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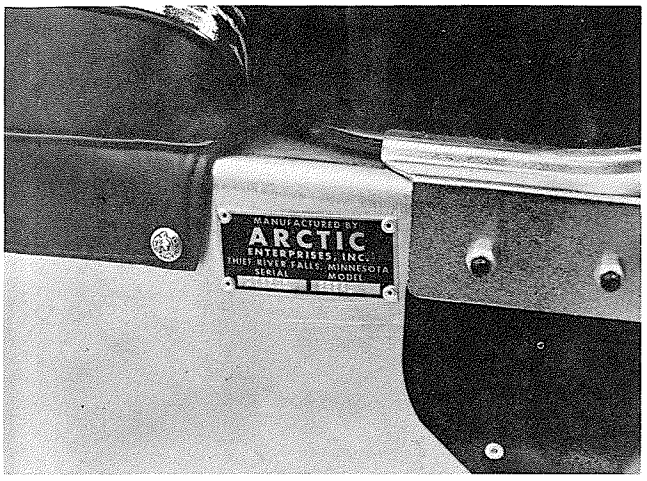
IDENTIFICATION

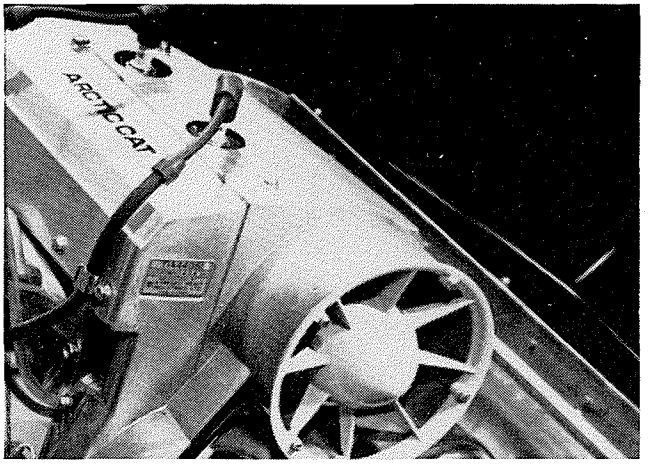
Each Arctic Cat snowmobile has three (3) identifying numbers; chassis model and serial number, a body serial number, and an engine model and serial number.

Chassis Model and Serial Number – Plate located on the right front side of the body tunnel. All internal records are maintained by the chassis serial number.



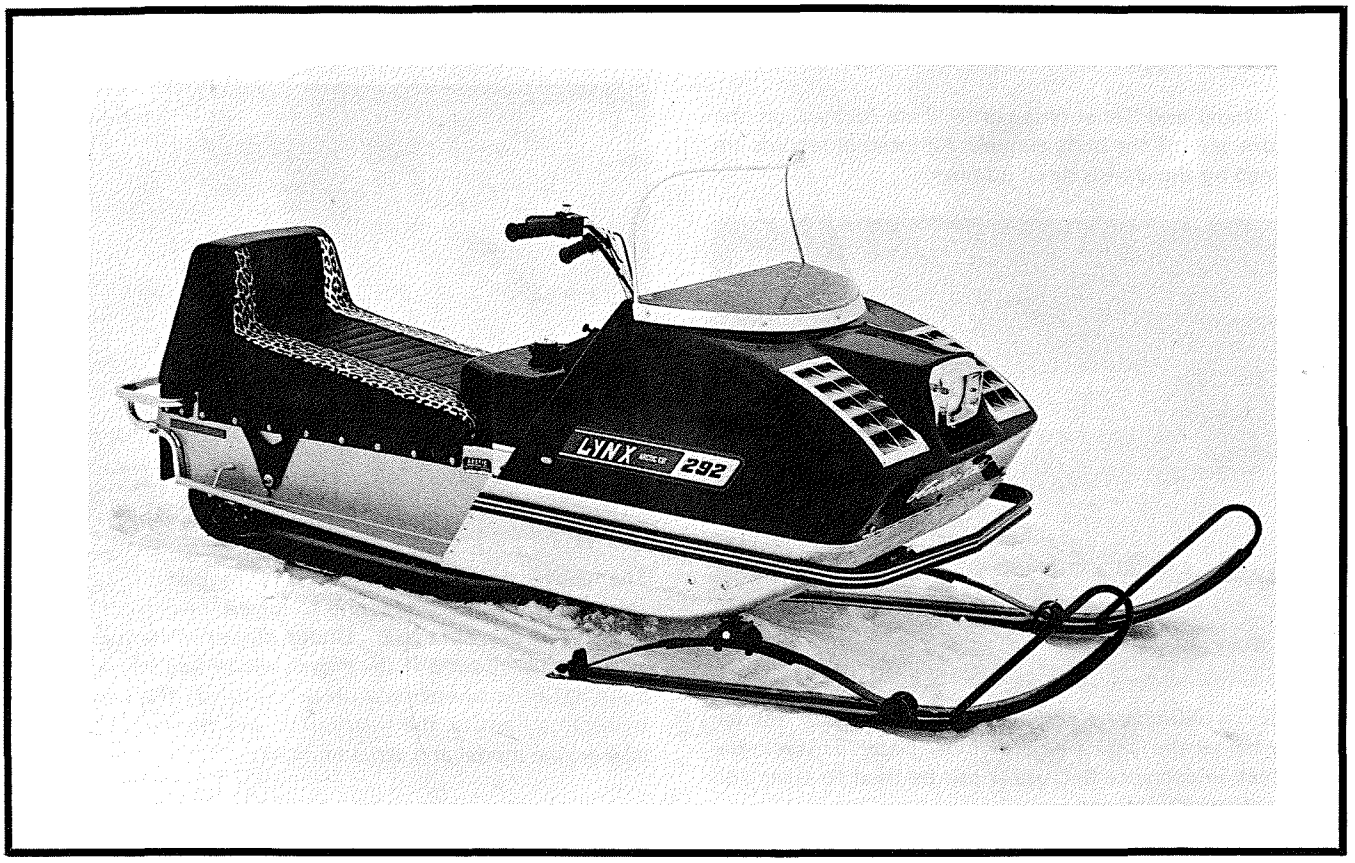
Body Serial Number – Stamped into the body tunnel, directly below the chassis serial number plate. This number is of great importance because it can be used to trace and identify stolen machines.

Engine Model and Serial Number – Located on the engine nameplate or stamped into the block of the engine.



The above described numbers are required to properly complete warranty claims and to insure the correct replacement parts are obtained. Under no circumstances should warranty be allowed if the chassis model and serial number plate has been tampered with or removed. If a new engine is installed, notify the distributor and the factory of the new engine model and serial number.

LYNX SPECIFICATIONS



SERVICE DATA

Chassis:

Length W/Skis	95"
Height W/Windshield	39"
Height W/O Windshield	31"
Overall Width	31½"
Track Width	17"
Track Length On Ground	26"
Approximate Curb Weight	336 Lbs.
Fuel Capacity	4½ Gal.

Engine:

Make	Arctic
Model	.KT150B
Bore	74mm
Stroke	68mm
Cylinders	1
Displacement	292cc
Cooling	Centrifugal Fan

Ignition:

Type	Flywheel Magneto
Point Gap	.012" - .016"
Timing	.026" BTDC*

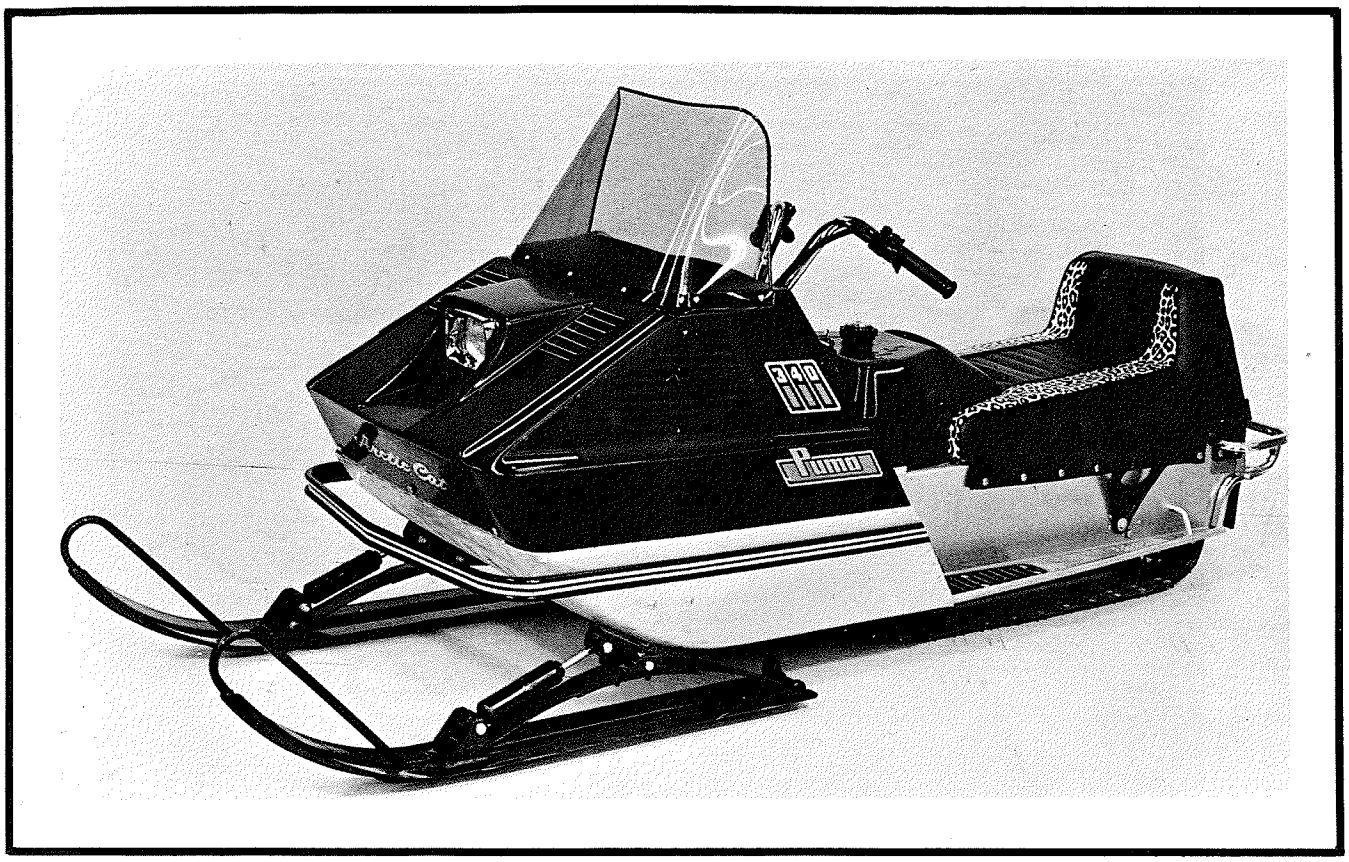
Spark Plug:

Champion	K9
Bosch	M280T31
Electrode Gap	.020"

Fuel/Oil Ratio	20:1

*Retarded Cam

PUMA SPECIFICATIONS



SERVICE DATA

Chassis:

Length W/Skis	95"
Height W/Windshield	41"
Height W/O Windshield	30½"
Overall Width	31½"
Track Width	17"
Track Length On Ground	26"
Approximate Curb Weight	381 Lbs.
Fuel Capacity	6½ Gal.

Engine:

Model	T1A340S1	T1A400S1	T1A440S1
Make	Arctic	Arctic	Arctic
Bore	60mm	65mm	68mm
Stroke	60mm	60mm	60mm
Cylinders	2	2	2
Displacement	339cc	398cc	436cc
Cooling	Axial Fan	Axial Fan	Axial Fan

Ignition:

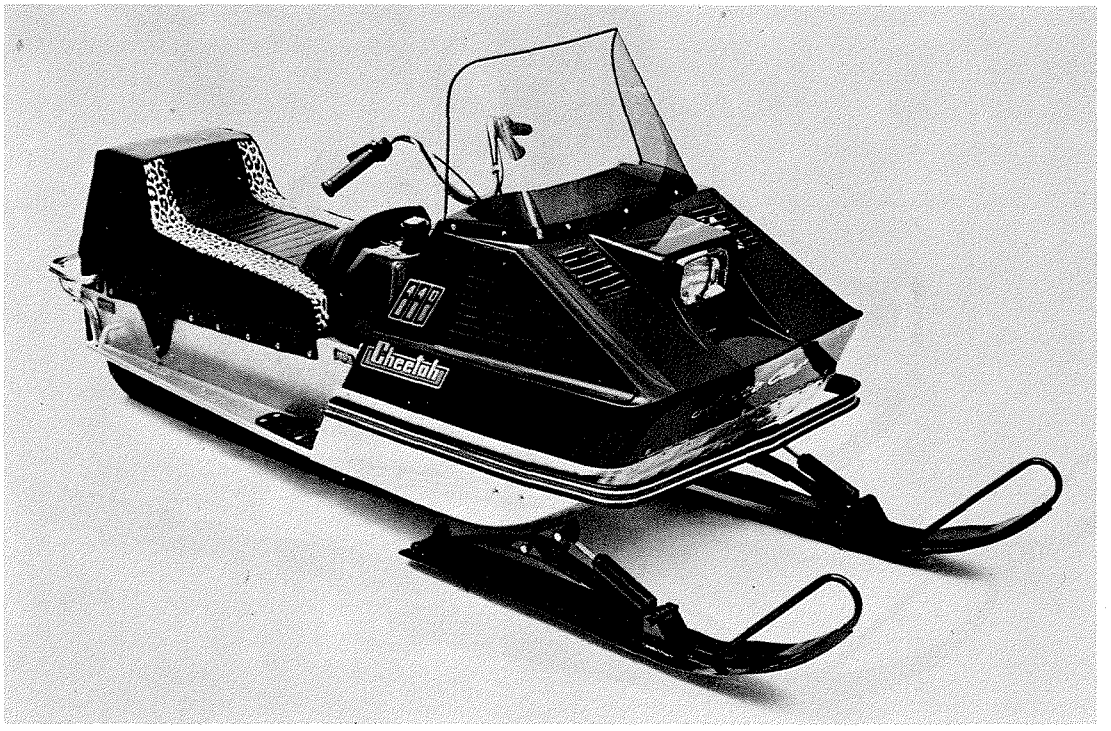
Type	Flywheel Magneto		
Point Gap	.012" - .016"	.012" - .016"	.012" - .016"
Timing	.015" BTDC*	.015" BTDC*	.015" BTDC*

Spark Plug:

NGK	B9ES	B9ES	B9ES
Electrode Gap	.020"	.020"	.020"
Fuel/Oil Ratio	20:1	20:1	20:1

*Retarded Cam

CHEETAH SPECIFICATIONS



SERVICE DATA

Chassis:

Length W/Skis	103"
Height W/Windshield	41"
Height W/O Windshield	30½"
Overall Width	31½"
Track Width	17"
Track Length On Ground	33"
Approximate Curb Weight	405 Lbs.
Fuel Capacity	6½ Gal.

