# Disassembly and Assembly Procedures Manua (SMALL SERIES)

Dry Weight (less attachment) Type of Drive: Front Handle: Chain Oil Pump: Choke Equipped: Muffler: Throttle Lock: Guide Bar: Chain: Sprocket: Ignition: Breaker Point Gap Spark Plug: Spark Plug Gap: Fuel Capacity: Oil Capacity: Engine Lubrication: Fuel/Oil Mix Ratio: Chain Oil: Engine Type: Bore and Stroke: Displacement: Compression Ratio: Compression Pressure: Decompression valve: Crankshaft: Crankshaft Main Bearings: Crankshaft Seals: Connecting Rod: Con Rod Bearing-Wrist Pin End: Con Rod Bearing-Crankpin End: Piston: Piston Rings: Piston Ring Gap: Crankcase: Cylinder Type: Starter: Clutch: Carburetor: Air Filter: Cylinder Angle: R.P.M. @ Maximum H.P.: Chain Speed @ Maximum H.P.:

# MODEL 1074 SPECIFICATIONS POUNDS: 11.0 KILOGRAMS: 4.9

Direct Half wrap, cushioned grip Automatic Yes **Baffle Plate** Push button - standard 14-inch (35 cm) / 16-inch (40 cm) Sprocket Nosed .325" Pitch, .058 Gauge .325" x 8-tooth (Star Type) **Breaker Points** .016" (.406 mm) CJ8 .030" (.762 mm) .4551. 16.0 fl. oz. 15.4 fl. oz. (Imperial) (U.S. Units) (S.I. Units) 4.9 fl. oz. .1451. 5.1 fl. oz. 2 Cycle Engine Oil 24:1 (4%) S.A.E. 10 to 40 Wt. (seasonal) Single Cylinder — Air-Cooled 1-5/8" (41.3 mm.) x 1-1/2" (38.1 mm.) (respectively) 3.1 cu. in./51 c.c. 7.1:1 (PSMA. STD.) 155 psig/1069 kPa Automatic Three piece construction, forged alloy steel **Ball Bearing** Spring loaded, synthetic rubber One piece, forged alloy steel Needle Roller Needle Roller Aluminum Alloy One cast iron compression ring - Captive against rotation .098"/.088" Two piece die cast magnesium Die cast aluminum — chrome plated bore Bendix type — "Easy Arc" — Automatic rewind Centrifugal - Two die cast zinc shoes All position — Diaphragm type Pick-up head with replaceable felt element Horizontal 8,000 3,467 ft./min.

#### **MODEL P26E SPECIFICATIONS Pounds:** 11.0 **Kilograms**: 4.9 Dry Weight (less attachments): Direct Type of Drive: Half wrap — Cushioned grip Front Handle: Chain Oil Pump: Automatic Yes Choke Equipped: Spark Arresting Screen Muffler: Push Button — Standard Throttle Lock: Guide Bar: 16" (40 cm) Sprocket Nosed .325" Pitch. .058 Gauge Chain: Sprocket: .325 x 8-tooth (Star Type) Electronic Ignition System: RCJ8 Spark Plug: Spark Plug Gap: .030" (.762 mm) 15.4 fl. oz. .4551. Fuel Capacity: 16.0 fl. oz. (U.S. Units) (S.I. Units) (Imperial) 4.9 fl. oz. .1451. 5.1 fl. oz. Oil Capacity: Engine Lubrication: 2 Cycle Engine Oil 24:1 (4%) Fuel/Oil Mix Ratio: S.A.E. 10 to 40 Wt. (seasonal) Chain Oil: Engine Type: Single Cylinder — Air-Cooled Bore and Stroke: 1-5/8" (41.3 mm.) x 1-1/2" (38.1 mm.) (respectively) Displacement: 3.1 cu. in. / 51 c.c. 7.1:1 (PSMA. STD.) Compression Ratio: Compression Pressure: 155 psig/1069 kPa Decompression Valve: Automatic Crankshaft: Three piece contruction, forged alloy steel Crankshaft Main Bearings: Ball Bearing Crankshaft Seals: Spring loaded, synthetic rubber Connecting Rod: One piece, forged alloy steel Con Rod Bearing-Wrist Pin End: Needle Roller Con Rod Bearing-Crankpin End: Needle Roller Piston: Alluminum Alloy Piston Ring: One cast iron compression ring - Captive against rotation Piston Ring Gap: .098"/.088" Crankcase: Two piece die cast magnesium Cylinder Type: Die cast aluminum — Chrome plated bore Bendix type — "Easy Arc" — Automatic rewind Starter: Clutch: Centrifugal – Three shoe die cast zinc Carburetor: All position — Diaphragm type Air Filter: Polyester felt

