

SECTION X

TOOLS/PUBLICATIONS

Contents of this Section

Special Service Tools	1 – 1 <i>h</i>
Publications – Technical Service Training Material	2 – 3
Glossary	4 – 7



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Ski Alignment Bar

For spindle alignment primarily on IFS models

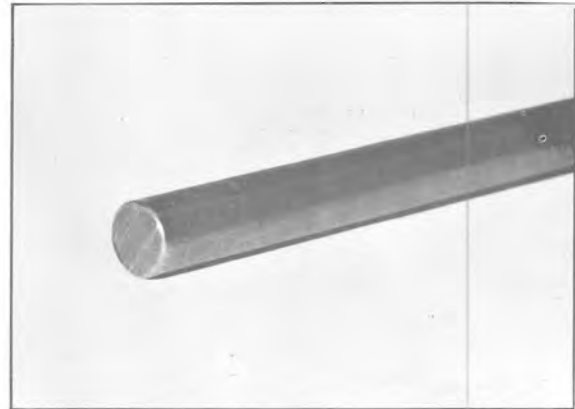
Alignment Bar Specifications:

Material: C-1018

Diameter: .623"-.625"

Length: 42"

Not available through Polaris



PN 2870335 – Multitester

Tests all electrical circuits and components



PN 2870459 – Ignition Timing Dial Indicator

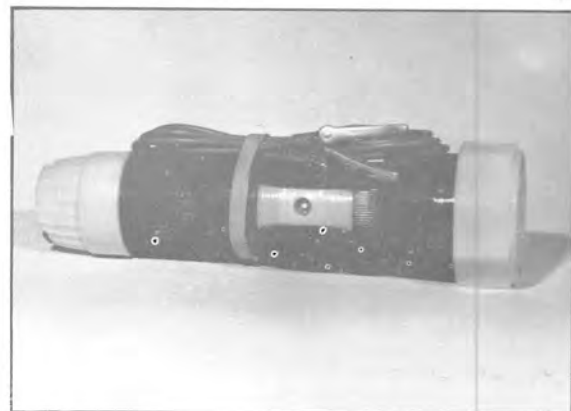
0 – 1" Range

Indicates piston BTDC position for timing all engines



PN 2870466 – Continuity Light

Checks electrical circuit continuity, breaker point timing and doubles as a flashlight



TOOLS/PUBLICATIONS

Special Service Tools

PN 2870422 – CDI Timing Fixture
Increases timing accuracy on EC34PT, EC44PT
1978 - 1980 TX, TX-C engines



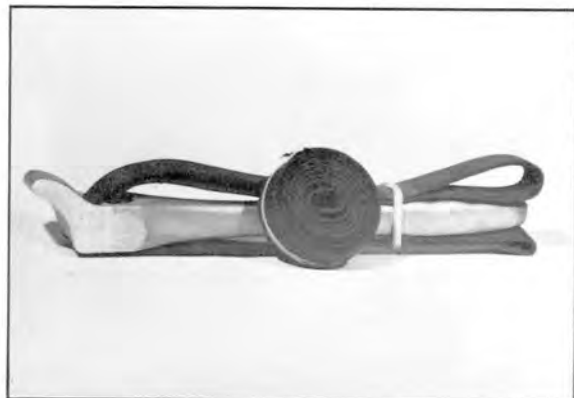
PN 2870159 – Flywheel Puller
Used on all models except those requiring the
2870477 puller listed below
PN 3080706 – Replacement Bolts



PN 2870477 – Flywheel Puller
Pulls flywheels on 34PT, 44PT 1978 - 1980 TX,
TX-C and all 34PL engines
PN 3080706 – Replacement Bolts

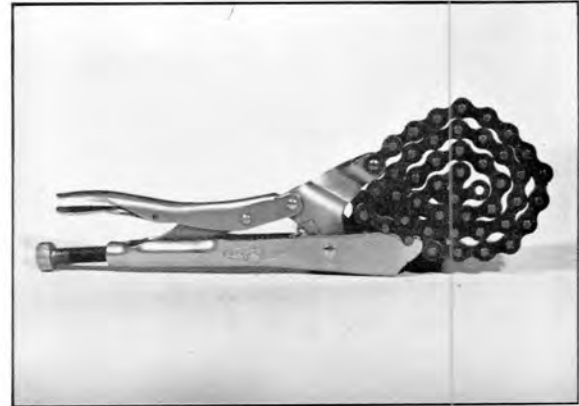


PN 2870336 – Strap Wrench
PN 2870389 – Replacement Strap
Aids in the removal and installation of flywheels,
drive clutches and other cylindrical objects which
need holding or turning