Engine:

Model	T1A340S1	T1A400S1	T1A440S1
Make	Arctic	Arctic	Arctic
Bore	60mm	65mm	68mm
Stroke	60mm	60mm	60mm
Cylinders	2	2	2
Displacement	339cc	398cc	436cc
Cooling	Axial Fan	Axial Fan	Axial Fan

Ignition:

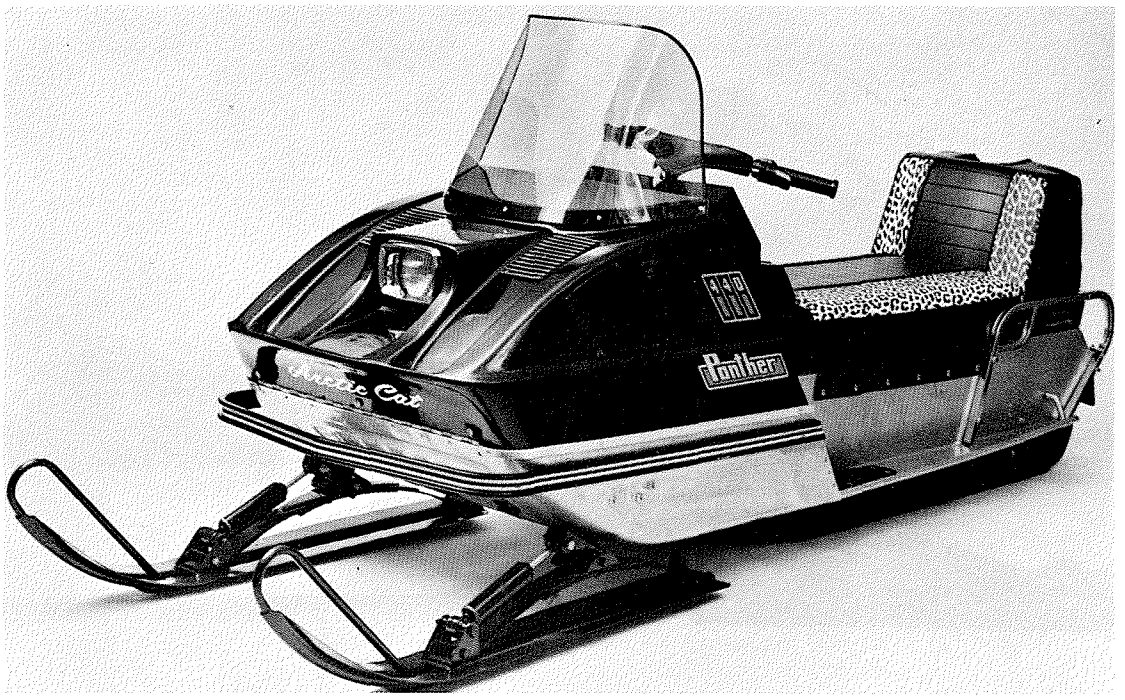
Type	Flywheel Magneto		
Point Gap	.012" - .016"	.012" - .016"	.012" - .016"
Timing	.015" BTDC*	.015" BTDC*	.015" BTDC*

Spark Plug:

NGK	B9ES	B9ES	B9ES
Electrode Gap	.020"	.020"	.020"
Fuel/Oil Ratio	20:1	20:1	20:1

*Retarded Cam

PANTHER SPECIFICATIONS



SERVICE DATA

Chassis:

Length W/Skis	105"
Height W/Windshield	42"
Height W/O Windshield	31"
Overall Width	31½"
Track Width	17"
Track Length On Ground	36"
Approximate Curb Weight	425 Lbs.
Fuel Capacity	5 Gal.

Engine:

Model	KM914	T1A340S1	T1A400S1	T1A440S1
Make	Sa/Wa	Arctic	Arctic	Arctic
Bore		60mm	65mm	68mm
Stroke		60mm	65mm	68mm
Cylinders		2	2	2
Displacement		339cc	398cc	436cc
Cooling	Axial Fan	Axial Fan	Axial Fan	Axial Fan

Ignition:

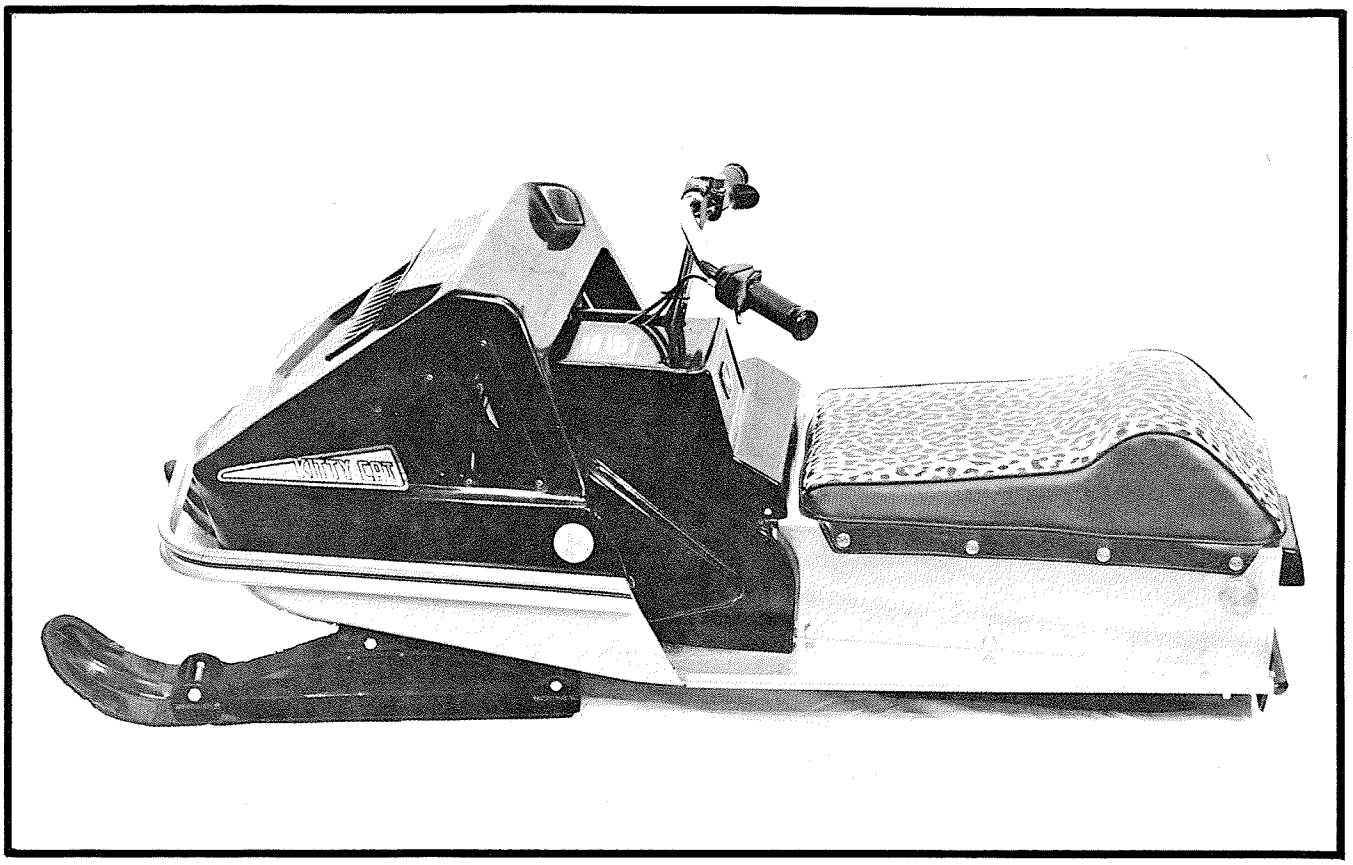
Type		Flywheel Magneto		
Point Gap	.014" - .018"	.012" - .016"	.012" - .016"	.012" - .016"
Timing	10° - 12° BTDC	.015" BTDC*	.015" BTDC*	.015" B

Spark Plug:

Bosch	W150M11S			
NGK		B9ES	B9ES	B9ES
Electrode Gap	.020"	.020"	.020"	.020"
Fuel/Oil Ratio	50:1	20:1	20:1	20:1

*Retarded Cam

KITTY CAT SPECIFICATIONS



SERVICE DATA

Chassis:

Overall Length	56"
Overall Height	22"
Overall Width	23"
Track Width	10"
Track Length On Ground	14"
Approximate Curb Weight	100 Lbs.
Fuel Capacity	2 Qts.
Carrying Capacity	1 Rider, 100 Lbs. Max.

Engine:

Make	Arctic
Model	T5A060S1A
Bore	42mm
Stroke	44mm
Cylinders	1
Displacement	60cc

Ignition:

Type	Flywheel Magneto
Point Gap	.012" - .016"
Timing	25° BTDC

Spark Plug:

NGK	B6H
Electrode Gap	.020"

Fuel/Oil Ratio	25:1

Millimeter/Decimal/Inch Conversion Table

MM	Decimal Equiv.	Inches	+ or –	MM	Decimal Equiv.	Inches	+ or –
1	0.0394	1/32	+	53	2.0866	2 3/32	–
2	0.0787	3/32	–	54	2.1260	2 1/8	+
3	0.1181	1/8	–	55	2.1654	2 5/32	+
4	0.1575	5/32	+	56	2.2047	2 7/32	–
5	0.1969	3/16	+	57	2.2441	2 1/4	–
6	0.2362	1/4	–	58	2.2835	2 9/32	+
7	0.2756	9/32	–	59	2.3228	2 5/16	+
8	0.3150	5/16	+	60	2.3622	2 3/8	–
9	0.3543	11/32	+	61	2.4016	2 13/32	–
10	0.3937	13/32	–	62	2.4409	2 7/16	+
11	0.4331	7/16	–	63	2.4803	2 15/32	+
12	0.4724	15/32	+	64	2.5197	2 17/32	–
13	0.5118	1/2	+	65	2.5591	2 9/16	–
14	0.5512	9/16	–	66	2.5984	2 19/32	+
15	0.5906	19/32	–	67	2.6378	2 5/8	+
16	0.6299	5/8	+	68	2.6772	2 11/16	–
17	0.6693	21/32	+	69	2.7165	2 23/32	–
18	0.7087	23/32	–	70	2.7559	2 3/4	+
19	0.7480	3/4	–	71	2.7953	2 25/32	+
20	0.7874	25/32	+	72	2.8346	2 27/32	–
21	0.8268	13/16	+	73	2.8740	2 7/8	–
22	0.8661	7/8	–	74	2.9134	2 29/32	+
23	0.9055	29/32	–	75	2.9528	2 15/16	+
24	0.9449	15/16	+	76	2.9921	3.0	–
25	0.9843	31/32	+	77	3.0315	3 1/32	+
26	1.0236	1 1/32	–	78	3.0709	3 1/16	+
27	1.0630	1 1/16	+	79	3.1102	3 1/8	–
28	1.1024	1 3/32	+	80	3.1496	3 5/32	–
29	1.1417	1 5/32	–	81	3.1890	3 3/16	+
30	1.1811	1 3/16	–	82	3.2283	3 7/32	+
31	1.2205	1 7/32	+	83	3.2677	3 9/32	–
32	1.2598	1 1/4	+	84	3.3071	3 5/16	–
33	1.2992	1 5/16	–	85	3.3465	3 11/32	+
34	1.3386	1 11/32	–	86	3.3858	3 3/8	+
35	1.3780	1 3/8	+	87	3.4252	3 7/16	–
36	1.4173	1 13/32	+	88	3.4646	3 15/32	–
37	1.4567	1 15/32	–	89	3.5039	3 1/2	+
38	1.4961	1 1/2	–	90	3.5433	3 17/32	+
39	1.5354	1 17/32	+	91	3.5827	3 19/32	–
40	1.5748	1 9/16	+	92	3.6220	3 5/8	–
41	1.6142	1 5/8	–	93	3.6614	3 21/32	+
42	1.6535	1 21/32	–	94	3.7008	3 11/16	+
43	1.6929	1 11/16	+	95	3.7402	3 3/4	–
44	1.7323	1 23/32	+	96	3.7795	3 25/32	–
45	1.7717	1 25/32	–	97	3.8189	3 13/16	+
46	1.8110	1 13/16	–	98	3.8583	3 27/32	+
47	1.8504	1 27/32	+	99	3.8976	3 29/32	–
48	1.8898	1 7/8	+	100	3.9370	3 15/16	–
49	1.9291	1 15/16	–	101	3.9764	3 31/32	+
50	1.9685	1 31/32	–	102	4.0157	4 1/32	–
51	2.0079	2.0	+	103	4.0551	4 1/16	–
52	2.0472	2 1/16	–	104	4.0945	4 3/32	+

+ = Decimal equivalent is greater than the fraction.
– = Decimal equivalent is less than the fraction.