Cylinder Angle: R.P.M. @ Maximum H.P.: Chain Speed @ Maximum H.P.:

Fuel Filter:

Horizontal 8,000

Pick-up head with replaceable felt element

3,467 ft./min.

Dry Weight (less attachments)		<b>P28</b> E	P28ES	
	Pounds:	12.8	13.4	
	Kilograms:	5.8	6.1	
Type of Drive:		Direct		
Front Handle:		Fully vibration isolated	<ul> <li>Cushioned grip</li> </ul>	
Rear Handle:		Fully vibration isolated		
Chain Oil Pump:		Automatic		
Choke Equipped:		Yes		
Muffler:		Spark arresting screen	(K.,) <sup>28</sup>	
Safety Throttle Inter-Lock:		Standard		
Throttle Lock:		Standard	и <u>й</u> н	
Guide Bar:	1	16" (40 cm.) Sprocket	Nosed	
Chain:		.325" Pitch, .058 Gaug	ae	
Sprocket:		.325 x 8-tooth (Star Ty	pe)	
Ignition System:		Electronic	▲	
Spark Plug:		RCJ 8		
Spark Plug Gap:		.030"		
Fuel Capacity:		16.0 fl. oz. 15.4 fl.	oz455 l.	
		(Imperial) (U.S. U	Inits) (S.I. Units)	
Oil Capacity:		5.1 fl. oz. 4.9 fl. c	oz145 l.	
Engine Lubrication:		2 Cycle Engine Oil		
Fuel/Oil Mix Ratio:		24:1 (4%)		
Chain Oil:	<b>`</b>	S.A.E. 10 to 40 Wt. (se	easonal)	
Engine Type:		Single Cylinder — Air-Cooled		
Bore and Stroke:		1-5/8" (41.3 mm.) x $1-1/2$ " (38.1 mm.) (respectively)		
Displacement:		3.1 cu. in./51 c.c.		
Compression Ratio:		7.1:1 (PSMA. STD.)		
Compression Pressure:		155 psig/1069 kPa		
Decompression Valve:		Automatic		
Crankshaft:		Three piece constructio	n, forged allov steel	
Crankshaft Main Bearings:	ан на селото на селот На селото на	Ball Bearing		
Crankshaft Seals:		Spring loaded, syntheti	c rubber	
Connection Rod:		One piece, forged alloy	steel	
Con Rod Bearing-Wrist Pin End:		Needle Roller		
Con Rod Bearing-Crankpin End:		Needle Roller		
Piston:		Aluminum Alloy		
Piston Ring:		One cast iron compress	ion ring — Captive against rotation	
Piston Ring Gap:		.098"/.088"		
Crankcase:		Two piece die cast mag	nesium	
Cylinder Type:		Die cast aluminum — Chrome plated bore		
Starter:		Bendix type — "Easy Arc" — Automatic rewind		
Clutch:		Centrifugal — Three shoe die cast zinc		
Carburetor:		All position — Diaphragm type		
Air Filter:		Polyester Felt		
Fuel Filter:		Pick-up head with repla	ceable felt element	
Cylinder Angle:		Horizontal		
R.P.M. @ Maximum H.P.:		8,000		
Chain Speed @ Maximum H.P.:		3,467 ft./min.		
		-10 E		

# **MODEL P28E SERIES SPECIFICATIONS**

### LOCTITE APPLICATION GRADE "242" (BLUE)

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## **MODEL 1074**

#### 1) Muffler mounting screws.

2) Decompression lever screws.