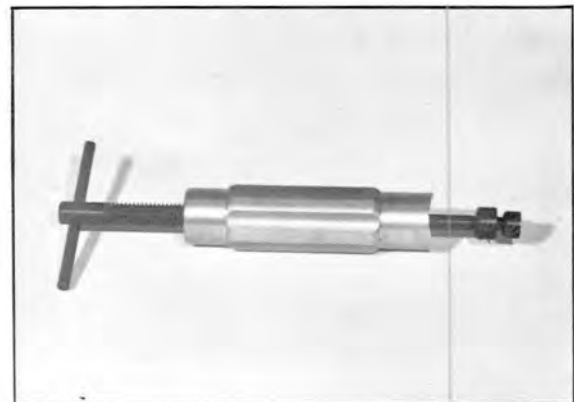
PN 2870203 – Chain Wrench

Holds flywheel puller on 3 cylinder engines and aids in removal and installation of drive clutches, etc.



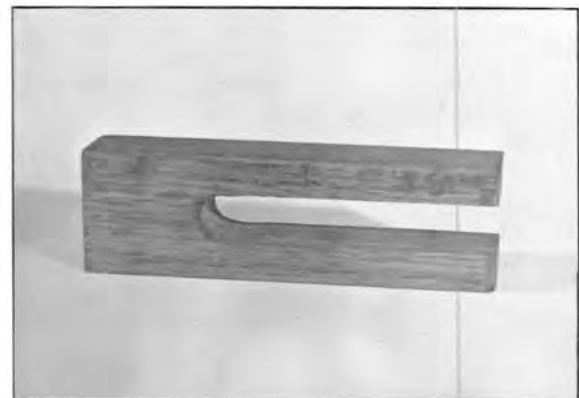
PN 2870386 – Piston Pin Puller

Removes piston pins on all engines



PN 2870390 – Piston Support Block

Supports piston and prevents piston skirt damage during cylinder installation on all engines



PN 2870303 – Ammco Model 3950 Cylinder Hone

Rigid cylinder hone for deglazing and truing heat distorted cylinders
1 7/8" – 2 3/4" Range



TOOLS/PUBLICATIONS

Special Service Tools

Replacement Ammco Hone Stone Sets

Cylinder Hone Stone Set Std. Fine (Ammco No. 3952) – PN 2870305

Cylinder Hone Stone Set Std. Coarse (Ammco No. 3951) – PN 2870304

Cylinder Hone Stone Set O.S. Fine (Ammco No. 3954) – PN 2870307

Cylinder Hone Stone Set O.S. Coarse (Ammco No. 3953) – PN 2870306

O.S. Stone Sets Range 2 1/2" – 3 3/8"



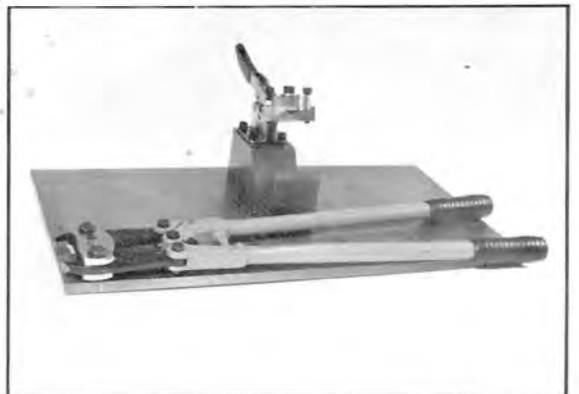
PN 2870588 – Ammco 3880 Honing Oil

Improves hone operation and prevents stone loading



PN 2870569 – Crankshaft Alignment Kit

Used for checking and straightening crankshafts on all Polaris engines



PN 2870509 – Uni-Syn Gauge

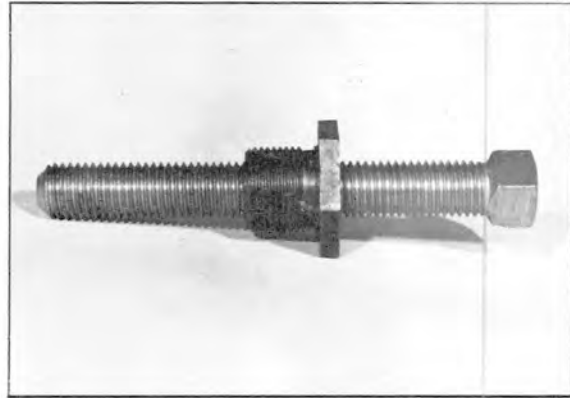
Used to synchronize carburetor air flow on multi carburetor engines