Millimeter/Decimal/Inch Conversion Table

MM	Decimal Equiv.	Inches	+ or −	MM	Decimal Equiv.	Inches	+ or −
105	4.1339	4 1/8	+	157	6.1811	6 3/16	−
106	4.1732	4 3/16	−	158	6.2205	6 7/32	+
107	4.2126	4 7/32	−	159	6.2598	6 1/4	+
108	4.2520	4 1/4	+	160	6.2992	6 5/16	−
109	4.2913	4 9/32	+	161	6.3386	6 11/32	−
110	4.3307	4 11/32	−	162	6.3779	6 3/8	+
111	4.3701	4 3/8	−	163	6.4173	6 13/32	+
112	4.4094	4 13/32	+	164	6.4567	6 15/32	−
113	4.4488	4 7/16	+	165	6.4961	6 1/2	−
114	4.4882	4 1/2	−	166	6.5354	6 17/32	+
115	4.5276	4 17/32	−	167	6.5748	6 9/16	+
116	4.5669	4 9/16	+	168	6.6142	6 5/8	−
117	4.6063	4 19/32	+	169	6.6535	6 21/32	−
118	4.6457	4 21/32	−	170	6.6929	6 11/16	+
119	4.6850	4 11/16	−	171	6.7323	6 23/32	+
120	4.7244	4 23/32	+	172	6.7716	6 25/32	−
121	4.7638	4 3/4	+	173	6.8110	6 13/16	−
122	4.8031	4 13/16	−	174	6.8504	6 27/32	+
123	4.8425	4 27/32	−	175	6.8898	6 7/8	+
124	4.8819	4 7/8	+	176	6.9291	6 15/16	−
125	4.9213	4 29/32	+	177	6.9685	6 31/32	−
126	4.9606	4 31/32	−	178	7.0079	7.0	+
127	5.0000	5.0		179	7.0472	7 1/16	−
128	5.0394	5 1/32	+	180	7.0866	7 3/32	−
129	5.0787	5 3/32	−	181	7.1260	7 1/8	+
130	5.1181	5 1/8	−	182	7.1653	7 5/32	+
131	5.1575	5 5/32	+	183	7.2047	7 7/32	−
132	5.1968	5 3/16	+	184	7.2441	7 1/4	−
133	5.2362	5 1/4	−	185	7.2835	7 9/32	+
134	5.2756	5 9/32	−	186	7.3228	7 5/16	+
135	5.3150	5 5/16	+	187	7.3622	7 3/8	−
136	5.3543	5 11/32	+	188	7.4016	7 13/32	−
137	5.3937	5 13/32	−	189	7.4409	7 7/16	+
138	5.4331	5 7/16	−	190	7.4803	7 15/32	+
139	5.4724	5 15/32	+	191	7.5197	7 17/32	−
140	5.5118	5 1/2	+	192	7.5590	7 9/16	−
141	5.5512	5 9/16	−	193	7.5984	7 19/32	+
142	5.5905	5 19/32	−	194	7.6378	7 5/8	+
143	5.6299	5 5/8	+	195	7.6772	7 11/16	−
144	5.6693	5 21/32	+	196	7.7165	7 23/32	−
145	5.7087	5 23/32	−	197	7.7559	7 3/4	+
146	5.7480	5 3/4	−	198	7.7953	7 25/32	+
147	5.7874	5 25/32	+	199	7.8346	7 27/32	−
148	5.8268	5 13/16	+	200	7.8740	7 7/8	−
149	5.8661	5 7/8	−	201	7.9134	7 29/32	+
150	5.9055	5 29/32	−	202	7.9527	7 15/16	+
151	5.9449	5 15/16	+	203	7.9921	8.0	−
152	5.9842	5 31/32	+	204	8.0315	8 1/32	+
153	6.0236	6 1/32	−	205	8.0709	8 1/16	+
154	6.0630	6 1/16	+	206	8.1102	8 1/8	−
155	6.1024	6 3/32	+	207	8.1496	8 5/32	−
156	6.1417	6 5/32	−	208	8.1890	8 3/16	+

\+ = Decimal equivalent is greater than the fraction.
− = Decimal equivalent is less than the fraction.

Millimeter/Decimal/Inch Conversion Table

MM	Decimal Equiv.	Inches	+ or −	MM	Decimal Equiv.	Inches	+ or −
209	8.2283	8 7/32	+	255	10.0393	10 1/32	+
210	8.2677	8 9/32	−	256	10.0787	10 3/32	−
211	8.3071	8 5/16	−	257	10.1181	10 1/8	−
212	8.3464	8 11/32	+	258	10.1575	10 5/32	+
213	8.3858	8 3/8	+	259	10.1968	10 3/16	+
214	8.4252	8 7/16	−	260	10.2362	10 1/4	−
215	8.4646	8 15/32	−	261	10.2756	10 9/32	−
216	8.5039	8 1/2	+	262	10.3149	10 5/16	+
217	8.5433	8 17/32	+	263	10.3543	10 11/32	+
218	8.5827	8 19/32	−	264	10.3937	10 13/32	−
219	8.6220	8 5/8	−	265	10.4330	10 7/16	−
220	8.6614	8 21/32	+	266	10.4724	10 15/32	+
221	8.7008	8 11/16	+	267	10.5118	10 1/2	+
222	8.7401	8 3/4	−	268	10.5512	10 9/16	−
223	8.7795	8 25/32	−	269	10.5905	10 19/32	−
224	8.8189	8 13/16	+	270	10.6299	10 5/8	+
225	8.8583	8 27/32	+	271	10.6693	10 21/32	+
226	8.8976	8 29/32	−	272	10.7086	10 23/32	−
227	8.9370	8 15/16	−	273	10.7480	10 3/4	−
228	8.9764	8 31/32	+	274	10.7874	10 25/32	+
229	9.0157	9 1/32	−	275	10.8268	10 13/16	+
230	9.0551	9 1/16	−	276	10.8661	10 7/8	−
231	9.0945	9 3/32	+	277	10.9055	10 29/32	−
232	9.1338	9 1/8	+	278	10.9449	10 15/16	+
233	9.1732	9 3/16	−	279	10.9842	10 31/32	+
234	9.2126	9 7/32	−	280	11.0236	11 1/32	−
235	9.2520	9 1/4	+	281	11.0630	11 1/16	+
236	9.2913	9 9/32	+	282	11.1023	11 3/32	+
237	9.3307	9 11/32	−	283	11.1417	11 5/32	−
238	9.3701	9 3/8	−	284	11.1811	11 3/16	−
239	9.4094	9 13/32	+	285	11.2204	11 7/32	+
240	9.4488	9 7/16	+	286	11.2598	11 1/4	+
241	9.4882	9 1/2	−	287	11.2992	11 5/16	−
242	9.5275	9 17/32	−	288	11.3386	11 11/32	−
243	9.5669	9 9/16	+	289	11.3779	11 3/8	+
244	9.6063	9 19/32	+	290	11.4173	11 13/32	+
245	9.6457	9 21/32	−	291	11.4567	11 15/32	−
246	9.6850	9 11/16	−	292	11.4960	11 1/2	−
247	9.7244	9 23/32	+	293	11.5354	11 17/32	+
248	9.7638	9 3/4	+	294	11.5748	11 9/16	+
249	9.8031	9 13/16	−	295	11.6142	11 5/8	−
250	9.8425	9 27/32	−	296	11.6535	11 21/32	−
251	9.8819	9 7/8	+	297	11.6929	11 11/16	+
252	9.9212	9 29/32	+	298	11.7323	11 23/32	+
253	9.9606	9 31/32	−	299	11.7716	11 25/32	−
254	10.0000	10.0		300	11.8110	11 13/16	−

\+ = Decimal equivalent is greater than the fraction.
− = Decimal equivalent is less than the fraction.

Conversions

Number of Cubic Centimeters x 0.061 = Cubic Inches
Number of Cubic Inches x 16.387 = Cubic Centimeters
Number of Foot Pounds x 0.1383 = Kilograms in Meters
Number of Kilogram Meters x 7.235 = Foot Pounds

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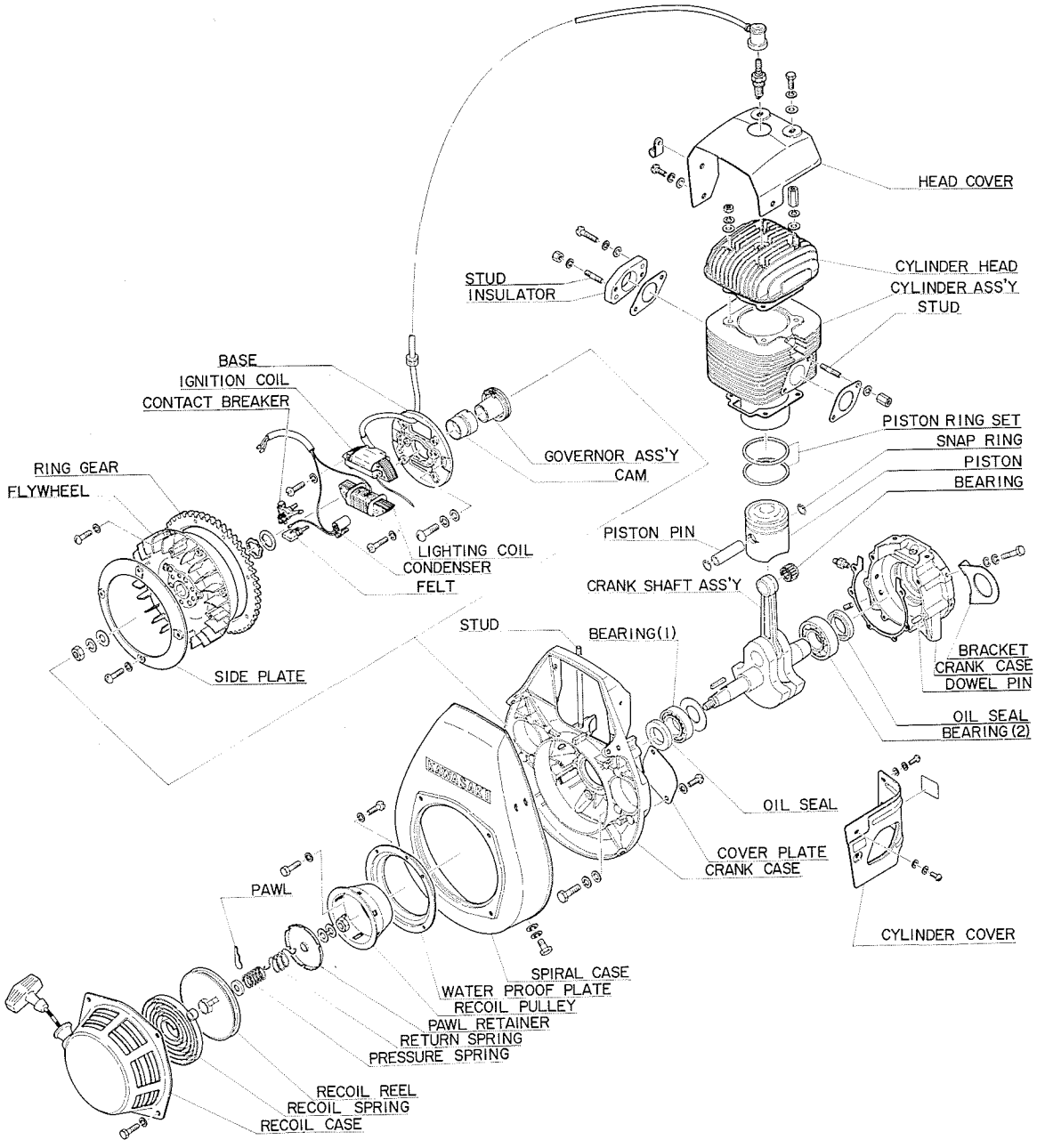
KT150 ENGINE/TORQUE SPECIFICATIONS



Tightening Torques

Cylinder Head	16 Ft. Lbs.
Crankcase Bolts	13 Ft. Lbs.
Flywheel Nut	56 Ft. Lbs.
Recoil Starter Mounting Bolts	13 Ft. Lbs.
Spark Plug	25 Ft. Lbs.

ENGINE THEORY OF OPERATION

General

The engines used in all Arctic Cat snowmobiles utilize air as the primary cooling agent. The air-cooled engine is simple to maintain and does not require protection from freezing.

Conversely, water-cooled engines, because they utilize a radiator, hoses, water lines, and a water pump, require low temperature protection from freezing and the expansion of water. The cost of said maintenance and component parts is much greater than the air-cooled engine.

Any engine generates heat during operation (combustion process) and eventually must be dissipated to prevent overheating and possible engine damage. Air-cooled engines are equipped with a blower or axial fan which blows a cool air stream around the engine crankcase and cylinder(s). An engine shroud directs this cool air stream over the areas of heat buildup. These heat buildup areas are usually finned so as to accommodate maximum cool air flow.

Combustion Cycle

During each revolution of the crankshaft, the piston makes one stroke up and one stroke down the cylinder. As a result, for each crankshaft revolution there are two piston strokes with combustion occurring each time the piston reaches the top of the cylinder. Considering this information, the name "two stroke engine" is clearly evident.

The Kawasaki engine has four (4) "ports" cut into the cylinder wall: the exhaust port; inlet port; and two transfer ports.

Exhaust Port – The burned gases pass out of the cylinder to the atmosphere.

Inlet Port – Connects the carburetor to the crankcase.

Transfer Ports – Located at the upper end of the passages connecting the cylinder to the crankcase.

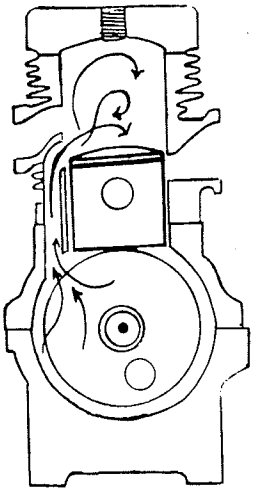
NOTE: The inlet port opening and closing is controlled by the piston skirt. The transfer and exhaust ports are controlled by the top edge of the piston.

With the piston positioned at bottom dead center (BDC) the engine operating cycle commences. On the upward stroke of the piston, the top side of the piston seals off the transfer ports and the exhaust port, compressing the fuel/air mixture into the cylinder head cavity. Simultaneously, the piston skirt uncovers the inlet port and a fresh charge of the fuel/air mixture is drawn into the crankcase.

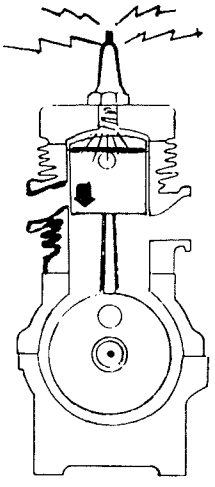
As the piston reaches the top of the stroke, the compressed fuel/air mixture is ignited by the spark plug. The ignited gases, expanding from the combustion process, push the piston down the cylinder; this is known as the power stroke. Continuing the piston descent, the exhaust port is uncovered and at this time, the burned gases escape through the exhaust system and into the atmosphere.

Near the bottom of the stroke, the piston uncovers the transfer ports, allowing the fuel/air mixture that was drawn into the crankcase to be pumped into the cylinder. The pumping action is a result of the piston skirt sealing off the inlet port, causing a pressure rise in the crankcase.

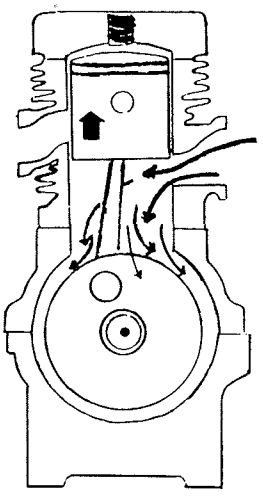
NOTE: To prevent some of the fuel/air mixture from escaping through the exhaust port, the cylinder head is shaped to act as a barrier and the muffler serves as a restricter. This assists in cleaning the combustion chamber of all the burned gases and limits the escape of the fuel/air mixture when it is being pumped into the cylinder. The piston then begins to rise again to start another cycle of operation.