3) Condensor mounting screw.

4) Clutch driver threads.

#### **MODEL P26E**

- 1) Muffler mounting screws.
- 2) Decompression lever screws.

3) Clutch driver threads.

NOTE: Apply Grade "AV" (Red) Loctite to choke plate securing screw.

# MODEL P28E/P28ES

- 1) Muffler mounting screws.
- 2) Decompression lever screws.
- 3) Clutch driver threads.
- 4) Screw (1/4-20) rear handle to front handle.
- 5) Rear handle cover retaining screws.
- NOTE: Apply Grade "AV" (Red) Loctite to choke plate securing screw.

FUEL LINE INFORMATION							
PART NO.	LENGTH	OUTSIDE DIAMETER	INSIDE DIAMETER	MODELS USED ON & APPLICATION			
429970	3``	1/4"	1/8``	1074, P26E,	P28E (Coi	nnector to Carb.)	
431534	5-1/4"	1/4"	1/8"	1074, P26E,	P28E (Fue	el Vent Line)	
				P41, FM, 10	74, P26, P	26E, P28, P28E (	Connector to
				Pick-Up)			
431537	7-1/4``	1/4"	1/8"	P41, FM (Co	onnector to	Carb.)	
431535	5-3/4``	1/4"	1/8"	P51, P61 (C	P51, P61 (Connector to Pick-Up)		
431536	7``	1/4	1/8"	P51, P61 (C	P51, P61 (Connector to Carb.)		
431541	10 ft.	Length of Fu	uel Line for all N	Aodels	odels		
		CRA	NKCASE SI	EAL INFOR	MATIO	N	
SEAL P/N		· SEA	AL P/N		FOR	SAW MODELS,	
MAGNETO SI	DE	DR	IVESIDE				s Grossian.
428746		428	3746	, " .	1074	,P26E,P28E,FM,	P41,P51,P61
	and the second secon	STA	ARTER COP	RD INFORM	ATION		
PART NUMBER LENGTH			FOR	SAW MODELS			
426752		41			P41,	P51,P61	
429278		43``			1074,P26E,P28E,FM		
Starter cord is a	available in a 5	50 meter bulk r	oll.				
PART NUMBER		LEI	LENGTH AND SIZE		FOR SAW MODELS		
432363		50 Metres .156`` Dia.		Jia.	P41,P51,P61		
432364		50	Metres .130" D	Dia.	1074	,P26E;P28E,FM	
			OIL LINE I	NFORMAT	ION	90	
PART NUMBE	ER DESCR	IPTION		LE	NGTH	MODELS USE	ED ON
430227	Automa	Automatic Oil Pump Pick-up		4-1	1/2"	FM, P41	
430640	Automa	utomatic Oil Pump Pick-up		5"		P51, P61	
A 5' length of t	he automatic o	oil pump pick-u	up line for the a	bove four (4) m	nodels is ava	ailable under P/N	4326561/8"
I.D. x 3/16 <sup>°°</sup> C	).D.			e se és			e 1
Model P61 has	s two (2) lines	connecting the	manual and au	itgmatic oil pur	nps.		
PART NUMBER		LENGTH		HOSE SIZE			
432296		5-1/2"			3/32" I.D. x 1/4" O.D.		