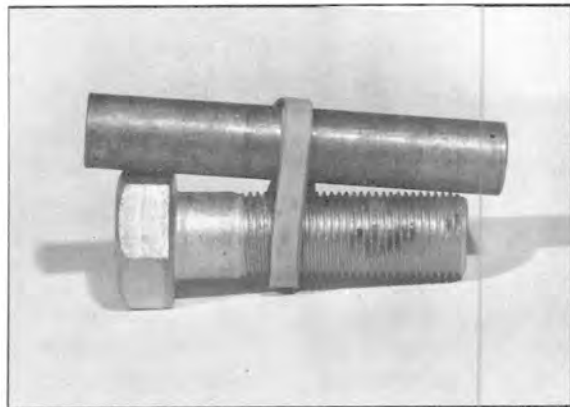
TOOLS/PUBLICATIONS

Special Service Tools

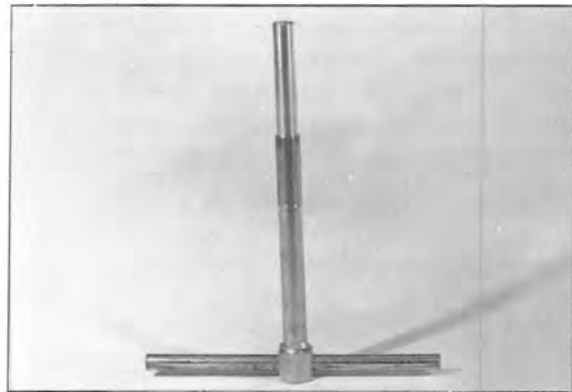
PN 2870030 – Steel Drive Clutch Puller
Removes all Polaris steel drive clutches from engines
1965-1971



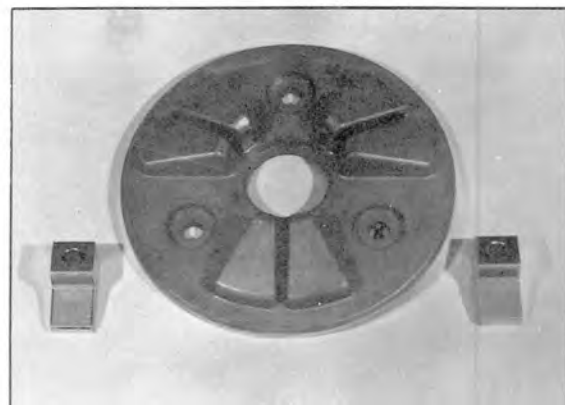
PN 2870130 – Aluminum Drive Clutch Puller
Removes all aluminum drive clutches from engines



PN 2870506 – T Handle Drive Clutch Puller
Quick aluminum drive clutch removal for most
models



PN 2870461 – Drive Clutch Holding Fixture
PN 2870547 – Electric Start Version
PN 5130518 – Replacement Holding Tabs
Used for disassembly of all aluminum drive clutches



TOOLS/PUBLICATIONS

Special Service Tools

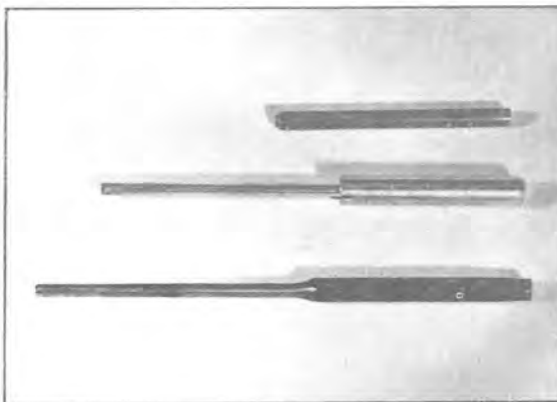
PN 2870338 — Drive Clutch Spider Nut Driver
For removal and installation of drive clutch spider
jam nut on high performance models



PN 2870341 — Spider Removal Tool
Fits all aluminum drive clutch spiders. For removal
and retorquing of spider



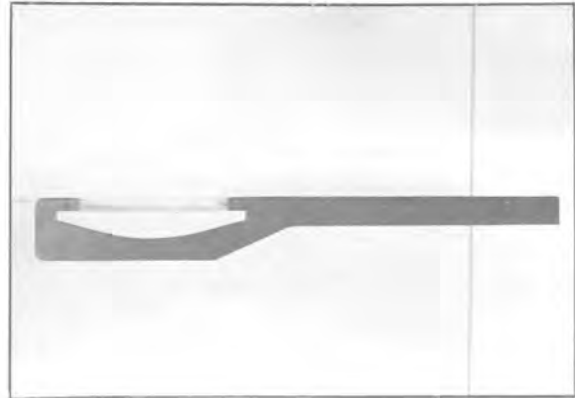
PN 2870401 — Spider Roller Centering Punch
PN 2870402 — Shift Weight Spring Pin Punch
PN 2870507 — Shift Weight / Roller Pin Punch