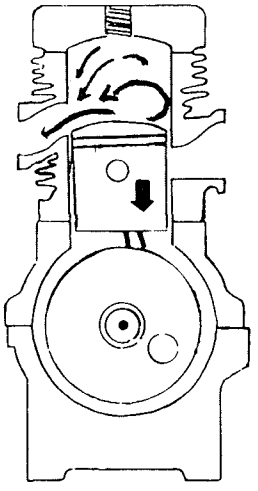
FUEL TRANSFER



POWER



INTAKE

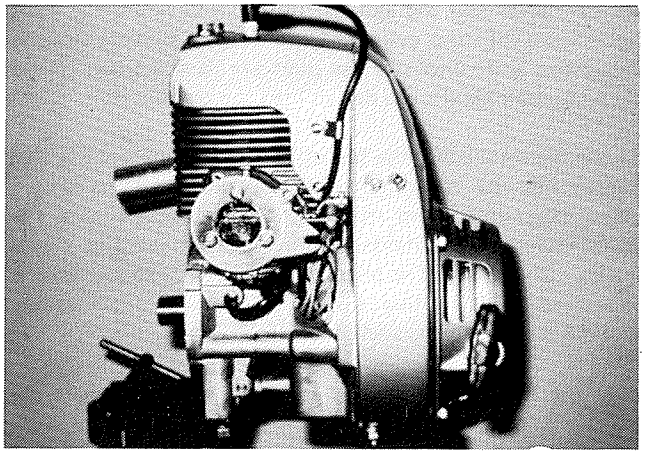


EXHAUST

ENGINE SERVICING (SINGLE CYLINDER)

General Engine Information

In the manufacture of Arctic Cat snowmobiles, both the single cylinder (KT150A and KT150B) and the twin-cylinder (T1A) engines are used. This engine section will provide you with the information necessary to service the single-cylinder (KT150) engine. Read and understand this section before performing any engine service procedures.



Engine Removal

To remove the engine from the front end assembly, use the following procedure:

NOTE: When the engine is being removed and during engine disassembly, all fasteners should be retained with the appropriate component parts.

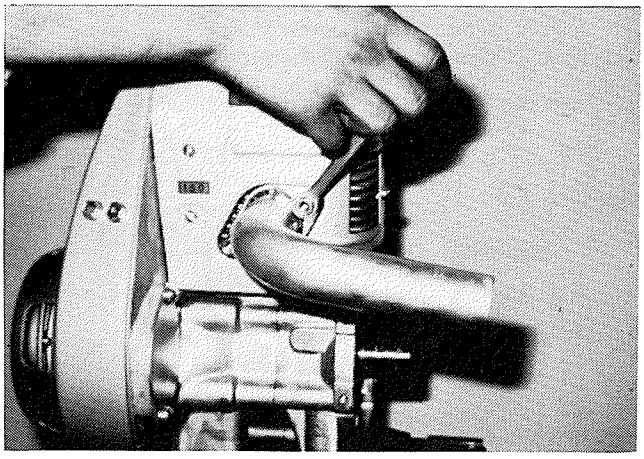
1. Open or remove the hood, whichever will better facilitate engine removal and servicing. If the hood is removed, the headlight harness must be removed first.
2. Disconnect the spark plug lead wire.
3. Remove the drive belt (see Drive Belt Removal, page 109).
4. Disconnect the headlight/ignition harness at the recoil side of the engine.
5. Disconnect the choke and the throttle cable wires at the carburetor.
6. Remove the inlet fuel line and the vapor return line at the carburetor.

WARNING
To prevent gas leakage, insure that the fuel line ends are positioned above the fuel tank.

7. Disassemble the muffler from the exhaust outlet pipe by removing the wire clip that secures the muffler to the exhaust outlet pipe.
8. Remove the bracket securing the recoil starter handle to the right side of the console.
9. On electric start models, perform the following:
   A) Disconnect the negative (–) battery cable (black) from the negative (–) battery terminal.
   B) Disconnect the regulator rectifier.
   C) Disconnect the positive (+) battery cable (red) and the solenoid wires from the starter.
10. Loosen the locking collar at the base of the steering post with an Allen wrench. Slide collar up the steering post to keep it away from the engine base plate.
11. Remove the two (2) lock nuts and flat washers that secure the rear of the engine base plate.
12. Lastly, remove the two (2) lock nuts and flat washers that secure the front of the engine base plate. The lock nuts and flat washers are located directly below the exhaust outlet pipe (center of engine).

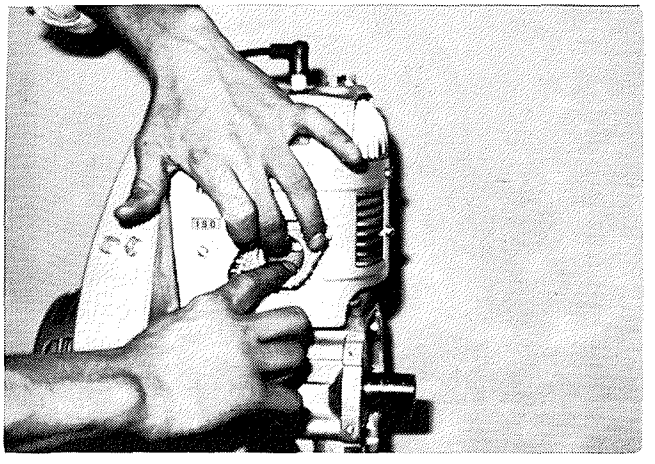
Engine Disassembly

1. Remove the two (2) coupling nuts and lock washers securing the exhaust outlet pipe to the engine. Slide exhaust outlet pipe off the mounting studs.

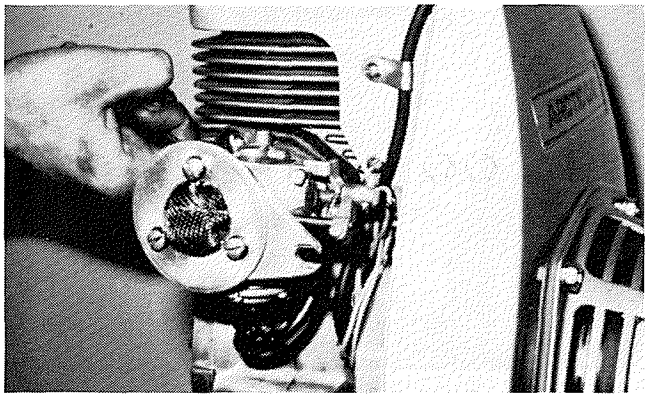


ENGINE SERVICING (SINGLE CYLINDER)

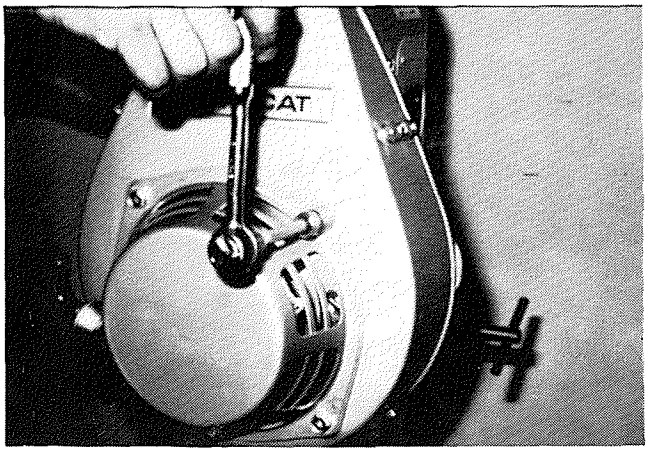
2. Remove the asbestos exhaust outlet gasket.



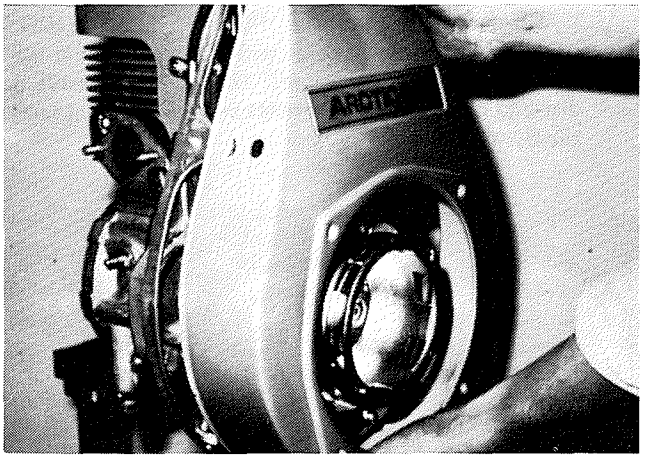
3. Disconnect the impulse line at the engine. Unscrew the two (2) carburetor flange nuts and slide washers off mounting studs. Carefully pull carburetor from the mounting studs. **CAUTION: Be sure the mounting studs do not back out; breakage of the carburetor ear could result when reassembling.**



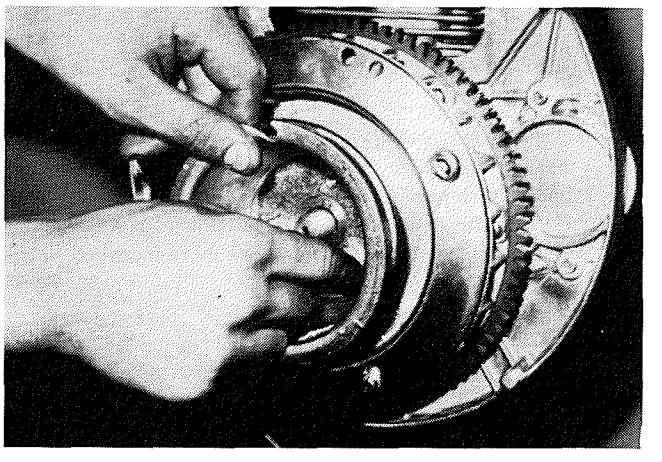
4. Remove the four (4) capscrews and washers securing the recoil starter and set aside.



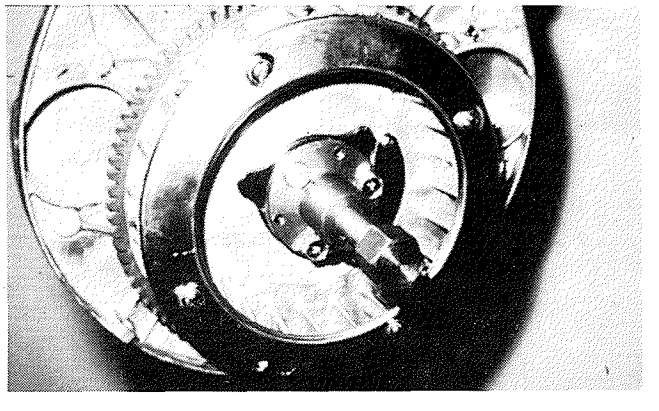
5. Remove the six (6) bolts securing the spiral case to fan cowl. Pull spiral case straight out from the engine.



6. Using a flywheel holding tool and a 13mm socket wrench, remove the three (3) bolts and rope pulley.



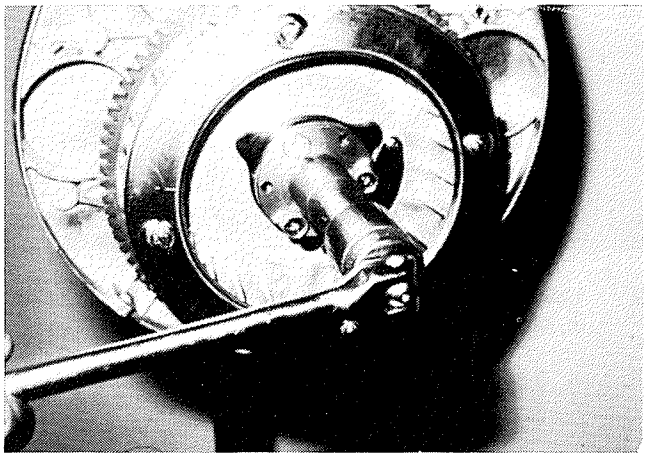
7. Install flywheel puller (Arctic Part No. 0144-064) by using the three (3) rope pulley bolts. **CAUTION: Insure the flywheel puller is evenly seated and all three bolts are tightened uniformly. If bolts protrude through the flywheel, damage to the magneto coils may occur.**



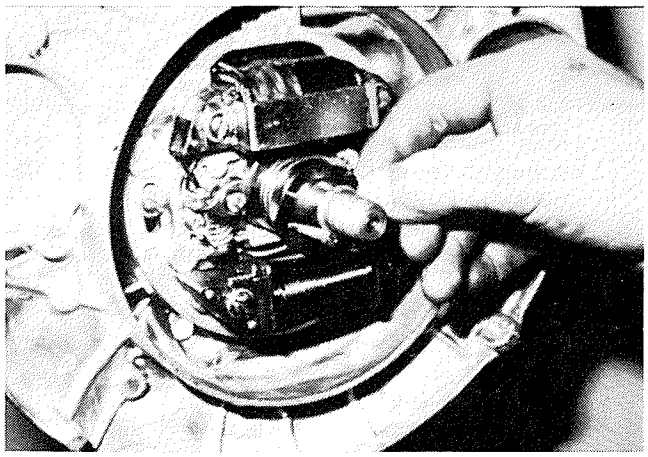
ENGINE SERVICING (SINGLE CYLINDER)

8. Tighten the flywheel puller bolt until the flywheel freely disengages.

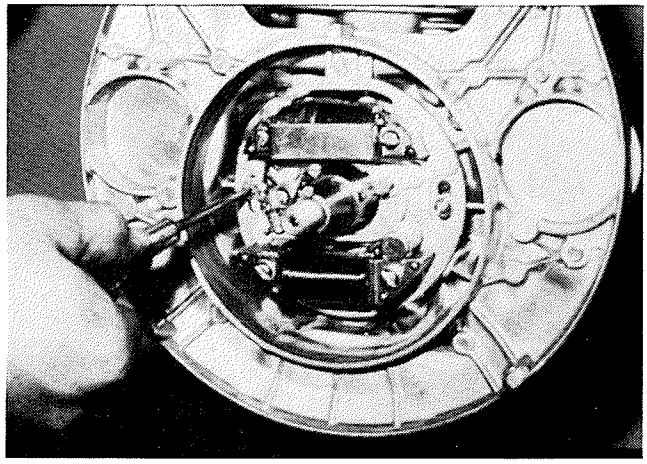
9. Pull flywheel off the crankshaft and remove the flywheel puller from the flywheel. **CAUTION: Always place the flywheel with magnets facing upward on a clean, dry area. Damage may result if dirt and other foreign particles come in contact with the flywheel magnets.**



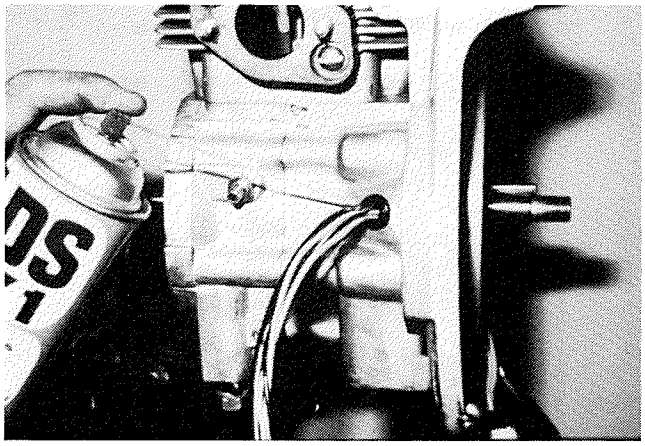
10. Remove the spring washer and the flat washer next to the ignition cam. **NOTE: Steel flat washer is always positioned next to the ignition cam.** Mark the position of the magneto base in relation to the crankcase with a scribe, insuring that it can be re-installed in the same position.



