut	19	1	Sprocket to crankshaft	100-125	11,3 - 14,1
10 X 3/4" Plastite		1	Pulley to starter housing	30-40	3,4 - 4,5
10-32 X 5/8" self-tap	16	1	Starter housing to engine housing	40-50	4,5 - 5,6

XL (PLASTIC HOUSING)

10 X 3/4"	19	4	Starter housing to engine housing	30-40	3,4 - 4,5
*10 X 5/8"	16	1	Handle cover to engine housing	20	2,3
10 X 3/4"	19	1	Handguard to engine housing	40-50	4,5 - 5,6
**13/64-16 X 3/4"	19	4	Starter housing to engine housing	30-40	3,4 - 4,5
8 X 1/2"	13	4	Handle bar to housings	20	2,3
10-16 hi-lo		2	Plastic handle bar to housings	20-30	2,3 - 3,4
8-32 X 1/2"	13	2	Chain stop to engine housing	20-30	2,3 - 3,4

XL-2, SUPER 2

*6-32 X 3/8"	10	3	Oil pump cover to crankcase	18-24	2,0 - 2,7
8 X 1/2"	13	2	Handle bar to starter housing	20	2,3
10-32 X 5/8"	16	1	Handle bar to engine housing	50-60	5,6 - 6,8
10-32 x 3/4"	19	1	Handguard to engine housing	40-50	4,5 - 5,6

*Require fastener compound Homelite part #23488-C.

**Use to replace #10 x 3/4" (19 mm) screws when original threads are stripped.

ENGINE SPECIFICATIONS

Engine firing timing angle	27° + 2° BTDC, not adjustable
Compression	Low 115 psi (7,9 bars) High 145 psi (10 bars) Taken from new hot engine, below 90 psi (6,2 bars) indicates a problem.
Bore	1 5/16" (33,34 mm) Super 2 1 7/16" (36,51 mm)
Stroke	1 3/16" (30,16 mm)
Displacement	1.6 cu. In. (26 cm^3)
Speed	7,000 rpm cutting, 2900 - 3200 rpm idle, 10,000 no load (approximate)
Spark Plug	Champion DJ-7J (Homelite #68616-S)
Point Gap	.015 (0,4 mm)
Rotor Air Gap	.015 (0,4 mm)
Spark Plug Gap	.025 (0,6 mm)

HOMELITE DIVISION OF TEXTRON INC.
14401 Carowinds Boulevard
P.O. Box 7047
Charlotte, N.C. 28217

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