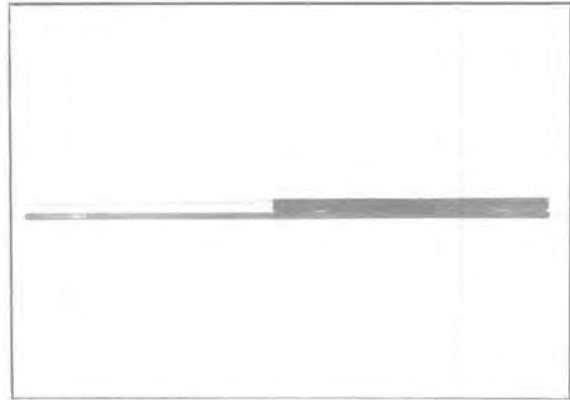
PN 2870310 — Roller Pin Gauge Block
Used during removal and installation of spider roller
pins in standard aluminum drive clutches



PN 2870426 – 5/8" Offset Clutch Alignment Tool
Establishes correct 5/8" drive/driven clutch offset and alignment



PN 2870161 – 9/16" Offset Clutch Alignment Tool
Establishes correct 9/16" drive/driven clutch offset and alignment



PN 2870576 – Drive Clutch Bore Tapered Reamer
Cleans up all drive clutch bore tapers to ensure proper fit to engine crankshaft



PN 2870399 – Jackshaft Alignment Tool
Ensures correct jackshaft bearing alignment during chaincase installation



TOOLS/PUBLICATIONS

Special Service Tools

PN 2870354 – Suspension Compression Tool

Assists with necessary compression of rear suspension springs and shocks to permit tunnel mounting bolt installation



PN 2870380 – IDL Track Clipping Tool

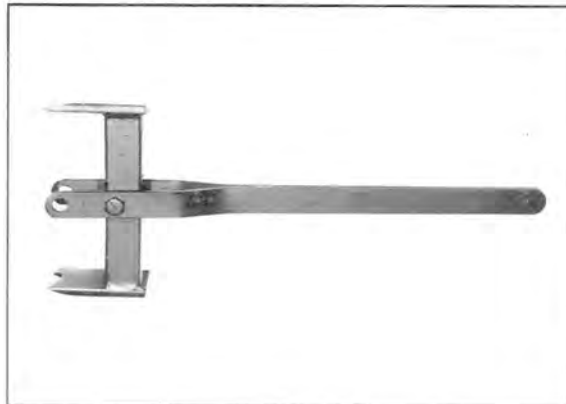
Used for installation of all rubber track clips

PN 7515461 – Replacement allen head guide bolt



PN 2870623 – Shock Absorber Spring Compression Tool

Tool



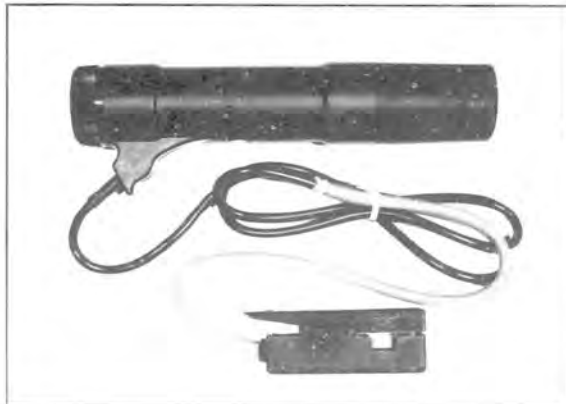
PN 2870630 – CDI Strobe Timing Light

High intensity strobe, works on all types of ignition systems including the difficult to time 3 cyls.

Self contained

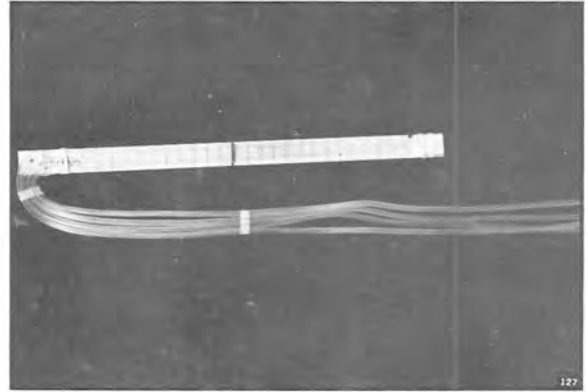
Requires no outside power source

(Two "D" cell batteries included)