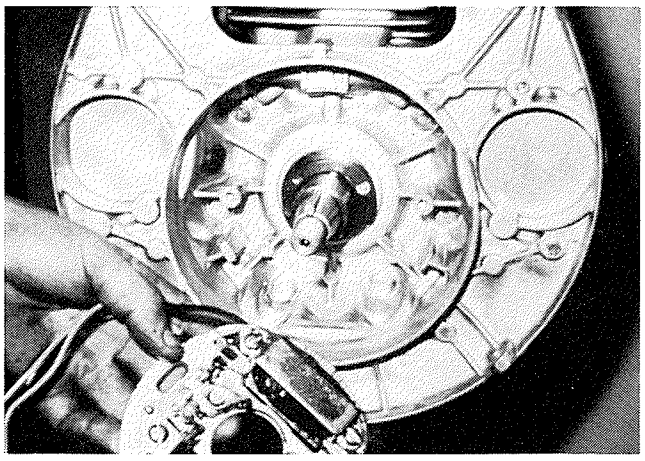
11. Remove the two (2) screws that secure the magneto assembly (see top right column photo).



12. Spray the wiring with lubricant or silicone spray to facilitate removal. To enable the wire to be pulled through the grommet, remove spark plug wire cap, and the holding clamp. Pull ignition wiring through grommet.

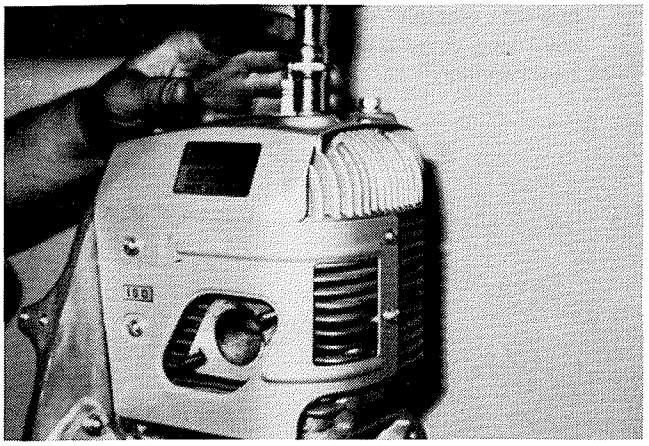


13. Remove the magneto assembly, cam governor assembly, and the flywheel key. **NOTE: Cam governor assembly must be removed before the key in the crankshaft is pulled.**

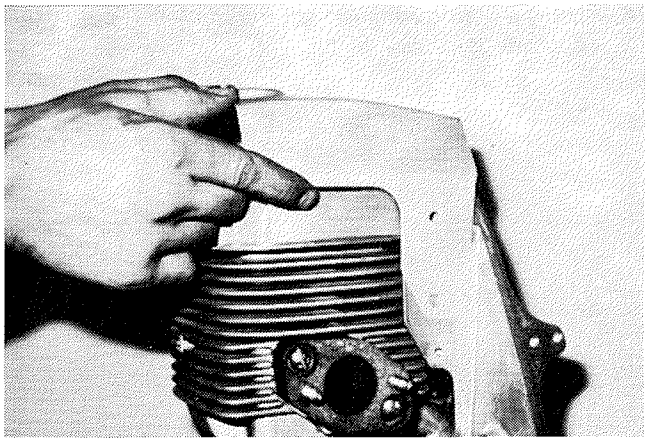


ENGINE SERVICING (SINGLE CYLINDER)

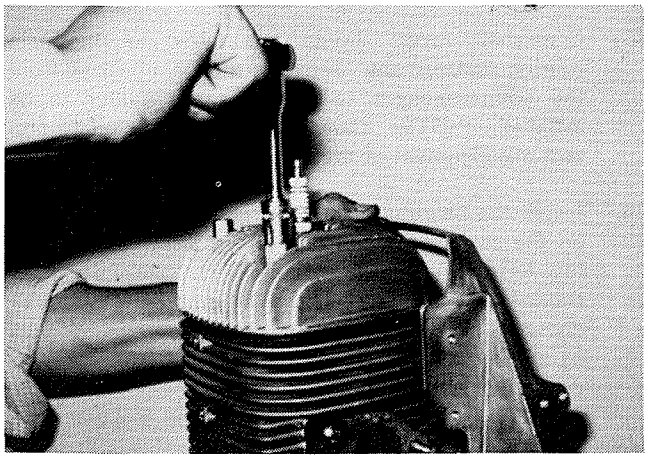
14. Remove the bolts retaining the cylinder head cover and the screws retaining the engine shrouding.



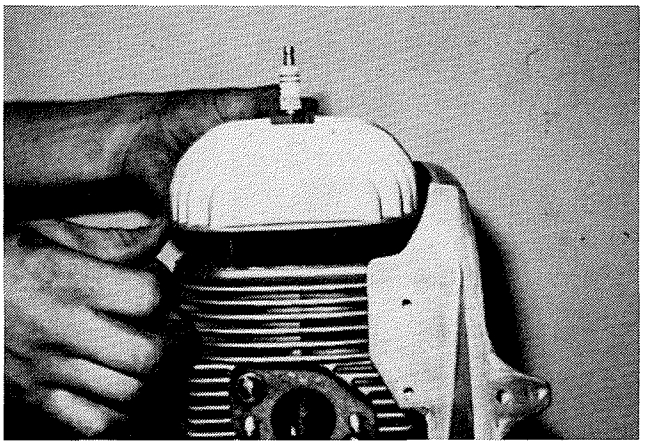
15. Both the cylinder cover and head covers can now be removed.



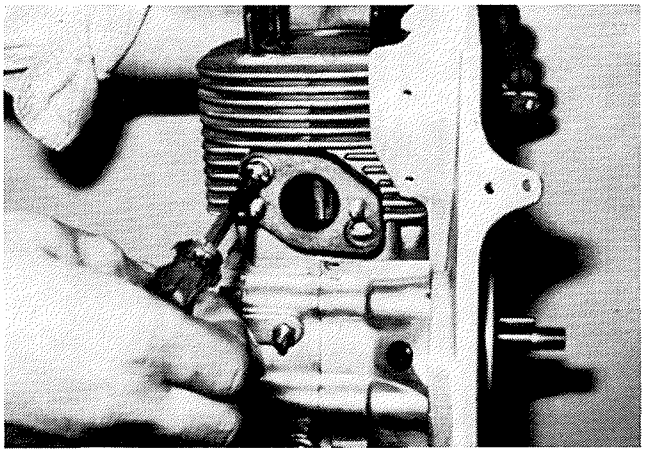
16. Disassemble the cylinder head from the cylinder by removing the four (4) cylinder head nuts and washers.



17. Remove cylinder head and gasket. **NOTE: It is advisable to replace the gasket when reassembling a used engine.**



18. To disassemble the carburetor insulator block from the cylinder, remove the two (2) screws and lock washers.



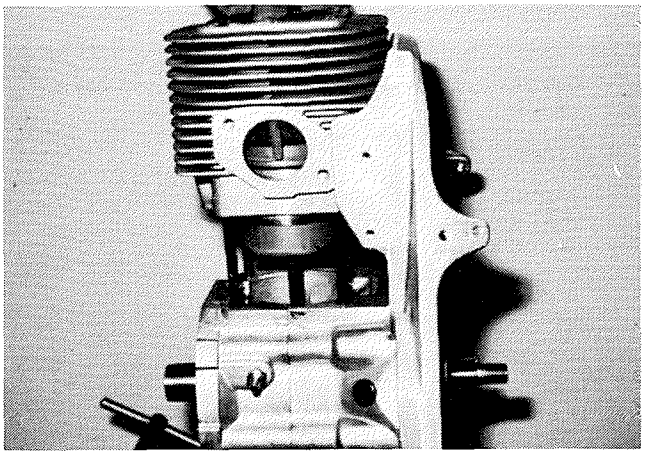
19. **NOTE: Insure the carburetor insulator block is not damaged or cracked.**

20. Rotate the crankshaft until the piston reaches bottom dead center (BDC). Remove the cylinder and cylinder gasket. **NOTE: Replace the cylinder gasket when reassembling the engine.** While removing the cylinder, grasp the piston for stabilization to prevent possible piston damage if the piston should come in contact with cylinder studs (see top left column photo, page 16).

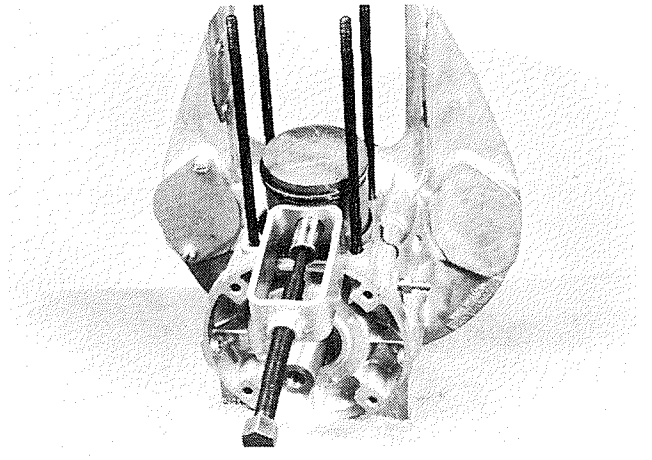
CAUTION: When performing top end repair, stuff a clean shop cloth into the crankcase opening around the con-

ENGINE SERVICING (SINGLE CYLINDER)

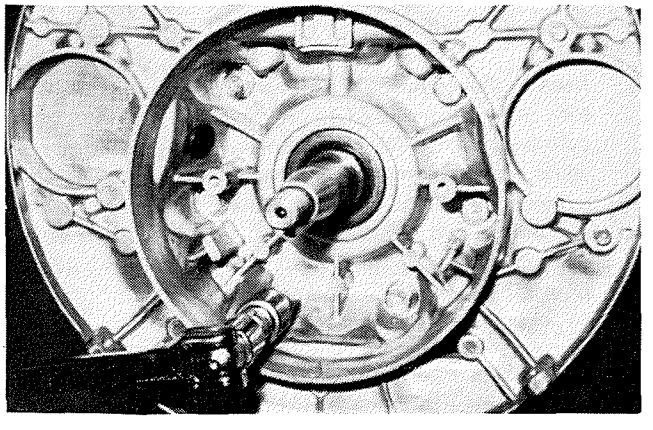
necting rod to prevent objects and foreign particles from falling into the crankcase.



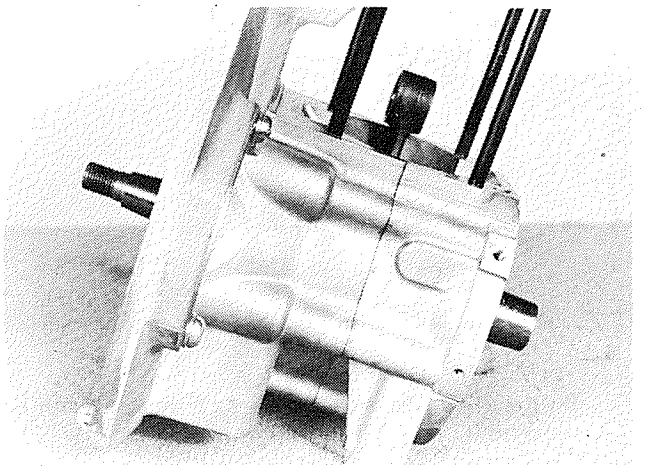
21. To disengage the piston from the connecting rod, remove the circlips. Using a piston pin puller (Arctic Part No. 0144-003), remove the piston pin.



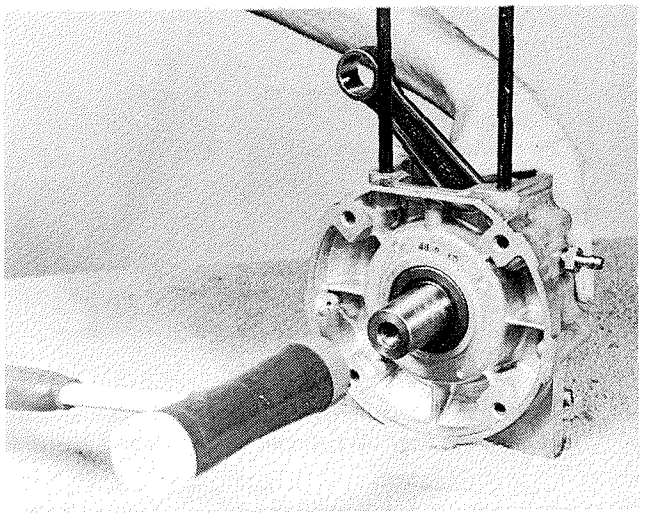
22. Separate the crankcase in halves by removing the six (6) crankcase bolts. **NOTE: The two (2) center crankcase bolts are longer than the other four (4) bolts and therefore, must be replaced in the same positions to prevent possible crankcase damage.**



23. When separating the two (2) crankcase halves, hold magneto side of the case and tap the end of the crankshaft with a plastic mallet. **CAUTION: To prevent possible damage to the crankshaft and crankcase, never tap the end of the crankshaft with a steel hammer.**



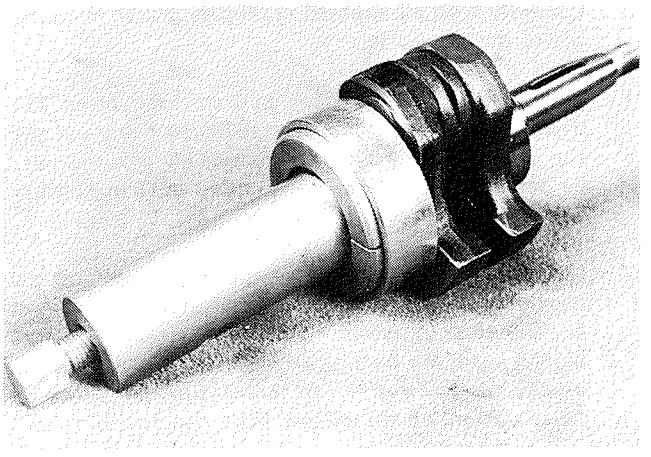
24. Using a plastic hammer, tap the crankshaft out of the opposite crankcase half.