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# **TORQUE SPECIFICATIONS**

MODELS 1074, P26E, P28E/P28ES

A)	Cylinder Base	70 — 80 in. lbs.
B)	Clutch Driver	18 - 22 ft. lbs.
C)	Flywheel Nut	20 - 25 ft. lbs.
D)	Spark Plug	7 — 8 ft. lbs.
E)	Carburetor Mounting Screws	15 - 20 in. lbs.
F)	Insulating Block Mounting Screws	55 — 20 in. lbs.
G)	Muffler Mounting Screws	55 — 60 in. lbs.
H)	Decompression Valve	80 — 90 in. lbs.
I)	Ignition Switch Nut	25 - 30 in. lbs.
J)	Choke Shutter Screw (P26E, P28E)	4 – 6 in. lbs.
K)	Muffler Cover Screws	25 — 35 in. lbs.
L)	Fuel Connector - Air Box	45 - 50 in. lbs.
M)	Terminal Block Screw	6 — 8 in. lbs.
N)	Shock Mounts (P28E)	1/4 urn pre-tention
O)	Shock Mount Screws (P28E)	30 — 40 in. lbs.
P) 1)	Screws (Metal Starter Cover)	45 – 50 in. lbs. (1074, P26E, P28E)
2)	Screws (New Style Starter Cover)	25 - 30 in. lbs. (1074, P26E, P28E)
Q) 1)	Decompression Lever Screws (New Style Starter Cover)	5 - 10 in. lbs. (1074, P26E, P28E)
2)	Decompression Lever Screws (Metal Starter Cover)	6 - 8 in. lbs. (1074, P26E, P28E)
	THREAD SIZE	TOROUF
	#6	6 - 8 in the
	" U #8	5 - 25 in the
	" 0	10 - 20 III. 105.

# SUBJECT: DISASSEMBLY AND ASSEMBLY PROCEDURES FOR MODELS 1074, P26E, & P28E

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## A. DISASSEMBLY PROCEDURE



Remove air filter top cover by turning the centrally located hold down screw 1/4 turn (either direction).



45 - 50 in. lbs.

70 - 80 in. lbs.

Remove the carburetor securing screws, disengage throttle link and fuel line. Remove the carburetor and choke assembly.

NOTE: Use caution when removing the fuel line...fuel in tank may be under pressure.



Model 1074 uses a thermo plastic choke rod and choke tube assembly. Model P26E and P28E is fitted with an all metal choke rod and choke tube assembly. Conversion of model 1074 to an all metal assembly require that BOTH the choke rod and choke tube be installed.



REMOVAL OF CLUTCH ASSEMBLY: Remove the spark plug, and install piston stop P/N 432331. Rotate the engine until the piston comes up against the piston stop. Using clutch driver wrench, P/N 473372, remove the clutch assembly, by turning the clutch assembly in a CLOCKWISE direction.



MODEL 1074 uses a 2-shoe die cast clutch assembly.



MODELS P26E & P28E use a 3-shoe die cast clutch assembly.



Remove the front handle. This handle is the same on models 1074, and P26E.



Complete handle assembly as used on model P28 and P28E.



To service the throttle and safety interlock trigger, on model P28 and P28E, remove one-half of the rear handle grip. CAUTION: care should be taken when the handle half is separated to ensure that the two tension springs do not disengage unexpectedly and become lost.



The oil tank vent is located in a recess in the casting, behind the front handle assembly. The fuel tank venting line is situated under the clutch cover and vents into the atmosphere.



The flywheel nut is removed by turning the nut CLOCK-WISE; it is left hand thread. When removing the flywheel nut use piston stop P/N 432331. NOTE: an impact gun should NEVER be used for removal of the flywheel nut or the clutch nut when using the piston stop....the piston &/or con rod could become damaged.

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To remove the flywheel, use flywheel and crankcase puller, P/N 475501. Ensuring that the two #12-24 puller screws, are well engaged within the flywheel threads. With piston stop in place, apply torque to the jack screw in the center of the flywheel puller until the flywheel disengages from the crankshaft taper.



Remove the cylinder shroud and disconnect the switch wire lead from the ignition switch terminal.



Remove the high tension coil secured by two 10-24 screws.



The high tension coil used on models 1074 (shown on right) and the electronic ignition used on model P26E and P28E (shown on left) are different in design and function.



MODEL 1074 — Muffler cover assembly and baffle plate is shown lower left. MODEL P26E AND P28E muffler cover assembly and spark arrestor screen assembly is shown in the lower right. The MODEL P28E uses two spacers and two longer screws to fasten the muffler body to the bottom of the cylinder. The muffler shield used on model 1074, P26E, P28E has been redesigned to provide clearance for the ignition switch wire for models P26E and P28E.