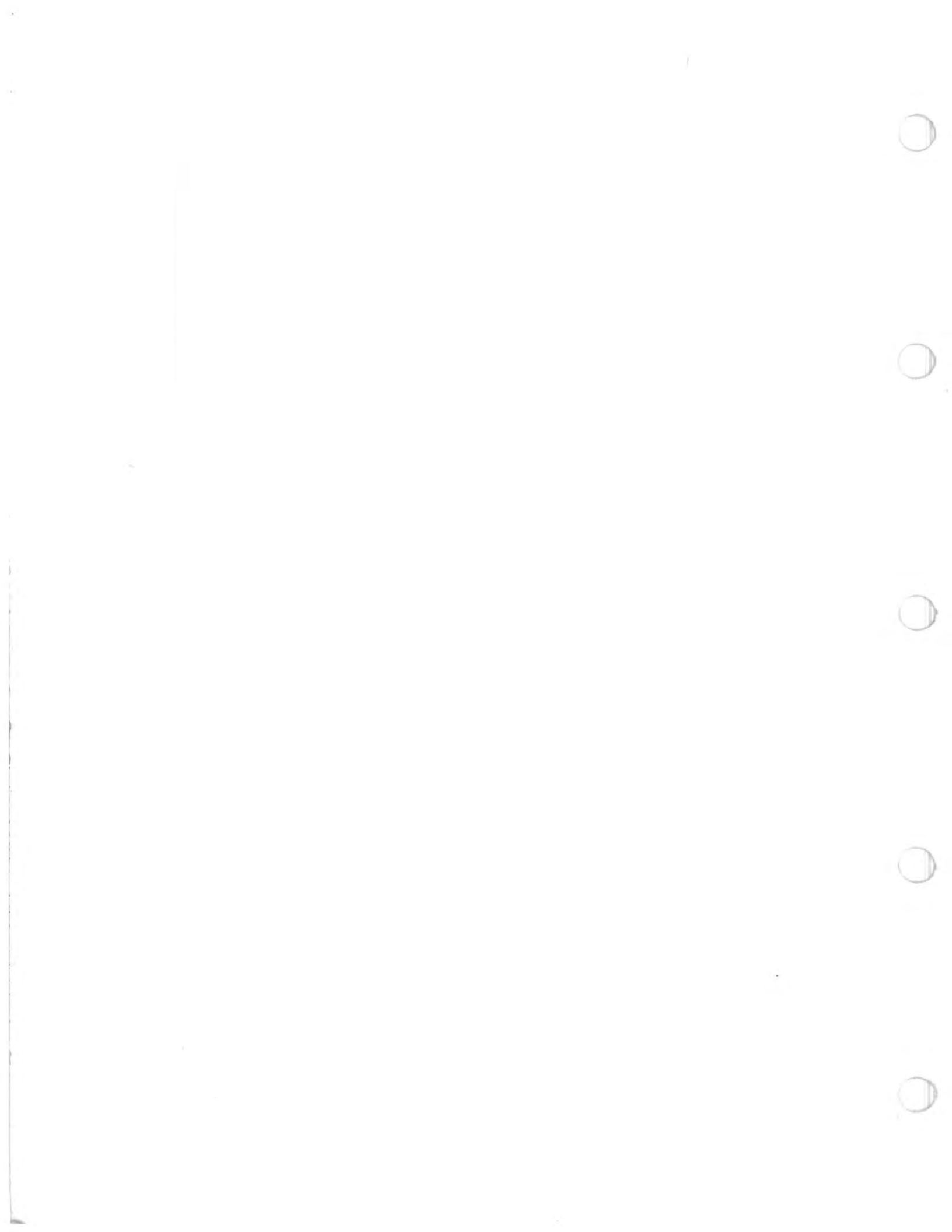
TOOLS/PUBLICATIONS
Technical Service Training Material

PN 2870672 – Carburetor Synchronizing Manometer
Accurate synchronization of multi carbureted engines
which are equipped with vacuum spigots



PN 2870702 – Transmission Seal/Bearing Driver
For installing bearings and case seals during trans-
mission gearcase overhaul





RECOMMENDED SHOP SUPPLIES/ACCESSORIES

<u>Description</u>	<u>Part Number</u>
Ammco 3880 Honing Oil	2870588
Chaincase Oil — One Gallon	2870464
Chaincase Oil Pump	2870465
Low Temp Grease — 14½ Oz. Cartridge	2870577
Clutch and Control Cable Lubricant	2870510
Fuel System Deicer (Isopropyl)	2870505
Loctite Primer T — 6 Oz. Aerosol	2870585
Loctite RC 680 — 10cc Retaining Compound	2870584
Loctite 515 Gasket Eliminator — 50cc Tube	2870587
Loctite/Chisel Gasket Remover — 18 Oz.	2870601
Metal Polish — 8 Oz.	2870632
Dot 5 Silicone Brake Fluid	2870381