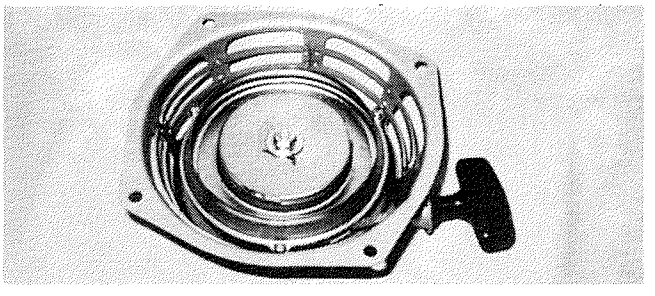
25. Crankshaft repair should be limited to the main bearing replacement. Separate the main bearing from the counterweights to allow bearing puller to be installed. **NOTE: Care should be exercised to prevent misalignment of the crankshaft.**

26. Install the bearing puller (Arctic Part No. 0144-006) on the crankshaft and remove the main bearing (see top left column photo, page 17). **NOTE: The crankshaft is a factory assembled unit, and therefore, disassembly is not recommended. No warranty will be allowed on any component of the engine if the crankshaft has been disassembled. If the crankshaft should fail during the warranty period, replace with a new factory assembled unit.**

ENGINE SERVICING (SINGLE CYLINDER)



27. Disassemble the recoil assembly (see Recoil Starter Disassembly, page 22).

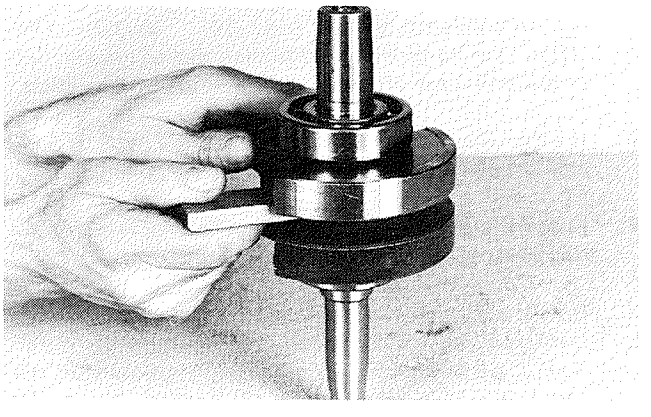


28. At this point the engine and recoil assembly have been completely disassembled. Clean all component parts and replace any defective or questionable items.

Engine Assembly

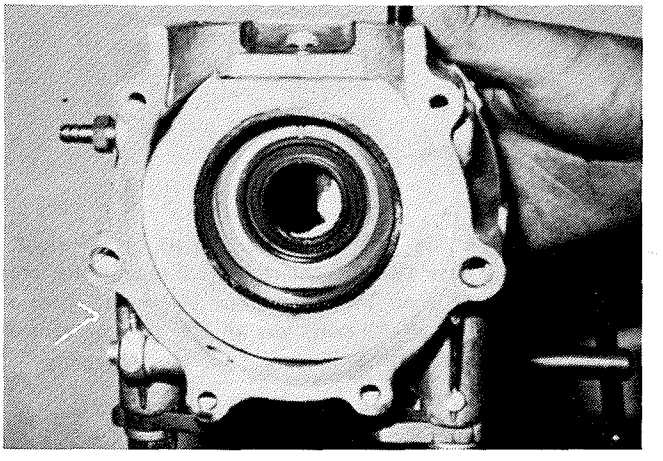
Prior to assembling the engine, insure all parts are clean and damaged components replaced. To assemble the engine, proceed as follows:

1. Support the crankshaft between the flyweights and install new main bearings. Crankshaft is supported to prevent accidental misalignment while the bearing is being pressed on the crankshaft.



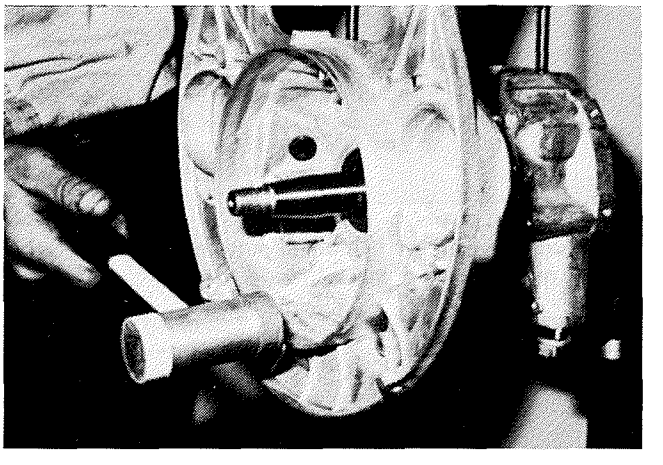
2. Inspect the crankshaft seals and replace if necessary. To insure a good seal, pack the oil seal lips with bearing grease. Clean the gasket surface and install a new crankcase gasket, using crankcase sealer (Arctic Part No. 3000-211).

3. With a propane torch, heat the bearing seat of the PTO side crankcase. **CAUTION: To prevent seal or gasket damage resulting in improper sealing, insure that the torch flame does not contact the seal and gasket.**



4. Install crankshaft to PTO side of crankcase, insuring that the bearing has seated properly.

5. Perform step three (3) on magneto side of crankcase.

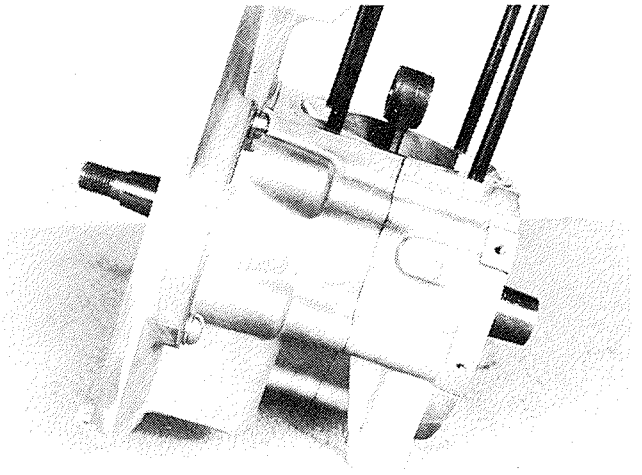


6. Assemble the two crankcase halves and the crankshaft assembly. Insure bearings are seated properly.

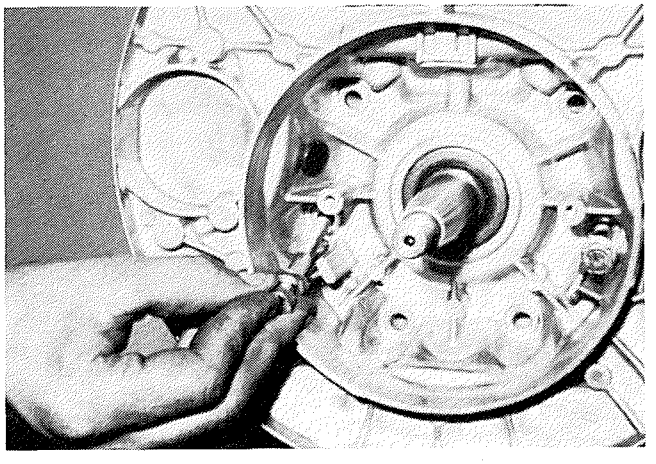
7. After the crankcase halves have firmly seated together, rotate the crankshaft to insure that it rotates freely. If resistance is felt, the bearings may not have fully seated in the crankcase halves. To correct this situation, tap on both ends of the crankshaft with a

ENGINE SERVICING (SINGLE CYLINDER)

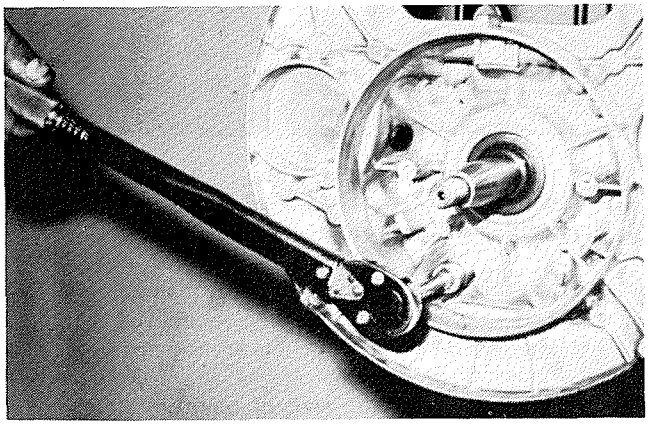
plastic mallet, doing so while the crankcase bearing seats are still warm from heating.



8. Install the six (6) crankcase bolts finger tight. **NOTE: The two (2) center crankcase bolts are 9mm longer than the other four (4) bolts. Insure that these two (2) bolts are in the proper center locations before tightening.**



9. Using a crisscross tightening pattern, torque all bolts to thirteen (13) ft. lbs.

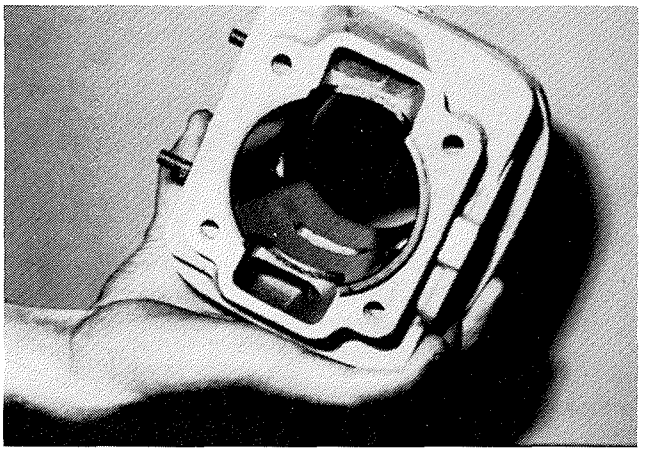


10. Carefully trim all exposed crankcase gasket from the top of the crankcase.

11. Before installing the piston and cylinder, clean and decarbonize the exhaust port, cylinder head and the top of the piston. **NOTE: Piston ring grooves must be perfectly clean before any upper end components are replaced.**

12. Check the condition of the piston, rings, and the needle bearing and piston pin. Rings are the most likely items to wear. Therefore, check each ring before installing on piston. **NOTE: Worn rings can usually be detected by an increase in end gap or by discoloration of the piston skirt due to "blowby".**

13. Check the cylinder walls; replace cylinder if damage is evident. If small deposits of aluminum have adhered to the cylinder bore (no grooves), the cylinder may be salvaged by a very light honing process.



14. Check the ring end gap by placing the ring in the lower portion of the cylinder and lightly press on the ring with the top of the piston. With a feeler gauge, insure that the ring end gap is .006" - .014".

15. If a new piston is being installed, always use a new set of rings. The light green teflon colored ring must be installed in the top ring groove of the piston (see top left column photo, page 19). **NOTE: The teflon coating provides protection during engine run-in but will wear off after several hours of operation.**

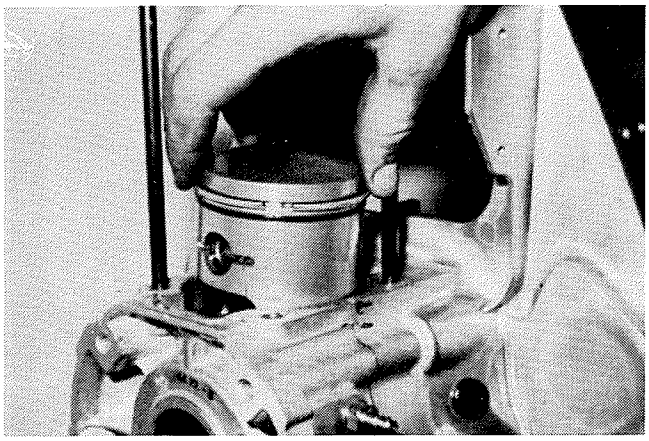
16. If either the piston pin or needle bearing need replacement, replace as a complete set.

17. Install the open ends of the rings between the piston ring groove pins (see top left column photo, page 19).

18. Install the needle bearing in the upper end of the crankshaft and slide piston into position on crankshaft. Secure piston to crankshaft with piston pin and retain in place with two (2) circlips. Insure the

ENGINE SERVICING (SINGLE CYLINDER)

circlips are seated in the piston pin grooves. **NOTE: Open end of circlips must face either up or down. Install circlip on magneto side before installing the piston.**

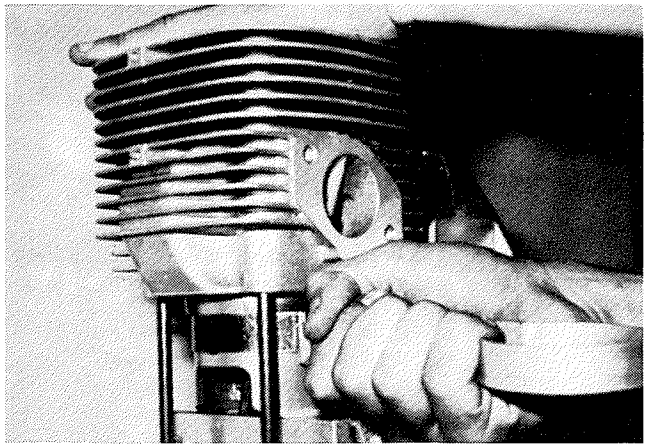


19. Clean the gasket areas of the crankcase and check the bottom of the cylinder for damaged surfaces. Install a new cylinder base gasket.

20. Lubricate the upper and lower rod bearings, sides of piston, and the cylinder walls with Arctic Cat Purple Powerlube.

21. Position a block of soft metal or wood under the piston and turn the crankshaft until both skirts (bottom edge) of the piston rest on the block (see photo below).