Remove the cylinder block. NOTE: On re-assembly be sure the cylinder base gasket is installed correctly; the

notch in the gasket must be positioned over the impulse hole of the cylinder base, as shown.



The crankcase seals are removed by using seal puller, P/N 471437. Slide the seal puller over the shaft and turn the threaded portion of the tool into the crankcase seal. Tightening the jack screw will extract the seal from the crankcase.



Remove the oil pump bar pad. NOTE: Inside the bar pad are 2 sealing gromments that MUST be in position during re-assembly. The oil discharge port in the oil pump barrel is being pointed out.



Remove the oil pump components. NOTE: There is a 3rd sealing grommet situated behind the pump barrel at the oil tank exit hole in the crankcase. As in S18, extract the crankcase seal.



The seal puller is being shown removing the crankcase seal from the crankcase. NOTE: This seal cannot be reused because it will be damaged during removal.



Remove the piston from the connecting rod assembly using wrist pin extractor/installer, P/N 475420. Remove the wrist pin keepers and the piston ring. Install the wrist pin extractor with the proper diameter extractor sleeve. Applying heat to the piston will ease the wrist pin removal.



An illustration of the complete wrist pin extractor/installer assembly.



A new wrist pin bearing can be installed in the connecting rod using wrist pin bearing installer/remover, P/N 475453. Place a new bearing on the bolt portion of the bearing extractor tool, and thread this bolt into the nut end of the extractor.



The old bearing may now be removed from the wrist pin bearing/installer extractor tool.



The engine is now completely dismantled.

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Remove the main bearings from the crankcase using main bearing driver, P/N 470335. This bearing may be driven out cold, but, it is recommended that the crankcase be heated permitting the bearing to be more easily removed.

# **B. ASSEMBLY PROCEDURE:**



The main bearings on all 1074 thru P28 models are an interference fit in the crankcase half in both the driveside and magneto side. The crankcase half must be heated (propane torch, heat lamp, or boiling water) to a temperature of approximately 200 degrees F. to allow proper assembly of the main bearings into the crankcase.



Starting re-assembly with the driveside crankcase half; install the crankshaft. NOTE: The main bearings are a slip

fit on the crankshaft. Position the crankcase gasket over the dowel pins; install the throttle trigger and throttle link; insert the square (10-24) nut in the nut pocket provided in the rear handle.



Position the magneto side crankcase half over the crankshaft. Place and tighten all crankcase screws. Torque the screws in an outward spiral pattern beginning with the screws nearest the crankshaft.



After all the screws have been torqued, cut the gasket bridge flush with the cylinder base surface. NOTE: If gasket is not cut flush with the casting, a cylinder base leak will result.



To install the crankcase seals, apply a small amount of oil or grease to the inner lip of the seal. Position the seal squarely against the crankcase and drive the seal flush with the crankcase surface using seal driver, P/N 429445.



Install the magneto side crankcase seal as described in Fig. 32. Using a hammer, carefully tap the terminal post into the crankcase.



Unlike the 1074, the magneto side crankcase halves on models P26E and P28E will not be machined. When installing a new crankcase seal in these models the crankcase seal must be driven .065" below the casting surface. The seal may be driven flush with seal driver, P/N 429445, then using main bearing driver, P/N 470335, the seal may be driven .065" BELOW flush.



To install the piston, use extractor/installer, P/N 475420. The extractor sleeve is used as a pilot pin. Place the piston on the connecting rod and insert the pilot sleeve. Install the wrist pin on the rod of the assembly tool. APPLY HEAT TO THE PISTON. The 3/4" hexagon

nut portion of the tool pushes the wrist pin into place.



NOTE: Be sure that the "E" marked on top of the piston is TOWARD THE EXHAUST side of the cylinder.



When setting the breaker points on 1074, be sure to set the point gap at .015". NOTE: Rotate the crankshaft until the highest point on the crankshaft cam is contacting the rubbing block of the rocker arm.