TECHNICAL SERVICE PUBLICATIONS

<u>Part Number</u>	<u>Description</u>
9911269	1987 Master Repair Manual Update Packet — Includes all service information and specifications pertinent to the 1987 models. Individual pages are numbered by sections for placement into the Master Repair Manual
9911283	1987 Technical Service Data Wallcharts Packet
9911210	1987 Star, Sprint, Sprint ES Operators Manual
9911229	1987 Star Trak Operators Manual
9911227	1987 Long Track, Long Track Reverse Low Range Operators Manual
9911219	1987 Indy Trail, 400, 600 Operators Manual
9911281	1987 Indy Trail, 400 133—SKS Operators Manual Supplement
9911288	Serviceman's Handbook — Quick Reference Spec Book — 1968 — 1987

TOOLS/PUBLICATIONS

Publications

TECHNICAL SERVICE TRAINING MATERIAL

<u>Part Number</u>	<u>Description</u>
9911284	Polaris Master Repair Manual Reprint – Includes all service information and important specifications such as ignition, carburetion, clutch data, etc., from 1972 through 1987. Its looseleaf design enables additions and updates to be made on a continuing basis.
9911092	1986 Master Repair Manual Update Packet
9910948	1985 Master Repair Manual Update Packet
9910902	1984 Master Repair Manual Update Packet
9910431	Polaris Service Manual Binder – Contains all shop manuals from 1974 through 1978
9910432	Service and Information Bulletin Package – Complete set of recent service and information bulletins
9911285	150–Mile Initial Maintenance Inspection Forms (Package of 25)
9911286	1000–Mile Extended Maintenance Inspection Forms (Package of 25)
9911287	2000–Mile Extended Maintenance Inspection Forms (Package of 25)

OPERATORS MANUALS AND PART NUMBERS

9911076	1986 Star, Sprint, SS Operators Maintenance and Safety Manual
9911087	1986 Long Track Operators Maintenance and Safety Manual
9911082	1986 Indy Trail, 400, 600, 600 LE Operators Maintenance and Safety Manual
9910929	1985 Star – SS Operators Maintenance and Safety Manual
9910937	1985 Long Track Operators Maintenance and Safety Manual
9910938	1985 Indy Trail, 400, 600 Operators Maintenance and Safety Manual
9910837	1984 Star/SS
9910838	1984 Long Track
9910842	1984 Indy 600/Trail
9910836	1984 Indy 400
9910786	1983 Star, Sport, SS
9910787	1983 Gemini
9910788	1983 Indy Series
9910820	1983 Long Track
9910789	1983 French
9910752	1982 Cutlass SS Owners Manual
9910751	1982 TX-C Owners Manual
9910750	1982 TX-L Owners Manual
9910753	1982 TX-L Indy, Centurion Indy Owners Manual
9910765	1982 French Owners Manual
9910678	1981 Gemini Owners Manual
9910677	1981 Galaxy Owners Manual
9910681	1981 Cutlass, Cutlass SS Owners Manual

OWNERS MANUALS

Part Number	Description
9910680	1981 TX-C Owners Manual
9910679	1981 TX-L Owners Manual
9910682	1981 TX-L Indy, Centurion Indy Owners Manual
9910683	1981 French Gemini, Galaxy, Cutlass, Cutlass SS Owners Manual
9910684	1981 French TX-C, TX-L, TX-L Indy, Centurion Indy Owners Manual
9910607	1980 Gemini, Apollo Owners Manual
9910608	1980 Galaxy Owners Manual
9910609	1980 TX, TX-C Owners Manual
9910610	1980 TX-L, Centurion Owners Manual
9910611	1980 TX-L Indy Owners Manual
9910612	1980 French Gemini, Apollo, Galaxy Owners Manual
9910613	1980 French TX, TX-C, TX-L, Centurion, TX-L Indy Owners Manual
9910547	1979 Gemini, Apollo, Cobra Owners Manual
9910550	1979 TX Owners Manual
9910562	1979 TX-C Owners Manual
9910554	1979 TX-L, Centurion Owners Manual
9910555	1979 French Gemini, Apollo, Cobra Owners Manual
9910578	1979 French TX, TX-C, TX-L, Centurion Owners Manual
9910433	1978 Colt, S/S 340 Owners Manual
9910436	1978 Cobra Owners Manual
9910437	1978 TX Owners Manual
9910438	1978 TX-L Owners Manual
9910442	1978 French Owners Manual
9910394	1977 Colt, Colt SS, Electra Owners Manual
9910414	1977 TX Owners Manual
9910424	1977 TX-L Owners Manual
9910425	1977 French Owners Manual
9910333	1976 Colt, Colt SS, Electra Owners Manual
9910383	1976 TX Owners Manual
9910388	1976 Starfire Technical Owners Manual
9910375	1976 French Owners Manual
9910393	1976 French TX Owners Manual
9910293	1975 Colt, Colt SS, Electra, TX Owners Manual
9910264	1975 TC Owners Manual
9910344	1975 TX Modification Manual
9910346	1975 French Owners Manual
9910224	1974 Owners Manual
9910224	1974 French Owners Manual
9910163	1973 Owners Manual
9910163	1973 French Owners Manual
9910206	1973 TX Starfire Owners Technical Manual
9910130	1972 Owners Manual
9910130	1972 French Owners Manual