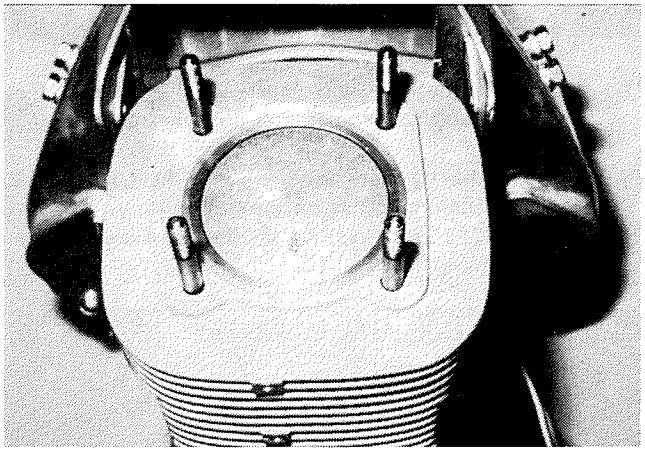
22. Hold the rings with a piston ring compressor (Arctic Part No. 0144-001) and carefully slide the cylinder over the bolts (see photo below). When the cylinder is positioned over the piston rings, carefully remove the ring compressor and the block. **NOTE: Insure cylinder base gasket was not damaged when block was removed.**



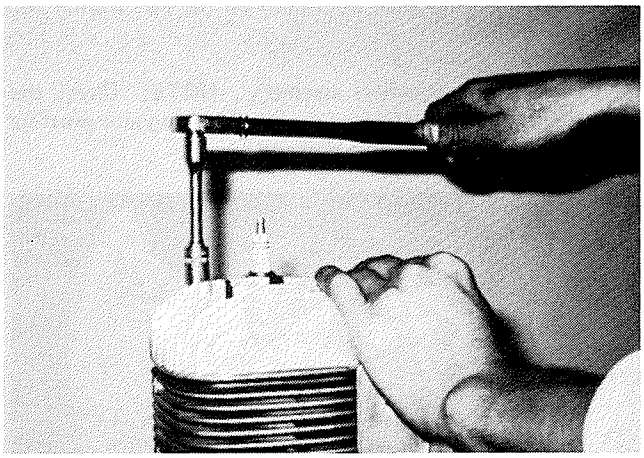
NOTE: Standard piston to cylinder clearance is .0035" at the skirt and should not exceed .005". The Arctic Cat piston is made of special alloy with an anti-friction surface material. Always use genuine Arctic Cat pistons for replacement.

23. Maintaining even pressure, press cylinder down until cylinder has firmly seated on the crankcase.

24. Observe the top of the piston; arrow must point toward the exhaust side of the engine. **NOTE: On 1971 model KT150 engines and prior to 1971, the arrow must point toward the PTO side of the engine.**

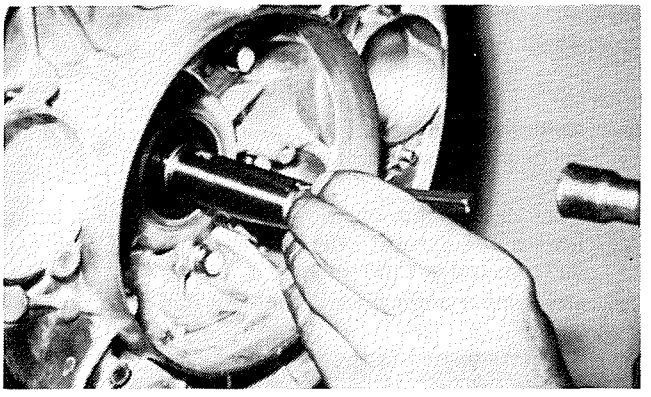


25. Install a new cylinder head gasket. Carefully position the cylinder head over the cylinder bolts. Start the four (4) cylinder head nuts and torque nuts to 8 ft. lbs. in a crisscross pattern. When all four (4) nuts have been torqued to 8 ft. lbs., re-torque the nuts to 16 ft. lbs., using the same crisscross sequence. **NOTE: Install coupling nuts on the PTO side of engine.**



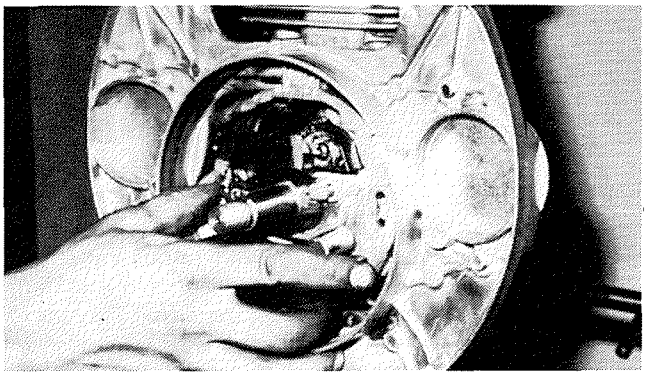
26. Install key on crankshaft, using a plastic mallet to firmly seat it in groove. Then install cam-governor assembly. Key should be even with shoulder of shaft (see top left column photo, page 20). **NOTE: Care should be exercised to prevent damage to the key.**

ENGINE SERVICING (SINGLE CYLINDER)



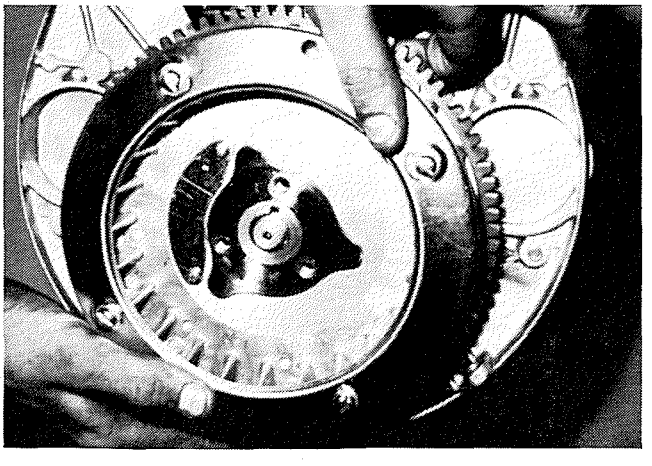
27. Insert the magneto wires through the hole in the crankcase and seat the rubber grommet in the hole.

28. Position the magneto assembly per the scribe mark made on the crankshaft during disassembly. Tighten the two (2) screws securely as this will insure nearly-correct timing.

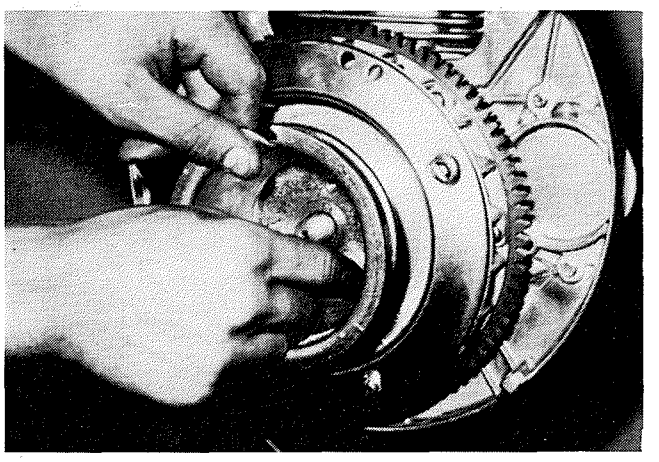


29. Position the flat washer and spring washer on crankshaft, insuring that the notch on the flat washer fits over the key.

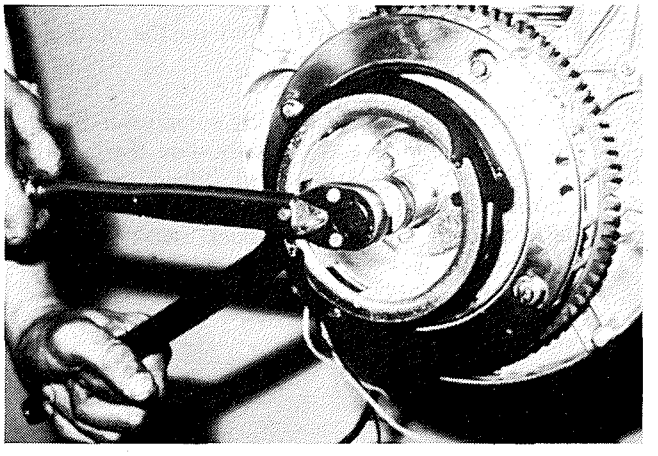
30. Replace the flywheel assembly. **NOTE: Check the magneto for particles of metal. The magneto must be clean to avoid possible damage.**



31. Assemble the emergency rope pulley to the flywheel. Using a flywheel holding tool to hold the flywheel, slightly torque the three (3) emergency rope pulley bolts.



32. Install the special washer and flywheel nut. Hold the flywheel with a flywheel holding tool and torque the nut to 56 ft. lbs. Remove auxiliary rope pulley. Bend locking tabs of the special washer to properly retain flywheel nut.

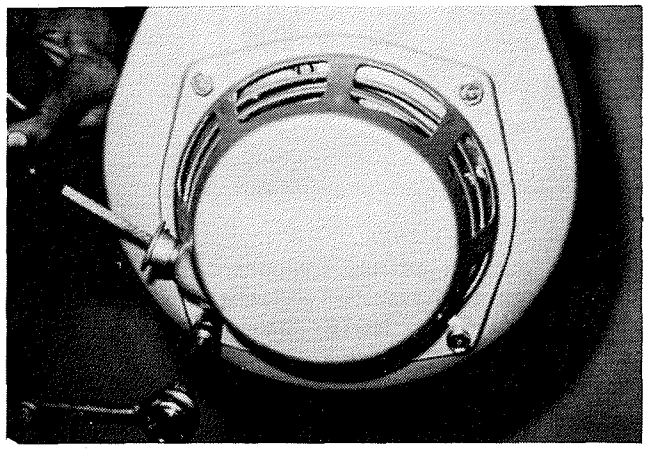


33. Properly time the engine (see Timing, page 25).

34. When the engine has been timed, replace the auxiliary rope pulley and secure in place with three (3) lockwashers and bolts. Torque bolts to 13 ft. lbs.

ENGINE SERVICING (SINGLE CYLINDER)

35. Install the recoil assembly to the engine with the four (4) mounting bolts. Tighten bolts to a point just before binding of the recoil assembly occurs. Pull the recoil rope out approximately six (6) to ten (10) inches or until the pawls engage securely, centering the recoil assembly. Torque the mounting bolts to 5 ft. lbs.



36. Using the two screws and lockwashers, replace the insulator gasket, insulator block, and carburetor to the intake side of the cylinder. **NOTE: A new gasket should be installed between the insulator and the cylinder.**

37. Install a gasket and the carburetor on the mounting studs and secure the carburetor in place with two (2) washers and flange nuts. Connect the impulse line to the engine.

38. Replace the exhaust outlet pipe by installing a new asbestos gasket and exhaust outlet pipe on the mounting studs. Secure the exhaust outlet pipe in place with two (2) lockwashers and nuts.

Engine Installation

1. Position the engine on the front end assembly and secure in place with the four (4) engine mounting nuts and washers.

2. Secure the recoil starter handle and bracket assembly to the right side of the console.

3. Connect the muffler to the exhaust outlet pipe.

4. Connect the positive (+) battery cable (red) and the solenoid wires to the starter if so equipped.

5. Connect the regulator rectifier.

6. Secure the negative (—) battery cable (black) to the negative (—) battery terminal if so equipped.

7. Replace the inlet and vapor return lines on the carburetor.

8. Connect the ignition/headlight harness at the recoil side of the engine.

9. Connect the headlight harness connector to the headlight.

10. Install the choke and throttle cable wires at the carburetor and secure in place.

11. Install the drive belt.

12. Install the spark plug lead wire on the spark plug.

13. Finally, close or replace the hood, whichever was performed to facilitate engine removal and servicing.

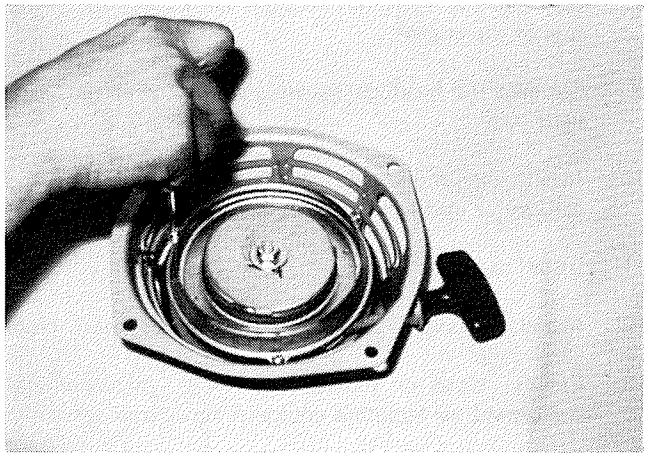
ENGINE SERVICING (SINGLE CYLINDER)

Recoil Starter Disassembly

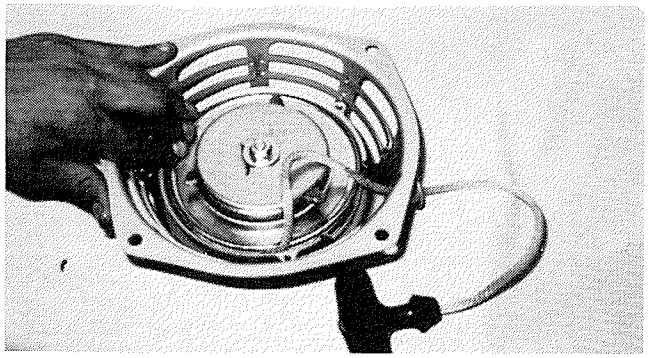
1. Remove the recoil starter handle from the right side of the console.

2. Disassemble the recoil starter from the engine by removing the four (4) bolts and lockwashers.

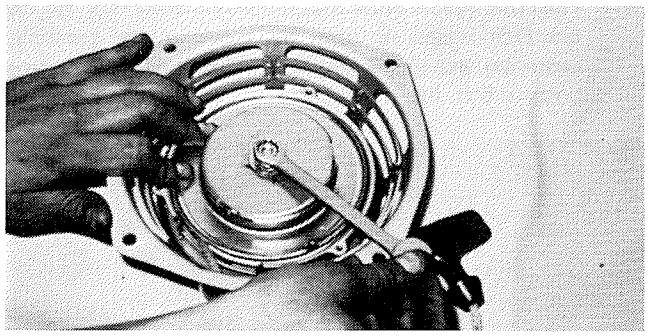
3. If the recoil starter is so equipped, remove the water-proofing plate, using a Phillips screwdriver.