Install the breaker point box cover...be sure it is properly seated in the machined groove in the crankcase. With the ignition cover in place, apply a sealant around the entire circumference of the cover. Suggested sealants are "Silicone RTV", "Plio-bond" or "Seal-all".



A "nail-set" ground off at a 45 degree angle or similar tool is handy for removing the welch plug covering the vernay valve. Use care not to damage the valve module below the welch plug.



Before installing the carburetor, muffler and decompression value, block off these openings with the appropriate plates provided in the air leak test kit, P/N 475556.

Attach the pressure pump, P/N 475467, to the connector on the blank off plate for the insulating block and pressurize the crankcase to a maximum of 5-7 lbs per square inch. The pressure on the gauge should not drop off. If pressure drops, an air leak will have to be located and corrected.



The air gap setting between the magnets on the flywheel and high tension coil, and/or ignition module, is  $.010^{"}$ .  $.012^{"}$ . NOTE: Prior to tightening the coil or module

screws, push the coil or module toward the magnets on the flywheel with the feeler gauge between them. Tighten the mounting screws securely.



The flywheel on the P26E and P28E appears to be identical to that of the model 1074, however, the KEYWAY LOCATION on the "E" model flywheel IS DIFFERENT. NOTE: Models P26E and P28E will have an "A" suffix stamped after the part number, and a yellow dot or slash of paint on the flywheel.



To install the clutch spring on the 2-shoe die cast clutch assembly, clamp approximately one half of one shoe in a vise, install the second shoe on the driver, and with a shoe-horn like tool pry the clutch spring into the spring groove of the second shoe, as shown.



To load the three-shoe clutch assembly that is used on models P26E, P28E, use assembly tool, P/N 432537.



To install the rewind spring on all models, place the spring through the slot provided in the blower housing. Engage the end of the spring in the slot on the under side of the pulley. Carefully position the pulley over the starter post. Once the pulley is in position, install the "E" clip to prevent the pulley from coming off the post. NOTE: Apply a small amount of grease to the underside of the pulley when installing the rewind spring.



Rotate the starter pulley in a CLOCKWISE DIRECTION until the starter spring is completely wound into the starter housing.



NOTE: It is not necessary to remove the starter pulley to install a new starter cord. Route the starter cord through the hole in the pulley, locate the cord in the notch provided in the pulley edge, and pre-tention the pulley approx. 10 turns. Feed the cord through the hole in the blower cover, slowly releasing the rope to allow it to wind on to the pulley. Release the remaining spring pretension once the entire length of the cord is wound on the pulley.



Apply  $2 \cdot 1/2$  to 3 turns pre-tension on the rewind spring.



Once the starter assembly is pre-tensioned, install the starter handle and the small knot retaining washer. NOTE: This washer is to prevent the cord knot from being pulled through the handle.



Once the starter assembly is complete, check that the tang of the decompression lever is correctly positioned on the top of the starter pinion flange as shown.



Before the carburetor insulating block is installed, apply a sealant to the floor of the air box at the crankcase joint. The sealant prevents unfiltered air from entering the carburetor. Suggested sealants are "Plio-Bond", "Silicone RTV" or "Seal-All".



A Tillotson carburetor is used on model P28E. Model 1074 and P26E use a Walbro carburetor. While the Tillotson carburetor will fit all three models, the Walbro carburetor will only adapt to model 1074 and P26, due to the position of the throttle link holes in the throttle lever.



The correct inlet lever setting is flush with the metering chamber floor as shown. This applies to all model Walbro and Tillotson carburetors.



A high metering lever will result in a rich or flooding condition, whereas a low metering lever setting will result in lean idle and acceleration.



During the re-assembly of all carburetors, make sure the inlet screen is in place. The function of this screen is to filter all fuel going to the metering section of the carburetor.



Install the carburetor and choke tube assembly. Be sure all gaskets are correctly positioned. NOTE: Check for FREE OPERATION of the throttle linkage.



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