SHOP MANUALS

Part Number	Description
9910513	1978 Shop Manual
9910415	1977 Shop Manual
9910379	1976 Shop Manual
9910307	1975 Shop Manual
9910263	1975 TC Shop Manual
9910226	1974 Shop Manual
9910262	1974 TX Shop Manual Supplement
9910167	1973 Shop Manual

TOOLS/PUBLICATIONS

Glossary

Air Gap Spark Test:	A good check for ignition voltage and general ignition system condition. Spark should arc 3/8" minimum from end of high tension lead to ground (several testers are available)
Alternator:	Electrical generator producing voltage alternating current.
BTDC:	Before top dead center.
CDI:	Capacitor discharge ignition. Ignition system which stores voltage generated by the stator plate exciter coil in a capacitor or condenser (in CDI box). At the proper moment a voltage, generated by the stator plate pulser coil, closes an electronic switch (thyristor) in the CDI box and allows the voltage in the capacitor to discharge into the primary windings of the ignition coil.
Center Distance:	Distance between center of crankshaft and center of driven clutch shaft.
Chain Pitch:	Distance between chain link pins (No. 35 = 3/8"). Polaris measures chain length in number of pitches, i.e., Colt 250 uses 86 pitch chain.
Clutch Buttons:	Plastic bushings which transmit rotation of the clutch to the movable sheave in the drive and driven clutch.
Clutch Offset:	Drive and driven clutches are offset so that drive belt will stay nearly straight as it moves along the clutch face.
Clutch Weights:	Three levers in the drive clutch which, relative to their weight, profile, and engine RPM, cause the drive clutch to close.
Coil:	A winding of wire around an iron core which has the ability to generate an electrical current when a magnetic current passes through it.
Condenser/Capacitor:	A storage reservoir for electricity, used in both E.T. and CDI systems.
Crankshaft Run-Out:	Run-out or "bend" of crankshaft measured with a dial indicator while crankshaft is supported between centers on V blocks or resting in lower half of crankcase. Measure at various points especially at PTO (.006 maximum run-out is allowable).
Detonation:	The spontaneous ignition of the unburned fuel/air mixture after normal spark ignition. Piston looks "hammered" through, rough appearance around hole. Causes: 1) too high a compression ratio for the fuel octane; 2) low octane fuel; 3) over-advanced ignition timing.
Dial Bore Gauge:	A cylinder measuring instrument which uses a dial indicator. Good for showing taper and out-of-round in the cylinder bore.
E. T. Ignition:	Energy transfer ignition. Magneto type ignition system using an external ignition coil.
Effective Compression Ratio:	Compression ratio measured from after the piston closes the exhaust port.
Electrical Open:	(Open circuit) An electrical circuit which isn't complete. Example: Poor connections or broken wire at hi-lo beam switch. Result: No head lights.

Electrical Short:	(Short circuit) An electrical circuit which is completed before the current reaches the intended component. Example: A bare wire touching the snowmobile chassis under the seat. Result: No taillights or brake lights.
End Seals:	Rubber seals at each end of the crankshaft.
Engagement RPM:	Engine RPM at which the drive clutch engages to make contact with the drive belt.
Foot Pound:	Ft./lb. or lb./ft. A force of one pound at the end of a lever one foot in length, applied in a rotational direction.
g.:	Gram. Unit of weight in the metric system.
Head Volume:	Cylinder head capacity in cc, head removed from engine with spark plug installed.
Heat Exchanger:	A device used to transfer heat. The TX-L uses two heat exchangers mounted under the running boards. They, in turn, dissipate engine heat to the atmosphere.
Hi-fax:	The special slide material which fits onto the bottom of the suspension rails.
High Tension Wire:	The heavy insulated wire which carries the high secondary voltage from the coil to the spark plug.
Holed or Vented Piston:	Piston which a hole has formed on the dome. Causes: 1) detonation; 2) pre-ignition.
Ignition Coil:	A type of transformer which increases voltage in the primary windings (\sim 200 V) to a higher voltage in the secondary windings (\sim 14KV – 32KV) through induction. Secondary voltage is high enough to arc the air gap at the spark plug.
Ignition Generating Coil:	(Exciter coil, primary charge coil) Stator plate coil which generates primary ignition voltage. CDI system uses one ignition generating coil. Twin cylinder E.T. ignition systems use two ignition generating coils. Coil is mounted at the top of the stator plate.
Inch Pound:	12 in./lbs. = 1 ft./lb.
Kg/cm ² :	Kilograms per square centimeter.
Keystone Ring:	A piston ring with bevel on upper inside surface.
Kilogram/meter:	A force of one kilogram at the end of a lever one meter in length, applied in a rotational direction.
L Ring:	A wide face piston ring with an "L" shaped cross section. (Leg of "L" goes up when installing on piston.)
Labyrinth Seal:	A pressure-type center seal identified by series of grooves and lands. Polaris engines use this type of seal to separate the cylinders in the crankcase halves.
Lighting Coil:	Large coil mounted at the bottom of the stator plate. Generates voltage for lights, battery charging, etc.
mm:	Millimeter. Unit of length in the metric system. 1mm = .040"