4. Release the preload on the recoil starter spring by using the following procedure:
   A. Pull rope outward until rope can be positioned in the notch of the recoil reel.
   B. Rotate the reel assembly clockwise.
   C. Rotate the recoil reel a sufficient number of turns so that when the reel is released, slack will remain in the rope.

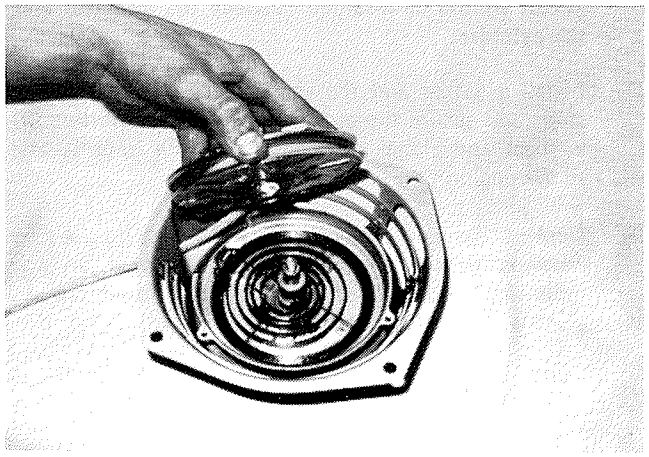


5. Remove the outside retaining nut, lockwasher and flat washer that secures the entire assembly in position.



6. Lift out the internal components and pay special attention to the location and relative position of each component part. **NOTE: Observe the positioning of the small return spring.**

7. Carefully lift out the reel, making sure that the main recoil spring is not accidentally pulled out. **NOTE: The main spring should not be removed from the case unless it is necessary to clean or replace it.**



8. Observe the general condition of the nylon recoil rope. If there are any signs of wear or deterioration, replace with a new Arctic recoil rope.

9. If the main recoil spring must be removed, carefully lift the spring out, protecting against a sudden un-coiling of the spring.

WARNING

Personal injury may be incurred if the spring should suddenly uncoil and strike the mechanic or a bystander.

ENGINE SERVICING (SINGLE CYLINDER)

Inspection/Cleaning

1. Inspect all parts for wear or damage; replace all necessary parts.

2. Remove lubricant buildup from parts by washing in a cleaning solvent.

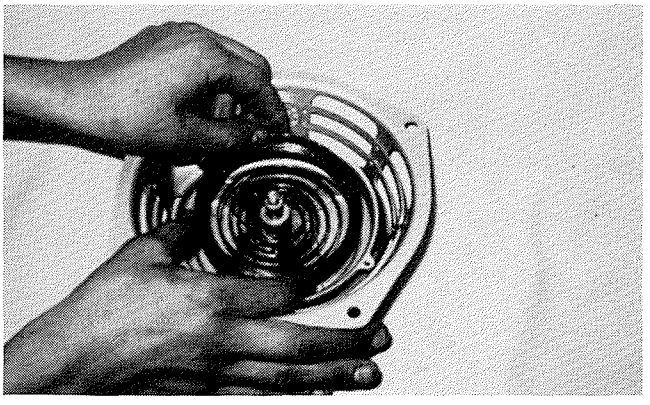
Recoil Starter Assembly

1. Lubricate the component parts of the recoil assembly with petroleum jelly or light grease. **NOTE: Free movement of the recoil mechanism depends upon lubrication between the coils of the main recoil spring.**

2. Wind the main recoil spring, using the recoil spring tool (Arctic Part No. 0144-005).

3. Wind the spring into the tool, starting with the outer coil (end with hook) and press the inner coils into position one by one.

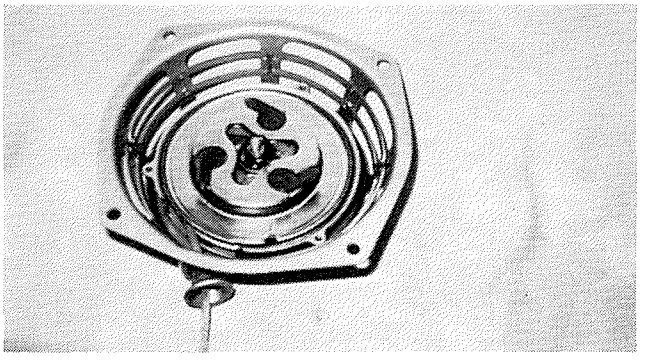
CAUTION: Spring must be wound in a counterclockwise direction with the hook on the spring in contact with the lug of the outer case.



4. Position the recoil spring tool in the case and transfer the spring from the tool to the case.

5. Install the rope and recoil reel over the recoil spring so that the center lug of the recoil reel engages with the inner hook of the main spring.

6. Replace the dished washer, three (3) engagement pawls, pressure spring, and the return spring.



7. Install the retainer cover so that the end of the return spring protrudes through the retainer cover.

8. Rotate the retainer cover one-third turn clockwise to slightly preload the spring.

9. Replace the center flat washer, lockwasher and nut.

10. If the recoil rope handle was not removed during disassembly, position the rope in the notch of the recoil reel and rotate the recoil reel two (2) turns counterclockwise to preload the recoil spring.

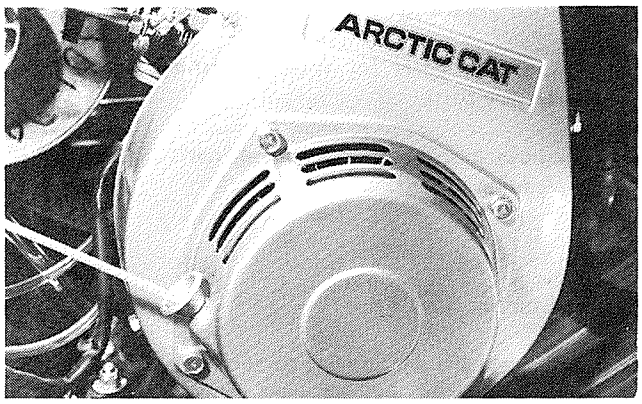
ENGINE SERVICING (SINGLE CYLINDER)

11. If the recoil rope handle was removed, turn recoil reel three (3) turns counterclockwise and insert the end of the rope through the hole in the recoil case. **NOTE: There should be evidence of rope tension.**

12. Tie a knot temporarily to retain the rope and install the recoil rope handle.

13. Pull the recoil rope to insure the recoil starter assembly is operating properly (pawls must extend and retract).

14. Replace the waterproofing plate and install the recoil starter assembly to the engine, using four (4) lockwashers and bolts.



15. Install the recoil starter handle to the right side of the console.

ENGINE SERVICING (SINGLE CYLINDER)

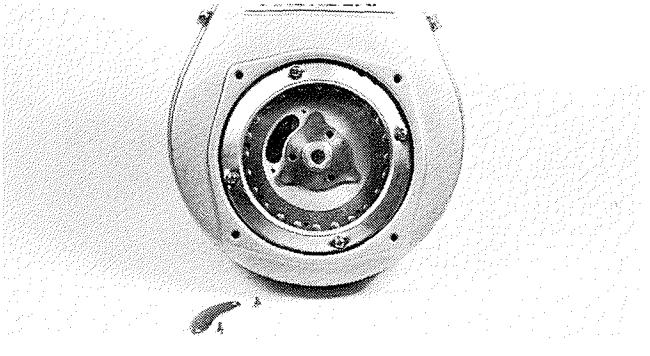
Timing (Single Cylinder)

1. Disconnect the spark plug lead wire and remove the spark plug from the cylinder head.

2. Disassemble the recoil starter from the engine by removing the four (4) bolts and lockwashers.

3. Remove the auxiliary starting pulley from the flywheel, using the holding tool (Arctic part number 0144-007).

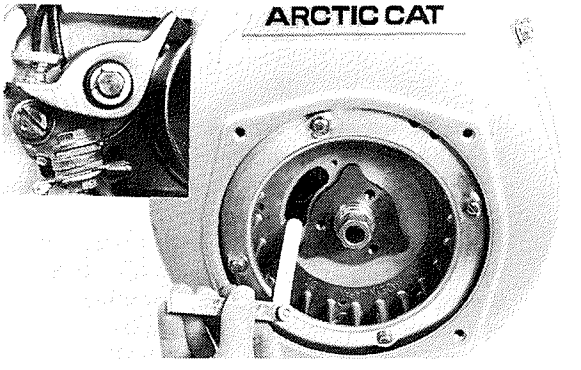
4. Remove the two screws and cover plate from the flywheel.



5. Inspect the condition of the breaker points; if pitted or burnt, replacement is necessary. **NOTE: Points may be resurfaced (cleaned) by inserting a piece of paper between the points and rubbing it against the contact surfaces. "SNAP ON Flex Stone" used in conjunction with spray cleaner may also be used to resurface the points.**

6. Rotate the crankshaft until the points are in a fully-open position.

7. Adjust the points to .014", using a screwdriver and feeler gauge. **NOTE: After the points are secured in position, recheck the point gap; tightening the screw may have altered the point gap.**



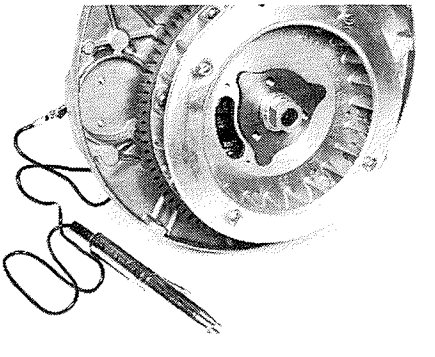
8. Check the timing, using a continuity light in conjunction with the Timing Mark Method (see step 9) or the Dial Indicator Method (see step 10).

TIMING MARK METHOD

9. Check the timing, using the timing marks on the flywheel and crankcase. Use the following procedure:

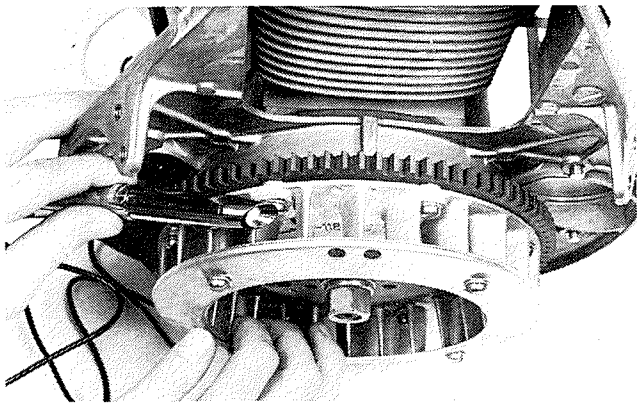
   A. Remove the cover housing.

   B. Connect one wire of the continuity light to the black wire running from the engine. Ground the other continuity light wire to the engine.

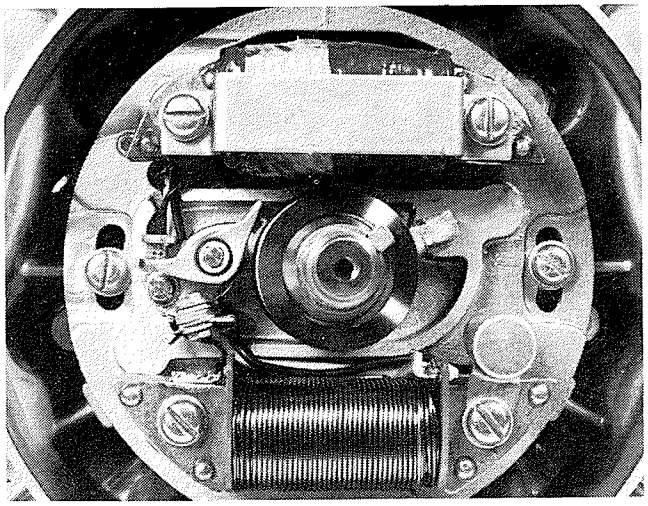


C. Rotate the flywheel 1/4 turn counterclockwise.

D. Slowly rotate the flywheel clockwise until the continuity light brightens. When the continuity light brightens, it indicates the firing moment of the engine. **NOTE: The "F" mark and the timing mark in the crankcase should now be aligned.**



E. If the timing marks are not aligned, loosen the two (2) stator plate retaining screws. When the "F" mark is positioned to the right of the crankcase timing mark, rotate the stator plate counterclockwise to advance the timing. When the "F" mark is positioned to the left of the timing mark in the crankcase, rotate the stator plate clockwise to retard the timing. **NOTE: The "F" mark and the timing mark in the crankcase should now be aligned.**



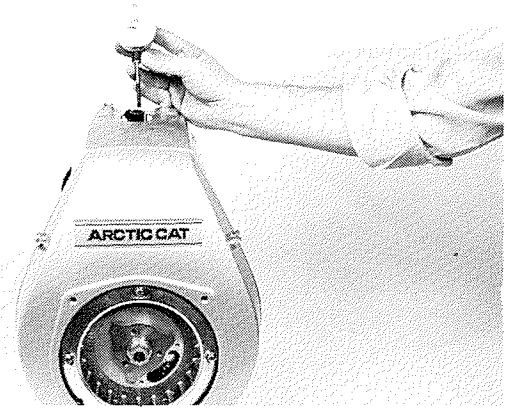
DIAL INDICATOR METHOD

10. To check the timing, using the dial indicator method, use the following procedure:

A. Perform steps 1 - 7.

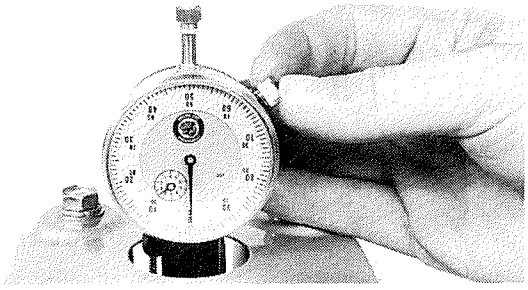
B. Rotate the crankshaft to position the piston at top dead center (TDC).

C. Install the dial indicator adapter into the spark plug hole. Place the dial indicator into the adapter. **NOTE: DO NOT LOCK INDICATOR INTO POSITION.**



D. Slowly rotate the crankshaft clockwise and counterclockwise to determine the exact point of needle reversal. At this point, lock the dial gauge in position by tightening the thumb screw.

E. Slowly rotate the crankshaft clockwise and counterclockwise to determine the point of needle reversal. At this point, set the movable dial face at 0.



F. Connect one (1) wire of the continuity light to the black wire running from the engine. Ground the other continuity light wire to the engine.