TOOLS/PUBLICATIONS

Glossary

Magnetic Induction:	As a conductor; i.e., coil, is moved through a magnetic field, a voltage will be generated in the windings. This is how mechanical energy in our engines is converted to electrical energy in the lighting coil, ignition generating coils and trigger coil.
No. 1 Cylinder:	Cylinder on flywheel side of engine.
No. 2 Cylinder:	Cylinder on PTO side of engine.
Ohm:	(Ω) The unit of electrical resistance opposing current flow.
Piston Clearance:	Total distance between piston and cylinder wall.
Piston Erosion:	Piston dome melts. Usually occurs at the exhaust port area. Causes: Lean fuel/air mixture, improper spark plug heat range.
Pre-ignition:	A problem in combustion where the fuel/air mixture is ignited before normal spark ignition. Piston looks melted at area of damage. Causes: 1) too hot a spark plug; 2) spark plug not properly torqued; 3) "glowing" piece of head gasket, metal burr, or carbon in the combustion chamber; 4) lean fuel/air mixture.
Primary Circuit:	This circuit is responsible for the voltage build-up in the primary windings of the coil. Parts of this circuit include the exciter coil, points and condenser, wires from the stator plate to the small primary winding in the ignition coil. In the CDI system the parts include the exciter coil, the trigger coil, the wires from stator plate to CDI box and to the low resistance primary windings in the ignition coil.
Primary Clutch:	Drive clutch on engine.
Primary Compression:	Pressure built up in the crankcase of a two stroke engine.
psi.:	Pounds per square inch.
R & R:	Remove and replace.
RFI:	Radio frequency interference. Caused by high voltage from the ignition system. There are special plug caps and spark plugs to help eliminate this problem. (Required in Canada.)
RPM:	Revolutions per minute.
Resistance:	In the mechanical sense, friction or load. In the electrical sense, ohms. Both result in energy conversion to heat.
Right Side & Left Side:	Always referred to based on normal operating position of the driver.
Running Timing:	Ignition timing when fully advanced or at specified RPM.
Secondary Circuit:	This circuit consists of the large secondary coil windings, high tension wire and to ground through the spark plug air gap.
Secondary Clutch:	Driven clutch on chaincase or jackshaft.
Seized Piston:	Galling of the sides of a piston. Usually there is a transfer of aluminum from the piston onto the cylinder wall. Causes: 1) improper lubrication; 2) excessive temperatures; 3) insufficient piston clearance; 4) stuck piston rings.

Spark Plug Reach:	Length of thread portion on spark plug. Polaris uses 3/4" reach plugs.
Static Timing:	Ignition timing when engine is at zero RPM.
Stator Plate:	The plate mounted under the flywheel supporting the primary ignition components and lighting coil.
Surge Tank:	The fill tank in the liquid cooling system.
TDC:	Top dead center. Piston's most outward travel from crankshaft.
Transfer:	The movement of fuel/air from the crankcase to the combustion chamber in a two stroke engine.
Trigger Coil:	(Pulser coil) Generates the voltage for triggering (closing) the thyristor and timing the spark in CDI systems. Small coil mounted at the top of the stator plate next to the ignition generating coil.
ACV:	Alternating current voltage.
DCV:	Direct current voltage.
V Regulator:	Voltage regulator. Maintains maximum lighting coil output @ 14.5 ACV as engine RPM increases.
Venturi:	An area of air constriction. A venturi is used in carburetors to increase velocity pressure (speed up air flow) which decreases static pressure (lowers pressure in venturi to below atmospheric pressure) causing fuel to be pushed through jets, etc., and into the venturi to be mixed with air and form a combustible air/fuel mixture.
Volt:	The unit of measure for electrical pressure or electromotive force. Measured by a Voltmeter in parallel with the circuit.
Watt:	The unit of electrical power. $Watts = Amperes \times Volts$.

